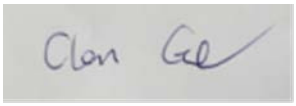
RF TEST REPORT

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

Report No.: FCC_RF_SL16040101-AER-001_UNII_Sector_Rev. 1.0
Supersede Report No.: NONE

Applicant	:	Aerohive Networks, Inc.
Product Name	:	Access Point
Model No.	:	AP245X
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	WBV-AP245
IC ID	:	7774A-AP245
Dates of test	:	05/12/2016 – 06/03/2016
Issue Date	:	06/16/2016
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:	
	
Rachana Khanduri	**Chen Ge**
Test Engineer	**Engineer Reviewer**
This test report may be reproduced in full only **Test result presented in this test report is applicable to the tested sample only**	

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

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

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL16040101-AER-001_UNII_Sector	None	Original	06/14/2016
FCC_RF_SL16040101-AER-001_UNII_Sector_Rev. 1.0	Rev. 1.0	Updated Internal Photos and Test Instruments information	06/16/2016

2 Executive Summary

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

Company: Aerohive Networks, Inc.
Product: Access Point
Model: AP245X

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	Aerohive Networks, Inc.
Applicant Address	1011 McCarthy Blvd, Milpitas, CA 95035, California, United States
Manufacturer Name	Aerohive Networks, Inc.
Manufacturer Address	1011 McCarthy Blvd, Milpitas, CA 95035, California, United States

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.	AP245X
Trade Name	Aerohive
Serial No.	N/A
Host Model No.	N/A
Input Power	100-240V, 50/60Hz
Power Adapter Manu/Model	Microsemi 9001GR
Power Adapter SN	C15336594000002605
Product Hardware version	1
Product Software version	HIVEOS 7.0r1
Radio Hardware version	1
Radio Software version	HIVEOS 7.0r1
Date of EUT received	05/07/2016
Equipment Class/ Category	DTS,UNII
Port/Connectors	PoE, Ethernet,USB

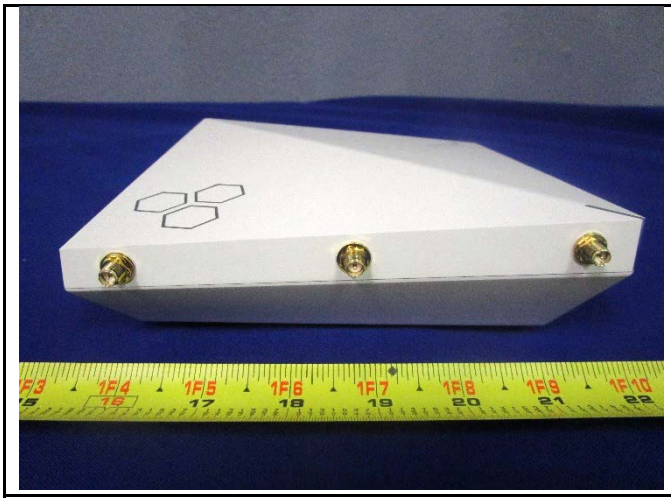
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5725-5825MHz	2412-2462MHz 5180-5240MHz 5240-5320MHz 5500-5700MHz 5725-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz	5210MHz, 5290MHz 5530MHZ, 5610MHz, 5690MHz,5775MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	11	11	22	11(2.4GHz) 22 (5GHz)	10(5GHz)	6 (5GHz)
Antenna Type	Sector Antenna					
Antenna Gain (Peak)	5.5 dBi (for 2.4GHz) 6 dBi (5GHz)					
Antenna Connector Type	U.FL connector					

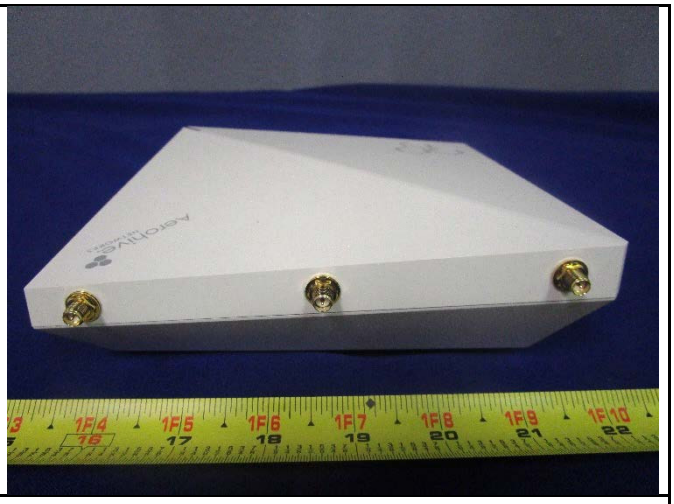
EUT Power Setting

Mode	Frequency	Power Setting
802.11-a	5180	88
802.11-a	5200	88
802.11-a	5240	88
802.11-n-20	5180	88
802.11-n-20	5200	88
802.11-n-20	5240	88
802.11-n-40	5190	88
802.11-n-40	5230	88
802.11-ac-80	5210	88
802.11-a	5745	88
802.11-a	5785	88
802.11-a	5825	88
802.11-n-20	5745	88
802.11-n-20	5785	88
802.11-n-20	5825	88
802.11-n-40	5755	88
802.11-n-40	5795	88
802.11-ac-80	5775	88

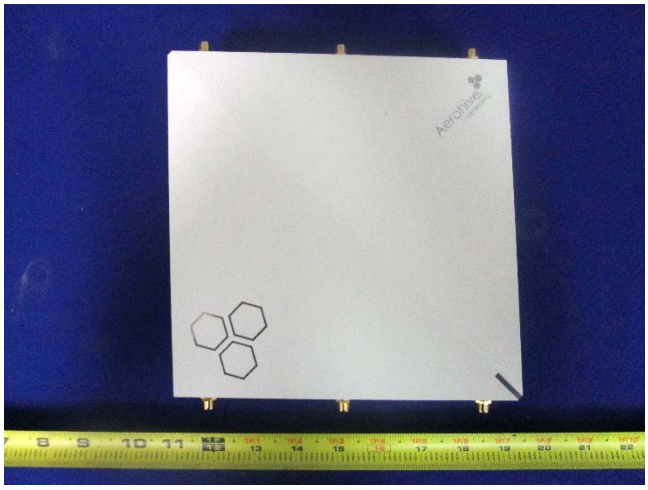
6.3 EUT Photos-External



EUT - Front View

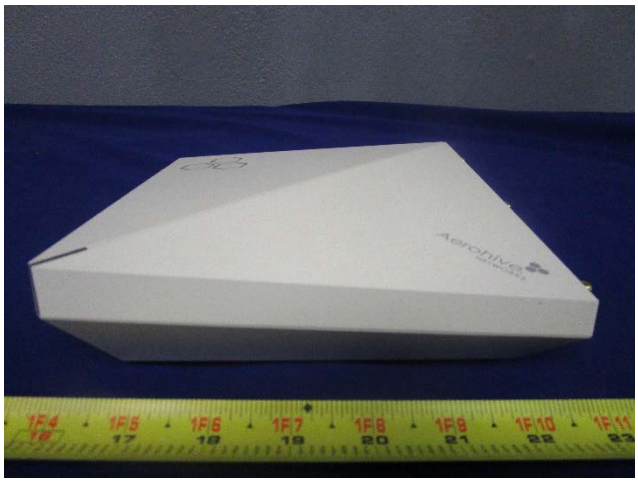


EUT – Rear View

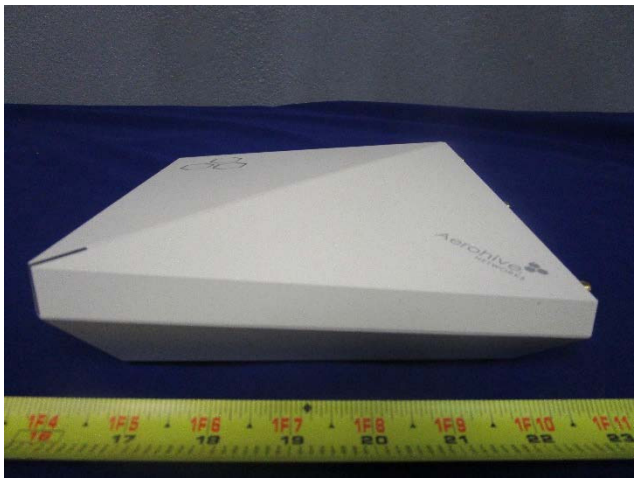


EUT - Top View

EUT – Bottom View



EUT – Left Side View



EUT – Right Side View

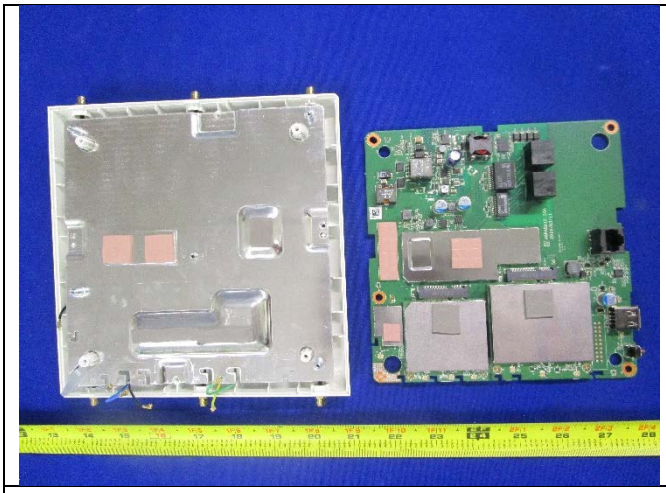
Antenna- Top View

Antenna – Bottom View

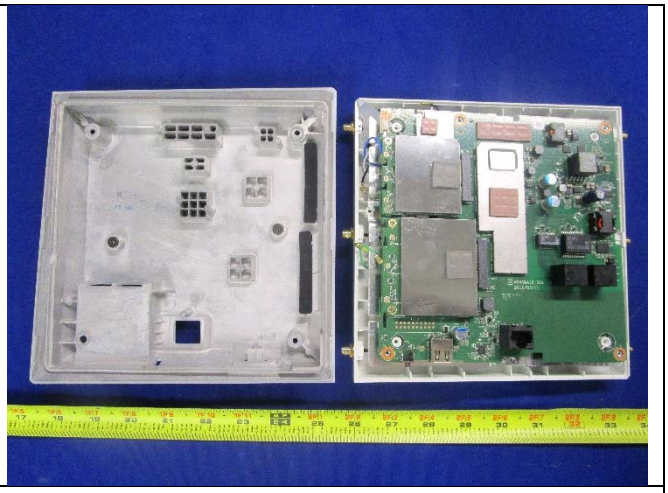
Support Equipment Power Supply Top View

Support Equipment Power Supply Bottom View

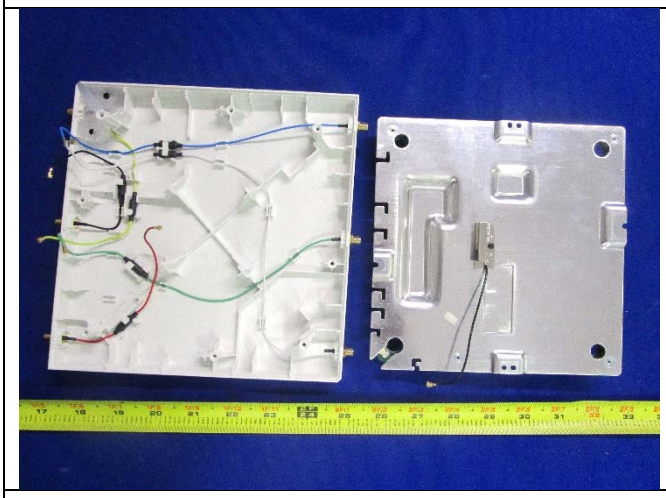
6.4 EUT Photos –Internal



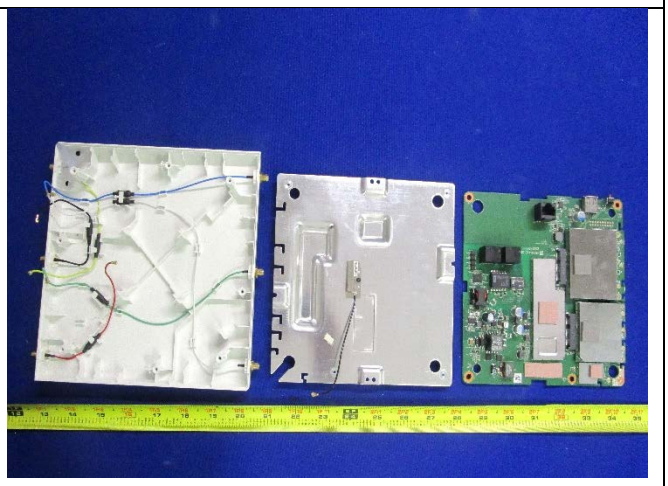
EUT: Cover Off View 1



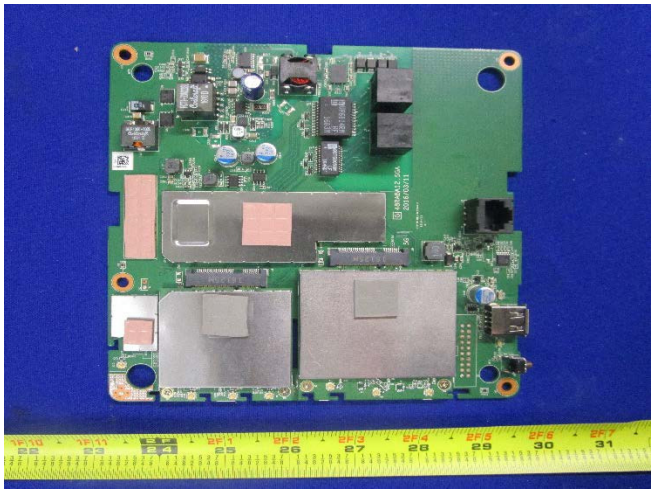
EUT: Cover Off View 2



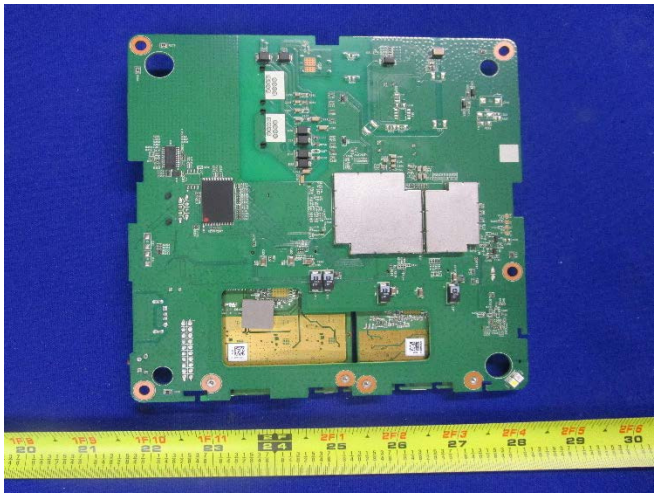
EUT: Cover Off View 3



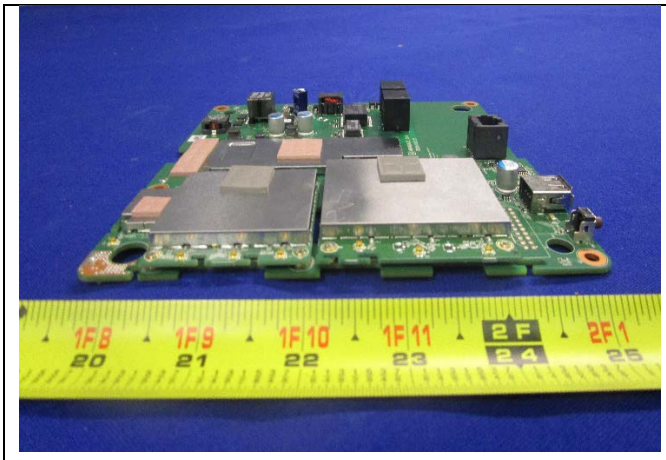
EUT: Cover Off View 4



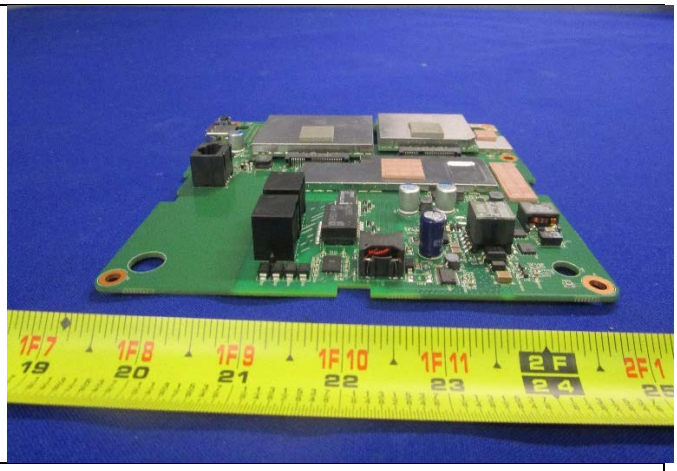
PCBA Top View



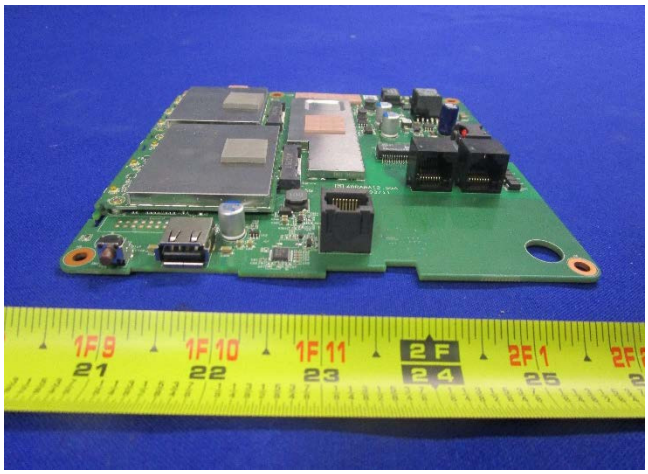
PCBA Bottom View



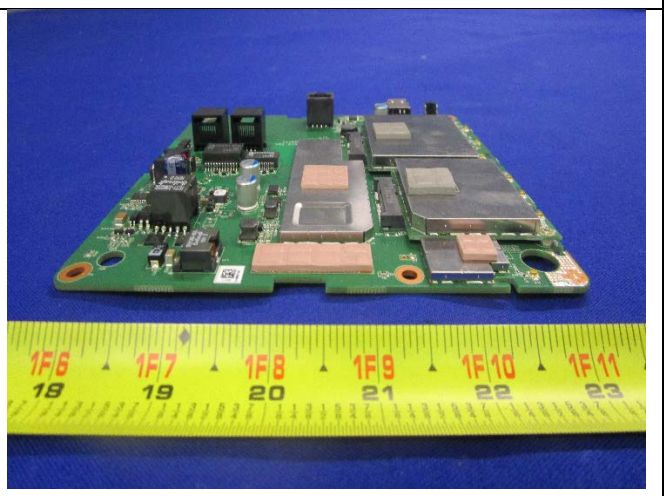
PCBA Front View



PCBA Rear View

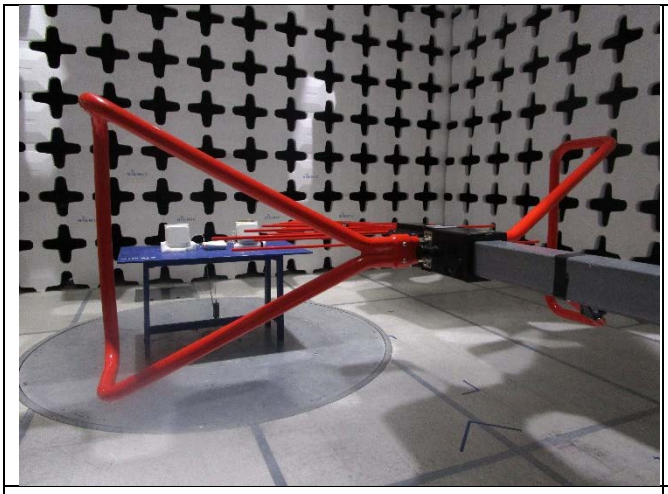


PCBA Left-Side View

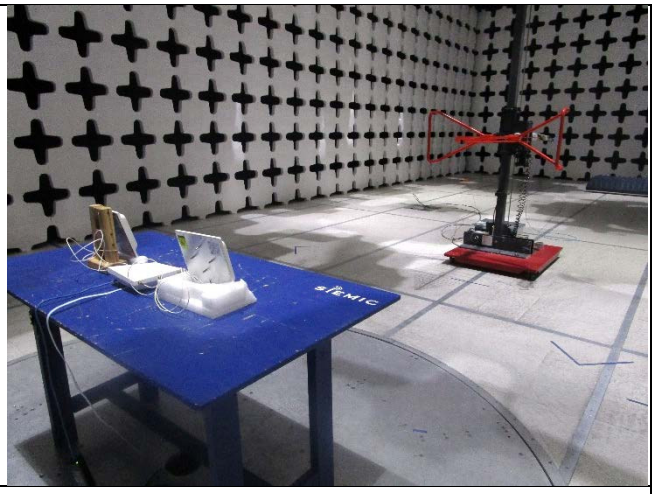


PCBA Right-Side View

6.5 EUT Test Setup Photos



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View

Radiated Emissions (>1GHz) – Front View

Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Latitude 3550	N/A	Dell	-

7.2 Cabling Description

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

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Tera Term	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 C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	☐ Pass ☒ N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☐ Pass ☒ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☐ Pass ☒ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☒ Pass ☐ N/A
Remark	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. 3. The device is operating at near 98% duty cycle.			
Note	Output Power, Power Spectral Density and Radiated Spurious Emission was tested for AP245X with Sector antenna. Please refer to FCC ID: WBV-AP245 for rest of the items.			

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 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	05/26/2016	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	21ºC 40% 1019mbar
Remark	Directional Gain = G_{ANT} + 10*log(N_{ANT}) dBi Antenna Gain (G_{ANT}) = 6dBi N_{ANT} = 3			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Rachana Khanduri* at *RF Test Site*.

Output Power measurement result for 5.2GHz

For Non-Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain 1	Chain 2	Chain 3	Combined Power		
Output power	802.11a	5180	Low	18.31	18.02	18.09	22.91	30	Pass
Output power	802.11a	5200	Mid	18.49	17.95	18.05	22.94	30	Pass
Output power	802.11a	5240	High	18.32	17.92	17.90	22.82	30	Pass
Output power	802.11n-20M	5180	Low	18.44	18.22	18.11	23.03	30	Pass
Output power	802.11n-20M	5200	Mid	18.36	18.09	18.07	22.95	30	Pass
Output power	802.11n-20M	5240	High	18.32	17.85	17.85	22.78	30	Pass
Output power	802.11n-40M	5190	Low	18.51	17.49	18.14	22.84	30	Pass
Output power	802.11n-40M	5230	High	18.37	17.30	18.15	22.74	30	Pass
Output power	802.11ac-80M	5210	-	17.76	19.04	21.40	24.44	30	Pass

For Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain 1	Chain 2	Chain 3	Combined Power		
Output power	802.11a	5180	Low	18.31	18.02	18.09	22.91	25.23	Pass
Output power	802.11a	5200	Mid	18.49	17.95	18.05	22.94	25.23	Pass
Output power	802.11a	5240	High	18.32	17.92	17.90	22.82	25.23	Pass
Output power	802.11n-20M	5180	Low	18.44	18.22	18.11	23.03	25.23	Pass
Output power	802.11n-20M	5200	Mid	18.36	18.09	18.07	22.95	25.23	Pass
Output power	802.11n-20M	5240	High	18.32	17.85	17.85	22.78	25.23	Pass
Output power	802.11n-40M	5190	Low	18.51	17.49	18.14	22.84	25.23	Pass
Output power	802.11n-40M	5230	High	18.37	17.30	18.15	22.74	25.23	Pass
Output power	802.11ac-80M	5210	-	17.76	19.04	21.40	24.44	25.23	Pass
Note	Directional Gain = 6 + 10* log(3) = 10.77dBi Directional Gain is greater than 6dBi. So, Limit = 30- 4.77 = 25.23dBm								

Output Power Measurement Results for 5.8GHz

For Non-Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain 1	Chain 2	Chain 3	Combined Power		
Output power	802.11a	5745	Low	18.25	17.70	18.46	22.92	30	Pass
Output power	802.11a	5785	Mid	18.20	17.64	18.50	22.90	30	Pass
Output power	802.11a	5825	High	18.35	17.56	18.48	22.92	30	Pass
Output power	802.11n-20M	5745	Low	18.39	17.68	18.46	22.96	30	Pass
Output power	802.11n-20M	5785	Mid	18.34	17.61	18.51	22.94	30	Pass
Output power	802.11n-20M	5825	High	18.25	17.6	18.40	22.87	30	Pass
Output power	802.11n-40M	5755	Low	18.34	17.81	18.62	23.04	30	Pass
Output power	802.11n-40M	5795	High	18.29	17.82	18.67	23.05	30	Pass
Output power	802.11ac-80M	5775	-	18.50	17.61	19.09	23.21	30	Pass

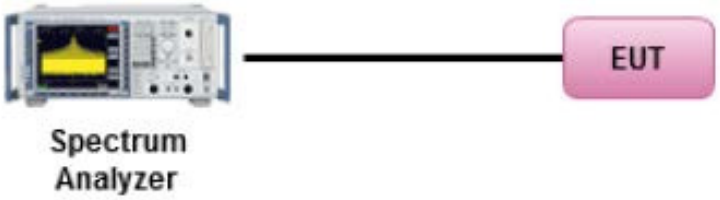
For Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain 1	Chain 2	Chain 3	Combined Power		
Output power	802.11a	5745	Low	18.25	17.70	18.46	22.92	25.23	Pass
Output power	802.11a	5785	Mid	18.20	17.64	18.50	22.90	25.23	Pass
Output power	802.11a	5825	High	18.35	17.56	18.48	22.92	25.23	Pass
Output power	802.11n-20M	5745	Low	18.39	17.68	18.46	22.96	25.23	Pass
Output power	802.11n-20M	5785	Mid	18.34	17.61	18.51	22.94	25.23	Pass
Output power	802.11n-20M	5825	High	18.25	17.60	18.40	22.87	25.23	Pass
Output power	802.11n-40M	5755	Low	18.34	17.81	18.62	23.04	25.23	Pass
Output power	802.11n-40M	5795	High	18.29	17.82	18.67	23.05	25.23	Pass
Output power	802.11ac-80M	5775	-	18.50	17.61	19.09	23.21	25.23	Pass
Note	Directional Gain = 6 + 10* log(3) = 10.77dBi Directional Gain is greater than 6dBi. So, Limit = 30- 4.77 = 25.23dBm								

10.2 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	05/26/2016	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22ºC 42% 1020mbar
Remark	Directional Gain = G_{ANT} + 10*log(N_{ANT}) dBi Antenna Gain (G_{ANT}) = 6dBi N_{ANT} = 3			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Rachana Khanduri* at *RF Test Site*.

PSD Measurement Results for 5.2GHz

For Non-Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)				Limit (dBm)	Result
				Chain 1	Chain 2	Chain 3	Combined PSD		
PSD	802.11a	5180	Low	6.95	6.24	6.26	11.27	17	Pass
PSD	802.11a	5200	Mid	6.63	6.12	6.34	11.14	17	Pass
PSD	802.11a	5240	High	6.38	6.11	6.20	11.00	17	Pass
PSD	802.11n-20	5180	Low	6.53	5.95	6.18	11.00	17	Pass
PSD	802.11n-20	5200	Mid	6.22	5.78	6.01	10.78	17	Pass
PSD	802.11n-20	5240	High	6.03	5.54	5.82	10.57	17	Pass
PSD	802.11n-40	5190	Low	3.34	2.15	3.24	7.72	17	Pass
PSD	802.11n-40	5230	High	3.49	1.99	2.84	7.59	17	Pass
PSD	802.11ac-80	5210	-	0.58	1.68	3.79	7.00	17	Pass

For Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)				Limit (dBm/MHz)	Result
				Chain 1	Chain 2	Chain 3	Combined PSD		
PSD	802.11a	5180	Low	6.95	6.24	6.26	11.27	12.23	Pass
PSD	802.11a	5200	Mid	6.63	6.12	6.34	11.14	12.23	Pass
PSD	802.11a	5240	High	6.38	6.11	6.20	11.00	12.23	Pass
PSD	802.11n-20	5180	Low	6.53	5.95	6.18	11.00	12.23	Pass
PSD	802.11n-20	5200	Mid	6.22	5.78	6.01	10.78	12.23	Pass
PSD	802.11n-20	5240	High	6.03	5.54	5.82	10.57	12.23	Pass
PSD	802.11n-40	5190	Low	3.34	2.15	3.24	7.72	12.23	Pass
PSD	802.11n-40	5230	High	3.49	1.99	2.84	7.59	12.23	Pass
PSD	802.11ac-80	5210	-	0.58	1.68	3.79	7.00	12.23	Pass
Note	Directional Gain = 6 + 10* log(3) = 10.77dBi Directional Gain is greater than 6dBi. So, Limit = 17- 4.77 = 12.23dBm/MHz								

PSD Measurement Results for 5.8GHz

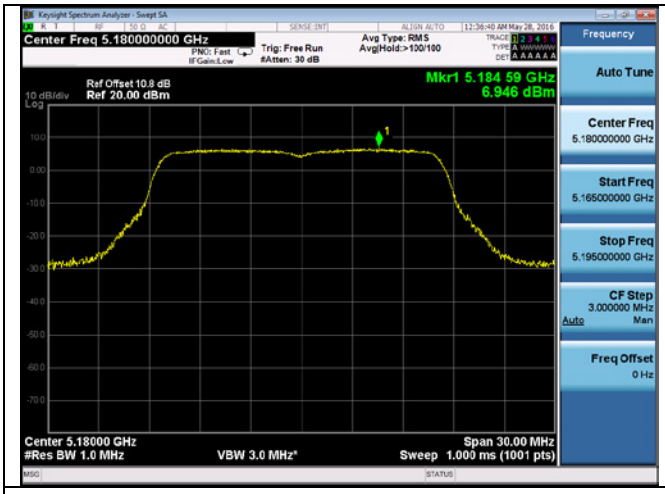
For Non-Beamforming

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)				Correction Factor (dB)	Combined PSD (dBm/500 kHz)	Limit (dBm/ 500kHz)	Result
				Chain 1	Chain 2	Chain 3	Combined				
PSD	802.11a	5745	Low	-3.28	-3.45	-3.07	1.51	6.99	8.50	30	Pass
PSD	802.11a	5785	Mid	-2.84	-3.44	-2.92	1.71	6.99	8.70	30	Pass
PSD	802.11a	5825	High	-2.83	-3.75	-2.69	1.71	6.99	8.70	30	Pass
PSD	802.11n-20	5745	Low	-3.82	-4.03	-3.05	1.56	6.99	8.55	30	Pass
PSD	802.11n-20	5785	Mid	-3.30	-3.70	-3.11	1.41	6.99	8.40	30	Pass
PSD	802.11n-20	5825	High	-3.18	-3.71	-2.78	1.56	6.99	8.55	30	Pass
PSD	802.11n-40	5755	Low	-6.63	-6.82	-5.88	-1.65	6.99	5.34	30	Pass
PSD	802.11n-40	5795	High	-6.71	-6.90	-5.58	-1.58	6.99	5.41	30	Pass
PSD	802.11ac-80	5775	Mid	-9.25	-10.03	-8.66	-4.51	6.99	2.48	30	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.										

For Beamforming

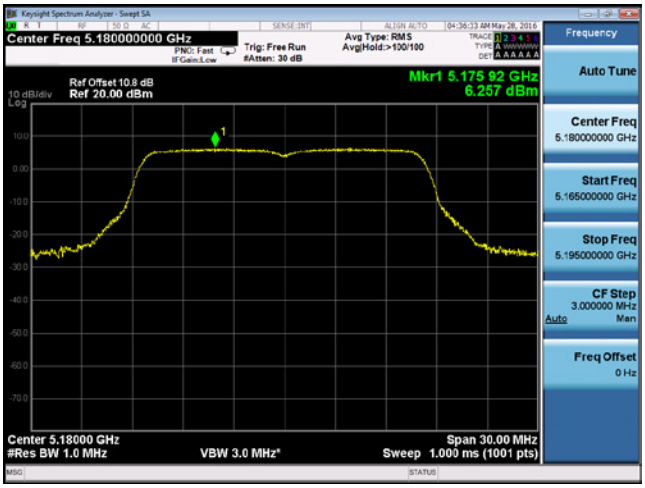
Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100kHz)				Correction Factor (dB)	Combined PSD (dBm/500 kHz)	Limit (dBm/ 500kHz)	Result
				Chain 1	Chain 2	Chain 3	Combined				
PSD	802.11a	5745	Low	-3.28	-3.45	-3.07	1.51	6.99	8.50	25.23	Pass
PSD	802.11a	5785	Mid	-2.84	-3.44	-2.92	1.71	6.99	8.70	25.23	Pass
PSD	802.11a	5825	High	-2.83	-3.75	-2.69	1.71	6.99	8.70	25.23	Pass
PSD	802.11n-20	5745	Low	-3.82	-4.03	-3.05	1.56	6.99	8.55	25.23	Pass
PSD	802.11n-20	5785	Mid	-3.30	-3.70	-3.11	1.41	6.99	8.40	25.23	Pass
PSD	802.11n-20	5825	High	-3.18	-3.71	-2.78	1.56	6.99	8.55	25.23	Pass
PSD	802.11n-40	5755	Low	-6.63	-6.82	-5.88	-1.65	6.99	5.34	25.23	Pass
PSD	802.11n-40	5795	High	-6.71	-6.90	-5.58	-1.58	6.99	5.41	25.23	Pass
PSD	802.11ac-80	5775	Mid	-9.25	-10.03	-8.66	-4.51	6.99	2.48	25.23	Pass
Note	BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test.										
Remark	Directional Gain = 6 + 10* log(3) = 10.77dBi Directional Gain is greater than 6dBi. So, Limit = 30- 4.77 = 25.23dBm/500kHz										

Test Plots

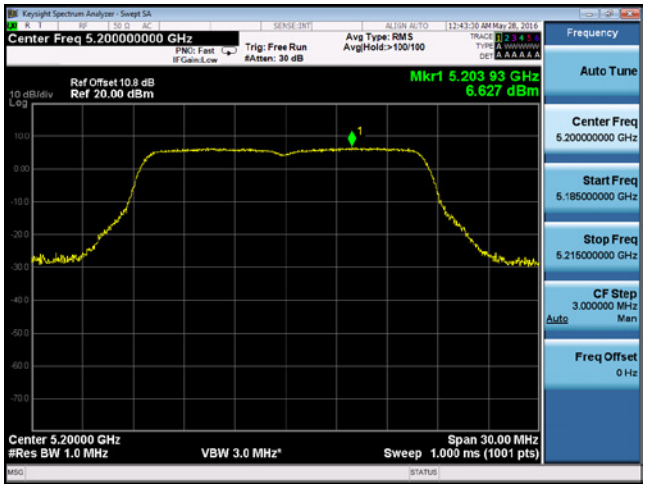


PSD-802.11a-5180M-chain1

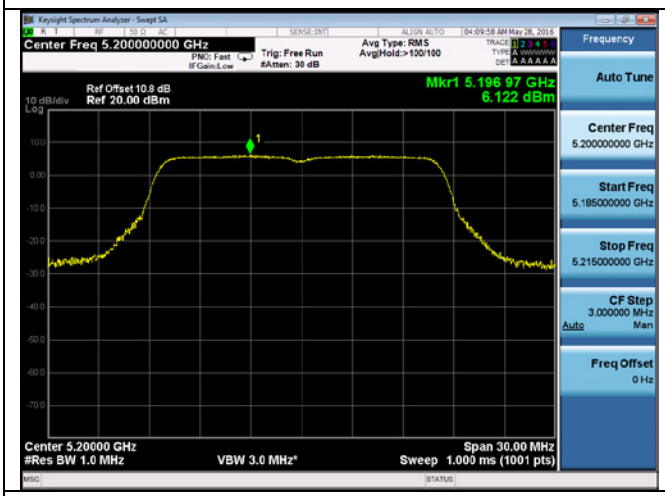
PSD-802.11a-5180M-chain2



PSD-802.11a-5180M-chain3

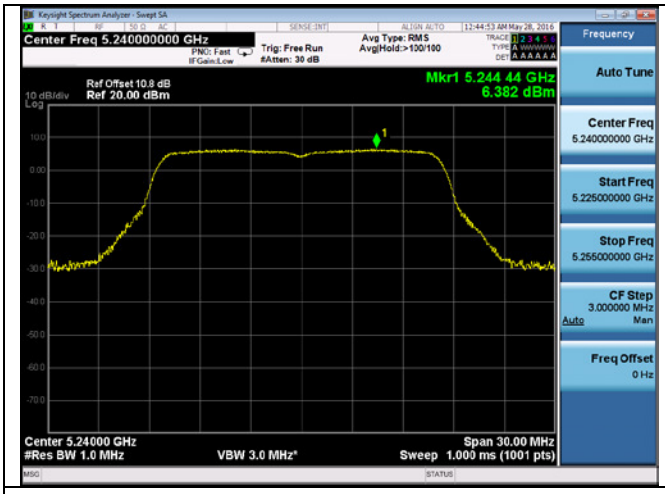


PSD-802.11a-5200M-chain1

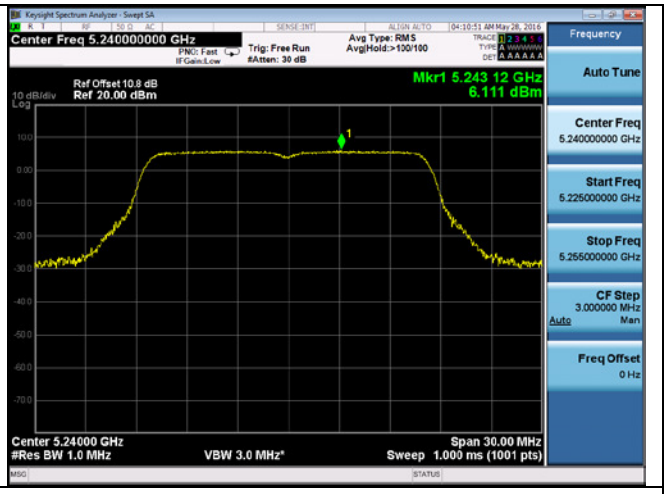


PSD-802.11a-5200M-chain2

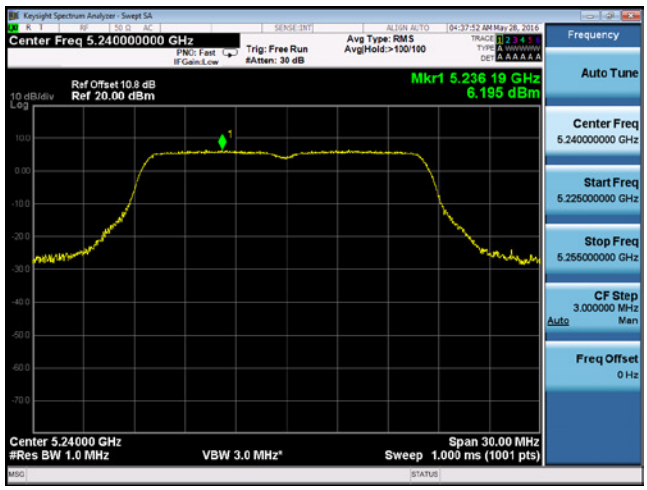
PSD-802.11a-5200M-chain3



PSD-802.11a-5240M-chain1

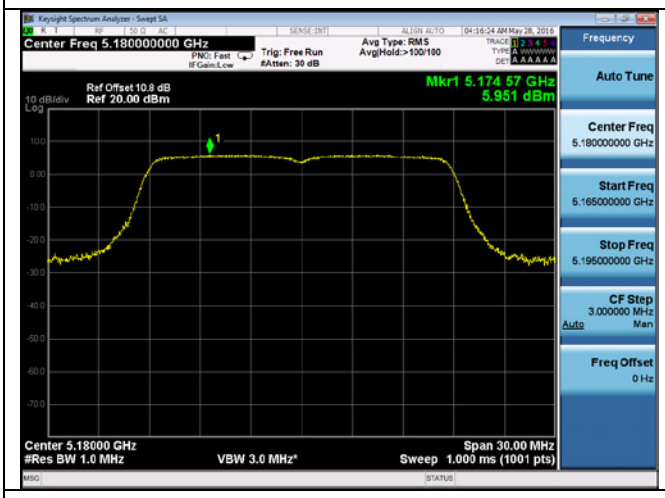


PSD-802.11a-5240M-chain2



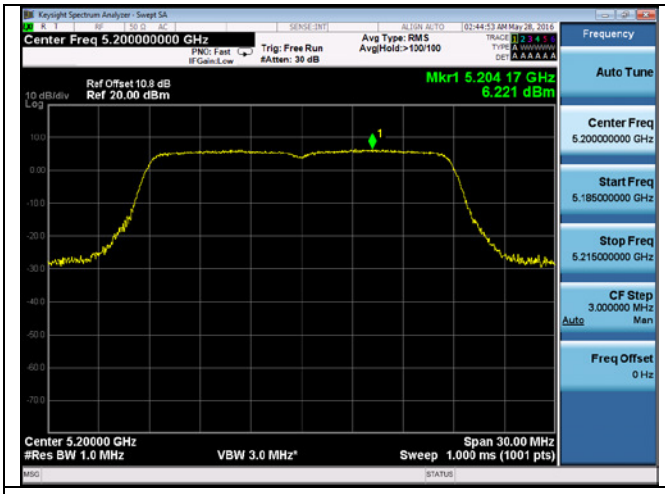
PSD-802.11a-5240M-chain3

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

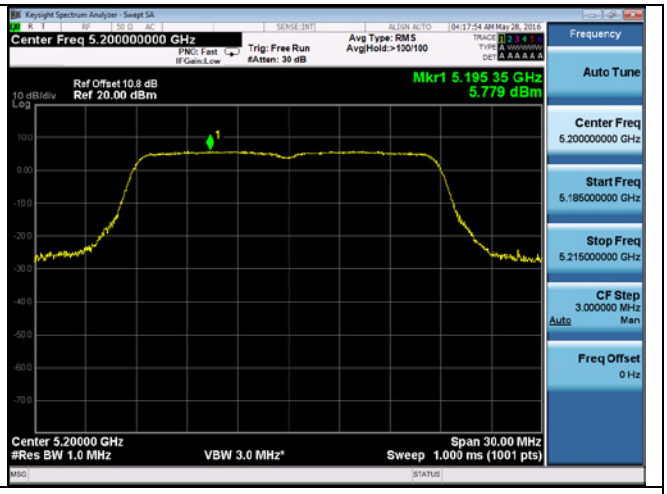


PSD-802.11n-20M -5180M-chain2

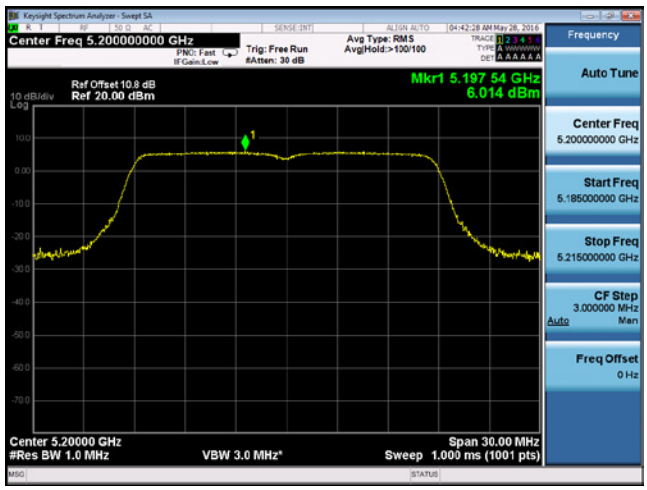
PSD-802.11n-20M -5180M-chain3



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

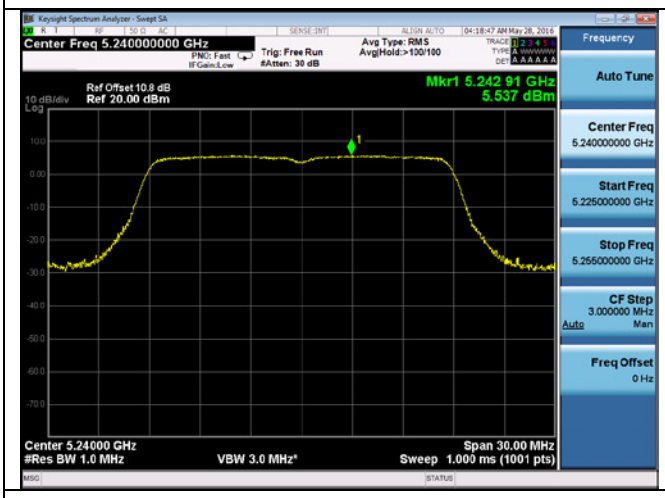


PSD-802.11n-20M-5200M-chain2



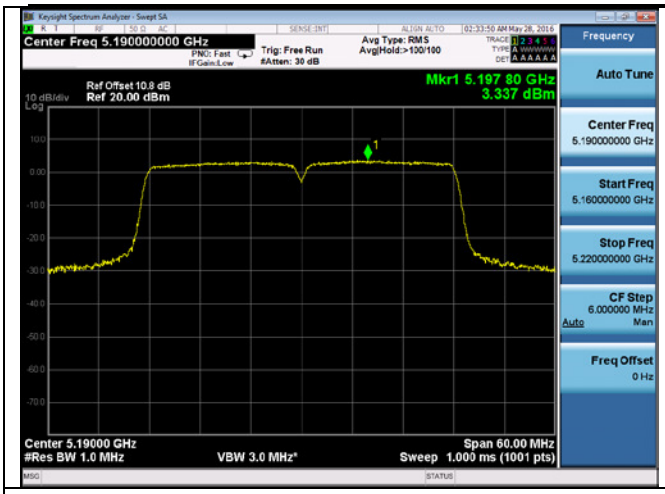
PSD-802.11n-20M-5200M-chain3

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

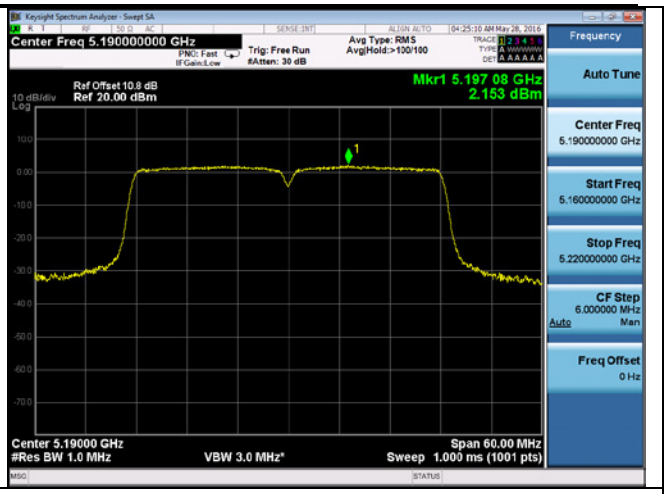


PSD-802.11n-20M-5240M-chain2

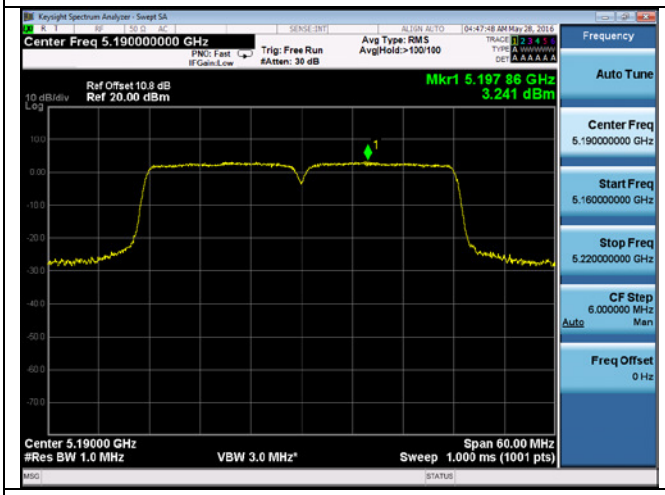
PSD-802.11n-20M-5240M-chain3



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

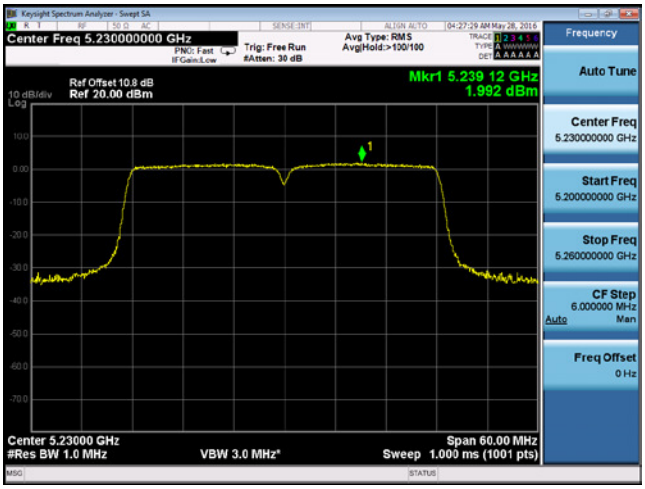


PSD-802.11n-40M-5190M-chain2

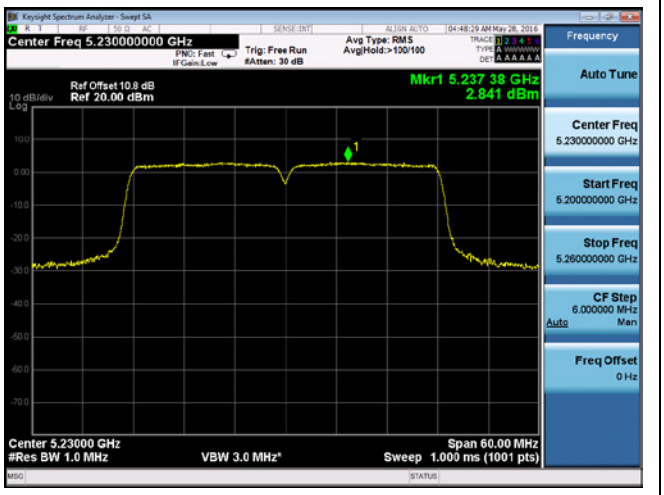


PSD-802.11n-40M-5190M-chain3

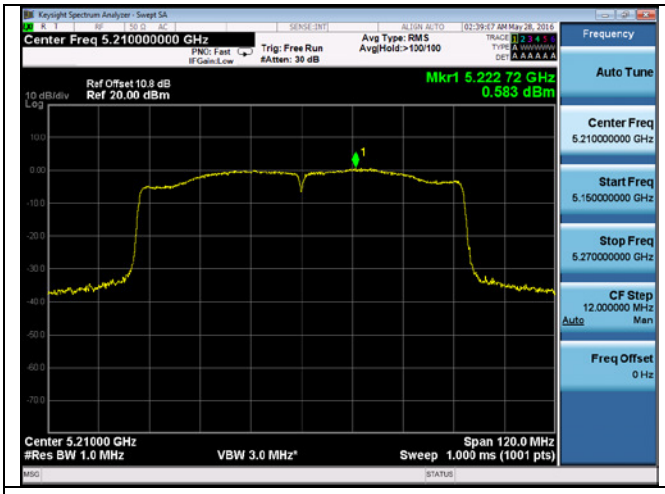
PSD-802.11n-40M-5230M-chain1



PSD-802.11n-40M-5230M-chain2

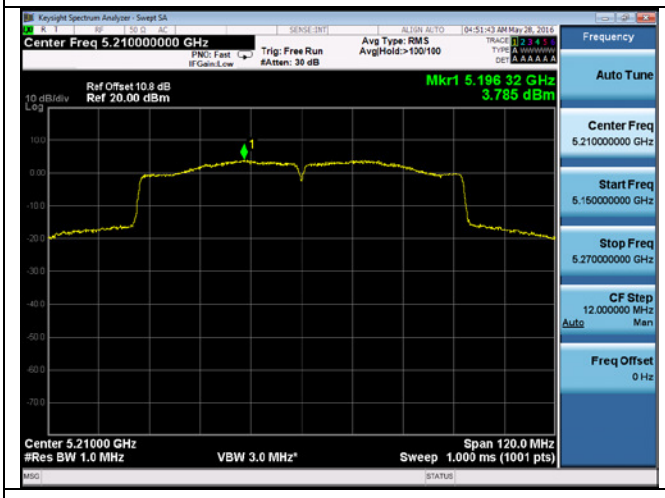


PSD-802.11n-40M-5230M-chain3

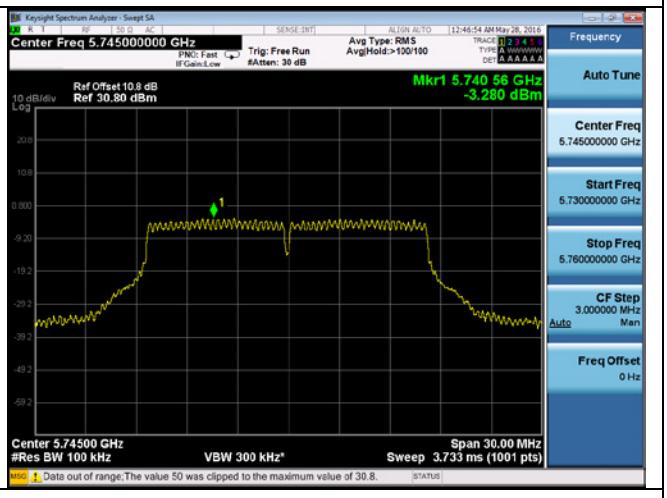


PSD-802.11ac-80M-5210M-chain1

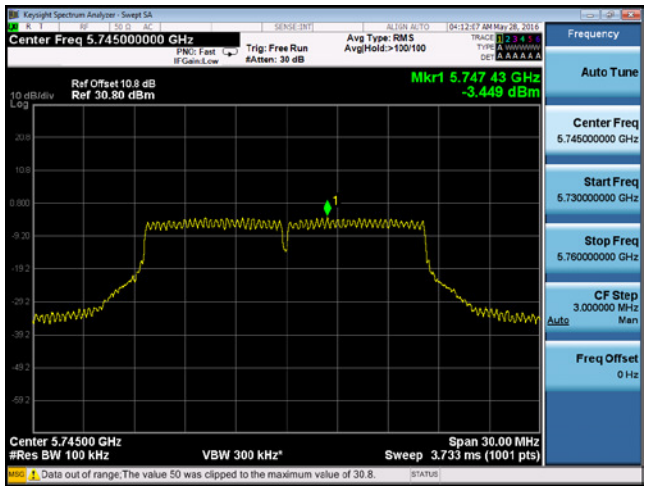
PSD-802.11ac-80M-5210M-chain2



PSD-802.11ac-80M-5210M-chain3

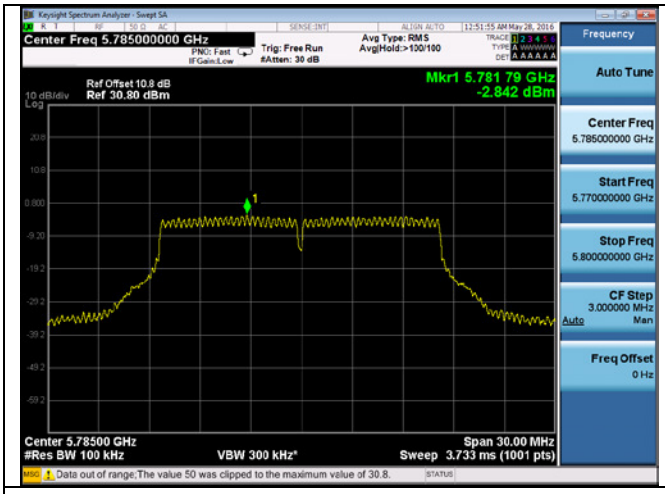


PSD-802.11a-5745M-chain1

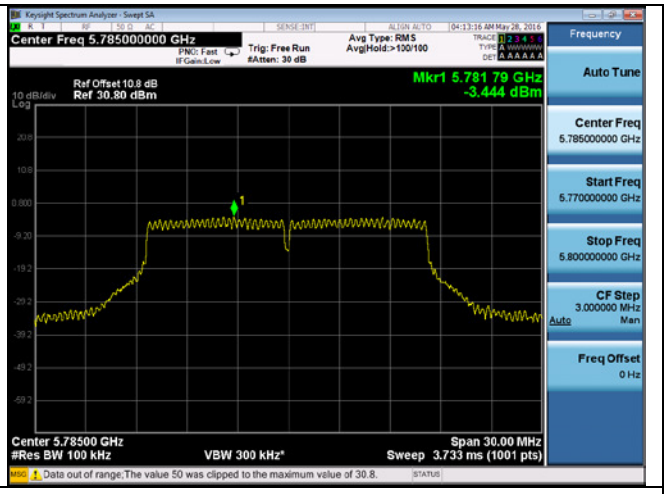


PSD-802.11a-5745M-chain2

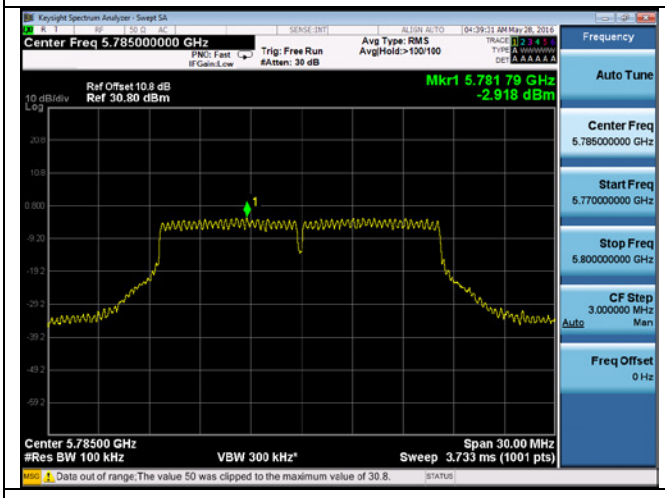
PSD-802.11a-5745M-chain3



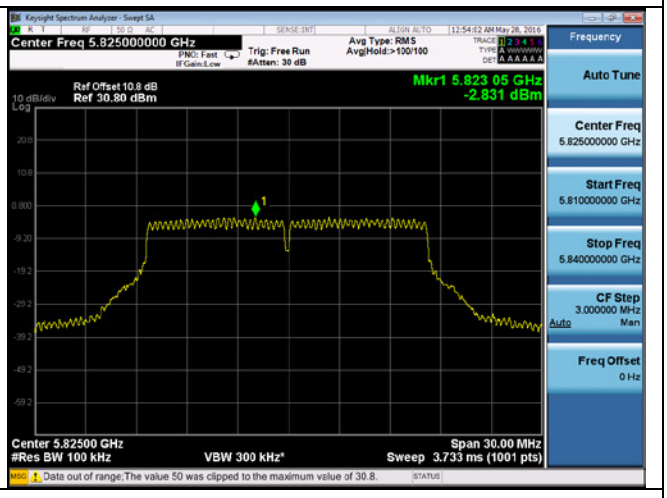
PSD-802.11a-5785M-chain1



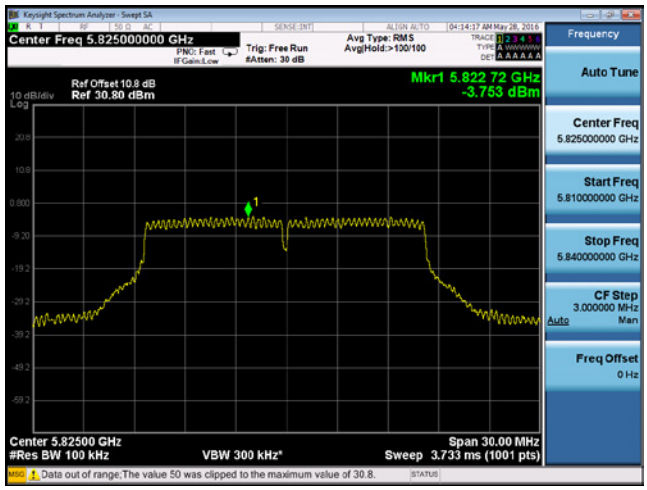
PSD-802.11a-5785M-chain2



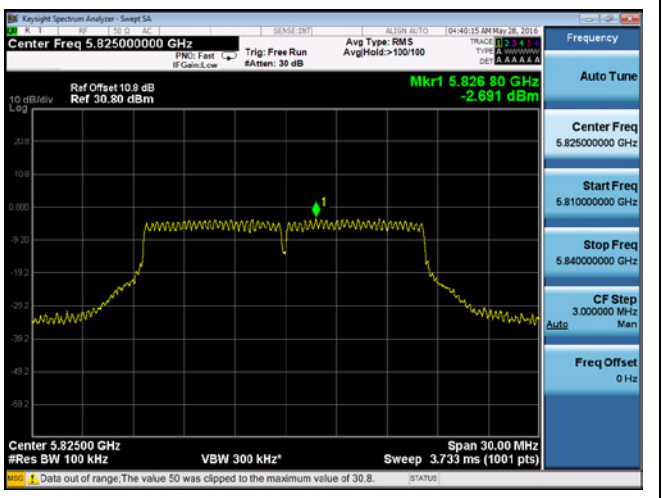
PSD-802.11a-5785M-chain3



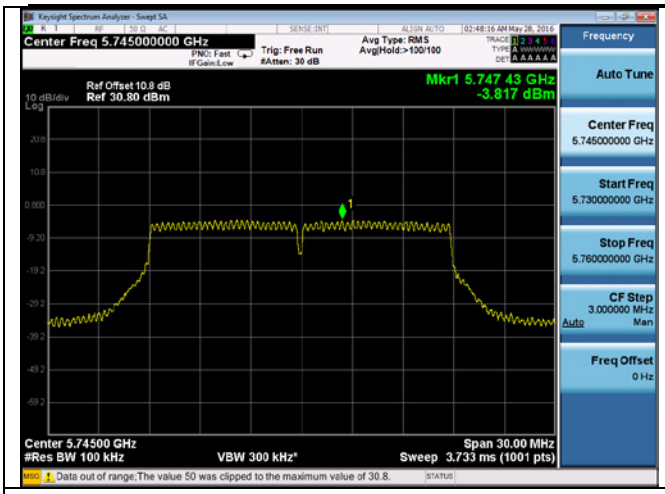
PSD-802.11a-5825M-chain1



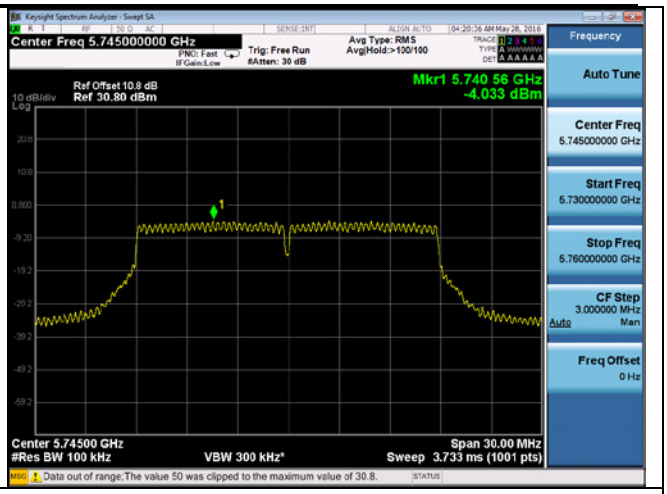
PSD-802.11a-5825M-chain2



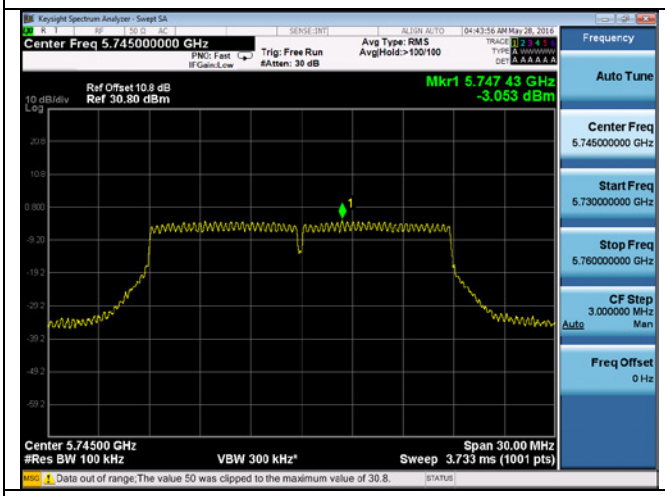
PSD-802.11a-5825M-chain3



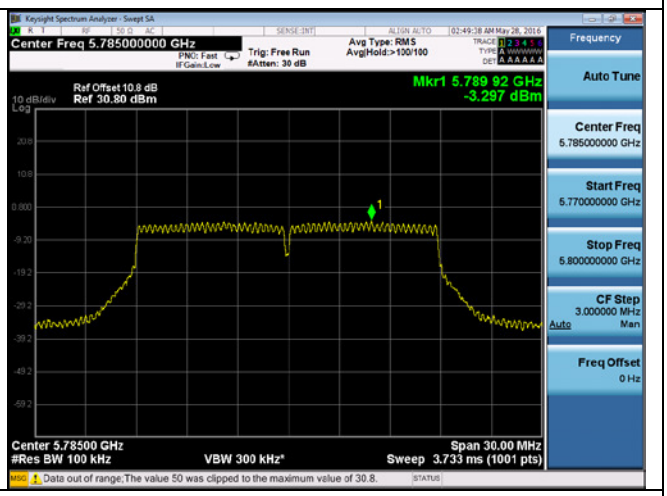
PSD-802.11n-20-5745M-chain1



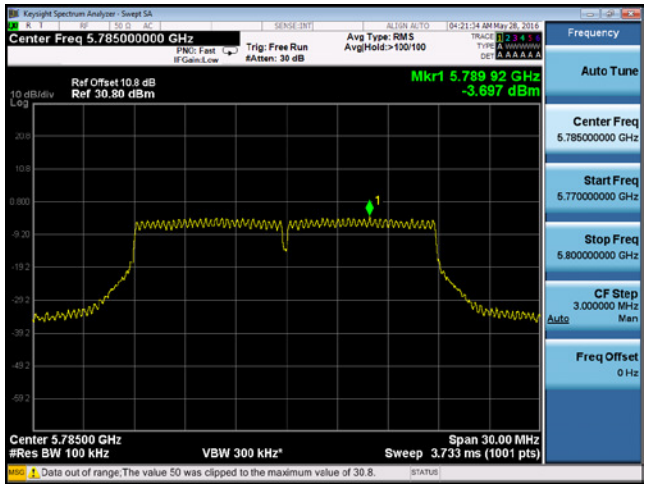
PSD-802.11n-20-5745M-chain2



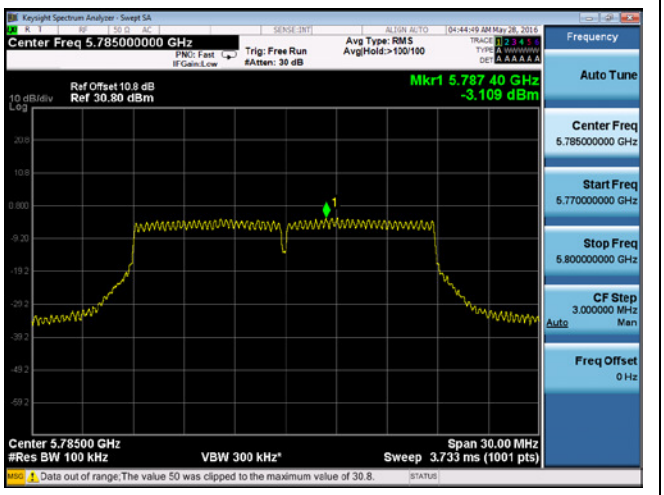
PSD-802.11n-20-5745M-chain3



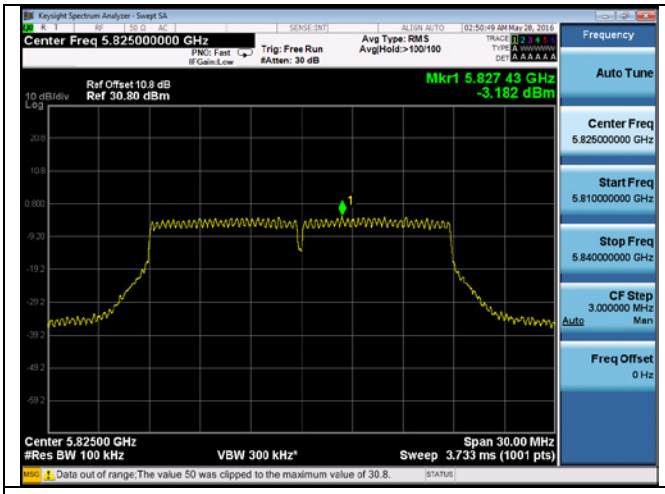
PSD-802.11n-20-5785M-chain1



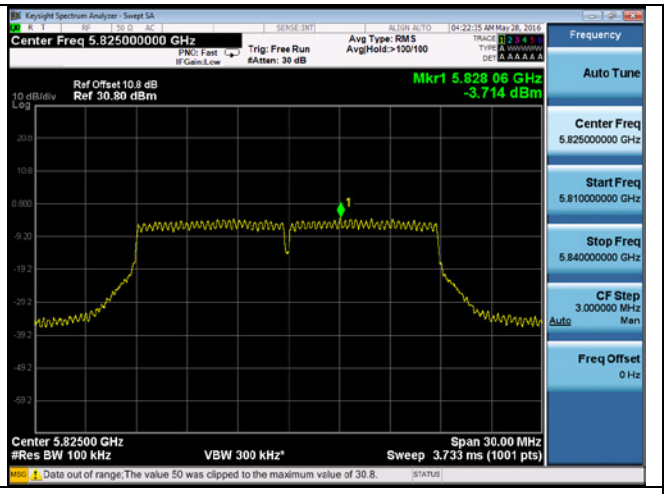
PSD-802.11n-20-5785M-chain2



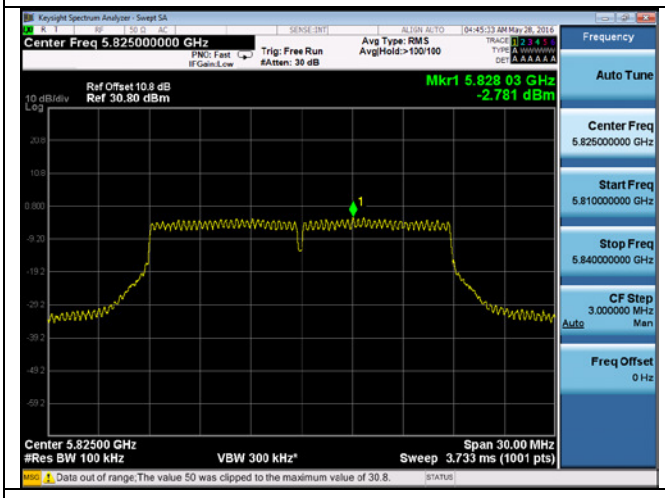
PSD-802.11n-20-5785M-chain3



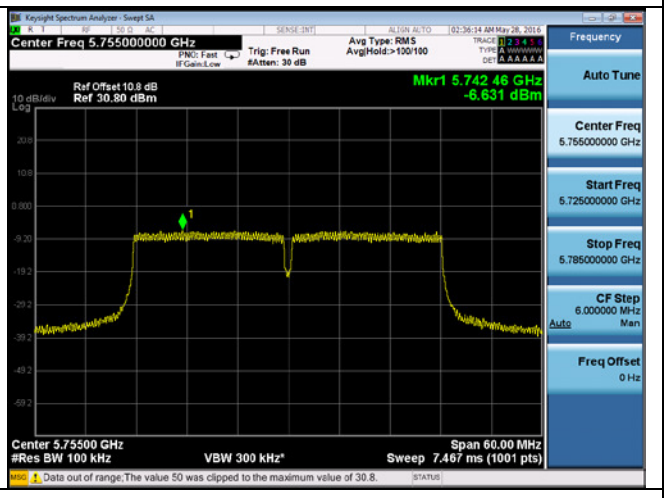
PSD-802.11n-20-5825M-chain1



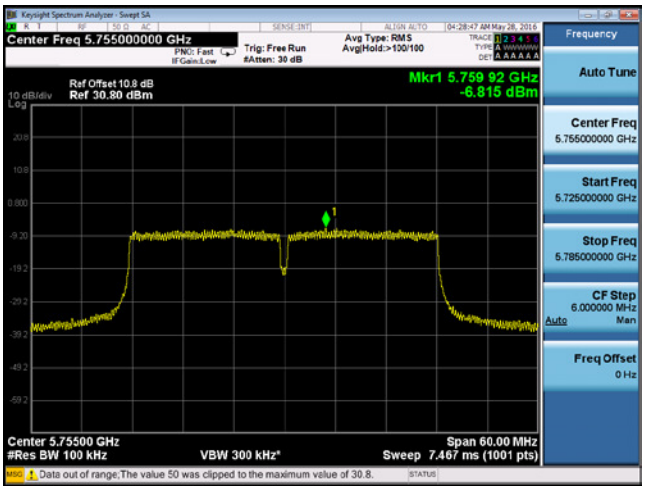
PSD-802.11n-20-5825M-chain2



PSD-802.11n-20-5825M-chain3



PSD-802.11n-40-5755M-chain1



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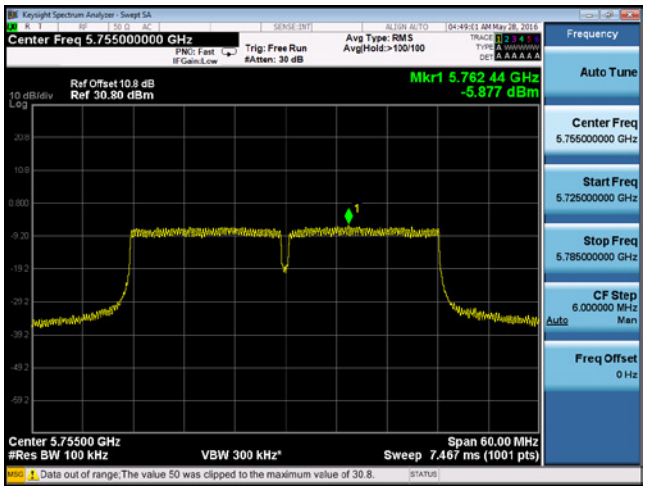
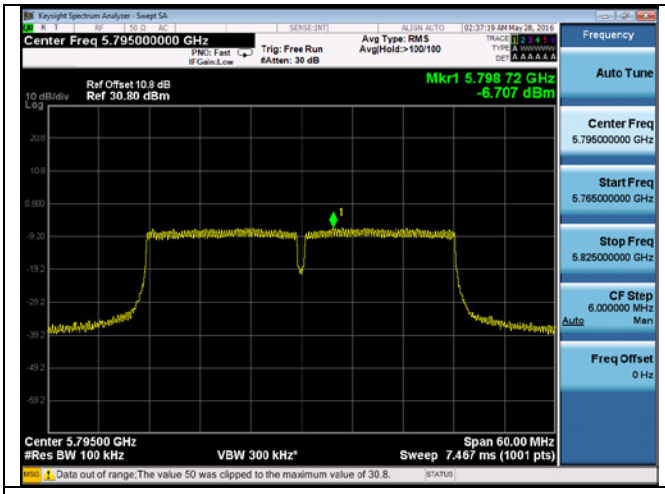
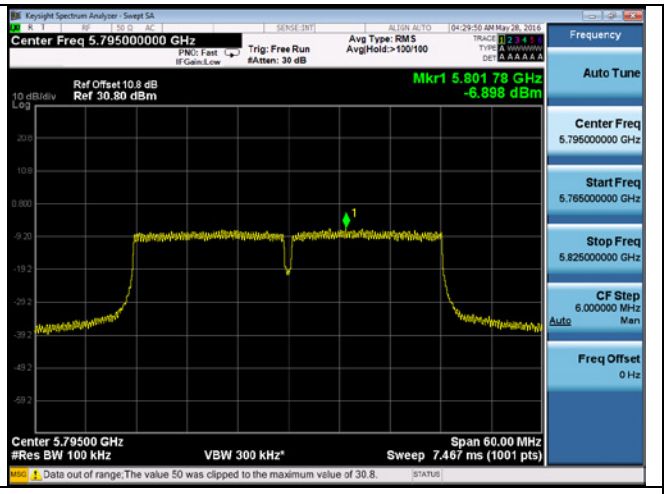


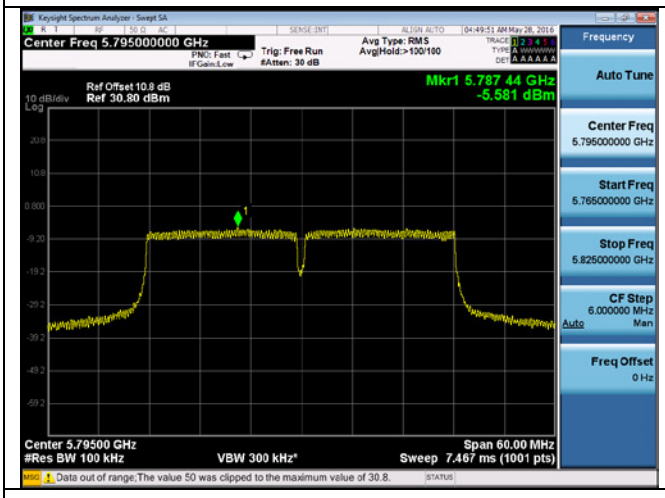
PSD-802.11n-40-5755M-chain3



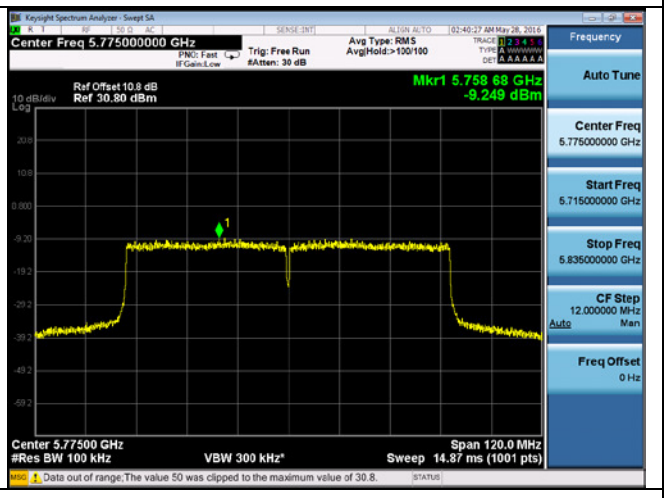
PSD-802.11n-40-5795M-chain1



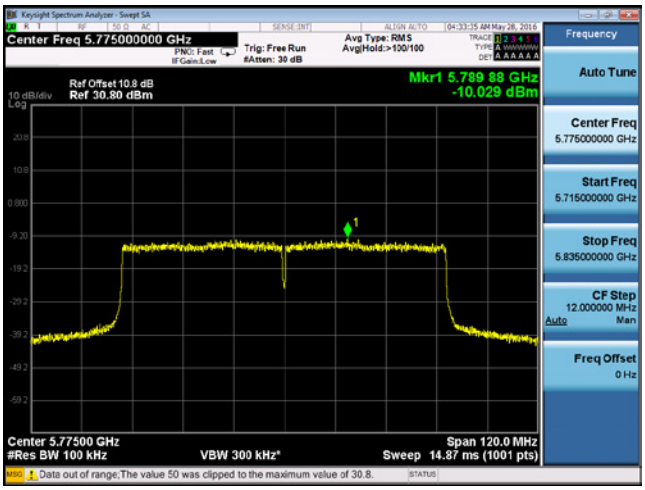
PSD-802.11n-40-5795M-chain2



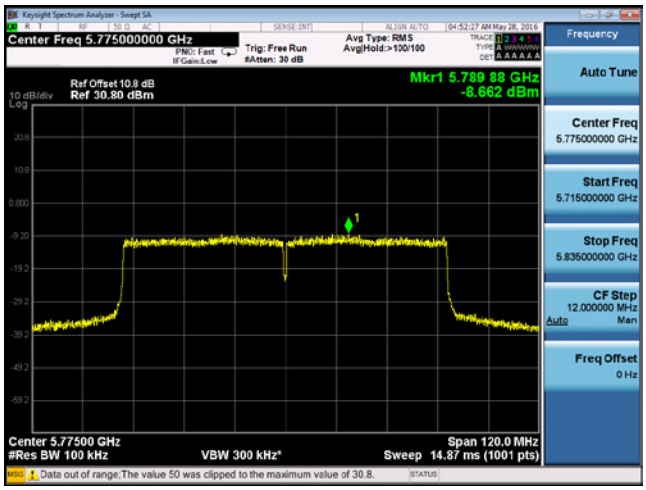
PSD-802.11n-40-5795M-chain3



PSD-802.11ac-80-5775M-chain1



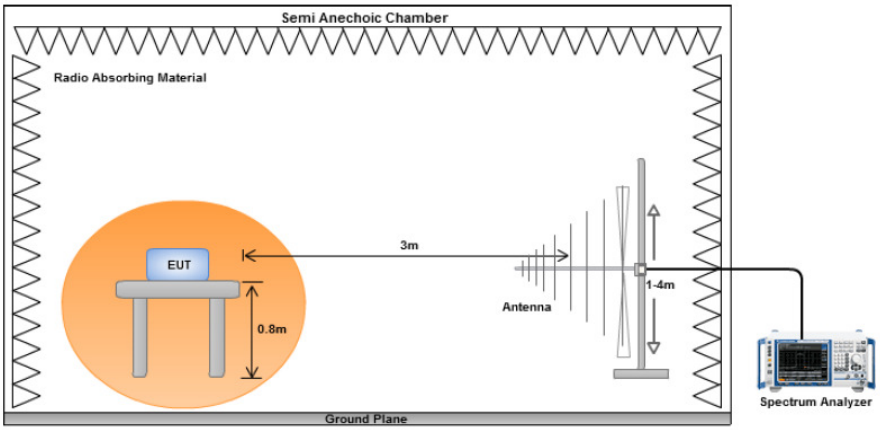
PSD-802.11ac-80-5775M-chain2



PSD-802.11ac-80-5775M-chain3

10.3 Radiated Emissions below 1GHz

Requirement(s):

<table>
<tr><th>Spec</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.407(b)
15.209 (a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="2"> 
</td></tr>
<tr><td>Procedure</td><td colspan="2">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.</td></tr>
<tr><td>Remark</td><td colspan="2">The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.</td></tr>
<tr><td>Result</td><td colspan="2">☒ Pass ☐ Fail</td></tr>
</table>

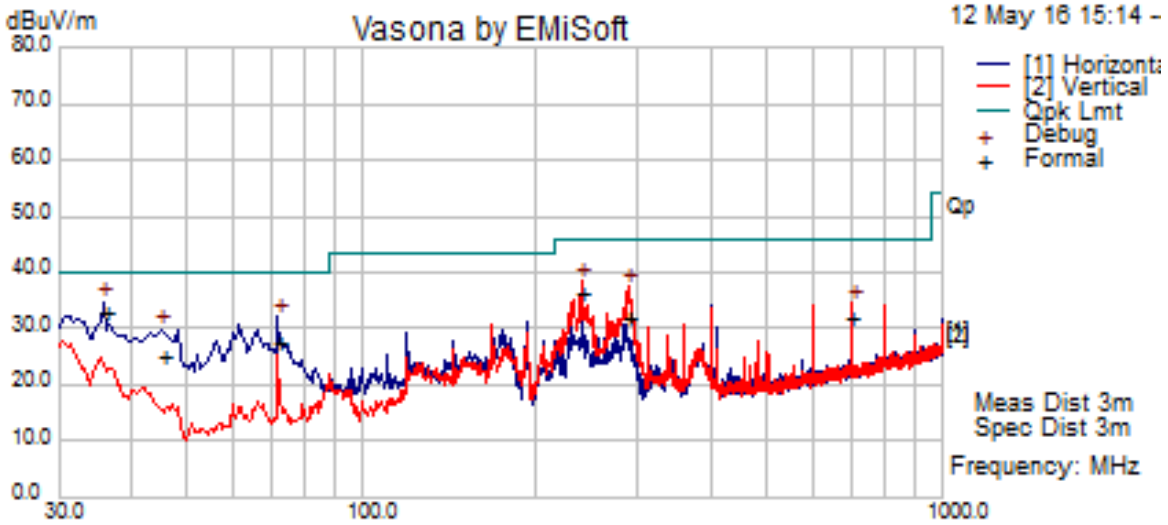
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Rachana Khanduri at 10m chamber.

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:	120VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	05/12/2016			
Remarks:	5GHz 11n-40 5230MHz			

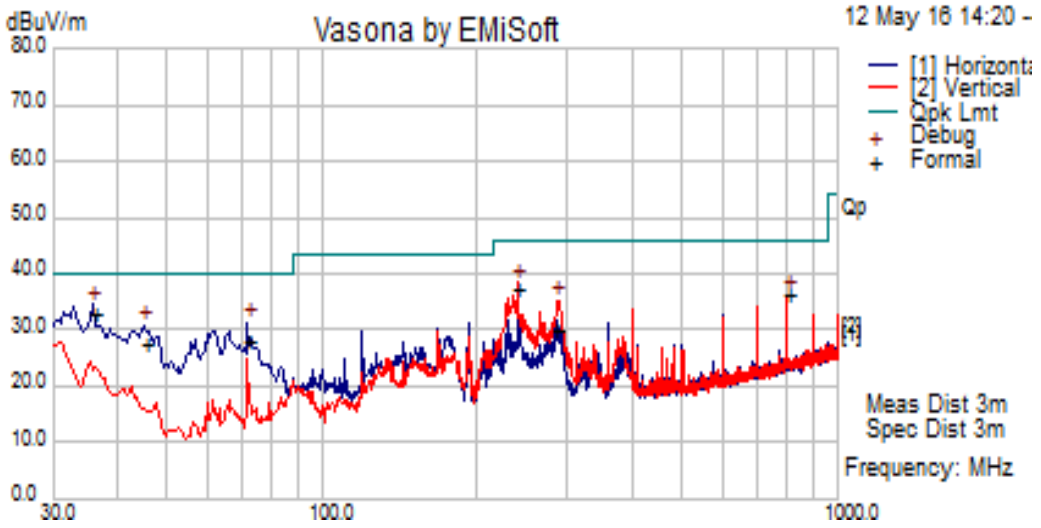


Quasi Max Measurement

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
36.01	52.71	0.87	-20.78	32.79	Quasi Max	H	128.00	70.00	40.00	-7.21	Pass
240.01	61.77	2.33	-27.59	36.51	Quasi Max	V	138.00	276.00	46.02	-9.51	Pass
71.96	57.13	1.27	-30.97	27.43	Quasi Max	H	179.00	356.00	40.00	-12.57	Pass
288.23	55.51	2.58	-26.31	31.78	Quasi Max	V	118.00	184.00	46.02	-14.24	Pass
45.24	51.53	0.98	-27.27	25.24	Quasi Max	H	150.00	236.00	40.00	-14.76	Pass
700.04	46.42	4.17	-18.73	31.86	Quasi Max	V	104.00	245.00	46.02	-14.16	Pass

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

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	05/12/2016			
Remarks:	5GHz 11n-40 5795MHz			

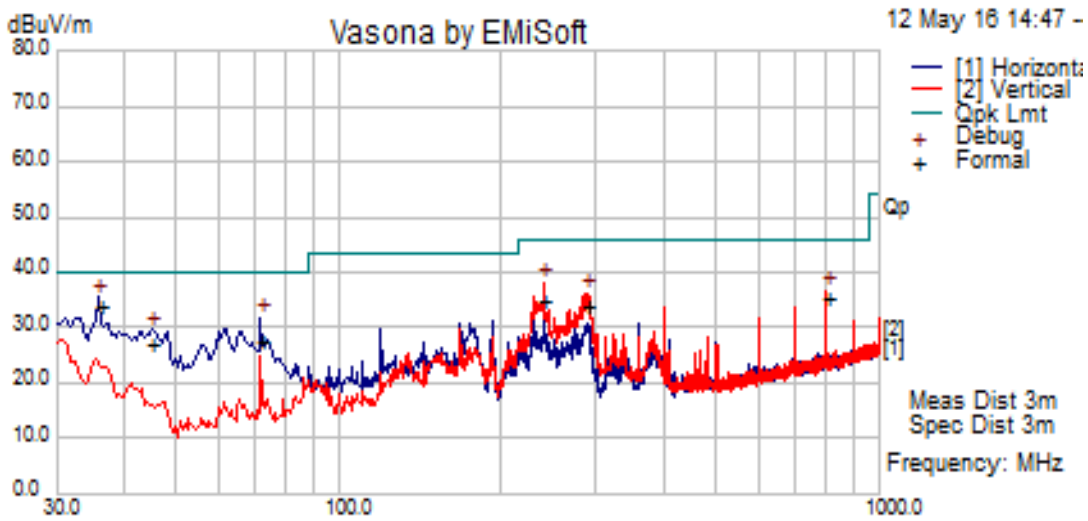


Quasi Max Measurement

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
36.00	52.80	0.87	-20.77	32.89	Quasi Max	H	134.00	304.00	40.00	-7.11	Pass
240.02	62.64	2.33	-27.59	37.38	Quasi Max	V	133.00	273.00	46.02	-8.64	Pass
71.96	57.66	1.27	-30.97	27.96	Quasi Max	H	112.00	328.00	40.00	-12.04	Pass
45.22	53.65	0.98	-27.26	27.38	Quasi Max	H	103.00	305.00	40.00	-12.62	Pass
800.01	49.38	4.51	-17.40	36.49	Quasi Max	V	100.00	203.00	46.02	-9.53	Pass
285.56	53.56	2.59	-26.27	29.89	Quasi Max	V	141.00	84.00	46.02	-16.13	Pass

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

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	02/19/2016			
Remarks:	5GHz 11ac-80 5775MHz			



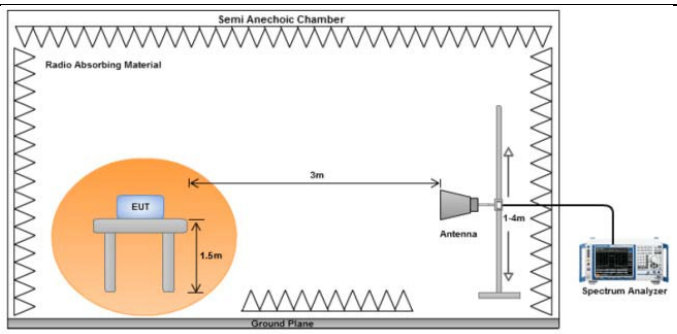
Quasi Max Measurement

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
36.01	53.60	0.87	-20.78	33.68	Quasi Max	H	109.00	316.00	40.00	-6.32	Pass
240.01	60.03	2.33	-27.59	34.77	Quasi Max	V	107.00	293.00	46.02	-11.25	Pass
71.96	57.25	1.27	-30.97	27.55	Quasi Max	H	153.00	350.00	40.00	-12.45	Pass
799.99	48.23	4.51	-17.41	35.33	Quasi Max	V	100.00	203.00	46.02	-10.69	Pass
288.91	57.52	2.58	-26.32	33.78	Quasi Max	V	100.00	340.00	46.02	-12.24	Pass
45.03	53.22	0.98	-27.14	27.06	Quasi Max	H	105.00	222.00	40.00	-12.94	Pass

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

10.4 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.407(b)(2), 15.407(b)(6)	(1)	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☐
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.	☐
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☒
	(5)	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	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	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

Test was done by Rachana Khanduri at 3m chamber.

Radiated Spurious Emission Test Results (Above 1GHz)

Above 1GHz – 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
17903.72	48.89	9.46	-3.08	55.27	Peak Max	H	111	121	74	-18.73	Pass
1537.29	65.33	4.77	-29.18	40.93	Peak Max	V	229	259	74	-33.08	Pass
2133.27	61.75	5.10	-25.49	41.36	Peak Max	V	233	328	74	-32.64	Pass
17903.72	36.95	9.46	-3.08	43.33	Average Max	H	111	121	54	-10.67	Pass
1537.29	62.73	4.77	-29.18	38.33	Average Max	V	229	259	54	-15.67	Pass
2133.27	46.89	5.10	-25.49	26.50	Average Max	V	233	328	54	-27.50	Pass

Above 1GHz – 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
17840.56	49.44	9.45	-3.33	55.56	Peak Max	H	180	361	74	-18.44	Pass
1537.29	65.52	4.77	-29.18	41.12	Peak Max	V	232	258	74	-32.88	Pass
3075.23	53.51	6.56	-21.03	39.05	Peak Max	V	242	0	74	-34.95	Pass
17840.56	37.14	9.45	-3.33	43.26	Average Max	H	180	361	54	-10.74	Pass
1537.29	62.85	4.77	-29.18	38.45	Average Max	V	232	258	54	-15.55	Pass
3075.23	42.18	6.56	-21.03	27.71	Average Max	V	242	0	54	-26.29	Pass

Above 1GHz – 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
17655.63	48.85	9.43	-3.27	55.00	Peak Max	V	131	0	74	-19.00	Pass
9682.84	49.42	7.92	-10.08	47.25	Peak Max	V	112	100	74	-26.75	Pass
1537.30	67.03	4.77	-29.18	42.62	Peak Max	H	151	221	74	-31.38	Pass
17655.63	36.74	9.43	-3.27	42.89	Average Max	V	131	0	54	-11.11	Pass
9682.84	37.52	7.92	-10.08	35.35	Average Max	V	112	100	54	-18.65	Pass
1537.30	65.60	4.77	-29.18	41.19	Average Max	H	151	221	54	-12.81	Pass

Above 1GHz – 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
12450.66	49.24	8.96	-7.29	50.91	Peak Max	V	162	355	74	-23.09	Pass
1537.31	65.16	4.77	-29.18	40.75	Peak Max	V	230	259	74	-33.25	Pass
2132.68	59.44	5.10	-25.49	39.05	Peak Max	V	238	0	74	-34.95	Pass
12450.66	37.98	8.96	-7.29	39.65	Average Max	V	162	355	54	-14.35	Pass
1537.31	62.44	4.77	-29.18	38.03	Average Max	V	230	259	54	-15.97	Pass
2132.68	45.50	5.10	-25.49	25.11	Average Max	V	238	0	54	-28.89	Pass

Above 1GHz – 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
17852.95	49.39	9.45	-3.27	55.56	Peak Max	H	194	273	74	-18.44	Pass
1537.20	65.16	4.77	-29.18	40.76	Peak Max	H	100	240	74	-33.25	Pass
2133.42	61.25	5.10	-25.49	40.87	Peak Max	H	216	280	74	-33.13	Pass
17852.95	37.16	9.45	-3.27	43.34	Average Max	H	194	273	54	-10.66	Pass
1537.20	62.87	4.77	-29.18	38.46	Average Max	H	100	240	54	-15.54	Pass
2133.42	45.07	5.10	-25.49	24.68	Average Max	H	216	280	54	-29.32	Pass

Above 1GHz – 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
2503.03	53.46	5.94	-23.84	35.57	Peak Max	V	243	54	74	-38.43	Pass
6075.22	59.18	7.17	-15.17	51.19	Peak Max	V	247	361	74	-22.81	Pass
1537.45	64.80	4.77	-29.17	40.39	Peak Max	V	225	260	74	-33.61	Pass
2503.03	42.07	5.94	-23.84	24.18	Average Max	V	243	54	54	-29.82	Pass
6075.22	49.20	7.17	-15.17	41.21	Average Max	V	247	361	54	-12.79	Pass
1537.45	62.04	4.77	-29.17	37.63	Average Max	V	225	260	54	-16.37	Pass

Above 1GHz – 802.11n 20– 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
17681.20	48.59	9.43	-3.15	54.86	Peak Max	V	169	146	74	-19.14	Pass
1537.34	63.90	4.77	-29.18	39.50	Peak Max	V	225	261	74	-34.50	Pass
2132.92	60.75	5.10	-25.49	40.37	Peak Max	V	197	360	74	-33.63	Pass
17681.20	36.90	9.43	-3.15	43.18	Average Max	V	169	146	54	-10.83	Pass
1537.34	61.21	4.77	-29.18	36.81	Average Max	V	225	261	54	-17.19	Pass
2132.92	46.13	5.10	-25.49	25.74	Average Max	V	197	360	54	-28.26	Pass

Above 1GHz – 802.11n – 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
17852.69	49.79	9.45	-3.28	55.97	Peak Max	V	109	4	74	-18.03	Pass
1537.30	65.15	4.77	-29.18	40.74	Peak Max	V	230	263	74	-33.26	Pass
2132.28	62.36	5.10	-25.49	41.97	Peak Max	V	245	0	74	-32.03	Pass
17852.69	37.33	9.45	-3.28	43.51	Average Max	V	109	4	54	-10.49	Pass
1537.30	62.94	4.77	-29.18	38.53	Average Max	V	230	263	54	-15.47	Pass
2132.28	46.04	5.10	-25.49	25.65	Average Max	V	245	0	54	-28.35	Pass

Above 1GHz – 802.11n 20– 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
17915.60	48.87	9.46	-3.10	55.23	Peak Max	H	230	230	74	-18.77	Pass
1537.31	65.58	4.77	-29.18	41.17	Peak Max	V	229	262	74	-32.83	Pass
1947.16	57.70	4.76	-27.82	34.64	Peak Max	H	213	146	74	-39.36	Pass
17915.60	37.31	9.46	-3.10	43.67	Average Max	H	230	230	54	-10.33	Pass
1537.31	63.52	4.77	-29.18	39.12	Average Max	V	229	262	54	-14.88	Pass
1947.16	44.82	4.76	-27.82	21.76	Average Max	H	213	146	54	-32.24	Pass

Above 1GHz – 802.11n20 – 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
17918.44	49.65	9.46	-3.11	56.01	Peak Max	V	166	46	74	-18.00	Pass
7243.95	49.18	7.36	-11.55	44.99	Peak Max	V	231	338	74	-29.01	Pass
1537.33	66.20	4.77	-29.18	41.80	Peak Max	V	229	260	74	-32.20	Pass
17918.44	37.32	9.46	-3.11	43.67	Average Max	V	166	46	54	-10.33	Pass
7243.95	38.19	7.36	-11.55	34.00	Average Max	V	231	338	54	-20.00	Pass
1537.33	64.37	4.77	-29.18	39.97	Average Max	V	229	260	54	-14.03	Pass

Above 1GHz – 802.11n20 – 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
6032.11	58.04	7.17	-15.21	49.99	Peak Max	V	202	0	74	-24.01	Pass
1537.34	66.32	4.77	-29.18	41.91	Peak Max	V	231	260	74	-32.09	Pass
2133.38	62.35	5.10	-25.49	41.96	Peak Max	H	246	187	74	-32.04	Pass
6032.11	46.97	7.17	-15.21	38.92	Average Max	V	202	0	54	-15.08	Pass
1537.34	64.43	4.77	-29.18	40.03	Average Max	V	231	260	54	-13.97	Pass
2133.38	50.13	5.10	-25.49	29.74	Average Max	H	246	187	54	-24.26	Pass

Above 1GHz – 802.11n20– 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
17049.28	48.72	9.32	-5.07	52.98	Peak Max	V	144	0	74	-21.02	Pass
6076.80	52.90	7.17	-15.16	44.91	Peak Max	H	163	325	74	-29.09	Pass
1537.24	66.40	4.77	-29.18	41.99	Peak Max	V	231	260	74	-32.01	Pass
17049.28	37.20	9.32	-5.07	41.46	Average Max	V	144	0	54	-12.54	Pass
6076.80	41.79	7.17	-15.16	33.80	Average Max	H	163	325	54	-20.20	Pass
1537.24	64.63	4.77	-29.18	40.22	Average Max	V	231	260	54	-13.78	Pass

Above 1GHz – 802.11n40 – 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
17911.48	49.52	9.46	-3.09	55.88	Peak Max	H	121	236	74	-18.12	Pass
1537.30	73.23	4.77	-29.18	48.82	Peak Max	H	148	228	74	-25.18	Pass
1950.44	64.37	4.76	-27.77	41.36	Peak Max	H	100	264	74	-32.64	Pass
17911.48	37.28	9.46	-3.09	43.65	Average Max	H	121	236	54	-10.35	Pass
1537.30	72.24	4.77	-29.18	47.83	Average Max	H	148	228	54	-6.17	Pass
1950.44	50.37	4.76	-27.77	27.36	Average Max	H	100	264	54	-26.64	Pass

Above 1GHz – 802.11n – 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
9405.34	50.37	7.81	-10.19	48.00	Peak Max	V	188	307	74	-26.01	Pass
1537.32	70.75	4.77	-29.18	46.34	Peak Max	H	100	230	74	-27.66	Pass
7295.13	50.91	7.35	-11.5	46.75	Peak Max	V	112	280	74	-27.25	Pass
9405.34	38.76	7.81	-10.19	36.39	Average Max	V	188	307	54	-17.62	Pass
1537.32	69.22	4.77	-29.18	44.81	Average Max	H	100	230	54	-9.19	Pass
7295.15	38.28	7.35	-11.5	34.13	Average Max	V	112	280	54	-19.88	Pass

Above 1GHz – 802.11n40 – 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
6234.69	55.14	7.2	-14.86	47.49	Peak Max	V	242	19	74	-26.52	Pass
1537.37	67.69	4.77	-29.18	43.29	Peak Max	V	243	85	74	-30.71	Pass
1943.70	63.19	4.76	-27.87	40.08	Peak Max	V	231	116	74	-33.92	Pass
6234.69	48.24	7.2	-14.86	40.58	Average Max	V	242	19	54	-13.42	Pass
1537.37	64.55	4.77	-29.18	40.14	Average Max	V	243	85	54	-13.86	Pass
1943.70	51.86	4.76	-27.87	28.75	Average Max	V	231	116	54	-25.25	Pass

Above 1GHz – 802.11n40 – 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
17952.09	49.06	9.46	-3.17	55.35	Peak Max	H	221	254	74	-18.65	Pass
1537.36	71.01	4.77	-29.18	46.61	Peak Max	H	100	218	74	-27.39	Pass
2133.50	63.08	5.1	-25.49	42.69	Peak Max	V	238	181	74	-31.31	Pass
17952.09	36.97	9.46	-3.17	43.26	Average Max	H	221	254	54	-10.74	Pass
1537.36	69.16	4.77	-29.18	44.75	Average Max	H	100	218	54	-9.25	Pass
2133.50	48.39	5.10	-25.49	28.01	Average Max	V	238	181	54	-25.99	Pass

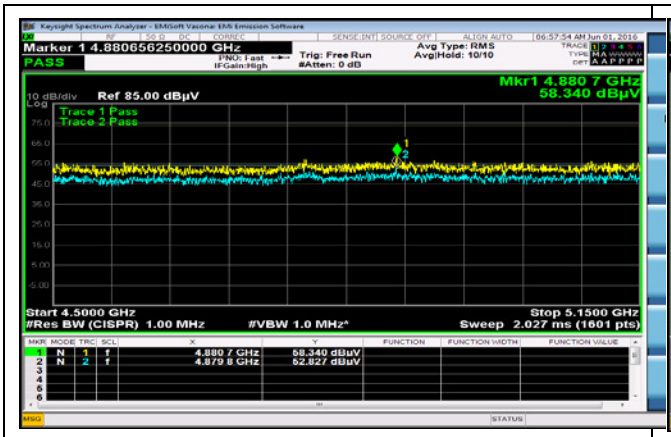
Above 1GHz – 802.11ac80 – 5210MHz

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
17229.84	49.38	9.36	-4.45	54.29	Peak Max	V	102	159	74	-19.71	Pass
1537.31	65.54	4.77	-29.18	41.14	Peak Max	V	99	119	74	-32.86	Pass
1945.47	63.43	4.76	-27.85	40.35	Peak Max	H	246	140	74	-33.65	Pass
17229.84	37.82	9.36	-4.45	42.73	Average Max	V	102	159	54	-11.27	Pass
1537.31	62.90	4.77	-29.18	38.49	Average Max	V	99	119	54	-15.51	Pass
1945.47	52.26	4.76	-27.85	29.18	Average Max	H	246	140	54	-24.82	Pass

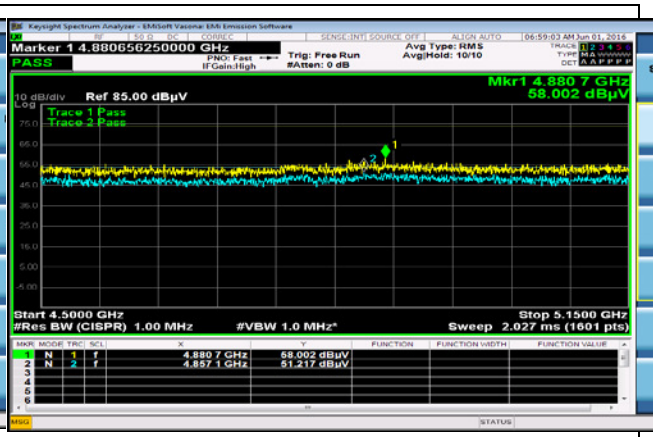
Above 1GHz – 802.11ac80 – 5775MHz

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
17936.78	49.72	9.46	-3.14	56.05	Peak Max	H	218	137	74	-17.95	Pass
1537.27	69.70	4.77	-29.18	45.29	Peak Max	H	241	219	74	-28.71	Pass
1950.51	63.00	4.76	-27.77	39.99	Peak Max	H	104	326	74	-34.01	Pass
17936.78	37.31	9.46	-3.14	43.63	Average Max	H	218	137	54	-10.37	Pass
1537.30	67.75	4.77	-29.18	43.34	Average Max	H	241	219	54	-10.66	Pass
1950.51	46.38	4.76	-27.77	23.37	Average Max	H	104	326	54	-30.63	Pass

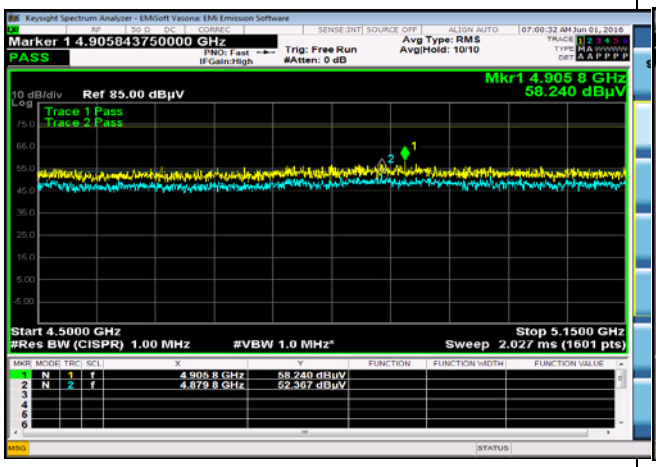
Radiated Restricted Band Test Results (Above 1GHz)



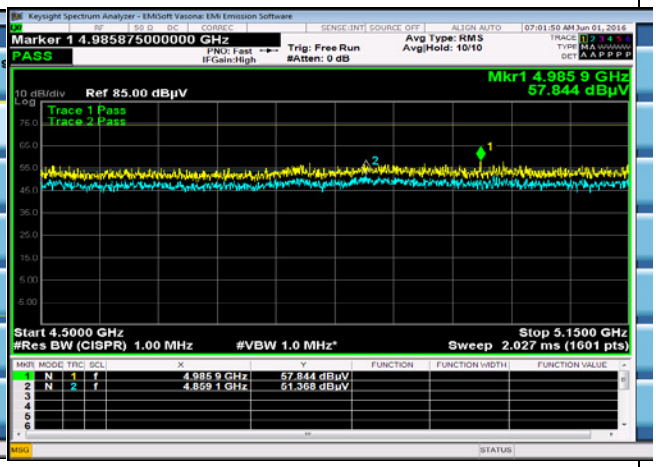
Lower Band 802.11a 5180MHz



Lower Band 802.11n-20M 5180MHz



Lower Band 802.11n-40M 5190MHz



Restriced Band-802.11ac-80M 5210M

Annex A. TEST INSTRUMENT

Instrument	Model	Manufacturer	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2016	1 Year	06/08/2017	☐
CHASE LISN (9k-30MHz)	MN2050B	Chase	1018	08/07/2015	1 Year	08/07/2016	☐
Radiated Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2016	1 Year	06/08/2017	☑
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2015	1 Year	08/20/2016	☑
Pre-Amplifier (1-26.5GHz)	8449B	Hewlett Packard	3008A00715	03/30/2016	1 Year	03/30/2017	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	RF Bay, Inc.	11140711	02/10/2016	1 Year	02/10/2017	☑
ETS-Lingren Loop Antenna	6512	ETS-Lingren	00049120	05/12/2015	1 Year	05/12/2016	☐
Bi-Log antenna (30MHz~2GHz)	JB1	Sunol Sciences	A030702	08/15/2015	1 Year	08/15/2016	☑
Horn Antenna (1-26.5GHz)	3115	EMCO	10SL0059	08/25/2015	1 Year	08/25/2016	☑
3 Meters SAC	3M	ETS-Lingren	N/A	06/09/2016	1 Year	06/09/2017	☑
10 Meters SAC	10M	ETS-Lingren	N/A	09/05/2015	1 Year	09/05/2016	☑
RF Conducted Measurement							
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2015	1 Year	08/20/2016	☑
USB RF Power Sensor	7002-006	ETS-Lingren	10SL0190	09/03/2015	1 Year	09/03/2016	☑

Test Software Version

Test Item	Vendor	Software	Version
Radiated Emission	EMISoft	EMISoft Vasona	V5.0

Annex B. SIEMIC Accreditation

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

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