RF TEST REPORT

SIEMIC
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Report No.: FCC_RF_SL16032201-SLX-008_UNII_Rev. 3.0
Supersede Report No.: FCC_RF_SL16032201-SLX-008_UNII_Rev. 2.0

Applicant	:	Hospira, Inc.
Product Name	:	SDIO Wireless Module
Model No.	:	SX-SDMAN
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	STJ-SDMAN
Dates of test	:	04/07/2016 – 06/03/2016
Issue Date	:	06/03/2016
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	Chen Ge
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_SL16032201-SLX-008_UNII	None	Original	04/14/2016
FCC _RF_SL16032201-SLX-008_UNII_Rev. 1.0	Rev. 1.0	Updated EUT photos	04/18/2016
FCC _RF_SL16032201-SLX-008_UNII_Rev. 2.0	Rev. 2.0	Updated EUT photos	05/10/2016
FCC _RF_SL16032201-SLX-008_UNII_Rev. 2.0	Rev. 3.0	Updated Test Data	06/03/2016

2 Executive Summary

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

Company: Hospira, Inc.
Product: SDIO Wireless Module
Model: SX-SDMAN

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	Hospira, Inc.
Applicant Address	275 North Field Drive, Lake Forest, Illinois, US, 60045
Manufacturer Name	Hospira, Inc.
Manufacturer Address	275 North Field Drive, Lake Forest, Illinois, US, 60045

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	SDIO Wireless Module
Model No.	SX-SDMAN
Trade Name	Hospira
Serial No.	N/A
Input Power	AC 100-120V, 50/60Hz
Power Adapter Manu/Model	US115-05
Power Adapter SN	C01-0175140
Hardware version	N/A
Software version	N/A
Test Software version	N/A
Date of EUT received	04/01/2016
Equipment Class/ Category	UNII
Clock Frequencies	N/A
Port/Connectors	USB

6.2 Radio Description

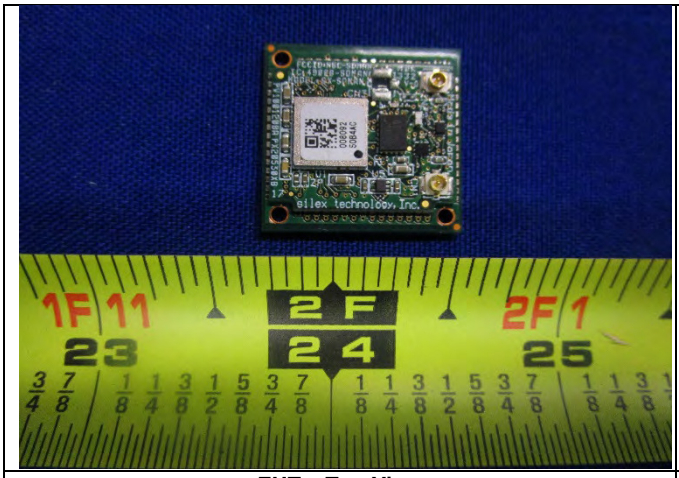
Radio Type	802.11a	802.11n-20M	802.11n-40M
Operating Frequency	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	20MHz	20MHz (5GHz)	40MHz
Number of Channels	24	24 (5GHz)	11 (5GHz)
Antenna Type	Embedded antenna - Ethertronics		
Antenna Gain	2 dBi (2.4 GHz), 2.5 dBi (5 GHz)		
Antenna Connector Type	U.FL connector		
Remarks	2.4GHz and 5GHz Radio does not transmit simultaneously		

EUT Power Setting

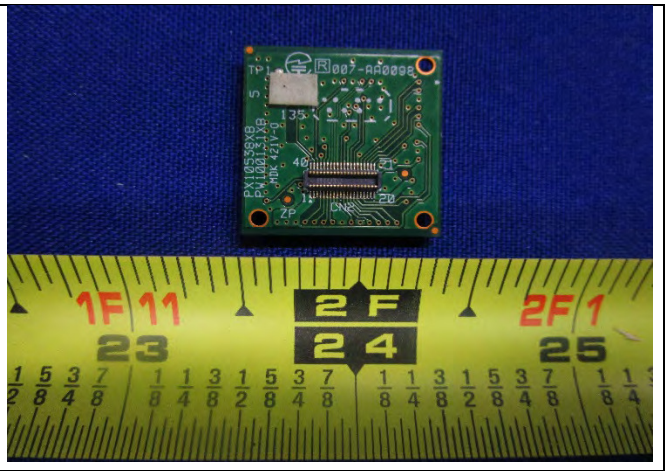
5.2 GHz			
Test mode	**Freq(MHz)**	**CH**	**Power settings**
802.11a	5180	Low	14
	5200	Mid	14
	5240	High	14
802.11n20	5180	Low	13
	5200	Mid	14
	5240	High	14
802.11n40	5190	Low	9.5
	5230	High	14

5.8 GHz			
Test mode	**Freq(MHz)**	**CH**	**Power settings**
802.11a	5745	Low	13
	5785	Mid	13
	5825	High	13
802.11n20	5745	Low	13
	5785	Mid	13
	5825	High	13
802.11n40	5755	Low	13
	5795	High	13

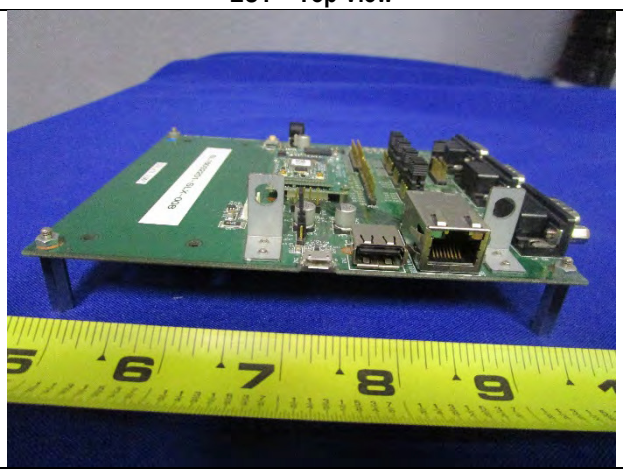
6.3 EUT Photo



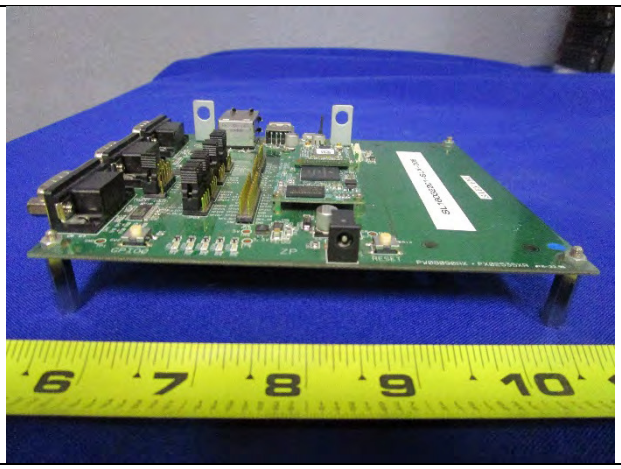
EUT – Top View



EUT – Bottom View

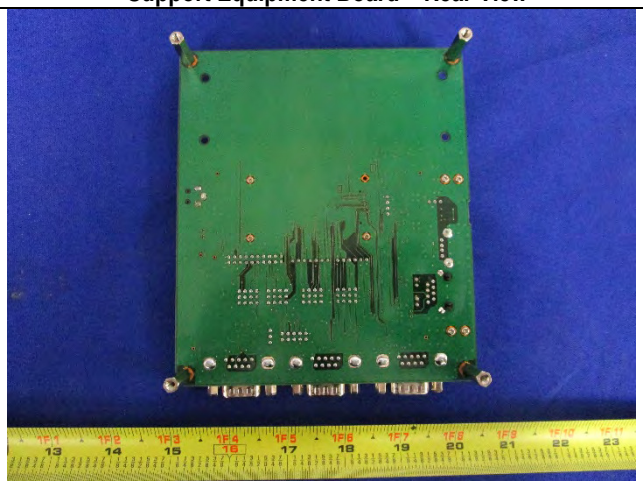


Support Equipment Board – Front View

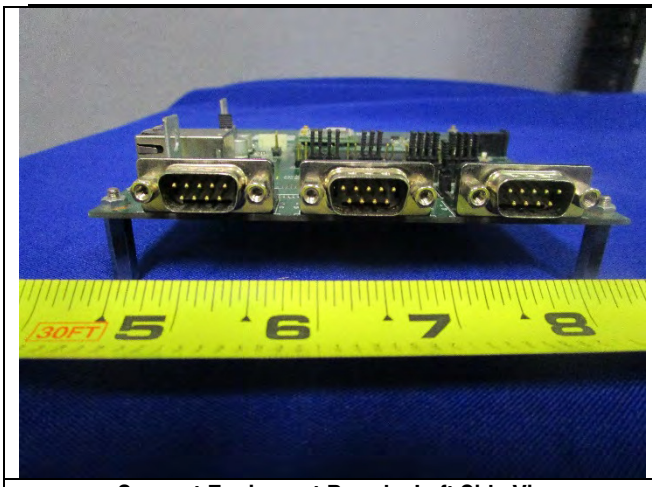


Support Equipment Board – Rear View

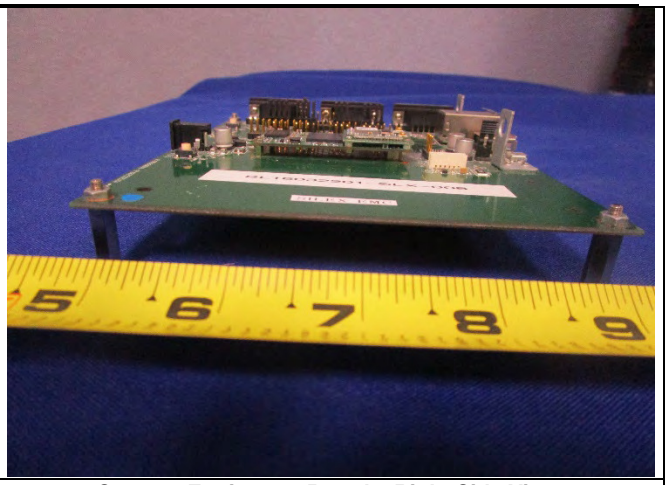
Support Equipment Board – Top View



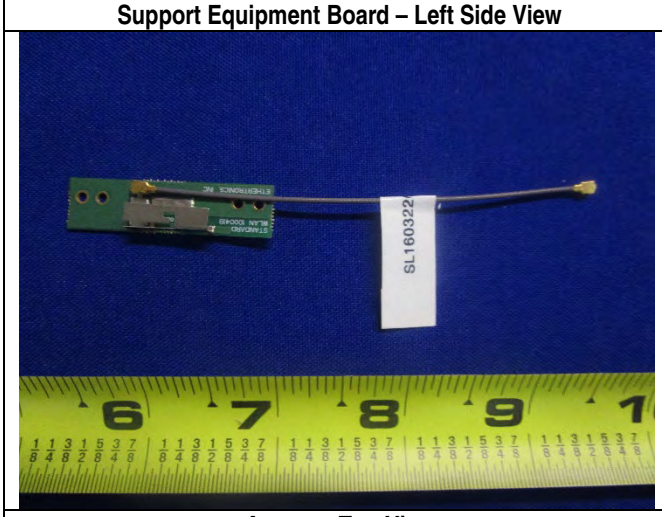
Support Equipment Board – Bottom View



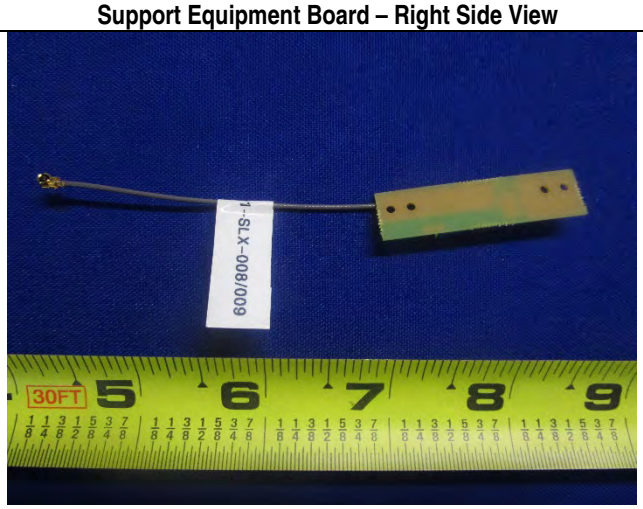
Support Equipment Board – Left Side View



Support Equipment Board – Right Side View



Antenna Top View

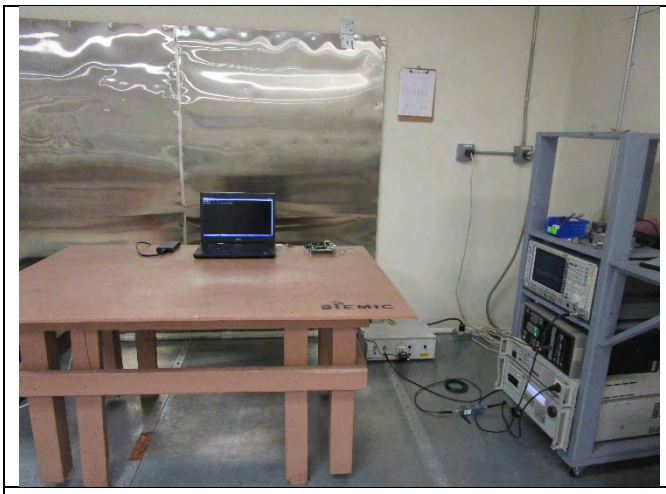


Antenna Bottom View

Support Equipment Power Supply Top View

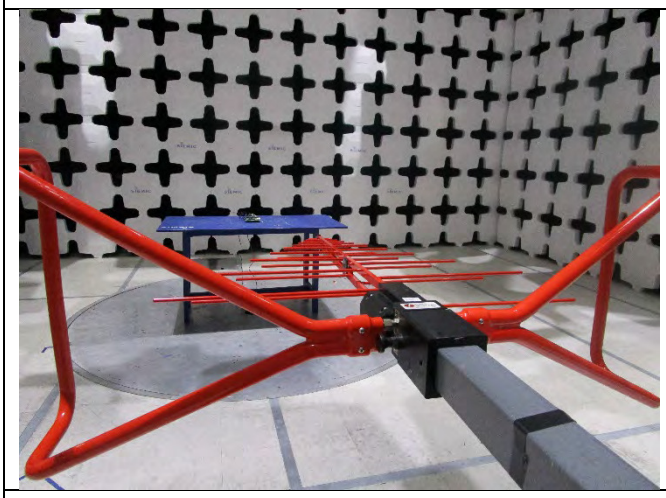
Support Equipment Power Supply Bottom View

6.4 EUT Test Setup Photos

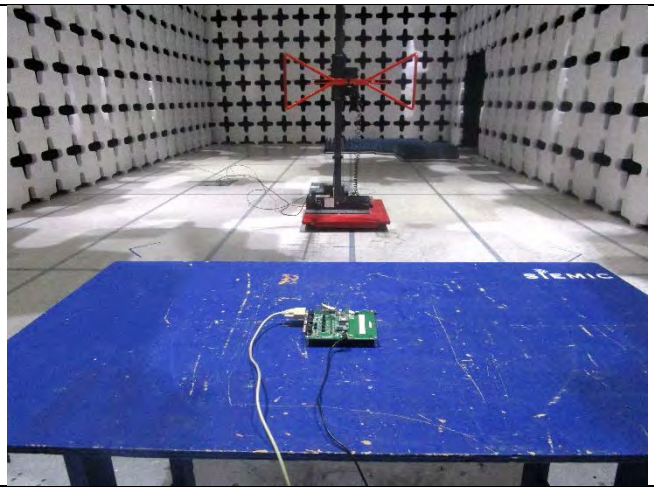


AC Line Conducted Emissions – Front View

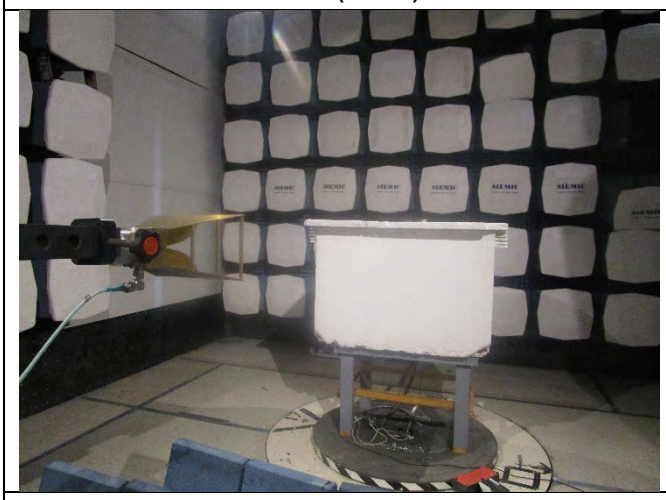
AC Line Conducted Emissions – Rear View



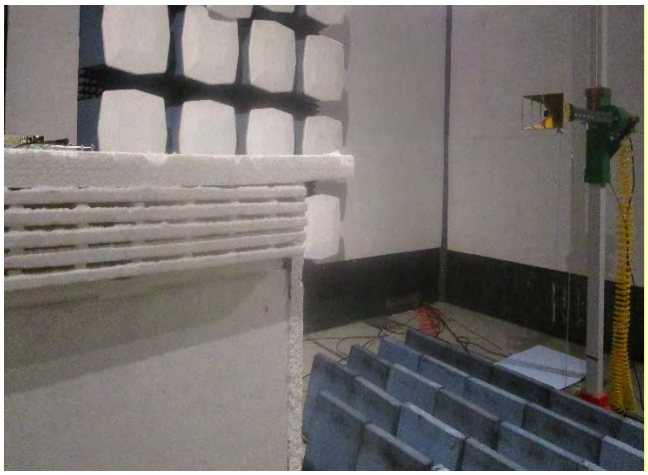
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Lattitude/E6510	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	
USB	EUT	I/O Port	Laptop	USB	2	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Tera Term Pro	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 – 2013 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.10 – 2013	☒ 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 – 2013 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
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

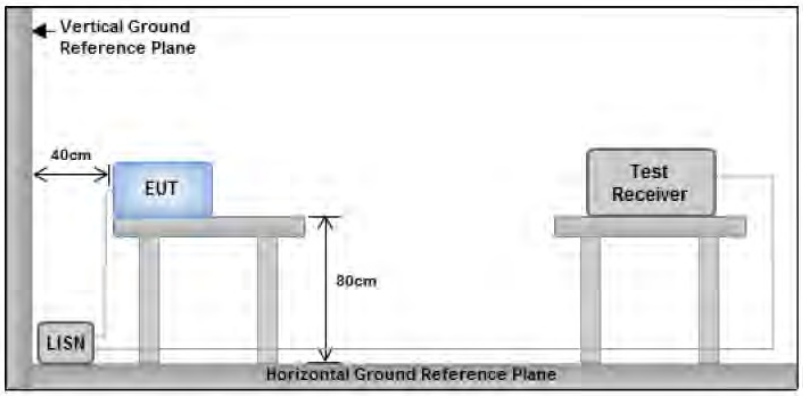
Emissions			
Test Item	**Frequency Range**	**Description**	**Uncertainty**
AC Conducted Emissions	150KHz – 30MHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±3.5dB
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level 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 80 cm from EUT and at least 80 cm from other units and other metal planes	
Procedure	- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50µH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply.	
Remark	EUT was tested at 120VAC, 60Hz	
Result	☒ Pass ☐ Fail	

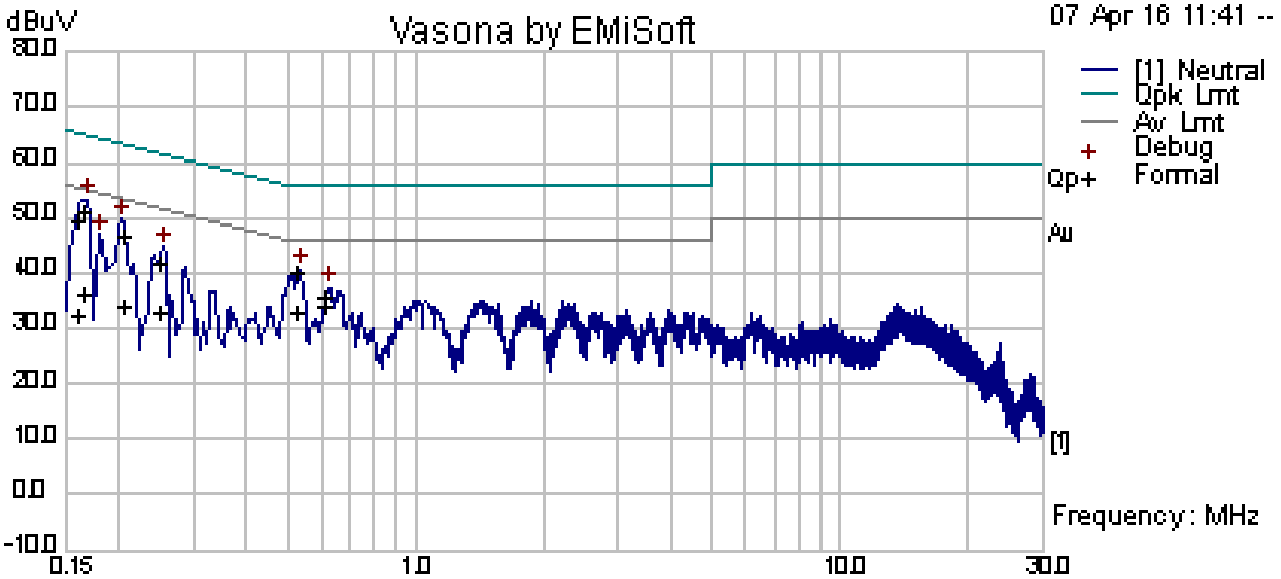
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Rachana Khanduri* at *Conducted Emission Test Site*.

Conducted Emission Test Results

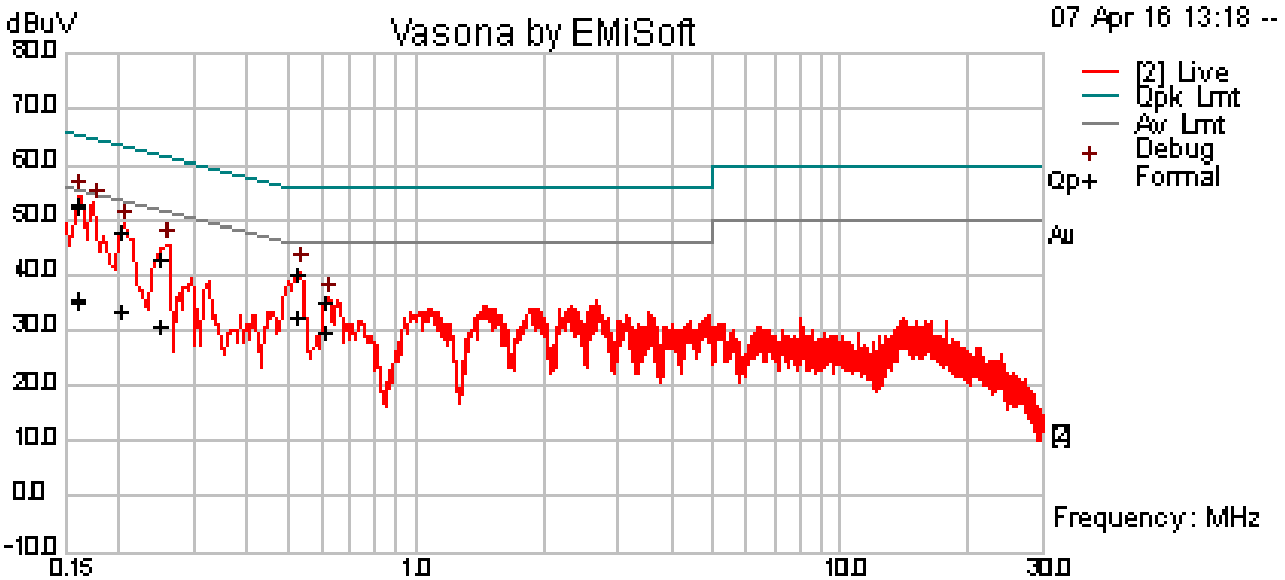
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	04/07/2016			
Remarks	AC Line @ Neutral			



Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.16	37.97	10.00	1.68	49.66	Quasi Peak	Neutral	65.52	-15.86	Pass
0.20	35.35	10.00	1.29	46.64	Quasi Peak	Neutral	63.44	-16.80	Pass
0.52	29.29	10.01	0.67	39.97	Quasi Peak	Neutral	56.00	-16.03	Pass
0.25	31.04	10.00	1.07	42.11	Quasi Peak	Neutral	61.83	-19.71	Pass
0.17	39.51	10.00	1.61	51.12	Quasi Peak	Neutral	65.20	-14.09	Pass
0.61	25.20	10.01	0.64	35.85	Quasi Peak	Neutral	56.00	-20.15	Pass
0.16	20.55	10.00	1.68	32.24	Average	Neutral	55.52	-23.28	Pass
0.20	23.01	10.00	1.29	34.29	Average	Neutral	53.44	-19.14	Pass
0.52	22.29	10.01	0.67	32.97	Average	Neutral	46.00	-13.03	Pass
0.25	21.79	10.00	1.07	32.86	Average	Neutral	51.83	-18.97	Pass
0.17	24.79	10.00	1.61	36.40	Average	Neutral	55.20	-18.80	Pass
0.61	23.62	10.01	0.64	34.26	Average	Neutral	46.00	-11.74	Pass

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	04/07/2016			
Remarks	AC Line @ Line			



Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.16	41.28	10.00	1.66	52.94	Quasi Peak	Live	65.41	-12.47	Pass
0.20	36.45	10.00	1.30	47.75	Quasi Peak	Live	63.51	-15.75	Pass
0.52	29.68	10.01	0.67	40.35	Quasi Peak	Live	56.00	-15.65	Pass
0.25	31.79	10.00	1.06	42.85	Quasi Peak	Live	61.74	-18.90	Pass
0.61	24.44	10.01	0.64	35.09	Quasi Peak	Live	56.00	-20.91	Pass
0.16	24.03	10.00	1.66	35.69	Average	Live	55.41	-19.72	Pass
0.20	22.45	10.00	1.30	33.75	Average	Live	53.51	-19.76	Pass
0.52	21.65	10.01	0.67	32.33	Average	Live	46.00	-13.67	Pass
0.25	20.00	10.00	1.06	31.06	Average	Live	51.74	-20.68	Pass
0.61	19.34	10.01	0.64	29.99	Average	Live	46.00	-16.01	Pass

Note: The results above show only the worst case.

10.2 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	-	99% 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.
  - Set RBW = around 1% of emission bandwidth
  - Set VBW > RBW
  - Detector = Peak
  - 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.
  - Set RBW = 100 KHz
  - Set VBW ≥ 3 x RBW
  - Detector = Peak
  - Trace mode = max hold
  - Sweep = auto couple
- Capture the plot.
- Repeat above steps for different test channel and other modulation type.

Test Date	04/07/2016	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22ºC 38% 1020mbar
Remark	None			
Result	☒ Pass ☐ Fail			

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

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

26dB Bandwidth measurement result :

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
26dB BW	802.11a	5180	Low	20.45	-	-
		5200	Mid	20.68	-	-
		5240	High	20.67	-	-
	802.11n-20	5180	Low	21.92	-	-
		5200	Mid	21.98	-	-
		5240	High	22.96	-	-
	802.11n-40	5190	Low	43.81	-	-
		5230	High	45.76	-	-

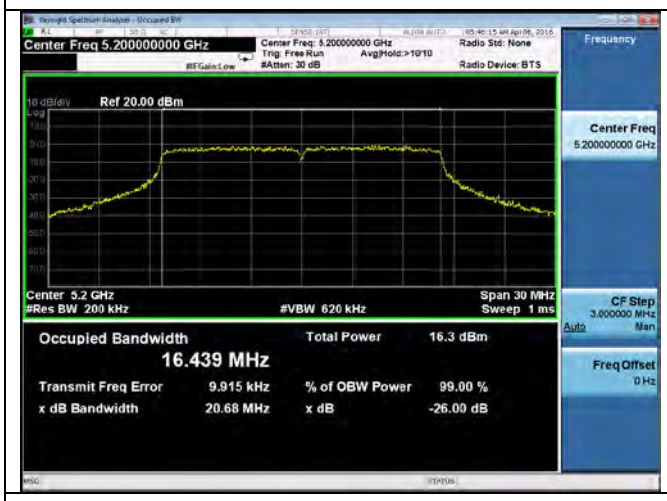
6dB Bandwidth measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.45	≥0.5	Pass
		5785	Mid	16.44	≥0.5	Pass
		5825	High	16.43	≥0.5	Pass
	802.11n-20	5745	Low	17.03	≥0.5	Pass
		5785	Mid	16.95	≥0.5	Pass
		5825	High	16.88	≥0.5	Pass
	802.11n-40	5755	Low	35.52	≥0.5	Pass
		5795	High	35.80	≥0.5	Pass

26dB Bandwidth Test Plots

26dB BW - 802.11a 5180MHz

26dB BW - 802.11n-20M 5180MHz

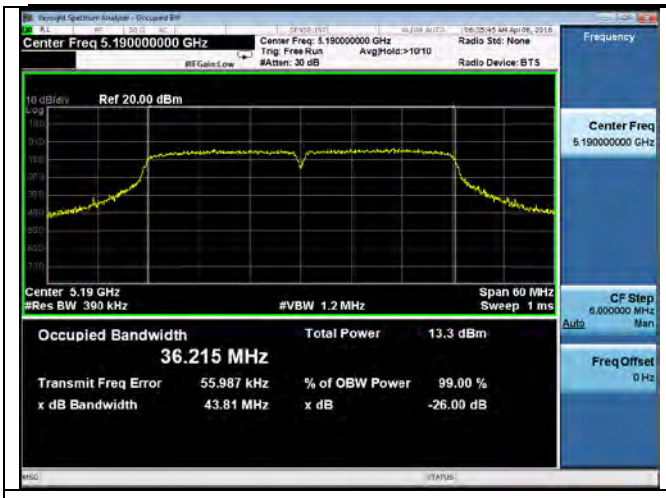


26dB BW - 802.11a 5200MHz

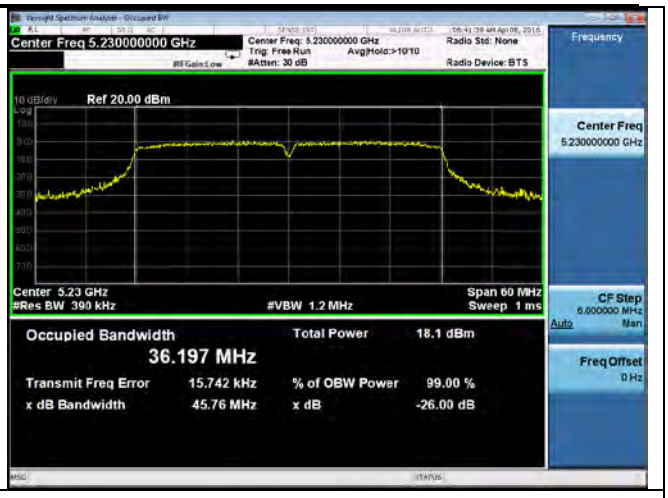
26dB BW - 802.11n-20M 5200MHz

26dB BW - 802.11a 5240MHz

26dB BW - 802.11n-20M 5240MHz



26dB BW - 802.11n40 5190MHz



26dB BW - 802.11n-40M 5230MHz

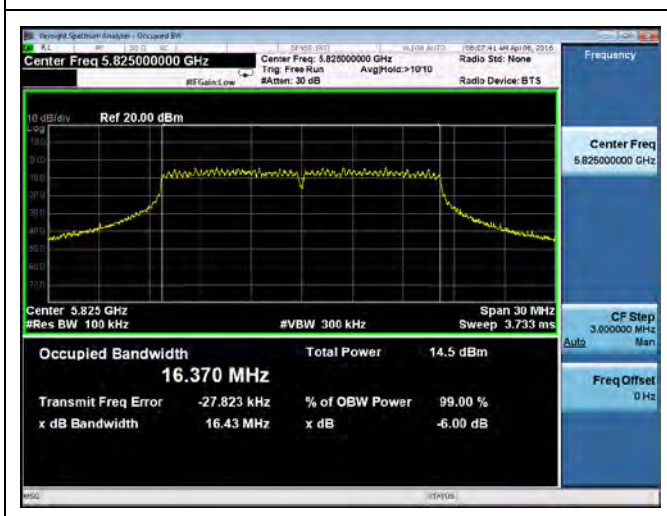
6dB Bandwidth Test Plots

6dB BW 802.11a 5745MHz

6dB BW 802.11n-20M 5745MHz

6dB BW 802.11a 5785MHz

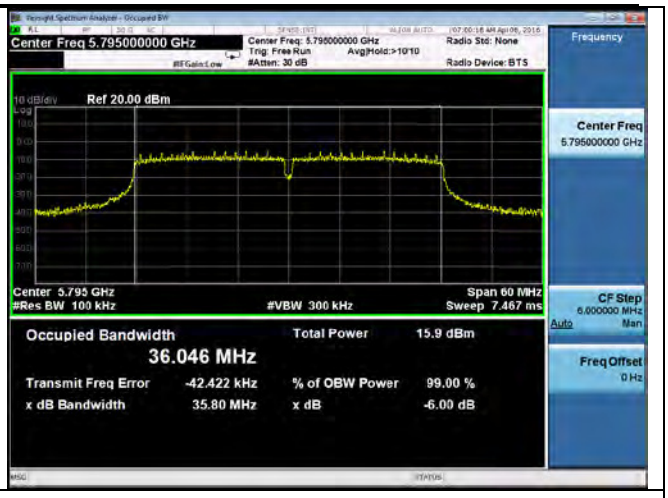
6dB BW 802.11n-20M 5785MHz



6dB BW 802.11a 5825MHz

6dB BW 802.11n-20M 5825MHz

6dB BW 802.11n-40M 5755MHz



6dB BW 802.11n40 5795MHz

10.3 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	04/07/2016	Environmental condition	Temperature 21ºC Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	-		
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 :

5.2 GHz							
Test mode	Freq(MHz)	CH	Conducted Power (dBm)		Highest Conducted Power (dBm)	Limit (dBm)	Result
			Chain 1	Chain 2			
802.11a	5180	Low	9.87	10.40	10.40	30	pass
	5200	Mid	10.05	10.45	10.45	30	pass
	5240	High	10.25	10.79	10.79	30	pass
802.11n20	5180	Low	10.52	10.83	10.83	30	pass
	5200	Mid	10.68	10.86	10.86	30	pass
	5240	High	10.85	11.80	11.80	30	pass
802.11n40	5190	Low	7.99	7.56	7.99	30	pass
	5230	High	12.53	11.75	12.53	30	pass

5.8 GHz							
Test mode	Freq(MHz)	CH	Conducted Power (dBm)		Highest Conducted Power (dBm)	Limit (dBm)	Result
			Chain 1	Chain 2			
802.11a	5745	Low	7.42	8.65	8.65	30	Pass
	5785	Mid	9.18	9.78	9.78	30	Pass
	5825	High	9.47	10.13	10.13	30	Pass
802.11n20	5745	Low	10.37	11.36	11.36	30	Pass
	5785	Mid	11.53	12.07	12.07	30	Pass
	5825	High	11.59	12.53	12.53	30	Pass
802.11n40	5755	Low	10.93	11.83	11.83	30	Pass
	5795	High	11.22	11.96	11.96	30	Pass

Note: Chain 1 and Chain 2 does not transmit simultaneously.

10.4 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☐
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☒
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.	☒
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	☒

Test Setup				
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1 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	04/07/2016	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22ºC 42% 1020mbar
Remark	-			
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:

5.2 GHz							
Test mode	Freq(MHz)	CH	Conducted PSD (dBm/MHz)		Highest Conducted PSD (dBm/MHz)	Limit (dBm/MHz)	Result
			Chain 1	Chain 2			
802.11a	5180	Low	6.08	5.82	6.08	17	Pass
	5200	Mid	5.31	5.38	5.38	17	Pass
	5240	High	5.99	6.22	6.22	17	Pass
802.11n20	5180	Low	5.95	5.69	5.95	17	Pass
	5200	Mid	5.72	5.15	5.72	17	Pass
	5240	High	5.83	5.79	5.83	17	Pass
802.11n40	5190	Low	-0.46	-1.06	-0.46	17	Pass
	5230	High	4.47	3.24	4.47	17	Pass

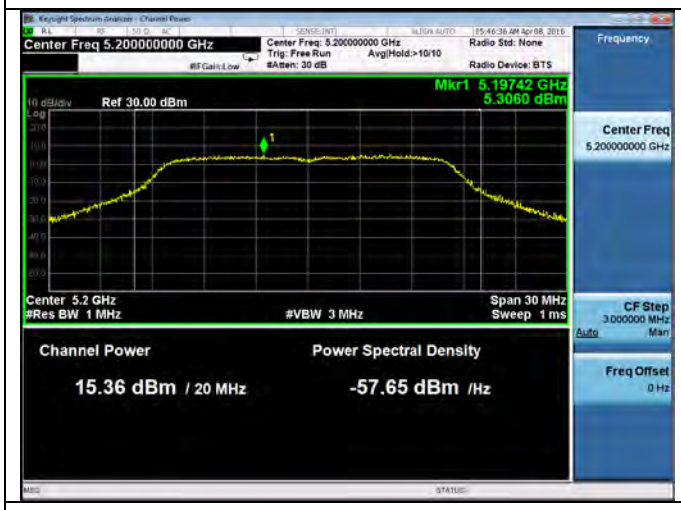
5.8 GHz									
Test mode	Freq(MHz)	CH	Conducted PSD (dBm/100KHz)		Highest Conducted PSD	Correction Factor	Corrected PSD (dBm/500KHz)	Limit (dBm/500KHz)	Result
			Chain 1	Chain 2					
802.11a	5745	Low	-4.46	-3.85	-3.85	6.99	3.14	30	Pass
	5785	Mid	-3.47	-3.01	-3.01	6.99	3.98	30	Pass
	5825	High	-3.07	2.52	2.52	6.99	9.51	30	Pass
802.11n20	5745	Low	-1.25	-0.60	-0.60	6.99	6.39	30	Pass
	5785	Mid	-1.33	0.21	0.21	6.99	7.20	30	Pass
	5825	High	-0.06	1.05	1.05	6.99	8.04	30	Pass
802.11n40	5755	Low	-4.09	-12.17	-4.09	6.99	2.90	30	Pass
	5795	High	-3.30	-11.59	-3.30	6.99	3.69	30	Pass
*Note	BW correction factor = 10log(500kHz/RBW)								

Note: Chain 1 and Chain 2 does not transmit simultaneously.

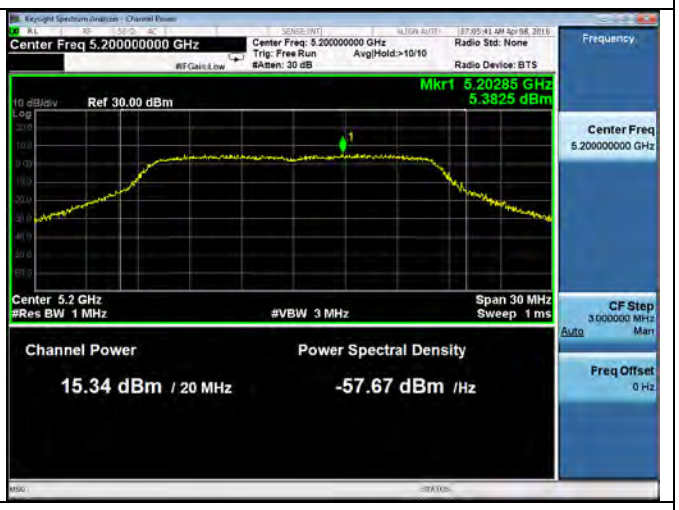
Test Plots

PSD-802.11a-5180M (Chain 1)

PSD-802.11a-5180M (Chain 2)

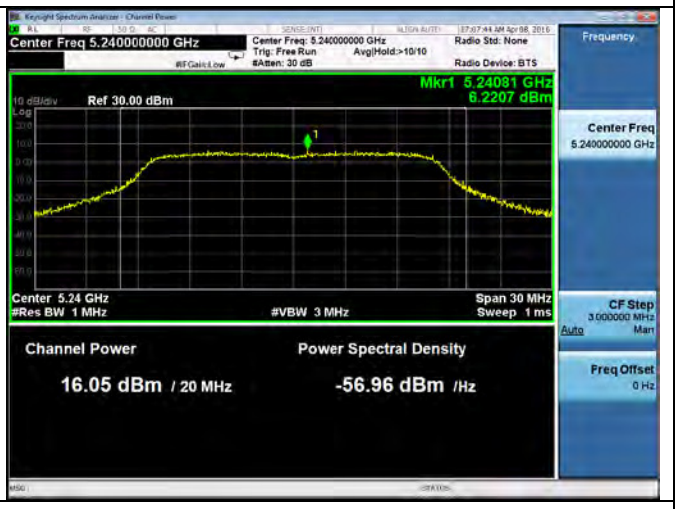


PSD-802.11a-5200M (Chain 1)

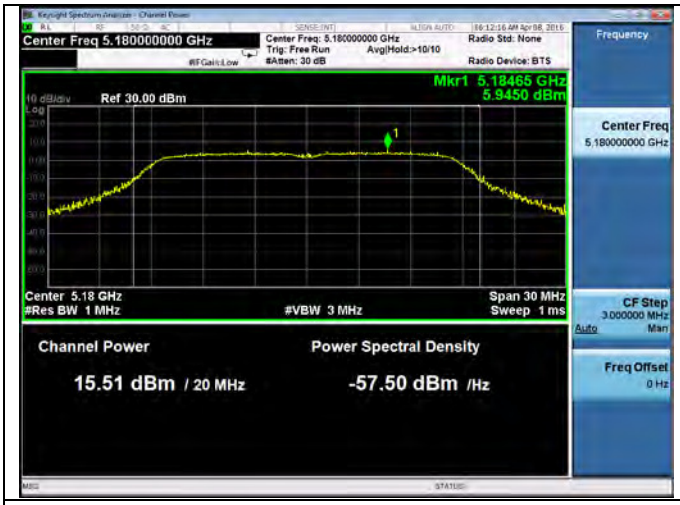


PSD-802.11a-5200M (Chain 2)

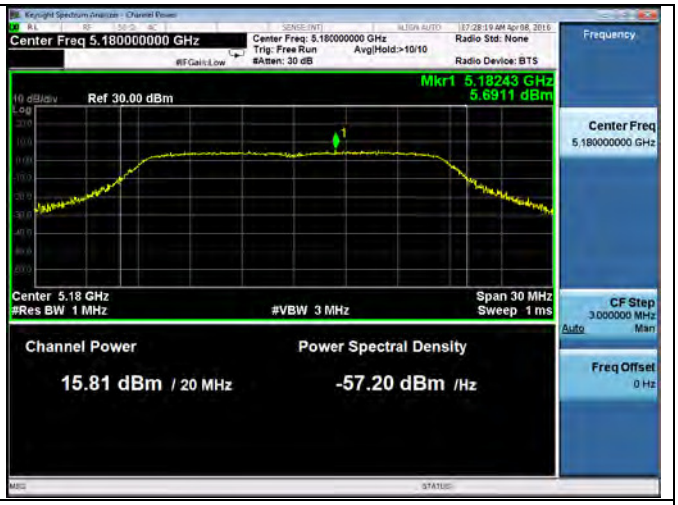
PSD-802.11a-5240M (Chain 1)



PSD-802.11a-5240M (Chain 2)



PSD-802.11n-20M-5180M (Chain 1)

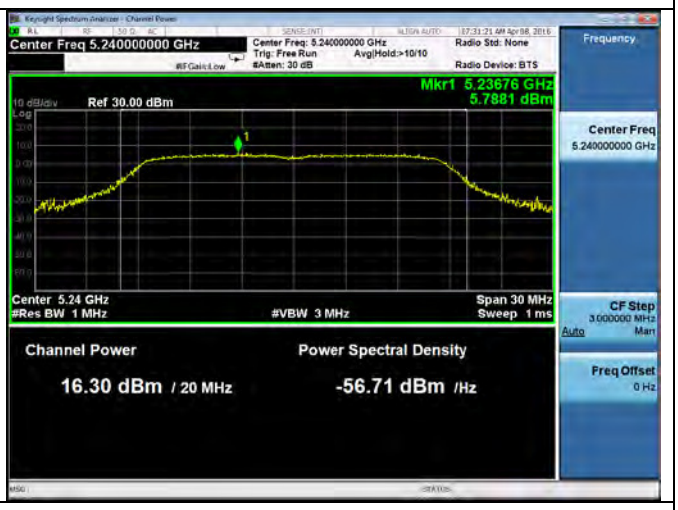


PSD-802.11n-20M-5180M (Chain 2)

PSD-802.11n-20M-5200M (Chain 1)

PSD-802.11n-20M-5200M (Chain 2)

PSD-802.11n-20M-5240M (Chain 1)

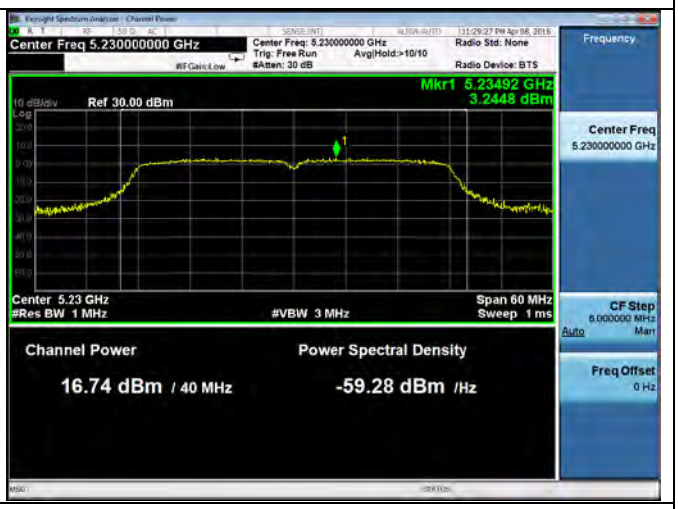


PSD-802.11n-20M-5240M (Chain 2)

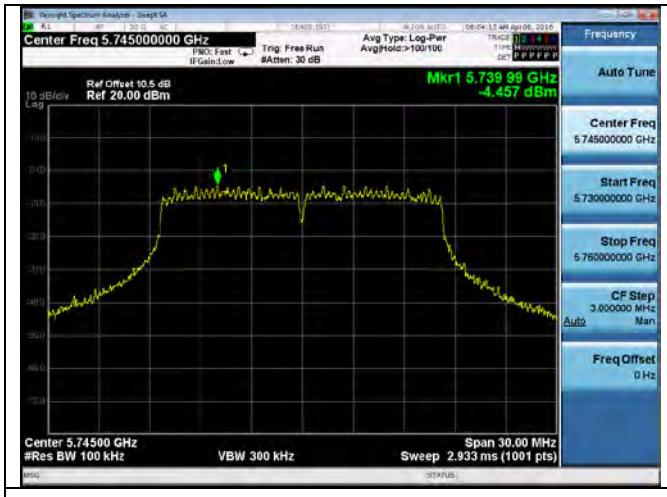
PSD-802.11n-40M-5190M (Chain 1)

PSD-802.11n-40M-5190M (Chain 2)

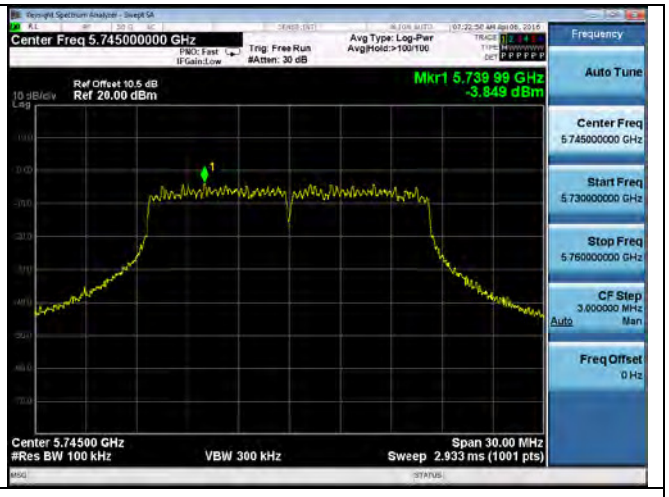
PSD-802.11n-40M-5230M (Chain 1)



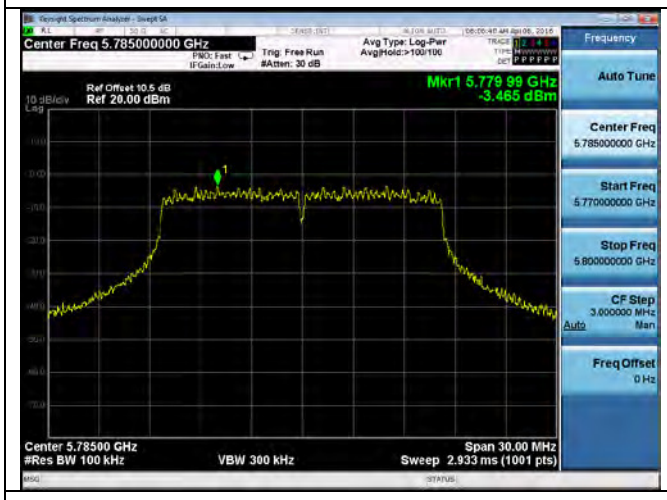
PSD-802.11n-40M-5230M (Chain 2)



PSD-802.11a 5745MHz Chain 1

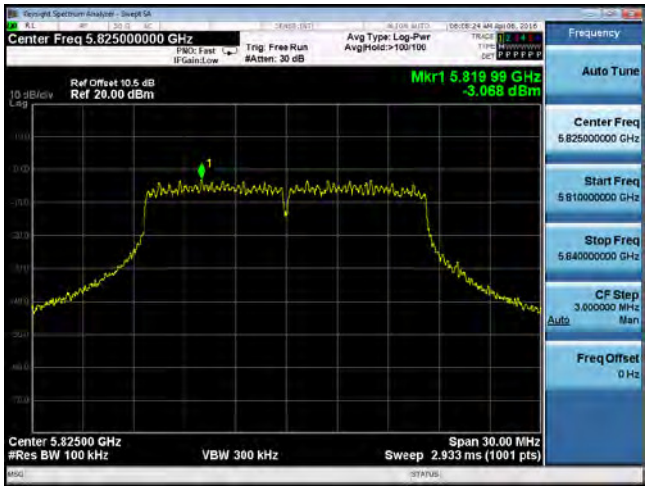


PSD-802.11a 5745MHz Chain 2



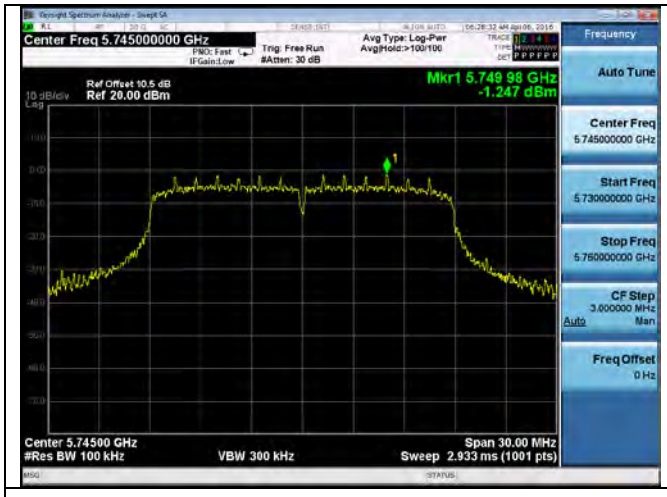
PSD-802.11a 5785MHz Chain 1

PSD-802.11a 5785MHz Chain 2



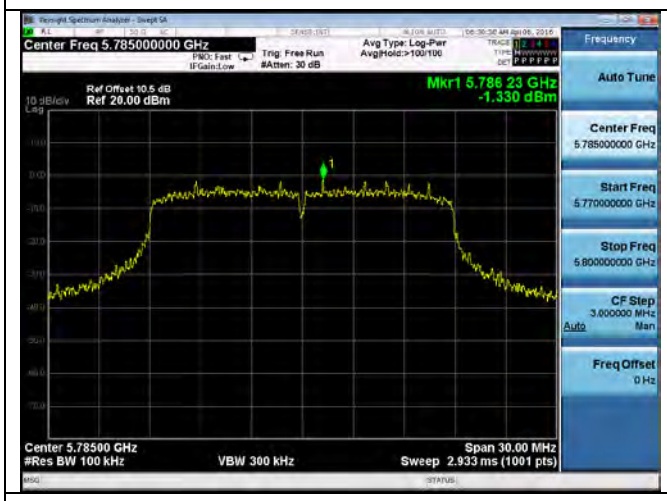
PSD-802.11a 5825MHz Chain 1

PSD-802.11a 5825MHz Chain 2



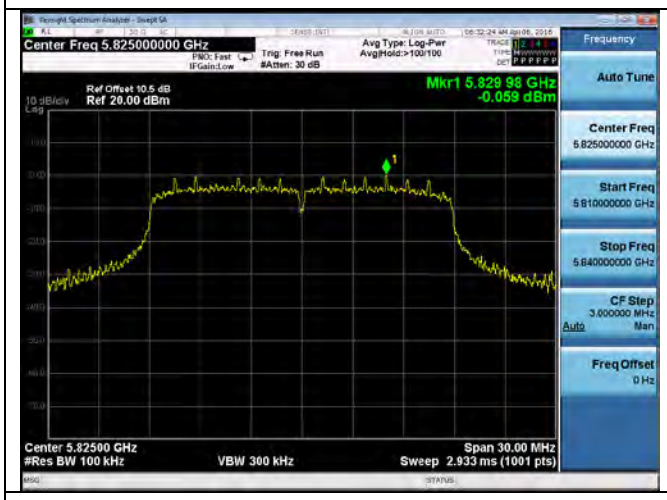
PSD-802.11n-20M 5745MHz Chain 1

PSD-802.11n-20M 5745MHz Chain 2



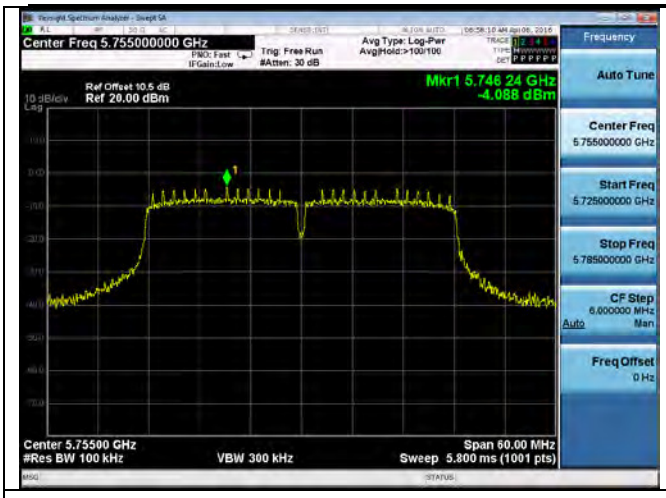
PSD-802.11n-20M 5785MHz Chain 1

PSD-802.11n-20M 5785MHz Chain 2



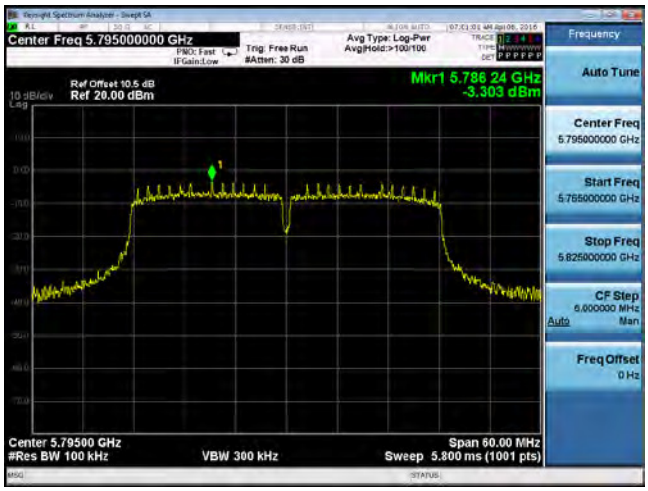
PSD-802.11n-20M 5825MHz Chain 1

PSD-802.11n-20M 5825MHz Chain 1

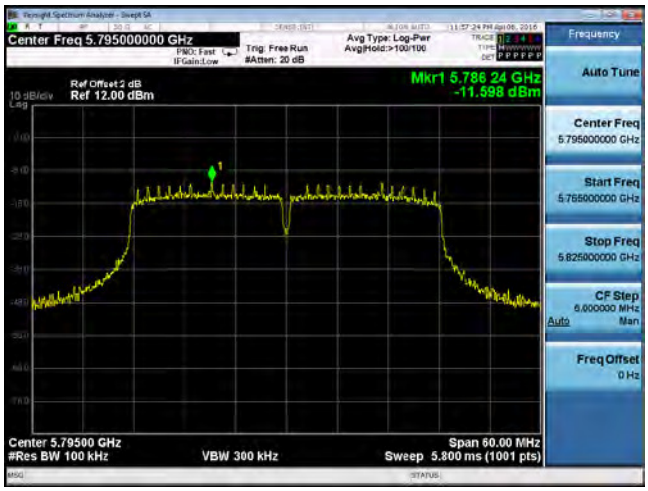


PSD-802.11n40-5755 MHz Chain 1

PSD-802.11n40-5755 MHz Chain 2



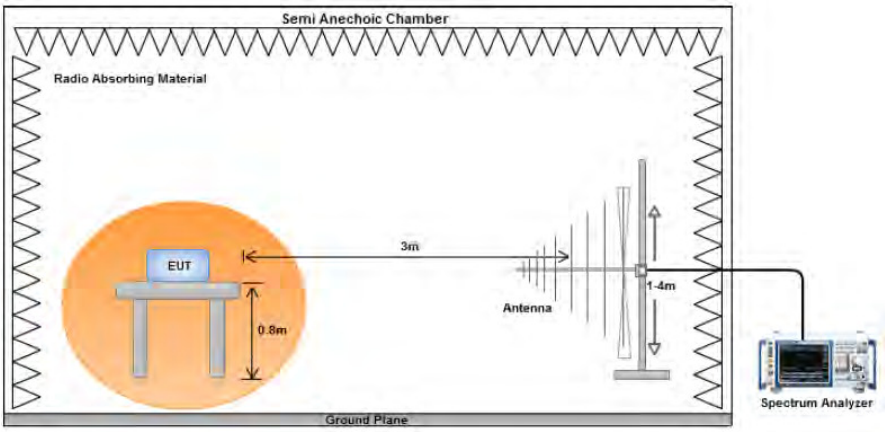
PSD-802.11n40-5795 MHz Chain 1



PSD-802.11n40-5795 MHz Chain 2

10.5 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> 
</td><td></td></tr>
<tr><td>Procedure</td><td>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><td></td></tr>
<tr><td>Remark</td><td>Both horizontal and vertical polarities were investigated. The results show only the worst case.</td><td></td></tr>
<tr><td>Result</td><td>☒ Pass ☐ Fail</td><td></td></tr>
</table>

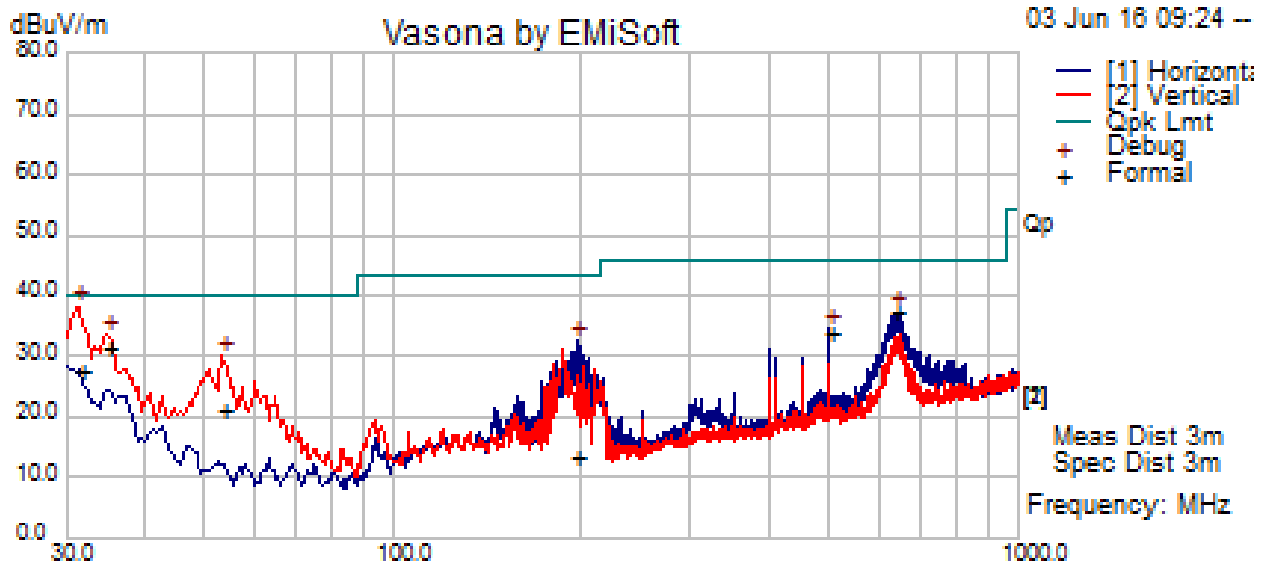
Test Data ☒ Yes (See below) ☐ N/A

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):	25.7	Result	Pass
	Humidity (%)	29		
	Atmospheric (mPa):	1021		
Mains Power:	110VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	06/03/2016			
Remarks:	5.2GHz 11n40 5230			

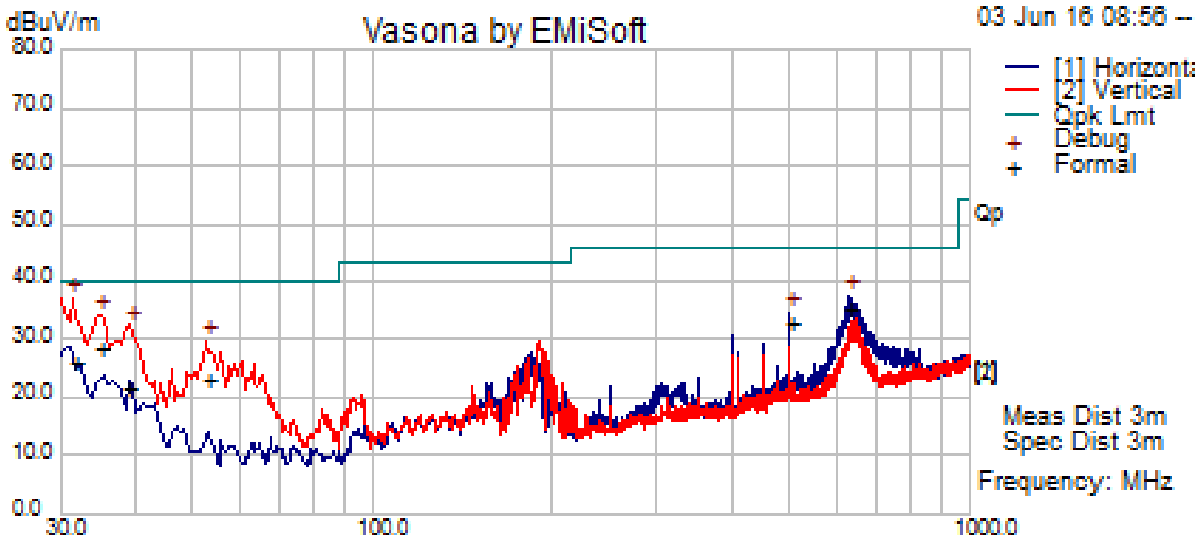


Quasi Max Measurement

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
31.66	43.92	0.84	-17.14	27.62	Quasi Max	V	250.00	36.00	40.00	-12.38	Pass
35.05	50.56	0.85	-20.02	31.39	Quasi Max	V	102.00	33.00	40.00	-8.61	Pass
639.65	52.56	3.93	-19.30	37.18	Quasi Max	H	133.00	339.00	46.02	-8.84	Pass
53.46	50.51	1.13	-30.49	21.15	Quasi Max	V	105.00	347.00	40.00	-18.85	Pass
196.31	38.21	2.08	-26.92	13.36	Quasi Max	H	318.00	117.00	43.52	-30.16	Pass
499.99	51.70	3.52	-21.59	33.63	Quasi Max	H	184.00	347.00	46.02	-12.39	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):	25.7	Result	Pass
	Humidity (%)	29		
	Atmospheric (mPa):	1021		
Mains Power:	110VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	06/03/2016			
Remarks:	5.8GHz 11n-40M 5795MHz			



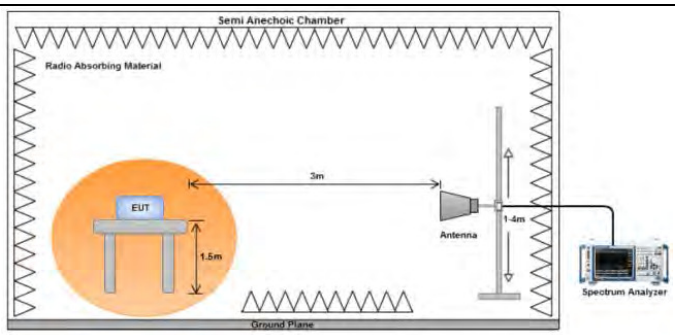
Quasi Max Measurement

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
31.59	42.38	0.84	-17.08	26.14	Quasi Max	V	234.00	27.00	40.00	-13.86	Pass
35.07	47.83	0.85	-20.03	28.65	Quasi Max	V	104.00	270.00	40.00	-11.35	Pass
39.05	43.66	0.93	-23.08	21.52	Quasi Max	V	126.00	327.00	40.00	-18.48	Pass
629.36	51.31	3.91	-19.81	35.41	Quasi Max	H	149.00	183.00	46.02	-10.61	Pass
53.00	52.44	1.13	-30.44	23.13	Quasi Max	V	114.00	339.00	40.00	-16.87	Pass
500.02	50.93	3.52	-21.59	32.86	Quasi Max	H	179.00	340.00	46.02	-13.16	Pass

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

10.6 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 Emission Test Results (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
17989.27	47.40	9.47	-3.24	53.63	Peak Max	H	215.00	0.00	74.00	-20.37	Pass
1535.78	71.88	4.77	-29.18	47.47	Peak Max	H	111.00	248.00	74.00	-26.53	Pass
1943.63	63.63	4.76	-27.87	40.52	Peak Max	H	218.00	234.00	74.00	-33.49	Pass
17989.27	36.14	9.47	-3.24	42.37	Average Max	H	215.00	0.00	54.00	-11.63	Pass
1535.78	69.55	4.77	-29.18	45.14	Average Max	H	111.00	248.00	54.00	-8.86	Pass
1943.63	52.43	4.76	-27.87	29.31	Average Max	H	218.00	234.00	54.00	-24.69	Pass

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
17895.39	48.50	9.46	-3.09	54.87	Peak Max	V	131.00	150.00	74.00	-19.13	Pass
1535.91	69.56	4.77	-29.18	45.15	Peak Max	V	186.00	4.00	74.00	-28.85	Pass
1943.86	63.13	4.76	-27.87	40.03	Peak Max	H	218.00	361.00	74.00	-33.97	Pass
17895.39	36.94	9.46	-3.09	43.31	Average Max	V	131.00	150.00	54.00	-10.69	Pass
1535.91	66.90	4.77	-29.18	42.49	Average Max	V	186.00	4.00	54.00	-11.51	Pass
1943.86	49.61	4.76	-27.87	26.51	Average Max	H	218.00	361.00	54.00	-27.49	Pass

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
9502.06	51.13	7.84	-10.36	48.61	Peak Max	V	240.00	156.00	74.00	-25.39	Pass
1535.90	68.79	4.77	-29.18	44.38	Peak Max	V	102.00	5.00	74.00	-29.62	Pass
2131.92	60.25	5.10	-25.48	39.86	Peak Max	H	236.00	100.00	74.00	-34.14	Pass
9502.06	39.21	7.84	-10.36	36.69	Average Max	V	240.00	156.00	54.00	-17.31	Pass
1535.90	66.28	4.77	-29.18	41.87	Average Max	V	102.00	5.00	54.00	-12.13	Pass
2131.92	48.54	5.10	-25.48	28.16	Average Max	H	236.00	100.00	54.00	-25.85	Pass

802.11n20 – 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
17549.27	48.00	9.42	-3.68	53.74	Peak Max	H	154.00	54.00	74.00	-20.26	Pass
1535.92	70.01	4.77	-29.18	45.60	Peak Max	H	121.00	221.00	74.00	-28.40	Pass
1944.25	64.03	4.76	-27.86	40.93	Peak Max	H	237.00	201.00	74.00	-33.07	Pass
17549.27	36.25	9.42	-3.68	41.99	Average Max	H	154.00	54.00	54.00	-12.01	Pass
1535.92	68.38	4.77	-29.18	43.97	Average Max	H	121.00	221.00	54.00	-10.04	Pass
1944.25	50.77	4.76	-27.86	27.67	Average Max	H	237.00	201.00	54.00	-26.33	Pass

802.11n20 – 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
17831.19	48.81	9.45	-3.37	54.89	Peak Max	H	121.00	85.00	74.00	-19.11	Pass
1535.98	68.83	4.77	-29.18	44.42	Peak Max	V	186.00	0.00	74.00	-29.58	Pass
1736.78	56.69	4.76	-28.49	32.96	Peak Max	H	222.00	253.00	74.00	-41.04	Pass
17831.19	37.02	9.45	-3.37	43.10	Average Max	H	121.00	85.00	54.00	-10.90	Pass
1535.98	66.70	4.77	-29.18	42.29	Average Max	V	186.00	0.00	54.00	-11.71	Pass
1736.78	44.74	4.76	-28.49	21.02	Average Max	H	222.00	253.00	54.00	-32.99	Pass

802.11n20 – 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
17709.64	48.15	9.44	-3.11	54.47	Peak Max	V	233.00	53.00	74.00	-19.53	Pass
1535.96	67.93	4.77	-29.18	43.52	Peak Max	V	183.00	0.00	74.00	-30.48	Pass
1944.83	63.46	4.76	-27.85	40.37	Peak Max	H	229.00	304.00	74.00	-33.64	Pass
17709.64	36.37	9.44	-3.11	42.69	Average Max	V	233.00	53.00	54.00	-11.31	Pass
1535.96	65.92	4.77	-29.18	41.51	Average Max	V	183.00	0.00	54.00	-12.49	Pass
1944.83	46.89	4.76	-27.85	23.80	Average Max	H	229.00	304.00	54.00	-30.20	Pass

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
17932.65	48.49	9.46	-3.13	54.82	Peak Max	H	154.00	319.00	74.00	-19.18	Pass
8663.28	50.32	7.61	-10.84	47.09	Peak Max	V	165.00	285.00	74.00	-26.91	Pass
1535.76	69.01	4.77	-29.18	44.60	Peak Max	H	246.00	18.00	74.00	-29.40	Pass
17932.65	37.30	9.46	-3.13	43.63	Average Max	H	154.00	319.00	54.00	-10.37	Pass
8663.28	38.57	7.61	-10.84	35.34	Average Max	V	165.00	285.00	54.00	-18.66	Pass
1535.76	66.59	4.77	-29.18	42.18	Average Max	H	246.00	18.00	54.00	-11.82	Pass

802.11n40 – 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
17898.10	48.85	9.46	-3.08	55.23	Peak Max	V	102.00	0.00	74.00	-18.77	Pass
9191.15	49.18	7.75	-10.44	46.48	Peak Max	V	197.00	160.00	74.00	-27.52	Pass
1536.01	67.30	4.77	-29.18	42.89	Peak Max	V	173.00	151.00	74.00	-31.11	Pass
17898.10	36.98	9.46	-3.08	43.36	Average Max	V	102.00	0.00	54.00	-10.64	Pass
9191.15	37.90	7.75	-10.44	35.20	Average Max	V	197.00	160.00	54.00	-18.80	Pass
1536.01	65.53	4.77	-29.18	41.12	Average Max	V	173.00	151.00	54.00	-12.88	Pass

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
17841.24	48.43	9.45	-3.33	54.56	Peak Max	H	215.00	92.00	74.00	-19.44	Pass
1535.86	71.07	4.77	-29.18	46.66	Peak Max	V	169.00	150.00	74.00	-27.34	Pass
1944.86	63.66	4.76	-27.85	40.57	Peak Max	H	236.00	205.00	74.00	-33.43	Pass
17841.24	37.24	9.45	-3.33	43.36	Average Max	H	215.00	92.00	54.00	-10.64	Pass
1535.86	69.32	4.77	-29.18	44.91	Average Max	V	169.00	150.00	54.00	-9.10	Pass
1944.86	51.97	4.76	-27.85	28.88	Average Max	H	236.00	205.00	54.00	-25.12	Pass

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
17851.23	48.76	9.45	-3.28	54.93	Peak Max	H	235.00	309.00	74.00	-19.07	Pass
1535.84	70.95	4.77	-29.18	46.54	Peak Max	V	160.00	149.00	74.00	-27.46	Pass
1944.29	62.92	4.76	-27.86	39.81	Peak Max	H	164.00	86.00	74.00	-34.19	Pass
17851.23	37.04	9.45	-3.28	43.22	Average Max	H	235.00	309.00	54.00	-10.79	Pass
1535.84	69.18	4.77	-29.18	44.77	Average Max	V	160.00	149.00	54.00	-9.23	Pass
1944.29	51.65	4.76	-27.86	28.55	Average Max	H	164.00	86.00	54.00	-25.45	Pass

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
17674.15	48.41	9.43	-3.19	54.65	Peak Max	H	146.00	59.00	74.00	-19.35	Pass
1535.81	69.45	4.77	-29.18	45.04	Peak Max	V	173.00	153.00	74.00	-28.96	Pass
3883.39	57.14	6.80	-19.51	44.43	Peak Max	H	101.00	128.00	74.00	-29.57	Pass
17674.15	36.85	9.43	-3.19	43.09	Average Max	H	146.00	59.00	54.00	-10.91	Pass
1535.81	67.57	4.77	-29.18	43.16	Average Max	V	173.00	153.00	54.00	-10.84	Pass
3883.39	52.11	6.80	-19.51	39.40	Average Max	H	101.00	128.00	54.00	-14.60	Pass

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
11491.78	51.79	8.54	-8.09	52.24	Peak Max	V	245.00	15.00	74.00	-21.76	Pass
1535.98	67.91	4.77	-29.18	43.50	Peak Max	H	121.00	217.00	74.00	-30.50	Pass
1942.27	59.81	4.76	-27.89	36.68	Peak Max	H	236.00	305.00	74.00	-37.32	Pass
11491.78	39.11	8.54	-8.09	39.56	Average Max	V	245.00	15.00	54.00	-14.44	Pass
1535.98	65.85	4.77	-29.18	41.44	Average Max	H	121.00	217.00	54.00	-12.56	Pass
1942.27	48.57	4.76	-27.89	25.44	Average Max	H	236.00	305.00	54.00	-28.57	Pass

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
11566.28	55.05	8.57	-8.04	55.57	Peak Max	V	208.00	266.00	74.00	-18.43	Pass
1535.95	67.31	4.77	-29.18	42.90	Peak Max	V	176.00	5.00	74.00	-31.10	Pass
4922.60	49.37	7.07	-16.97	39.47	Peak Max	V	236.00	15.00	74.00	-34.53	Pass
11566.28	42.34	8.57	-8.04	42.87	Average Max	V	208.00	266.00	54.00	-11.13	Pass
1535.95	65.30	4.77	-29.18	40.89	Average Max	V	176.00	5.00	54.00	-13.11	Pass
4922.60	38.56	7.07	-16.97	28.65	Average Max	V	236.00	15.00	54.00	-25.35	Pass

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
17648.20	48.16	9.43	-3.31	54.28	Peak Max	H	245.00	339.00	74.00	-19.72	Pass
1535.95	66.42	4.77	-29.18	42.01	Peak Max	H	123.00	218.00	74.00	-31.99	Pass
1944.93	63.23	4.76	-27.85	40.13	Peak Max	H	162.00	68.00	74.00	-33.87	Pass
17648.20	36.57	9.43	-3.31	42.69	Average Max	H	245.00	339.00	54.00	-11.31	Pass
1535.95	64.68	4.77	-29.18	40.27	Average Max	H	123.00	218.00	54.00	-13.73	Pass
1944.93	44.79	4.76	-27.85	21.69	Average Max	H	162.00	68.00	54.00	-32.31	Pass

802.11n40 – 5755MHz

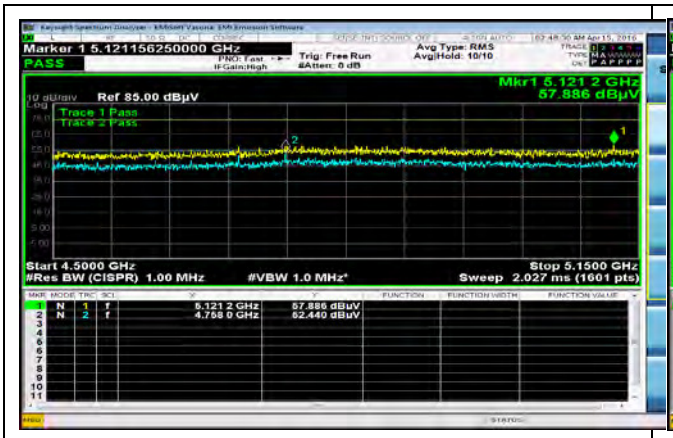
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17665.47	48.41	9.43	-3.23	54.61	Peak Max	H	213.00	25.00	74.00	-19.39	Pass
1535.90	66.98	4.77	-29.18	42.57	Peak Max	V	186.00	5.00	74.00	-31.43	Pass
2130.94	62.75	5.10	-25.48	42.37	Peak Max	H	232.00	190.00	74.00	-31.63	Pass
17665.47	36.98	9.43	-3.23	43.18	Average Max	H	213.00	25.00	54.00	-10.82	Pass
1535.90	64.84	4.77	-29.18	40.43	Average Max	V	186.00	5.00	54.00	-13.57	Pass
2130.94	52.31	5.10	-25.48	31.93	Average Max	H	232.00	190.00	54.00	-22.07	Pass

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
17910.86	49.75	9.46	-3.09	56.11	Peak Max	V	154.00	266.00	74.00	-17.89	Pass
1536.01	65.99	4.77	-29.18	41.58	Peak Max	V	176.00	5.00	74.00	-32.42	Pass
2133.19	58.97	5.10	-25.49	38.59	Peak Max	V	169.00	225.00	74.00	-35.41	Pass
17910.86	37.23	9.46	-3.09	43.60	Average Max	V	154.00	266.00	54.00	-10.40	Pass
1536.01	63.95	4.77	-29.18	39.54	Average Max	V	176.00	5.00	54.00	-14.46	Pass
2133.19	43.25	5.10	-25.49	22.86	Average Max	V	169.00	225.00	54.00	-31.14	Pass

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

Restricted Band Measurement Plots:

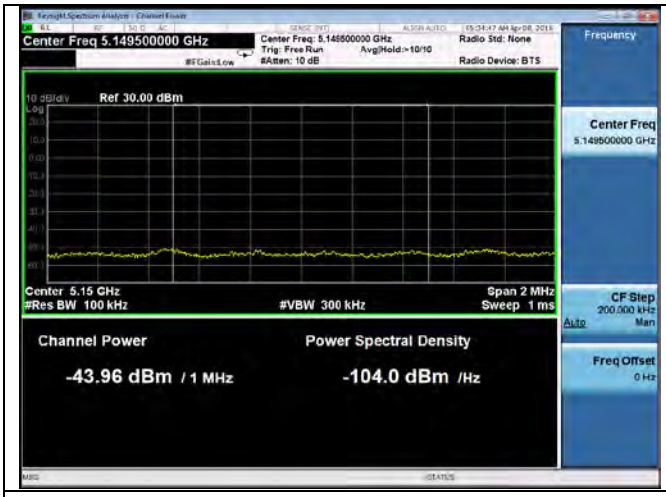


Lower Band 802.11a 5180MHz

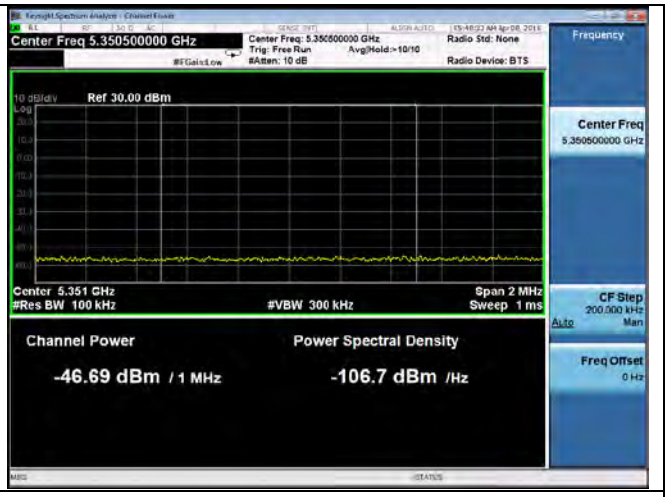
Lower Band 802.11n-20M 5180MHz

Lower Band 802.11n-40M 5190MHz

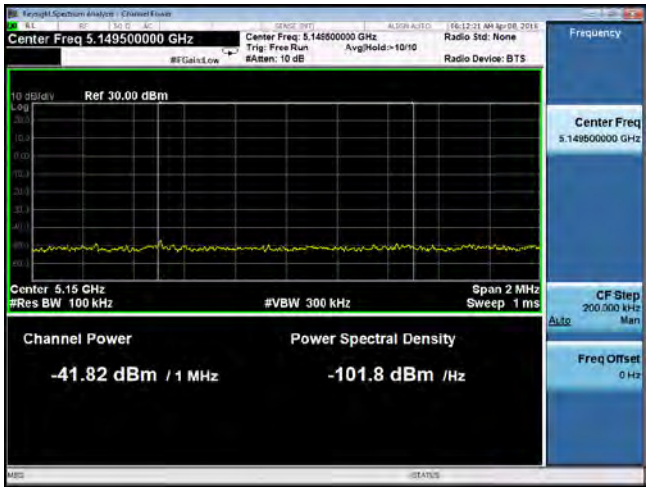
Conducted Band Edge Measurement Plots (Plot shows only worst case of both chains)



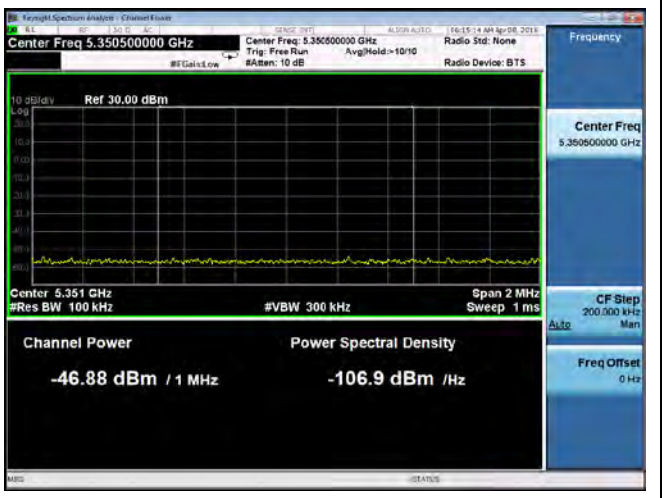
Band Edge-802.11a 5180 MHz (Limit: -27dBm/MHz eirp)



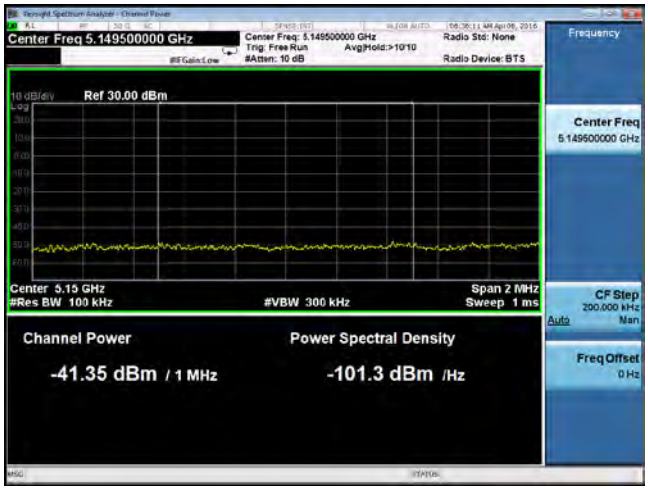
Band Edge-802.11a 5240 MHz (Limit: -27dBm/MHz eirp)



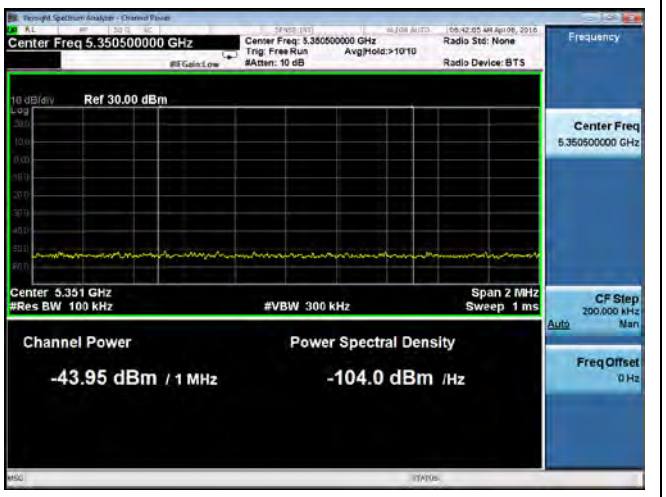
Band Edge-802.11n20 5180 MHz (Limit: -27dBm/MHz eirp)



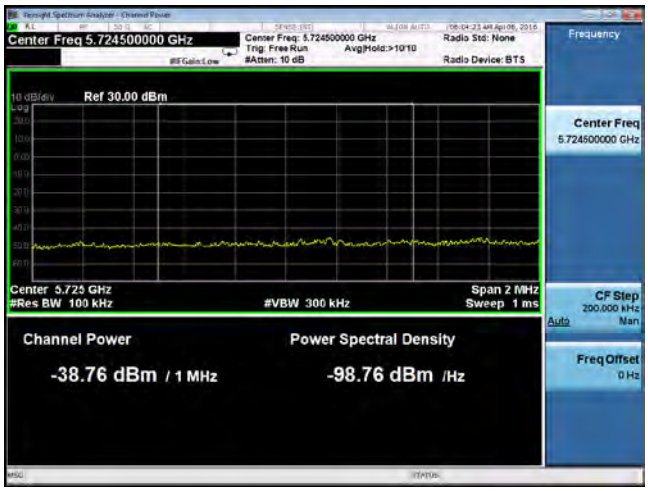
Band Edge-802.11n20 5240 MHz (Limit: -27dBm/MHz eirp)



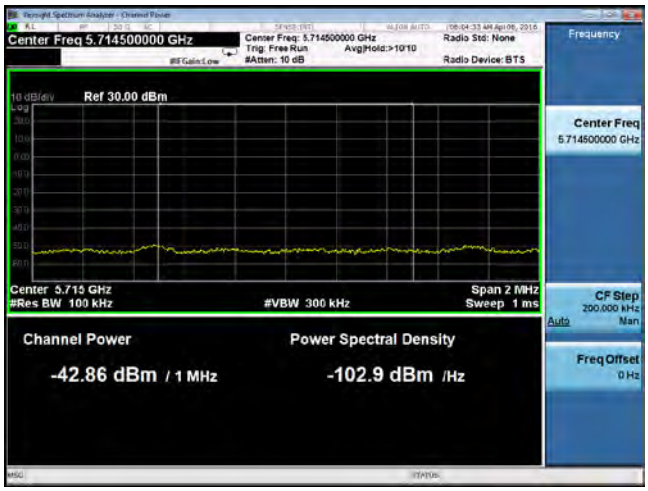
Band Edge-802.11n40 5190 MHz (Limit: -27dBm/MHz eirp)



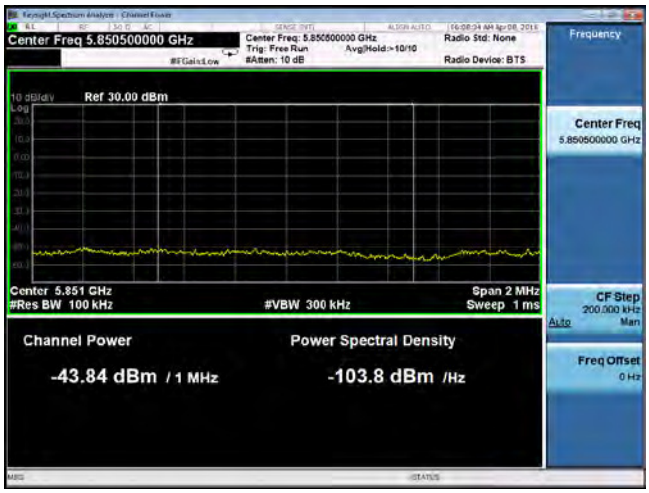
Band Edge-802.11n40 5230 MHz (Limit: -27dBm/MHz eirp)



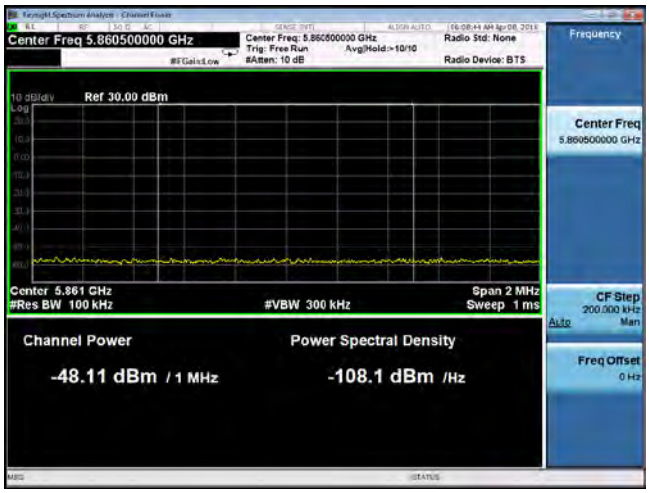
5.8GHz Band Edge-802.11a 5745 MHz (Limit: -17 eirp)



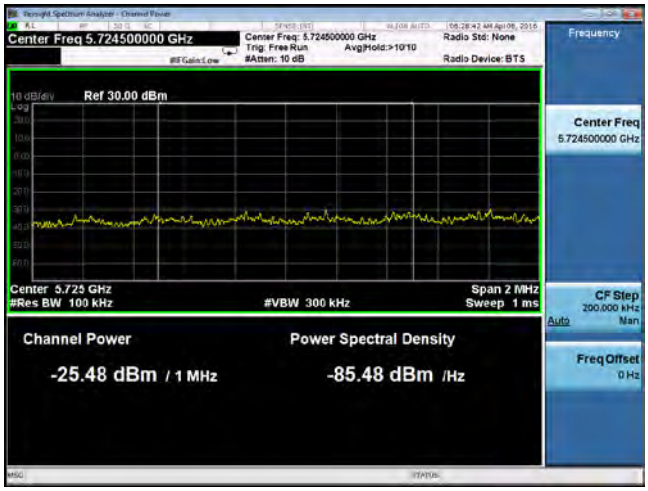
5.8GHz Band Edge-802.11a 5745 MHz (Limit: -27 eirp)



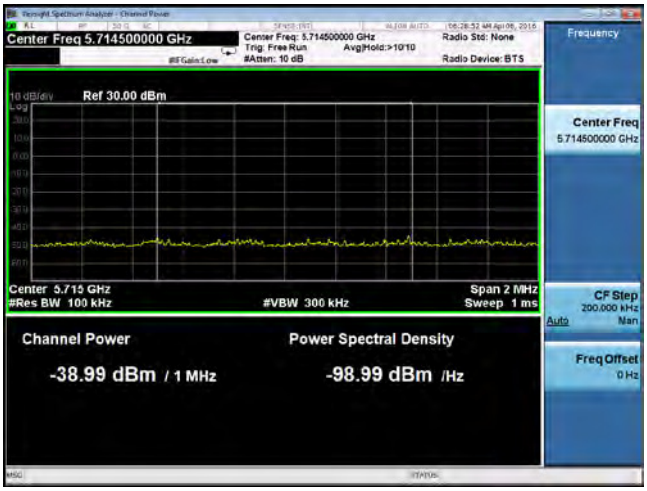
5.8GHz Band Edge-802.11a 5825 MHz (Limit: -17 eirp)



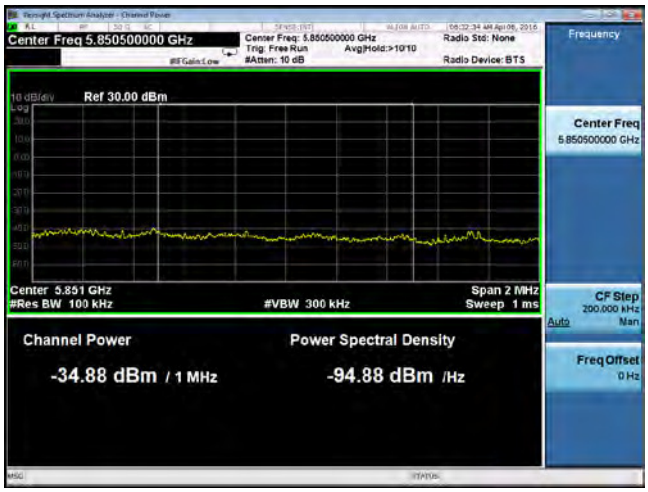
5.8GHz Band Edge-802.11a 5825 MHz (Limit: -27 eirp)



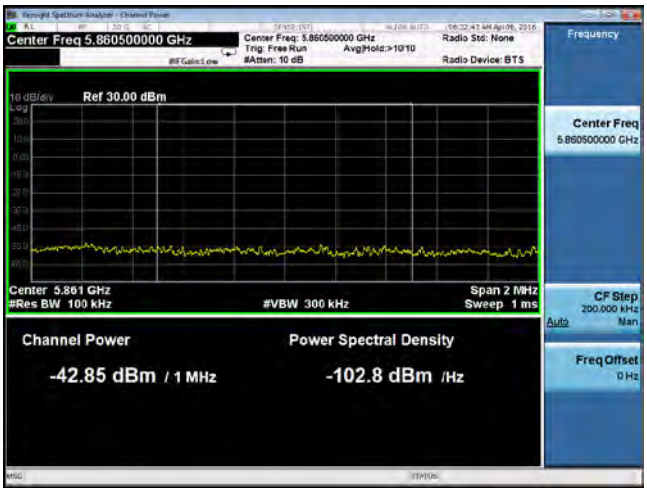
5.8GHz Band Edge-802.11n20 5745 MHz (Limit: -17 eirp)



5.8GHz Band Edge-802.11n20 5745 MHz (Limit: -27 eirp)

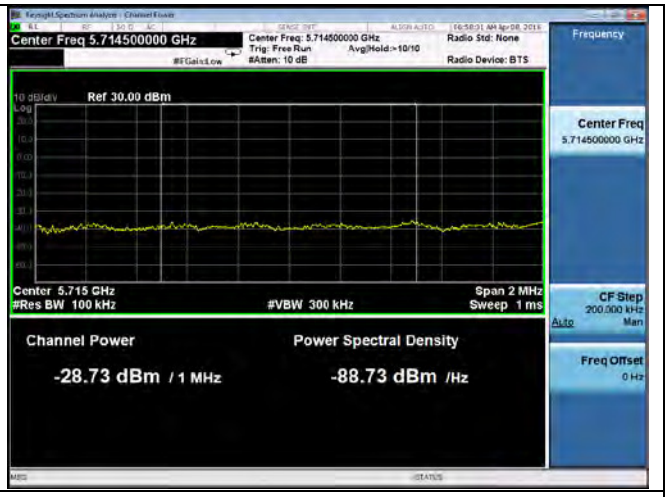


5.8GHz Band Edge-802.11n20 5825 MHz (Limit: -17 eirp)

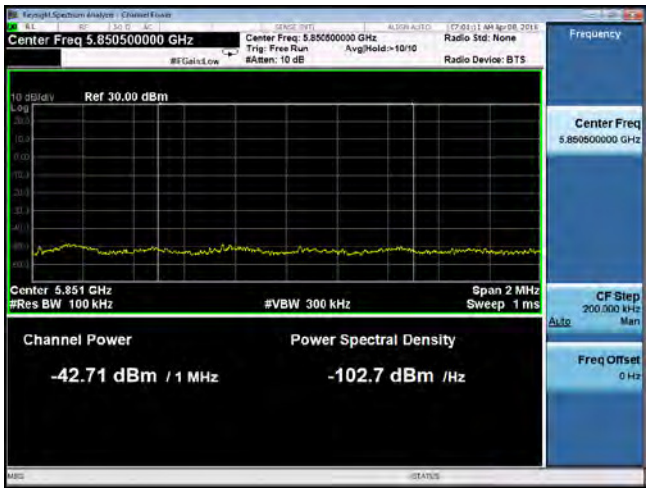


5.8GHz Band Edge-802.11n20 5825 MHz (Limit: -27 eirp)

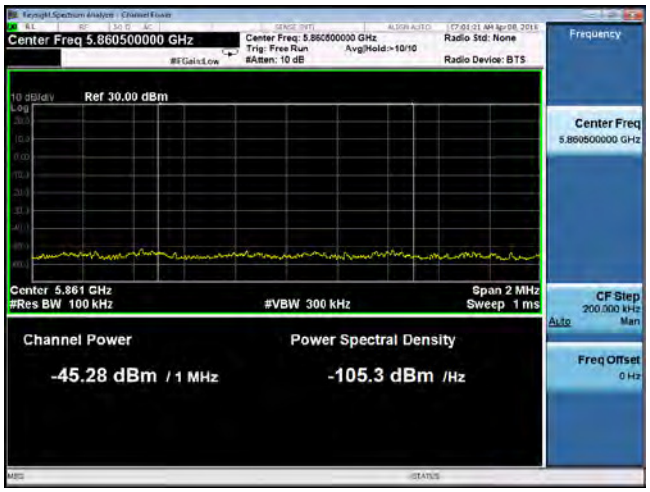
5.8GHz Band Edge-802.11n40 5755 MHz (Limit: -17 eirp)



5.8GHz Band Edge-802.11n40 5755 MHz (Limit: -27 eirp)



5.8GHz Band Edge-802.11n40 5795 MHz (Limit: -17 eirp)



5.8GHz Band Edge-802.11n40 5795 MHz (Limit: -27 eirp)

Note: The results above show only the worst case. Antenna gain = 4.9 dBi.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	06/03/2015	1 Year	06/03/2016	☑
CHASE LISN	MN2050B	1018	08/07/2015	1 Year	08/07/2016	☑
Radiated Emissions						
R & S Receiver	ESL6	100178	05/27/2015	1 Year	05/27/2016	☑
R & S Receiver	ESIB 40	100179	06/03/2015	1 Year	06/03/2016	☑
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	03/30/2016	1 Year	03/30/2017	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/10/2016	1 Year	02/10/2017	☑
ETS-Lingren Loop Antenna	6512	00049120	08/20/2015	1 Year	08/20/2016	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/15/2015	1 Year	08/15/2016	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	08/25/2015	1 Year	08/25/2016	☑
3 Meters SAC	3M	N/A	10/30/2015	1 Year	10/30/2016	☑
10 Meters SAC	10M	N/A	05/06/2015	1 Year	05/06/2016	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	10/27/2015	1 Year	10/27/2016	☑
R & S Receiver	ESIB 40	100179	06/03/2015	1 Year	06/03/2016	☑
Test Equity Environment Chamber	1007H	61201	07/28/2015	1 Year	07/28/2016	☑
USB RF Power Sensor	7002-006	159860	09/22/2015	1 Year	09/22/2016	☑

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