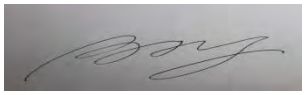
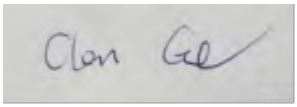
RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC_IC_SL18040201-RIO-001_UNII
Supersede Report No.:

Applicant	:	Resinio Ltd
Product Name	:	Balena Fin
Model No.	:	BLNFN100001
Test Standard	:	47 CFR 15.407 RSS-247 Issue 2
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01r02
FCC ID	:	2APW6BLN-FN-1-00001
IC		24038-BLNFN100001
Dates of test	:	05/01/2018 to 06/06/2018
Issue Date	:	06/08/2018
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:	
	
Benjamin Jing	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

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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_IC_SL18040201-RIO-001_UNII	None	Original	06/08/2018

2 Executive Summary

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

Company: Resinio Ltd
Product: Balena Fin
Model: BLNFN100001

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	Resinio Ltd
Applicant Address	One London Wall 6th floor London EC2Y 5EB United Kingdom
Manufacturer Name	Resinio Ltd
Manufacturer Address	One London Wall 6th floor London EC2Y 5EB United Kingdom

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	Balena Fin
Model No.	BLNFN100001
Trade Name	Resin.io
Serial No.	BLNFN100001
Input Power	120VAC/60Hz
Power Adapter Manu/Model	VEL36US120-US-JA
Power Adapter SN	E317867
Date of EUT received	04/15/2018
Equipment Class/ Category	DTS, UNII
Clock Frequencies	48MHz XTAL Frequency, 25MHz Clock
Port/Connectors	1 X RJ45, 2 X USB, 1 X mini USB, 1 X HDMI
Product Hardware version	1.0
Product Software version	1.0
Radio Hardware version	1.0
Radio Software version	1.0
Test Software version	1.0

6.2 Radio Description

Radio Type	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	5180–5240MHz 5260-5320MHz 5500-5720MHz 5745-5825MHz	5180–5240MHz 5260-5320MHz 5500-5720MHz 5745 -5825MHz	5190-5230MHz 5270-5310MHz 5510-5710MHz 5755-5795MHz	5210MHz , 5290MHz 5530MHz , 5610MHz, 5690MHz, 5775MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing	20MHz	20MHz	40MHz	80MHz
Number of Channels	16	16	8	4
Antenna Type	External antenna : ¼ Dipole - Omni Embedded antenna : SMD			
Antenna Gain (Peak)	External antenna : 2 dBi Embedded antenna : 1 dBi			
Antenna Connector Type	U.FI			
Note	2.4GHz and 5GHz Radio transmit simultaneously			

EUT Power level setting

Mode	Frequency	Power Setting
802.11-a	5180	14
802.11-a	5220	15
802.11-a	5240	15
802.11-n-20	5180	14
802.11-n-20	5220	15
802.11-n-20	5240	15
802.11-n-40	5190	14
802.11-n-40	5230	14
802.11-ac-80	5210	14
802.11-a	5260	15
802.11-a	5300	15
802.11-a	5320	14
802.11-n-20	5260	15
802.11-n-20	5300	15
802.11-n-20	5320	14
802.11-n-40	5270	14
802.11-n-40	5310	14
802.11-ac-80	5290	14
802.11-a	5500	14
802.11-a	5600	15
802.11-a	5700	15
802.11-n-20	5500	14
802.11-n-20	5600	15
802.11-n-20	5700	15
802.11-n-40	5510	14
802.11-n-40	5590	14
802.11-n-40	5670	14
802.11-ac-80	5530	13
802.11-ac-80	5610	13
802.11-a	5745	15
802.11-a	5785	15
802.11-a	5825	15
802.11-n-20	5745	15
802.11-n-20	5785	15
802.11-n-20	5825	15
802.11-n-40	5755	14
802.11-n-40	5795	14
802.11-ac-80	5775	14

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	
2	Router	WNR2000	N/A	Netgear	

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
Ethernet	RJ-45	EUT	RJ-45	Laptop	Ethernet 1 m	no	Unshiel ded

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Dut Labtool	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	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
	IC	Rss Gen 8.10	IC		
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☒ Pass ☐ N/A
	IC	RSS Gen 8.8		RSS Gen Issue 4 :2014	

UNII Bands Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
26 & 6dB Bandwidth	FCC	15.407 (a) (2)	FCC	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
	IC	RSS247 (5.2.1)	IC		
99% Occuipied Bandwidth	FCC	-	FCC	-	☒ Pass ☐N/A
	IC	RSS-247 (5.2.1)		RSS Gen Issue 5, April 2018	
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), (6))	FCC	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Maximum conducted Output Power	FCC	15.407 (a) (2)	FCC	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
	IC	RSS247 (5.4.4)	IC		
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 5, April 2018	☐ Pass ☒ N/A
Power reduction Antenna Gain > 6 dBi	FCC	15.407 (a) (2))	FCC	--	☐ Pass ☒ N/A
	IC	--	IC	-	
Power Spectral Density	FCC	15.407 (a) (2)	FCC	789033 D02 General UNII Test Procedures New Rules v01r02	☒ Pass ☐ N/A
	IC	RSS247 (5.2.2)	IC		
Frequency Stability	FCC	15.407(g)	FCC	-	☐ Pass ☒ N/A
	IC	-	IC	-	
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	FCC)	-	☐ Pass ☒ N/A
RF Exposure requirement	FCC	15.407(f)	FCC	-	☐ Pass ☒ N/A
DFS	FCC	15.407	FCC	FCC KDB 905462 D02 UNII DFS v02	☒ Pass ☐ N/A
Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 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

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					3.856266

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					6.0118262

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:
- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					8.4726

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					0.952174

The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 Antenna Requirement

Spec	Requirement	Applicable
15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	☒
Remark	N/A	
Result	☒ Pass ☐ Fail	

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

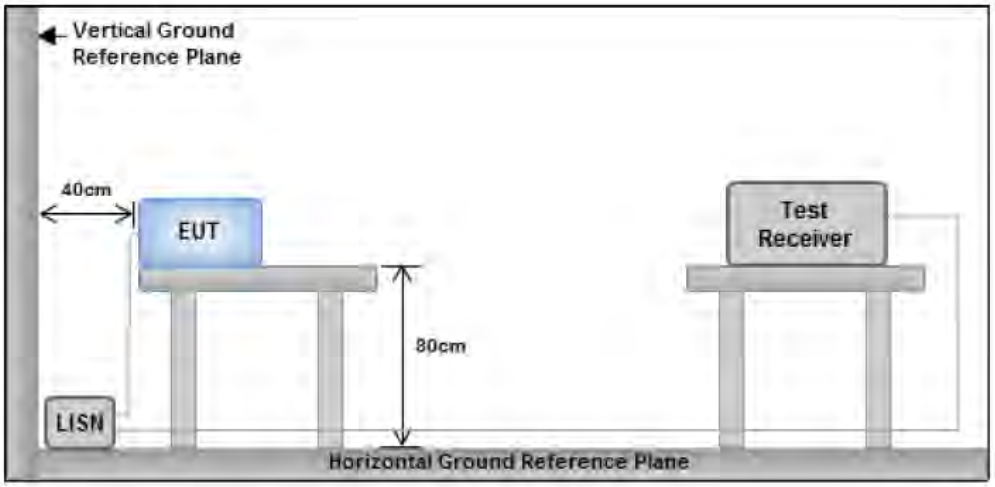
Antenna Connector Construction

Antenna Type	External antenna : ¼ Dipole - Omni Embedded antenna : SMD
Antenna Gain (Peak)	External antenna : 2 dBi Embedded antenna : 1 dBi
Antenna Connector Type	U.FL
Note	The antenna used U.FL antenna connectors which is a unique type which meet the requirement.

10.2 Conducted Emissions

Conducted Emission FCC 15.207

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
FCC 15.207 RSS247(A8.1)	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 in two modes of operations: (1) P.O.E Mode; (2) Power Supply Mode	
Result	☒ Pass ☐ Fail	

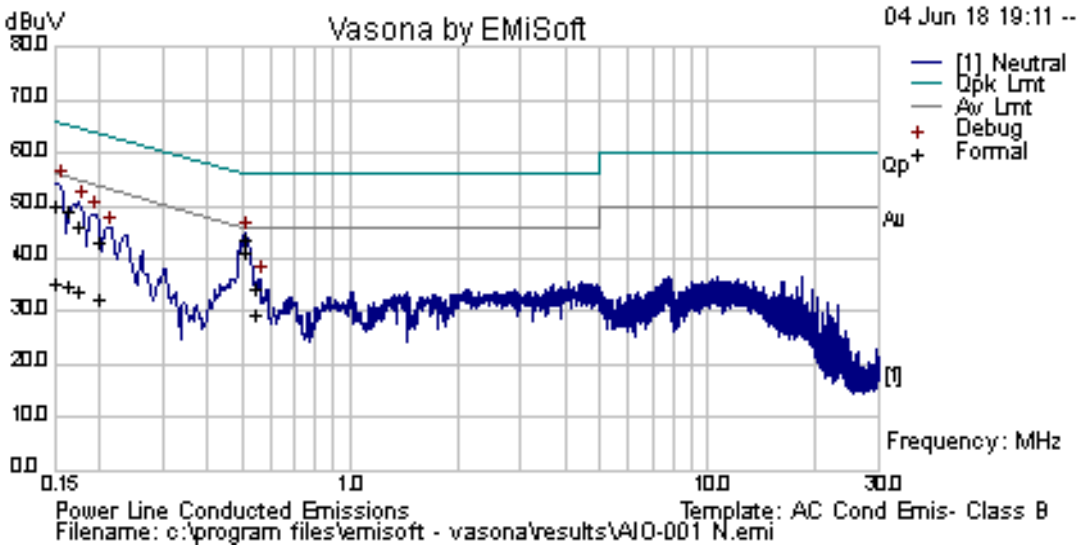
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Benjamin 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:	Benjamin Jing			
Test Date:	06/04/2018			
Remarks	Conducted @ Neutral			

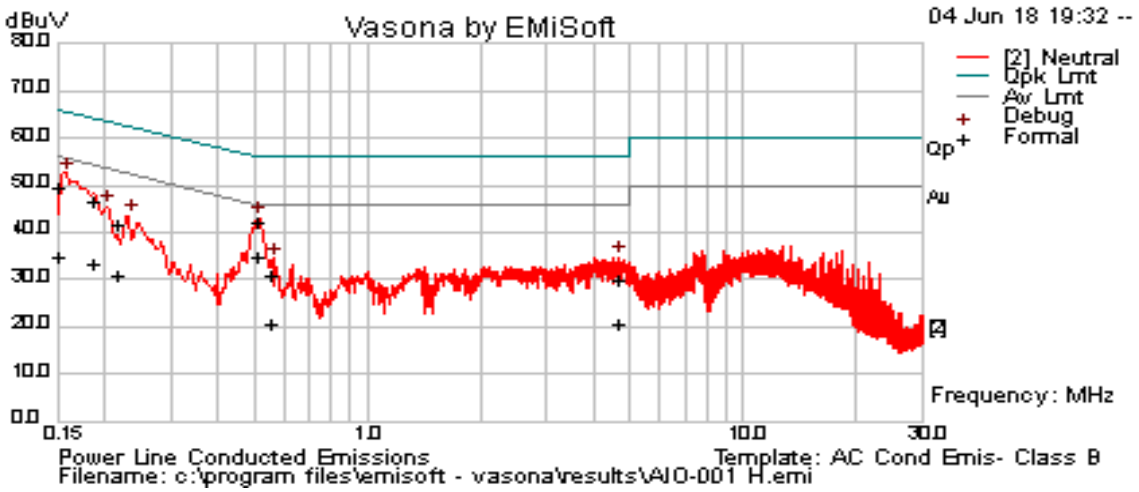


Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line/ Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.511695	34.25	9.33	0.04	43.62	Quasi Peak	Neutral	56	-12.38	Pass
0.150002	40.61	9.33	0.05	49.99	Quasi Peak	Neutral	66	-16.01	Pass
0.161495	39.61	9.33	0.05	48.98	Quasi Peak	Neutral	65.39	-16.4	Pass
0.175154	36.87	9.33	0.05	46.25	Quasi Peak	Neutral	64.71	-18.47	Pass
0.199395	33.66	9.32	0.04	43.03	Quasi Peak	Neutral	63.64	-20.61	Pass
0.54695	24.88	9.33	0.05	34.26	Quasi Peak	Neutral	56	-21.74	Pass
0.511695	31.63	9.33	0.04	41.01	Average	Neutral	46	-4.99	Pass
0.150002	26.03	9.33	0.05	35.41	Average	Neutral	56	-20.59	Pass
0.161495	25.63	9.33	0.05	35.01	Average	Neutral	55.39	-20.38	Pass
0.175154	24.62	9.33	0.05	33.99	Average	Neutral	54.71	-20.72	Pass
0.199395	23	9.32	0.04	32.36	Average	Neutral	53.64	-21.27	Pass
0.54695	20.3	9.33	0.05	29.68	Average	Neutral	46	-16.32	Pass

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Benjamin Jing			
Test Date:	06/04/2018			
Remarks	Conducted @ Live			



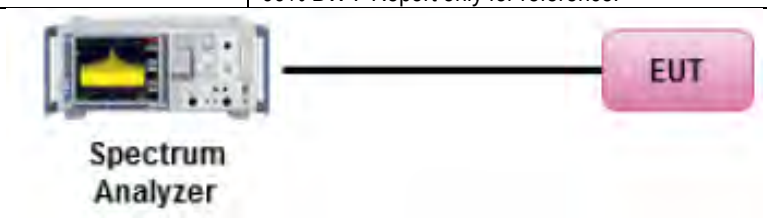
Live Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line/ Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.150002	40.1	9.33	0.05	49.48	Quasi Peak	Live	66	-16.52	Pass
0.511768	32.84	9.33	0.04	42.22	Quasi Peak	Live	56	-13.78	Pass
0.186662	37.34	9.32	0.04	46.71	Quasi Peak	Live	64.18	-17.48	Pass
0.216505	32.09	9.32	0.04	41.45	Quasi Peak	Live	62.95	-21.5	Pass
4.641004	20.58	9.35	0.08	30.01	Quasi Peak	Live	56	-25.99	Pass
0.554657	21.69	9.33	0.05	31.07	Quasi Peak	Live	56	-24.93	Pass
0.150002	25.68	9.33	0.05	35.06	Average	Live	56	-20.94	Pass
0.511768	25.64	9.33	0.04	35.01	Average	Live	46	-10.99	Pass
0.186662	24.21	9.32	0.04	33.58	Average	Live	54.18	-20.61	Pass
0.216505	21.32	9.32	0.04	30.68	Average	Live	52.95	-22.27	Pass
4.641004	11.09	9.35	0.08	20.51	Average	Live	46	-25.49	Pass
0.554657	11.36	9.33	0.05	20.74	Average	Live	46	-25.26	Pass

Note: The results above show only the worst case.

10.3 26 dB, 99%, and 6 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a) (1), & (2) e)	26 dB Emission BW: Report only for reference and power limit calculation.	☒
RSS 247	6.2	6 dB BW: > 500 KHz within 5725 -5850 MHz band. 99% BW : Report only for reference.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01r02 26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz) - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. o Set RBW = around 1% of emission bandwidth o Set VBW > RBW o Detector = Peak o Trace mode = max hold - Capture the plot. - Repeat above steps for different test channel and other modulation type.		
Test Date	05/23/2018	Environmental condition	Temperature 23ºC Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

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

Test was done by Benjamin at RF test site.

26dB & 99% Bandwidth Measurement Result for UNII Band 1

Type	Test mode	Freq (MHz)	CH	26 dB BW (MHz)	99% BW (MHz)
26dB BW & 99% BW	802.11a	5180	Low	19.3	17.6
	802.11a	5200	Mid	18.9	17.6
	802.11a	5240	High	19.2	17.6
	802.11n-20	5180	Low	19.2	17.6
	802.11n-20	5200	Mid	19.2	17.7
	802.11n-20	5240	High	19.2	17.5
	802.11n-40	5190	Low	39.9	35.9
	802.11n-40	5230	High	38.7	36.0
	802.11ac-80	5210	Mid	80.8	76.1

26dB & 99% Bandwidth Measurement Result for UNII Band 2 :

Type	Test mode	Freq (MHz)	CH	26 dB BW (MHz)	99% BW (MHz)
26dB BW & 99% BW	802.11a	5260	Low	19.2	17.5
	802.11a	5300	Mid	19.3	17.6
	802.11a	5320	High	19.2	17.6
	802.11n-20	5260	Low	19.3	17.5
	802.11n-20	5300	Mid	19.5	17.6
	802.11n-20	5320	High	19.7	17.6
	802.11n-40	5270	Low	39.1	36.0
	802.11n-40	5310	High	39.1	36.0
	802.11ac-80	5290	Mid	80.8	76.1

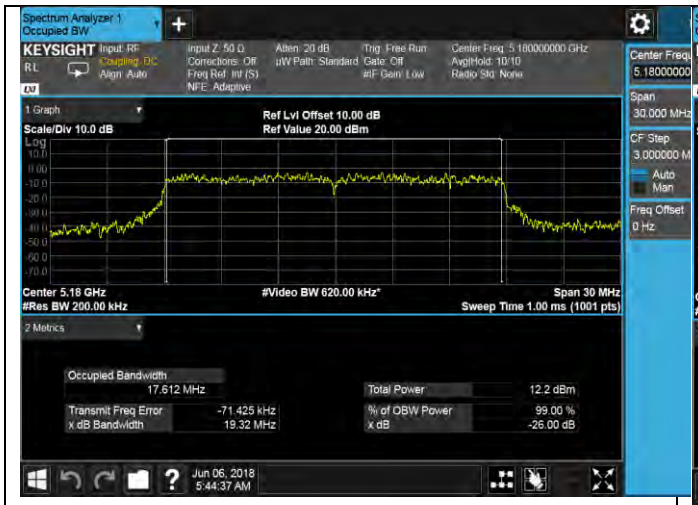
26dB & 99% Bandwidth Measurement Result for UNII Band 3 :

Type	Test mode	Freq (MHz)	CH	26 dB BW (MHz)	99% BW (MHz)
26dB BW & 99% BW	802.11a	5500	Low	19.5	17.6
	802.11a	5600	Mid	19.1	17.6
	802.11a	5700	High	19.7	17.7
	802.11n-20	5500	Low	19.3	17.7
	802.11n-20	5600	Mid	19.4	17.6
	802.11n-20	5700	High	19.3	17.6
	802.11n-40	5510	Low	39.0	36.0
	802.11n-40	5590	Mid	38.4	36.1
	802.11n-40	5670	High	39.4	36.3
	802.11ac-80	5530	Low	80.7	75.9
	802.11ac-80	5610	High	80.6	76.0
	802.11ac-80	5690	High	80.0	76.0

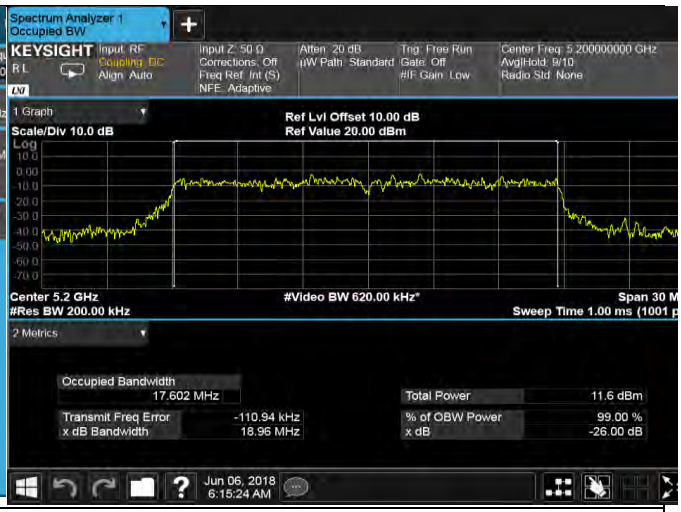
6 dB Bandwidth Measurement Result for UNII Band 4 :

Type	Test mode	Freq (MHz)	CH	Result (MHz)
6dB BW	802.11a	5745	Low	17.2
	802.11a	5785	Mid	17.4
	802.11a	5825	High	17.1
	802.11n-20	5745	Low	17.3
	802.11n-20	5785	Mid	17.1
	802.11n-20	5825	High	17.2
	802.11n-40	5755	Low	36.7
	802.11n-40	5795	High	36.4
	802.11ac-80	5775	Mid	75.6

26dB & 99% Bandwidth Test Plots

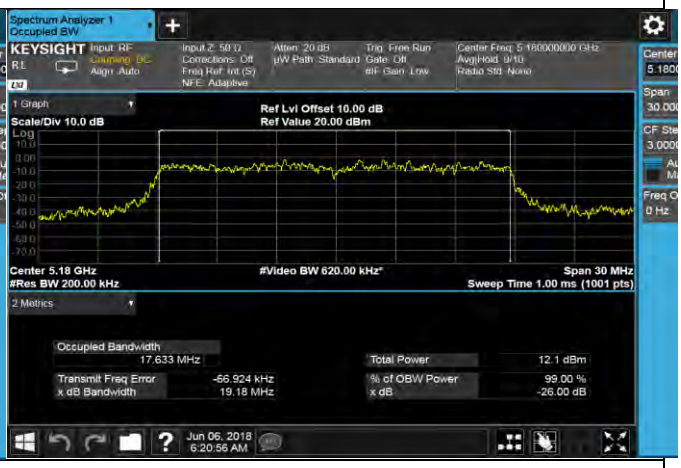


26dB & 99% BW -802.11a 5180MHz



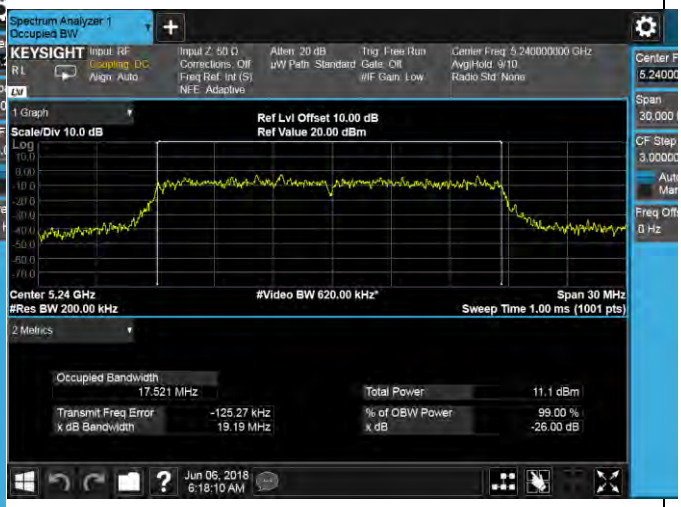
26dB & 99% BW -802.11a 5200MHz

26dB & 99% BW -802.11a 5240MHz



26dB & 99% BW -802.11n-20 5180MHz

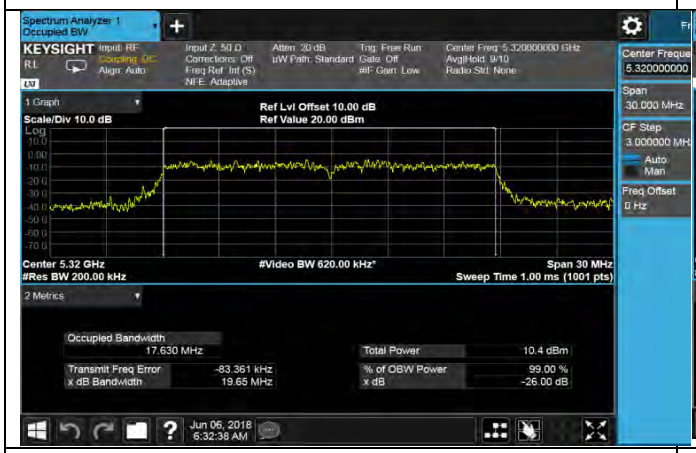
26dB & 99% BW -802.11n-20 5200MHz



26dB & 99% BW -802.11n-20 5240MHz

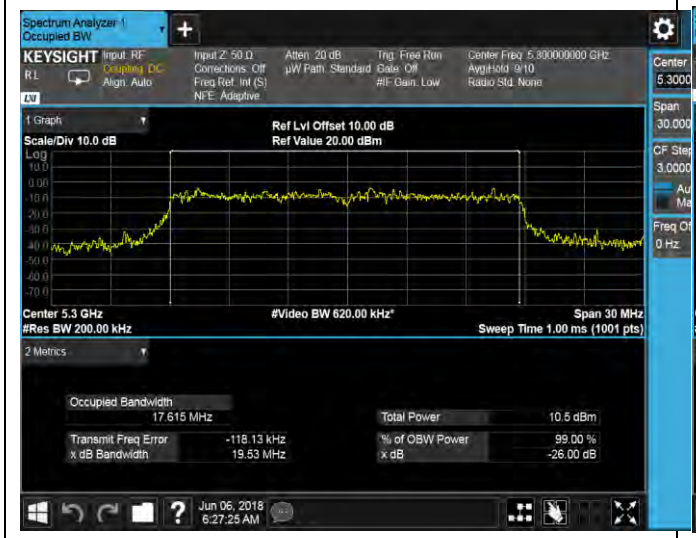
26dB & 99% BW -802.11a 5260MHz

26dB & 99% BW -802.11a 5300MHz



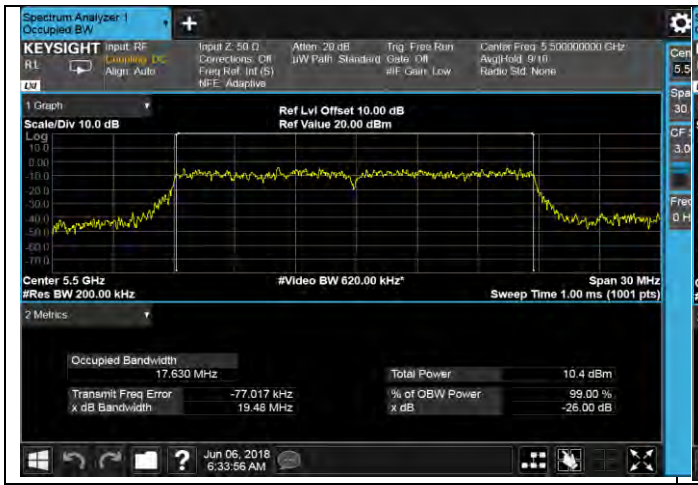
26dB & 99% BW -802.11a 5320MHz

26dB & 99% BW -802.11n-20 5260MHz



26dB & 99% BW -802.11n-20 5300MHz

26dB & 99% BW -802.11n-20 5320MHz

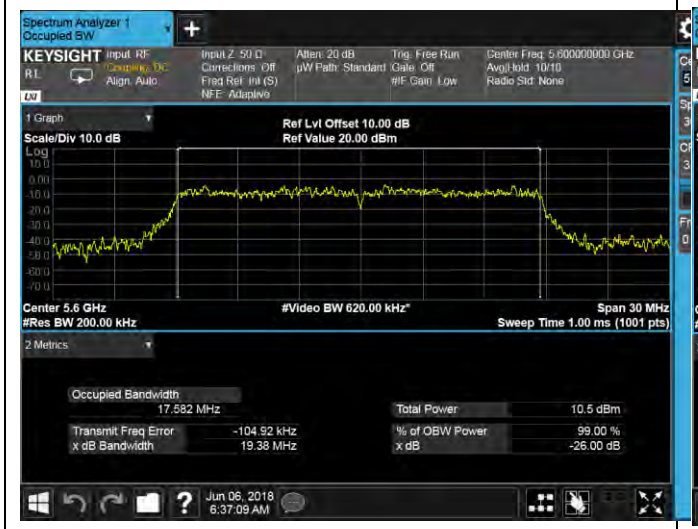


26dB & 99% BW -802.11a 5500MHz

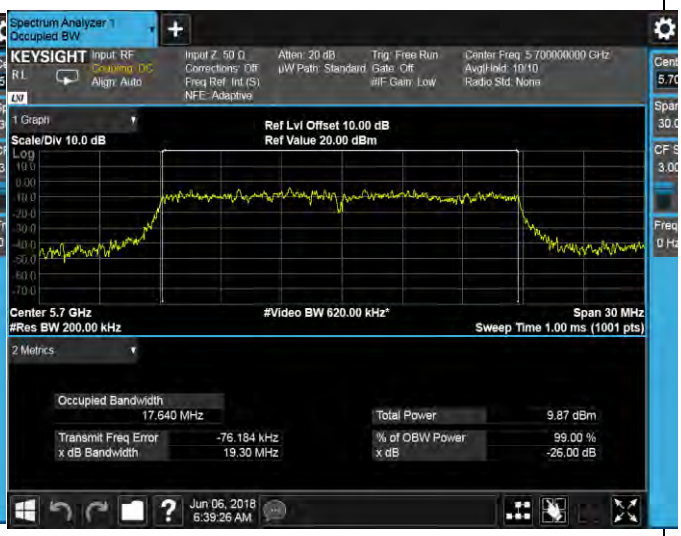
26dB & 99% BW -802.11a 5600MHz

26dB & 99% BW -802.11a 5700MHz

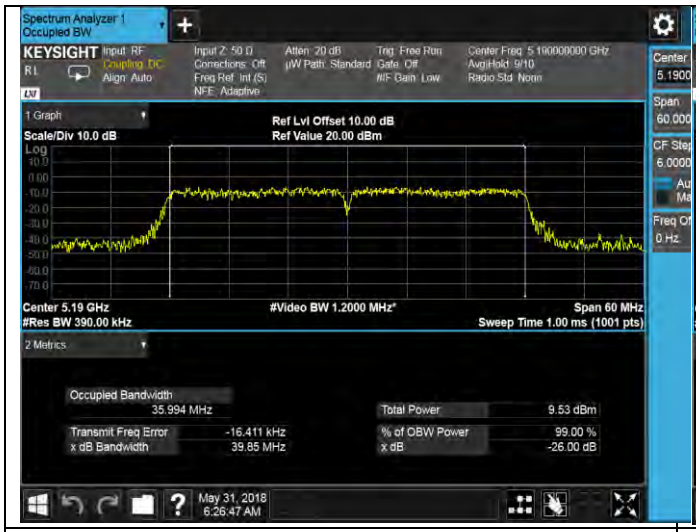
26dB B& 99% W -802.11n-20 5500MHz



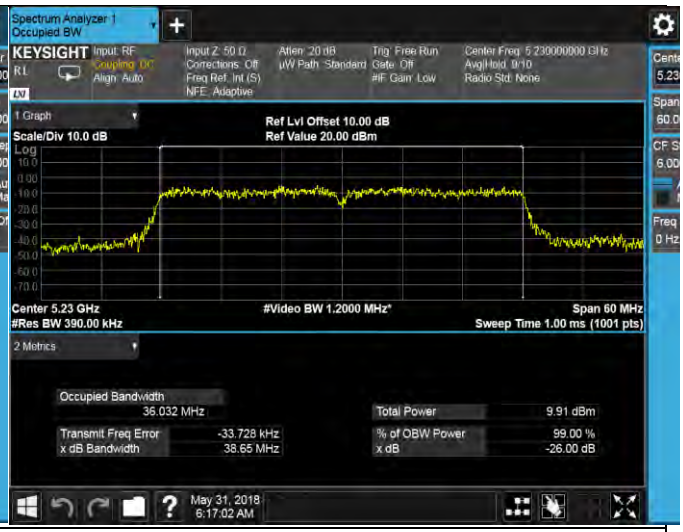
26dB & 99% BW -802.11n-20 5600MHz



26dB & 99% BW -802.11n-20 5700MHz



26dB & 99% BW -802.11n 40 5190MHz



26dB & 99% BW -802.11n 40 5230MHz

26dB & 99% BW -802.11n40 5270 MHz

26dB BW & 99% -802.11n40 5310MHz

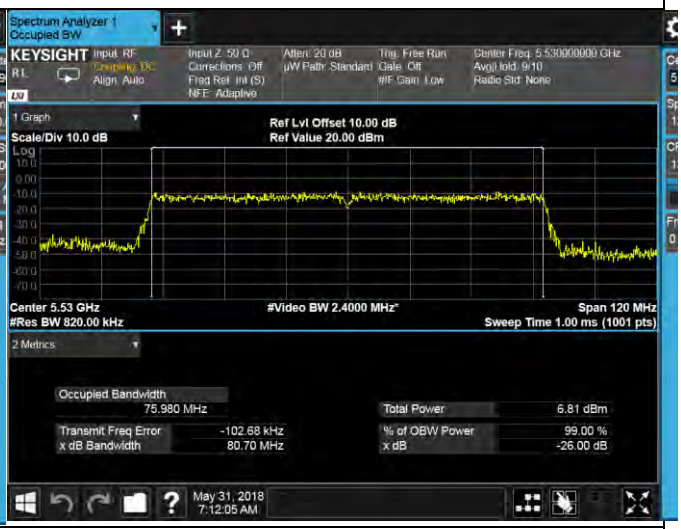
26dB & 99% BW -802.11n40 5510MHz

26dB & 99% BW -802.11n40 5590MHz

26dB & 99% BW -802.11n40 5670MHz

26dB & 99% BW -802.11ac 80 5210MHz

26dB & 99% BW -802.11ac 80 -5290MHz

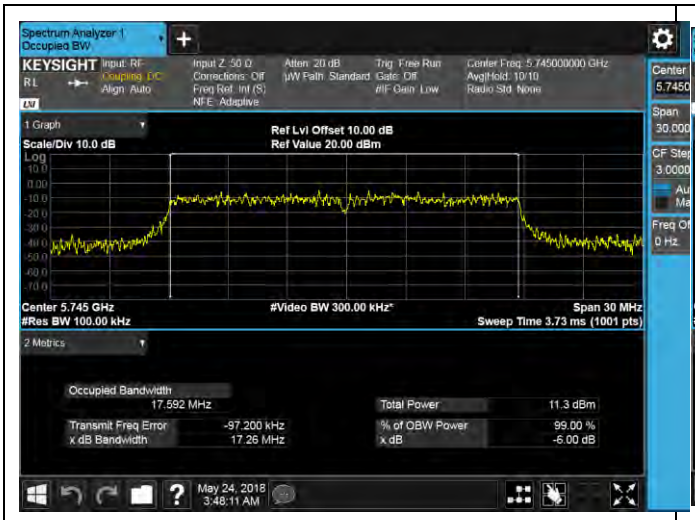


26dB & 99% BW -802.11ac 80 -5530MHz -

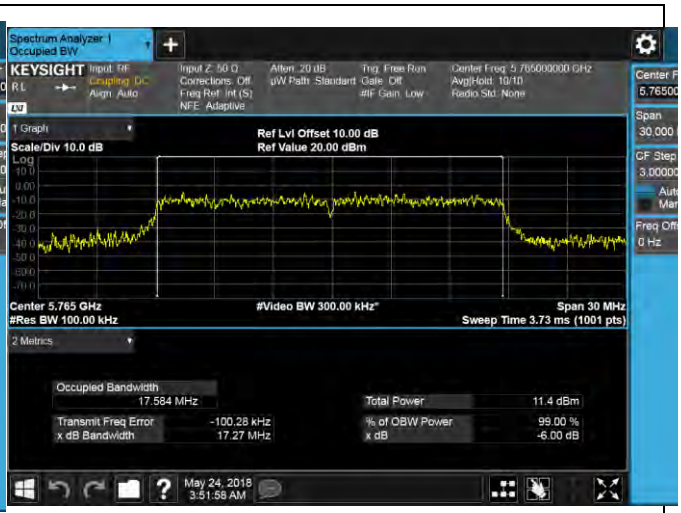
26dB & 99% BW -802.11ac 80 5610MHz

26dB & 99% BW -802.11ac 80 5690 MHz

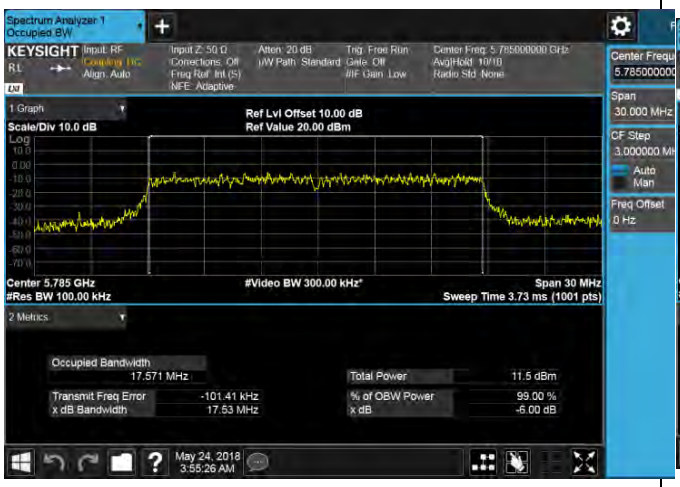
6dB Bandwidth Test Plots



6dB BW -802.11a 5745 MHz

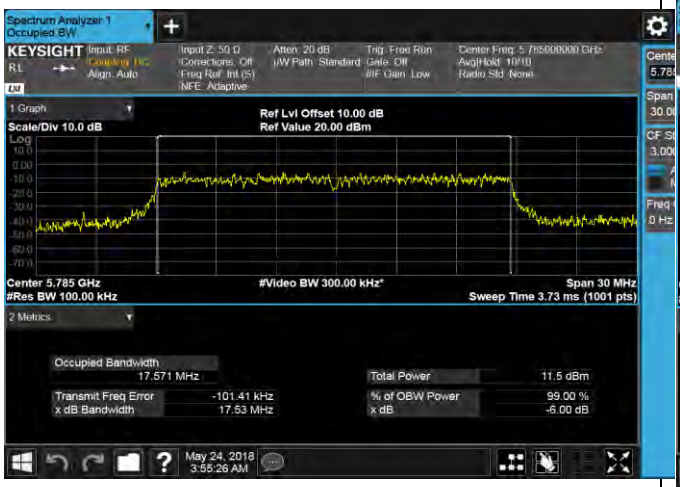


6dB BW -802.11a 5765MHz



6dB BW -802.11a 5785 MHz

6dB BW -802.11n 20 - 5745 MHz



6dB BW -802.11n-20 5785MHz

6dB BW -802.11n -20 5825MHz

6dB BW -802.11n-40 5755MHz

6dB BW -802.11n-40 5795MHz

6dB BW -802.11ac 80 -5775MHz

10.4 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407 RSS247	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	FCC 789033 D02 General UNII Test Procedures New Rules v01r02 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. Per RSS 247 for 5150 -5250 MHz, the maximum e.i.r.p shall not exceed 200 mW or 10+10log B , dBm, , whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not excesd 10 dBm in any 1 MHz band.		
Test Date	05/18/2018	Environmental condition	Temperature 21ºC Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	The EUT has two antennas which are cross-polarized, the directional gain=individual gain of each antenna =1dBi.		
Result	☒ Pass ☐ Fail		

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

Test was done by Benjamin at RF test site.

Output Power Measurement Result for UNII Band 1

For FCC UNII Band 1

Type	Mode	Frequency MHz	CH	Output Power dBm	Limit dBm	Result
Output Power	802.11a	5180	Low	11.3	24	Pass
		5200	Mid	11.5	24	Pass
		5240	High	10.6	24	Pass
	802.11n 20	5180	Low	11.2	24	Pass
		5200	Mid	11.7	24	Pass
		5240	High	10.6	24	Pass
	802.11n-40	5190	Low	9.53	24	Pass
		5230	High	9.72	24	Pass
	802.11ac 80	5210	Mid	8.81	24	Pass

For IC UNII Band 1 (2dBi antenna, worst case)

Type	Mode	Frequency MHz	CH	Output Power dBm	E.I.R.P. dBm	Limit dBm	Result
Output Power	802.11a	5180	Low	11.3	13.3	23	Pass
		5200	Mid	11.5	13.5	23	Pass
		5240	High	10.6	12.6	23	Pass
	802.11n 20	5180	Low	11.2	13.2	23	Pass
		5200	Mid	11.7	13.7	23	Pass
		5240	High	10.6	12.6	23	Pass
	802.11n-40	5190	Low	9.53	11.5	23	Pass
		5230	High	9.72	11.7	23	Pass
	802.11ac 80	5210	Mid	8.81	10.8	23	Pass

Output Power Measurement Result for UNII Band 2

Type	Mode	Frequency MHz	CH	Output Power dBm	Limit dBm	Result
Output Power	802.11a	5260	Low	11.1	24	Pass
		5300	Mid	10.3	24	Pass
		5320	High	9.68	24	Pass
	802.11n 20	5260	Low	11.2	24	Pass
		5300	Mid	10.1	24	Pass
		5320	High	9.65	24	Pass
	802.11n-40	5270	Low	9.51	24	Pass
		5310	High	9.69	24	Pass
	802.11ac 80	5290	Mid	8.54	24	Pass

Output Power Measurement Result for UNII Band 3

Type	Mode	Frequency MHz	CH	Output Power dBm	Limit dBm	Result
Output Power	802.11a	5500	Low	9.44	24	Pass
		5600	Mid	10.3	24	Pass
		5700	High	9.41	24	Pass
	802.11n 20	5500	Low	9.42	24	Pass
		5600	Mid	10.1	24	Pass
		5700	High	9.38	24	Pass
	802.11n-40	5510	Low	7.95	24	Pass
		5590	Mid	8.03	24	Pass
		5670	High	7.81	24	Pass
	801.11ac 80	5530	Low	6.95	24	Pass
		5610	Mid	7.42	24	Pass
		5690	High	6.84	24	Pass

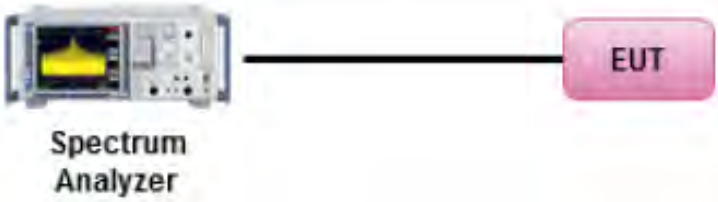
Output Power Measurement Result for UNII Band 4

Type	Mode	Frequency MHz	CH	Output Power dBm	Limit dBm	Result
Output Power	802.11a	5745	Low	10.6	30	Pass
		5785	Mid	10.4	30	Pass
		5825	High	10.1	30	Pass
	802.11n 20	5745	Low	10.5	30	Pass
		5785	Mid	10.2	30	Pass
		5825	High	9.97	30	Pass
	802.11n-40	5755	Low	7.96	30	Pass
		5795	High	7.83	30	Pass
	802.11ac 80	5775	Mid	6.85	30	Pass

10.5 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407 RSS247	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 v01r02, 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	05/18/2018	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22ºC 42% 1020mbar
Remark	The EUT has two antennas which are cross-polarized, the directional gain=individual gain of each antenna =0dBi.			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Benjamin at RF test site.

PSD Measurement Result for UNII Band 1

For FCC UNII Band 1

Type	Mode	Frequency MHz	CH	Conducted PSD dBm /MHz	Limit dBm	Result
PSD	802.11a	5180	Low	-3.74	11	Pass
		5200	Mid	-4.28	11	Pass
		5240	High	-4.60	11	Pass
	802.11n 20	5180	Low	-3.42	11	Pass
		5200	Mid	-4.14	11	Pass
		5240	High	-4.58	11	Pass
	802.11n-40	5190	Low	-8.02	11	Pass
		5230	High	-8.45	11	Pass
	802.11ac 80	5210	Mid	-13.3	11	Pass

For IC UNII Band 1 (2dBi antenna, worst case)

Type	Mode	Frequency MHz	CH	Conducted PSD dBm /MHz	E.I.R.P. dBm	Limit dBm	Result
PSD	802.11a	5180	Low	-3.74	-1.74	10	Pass
		5200	Mid	-4.28	-2.28	10	Pass
		5240	High	-4.60	-2.60	10	Pass
	802.11n 20	5180	Low	-3.42	-1.42	10	Pass
		5200	Mid	-4.14	-2.14	10	Pass
		5240	High	-4.58	-2.58	10	Pass
	802.11n-40	5190	Low	-8.02	-6.02	10	Pass
		5230	High	-8.45	-6.45	10	Pass
	802.11ac 80	5210	Mid	-13.3	-1.74	10	Pass

PSD Measurement Result for UNII Band 2

Type	Mode	Frequency MHz	CH	Conducted PSD dBm /MHz	Limit dBm	Result
PSD	802.11a	5260	Low	-4.70	11	Pass
		5300	Mid	-5.02	11	Pass
		5320	High	-5.33	11	Pass
	802.11n 20	5260	Low	-4.80	11	Pass
		5300	Mid	-4.83	11	Pass
		5320	High	-5.03	11	Pass
	802.11n-40	5270	Low	-8.79	11	Pass
		5310	High	-8.78	11	Pass
	802.11ac 80	5290	Mid	-13.35	11	Pass

PSD Measurement Result for UNII Band 3

Type	Mode	Frequency MHz	CH	Conducted PSD dBm /MHz	Limit dBm	Result
PSD	802.11a	5500	Low	-5.25	11	Pass
		5600	Mid	-5.59	11	Pass
		5700	High	-5.62	11	Pass
	802.11n 20	5500	Low	-5.45	11	Pass
		5600	Mid	-5.21	11	Pass
		5700	High	-5.06	11	Pass
	802.11n-40	5510	Low	-10.4	11	Pass
		5590	Mid	-10.8	11	Pass
		5670	High	-5.73	11	Pass
	802.11ac-80	5530	Low	-14.8	11	Pass
		5610	Mid	-15.4	11	Pass
		5690	High	-14.8	11	Pass

PSD Measurement Result for UNII Band 4

Type	Mode	Frequency MHz	CH	Conducted PSD dBm /100kHz	Corrected Level dBm /500kHz	Limit dBm/ 500KHz	Result
PSD	802.11a	5745	Low	-9.91	-2.92	30	Pass
		5785	Mid	-10.5	-3.51	30	Pass
		5825	High	-10.7	-3.71	30	Pass
	802.11n 20	5745	Low	-9.91	-2.92	30	Pass
		5785	Mid	-10.6	-3.61	30	Pass
		5825	High	-10.8	-3.81	30	Pass
	802.11n-40	5755	Low	-17.7	-10.7	30	Pass
		5795	High	-18.0	-11.1	30	Pass
	802.11ac 80	5775	Mid	-21.6	-14.6	30	Pass

Band 4 Correction Factor = 10 log (500/100) = 6.99

Test Plots

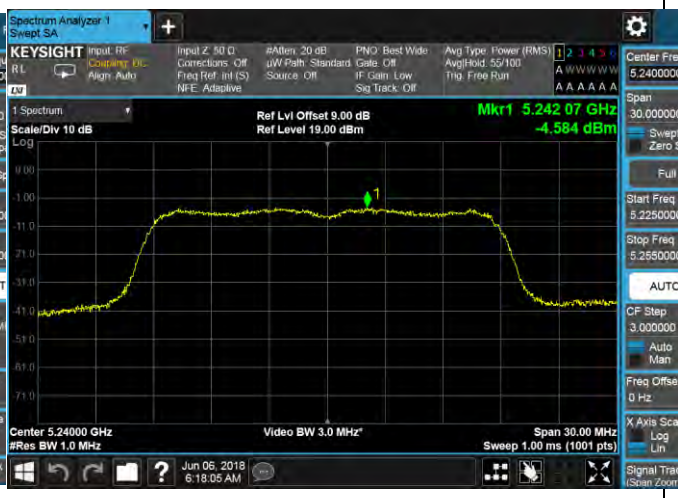
802.11a 5180MHz

802.11a 5200MHz

802.11a 5240MHz

802.11n-20 5180MHz

802.11n-20 5200MHz

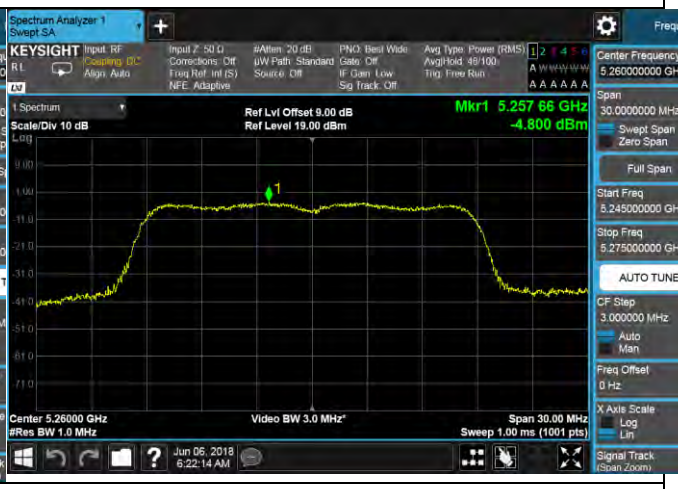


802.11n-20 5240MHz

802.11a 5260MHz

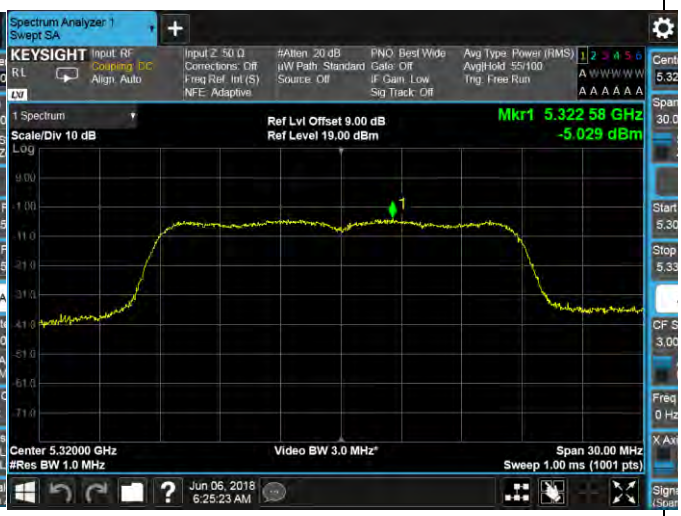
802.11a 5300MHz

802.11a 5320MHz



802.11n-20 5260MHz

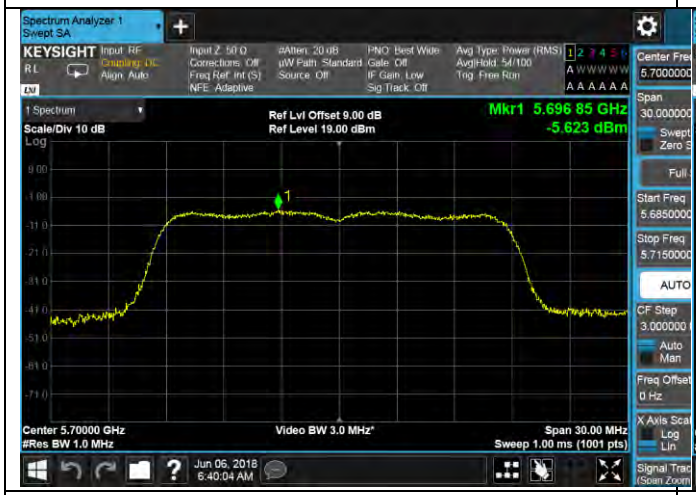
802.11n-20 5300MHz



802.11n-20 5320MHz

802.11a 5500MHz

802.11a 5600MHz



802.11a 5700MHz

802.11n-20 5500MHz

802.11n-20 5600MHz

802.11n-20 5700MHz

802.11n 40 5190MHz

802.11n 40 5230MHz

802.11n40 5270 MHz

802.11n40 5310MHz

802.11n40 5510MHz

802.11n40 5590MHz

802.11n40 5670MHz

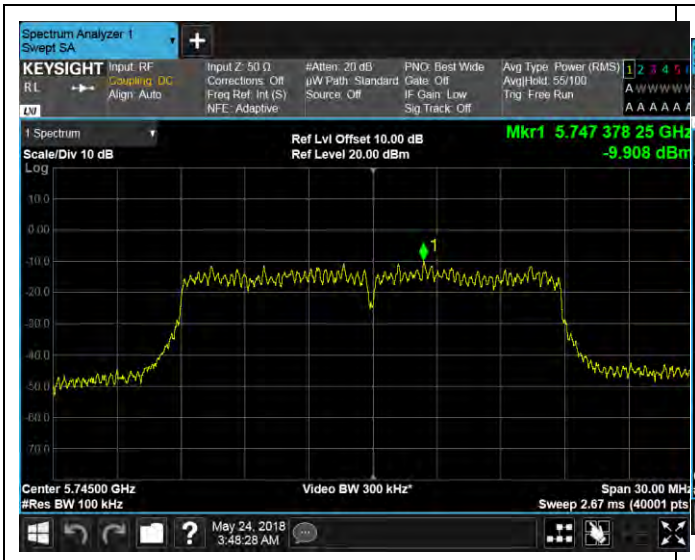
802.11ac 80 5210MHz

802.11ac 80 -5290MHz

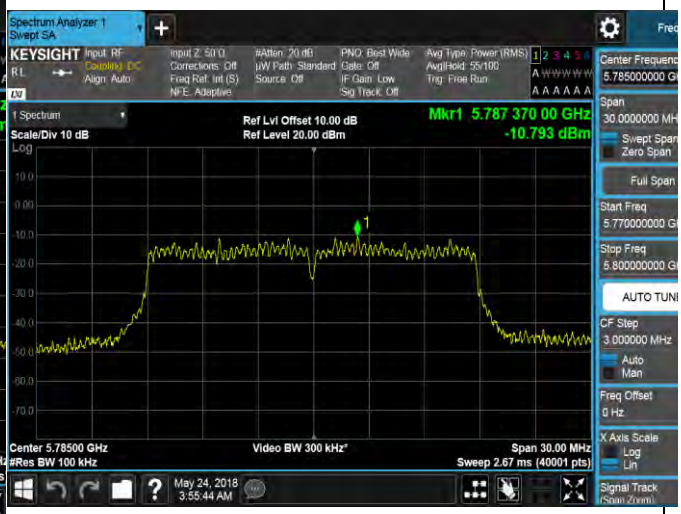
802.11ac 80 -5530MHz -

802.11ac 80 5610MHz

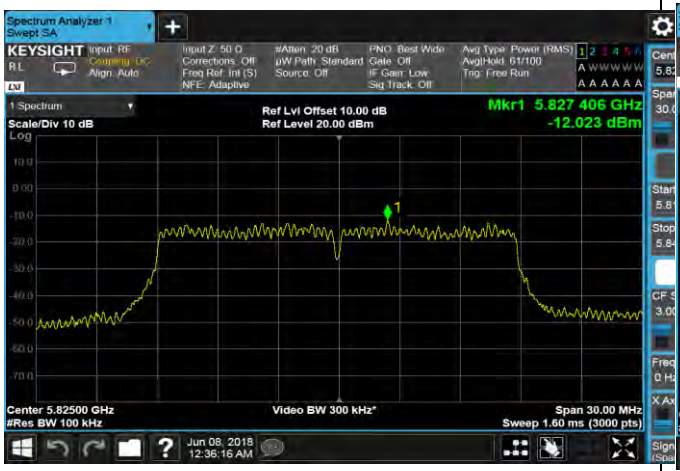
802.11ac 80 5690 MHz



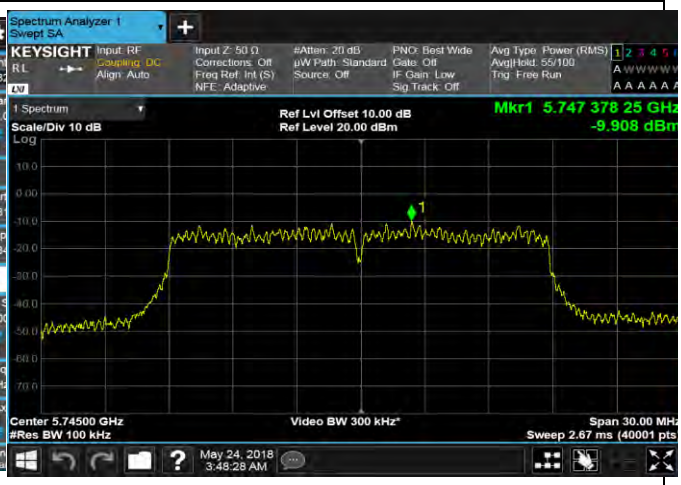
802.11a 5745 MHz



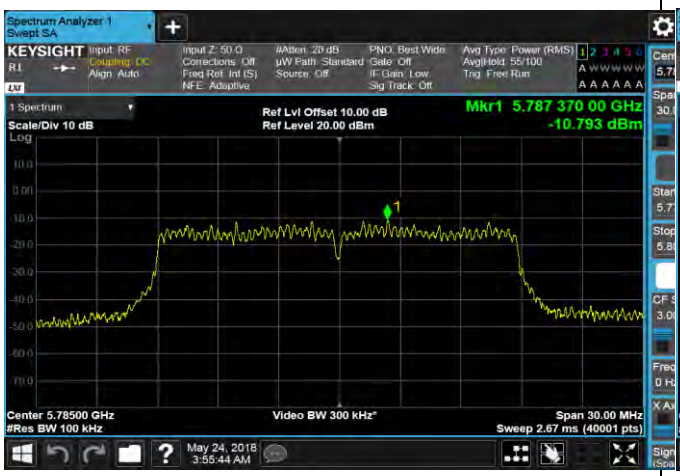
802.11a 5785MHz



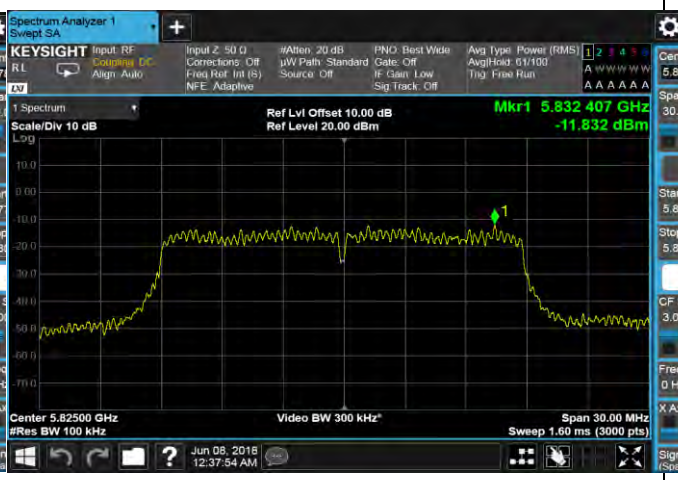
802.11a 5825 MHz



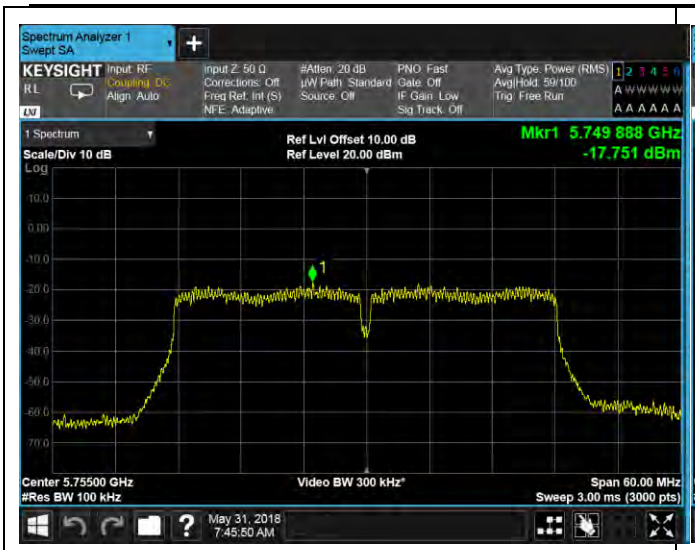
802.11n 20 - 5745 MHz



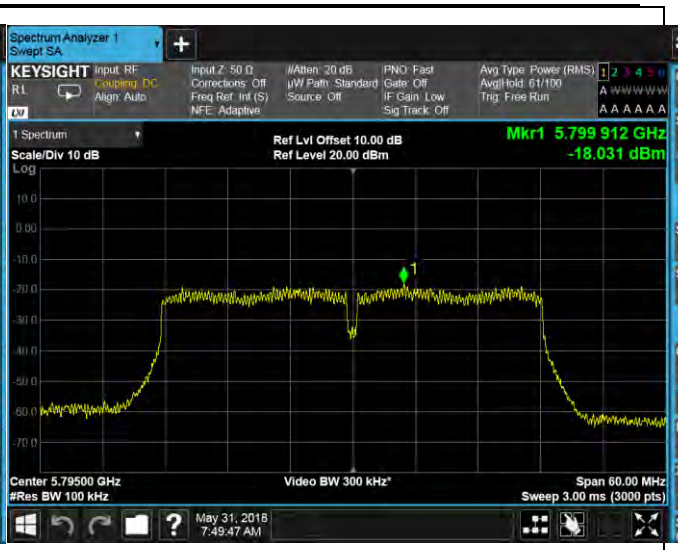
802.11n-20 5785MHz



802.11n -20 5825MHz



802.11n-40 5755MHz



802.11n-40 5795MHz

802.11ac 80 -5775MHz

10.6 Band Edge Measurement

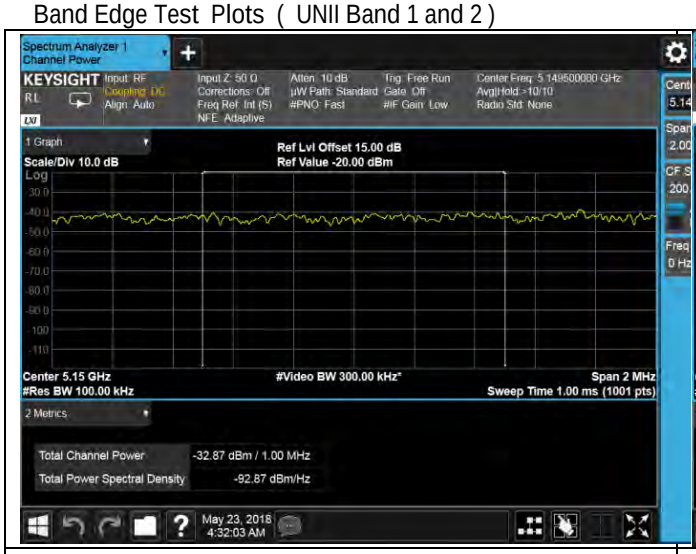
Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§ 15.407(b)(2), 15.407(b)(6) RSS247	(1)	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☐
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.	☐
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☒
Test Setup			
Procedure	789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1 Band Edge measurement: - For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes: - Set RBW=100kHz - Set VBW=100kHz - Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured.		
Remark	Antenna gain was added to the offset.		
Result	☒ Pass ☐ Fail		

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

Test was done by Benjamin RF test site.

Band Edge Test Plots (UNII Band 1 and 2)



Band Edge-802.11a-5180MHz

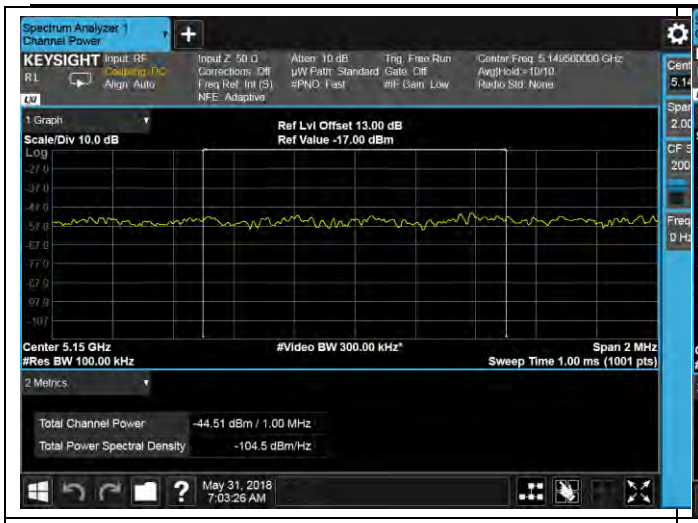
Band Edge-802.11a -5320MHz

Band Edge -802.11n 20 -5180MHz

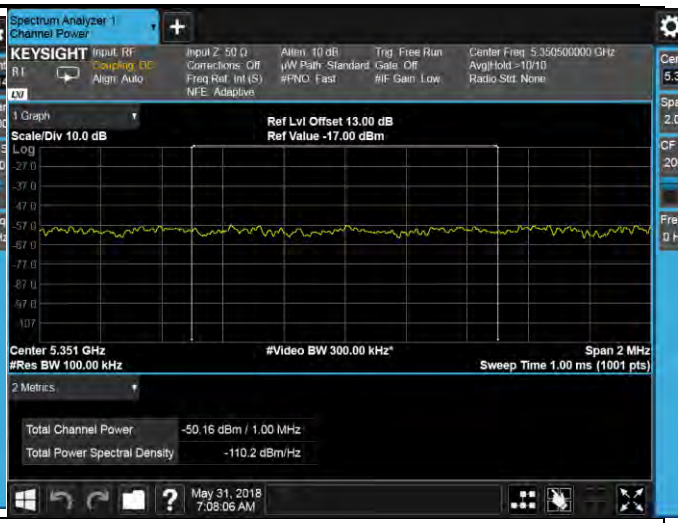
Band Edge -802.11n 20 -5320MHz

Band Edge -802.11n-40 -5190MHz

Band Edge -802.11n-40M -5310MHz



Band Edge -802.11ac-80- 5210MHz



Band Edge -802.11ac 80 - 5290MHz

Band Edge Test Plots (UNII Band 3)

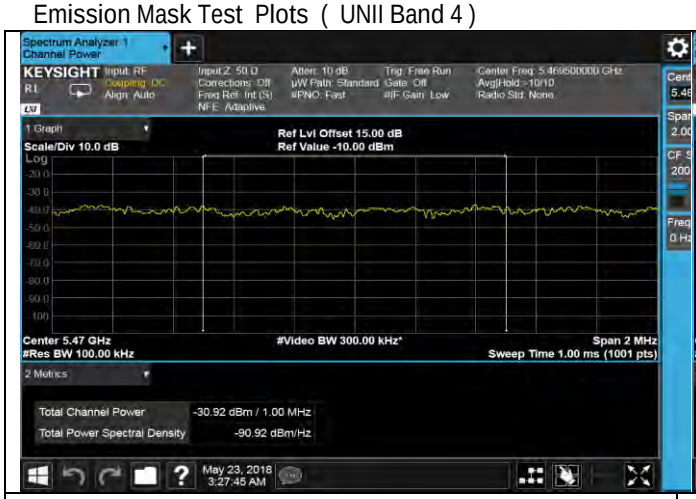
Band Edge -802.11a-5500M-

Band Edge -802.11n 20- 5500MHz

Band Edge -802.11n 40 -5510MHz

Band Edge -802.11ac 80 -5530MHz

Emission Mask Test Plots (UNII Band 4)



Band Edge -802.11a-5500M-

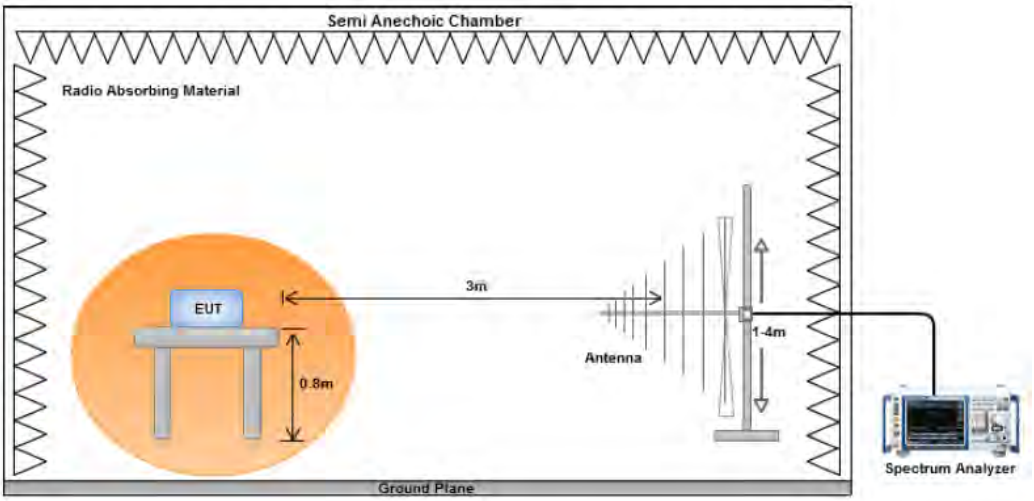
Band Edge -802.11n 20- 5500MHz

Band Edge -802.11n 40 -5510MHz

Band Edge -802.11ac 80 -5530MHz

10.7 Radiated Spurious 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

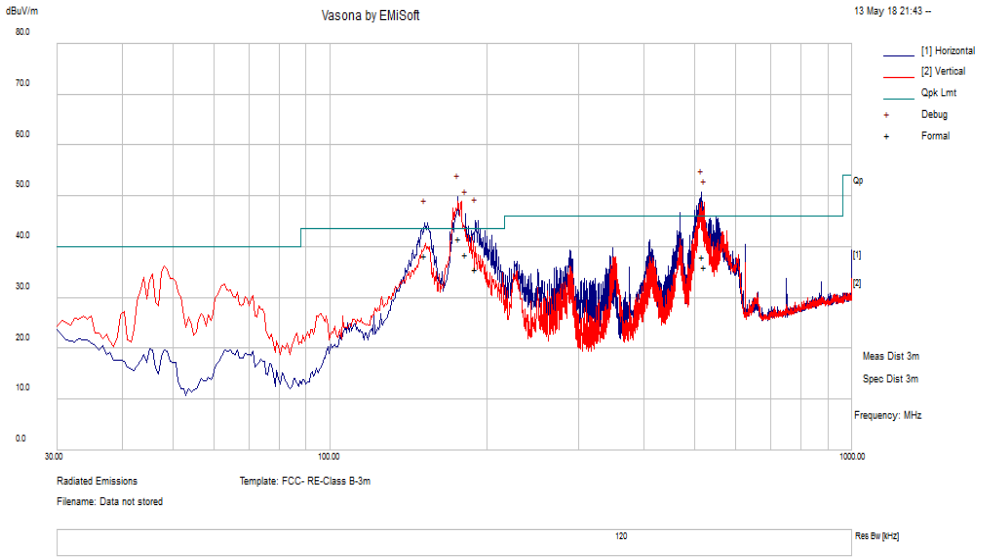
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Benjamin at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26	Result	Pass
	Humidity (%)	47		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Benjamin Jing			
Test Date:	05/13/2018			
Remarks:	802.11a, 5500MHz			

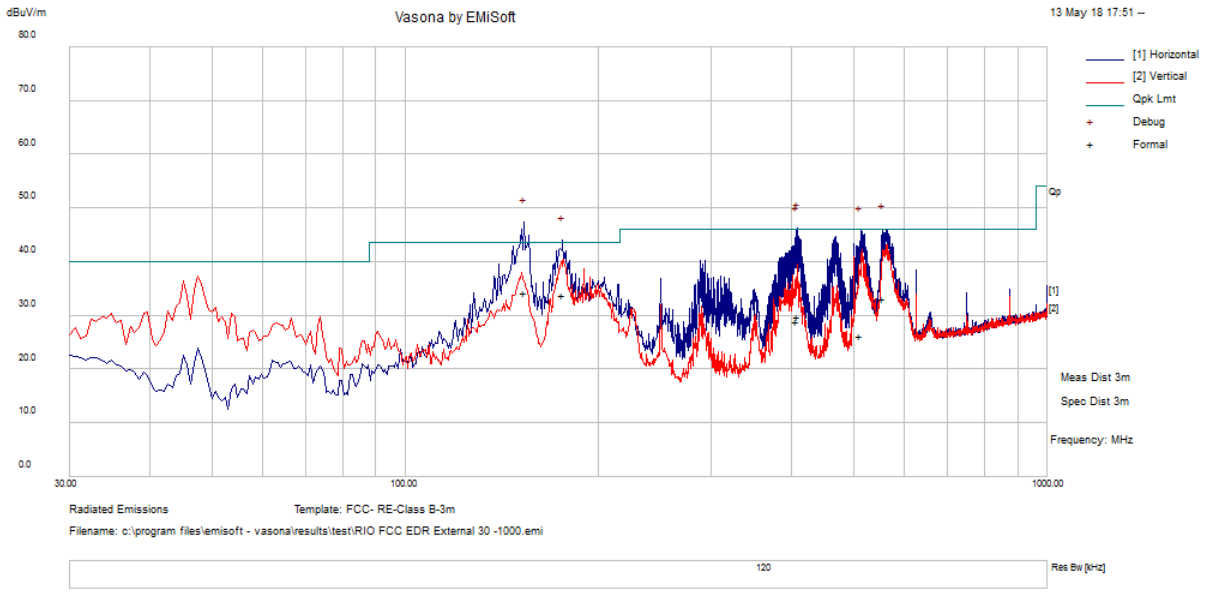
External Antenna



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
516.1216	40.98	14.34	-18.29	37.04	Quasi Max	H	198	156	46	-8.96	Pass
175.6222	51.55	12.4	-24.79	39.16	Quasi Max	V	143	29	43.5	-4.34	Pass
519.0197	40.1	14.37	-18.23	36.25	Quasi Max	H	182	112	46	-9.75	Pass
153.4781	48.33	12.21	-23.62	36.93	Quasi Max	H	133	85	43.5	-6.58	Pass
525.7934	40.61	14.44	-18.1	36.95	Quasi Max	H	192	141	46	-9.05	Pass
47.79344	49.01	11.43	-26.04	34.4	Quasi Max	V	112	261	40	-5.6	Pass

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

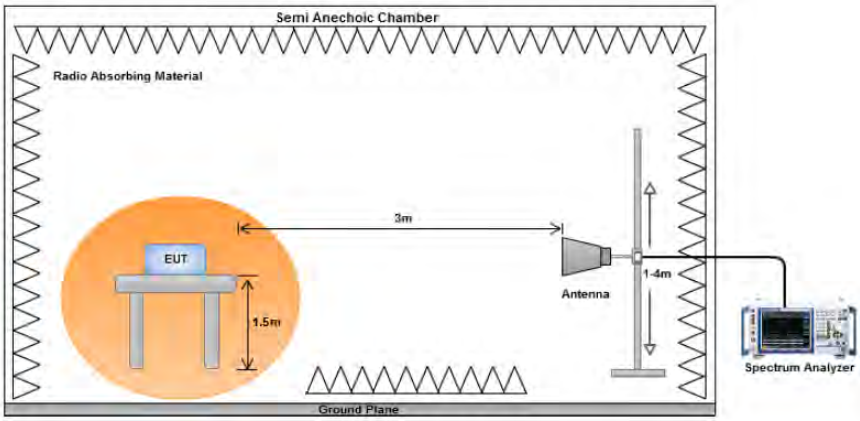
Embedded Antenna



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
511.9788	40.18	14.3	-18.4	36.08	Quasi Max	H	177	356	46	-9.92	Pass
510.0609	37.91	14.27	-18.46	33.72	Quasi Max	H	196	339	46	-12.29	Pass
514.3263	31.22	14.33	-18.32	27.22	Quasi Max	H	242	204	46	-18.78	Pass
153.5675	52.25	12.21	-23.62	40.85	Quasi Max	H	231	81	43.5	-2.65	Pass
508.5647	38.34	14.25	-18.48	34.11	Quasi Max	H	181	141	46	-11.89	Pass
518.1141	36.3	14.36	-18.25	32.42	Quasi Max	H	185	136	46	-13.58	Pass

10.8 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	The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	☒ Pass ☐ Fail		

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

Radiated Emission Test Results (Above 1GHz)

External antenna

UNII Band 1

1GHz -40GHz – 802.11a – 5180MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	imit dBuV/m	Margin dB	Pass /Fail
17787.63	38.86	8.1	8.28	55.24	Peak Max	V	159	48	74	-18.76	Pass
13211.2	37.35	6.98	4.73	49.06	Peak Max	V	130	142	74	-24.95	Pass
6140.579	38.6	4.74	-0.31	43.03	Peak Max	V	133	222	74	-30.97	Pass
17787.63	26.55	8.1	8.28	42.94	Average Max	V	159	48	54	-11.06	Pass
13211.2	24.95	6.98	4.73	36.66	Average Max	V	130	142	54	-17.34	Pass
6140.579	26.28	4.74	-0.31	30.71	Average Max	V	133	222	54	-23.29	Pass

1GHz-40GHz- 802.11a - 5220MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17966.68	38.33	7.9	8.72	54.94	Peak Max	V	175	4	74	-19.06	Pass
12487.7	38.36	6.54	4.15	49.05	Peak Max	V	105	278	74	-24.96	Pass
2560.119	42.3	3.04	-3.31	42.03	Peak Max	V	193	91	74	-31.97	Pass
17966.68	26.63	7.9	8.72	43.25	Average Max	V	175	4	54	-10.75	Pass
12487.7	26.01	6.54	4.15	36.7	Average Max	V	105	278	54	-17.3	Pass
2560.119	29.23	3.04	-3.31	28.96	Average Max	V	193	91	54	-25.04	Pass

1GHz-40GHz – 802.11a – 5240MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 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
17927.58	38.55	7.94	8.67	55.17	Peak Max	V	102	50	74	-18.83	Pass
1926.358	41.81	2.69	-2.7	41.8	Peak Max	H	347	344	74	-32.2	Pass
1394.72	43.32	2.24	-6.25	39.32	Peak Max	H	331	121	74	-34.69	Pass
17927.58	26.75	7.94	8.67	43.37	Average Max	V	102	50	54	-10.64	Pass
1926.358	29.76	2.69	-2.7	29.75	Average Max	H	347	344	54	-24.25	Pass
1394.72	30.85	2.24	-6.25	26.85	Average Max	H	331	121	54	-27.15	Pass

1GHz-40GHz – 802.11n20 – 5220MHz

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
17575.73	39.52	8.23	7.85	55.6	Peak Max	H	118	32	74	-18.4	Pass
8331.393	39.6	5.41	-0.76	44.25	Peak Max	V	107	68	74	-29.75	Pass
1882.628	43.49	2.66	-2.83	43.33	Peak Max	V	115	301	74	-30.67	Pass
17575.73	26.71	8.23	7.85	42.8	Average Max	H	118	32	54	-11.2	Pass
8331.393	26.8	5.41	-0.76	31.45	Average Max	V	107	68	54	-22.55	Pass
1882.628	30	2.66	-2.83	29.84	Average Max	V	115	301	54	-24.16	Pass

1GHz-40GHz- 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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 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
17577	39.16	8.23	7.85	55.25	Peak Max	H	112	269	74	-18.75	Pass
1883.168	41.61	2.66	-2.82	41.46	Peak Max	H	311	59	74	-32.54	Pass
1372.33	42.54	2.22	-6.03	38.74	Peak Max	V	140	95	74	-35.26	Pass
17577	26.76	8.23	7.85	42.84	Average Max	H	112	269	54	-11.16	Pass
1883.168	30.01	2.66	-2.82	29.86	Average Max	H	311	59	54	-24.14	Pass
1372.33	30.62	2.22	-6.03	26.81	Average Max	V	140	95	54	-27.19	Pass

1GHz-40GHz- 802.11ac 80 - 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
17575.73	39.52	8.23	7.85	55.6	Peak Max	H	118	32	74	-18.4	Pass
8331.393	39.6	5.41	-0.76	44.25	Peak Max	V	107	68	74	-29.75	Pass
1882.628	43.49	2.66	-2.83	43.33	Peak Max	V	115	301	74	-30.67	Pass
17575.73	26.71	8.23	7.85	42.8	Average Max	H	118	32	54	-11.2	Pass
8331.393	26.8	5.41	-0.76	31.45	Average Max	V	107	68	54	-22.55	Pass
1882.628	30	2.66	-2.83	29.84	Average Max	V	115	301	54	-24.16	Pass

UNII Band 2

1GHz-405GHz- 802.11a - 5260MHz

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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz – 802.11a – 5300MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz- 802.11a - 5320MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass

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

1GHz-40GHz- 802.11n20 - 5260MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz – 802.11n20 – 5300MHz

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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 802.11n20 - 5320MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz- 802.11n40 - 5270MHz

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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 802.11n40 – 5310MHz

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
17927.58	38.55	7.94	8.67	55.17	Peak Max	V	102	50	74	-18.83	Pass
1926.358	41.81	2.69	-2.7	41.8	Peak Max	H	347	344	74	-32.2	Pass
1394.72	43.32	2.24	-6.25	39.32	Peak Max	H	331	121	74	-34.69	Pass
17927.58	26.75	7.94	8.67	43.37	Average Max	V	102	50	54	-10.64	Pass
1926.358	29.76	2.69	-2.7	29.75	Average Max	H	347	344	54	-24.25	Pass
1394.72	30.85	2.24	-6.25	26.85	Average Max	H	331	121	54	-27.15	Pass

1GHz-40GHz- 802.11ac 80 - 5290MHz

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
15663.58	43.99	7.72	5.42	57.13	Peak Max	H	113	336	74	-16.87	Pass
13040.76	37.19	6.92	4.76	48.88	Peak Max	V	322	214	74	-25.13	Pass
2020.366	40.73	2.75	-2.6	40.88	Peak Max	V	215	14	74	-33.12	Pass
15663.58	31.94	7.72	5.42	45.09	Average Max	H	113	336	54	-8.92	Pass
13040.76	25.13	6.92	4.76	36.82	Average Max	V	322	214	54	-17.19	Pass
2020.366	28.07	2.75	-2.6	28.22	Average Max	V	215	14	54	-25.78	Pass

UNII Band 3

1GHz-40GHz- 802.11a - 5500MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz – 802.11a – 5600MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 802.11a - 5700MHz

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
15534.56	43.92	7.61	5.3	56.83	Peak Max	V	236	207	74	-17.17	Pass
17969.24	38.97	7.89	8.72	55.59	Peak Max	H	310	261	74	-18.42	Pass
2046.44	39.67	2.77	-2.91	39.52	Peak Max	V	177	214	74	-34.48	Pass
15534.56	31.46	7.61	5.3	44.37	Average Max	V	236	207	54	-9.63	Pass
17969.24	26.69	7.89	8.72	43.31	Average Max	H	310	261	54	-10.69	Pass
2046.44	27.55	2.77	-2.91	27.4	Average Max	V	177	214	54	-26.6	Pass

1GHz-40GHz- 802.11n20 - 5500Hz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz – 802.11n20 – 5600MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 802.11n20 - 5700MHz

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
15543.85	44.67	7.62	5.3	57.59	Peak Max	V	271	293	74	-16.41	Pass
17533.39	39.37	8.25	7.8	55.42	Peak Max	V	108	104	74	-18.58	Pass
2020.366	40.73	2.75	-2.6	40.88	Peak Max	V	215	14	74	-33.12	Pass
15543.85	32.37	7.62	5.3	45.29	Average Max	V	271	293	54	-8.71	Pass
17533.39	26.56	8.25	7.8	42.62	Average Max	V	108	104	54	-11.38	Pass
2020.366	28.07	2.75	-2.6	28.22	Average Max	V	215	14	54	-25.78	Pass

1GHz-40GHz- 802.11n40 - 5510MHz

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
15545.16	38.77	7.62	5.3	51.69	Peak Max	V	164	297	74	-22.31	Pass
17870.85	38.49	8.01	8.55	55.05	Peak Max	H	346	331	74	-18.95	Pass
2077.503	40.74	2.79	-2.9	40.63	Peak Max	V	304	33	74	-33.37	Pass
15545.16	26.91	7.62	5.3	39.83	Average Max	V	164	297	54	-14.17	Pass
17870.85	26.54	8.01	8.55	43.1	Average Max	H	346	331	54	-10.9	Pass
2077.503	28.42	2.79	-2.9	28.31	Average Max	V	304	33	54	-25.7	Pass

1GHz-40GHz – 802.11n40 – 5590MHz

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
16502.55	43.31	8.1	5.89	57.3	Peak Max	V	271	318	74	-16.7	Pass
18001.97	79.96	7.86	-32.54	55.28	Peak Max	V	158	268	74	-18.72	Pass
2051.591	40.88	2.77	-2.95	40.7	Peak Max	V	230	20	74	-33.3	Pass
16502.55	31.68	8.1	5.89	45.67	Average Max	V	271	318	54	-8.33	Pass
18001.97	67.97	7.86	-32.54	43.29	Average Max	V	158	268	54	-10.71	Pass
2051.591	27.73	2.77	-2.95	27.55	Average Max	V	230	20	54	-26.46	Pass

1GHz-40GHz – 802.11n40 – 5670MHz

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
16500.43	38.79	8.1	5.88	52.78	Peak Max	H	336	180	74	-21.22	Pass
9854.48	38.74	5.67	1.05	45.46	Peak Max	V	347	169	74	-28.54	Pass
2011.402	41.42	2.74	-2.49	41.68	Peak Max	V	303	247	74	-32.32	Pass
16500.43	26.5	8.1	5.88	40.49	Average Max	H	336	180	54	-13.51	Pass
9854.48	26.56	5.67	1.05	33.28	Average Max	V	347	169	54	-20.72	Pass
2011.402	28.5	2.74	-2.49	28.75	Average Max	V	303	247	54	-25.25	Pass

1GHz-40GHz- 802.11ac 80 - 5610MHz

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
17691.74	39.07	8.18	7.99	55.24	Peak Max	V	276	267	74	-18.77	Pass
4757.045	40.39	4.06	-0.92	43.52	Peak Max	V	273	46	74	-30.48	Pass
2034.515	40.49	2.76	-2.77	40.48	Peak Max	V	101	75	74	-33.52	Pass
17691.74	26.52	8.18	7.99	42.69	Average Max	V	276	267	54	-11.31	Pass
4757.045	27.8	4.06	-0.92	30.94	Average Max	V	273	46	54	-23.07	Pass
2034.515	27.57	2.76	-2.77	27.56	Average Max	V	101	75	54	-26.44	Pass

UNII Band 4

1GHz -40GHz – 802.11a – 5745MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	imit dBuV/m	Margin dB	Pass /Fail
17990.21	39.05	7.87	8.75	55.67	Peak Max	V	150	16	74	-18.33	Pass
16269.06	39.46	8.17	5.86	53.49	Peak Max	V	127	113	74	-20.51	Pass
1988.097	41.82	2.73	-2.45	42.1	Peak Max	V	314	19	74	-31.9	Pass
17990.21	26.69	7.87	8.75	43.31	Average Max	V	150	16	54	-10.69	Pass
16269.06	26.66	8.17	5.86	40.68	Average Max	V	127	113	54	-13.32	Pass
1988.097	28.77	2.73	-2.45	29.05	Average Max	V	314	19	54	-24.95	Pass

1GHz-40GHz- 802.11a - 5785MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17966.68	38.33	7.9	8.72	54.94	Peak Max	V	175	4	74	-19.06	Pass
12487.7	38.36	6.54	4.15	49.05	Peak Max	V	105	278	74	-24.96	Pass
2560.119	42.3	3.04	-3.31	42.03	Peak Max	V	193	91	74	-31.97	Pass
17966.68	26.63	7.9	8.72	43.25	Average Max	V	175	4	54	-10.75	Pass
12487.7	26.01	6.54	4.15	36.7	Average Max	V	105	278	54	-17.3	Pass
2560.119	29.23	3.04	-3.31	28.96	Average Max	V	193	91	54	-25.04	Pass

1GHz-40GHz – 802.11a – 5825MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17926.39	38.55	7.94	8.67	55.17	Peak Max	V	240	343	74	-18.84	Pass
12133.5	38.3	6.45	3.55	48.3	Peak Max	V	175	101	74	-25.7	Pass
1966.593	40.8	2.72	-2.64	40.88	Peak Max	V	305	82	74	-33.12	Pass
17926.39	26.66	7.94	8.67	43.27	Average Max	V	240	343	54	-10.73	Pass
12133.5	26.26	6.45	3.55	36.26	Average Max	V	175	101	54	-17.74	Pass
1966.593	27.72	2.72	-2.64	27.8	Average Max	V	305	82	54	-26.21	Pass

1GHz-40GHz- 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
15534.56	43.92	7.61	5.3	56.83	Peak Max	V	236	207	74	-17.17	Pass
17969.24	38.97	7.89	8.72	55.59	Peak Max	H	310	261	74	-18.42	Pass
2046.44	39.67	2.77	-2.91	39.52	Peak Max	V	177	214	74	-34.48	Pass
15534.56	31.46	7.61	5.3	44.37	Average Max	V	236	207	54	-9.63	Pass
17969.24	26.69	7.89	8.72	43.31	Average Max	H	310	261	54	-10.69	Pass
2046.44	27.55	2.77	-2.91	27.4	Average Max	V	177	214	54	-26.6	Pass

1GHz-40GHz – 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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 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
17768.19	39.49	8.13	8.22	55.84	Peak Max	V	154	357	74	-18.16	Pass
10759.21	38.08	6.17	1.77	46.02	Peak Max	V	236	179	74	-27.98	Pass
1987.497	40.73	2.73	-2.46	41	Peak Max	V	209	339	74	-33	Pass
17768.19	26.53	8.13	8.22	42.88	Average Max	V	154	357	54	-11.13	Pass
10759.21	26.41	6.17	1.77	34.36	Average Max	V	236	179	54	-19.64	Pass
1987.497	28.74	2.73	-2.46	29.01	Average Max	V	209	339	54	-24.99	Pass

1GHz-40GHz- 802.11ac 80 - 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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

Radiated Restricted Band Measurement Plots :

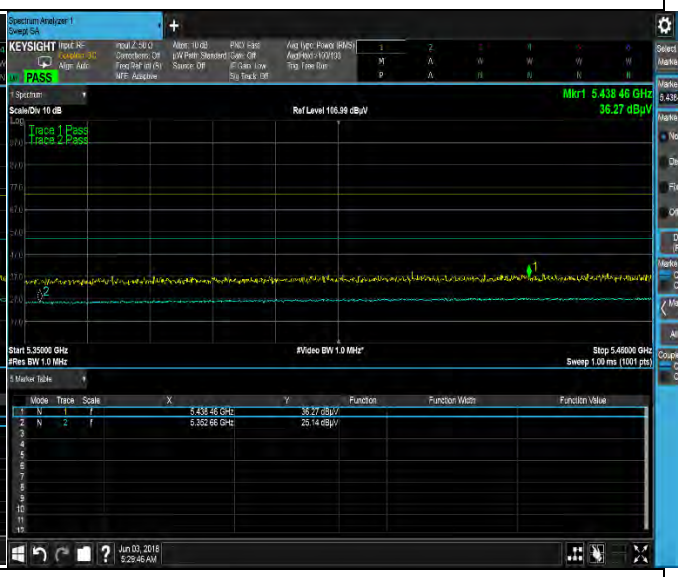
External antenna

UNII Band 1 and 2

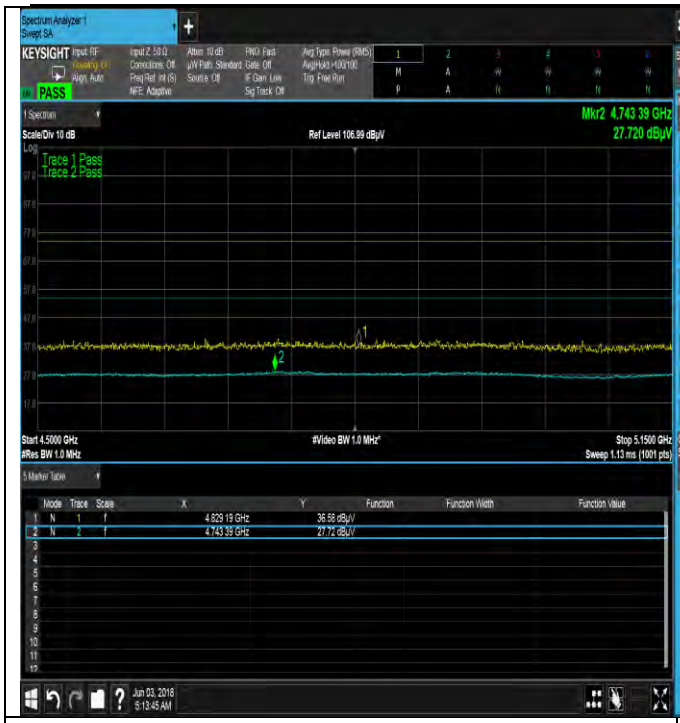
Band Edge-802.11a-5180MHz

Band Edge-802.11a -5320MHz

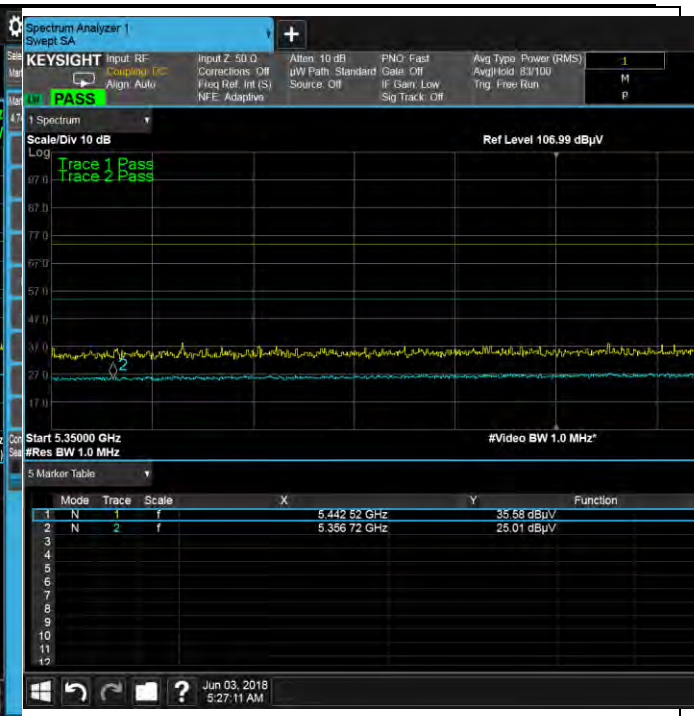
Band Edge -802.11n 20 -5180MHz



Band Edge -802.11n 20 -5320MHz

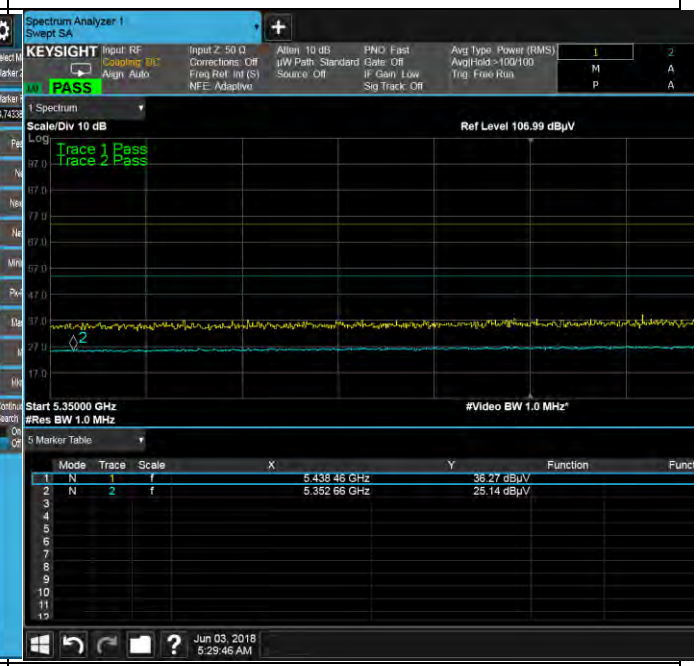


Band Edge -802.11n-40 -5190MHz



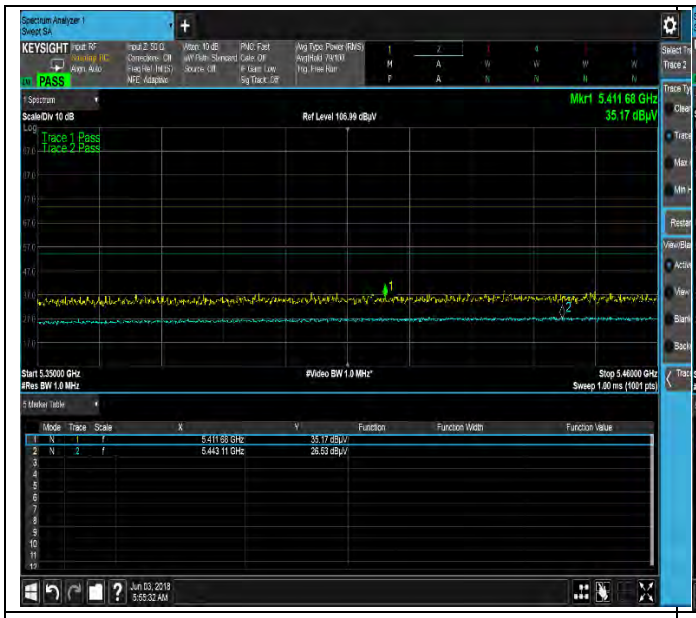
Band Edge -802.11n-40M -5310MHz

Band Edge -802.11ac-80- 5210MHz



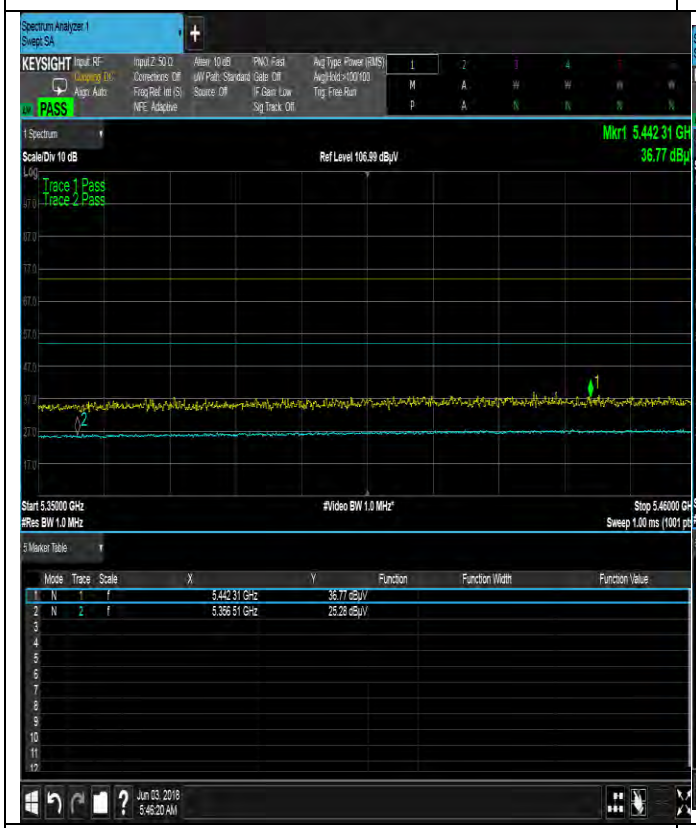
Band Edge -802.11ac 80 - 5290MHz

UNII Band 3

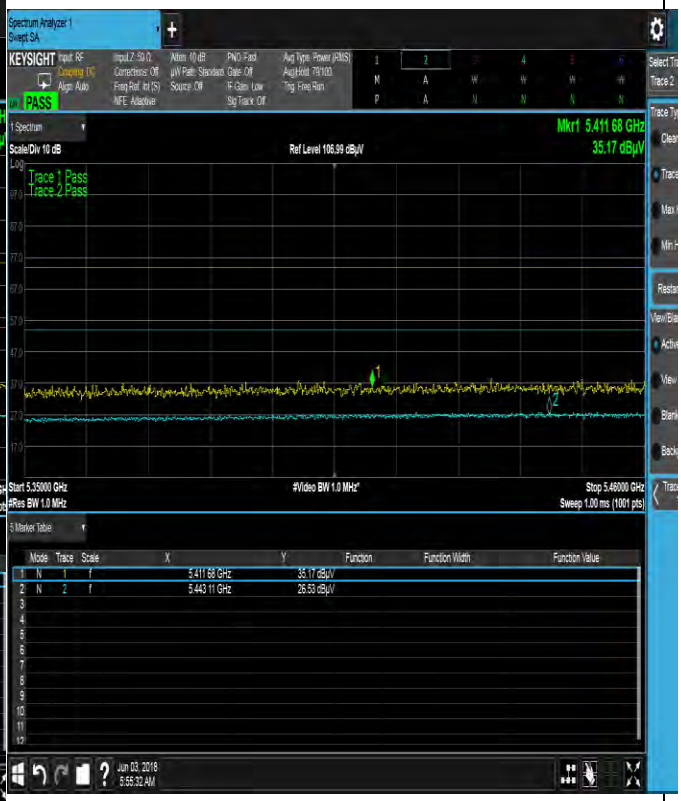


Band Edge -802.11a-5500M-

Band Edge -802.11n 20- 5500MHz



Band Edge -802.11n 40 -5510MHz



Band Edge -802.11ac 80 -5530MHz

Embedded Antenna

UNII Band 1

1GHz -40GHz – 802.11a – 5180MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	imit dBuV/m	Margin dB	Pass /Fail
17787.63	38.86	8.1	8.28	55.24	Peak Max	V	159	48	74	-18.76	Pass
13211.2	37.35	6.98	4.73	49.06	Peak Max	V	130	142	74	-24.95	Pass
6140.579	38.6	4.74	-0.31	43.03	Peak Max	V	133	222	74	-30.97	Pass
17787.63	26.55	8.1	8.28	42.94	Average Max	V	159	48	54	-11.06	Pass
13211.2	24.95	6.98	4.73	36.66	Average Max	V	130	142	54	-17.34	Pass
6140.579	26.28	4.74	-0.31	30.71	Average Max	V	133	222	54	-23.29	Pass

1GHz-40GHz- 802.11a - 5220MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17966.68	38.33	7.9	8.72	54.94	Peak Max	V	175	4	74	-19.06	Pass
12487.7	38.36	6.54	4.15	49.05	Peak Max	V	105	278	74	-24.96	Pass
2560.119	42.3	3.04	-3.31	42.03	Peak Max	V	193	91	74	-31.97	Pass
17966.68	26.63	7.9	8.72	43.25	Average Max	V	175	4	54	-10.75	Pass
12487.7	26.01	6.54	4.15	36.7	Average Max	V	105	278	54	-17.3	Pass
2560.119	29.23	3.04	-3.31	28.96	Average Max	V	193	91	54	-25.04	Pass

1GHz-40GHz – 802.11a – 5240MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 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
17927.58	38.55	7.94	8.67	55.17	Peak Max	V	102	50	74	-18.83	Pass
1926.358	41.81	2.69	-2.7	41.8	Peak Max	H	347	344	74	-32.2	Pass
1394.72	43.32	2.24	-6.25	39.32	Peak Max	H	331	121	74	-34.69	Pass
17927.58	26.75	7.94	8.67	43.37	Average Max	V	102	50	54	-10.64	Pass
1926.358	29.76	2.69	-2.7	29.75	Average Max	H	347	344	54	-24.25	Pass
1394.72	30.85	2.24	-6.25	26.85	Average Max	H	331	121	54	-27.15	Pass

1GHz-40GHz – 802.11n20 – 5220MHz

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
17575.73	39.52	8.23	7.85	55.6	Peak Max	H	118	32	74	-18.4	Pass
8331.393	39.6	5.41	-0.76	44.25	Peak Max	V	107	68	74	-29.75	Pass
1882.628	43.49	2.66	-2.83	43.33	Peak Max	V	115	301	74	-30.67	Pass
17575.73	26.71	8.23	7.85	42.8	Average Max	H	118	32	54	-11.2	Pass
8331.393	26.8	5.41	-0.76	31.45	Average Max	V	107	68	54	-22.55	Pass
1882.628	30	2.66	-2.83	29.84	Average Max	V	115	301	54	-24.16	Pass

1GHz-40GHz- 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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 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
17577	39.16	8.23	7.85	55.25	Peak Max	H	112	269	74	-18.75	Pass
1883.168	41.61	2.66	-2.82	41.46	Peak Max	H	311	59	74	-32.54	Pass
1372.33	42.54	2.22	-6.03	38.74	Peak Max	V	140	95	74	-35.26	Pass
17577	26.76	8.23	7.85	42.84	Average Max	H	112	269	54	-11.16	Pass
1883.168	30.01	2.66	-2.82	29.86	Average Max	H	311	59	54	-24.14	Pass
1372.33	30.62	2.22	-6.03	26.81	Average Max	V	140	95	54	-27.19	Pass

1GHz-40GHz- 802.11ac 80 - 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
17575.73	39.52	8.23	7.85	55.6	Peak Max	H	118	32	74	-18.4	Pass
8331.393	39.6	5.41	-0.76	44.25	Peak Max	V	107	68	74	-29.75	Pass
1882.628	43.49	2.66	-2.83	43.33	Peak Max	V	115	301	74	-30.67	Pass
17575.73	26.71	8.23	7.85	42.8	Average Max	H	118	32	54	-11.2	Pass
8331.393	26.8	5.41	-0.76	31.45	Average Max	V	107	68	54	-22.55	Pass
1882.628	30	2.66	-2.83	29.84	Average Max	V	115	301	54	-24.16	Pass

UNII Band 2

1GHz-405GHz- 802.11a - 5260MHz

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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz – 802.11a – 5300MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz- 802.11a - 5320MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass

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

1GHz-40GHz- 802.11n20 - 5260MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz – 802.11n20 – 5300MHz

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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 802.11n20 - 5320MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz- 802.11n40 - 5270MHz

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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 802.11n40 – 5310MHz

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
17927.58	38.55	7.94	8.67	55.17	Peak Max	V	102	50	74	-18.83	Pass
1926.358	41.81	2.69	-2.7	41.8	Peak Max	H	347	344	74	-32.2	Pass
1394.72	43.32	2.24	-6.25	39.32	Peak Max	H	331	121	74	-34.69	Pass
17927.58	26.75	7.94	8.67	43.37	Average Max	V	102	50	54	-10.64	Pass
1926.358	29.76	2.69	-2.7	29.75	Average Max	H	347	344	54	-24.25	Pass
1394.72	30.85	2.24	-6.25	26.85	Average Max	H	331	121	54	-27.15	Pass

1GHz-40GHz- 802.11ac 80 - 5290MHz

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
15663.58	43.99	7.72	5.42	57.13	Peak Max	H	113	336	74	-16.87	Pass
13040.76	37.19	6.92	4.76	48.88	Peak Max	V	322	214	74	-25.13	Pass
2020.366	40.73	2.75	-2.6	40.88	Peak Max	V	215	14	74	-33.12	Pass
15663.58	31.94	7.72	5.42	45.09	Average Max	H	113	336	54	-8.92	Pass
13040.76	25.13	6.92	4.76	36.82	Average Max	V	322	214	54	-17.19	Pass
2020.366	28.07	2.75	-2.6	28.22	Average Max	V	215	14	54	-25.78	Pass

UNII Band 3

1GHz-40GHz- 802.11a - 5500MHz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz – 802.11a – 5600MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 802.11a - 5700MHz

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
15534.56	43.92	7.61	5.3	56.83	Peak Max	V	236	207	74	-17.17	Pass
17969.24	38.97	7.89	8.72	55.59	Peak Max	H	310	261	74	-18.42	Pass
2046.44	39.67	2.77	-2.91	39.52	Peak Max	V	177	214	74	-34.48	Pass
15534.56	31.46	7.61	5.3	44.37	Average Max	V	236	207	54	-9.63	Pass
17969.24	26.69	7.89	8.72	43.31	Average Max	H	310	261	54	-10.69	Pass
2046.44	27.55	2.77	-2.91	27.4	Average Max	V	177	214	54	-26.6	Pass

1GHz-40GHz- 802.11n20 - 5500Hz

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
17774.91	38.83	8.12	8.24	55.19	Peak Max	H	214	340	74	-18.81	Pass
2577.14	41.76	3.05	-3.28	41.52	Peak Max	V	101	349	74	-32.48	Pass
1009.933	48	1.89	-7.86	42.03	Peak Max	V	103	228	74	-31.97	Pass
17774.91	26.53	8.12	8.24	42.89	Average Max	H	214	340	54	-11.11	Pass
2577.14	29.11	3.05	-3.28	28.88	Average Max	V	101	349	54	-25.12	Pass
1009.933	40.99	1.89	-7.86	35.03	Average Max	V	103	228	54	-18.97	Pass

1GHz-40GHz – 802.11n20 – 5600MHz

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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 802.11n20 - 5700MHz

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
15543.85	44.67	7.62	5.3	57.59	Peak Max	V	271	293	74	-16.41	Pass
17533.39	39.37	8.25	7.8	55.42	Peak Max	V	108	104	74	-18.58	Pass
2020.366	40.73	2.75	-2.6	40.88	Peak Max	V	215	14	74	-33.12	Pass
15543.85	32.37	7.62	5.3	45.29	Average Max	V	271	293	54	-8.71	Pass
17533.39	26.56	8.25	7.8	42.62	Average Max	V	108	104	54	-11.38	Pass
2020.366	28.07	2.75	-2.6	28.22	Average Max	V	215	14	54	-25.78	Pass

1GHz-40GHz- 802.11n40 - 5510MHz

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
15545.16	38.77	7.62	5.3	51.69	Peak Max	V	164	297	74	-22.31	Pass
17870.85	38.49	8.01	8.55	55.05	Peak Max	H	346	331	74	-18.95	Pass
2077.503	40.74	2.79	-2.9	40.63	Peak Max	V	304	33	74	-33.37	Pass
15545.16	26.91	7.62	5.3	39.83	Average Max	V	164	297	54	-14.17	Pass
17870.85	26.54	8.01	8.55	43.1	Average Max	H	346	331	54	-10.9	Pass
2077.503	28.42	2.79	-2.9	28.31	Average Max	V	304	33	54	-25.7	Pass

1GHz-40GHz – 802.11n40 – 5590MHz

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
16502.55	43.31	8.1	5.89	57.3	Peak Max	V	271	318	74	-16.7	Pass
18001.97	79.96	7.86	-32.54	55.28	Peak Max	V	158	268	74	-18.72	Pass
2051.591	40.88	2.77	-2.95	40.7	Peak Max	V	230	20	74	-33.3	Pass
16502.55	31.68	8.1	5.89	45.67	Average Max	V	271	318	54	-8.33	Pass
18001.97	67.97	7.86	-32.54	43.29	Average Max	V	158	268	54	-10.71	Pass
2051.591	27.73	2.77	-2.95	27.55	Average Max	V	230	20	54	-26.46	Pass

1GHz-40GHz – 802.11n40 – 5670MHz

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
16500.43	38.79	8.1	5.88	52.78	Peak Max	H	336	180	74	-21.22	Pass
9854.48	38.74	5.67	1.05	45.46	Peak Max	V	347	169	74	-28.54	Pass
2011.402	41.42	2.74	-2.49	41.68	Peak Max	V	303	247	74	-32.32	Pass
16500.43	26.5	8.1	5.88	40.49	Average Max	H	336	180	54	-13.51	Pass
9854.48	26.56	5.67	1.05	33.28	Average Max	V	347	169	54	-20.72	Pass
2011.402	28.5	2.74	-2.49	28.75	Average Max	V	303	247	54	-25.25	Pass

1GHz-40GHz- 802.11ac 80 - 5610MHz

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
17691.74	39.07	8.18	7.99	55.24	Peak Max	V	276	267	74	-18.77	Pass
4757.045	40.39	4.06	-0.92	43.52	Peak Max	V	273	46	74	-30.48	Pass
2034.515	40.49	2.76	-2.77	40.48	Peak Max	V	101	75	74	-33.52	Pass
17691.74	26.52	8.18	7.99	42.69	Average Max	V	276	267	54	-11.31	Pass
4757.045	27.8	4.06	-0.92	30.94	Average Max	V	273	46	54	-23.07	Pass
2034.515	27.57	2.76	-2.77	27.56	Average Max	V	101	75	54	-26.44	Pass

UNII Band 4

1GHz -40GHz – 802.11a – 5745MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	imit dBuV/m	Margin dB	Pass /Fail
17990.21	39.05	7.87	8.75	55.67	Peak Max	V	150	16	74	-18.33	Pass
16269.06	39.46	8.17	5.86	53.49	Peak Max	V	127	113	74	-20.51	Pass
1988.097	41.82	2.73	-2.45	42.1	Peak Max	V	314	19	74	-31.9	Pass
17990.21	26.69	7.87	8.75	43.31	Average Max	V	150	16	54	-10.69	Pass
16269.06	26.66	8.17	5.86	40.68	Average Max	V	127	113	54	-13.32	Pass
1988.097	28.77	2.73	-2.45	29.05	Average Max	V	314	19	54	-24.95	Pass

1GHz-40GHz- 802.11a - 5785MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17966.68	38.33	7.9	8.72	54.94	Peak Max	V	175	4	74	-19.06	Pass
12487.7	38.36	6.54	4.15	49.05	Peak Max	V	105	278	74	-24.96	Pass
2560.119	42.3	3.04	-3.31	42.03	Peak Max	V	193	91	74	-31.97	Pass
17966.68	26.63	7.9	8.72	43.25	Average Max	V	175	4	54	-10.75	Pass
12487.7	26.01	6.54	4.15	36.7	Average Max	V	105	278	54	-17.3	Pass
2560.119	29.23	3.04	-3.31	28.96	Average Max	V	193	91	54	-25.04	Pass

1GHz-40GHz – 802.11a – 5825MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17926.39	38.55	7.94	8.67	55.17	Peak Max	V	240	343	74	-18.84	Pass
12133.5	38.3	6.45	3.55	48.3	Peak Max	V	175	101	74	-25.7	Pass
1966.593	40.8	2.72	-2.64	40.88	Peak Max	V	305	82	74	-33.12	Pass
17926.39	26.66	7.94	8.67	43.27	Average Max	V	240	343	54	-10.73	Pass
12133.5	26.26	6.45	3.55	36.26	Average Max	V	175	101	54	-17.74	Pass
1966.593	27.72	2.72	-2.64	27.8	Average Max	V	305	82	54	-26.21	Pass

1GHz-40GHz- 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
15534.56	43.92	7.61	5.3	56.83	Peak Max	V	236	207	74	-17.17	Pass
17969.24	38.97	7.89	8.72	55.59	Peak Max	H	310	261	74	-18.42	Pass
2046.44	39.67	2.77	-2.91	39.52	Peak Max	V	177	214	74	-34.48	Pass
15534.56	31.46	7.61	5.3	44.37	Average Max	V	236	207	54	-9.63	Pass
17969.24	26.69	7.89	8.72	43.31	Average Max	H	310	261	54	-10.69	Pass
2046.44	27.55	2.77	-2.91	27.4	Average Max	V	177	214	54	-26.6	Pass

1GHz-40GHz – 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
17913.3	38.68	7.96	8.66	55.3	Peak Max	V	122	118	74	-18.7	Pass
11838.07	38.26	6.31	3.08	47.66	Peak Max	V	216	86	74	-26.34	Pass
10171.72	38.94	5.93	1.4	46.28	Peak Max	V	278	356	74	-27.72	Pass
17913.3	26.66	7.96	8.66	43.28	Average Max	V	122	118	54	-10.72	Pass
11838.07	25.82	6.31	3.08	35.22	Average Max	V	216	86	54	-18.78	Pass
10171.72	26.7	5.93	1.4	34.04	Average Max	V	278	356	54	-19.97	Pass

1GHz-40GHz- 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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

1GHz-40GHz- 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
17501.4	38.27	8.27	7.76	54.3	Peak Max	V	152	66	74	-19.71	Pass
10853.25	38.5	6.16	1.87	46.52	Peak Max	V	257	296	74	-27.48	Pass
1860.175	39.8	2.65	-3.11	39.35	Peak Max	V	194	274	74	-34.66	Pass
17501.4	26.56	8.27	7.76	42.59	Average Max	V	152	66	54	-11.41	Pass
10853.25	26.53	6.16	1.87	34.56	Average Max	V	257	296	54	-19.44	Pass
1860.175	27.47	2.65	-3.11	27.01	Average Max	V	194	274	54	-26.99	Pass

1GHz-40GHz – 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
17768.19	39.49	8.13	8.22	55.84	Peak Max	V	154	357	74	-18.16	Pass
10759.21	38.08	6.17	1.77	46.02	Peak Max	V	236	179	74	-27.98	Pass
1987.497	40.73	2.73	-2.46	41	Peak Max	V	209	339	74	-33	Pass
17768.19	26.53	8.13	8.22	42.88	Average Max	V	154	357	54	-11.13	Pass
10759.21	26.41	6.17	1.77	34.36	Average Max	V	236	179	54	-19.64	Pass
1987.497	28.74	2.73	-2.46	29.01	Average Max	V	209	339	54	-24.99	Pass

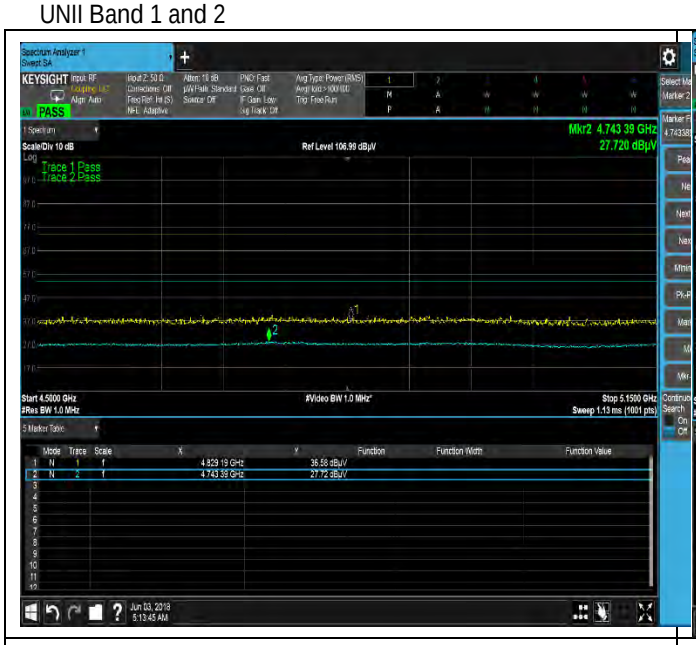
1GHz-40GHz- 802.11ac 80 - 5775MHz

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
17817.82	39.66	8.07	8.38	56.11	Peak Max	H	121	146	74	-17.89	Pass
3583.082	39.8	3.57	-1.57	41.8	Peak Max	V	343	29	74	-32.2	Pass
2353.138	41.64	2.94	-3.6	40.99	Peak Max	V	274	182	74	-33.01	Pass
17817.82	26.51	8.07	8.38	42.96	Average Max	H	121	146	54	-11.04	Pass
3583.082	26.92	3.57	-1.57	28.92	Average Max	V	343	29	54	-25.08	Pass
2353.138	28.83	2.94	-3.6	28.17	Average Max	V	274	182	54	-25.83	Pass

Radiated Restricted Band Measurement Plots :

Embadded Antenna

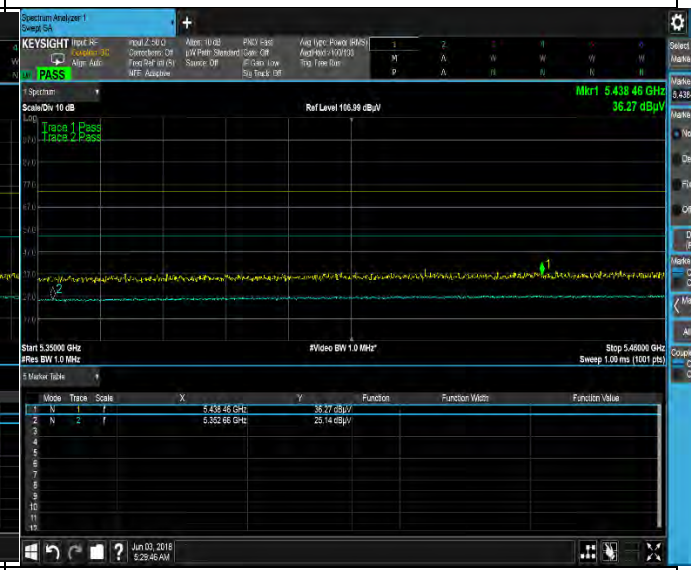
UNII Band 1 and 2



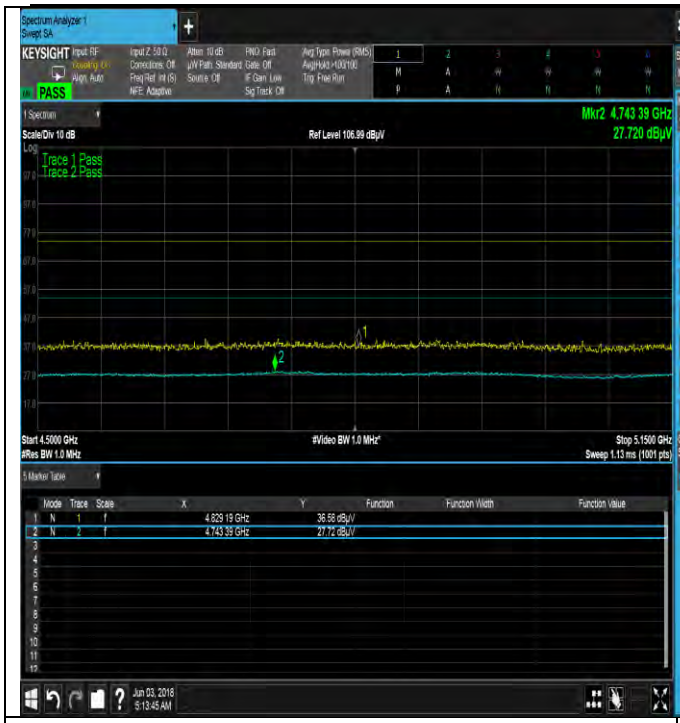
Band Edge-802.11a-5180MHz

Band Edge-802.11a -5320MHz

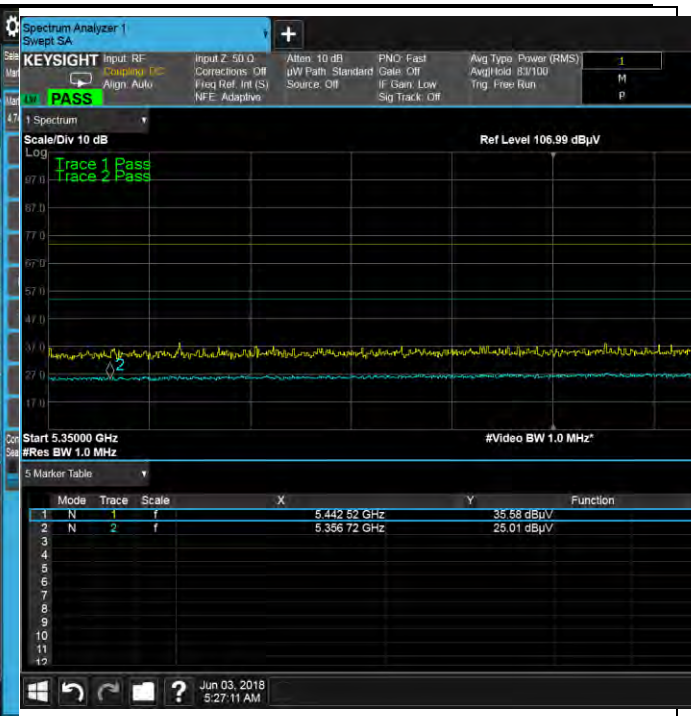
Band Edge -802.11n 20 -5180MHz



Band Edge -802.11n 20 -5320MHz

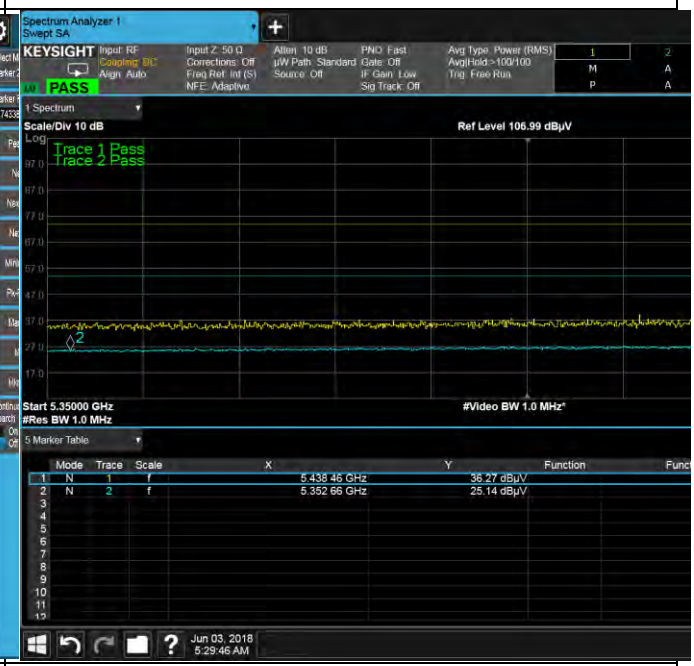


Band Edge -802.11n-40 -5190MHz



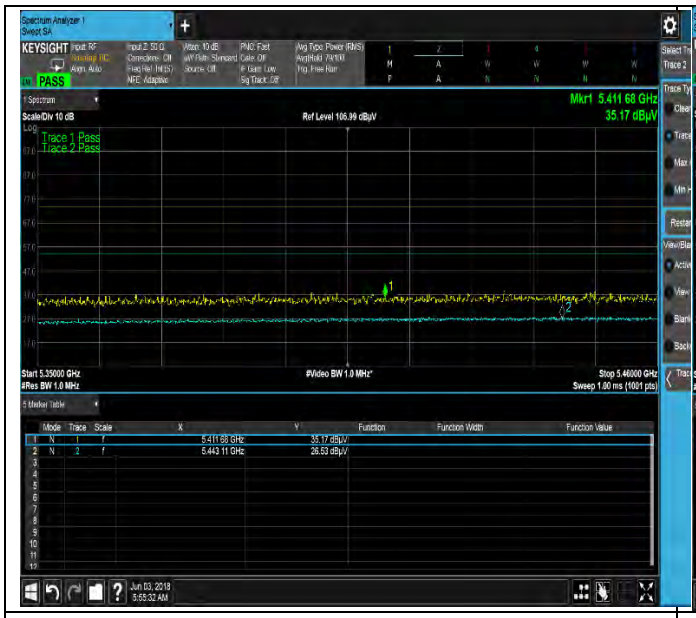
Band Edge -802.11n-40M -5310MHz

Band Edge -802.11ac-80- 5210MHz



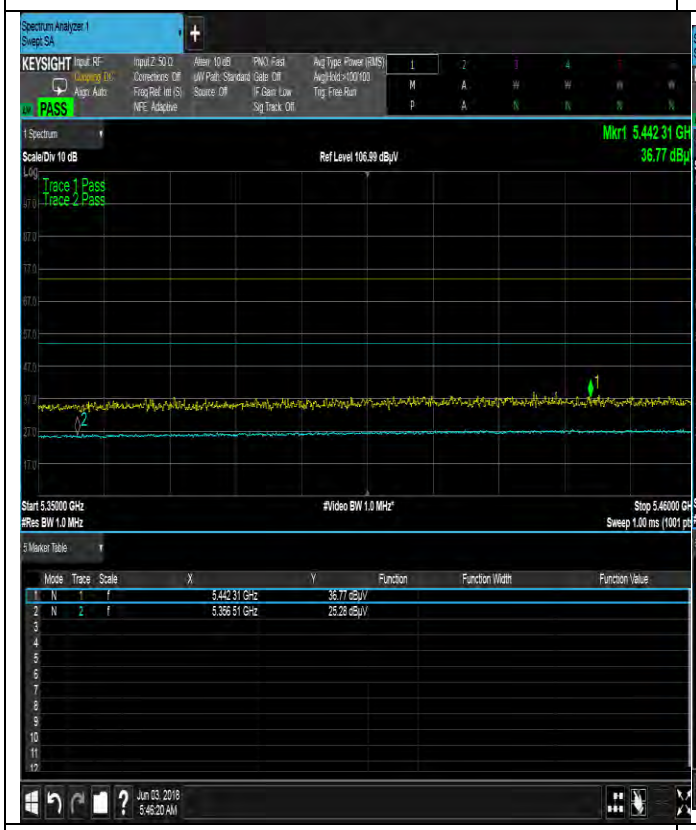
Band Edge -802.11ac 80 - 5290MHz

UNII Band 3

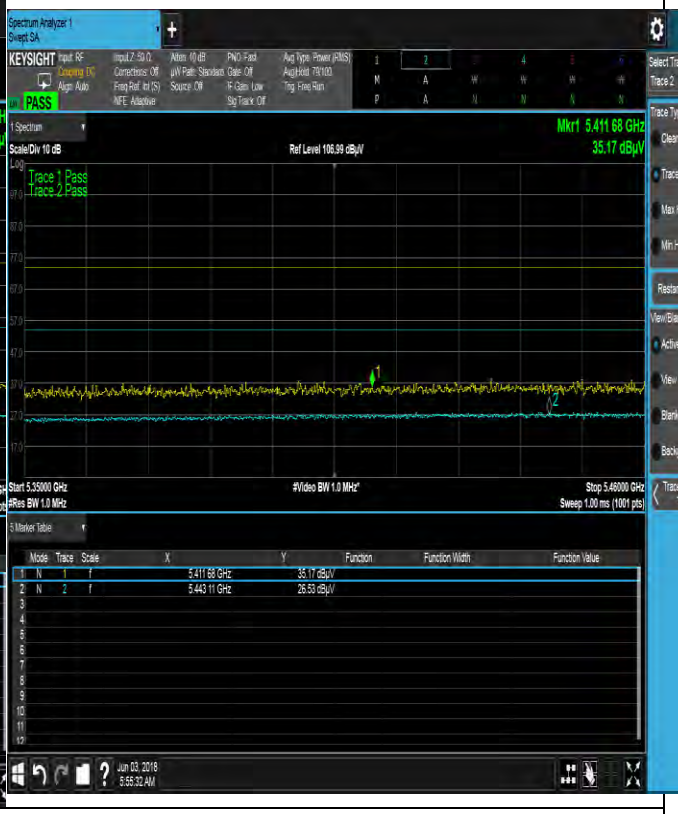


Band Edge -802.11a-5500M-

Band Edge -802.11n 20- 5500MHz



Band Edge -802.11n 40 -5510MHz

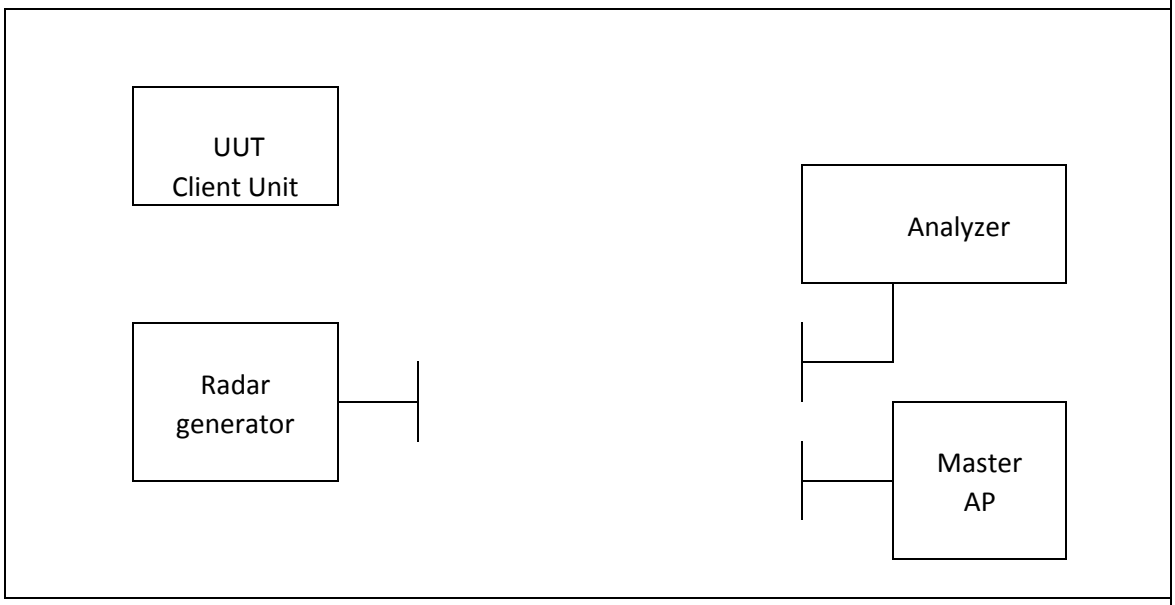


Band Edge -802.11ac 80 -5530MHz

10.9 DFS

Spec	Item	Requirement	Applicable
§ 15.407 RSS247	UNII Detection Bandwidth	47CFR15.407 (h) RSS 247 Issue 2 2017	☐
	Initial Channel Availability Check Time	47CFR15.407 (h) RSS 247 Issue 2 2017	☐
	Radar Burst at the Beginning of the Channel Availability Check Time	47CFR15.407 (h) RSS 247 Issue 2 2017	☐
	Radar Burst at the End of the Channel Availability Check Time	47CFR15.407 (h) RSS 247 Issue 2 2017	☐
	In-Service Monitoring - Channel Move Time	47CFR15.407 (h) RSS 247 Issue 2 2017	☒
	In-Service Monitoring - Channel Closing Transmission Time	47CFR15.407 (h) RSS 247 Issue 2 2017	☒
	In-Service Monitoring - Non-Occupancy Period	47CFR15.407 (h) RSS 247 Issue 2 2017	☒
	Statistical Performance Check	47CFR15.407 (h) RSS 247 Issue 2 2017	☐

Test Setup



Test Procedure	FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02		
Test Date	06/1/2018	Environmental condition	Temperature 22ºC Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	The EUT is a client station , there is no radar detection requirement for it .		
Result	☒ Pass ☐ Fail		

DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the UNII 99% transmission power bandwidth See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Non-Occupancy Period, Channel Move Time, and Channel Closing Transmission Time

The UUT operating as a Client Device will associate with a UNII master device at Mid Channel. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

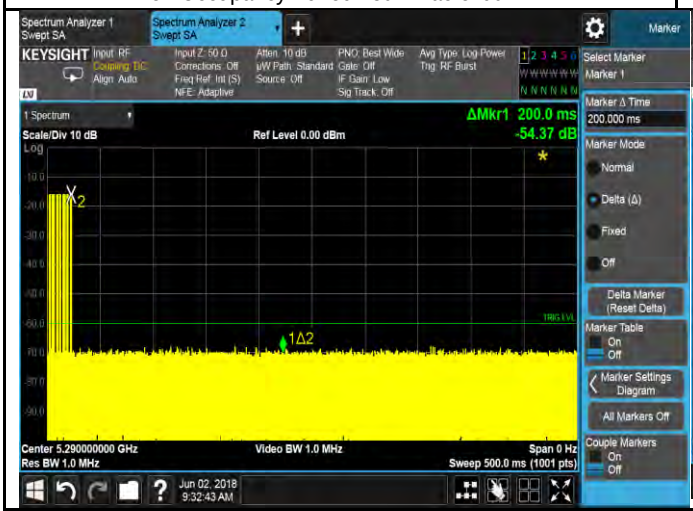
At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at -64dBm.

Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time results to the limits defined in the DFS Response requirement values table.

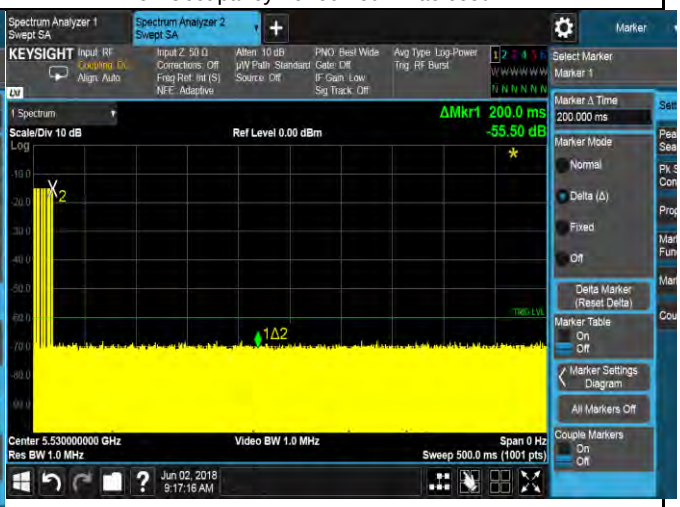
DFS Test Result

Non-Occupancy Period - 802.11ac-5290MHz

Non-Occupancy Period - 802.11ac-5530MHz

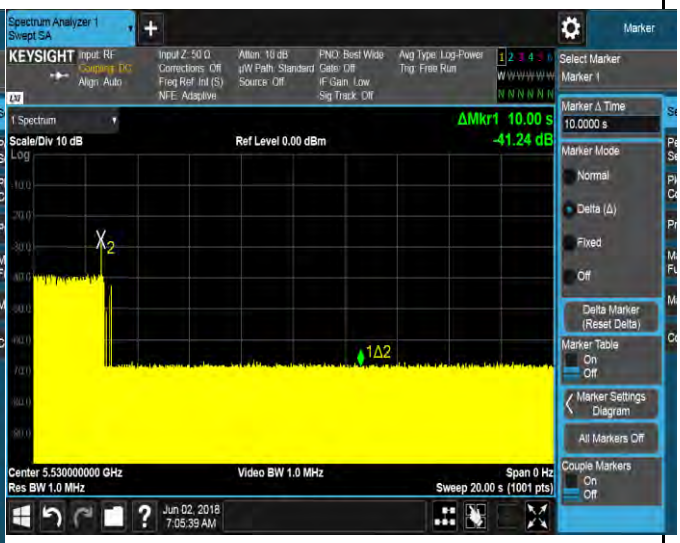


Channel Move Time & Closing Time - 802.11ac-5290MHz (Type 0)



Channel Move Time & Closing Time - 802.11ac-5530MHz (Type 0)

Channel Move Time & Closing Time - 802.11ac-5290MHz (Type 0)



Channel Move Time & Closing Time - 802.11ac-5530MHz (Type 0)

Annex A . Test Instrument

A.
TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	06/08/2017	1 Year	06/08/2018	☑
CHASE LISN	MN2050B	1018	08/07/2017	1 Year	08/07/2018	☑
Radiated Emissions						
R & S Receiver	ESIB 40	1018	08/07/2017	1 Year	08/07/2018	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2017	1 Year	08/12/2018	☑
Horn Antenna (1GHz~26GHz)	3115	100059	08/25/2017	1 Year	08/25/2018	☑
Horn Antenna (26GHz~40GHz)	AH-840	101013	08/28/2017	1 Year	08/28/2018	☑
Pre-Amp (30MHz~40GHz)	LPA-6-30	11140711	02/10/2018	1 Year	02/10/2019	☑
3 Meters SAC	3M	N/A	08/08/2017	1 Year	08/08/2018	☑
10 Meters SAC	10M	N/A	09/05/2017	1 Year	09/05/2018	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	08/20/2017	1 Year	08/20/2018	☑
R & S Receiver	ESIB 40	100179	06/08/2017	1 Year	06/08/2018	☑
ETS-Lingren USB RF Power Sensor	7002-006	10SL0190	09/03/2017	1 Year	09/03/2018	☑

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