

RF TEST REPORT



Report No.: FCC_RF_SL14122201-RUC-033_UNII REV1.0

Supersede Report No.: FCC_RF_SL14122201-RUC-033_UNII

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	Access Point
Model No.	:	C500
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.10:2013 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	S9GC500
IC ID	:	5912A-C500
Dates of test	:	02/09/2015 to 03/04/2015
Issue Date	:	03/04/2015
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification []		

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

Issued By:
SIEMIC Laboratories
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Accreditations for Conformity Assessment

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

Accreditations for Product Certifications

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

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL14122201-RUC-033_UNII	None	Original	03/04/2015
FCC_RF_SL14122201-RUC-033_UNII REV1.0	REV1.0	updated 5.8GHz PSD Limit	06/19/2015

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: Access Point
Model: C500

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

3 Customer information

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

4 Test site information

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

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Access Point
Model No.	:	C500
Trade Name	:	Ruckus
Serial No.	:	471406000039
Host Model No.	:	N/A
Input Power	:	12VDC
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Date of EUT received	:	02/09/2015
Equipment Class/ Category	:	DTS, UNII
Clock Frequencies	:	N/A
Port/Connectors	:	PoE, Ethernet

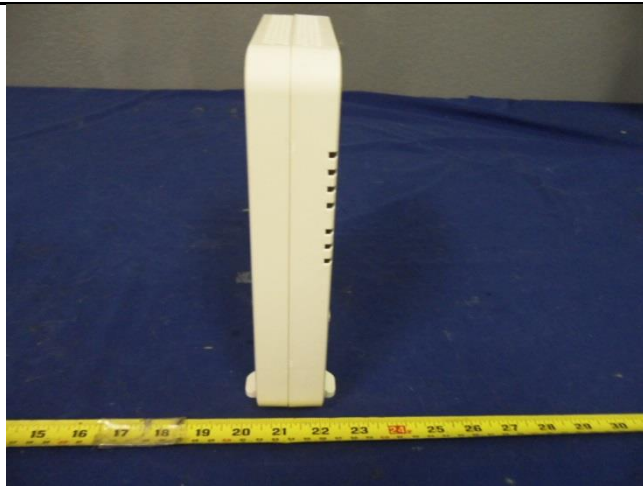
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5745-5825MHz	2412-2462MHz 5180-5240MHz 5745-5825MHz	2422-2452MHz 5190-5230MHz 5755-5795MHz	5210MHz 5775MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	11	11	9	11(2.4GH) 9 (5GHz)	9(2.4GH) 4(5GHz)	2
Antenna Type	Internal Omni PCB Antennas					
Antenna Gain (Peak)	0 dBi (2.4GHz), 1 dBi (5 GHz)					
Antenna Connector Type	U.FL					
Note	N/A					

EUT Power Level Settings

Mode	Frequency	Power Setting
802.11-a	5180	21
802.11-a	5200	23
802.11-a	5240	23
802.11-n-20	5180	21
802.11-n-20	5200	23
802.11-n-20	5240	23
802.11-n-40	5190	19
802.11-n-40	5230	23
802.11-ac-80	5210	17
802.11-a	5745	21
802.11-a	5785	23
802.11-a	5825	23
802.11-n-20	5745	21
802.11-n-20	5785	23
802.11-n-20	5825	23
802.11-n-40	5755	19
802.11-n-40	5795	23
802.11-ac-80	5775	16

6.3 EUT Photos - External



Front View



Rear View



Right Side View

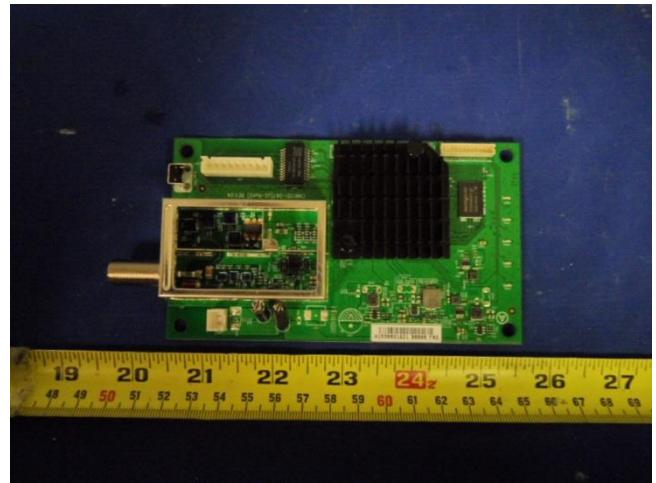


Left Side View

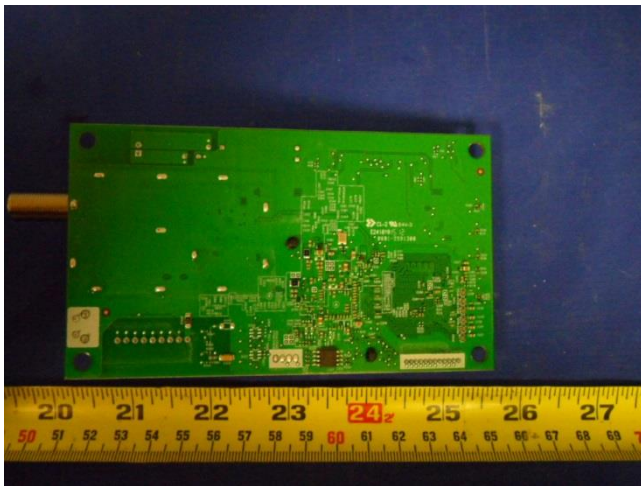
6.4 EUT Photos - Interna



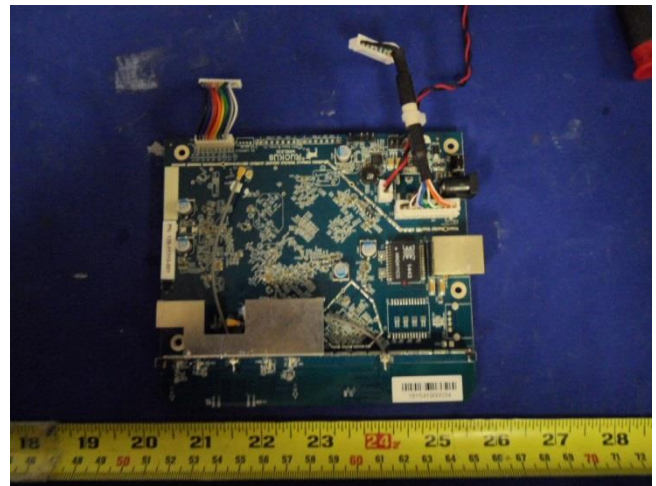
EUT Case off View



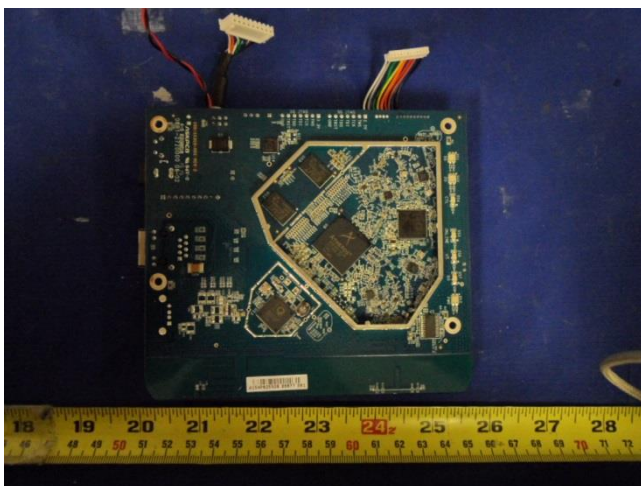
Modem Board Top View



Modem Board Bottom View

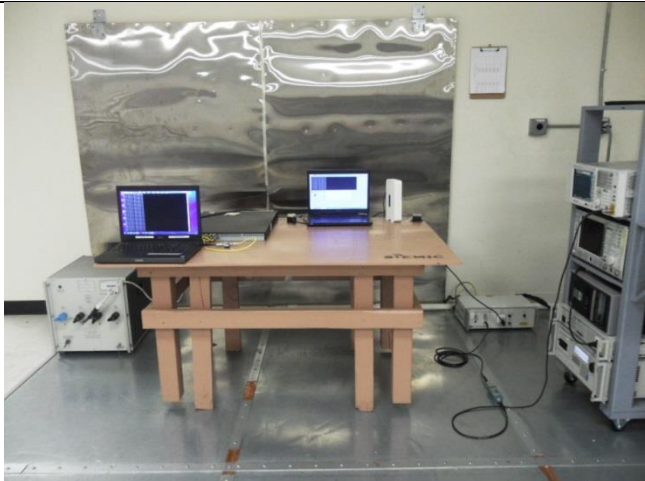


Main Board Top View

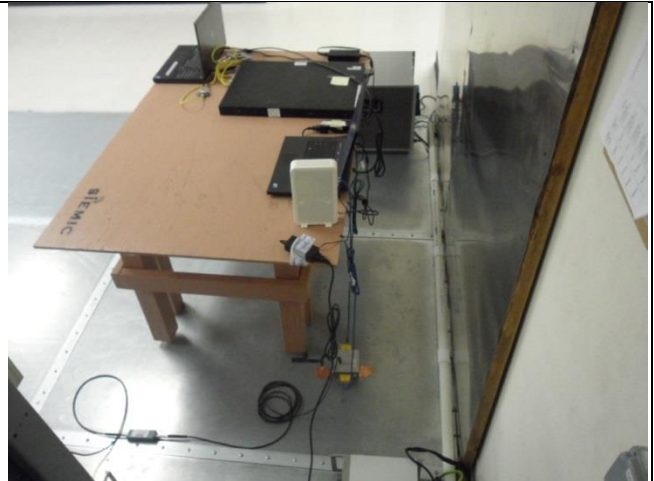


Main Board Bottom View

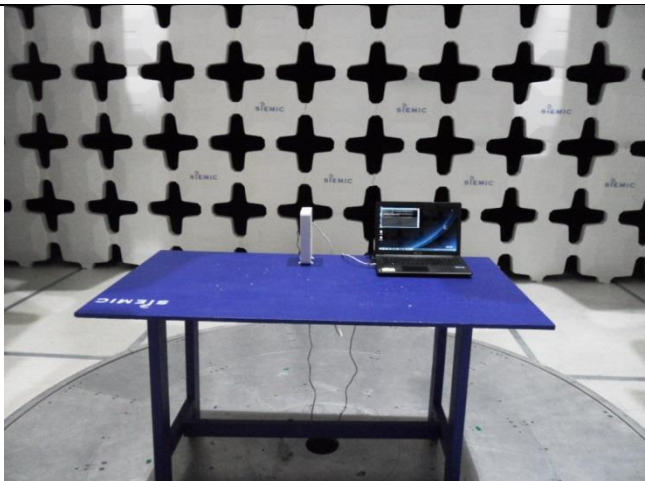
6.5 EUT Test Setup Photos



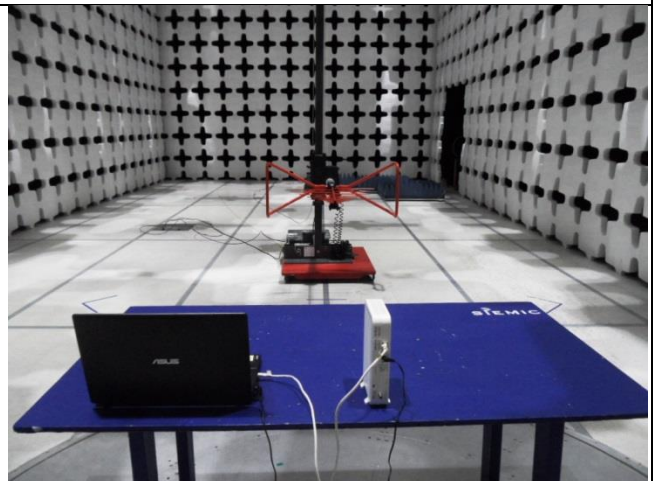
AC Line Conducted Emissions – Front View



AC Line Conducted Emissions – Rear View



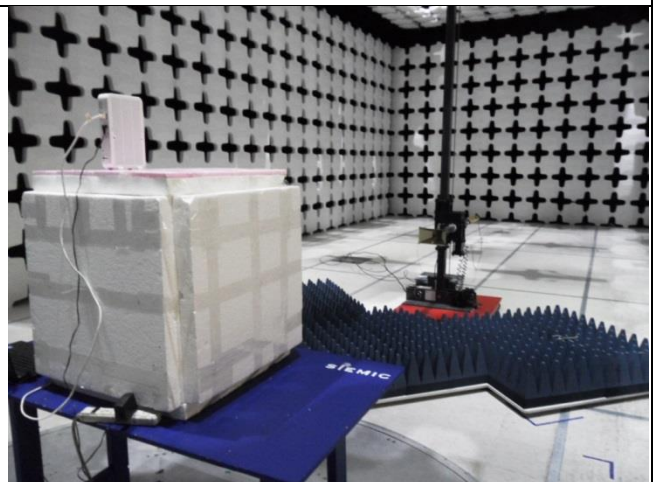
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	PP01L Latitude E5440	F1WPF12	Dell	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
RJ45	EUT	RJ45	Laptop	RJ45	1	Unshielded	-

7.3 Test Software Description

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

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.10:2013 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.10:2013	☒ Pass ☐ N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☐ Pass ☒ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.10:2013 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☒ Pass ☐ N/A
Remark	- All measurement uncertainties are not taken into consideration for all presented test result. - The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.			

9 Measurement Uncertainty

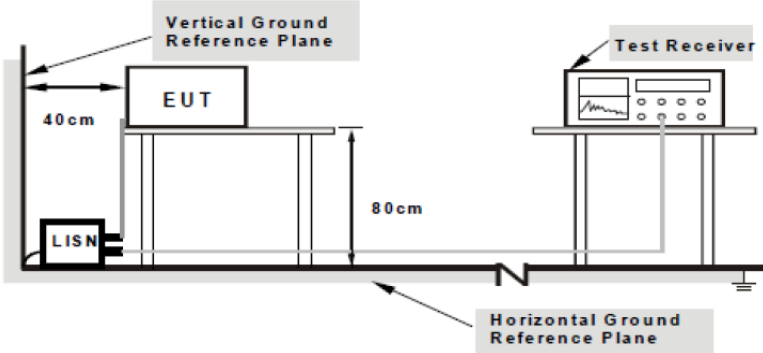
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious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

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

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

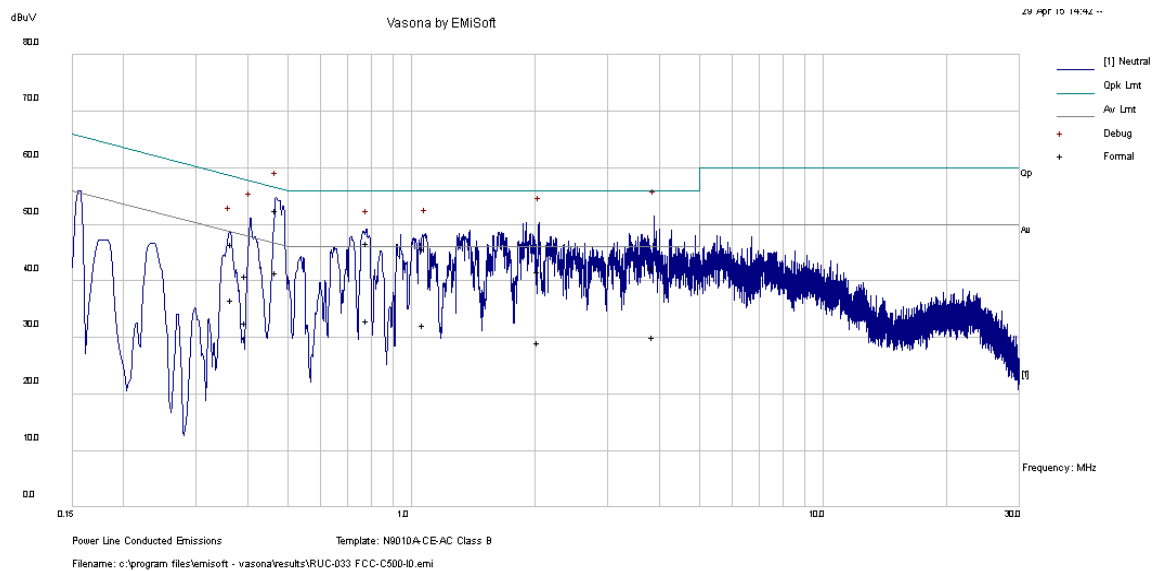
Spec	Item	Requirement	Applicable
47CFR§15.207	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz,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

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Osvaldo Casorla			
Test Date:	04/29/2015			
Remarks	Line			

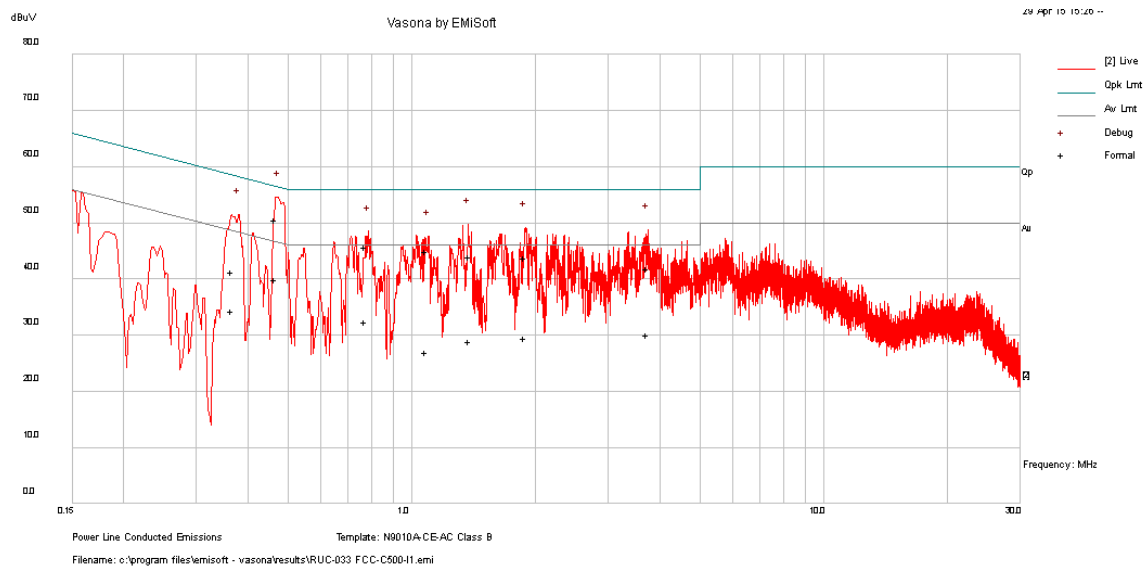


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.47	41.84	10.01	0.73	52.59	Quasi Peak	Neutral	56.53	-3.94	Pass
3.87	31.10	10.03	1.07	42.20	Quasi Peak	Neutral	56.00	-13.80	Pass
2.04	30.72	10.02	0.95	41.69	Quasi Peak	Neutral	56.00	-14.31	Pass
0.40	30.11	10.01	0.73	40.84	Quasi Peak	Neutral	57.91	-17.07	Pass
1.07	34.94	10.02	0.79	45.75	Quasi Peak	Neutral	56.00	-10.25	Pass
0.78	35.97	10.01	0.76	46.75	Quasi Peak	Neutral	56.00	-9.26	Pass
0.47	30.68	10.01	0.73	41.42	Average	Neutral	46.53	-5.11	Pass
3.87	19.08	10.03	1.07	30.18	Average	Neutral	46.00	-15.82	Pass
2.04	18.24	10.02	0.95	29.21	Average	Neutral	46.00	-16.79	Pass
0.40	21.87	10.01	0.73	32.60	Average	Neutral	47.91	-15.31	Pass
1.07	21.37	10.02	0.79	32.18	Average	Neutral	46.00	-13.82	Pass
0.78	22.14	10.01	0.76	32.92	Average	Neutral	46	-13.08	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:	Osvaldo Casorla			
Test Date:	04/29/2015			
Remarks	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
0.47	39.91	10.01	0.73	50.65	Quasi Peak	Live	56.55	-5.90	Pass
1.38	33.15	10.02	0.85	44.02	Quasi Peak	Live	56.00	-11.98	Pass
0.37	30.49	10.01	0.72	41.22	Quasi Peak	Live	58.57	-17.35	Pass
1.88	32.85	10.02	0.93	43.81	Quasi Peak	Live	56.00	-12.19	Pass
3.74	30.82	10.03	1.05	41.91	Quasi Peak	Live	56.00	-14.09	Pass
0.77	34.92	10.01	0.76	45.69	Quasi Peak	Live	56.00	-10.31	Pass
0.47	29.28	10.01	0.73	40.02	Average	Live	46.55	-6.53	Pass
1.38	18.04	10.02	0.85	28.90	Average	Live	46.00	-17.10	Pass
0.37	23.56	10.01	0.72	34.29	Average	Live	48.57	-14.28	Pass
1.88	18.64	10.02	0.93	29.59	Average	Live	46.00	-16.41	Pass
3.74	19.03	10.03	1.05	30.12	Average	Live	46.00	-15.88	Pass
0.77	21.61	10.01	0.76	32.38	Average	Live	46	-13.62	Pass

10.2 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	-	26 dB Emission BW: Report only for reference.	☒
	a) (2)	26 dB Emission BW: Report only for power limit calculation.	☐
	e)	Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.	☐
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 <u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. - o Set RBW = around 1% of emission bandwidth - o Set VBW > RBW - o Detector = Peak - o Trace mode = max hold - Capture the plot. - Repeat above steps for different test channel and other modulation type. <u>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)</u> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 6dB BW. - o Set RBW = 100 KHz - o Set VBW ≥ 3 x RBW - o Detector = Peak - o Trace mode = max hold - o Sweep = auto couple - Capture the plot. - Repeat above steps for different test channel and other modulation type.		
Test Date	02/13/2015	Environmental condition	Temperature 22°C Relative Humidity 38% Atmospheric Pressure 1020mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Equipment Setting

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

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes ☐ N/A

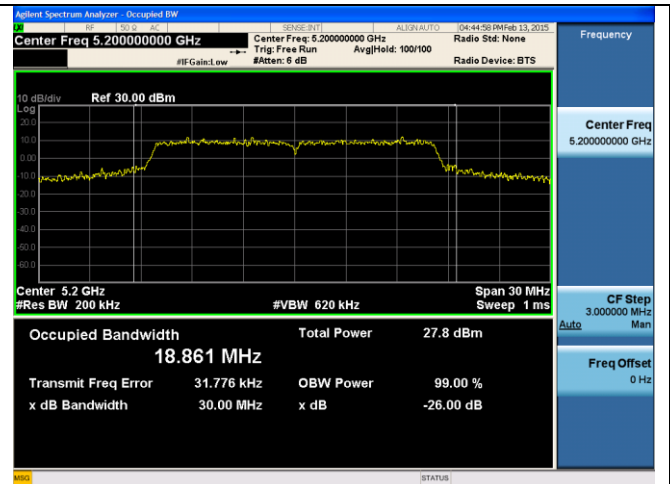
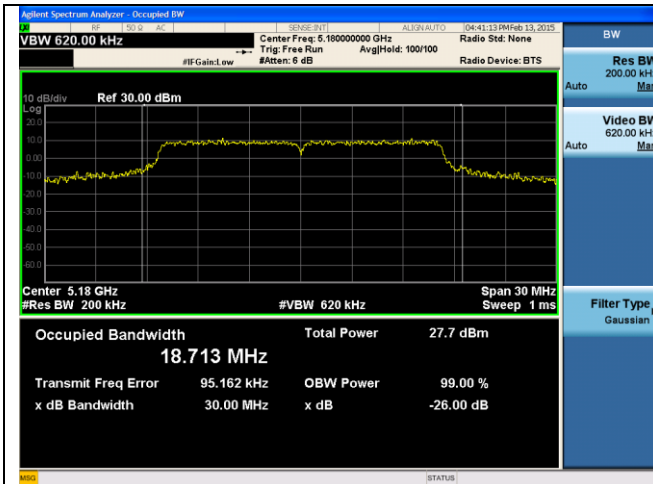
26dB&99% Bandwidth measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
26dB BW	802.11a	5180	Low	30.00	-
26dB BW	802.11a	5200	Mid	30.00	-
26dB BW	802.11a	5240	High	29.82	-
26dB BW	802.11n-20	5180	Low	30.00	-
26dB BW	802.11n-20	5200	Mid	30.00	-
26dB BW	802.11n-20	5240	High	29.63	-
26dB BW	802.11n-40	5190	Low	60.00	-
26dB BW	802.11n-40	5230	High	58.64	-
26dB BW	802.11ac-80	5210	Mid	120.00	-
99% BW	802.11a	5180	Low	18.71	-
99% BW	802.11a	5200	Mid	18.86	-
99% BW	802.11a	5240	High	16.96	-
99% BW	802.11n-20	5180	Low	19.60	-
99% BW	802.11n-20	5200	Mid	19.24	-
99% BW	802.11n-20	5240	High	18.00	-
99% BW	802.11n-40	5190	Low	37.20	-
99% BW	802.11n-40	5230	High	36.50	-
99% BW	802.11ac-80	5210	Mid	76.79	-

6dB Bandwidth measurement result for 5.8GHz

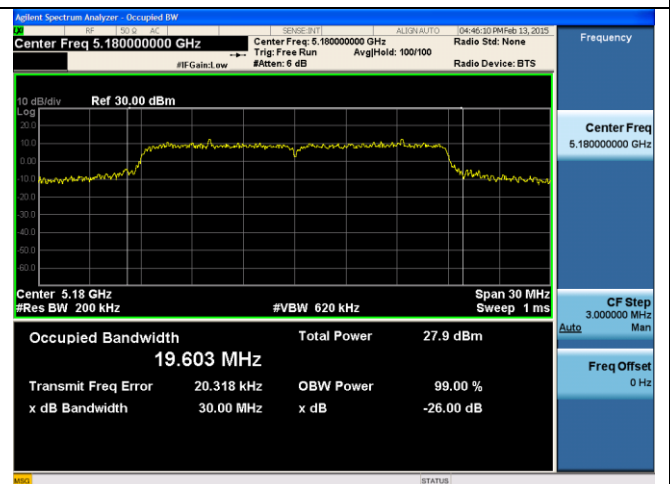
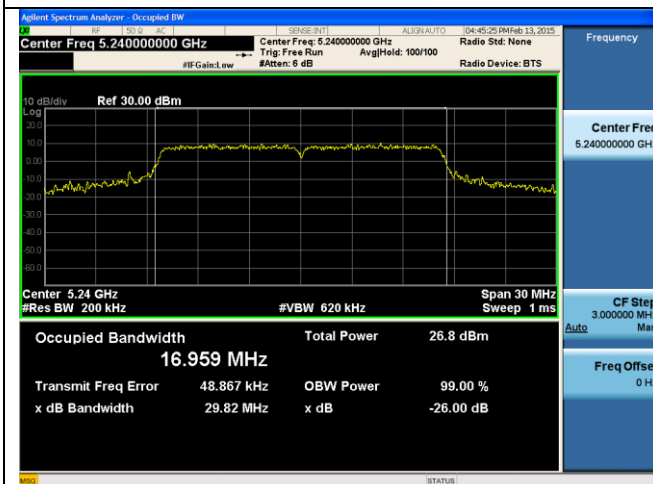
Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.40	≥0.5	Pass
6dB BW	802.11a	5785	Mid	16.38	≥0.5	Pass
6dB BW	802.11a	5825	High	16.54	≥0.5	Pass
6dB BW	802.11n-20	5745	Low	17.80	≥0.5	Pass
6dB BW	802.11n-20	5785	Mid	17.59	≥0.5	Pass
6dB BW	802.11n-20	5825	High	17.58	≥0.5	Pass
6dB BW	802.11n-40	5755	Low	36.46	≥0.5	Pass
6dB BW	802.11n-40	5795	High	36.51	≥0.5	Pass
6dB BW	802.11ac-80	5775	Mid	76.37	≥0.5	Pass

26dB Bandwidth Test Plots



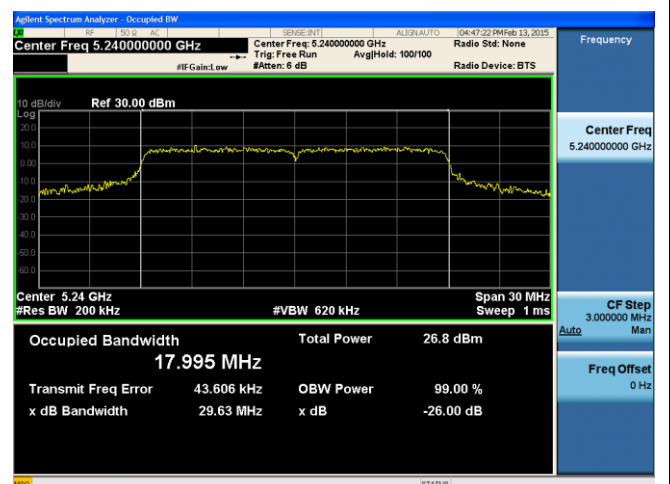
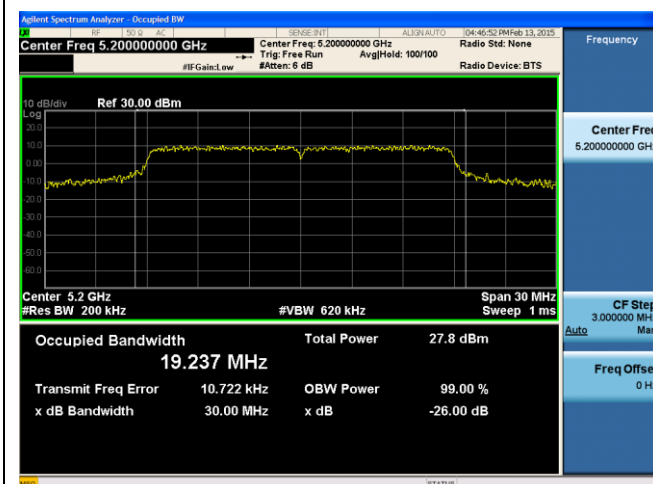
26dB BW - 802.11a 5180MHz

26dB BW - 802.11a 5200MHz



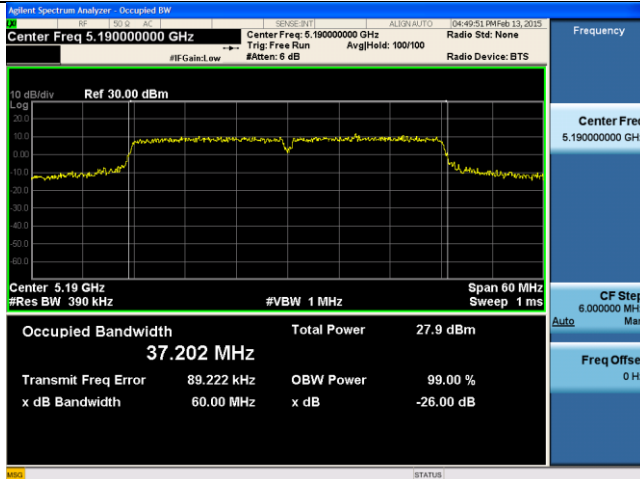
26dB BW - 802.11a 5240MHz

26dB BW - 802.11n-20M 5180MHz

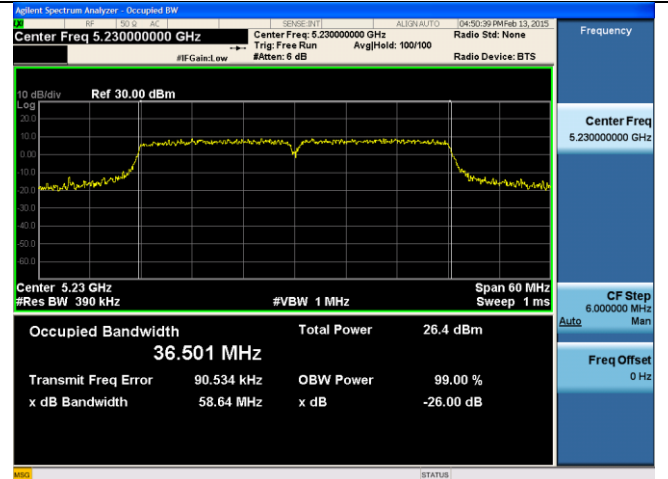


26dB BW - 802.11n-20M 5200MHz

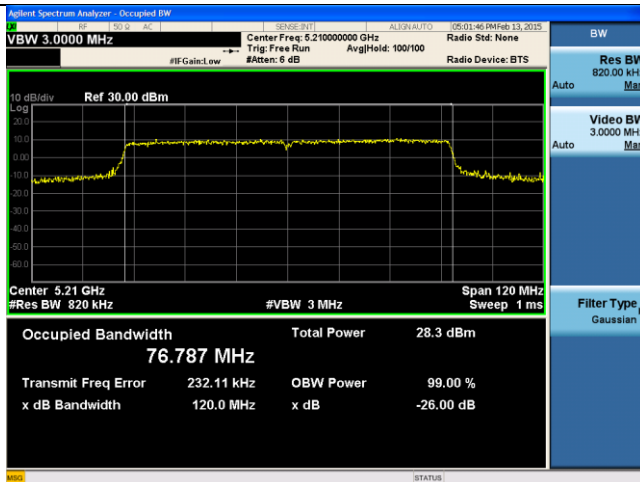
26dB BW - 802.11n-20M 5240MHz



26dB BW - 802.11n-40M 5190MHz

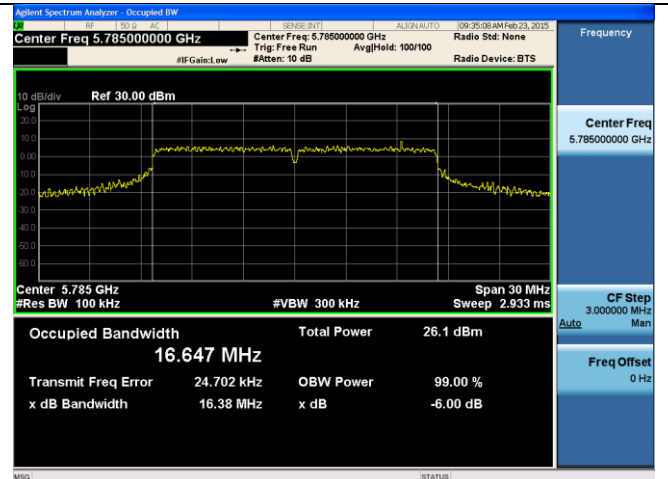
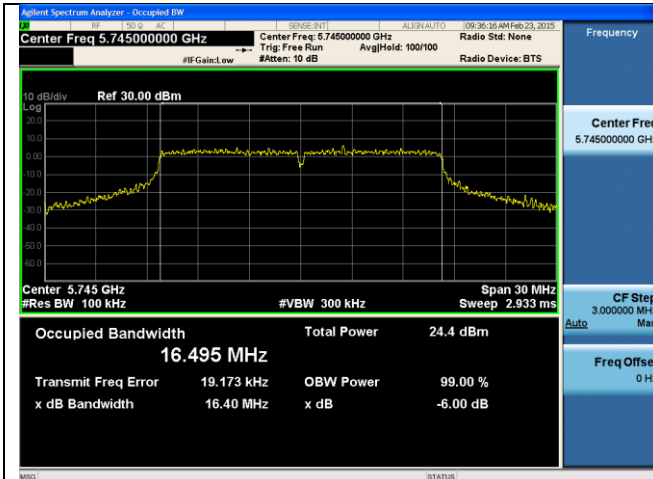


26dB BW - 802.11n-40M 5230MHz



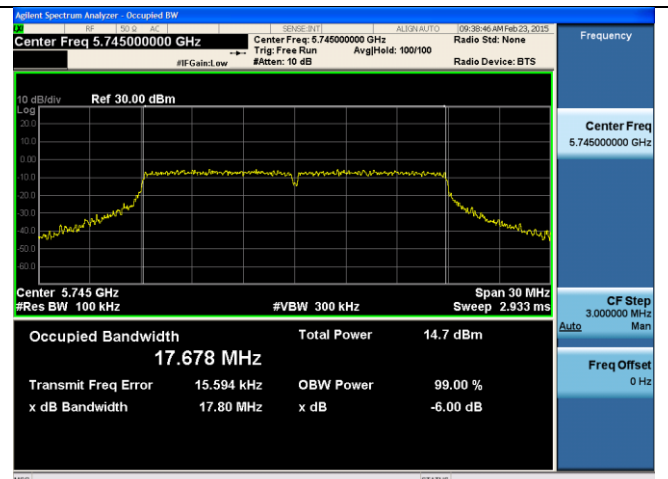
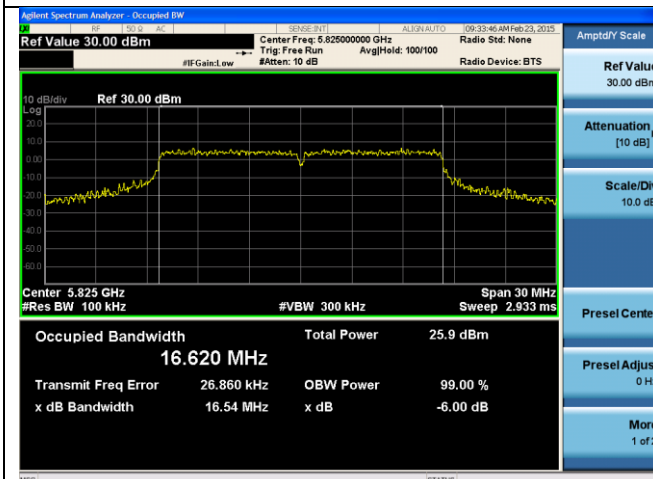
26dB BW - 802.11ac-80M 5210MHz

6dB Bandwidth Test Plots



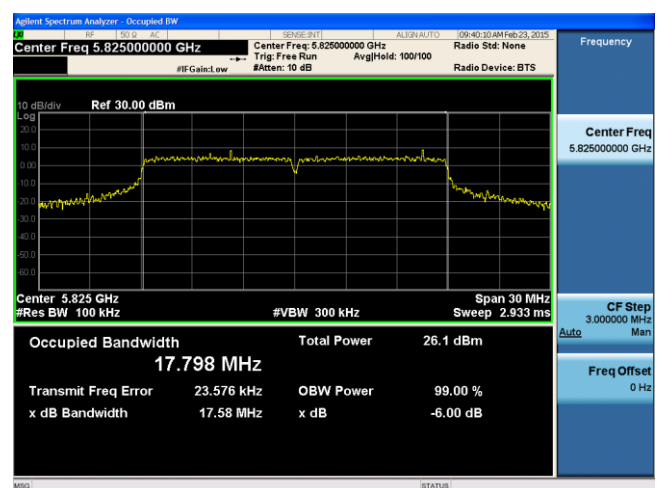
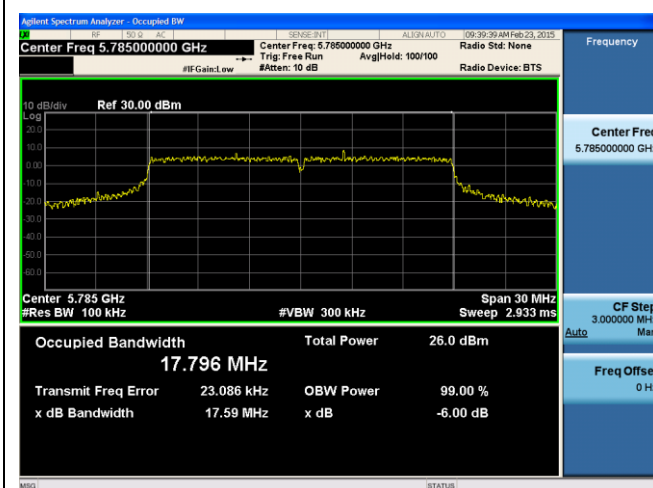
6dB BW 802.11a 5745MHz

6dB BW 802.11a 5785MHz



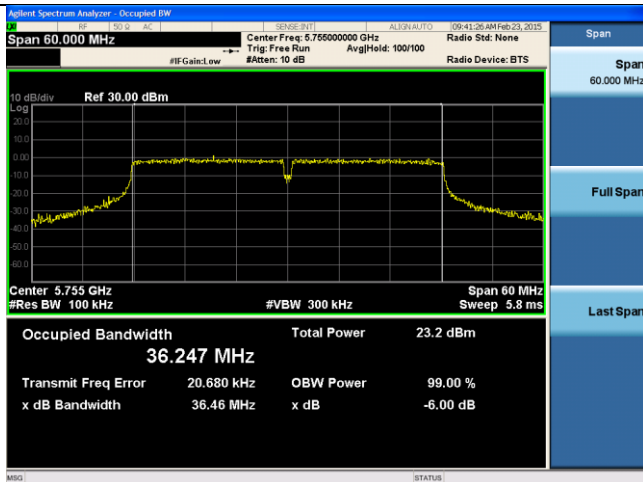
6dB BW 802.11a 5825MHz

6dB BW 802.11n-20M 5745MHz

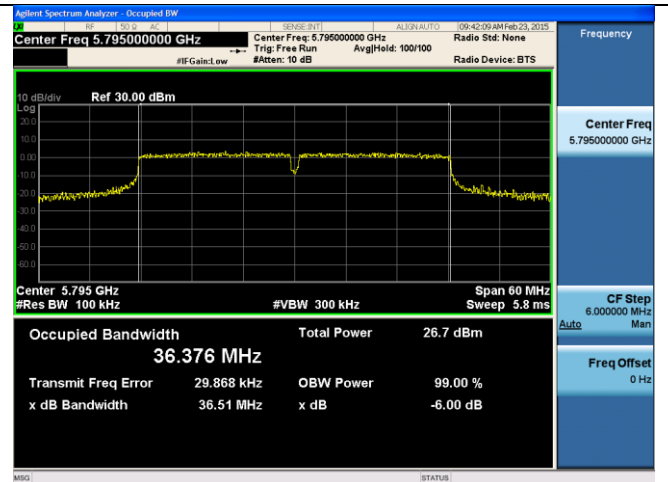


6dB BW 802.11n-20M 5785MHz

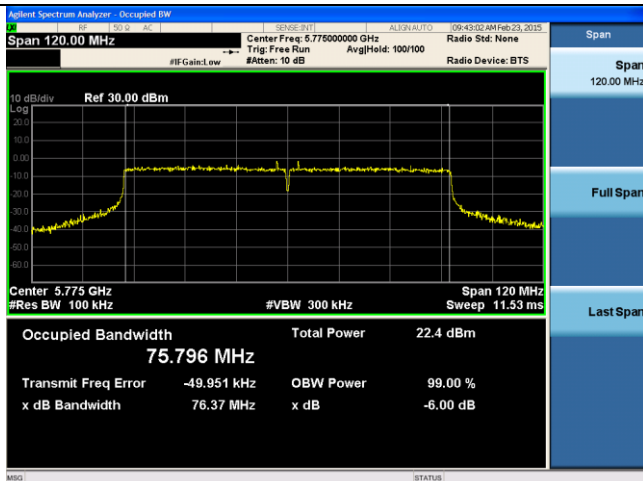
6dB BW 802.11n-20M 5825MHz



6dB BW 802.11n-40M 5755MHz



6dB BW 802.11n-40M 5795MHz



6dB BW 802.11ac-80M 5775MHz

10.3 Peak Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	☐
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.	☒
	a)(1)(iii)	For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.	☐
	a)(1)(iv)	For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.	☐
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.	☐
	a)(3)	For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 <u>Measurement using a Power Meter (PM)</u> Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required. - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result - Repeat above steps for different test channel and other modulation type.		
Test Date	02/13/2015	Environmental condition	Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Output Power measurement result for 5.2GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain1	Chain2	Combined Power		
Output power	802.11a	5180	Low	20.93	20.35	23.66	30	Pass
Output power	802.11a	5200	Mid	21.80	21.35	24.59	30	Pass
Output power	802.11a	5240	High	20.92	21.02	23.98	30	Pass
Output power	802.11n-20M	5180	Low	20.84	20.19	23.54	30	Pass
Output power	802.11n-20M	5200	Mid	21.76	21.48	24.63	30	Pass
Output power	802.11n-20M	5240	High	20.86	20.91	23.90	30	Pass
Output power	802.11n-40M	5190	Low	18.65	18.02	21.36	30	Pass
Output power	802.11n-40M	5230	Mid	20.34	20.31	23.34	30	Pass
Output power	802.11ac-	5210	High	16.43	16.13	19.29	30	Pass

Output Power Measurement Results for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain1	Chain2	Combined Power		
Output	802.11a	5745	Low	18.65	19.05	21.86	30	Pass
Output	802.11a	5785	Mid	19.46	19.78	22.63	30	Pass
Output	802.11a	5825	High	19.64	19.99	22.83	30	Pass
Output	802.11n-20M	5745	Low	18.71	19.00	21.87	30	Pass
Output	802.11n-20M	5785	Mid	19.39	19.82	22.62	30	Pass
Output	802.11n-20M	5825	High	19.66	19.93	22.81	30	Pass
Output	802.11n-40M	5755	Low	17.56	17.94	20.76	30	Pass
Output	802.11n-40M	5795	Mid	20.44	20.77	23.62	30	Pass
Output	802.11ac-80M	5775	High	14.76	15.13	17.96	30	Pass

10.4 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☐
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☒
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.	☐
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1 <u>Maximum spectral density measurement procedure</u> - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW ≥ 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.		
Test Date	02/13/2015	Environmental condition	Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Equipment Setting

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

Test Data ☒ Yes ☐ N/A

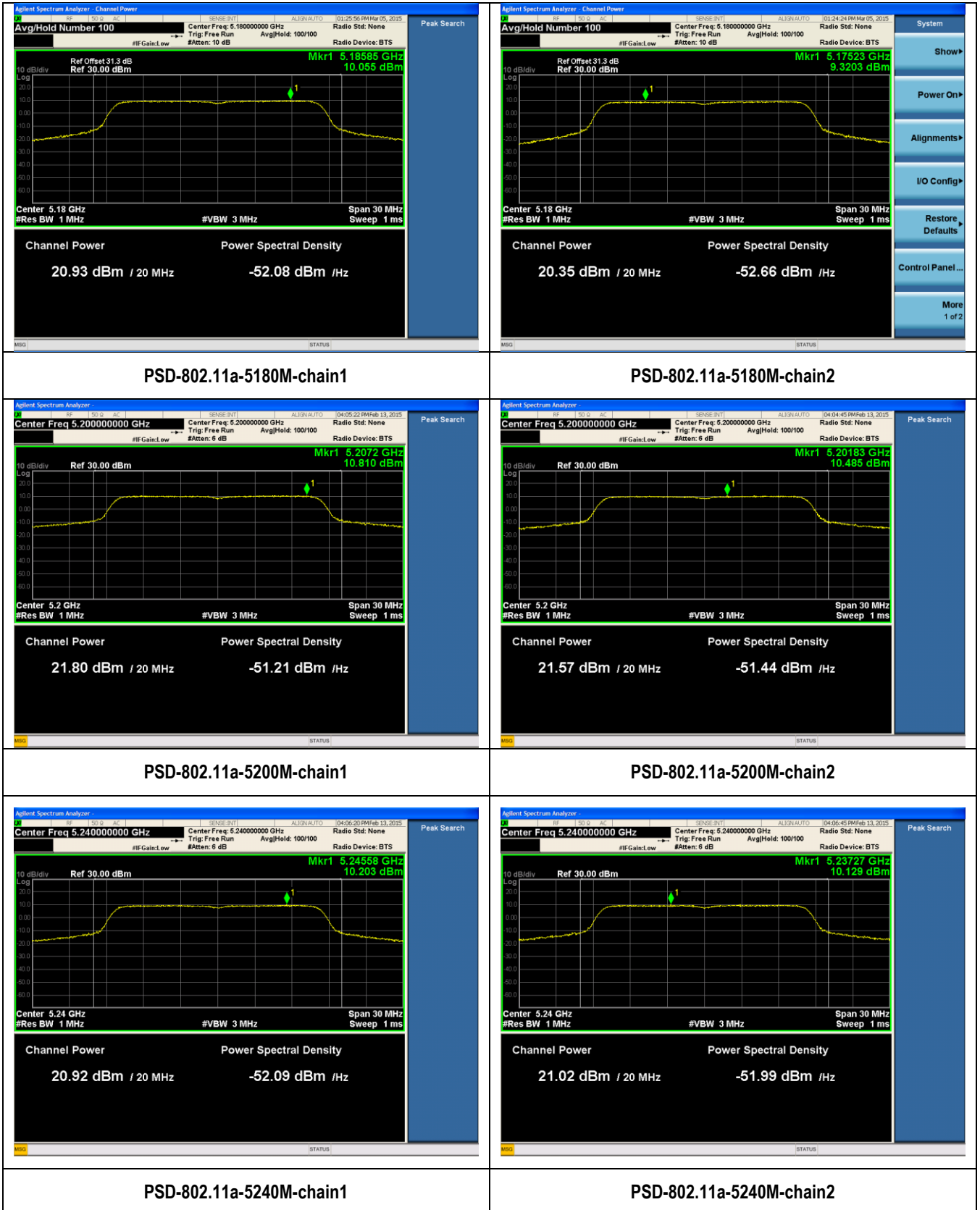
Test Plot ☒ Yes (See below) ☐ N/A

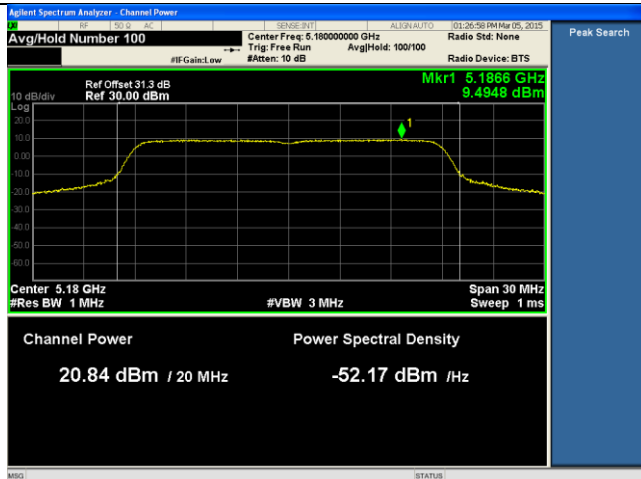
PSD measurement result

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm/MHz)	Result
				Chain1	Chain2	Combined PSD		
PSD	802.11a	5180	Low	10.055	9.320	12.713	17	Pass
PSD	802.11a	5200	Mid	10.810	10.485	13.661	17	Pass
PSD	802.11a	5240	High	10.203	10.129	13.176	17	Pass
PSD	802.11n-20	5180	Low	9.495	8.830	12.186	17	Pass
PSD	802.11n-20	5200	Mid	10.361	10.142	13.263	17	Pass
PSD	802.11n-20	5240	High	9.591	9.418	12.516	17	Pass
PSD	802.11n-40	5190	Low	4.408	3.941	7.192	17	Pass
PSD	802.11n-40	5230	High	5.958	6.116	9.048	17	Pass
PSD	802.11ac-80	5210	Mid	-1.064	-1.043	1.957	17	Pass

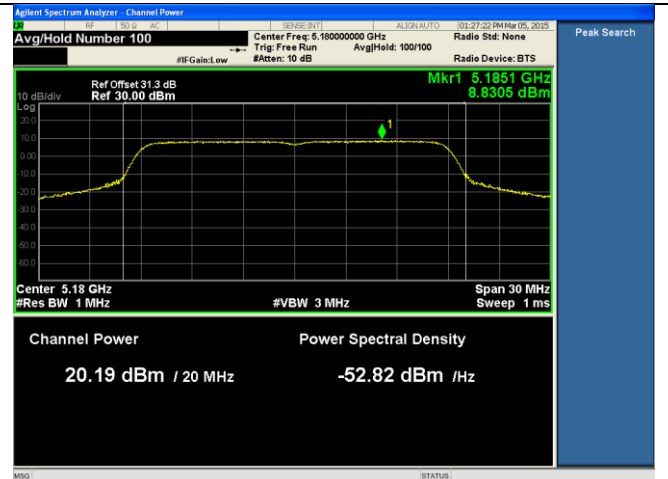
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Combined PSD	Limit (dBm/500KHz)	Result
				Chain1	Chain2	correction factor (dB)			
PSD	802.11a	5745	Low	3.962	4.571	6.99	14.277	30	Pass
PSD	802.11a	5785	Mid	4.939	6.238	6.99	15.637	30	Pass
PSD	802.11a	5825	High	5.057	5.584	6.99	15.329	30	Pass
PSD	802.11n-20	5745	Low	4.516	5.424	6.99	14.994	30	Pass
PSD	802.11n-20	5785	Mid	4.086	4.841	6.99	14.480	30	Pass
PSD	802.11n-20	5825	High	6.902	8.089	6.99	17.536	30	Pass
PSD	802.11n-40	5755	Low	0.700	-0.129	6.99	10.306	30	Pass
PSD	802.11n-40	5795	High	2.750	3.457	6.99	13.118	30	Pass
PSD	802.11ac-80	5775	Mid	-8.021	-5.229	6.99	3.596	30	Pass

Test Plots

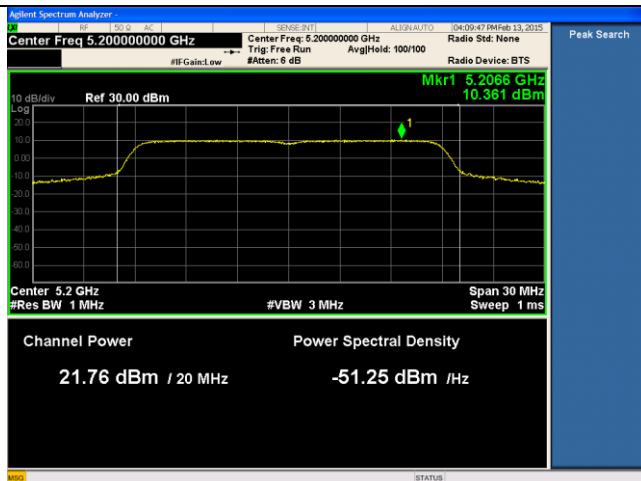




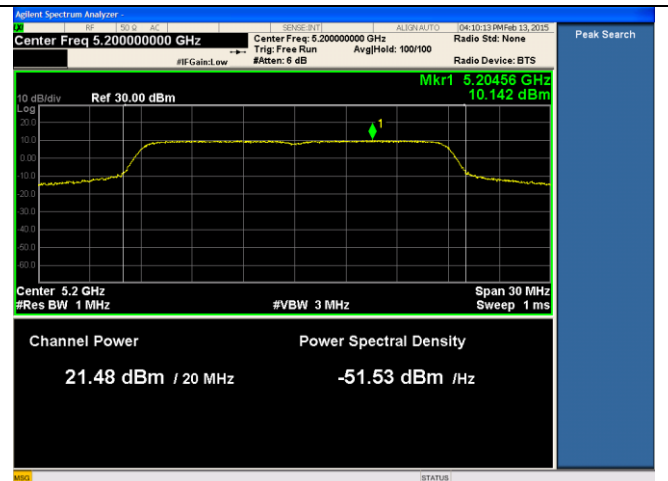
PSD-802.11n HT20-5180M-chain1



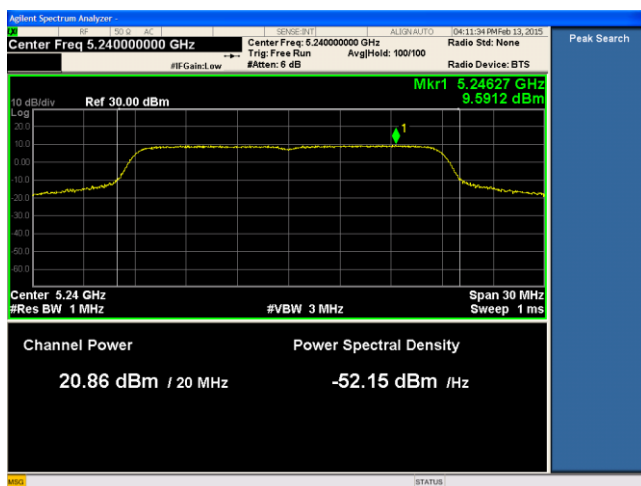
PSD-802.11n HT20-5180M-chain2



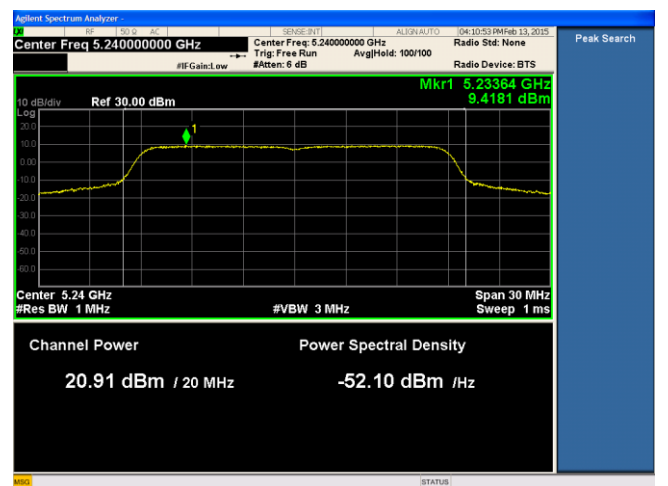
PSD-802.11n HT20-5200M-chain1



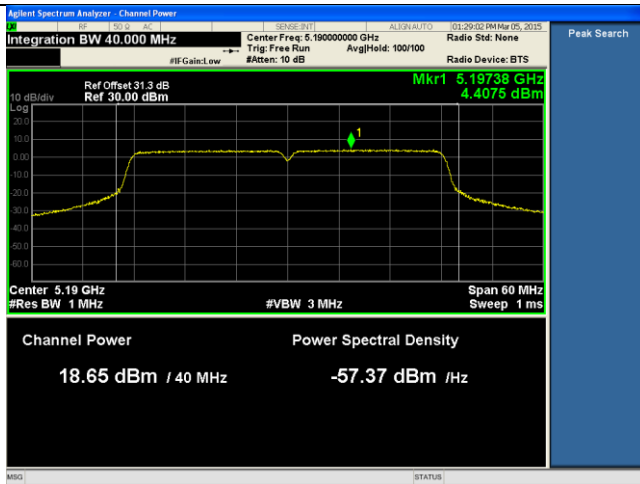
PSD-802.11n HT20-5200M-chain2



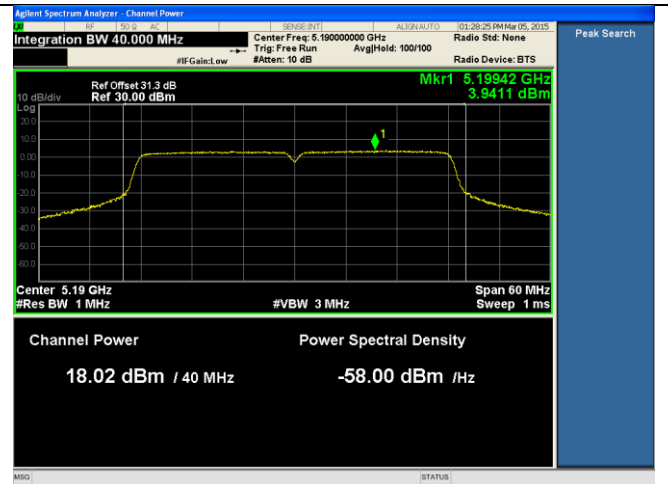
PSD-802.11n HT20-5240M-chain1



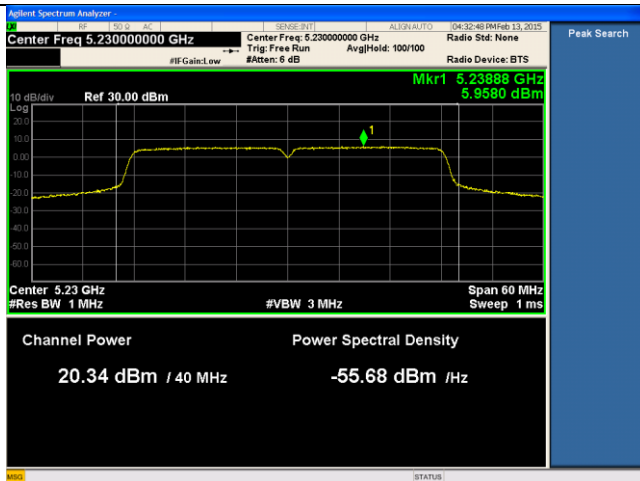
PSD-802.11n HT20-5240M-chain2



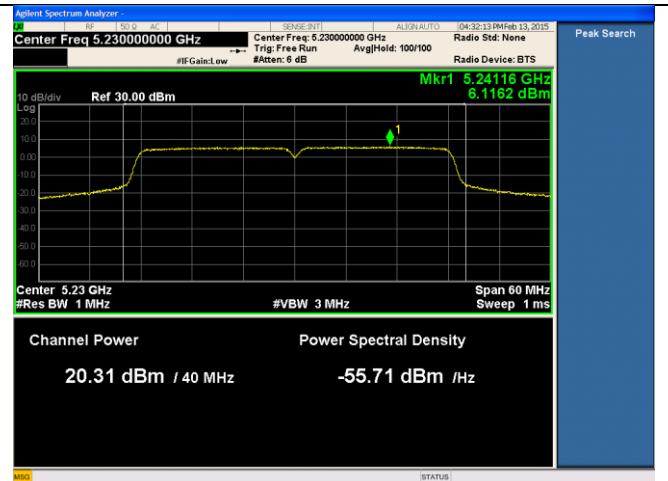
PSD-802.11n HT40-5190M-chain1



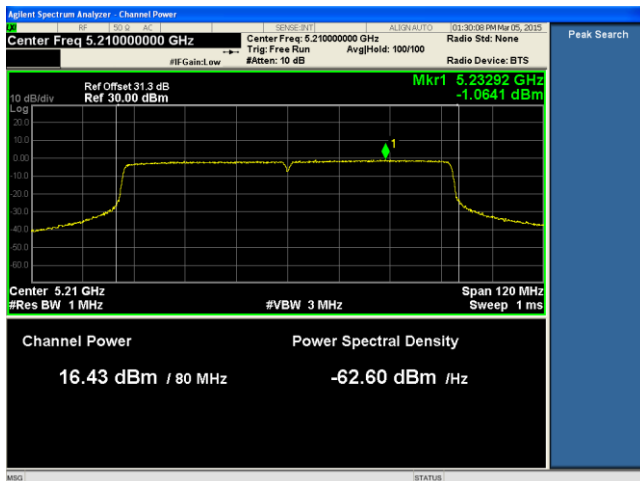
PSD-802.11n HT40-5190M-chain2



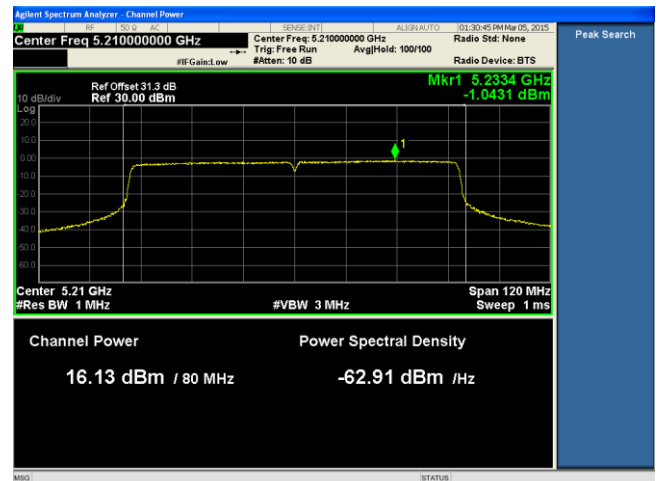
PSD-802.11n HT40-5230M-chain1



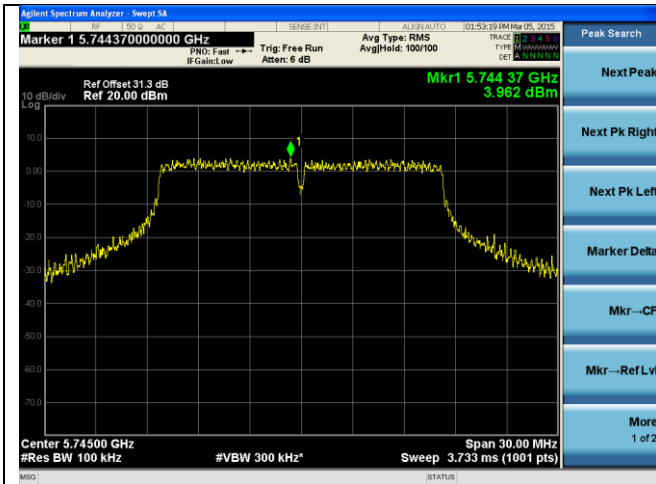
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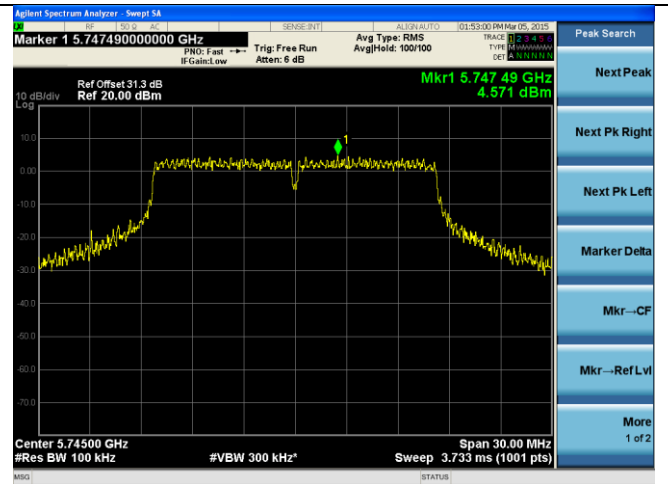
PSD-802.11ac-5210M-chain1



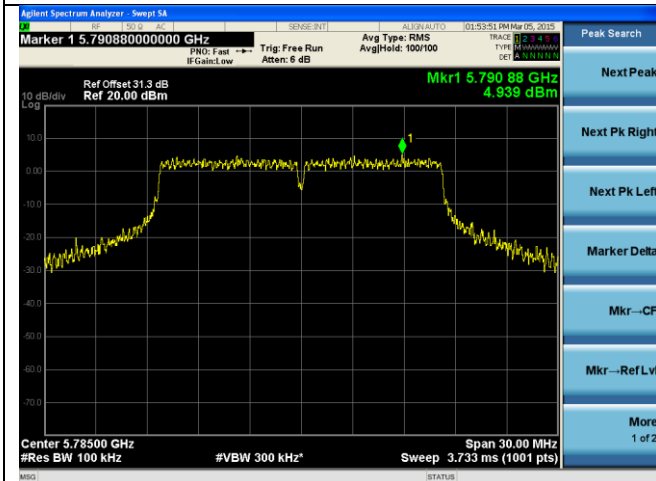
PSD-802.11ac-5210M-chain2



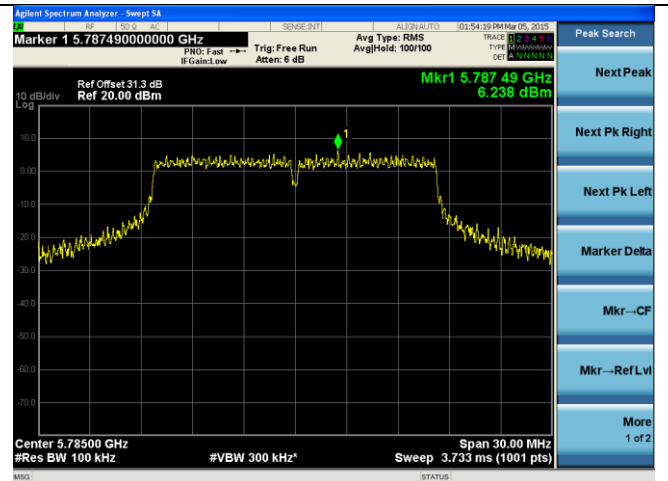
PSD-802.11a-5745M-chain1



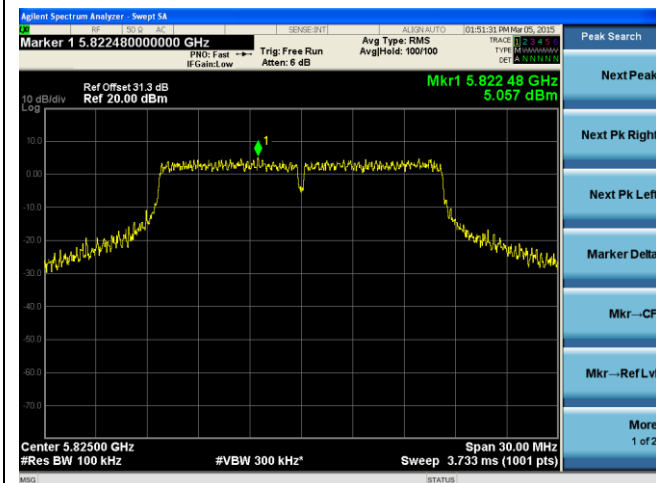
PSD-802.11a-5745M-chain2



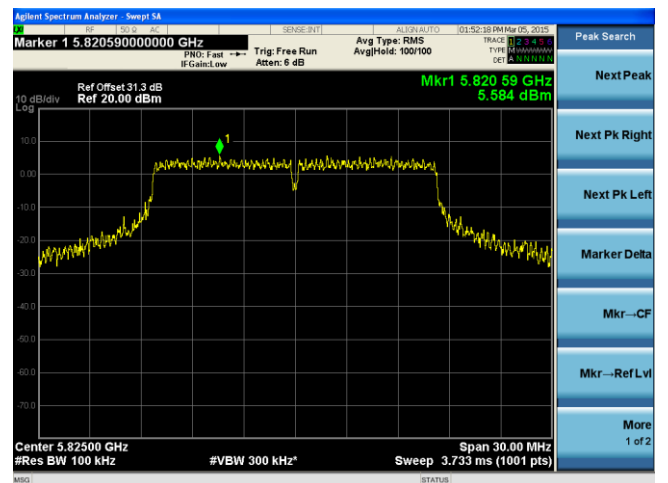
PSD-802.11a-5785M-chain1



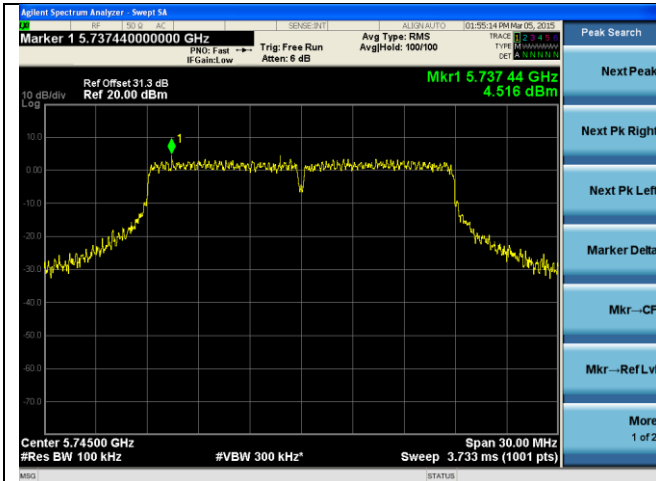
PSD-802.11a -5785M-chain2



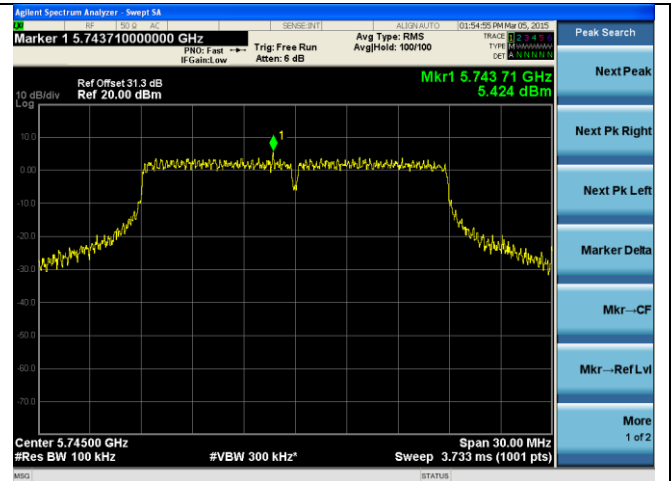
PSD-802.11a-5825M-chain1



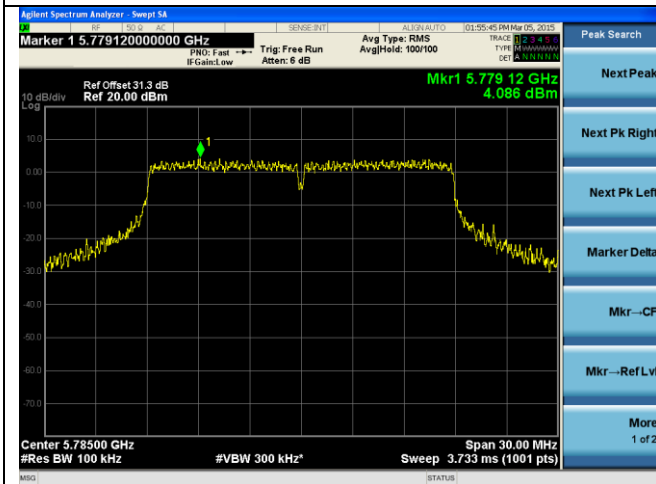
PSD-802.11a -5825M-chain2



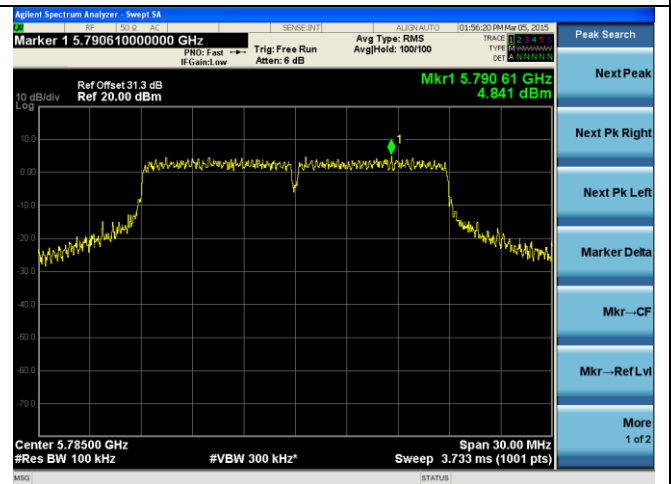
PSD-802.11n HT20-5745M-chain1



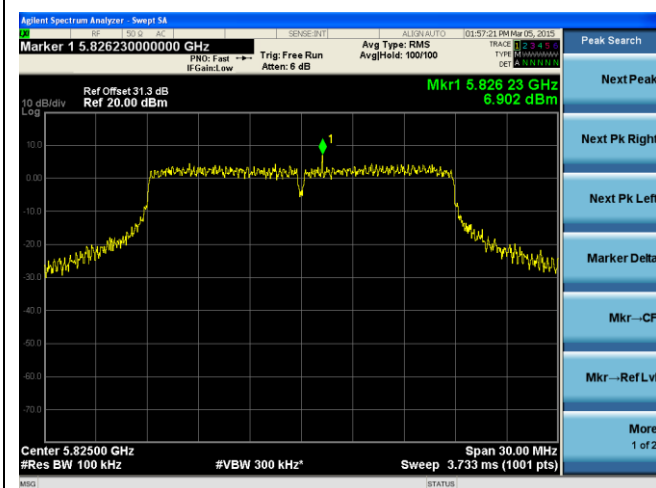
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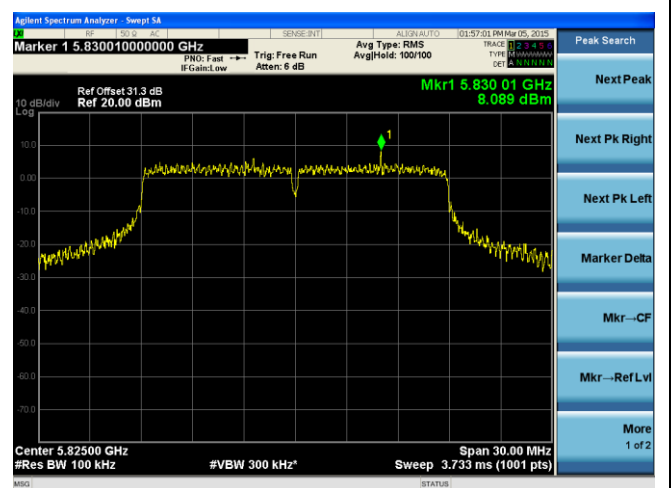
PSD-802.11n HT20-5785M-chain1



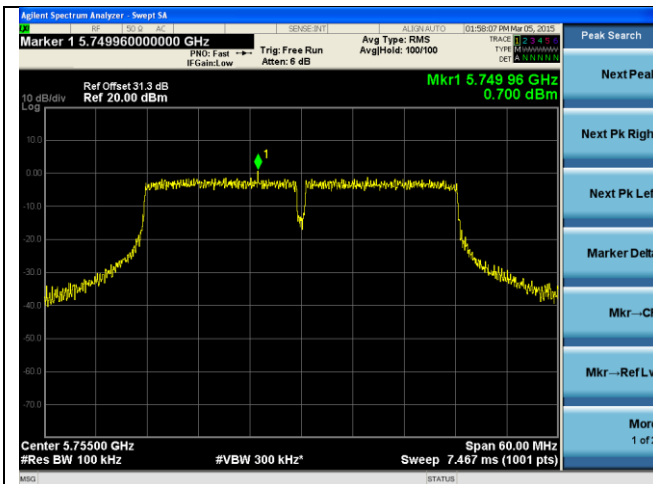
PSD-802.11n HT20-5785M-chain2



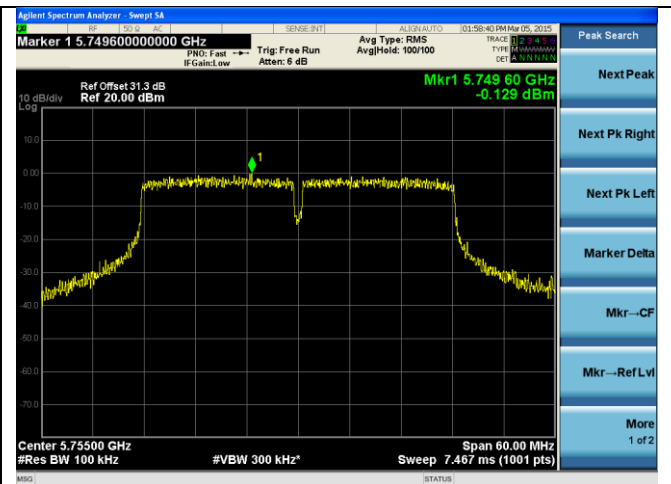
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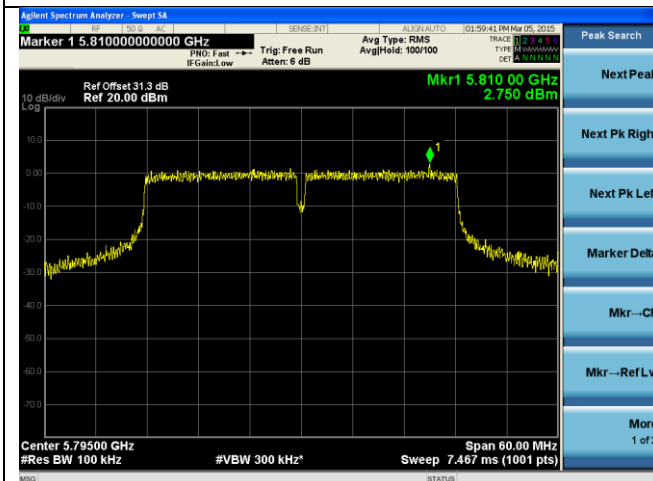
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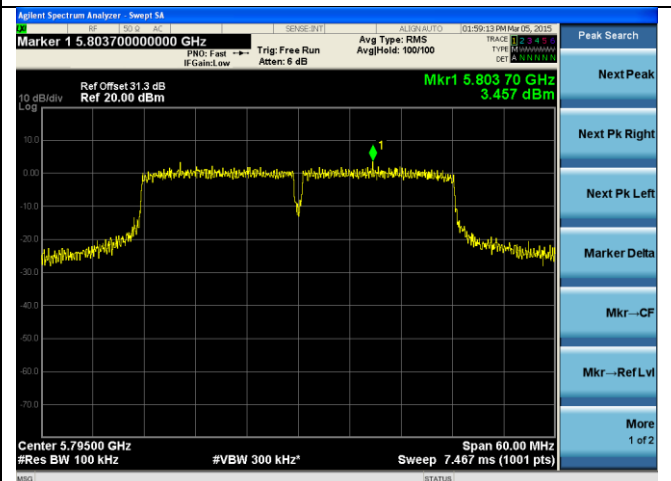
PSD-802.11n HT40-5755M-chain1



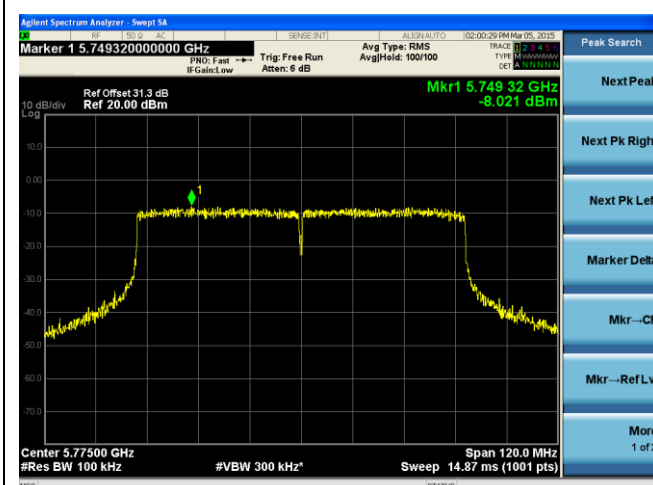
PSD-802.11n HT40-5755M-chain2



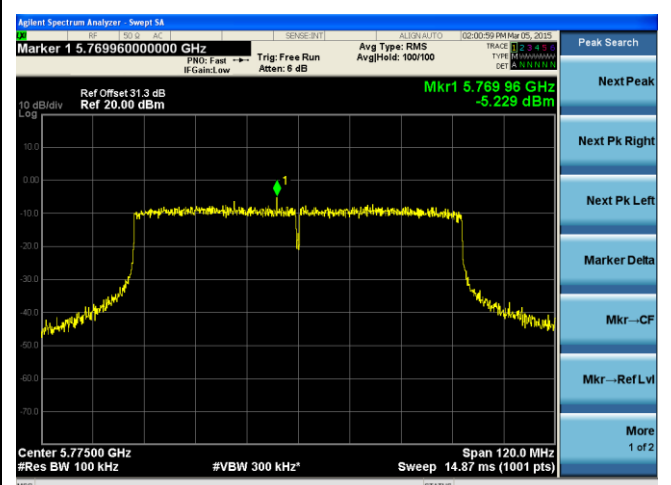
PSD-802.11n HT40-5795M-chain1



PSD-802.11n HT40-5795M-chain2



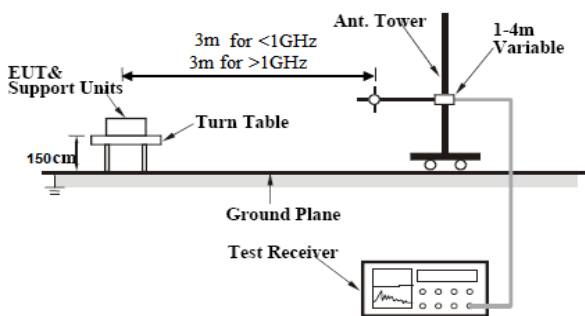
PSD-802.11ac-5775M-chain1



PSD-802.11ac-5775M-chain2

10.5 Radiated Emissions below 1GHz

Requirement(s):

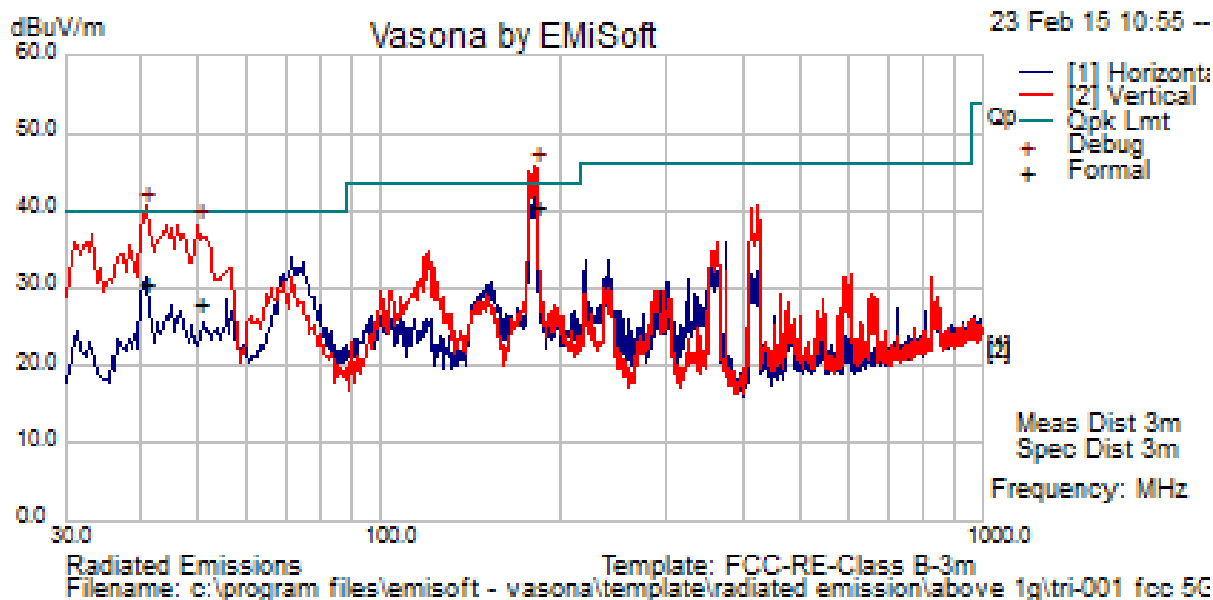
Spec	Requirement	Applicable										
47CFR§ 15.407(b) 15.209 (a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall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

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Emission			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	40		
	Atmospheric(mbar):	1019		
Mains Power:	120VAC, 60Hz			
Tested by:	Teody Manansala			
Test Date:	2/23/2015			
Remarks:	802.11ac-80MHz: EUT Tx continuously at 5210MHz			



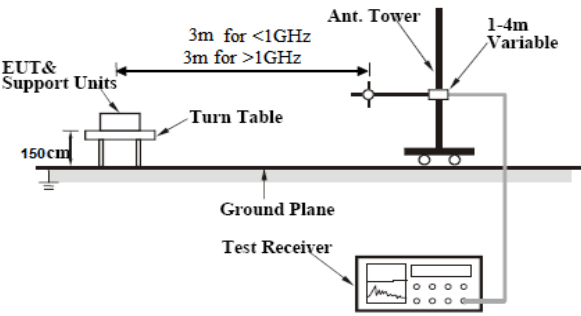
30MHz – 1000MHz at 3 meters

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
181.50	67.00	2.41	-28.88	40.52	Quasi Max	V	113.00	215.00	43.50	-2.98	Pass
40.87	55.85	1.16	-26.48	30.53	Quasi Max	V	139.00	201.00	40.00	-9.47	Pass
49.97	57.05	1.16	-30.36	27.85	Quasi Max	V	197.00	119.00	40.00	-12.15	Pass

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

10.6 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§ 15.407(b)(2), 15.407(b)(6)	(1)	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☐
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☐
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☒
	(5)	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - An average measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	☒ Pass ☐ Fail		

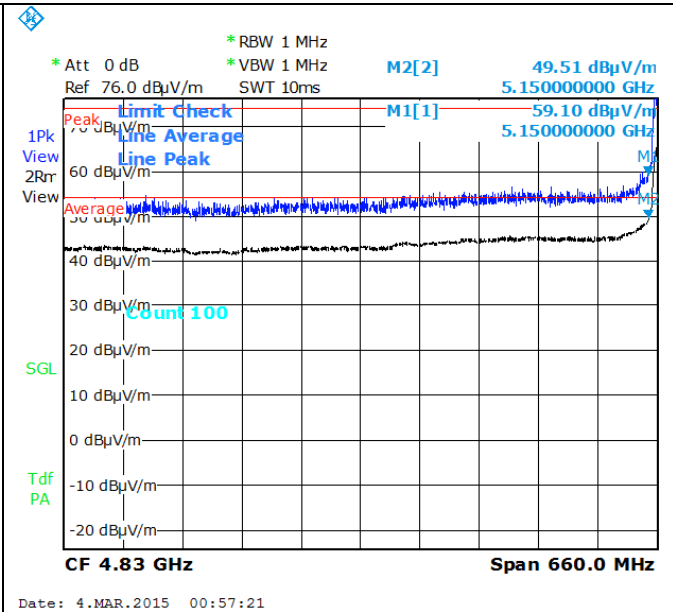
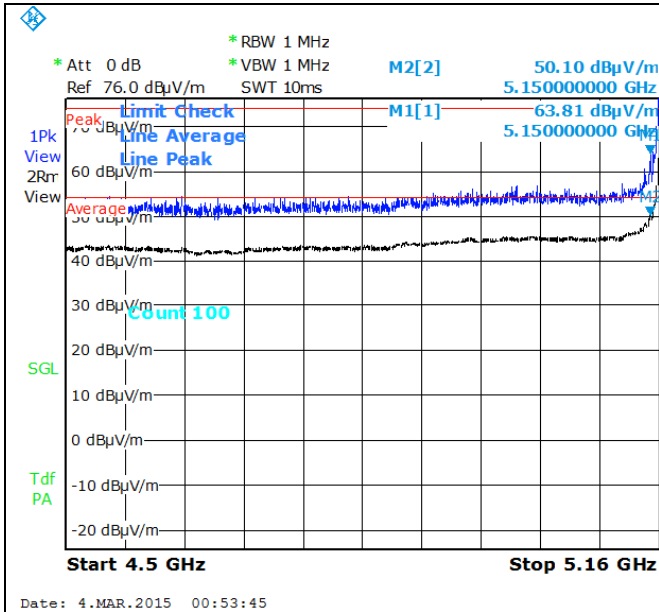
Equipment Setting

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

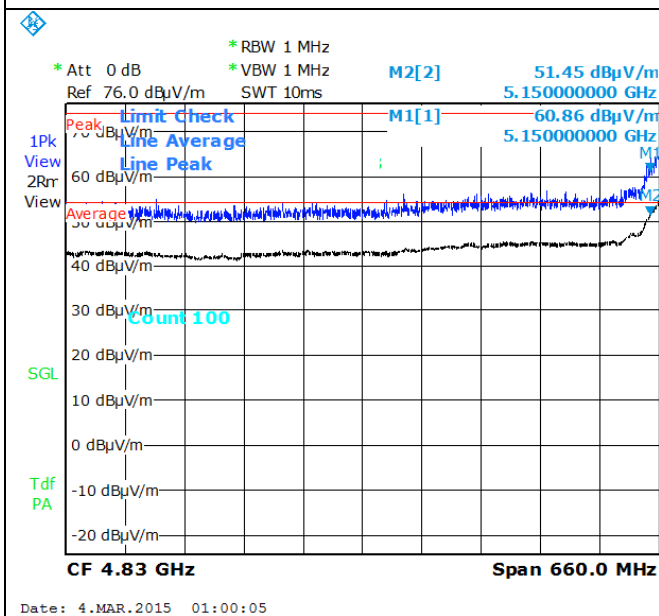
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

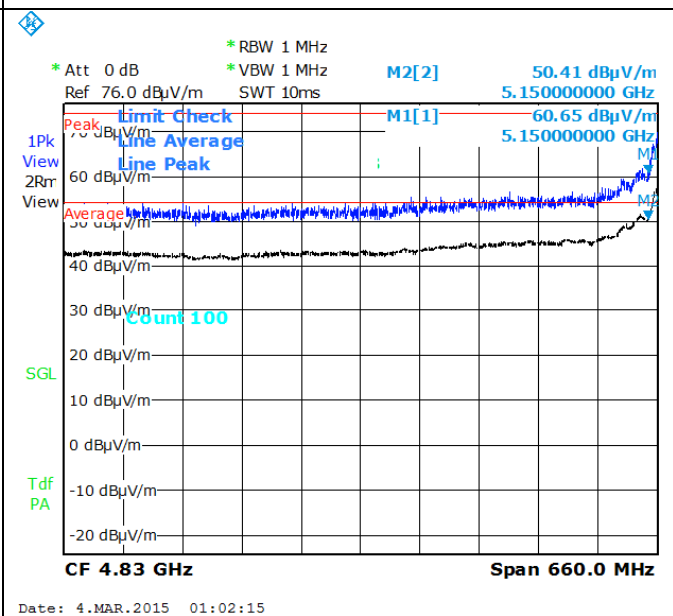
Restricted Band Measurement Plots:



Restriced Band(4500-5150MHz)-802.11a-5180M



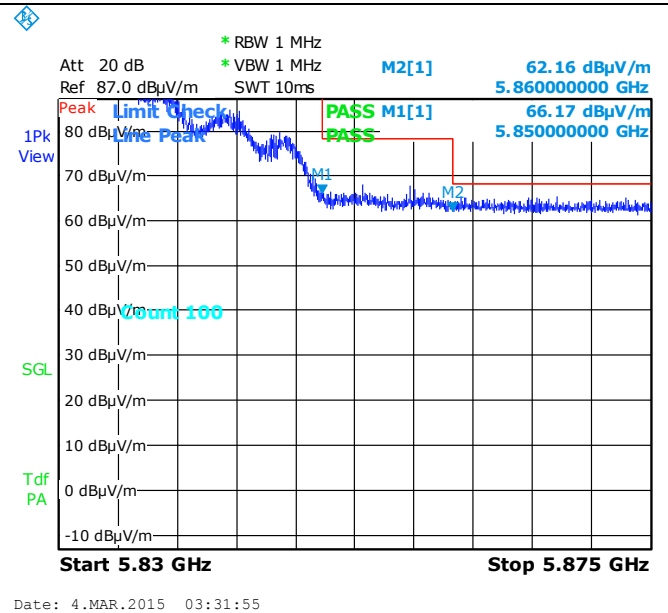
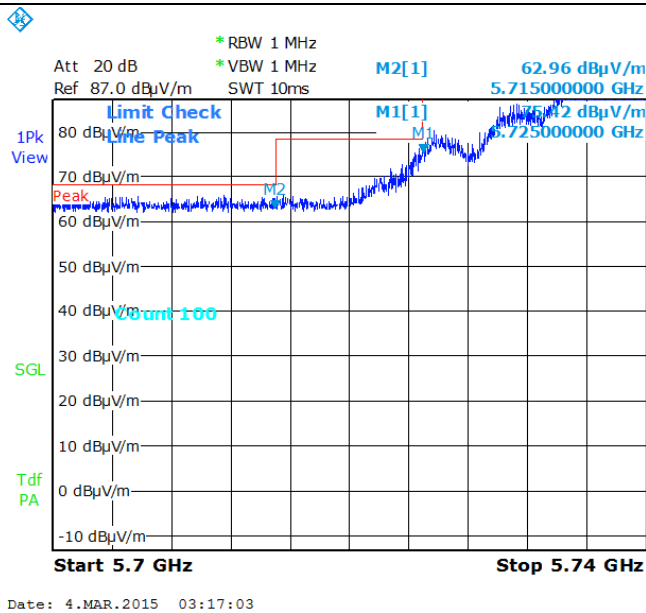
Restriced Band(4500-5150MHz)-802.11n-HT20-5180M



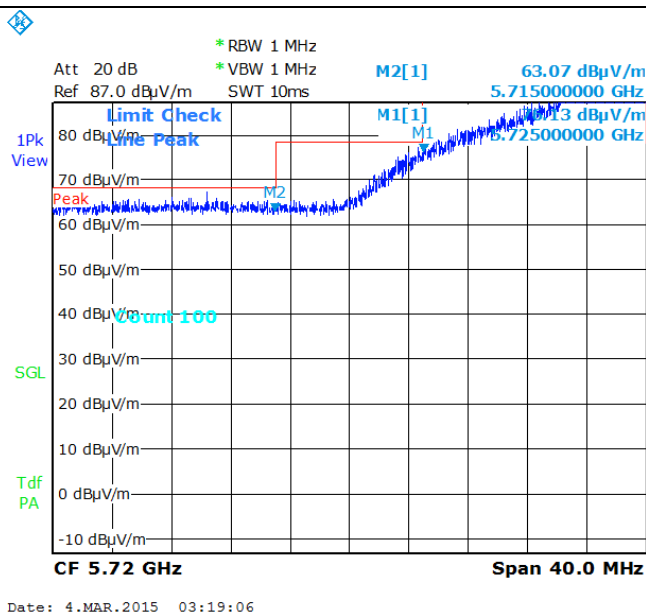
Restriced Band(4500-5150MHz)-802.11n-HT40-5190M

Restriced Band(4500-5150MHz)-802.11ac-5210M

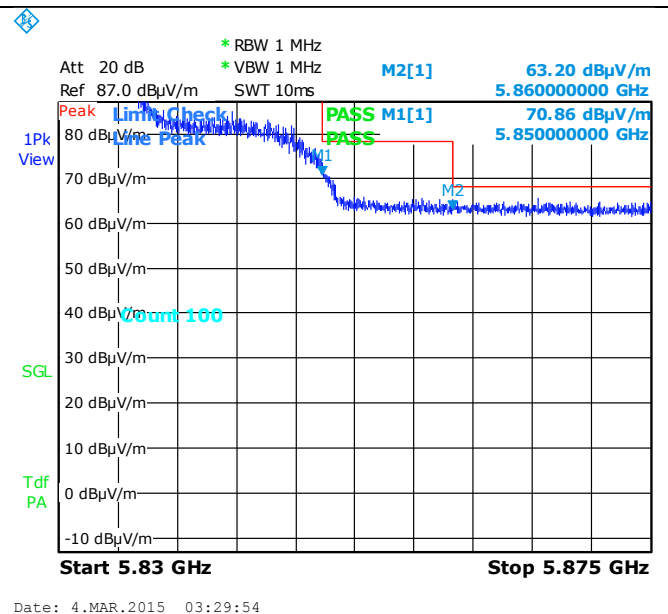
Radiated Band Edge Measurement Plots:



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

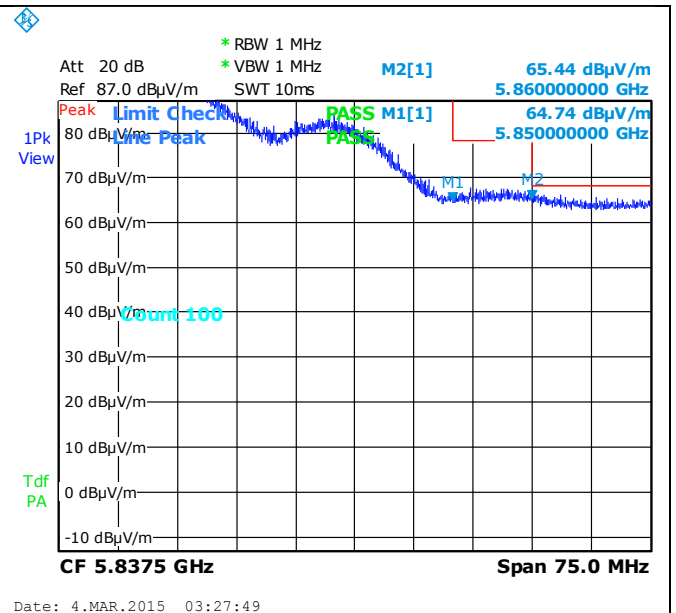
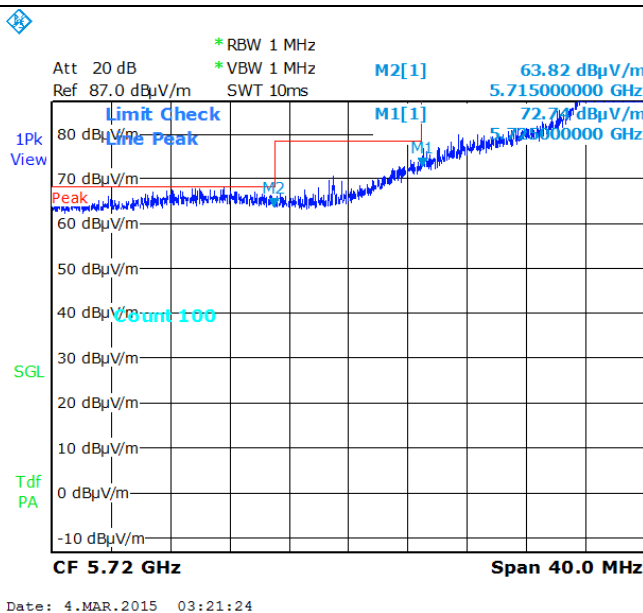


Radiated Band Edge-802.11a 5825M- Edge Freq 5850MHz



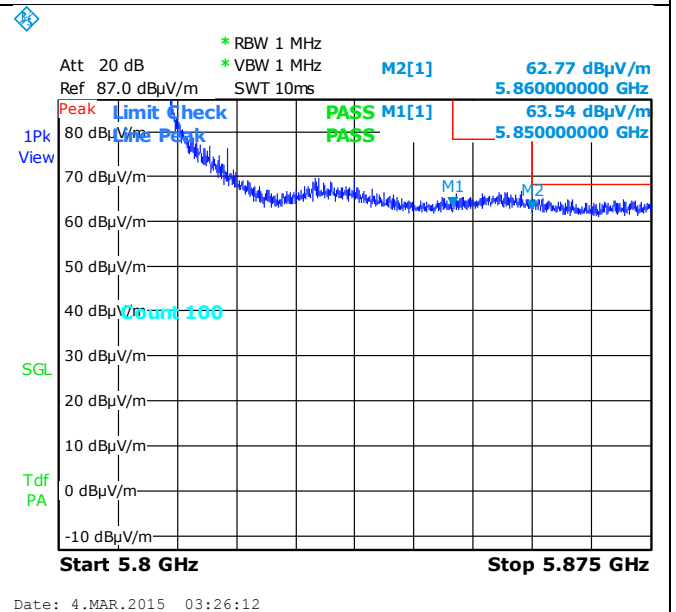
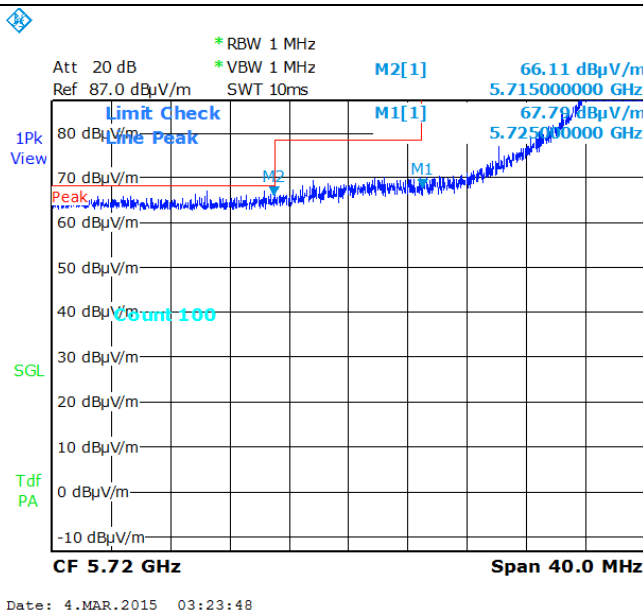
Radiated Band Edge-802.11n20 5745M- Edge Freq 5725MHz

Radiated Band Edge-802.11n20 5825M- Edge Freq 5850MHz



Radiated Band Edge-802.11n40 5755M- Edge Freq 5725MHz

Radiated Band Edge-802.11n40 5795M- Edge Freq 5850MHz



Restricted Band-802.11ac 5775M- Edge Freq 5725MHz

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

Radiated Emission Test Results (Above 1GHz)

802.11a – 5180MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
6894.06	45.10	8.27	8.28	61.66	Peak Max	H	100.00	40.00	74.00	-12.34	Pass
10367.49	44.63	10.97	8.60	64.20	Peak Max	V	157.00	78.00	74.00	-9.80	Pass
14594.14	43.05	13.27	8.17	64.48	Peak Max	V	127.00	264.00	74.00	-9.52	Pass
6894.06	31.78	8.27	8.28	48.34	Average Max	H	100.00	40.00	54.00	-5.66	Pass
10367.49	31.03	10.97	8.60	50.61	Average Max	V	157.00	78.00	54.00	-3.39	Pass
14594.14	29.74	13.27	8.17	51.17	Average Max	V	127.00	264.00	54.00	-2.83	Pass

802.11a – 5200MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
6927.23	45.24	8.27	8.15	61.66	Peak Max	H	152.00	155.00	74.00	-12.34	Pass
10403.64	43.67	10.96	8.58	63.21	Peak Max	H	106.00	143.00	74.00	-10.79	Pass
14082.94	43.10	12.76	7.53	63.39	Peak Max	H	215.00	193.00	74.00	-10.61	Pass
6927.23	31.39	8.27	8.15	47.81	Average Max	H	152.00	155.00	54.00	-6.19	Pass
10403.64	29.99	10.96	8.58	49.52	Average Max	H	106.00	143.00	54.00	-4.48	Pass
14082.94	29.99	12.76	7.53	50.28	Average Max	H	215.00	193.00	54.00	-3.72	Pass

802.11a – 5240MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
6997.10	47.75	8.25	7.88	63.88	Peak Max	V	205.00	242.00	74.00	-10.12	Pass
10472.73	43.02	10.93	8.54	62.49	Peak Max	V	165.00	80.00	74.00	-11.51	Pass
17931.48	40.60	13.00	10.84	64.44	Peak Max	H	264.00	38.00	74.00	-9.56	Pass
6997.10	33.87	8.25	7.88	50.00	Average Max	V	205.00	242.00	54.00	-4.00	Pass
10472.73	29.34	10.93	8.54	48.81	Average Max	V	165.00	80.00	54.00	-5.19	Pass
17931.48	27.09	13.00	10.84	50.93	Average Max	H	264.00	38.00	54.00	-3.07	Pass

802.11n-HT20 – 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
6893.16	45.23	8.27	8.29	61.79	Peak Max	H	238.00	206.00	74.00	-12.21	Pass
10366.78	45.17	10.97	8.60	64.75	Peak Max	V	123.00	95.00	74.00	-9.25	Pass
14625.39	43.47	13.32	8.08	64.88	Peak Max	H	217.00	273.00	74.00	-9.12	Pass
6893.16	31.60	8.27	8.29	48.17	Average Max	H	238.00	206.00	54.00	-5.83	Pass
10366.78	31.56	10.97	8.60	51.14	Average Max	V	123.00	95.00	54.00	-2.86	Pass
14625.39	29.65	13.32	8.08	51.06	Average Max	H	217.00	273.00	54.00	-2.94	Pass

802.11n-HT20 – 5200MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
6928.08	44.57	8.27	8.15	60.99	Peak Max	H	297.00	260.00	74.00	-13.01	Pass
10401.30	46.61	10.96	8.58	66.15	Peak Max	H	112.00	132.00	74.00	-7.85	Pass
1986.19	44.33	3.31	11.37	59.01	Peak Max	V	298.00	214.00	74.00	-14.99	Pass
6928.08	31.56	8.27	8.15	47.98	Average Max	H	297.00	260.00	54.00	-6.02	Pass
10401.30	32.11	10.96	8.58	51.65	Average Max	H	112.00	132.00	54.00	-2.35	Pass
1986.19	30.96	3.31	11.37	45.65	Average Max	V	298.00	214.00	54.00	-8.35	Pass

802.11-HT20 – 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
6997.41	46.80	8.25	7.88	62.93	Peak Max	V	172.00	69.00	74.00	-11.07	Pass
1986.51	43.78	3.32	11.37	58.47	Peak Max	V	260.00	32.00	74.00	-15.53	Pass
10504.20	41.36	10.92	8.52	60.80	Peak Max	V	206.00	255.00	74.00	-13.20	Pass
6997.41	33.97	8.25	7.88	50.10	Average Max	V	172.00	69.00	54.00	-3.90	Pass
1986.51	30.65	3.32	11.37	45.34	Average Max	V	260.00	32.00	54.00	-8.66	Pass
10504.20	28.15	10.92	8.52	47.59	Average Max	V	206.00	255.00	54.00	-6.41	Pass

802.11n-HT40 – 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
6926.51	44.43	8.27	8.16	60.85	Peak Max	H	186.00	298.00	74.00	-13.15	Pass
2091.88	43.78	3.69	11.19	58.65	Peak Max	H	234.00	315.00	74.00	-15.35	Pass
10378.55	42.49	10.97	8.60	62.05	Peak Max	V	176.00	75.00	74.00	-11.95	Pass
6926.51	31.12	8.27	8.16	47.54	Average Max	H	186.00	298.00	54.00	-6.46	Pass
2091.88	30.47	3.69	11.19	45.34	Average Max	H	234.00	315.00	54.00	-8.66	Pass
10378.55	29.12	10.97	8.60	48.68	Average Max	V	176.00	75.00	54.00	-5.32	Pass

802.11n-HT40 – 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
10458.18	44.51	10.94	8.55	63.99	Peak Max	V	120.00	88.00	74.00	-10.01	Pass
1985.98	43.38	3.31	11.37	58.06	Peak Max	H	256.00	196.00	74.00	-15.94	Pass
6313.87	44.76	7.83	10.32	62.91	Peak Max	H	261.00	30.00	74.00	-11.09	Pass
10458.18	30.59	10.94	8.55	50.08	Average Max	V	120.00	88.00	54.00	-3.92	Pass
1985.98	29.86	3.31	11.37	44.55	Average Max	H	256.00	196.00	54.00	-9.45	Pass
6313.87	31.52	7.83	10.32	49.66	Average Max	H	261.00	30.00	54.00	-4.34	Pass

802.11ac – 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
6929.41	44.29	8.27	8.14	60.71	Peak Max	H	102.00	94.00	74.00	-13.29	Pass
2091.23	43.92	3.68	11.19	58.79	Peak Max	H	206.00	241.00	74.00	-15.21	Pass
10420.04	41.85	10.95	8.57	61.38	Peak Max	V	172.00	105.00	74.00	-12.62	Pass
6929.41	30.94	8.27	8.14	47.35	Average Max	H	102.00	94.00	54.00	-6.65	Pass
2091.23	30.15	3.68	11.19	45.03	Average Max	H	206.00	241.00	54.00	-8.97	Pass
10420.04	28.54	10.95	8.57	48.06	Average Max	V	172.00	105.00	54.00	-5.94	Pass

802.11a – 5745MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
6176.77	45.24	7.42	10.64	63.30	Peak Max	H	105.00	348.00	74.00	-10.70	Pass
1001.13	46.02	2.44	9.68	58.14	Peak Max	H	202.00	221.00	74.00	-15.86	Pass
4033.21	40.85	5.86	12.08	58.79	Peak Max	H	278.00	175.00	74.00	-15.21	Pass
6176.77	32.17	7.42	10.64	50.23	Average Max	H	105.00	348.00	54.00	-3.77	Pass
1001.13	32.93	2.44	9.68	45.04	Average Max	H	202.00	221.00	54.00	-8.96	Pass
4033.21	27.39	5.86	12.08	45.33	Average Max	H	278.00	175.00	54.00	-8.67	Pass

802.11a – 5785MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1001.25	46.41	2.44	9.68	58.53	Peak Max	V	269.00	103.00	74.00	-15.47	Pass
4132.96	40.46	5.94	11.64	58.04	Peak Max	H	220.00	167.00	74.00	-15.96	Pass
6179.13	45.90	7.43	10.64	63.96	Peak Max	H	105.00	207.00	74.00	-10.04	Pass
1001.25	32.83	2.44	9.68	44.95	Average Max	V	269.00	103.00	54.00	-9.05	Pass
4132.96	27.08	5.94	11.64	44.67	Average Max	H	220.00	167.00	54.00	-9.33	Pass
6179.13	32.10	7.43	10.64	50.17	Average Max	H	105.00	207.00	54.00	-3.83	Pass

802.11a – 5825MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
2055.12	43.66	3.55	11.30	58.51	Peak Max	V	171.00	300.00	74.00	-15.49	Pass
6176.61	45.24	7.42	10.64	63.30	Peak Max	V	292.00	179.00	74.00	-10.70	Pass
4098.51	41.15	5.91	11.79	58.86	Peak Max	V	100.00	164.00	74.00	-15.14	Pass
2055.12	30.63	3.55	11.30	45.48	Average Max	V	171.00	300.00	54.00	-8.52	Pass
6176.61	31.85	7.42	10.64	49.91	Average Max	V	292.00	179.00	54.00	-4.09	Pass
4098.51	27.44	5.91	11.79	45.15	Average Max	V	100.00	164.00	54.00	-8.85	Pass

802.11n-HT20 – 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
6179.18	44.84	7.43	10.64	62.90	Peak Max	H	163.00	335.00	74.00	-11.10	Pass
2057.44	43.93	3.55	11.29	58.78	Peak Max	V	227.00	131.00	74.00	-15.22	Pass
14898.68	42.43	13.80	7.36	63.60	Peak Max	H	114.00	277.00	74.00	-10.40	Pass
6179.18	31.71	7.43	10.64	49.77	Average Max	H	163.00	335.00	54.00	-4.23	Pass
2057.44	30.22	3.55	11.29	45.06	Average Max	V	227.00	131.00	54.00	-8.94	Pass
14898.68	29.46	13.80	7.36	50.63	Average Max	H	114.00	277.00	54.00	-3.37	Pass

802.11n-HT20 – 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
2022.67	42.99	3.42	11.40	57.81	Peak Max	V	245.00	316.00	74.00	-16.19	Pass
6248.30	45.68	7.63	10.47	63.79	Peak Max	H	171.00	339.00	74.00	-10.21	Pass
14591.74	42.54	13.26	8.17	63.98	Peak Max	H	290.00	33.00	74.00	-10.02	Pass
2022.67	29.83	3.42	11.40	44.65	Average Max	V	245.00	316.00	54.00	-9.35	Pass
6248.30	31.78	7.63	10.47	49.89	Average Max	H	171.00	339.00	54.00	-4.11	Pass
14591.74	29.45	13.26	8.17	50.89	Average Max	H	290.00	33.00	54.00	-3.11	Pass

802.11-HT20 – 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
1986.71	43.24	3.32	11.37	57.93	Peak Max	V	287.00	131.00	74.00	-16.07	Pass
6348.55	45.31	7.93	10.24	63.48	Peak Max	H	100.00	337.00	74.00	-10.52	Pass
4031.07	40.05	5.86	12.09	58.00	Peak Max	H	268.00	75.00	74.00	-16.00	Pass
1986.71	29.95	3.32	11.37	44.64	Average Max	V	287.00	131.00	54.00	-9.36	Pass
6348.55	31.93	7.93	10.24	50.10	Average Max	H	100.00	337.00	54.00	-3.90	Pass
4031.07	27.03	5.86	12.09	44.97	Average Max	H	268.00	75.00	54.00	-9.03	Pass

802.11n-HT40 – 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
2023.33	43.25	3.42	11.40	58.08	Peak Max	H	259.00	339.00	74.00	-15.92	Pass
11509.84	41.85	12.16	8.01	62.02	Peak Max	H	139.00	304.00	74.00	-11.98	Pass
4066.41	39.71	5.89	11.93	57.53	Peak Max	V	200.00	2.00	74.00	-16.47	Pass
2023.33	29.66	3.42	11.40	44.48	Average Max	H	259.00	339.00	54.00	-9.52	Pass
11509.84	28.81	12.16	8.01	48.97	Average Max	H	139.00	304.00	54.00	-5.03	Pass
4066.41	26.42	5.89	11.93	44.24	Average Max	V	200.00	2.00	54.00	-9.76	Pass

802.11n-HT40 – 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
6177.70	44.42	7.42	10.64	62.48	Peak Max	H	106.00	217.00	74.00	-11.52	Pass
11591.14	41.57	12.17	8.10	61.84	Peak Max	V	123.00	207.00	74.00	-12.16	Pass
4066.20	39.84	5.89	11.94	57.66	Peak Max	H	167.00	254.00	74.00	-16.34	Pass
6177.70	31.70	7.42	10.64	49.76	Average Max	H	106.00	217.00	54.00	-4.24	Pass
11591.14	28.31	12.17	8.10	48.58	Average Max	V	123.00	207.00	54.00	-5.42	Pass
4066.20	26.42	5.89	11.94	44.24	Average Max	H	167.00	254.00	54.00	-9.76	Pass

802.11ac – 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
5805.29	44.86	6.76	10.59	62.21	Peak Max	V	100.00	62.00	74.00	-11.79	Pass
11549.66	41.71	12.17	8.05	61.93	Peak Max	V	272.00	296.00	74.00	-12.07	Pass
2056.89	43.12	3.55	11.30	57.97	Peak Max	V	131.00	122.00	74.00	-16.03	Pass
5805.29	32.58	6.76	10.59	49.94	Average Max	V	100.00	62.00	54.00	-4.06	Pass
11549.66	28.30	12.17	8.05	48.52	Average Max	V	272.00	296.00	54.00	-5.48	Pass
2056.89	30.21	3.55	11.30	45.06	Average Max	V	131.00	122.00	54.00	-8.94	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Cycle	Cal Due	In use
Conducted Emissions					
Spectrum Analyzer	N9010A	MY50210206	1 Year	08/13/2015	☒
Signal Analyzer	FSIQ7	825555/013	1 Year	05/28/2016	☐
V-LISN (150 kHz – 30 MHz)	NNLK 8129	8129-190	1 Year	08/11/2015	☒
LISN (9 kHz – 30 MHz)	MN2050B	1018	1 Year	07/31/2015	☒
TLISN	ISN T800	30814	1 Year	08/08/2015	☐
Hygro Hermograph	ST-50	HE01-000092	1 Year	05/25/2016	☒
Radiated Emissions					
R & S Receiver	ESL6	100178	1 Year	05/27/2016	☒
EMI Test Receiver	ESIB 40	100179	1 Year	05/24/2016	☒
Antenna - Biconlog (30 MHz – 2 GHz)	JB1	A030702	1 Year	08/12/2015	☒
DoubleRidged Waveguide Horn Antenna (1-18 GHz)	3115	10SL0059	1 Year	08/11/2015	☒
Horn Antenna (18-40 GHz)	AH-840	101013	1 Year	08/11/2015	☒
RF Pre-Amplifier	LPA-6-30	11140711	1 Year	02/19/2016	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	1 Year	02/19/2016	☒
10 Meters SAC	10M	N/A	1 Year	09/05/2015	☒
Hygro Hermograph	ST-50	HE01-000092	1 Year	05/25/2016	☒
RF Conducted Measurement					
Spectrum Analyzer	N9010A	MY50210206	1 Year	8/13/2015	☒
Spectrum Analyzer	E4407B	US88441016	1 Year	03/30/2015	☒
R & S Receiver	ESIB 40	100179	1 Year	05/24/2016	☒
Hygro Hermograph	ST-50	HE01-000092	1 Year	05/25/2016	☒

Annex B. SIEMIC Accreditation

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

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