RF TEST REPORT

Report No.: FCC_IC_SL17063001-RUC-018_DTS
Supersede Report No.:

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	T310 (C/D) Access Point
Model No.	:	T310
Test Standard	:	47 CFR 15.247 RSS-247 Issue 2, February 2017
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r05
FCC ID	:	S9GT310
IC ID	:	5912A-T310
Dates of test	:	08/21/2017-10/05/2017
Issue Date	:	10/06/2017
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:	
Cipher	**Chen Ge**
Test Engineer	Engineer Reviewer

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

ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

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

Accreditations for Product Certifications

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

CONTENTS

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_SL17063001-RUC-018_DTS	None	Original	10/06/2017

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: T310 (C/D) Access Point
Model: T310

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	T310 (C/D) Access Point
Model No.	T310
Trade Name	Ruckus
Serial No.	291706000098
Host Model No.	N/A
Input Power	100-240VAC 50/60Hz
Power Adapter Manu/Model	HK-AD-120A100-US
Power Adapter SN	N/A
Date of EUT received	08/20/2017
Equipment Class/ Category	DTS, UNII
Port/Connectors	PoE, Ethernet

6.2 Radio Description

Radio Type	802.11b	802.11g	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	2412-2462MHz	2422-2452MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	5MHz	5MHz
Number of Channels	11	11	11	7
Antenna Type	PCB Antenna			
Antenna Gain (Peak)	2.4G: 2.5dBi for Vertical 1dBi for Horizontal			
Antenna Connector Type	U.FL			
Note	Two PCB antenna's, One dual band horizontal, and One dual band vertical antenna.			

Note: The AP supports Beamforming mode and the power setting for Beamforming and Non-Beamforming modes are the same.

EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	43
802.11-b	2437	44
802.11-b	2462	42
802.11-g	2412	34
802.11-g	2437	42
802.11-g	2462	34
802.11-n-20	2412	33
802.11-n-20	2437	40
802.11-n-20	2462	34
802.11-n-40	2422	32
802.11-n-40	2437	40
802.11-n-40	2452	30

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	VOSTRO 1520	26543939185	Dell	-

7.2 Cabling Description

Item	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
1	EUT	RJ45	Power Over Ethernet Injector	RJ45	>3m	N/A	-
2	Laptop	RJ45	Power Over Ethernet Injector	RJ45	>3m	N/A	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Command prompt	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 v03r05	☒ 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	IC	RSS Gen Issue 4: 2014	

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☒ Pass ☐ N/A
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS247 (5.2.1)	IC		
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS247 (5.4.4)	IC		
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	☐ Pass ☒ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☐ Pass ☒ N/A
	IC	-	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS247 (5.2.2)	IC		
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass ☒ N/A
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	
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**

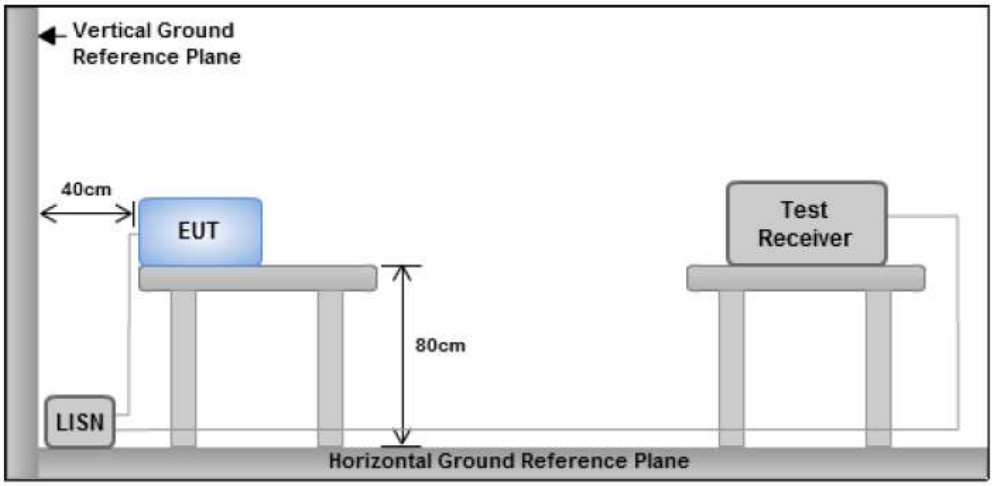
The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, Examination and Derived Results

10.1 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
15.207(a) 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		

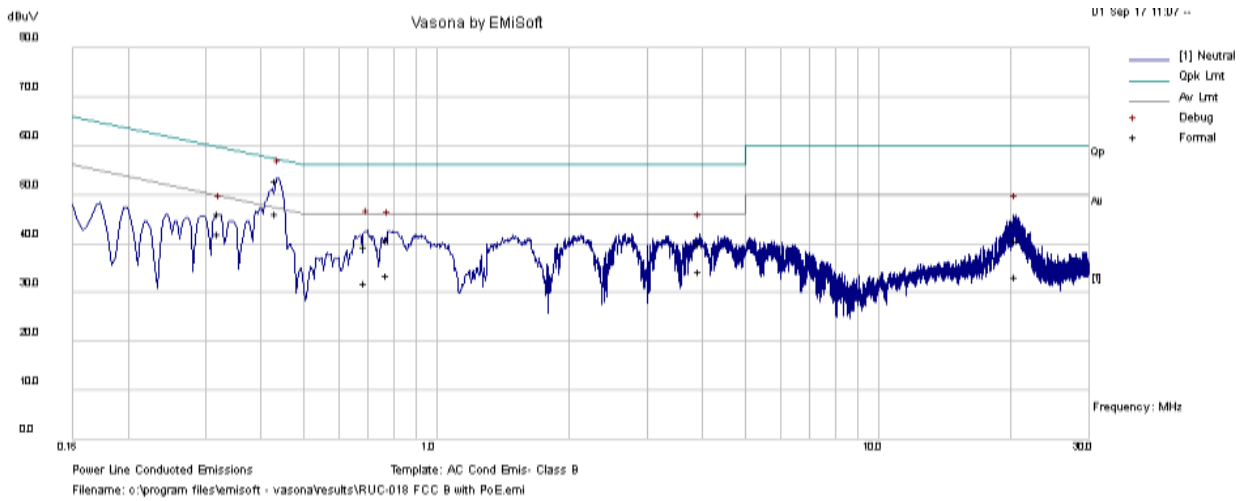
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Kushal Shastri at Conducted Emission test site.

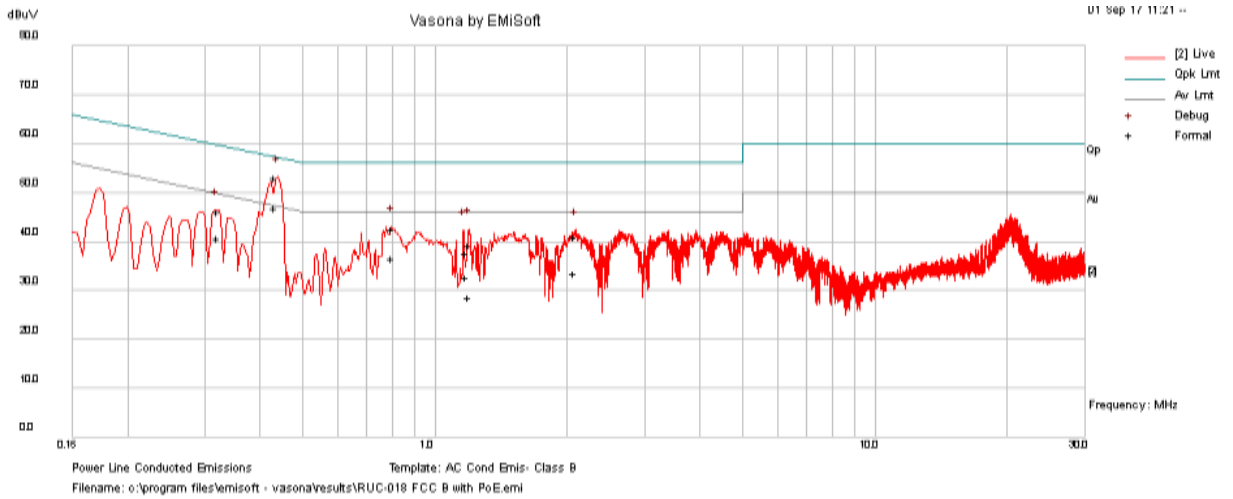
Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Neutral– P.O.E Mode			



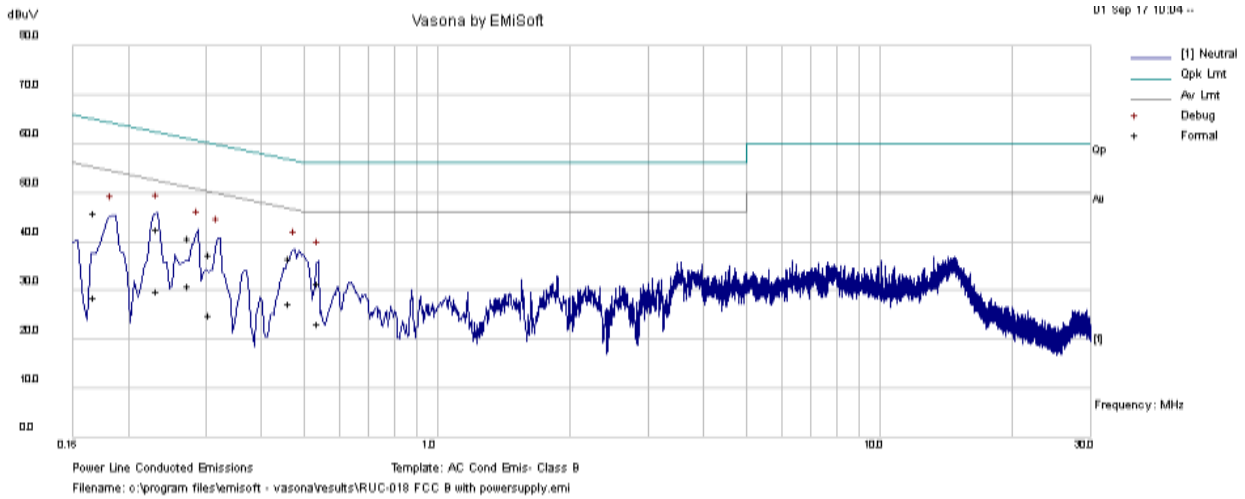
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.432421	42.16	10.01	0.68	52.84	Quasi Peak	Neutral	57.21	-4.36	Pass
0.686549	28.78	10.01	0.56	39.35	Quasi Peak	Neutral	56	-16.65	Pass
0.771415	30.22	10.01	0.55	40.78	Quasi Peak	Neutral	56	-15.22	Pass
0.319527	35.24	10	0.81	46.06	Quasi Peak	Neutral	59.72	-13.66	Pass
3.932571	29.4	10.03	0.5	39.93	Quasi Peak	Neutral	56	-16.07	Pass
20.48071	29.82	10.07	0.67	40.56	Quasi Peak	Neutral	60	-19.44	Pass
0.432421	35.47	10.01	0.68	46.15	Average	Neutral	47.21	-1.06	Pass
0.686549	21.35	10.01	0.56	31.92	Average	Neutral	46	-14.08	Pass
0.771415	23.03	10.01	0.55	33.6	Average	Neutral	46	-12.4	Pass
0.319527	31.06	10	0.81	41.88	Average	Neutral	49.72	-7.84	Pass
3.932571	23.65	10.03	0.5	34.18	Average	Neutral	46	-11.82	Pass
20.48071	22.54	10.07	0.67	33.28	Average	Neutral	50	-16.72	Pass

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Live - P.O.E Mode			



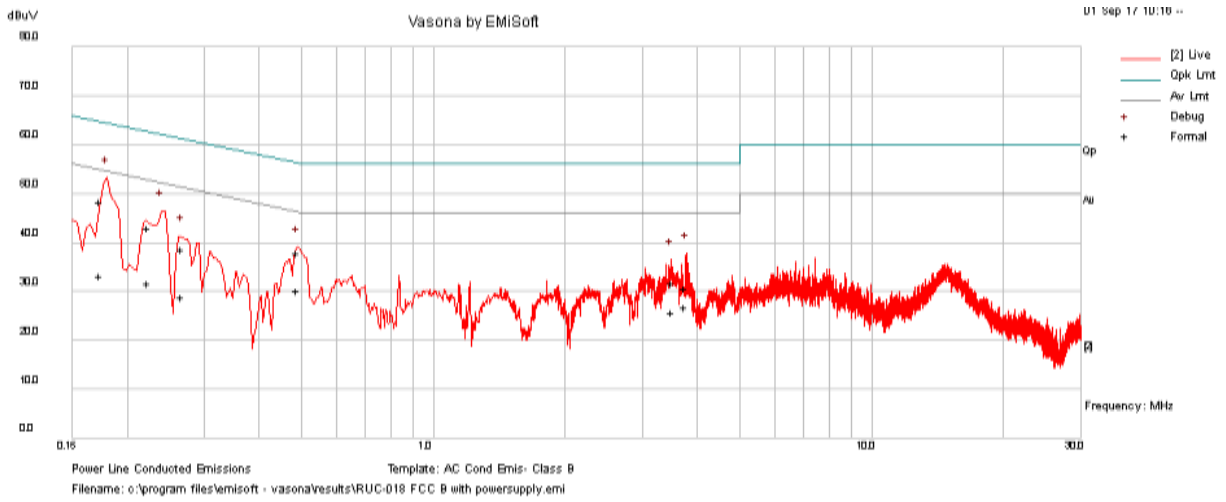
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.432709	42.5	10.01	0.68	53.18	Quasi Peak	Live	57.2	-4.02	Pass
0.797327	32.02	10.01	0.55	42.58	Quasi Peak	Live	56	-13.42	Pass
0.320621	35.23	10	0.81	46.04	Quasi Peak	Live	59.69	-13.65	Pass
1.192701	28.73	10.02	0.52	39.27	Quasi Peak	Live	56	-16.73	Pass
2.080816	30.49	10.02	0.5	41.02	Quasi Peak	Live	56	-14.98	Pass
1.178802	27.07	10.02	0.52	37.6	Quasi Peak	Live	56	-18.4	Pass
0.432709	36.14	10.01	0.68	46.82	Average	Live	47.2	-0.38	Pass
0.797327	25.95	10.01	0.55	36.52	Average	Live	46	-9.48	Pass
0.320621	29.98	10	0.81	40.8	Average	Live	49.69	-8.89	Pass
1.192701	18.15	10.02	0.52	28.69	Average	Live	46	-17.31	Pass
2.080816	22.94	10.02	0.5	33.46	Average	Live	46	-12.54	Pass
1.178802	22.11	10.02	0.52	32.65	Average	Live	46	-13.35	Pass

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Neutral– Power Supply			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.23281	31.49	10	1.08	42.58	Quasi Peak	Neutral	62.35	-19.77	Pass
0.463756	25.99	10.01	0.65	36.65	Quasi Peak	Neutral	56.63	-19.97	Pass
0.273752	29.75	10	0.93	40.68	Quasi Peak	Neutral	61	-20.32	Pass
0.168108	34.22	10	1.52	45.75	Quasi Peak	Neutral	65.05	-19.3	Pass
0.305904	26.39	10	0.84	37.23	Quasi Peak	Neutral	60.08	-22.85	Pass
0.536705	20.9	10.01	0.61	31.52	Quasi Peak	Neutral	56	-24.48	Pass
0.23281	18.74	10	1.08	29.82	Average	Neutral	52.35	-22.52	Pass
0.463756	16.74	10.01	0.65	27.4	Average	Neutral	46.63	-19.22	Pass
0.273752	19.99	10	0.93	30.91	Average	Neutral	51	-20.09	Pass
0.168108	17.16	10	1.52	28.69	Average	Neutral	55.05	-26.37	Pass
0.305904	14.22	10	0.84	25.06	Average	Neutral	50.08	-25.02	Pass
0.536705	12.69	10.01	0.61	23.31	Average	Neutral	46	-22.69	Pass

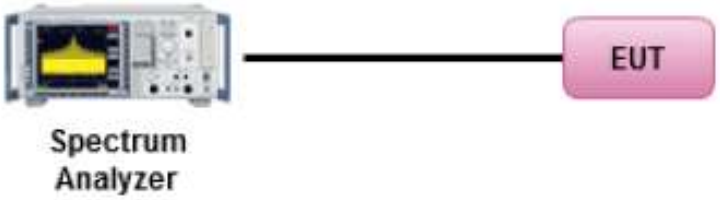
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	25.7	Result:	☒ Pass ☐ Fail
	Humidity (%):	43.3		
	Atmospheric(mbar):	1014.9		
Mains Power:	120Vac, 60Hz			
Tested by:	Kushal Shastri			
Test Date:	08/21/2017-10/05/2017			
Remarks	Live– Power Supply			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.173242	37.05	10	1.47	48.52	Quasi Peak	Live	64.8	-16.28	Pass
0.223118	31.77	10	1.13	42.9	Quasi Peak	Live	62.7	-19.8	Pass
0.48802	27.3	10.01	0.64	37.95	Quasi Peak	Live	56.2	-18.25	Pass
3.762982	20.11	10.03	0.5	30.65	Quasi Peak	Live	56	-25.35	Pass
3.501415	21.29	10.03	0.5	31.82	Quasi Peak	Live	56	-24.18	Pass
0.267331	27.61	10	0.94	38.56	Quasi Peak	Live	61.2	-22.64	Pass
0.173242	21.71	10	1.47	33.18	Average	Live	54.8	-21.62	Pass
0.223118	20.52	10	1.13	31.65	Average	Live	52.7	-21.05	Pass
0.48802	19.45	10.01	0.64	30.1	Average	Live	46.2	-16.1	Pass
3.762982	16.34	10.03	0.5	26.87	Average	Live	46	-19.13	Pass
3.501415	15.15	10.03	0.5	25.68	Average	Live	46	-20.32	Pass
0.267331	17.79	10	0.94	28.74	Average	Live	51.2	-22.46	Pass

10.2 6dB & 99% Bandwidth

Requirement(s):

Spec	Requirement	Applicable
§ 15.247 RSS247 (5.2.1)	6dB BW≥500KHz;	☒
RSS Gen 4.6.1	The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual. The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth	☒
Test Setup		
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 8.1 DTS bandwidth 6dB Emission bandwidth measurement procedure - Set RBW = 100 kHz. - Set the video bandwidth (VBW) ⩾ 3 x RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. - Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.	
Test Date	08/21/2017-10/05/2017	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 Cipher at RF test site.

6dB Bandwidth measurement result for 2.4GHz

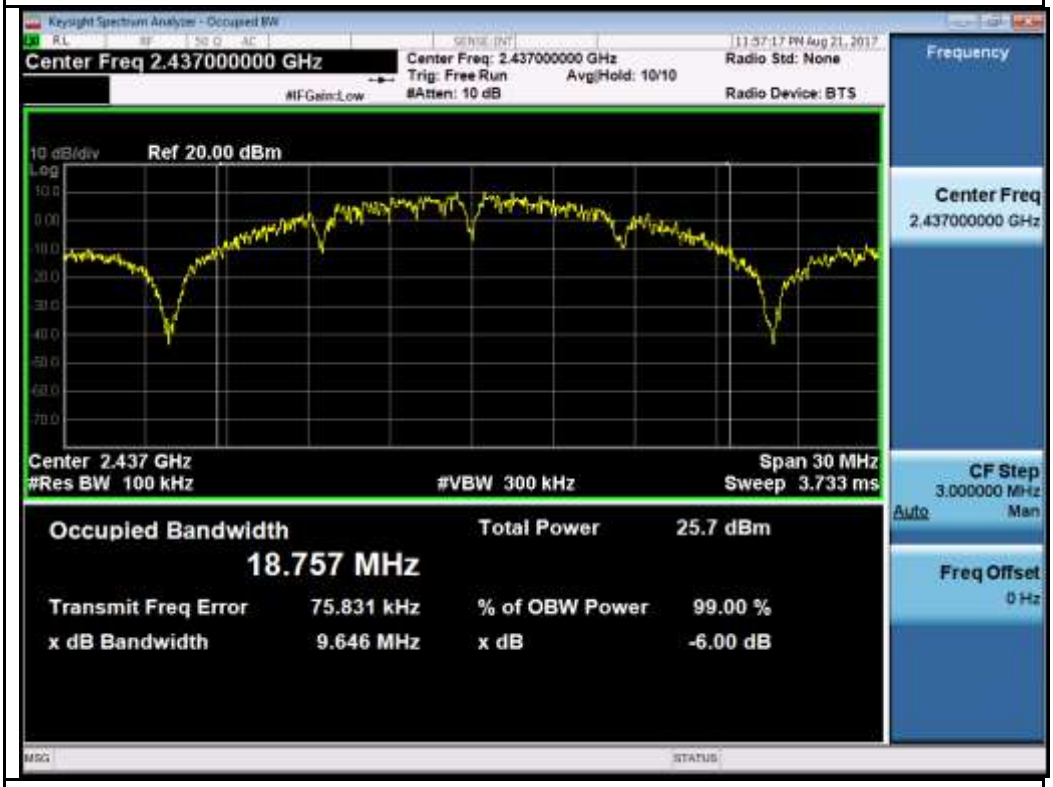
Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11b	2412	Low	9.886	≥0.5	Pass
		2437	Mid	9.646	≥0.5	Pass
		2462	High	10.008	≥0.5	Pass
	802.11g	2412	Low	16.332	≥0.5	Pass
		2437	Mid	15.270	≥0.5	Pass
		2462	High	15.677	≥0.5	Pass
	802.11n-20M	2412	Low	17.516	≥0.5	Pass
		2437	Mid	15.723	≥0.5	Pass
		2462	High	17.674	≥0.5	Pass
	802.11n-40M	2422	Low	30.431	≥0.5	Pass
		2437	Mid	33.860	≥0.5	Pass
		2452	High	34.210	≥0.5	Pass

99% OBW measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
99% OBW	802.11b	2412	Low	15.314
		2437	Mid	18.757
		2462	High	16.369
	802.11g	2412	Low	16.371
		2437	Mid	16.448
		2462	High	16.391
	802.11n-20M	2412	Low	17.613
		2437	Mid	19.347
		2462	High	17.648
	802.11n-40M	2422	Low	35.878
		2437	Mid	36.113
		2452	High	36.049

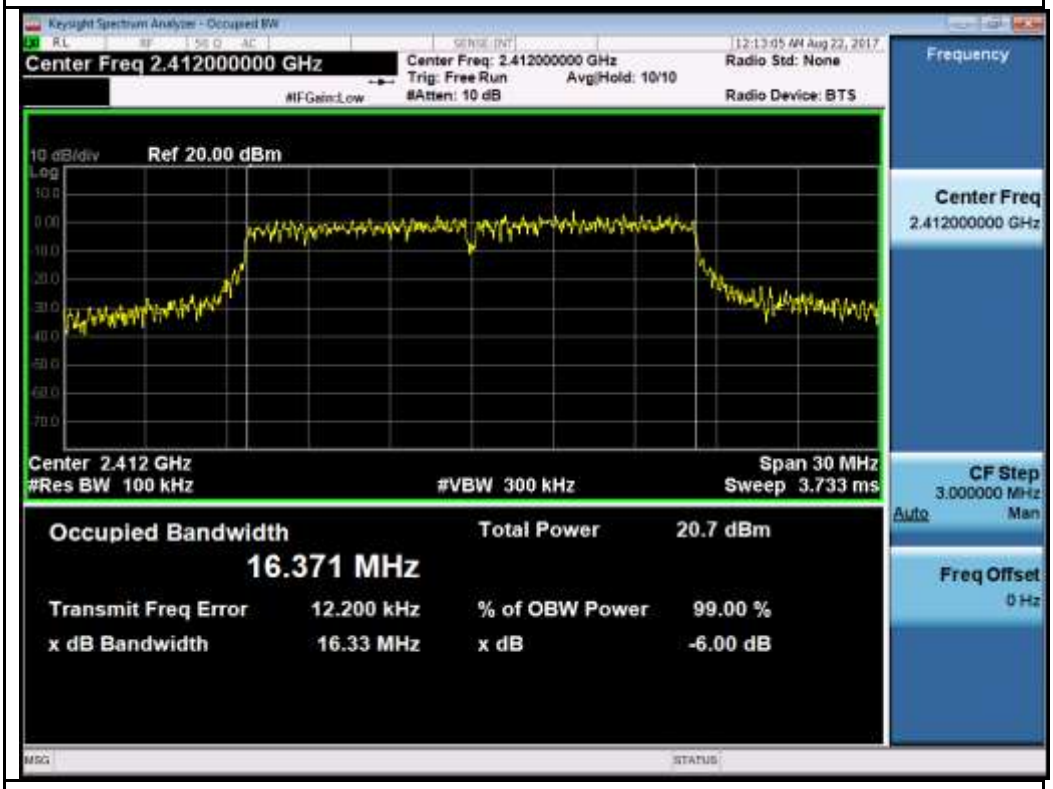
6dB & 99% Bandwidth Test Plots

802.11b-2412MHz



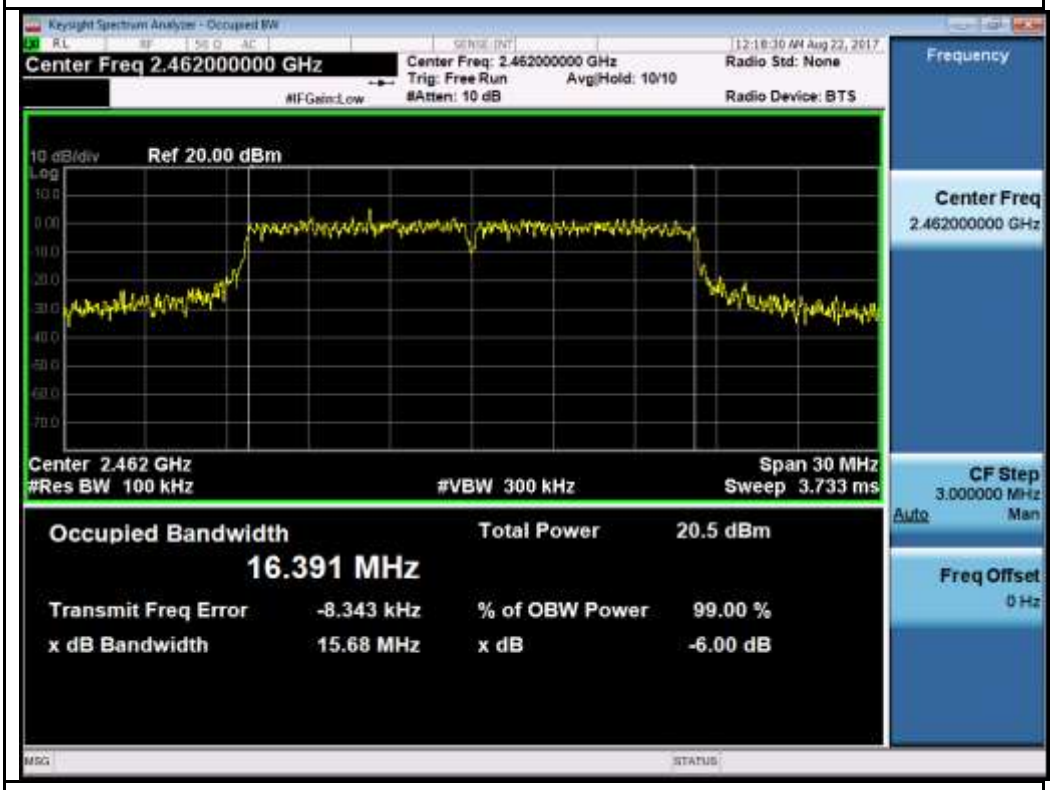
802.11b-2437MHz

802.11b-2462MHz

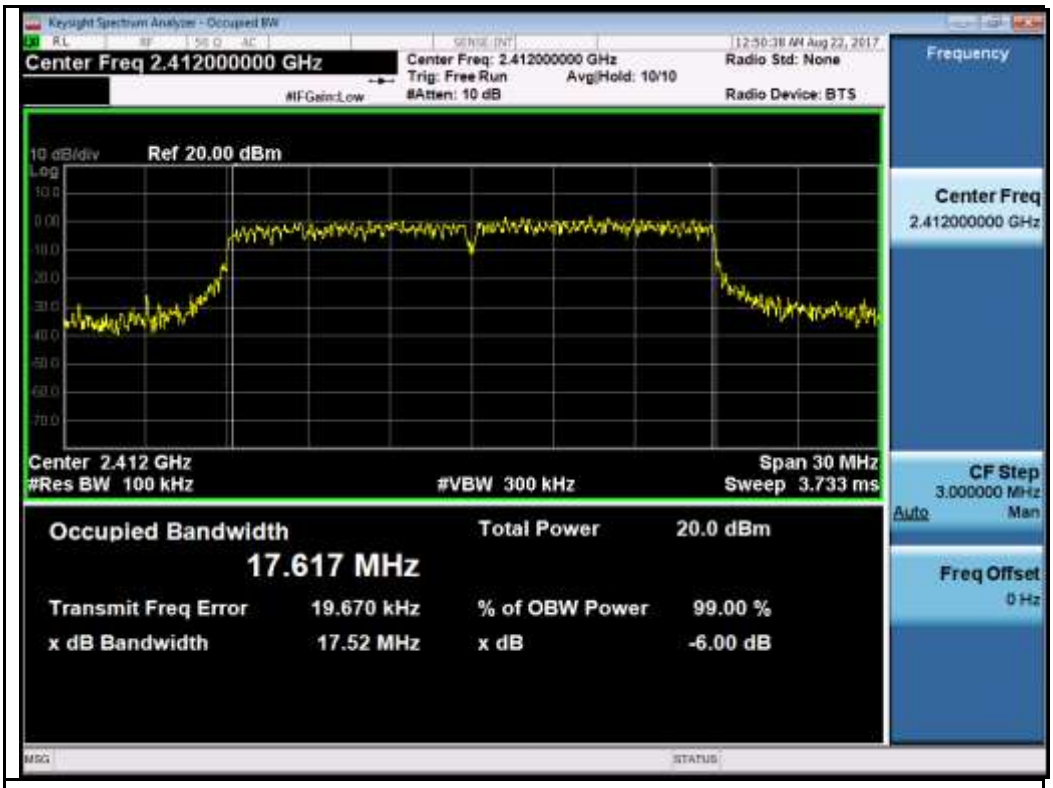


802.11g-2412MHz

802.11g-2437MHz

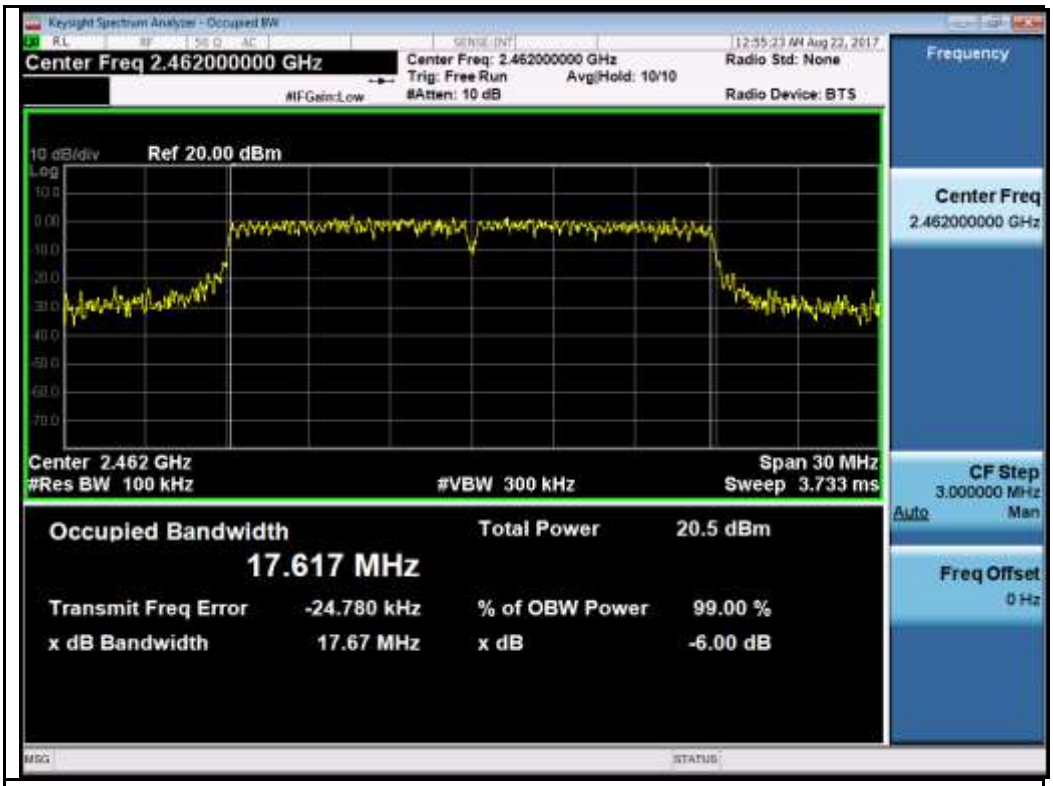


802.11g-2462MHz

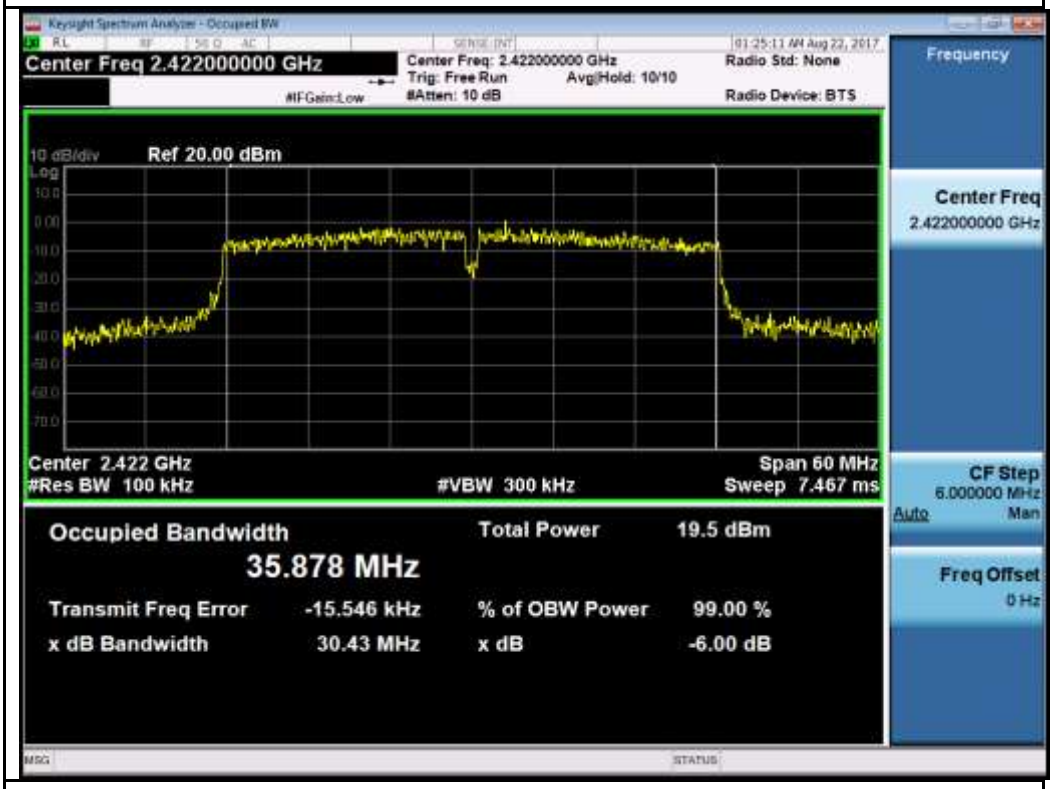


802.11n-HT20-2412MHz

802.11n-HT20-2437MHz



802.11n-HT20-2462MHz



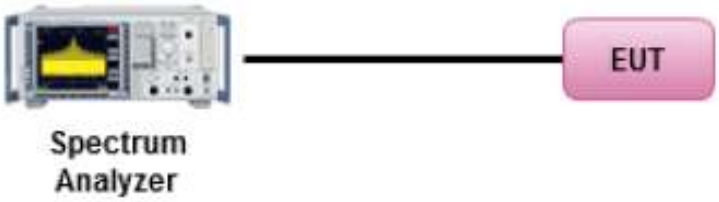
802.11n-HT40-2422MHz

802.11n-HT40-2437MHz

802.11n-HT40-2452MHz

10.3 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247 RSS247 (5.4.4)	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤1 Watt	☒
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 9.2.2.2 Measurement using a Spectrum Analyzer (SA) (a) Set span to at least 1.5 times the OBW (b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz. (c) Set VBW ≥ 3 x RBW. (d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.) (e) Sweep time = auto. (f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode. (g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run". (h) Trace average at least 100 traces in power averaging (i.e., RMS) mode (i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.		
Test Date	08/21/2017-10/05/2017	Environmental condition	Temperature 23°C Relative Humidity 44% Atmospheric Pressure 1021mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

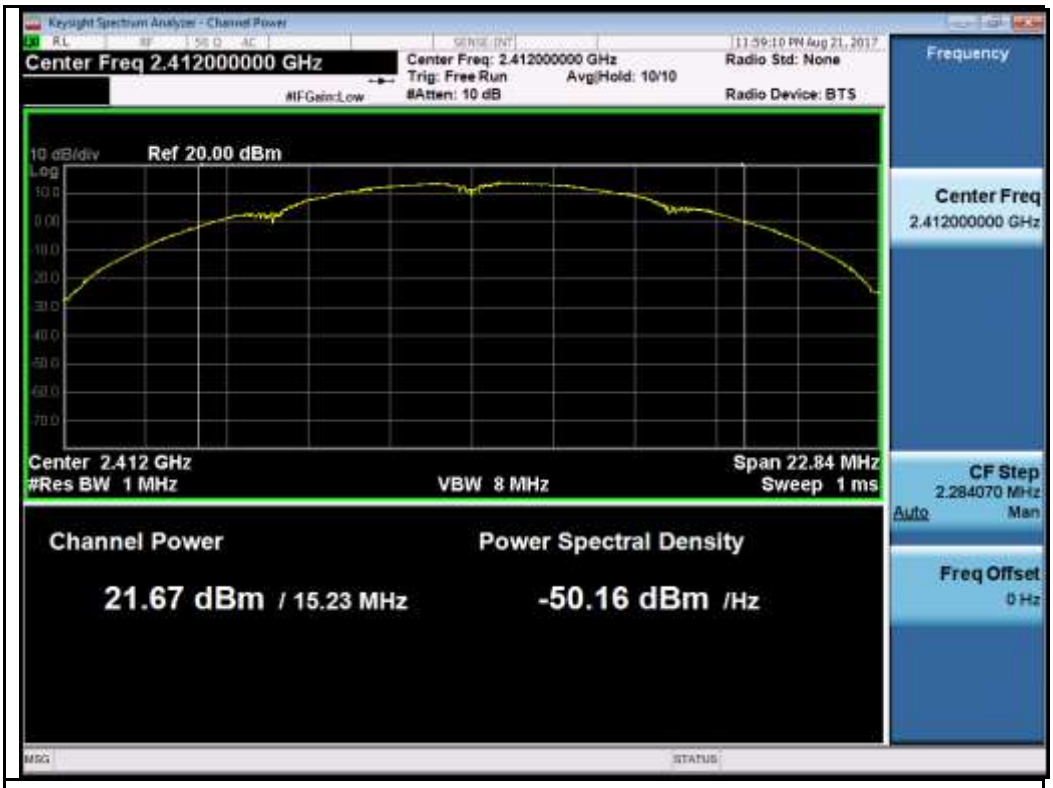
Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Cipher at RF test site.

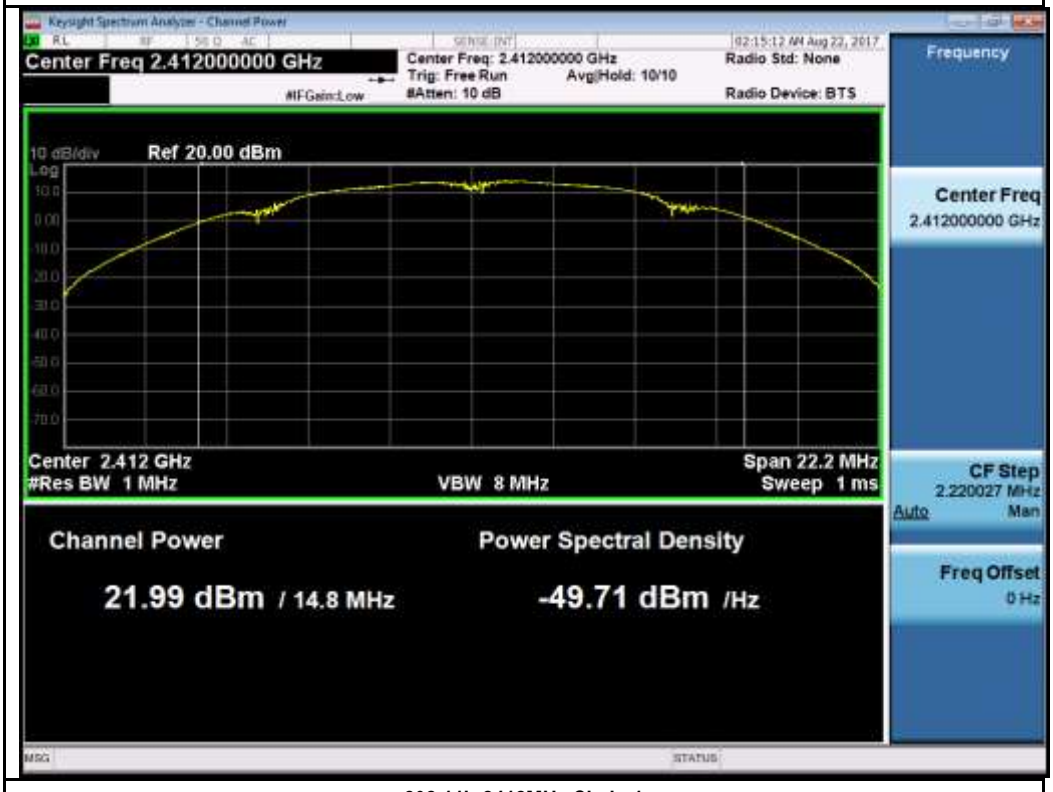
Output Power measurement result

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain 0	Chain 1	Combined Power		
Output Power	802.11b	2412	Low	21.67	21.99	24.84	30	Pass
		2437	Mid	21.80	21.69	24.76	30	Pass
		2462	High	21.42	21.45	24.45	30	Pass
	802.11g	2412	Low	16.71	16.89	19.81	30	Pass
		2437	Mid	20.11	20.24	23.19	30	Pass
		2462	High	16.72	16.83	19.79	30	Pass
	802.11n-20M	2412	Low	16.50	16.35	19.44	30	Pass
		2437	Mid	19.69	19.51	22.61	30	Pass
		2462	High	16.43	16.87	19.67	30	Pass
	802.11n-40M	2422	Low	16.36	15.54	18.98	30	Pass
		2437	Mid	20.62	20.44	23.54	30	Pass
		2452	High	14.40	14.84	17.64	30	Pass
Note	Two chains are cross-polarized, additional gain is 10 log10(NANT)=0dB,N=1 ,max directional gain of the EUT is 2.5dBi. No limit adjustment is needed. All the mode transmission is MIMO.							

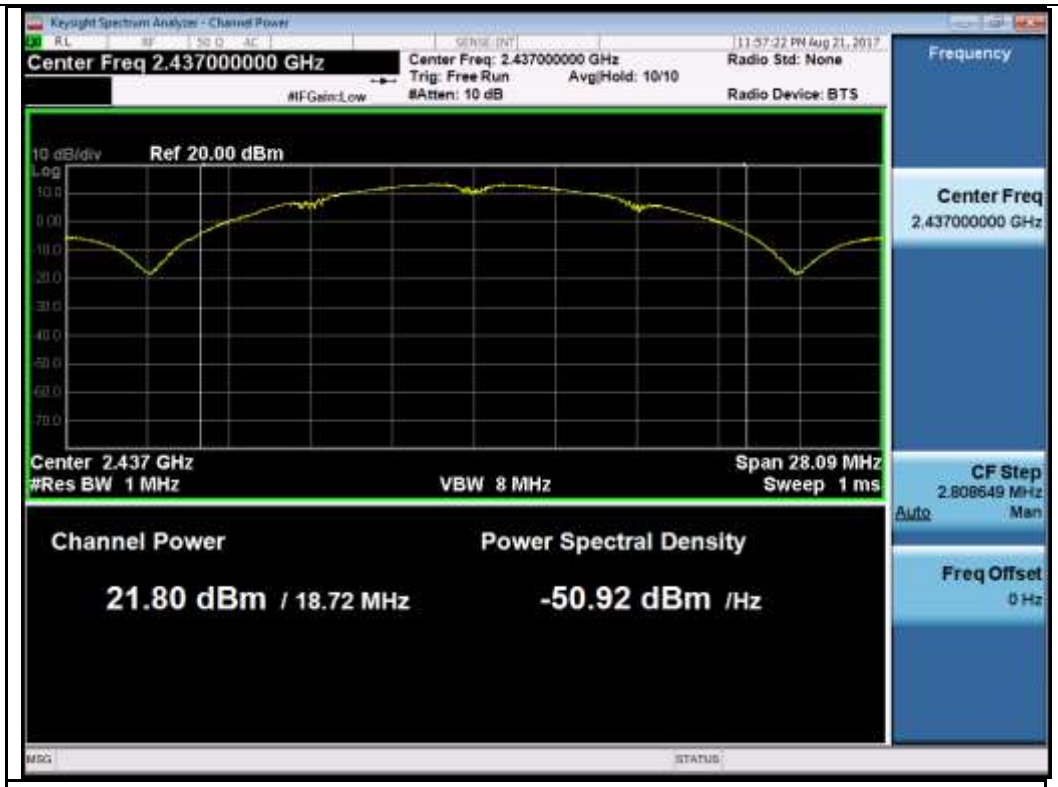
Test Plots:



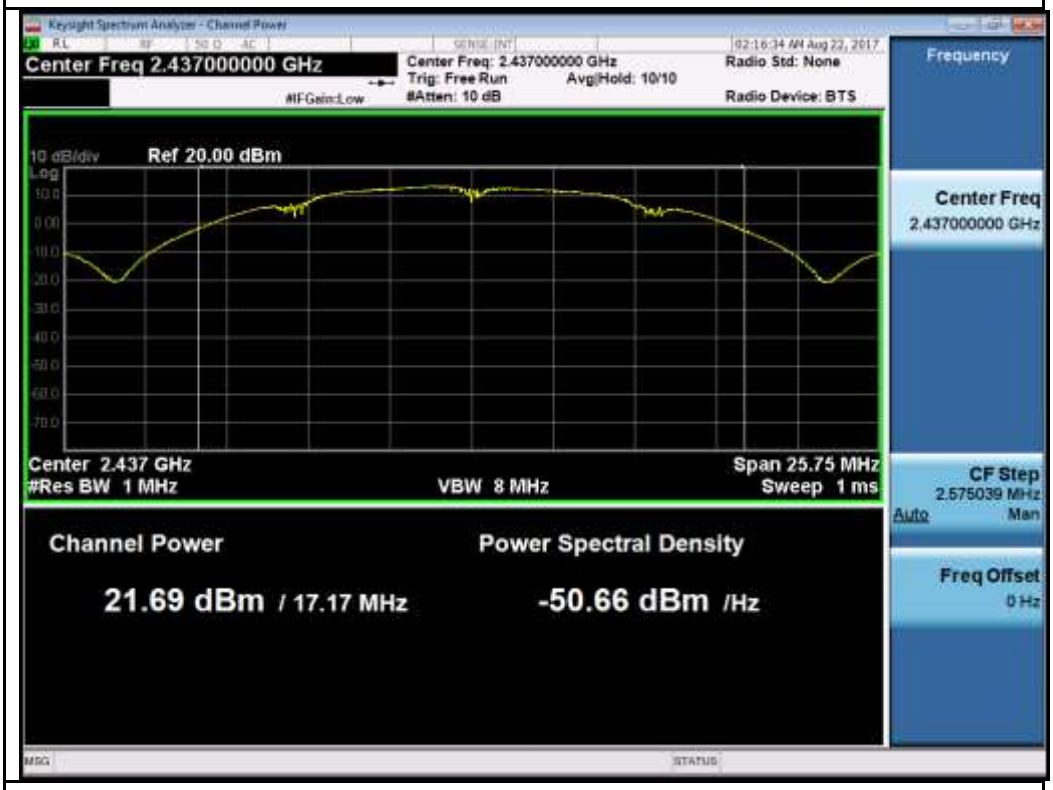
802.11b-2412MHz Chain 0



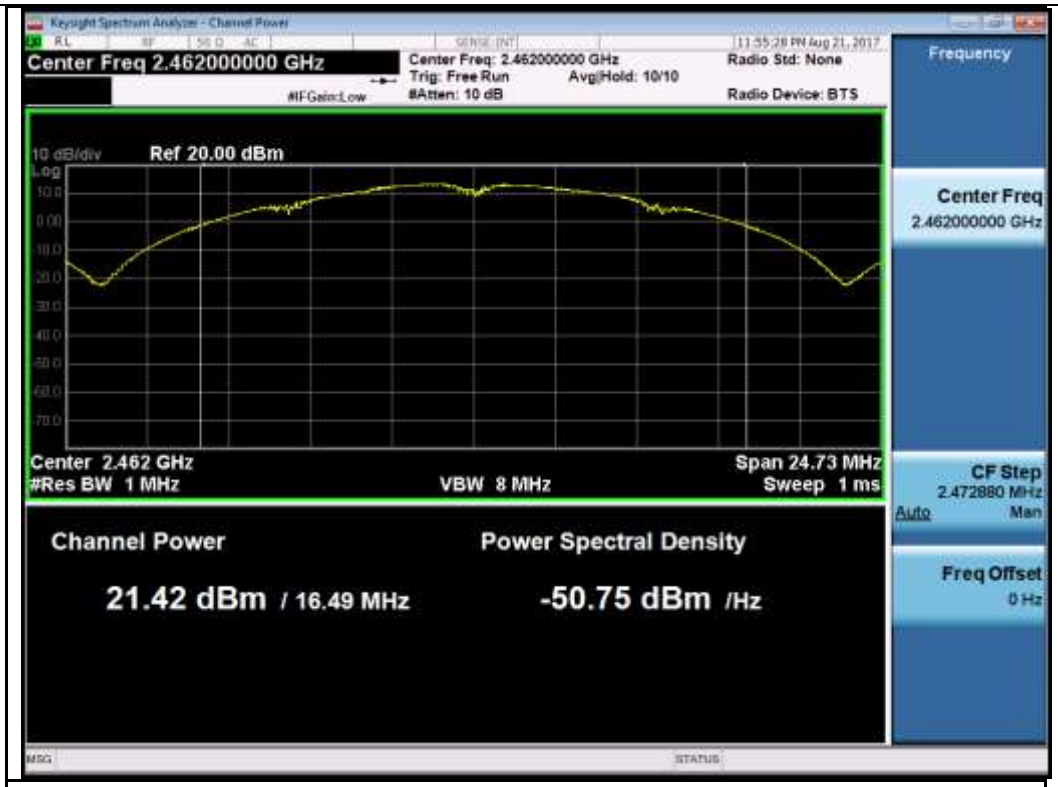
802.11b-2412MHz Chain 1



802.11b-2437MHz Chain 0

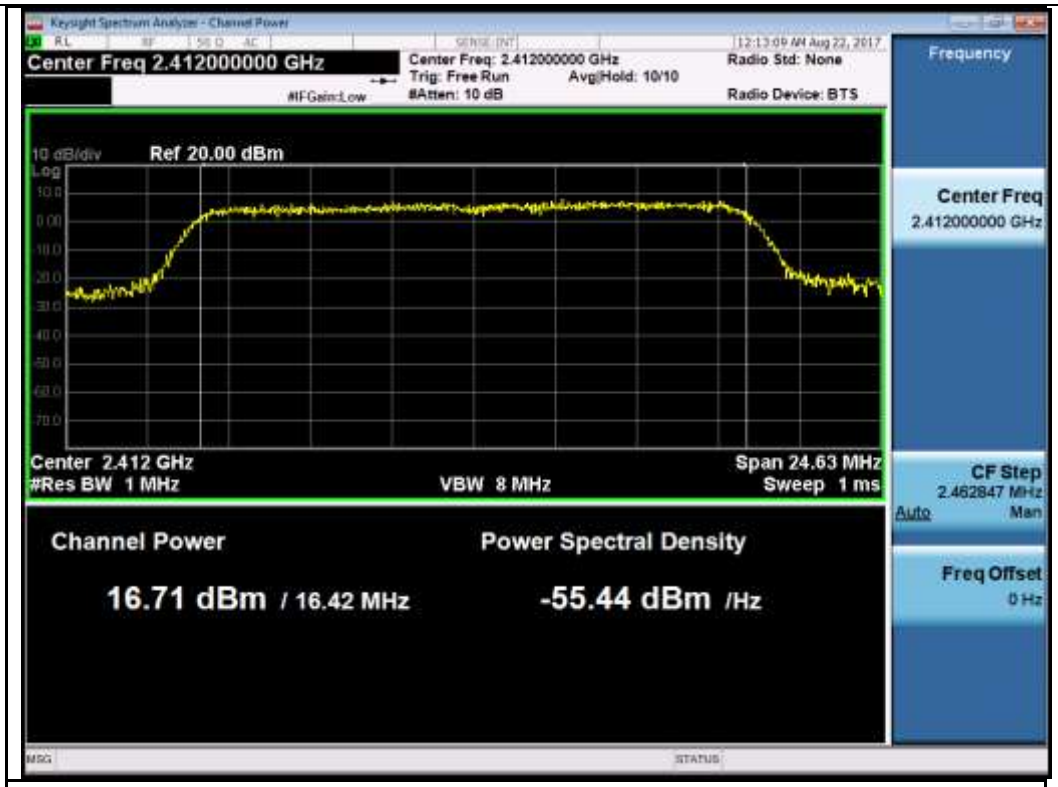


802.11b-2437MHz Chain 1

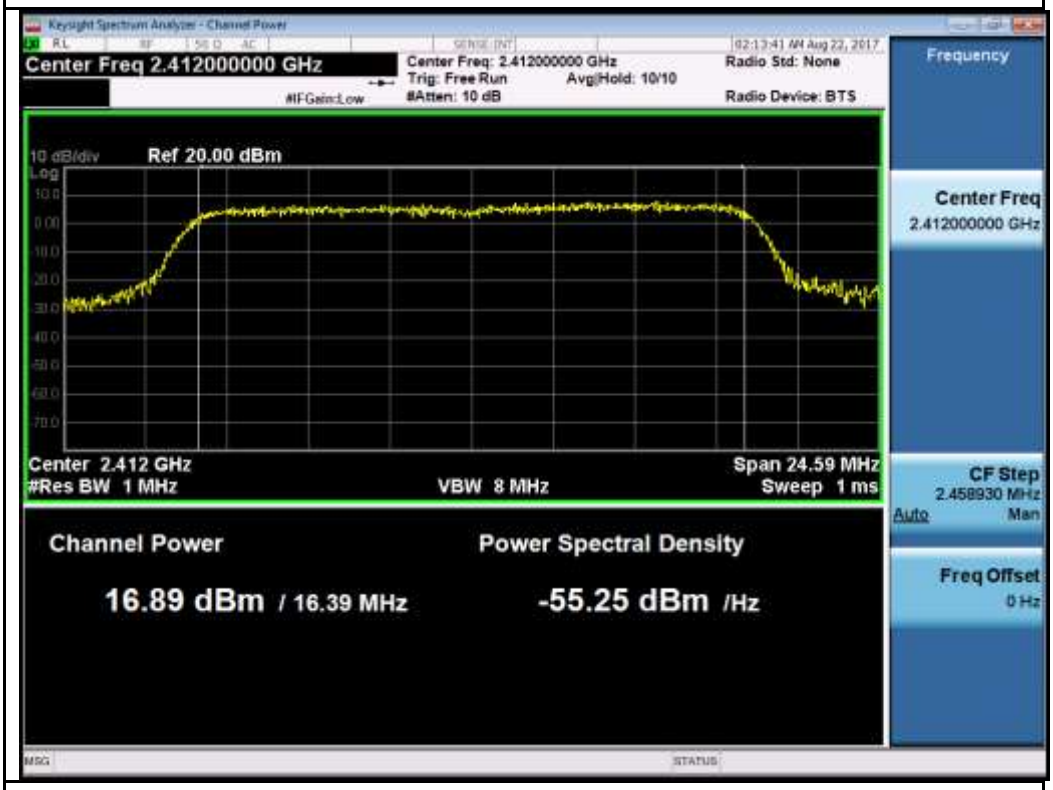


802.11b-2462MHz Chain 0

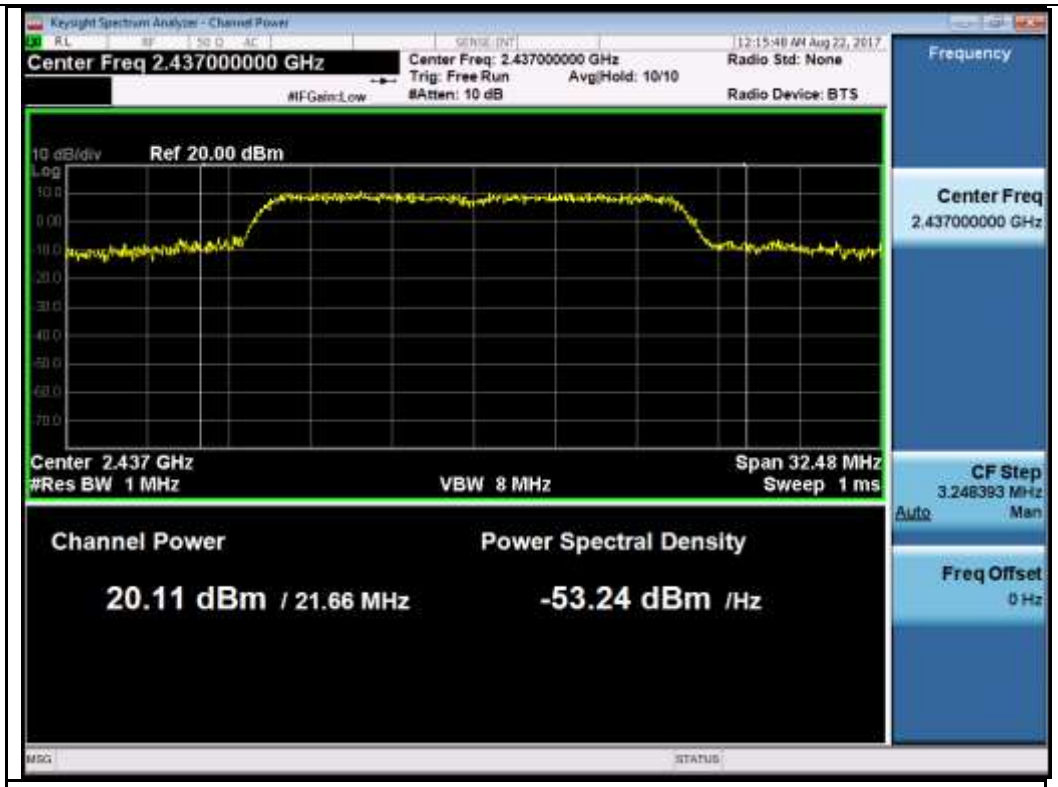
802.11b-2462MHz Chain 1



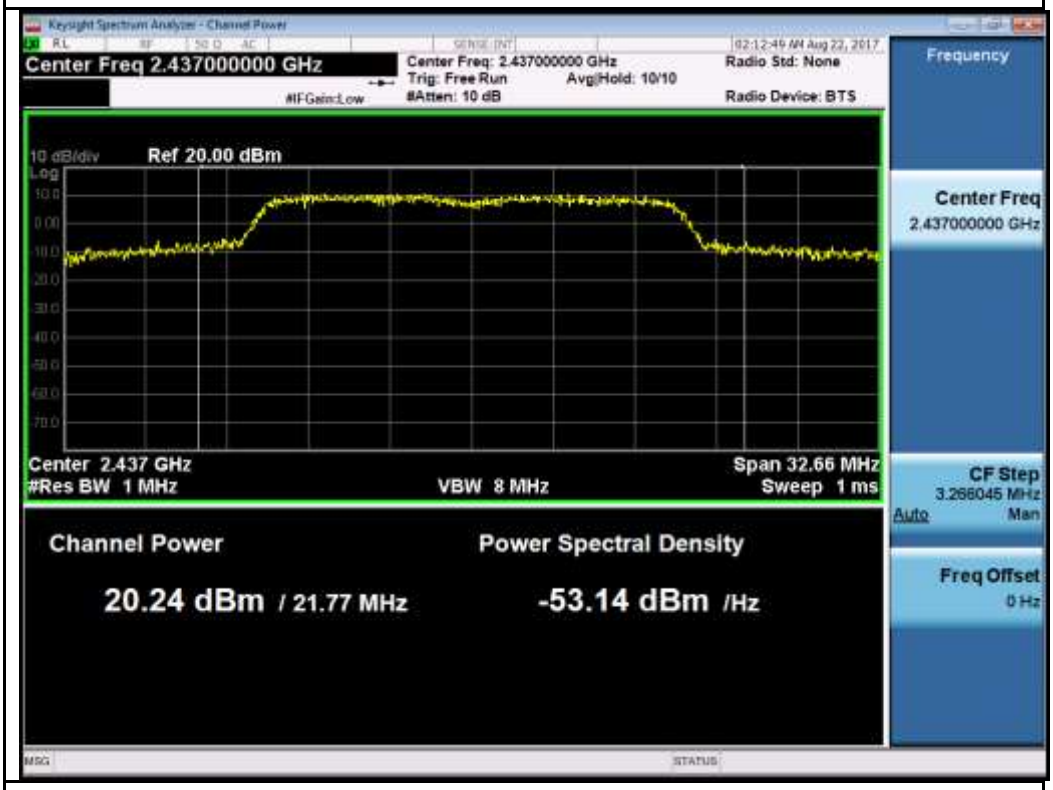
802.11g-2412MHz Chain 0



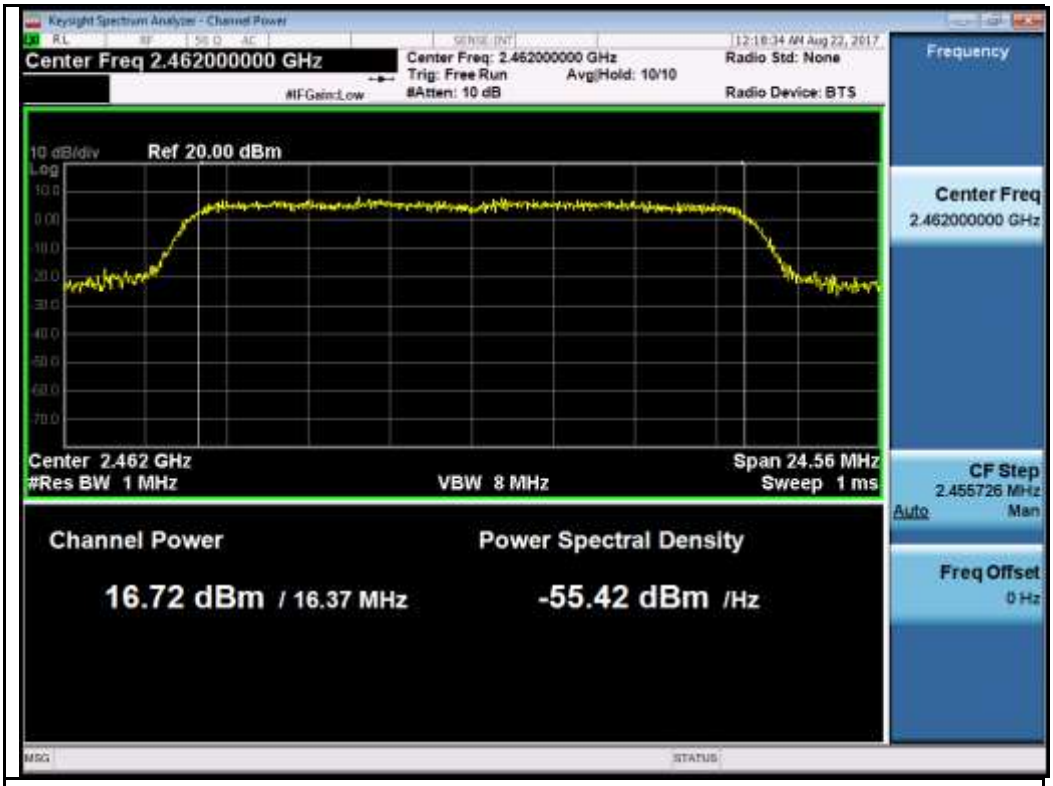
802.11g-2412MHz Chain 1



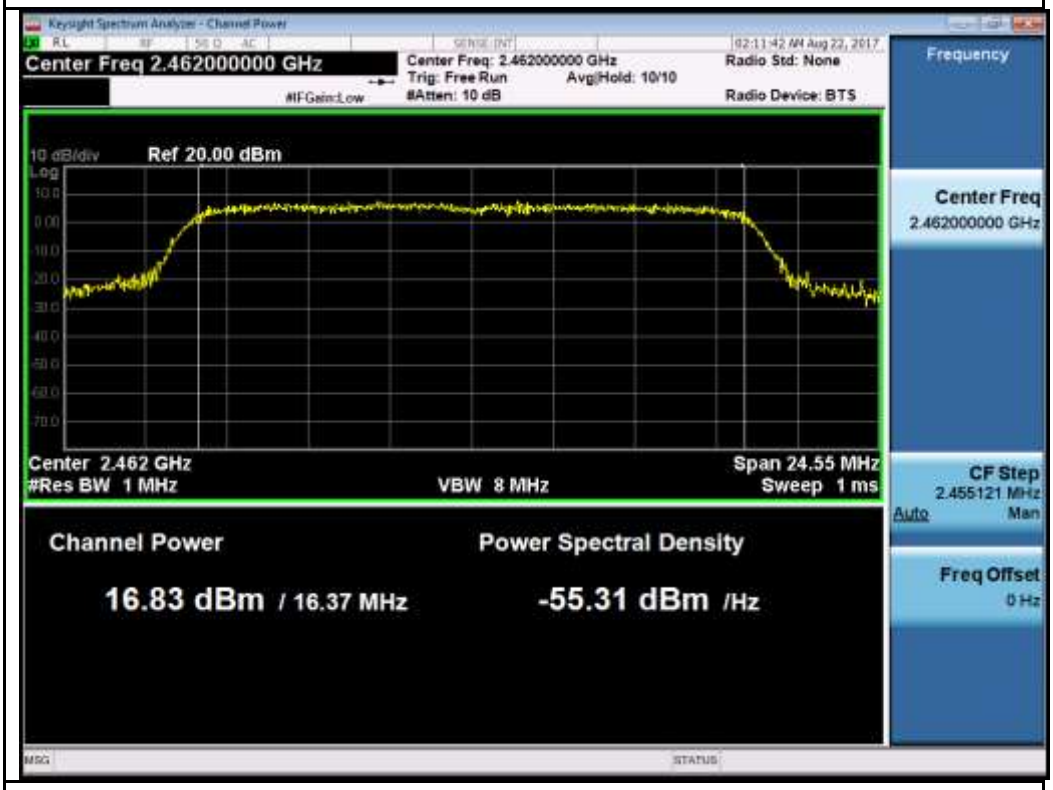
802.11g-2437MHz Chain 0



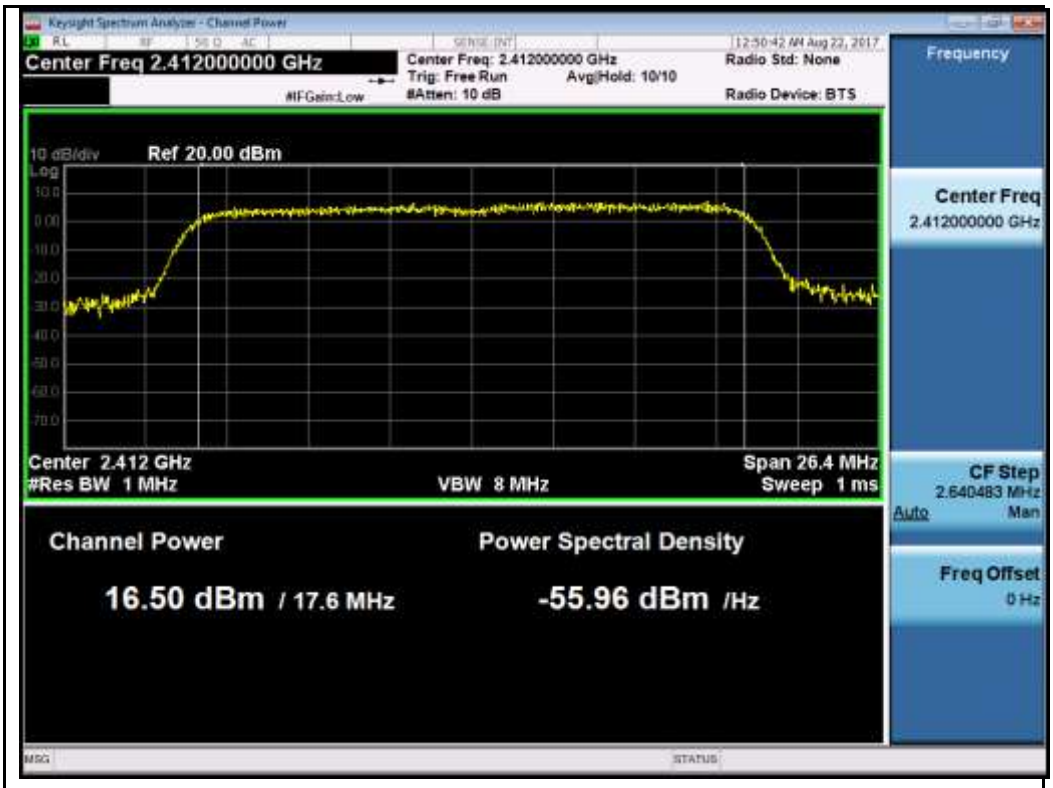
802.11g-2437MHz Chain 1



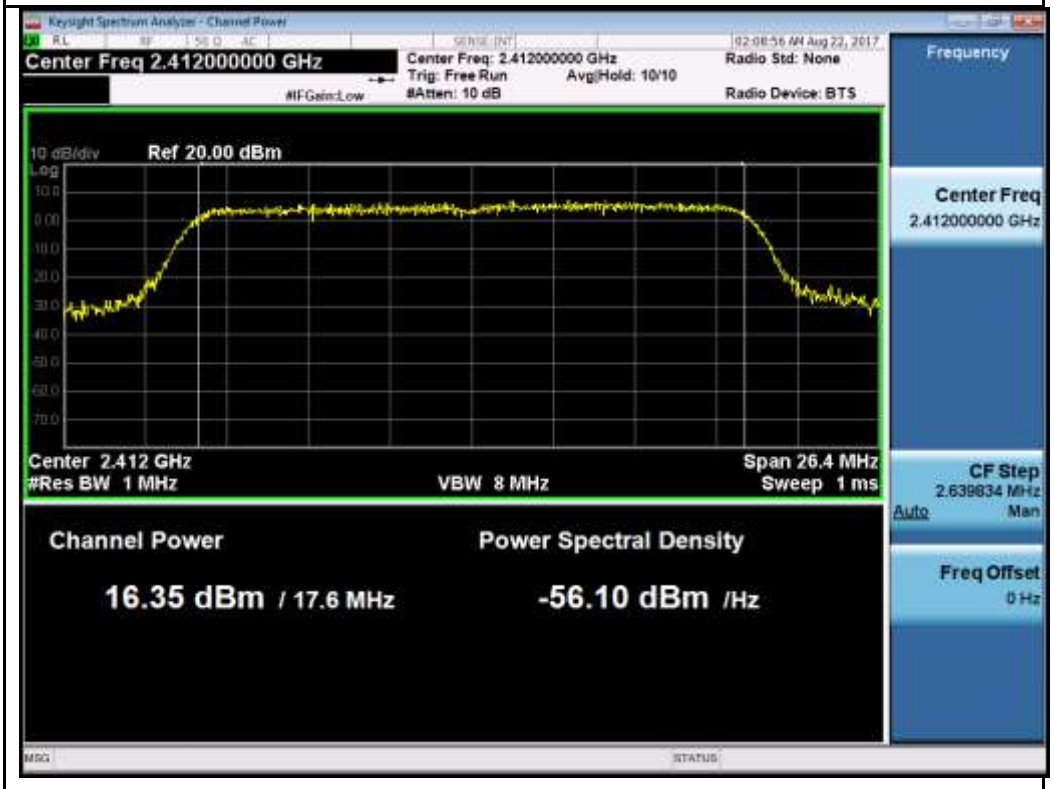
802.11g-2462MHz Chain 0



802.11g-2462MHz Chain 1

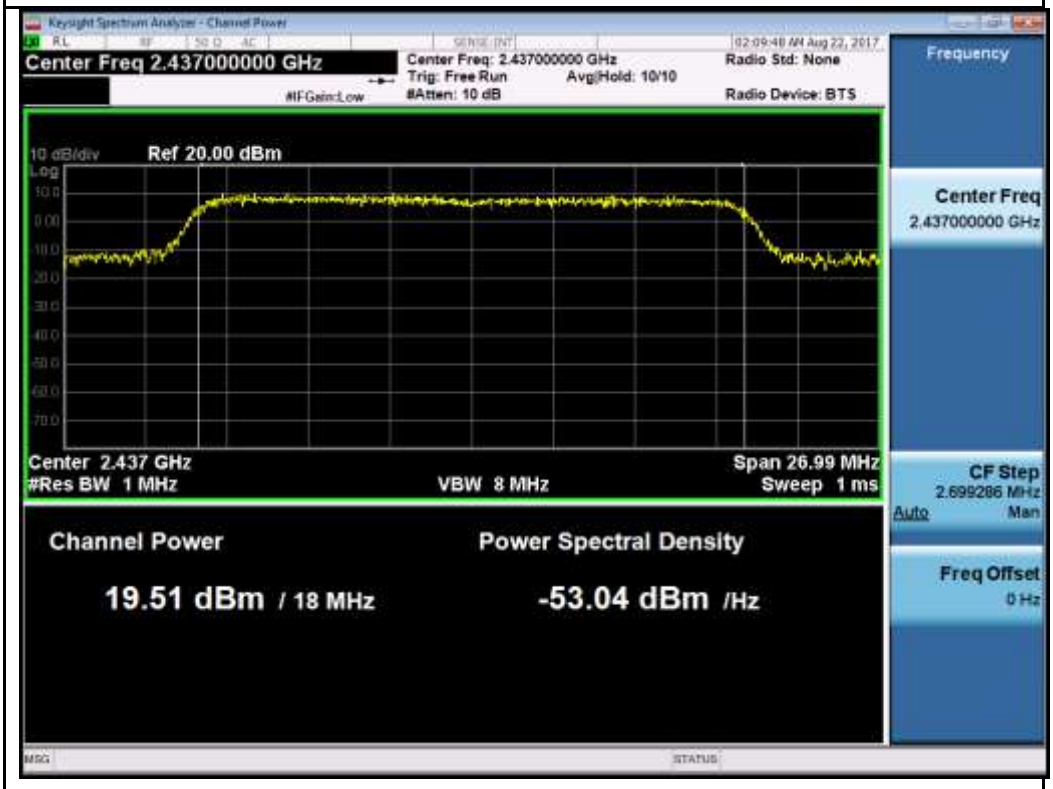


802.11n-HT20 2412MHz Chain 0

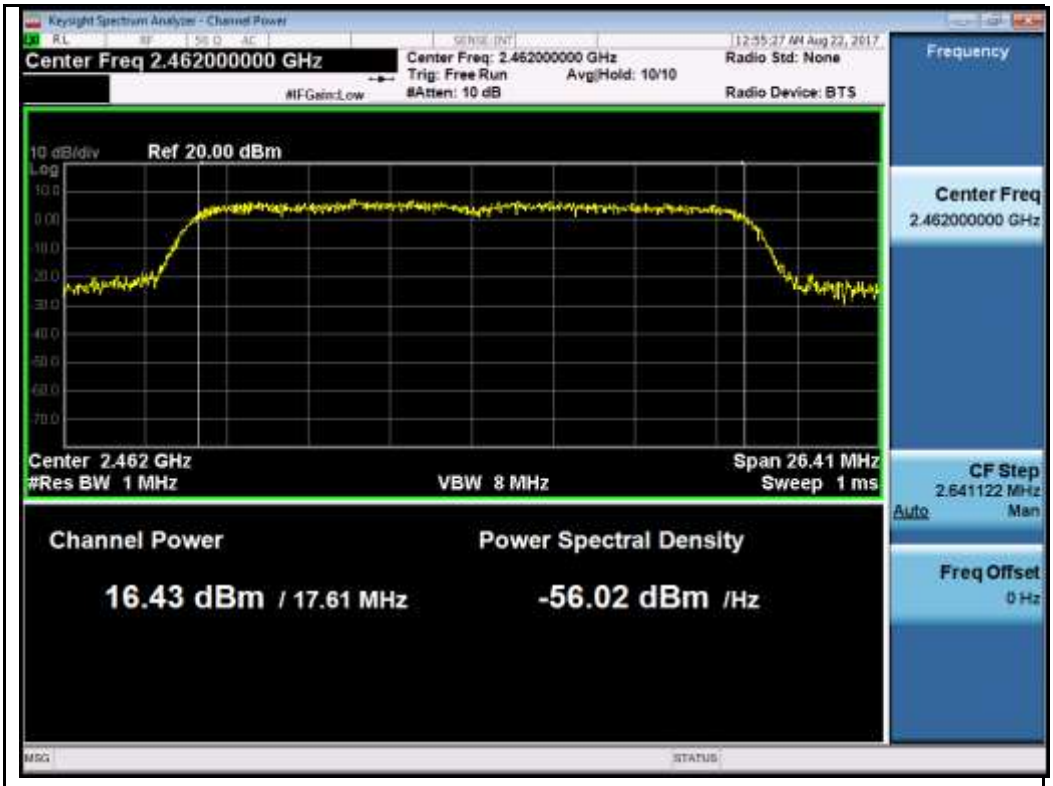


802.11n-HT20 2412MHz Chain 1

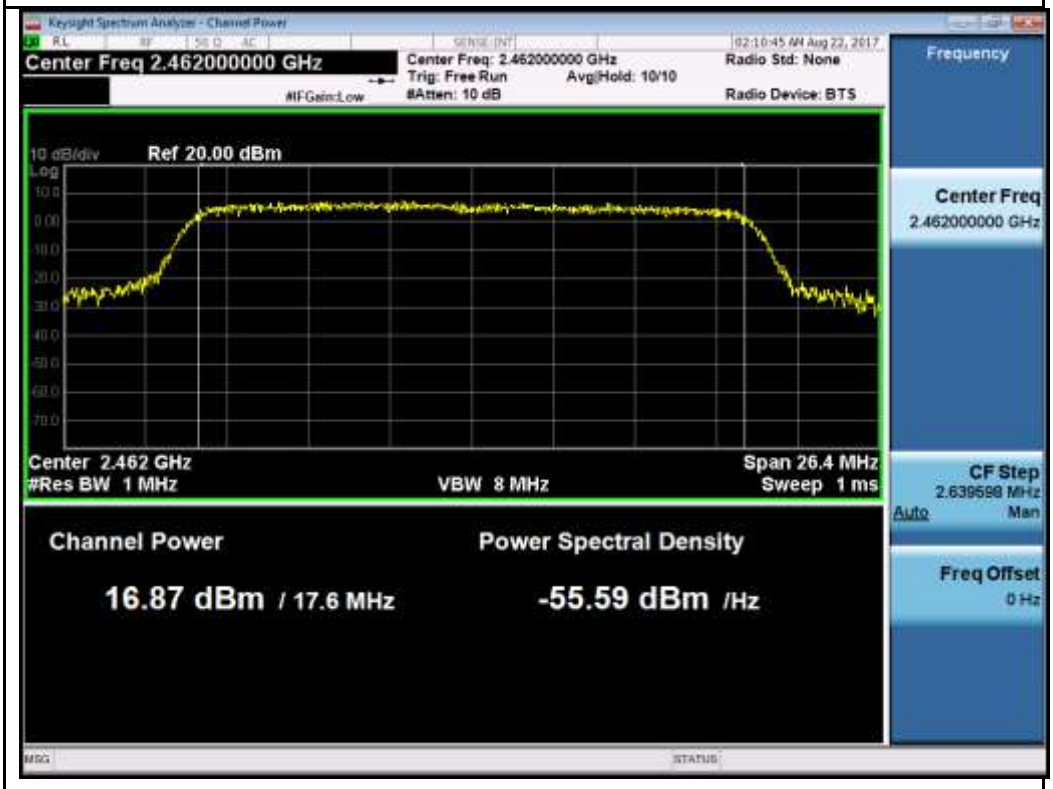
802.11n-HT20 2437MHz Chain 0



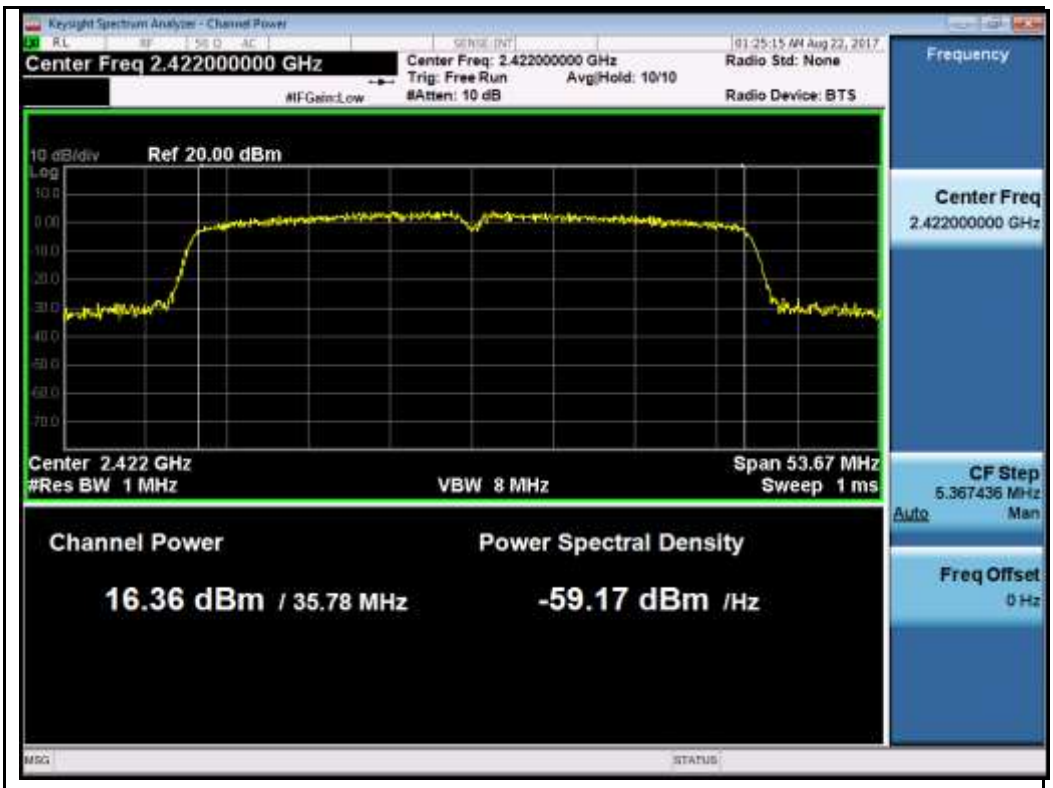
802.11n-HT20 2437MHz Chain 1



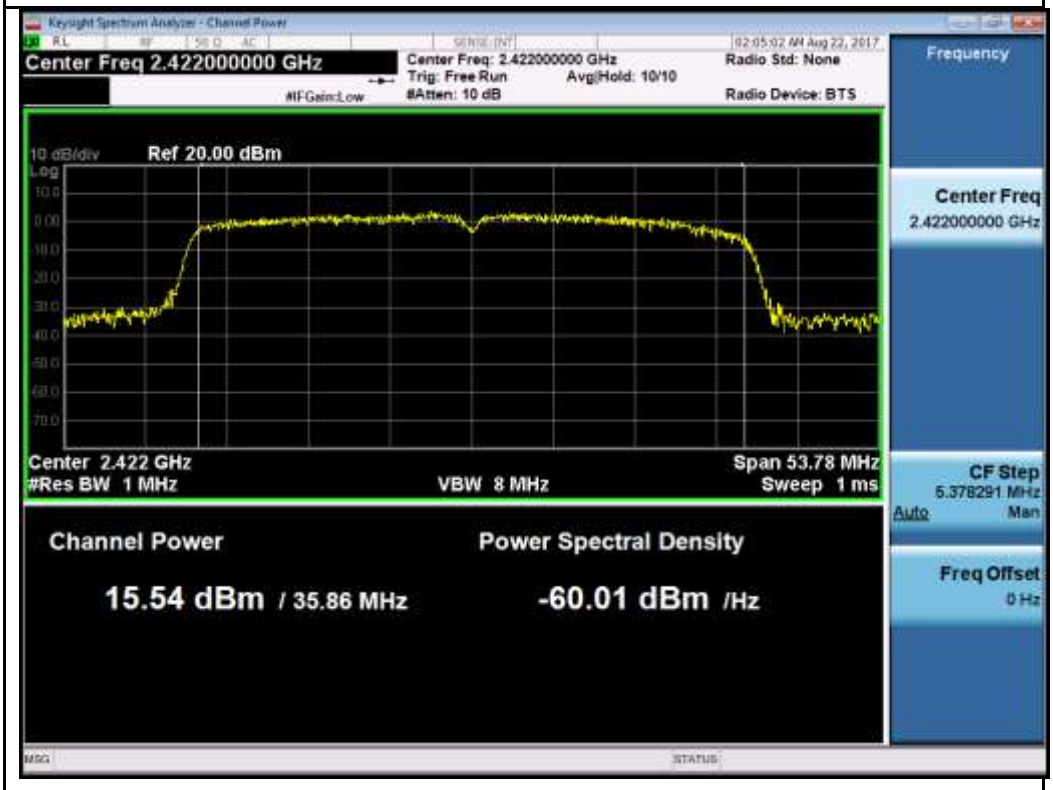
802.11n-HT20 2462MHz Chain 0



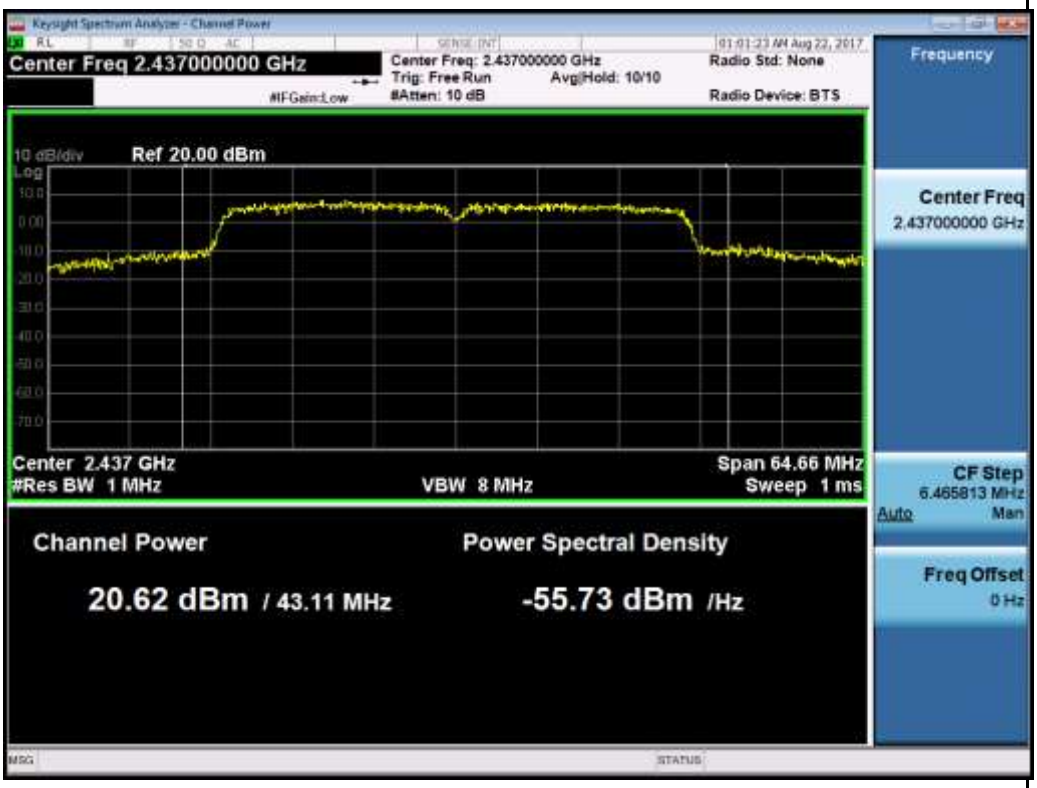
802.11n-HT20 2462MHz Chain 1



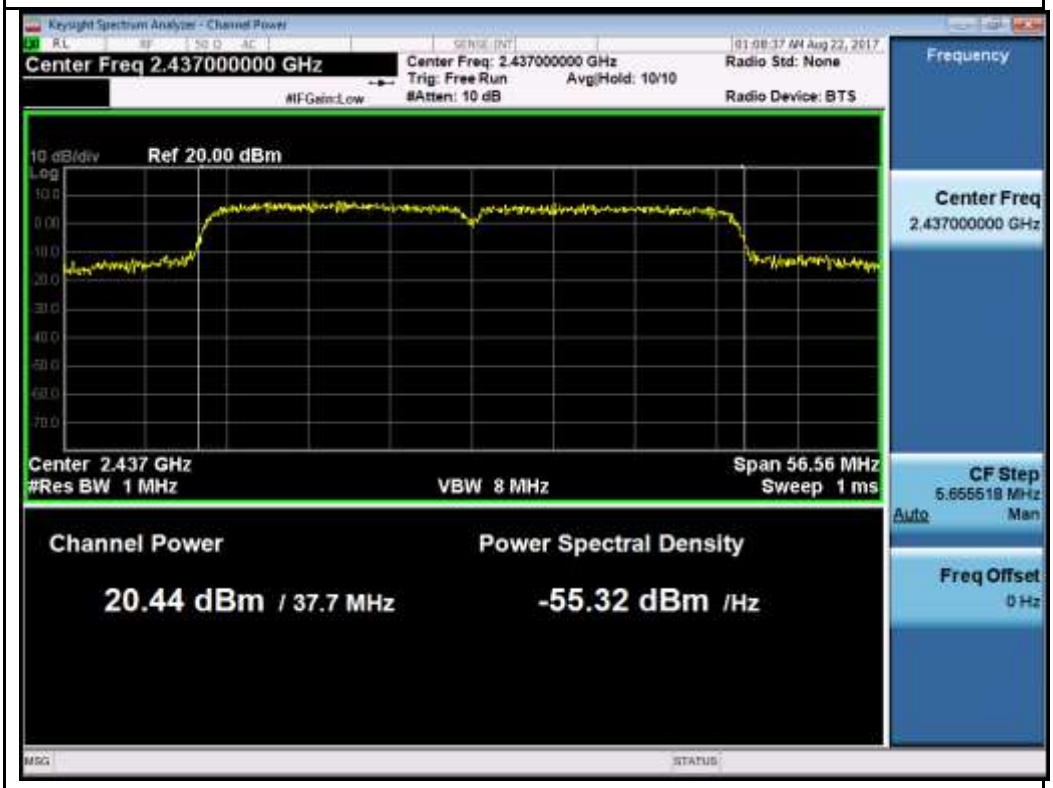
802.11n-HT40 2422MHz Chain 0



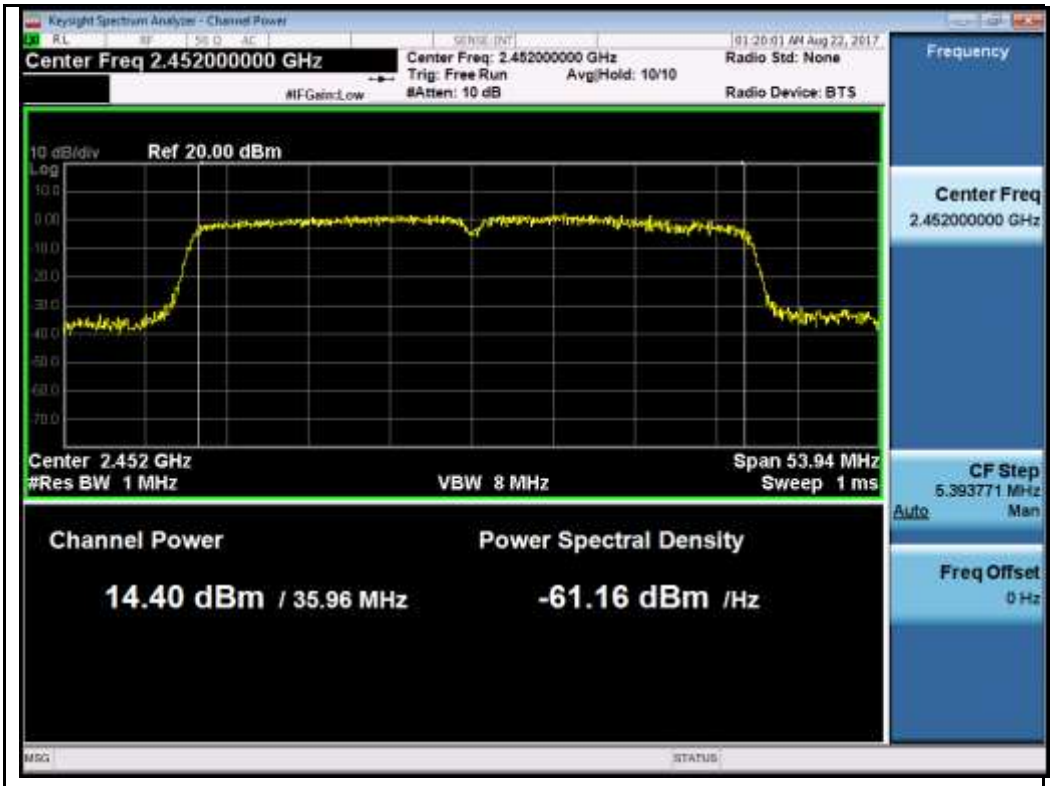
802.11n-HT40 2422MHz Chain 1



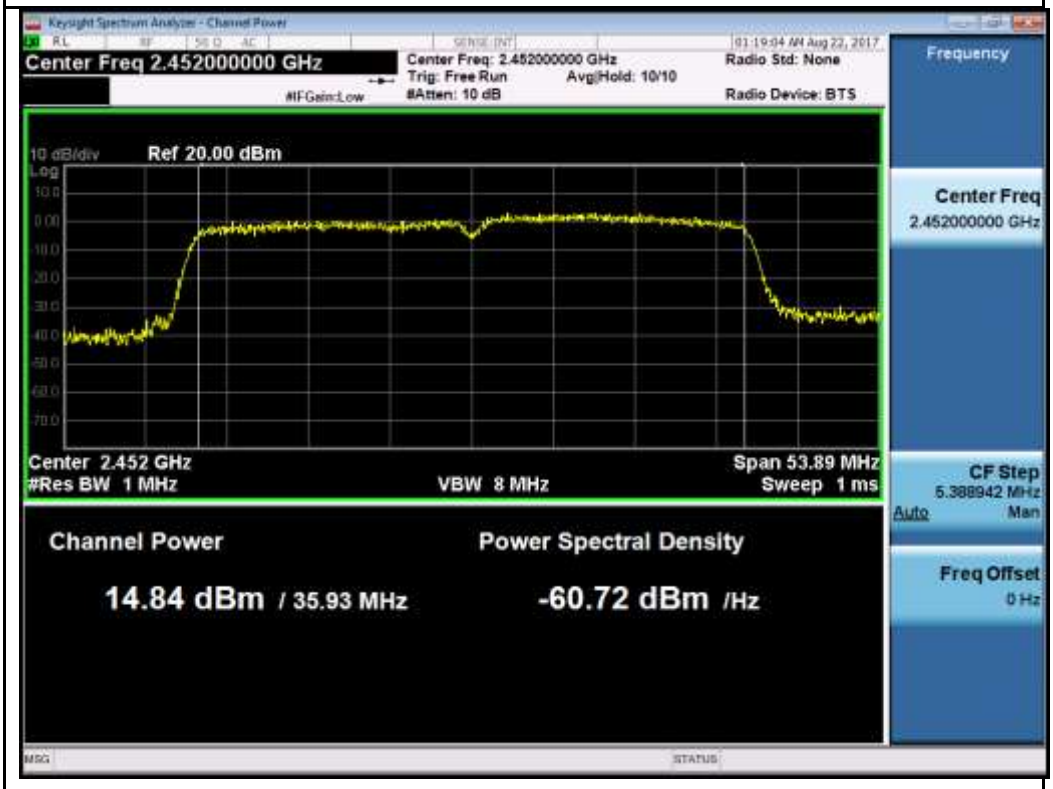
802.11n-HT40 2437MHz Chain 0



802.11n-HT40 2437MHz Chain 1



802.11n-HT40 2452MHz Chain 0

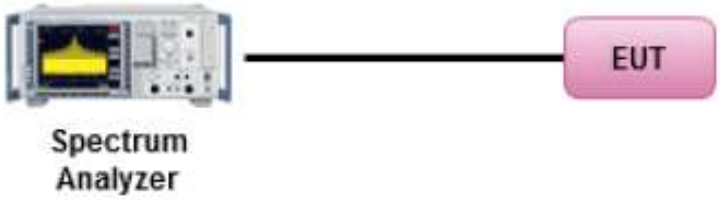


802.11n-HT40 2452MHz Chain 1

10.4 Band Edge

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247 RSS247(5.5)	d)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209 (a) is not required ☐ 20 dB down ☒ 30 dB down	☒

Test Setup				
Test Procedure	558074 D01 DTS Meas Guidance v03r05 Band Edge measurement procedure 1. Set the EUT to maximum power setting and enable the EUT transmit continuously. 2. Band edge emissions must be at least 30 dB down from the highest emission level within the authorized band as a measured. The attunation shall be be 30 dB instead of 20 dB when Peak conducted output power procedure is used. 3. Change modulation and channel bandwidth then repeat step 1 to 2. 4. Measured and record the results in the test report.			
Test Date	08/21/2017-10/05/2017	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22°C 46% 1020mbar
Remark	-			
Result	☒ Pass ☐ Fail			

Test Data ☐ Yes ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at RF test site.

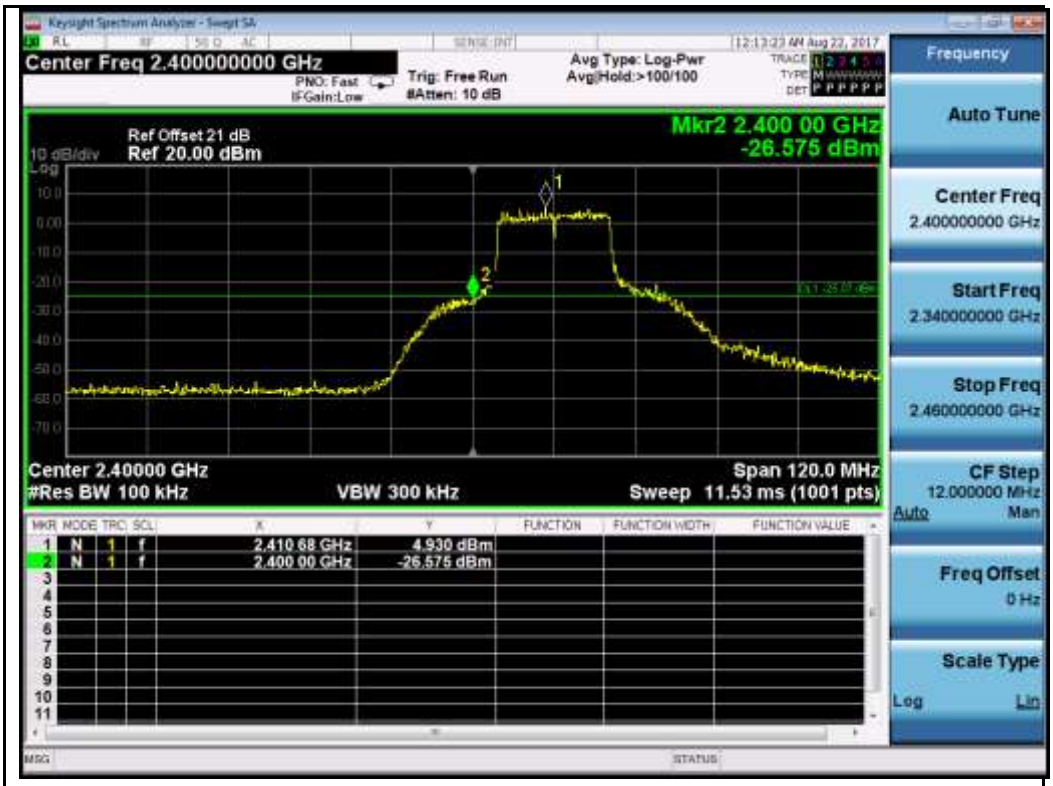
Test Plots

802.11b-2412MHz Chain 0

802.11b-2412MHz Chain 1

802.11b-2462MHz Chain 0

802.11b-2462MHz Chain 1

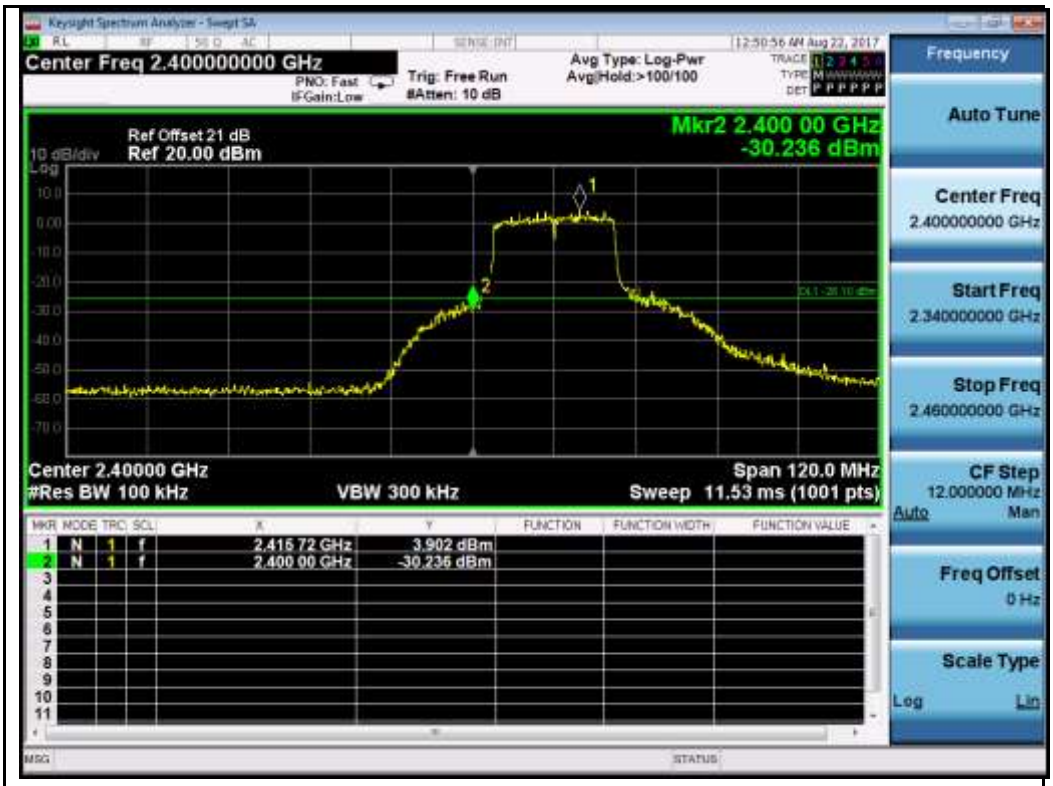


802.11g-2412MHz Chain 0

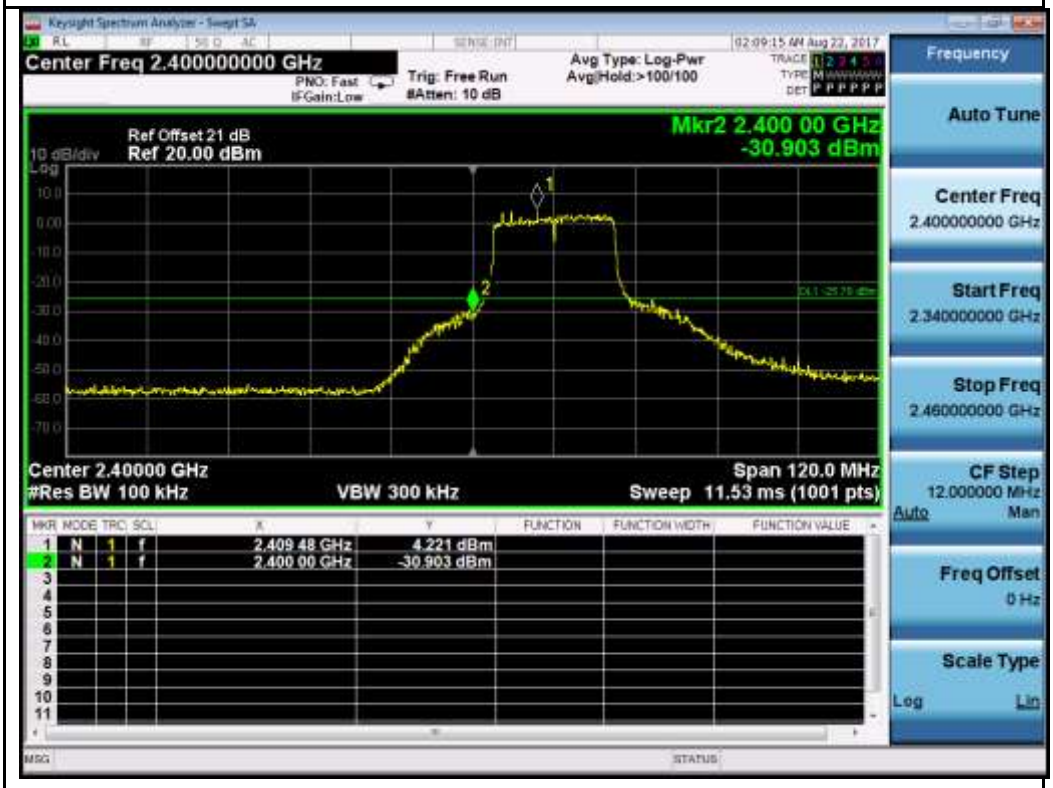
802.11g-2412MHz Chain 1

802.11g-2462MHz Chain 0

802.11g-2462MHz Chain 1

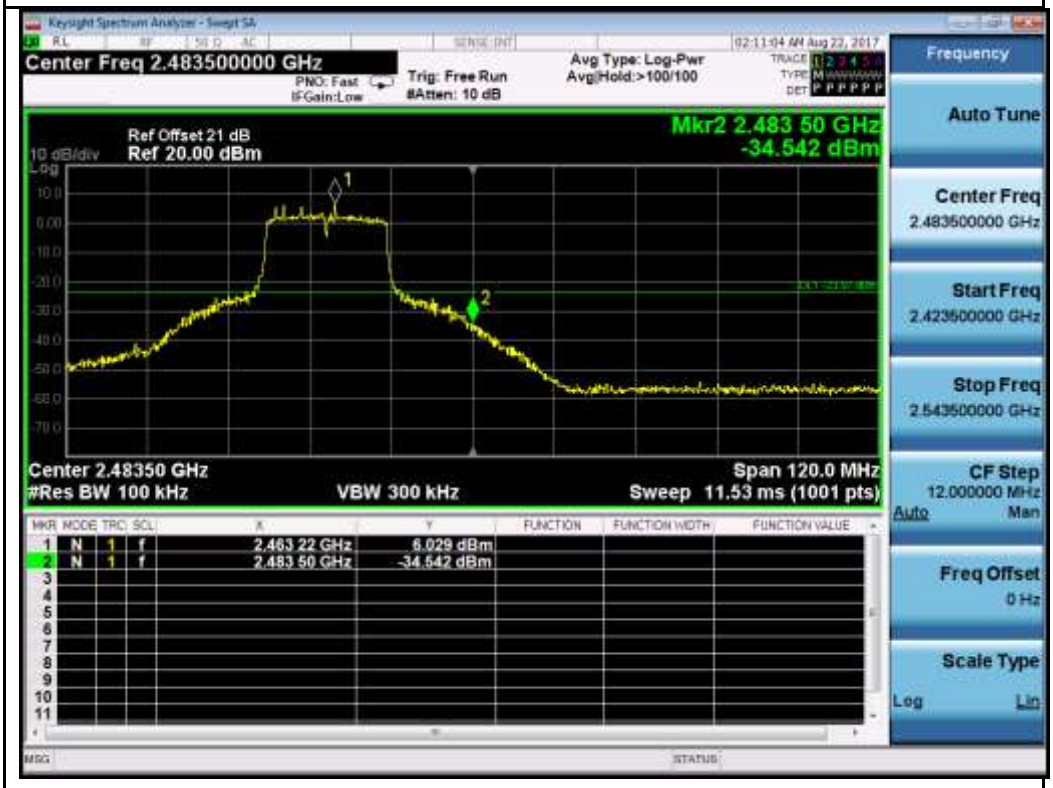


802.11n-HT20-2412MHz Chain 0

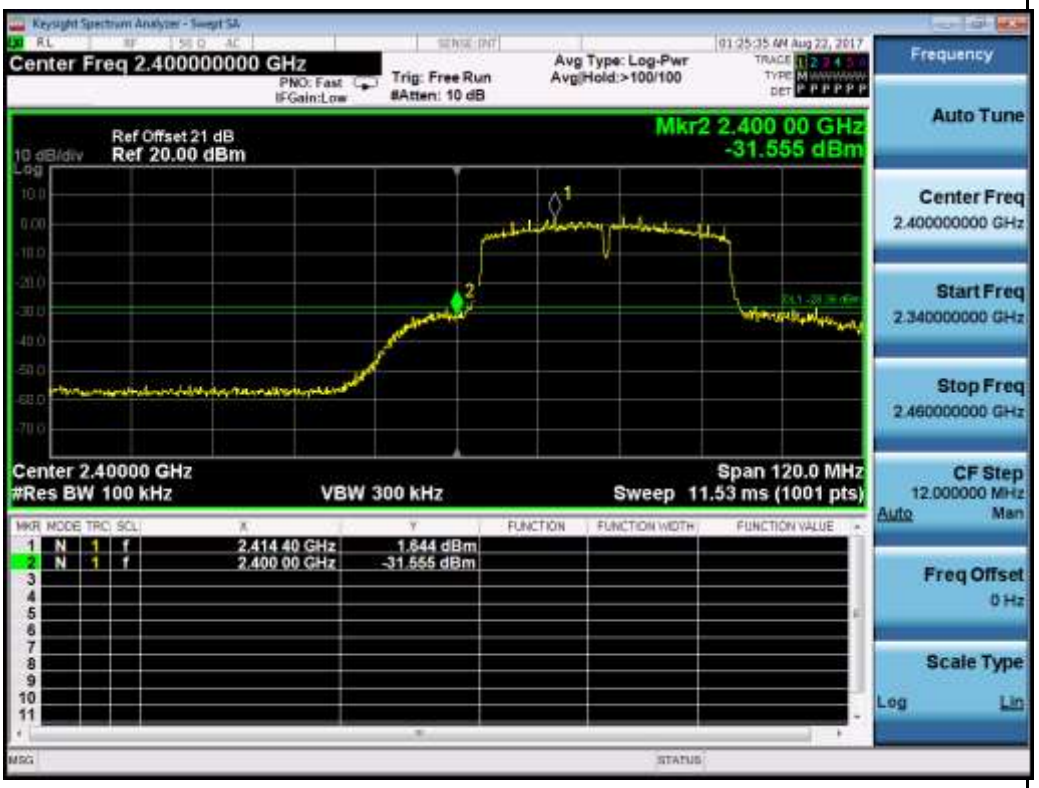


802.11n-HT20-2412MHz Chain 1

802.11n-HT20-2462MHz Chain 0



802.11n-HT20-2462MHz Chain 1



802.11n-HT40-2422MHz Chain 0

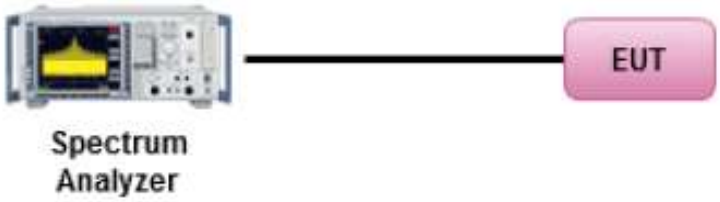
802.11n-HT40-2422MHz Chain 1

802.11n-HT40-2452MHz Chain 0

802.11n-HT40-2452MHz Chain 1

10.5 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(e) RSS247 (5.2.2)	e)	DSSS: ≤8dBm/3KHz	☒
	f)	DSSS in hybrid sys with FH turned off: ≤8dBm/3KHz	☐
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 10.2 Method PKPSD (peak PSD) Peak spectral density measurement procedure - Set analyzer center frequency to DTS channel center frequency. - Set the span to 1.5 times the DTS bandwidth. - Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz. - Set the VBW ≥ 3 x RBW. - Detector = Peak - Sweep time = auto couple. - Trace mode = Max Hold - Allow trace to fully stabilize. - Use the peak marker function to determine the maximum amplitude level within the RBW. - If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.		
Test Date	08/21/2017-10/05/2017	Environmental condition	Temperature 22ºC Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at RF test site.

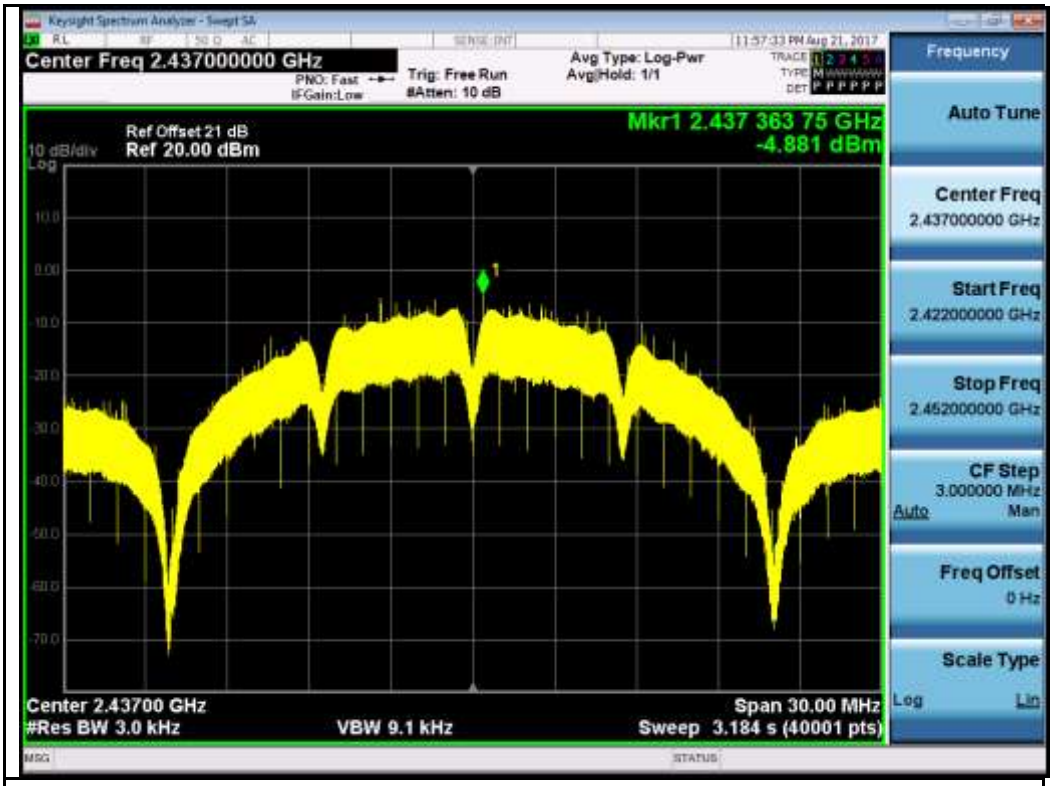
PSD measurement results

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/3KHz)			Limit (dBm/3KHz)	Result
				Chain0	Chain1	Combine		
PSD	802.11b	2412	Low	-2.217	-2.966	0.435	≤8	Pass
		2437	Mid	-4.881	-3.412	-1.074	≤8	Pass
		2462	High	-4.016	-2.994	-0.465	≤8	Pass
	802.11g	2412	Low	-10.375	-10.406	-7.380	≤8	Pass
		2437	Mid	-7.388	-7.345	-4.356	≤8	Pass
		2462	High	-10.878	-9.492	-7.120	≤8	Pass
	802.11n-20M	2412	Low	-10.978	-11.058	-8.008	≤8	Pass
		2437	Mid	-8.324	-8.183	-5.243	≤8	Pass
		2462	High	-9.228	-10.223	-6.687	≤8	Pass
	802.11n-40M	2422	Low	-12.540	-13.092	-9.797	≤8	Pass
		2437	Mid	-8.445	-9.711	-6.022	≤8	Pass
		2452	High	-14.508	-14.272	-11.378	≤8	Pass
Note	Two chains are cross-polarized, additional gain is 10 log10(NANT)=0dB,N=1 ,max directional gain of the EUT is 2.5dBi. No limit adjustment is needed. All the mode transmission is MIMO.							

Test Plots:

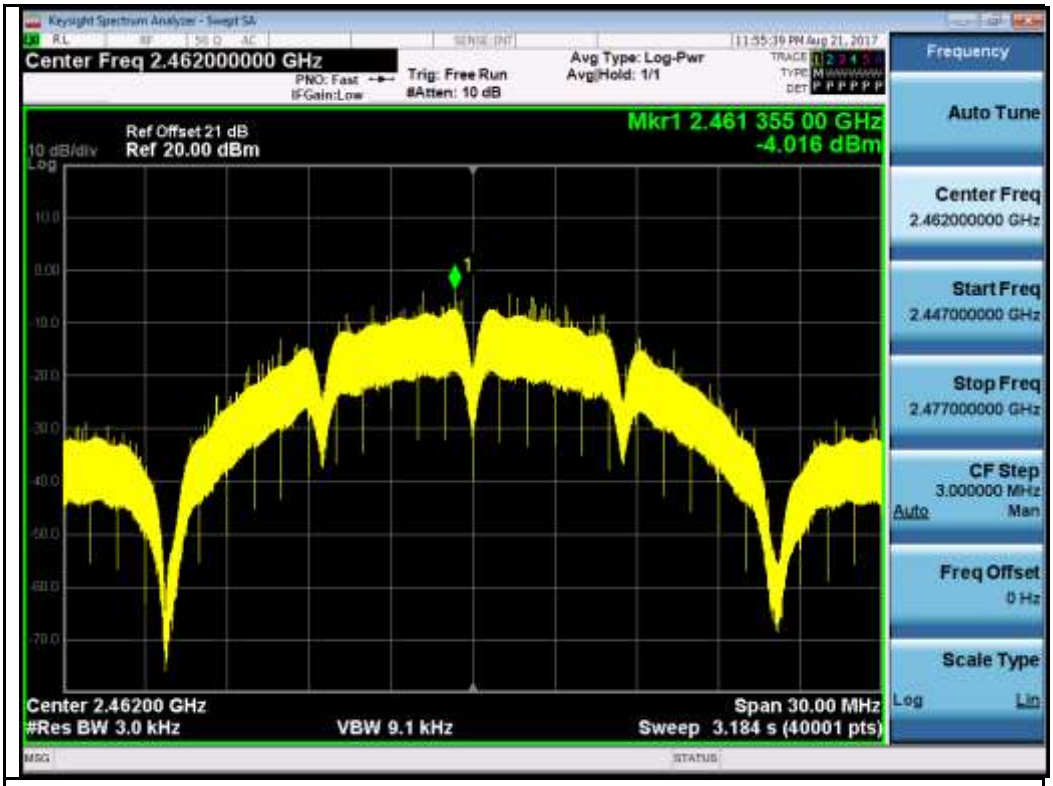
802.11b-2412MHz Chain 0

802.11b-2412MHz Chain 1



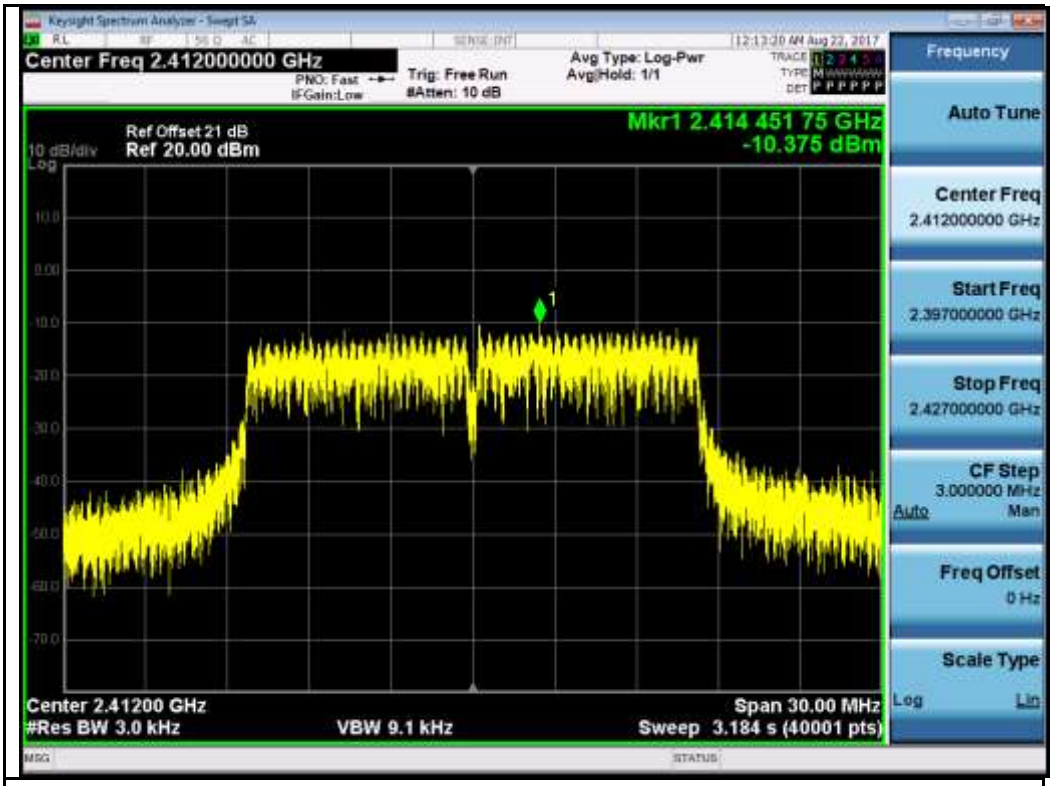
802.11b-2437MHz Chain 0

802.11b-2437MHz Chain 1

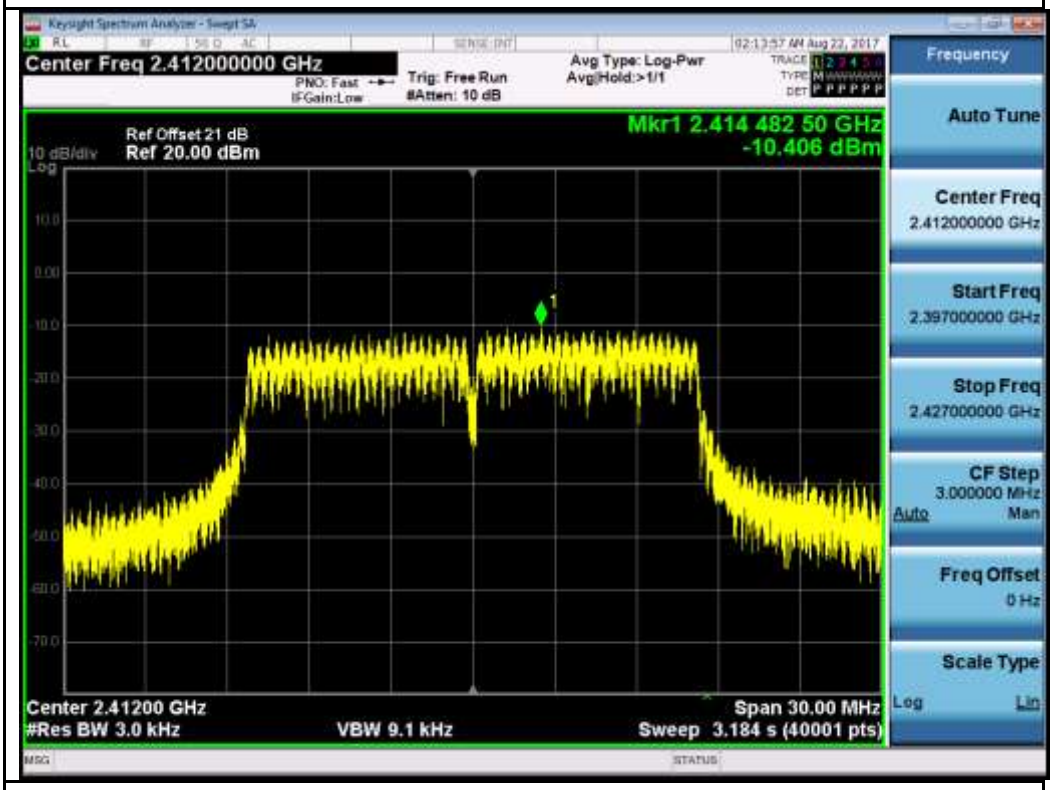


802.11b-2462MHz Chain 0

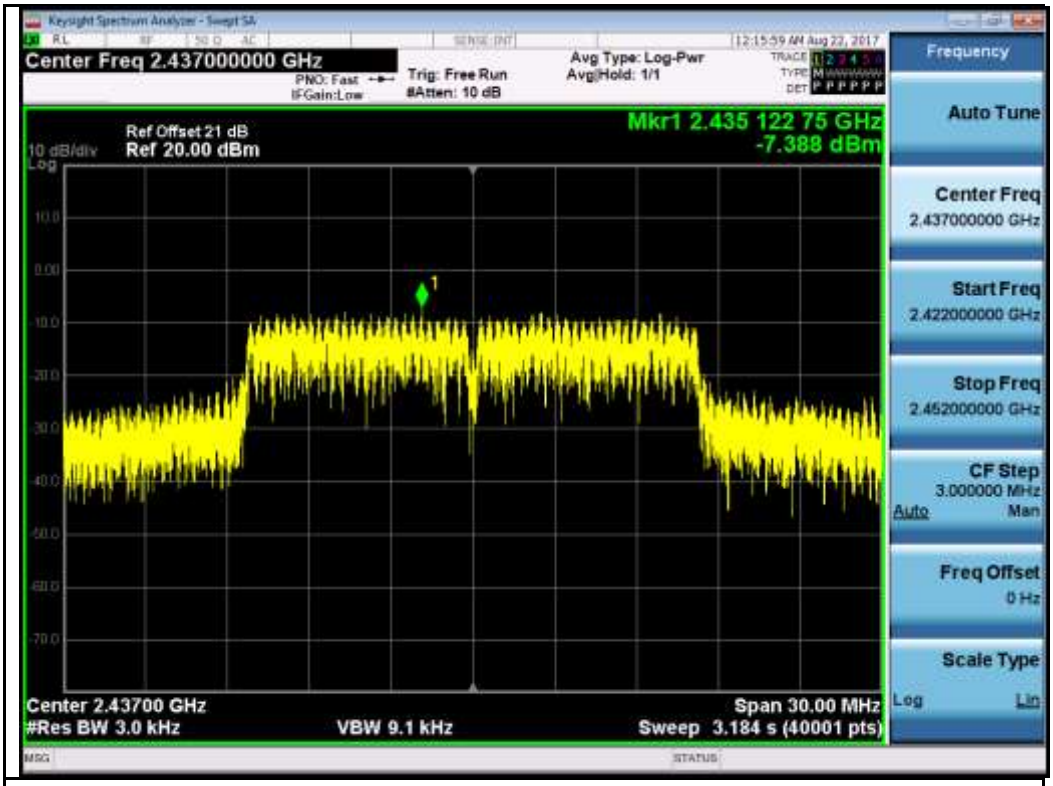
802.11b-2462MHz Chain 1



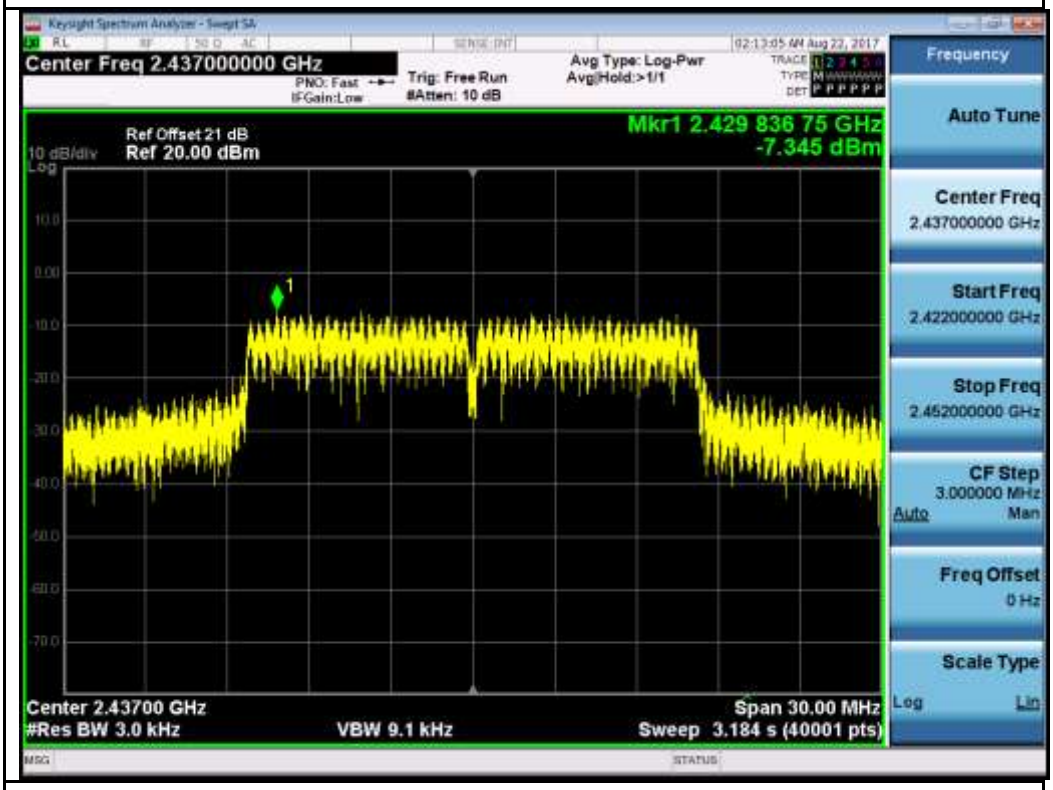
802.11g-2412MHz Chain 0



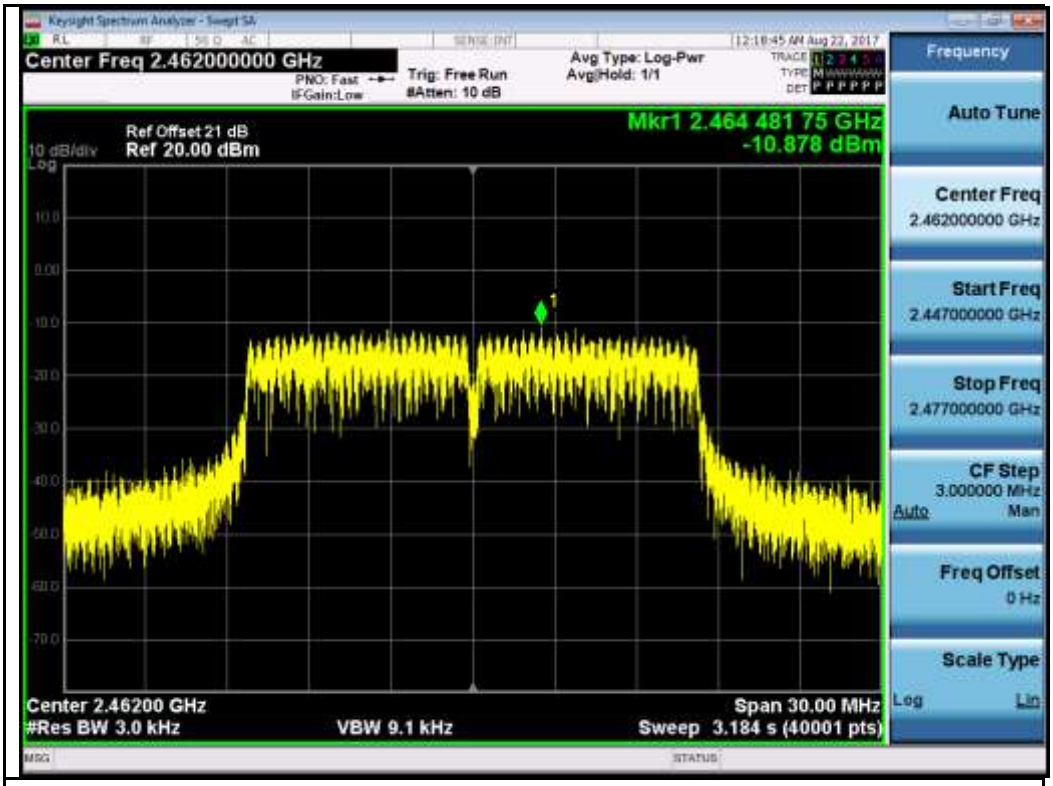
802.11g-2412MHz Chain 1



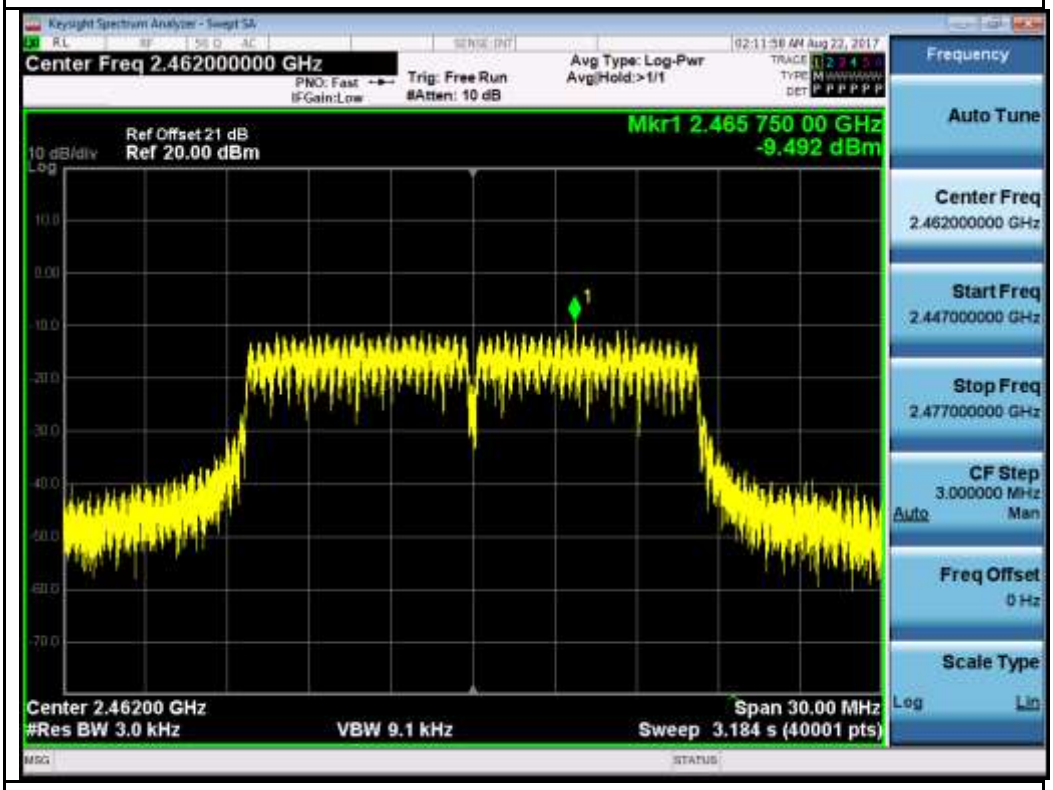
802.11g-2437MHz Chain 0



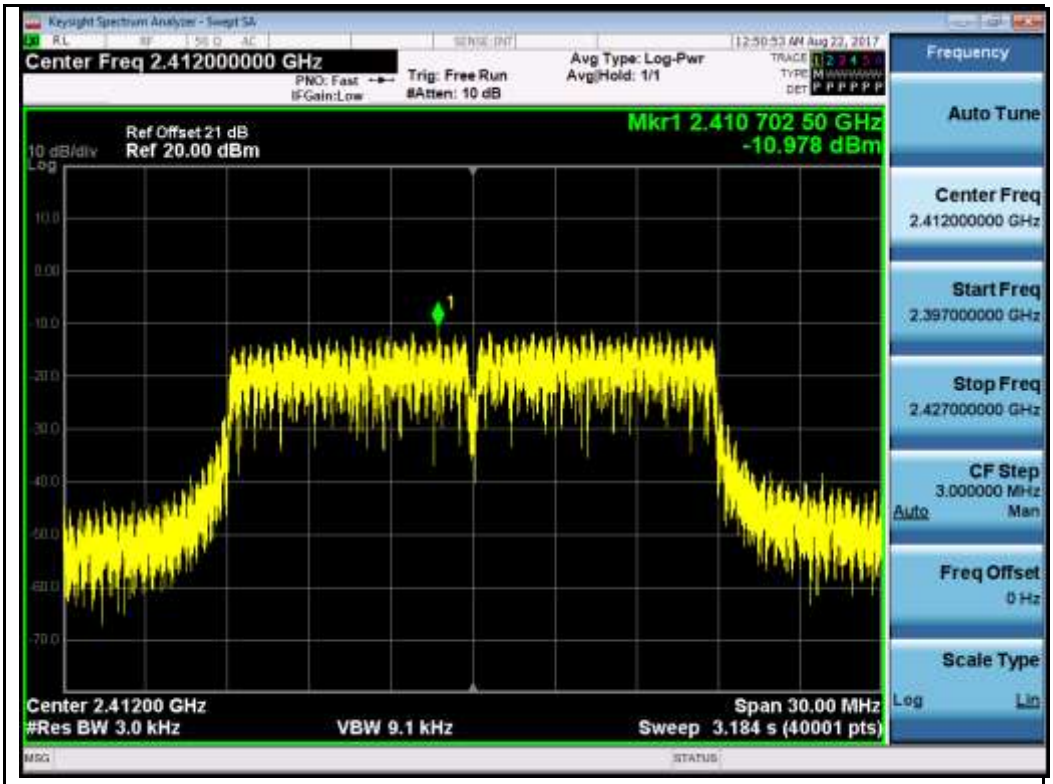
802.11g-2437MHz Chain 1



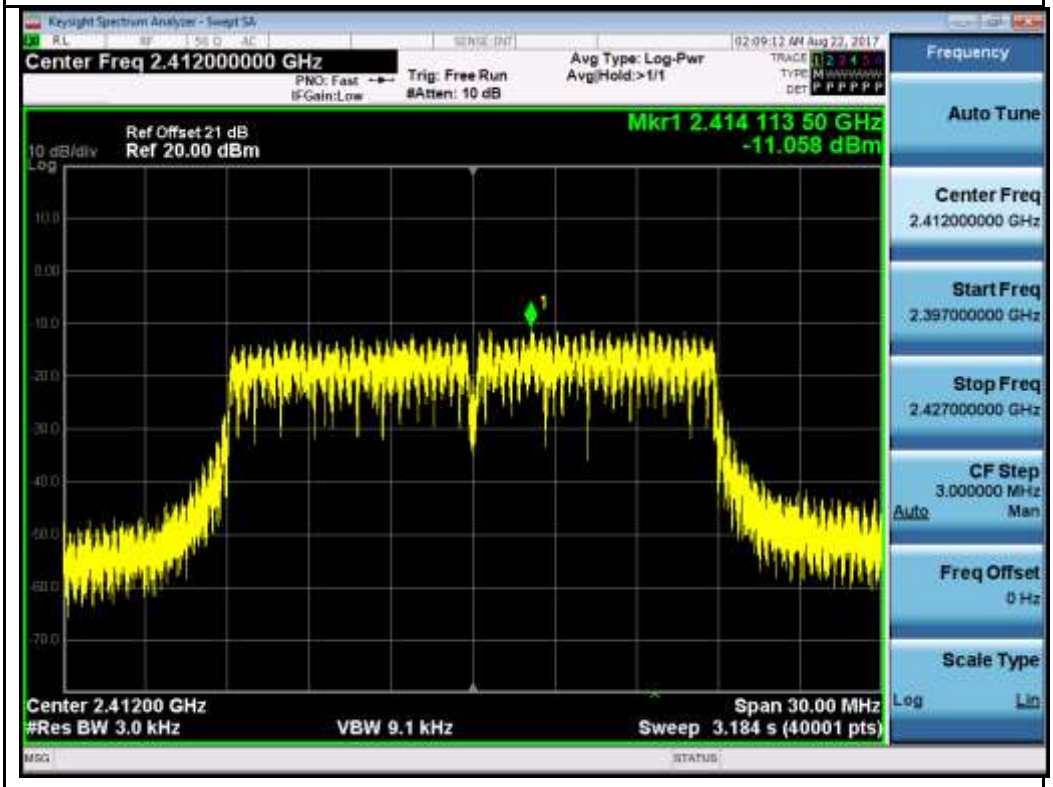
802.11g-2462MHz Chain 0



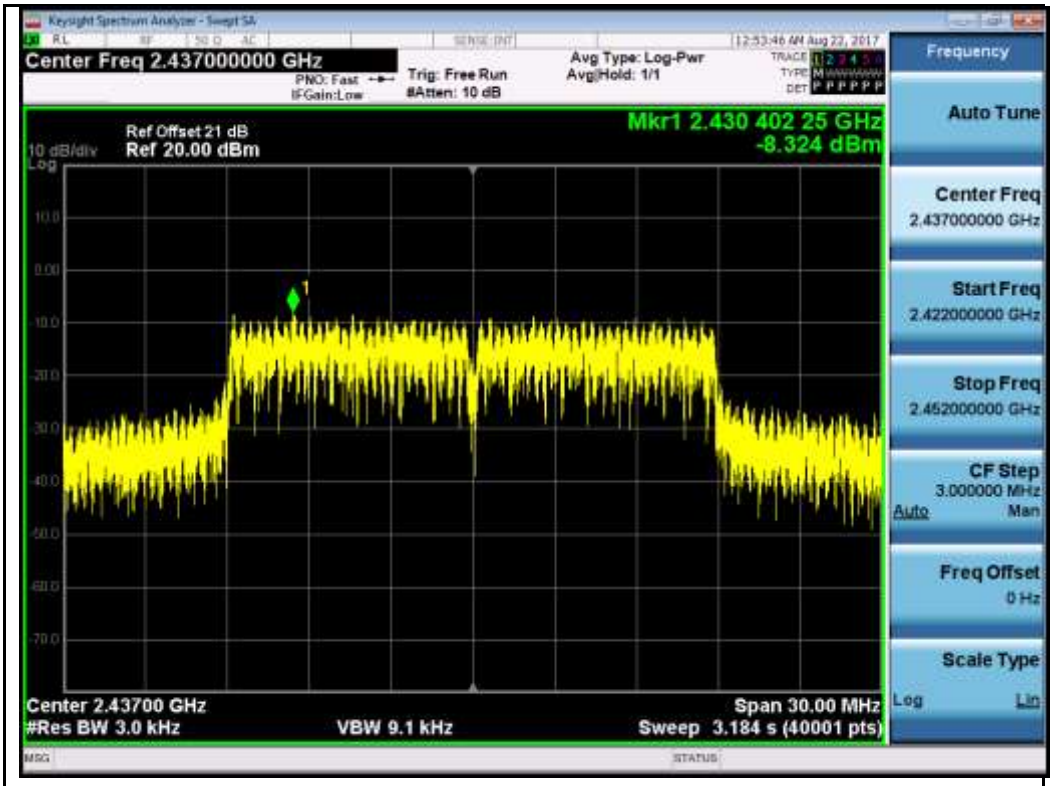
802.11g-2462MHz Chain 1



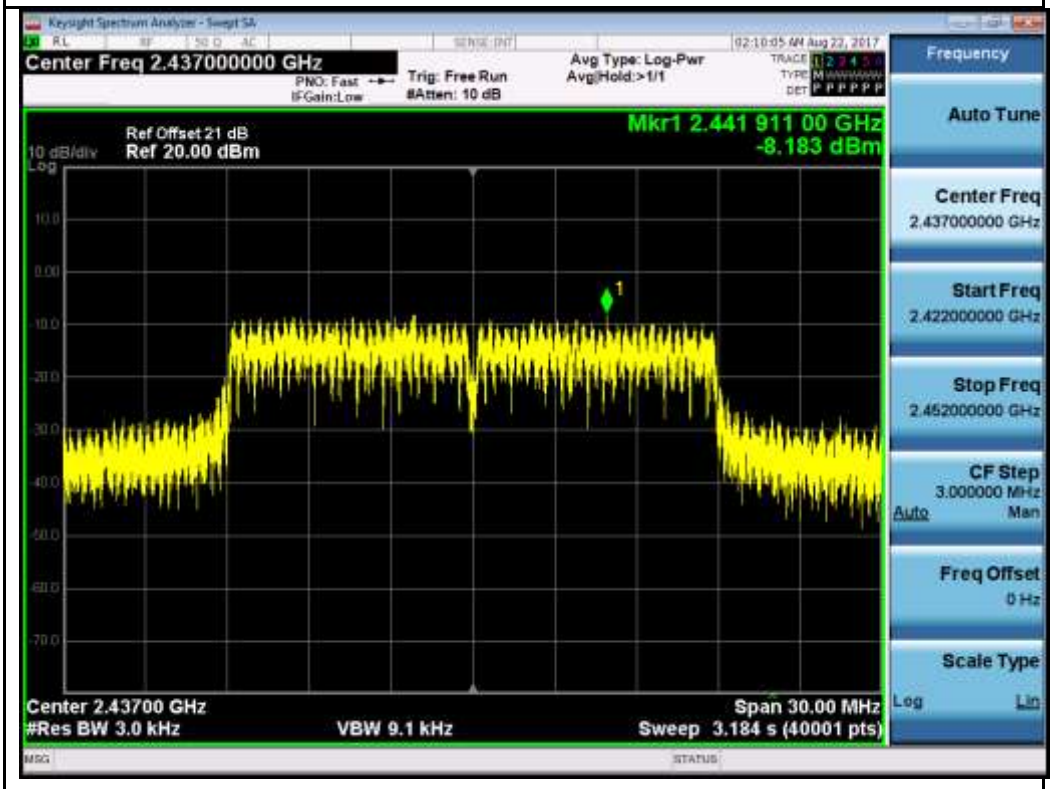
802.11n-HT20 2412MHz Chain 0



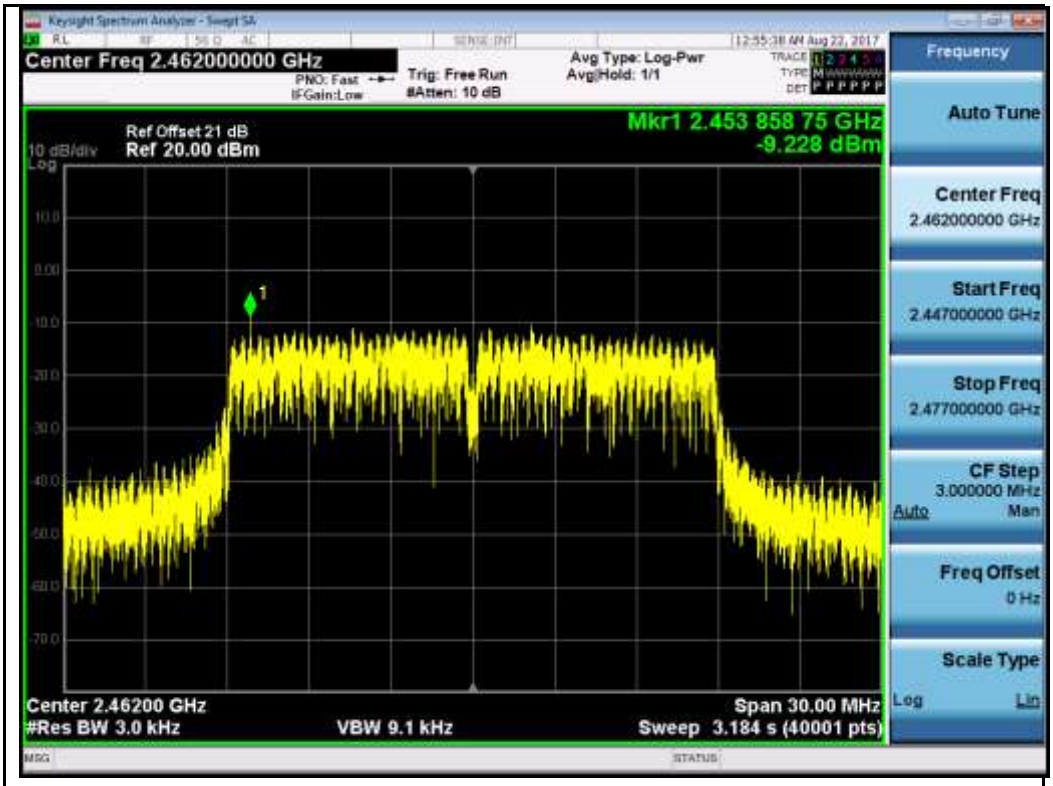
802.11n-HT20 2412MHz Chain 1



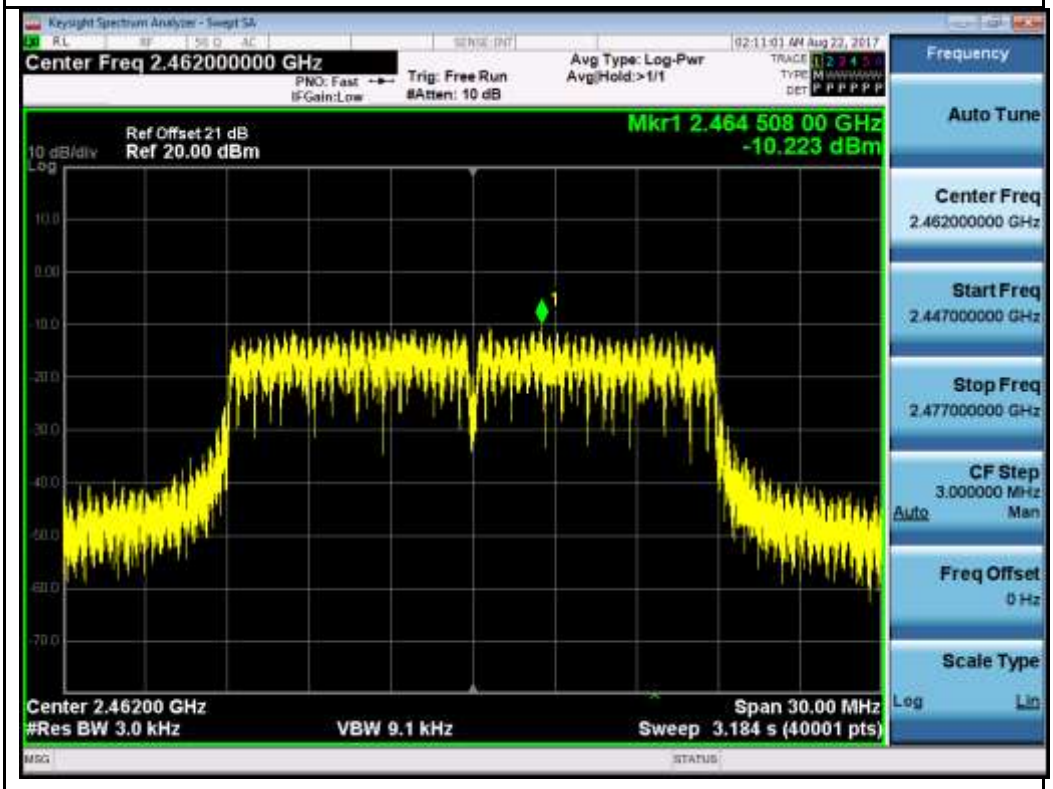
802.11n-HT20 2437MHz Chain 0



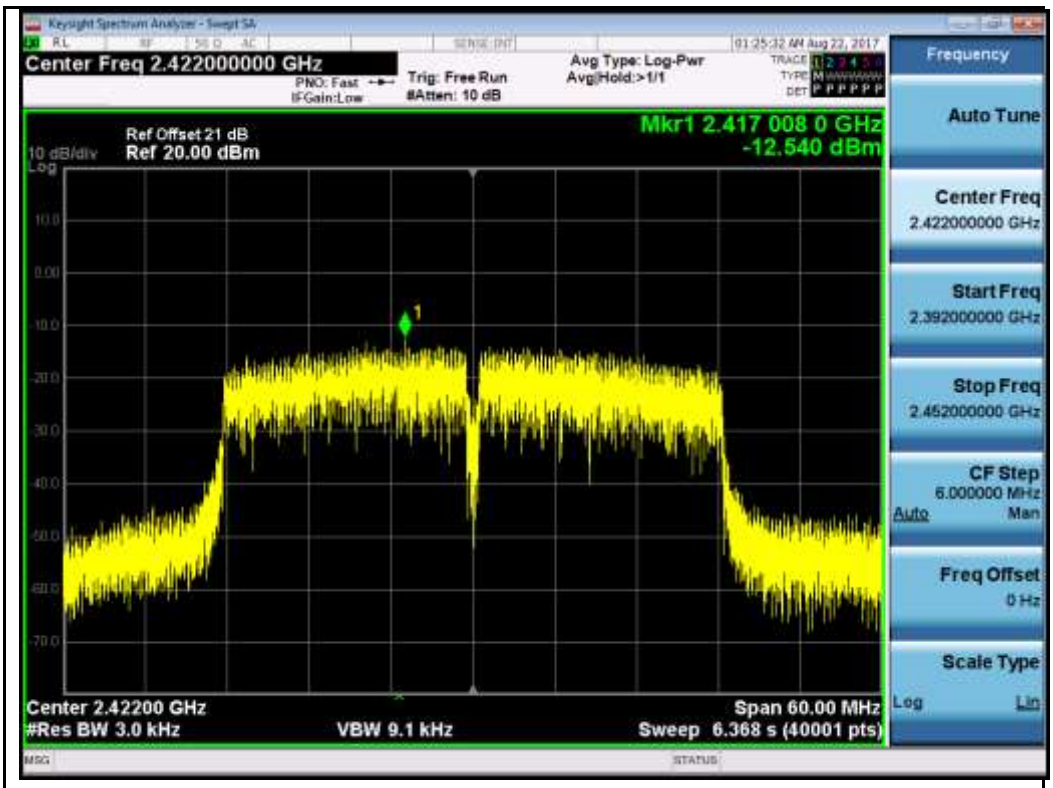
802.11n-HT20 2437MHz Chain 1



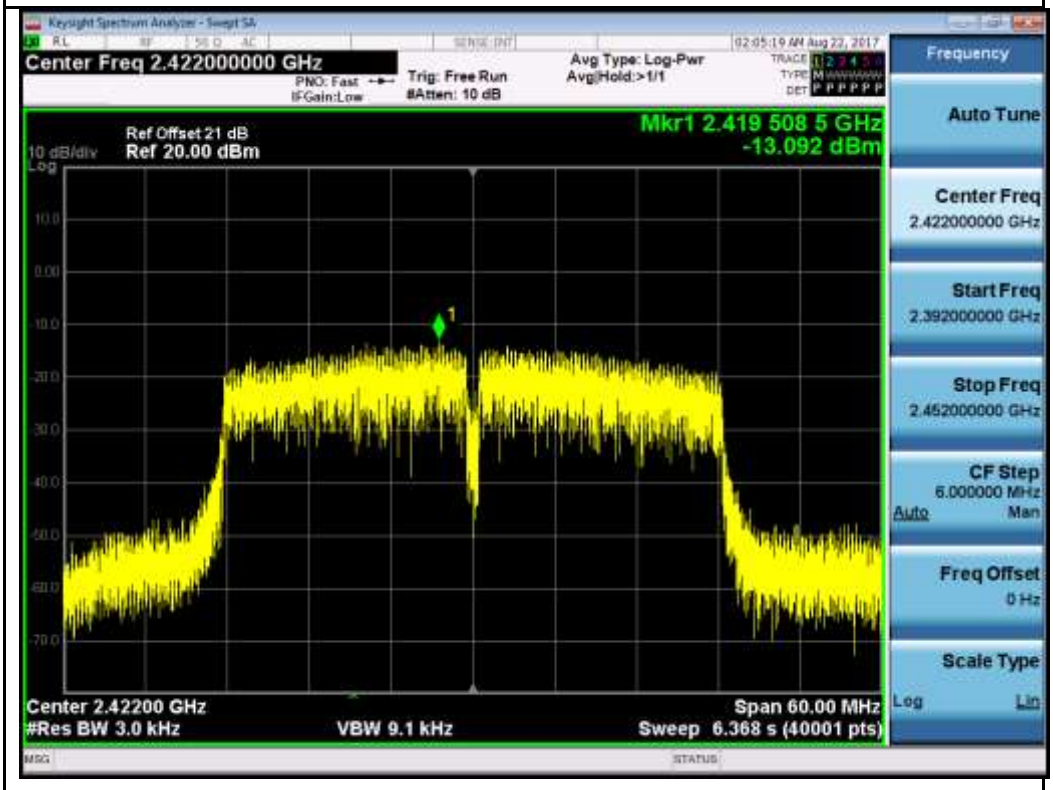
802.11n-HT20 2462MHz Chain 0



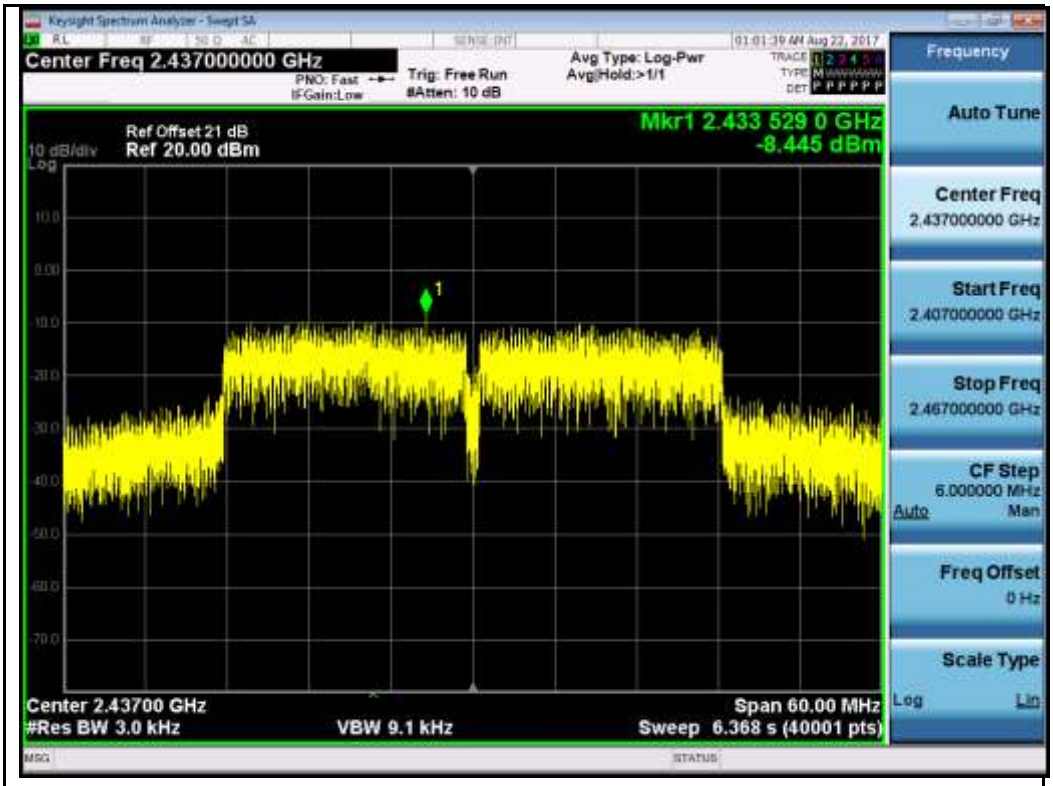
802.11n-HT20 2462MHz Chain 1



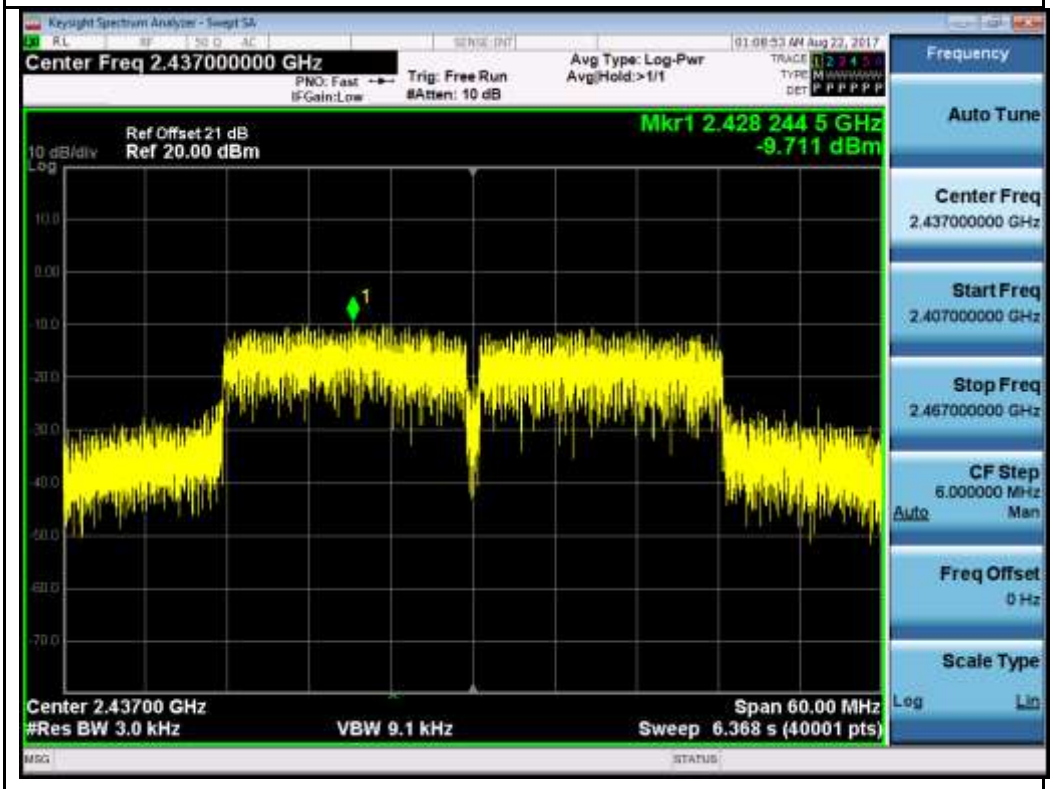
802.11n-HT40 2422MHz Chain 0



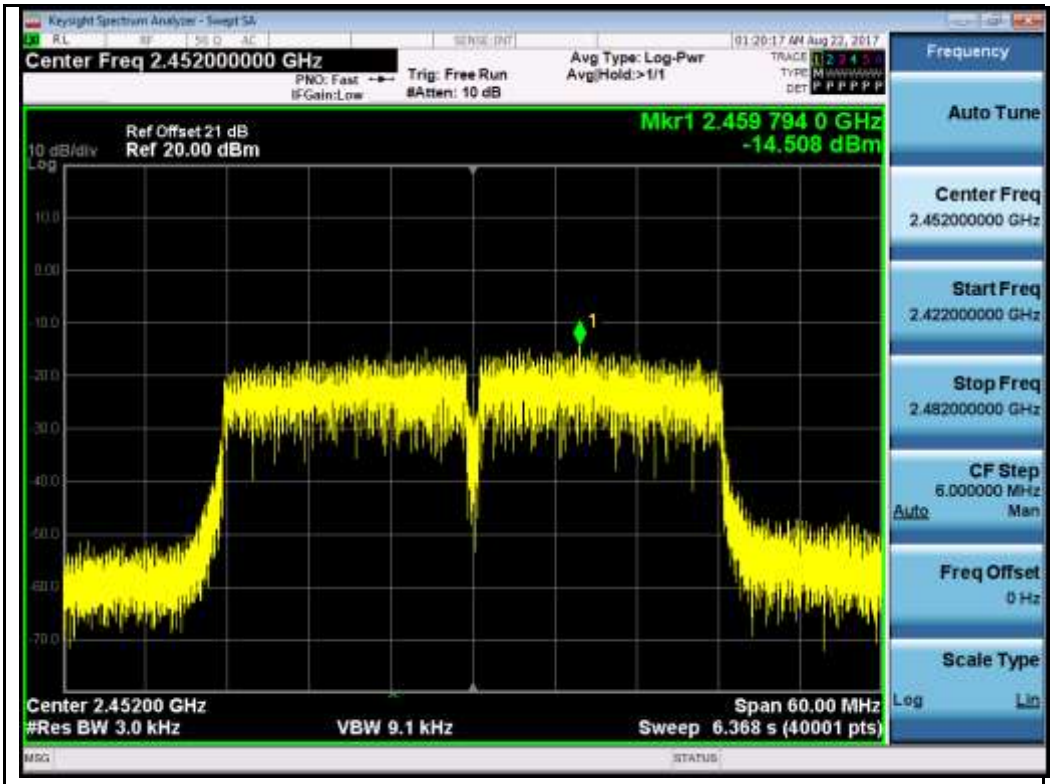
802.11n-HT40 2422MHz Chain 1



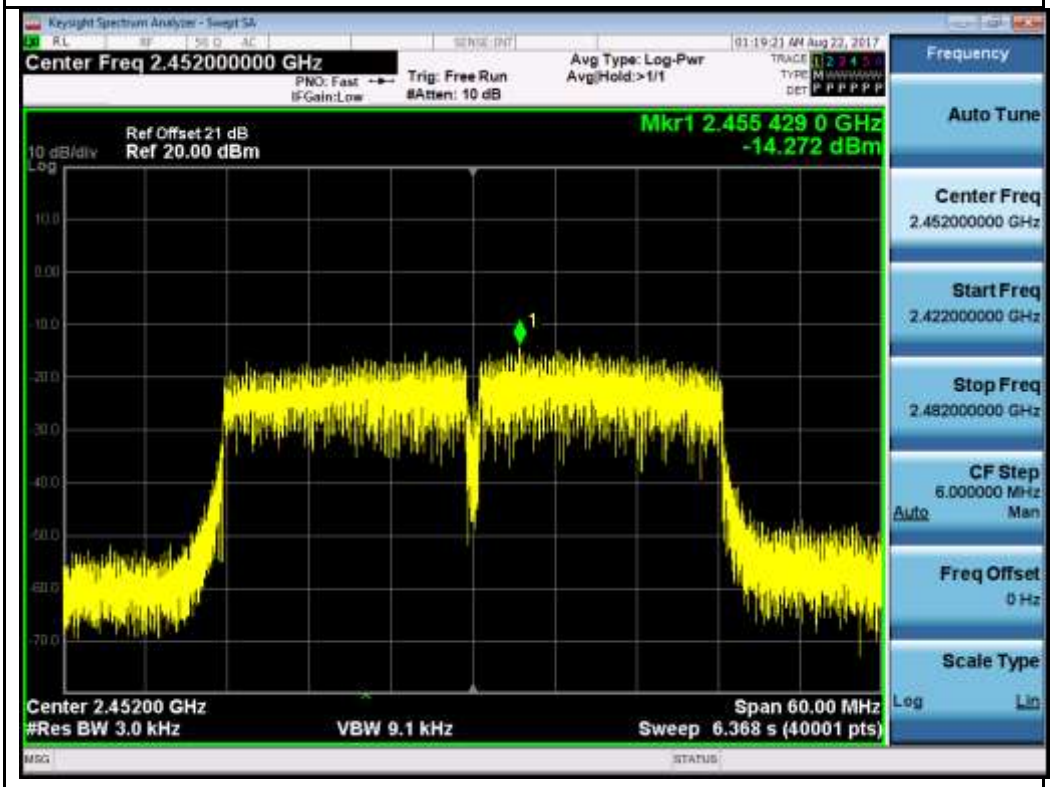
802.11n-HT40 2437MHz Chain 0



802.11n-HT40 2437MHz Chain 1



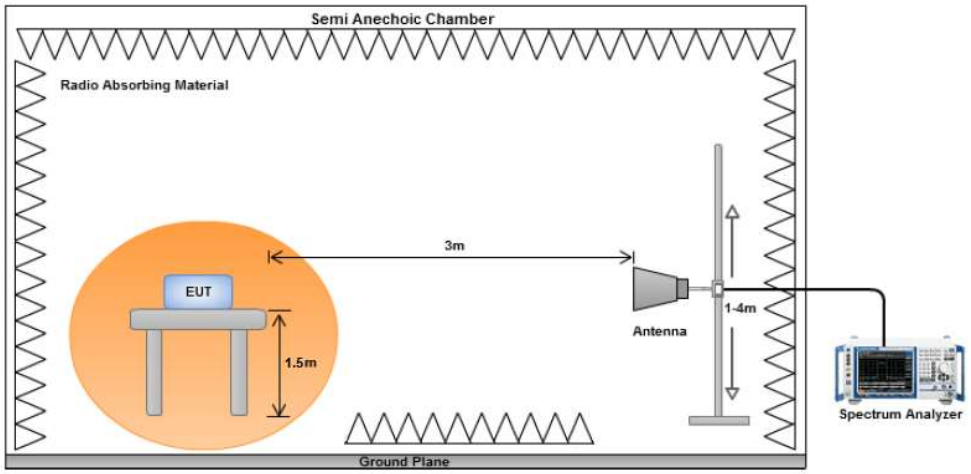
802.11n-HT40 2452MHz Chain 0



802.11n-HT40 2452MHz Chain 1

10.6 Radiated Spurious Emissions in restricted band

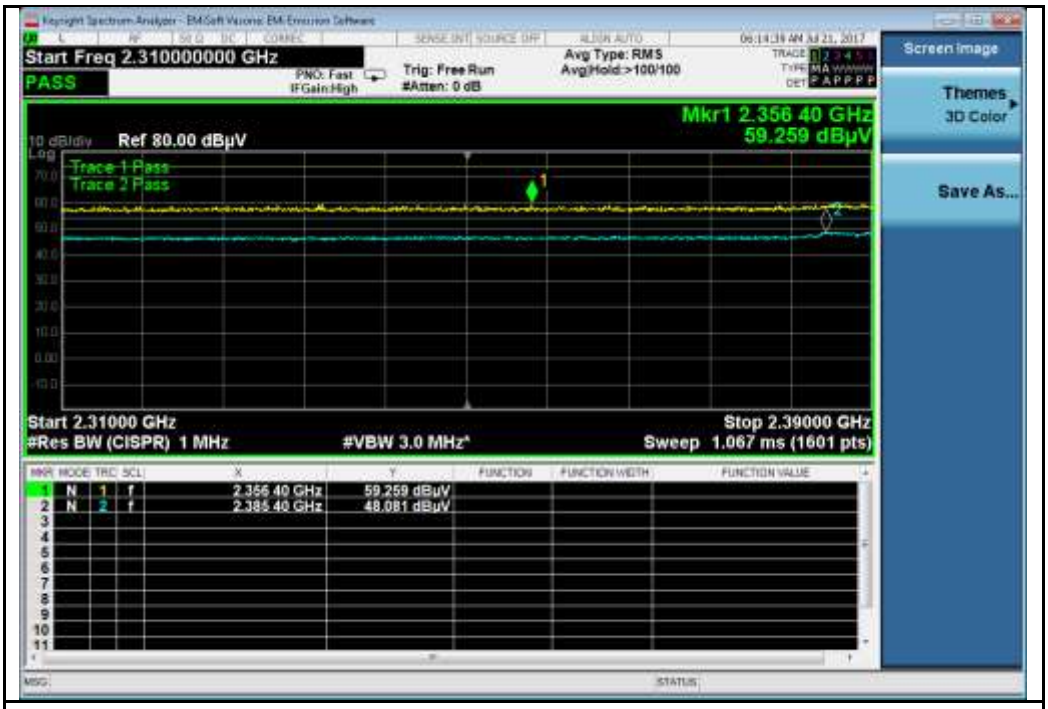
Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(A8.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or 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. Radiated measurement was measured with antenna port terminated, there isn't outstanding emission found at the edge of restricted frequency, within x dB margin	
Result		☒ Pass ☐ Fail	

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

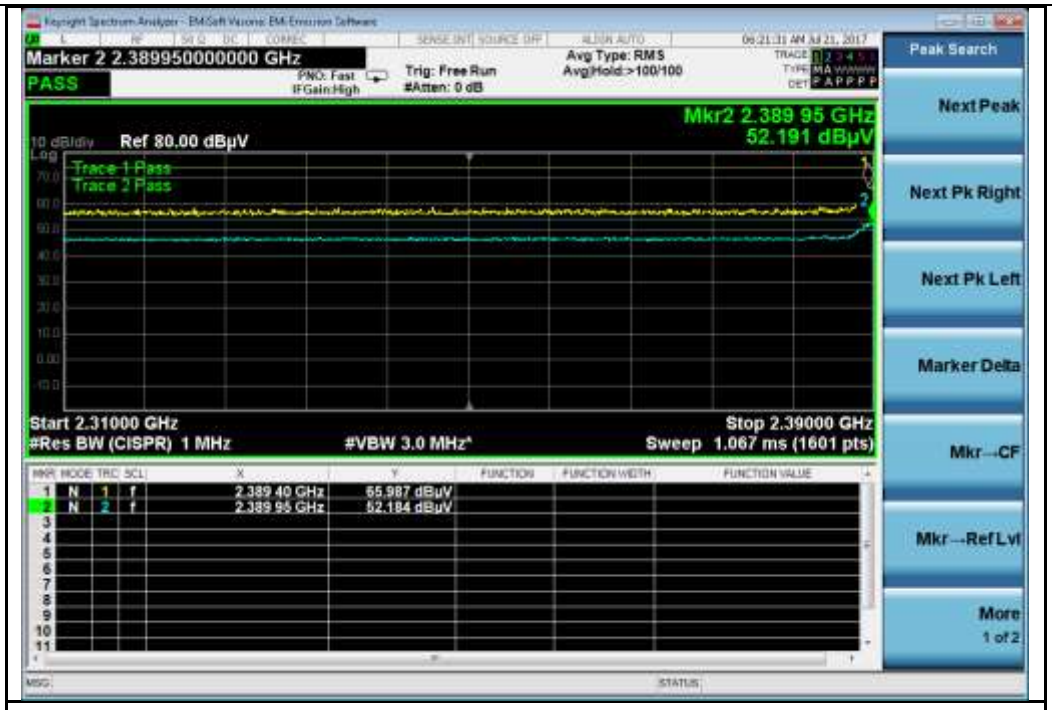
Test was done by Cipher at 10m chamber.

Restricted Band Measurement Plots:



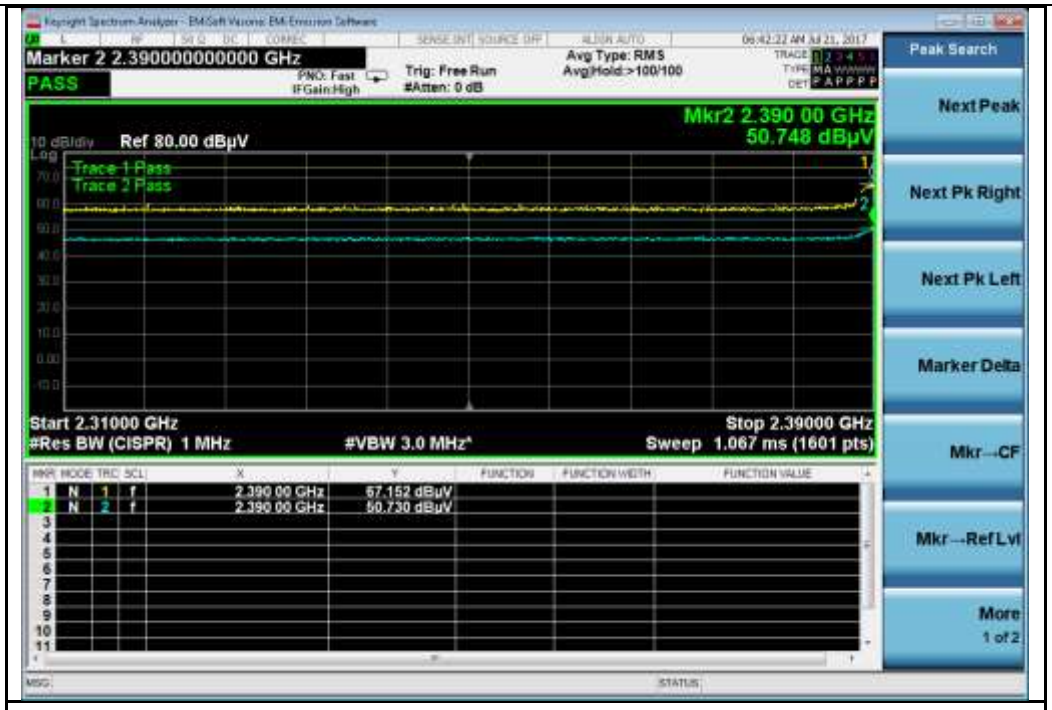
802.11b-2412MHz

802.11b-2462MHz

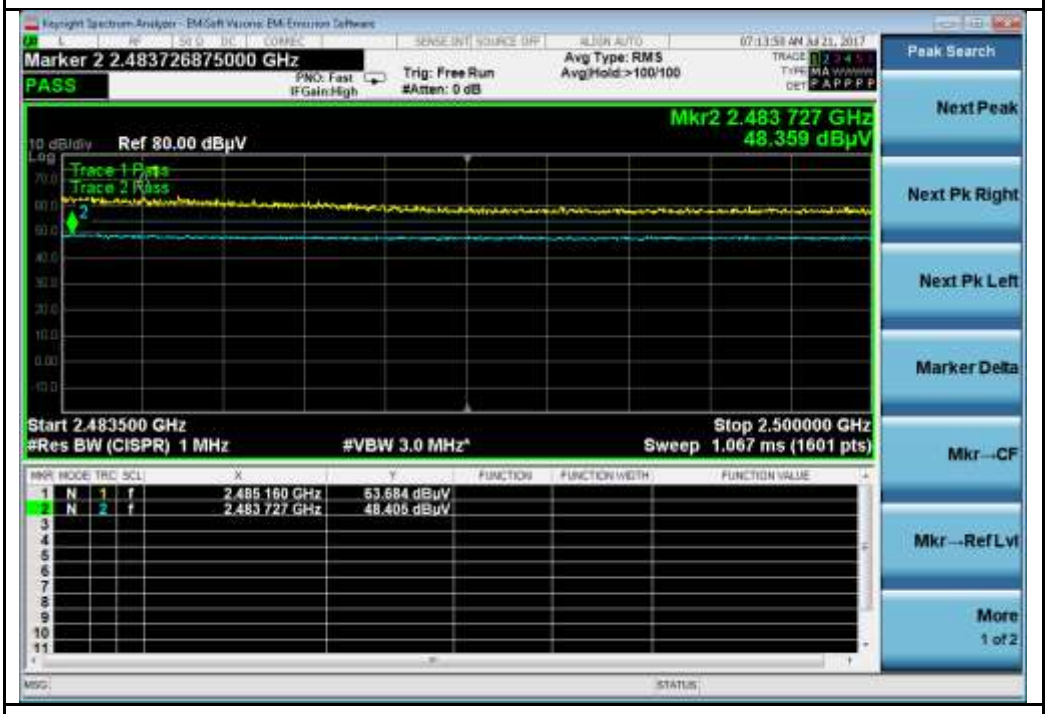


802.11g-2412MHz

802.11g-2462MHz



802.11n-HT20-2412MHz



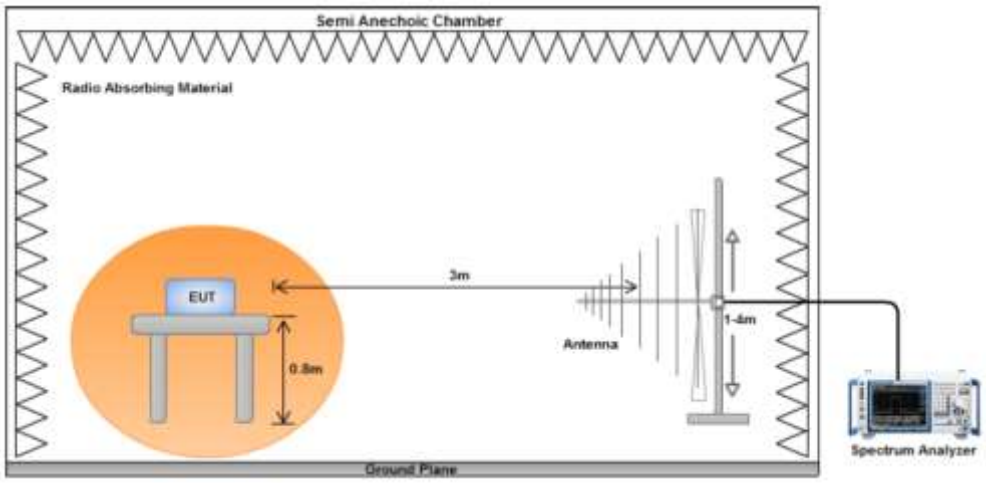
802.11n-HT20-2462MHz

802.11n-HT40-2422MHz

802.11n-HT40-2452MHz

10.7 Radiated Spurious Emissions below 1GHz

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.247(d)
RSS247 (5.5)</td><td>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="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">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="3">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="3">☒ Pass ☐ Fail</td></tr>
</table>

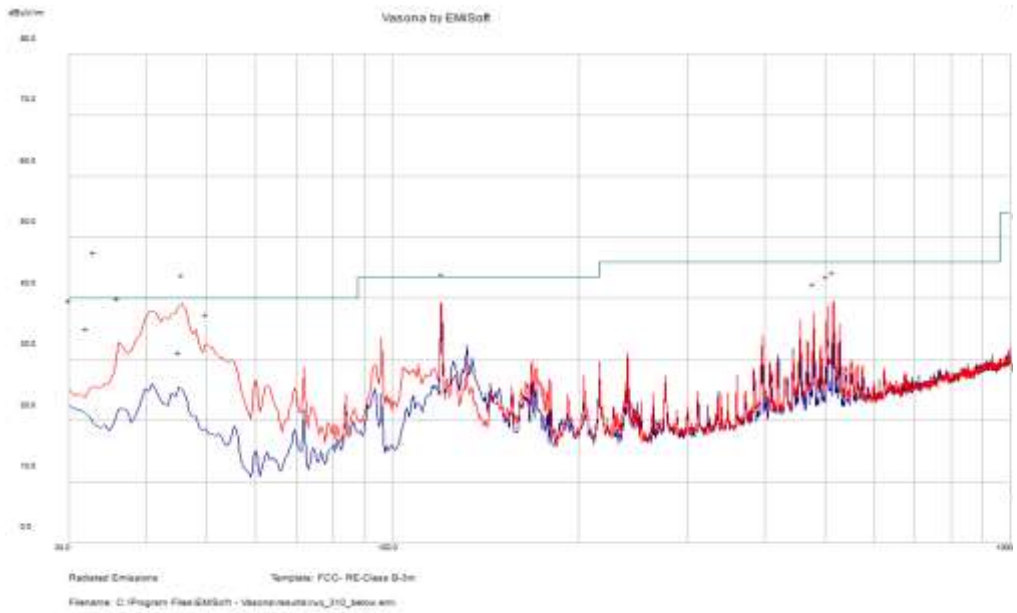
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Shuo Zhang at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	23	Result	Pass
	Humidity (%)	46		
	Atmospheric (mbar):	1018		
Mains Power:	120VAC, 60Hz			
Tested by:	Shuo Zhang			
Test Date:	08/21/2017-10/05/2017			
Remarks:	802.11n HT40, middle channel			



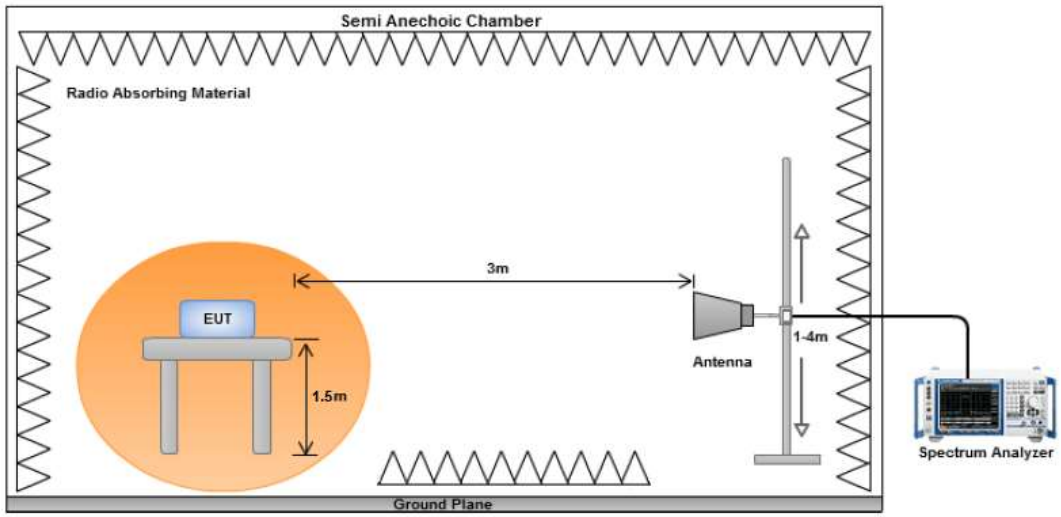
Quasi Max Measurements

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
45.56	42.84	11.53	-25.38	28.99	Quasi Max	V	246	8	40	-11.01	Pass
120.08	41.79	12.25	-22.85	31.19	Quasi Max	V	159	181	43.5	-12.31	Pass
516.06	36.94	14.76	-18.71	32.98	Quasi Max	V	100	55	46	-13.02	Pass
504.16	33.6	14.63	-18.6	29.63	Quasi Max	V	100	36	46	-16.37	Pass
50.16	41.08	11.58	-26.88	25.78	Quasi Max	V	152	309	40	-14.22	Pass
480.04	36.96	14.55	-19.06	32.45	Quasi Max	V	115	66	46	-13.55	Pass

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

10.8 Radiated Spurious Emissions between 1GHz – 25GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS210(A8.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or 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. There isn't outstanding emission found at the edge of restricted frequency.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Shuo Zhang at 10m chamber.

Radiated Emission Test Results (Above 1GHz)

Above 1GHz-25GHz – 802.11b – 2412MHz

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
4823.77	55.37	4.17	-2.06	57.47	Peak Max	H	277	122	74	-16.53	Pass
8873.76	38.74	6	1.39	46.13	Peak Max	V	230	260	74	-27.88	Pass
3872.20	39.39	3.77	-2.39	40.78	Peak Max	V	361	64	74	-33.22	Pass
4823.77	38.01	4.17	-2.06	40.12	Average Max	H	277	122	54	-13.88	Pass
8873.76	25.88	6	1.39	33.27	Average Max	V	230	260	54	-20.73	Pass
3872.20	27.3	3.77	-2.39	28.68	Average Max	V	361	64	54	-25.32	Pass

Above 1GHz-25GHz- 802.11b - 2437MHz

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
4874.10	49.67	4.2	-2.14	51.73	Peak Max	H	335	299	74	-22.27	Pass
9686.75	38.21	6.56	1.12	45.89	Peak Max	H	233	211	74	-28.11	Pass
3944.08	39.41	3.81	-2.26	40.96	Peak Max	V	328	198	74	-33.04	Pass
4874.10	32.33	4.2	-2.14	34.39	Average Max	H	335	299	54	-19.61	Pass
9686.75	26.21	6.56	1.12	33.89	Average Max	H	233	211	54	-20.11	Pass
3944.08	26.55	3.81	-2.26	28.09	Average Max	V	328	198	54	-25.91	Pass

Above 1GHz-25GHz – 802.11b – 2462MHz

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
9647.49	38.29	6.56	1.26	46.11	Peak Max	H	247	332	74	-27.89	Pass
4924.08	48.74	4.23	-2.18	50.79	Peak Max	H	222	109	74	-23.21	Pass
5216.98	38.9	4.54	-1.64	41.8	Peak Max	V	334	319	74	-32.2	Pass
9647.49	26.03	6.56	1.26	33.85	Average Max	H	247	332	54	-20.15	Pass
4924.08	34.3	4.23	-2.18	36.35	Average Max	H	222	109	54	-17.65	Pass
5216.98	26.82	4.54	-1.64	29.72	Average Max	V	334	319	54	-24.28	Pass

Above 1GHz-25GHz- 802.11g - 2412MHz

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
9049.19	38.81	6.11	1.39	46.32	Peak Max	H	143	237	74	-27.68	Pass
4830.82	38.34	4.17	-2.07	40.44	Peak Max	V	270	169	74	-33.56	Pass
3613.50	39.76	3.63	-3.35	40.04	Peak Max	V	109	337	74	-33.96	Pass
9049.19	26.26	6.11	1.39	33.77	Average Max	H	143	237	54	-20.23	Pass
4830.82	26.86	4.17	-2.07	28.96	Average Max	V	270	169	54	-25.04	Pass
3613.50	27.36	3.63	-3.35	27.65	Average Max	V	109	337	54	-26.35	Pass

Above 1GHz-25GHz – 802.11g – 2437MHz

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
9608.32	38.62	6.57	1.4	46.59	Peak Max	H	103	24	74	-27.41	Pass
4875.40	45.38	4.2	-2.14	47.44	Peak Max	H	148	81	74	-26.56	Pass
7312.17	37.76	5.35	0.93	44.04	Peak Max	V	310	97	74	-29.97	Pass
9608.32	26.67	6.57	1.4	34.64	Average Max	H	103	24	54	-19.36	Pass
4875.40	27.09	4.2	-2.14	29.14	Average Max	H	148	81	54	-24.86	Pass
7312.17	25.79	5.35	0.93	32.07	Average Max	V	310	97	54	-21.94	Pass

Above 1GHz-25GHz- 802.11g - 2462MHz

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
9451.48	38.22	6.54	1.73	46.49	Peak Max	H	334	20	74	-27.51	Pass
4864.23	39.14	4.19	-2.13	41.2	Peak Max	V	166	100	74	-32.8	Pass
3610.30	39.42	3.63	-3.35	39.7	Peak Max	V	377	277	74	-34.3	Pass
9451.48	26.38	6.54	1.73	34.65	Average Max	H	334	20	54	-19.35	Pass
4864.23	27.03	4.19	-2.13	29.09	Average Max	V	166	100	54	-24.91	Pass
3610.30	27.33	3.63	-3.35	27.61	Average Max	V	377	277	54	-26.39	Pass

Above 1GHz-25GHz- 802.11n20 - 2412MHz

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
9591.19	38.83	6.57	1.48	46.88	Peak Max	V	378	249	74	-27.12	Pass
4824.93	44.79	4.17	-2.06	46.89	Peak Max	H	231	275	74	-27.11	Pass
3953.45	39.77	3.82	-2.25	41.34	Peak Max	V	270	83	74	-32.67	Pass
9591.19	26.51	6.57	1.48	34.57	Average Max	V	378	249	54	-19.43	Pass
4824.93	26.99	4.17	-2.06	29.1	Average Max	H	231	275	54	-24.9	Pass
3953.45	26.95	3.82	-2.25	28.52	Average Max	V	270	83	54	-25.48	Pass

Above 1GHz-25GHz – 802.11n20 – 2437MHz

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
9587.58	37.89	6.57	1.51	45.97	Peak Max	H	362	198	74	-28.03	Pass
4870.57	41.57	4.2	-2.14	43.63	Peak Max	H	147	269	74	-30.38	Pass
3814.28	39.95	3.74	-2.5	41.2	Peak Max	V	376	308	74	-32.8	Pass
9587.58	26.39	6.57	1.51	34.47	Average Max	H	362	198	54	-19.53	Pass
4870.57	26.93	4.2	-2.14	28.99	Average Max	H	147	269	54	-25.01	Pass
3814.28	27.37	3.74	-2.5	28.62	Average Max	V	376	308	54	-25.38	Pass

Above 1GHz-25GHz- 802.11n20 - 2462MHz

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
9693.06	38.35	6.55	1.1	46.01	Peak Max	H	299	298	74	-27.99	Pass
3875.34	39.53	3.78	-2.38	40.93	Peak Max	V	132	131	74	-33.08	Pass
3256.34	41.58	3.5	-3.85	41.23	Peak Max	V	103	70	74	-32.77	Pass
9693.06	26.37	6.55	1.1	34.03	Average Max	H	299	298	54	-19.97	Pass
3875.34	27.48	3.78	-2.38	28.87	Average Max	V	132	131	54	-25.13	Pass
3256.34	28.4	3.5	-3.85	28.05	Average Max	V	103	70	54	-25.95	Pass

Above 1GHz-25GHz- 802.11n40 - 2422MHz

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
9608.46	38.97	6.57	1.4	46.94	Peak Max	V	225	181	74	-27.06	Pass
4843.99	39.59	4.18	-2.09	41.67	Peak Max	H	121	14	74	-32.33	Pass
3795.36	39.43	3.73	-2.56	40.61	Peak Max	V	112	270	74	-33.4	Pass
9608.46	26.98	6.57	1.4	34.95	Average Max	V	225	181	54	-19.05	Pass
4843.99	27.5	4.18	-2.09	29.59	Average Max	H	121	14	54	-24.41	Pass
3795.36	27.53	3.73	-2.56	28.71	Average Max	V	112	270	54	-25.29	Pass

Above 1GHz-25GHz – 802.11n40 – 2437MHz

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
9454.23	38.64	6.54	1.75	46.94	Peak Max	V	113	74	74	-27.06	Pass
4875.49	45.71	4.2	-2.14	47.76	Peak Max	H	231	288	74	-26.24	Pass
5978.37	39.17	4.79	-0.26	43.7	Peak Max	V	124	276	74	-30.3	Pass
9454.23	26.3	6.54	1.75	34.59	Average Max	V	113	74	54	-19.41	Pass
4875.49	27.66	4.2	-2.14	29.71	Average Max	H	231	288	54	-24.29	Pass
5978.37	26.34	4.79	-0.26	30.88	Average Max	V	124	276	54	-23.13	Pass

Above 1GHz-25GHz- 802.11n40 - 2452MHz

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
9505.45	39.04	6.59	2.03	47.65	Peak Max	H	273	39	74	-26.35	Pass
4779.91	39.01	4.14	-2.12	41.04	Peak Max	V	355	301	74	-32.96	Pass
3884.54	39.93	3.78	-2.37	41.34	Peak Max	V	268	307	74	-32.66	Pass
9505.45	26.26	6.59	2.03	34.88	Average Max	H	273	39	54	-19.13	Pass
4779.91	27.09	4.14	-2.12	29.11	Average Max	V	355	301	54	-24.89	Pass
3884.54	27.42	3.78	-2.37	28.84	Average Max	V	268	307	54	-25.16	Pass

Annex 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	☑
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