RF TEST REPORT

Report No.: FCC IC_SL18031402-SEV-005_DTS
Supersede Report No.:

Applicant	:	Lippert Components Inc.
Product Name	:	WiFi On-The-Go
Model No.	:	WE826-T
Test Standard	:	47 CFR 15.247
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v04
FCC ID	:	XNI-IDS23004
IC ID	:	23958-IDS23004
Dates of test	:	05/11/2018-05/27/2018
Issue Date	:	05/29/2018
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
	
Deon Dai	Chen Ge
Test Engineer	Engineer Reviewer

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

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_SL18031402-SEV-005_DTS	None	Original	05/29/2018

2 Executive Summary

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

Company: Lippert Components Inc.
Product: WiFi On-The-Go
Model: WE826-T

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	:	Lippert Components Inc.
Applicant Address	:	6801 15 Mile Rd. Sterling Heights, MI 48312
Manufacturer Name	:	Lippert Components Inc.
Manufacturer Address	:	6801 15 Mile Rd. Sterling Heights, MI 48312

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	WiFi On-The-Go
Model No.	WE826-T
Trade Name	WiFi On-The-Go
Serial No.	N/A
Host Model No.	N/A
Input Power	12V DC, 1A
Power Adapter Manu/Model	012D12
Power Adapter SN	N/A
Date of EUT received	March 18,2018
Equipment Class/ Category	DTS
Port/Connectors	1xUSB, 4x CAT5 LAN, 1x CAT5 WAN, 2xSMA – WiFi, 2xSMA - LTE

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	Dipole Antenna			
Antenna Gain (Peak)	2.4GHz: 5 dBi			
Antenna Connector Type	SMA			
Note	N/A			

EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	10
802.11-b	2437	10
802.11-b	2462	10
802.11-g	2412	06
802.11-g	2437	06
802.11-g	2462	06
802.11-n-20	2412	06
802.11-n-20	2437	06
802.11-n-20	2462	06
802.11-n-40	2422	04
802.11-n-40	2437	04
802.11-n-40	2452	04

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	2	Unshielded	-
-	-	-	-	-	-	-	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	MT7620QA	Set the EUT to transmit continuously in different test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	☒ Pass ☐ N/A
	IC	RSS Gen 8.10	IC		
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☒ Pass ☐ N/A
	IC	RSS Gen 8.8	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 v04	☒ 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 v04	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	☒ 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 v04	☒ 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

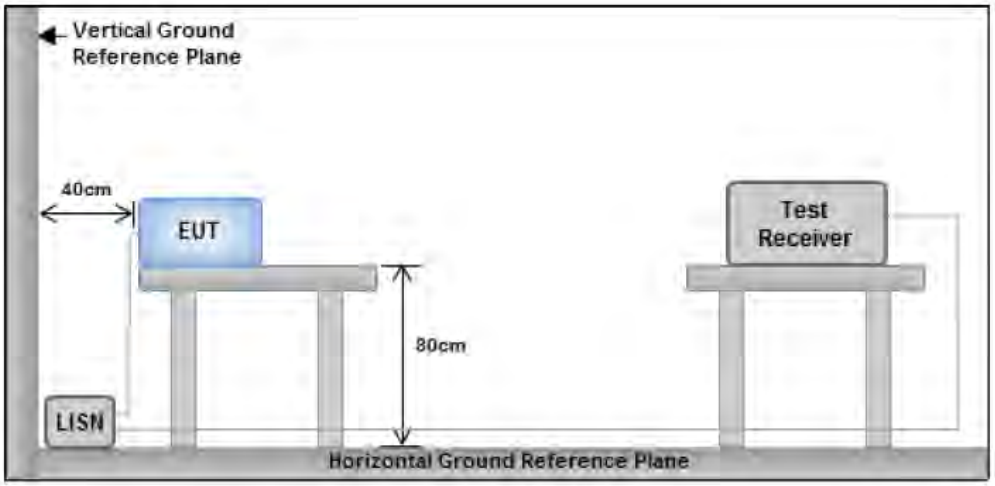
10.1 Conducted Emissions

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
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 at 120VAC, 60Hz
Result	☒ Pass ☐ Fail

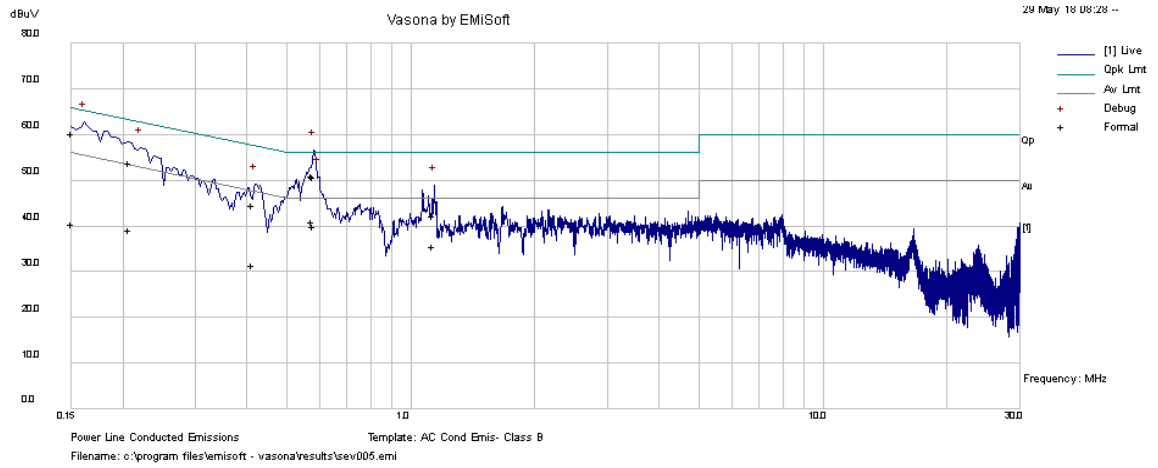
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at Conducted Emission test site.

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	Deon Dai			
Test Date:	05/27/2018			
Remarks	Power Supply, Live			

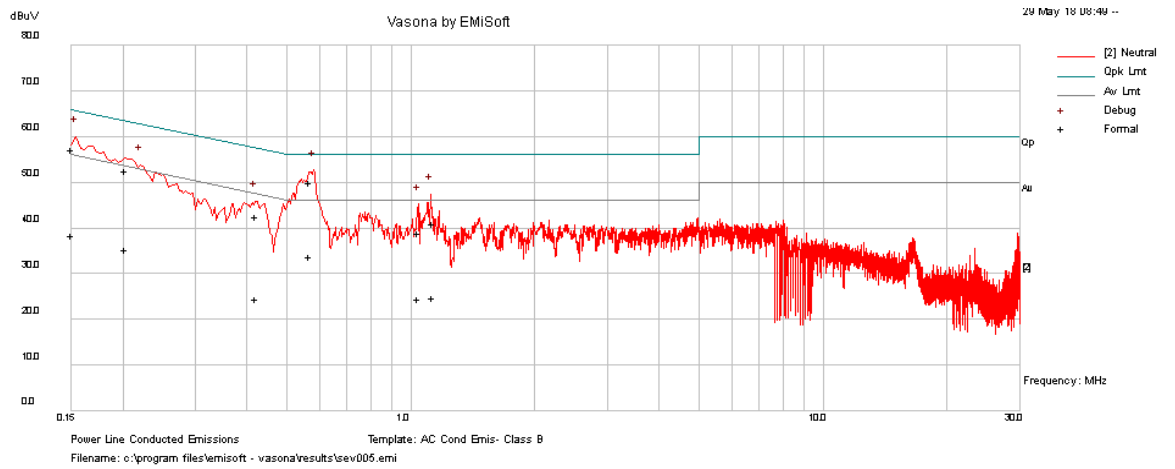


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.58	41.51	9.33	0.06	50.89	Quasi Peak	Live	56	-5.11	Pass
0.15	50.8	9.33	0.05	60.18	Quasi Peak	Live	66	-5.82	Pass
0.58	41.32	9.33	0.06	50.71	Quasi Peak	Live	56	-5.29	Pass
0.21	44.48	9.32	0.04	53.84	Quasi Peak	Live	63.31	-9.47	Pass
1.13	32.77	9.33	0.05	42.14	Quasi Peak	Live	56	-13.86	Pass
0.41	35.26	9.33	0.04	44.63	Quasi Peak	Live	57.62	-12.99	Pass
0.58	31.64	9.33	0.06	41.03	Average	Live	46	-4.97	Pass
0.15	31.11	9.33	0.05	40.48	Average	Live	56	-15.52	Pass
0.58	30.57	9.33	0.06	39.96	Average	Live	46	-6.04	Pass
0.21	29.8	9.32	0.04	39.16	Average	Live	53.31	-14.15	Pass
1.13	26.1	9.33	0.05	35.48	Average	Live	46	-10.52	Pass
0.41	22.18	9.33	0.04	31.55	Average	Live	47.62	-16.07	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:	Deon Dai			
Test Date:	05/27/2018			
Remarks	Power Supply, Neutral			

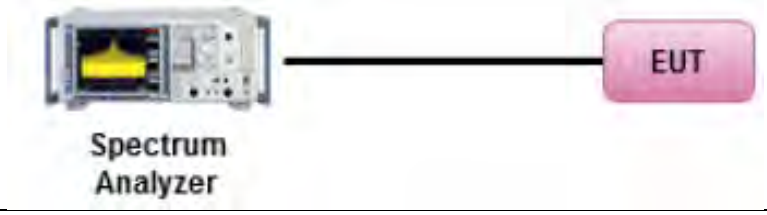


Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.57	40.64	9.33	0.05	50.02	Quasi Peak	Neutral	56	-5.98	Pass
0.15	47.9	9.33	0.05	57.28	Quasi Peak	Neutral	66	-8.72	Pass
1.13	31.49	9.33	0.05	40.87	Quasi Peak	Neutral	56	-15.13	Pass
0.20	43.25	9.32	0.04	52.61	Quasi Peak	Neutral	63.48	-10.86	Pass
1.04	29.41	9.33	0.04	38.78	Quasi Peak	Neutral	56	-17.22	Pass
0.42	33.1	9.33	0.04	42.46	Quasi Peak	Neutral	57.41	-14.95	Pass
0.57	24.28	9.33	0.05	33.66	Average	Neutral	46	-12.34	Pass
0.15	29.02	9.33	0.05	38.4	Average	Neutral	56	-17.6	Pass
1.13	15.44	9.33	0.05	24.82	Average	Neutral	46	-21.18	Pass
0.20	25.86	9.32	0.04	35.22	Average	Neutral	53.48	-18.26	Pass
1.04	15.13	9.33	0.04	24.5	Average	Neutral	46	-21.5	Pass
0.42	15.14	9.33	0.04	24.5	Average	Neutral	47.41	-22.91	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 v04, 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	05/12/2018	Environmental condition	Temperature 23ºC Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

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

Test was done by Deon Dai 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	9.831	≥0.5	Pass
		2437	Mid	9.882	≥0.5	Pass
		2462	High	9.626	≥0.5	Pass
	802.11g	2412	Low	16.56	≥0.5	Pass
		2437	Mid	16.47	≥0.5	Pass
		2462	High	16.50	≥0.5	Pass
	802.11n-20M	2412	Low	17.67	≥0.5	Pass
		2437	Mid	17.69	≥0.5	Pass
		2462	High	17.67	≥0.5	Pass
	802.11n-40M	2422	Low	36.48	≥0.5	Pass
		2437	Mid	36.46	≥0.5	Pass
		2452	High	36.49	≥0.5	Pass

99% OBW measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
99% OBW	802.11b	2412	Low	12.315
		2437	Mid	12.372
		2462	High	12.370
	802.11g	2412	Low	16.468
		2437	Mid	16.428
		2462	High	16.437
	802.11n-20M	2412	Low	17.612
		2437	Mid	17.618
		2462	High	17.602
	802.11n-40M	2422	Low	36.234
		2437	Mid	36.232
		2452	High	36.224

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

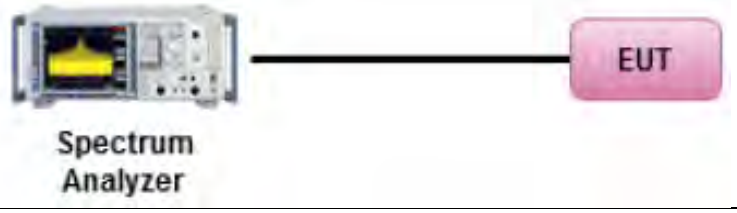
802.11n-HT40-2437MHz

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 v04, 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	05/12/2018-05/14/2018	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 44% 1021mbar
Remark	The EUT has two antennas, the directional gain= 10xlog(2) + individual gain of each antenna =8dBi.			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Deon Dai at RF test site.

Output Power measurement result

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output power	802.11b	2412	Low	19.21	17.89	21.61	30	Pass
		2437	Mid	19.00	17.58	21.36	30	Pass
		2462	High	19.53	18.66	22.13	30	Pass
	802.11g	2412	Low	15.20	14.51	17.88	30	Pass
		2437	Mid	15.26	14.62	17.96	30	Pass
		2462	High	15.30	14.44	17.90	30	Pass
	802.11n-20M	2412	Low	14.43	14.10	17.28	30	Pass
		2437	Mid	14.70	14.12	17.43	30	Pass
		2462	High	14.66	13.81	17.27	30	Pass
	802.11n-40M	2422	Low	9.95	10.89	13.46	30	Pass
		2437	Mid	10.92	10.92	13.93	30	Pass
		2452	High	11.43	10.83	14.15	30	Pass
Note	-							

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

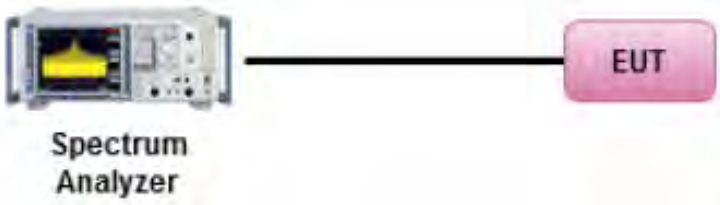
802.11n-HT40 2452MHz Chain 0

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 v04 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	05/12/2018-05/14/2018	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22°C 46% 1020mbar
Remark	-			
Result	☒ Pass ☐ Fail			

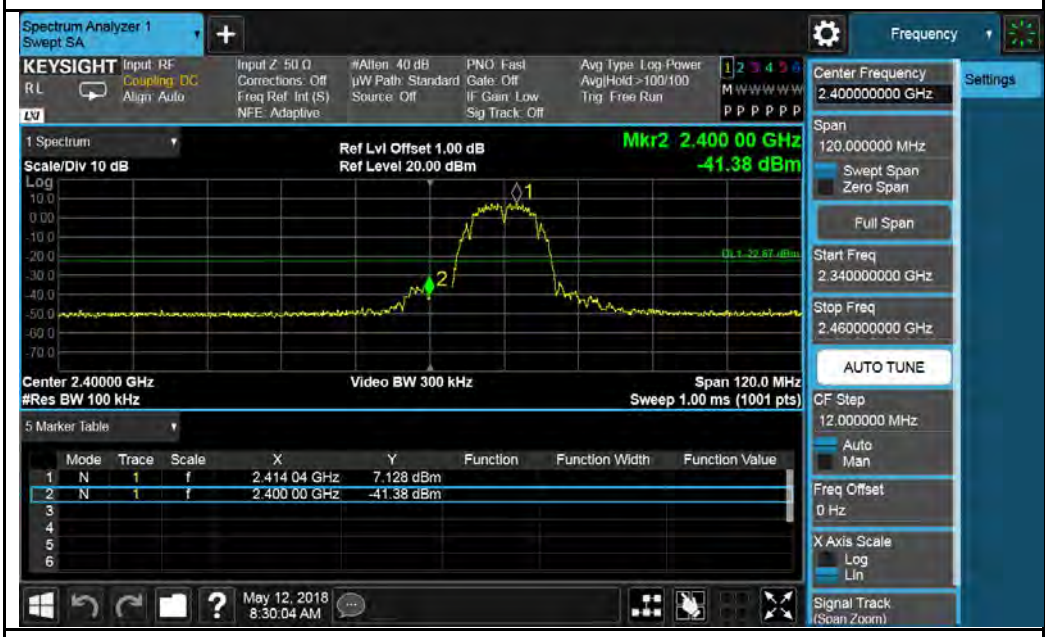
Test Data ☐ Yes ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

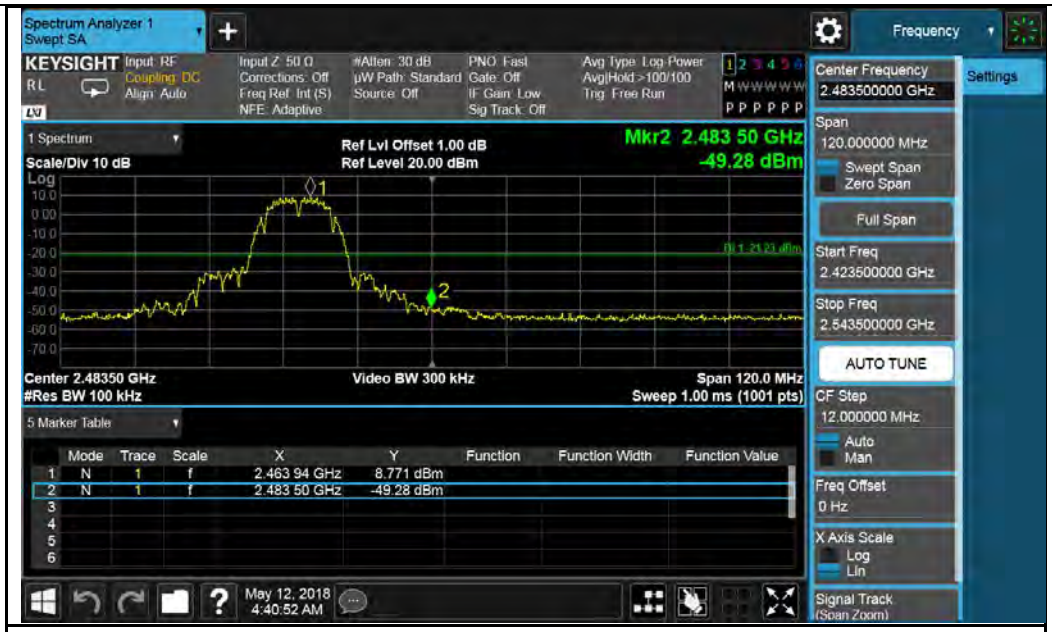
Test was done by Deon Dai at RF test site.

Test Plots

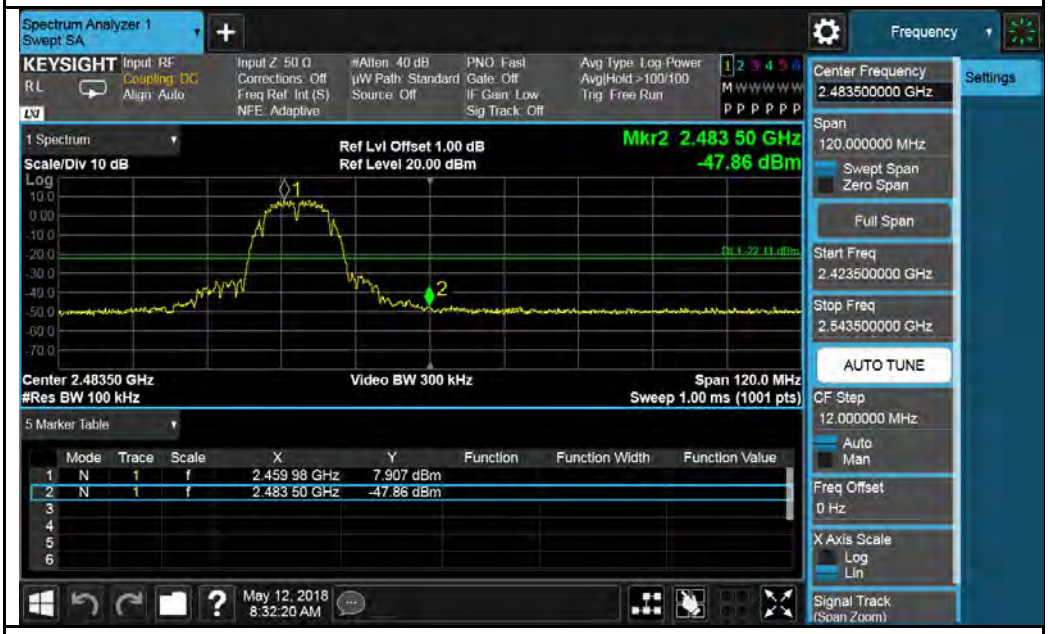
802.11b-2412MHz Chain 0



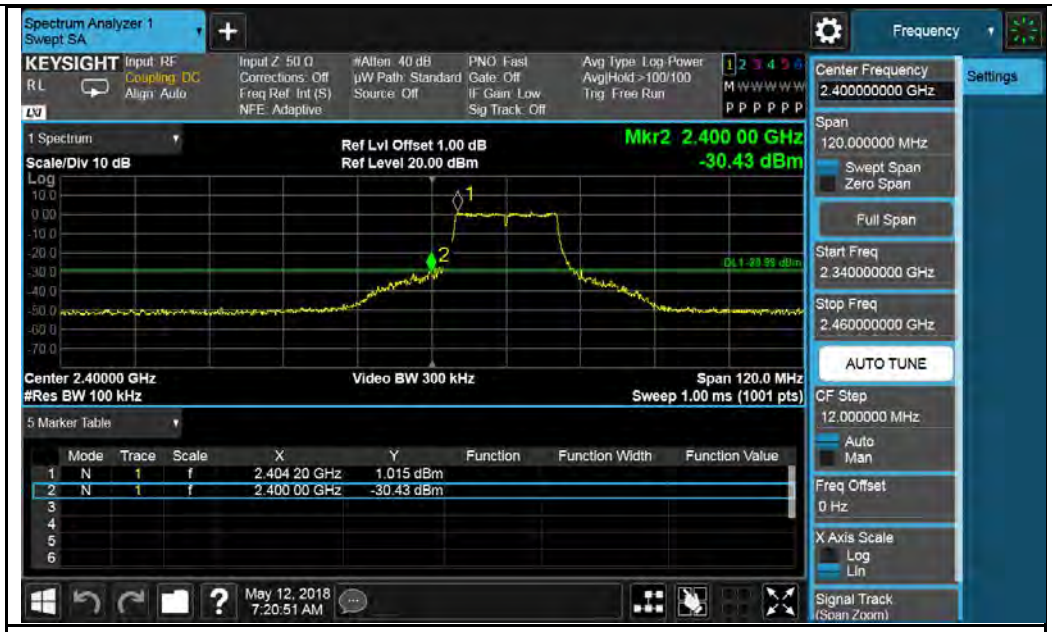
802.11b-2412MHz Chain 1



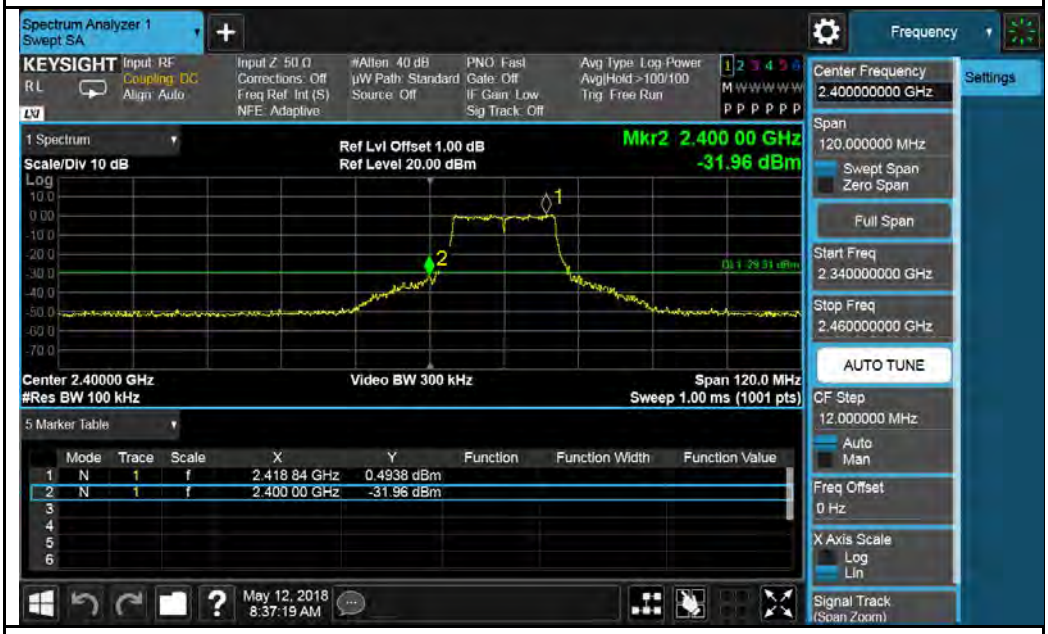
802.11b-2462MHz Chain 0



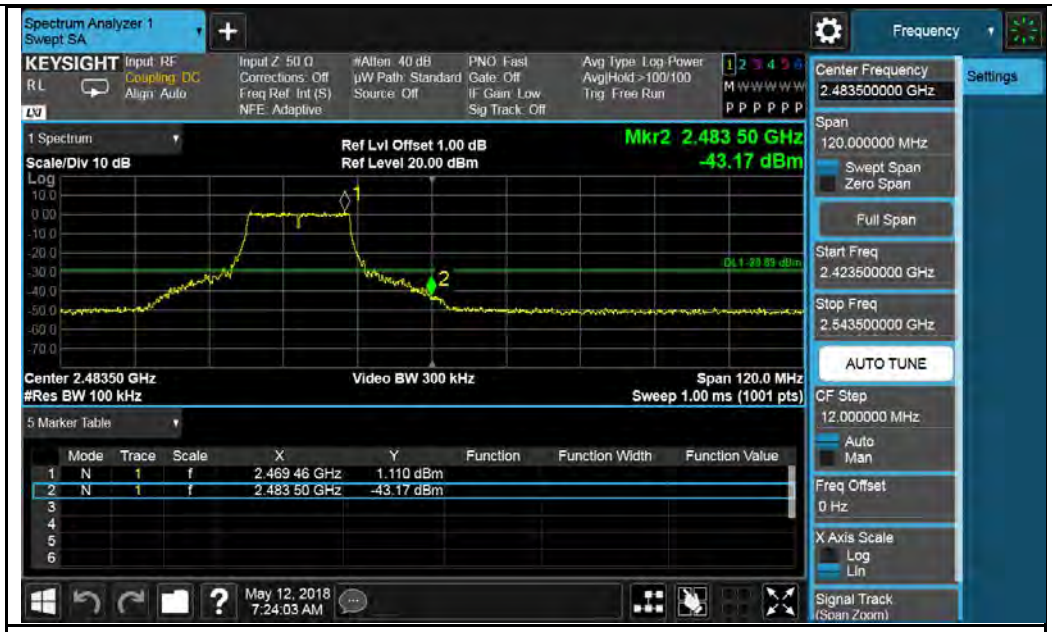
802.11b-2462MHz Chain 1



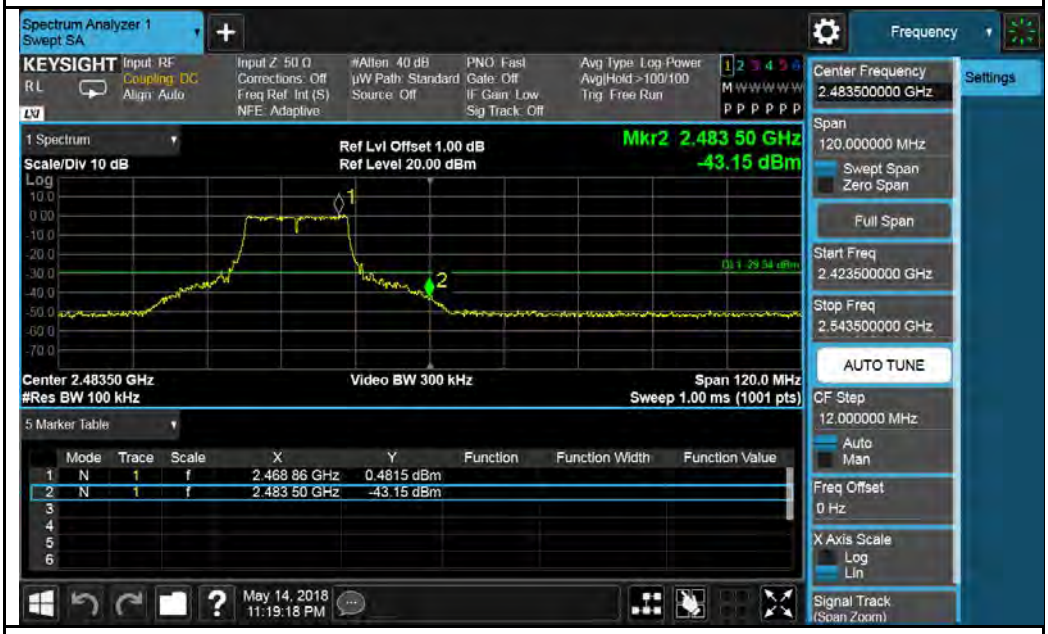
802.11g-2412MHz Chain 0



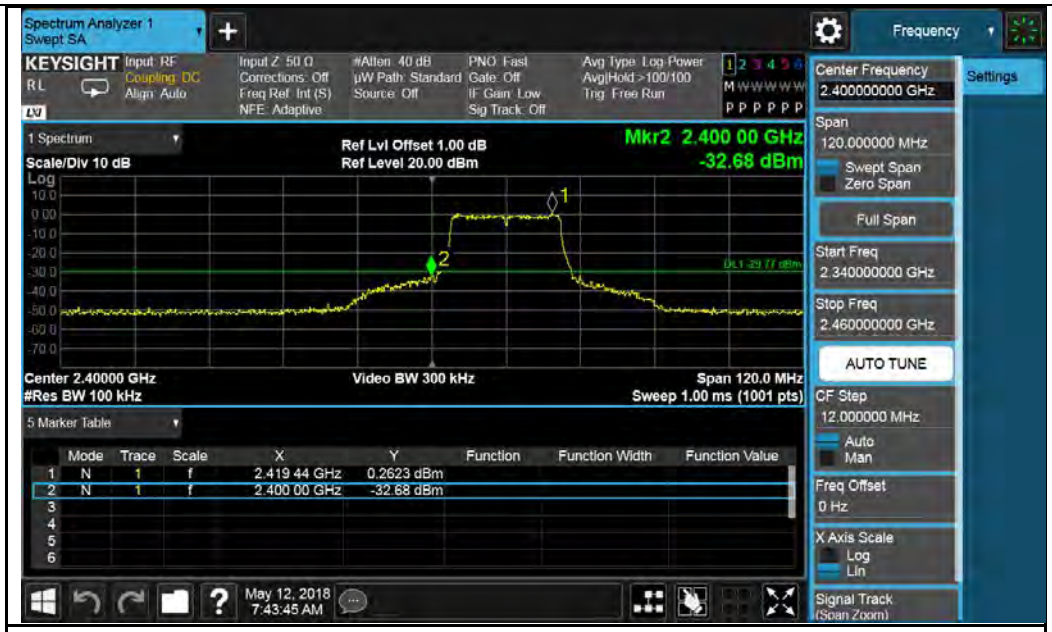
802.11g-2412MHz Chain 1



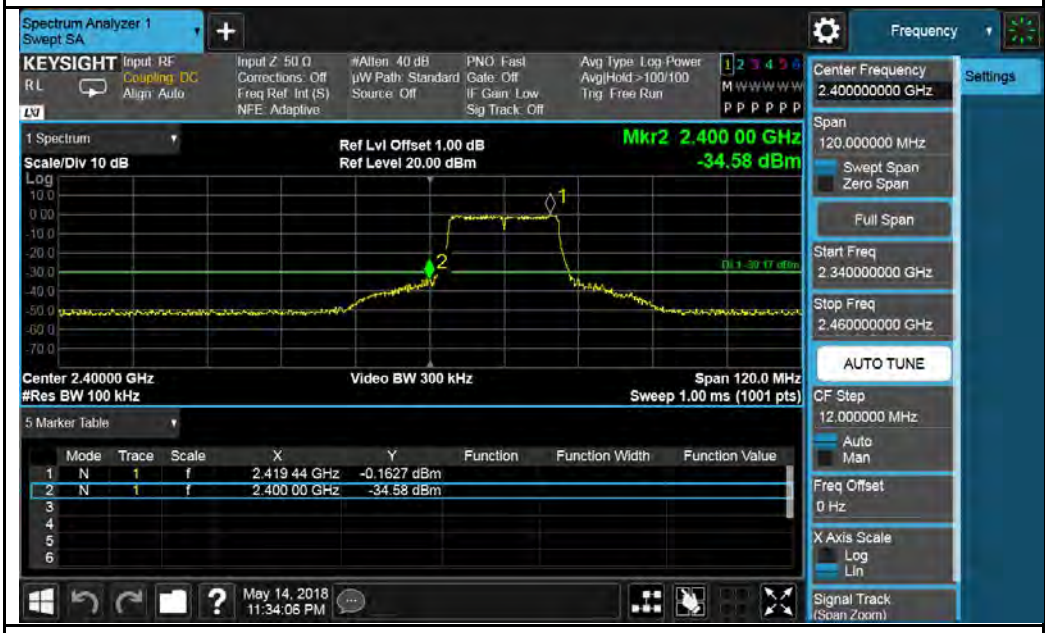
802.11g-2462MHz Chain 0



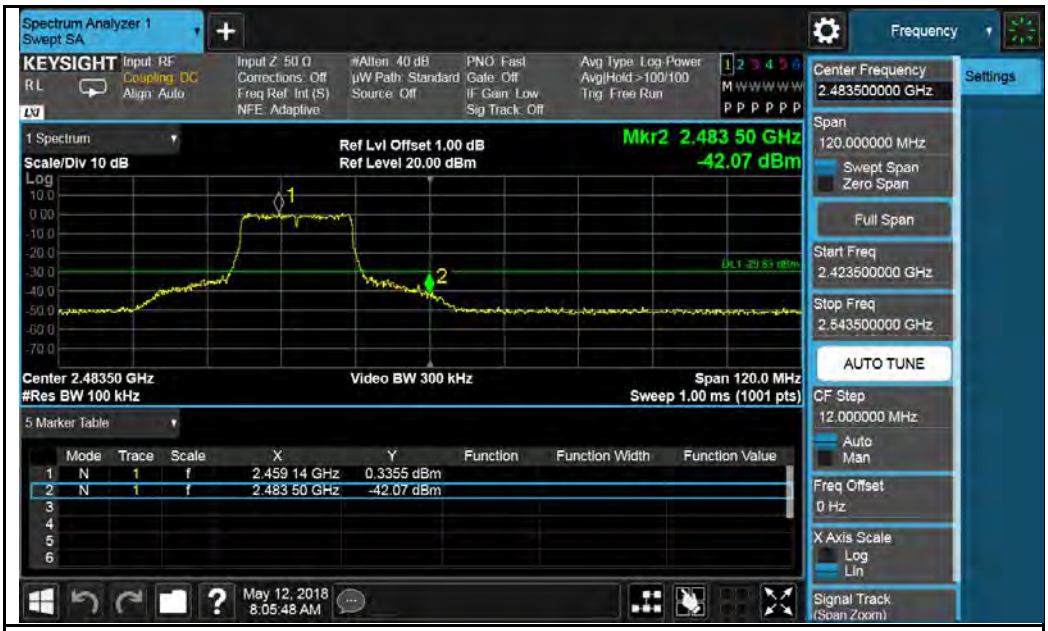
802.11g-2462MHz Chain 1



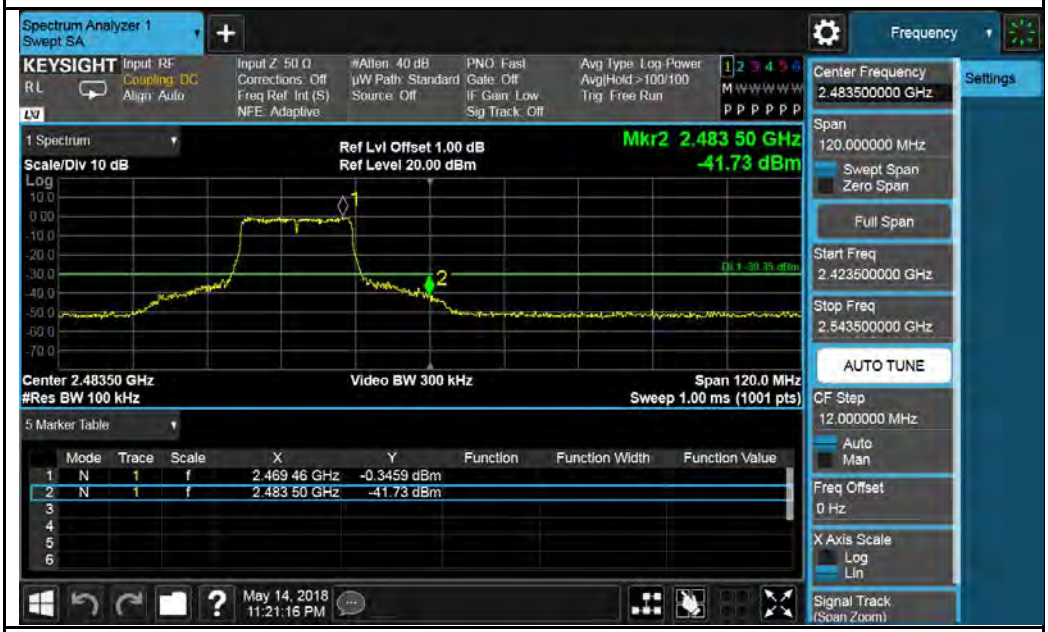
802.11n-HT20-2412MHz Chain 0



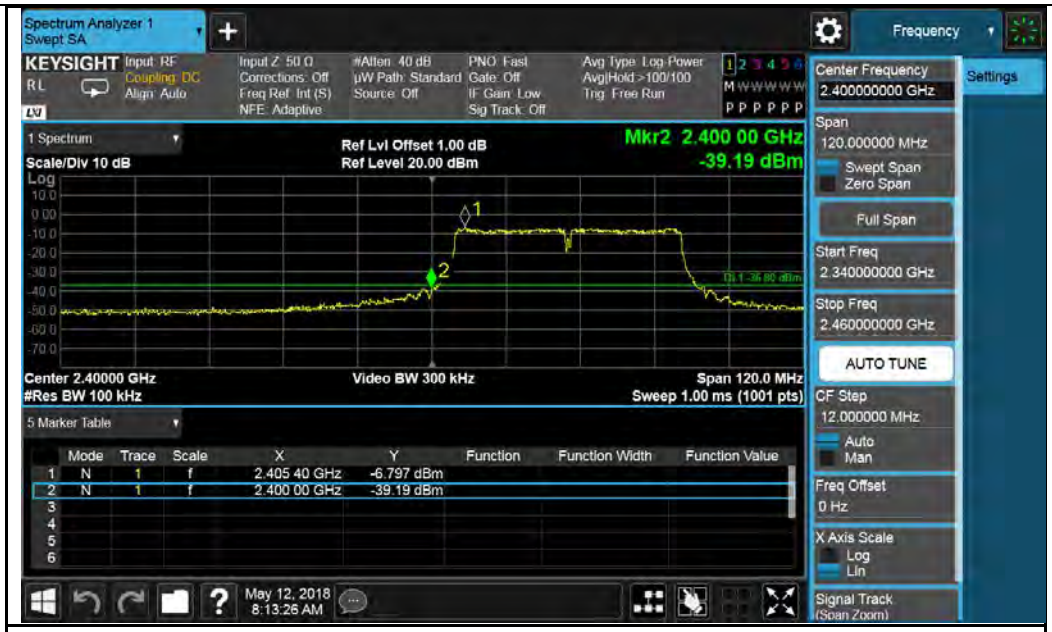
802.11n-HT20-2412MHz Chain 1



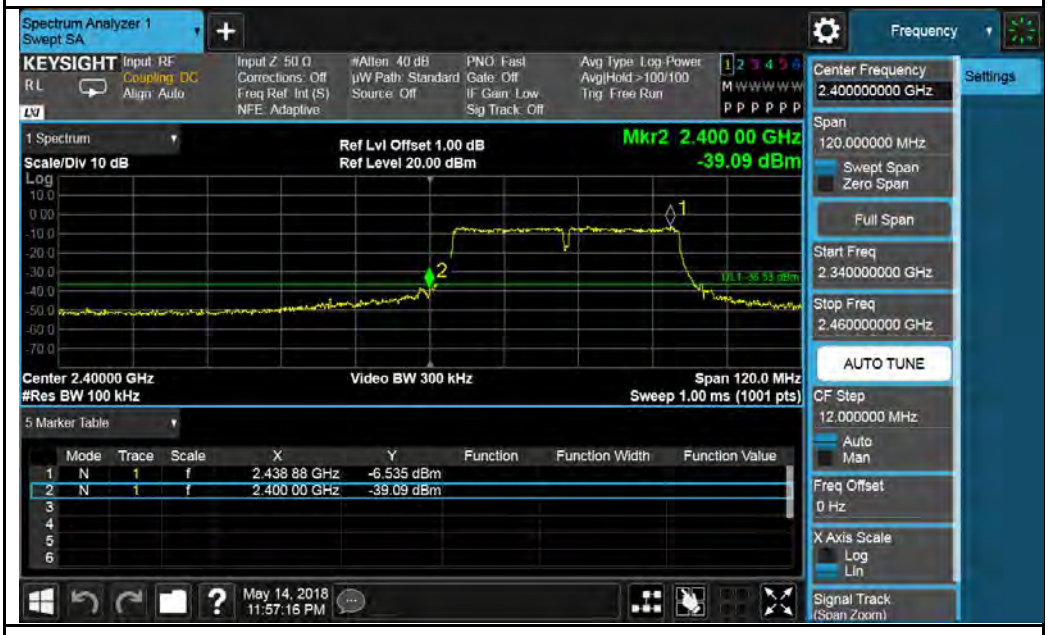
802.11n-HT20-2462MHz Chain 0



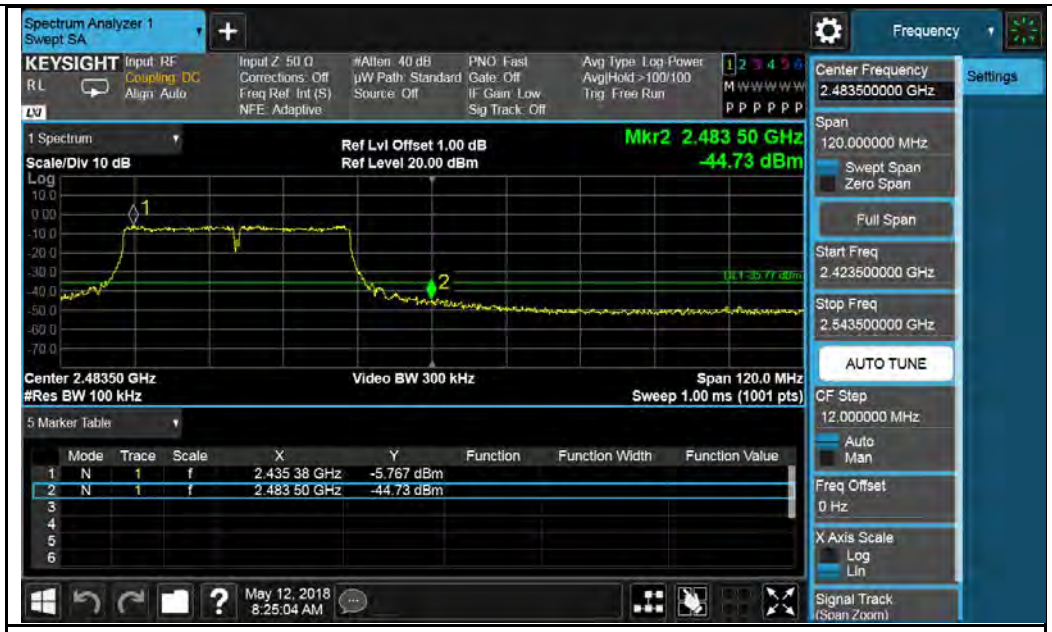
802.11n-HT20-2462MHz Chain 1



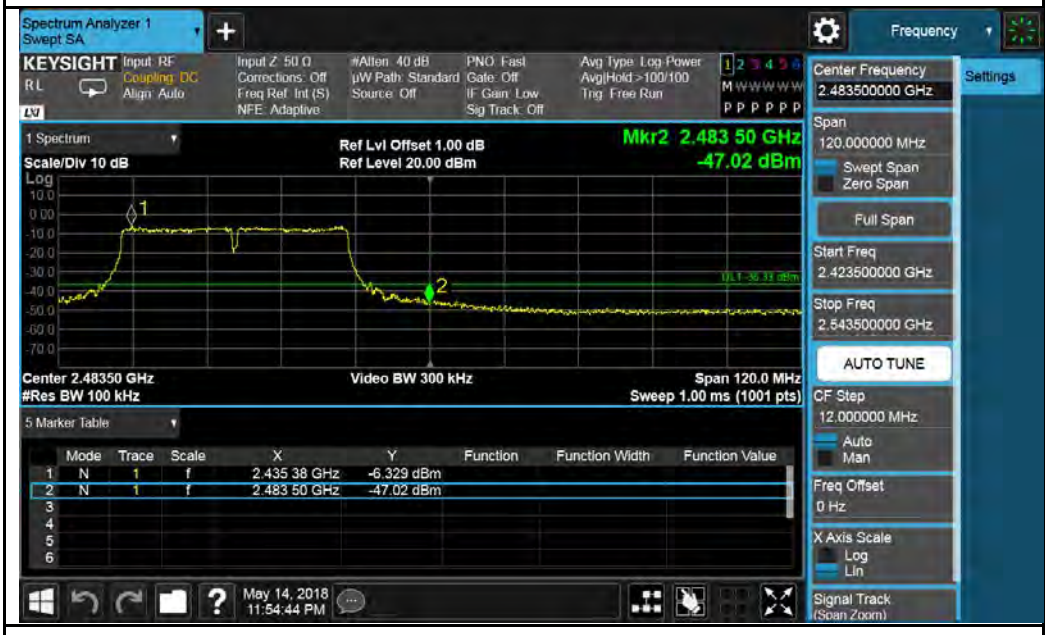
802.11n-HT40-2422MHz Chain 0



802.11n-HT40-2422MHz Chain 1



802.11n-HT40-2452MHz Chain 0

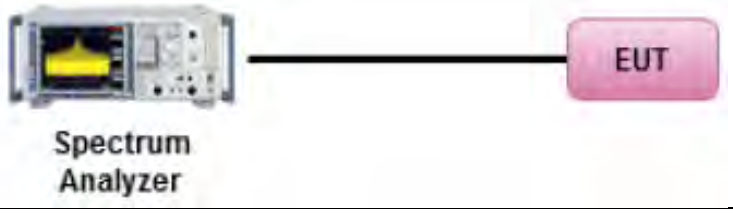


802.11n-HT40-2452MHz Chain 1

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 v04, 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	05/12/2018-05/14/2018	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22°C 46% 1020mbar
Remark	The EUT has two antennas, the directional gain= 10xlog(2) + individual gain of each antenna =8dBi.			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes ☐ N/A

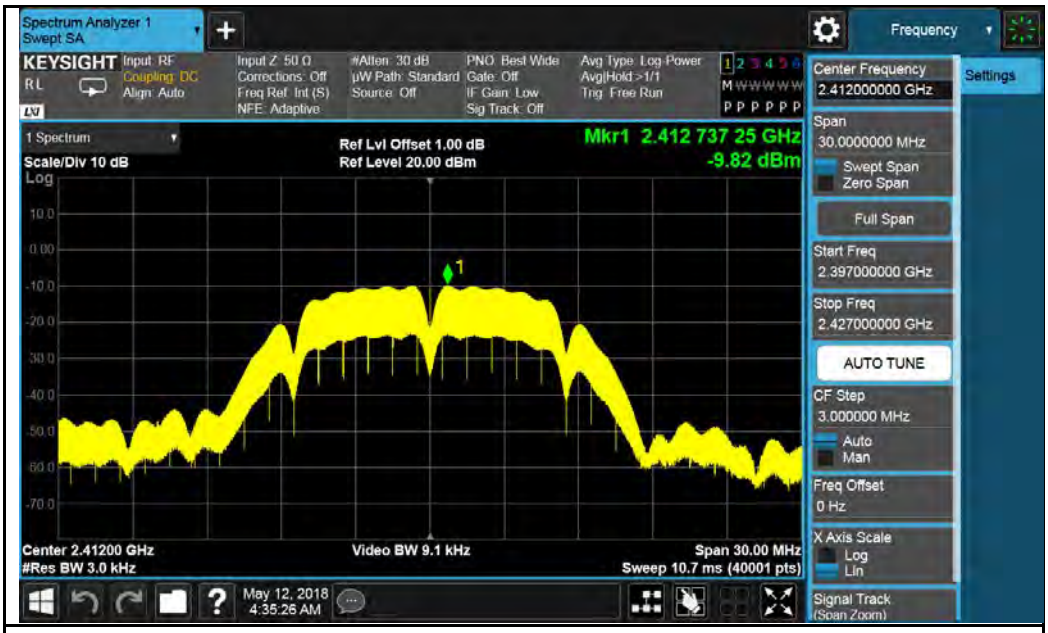
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at RF test site.

PSD measurement results

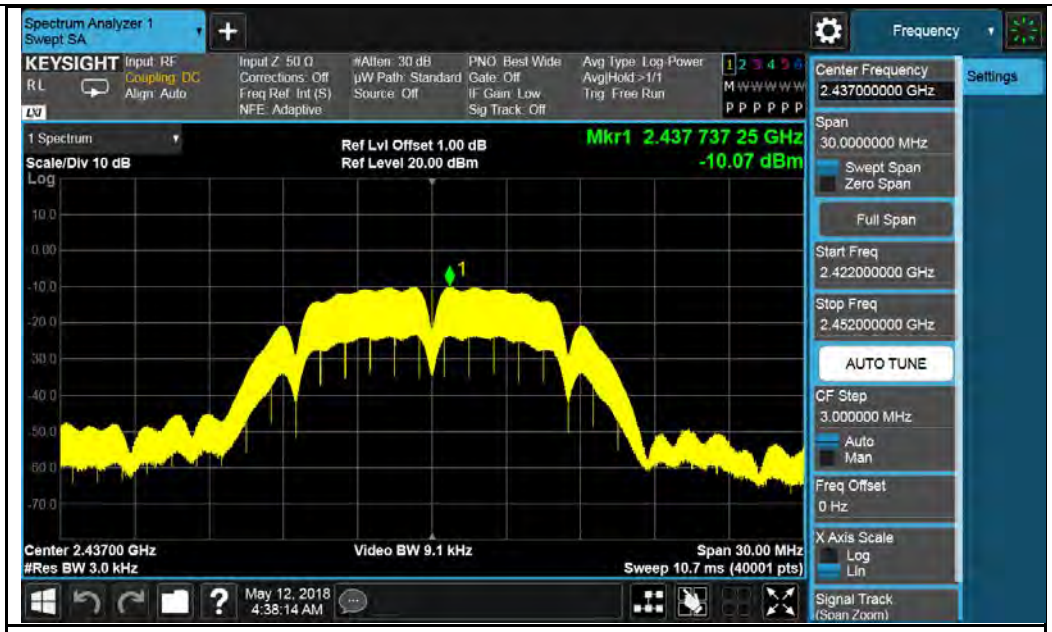
Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/3KHz)			Limit (dBm/3KHz)	Result
				Chain0	Chain1	Combined PSD		
PSD	802.11b	2412	Low	-9.82	-11.21	-7.45	≤8	Pass
		2437	Mid	-10.07	-11.45	-7.70	≤8	Pass
		2462	High	-9.59	-10.42	-6.97	≤8	Pass
	802.11g	2412	Low	-13.03	-14.14	-10.54	≤8	Pass
		2437	Mid	-12.54	-13.60	-10.03	≤8	Pass
		2462	High	-13.07	-13.88	-10.45	≤8	Pass
	802.11n-20M	2412	Low	-12.43	-13.26	-9.81	≤8	Pass
		2437	Mid	-13.01	-12.88	-9.93	≤8	Pass
		2462	High	-13.05	-13.55	-10.28	≤8	Pass
	802.11n-40M	2422	Low	-15.75	-18.35	-13.85	≤8	Pass
		2437	Mid	-16.20	-18.47	-14.18	≤8	Pass
		2452	High	-16.97	-18.19	-14.53	≤8	Pass
Note	-							

Test Plots

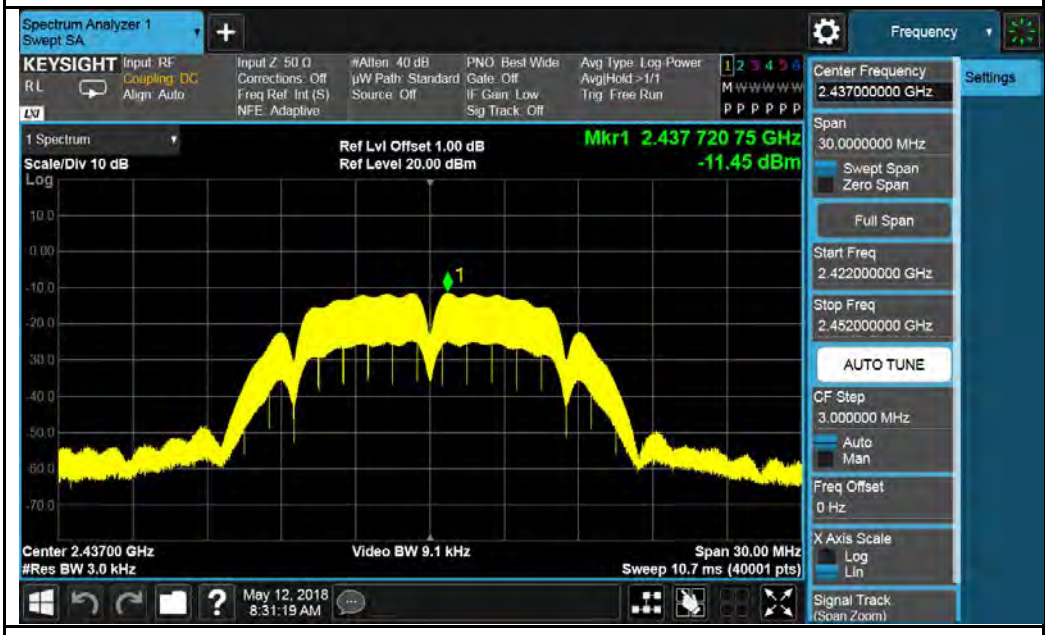


802.11b-2412MHz Chain 0

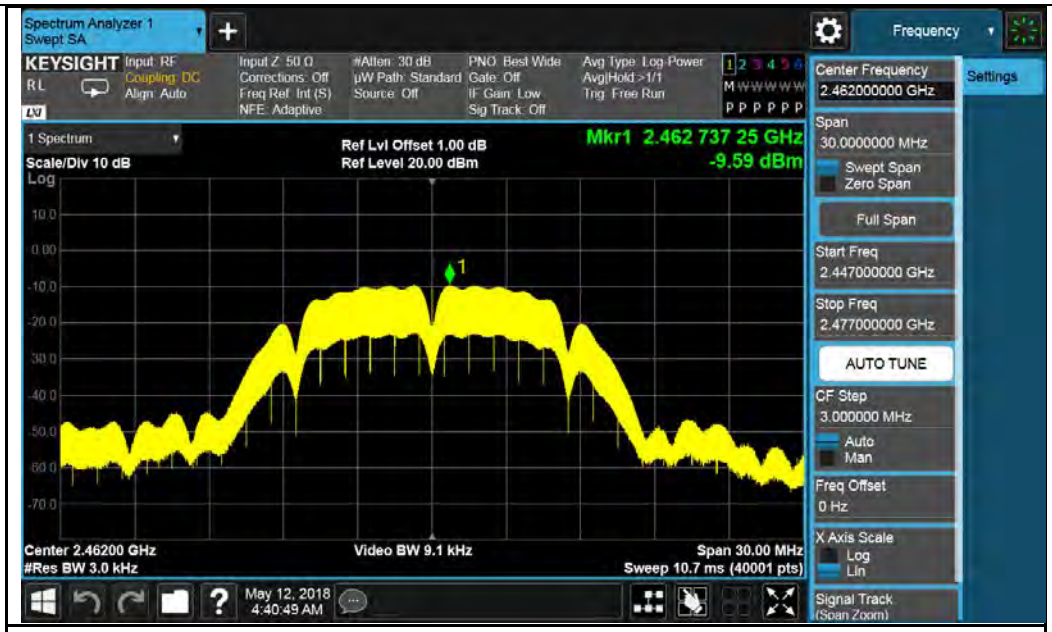
802.11b-2412MHz Chain 1



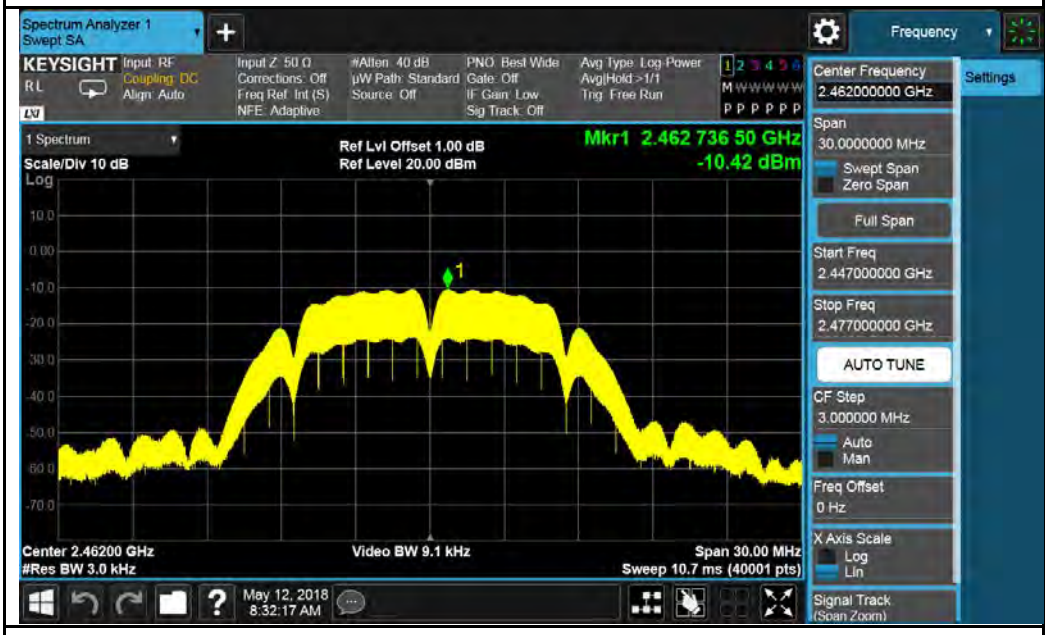
802.11b-2437MHz Chain 0



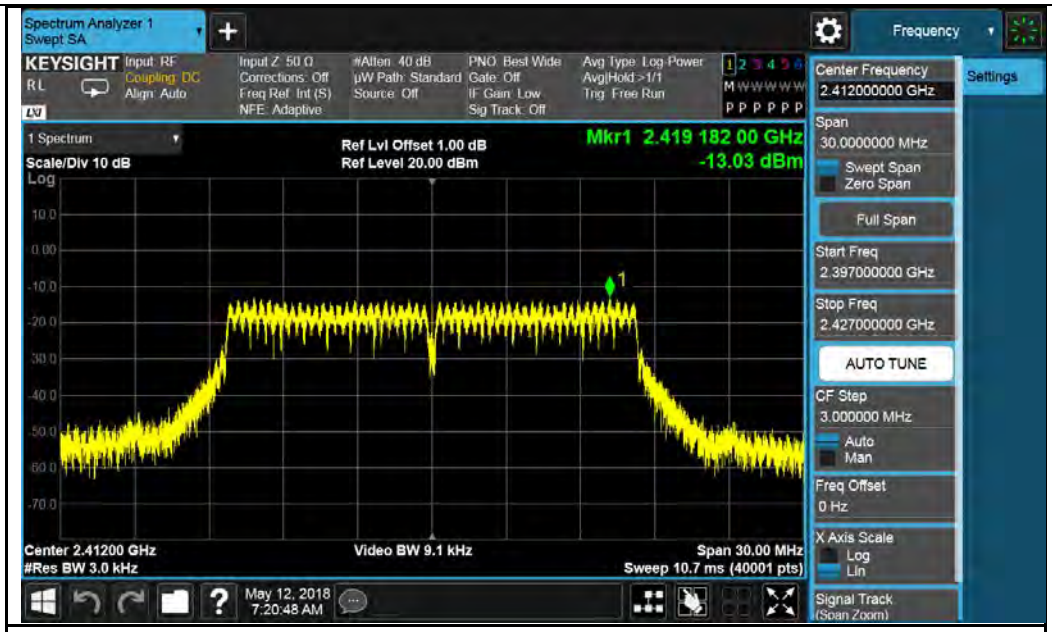
802.11b-2437MHz Chain 1



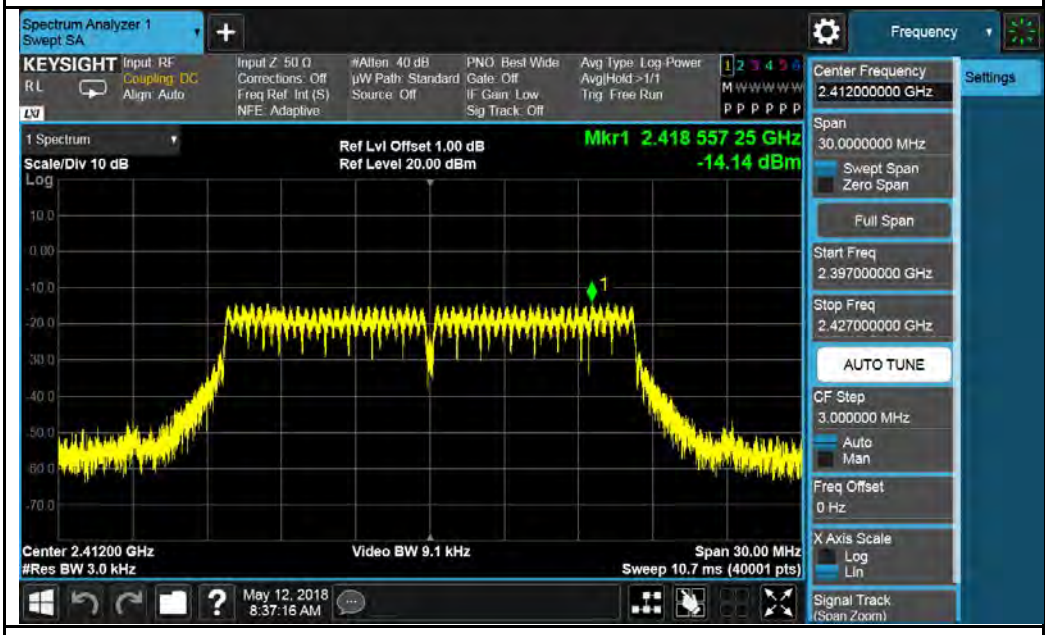
802.11b-2462MHz Chain 0



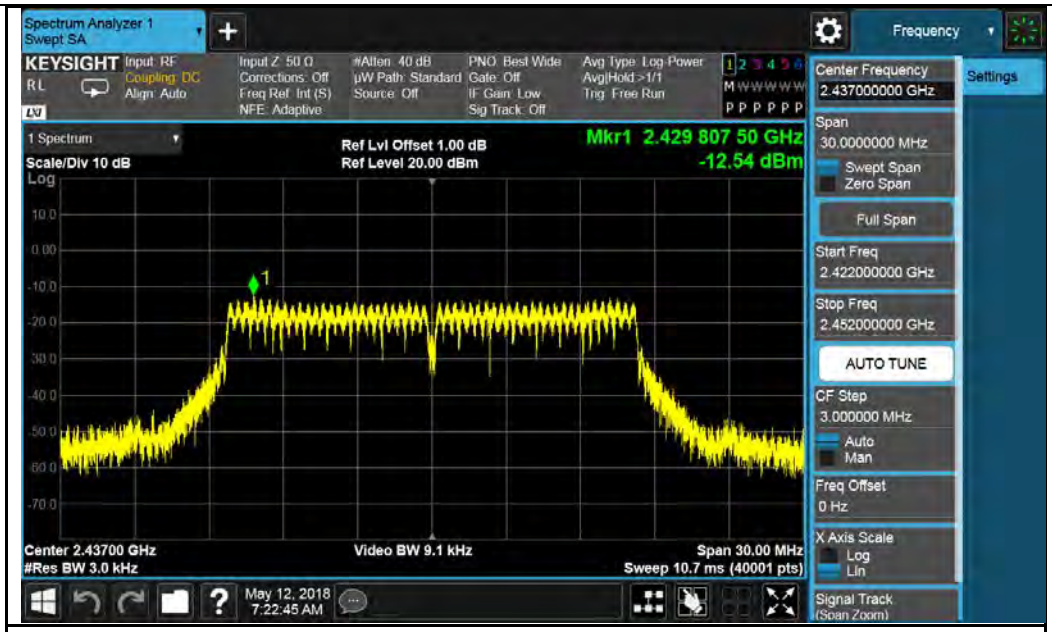
802.11b-2462MHz Chain 1



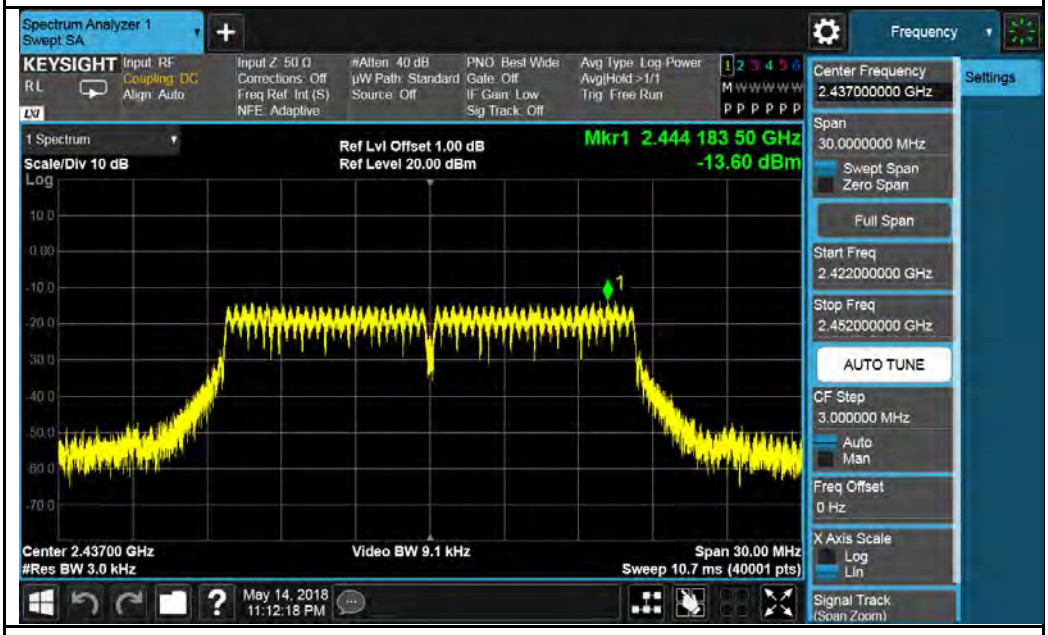
802.11g-2412MHz Chain 0



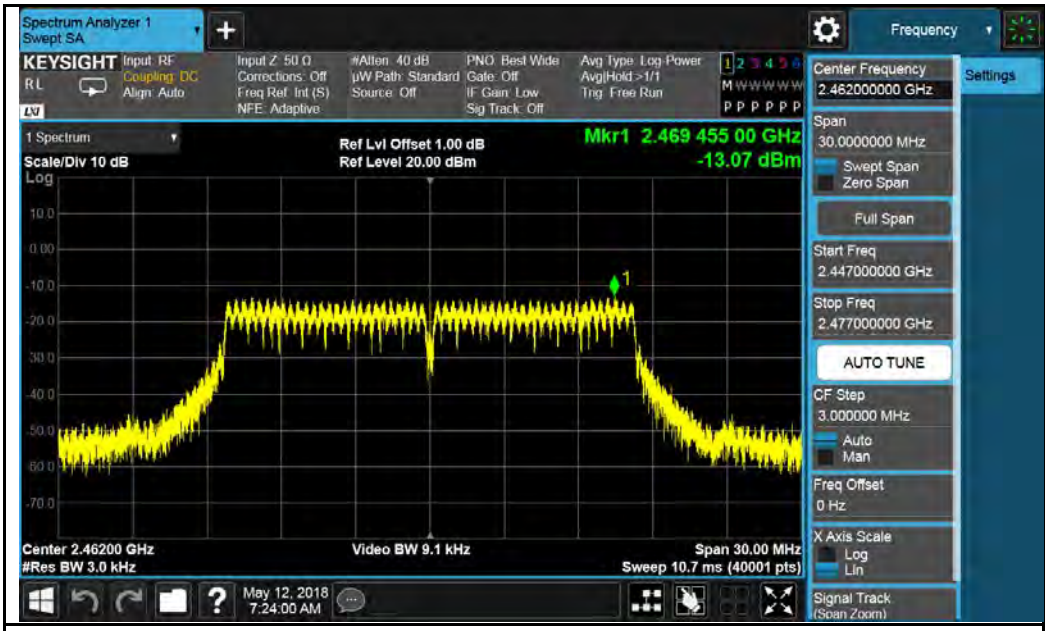
802.11g-2412MHz Chain 1



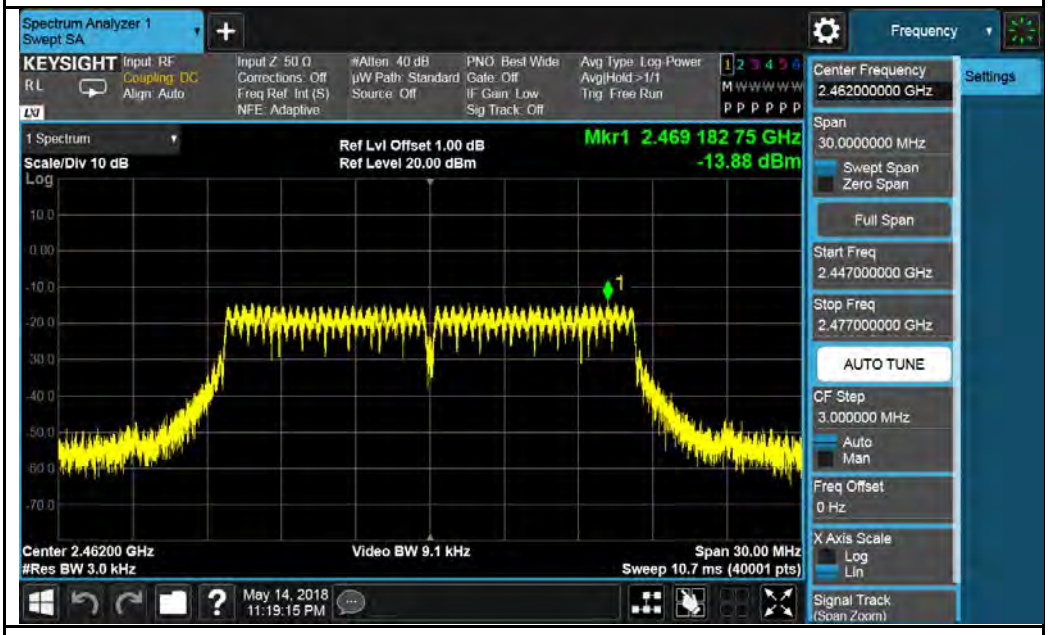
802.11g-2437MHz Chain 0



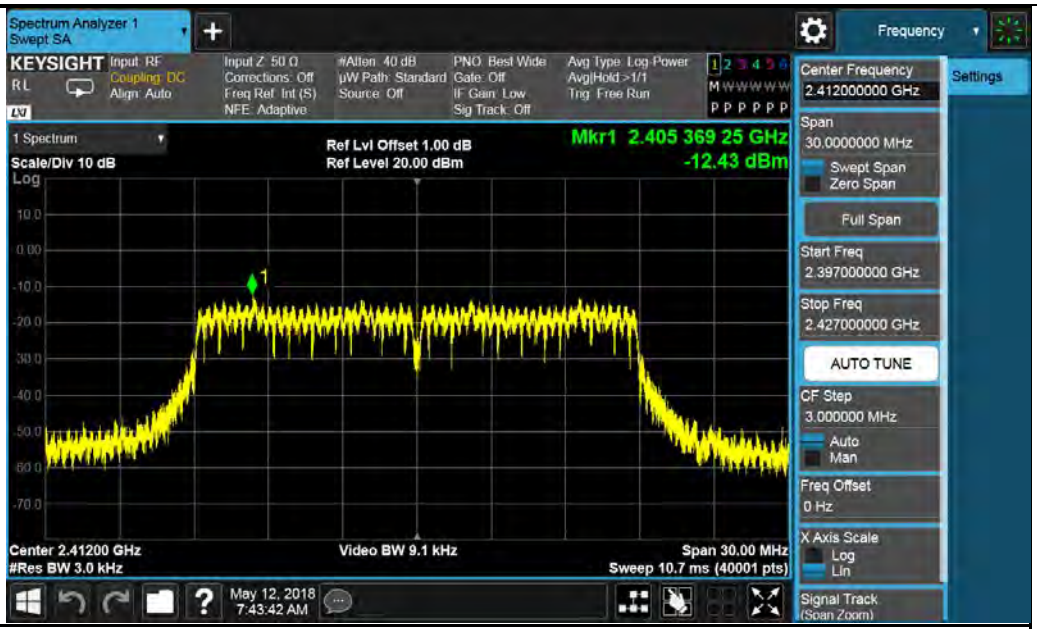
802.11g-2437MHz Chain 1



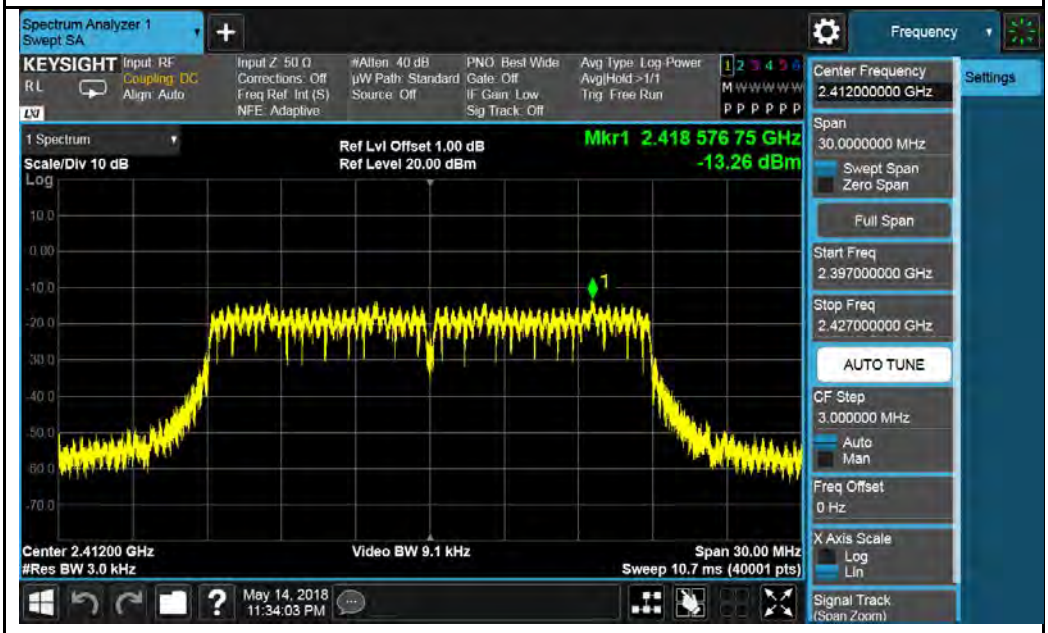
802.11g-2462MHz Chain 0



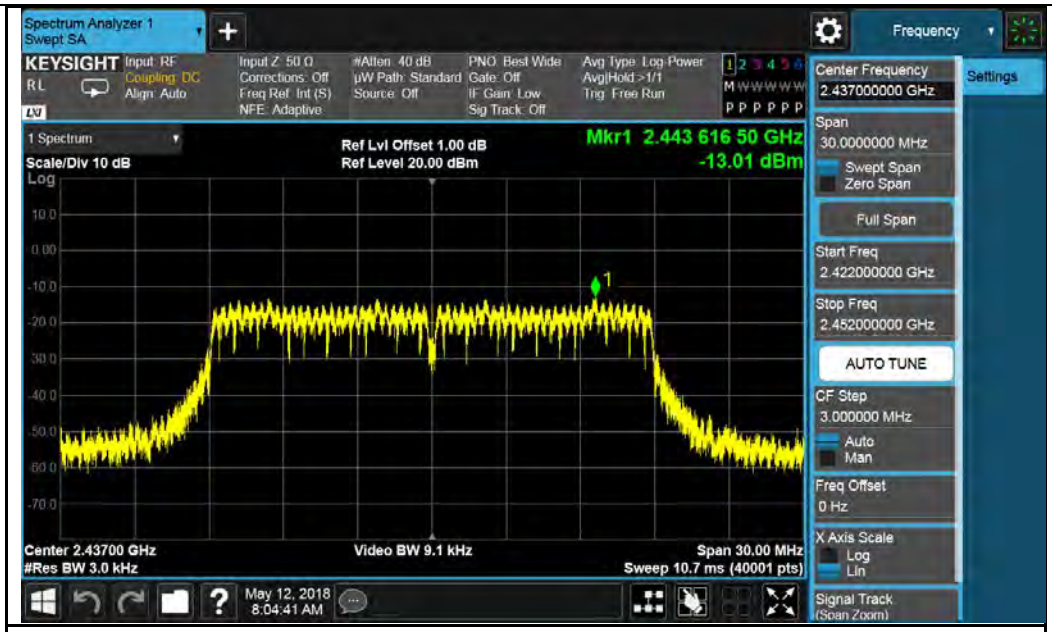
802.11g-2462MHz Chain 1



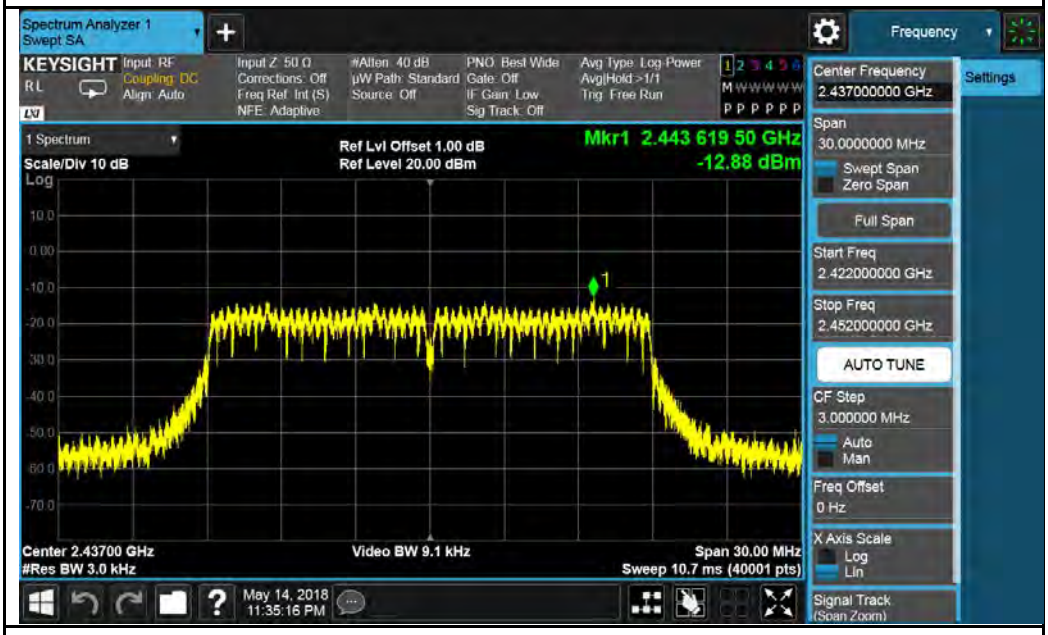
802.11n-HT20 2412MHz Chain 0



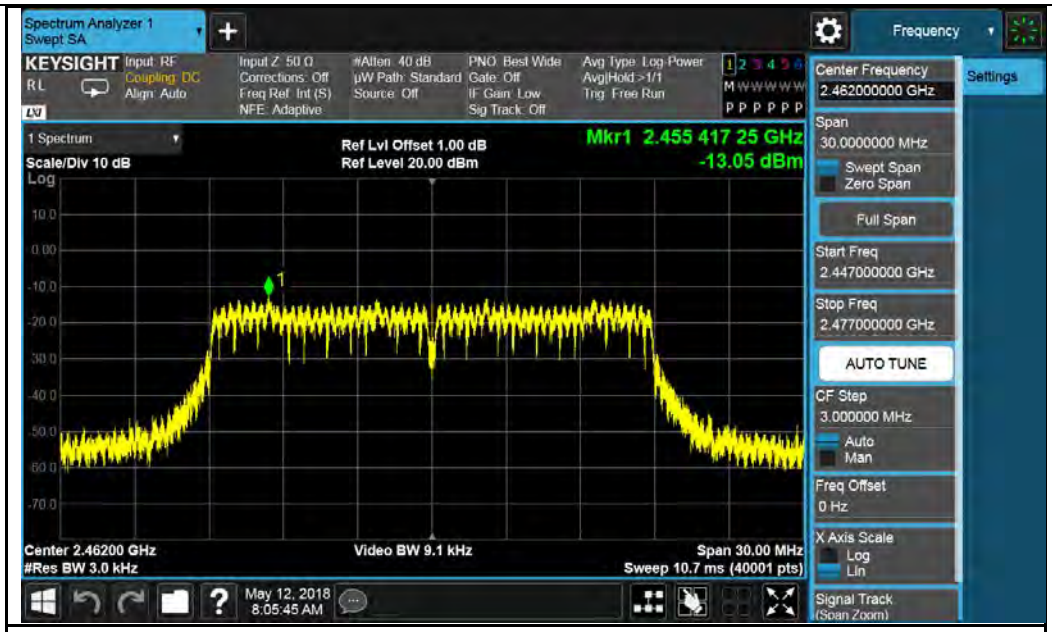
802.11n-HT20 2412MHz Chain 1



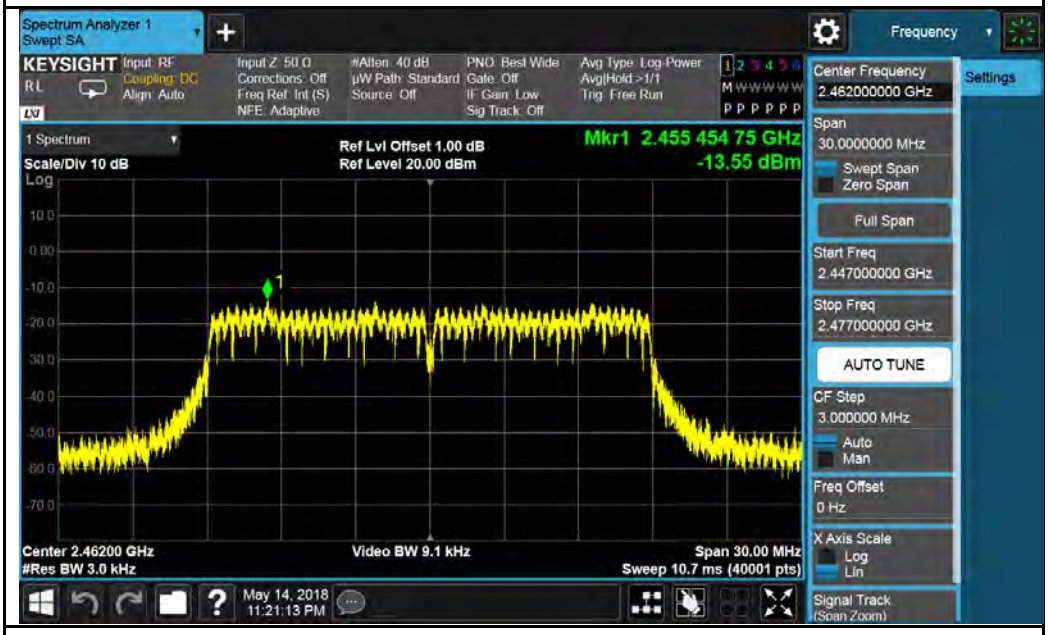
802.11n-HT20 2437MHz Chain 0



802.11n-HT20 2437MHz Chain 1

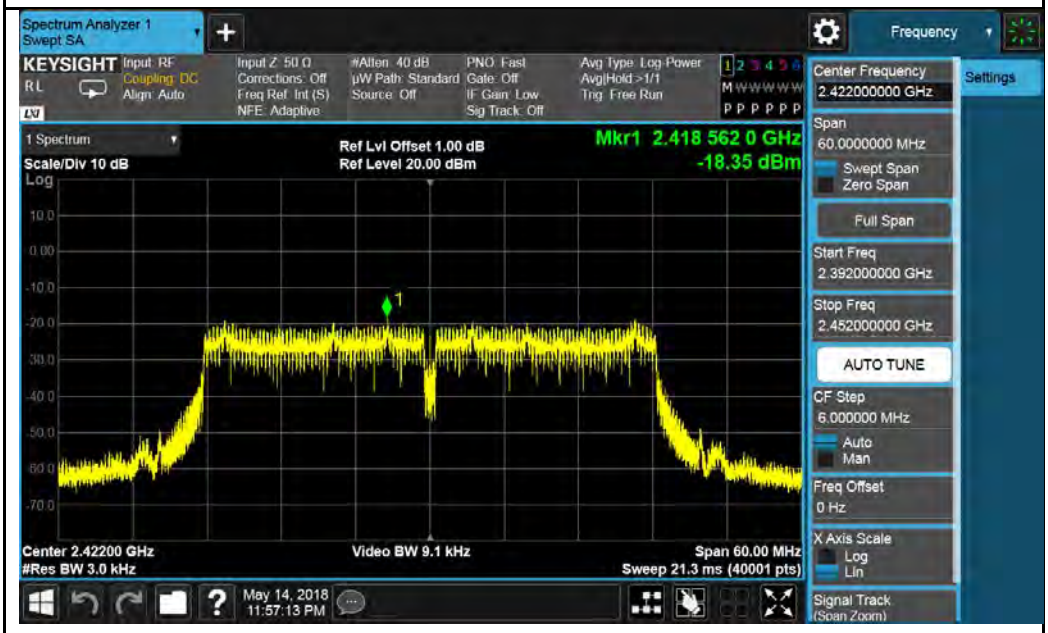


802.11n-HT20 2462MHz Chain 0



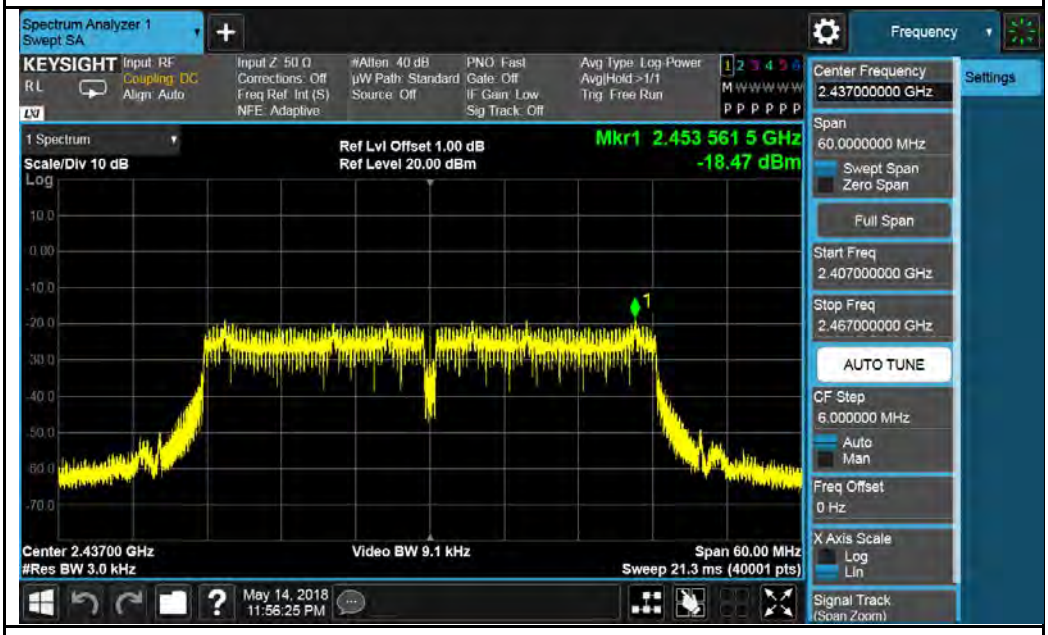
802.11n-HT20 2462MHz Chain 1

802.11n-HT40 2422MHz Chain 0

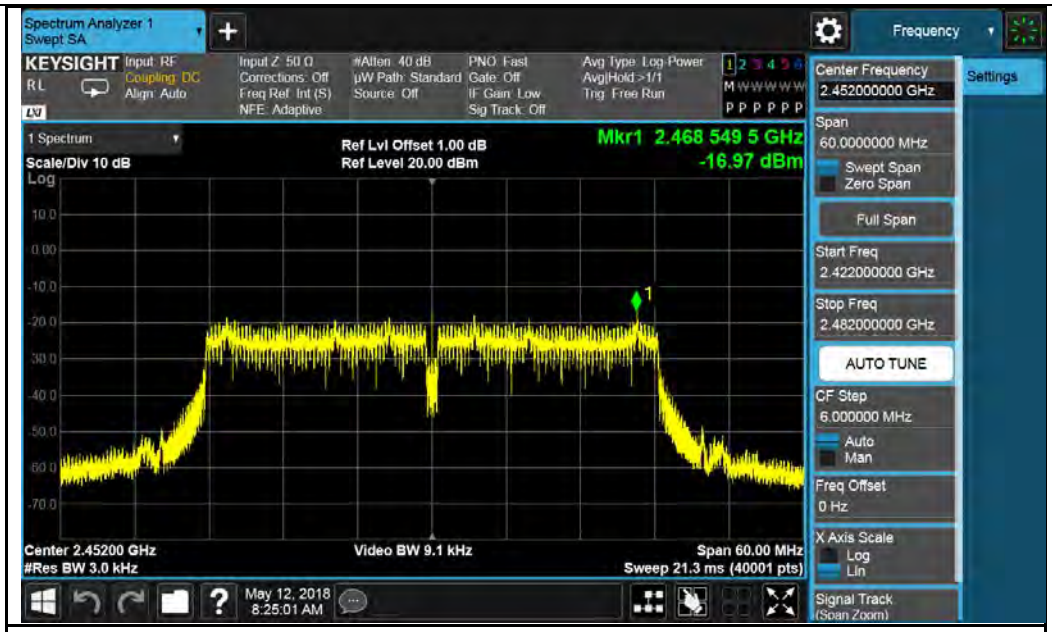


802.11n-HT40 2422MHz Chain 1

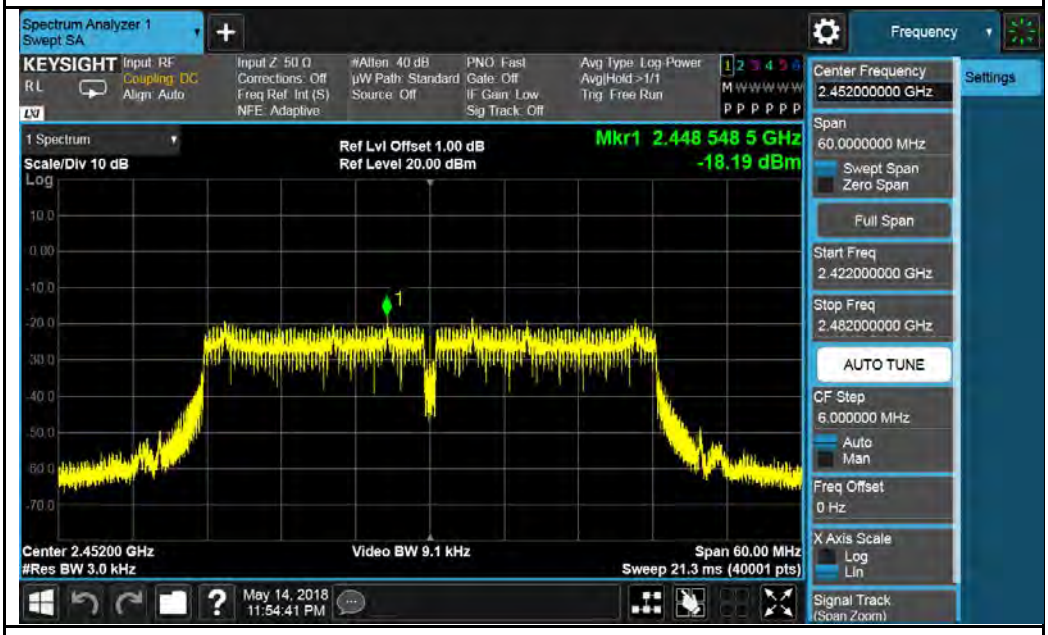
802.11n-HT40 2437MHz Chain 0



802.11n-HT40 2437MHz Chain 1



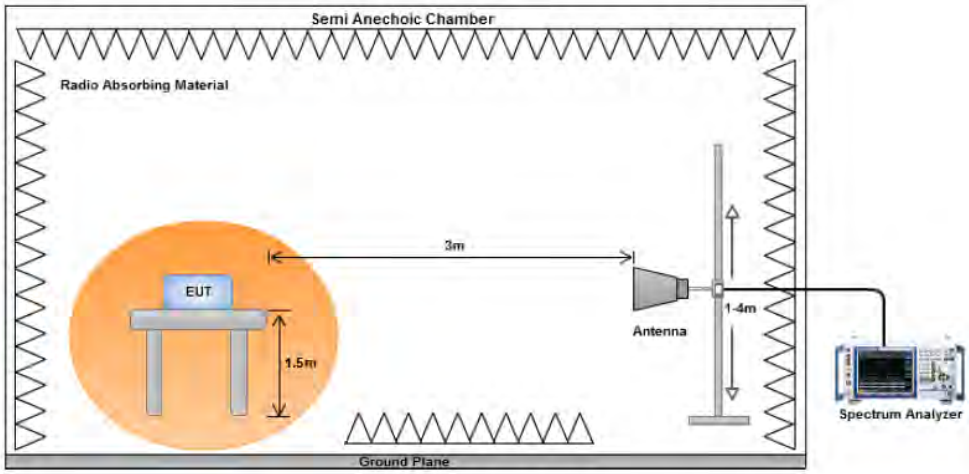
802.11n-HT40 2452MHz Chain 0



802.11n-HT40 2452MHz Chain 1

10.6 Radiated Spurious Emissions in restricted band

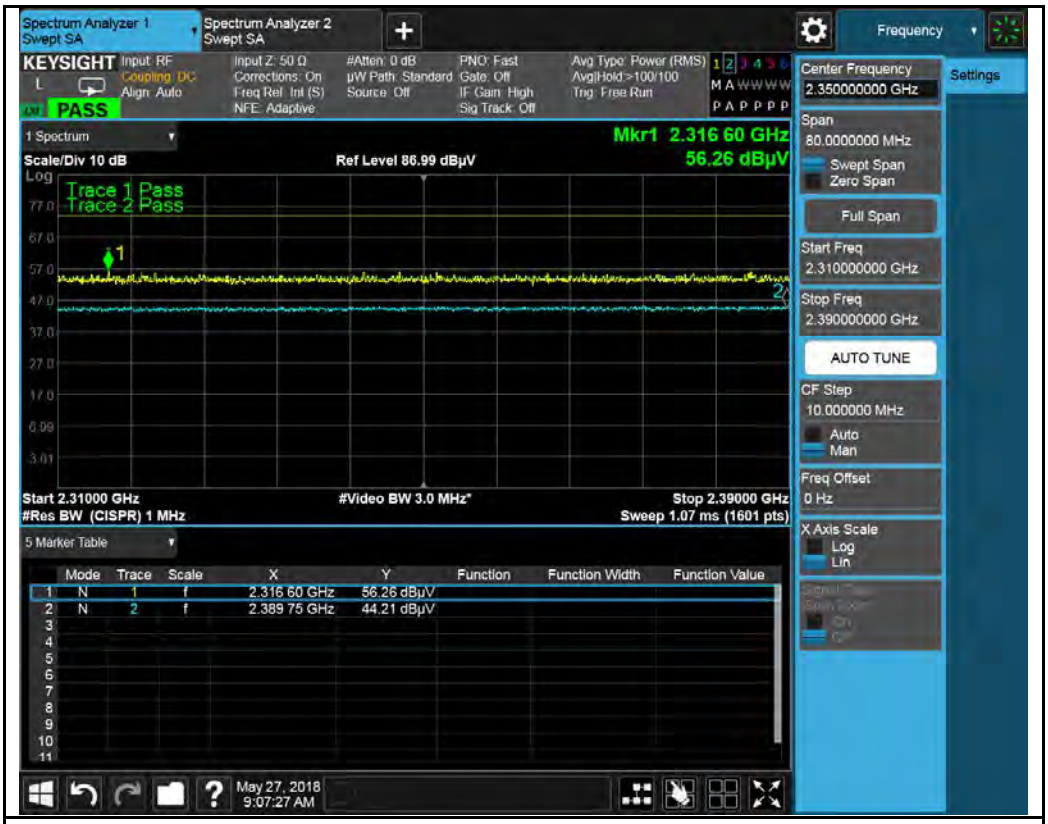
Requirement(s):

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

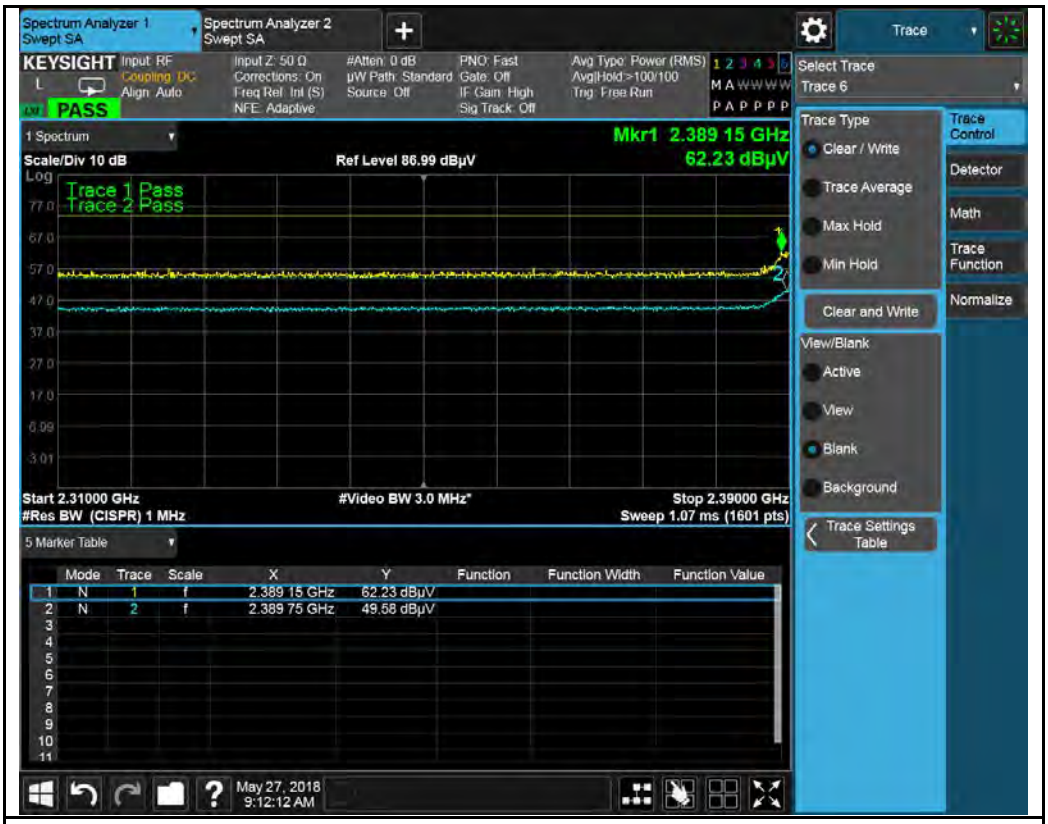
Test was done by Deon Dai at 10m chamber.

Restricted Band Measurement Plots:

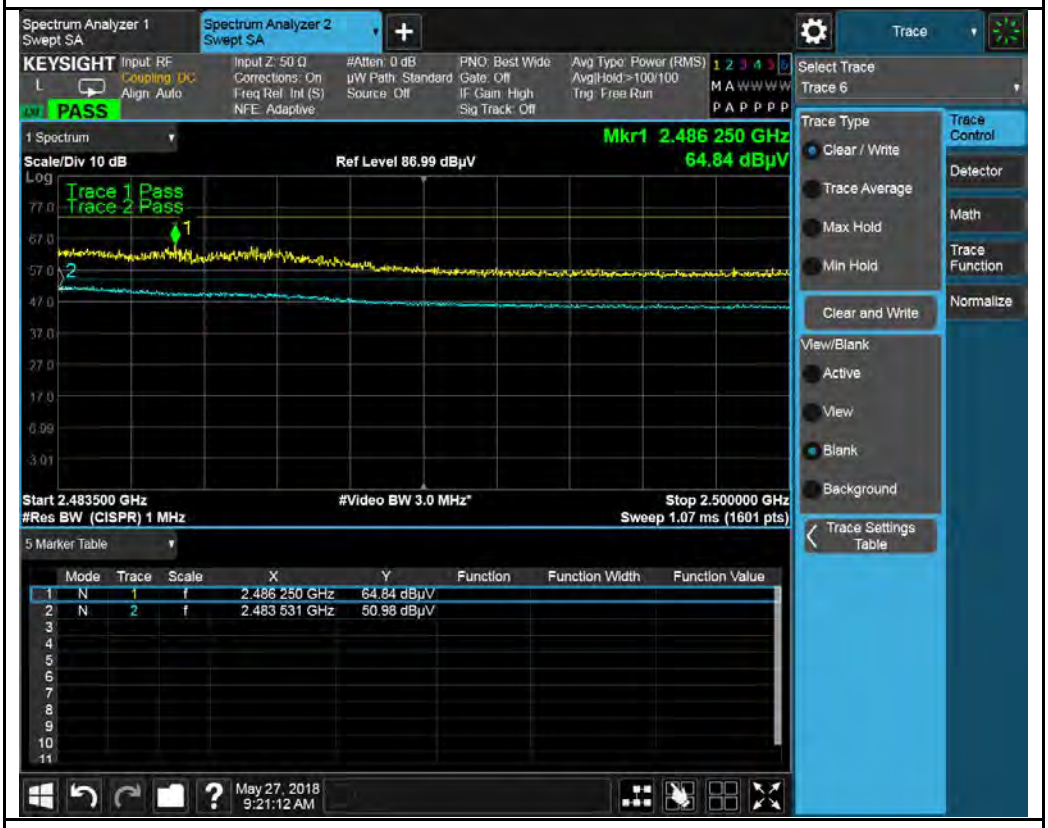


802.11b-2412MHz

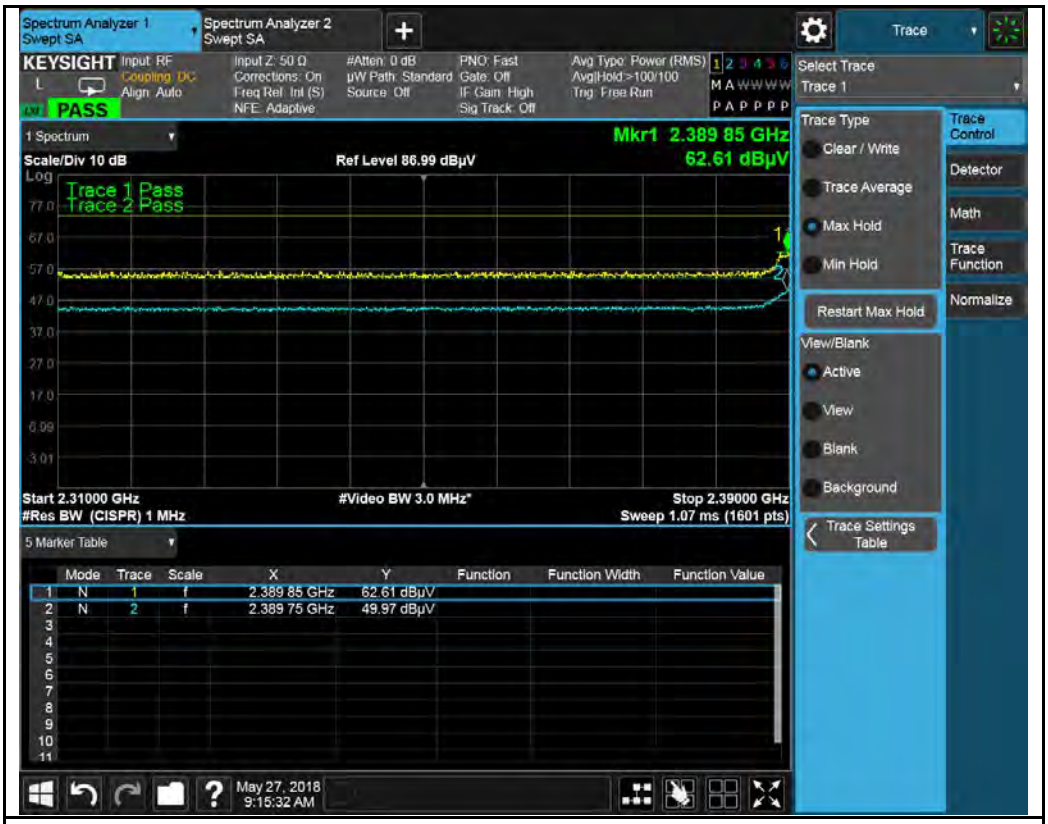
802.11b-2462MHz



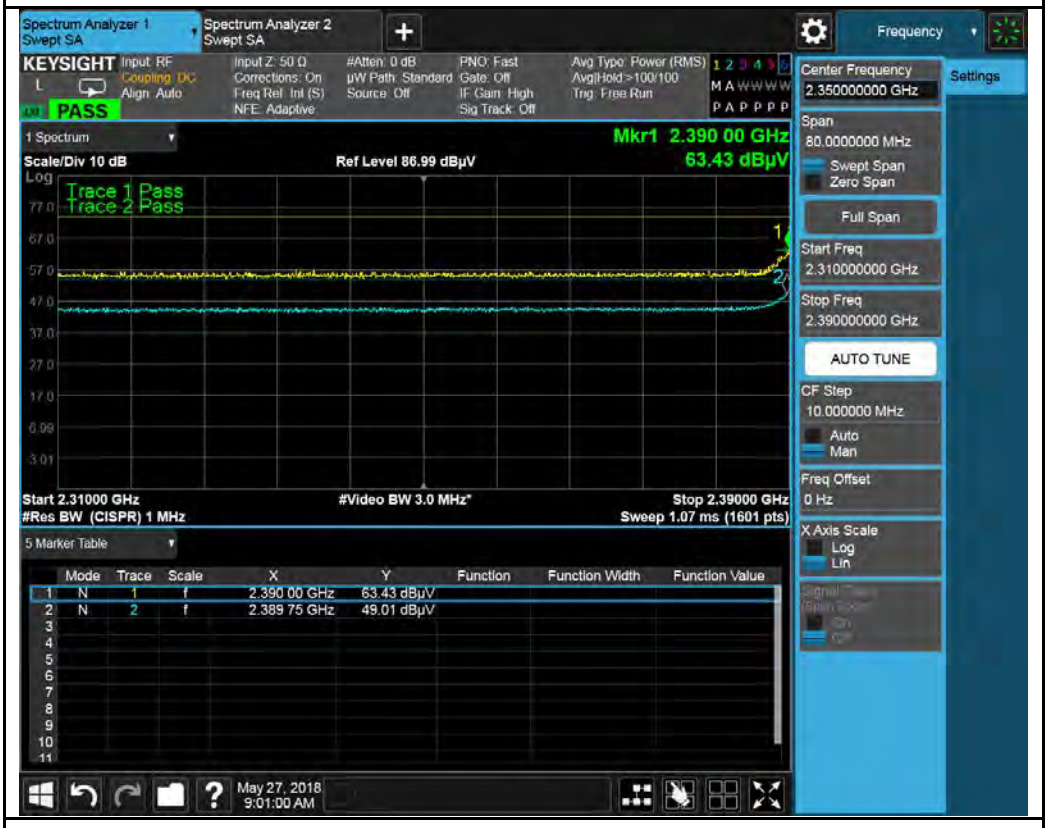
802.11g-2412MHz



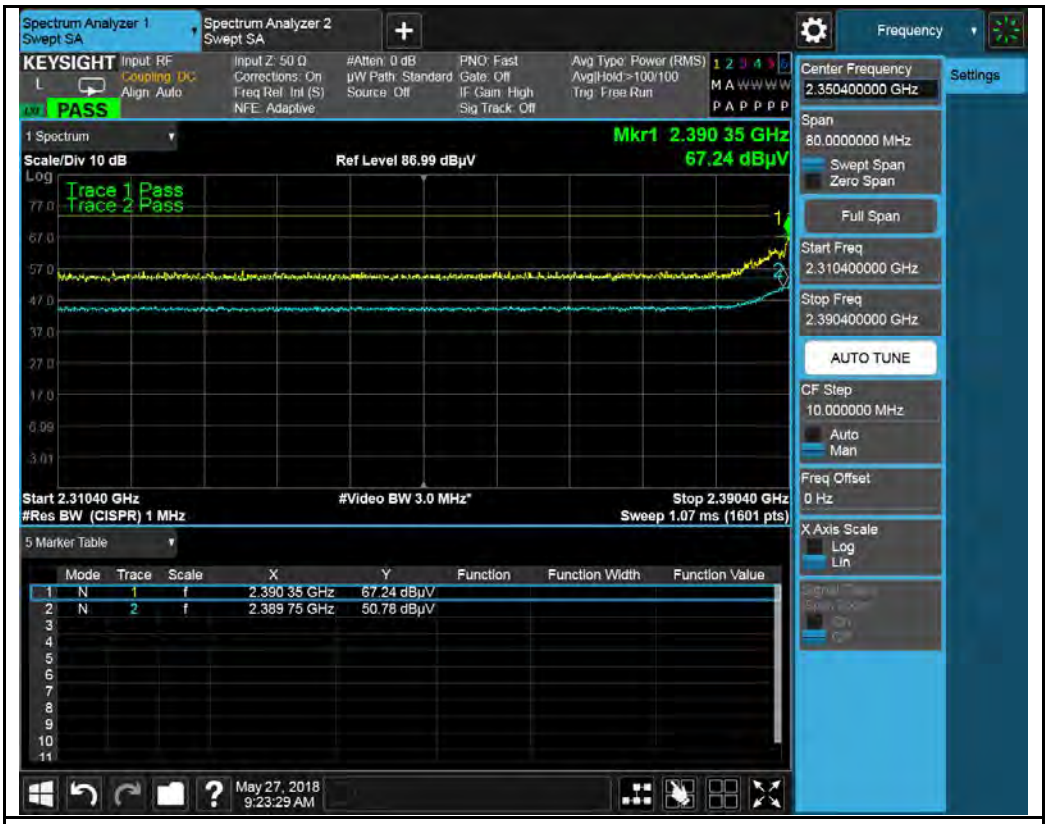
802.11g-2462MHz



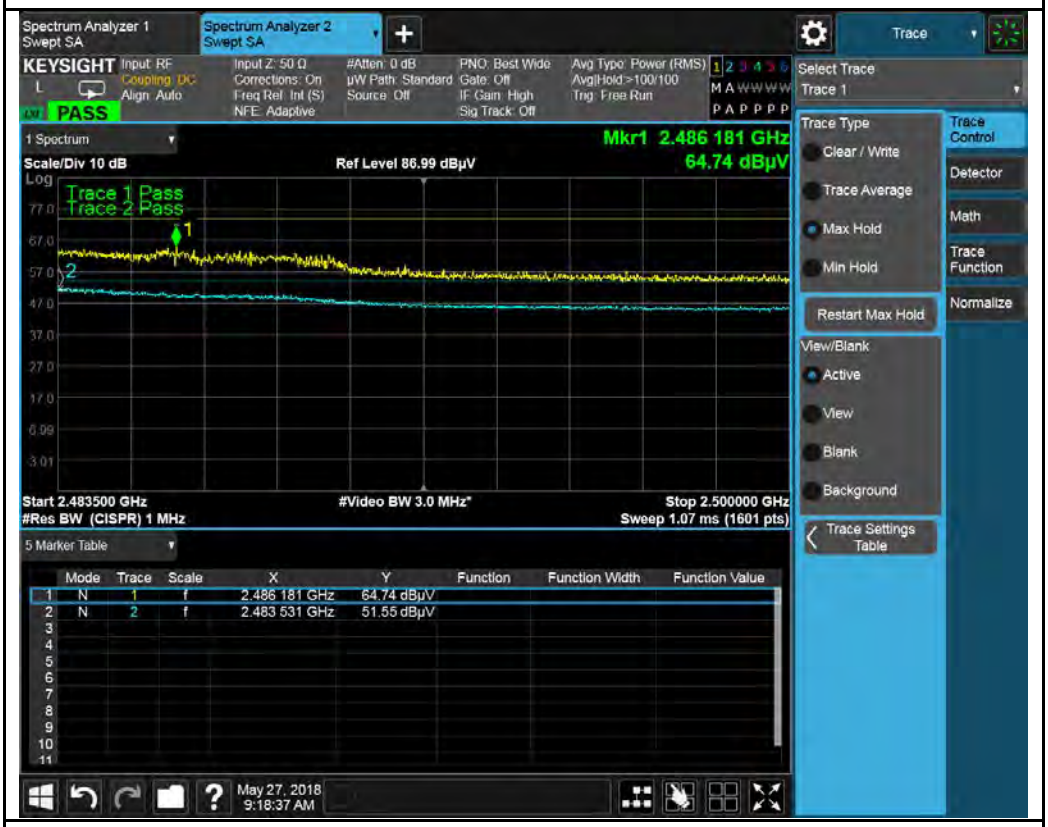
802.11n-HT20-2412MHz



802.11n-HT20-2462MHz



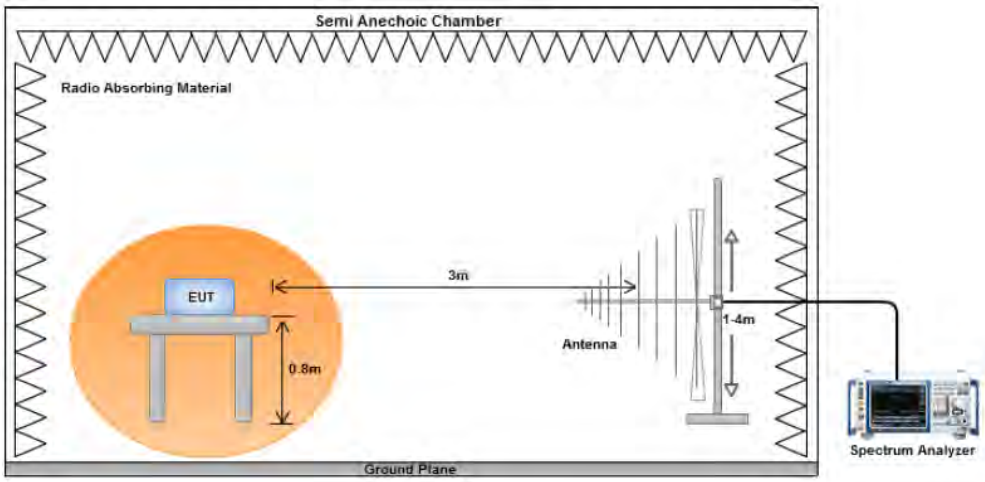
802.11n-HT40-2422MHz



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>

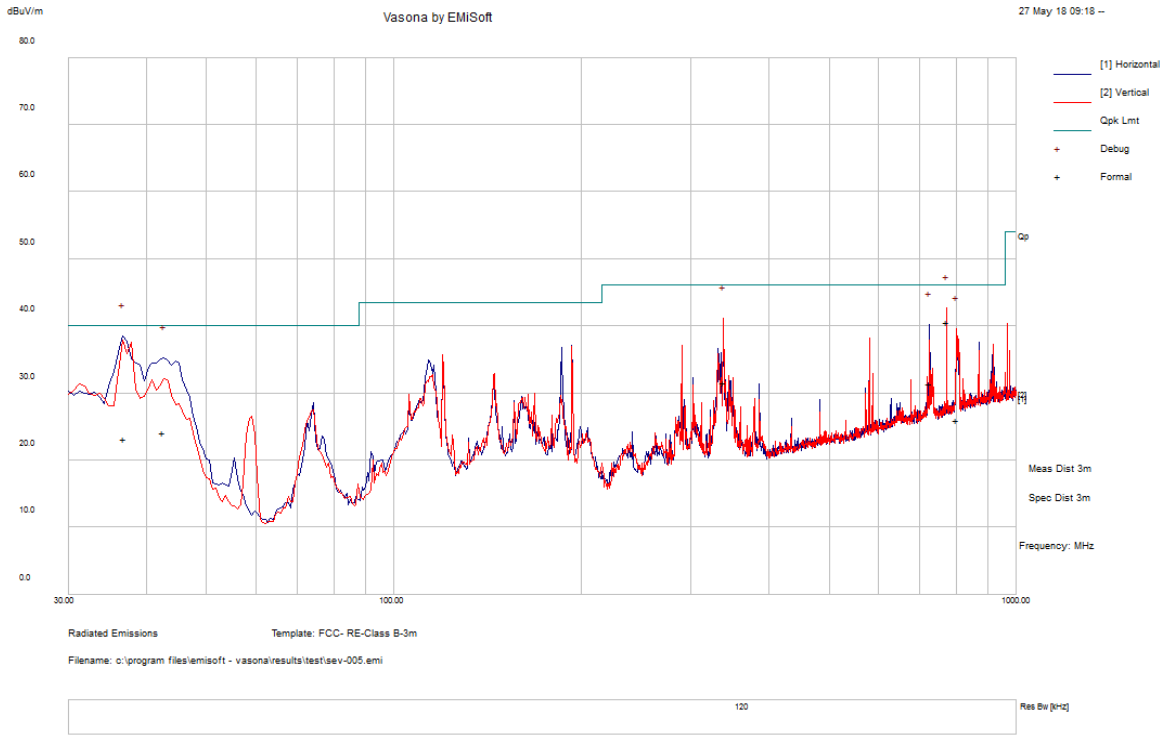
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Deon Dai			
Test Date:	05/27/2018			
Remarks:	Mid CH Continue TX			

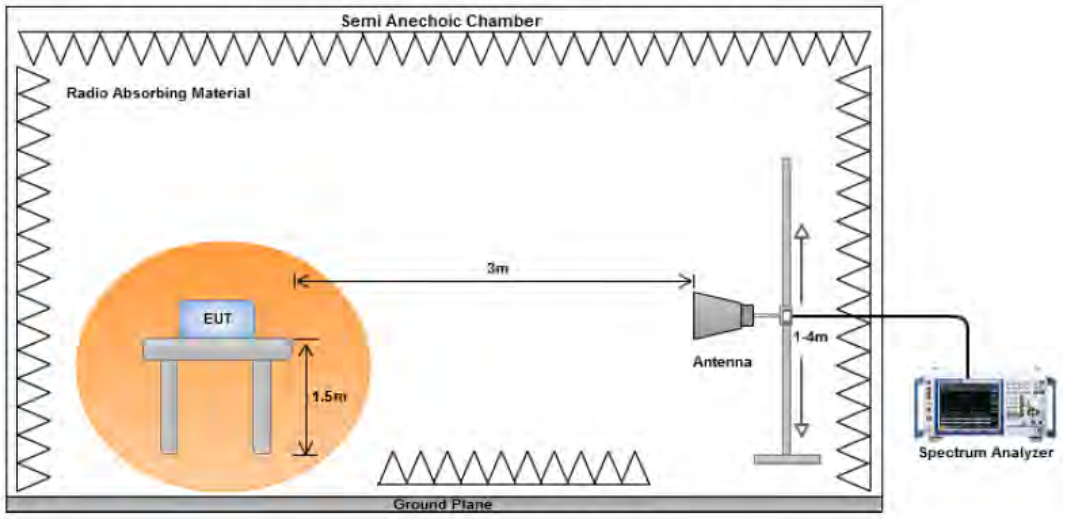


Frequency MHz	Raw dBµV/m	Cable Loss	AF dB	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
36.87	30.79	11.24	-18.88	23.16	Quasi Max	H	307	151	40	-16.84	Pass
773.34	39.8	15.49	-14.75	40.55	Quasi Max	V	257	13	46	-5.46	Pass
42.50	35.62	11.35	-22.86	24.11	Quasi Max	H	102	218	40	-15.89	Pass
338.20	40.31	13.49	-22.23	31.57	Quasi Max	V	146	317	46	-14.43	Pass
724.82	31.6	15.18	-15.3	31.48	Quasi Max	H	127	356	46	-14.52	Pass
801.51	25.18	15.46	-14.63	26.01	Quasi Max	V	327	92	46	-19.99	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), 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 25GHz. 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 Deon Dai 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
4823.95	46.67	4.17	-2.06	48.78	Peak Max	V	125	266	74	-25.22	Pass
7235.55	36.74	5.32	0.97	43.03	Peak Max	V	102	154	74	-30.97	Pass
9645.35	25.28	6.56	1.27	33.11	Peak Max	H	200	29	74	-40.89	Pass
4823.95	38.44	4.17	-2.06	40.55	Average Max	V	120	299	54	-13.45	Pass
7235.55	24.42	5.32	0.97	30.71	Average Max	V	201	21	54	-23.29	Pass
9645.35	24.41	6.56	1.27	32.24	Average Max	H	110	359	54	-21.76	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
7309.36	37.49	5.35	0.94	43.78	Peak Max	V	100	322	74	-30.22	Pass
9751.38	37.45	6.54	1.13	45.12	Peak Max	H	201	211	74	-28.88	Pass
4877.15	42.8	4.2	-2.15	44.85	Peak Max	V	120	259	74	-29.15	Pass
7309.36	25.2	5.35	0.94	31.49	Average Max	V	110	198	54	-22.51	Pass
9751.38	25.02	6.54	1.13	32.69	Average Max	H	198	205	54	-21.31	Pass
4877.15	36.25	4.2	-2.15	38.3	Average Max	V	100	52	54	-15.7	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
7385.87	37.44	5.38	0.54	43.36	Peak Max	H	221	212	74	-30.64	Pass
9849.4	37.8	6.53	1.12	45.45	Peak Max	V	100	24	74	-28.55	Pass
4920.85	44.08	4.22	-2.18	46.12	Peak Max	V	102	299	74	-27.88	Pass
7385.87	25.74	5.38	0.54	31.66	Average Max	H	100	311	54	-22.34	Pass
9849.4	25.23	6.53	1.12	32.88	Average Max	V	122	302	54	-21.12	Pass
4920.85	38.75	4.22	-2.18	40.79	Average Max	V	125	198	54	-13.21	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
7235.3	37.48	5.32	0.97	43.77	Peak Max	H	122	295	74	-30.23	Pass
9645	37.62	6.56	1.26	45.44	Peak Max	V	198	120	74	-28.56	Pass
4822.35	36.82	4.17	-2.06	38.93	Peak Max	H	102	222	74	-35.07	Pass
7235.3	22.65	5.32	0.97	28.94	Average Max	H	214	24	54	-25.06	Pass
9645	23.93	6.56	1.26	31.75	Average Max	V	112	138	54	-22.25	Pass
4822.35	24.68	4.17	-2.06	26.79	Average Max	H	198	231	54	-27.21	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
7321.5	36.92	5.35	0.93	43.2	Peak Max	H	205	325	74	-30.8	Pass
9748.55	37.41	6.54	1.13	45.08	Peak Max	V	112	144	74	-28.92	Pass
4865.58	48.22	4.19	-2.13	50.28	Peak Max	V	165	23	74	-23.72	Pass
7321.5	24.87	5.35	0.93	31.15	Average Max	H	344	356	54	-22.85	Pass
9748.55	25.35	6.54	1.13	33.02	Average Max	V	122	168	54	-20.98	Pass
4865.58	33.86	4.19	-2.13	35.92	Average Max	V	136	344	54	-18.08	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
7385.25	37.24	5.38	0.55	43.17	Peak Max	H	170	231	74	-30.83	Pass
9846.35	37.15	6.53	1.12	44.8	Peak Max	H	158	122	74	-29.2	Pass
4923.66	41.47	4.23	-2.18	43.52	Peak Max	V	102	180	74	-30.48	Pass
7385.25	25.22	5.38	0.55	31.15	Average Max	H	299	188	54	-22.85	Pass
9846.35	25.08	6.53	1.12	32.73	Average Max	H	199	236	54	-21.27	Pass
4923.66	28.27	4.23	-2.18	30.32	Average Max	V	120	189	54	-23.68	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
9590.44	37.47	6.57	1.48	45.52	Peak Max	V	144	255	74	-28.48	Pass
4823.65	42.43	4.17	-2.06	44.54	Peak Max	H	255	277	74	-29.46	Pass
3954.25	37.42	3.82	-2.25	38.99	Peak Max	V	121	244	74	-35.01	Pass
9590.44	22.86	6.57	1.48	30.91	Average Max	V	199	199	54	-23.09	Pass
4823.65	24.37	4.17	-2.06	26.48	Average Max	H	214	299	54	-27.52	Pass
3954.25	24.97	3.82	-2.25	26.54	Average Max	V	202	360	54	-27.46	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
9586.45	36.61	6.57	1.51	44.69	Peak Max	H	266	299	74	-29.31	Pass
4873.21	40.32	4.2	-2.14	42.38	Peak Max	H	202	145	74	-31.62	Pass
3815.25	38.63	3.74	-2.5	39.87	Peak Max	V	141	322	74	-34.13	Pass
9586.45	25.1	6.57	1.51	33.18	Average Max	H	122	299	54	-20.82	Pass
4873.21	25.91	4.2	-2.14	27.97	Average Max	H	199	21	54	-26.03	Pass
3815.25	26.01	3.74	-2.5	27.25	Average Max	V	130	214	54	-26.75	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
9695.25	36.85	6.55	1.1	44.5	Peak Max	H	200	144	74	-29.5	Pass
3876.53	37.52	3.78	-2.38	38.92	Peak Max	V	100	193	74	-35.08	Pass
3255.64	40.49	3.5	-3.85	40.14	Peak Max	V	102	292	74	-33.86	Pass
9695.25	25.04	6.55	1.1	32.69	Average Max	H	199	319	54	-21.31	Pass
3876.53	26.28	3.78	-2.38	27.68	Average Max	V	110	28	54	-26.32	Pass
3255.64	27.26	3.5	-3.85	26.91	Average Max	V	109	289	54	-27.09	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
4846.35	39.54	4.18	-2.1	41.62	Peak Max	H	105	151	74	-32.38	Pass
7265.25	36.42	5.33	0.98	42.73	Peak Max	V	199	201	74	-31.27	Pass
9687.54	37.36	6.56	1.12	45.04	Peak Max	H	233	266	74	-28.96	Pass
4846.35	27.47	4.18	-2.1	29.55	Average Max	H	108	195	54	-24.45	Pass
7265.25	23.59	5.33	0.98	29.9	Average Max	V	100	209	54	-24.1	Pass
9687.54	24.94	6.56	1.12	32.62	Average Max	H	198	219	54	-21.38	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
9745.65	37.97	6.54	1.12	45.63	Peak Max	H	300	155	74	-28.37	Pass
7322.25	37.4	5.35	0.92	43.67	Peak Max	V	122	124	74	-30.33	Pass
4872.52	43.51	4.2	-2.14	45.57	Peak Max	H	198	214	74	-28.43	Pass
9745.65	25.04	6.54	1.12	32.7	Average Max	H	188	299	54	-21.3	Pass
7322.25	24.57	5.35	0.92	30.84	Average Max	V	120	281	54	-23.16	Pass
4872.52	30.98	4.2	-2.14	33.04	Average Max	H	299	254	54	-20.96	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
7355.32	37.67	5.37	0.7	43.74	Peak Max	H	220	258	74	-30.26	Pass
9805.65	37.97	6.53	1.17	45.67	Peak Max	V	244	211	74	-28.33	Pass
4903.25	43.55	4.21	-2.18	45.58	Peak Max	H	159	258	74	-28.42	Pass
7355.32	25.3	5.37	0.7	31.37	Average Max	H	211	2	54	-22.63	Pass
9805.65	25.38	6.53	1.17	33.08	Average Max	V	122	198	54	-20.92	Pass
4903.25	31.59	4.21	-2.18	33.62	Average Max	H	199	244	54	-20.38	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						
Keysight EXA 44GHz Spectrum Analyzer	N9030B(PXA)	MY57140374	09/06/2017	1 Year	09/06/2018	☑
Bi-Log antenna (30MHz~1GHz)	JB1	A030702	03/09/2018	2 Year	03/09/2020	☑
Horn Antenna (1GHz~18GHz)	3115	100059	11/09/2017	1 Year	11/09/2018	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	08/20/2017	1 Year	08/20/2018	☑
Keysight EXA 44GHz Spectrum Analyzer	N9030B(PXA)	MY57140374	09/06/2017	1 Year	09/06/2018	☑
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