

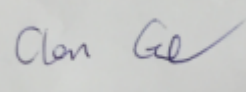
RF TEST REPORT



Report No.: FCC_IC RF_SL16032301-RUC-014_DTS Rev 2.0

Supersede Report No.: FCC_IC RF_SL16032301-RUC-014_DTS

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	H510 Access Point
Model No.	:	H510
Test Standard	:	47 CFR 15.247
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r05
FCC ID	:	S9GH510
IC ID	:	5912A-H510
Dates of test	:	05/27/2016 to 06/20/2016
Issue Date	:	07/19/2016
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X]		
Equipment did not comply with the specification []		

This Test Report is Issued Under the Authority of:	
	
Gary Chou	Chen Ge
Test Engineer	Engineer Reviewer

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



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: www.siemic.com; Follow us at:



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	4
2	EXECUTIVE SUMMARY	5
3	CUSTOMER INFORMATION	5
4	TEST SITE INFORMATION	5
5	MODIFICATION	5
6	EUT INFORMATION	6
6.1	EUT Description	6
6.2	Radio Description	6
7	SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION.....	8
7.1	Supporting Equipment	8
7.2	Cabling Description	8
7.3	Test Software Description	8
8	TEST SUMMARY	9
9	MEASUREMENT UNCERTAINTY	10
10	MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	11
10.1	Conducted Emissions.....	11
10.2	6dB Bandwidth	14
10.3	99% Occupied Bandwidth	18
10.4	Output Power	22
10.5	Band Edge	24
10.6	Peak Spectral Density	28
10.7	Radiated Spurious Emissions in restricted band.....	34
10.8	Radiated Spurious Emissions below 1GHz	37
10.9	Radiated Spurious Emissions between 1GHz – 25GHz.....	39
	ANNEX A. TEST INSTRUMENT	44
	ANNEX B. SIEMIC ACCREDITATION	45

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC RF_SL16032301-RUC-014_DTS	None	Original	06/22/2016
FCC_IC RF_SL16032301-RUC-014_DTS Rev 1.0	1.0	Updated per customer	07/06/2016
FCC_IC RF_SL16032301-RUC-014_DTS Rev 2.0	2.0	Updated per TCB reviewer	07/19/2016

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: H510 Access Point
Model: H510

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	H510 Access Point
Model No.	H510
Trade Name	Ruckus
Serial No.	141606000019
Host Model No.	N/A
Input Power	48VDC (PoE)
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Date of EUT received	05/26/2016
Equipment Class/ Category	DTS, UNII
Clock Frequencies	48MHz XTAL Frequency, 25MHz Clock
Port/Connectors	PoE, Ethernet
Product Hardware version	705-60455-001
Product Software version	812-72425-001
Radio Hardware version	705-60455-001
Radio Software version	812-72425-001
Test Software version	117-11343-001

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	Internal Omni PCB Antenna			
Antenna Gain (Peak)	2.4GHz: 0 dBi			
Antenna Connector Type	U.FL			
Note	2.4GHz and 5GHz Radio transmit simultaneously			

EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	22
802.11-b	2437	22
802.11-b	2462	22
802.11-g	2412	17
802.11-g	2437	22
802.11-g	2462	16
802.11-n-20	2412	17
802.11-n-20	2437	22
802.11-n-20	2462	16
802.11-n-40	2422	16
802.11-n-40	2437	22
802.11-n-40	2452	13

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	-
2	POE Adapter	740-64214-001	N/A	Ruckus	-

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	POE	RJ45	2	Unshielded	-
RJ45	POE	RJ45	Laptop	RJ45	3	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Command Line in windows	Set the EUT to transmit continuously in diferent test 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	☒ Pass
	IC	RSS Gen 8.10	IC	558074 D01 DTS Meas Guidance v03r05	☐ N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☒ Pass
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	☐ N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☒ Pass
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	☐ N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass
	IC	RSS247 (5.2.1)	IC		☐ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013	☒ Pass
	IC	RSS247 (5.5)	IC	558074 D01 DTS Meas Guidance v03r05	☐ N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass
	IC	RSS247 (5.4.4)	IC		☐ N/A
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
	IC	-	IC	-	☒ N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ Pass
	IC	RSS247 (5.2.2)	IC		☐ N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	☒ N/A
Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.				

9 Measurement Uncertainty

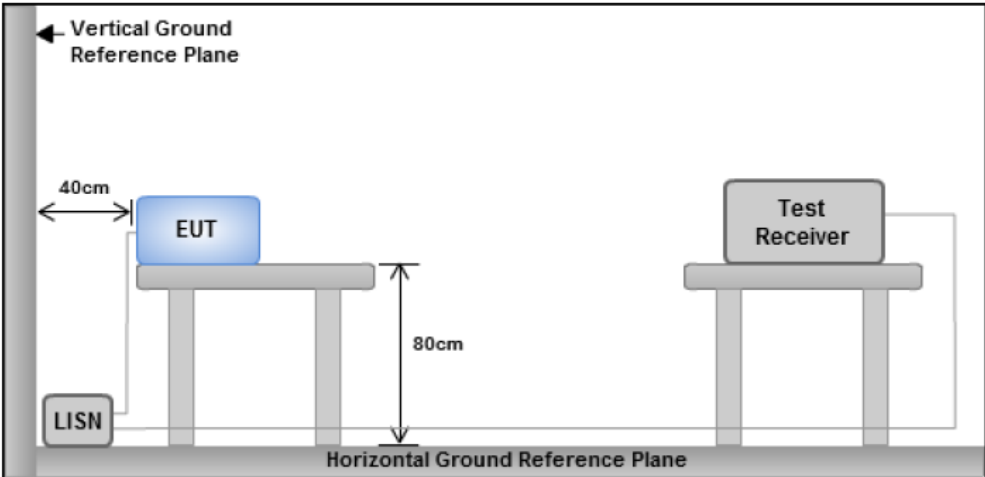
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious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

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

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

Spec	Item	Requirement	Applicable
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 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.	☒
Test Setup	 Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 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		

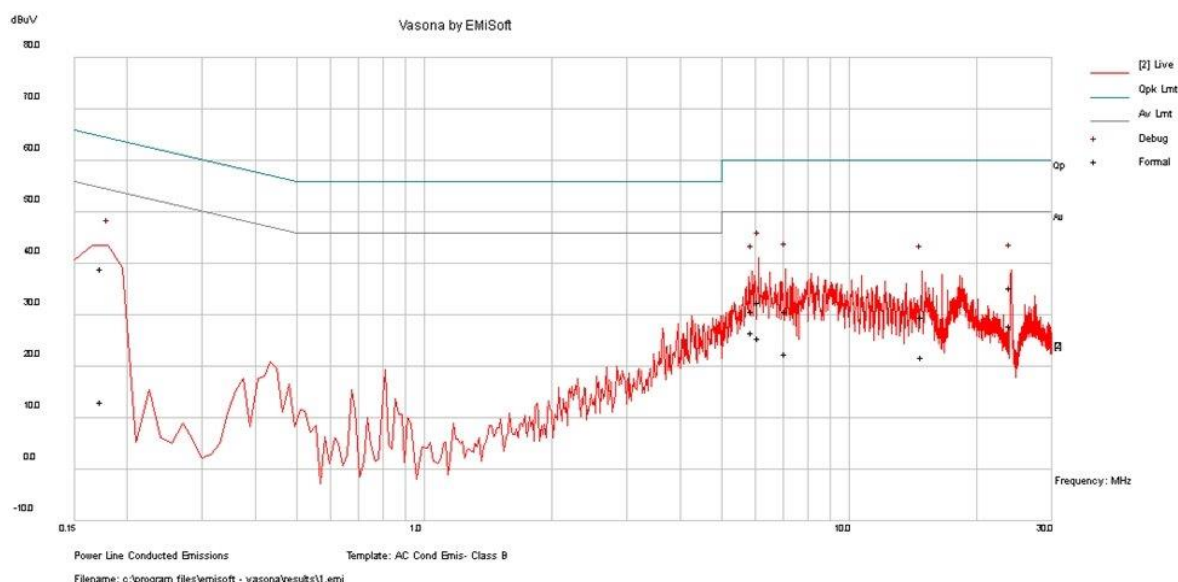
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Gary Chou 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:	Gary Chou			
Test Date:	06/22/2016			
Remarks	Power Supply, Line			

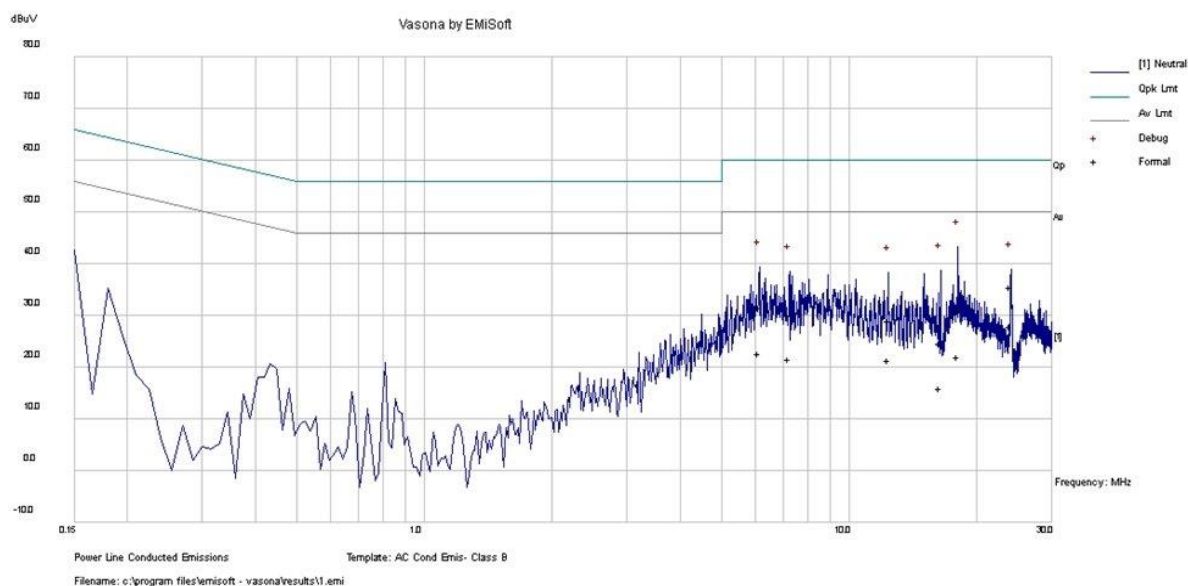


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
6.13	22.03	10.04	0.55	32.62	Quasi Peak	Line	60	-27.38	Pass
7.07	20.14	10.04	0.55	30.73	Quasi Peak	Line	60	-29.27	Pass
0.17	27.63	10	1.51	39.15	Quasi Peak	Line	64.76	-25.61	Pass
24.00	24.53	10.08	0.76	35.37	Quasi Peak	Line	60	-24.63	Pass
5.90	20.32	10.04	0.55	30.91	Quasi Peak	Line	60	-29.09	Pass
14.81	18.99	10.06	0.6	29.65	Quasi Peak	Line	60	-30.35	Pass
6.13	15.01	10.04	0.55	25.6	Average	Line	50	-24.4	Pass
7.07	12.05	10.04	0.55	22.64	Average	Line	50	-27.36	Pass
0.17	1.63	10	1.51	13.15	Average	Line	54.76	-41.61	Pass
24.00	17.2	10.08	0.76	28.03	Average	Line	50	-21.97	Pass
5.90	16.21	10.04	0.55	26.8	Average	Line	50	-23.2	Pass
14.81	11.29	10.06	0.6	21.95	Average	Line	50	-28.05	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:	Gary Chou			
Test Date:	06/22/2016			
Remarks	Power Supply, Neutral			

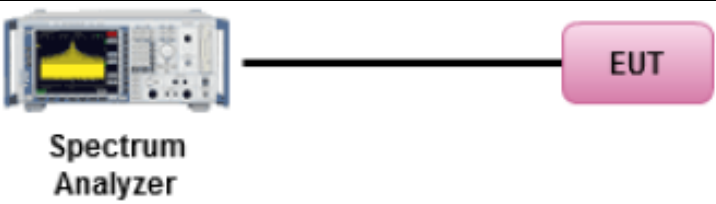


Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
18.03	20.42	10.07	0.66	31.14	Quasi Peak	Neutral	60	-28.86	Pass
6.13	21.16	10.04	0.55	31.75	Quasi Peak	Neutral	60	-28.25	Pass
23.99	24.74	10.08	0.76	35.57	Quasi Peak	Neutral	60	-24.43	Pass
16.38	14.07	10.06	0.63	24.76	Quasi Peak	Neutral	60	-35.24	Pass
7.24	19.64	10.04	0.55	30.24	Quasi Peak	Neutral	60	-29.76	Pass
12.35	18.37	10.05	0.58	29	Quasi Peak	Neutral	60	-31	Pass
18.03	11.34	10.07	0.66	22.06	Average	Neutral	50	-27.94	Pass
6.13	12.14	10.04	0.55	22.73	Average	Neutral	50	-27.27	Pass
23.99	17.24	10.08	0.76	28.07	Average	Neutral	50	-21.93	Pass
16.38	5.31	10.06	0.63	16	Average	Neutral	50	-34	Pass
7.24	11.05	10.04	0.55	21.65	Average	Neutral	50	-28.35	Pass
12.35	10.94	10.05	0.58	21.57	Average	Neutral	50	-28.43	Pass

10.2 6dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247 RSS247 (5.2.1)	a)(2)	6dB BW≥500KHz;	☒
Test Setup	 Spectrum Analyzer		
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 8.1 DTS bandwidth <u>6dB Emission bandwidth measurement procedure</u> - Set RBW = 100 kHz. - Set the video bandwidth (VBW) $\geq 3 \times$ 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	05/28/2016	Environmental condition	Temperature 23°C Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

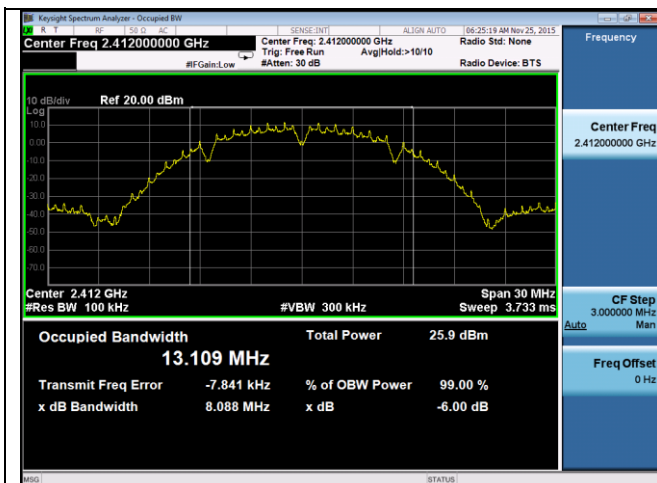
Test Plot ☒ Yes ☐ N/A

Test was done by Chen Ge at RF test site.

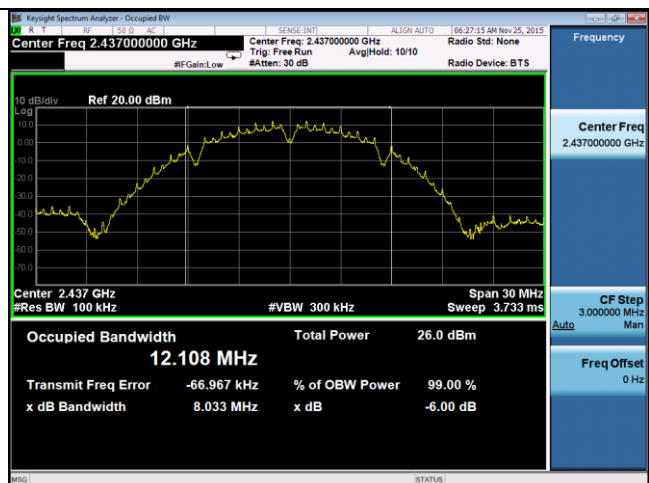
6dB Bandwidth measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11b	2412	Low	8.08	≥0.5	Pass
		2437	Mid	8.03	≥0.5	Pass
		2462	High	7.06	≥0.5	Pass
	802.11g	2412	Low	15.94	≥0.5	Pass
		2437	Mid	16.08	≥0.5	Pass
		2462	High	16.32	≥0.5	Pass
	802.11n-20M	2412	Low	16.92	≥0.5	Pass
		2437	Mid	16.90	≥0.5	Pass
		2462	High	17.57	≥0.5	Pass
	802.11n-40M	2422	Low	34.05	≥0.5	Pass
		2437	Mid	31.94	≥0.5	Pass
		2452	High	36.29	≥0.5	Pass

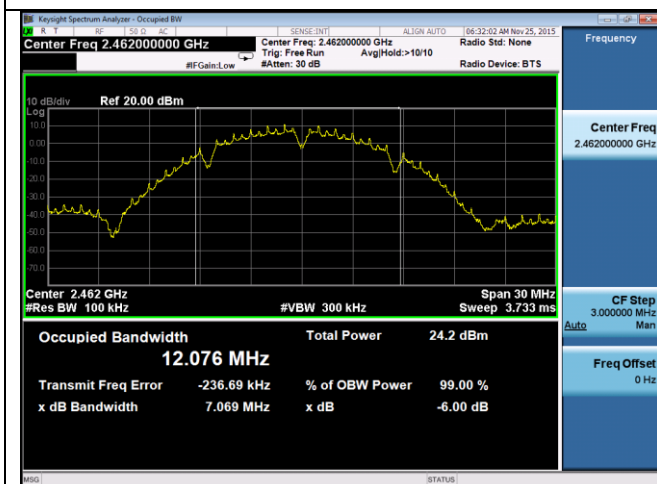
6dB Bandwidth Test Plots



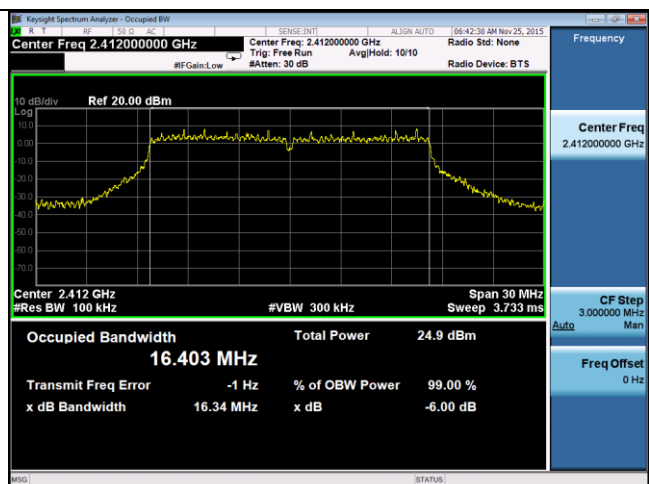
6dB BW -2.4G 802.11b 2412MHz



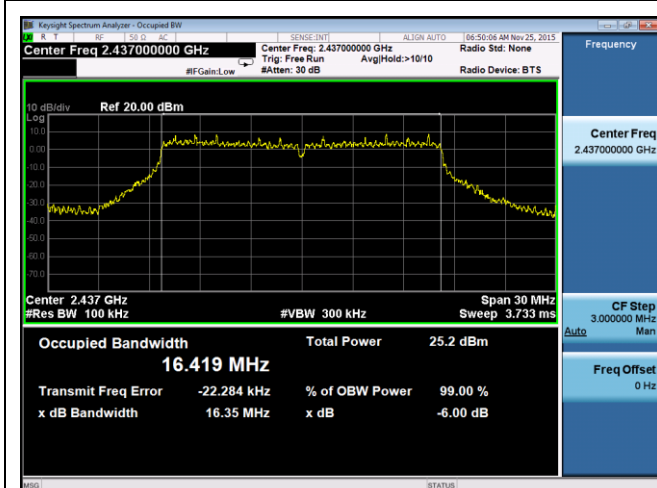
6dB BW -2.4G 802.11b 2437MHz



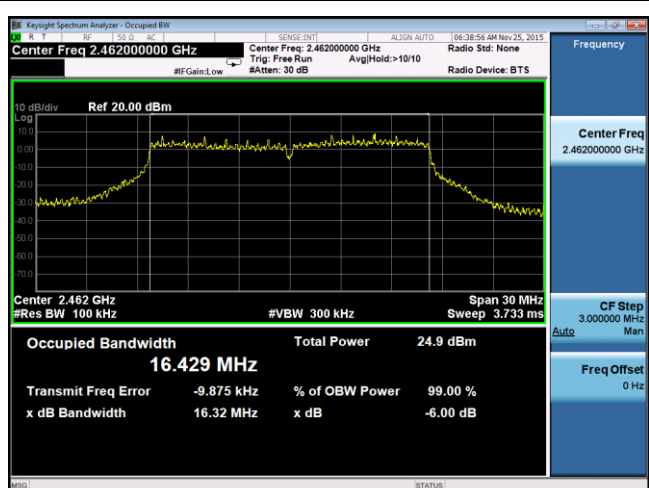
6dB BW -2.4G 802.11b 2462MHz



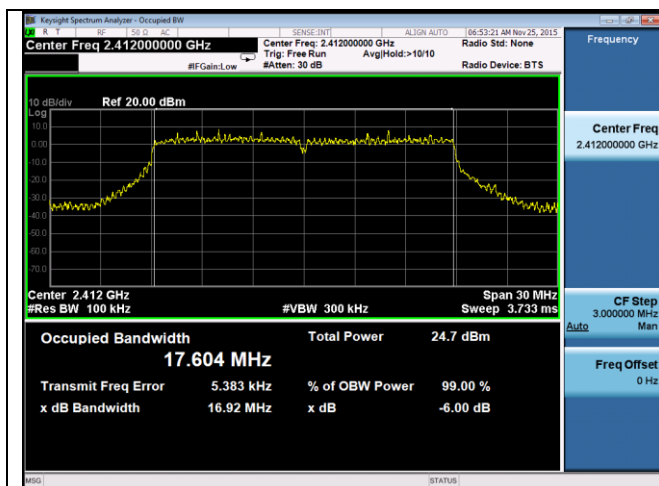
6dB BW -2.4G 802.11g 2412MHz



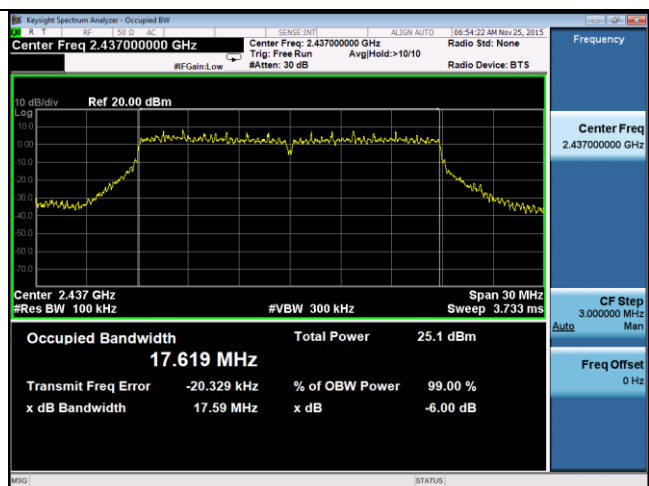
6dB BW -2.4G 802.11g 2437MHz



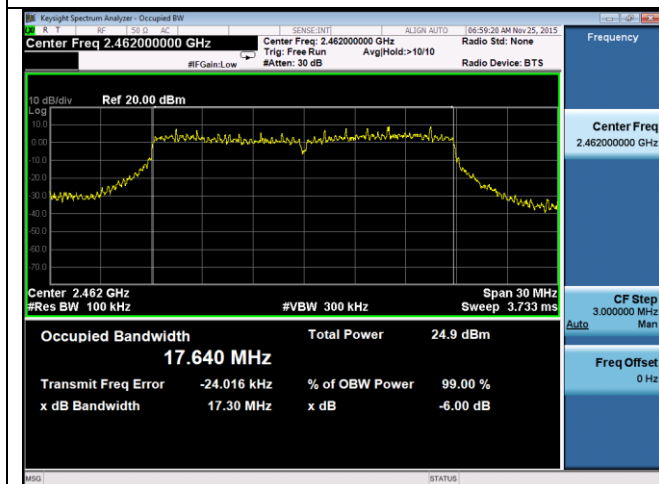
6dB BW -2.4G 802.11g 2462MHz



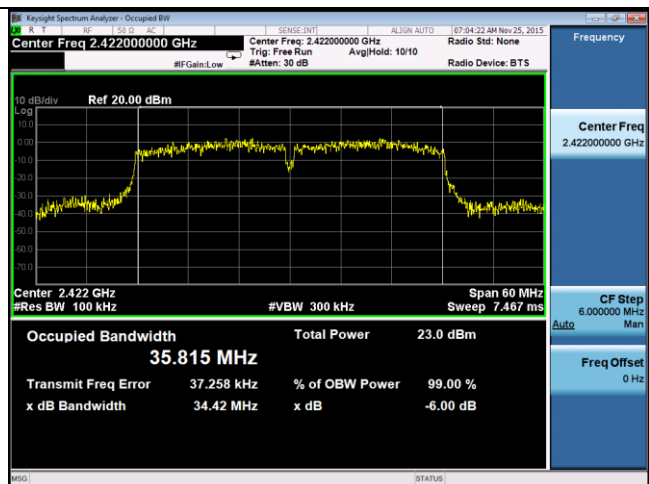
6dB BW -2.4G 802.11n-20M 2412MHz



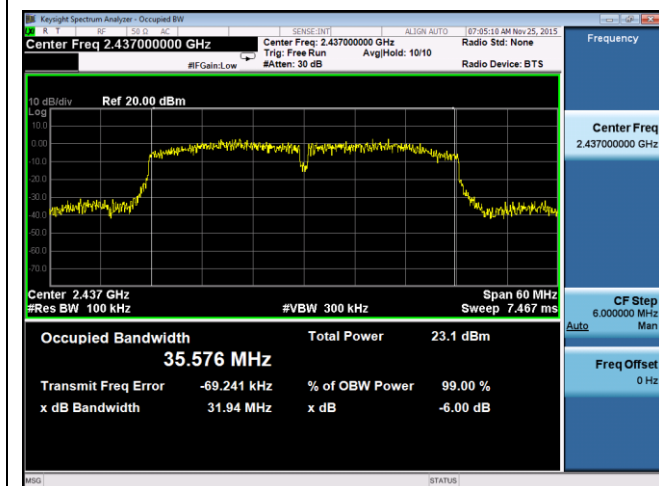
6dB BW -2.4G 802.11n-20M 2437MHz



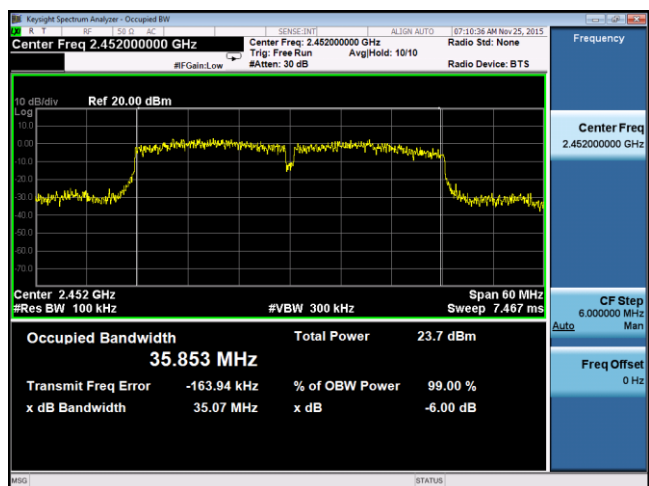
6dB BW -2.4G 802.11n-20M 2462MHz



6dB BW -2.4G 802.11n-40M 2422MHz



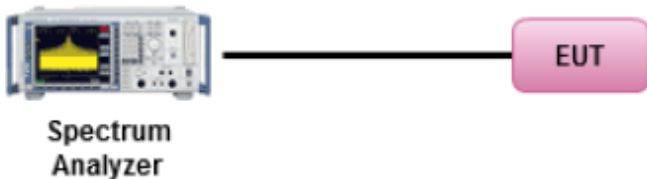
6dB BW -2.4G 802.11n-40M 2437MHz



6dB BW -2.4G 802.11n-40M 2452MHz

10.3 99% Occupied Bandwidth

Requirements:

Spec	Requirement	Applicable
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		
Procedure	1. EUT was set for low , mid, high channel with modulated mode and highest RF output power. 2. The spectrum analyzer was connected to the antenna terminal.	
Test Date	05/28/2016	Environmental condition Temperature 23oC Relative Humidity 47% Atmospheric Pressure 1019mbar
Remark	-	
Result	☒ Pass ☐ Fail	

Test Data ☒ Yes (See below) ☐ N/A

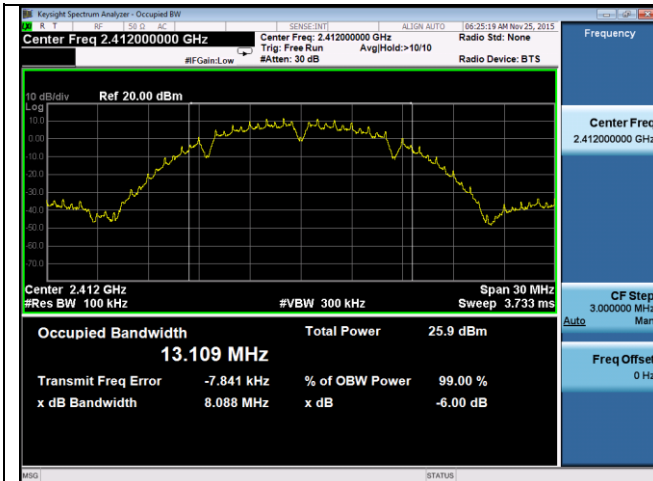
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at RF test site.

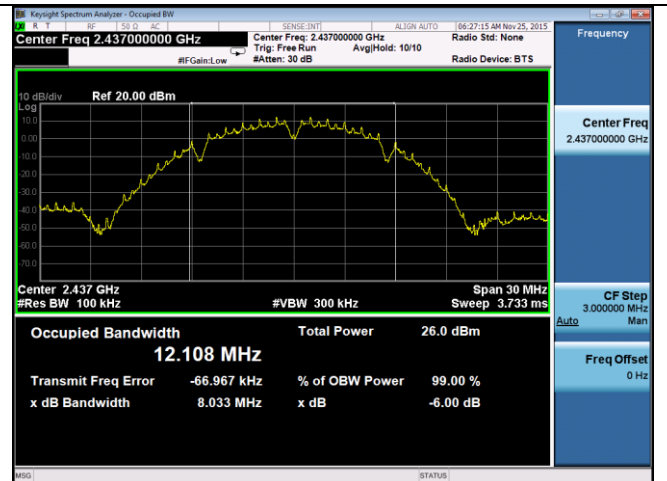
99% OBW measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
99% OBW	802.11b	2412	Low	13.10
		2437	Mid	12.10
		2462	High	12.07
	802.11g	2412	Low	16.40
		2437	Mid	16.41
		2462	High	16.42
	802.11n-20M	2412	Low	17.60
		2437	Mid	17.61
		2462	High	17.64
	802.11n-40M	2422	Low	35.81
		2437	Mid	35.57
		2452	High	35.85

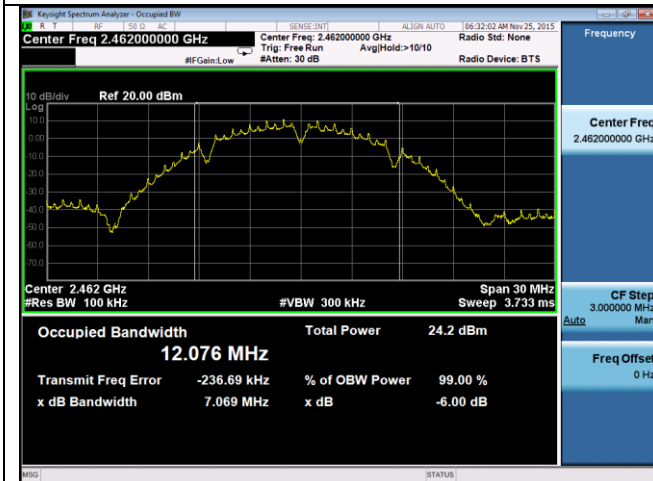
Test Plots



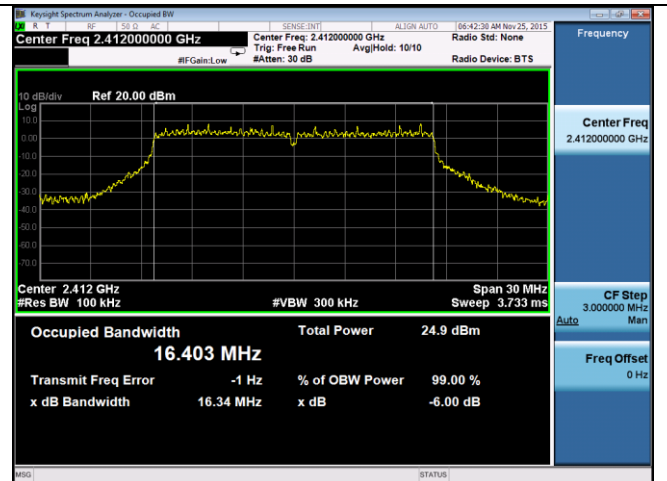
99% BW -2.4G 802.11b 2412MHz



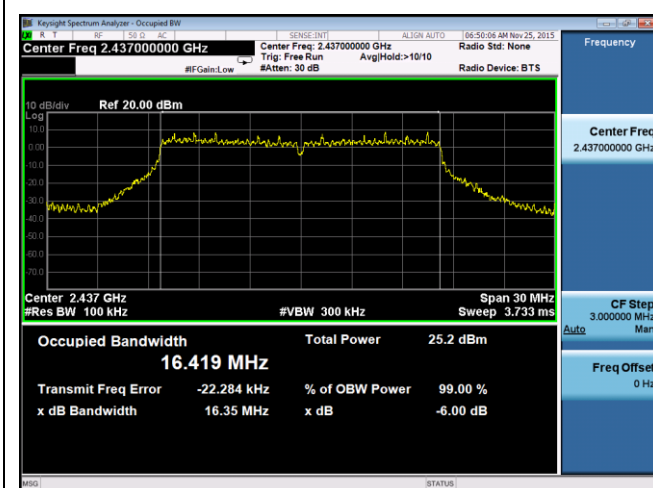
99%BW -2.4G 802.11b 2437MHz



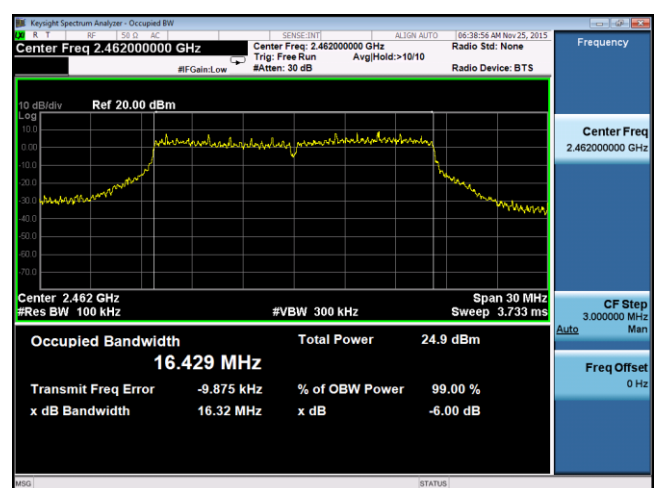
99%BW -2.4G 802.11b 2462MHz



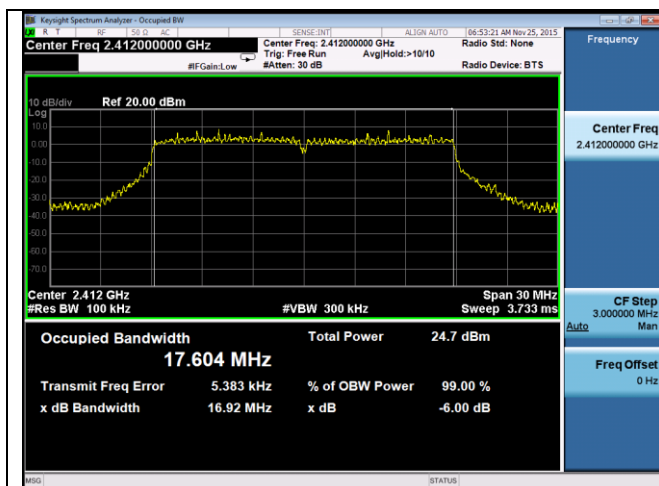
99%BW -2.4G 802.11g 2412MHz



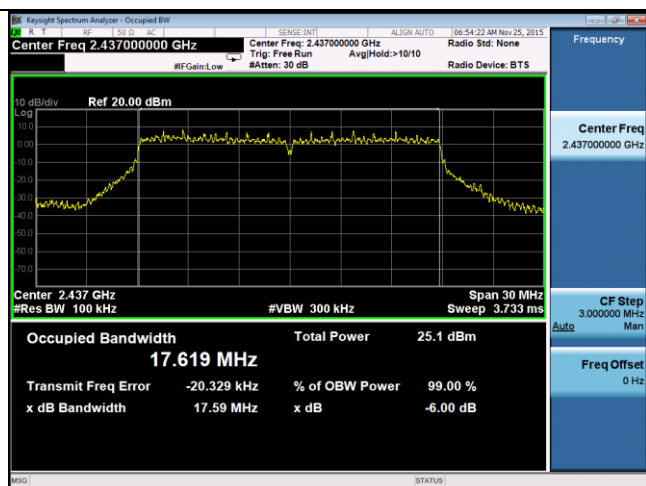
99%BW -2.4G 802.11g 2437MHz



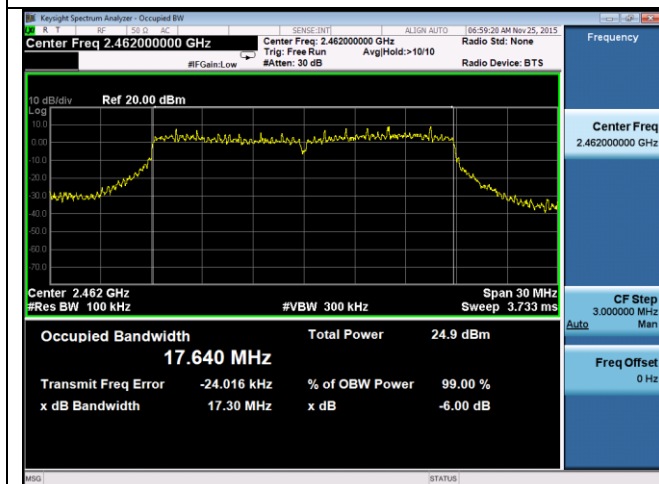
99%BW -2.4G 802.11g 2462MHz



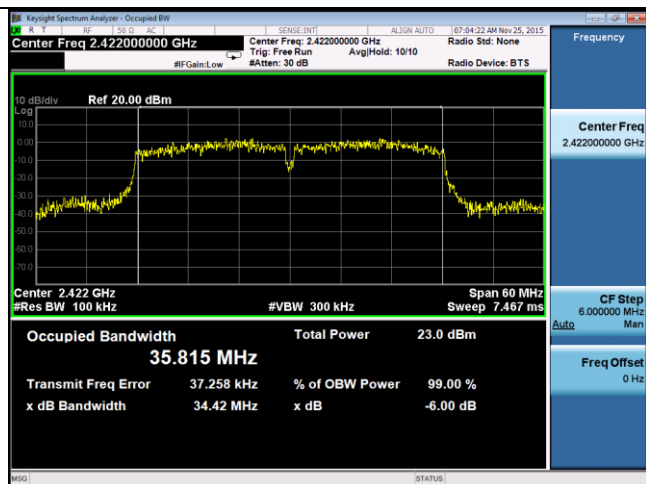
99%BW -2.4G 802.11n-20M 2412MHz



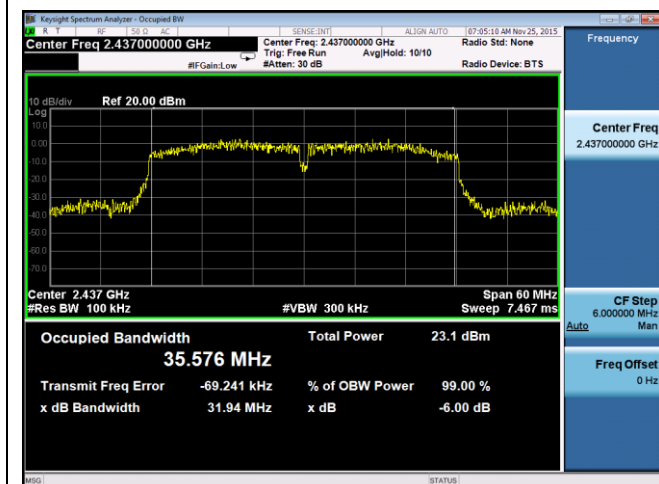
99%BW -2.4G 802.11n-20M 2437MHz



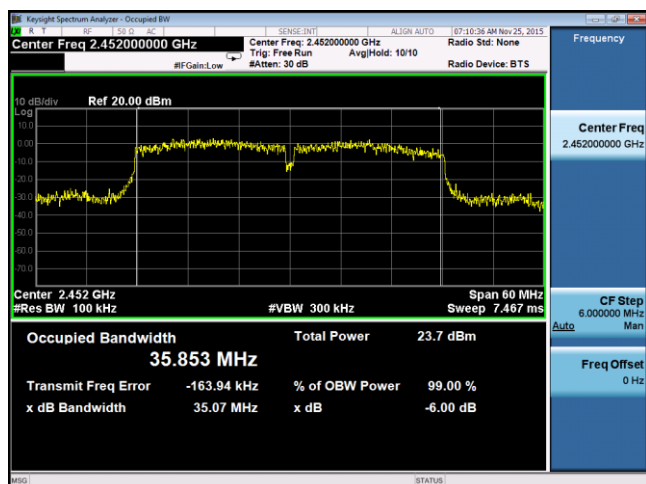
99%BW -2.4G 802.11n-20M 2462MHz



99%BW -2.4G 802.11n-40M 2422MHz



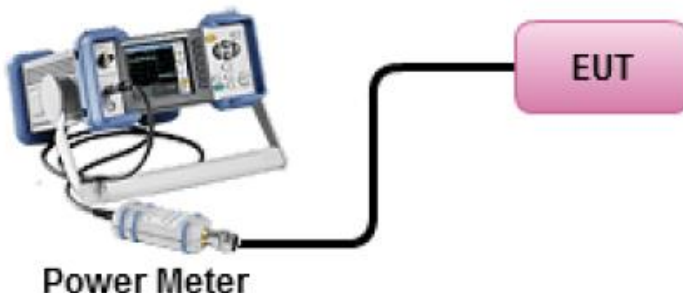
99%BW -2.4G 802.11n-40M 2437MHz



99%BW -2.4G 802.11n-40M 2452MHz

10.4 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247 RSS247 (5.4.4)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☐
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☐
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & < 50 channels: ≤ 0.25 Watt	☐
	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤ 1 Watt	☒
Test Setup	 Power Meter		
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 9.2.3.1 <u>Measurement using a Power Meter (PM)</u> Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required. - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result Repeat above steps for different test channel and other modulation type.		
Test Date	05/27/2016 – 06/03/2016	Environmental condition	Temperature 23°C Relative Humidity 44% Atmospheric Pressure 1021mbar
Remark	The EUT has two antennas which are cross-polarized, the directional gain=individual gain of each antenna =0dBi.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

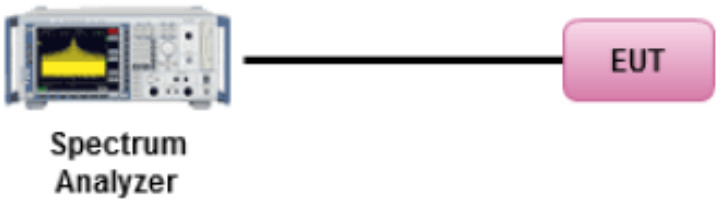
Test was done by **Chen Ge** at RF test site.

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	20.06	20.11	23.10	30	Pass
		2437	Mid	21.48	20.70	24.12	30	Pass
		2462	High	20.32	20.55	23.45	30	Pass
	802.11g	2412	Low	14.94	14.86	17.91	30	Pass
		2437	Mid	20.58	19.88	23.25	30	Pass
		2462	High	14.27	14.76	17.53	30	Pass
	802.11n-20M	2412	Low	15.14	14.98	18.07	30	Pass
		2437	Mid	20.61	19.87	23.27	30	Pass
		2462	High	14.61	14.73	17.68	30	Pass
	802.11n-40M	2422	Low	14.68	15.00	17.85	30	Pass
		2437	Mid	21.05	20.56	23.82	30	Pass
		2452	High	11.00	11.36	14.19	30	Pass
Note	N/A							

10.5 Band Edge

Requirement(s):

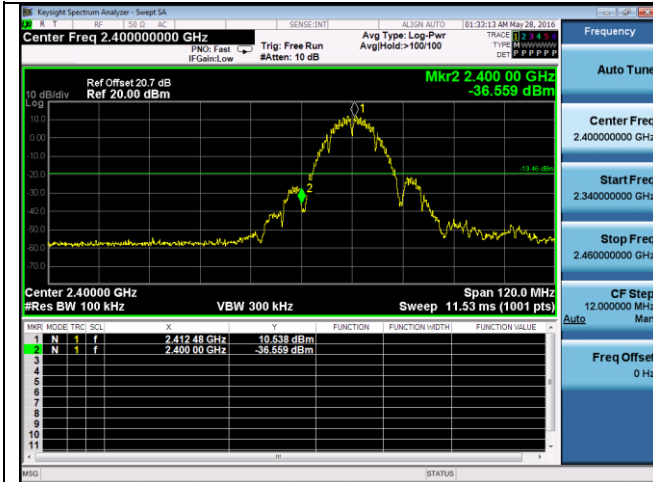
Spec	Item	Requirement	Applicable
§ 15.247 RSS247(5.5)	d)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be 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 <u>Band Edge measurement procedure</u> 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 attenuation shall 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	05/27/2016 – 06/03/2016	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at RF test site.

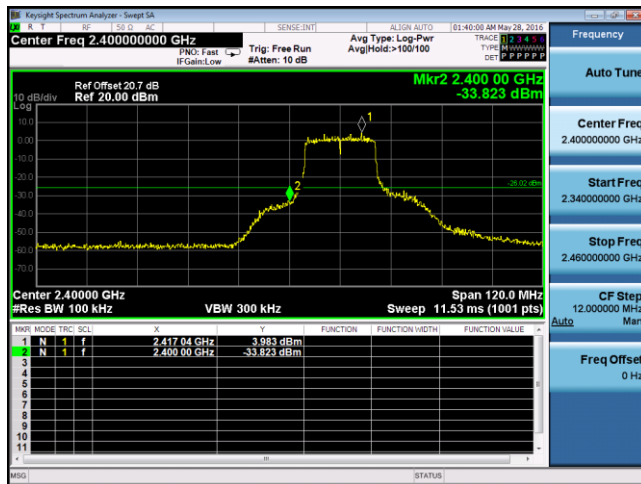
Test Plots Chain 0:



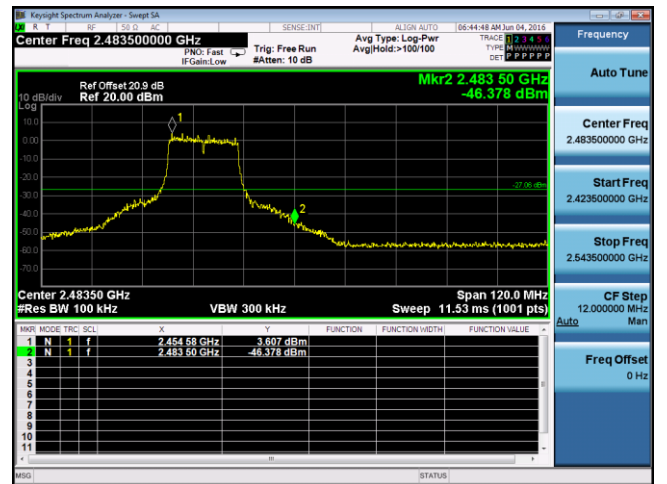
Band Edge-2.4G-802.11b Low



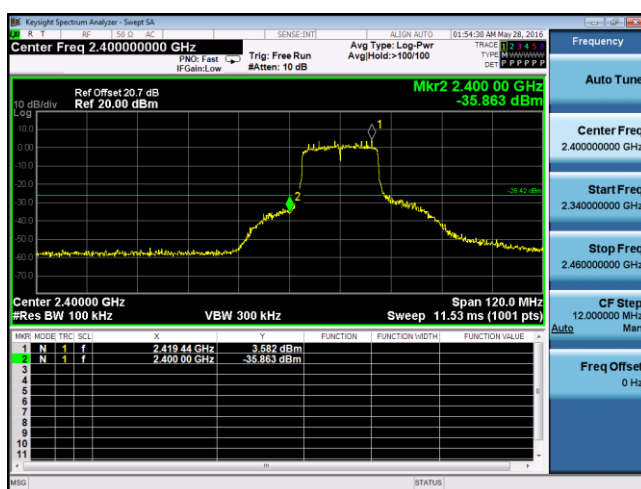
Band Edge-2.4G-802.11b High



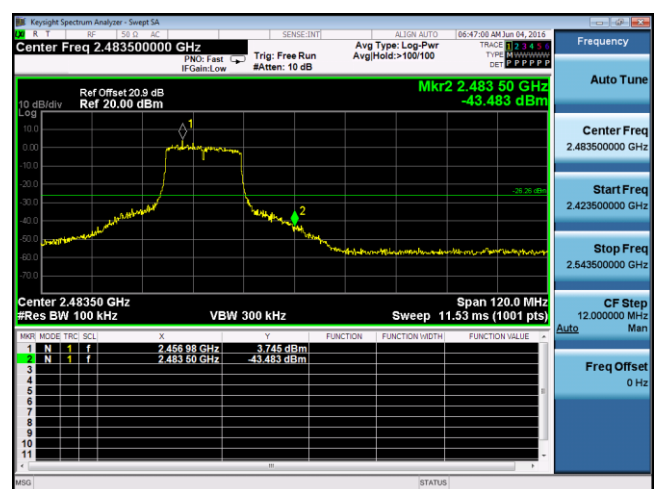
Band Edge-2.4G-802.11g Low



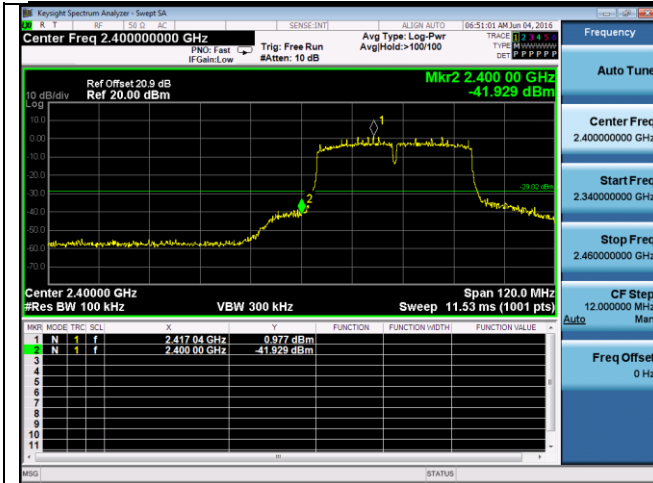
Band Edge-2.4G-802.11g High



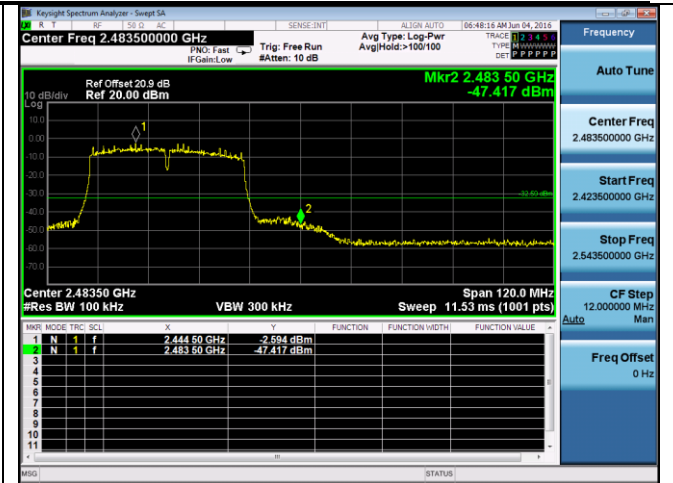
Band Edge-2.4G-802.11n20 Low



Band Edge-2.4G-802.11n20 High

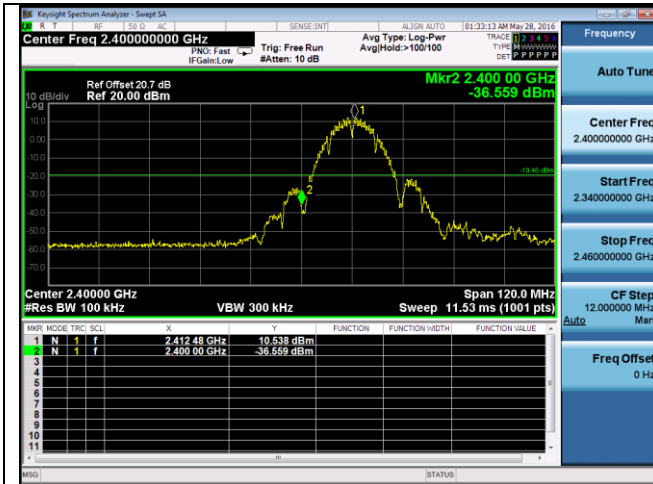


Band Edge-2.4G-802.11n40 Low



Band Edge-2.4G-802.11n40 High

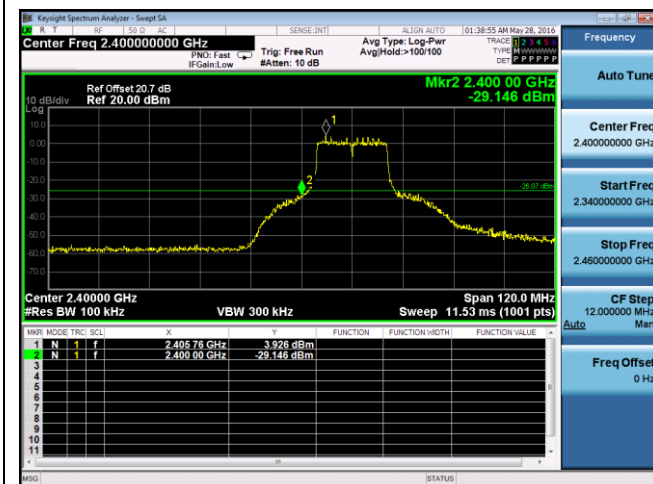
Chain 1:



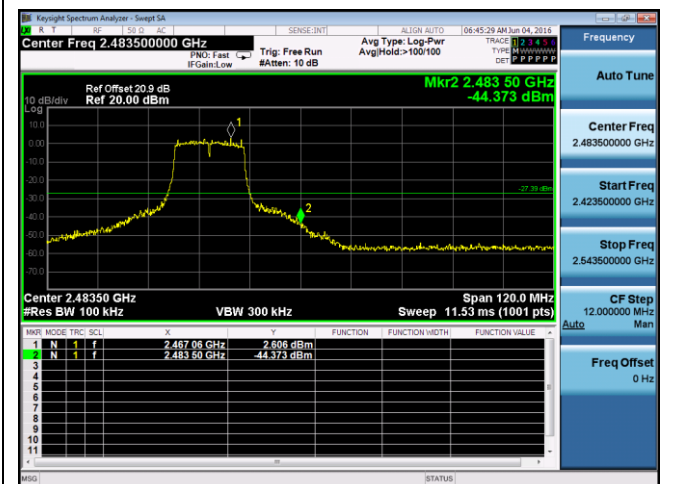
Band Edge-2.4G-802.11b Low



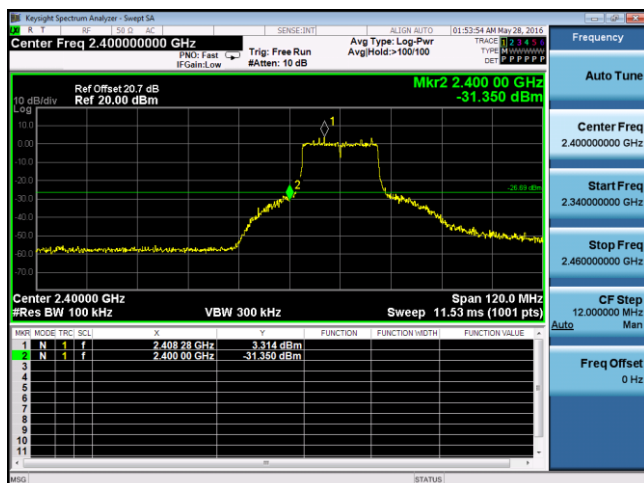
Band Edge-2.4G-802.11b High



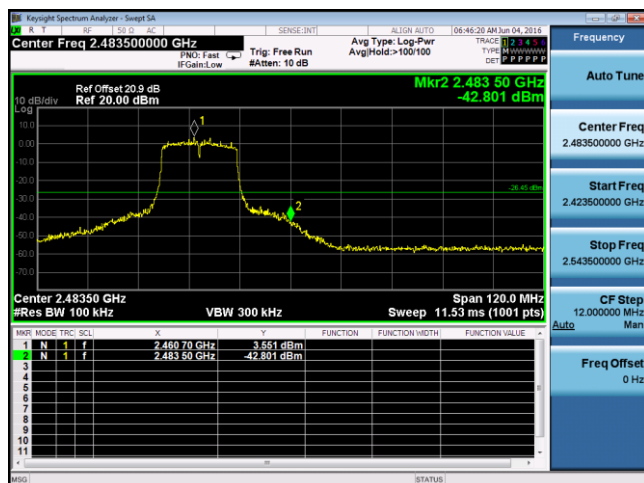
Band Edge-2.4G-802.11g Low



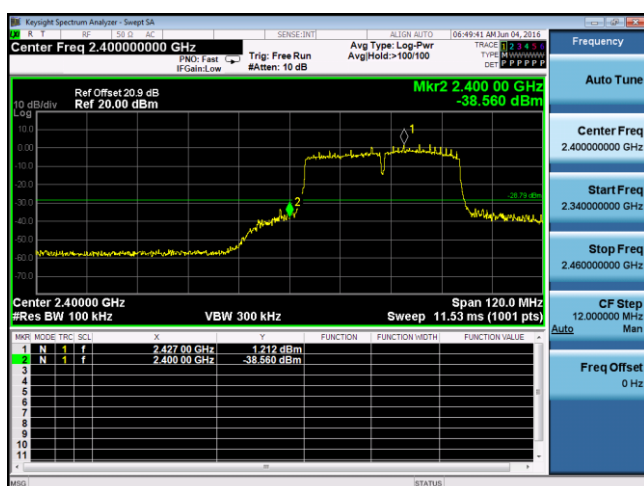
Band Edge-2.4G-802.11g High



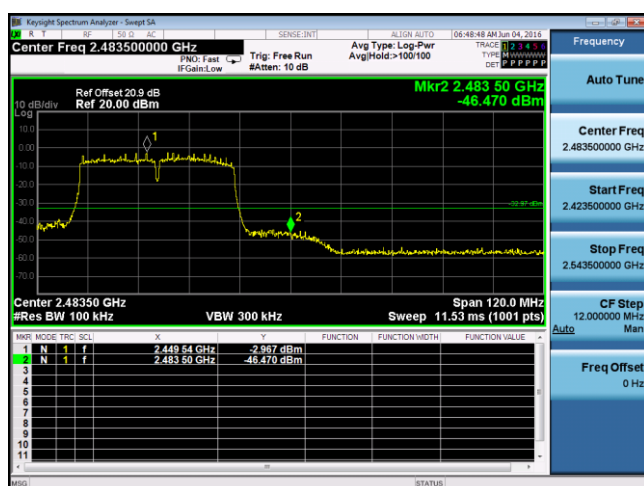
Band Edge-2.4G-802.11n20 Low



Band Edge-2.4G-802.11n20 High



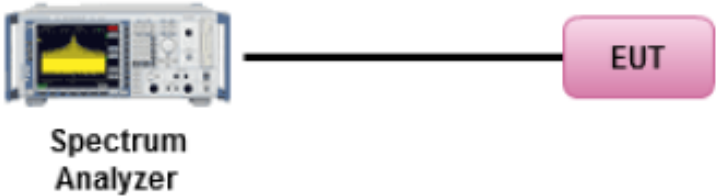
Band Edge-2.4G-802.11n40 Low



Band Edge-2.4G-802.11n40 High

10.6 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(e) RSS247 (5.2.2)	e)	DSSS: $\leq 8\text{dBm}/3\text{KHz}$	☒
	f)	DSSS in hybrid sys with FH turned off: $\leq 8\text{dBm}/3\text{KHz}$	☐
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 10.2 Method PKPSD (peak PSD) <u>Peak spectral density measurement procedure</u> - Set analyzer center frequency to DTS channel center frequency. - Set the span to 1.5 times the DTS bandwidth. - Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$. - Set the VBW $\geq 3 \times \text{RBW}$. - 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	05/27/2016 – 06/03/2016	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	The EUT has two antennas which are cross-polarized, the directional gain=individual gain of each antenna =0dBi.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at RF test site.

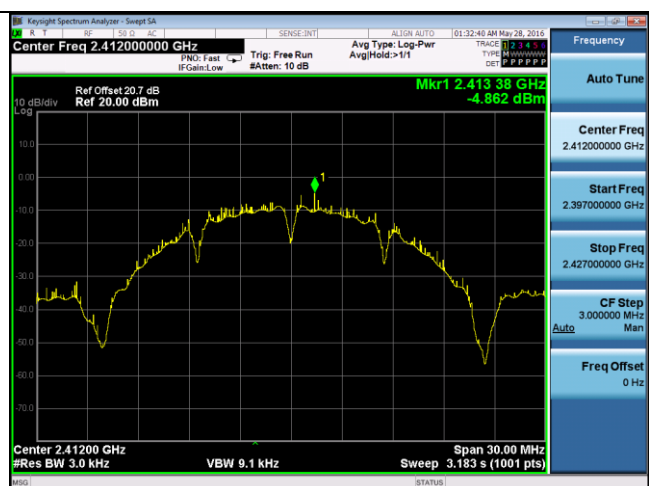
PSD measurement results

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100KHz)			Limit (dBm/3KHz)	Result
				Chain0	Chain1	Combined PSD		
PSD	802.11b	2412	Low	-5.24	-4.86	-2.04	≤8	Pass
		2437	Mid	-2.76	-2.57	0.35	≤8	Pass
		2462	High	-5.63	-4.14	-1.81	≤8	Pass
	802.11g	2412	Low	-12.1	-12.79	-9.42	≤8	Pass
		2437	Mid	-6.80	-8.04	-4.37	≤8	Pass
		2462	High	-13.25	-12.01	-9.58	≤8	Pass
	802.11n-20M	2412	Low	-11.51	-12.29	-8.87	≤8	Pass
		2437	Mid	-6.94	-7.36	-4.13	≤8	Pass
		2462	High	-12.89	-12.13	-9.48	≤8	Pass
	802.11n-40M	2422	Low	-15.2	-14.31	-11.72	≤8	Pass
		2437	Mid	-7.61	-8.14	-4.86	≤8	Pass
		2452	High	-18.78	-18.45	-15.60	≤8	Pass
Note								

Test Plots



PSD-2.4G-802.11b Low-chain0



PSD-2.4G-802.11b Low-chain1



PSD-2.4G-802.11b Mid-chain0



PSD-2.4G-802.11b Mid-chain1



PSD-2.4G-802.11b High-chain0



PSD-2.4G-802.11b High-chain1