

RF TEST REPORT



Report No.: FCC IC_RF_SL15073101-RUC-023_DTS
Supersede Report No.:

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	ZoneFlex R510 Access Point
Model No.	:	R510
Test Standard	:	47 CFR 15.247
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r04
FCC ID	:	S9GR510
IC ID	:	5912A-R510
Dates of test	:	11/01/2015 to 11/20/2015
Issue Date	:	01/21/2015
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		

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

Issued By:
SIEMIC Laboratories
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Laboratory Introduction

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



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

Accreditations for Conformity Assessment

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

Accreditations for Product Certifications

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

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC IC_RF_SL15073101-RUC-023_DTS	None	Original	11/20/2015

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: ZoneFlex R510 Access Point
Model: R510

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	ZoneFlex R510 Access Point
Model No.	R510
Trade Name	Ruckus
Serial No.	42150600025
Host Model No.	N/A
Input Power	48VDC (PoE)
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Date of EUT received	11/02/2015
Equipment Class/ Category	DTS, UNII
Clock Frequencies	N/A
Port/Connectors	PoE, Ethernet
Product Hardware version	705-60429-001
Product Software version	812-72419-002
Radio Hardware version	705-60429-001
Radio Software version	812-72419-002
Test Software version	117-11330-002

6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-HT20	802.11n-HT40	802.11ac
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5320MHz 5500-5720MHz 5745-5825MHz	2412-2462MHz 5180-5320MHz 5500-5720MHz 5745-5825MHz	2422-2452MHz 5190-5310MHz 5510-5710MHz 5755-5795MHz	5210MHz, 5290MHz 5530MHz, 5610MHz 5690MHz, 5775MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	11	11	20	11(2.4GH) 20 (5GHz)	9(2.4GH) 10(5GHz)	6
Antenna Type	Internal Omni PCB Antennas					
Antenna Gain (Peak)	1 dBi (2.4GHz), 3 dBi (5 GHz)					
Antenna Connector Type	U.FL					
Note	N/A					

EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	21
802.11-b	2437	21
802.11-b	2462	22
802.11-g	2412	21
802.11-g	2437	23
802.11-g	2462	19
802.11-n-20	2412	21
802.11-n-20	2437	23
802.11-n-20	2462	20
802.11-n-40	2422	19
802.11-n-40	2437	21
802.11-n-40	2452	16

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	740-64157-001	133279963	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 558074 D01 DTS Meas Guidance v03r04	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen 8.10	IC		<input type="checkbox"/> N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	<input type="checkbox"/> N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	<input type="checkbox"/> N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r04	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.2.1)	IC		<input type="checkbox"/> N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v03r04	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.5)	IC		<input type="checkbox"/> N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r04	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.4.4)	IC		<input type="checkbox"/> N/A
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	<input type="checkbox"/> Pass
	IC	-	IC	-	<input checked="" type="checkbox"/> N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r04	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.2.2)	IC		<input type="checkbox"/> N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	<input type="checkbox"/> Pass
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	<input checked="" type="checkbox"/> 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

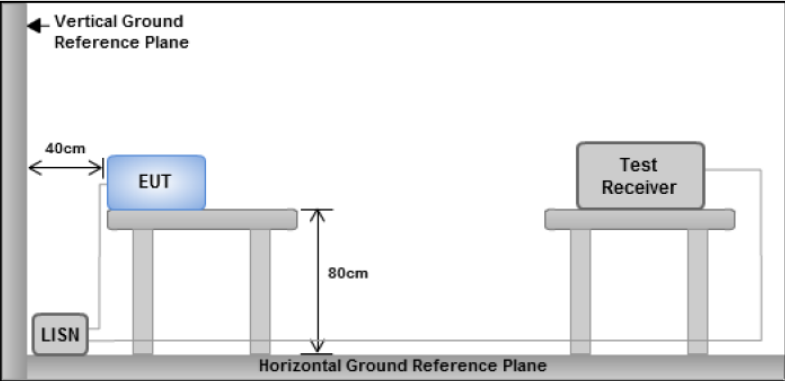
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious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

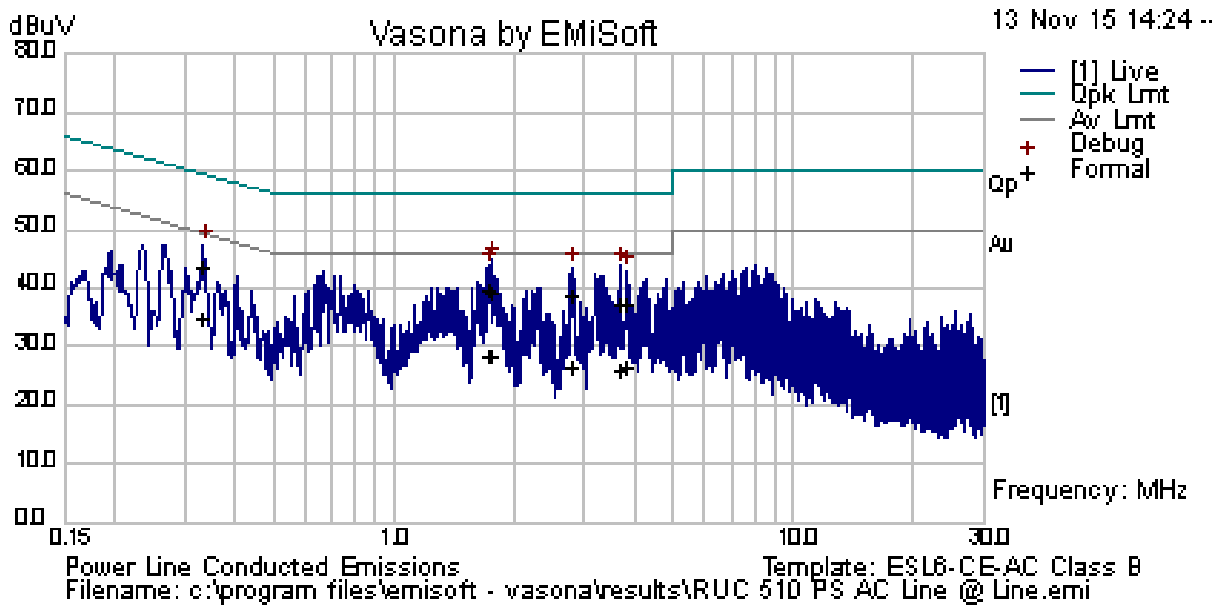
Spec	Item	Requirement	Applicable
§ 15.205 RSS Gen Issue 4: 2014 (8.8)	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the 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.	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;">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</p>		
Procedure	<ul style="list-style-type: none"> - 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 tested with AC 120V 60Hz		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

Test Plot Yes (See below) N/A

Conducted Emission Test Results

Test specification:	Conducted Emissions			Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Environmental Conditions:	Temp(°C):	21			
	Humidity (%):	42			
	Atmospheric(mbar):	1021			
Mains Power:	120Vac, 60Hz				
Tested by:	Teody Manansala				
Test Date:	11/13/2015				
Remarks	Power Supply, Line				

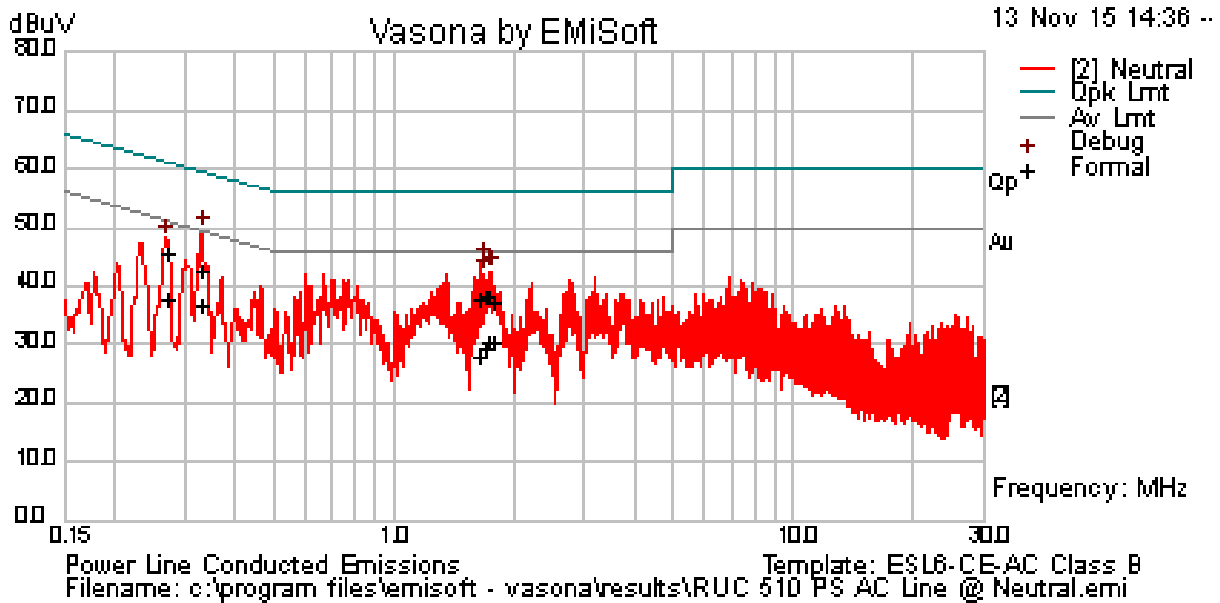


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
1.76	28.86	10.02	0.55	39.43	Quasi Peak	Line	56.00	-16.57	Pass
0.33	32.99	10.01	0.85	43.84	Quasi Peak	Line	59.44	-15.60	Pass
3.68	26.50	10.03	0.55	37.08	Quasi Peak	Line	56.00	-18.92	Pass
1.73	29.13	10.02	0.55	39.71	Quasi Peak	Line	56.00	-16.29	Pass
2.78	28.38	10.03	0.55	38.96	Quasi Peak	Line	56.00	-17.04	Pass
3.81	26.48	10.03	0.55	37.06	Quasi Peak	Line	56.00	-18.94	Pass
1.76	18.01	10.02	0.55	28.59	Average	Line	46.00	-17.41	Pass
0.33	23.98	10.01	0.85	34.83	Average	Line	49.44	-14.60	Pass
3.68	15.20	10.03	0.55	25.78	Average	Line	46.00	-20.22	Pass
1.73	17.95	10.02	0.55	28.53	Average	Line	46.00	-17.47	Pass
2.78	15.86	10.03	0.55	26.43	Average	Line	46.00	-19.57	Pass
3.81	15.82	10.03	0.55	26.40	Average	Line	46.00	-19.60	Pass

Conducted Emission Test Results

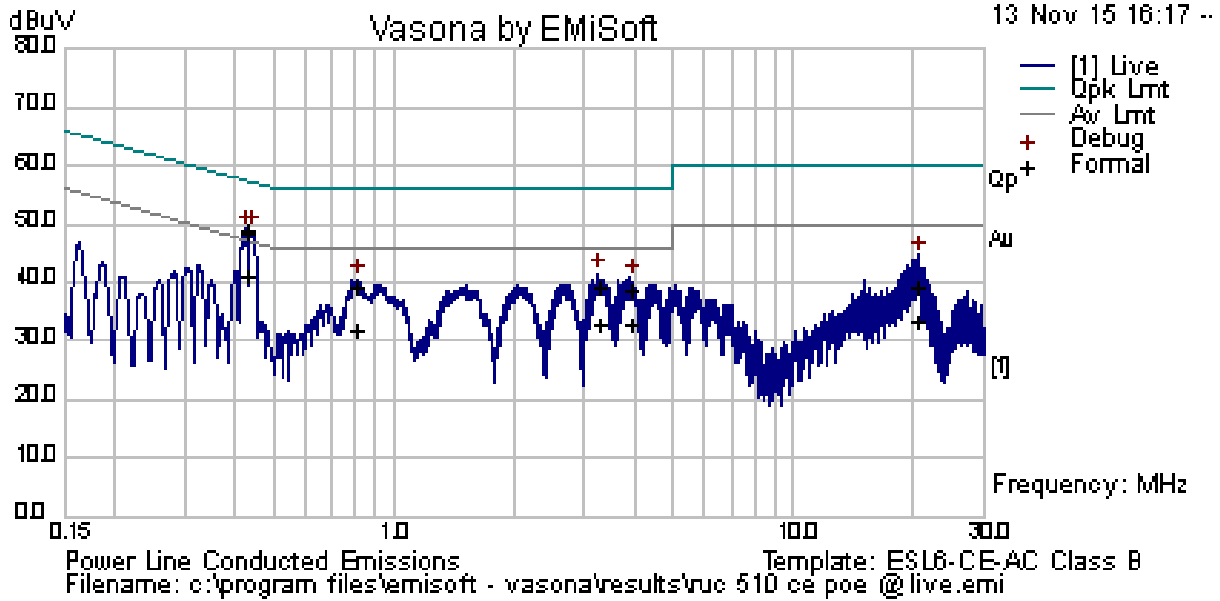
Test specification:	Conducted Emissions			Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Environmental Conditions:	Temp(°C):	21			
	Humidity (%):	42			
	Atmospheric(mbar):	1021			
Mains Power:	120Vac, 60Hz				
Tested by:	Teody Manansala				
Test Date:	11/13/2015				
Remarks	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
0.33	31.92	10.01	0.85	42.78	Quasi Peak	Neutral	59.46	-16.68	Pass
1.65	27.10	10.02	0.56	37.68	Quasi Peak	Neutral	56.00	-18.32	Pass
0.27	34.42	10.00	1.00	45.42	Quasi Peak	Neutral	61.13	-15.71	Pass
1.71	27.90	10.02	0.56	38.48	Quasi Peak	Neutral	56.00	-17.52	Pass
1.77	26.88	10.02	0.55	37.45	Quasi Peak	Neutral	56.00	-18.55	Pass
1.69	27.71	10.02	0.56	38.29	Quasi Peak	Neutral	56.00	-17.71	Pass
0.33	25.94	10.01	0.85	36.79	Average	Neutral	49.46	-12.67	Pass
1.65	17.19	10.02	0.56	27.77	Average	Neutral	46.00	-18.23	Pass
0.27	26.82	10.00	1.00	37.82	Average	Neutral	51.13	-13.31	Pass
1.71	19.72	10.02	0.56	30.29	Average	Neutral	46.00	-15.71	Pass
1.77	19.92	10.02	0.55	30.50	Average	Neutral	46.00	-15.50	Pass
1.69	18.71	10.02	0.56	29.29	Average	Neutral	46.00	-16.71	Pass

Test specification:	Conducted Emissions			Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Environmental Conditions:	Temp(°C):	21			
	Humidity (%):	42			
	Atmospheric(mbar):	1021			
Mains Power:	120Vac, 60Hz				
Tested by:	Teody Manansala				
Test Date:	11/13/2015				
Remarks	POE, Line				

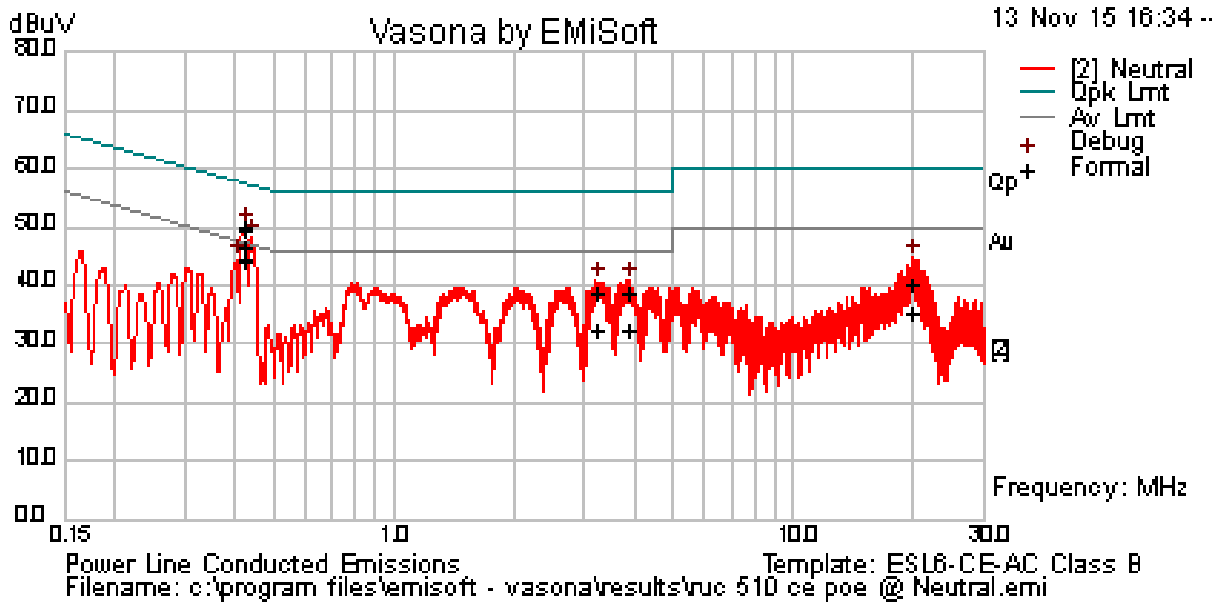


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.43	37.61	10.01	0.73	48.35	Quasi Peak	Line	57.30	-8.95	Pass
0.45	38.06	10.01	0.73	48.80	Quasi Peak	Line	57.30	-8.51	Pass
3.26	28.49	10.03	0.55	39.07	Quasi Peak	Line	56.00	-16.93	Pass
3.91	28.20	10.03	0.55	38.78	Quasi Peak	Line	56.00	-17.22	Pass
20.55	28.33	10.07	0.70	39.10	Quasi Peak	Line	60.00	-20.90	Pass
0.81	28.79	10.01	0.60	39.40	Quasi Peak	Line	56.00	-16.60	Pass
0.43	30.39	10.01	0.73	41.12	Average	Line	47.30	-6.18	Pass
0.45	30.61	10.01	0.73	41.35	Average	Line	47.30	-5.95	Pass
3.26	22.21	10.03	0.55	32.79	Average	Line	46.00	-13.21	Pass
3.91	22.25	10.03	0.55	32.84	Average	Line	46.00	-13.16	Pass
20.55	22.66	10.07	0.70	33.43	Average	Line	50.00	-16.57	Pass
0.81	21.16	10.01	0.60	31.77	Average	Line	46.00	-14.23	Pass

Conducted Emission Test Results

Test specification:	Conducted Emissions			Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Environmental Conditions:	Temp(°C):	21			
	Humidity (%):	42			
	Atmospheric(mbar):	1021			
Mains Power:	120Vac, 60Hz				
Tested by:	Teody Manansala				
Test Date:	11/13/2015				
Remarks	POE, Neutral				

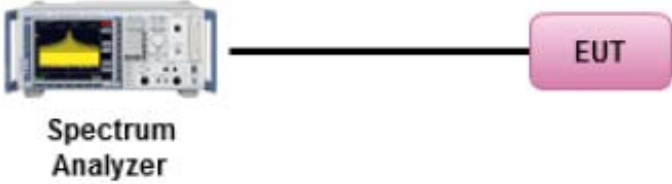


Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line / Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
0.43	39.06	10.01	0.73	49.80	Quasi Peak	Neutral	57.32	-7.52	Pass
0.45	39.10	10.01	0.73	49.84	Quasi Peak	Neutral	57.31	-7.47	Pass
0.42	38.56	10.01	0.73	49.30	Quasi Peak	Neutral	57.41	-8.11	Pass
3.90	27.99	10.03	0.55	38.57	Quasi Peak	Neutral	56.00	-17.43	Pass
3.23	28.09	10.03	0.55	38.67	Quasi Peak	Neutral	56.00	-17.33	Pass
19.96	29.66	10.07	0.69	40.42	Quasi Peak	Neutral	60.00	-19.58	Pass
0.43	33.70	10.01	0.73	44.44	Average	Neutral	47.32	-2.88	Pass
0.45	33.50	10.01	0.73	44.24	Average	Neutral	47.31	-3.07	Pass
0.42	36.01	10.01	0.73	46.75	Average	Neutral	47.41	-0.67	Pass
3.90	21.74	10.03	0.55	32.32	Average	Neutral	46.00	-13.68	Pass
3.23	21.75	10.03	0.55	32.33	Average	Neutral	46.00	-13.67	Pass
19.96	24.46	10.07	0.69	35.22	Average	Neutral	50.00	-14.78	Pass

10.2 6dB Bandwidth

Requirement(s):

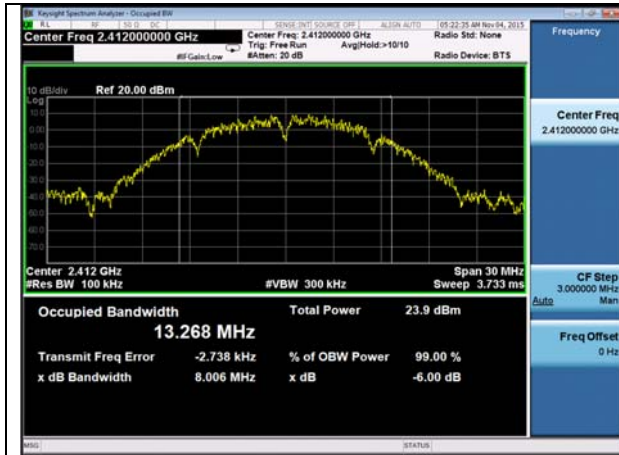
Spec	Item	Requirement	Applicable
§ 15.247 RSS247 (5.2.1)	a)(2)	6dB BW≥500KHz;	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;">Spectrum Analyzer</p>		
Test Procedure	558074 D01 DTS Meas Guidance v03r04, 8.1 DTS bandwidth <u>6dB Emission bandwidth measurement procedure</u> <ul style="list-style-type: none"> - 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	11/01/2015 – 11/20/2015	Environmental condition	Temperature 23°C Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A
 Test Plot Yes N/A

6dB Bandwidth measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11b	2412	Low	8.00	≥0.5	Pass
6dB BW	802.11b	2437	Mid	7.09	≥0.5	Pass
6dB BW	802.11b	2462	High	8.08	≥0.5	Pass
6dB BW	802.11g	2412	Low	16.32	≥0.5	Pass
6dB BW	802.11g	2437	Mid	16.39	≥0.5	Pass
6dB BW	802.11g	2462	High	16.28	≥0.5	Pass
6dB BW	802.11n-20M	2412	Low	17.52	≥0.5	Pass
6dB BW	802.11n-20M	2437	Mid	17.60	≥0.5	Pass
6dB BW	802.11n-20M	2462	High	17.55	≥0.5	Pass
6dB BW	802.11n-40M	2422	Low	36.40	≥0.5	Pass
6dB BW	802.11n-40M	2437	Mid	36.36	≥0.5	Pass
6dB BW	802.11n-40M	2452	High	36.40	≥0.5	Pass

6dB Bandwidth Test Plots



6dB BW -2.4G 802.11b 2412MHz



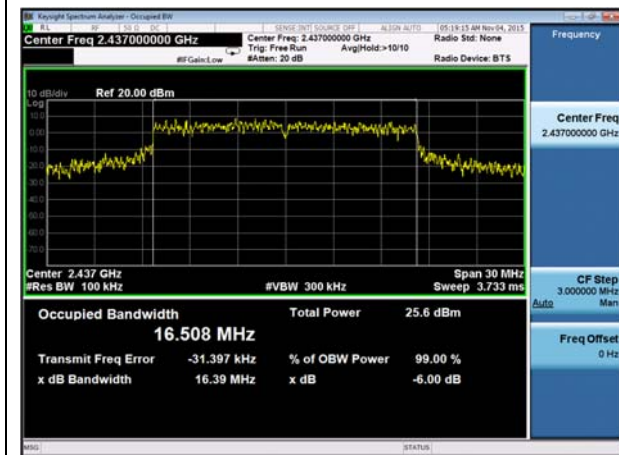
6dB BW -2.4G 802.11b 2437MHz



6dB BW -2.4G 802.11b 2462MHz



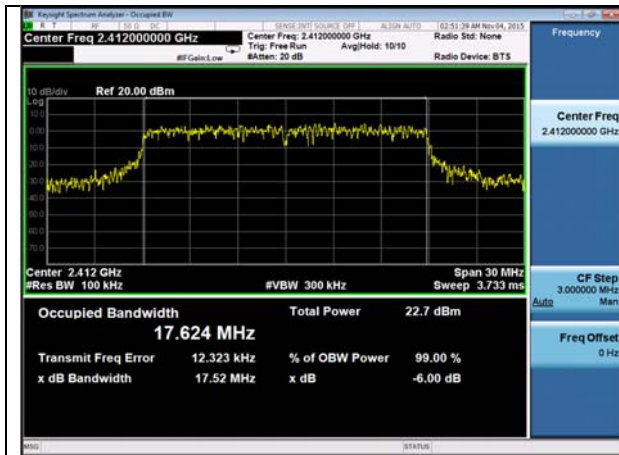
6dB BW -2.4G 802.11g 2412MHz



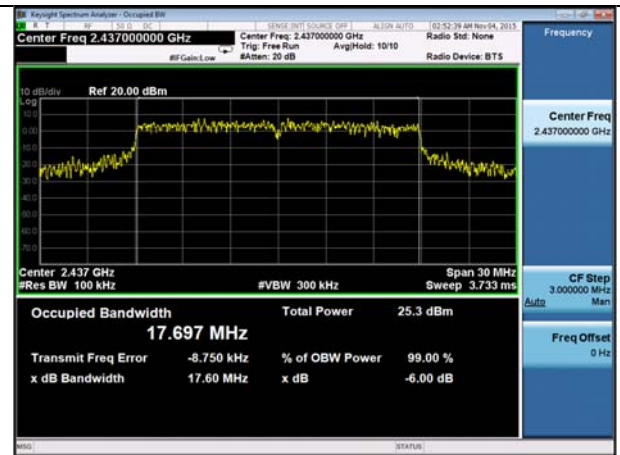
6dB BW -2.4G 802.11g 2437MHz



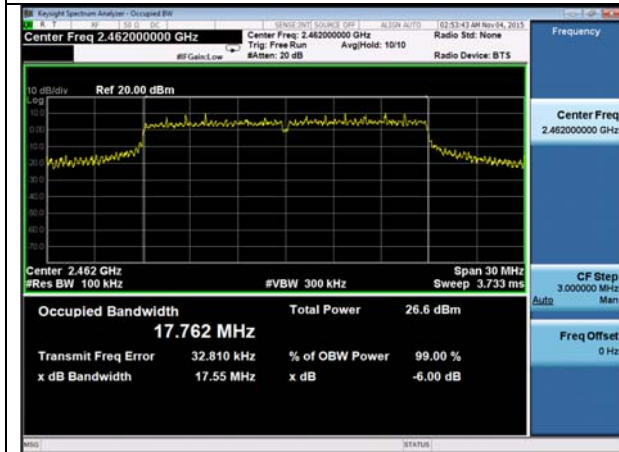
6dB BW -2.4G 802.11g 2462MHz



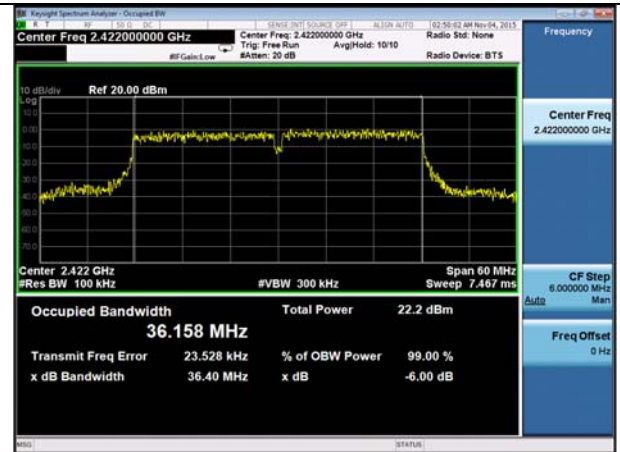
6dB BW -2.4G 802.11n-20M 2412MHz



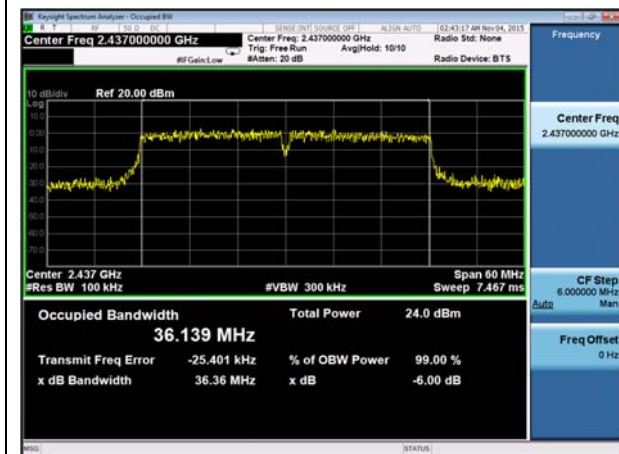
6dB BW -2.4G 802.11n-20M 2437MHz



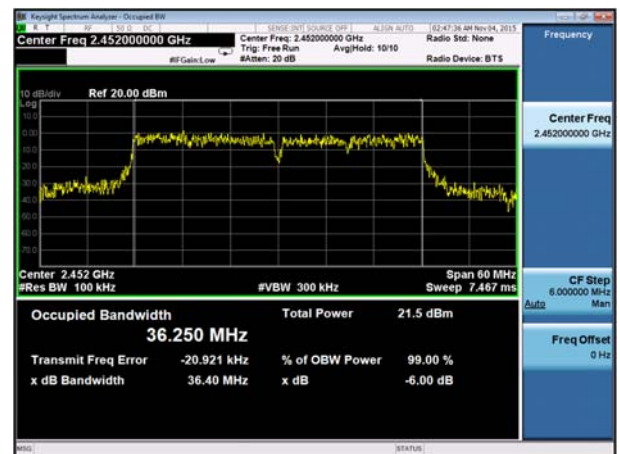
6dB BW -2.4G 802.11n-20M 2462MHz



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



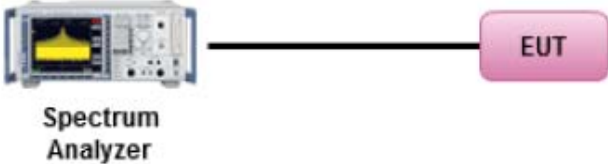
6dB BW -2.4G 802.11n-40M 2437MHz



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	<input checked="" type="checkbox"/>									
Test Setup	 <p>The diagram shows a Spectrum Analyzer on the left, connected by a line to a pink rounded rectangle labeled 'EUT' on the right.</p>										
Procedure	<ol style="list-style-type: none"> EUT was set for low , mid, high channel with modulated mode and highest RF output power. The spectrum analyzer was connected to the antenna terminal. 										
Test Date	11/01/2015 – 11/20/2015	<table border="1"> <tr> <td>Environmental condition</td> <td>Temperature</td> <td>23oC</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>47%</td> </tr> <tr> <td></td> <td>Atmospheric Pressure</td> <td>1019mbar</td> </tr> </table>	Environmental condition	Temperature	23oC		Relative Humidity	47%		Atmospheric Pressure	1019mbar
Environmental condition	Temperature	23oC									
	Relative Humidity	47%									
	Atmospheric Pressure	1019mbar									
Remark	-										
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail										

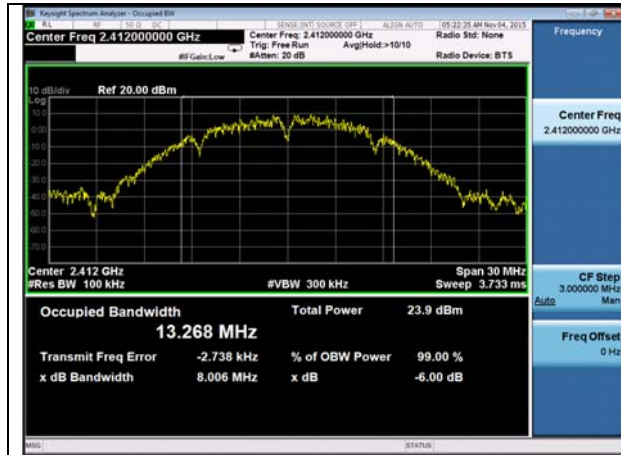
Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

99% OBW measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
99% OBW	802.11b	2412	Low	13.26
99% OBW	802.11b	2437	Mid	13.01
99% OBW	802.11b	2462	High	14.03
99% OBW	802.11g	2412	Low	16.41
99% OBW	802.11g	2437	Mid	16.50
99% OBW	802.11g	2462	High	16.44
99% OBW	802.11n-20M	2412	Low	17.62
99% OBW	802.11n-20M	2437	Mid	17.69
99% OBW	802.11n-20M	2462	High	17.76
99% OBW	802.11n-40M	2422	Low	36.15
99% OBW	802.11n-40M	2437	Mid	36.13
99% OBW	802.11n-40M	2452	High	36.25

Test Plots



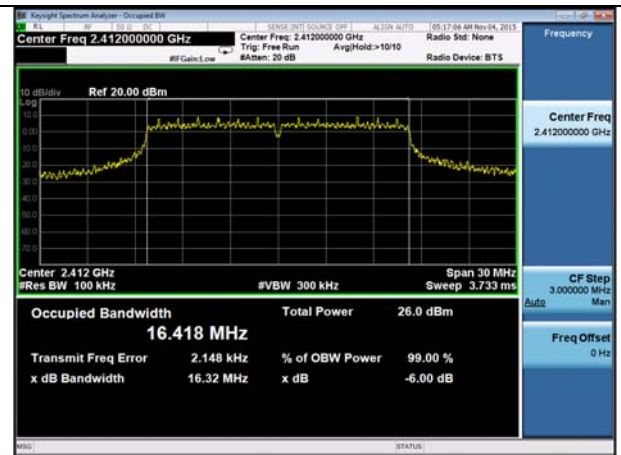
99% BW -2.4G 802.11b 2412MHz



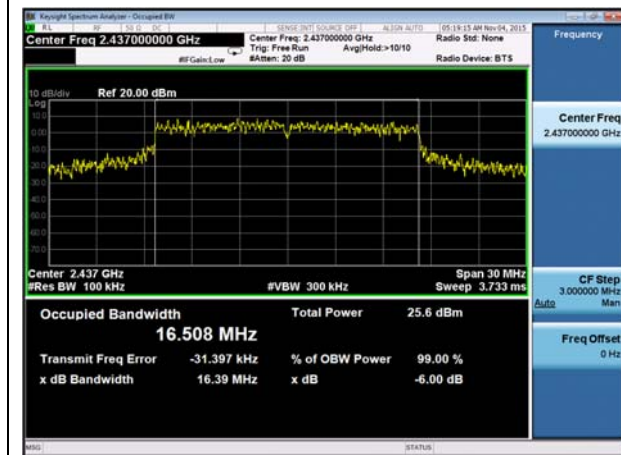
99% BW -2.4G 802.11b 2437MHz



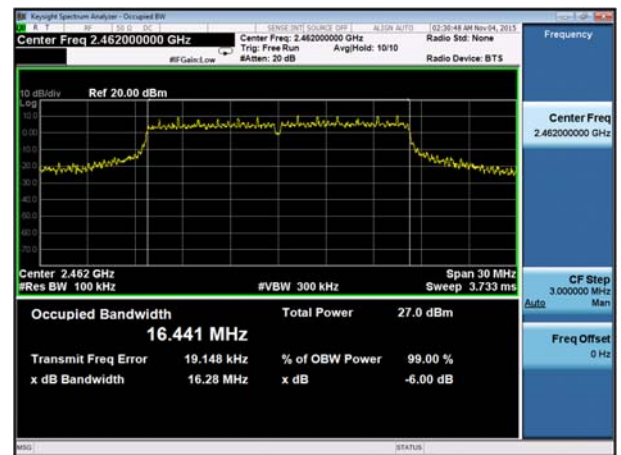
99% BW -2.4G 802.11b 2462MHz



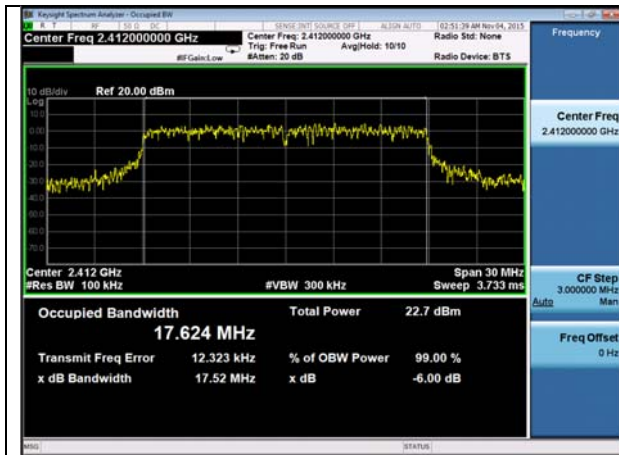
99% BW -2.4G 802.11g 2412MHz



99% BW -2.4G 802.11g 2437MHz



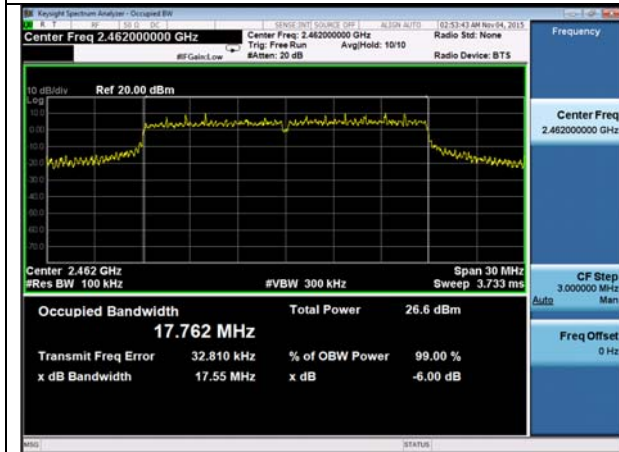
99% BW -2.4G 802.11g 2462MHz



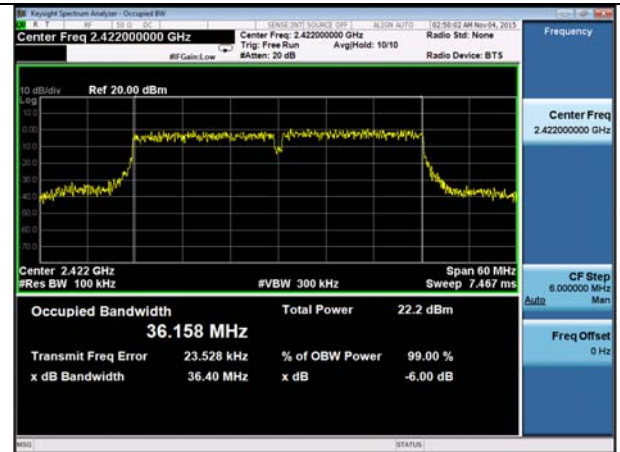
99%BW -2.4G 802.11n-20M 2412MHz



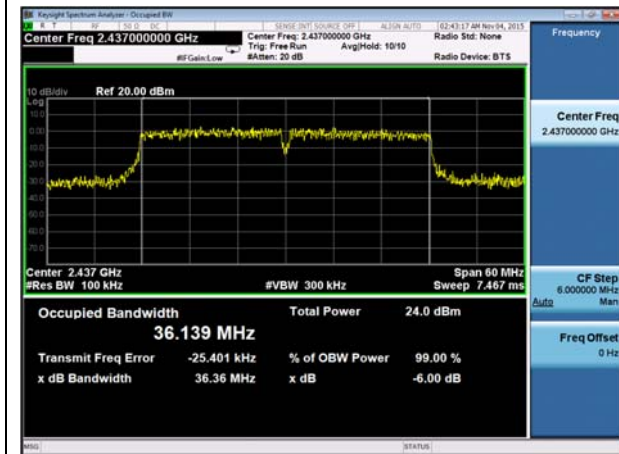
99%BW -2.4G 802.11n-20M 2437MHz



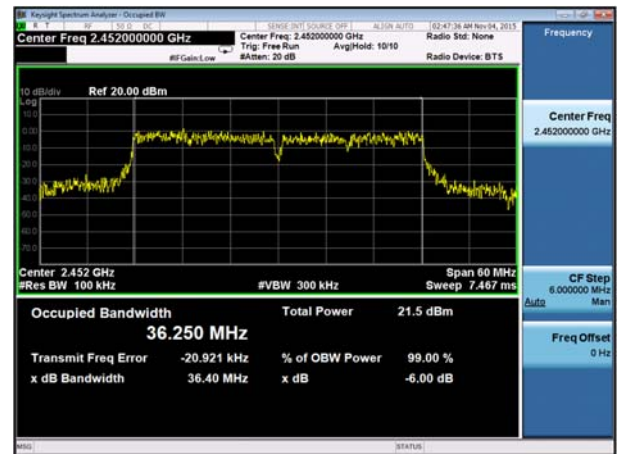
99%BW -2.4G 802.11n-20M 2462MHz



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	<input type="checkbox"/>
	b)	FHSS in 5725-5850MHz: ≤1 Watt	<input type="checkbox"/>
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤0.125 Watt.	<input type="checkbox"/>
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤1 Watt	<input type="checkbox"/>
	e)	FHSS in 902-928MHz with ≥ 25 & <50 channels: ≤0.25 Watt	<input type="checkbox"/>
	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤1 Watt	<input checked="" type="checkbox"/>
Test Setup			
Test Procedure	<p>558074 D01 DTS Meas Guidance v03r04, 9.2.3.1</p> <p><u>Measurement using a Power Meter (PM)</u></p> <p>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.</p> <ul style="list-style-type: none"> - 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 <p>Repeat above steps for different test channel and other modulation type.</p>		
Test Date	11/01/2015 – 11/20/2015	Environmental condition	Temperature 23°C Relative Humidity 44% Atmospheric Pressure 1021mbar
Remark	None		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

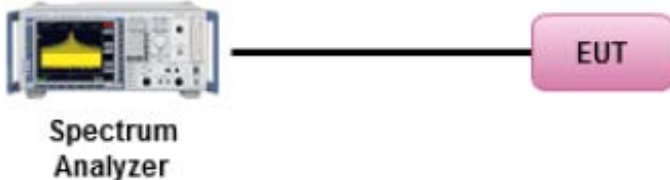
Test Plot Yes (See below) N/A

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	20.84	21.35	24.11	30	Pass
Output power	802.11b	2437	Mid	21.03	21.62	24.35	30	Pass
Output power	802.11b	2462	High	21.42	21.87	24.66	30	Pass
Output power	802.11g	2412	Low	19.93	20.15	23.05	30	Pass
Output power	802.11g	2437	Mid	22.07	22.25	25.17	30	Pass
Output power	802.11g	2462	High	17.44	17.20	20.33	30	Pass
Output power	802.11n-20M	2412	Low	19.87	20.11	23.00	30	Pass
Output power	802.11n-20M	2437	Mid	22.10	22.22	25.17	30	Pass
Output power	802.11n-20M	2462	High	18.26	18.10	21.19	30	Pass
Output power	802.11n-40M	2422	Low	19.06	19.29	22.19	30	Pass
Output power	802.11n-40M	2437	Mid	20.75	20.91	23.84	30	Pass
Output power	802.11n-40M	2452	High	15.93	15.85	18.90	30	Pass
Note	N/A							

10.5 Band Edge

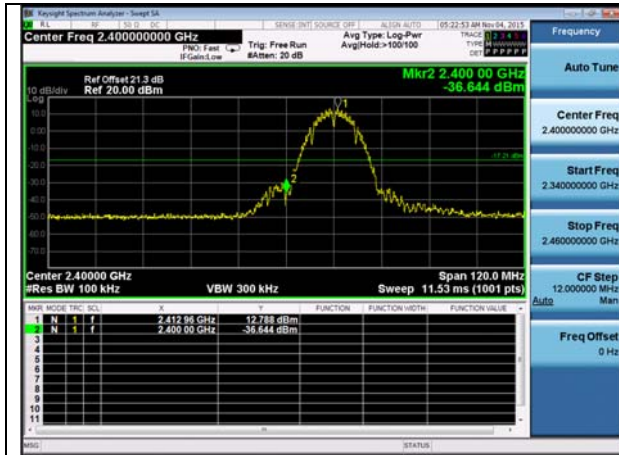
Requirement(s):

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 <input type="checkbox"/> 20 dB down <input checked="" type="checkbox"/> 30 dB down	<input checked="" type="checkbox"/>
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r04 <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 attunation 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	11/01/2015 – 11/20/2015	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	-		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

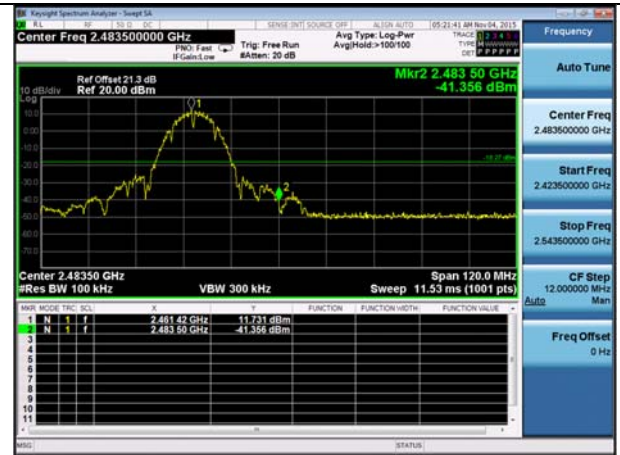
Test Data Yes N/A

Test Plot Yes (See below) N/A

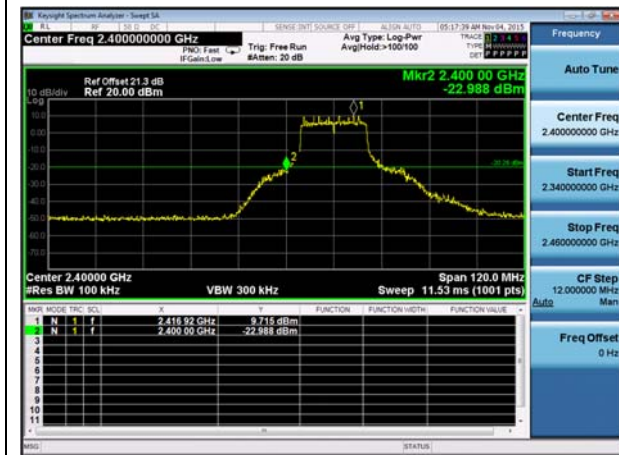
Test Plots
Chain 0:



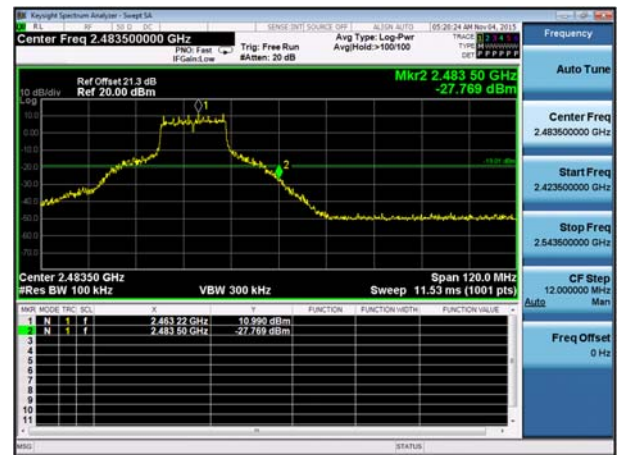
Band Edge-2.4G-802.11b Low



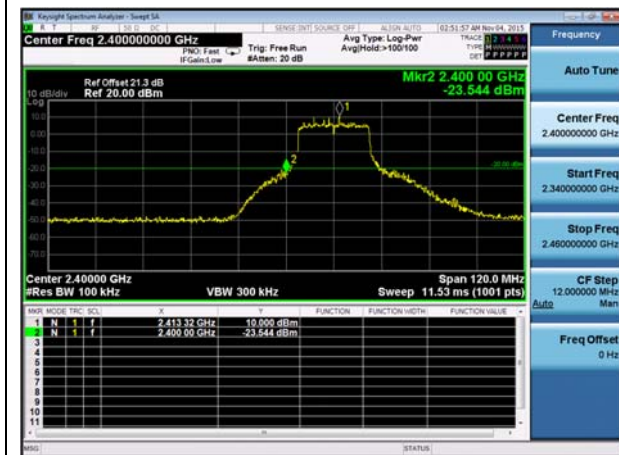
Band Edge-2.4G-802.11b High



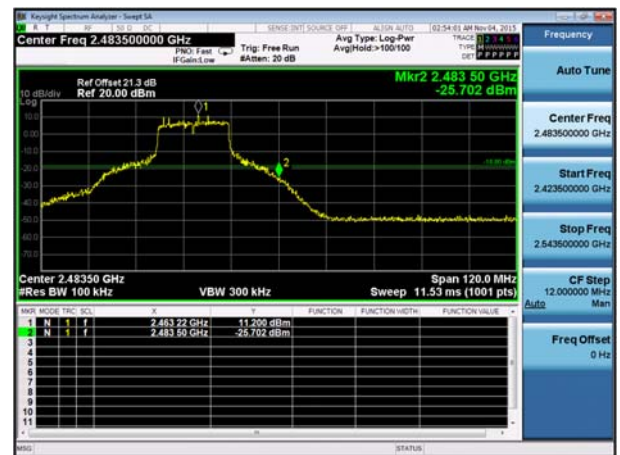
Band Edge-2.4G-802.11g Low



Band Edge-2.4G-802.11g High



Band Edge-2.4G-802.11n20 Low



Band Edge-2.4G-802.11n20 High

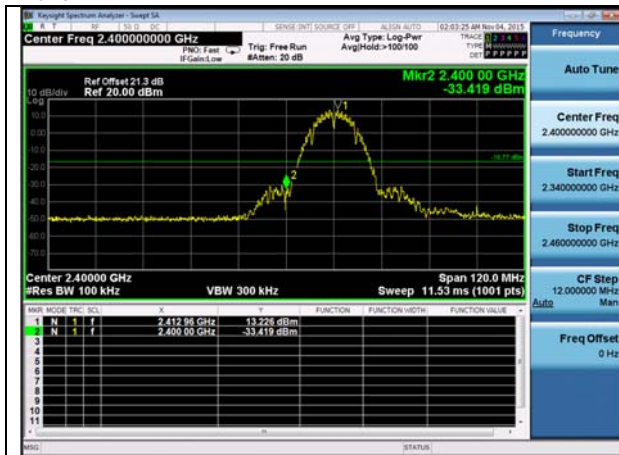


Band Edge-2.4G-802.11n40 Low

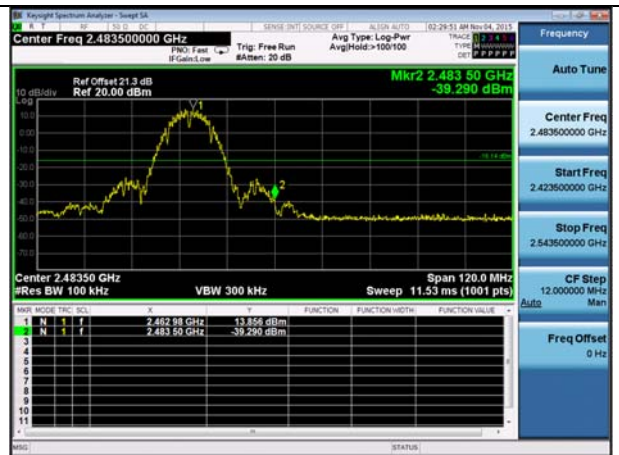


Band Edge-2.4G-802.11n40 High

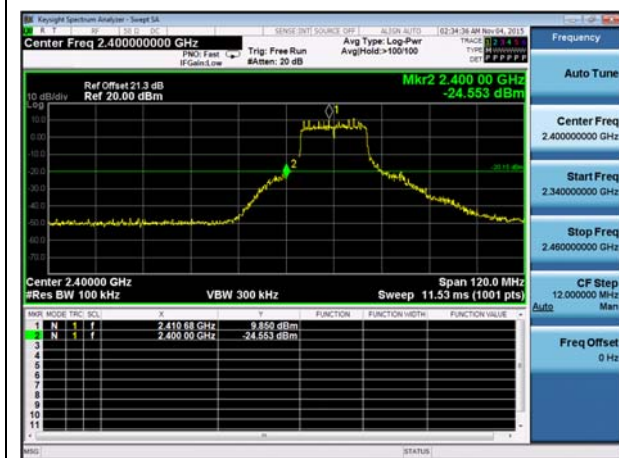
Chain 1:



Band Edge-2.4G-802.11b Low



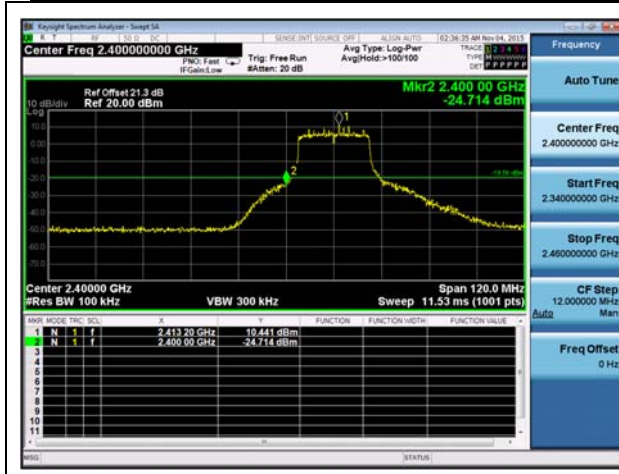
Band Edge-2.4G-802.11b High



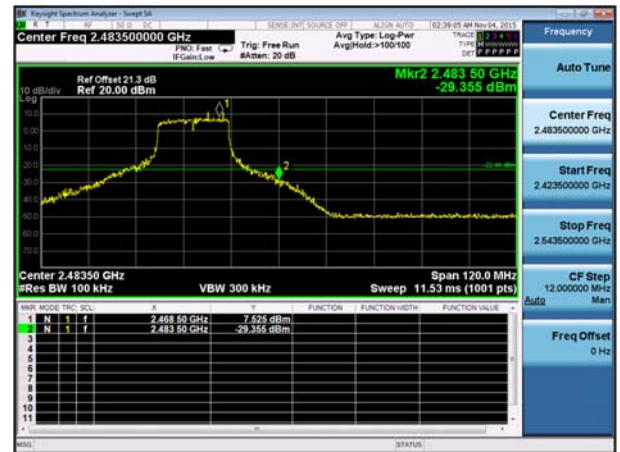
Band Edge-2.4G-802.11g Low



Band Edge-2.4G-802.11g High



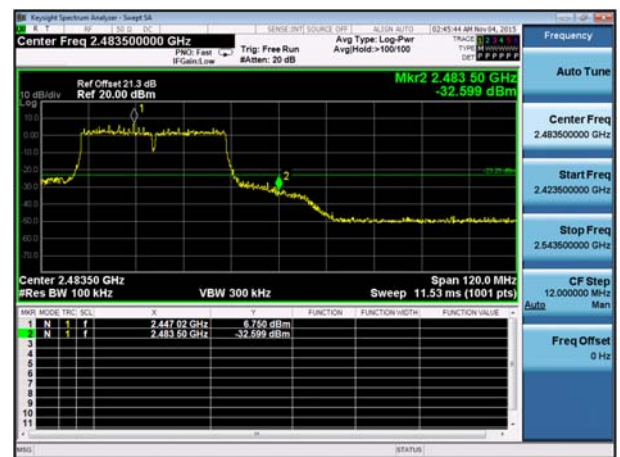
Band Edge-2.4G-802.11n20 Low



Band Edge-2.4G-802.11n20 High



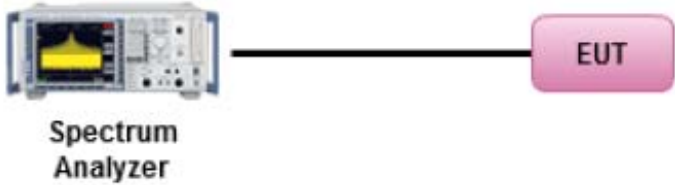
Band Edge-2.4G-802.11n40 Low



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: ≤8dBm/3KHz	<input checked="" type="checkbox"/>
	f)	DSSS in hybrid sys with FH turned off: ≤8dBm/3KHz	<input type="checkbox"/>
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r04, 10.2 Method PKPSD (peak PSD) <u>Peak spectral density measurement procedure</u> <ul style="list-style-type: none"> - 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	11/01/2015 – 11/20/2015	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	-		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

Test Plot Yes (See below) N/A

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	-4.17	-3.37	-0.74	≤8	Pass
PSD	802.11b	2437	Mid	-4.02	-3.72	-0.86	≤8	Pass
PSD	802.11b	2462	High	-4.43	-4.35	-1.38	≤8	Pass
PSD	802.11g	2412	Low	-7.68	-6.60	-4.10	≤8	Pass
PSD	802.11g	2437	Mid	-5.06	-4.99	-2.01	≤8	Pass
PSD	802.11g	2462	High	-10.09	-10.07	-7.07	≤8	Pass
PSD	802.11n-20M	2412	Low	-6.95	-7.26	-4.09	≤8	Pass
PSD	802.11n-20M	2437	Mid	-5.00	-4.84	-1.91	≤8	Pass
PSD	802.11n-20M	2462	High	-9.05	-9.05	-6.04	≤8	Pass
PSD	802.11n-40M	2422	Low	-10.60	-8.95	-6.69	≤8	Pass
PSD	802.11n-40M	2437	Mid	-7.89	-8.48	-5.16	≤8	Pass
PSD	802.11n-40M	2452	High	-13.51	-13.60	-10.54	≤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



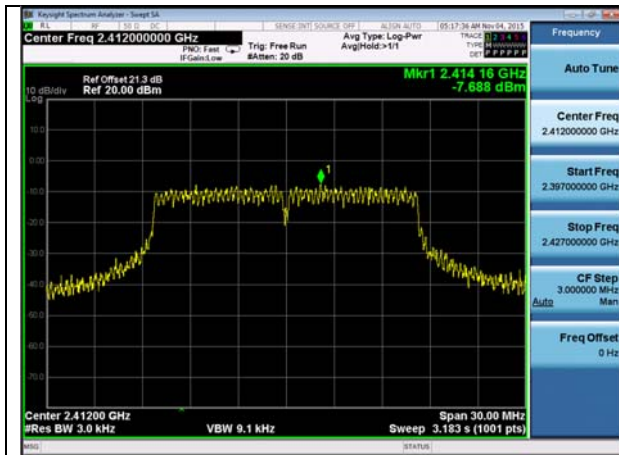
PSD-2.4G-802.11b Mid-chain1



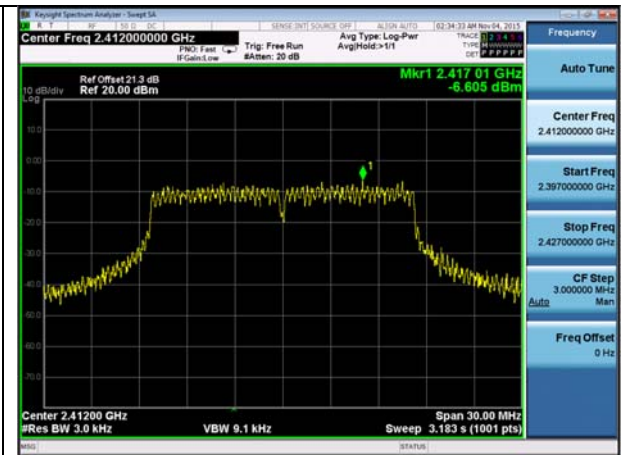
PSD-2.4G-802.11b High-chain0



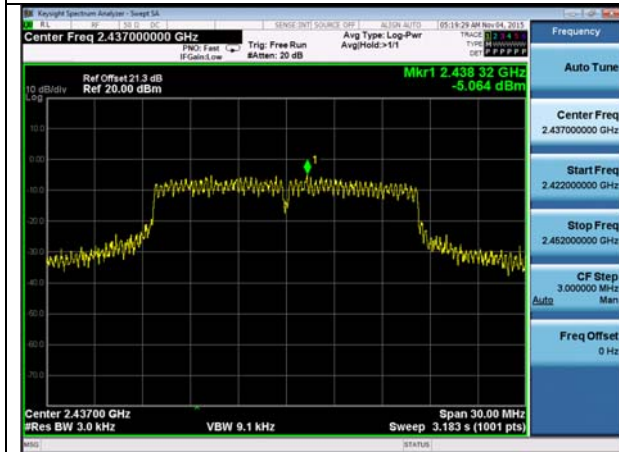
PSD-2.4G-802.11b High-chain1



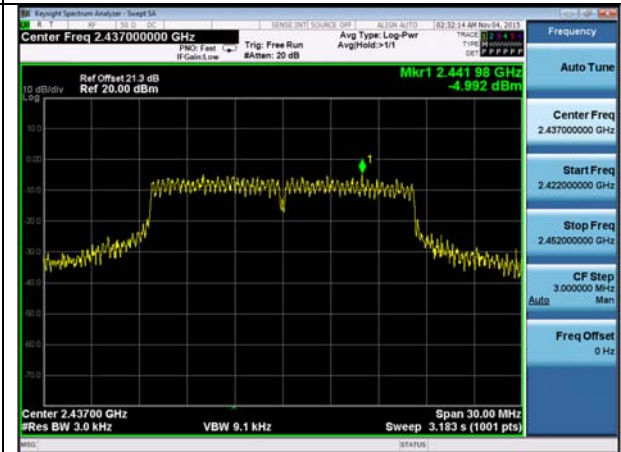
PSD-2.4G-802.11g Low-chain0



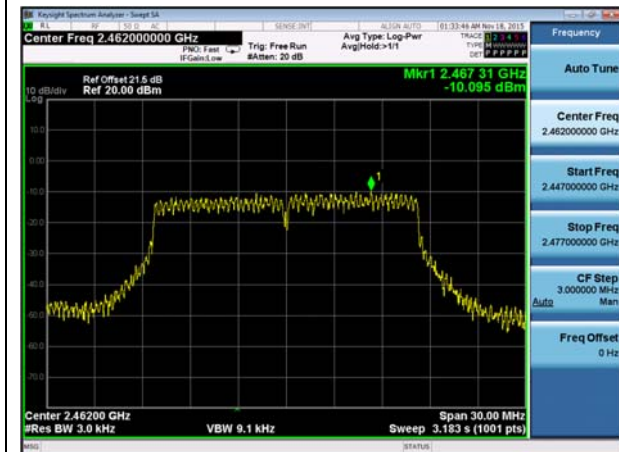
PSD-2.4G-802.11g Low-chain1



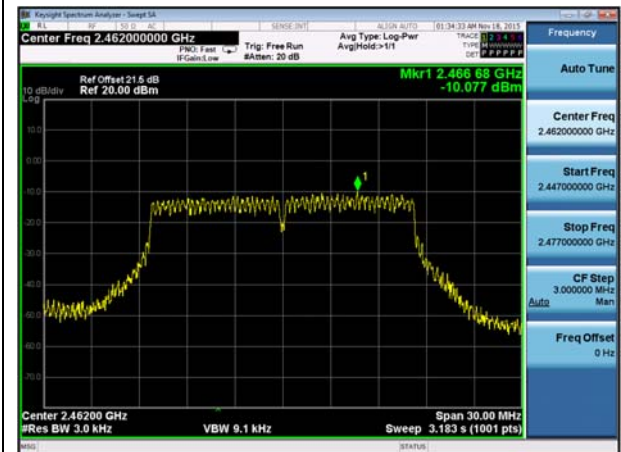
PSD-2.4G-802.11g Mid-chain0



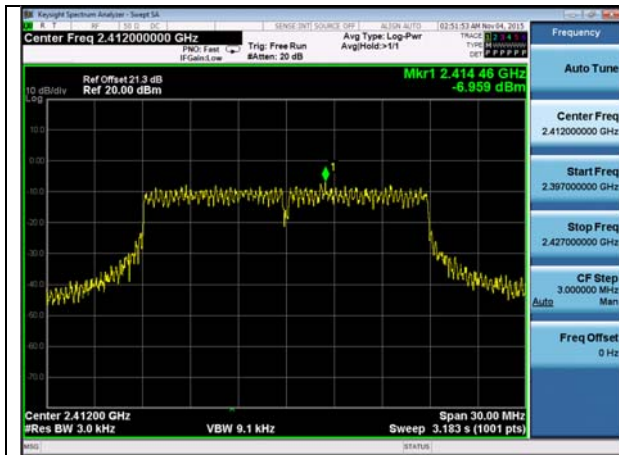
PSD-2.4G-802.11g Mid-chain1



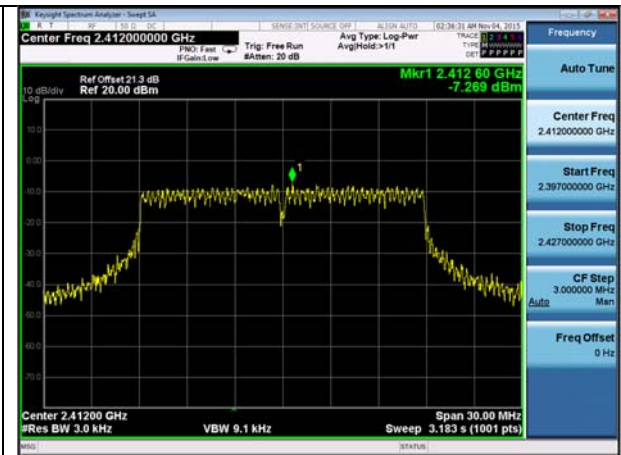
PSD-2.4G-802.11g High-chain0



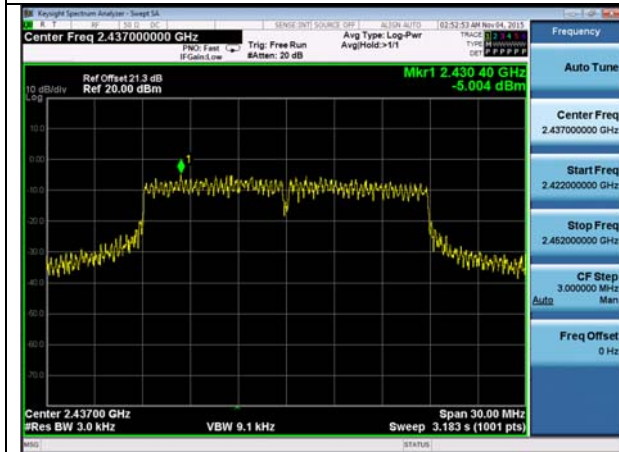
PSD-2.4G-802.11g High-chain1



PSD-2.4G-802.11n20 Low-chain0



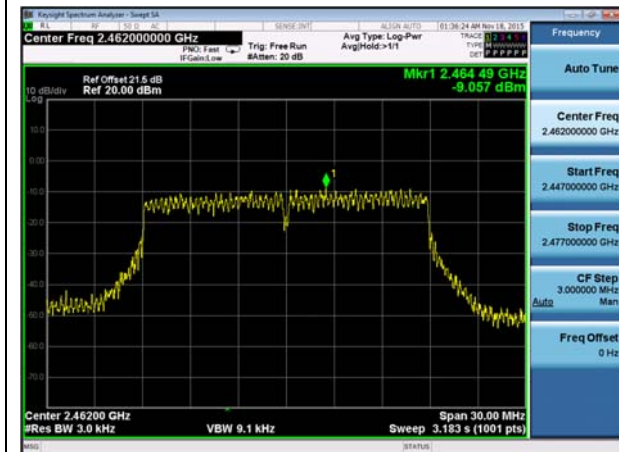
PSD-2.4G-802.11n20 Low-chain1



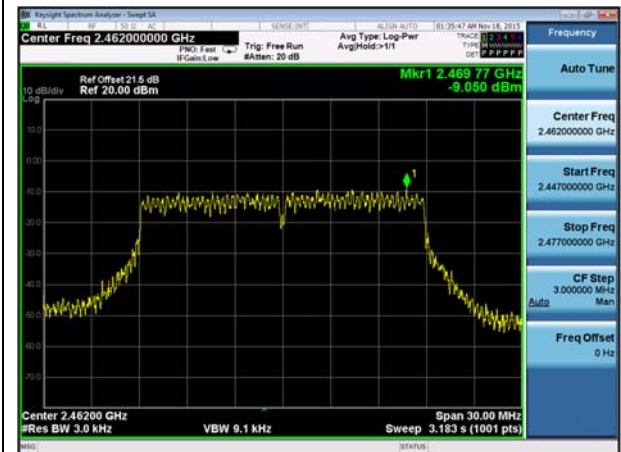
PSD-2.4G-802.11n20 Mid-chain0



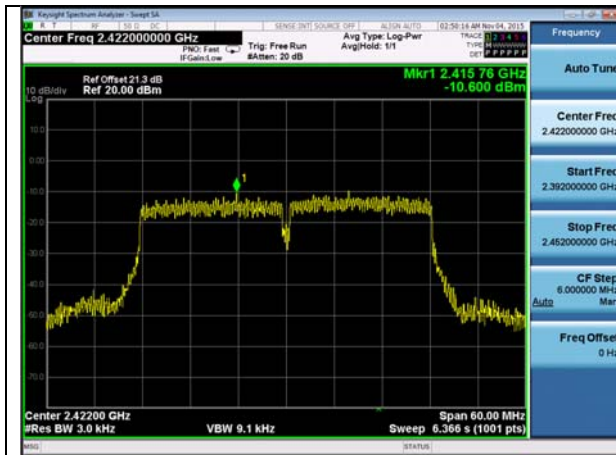
PSD-2.4G-802.11n20 Mid-chain1



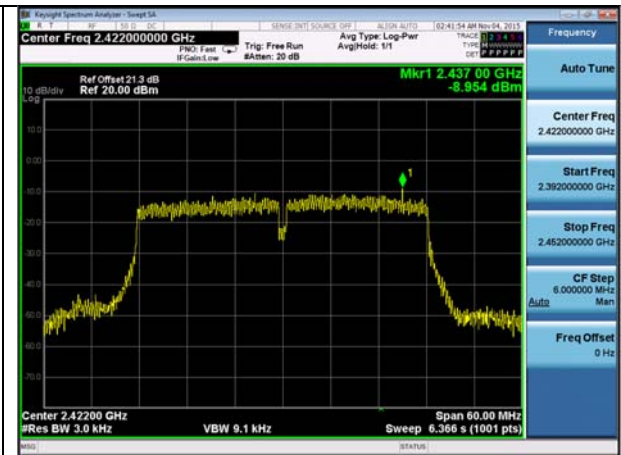
PSD-2.4G-802.11n20 High-chain0



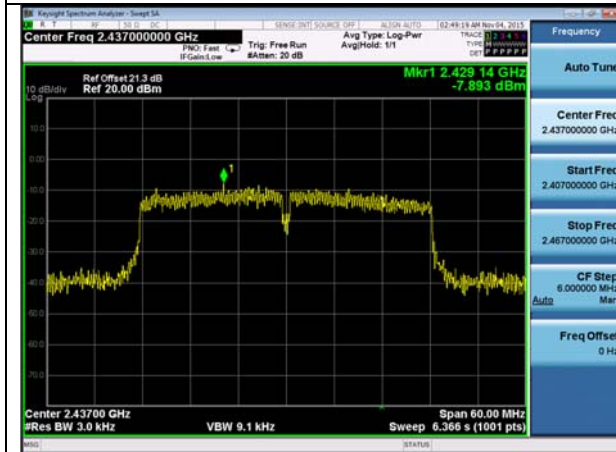
PSD-2.4G-802.11n20 High-chain1



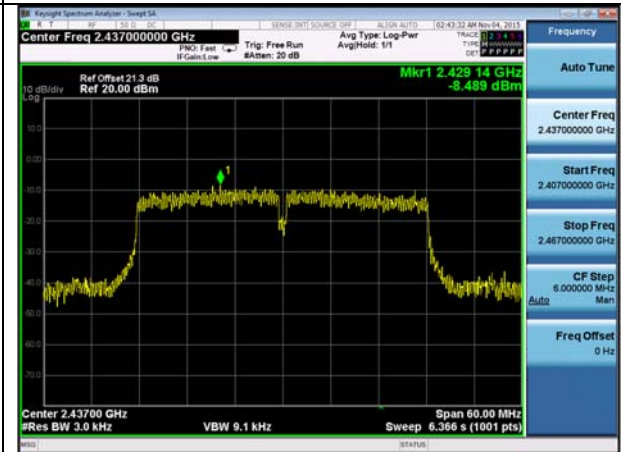
PSD-2.4G-802.11n40 Low-chain0



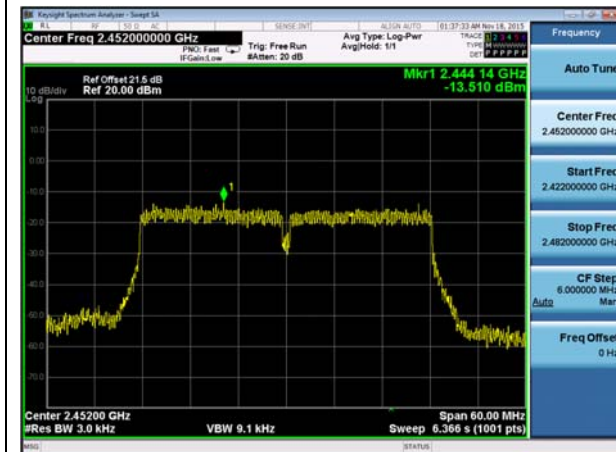
PSD-2.4G-802.11n40 Low-chain1



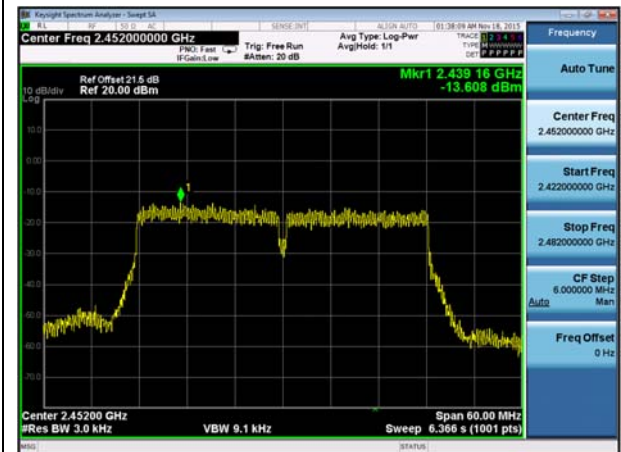
PSD-2.4G-802.11n40 Mid-chain0



PSD-2.4G-802.11n40 Mid-chain1



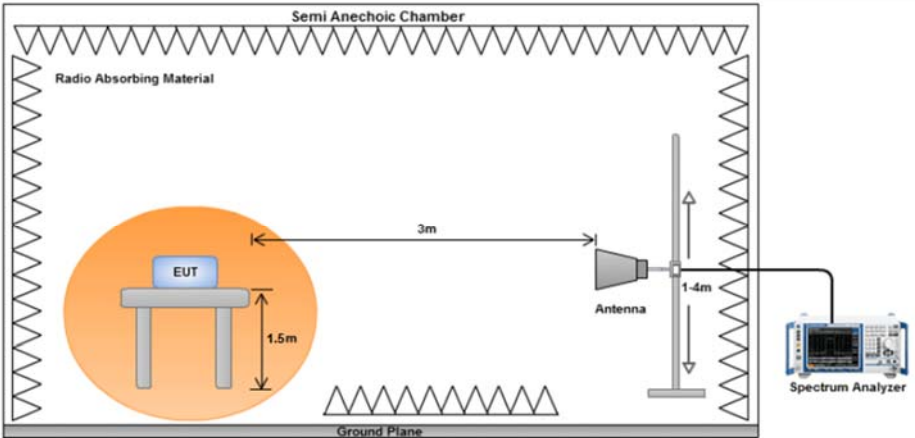
PSD-2.4G-802.11n40 High-chain0



PSD-2.4G-802.11n40 High-chain1

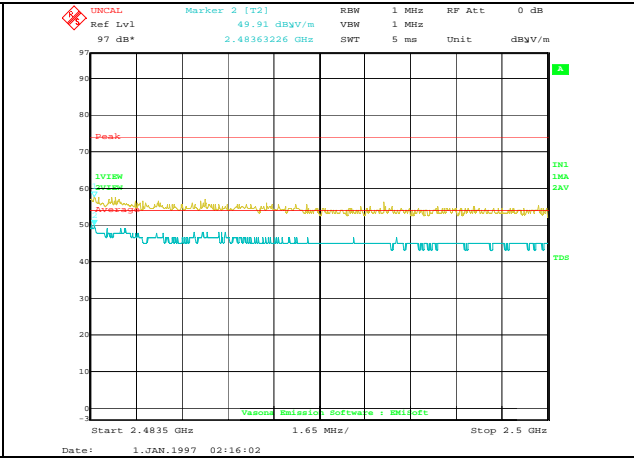
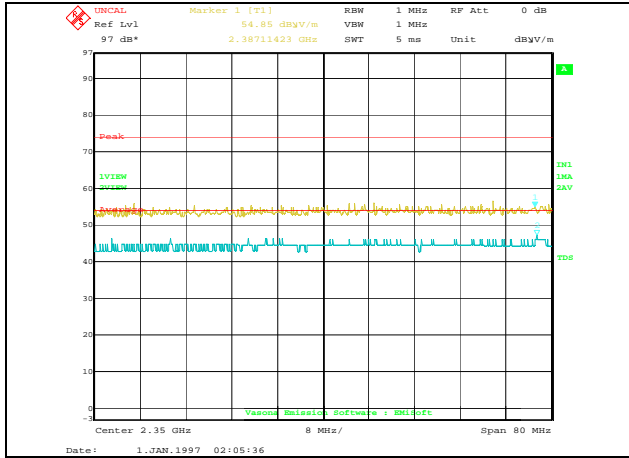
10.7 Radiated Spurious Emissions in restricted band

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 <input type="checkbox"/> 20 dB down <input checked="" type="checkbox"/> 30 dB down	<input checked="" type="checkbox"/>
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	<input checked="" type="checkbox"/>
Test Setup			
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. An average measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. 		
Remark	The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

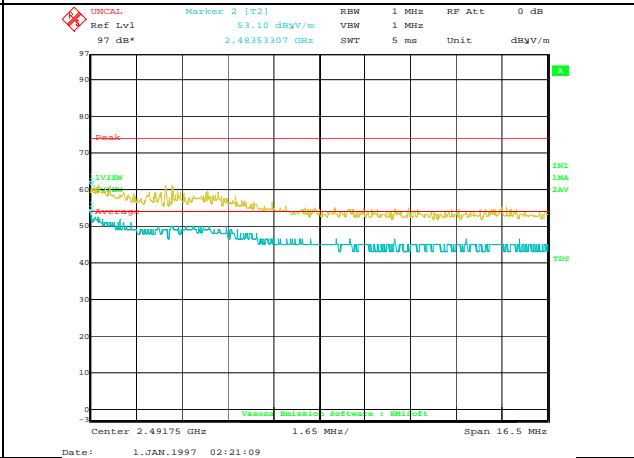
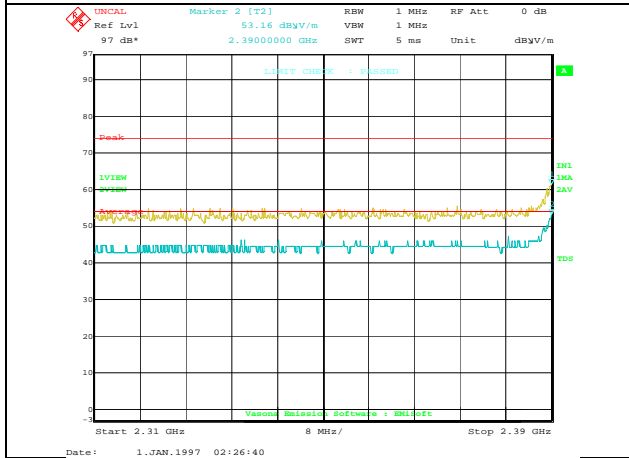
Test Data Yes (See below) N/A
Test Plot Yes (See below) N/A

Restricted Band Measurement Plots:



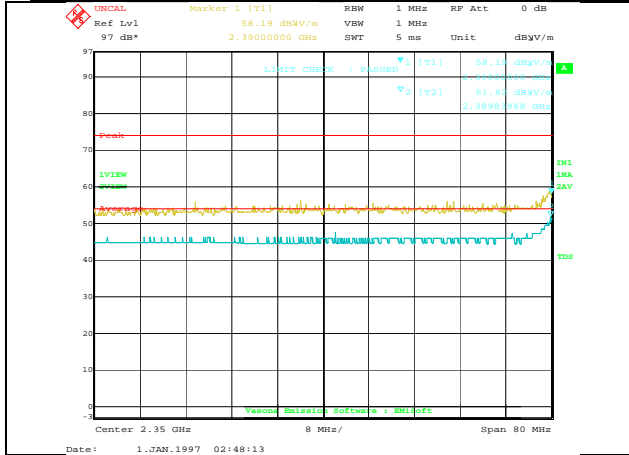
802.11b 2412M-Restricted Band 2310-2390MHz

802.11b 2462M-Restricted Band 2483.5-2500MHz

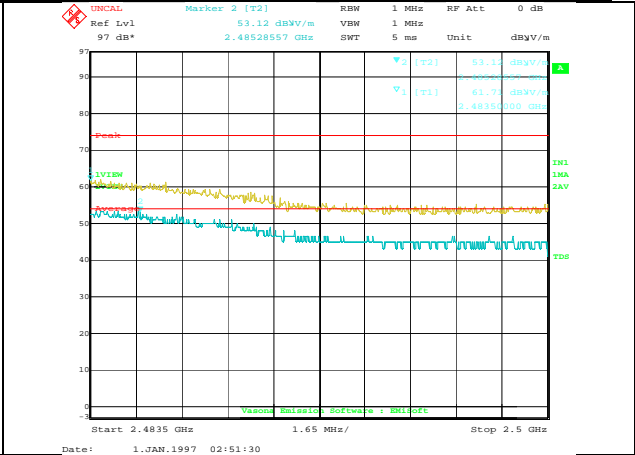


802.11g 2412M-Restricted Band 2310-2390MHz

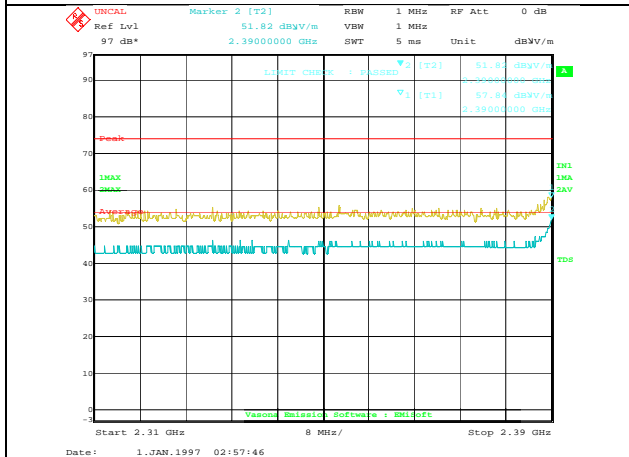
802.11g 2462M-Restricted Band 2483.5-2500MHz



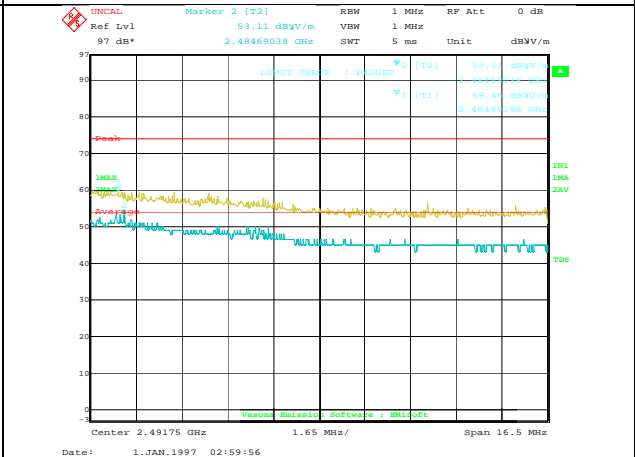
802.11n20 2412M-Restricted Band 2310-2390MHz



802.11n20 2462M-Restricted Band 2483.5-2500MHz



802.11n40 2422M-Restricted Band 2310-2390MHz



802.11n40 2452M-Restricted Band 2483.5-2500MHz

10.8 Radiated Spurious Emissions below 1GHz

Requirement(s):

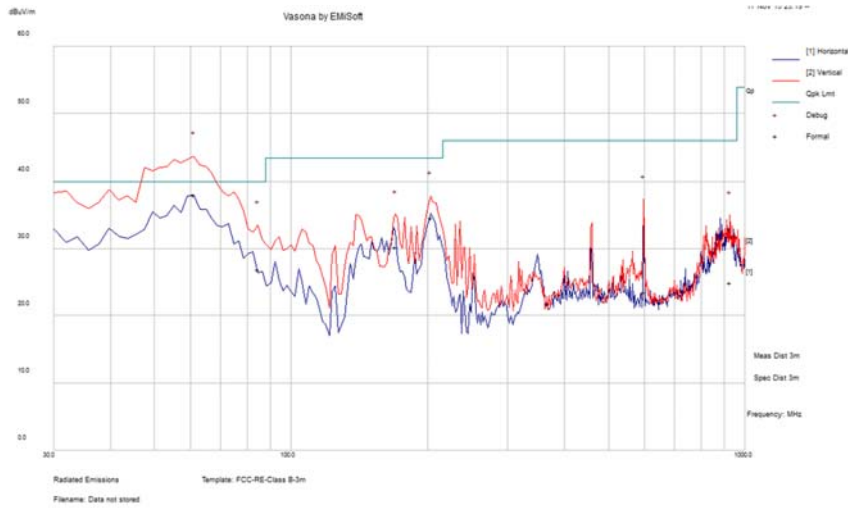
Spec	Item	Requirement	Applicable										
47CFR§15.247(d) RSS247 (5.5)	a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <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> </tbody> </table>	Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	<input checked="" type="checkbox"/>
Frequency range (MHz)	Field Strength (uV/m)												
30 – 88	100												
88 – 216	150												
216 960	200												
Above 960	500												
Test Setup													
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. A Quasi-peak measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. 												
Remark	The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.												
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail												

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	26.1			
	Humidity (%)	47.5			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Gary Chou				
Test Date:	11/17/2015				
Remarks:	Worst case, 802.11n HT20, middle channel				



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
60.99	67.13	1.16	-30.25	38.04	Quasi Max	V	100	182	40	-1.96	Pass
203.16	58.48	2.43	-26.23	34.68	Quasi Max	V	100	132	43.52	-8.84	Pass
84.65	56.14	1.45	-30.75	26.84	Quasi Max	V	100	113	40	-13.16	Pass
169.94	55.28	2.18	-27.14	30.33	Quasi Max	V	100	130	43.52	-13.19	Pass
597.82	38.85	4.27	-19.68	23.44	Quasi Max	V	100	244	46.02	-22.58	Pass
926.29	34.87	5.54	-15.54	24.86	Quasi Max	V	100	72	46.02	-21.16	Pass

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

10.9 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 <input type="checkbox"/> 20 dB down <input checked="" type="checkbox"/> 30 dB down	<input checked="" type="checkbox"/>
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	<input checked="" type="checkbox"/>
Test Setup			
Procedure	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

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
4185.68	37.55	8.97	14.94	61.46	Peak Max	V	162	324	74	-12.54	Pass
1042.91	42.48	3.42	13.13	59.02	Peak Max	V	180	81	74	-14.98	Pass
4185.68	25.76	8.97	14.94	49.67	Average Max	V	162	324	54	-4.33	Pass
1042.91	30.61	3.42	13.13	47.15	Average Max	V	180	81	54	-6.85	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
4049.37	37.48	8.63	15.53	61.64	Peak Max	H	118	306	74	-12.36	Pass
1254.95	38.6	3.71	12.83	55.14	Peak Max	H	130	349	74	-18.86	Pass
4049.37	25.62	8.63	15.53	49.78	Average Max	H	118	306	54	-4.22	Pass
1254.95	27.54	3.71	12.83	44.08	Average Max	H	130	349	54	-9.92	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
4049.43	36.83	8.63	15.53	60.99	Peak Max	V	221	82	74	-13.01	Pass
1999.34	39.59	4.28	14.99	58.86	Peak Max	V	114	337	74	-15.14	Pass
4049.43	25.44	8.63	15.53	49.6	Average Max	V	221	82	54	-4.4	Pass
1999.34	28.12	4.28	14.99	47.39	Average Max	V	114	337	54	-6.61	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
4217.55	37.31	9.04	14.81	61.16	Peak Max	H	153	297	74	-12.84	Pass
1019.90	43.85	3.38	13.17	60.4	Peak Max	H	202	215	74	-13.6	Pass
4217.55	25.66	9.04	14.81	49.51	Average Max	H	153	297	54	-4.49	Pass
1019.90	31.56	3.38	13.17	48.1	Average Max	H	202	215	54	-5.9	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
4156.41	37.41	8.89	15.07	61.37	Peak Max	V	184	242	74	-12.63	Pass
6160.60	37.12	10.68	14.2	62	Peak Max	V	156	281	74	-12	Pass
4156.41	25.73	8.89	15.07	49.69	Average Max	V	184	242	54	-4.31	Pass
6160.60	24.61	10.68	14.2	49.49	Average Max	V	156	281	54	-4.51	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
4068.96	37.93	8.68	15.44	62.05	Peak Max	V	194	283	74	-11.95	Pass
5975.93	36.37	10.41	14.53	61.31	Peak Max	V	226	318	74	-12.69	Pass
4068.96	25.66	8.68	15.44	49.78	Average Max	V	194	283	54	-4.22	Pass
5975.93	24.13	10.41	14.53	49.07	Average Max	V	226	318	54	-4.93	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
4028.89	37.03	8.57	15.62	61.23	Peak Max	V	185	244	74	-12.77	Pass
1029.88	42.81	3.4	13.15	59.36	Peak Max	V	239	228	74	-14.64	Pass
4028.89	25.56	8.57	15.62	49.76	Average Max	V	185	244	54	-4.25	Pass
1029.88	31.18	3.4	13.15	47.73	Average Max	V	239	228	54	-6.27	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
4093.82	38.11	8.74	15.34	62.18	Peak Max	V	129	127	74	-11.82	Pass
6161.79	36.85	10.68	14.2	61.73	Peak Max	V	170	286	74	-12.27	Pass
4093.82	25.79	8.74	15.34	49.87	Average Max	V	129	127	54	-4.14	Pass
6161.79	24.63	10.68	14.2	49.51	Average Max	V	170	286	54	-4.49	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
6174.01	35.99	10.7	14.17	60.86	Peak Max	H	132	186	74	-13.14	Pass
2083.60	39.62	4.36	14.73	58.71	Peak Max	H	151	263	74	-15.29	Pass
6174.01	24.42	10.7	14.17	49.28	Average Max	H	132	186	54	-4.72	Pass
2083.60	27.6	4.36	14.73	46.69	Average Max	H	151	263	54	-7.31	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
4240.30	36.99	9.1	14.71	60.8	Peak Max	H	235	76	74	-13.21	Pass
1001.84	34.36	3.35	13.2	50.91	Peak Max	V	118	158	74	-23.09	Pass
4240.30	25.56	9.1	14.71	49.36	Average Max	H	235	76	54	-4.64	Pass
1001.84	31.76	3.35	13.2	48.31	Average Max	V	118	158	54	-5.69	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
4175.65	37.14	8.94	14.98	61.06	Peak Max	V	207	214	74	-12.94	Pass
1031.30	34.49	3.35	13.2	51.04	Peak Max	V	127	126	74	-22.96	Pass
4175.65	25.73	8.94	14.98	49.65	Average Max	V	207	214	54	-4.35	Pass
1031.30	31.74	3.35	13.2	48.29	Average Max	V	127	126	54	-5.71	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
4188.78	37.12	8.97	14.93	61.02	Peak Max	V	129	272	74	-12.98	Pass
6240.99	35.58	10.78	14.01	60.37	Peak Max	V	119	354	74	-13.63	Pass
4188.78	25.78	8.97	14.93	49.69	Average Max	V	129	272	54	-4.32	Pass
6240.99	24.48	10.78	14.01	49.27	Average Max	V	119	354	54	-4.73	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	05/23/2015	1 Year	05/23/2016	<input checked="" type="checkbox"/>
CHASE LISN	MN2050B	1018	08/07/2015	1 Year	08/07/2016	<input checked="" type="checkbox"/>
Radiated Emissions						
R & S Receiver	ESL6	100178	05/27/2015	1 Year	05/27/2016	<input checked="" type="checkbox"/>
R & S Receiver	ESIB 40	100179	05/23/2015	1 Year	05/23/2016	<input checked="" type="checkbox"/>
ETS-Lingren Loop Antenna	6512	00049120	05/12/2015	1 Year	05/12/2016	<input checked="" type="checkbox"/>
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2015	1 Year	08/12/2016	<input checked="" type="checkbox"/>
3 Meters SAC	3M	N/A	08/08/2015	1 Year	08/08/2016	<input checked="" type="checkbox"/>
10 Meters SAC	10M	N/A	09/05/2015	1 Year	09/05/2016	<input checked="" type="checkbox"/>
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	08/20/2015	1 Year	08/20/2016	<input checked="" type="checkbox"/>
R & S Receiver	ESIB 40	100179	05/23/2015	1 Year	05/23/2016	<input checked="" type="checkbox"/>
ETS-Lingren USB RF Power Sensor	7002-006	10SL0190	09/03/2015	1 Year	09/03/2016	<input checked="" type="checkbox"/>

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