

FCC 47 CFR PART 15 SUBPART C RF Test Report

Applicant : Ubiquiti Networks, Inc.
Applicant Address : 2580 Orchard Parkway, San Jose, California, United States, 95131
Product Type : Access Point
Trade Name : UBIQUITI
Model Number : UAP-AC-LR
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2014
ANSI C63.10:2013
Receive Date : Apr. 20, 2015
Test Period : Jun. 08 ~ 25, 2015
Issue Date : Aug. 04, 2015

Issue by

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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Aug. 04, 2015	Initial Issue	

Verification of Compliance

Issued Date: 08/04/2015

Applicant : Ubiquiti Networks, Inc.
Address Applicant : 2580 Orchard Parkway, San Jose, California, United States, 95131
Product Type : Access Point
Trade Name : UBIQUITI
Model Number : UAP-AC-LR
FCC ID : SWX-UAPACLR
EUT Rated Voltage : DC 24V, 0.5A
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2014
ANSI C63.10:2013
Test Result : Complied
Performing Lab. : A Test Lab Techno Corp.

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Taoyuan County 334, Taiwan R.O.C.
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Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : Fly Lu (Fly Lu) (Manager)
Reviewed By : Eric Ou Yang (Eric Ou Yang) (Testing Engineer)

TABLE OF CONTENTS

1	General Information	6
2	EUT Description	7
3	Test Methodology	8
3.1.	Mode of Operation.....	8
3.2.	EUT Exercise Software	12
3.3.	Configuration of Test System Details	13
3.4.	Test Site Environment	14
4	Conducted Emission Measurement	15
4.1.	Limit	15
4.2.	Test Instruments	15
4.3.	Test Setup.....	15
4.4.	Test Procedure	16
4.5.	Test Result.....	17
5	Radiated Emission Measurement.....	19
5.1.	Limit	19
5.2.	Test Instruments	19
5.3.	Setup	20
5.4.	Test Procedure	22
5.5.	Test Result.....	24
6	Maximum Conducted Output Power Measurement.....	32
6.1.	Limit	32
6.2.	Test Setup.....	32
6.3.	Test Instruments	32
6.4.	Test Procedure	32
6.5.	Test Result.....	33
7	6dB RF Bandwidth Measurement.....	37
7.1.	Limit	37
7.2.	Test Setup.....	37
7.3.	Test Instruments	37
7.4.	Test Procedure	37
7.5.	Test Result.....	38
7.6.	Test Graphs	39
8	Maximum Power Density Measurement	51
8.1.	Limit	51
8.2.	Test Setup.....	51
8.3.	Test Instruments	51
8.4.	Test Procedure	51
8.5.	Test Result.....	52
8.6.	Test Graphs	53

9	Out of Band Conducted Emissions Measurement	65
9.1.	Limit	65
9.2.	Test Setup.....	65
9.3.	Test Instruments	65
9.4.	Test Procedure	65
9.5.	Test Graphs	66
10	Band Edges Measurement	102
10.1.	Limit	102
10.2.	Test Setup.....	102
10.3.	Test Instruments	102
10.4.	Test Procedure	103
10.5.	Test Result.....	104
11	Antenna Measurement.....	108
11.1.	Limit	108
11.2.	Antenna Connector Construction	108

1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
15.247			
15.207	AC Power Conducted Emission	PASS	----
----	99 % Occupied Bandwidth	PASS	----
Standard	Item	Result	Remark
15.247			
15.247(d)	Transmitter Radiated Emissions	PASS	----
15.247(b)(3)	Max. Output Power	PASS	----
15.247(a)(2)	6dB RF Bandwidth	PASS	----
15.247(e)	Power Spectral Density	PASS	----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	----
15.247(d)	Band Edge Measurement	PASS	----
15.203	Antenna Requirement	PASS	----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)	
Conducted Emission	9kHz ~ 30MHz	± 2.02	
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.98
		Vertical	± 3.62
	1000MHz ~ 18000MHz	Horizontal	± 3.11
		Vertical	± 3.07
	18000MHz ~ 40000MHz	Horizontal	± 3.66
		Vertical	± 3.54

2 EUT Description

Applicant	Ubiquiti Networks, Inc.
Applicant Address	2580 Orchard Parkway, San Jose, California, United States, 95131
Manufacturer	Ubiquiti Networks, Inc.
Manufacturer Address	2580 Orchard Parkway, San Jose, California, United States, 95131
Product Type	Access Point
Trade Name	UBIQUITI
Model Number	UAP-AC-LR
FCC ID	SWX-UAPACLR
Operate Band	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz & 40MHz
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2462 MHz IEEE 802.11n 2.4GHz 40MHz: 2422 ~ 2452 MHz
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: DSSS + OFDM IEEE 802.11n 2.4GHz 20MHz: OFDM IEEE 802.11n 2.4GHz 40MHz: OFDM
Channel Numbers	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 11ch IEEE 802.11n 2.4GHz 40MHz: 9ch
Antenna Delivery	3TX + 3RX
Antenna Used	Dual band tri pol antenna
Antenna Gain	3 dBi
RF Output Power	IEEE 802.11b: 0.050 W / 16.98 dBm IEEE 802.11g: 0.114 W / 20.58 dBm IEEE 802.11n 2.4GHz 20MHz: 0.112 W / 20.49 dBm IEEE 802.11n 2.4GHz 40MHz: 0.064 W / 18.05 dBm

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal operation mode
Mode 2: IEEE 802.11b link mode
Mode 3: IEEE 802.11g link mode
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

Test Mode	ANT-0	ANT-1	ANT-2	ANT-0+1+2
Mode 2: IEEE 802.11b link mode	V	V	V	V
Mode 3: IEEE 802.11g link mode	V	V	V	V
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode	V	V	V	V
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode	V	V	V	V

Test Mode	Antenna Delivery	Test Channel	Data Rate
Mode 2: IEEE 802.11b link mode	3TX / 3RX	1, 6, 11	1
Mode 3: IEEE 802.11g link mode	3TX / 3RX	1, 6, 11	6
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode	3TX / 3RX	1, 6, 11	19.5
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode	3TX / 3RX	3, 6, 9	40.5

Duty cycle

Test Mode	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
Mode 2: IEEE 802.11b link mode	2412.0	12.260	13.320	0.920	0.360	0.082
Mode 3: IEEE 802.11g link mode	2412.0	2.040	2.168	0.941	0.264	0.490
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode	2412.0	0.681	0.804	0.847	0.721	1.468
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode	2422.0	0.354	0.431	0.821	0.855	2.825

Duty Cycle Graphs

Mode 2: IEEE 802.11b link mode	
On time	<p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.412000000 GHz Ref Offset 11.7 dB Ref 10.00 dBm ΔMkr1 12.26 ms 0.35 dB Center 2.412000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 32.00 ms (1001 pts) Span 0 Hz</p>
On+off time	<p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.412000000 GHz Ref Offset 11.7 dB Ref 10.00 dBm ΔMkr1 12.32 ms -1.52 dB Center 2.412000000 GHz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 32.00 ms (1001 pts) Span 0 Hz</p>

Mode 3: IEEE 802.11g Mode	
<p>On time</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.412000000 GHz Trig: Free Run Avg Type: Log-Pwr <small>PROJ: Nida #Gain: 1 uw #Atten: 20 dB</small></p> <p>10 dB/div Ref Offset 11.7 dB ΔMkr1 2.040 ms Log Ref 20.00 dBm 0.83 dB</p> <p>Center 2.412000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 8.000 ms (1001 pts)</p> <p>Frequency Auto Tune Center Freq 2.412000000 GHz Start Freq 2.412000000 GHz Stop Freq 2.412000000 GHz CF Step 1.000000 MHz Freq Offset 0 Hz</p>
<p>On+off time</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.412000000 GHz Trig: Free Run Avg Type: Log-Pwr <small>PROJ: Nida #Gain: 1 uw #Atten: 20 dB</small></p> <p>10 dB/div Ref Offset 11.7 dB ΔMkr1 2.168 ms Log Ref 20.00 dBm 0.26 dB</p> <p>Center 2.412000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 8.000 ms (1001 pts)</p> <p>Frequency Auto Tune Center Freq 2.412000000 GHz Start Freq 2.412000000 GHz Stop Freq 2.412000000 GHz CF Step 1.000000 MHz Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz Mode

<p>On time</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.412000000 GHz</p> <p>Stop Freq 2.412000000 GHz</p> <p>CF Step 1.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>On+off time</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.412000000 GHz</p> <p>Stop Freq 2.412000000 GHz</p> <p>CF Step 1.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

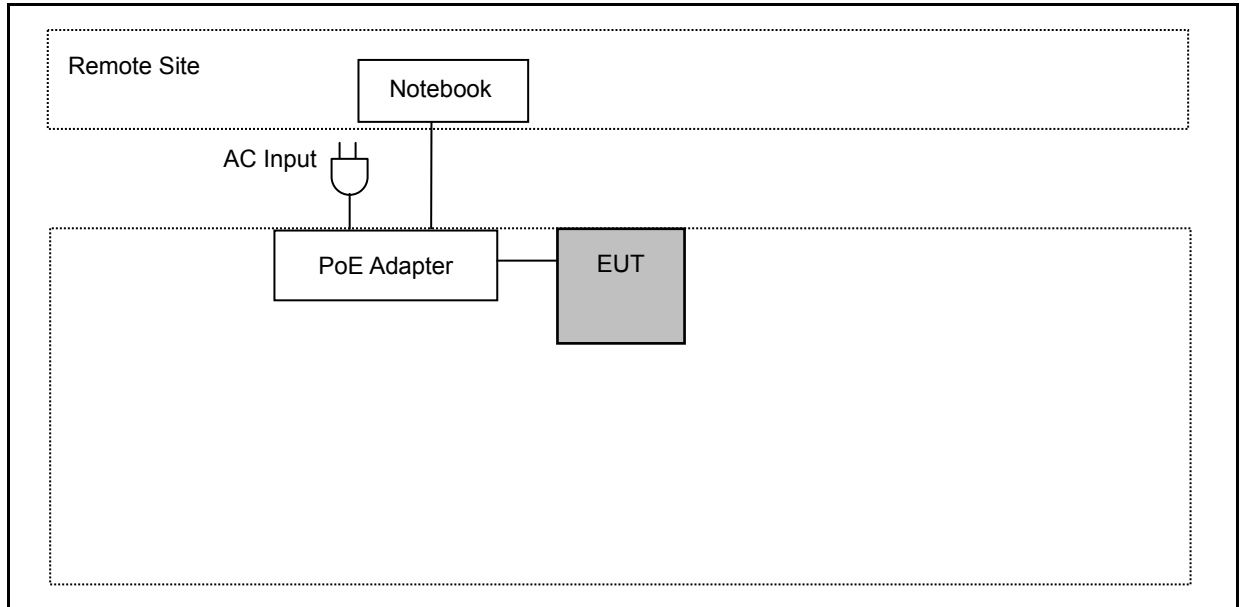
Mode 5: IEEE 802.11n 2.4GHz 40MHz Mode	
On time	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 2.422000000 GHz Ref Offset 11.7 dB Ref 20.00 dBm ΔMkr1 354.0 us -0.69 dB Center 2.422000000 GHz Res BW 470 kHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)</p>
On+off time	<p>Agilent Spectrum Analyzer - Sweep 5A Center Freq 2.422000000 GHz Ref Offset 11.7 dB Ref 20.00 dBm ΔMkr1 431.0 us 1.42 dB Center 2.422000000 GHz Res BW 470 kHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)</p>

3.2. EUT Exercise Software

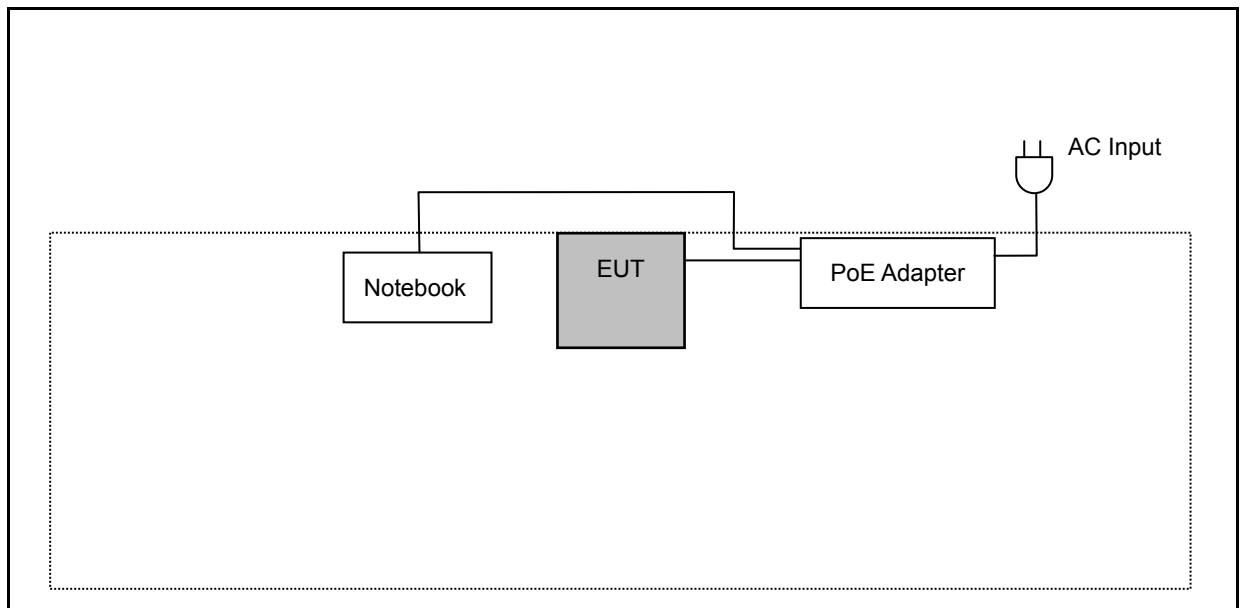
- | |
|---|
| 1. Setup the EUT shown on 3.3. |
| 2. Turn on the power of all equipment. |
| 3. Turn on Wi-Fi function link to Notebook. |
| 4. EUT run test program. |

3.3. Configuration of Test System Details

Conducted Emissions



Radiated Emissions



3.4. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

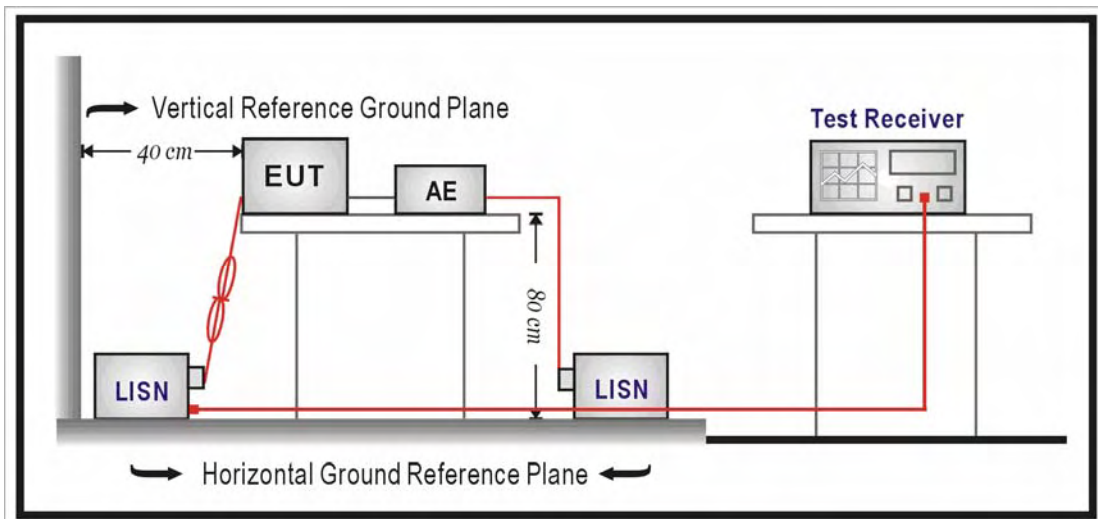
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/12/2014	(1)
LISN	R&S	ENV216	101040	03/10/2015	(1)
LISN	R&S	ENV216	101041	03/06/2015	(1)
RF Cable	EMCI	RG 214/U	TE-02	06/30/2014	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

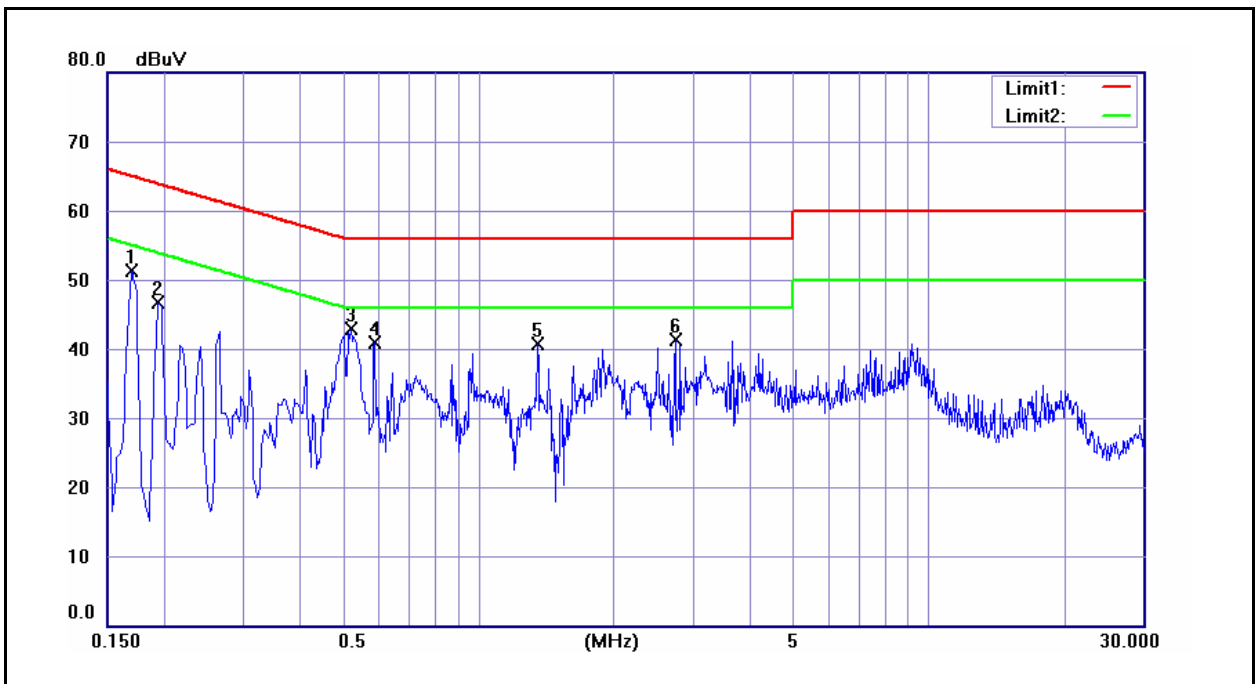
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	06/08/2015
		Test By:	Eric Ou Yang
Description:			

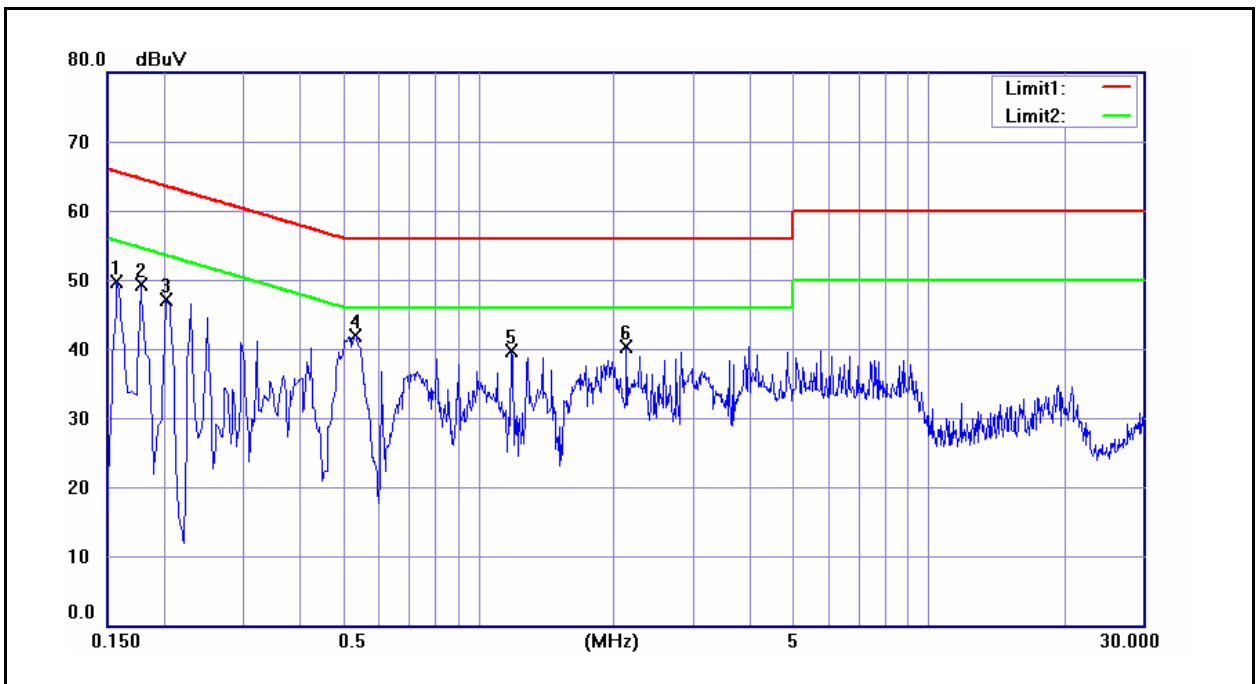


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1700	39.84	24.14	9.64	49.48	33.78	64.96	54.96	-15.48	-21.18	Pass
2	0.1940	35.65	16.89	9.64	45.29	26.53	63.86	53.86	-18.57	-27.33	Pass
3	0.5220	31.35	21.26	9.65	41.00	30.91	56.00	46.00	-15.00	-15.09	Pass
4	0.5900	25.16	9.63	9.65	34.81	19.28	56.00	46.00	-21.19	-26.72	Pass
5	1.3580	22.37	13.03	9.71	32.08	22.74	56.00	46.00	-23.92	-23.26	Pass
6	2.7420	19.57	7.45	9.79	29.36	17.24	56.00	46.00	-26.64	-28.76	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	06/08/2015
		Test By:	Eric Ou Yang
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1580	36.80	15.32	9.62	46.42	24.94	65.57	55.57	-19.15	-30.63	Pass
2	0.1780	36.41	13.11	9.62	46.03	22.73	64.58	54.58	-18.55	-31.85	Pass
3	0.2020	35.21	21.85	9.62	44.83	31.47	63.53	53.53	-18.70	-22.06	Pass
4	0.5340	31.44	22.64	9.64	41.08	32.28	56.00	46.00	-14.92	-13.72	Pass
5	1.1900	18.93	7.79	9.68	28.61	17.47	56.00	46.00	-27.39	-28.53	Pass
6	2.1340	21.68	11.96	9.72	31.40	21.68	56.00	46.00	-24.60	-24.32	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5 Radiated Emission Measurement

5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at meter)	Measurement Distance (meters)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

5.2. Test Instruments

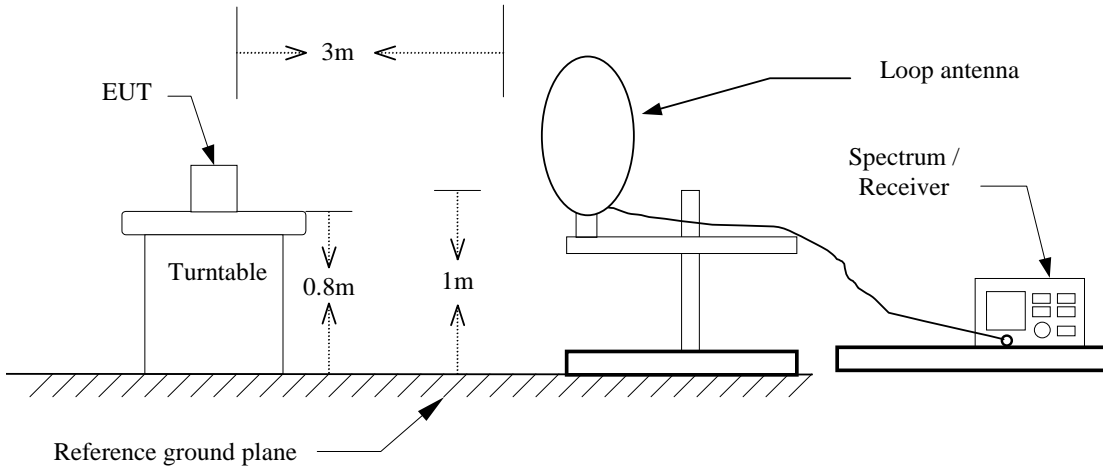
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2015	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/24/2015	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/22/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/12/2015	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/02/2014	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	02/02/2015	(1)
Microwave Cable	EMCI	EMC-104-SM-S M-14000	140202	02/24/2015	(1)
Microwave Cable	EMCI	EMC104-SM-S M-600	140301	02/24/2015	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

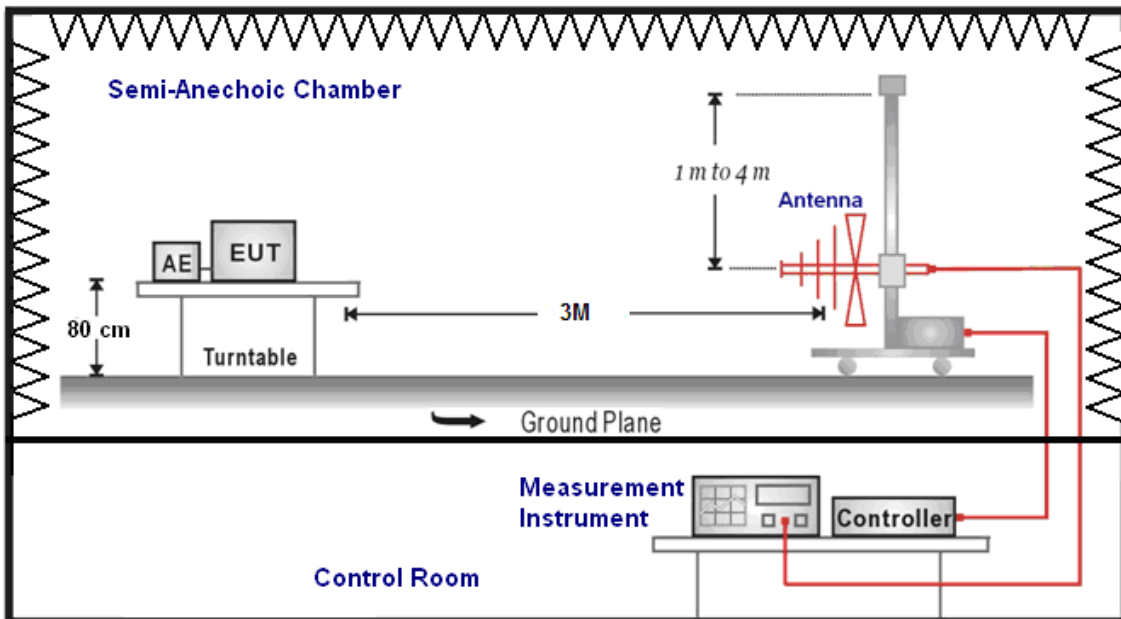
Note: N.C.R. = No Calibration Request.

5.3. Setup

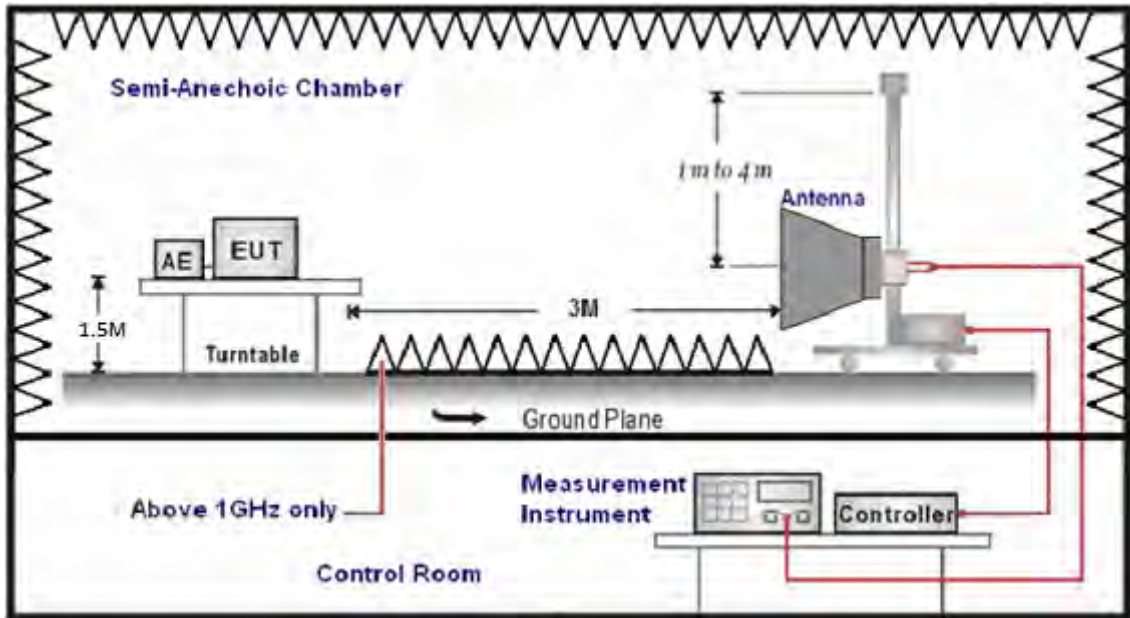
9kHz ~ 30MHz



Below 1GHz



Above 1GHz



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 1.5 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements when Duty cycle >98% / 1/T for average measurements when Duty cycle <98%.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 1	Date:	06/25/2015
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
133.0000	38.57	-12.64	25.93	43.50	-17.57	QP	H
170.0000	38.17	-11.59	26.58	43.50	-16.92	QP	H
300.0000	37.85	-9.42	28.43	46.00	-17.57	QP	H
387.5000	33.45	-7.63	25.82	46.00	-20.18	QP	H
566.5000	27.27	-4.04	23.23	46.00	-22.77	QP	H
872.0000	27.76	1.92	29.68	46.00	-16.32	QP	H
194.5000	35.58	-13.44	22.14	43.50	-21.36	QP	V
237.5000	36.82	-11.86	24.96	46.00	-21.04	QP	V
408.0000	29.89	-7.19	22.70	46.00	-23.30	QP	V
516.5000	27.47	-5.12	22.35	46.00	-23.65	QP	V
667.0000	34.39	-2.17	32.22	46.00	-13.78	QP	V
872.5000	28.53	1.93	30.46	46.00	-15.54	QP	V

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	06/25/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3023.000	38.04	1.81	39.85	74.00	-34.15	peak	H
4626.000	33.15	6.85	40.00	74.00	-34.00	peak	H
6698.000	33.28	12.03	45.31	74.00	-28.69	peak	H
3051.000	37.95	1.94	39.89	74.00	-34.11	peak	V
4824.000	41.74	7.48	49.22	74.00	-24.78	peak	V
6663.000	33.09	11.94	45.03	74.00	-28.97	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	06/25/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3086.000	37.29	2.09	39.38	74.00	-34.62	peak	H
4570.000	33.29	6.68	39.97	74.00	-34.03	peak	H
6698.000	33.85	12.03	45.88	74.00	-28.12	peak	H
3023.000	37.96	1.81	39.77	74.00	-34.23	peak	V
4874.000	39.26	7.63	46.89	74.00	-27.11	peak	V
6677.000	34.93	11.97	46.90	74.00	-27.10	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 2	Date:	06/25/2015
Frequency:	2462MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3009.000	38.25	1.75	40.00	74.00	-34.00	peak	H
4619.000	34.41	6.83	41.24	74.00	-32.76	peak	H
6691.000	34.63	12.02	46.65	74.00	-27.35	peak	H
3002.000	39.46	1.72	41.18	74.00	-32.82	peak	V
4924.000	40.38	7.79	48.17	74.00	-25.83	peak	V
6663.000	33.90	11.94	45.84	74.00	-28.16	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	06/25/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3037.000	36.63	1.87	38.50	74.00	-35.50	peak	H
4598.000	33.46	6.77	40.23	74.00	-33.77	peak	H
6691.000	32.77	12.02	44.79	74.00	-29.21	peak	H
3058.000	37.81	1.97	39.78	74.00	-34.22	peak	V
4661.000	33.88	6.96	40.84	74.00	-33.16	peak	V
6705.000	35.22	12.05	47.27	74.00	-26.73	peak	V

Standard:	FCC Part 15C		Test Distance:	3m			
Test item:	Radiated Emission		Power:	AC 120V/60Hz			
Model Number:	UAP-AC-LR		Temp.(°C)/Hum.(%RH):	26(°C)/60%RH			
Mode:	Mode 3		Date:	06/25/2015			
Frequency:	2437MHz		Test By:	Eric Ou Yang			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3023.000	37.92	1.81	39.73	74.00	-34.27	peak	H
4605.000	34.85	6.79	41.64	74.00	-32.36	peak	H
6698.000	35.04	12.03	47.07	74.00	-26.93	peak	H
3023.000	38.20	1.81	40.01	74.00	-33.99	peak	V
4577.000	34.43	6.69	41.12	74.00	-32.88	peak	V
6698.000	33.80	12.03	45.83	74.00	-28.17	peak	V

Standard:	FCC Part 15C		Test Distance:	3m			
Test item:	Radiated Emission		Power:	AC 120V/60Hz			
Model Number:	UAP-AC-LR		Temp.(°C)/Hum.(%RH):	26(°C)/60%RH			
Mode:	Mode 3		Date:	06/25/2015			
Frequency:	2462MHz		Test By:	Eric Ou Yang			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	36.70	1.94	38.64	74.00	-35.36	peak	H
4619.000	33.63	6.83	40.46	74.00	-33.54	peak	H
6642.000	33.43	11.89	45.32	74.00	-28.68	peak	H
3023.000	38.36	1.81	40.17	74.00	-33.83	peak	V
4633.000	34.11	6.88	40.99	74.00	-33.01	peak	V
6726.000	34.50	12.10	46.60	74.00	-27.40	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	06/25/2015
Frequency:	2412MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	36.29	1.94	38.23	74.00	-35.77	peak	H
4591.000	33.73	6.74	40.47	74.00	-33.53	peak	H
6670.000	34.09	11.96	46.05	74.00	-27.95	peak	H
3030.000	38.30	1.85	40.15	74.00	-33.85	peak	V
4570.000	34.66	6.68	41.34	74.00	-32.66	peak	V
6719.000	34.13	12.08	46.21	74.00	-27.79	peak	V

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	UAP-AC-LR	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	06/25/2015
Frequency:	2437MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.21	1.94	39.15	74.00	-34.85	peak	H
4577.000	33.91	6.69	40.60	74.00	-33.40	peak	H
6670.000	33.51	11.96	45.47	74.00	-28.53	peak	H
3030.000	39.31	1.85	41.16	74.00	-32.84	peak	V
4570.000	34.49	6.68	41.17	74.00	-32.83	peak	V
6670.000	33.37	11.96	45.33	74.00	-28.67	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	06/25/2015		
Frequency:	2462MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3002.000	37.19	1.72	38.91	74.00	-35.09	peak	H
4626.000	33.70	6.85	40.55	74.00	-33.45	peak	H
6691.000	33.72	12.02	45.74	74.00	-28.26	peak	H
3037.000	37.80	1.87	39.67	74.00	-34.33	peak	V
4591.000	34.61	6.74	41.35	74.00	-32.65	peak	V
6677.000	33.82	11.97	45.79	74.00	-28.21	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	06/25/2015		
Frequency:	2422MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2995.000	36.09	1.70	37.79	74.00	-36.21	peak	H
4598.000	33.36	6.77	40.13	74.00	-33.87	peak	H
6649.000	33.17	11.91	45.08	74.00	-28.92	peak	H
3030.000	38.03	1.85	39.88	74.00	-34.12	peak	V
4626.000	34.85	6.85	41.70	74.00	-32.30	peak	V
6649.000	33.36	11.91	45.27	74.00	-28.73	peak	V

Standard:	FCC Part 15C		Test Distance:	3m			
Test item:	Radiated Emission		Power:	AC 120V/60Hz			
Model Number:	UAP-AC-LR		Temp.(°C)/Hum.(%RH):	26(°C)/60%RH			
Mode:	Mode 5		Date:	06/25/2015			
Frequency:	2437MHz		Test By:	Eric Ou Yang			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.58	1.85	39.43	74.00	-34.57	peak	H
4570.000	34.00	6.68	40.68	74.00	-33.32	peak	H
6691.000	33.44	12.02	45.46	74.00	-28.54	peak	H
3037.000	37.98	1.87	39.85	74.00	-34.15	peak	V
4591.000	35.18	6.74	41.92	74.00	-32.08	peak	V
6719.000	33.75	12.08	45.83	74.00	-28.17	peak	V

Standard:	FCC Part 15C		Test Distance:	3m			
Test item:	Radiated Emission		Power:	AC 120V/60Hz			
Model Number:	UAP-AC-LR		Temp.(°C)/Hum.(%RH):	26(°C)/60%RH			
Mode:	Mode 5		Date:	06/25/2015			
Frequency:	2452MHz		Test By:	Eric Ou Yang			
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3037.000	36.70	1.87	38.57	74.00	-35.43	peak	H
4626.000	33.25	6.85	40.10	74.00	-33.90	peak	H
6719.000	33.31	12.08	45.39	74.00	-28.61	peak	H
3037.000	38.24	1.87	40.11	74.00	-33.89	peak	V
4542.000	34.81	6.59	41.40	74.00	-32.60	peak	V
6691.000	34.23	12.02	46.25	74.00	-27.75	peak	V

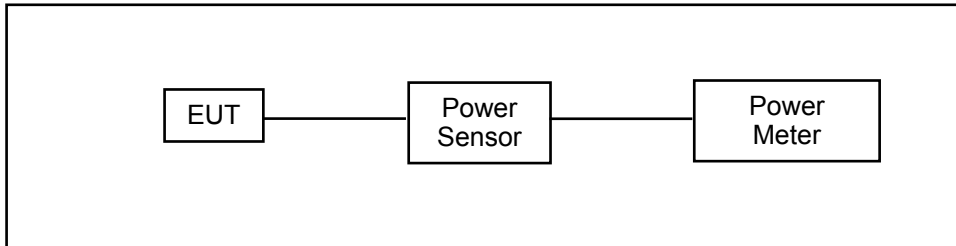
Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2.4GHz+5GHz			Date:	06/26/2015		
	Simultaneous Transmitting			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2813.000	35.33	5.62	40.95	74.00	-33.05	peak	H
4570.000	32.94	9.87	42.81	74.00	-31.19	peak	H
7650.000	31.70	13.27	44.97	74.00	-29.03	peak	H
2834.000	36.18	5.67	41.85	74.00	-32.15	peak	V
4542.000	31.66	9.83	41.49	74.00	-32.51	peak	V
7685.000	32.80	13.30	46.10	74.00	-27.90	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for maximum output power is 30dBm.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Power Sensor	Anritsu	MA2411B	1126022	08/21/2014	(1)
Power Meter	Anritsu	ML2495A	1135009	08/21/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Model Number	UAP-AC-LR										
Test Item	Maximum Conducted Output Power										
Test Mode	Mode 2: IEEE 802.11b link mode										
Date of Test	06/08/2015							Test Site		TE05	
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-0		ANT-1		ANT-0		ANT-1			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2412	1M	8.84	0.008	9.51	0.009	12.00	0.016	12.61	0.018	< 30	
2437		8.61	0.007	9.21	0.008	11.82	0.015	12.35	0.017	< 30	
2462		8.71	0.007	9.15	0.008	11.88	0.015	12.24	0.017	< 30	
2437	2M	8.59	0.007	9.16	0.008	11.85	0.015	12.31	0.017	< 30	
2437	5.5M	8.56	0.007	9.11	0.008	11.87	0.015	12.25	0.017	< 30	
2437	11M	8.55	0.007	9.08	0.008	11.89	0.015	12.21	0.017	< 30	
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-2		ANT-0+1+2		ANT-2		ANT-0+1+2			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2412	1M	8.87	0.008	13.86	0.024	11.98	0.016	16.98	0.050	< 30	
2437		8.77	0.008	13.64	0.023	11.86	0.015	16.79	0.048	< 30	
2462		8.84	0.008	13.68	0.023	11.94	0.016	16.79	0.048	< 30	
2437	2M	8.75	0.007	13.61	0.023	11.84	0.015	16.78	0.048	< 30	
2437	5.5M	8.72	0.007	13.57	0.023	11.81	0.015	16.75	0.047	< 30	
2437	11M	8.71	0.007	13.56	0.023	11.79	0.015	16.74	0.047	< 30	

Model Number	UAP-AC-LR									
Test Item	Maximum Conducted Output Power									
Test Mode	Mode 3: IEEE 802.11g link mode									
Date of Test	06/08/2015							Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)
		ANT-0		ANT-1		ANT-0		ANT-1		
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	
2412	6M	6.92	0.005	7.29	0.005	15.58	0.036	16.17	0.041	< 30
2437		6.84	0.005	7.24	0.005	15.48	0.035	16.13	0.041	< 30
2462		6.88	0.005	7.17	0.005	15.53	0.036	16.08	0.041	< 30
2437	9M	6.82	0.005	7.22	0.005	15.55	0.036	16.10	0.041	< 30
2437	12M	6.81	0.005	7.19	0.005	15.53	0.036	16.06	0.040	< 30
2437	18M	6.79	0.005	7.18	0.005	15.50	0.035	16.04	0.040	< 30
2437	24M	6.77	0.005	7.15	0.005	15.49	0.035	16.01	0.040	< 30
2437	36M	6.76	0.005	7.12	0.005	15.47	0.035	15.99	0.040	< 30
2437	48M	6.74	0.005	7.10	0.005	15.44	0.035	15.96	0.039	< 30
2437	54M	6.72	0.005	7.08	0.005	15.42	0.035	15.93	0.039	< 30
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)
		ANT-2		ANT-0+1+2		ANT-2		ANT-0+1+2		
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	
2412	6M	6.88	0.005	11.81	0.015	15.65	0.037	20.58	0.114	< 30
2437		6.66	0.005	11.69	0.015	15.46	0.035	20.47	0.111	< 30
2462		6.76	0.005	11.71	0.015	15.55	0.036	20.50	0.112	< 30
2437	9M	6.64	0.005	11.67	0.015	15.43	0.035	20.47	0.112	< 30
2437	12M	6.63	0.005	11.65	0.015	15.41	0.035	20.45	0.111	< 30
2437	18M	6.61	0.005	11.64	0.015	15.38	0.035	20.42	0.110	< 30
2437	24M	6.59	0.005	11.61	0.015	15.37	0.034	20.40	0.110	< 30
2437	36M	6.56	0.005	11.59	0.014	15.35	0.034	20.38	0.109	< 30
2437	48M	6.55	0.005	11.57	0.014	15.33	0.034	20.36	0.109	< 30
2437	54M	6.53	0.004	11.55	0.014	15.30	0.034	20.33	0.108	< 30

Model Number	UAP-AC-LR										
Test Item	Maximum Conducted Output Power										
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode										
Date of Test	06/08/2015							Test Site	TE05		
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-0		ANT-1		ANT-0		ANT-1			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2412	19.5M	6.43	0.004	7.13	0.005	15.45	0.035	15.94	0.039	< 30	
2437		6.49	0.004	6.97	0.005	15.52	0.036	15.78	0.038	< 30	
2462		6.54	0.005	7.23	0.005	15.58	0.036	16.02	0.040	< 30	
2437	39M	6.47	0.004	6.96	0.005	15.49	0.035	15.76	0.038	< 30	
2437	58.5M	6.46	0.004	6.94	0.005	15.48	0.035	15.74	0.037	< 30	
2437	78M	6.44	0.004	6.93	0.005	15.45	0.035	15.73	0.037	< 30	
2437	117M	6.41	0.004	6.91	0.005	15.43	0.035	15.71	0.037	< 30	
2437	156M	6.39	0.004	6.87	0.005	15.41	0.035	15.69	0.037	< 30	
2437	175.5M	6.37	0.004	6.85	0.005	15.38	0.035	15.65	0.037	< 30	
2437	195M	6.32	0.004	6.84	0.005	15.35	0.034	15.63	0.037	< 30	
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-2		ANT-0+1+2		ANT-2		ANT-0+1+2			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2412	19.5M	6.38	0.004	11.43	0.014	15.17	0.033	20.30	0.107	< 30	
2437		6.57	0.005	11.45	0.014	15.35	0.034	20.32	0.108	< 30	
2462		6.73	0.005	11.61	0.015	15.53	0.036	20.49	0.112	< 30	
2437	39M	6.54	0.005	11.43	0.014	15.32	0.034	20.30	0.107	< 30	
2437	58.5M	6.52	0.004	11.42	0.014	15.29	0.034	20.28	0.107	< 30	
2437	78M	6.49	0.004	11.40	0.014	15.27	0.034	20.26	0.106	< 30	
2437	117M	6.48	0.004	11.38	0.014	15.25	0.033	20.24	0.106	< 30	
2437	156M	6.46	0.004	11.35	0.014	15.23	0.033	20.22	0.105	< 30	
2437	175.5M	6.43	0.004	11.33	0.014	15.20	0.033	20.19	0.104	< 30	
2437	195M	6.42	0.004	11.30	0.014	15.18	0.033	20.16	0.104	< 30	

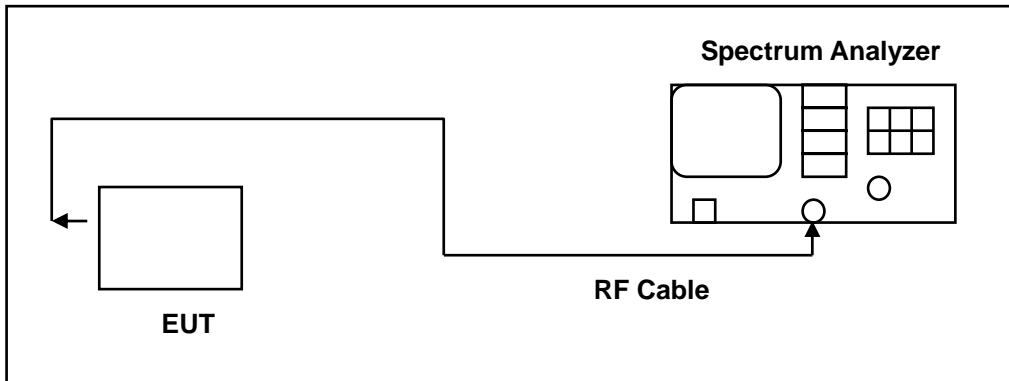
Model Number	UAP-AC-LR										
Test Item	Maximum Conducted Output Power										
Test Mode	Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode										
Date of Test	06/08/2015							Test Site	TE05		
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-0		ANT-1		ANT-0		ANT-1			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2422	40.5M	4.91	0.003	5.73	0.004	12.83	0.019	13.85	0.024	< 30	
2437		5.16	0.003	5.66	0.004	13.06	0.020	13.77	0.024	< 30	
2452		4.83	0.003	5.69	0.004	12.74	0.019	13.81	0.024	< 30	
2437	81M	4.91	0.003	5.41	0.003	12.84	0.019	13.53	0.023	< 30	
2437	121.5M	4.78	0.003	5.17	0.003	12.72	0.019	13.25	0.021	< 30	
2437	162M	4.58	0.003	4.94	0.003	12.55	0.018	13.01	0.020	< 30	
2437	243M	4.25	0.003	4.62	0.003	12.25	0.017	12.78	0.019	< 30	
2437	324M	3.80	0.002	4.15	0.003	11.78	0.015	12.31	0.017	< 30	
2437	364.5M	3.77	0.002	3.99	0.003	11.53	0.014	12.05	0.016	< 30	
2437	405M	3.75	0.002	3.73	0.002	11.39	0.014	11.84	0.015	< 30	
Frequency (MHz)	Data Rate	Average Power				Peak Power				Limit (dBm)	
		ANT-2		ANT-0+1+2		ANT-2		ANT-0+1+2			
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)		
2422	40.5M	5.01	0.003	10.00	0.010	12.89	0.019	17.99	0.063	< 30	
2437		5.08	0.003	10.08	0.010	12.97	0.020	18.05	0.064	< 30	
2452		5.11	0.003	10.00	0.010	13.01	0.020	17.98	0.063	< 30	
2437	81M	4.86	0.003	9.84	0.010	12.78	0.019	17.83	0.061	< 30	
2437	121.5M	4.53	0.003	9.61	0.009	12.47	0.018	17.60	0.058	< 30	
2437	162M	4.31	0.003	9.39	0.009	12.23	0.017	17.38	0.055	< 30	
2437	243M	3.99	0.003	9.07	0.008	11.95	0.016	17.11	0.051	< 30	
2437	324M	3.79	0.002	8.69	0.007	11.52	0.014	16.65	0.046	< 30	
2437	364.5M	3.77	0.002	8.62	0.007	11.36	0.014	16.43	0.044	< 30	
2437	405M	3.76	0.002	8.52	0.007	11.11	0.013	16.23	0.042	< 30	

7 6dB RF Bandwidth Measurement

7.1. Limit

6dB RF Bandwidth: Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	----

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

7.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

6dB RF Bandwidth: The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES RBW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel low, middle, high)

99 % Occupied Bandwidth: The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

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 since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are 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.

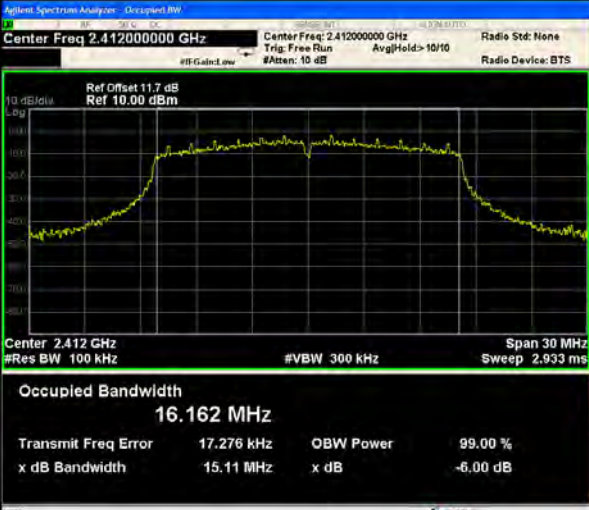
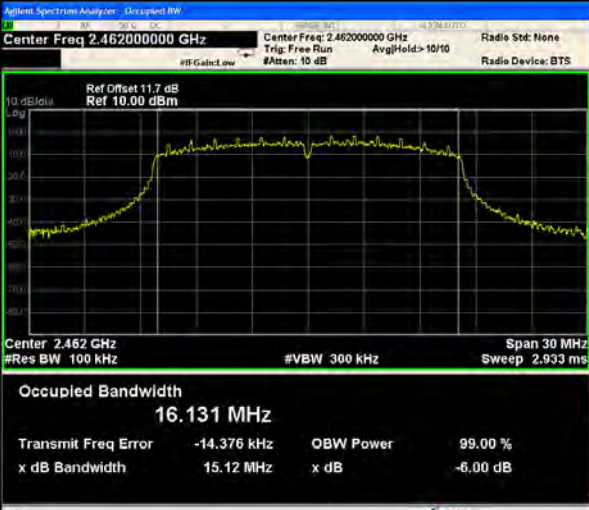
7.5. Test Result

Model Number	UAP-AC-LR				
Test Item	6dB RF Bandwidth				
Test Mode	Mode 2: IEEE 802.11b link mode Mode 3: IEEE 802.11g link mode Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode				
Date of Test	06/19/2015			Test Site	TE05
Test Mode	Frequency (MHz)	Measurement (MHz)			Limit (MHz)
		ANT-0	ANT-1	ANT-2	
Mode 2	2412	7.082	7.086	7.096	> 0.500
	2437	7.081	7.070	7.086	> 0.500
	2462	7.105	7.080	7.071	> 0.500
Mode 3	2412	15.110	15.120	15.090	> 0.500
	2437	15.080	15.130	15.120	> 0.500
	2462	15.120	15.120	15.110	> 0.500
Mode 4	2412	15.110	15.120	15.130	> 0.500
	2437	15.110	15.120	15.110	> 0.500
	2462	15.130	15.120	15.120	> 0.500
Mode 5	2422	31.260	32.520	33.810	> 0.500
	2437	31.320	32.580	33.800	> 0.500
	2452	33.800	32.550	32.570	> 0.500

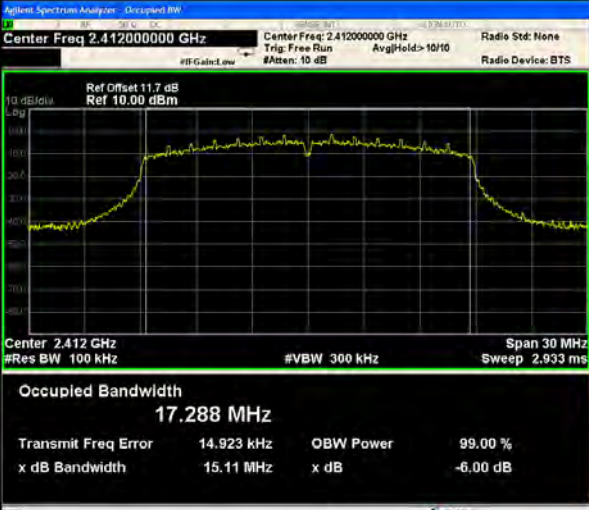

7.6. Test Graphs

Mode 2: IEEE 802.11b link mode_ANT-0	
2412	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None Trig: Free Run AvgHold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 12.027 MHz</p> <p>Transmit Freq Error -12.130 kHz OBW Power 99.00 % x dB Bandwidth 7.082 MHz x dB -6.00 dB</p> <p>Frequency Center Freq 2.41200000 GHz CF Step 3.000000 MHz Freq Offset 0 Hz</p>
2437	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run AvgHold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 11.998 MHz</p> <p>Transmit Freq Error -15.120 kHz OBW Power 99.00 % x dB Bandwidth 7.081 MHz x dB -6.00 dB</p> <p>Frequency Center Freq 2.43700000 GHz CF Step 3.000000 MHz Freq Offset 0 Hz</p>
2462	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None Trig: Free Run AvgHold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 12.011 MHz</p> <p>Transmit Freq Error -13.856 kHz OBW Power 99.00 % x dB Bandwidth 7.105 MHz x dB -6.00 dB</p> <p>Frequency Center Freq 2.46200000 GHz CF Step 3.000000 MHz Freq Offset 0 Hz</p>

Mode 3: IEEE 802.11g link mode_ANT-0

2412	 <p>Center Freq 2.41200000 GHz</p> <p>Center Freq 2.41200000 GHz</p> <p>Center 2.412 GHz</p> <p>Occupied Bandwidth 16.162 MHz</p> <p>Transmit Freq Error 17.276 kHz</p> <p>x dB Bandwidth 15.11 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2437	 <p>Center Freq 2.43700000 GHz</p> <p>Center Freq 2.43700000 GHz</p> <p>Center 2.437 GHz</p> <p>Occupied Bandwidth 16.132 MHz</p> <p>Transmit Freq Error -7.806 kHz</p> <p>x dB Bandwidth 15.08 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2462	 <p>Center Freq 2.46200000 GHz</p> <p>Center Freq 2.46200000 GHz</p> <p>Center 2.462 GHz</p> <p>Occupied Bandwidth 16.131 MHz</p> <p>Transmit Freq Error -14.376 kHz</p> <p>x dB Bandwidth 15.12 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-0

2412	 <p>Center Freq 2.41200000 GHz</p> <p>Center Freq 2.41200000 GHz</p> <p>Center 2.412 GHz</p> <p>Occupied Bandwidth 17.288 MHz</p> <p>Transmit Freq Error 14.923 kHz</p> <p>x dB Bandwidth 15.11 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2437	 <p>Center Freq 2.43700000 GHz</p> <p>Center Freq 2.43700000 GHz</p> <p>Center 2.437 GHz</p> <p>Occupied Bandwidth 17.296 MHz</p> <p>Transmit Freq Error 15.601 kHz</p> <p>x dB Bandwidth 15.11 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2462	 <p>Center Freq 2.46200000 GHz</p> <p>Center Freq 2.46200000 GHz</p> <p>Center 2.462 GHz</p> <p>Occupied Bandwidth 17.287 MHz</p> <p>Transmit Freq Error -1.579 kHz</p> <p>x dB Bandwidth 15.13 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>

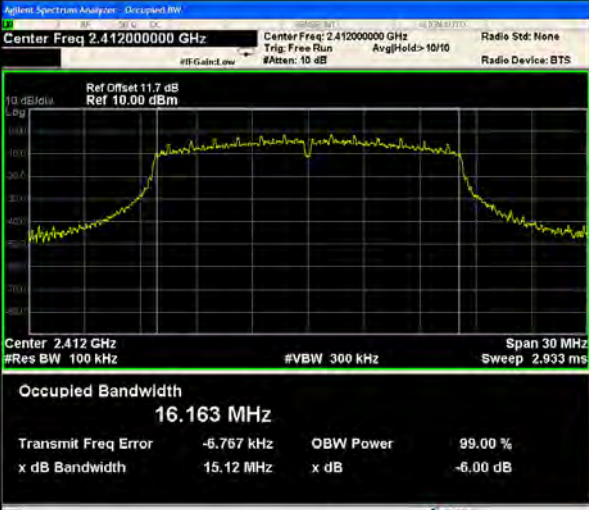
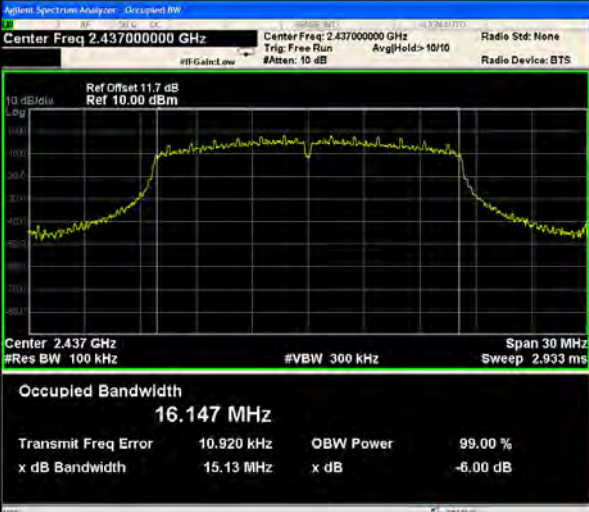
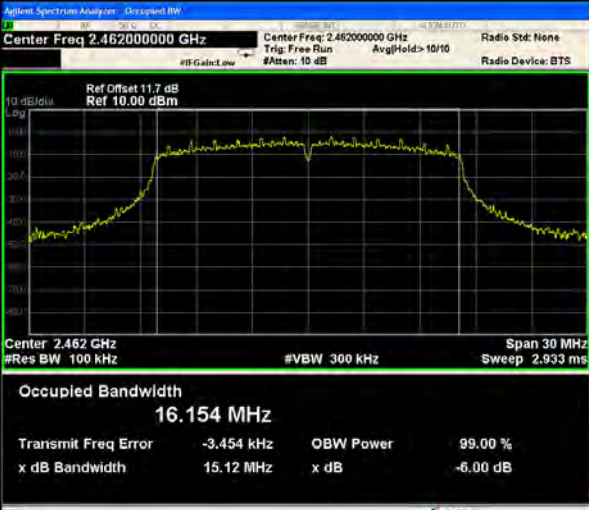
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-0

2422	 <p>Center Freq 2.422000000 GHz</p> <p>Center Freq 2.422 GHz</p> <p>Occupied Bandwidth 35.620 MHz</p> <p>Transmit Freq Error 64.278 kHz</p> <p>x dB Bandwidth 31.26 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.422000000 GHz</p> <p>CF Step 5.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2437	 <p>Center Freq 2.437000000 GHz</p> <p>Center Freq 2.437 GHz</p> <p>Occupied Bandwidth 35.569 MHz</p> <p>Transmit Freq Error 51.921 kHz</p> <p>x dB Bandwidth 31.32 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 5.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2452	 <p>Center Freq 2.452000000 GHz</p> <p>Center Freq 2.452 GHz</p> <p>Occupied Bandwidth 35.601 MHz</p> <p>Transmit Freq Error 50.402 kHz</p> <p>x dB Bandwidth 33.80 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.452000000 GHz</p> <p>CF Step 5.000000 MHz</p> <p>Freq Offset 0 Hz</p>

Mode 2: IEEE 802.11b link mode_ANT-1

2412	 <p>Center Freq 2.41200000 GHz</p> <p>Center Freq 2.41200000 GHz</p> <p>Center 2.412 GHz</p> <p>Occupied Bandwidth 11.932 MHz</p> <p>Transmit Freq Error 20.221 kHz</p> <p>x dB Bandwidth 7.086 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2437	 <p>Center Freq 2.43700000 GHz</p> <p>Center Freq 2.43700000 GHz</p> <p>Center 2.437 GHz</p> <p>Occupied Bandwidth 11.920 MHz</p> <p>Transmit Freq Error 10.930 kHz</p> <p>x dB Bandwidth 7.070 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
2462	 <p>Center Freq 2.46200000 GHz</p> <p>Center Freq 2.46200000 GHz</p> <p>Center 2.462 GHz</p> <p>Occupied Bandwidth 11.803 MHz</p> <p>Transmit Freq Error 58.292 kHz</p> <p>x dB Bandwidth 7.080 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>

Mode 3: IEEE 802.11g link mode_ANT-1

<p>2412</p>	 <p>Center Freq 2.41200000 GHz</p> <p>Center Freq 2.41200000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.412 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>16.163 MHz</p> <p>Transmit Freq Error -5.767 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.12 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>	 <p>Center Freq 2.43700000 GHz</p> <p>Center Freq 2.43700000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.437 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>16.147 MHz</p> <p>Transmit Freq Error 10.920 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.13 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>	 <p>Center Freq 2.46200000 GHz</p> <p>Center Freq 2.46200000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.462 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>16.154 MHz</p> <p>Transmit Freq Error -3.454 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.12 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-1

2412	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.310 MHz</p> <p>Transmit Freq Error 11.785 kHz OBW Power 99.00 % x dB Bandwidth 15.12 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.412000000 GHz</p> <p>CF Step 3.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>
2437	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.309 MHz</p> <p>Transmit Freq Error 25.834 kHz OBW Power 99.00 % x dB Bandwidth 15.12 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 3.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>
2462	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.297 MHz</p> <p>Transmit Freq Error 20.964 kHz OBW Power 99.00 % x dB Bandwidth 15.12 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 3.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>


Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-1

2422	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz Center Freq: 2.422000000 GHz Radio Std: None Trig: Free Run Avg/Hold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.422 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.604 MHz</p> <p>Transmit Freq Error 48.305 kHz OBW Power 99.00 % x dB Bandwidth 32.52 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.422000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2437	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run Avg/Hold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.639 MHz</p> <p>Transmit Freq Error 50.019 kHz OBW Power 99.00 % x dB Bandwidth 32.58 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2452	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz Center Freq: 2.452000000 GHz Radio Std: None Trig: Free Run Avg/Hold: >10/10 Radio Device: BTS #Gain: Low #Atten: 10 dB</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.452 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.602 MHz</p> <p>Transmit Freq Error 37.797 kHz OBW Power 99.00 % x dB Bandwidth 32.55 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.452000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 2: IEEE 802.11b link mode_ANT-2

<p>2412</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 11.926 MHz</p> <p>Transmit Freq Error 10.509 kHz OBW Power 99.00 % x dB Bandwidth 7.096 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 11.949 MHz</p> <p>Transmit Freq Error 17.465 kHz OBW Power 99.00 % x dB Bandwidth 7.086 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 11.817 MHz</p> <p>Transmit Freq Error -12.873 kHz OBW Power 99.00 % x dB Bandwidth 7.071 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 3: IEEE 802.11g link mode_ANT-2

2412	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Radio Std: None Trig: Free Run Avg/Hold: > 10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.412 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.177 MHz</p> <p>Transmit Freq Error -8.993 kHz OBW Power 99.00 % x dB Bandwidth 15.09 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2437	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run Avg/Hold: > 10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.176 MHz</p> <p>Transmit Freq Error 718 Hz OBW Power 99.00 % x dB Bandwidth 15.12 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2462	 <p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Radio Std: None Trig: Free Run Avg/Hold: > 10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 16.140 MHz</p> <p>Transmit Freq Error -8.087 kHz OBW Power 99.00 % x dB Bandwidth 15.11 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-2

2412	<p>Center Freq 2.41200000 GHz</p> <p>Center Freq 2.41200000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.412 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>17.295 MHz</p> <p>Transmit Freq Error -417 Hz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.13 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.41200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>
2437	<p>Center Freq 2.43700000 GHz</p> <p>Center Freq 2.43700000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.437 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>17.298 MHz</p> <p>Transmit Freq Error 2.124 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.11 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>
2462	<p>Center Freq 2.46200000 GHz</p> <p>Center Freq 2.46200000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Center 2.462 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 30 MHz</p> <p>Sweep 2.933 ms</p> <p>Occupied Bandwidth</p> <p>17.302 MHz</p> <p>Transmit Freq Error -1.102 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 15.12 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Man</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-2

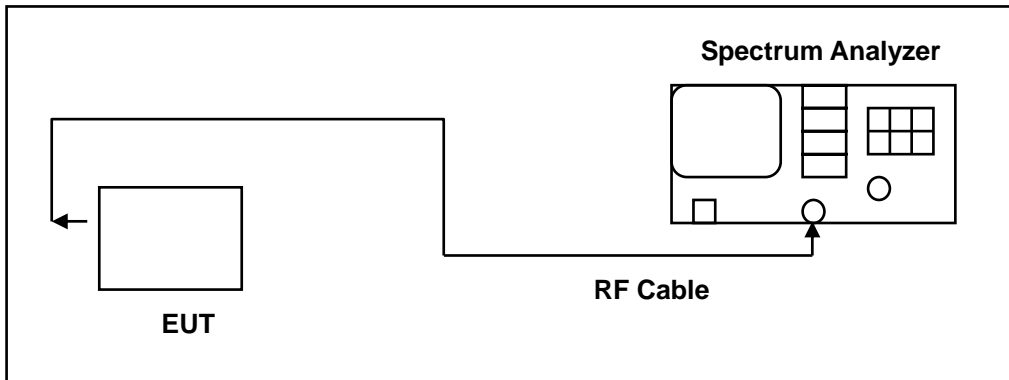
2422	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.422000000 GHz Center Freq: 2.422000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.422 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.586 MHz</p> <p>Transmit Freq Error 22.945 kHz OBW Power 99.00 % x dB Bandwidth 33.81 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.422000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2437	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.437 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.610 MHz</p> <p>Transmit Freq Error 19.946 kHz OBW Power 99.00 % x dB Bandwidth 33.80 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2452	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.452000000 GHz Center Freq: 2.452000000 GHz Radio Std: None Trig: Free Run #Atten: 10 dB Avg/Hold: >10/10 Radio Device: BTS</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Center 2.452 GHz Span 50 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.3 ms</p> <p>Occupied Bandwidth 35.593 MHz</p> <p>Transmit Freq Error 35.361 kHz OBW Power 99.00 % x dB Bandwidth 32.57 MHz x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.452000000 GHz</p> <p>CF Step 5.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

8 Maximum Power Density Measurement

8.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

8.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.


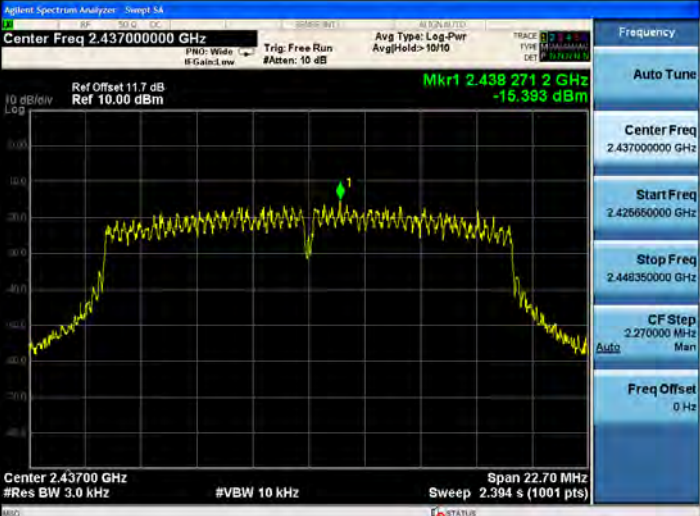

8.5. Test Result

Model Number	UAP-AC-LR					
Test Item	Maximum Power Density					
Test Mode	Mode 2: IEEE 802.11b link mode Mode 3: IEEE 802.11g link mode Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode					
Date of Test	06/19/2015				Test Site	TE05
Test Mode	Frequency (MHz)	Measurement (dBm/3KHz)				Limit (dBm/3KHz)
		ANT-0	ANT-1	ANT-2	ANT-0+1+2	
Mode 2	2412	-10.906	-10.141	-11.931	-6.160	< 8
	2437	-10.435	-10.920	-11.413	-6.133	< 8
	2462	-10.637	-10.991	-11.290	-6.193	< 8
Mode 3	2412	-15.019	-16.381	-16.382	-11.107	< 8
	2437	-15.393	-15.494	-17.454	-11.245	< 8
	2462	-16.670	-15.587	-16.558	-11.473	< 8
Mode 4	2412	-15.920	-17.030	-17.962	-12.119	< 8
	2437	-16.209	-15.941	-15.409	-11.069	< 8
	2462	-14.932	-16.600	-16.972	-11.303	< 8
Mode 5	2422	-20.781	-19.674	-19.893	-15.319	< 8
	2437	-20.251	-21.010	-21.144	-16.012	< 8
	2452	-20.087	-21.436	-20.942	-16.014	< 8

8.6. Test Graphs

Mode 2: IEEE 802.11b link mode_ANT-0	
2412	<p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.41200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.412 599 GHz -10.906 dBm Center 2.412000 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 10.70 MHz Sweep 1.128 s (1001 pts)</p>
2437	<p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.43700000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.437 492 GHz -10.435 dBm Center 2.437000 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 10.70 MHz Sweep 1.128 s (1001 pts)</p>
2462	<p>Agilent Spectrum Analyzer - Sweep 54 Sweep Time 60.0 s Center Freq 2.46200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.462 599 GHz -10.637 dBm Center 2.462000 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 10.70 MHz Sweep 1.128 s (1001 pts)</p>



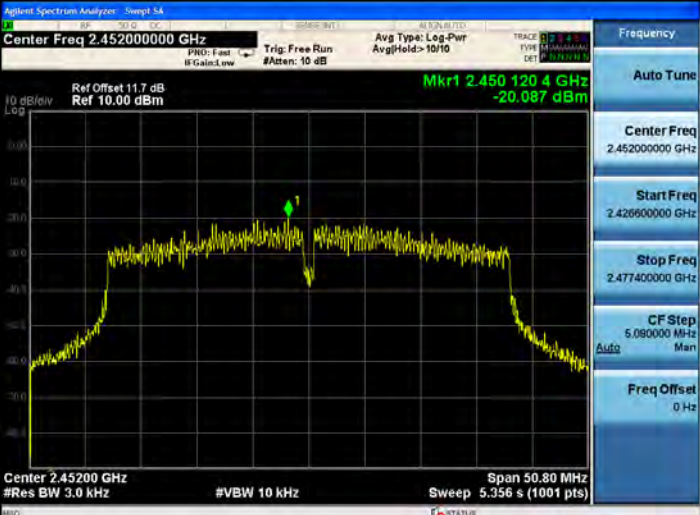
Mode 3: IEEE 802.11g link mode_ANT-0

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Man</p> <p>Freq Offset 0 Hz</p>




Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-0

2412		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2437		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44850000 GHz</p> <p>CF Step 2.270000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2462		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47350000 GHz</p> <p>CF Step 2.270000 MHz Auto</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-0

2422		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39600000 GHz</p> <p>Stop Freq 2.44740000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2437		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.41160000 GHz</p> <p>Stop Freq 2.46240000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2452		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42660000 GHz</p> <p>Stop Freq 2.47740000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 2: IEEE 802.11b link mode_ANT-1

<p>2412</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.41200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.412 599 GHz -10.141 dBm Avg Type: Log-Pwr AvgHold> 10/10 Trig: Free Run #Atten: 10 dB Span 10.70 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.128 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.41750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.43700000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.437 492 GHz -10.920 dBm Avg Type: Log-Pwr AvgHold> 10/10 Trig: Free Run #Atten: 10 dB Span 10.70 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.128 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.43150000 GHz</p> <p>Stop Freq 2.44250000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.46200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.461 497 GHz -10.991 dBm Avg Type: Log-Pwr AvgHold> 10/10 Trig: Free Run #Atten: 10 dB Span 10.70 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 1.128 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45650000 GHz</p> <p>Stop Freq 2.46750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 3: IEEE 802.11g link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>


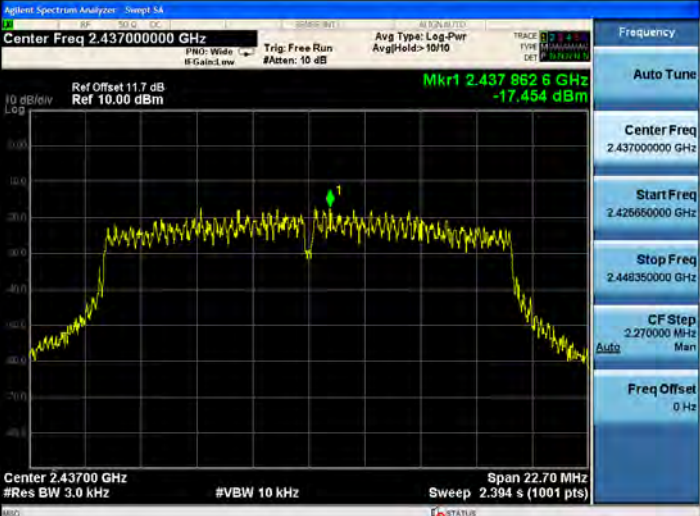
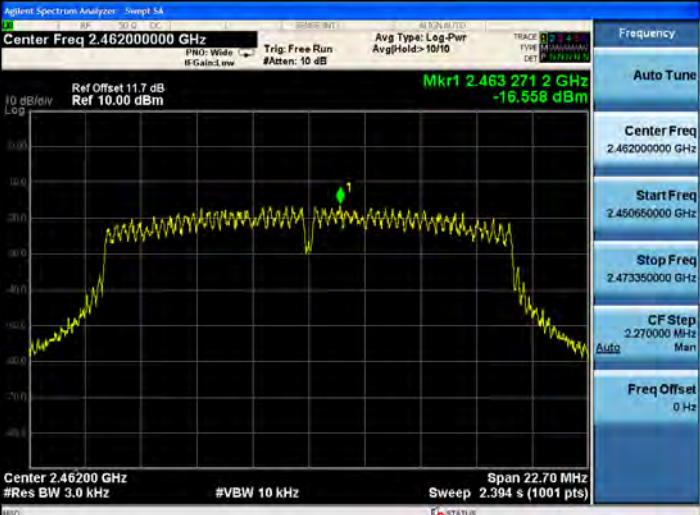
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-1

2422		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.39600000 GHz</p> <p>Stop Freq 2.44740000 GHz</p> <p>CF Step 5.080000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2437		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.41160000 GHz</p> <p>Stop Freq 2.46240000 GHz</p> <p>CF Step 5.080000 MHz Auto</p> <p>Freq Offset 0 Hz</p>
2452		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.42600000 GHz</p> <p>Stop Freq 2.47740000 GHz</p> <p>CF Step 5.080000 MHz Auto</p> <p>Freq Offset 0 Hz</p>


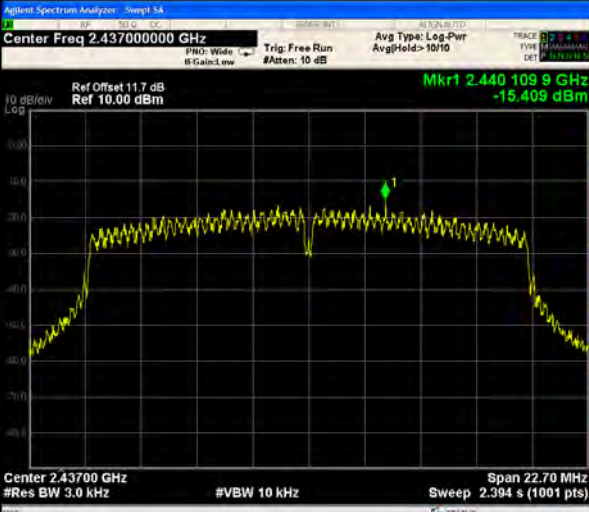
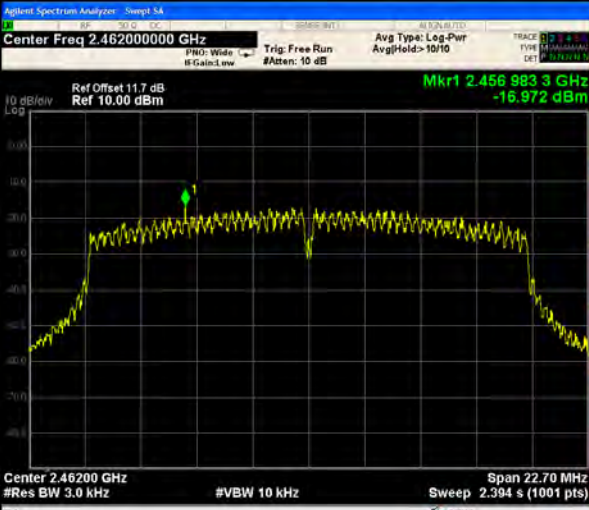
Mode 2: IEEE 802.11b link mode_ANT-2

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412000000 GHz</p> <p>Start Freq 2.406500000 GHz</p> <p>Stop Freq 2.417500000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.431500000 GHz</p> <p>Stop Freq 2.442500000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.462000000 GHz</p> <p>Start Freq 2.456500000 GHz</p> <p>Stop Freq 2.467500000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>


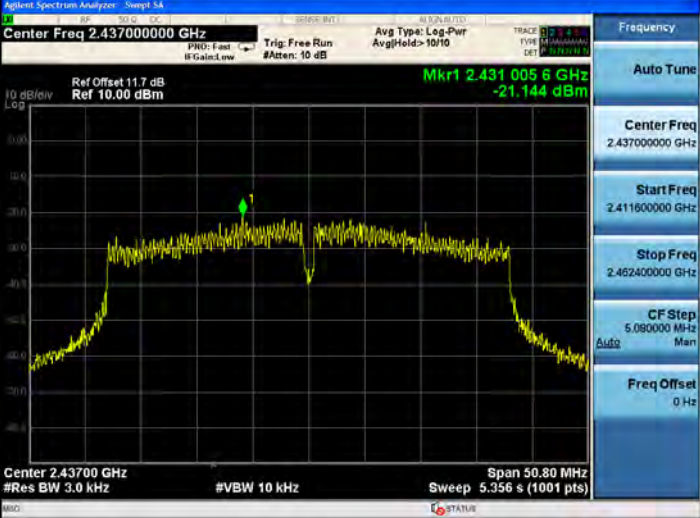

Mode 3: IEEE 802.11g link mode_ANT-2

<p>2412</p>	
<p>2437</p>	
<p>2462</p>	

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-2

<p>2412</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.41200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.410 093 2 GHz -17.962 dBm Trig: Free Run #Atten: 10 dB Avg Type: Log-Pwr AvgHold> 10/10 #Res BW 3.0 kHz #VBW 10 kHz Span 22.70 MHz Sweep 2.394 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.43700000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.440 109 9 GHz -15.409 dBm Trig: Free Run #Atten: 10 dB Avg Type: Log-Pwr AvgHold> 10/10 #Res BW 3.0 kHz #VBW 10 kHz Span 22.70 MHz Sweep 2.394 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>	 <p>Agilent Spectrum Analyzer - Sweep 54 Center Freq 2.46200000 GHz Ref Offset 11.7 dB Ref 10.00 dBm Mkr1 2.456 983 3 GHz -16.972 dBm Trig: Free Run #Atten: 10 dB Avg Type: Log-Pwr AvgHold> 10/10 #Res BW 3.0 kHz #VBW 10 kHz Span 22.70 MHz Sweep 2.394 s (1001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-2

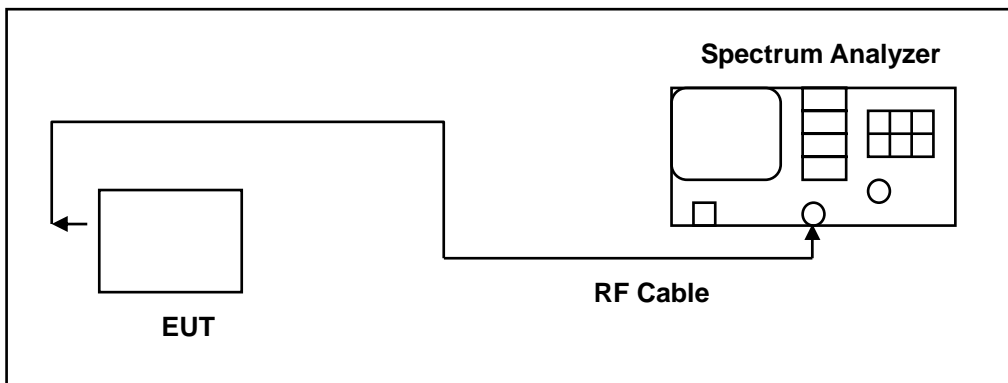
2422		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.422000000 GHz</p> <p>Start Freq 2.396000000 GHz</p> <p>Stop Freq 2.447400000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2437		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.411600000 GHz</p> <p>Stop Freq 2.462400000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
2452		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.452000000 GHz</p> <p>Start Freq 2.426000000 GHz</p> <p>Stop Freq 2.477400000 GHz</p> <p>CF Step 5.080000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

9 Out of Band Conducted Emissions Measurement

9.1. Limit

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 below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/16/2014	(1)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/24/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band.

The test was performed at 3 channels.

9.5. Test Graphs

Reference level

Mode 2: IEEE 802.11b link mode_ANT-0	
2412	
2437	
2462	

Mode 3: IEEE 802.11g link mode_ANT-0

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>




Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-0

2412		<table border="1"> <thead> <tr> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Auto Tune</td> </tr> <tr> <td>Center Freq 2.41200000 GHz</td> </tr> <tr> <td>Start Freq 2.40650000 GHz</td> </tr> <tr> <td>Stop Freq 2.42350000 GHz</td> </tr> <tr> <td>CF Step 2.270000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset 0 Hz</td> </tr> </tbody> </table>	Frequency	Auto Tune	Center Freq 2.41200000 GHz	Start Freq 2.40650000 GHz	Stop Freq 2.42350000 GHz	CF Step 2.270000 MHz Auto Man	Freq Offset 0 Hz
Frequency									
Auto Tune									
Center Freq 2.41200000 GHz									
Start Freq 2.40650000 GHz									
Stop Freq 2.42350000 GHz									
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Freq Offset 0 Hz									
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Center Freq 2.46200000 GHz									
Start Freq 2.45050000 GHz									
Stop Freq 2.47335000 GHz									
CF Step 2.270000 MHz Auto Man									
Freq Offset 0 Hz									

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-0

<p>2422</p>		<table border="1"> <thead> <tr> <th colspan="2">Frequency</th> </tr> </thead> <tbody> <tr> <td>Auto Tune</td> <td></td> </tr> <tr> <td>Center Freq</td> <td>2.42200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.396600000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.447400000 GHz</td> </tr> <tr> <td>CF Step</td> <td>5.090000 MHz Man</td> </tr> <tr> <td>Freq Offset</td> <td>0 Hz</td> </tr> </tbody> </table>	Frequency		Auto Tune		Center Freq	2.42200000 GHz	Start Freq	2.396600000 GHz	Stop Freq	2.447400000 GHz	CF Step	5.090000 MHz Man	Freq Offset	0 Hz
Frequency																
Auto Tune																
Center Freq	2.42200000 GHz															
Start Freq	2.396600000 GHz															
Stop Freq	2.447400000 GHz															
CF Step	5.090000 MHz Man															
Freq Offset	0 Hz															
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CF Step	5.090000 MHz Man															
Freq Offset	0 Hz															
<p>2452</p>		<table border="1"> <thead> <tr> <th colspan="2">Frequency</th> </tr> </thead> <tbody> <tr> <td>Auto Tune</td> <td></td> </tr> <tr> <td>Center Freq</td> <td>2.45200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.426600000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.477400000 GHz</td> </tr> <tr> <td>CF Step</td> <td>5.090000 MHz Man</td> </tr> <tr> <td>Freq Offset</td> <td>0 Hz</td> </tr> </tbody> </table>	Frequency		Auto Tune		Center Freq	2.45200000 GHz	Start Freq	2.426600000 GHz	Stop Freq	2.477400000 GHz	CF Step	5.090000 MHz Man	Freq Offset	0 Hz
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Auto Tune																
Center Freq	2.45200000 GHz															
Start Freq	2.426600000 GHz															
Stop Freq	2.477400000 GHz															
CF Step	5.090000 MHz Man															
Freq Offset	0 Hz															

Mode 2: IEEE 802.11b link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.41750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.43150000 GHz</p> <p>Stop Freq 2.44250000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45650000 GHz</p> <p>Stop Freq 2.46750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>




Mode 3: IEEE 802.11g link mode_ANT-1

<p>2412</p>		<table border="1"> <thead> <tr> <th colspan="2">Frequency</th> </tr> </thead> <tbody> <tr> <td>Auto Tune</td> <td></td> </tr> <tr> <td>Center Freq</td> <td>2.41200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.40650000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42350000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.270000 MHz</td> </tr> <tr> <td>Auto</td> <td>Man</td> </tr> <tr> <td>Freq Offset</td> <td>0 Hz</td> </tr> </tbody> </table>	Frequency		Auto Tune		Center Freq	2.41200000 GHz	Start Freq	2.40650000 GHz	Stop Freq	2.42350000 GHz	CF Step	2.270000 MHz	Auto	Man	Freq Offset	0 Hz
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CF Step	2.270000 MHz																	
Auto	Man																	
Freq Offset	0 Hz																	




Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>




Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-1

<p>2422</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.396600000 GHz</p> <p>Stop Freq 2.447400000 GHz</p> <p>CF Step 5.090000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.411600000 GHz</p> <p>Stop Freq 2.462400000 GHz</p> <p>CF Step 5.090000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2452</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.452000000 GHz</p> <p>Start Freq 2.426600000 GHz</p> <p>Stop Freq 2.477400000 GHz</p> <p>CF Step 5.090000 MHz Man</p> <p>Freq Offset 0 Hz</p>

Mode 2: IEEE 802.11b link mode_ANT-2

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.41750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.43150000 GHz</p> <p>Stop Freq 2.44250000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45650000 GHz</p> <p>Stop Freq 2.46750000 GHz</p> <p>CF Step 1.070000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>




Mode 3: IEEE 802.11g link mode_ANT-2

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-2

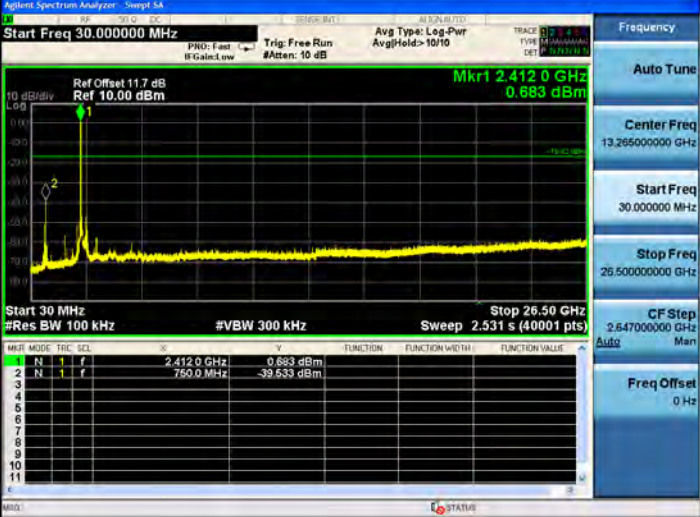
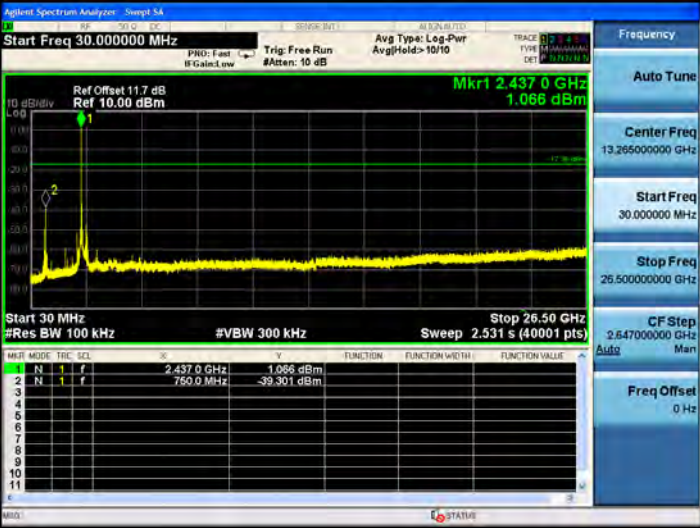
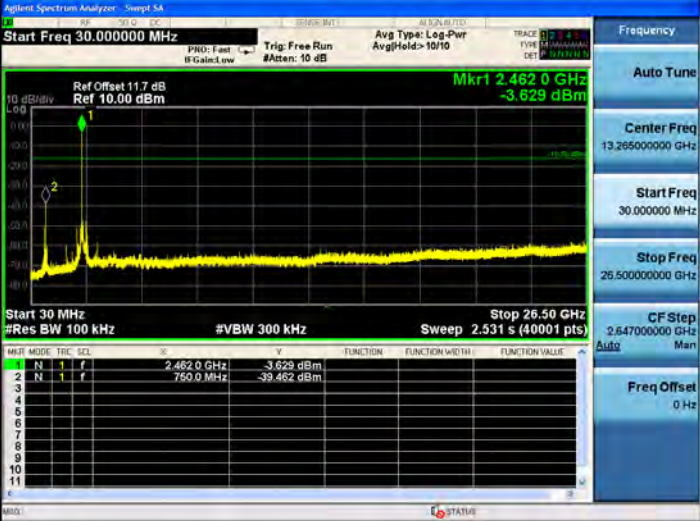
<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.42350000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42650000 GHz</p> <p>Stop Freq 2.44835000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.45050000 GHz</p> <p>Stop Freq 2.47335000 GHz</p> <p>CF Step 2.270000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-2

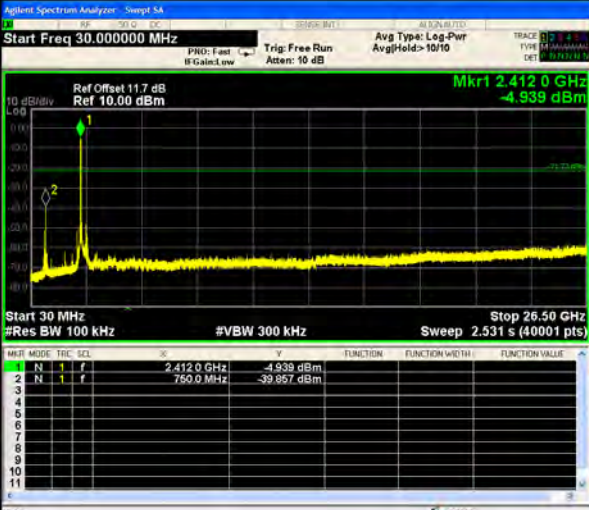
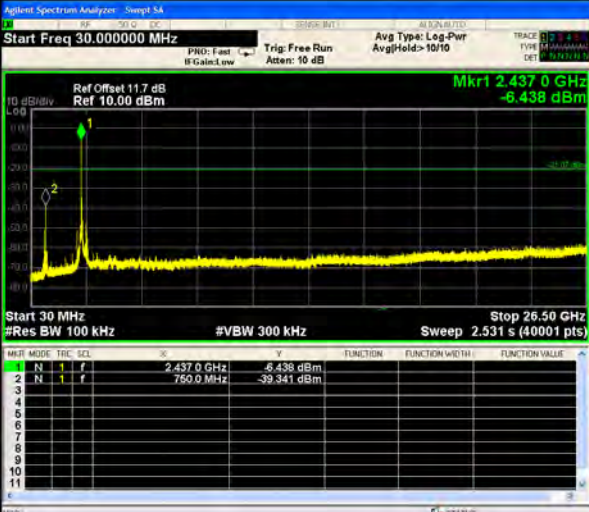
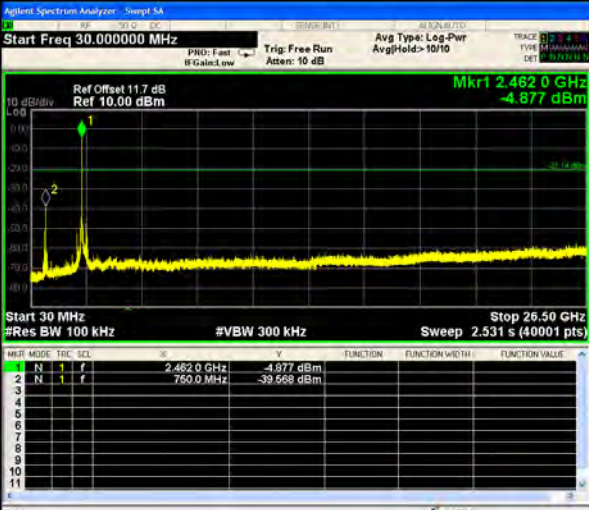
<p>2422</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.42200000 GHz</p> <p>Start Freq 2.396600000 GHz</p> <p>Stop Freq 2.447400000 GHz</p> <p>CF Step 5.080000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.411600000 GHz</p> <p>Stop Freq 2.462400000 GHz</p> <p>CF Step 5.080000 MHz Man</p> <p>Freq Offset 0 Hz</p>
<p>2452</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.45200000 GHz</p> <p>Start Freq 2.426600000 GHz</p> <p>Stop Freq 2.477400000 GHz</p> <p>CF Step 5.080000 MHz Man</p> <p>Freq Offset 0 Hz</p>

Out of Band Conducted Emissions

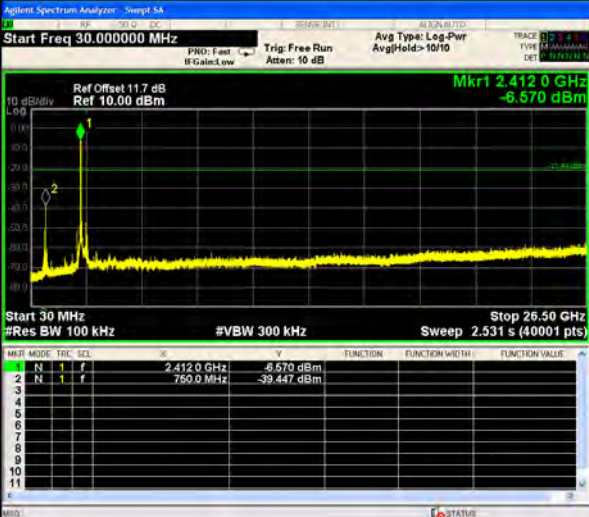
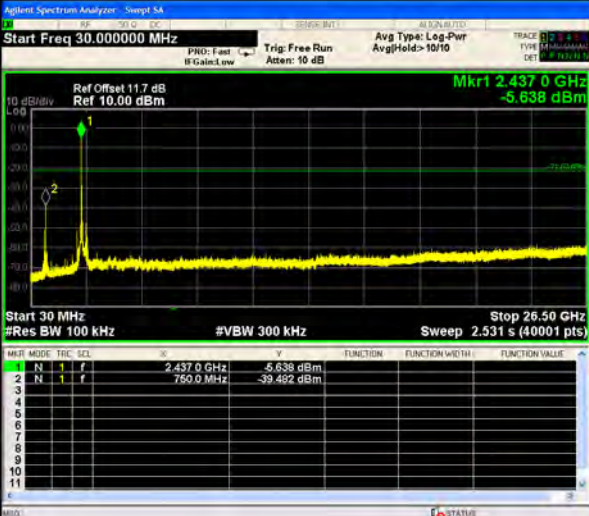
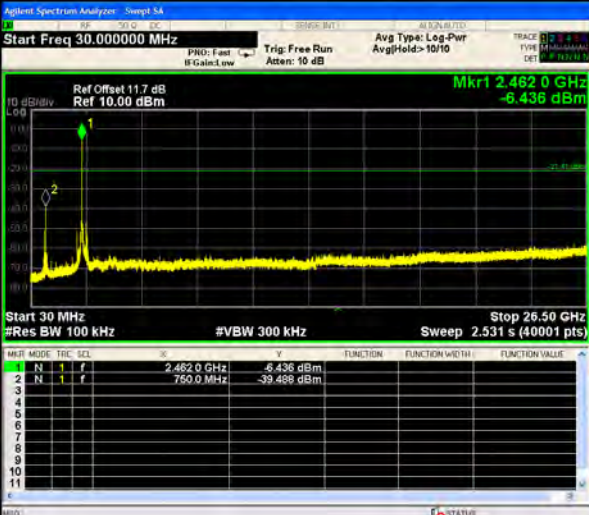
Mode 2: IEEE 802.11b link mode_ANT-0

<p>2412</p>	 <p>Agilent Spectrum Analyzer - Sweep 5A</p> <p>Start Freq 30.000000 MHz</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Mkr1 2.412 0 GHz 0.683 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.50 GHz Sweep 2.531 s (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRIG</th> <th>SEL</th> <th>F</th> <th>V</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td>2.412 0 GHz</td> <td>0.683 dBm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td>750.0 MHz</td> <td>-39.533 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRIG	SEL	F	V	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.412 0 GHz	0.683 dBm				2	N	1	f	750.0 MHz	-39.533 dBm				<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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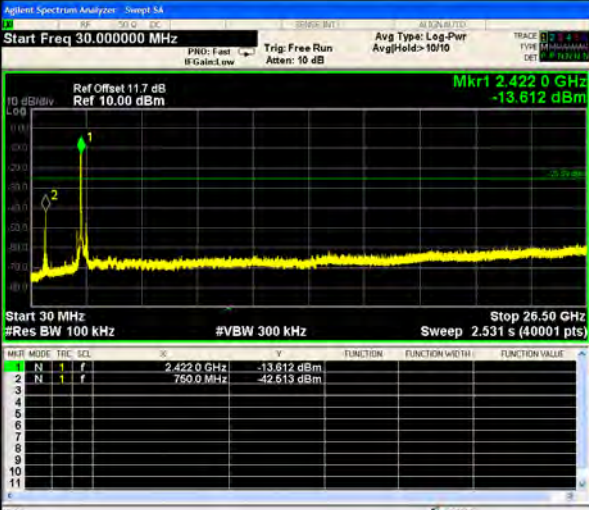
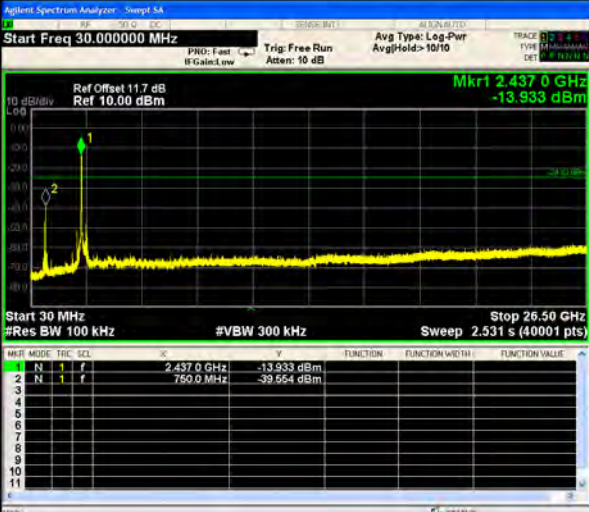
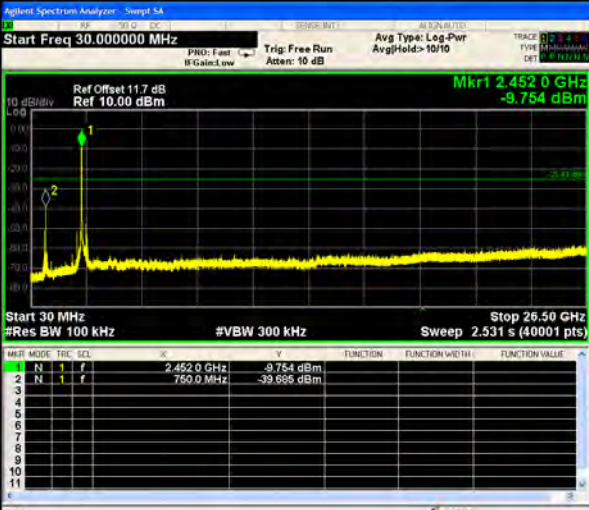
Mode 3: IEEE 802.11g link mode_ANT-0

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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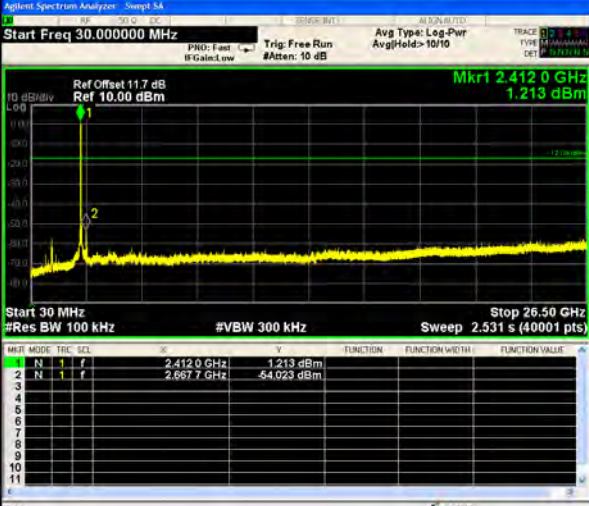
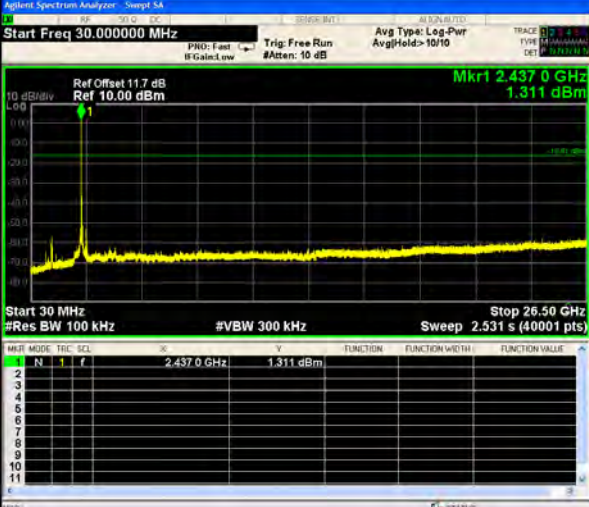
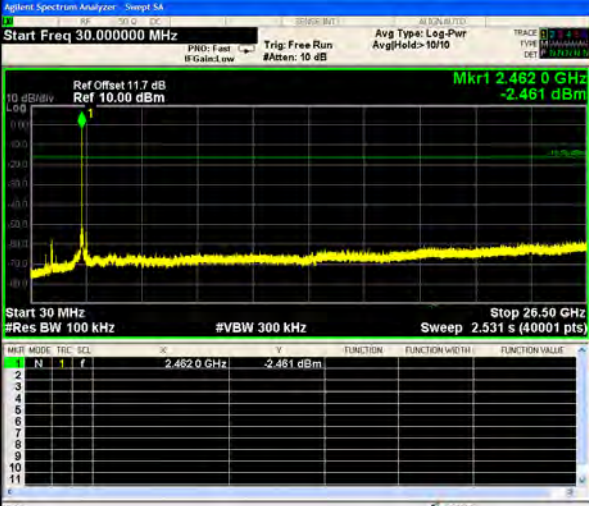
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-0

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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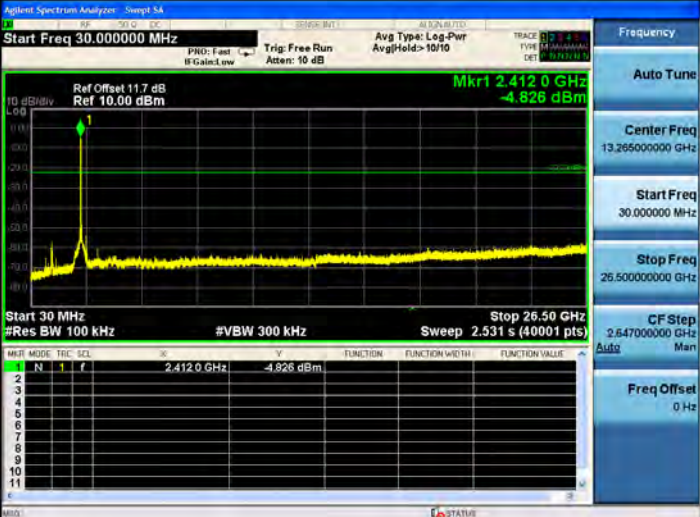
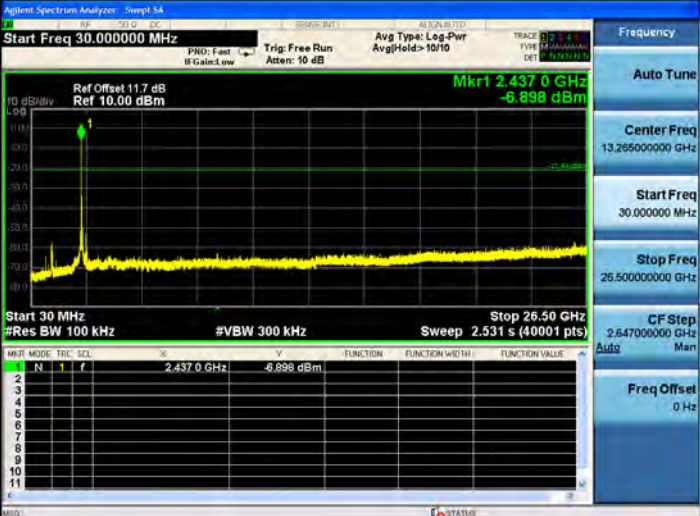
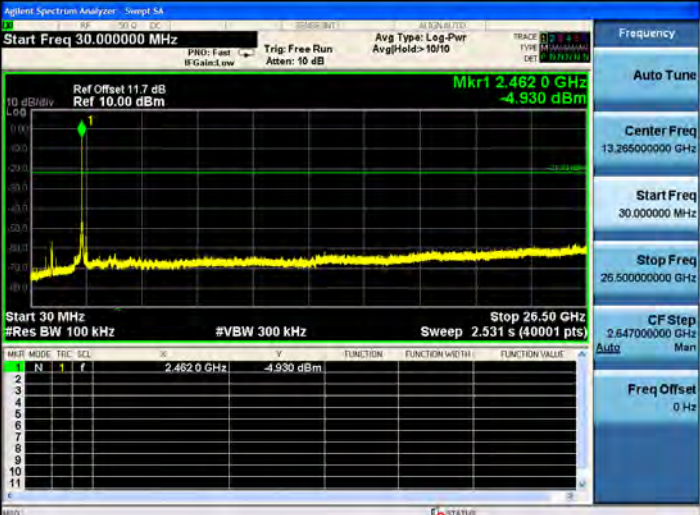
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-0

<p>2422</p>	 <p>Agilent Spectrum Analyzer - Sweep 54</p> <p>Start Freq 30.000000 MHz</p> <p>Trig: Free Run</p> <p>Avg Type: Log-Pwr</p> <p>Ref Offset 11.7 dB</p> <p>Ref 10.00 dBm</p> <p>Mkr1 2.422 0 GHz</p> <p>-13.612 dBm</p> <p>10 dB/div</p> <p>Start 30 MHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Stop 26.50 GHz</p> <p>Sweep 2.531 s (40001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCZ</th> <th>F</th> <th>F</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>f</td> <td></td> <td></td> <td>2.422 0 GHz</td> <td></td> <td></td> <td>-13.612 dBm</td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>f</td> <td></td> <td></td> <td>750.0 MHz</td> <td></td> <td></td> <td>-42.613 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCZ	F	F	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f			2.422 0 GHz			-13.612 dBm	2	N	1	f			750.0 MHz			-42.613 dBm	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>
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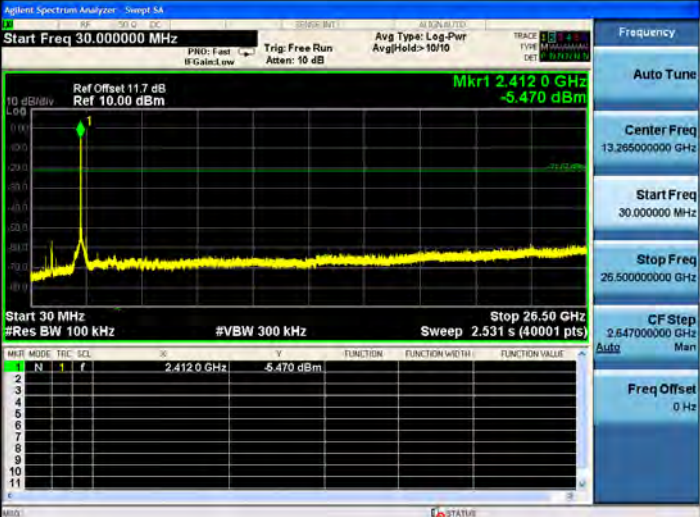
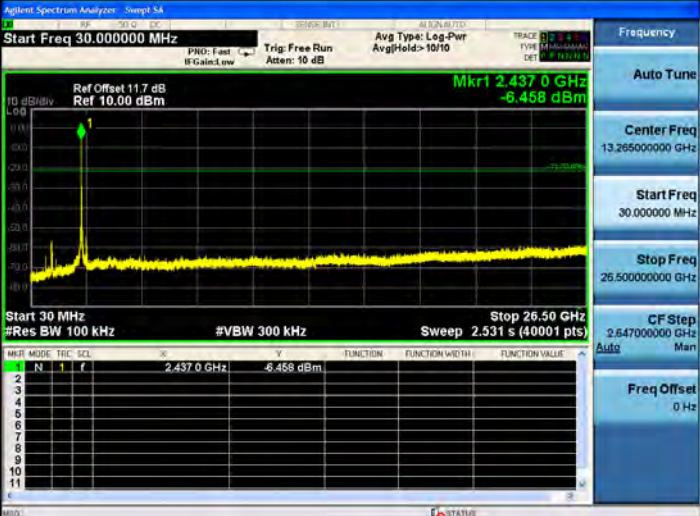
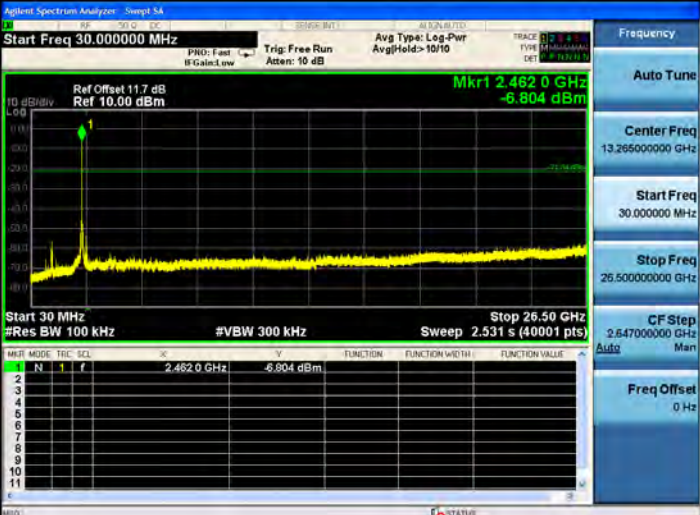
Mode 2: IEEE 802.11b link mode_ANT-1

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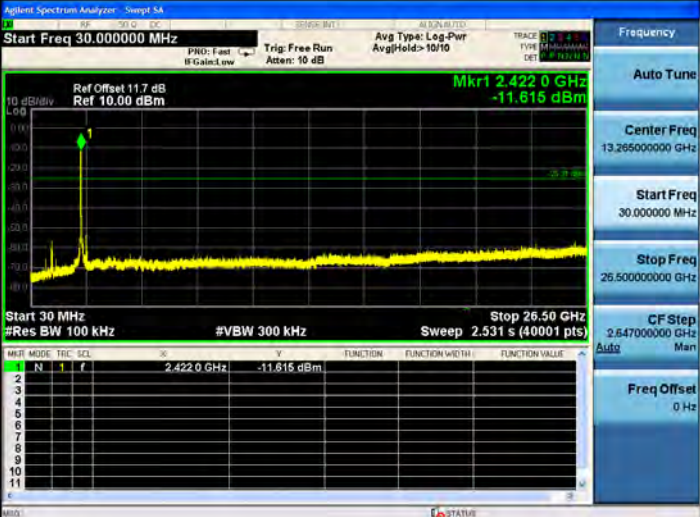
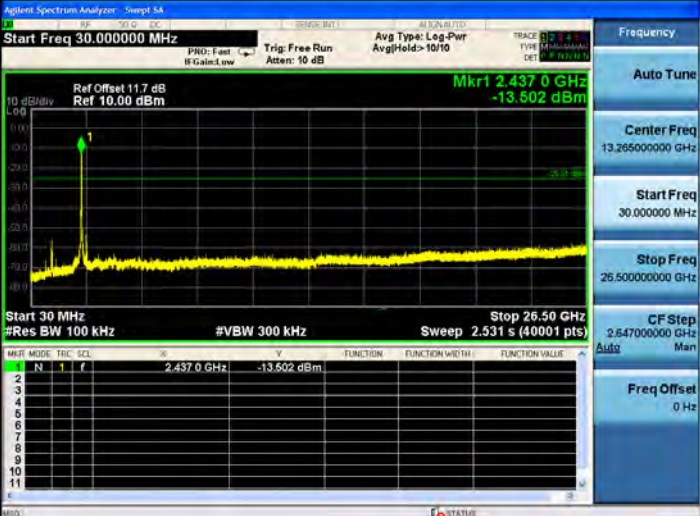

Mode 3: IEEE 802.11g link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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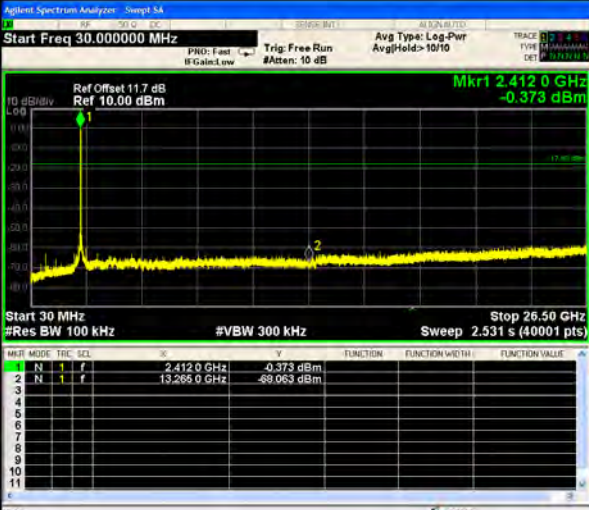
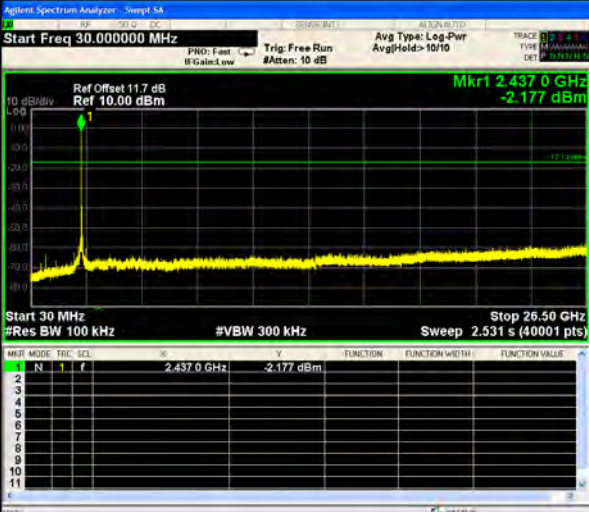
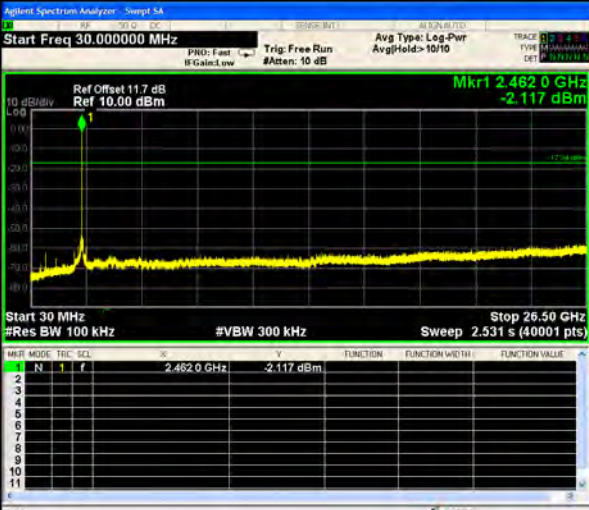
Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-1

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-1

<p>2422</p>	 <p>Agilent Spectrum Analyzer - Sweep 5A</p> <p>Start Freq 30.000000 MHz</p> <p>Ref Offset 11.7 dB Ref 10.00 dBm</p> <p>Mkr1 2.422 0 GHz -11.615 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.50 GHz Sweep 2.531 s (40001 pts)</p> <table border="1"> <thead> <tr> <th>MARKER</th> <th>MODE</th> <th>TRC</th> <th>S2L</th> <th>F</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td></td> <td>2.422 0 GHz -11.615 dBm</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MARKER	MODE	TRC	S2L	F	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	1	1			2.422 0 GHz -11.615 dBm	2								3								4								5								6								7								8								9								10								11								<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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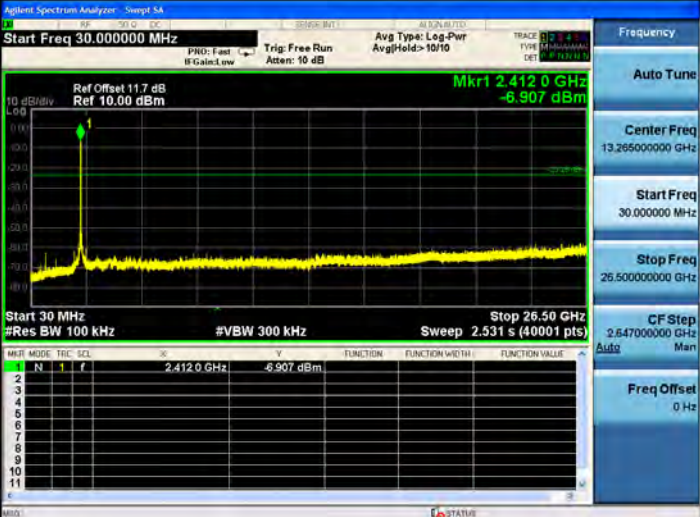
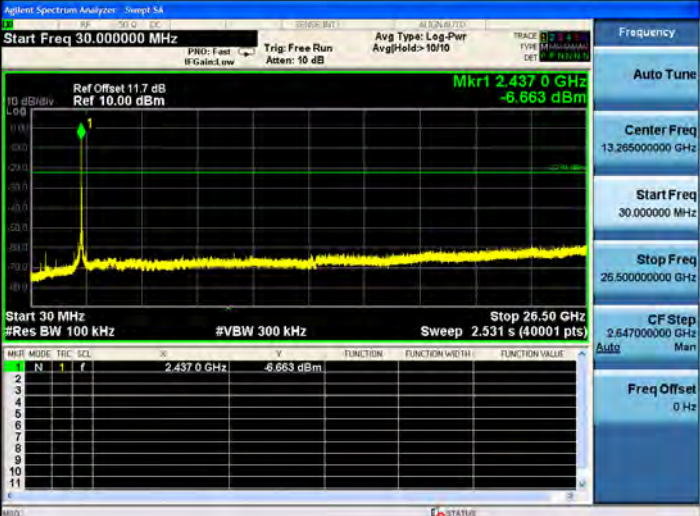
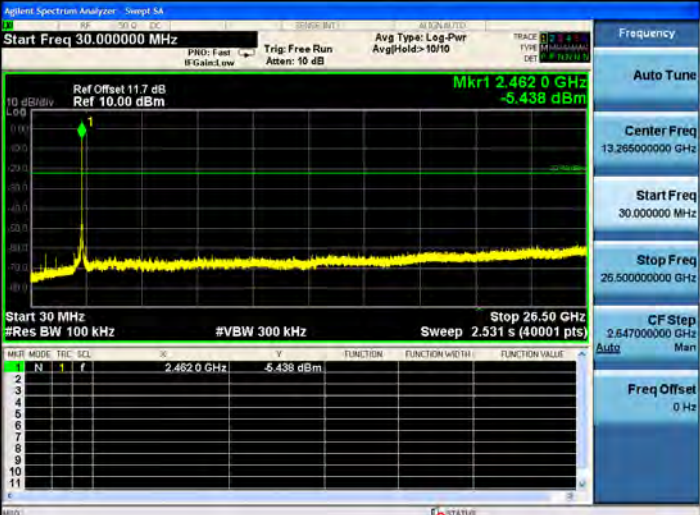
Mode 2: IEEE 802.11b link mode_ANT-2

<p>2412</p>	 <table border="1" data-bbox="635 728 1225 891"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCZ</th> <th>F</th> <th>F</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>1</td> <td>1</td> <td>F</td> <td></td> <td>2.4120 GHz</td> <td></td> <td></td> <td>-0.373 dBm</td> </tr> <tr> <td>2</td> <td>N</td> <td>1</td> <td>1</td> <td>F</td> <td></td> <td>13.2650 GHz</td> <td></td> <td></td> <td>-69.063 dBm</td> </tr> </tbody> </table>	MKR	MODE	TRC	SCZ	F	F	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	1	F		2.4120 GHz			-0.373 dBm	2	N	1	1	F		13.2650 GHz			-69.063 dBm	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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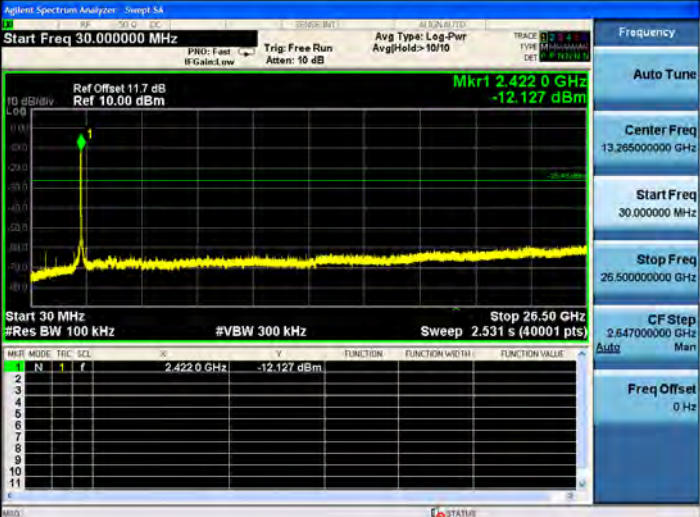
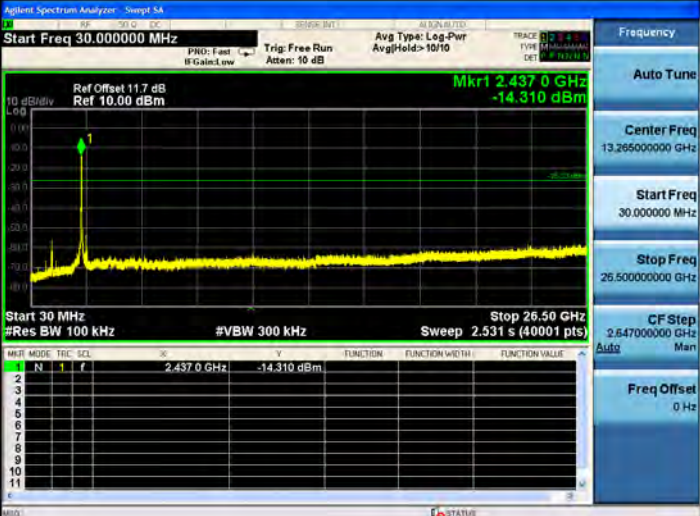
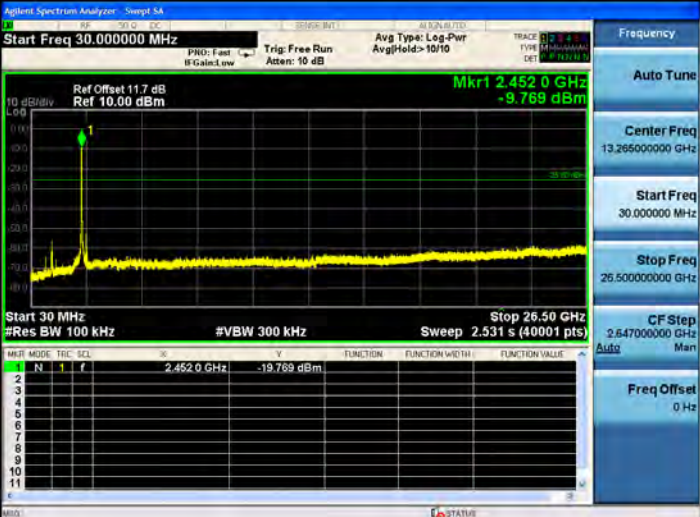
Mode 3: IEEE 802.11g link mode_ANT-2

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
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Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-2

<p>2412</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2462</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

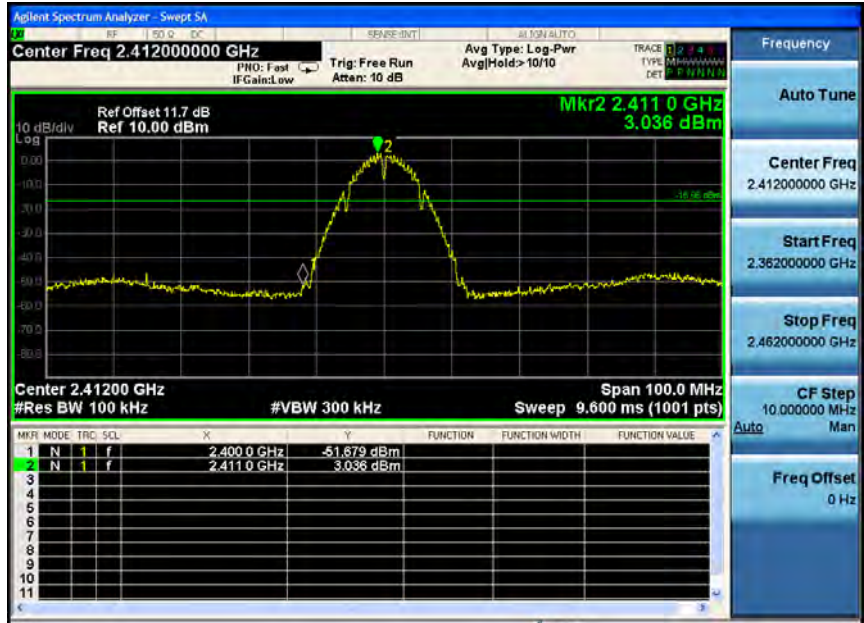
Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-2

<p>2422</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2437</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>2452</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.265000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.500000000 GHz</p> <p>CF Step 2.647000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

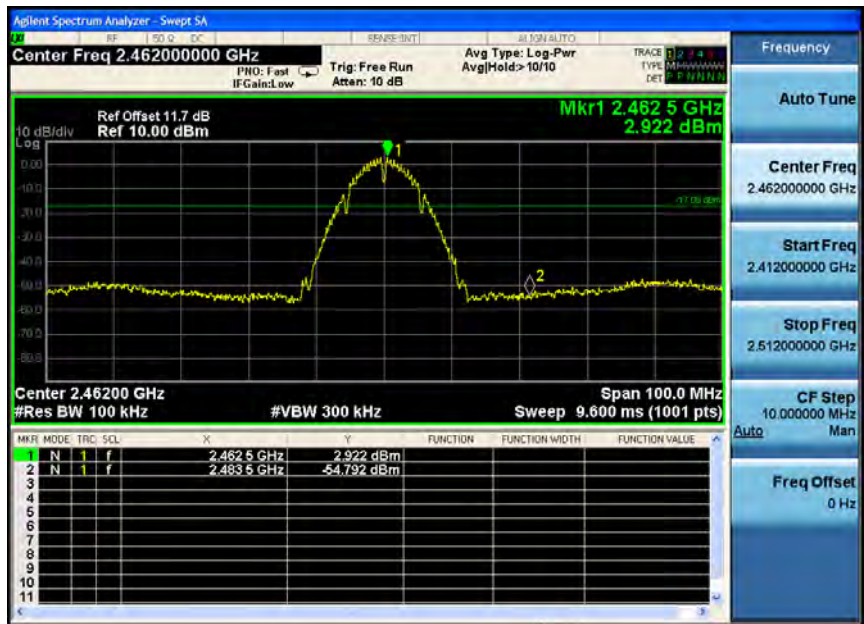
Conducted Band Edge

Mode 2: IEEE 802.11b link mode_ANT-0

2412

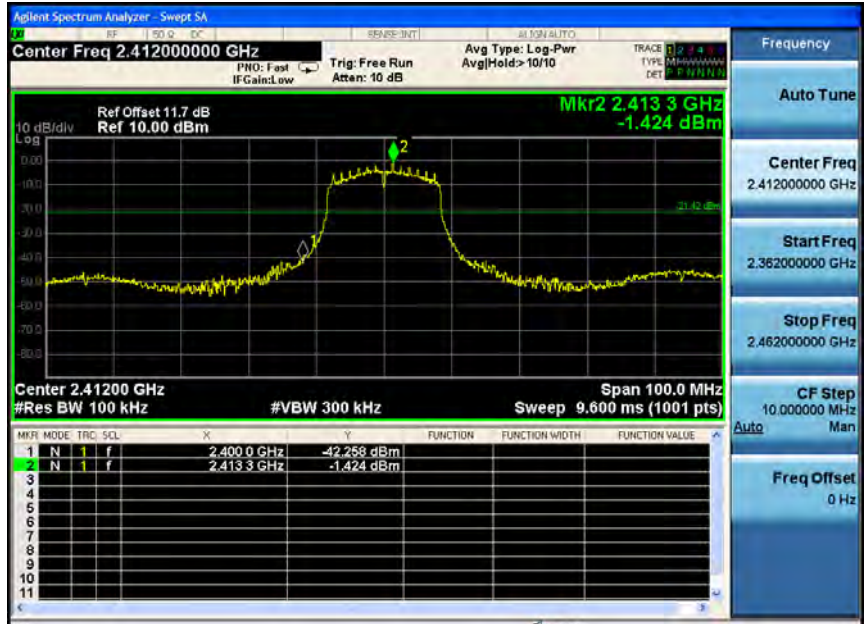


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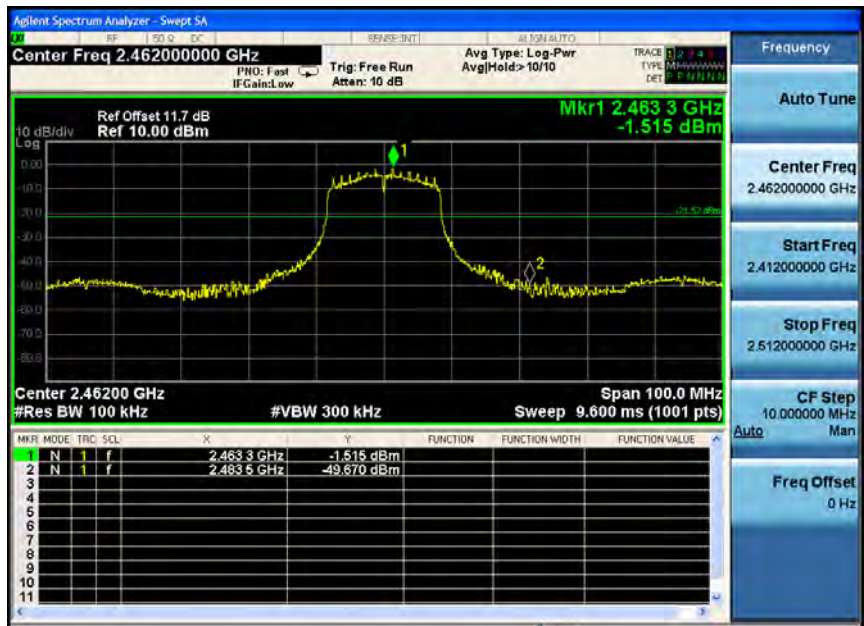


Mode 3: IEEE 802.11g link mode_ANT-0

2412

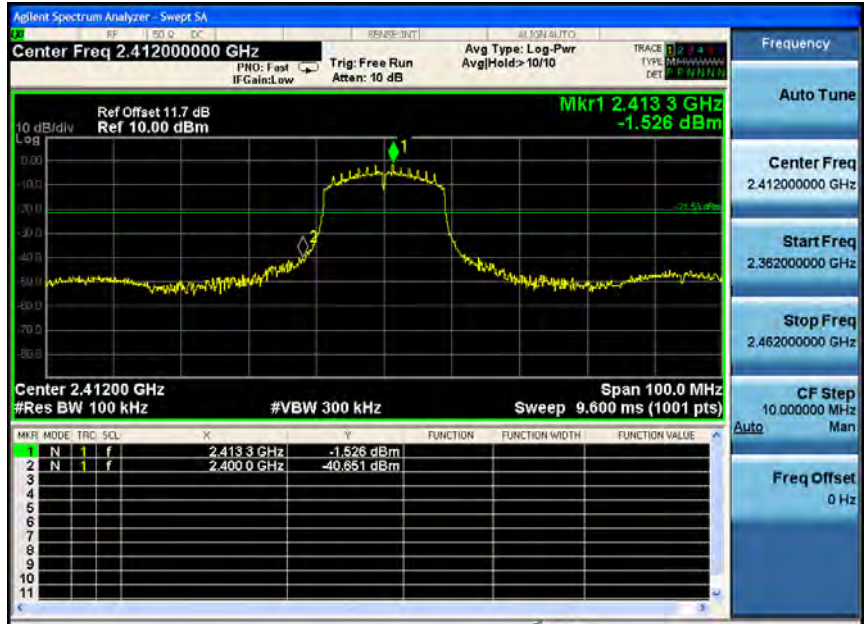


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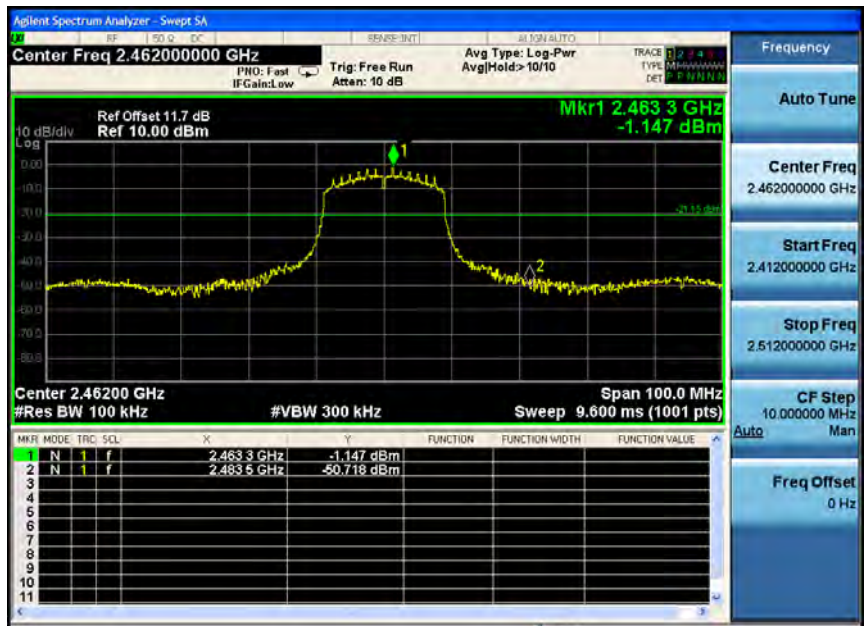


Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-0

2412

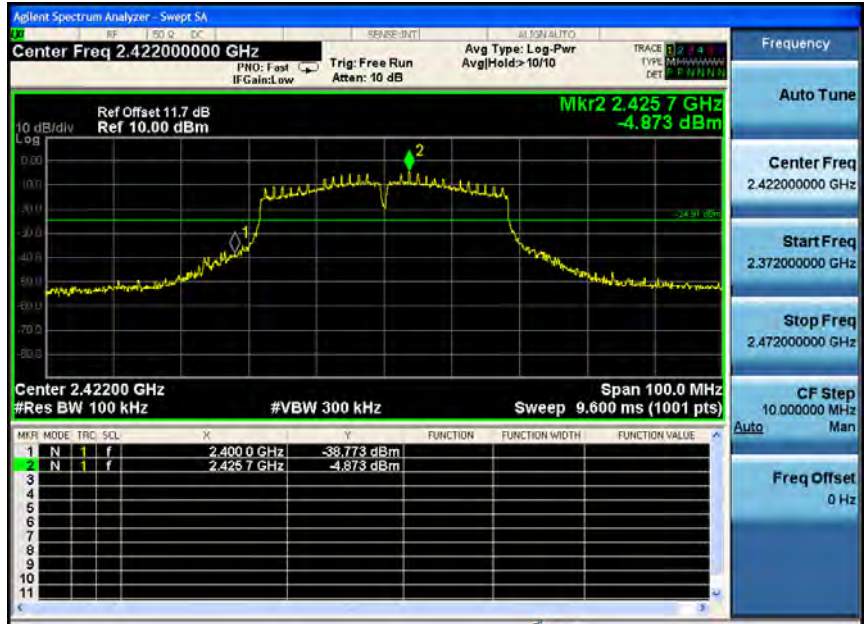


2462



Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-0

2422

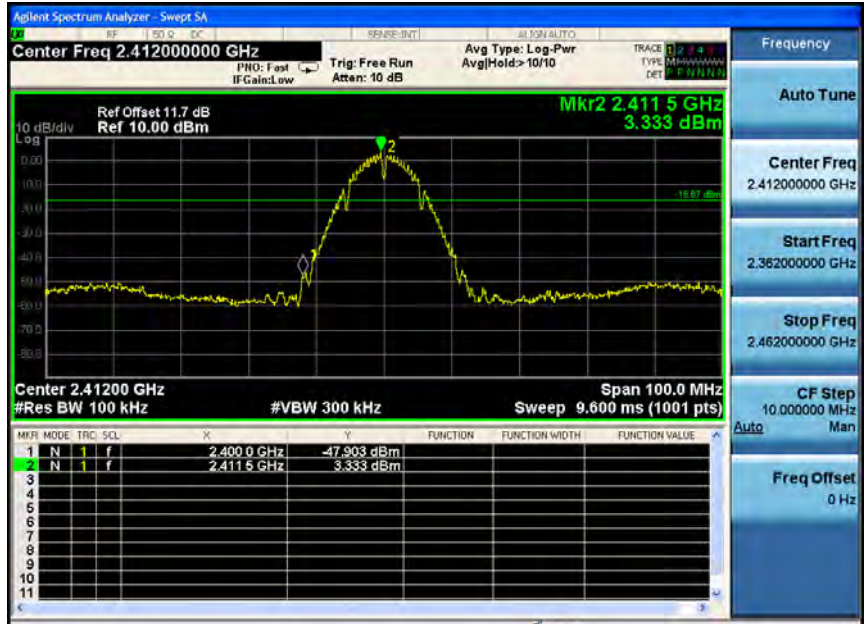


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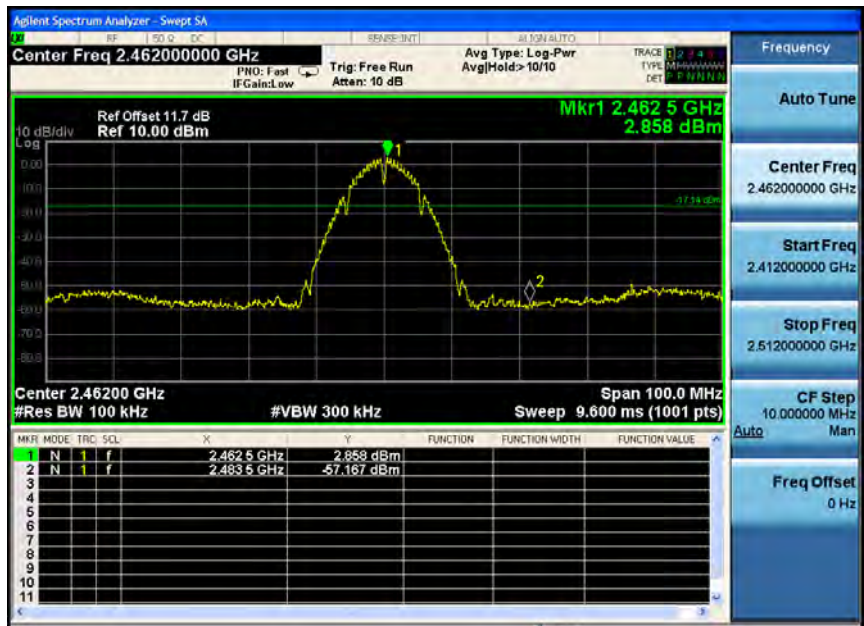


Mode 2: IEEE 802.11b link mode_ANT-1

2412

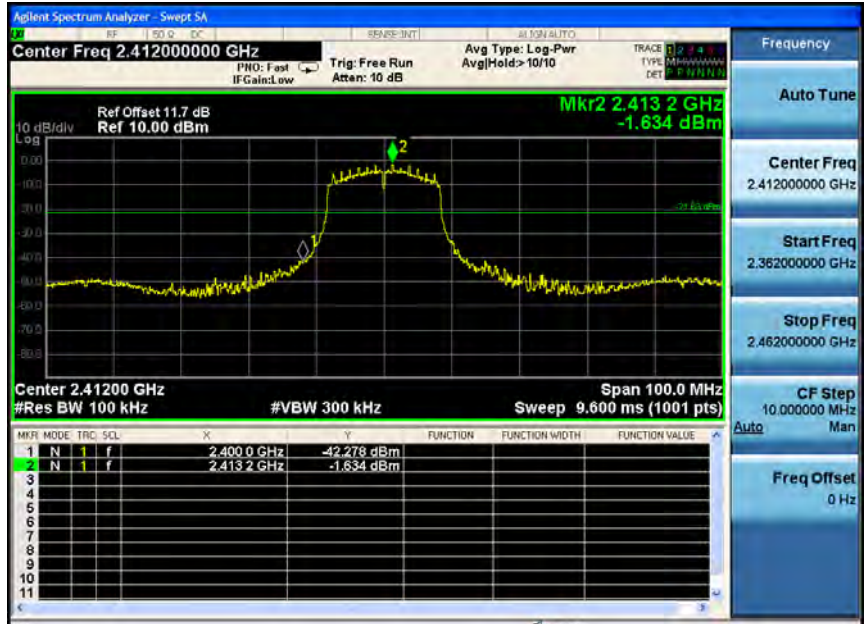


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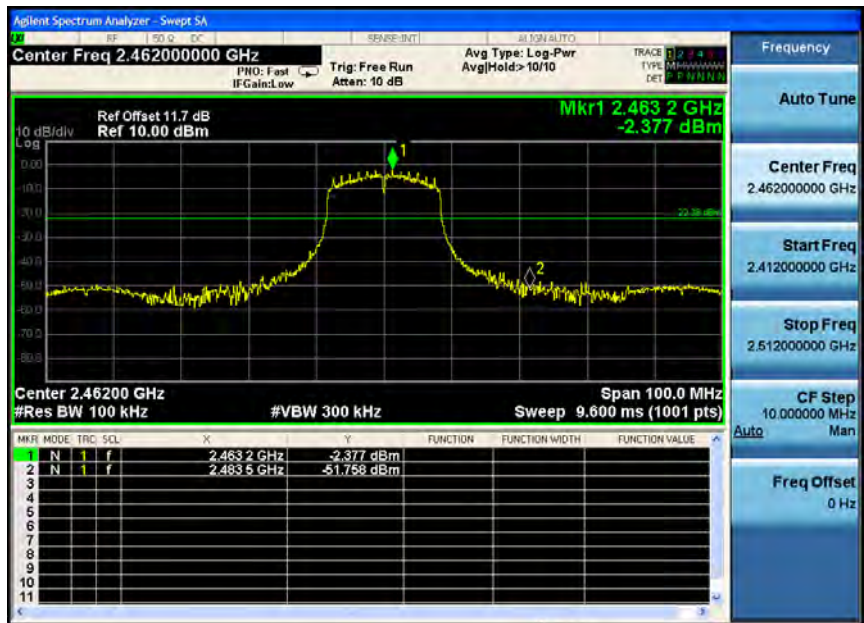


Mode 3: IEEE 802.11g link mode_ANT-1

2412

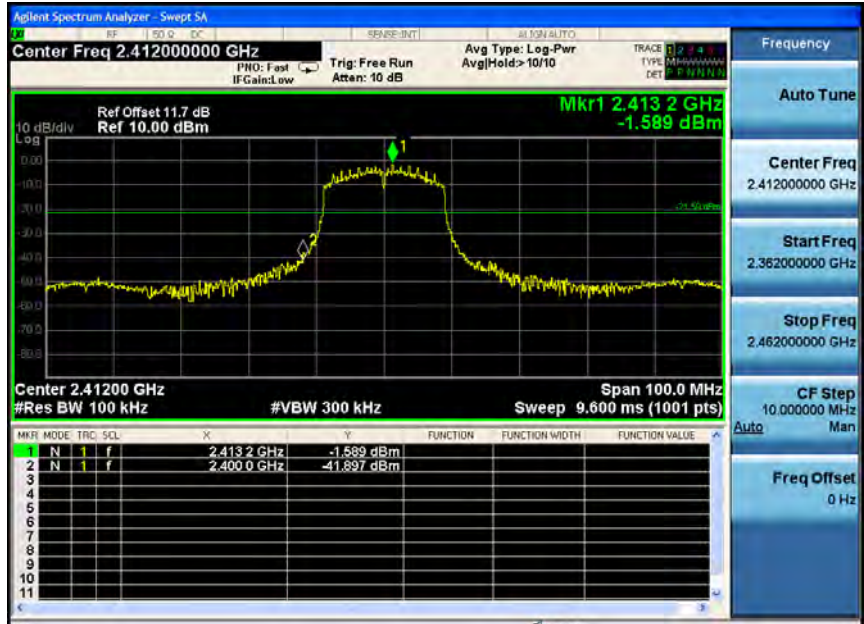


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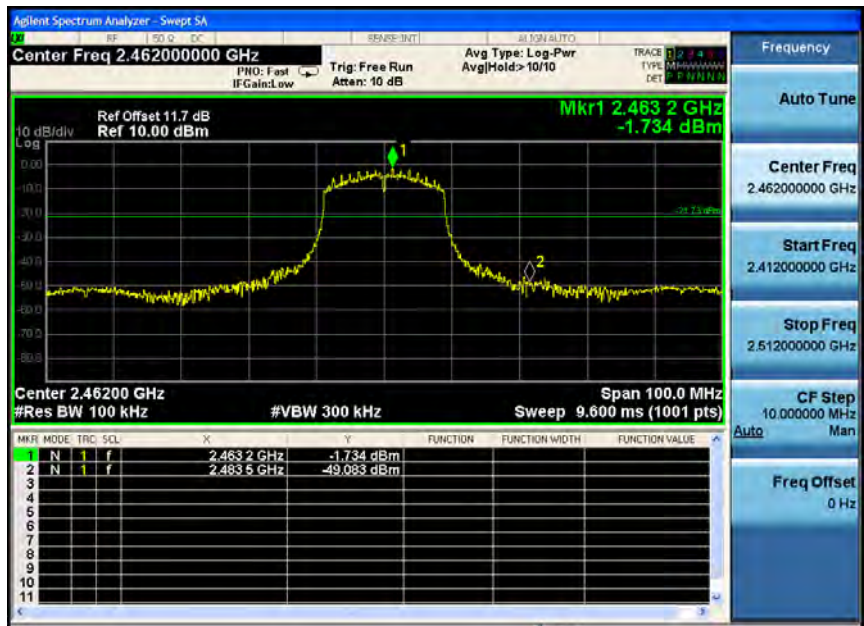


Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-1

2412

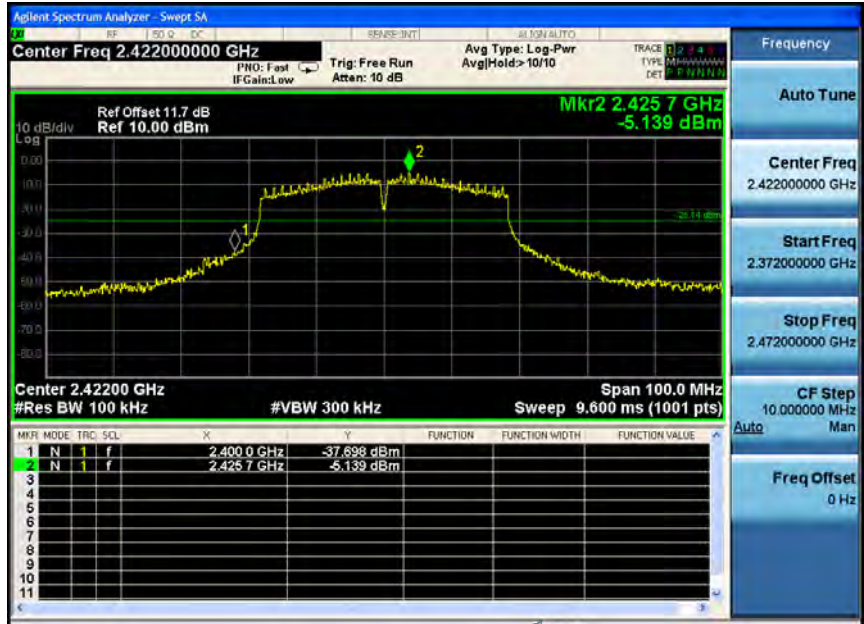


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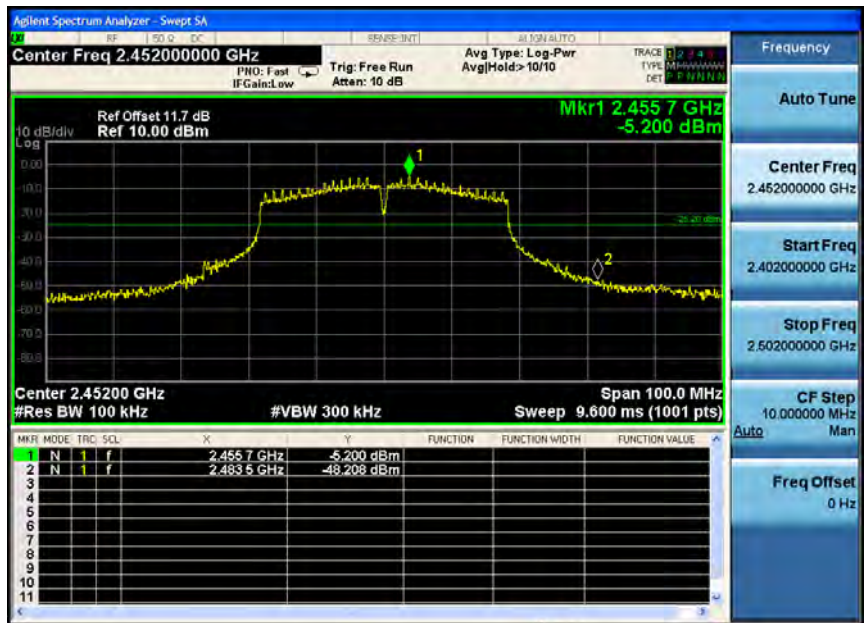


Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-1

2422

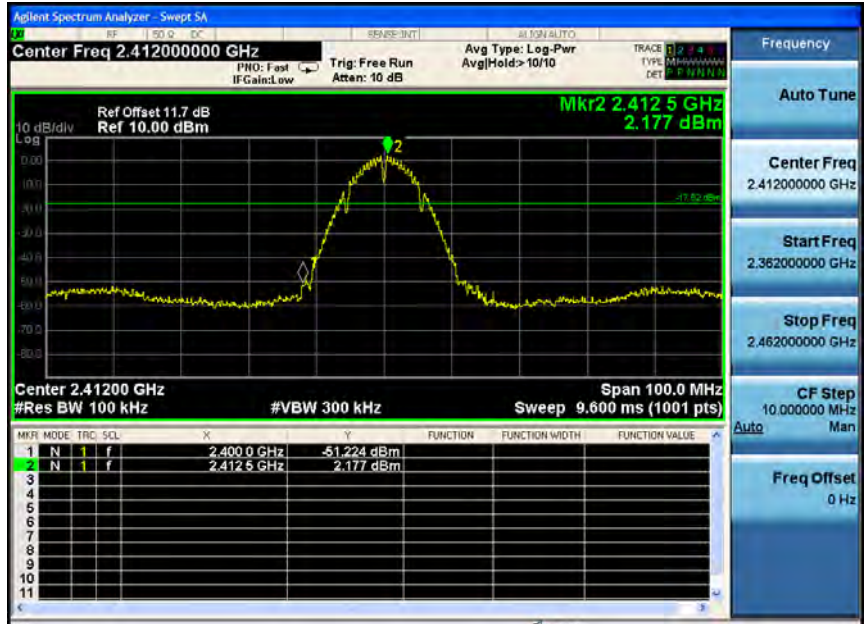


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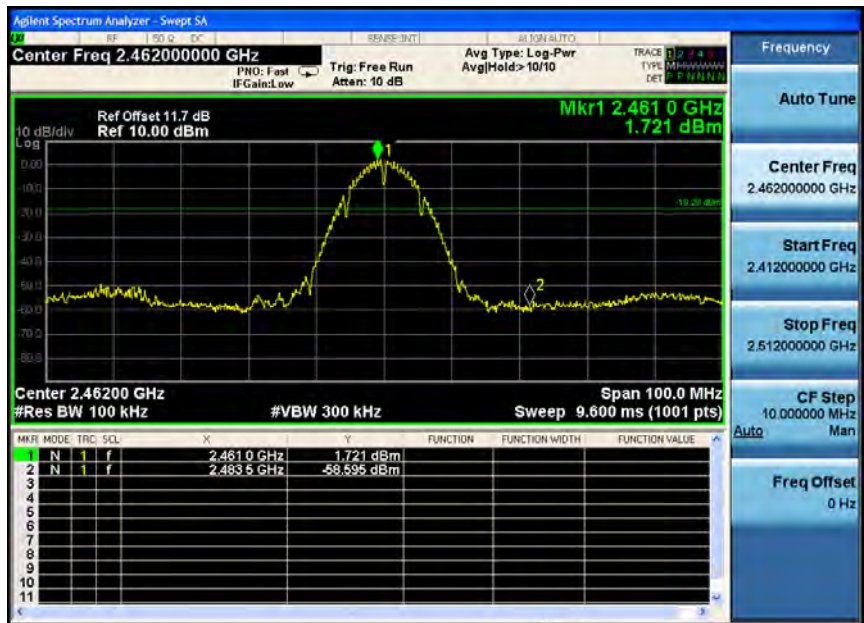


Mode 2: IEEE 802.11b link mode_ANT-2

2412

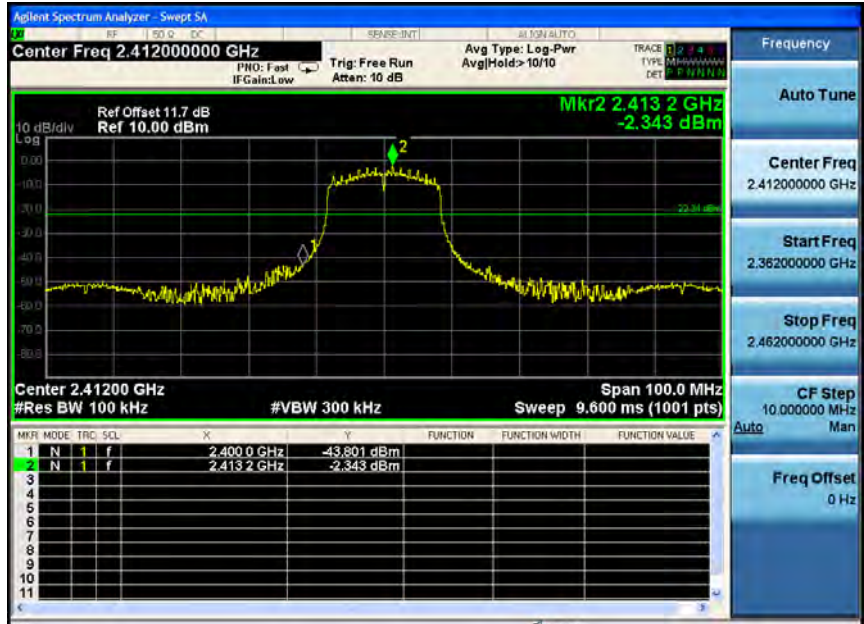


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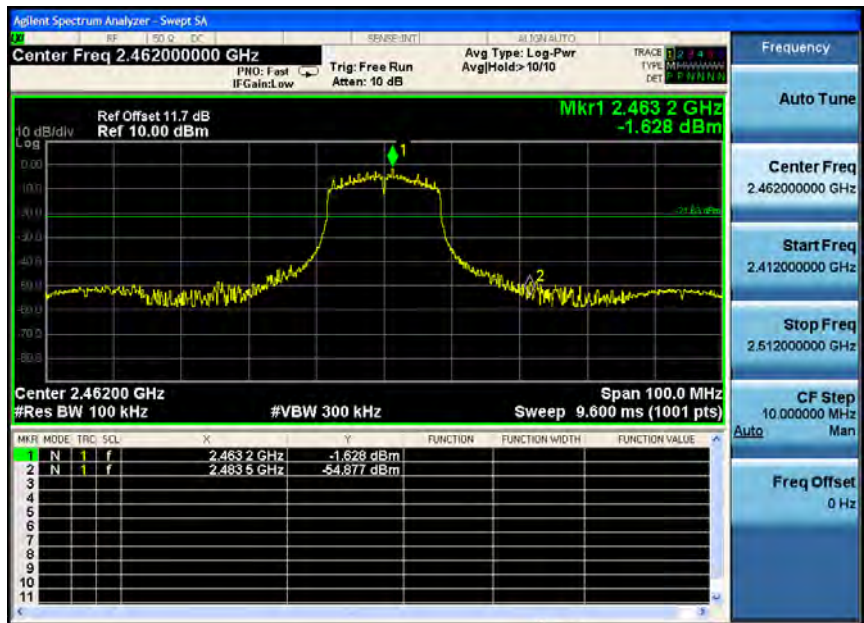


Mode 3: IEEE 802.11g link mode_ANT-2

2412

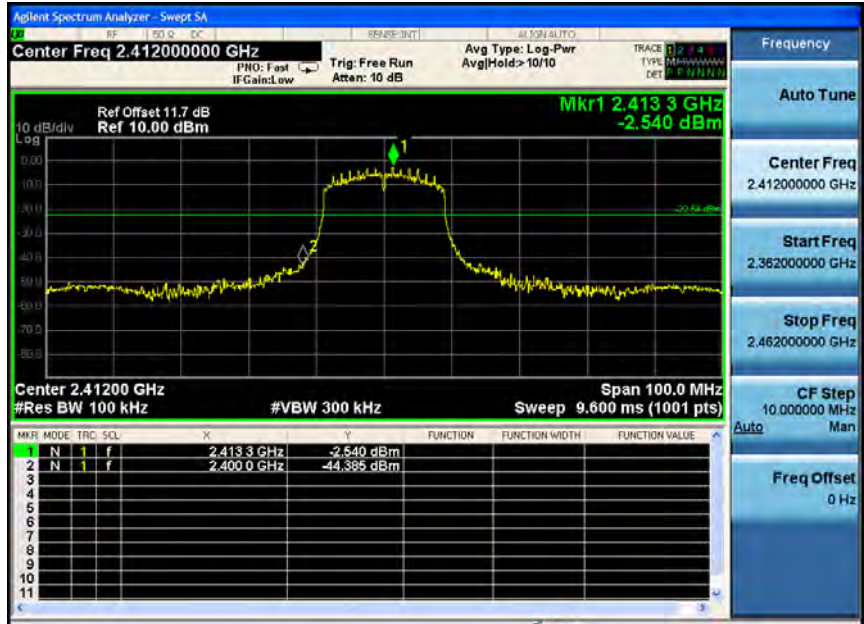


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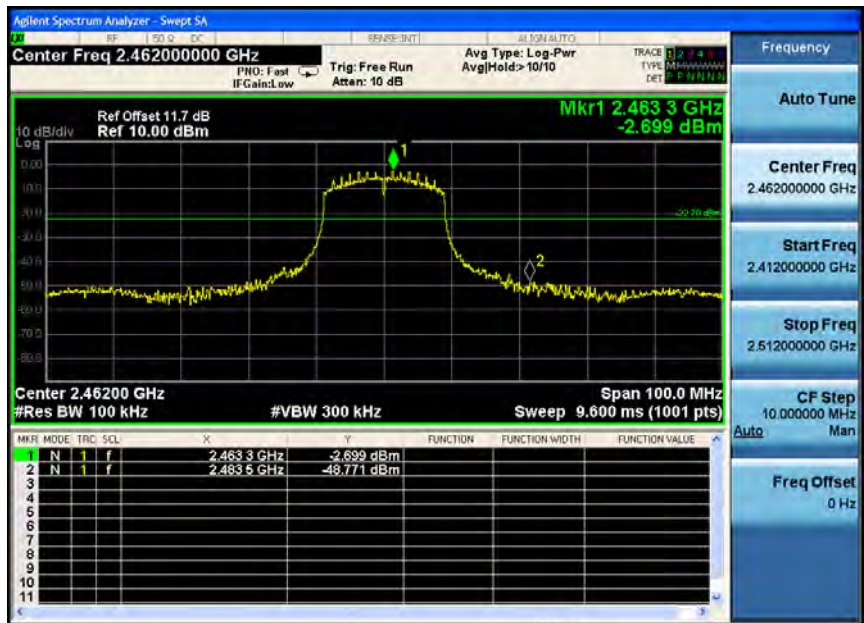


Mode 4: IEEE 802.11n 2.4GHz 20MHz link mode_ANT-2

2412

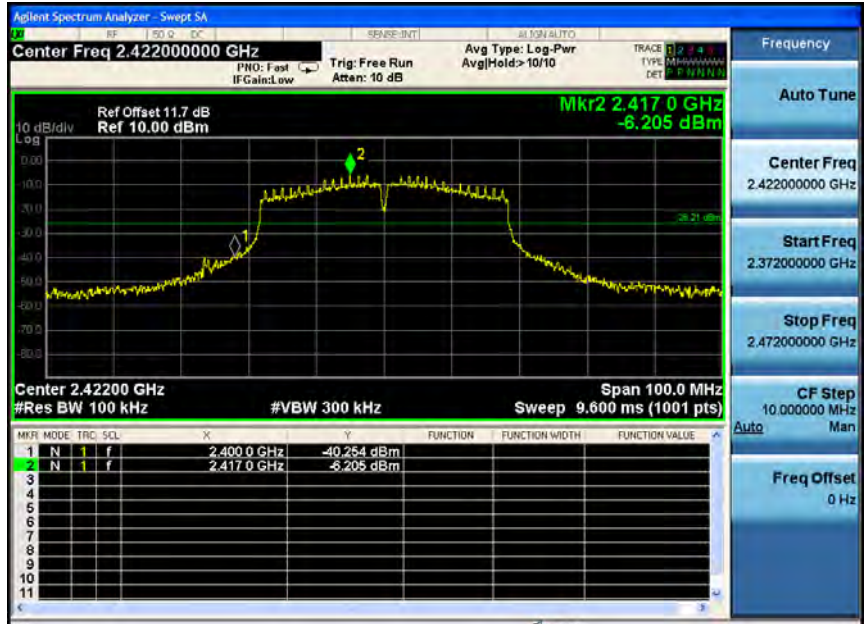


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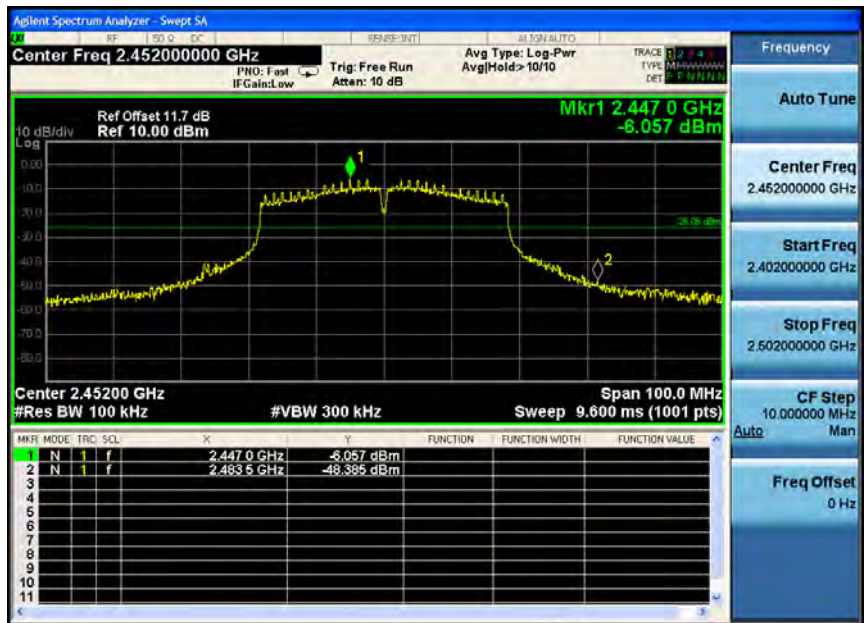


Mode 5: IEEE 802.11n 2.4GHz 40MHz link mode_ANT-2

2422



2452

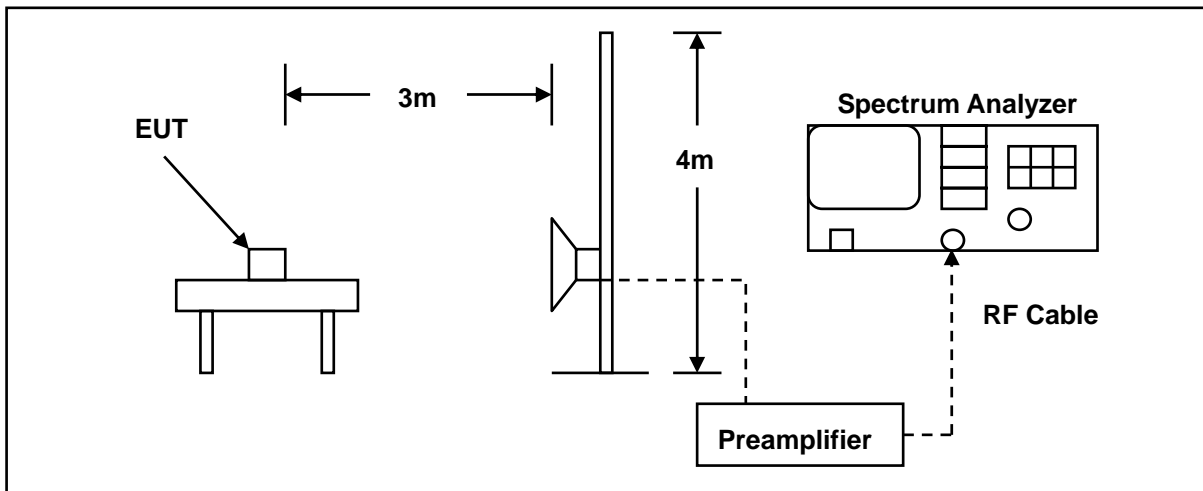


10 Band Edges Measurement

10.1.Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

10.2.Test Setup



10.3.Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/06/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/06/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/24/2015	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/24/2015	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/12/2015	(1)
Microwave Cable	EMCI	EMC-104-SM-S M-14000	140202	02/24/2015	(1)
Microwave Cable	EMCI	EMC104-SM-S M-600	140301	02/24/2015	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

Note: N.C.R. = No Calibration Request.

10.4. Test Procedure

The EUT tested to DTS test procedure of KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements when Duty cycle >98% / 1/T for average measurements when Duty cycle <98%.

10.5. Test Result

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 2			Date:	06/25/2015		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2368.960	59.53	-0.55	58.98	74.00	-15.02	peak	H
2368.960	47.99	-0.55	47.44	54.00	-6.56	AVG	H
2390.000	51.77	-0.46	51.31	74.00	-22.69	peak	H
2371.490	65.82	-0.54	65.28	74.00	-8.72	peak	V
2371.490	53.38	-0.54	52.84	54.00	-1.16	AVG	V
2390.000	58.43	-0.46	57.97	74.00	-16.03	peak	V
2390.000	47.94	-0.46	47.48	54.00	-6.52	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 2			Date:	06/25/2015		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	50.97	-0.06	50.91	74.00	-23.09	peak	H
2498.040	54.93	0.01	54.94	74.00	-19.06	peak	H
2498.040	42.73	0.01	42.74	54.00	-11.26	AVG	H
2483.500	56.85	-0.06	56.79	74.00	-17.21	peak	V
2483.500	46.97	-0.06	46.91	54.00	-7.09	AVG	V
2498.160	63.35	0.01	63.36	74.00	-10.64	peak	V
2498.160	51.12	0.01	51.13	54.00	-2.87	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	06/25/2015		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2363.240	59.95	-0.59	59.36	74.00	-14.64	peak	H
2363.240	48.41	-0.59	47.82	54.00	-6.18	AVG	H
2390.000	60.18	-0.46	59.72	74.00	-14.28	peak	H
2390.000	42.23	-0.46	41.77	54.00	-12.23	AVG	H
2369.070	66.41	-0.55	65.86	74.00	-8.14	peak	V
2369.070	53.17	-0.55	52.62	54.00	-1.38	AVG	V
2390.000	67.14	-0.46	66.68	74.00	-7.32	peak	V
2390.000	47.46	-0.46	47.00	54.00	-7.00	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	06/25/2015		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	56.22	-0.06	56.16	74.00	-17.84	peak	H
2483.500	40.94	-0.06	40.88	54.00	-13.12	AVG	H
2484.520	65.35	-0.06	65.29	74.00	-8.71	peak	H
2484.520	41.08	-0.06	41.02	54.00	-12.98	AVG	H
2483.500	66.71	-0.06	66.65	74.00	-7.35	peak	V
2483.500	46.38	-0.06	46.32	54.00	-7.68	AVG	V
2485.000	72.53	-0.06	72.47	74.00	-1.53	peak	V
2485.000	50.21	-0.06	50.15	54.00	-3.85	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	06/25/2015		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2365.880	59.30	-0.57	58.73	74.00	-15.27	peak	H
2365.880	44.68	-0.57	44.11	54.00	-9.89	AVG	H
2390.000	56.05	-0.46	55.59	74.00	-18.41	peak	H
2390.000	43.91	-0.46	43.45	54.00	-10.55	AVG	H
2370.610	63.18	-0.55	62.63	74.00	-11.37	peak	V
2370.610	51.08	-0.55	50.53	54.00	-3.47	AVG	V
2390.000	63.66	-0.46	63.20	74.00	-10.80	peak	V
2390.000	48.06	-0.46	47.60	54.00	-6.40	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	06/25/2015		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	57.22	-0.06	57.16	74.00	-16.84	peak	H
2483.500	43.69	-0.06	43.63	54.00	-10.37	AVG	H
2499.400	56.96	0.01	56.97	74.00	-17.03	peak	H
2499.400	43.60	0.01	43.61	54.00	-10.39	AVG	H
2483.500	64.40	-0.06	64.34	74.00	-9.66	peak	V
2483.500	49.47	-0.06	49.41	54.00	-4.59	AVG	V
2498.760	62.04	0.01	62.05	74.00	-11.95	peak	V
2498.760	48.67	0.01	48.68	54.00	-5.32	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	06/25/2015		
Frequency:	2422 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.200	61.97	-0.47	61.50	74.00	-12.50	peak	H
2389.200	47.37	-0.47	46.90	54.00	-7.10	AVG	H
2390.000	62.69	-0.46	62.23	74.00	-11.77	peak	H
2390.000	47.55	-0.46	47.09	54.00	-6.91	AVG	H
2389.320	68.64	-0.47	68.17	74.00	-5.83	peak	V
2389.320	51.63	-0.47	51.16	54.00	-2.84	AVG	V
2390.000	67.12	-0.46	66.66	74.00	-7.34	peak	V
2390.000	52.31	-0.46	51.85	54.00	-2.15	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	UAP-AC-LR			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	06/25/2015		
Frequency:	2452 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	59.96	-0.06	59.90	74.00	-14.10	peak	H
2483.500	45.42	-0.06	45.36	54.00	-8.64	AVG	H
2495.950	58.69	-0.01	58.68	74.00	-15.32	peak	H
2495.950	42.57	-0.01	42.56	54.00	-11.44	AVG	H
2483.500	70.44	-0.06	70.38	74.00	-3.62	peak	V
2483.500	51.73	-0.06	51.67	54.00	-2.33	AVG	V
2489.150	68.43	-0.04	68.39	74.00	-5.61	peak	V
2489.150	50.61	-0.04	50.57	54.00	-3.43	AVG	V

11 Antenna Measurement

11.1.Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2.Antenna Connector Construction

The antenna used in this product is Dual band tri pol antenna. And the maximum Gain of this antenna is 3 dBi.