ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENTS

OF

wireless adapter

MODEL No.: W Adapt

FCC ID: IPUWADAPTER

Trade Mark: D.

REPORT NO.: ES140827374E1

ISSUE DATE: October 17, 2014

Prepared for

DEI Sales Inc. dba Definitive Technology

One Viper Way, Vista, California, United States

Prepared by

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VERIFICATION OF COMPLIANCE

Applicant:	DEI Sales Inc. dba Definitive Technology One Viper Way, Vista, California, United States
Manufacturer:	SHENZHEN FENDA TECHNOLOGY CO., LTD. Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Product Description:	wireless adapter
Model Number:	W Adapt
File Number:	ES140827374E1
Date of Test:	August 28, 2014 to October 17, 2014

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD.
The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247

The test results of this report relate only to the tested sample identified in this report.

Date of Test : August 28, 2014 to October 17, 2014

Prepared by : Yaping Shen

Yaping Shen/Editor

Reviewer : Jack . Li

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Lisa Wang/Manager

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1. General Information

1.1 Product Description

A major technical descriptions of EUT is described as following:

A). Operation Frequency:
2.4G 802.11b/g/n(HT20):2412MHz-2462MHz; 802.11n(HT40): 2422MHz-2452MHz
5G 802.11a/n(HT20):5180-5240 MHz; 802.11n(HT40): 5190-5230 MHz;
B). Modulation: OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/g/n,
DSSS with DBPSK/DQPSK/CCK for 802.11b;
C). Number of Channel: 2.4G 802.11b/g/n(HT20): 11channels; 802.11n(HT40): 7channels
5G 802.11a/n(HT20): 7channels; 802.11n(HT40): 2 channels;
D). Max Peak Conducted Power: 2.4G wifi 22.52dBm, 5G wifi 15.84dBm
E) .Antenna Gain: 2.0dBi for 2.4G WIFI; 2.0dBi for 5G WIFI;
F). Antenna Type: Metal antenna
G). Power Supply: AC 100-240V~50/60Hz

Note:
1. This device is included 802.11b, 802.11g, 802.11n 2.4GHz and 802.11a/n 5GHz transceiver function.
2. Test of channel was included the lowest middle and highest frequency in lowest data rate and to perform the test, then record on this report.

1.2 Related Submittal(s) / Grant(s)

This submittal(s) (test report) is intended for FCC ID: IPUWADAPTER filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.
The composite system is compliance with Subpart B is authorized under a DOC procedure.

1.3 Test Methodology

All the test program has follow FCC new test procedure KDB558074 D01 v03r02, Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2009). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description

EMC Lab.	:	Accredited by CNAS, 2013.10.29 The certificate is valid until 2016.10.28 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01: 2006(identical to ISO/IEC17025: 2005) The Certificate Registration Number is L2291 Accredited by TUV Rheinland Shenzhen 2010.5.25 The Laboratory has been assessed according to the requirements ISO/IEC 17025 Accredited by FCC, April 17, 2013 The Certificate Registration Number is 406365. Accredited by Industry Canada, March 05, 2010 The Certificate Registration Number is 4480A-2.
Name of Firm	:	SHENZHEN EMTEK CO., LTD.
Site Location	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. Emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

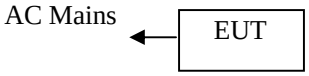


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	wireless adapter	D.	W Adapt	IPUWADAPTER	N/A	EUT
2.	Mobile Phone	OPPO	R819T	N/A	N/A	Support equipment

Note:

(1) Unless otherwise denoted as EUT in『Remark』column, device(s) used in tested system is a support equipment.

3. Description of Test Modes

The Transmitter of EUT is an wireless amplifier and powered by host equipment; these is Digital Transmission system (DTS) and have modulation OFDM, DSSS, DBPSK, DQPSK, CCK, 16QAM, 64QAM. According exploratory test, EUT will have maximum output power in those data rate (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n: MCS0), so those data rate were used for all test.
The equipment enables high-speed access without wires to network assets. This adapter uses the IEEE 802.11 protocol to enable wireless communications between the host and Wireless rooter.

For 802.11b/g/n(HT20):
1. For lowest channel : 2412MHz (Channel 1)
2. For middle channel : 2437MHz (Channel 6)
3. For highest channel : 2462MHz (Channel 11)

For 802.11n(HT40)
4. For lowest channel : 2422MHz (Channel 3)
5. For middle channel : 2437MHz (Channel 6)
6. For highest channel : 2452MHz (Channel 9)

4. Summary of Test Results

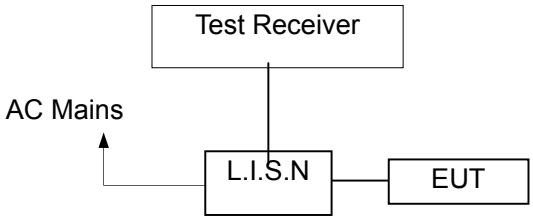
FCC Rules	Description Of Test	Result
§15.247(a)(2)	6dB bandwidth	Pass
§15.247(b)(3)	Max Peak output Power test	Pass
§15.247(e)	Power density	Pass
§15.247(d)	Band edge test	Pass
§15.207	AC Power Conducted Emission	Pass
§15.247(d), §15.209	Radiated Emission	Pass
§15.247(d)	Antenna Port Emission	Pass
§15.247(b)&§15.203	Antenna Application	Pass

5. Conducted Emissions Test

5.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/17/2014	05/16/2015
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/17/2014	05/16/2015
50Ω Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/17/2014	05/16/2015
Voltage Probe	Rohde & Schwarz	TK9416	N/A	05/17/2014	05/16/2015
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	05/17/2014	05/16/2015

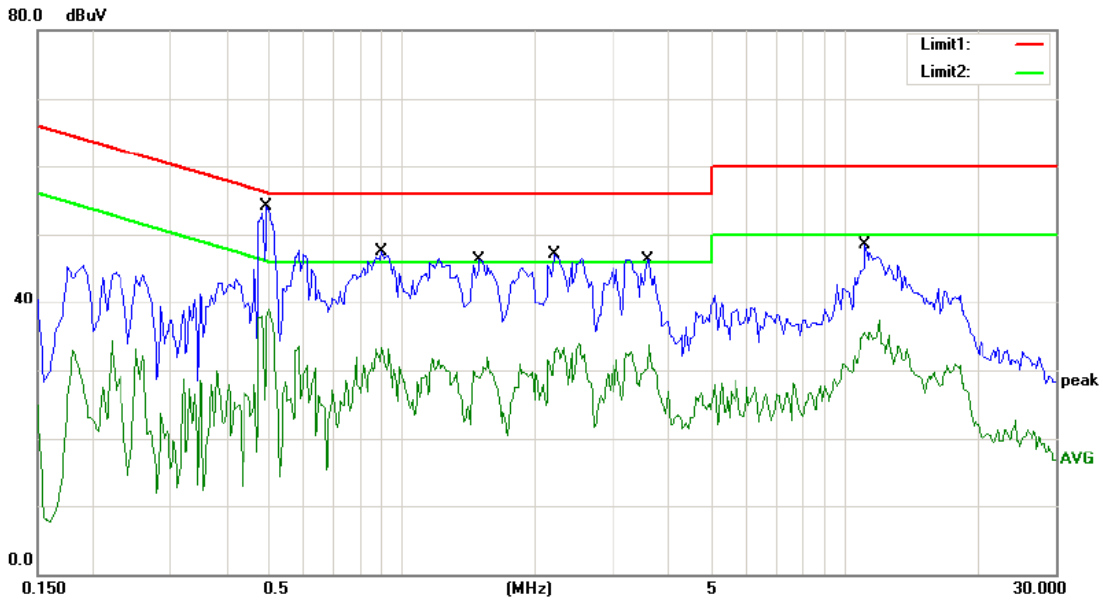
5.4 Conducted Emission Limit

Conducted Emission

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

Note: 1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

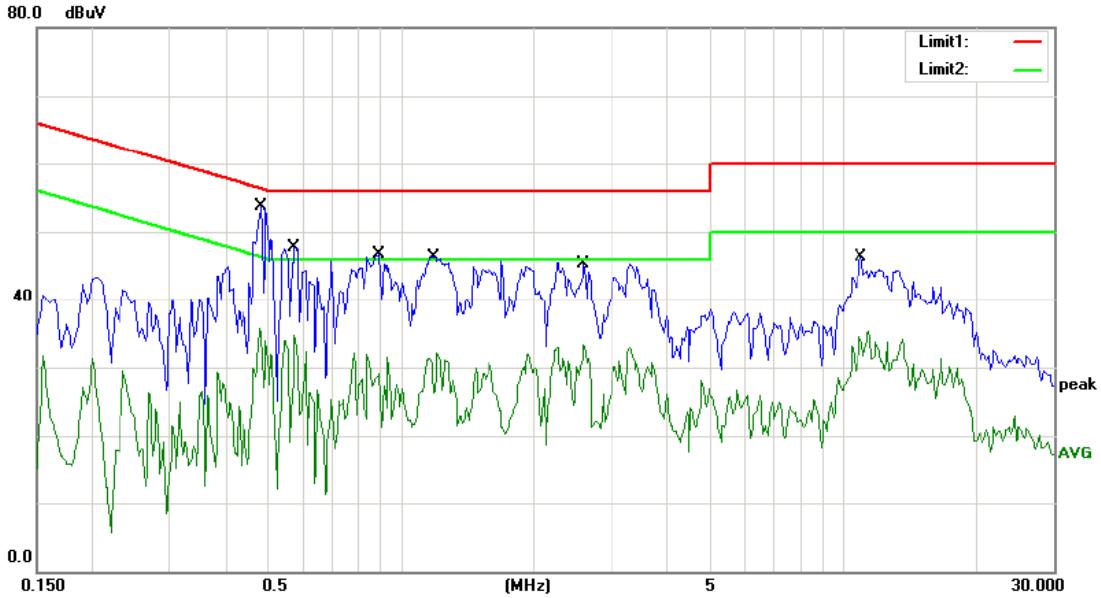
5.5 Measurement Result



Site Conduction #1 Phase: L1 Temperature: 26
Limit: (CE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 60 %
Mode: WIFI ON
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4950	50.60	0.00	50.60	56.08	-5.48	QP	
2		0.4950	38.89	0.00	38.89	46.08	-7.19	AVG	
3		0.9000	47.45	0.00	47.45	56.00	-8.55	QP	
4		0.9000	33.23	0.00	33.23	46.00	-12.77	AVG	
5		1.4950	46.23	0.00	46.23	56.00	-9.77	QP	
6		1.4950	30.71	0.00	30.71	46.00	-15.29	AVG	
7		2.2100	47.01	0.00	47.01	56.00	-8.99	QP	
8		2.2100	33.36	0.00	33.36	46.00	-12.64	AVG	
9		3.5900	46.31	0.00	46.31	56.00	-9.69	QP	
10		3.5900	33.66	0.00	33.66	46.00	-12.34	AVG	
11		11.1500	48.42	0.00	48.42	60.00	-11.58	QP	
12		11.1500	37.21	0.00	37.21	50.00	-12.79	AVG	

*:Maximum data x:Over limit I:over margin Comment: Factor build in receiver. Operator: ZHL



Site Conduction #1 Phase: N Temperature: 26
Limit: (CE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 60 %
Mode: WIFI ON
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4850	50.23	0.00	50.23	56.25	-6.02	QP	
2		0.4850	35.74	0.00	35.74	46.25	-10.51	AVG	
3		0.5750	47.64	0.00	47.64	56.00	-8.36	QP	
4		0.5750	34.64	0.00	34.64	46.00	-11.36	AVG	
5		0.8950	46.62	0.00	46.62	56.00	-9.38	QP	
6		0.8950	32.14	0.00	32.14	46.00	-13.86	AVG	
7		1.1900	46.37	0.00	46.37	56.00	-9.63	QP	
8		1.1900	32.09	0.00	32.09	46.00	-13.91	AVG	
9		2.5900	45.37	0.00	45.37	56.00	-10.63	QP	
10		2.5900	33.34	0.00	33.34	46.00	-12.66	AVG	
11		11.0000	46.23	0.00	46.23	60.00	-13.77	QP	
12		11.0000	35.35	0.00	35.35	50.00	-14.65	AVG	

*:Maximum data x:Over limit I:over margin Comment: Factor build in receiver. Operator: ZHL

6. Radiated Emission Test

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured was complete.

When spectrum scanned from 30 MHz to 1GHz setting resolution bandwidth 120 kHz and video bandwidth 300kHz.

EMI Test Receiver	Setting
Attenuation	Auto
RB	120kHz
VB	300kHz
Detector	QP
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz.

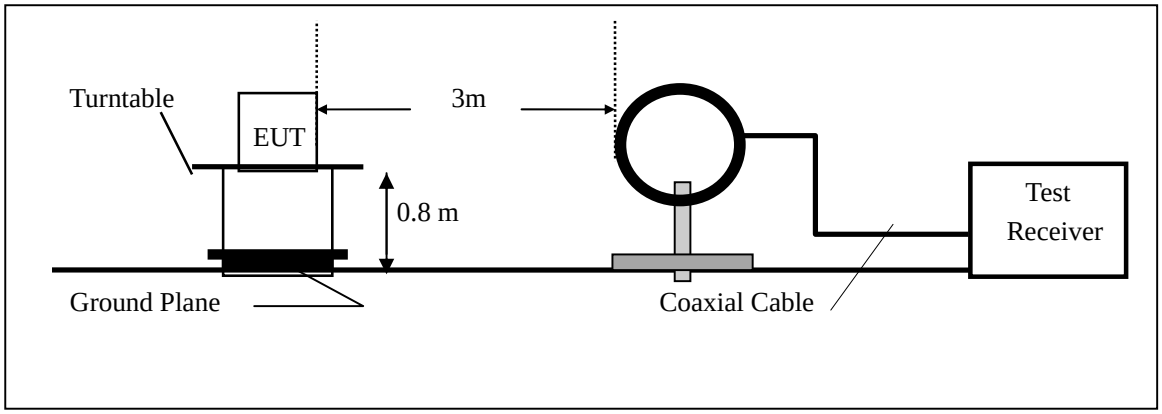
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz.

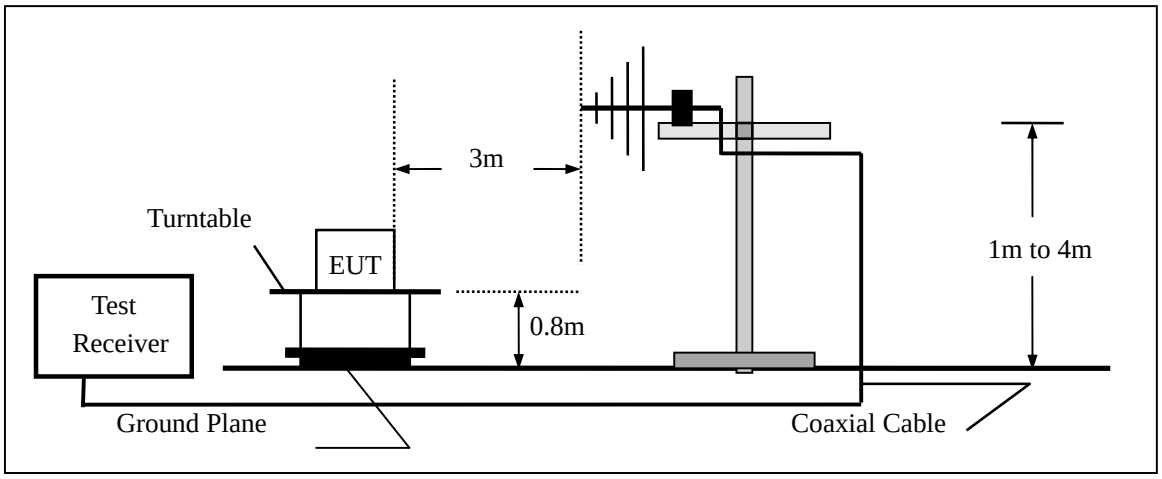
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

6.2 Test SET-UP (Block Diagram of Configuration)

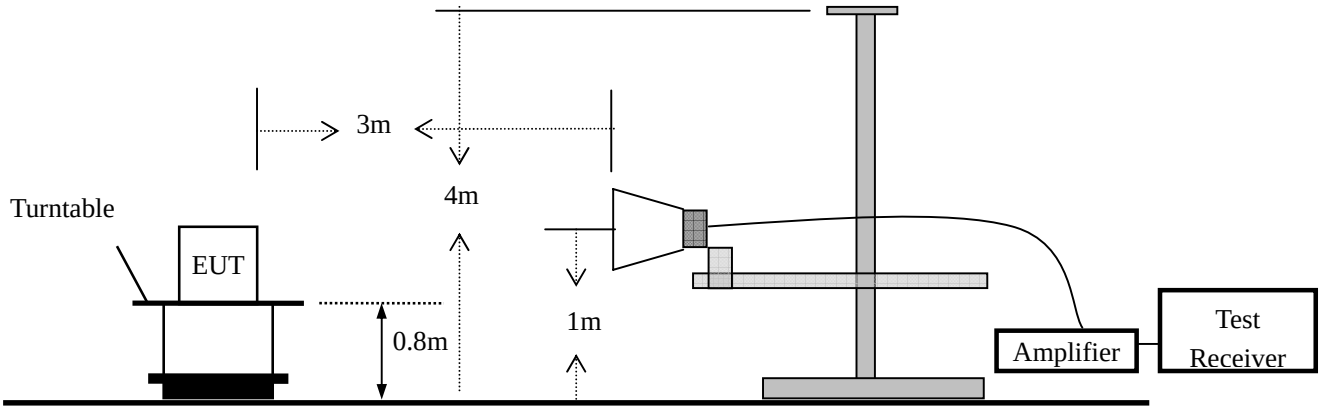
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



6.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/17/2014	05/16/2015
Pre-Amplifier	HP	8447D	2944A07999	05/17/2014	05/16/2015
Bilog Antenna	Schwarzbeck	VULB9163	142	05/17/2014	05/16/2015
Loop Antenna	ARA	PLA-1030/B	1029	05/17/2014	05/16/2015
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/17/2014	05/16/2015
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	ACRX1	05/17/2014	05/16/2015
Cable	Rosenberger	N/A	FP2RX2	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	CRPX1	05/17/2014	05/16/2015
Cable	Schwarzbeck	AK9513	CRRX2	05/17/2014	05/16/2015

6.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Frequencies (MHz)	Field Strength (micorvolts/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

15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

6.5 Measurement Result

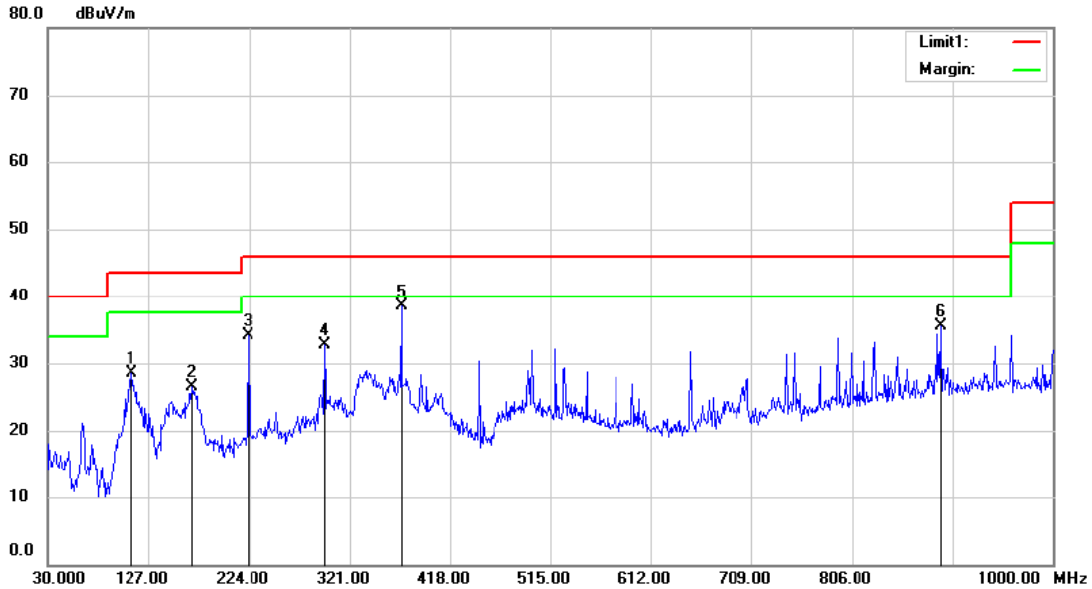
All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded as below:

Operation Mode:	TX Mode	Test Date :	September 15, 2014
Frequency Range:	9KHz~30MHz	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP
Note:			

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Operation Mode:	TX 2412	Test Date :	September 15, 2014
Frequency Range:	30MHz-1GHz	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP
Note:			



Site site #3 Polarization: ***Horizontal*** Temperature: 24 C

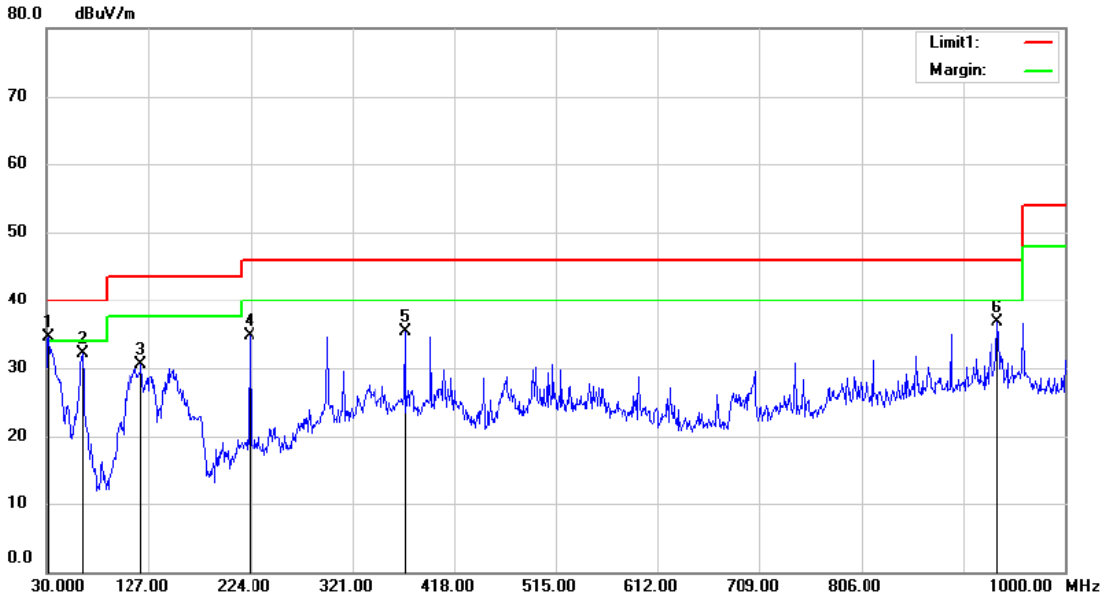
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %

Mode:TX2412

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		110.5100	42.90	-14.33	28.57	43.50	-14.93	QP			
2		168.7100	45.83	-19.34	26.49	43.50	-17.01	QP			
3		223.0300	50.14	-15.98	34.16	46.00	-11.84	QP			
4		296.7500	46.31	-13.63	32.68	46.00	-13.32	QP			
5	*	371.4400	48.83	-10.32	38.51	46.00	-7.49	QP			
6		891.3600	36.26	-0.82	35.44	46.00	-10.56	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP



Site site #3 Polarization: ***Vertical*** Temperature: 24 C

Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %

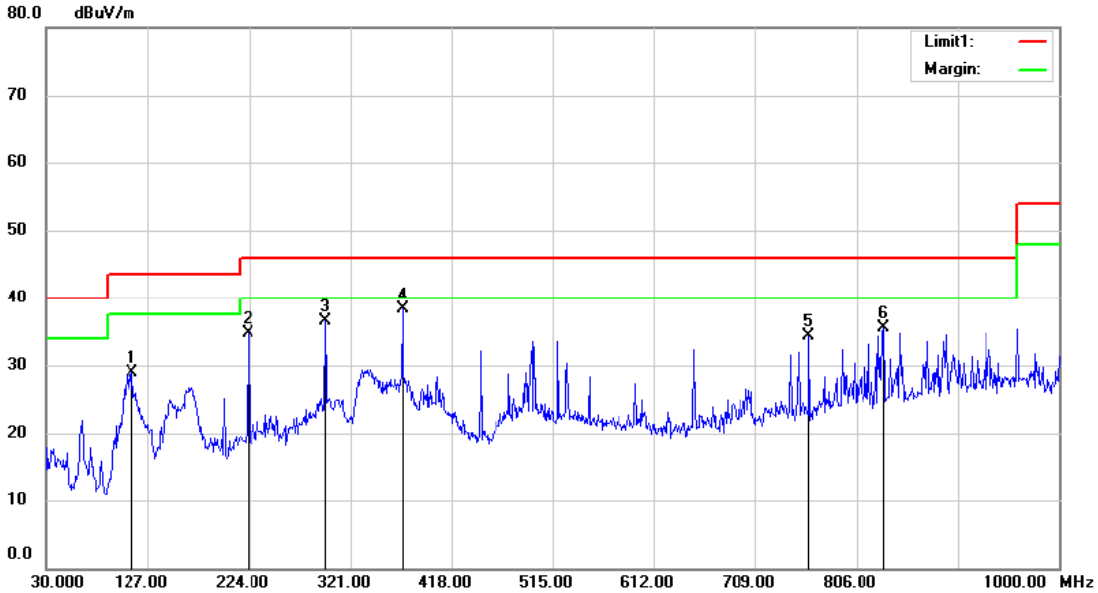
Mode:TX2412

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.9400	50.22	-15.75	34.47	40.00	-5.53	QP			
2		63.9500	48.72	-16.70	32.02	40.00	-7.98	QP			
3		120.2100	46.86	-16.36	30.50	43.50	-13.00	QP			
4		223.0300	50.61	-15.98	34.63	46.00	-11.37	QP			
5		371.4400	45.53	-10.32	35.21	46.00	-10.79	QP			
6		935.9800	37.30	-0.69	36.61	46.00	-9.39	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP

Operation Mode:	TX 2437	Test Date :	September 15, 2014
Frequency Range:	30MHz-1GHz	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP
Note:			



Site site #3 Polarization: ***Horizontal*** Temperature: 24 C

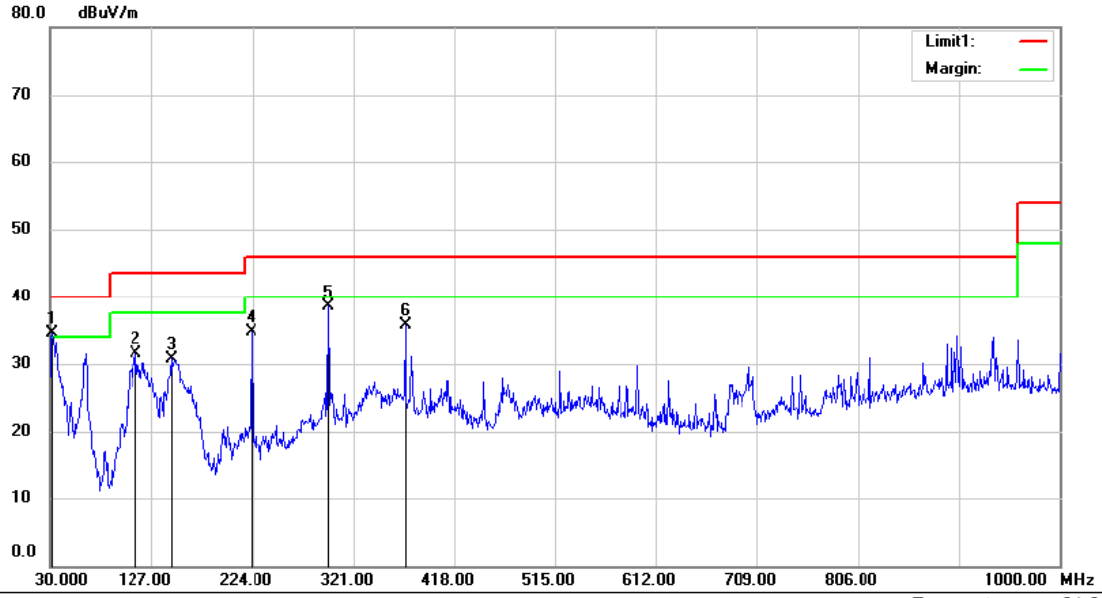
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %

Mode:TX2437

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		112.4500	43.63	-14.74	28.89	43.50	-14.61	QP			
2		223.0300	50.66	-15.98	34.68	46.00	-11.32	QP			
3		296.7500	50.19	-13.63	36.56	46.00	-9.44	QP			
4	*	371.4400	48.56	-10.32	38.24	46.00	-7.76	QP			
5		760.4100	38.36	-4.10	34.26	46.00	-11.74	QP			
6		832.1900	37.69	-2.15	35.54	46.00	-10.46	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP



Site site #3 Polarization: ***Vertical*** Temperature: 24 C

Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %

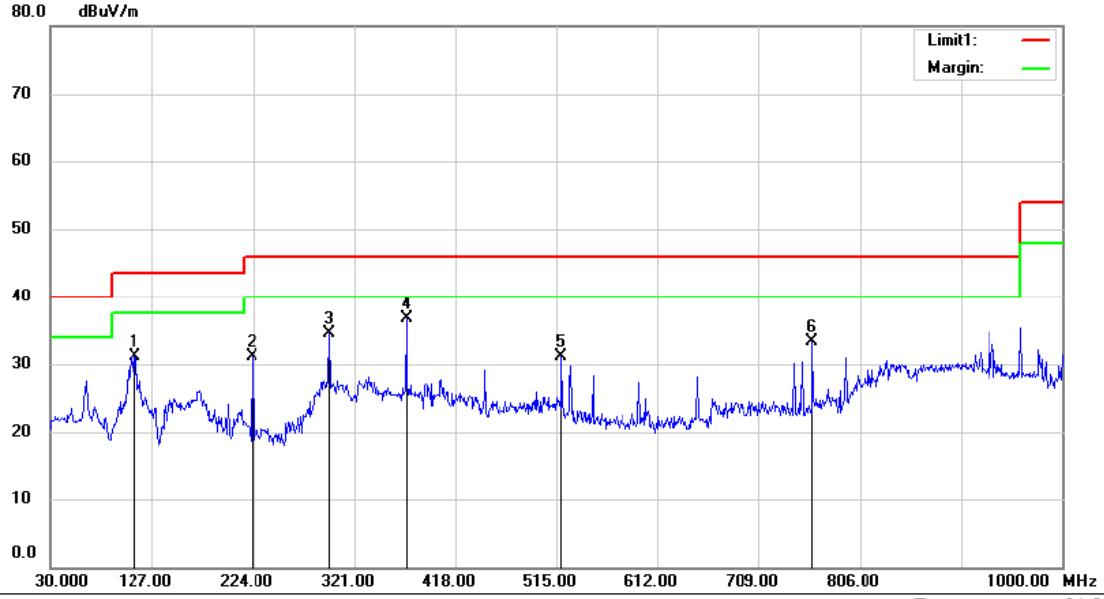
Mode:TX2437

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.9400	50.30	-15.75	34.55	40.00	-5.45	QP			
2		112.4500	46.26	-14.74	31.52	43.50	-11.98	QP			
3		146.4000	48.79	-17.99	30.80	43.50	-12.70	QP			
4		223.0300	50.77	-15.98	34.79	46.00	-11.21	QP			
5		296.7500	52.09	-13.63	38.46	46.00	-7.54	QP			
6		371.4400	46.06	-10.32	35.74	46.00	-10.26	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP

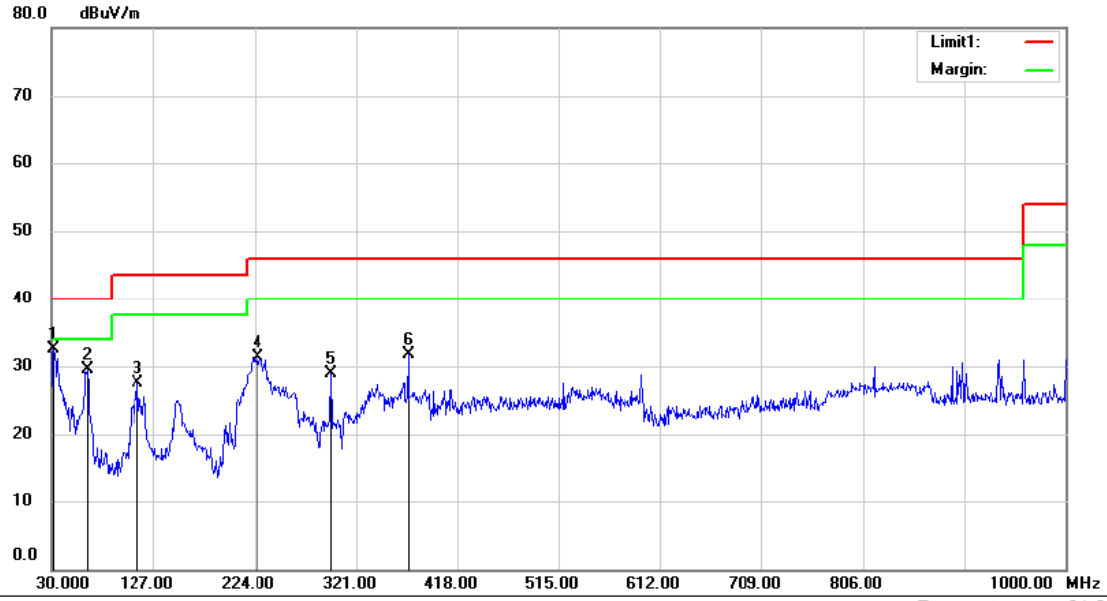
Operation Mode:	TX 2462	Test Date :	September 15, 2014
Frequency Range:	30MHz-1GHz	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP
Note:			



Site site #3	Polarization: ***Horizontal***	Temperature:	24 C
Limit: (RE)FCC PART 15 C	Power: AC 120V/60Hz	Humidity:	53 %
Mode:TX2462			
Note:			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		110.5100	45.44	-14.33	31.11	43.50	-12.39	QP			
2		223.0300	47.16	-15.98	31.18	46.00	-14.82	QP			
3		296.7500	48.19	-13.63	34.56	46.00	-11.44	QP			
4	*	371.4400	47.06	-10.32	36.74	46.00	-9.26	QP			
5		519.8500	38.72	-7.63	31.09	46.00	-14.91	QP			
6		760.4100	37.36	-4.10	33.26	46.00	-12.74	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP



Site site #3 Polarization: ***Vertical*** Temperature: 24 C

Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %

Mode:TX2462

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.9400	48.30	-15.75	32.55	40.00	-7.45	QP			
2		63.9500	46.27	-16.70	29.57	40.00	-10.43	QP			
3		112.4500	42.26	-14.74	27.52	43.50	-15.98	QP			
4		226.9100	46.74	-15.50	31.24	46.00	-14.76	QP			
5		296.7500	42.59	-13.63	28.96	46.00	-17.04	QP			
6		371.4400	42.06	-10.32	31.74	46.00	-14.26	QP			

*:Maximum data x:Over limit !:over margin Operator: SYP

Operation Mode:	802.11b TX Channel 1	Test Date :	September 15, 2014
Frequency Range:	Above 1GHz	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
4995.00	V	64.91	46.50	74.00	54.00	-9.09	-7.50
6534.25	V	58.91	40.50	74.00	54.00	-15.09	-13.50
8355.50	V	53.61	35.20	74.00	54.00	-20.39	-18.80
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
2988.78	H	52.04	33.63	74.00	54.00	-21.96	-20.37
3206.73	H	51.72	33.31	74.00	54.00	-22.28	-20.69
4786.86	H	60.35	41.94	74.00	54.00	-13.65	-12.06

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " 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.

Operation Mode:	802.11b TX Channel 6	Test Date :	September 15, 2014
Frequency Range:	Above 1GHz	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
1697.24	V	59.10	38.84	74.00	54.00	-14.90	-15.16
1942.43	V	57.94	37.68	74.00	54.00	-16.06	-16.32
2351.08	V	63.40	48.14	74.00	54.00	-10.60	-5.86
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
2715.36	H	66.40	46.14	74.00	54.00	-7.60	-7.86
3178.50	H	55.31	35.05	74.00	54.00	-18.69	-18.95
3314.72	H	55.53	35.27	74.00	54.00	-18.47	-18.73

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " 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.

Operation Mode:	802.11b TX (Channel 11)	Test Date :	September 15, 2014
Frequency Range:	Above 1GHz	Temperature :	24℃
Test Result:	PASS	Humidity :	53 %
Measured Distance:	3m	Test By:	SYP

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
4487.18	V	51.61	35.11	74.00	54.00	-22.39	-18.89
6448.72	V	51.78	35.28	74.00	54.00	-22.22	-18.72
9527.24	V	53.17	36.67	74.00	54.00	-20.83	-17.33
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
6530.45	H	53.02	36.52	74.00	54.00	-20.98	-17.48
8383.01	H	53.69	37.19	74.00	54.00	-20.31	-16.81
9445.51	H	53.47	36.97	74.00	54.00	-20.53	-17.03

No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.247.

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " -- " 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.

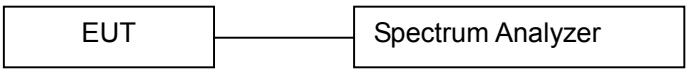
7. 6dB Bandwidth Test

7.1 Measurement Procedure

The EUT was operating in IEEE 802.11b/g/n mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

1. The testing follows FCC KDB Publication No. 558074 DTS 001 Meas. Guidance v03r02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously
4. Make the measurement with the spectrum analyzer 's resolution bandwidth (RBW) = 100 kHz.Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement The 6dB bandwidth must be greater than 500 kHz
5. Measure and record the results in the test report.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

7.4 Measurement Results

6db Bandwidth Test Data Chart:
Refer to attached data chart.

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11b		Antenna:	A

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	9.561	6db Bandwidth
6	2437	9.881	6db Bandwidth
11	2462	9.559	6db Bandwidth

x dB -6.00 dB
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
13.390 MHz
Total Power 21.1 dBm
Transmit Freq Error -17.949 kHz
OBW Power 99.00 %
x dB Bandwidth 9.881 MHz
x dB -6.00 dB
Detector
Peak
Auto
Man

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
13.413 MHz
Total Power 21.7 dBm
Transmit Freq Error -56.345 kHz
OBW Power 99.00 %
x dB Bandwidth 9.559 MHz
x dB -6.00 dB
Detector
Peak
Auto
Man

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11b		Antenna:	B

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	9.560	6db Bandwidth
6	2437	9.552	6db Bandwidth
11	2462	9.557	6db Bandwidth

x dB -6.00 dB
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
13.392 MHz
Total Power
21.1 dBm
Transmit Freq Error
-19.666 kHz
OBW Power
99.00 %
x dB Bandwidth
9.552 MHz
x dB
-6.00 dB
Detector
Peak
Auto
Man

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 22.00 dBm
Center Freq
2.462000000 GHz
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
13.413 MHz
Total Power
21.8 dBm
Freq Offset
0 Hz
Transmit Freq Error
-55.008 kHz
OBW Power
99.00 %
x dB Bandwidth
9.557 MHz
x dB
-6.00 dB

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11g		Antenna:	A

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	16.46	6db Bandwidth
6	2437	16.58	6db Bandwidth
11	2462	16.59	6db Bandwidth

Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 22.00 dBm
Center Freq
2.437000000 GHz
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
16.506 MHz
Total Power
20.2 dBm
Freq Offset
0 Hz
Transmit Freq Error
1.551 kHz
OBW Power
99.00 %
x dB Bandwidth
16.58 MHz
x dB
-6.00 dB

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 22.00 dBm
Center Freq
2.462000000 GHz
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
16.504 MHz
Total Power
20.9 dBm
Freq Offset
0 Hz
Transmit Freq Error
-16.551 kHz
OBW Power
99.00 %
x dB Bandwidth
16.59 MHz
x dB
-6.00 dB

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11g		Antenna:	B

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	16.60	6db Bandwidth
6	2437	16.59	6db Bandwidth
11	2462	16.59	6db Bandwidth

Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 22.00 dBm
Center Freq
2.437000000 GHz
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
16.505 MHz
Total Power
20.0 dBm
Transmit Freq Error
2.478 kHz
OBW Power
99.00 %
x dB Bandwidth
16.59 MHz
x dB
-6.00 dB
Freq Offset
0 Hz

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 22.00 dBm
Center Freq
2.462000000 GHz
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
16.511 MHz
Total Power
20.8 dBm
Transmit Freq Error
-12.009 kHz
OBW Power
99.00 %
x dB Bandwidth
16.59 MHz
x dB
-6.00 dB
Freq Offset
0 Hz

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11 n (HT20)		Antenna:	A

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	17.63	6db Bandwidth
6	2437	17.84	6db Bandwidth
11	2462	17.82	6db Bandwidth

x dB -6.00 dB
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.702 MHz
Total Power
19.8 dBm
Transmit Freq Error
-3.618 kHz
OBW Power
99.00 %
x dB Bandwidth
17.84 MHz
x dB
-6.00 dB
Detector
Peak
Auto
Man
File <Screen_0079.png> saved

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.704 MHz
Total Power
20.6 dBm
Transmit Freq Error
-11.492 kHz
OBW Power
99.00 %
x dB Bandwidth
17.82 MHz
x dB
-6.00 dB
Detector
Peak
Auto
Man
File <Screen_0081.png> saved

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11 n (HT20)		Antenna:	B

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
1	2412	17.85	6db Bandwidth
6	2437	17.73	6db Bandwidth
11	2462	17.83	6db Bandwidth

x dB -6.00 dB
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.701 MHz
Total Power
19.8 dBm
Transmit Freq Error
-3.194 kHz
OBW Power
99.00 %
x dB Bandwidth
17.73 MHz
x dB
-6.00 dB
Detector
Auto
Man

Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 22.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
17.711 MHz
Total Power
20.9 dBm
Transmit Freq Error
-12.456 kHz
OBW Power
99.00 %
x dB Bandwidth
17.83 MHz
x dB
-6.00 dB
Detector
Auto
Man

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11 n (HT40)		Antenna:	A

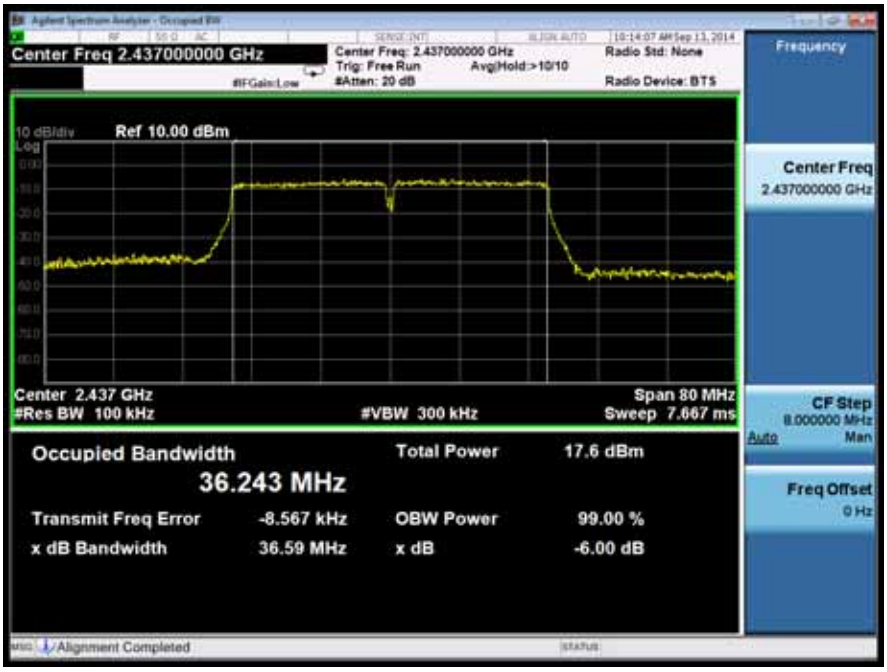
Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
3	2422	36.49	6db Bandwidth
6	2437	36.58	6db Bandwidth
9	2452	36.59	6db Bandwidth

Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80 MHz
Sweep 7.667 ms
Occupied Bandwidth
36.237 MHz
Total Power 17.4 dBm
Transmit Freq Error -11.115 kHz
OBW Power 99.00 %
x dB Bandwidth 36.58 MHz
x dB -6.00 dB
Detector
Auto
Man

x dB -6.00 dB
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80 MHz
Sweep 7.667 ms
Occupied Bandwidth
36.234 MHz
Total Power 16.7 dBm
Transmit Freq Error -27.956 kHz
OBW Power 99.00 %
x dB Bandwidth 36.59 MHz
x dB -6.00 dB
Detector
Auto
Man
File <Screen_0110.png> saved

Spectrum Detector:	PK	Test Date:	September 12, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode: 802.11 n (HT40)		Antenna:	B

Channel number	Channel frequency (MHz)	Measurement level (MHz)	Mode
3	2422	36.44	6db Bandwidth
6	2437	36.59	6db Bandwidth
9	2452	36.42	6db Bandwidth


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 10.00 dBm
Center Freq
2.437000000 GHz
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80 MHz
Sweep 7.667 ms
CF Step
8.000000 MHz
Auto
Man
Occupied Bandwidth
36.243 MHz
Total Power
17.6 dBm
Freq Offset
0 Hz
Transmit Freq Error
-8.567 kHz
OBW Power
99.00 %
x dB Bandwidth
36.59 MHz
x dB
-6.00 dB
Alignment Completed

Agilent Spectrum Analyzer - Occupied BW
x dB -6.00 dB
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 10.00 dBm
Clear Write
Average
Max Hold
Min Hold
Center 2.452 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80 MHz
Sweep 7.667 ms
Occupied Bandwidth
36.240 MHz
Total Power
16.9 dBm
Detector
Peak
Auto
Man
Transmit Freq Error
-26.399 kHz
OBW Power
99.00 %
x dB Bandwidth
36.42 MHz
x dB
-6.00 dB

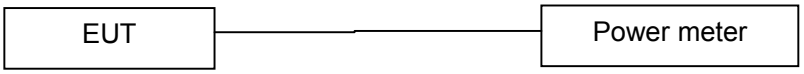
8. Maximum Peak Output Power Test

8.1 Measurement Procedure

The maximum peak conducted output power can be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast, average-responding diode type sensor.

a. The Transmitter output (antenna port) was connected to the power meter.
b. Turn on the EUT and power meter and then record the peak power value.
c. Repeat above procedures on all channels needed to be tested.

8.2 Test SET-UP (Block Diagram of Configuration)



8.3 Measurement Equipment Used

EQUIPMENT TYPE	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power meter	ML2495A	0824006	05/17/2014	05/16/2015
Power sensor	MA2411B	0738172	05/17/2014	05/16/2015

8.4 Peak Power output limit

The maximum peak power shall be less 1Watt.

8.5 Measurement Results

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11b	Antenna:	A

Channel number	Channel Frequency(MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412	19.66	1W(30dBm)	PASS
6	2437	19.86	1W(30dBm)	PASS
11	2462	20.67	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11b	Antenna:	B

Channel number	Channel Frequency(MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412	19.68	1W(30dBm)	PASS
6	2437	19.87	1W(30dBm)	PASS
11	2462	20.53	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11g	Antenna:	A

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	21.63	1W(30dBm)	PASS
6	2437.00	21.55	1W(30dBm)	PASS
11	2462.00	21.52	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11g	Antenna:	B

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	21.80	1W(30dBm)	PASS
6	2437.00	21.44	1W(30dBm)	PASS
11	2462.00	22.24	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11n H20	Antenna:	A

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	21.54	1W(30dBm)	PASS
6	2437.00	21.50	1W(30dBm)	PASS
11	2462.00	21.34	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11n H20	Antenna:	B

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
1	2412.00	21.50	1W(30dBm)	PASS
6	2437.00	21.33	1W(30dBm)	PASS
11	2462.00	22.52	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11n H40	Antenna:	A

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
3	2422.00	18.54	1W(30dBm)	PASS
6	2437.00	18.80	1W(30dBm)	PASS
9	2452.00	18.11	1W(30dBm)	PASS

Spectrum Detector:	PK	Test Date:	September 13, 2014
Test By:	KK	Temperature:	24°C
Test Result:	PASS	Humidity:	53 %
Operation Mode:	802.11n H40	Antenna:	B

Channel number	Channel Frequency (MHz)	Peak Power output(dBm)	Peak Power Limit(W)	Pass/Fail
3	2422.00	18.17	1W(30dBm)	PASS
6	2437.00	18.68	1W(30dBm)	PASS
9	2452.00	18.03	1W(30dBm)	PASS

9. Band Edge Test

9.1 Measurement Procedure

1. The EUT was Operating in could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz.

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz.

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

9.2 Test SET-UP (Block Diagram of Configuration)

As 6.2 Test set up (B) and (C)

9.3 Measurement Equipment Used

Same as 6.3 Radiated Emission Measurement.

9.4 Measurement Results

Test mode: 802.11b

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	01	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2388.54	H	54.87	44.87	74	54
2396.35	V	53.95	43.69	74	54

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	11	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2484.50	H	53.98	40.95	74	54
2485.95	V	55.67	43.78	74	54

Test mode: 802.11g

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	01	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2369.87	H	55.45	40.55	74	54
2395.47	V	57.05	44.66	74	54

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	11	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2486.98	H	51.54	42.99	74	54
2490.36	V	51.56	40.33	74	54

Test mode: 802.11n HT20

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	01	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2391.74	H	53.77	41.85	74	54
2394.66	V	52.56	44.65	74	54

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	11	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2485.16	H	53.65	41.66	74	54
2484.33	V	54.59	44.55	74	54

Test mode: 802.11n HT40

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	01	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2383.65	H	50.66	40.78	74	54
2391.45	V	52.46	38.62	74	54

Spectrum Detector:	PK/AV	Test Date :	September 15, 2014
Test By:	KK	Temperature :	24°C
Test channel:	11	Humidity :	53 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2485.69	H	53.14	40.32	74	54
2484.64	V	50.44	42.16	74	54

10. Power Density

10.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

10.2 Measuring Instruments and Setting

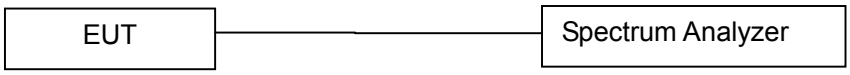
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS bandwidth.
RB	3kHz ≤RBW ≤100KHz
VB	3 x RBW
Detector	Peak
Trace	Max hold
Sweep Time	Automatic

10.3 Test Procedures

a. The transmitter output (antenna port) was connected to the spectrum analyzer.
b. Set analyzer center frequency to DTS channel center frequency.
c. Set the analyzer span to a minimum of 1.5 times the DTS bandwidth.
d. Set the RBW ≥ 3 kHz. Set the VBW ≥ 3 x RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

10.4 Block Diagram of Test Setup



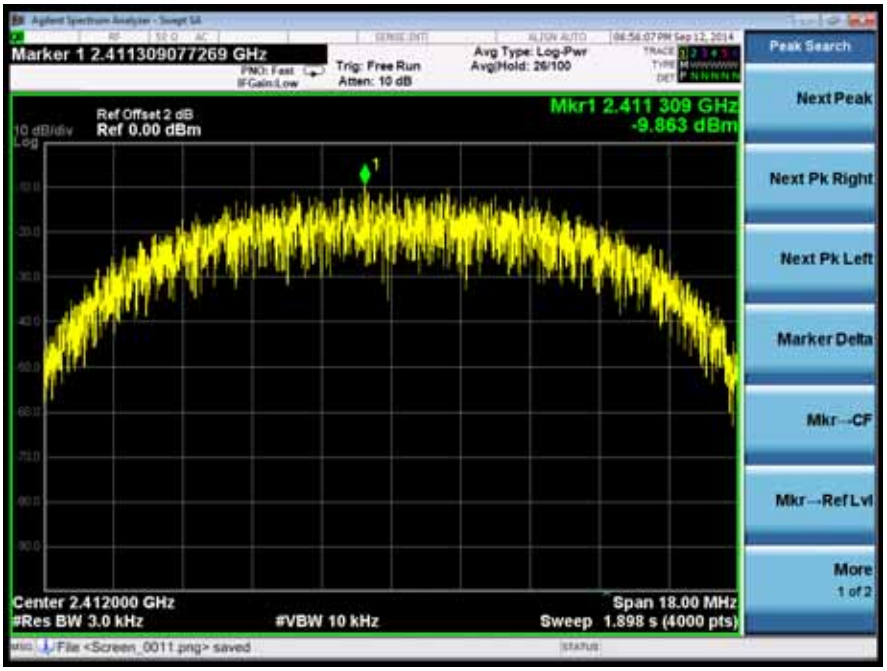
10.5 Limit

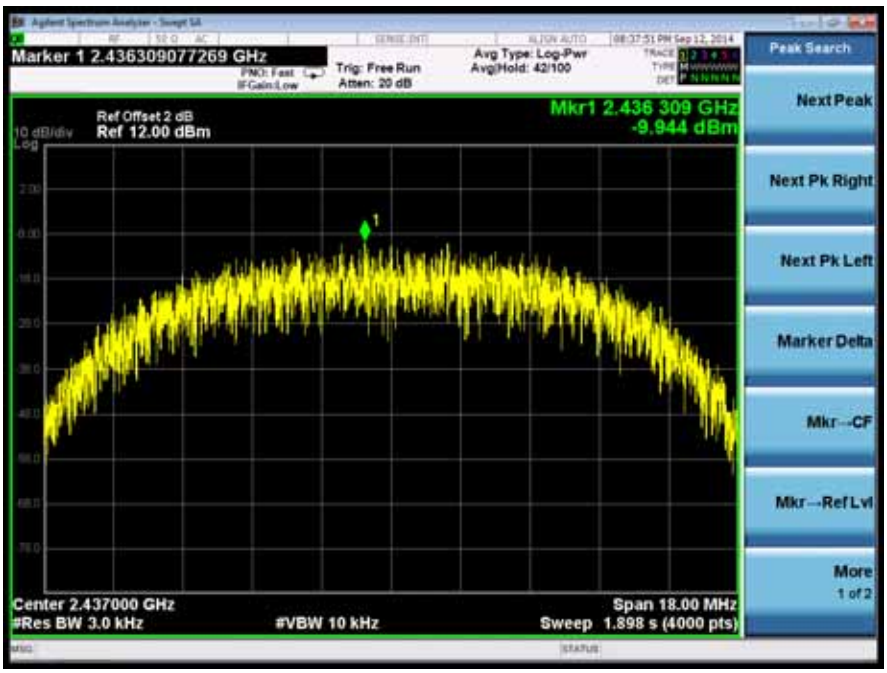
The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3 kHz bandwidth.

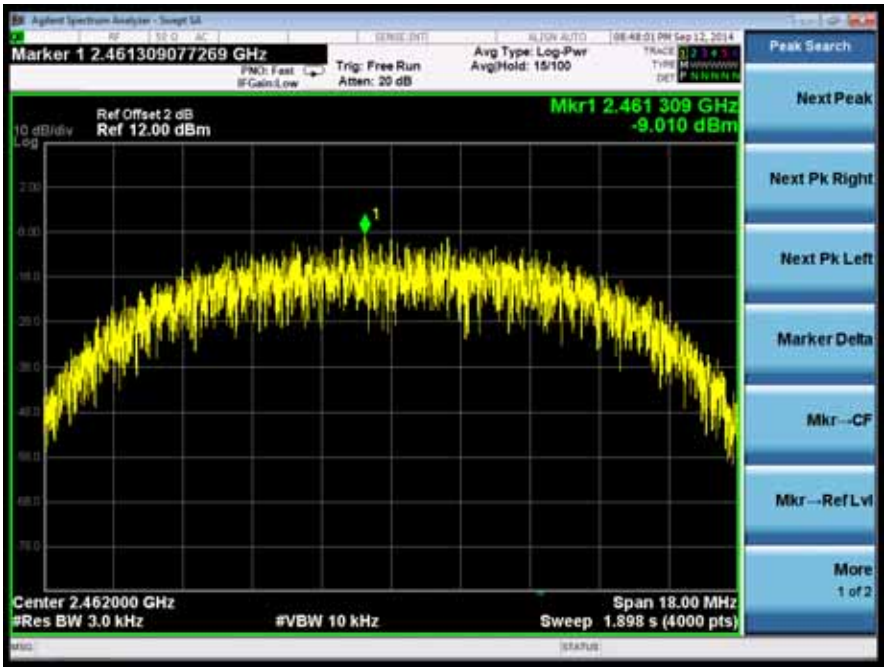
10.6 Test Result

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11 b	Antenna:	A

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-9.863	<8dBm	PASS
6	-9.944	<8dBm	PASS
11	-9.010	<8dBm	PASS

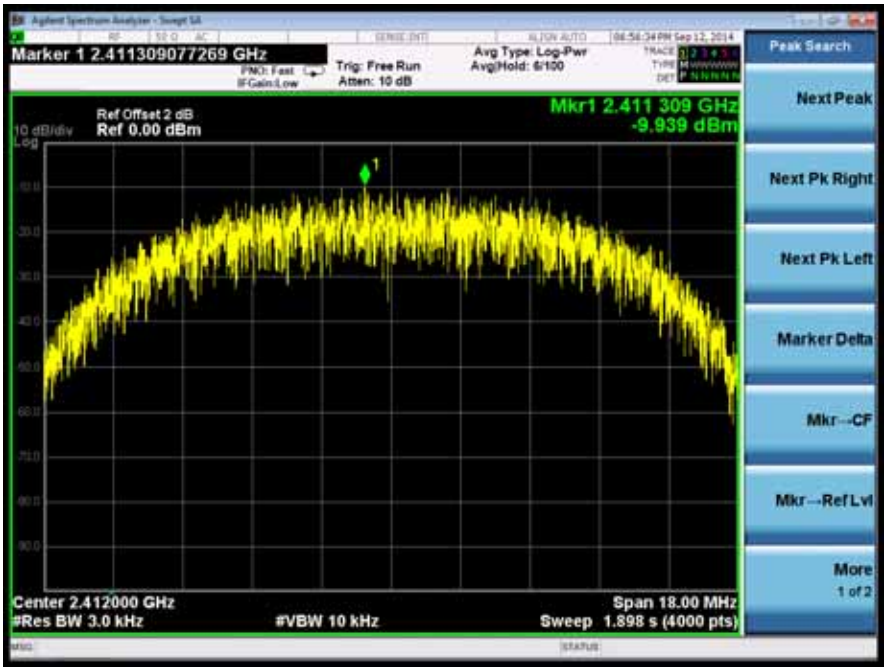


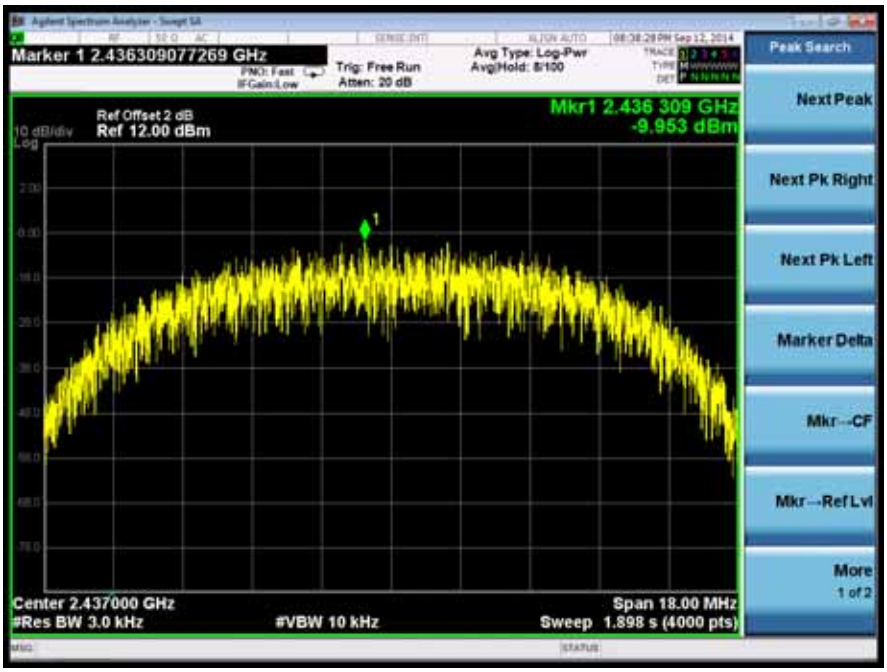

Marker 1 2.436309077269 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg/Hold: 42/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 309 GHz
-9.944 dBm
Center 2.437000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 18.00 MHz
Sweep 1.898 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

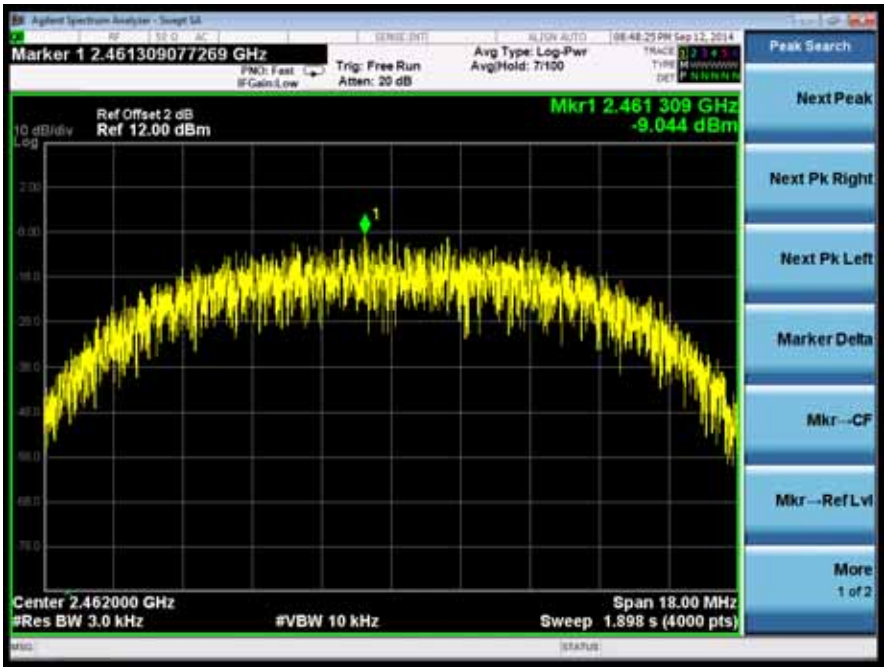

Marker 1 2.461309077269 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg/Hold: 15/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.461 309 GHz
-9.010 dBm
Center 2.462000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 18.00 MHz
Sweep 1.898 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11 b	Antenna:	B

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-9.939	<8dBm	PASS
6	-9.953	<8dBm	PASS
11	-9.044	<8dBm	PASS

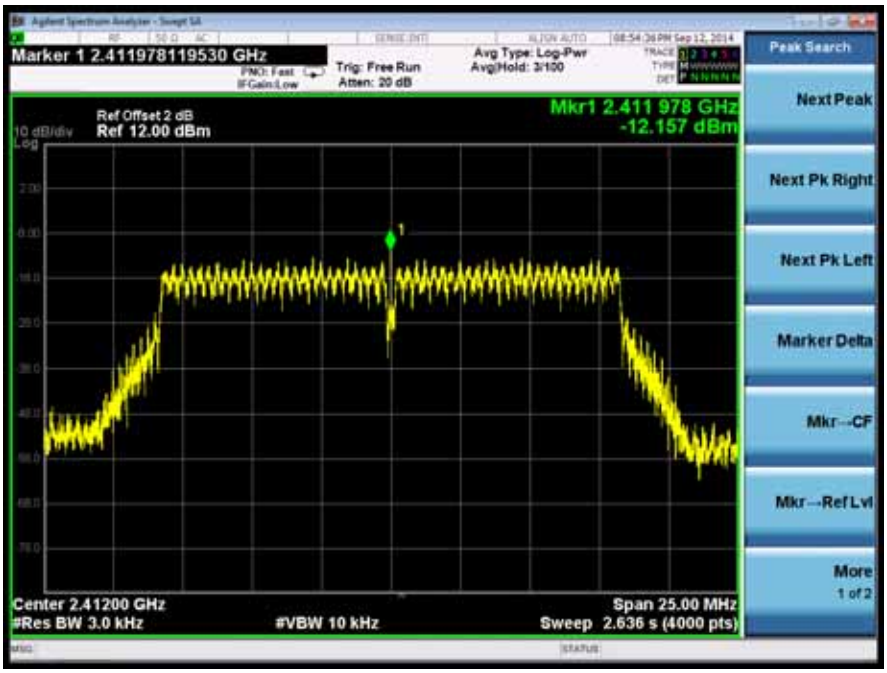




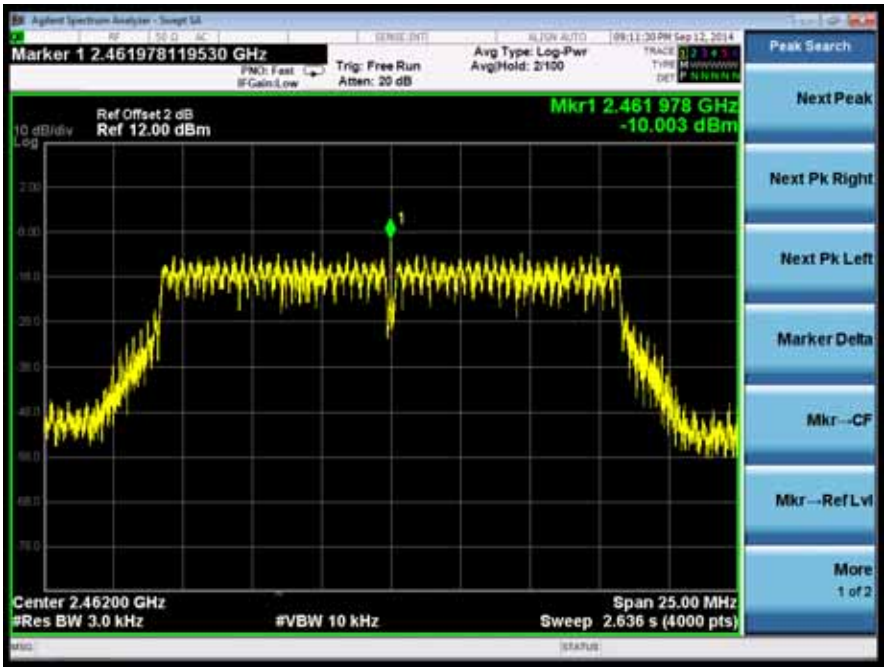

Marker 1 2.461309077269 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 7/100
Ref Offset 2 dB
10 dB/div Ref 12.00 dBm
Mkr1 2.461 309 GHz
-9.044 dBm
Center 2.462000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 18.00 MHz
Sweep 1.898 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11 g	Antenna	A

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-12.157	<8dBm	PASS
6	-11.508	<8dBm	PASS
11	-10.003	<8dBm	PASS

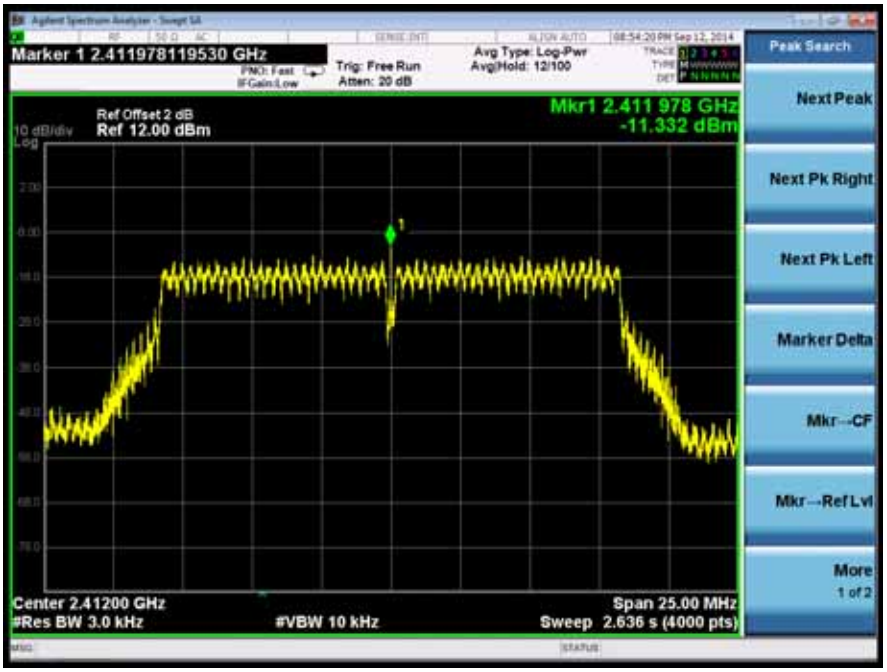


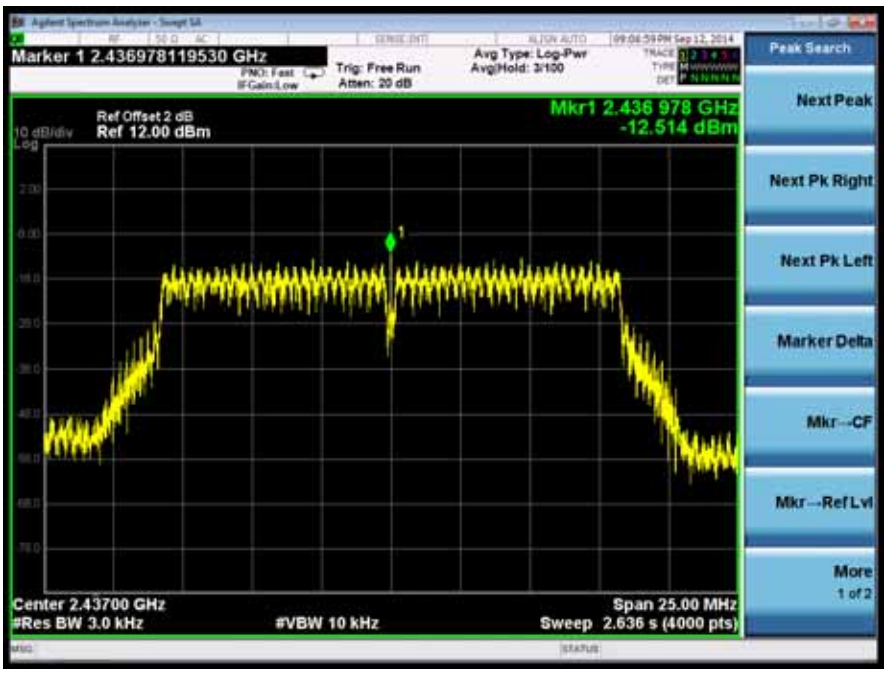
Marker 1 2.436978119530 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 978 GHz
-11.508 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

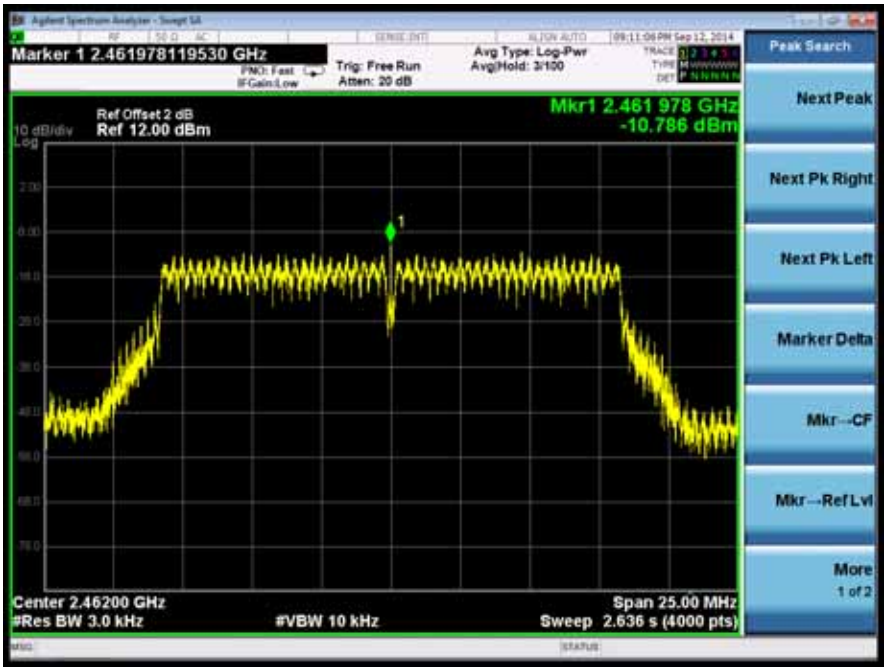

Marker 1 2.461978119530 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.461 978 GHz
-10.003 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11 g	Antenna	B

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
1	-11.332	<8dBm	PASS
6	-12.514	<8dBm	PASS
11	-10.786	<8dBm	PASS



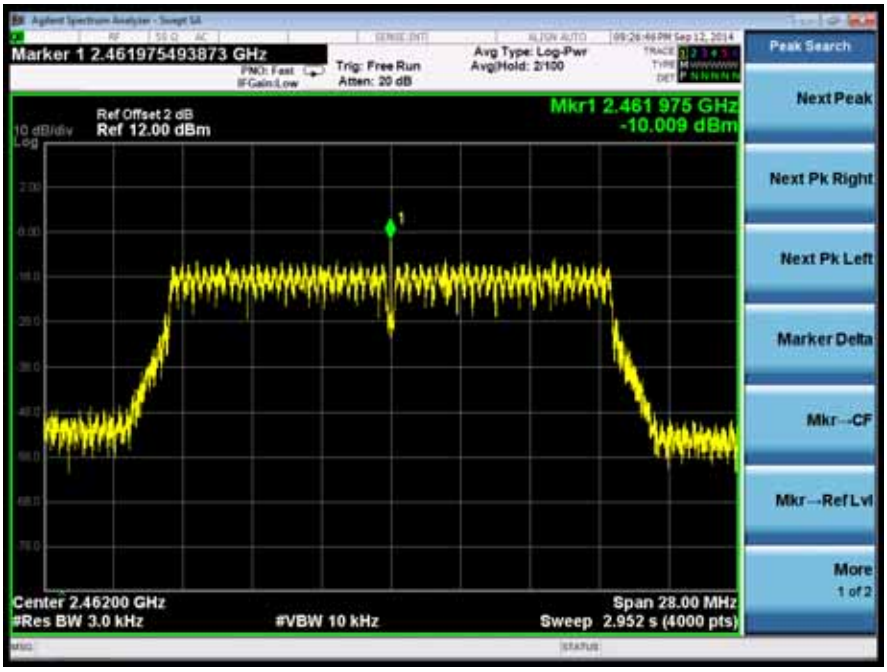

Marker 1 2.436978119530 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 3/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 978 GHz
-12.514 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Marker 1 2.461978119530 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 3/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.461 978 GHz
-10.786 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 25.00 MHz
Sweep 2.636 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11n HT20	Antenna	A

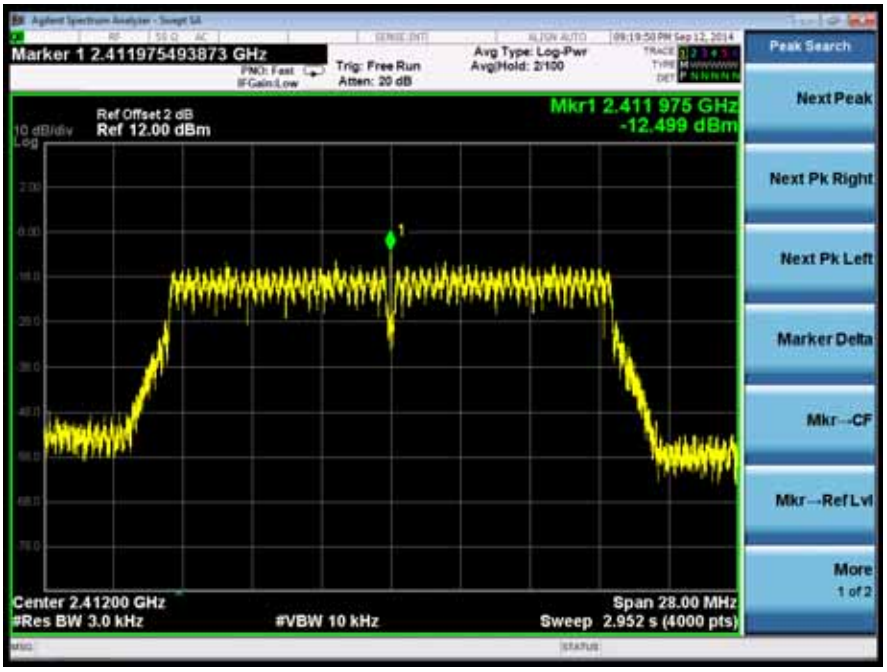
Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
l	-11.515	<8dBm	PASS
6	-11.258	<8dBm	PASS
11	-10.009	<8dBm	PASS

Marker 1 2.436975493873 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 3/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 975 GHz
-11.258 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 28.00 MHz
Sweep 2.952 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Marker 1 2.461975493873 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.461 975 GHz
-10.009 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 28.00 MHz
Sweep 2.952 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11n HT20	Antenna	B

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
l	-12.499	<8dBm	PASS
6	-11.654	<8dBm	PASS
11	-10.046	<8dBm	PASS

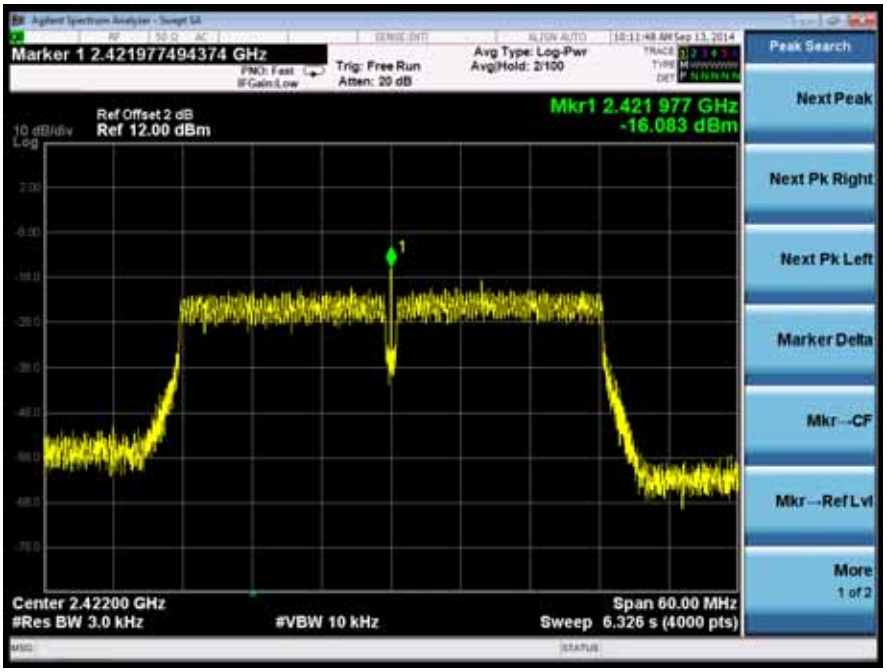


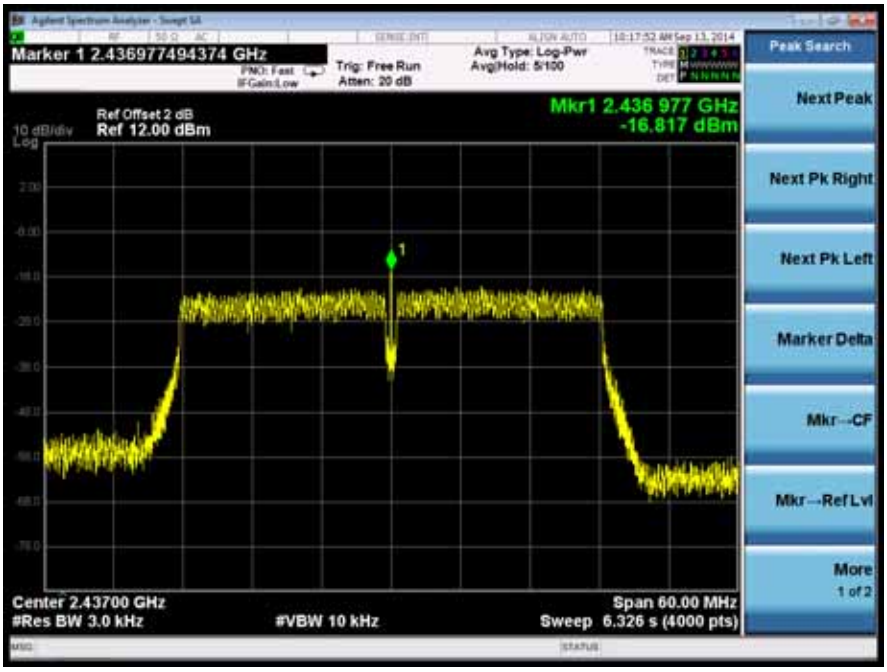
Marker 1 2.436975493873 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 3/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 975 GHz
-11.654 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 28.00 MHz
Sweep 2.952 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

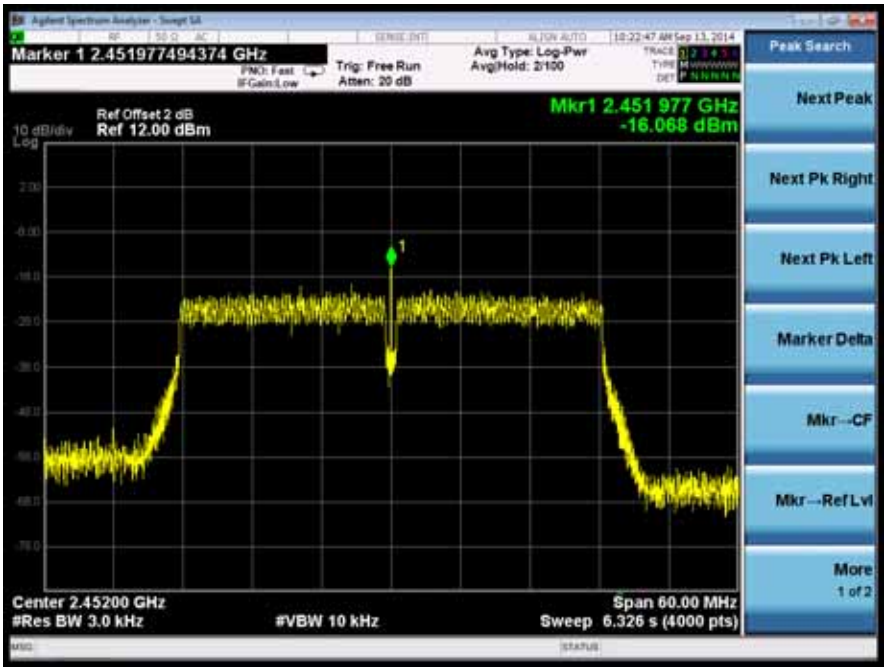
Marker 1 2.461975493873 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.461 975 GHz
-10.046 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 28.00 MHz
Sweep 2.952 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11n HT40	Antenna:	A

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
3	-16.083	<8dBm	PASS
6	-16.817	<8dBm	PASS
9	-16.068	<8dBm	PASS

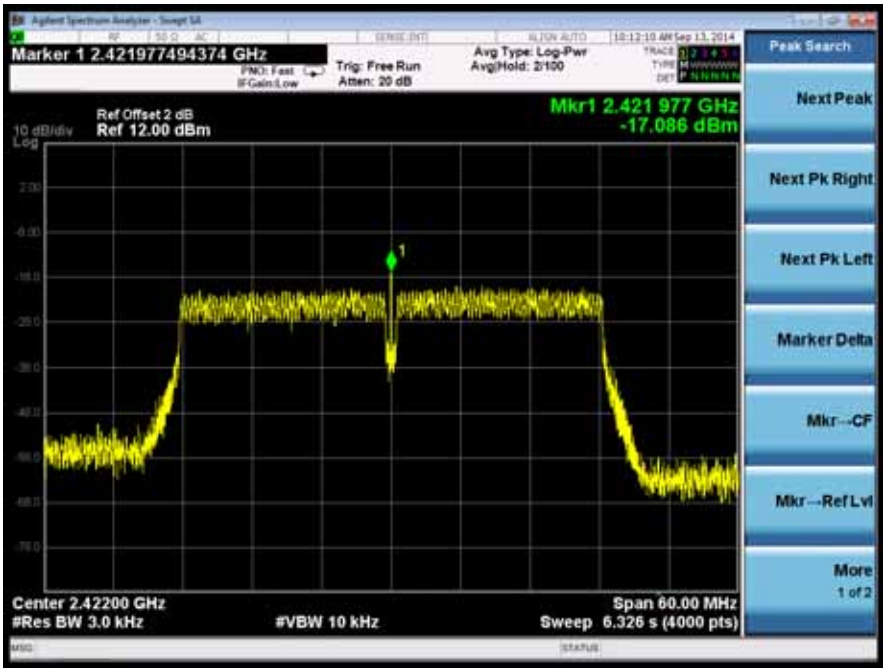


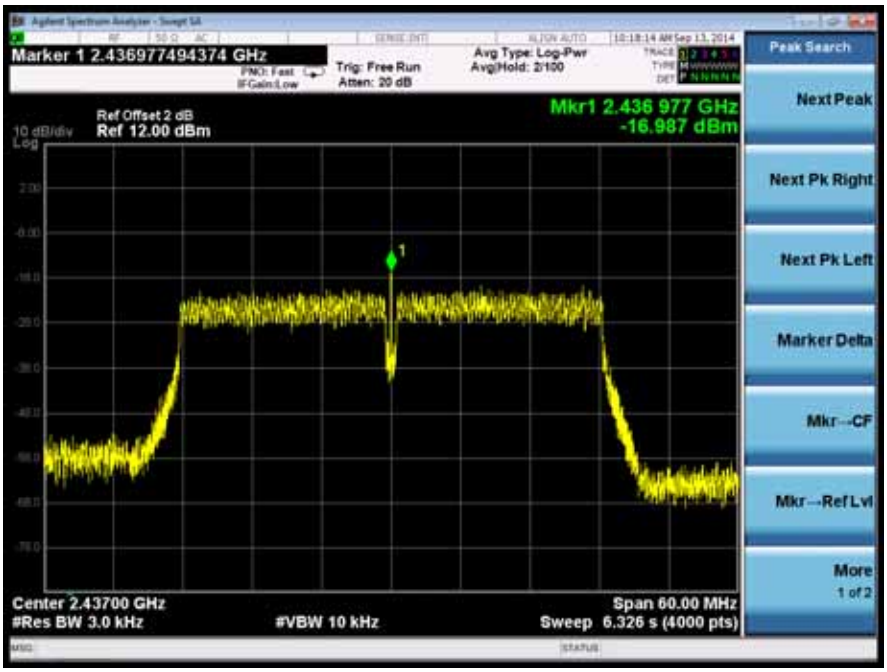

Marker 1 2.436977494374 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 5/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 977 GHz
-16.817 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 60.00 MHz
Sweep 6.326 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

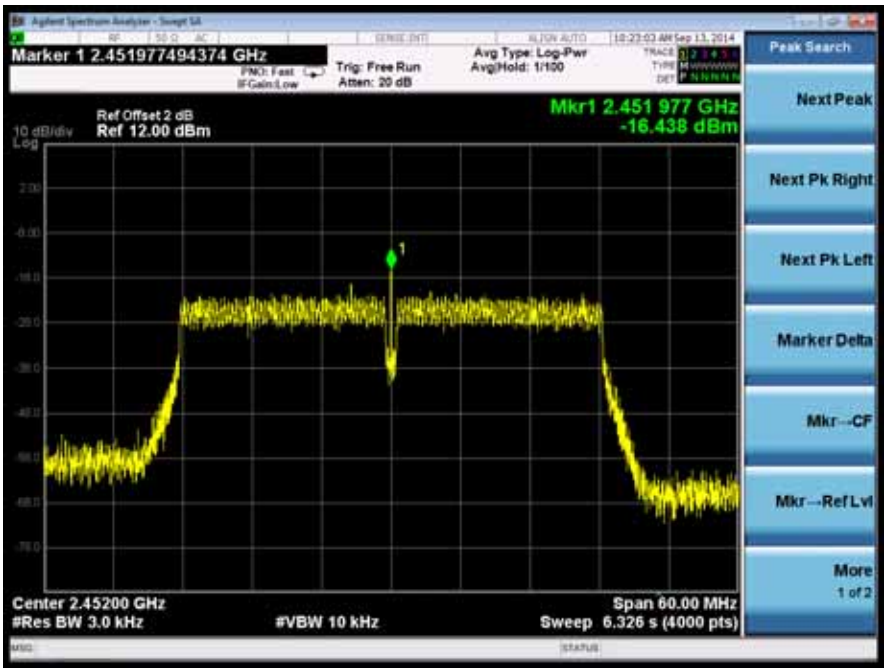

Marker 1 2.451977494374 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.451 977 GHz
-16.068 dBm
Center 2.45200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 60.00 MHz
Sweep 6.326 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Spectrum Detector:	PK	Test Date :	September 12, 2014
Test By:	KK	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Operation Mode:	802.11n HT40	Antenna:	B

Channel	Measurement Level (dBm)	Required Limit (dBm)	Result
3	-17.086	<8dBm	PASS
6	-16.987	<8dBm	PASS
9	-16.438	<8dBm	PASS




Marker 1 2.436977494374 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.436 977 GHz
-16.987 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 60.00 MHz
Sweep 6.326 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Marker 1 2.451977494374 GHz
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
Ref Offset 2 dB
10 dB/div
Ref 12.00 dBm
Mkr1 2.451 977 GHz
-16.438 dBm
Center 2.45200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 60.00 MHz
Sweep 6.326 s (4000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

11. Antenna Port Emission

11.1 Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Signal Analyzer	Agilent	N9010A	My53470879	05/17/2014	05/16/2015

11.2 Measuring Instruments and Setting

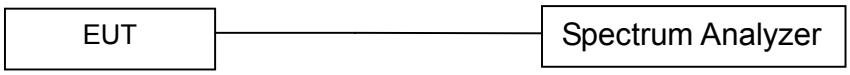
The following table is the setting of spectrum analyzer.

Spectrum analyzer	Setting
Attenuation	Auto
RB	100kHz
VB	300KHz
Detector	Peak
Trace	Max hold

11.3 Test Procedures

The conducted spurious emissions were measured conducted using a spectrum analyzer at low, Middle, and high channels, the limit was determined by attenuation 20dB of the RF peak power output.

11.4 Block Diagram of Test setup

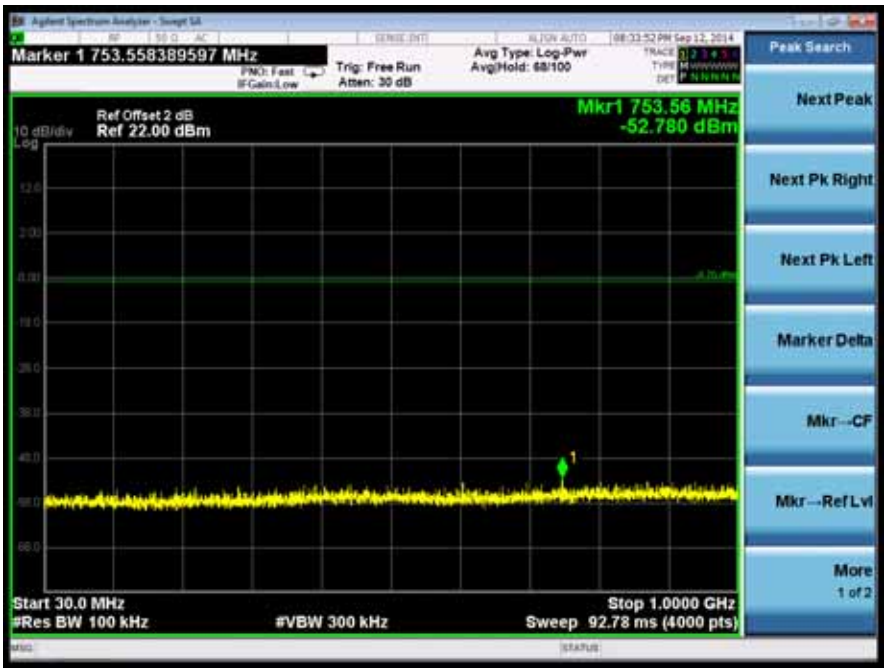


11.5 Test Result

PASS.

802.11b Low Channel 1

802.11b Mid Channel 6



802.11b High Channel 11

12. Antenna Application

12.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 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 FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2 Result

The EUT'S antenna is Metal antenna, and the antenna can't be replaced by the user, which in accordance to section 15.203, please refer to the internal photos. The antenna's gain is 2.0dBi and meets the requirement.