

## FCC PART 15.247

## TEST REPORT

For

### Huawei Technologies Co., Ltd.

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**FCC ID: QISEA260-135**

<b>Report Type:</b> Original Report	<b>Product Type:</b> LTE CPE
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<b>Report Number:</b> RDG150403001-00B	
<b>Report Date:</b> 2015-04-30	
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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *Huawei Technologies Co., Ltd.*'s product, model number: *eA260-135* (FCC ID: *QISEA260-135*) (the "EUT") in this report was a *LTE CPE*, which was measured approximately: 19.0 cm (L) x 3.5 cm (W) x 17.6 cm (H), rated input voltage: DC 12V from adapter.

Adapter information:  
Model: HW-120200U6W  
Input: AC 100-240V, 50/60Hz, 0.8A  
Output: DC 12V, 2.0A

*\* All measurement and test data in this report was gathered from production sample serial number: 150403001 (Assigned by BACL, Dongguan). The EUT was received on 2015-04-07*

### Objective

This report is prepared on behalf of *Huawei Technologies Co., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

### Related Submittal(s)/Grant(s)

FCC PCB submissions with FCC ID: QISEA260-135.  
FCC JBP submissions with FCC ID: QISEA260-135.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer. For For 2.4GHz band, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

For 802.11b, 802.11g, and 802.11n ht20 modes were tested with Channel 1, 6 and 11. For 802.11n ht40 mode were tested with Channel 3, 6 and 9.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

### EUT Exercise Software

The test software: 'IPOP' was used in testing, which was provided by manufacturer, and configured the maximum power with 100% duty cycle as following table:

Test Mode	Test Software Version	IPOP		
		2412MHz	2437MHz	2462MHz
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting (Chain 0)	1500	1500	1400
	Power Level Setting (Chain 1)	1600	1500	1600
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting (Chain 0)	1600	1600	1500
	Power Level Setting (Chain 1)	1700	1600	1700
802.11n20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS8	MCS8	MCS8
	Power Level Setting (Chain 0)	1500	1500	1400
	Power Level Setting (Chain 1)	1600	1500	1600
802.11n40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS8	MCS8	MCS8
	Power Level Setting (Chain 0)	1500	1500	1500
	Power Level Setting (Chain 1)	1600	1500	1500

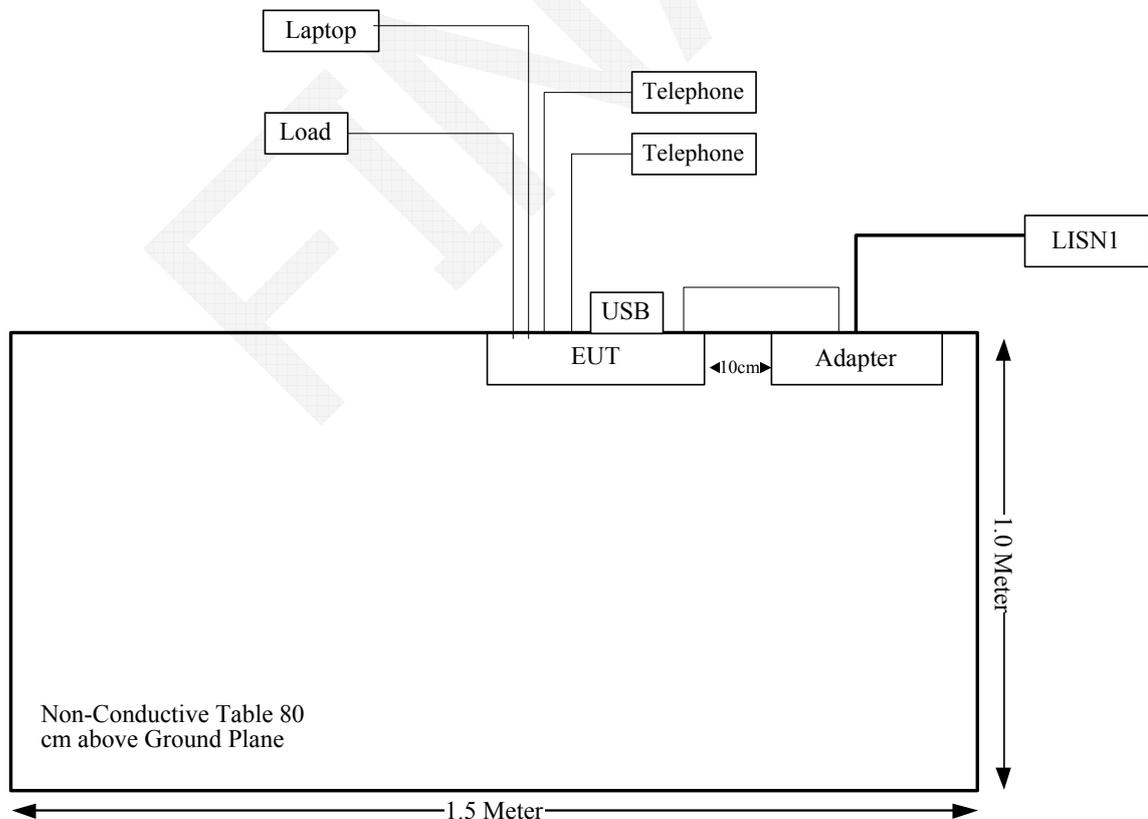
**Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
TOSHIBA	Flash Disk	N/A	N/A
DELL	Laptop	PP11L	QDS-BRCM1017
AVAYA	Telephone	6408D+	A21654513314
AVAYA	Telephone	6408D+	041654712819

**External I/O Cable**

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	No	10	Laptop	EUT
RJ11 Cable	No	No	10	Telephone	EUT
RJ11 Cable	No	No	10	Telephone	EUT
RJ45 Cable*3	No	No	10	Load	EUT

**Block Diagram of Test Setup**



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

**FCC §15.247 (i) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

According to subpart 1.1307 (b)(1)and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; \* = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

**Calculated Formulary:**

Predication of MPE limit at a given distance

S = PG/4πR<sup>2</sup> = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

**Calculated Data:**

Mode	Frequency Range (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
Wi-Fi	2412-2462	-3.00	0.50	23.41	219.28	20.00	0.02	1.0
LTE	3650-3700	5.50	3.55	17.66	58.34	20.00	0.04	1.0

Wi-Fi (2.4 G) and LTE can transmit simultaneously, MPE evaluation is as below formula:

PD1/Limit1+PD2/Limit2+..... < 1, PD (Power Density)

= 0.02/1+0.04/1=0.06 < 1

Result: MPE evaluation of single and simultaneous transmission meet the requirement of standard.

## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

### **Antenna Connector Construction**

The EUT has two internal PCB antennas and the gains of both antennas are -3.0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

**FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS**

**Applicable Standard**

FCC§15.207

**Measurement Uncertainty**

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

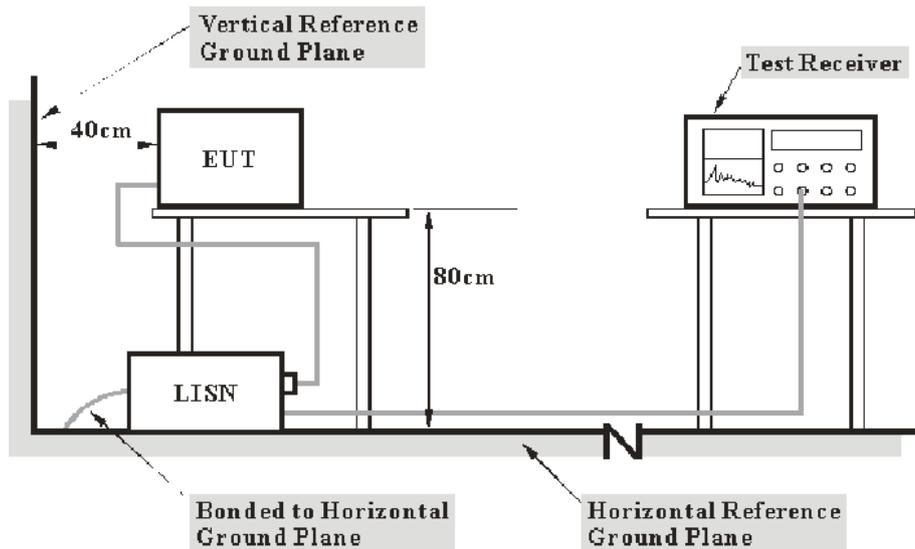
- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2:2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of  $U_{cispr}$

Measurement	$U_{cispr}$
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

**EUT Setup**



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

$V_C$  (cord. Reading): corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN

$C_f$ : Correction Factor

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2014-10-20	2015-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2014-06-09	2015-06-09
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-12-11	2015-12-11
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

**12.90 dB at 0.163741 MHz** in the **Line** conducted mode

### Test Data

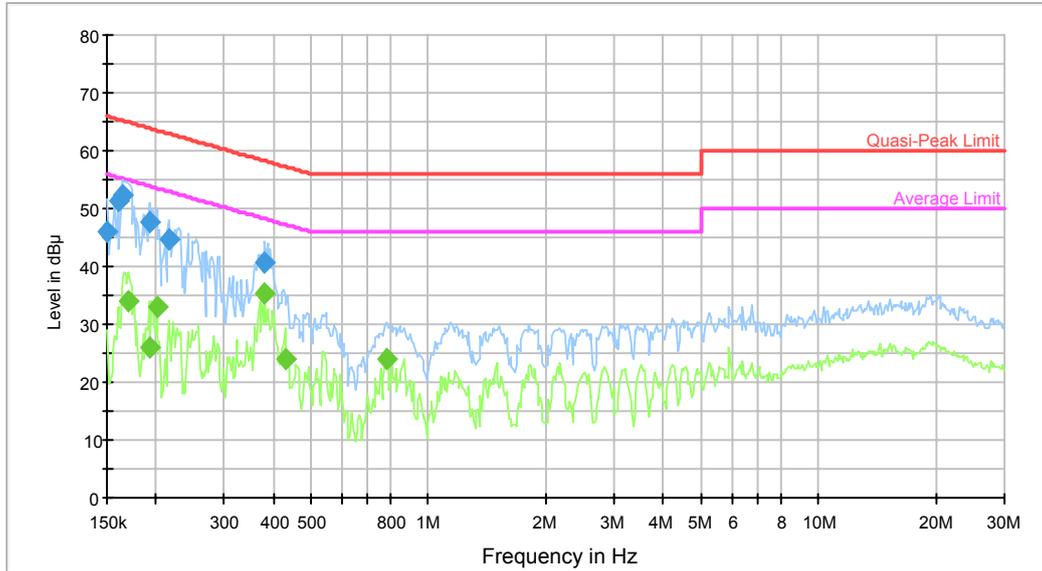
#### Environmental Conditions

<b>Temperature:</b>	22.2 °C
<b>Relative Humidity:</b>	59 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Allen Qiao on 2015-04-13.*

Test Mode: Transmitting

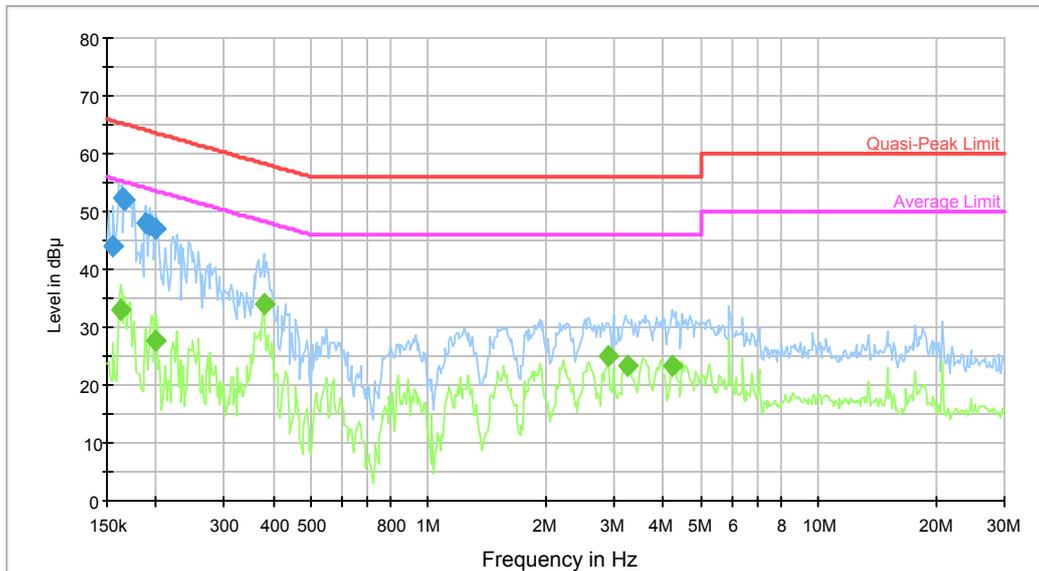
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	46.0	9.000	L1	10.2	20.0	66.0	Compliance
0.159873	51.3	9.000	L1	10.2	14.2	65.5	Compliance
0.163741	52.4	9.000	L1	10.2	12.9	65.3	Compliance
0.192030	47.7	9.000	L1	10.2	16.2	63.9	Compliance
0.216409	44.6	9.000	L1	10.2	18.4	63.0	Compliance
0.381043	40.6	9.000	L1	10.3	17.7	58.3	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170396	33.8	9.000	L1	10.2	21.1	54.9	Compliance
0.192030	26.1	9.000	L1	10.2	27.9	53.9	Compliance
0.201433	33.1	9.000	L1	10.2	20.4	53.6	Compliance
0.381043	35.3	9.000	L1	10.3	13.0	48.3	Compliance
0.429420	24.0	9.000	L1	10.2	23.3	47.3	Compliance
0.780588	24.1	9.000	L1	10.4	21.9	46.0	Compliance

**AC120 V, 60 Hz, Neutral:**



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.156097	44.1	9.000	N	10.2	21.6	65.7	Compliance
0.163741	52.2	9.000	N	10.2	13.1	65.3	Compliance
0.166371	51.9	9.000	N	10.2	13.2	65.1	Compliance
0.188994	48.1	9.000	N	10.2	16.0	64.1	Compliance
0.192030	47.8	9.000	N	10.2	16.2	63.9	Compliance
0.199835	47.1	9.000	N	10.2	16.5	63.6	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.162441	33.2	9.000	N	10.2	22.2	55.3	Compliance
0.199835	27.7	9.000	N	10.2	25.9	53.6	Compliance
0.378019	33.8	9.000	N	10.3	14.5	48.3	Compliance
2.906762	25.1	9.000	N	10.6	20.9	46.0	Compliance
3.249802	23.3	9.000	N	10.6	22.7	46.0	Compliance
4.227217	23.3	9.000	N	10.7	22.7	46.0	Compliance

## FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 2, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

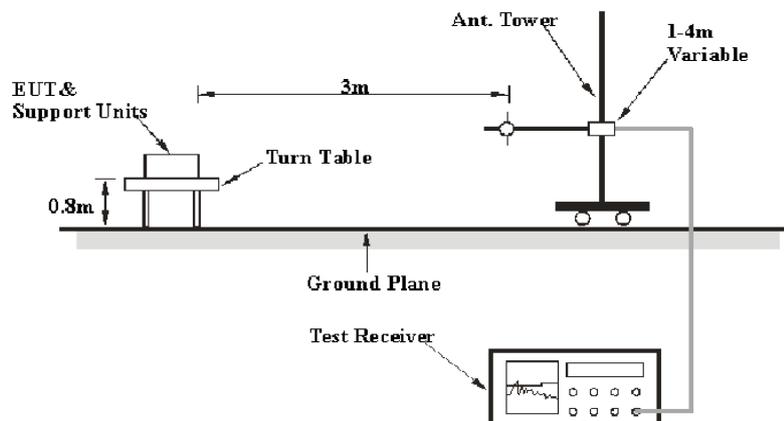
6G~18GHz: 5.23 dB

Table 2 – Values of  $U_{cispr}$

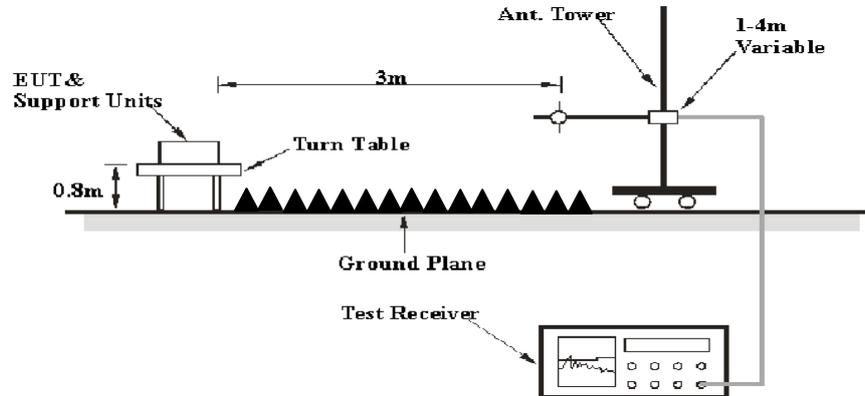
Measurement	$U_{cispr}$
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

### EUT Setup

#### Below 1GHz:



**Above 1GHz:**



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source

**EMI Test Receiver & Spectrum Analyzer Setup**

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

**Test Procedure**

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2014-12-04	2015-12-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2014-09-06	2015-09-06

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247, with the worst margin reading of:

**3.19 dB at 2483.5 MHz** in the **Horizontal** polarization for 802.11n 40 Mode

## Test Data

### Environmental Conditions

Temperature:	24.1°C
Relative Humidity:	58 %
ATM Pressure:	100.7 kPa

*The testing was performed by Allen Qiao on 2015-04-17.*

Mode: Transmitting  
802.11b Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2412 MHz									
2412	83.68	PK	H	25.67	3.68	0.00	113.03	N/A	N/A
2412	75.6	AV	H	25.67	3.68	0.00	104.95	N/A	N/A
2412	76.05	PK	V	25.67	3.68	0.00	105.40	N/A	N/A
2412	68.05	AV	V	25.67	3.68	0.00	97.40	N/A	N/A
2390	26.34	PK	V	25.61	3.63	0.00	55.58	74.00	18.42
2390	14.55	AV	V	25.61	3.63	0.00	43.79	54.00	10.21
4824	40.33	PK	V	30.64	5.03	27.41	48.59	74.00	25.41
4824	28.46	AV	V	30.64	5.03	27.41	36.72	54.00	17.28
7236	38.56	PK	V	34.17	6.65	25.90	53.48	74.00	20.52
7236	26.34	AV	V	34.17	6.65	25.90	41.26	54.00	12.74
9648	32.28	PK	V	36.06	8.55	27.46	49.43	74.00	24.57
9648	19.67	AV	V	36.06	8.55	27.46	36.82	54.00	17.18
5143	34.58	PK	V	31.39	5.31	27.19	44.09	74.00	29.91
5143	21.29	AV	V	31.39	5.31	27.19	30.80	54.00	23.20
46.49	41.82	QP	V	10.20	0.89	21.42	31.49	40.00	8.51
Middle Channel: 2437 MHz									
2437	83.27	PK	H	25.74	3.75	0.00	112.76	N/A	N/A
2437	75.38	AV	H	25.74	3.75	0.00	104.87	N/A	N/A
2437	75.55	PK	V	25.74	3.75	0.00	105.04	N/A	N/A
2437	67.13	AV	V	25.74	3.75	0.00	96.62	N/A	N/A
4874	39.9	PK	V	30.77	5.14	27.42	48.39	74.00	25.61
4874	28.11	AV	V	30.77	5.14	27.42	36.60	54.00	17.40
7311	38.24	PK	V	34.35	6.74	25.88	53.45	74.00	20.55
7311	25.84	AV	V	34.35	6.74	25.88	41.05	54.00	12.95
9748	32.05	PK	V	36.30	8.61	27.24	49.72	74.00	24.28
9748	19.44	AV	V	36.30	8.61	27.24	37.11	54.00	16.89
5143	34.21	PK	V	31.39	5.31	27.19	43.72	74.00	30.28
5143	21.03	AV	V	31.39	5.31	27.19	30.54	54.00	23.46
2367	35.45	PK	V	25.55	3.58	27.32	37.26	74.00	36.74
2367	22.18	AV	V	25.55	3.58	27.32	23.99	54.00	30.01
46.49	40.99	QP	V	10.20	0.89	21.42	30.66	40.00	9.34
High Channel: 2462 MHz									
2462	82.31	PK	H	25.80	3.75	0.00	111.86	N/A	N/A
2462	75.12	AV	H	25.80	3.75	0.00	104.67	N/A	N/A
2462	74.69	PK	V	25.80	3.75	0.00	104.24	N/A	N/A
2462	66.35	AV	V	25.80	3.75	0.00	95.90	N/A	N/A
2483.5	27.31	PK	H	25.86	3.67	0.00	56.84	74.00	17.16
2483.5	15.25	AV	H	25.86	3.67	0.00	44.78	54.00	9.22
4924	39.2	PK	H	30.90	5.34	27.43	48.01	74.00	25.99
4924	27.21	AV	H	30.90	5.34	27.43	36.02	54.00	17.98
7386	37.86	PK	H	34.53	6.83	25.86	53.36	74.00	20.64
7386	25.41	AV	H	34.53	6.83	25.86	40.91	54.00	13.09
9848	31.7	PK	H	36.54	8.66	26.94	49.96	74.00	24.04
9848	18.96	AV	H	36.54	8.66	26.94	37.22	54.00	16.78
5143	33.98	PK	H	31.39	5.31	27.19	43.49	74.00	30.51
5143	20.81	AV	H	31.39	5.31	27.19	30.32	54.00	23.68
46.49	40.32	QP	V	10.20	0.89	21.42	29.99	40.00	10.01

\*Within measurement uncertainty!

802.11g Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2412 MHz									
2412	80.56	PK	H	25.67	3.68	0.00	109.91	N/A	N/A
2412	66.46	AV	H	25.67	3.68	0.00	95.81	N/A	N/A
2412	74.65	PK	V	25.67	3.68	0.00	104.00	N/A	N/A
2412	61.84	AV	V	25.67	3.68	0.00	91.19	N/A	N/A
2390	34.16	PK	V	25.61	3.63	0.00	63.40	74.00	10.60
2390	16.65	AV	V	25.61	3.63	0.00	45.89	54.00	8.11
4824	36.35	PK	V	30.64	5.03	27.41	44.61	74.00	29.39
4824	23.84	AV	V	30.64	5.03	27.41	32.10	54.00	21.90
7236	34.25	PK	V	34.17	6.65	25.90	49.17	74.00	24.83
7236	22.17	AV	V	34.17	6.65	25.90	37.09	54.00	16.91
9648	30.45	PK	V	36.06	8.55	27.46	47.60	74.00	26.40
9648	18.36	AV	V	36.06	8.55	27.46	35.51	54.00	18.49
1136	36.67	PK	V	22.65	3.04	26.71	35.65	74.00	38.35
1136	22.48	AV	V	22.65	3.04	26.71	21.46	54.00	32.54
46.49	41.47	QP	V	10.20	0.89	21.42	31.14	40.00	8.86
Middle Channel: 2437 MHz									
2437	79.74	PK	H	25.74	3.75	0.00	109.23	N/A	N/A
2437	65.59	AV	H	25.74	3.75	0.00	95.08	N/A	N/A
2437	73.79	PK	V	25.74	3.75	0.00	103.28	N/A	N/A
2437	61.1	AV	V	25.74	3.75	0.00	90.59	N/A	N/A
4874	35.88	PK	H	30.77	5.14	27.42	44.37	74.00	29.63
4874	23.59	AV	H	30.77	5.14	27.42	32.08	54.00	21.92
7311	33.97	PK	H	34.35	6.74	25.88	49.18	74.00	24.82
7311	21.74	AV	H	34.35	6.74	25.88	36.95	54.00	17.05
9748	30.1	PK	H	36.30	8.61	27.24	47.77	74.00	26.23
9748	18.12	AV	H	36.30	8.61	27.24	35.79	54.00	18.21
1136	36.33	PK	H	22.65	3.04	26.71	35.31	74.00	38.69
1136	22.06	AV	H	22.65	3.04	26.71	21.04	54.00	32.96
2367	34.58	PK	H	25.55	3.58	27.32	36.39	74.00	37.61
2367	22.13	AV	H	25.55	3.58	27.32	23.94	54.00	30.06
46.49	41.55	QP	V	10.20	0.89	21.42	31.22	40.00	8.78
High Channel: 2462 MHz									
2462	78.05	PK	H	25.80	3.75	0.00	107.60	N/A	N/A
2462	65.17	AV	H	25.80	3.75	0.00	94.72	N/A	N/A
2462	73.26	PK	V	25.80	3.75	0.00	102.81	N/A	N/A
2462	60.32	AV	V	25.80	3.75	0.00	89.87	N/A	N/A
2483.5	37.22	PK	H	25.86	3.67	0.00	66.75	74.00	7.25
2483.5	18.66	AV	H	25.86	3.67	0.00	48.19	54.00	5.81
4924	36.34	PK	H	30.90	5.34	27.43	45.15	74.00	28.85
4924	23.4	AV	H	30.90	5.34	27.43	32.21	54.00	21.79
7386	33.68	PK	H	34.53	6.83	25.86	49.18	74.00	24.82
7386	21.27	AV	H	34.53	6.83	25.86	36.77	54.00	17.23
9848	29.81	PK	H	36.54	8.66	26.94	48.07	74.00	25.93
9848	17.71	AV	H	36.54	8.66	26.94	35.97	54.00	18.03
1136	35.88	PK	H	22.65	3.04	26.71	34.86	74.00	39.14
1136	21.77	AV	H	22.65	3.04	26.71	20.75	54.00	33.25
46.49	40.95	QP	V	10.20	0.89	21.42	30.62	40.00	9.38

802.11 n20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2412 MHz									
2412	78.53	PK	H	25.67	3.68	0.00	107.88	N/A	N/A
2412	68.38	AV	H	25.67	3.68	0.00	97.73	N/A	N/A
2412	73.34	PK	V	25.67	3.68	0.00	102.69	N/A	N/A
2412	62.02	AV	V	25.67	3.68	0.00	91.37	N/A	N/A
2390	33.68	PK	H	25.61	3.63	0.00	62.92	74.00	11.08
2390	15.76	AV	H	25.61	3.63	0.00	45.00	54.00	9.00
4824	37.89	PK	H	30.64	5.03	27.41	46.15	74.00	27.85
4824	24.58	AV	H	30.64	5.03	27.41	32.84	54.00	21.16
7236	35.89	PK	H	34.17	6.65	25.90	50.81	74.00	23.19
7236	22.87	AV	H	34.17	6.65	25.90	37.79	54.00	16.21
9648	32.64	PK	H	36.06	8.55	27.46	49.79	74.00	24.21
9648	20.18	AV	H	36.06	8.55	27.46	37.33	54.00	16.67
1136	35.32	PK	H	22.65	3.04	26.71	34.30	74.00	39.70
1136	23.02	AV	H	22.65	3.04	26.71	22.00	54.00	32.00
46.49	40.18	QP	V	10.20	0.89	21.42	29.85	40.00	10.15
Middle Channel: 2437 MHz									
2437	77.88	PK	H	25.74	3.75	0.00	107.37	N/A	N/A
2437	67.64	AV	H	25.74	3.75	0.00	97.13	N/A	N/A
2437	72.54	PK	V	25.74	3.75	0.00	102.03	N/A	N/A
2437	61.32	AV	V	25.74	3.75	0.00	90.81	N/A	N/A
4874	37.23	PK	H	30.77	5.14	27.42	45.72	74.00	28.28
4874	23.73	AV	H	30.77	5.14	27.42	32.22	54.00	21.78
7311	35.51	PK	H	34.35	6.74	25.88	50.72	74.00	23.28
7311	22.55	AV	H	34.35	6.74	25.88	37.76	54.00	16.24
9748	32.5	PK	H	36.30	8.61	27.24	50.17	74.00	23.83
9748	19.94	AV	H	36.30	8.61	27.24	37.61	54.00	16.39
1136	36.01	PK	H	22.65	3.04	26.71	34.99	74.00	39.01
1136	22.85	AV	H	22.65	3.04	26.71	21.83	54.00	32.17
2367	34.56	PK	H	25.55	3.58	27.32	36.37	74.00	37.63
2367	21.88	AV	H	25.55	3.58	27.32	23.69	54.00	30.31
46.49	41.52	QP	V	10.20	0.89	21.42	31.19	40.00	8.81
High Channel: 2462 MHz									
2462	77.04	PK	H	25.80	3.75	0.00	106.59	N/A	N/A
2462	66.33	AV	H	25.80	3.75	0.00	95.88	N/A	N/A
2462	71.69	PK	V	25.80	3.75	0.00	101.24	N/A	N/A
2462	60.68	AV	V	25.80	3.75	0.00	90.23	N/A	N/A
2483.5	38.01	PK	H	25.86	3.67	0.00	67.54	74.00	6.46
2483.5	19.34	AV	H	25.86	3.67	0.00	48.87	54.00	5.13
4924	36.87	PK	H	30.90	5.34	27.43	45.68	74.00	28.32
4924	23.47	AV	H	30.90	5.34	27.43	32.28	54.00	21.72
7386	35.24	PK	H	34.53	6.83	25.86	50.74	74.00	23.26
7386	22.21	AV	H	34.53	6.83	25.86	37.71	54.00	16.29
9848	32.28	PK	H	36.54	8.66	26.94	50.54	74.00	23.46
9848	19.58	AV	H	36.54	8.66	26.94	37.84	54.00	16.16
1136	35.68	PK	H	22.65	3.04	26.71	34.66	74.00	39.34
1136	22.47	AV	H	22.65	3.04	26.71	21.45	54.00	32.55
46.49	40.97	QP	V	10.20	0.89	21.42	30.64	40.00	9.36

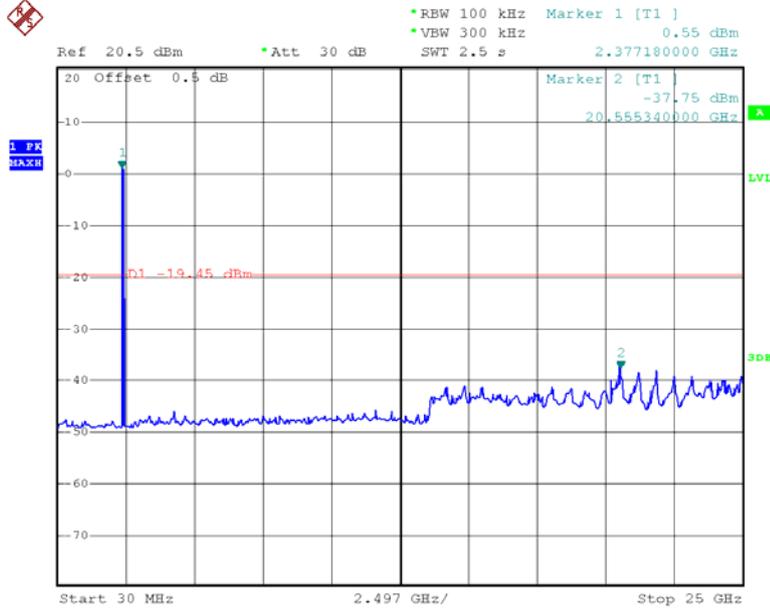
802.11 n40 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	FCC 15.247	
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Low Channel: 2422 MHz									
2422	75.82	PK	H	25.70	3.71	0.00	105.23	N/A	N/A
2422	64.39	AV	H	25.70	3.71	0.00	93.80	N/A	N/A
2422	70.21	PK	V	25.70	3.71	0.00	99.62	N/A	N/A
2422	59.24	AV	V	25.70	3.71	0.00	88.65	N/A	N/A
2390	29.34	PK	V	25.61	3.63	0.00	58.58	74.00	15.42
2390	15.89	AV	V	25.61	3.63	0.00	45.13	54.00	8.87
4844	34.56	PK	V	30.69	4.99	27.42	42.82	74.00	31.18
4844	21.74	AV	V	30.69	4.99	27.42	41.69	54.00	12.31
7266	33.43	PK	V	34.24	6.68	25.89	35.47	74.00	38.53
7266	20.44	AV	V	34.24	6.68	25.89	35.47	54.00	18.53
9688	32.16	PK	V	36.15	8.58	27.37	49.52	74.00	24.48
9688	19.94	AV	V	36.15	8.58	27.37	37.30	54.00	16.70
2367	37.07	PK	V	25.55	3.58	27.32	38.88	74.00	35.12
2367	22.81	AV	V	25.55	3.58	27.32	24.62	54.00	29.38
46.49	41.89	QP	V	10.20	0.89	21.42	31.56	40.00	8.44
Middle Channel: 2437 MHz									
2437	75.44	PK	H	25.74	3.75	0.00	104.93	N/A	N/A
2437	63.53	AV	H	25.74	3.75	0.00	93.02	N/A	N/A
2437	69.34	PK	V	25.74	3.75	0.00	98.83	N/A	N/A
2437	58.63	AV	V	25.74	3.75	0.00	88.12	N/A	N/A
4874	34.53	PK	H	30.77	5.14	27.42	43.02	74.00	30.98
4874	21.56	AV	H	30.77	5.14	27.42	30.05	54.00	23.95
7311	33.42	PK	H	34.35	6.74	25.88	48.63	74.00	25.37
7311	20.38	AV	H	34.35	6.74	25.88	35.59	54.00	18.41
9748	31.88	PK	H	36.30	8.61	27.24	49.55	74.00	24.45
9748	19.66	AV	H	36.30	8.61	27.24	37.33	54.00	16.67
2950	36.85	PK	H	27.07	6.61	27.54	42.99	74.00	31.01
2950	22.51	AV	H	27.07	6.61	27.54	28.65	54.00	25.35
2367	35.42	PK	H	25.55	3.58	27.32	37.23	74.00	36.77
2367	22.23	AV	H	25.55	3.58	27.32	24.04	54.00	29.96
46.49	42.03	QP	V	10.20	0.89	21.42	31.70	40.00	8.30
High Channel: 2452 MHz									
2452	75.15	PK	H	25.78	3.78	0.00	104.71	N/A	N/A
2452	63.95	AV	H	25.78	3.78	0.00	93.51	N/A	N/A
2452	68.57	PK	V	25.78	3.78	0.00	98.13	N/A	N/A
2452	57.73	AV	V	25.78	3.78	0.00	87.29	N/A	N/A
2483.5	36.88	PK	H	25.86	3.67	0.00	66.41	74.00	7.59
2483.5	21.28	AV	H	25.86	3.67	0.00	50.81	54.00	3.19 *
4904	34.29	PK	H	30.85	5.31	27.43	43.02	74.00	30.98
4904	21.34	AV	H	30.85	5.31	27.43	30.07	54.00	23.93
7356	33.18	PK	H	34.45	6.79	25.87	48.55	74.00	25.45
7356	20.35	AV	H	34.45	6.79	25.87	35.72	54.00	18.28
9808	31.82	PK	H	36.44	8.64	27.09	49.81	74.00	24.19
9808	19.49	AV	H	36.44	8.64	27.09	37.48	54.00	16.52
2367	36.55	PK	H	25.55	3.58	27.32	38.36	74.00	35.64
2367	22.46	AV	H	25.55	3.58	27.32	24.27	54.00	29.73
46.49	41.85	QP	V	10.20	0.89	21.42	31.52	40.00	8.48

\*Within measurement uncertainty!

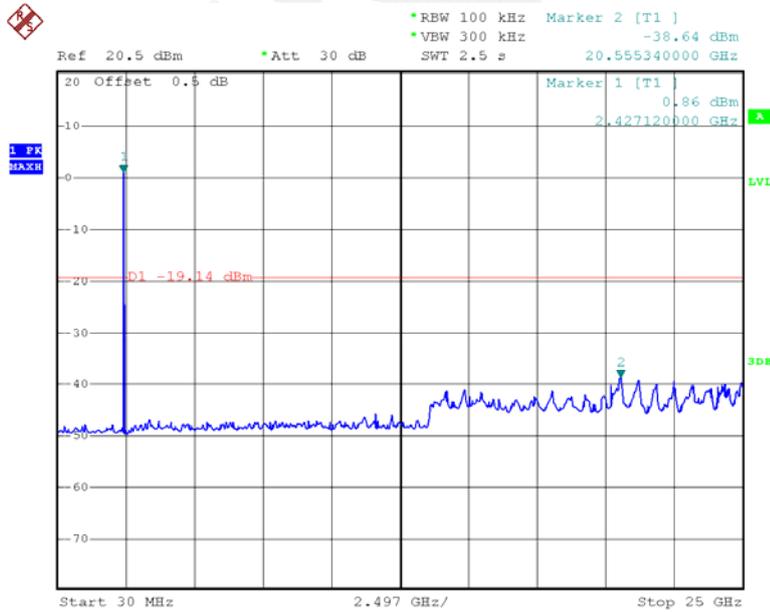
### Conducted Spurious Emissions at Antenna Port

#### Chain0: 802.11b Low Channel



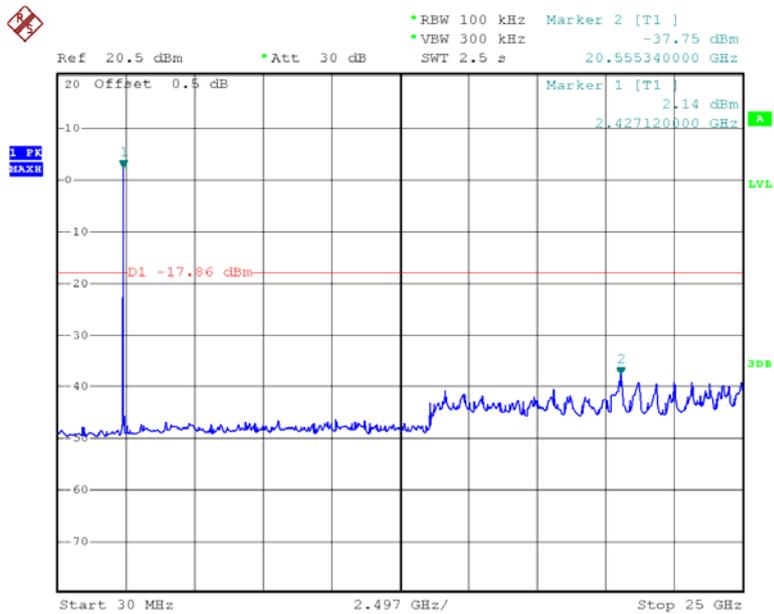
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#### Chain0: 802.11b Middle Channel



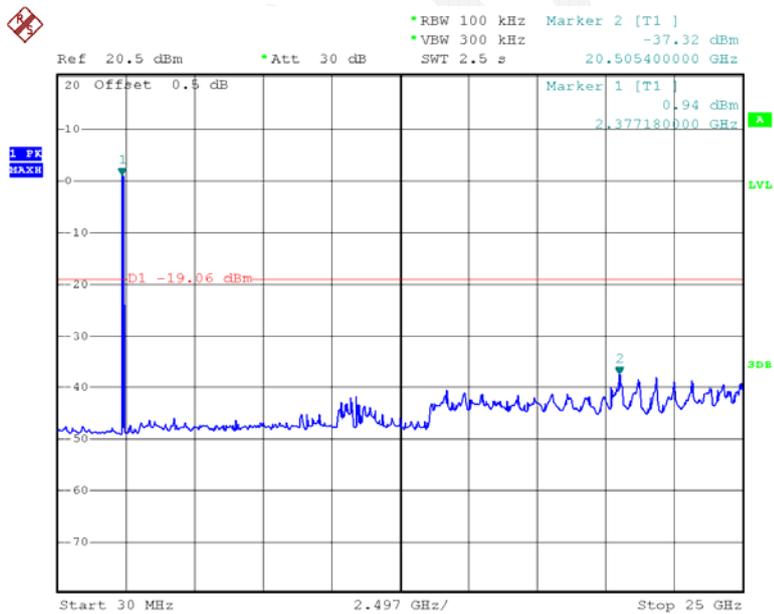
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### Chain0: 802.11b High Channel



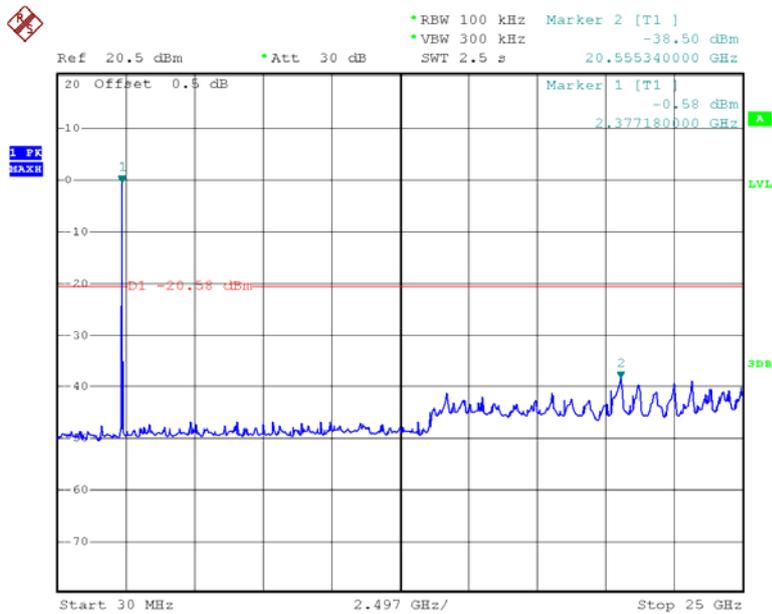
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### Chain0: 802.11g Low Channel



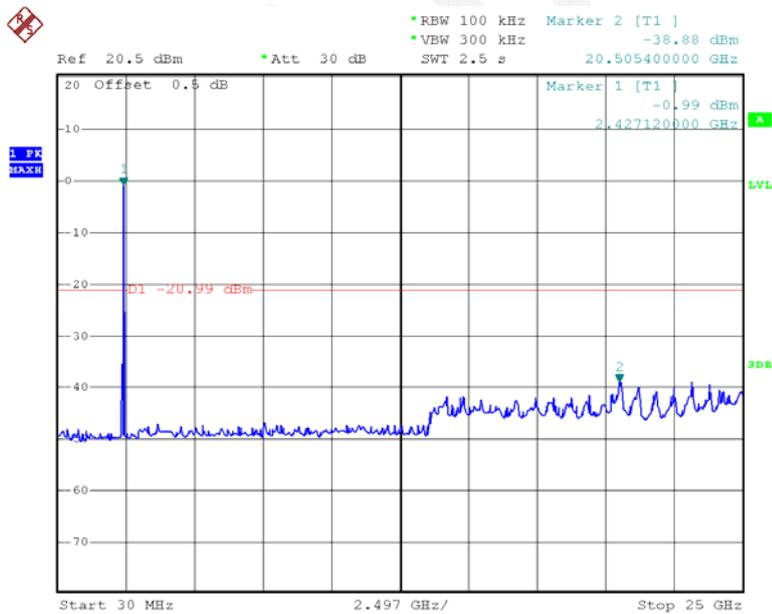
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### Chain0: 802.11g Middle Channel



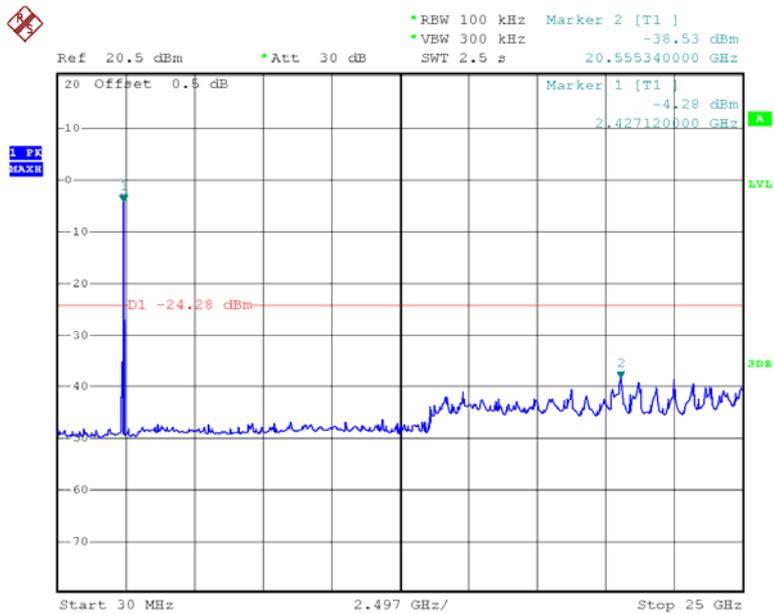
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### Chain0: 802.11g High Channel



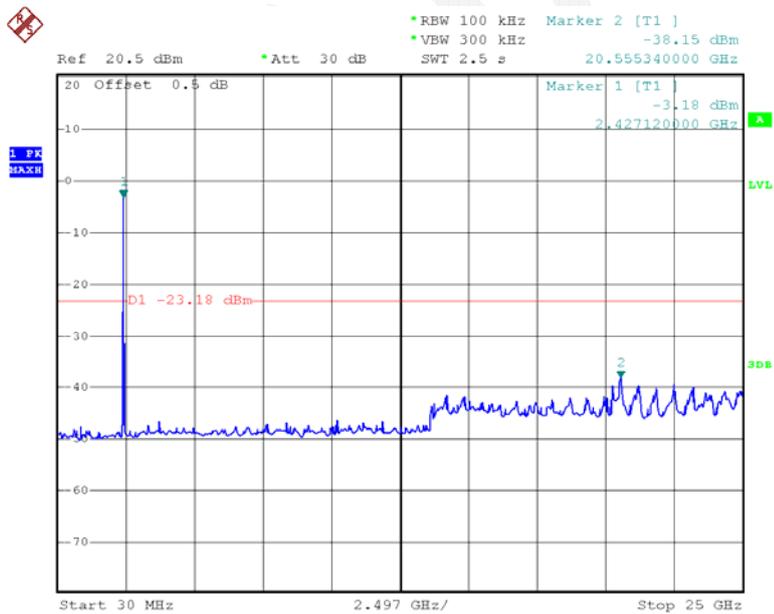
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### Chain0: 802.11n20 Low Channel



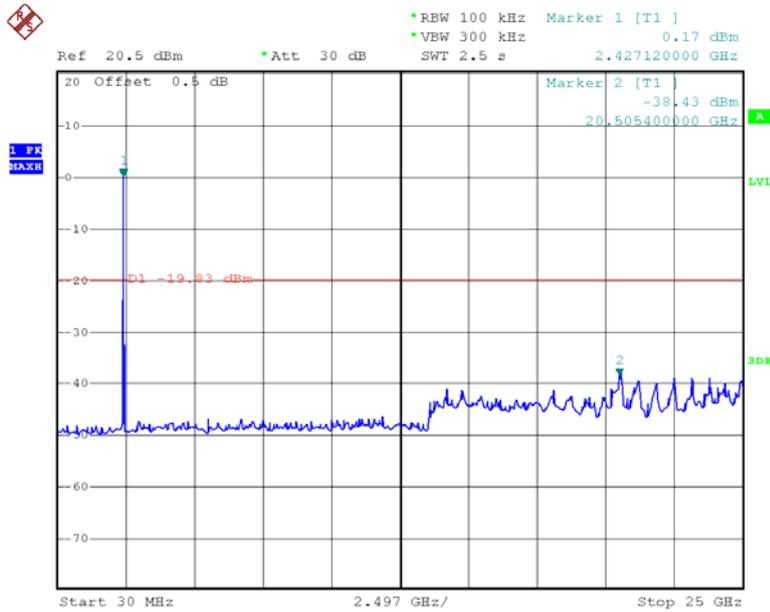
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### Chain0: 802.11n20 Middle Channel



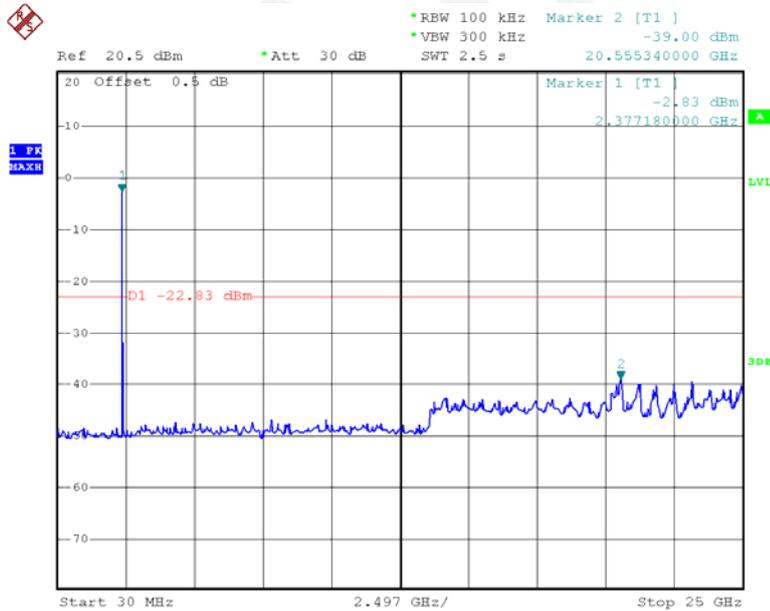
Date: 17.APR.2015 13:35:35

### Chain0: 802.11n20 High Channel



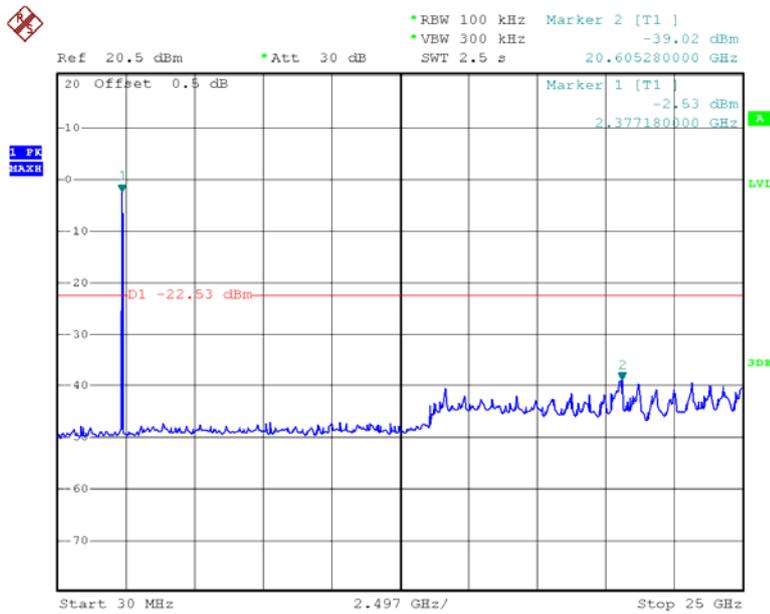
Date: 17.APR.2015 13:34:02

### Chain0: 802.11n40 Low Channel



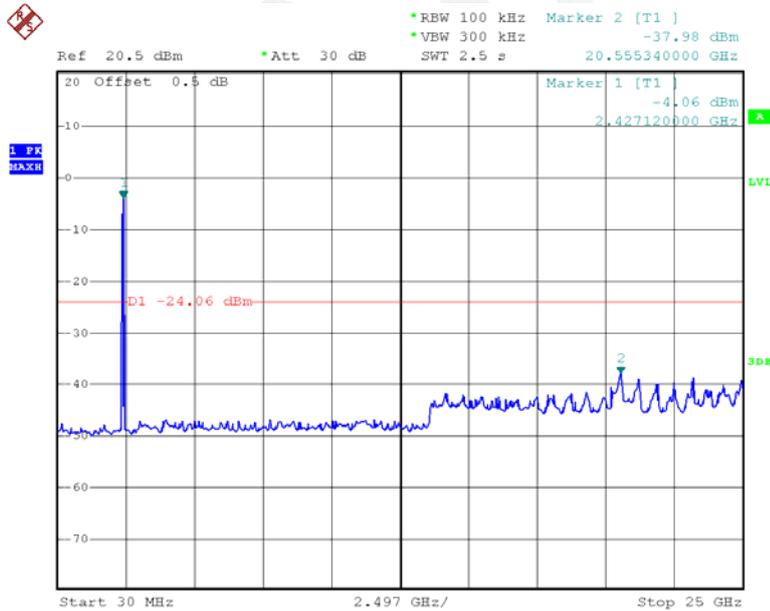
Date: 17.APR.2015 13:37:44

### Chain0: 802.11n40 Middle Channel



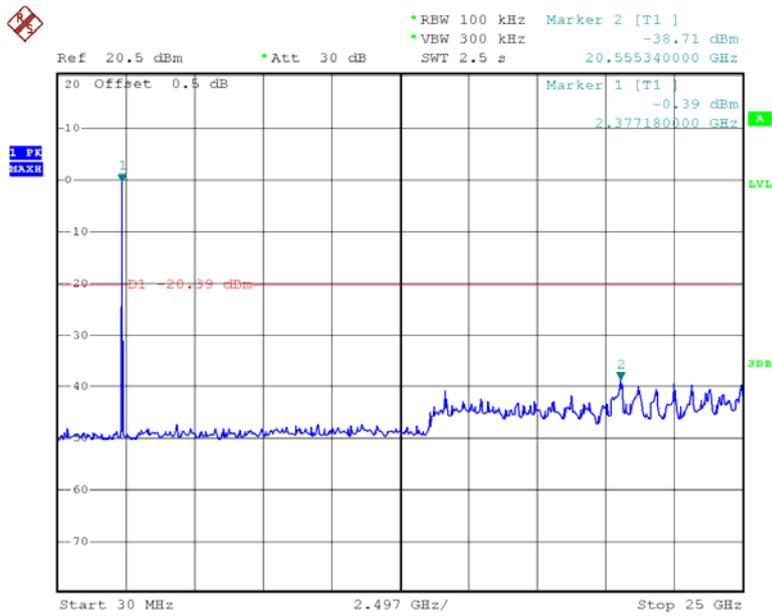
Date: 17.APR.2015 13:38:47

### Chain0: 802.11n40 High Channel



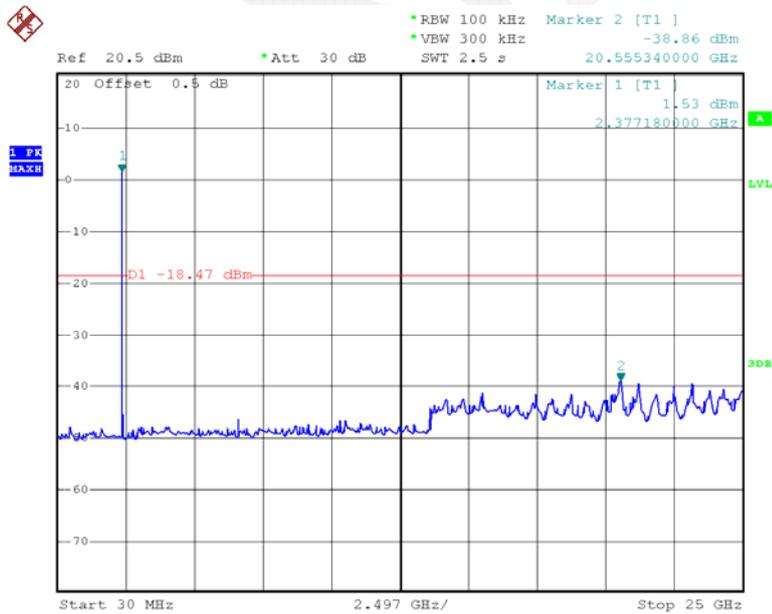
Date: 17.APR.2015 13:40:43

### Chain1: 802.11b Low Channel



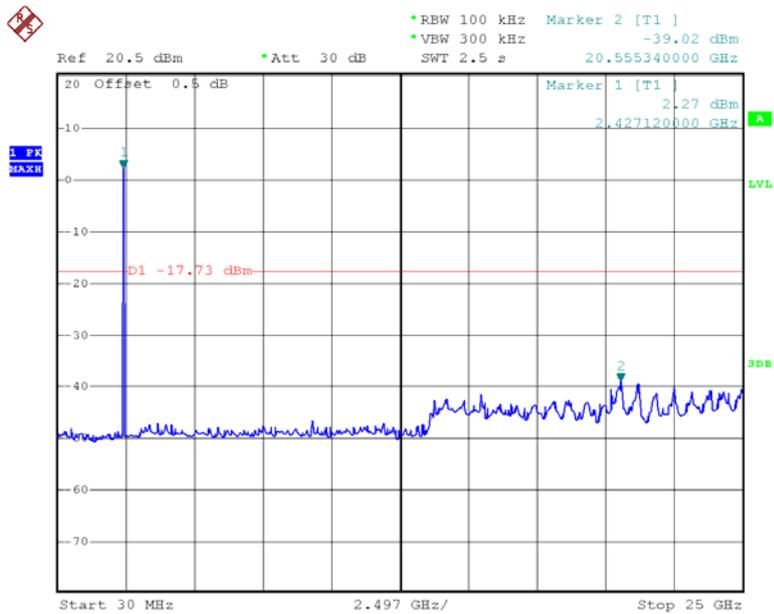
Date: 17.APR.2015 13:52:31

### Chain1: 802.11b Middle Channel



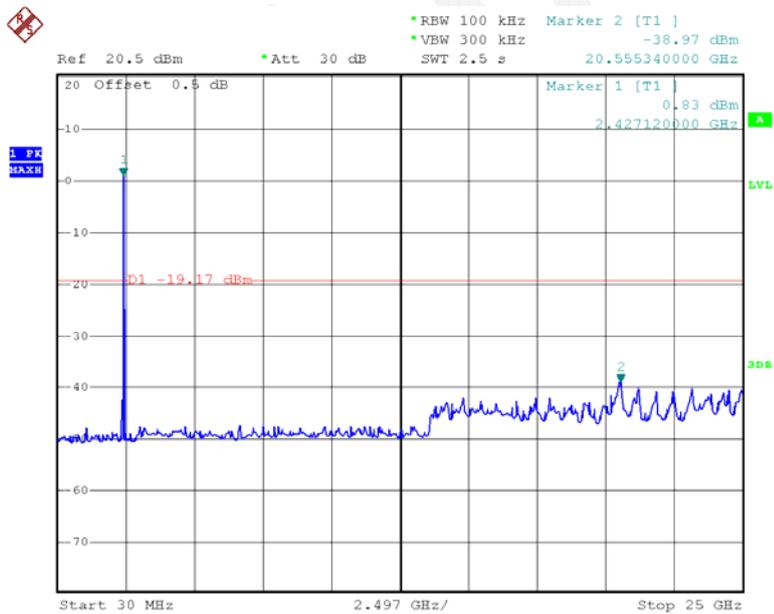
Date: 17.APR.2015 13:53:20

### Chain1: 802.11b High Channel



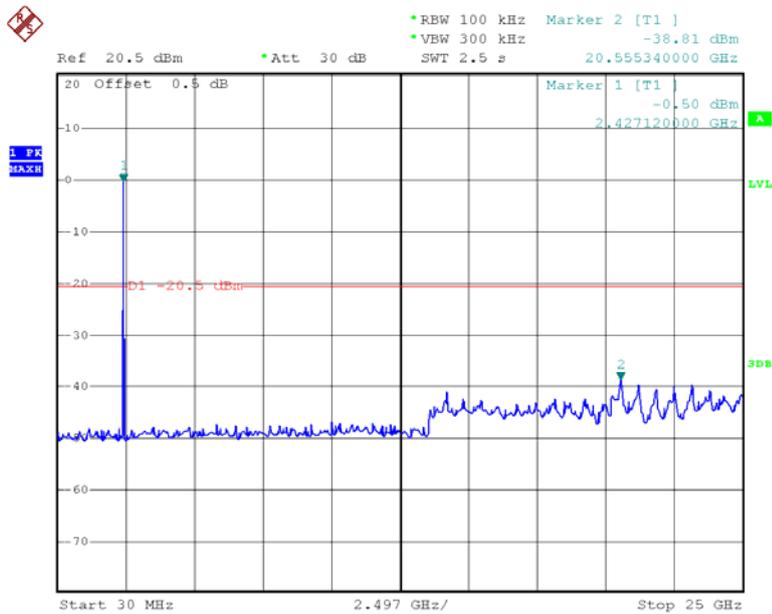
Date: 17.APR.2015 13:53:55

### Chain1: 802.11g Low Channel



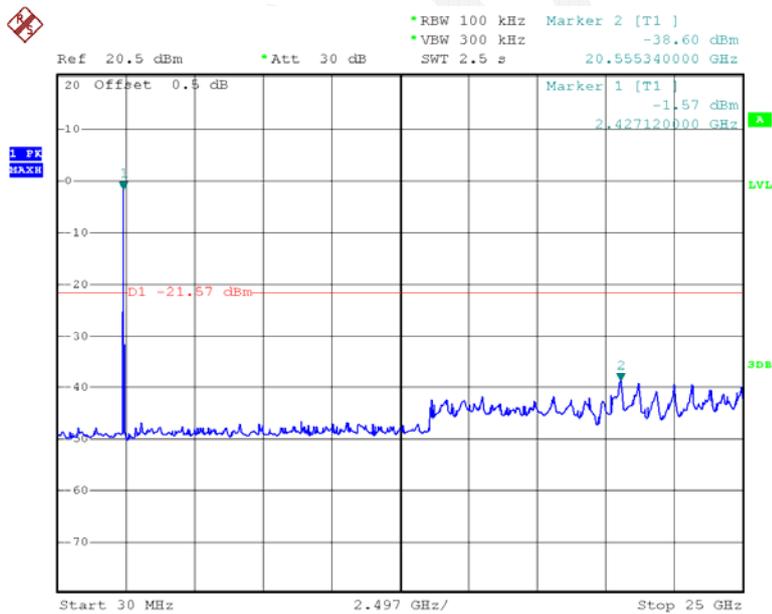
Date: 17.APR.2015 13:51:52

### Chain1: 802.11g Middle Channel



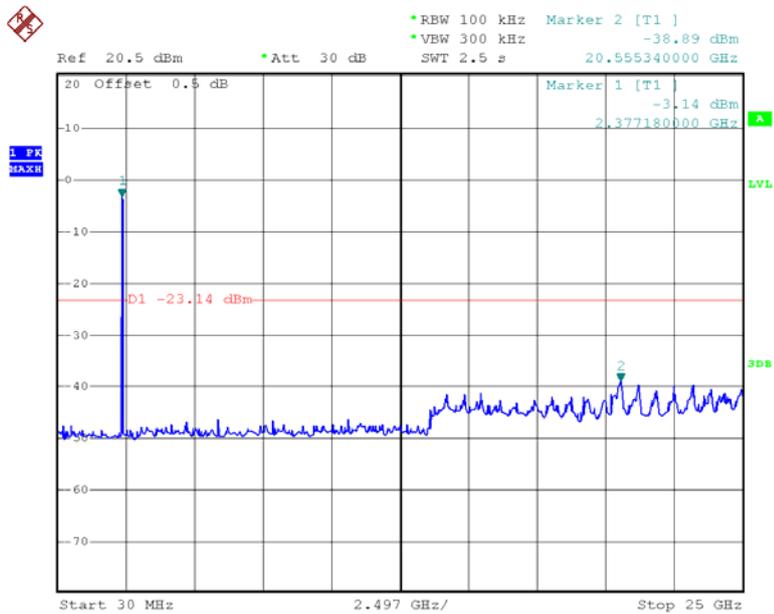
Date: 17.APR.2015 13:51:13

### Chain1: 802.11g High Channel



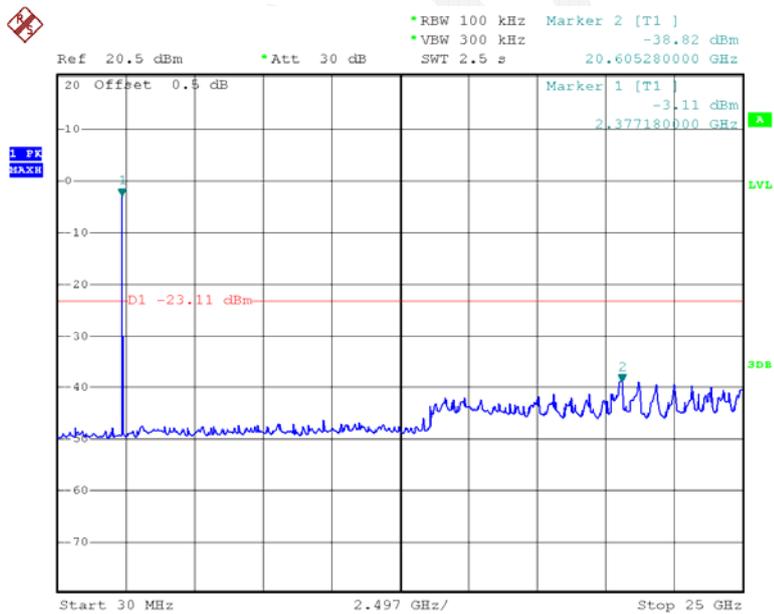
Date: 17.APR.2015 13:50:41

### Chain1: 802.11n20 Low Channel



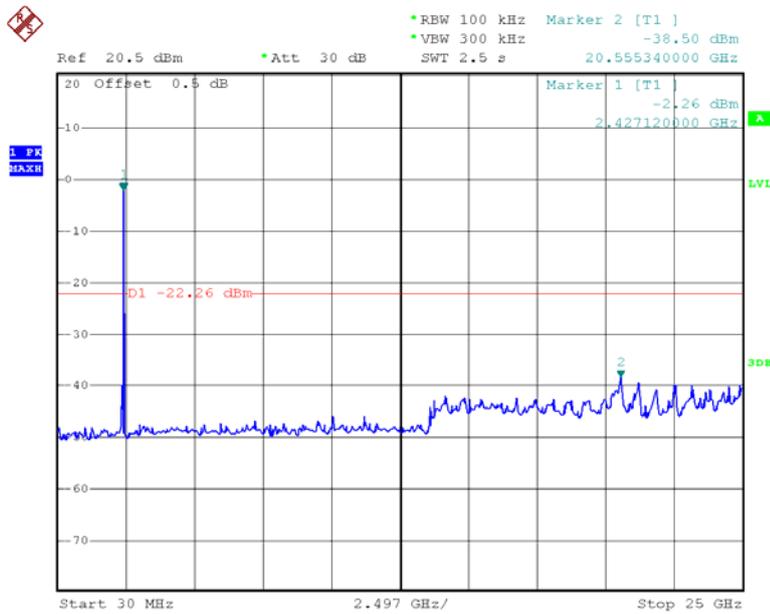
Date: 17.APR.2015 13:47:05

### Chain1: 802.11n20 Middle Channel



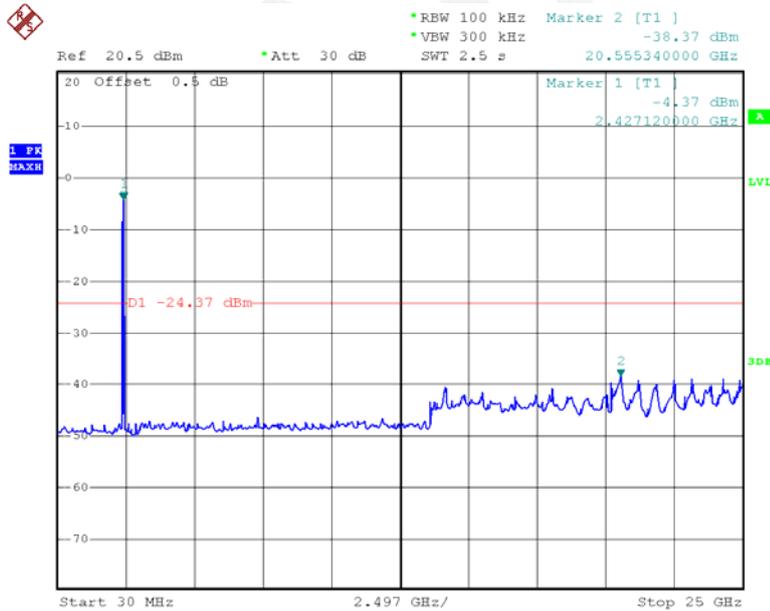
Date: 17.APR.2015 13:48:50

### Chain1: 802.11n20 High Channel



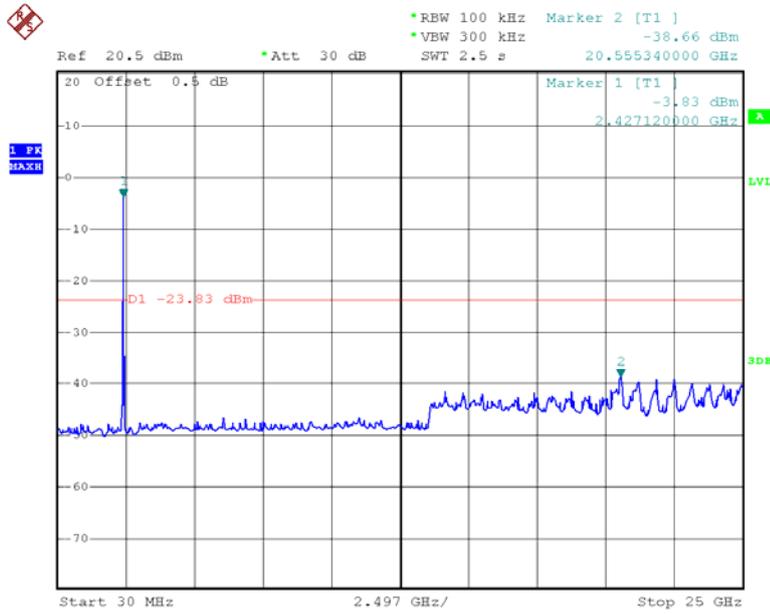
Date: 17.APR.2015 13:49:45

### Chain1: 802.11n40 Low Channel



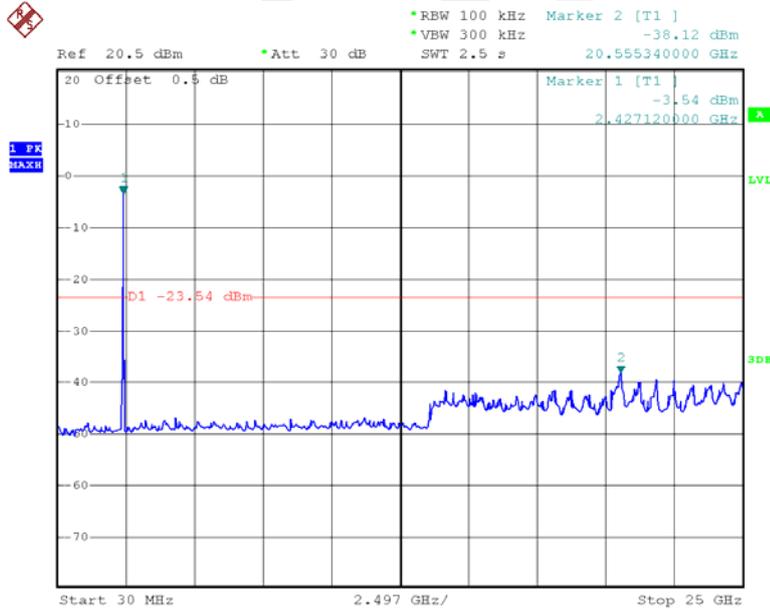
Date: 17.APR.2015 13:46:25

### Chain1: 802.11n40 Middle Channel



Date: 17.APR.2015 13:44:05

### Chain1: 802.11n40 High Channel



Date: 17.APR.2015 13:41:55

## FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

### Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	24.1 °C-24.3°C
<b>Relative Humidity:</b>	51 %-57%
<b>ATM Pressure:</b>	100.7 kPa-101.1kPa

\* The testing was performed by Allen Qiao on 2015-04-16 & 2015-04-17.

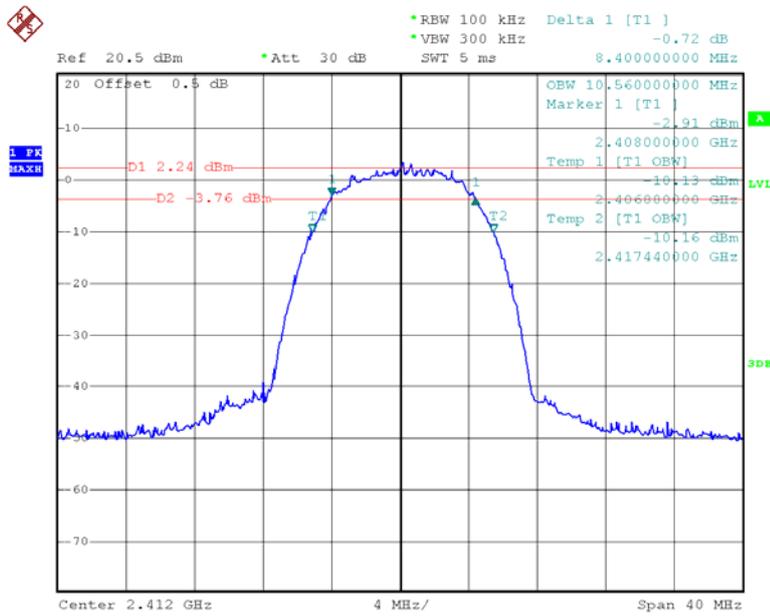
**Test Result:** Pass.

Please refer to the following tables and plots.

*Test Mode: Transmitting*

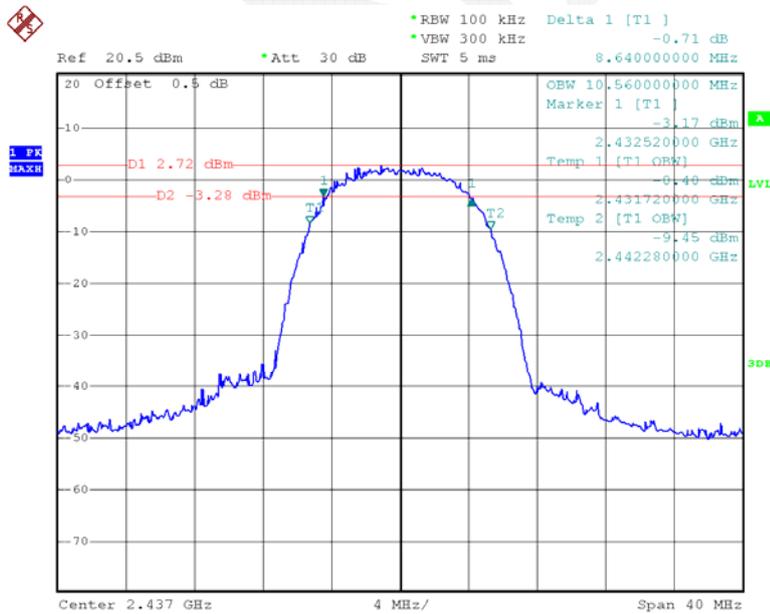
Test Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Limit (kHz)
			Chain 0	Chain 1	
802.11b	Low	2412	8.40	8.72	>500
	Middle	2437	8.64	7.84	>500
	High	2462	8.48	8.24	>500
802.11g	Low	2412	16.64	16.72	>500
	Middle	2437	16.64	16.56	>500
	High	2462	16.56	16.64	>500
802.11n20	Low	2412	17.68	17.68	>500
	Middle	2437	17.84	17.68	>500
	High	2462	17.84	17.76	>500
802.11n40	Low	2422	32.64	35.84	>500
	Middle	2437	36.16	35.68	>500
	High	2452	35.36	35.84	>500

### Chain0: 802.11b Low Channel



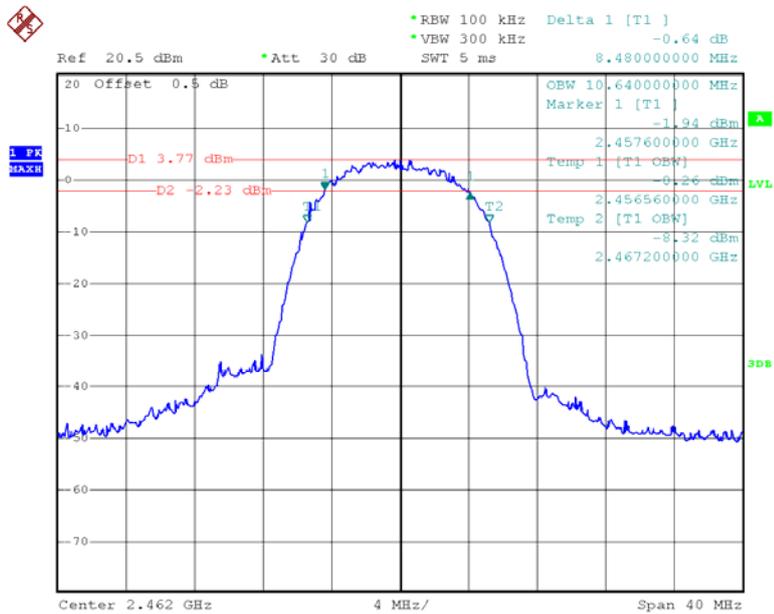
Date: 16.APR.2015 22:43:46

### Chain0: 802.11b Middle Channel



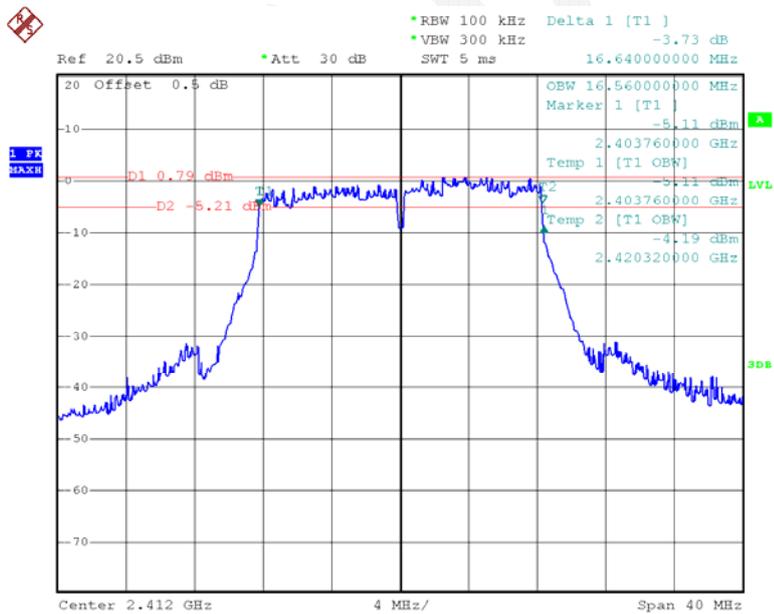
Date: 16.APR.2015 22:44:37

### Chain0: 802.11b High Channel



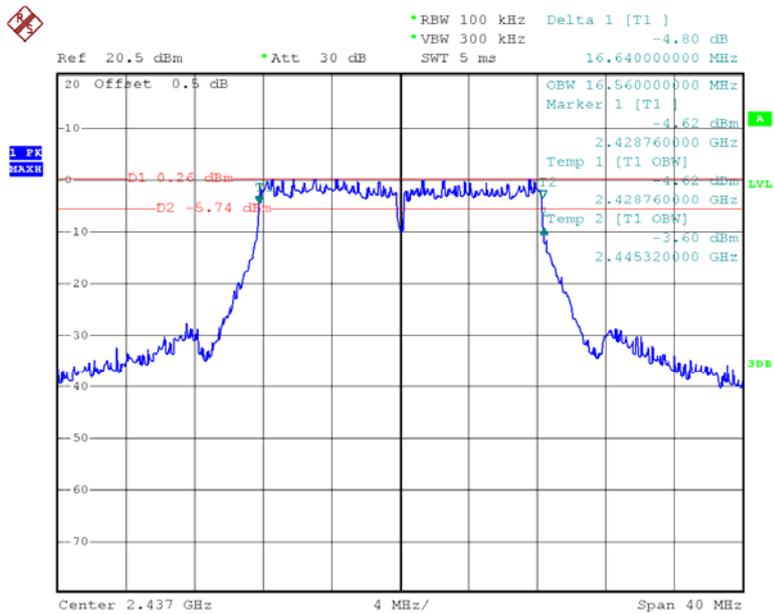
Date: 16.APR.2015 22:45:40

### Chain0: 802.11g Low Channel



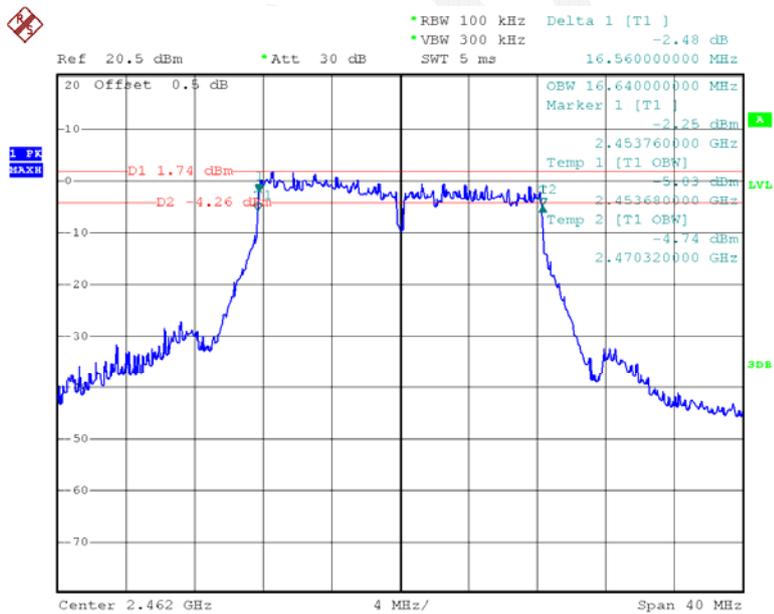
Date: 17.APR.2015 12:00:15

### Chain0: 802.11g Middle Channel



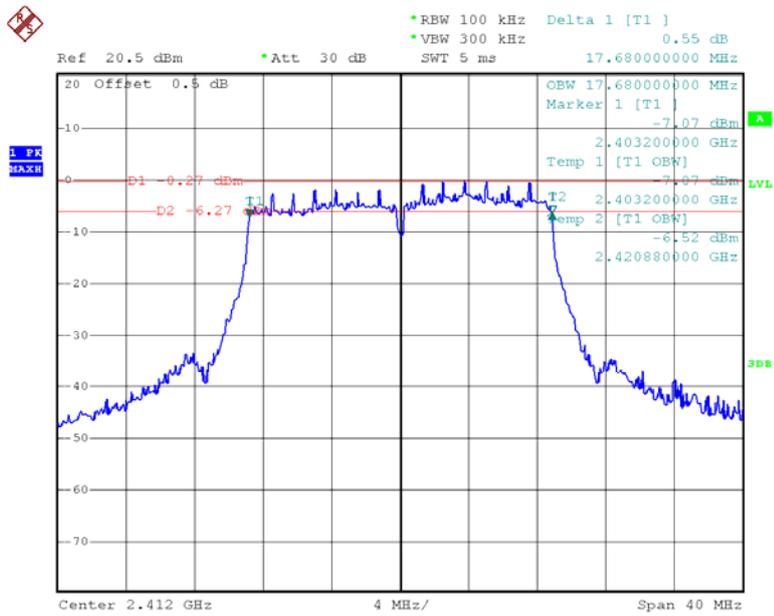
Date: 17.APR.2015 12:01:24

### Chain0: 802.11g High Channel



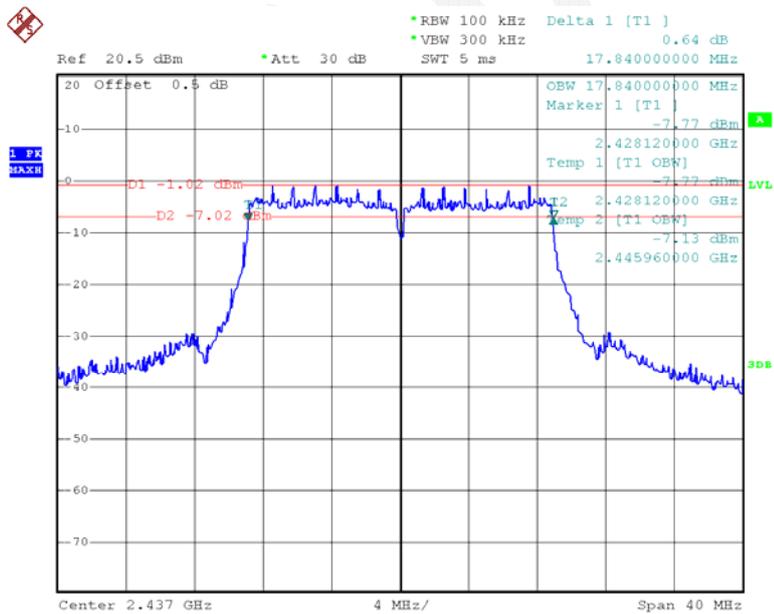
Date: 17.APR.2015 12:02:30

**Chain0: 802.11n20 Low Channel**



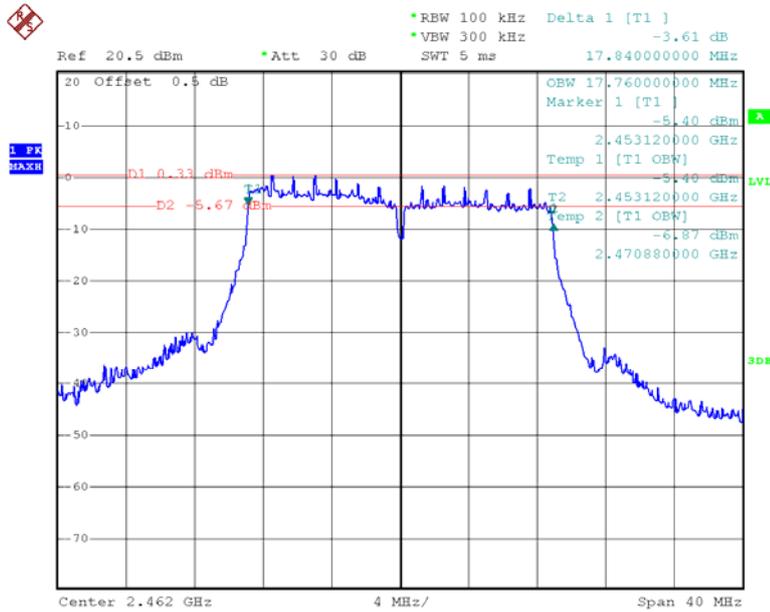
Date: 17.APR.2015 12:05:38

**Chain0: 802.11n20 Middle Channel**



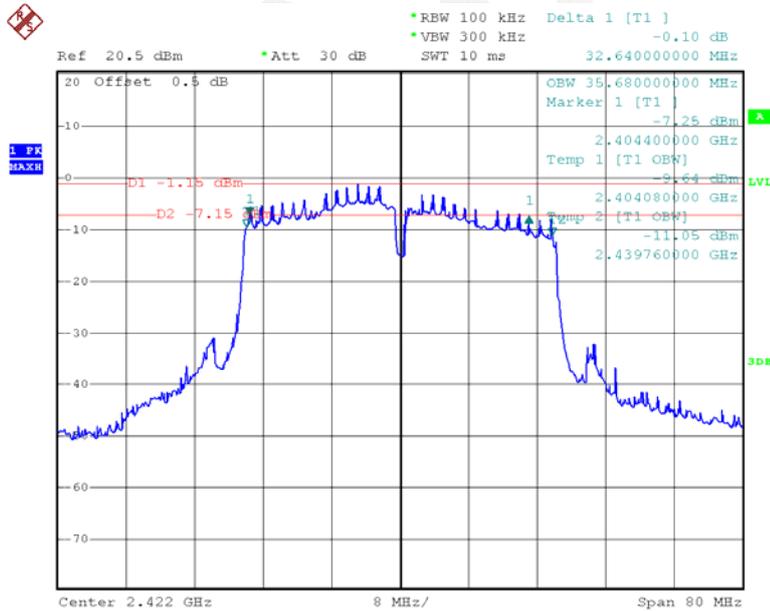
Date: 17.APR.2015 12:04:48

### Chain0: 802.11n20 High Channel



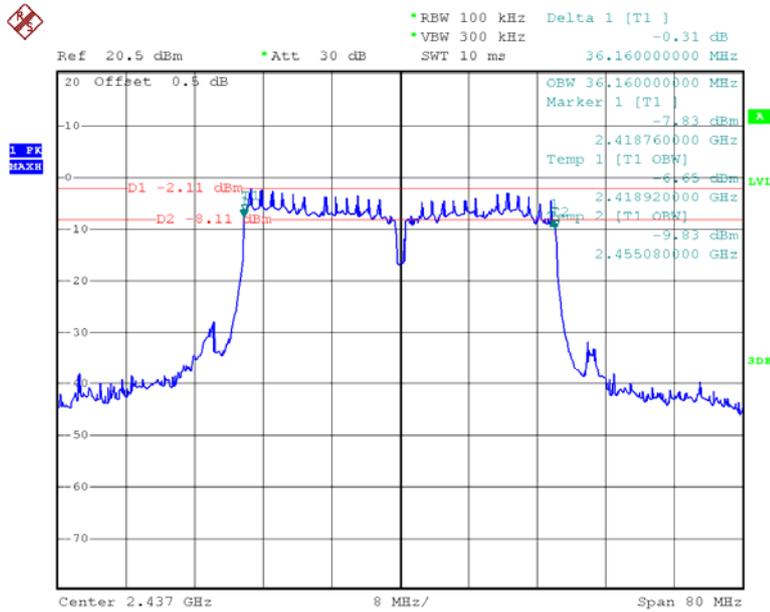
Date: 17.APR.2015 12:03:46

### Chain0: 802.11n40 Low Channel



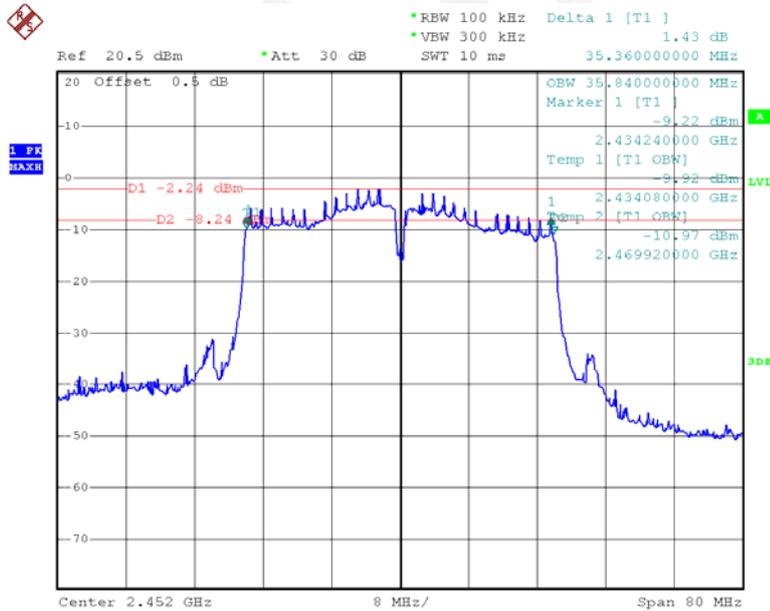
Date: 17.APR.2015 12:06:53

**Chain0: 802.11n40 Middle Channel**



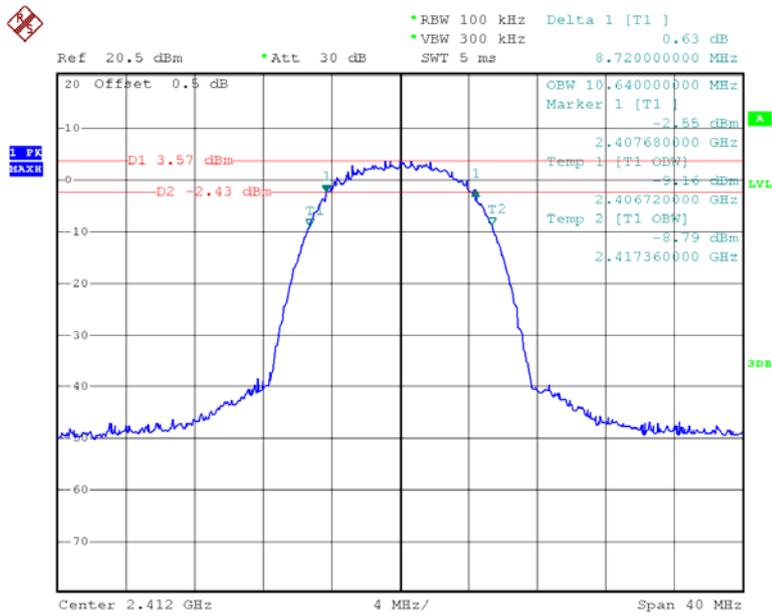
Date: 17.APR.2015 12:08:38

**Chain0: 802.11n40 High Channel**



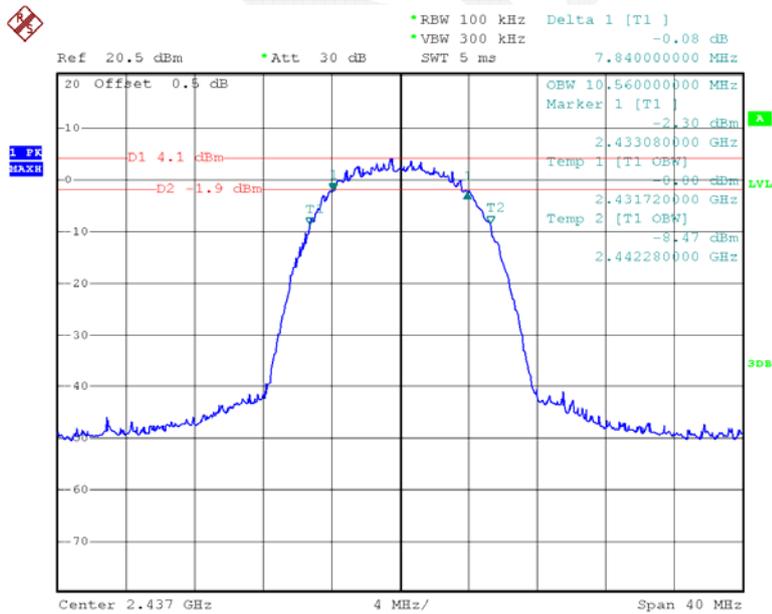
Date: 17.APR.2015 12:09:28

### Chain1: 802.11b Low Channel



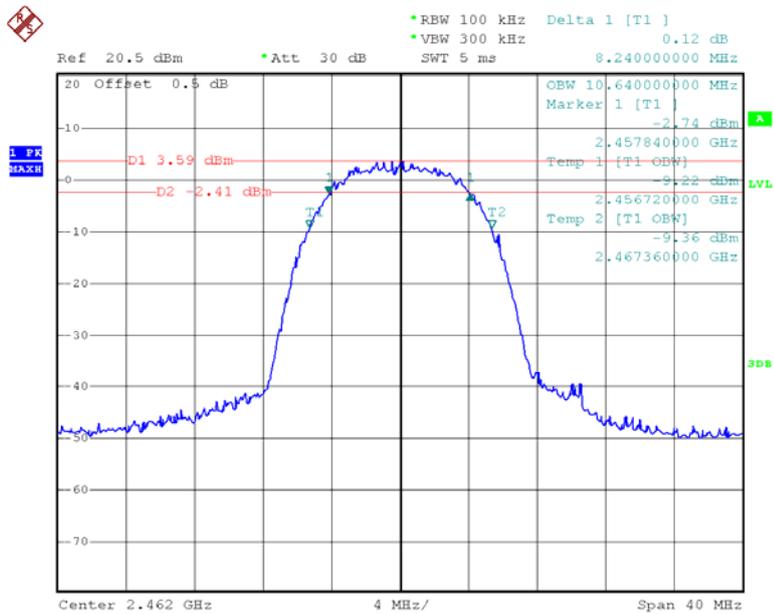
Date: 17.APR.2015 12:29:23

### Chain1: 802.11b Middle Channel



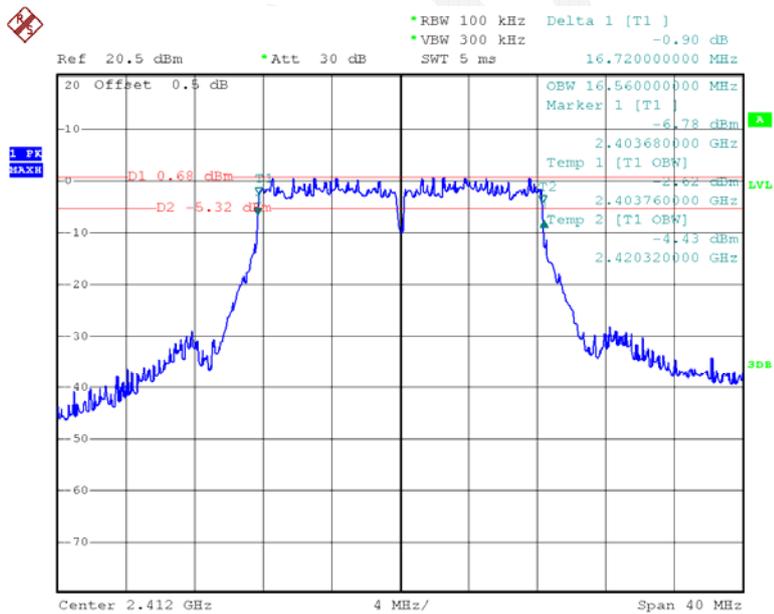
Date: 17.APR.2015 12:30:18

### Chain1: 802.11b High Channel



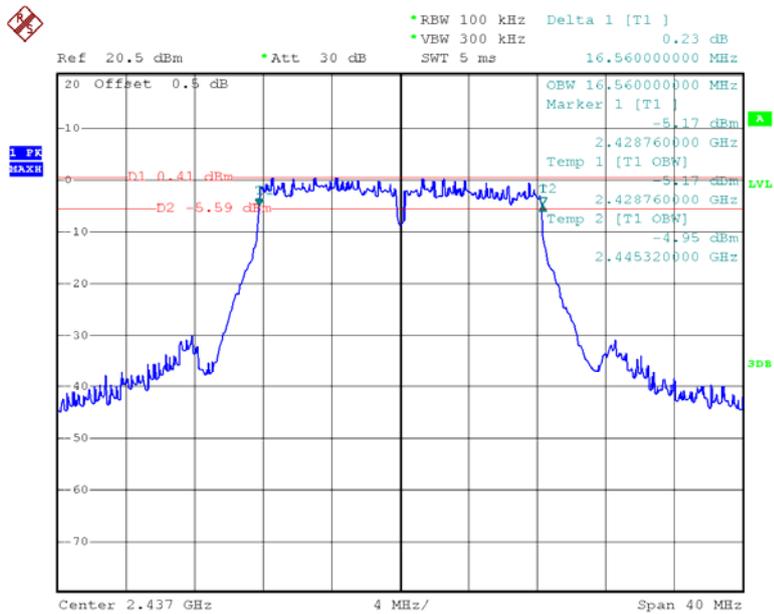
Date: 17.APR.2015 12:31:31

### Chain1: 802.11g Low Channel



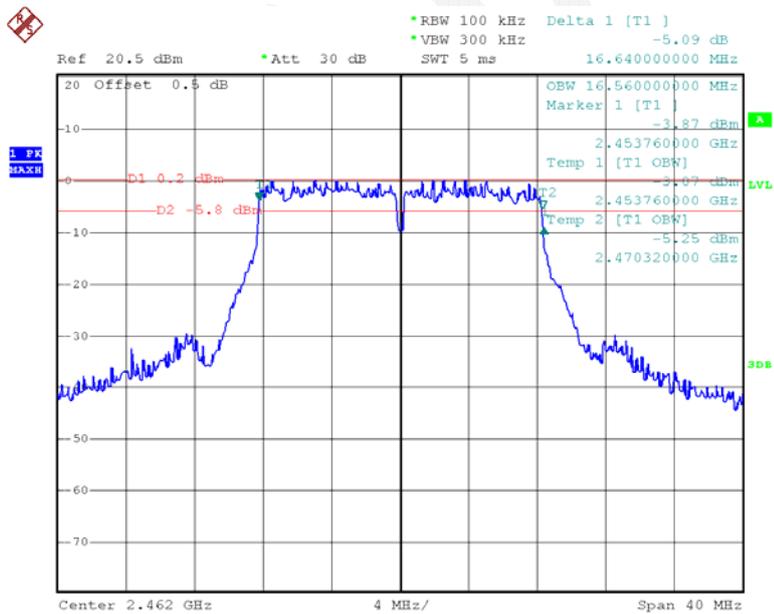
Date: 17.APR.2015 12:28:15

### Chain1: 802.11g Middle Channel



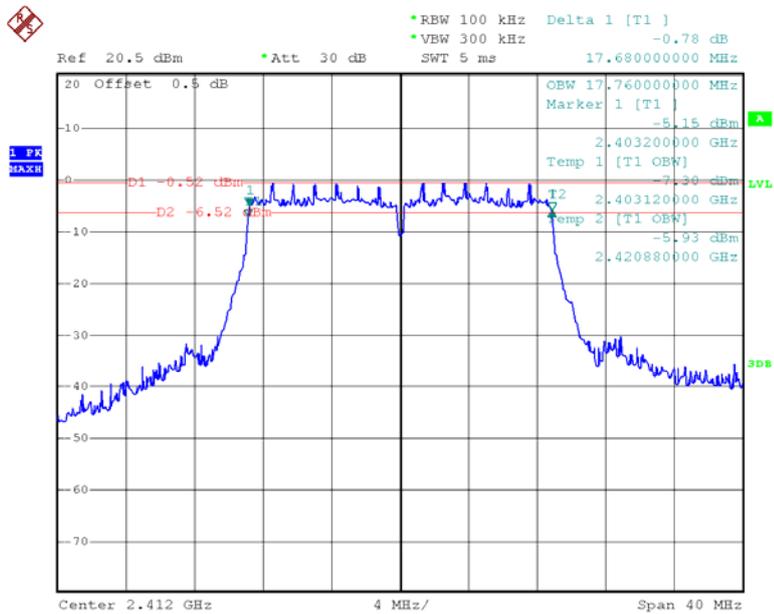
Date: 17.APR.2015 12:27:24

### Chain1: 802.11g High Channel



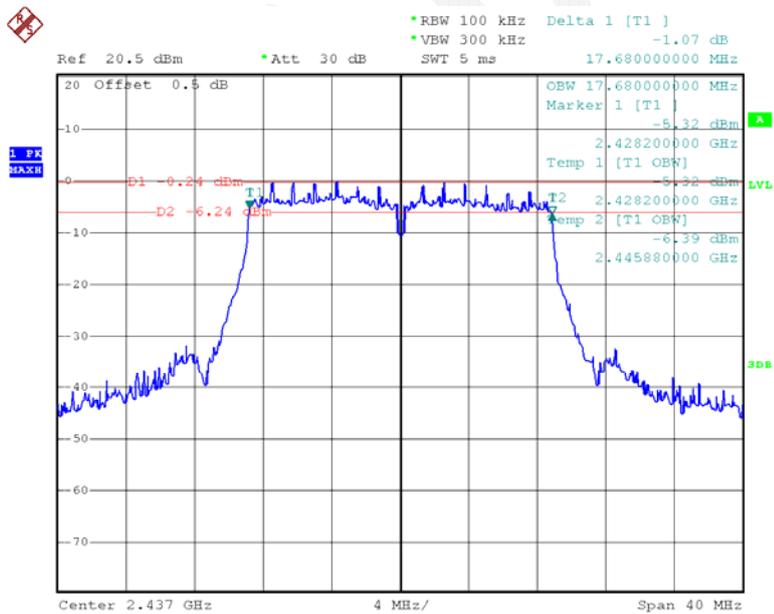
Date: 17.APR.2015 12:25:41

**Chain1: 802.11n20 Low Channel**



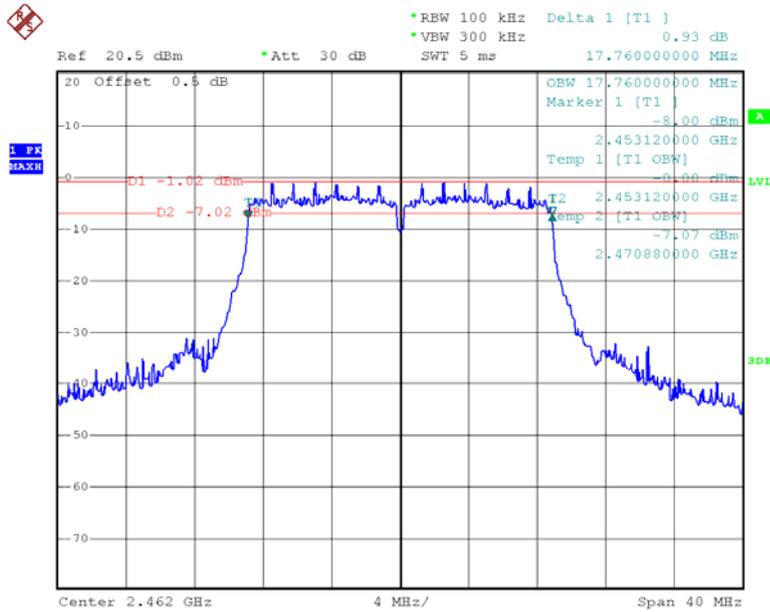
Date: 17.APR.2015 12:22:21

**Chain1: 802.11n20 Middle Channel**



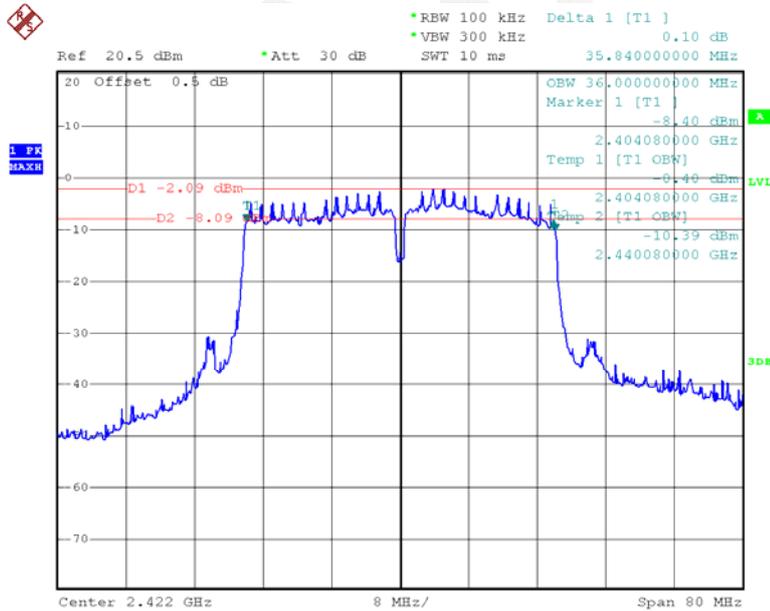
Date: 17.APR.2015 12:23:09

### Chain1: 802.11n20 High Channel



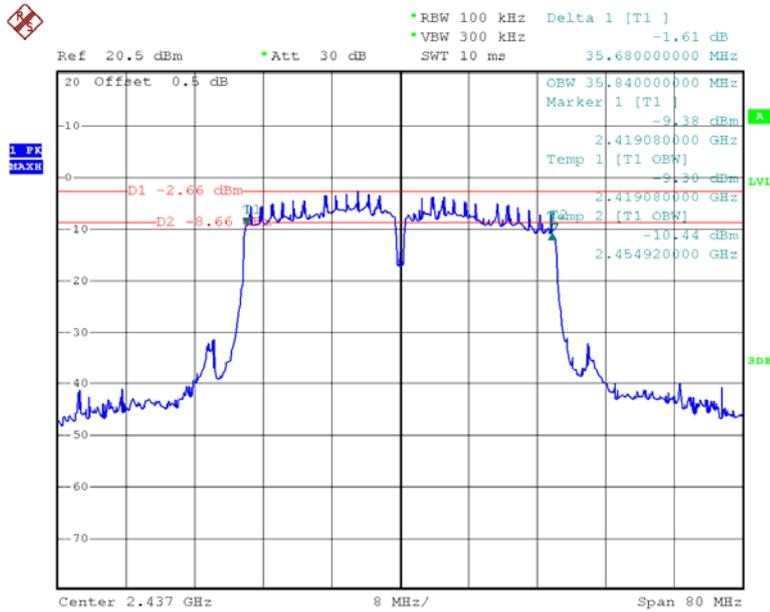
Date: 17.APR.2015 12:23:57

### Chain1: 802.11n40 Low Channel



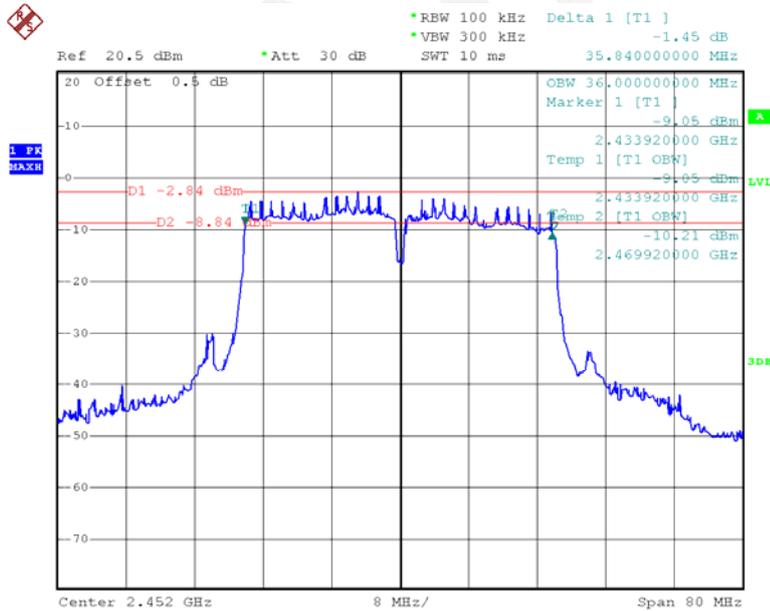
Date: 17.APR.2015 12:21:11

**Chain1: 802.11n40 Middle Channel**



Date: 17.APR.2015 12:20:20

**Chain1: 802.11n40 High Channel**



Date: 17.APR.2015 12:19:31

## FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

### Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

### Test Procedure

1. According to KDB 558074 D01 DTS Meas Guidance v03r02, place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer or power meter sensor and power meter.
3. Add a correction factor to the display.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2014-11-03	2015-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2014-11-03	2015-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2014-11-03	2015-11-03

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	24.1 °C-24.3°C
<b>Relative Humidity:</b>	51 %-57%
<b>ATM Pressure:</b>	100.7 kPa-101.1kPa

\* The testing was performed by Allen Qiao on 2015-04-16 & 2015-04-17.

Test Mode: Transmitting

Test Mode	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)			Limit (dBm)	Result
			Chain 0	Chain 1	Total		
802.11b	Low	2412	16.36	17.68	20.08	30	PASS
	Middle	2437	16.67	17.32	20.02	30	PASS
	High	2462	17.40	16.91	20.17	30	PASS
802.11g	Low	2412	19.64	21.05	23.41	30	PASS
	Middle	2437	19.91	20.12	23.03	30	PASS
	High	2462	19.84	19.61	22.74	30	PASS
802.11n20	Low	2412	18.24	19.09	21.7	30	PASS
	Middle	2437	18.55	19.11	21.85	30	PASS
	High	2462	18.40	18.67	21.55	30	PASS
802.11n40	Low	2422	18.32	19.13	21.75	30	PASS
	Middle	2437	18.60	18.62	21.62	30	PASS
	High	2452	17.99	18.53	21.28	30	PASS

Test Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)			Limit (dBm)	Result
			Chain 0	Chain 1	Total		
802.11b	Low	2412	16.11	16.65	19.4	30	PASS
	Middle	2437	16.17	16.63	19.42	30	PASS
	High	2462	16.94	16.38	19.68	30	PASS
802.11g	Low	2412	16.11	16.28	19.21	30	PASS
	Middle	2437	16.32	16.47	19.41	30	PASS
	High	2462	16.19	16.28	19.25	30	PASS
802.11n20	Low	2412	14.36	14.76	17.57	30	PASS
	Middle	2437	14.42	14.90	17.68	30	PASS
	High	2462	14.59	14.61	17.61	30	PASS
802.11n40	Low	2422	12.35	12.57	15.47	30	PASS
	Middle	2437	12.51	12.17	15.35	30	PASS
	High	2452	12.01	12.06	15.05	30	PASS

Please refer to the following plots

## **FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE**

### **Applicable Standard**

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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### **Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### **Test Data**

#### **Environmental Conditions**

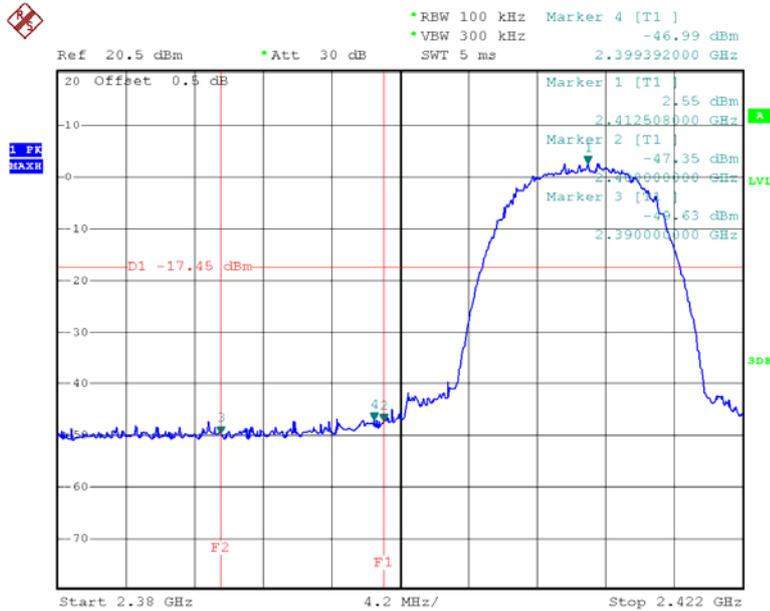
<b>Temperature:</b>	24.3 °C
<b>Relative Humidity:</b>	57 %
<b>ATM Pressure:</b>	100.7 kPa

\* The testing was performed by Allen Qiao on 2015-04-17.

#### **Test Result: Compliance**

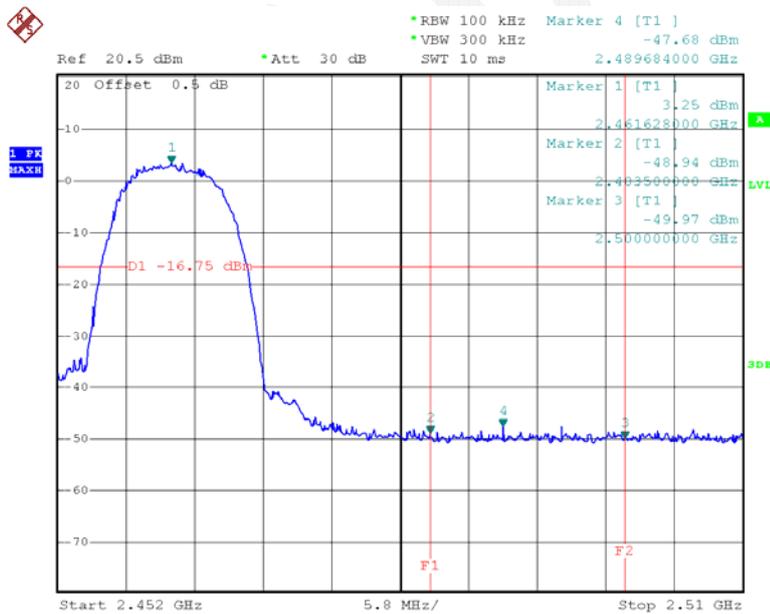
Please refer to following table and plots.

**Chain0: 802.11b Band Edge, Left Side**



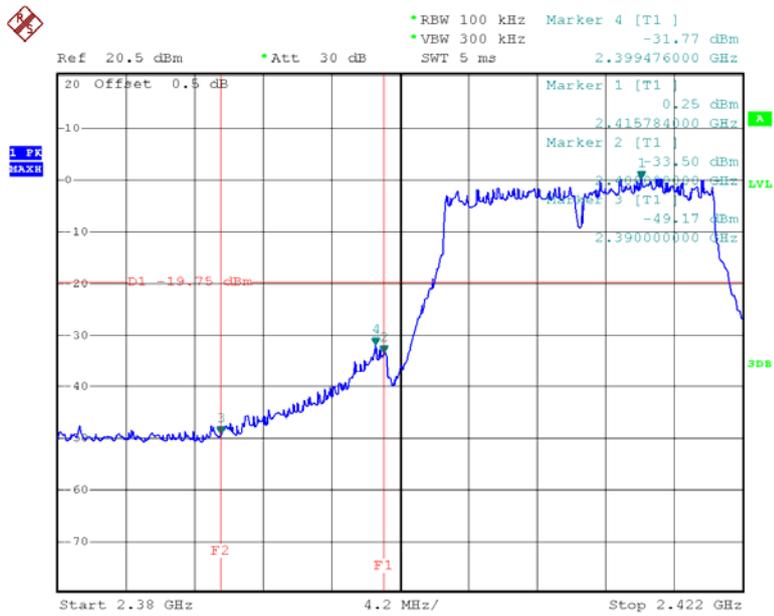
Date: 17.APR.2015 13:06:44

**Chain0: 802.11b Band Edge, Right Side**



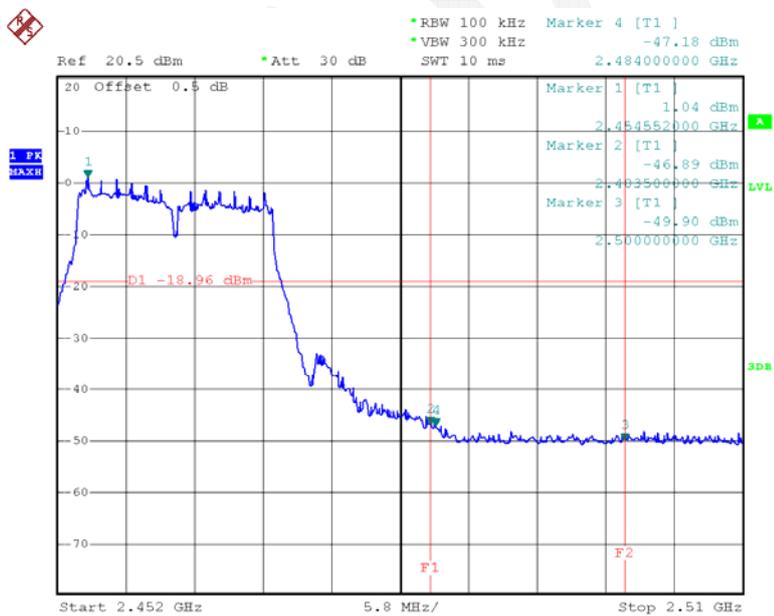
Date: 17.APR.2015 13:16:53

**Chain0: 802.11g Band Edge, Left Side**



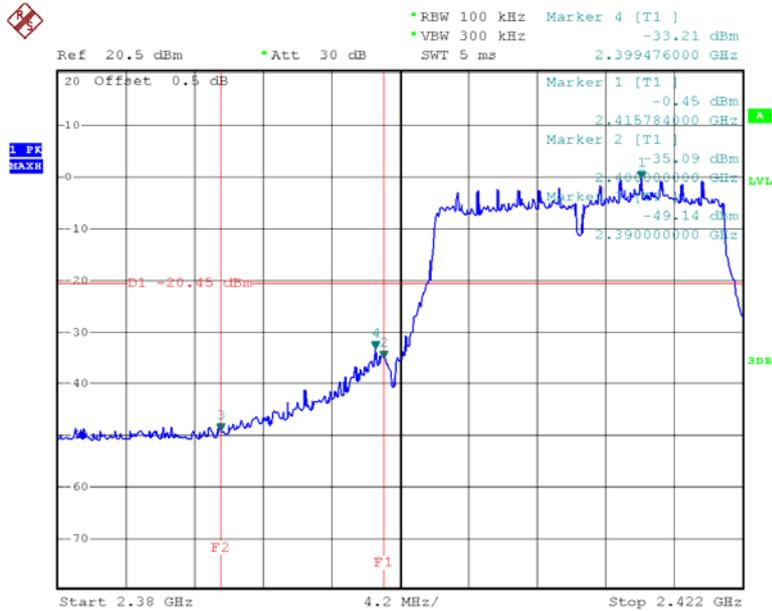
Date: 17.APR.2015 13:08:13

**Chain0: 802.11g Band Edge, Right Side**



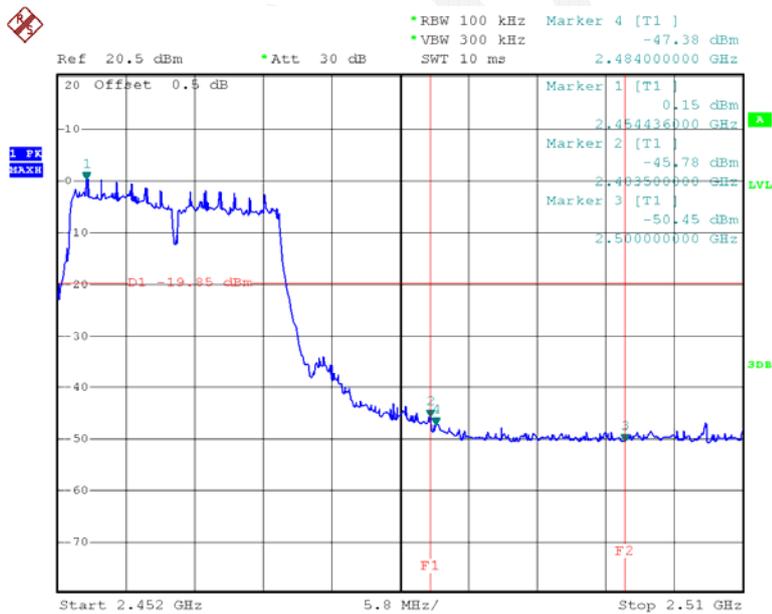
Date: 17.APR.2015 13:15:02

**Chain0: 802.11n20 Band Edge, Left Side**



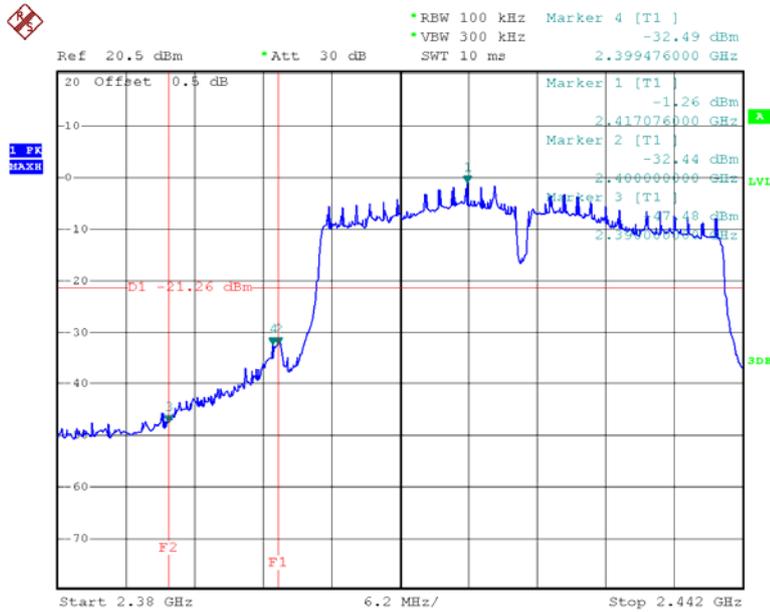
Date: 17.APR.2015 13:09:13

**Chain0: 802.11n20 Band Edge, Right Side**



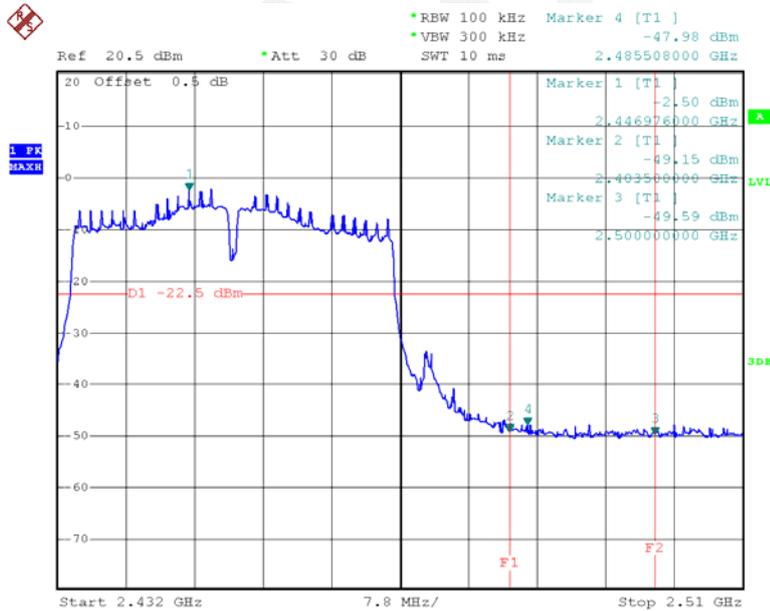
Date: 17.APR.2015 13:13:00

**Chain0: 802.11n40 Band Edge, Left Side**



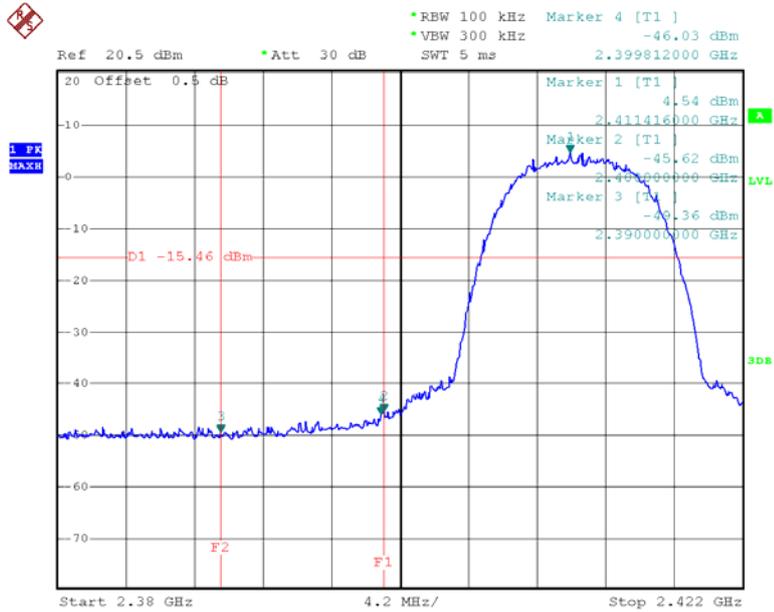
Date: 17.APR.2015 13:10:17

**Chain0: 802.11n40 Band Edge, Right Side**



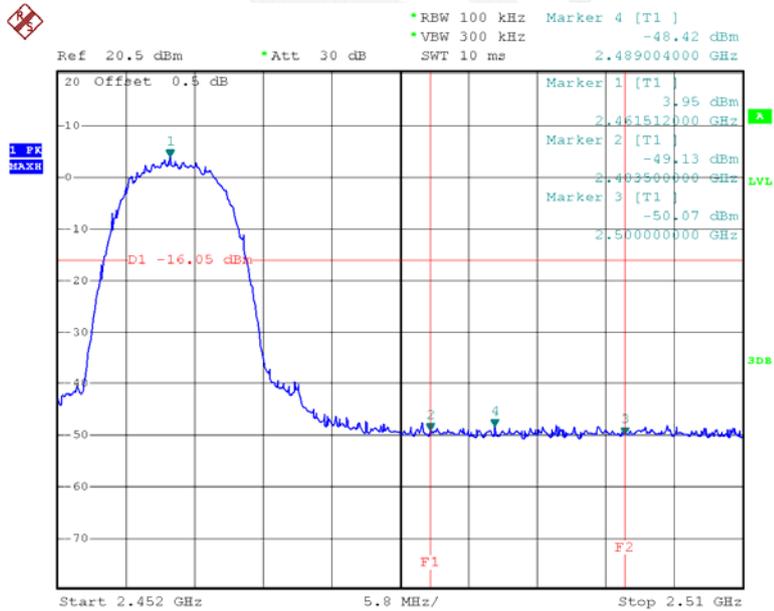
Date: 17.APR.2015 13:11:45

**Chain1: 802.11b Band Edge, Left Side**



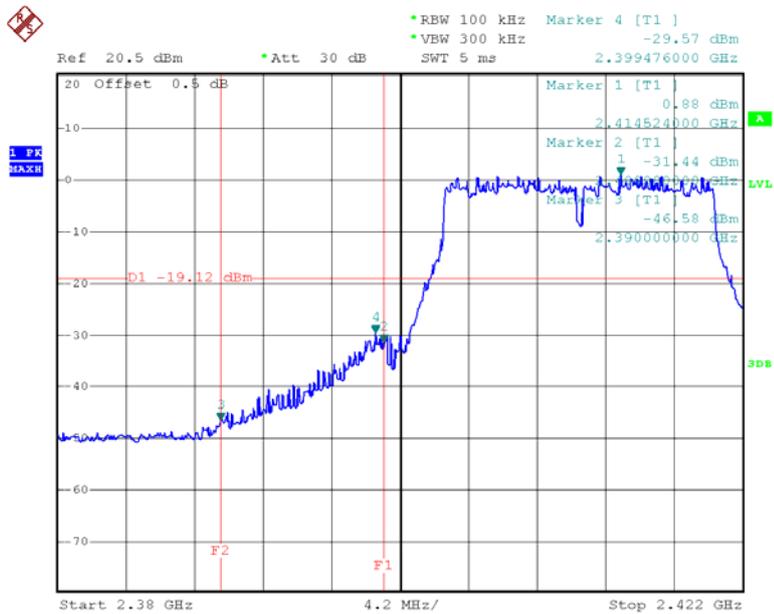
Date: 17.APR.2015 13:05:09

**Chain1: 802.11b Band Edge, Right Side**



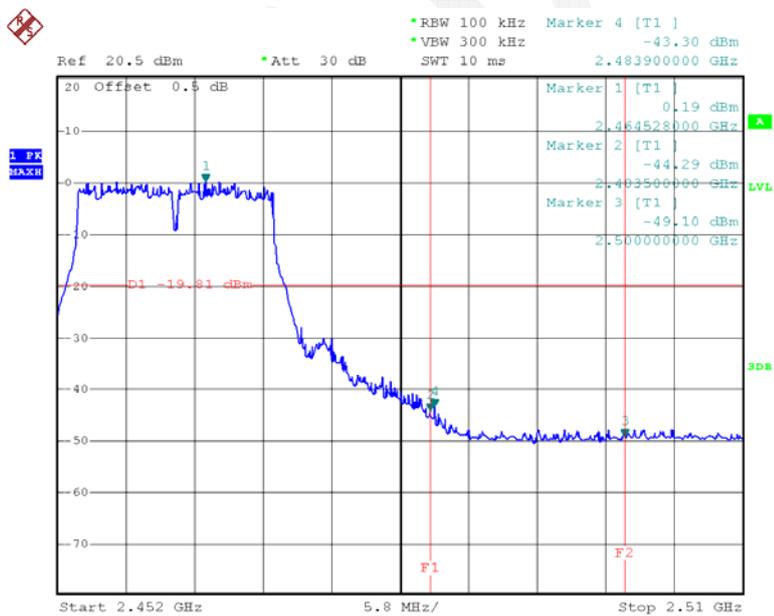
Date: 17.APR.2015 12:37:50

**Chain1: 802.11g Band Edge, Left Side**



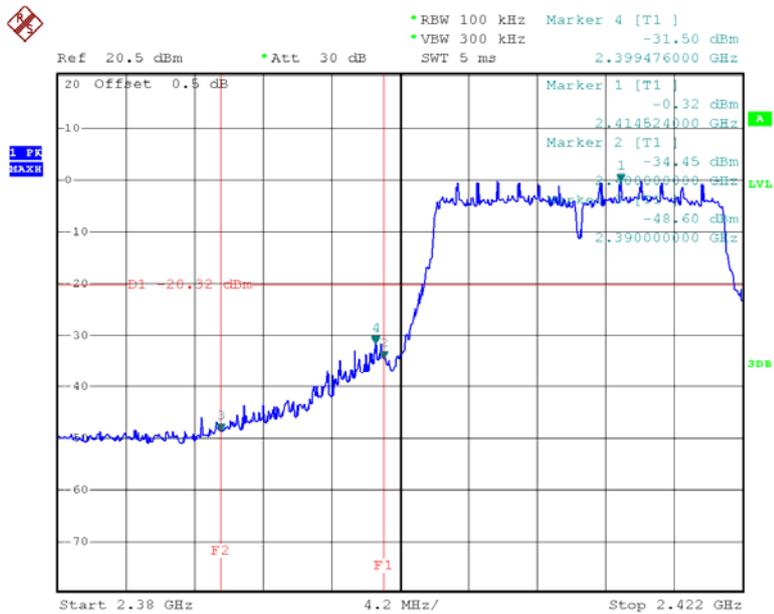
Date: 17.APR.2015 13:03:57

**Chain1: 802.11g Band Edge, Right Side**



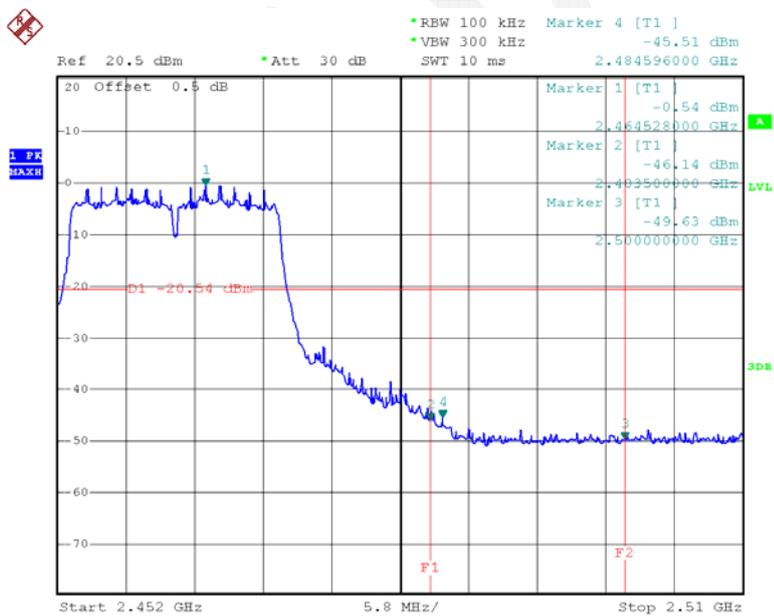
Date: 17.APR.2015 12:36:43

**Chain1: 802.11n20 Band Edge, Left Side**



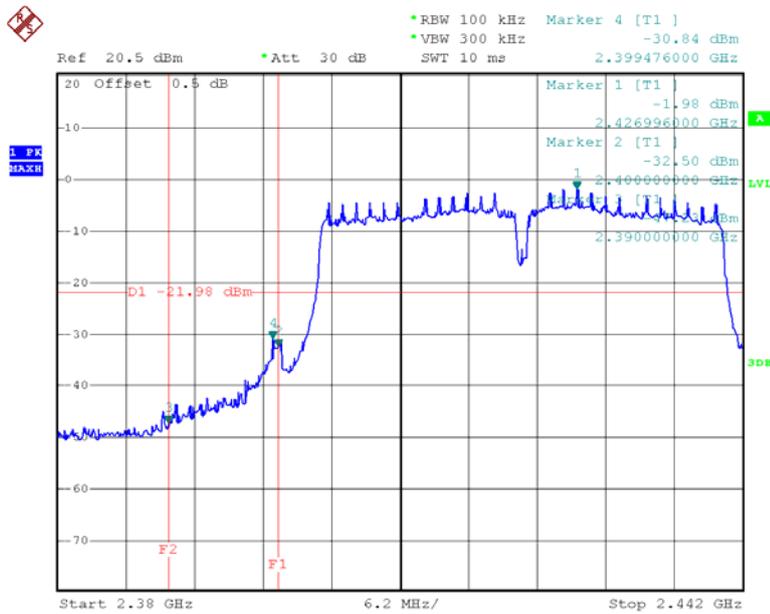
Date: 17.APR.2015 13:02:47

**Chain1: 802.11n20 Band Edge, Right Side**



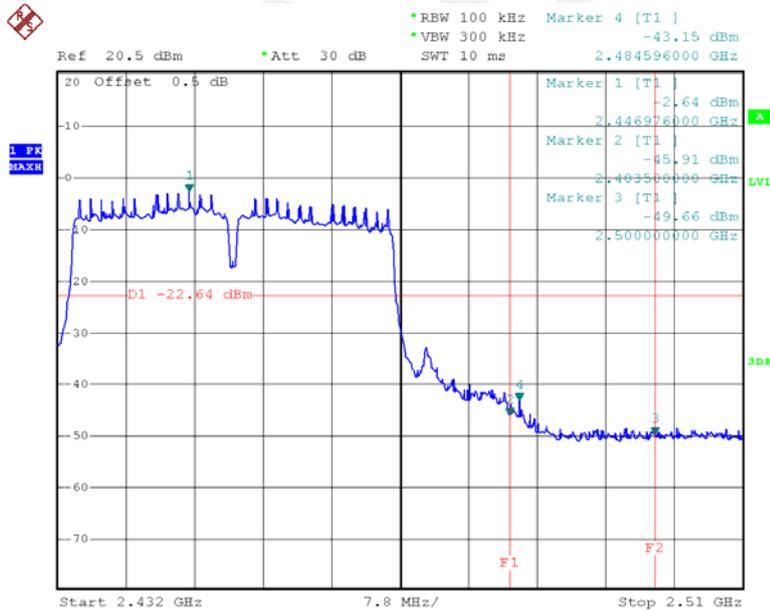
Date: 17.APR.2015 12:57:33

**Chain1: 802.11n40 Band Edge, Left Side**



Date: 17.APR.2015 13:01:26

**Chain1: 802.11n40 Band Edge, Right Side**



Date: 17.APR.2015 12:59:00

## FCC §15.247(e) - POWER SPECTRAL DENSITY

### Applicable Standard

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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW = 3 kHz, VBW = 10 kHz, Set the span to 1.5 times the DTS bandwidth.
4. Use the peak marker function to determine the maximum amplitude level.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test Data

#### Environmental Conditions

Temperature:	24.3 °C
Relative Humidity:	57 %
ATM Pressure:	100.7 kPa

\* The testing was performed by Allen Qiao on 2015-04-17.

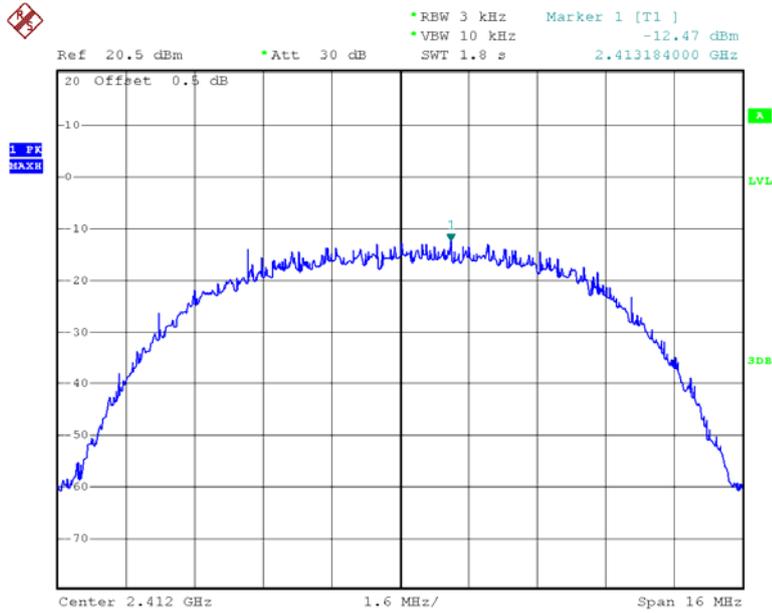
*Test Mode: Transmitting*

**Test Result: Pass**

Test Mode	Channel	PSD (dBm/3kHz)			Limit (dBm/3kHz)	Result
		Chain 0	Chain 1	Total		
802.11b	Low	-12.47	-10.84	-8.57	8	Pass
	Middle	-12.41	-10.16	-8.13	8	Pass
	High	-11.54	-10.25	-7.84	8	Pass
802.11g	Low	-14.62	-13.70	-11.13	8	Pass
	Middle	-14.20	-14.08	-11.13	8	Pass
	High	-13.90	-14.49	-11.17	8	Pass
802.11n20	Low	-14.27	-14.80	-11.52	8	Pass
	Middle	-14.64	-14.30	-11.46	8	Pass
	High	-14.82	-14.80	-11.8	8	Pass
802.11n40	Low	-16.82	-17.13	-13.96	8	Pass
	Middle	-17.98	-18.02	-14.99	8	Pass
	High	-17.95	-18.51	-15.21	8	Pass

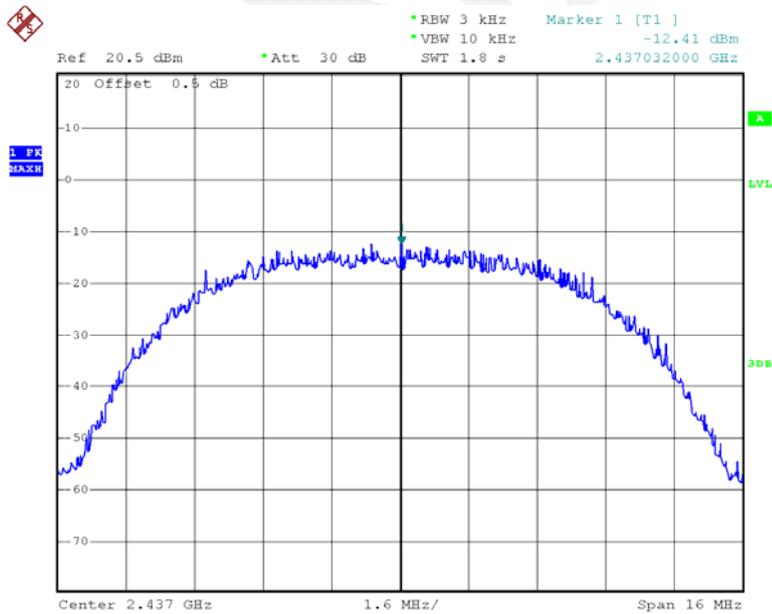
Please refer to the following plots

### Chain0: 802.11b Low Channel



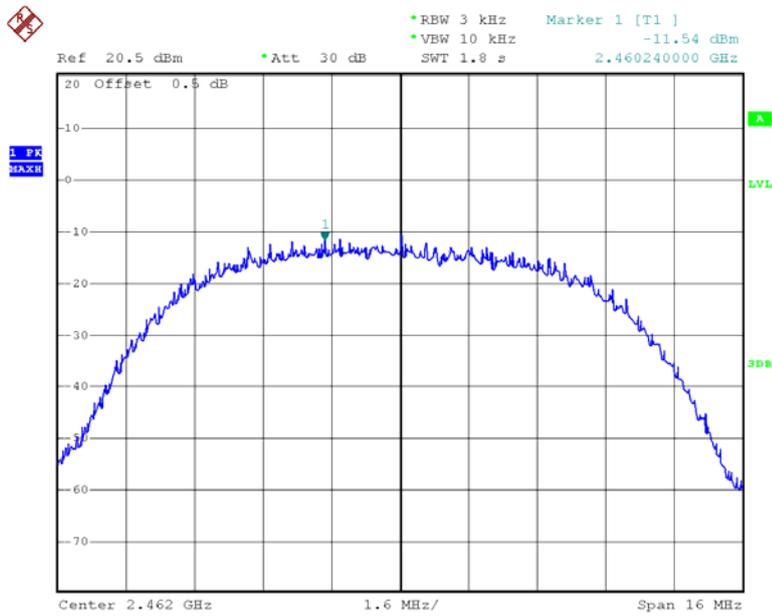
Date: 17.APR.2015 15:23:21

### Chain0: 802.11b Middle Channel



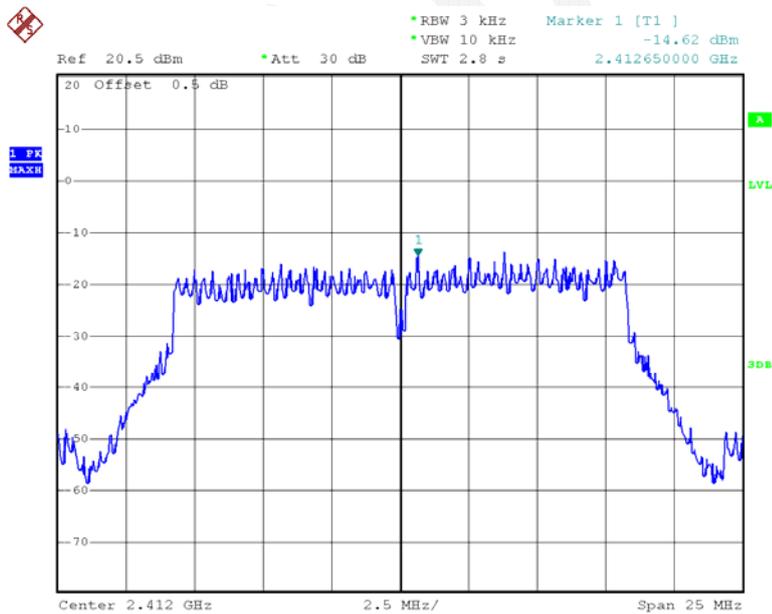
Date: 17.APR.2015 15:23:50

### Chain0: 802.11b High Channel



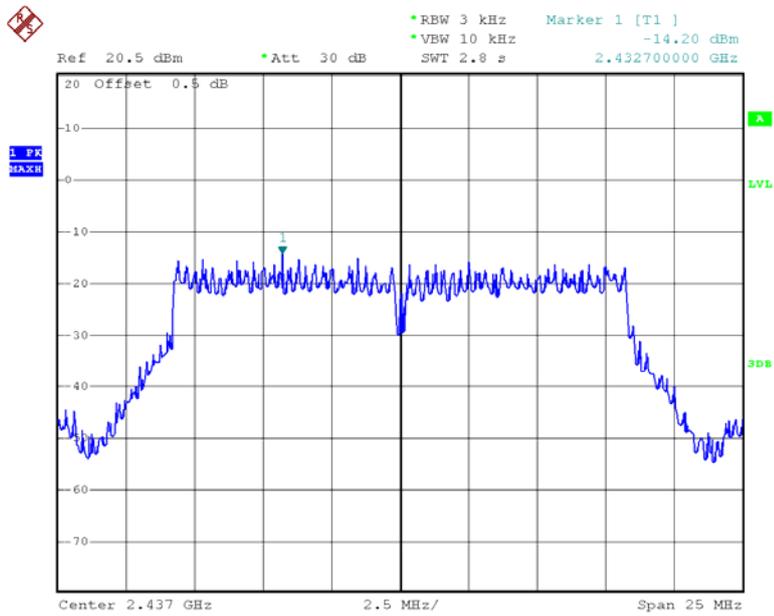
Date: 17.APR.2015 15:24:39

### Chain0: 802.11g Low Channel



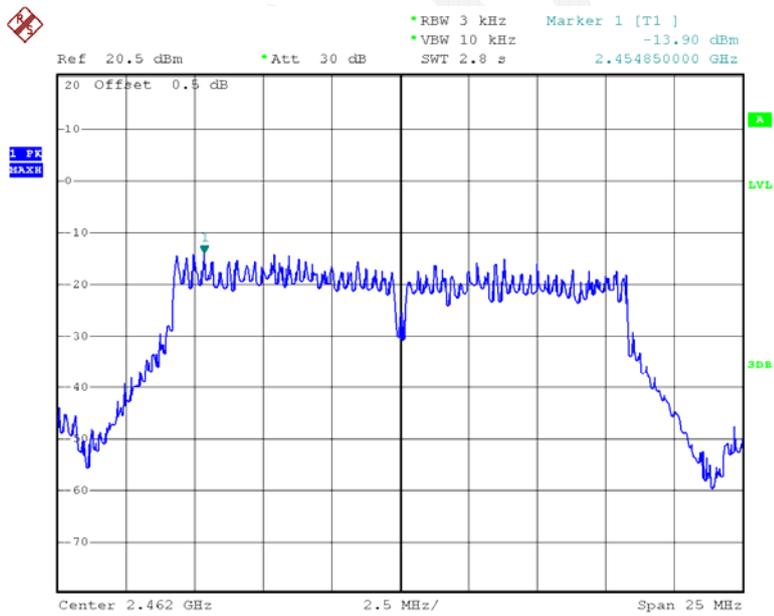
Date: 17.APR.2015 15:22:03

### Chain0: 802.11g Middle Channel



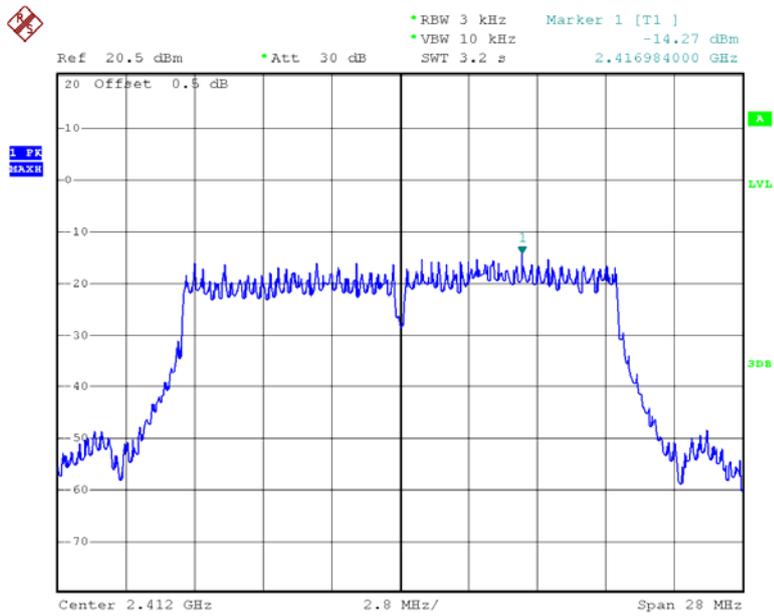
Date: 17.APR.2015 14:15:28

### Chain0: 802.11g High Channel



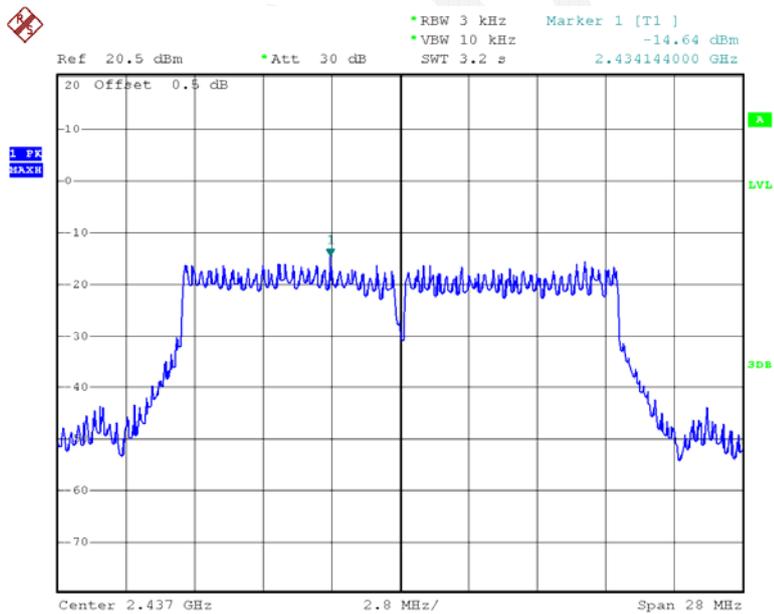
Date: 17.APR.2015 14:14:45

### Chain0: 802.11n20 Low Channel



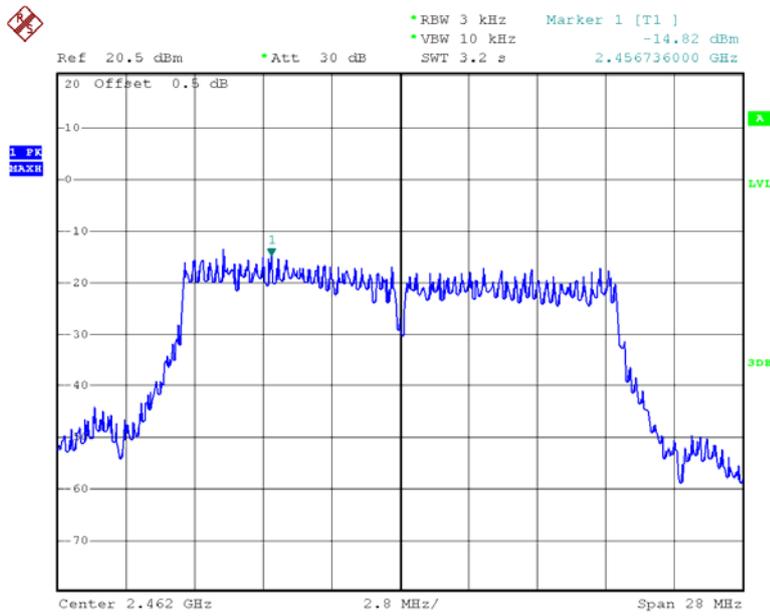
Date: 17.APR.2015 14:12:07

### Chain0: 802.11n20 Middle Channel



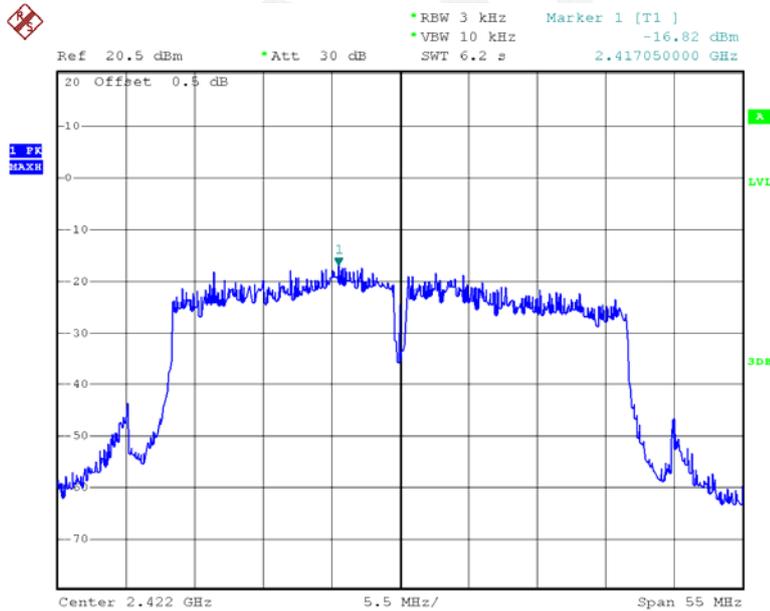
Date: 17.APR.2015 14:12:51

### Chain0: 802.11n20 High Channel



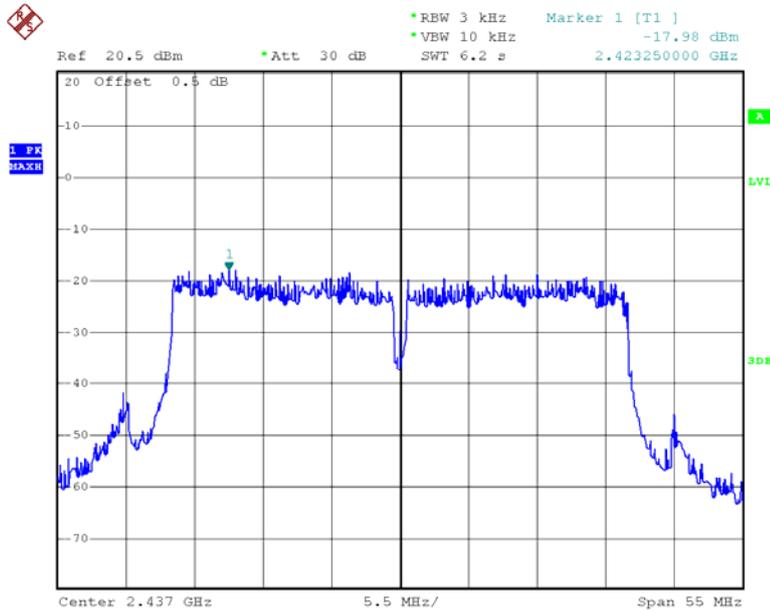
Date: 17.APR.2015 14:13:30

### Chain0: 802.11n40 Low Channel



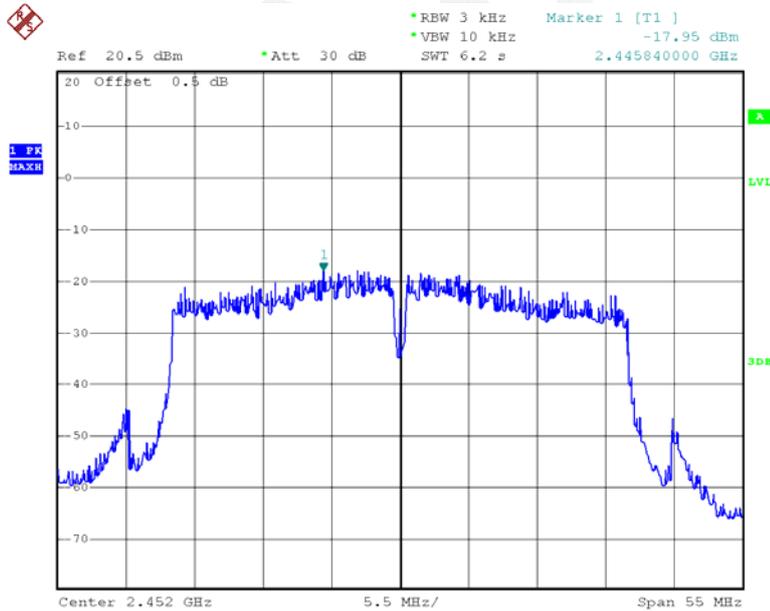
Date: 17.APR.2015 14:10:39

### Chain0: 802.11n40 Middle Channel



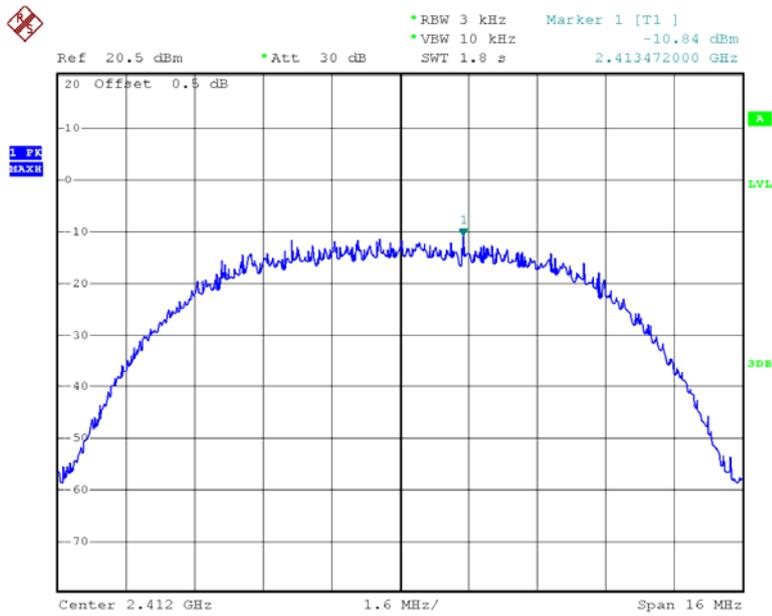
Date: 17.APR.2015 14:10:05

### Chain0: 802.11n40 High Channel



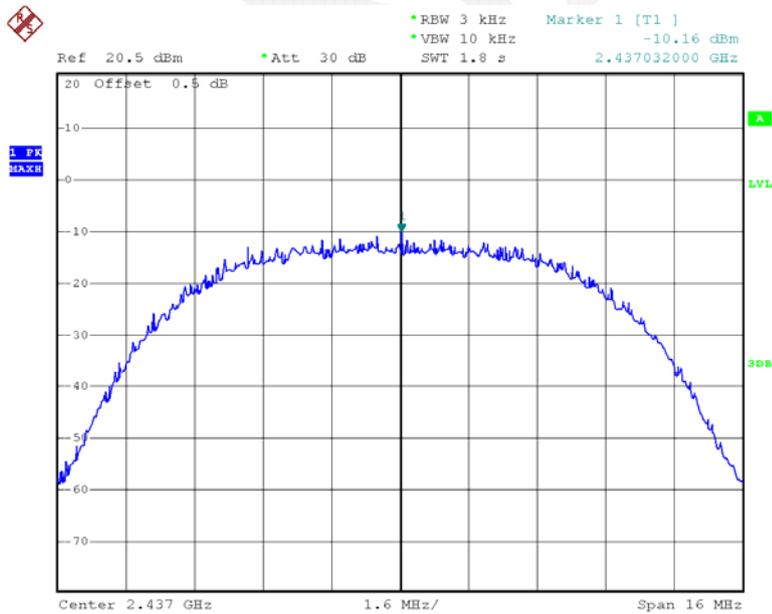
Date: 17.APR.2015 14:09:34

### Chain1: 802.11b Low Channel



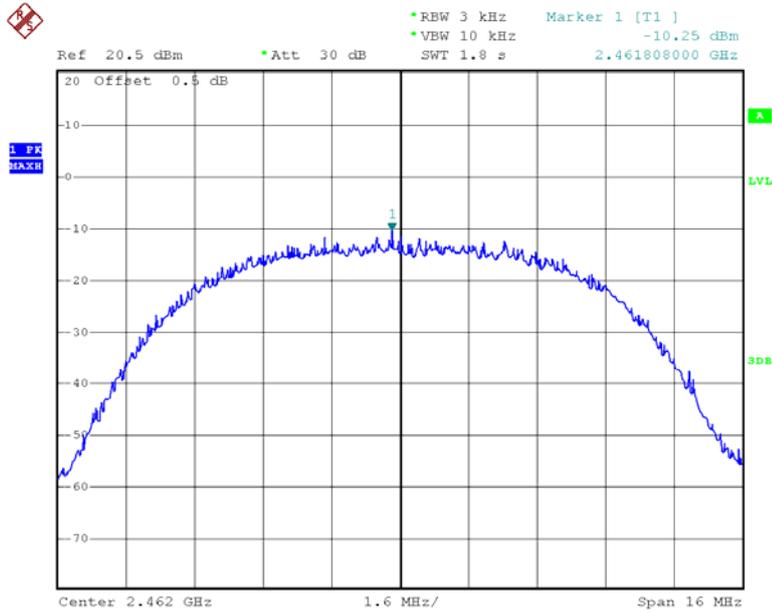
Date: 17.APR.2015 13:58:04

### Chain1: 802.11b Middle Channel



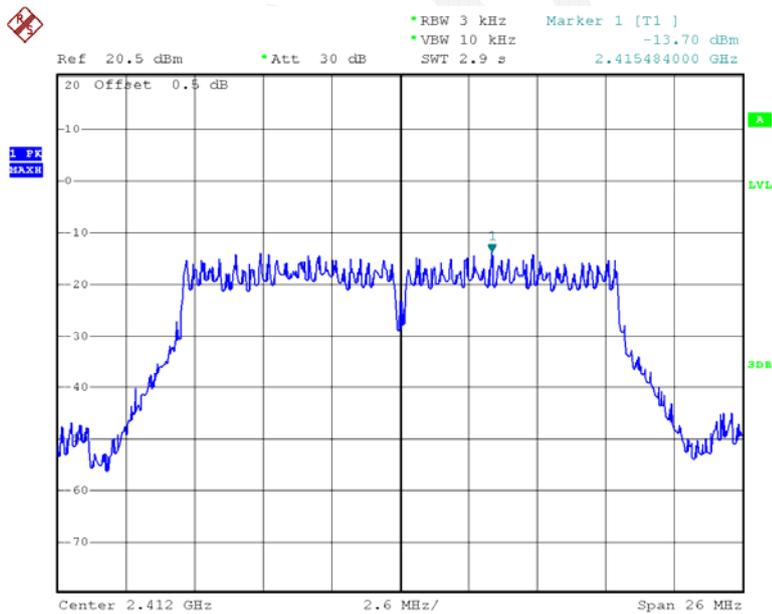
Date: 17.APR.2015 13:57:18

### Chain1: 802.11b High Channel



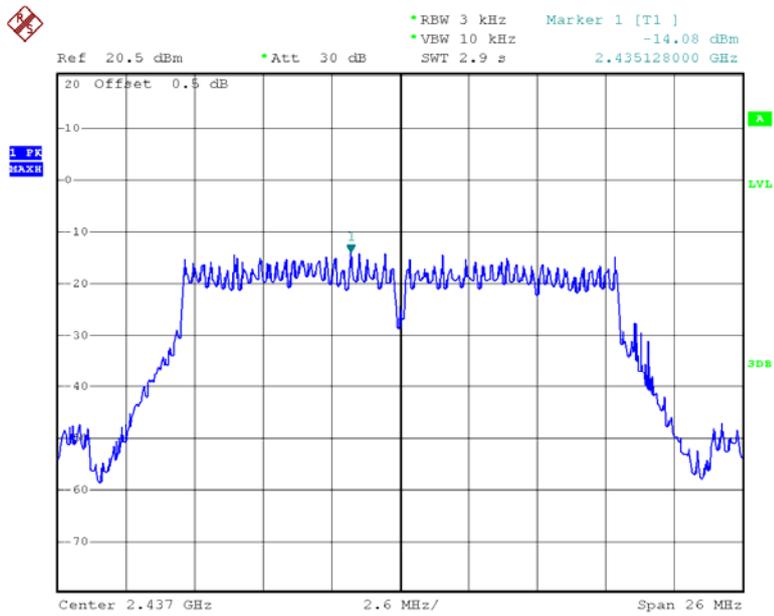
Date: 17.APR.2015 13:56:13

### Chain1: 802.11g Low Channel



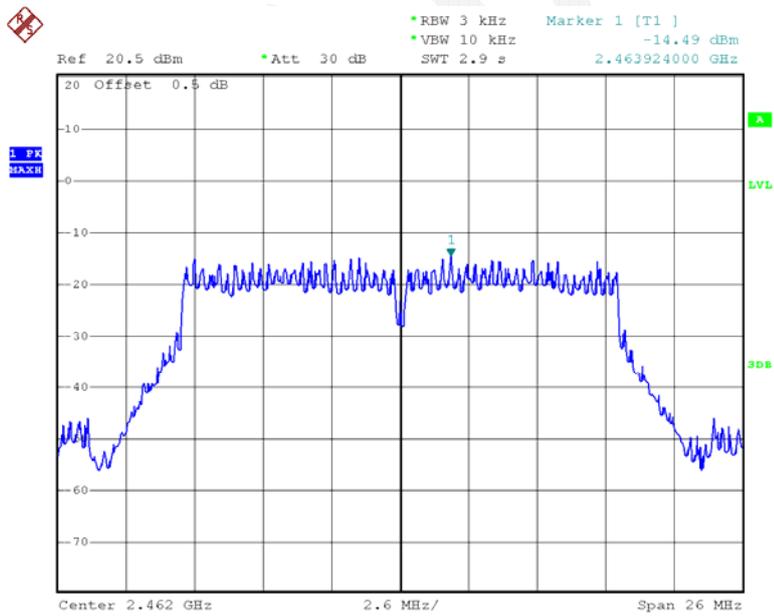
Date: 17.APR.2015 13:59:20

### Chain1: 802.11g Middle Channel



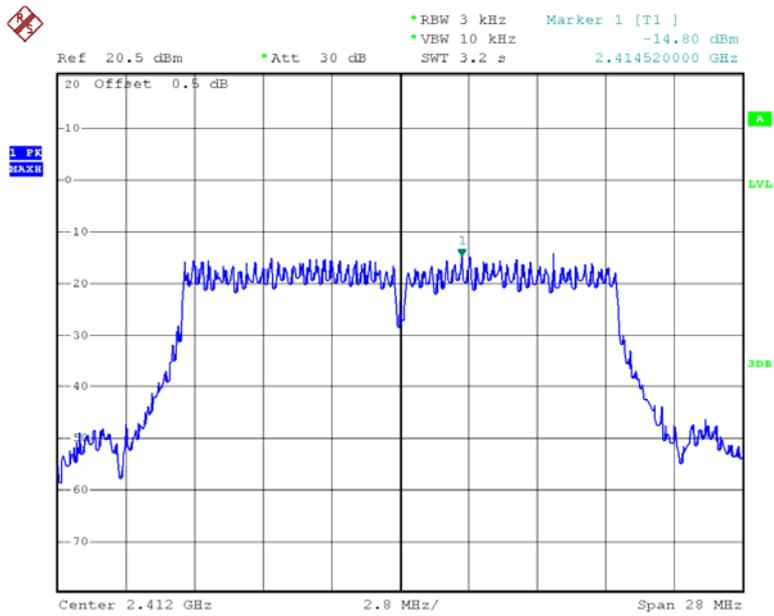
Date: 17.APR.2015 14:00:01

### Chain1: 802.11g High Channel



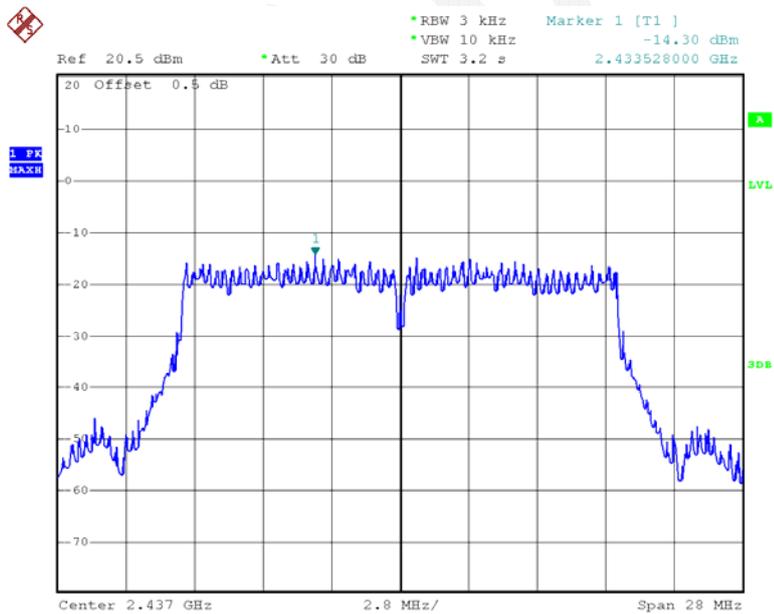
Date: 17.APR.2015 14:00:42

### Chain1: 802.11n20 Low Channel



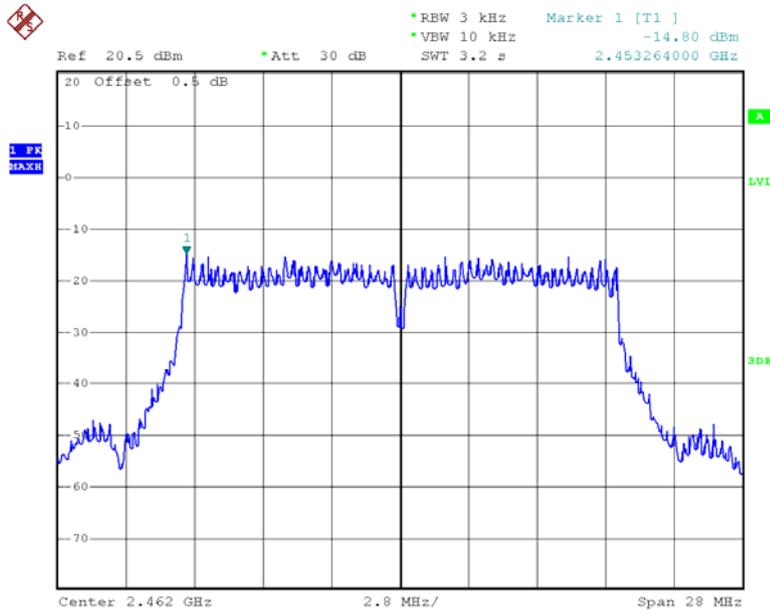
Date: 17.APR.2015 14:04:11

### Chain1: 802.11n20 Middle Channel



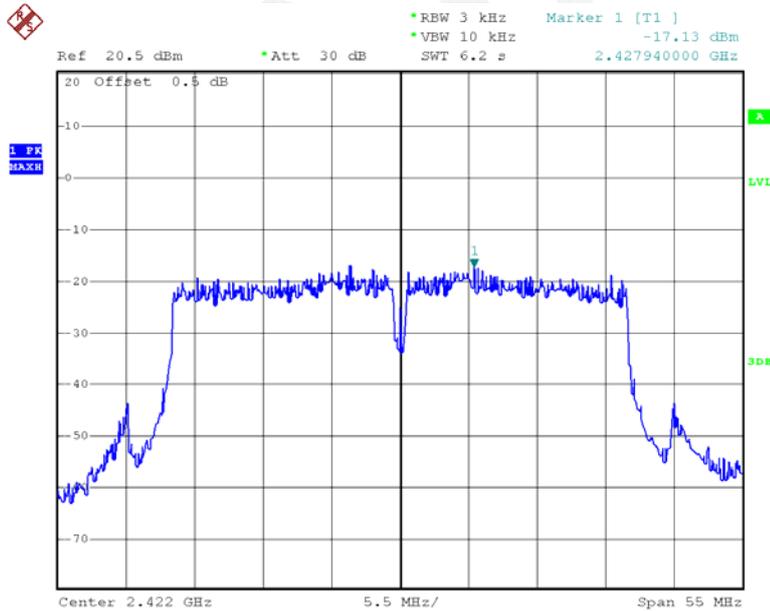
Date: 17.APR.2015 14:03:28

### Chain1: 802.11n20 High Channel



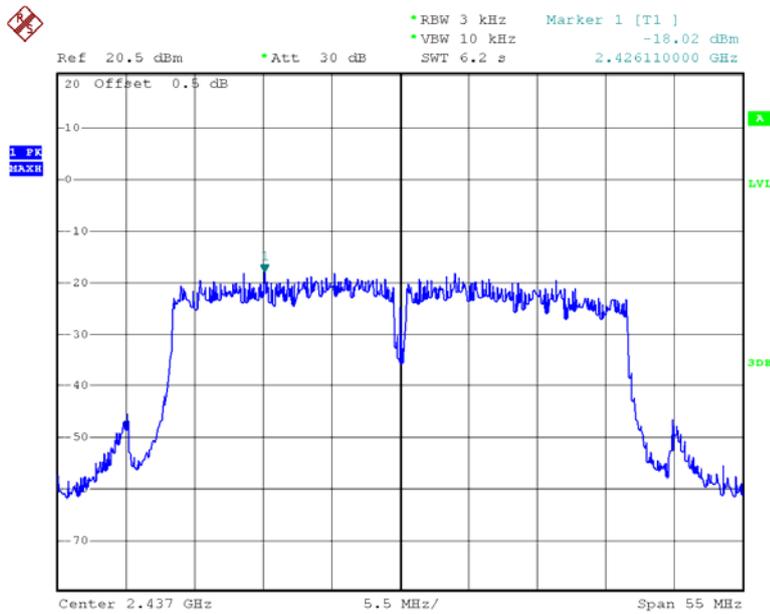
Date: 17.APR.2015 14:01:48

### Chain1: 802.11n40 Low Channel



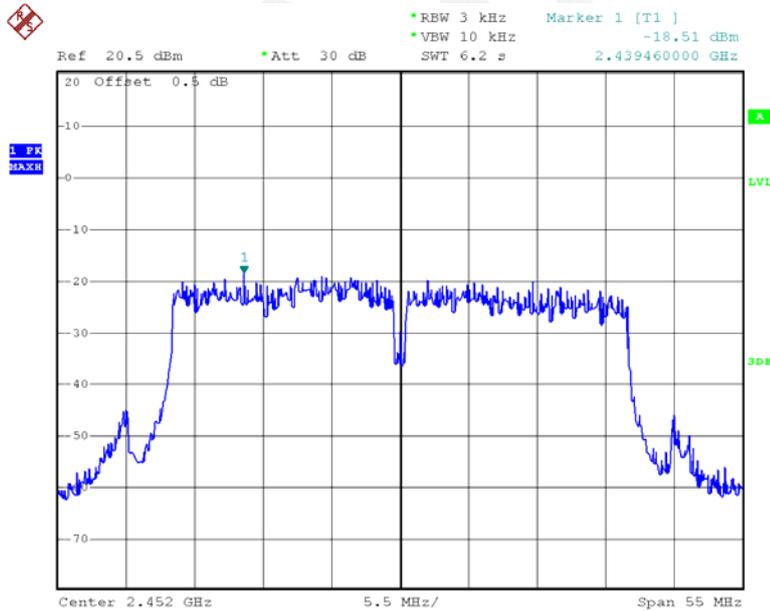
Date: 17.APR.2015 14:05:34

### Chain1: 802.11n40 Middle Channel



Date: 17.APR.2015 14:06:22

### Chain1: 802.11n40 High Channel



Date: 17.APR.2015 14:07:27

\*\*\*\*\* END OF REPORT \*\*\*\*\*