

FCC PART 15.247

TEST REPORT

For

L-com, Inc

45 Beechwood Drive, North Andover, MA 01845, USA

FCC ID: MYF-LCUSB2415

Report Type: Original Report	Product Type: 2.4GHz 802.11n Wireless USB adapter
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Report Number: <u>R2DG140430006-00</u>	
Report Date: <u>2014-06-25</u>	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
DESCRIPTION OF TEST CONFIGURATION	6
EUT EXERCISE SOFTWARE	6
EQUIPMENT MODIFICATIONS	7
SUPPORT EQUIPMENT LIST AND DETAILS	7
EXTERNAL CABLE.....	7
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §15.247 (i) & §1.1307 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	9
APPLICABLE STANDARD	9
FCC §15.203 - ANTENNA REQUIREMENT.....	10
APPLICABLE STANDARD	10
ANTENNA CONNECTOR CONSTRUCTION	10
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	11
APPLICABLE STANDARD	11
MEASUREMENT UNCERTAINTY.....	11
EUT SETUP.....	11
EMI TEST RECEIVER SETUP.....	12
TEST PROCEDURE	12
CORRECTED AMPLITUDE & MARGIN CALCULATION	12
TEST EQUIPMENT LIST AND DETAILS.....	13
TEST RESULTS SUMMARY	13
TEST DATA	13
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS.....	16
APPLICABLE STANDARD	16
MEASUREMENT UNCERTAINTY.....	16
EUT SETUP	16
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	17
TEST PROCEDURE	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	18
TEST EQUIPMENT LIST AND DETAILS.....	18
TEST RESULTS SUMMARY	18
TEST DATA	18
FCC §15.247(a) (2) – 6dB BANDWIDTH.....	29
APPLICABLE STANDARD	29
TEST PROCEDURE	29
TEST EQUIPMENT LIST AND DETAILS.....	29
TEST DATA	29
FCC §15.247(b) (3) - MAXIMUM PEAK CONDUCTED OUTPUT POWER.....	37

APPLICABLE STANDARD	37
TEST PROCEDURE	37
TEST EQUIPMENT LIST AND DETAILS.....	37
TEST DATA	37
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE.....	45
APPLICABLE STANDARD	45
TEST PROCEDURE	45
TEST EQUIPMENT LIST AND DETAILS.....	45
TEST DATA	45
FCC §15.247(e) - POWER SPECTRAL DENSITY	50
APPLICABLE STANDARD	50
TEST PROCEDURE	50
TEST EQUIPMENT LIST AND DETAILS.....	50
TEST DATA	50

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *L-com, Inc's* product, model number: *ARK-2404U-3(FCC ID: MYF-LCUSB2415)* (the "EUT") in this report was a *2.4GHz 802.11n Wireless USB adapter*, which was measured approximately: 3.8cm (L) x 3.8 cm (W) x 36.7 cm(H), rated input voltage: DC 5V from system.

** All measurement and test data in this report was gathered from production sample serial number: 140430006. (Assigned by BACL.Dongguan). The EUT was received on 2014-05-05.*

Objective

This report is prepared on behalf of *L-com, Inc* 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)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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 Engineering Mode, which was provided by the manufacturer.

For 2.4G 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 802.11n20 modes were tested with Channel 1, 6 and 11.

For 802.11n40 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 software “QA_RT3x7x_V1.5.6.7” was used for testing, which was provided by manufacturer.

Test Mode	Test Software Version	QA_RT3x7x_V1.5.6.7		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	1F	1F	1F
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	1B	1B	1B
802.11n ht20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	1A	1A	1A
802.11n ht40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	14	14	14

Equipment Modifications

No modification was made to the EUT.

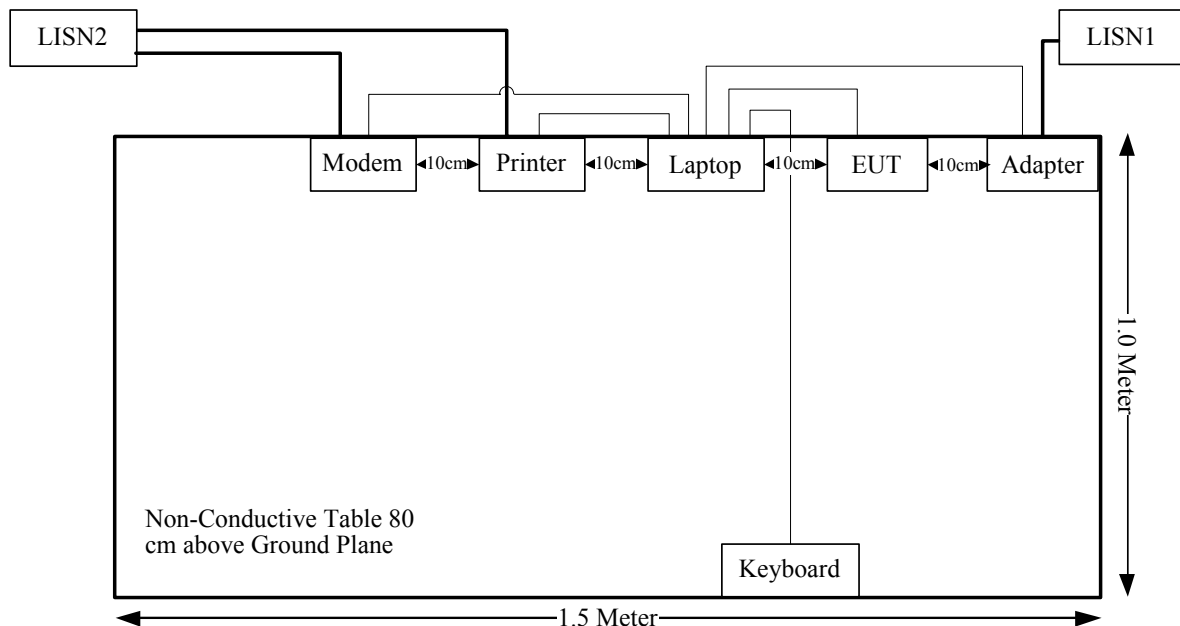
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017
HP	Printer	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL05DC
SAST	Modem	AEM-2100	0293

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Serial Cable	yes	No	1.2	Serial Port of Laptop	Modem
Parallel Cable	yes	No	1.2	Parallel Port of Laptop	Printer
USB Cable	No	No	5	USB Port of Laptop	EUT
Keyboard Cable	yes	No	1.5	USB Port of Laptop	Keyboard

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 & §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 Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Conducted 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) & §1.1307 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i) and subpart §1.1307, 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) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

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);

Calculated Data:

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
2.4G-802.11b	2412	4	2.51	24.75	298.54	20	0.15	1.0
2.4G-802.11g	2462	4	2.51	25.79	379.31	20	0.19	1.0
2.4G-802.11n HT20	2437	4	2.51	25.48	353.18	20	0.18	1.0
2.4G-802.11n HT40	2422	4	2.51	19.76	94.62	20	0.05	1.0

Result: The device meet FCC MPE at 20 cm distance

FCC §15.203 - ANTENNA REQUIREMENT

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.
- c. 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 one dedicated antenna arrangement for Wi-Fi, and the antenna gain is 4.0dBi, fulfill the requirement of the item c above. Please refer to the internal 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_{cisp} 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_{cisp} of Table 1, then:

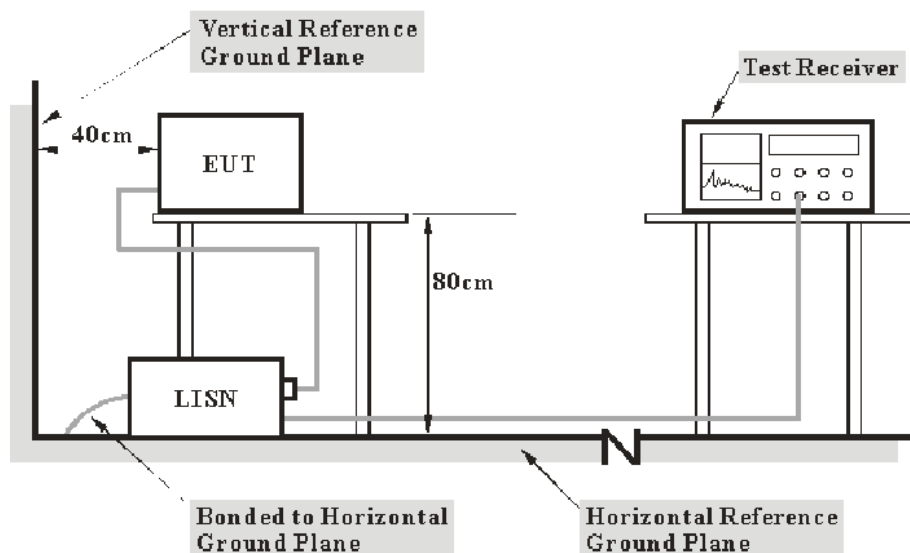
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

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_{cisp}

Measurement	U_{cisp}
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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter of notebook 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 first LISN and the other support equipments were connected to the outlet of the second 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	2013-11-20	2014-11-19
R&S	Two-line V-network	ENV216	3560.6550.12	2014-01-22	2015-01-21
R&S	L.I.S.N	ESH3-Z5	100113	N/A	N/A
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:

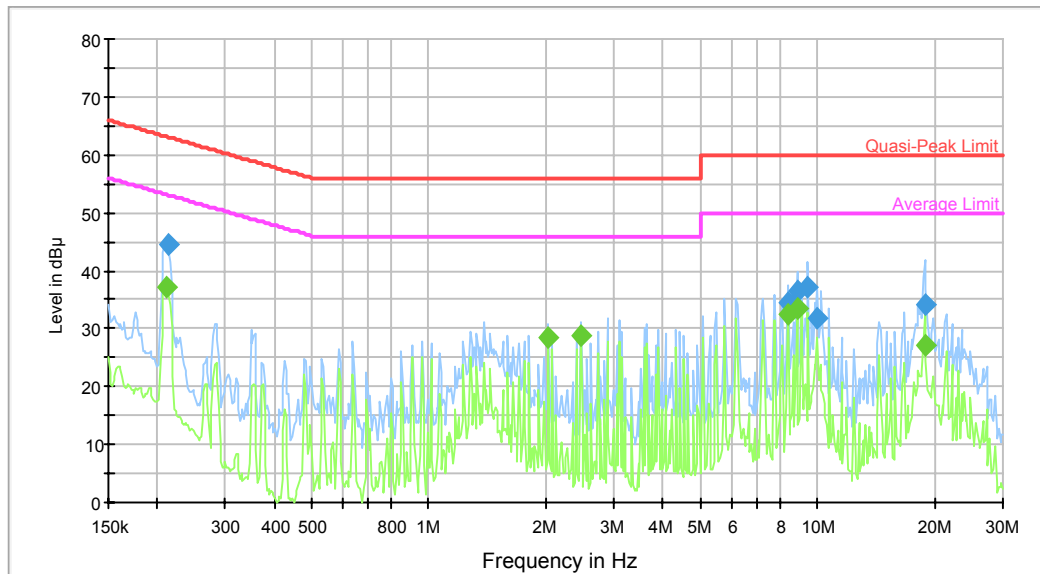
15.8 dB at 0.212988 MHz in the **Neutral** conducted mode

Test Data**Environmental Conditions**

Temperature:	27.4 °C
Relative Humidity:	70 %
ATM Pressure:	100 kPa

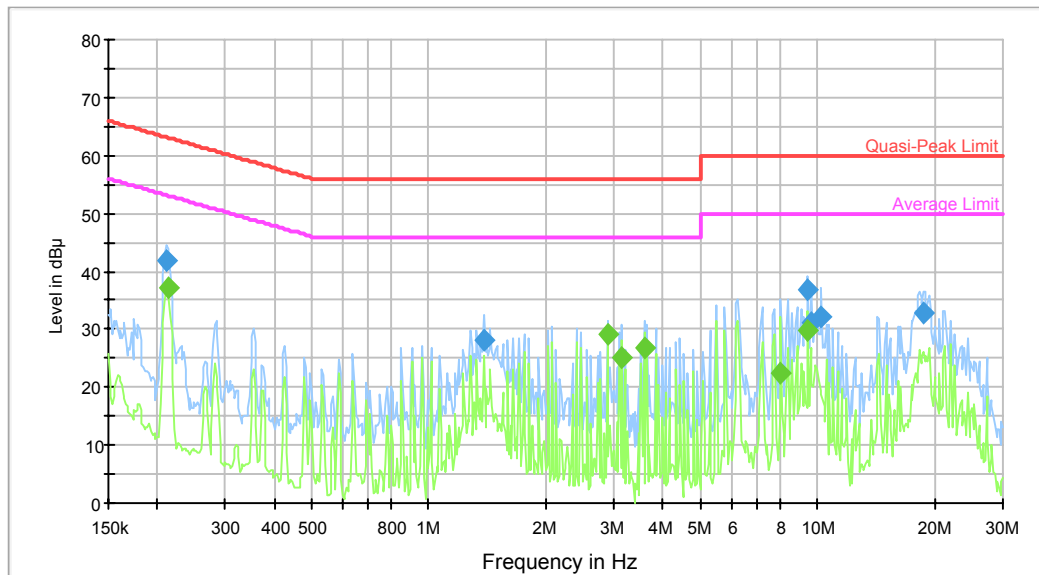
The testing was performed by Dean Liu on 2014-05-19.

Test Mode: Transmitting

AC 120 V, 60 Hz, Line:

Frequency (MHz)	Corrected Quasi-Peak (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.212988	44.5	9.000	L1	10.8	18.6	63.1	Compliance
8.388036	34.4	9.000	L1	10.7	25.6	60.0	Compliance
8.869191	36.6	9.000	L1	10.7	23.4	60.0	Compliance
9.452969	37.1	9.000	L1	10.7	22.9	60.0	Compliance
9.995211	31.8	9.000	L1	10.7	28.2	60.0	Compliance
18.907519	34.0	9.000	L1	11.1	26.0	60.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.211298	37.0	9.000	L1	10.8	16.1	53.2	Compliance
2.030886	28.4	9.000	L1	10.5	17.6	46.0	Compliance
2.458886	28.8	9.000	L1	10.5	17.2	46.0	Compliance
8.388036	32.5	9.000	L1	10.7	17.5	50.0	Compliance
8.869191	33.6	9.000	L1	10.7	16.4	50.0	Compliance
18.907519	27.3	9.000	L1	11.1	22.7	50.0	Compliance

AC 120 V, 60 Hz, Neutral:

Frequency (MHz)	Corrected Quasi-Peak (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.211298	41.7	9.000	N	11.3	21.4	63.2	Compliance
1.385415	28.1	9.000	N	10.5	27.9	56.0	Compliance
9.452969	36.9	9.000	N	10.7	23.2	60.0	Compliance
9.681660	31.1	9.000	N	10.7	28.9	60.0	Compliance
10.237020	32.2	9.000	N	10.7	27.8	60.0	Compliance
18.757459	32.9	9.000	N	11.0	27.1	60.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.212988	37.2	9.000	N	11.3	15.8	53.1	Compliance
2.883693	29.0	9.000	N	10.6	17.0	46.0	Compliance
3.147856	25.3	9.000	N	10.7	20.7	46.0	Compliance
3.575883	26.8	9.000	N	10.7	19.2	46.0	Compliance
8.060419	22.3	9.000	N	10.6	27.7	50.0	Compliance
9.452969	29.6	9.000	N	10.7	20.4	50.0	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_{cisp} 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_{cisp} of Table 2, then:

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

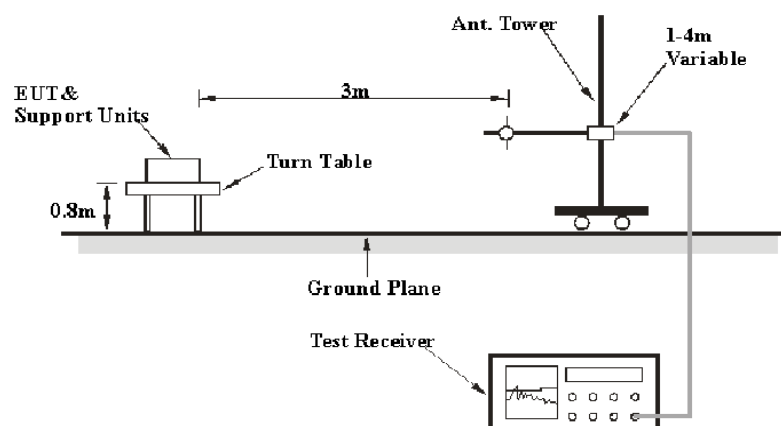
6G~18GHz: 5.23 dB

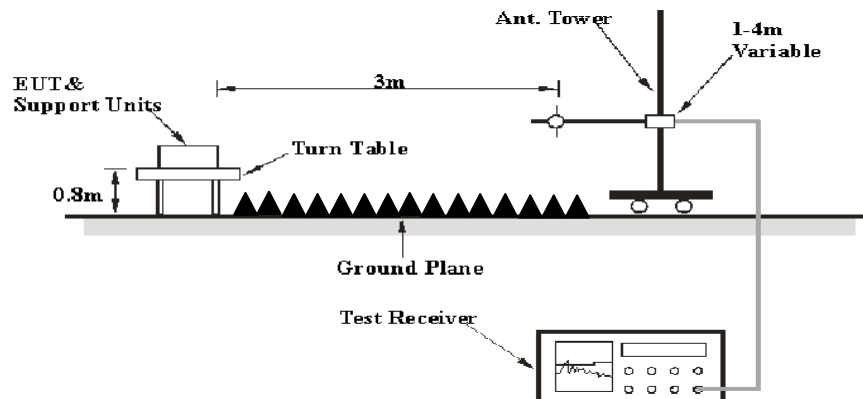
Table 2 – Values of U_{cisp}

Measurement	U_{cisp}
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 C63.4-2003. 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 first AC floor outlet and the other support equipments were connected to the second 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	2015-05-08
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
HP	Amplifier	8447E	2434A02181	2013-09-06	2014-09-05
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-08
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-18
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-08
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2013-06-16	2014-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2013-09-06	2014-09-05

* **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:

0.62 dB at 2483.5 MHz in the Vertical polarization for 802.11g Mode

Test Data

Environmental Conditions

Temperature:	27.4 °C-28 °C
Relative Humidity:	70 %-60%
ATM Pressure:	100 kPa -99.6 kPa

The testing was performed by Dean Liu on 2014-05-19&2014-06-11.

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/m)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2412 MHz									
2412	70.41	PK	H	25.67	4.42	0.00	100.50	N/A	N/A
2412	65.75	AV	H	25.67	4.42	0.00	95.84	N/A	N/A
2412	81.48	PK	V	25.67	4.42	0.00	111.57	N/A	N/A
2412	76.51	AV	V	25.67	4.42	0.00	106.60	N/A	N/A
2390	27.16	PK	V	25.61	4.39	0.00	57.16	74.00	16.84
2390	15.24	AV	V	25.61	4.39	0.00	45.24	54.00	8.76
4824	46.36	PK	V	30.64	6.03	27.41	55.62	74.00	18.38
4824	37.21	AV	V	30.64	6.03	27.41	46.47	54.00	7.53
7236	33.26	PK	V	34.17	7.47	25.90	49.00	74.00	25.00
7236	21.96	AV	V	34.17	7.47	25.90	37.70	54.00	16.30
9648	28.78	PK	V	36.06	8.81	27.46	46.19	74.00	27.81
9648	18.77	AV	V	36.06	8.81	27.46	36.18	54.00	17.82
7090	32.06	PK	V	33.82	7.39	26.09	47.18	74.00	26.82
7090	20.98	AV	V	33.82	7.39	26.09	36.10	54.00	17.90
119.24	47.90	QP	V	14.07	1.34	21.41	41.90	43.50	1.60*
Middle Channel: 2437 MHz									
2442	70.56	PK	H	25.75	4.40	0.00	100.71	N/A	N/A
2442	66.47	AV	H	25.75	4.40	0.00	96.62	N/A	N/A
2442	79.89	PK	V	25.75	4.40	0.00	110.04	N/A	N/A
2442	75.72	AV	V	25.75	4.40	0.00	105.87	N/A	N/A
4884	47.93	PK	V	30.80	6.08	27.42	57.39	74.00	16.61
4884	38.25	AV	V	30.80	6.08	27.42	47.71	54.00	6.29
7326	31.33	PK	V	34.38	7.52	25.88	47.35	74.00	26.65
7326	19.56	AV	V	34.38	7.52	25.88	35.58	54.00	18.42
9768	28.69	PK	V	36.34	8.83	27.19	46.67	74.00	27.33
9768	17.09	AV	V	36.34	8.83	27.19	35.07	54.00	18.93
7090	31.81	PK	V	33.82	7.39	26.09	46.93	74.00	27.07
7090	20.17	AV	V	33.82	7.39	26.09	35.29	54.00	18.71
1650	31.00	PK	V	23.90	3.41	27.74	30.57	74.00	43.43
1650	20.36	AV	V	23.90	3.41	27.74	19.93	54.00	34.07
119.24	47.20	QP	V	14.07	1.34	21.41	41.20	43.50	2.30*
High Channel: 2462 MHz									
2462	70.67	PK	H	25.80	4.43	0.00	100.90	N/A	N/A
2462	66.49	AV	H	25.80	4.43	0.00	96.72	N/A	N/A
2462	81.19	PK	V	25.80	4.43	0.00	111.42	N/A	N/A
2462	76.02	AV	V	25.80	4.43	0.00	106.25	N/A	N/A
2483.5	29.20	PK	V	25.86	4.49	0.00	59.55	74.00	14.45
2483.5	17.96	AV	V	25.86	4.49	0.00	48.31	54.00	5.69
4924	46.43	PK	V	30.90	5.97	27.43	55.87	74.00	18.13
4924	37.13	AV	V	30.90	5.97	27.43	46.57	54.00	7.43
7386	31.40	PK	V	34.53	7.55	25.86	47.62	74.00	26.38
7386	19.67	AV	V	34.53	7.55	25.86	35.89	54.00	18.11
9848	28.08	PK	V	36.54	8.85	26.94	46.53	74.00	27.47
9848	16.59	AV	V	36.54	8.85	26.94	35.04	54.00	18.96
7090	31.24	PK	V	33.82	7.39	26.09	46.36	74.00	27.64
7090	20.03	AV	V	33.82	7.39	26.09	35.15	54.00	18.85
119.24	47.80	OP	V	14.07	1.34	21.41	41.80	43.50	1.70*

802.11g Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB/m)	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	66.99	PK	H	25.67	4.42	0.00	97.08	N/A	N/A
2412	55.69	AV	H	25.67	4.42	0.00	85.78	N/A	N/A
2412	80.9	PK	V	25.67	4.42	0.00	110.99	N/A	N/A
2412	70.79	AV	V	25.67	4.42	0.00	100.88	N/A	N/A
2390	36.74	PK	V	25.61	4.39	0.00	66.74	74.00	7.26
2390	22.05	AV	V	25.61	4.39	0.00	52.05	54.00	1.95*
4824	46.8	PK	V	30.64	6.03	27.41	56.06	74.00	17.94
4824	33.6	AV	V	30.64	6.03	27.41	42.86	54.00	11.14
7236	30.78	PK	V	34.17	7.47	25.90	46.52	74.00	27.48
7236	19.86	AV	V	34.17	7.47	25.90	35.60	54.00	18.40
9648	29.35	PK	V	36.06	8.81	27.46	46.76	74.00	27.24
9648	16.88	AV	V	36.06	8.81	27.46	34.29	54.00	19.71
7405	31.61	PK	V	34.57	7.56	25.87	47.87	74.00	26.13
7405	20.12	AV	V	34.57	7.56	25.87	36.38	54.00	17.62
119.24	47.2	QP	V	14.07	1.34	21.41	41.20	43.50	2.30*
Middle Channel: 2437 MHz									
2442	66.15	PK	H	25.75	4.40	0.00	96.30	N/A	N/A
2442	56.89	AV	H	25.75	4.40	0.00	87.04	N/A	N/A
2442	79.71	PK	V	25.75	4.40	0.00	109.86	N/A	N/A
2442	69.38	AV	V	25.75	4.40	0.00	99.53	N/A	N/A
4884	46.85	PK	V	30.80	6.08	27.42	56.31	74.00	17.69
4884	33.2	AV	V	30.80	6.08	27.42	42.66	54.00	11.34
7326	31.47	PK	V	34.38	7.52	25.88	47.49	74.00	26.51
7326	20.34	AV	V	34.38	7.52	25.88	36.36	54.00	17.64
9768	28.39	PK	V	36.34	8.83	27.19	46.37	74.00	27.63
9768	17.13	AV	V	36.34	8.83	27.19	35.11	54.00	18.89
7405	31.01	PK	V	34.57	7.56	25.87	47.27	74.00	26.73
7405	20.13	AV	V	34.57	7.56	25.87	36.39	54.00	17.61
1650	32.03	PK	V	23.90	3.41	27.74	31.60	74.00	42.40
1650	20.79	AV	V	23.90	3.41	27.74	20.36	54.00	33.64
119.24	46.9	QP	V	14.07	1.34	21.41	40.90	43.50	2.60*
High Channel: 2462 MHz									
2462	66.95	PK	H	25.80	4.43	0.00	97.18	N/A	N/A
2462	57.01	AV	H	25.80	4.43	0.00	87.24	N/A	N/A
2462	80.51	PK	V	25.80	4.43	0.00	110.74	N/A	N/A
2462	69.75	AV	V	25.80	4.43	0.00	99.98	N/A	N/A
2483.5	38.96	PK	V	25.86	4.49	0.00	69.31	74.00	4.69*
2483.5	23.03	AV	V	25.86	4.49	0.00	53.38	54.00	0.62*
4924	47	PK	V	30.90	5.97	27.43	56.44	74.00	17.56
4924	34.82	AV	V	30.90	5.97	27.43	44.26	54.00	9.74
7386	31.68	PK	V	34.53	7.55	25.86	47.90	74.00	26.10
7386	20.24	AV	V	34.53	7.55	25.86	36.46	54.00	17.54
9848	28.67	PK	V	36.54	8.85	26.94	47.12	74.00	26.88
9848	17.11	AV	V	36.54	8.85	26.94	35.56	54.00	18.44
7405	31.17	PK	V	34.57	7.56	25.87	47.43	74.00	26.57
7405	19.57	AV	V	34.57	7.56	25.87	35.83	54.00	18.17
119.24	47.1	QP	V	14.07	1.34	21.41	41.10	43.50	2.40*

802.11n-HT20 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	66.88	PK	H	25.67	4.42	0.00	96.97	N/A	N/A
2412	56.26	AV	H	25.67	4.42	0.00	86.35	N/A	N/A
2412	78.07	PK	V	25.67	4.42	0.00	108.16	N/A	N/A
2412	68.53	AV	V	25.67	4.42	0.00	98.62	N/A	N/A
2390	36.99	PK	V	25.61	4.39	0.00	66.99	74.00	7.01
2390	20.86	AV	V	25.61	4.39	0.00	50.86	54.00	3.14*
4824	45.97	PK	V	30.64	6.03	27.41	55.23	74.00	18.77
4824	31.96	AV	V	30.64	6.03	27.41	41.22	54.00	12.78
7236	31.19	PK	V	34.17	7.47	25.90	46.93	74.00	27.07
7236	19.37	AV	V	34.17	7.47	25.90	35.11	54.00	18.89
9648	30.26	PK	V	36.06	8.81	27.46	47.67	74.00	26.33
9648	19.15	AV	V	36.06	8.81	27.46	36.56	54.00	17.44
7105	31.89	PK	V	33.85	7.40	26.07	47.07	74.00	26.93
7105	19.89	AV	V	33.85	7.40	26.07	35.07	54.00	18.93
119.24	47.3	QP	V	14.07	1.34	21.41	41.30	43.50	2.20*
Middle Channel: 2437 MHz									
2442	67.39	PK	H	25.75	4.40	0.00	97.54	N/A	N/A
2442	57.51	AV	H	25.75	4.40	0.00	87.66	N/A	N/A
2442	79.75	PK	V	25.75	4.40	0.00	109.90	N/A	N/A
2442	69.44	AV	V	25.75	4.40	0.00	99.59	N/A	N/A
4884	45.04	PK	V	30.80	6.08	27.42	54.50	74.00	19.50
4884	31.49	AV	V	30.80	6.08	27.42	40.95	54.00	13.05
7326	31.81	PK	V	34.38	7.52	25.88	47.83	74.00	26.17
7326	19.51	AV	V	34.38	7.52	25.88	35.53	54.00	18.47
9768	30.81	PK	V	36.34	8.83	27.19	48.79	74.00	25.21
9768	19.67	AV	V	36.34	8.83	27.19	37.65	54.00	16.35
7105	31.99	PK	V	33.85	7.40	26.07	47.17	74.00	26.83
7105	20.16	AV	V	33.85	7.40	26.07	35.34	54.00	18.66
1650	32.34	PK	V	23.90	3.41	27.74	31.91	74.00	42.09
1650	21.2	AV	V	23.90	3.41	27.74	20.77	54.00	33.23
119.24	47.2	QP	V	14.07	1.34	21.41	41.20	43.50	2.30*
High Channel: 2462 MHz									
2462	65.03	PK	H	25.80	4.43	0.00	95.26	N/A	N/A
2462	55.16	AV	H	25.80	4.43	0.00	85.39	N/A	N/A
2462	78.92	PK	V	25.80	4.43	0.00	109.15	N/A	N/A
2462	69.81	AV	V	25.80	4.43	0.00	100.04	N/A	N/A
2483.5	42.3	PK	V	25.86	4.49	0.00	72.65	74.00	1.35*
2483.5	22	AV	V	25.86	4.49	0.00	52.35	54.00	1.65*
4924	45.36	PK	V	30.90	5.97	27.43	54.80	74.00	19.20
4924	32.48	AV	V	30.90	5.97	27.43	41.92	54.00	12.08
7386	30.78	PK	V	34.53	7.55	25.86	47.00	74.00	27.00
7386	19.86	AV	V	34.53	7.55	25.86	36.08	54.00	17.92
9848	29.35	PK	V	36.54	8.85	26.94	47.80	74.00	26.20
9848	16.88	AV	V	36.54	8.85	26.94	35.33	54.00	18.67
7105	31.61	PK	V	33.85	7.40	26.07	46.79	74.00	27.21
7105	20.12	AV	V	33.85	7.40	26.07	35.30	54.00	18.70
119.24	47.6	QP	V	14.07	1.34	21.41	41.60	43.50	1.90*

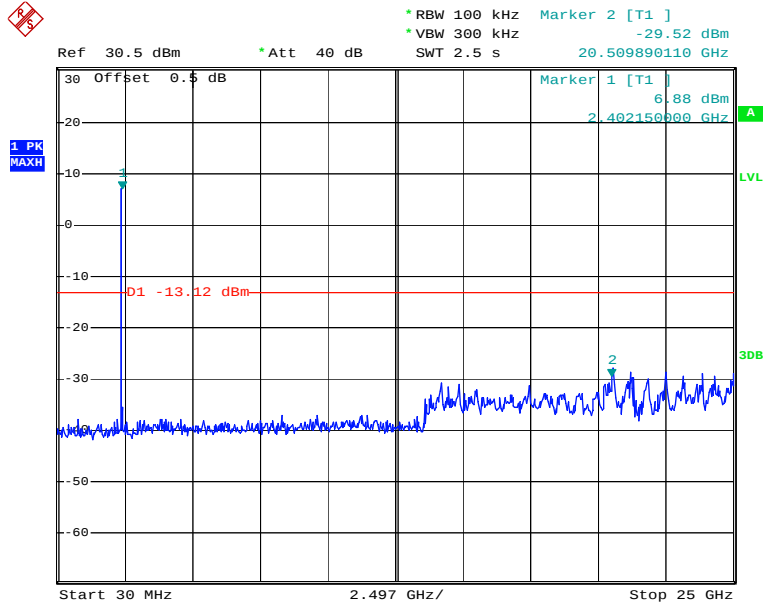
802.11n-HT40 Mode

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	62.11	PK	H	25.70	4.41	0.00	92.22	N/A	N/A
2422	53.27	AV	H	25.70	4.41	0.00	83.38	N/A	N/A
2422	72.66	PK	V	25.70	4.41	0.00	102.77	N/A	N/A
2422	64.06	AV	V	25.70	4.41	0.00	94.17	N/A	N/A
2390	39.74	PK	V	25.61	4.39	0.00	69.74	74.00	4.26*
2390	21.13	AV	V	25.61	4.39	0.00	51.13	54.00	2.87*
4844	36.3	PK	V	30.69	6.08	27.42	45.65	74.00	28.35
4844	27.37	AV	V	30.69	6.08	27.42	36.72	54.00	17.28
7266	27.29	PK	V	34.24	7.48	25.89	43.12	74.00	30.88
7266	18.67	AV	V	34.24	7.48	25.89	34.50	54.00	19.50
9688	23.54	PK	V	36.15	8.82	27.37	41.14	74.00	32.86
9688	16.37	AV	V	36.15	8.82	27.37	33.97	54.00	20.03
7090	27.79	PK	V	33.82	7.39	26.09	42.91	74.00	31.09
7090	19.13	AV	V	33.82	7.39	26.09	34.25	54.00	19.75
119.24	47.3	QP	V	14.07	1.34	21.41	41.30	43.50	2.20*
Middle Channel: 2437 MHz									
2437	62.84	PK	H	25.74	4.41	0.00	92.99	N/A	N/A
2437	53.37	AV	H	25.74	4.41	0.00	83.52	N/A	N/A
2437	72.68	PK	V	25.74	4.41	0.00	102.83	N/A	N/A
2437	64.13	AV	V	25.74	4.41	0.00	94.28	N/A	N/A
4874	35.95	PK	V	30.77	6.09	27.42	45.39	74.00	28.61
4874	25.87	AV	V	30.77	6.09	27.42	35.31	54.00	18.69
7311	27.39	PK	V	34.35	7.51	25.88	43.37	74.00	30.63
7311	19.01	AV	V	34.35	7.51	25.88	34.99	54.00	19.01
9748	23.78	PK	V	36.30	8.83	27.24	41.67	74.00	32.33
9748	15.43	AV	V	36.30	8.83	27.24	33.32	54.00	20.68
7090	26.98	PK	V	33.82	7.39	26.09	42.10	74.00	31.90
7090	18.89	AV	V	33.82	7.39	26.09	34.01	54.00	19.99
1650	31.89	PK	V	23.90	3.41	27.74	31.46	74.00	42.54
1650	20.92	AV	V	23.90	3.41	27.74	20.49	54.00	33.51
119.24	47.5	QP	V	14.07	1.34	21.41	41.50	43.50	2.00*
High Channel: 2452 MHz									
2452	61.64	PK	H	25.78	4.41	0.00	91.83	N/A	N/A
2452	52.98	AV	H	25.78	4.41	0.00	83.17	N/A	N/A
2452	73.23	PK	V	25.78	4.41	0.00	103.42	N/A	N/A
2452	64.46	AV	V	25.78	4.41	0.00	94.65	N/A	N/A
2483.5	38.23	PK	V	25.86	4.49	0.00	68.58	74.00	5.42
2483.5	21.3	AV	V	25.86	4.49	0.00	51.65	54.00	2.35*
4904	35.22	PK	V	30.85	6.06	27.43	44.70	74.00	29.30
4904	25.17	AV	V	30.85	6.06	27.43	34.65	54.00	19.35
7356	27.44	PK	V	34.45	7.53	25.87	43.55	74.00	30.45
7356	19.19	AV	V	34.45	7.53	25.87	35.30	54.00	18.70
9808	24.22	PK	V	36.44	8.84	27.09	42.41	74.00	31.59
9808	16.34	AV	V	36.44	8.84	27.09	34.53	54.00	19.47
7090	27.39	PK	V	33.82	7.39	26.09	42.51	74.00	31.49
7090	19.1	AV	V	33.82	7.39	26.09	34.22	54.00	19.78
119.24	47.4	QP	V	14.07	1.34	21.41	41.40	43.50	2.10*

*Within measurement uncertainty!

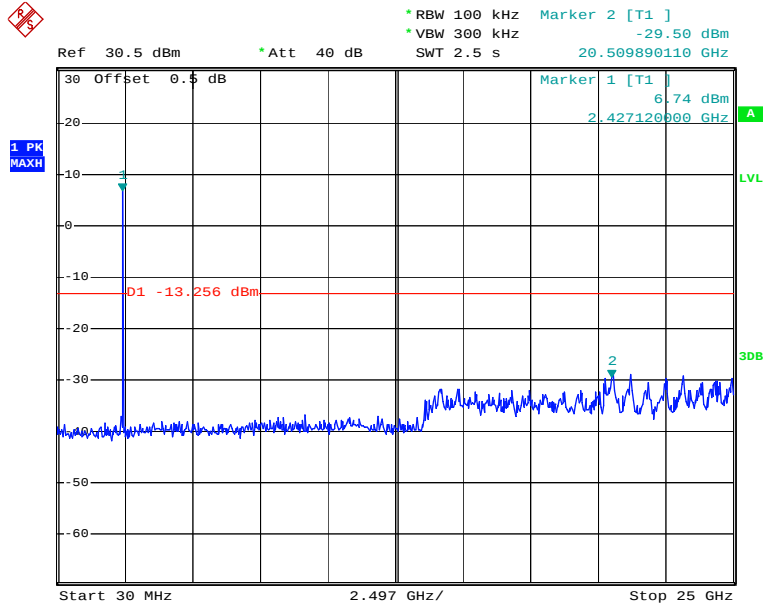
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



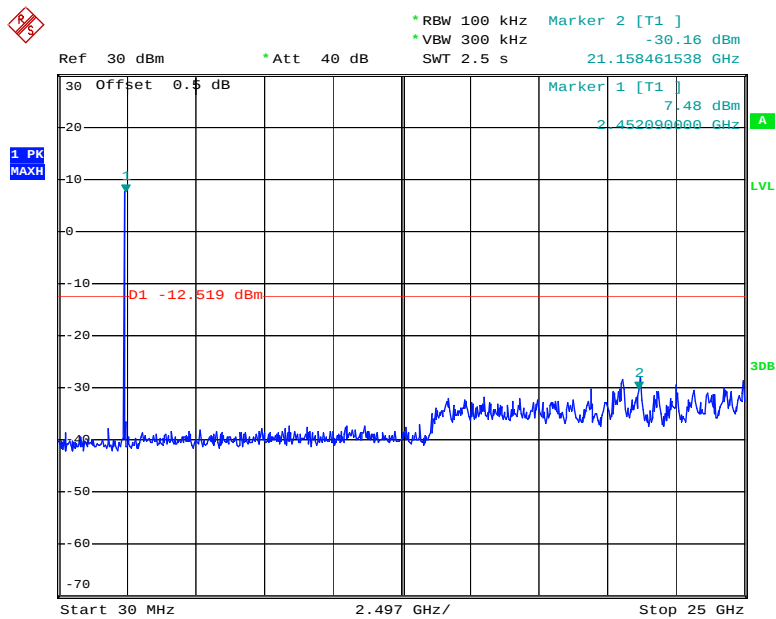
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802.11b Middle Channel



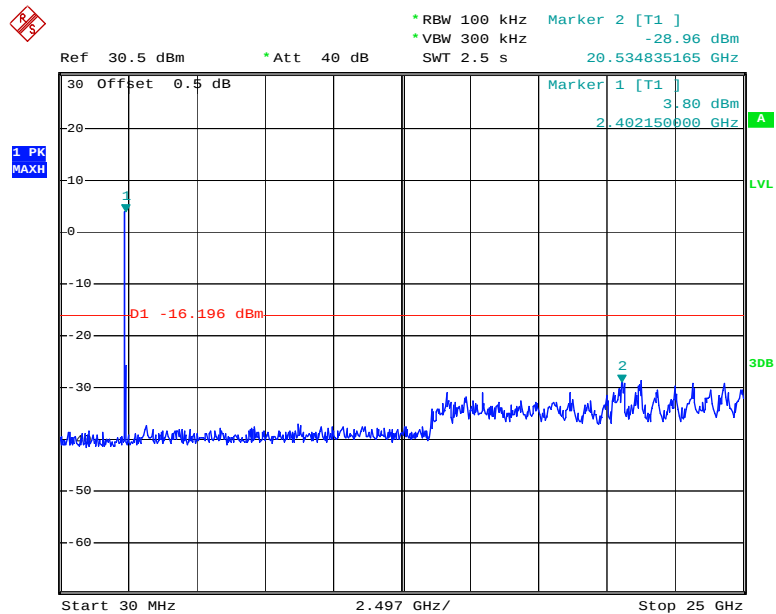
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802.11b High Channel



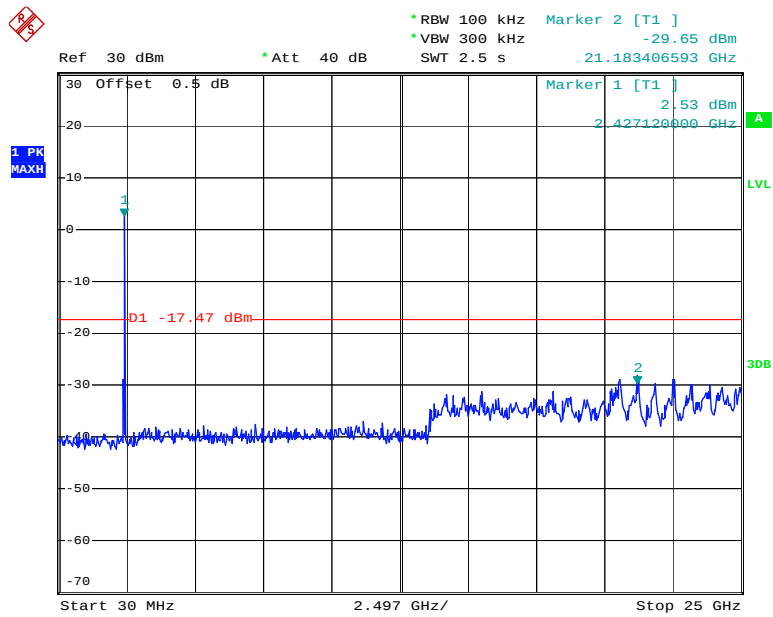
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802.11g Low Channel



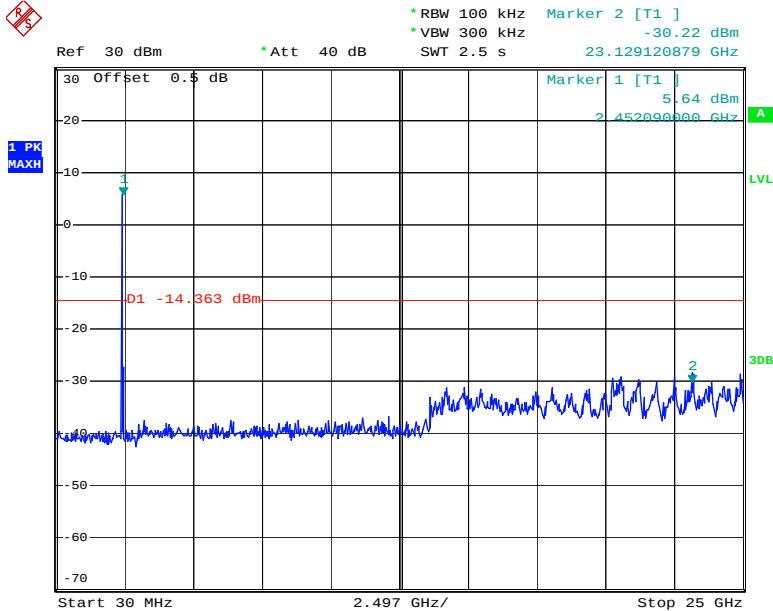
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802.11g Middle Channel



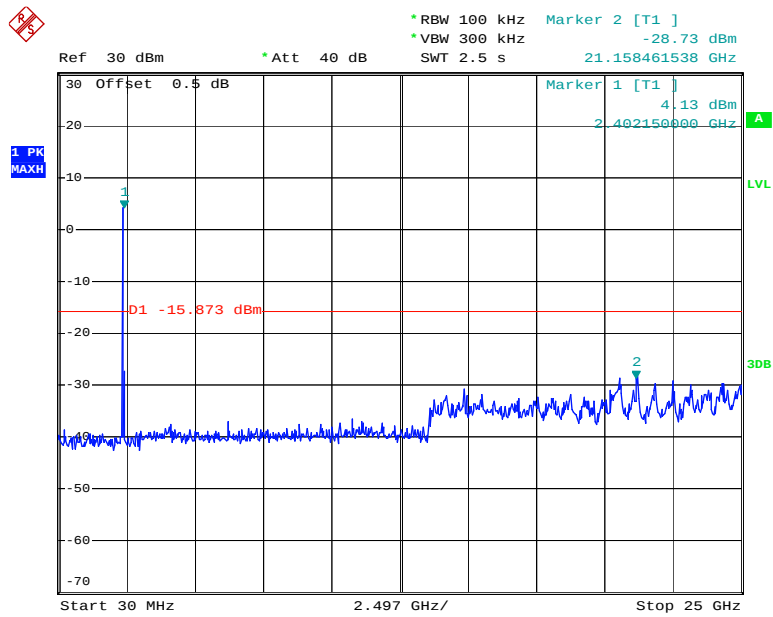
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802.11g High Channel



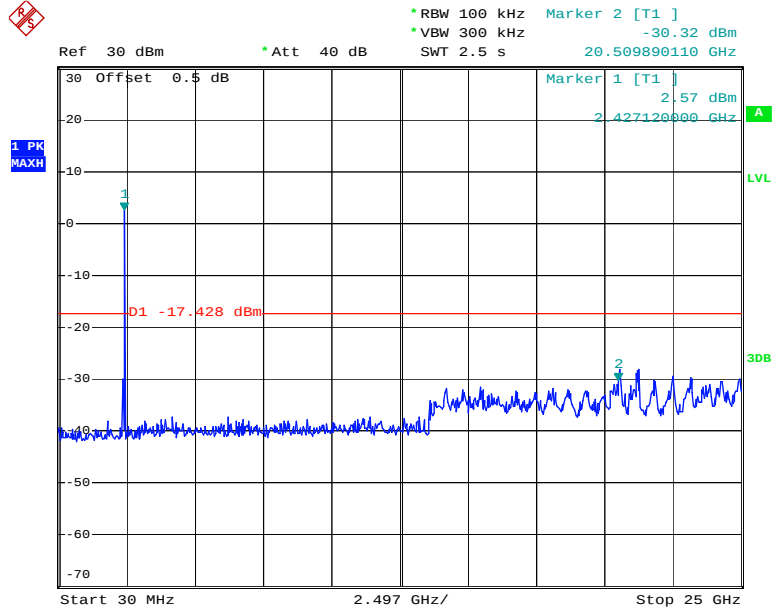
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802.11n-HT20 Low Channel



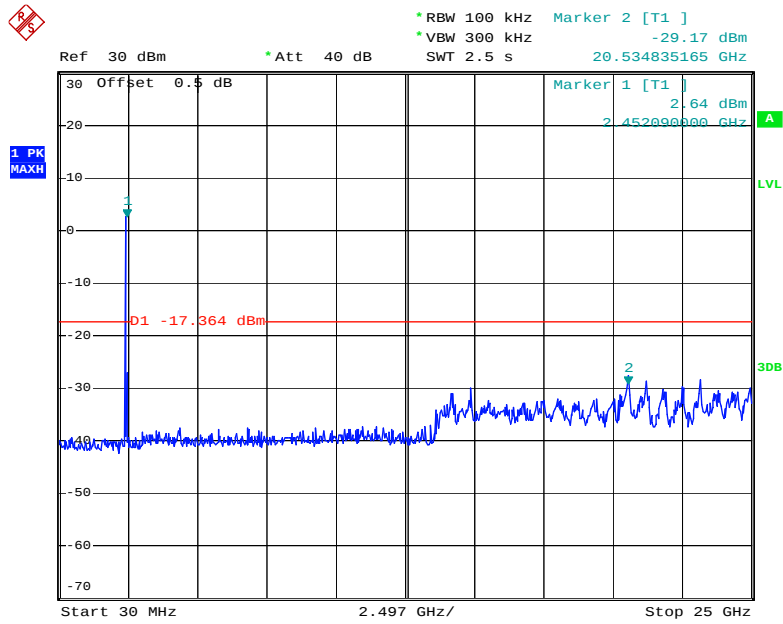
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802.11n-HT20 Middle Channel



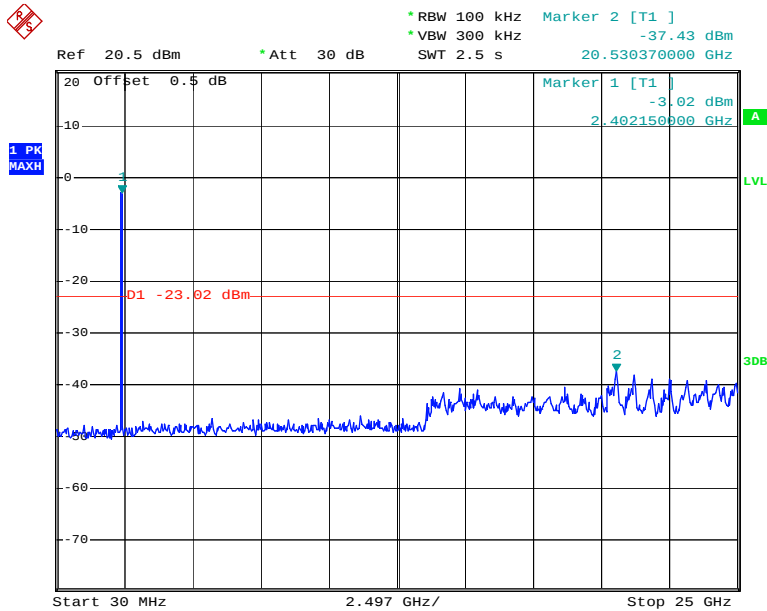
Date: 19.MAY.2014 11:49:30

802.11n-HT20 High Channel



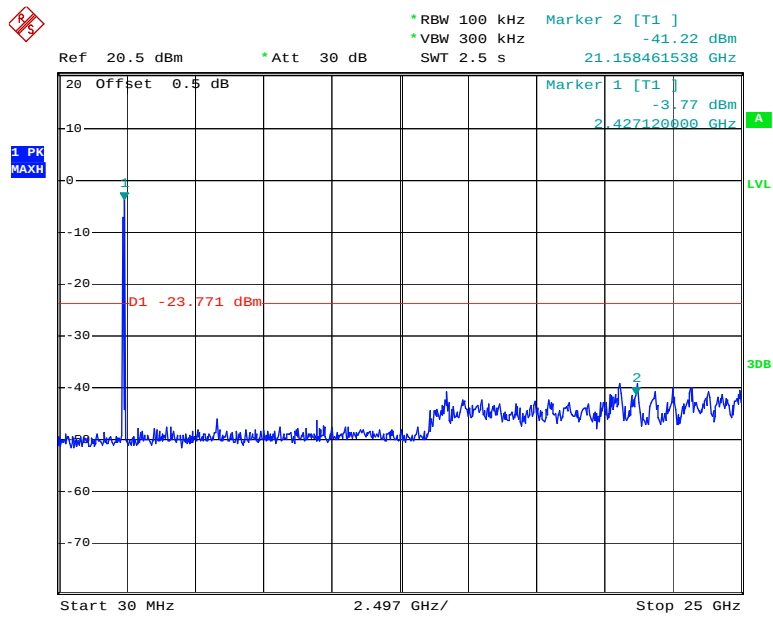
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802.11n-HT40 Low Channel



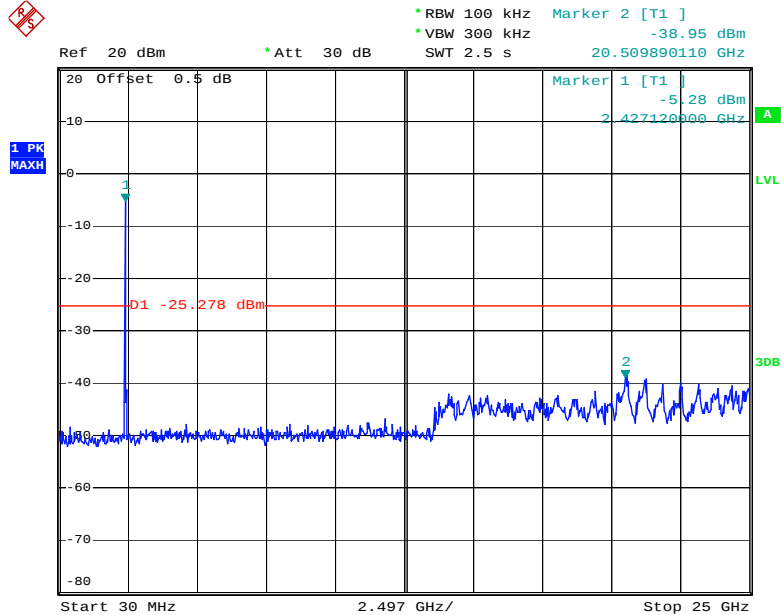
Date: 11.JUN.2014 16:29:53

802.11n-HT40 Middle Channel



Date: 11.JUN.2014 16:41:40

802.11n-HT40 High Channel



Date: 11.JUN.2014 16:43:18

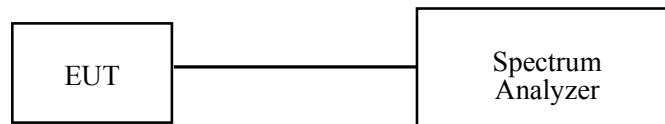
FCC §15.247(a) (2) – 6dB BANDWIDTH

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	2015-05-08

* **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:	27.4 °C-28 °C
Relative Humidity:	70 %-60%
ATM Pressure:	100 kPa -99.6 kPa

The testing was performed by Dean Liu on 2014-05-19&2014-06-11.

Test Result: Pass.

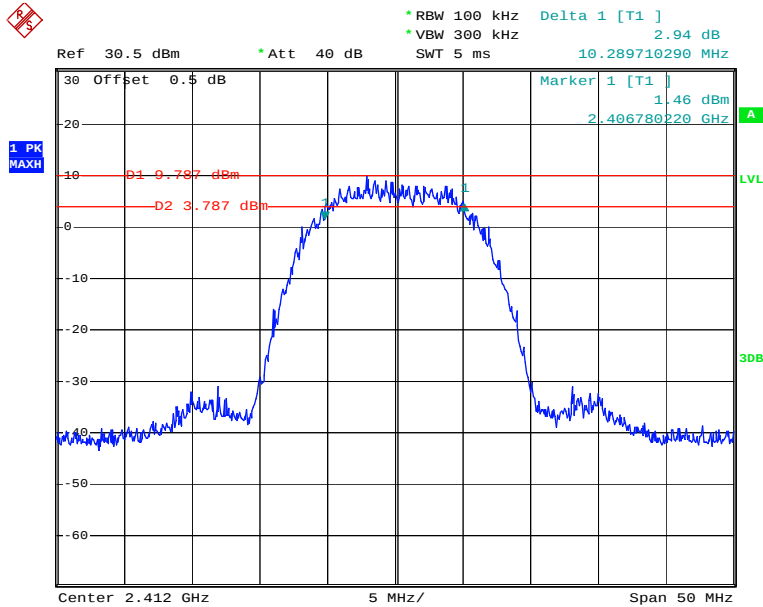
Please refer to the following tables and plots.

Test Mode: Transmitting

Test Mode	Channel	Frequency	6 dB Bandwidth
		(MHz)	(MHz)
802.11b	Low	2412	10.29
	Middle	2437	10.29
	High	2462	9.14
802.11g	Low	2412	16.43
	Middle	2437	16.38
	High	2462	16.43
802.11n- HT20	Low	2412	16.98
	Middle	2437	17.33
	High	2462	17.13
802.11n- HT40	Low	2422	35.16
	Middle	2437	35.46
	High	2452	35.26

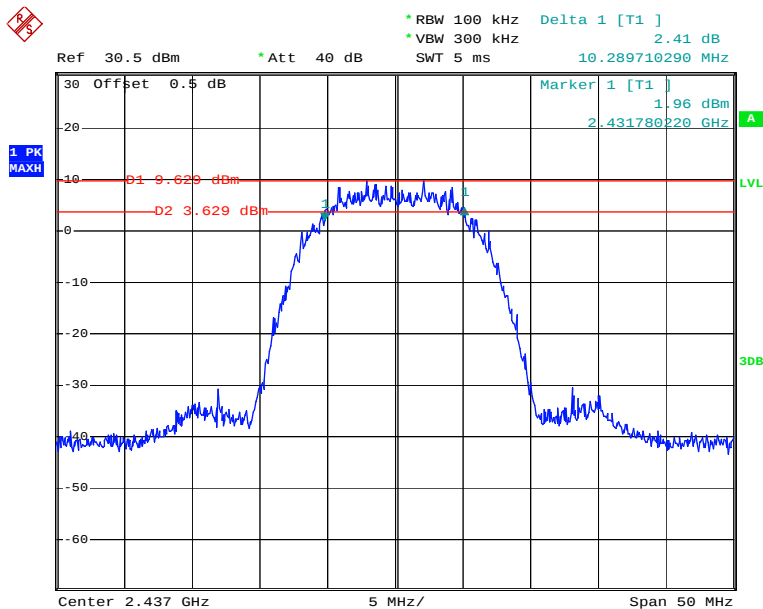
6 dB Bandwidth:

802.11b Low Channel



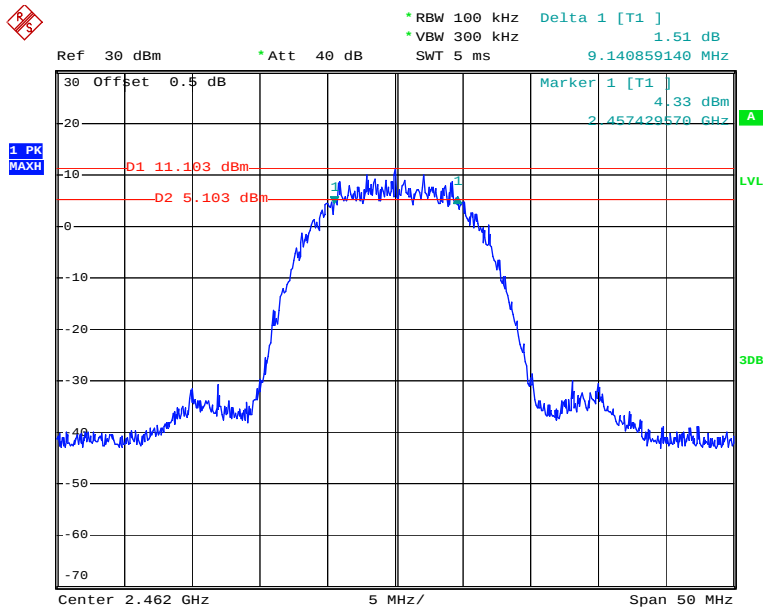
Date: 19.MAY.2014 11:09:35

802.11b Middle Channel



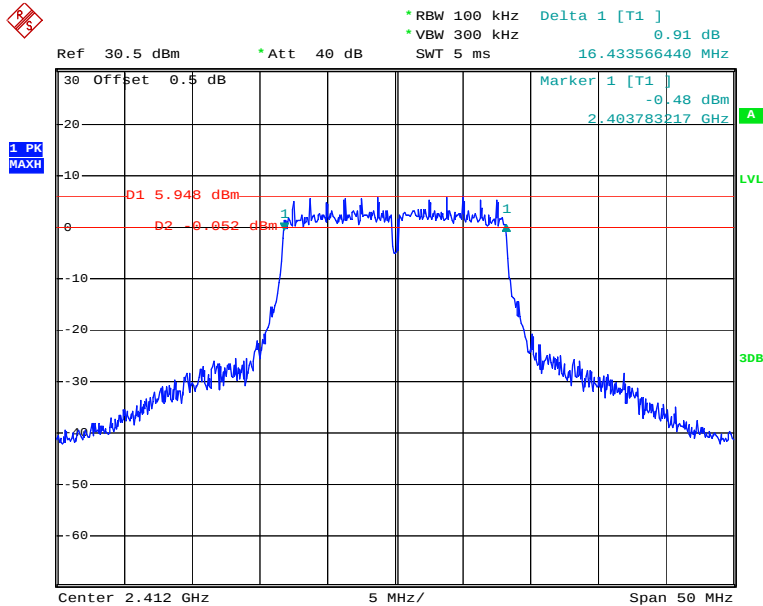
Date: 19.MAY.2014 11:23:05

802.11b High Channel



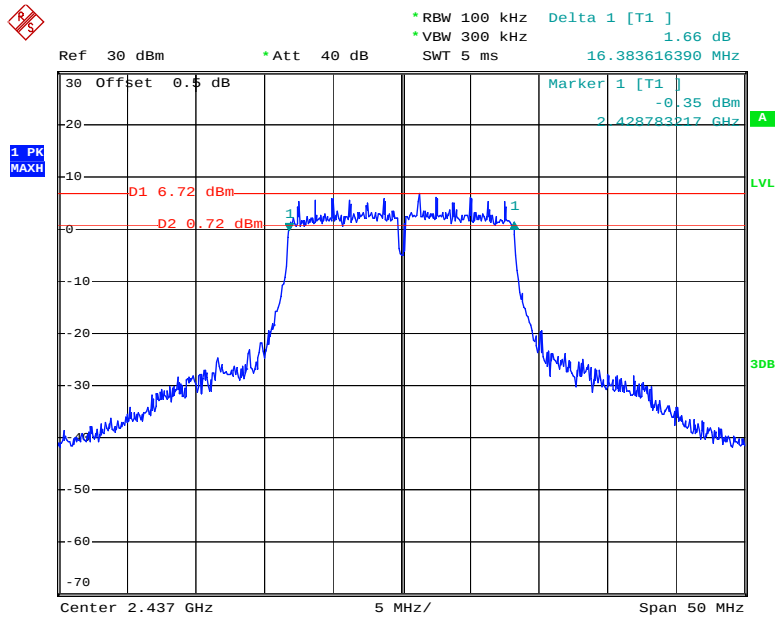
Date: 19.MAY.2014 11:29:02

802.11g Low Channel



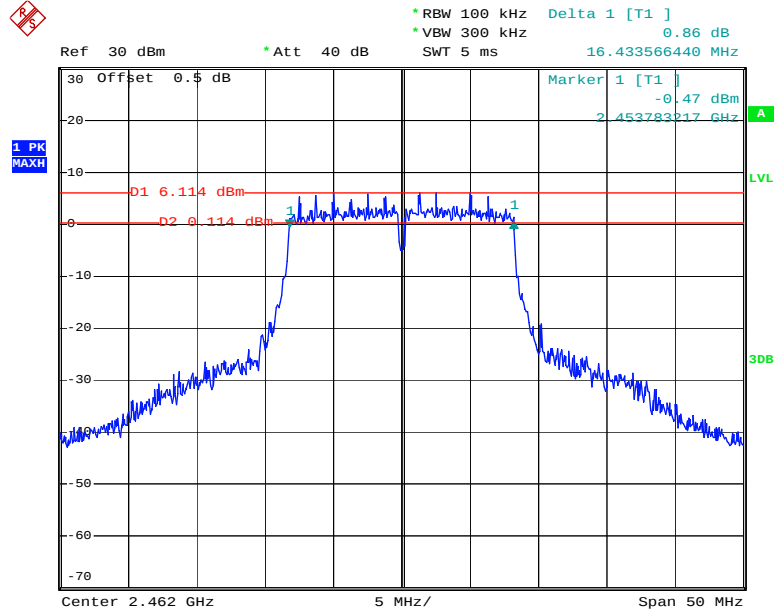
Date: 19.MAY.2014 11:38:00

802.11g Middle Channel



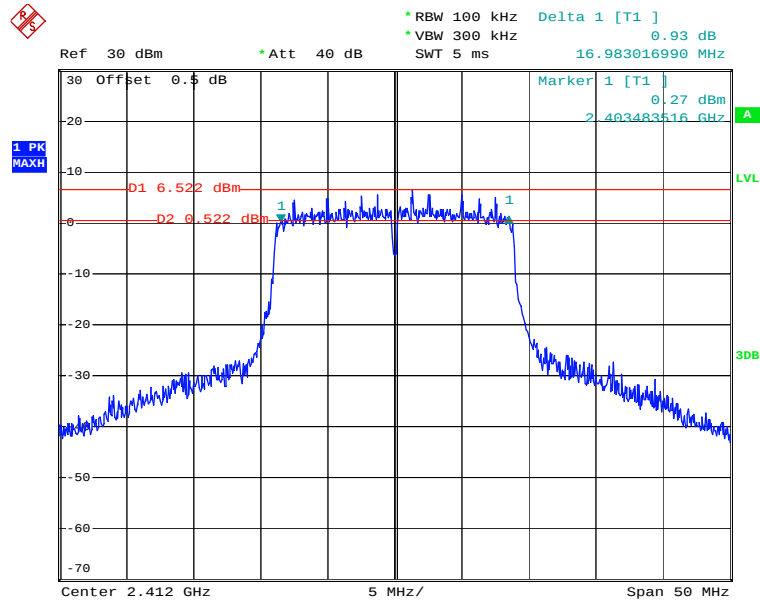
Date: 19.MAY.2014 11:40:45

802.11g High Channel



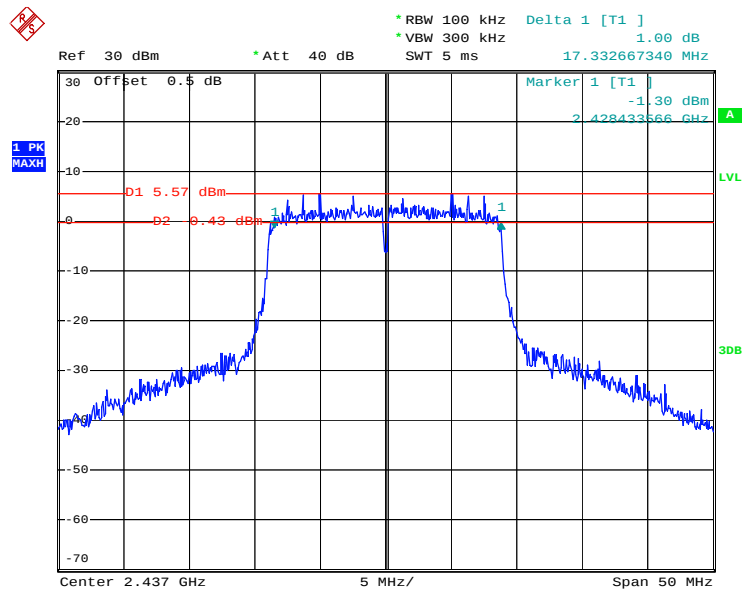
Date: 19.MAY.2014 11:42:40

802.11n-HT20 Low Channel



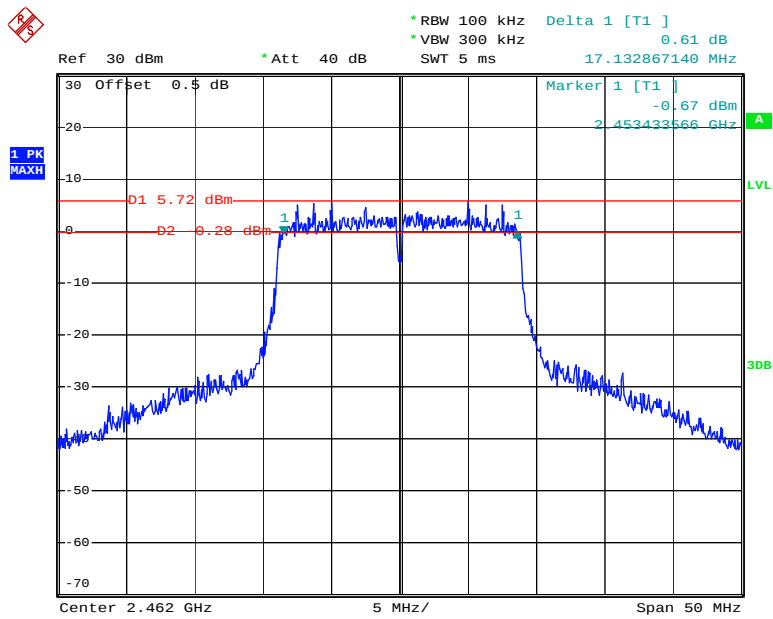
Date: 19.MAY.2014 11:46:00

802.11n-HT20 Middle Channel



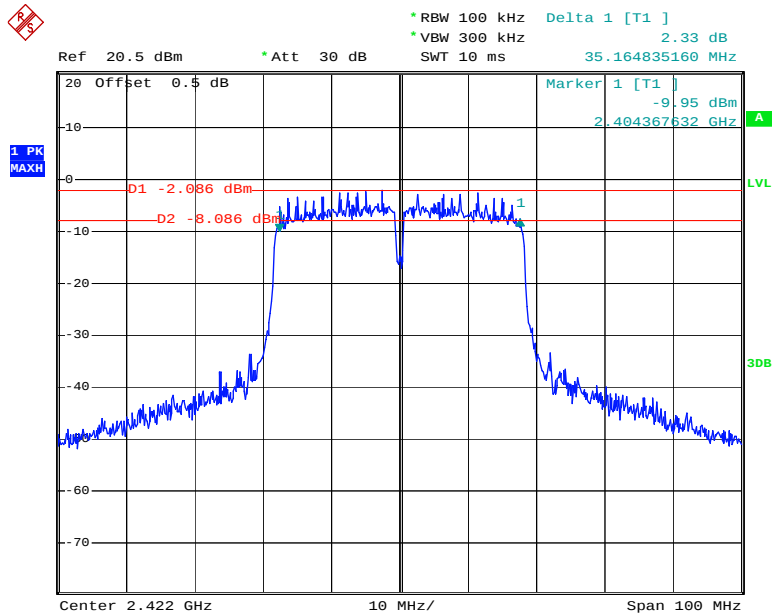
Date: 19.MAY.2014 11:48:41

802.11n-HT20 High Channel



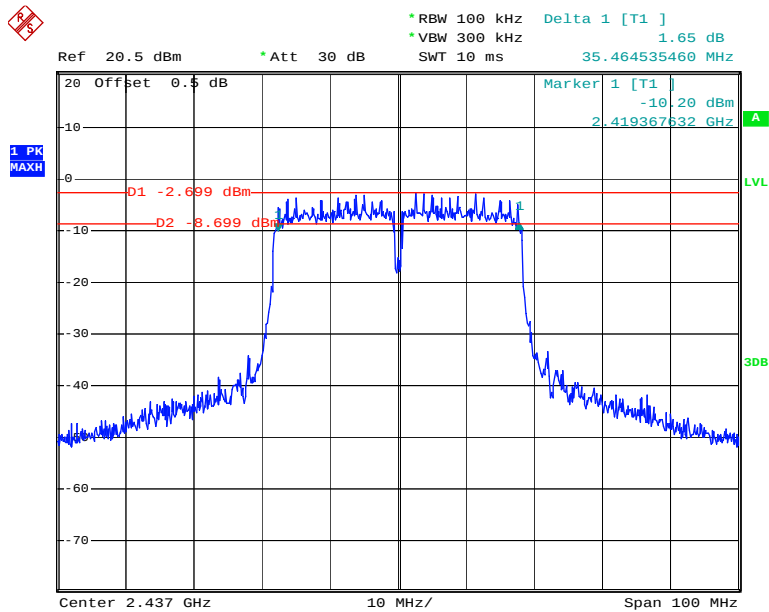
Date: 19.MAY.2014 11:50:34

802.11n-HT40 Low Channel



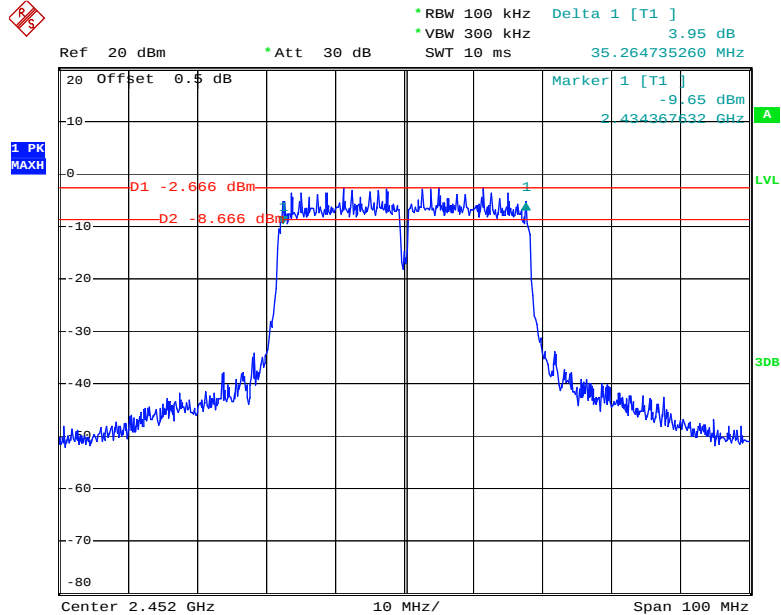
Date: 11.JUN.2014 16:26:27

802.11n-HT40 Middle Channel



Date: 11.JUN.2014 16:40:38

802.11n-HT40 High Channel



Date: 11.JUN.2014 16:42:19

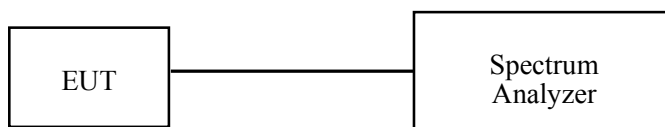
FCC §15.247(b) (3) - MAXIMUM PEAK CONDUCTED OUTPUT POWER

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.
3. Add a correction factor to the display.



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	2015-05-08

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

Test Data

Environmental Conditions

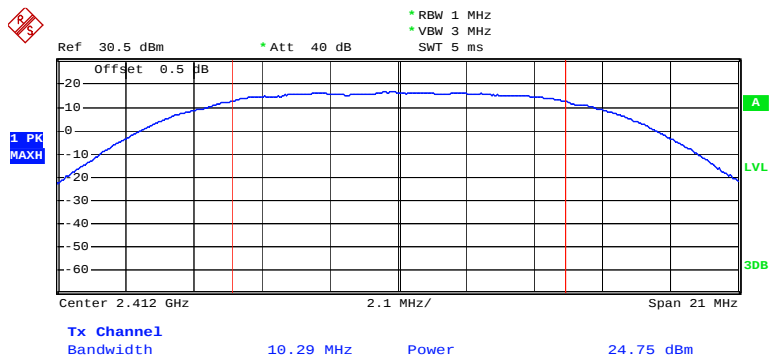
Temperature:	27.4 °C-28 °C
Relative Humidity:	70 %-60%
ATM Pressure:	100 kPa -99.6 kPa

The testing was performed by Dean Liu on 2014-05-19&2014-06-11.

Test Mode: Transmitting

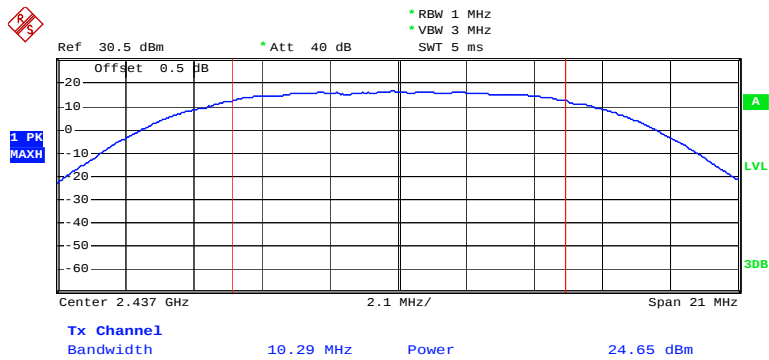
Test Mode	Channel	Frequency	Max Peak Conducted Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	24.75	30	PASS
	Middle	2437	24.65	30	PASS
	High	2462	24.52	30	PASS
802.11 g	Low	2412	25.77	30	PASS
	Middle	2437	25.70	30	PASS
	High	2462	25.79	30	PASS
802.11n- HT20	Low	2412	25.42	30	PASS
	Middle	2437	25.48	30	PASS
	High	2462	25.44	30	PASS
802.11n- HT40	Low	2422	19.76	30	PASS
	Middle	2437	19.56	30	PASS
	High	2452	19.59	30	PASS

802.11b RF Output Power, Low Channel



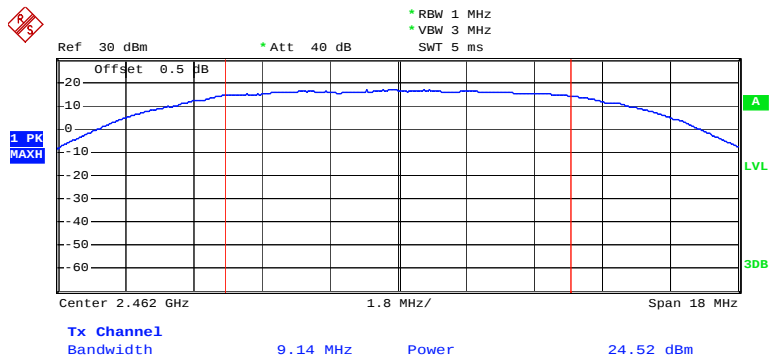
Date: 19.MAY.2014 11:09:53

802.11b RF Output Power, Middle Channel



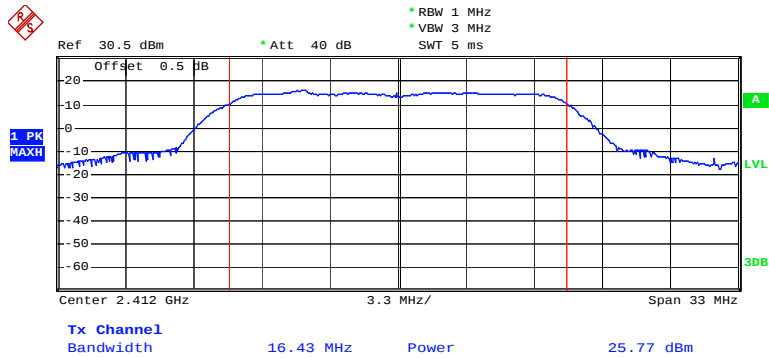
Date: 19.MAY.2014 11:23:23

802.11b RF Output Power, High Channel



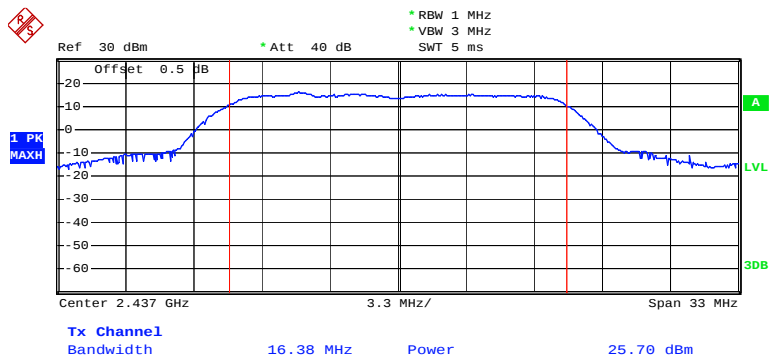
Date: 19.MAY.2014 11:29:23

802.11g RF Output Power, Low Channel



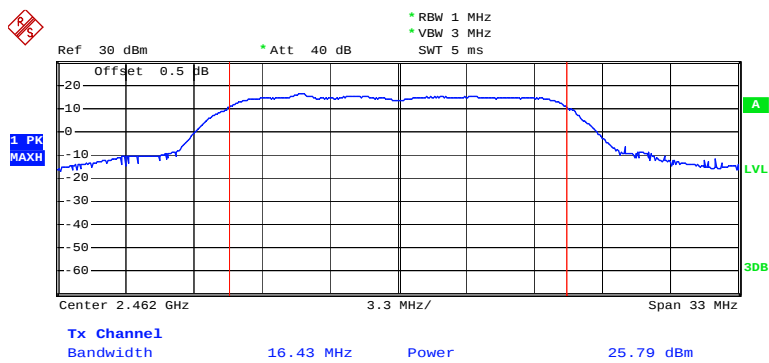
Date: 19.MAY.2014 11:38:19

802.11g RF Output Power, Middle Channel



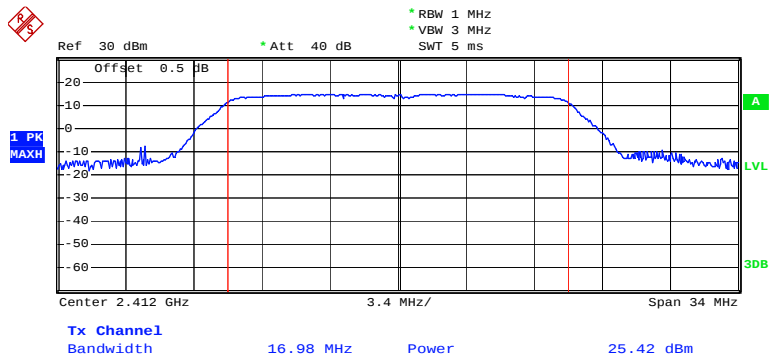
Date: 19.MAY.2014 11:41:07

802.11g RF Output Power, High Channel



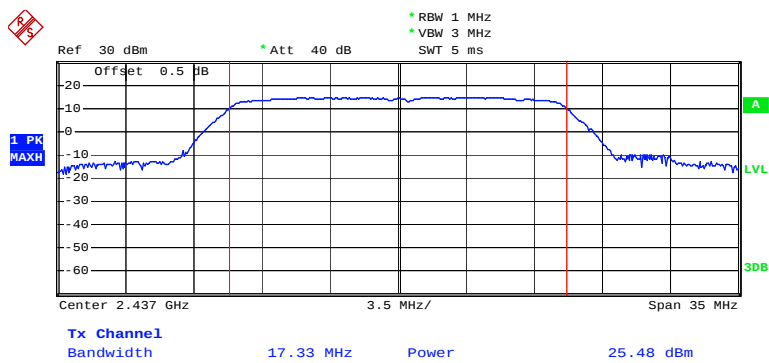
Date: 19.MAY.2014 11:43:02

802.11n-HT20 RF Output Power, Low Channel



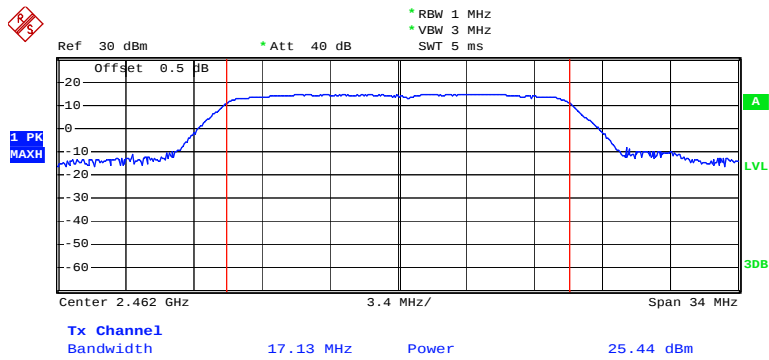
Date: 19.MAY.2014 11:46:16

802.11n-HT20 RF Output Power, Middle Channel



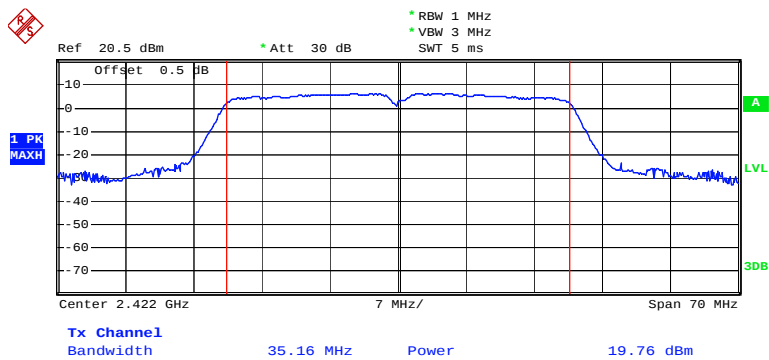
Date: 19.MAY.2014 11:49:03

802.11n-HT20 RF Output Power, High Channel



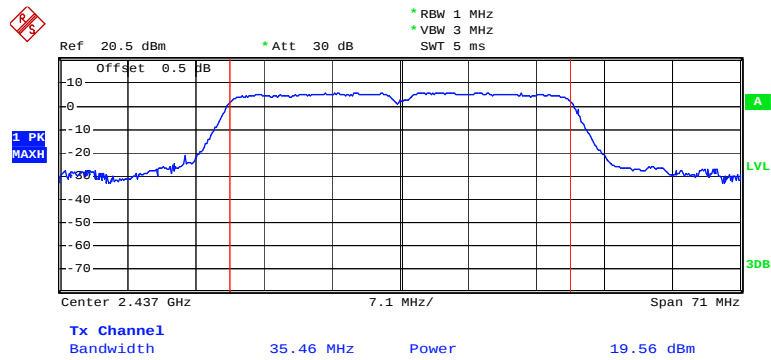
Date: 19.MAY.2014 11:50:57

802.11n-HT40 RF Output Power, Low Channel



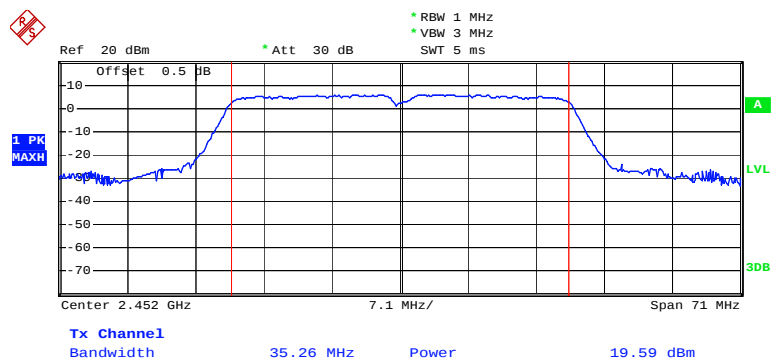
Date: 11.JUN.2014 16:26:45

802.11n-HT40 RF Output Power, Middle Channel



Date: 11.JUN.2014 16:41:01

802.11n-HT40 RF Output Power, High Channel



Date: 11.JUN.2014 16:42:38

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	2015-05-08

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

Test Data

Environmental Conditions

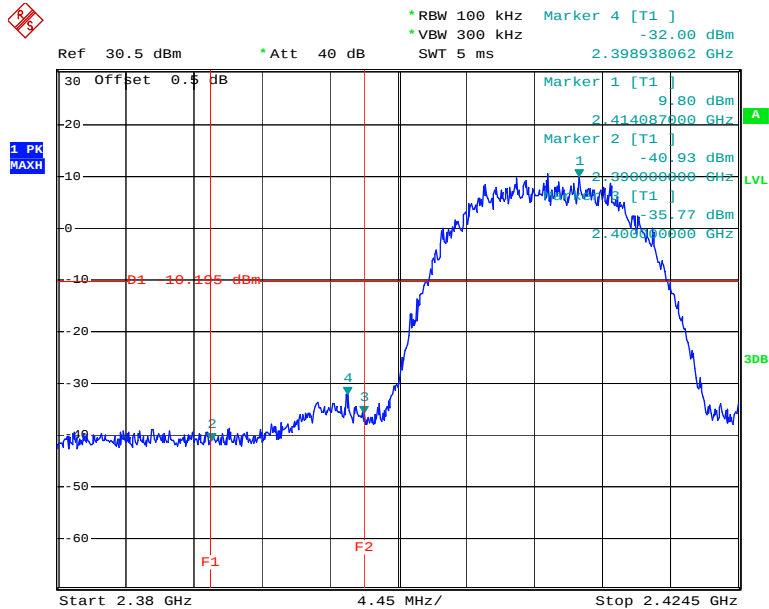
Temperature:	27.4 °C-28 °C
Relative Humidity:	70 %-60%
ATM Pressure:	100 kPa -99.6 kPa

The testing was performed by Dean Liu on 2014-05-19&2014-06-11.

Test Result: *Compliance*

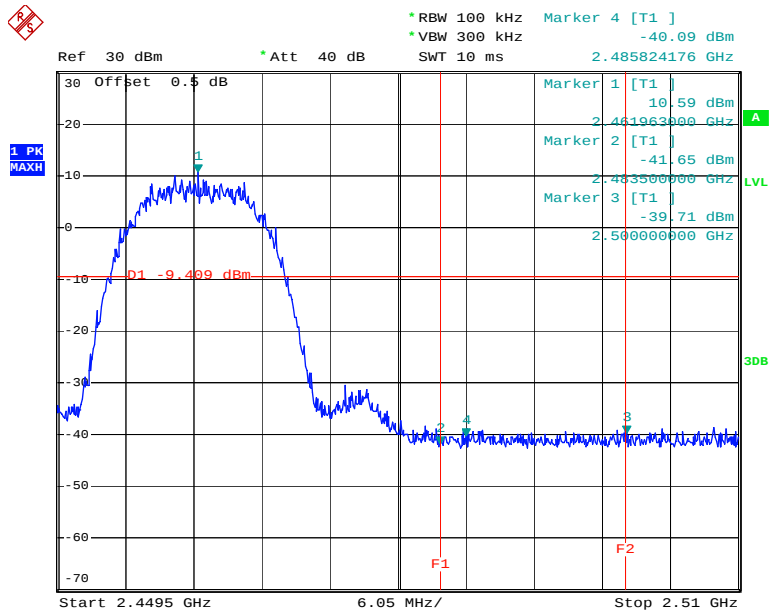
Please refer to following plots.

802.11b: Band Edge, Left Side



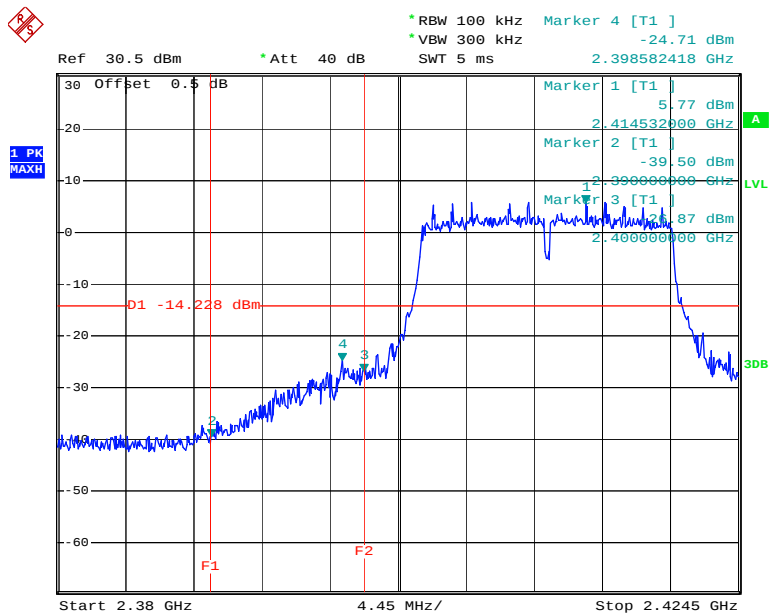
Date: 19.MAY.2014 11:10:27

802.11b: Band Edge, Right Side



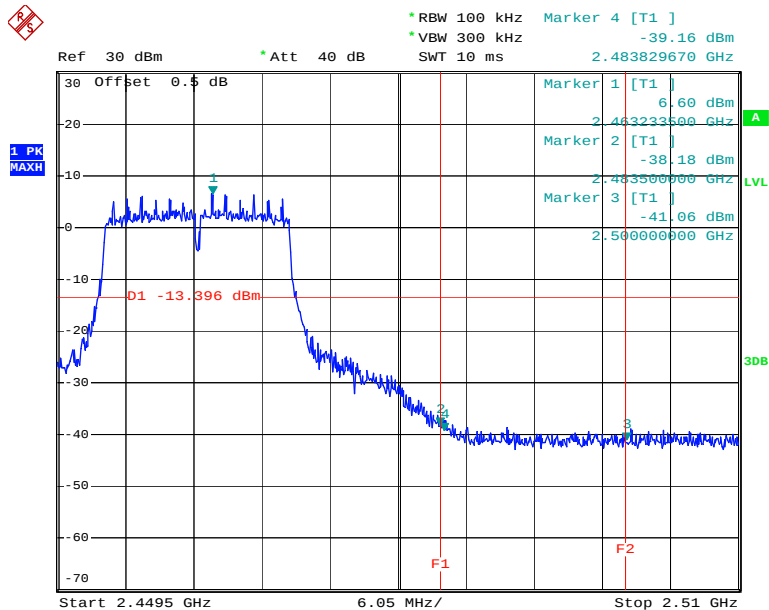
Date: 19.MAY.2014 11:29:57

802.11g: Band Edge, Left Side



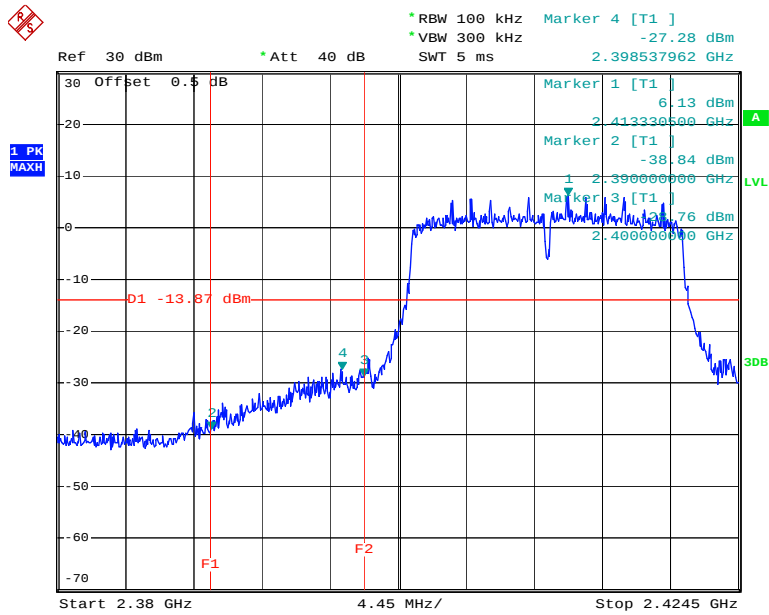
Date: 19.MAY.2014 11:38:57

802.11g: Band Edge, Right Side



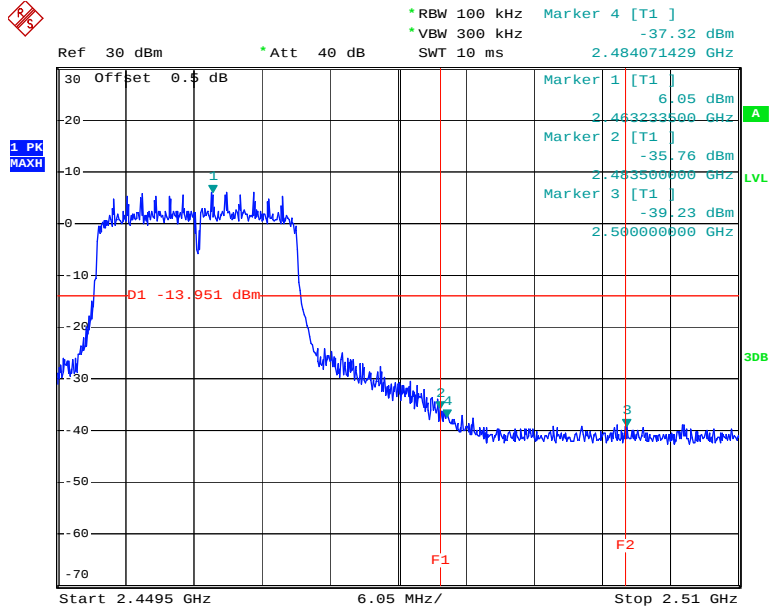
Date: 19.MAY.2014 11:43:40

802.11n-HT20 Band Edge, Left Side



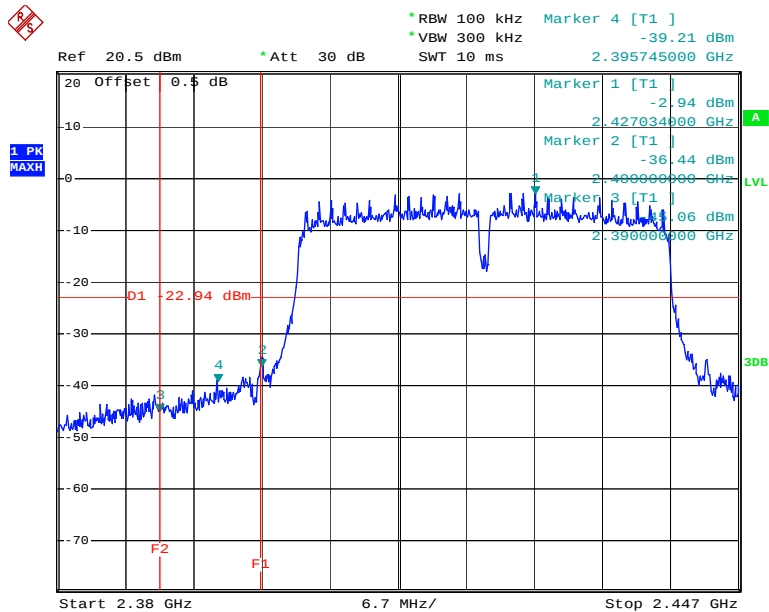
Date: 19.MAY.2014 11:46:54

802.11n-HT20 Band Edge, Right Side



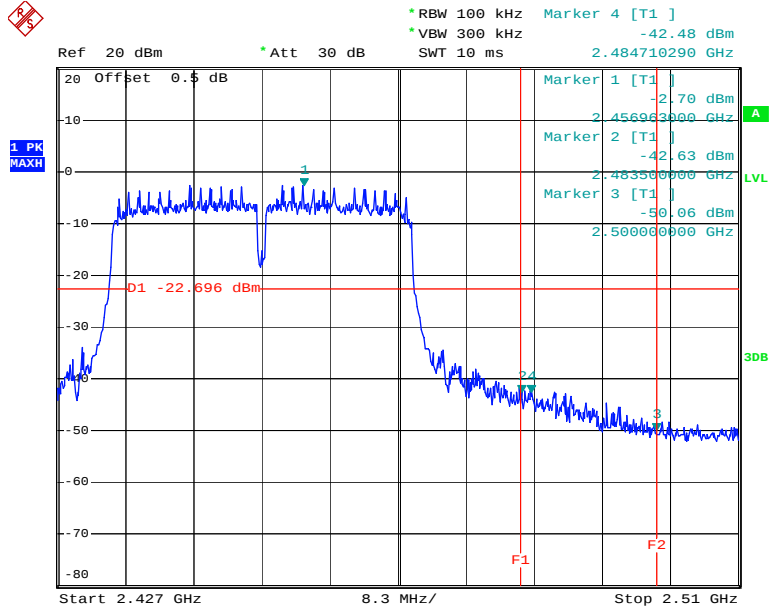
Date: 19.MAY.2014 11:51:36

802.11n-HT40 Band Edge, Left Side



Date: 11.JUN.2014 16:31:01

802.11n-HT40 Band Edge, Right Side



Date: 11.JUN.2014 16:43:30

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	2015-05-08

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

Test Data

Environmental Conditions

Temperature:	27.4 °C-28 °C
Relative Humidity:	70 %-60%
ATM Pressure:	100 kPa -99.6 kPa

The testing was performed by Dean Liu on 2014-05-19&2014-06-11.

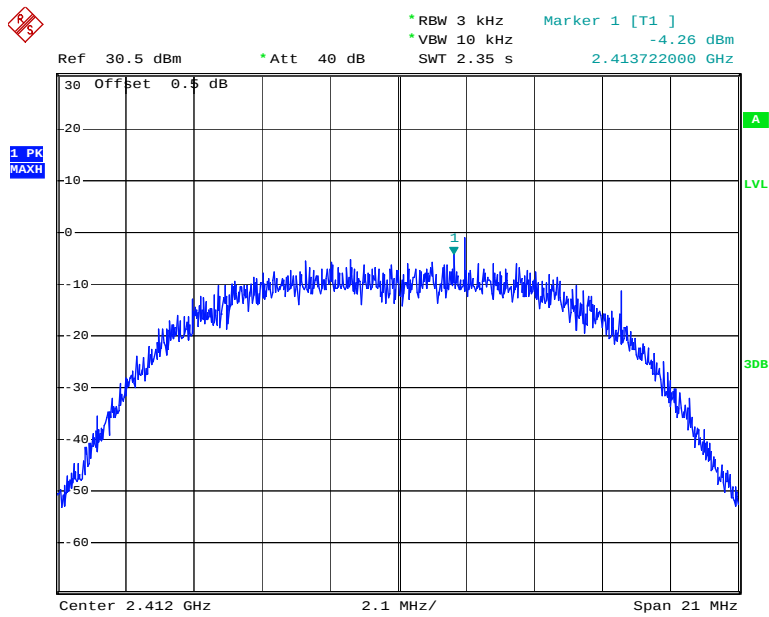
Test Mode: Transmitting

Test Result: Pass

Test Mode	Channel	PSD	Limit	Result
		(dBm/3kHz)	(dBm/3kHz)	
802.11b	Low	-4.26	≤ 8	PASS
	Middle	-4.35	≤ 8	PASS
	High	-5.31	≤ 8	PASS
802.11 g	Low	-9.76	≤ 8	PASS
	Middle	-9.45	≤ 8	PASS
	High	-8.10	≤ 8	PASS
802.11n-HT20	Low	-9.20	≤ 8	PASS
	Middle	-9.65	≤ 8	PASS
	High	-10.08	≤ 8	PASS
802.11n-HT40	Low	-17.61	≤ 8	PASS
	Middle	-18.56	≤ 8	PASS
	High	-17.13	≤ 8	PASS

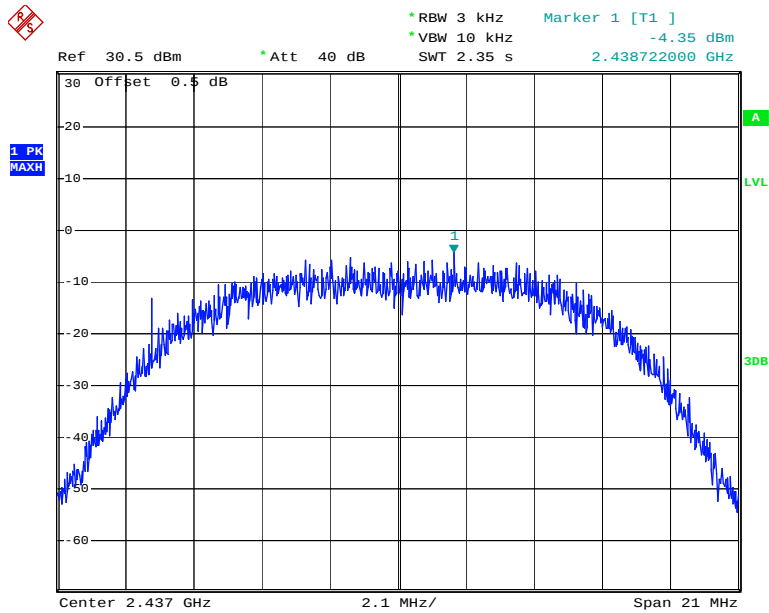
Please refer to the following plots

Power Spectral Density, 802.11b Low Channel



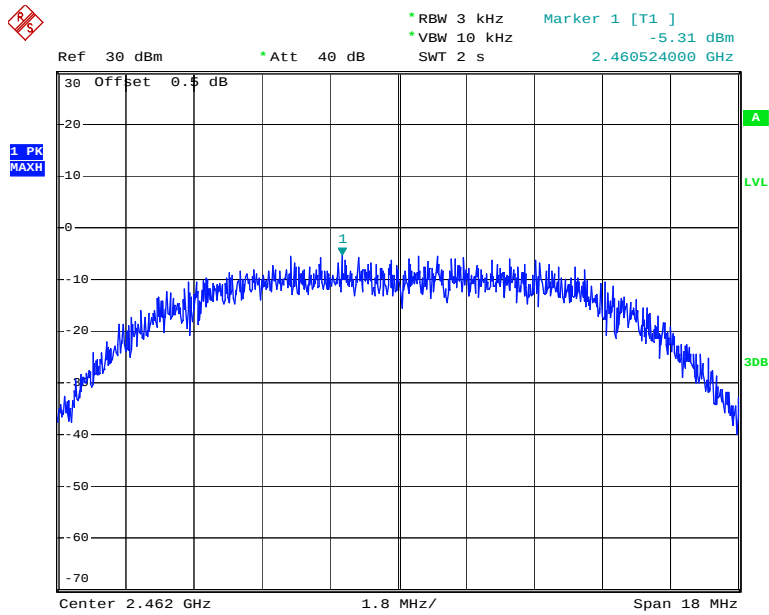
Date: 19.MAY.2014 11:10:59

Power Spectral Density, 802.11b Middle Channel



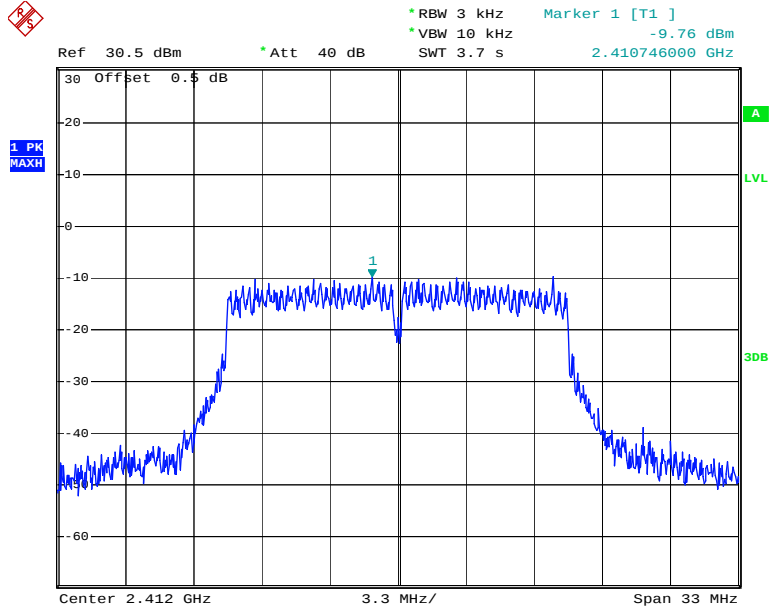
Date: 19.MAY.2014 11:23:33

Power Spectral Density, 802.11b High Channel



Date: 19.MAY.2014 11:30:46

Power Spectral Density, 802.11g Low Channel



Date: 19.MAY.2014 11:38:32

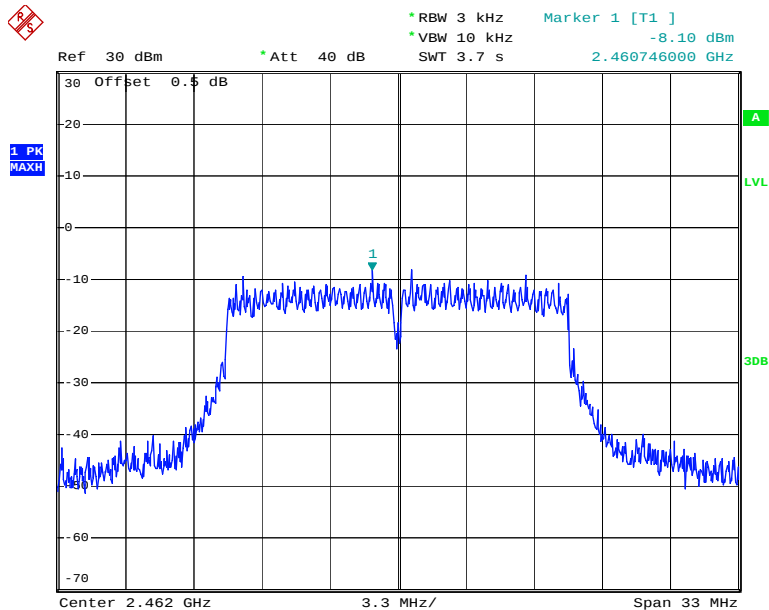
Ref 30 dBm Att 40 dB RBW 3 kHz VBW 10 kHz SWT 3.7 s Marker 1 [T1] -9.45 dBm 2.439211000 GHz

Offset 0.5 dB

1 PK MAXH

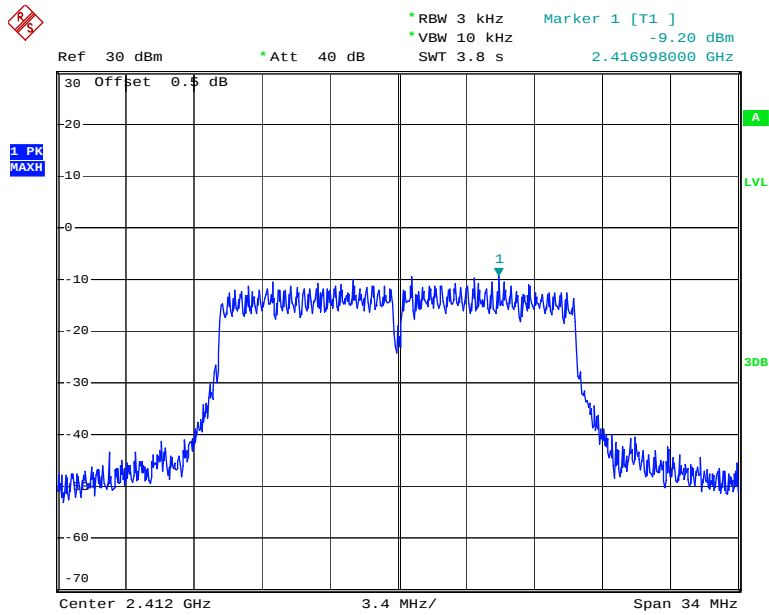
Center 2.437 GHz 3.3 MHz/ Span 33 MHz

Power Spectral Density, 802.11g High Channel



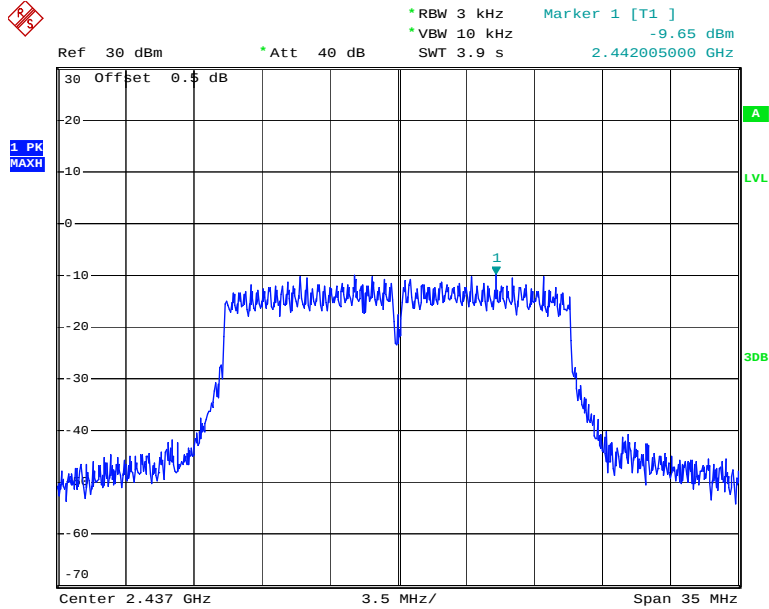
Page 54 of 57

Power Spectral Density, 802.11n-HT20 Low Channel



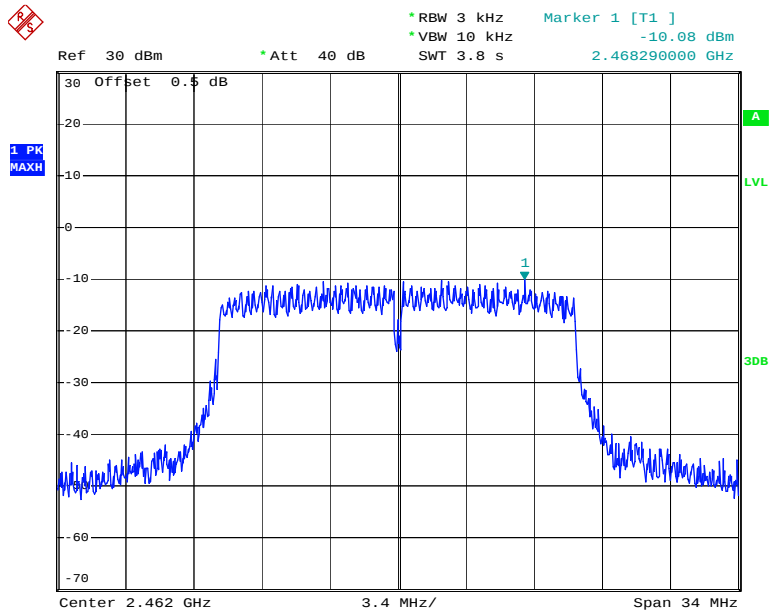
Date: 19.MAY.2014 11:46:29

Power Spectral Density, 802.11n-HT20 Middle Channel



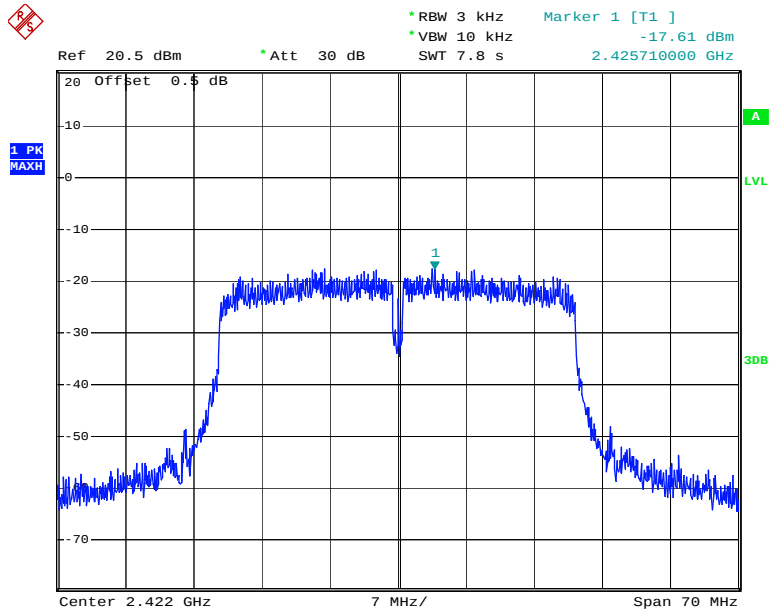
Date: 19.MAY.2014 11:49:17

Power Spectral Density, 802.11n-HT20 High Channel



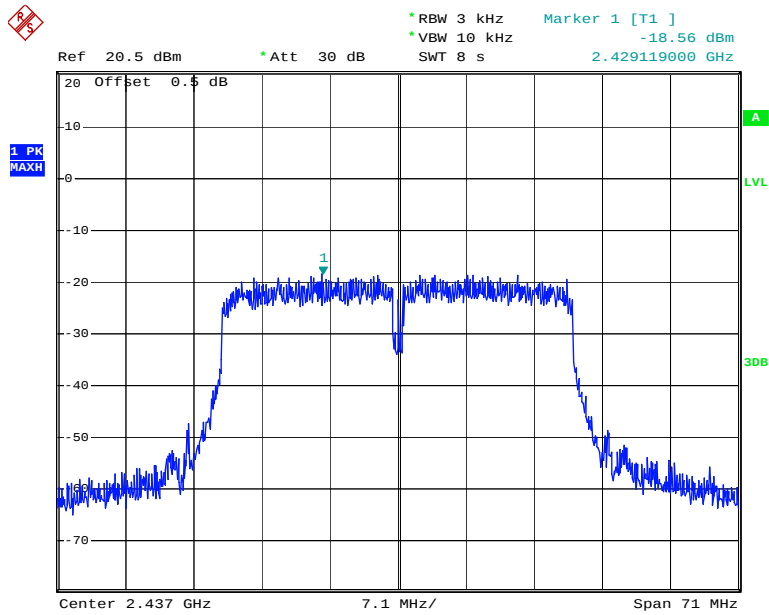
Date: 19.MAY.2014 11:51:11

Power Spectral Density, 802.11n-HT40 Low Channel



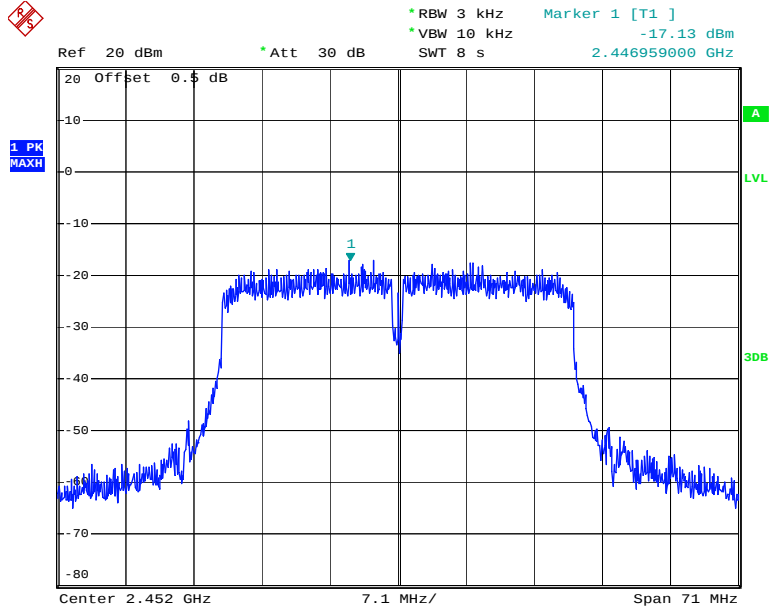
Date: 11.JUN.2014 16:27:10

Power Spectral Density, 802.11n-HT40 Middle Channel



Date: 11.JUN.2014 16:41:27

Power Spectral Density, 802.11n-HT40 High Channel



Date: 11.JUN.2014 16:43:05

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