

FCC PART 15.247

TEST REPORT

For

Jiangsu SEUIC Technology Co., Ltd

No23, Wenzhu Road, Yuhuatai District, Nanjing, Jiangsu, China.

FCC ID: 2AC68-AUTOID6

Report Type: Original Report	Product Type: AUTOID6
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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	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §15.247 (i) & §2.1093 – RF EXPOSURE	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) – 6 dB EMISSION BANDWIDTH.....	27
APPLICABLE STANDARD	27
TEST PROCEDURE	27
TEST EQUIPMENT LIST AND DETAILS.....	27
TEST DATA	27
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER.....	34
APPLICABLE STANDARD	34

TEST PROCEDURE	34
TEST EQUIPMENT LIST AND DETAILS.....	34
TEST DATA	34
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE.....	36
APPLICABLE STANDARD	36
TEST PROCEDURE	36
TEST EQUIPMENT LIST AND DETAILS.....	36
TEST DATA	36
FCC §15.247(e) - POWER SPECTRAL DENSITY	40
APPLICABLE STANDARD	40
TEST PROCEDURE	40
TEST EQUIPMENT LIST AND DETAILS.....	40
TEST DATA	40

FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Jiangsu SEUIC Technology Co.,Ltd*'s product, model number: *AUTOID6* (FCC ID: 2AC68-AUTOID6) or ("EUT") in this report is a *AUTOID6*, rated input voltage: DC 5V from adapter or DC 3.7V from lithium battery.

The measurement please refer below:

Description	Serial Number	Length (cm)	Width (cm)	High (cm)
RFID antenna on the back side	140814050-1	15.6	8.1	5.6
RFID antenna on the top side	140814050-2	19.7	8.4	5.6

Adapter information:

Model: FJ-SW0503000U

Input: AC 100-240V, 50/60Hz, 0.6A max

Output: DC 5V, 3000mA

**Two type of RFID antenna employed for this product, please refer to the EUT photos, the antenna type don't effected the test results,all measurement and test data in this report was gathered from production sample serial number: 140814050-1 .The EUT was received on 2014-08-21*

Objective

This report is prepared on behalf of *Jiangsu SEUIC Technology 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 Part15C DSS submissions with FCC ID: 2AC68-AUTOID6 for BT.

FCC Part15C DSS submissions with FCC ID: 2AC68-AUTOID6 for RFID.

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 an engineering mode, which was provided by 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 802.11n-HT20 modes were tested with Channel 1, 6 and 11.

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

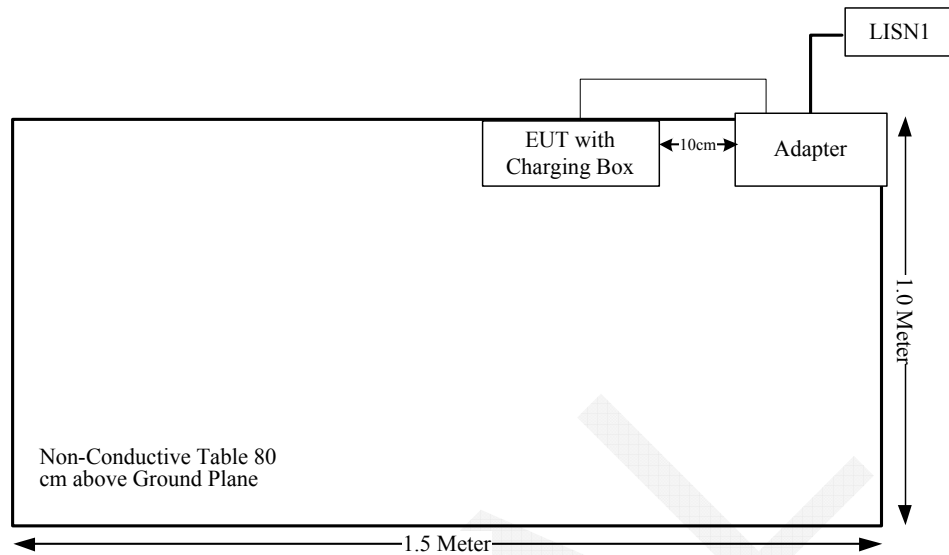
The software “ENGINEER MODE” embedded in the EUT was used, which was provided by manufacturer. The maximum power with 100% duty cycle was set by default configuration.

Test Mode	Test Software Version	ENGINEER MODE		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	9	9	9
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	8	8	8
802.11n-HT20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	8	8	8

Equipment Modifications

No modification was made to the EUT.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1) & §2.1093	RF Exposure	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 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) & §2.1093 – RF EXPOSURE

Applicable Standard

According to §15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v05r02:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

The maximum conducted (average) output power= 9.18 dBm(8.28mW) at 2437 MHz
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$
 $= 8.28/5 \cdot (\sqrt{2.437}) = 2.58 < 7.5$

So the stand-alone SAR evaluation is not necessary for extremity (hands) use.

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.

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 integral antenna arrangement for Wi-Fi, and the antenna gain is 1 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_{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:

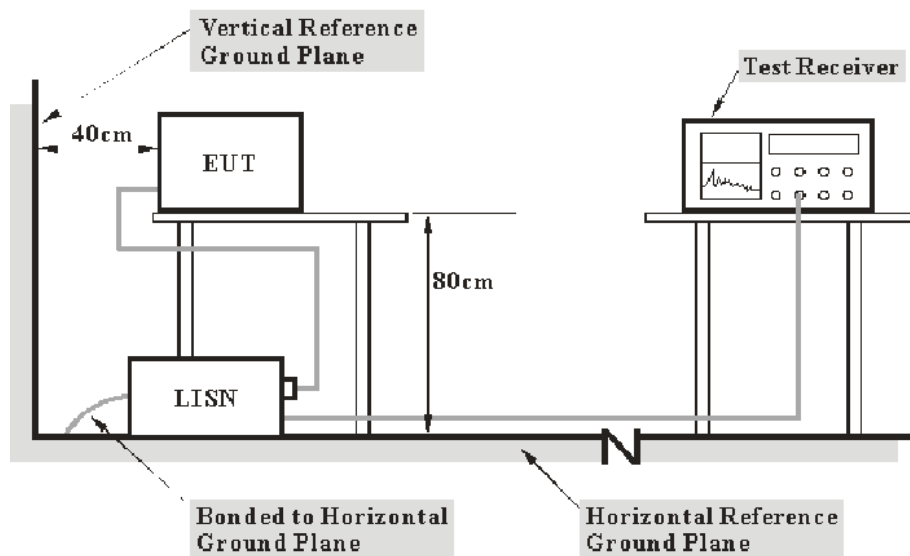
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

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 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

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	2014-11-20
R&S	L.I.S.N	ESH3-Z5	843331/015	N/A	N/A
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-01-22	2015-01-22
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:

18.6 dB at 0.184529MHz in the **Neutral** conducted mode

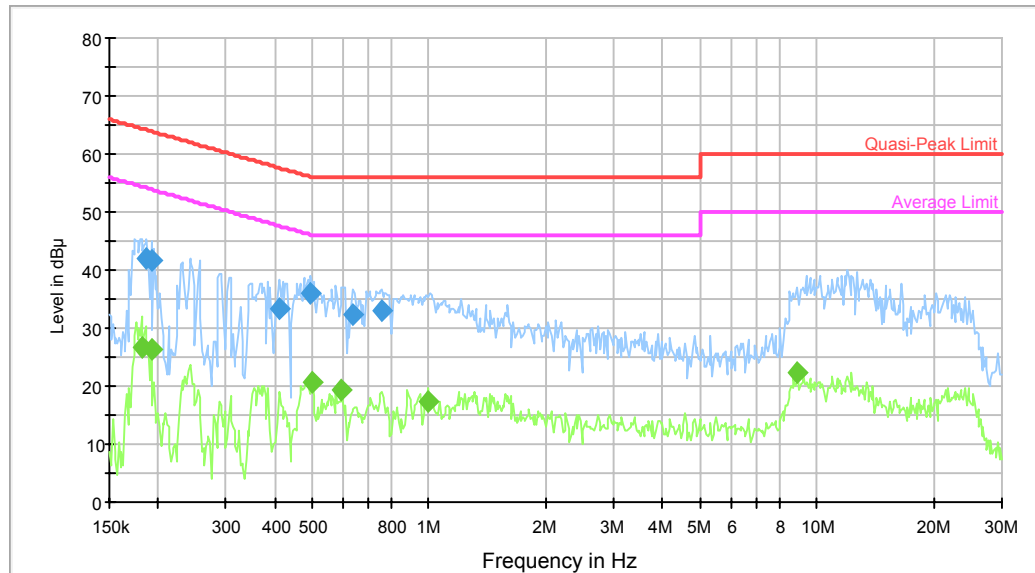
Test Data**Environmental Conditions**

Temperature:	28.16 °C
Relative Humidity:	49 %
ATM Pressure:	100.4 kPa

The testing was performed by Sevin Li on 2014-08-25.

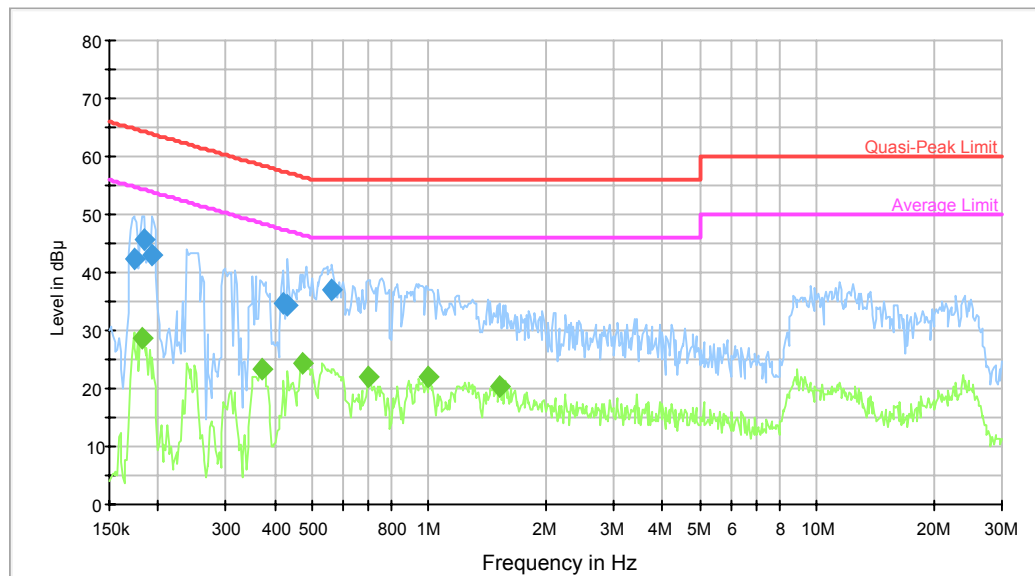
Test Mode: Charging& wifi operating

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Quasi-Peak (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.187494	42.2	9.000	L1	10.6	22.0	64.1	Compliance
0.192030	41.8	9.000	L1	10.6	22.2	63.9	Compliance
0.412647	33.2	9.000	L1	10.5	24.4	57.6	Compliance
0.495646	35.9	9.000	L1	10.4	20.2	56.1	Compliance
0.634524	32.4	9.000	L1	10.5	23.6	56.0	Compliance
0.756101	33.2	9.000	L1	10.5	22.8	56.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.181612	26.8	9.000	L1	10.5	27.6	54.4	Compliance
0.192030	26.2	9.000	L1	10.6	27.7	53.9	Compliance
0.499611	20.5	9.000	L1	10.4	25.5	46.0	Compliance
0.595338	19.2	9.000	L1	10.4	26.8	46.0	Compliance
0.999305	17.2	9.000	L1	10.4	28.8	46.0	Compliance
8.940144	22.4	9.000	L1	10.7	27.6	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
0.173134	42.4	9.000	N	10.7	22.4	64.8	Compliance
0.184529	45.7	9.000	N	11.0	18.6	64.3	Compliance
0.193566	43.1	9.000	N	11.2	20.8	63.9	Compliance
0.422630	34.7	9.000	N	10.7	22.7	57.4	Compliance
0.432855	34.2	9.000	N	10.6	23.0	57.2	Compliance
0.563041	36.9	9.000	N	10.4	19.1	56.0	Compliance

Frequency (MHz)	Corrected Average (dBμV)	Bandwidth (kHz)	Line	Corr. Factor (dB)	Margin (dB)	Limit (dBμV)	Comment
0.183065	28.7	9.000	N	11.0	25.6	54.3	Compliance
0.369089	23.3	9.000	N	10.9	25.2	48.5	Compliance
0.472507	24.5	9.000	N	10.5	22.0	46.5	Compliance
0.698191	22.0	9.000	N	10.6	24.0	46.0	Compliance
0.999305	22.0	9.000	N	10.5	24.0	46.0	Compliance
1.524426	20.3	9.000	N	10.5	25.7	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_{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

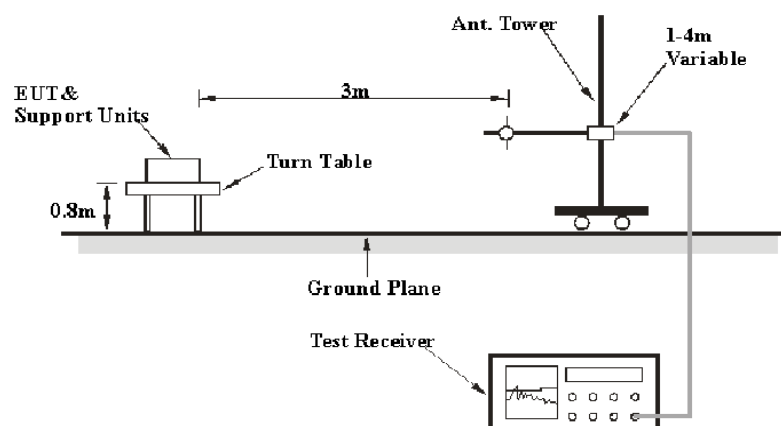
6G~18GHz: 5.23 dB

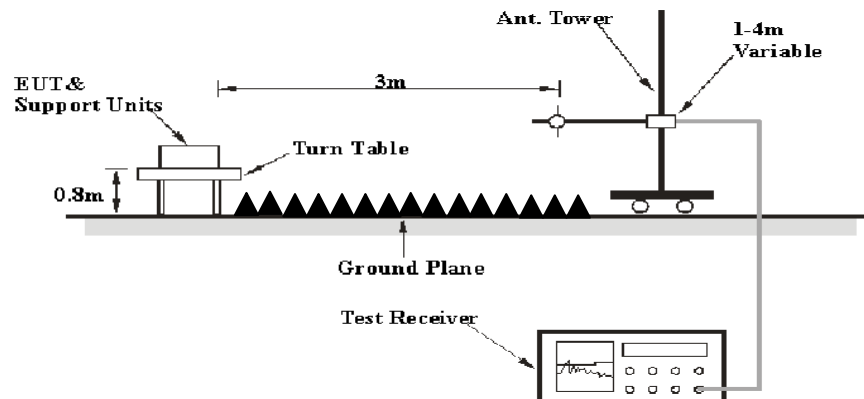
Table 2 – Values of U_{cisp}

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
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Ave.

Test Procedure

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	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
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:

3.03 dB at 4874 MHz in the Vertical polarization for 802.11b mode

Test Data

Environmental Conditions

Temperature:	26.7 °C-
Relative Humidity:	53 %
ATM Pressure:	100.6kPa

The testing was performed by Sevin Li on 2014-09-30

802.11b:

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	92.68	PK	V	25.67	4.42	27.33	95.44	N/A	N/A
2412	89.62	AV	V	25.67	4.42	27.33	92.38	N/A	N/A
2412	90.37	PK	H	25.67	4.42	27.33	93.13	N/A	N/A
2412	97.46	AV	H	25.67	4.42	27.33	100.22	N/A	N/A
2390	41.25	PK	V	25.61	4.39	27.32	43.93	74.00	30.07
2390	30.07	AV	V	25.61	4.39	27.32	32.75	54.00	21.25
4824	43.29	PK	V	30.64	6.03	27.41	52.55	74.00	21.45
4824	41.59	AV	V	30.64	6.03	27.41	50.85	54.00	3.15
7236	32.65	PK	V	34.17	7.47	25.90	48.39	74.00	25.61
7236	20.31	AV	V	34.17	7.47	25.90	36.05	54.00	17.95
9648	29.85	PK	V	36.06	8.81	27.46	47.26	74.00	26.74
9648	18.62	AV	V	36.06	8.81	27.46	36.03	54.00	17.97
4976	31.88	PK	V	31.04	5.97	27.44	41.45	74.00	32.55
4976	20.29	AV	V	31.04	5.97	27.44	29.86	54.00	24.14
42.5	35.2	PK	H	12.63	0.84	21.42	27.25	40.00	12.75
Middle Channel: 2437 MHz									
2437	92.55	PK	V	25.74	4.41	27.34	95.36	N/A	N/A
2437	89.50	AV	V	25.74	4.41	27.34	92.31	N/A	N/A
2437	90.25	PK	H	25.74	4.41	27.34	93.06	N/A	N/A
2437	97.33	AV	H	25.74	4.41	27.34	100.14	N/A	N/A
4874	43.23	PK	V	30.77	6.09	27.42	52.67	74.00	21.33
4874	41.53	AV	V	30.77	6.09	27.42	50.97	54.00	3.03
7311	32.60	PK	V	34.35	7.51	25.88	48.58	74.00	25.42
7311	20.28	AV	V	34.35	7.51	25.88	36.26	54.00	17.74
9748	30.81	PK	V	36.30	8.83	27.24	48.70	74.00	25.30
9748	19.42	AV	V	36.30	8.83	27.24	37.31	54.00	16.69
5962	32.03	PK	V	32.19	6.31	26.99	43.54	74.00	30.46
5962	21.12	AV	V	32.19	6.31	26.99	32.63	54.00	21.37
42.5	35.07	PK	H	12.63	0.84	21.42	27.12	40.00	12.88
High Channel: 2462 MHz									
2462	92.88	PK	V	25.80	4.43	27.35	95.76	N/A	N/A
2462	89.88	AV	V	25.80	4.43	27.35	92.76	N/A	N/A
2462	90.56	PK	H	25.80	4.43	27.35	93.44	N/A	N/A
2462	97.67	AV	H	25.80	4.43	27.35	100.55	N/A	N/A
2483.5	43.65	PK	V	25.86	4.49	27.36	46.64	74.00	27.36
2483.5	31.24	AV	V	25.86	4.49	27.36	34.23	54.00	19.77
4924	43.38	PK	V	30.90	5.97	27.43	52.82	74.00	21.18
4924	41.28	AV	V	30.90	5.97	27.43	50.72	54.00	3.28
7386	32.72	PK	V	34.53	7.55	25.86	48.94	74.00	25.06
7386	20.35	AV	V	34.53	7.55	25.86	36.57	54.00	17.43
9848	29.91	PK	V	36.54	8.85	26.94	48.36	74.00	25.64
9848	18.66	AV	V	36.54	8.85	26.94	37.11	54.00	16.89
5760	31.62	PK	V	32.15	6.11	26.59	43.29	74.00	30.71
5760	20.45	AV	V	32.15	6.11	26.59	32.12	54.00	21.88
42.5	35.24	PK	H	12.63	0.84	21.42	27.29	40.00	12.71

802.11g:

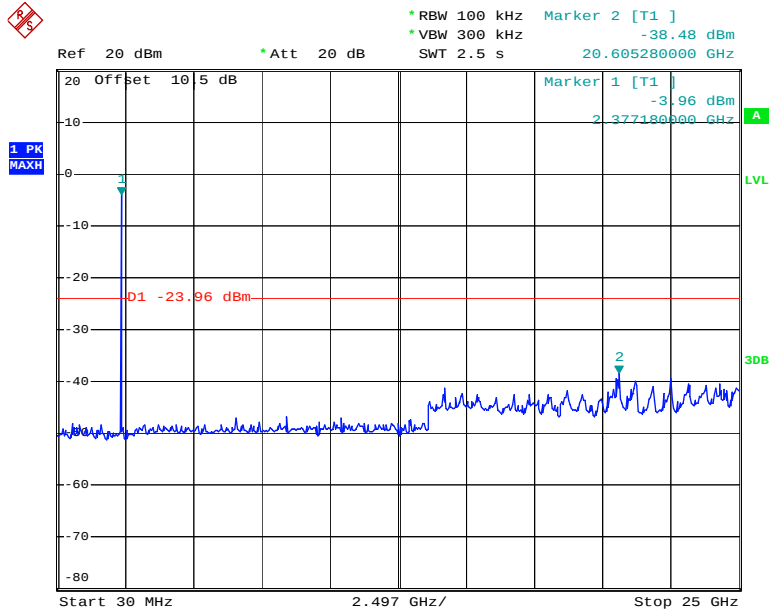
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB/m)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2412 MHz									
2412	94.4	PK	V	25.67	4.42	27.33	97.16	N/A	N/A
2412	84.2	AV	V	25.67	4.42	27.33	86.96	N/A	N/A
2412	94.32	PK	H	25.67	4.42	27.33	97.08	N/A	N/A
2412	83.97	AV	H	25.67	4.42	27.33	86.73	N/A	N/A
2390	53.25	PK	V	25.61	4.39	27.32	55.93	74.00	18.07
2390	36.44	AV	V	25.61	4.39	27.32	39.12	54.00	14.88
4824	44.1	PK	V	30.64	6.03	27.41	53.36	74.00	20.64
4824	31.19	AV	V	30.64	6.03	27.41	40.45	54.00	13.55
7236	31.14	PK	V	34.17	7.47	25.90	46.88	74.00	27.12
7236	20.15	AV	V	34.17	7.47	25.90	35.89	54.00	18.11
9648	30.21	PK	V	36.06	8.81	27.46	47.62	74.00	26.38
9648	19.37	AV	V	36.06	8.81	27.46	36.78	54.00	17.22
7525	31.67	PK	V	34.82	7.61	26.20	47.90	74.00	26.10
7525	20.74	AV	V	34.82	7.61	26.20	36.97	54.00	17.03
42.5	35.21	QP	H	12.63	0.84	21.42	27.26	40.00	12.74
Middle Channel: 2437 MHz									
2437	94.21	PK	V	25.74	4.41	27.34	97.02	N/A	N/A
2437	84.03	AV	V	25.74	4.41	27.34	86.84	N/A	N/A
2437	94.13	PK	H	25.74	4.41	27.34	96.94	N/A	N/A
2437	83.8	AV	H	25.74	4.41	27.34	86.61	N/A	N/A
4874	44.01	PK	V	30.77	6.09	27.42	53.45	74.00	20.55
4874	31.12	AV	V	30.77	6.09	27.42	40.56	54.00	13.44
7311	31.07	PK	V	34.35	7.51	25.88	47.05	74.00	26.95
7311	20.18	AV	V	34.35	7.51	25.88	36.16	54.00	17.84
9748	30.14	PK	V	36.30	8.83	27.24	48.03	74.00	25.97
9748	19.33	AV	V	36.30	8.83	27.24	37.22	54.00	16.78
5962	32.14	PK	V	32.19	6.31	26.99	43.65	74.00	30.35
5960	21.32	AV	V	32.19	6.31	26.98	32.84	54.00	21.16
42.5	35.06	QP	H	12.63	0.84	21.42	27.11	40.00	12.89
High Channel: 2462 MHz									
2462	94.5	PK	H	25.80	4.43	27.35	97.38	N/A	N/A
2462	84.29	AV	H	25.80	4.43	27.35	87.17	N/A	N/A
2462	94.11	PK	V	25.80	4.43	27.35	96.99	N/A	N/A
2462	83.64	PK	V	25.80	4.43	27.35	86.52	N/A	N/A
2483.5	54.12	PK	V	25.86	4.49	27.36	57.11	74.00	16.89
2483.5	36.48	AV	V	25.86	4.49	27.36	39.47	54.00	14.53
4924	44.96	PK	V	30.90	5.97	27.43	54.40	74.00	19.60
4924	31.88	AV	V	30.90	5.97	27.43	41.32	54.00	12.68
7386	31.17	PK	V	34.53	7.55	25.86	47.39	74.00	26.61
7386	20.17	AV	V	34.53	7.55	25.86	36.39	54.00	17.61
9848	30.24	PK	V	36.54	8.85	26.94	48.69	74.00	25.31
9848	19.39	AV	V	36.54	8.85	26.94	37.84	54.00	16.16
6012	31.7	PK	V	32.20	6.25	27.07	43.08	74.00	30.92
6012	20.76	AV	V	32.20	6.25	27.07	32.14	54.00	21.86
40.5	34.69	QP	H	14.07	0.83	21.42	28.17	40.00	11.83

802.11n ht20:

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	94.21	PK	V	25.67	4.42	27.33	96.97	N/A	N/A
2412	78.65	AV	V	25.67	4.42	27.33	81.41	N/A	N/A
2412	93.87	PK	H	25.67	4.42	27.33	96.63	N/A	N/A
2412	78.14	AV	H	25.67	4.42	27.33	80.90	N/A	N/A
2390	51.65	PK	V	25.61	4.39	27.32	54.33	74.00	19.67
2390	30.59	AV	H	25.61	4.39	27.32	33.27	54.00	20.73
4824	45.89	PK	V	30.64	6.03	27.41	55.15	74.00	18.85
4824	28.66	AV	V	30.64	6.03	27.41	37.92	54.00	16.08
7236	31.87	PK	V	34.17	7.47	25.90	47.61	74.00	26.39
7236	20.69	AV	V	34.17	7.47	25.90	36.43	54.00	17.57
9648	30.74	PK	V	36.06	8.81	27.46	48.15	74.00	25.85
9648	19.36	AV	V	36.06	8.81	27.46	36.77	54.00	17.23
5960	30.96	PK	V	32.19	6.31	26.98	42.48	74.00	31.52
5960	20.41	AV	V	32.19	6.31	26.98	31.93	54.00	22.07
42.5	35.21	QP	H	12.63	0.84	21.42	27.26	40.00	12.74
Middle Channel: 2437 MHz									
2437	94.11	PK	V	25.74	4.41	27.34	96.92	N/A	N/A
2437	78.03	AV	V	25.74	4.41	27.34	80.84	N/A	N/A
2437	92.91	PK	H	25.74	4.41	27.34	95.72	N/A	N/A
2437	77.65	AV	H	25.74	4.41	27.34	80.46	N/A	N/A
4874	44.29	PK	V	30.77	6.09	27.42	53.73	74.00	20.27
4874	29.14	AV	V	30.77	6.09	27.42	38.58	54.00	15.42
7311	32.01	PK	V	34.35	7.51	25.88	47.99	74.00	26.01
7311	20.34	AV	V	34.35	7.51	25.88	36.32	54.00	17.68
9748	30.68	PK	V	36.30	8.83	27.24	48.57	74.00	25.43
9748	19.57	AV	V	36.30	8.83	27.24	37.46	54.00	16.54
6210	30.96	PK	V	32.24	6.50	26.74	42.96	74.00	31.04
6210	20.41	AV	V	32.24	6.50	26.74	32.41	54.00	21.59
42.5	34.98	QP	H	12.63	0.84	21.42	27.03	40.00	12.97
High Channel: 2462 MHz									
2462	94.35	PK	H	25.80	4.43	27.35	97.23	N/A	N/A
2462	78.76	AV	H	25.80	4.43	27.35	81.64	N/A	N/A
2462	94.01	PK	V	25.80	4.43	27.35	96.89	N/A	N/A
2462	78.25	PK	V	25.80	4.43	27.35	81.13	N/A	N/A
2483.5	52.2	PK	V	25.86	4.49	27.36	55.19	74.00	18.81
2483.5	30.63	AV	V	25.86	4.49	27.36	33.62	54.00	20.38
4924	45.95	PK	V	30.90	5.97	27.43	55.39	74.00	18.61
4924	28.7	AV	V	30.90	5.97	27.43	38.14	54.00	15.86
7386	31.91	PK	V	34.53	7.55	25.86	48.13	74.00	25.87
7386	20.72	AV	V	34.53	7.55	25.86	36.94	54.00	17.06
9848	30.78	PK	V	36.54	8.85	26.94	49.23	74.00	24.77
9848	19.38	AV	V	36.54	8.85	26.94	37.83	54.00	16.17
6010	31.01	PK	V	32.20	6.25	27.07	42.39	74.00	31.61
6010	20.44	AV	V	32.20	6.25	27.07	31.82	54.00	22.18
42.5	35.39	QP	H	12.63	0.84	21.42	27.44	40.00	12.56

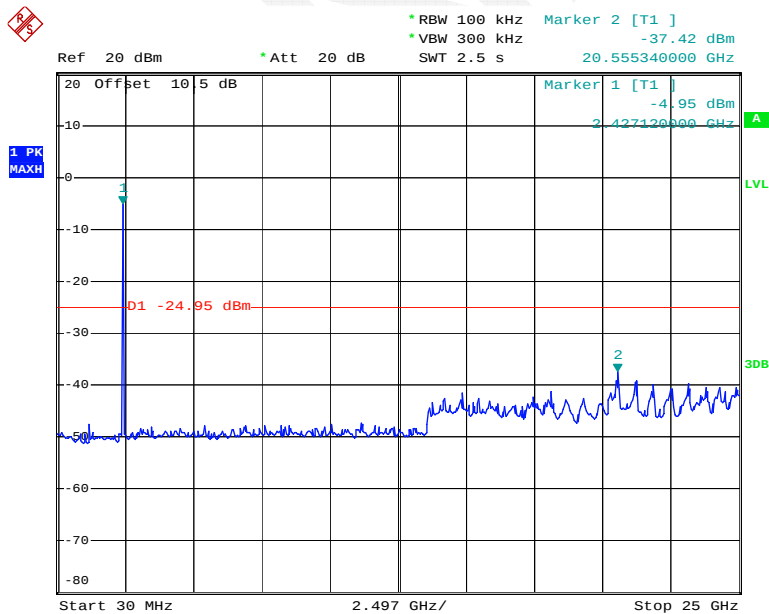
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



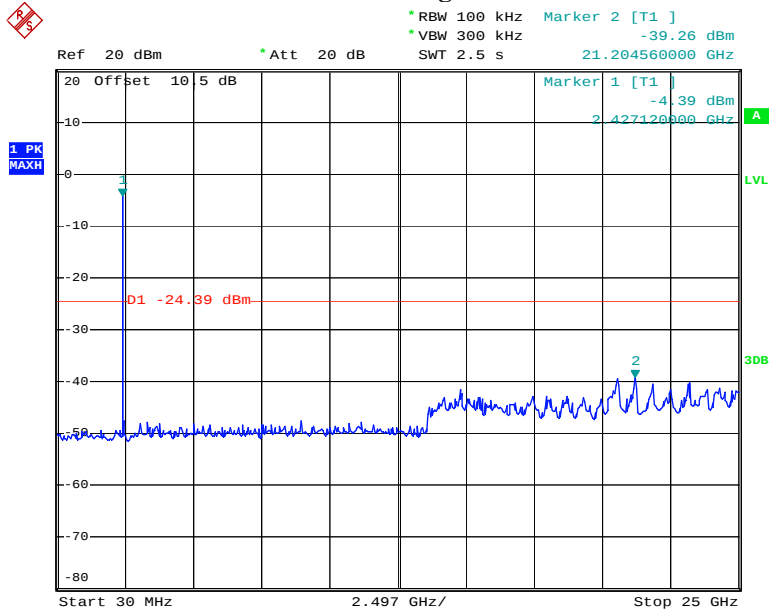
Date: 30.SEP.2014 16:19:16

802.11b Middle Channel



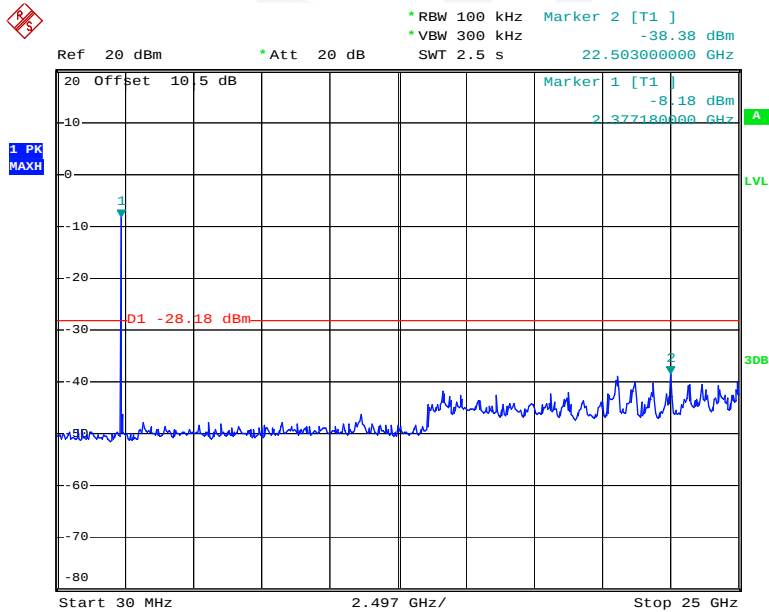
Date: 30.SEP.2014 16:23:19

802.11b High Channel



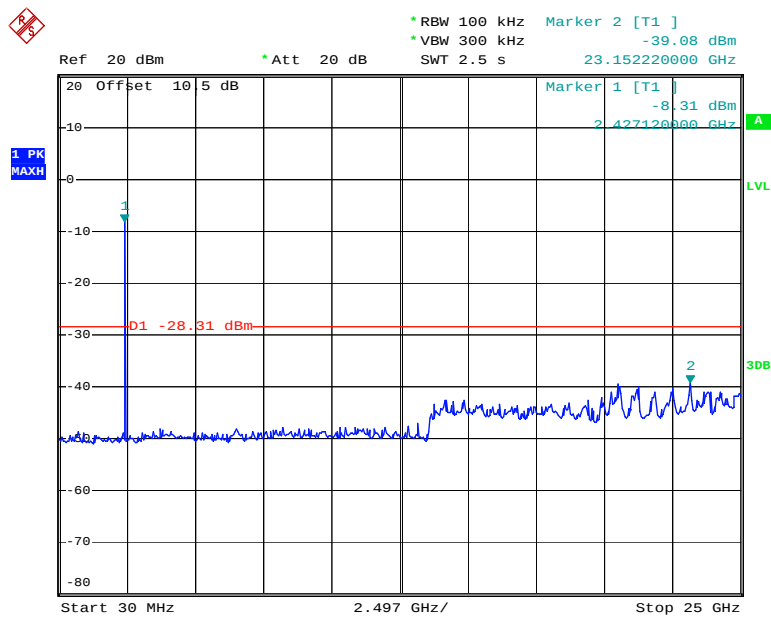
Date: 30.SEP.2014 16:30:02

802.11g Low Channel



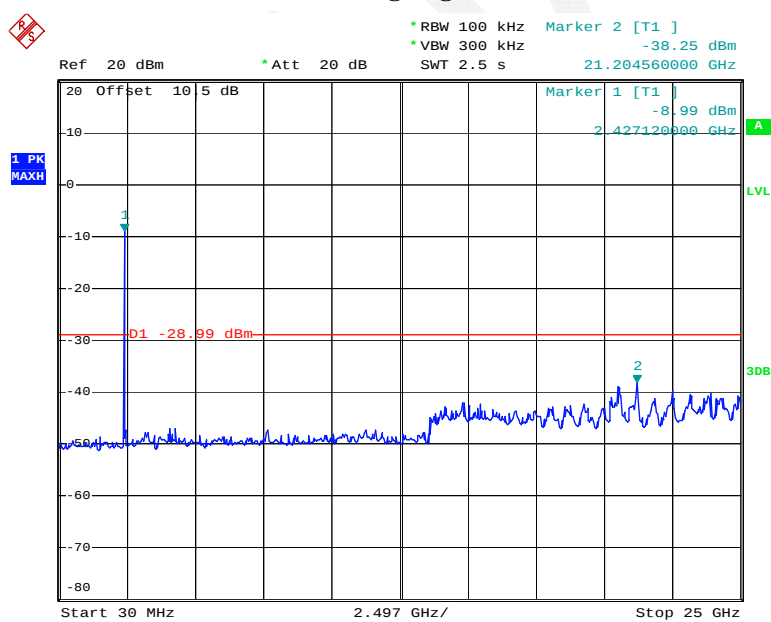
Date: 30.SEP.2014 16:45:13

802.11g Middle Channel



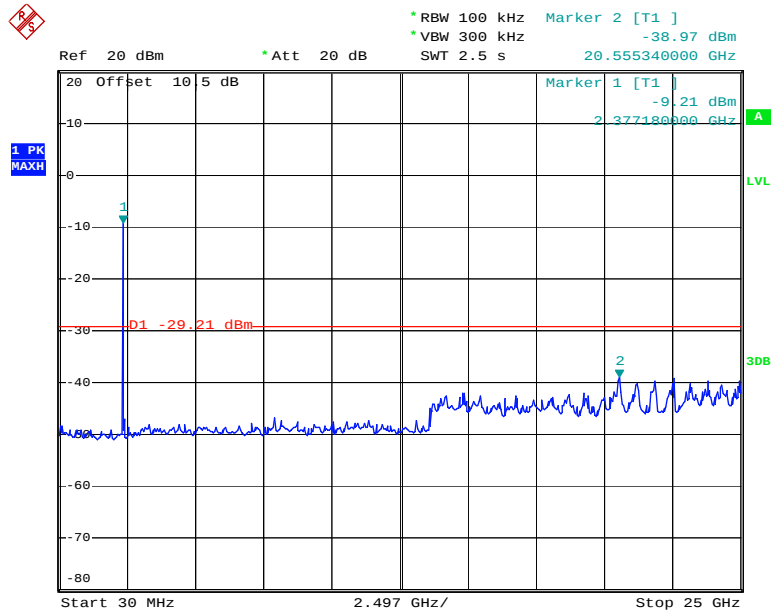
Date: 30.SEP.2014 16:40:31

802.11g High Channel



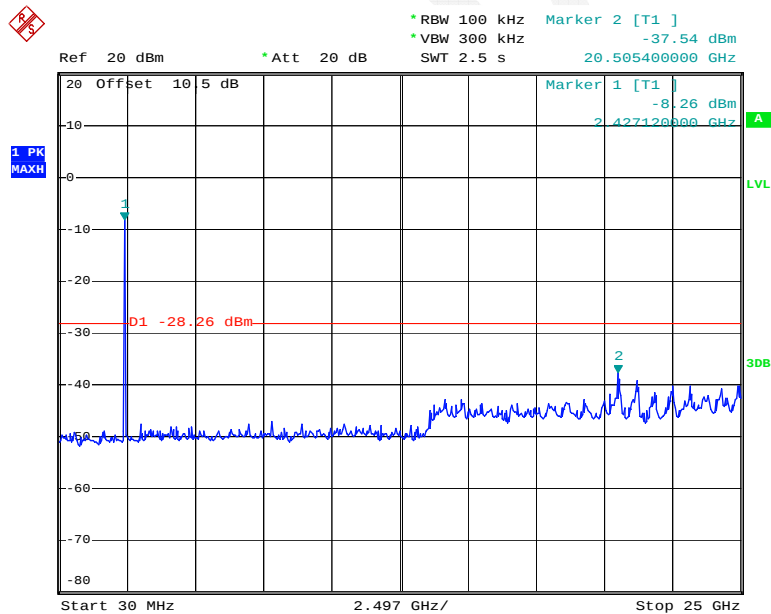
Date: 30.SEP.2014 16:35:11

802.11n-HT20 Low Channel



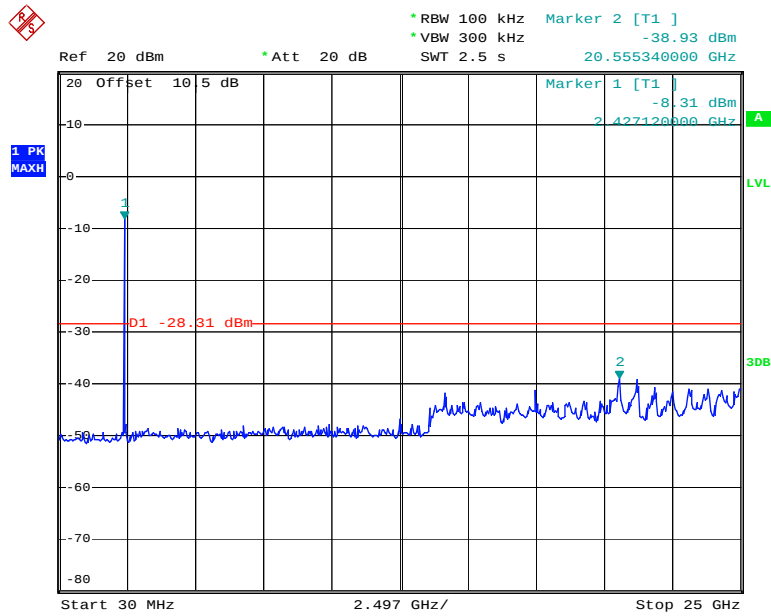
Date: 30.SEP.2014 16:55:47

802.11n-HT20 Middle Channel



Date: 30.SEP.2014 17:03:23

802.11n-HT20 High Channel



Date: 30.SEP.2014 17:49:25

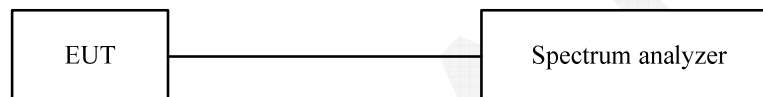
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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

Temperature:	28.9 °C
Relative Humidity:	65 %
ATM Pressure:	100.6 kPa

* The testing was performed by Sevin Li on 2014-09-30.

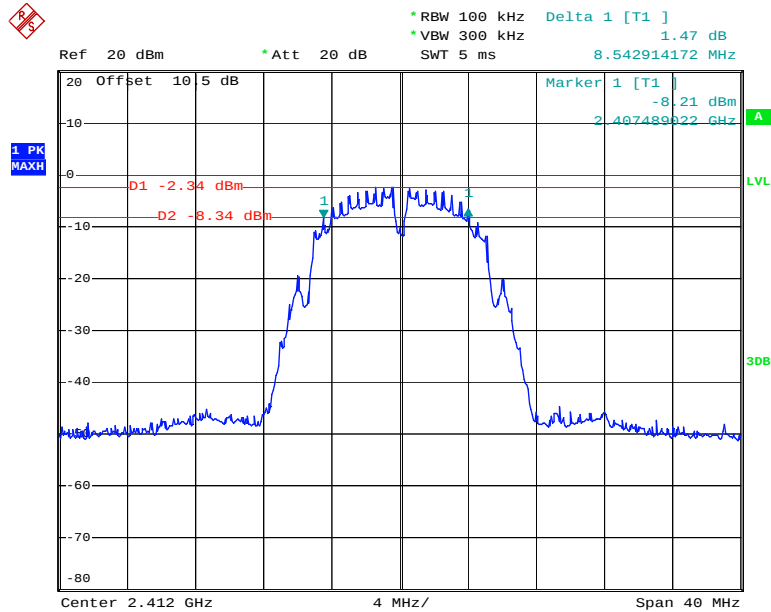
Test Result: Pass.

Please refer to the following tables and plots.

Test Mode: Transmitting

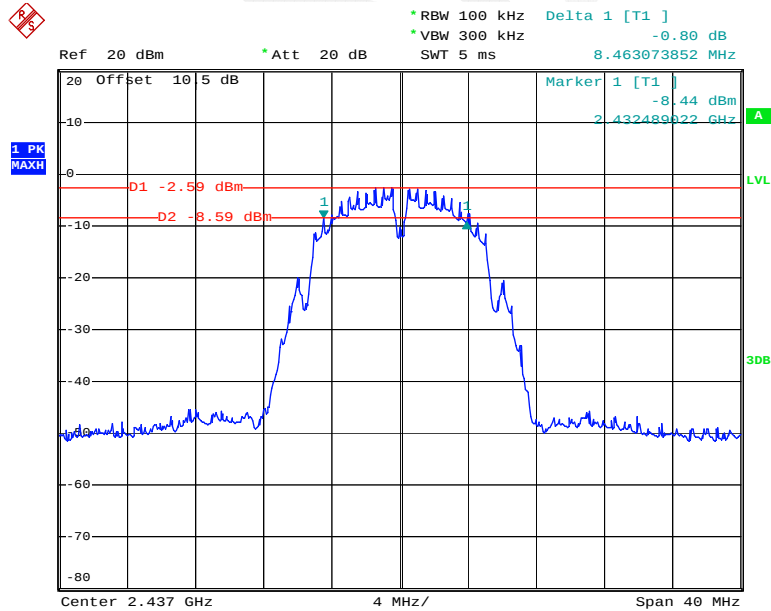
Test Mode	Channel	Frequency	6 dB Bandwidth
		(MHz)	(MHz)
802.11b	Low	2412	8.54
	Middle	2437	8.46
	High	2462	8.14
802.11g	Low	2412	14.85
	Middle	2437	15.09
	High	2462	15.09
802.11n-HT20	Low	2412	15.01
	Middle	2437	15.09
	High	2462	15.09

802.11b Low Channel



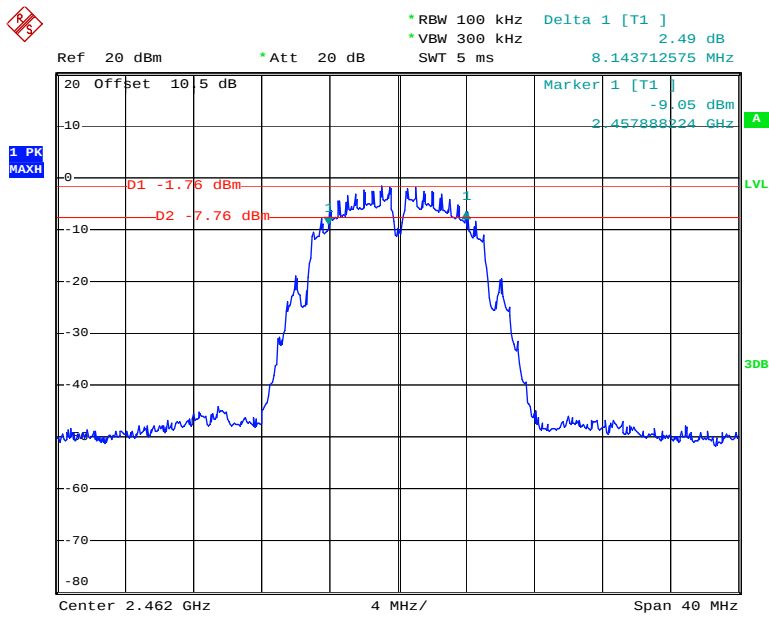
Date: 30.SEP.2014 16:16:36

802.11b Middle Channel



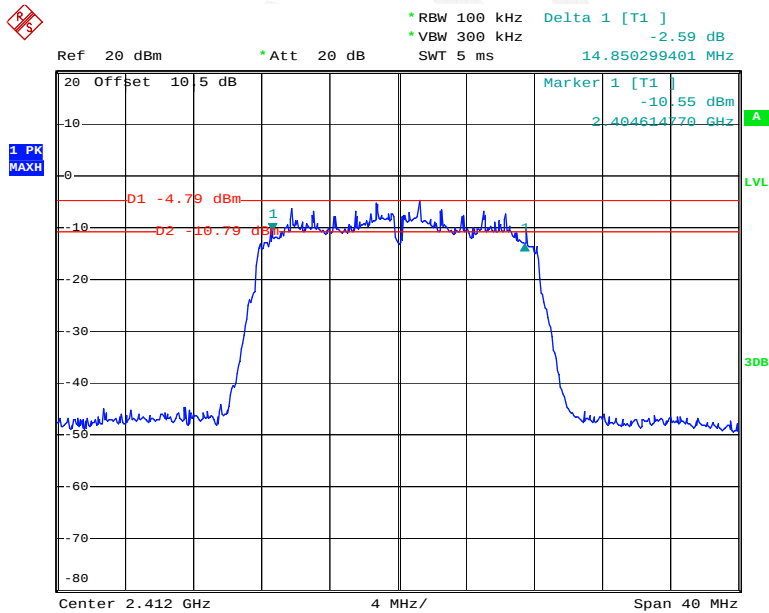
Date: 30.SEP.2014 16:20:29

802.11b High Channel



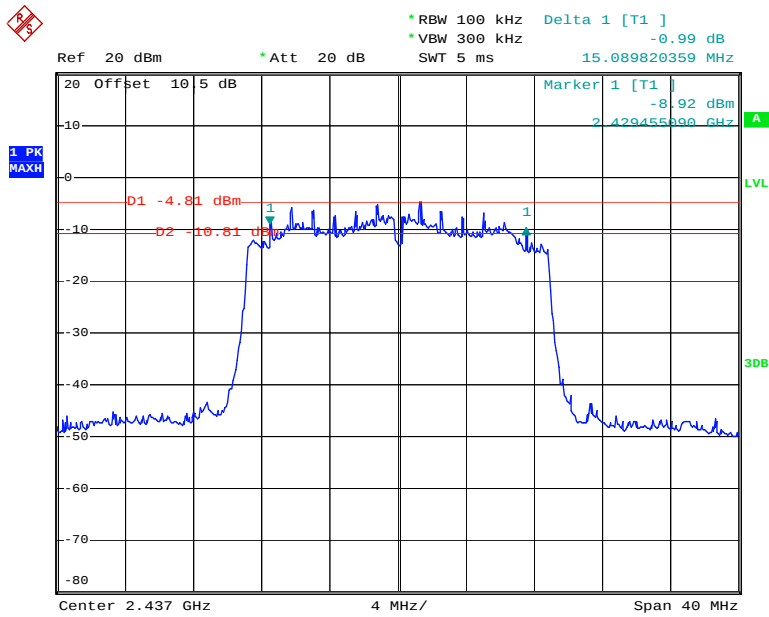
Date: 30.SEP.2014 16:27:51

802.11g Low Channel



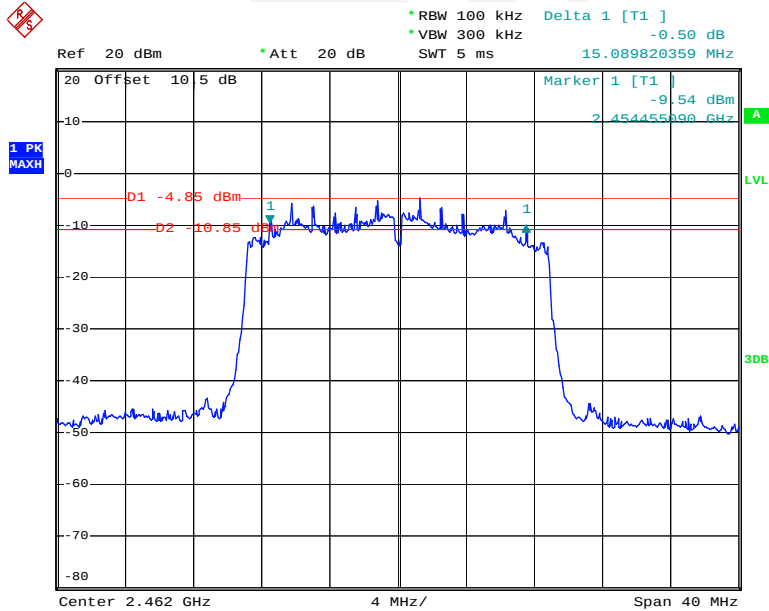
Date: 30.SEP.2014 16:41:27

802.11g Middle Channel



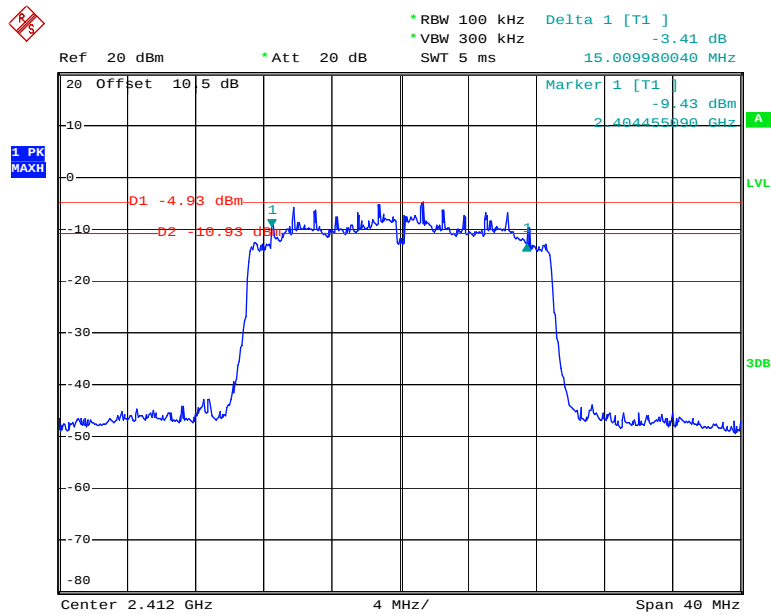
Date: 30.SEP.2014 16:59:08

802.11g High Channel



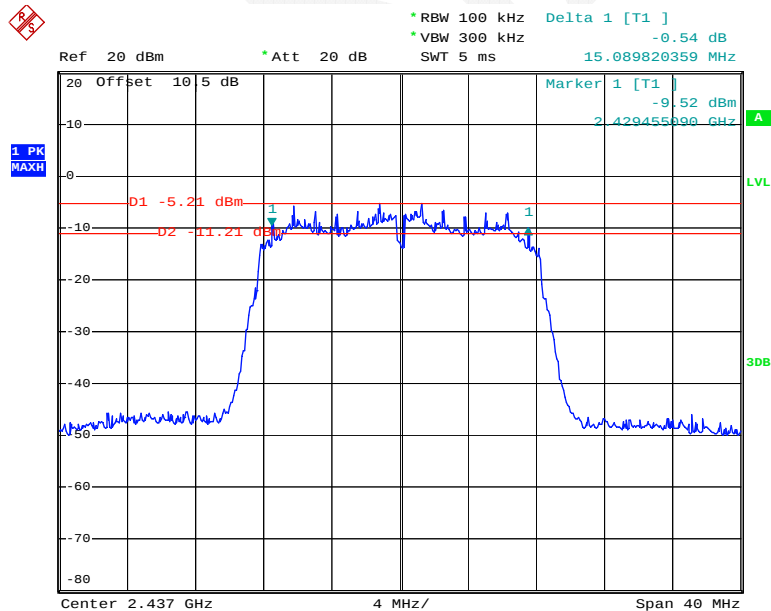
Date: 30.SEP.2014 17:04:27

802.11n-HT20 Low Channel



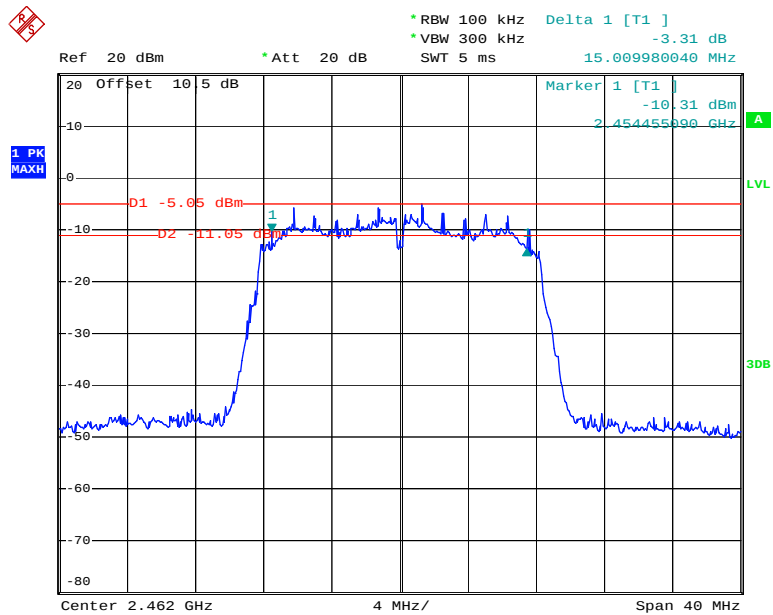
Date: 30.SEP.2014 16:48:45

802.11n-HT20 Middle Channel



Date: 30.SEP.2014 16:36:18

802.11n-HT20 High Channel



Date: 30.SEP.2014 16:31:13

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 the test equipment.
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	2013-11-12	2014-11-12
Agilent	Wideband Power Sensor	N1921A	MY54170013	2013-11-12	2014-11-12
Agilent	P-Series Power Meter	N1912A	MY5000448	2013-11-12	2014-11-12

* **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:	28.9 °C
Relative Humidity:	65 %
ATM Pressure:	100.6 kPa

* The testing was performed by Sevin Li on 2014-09-30

Test Mode: Transmitting

Please refer to the following tables and plots.

Mode	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)	Conducted Average Power (dBm)	Limit (dBm)
2.4G Band 802.11 b	Low Channel	2412	8.91	8.81	30
	Middle Channel	2437	8.77	8.65	30
	High Channel	2462	9.2	9.01	30
2.4G Band 802.11 g	Low Channel	2412	13.09	9.03	30
	Middle Channel	2437	13.12	9.08	30
	High Channel	2462	13.03	9.03	30
2.4G Band 802.11 n20	Low Channel	2412	13.16	9.16	30
	Middle Channel	2437	13.14	9.18	30
	High Channel	2462	12.92	9.14	30

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

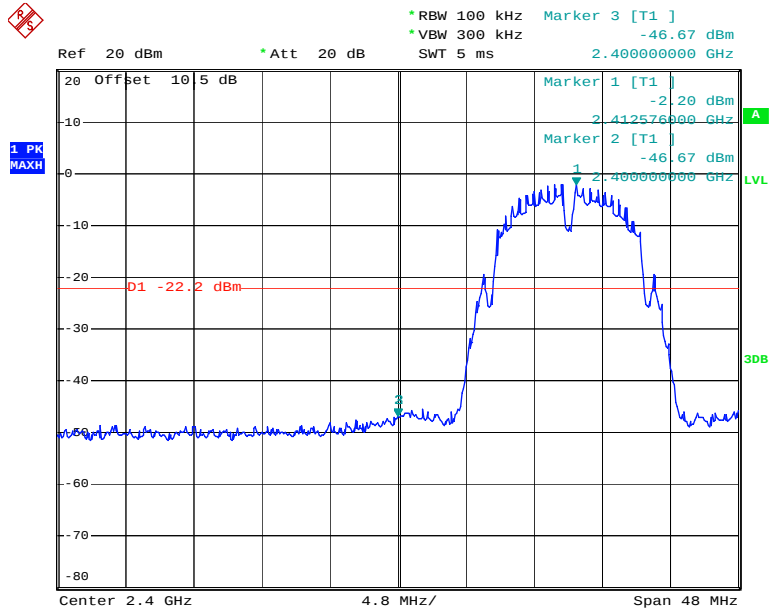
Temperature:	28.9 °C
Relative Humidity:	65 %
ATM Pressure:	100.6 kPa

* The testing was performed by Sevin Li on 2014-09-30

Test Result: Compliance

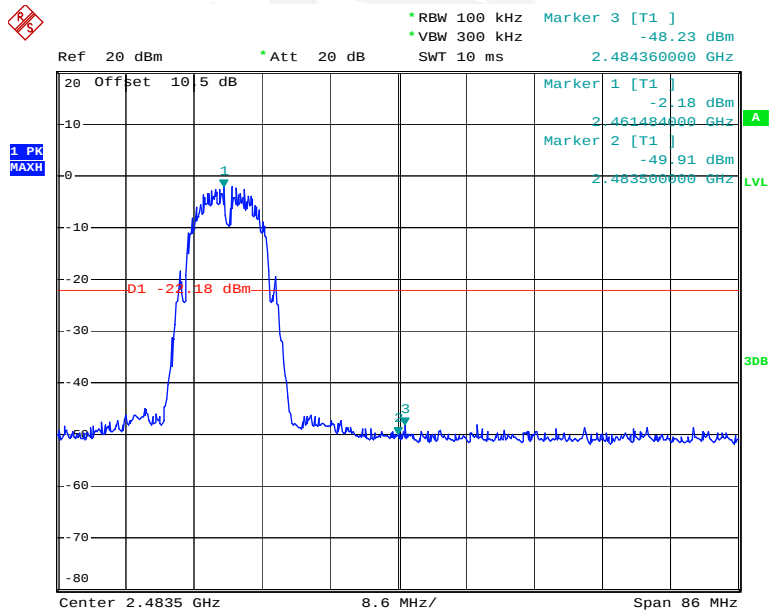
Please refer to following plots.

802.11b: Band Edge, Left Side



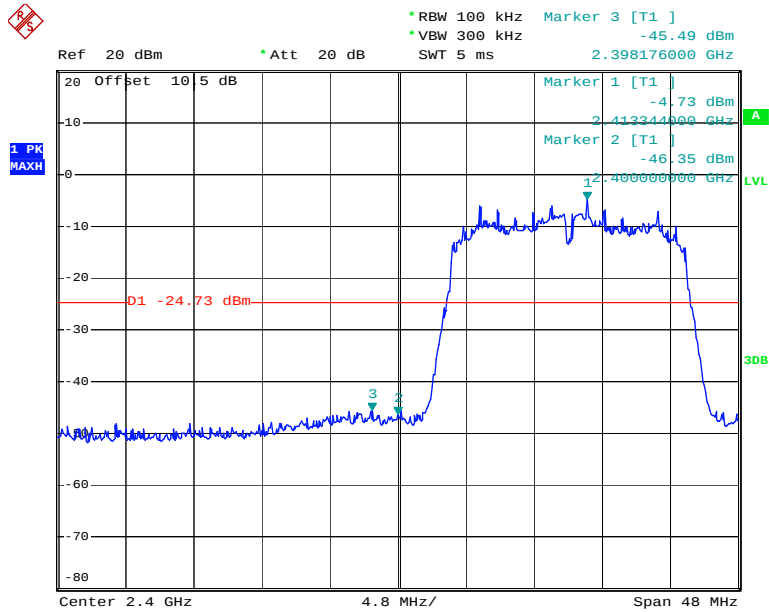
Date: 30.SEP.2014 16:19:47

802.11b: Band Edge, Right Side



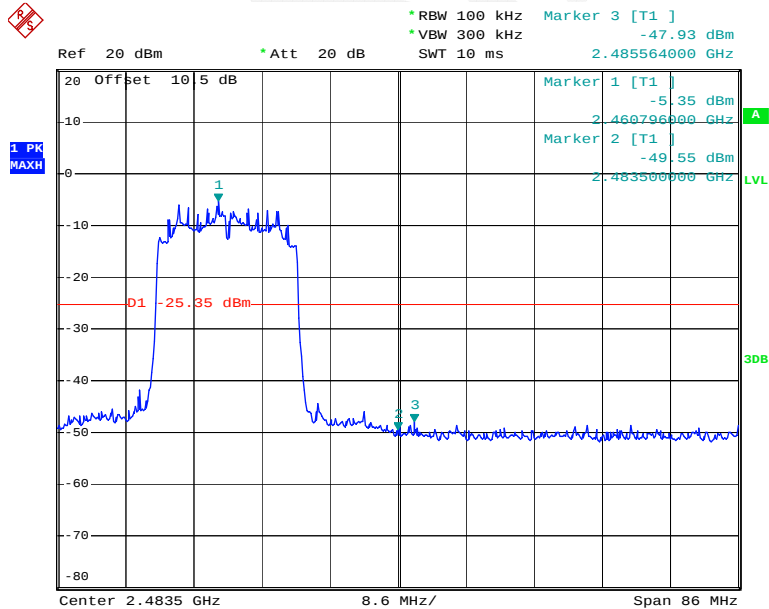
Date: 30.SEP.2014 16:30:23

802.11g: Band Edge, Left Side



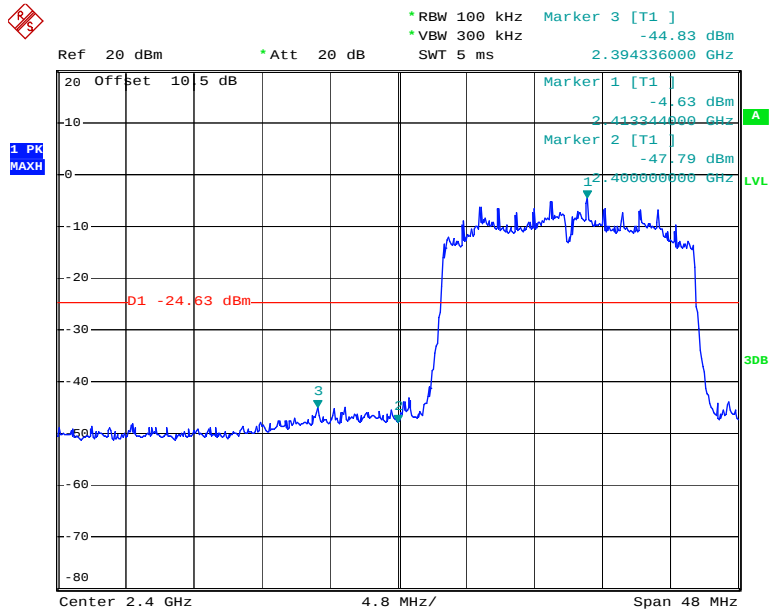
Date: 30.SEP.2014 16:45:34

802.11g: Band Edge, Right Side



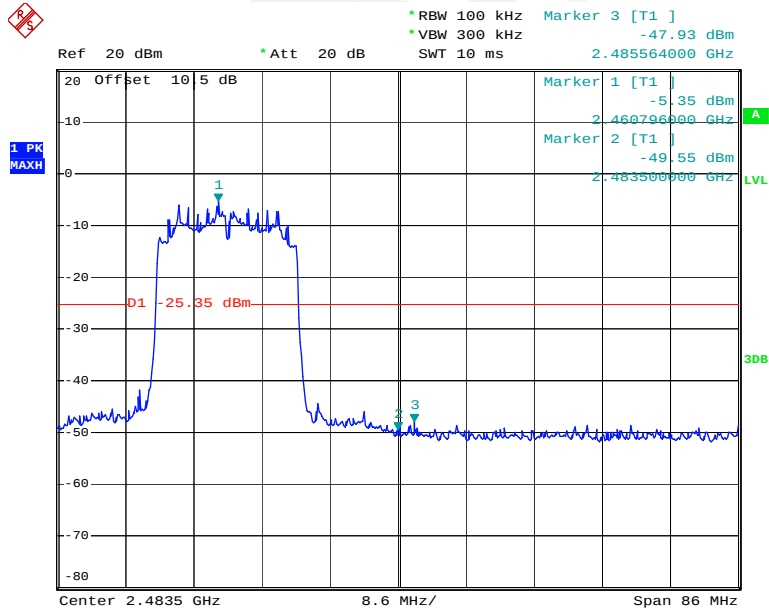
Date: 30.SEP.2014 17:49:46

802.11n-HT20 Band Edge, Left Side



Date: 30.SEP.2014 16:56:16

802.11n-HT20 Band Edge, Right Side



Date: 30.SEP.2014 17:49:46

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:	29.4 °C
Relative Humidity:	59 %
ATM Pressure:	100.4kPa

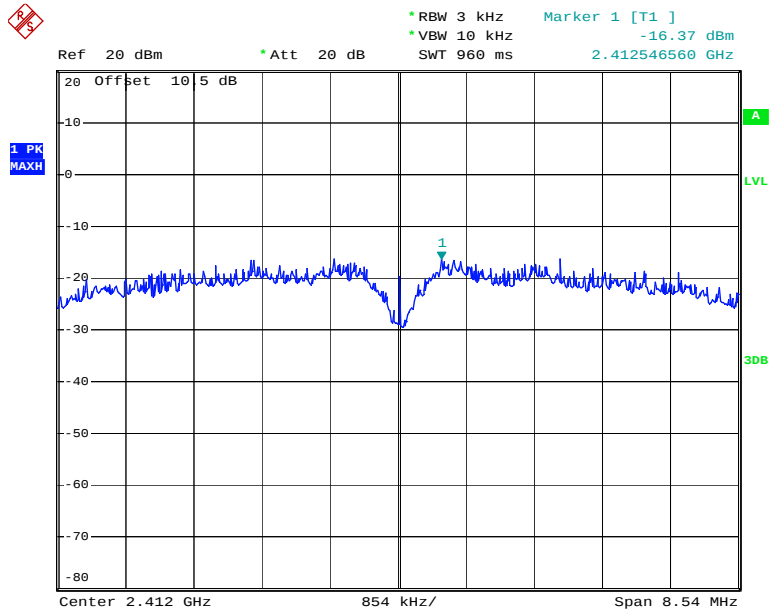
* The testing was performed by Sevin Li on 2014-09-30

Test Mode: Transmitting

Test Result: Pass. Please refer to the following tables and plots.

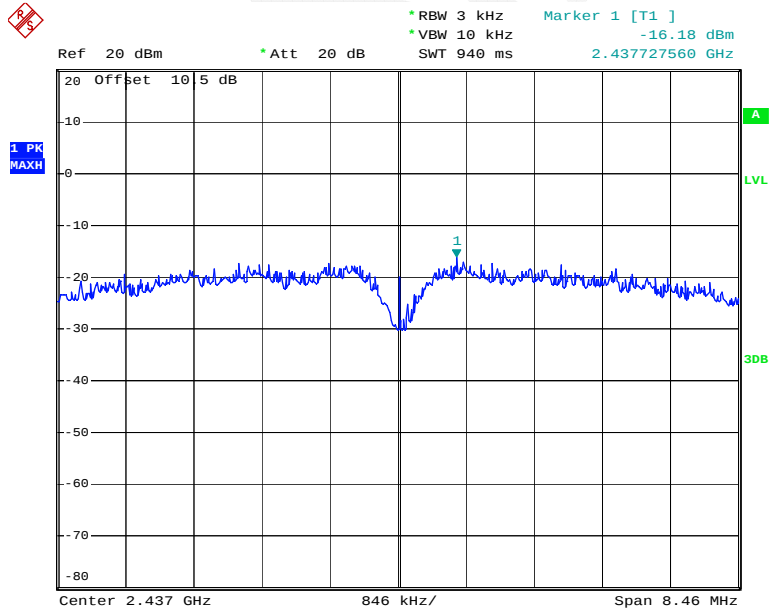
Test Mode	Channel	PSD	Limit	Result
		(dBm/3kHz)	(dBm/3kHz)	
802.11b	Low	-16.37	≤ 8	PASS
	Middle	-16.18	≤ 8	PASS
	High	-15.58	≤ 8	PASS
802.11 g	Low	-18.3	≤ 8	PASS
	Middle	-18.91	≤ 8	PASS
	High	-19.3	≤ 8	PASS
802.11n-HT20	Low	-19.08	≤ 8	PASS
	Middle	-18.75	≤ 8	PASS
	High	-18.45	≤ 8	PASS

Power Spectral Density, 802.11b Low Channel



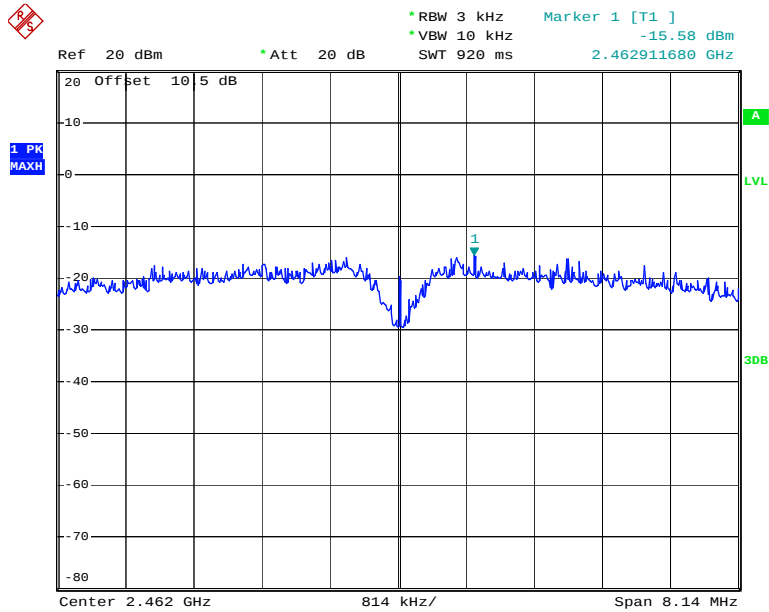
Date: 30.SEP.2014 16:18:40

Power Spectral Density, 802.11b Middle Channel



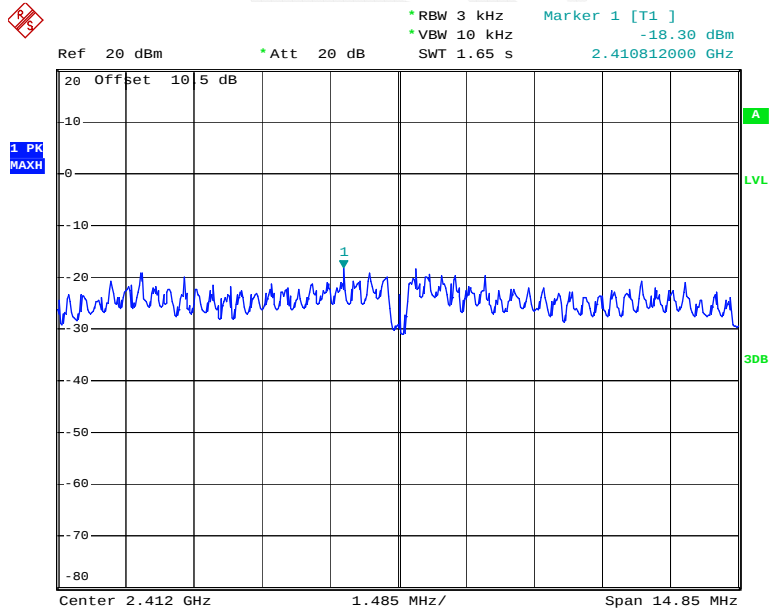
Date: 30.SEP.2014 16:22:46

Power Spectral Density, 802.11b High Channel



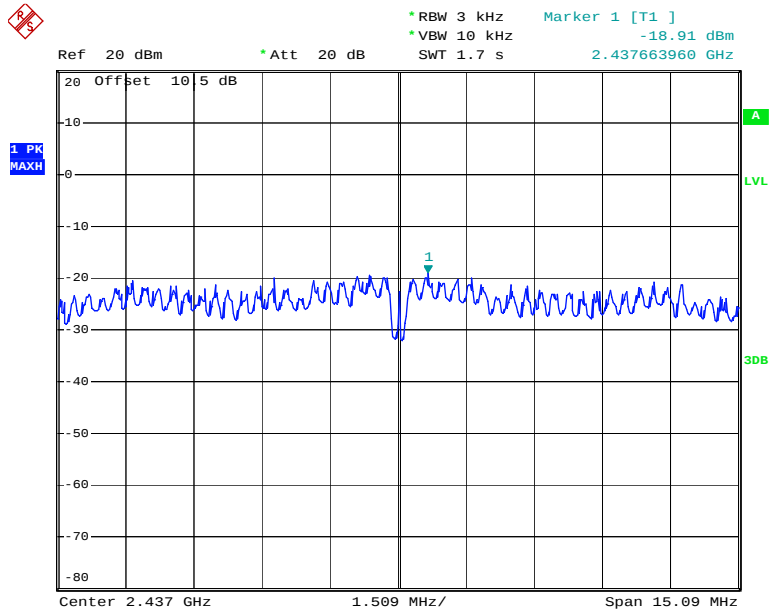
Date: 30.SEP.2014 16:29:40

Power Spectral Density, 802.11g Low Channel



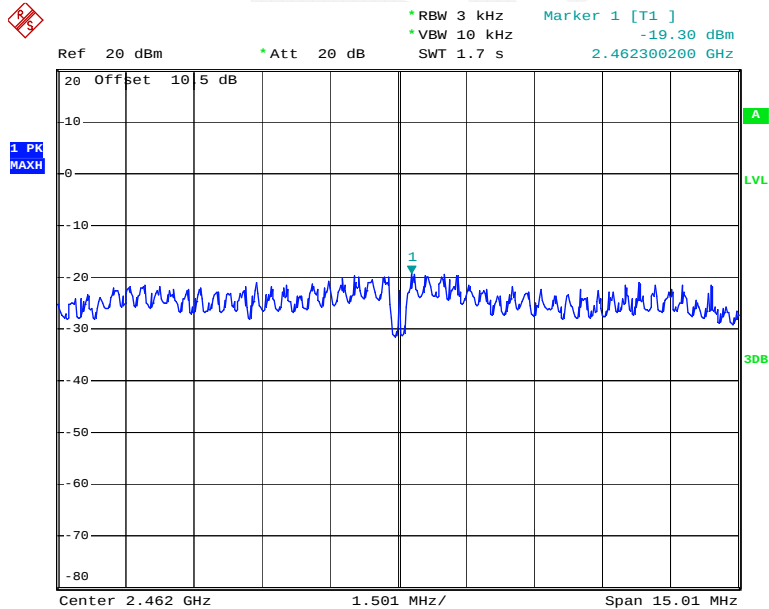
Date: 30.SEP.2014 16:44:42

Power Spectral Density, 802.11g Middle Channel



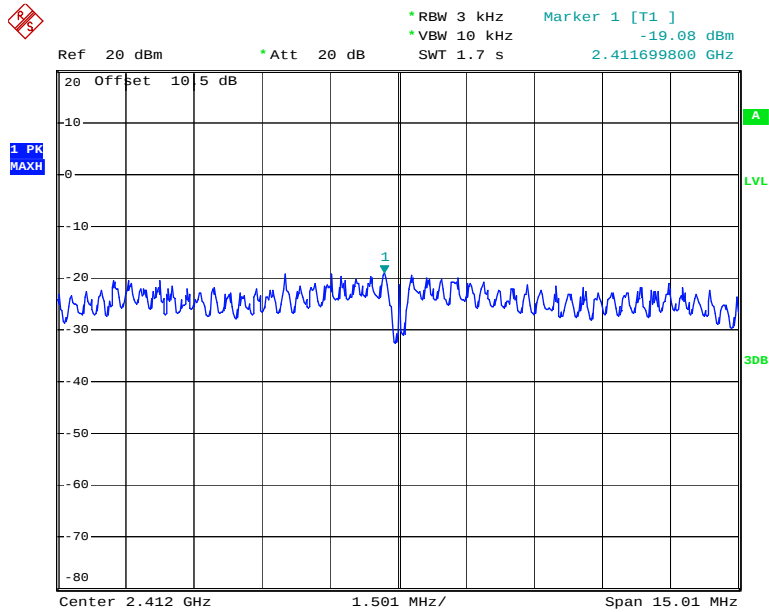
Date: 30.SEP.2014 16:39:55

Power Spectral Density, 802.11g High Channel



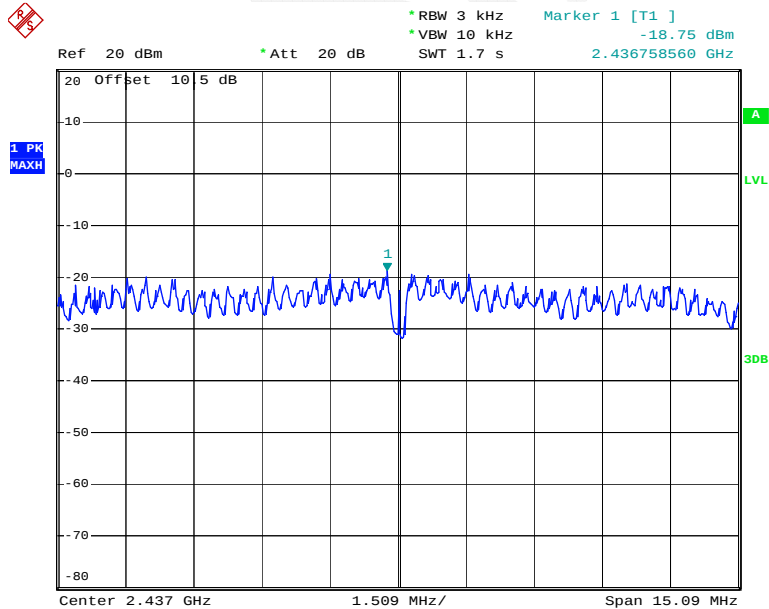
Date: 30.SEP.2014 16:34:32

Power Spectral Density, 802.11n-HT20 Low Channel



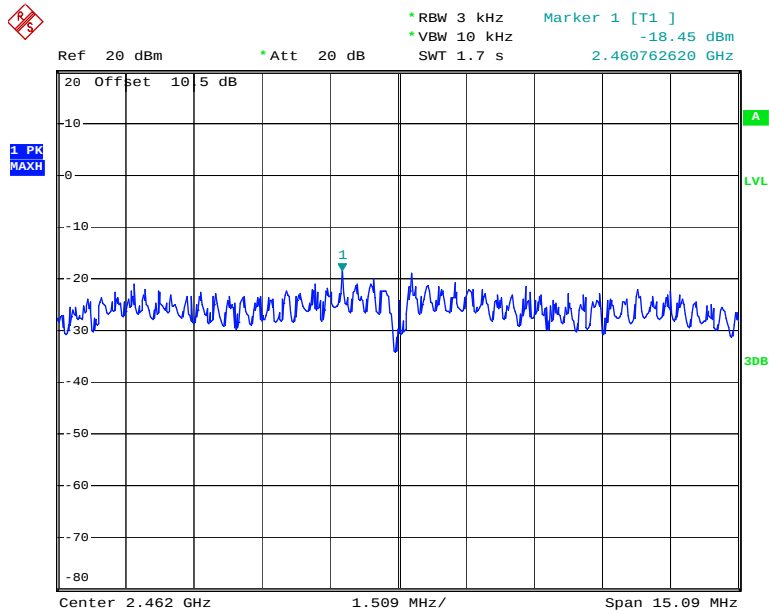
Date: 30.SEP.2014 16:54:53

Power Spectral Density, 802.11n-HT20 Middle Channel



Date: 30.SEP.2014 17:02:45

Power Spectral Density, 802.11n-HT20 High Channel



Date: 30.SEP.2014 17:07:17

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