FCC PART 15.247

TEST REPORT

For

COMERCIALIZADORA MILENIO SA DE CV

Vasco De Quiroga 3900 Office 704, Mexico City 05300

FCC ID: 2ABD2PSPC505

Report Type:	Product Type:
Original Report	Cosmo 505 (Mobile Phone)

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Report Number:	RSZ131111001-00C
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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
EQUIPMENT MODIFICATIONS 6
EUT EXERCISE SOFTWARE 6
EXTERNAL I/O CABLE 6
BLOCK DIAGRAM OF TEST SETUP 7
SUMMARY OF TEST RESULTS **8**
FCC§15.247 (i), §1.1307 (b) (1) & §2.1093 – RF EXPOSURE **9**
STANDARD APPLICABLE 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
TEST EQUIPMENT LIST AND DETAILS 12
TEST RESULTS SUMMARY 12
TEST DATA 13
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS **15**
APPLICABLE STANDARD 15
MEASUREMENT UNCERTAINTY 15
EUT SETUP 15
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP 16
TEST PROCEDURE 16
TEST EQUIPMENT LIST AND DETAILS 16
CORRECTED AMPLITUDE & MARGIN CALCULATION 17
TEST RESULTS SUMMARY 17
TEST DATA 17
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH **29**
APPLICABLE STANDARD 29
TEST PROCEDURE 29
TEST EQUIPMENT LIST AND DETAILS 29
TEST DATA 29
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER **36**
APPLICABLE STANDARD 36

TEST PROCEDURE 36
TEST EQUIPMENT LIST AND DETAILS....36
TEST DATA 36

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE....43

APPLICABLE STANDARD 43
TEST PROCEDURE 43
TEST EQUIPMENT LIST AND DETAILS....43
TEST DATA 43

FCC §15.247(e) - POWER SPECTRAL DENSITY 48

APPLICABLE STANDARD 48
TEST PROCEDURE 48
TEST EQUIPMENT LIST AND DETAILS....48
TEST DATA 48

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *COMERCIALIZADORA MILENIO SA DE CV*'s product, model number: *PSPC505 (FCC ID: 2ABD2PSPC505)* or the "EUT" in this report was a *Mobile Phone,* named as *Cosmo 505* by applicant, which was measured approximately: 14.9 cm (L) x 7.2 cm (W) x 1.0 cm (H), rated input voltage: DC 3.7 V Li-ion battery or DC 5V charging from adapter.

Adapter Information:
Model: PSPC505
Input: 100-240 V, 50/60Hz, 0.15A
Output: DC 5.0V, 1A

** All measurement and test data in this report was gathered from production sample serial number: 1311021 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-11-11.*

Objective

This report is prepared on behalf of *COMERCIALIZADORA MILENIO SA DE CV* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP, Part 15.247 DSS and Part 22H/24E PCE submissions with FCC ID: 2ABD2PSPC505

Test Methodology

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

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with RF radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. 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

For 802.11b, 802.11g, and 802.11n-HT20 mode, 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, 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

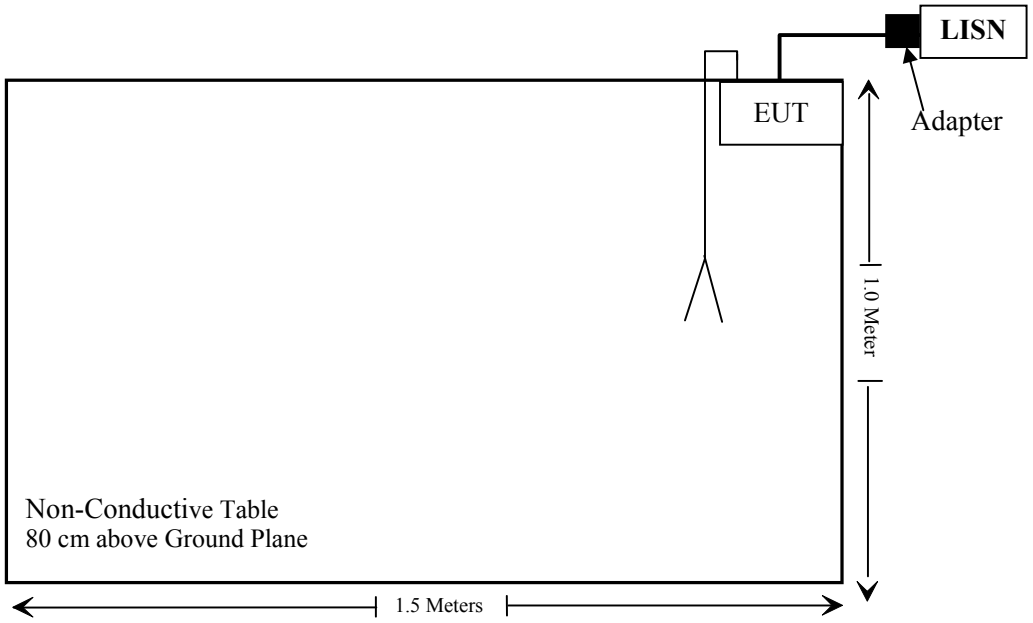
Wifi test with adb command.

The test was performed under:
802.11b: Data rate: 11Mbps, Power level: 11
802.11g: Data rate: 54 Mbps, Power level: 11
802.11n-HT20: Data rate: MCS7, Power level: 11

External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detectable USB Cable	0.95	Adapter	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	Pass
§15.203	Antenna Requirement	Pass
§15.207 (a)	AC Line Conducted Emissions	Pass
§15.247(d)	Spurious Emissions at Antenna Port	Pass
§15.205, §15.209, §15.247(d)	Spurious Emissions	Pass
§15.247 (a)(2)	6 dB Emission Bandwidth	Pass
§15.247(b)(3)	Maximum Peak Output Power	Pass
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Pass
§15.247(e)	Power Spectral Density	Pass

FCC§15.247 (i), §1.1307 (b) (1) & §2.1093 – RF EXPOSURE

Standard Applicable

According to §15.247 (i) and §1.1307(b)(1), 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 General Population/Uncontrolled Exposure

Result: Compliant

Please refer to the SAR report, report No.: RSZ131111001-20.

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

Antenna Connector Construction

The EUT has one integral antenna arrangement for Wi-Fi, which was permanently attached, the antenna gain is 1.2dBi, fulfill the requirement of this section. Please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

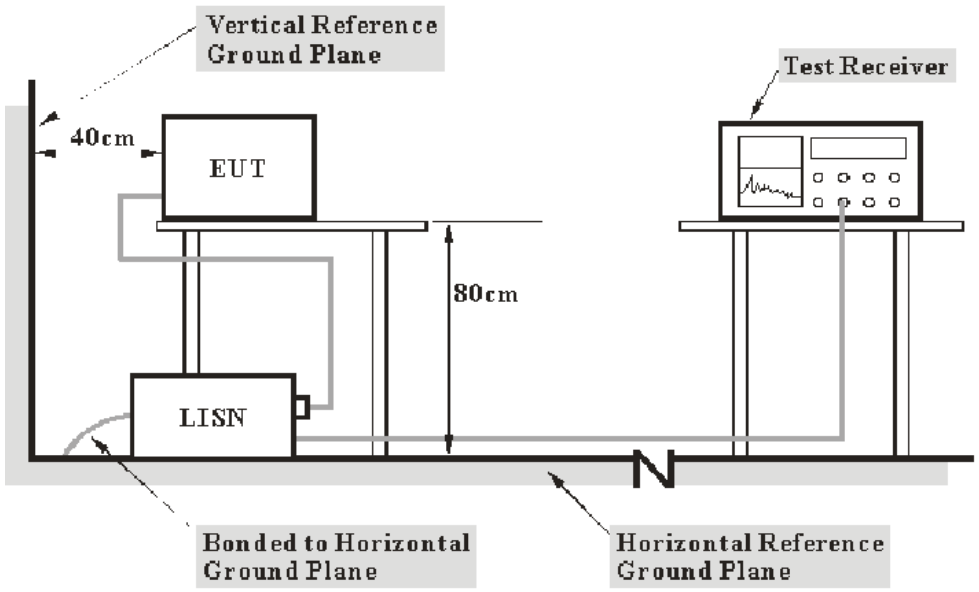
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

EUT Setup



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

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

The 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2013-06-17	2014-06-17
Rohde & Schwarz	LISN.	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	--	--

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

Test Results Summary

According to the recorded data in following table, with the worst margin reading of:

7.6 dB at **0.414000 MHz** in the **Neutral** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

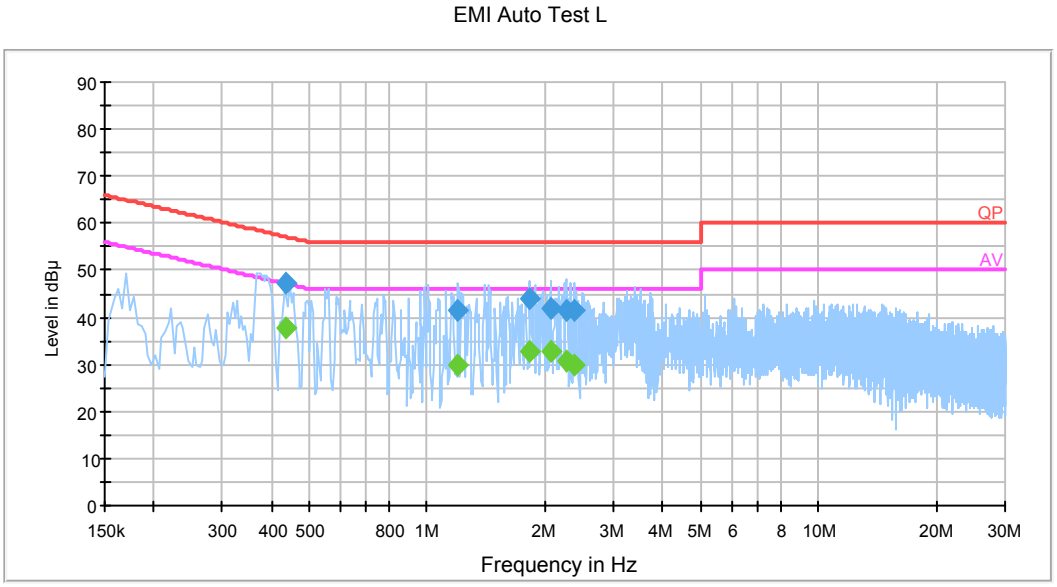
Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2013-11-12.

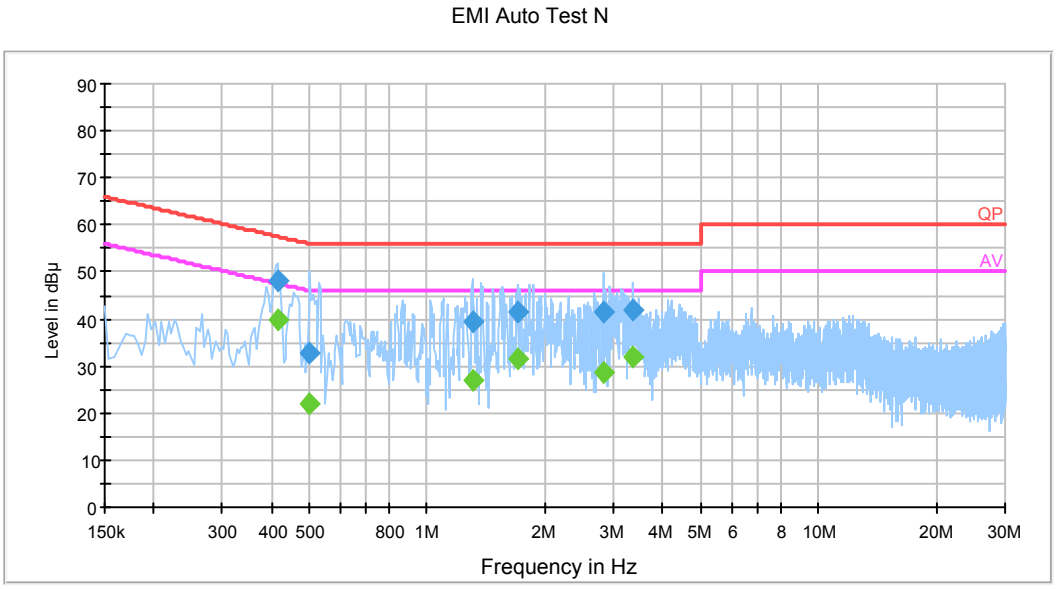
EUT operation mode: Charging & transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
0.434000	37.6	19.5	47.2	9.6	Ave.
0.434000	47.2	19.5	57.2	10.0	QP
1.834000	43.8	19.5	56.0	12.2	QP
2.070000	33.0	19.5	46.0	13.0	Ave.
1.834000	32.7	19.5	46.0	13.3	Ave.
2.070000	42.0	19.5	56.0	14.0	QP
2.262000	41.5	19.5	56.0	14.5	QP
2.386000	41.5	19.5	56.0	14.5	QP
1.202000	41.4	19.5	56.0	14.6	QP
2.262000	30.5	19.5	46.0	15.5	Ave.
1.202000	30.0	19.5	46.0	16.0	Ave.
2.386000	29.7	19.5	46.0	16.3	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
0.414000	40.0	19.5	47.6	7.6	Ave.
0.414000	48.1	19.5	57.6	9.5	QP
3.342000	41.8	19.6	56.0	14.2	QP
3.342000	31.8	19.6	46.0	14.2	Ave.
1.702000	41.7	19.5	56.0	14.3	QP
2.818000	41.4	19.6	56.0	14.6	QP
1.702000	31.4	19.5	46.0	14.6	Ave.
1.306000	39.5	19.5	56.0	16.5	QP
2.818000	28.5	19.6	46.0	17.5	Ave.
1.306000	27.1	19.5	46.0	18.9	Ave.
0.502000	32.8	19.5	56.0	23.2	QP
0.502000	21.9	19.5	46.0	24.1	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

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

Applicable Standard

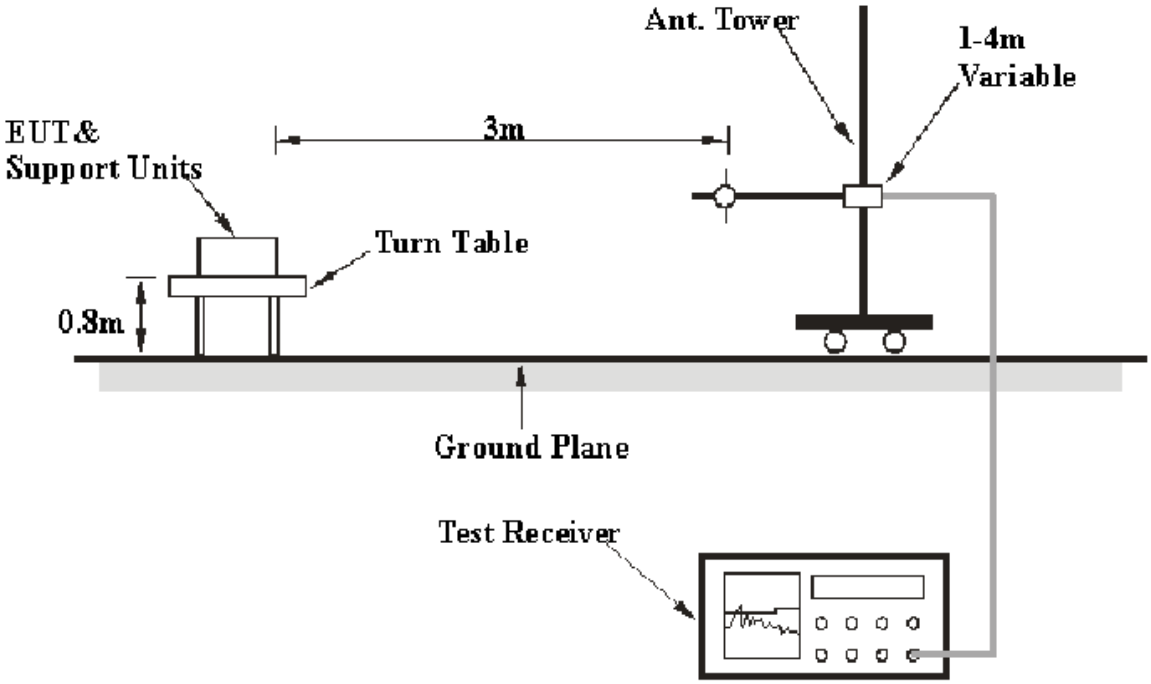
FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement at antenna port. And the uncertainty will not be taken into consideration for the test data recorded in the report

EUT Setup



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

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	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-17	2014-09-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	NCR	NCR
Sunol Sciences	Horn Antenna	DRH-118	A052304	2012-11-30	2013-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13

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

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, with the worst margin reading of:

6.85 dB at **2389.0 MHz** in the **Horizontal** polarization for 802.11b Mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2013-11-19.

EUT operation mode: Transmitting

30 MHz-25 GHz:

802.11b Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11b									
Low Channel (2412 MHz)									
218.5	44.87	QP	160	1.2	H	-15.4	29.47	46	16.53
2412.0	94.76	PK	78	1.4	H	6.13	100.89	/	/
2412.0	85.84	Ave.	78	1.4	H	6.13	91.97	/	/
2412.0	97.93	PK	313	1.3	V	6.13	104.06	/	/
2412.0	82.79	Ave.	313	1.3	V	6.13	88.92	/	/
2389.0	50.24	PK	22	1.3	H	6.13	56.37	74	17.63
2389.0	41.02	Ave.	22	1.3	H	6.13	47.15	54	6.85
2498.8	34.95	PK	121	1.4	V	7.21	42.16	74	31.84
2498.8	20.52	Ave.	121	1.4	V	7.21	27.73	54	26.27
4824.0	45.82	PK	154	1.2	H	12.40	58.22	74	15.78
4824.0	33.90	Ave.	154	1.2	H	12.40	46.30	54	7.70
7236.0	36.09	PK	164	1.3	V	16.62	52.71	74	21.29
7236.0	18.34	Ave.	164	1.3	V	16.62	34.96	54	19.04
9648.0	35.98	PK	30	1.4	V	19.29	55.27	74	18.73
9648.0	19.50	Ave.	30	1.4	V	19.29	38.79	54	15.21
Middle Channel (2437 MHz)									
218.5	46.76	QP	230	1.3	H	-15.4	31.36	46	14.64
2437.0	97.26	PK	107	1.2	H	7.21	104.47	/	/
2437.0	73.80	Ave.	107	1.2	H	7.21	81.01	/	/
2437.0	95.55	PK	7	1.4	V	7.21	102.76	/	/
2437.0	84.61	Ave.	7	1.4	V	7.21	91.82	/	/
2379.9	39.12	PK	85	1.5	V	6.13	45.25	74	28.75
2379.9	21.43	Ave.	85	1.5	V	6.13	27.56	54	26.44
2483.9	36.91	PK	296	1.4	V	7.21	44.12	74	29.88
2483.9	21.43	Ave.	296	1.4	V	7.21	28.64	54	25.36
4874.0	45.17	PK	243	1.4	V	12.46	57.63	74	16.37
4874.0	33.48	Ave.	243	1.4	V	12.46	45.94	54	8.06
7311.0	36.54	PK	32	1.4	V	16.49	53.03	74	20.97
7311.0	22.26	Ave.	32	1.4	V	16.49	38.75	54	15.25
9748.0	35.15	PK	44	1.3	H	19.40	54.55	74	19.45
9748.0	22.34	Ave.	44	1.3	H	19.40	41.74	54	12.26

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
218.5	45.93	QP	130	1.3	H	-15.4	30.53	46	15.47
2462.0	95.00	PK	286	1.5	H	7.21	102.21	/	/
2462.0	83.32	Ave.	286	1.5	H	7.21	90.53	/	/
2462.0	92.06	PK	324	1.4	V	7.21	99.27	/	/
2462.0	81.70	Ave.	324	1.4	V	7.21	88.91	/	/
2386.0	38.05	PK	163	1.5	H	6.13	44.18	74	29.82
2386.0	22.26	Ave.	163	1.5	H	6.13	28.39	54	25.61
2487.8	39.74	PK	210	1.2	V	7.21	46.95	74	27.05
2487.8	25.52	Ave.	210	1.2	V	7.21	32.73	54	21.27
4924.0	42.84	PK	165	1.4	H	12.50	55.34	74	18.66
4924.0	29.39	Ave.	165	1.4	H	12.50	41.89	54	12.11
7386.0	33.15	PK	53	1.2	H	15.91	49.06	74	24.94
7386.0	17.00	Ave.	53	1.2	H	15.91	32.91	54	21.09
9848.0	33.46	PK	123	1.4	H	19.39	52.85	74	21.15
9848.0	17.55	Ave.	123	1.4	H	19.39	36.94	54	17.06

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
218.5	46.47	QP	263	1.0	H	-15.4	31.07	46	14.93
2412.0	95.29	PK	74	1.3	H	6.13	101.42	/	/
2412.0	73.99	Ave.	74	1.3	H	6.13	80.12	/	/
2412.0	94.23	PK	17	1.2	V	6.13	100.36	/	/
2412.0	76.17	Ave.	17	1.2	V	6.13	82.30	/	/
2389.5	51.89	PK	238	1.5	H	6.13	58.02	74	15.98
2389.5	31.54	Ave.	238	1.5	H	6.13	37.67	54	16.33
2492.3	35.47	PK	75	1.5	H	7.21	42.68	74	31.32
2492.3	20.52	Ave.	75	1.5	H	7.21	27.73	54	26.27
4824.0	45.15	PK	143	1.4	H	12.40	57.55	74	16.45
4824.0	26.04	Ave.	143	1.4	H	12.40	38.44	54	15.56
7236.0	32.74	PK	124	1.3	V	16.49	49.23	74	24.77
7236.0	17.55	Ave.	124	1.3	V	16.49	34.04	54	19.96
9648.0	32.68	PK	48	1.2	V	19.29	51.97	74	22.03
9648.0	17.47	Ave.	48	1.2	V	19.29	36.76	54	17.24
Middle Channel (2437 MHz)									
218.5	45.87	QP	92	1.3	H	-15.4	30.47	46	15.53
2437.0	92.68	PK	96	1.3	H	7.21	99.89	/	/
2437.0	75.05	Ave.	96	1.3	H	7.21	82.26	/	/
2437.0	94.26	PK	124	1.4	V	7.21	101.47	/	/
2437.0	73.22	Ave.	124	1.4	V	7.21	80.43	/	/
2389.2	41.92	PK	13	1.3	V	6.13	48.05	74	25.95
2389.2	24.36	Ave.	13	1.3	V	6.13	30.49	54	23.51
2486.0	42.52	PK	2	1.3	H	7.21	49.73	74	24.27
2486.0	23.71	Ave.	2	1.3	H	7.21	30.92	54	23.08
4874.0	35.63	PK	42	1.3	V	12.46	48.09	74	25.91
4874.0	18.69	Ave.	42	1.3	V	12.46	31.15	54	22.85
7311.0	33.12	PK	351	1.2	V	16.49	49.61	74	24.39
7311.0	18.91	Ave.	351	1.2	V	16.49	35.40	54	18.60
9748.0	32.15	PK	188	1.4	H	19.40	51.55	74	22.45
9748.0	18.55	Ave.	188	1.4	H	19.40	37.95	54	16.05

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
218.5	45.65	QP	201	1.4	H	-15.4	30.25	46	15.75
2462.0	92.33	PK	75	1.3	H	7.21	99.54	/	/
2462.0	74.89	Ave.	75	1.3	H	7.21	82.10	/	/
2462.0	94.43	PK	176	1.3	V	7.21	101.64	/	/
2462.0	72.90	Ave.	176	1.3	V	7.21	80.11	/	/
2381.7	35.47	PK	186	1.5	H	6.13	41.60	74	32.40
2381.7	18.96	Ave.	186	1.5	H	6.13	25.09	54	28.91
2483.6	53.08	PK	208	1.3	V	7.21	60.29	74	13.71
2483.6	28.28	Ave.	208	1.3	V	7.21	35.49	54	18.51
4924.0	35.73	PK	258	1.3	H	12.50	48.23	74	25.77
4924.0	18.33	Ave.	258	1.3	H	12.50	30.83	54	23.17
7386.0	33.21	PK	94	1.3	H	15.91	49.12	74	24.88
7386.0	18.18	Ave.	94	1.3	H	15.91	34.09	54	19.91
9848.0	32.16	PK	308	1.3	V	19.39	51.55	74	22.45
9848.0	18.37	Ave.	308	1.3	V	19.39	37.76	54	16.24

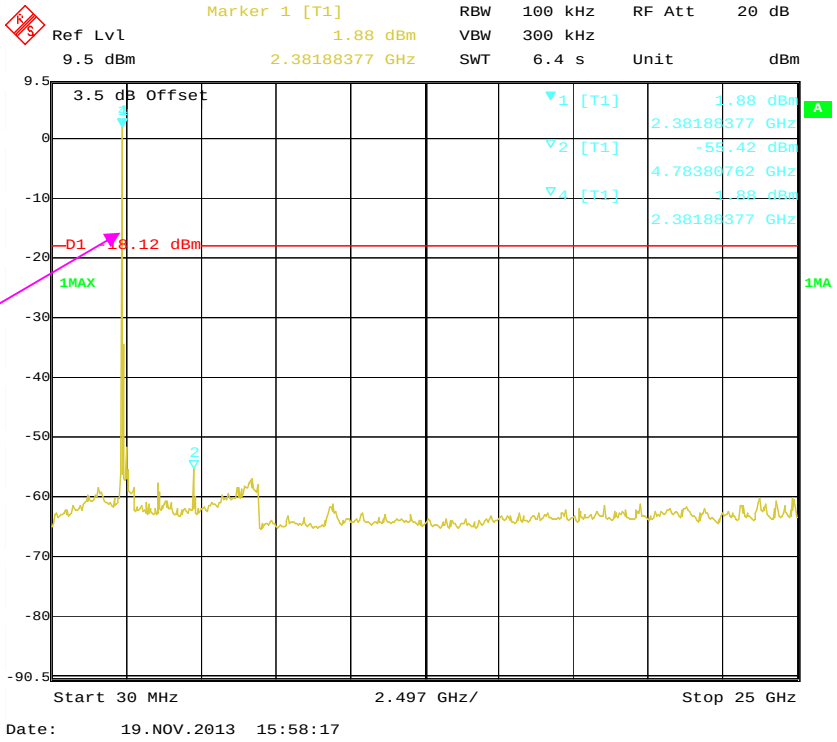
802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
218.5	47.06	QP	160	1.5	H	-15.4	31.66	46	14.34
2412.0	92.64	PK	64	1.4	H	6.13	98.77	/	/
2412.0	52.82	Ave.	64	1.4	H	6.13	58.95	/	/
2412.0	93.44	PK	322	1.3	V	6.13	99.57	/	/
2412.0	52.31	Ave.	322	1.3	V	6.13	58.44	/	/
2386.7	50.61	PK	345	1.3	H	6.13	56.74	74	17.26
2386.7	28.67	Ave.	345	1.3	H	6.13	34.80	54	19.20
2485.8	36.91	PK	61	1.5	H	7.21	44.12	74	29.88
2485.8	20.17	Ave.	61	1.5	H	7.21	27.38	54	26.62
4824.0	40.94	PK	133	1.3	H	12.40	53.34	74	20.66
4824.0	20.12	Ave.	133	1.3	H	12.40	32.52	54	21.48
7236.0	34.71	PK	135	1.4	V	16.62	51.33	74	22.67
7236.0	18.79	Ave.	135	1.4	V	16.62	35.41	54	18.59
9648.0	34.66	PK	69	1.4	H	19.29	53.95	74	20.05
9648.0	18.81	Ave.	69	1.4	H	19.29	38.10	54	15.90
Middle Channel (2437 MHz)									
218.5	47.15	QP	230	1.5	H	-15.4	31.75	46	14.25
2437.0	93.81	PK	97	1.2	H	7.21	101.02	/	/
2437.0	75.45	Ave.	97	1.2	H	7.21	82.66	/	/
2437.0	94.62	PK	36	1.3	V	7.21	101.83	/	/
2437.0	73.41	Ave.	36	1.3	V	7.21	80.62	/	/
2373.5	36.19	PK	222	1.2	V	6.13	42.32	74	31.68
2373.5	21.03	Ave.	222	1.2	V	6.13	27.16	54	26.84
2486.2	35.51	PK	187	1.2	H	7.21	42.72	74	31.28
2486.2	20.70	Ave.	187	1.2	H	7.21	27.91	54	26.09
4874.0	34.11	PK	205	1.3	V	12.46	46.57	74	27.43
4874.0	19.87	Ave.	205	1.3	V	12.46	32.33	54	21.67
7311.0	33.67	PK	305	1.4	V	16.49	50.16	74	23.84
7311.0	19.13	Ave.	305	1.4	V	16.49	35.62	54	18.38
9748.0	33.21	PK	33	1.4	V	19.29	52.50	74	21.50
9748.0	19.02	Ave.	33	1.4	V	19.29	38.31	54	15.69

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
218.5	46.92	QP	55	1.6	H	-15.4	31.52	46	14.48
2462.0	90.24	PK	326	1.4	H	7.21	97.45	/	/
2462.0	69.13	Ave.	326	1.4	H	7.21	76.34	/	/
2462.0	89.14	PK	111	1.4	V	7.21	96.35	/	/
2462.0	68.64	Ave.	111	1.4	V	7.21	75.85	/	/
2371.2	37.04	PK	329	1.4	H	6.13	43.17	74	30.83
2371.2	19.46	Ave.	329	1.4	H	6.13	25.59	54	28.41
2483.9	47.78	PK	214	1.3	V	7.21	54.99	74	19.01
2483.9	24.96	Ave.	214	1.3	V	7.21	32.17	54	21.83
4924.0	35.72	PK	229	1.2	H	12.50	48.22	74	25.78
4924.0	19.41	Ave.	229	1.2	H	12.50	31.91	54	22.09
7386.0	34.91	PK	270	1.4	H	15.91	50.82	74	23.18
7386.0	20.42	Ave.	270	1.4	H	15.91	36.33	54	17.67
9848.0	34.22	PK	248	1.4	V	19.39	53.61	74	20.39
9848.0	19.24	Ave.	248	1.4	V	19.39	38.63	54	15.37

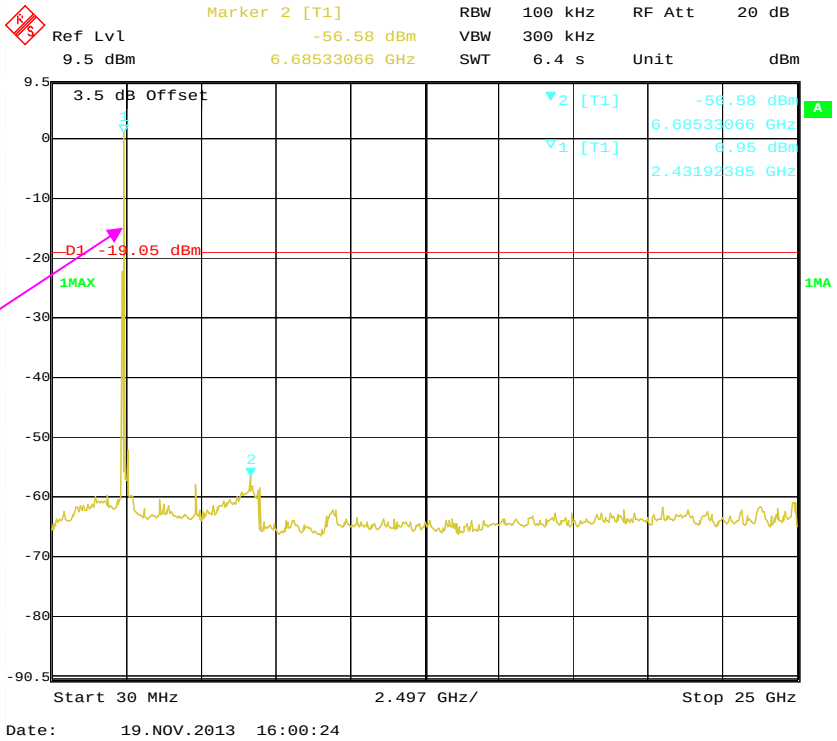
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



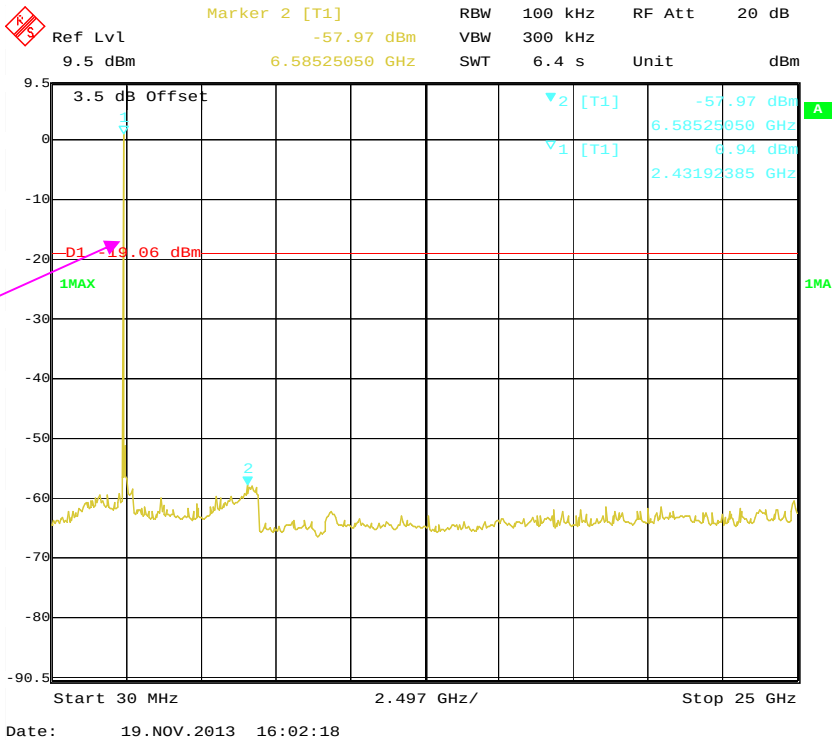
Fundamental

802.11b Middle Channel



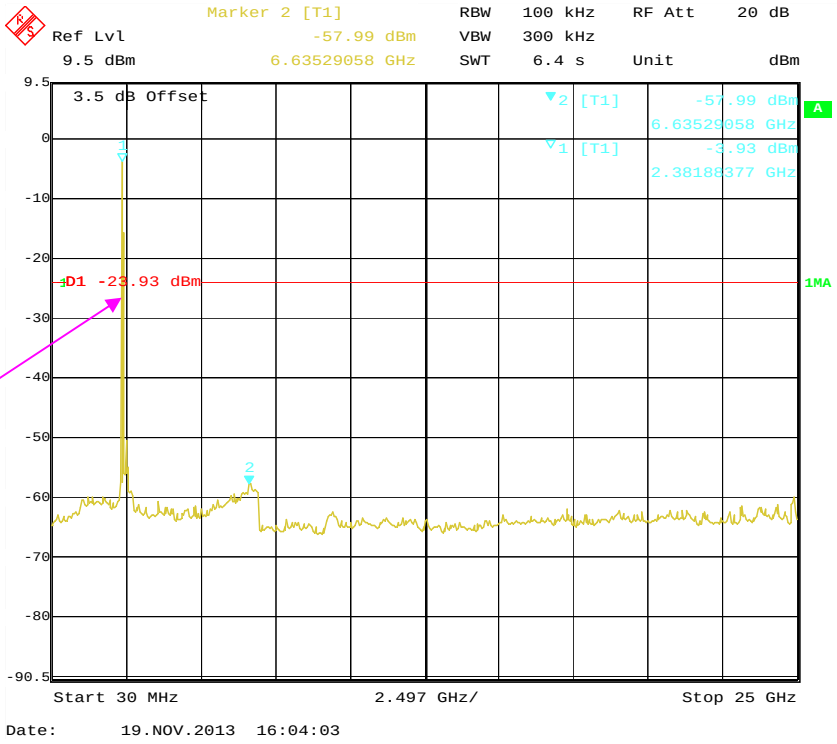
Fundamental

802.11b High Channel



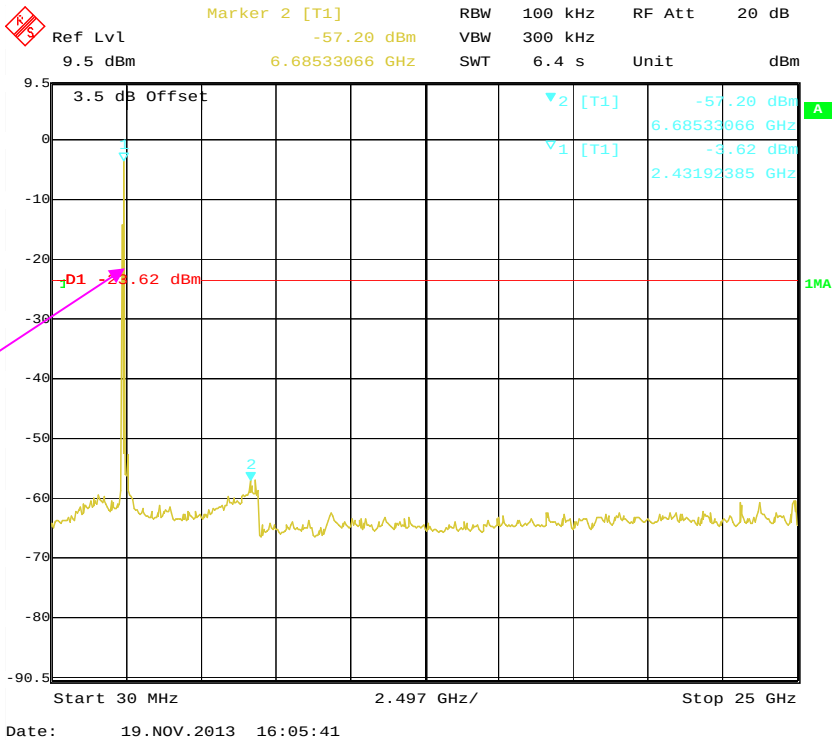
Fundamental

802.11g Low Channel



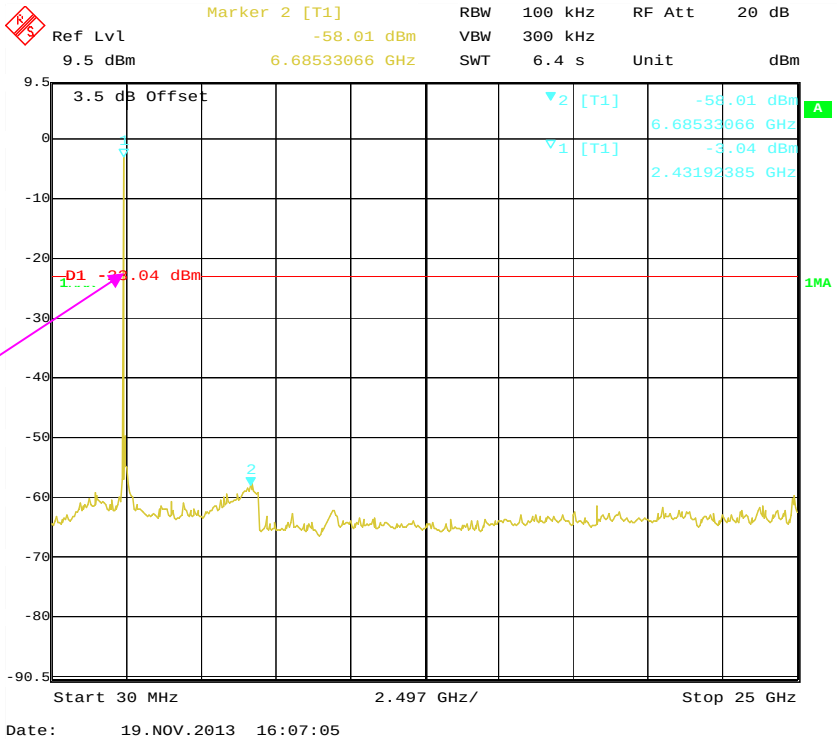
Fundamental

802.11g Middle Channel



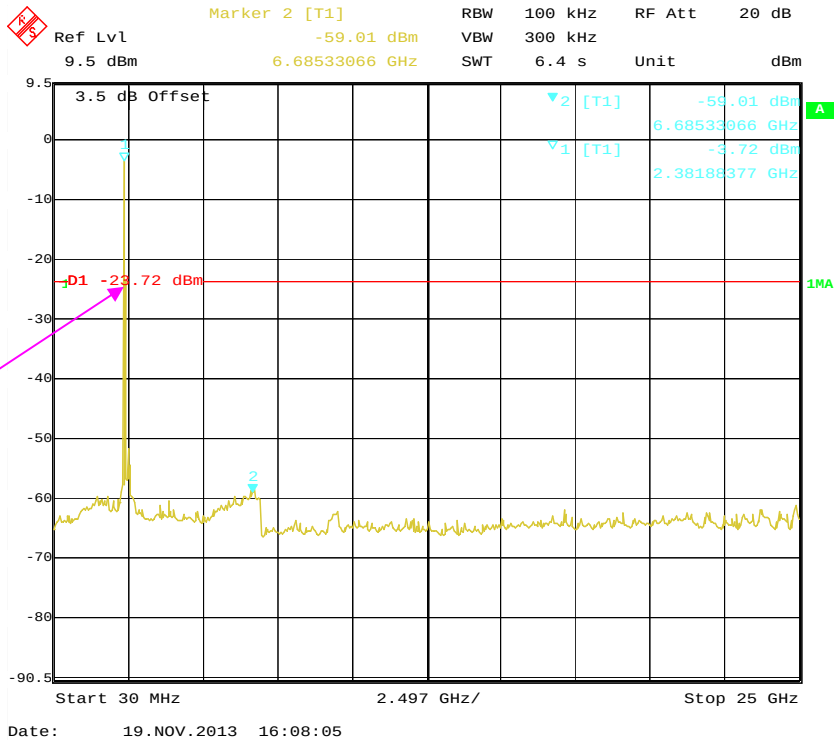
Fundamental

802.11g High Channel



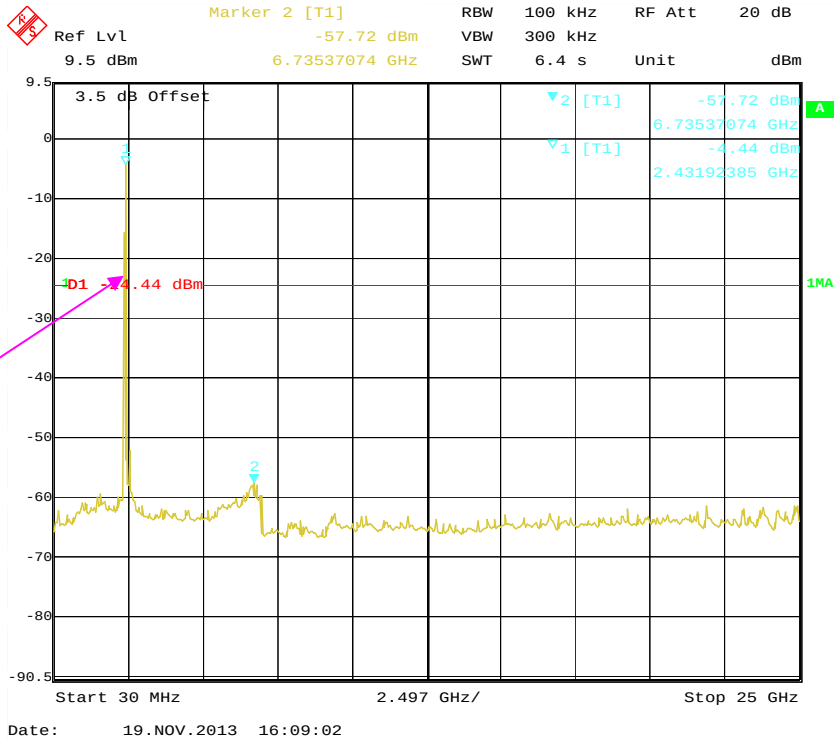
Fundamental

802.11n-HT20 Low Channel



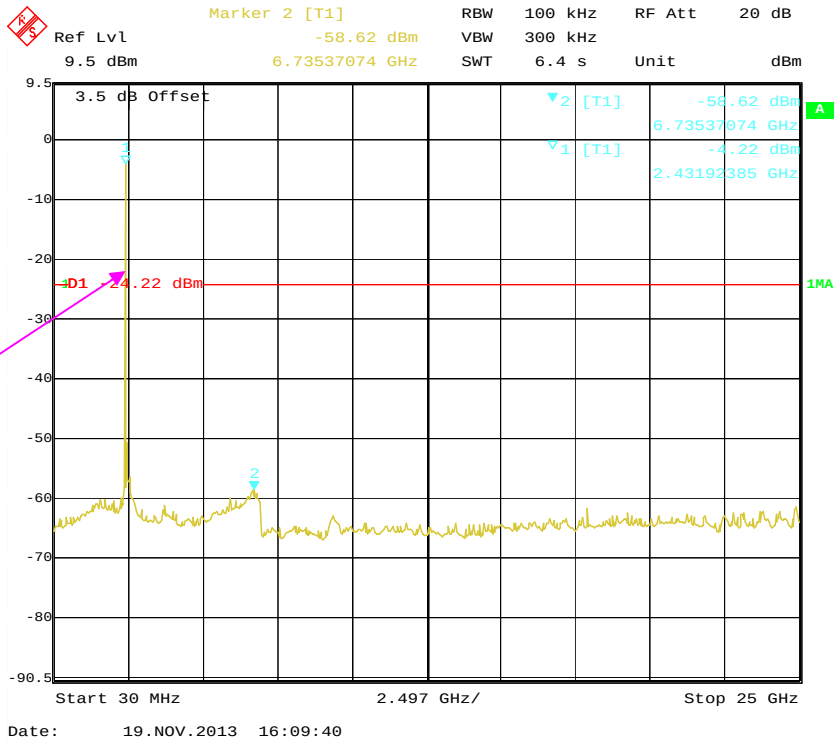
Fundamental

802.11n-HT20 Middle Channel



Fundamental

802.11n-HT20 High Channel



Fundamental

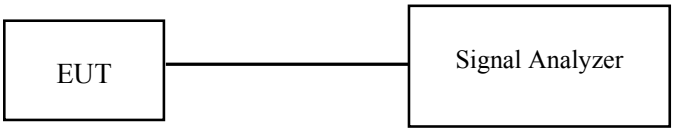
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0kPa

The testing was performed by Haiguo Li on 2013-11-19.

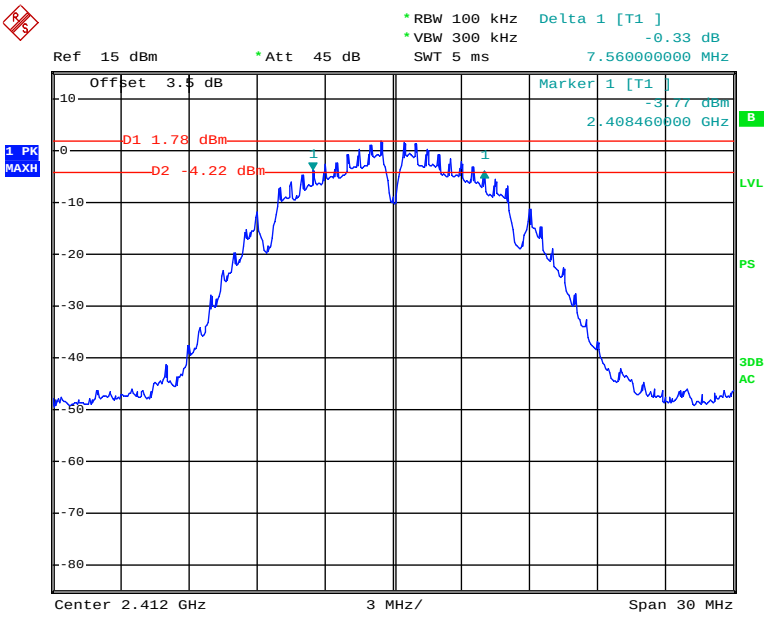
Test Result: Pass.

Please refer to the following tables and plots.

EUT operation mode: Transmitting

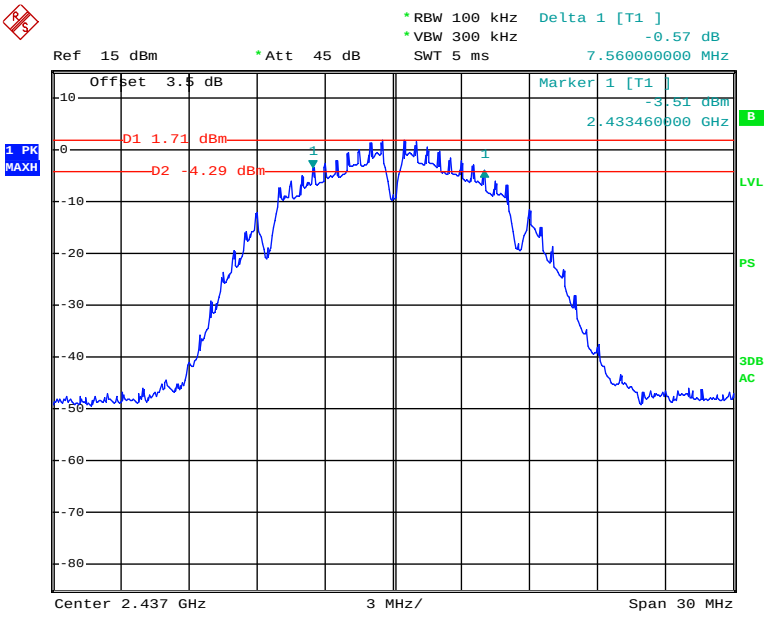
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)
802.11b mode			
Low	2412	7.56	≥500
Middle	2437	7.56	≥500
High	2462	7.56	≥500
802.11g mode			
Low	2412	15.18	≥500
Middle	2437	15.18	≥500
High	2462	15.24	≥500
802.11n-HT20 mode			
Low	2412	17.58	≥500
Middle	2437	17.58	≥500
High	2462	17.64	≥500

802.11b Low Channel



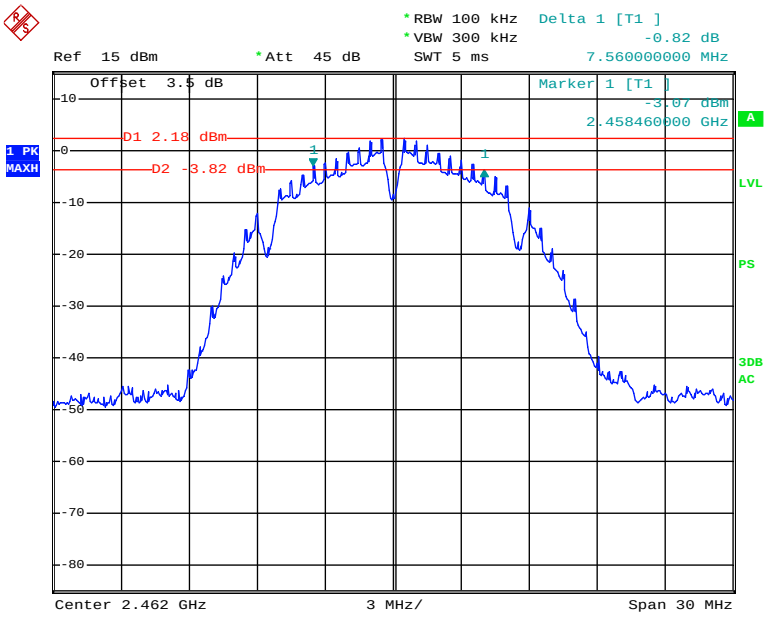
Date: 19.NOV.2013 10:53:31

802.11b Middle Channel



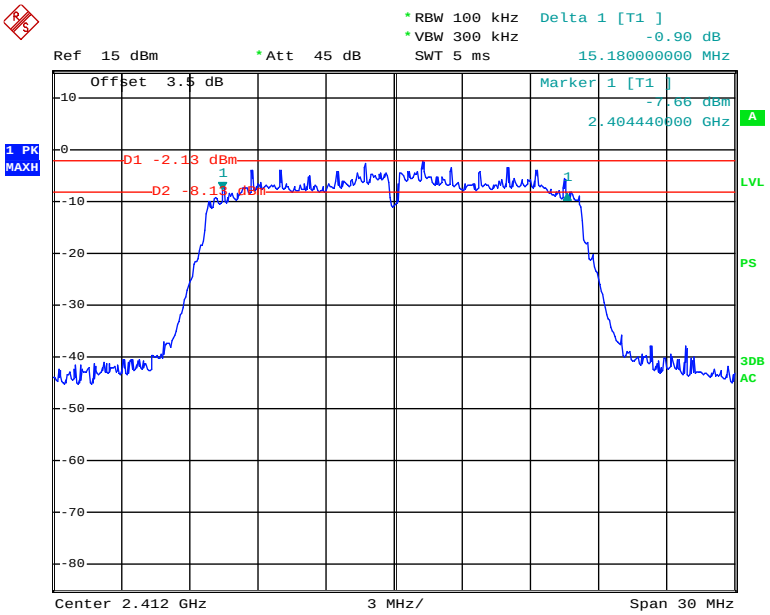
Date: 19.NOV.2013 10:37:08

802.11b High Channel



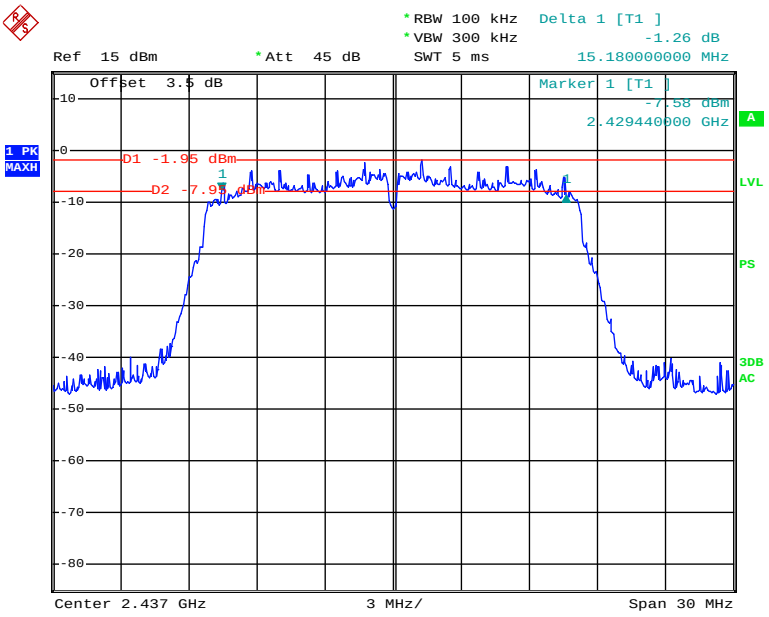
Date: 19.NOV.2013 12:42:51

802.11g Low Channel



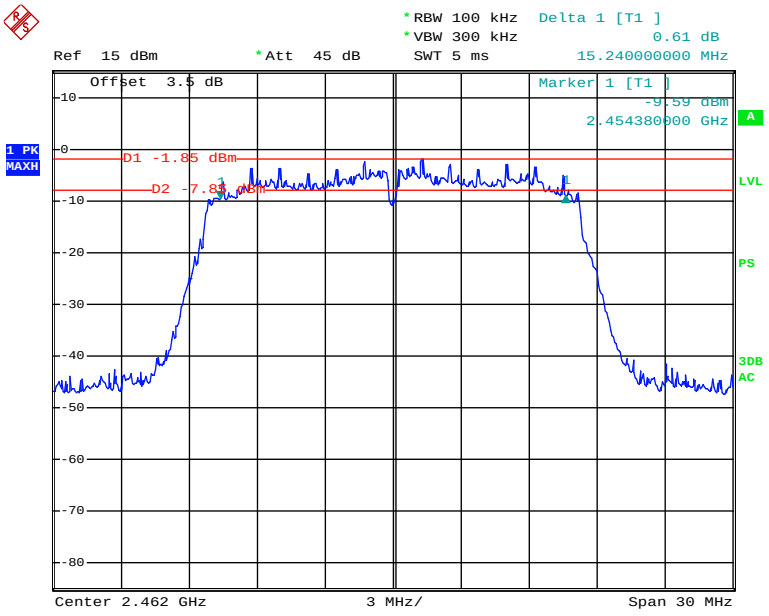
Date: 19.NOV.2013 12:54:58

802.11g Middle Channel



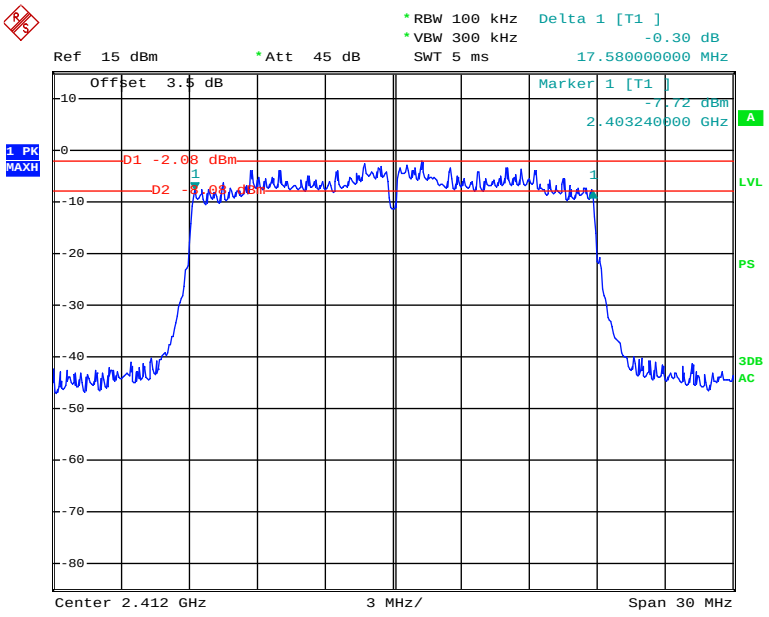
Date: 19.NOV.2013 13:01:31

802.11g High Channel



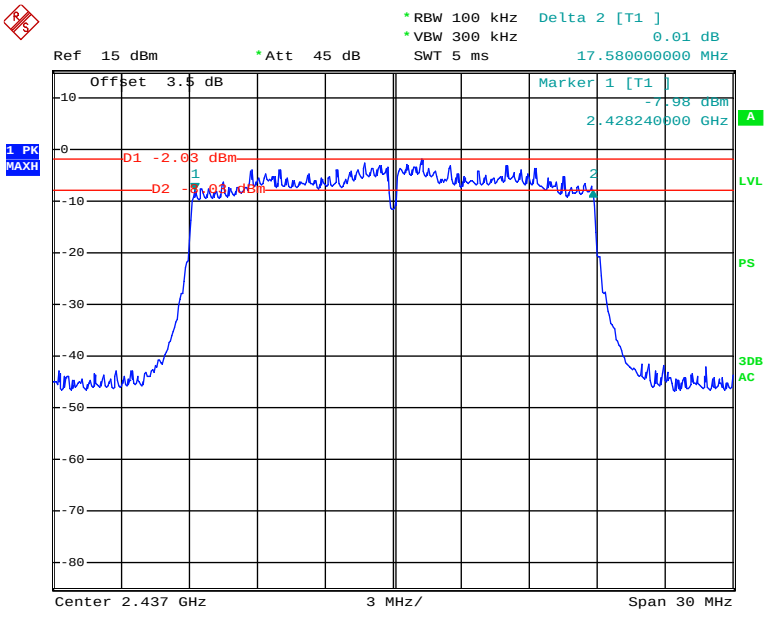
Date: 19.NOV.2013 13:08:26

802.11n-HT20 Low Channel



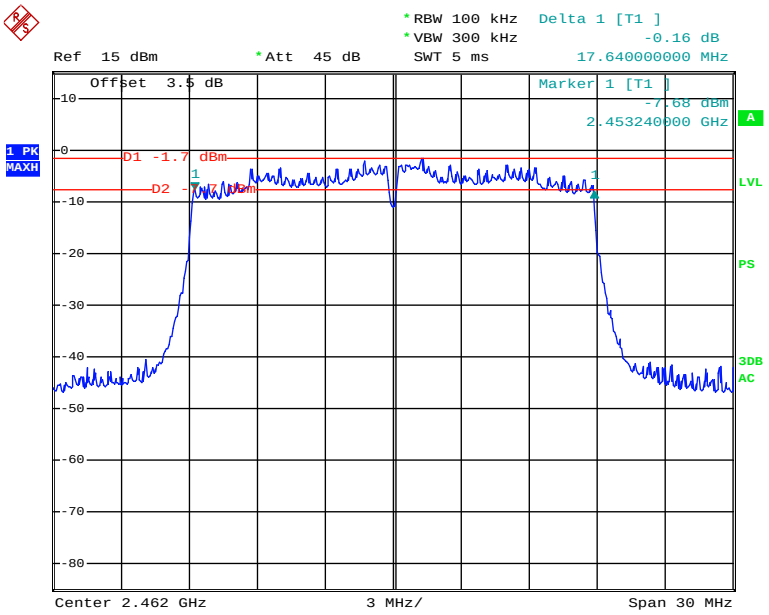
Date: 19.NOV.2013 13:34:04

802.11n-HT20 Middle Channel



Date: 19.NOV.2013 13:48:49

802.11n-HT20 High Channel



Date: 19.NOV.2013 13:59:15

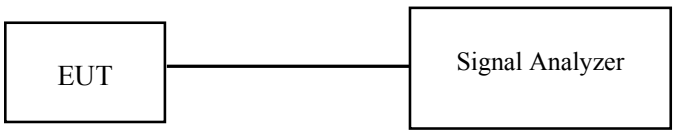
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

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. 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 an EMI Test Receiver.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2013-11-12	2014-11-12
HP	Power Meter	EPM-441A	GB37481494	2013-11-24	2014-11-24

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

Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101.0 kPa

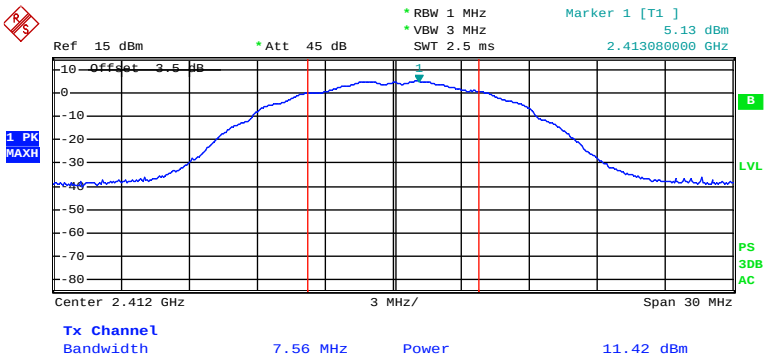
The testing was performed by Haiguo Li on 2013-11-19 and 2013-11-21.

EUT operation mode: Transmitting

Channel	Frequency (MHz)	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)
802.11b				
Low	2412	11.42	9.20	30
Middle	2437	11.60	9.16	30
High	2462	11.78	9.52	30
802.11g				
Low	2412	16.08	9.46	30
Middle	2437	16.30	9.51	30
High	2462	16.40	9.61	30
802.11n-HT20				
Low	2412	15.90	9.39	30
Middle	2437	16.07	9.50	30
High	2462	15.78	9.52	30

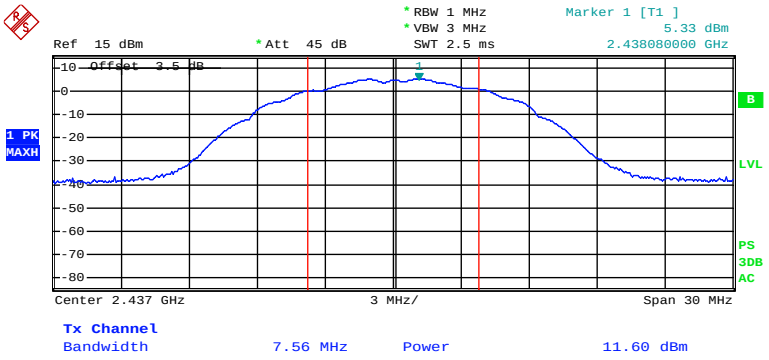
Note: The data above was tested in conducted mode

802.11b RF Peak Output Power, Low Channel



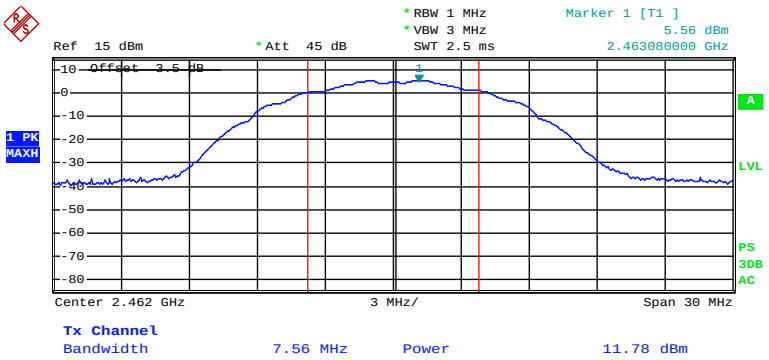
Date: 19.NOV.2013 10:58:38

802.11b RF Peak Output Power, Middle Channel



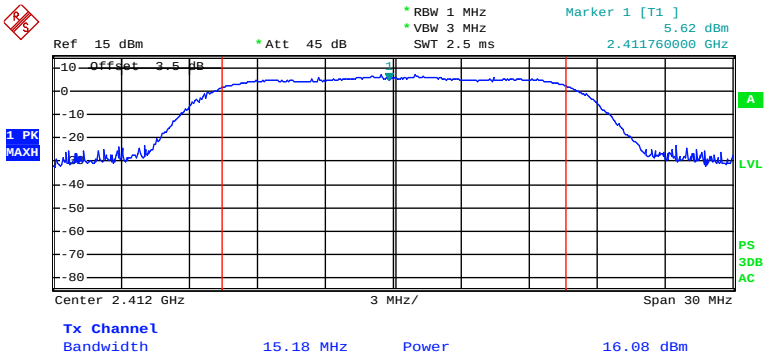
Date: 19.NOV.2013 10:38:12

802.11b RF Peak Output Power, High Channel



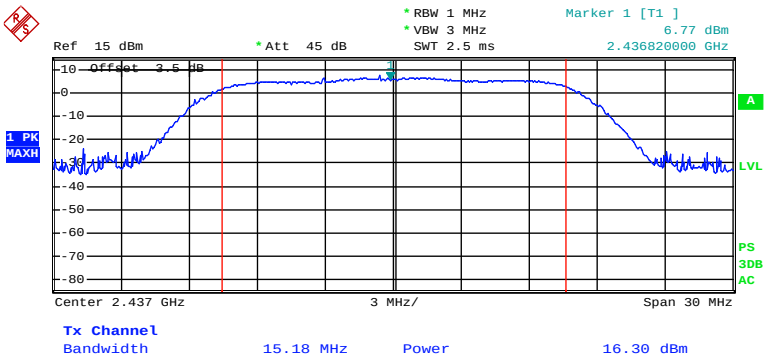
Date: 19.NOV.2013 12:45:04

802.11g RF Peak Output Power, Low Channel



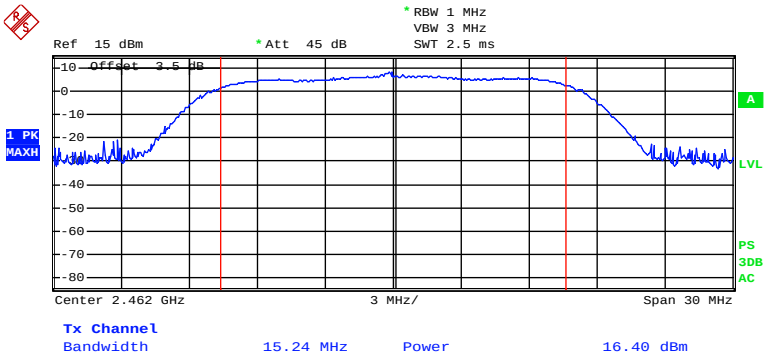
Date: 19.NOV.2013 12:55:38

802.11g RF Peak Output Power, Middle Channel



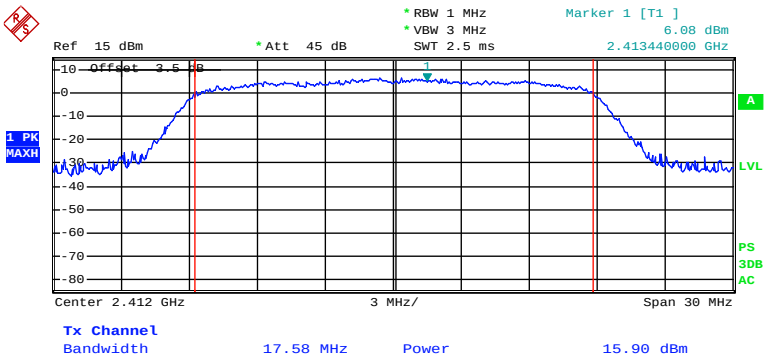
Date: 19.NOV.2013 13:03:28

802.11g RF Peak Output Power, High Channel



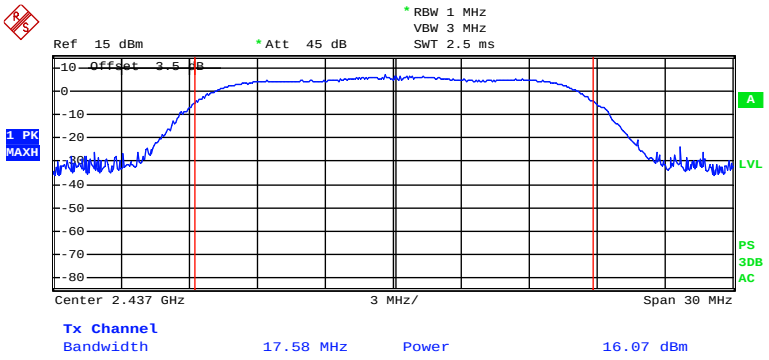
Date: 21.NOV.2013 08:20:35

802.11n-HT20 RF Peak Output Power, Low Channel



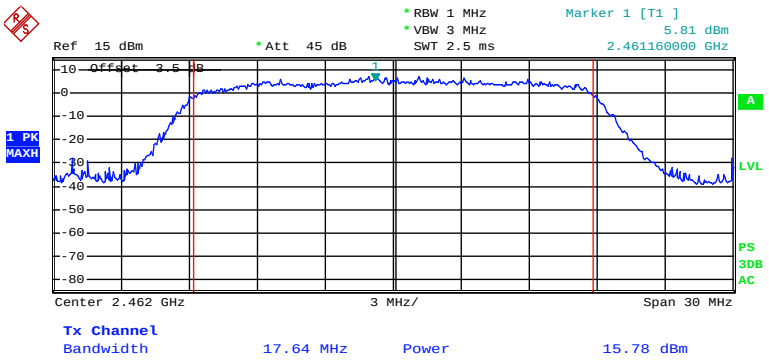
Date: 19.NOV.2013 13:40:22

802.11n-HT20 RF Peak Output Power, Middle Channel



Date: 21.NOV.2013 08:15:42

802.11n-HT20 RF Peak Output Power, High Channel



Date: 19.NOV.2013 14:02:11

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
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

Temperature:	24℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

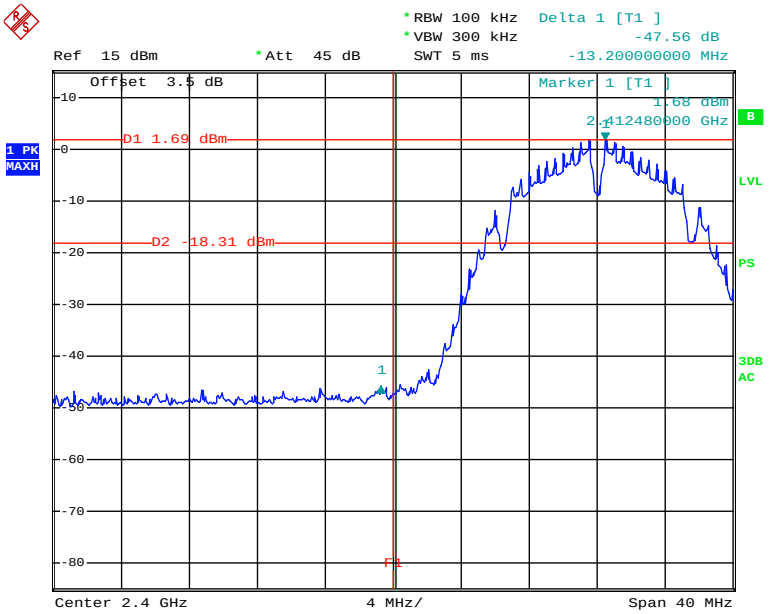
The testing was performed by Haiguo Li on 2013-11-19.

Test Result: *Compliance*

Channel	Delta Peak to Band Emission (dBc)	≥Limit (dBc)	Result
802.11b mode			
Left-band	47.56	20	Pass
Right-band	48.14	20	Pass
802.11g mode			
Left-band	39.30	20	Pass
Right-band	43.82	20	Pass
802.11n-HT20 mode			
Left-band	39.86	20	Pass
Right-band	44.20	20	Pass

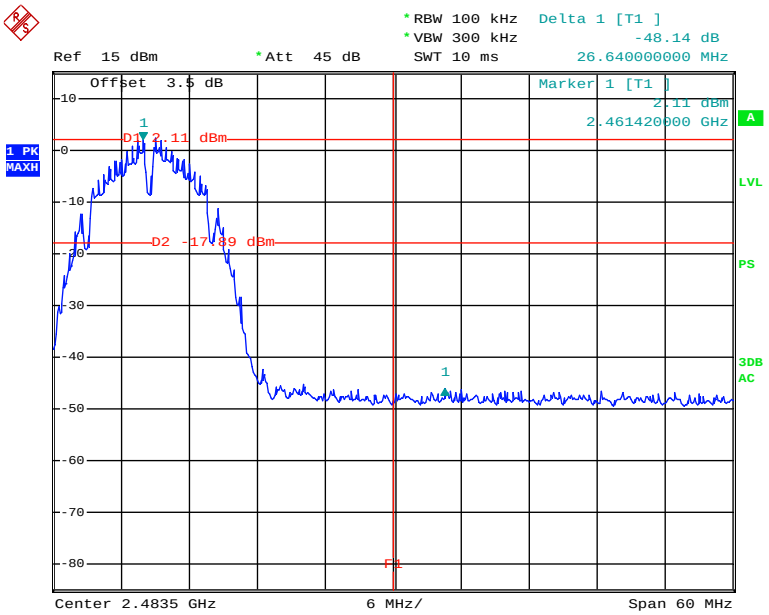
Please refer to following plots.

802.11b: Band Edge, Left Side



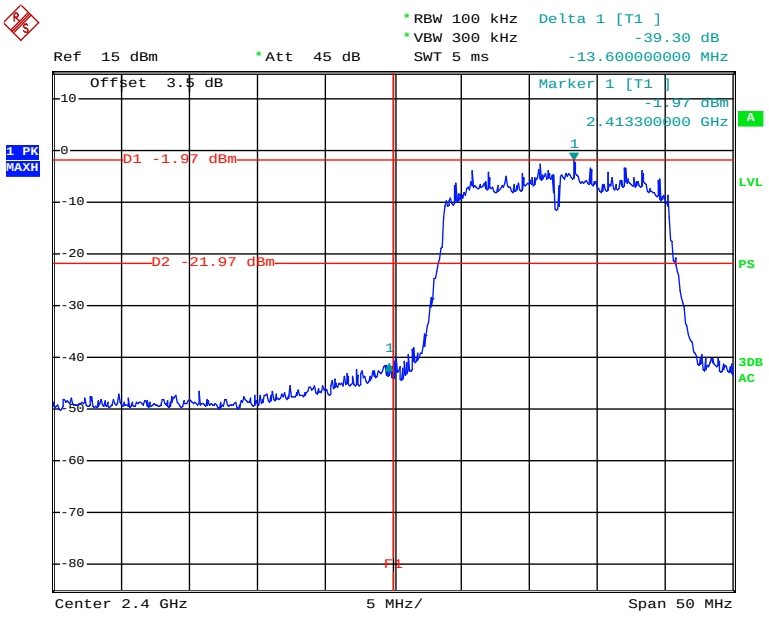
Date: 19.NOV.2013 11:01:39

802.11b: Band Edge, Right Side



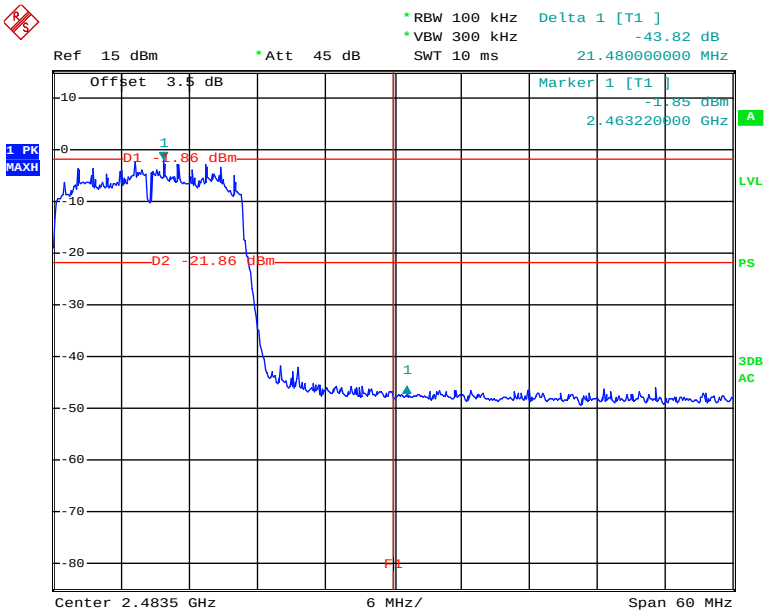
Date: 19.NOV.2013 12:47:35

802.11g: Band Edge, Left Side



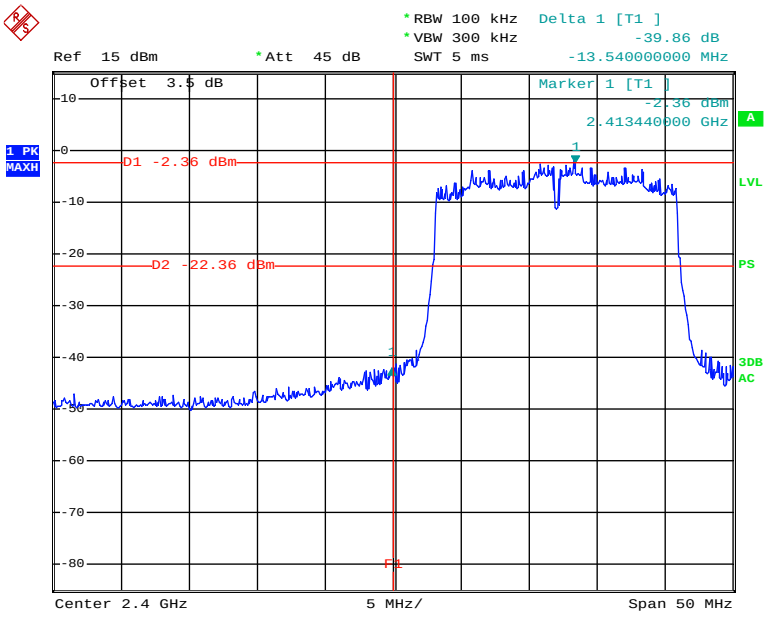
Date: 19.NOV.2013 12:59:53

802.11g: Band Edge, Right Side



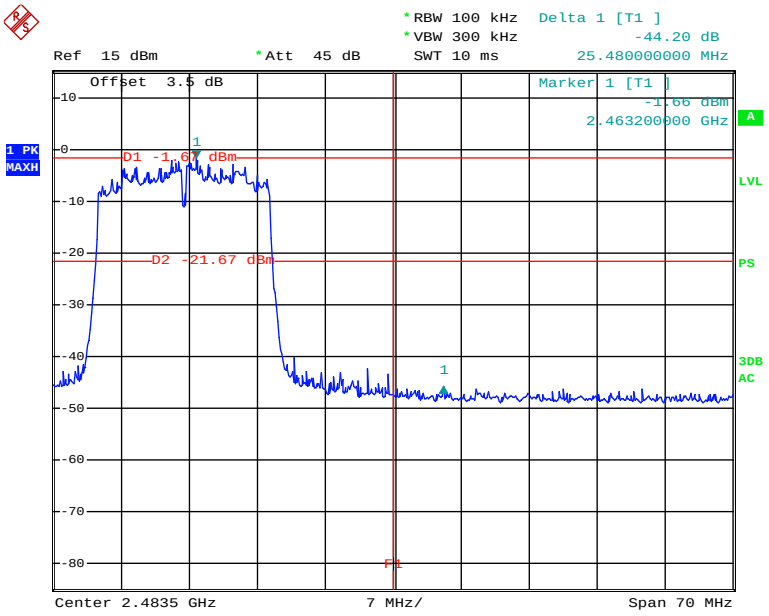
Date: 19.NOV.2013 13:06:05

802.11n-HT20: Band Edge, Left Side



Date: 19.NOV.2013 13:42:39

802.11n-HT20: Band Edge, Right Side



Date: 19.NOV.2013 14:04:56

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. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
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
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

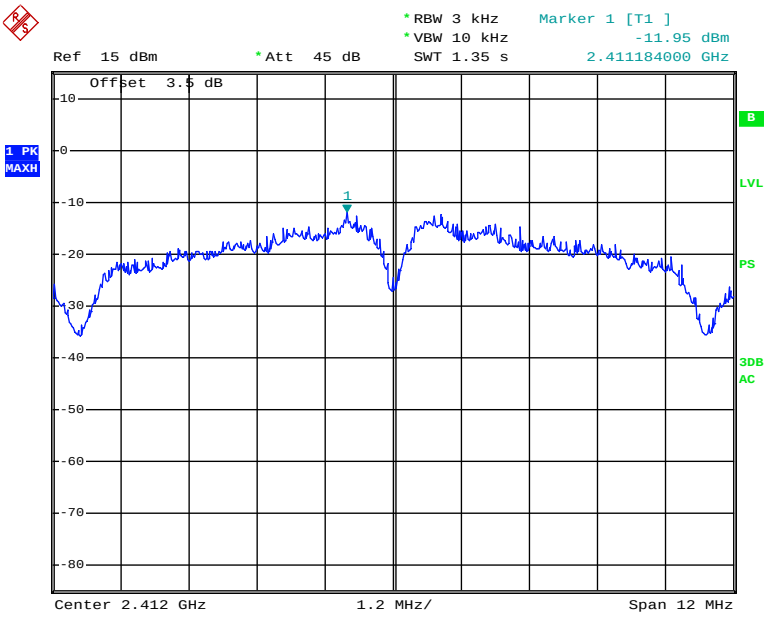
The testing was performed by Haiguo Li on 2013-11-19.

EUT operation mode: Transmitting

Test Result: Pass

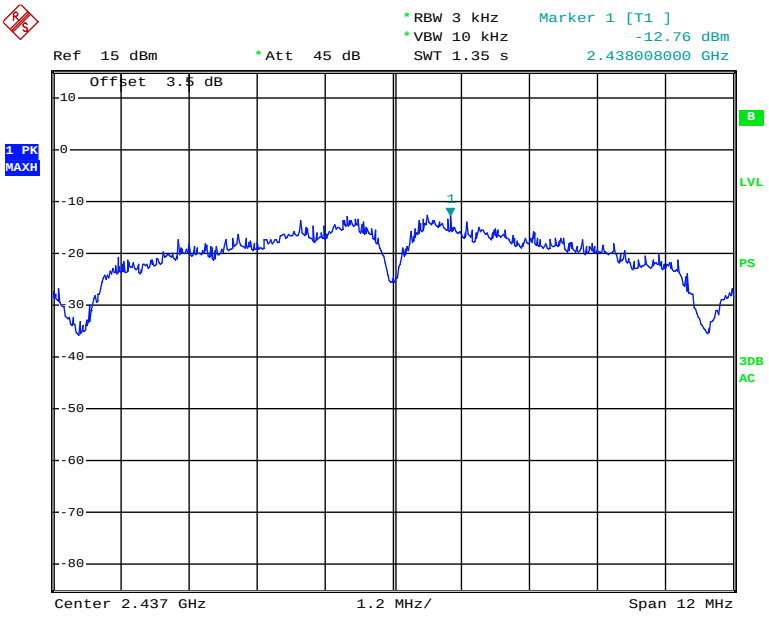
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-11.95	≤8
Middle	2437	-12.76	≤8
High	2462	-11.90	≤8
802.11g mode			
Low	2412	-16.75	≤8
Middle	2437	-16.47	≤8
High	2462	-15.89	≤8
802.11n-HT20 mode			
Low	2412	-17.28	≤8
Middle	2437	-17.40	≤8
High	2462	-16.78	≤8

Power Spectral Density, 802.11b Low Channel



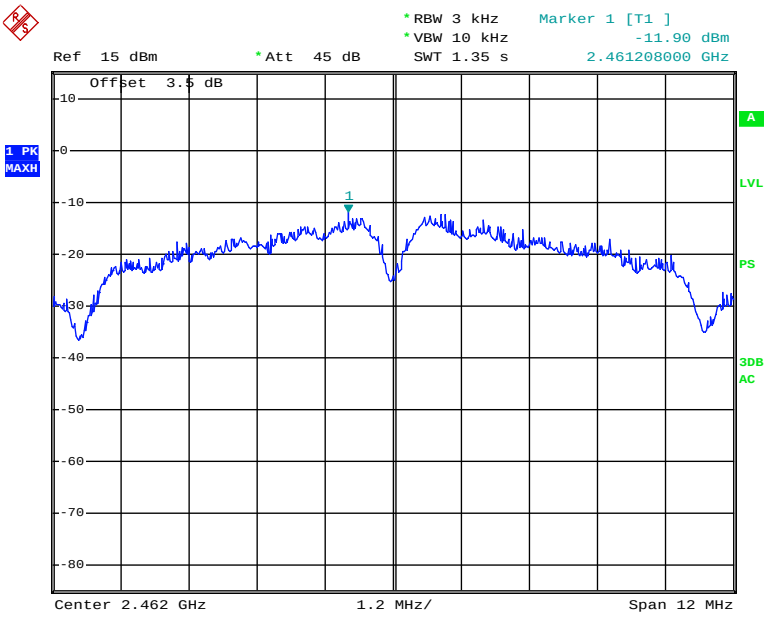
Date: 19.NOV.2013 10:51:41

Power Spectral Density, 802.11b Middle Channel



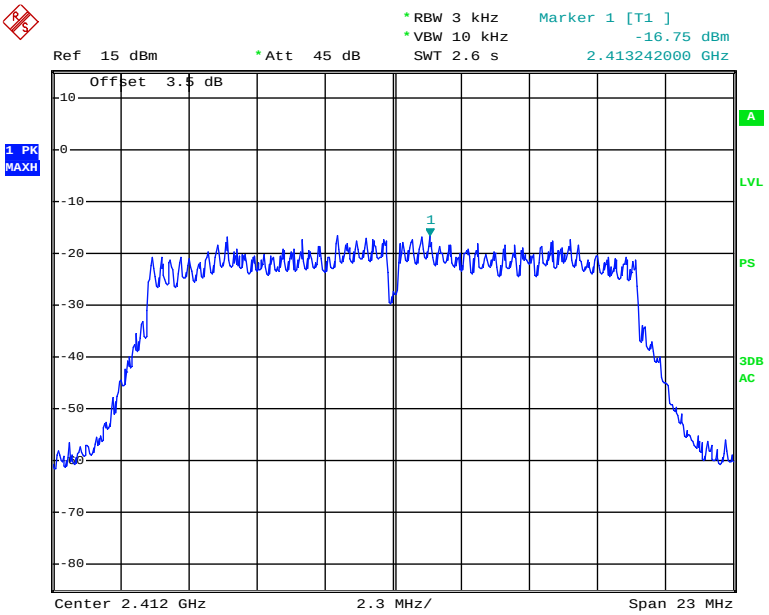
Date: 19.NOV.2013 10:48:16

Power Spectral Density, 802.11b High Channel



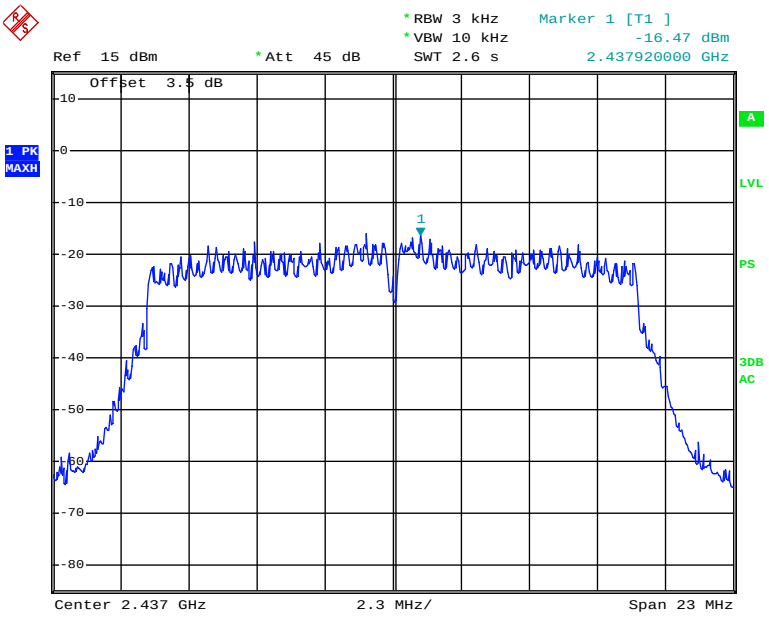
Date: 19.NOV.2013 12:45:52

Power Spectral Density, 802.11g Low Channel



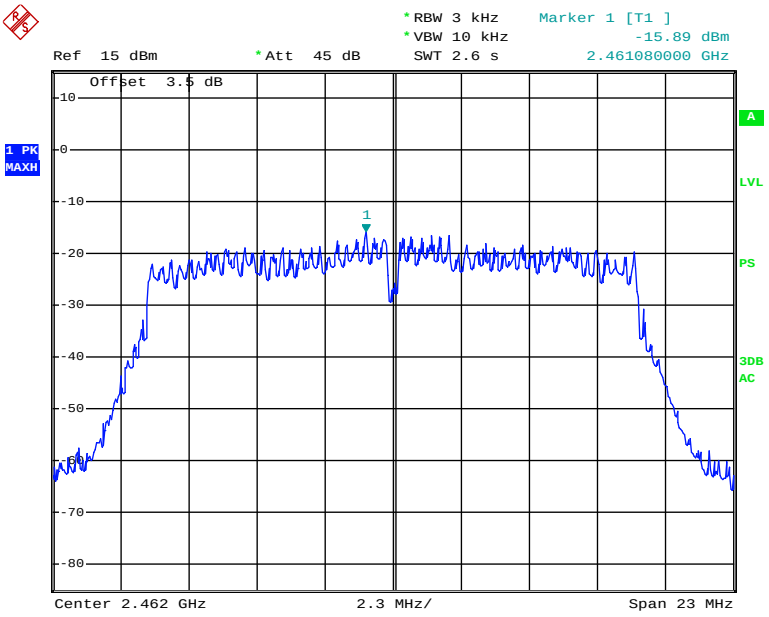
Date: 19.NOV.2013 12:58:21

Power Spectral Density, 802.11g Middle Channel



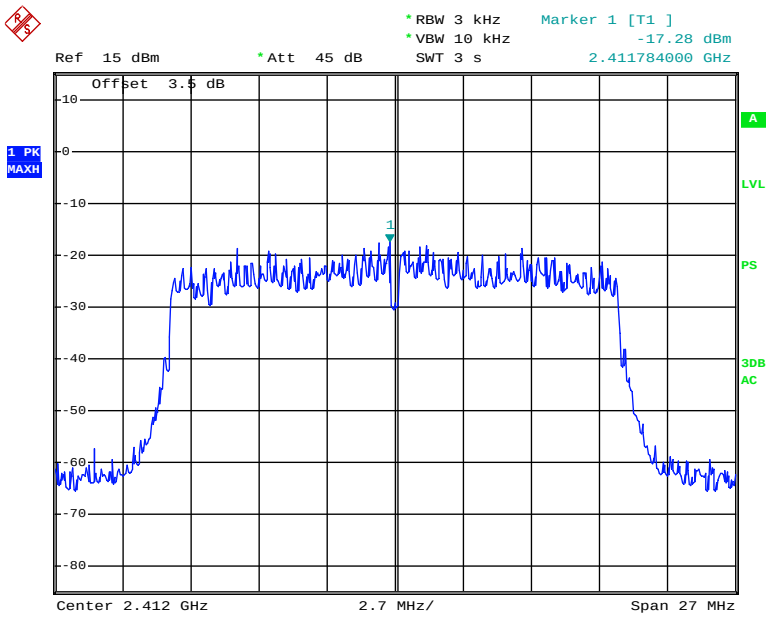
Date: 19.NOV.2013 13:04:07

Power Spectral Density, 802.11g High Channel



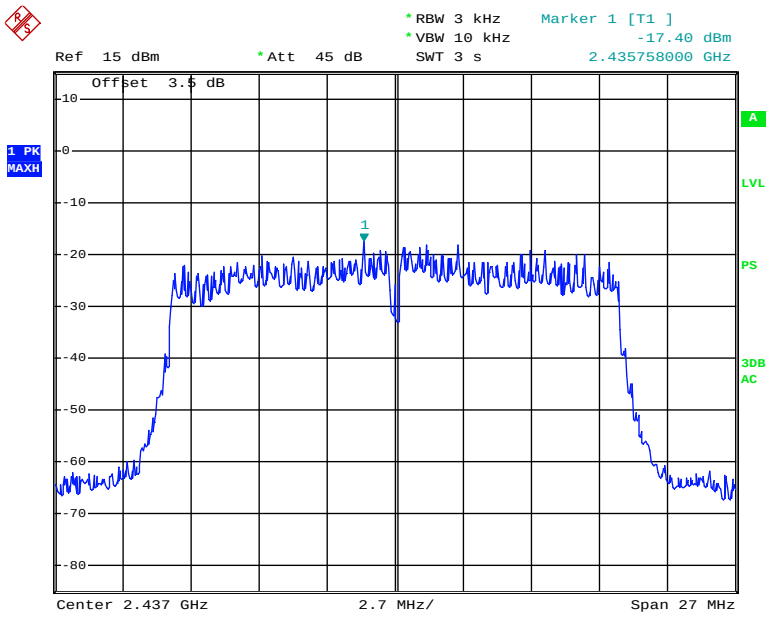
Date: 19.NOV.2013 13:04:49

Power Spectral Density, 802.11n-HT20 Low Channel



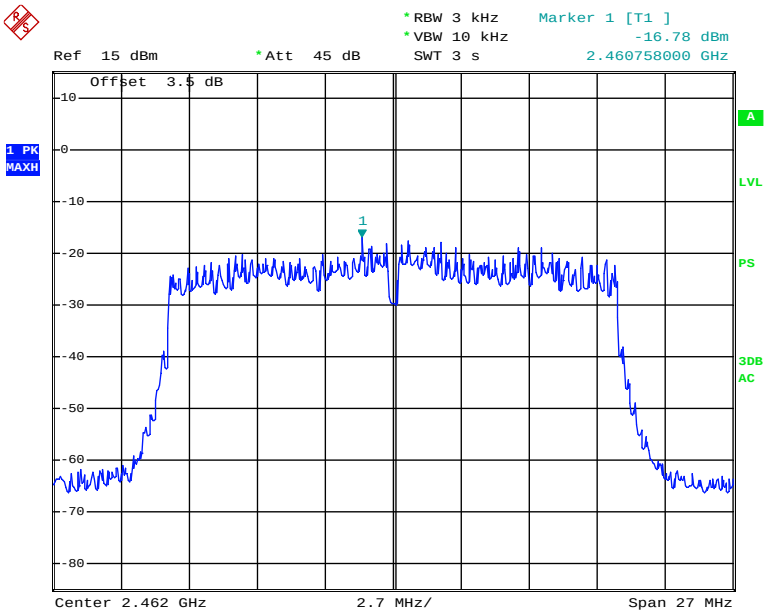
Date: 19.NOV.2013 13:45:27

Power Spectral Density, 802.11n-HT20 Middle Channel



Date: 19.NOV.2013 13:46:11

Power Spectral Density, 802.11n-HT20 High Channel



Date: 19.NOV.2013 14:06:18

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