FCC PART 15.247

TEST REPORT

For

SWAGTEK

10205 NW 19th Street STE101, Miami, Florida 33172 United States

FCC ID: O55X4422A

Report Type:	**Product Type:**
Original Report	Smart Phone

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Report Number:	RSZ150906006-00C
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SWAGTEK's* product, model number: *X4 (FCC ID: O55X4422A)* or the "EUT" in this report was a *Smart Phone,* which was measured approximately: 126 mm (L) × 63 mm (W) × 10 mm (H), rated with input voltage: DC 3.7 V Li-ion battery or DC 5 V from adapter.

Adapter Information:
Input: AC100~240V; 50/60Hz, 0.15A
Output: DC 5V, 750mA

Note: This series products model: X4plus, X40E, Ruby, Gem, V4 and X4 are identical schematics, the difference among them is just the model number due to marketing purpose, and model X4 was selected for fully testing, the detailed information can be referred to the attached declaration letter that stated and guaranteed by the applicant.

**All measurement and test data in this report was gathered from production sample serial number: 1506317 (Assigned by Shenzhen BACL).The EUT supplied by the applicant was received on 2015-09-06.*

Objective

This report is prepared on behalf of *SWAGTEK* 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: O55X4422A.

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 October 31, 2013. 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, 13 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442	/	/

EUT was tested with Channel 1, 6 and 13.

For 802.11n-HT40 mode, 9 channels are provided to testing:

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

EUT was tested with Channel 1, 4 and 9.

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

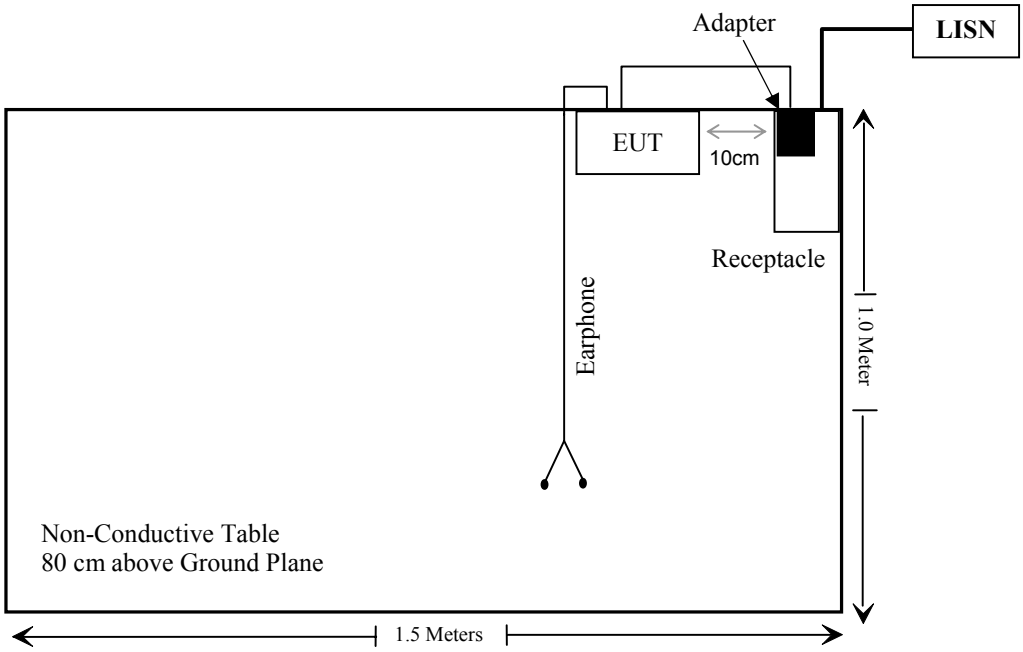
No software
The test was performed under:
802.11b: Data rate: 1 Mbps, Power level: 11
802.11g: Data rate: 6 Mbps, Power level: 11
802.11n-HT20: Data rate: MCS0, Power level: 11
802.11n-HT20: Data rate: MCS0, Power level: 11

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emission



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
§15.205, §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), §1.1307 (b) (1) & §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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(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 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

For worst case:

Mode	Frequency (MHz)	Power (dBm)	Power (mW)	Distance (mm)	Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
BT4.0	2402	0.06	1.01	5	0.31	3.0	Yes
WIFI	2437	9.15	8.22	5	2. 57	3.0	Yes

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 an internal antenna arrangement, which was permanently attached and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

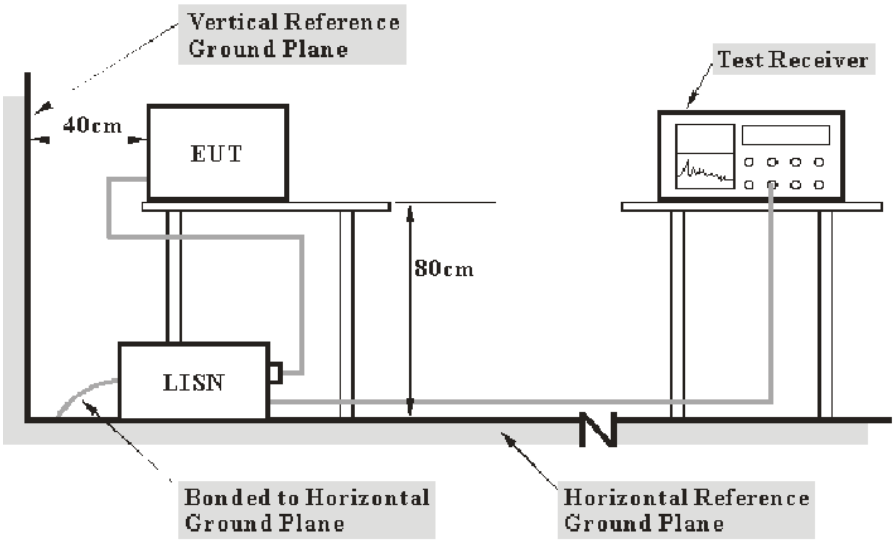
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN and receiver, LISN voltage division factor, LISN 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	Expanded 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 spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

All final 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	2015-06-03	2016-06-03
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2014-12-01	2015-12-01
Rohde & Schwarz	LISN	ESH2-Z5	892107/021	2015-08-22	2016-08-22
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2014-10-15	2015-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	NCR	NCR

*** 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 Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB 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, the EUT complied with the FCC Part 15.207, the worst margin reading as below:

9.7 dB at **0.474770 MHz** in the **Line** conducted mode for **WIFI Mode**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies 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

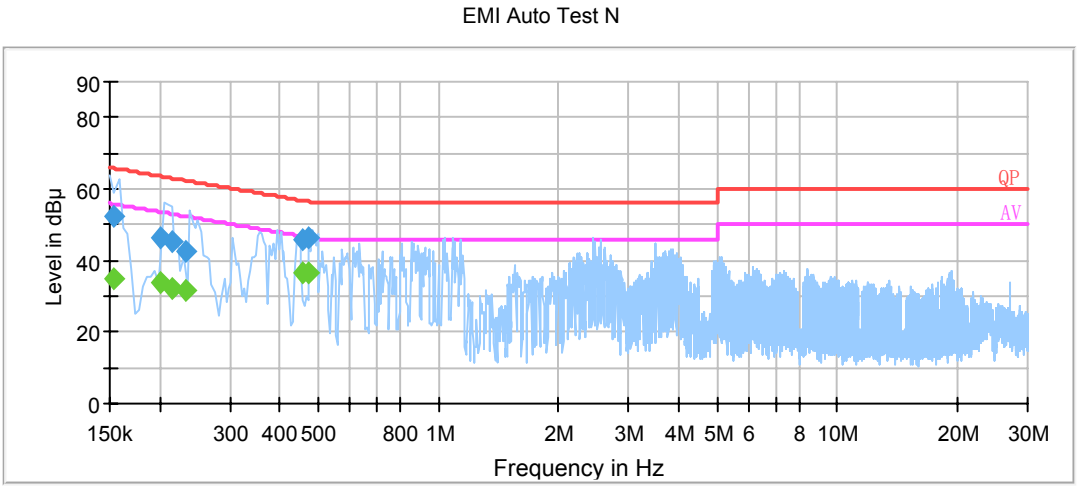
Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2015-09-16.

EUT operation mode: Charging & Transmitting

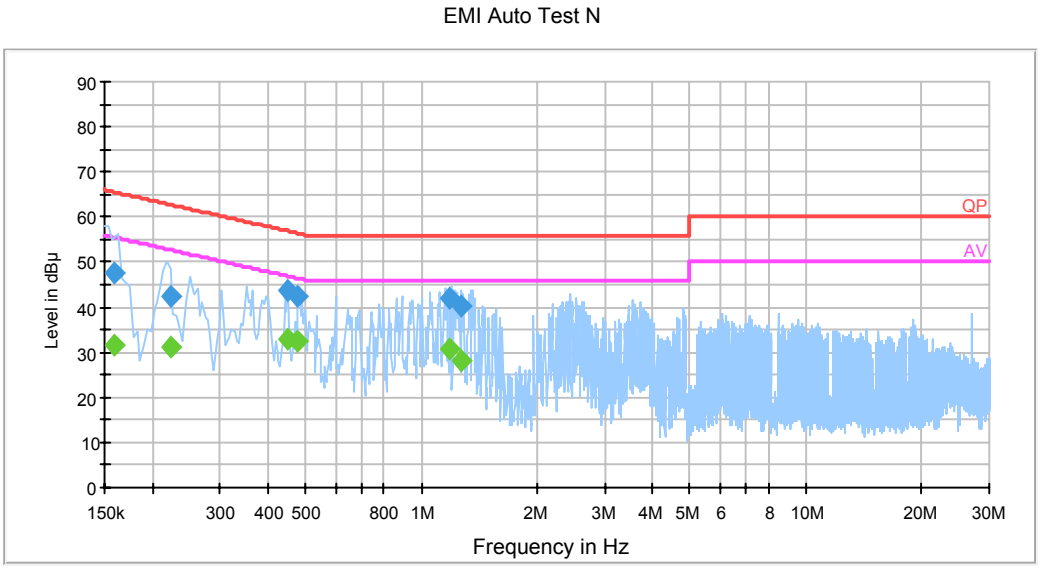
WIFI Mode:

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.154000	52.3	20.0	65.8	13.5	QP
0.154000	34.9	20.0	55.8	20.8	Ave.
0.201500	46.6	20.0	63.5	17.0	QP
0.201500	33.7	20.0	53.5	19.9	Ave.
0.214501	45.5	20.0	63.0	17.5	QP
0.214501	32.3	20.0	53.0	20.7	Ave.
0.233500	42.8	20.0	62.3	19.5	QP
0.233500	31.4	20.0	52.3	20.9	Ave.
0.455250	45.7	19.9	56.8	11.1	QP
0.455250	36.3	19.9	46.8	10.5	Ave.
0.474770	46.6	19.9	56.4	9.8	QP
0.474770	36.7	19.9	46.4	9.7	Ave.

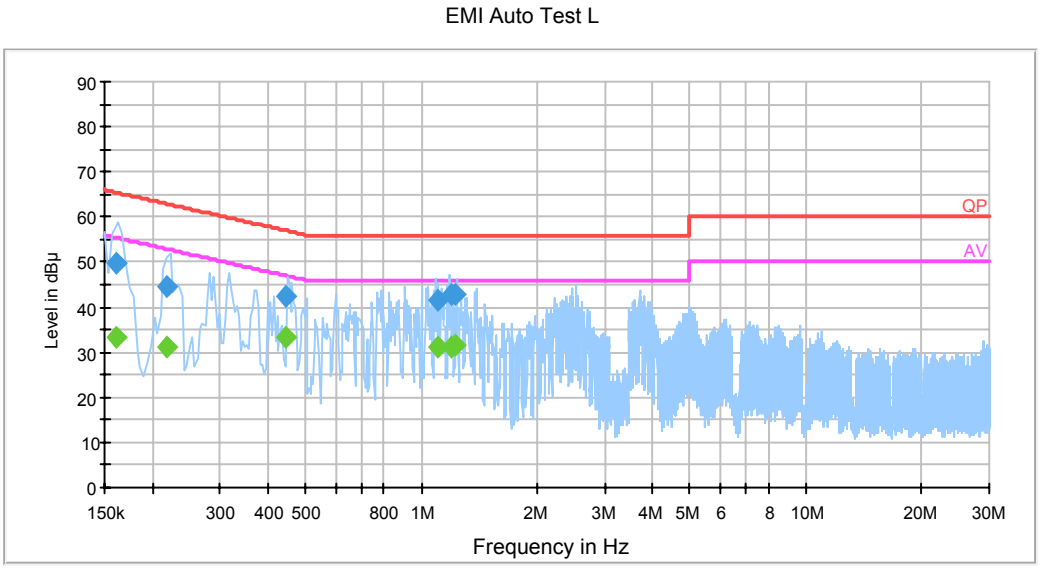
AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.158500	47.7	20.0	65.5	17.8	QP
0.158500	31.8	20.0	55.5	23.8	Ave.
0.222500	42.3	20.0	62.7	20.4	QP
0.222500	31.1	20.0	52.7	21.6	Ave.
0.451250	43.8	19.9	56.9	13.0	QP
0.451250	32.9	19.9	46.9	14.0	Ave.
0.478770	42.2	19.9	56.4	14.1	QP
0.478770	32.4	19.9	46.4	13.9	Ave.
1.184030	42.0	20.0	56.0	14.0	QP
1.184030	30.7	20.0	46.0	15.3	Ave.
1.270890	40.2	20.0	56.0	15.8	QP
1.270890	28.0	20.0	46.0	18.0	Ave.

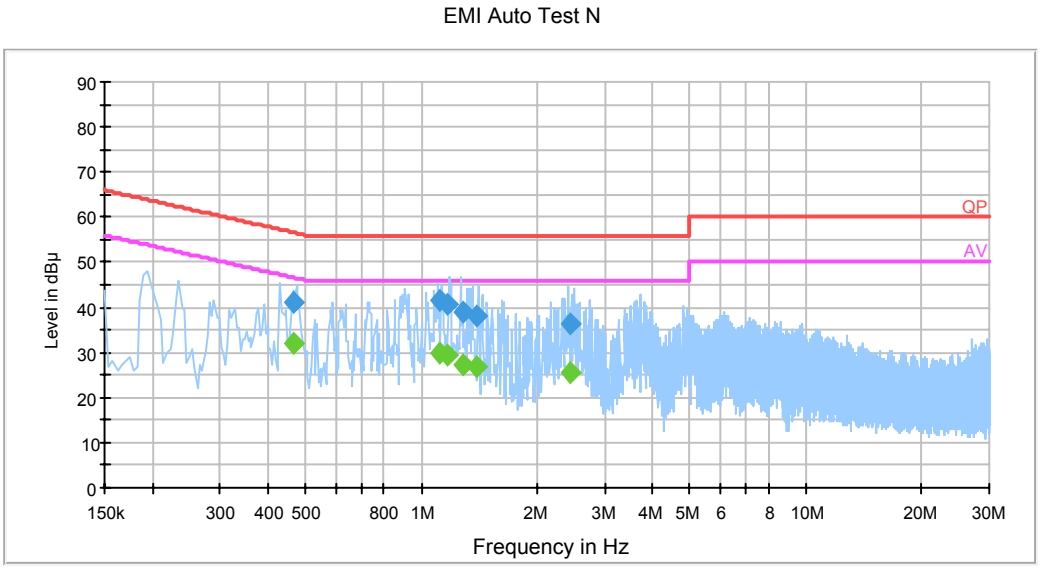
BLE Mode:

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.161500	49.8	20.0	65.4	15.6	QP
0.161500	33.5	20.0	55.4	21.9	Ave.
0.217500	44.6	20.0	62.9	18.3	QP
0.217500	31.3	20.0	52.9	21.6	Ave.
0.443250	42.6	19.9	57.0	14.4	QP
0.443250	33.3	19.9	47.0	13.7	Ave.
1.101650	41.7	20.0	56.0	14.3	QP
1.101650	31.3	20.0	46.0	14.7	Ave.
1.196210	42.8	20.0	56.0	13.2	QP
1.196210	31.3	20.0	46.0	14.7	Ave.
1.219490	42.9	20.0	56.0	13.1	QP
1.219490	31.5	20.0	46.0	14.5	Ave.

AC 120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.466890	41.3	19.9	56.6	15.3	QP
0.466890	32.2	19.9	46.6	14.4	Ave.
1.117410	41.5	20.0	56.0	14.5	QP
1.117410	29.9	20.0	46.0	16.1	Ave.
1.168210	40.6	20.0	56.0	15.4	QP
1.168210	29.4	20.0	46.0	16.6	Ave.
1.284990	38.9	20.0	56.0	17.1	QP
1.284990	27.1	20.0	46.0	18.9	Ave.
1.400850	38.2	20.0	56.0	17.8	QP
1.400850	26.6	20.0	46.0	19.4	Ave.
2.442090	36.5	20.0	56.0	19.5	QP
2.442090	25.7	20.0	46.0	20.3	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
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;

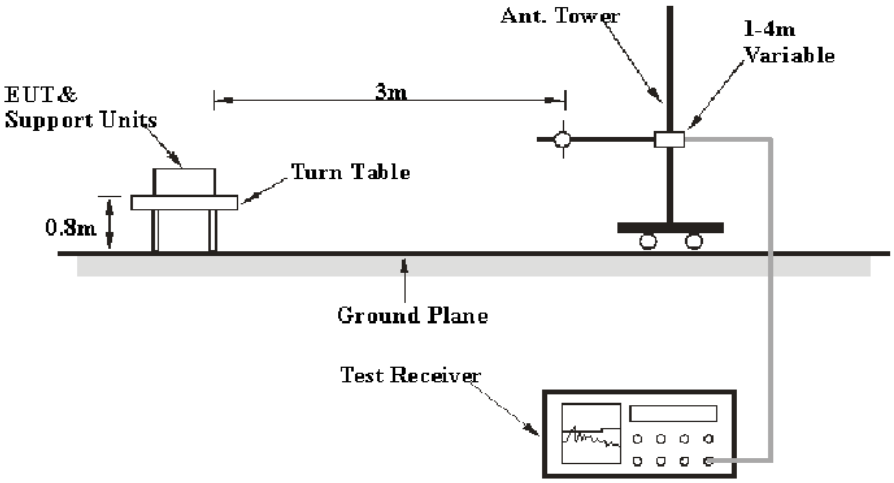
Measurement Uncertainty

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.

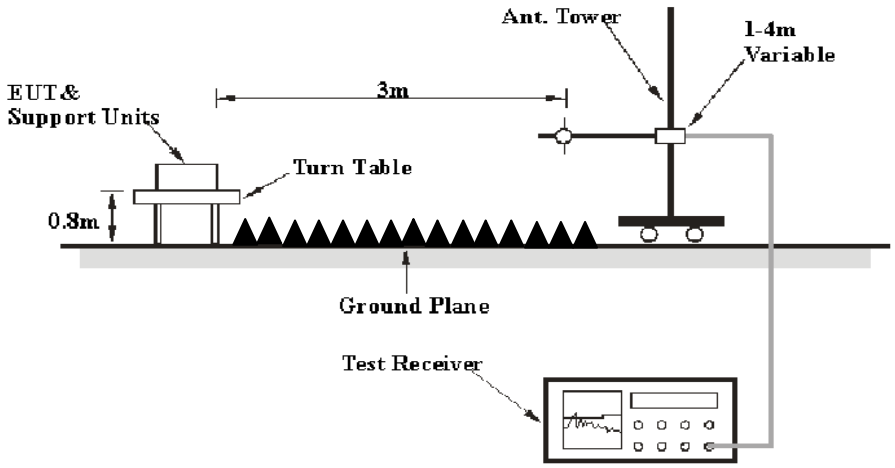
Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz and 4.92 dB for above 1GHz, 1.95dB for conducted measurement at antenna port. And the uncertainty will not be taken into consideration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

EUT Setup

Below 1 GHz:



Above 1GHz:



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.

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	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	HP8447E	1937A01046	2015-05-06	2016-05-06
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2014-11-03	2015-11-03
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Mini	Amplifier	ZVA-183-S+	5969001149	2015-04-23	2016-04-23
A.H. System	Horn Antenna	SAS-200/571	135	2013-02-11	2016-02-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2014-12-11	2015-12-11
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
TDK	Chamber	Chamber A	2#	2012-10-15	2015-10-15
TDK	Chamber	Chamber B	1#	2015-07-22	2016-07-22
DUCOMMUN	Pre-amplifier	ALN-22093530-01	991373-01	2015-08-03	2016-08-03
R&S	Auto test Software	EMC32	V9.10	NCR	NCR

*** 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, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

6.80 dB at **246.16 MHz** in the **Horizontal** polarization for **BLE** mode Middle channel

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies 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:	25 ℃
Relative Humidity:	49 %
ATM Pressure:	100.5 kPa

The testing was performed by Mike Hu on 2015-09-16.

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)
Low Channel (2412 MHz)									
246.16	53.26	QP	67	1.3	H	-14.6	38.66	46	7.34
2412.00	97.46	PK	225	2.4	H	4.97	102.43	/	/
2412.00	89.93	Ave.	225	2.4	H	4.97	94.90	/	/
2412.00	92.45	PK	257	1.4	V	4.97	97.42	/	/
2412.00	83.36	Ave.	257	1.4	V	4.97	88.33	/	/
2378.53	44.26	PK	223	2.0	V	4.97	49.23	74	24.77
2378.53	28.24	Ave.	223	2.0	V	4.97	33.21	54	20.79
2485.17	36.57	PK	119	1.3	V	4.97	41.54	74	32.46
2485.17	18.68	Ave.	119	1.3	V	4.97	23.65	54	30.35
2488.72	36.49	PK	219	2.3	V	6.29	42.78	74	31.22
2488.72	19.53	Ave.	219	2.3	V	6.29	25.82	54	28.18
4824.00	36.24	PK	286	2.1	H	16.92	53.16	74	20.84
4824.00	17.65	Ave.	286	2.1	H	16.92	34.57	54	19.43
7236.00	36.04	PK	10	1.2	H	19.08	55.12	74	18.88
7236.00	17.24	Ave.	10	1.2	H	19.08	36.32	54	17.68
9648.00	34.43	PK	82	2.5	H	22.72	57.15	74	16.85
9648.00	17.22	Ave.	82	2.5	H	22.72	39.94	54	14.06

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)
Middle Channel (2437 MHz)									
246.16	53.02	QP	264	1.3	H	-14.6	38.42	46	7.58
2437.00	95.54	PK	105	1.6	H	4.97	100.51	/	/
2437.00	86.38	Ave.	105	1.6	H	4.97	91.35	/	/
2437.00	93.24	PK	162	1.8	V	4.97	98.21	/	/
2437.00	84.27	Ave.	162	1.8	V	4.97	89.24	/	/
2379.72	37.65	PK	98	1.1	V	4.97	42.62	74	31.38
2379.72	18.86	Ave.	98	1.1	V	4.97	23.83	54	30.17
2372.86	38.40	PK	130	1.9	H	4.97	43.37	74	30.63
2372.86	18.45	Ave.	130	1.9	H	4.97	23.42	54	30.58
2485.83	37.22	PK	252	1.6	H	6.29	43.51	74	30.49
2485.53	18.84	Ave.	252	1.6	H	6.29	25.13	54	28.87
4874.00	36.54	PK	24	2.1	V	16.91	53.45	74	20.55
4874.00	17.82	Ave.	24	2.1	V	16.91	34.73	54	19.27
7311.00	36.45	PK	44	1.8	V	19.40	55.85	74	18.15
7311.00	18.27	Ave.	44	1.8	V	19.40	37.67	54	16.33
9748.00	35.90	PK	356	1.7	H	22.72	58.62	74	15.38
9748.00	17.63	Ave.	356	1.7	H	22.72	40.35	54	13.65
High Channel (2472 MHz)									
246.16	53.70	QP	154	1.3	H	-14.6	39.10	46	6.90
2472.00	96.45	PK	334	1.9	H	6.29	102.74	/	/
2472.00	87.21	Ave.	334	1.9	H	6.29	93.50	/	/
2472.00	93.51	PK	154	1.7	V	6.29	99.80	/	/
2472.00	84.18	Ave.	154	1.7	V	6.29	90.47	/	/
2386.71	35.17	PK	170	1.4	V	4.97	40.14	74	33.86
2386.71	18.57	Ave.	170	1.4	V	4.97	23.54	54	30.46
2484.50	48.57	PK	249	2.3	V	6.29	54.86	74	19.14
2484.50	31.28	Ave.	249	2.3	V	6.29	37.57	54	16.43
2487.69	49.11	PK	319	1.4	H	6.29	55.40	74	18.60
2487.69	32.32	Ave.	319	1.4	H	6.29	38.61	54	15.39
4944.00	35.52	PK	309	2.0	H	16.91	52.43	74	21.57
4944.00	17.22	Ave.	309	2.0	H	16.91	34.13	54	19.87
7416.00	37.20	PK	262	2.4	V	18.34	55.54	74	18.46
7416.00	17.73	Ave.	262	2.4	V	18.34	36.07	54	17.93
9888.00	35.88	PK	293	1.6	H	23.79	59.67	74	14.33
9888.00	17.94	Ave.	293	1.6	H	23.79	41.73	54	12.27

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)									
246.16	52.83	QP	320	1.6	H	-14.6	38.23	46	7.77
2412.00	95.64	PK	333	1.1	H	4.97	100.61	/	/
2412.00	80.34	Ave.	333	1.1	H	4.97	85.31	/	/
2412.00	92.67	PK	208	1.6	V	4.97	97.64	/	/
2412.00	77.63	Ave.	208	1.6	V	4.97	82.60	/	/
2386.85	48.45	PK	151	1.9	V	4.97	53.42	74	20.58
2386.85	31.66	Ave.	151	1.9	V	4.97	36.63	54	17.37
2389.24	49.28	PK	257	1.8	V	4.97	54.25	74	19.75
2389.24	33.41	Ave.	257	1.8	V	4.97	38.38	54	15.62
2491.93	35.53	PK	334	2.0	V	6.29	41.82	74	32.18
2491.93	18.02	Ave.	334	2.0	V	6.29	24.31	54	29.69
4824.00	36.75	PK	87	2.2	H	16.92	53.67	74	20.33
4824.00	17.35	Ave.	87	2.2	H	16.92	34.27	54	19.73
7236.00	37.27	PK	294	2.0	H	19.08	56.35	74	17.65
7236.00	18.57	Ave.	294	2.0	H	19.08	37.65	54	16.35
9648.00	35.33	PK	290	2.0	H	22.72	58.05	74	15.95
9648.00	17.70	Ave.	290	2.0	H	22.72	40.42	54	13.58
Middle Channel (2437 MHz)									
246.16	53.22	QP	164	1.6	H	-14.6	38.62	46	7.8
2437.00	95.28	PK	223	2.3	H	4.97	100.25	/	/
2437.00	80.24	Ave.	223	2.3	H	4.97	85.21	/	/
2437.00	92.44	PK	290	1.6	V	4.97	97.41	/	/
2437.00	79.27	Ave.	290	1.6	V	4.97	84.24	/	/
2376.75	38.13	PK	293	1.3	V	4.97	43.10	74	30.90
2376.75	20.55	Ave.	293	1.3	V	4.97	25.52	54	28.48
2386.73	37.22	PK	152	1.8	V	4.97	42.19	74	31.81
2386.73	19.46	Ave.	152	1.8	V	4.97	24.43	54	29.57
2490.64	36.77	PK	212	2.0	H	6.29	43.06	74	30.94
2490.64	18.55	Ave.	212	2.0	H	6.29	24.84	54	29.16
4874.00	36.11	PK	348	1.8	H	16.91	53.02	74	20.98
4874.00	18.64	Ave.	348	1.8	H	16.91	35.55	54	18.45
7311.00	36.76	PK	143	1.3	V	19.40	56.16	74	17.84
7311.00	17.28	Ave.	143	1.3	V	19.40	36.68	54	17.32
9748.00	35.27	PK	331	1.2	H	22.72	57.99	74	16.01
9748.00	17.55	Ave.	331	1.2	H	22.72	40.27	54	13.73

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 (2472 MHz)									
246.16	52.96	QP	128	1.6	H	-14.6	38.36	46	7.64
2472.00	96.12	PK	215	1.1	H	6.29	102.41	/	/
2472.00	81.24	Ave.	215	1.1	H	6.29	87.53	/	/
2472.00	92.54	PK	207	1.7	V	6.29	98.83	/	/
2472.00	77.91	Ave.	207	1.7	V	6.29	84.20	/	/
2388.68	36.50	PK	310	1.5	H	4.97	41.47	74	32.53
2388.68	18.67	Ave.	310	1.5	H	4.97	23.64	54	30.36
2483.50	50.57	PK	184	1.3	H	6.29	56.86	74	17.14
2483.50	35.81	Ave.	184	1.3	H	6.29	42.10	54	11.90
2486.26	52.14	PK	357	1.9	V	6.29	58.43	74	15.57
2486.26	39.25	Ave.	357	1.9	V	6.29	45.54	54	8.46
4944.00	35.44	PK	242	2.2	V	16.91	52.35	74	21.65
4944.00	17.88	Ave.	242	2.2	V	16.91	34.79	54	19.21
7416.00	36.21	PK	215	1.8	V	18.34	54.55	74	19.45
7416.00	17.27	Ave.	215	1.8	V	18.34	35.61	54	18.39
9888.00	36.16	PK	196	1.8	H	23.79	59.95	74	14.05
9888.00	17.88	Ave.	196	1.8	H	23.79	41.67	54	12.33

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)									
246.16	53.00	QP	241	1.2	H	-14.6	38.40	46	7.60
2412.00	95.60	PK	310	1.3	H	4.97	100.57	/	/
2412.00	80.34	Ave.	310	1.3	H	4.97	85.31	/	/
2412.00	92.67	PK	181	1.5	V	4.97	97.64	/	/
2412.00	77.76	Ave.	181	1.5	V	4.97	82.73	/	/
2386.29	48.95	PK	310	1.4	V	4.97	53.92	74	20.08
2386.29	31.28	Ave.	310	1.4	V	4.97	36.25	54	17.75
2388.55	49.24	PK	53	1.8	V	4.97	54.21	74	19.79
2388.55	32.56	Ave.	53	1.8	V	4.97	37.53	54	16.47
2491.70	37.64	PK	157	1.5	H	6.29	43.93	74	30.07
2491.70	18.29	Ave.	157	1.5	H	6.29	24.58	54	29.42
4824.00	37.51	PK	261	1.1	H	16.92	54.43	74	19.57
4824.00	17.84	Ave.	261	1.1	H	16.92	34.76	54	19.24
7236.00	36.87	PK	136	1.3	V	19.08	55.95	74	18.05
7236.00	18.14	Ave.	136	1.3	V	19.08	37.22	54	16.78
9648.00	35.75	PK	138	2.4	V	22.72	58.47	74	15.53
9648.00	17.90	Ave.	138	2.4	V	22.72	40.62	54	13.38
Middle Channel (2437 MHz)									
246.16	53.04	QP	154	1.5	H	-14.6	38.44	46	7.56
2437.00	93.25	PK	45	1.7	H	4.97	98.22	/	/
2437.00	78.36	Ave.	45	1.7	H	4.97	83.33	/	/
2437.00	91.02	PK	288	1.9	V	4.97	95.99	/	/
2437.00	76.11	Ave.	288	1.9	V	4.97	81.08	/	/
2387.46	38.25	PK	13	1.4	V	4.97	43.22	74	30.78
2387.46	18.71	Ave.	13	1.4	V	4.97	23.68	54	30.32
2389.23	37.66	PK	0	2.0	V	4.97	42.63	74	31.37
2389.23	18.92	Ave.	0	2.0	V	4.97	23.89	54	30.11
2491.52	38.33	PK	148	1.8	H	6.29	44.62	74	29.38
2491.52	18.66	Ave.	148	1.8	H	6.29	24.95	54	29.05
4874.00	36.44	PK	218	2.0	H	16.91	53.35	74	20.65
4874.00	17.22	Ave.	218	2.0	H	16.91	34.13	54	19.87
7311.00	37.34	PK	89	1.5	V	19.40	56.74	74	17.26
7311.00	17.84	Ave.	89	1.5	V	19.40	37.24	54	16.76
9748.00	36.22	PK	133	1.1	H	22.72	58.94	74	15.06
9748.00	17.45	Ave.	133	1.1	H	22.72	40.17	54	13.83

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 (2472 MHz)									
246.16	52.85	QP	157	1.6	H	-14.6	38.25	46	7.75
2472.00	94.25	PK	116	2.0	H	6.29	100.54	/	/
2472.00	79.43	Ave.	116	2.0	H	6.29	85.72	/	/
2472.00	90.16	PK	78	1.2	V	6.29	96.45	/	/
2472.00	75.27	Ave.	78	1.2	V	6.29	81.56	/	/
2389.40	36.58	PK	157	1.5	V	4.97	41.55	74	32.45
2389.40	19.84	Ave.	157	1.5	V	4.97	24.81	54	29.19
2388.39	37.41	PK	18	2.4	V	4.97	42.38	74	31.62
2388.39	19.54	Ave.	18	2.4	V	4.97	24.51	54	29.49
2484.19	50.24	PK	200	1.6	H	6.29	56.53	74	17.47
2484.19	35.57	Ave.	200	1.6	H	6.29	41.86	54	12.14
4944.00	36.35	PK	37	2.5	H	16.91	53.26	74	20.74
4944.00	17.88	Ave.	37	2.5	H	16.91	34.79	54	19.21
7416.00	36.16	PK	340	2.2	V	18.34	54.50	74	19.50
7416.00	17.35	Ave.	340	2.2	V	18.34	35.69	54	18.31
9888.00	35.66	PK	359	1.1	H	23.79	59.45	74	14.55
9888.00	17.57	Ave.	359	1.1	H	23.79	41.36	54	12.64

802.11n-HT40 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 (2422 MHz)									
246.16	52.93	QP	220	1.3	H	-14.6	38.33	46	7.67
2422.00	92.10	PK	162	2.1	H	4.97	97.07	/	/
2422.00	76.08	Ave.	162	2.1	H	4.97	81.05	/	/
2422.00	90.67	PK	213	1.0	V	4.97	95.64	/	/
2422.00	73.84	Ave.	213	1.0	V	4.97	78.81	/	/
2385.66	53.57	PK	145	1.6	V	4.97	58.54	74	15.46
2385.66	32.81	Ave.	145	1.6	V	4.97	37.78	54	16.22
2389.37	54.99	PK	315	2.4	H	4.97	59.96	74	14.04
2389.37	33.37	Ave.	315	2.4	H	4.97	38.34	54	15.66
2485.62	35.82	PK	307	1.7	V	6.29	42.11	74	31.89
2485.62	20.34	Ave.	307	1.7	V	6.29	26.63	54	27.37
4844.00	36.12	PK	123	2.2	V	16.92	53.04	74	20.96
4844.00	17.88	Ave.	123	2.2	V	16.92	34.80	54	19.20
7266.00	37.35	PK	289	1.4	H	19.40	56.75	74	17.25
7266.00	18.63	Ave.	289	1.4	H	19.40	38.03	54	15.97
9688.00	35.23	PK	160	1.7	H	22.72	57.95	74	16.05
9688.00	17.85	Ave.	160	1.7	H	22.72	40.57	54	13.43
Middle Channel (2437 MHz)									
246.16	53.48	QP	164	1.5	H	-14.6	38.88	46	7.12
2437.00	91.12	PK	49	1.6	H	4.97	96.09	/	/
2437.00	75.28	Ave.	49	1.6	H	4.97	80.25	/	/
2437.00	89.64	PK	128	1.0	V	4.97	94.61	/	/
2437.00	73.48	Ave.	128	1.0	V	4.97	78.45	/	/
2386.74	37.22	PK	225	1.5	V	4.97	42.19	74	31.81
2386.74	18.62	Ave.	225	1.5	V	4.97	23.59	54	30.41
2387.55	38.22	PK	53	1.3	V	4.97	43.19	74	30.81
2387.55	18.97	Ave.	53	1.3	H	4.97	23.94	54	30.06
2490.24	38.23	PK	311	1.3	H	6.29	44.52	74	29.48
2490.24	18.01	Ave.	311	1.3	V	6.29	24.30	54	29.70
4874.00	36.15	PK	121	1.3	V	16.91	53.06	74	20.94
4874.00	18.56	Ave.	121	1.3	V	16.91	35.47	54	18.53
7311.00	37.50	PK	286	1.7	H	19.40	56.90	74	17.10
7311.00	17.37	Ave.	286	1.7	H	19.40	36.77	54	17.23
9748.00	35.49	PK	338	1.5	H	22.72	58.21	74	15.79
9748.00	17.60	Ave.	338	1.5	H	22.72	40.32	54	13.68

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)									
246.16	53.32	QP	127	1.6	H	-14.6	38.72	46	7.28
2462.00	92.12	PK	138	2.3	H	6.29	98.41	/	/
2462.00	76.95	Ave.	138	2.3	H	6.29	83.24	/	/
2462.00	90.05	PK	299	1.7	V	6.29	96.34	/	/
2462.00	74.36	Ave.	299	1.7	V	6.29	80.65	/	/
2388.27	37.25	PK	154	2.1	V	4.97	42.22	74	31.78
2388.27	19.06	Ave.	154	2.1	V	4.97	24.03	54	29.97
2483.50	54.24	PK	154	2.5	V	6.29	60.53	74	13.47
2483.50	36.58	Ave.	154	2.5	H	6.29	42.87	54	11.13
2490.55	53.28	PK	321	1.6	H	6.29	59.57	74	14.43
2490.55	35.29	Ave.	321	1.6	V	6.29	41.58	54	12.42
4924.00	35.12	PK	279	1.2	H	16.91	52.03	74	21.97
4924.00	17.86	Ave.	279	1.2	H	16.91	34.77	54	19.23
7386.00	36.13	PK	167	1.3	V	18.34	54.47	74	19.53
7386.00	18.22	Ave.	167	1.3	V	18.34	36.56	54	17.44
9848.00	35.88	PK	88	1.2	H	23.79	59.67	74	14.33
9848.00	18.24	Ave.	88	1.2	H	23.79	42.03	54	11.97

BLE 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 (2402 MHz)									
246.16	43.15	QP	230	1.5	H	-14.6	38.55	46	7.45
2402.00	89.24	PK	229	1.8	H	4.97	94.21	/	/
2402.00	80.40	Ave.	229	1.8	H	4.97	85.37	/	/
2402.00	85.35	PK	118	2.5	V	4.97	90.32	/	/
2402.00	76.92	Ave.	118	2.5	V	4.97	81.89	/	/
2382.75	36.52	PK	293	1.2	H	4.97	41.49	74	32.51
2382.75	19.44	Ave.	293	1.2	H	4.97	24.41	54	29.59
2386.86	35.35	PK	199	2.1	H	4.97	40.32	74	33.68
2386.86	19.66	Ave.	199	2.1	H	4.97	24.63	54	29.37
2489.44	34.55	PK	195	1.1	V	6.29	40.84	74	33.16
2489.44	18.44	Ave.	195	1.1	V	6.29	24.73	54	29.27
4804.00	35.15	PK	228	1.3	H	16.92	52.07	74	21.93
4804.00	17.88	Ave.	228	1.3	H	16.92	34.80	54	19.20
7206.00	35.96	PK	303	1.0	V	19.08	55.04	74	18.96
7206.00	18.38	Ave.	303	1.0	V	19.08	37.46	54	16.54
9608.00	35.31	PK	232	2.4	V	22.72	58.03	74	15.97
9608.00	18.08	Ave.	232	2.4	V	22.72	40.80	54	13.20
Middle Channel (2440 MHz)									
246.16	53.80	QP	154	1.2	H	-14.6	39.20	46	6.80
2440.00	88.64	PK	1	1.6	H	4.97	93.61	/	/
2440.00	79.62	Ave.	1	1.6	H	4.97	84.59	/	/
2440.00	85.12	PK	178	1.1	V	4.97	90.09	/	/
2440.00	76.38	Ave.	178	1.1	V	4.97	81.35	/	/
2388.50	36.22	PK	329	1.3	H	4.97	41.19	74	32.81
2388.50	18.35	Ave.	329	1.3	H	4.97	23.32	54	30.68
2484.90	35.41	PK	130	2.2	H	6.29	41.70	74	32.30
2484.90	18.11	Ave.	130	2.2	H	6.29	24.40	54	29.60
2487.80	35.66	PK	218	2.3	H	6.29	41.95	74	32.05
2487.80	17.73	Ave.	218	2.3	H	6.29	24.02	54	29.98
4880.00	35.55	PK	51	1.3	V	16.91	52.46	74	21.54
4880.00	17.62	Ave.	51	1.3	V	16.91	34.53	54	19.47
7320.00	36.73	PK	307	2.2	H	19.40	56.13	74	17.87
7320.00	18.20	Ave.	307	2.2	H	19.40	37.60	54	16.40
9760.00	36.66	PK	300	2.1	V	23.79	60.45	74	13.55
9760.00	18.13	Ave.	300	2.1	V	23.79	41.92	54	12.08

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 (2480 MHz)									
246.16	52.95	QP	144	1.3	H	-14.6	38.35	46	7.65
2480.00	89.12	PK	155	2.0	H	6.29	95.41	/	/
2480.00	79.42	Ave.	155	2.0	H	6.29	85.71	/	/
2480.00	85.57	PK	125	1.2	V	6.29	91.86	/	/
2480.00	77.17	Ave.	125	1.2	V	6.29	83.46	/	/
2380.42	35.27	PK	156	2.2	H	4.97	40.24	74	33.76
2380.42	18.65	Ave.	156	2.2	H	4.97	23.62	54	30.38
2483.57	36.40	PK	333	1.5	H	6.29	42.69	74	31.31
2483.57	20.57	Ave.	333	1.5	H	6.29	26.86	54	27.14
2485.32	36.41	PK	210	1.6	H	6.29	42.70	74	31.30
2485.32	20.66	Ave.	210	1.6	H	6.29	26.95	54	27.05
4960.00	34.55	PK	82	2.1	H	17.91	52.46	74	21.54
4960.00	17.20	Ave.	82	2.1	H	17.91	35.11	54	18.89
7440.00	35.37	PK	55	1.0	H	18.34	53.71	74	20.29
7440.00	17.88	Ave.	55	1.0	H	18.34	36.22	54	17.78
9920.00	35.42	PK	137	2.0	H	23.79	59.21	74	14.79
9920.00	18.34	Ave.	137	2.0	H	23.79	42.13	54	11.87

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

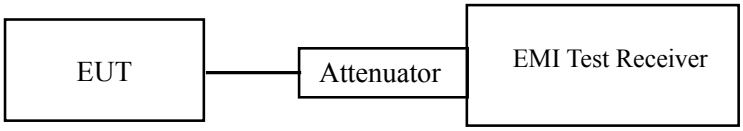
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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	ESR	1316.3003K03-101746-zn	2015-06-13	2016-06-13

*** 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).

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2015-09-10.

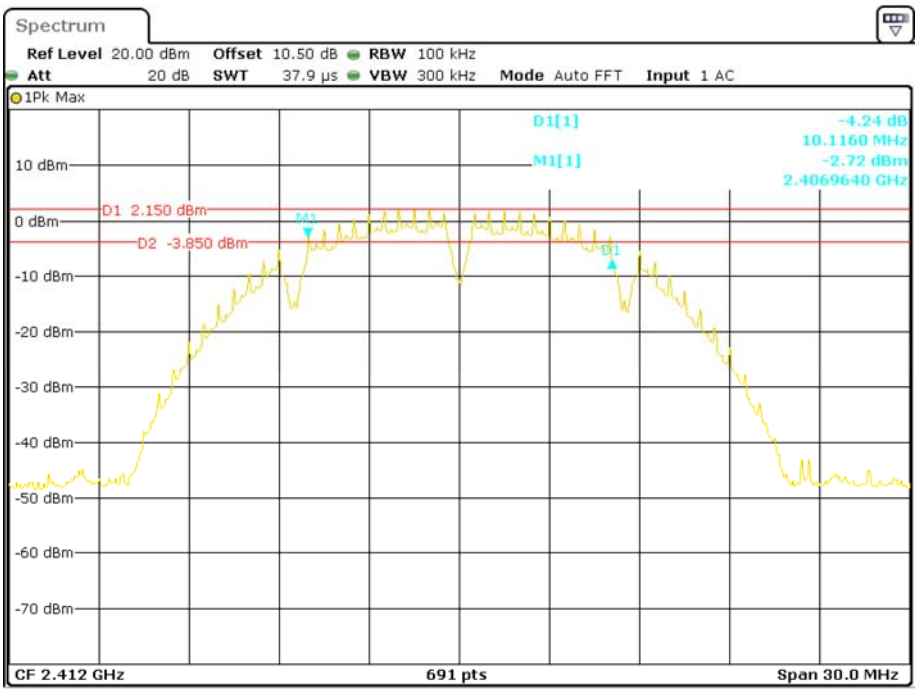
Test Result: Pass.

Please refer to the following tables and plots.

EUT operation mode: Transmitting

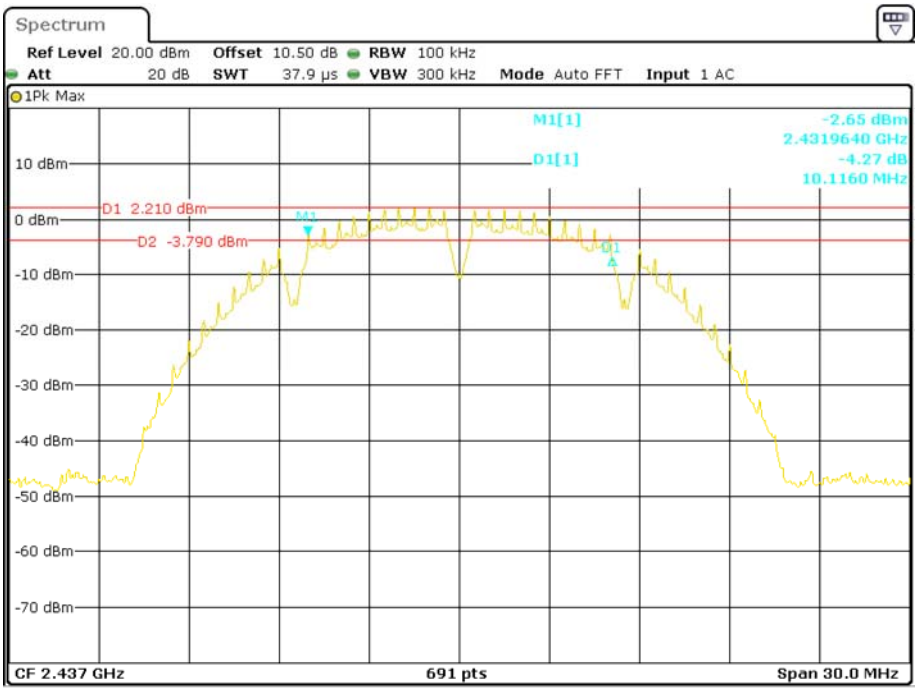
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)
802.11b mode			
Low	2412	10.12	≥500
Middle	2437	10.12	≥500
High	2472	10.10	≥500
802.11g mode			
Low	2412	16.41	≥500
Middle	2437	16.41	≥500
High	2472	16.41	≥500
802.11n-HT20 mode			
Low	2412	17.63	≥500
Middle	2437	17.63	≥500
High	2472	17.63	≥500
802.11n-HT40 mode			
Low	2422	36.15	≥500
Middle	2437	36.09	≥500
High	2462	36.09	≥500
BLE mode			
Low	2402	0.712	≥500
Middle	2440	0.712	≥500
High	2480	0.712	≥500

802.11b Low Channel



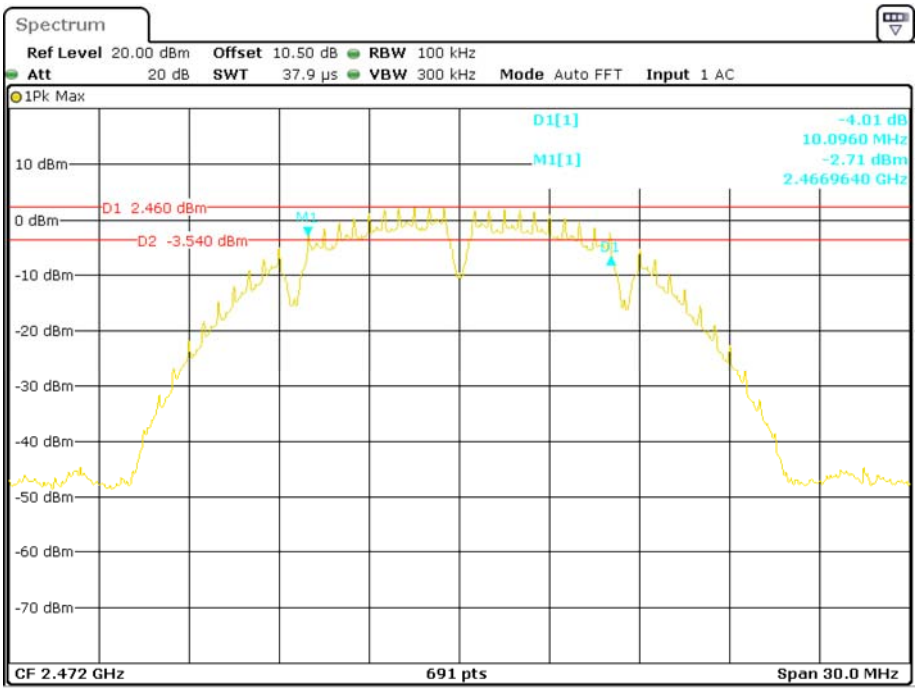
Date: 10.SEP.2015 13:42:24

802.11b Middle Channel



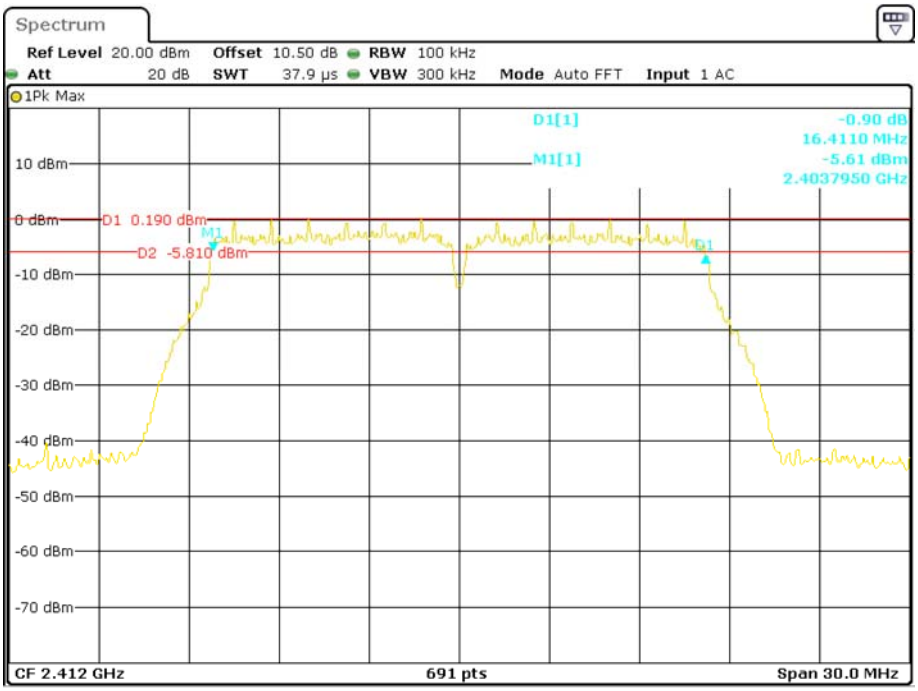
Date: 10.SEP.2015 13:41:13

802.11b High Channel



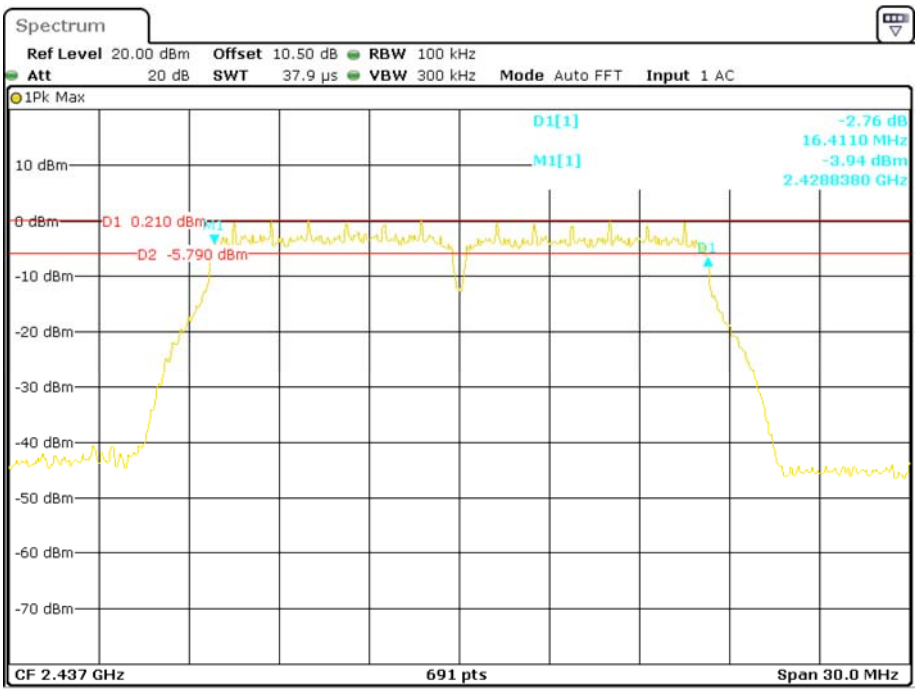
Date: 10.SEP.2015 13:37:04

802.11g Low Channel



Date: 10.SEP.2015 13:46:44

802.11g Middle Channel



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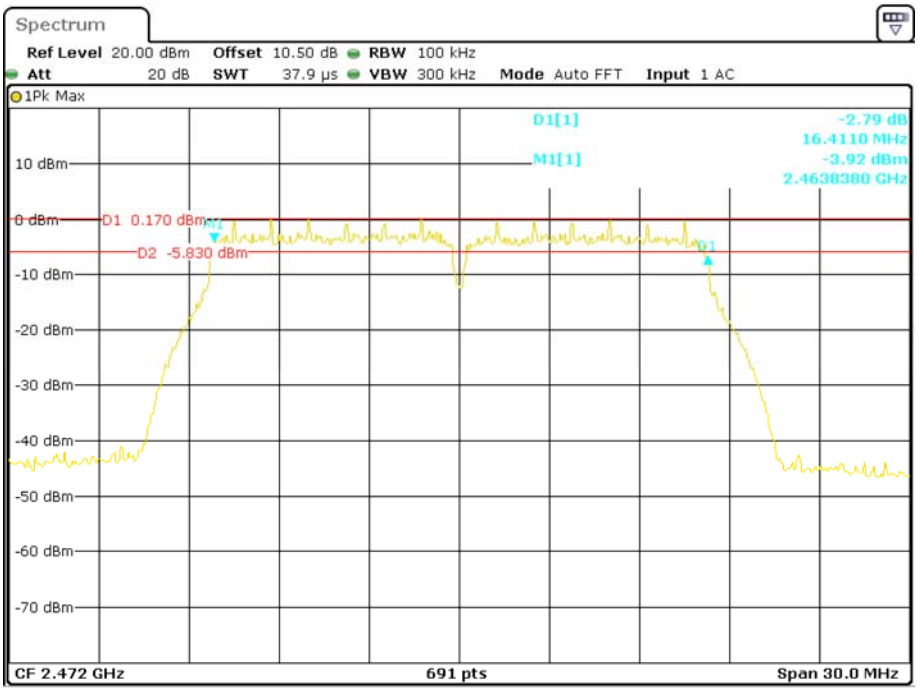
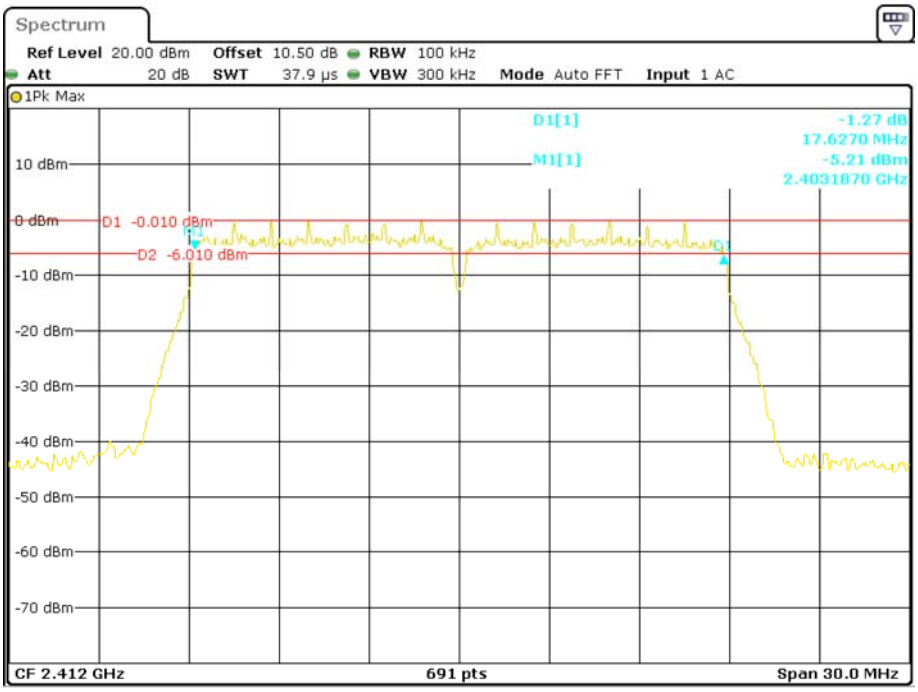
802.11g High Channel



Date: 10.SEP.2015 13:50:01

802.11n-HT20 Low Channel



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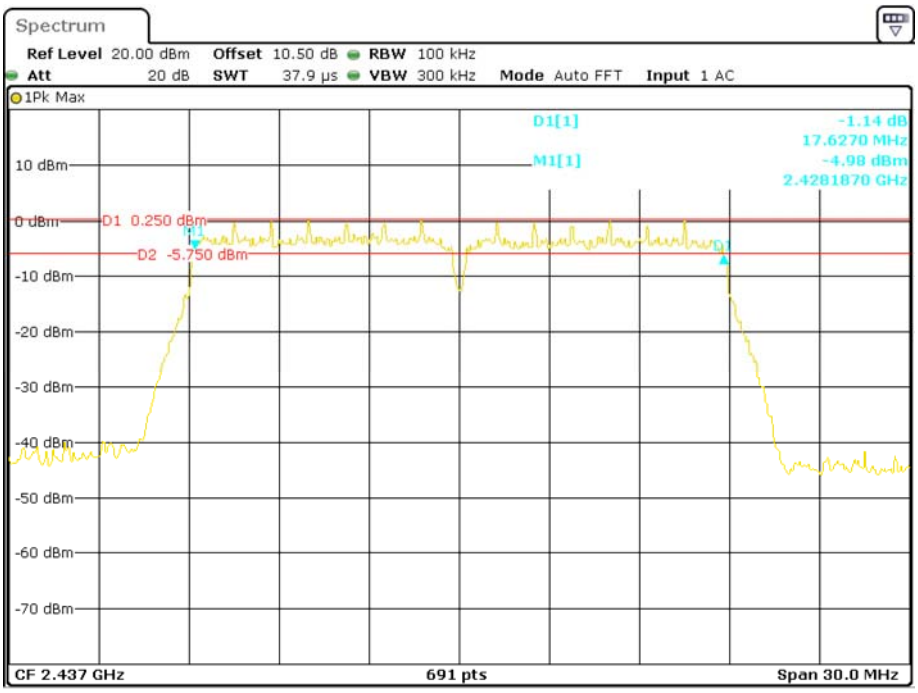
802.11n-HT20 Middle Channel



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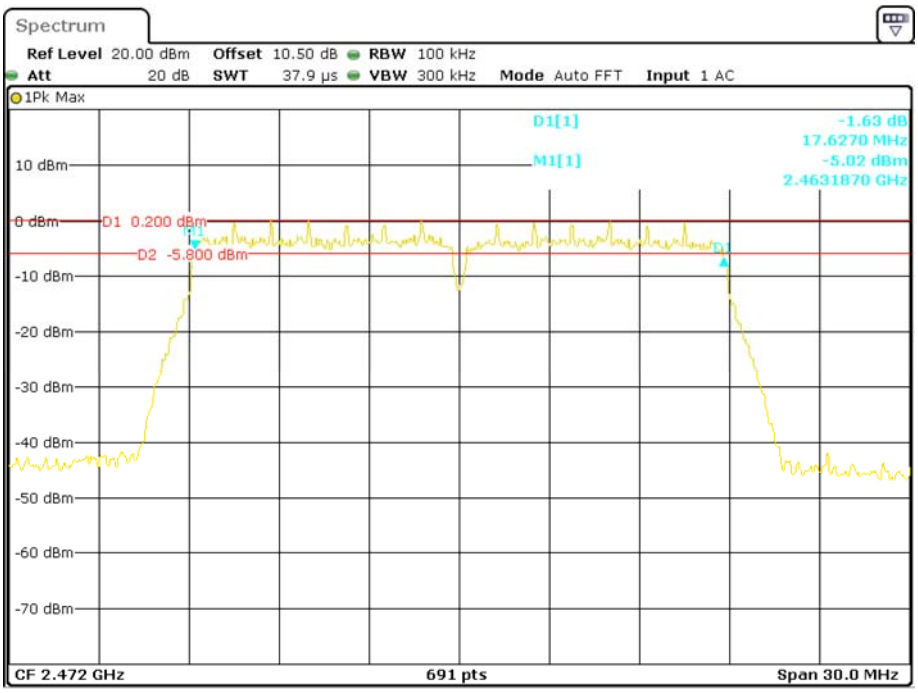
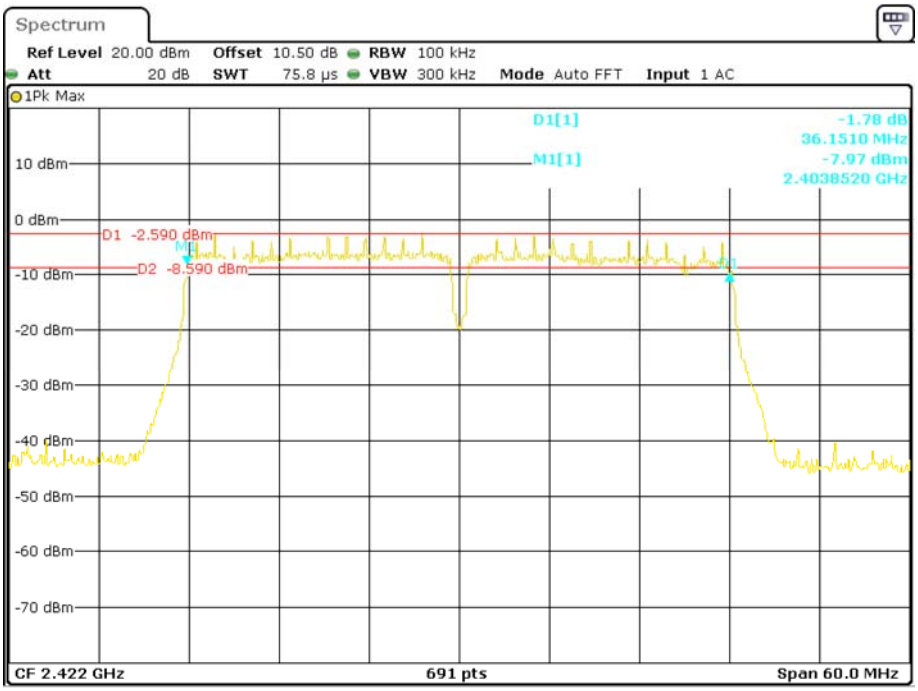
802.11n-HT20 High Channel



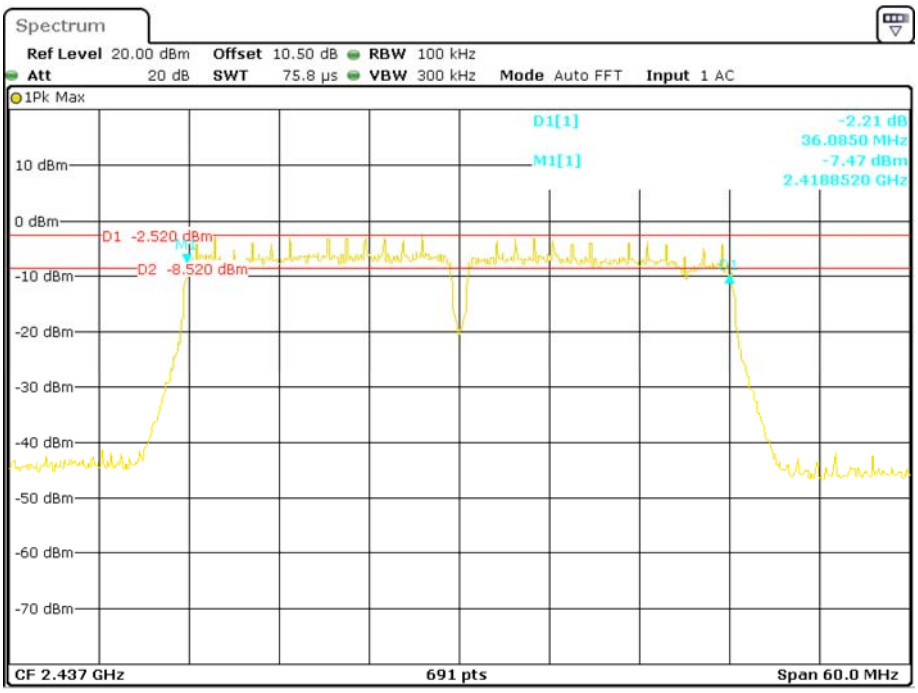
Date: 10.SEP.2015 13:51:25

802.11n-HT40 Low Channel



Date: 10.SEP.2015 13:57:06

802.11n-HT40 Middle Channel



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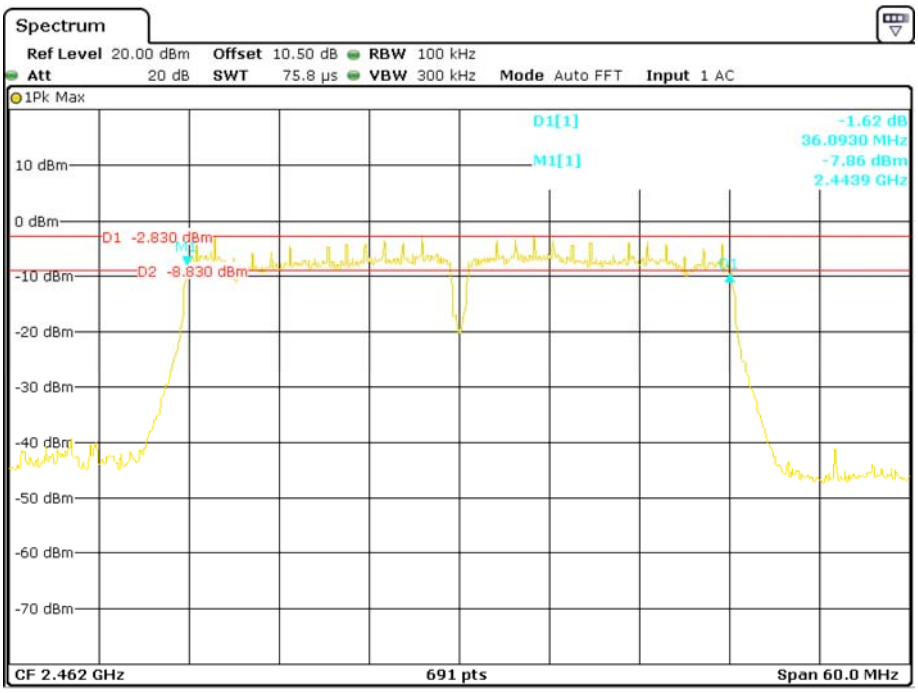
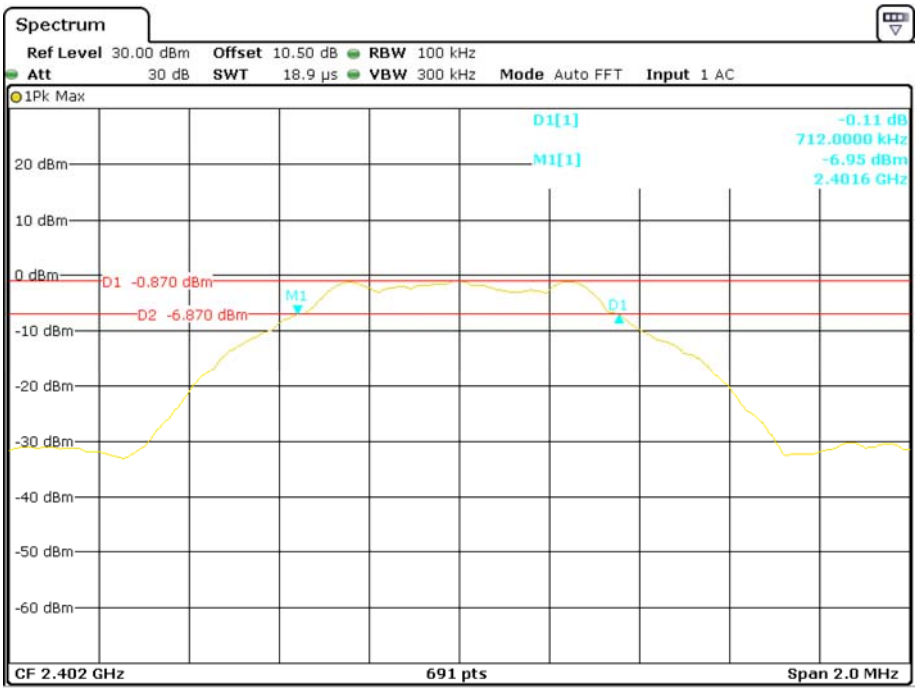
802.11n-HT40 High Channel



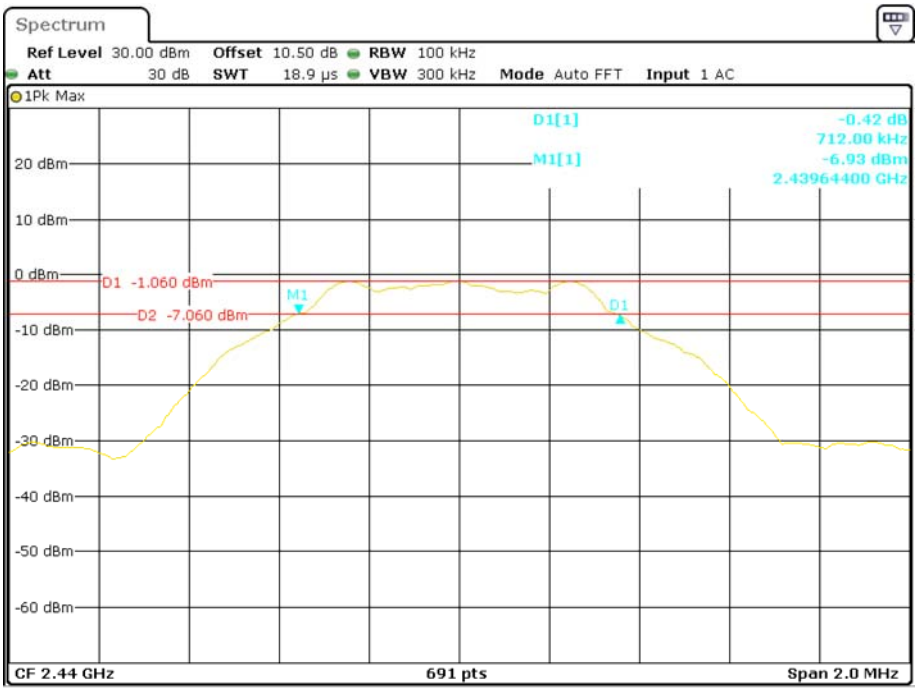
Date: 10.SEP.2015 14:02:16

BLE Low Channel



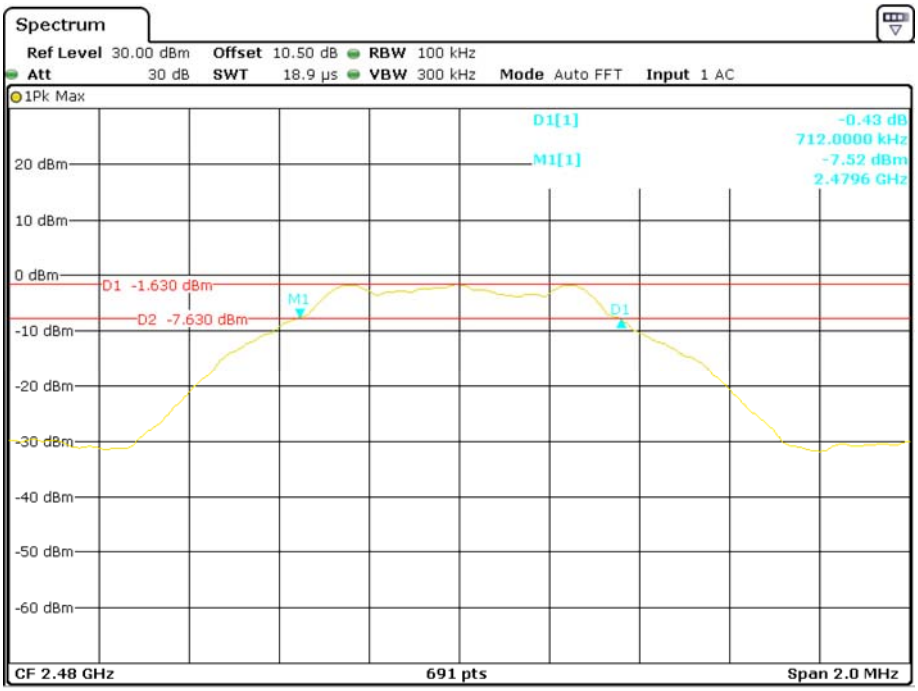
Date: 10.SEP.2015 10:46:03

BLE Middle Channel



Date: 10.SEP.2015 10:47:22

BLE High Channel



Date: 10.SEP.2015 10:49:36

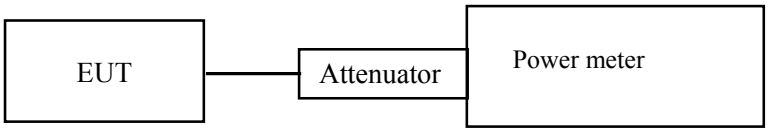
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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. 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 one 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
HP	Power Meter	N1912A	MY5000448	2014-11-03	2015-11-03
HP	Power Sensor	N1921A	MY54210016	2014-11-03	2015-11-03

*** 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:	25 ℃
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

The testing was performed by Mike Hu on 2015-09-10.

EUT operation mode: Transmitting

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b				
Low	2412	12.54	8.95	30
Middle	2437	12.35	9.15	30
High	2472	12.30	9.01	30
802.11g				
Low	2412	14.52	8.87	30
Middle	2437	14.68	8.93	30
High	2472	14.43	8.80	30
802.11n-HT20				
Low	2412	14.76	8.92	30
Middle	2437	14.80	8.82	30
High	2472	14.75	8.75	30
802.11n-HT40				
Low	2422	14.02	7.90	30
Middle	2437	14.24	8.01	30
High	2462	14.03	7.93	30

BLE mode

Channel	Frequency (MHz)	Max Peak Output Power (dBm)	Limit (dBm)	Result
Low	2402	0.06	30	Pass
Middle	2440	-0.16	30	Pass
High	2480	-0.66	30	Pass

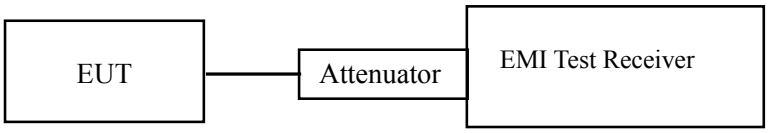
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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	ESR	1316.3003K03-101746-zn	2015-06-13	2016-06-13

*** 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).

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

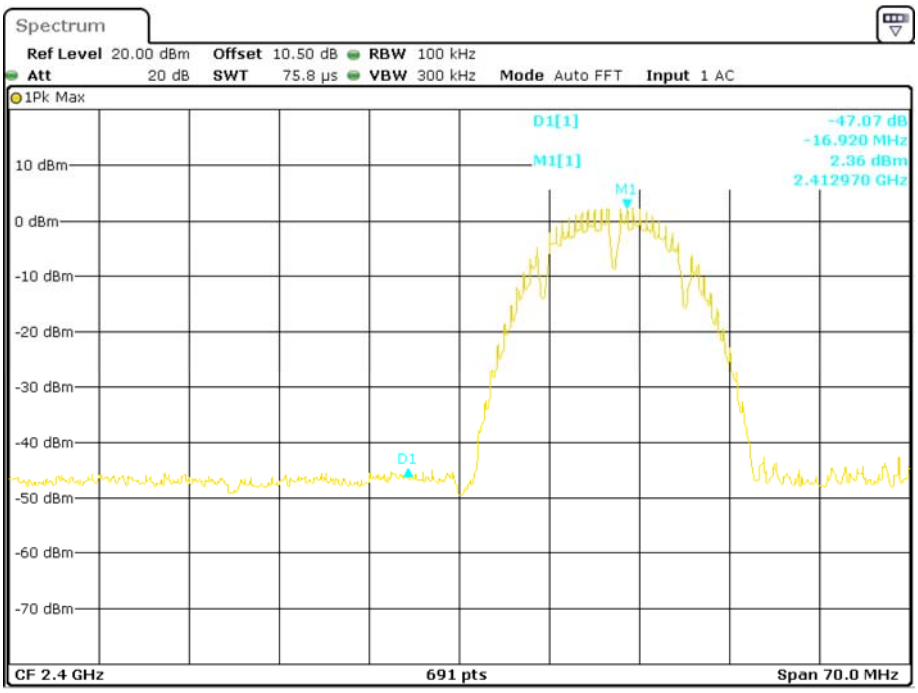
The testing was performed by Mike Hu on 2015-09-10.

Test Result: *Compliance*

Please refer to the following tables and plots.

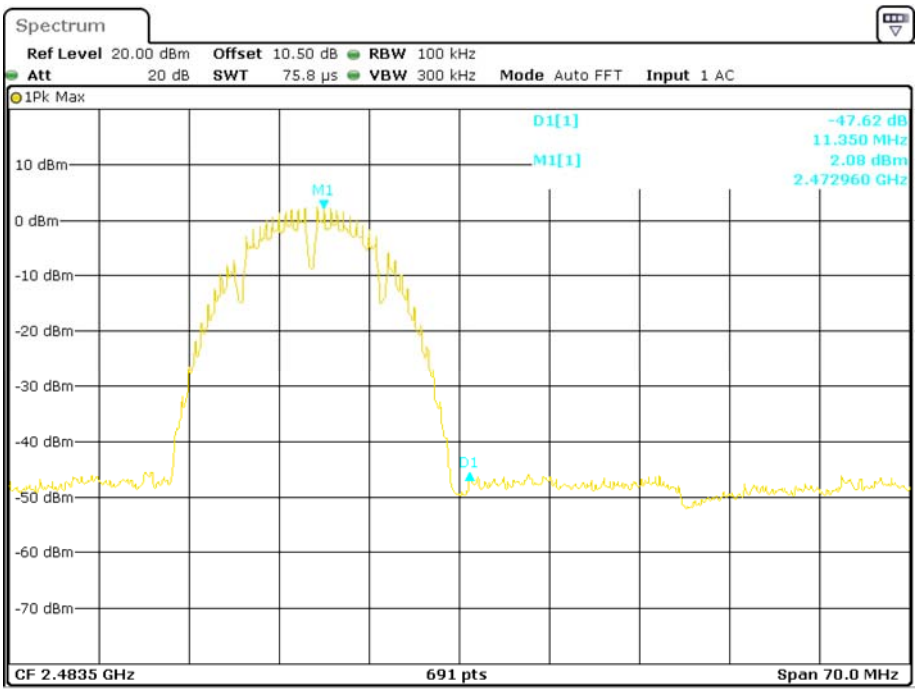
Mode	Band edges	Delta Peak to band emission (dBc)	Limit (dBc)
802.11b	Left Side	47.07	20
	Right Side	47.62	20
802.11g	Left Side	42.40	20
	Right Side	44.91	20
802.11n20	Left Side	41.70	20
	Right Side	44.92	20
802.11n40	Left Side	36.77	20
	Right Side	41.27	20
BLE	Left Side	34.51	20
	Right Side	34.57	20

802.11b: Band Edge, Left Side



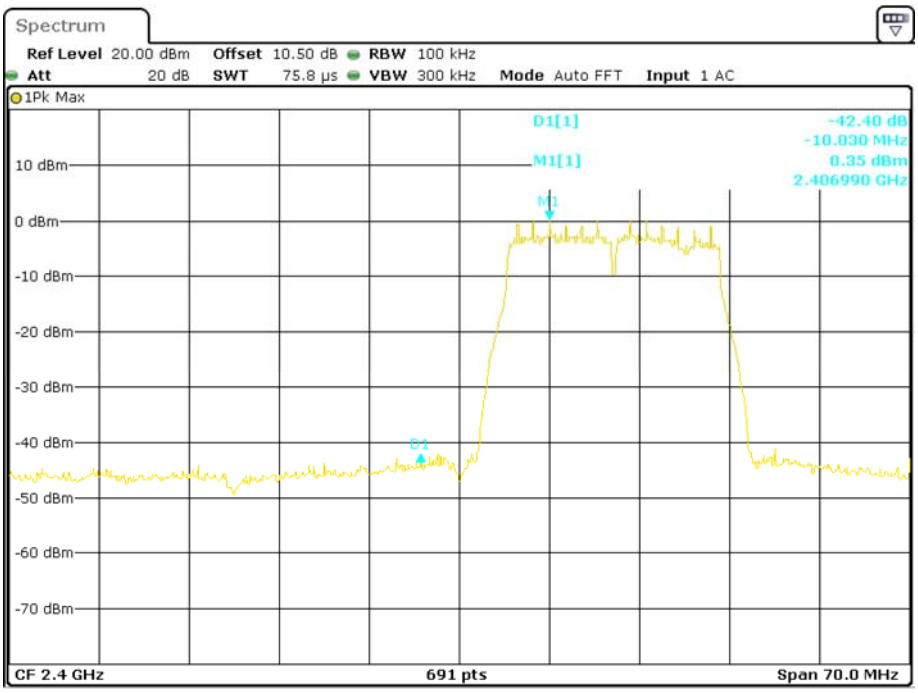
Date: 10.SEP.2015 13:33:29

802.11b: Band Edge, Right Side



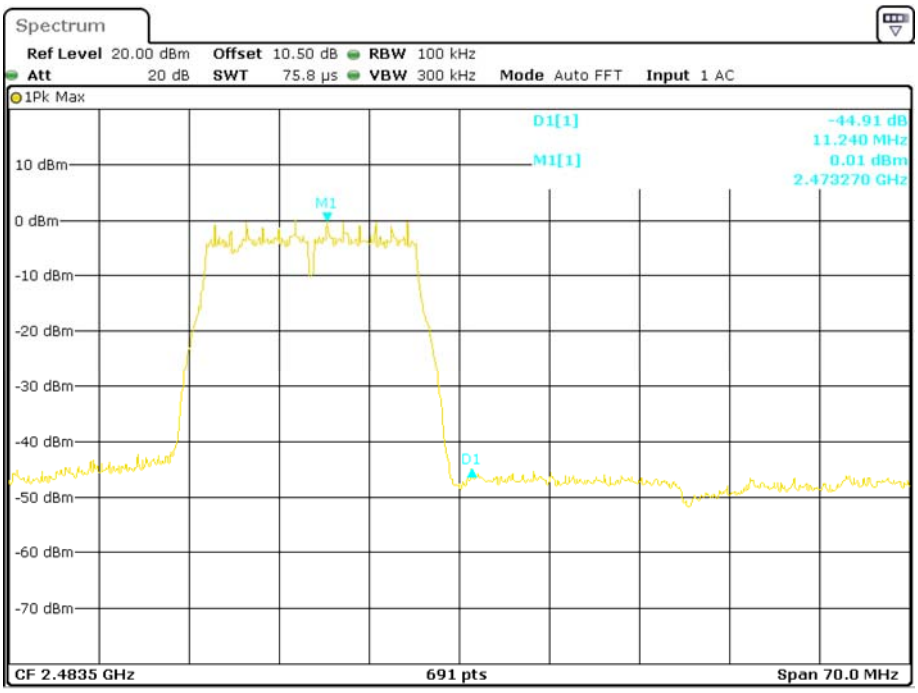
Date: 10.SEP.2015 13:35:24

802.11g: Band Edge, Left Side



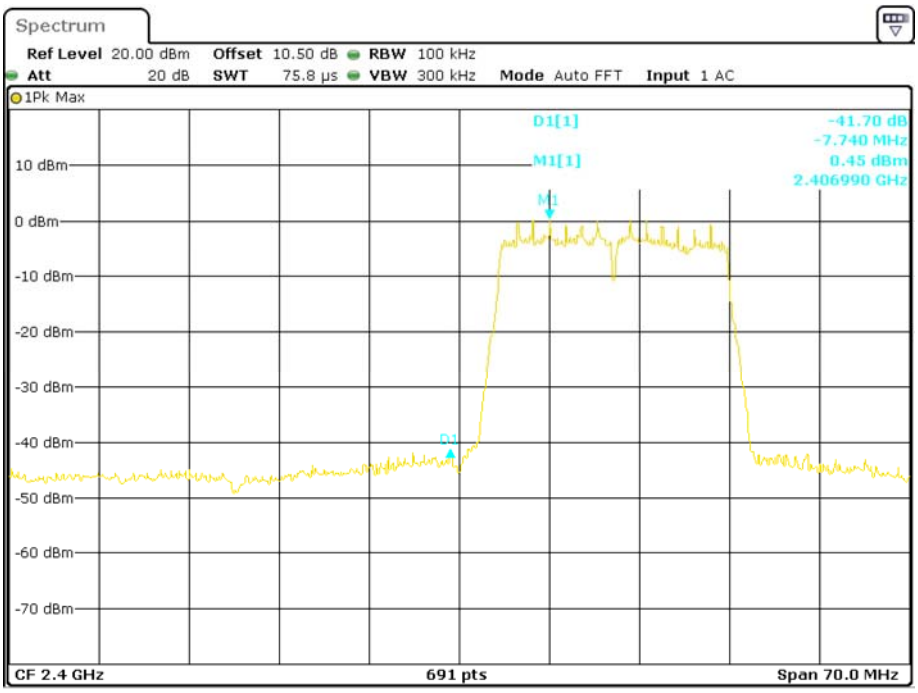
Date: 10.SEP.2015 13:31:29

802.11g: Band Edge, Right Side



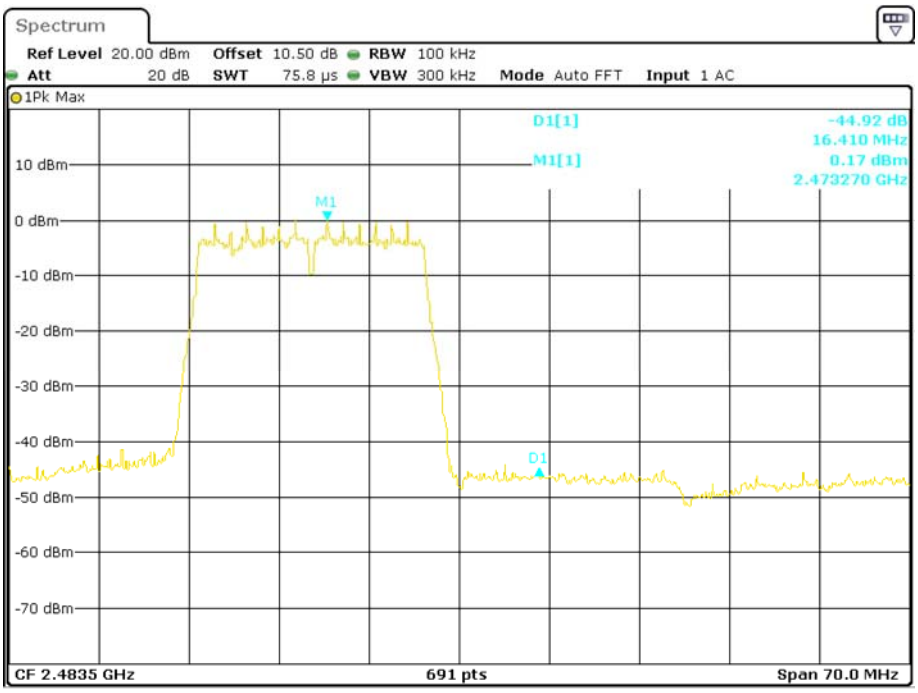
Date: 10.SEP.2015 13:29:30

802.11n-HT20: Band Edge, Left Side



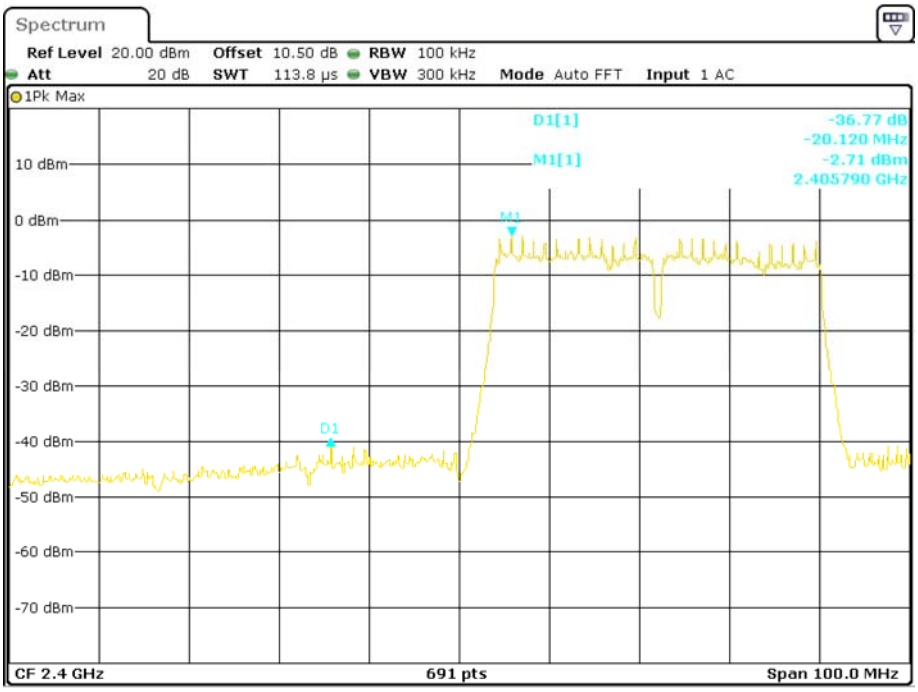
Date: 10.SEP.2015 13:26:19

802.11n-HT20: Band Edge, Right Side



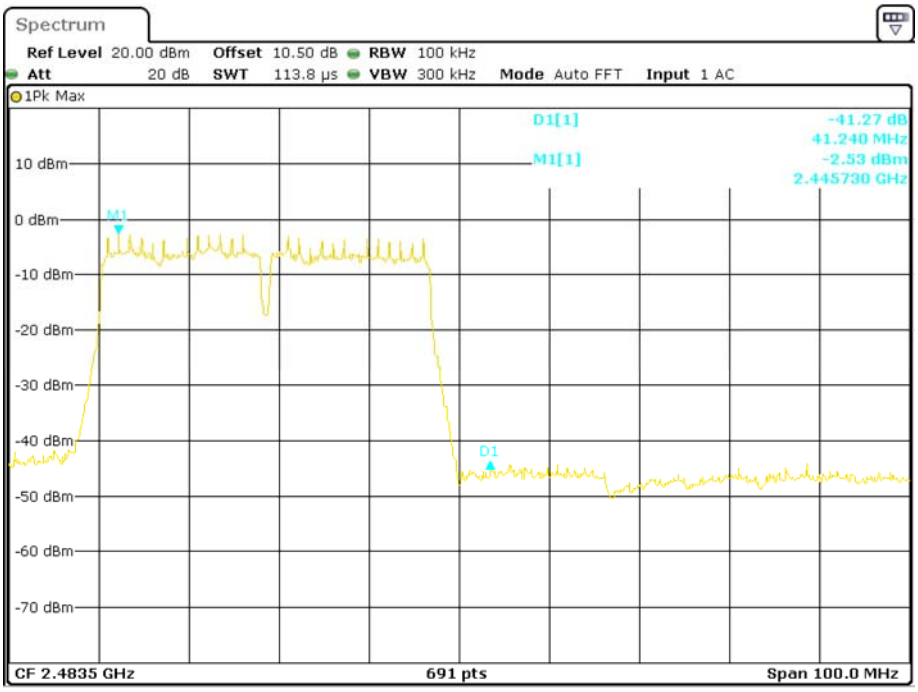
Date: 10.SEP.2015 13:27:55

802.11n-HT40: Band Edge, Left Side



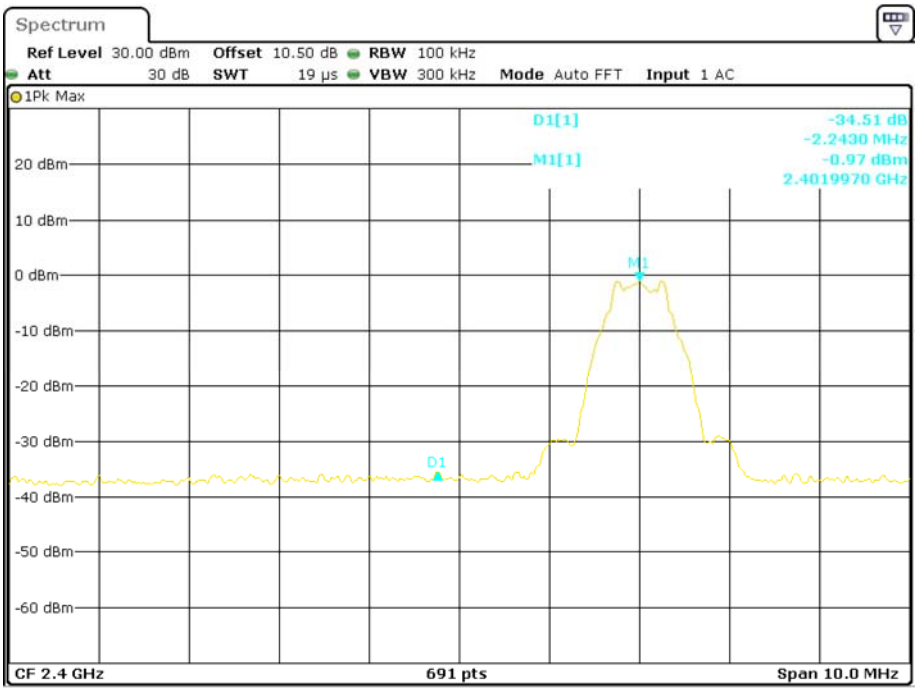
Date: 10.SEP.2015 13:25:03

802.11n-HT40: Band Edge, Right Side



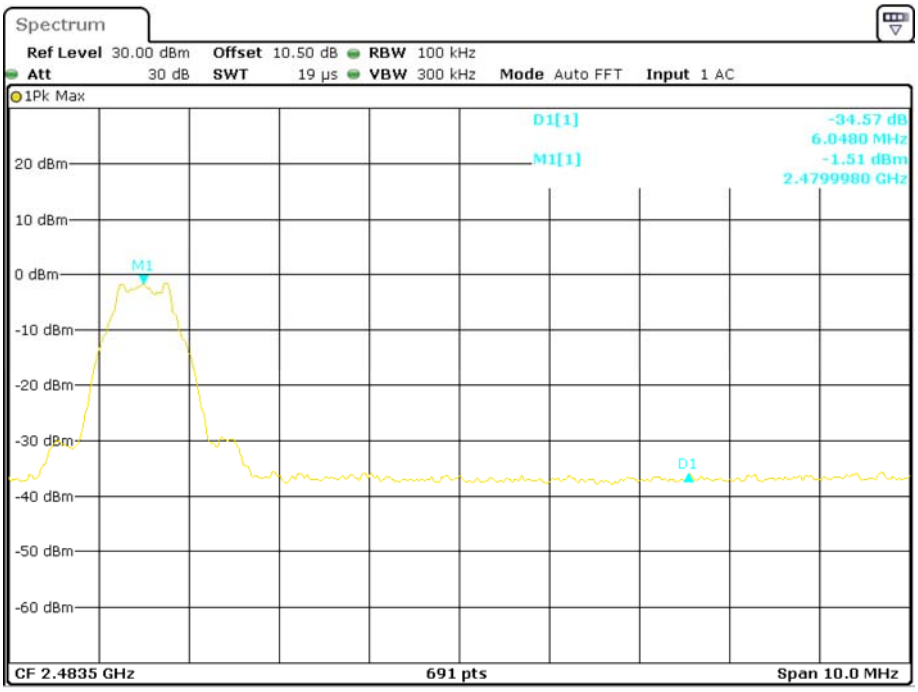
Date: 10.SEP.2015 13:23:24

BLE: Band Edge, Left Side



Date: 10.SEP.2015 10:59:16

BLE: Band Edge, Right Side



Date: 10.SEP.2015 10:55:45

FCC §15.247(e) - POWER SPECTRAL DENSITY

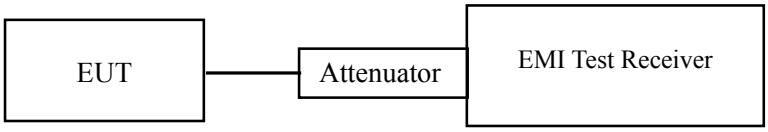
Applicable Standard

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

According to KDB558074 D01 DTS Measured Guidance v03r03 sub-clause 10.2

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: 3kHz≤ RBW≤100 kHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2015-06-13	2016-06-13

*** 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).

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

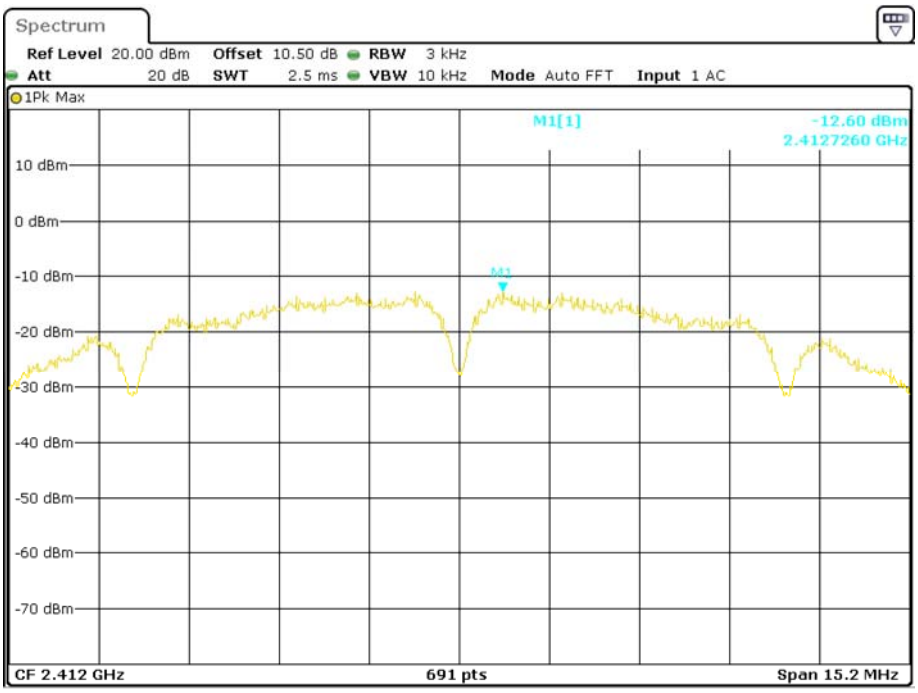
The testing was performed by Mike Hu on 2015-09-10.

EUT operation mode: Transmitting

Test Result: Pass

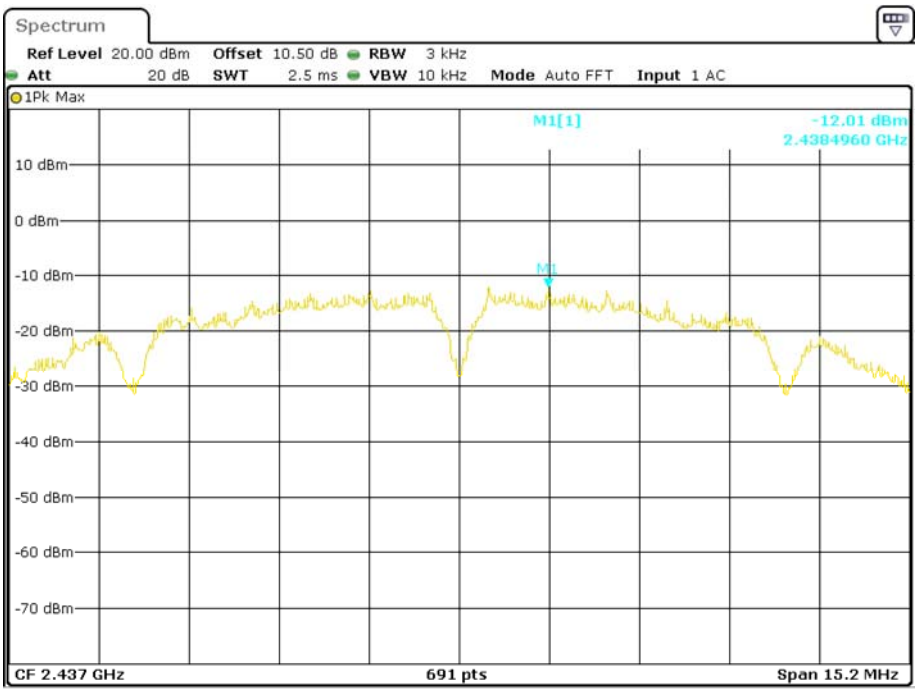
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-12.60	≤8
Middle	2437	-12.01	≤8
High	2472	-12.17	≤8
802.11g mode			
Low	2412	-13.72	≤8
Middle	2437	-13.95	≤8
High	2472	-14.11	≤8
802.11n-HT20 mode			
Low	2412	-13.77	≤8
Middle	2437	-14.03	≤8
High	2472	-14.27	≤8
802.11n-HT40 mode			
Low	2422	-17.33	≤8
Middle	2437	-16.28	≤8
High	2462	-17.13	≤8
BLE mode			
Low	2402	-17.03	≤8
Middle	2440	-17.20	≤8
High	2480	-17.75	≤8

Power Spectral Density, 802.11b Low Channel



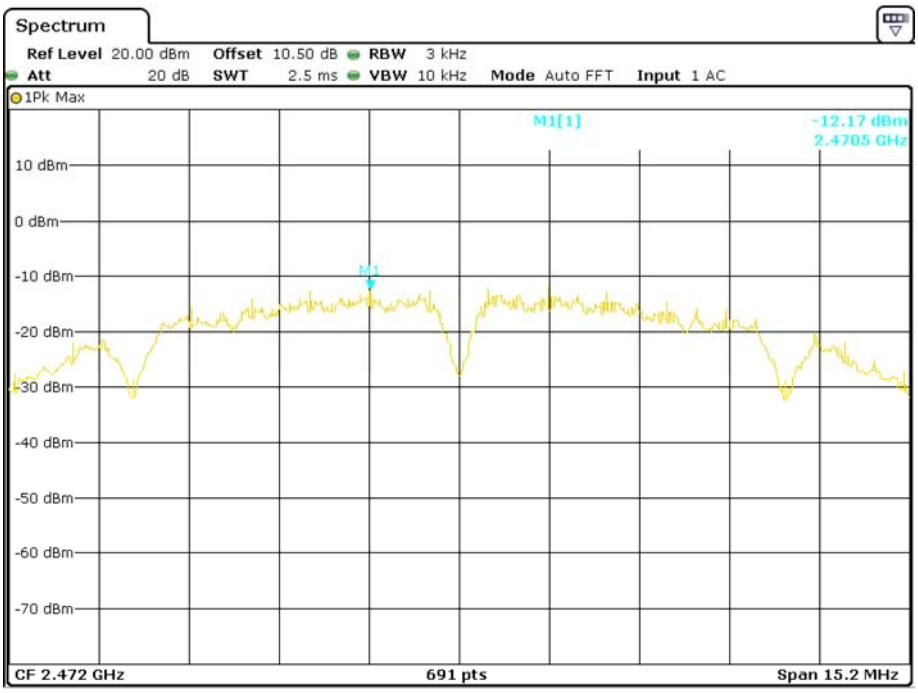
Date: 10.SEP.2015 14:20:48

Power Spectral Density, 802.11b Middle Channel



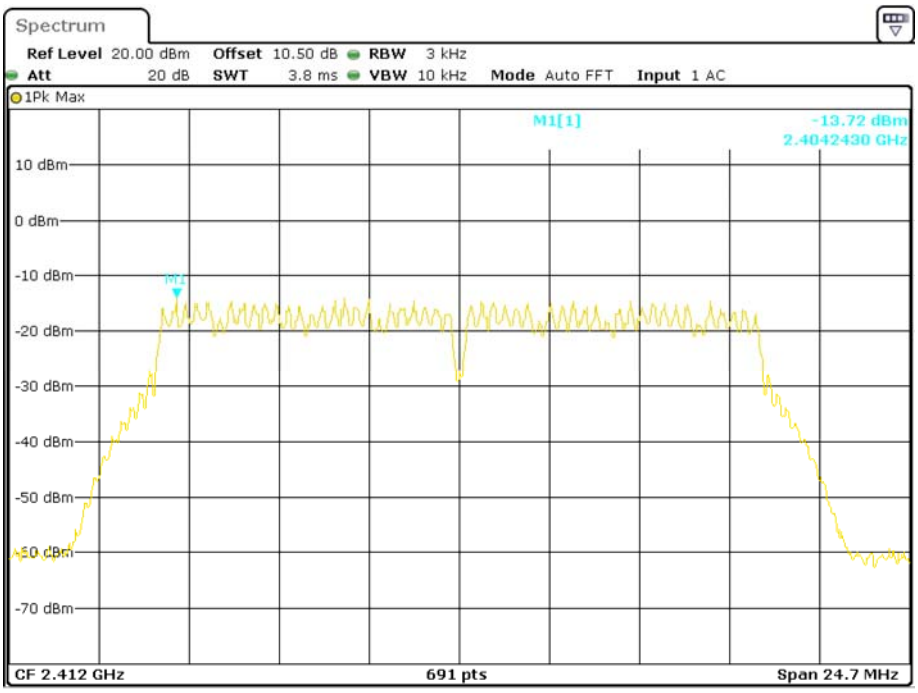
Date: 10.SEP.2015 14:22:00

Power Spectral Density, 802.11b High Channel



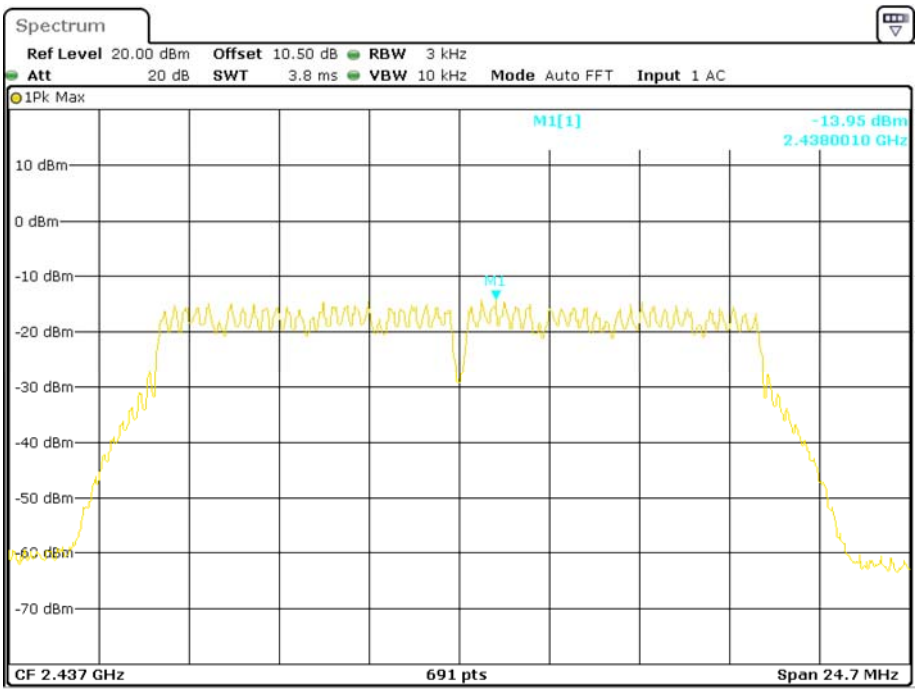
Date: 10.SEP.2015 14:33:01

Power Spectral Density, 802.11g Low Channel



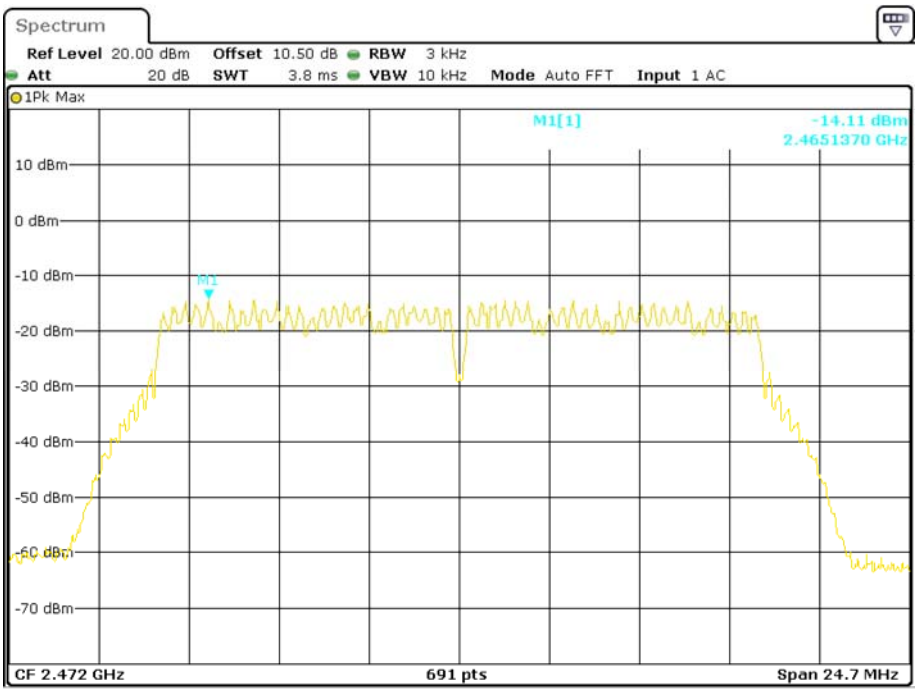
Date: 10.SEP.2015 14:18:21

Power Spectral Density, 802.11g Middle Channel



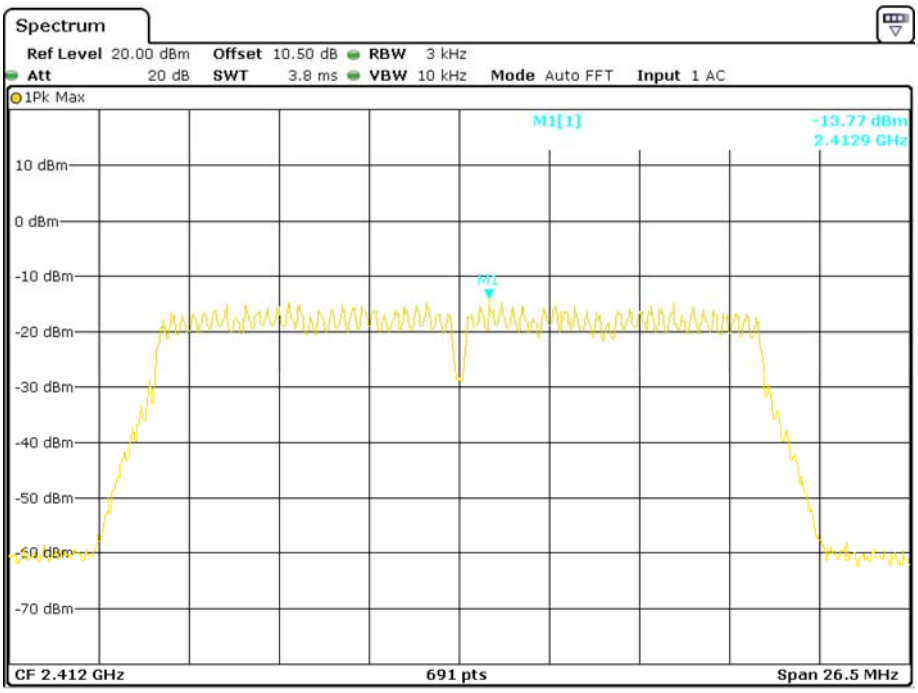
Date: 10.SEP.2015 14:17:32

Power Spectral Density, 802.11g High Channel



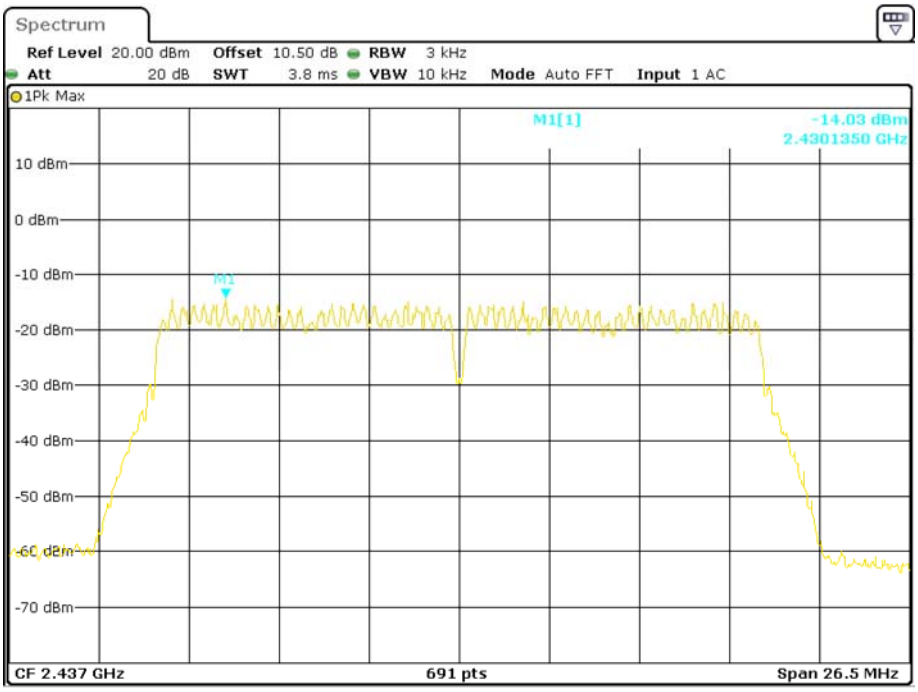
Date: 10.SEP.2015 14:16:38

Power Spectral Density, 802.11n-HT20 Low Channel



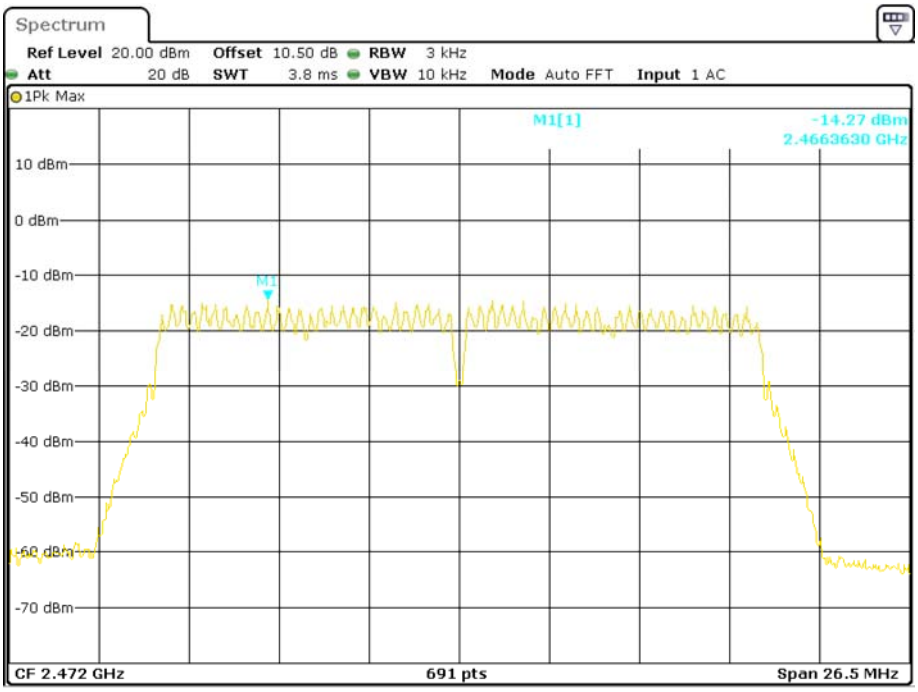
Date: 10.SEP.2015 14:12:24

Power Spectral Density, 802.11n-HT20 Middle Channel



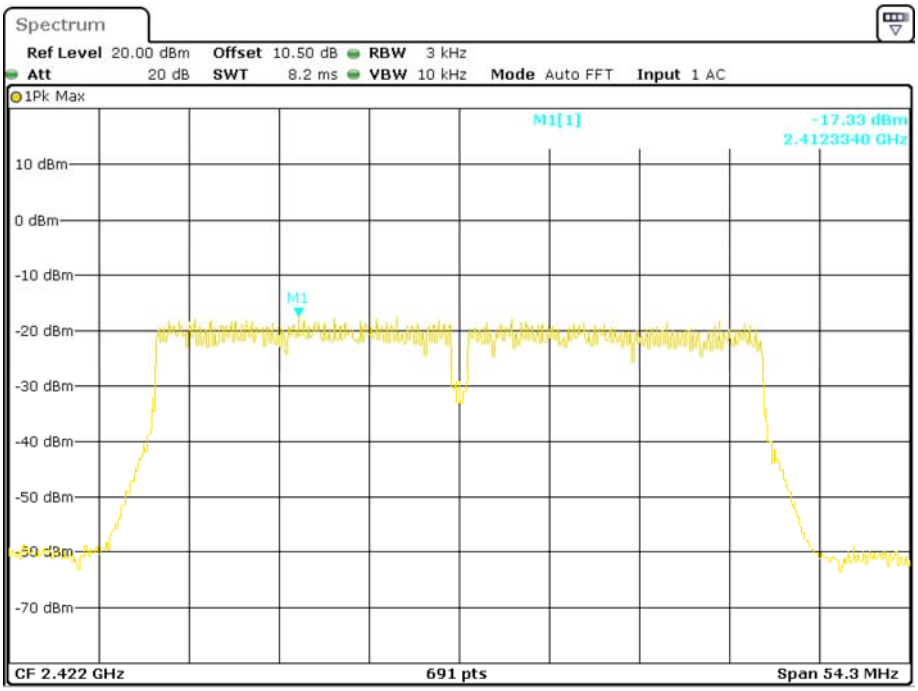
Date: 10.SEP.2015 14:13:12

Power Spectral Density, 802.11n-HT20 High Channel



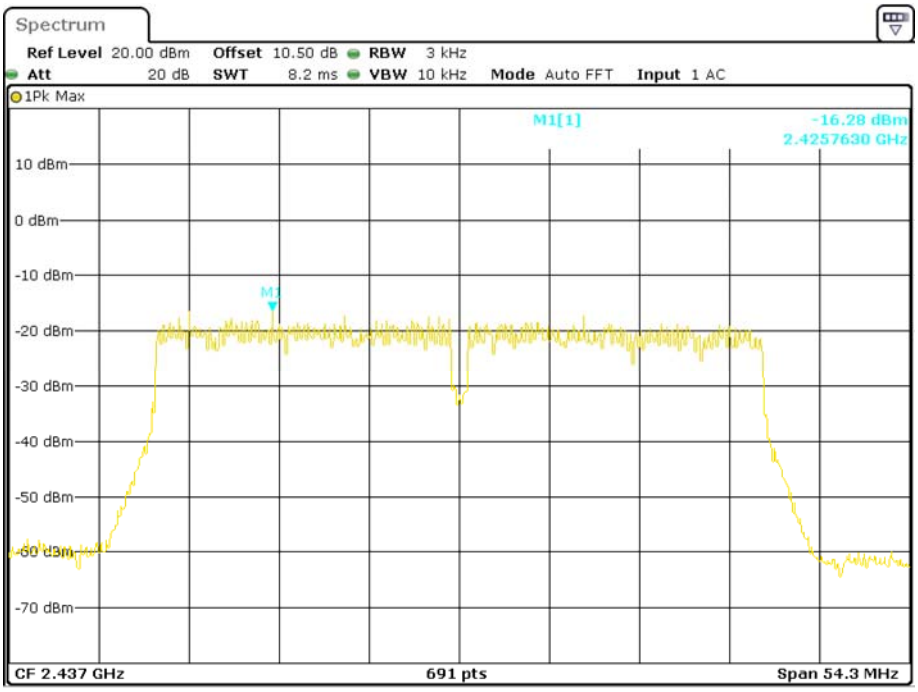
Date: 10.SEP.2015 14:14:16

Power Spectral Density, 802.11n-HT40 Low Channel



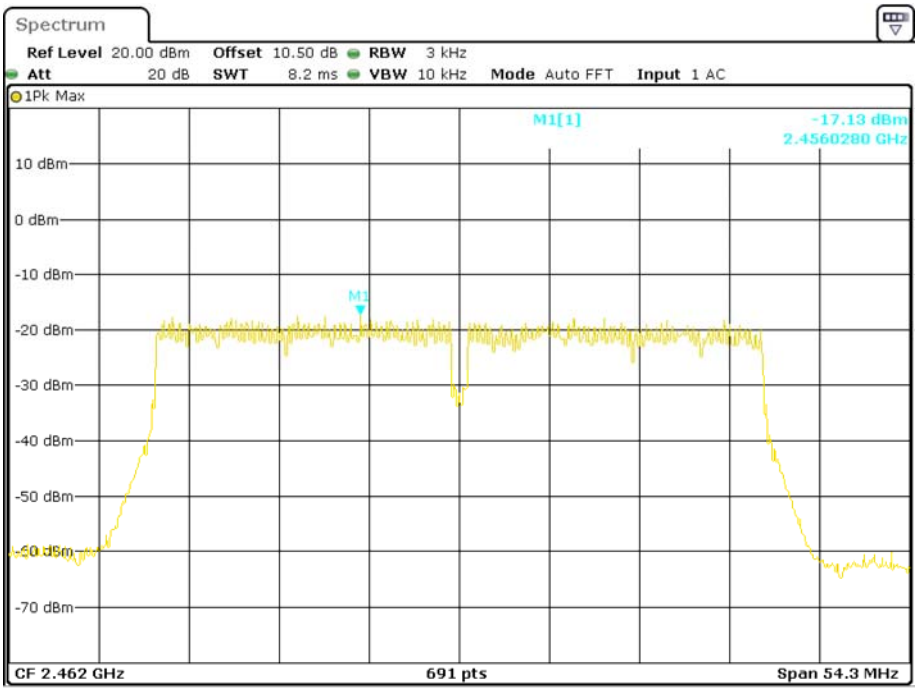
Date: 10.SEP.2015 14:08:13

Power Spectral Density, 802.11n-HT40 Middle Channel



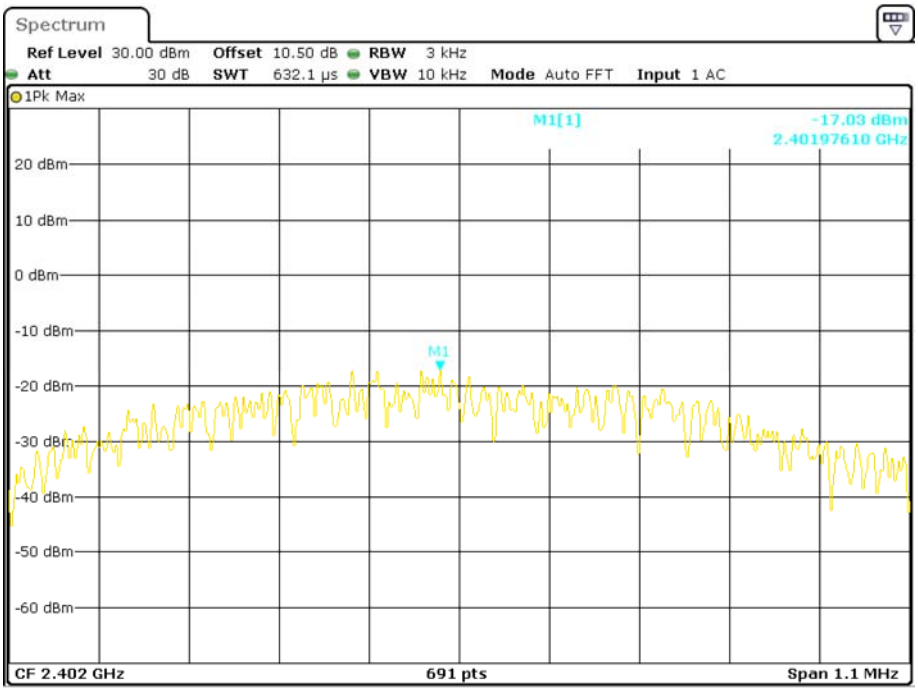
Date: 10.SEP.2015 14:06:29

Power Spectral Density, 802.11n-HT40 High Channel



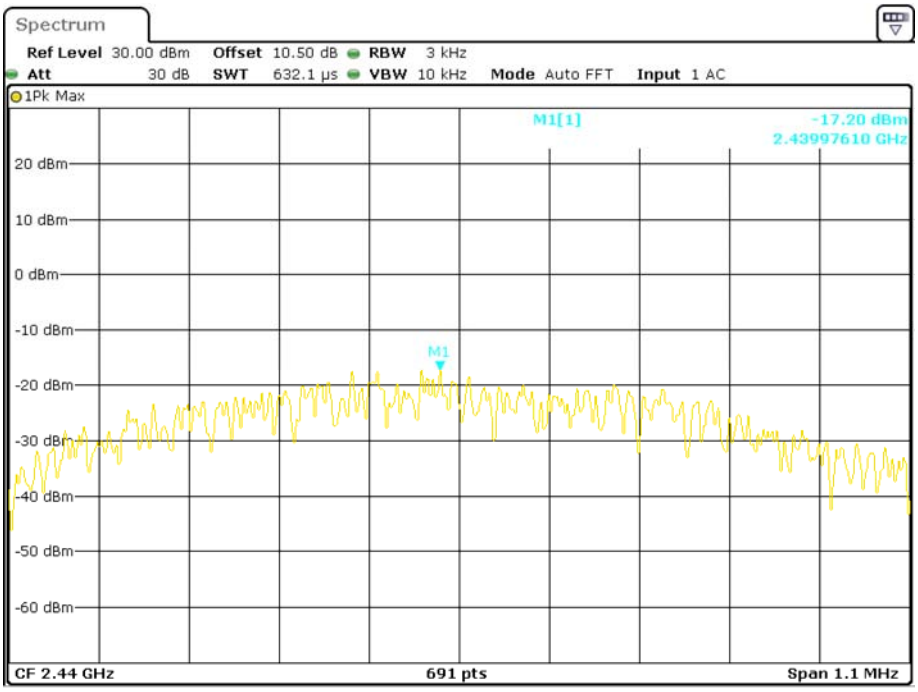
Date: 10.SEP.2015 14:04:45

Power Spectral Density, BLE Low Channel



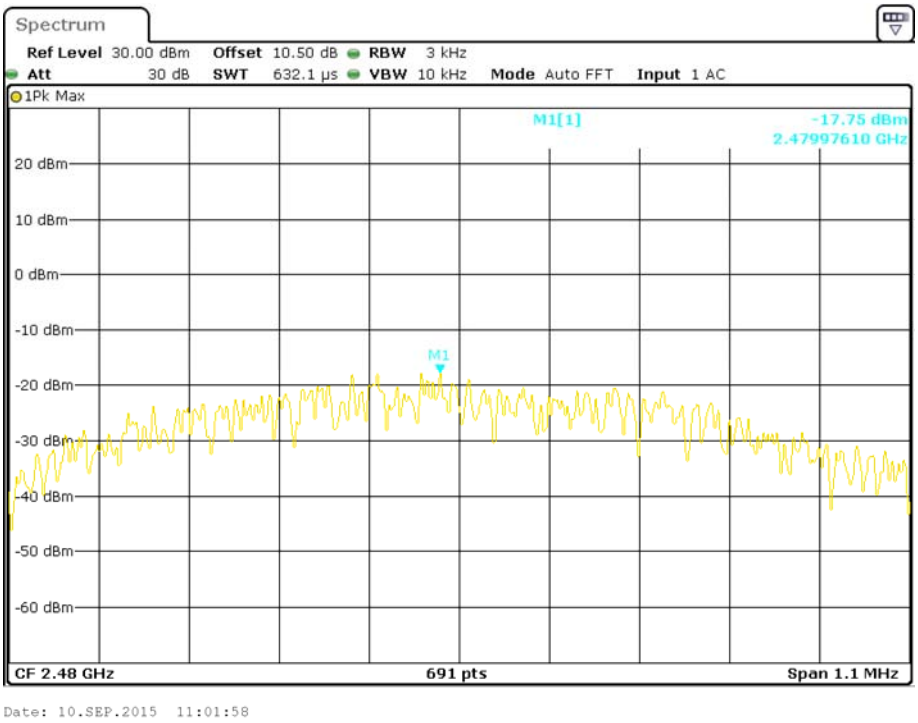
Date: 10.SEP.2015 11:03:37

Power Spectral Density, BLE Middle Channel



Date: 10.SEP.2015 11:03:09

Power Spectral Density, BLE High Channel



PRODUCT SIMILARITY DECLARATION LETTER

SWAGTEK
10205 NW 19th Street STE101, Miami, Florida 33172 United States
Tel: 1-305 421 9938 Fax: 1-305 471 9011

2015-9-18

Product Similarity Declaration

To Whom It May Concern,

We, SWAGTEK, hereby declare that we have a product named as Smart Phone(Model number: X4) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (X4plus;X40E;Ruby;Gem;V4) on reports and certificate, only the model name are difference. No other changes are made to them.
We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

Signature:

Charles Cheng

Manager

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