

FCC PART 15.247

TEST REPORT

For

HONG KONG IPRO TECHNOLOGY CO.,LIMITED

FLAT/RM A3, 9/F SILVERCORP INT TOWER 707-713 NATHAN RD MONGKOK, HONGKONG

FCC ID: PQ4IPROELITE

Report Type: Original Report	Product Type: Smart Mobile Phone
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *HONG KONG IPRO TECHNOLOGY CO.,LIMITED*'s product, model number: *ELITE (FCC ID: PQ4IPROELITE)* (or the "EUT") in this report was a *Smart Mobile Phone*, which was measured approximately: 14.4 cm (L) x8.2 cm (W) x7.33 cm (H), rated input voltage: DC3.7V rechargeable Li-ion battery or DC5V charging from adapter.

Adapter information:

Model: NTR-S01

Input: AC100-240V, 50/60Hz, 150mA

Output: DC 5.0V, 700mA

** All measurement and test data in this report was gathered from production sample serial number: IPROELITE000001(Assigned by Applicant). The EUT was received on 2014-12-31.*

Objective

This report is prepared on behalf of *HONG KONG IPRO TECHNOLOGY CO.,LIMITED* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: PQ4IPROELITE

FCC Part 22H, 24E PCE submissions with FCC ID: PQ4IPROELITE

FCC Part 15C DSS submissions with FCC ID: PQ4IPROELITE

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal 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 February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

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

For Bluetooth LE mode, 40 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	...	...
...	...	...	...
...	...	...	...
..	...	38	2478
19	2440	39	2480

EUT was tested with channel 0, 19 and 39.

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

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

The software “RF test tool built-in the EUT” was used for testing. The worst condition (maximum power with 100% duty cycle) was setting by the software as following table:

Test Mode	Test Software	Engineer Mode-TX		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	14	14	14
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	14	14	14
802.11n ht20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	14	14	14
802.11n ht40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	16	16	16
BLE	Test Frequency	2402MHz	2440MHz	2480MHz
	BLE	N/A	N/A	N/A

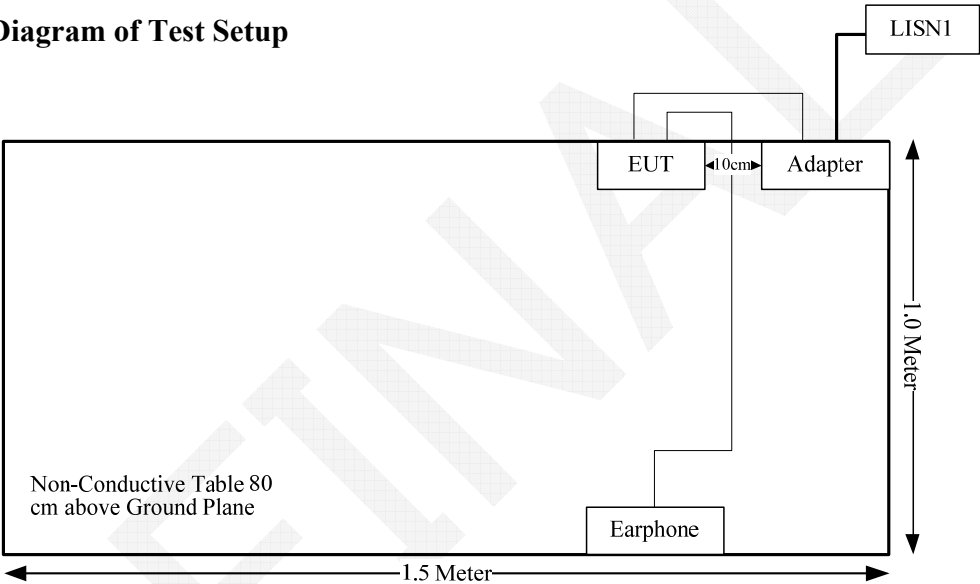
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Earphone Cable	No	No	1.1	Earphone Port of EUT	Earphone
USB Cable	Yes	No	1.0	USB Port of Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum conducted output power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE**Applicable Standard**

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

According to KDB447498 D01 General RF Exposure Guidance v05r02:

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

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

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

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

Measurement Result

The maximum conducted output power = 9.49 dBm (8.89 mW) at 2462 MHz
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})] [\sqrt{f(\text{GHz})}]$
 $= 8.89/5 \cdot (\sqrt{2.462}) = 2.79 < 3.0$

So the stand-alone SAR evaluation is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

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

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

Antenna Connector Construction

The EUT has one integral antenna arrangement for WiFi/BT, which was permanently attached and the antenna gain is 1.5 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

Measurement Uncertainty

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

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

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

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

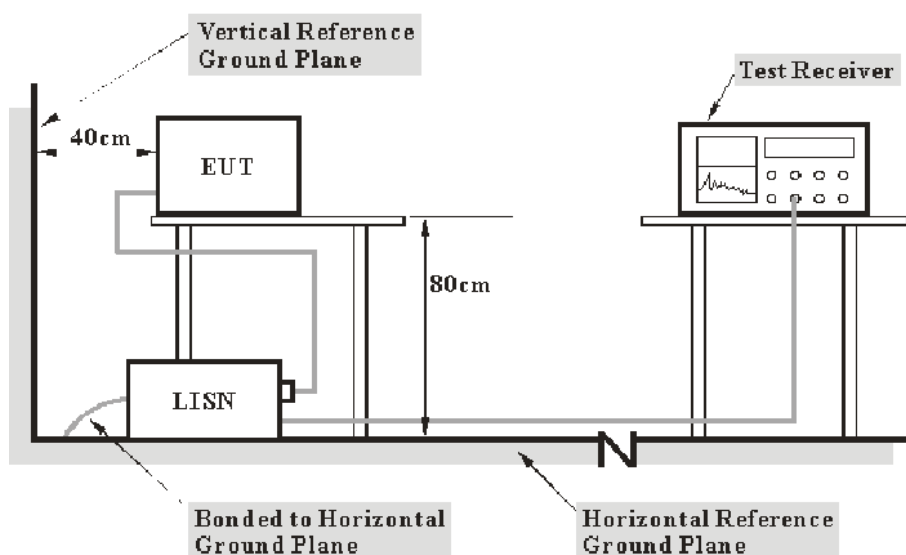
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

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

Table 1 – Values of U_{cispr}

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

EUT Setup



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

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2014-10-16	2015-10-16
R&S	L.I.S.N	ESH3-Z5	843331/015	N/A	N/A
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-01-22	2015-01-22
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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

Test Results Summary

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

3.6 dB at 0.499611 MHz in the **Line** conducted mode for BLE.

Test Data**Environmental Conditions**

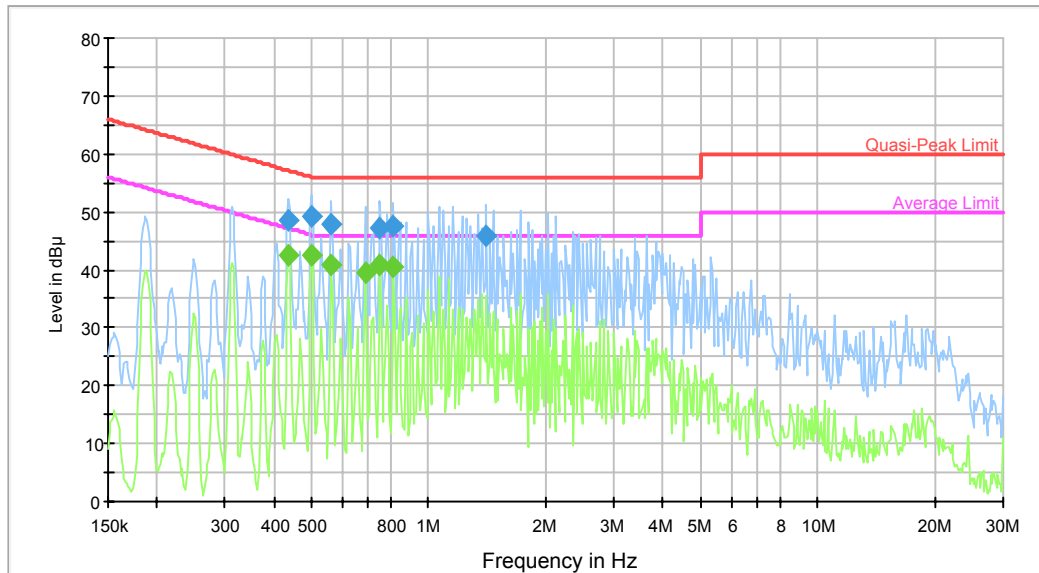
Temperature:	20.8 °C
Relative Humidity:	43 %
ATM Pressure:	100.8 kPa

The testing was performed by Sevin Li on 2015-01-04.

Test Mode: Chrging&Transmitting

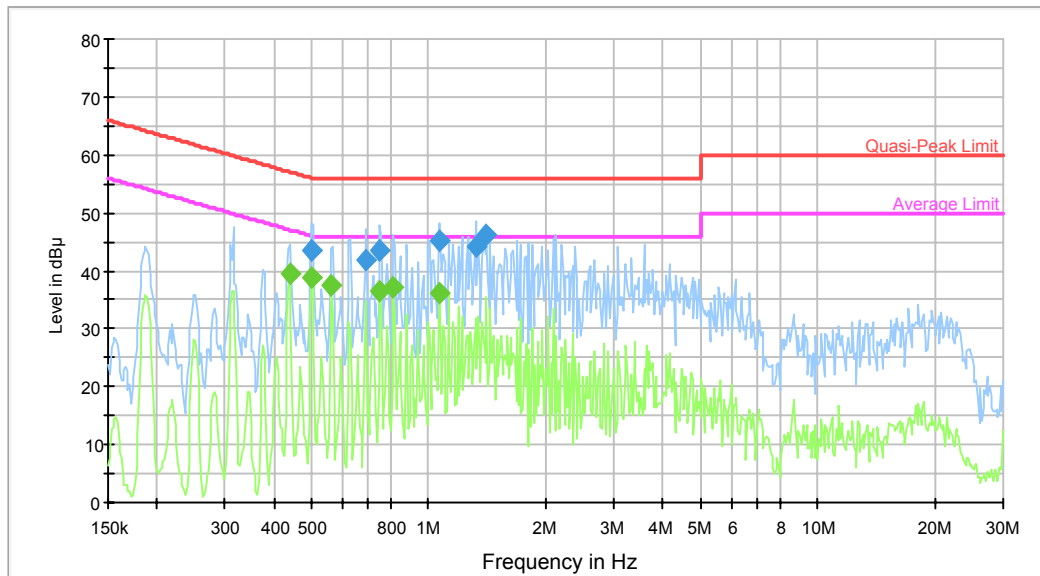
BLE:

AC120 V, 60 Hz, Line:



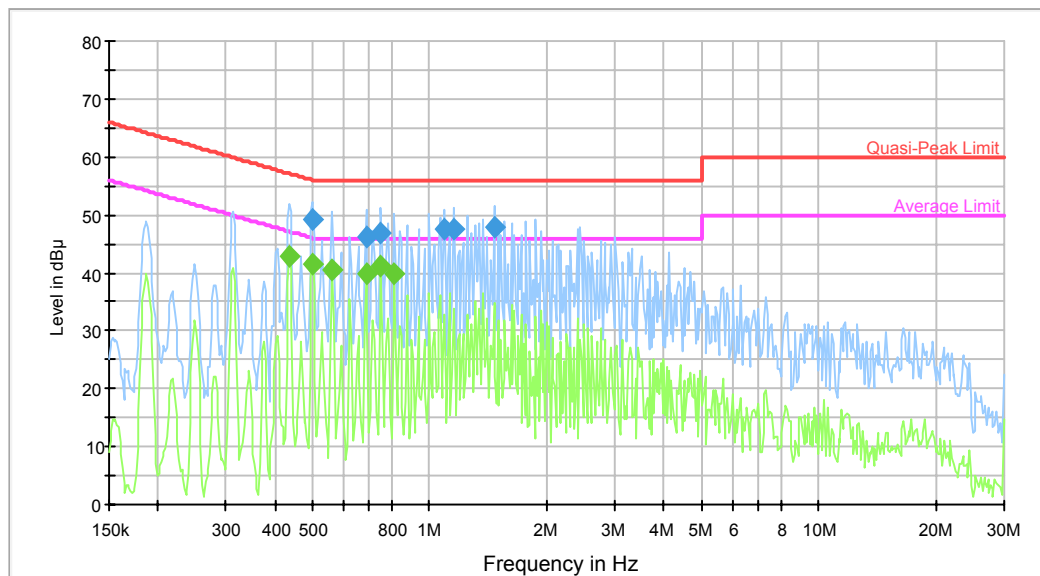
Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.436318	48.6	9.000	L1	10.5	8.6	57.1	Compliance
0.499611	49.1	9.000	L1	10.4	6.9	56.0	Compliance
0.563041	47.9	9.000	L1	10.4	8.1	56.0	Compliance
0.750100	47.3	9.000	L1	10.5	8.7	56.0	Compliance
0.812315	47.4	9.000	L1	10.5	8.6	56.0	Compliance
1.407671	45.8	9.000	L1	10.4	10.2	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.436318	42.6	9.000	L1	10.5	4.6	47.1	Compliance
0.499611	42.4	9.000	L1	10.4	3.6	46.0	Compliance
0.563041	40.8	9.000	L1	10.4	5.2	46.0	Compliance
0.687153	39.6	9.000	L1	10.6	6.4	46.0	Compliance
0.750100	40.7	9.000	L1	10.5	5.3	46.0	Compliance
0.812315	40.4	9.000	L1	10.5	5.6	46.0	Compliance

AC120 V, 60 Hz, Neutral:

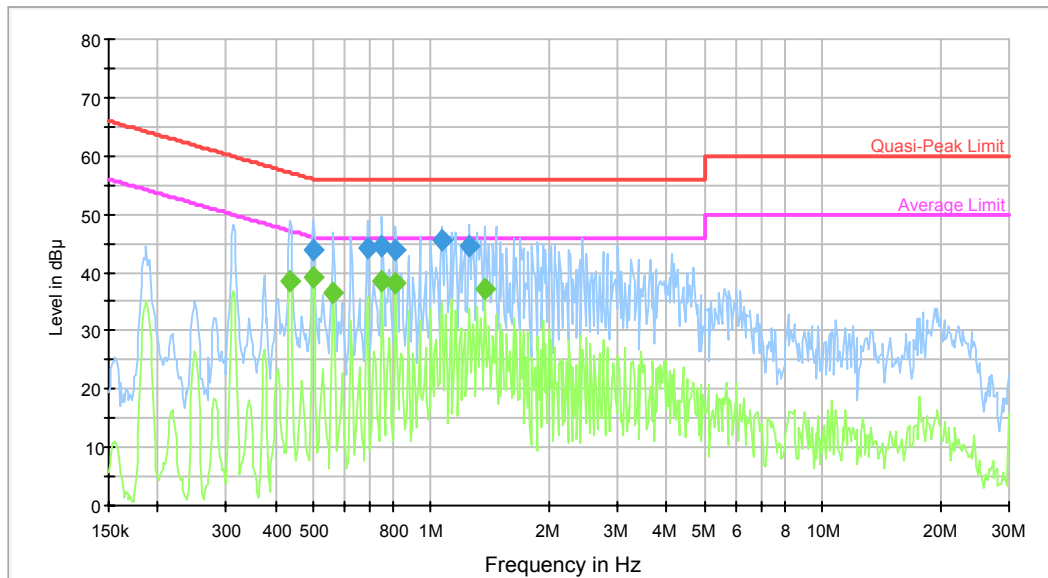
Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.499611	43.6	9.000	N	10.4	12.4	56.0	Compliance
0.692650	41.7	9.000	N	10.6	14.3	56.0	Compliance
0.750100	43.6	9.000	N	10.6	12.4	56.0	Compliance
1.065081	45.3	9.000	N	10.5	10.7	56.0	Compliance
1.320738	44.2	9.000	N	10.5	11.8	56.0	Compliance
1.407671	46.0	9.000	N	10.5	10.0	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.439808	39.5	9.000	N	10.6	7.6	47.1	Compliance
0.499611	38.8	9.000	N	10.4	7.3	46.0	Compliance
0.563041	37.3	9.000	N	10.4	8.7	46.0	Compliance
0.750100	36.6	9.000	N	10.6	9.4	46.0	Compliance
0.812315	37.2	9.000	N	10.5	8.8	46.0	Compliance
1.065081	36.2	9.000	N	10.5	9.8	46.0	Compliance

WiFi:**AC120 V, 60 Hz, Line:**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.499611	49.2	9.000	L1	10.4	6.8	56.0	Compliance
0.687153	46.1	9.000	L1	10.6	9.9	56.0	Compliance
0.750100	47.0	9.000	L1	10.5	9.0	56.0	Compliance
1.090848	47.4	9.000	L1	10.4	8.6	56.0	Compliance
1.153421	47.7	9.000	L1	10.4	8.3	56.0	Compliance
1.464886	48.0	9.000	L1	10.4	8.0	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.436318	42.8	9.000	L1	10.5	4.4	47.1	Compliance
0.499611	41.4	9.000	L1	10.4	4.6	46.0	Compliance
0.563041	40.5	9.000	L1	10.4	5.5	46.0	Compliance
0.687153	40.0	9.000	L1	10.6	6.0	46.0	Compliance
0.750100	41.3	9.000	L1	10.5	4.7	46.0	Compliance
0.812315	40.0	9.000	L1	10.5	6.0	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.499611	44.0	9.000	N	10.4	12.0	56.0	Compliance
0.687153	44.1	9.000	N	10.6	11.9	56.0	Compliance
0.750100	44.5	9.000	N	10.6	11.5	56.0	Compliance
0.812315	43.8	9.000	N	10.5	12.2	56.0	Compliance
1.065081	45.6	9.000	N	10.5	10.4	56.0	Compliance
1.249088	44.4	9.000	N	10.5	11.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.436318	38.5	9.000	N	10.6	8.6	47.1	Compliance
0.499611	39.2	9.000	N	10.4	6.8	46.0	Compliance
0.563041	36.6	9.000	N	10.4	9.4	46.0	Compliance
0.750100	38.4	9.000	N	10.6	7.6	46.0	Compliance
0.812315	38.1	9.000	N	10.5	7.9	46.0	Compliance
1.374420	37.1	9.000	N	10.5	8.9	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

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

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

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

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

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

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

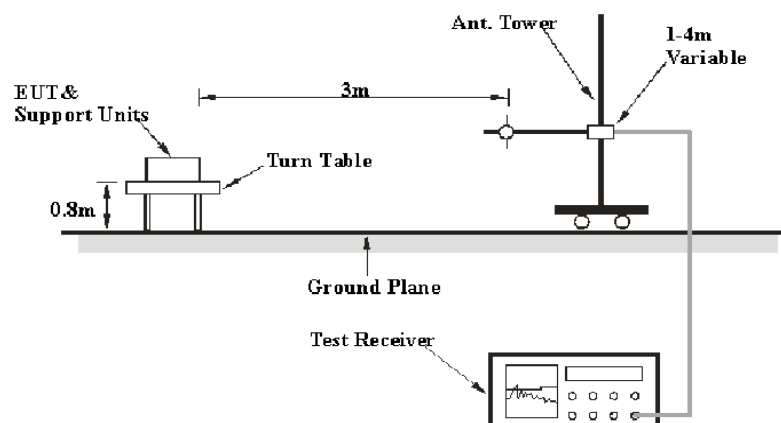
6G~18GHz: 5.23 dB

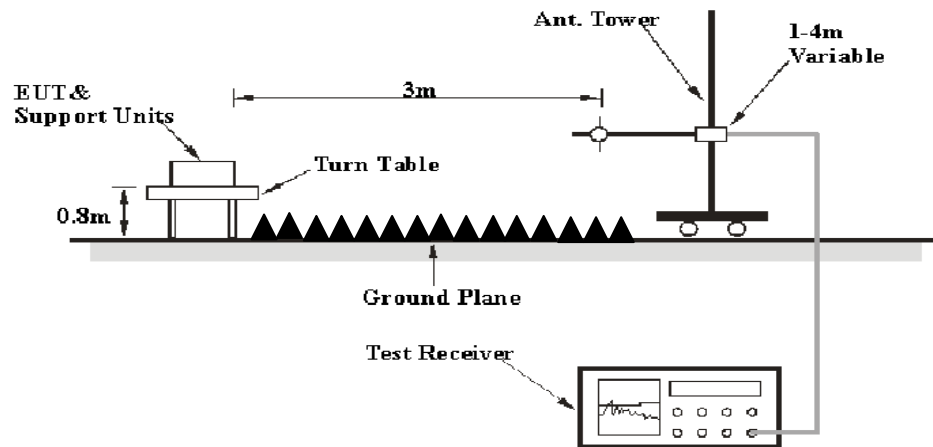
Table 2 – Values of U_{cisp}

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

EUT Setup

Below 1GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, and FCC 15.247 limits.

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	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
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2014-02-19	2015-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW- 18405536-JO	15964001001	2014-09-06	2015-09-06

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Equipment List and Details

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

Test Results Summary

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

3.56 dB at 2483.5MHz in the Vertical polarization for BLE Mode

Test Data**Environmental Conditions**

Temperature:	20.4°C
Relative Humidity:	58%
ATM Pressure:	101.4 kPa

The testing was performed by Sevin Li on 2015-01-07.

Test Mode: Transmitting

802.11b Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	62.83	PK	H	25.67	4.42	0.00	92.92	N/A	N/A
2412	58.64	AV	H	25.67	4.42	0.00	88.73	N/A	N/A
2412	60.78	PK	V	25.67	4.42	0.00	90.87	N/A	N/A
2412	56.91	AV	V	25.67	4.42	0.00	87.00	N/A	N/A
2390	26.13	PK	H	25.61	4.39	0.00	56.13	74.00	17.87
2390	14.36	AV	H	25.61	4.39	0.00	44.36	54.00	9.64
4824	34.27	PK	H	30.64	6.03	27.41	43.53	74.00	30.47
4824	22.11	AV	H	30.64	6.03	27.41	31.37	54.00	22.63
7236	32.77	PK	H	34.17	7.47	25.90	48.51	74.00	25.49
7236	21.17	AV	H	34.17	7.47	25.90	36.91	54.00	17.09
9648	31.28	PK	H	36.06	8.81	27.46	48.69	74.00	25.31
9648	19.5	AV	H	36.06	8.81	27.46	36.91	54.00	17.09
2445	34.83	PK	H	25.76	4.40	27.34	37.65	74.00	36.35
2445	22.24	AV	H	25.76	4.40	27.34	25.06	54.00	28.94
224.97	33.7	QP	H	11.68	1.82	21.47	25.73	46.00	20.27
Middle Channel: 2437 MHz									
2437	64.36	PK	H	25.74	4.41	0.00	94.51	N/A	N/A
2437	61.78	AV	H	25.74	4.41	0.00	91.93	N/A	N/A
2437	62.62	PK	V	25.74	4.41	0.00	92.77	N/A	N/A
2437	60.84	AV	V	25.74	4.41	0.00	90.99	N/A	N/A
4874	34.46	PK	H	30.77	6.09	27.42	43.90	74.00	30.10
4874	22.42	AV	H	30.77	6.09	27.42	31.86	54.00	22.14
7311	33.01	PK	H	34.35	7.51	25.88	48.99	74.00	25.01
7311	21.27	AV	H	34.35	7.51	25.88	37.25	54.00	16.75
9748	31.53	PK	H	36.30	8.83	27.24	49.42	74.00	24.58
9748	19.65	AV	H	36.30	8.83	27.24	37.54	54.00	16.46
2445	34.99	PK	H	25.76	4.40	27.34	37.81	74.00	36.19
2445	22.59	AV	H	25.76	4.40	27.34	25.41	54.00	28.59
1434	34.65	PK	H	23.43	3.14	27.14	34.08	74.00	39.92
1434	22.36	AV	H	23.43	3.14	27.14	21.79	54.00	32.21
224.97	33.3	QP	H	11.68	1.82	21.47	25.33	46.00	20.67
High Channel: 2462 MHz									
2462	65.36	PK	H	25.80	4.43	0.00	95.59	N/A	N/A
2462	61.28	AV	H	25.80	4.43	0.00	91.51	N/A	N/A
2462	63.56	PK	V	25.80	4.43	0.00	93.79	N/A	N/A
2462	56.39	AV	V	25.80	4.43	0.00	86.62	N/A	N/A
2483.5	27.96	PK	H	25.86	4.49	0.00	58.31	74.00	15.69
2483.5	15.14	AV	H	25.86	4.49	0.00	45.49	54.00	8.51
4924	35.51	PK	H	30.90	5.97	27.43	44.95	74.00	29.05
4924	23.68	AV	H	30.90	5.97	27.43	33.12	54.00	20.88
7386	33.17	PK	H	34.53	7.55	25.86	49.39	74.00	24.61
7386	21.43	AV	H	34.53	7.55	25.86	37.65	54.00	16.35
9848	31.85	PK	H	36.54	8.85	26.94	50.30	74.00	23.70
9848	19.78	AV	H	36.54	8.85	26.94	38.23	54.00	15.77
2445	35.31	PK	H	25.76	4.40	27.34	38.13	74.00	35.87
2445	22.79	AV	H	25.76	4.40	27.34	25.61	54.00	28.39
224.97	33.1	QP	H	11.68	1.82	21.47	25.13	46.00	20.87

802.11g Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	62.7	PK	H	25.67	4.42	0.00	92.79	N/A	N/A
2412	52.01	AV	H	25.67	4.42	0.00	82.10	N/A	N/A
2412	58.36	PK	V	25.67	4.42	0.00	88.45	N/A	N/A
2412	47.43	AV	V	25.67	4.42	0.00	77.52	N/A	N/A
2390	26.54	PK	H	25.61	4.39	0.00	56.54	74.00	17.46
2390	14.33	AV	H	25.61	4.39	0.00	44.33	54.00	9.67
4824	33.84	PK	H	30.64	6.03	27.41	43.10	74.00	30.90
4824	21.83	AV	H	30.64	6.03	27.41	31.09	54.00	22.91
7236	32.62	PK	H	34.17	7.47	25.90	48.36	74.00	25.64
7236	20.91	AV	H	34.17	7.47	25.90	36.65	54.00	17.35
9648	31.02	PK	H	36.06	8.81	27.46	48.43	74.00	25.57
9648	19.03	AV	H	36.06	8.81	27.46	36.44	54.00	17.56
2950	34.5	PK	H	27.07	6.91	27.54	40.94	74.00	33.06
2950	22.13	AV	H	27.07	6.91	27.54	28.57	54.00	25.43
224.97	31.2	QP	H	11.68	1.82	21.47	23.23	46.00	22.77
Low Channel: 2437 MHz									
2437	63.23	PK	H	25.74	4.41	0.00	93.38	N/A	N/A
2437	52.48	AV	H	25.74	4.41	0.00	82.63	N/A	N/A
2437	59.78	PK	V	25.74	4.41	0.00	89.93	N/A	N/A
2437	48.67	AV	V	25.74	4.41	0.00	78.82	N/A	N/A
4874	34.16	PK	H	30.77	6.09	27.42	43.60	74.00	30.40
4874	21.85	AV	H	30.77	6.09	27.42	31.29	54.00	22.71
7311	32.69	PK	H	34.35	7.51	25.88	48.67	74.00	25.33
7311	20.83	AV	H	34.35	7.51	25.88	36.81	54.00	17.19
9748	31.28	PK	H	36.30	8.83	27.24	49.17	74.00	24.83
9748	18.88	AV	H	36.30	8.83	27.24	36.77	54.00	17.23
2950	34.51	PK	H	27.07	6.91	27.54	40.95	74.00	33.05
2950	22	AV	H	27.07	6.91	27.54	28.44	54.00	25.56
1610	34.55	PK	H	23.82	3.27	27.80	33.84	74.00	40.16
1610	22.64	AV	H	23.82	3.27	27.80	21.93	54.00	32.07
224.97	31.5	QP	H	11.68	1.82	21.47	23.53	46.00	22.47
High Channel: 2462 MHz									
2462	64.73	PK	H	25.80	4.43	0.00	94.96	N/A	N/A
2462	54.75	AV	H	25.80	4.43	0.00	84.98	N/A	N/A
2462	60.98	PK	V	25.80	4.43	0.00	91.21	N/A	N/A
2462	49.99	AV	V	25.80	4.43	0.00	80.22	N/A	N/A
2483.5	28.13	PK	H	25.86	4.49	0.00	58.48	74.00	15.52
2483.5	15.64	AV	H	25.86	4.49	0.00	45.99	54.00	8.01
4924	34.08	PK	H	30.90	5.97	27.43	43.52	74.00	30.48
4924	21.9	AV	H	30.90	5.97	27.43	31.34	54.00	22.66
7386	32.55	PK	H	34.53	7.55	25.86	48.77	74.00	25.23
7386	21.05	AV	H	34.53	7.55	25.86	37.27	54.00	16.73
9848	31	PK	H	36.54	8.85	26.94	49.45	74.00	24.55
9848	18.92	AV	H	36.54	8.85	26.94	37.37	54.00	16.63
2950	34.44	PK	H	27.07	6.91	27.54	40.88	74.00	33.12
2950	21.83	AV	H	27.07	6.91	27.54	28.27	54.00	25.73
224.97	31.8	QP	H	11.68	1.82	21.47	23.83	46.00	22.17

802.11 n ht20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	61.39	PK	H	25.67	4.42	0.00	91.48	N/A	N/A
2412	50.28	AV	H	25.67	4.42	0.00	80.37	N/A	N/A
2412	57.41	PK	V	25.67	4.42	0.00	87.50	N/A	N/A
2412	46.53	AV	V	25.67	4.42	0.00	76.62	N/A	N/A
2390	26.33	PK	H	25.61	4.39	0.00	56.33	74.00	17.67
2390	14.1	AV	H	25.61	4.39	0.00	44.10	54.00	9.90
4824	33.24	PK	H	30.64	6.03	27.41	42.50	74.00	31.50
4824	21.02	AV	H	30.64	6.03	27.41	30.28	54.00	23.72
7236	32.14	PK	H	34.17	7.47	25.90	47.88	74.00	26.12
7236	20.33	AV	H	34.17	7.47	25.90	36.07	54.00	17.93
9648	30.57	PK	H	36.06	8.81	27.46	47.98	74.00	26.02
9648	18.34	AV	H	36.06	8.81	27.46	35.75	54.00	18.25
1336	33.87	PK	H	23.17	3.00	26.94	33.10	74.00	40.90
1336	21.45	AV	H	23.17	3.00	26.94	20.68	54.00	33.32
224.97	31.6	QP	H	11.68	1.82	21.47	23.63	46.00	22.37
Middle Channel: 2437 MHz									
2437	61.67	PK	H	25.74	4.41	0.00	91.82	N/A	N/A
2437	52.2	AV	H	25.74	4.41	0.00	82.35	N/A	N/A
2437	59.24	PK	V	25.74	4.41	0.00	89.39	N/A	N/A
2437	47.97	AV	V	25.74	4.41	0.00	78.12	N/A	N/A
4874	33.68	PK	H	30.77	6.09	27.42	43.12	74.00	30.88
4874	21.44	AV	H	30.77	6.09	27.42	30.88	54.00	23.12
7311	32.38	PK	H	34.35	7.51	25.88	48.36	74.00	25.64
7311	20.71	AV	H	34.35	7.51	25.88	36.69	54.00	17.31
9748	30.86	PK	H	36.30	8.83	27.24	48.75	74.00	25.25
9748	18.63	AV	H	36.30	8.83	27.24	36.52	54.00	17.48
2955	34.08	PK	H	27.08	6.96	27.54	40.58	74.00	33.42
2955	21.65	AV	H	27.08	6.96	27.54	28.15	54.00	25.85
1336	33.64	PK	H	23.17	3.00	26.94	32.87	74.00	41.13
1336	21.45	AV	H	23.17	3.00	26.94	20.68	54.00	33.32
224.97	31.7	QP	H	11.68	1.82	21.47	23.73	46.00	22.27
High Channel: 2462 MHz									
2462	63.52	PK	H	25.80	4.43	0.00	93.75	N/A	N/A
2462	53.36	AV	H	25.80	4.43	0.00	83.59	N/A	N/A
2462	60.43	PK	V	25.80	4.43	0.00	90.66	N/A	N/A
2462	49.36	AV	V	25.80	4.43	0.00	79.59	N/A	N/A
2483.5	26.66	PK	H	25.86	4.49	0.00	57.01	74.00	16.99
2483.5	14.25	AV	H	25.86	4.49	0.00	44.60	54.00	9.40
4924	34.08	PK	H	30.90	5.97	27.43	43.52	74.00	30.48
4924	21.66	AV	H	30.90	5.97	27.43	31.10	54.00	22.90
7386	32.78	PK	H	34.53	7.55	25.86	49.00	74.00	25.00
7386	21.07	AV	H	34.53	7.55	25.86	37.29	54.00	16.71
9848	31.34	PK	H	36.54	8.85	26.94	49.79	74.00	24.21
9848	19.11	AV	H	36.54	8.85	26.94	37.56	54.00	16.44
1336	34.27	PK	H	23.17	3.00	26.94	33.50	74.00	40.50
1336	22.02	AV	H	23.17	3.00	26.94	21.25	54.00	32.75
224.97	31.4	QP	H	11.68	1.82	21.47	23.43	46.00	22.57

802.11 n ht40 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	58.58	PK	H	25.70	4.41	0.00	88.69	N/A	N/A
2422	47.12	AV	H	25.70	4.41	0.00	77.23	N/A	N/A
2422	55.34	PK	V	25.70	4.41	0.00	85.45	N/A	N/A
2422	44.23	AV	V	25.70	4.41	0.00	74.34	N/A	N/A
2390	29.48	PK	H	25.61	4.39	0.00	59.48	74.00	14.52
2390	14.25	AV	H	25.61	4.39	0.00	44.25	54.00	9.75
4844	33.13	PK	H	30.69	6.08	27.42	42.48	74.00	31.52
4844	22.38	AV	H	30.69	6.08	27.42	31.73	54.00	22.27
7266	32.73	PK	H	34.24	7.48	25.89	48.56	74.00	25.44
7266	21.06	AV	H	34.24	7.48	25.89	36.89	54.00	17.11
9688	31.52	PK	H	36.15	8.82	27.37	49.12	74.00	24.88
9688	19.4	AV	H	36.15	8.82	27.37	37.00	54.00	17.00
2927	34.95	PK	H	27.01	6.71	27.54	41.13	74.00	32.87
2927	22.49	AV	H	27.01	6.71	27.54	28.67	54.00	25.33
224.97	31.9	QP	H	11.68	1.82	21.47	23.93	46.00	22.07
Middle Channel: 2437 MHz									
2437	60.18	PK	H	25.74	4.41	0.00	90.33	N/A	N/A
2437	48.36	AV	H	25.74	4.41	0.00	78.51	N/A	N/A
2437	57.34	PK	V	25.74	4.41	0.00	87.49	N/A	N/A
2437	45.29	AV	V	25.74	4.41	0.00	75.44	N/A	N/A
4874	34.86	PK	H	30.77	6.09	27.42	44.30	74.00	29.70
4874	22.65	AV	H	30.77	6.09	27.42	32.09	54.00	21.91
7311	33.41	PK	H	34.35	7.51	25.88	49.39	74.00	24.61
7311	21.37	AV	H	34.35	7.51	25.88	37.35	54.00	16.65
9748	31.7	PK	H	36.30	8.83	27.24	49.59	74.00	24.41
9748	19.71	AV	H	36.30	8.83	27.24	37.60	54.00	16.40
2927	35.16	PK	H	27.01	6.71	27.54	41.34	74.00	32.66
2927	22.68	AV	H	27.01	6.71	27.54	28.86	54.00	25.14
2993	33.82	PK	H	27.18	7.36	27.53	40.83	74.00	33.17
2993	21.64	AV	H	27.18	7.36	27.53	28.65	54.00	25.35
224.97	31.6	QP	H	11.68	1.82	21.47	23.63	46.00	22.37
High Channel: 2452 MHz									
2452	61.34	PK	H	25.78	4.41	0.00	91.53	N/A	N/A
2452	49.54	AV	H	25.78	4.41	0.00	79.73	N/A	N/A
2452	58.34	PK	V	25.78	4.41	0.00	88.53	N/A	N/A
2452	46.28	AV	V	25.78	4.41	0.00	76.47	N/A	N/A
2483.5	31.34	PK	H	25.86	4.49	0.00	61.69	74.00	12.31
2483.5	15.35	AV	H	25.86	4.49	0.00	45.70	54.00	8.30
4904	35.04	PK	H	30.85	6.06	27.43	44.52	74.00	29.48
4904	23.04	AV	H	30.85	6.06	27.43	32.52	54.00	21.48
7356	33.53	PK	H	34.45	7.53	25.87	49.64	74.00	24.36
7356	21.4	AV	H	34.45	7.53	25.87	37.51	54.00	16.49
9808	31.83	PK	H	36.44	8.84	27.09	50.02	74.00	23.98
9808	19.75	AV	H	36.44	8.84	27.09	37.94	54.00	16.06
2927	35.28	PK	H	27.01	6.71	27.54	41.46	74.00	32.54
2927	22.95	AV	H	27.01	6.71	27.54	29.13	54.00	24.87
224.97	31.8	QP	H	11.68	1.82	21.47	23.83	46.00	22.17

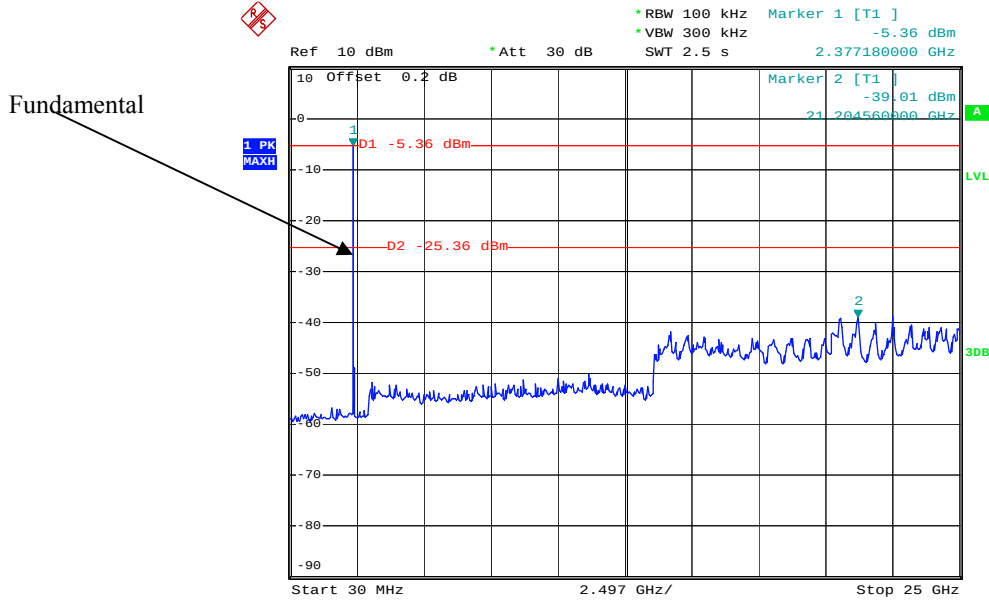
BLE Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2402 MHz									
2402	51.26	PK	H	25.65	4.42	0.00	81.33	N/A	N/A
2402	46.24	AV	H	25.65	4.42	0.00	76.31	N/A	N/A
2402	46.46	PK	V	25.65	4.42	0.00	76.53	N/A	N/A
2402	41.39	AV	V	25.65	4.42	0.00	71.46	N/A	N/A
2390	25.09	PK	H	25.61	4.39	0.00	55.09	74.00	18.91
2390	13.24	AV	H	25.61	4.39	0.00	43.24	54.00	10.76
4804	33.27	PK	H	30.59	5.98	27.41	42.43	74.00	31.57
4804	20.1	AV	H	30.59	5.98	27.41	29.26	54.00	24.74
7206	32.14	PK	H	34.09	7.45	25.91	47.77	74.00	26.23
7206	19.28	AV	H	34.09	7.45	25.91	34.91	54.00	19.09
9608	31.34	PK	H	35.96	8.80	27.55	48.55	74.00	25.45
9608	18.47	AV	H	35.96	8.80	27.55	35.68	54.00	18.32
3183	34.06	PK	H	27.79	6.97	27.38	41.44	74.00	32.56
3183	22.18	AV	H	27.79	6.97	27.38	29.56	54.00	24.44
194.9	29.8	QP	H	11.92	1.66	21.46	21.92	43.50	21.58
Middle Channel: 2440 MHz									
2440	52.31	PK	H	25.74	4.40	0.00	82.45	N/A	N/A
2440	47.08	AV	H	25.74	4.40	0.00	77.22	N/A	N/A
2440	47.12	PK	V	25.74	4.40	0.00	77.26	N/A	N/A
2440	42.24	AV	V	25.74	4.40	0.00	72.38	N/A	N/A
4880	33.42	PK	H	30.79	6.08	27.42	42.87	74.00	31.13
4880	19.99	AV	H	30.79	6.08	27.42	29.44	54.00	24.56
7320	31.95	PK	H	34.37	7.51	25.88	47.95	74.00	26.05
7320	19.62	AV	H	34.37	7.51	25.88	35.62	54.00	18.38
9760	31.31	PK	H	36.32	8.83	27.21	49.25	74.00	24.75
9760	18.36	AV	H	36.32	8.83	27.21	36.30	54.00	17.70
3183	34.2	PK	H	27.79	6.97	27.38	41.58	74.00	32.42
3183	22.29	AV	H	27.79	6.97	27.38	29.67	54.00	24.33
1835	36.51	PK	H	24.27	3.69	27.52	36.95	74.00	37.05
1835	33.44	AV	H	24.27	3.69	27.52	33.88	54.00	20.12
186.17	32.1	QP	H	11.37	1.64	21.45	23.66	43.50	19.84
224.97	28.6	QP	H	11.68	1.82	21.47	20.63	46.00	25.37
High Channel: 2480 MHz									
2480	53.24	PK	H	25.85	4.48	0.00	83.57	N/A	N/A
2480	48.31	AV	H	25.85	4.48	0.00	78.64	N/A	N/A
2480	47.67	PK	V	25.85	4.48	0.00	78.00	N/A	N/A
2480	42.49	AV	V	25.85	4.48	0.00	72.82	N/A	N/A
2483.5	33.17	PK	H	25.86	4.49	0.00	63.52	74.00	10.48
2483.5	20.09	AV	H	25.86	4.49	0.00	50.44	54.00	3.56 *
4960	32.23	PK	H	31.00	5.90	27.43	41.70	74.00	32.30
4960	19.32	AV	H	31.00	5.90	27.43	28.79	54.00	25.21
7440	31.43	PK	H	34.66	7.58	25.97	47.70	74.00	26.30
7440	18.29	AV	H	34.66	7.58	25.97	34.56	54.00	19.44
9920	34.11	PK	H	36.71	8.87	26.66	53.03	74.00	20.97
9920	22.09	AV	H	36.71	8.87	26.66	41.01	54.00	12.99
3183	33.64	PK	H	27.79	6.97	27.38	41.02	74.00	32.98
3183	21.56	AV	H	27.79	6.97	27.38	28.94	54.00	25.06
173.56	31.8	QP	V	11.59	1.56	21.44	23.51	43.50	19.99

*Within measurement uncertainty!

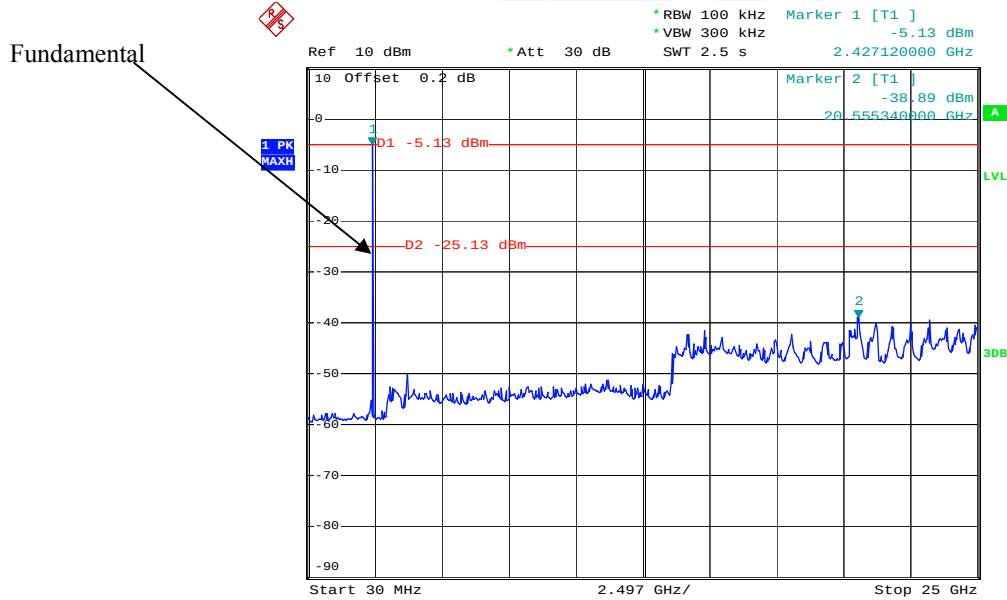
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



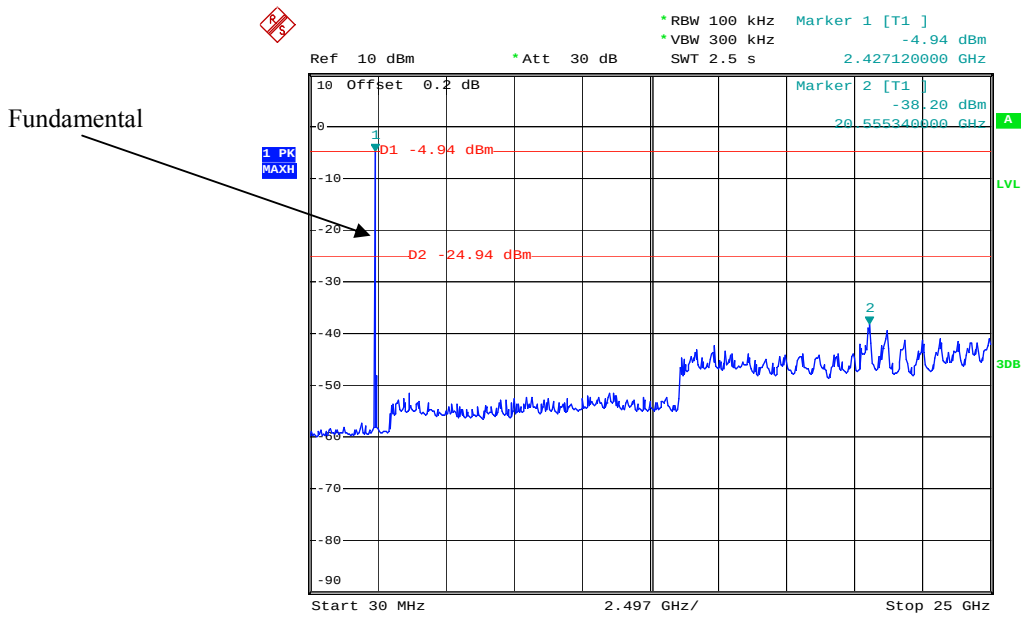
Date: 7.JAN.2015 15:49:46

802.11b Middle Channel



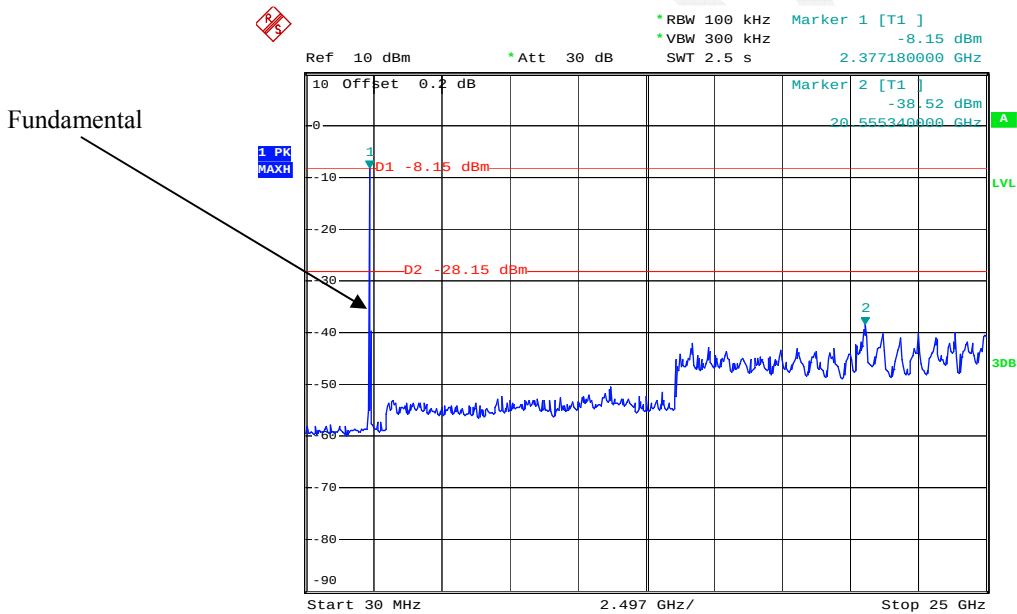
Date: 7.JAN.2015 15:51:03

802.11b High Channel



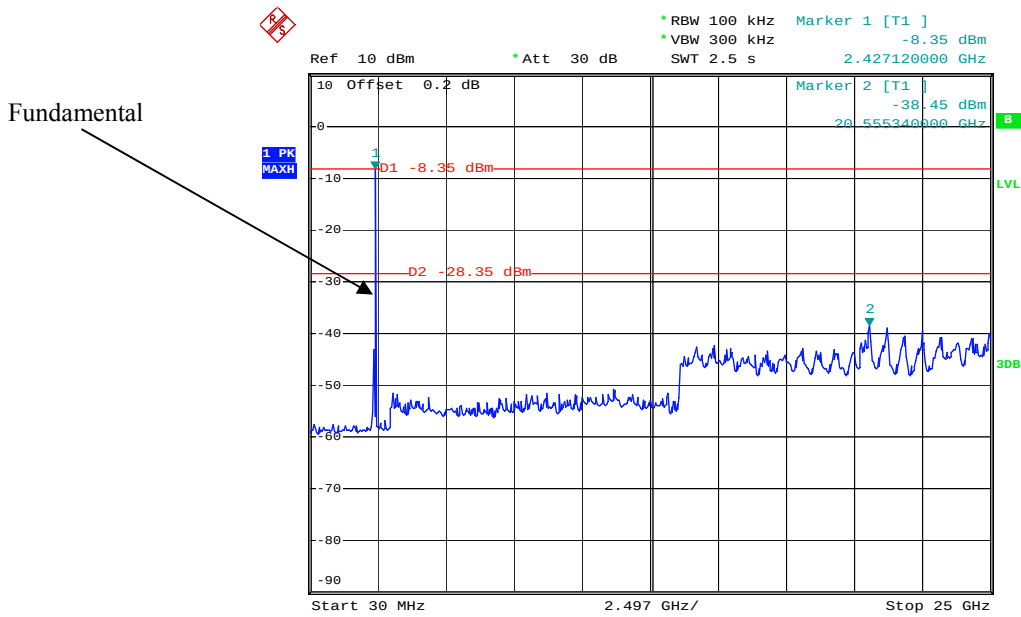
Date: 7.JAN.2015 15:51:58

802.11g Low Channel



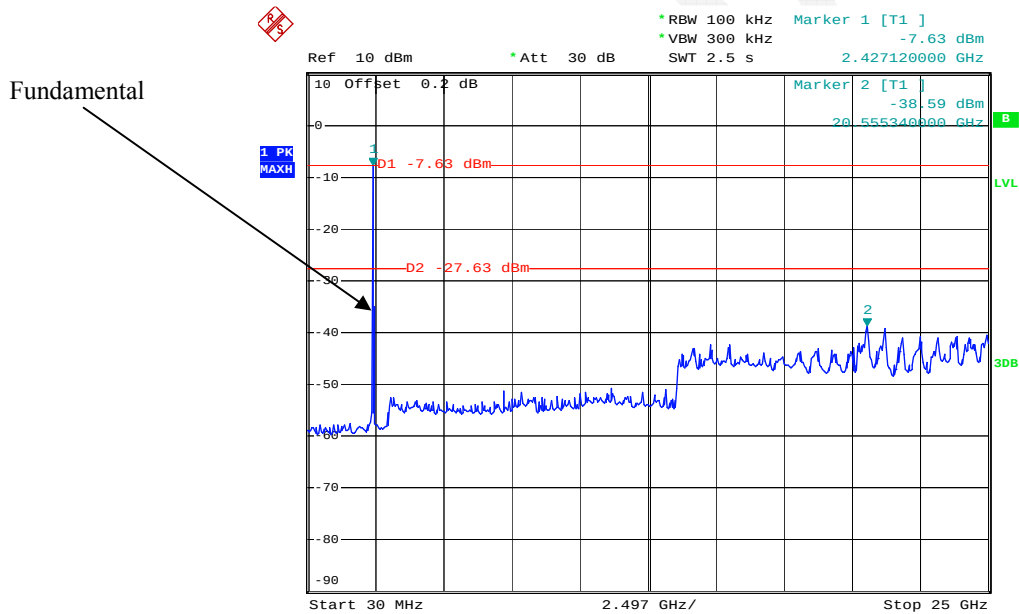
Date: 7.JAN.2015 15:53:07

802.11g Middle Channel



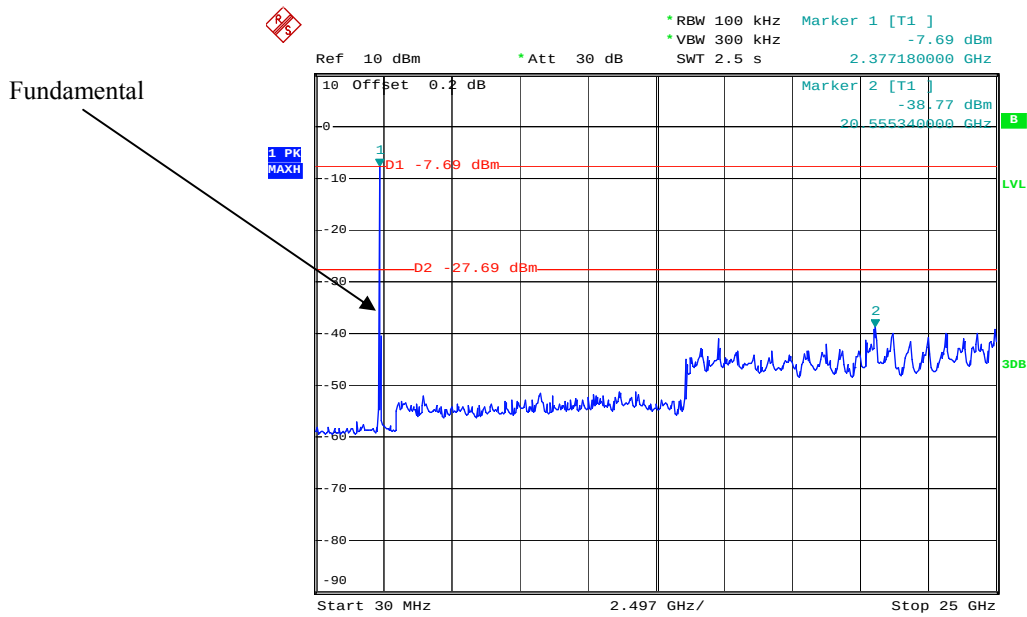
Date: 7.JAN.2015 15:57:42

802.11g High Channel



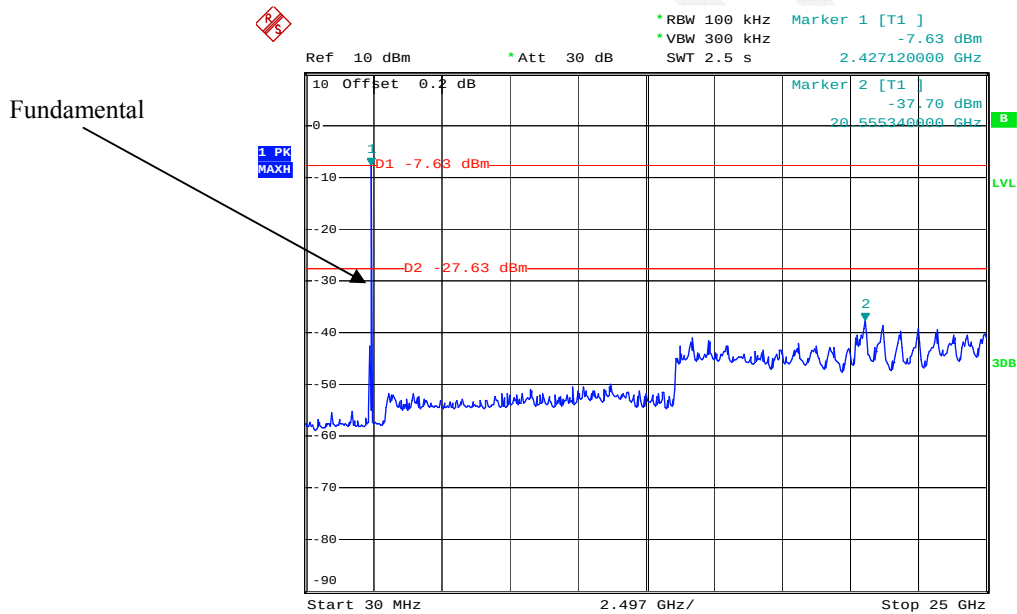
Date: 7.JAN.2015 15:59:16

802.11n ht20 Low Channel



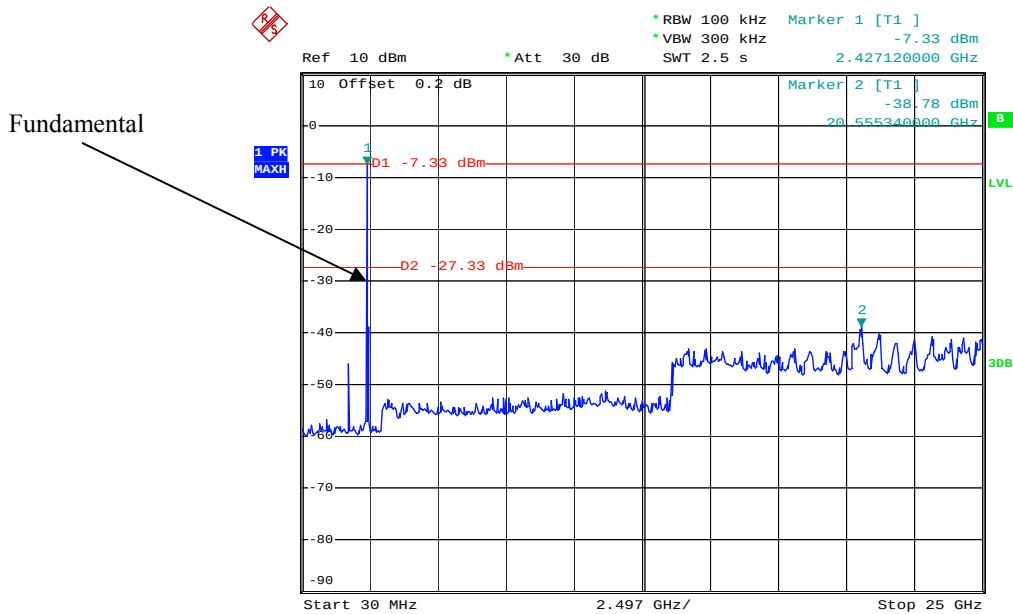
Date: 7.JAN.2015 16:00:47

802.11n ht20 Middle Channel



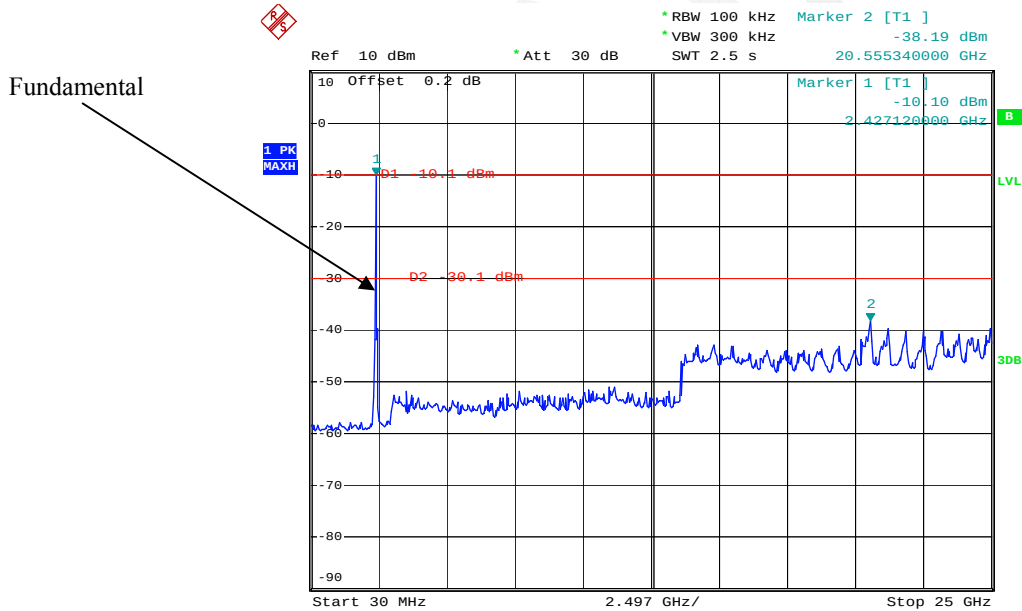
Date: 7.JAN.2015 16:12:13

802.11n ht20 High Channel



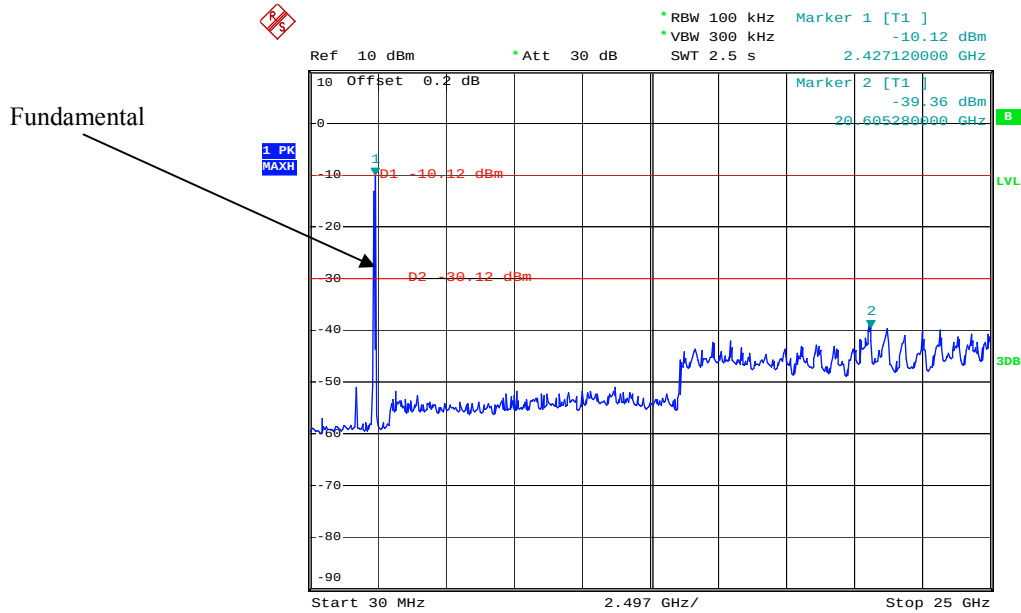
Date: 7.JAN.2015 16:13:43

802.11n ht40 Low Channel



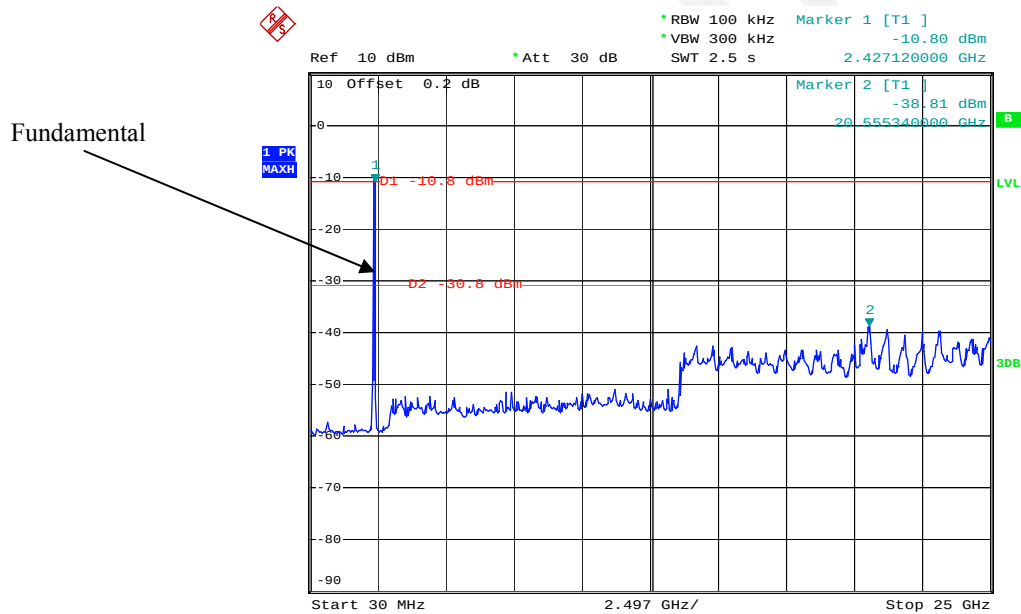
Date: 7.JAN.2015 16:54:09

802.11n ht40 Middle Channel



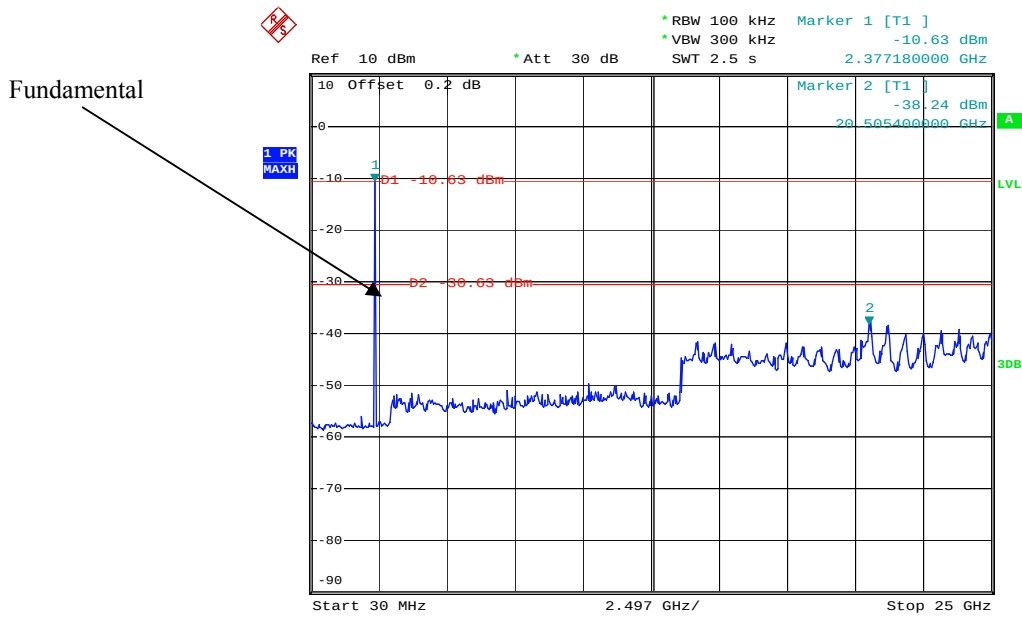
Date: 7.JAN.2015 16:55:15

802.11n ht40 High Channel



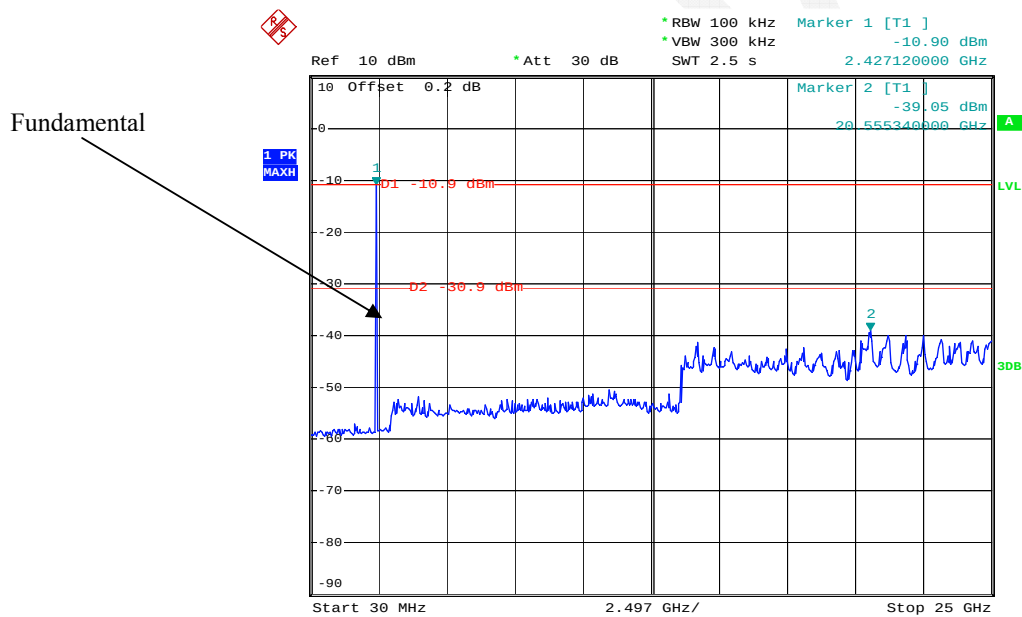
Date: 7.JAN.2015 16:56:19

BLE Low Channel



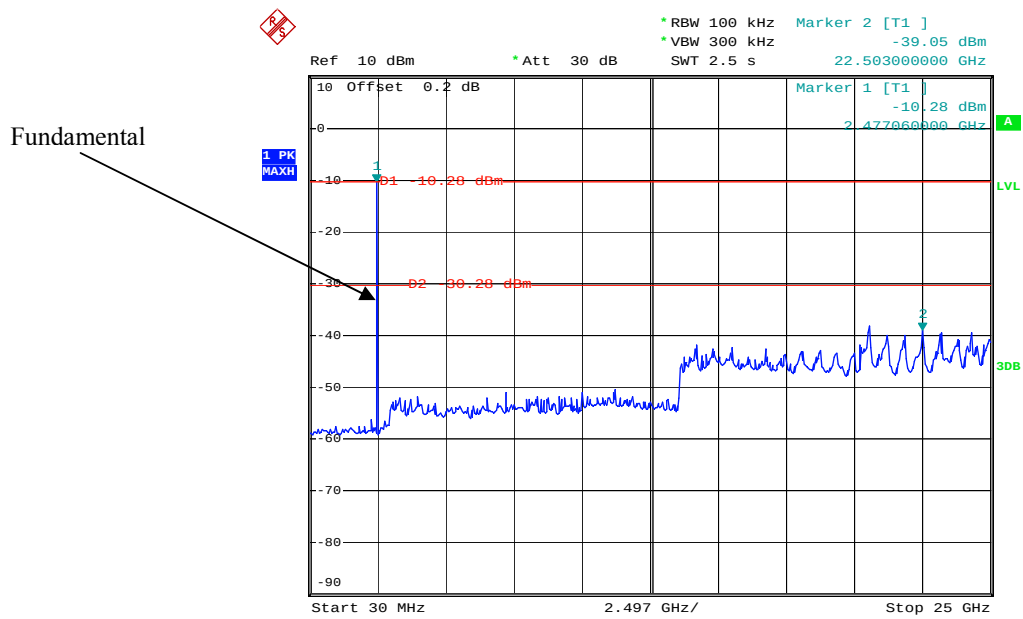
Date: 7.JAN.2015 11:47:39

BLE Middle Channel



Date: 7.JAN.2015 11:38:00

BLE High Channel



Date: 7.JAN.2015 11:36:15

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

According to KDB 558074 D01 DTS Meas Guidance v03r02 clause8.1 Option 1:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

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

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

Test Data

Environmental Conditions

Temperature:	24.1 °C
Relative Humidity:	58 %
ATM Pressure:	101.4kPa

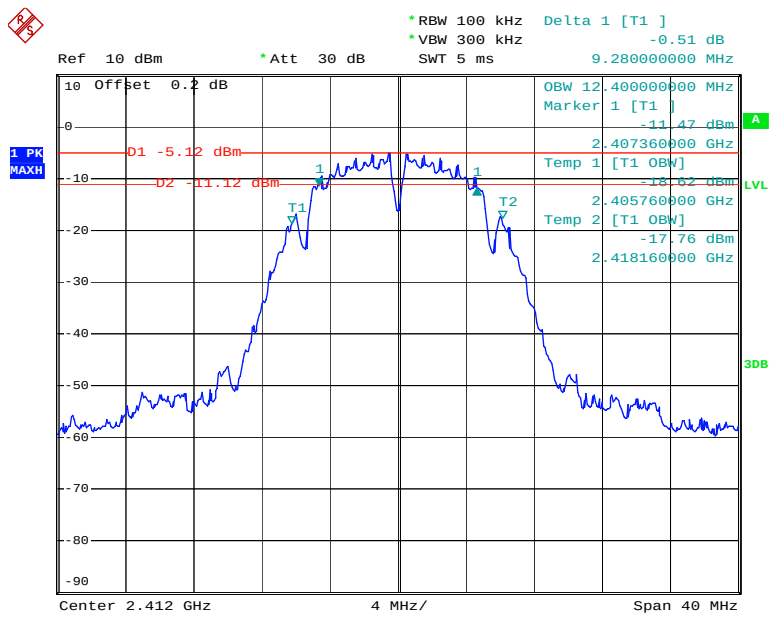
The testing was performed by Sevin Li on 2015-01-07.

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

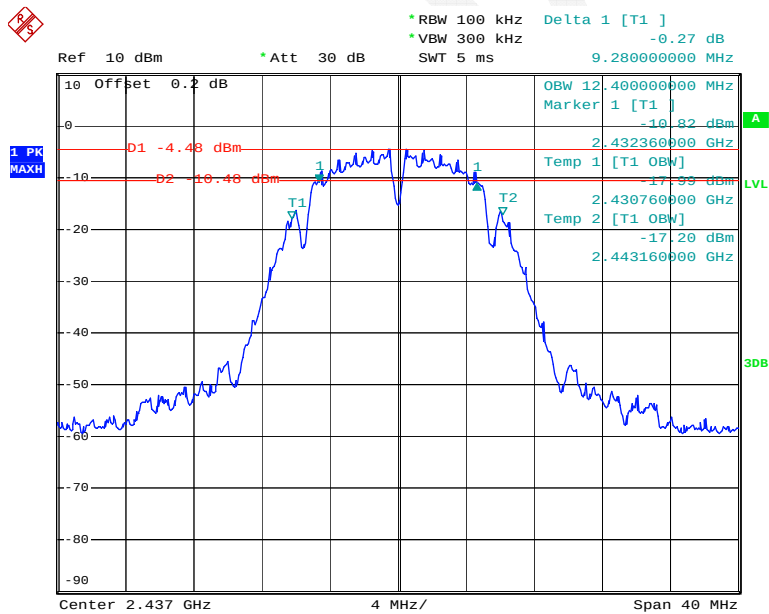
Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	9.28	≥ 0.5
	Middle	2437	9.28	≥ 0.5
	High	2462	9.28	≥ 0.5
802.11g	Low	2412	16.56	≥ 0.5
	Middle	2437	16.44	≥ 0.5
	High	2462	16.48	≥ 0.5
802.11n20	Low	2412	17.76	≥ 0.5
	Middle	2437	17.72	≥ 0.5
	High	2462	17.76	≥ 0.5
802.11n40	Low	2422	36.76	≥ 0.5
	Middle	2437	37.80	≥ 0.5
	High	2452	37.48	≥ 0.5
BLE	Low	2402	0.716	≥ 0.5
	Middle	2440	0.720	≥ 0.5
	High	2480	0.716	≥ 0.5

802.11b Low Channel



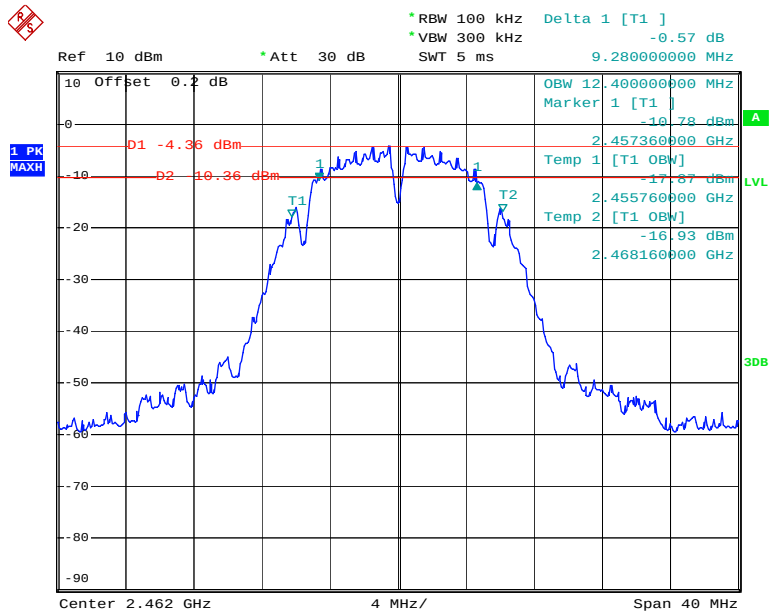
Date: 7.JAN.2015 14:21:46

802.11b Middle Channel



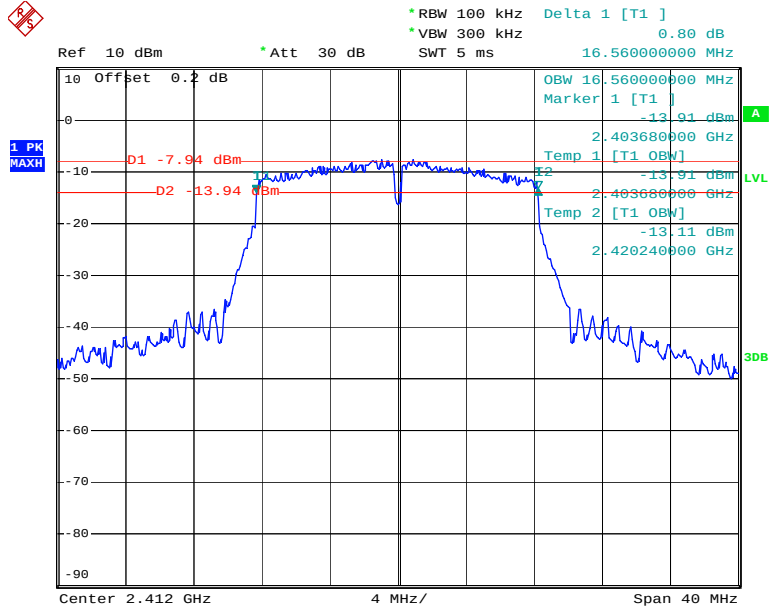
Date: 7.JAN.2015 14:23:12

802.11b High Channel



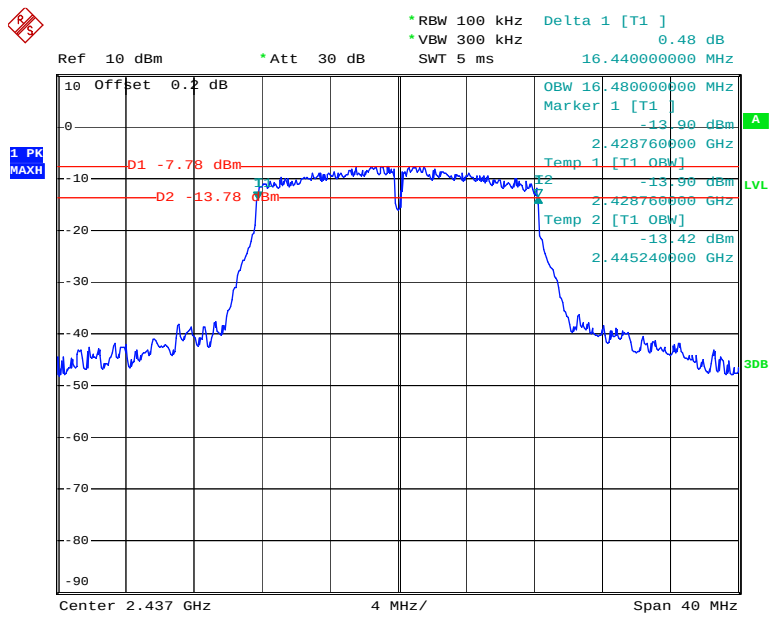
Date: 7.JAN.2015 14:24:17

802.11g Low Channel



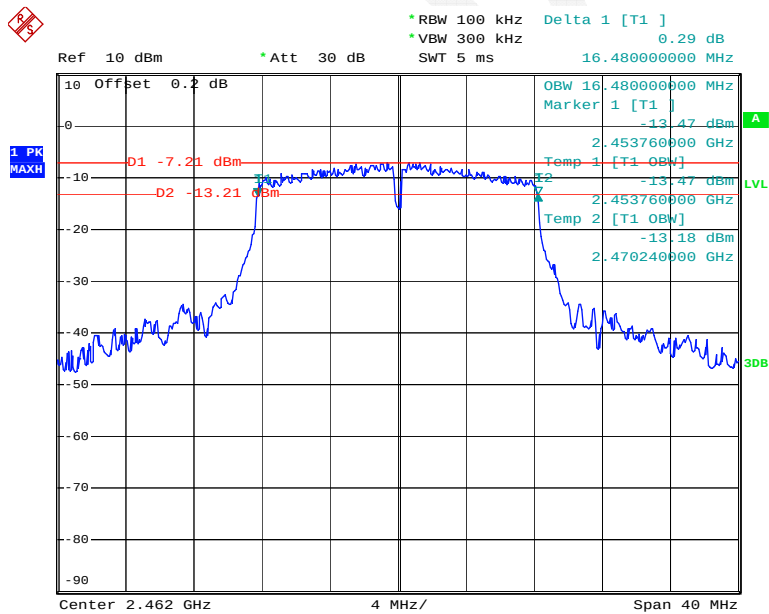
Date: 7.JAN.2015 14:53:42

802.11g Middle Channel



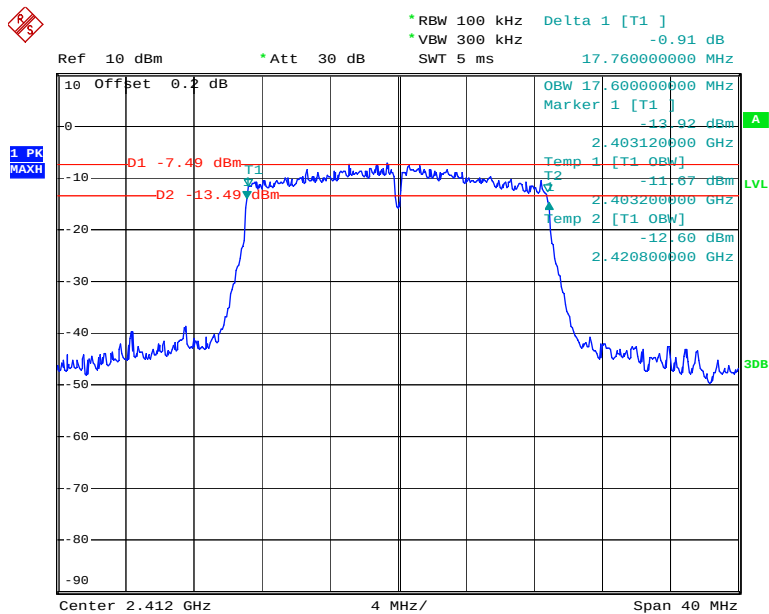
Date: 7.JAN.2015 14:54:59

802.11g High Channel



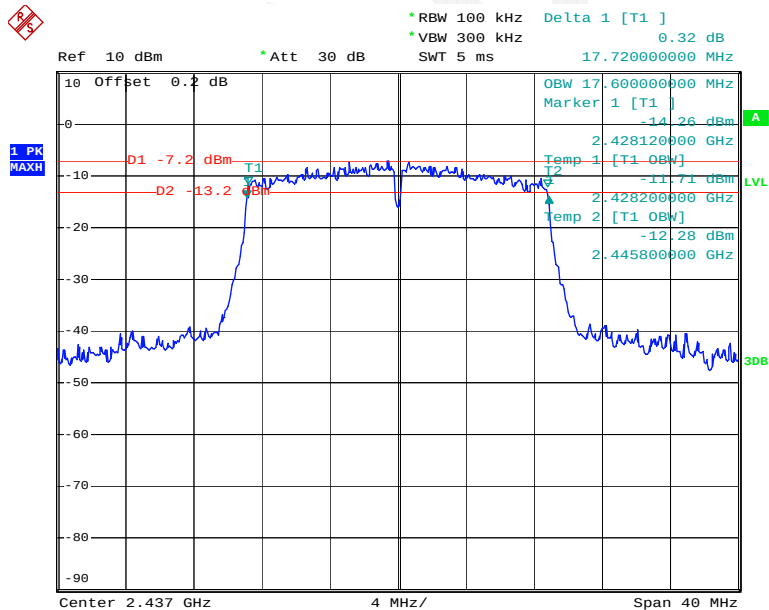
Date: 7.JAN.2015 14:56:14

802.11n ht20 Low Channel



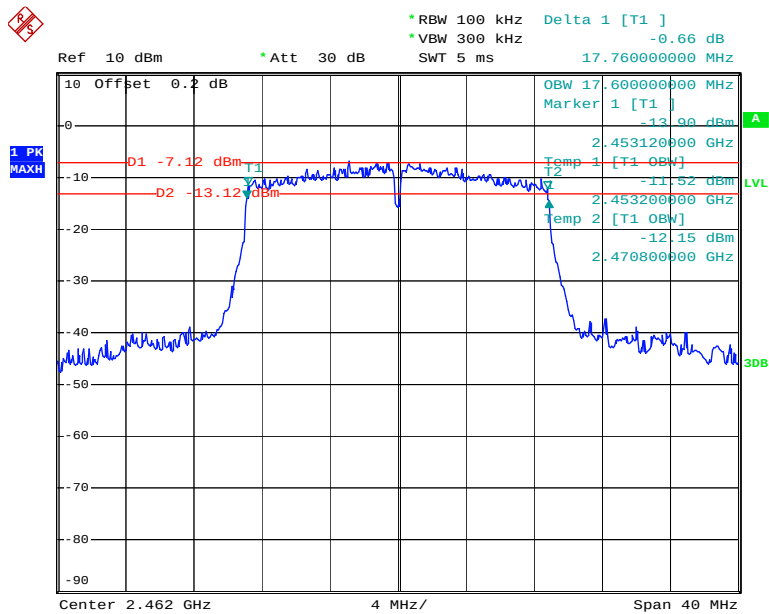
Date: 7.JAN.2015 14:57:50

802.11n ht20 Middle Channel



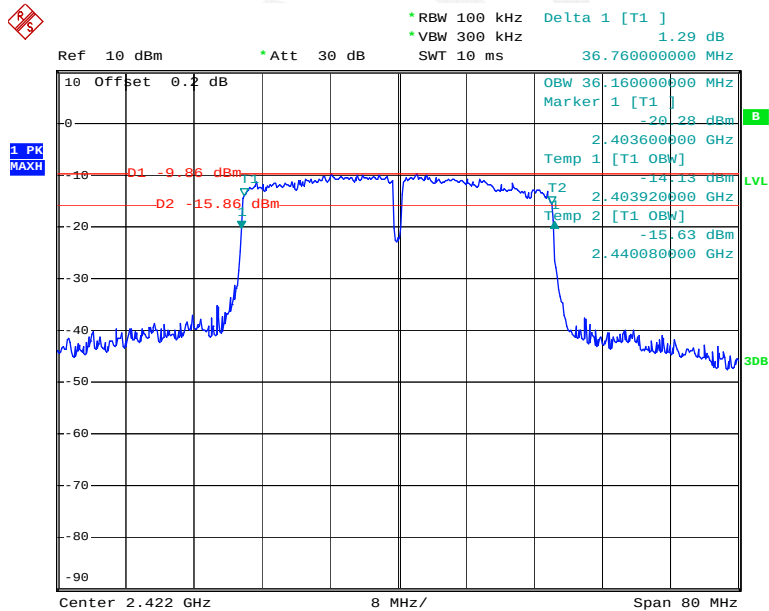
Date: 7.JAN.2015 15:00:09

802.11n ht20 High Channel



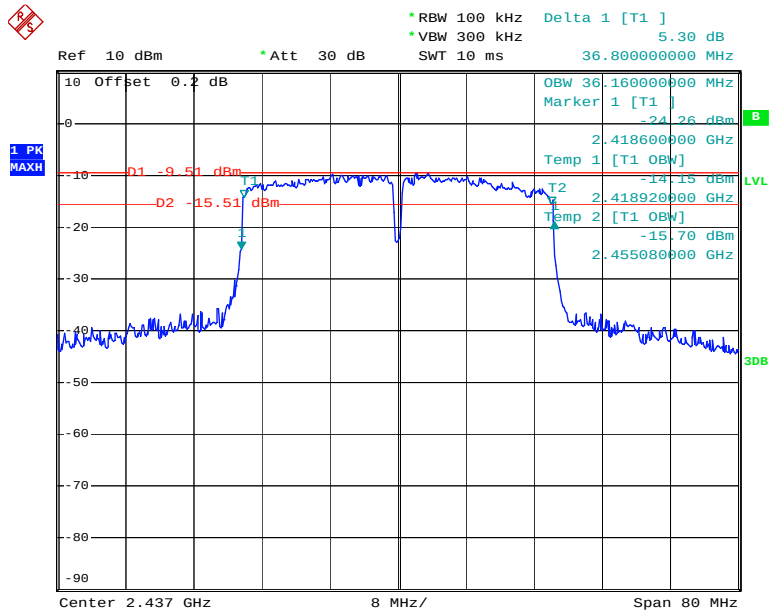
Date: 7.JAN.2015 15:07:42

802.11n ht40 Low Channel



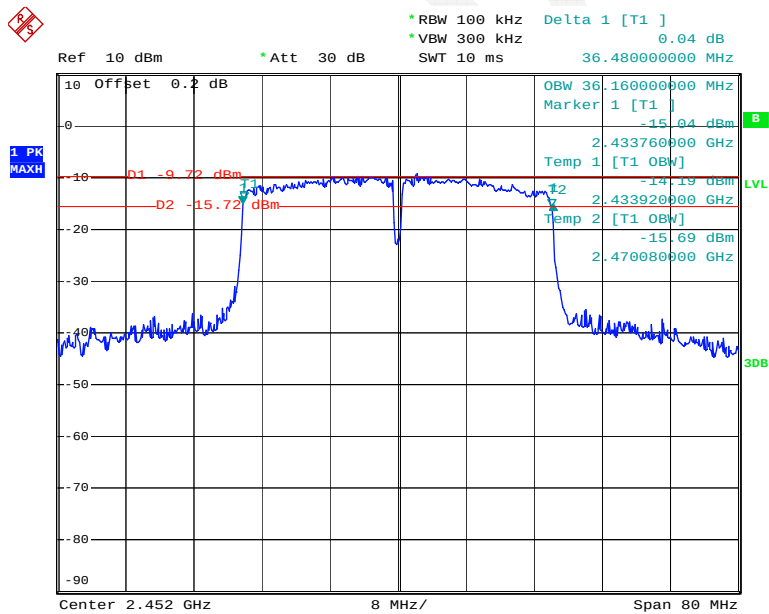
Date: 7.JAN.2015 16:35:56

802.11n ht40 Middle Channel



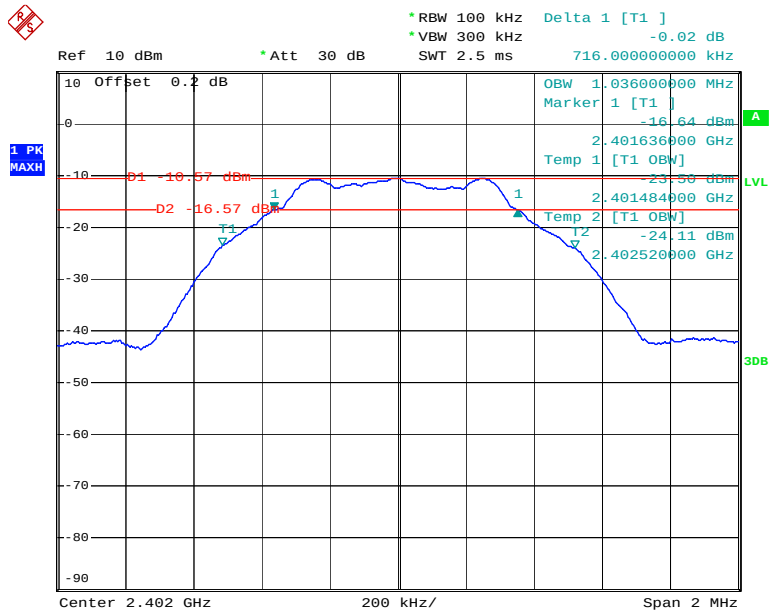
Date: 7. JAN. 2015 16:34:29

802.11n ht40 High Channel



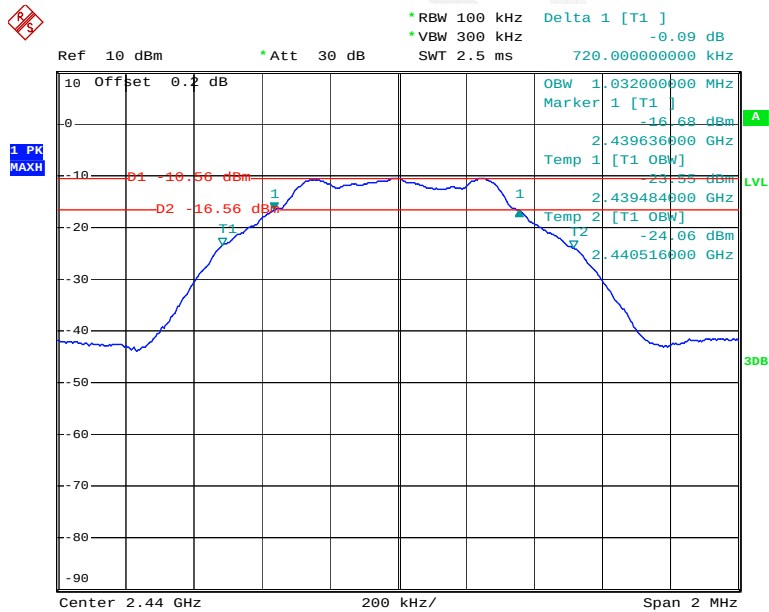
Date: 7. JAN. 2015 16:36:56

BLE Low Channel



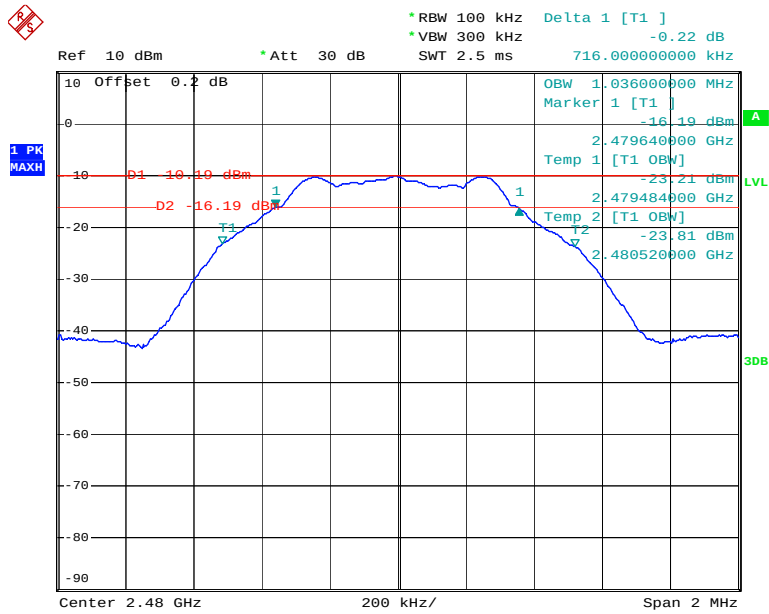
Date: 7.JAN.2015 11:25:46

BLE Middle Channel



Date: 7.JAN.2015 11:27:32

BLE High Channel



Date: 7.JAN.2015 11:28:39

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

According to KDB 558074 D01 DTS Meas Guidance v03r02

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 test equipment.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2014-11-03	2015-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2014-11-03	2015-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2014-11-03	2015-11-03
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data

Environmental Conditions

Temperature:	21.4°C
Relative Humidity:	42 %
ATM Pressure:	101.8 kPa

The testing was performed by Sevin Li on 2014-12-31.

Test Mode: Transmitting (Wi-Fi)

Test Result: Compliant. Please refer to the following table.

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	9.59	30	PASS
	Middle	2437	9.72	30	PASS
	High	2462	9.74	30	PASS
802.11g	Low	2412	13.81	30	PASS
	Middle	2437	14.04	30	PASS
	High	2462	14.12	30	PASS
802.11n20	Low	2412	14.03	30	PASS
	Middle	2437	14.08	30	PASS
	High	2462	14.12	30	PASS
802.11n40	Low	2422	15.93	30	PASS
	Middle	2437	15.98	30	PASS
	High	2452	15.88	30	PASS

Test mode	Channel	Frequency	Max Conducted Average Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	9.42	30	PASS
	Middle	2437	9.46	30	PASS
	High	2462	9.41	30	PASS
802.11g	Low	2412	9.40	30	PASS
	Middle	2437	9.39	30	PASS
	High	2462	9.42	30	PASS
802.11n20	Low	2412	9.50	30	PASS
	Middle	2437	9.44	30	PASS
	High	2462	9.49	30	PASS
802.11n40	Low	2422	9.11	30	PASS
	Middle	2437	9.13	30	PASS
	High	2452	9.12	30	PASS

Test Mode: Transmitting (BLE)

Test Result: Compliant. Please refer to the following table.

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
BLE	Low	2402	-9.61	30	PASS
	Middle	2440	-9.57	30	PASS
	High	2480	-9.22	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
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data

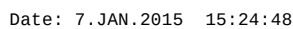
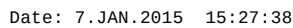
Environmental Conditions

Temperature:	24.15°C
Relative Humidity:	58%
ATM Pressure:	101.4 kPa

The testing was performed by Sevin Li on 2015-01-07.

Test mode: Transmitting

802.11b: Band Edge, Left Side



1. PK
MAXH

Ref 10 dBm Att 30 dB RBW 100 kHz VBW 300 kHz SWT 5 ms

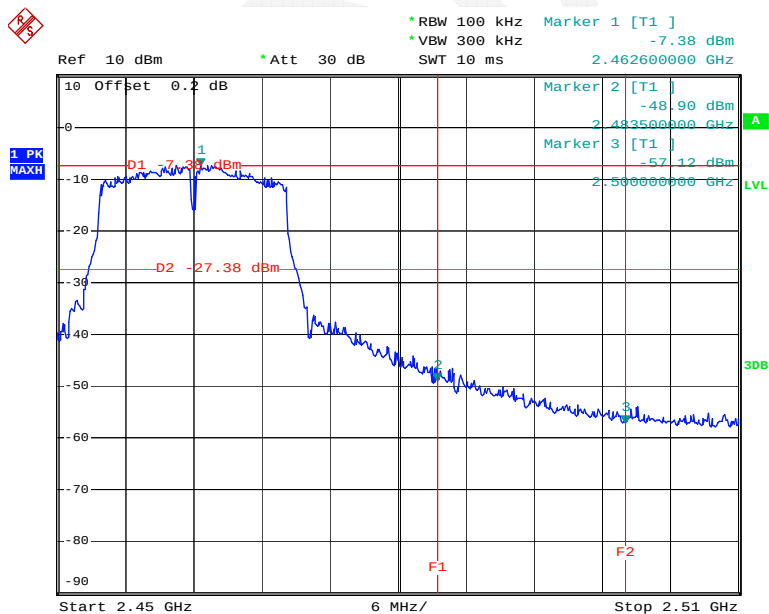
Marker 1 [T1] -7.64 dBm 2.413600000 GHz

Marker 2 [T1] -39.51 dBm 2.400000000 GHz

Marker 3 [T1] -48.61 dBm 2.390000000 GHz

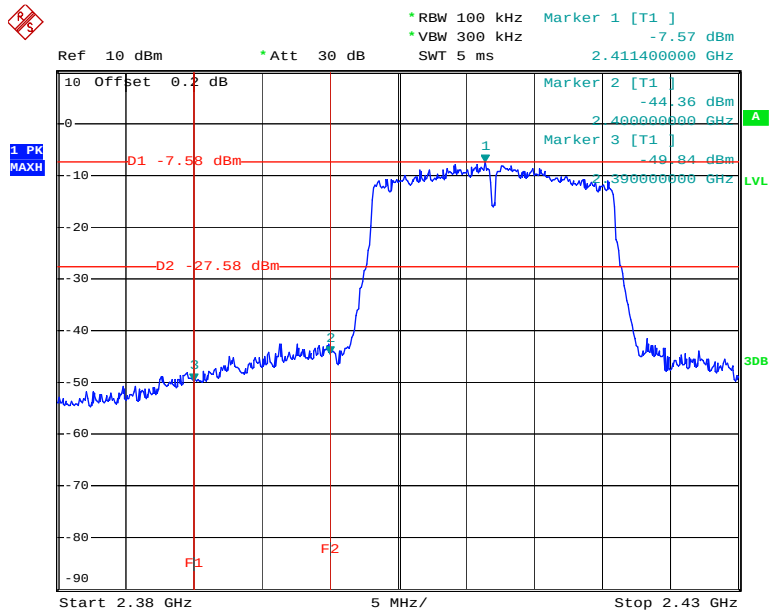
Start 2.38 GHz 5 MHz/ Stop 2.43 GHz

802.11g: Band Edge, Right Side



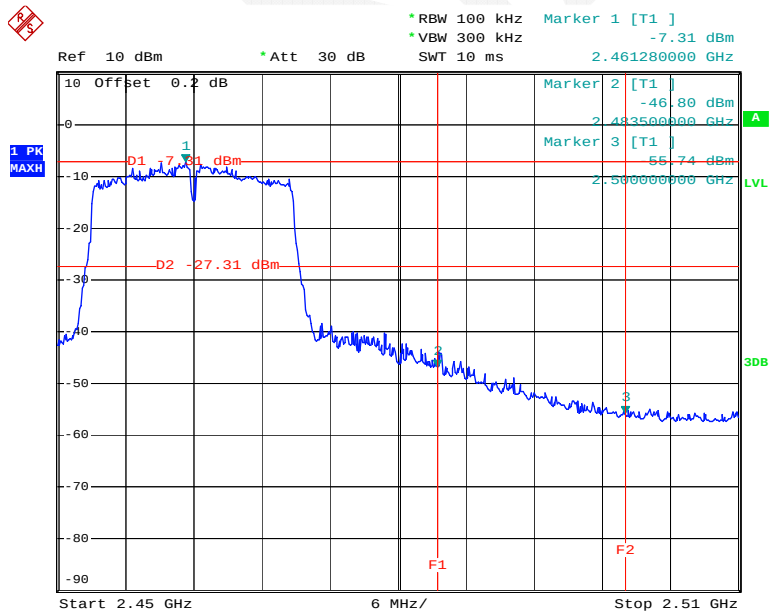
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802.11n ht20 Band Edge, Left Side



Date: 7. JAN. 2015 15:31:02

802.11n ht20 Band Edge, Right Side



Date: 7. JAN. 2015 15:18:48

* RBW 100 kHz
 * VBW 300 kHz
 SWT 10 ms

Ref 10 dBm
 * Att 30 dB

Marker 1 [T1]
 -9.89 dBm
 2.424100000 GHz

Marker 2 [T1]
 -38.69 dBm
 2.400000000 GHz

Marker 3 [T1]
 -43.34 dBm
 2.390000000 GHz

1 PK MAXH

10 Offset 0.2 dB

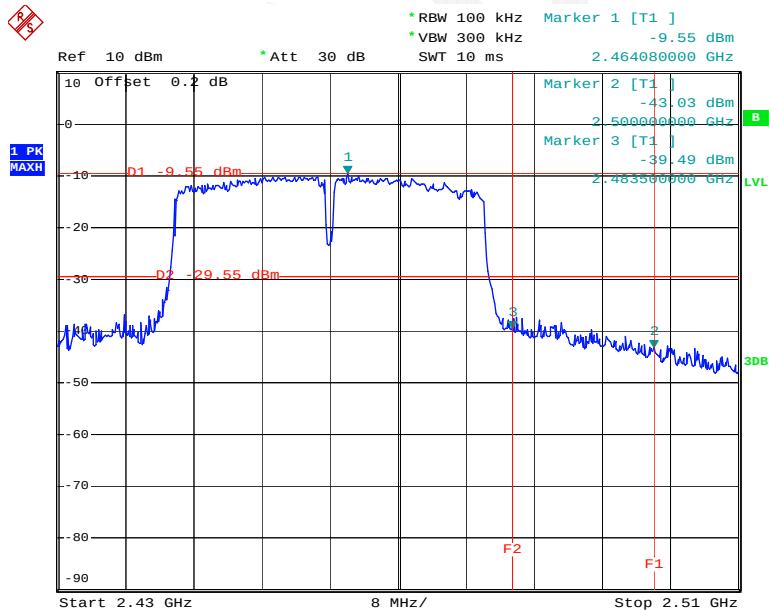
D1 -9.89 dBm
 D2 -29.89 dBm

F2
 F1

Start 2.38 GHz
 7 MHz/
 Stop 2.45 GHz

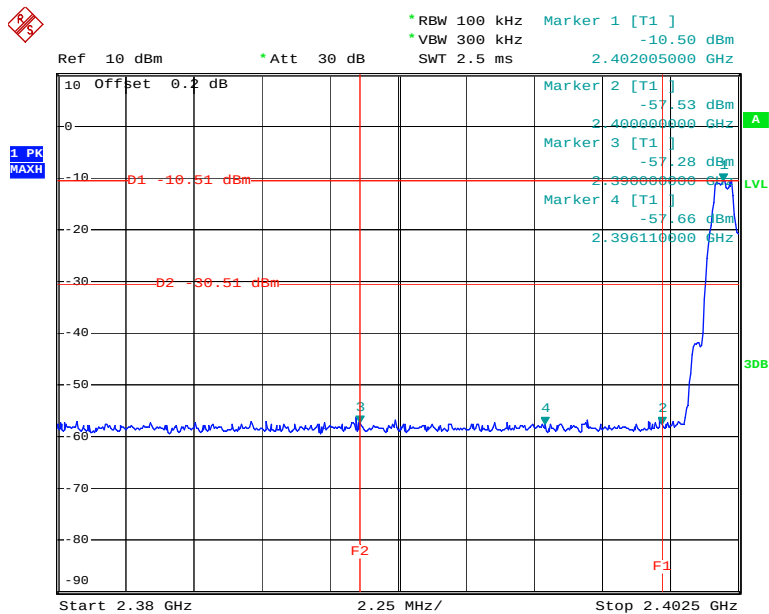
B
 LVL
 3DB

802.11n ht40 Band Edge, Right Side



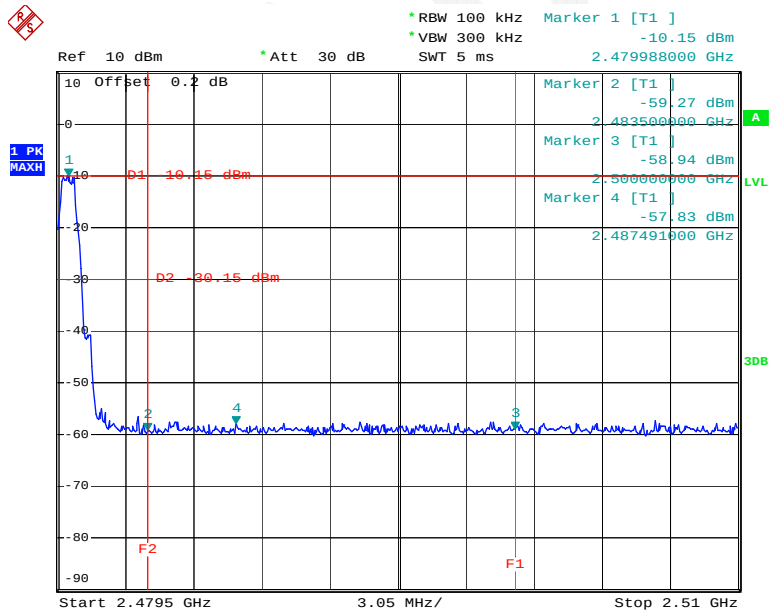
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BLE Band Edge , Left Side



Date: 7.JAN.2015 11:55:40

BLE Band Edge, Right Side



Date: 7.JAN.2015 11:57:13

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 KDB 558074 D01 DTS Meas Guidance v03r02 clause10.2:

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \times \text{RBW}$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) 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
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

Test Data

Environmental Conditions

Temperature:	24.1 °C
Relative Humidity:	58 %
ATM Pressure:	101.4 kPa

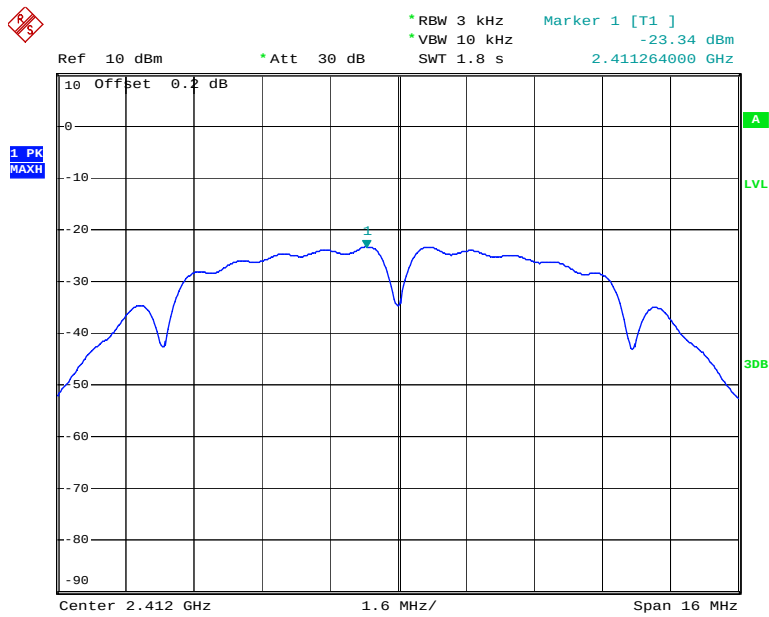
The testing was performed by Sevin Li on 2015-01-07.

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots

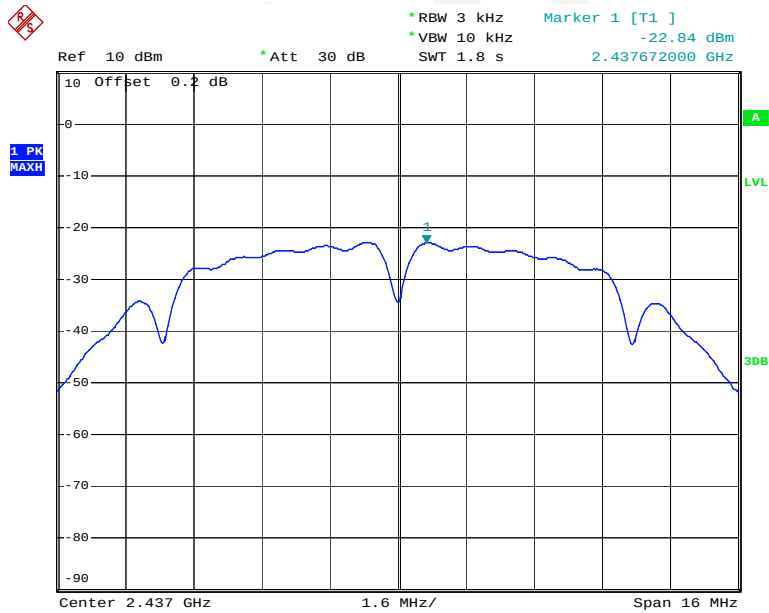
Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-23.34	≤ 8
	Middle	2437	-22.84	≤ 8
	High	2462	-22.56	≤ 8
802.11g	Low	2412	-21.83	≤ 8
	Middle	2437	-21.36	≤ 8
	High	2462	-21.23	≤ 8
802.11n20	Low	2412	-22.08	≤ 8
	Middle	2437	-22.21	≤ 8
	High	2462	-21.57	≤ 8
802.11n40	Low	2422	-23.97	≤ 8
	Middle	2437	-21.7	≤ 8
	High	2452	-23.29	≤ 8
BLE	Low	2402	-25.13	≤ 8
	Middle	2440	-25.13	≤ 8
	High	2480	-24.83	≤ 8

Power Spectral Density, 802.11b Low Channel



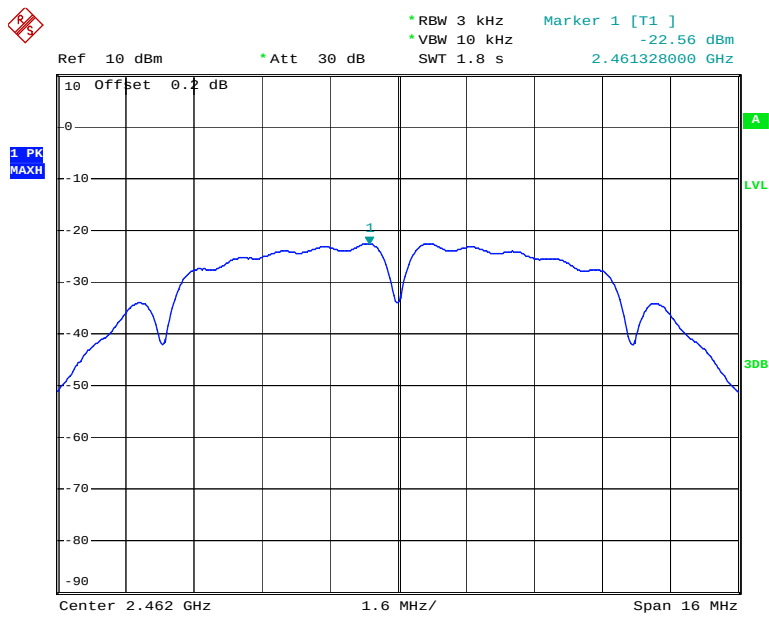
Date: 7.JAN.2015 15:35:31

Power Spectral Density, 802.11b Middle Channel



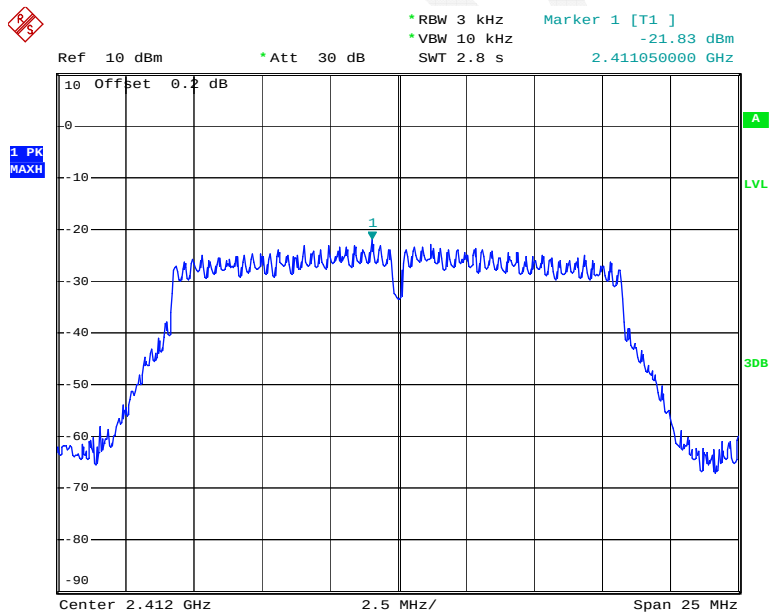
Date: 7.JAN.2015 15:36:07

Power Spectral Density, 802.11b High Channel



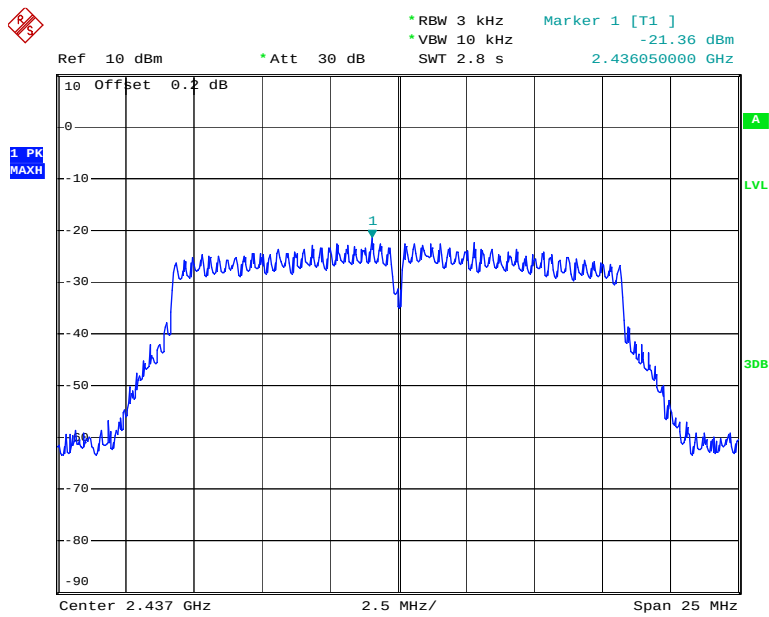
Date: 7.JAN.2015 15:36:39

Power Spectral Density, 802.11g Low Channel



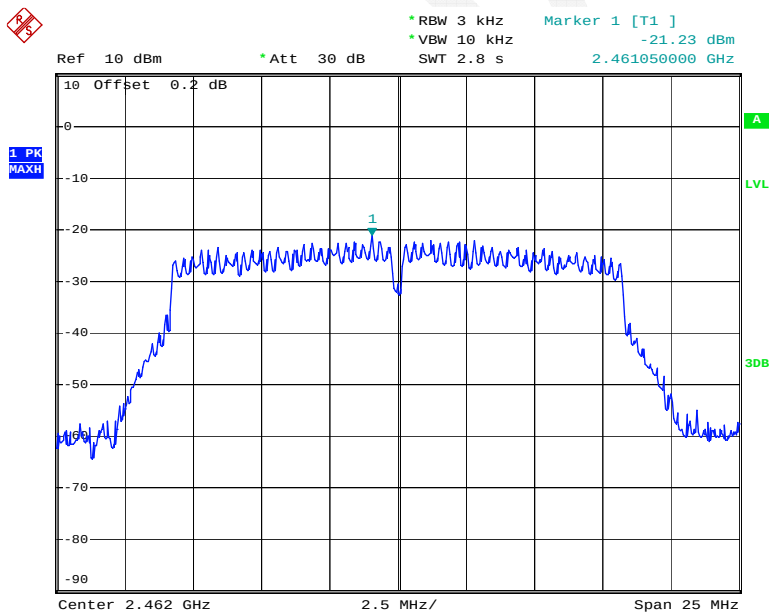
Date: 7.JAN.2015 15:42:04

Power Spectral Density, 802.11g Middle Channel



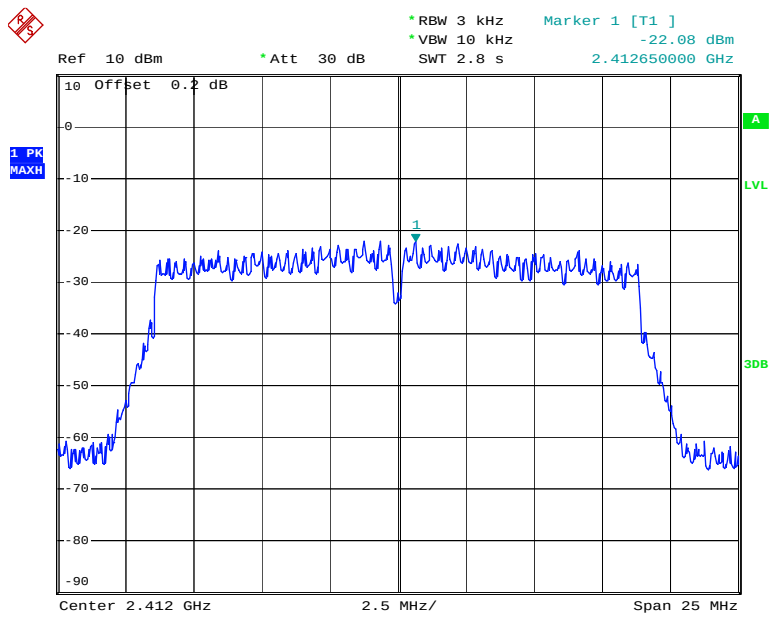
Date: 7.JAN.2015 15:41:31

Power Spectral Density, 802.11g High Channel



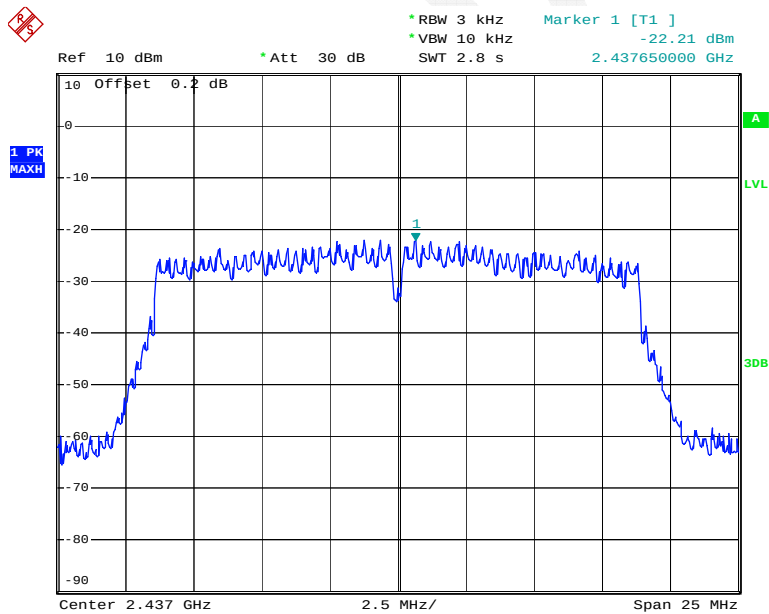
Date: 7.JAN.2015 15:40:33

Power Spectral Density, 802.11n ht20 Low Channel



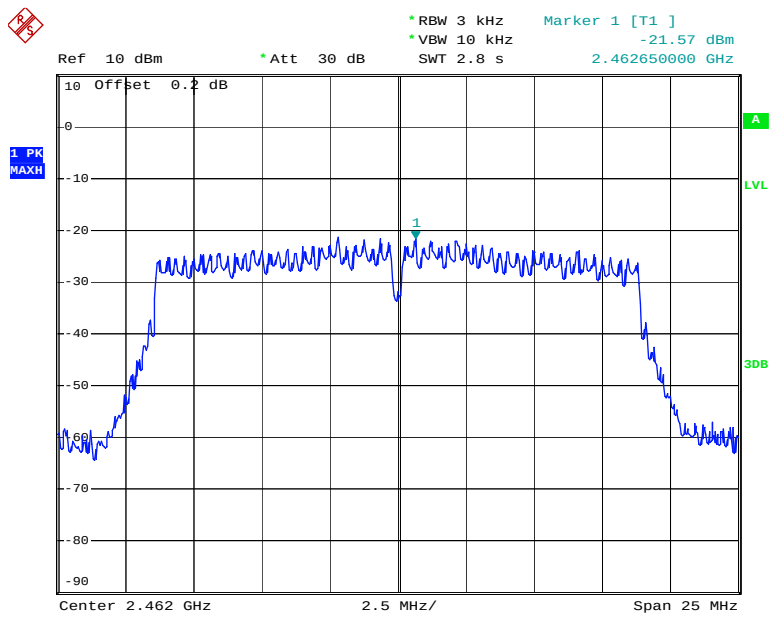
Date: 7.JAN.2015 15:42:37

Power Spectral Density, 802.11n ht20 Middle Channel



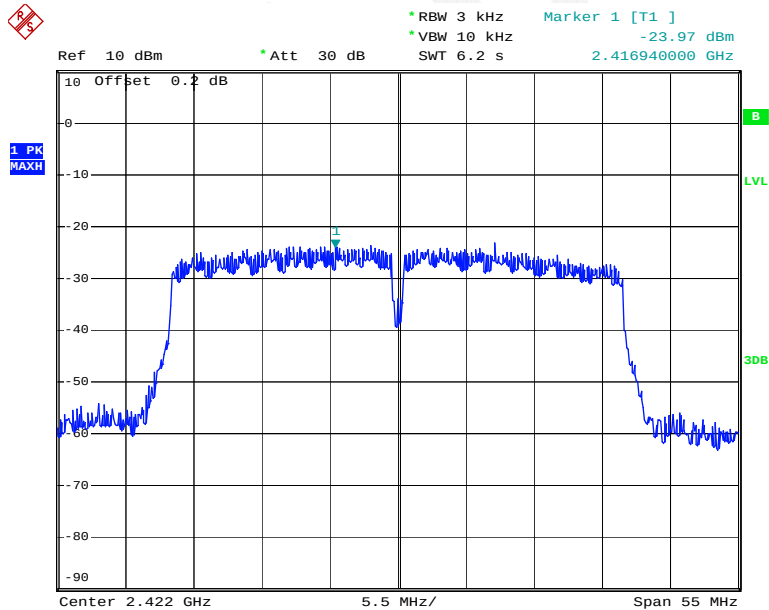
Date: 7.JAN.2015 15:43:15

Power Spectral Density, 802.11n ht20 High Channel



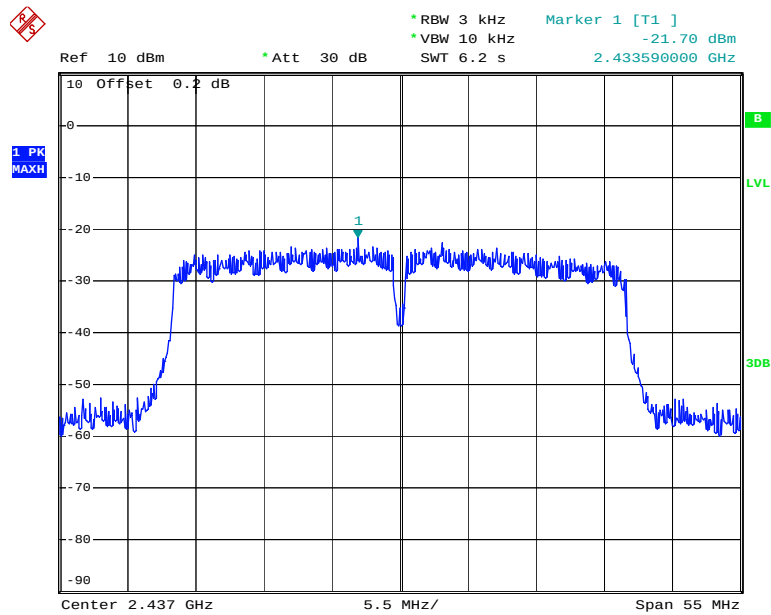
Date: 7.JAN.2015 15:43:42

Power Spectral Density, 802.11n ht40 Low Channel



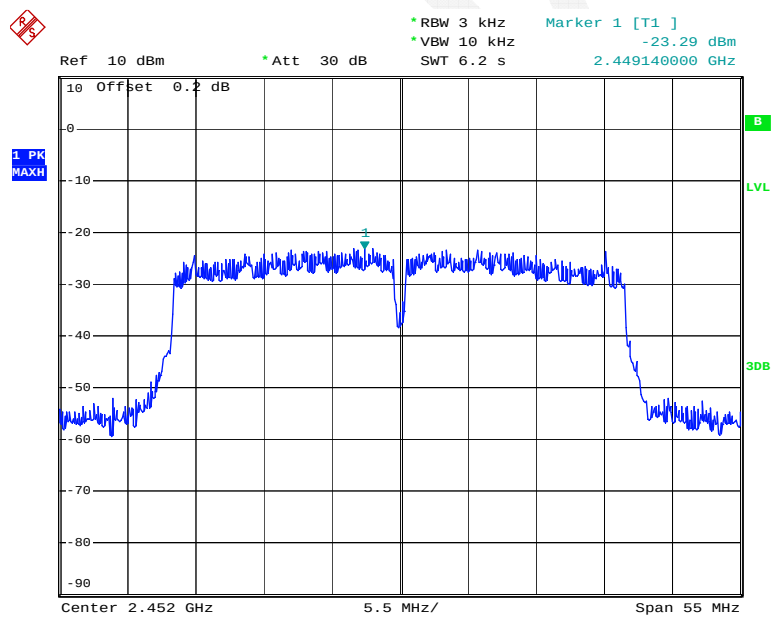
Date: 7.JAN.2015 16:50:30

Power Spectral Density, 802.11n ht40 Middle Channel



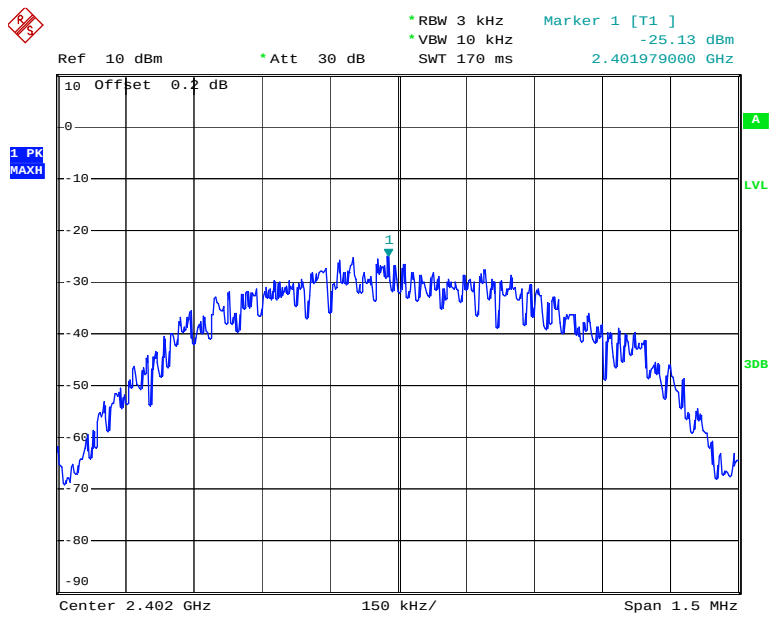
Date: 7.JAN.2015 16:51:38

Power Spectral Density, 802.11n ht40 High Channel



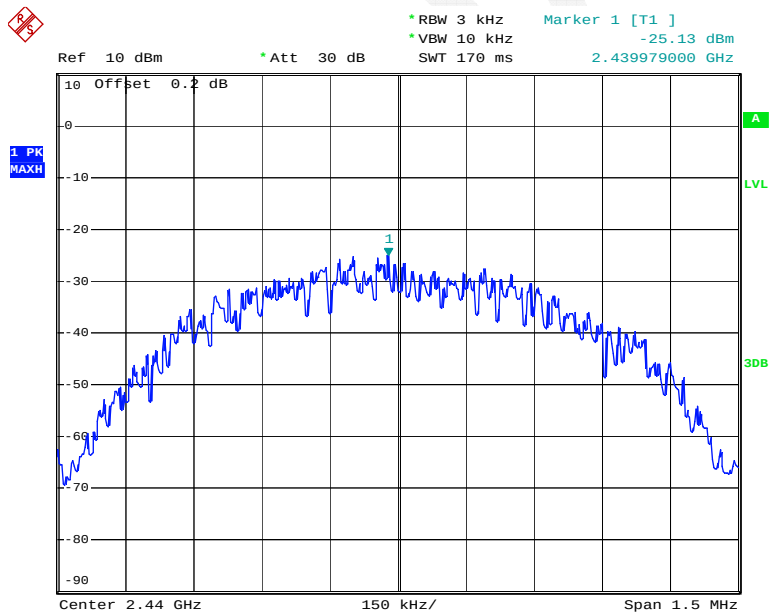
Date: 7.JAN.2015 16:52:42

Power Spectral Density, BLE Low Channel



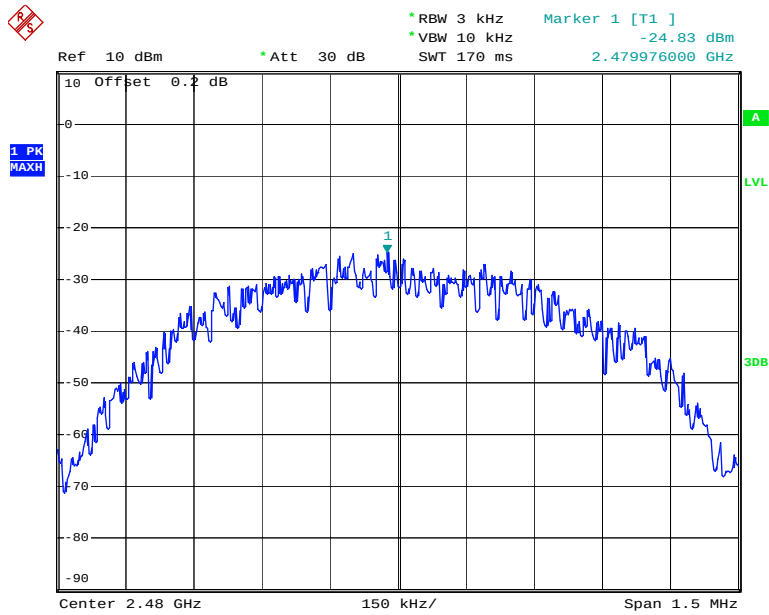
Date: 7.JAN.2015 11:32:42

Power Spectral Density, BLE Middle Channel



Date: 7.JAN.2015 11:33:30

Power Spectral Density, BLE High Channel



Date: 7.JAN.2015 11:33:54

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