FCC PART 15.247

TEST REPORT

For

i.safe MOBILE GmbH

i_PARK TAUBERFRANKEN 14 97922 Lauda-Koenigshofen, Germany

FCC ID: 2AACZ-INNOVATION2X

Report Type:	Product Type:
Original Report	Mobile phone

Test Engineer:	Dean Liu
Report Number:	RDG140805004-00B
Report Date:	2014-11-17
Reviewed By:	Sula Huang RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *i.safe MOBILE GmbH*'s product, model number: *INNOVATION2.0 (FCC ID: 2AACZ-INNOVATION2X)* (or the "EUT") in this report was a *Mobile phone*, which was measured approximately: 12.3 cm (L) x 7.0 cm (W) x 3.0 cm (H), rated input voltage: DC3.7 V rechargeable Li-ion or DC5V charging from adapter.

Adapter information: RugGear
Model: ICP12-050-2000B
Input: 100-240V~50/60Hz, 0.3A
Output: DC5.0V, 2000mA

** All measurement and test data in this report was gathered from production sample serial number: 1020.1201.0540 (Assigned by applicant). The EUT was received on 2014-08-08.*

Objective

This report is prepared on behalf of *i.safe MOBILE GmbH* 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: 2AACZ-INNOVATION2X.
FCC Part 22H, 24E PCE submissions with FCC ID: 2AACZ-INNOVATION2X.
FCC Part 15C DSS submissions with FCC ID: 2AACZ-INNOVATION2X.

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 testing 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	Test engineering mode		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	10	10	10
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	9	9	9
802.11n ht20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	8	8	8
802.11n ht40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	7	7	7
BLE	Test Frequency	2402MHz	2440MHz	2480MHz
	BLE	N/A	N/A	N/A

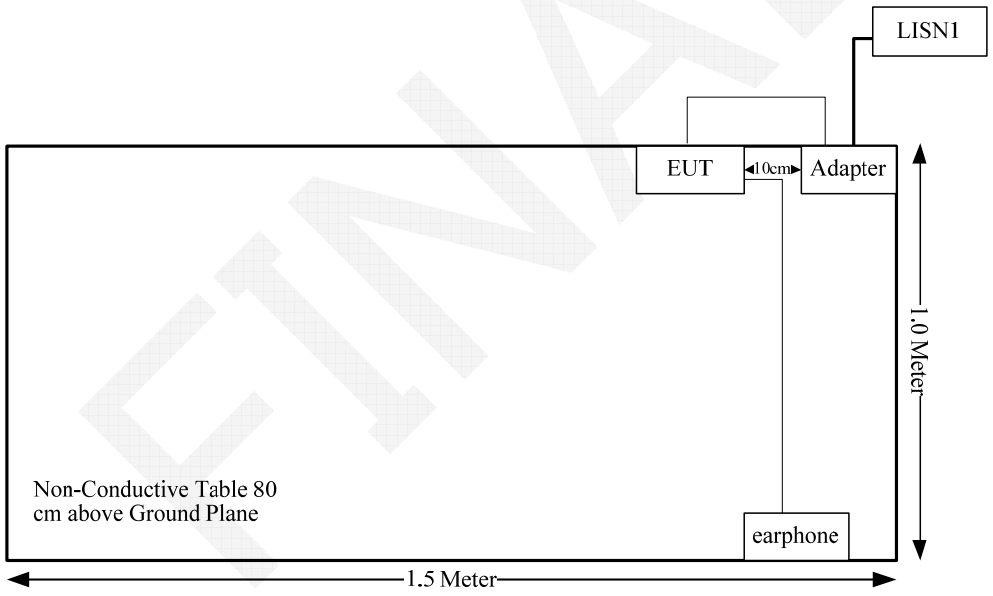
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Adapter DC Cable	No	No	1.0	Adapter	EUT
Earphone Cable	No	No	1.2	Earphone	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:
[(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
- 3.0 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= 9.15 dBm (8.22mW) at 2462MHz
[(max. power of channel, mW)/(min. test separation distance, mm)] [√f(GHz)]
= 8.22/5*(√2.462) = 2.58 < 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 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

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

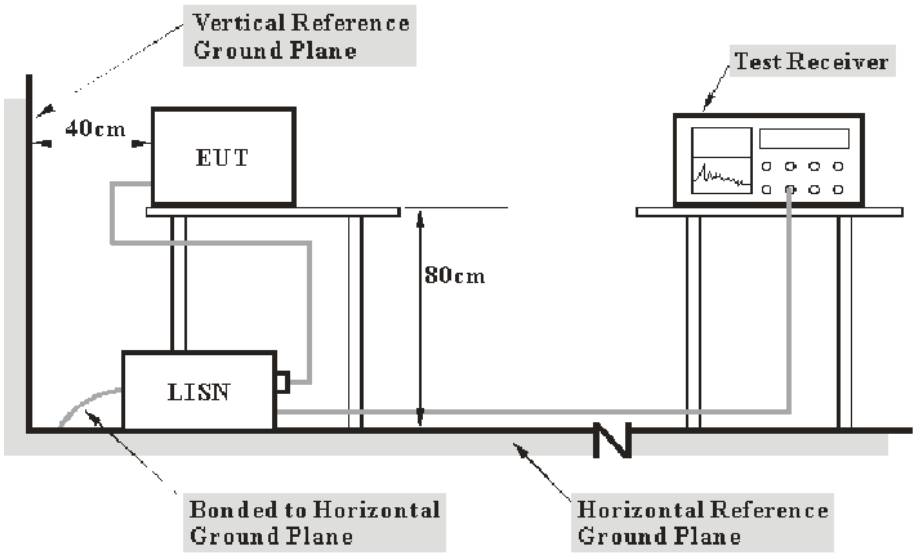
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of 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 of EUT 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 of EUT was connected to thefirst 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:

Margin = Limit – 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:

22.0 dB at **0.629488 MHz** in the **Neutral** conducted mode for BLE

Test Data

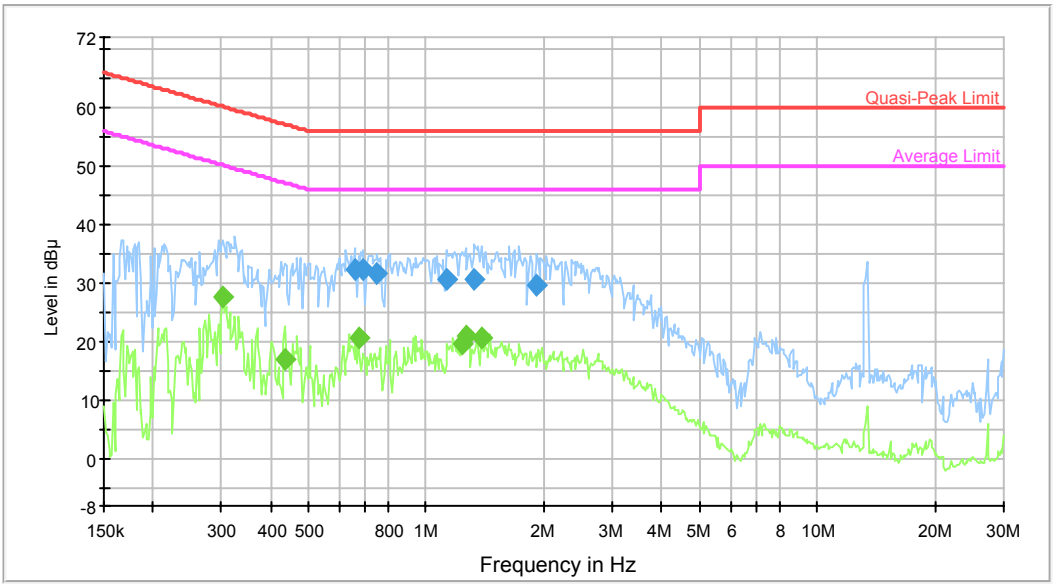
Environmental Conditions

Temperature:	27.6 °C
Relative Humidity:	51 %
ATM Pressure:	100.3 kPa

The testing was performed by Dean Liu on 2014-09-11.

Test Mode: Transmitting (Wi-Fi)

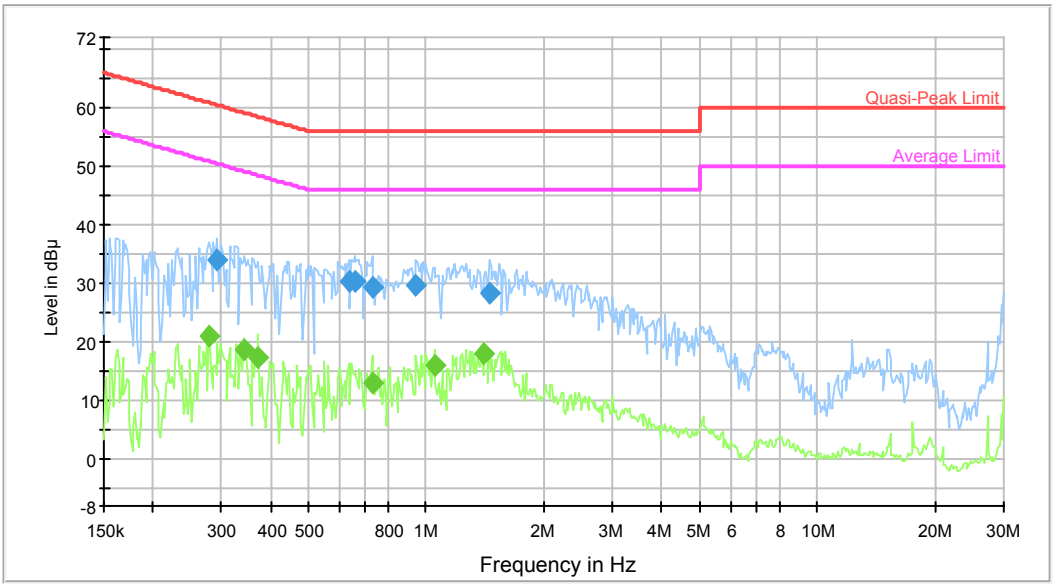
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.655073	32.3	9.000	L1	10.6	23.7	56.0	Compliance
0.692650	32.2	9.000	L1	10.6	23.8	56.0	Compliance
0.750100	31.7	9.000	L1	10.5	24.3	56.0	Compliance
1.126176	30.6	9.000	L1	10.4	25.4	56.0	Compliance
1.331304	30.8	9.000	L1	10.4	25.2	56.0	Compliance
1.920710	29.6	9.000	L1	10.4	26.4	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.302425	27.7	9.000	L1	10.7	22.5	50.2	Compliance
0.436318	17.0	9.000	L1	10.5	30.1	47.1	Compliance
0.670921	20.6	9.000	L1	10.6	25.4	46.0	Compliance
1.239175	19.8	9.000	L1	10.4	26.2	46.0	Compliance
1.259081	21.1	9.000	L1	10.4	24.9	46.0	Compliance
1.385415	20.8	9.000	L1	10.4	25.2	46.0	Compliance

AC120 V, 60 Hz, Neutral:

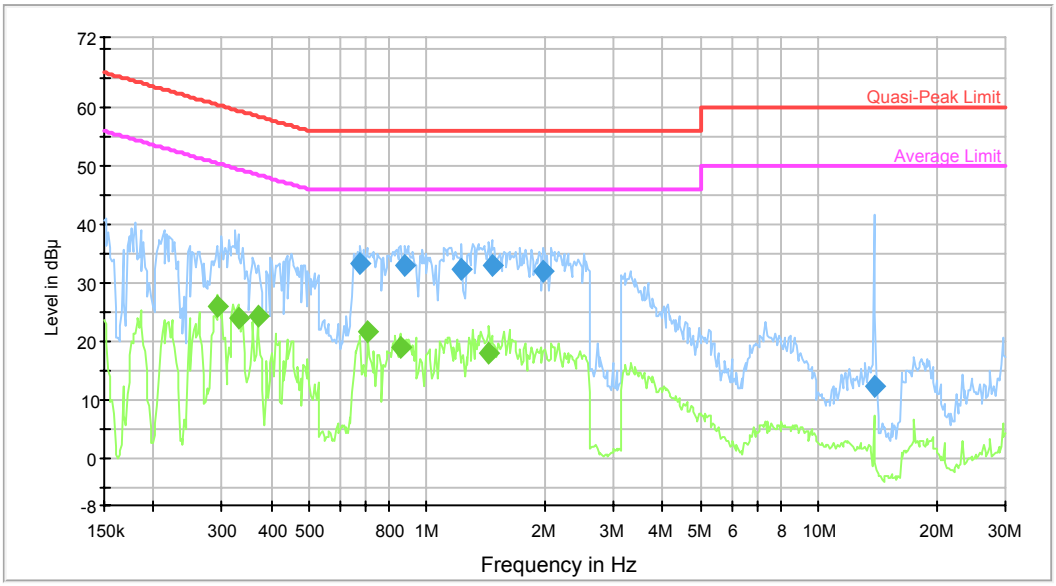


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.292938	34.0	9.000	N	11.1	26.5	60.4	Compliance
0.634524	30.3	9.000	N	10.5	25.7	56.0	Compliance
0.655073	30.2	9.000	N	10.6	25.8	56.0	Compliance
0.726569	29.5	9.000	N	10.6	26.5	56.0	Compliance
0.945093	29.7	9.000	N	10.5	26.3	56.0	Compliance
1.453260	28.3	9.000	N	10.5	27.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.279263	21.1	9.000	N	11.2	29.7	50.8	Compliance
0.340821	18.8	9.000	N	11.0	30.4	49.2	Compliance
0.372042	17.3	9.000	N	10.9	31.1	48.5	Compliance
0.726569	13.1	9.000	N	10.6	32.9	46.0	Compliance
1.048242	16.1	9.000	N	10.5	29.9	46.0	Compliance
1.407671	18.1	9.000	N	10.5	27.9	46.0	Compliance

Test Mode: Transmitting (BLE)

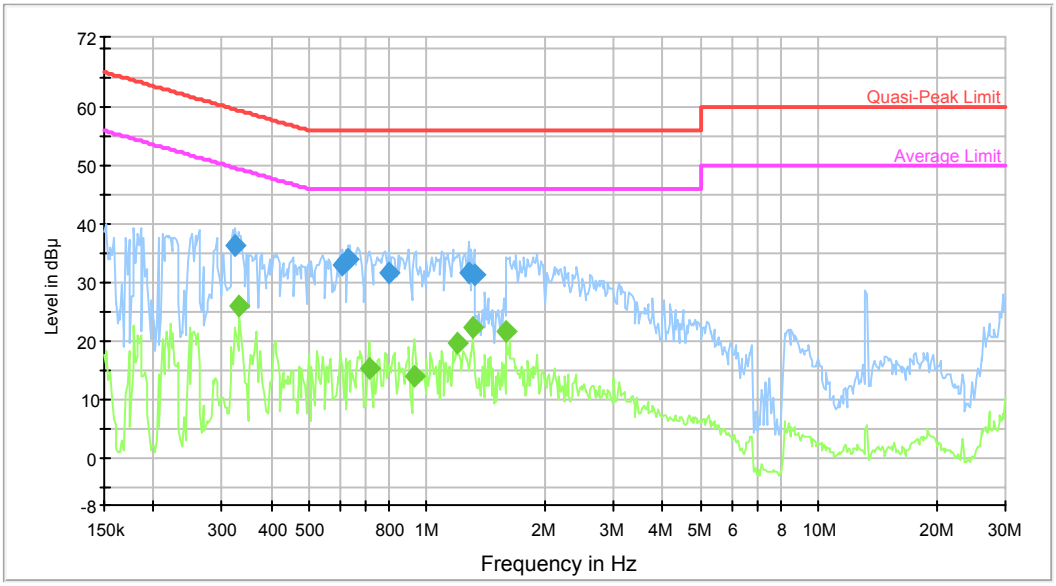
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.676289	33.5	9.000	L1	10.6	22.5	56.0	Compliance
0.879690	32.9	9.000	L1	10.5	23.1	56.0	Compliance
1.229340	32.4	9.000	L1	10.4	23.6	56.0	Compliance
1.464886	32.8	9.000	L1	10.4	23.2	56.0	Compliance
1.982914	32.0	9.000	L1	10.4	24.0	56.0	Compliance
13.857146	12.4	9.000	L1	10.5	47.6	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.292938	26.1	9.000	L1	10.7	24.3	50.4	Compliance
0.330129	23.9	9.000	L1	10.7	25.5	49.4	Compliance
0.369089	24.3	9.000	L1	10.7	24.2	48.5	Compliance
0.709407	21.6	9.000	L1	10.6	24.4	46.0	Compliance
0.858911	18.9	9.000	L1	10.5	27.1	46.0	Compliance
1.441726	17.9	9.000	L1	10.4	28.1	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.324910	36.4	9.000	N	11.1	23.1	59.6	Compliance
0.609741	32.9	9.000	N	10.5	23.2	56.0	Compliance
0.629488	34.0	9.000	N	10.5	22.0	56.0	Compliance
0.799472	31.8	9.000	N	10.5	24.2	56.0	Compliance
1.279307	31.8	9.000	N	10.5	24.2	56.0	Compliance
1.320738	31.3	9.000	N	10.5	24.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.332770	25.9	9.000	N	11.1	23.5	49.4	Compliance
0.715082	15.3	9.000	N	10.6	30.7	46.0	Compliance
0.930151	14.1	9.000	N	10.5	31.9	46.0	Compliance
1.190776	19.8	9.000	N	10.5	26.2	46.0	Compliance
1.310256	22.2	9.000	N	10.5	23.8	46.0	Compliance
1.599078	21.6	9.000	N	10.5	24.4	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_{cispr} 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_{cispr} of Table 2, 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.

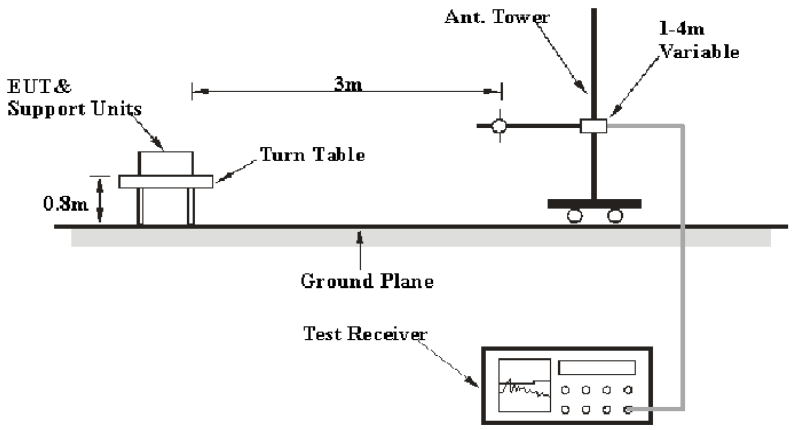
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

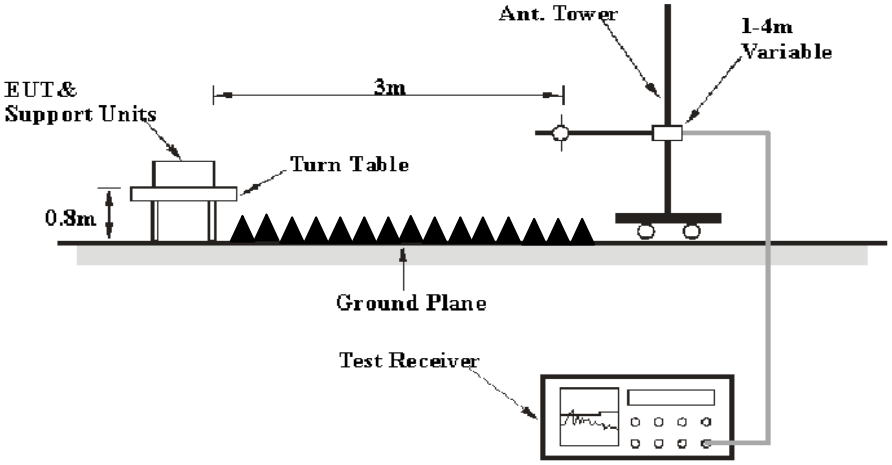
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, and FCC 15.247 limits.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

During the radiated emission test, the adapter of EUT was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Loss + 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 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 Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2014-09-06	2015-09-06

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

Test Results Summary

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

3.33 dB at **2483.5MHz** in the **Horizontal** polarization for 802.11 n ht40 Mode

Test Data

Environmental Conditions

Temperature:	26.8 °C-27.3°C
Relative Humidity:	53 %
ATM Pressure:	99.6 kPa-100.5 kPa

The testing was performed by Dean Liu on 2014-09-16 & 2014-09-17.

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	75.11	PK	H	25.67	4.42	0.00	105.20	N/A	N/A
2412	70.06	AV	H	25.67	4.42	0.00	100.15	N/A	N/A
2412	73.27	PK	V	25.67	4.42	0.00	103.36	N/A	N/A
2412	68.79	AV	V	25.67	4.42	0.00	98.88	N/A	N/A
2390	26.49	PK	H	25.61	4.39	0.00	56.49	74.00	17.51
2390	17.59	AV	H	25.61	4.39	0.00	47.59	54.00	6.41
4824	33.35	PK	H	30.64	6.03	27.41	42.61	74.00	31.39
4824	22.21	AV	H	30.64	6.03	27.41	31.47	54.00	22.53
7236	32.42	PK	H	34.17	7.47	25.90	48.16	74.00	25.84
7236	21.31	AV	H	34.17	7.47	25.90	37.05	54.00	16.95
9648	30.30	PK	H	36.06	8.81	27.46	47.71	74.00	26.29
9648	18.48	AV	H	36.06	8.81	27.46	35.89	54.00	18.11
2950	40.28	PK	H	27.07	6.91	27.54	46.72	74.00	27.28
2950	30.22	AV	H	27.07	6.91	27.54	36.66	54.00	17.34
325	32.73	QP	H	14.61	2.16	21.58	27.92	46.00	18.08
Middle Channel: 2437 MHz									
2437	75.27	PK	H	25.74	4.41	0.00	105.42	N/A	N/A
2437	70.05	AV	H	25.74	4.41	0.00	100.2	N/A	N/A
2437	72.81	PK	V	25.74	4.41	0.00	102.96	N/A	N/A
2437	68.43	AV	V	25.74	4.41	0.00	98.58	N/A	N/A
4874	33.17	PK	H	30.77	6.09	27.42	42.61	74.00	31.39
4874	20.53	AV	H	30.77	6.09	27.42	29.97	54.00	24.03
7311	33.57	PK	H	34.35	7.51	25.88	49.55	74.00	24.45
7311	21.15	AV	H	34.35	7.51	25.88	37.13	54.00	16.87
9748	31.09	PK	H	36.30	8.83	27.24	48.98	74.00	25.02
9748	19.61	AV	H	36.30	8.83	27.24	37.50	54.00	16.50
2950	38.67	PK	H	27.07	6.91	27.54	45.11	74.00	28.89
2950	26.80	AV	H	27.07	6.91	27.54	33.24	54.00	20.76
3610	36.88	PK	H	29.04	5.04	27.28	43.68	74.00	30.32
3610	23.76	AV	H	29.04	5.04	27.28	30.56	54.00	23.44
325	32.67	QP	H	14.61	2.16	21.58	27.86	46.00	18.14
High Channel: 2462 MHz									
2462	74.48	PK	H	25.80	4.43	0.00	104.71	N/A	N/A
2462	69.38	AV	H	25.80	4.43	0.00	99.61	N/A	N/A
2462	72.70	PK	V	25.80	4.43	0.00	102.93	N/A	N/A
2462	69.09	AV	V	25.80	4.43	0.00	99.32	N/A	N/A
2483.5	28.48	PK	H	25.86	4.49	0.00	58.83	74.00	15.17
2483.5	18.27	AV	H	25.86	4.49	0.00	48.62	54.00	5.38
4924	32.98	PK	H	30.90	5.97	27.43	42.42	74.00	31.58
4924	20.56	AV	H	30.90	5.97	27.43	30.00	54.00	24.00
7386	32.31	PK	H	34.53	7.55	25.86	48.53	74.00	25.47
7386	21.14	AV	H	34.53	7.55	25.86	37.36	54.00	16.64
9848	31.46	PK	H	36.54	8.85	26.94	49.91	74.00	24.09
9848	19.22	AV	H	36.54	8.85	26.94	37.67	54.00	16.33
2950	37.55	PK	H	27.07	6.91	27.54	43.99	74.00	30.01
2950	26.49	AV	H	27.07	6.91	27.54	32.93	54.00	21.07
325	32.82	QP	H	14.61	2.16	21.58	28.01	46.00	17.99

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	74.11	PK	H	25.67	4.42	0.00	104.20	N/A	N/A
2412	64.23	AV	H	25.67	4.42	0.00	94.32	N/A	N/A
2412	72.46	PK	V	25.67	4.42	0.00	102.55	N/A	N/A
2412	63.34	AV	V	25.67	4.42	0.00	93.43	N/A	N/A
2390	30.08	PK	H	25.61	4.39	0.00	60.08	74.00	13.92
2390	18.99	AV	H	25.61	4.39	0.00	48.99	54.00	5.01
4824	33.17	PK	H	30.64	6.03	27.41	42.43	74.00	31.57
4824	18.31	AV	H	30.64	6.03	27.41	27.57	54.00	26.43
7236	30.19	PK	H	34.17	7.47	25.90	45.93	74.00	28.07
7236	18.43	AV	H	34.17	7.47	25.90	34.17	54.00	19.83
9648	30.08	PK	H	36.06	8.81	27.46	47.49	74.00	26.51
9648	18.38	AV	H	36.06	8.81	27.46	35.79	54.00	18.21
2950	38.17	PK	H	27.07	6.91	27.54	44.61	74.00	29.39
2950	26.58	AV	H	27.07	6.91	27.54	33.02	54.00	20.98
325	32.70	QP	H	14.61	2.16	21.58	27.89	46.00	18.11
Middle Channel: 2437 MHz									
2437	72.21	PK	H	25.74	4.41	0.00	102.36	N/A	N/A
2437	63.44	AV	H	25.74	4.41	0.00	93.59	N/A	N/A
2437	70.01	PK	V	25.74	4.41	0.00	100.16	N/A	N/A
2437	61.15	AV	V	25.74	4.41	0.00	91.30	N/A	N/A
4874	33.21	PK	H	30.77	6.09	27.42	42.65	74.00	31.35
4874	22.15	AV	H	30.77	6.09	27.42	31.59	54.00	22.41
7311	32.20	PK	H	34.35	7.51	25.88	48.18	74.00	25.82
7311	31.79	AV	H	34.35	7.51	25.88	47.77	54.00	6.23
9748	30.23	PK	H	36.30	8.83	27.24	48.12	74.00	25.88
9748	19.37	AV	H	36.30	8.83	27.24	37.26	54.00	16.74
2950	37.55	PK	H	27.07	6.91	27.54	43.99	74.00	30.01
2950	26.82	AV	H	27.07	6.91	27.54	33.26	54.00	20.74
3610	40.09	PK	H	29.04	5.04	27.28	46.89	74.00	27.11
3610	36.21	AV	H	29.04	5.04	27.28	43.01	54.00	10.99
325	32.80	QP	H	14.61	2.16	21.58	27.99	46.00	18.01
High Channel: 2462 MHz									
2462	72.10	PK	H	25.80	4.43	0.00	102.33	N/A	N/A
2462	62.05	AV	H	25.80	4.43	0.00	92.28	N/A	N/A
2462	71.32	PK	V	25.80	4.43	0.00	101.55	N/A	N/A
2462	61.44	AV	V	25.80	4.43	0.00	91.67	N/A	N/A
2483.5	28.69	PK	H	25.86	4.49	0.00	59.04	74.00	14.96
2483.5	18.64	AV	H	25.86	4.49	0.00	48.99	54.00	5.01
4924	33.19	PK	H	30.90	5.97	27.43	42.63	74.00	31.37
4924	20.70	AV	H	30.90	5.97	27.43	30.14	54.00	23.86
7386	33.56	PK	H	34.53	7.55	25.86	49.78	74.00	24.22
7386	22.48	AV	H	34.53	7.55	25.86	38.70	54.00	15.30
9848	30.72	PK	H	36.54	8.85	26.94	49.17	74.00	24.83
9848	19.61	AV	H	36.54	8.85	26.94	38.06	54.00	15.94
2950	37.17	PK	H	27.07	6.91	27.54	43.61	74.00	30.39
2950	26.62	AV	H	27.07	6.91	27.54	33.06	54.00	20.94
325	32.75	QP	H	14.61	2.16	21.58	27.94	46.00	18.06

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	71.32	PK	H	25.67	4.42	0.00	101.41	N/A	N/A
2412	60.19	AV	H	25.67	4.42	0.00	90.28	N/A	N/A
2412	68.25	PK	V	25.67	4.42	0.00	98.34	N/A	N/A
2412	57.74	AV	V	25.67	4.42	0.00	87.83	N/A	N/A
2390	30.57	PK	H	25.61	4.39	0.00	60.57	74.00	13.43
2390	19.14	AV	H	25.61	4.39	0.00	49.14	54.00	4.86
4824	41.38	PK	H	30.64	6.03	27.41	50.64	74.00	23.36
4824	30.26	AV	H	30.64	6.03	27.41	39.52	54.00	14.48
7236	33.58	PK	H	34.17	7.47	25.90	49.32	74.00	24.68
7236	22.15	AV	H	34.17	7.47	25.90	37.89	54.00	16.11
9648	30.26	PK	H	36.06	8.81	27.46	47.67	74.00	26.33
9648	20.14	AV	H	36.06	8.81	27.46	37.55	54.00	16.45
2950	38.55	PK	H	27.07	6.91	27.54	44.99	74.00	29.01
2950	27.48	AV	H	27.07	6.91	27.54	33.92	54.00	20.08
325	32.80	QP	H	14.61	2.16	21.58	27.99	46.00	18.01
Middle Channel: 2437 MHz									
2437	71.99	PK	H	25.74	4.41	0.00	102.14	N/A	N/A
2437	60.94	AV	H	25.74	4.41	0.00	91.09	N/A	N/A
2437	69.21	PK	V	25.74	4.41	0.00	99.36	N/A	N/A
2437	57.03	AV	V	25.74	4.41	0.00	87.18	N/A	N/A
4874	39.60	PK	H	30.77	6.09	27.42	49.04	74.00	24.96
4874	28.41	AV	H	30.77	6.09	27.42	37.85	54.00	16.15
7311	31.23	PK	H	34.35	7.51	25.88	47.21	74.00	26.79
7311	20.31	AV	H	34.35	7.51	25.88	36.29	54.00	17.71
9748	30.57	PK	H	36.30	8.83	27.24	48.46	74.00	25.54
9748	20.10	AV	H	36.30	8.83	27.24	37.99	54.00	16.01
2950	38.50	PK	H	27.07	6.91	27.54	44.94	74.00	29.06
2950	27.63	AV	H	27.07	6.91	27.54	34.07	54.00	19.93
3610	38.59	PK	H	29.04	5.04	27.28	45.39	74.00	28.61
3610	26.99	AV	H	29.04	5.04	27.28	33.79	54.00	20.21
325	32.66	QP	H	14.61	2.16	21.58	27.85	46.00	18.15
High Channel: 2462 MHz									
2462	71.54	PK	H	25.80	4.43	0.00	101.77	N/A	N/A
2462	60.40	AV	H	25.80	4.43	0.00	90.63	N/A	N/A
2462	68.65	PK	V	25.80	4.43	0.00	98.88	N/A	N/A
2462	56.92	AV	V	25.80	4.43	0.00	87.15	N/A	N/A
2483.5	28.65	PK	H	25.86	4.49	0.00	59.00	74.00	15.00
2483.5	17.98	AV	H	25.86	4.49	0.00	48.33	54.00	5.67
4924	41.44	PK	H	30.90	5.97	27.43	50.88	74.00	23.12
4924	29.96	AV	H	30.90	5.97	27.43	39.40	54.00	14.60
7386	31.57	PK	H	34.53	7.55	25.86	47.79	74.00	26.21
7386	20.33	AV	H	34.53	7.55	25.86	36.55	54.00	17.45
9848	29.81	PK	H	36.54	8.85	26.94	48.26	74.00	25.74
9848	18.95	AV	H	36.54	8.85	26.94	37.40	54.00	16.60
2950	38.46	PK	H	27.07	6.91	27.54	44.90	74.00	29.10
2950	27.41	AV	H	27.07	6.91	27.54	33.85	54.00	20.15
325	32.62	QP	H	14.61	2.16	21.58	27.81	46.00	18.19

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	71.31	PK	H	25.70	4.41	0.00	101.42	N/A	N/A
2422	60.11	AV	H	25.70	4.41	0.00	90.22	N/A	N/A
2422	65.26	PK	V	25.70	4.41	0.00	95.37	N/A	N/A
2422	54.67	AV	V	25.70	4.41	0.00	84.78	N/A	N/A
2390	28.04	PK	H	25.61	4.39	0.00	58.04	74.00	15.96
2390	18.67	AV	H	25.61	4.39	0.00	48.67	54.00	5.33
4844	37.55	PK	H	30.69	6.08	27.42	46.90	74.00	27.10
4844	26.20	AV	H	30.69	6.08	27.42	35.55	54.00	18.45
7266	30.78	PK	H	34.24	7.48	25.89	46.61	74.00	27.39
7266	19.59	AV	H	34.24	7.48	25.89	35.42	54.00	18.58
9688	28.51	PK	H	36.15	8.82	27.37	46.11	74.00	27.89
9688	17.50	AV	H	36.15	8.82	27.37	35.10	54.00	18.90
2950	37.38	PK	H	27.07	6.91	27.54	43.82	74.00	30.18
2950	26.26	AV	H	27.07	6.91	27.54	32.70	54.00	21.30
325	32.60	QP	H	14.61	2.16	21.58	27.79	46.00	18.21
Middle Channel: 2437 MHz									
2437	70.36	PK	H	25.74	4.41	0.00	100.51	N/A	N/A
2437	58.93	AV	H	25.74	4.41	0.00	89.08	N/A	N/A
2437	64.25	PK	V	25.74	4.41	0.00	94.40	N/A	N/A
2437	53.68	AV	V	25.74	4.41	0.00	83.83	N/A	N/A
4874	34.52	PK	H	30.77	6.09	27.42	43.96	74.00	30.04
4874	25.13	AV	H	30.77	6.09	27.42	34.57	54.00	19.43
7311	29.64	PK	H	34.35	7.51	25.88	45.62	74.00	28.38
7311	20.36	AV	H	34.35	7.51	25.88	36.34	54.00	17.66
9748	29.15	PK	H	36.30	8.83	27.24	47.04	74.00	26.96
9748	18.69	AV	H	36.30	8.83	27.24	36.58	54.00	17.42
2950	36.52	PK	H	27.07	6.91	27.54	42.96	74.00	31.04
2950	30.24	AV	H	27.07	6.91	27.54	36.68	54.00	17.32
3610	36.26	PK	H	29.04	5.04	27.28	43.06	74.00	30.94
3610	25.74	AV	H	29.04	5.04	27.28	32.54	54.00	21.46
325	32.50	QP	H	14.61	2.16	21.58	27.69	46.00	18.31
High Channel: 2452 MHz									
2452	70.22	PK	H	25.78	4.41	0.00	100.41	N/A	N/A
2452	58.81	AV	H	25.78	4.41	0.00	89.00	N/A	N/A
2452	64.12	PK	V	25.78	4.41	0.00	94.31	N/A	N/A
2452	53.57	AV	V	25.78	4.41	0.00	83.76	N/A	N/A
2483.5	34.45	PK	H	25.86	4.49	0.00	64.80	74.00	9.20
2483.5	20.32	AV	H	25.86	4.49	0.00	50.67	54.00	3.33*
4904	29.58	PK	H	30.85	6.06	27.43	39.06	74.00	34.94
4904	20.32	AV	H	30.85	6.06	27.43	29.80	54.00	24.20
7356	29.09	PK	H	34.45	7.53	25.87	45.20	74.00	28.80
7356	18.65	AV	H	34.45	7.53	25.87	34.76	54.00	19.24
9808	36.45	PK	H	36.44	8.84	27.09	54.64	74.00	19.36
9808	30.18	AV	H	36.44	8.84	27.09	48.37	54.00	5.63*
2950	36.19	PK	H	27.07	6.91	27.54	42.63	74.00	31.37
2950	25.69	AV	H	27.07	6.91	27.54	32.13	54.00	21.87
325	32.65	QP	H	14.61	2.16	21.58	27.84	46.00	18.16

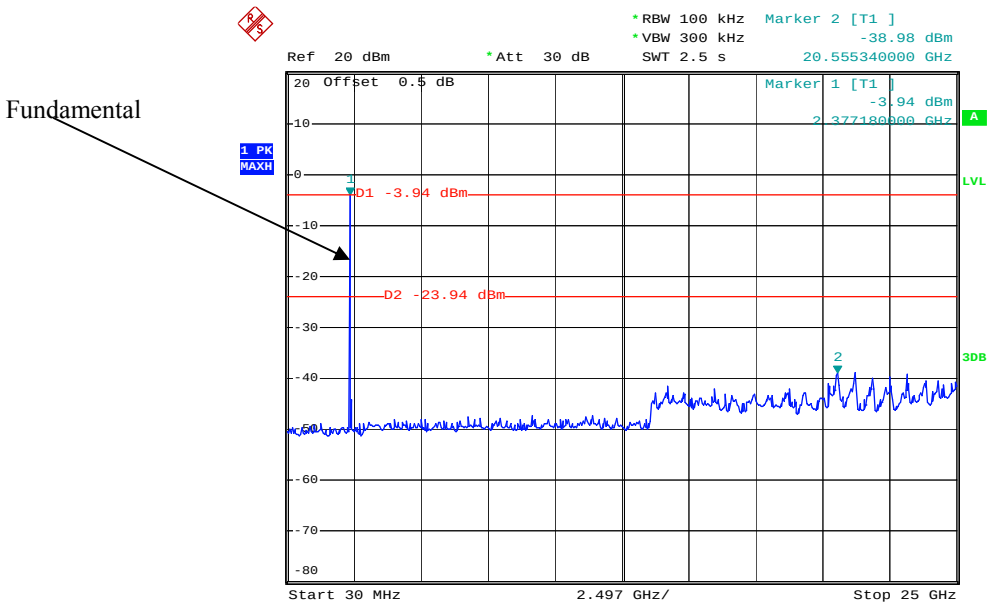
*Within measurement uncertainty!

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	88.30	PK	H	25.65	4.42	27.32	91.05	N/A	N/A
2402	81.40	AV	H	25.65	4.42	27.32	84.15	N/A	N/A
2402	79.88	PK	V	25.65	4.42	27.32	82.63	N/A	N/A
2402	62.46	AV	V	25.65	4.42	27.32	65.21	N/A	N/A
2390	33.78	PK	H	25.61	4.39	27.32	36.46	74.00	37.54
2390	23.49	AV	H	25.61	4.39	27.32	26.17	54.00	27.83
4804	35.62	PK	H	30.59	5.98	27.41	44.78	74.00	29.22
4804	26.68	AV	H	30.59	5.98	27.41	35.84	54.00	18.16
7206	28.83	PK	H	34.09	7.45	25.91	44.46	74.00	29.54
7206	20.73	AV	H	34.09	7.45	25.91	36.36	54.00	17.64
1610	33.89	PK	H	23.82	3.27	27.80	33.18	74.00	40.82
1610	26.69	AV	H	23.82	3.27	27.80	25.98	54.00	28.02
7440	29.38	PK	H	34.66	7.58	25.97	45.65	74.00	28.35
7440	20.87	AV	H	34.66	7.58	25.97	37.14	54.00	16.86
232.5	33.2	QP	H	12.01	1.84	21.48	25.57	46.00	20.43
Middle Channel: 2440 MHz									
2440	87.66	PK	H	25.74	4.4	27.34	90.46	N/A	N/A
2440	80.58	AV	H	25.74	4.4	27.34	83.38	N/A	N/A
2440	79.04	PK	V	25.74	4.4	27.34	81.84	N/A	N/A
2440	70.71	AV	V	25.74	4.4	27.34	73.51	N/A	N/A
4880	34.63	PK	H	30.79	6.08	27.42	44.08	74.00	29.92
4880	25.38	AV	H	30.79	6.08	27.42	34.83	54.00	19.17
7320	29.79	PK	H	34.37	7.51	25.88	45.79	74.00	28.21
7320	21.75	AV	H	34.37	7.51	25.88	37.75	54.00	16.25
1610	33.66	PK	H	23.82	3.27	27.80	32.95	74.00	41.05
1610	24.22	AV	H	23.82	3.27	27.80	23.51	54.00	30.49
7440	30.32	PK	H	34.66	7.58	25.97	46.59	74.00	27.41
7440	21.30	AV	H	34.66	7.58	25.97	37.57	54.00	16.43
232.5	32.60	QP	H	12.01	1.84	21.48	24.97	46.00	21.03
High Channel: 2480 MHz									
2480	87.35	PK	H	25.85	4.48	27.36	87.32	N/A	N/A
2480	70.52	AV	H	25.85	4.48	27.36	77.49	N/A	N/A
2480	78.76	PK	V	25.85	4.48	27.36	81.73	N/A	N/A
2480	70.26	AV	V	25.85	4.48	27.36	72.23	N/A	N/A
2483.5	35.65	PK	H	25.86	4.49	27.36	38.64	74.00	35.36
2483.5	27.16	AV	H	25.86	4.49	27.36	30.15	54.00	23.85
4960	35.29	PK	H	31.00	5.90	27.43	44.76	74.00	29.24
4960	25.29	AV	H	31.00	5.90	27.43	34.76	54.00	19.24
7440	29.47	PK	H	34.66	7.58	25.97	45.74	74.00	28.26
7440	21.41	AV	H	34.66	7.58	25.97	37.68	54.00	16.32
1610	32.43	PK	H	23.82	3.27	27.80	31.72	74.00	42.28
1610	23.86	AV	H	23.82	3.27	27.80	23.15	54.00	30.85
7440	29.40	PK	H	34.66	7.58	25.97	45.67	74.00	28.33
7440	19.88	AV	H	34.66	7.58	25.97	36.15	54.00	17.85
232.5	33.10	QP	H	12.01	1.84	21.48	25.47	46.00	20.53

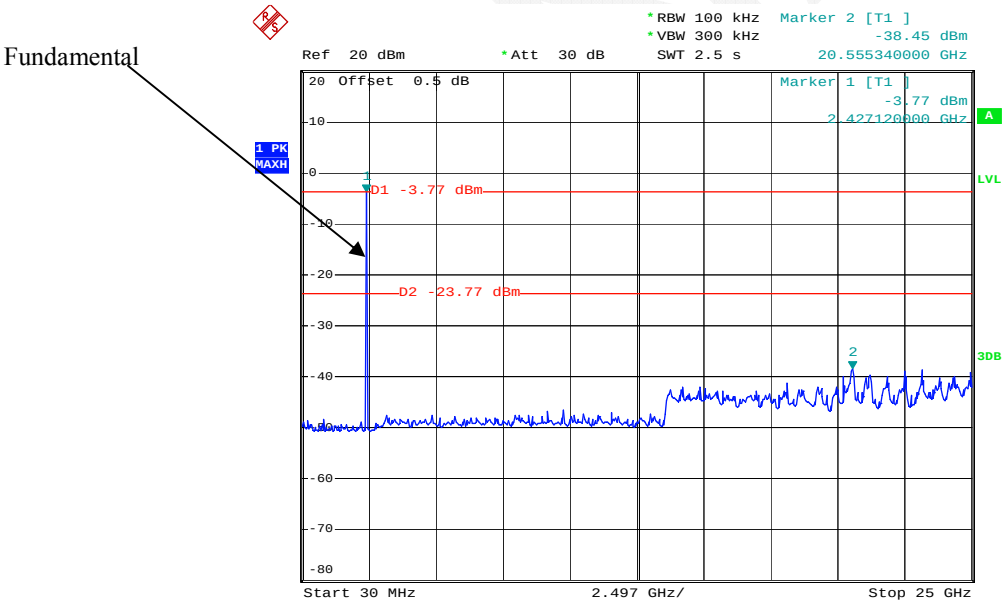
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



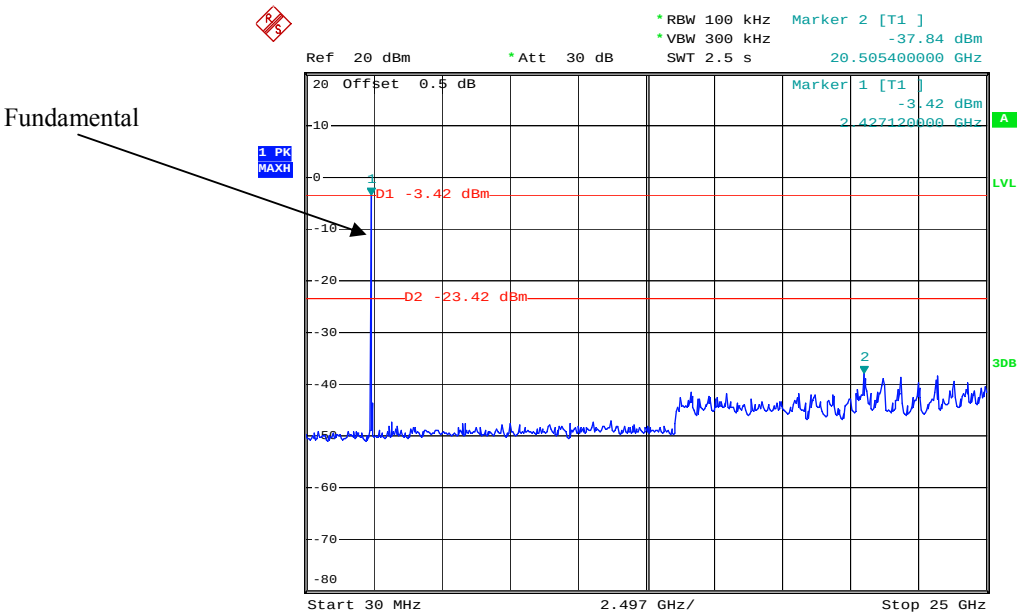
Date: 16.SEP.2014 20:56:46

802.11b Middle Channel



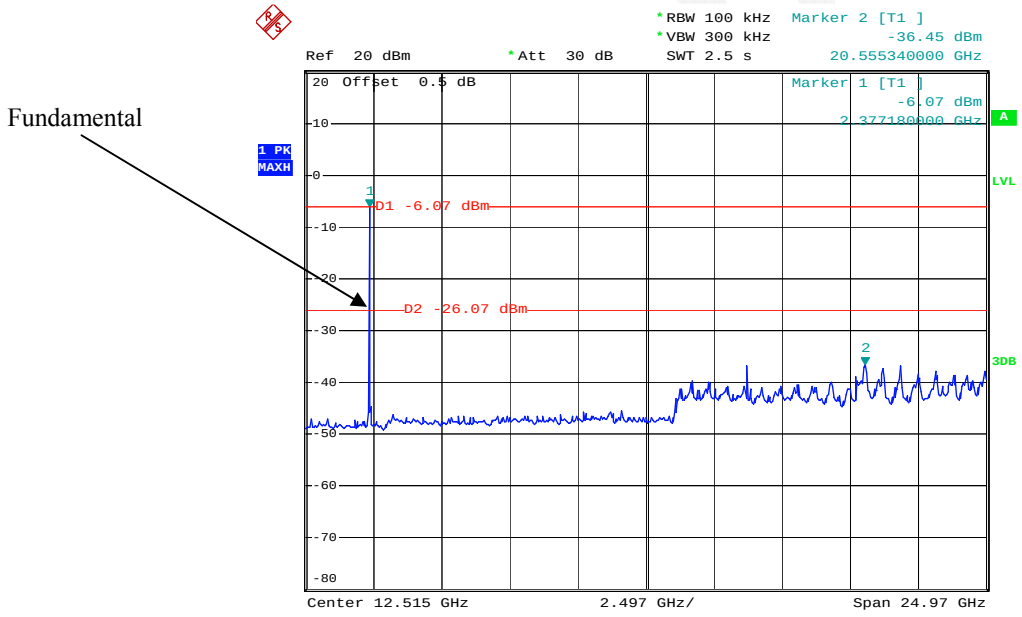
Date: 16.SEP.2014 21:08:47

802.11b High Channel



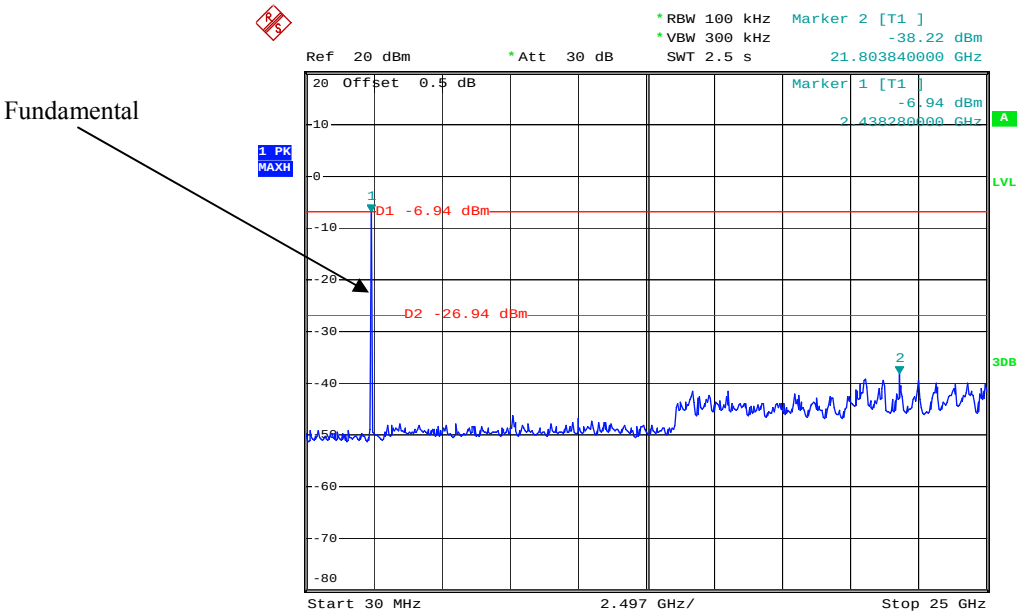
Date: 16.SEP.2014 21:20:42

802.11g Low Channel



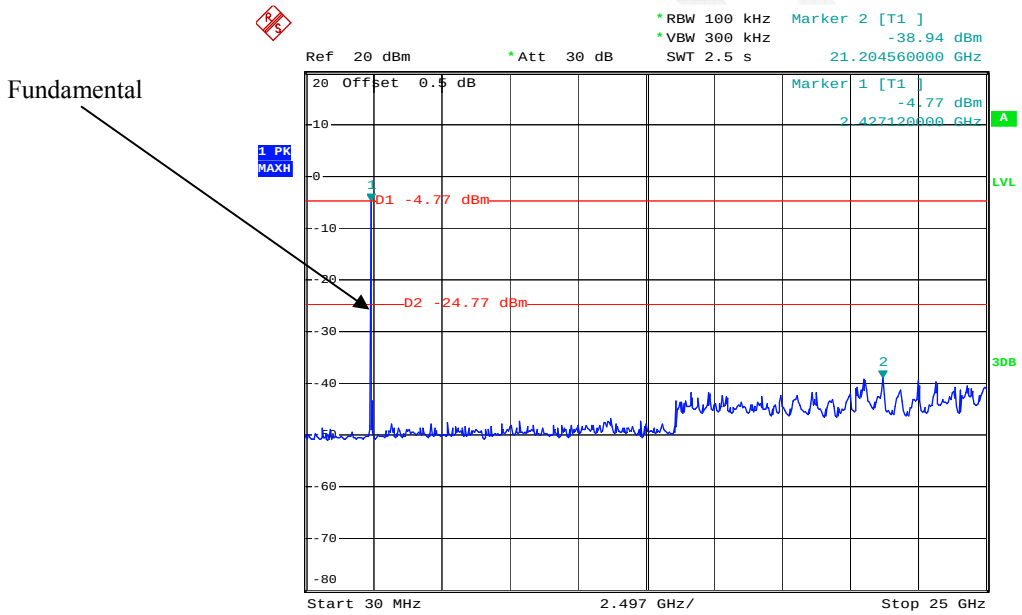
Date: 17.SEP.2014 09:58:02

802.11g Middle Channel



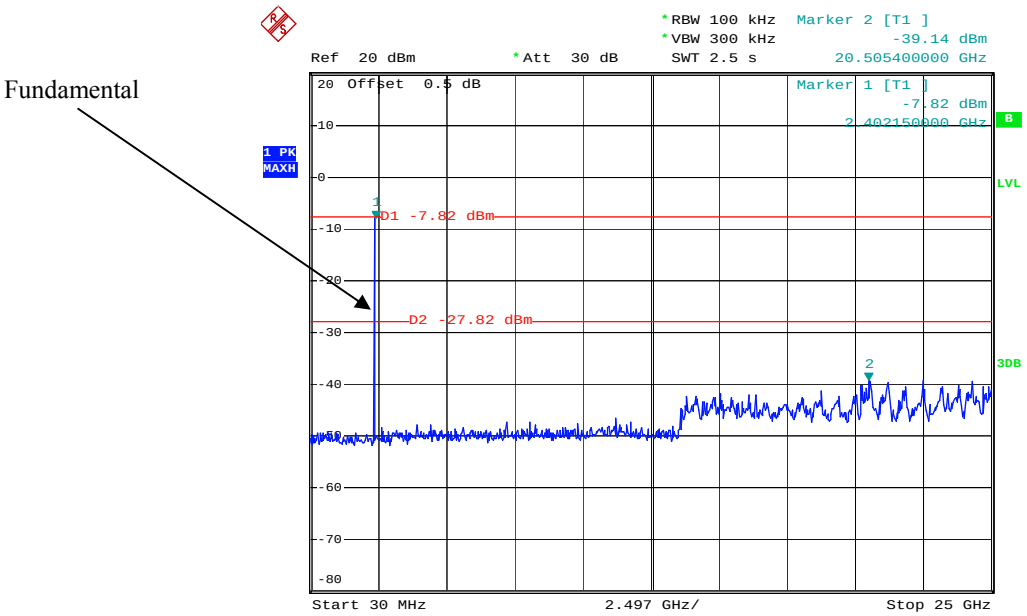
Date: 16.SEP.2014 21:57:37

802.11g High Channel



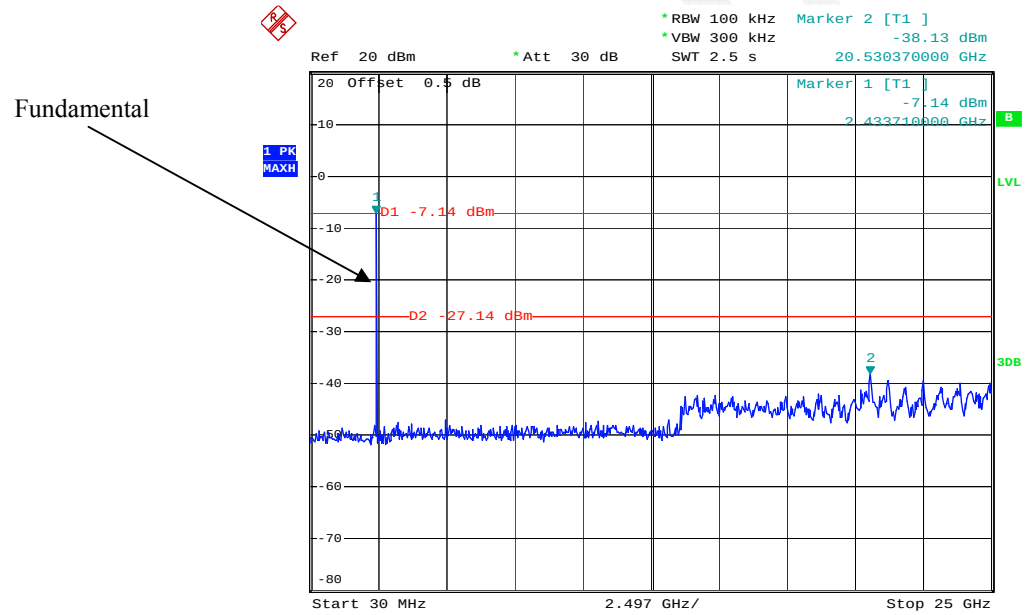
Date: 16.SEP.2014 21:41:42

802.11n ht20 Low Channel



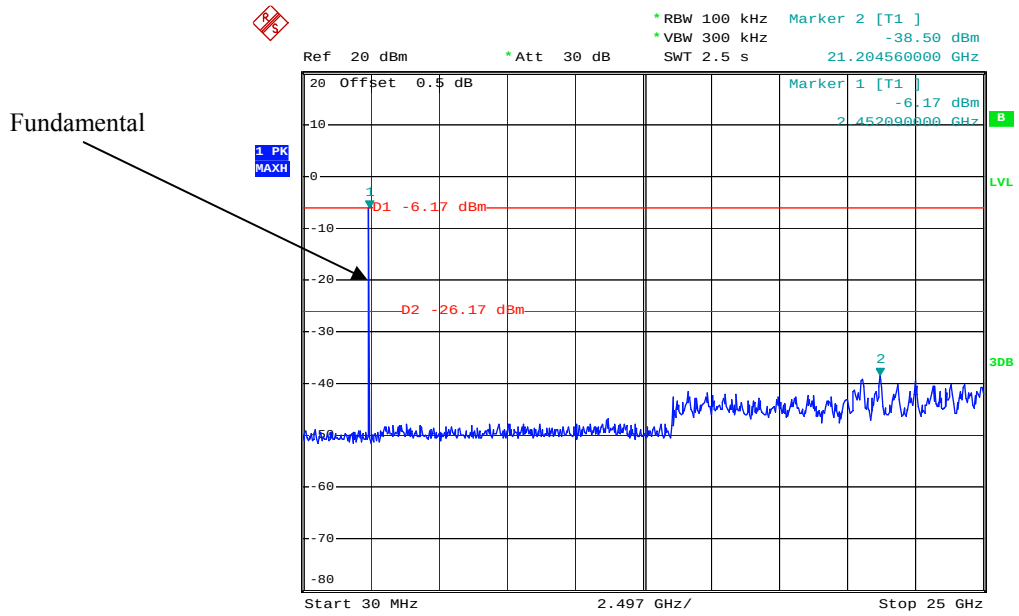
Date: 17.SEP.2014 10:14:47

802.11n ht20 Middle Channel



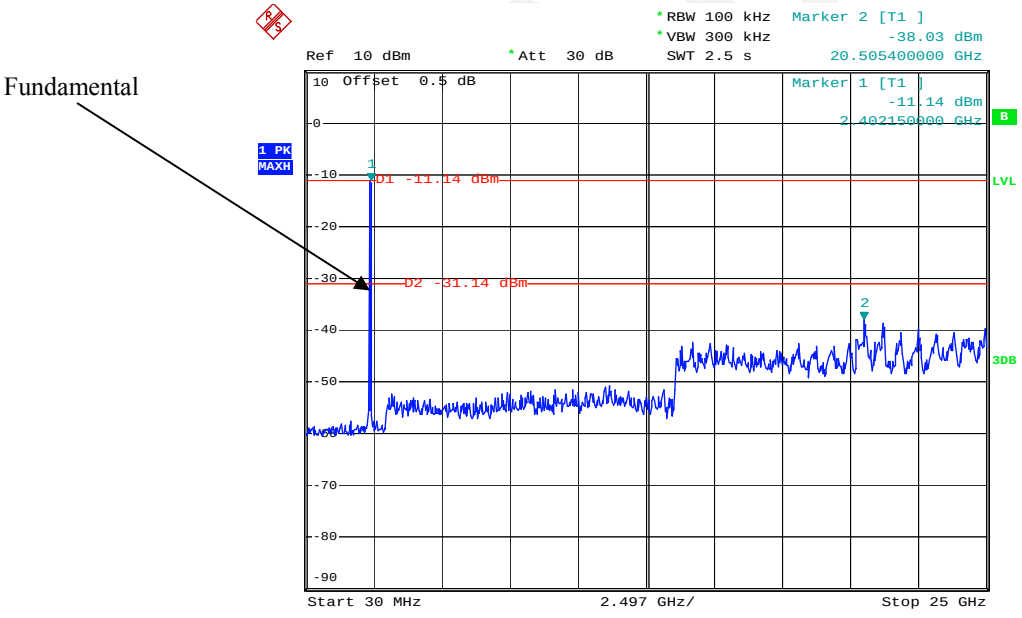
Date: 17.SEP.2014 10:23:44

802.11n ht20 High Channel



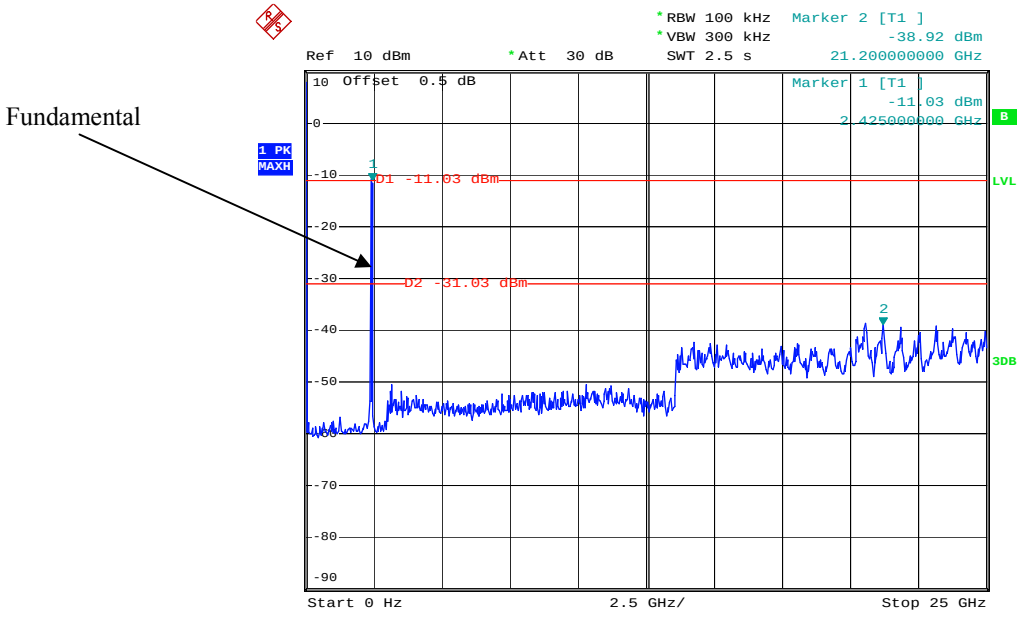
Date: 17.SEP.2014 10:42:42

802.11n ht40 Low Channel



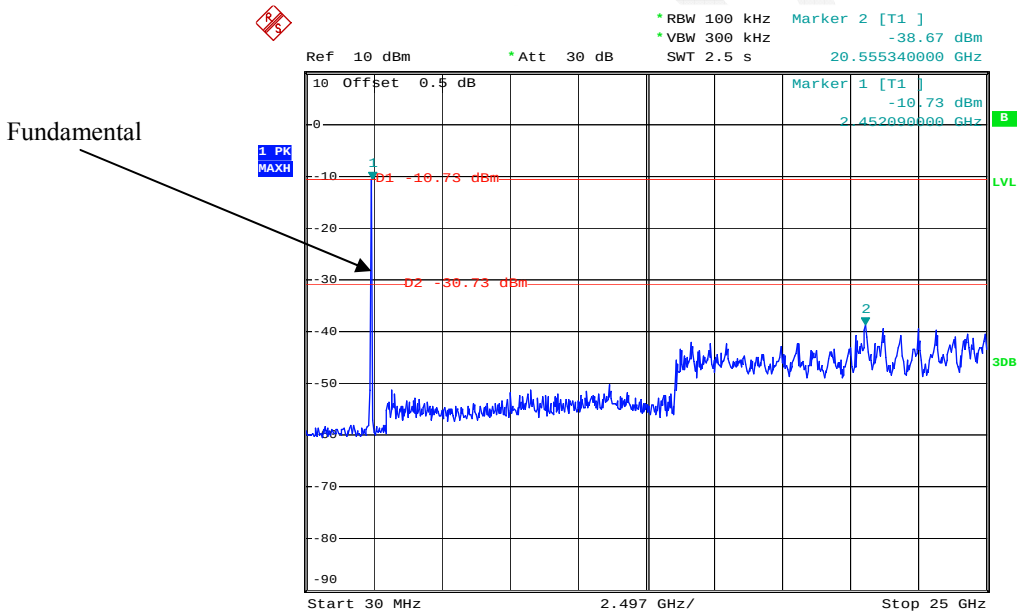
Date: 17.SEP.2014 11:04:38

802.11n ht40 Middle Channel



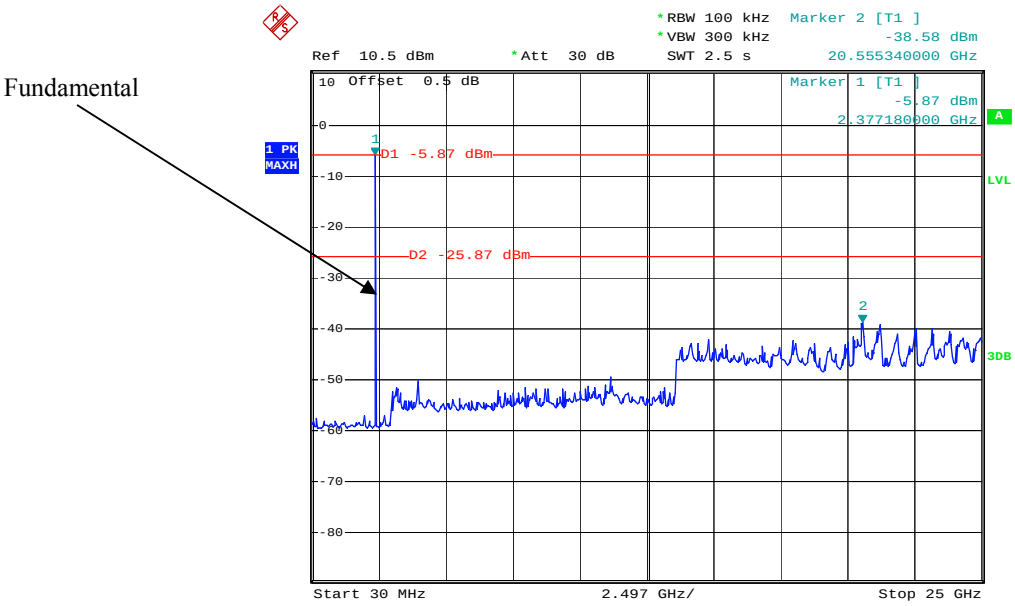
Date: 17.SEP.2014 11:09:46

802.11n ht40 High Channel



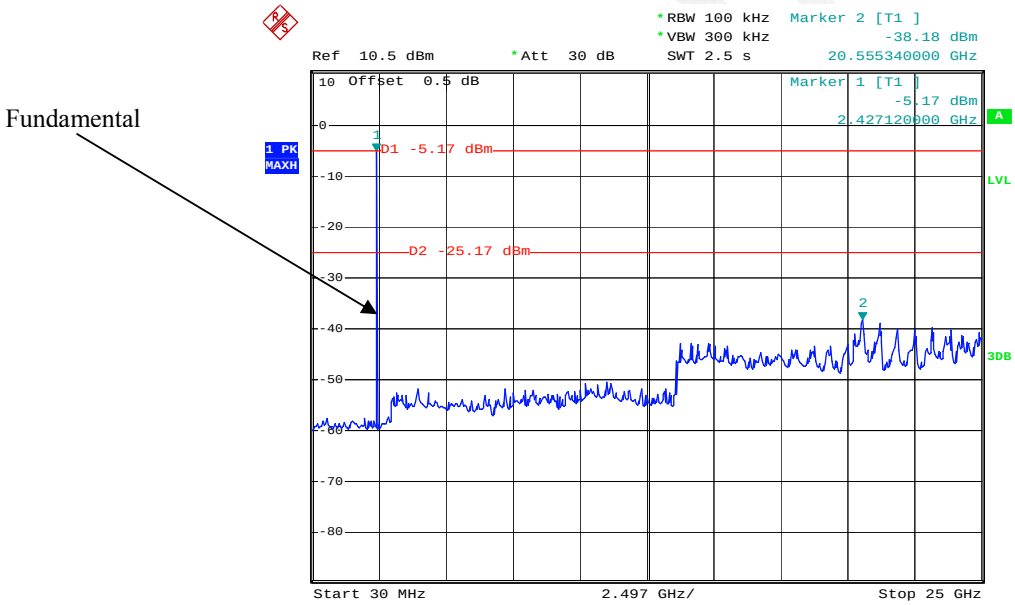
Date: 17.SEP.2014 11:19:34

BLE Low Channel



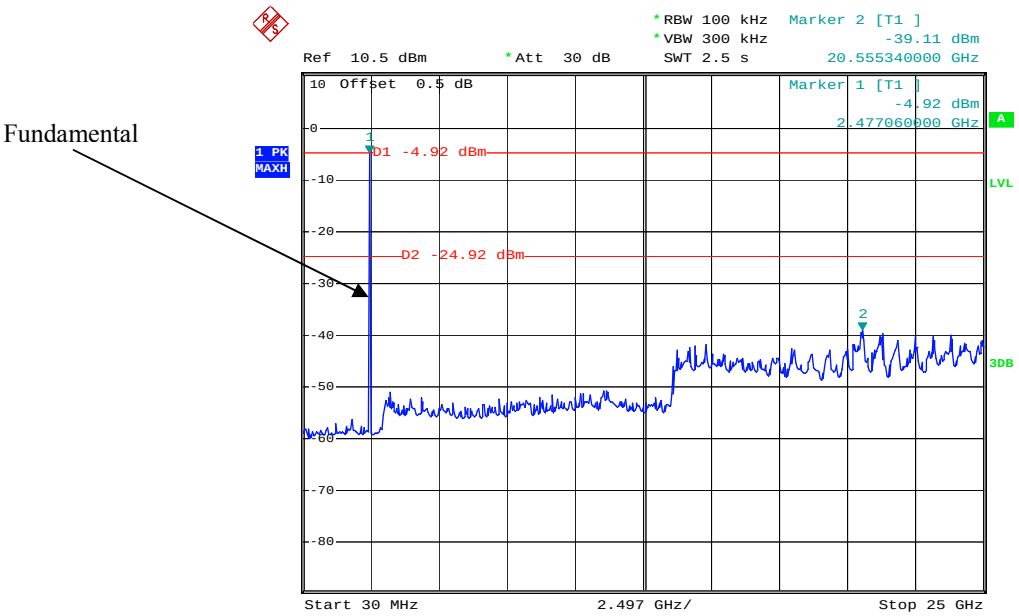
Date: 16.SEP.2014 20:07:01

BLE Middle Channel



Date: 16.SEP.2014 20:09:35

BLE High Channel



Date: 16.SEP.2014 20:13:36

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:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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	FSEM	DE31388	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:	27.7°C -28.8 °C
Relative Humidity:	67%-69 %
ATM Pressure:	99.6 kPa -100.5 kPa

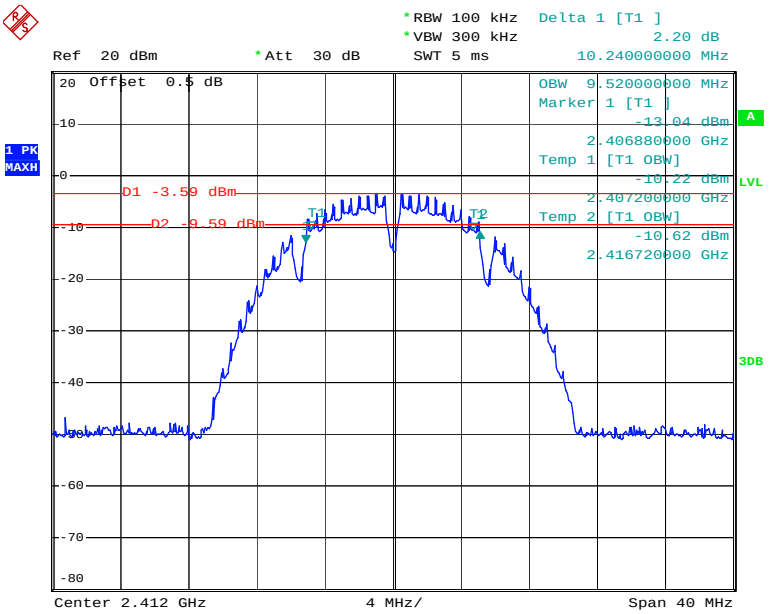
The testing was performed by Dean Liu on2014-09-16 & 2014-09-17

Test Mode: Transmitting

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

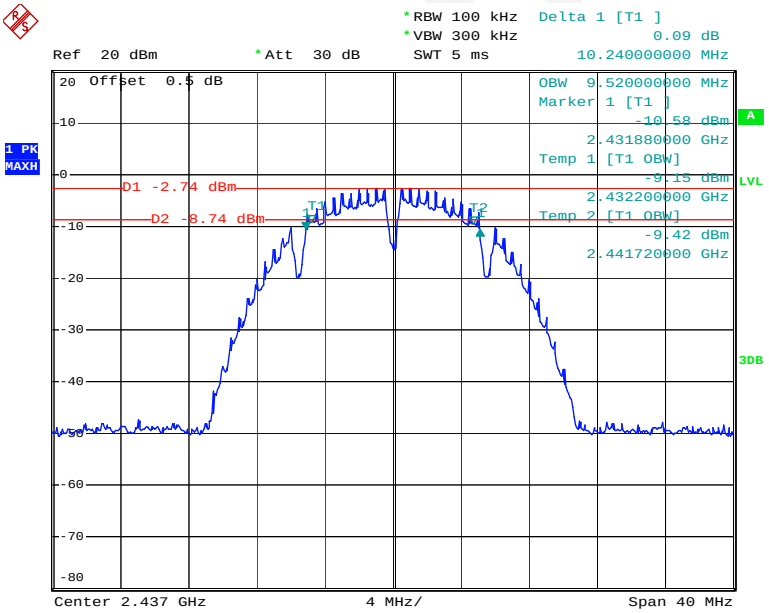
Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.24	≥0.5
	Middle	2437	10.24	≥0.5
	High	2462	10.24	≥0.5
802.11g	Low	2412	16.56	≥0.5
	Middle	2437	16.48	≥0.5
	High	2462	16.48	≥0.5
802.11n20	Low	2412	17.68	≥0.5
	Middle	2437	17.68	≥0.5
	High	2462	17.69	≥0.5
802.11n40	Low	2422	36.64	≥0.5
	Middle	2437	36.64	≥0.5
	High	2452	36.64	≥0.5
BLE	Low	2402	0.696	≥0.5
	Middle	2440	0.692	≥0.5
	High	2480	0.700	≥0.5

802.11b Low Channel



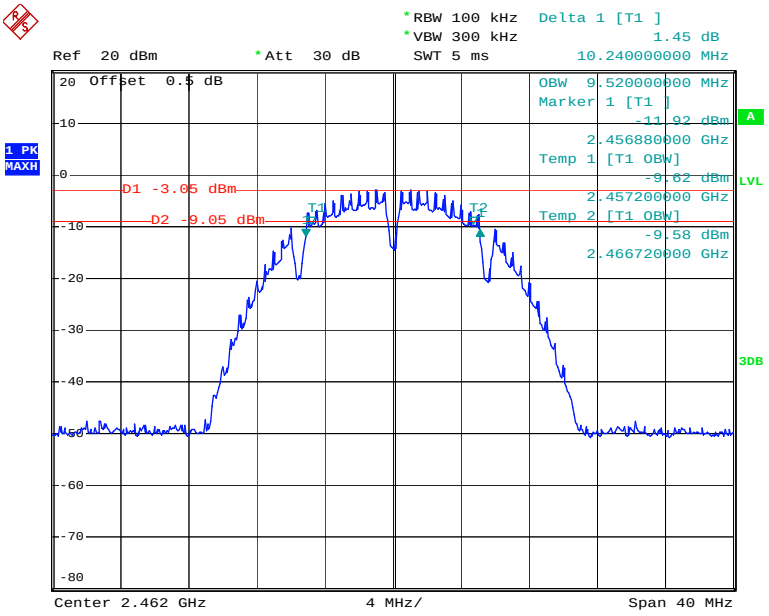
Date: 16.SEP.2014 20:37:30

802.11b Middle Channel



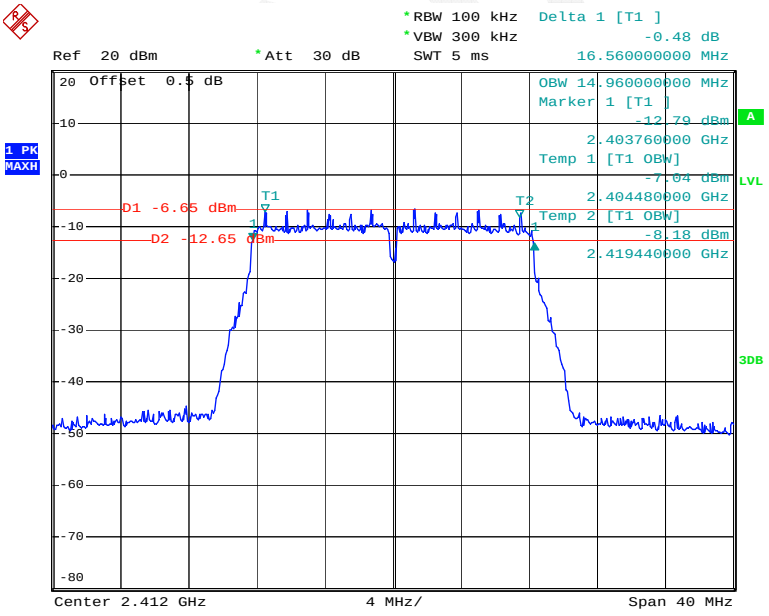
Date: 16.SEP.2014 21:00:23

802.11b High Channel



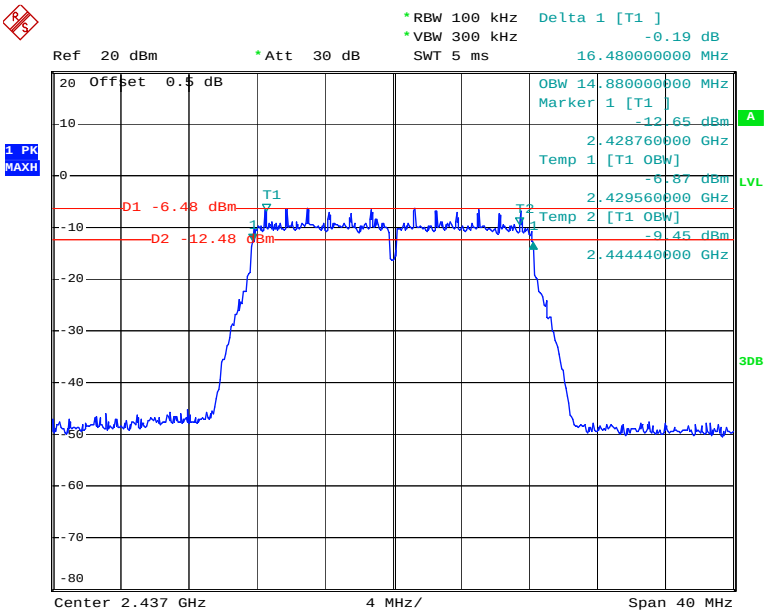
Date: 16.SEP.2014 21:13:11

802.11g Low Channel



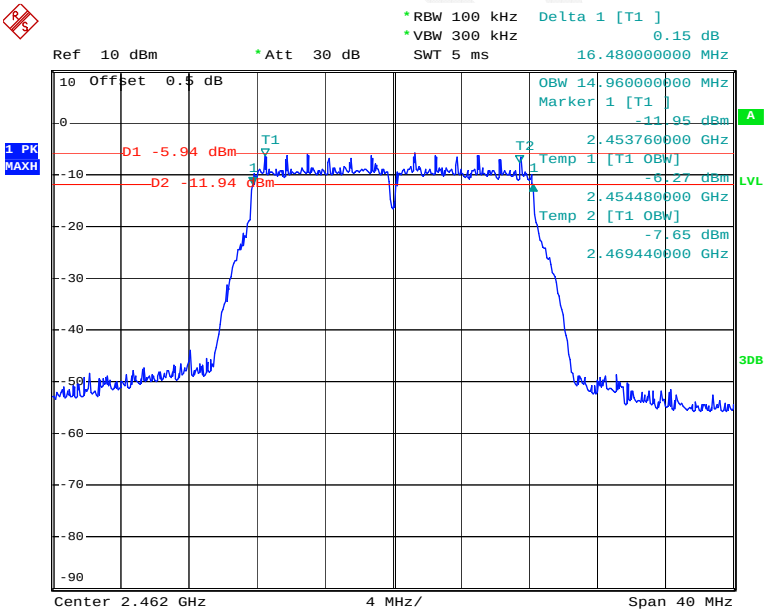
Date: 16.SEP.2014 21:59:00

802.11g Middle Channel



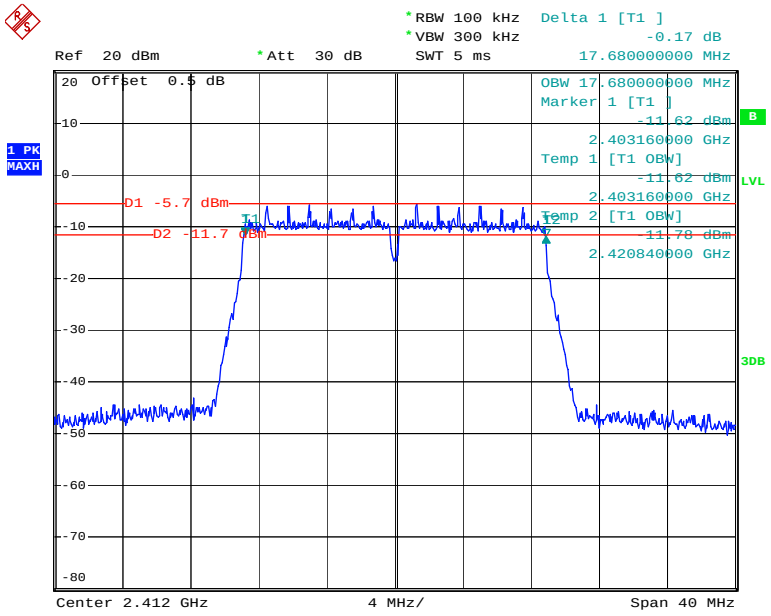
Date: 16.SEP.2014 21:51:18

802.11g High Channel



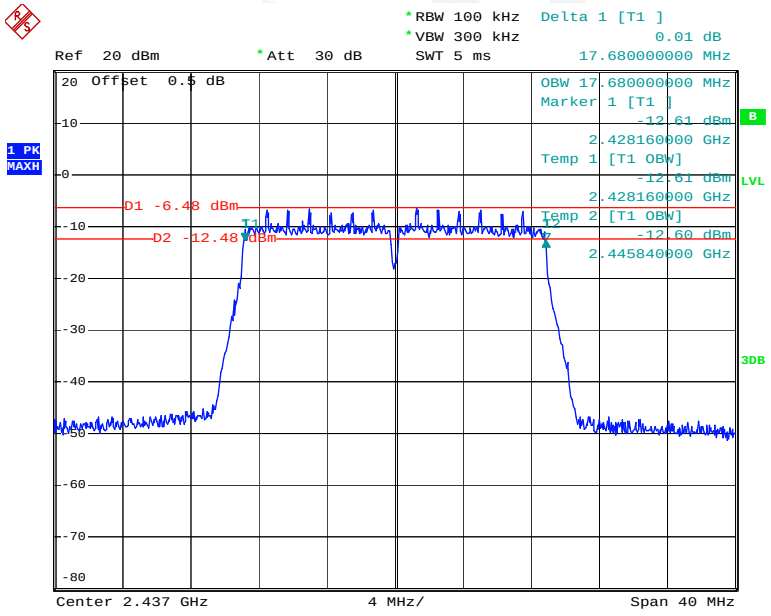
Date: 16.SEP.2014 21:27:10

802.11n ht20 Low Channel



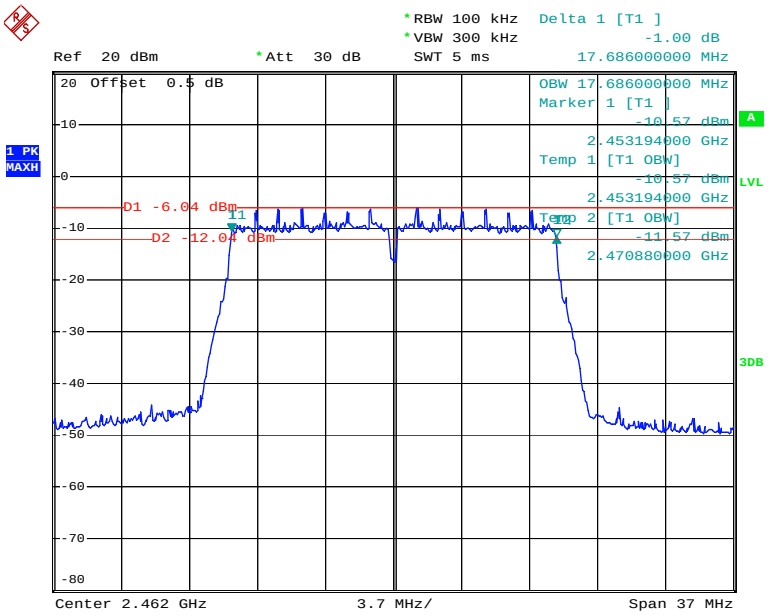
Date: 17.SEP.2014 10:07:07

802.11n ht20 Middle Channel



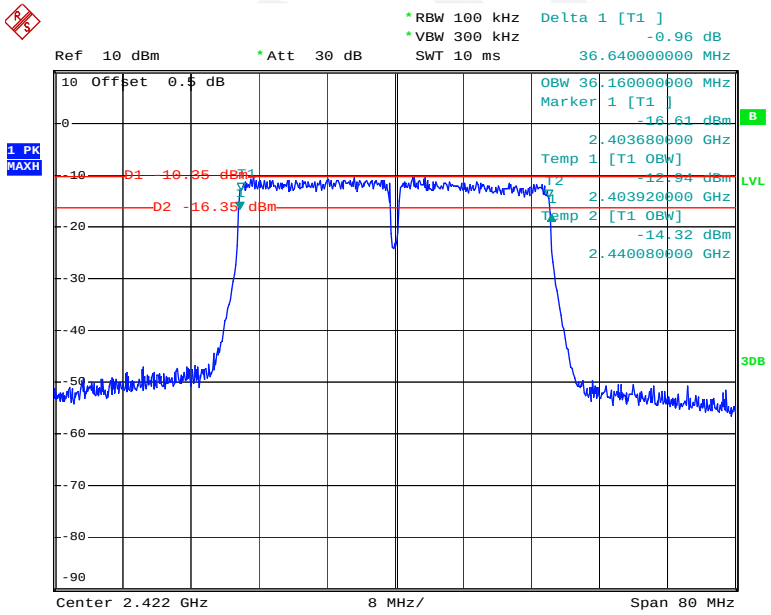
Date: 17.SEP.2014 10:17:57

802.11n ht20 High Channel



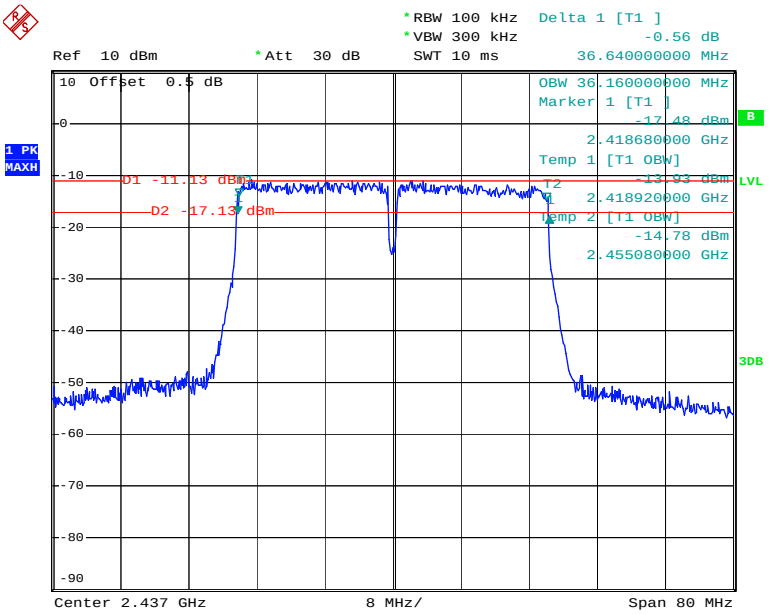
Date: 17.SEP.2014 21:35:49

802.11n ht40 Low Channel



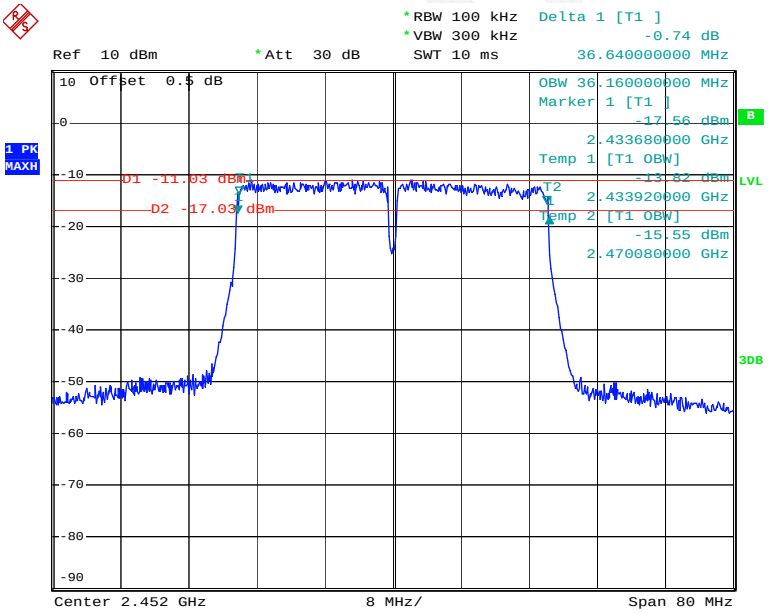
Date: 17.SEP.2014 10:51:39

802.11n ht40 Middle Channel



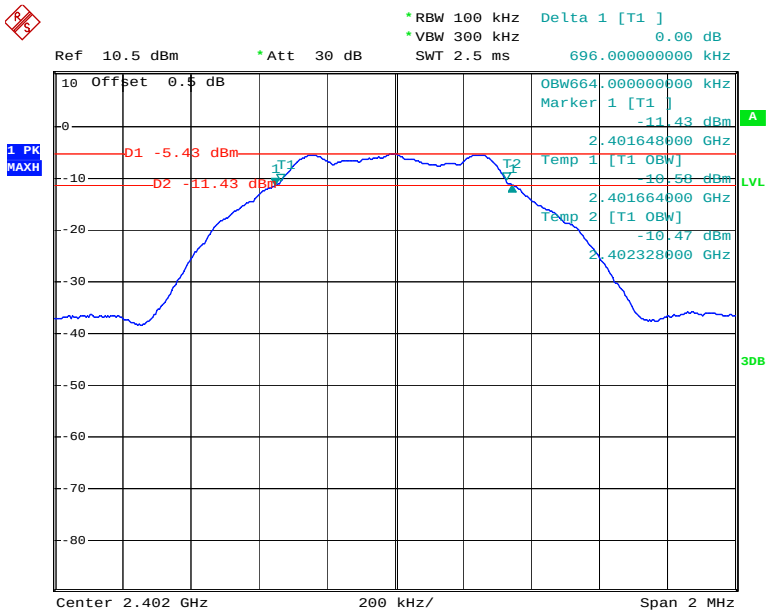
Date: 17.SEP.2014 11:06:01

802.11n ht40 High Channel



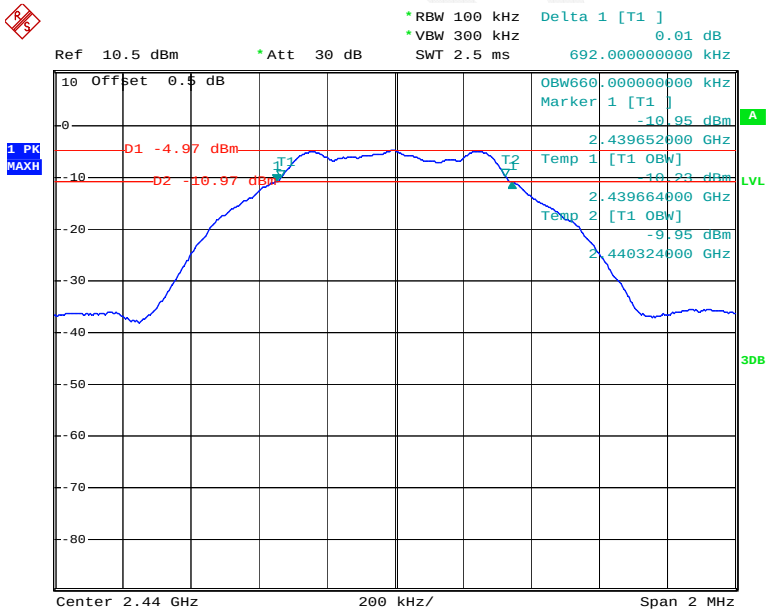
Date: 17.SEP.2014 11:12:49

BLE Low Channel



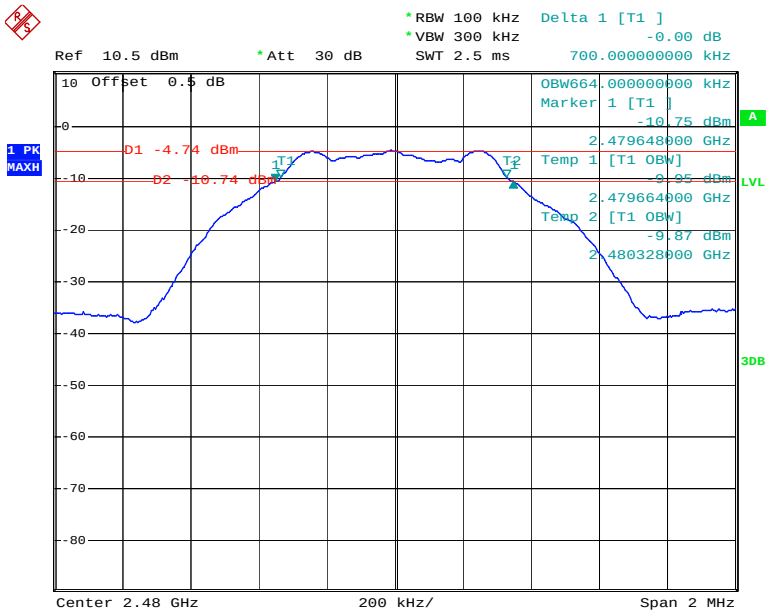
Date: 16.SEP.2014 20:04:52

BLE Middle Channel



Date: 16.SEP.2014 20:08:42

BLE High Channel



Date: 16.SEP.2014 20:11:42

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	2013-12-12	2014-12-12
Agilent	Wideband Power Sensor	N1921A	MY54170013	2013-12-12	2014-12-12
Agilent	P-Series Power Meter	N1912A	MY5000448	2013-12-12	2014-12-12
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09

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

Test Data

Environmental Conditions

Temperature:	28.4 °C
Relative Humidity:	57 %
ATM Pressure:	100.5 kPa

The testing was performed by Dean Liu on 2014-08-21

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	9.48	30	PASS
	Middle	2437	9.70	30	PASS
	High	2462	9.59	30	PASS
802.11g	Low	2412	12.26	30	PASS
	Middle	2437	12.78	30	PASS
	High	2462	13.13	30	PASS
802.11n20	Low	2412	12.50	30	PASS
	Middle	2437	12.51	30	PASS
	High	2462	12.91	30	PASS
802.11n40	Low	2422	14.59	30	PASS
	Middle	2437	15.02	30	PASS
	High	2452	14.93	30	PASS

Test mode	Channel	Frequency	Max Conducted Average Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	8.84	30	PASS
	Middle	2437	9.00	30	PASS
	High	2462	8.90	30	PASS
802.11g	Low	2412	8.68	30	PASS
	Middle	2437	9.03	30	PASS
	High	2462	9.07	30	PASS
802.11n20	Low	2412	8.90	30	PASS
	Middle	2437	8.98	30	PASS
	High	2462	9.15	30	PASS
802.11n40	Low	2422	8.44	30	PASS
	Middle	2437	9.06	30	PASS
	High	2452	8.73	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	-4.67	30	PASS
	Middle	2440	-4.24	30	PASS
	High	2480	-4.04	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	FSEM	DE31388	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

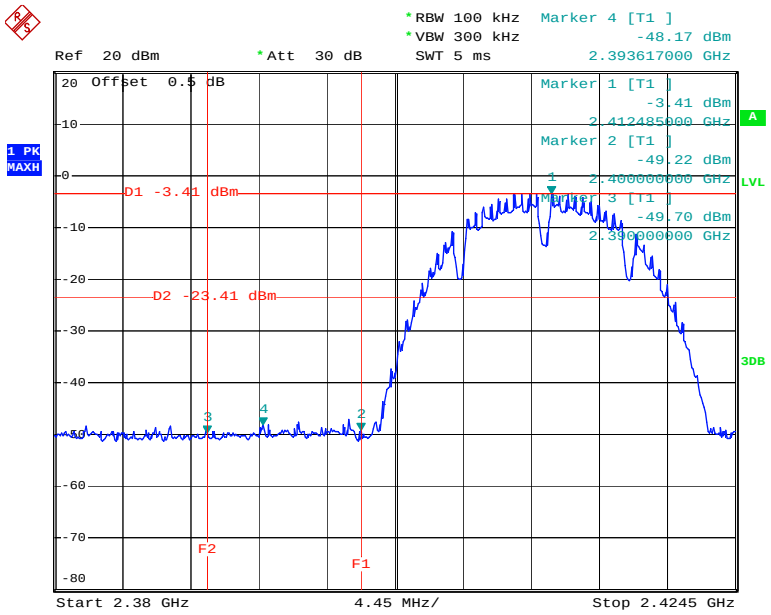
Temperature:	27.7°C -28.8 °C
Relative Humidity:	67%-69 %
ATM Pressure:	99.6 kPa -100.5 kPa

The testing was performed by Dean Liu on2014-09-16 & 2014-09-17

Test mode: Transmitting

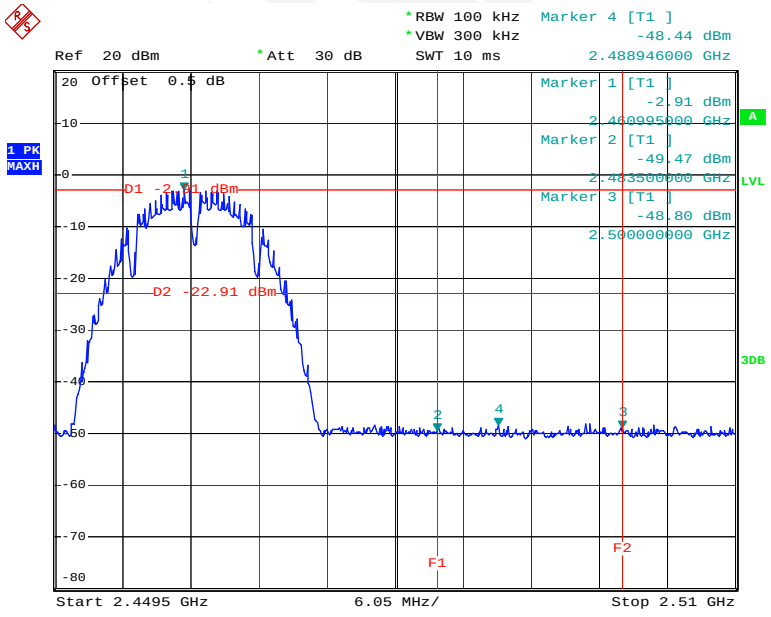
Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side



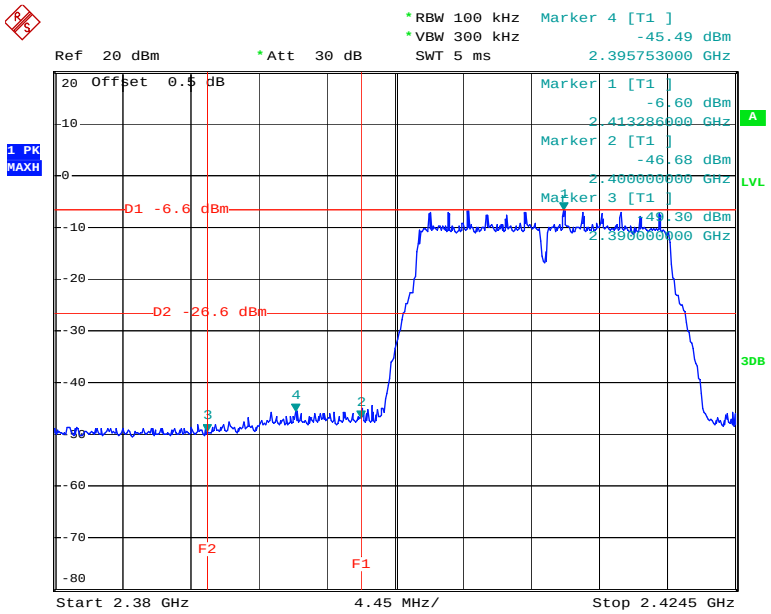
Date: 16.SEP.2014 20:54:16

802.11b: Band Edge, Right Side



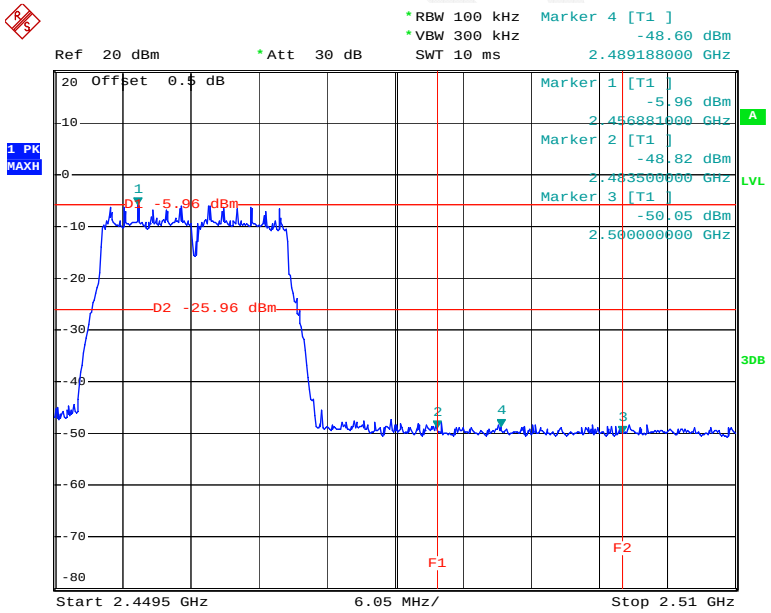
Date: 16.SEP.2014 21:18:46

802.11g: Band Edge, Left Side



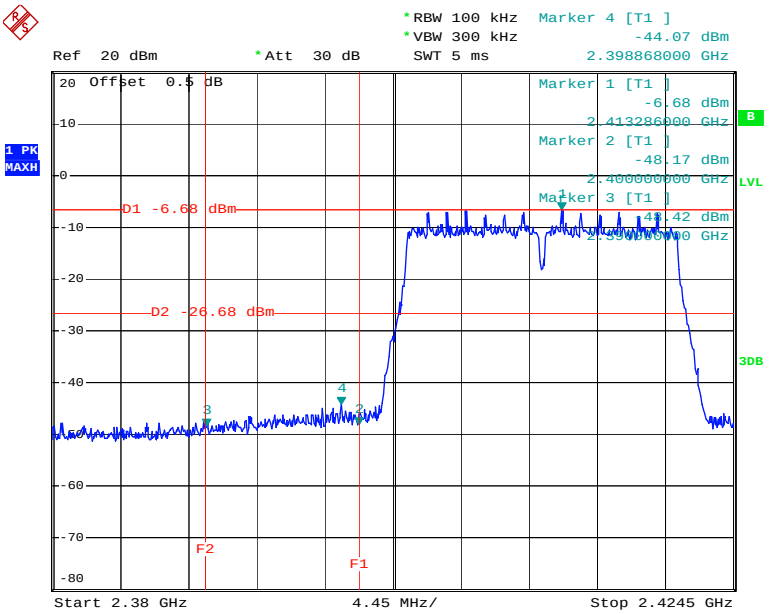
Date: 16.SEP.2014 22:04:59

802.11g: Band Edge, Right Side



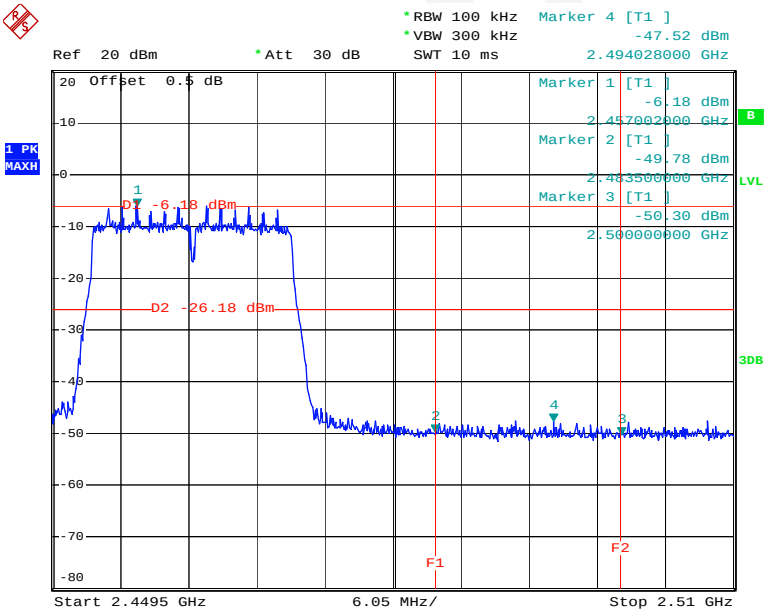
Date: 16.SEP.2014 21:32:13

802.11n ht20 Band Edge, Left Side



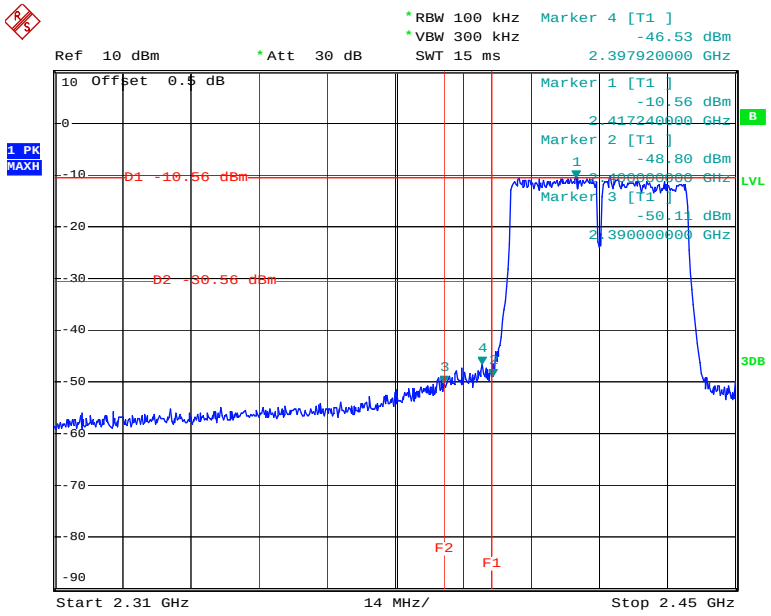
Date: 17.SEP.2014 10:13:12

802.11n ht20 Band Edge, Right Side



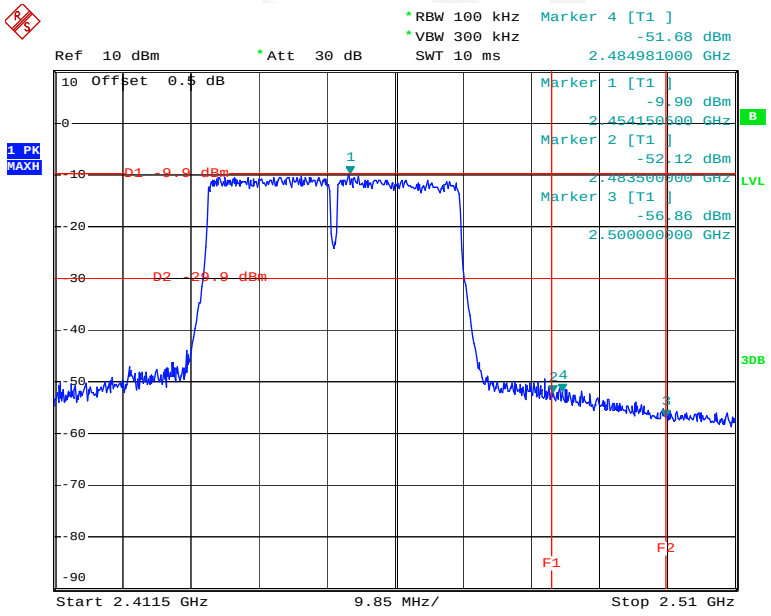
Date: 17.SEP.2014 10:41:41

802.11n ht40 Band Edge, Left Side



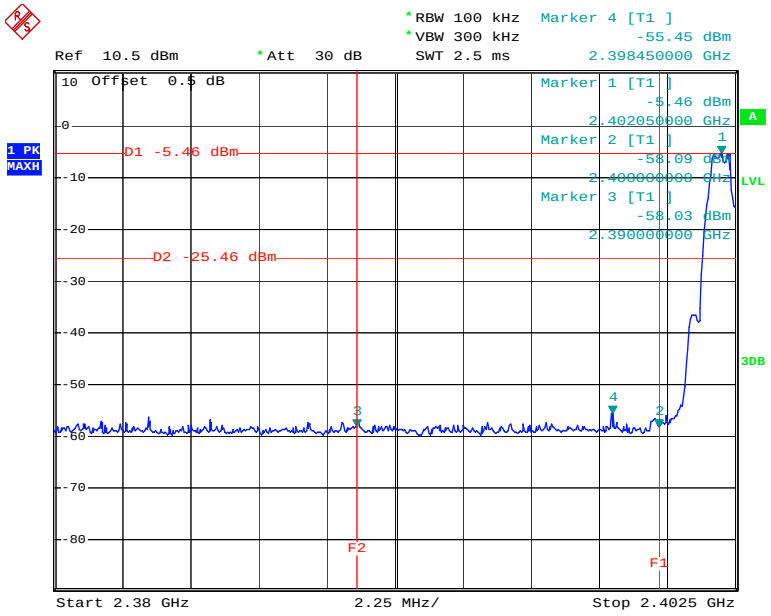
Date: 17.SEP.2014 11:01:50

802.11n ht40 Band Edge, Right Side



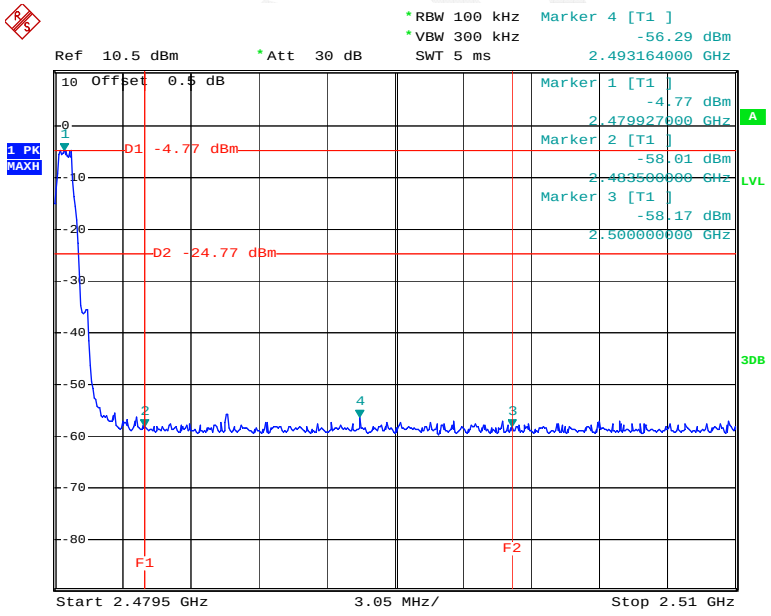
Date: 17.SEP.2014 11:18:13

BLE Band Edge， Left Side



Date: 16.SEP.2014 20:06:07

BLE Band Edge, Right Side



Date: 16.SEP.2014 20:12:56

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

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 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3×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	FSEM	DE31388	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:	27.7°C -28.8 °C
Relative Humidity:	67%-69 %
ATM Pressure:	101.7 kPa

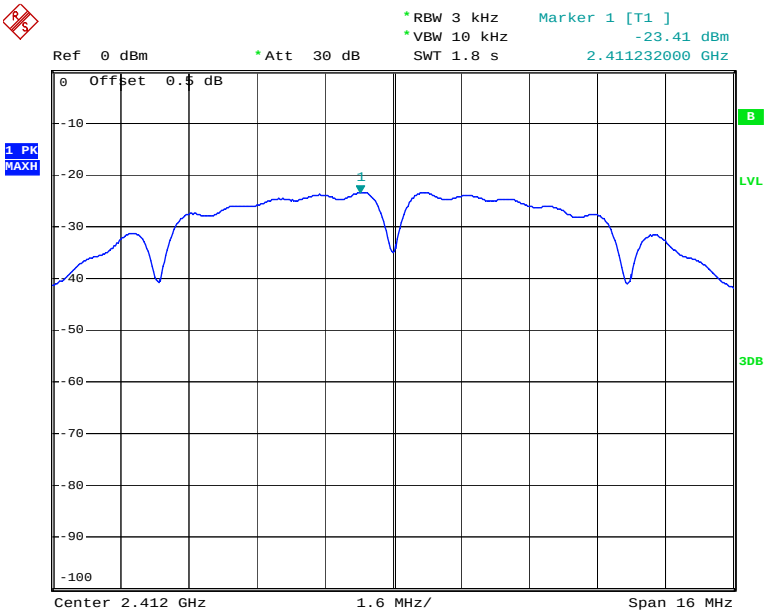
The testing was performed by Dean Liu on2014-11-18.

Test Mode: Transmitting

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

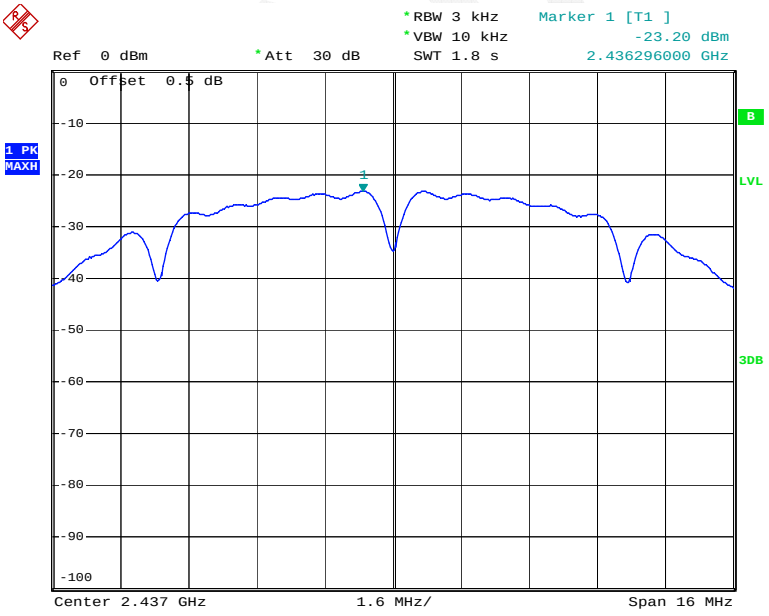
Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-23.41	≤8
	Middle	2437	-23.20	≤8
	High	2462	-24.09	≤8
802.11g	Low	2412	-23.82	≤8
	Middle	2437	-23.52	≤8
	High	2462	-23.87	≤8
802.11n20	Low	2412	-24.51	≤8
	Middle	2437	-23.99	≤8
	High	2462	-23.88	≤8
802.11n40	Low	2422	-25.24	≤8
	Middle	2437	-26.55	≤8
	High	2452	-25.06	≤8
BLE	Low	2402	-19.99	≤8
	Middle	2440	-19.55	≤8
	High	2480	-19.26	≤8

Power Spectral Density, 802.11b Low Channel



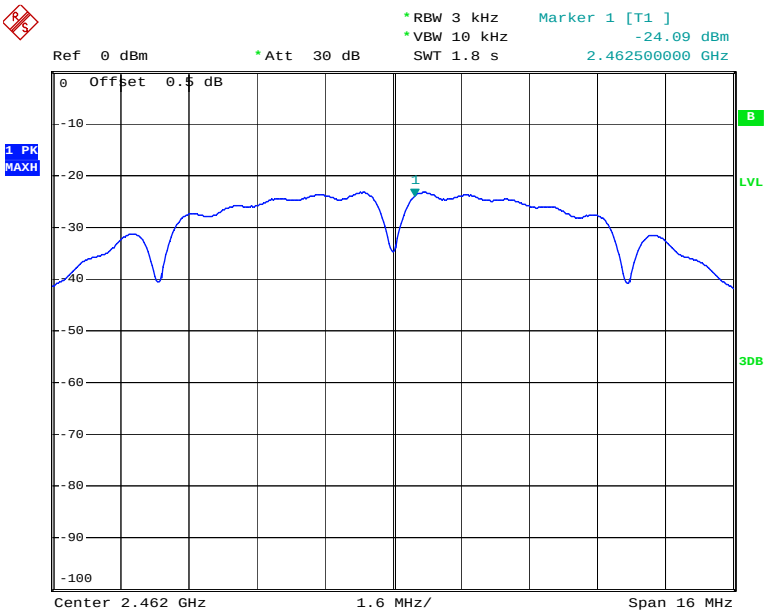
Date: 18.NOV.2014 20:02:44

Power Spectral Density, 802.11b Middle Channel



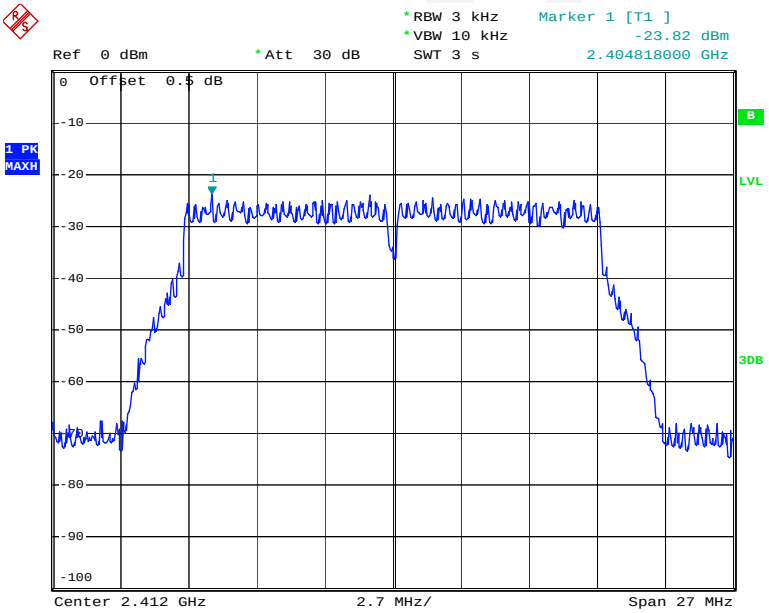
Date: 18.NOV.2014 20:02:14

Power Spectral Density, 802.11b High Channel



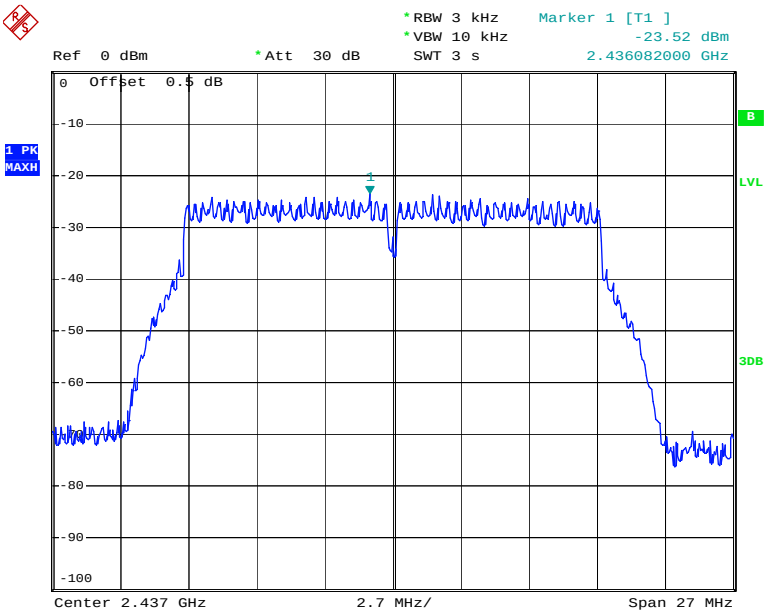
Date: 18.NOV.2014 20:01:32

Power Spectral Density, 802.11g Low Channel



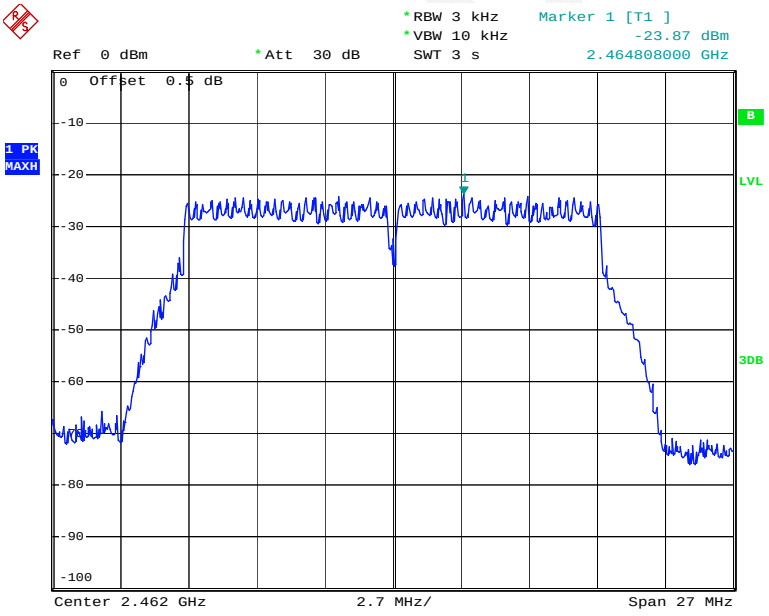
Date: 18.NOV.2014 19:52:26

Power Spectral Density, 802.11g Middle Channel



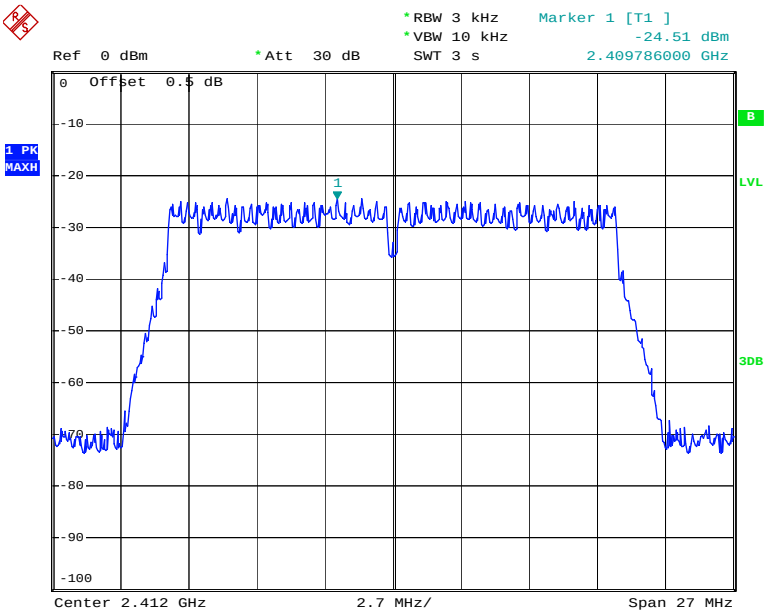
Date: 18.NOV.2014 19:53:02

Power Spectral Density, 802.11g High Channel



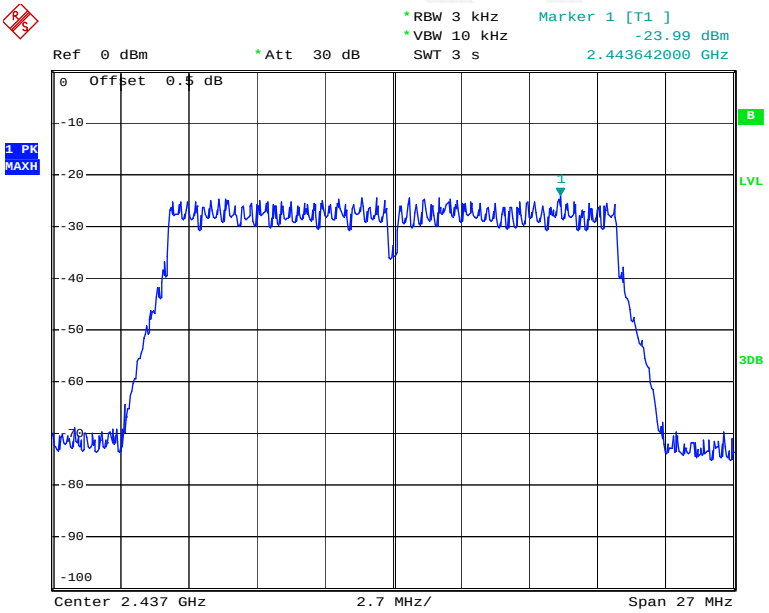
Date: 18.NOV.2014 19:53:35

Power Spectral Density, 802.11n ht20 Low Channel



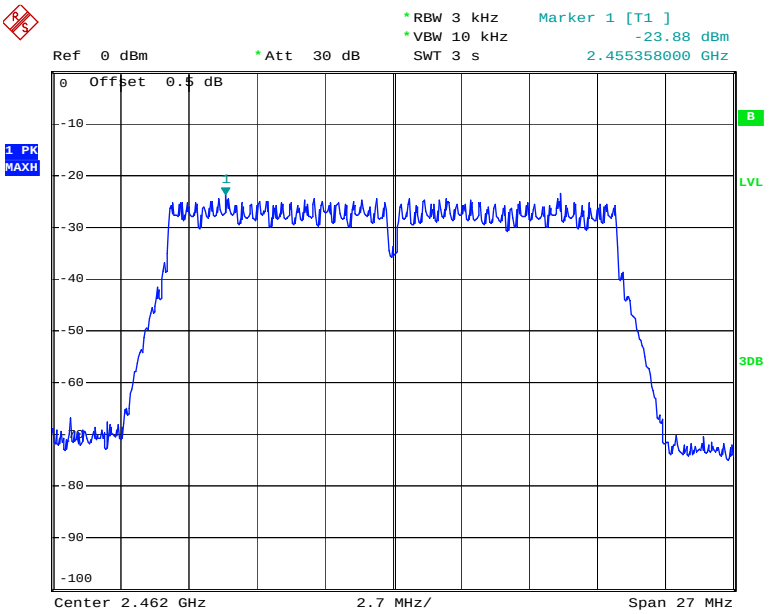
Date: 18.NOV.2014 19:51:13

Power Spectral Density, 802.11n ht20 Middle Channel



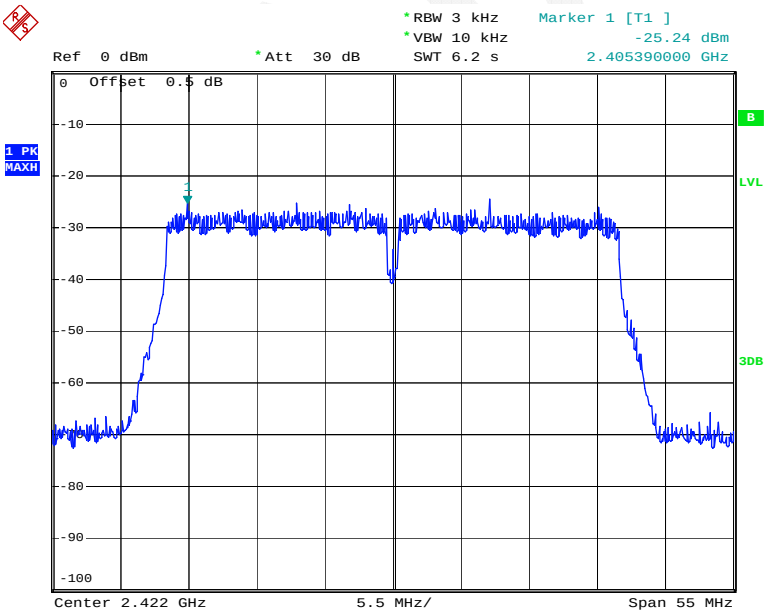
Date: 18.NOV.2014 19:50:40

Power Spectral Density, 802.11n ht20 High Channel



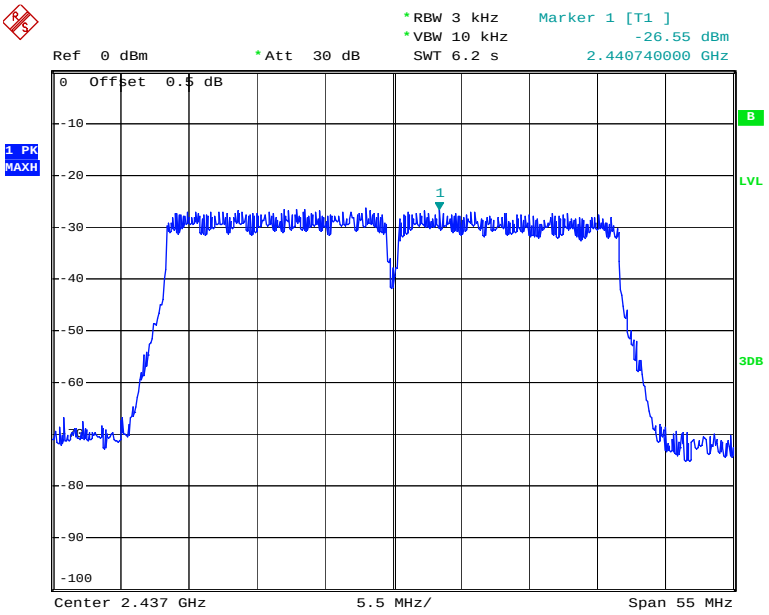
Date: 18.NOV.2014 19:50:07

Power Spectral Density, 802.11n ht40 Low Channel



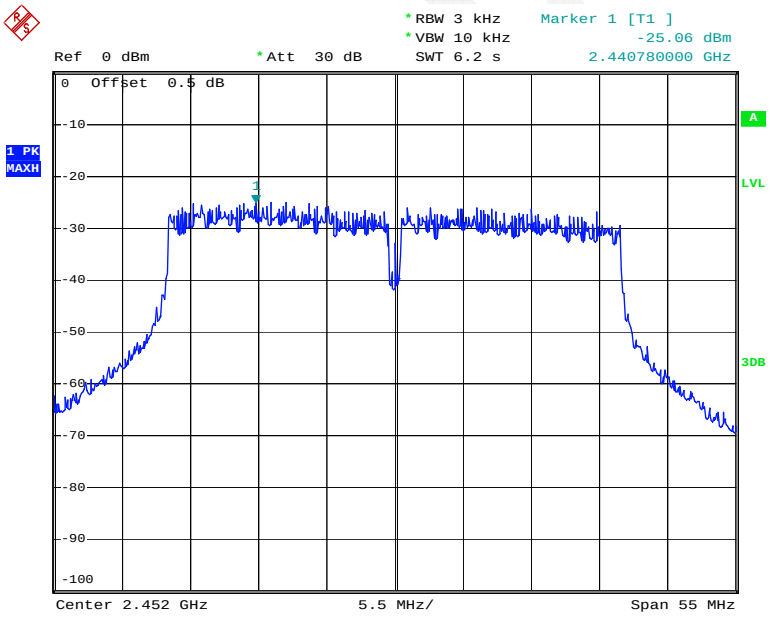
Date: 18.NOV.2014 19:30:50

Power Spectral Density, 802.11n ht40 Middle Channel



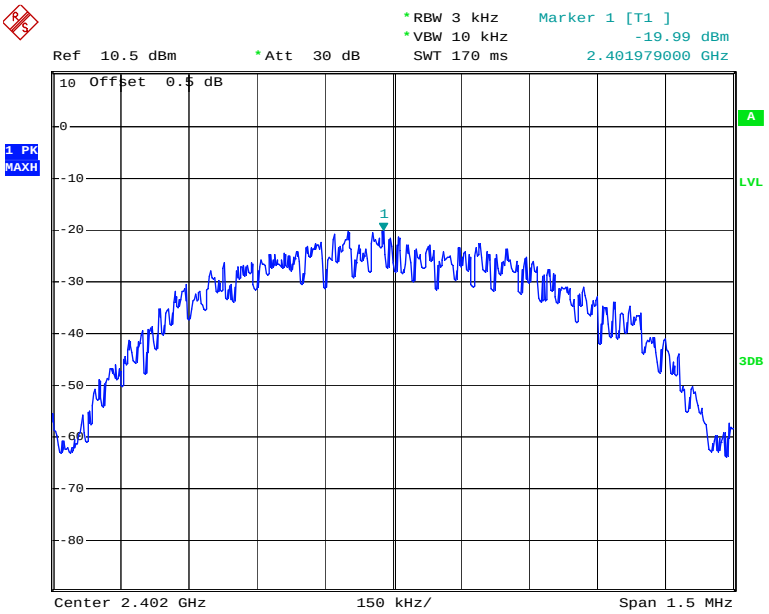
Date: 18.NOV.2014 19:36:42

Power Spectral Density, 802.11n ht40 High Channel



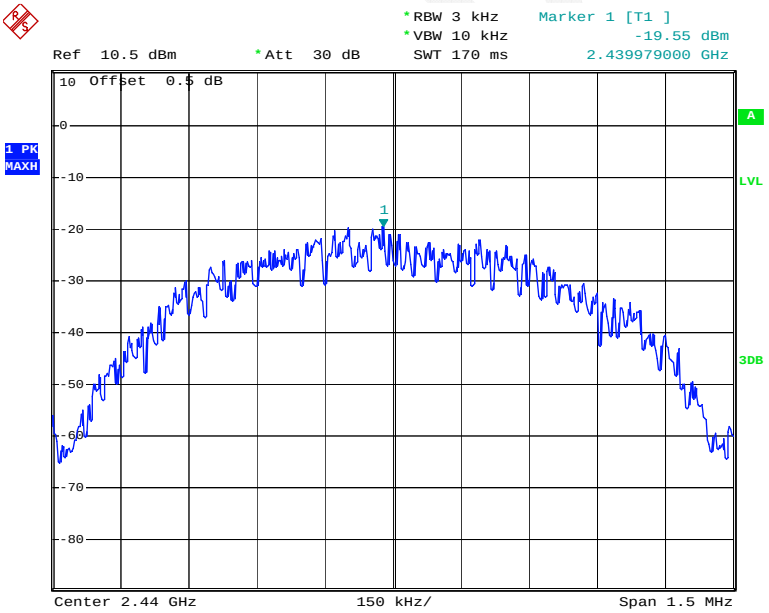
Date: 18.NOV.2014 12:05:31

Power Spectral Density, BLE Low Channel



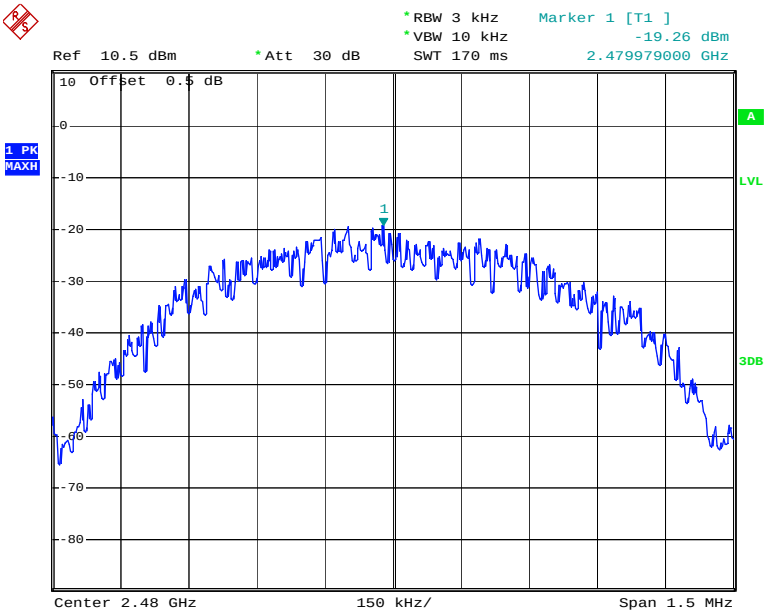
Date: 16.SEP.2014 20:03:43

Power Spectral Density, BLE Middle Channel



Date: 16.SEP.2014 20:07:50

Power Spectral Density, BLE High Channel



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