FCC PART 15.247

TEST REPORT

For

DT Research Inc.

6F., NO.1, Ning-Po E. Street, Taipei 100, Taiwan.

FCC ID: YE3800D
Model: DT311

Report Type:	**Product Type:**
Original Report	Mobile Tablet

Test Engineer:	Dean Liu
Report Number:	RDG150615001-00B
Report Date:	2015-07-01
Reviewed By:	Sula Huang RF Leader
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 *DT Research Inc.*'s product, model number: *DT311 (FCC ID: YE3800D)* (the "EUT") in this report was a *Mobile Tablet,* which was measured approximately: 31.5 cm (L) x 21.2 cm (W) x 4.2 cm (H) rated input voltage: DC 7.2V rechargeable Li-ion battery or DC19V charging from adapter. The device used Intel® Dual Band Wireless-AC 7265 module, FCC ID:PD97265NG, which support Bluetooth 4.0 standard include BLE and 802.11a/b/g/n/ac.

Adapter information:
Model: A11-065N1A
Input: 100-240V~50/60Hz, 1.7A
Output: 19V, 3.42A

All measurement and test data in this report was gathered from production sample serial number: 150615001 (Assigned by BACL, Dongguan). The EUT was received on 2015-06-15.

Objective

This report is prepared on behalf of *DT Research Inc.* 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 JBC, 15C DSS, 15E NII and Part 22H, 24E, 27 PCB submissions with FCC ID: YE3800D.

Test Methodology

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

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

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 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 WLAN, 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 802.11n20 modes were tested with Channel 1, 6 and 11.
For 802.11n40 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.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

The Engineering mode was configured by the software: DRTU V1.7.6., which was used to configure the test channel, and test data rate, the maximum power level was configured as default value by the system.

For WLAN, 100% ducty cycle was configured by the software, 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. The worst data rates as below:

802.11b: 1Mbps
802.11g: 6Mbps
802.11n ht20 SISO: MCS0
802.11n ht20 MIMO: MCS8
802.11n ht40 SISO: MCS0
802.11n ht40 MIMO: MCS8

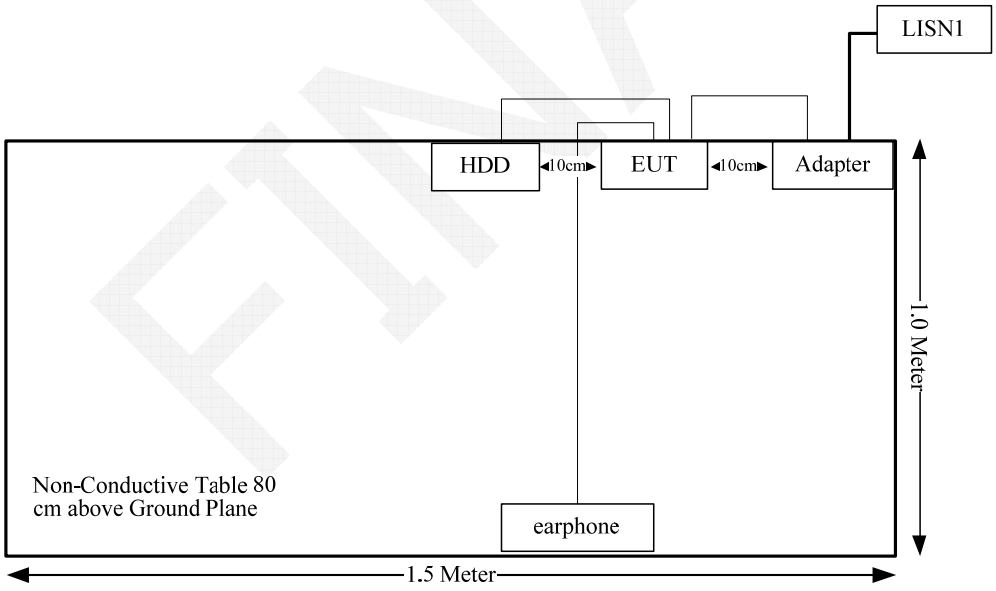
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
TOSHIBA	HDD	V63700-A 500GB	7283TCUTSJ2
/	Earphone	/	/

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Adapter cable	yes	No	1.18	Adapter 1	EUT
Adapter cable	yes	No	1.71	Adapter 2	EUT
Audio Cable	No	No	1.5	EUT	Earphone
USB Cable	yes	No	0.8	EUT	USB-HDD

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.

The SAR data please refer to the SAR report, report No.:RDG150615001-20.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT has two internal antenna arrangement for WLAN, and the Bluetooth use the main antenna in common, fulfill the requirement of this section. The antenna parameters please refer below table.

Frequency (GHz)	Main antenna Peak Gain (dBi)	AUX antenna Peak Gain (dBi)
2.4	1.08	0.67
2.45	0.67	0.86
2.5	-0.35	0.09
5.15	-0.18	2.67
5.25	0.14	3.14
5.35	1.42	2.87
5.47	2.21	2.34
5.6	1.88	1.29
5.725	2.54	0.99
5.785	2.93	0.81
5.85	2.88	0.46

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：

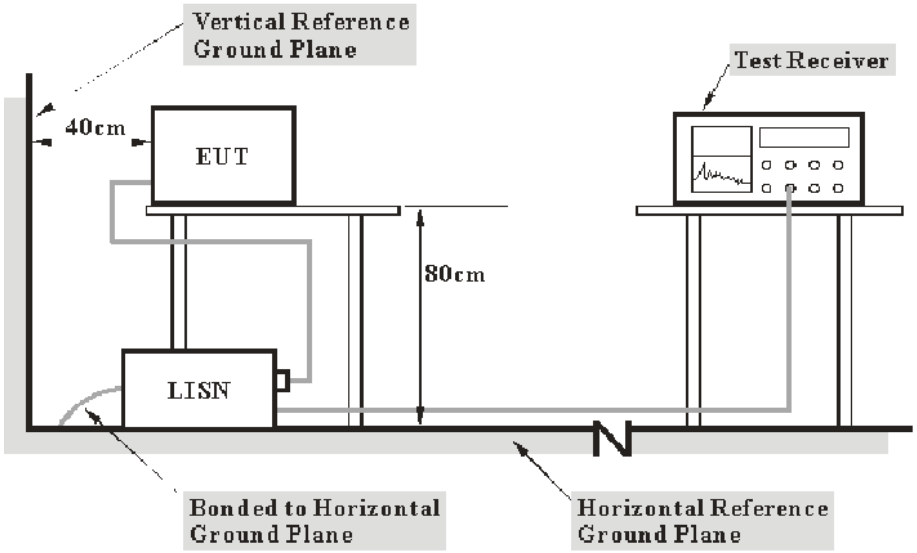
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of 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 C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the first 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	2014-10-20	2015-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-06-09	2016-06-09
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-12-11	2015-12-11
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:

7.0 dB at **0.192030 MHz** in the **Line** conducted mode for

Test Data

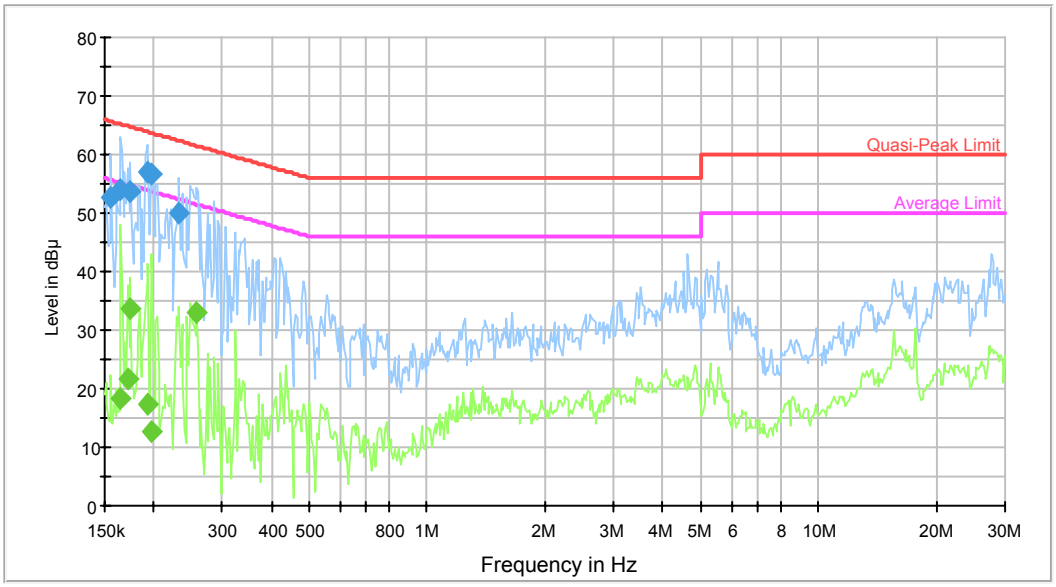
Environmental Conditions

Temperature:	27.6°C
Relative Humidity:	53 %
ATM Pressure:	100kPa

The testing was performed by Dean Liu on 2015-06-19.

Test Mode: Transmitting

AC120 V, 60 Hz, Line:

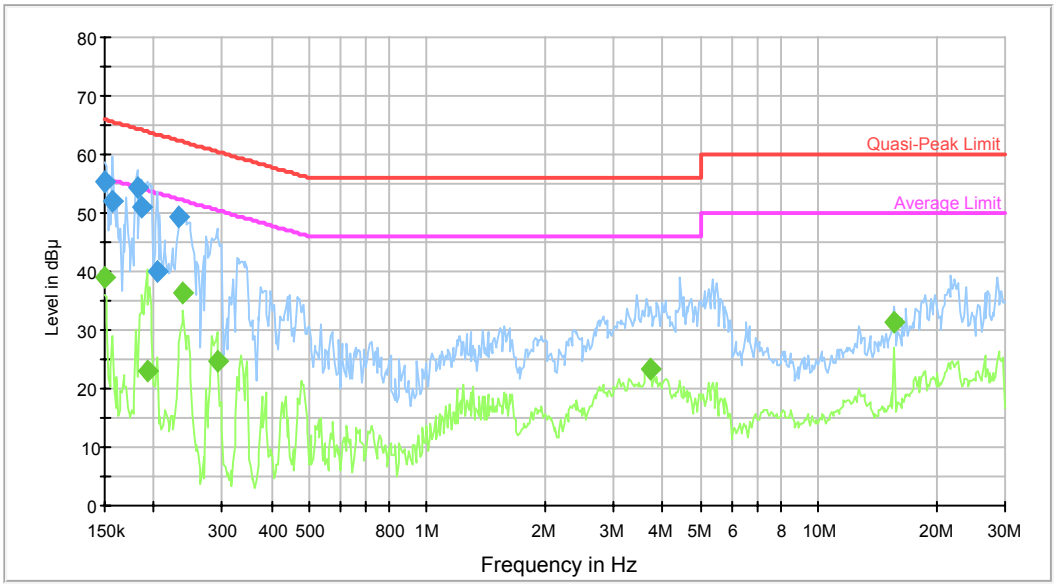


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.156097	52.8	9.000	L1	10.2	12.9	65.7	Compliance
0.165051	54.1	9.000	L1	10.2	11.1	65.2	Compliance
0.174519	53.8	9.000	L1	10.2	10.9	64.7	Compliance
0.192030	57.0	9.000	L1	10.2	6.9	63.9	Compliance
0.198249	56.7	9.000	L1	10.2	7.0	63.7	Compliance
0.232499	49.9	9.000	L1	10.2	12.5	62.4	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.165051	18.4	9.000	L1	10.2	36.8	55.2	Compliance
0.171759	21.7	9.000	L1	10.2	33.2	54.9	Compliance
0.174519	33.8	9.000	L1	10.2	20.9	54.7	Compliance
0.193566	17.3	9.000	L1	10.2	36.6	53.9	Compliance
0.198249	12.8	9.000	L1	10.2	40.9	53.7	Compliance
0.257874	32.9	9.000	L1	10.2	18.6	51.5	Compliance

**within mearsurement uncertainty!*

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	55.3	9.000	N	10.2	10.7	66.0	Compliance
0.157346	51.8	9.000	N	10.2	13.8	65.6	Compliance
0.181612	54.2	9.000	N	10.2	10.2	64.4	Compliance
0.187494	51.0	9.000	N	10.2	13.1	64.1	Compliance
0.204669	40.0	9.000	N	10.2	23.4	63.4	Compliance
0.232499	49.4	9.000	N	10.2	13.0	62.4	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	39.0	9.000	N	10.2	17.0	56.0	Compliance
0.192030	23.2	9.000	N	10.2	30.7	53.9	Compliance
0.238124	36.2	9.000	N	10.2	16.0	52.2	Compliance
0.290613	24.6	9.000	N	10.3	25.9	50.5	Compliance
3.721226	23.3	9.000	N	10.7	22.7	46.0	Compliance
15.616430	31.2	9.000	N	10.7	18.8	50.0	Compliance

**within mearsurement uncertainty!*

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.

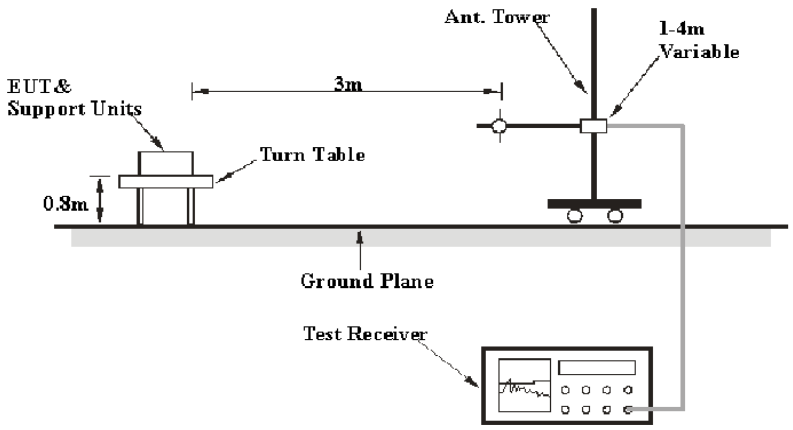
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

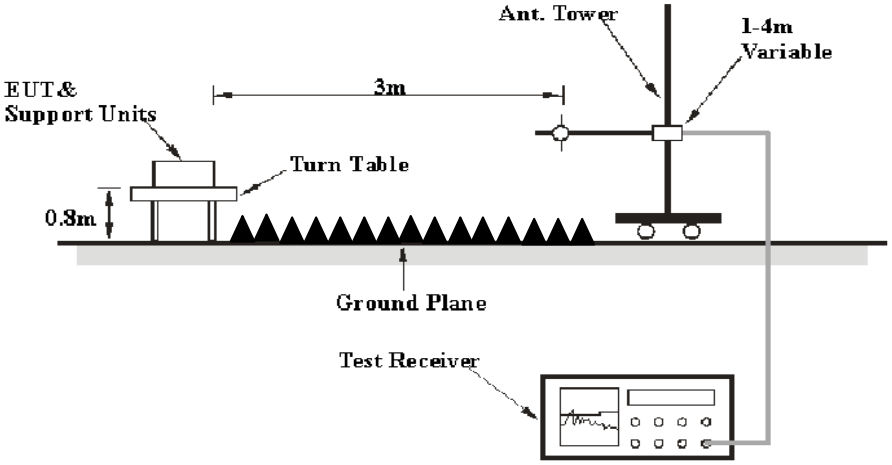
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

During the radiated emission test, the adapter 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	2015-05-09	2016-05-09
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	E4440A	SG43360054	2014-12-04	2015-12-04
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
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:

6.74 dB at **2390 MHz** in the **Vertical** polarization for WiFi Mode (802.11 n ht20 Mode)

Test Data

Environmental Conditions

Temperature:	25.4-25.6 °C
Relative Humidity:	59 %
ATM Pressure:	99.9-100 kPa

** The testing was performed by Dean Liu from 2015-06-18 to 2015-06-22.*

Test Mode: Transmitting
Note: per pretest, the worst mode was the SISO mode at chain 0, reported below tables:

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	68.59	PK	H	25.67	3.68	0.00	97.94	N/A	N/A
2412	63.85	AV	H	25.67	3.68	0.00	93.20	N/A	N/A
2412	73.37	PK	V	25.67	3.68	0.00	102.72	N/A	N/A
2412	68.63	AV	V	25.67	3.68	0.00	97.98	N/A	N/A
2390	27.68	PK	V	25.61	3.63	0.00	56.92	74.00	17.08
2390	15.61	AV	V	25.61	3.63	0.00	44.85	54.00	9.15
4824	32.59	PK	V	30.64	5.03	27.41	40.85	74.00	33.15
4824	20.92	AV	V	30.64	5.03	27.41	29.18	54.00	24.82
7236	32.06	PK	V	34.17	6.65	25.90	46.98	74.00	27.02
7236	20.02	AV	V	34.17	6.65	25.90	34.94	54.00	19.06
9648	30.44	PK	V	36.06	8.55	27.46	47.59	74.00	26.41
9648	18.43	AV	V	36.06	8.55	27.46	35.58	54.00	18.42
3131	34.3	PK	V	27.62	6.93	27.43	41.42	74.00	32.58
3131	22.51	AV	V	27.62	6.93	27.43	29.63	54.00	24.37
139.61	40.2	QP	H	13.27	1.44	21.42	33.49	43.50	10.01
Middle Channel: 2437 MHz									
2437	68.09	PK	H	25.74	3.75	0.00	97.58	N/A	N/A
2437	62.5	AV	H	25.74	3.75	0.00	91.99	N/A	N/A
2437	73.21	PK	V	25.74	3.75	0.00	102.70	N/A	N/A
2437	67.72	AV	V	25.74	3.75	0.00	97.21	N/A	N/A
4874	33.07	PK	V	30.77	5.14	27.42	41.56	74.00	32.44
4874	21.23	AV	V	30.77	5.14	27.42	29.72	54.00	24.28
7311	32.4	PK	V	34.35	6.74	25.88	47.61	74.00	26.39
7311	20.51	AV	V	34.35	6.74	25.88	35.72	54.00	18.28
9748	30.77	PK	V	36.30	8.61	27.24	48.44	74.00	25.56
9748	18.89	AV	V	36.30	8.61	27.24	36.56	54.00	17.44
3131	34.72	PK	V	27.62	6.93	27.43	41.84	74.00	32.16
3131	22.97	AV	V	27.62	6.93	27.43	30.09	54.00	23.91
1848	36.61	PK	V	24.30	3.05	27.52	36.44	74.00	37.56
1848	24.73	AV	V	24.30	3.05	27.52	24.56	54.00	29.44
345.25	38.4	QP	H	14.98	2.22	21.63	33.97	46.00	12.03
139.61	40.1	QP	H	13.27	1.44	21.42	33.39	43.50	10.11
High Channel: 2462 MHz									
2462	67.95	PK	H	25.80	3.75	0.00	97.50	N/A	N/A
2462	62.49	AV	H	25.80	3.75	0.00	92.04	N/A	N/A
2462	72.68	PK	V	25.80	3.75	0.00	102.23	N/A	N/A
2462	67.42	AV	V	25.80	3.75	0.00	96.97	N/A	N/A
2483.5	29.03	PK	V	25.86	3.67	0.00	58.56	74.00	15.44
2483.5	16.46	AV	V	25.86	3.67	0.00	45.99	54.00	8.01
4924	31.89	PK	V	30.90	5.34	27.43	40.70	74.00	33.30
4924	20.11	AV	V	30.90	5.34	27.43	28.92	54.00	25.08
7386	31.24	PK	V	34.53	6.83	25.86	46.74	74.00	27.26
7386	19.49	AV	V	34.53	6.83	25.86	34.99	54.00	19.01
9848	29.57	PK	V	36.54	8.66	26.94	47.83	74.00	26.17
9848	17.81	AV	V	36.54	8.66	26.94	36.07	54.00	17.93
3131	33.55	PK	V	27.62	6.93	27.43	40.67	74.00	33.33
3131	21.81	AV	V	27.62	6.93	27.43	28.93	54.00	25.07
345.25	38.5	QP	H	14.98	2.22	21.63	34.07	46.00	11.93
139.61	40.3	QP	H	13.27	1.44	21.42	33.59	43.50	9.91

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	71.01	PK	H	25.67	3.68	0.00	100.36	N/A	N/A
2412	61.43	AV	H	25.67	3.68	0.00	90.78	N/A	N/A
2412	75.95	PK	V	25.67	3.68	0.00	105.30	N/A	N/A
2412	65.7	AV	V	25.67	3.68	0.00	95.05	N/A	N/A
2390	30	PK	V	25.61	3.63	0.00	59.24	74.00	14.76
2390	17.07	AV	V	25.61	3.63	0.00	46.31	54.00	7.69
4824	31.98	PK	V	30.64	5.03	27.41	40.24	74.00	33.76
4824	20.12	AV	V	30.64	5.03	27.41	28.38	54.00	25.62
7236	31.97	PK	V	34.17	6.65	25.90	46.89	74.00	27.11
7236	20.3	AV	V	34.17	6.65	25.90	35.22	54.00	18.78
9648	30.29	PK	V	36.06	8.55	27.46	47.44	74.00	26.56
9648	18.37	AV	V	36.06	8.55	27.46	35.52	54.00	18.48
2950	35.13	PK	V	27.07	6.61	27.54	41.27	74.00	32.73
2950	23.29	AV	V	27.07	6.61	27.54	29.43	54.00	24.57
139.61	40.3	QP	H	13.27	1.44	21.42	33.59	43.50	9.91
Middle Channel: 2437 MHz									
2437	70.46	PK	H	25.74	3.75	0.00	99.95	N/A	N/A
2437	60.31	AV	H	25.74	3.75	0.00	89.80	N/A	N/A
2437	76.05	PK	V	25.74	3.75	0.00	105.54	N/A	N/A
2437	66.43	AV	V	25.74	3.75	0.00	95.92	N/A	N/A
4874	32.39	PK	V	30.77	5.14	27.42	40.88	74.00	33.12
4874	20.5	AV	V	30.77	5.14	27.42	28.99	54.00	25.01
7311	32.46	PK	V	34.35	6.74	25.88	47.67	74.00	26.33
7311	20.63	AV	V	34.35	6.74	25.88	35.84	54.00	18.16
9748	31.61	PK	V	36.30	8.61	27.24	49.28	74.00	24.72
9748	19.79	AV	V	36.30	8.61	27.24	37.46	54.00	16.54
2950	35.51	PK	V	27.07	6.61	27.54	41.65	74.00	32.35
2950	23.68	AV	V	27.07	6.61	27.54	29.82	54.00	24.18
1936	36.67	PK	V	24.47	2.99	27.50	36.63	74.00	37.37
1936	24.8	AV	V	24.47	2.99	27.50	24.76	54.00	29.24
345.25	37.6	QP	H	14.98	2.22	21.63	33.17	46.00	12.83
139.61	40.2	QP	H	13.27	1.44	21.42	33.49	43.50	10.01
High Channel: 2462 MHz									
2462	68.84	PK	H	25.80	3.75	0.00	98.39	N/A	N/A
2462	58.25	AV	H	25.80	3.75	0.00	87.80	N/A	N/A
2462	74.04	PK	V	25.80	3.75	0.00	103.59	N/A	N/A
2462	63.33	AV	V	25.80	3.75	0.00	92.88	N/A	N/A
2483.5	29.87	PK	V	25.86	3.67	0.00	59.40	74.00	14.60
2483.5	16.71	AV	V	25.86	3.67	0.00	46.24	54.00	7.76
4924	31.34	PK	V	30.90	5.34	27.43	40.15	74.00	33.85
4924	19.45	AV	V	30.90	5.34	27.43	28.26	54.00	25.74
7386	30.81	PK	V	34.53	6.83	25.86	46.31	74.00	27.69
7386	18.97	AV	V	34.53	6.83	25.86	34.47	54.00	19.53
9848	29.09	PK	V	36.54	8.66	26.94	47.35	74.00	26.65
9848	17.11	AV	V	36.54	8.66	26.94	35.37	54.00	18.63
2950	33.81	PK	V	27.07	6.61	27.54	39.95	74.00	34.05
2950	22.08	AV	V	27.07	6.61	27.54	28.22	54.00	25.78
345.25	37.4	QP	H	14.98	2.22	21.63	32.97	46.00	13.03
139.61	40.1	QP	H	13.27	1.44	21.42	33.39	43.50	10.11

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	70.7	PK	H	25.67	3.68	0.00	100.05	N/A	N/A
2412	59.86	AV	H	25.67	3.68	0.00	89.21	N/A	N/A
2412	75.5	PK	V	25.67	3.68	0.00	104.85	N/A	N/A
2412	64.61	AV	V	25.67	3.68	0.00	93.96	N/A	N/A
2390	34.09	PK	V	25.61	3.63	0.00	63.33	74.00	10.67
2390	18.02	AV	V	25.61	3.63	0.00	47.26	54.00	6.74
4824	31.97	PK	V	30.64	5.03	27.41	40.23	74.00	33.77
4824	20.09	AV	V	30.64	5.03	27.41	28.35	54.00	25.65
7236	32.34	PK	V	34.17	6.65	25.90	47.26	74.00	26.74
7236	21.07	AV	V	34.17	6.65	25.90	35.99	54.00	18.01
9648	29.82	PK	V	36.06	8.55	27.46	46.97	74.00	27.03
9648	17.97	AV	V	36.06	8.55	27.46	35.12	54.00	18.88
2950	34.53	PK	V	27.07	6.61	27.54	40.67	74.00	33.33
2950	22.53	AV	V	27.07	6.61	27.54	28.67	54.00	25.33
139.61	40.3	QP	H	13.27	1.44	21.42	33.59	43.50	9.91
Middle Channel: 2437 MHz									
2437	71.04	PK	H	25.74	3.75	0.00	100.53	N/A	N/A
2437	60.72	AV	H	25.74	3.75	0.00	90.21	N/A	N/A
2437	76.05	PK	V	25.74	3.75	0.00	105.54	N/A	N/A
2437	65.61	AV	V	25.74	3.75	0.00	95.10	N/A	N/A
4874	32.6	PK	V	30.77	5.14	27.42	41.09	74.00	32.91
4874	20.74	AV	V	30.77	5.14	27.42	29.23	54.00	24.77
7311	33.01	PK	V	34.35	6.74	25.88	48.22	74.00	25.78
7311	21.58	AV	V	34.35	6.74	25.88	36.79	54.00	17.21
9748	30.39	PK	V	36.30	8.61	27.24	48.06	74.00	25.94
9748	18.48	AV	V	36.30	8.61	27.24	36.15	54.00	17.85
2950	35.13	PK	V	27.07	6.61	27.54	41.27	74.00	32.73
2950	23.21	AV	V	27.07	6.61	27.54	29.35	54.00	24.65
1824	36.49	PK	V	24.25	2.83	27.52	36.05	74.00	37.95
1824	24.5	AV	V	24.25	2.83	27.52	24.06	54.00	29.94
345.25	37.9	QP	H	14.98	2.22	21.63	33.47	46.00	12.53
139.61	40.1	QP	H	13.27	1.44	21.42	33.39	43.50	10.11
High Channel: 2462 MHz									
2462	69.15	PK	H	25.80	3.75	0.00	98.70	N/A	N/A
2462	58.34	AV	H	25.80	3.75	0.00	87.89	N/A	N/A
2462	74.57	PK	V	25.80	3.75	0.00	104.12	N/A	N/A
2462	63.6	AV	V	25.80	3.75	0.00	93.15	N/A	N/A
2483.5	30.01	PK	V	25.86	3.67	0.00	59.54	74.00	14.46
2483.5	16.48	AV	V	25.86	3.67	0.00	46.01	54.00	7.99
4924	31.43	PK	V	30.90	5.34	27.43	40.24	74.00	33.76
4924	19.62	AV	V	30.90	5.34	27.43	28.43	54.00	25.57
7386	31.92	PK	V	34.53	6.83	25.86	47.42	74.00	26.58
7386	20.39	AV	V	34.53	6.83	25.86	35.89	54.00	18.11
9848	29.27	PK	V	36.54	8.66	26.94	47.53	74.00	26.47
9848	17.39	AV	V	36.54	8.66	26.94	35.65	54.00	18.35
2950	33.98	PK	V	27.07	6.61	27.54	40.12	74.00	33.88
2950	22.13	AV	V	27.07	6.61	27.54	28.27	54.00	25.73
345.25	38.2	QP	H	14.98	2.22	21.63	33.77	46.00	12.23
139.61	40.3	QP	H	13.27	1.44	21.42	33.59	43.50	9.91

802.11 n ht40 Mode

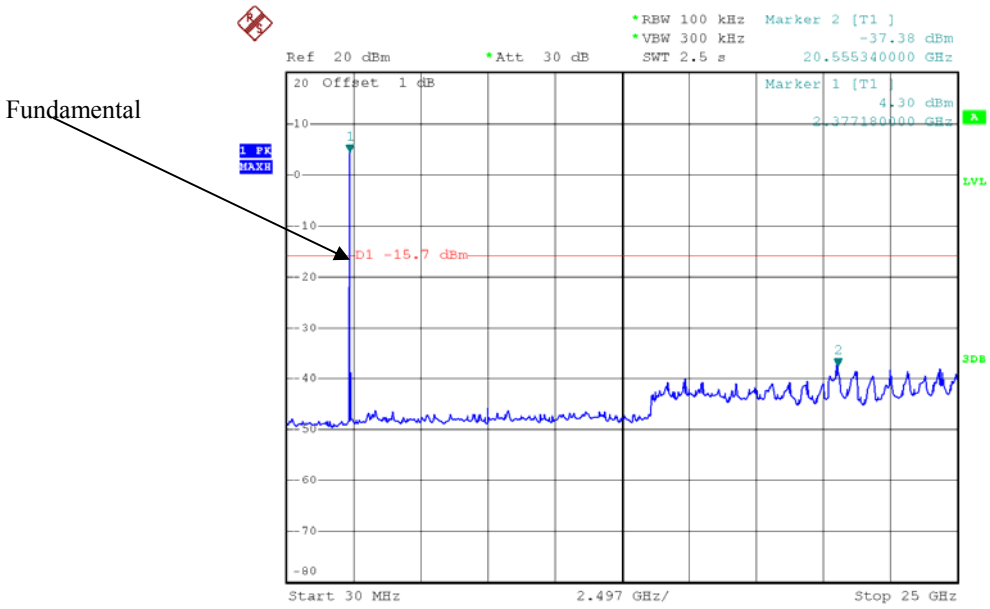
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	65.15	PK	H	25.70	3.71	0.00	94.56	N/A	N/A
2422	53.87	AV	H	25.70	3.71	0.00	83.28	N/A	N/A
2422	69.21	PK	V	25.70	3.71	0.00	98.62	N/A	N/A
2422	57.38	AV	V	25.70	3.71	0.00	86.79	N/A	N/A
2390	33.19	PK	V	25.61	3.63	0.00	62.43	74.00	11.57
2390	17.89	AV	V	25.61	3.63	0.00	47.13	54.00	6.87
4844	33.73	PK	V	30.69	4.99	27.42	41.99	74.00	32.01
4844	21.48	AV	V	30.69	4.99	27.42	41.55	54.00	12.45
7266	33.29	PK	V	34.24	6.68	25.89	35.89	74.00	38.11
7266	20.86	AV	V	34.24	6.68	25.89	35.89	54.00	18.11
9688	30.8	PK	V	36.15	8.58	27.37	48.16	74.00	25.84
9688	18.33	AV	V	36.15	8.58	27.37	35.69	54.00	18.31
3115	35.65	PK	V	27.57	6.88	27.44	42.66	74.00	31.34
3115	23.91	AV	V	27.57	6.88	27.44	30.92	54.00	23.08
139.61	40.5	QP	H	13.27	1.44	21.42	33.79	43.50	9.71
Middle Channel: 2437 MHz									
2437	67.94	PK	H	25.74	3.75	0.00	97.43	N/A	N/A
2437	56.01	AV	H	25.74	3.75	0.00	85.50	N/A	N/A
2437	72.04	PK	V	25.74	3.75	0.00	101.53	N/A	N/A
2437	60.86	AV	V	25.74	3.75	0.00	90.35	N/A	N/A
4874	34.47	PK	V	30.77	5.14	27.42	42.96	74.00	31.04
4874	22.01	AV	V	30.77	5.14	27.42	30.50	54.00	23.50
7311	34.36	PK	V	34.35	6.74	25.88	49.57	74.00	24.43
7311	22.01	AV	V	34.35	6.74	25.88	37.22	54.00	16.78
9748	32.09	PK	V	36.30	8.61	27.24	49.76	74.00	24.24
9748	19.46	AV	V	36.30	8.61	27.24	37.13	54.00	16.87
2950	36.04	PK	V	27.07	6.61	27.54	42.18	74.00	31.82
2950	23.9	AV	V	27.07	6.61	27.54	30.04	54.00	23.96
3115	36.48	PK	V	27.57	6.88	27.44	43.49	74.00	30.51
3115	24.6	AV	V	27.57	6.88	27.44	31.61	54.00	22.39
345.25	37.6	QP	H	14.98	2.22	21.63	33.17	46.00	12.83
139.61	40.4	QP	H	13.27	1.44	21.42	33.69	43.50	9.81
High Channel: 2452 MHz									
2452	63.7	PK	H	25.78	3.78	0.00	93.26	N/A	N/A
2452	52.61	AV	H	25.78	3.78	0.00	82.17	N/A	N/A
2452	68.49	PK	V	25.78	3.78	0.00	98.05	N/A	N/A
2452	57.3	AV	V	25.78	3.78	0.00	86.86	N/A	N/A
2483.5	27.51	PK	V	25.86	3.67	0.00	57.04	74.00	16.96
2483.5	16.16	AV	V	25.86	3.67	0.00	45.69	54.00	8.31
4904	32.86	PK	V	30.85	5.31	27.43	41.59	74.00	32.41
4904	20.57	AV	V	30.85	5.31	27.43	29.30	54.00	24.70
7356	32.77	PK	V	34.45	6.79	25.87	48.14	74.00	25.86
7356	20.34	AV	V	34.45	6.79	25.87	35.71	54.00	18.29
9808	30.35	PK	V	36.44	8.64	27.09	48.34	74.00	25.66
9808	17.93	AV	V	36.44	8.64	27.09	35.92	54.00	18.08
3115	34.45	PK	V	27.57	6.88	27.44	41.46	74.00	32.54
3115	22.03	AV	V	27.57	6.88	27.44	29.04	54.00	24.96
139.61	40.3	QP	H	13.27	1.44	21.42	33.59	43.50	9.91

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	67.13	PK	H	25.65	3.66	0.00	96.44	N/A	N/A
2402	63.85	AV	H	25.65	3.66	0.00	93.16	N/A	N/A
2402	68.78	PK	V	25.65	3.66	0.00	98.09	N/A	N/A
2402	64.44	AV	V	25.65	3.66	0.00	93.75	N/A	N/A
2390	24.87	PK	V	25.61	3.63	0.00	54.11	74.00	19.89
2390	13.38	AV	V	25.61	3.63	0.00	42.62	54.00	11.38
4804	32.18	PK	V	30.59	5.06	27.41	40.42	74.00	33.58
4804	20.11	AV	V	30.59	5.06	27.41	28.35	54.00	25.65
7206	32.24	PK	V	34.09	6.61	25.91	47.03	74.00	26.97
7206	19.88	AV	V	34.09	6.61	25.91	34.67	54.00	19.33
9608	31.02	PK	V	35.96	8.53	27.55	47.96	74.00	26.04
9608	18.75	AV	V	35.96	8.53	27.55	35.69	54.00	18.31
3071	34.01	PK	V	27.43	6.72	27.47	40.69	74.00	33.31
3071	21.64	AV	V	27.43	6.72	27.47	28.32	54.00	25.68
139.61	40.2	QP	H	13.27	1.44	21.42	33.49	43.50	10.01
Middle Channel: 2440 MHz									
2440	67.21	PK	H	25.74	3.76	0.00	96.71	N/A	N/A
2440	62.76	AV	H	25.74	3.76	0.00	92.26	N/A	N/A
2440	70.2	PK	V	25.74	3.76	0.00	99.70	N/A	N/A
2440	65.74	AV	V	25.74	3.76	0.00	95.24	N/A	N/A
4880	32.62	PK	V	30.79	5.18	27.42	41.17	74.00	32.83
4880	20.44	AV	V	30.79	5.18	27.42	28.99	54.00	25.01
7320	32.56	PK	V	34.37	6.75	25.88	47.80	74.00	26.20
7320	20.3	AV	V	34.37	6.75	25.88	35.54	54.00	18.46
9760	31.41	PK	V	36.32	8.62	27.21	49.14	74.00	24.86
9760	19.22	AV	V	36.32	8.62	27.21	36.95	54.00	17.05
3071	34.39	PK	V	27.43	6.72	27.47	41.07	74.00	32.93
3071	22.1	AV	V	27.43	6.72	27.47	28.78	54.00	25.22
2014	35.53	PK	V	24.64	3.20	27.47	35.90	74.00	38.10
2014	23.36	AV	V	24.64	3.20	27.47	23.73	54.00	30.27
345.25	37.5	QP	H	14.98	2.22	21.63	33.07	46.00	12.93
139.61	40.1	QP	H	13.27	1.44	21.42	33.39	43.50	10.11
High Channel: 2480 MHz									
2480	63.89	PK	H	25.85	3.68	0.00	93.42	N/A	N/A
2480	59.52	AV	H	25.85	3.68	0.00	89.05	N/A	N/A
2480	64.98	PK	V	25.85	3.68	0.00	94.51	N/A	N/A
2480	60.61	AV	V	25.85	3.68	0.00	90.14	N/A	N/A
2483.5	26.59	PK	V	25.86	3.67	0.00	56.12	74.00	17.88
2483.5	14.34	AV	V	25.86	3.67	0.00	43.87	54.00	10.13
4960	31.46	PK	V	31.00	5.34	27.43	40.37	74.00	33.63
4960	19.24	AV	V	31.00	5.34	27.43	28.15	54.00	25.85
7440	31.44	PK	V	34.66	6.89	25.97	47.02	74.00	26.98
7440	19.2	AV	V	34.66	6.89	25.97	34.78	54.00	19.22
9920	30.35	PK	V	36.71	8.71	26.66	49.11	74.00	24.89
9920	18.14	AV	V	36.71	8.71	26.66	36.90	54.00	17.10
3071	33.34	PK	V	27.43	6.72	27.47	40.02	74.00	33.98
3071	21.05	AV	V	27.43	6.72	27.47	27.73	54.00	26.27
345.25	37.6	QP	H	14.98	2.22	21.63	33.17	46.00	12.83
139.61	40.2	QP	H	13.27	1.44	21.42	33.49	43.50	10.01

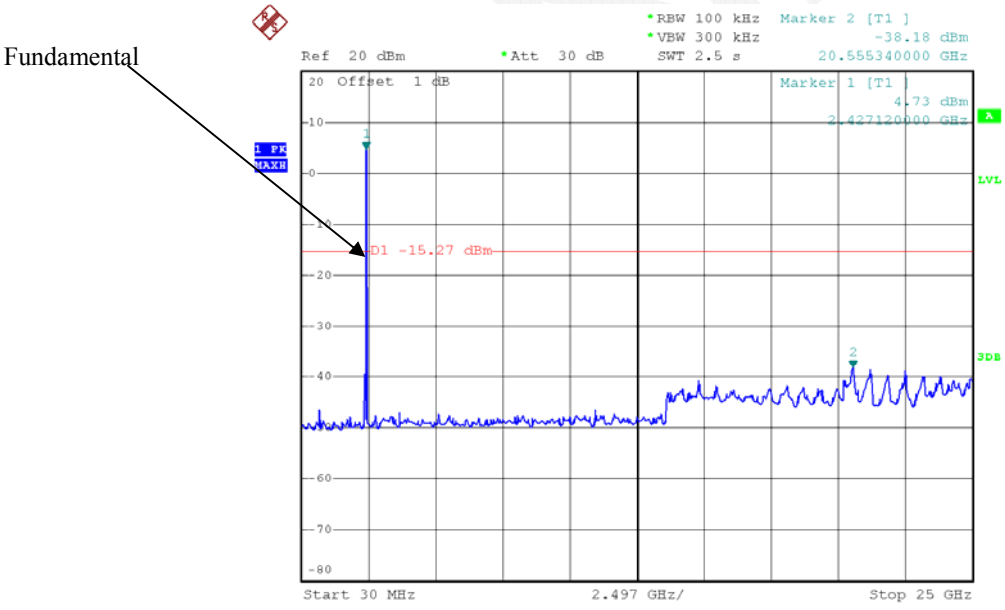
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel, Chain 0



Date: 22.JUN.2015 18:57:59

802.11b Middle Channel, Chain 0



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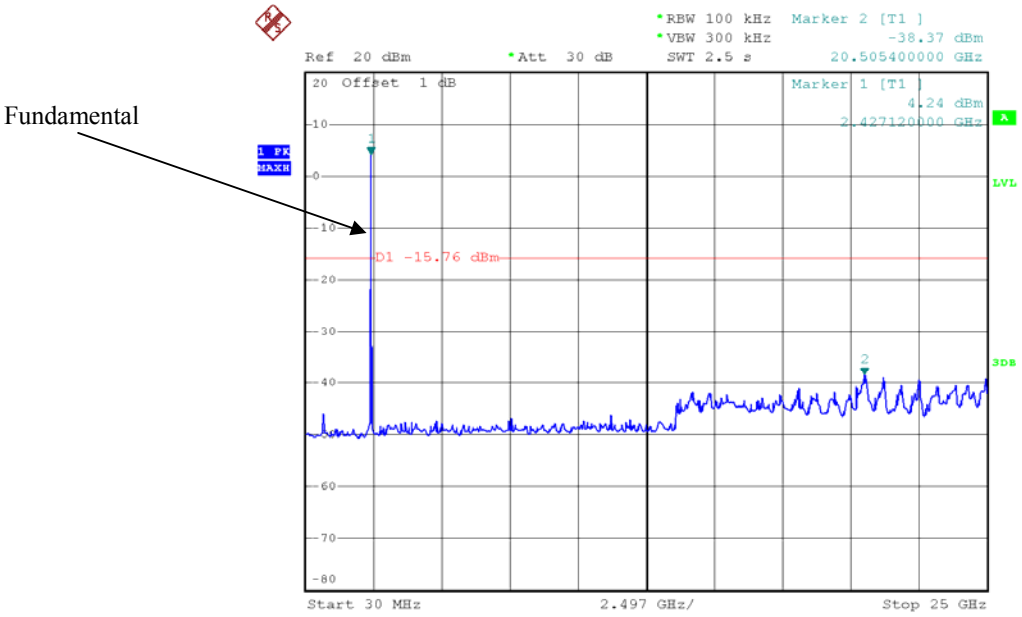
802.11b High Channel, Chain 0



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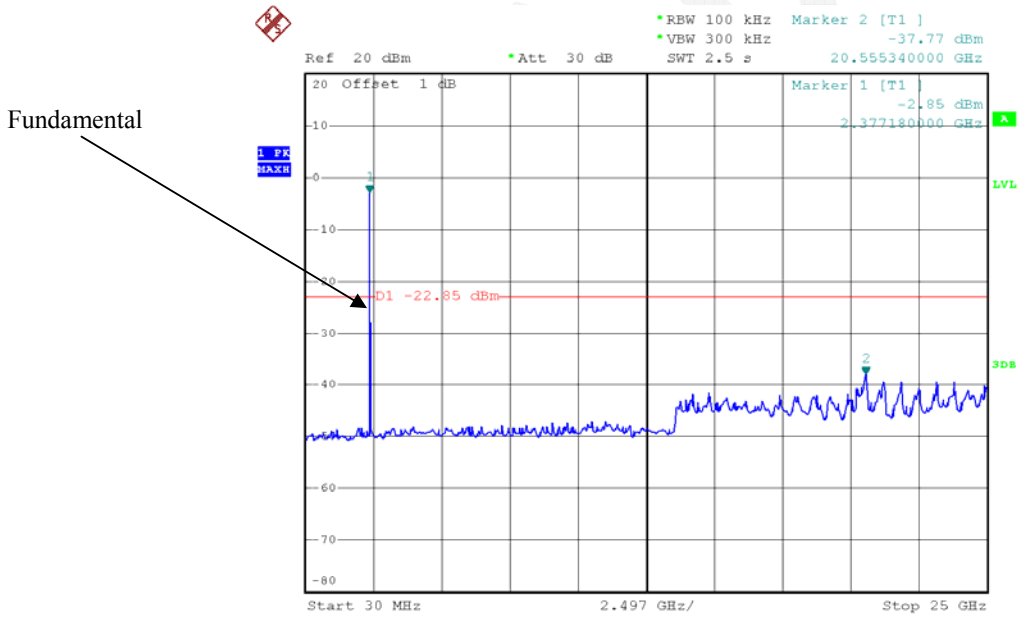
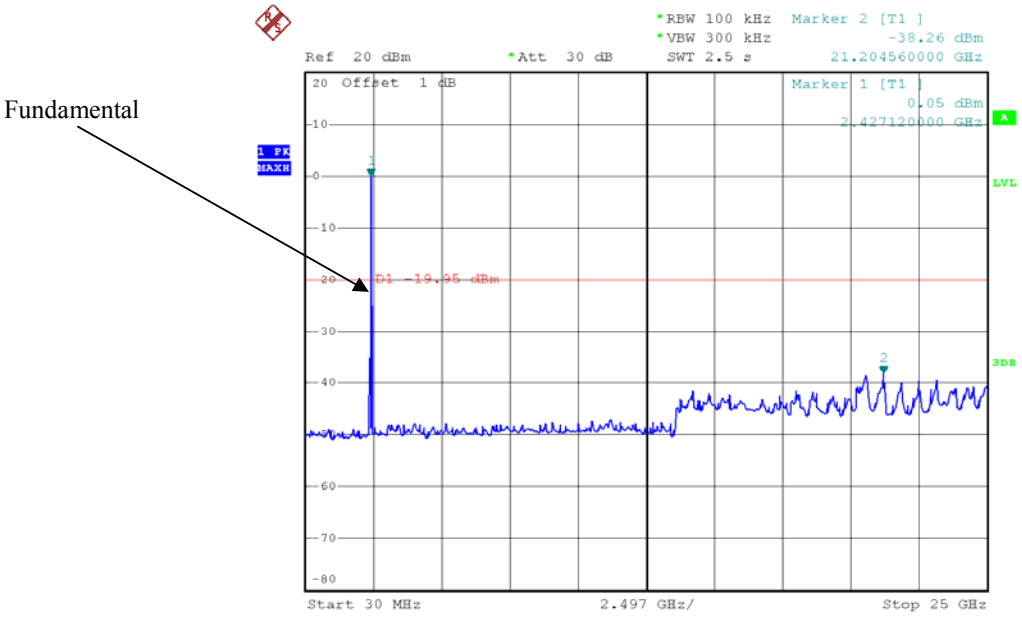
802.11g Low Channel, Chain 0



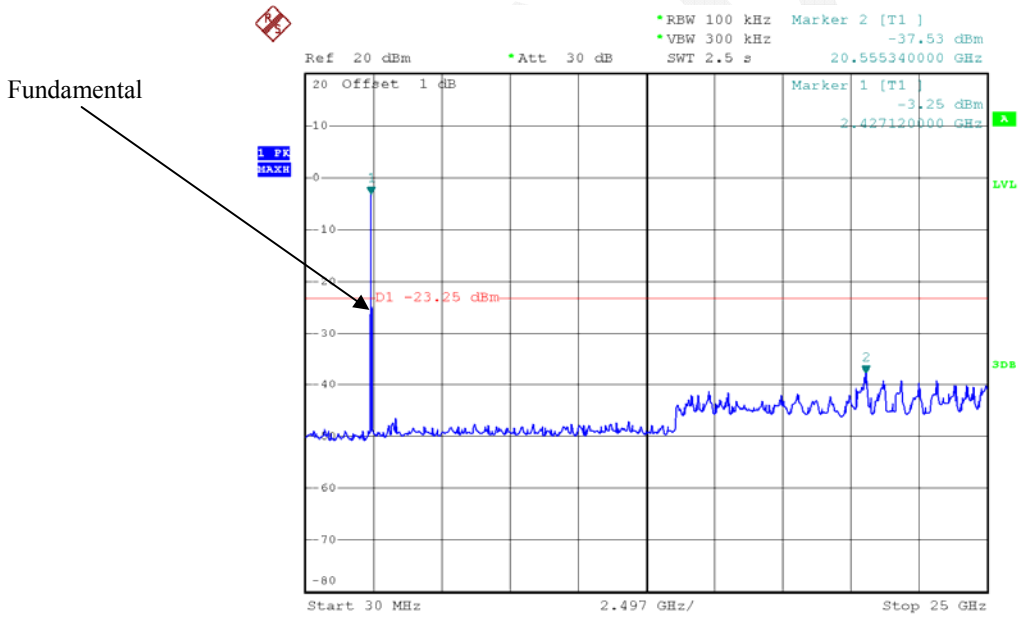
Date: 22.JUN.2015 19:00:58

802.11g Middle Channel, Chain 0



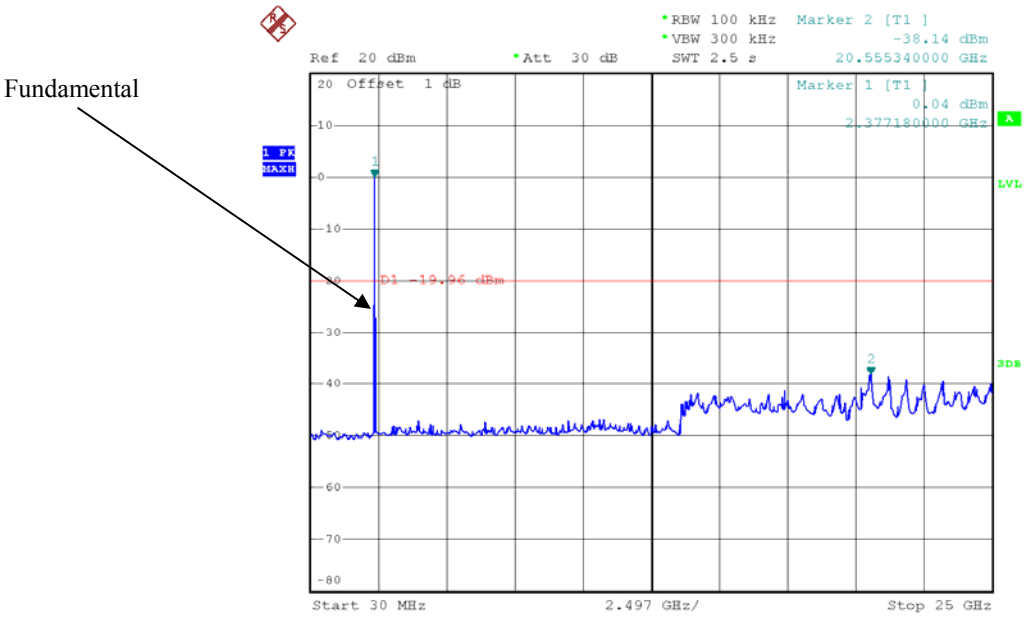
Date: 22.JUN.2015 19:01:41

802.11g High Channel, Chain 0



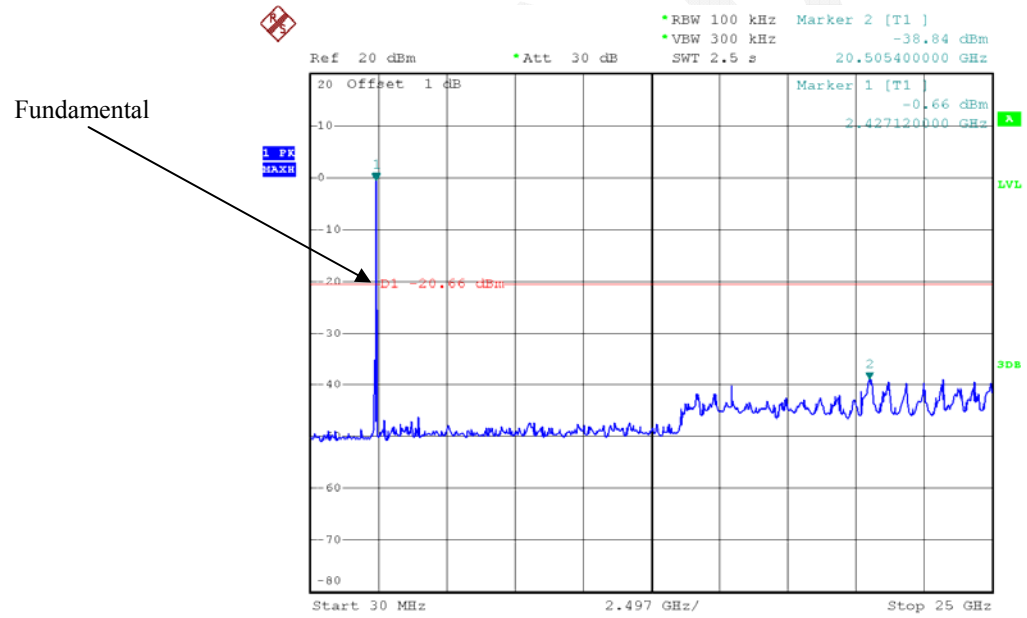
Date: 22.JUN.2015 19:02:36

802.11n ht20 Low Channel, Chain 0



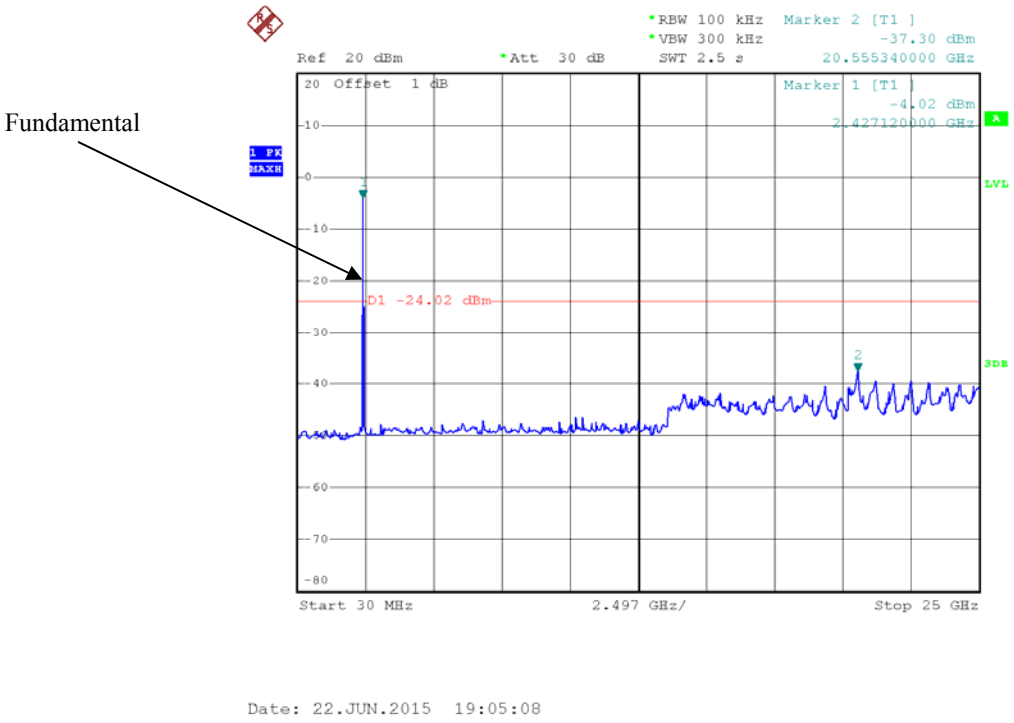
Date: 22.JUN.2015 19:03:35

802.11n ht20 Middle Channel, Chain 0

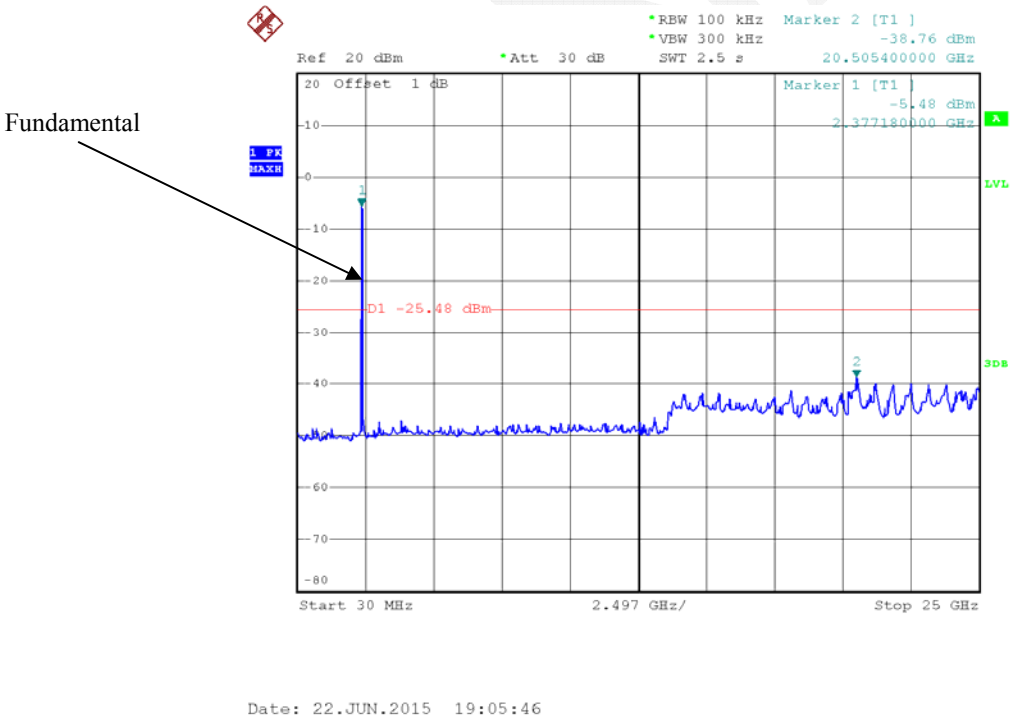


Date: 22.JUN.2015 19:04:13

802.11n ht20 High Channel, Chain 0

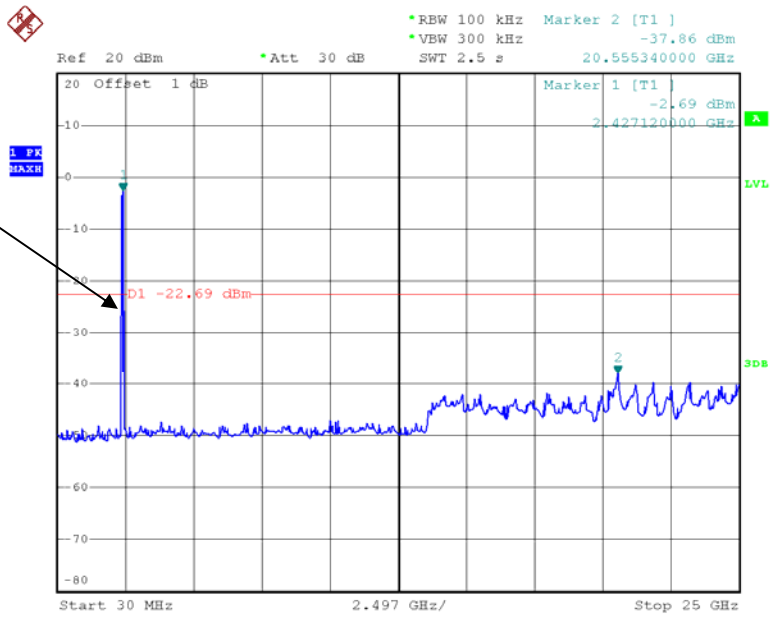


802.11n ht40 Low Channel, Chain 0



802.11n ht40 Middle Channel, Chain 0

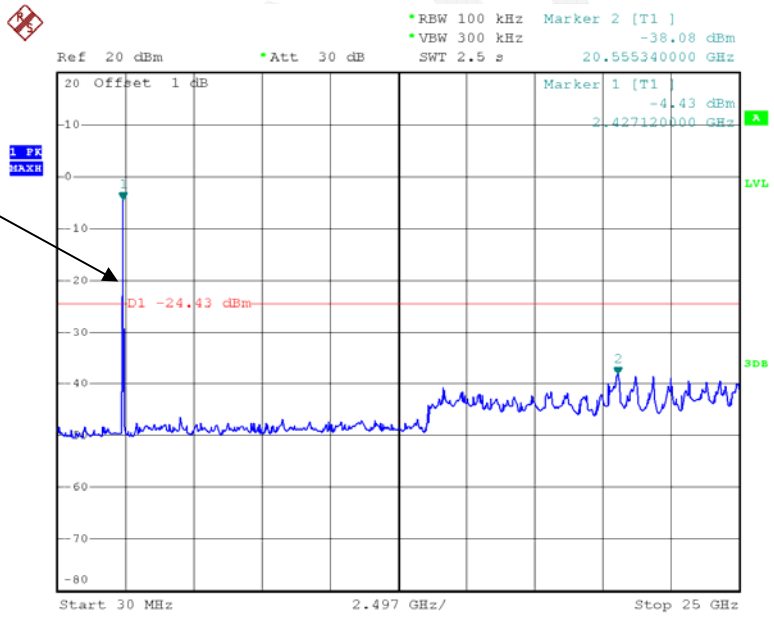
Fundamental



Date: 22.JUN.2015 19:06:15

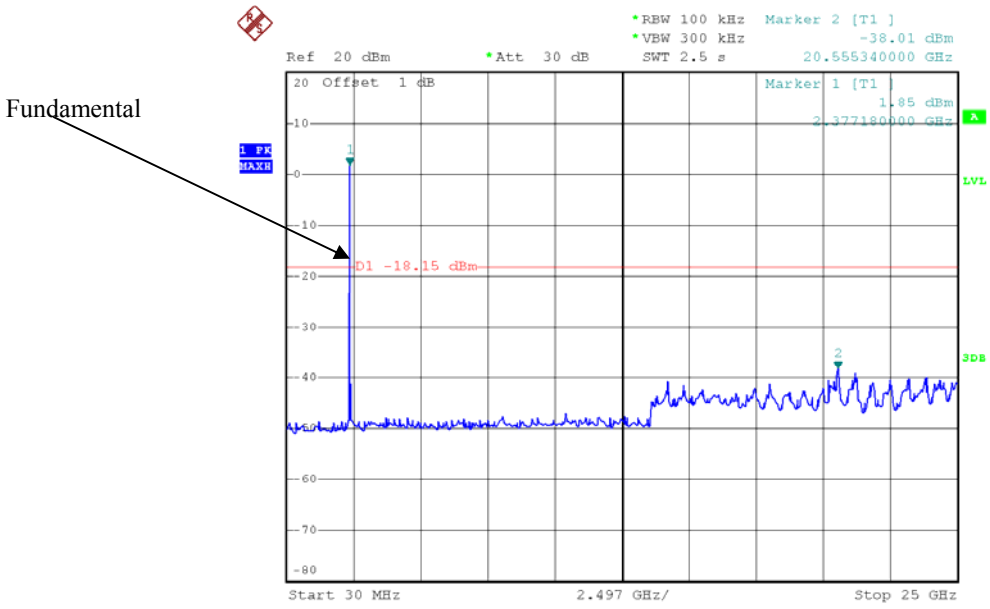
802.11n ht40 High Channel, Chain 0

Fundamental



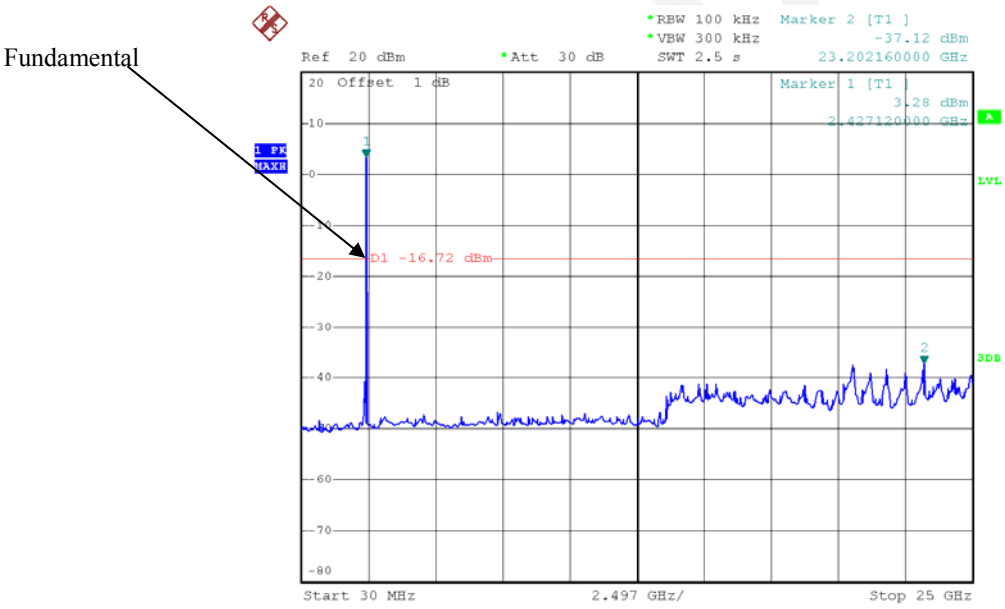
Date: 22.JUN.2015 19:07:57

802.11b Low Channel, Chain 1



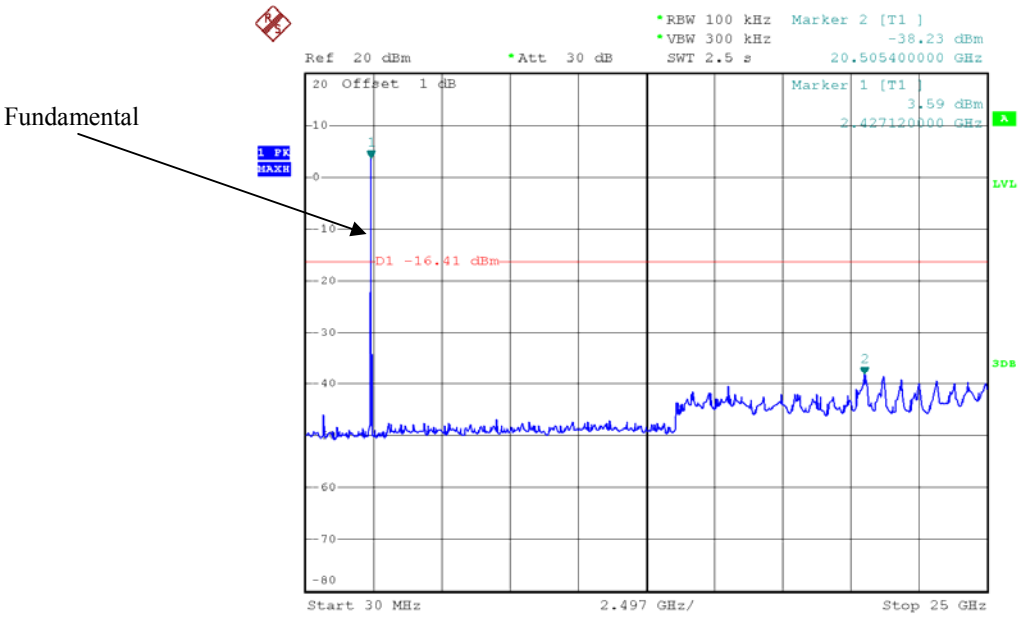
Date: 22.JUN.2015 19:17:36

802.11b Middle Channel, Chain 1



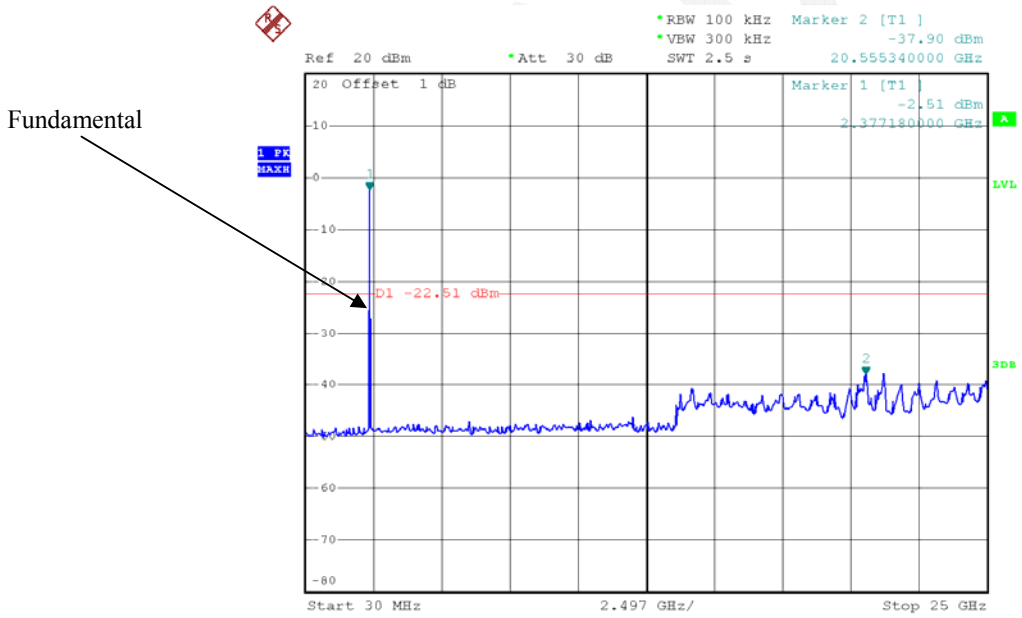
Date: 22.JUN.2015 19:18:55

802.11b High Channel, Chain 1



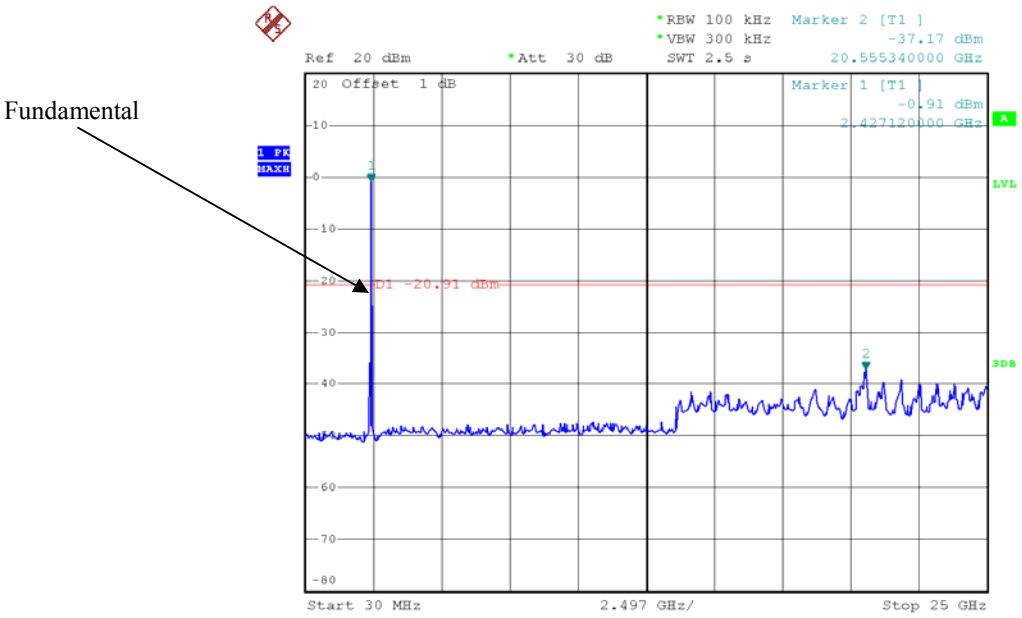
Date: 22.JUN.2015 19:19:58

802.11g Low Channel, Chain 1



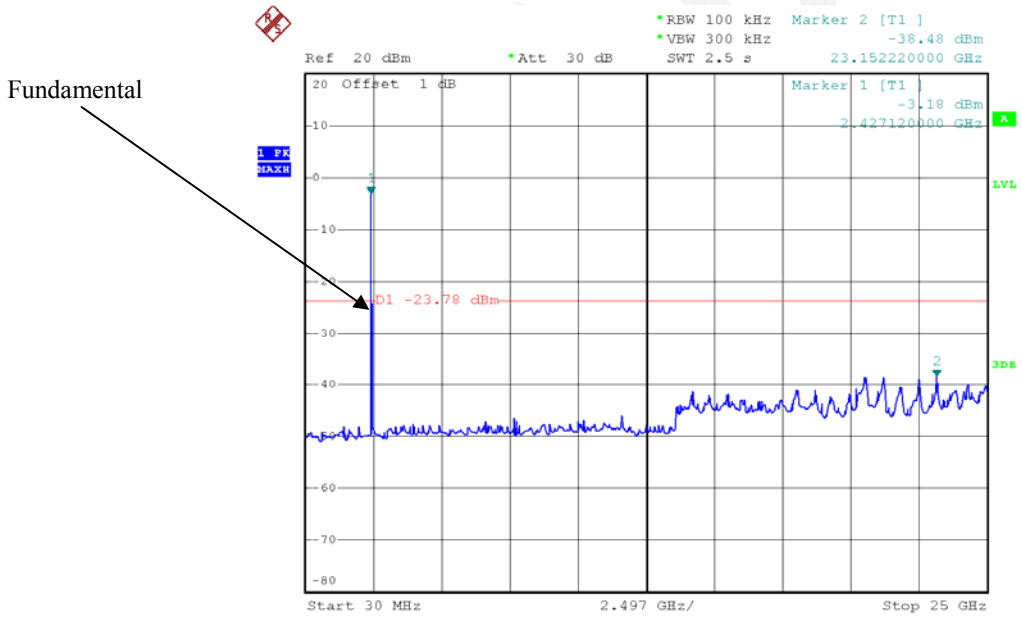
Date: 22.JUN.2015 19:22:43

802.11g Middle Channel, Chain 1



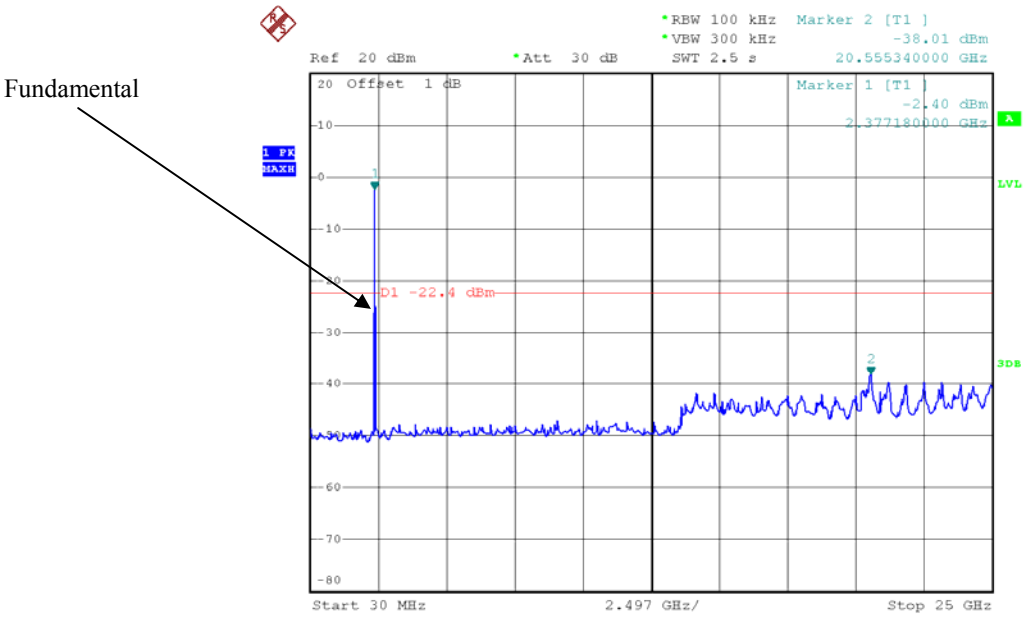
Date: 22.JUN.2015 19:23:52

802.11g High Channel, Chain 1



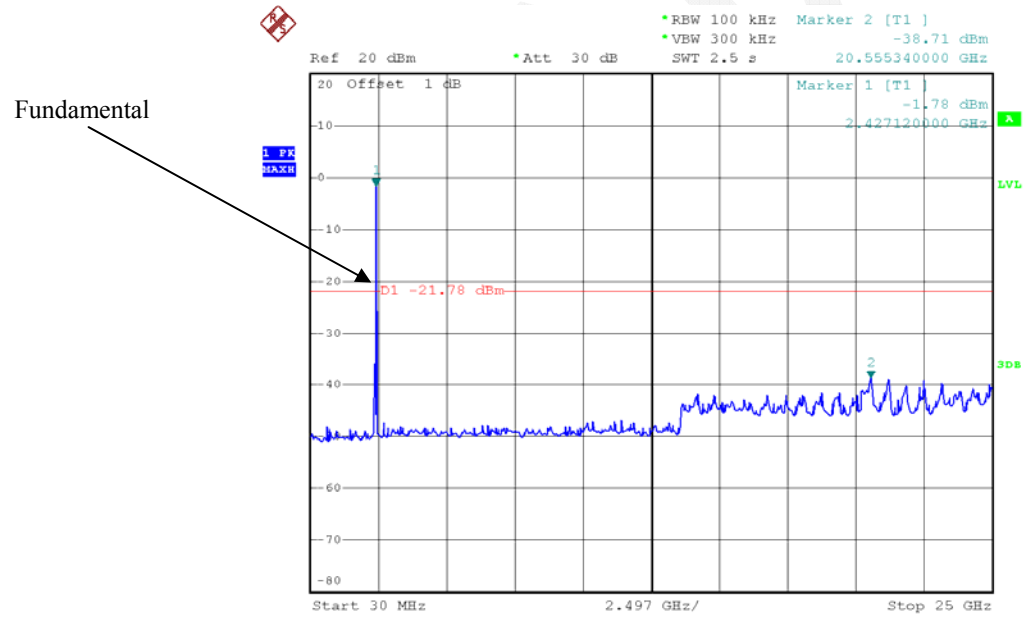
Date: 22.JUN.2015 19:24:48

802.11n ht20 Low Channel, Chain 1



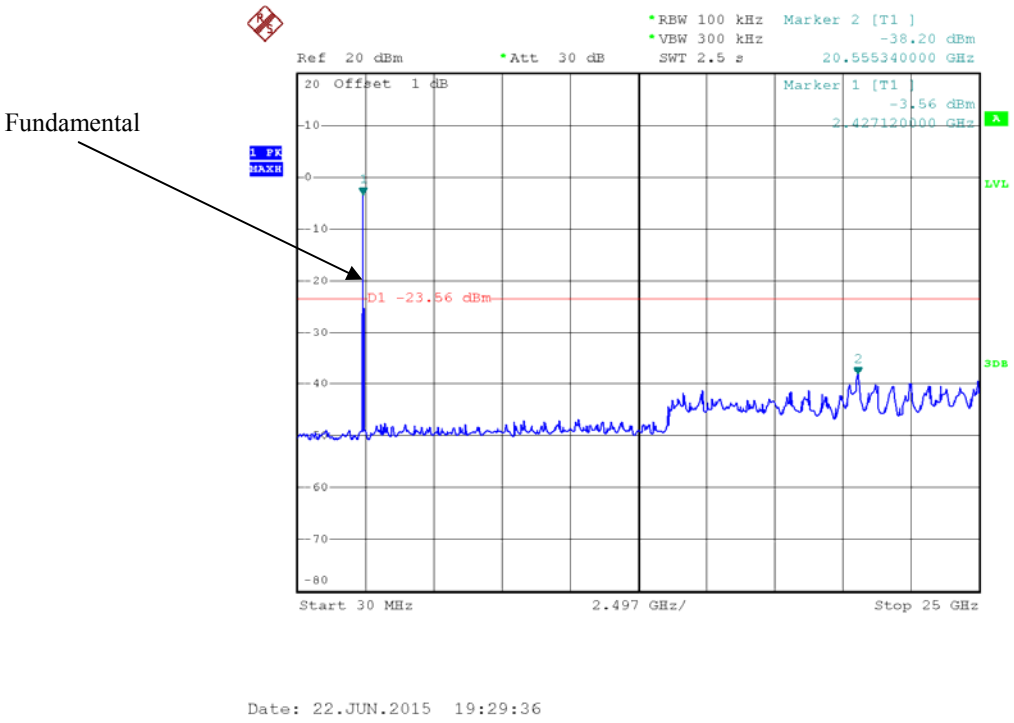
Date: 22.JUN.2015 19:28:09

802.11n ht20 Middle Channel, Chain 1

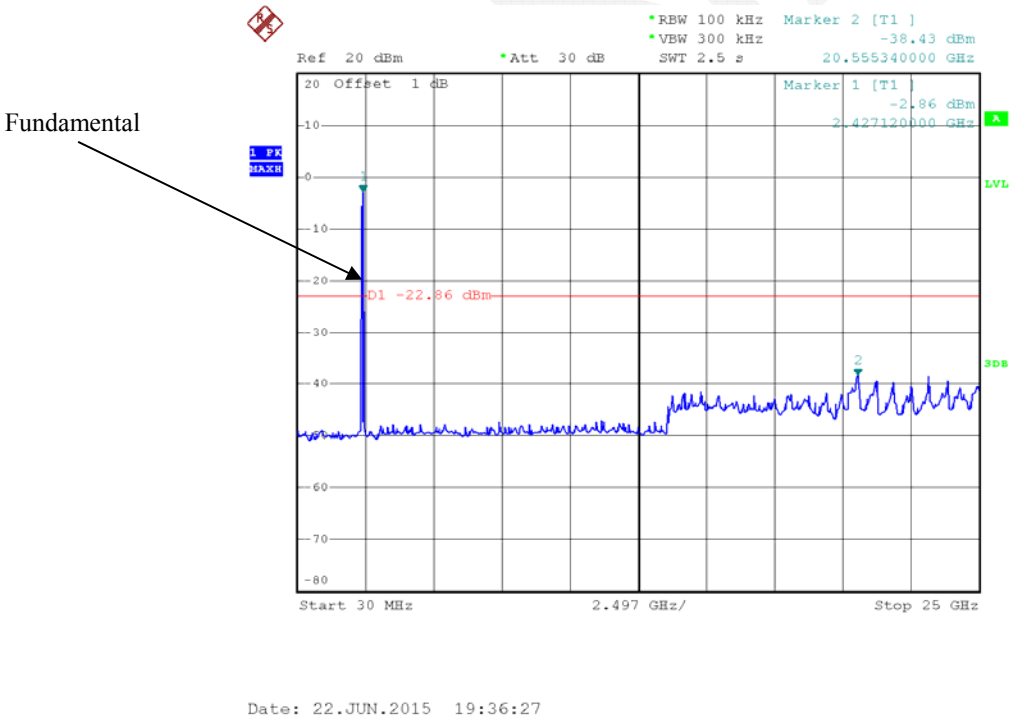


Date: 22.JUN.2015 19:28:57

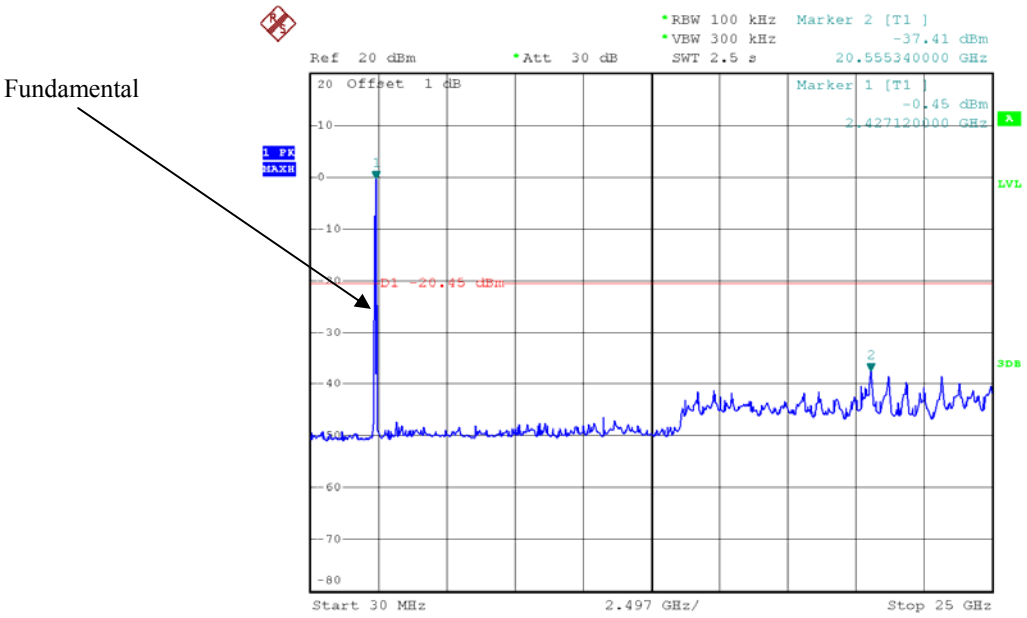
802.11n ht20 High Channel, Chain 1



802.11n ht40 Low Channel, Chain 1

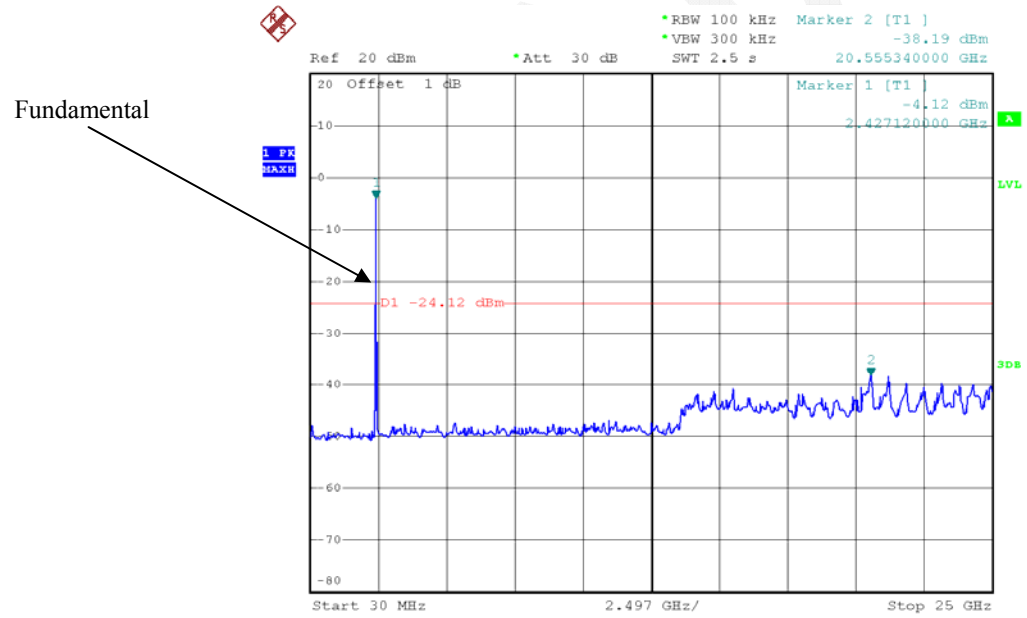


802.11n ht40 Middle Channel, Chain 1



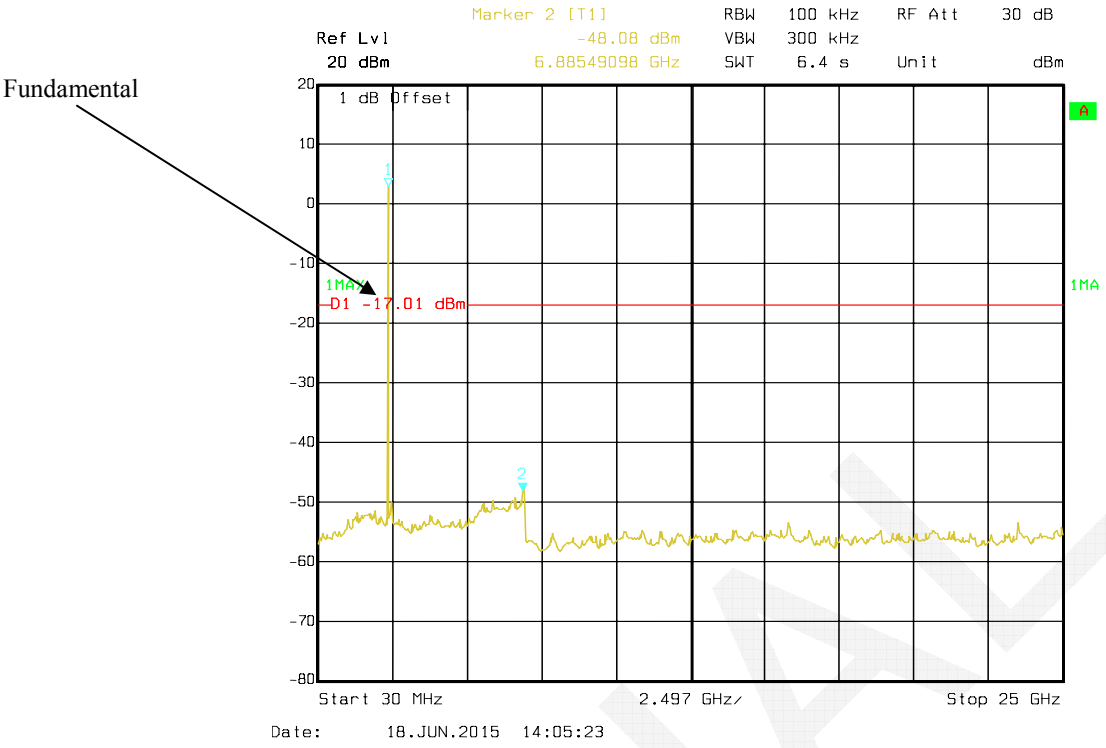
Date: 22.JUN.2015 19:36:56

802.11n ht40 High Channel, Chain 1

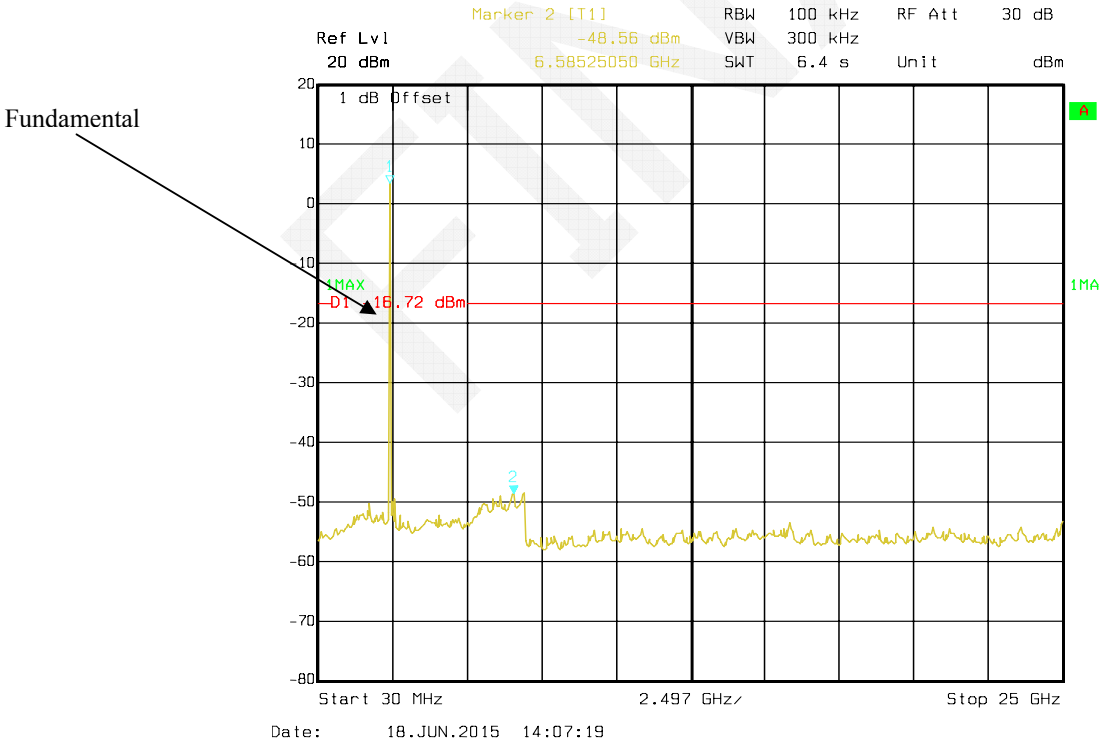


Date: 22.JUN.2015 19:37:46

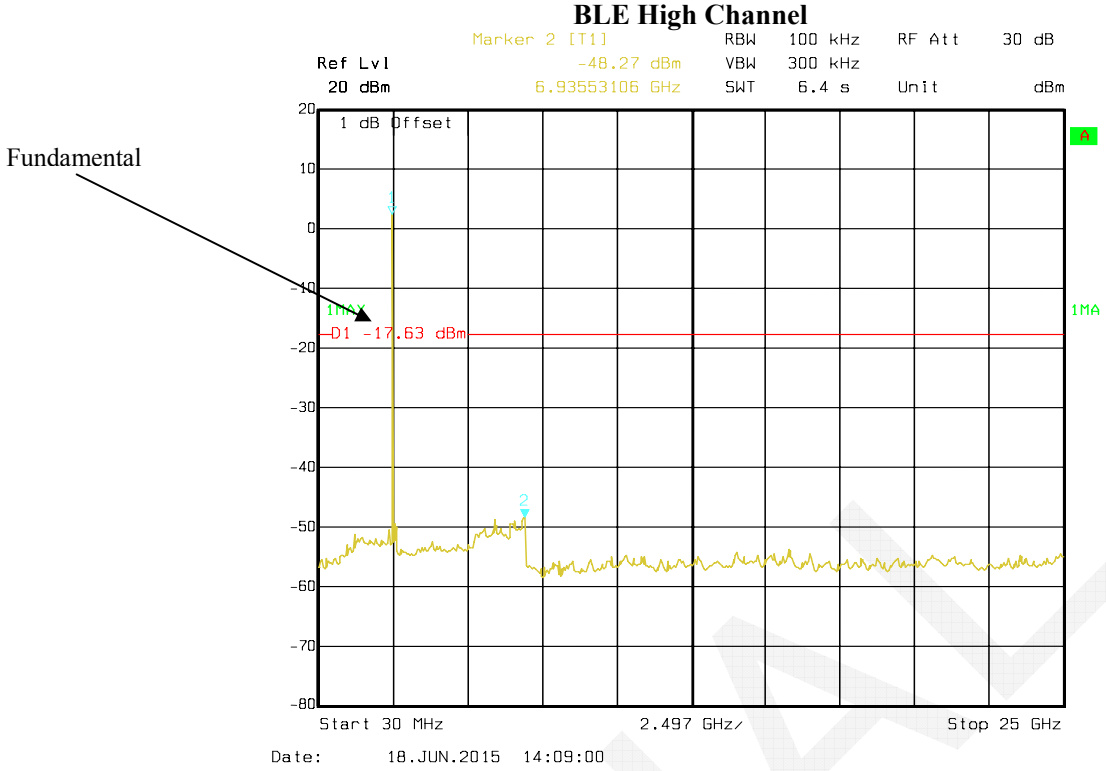
BLE Low Channel



BLE Middle Channel



BLE High Channel



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	2015-05-09	2016-05-09

*** 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:	25.4-25.6 °C
Relative Humidity:	59 %
ATM Pressure:	99.9-100 kPa

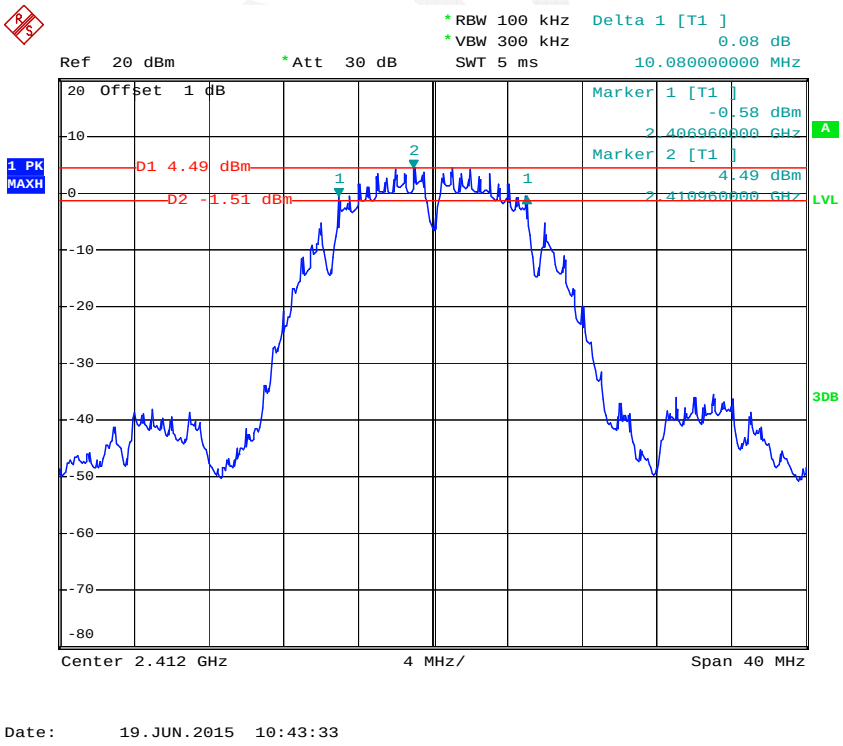
** The testing was performed by Dean Liu from 2015-06-19 to 2015-06-22.*

Test Mode: Transmitting

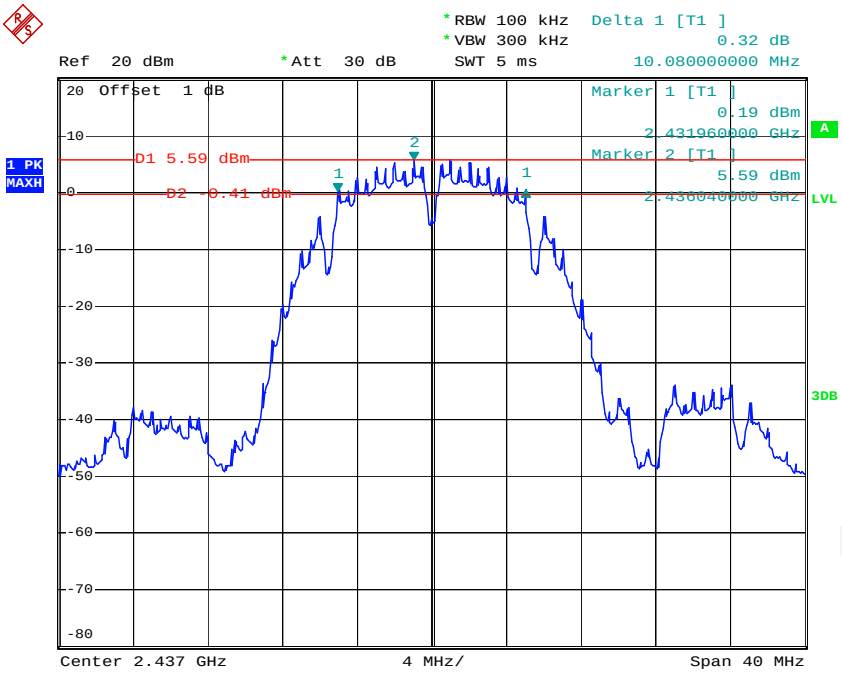
Test Result: Compliant. Please refer to the following table and plots.

Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)		Limits (MHz)
			Chain 0	Chain 1	
802.11 b	Low	2412	10.08	10.08	0.5
	Middle	2437	10.08	10.08	0.5
	High	2462	10.08	10.08	0.5
802.11 g	Low	2412	15.2	15.28	0.5
	Middle	2437	15.2	15.2	0.5
	High	2462	15.28	15.2	0.5
802.11 n20	Low	2412	15.28	15.2	0.5
	Middle	2437	15.2	15.12	0.5
	High	2462	15.36	15.28	0.5
802.11 n40	Low	2422	35.2	35.36	0.5
	Middle	2437	35.36	35.36	0.5
	High	2452	35.36	35.52	0.5
BLE	Low	2402	0.672	/	0.5
	Middle	2440	0.660	/	0.5
	High	2480	0.672	/	0.5

802.11b Low Channel, Chain 0

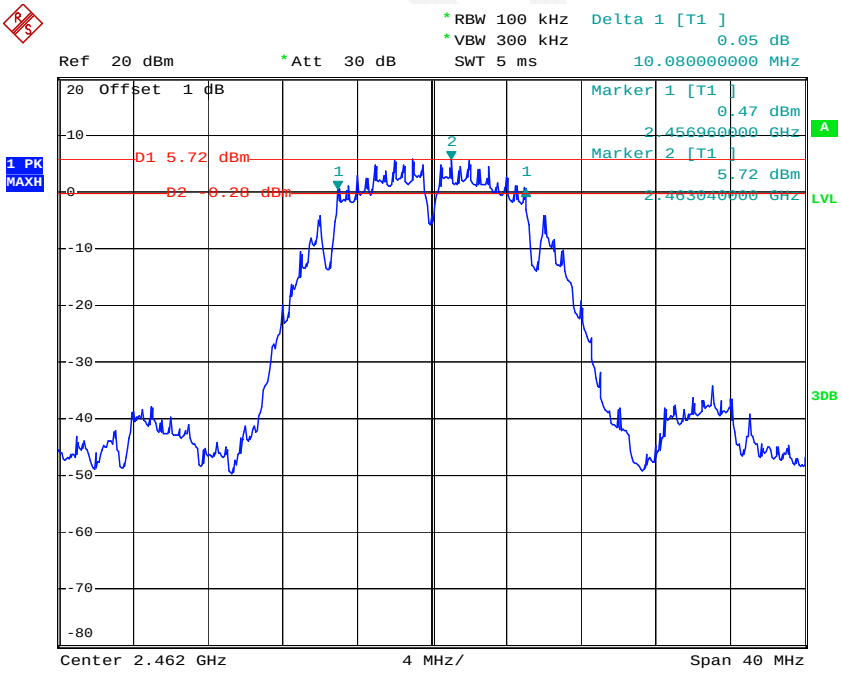


802.11b Middle Channel, Chain 0



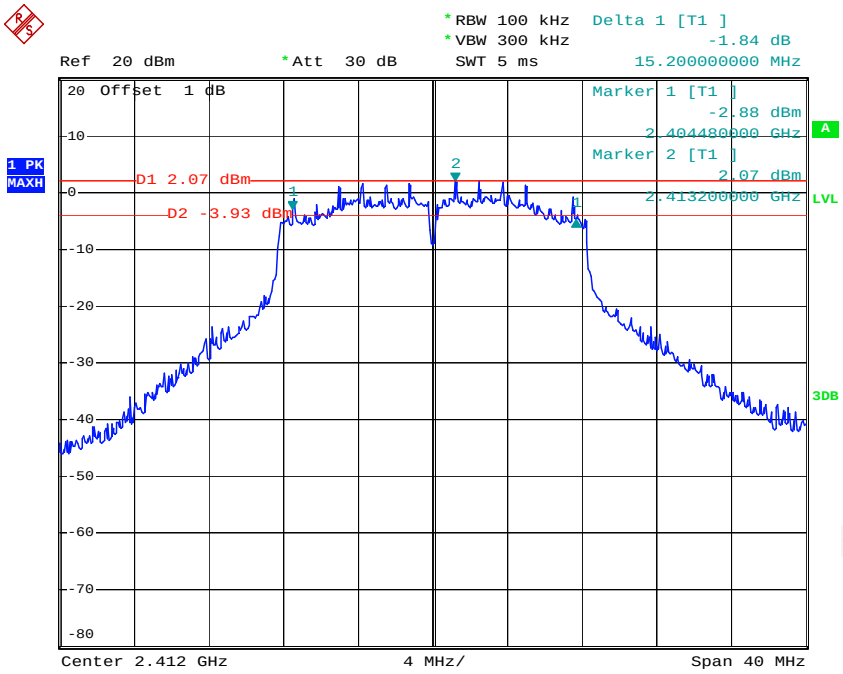
Date: 19.JUN.2015 10:49:11

802.11b High Channel, Chain 0



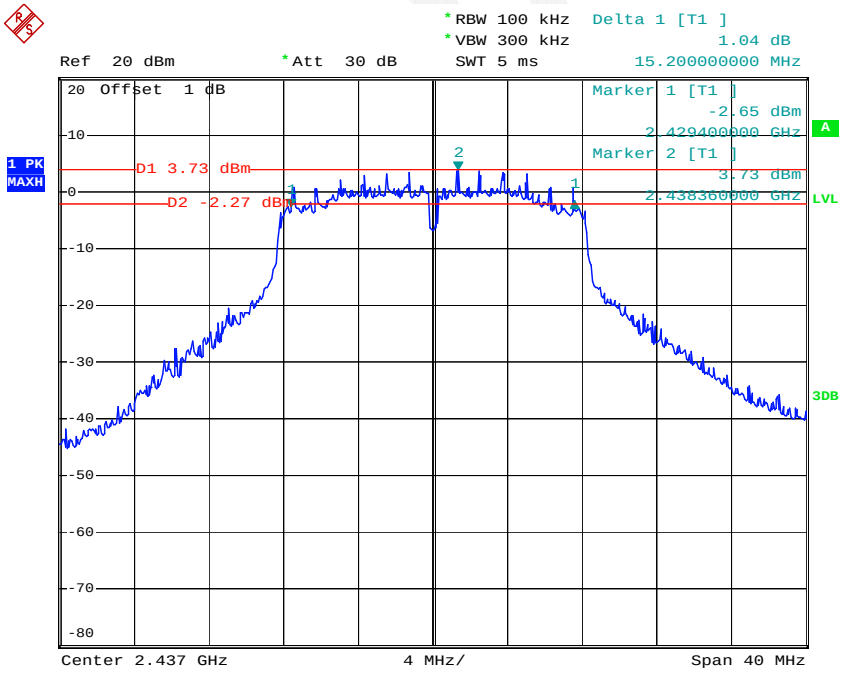
Date: 19.JUN.2015 10:51:39

802.11g Low Channel, Chain 0



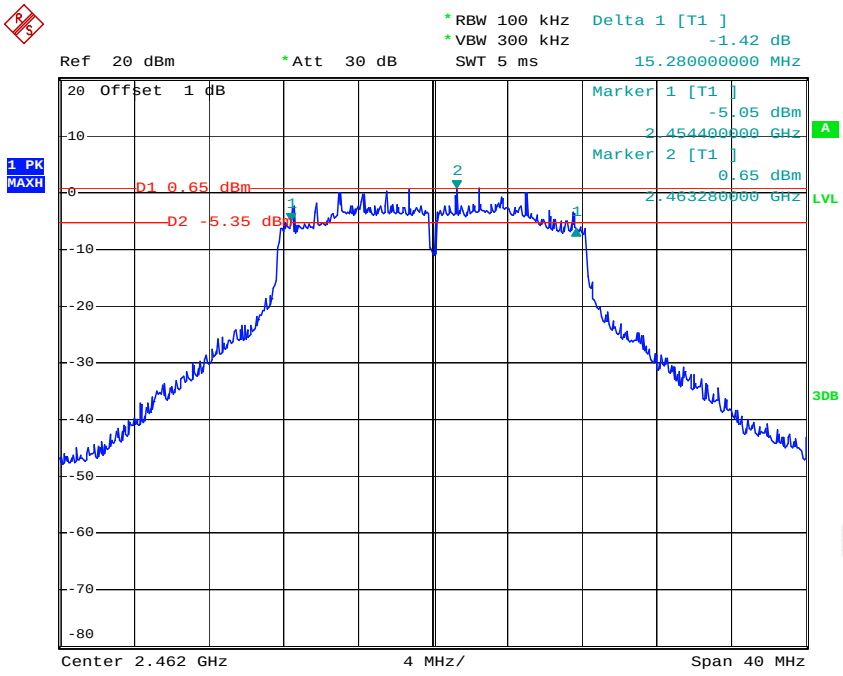
Date: 19.JUN.2015 10:55:34

802.11g Middle Channel, Chain 0



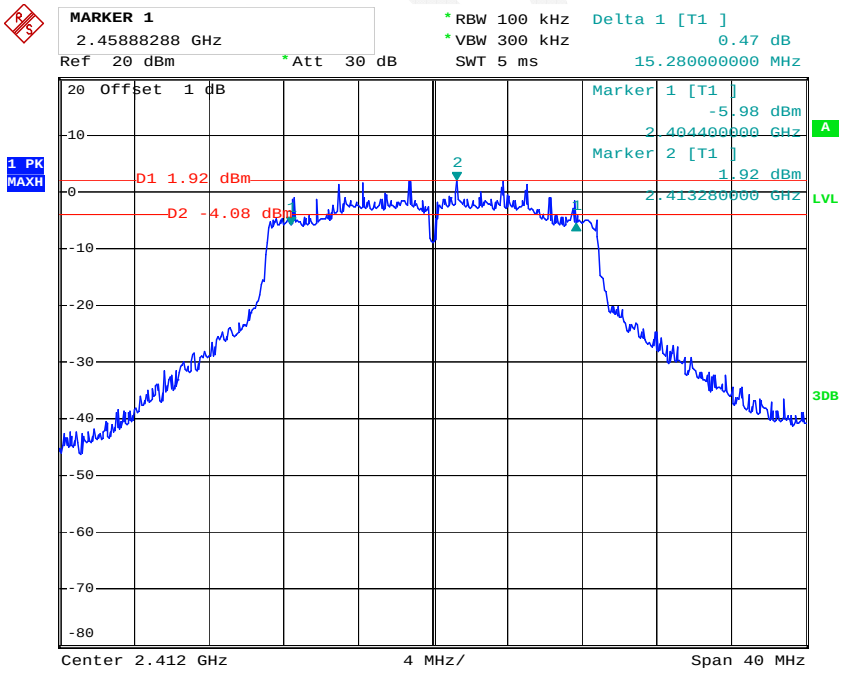
Date: 19.JUN.2015 11:00:21

802.11g High Channel, Chain 0



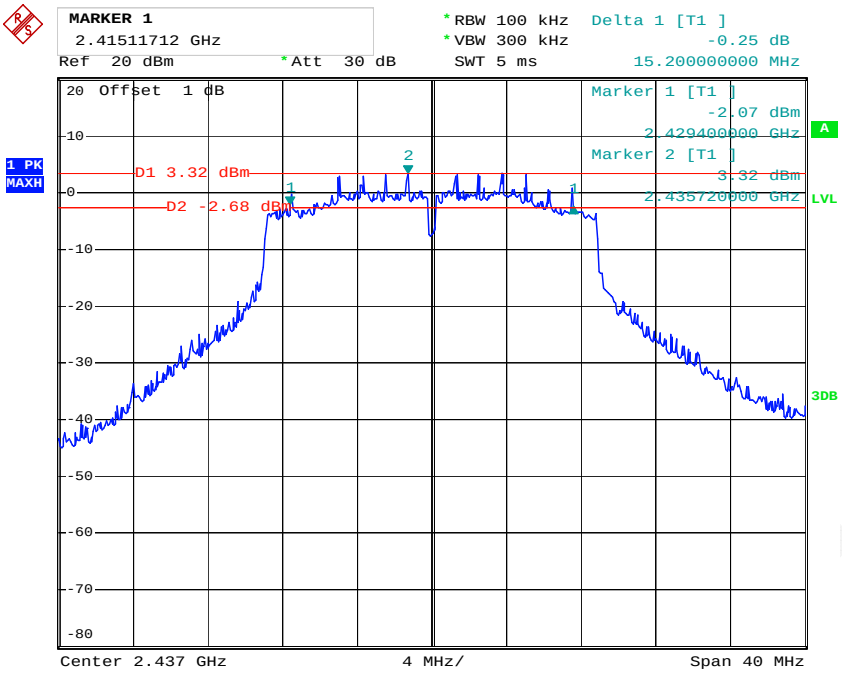
Date: 19.JUN.2015 11:03:05

802.11n ht20 Low Channel, Chain 0



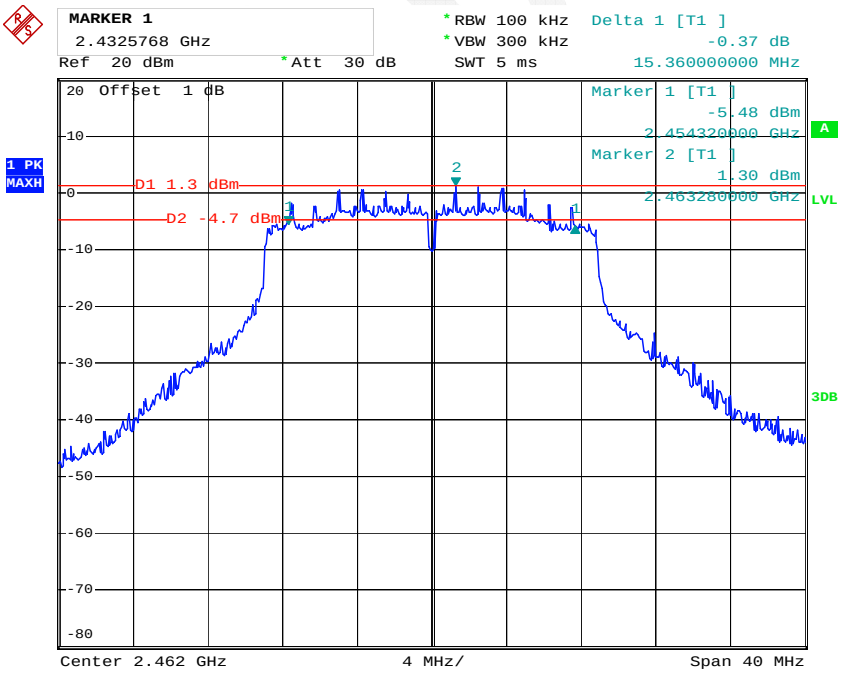
Date: 19.JUN.2015 11:11:57

802.11n ht20 Middle Channel, Chain 0



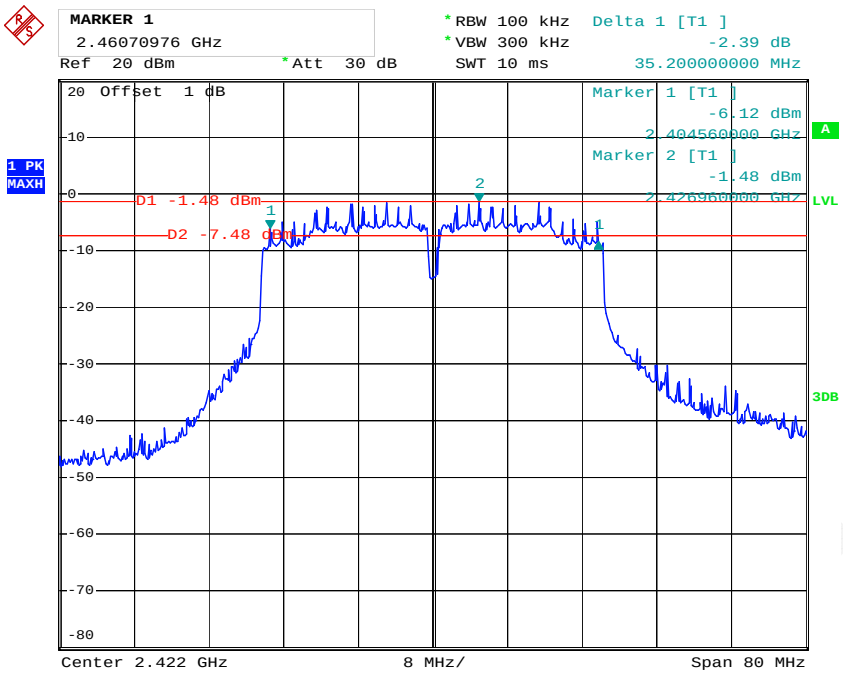
Date: 19.JUN.2015 11:18:58

802.11n ht20 High Channel, Chain 0



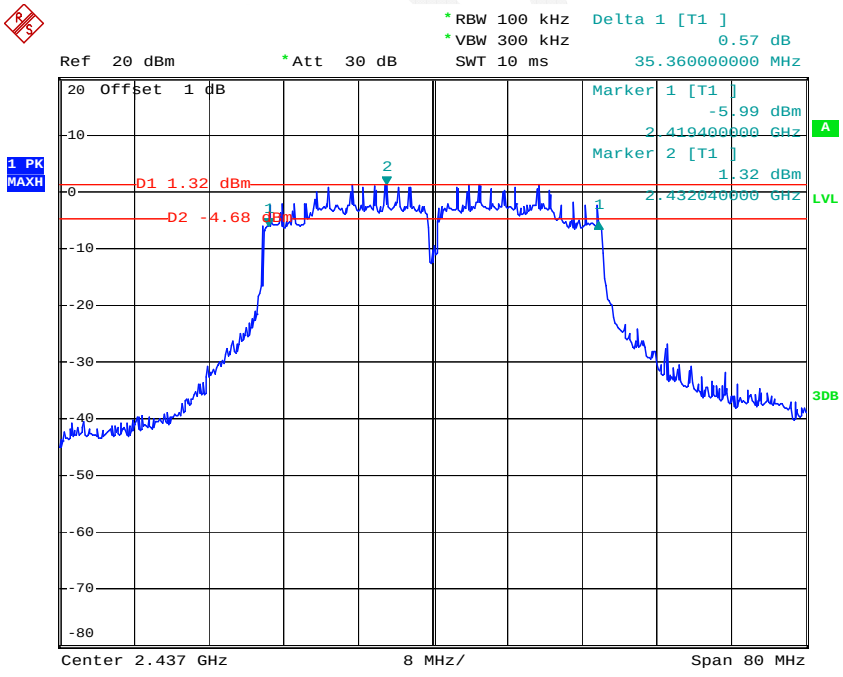
Date: 19.JUN.2015 11:32:40

802.11n ht40 Low Channel, Chain 0



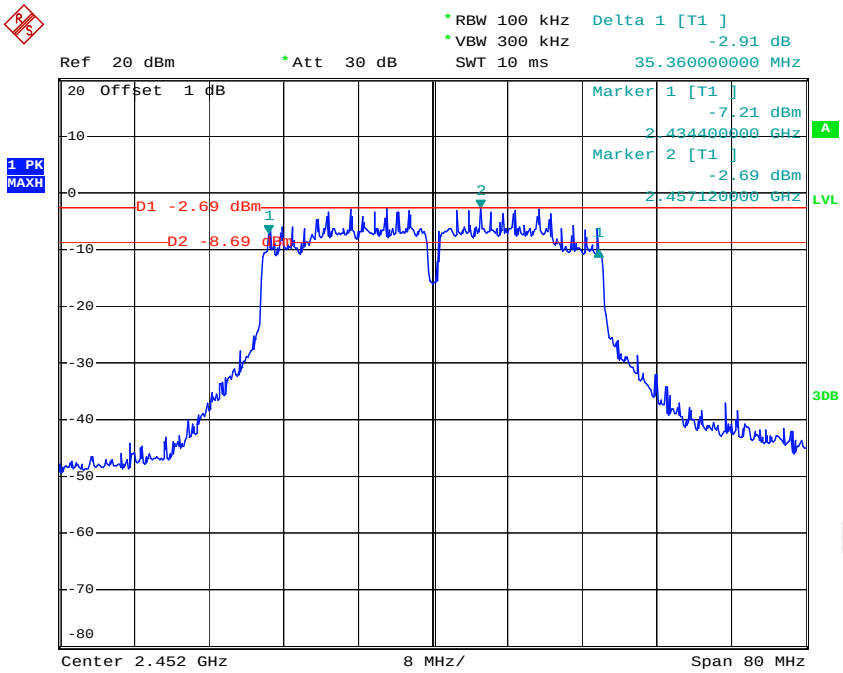
Date: 19.JUN.2015 11:43:05

802.11n ht40 Middle Channel, Chain 0



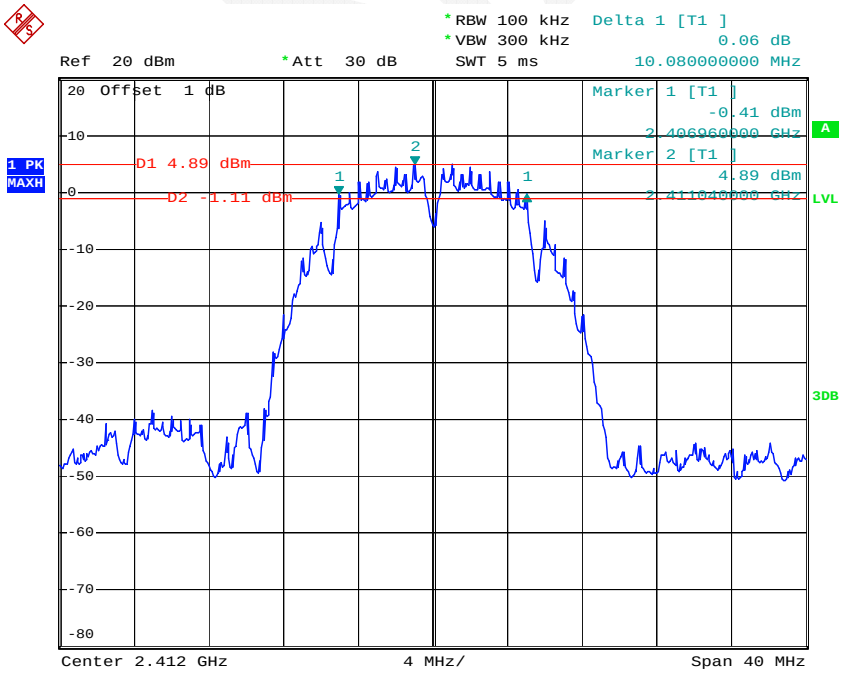
Date: 19.JUN.2015 11:46:46

802.11n ht40 High Channel, Chain 0



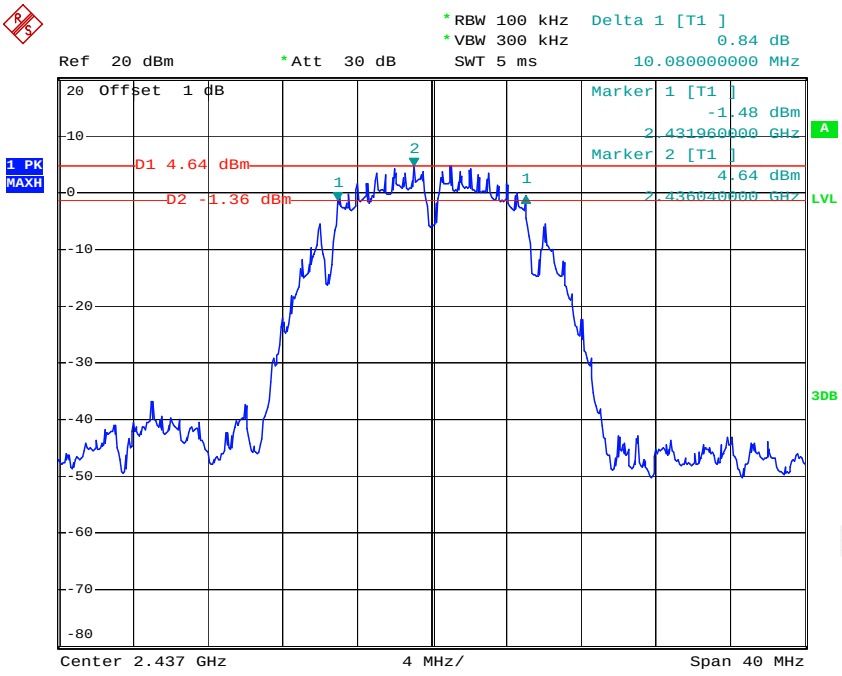
Date: 19.JUN.2015 11:49:17

802.11b Low Channel, Chain 1



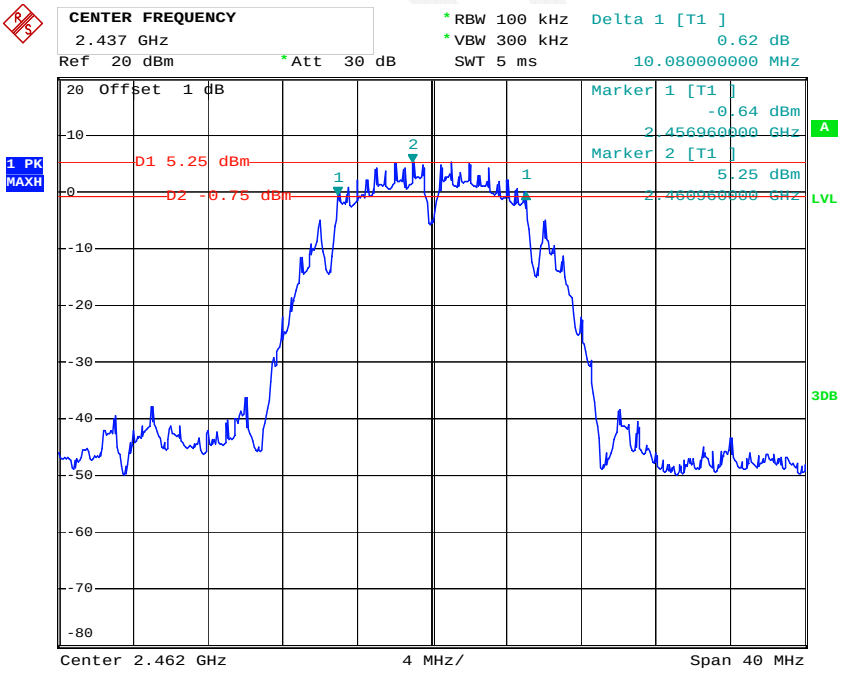
Date: 22.JUN.2015 12:49:24

802.11b Middle Channel, Chain 1



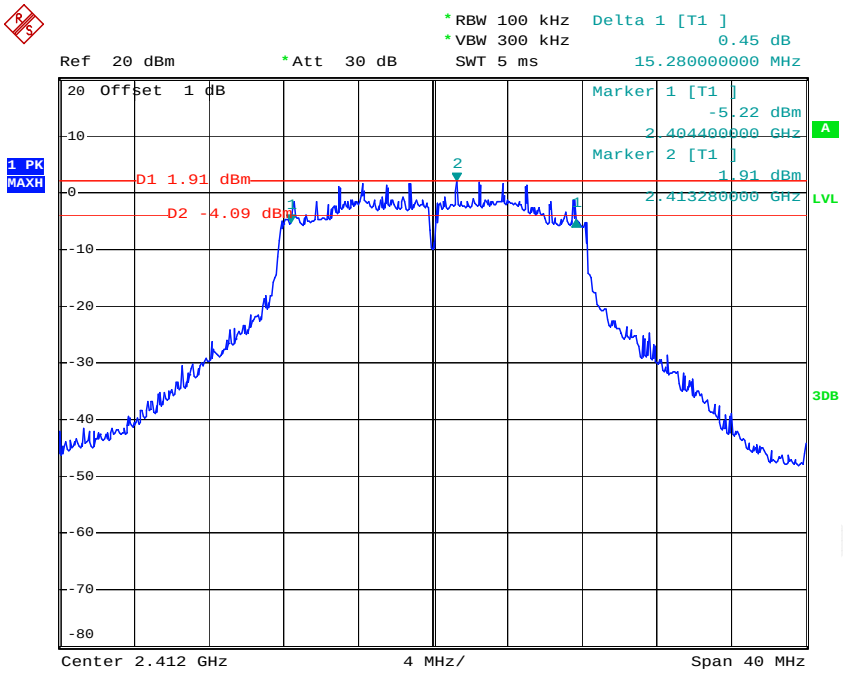
Date: 22.JUN.2015 12:51:52

802.11b High Channel, Chain 1



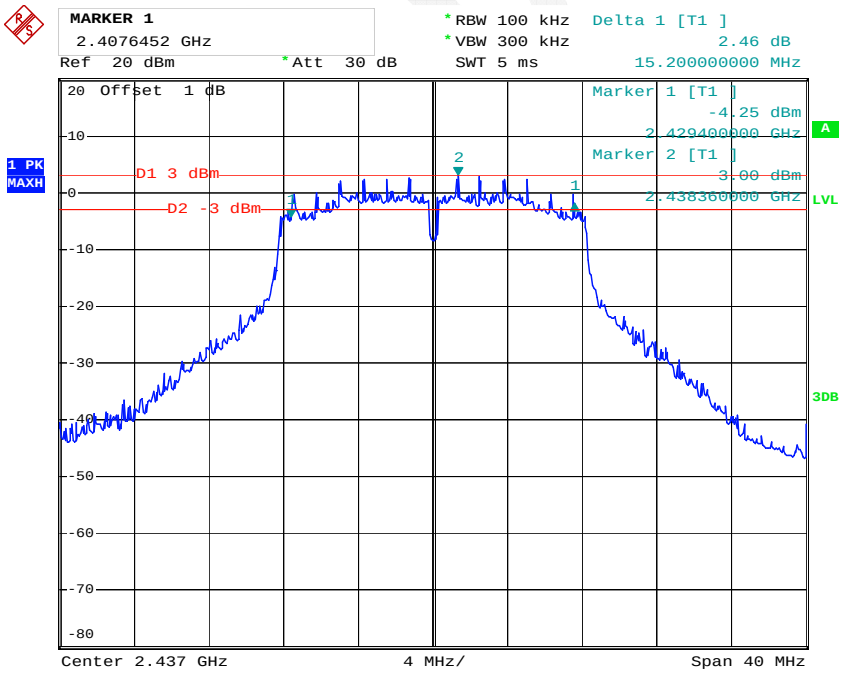
Date: 22.JUN.2015 14:00:49

802.11g Low Channel, Chain 1



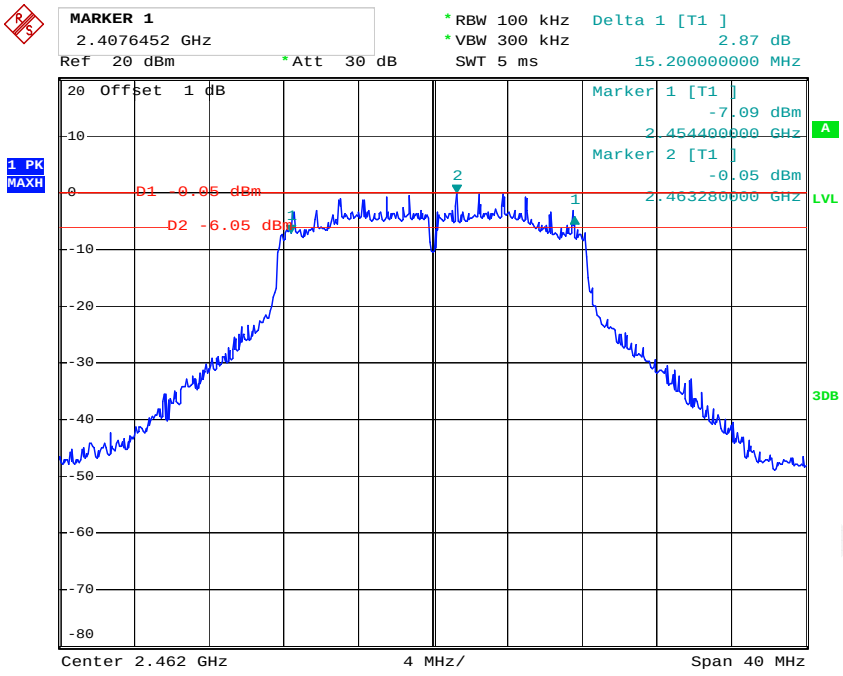
Date: 22.JUN.2015 14:04:09

802.11g Middle Channel, Chain 1



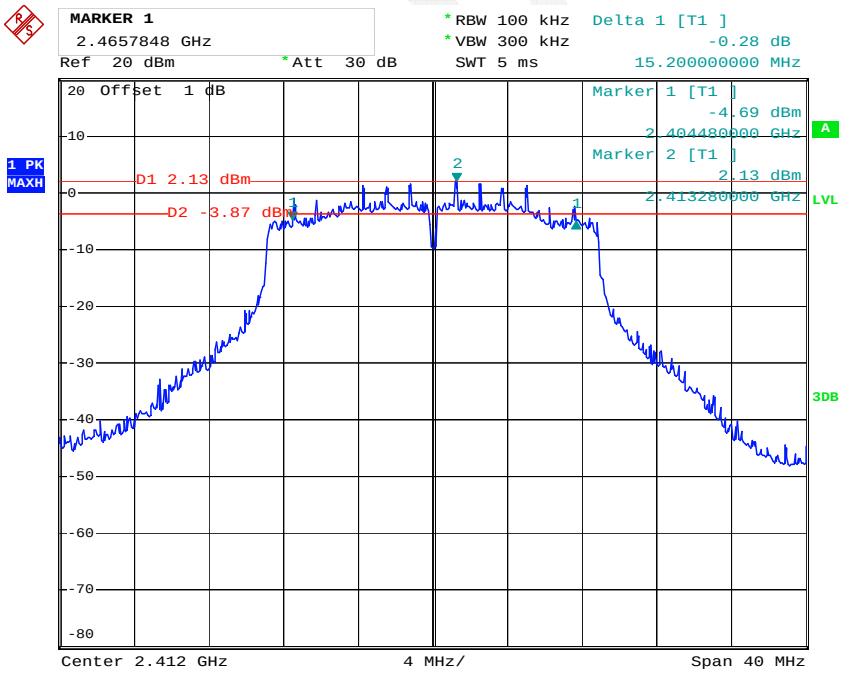
Date: 22.JUN.2015 14:11:29

802.11g High Channel, Chain 1



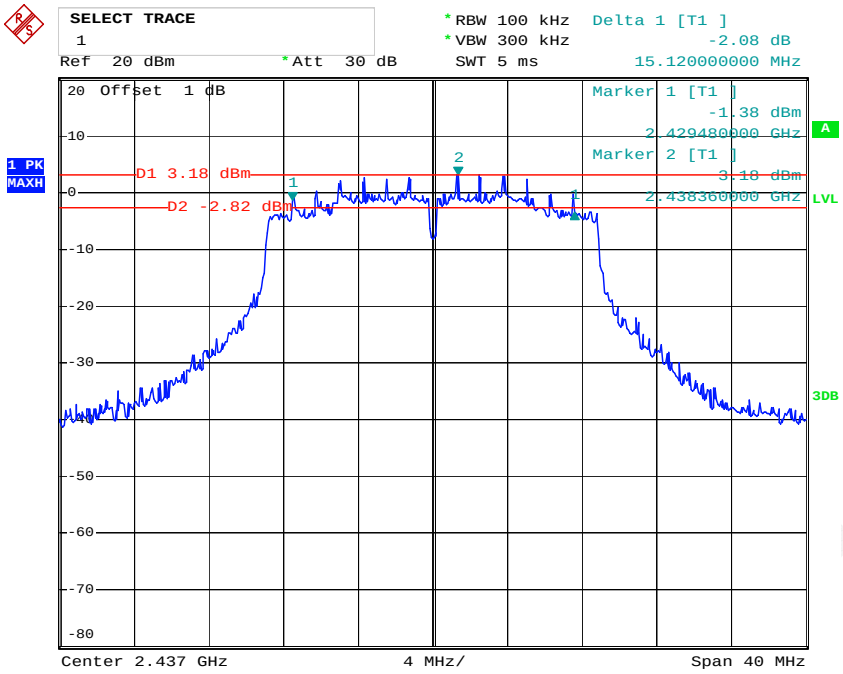
Date: 22.JUN.2015 14:14:40

802.11n ht20 Low Channel, Chain 1



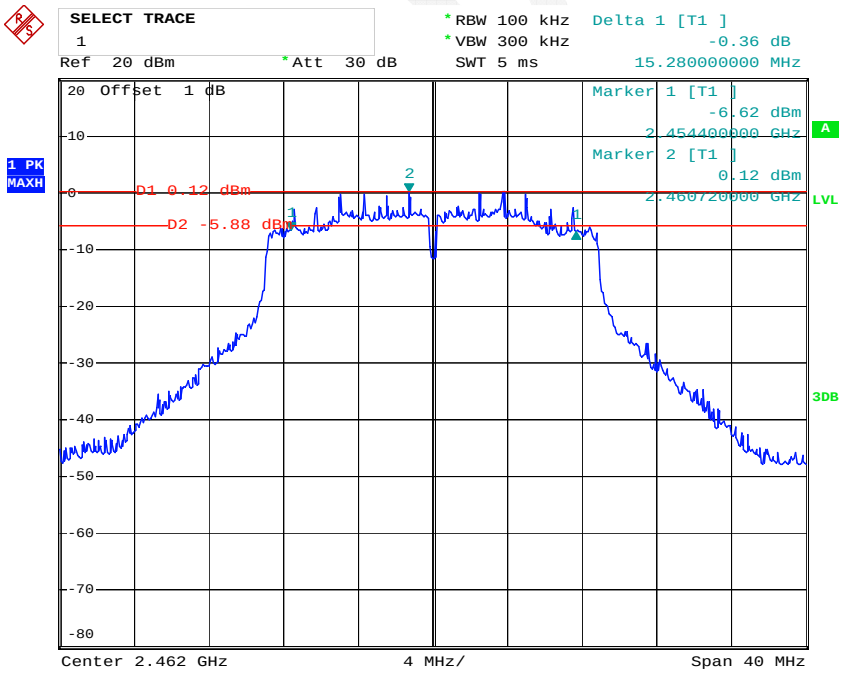
Date: 22.JUN.2015 14:20:17

802.11n ht20 Middle Channel, Chain 1



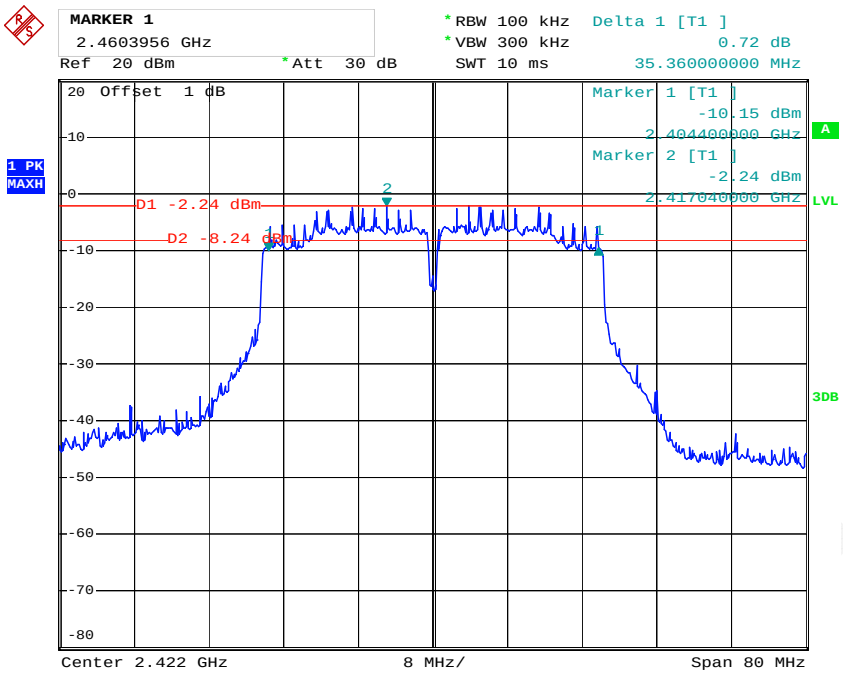
Date: 22.JUN.2015 14:31:10

802.11n ht20 High Channel, Chain 1



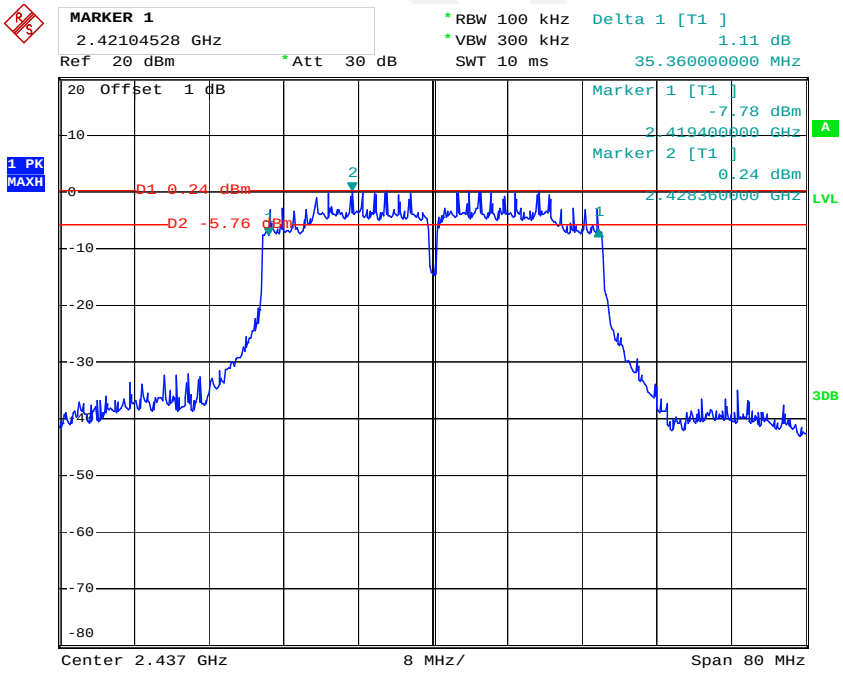
Date: 22.JUN.2015 14:33:41

802.11n ht40 Low Channel, Chain 1



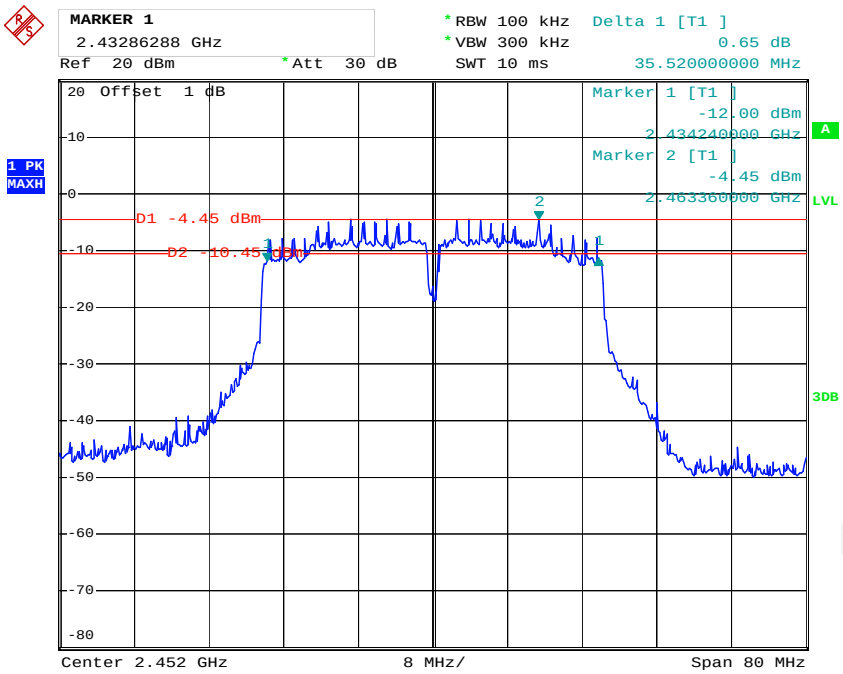
Date: 22.JUN.2015 14:38:57

802.11n ht40 Middle Channel, Chain 1



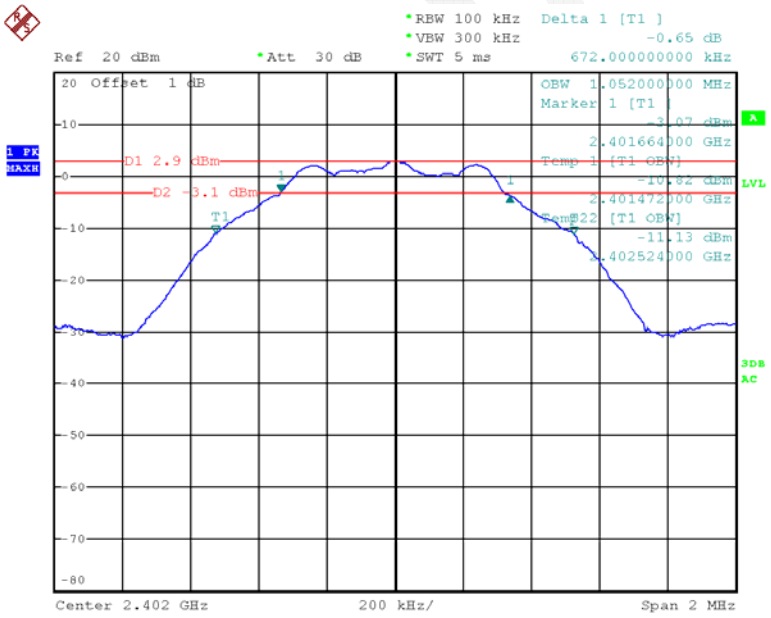
Date: 22.JUN.2015 14:45:31

802.11n ht40 High Channel, Chain 1



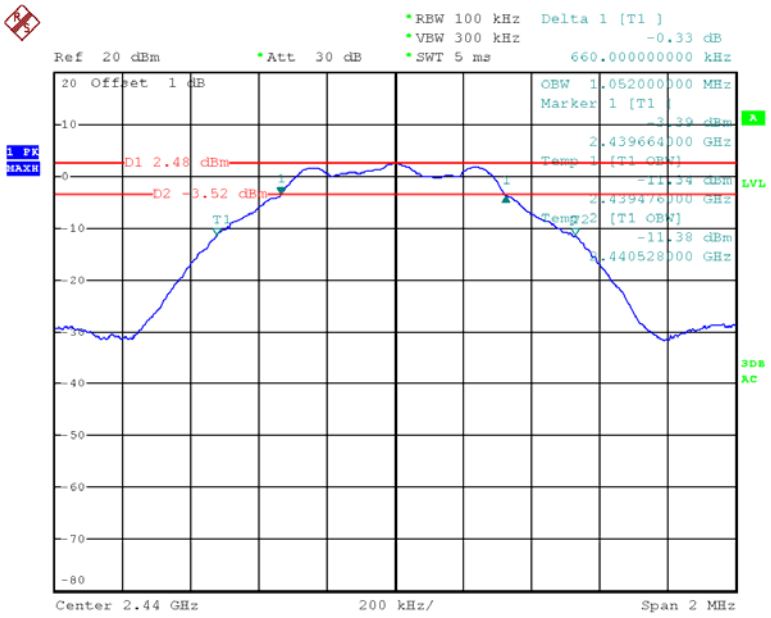
Date: 22.JUN.2015 14:50:08

BLE Low Channel



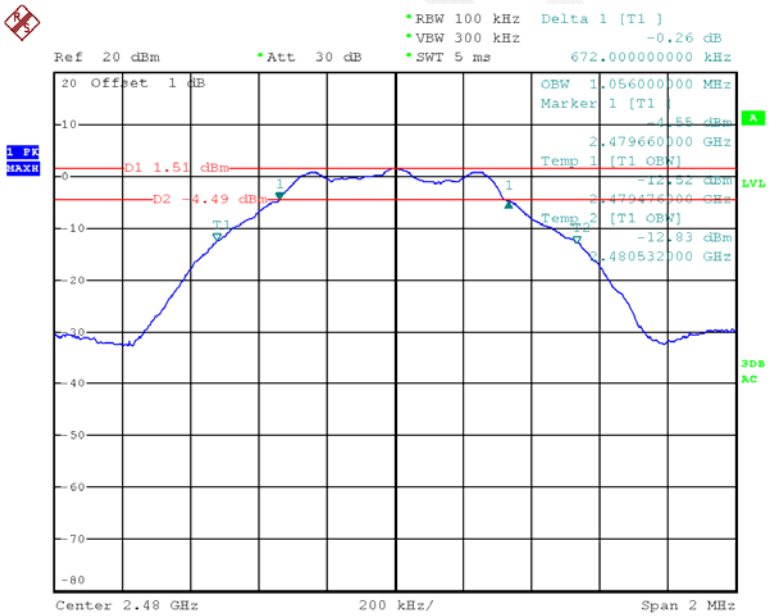
Date: 22.JUN.2015 10:56:47

BLE Middle Channel



Date: 22.JUN.2015 10:58:17

BLE High Channel



Date: 22.JUN.2015 10:59:39

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

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

*** 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:	25.3-25.8°C
Relative Humidity:	53-57 %
ATM Pressure:	99.-100 kPa

** The testing was performed by Dean Liu from 2015-06-19 to 2015-06-26.*

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

WLAN, SISO Mode:

Mode	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)		Limit (dBm)
			Chain 0	Chain 1	
802.11 b	Low	2412	16.73	16.95	30
	Middle	2437	17.54	16.88	30
	High	2462	18.05	17.63	30
802.11 g	Low	2412	20.38	20.29	30
	Middle	2437	22.01	21.25	30
	High	2462	19.14	18.31	30
802.11 n20	Low	2412	20.25	20.17	30
	Middle	2437	22.78	21.32	30
	High	2462	19.36	18.67	30
802.11 n40	Low	2422	19.83	19.24	30
	Middle	2437	22.75	21.68	30
	High	2452	18.74	17.08	30

Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)		Limit (dBm)
			Chain 0	Chain 1	
802.11 b	Low	2412	16.13	16.6	30
	Middle	2437	17.38	16.28	30
	High	2462	17.97	16.92	30
802.11 g	Low	2412	16.05	15.9	30
	Middle	2437	17.92	16.92	30
	High	2462	16.95	16.03	30
802.11 n20	Low	2412	15.84	15.78	30
	Middle	2437	17.74	17.01	30
	High	2462	15.26	14.46	30
802.11 n40	Low	2422	13.37	12.78	30
	Middle	2437	16.3	15.24	30
	High	2452	12.37	10.66	30

WLAN, MIMO Mode:

Mode	Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
802.11 b	Low	2412	13.3	13.52	16.42	30
	Middle	2437	13.93	14.62	17.3	30
	High	2462	14.65	15.19	17.94	30
802.11 g	Low	2412	17.48	17.93	20.72	30
	Middle	2437	19.39	18.05	21.78	30
	High	2462	17.93	17.76	20.86	30
802.11 n20	Low	2412	17.42	17.3	20.37	30
	Middle	2437	18.38	17.98	21.19	30
	High	2462	17.75	17.63	20.7	30
802.11 n40	Low	2422	15.35	15.44	18.41	30
	Middle	2437	19.33	18.76	22.06	30
	High	2452	15.92	15.16	18.57	30

Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Total	
802.11 b	Low	2412	13.1	13.32	16.22	30
	Middle	2437	13.69	14.41	17.08	30
	High	2462	14.44	14.96	17.72	30
802.11 g	Low	2412	13.18	13.52	16.36	30
	Middle	2437	15.06	13.78	17.48	30
	High	2462	13.67	13.44	16.57	30
802.11 n20	Low	2412	13.18	12.97	16.09	30
	Middle	2437	14.27	13.73	17.02	30
	High	2462	13.55	13.37	16.47	30
802.11 n40	Low	2422	8.91	8.99	11.96	30
	Middle	2437	12.95	12.4	15.69	30
	High	2452	9.52	8.73	12.15	30

Bluetooth LE mode:

Test mode	Channel	Frequency	Conducted Peak Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
BLE	Low	2402	3.09	30	PASS
	Middle	2440	2.67	30	PASS
	High	2480	1.70	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	2015-05-09	2016-05-09

*** 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

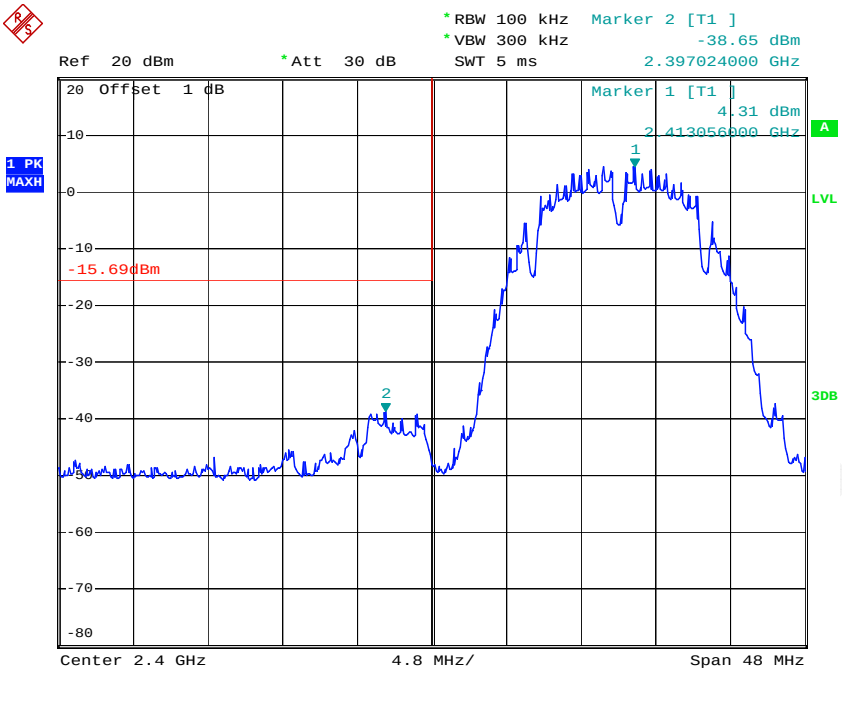
Temperature:	25.3-25.8°C
Relative Humidity:	53-57 %
ATM Pressure:	99.-100 kPa

** The testing was performed by Dean Liu from 2015-06-19 to 2015-06-26.*

Test mode: Transmitting

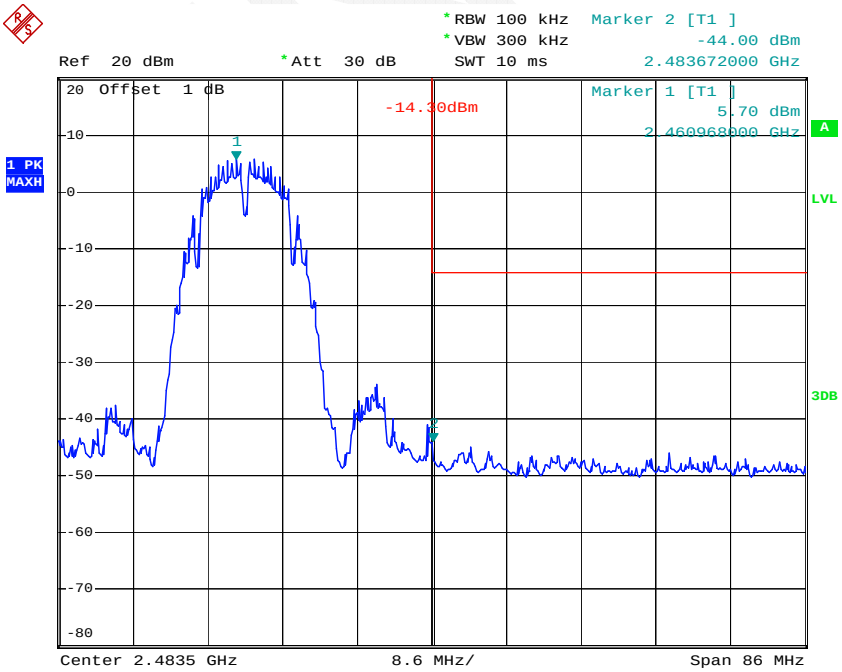
Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side, Chain 0



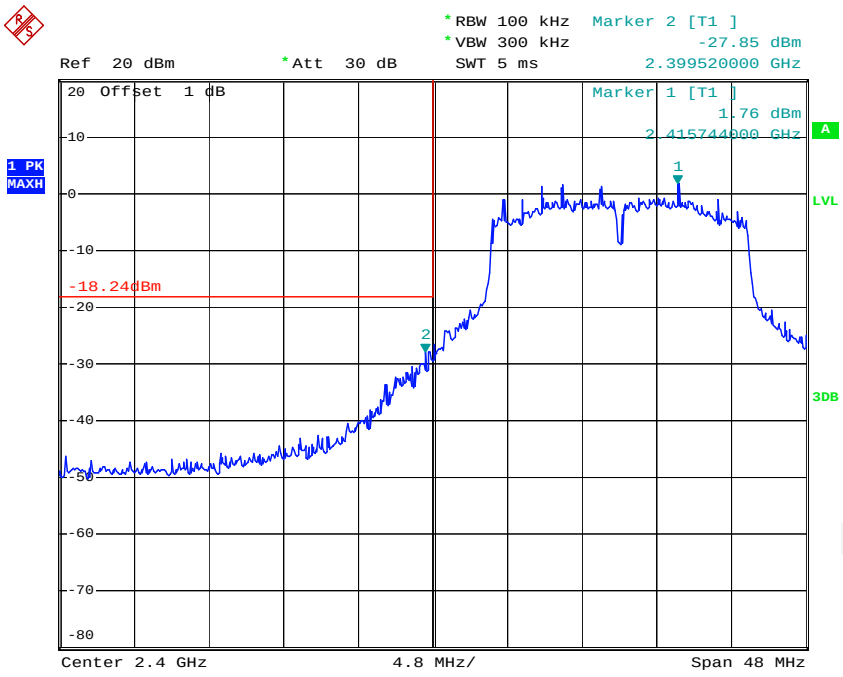
Date: 19.JUN.2015 10:45:10

802.11b: Band Edge, Right Side, Chain 0



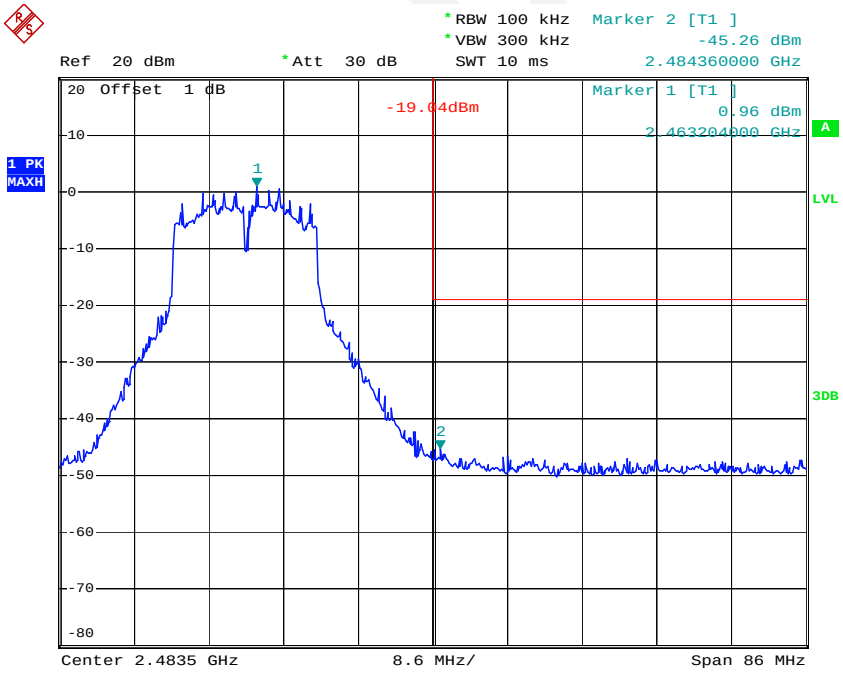
Date: 19.JUN.2015 10:53:26

802.11g: Band Edge, Left Side, Chain 0



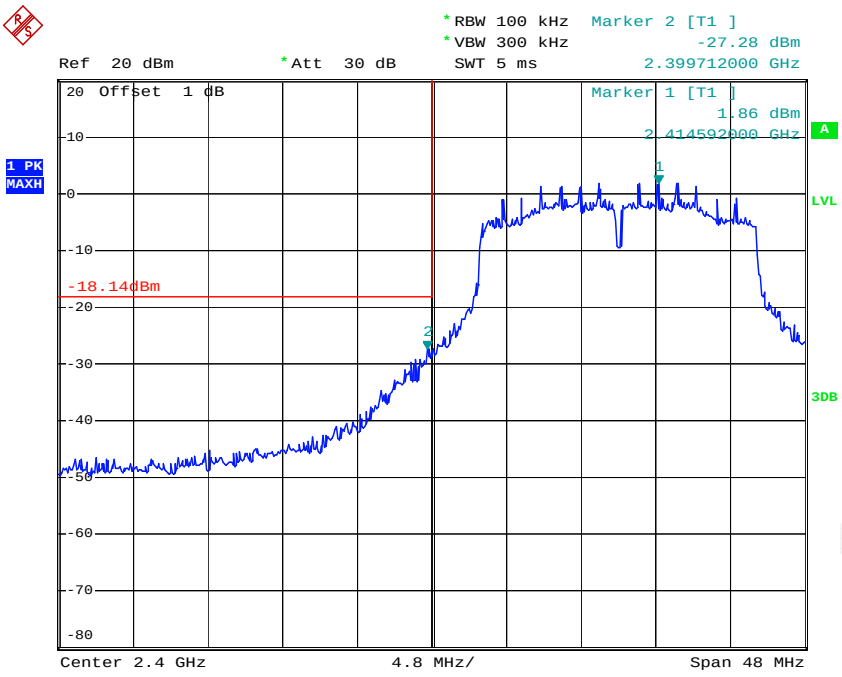
Date: 19.JUN.2015 10:57:16

802.11g: Band Edge, Right Side, Chain 0



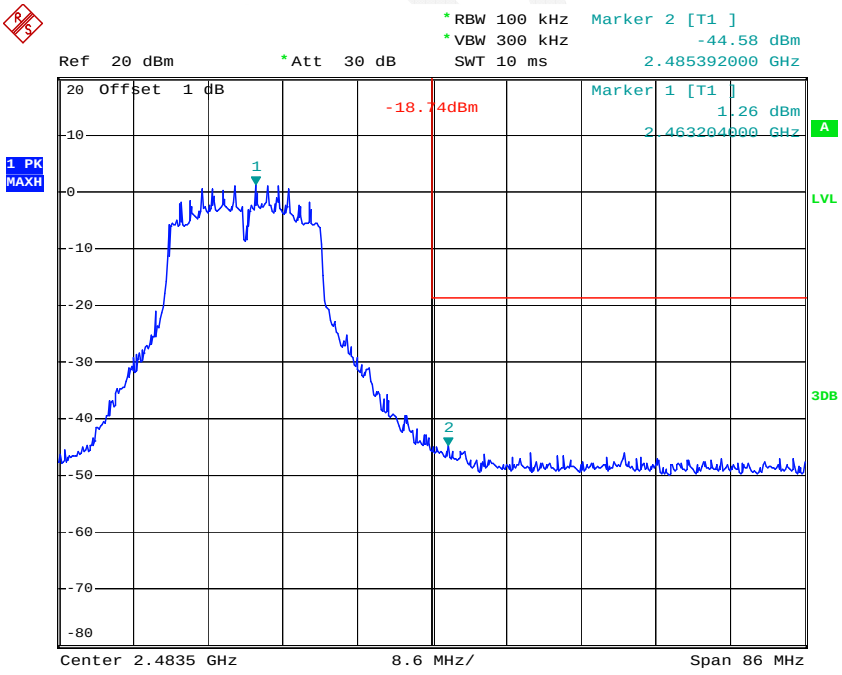
Date: 19.JUN.2015 11:04:48

802.11n ht20 Band Edge, Left Side, Chain 0



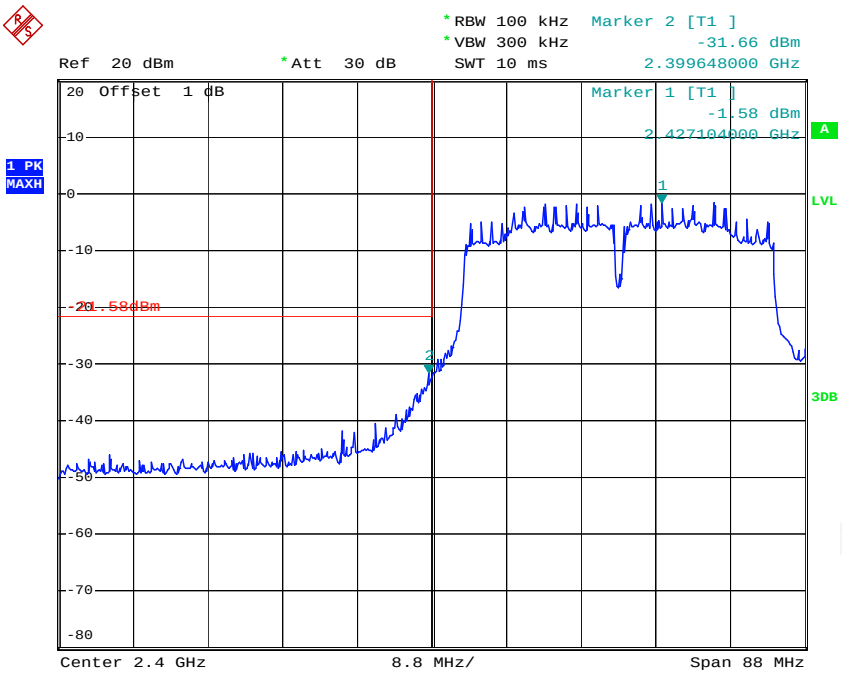
Date: 19.JUN.2015 11:14:35

802.11n ht20 Band Edge, Right Side, Chain 0



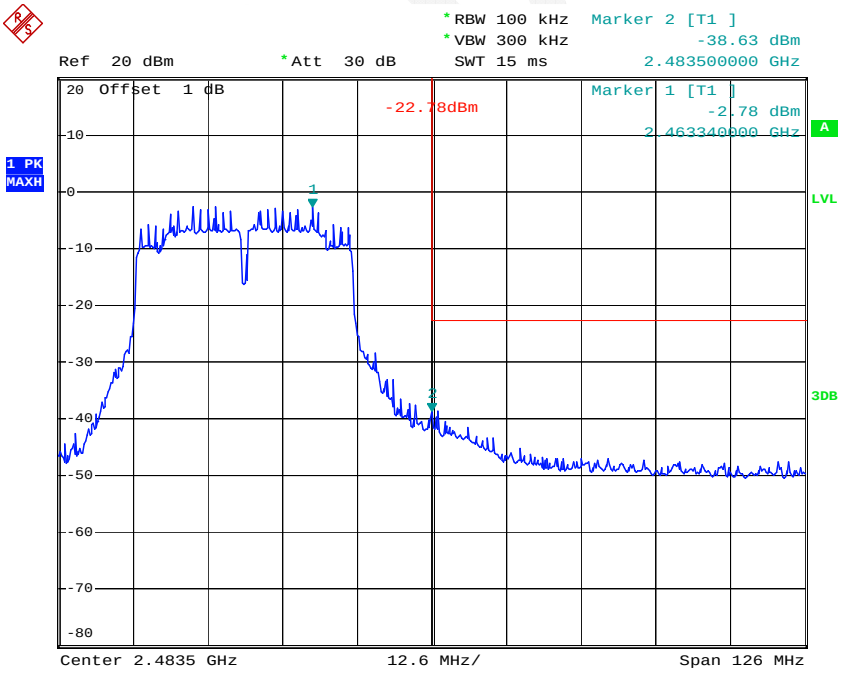
Date: 19.JUN.2015 11:35:23

802.11n ht40 Band Edge, Left Side, Chain 0



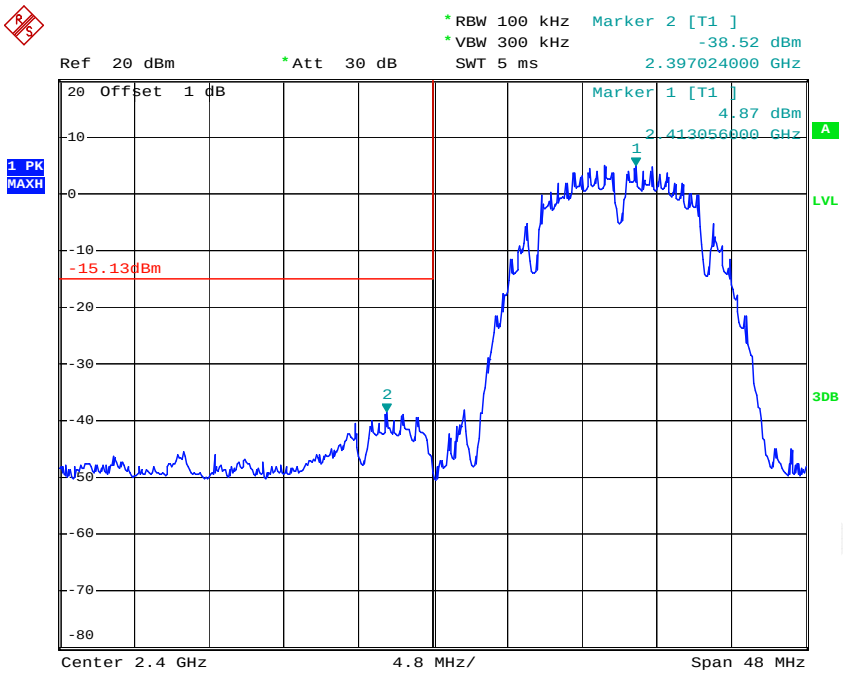
Date: 19.JUN.2015 11:45:47

802.11n ht40 Band Edge, Right Side, Chain 0



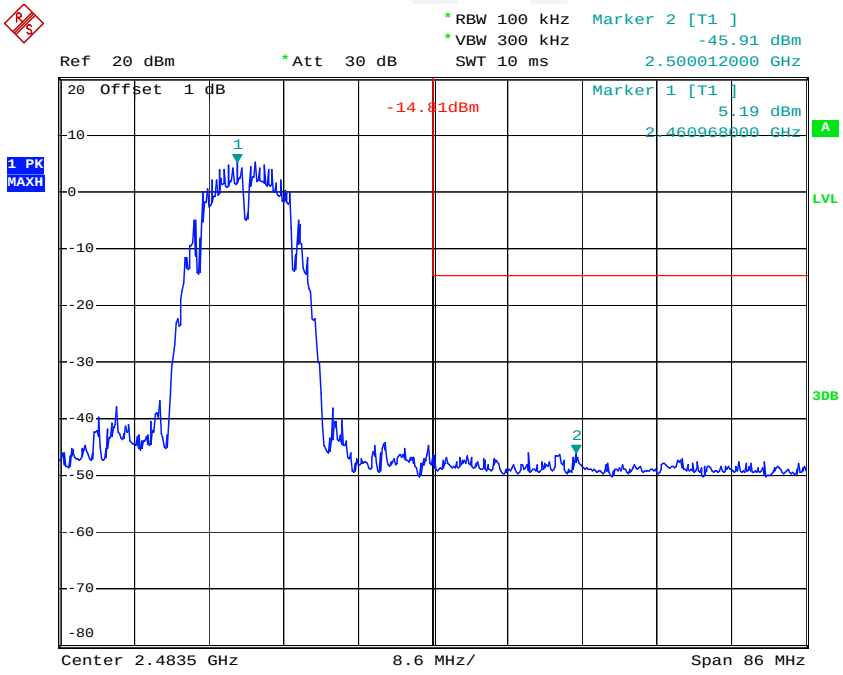
Date: 19.JUN.2015 11:51:28

802.11b: Band Edge, Left Side, Chain 1



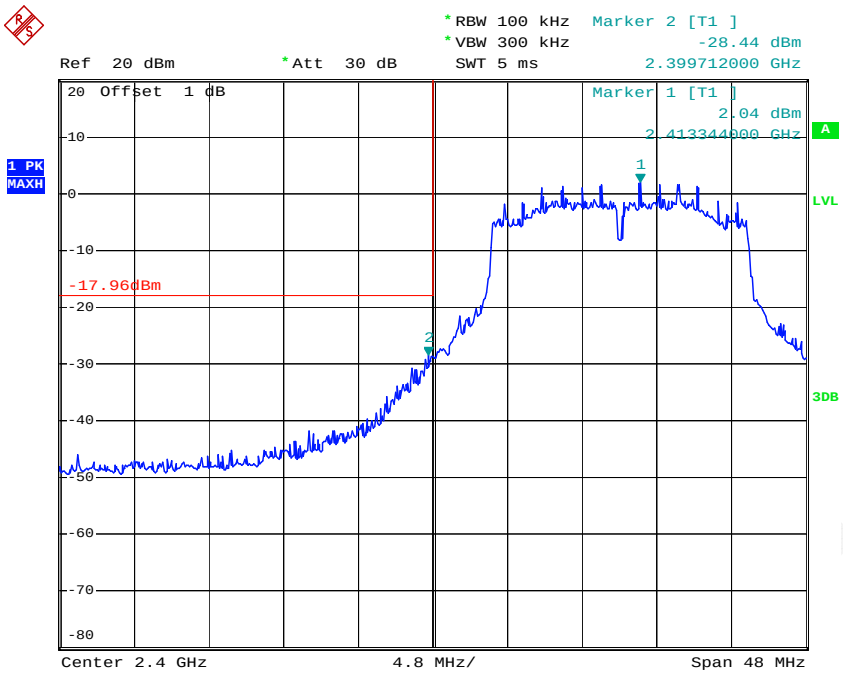
Date: 22.JUN.2015 12:51:09

802.11b: Band Edge, Right Side, Chain 1



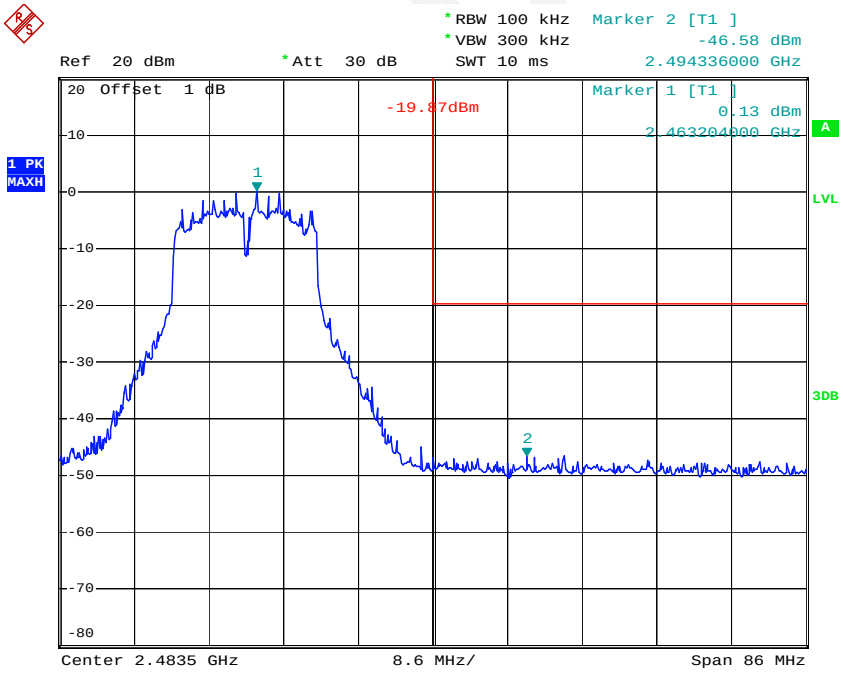
Date: 22.JUN.2015 14:03:11

802.11g: Band Edge, Left Side, Chain 1



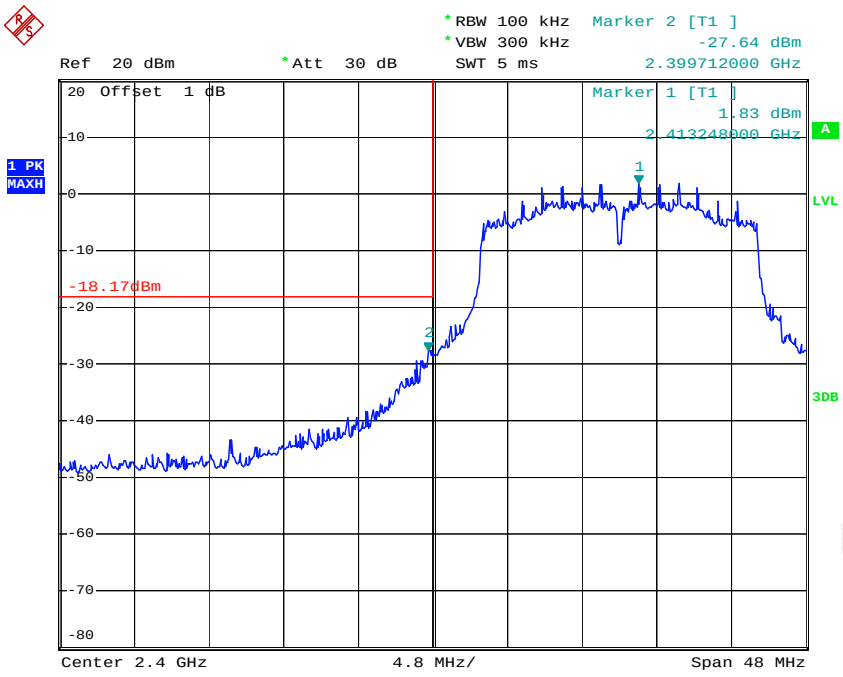
Date: 22.JUN.2015 14:06:04

802.11g: Band Edge, Right Side, Chain 1



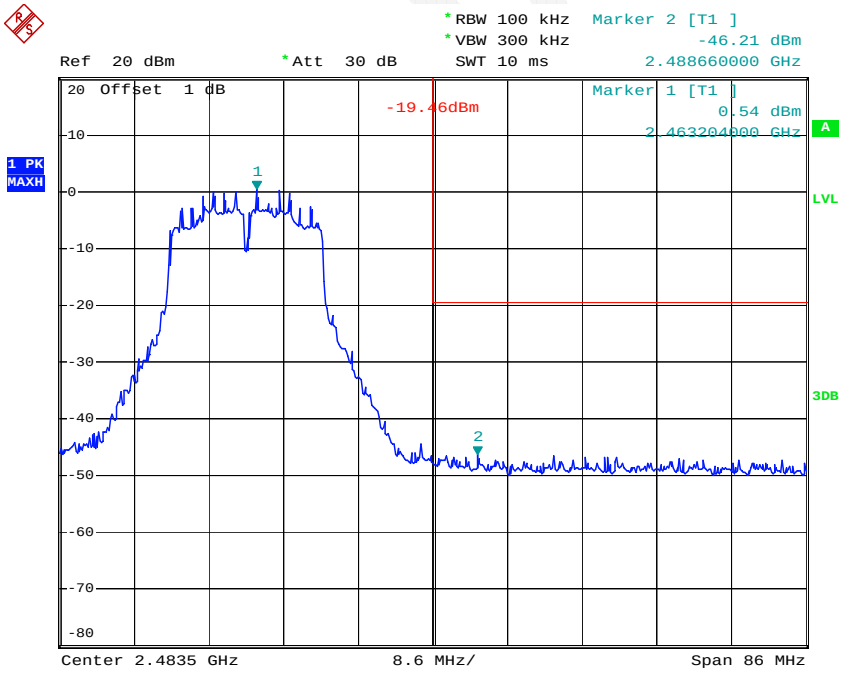
Date: 22.JUN.2015 14:17:00

802.11n ht20 Band Edge, Left Side, Chain 1



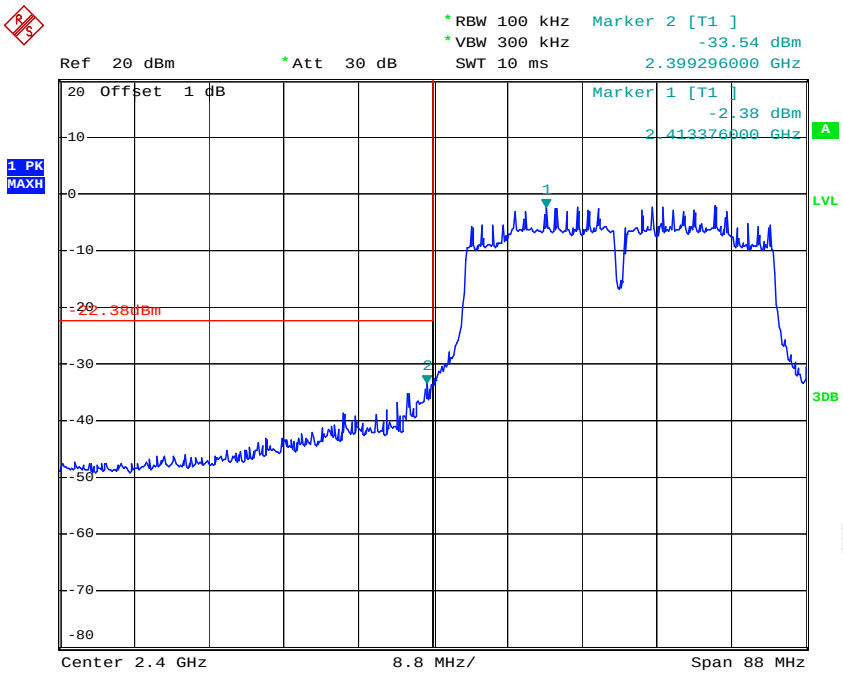
Date: 22.JUN.2015 14:23:00

802.11n ht20 Band Edge, Right Side, Chain 1



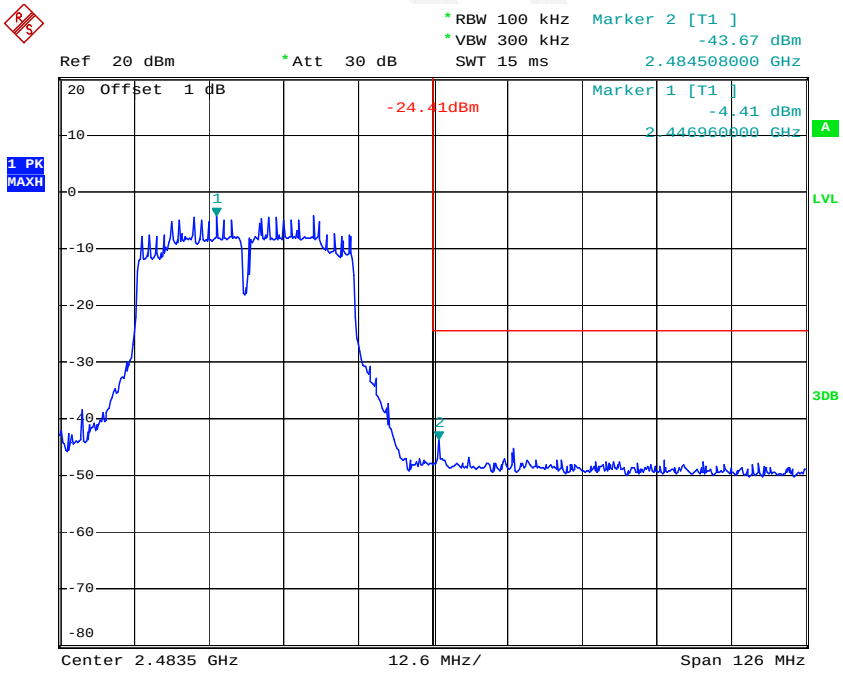
Date: 22.JUN.2015 14:35:41

802.11n ht40 Band Edge, Left Side, Chain 1



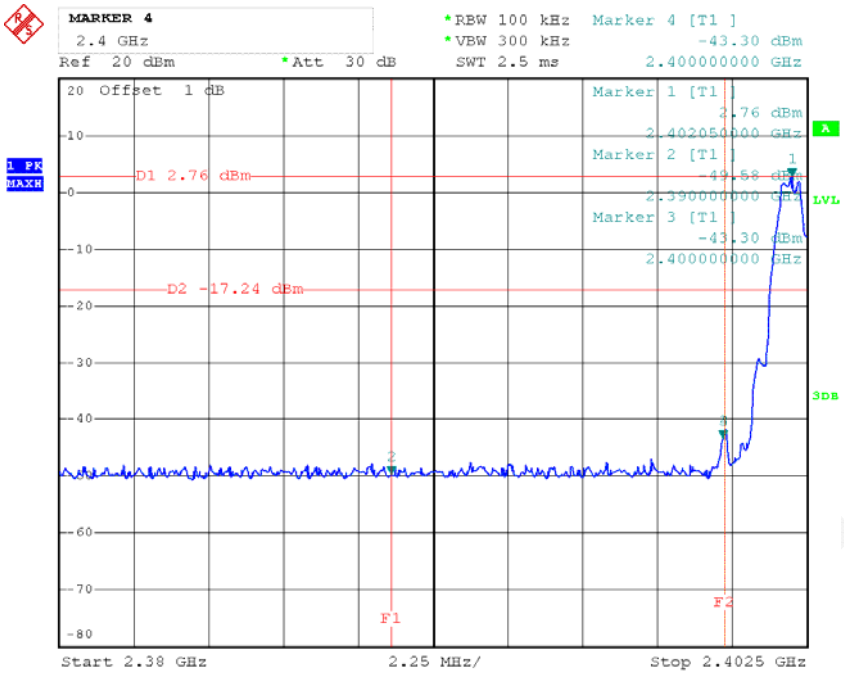
Date: 22.JUN.2015 14:41:33

802.11n ht40 Band Edge, Right Side, Chain 1



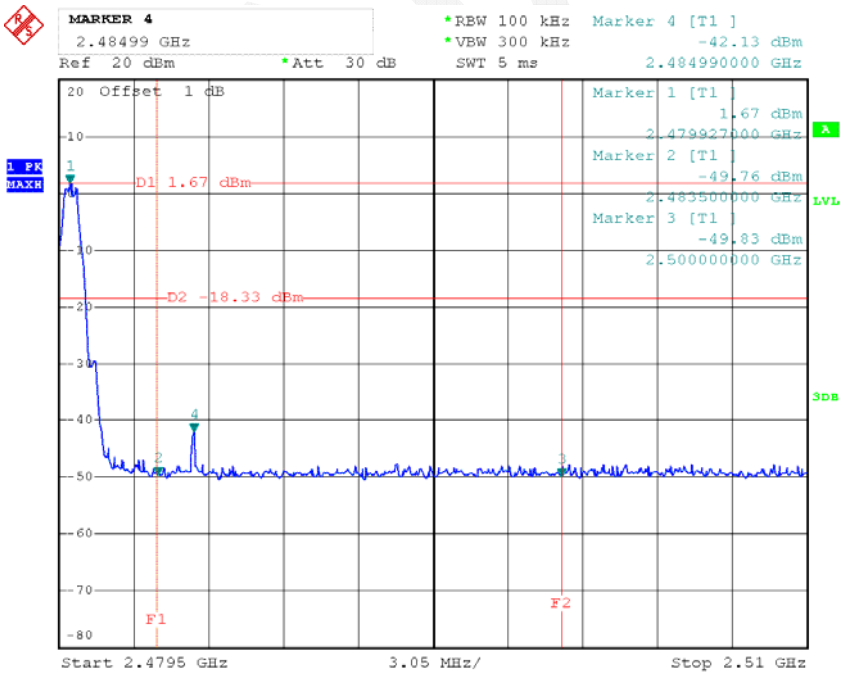
Date: 22.JUN.2015 14:53:30

BLE Band Edge， Left Side



Date: 26.JUN.2015 17:03:39

BLE Band Edge, Right Side



Date: 26.JUN.2015 17:06:31

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:

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	2015-05-09	2016-05-09

*** 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:	25.4-25.6 °C
Relative Humidity:	59 %
ATM Pressure:	99.9-100 kPa

** The testing was performed by Dean Liu from 2015-06-19 to 2015-06-22.*

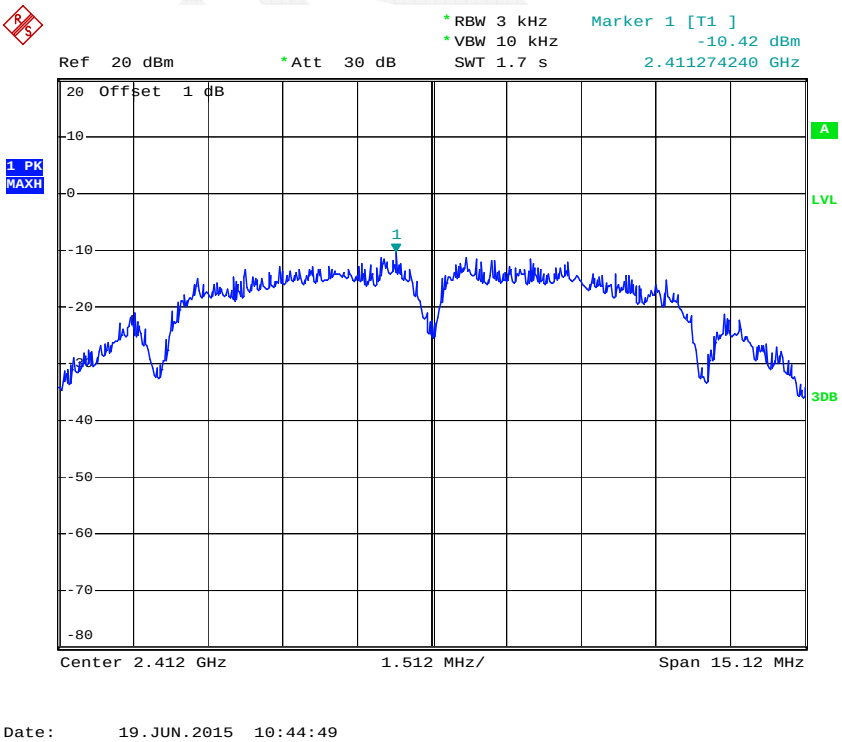
Test Mode: Transmitting

Note: per output power test, the SISO mode was the worst,so only SISO mode was test for this item,and used to evaluate MIMO mode compliance.

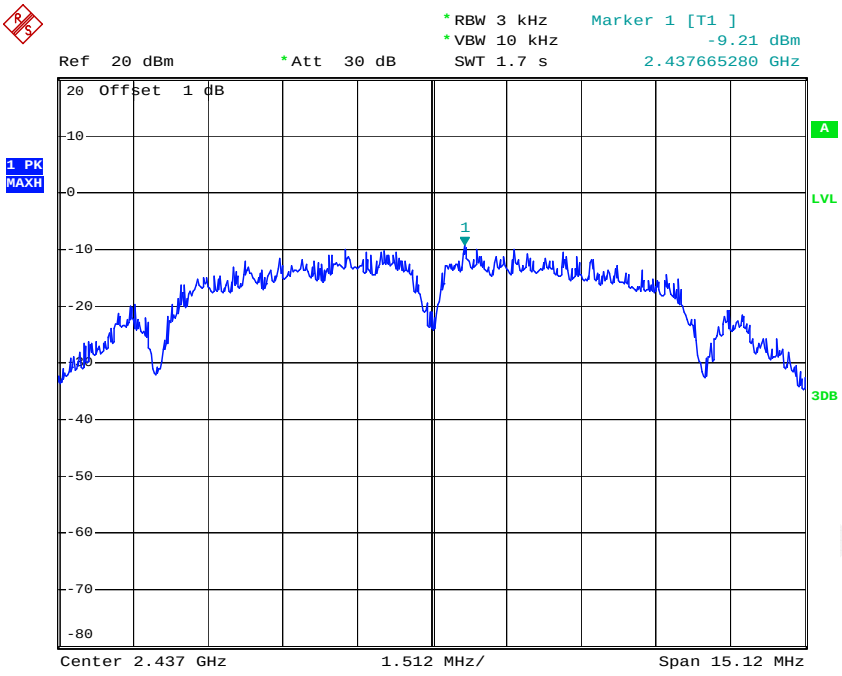
Test Result: Compliant. Please refer to the following table and plots

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)			Limit (dBm/3kHz)
			Chain 0	Chain 1	Total	
802.11 b	Low	2412	-10.42	-9.83	-7.10	8
	Middle	2437	-9.21	-10.57	-6.83	8
	High	2462	-9.12	-9.53	-6.31	8
802.11 g	Low	2412	-12.69	-12.91	-9.79	8
	Middle	2437	-10.51	-11.86	-8.12	8
	High	2462	-13.57	-14.58	-11.04	8
802.11 n20	Low	2412	-12.87	-13.03	-9.94	8
	Middle	2437	-9.56	-11.02	-7.22	8
	High	2462	-13.29	-14.3	-10.76	8
802.11 n40	Low	2422	-16.25	-16.8	-13.51	8
	Middle	2437	-13.5	-14.41	-10.92	8
	High	2452	-17.39	-18.95	-15.09	8
BLE	Low	2402	-12.86	/	-12.86	8
	Middle	2440	-13.31	/	-13.31	8
	High	2480	-14.38	/	-14.38	8

Power Spectral Density, 802.11b Low Channel, Chain 0

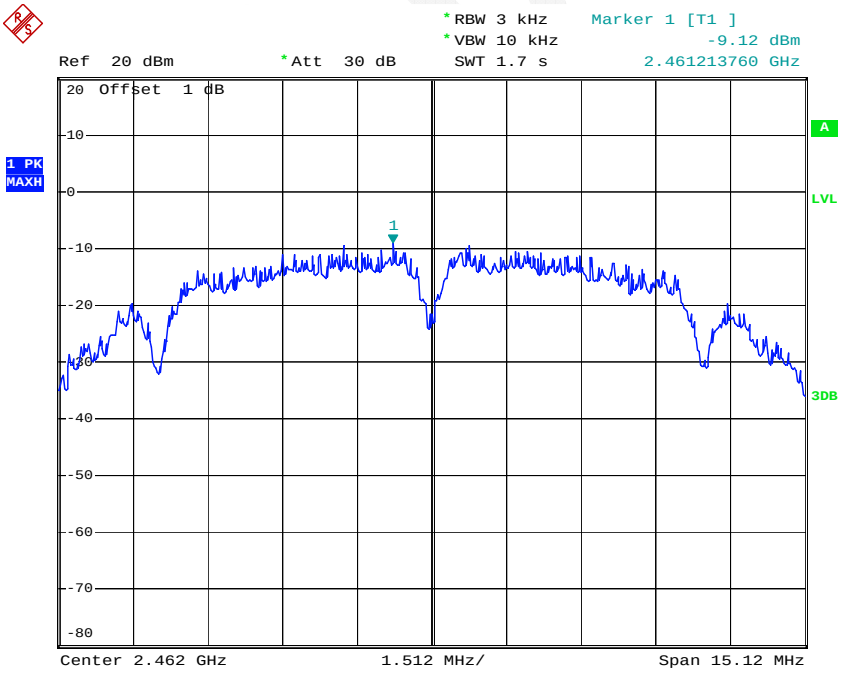


Power Spectral Density, 802.11b Middle Channel, Chain 0



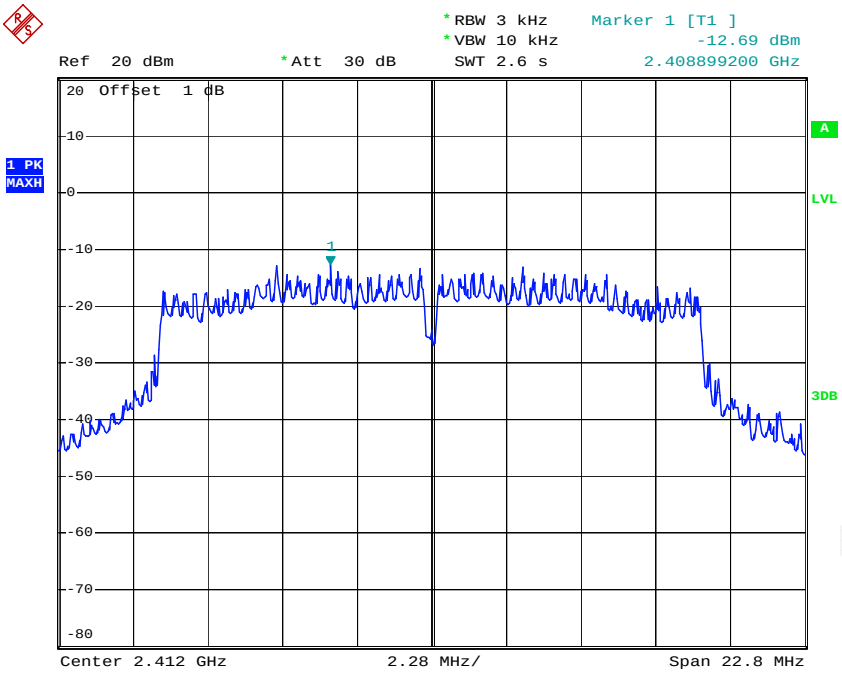
Date: 19.JUN.2015 10:50:46

Power Spectral Density, 802.11b High Channel, Chain 0



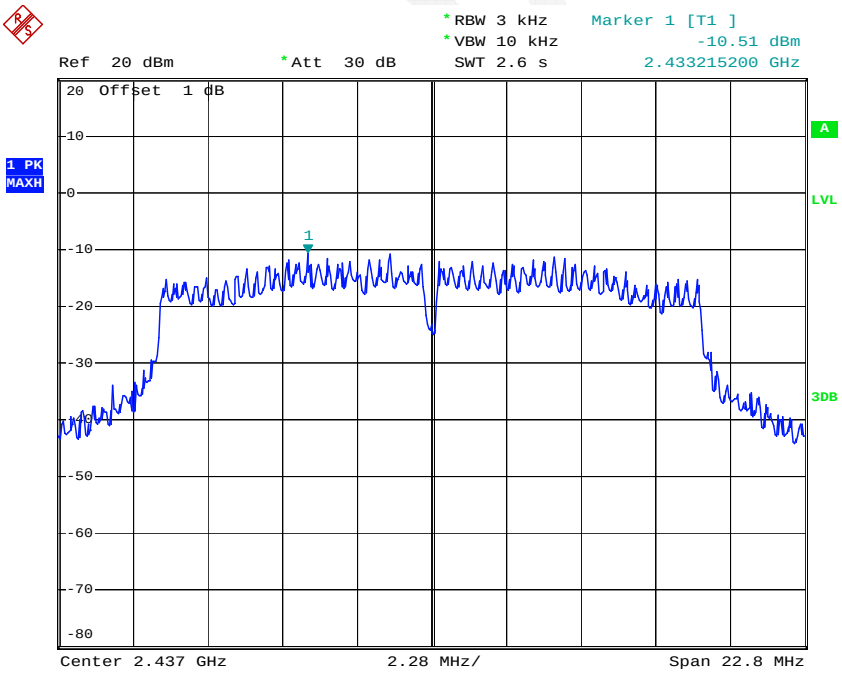
Date: 19.JUN.2015 10:53:47

Power Spectral Density, 802.11g Low Channel, Chain 0



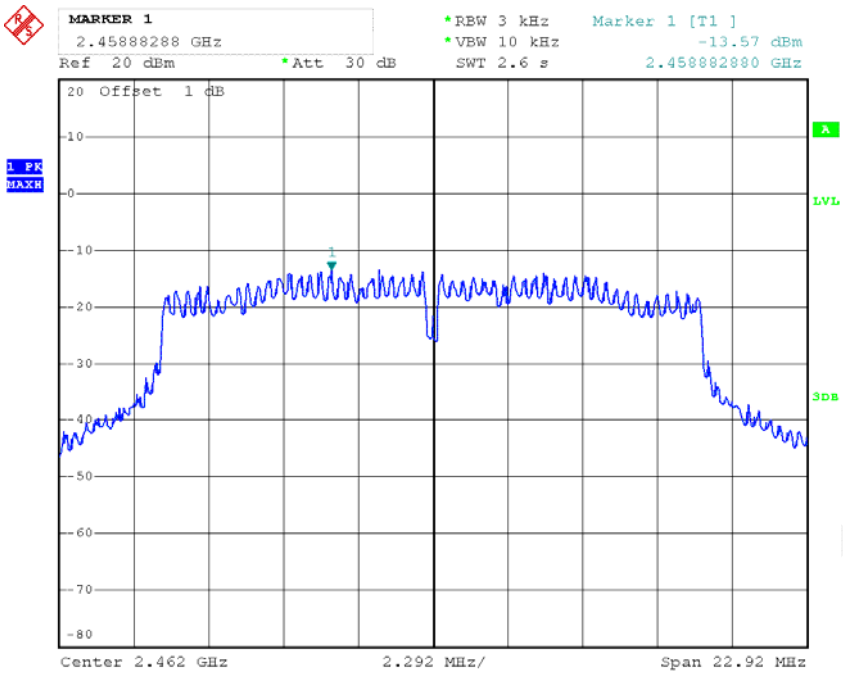
Date: 19.JUN.2015 10:56:56

Power Spectral Density, 802.11g Middle Channel, Chain 0

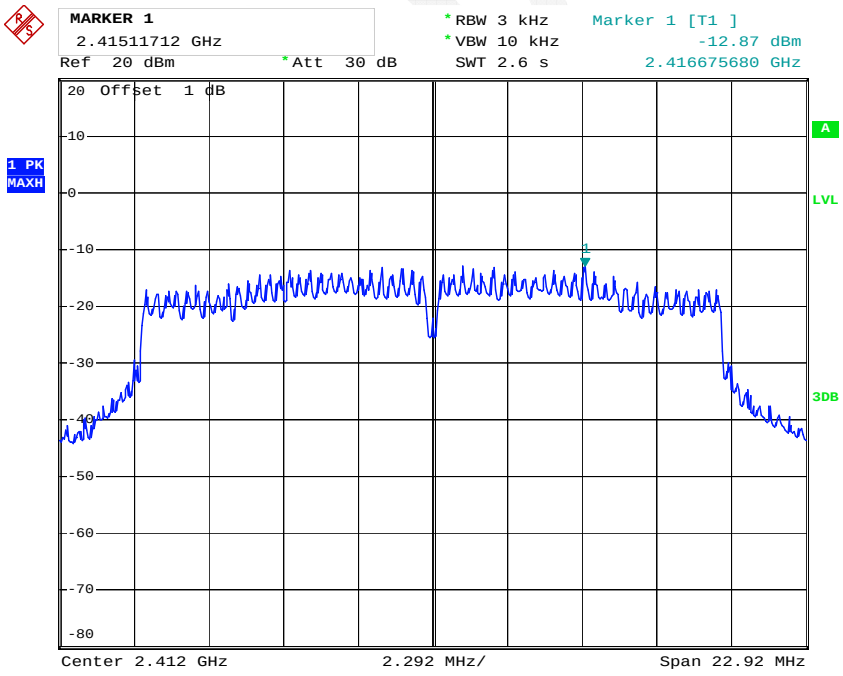


Date: 19.JUN.2015 11:02:19

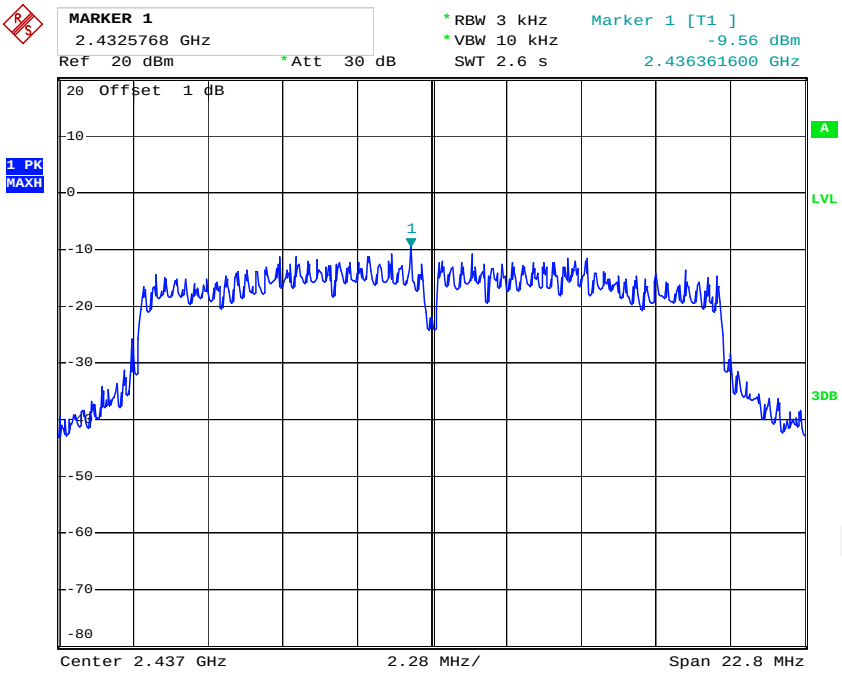
Power Spectral Density, 802.11g High Channel, Chain 0



Power Spectral Density, 802.11n ht20 Low Channel, Chain 0

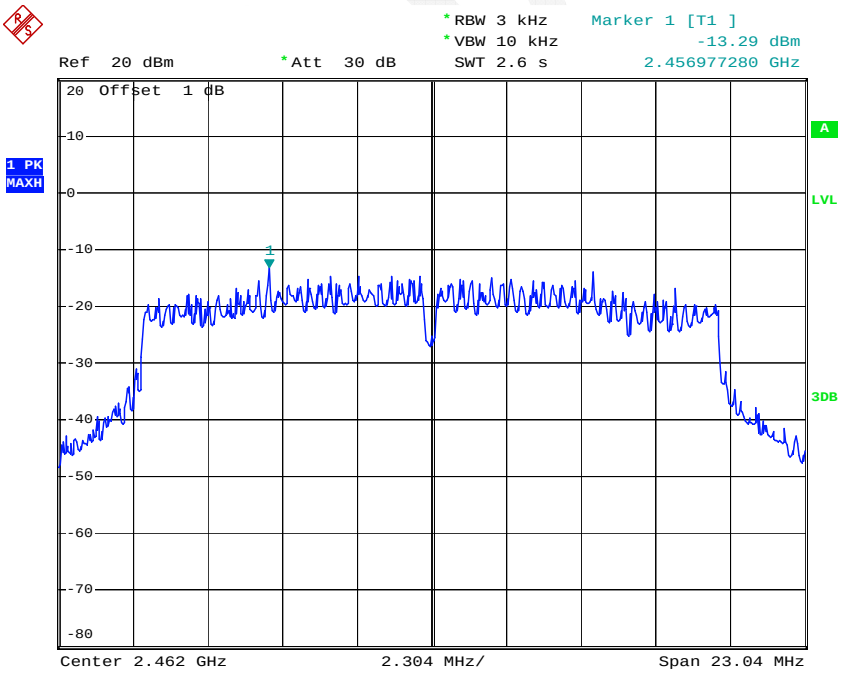


Power Spectral Density, 802.11n ht20 Middle Channel, Chain 0



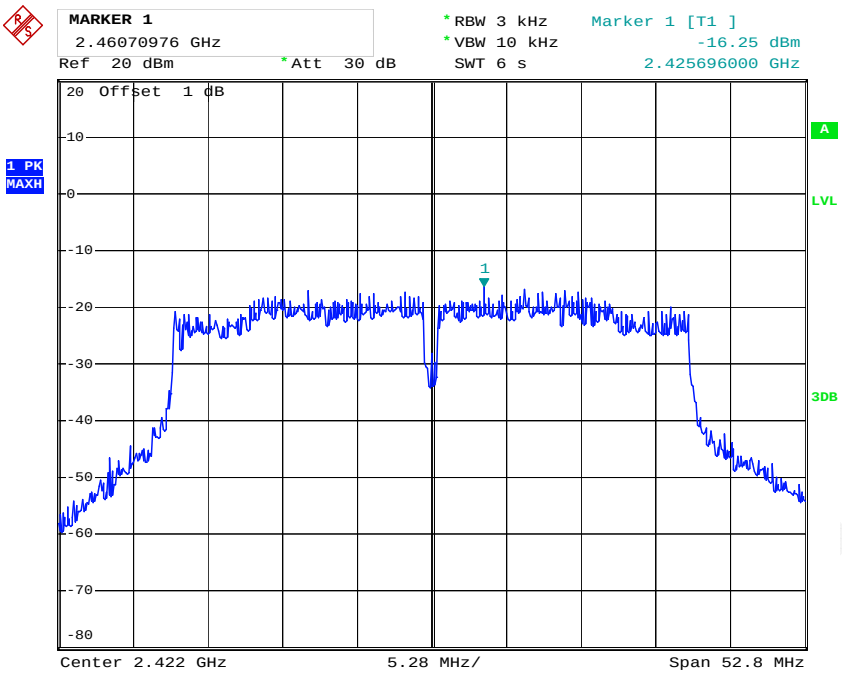
Date: 19.JUN.2015 11:31:44

Power Spectral Density, 802.11n ht20 High Channel, Chain 0



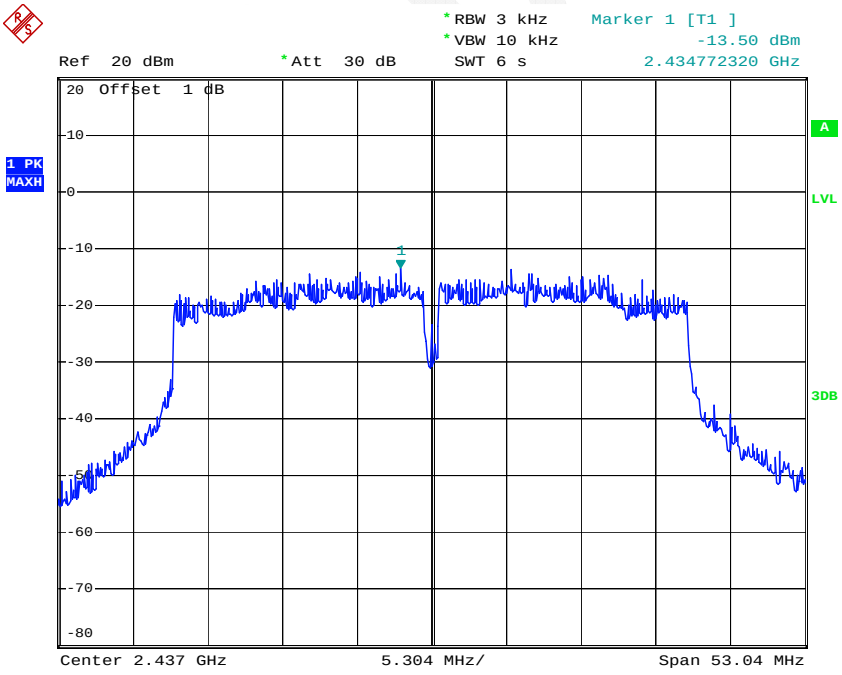
Date: 19.JUN.2015 11:37:56

Power Spectral Density, 802.11n ht40 Low Channel, Chain 0



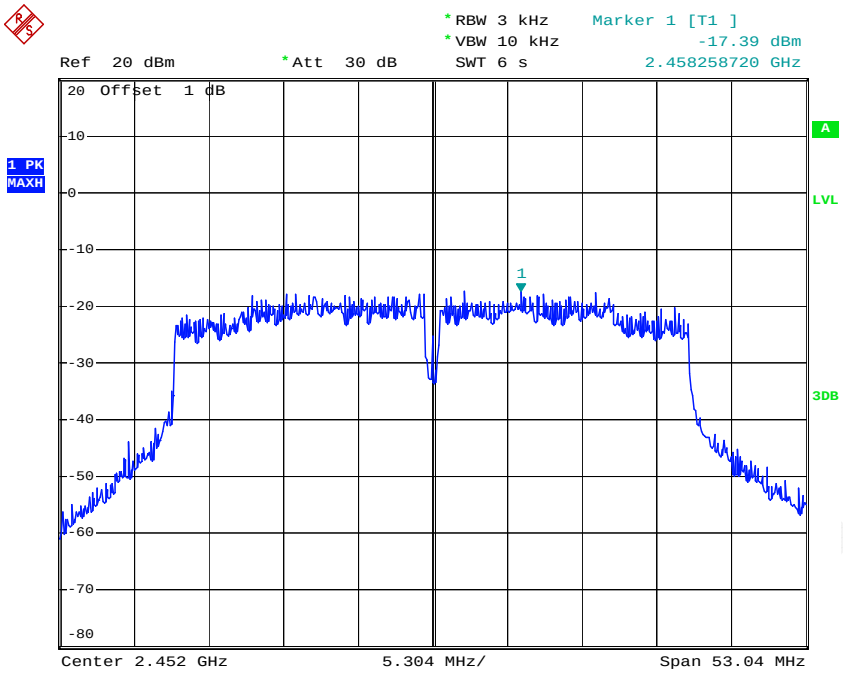
Date: 19.JUN.2015 11:45:12

Power Spectral Density, 802.11n ht40 Middle Channel, Chain 0



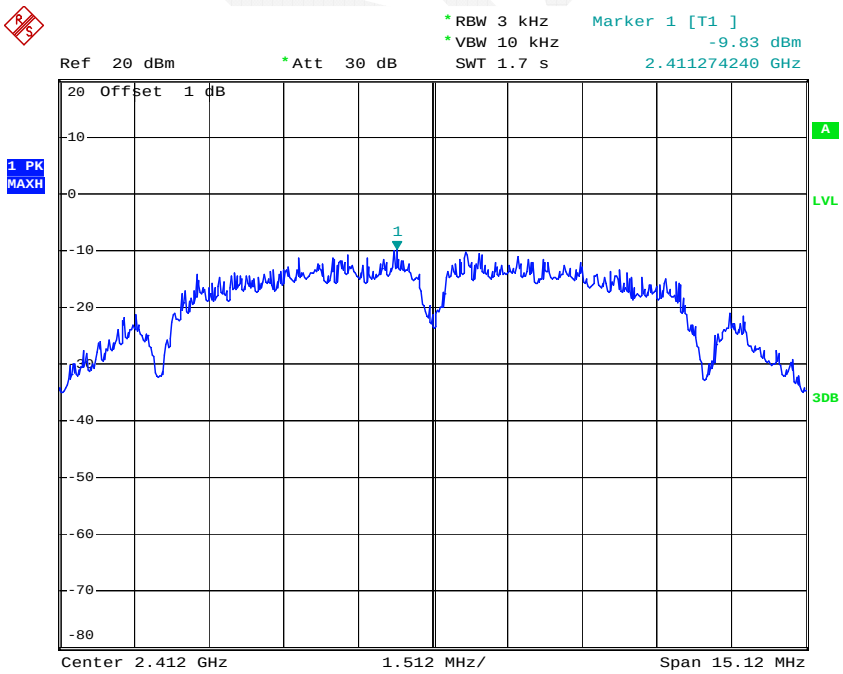
Date: 19.JUN.2015 11:48:15

Power Spectral Density, 802.11n ht40 High Channel, Chain 0



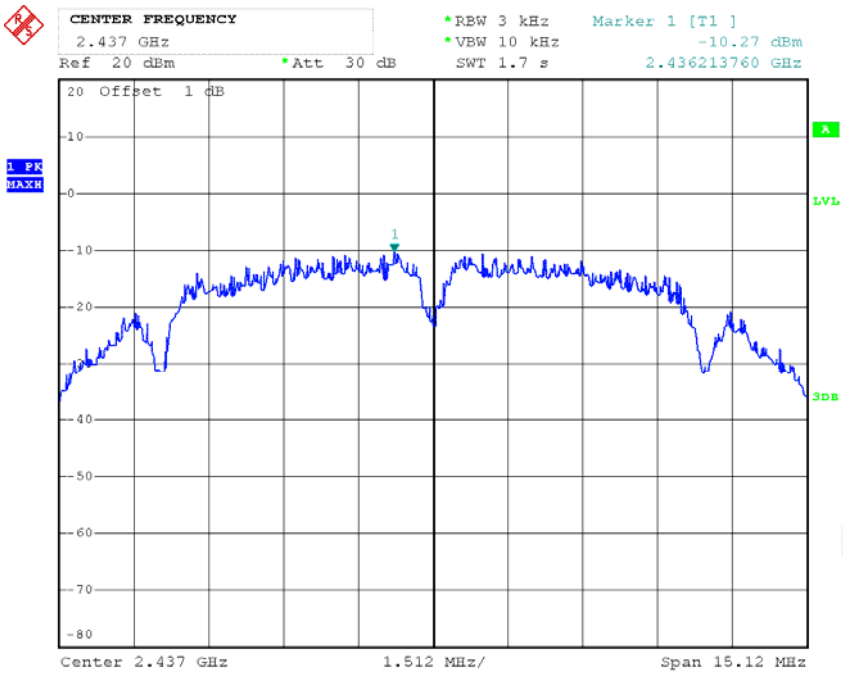
Date: 19.JUN.2015 11:54:08

Power Spectral Density, 802.11b Low Channel, Chain 1



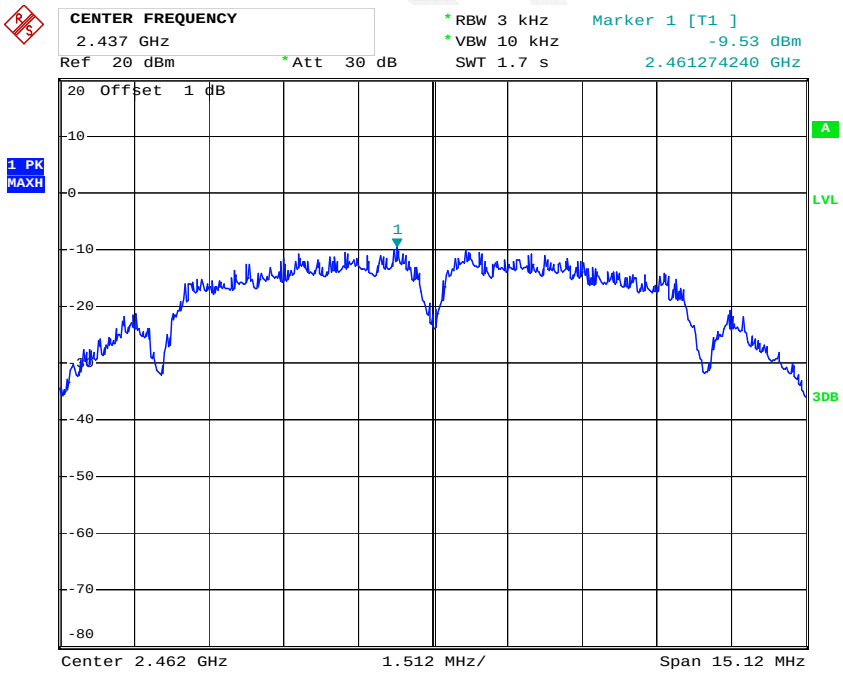
Date: 22.JUN.2015 12:50:39

Power Spectral Density, 802.11b Middle Channel, Chain 1



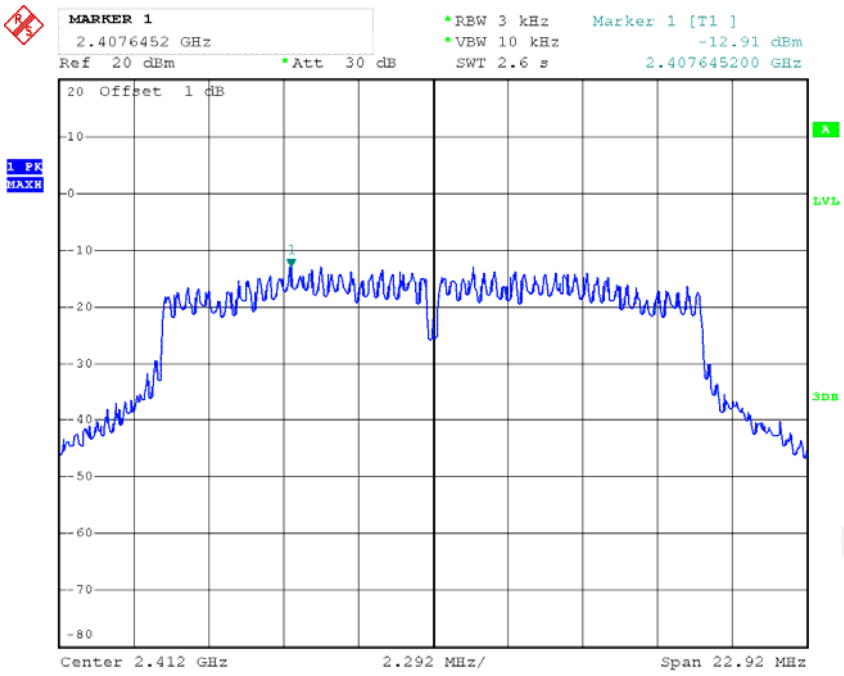
Date: 22.JUN.2015 13:59:17

Power Spectral Density, 802.11b High Channel, Chain 1



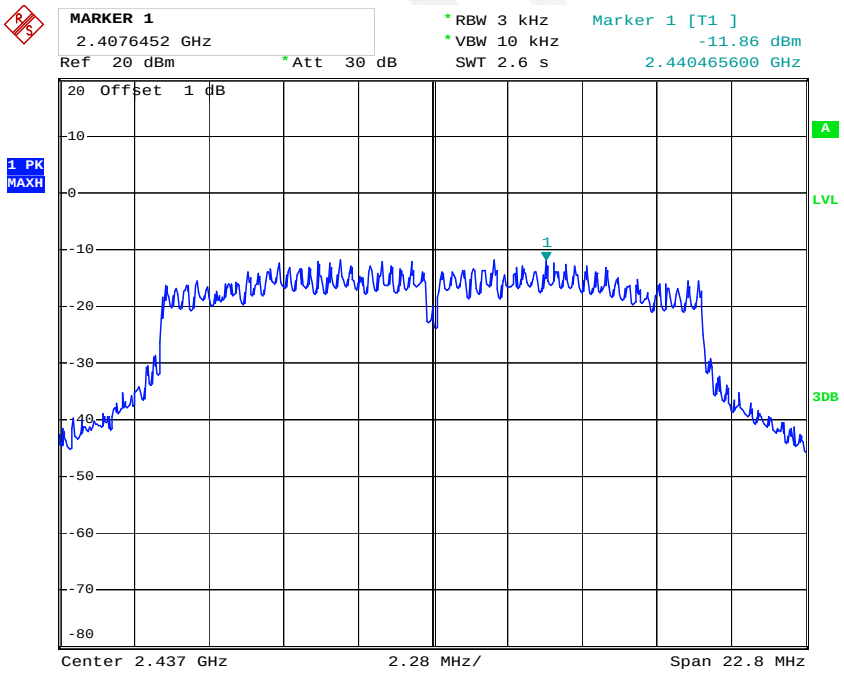
Date: 22.JUN.2015 14:02:36

Power Spectral Density, 802.11g Low Channel, Chain 1



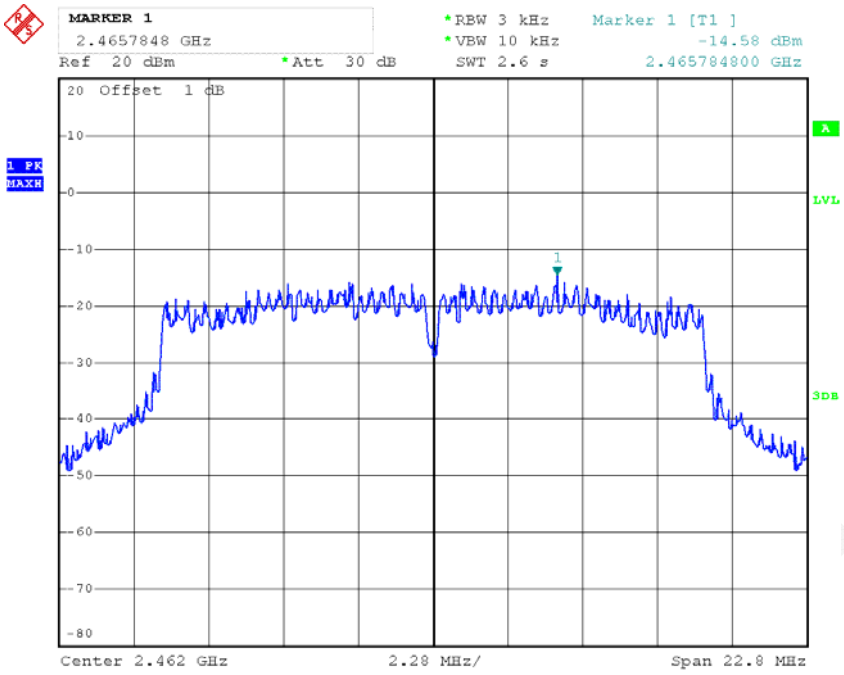
Date: 22.JUN.2015 14:09:13

Power Spectral Density, 802.11g Middle Channel, Chain 1



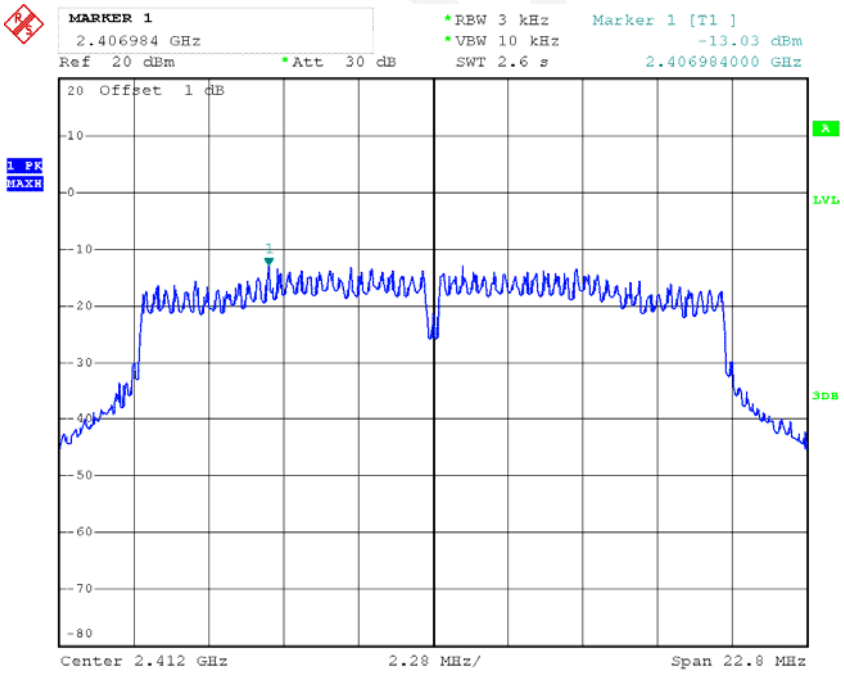
Date: 22.JUN.2015 14:13:40

Power Spectral Density, 802.11g High Channel, Chain 1



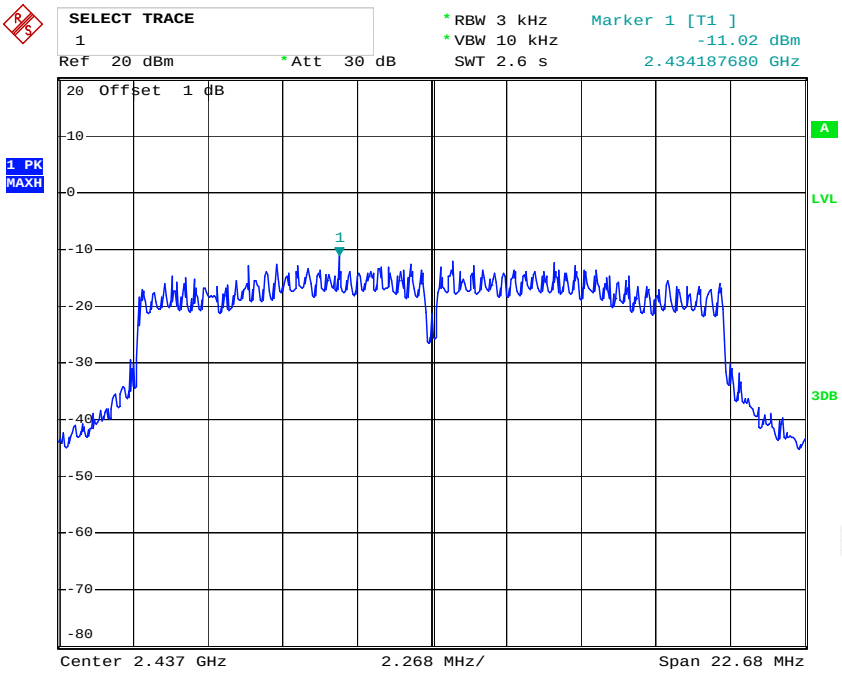
Date: 22.JUN.2015 14:17:43

Power Spectral Density, 802.11n ht20 Low Channel, Chain 1



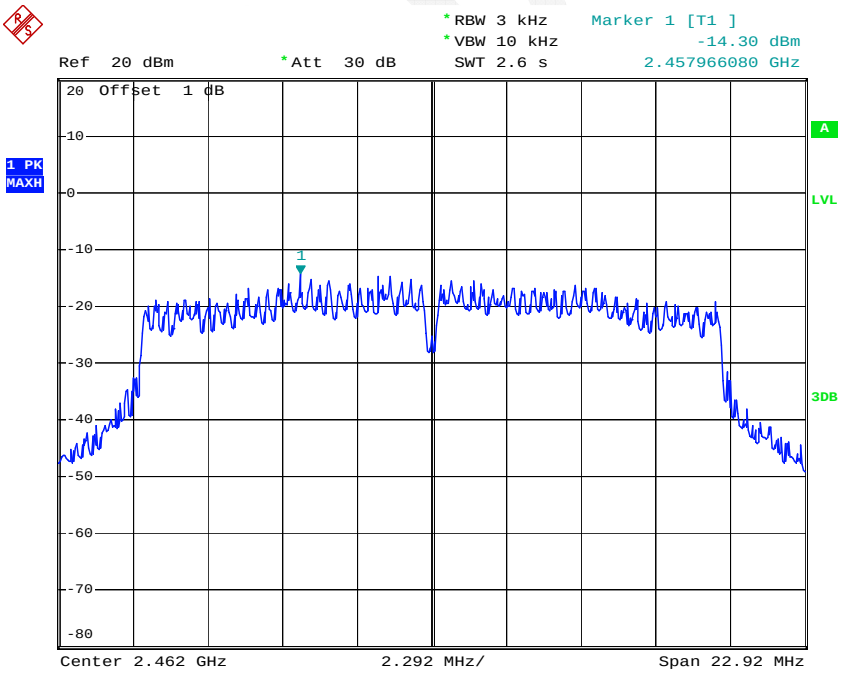
Date: 22.JUN.2015 14:27:54

Power Spectral Density, 802.11n ht20 Middle Channel, Chain 1



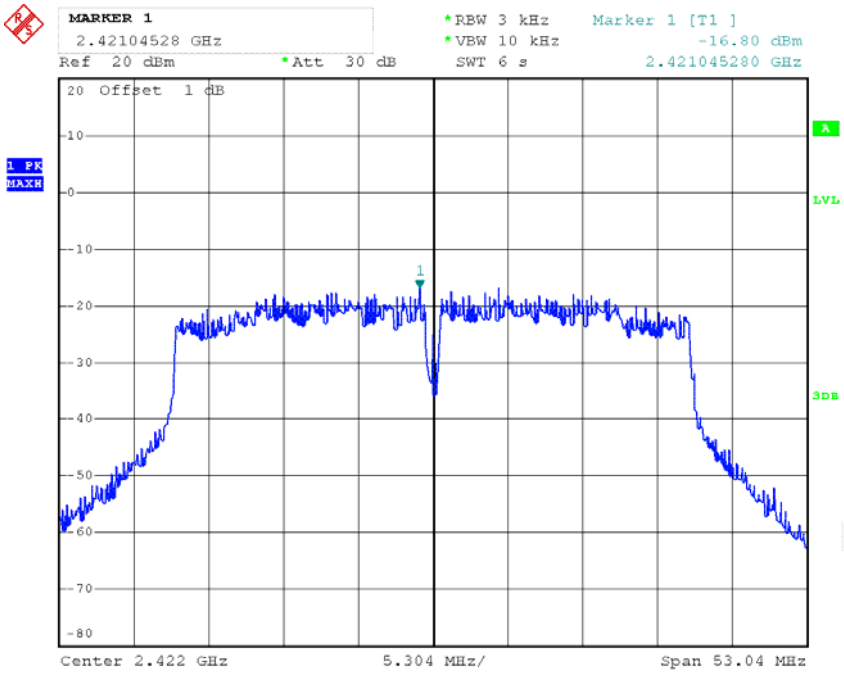
Date: 22.JUN.2015 14:32:52

Power Spectral Density, 802.11n ht20 High Channel, Chain 1



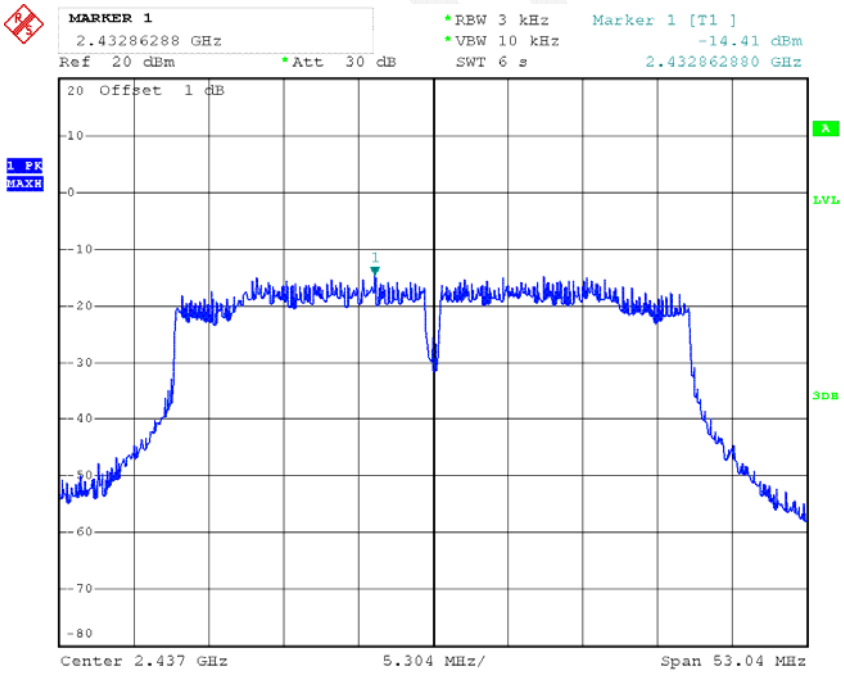
Date: 22.JUN.2015 14:36:02

Power Spectral Density, 802.11n ht40 Low Channel, Chain 1



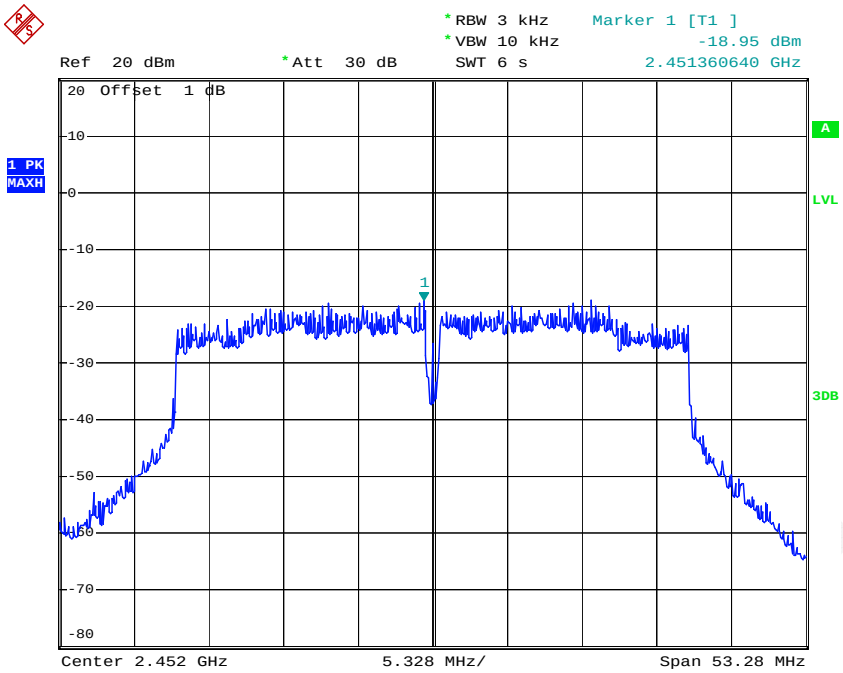
Date: 22.JUN.2015 14:43:54

Power Spectral Density, 802.11n ht40 Middle Channel, Chain 1



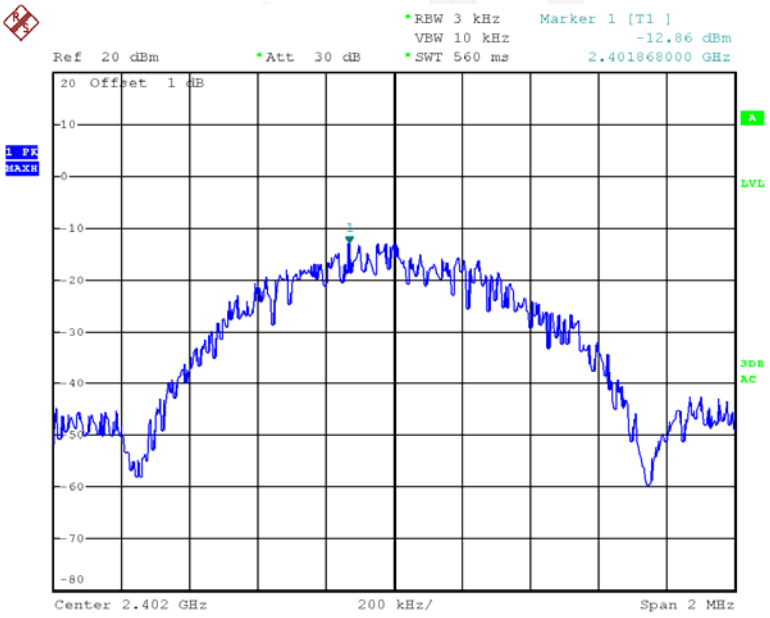
Date: 22.JUN.2015 14:48:54

Power Spectral Density, 802.11n ht40 High Channel, Chain 1



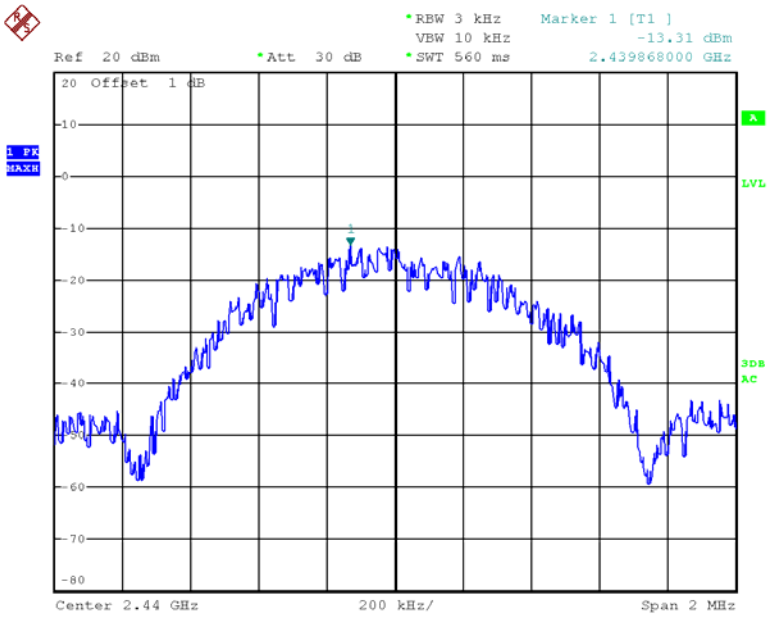
Date: 22.JUN.2015 14:54:24

Power Spectral Density, BLE Low Channel



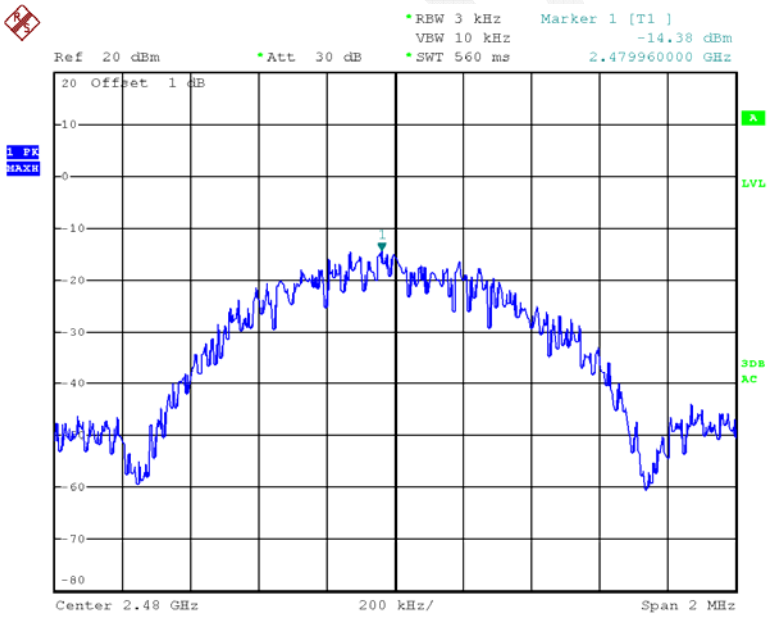
Date: 22.JUN.2015 18:26:04

Power Spectral Density, BLE Middle Channel



Date: 22.JUN.2015 18:26:43

Power Spectral Density, BLE High Channel



Date: 22.JUN.2015 18:26:59

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