



FCC PART 15.247

TEST REPORT

For

ZIONCOM ELECTRONICS (SHENZHEN) LTD.

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FCC ID: X7DWL0217

Report Type: Original Report	Product Type: Wi-Fi MODULE WL0217E (IEEE 802.11b/g/n)
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Report Number: RDG110906002-00	
Report Date: 2011-10-17	
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* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ZIONCOM ELECTRONICS (SHENZHEN) LTD.*'s product, model number: *WL0217 (FCC ID: X7DWL0217)* or ("EUT") in this report is a *Wi-Fi MODULE WL0217E (IEEE 802.11b/g/n)*, which was measured approximately: 5.40 cm (L) x 2.00 cm (W) x 0.35 cm (H), rated input voltage: DC 3.3V and DC 1.2V from test board.

** All measurement and test data in this report was gathered from production sample serial number: 1108059 (Assigned by BAACL). The EUT was received on 2011-09-06.*

Objective

This report is prepared on behalf of *ZIONCOM ELECTRONICS (SHENZHEN) LTD.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine 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)

No related submittal.

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. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

The uncertainty of any RF tests which use conducted method measurement is ± 0.96 dB, the uncertainty of any radiation on emissions measurement is ± 4.0 dB

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b and 802.11g, 802.11n20 mode, 11 channels are provided to testing:

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

EUT for 802.11b, 802.11g and 802.11 n20 modes were tested with Channel 1, 6 and 11.

For 802.11n40 mode, 7 channels are provided to testing:

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

EUT was tested with Channel 1, 4 and 7.

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.

EUT Exercise Software

The test was performed under “Duck_1_1_9d” which was provided by the manufacturer:

802.11b: data rate: 1 Mbps.

802.11g: data rate: 6 Mbps.

802.11n20: data rate: 6.5 Mbps.

802.11n40: data rate: 13.5 Mbps.

Equipment Modifications

No modification was made to the EUT tested.

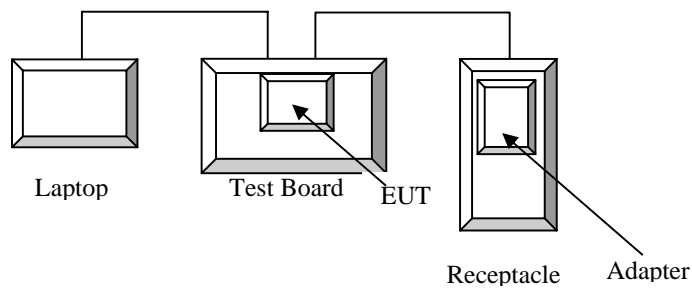
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
ZIONCOM	Test Board	N/A	N/A
Dell	Laptop	D260	N/A

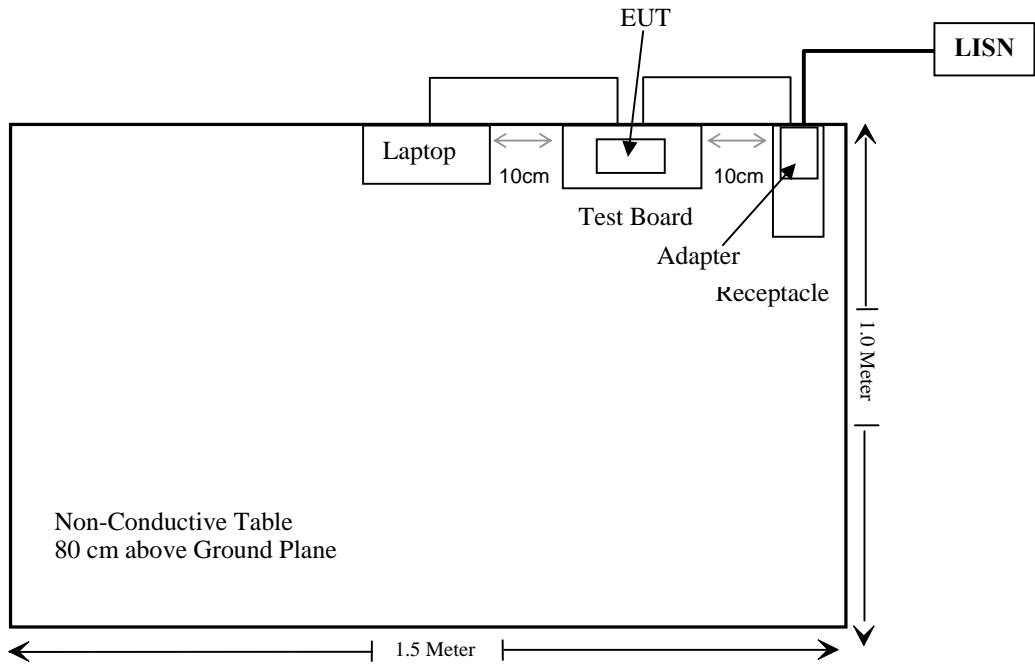
External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded detachable DC Power Cable	1.5	Test Board	Adapter
Unshielded detachable USB Cable	0.9	Test Board	Laptop

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible exposure (MPE)	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 Peak 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) & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to FCC §15.247(i) and subpart §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz;
 * = Plane-wave equivalent power density

MPE Calculation

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

S = power density (in appropriate units, e.g. mW/cm²);
 P = power input to the antenna (in appropriate units, e.g., mW);
 G = power gain of the antenna in the direction of interest relative to an isotropic radiator
 R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Radio Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limit (mW/cm²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2437	2	1.585	18.69	73.96	20	0.023	1.0
802.11g	2412	2	1.585	15.32	30.04	20	0.009	1.0
802.11n20	2437	2	1.585	14.59	28.77	20	0.009	1.0
802.11n40	2452	2	1.585	14.48	28.05	20	0.009	1.0

Result: The device meets FCC MPE at 20 cm distance.

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 printed antennas on PCB, which complied with 15.203, the maximum gain is 2.0 dBi, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

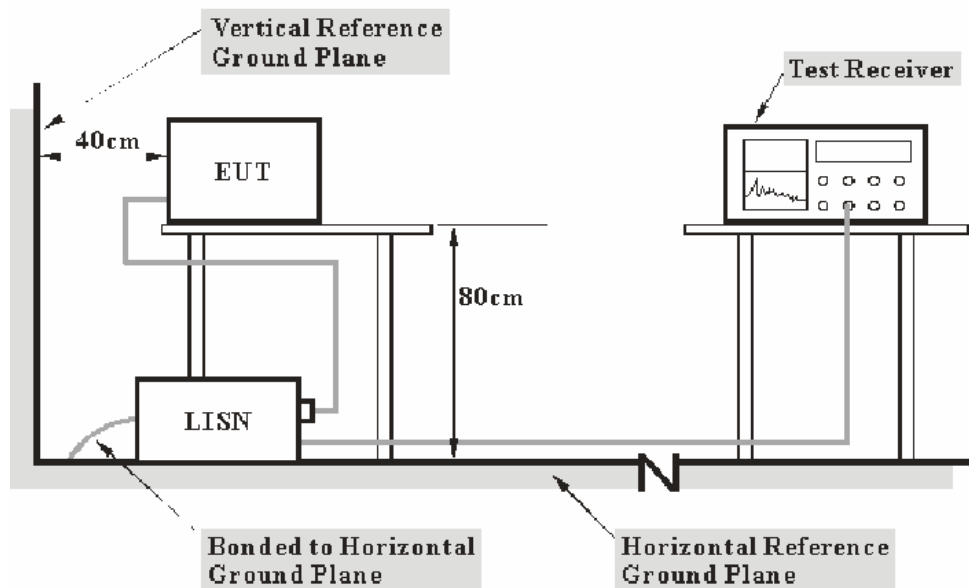
FCC §15.207

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ± 2.4 dB ($k=2$, 95% level of confidence).

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the 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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-04-09	2012-04-08

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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:

9.78 dB at 0.555 MHz in the **Line** conducted mode

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen on 2011-10-13.

Test Mode: Transmitting

120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.555	46.22	10.30	56.00	9.78	QP
1.890	29.13	10.30	46.00	16.87	Ave.
0.555	29.08	10.30	46.00	16.92	Ave.
0.970	28.60	10.30	46.00	17.40	Ave.
1.890	36.02	10.30	56.00	19.98	QP
0.970	33.67	10.30	56.00	22.33	QP
2.810	23.42	10.30	46.00	22.58	Ave.
2.805	30.37	10.30	56.00	25.63	QP
5.625	19.72	10.31	50.00	30.28	Ave.
8.995	17.93	10.38	50.00	32.07	Ave.
5.620	27.66	10.31	60.00	32.34	QP
8.995	23.14	10.38	60.00	36.86	QP

120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.555	44.51	10.30	56.00	11.49	QP
0.555	33.04	10.30	46.00	12.96	Ave.
1.585	29.80	10.30	46.00	16.20	Ave.
1.585	34.57	10.30	56.00	21.43	QP
2.750	33.71	10.30	56.00	22.29	QP
2.760	22.54	10.30	46.00	23.46	Ave.
4.990	19.44	10.30	46.00	26.56	Ave.
8.885	21.72	10.38	50.00	28.28	Ave.
4.990	26.95	10.30	56.00	29.05	QP
16.085	16.76	10.52	50.00	33.24	Ave.
8.880	23.99	10.38	60.00	36.01	QP
16.090	22.29	10.52	60.00	37.71	QP

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

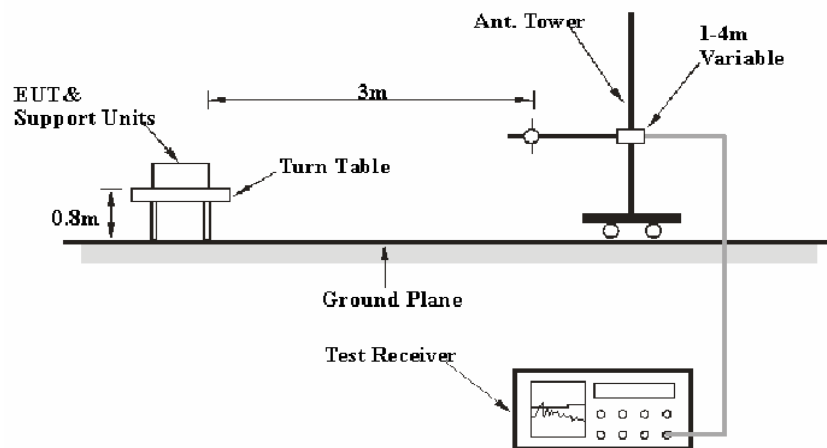
Measurement Uncertainty

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

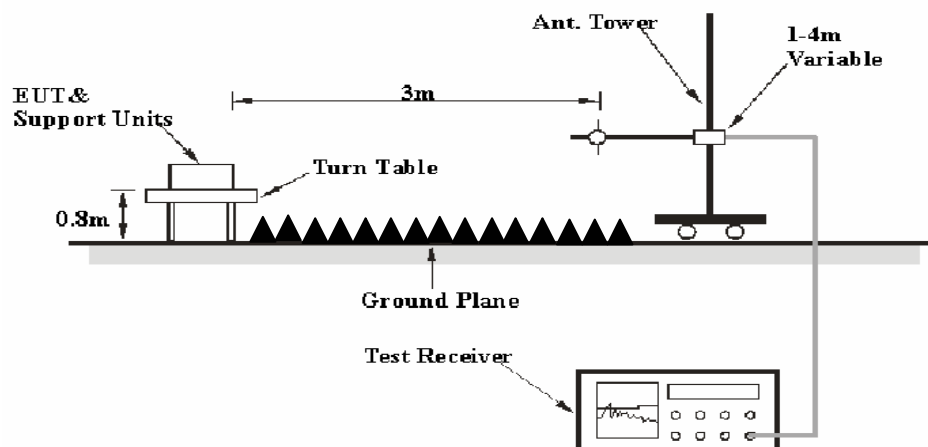
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB(k=2, 95% level of confidence) .

EUT Setup

Below 1 GHz:



Above 1 GHz:



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:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave.

Test Procedure

During the radiated emission test, the adapter was connected to the 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 Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-08-02	2012-08-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-07-05	2012-07-04
Mini-circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-07
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
HP	Spectrum Analyzer	8593A	2919A00242	2011-03-09	2012-03-08
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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:

1.49 dB at 4824.00 MHz in the Horizontal polarization (802.11b mode)

Test Data

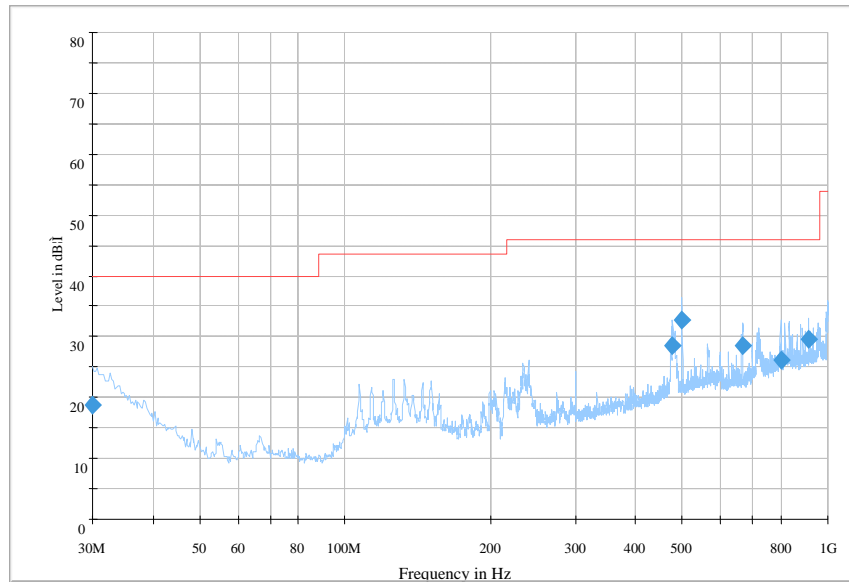
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen on 2011-10-15.

Mode: Transmitting (depend on free scan 802.11b mode is the worst case)

1) Below 1 GHz (worst case):



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Ant. Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
498.267500	32.9	100.7	H	81.0	-2.2	46.0	13.1
913.185000	29.7	129.9	H	157.0	2.0	46.0	16.3
477.655000	28.6	116.1	V	8.0	-2.0	46.0	17.4
664.865000	28.5	168.0	H	109.0	-1.6	46.0	17.5
797.997500	26.1	142.0	V	103.0	0.9	46.0	19.9
30.000000	18.8	201.0	V	348.0	1.5	40.0	21.2

2) Above 1 GHz:

802.11b Mode:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	38.36	Ave.	88	1.0	H	36.6	4.3	26.75	52.51	54	1.49*	Harmonic
4824	39.28	Ave.	306	1.1	V	35.4	4.3	26.75	52.23	54	1.77*	Harmonic
4824	41.76	PK	88	1.0	H	36.6	4.3	26.75	55.91	74	18.09	Harmonic
4824	42.18	PK	306	1.1	V	35.4	4.3	26.75	55.13	74	18.87	Harmonic
Middle Channel (2437 MHz)												
4874	38.83	Ave.	305	1.0	V	35.4	4.36	26.75	51.84	54	2.16*	Harmonic
4874	37.22	Ave.	124	1.0	H	36.6	4.36	26.75	51.43	54	2.57*	Harmonic
4874	42.87	PK	305	1.0	V	35.4	4.36	26.75	55.88	74	18.12	Harmonic
4874	40.61	PK	124	1.0	H	36.6	4.36	26.75	54.82	74	19.18	Harmonic
High Channel (2462 MHz)												
4924	38.17	Ave.	338	1.0	V	35.4	4.4	26.75	51.22	54	2.78*	Harmonic
4924	36.58	Ave.	167	1.2	H	36.6	4.4	26.75	50.83	54	3.17*	Harmonic
4924	42.06	PK	338	1.0	V	35.4	4.4	26.75	55.11	74	18.89	Harmonic
4924	40.19	PK	137	1.2	H	36.6	4.4	26.75	54.44	74	19.56	Harmonic

802.11g Mode:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	37.69	Ave.	306	1.1	V	35.4	4.3	26.75	50.64	54	3.36*	Harmonic
4824	36.08	Ave.	88	1.0	H	36.6	4.3	26.75	50.23	54	3.77*	Harmonic
4824	39.81	PK	88	1.0	H	36.6	4.3	26.75	53.96	74	20.04	Harmonic
4824	40.56	PK	306	1.1	V	35.4	4.3	26.75	53.51	74	20.49	Harmonic
Middle Channel (2437 MHz)												
4874	36.54	Ave.	124	1.0	H	36.6	4.36	26.75	50.75	54	3.25*	Harmonic
4874	37.08	Ave.	305	1.0	V	35.4	4.36	26.75	50.09	54	3.91*	Harmonic
4874	41.25	PK	305	1.0	V	35.4	4.36	26.75	54.26	74	19.74	Harmonic
4874	38.77	PK	124	1.0	H	36.6	4.36	26.75	52.98	74	21.02	Harmonic
High Channel (2462 MHz)												
4924	35.77	Ave.	167	1.2	H	36.6	4.4	26.75	50.02	54	3.98*	Harmonic
4924	36.52	Ave.	338	1.0	V	35.4	4.4	26.75	49.57	54	4.43	Harmonic
4924	40.62	PK	338	1.0	V	35.4	4.4	26.75	53.67	74	20.33	Harmonic
4924	38.26	PK	137	1.2	H	36.6	4.4	26.75	52.51	74	21.49	Harmonic

802.11n20 Mode:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	37.16	Ave.	306	1.1	V	35.4	4.3	26.75	50.11	54	3.89*	Harmonic
4824	35.49	Ave.	88	1.0	H	36.6	4.3	26.75	49.64	54	4.36	Harmonic
4824	39.57	PK	88	1.0	H	36.6	4.3	26.75	53.72	74	20.28	Harmonic
4824	40.08	PK	306	1.1	V	35.4	4.3	26.75	53.03	74	20.97	Harmonic
Middle Channel (2437 MHz)												
4874	36.04	Ave.	124	1.0	H	36.6	4.36	26.75	50.25	54	3.75*	Harmonic
4874	36.56	Ave.	305	1.0	V	35.4	4.36	26.75	49.57	54	4.43	Harmonic
4874	40.74	PK	305	1.0	V	35.4	4.36	26.75	53.75	74	20.25	Harmonic
4874	39.41	PK	124	1.0	H	36.6	4.36	26.75	53.62	74	20.38	Harmonic
High Channel (2462 MHz)												
4924	36.02	Ave.	167	1.2	H	36.6	4.4	26.75	50.27	54	3.73*	Harmonic
4924	36.28	Ave.	338	1.0	V	35.4	4.4	26.75	49.33	54	4.67	Harmonic
4924	40.17	PK	338	1.0	V	35.4	4.4	26.75	53.22	74	20.78	Harmonic
4924	38.74	PK	137	1.2	H	36.6	4.4	26.75	52.99	74	21.01	Harmonic

802.11n40 Mode:

Indicated		Detector (PK/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.209			
Frequency (MHz)	S.A. Reading (dBµV)			Height (m)	Polar (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2422 MHz)												
4844	34.67	Ave.	88	1.0	H	36.6	4.3	26.75	48.82	54	5.18	Harmonic
4844	35.64	Ave.	306	1.1	V	35.4	4.3	26.75	48.59	54	5.41	Harmonic
4844	38.15	PK	88	1.0	H	36.6	4.3	26.75	52.30	74	21.70	Harmonic
4844	38.77	PK	306	1.1	V	35.4	4.3	26.75	51.72	74	22.28	Harmonic
Middle Channel (2437 MHz)												
4874	36.07	Ave.	305	1.0	V	35.4	4.36	26.75	49.08	54	4.92	Harmonic
4874	34.28	Ave.	124	1.0	H	36.6	4.36	26.75	48.49	54	5.51	Harmonic
4874	38.06	PK	124	1.0	H	36.6	4.36	26.75	52.27	74	21.73	Harmonic
4874	39.14	PK	305	1.0	V	35.4	4.36	26.75	52.15	74	21.85	Harmonic
High Channel (2452 MHz)												
4904	35.25	Ave.	167	1.2	H	36.6	4.4	26.75	49.50	54	4.50	Harmonic
4904	35.81	Ave.	338	1.0	V	35.4	4.4	26.75	48.86	54	5.14	Harmonic
4904	39.67	PK	338	1.0	V	35.4	4.4	26.75	52.72	74	21.28	Harmonic
4904	38.44	PK	137	1.2	H	36.6	4.4	26.75	52.69	74	21.31	Harmonic

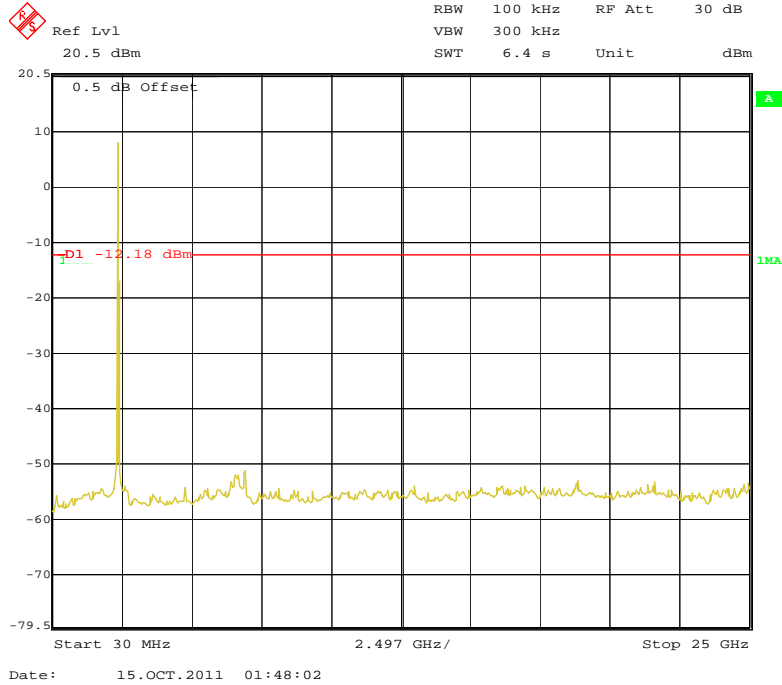
*Within measurement uncertainty!

3) Radiated spurious emission in restricted band: (worst case)

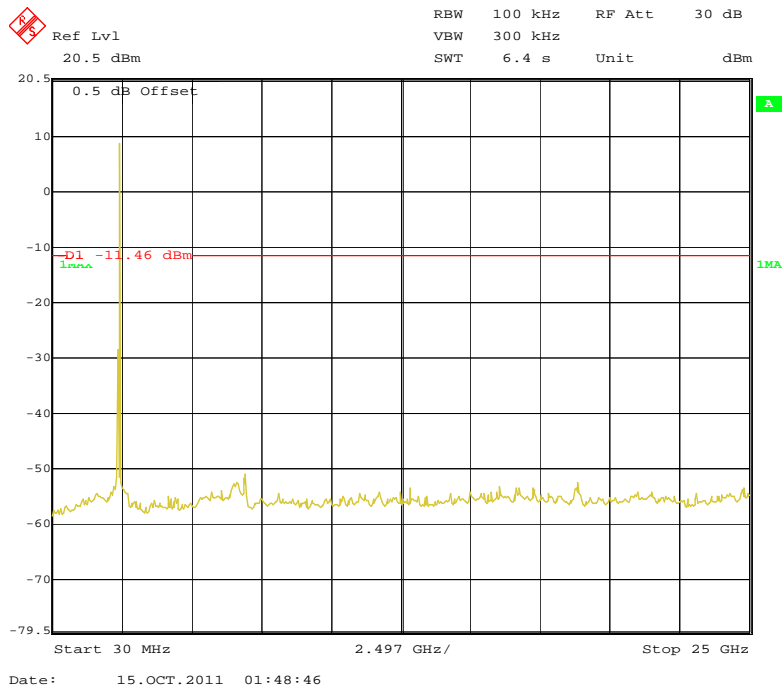
Freq. (MHz)	S.A. Reading (dBµV)	Detector PK /Ave	Direction Degree	Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/205/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
2386.79	38.94	Ave.	0	1.3	V	30.6	2.98	26.83	45.69	54	8.31
2386.79	56.50	PK	0	1.6	V	30.6	2.98	26.83	63.25	74	10.75
2387.18	34.10	Ave.	55	1.2	H	30.6	2.98	26.83	40.85	54	13.15
2484.67	33.43	Ave.	167	1.3	H	30.6	3.11	26.88	40.26	54	13.74
2483.90	32.79	Ave.	83	1.5	V	30.6	3.11	26.88	39.62	54	14.38
2387.18	52.79	PK	38	1.2	H	30.6	2.98	26.83	59.54	74	14.46
2483.90	50.28	PK	83	1.2	V	30.6	3.11	26.88	57.11	74	16.89
2484.67	49.22	PK	167	1.5	H	30.6	3.11	26.88	56.05	74	17.95

Conducted Spurious Emissions at Antenna Port

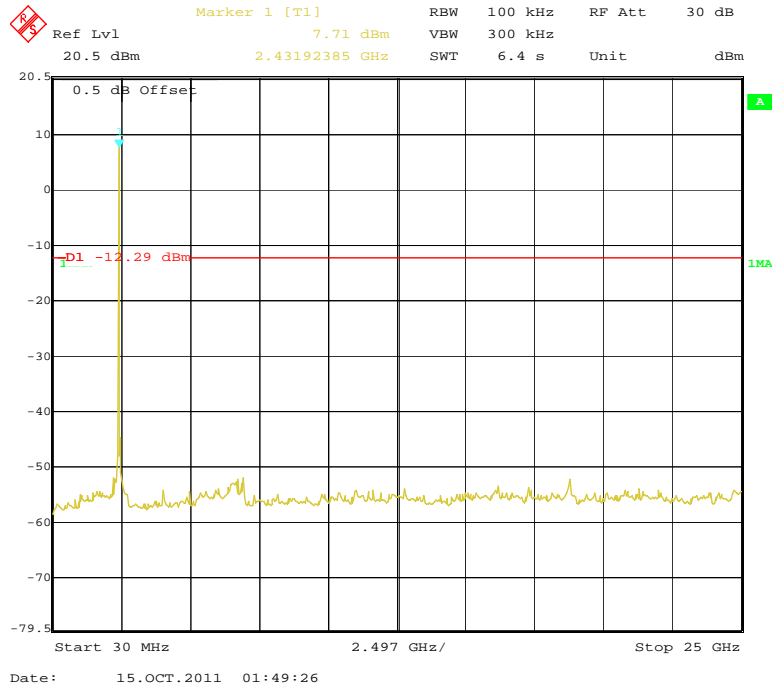
802.11b Low Channel-Antenna Port 0



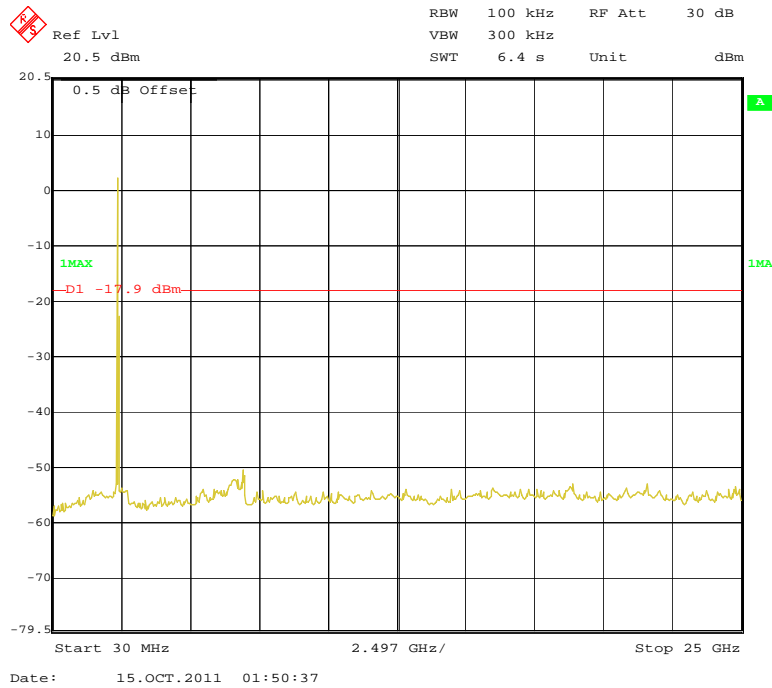
802.11b Middle Channel -Antenna Port 0



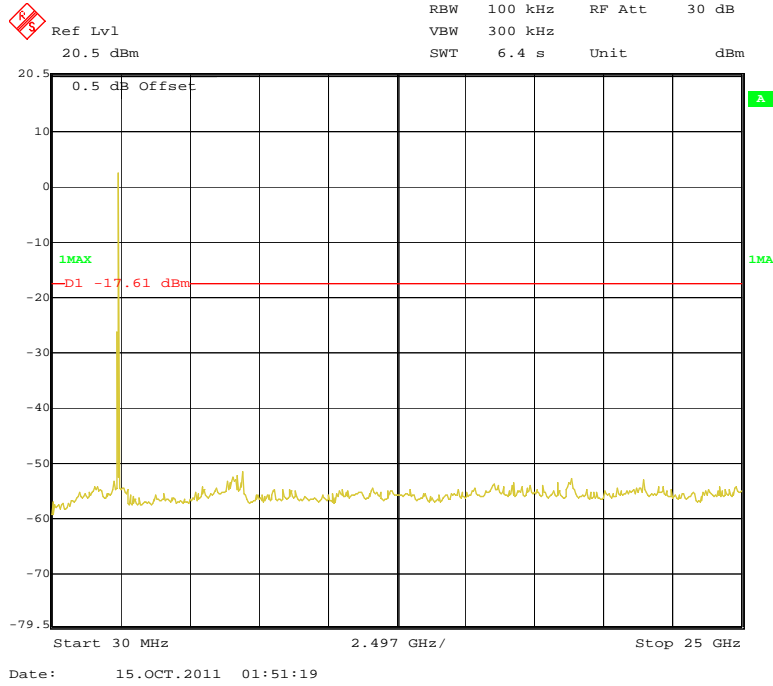
802.11b High Channel-Antenna Port 0



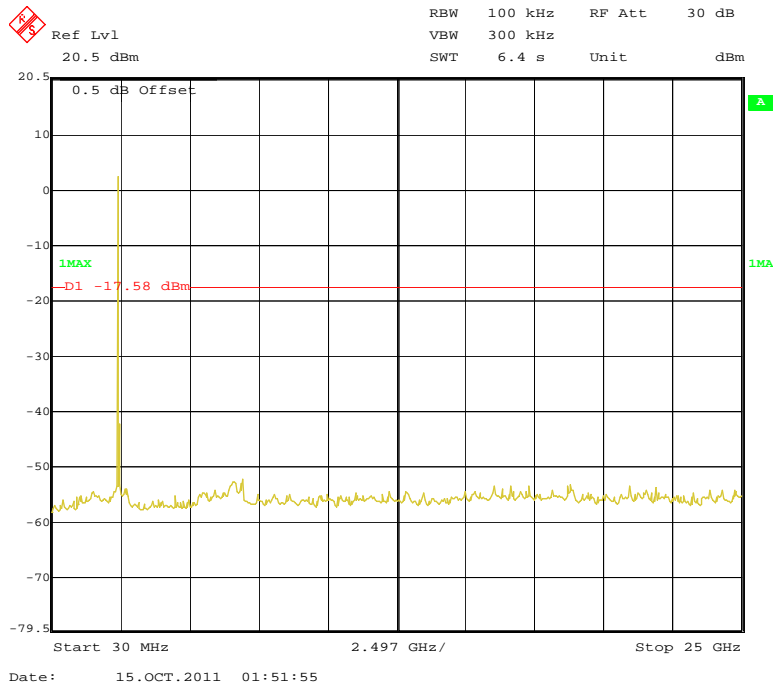
802.11g Low Channel -Antenna Port 0



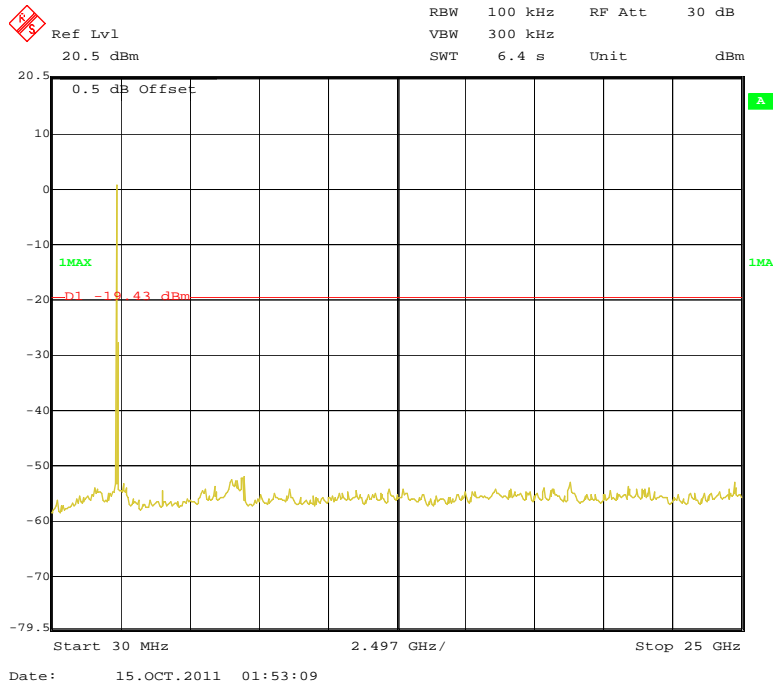
802.11g Middle Channel-Antenna Port 0



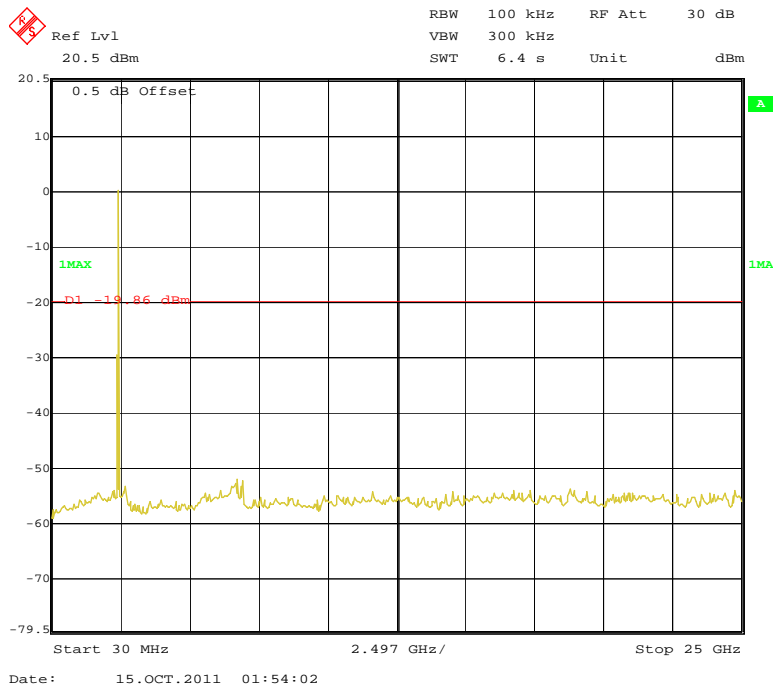
802.11g High Channel-Antenna Port 0



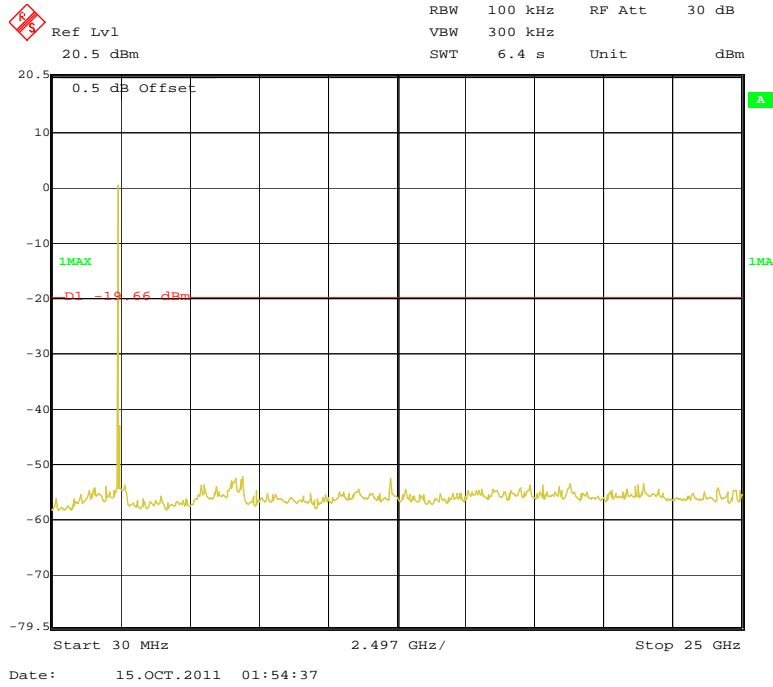
802.11n20 Low Channel-Antenna Port 0



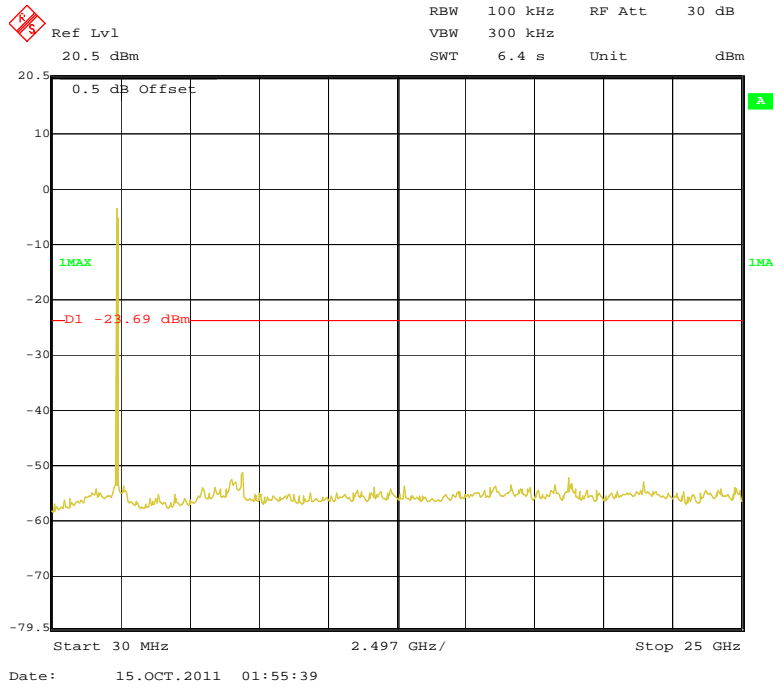
802.11n20 Middle Channel -Antenna Port 0



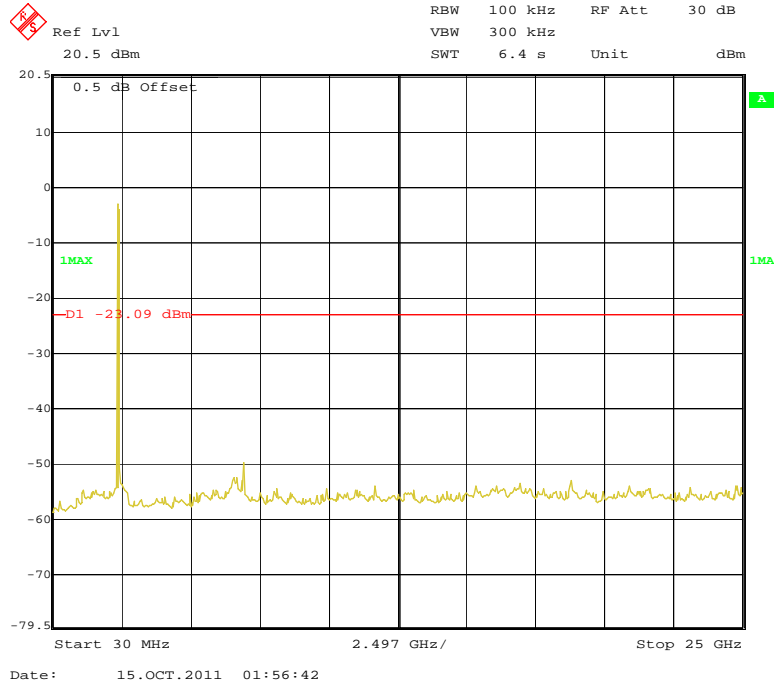
802.11n20 High Channel-Antenna Port 0



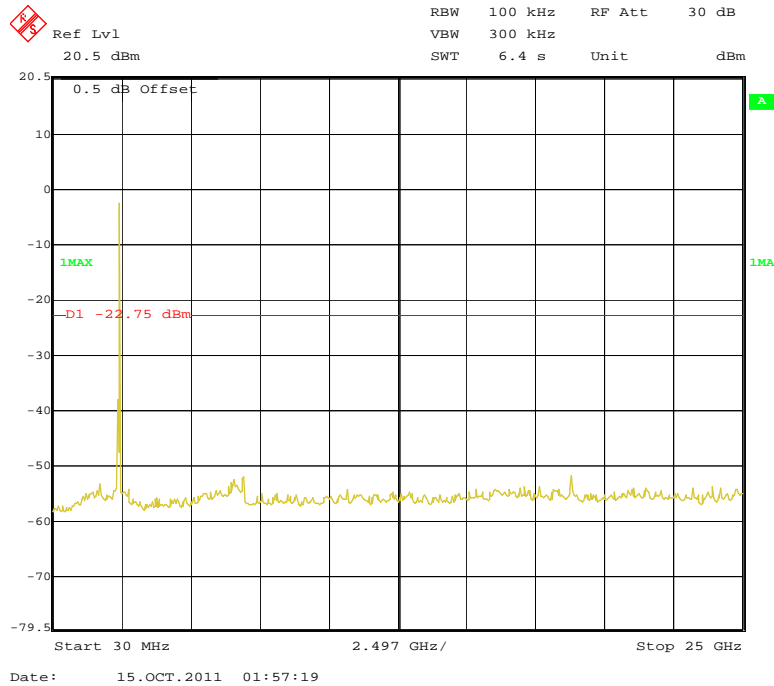
802.11n40 Low Channel -Antenna Port 0



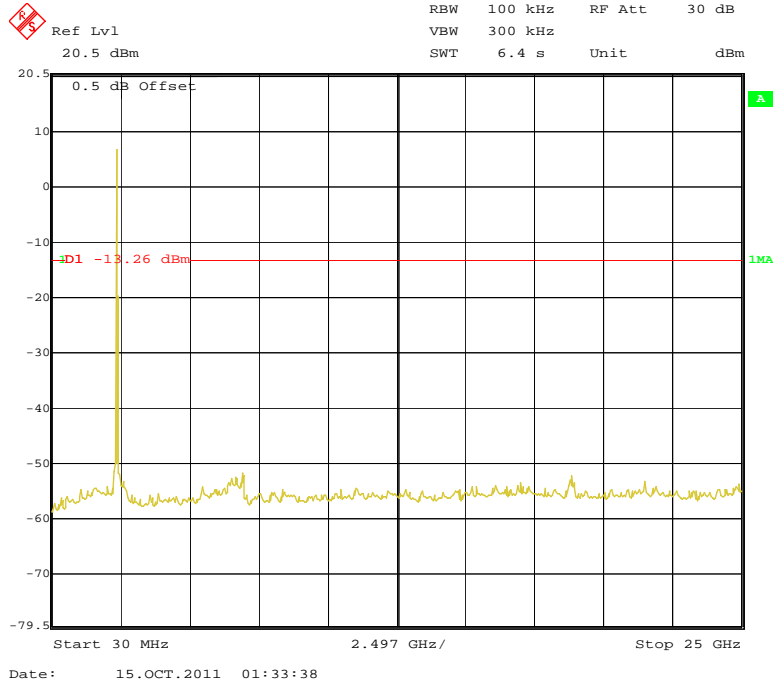
802.11n40 Middle Channel-Antenna Port 0



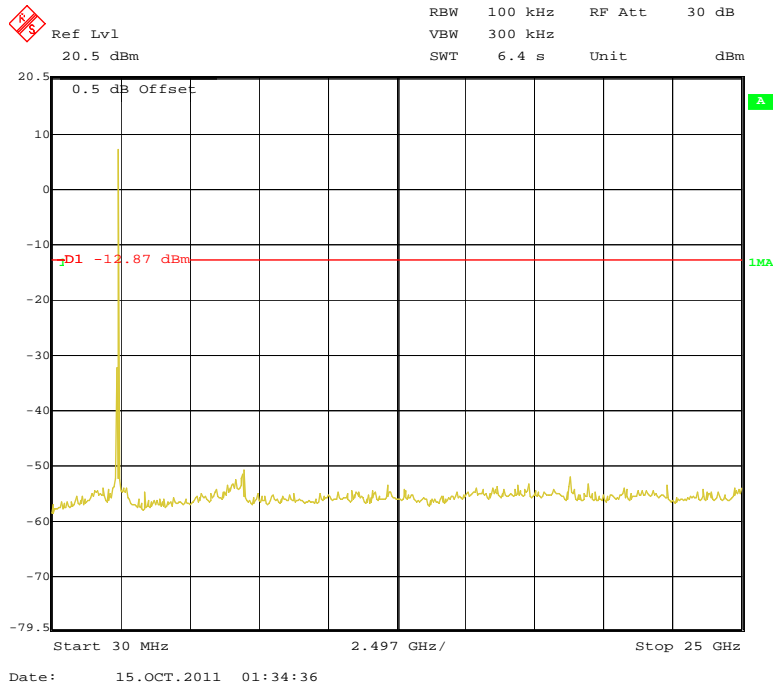
802.11n40 High Channel-Antenna Port 0



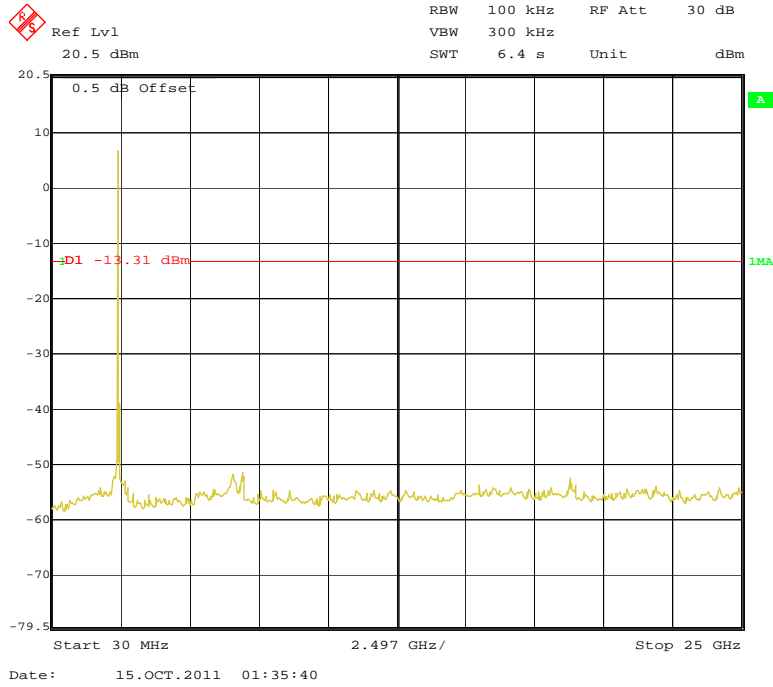
802.11b Low Channel-Antenna Port 1



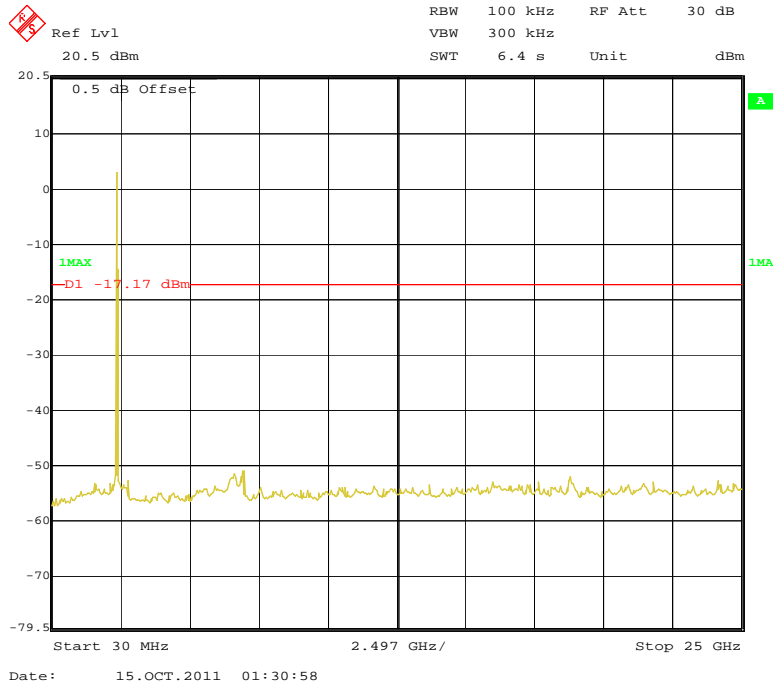
802.11b Middle Channel -Antenna Port 1



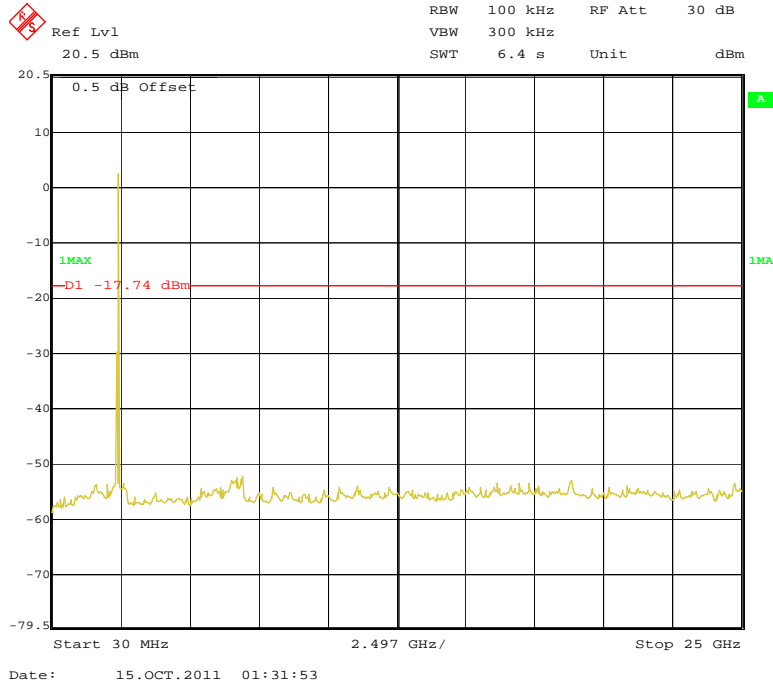
802.11b High Channel-Antenna Port 1



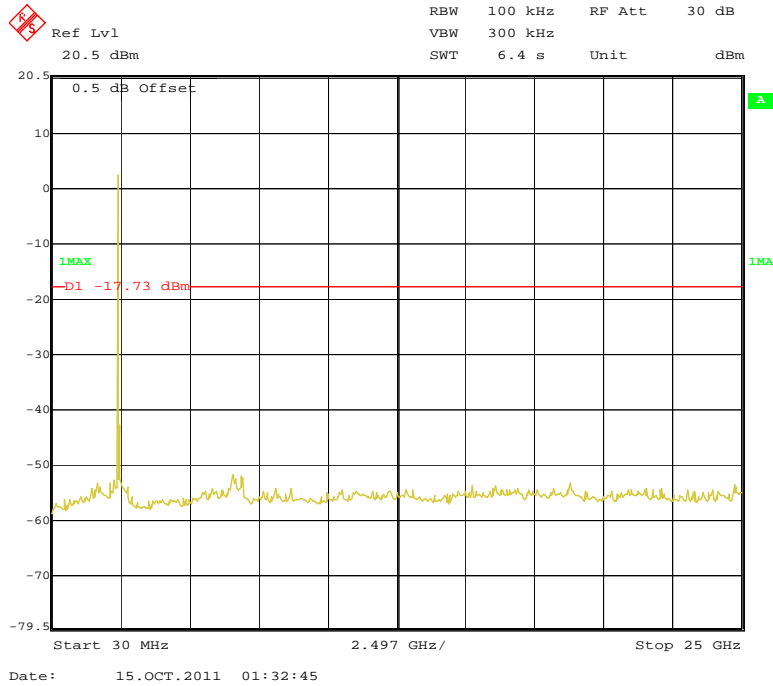
802.11g Low Channel -Antenna Port 1



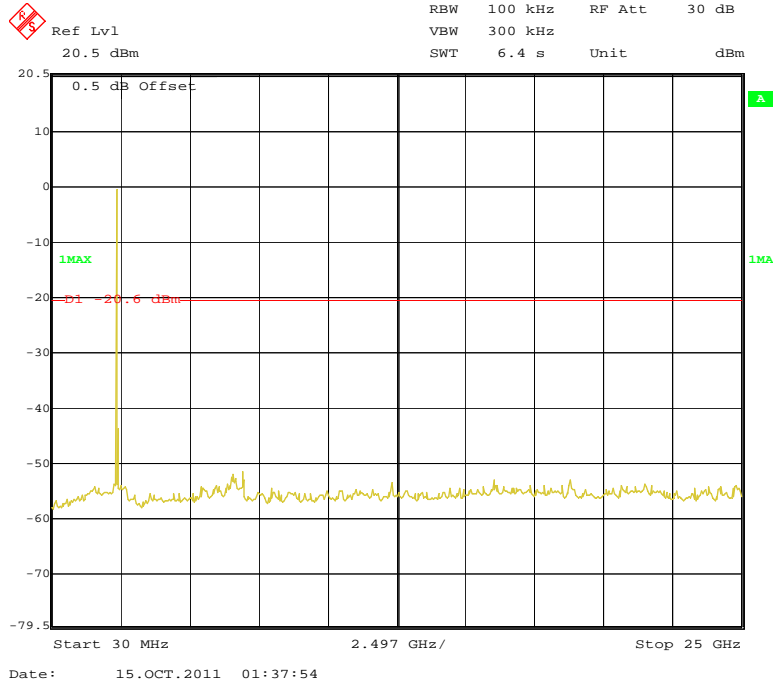
802.11g Middle Channel-Antenna Port 1



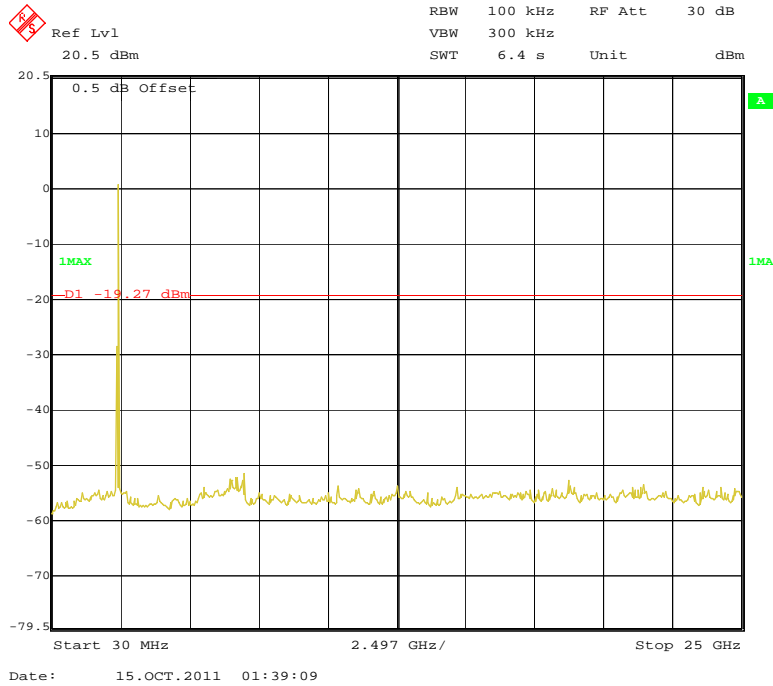
802.11g High Channel-Antenna Port 1



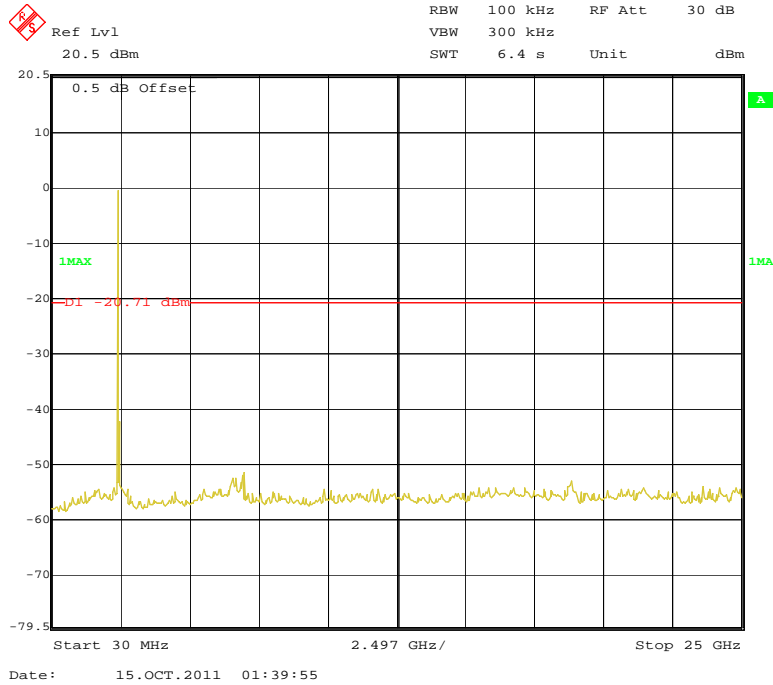
802.11n20 Low Channel-Antenna Port 1



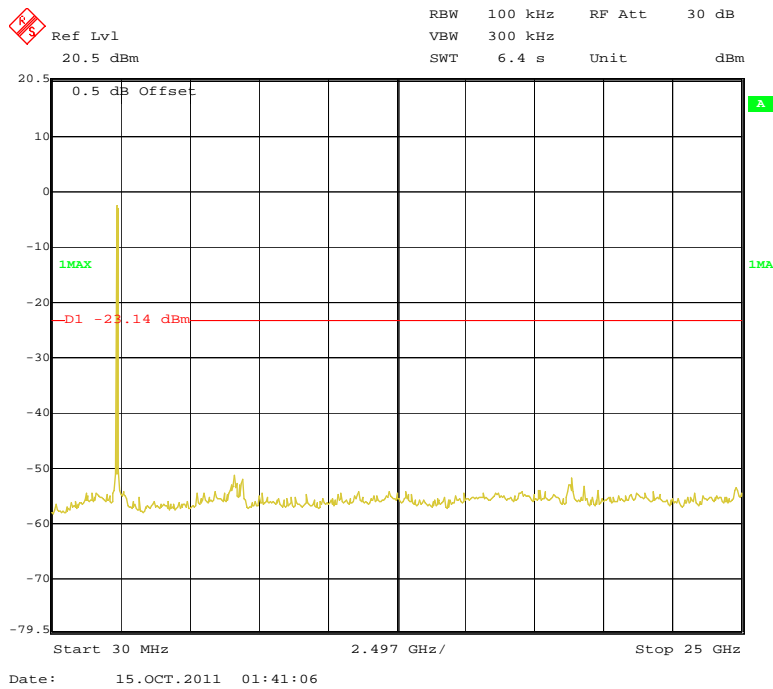
802.11n20 Middle Channel -Antenna Port 1



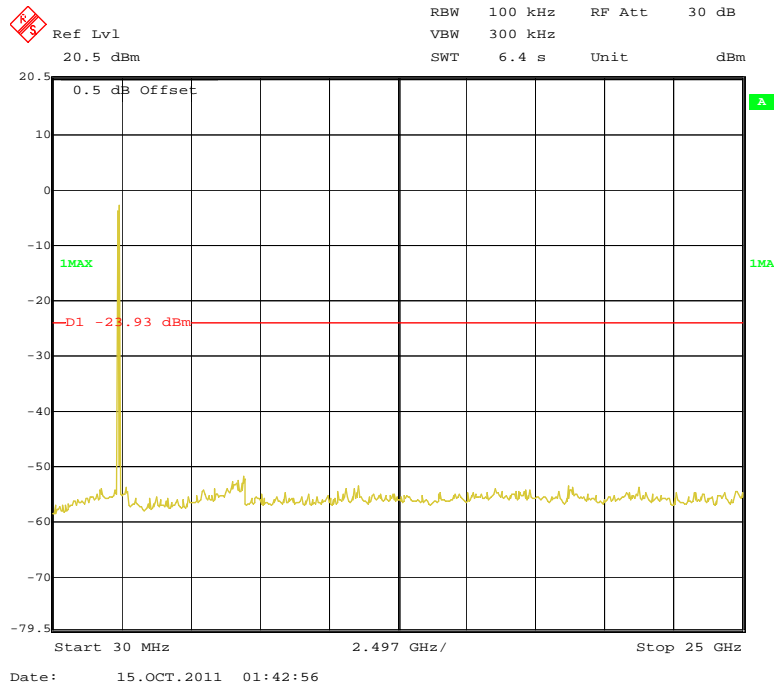
802.11n20 High Channel-Antenna Port 1



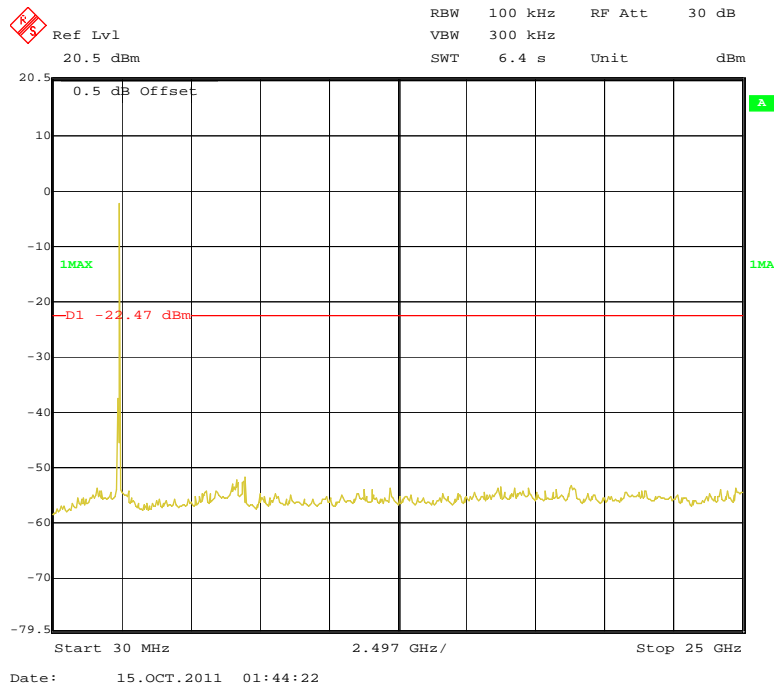
802.11n40 Low Channel -Antenna Port 1



802.11n40 Middle Channel-Antenna Port 1



802.11n40 High Channel-Antenna Port 1



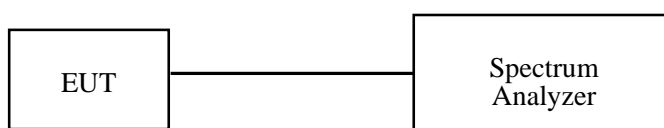
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Leon Chen from 2011-10-10 to 2011-10-13.

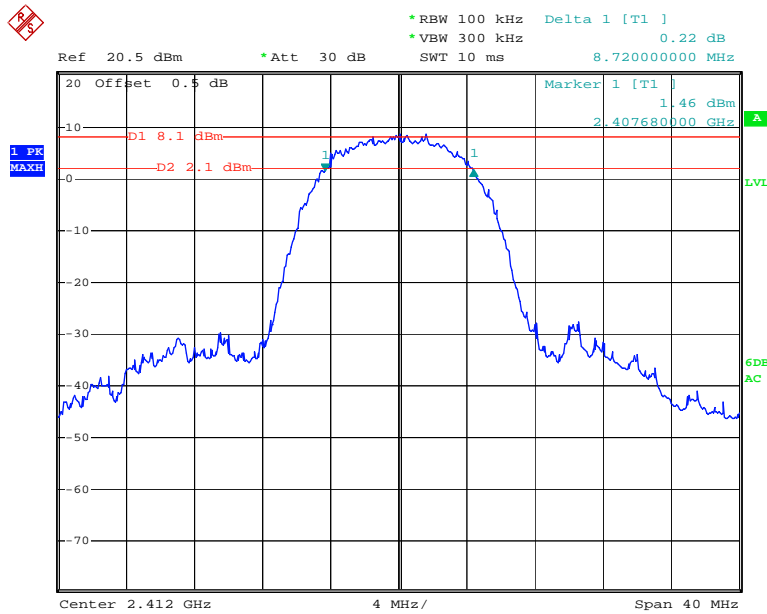
Test Result: Pass.

Please refer to the following tables and plots.

Antenna 0

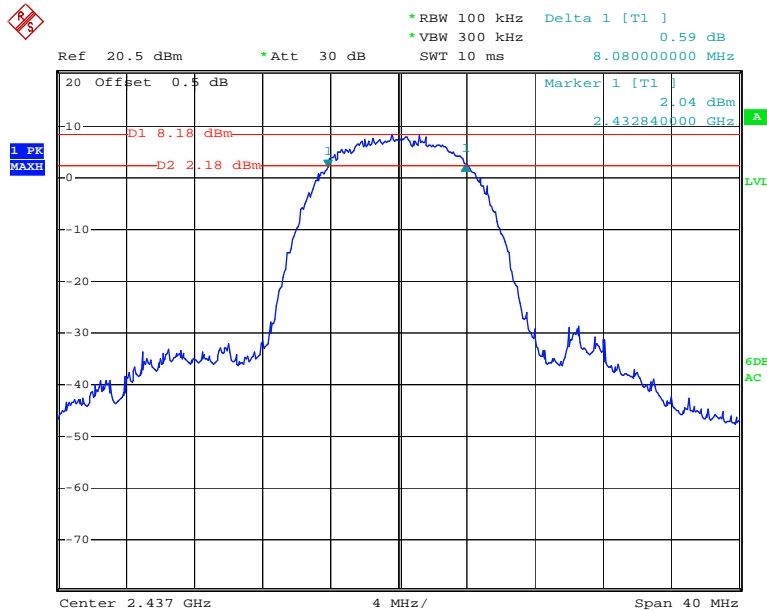
Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Limit (kHz)
802.11b mode				
Low	2412	1	8.72	> 500
Middle	2437	1	8.08	> 500
High	2462	1	8.48	> 500
802.11g mode				
Low	2412	6	15.28	> 500
Middle	2437	6	15.36	> 500
High	2462	6	15.28	> 500
802.11n20 mode				
Low	2412	6.5	16.32	> 500
Middle	2437	6.5	16.24	> 500
High	2462	6.5	16.24	> 500
802.11n40 mode				
Low	2422	13.5	36.72	> 500
Middle	2437	13.5	36.72	> 500
High	2452	13.5	36.72	> 500

802.11b Low Channel



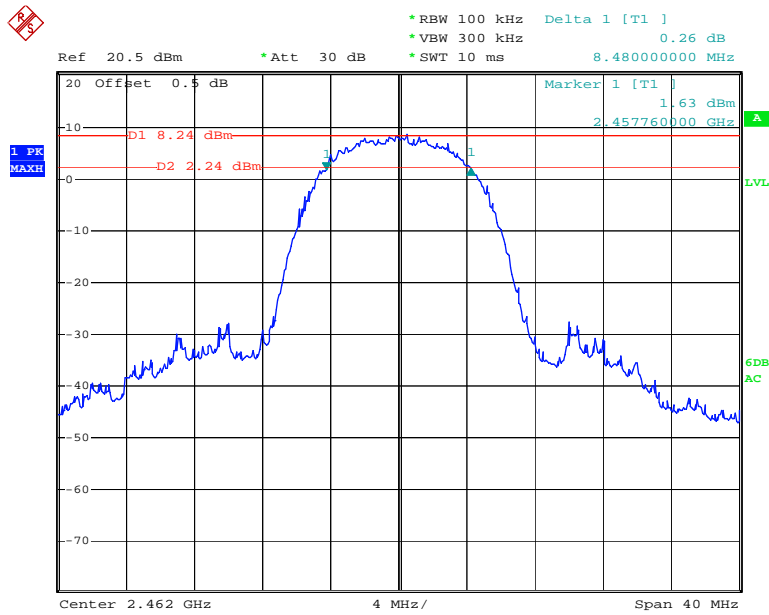
Date: 10.OCT.2011 16:41:14

802.11b Middle Channel



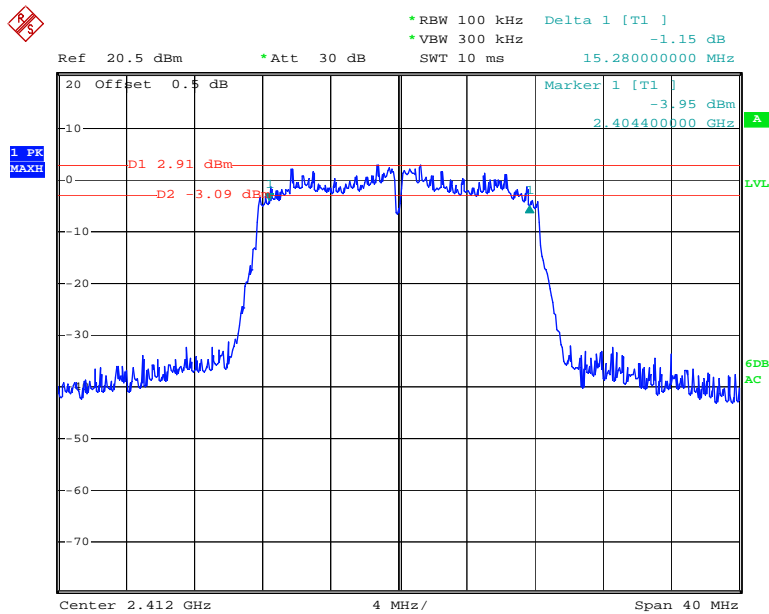
Date: 10.OCT.2011 17:07:36

802.11b High Channel



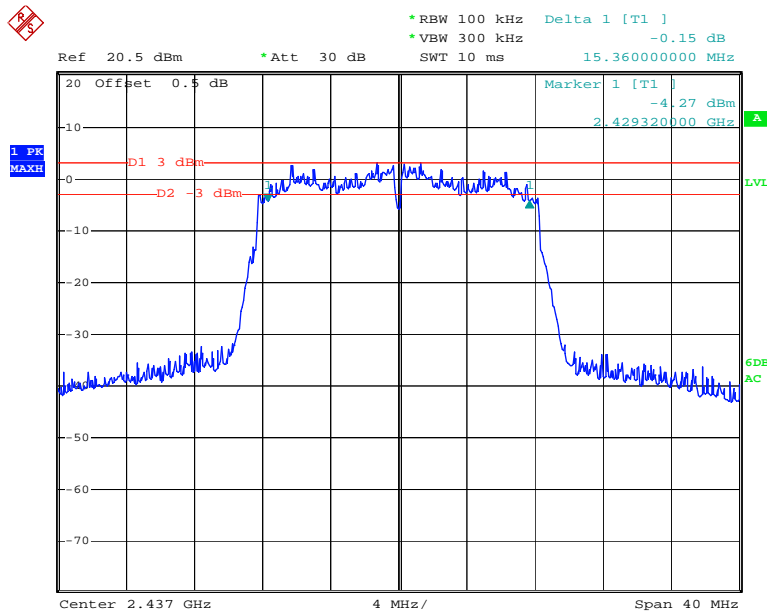
Date: 10.OCT.2011 17:29:34

802.11g Low Channel



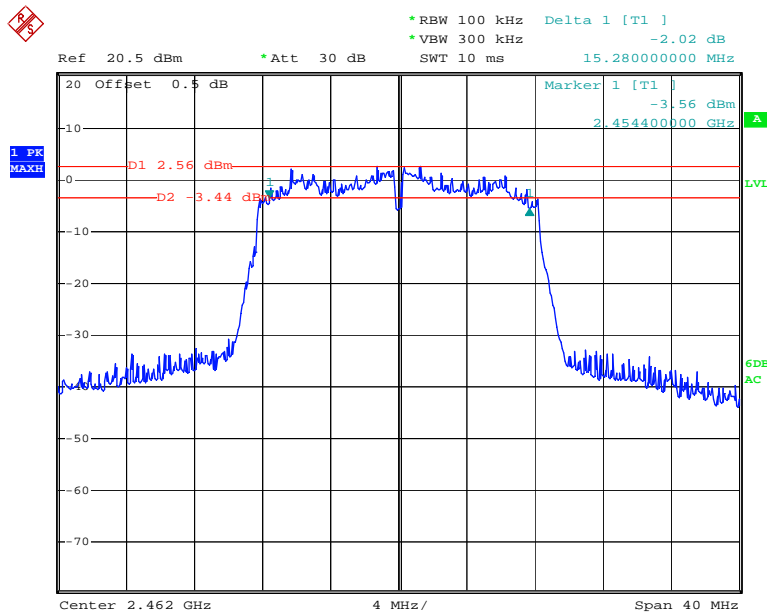
Date: 10.OCT.2011 18:04:18

802.11g Middle Channel



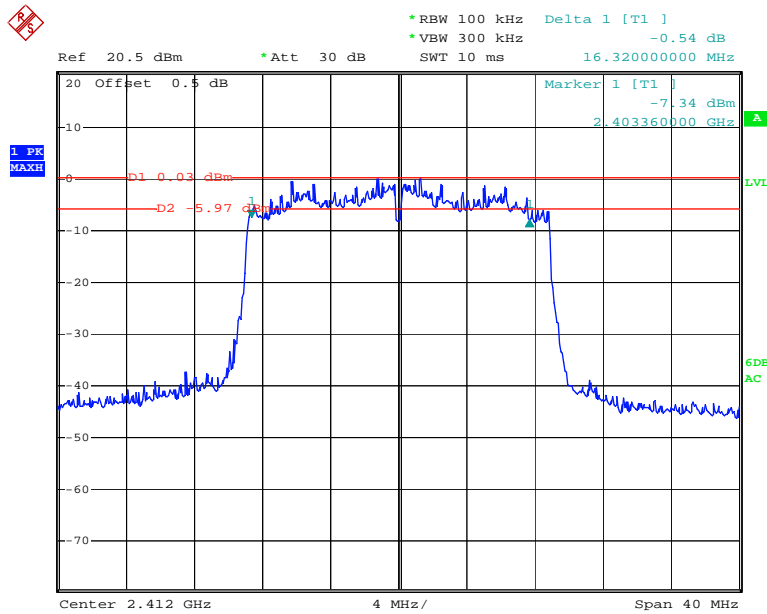
Date: 10.OCT.2011 19:05:19

802.11g High Channel



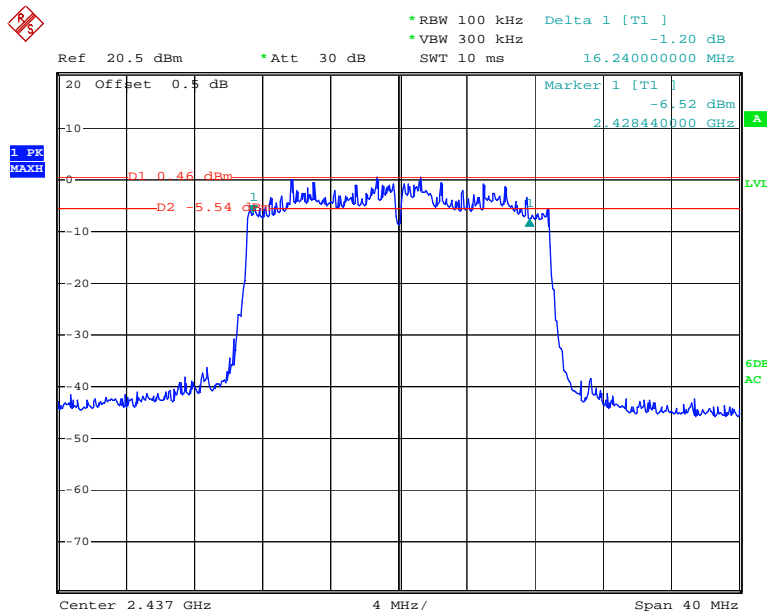
Date: 11.OCT.2011 10:11:32

802.11n20 Low Channel



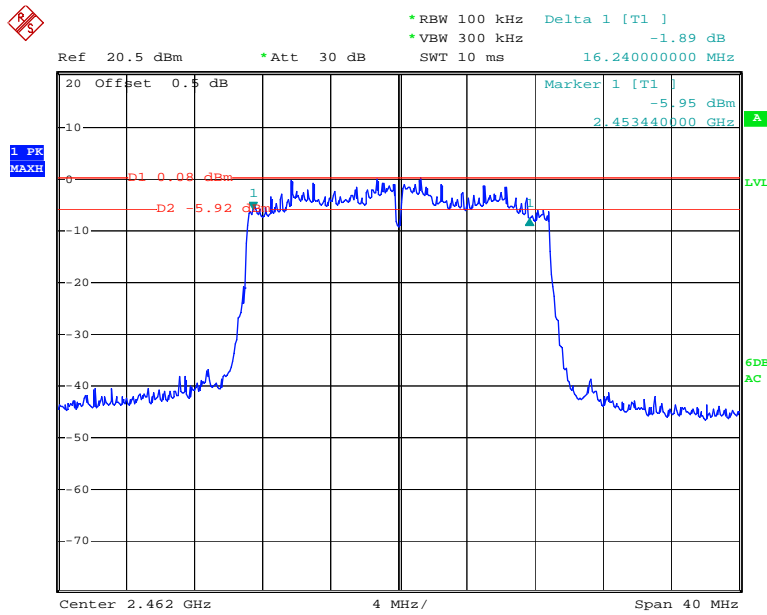
Date: 11.OCT.2011 10:30:55

802.11n20 Middle Channel



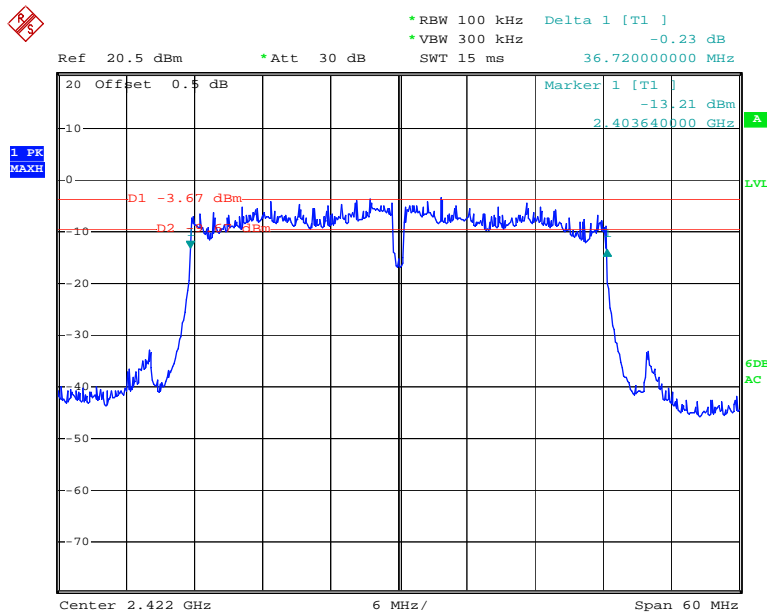
Date: 11.OCT.2011 10:49:20

802.11n20 High Channel



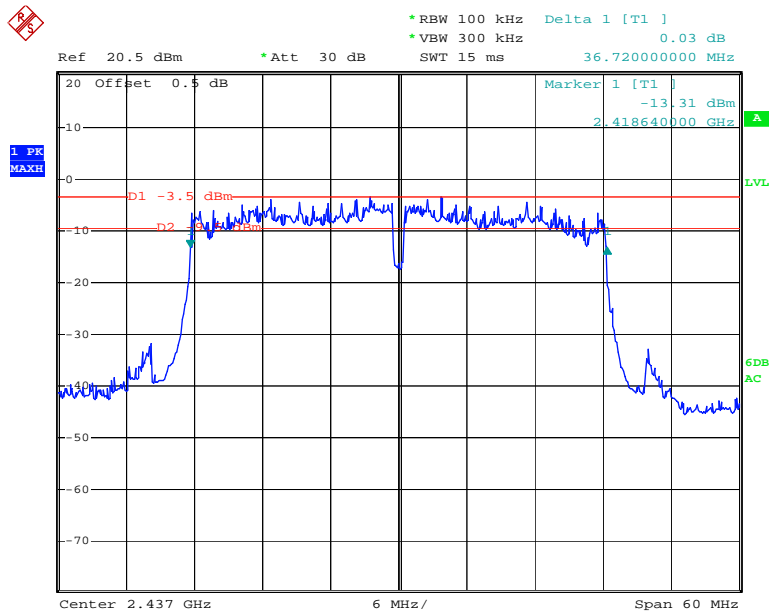
Date: 11.OCT.2011 11:08:46

802.11n40 Low Channel



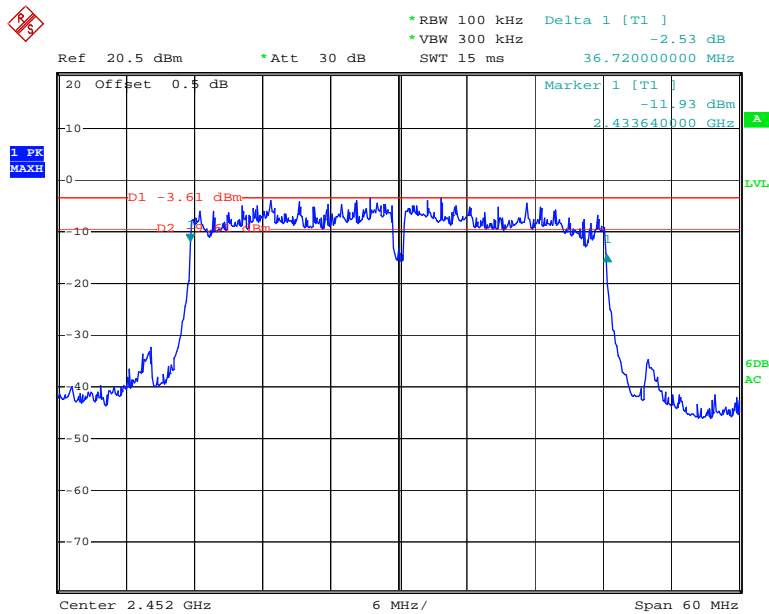
Date: 11.OCT.2011 11:38:58

802.11n40 Middle Channel



Date: 11.OCT.2011 12:02:54

802.11n40 High Channel

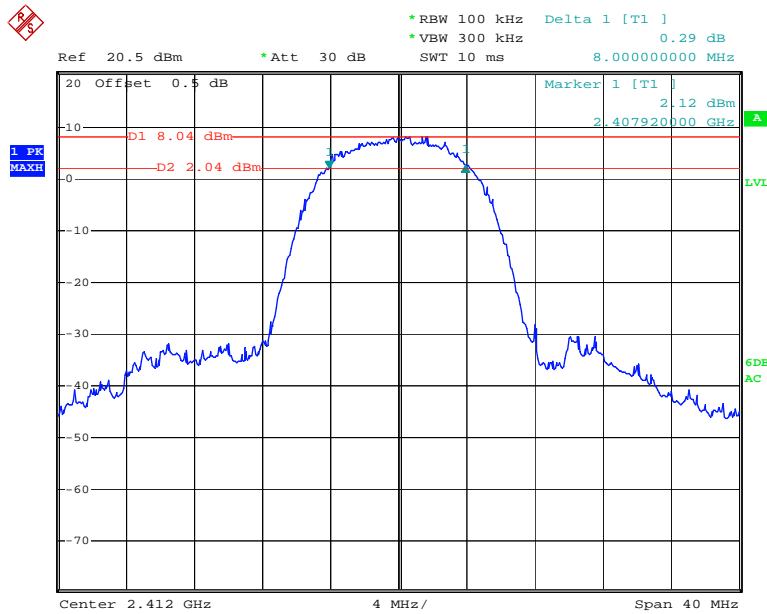


Date: 11.OCT.2011 13:03:49

Antenna 1

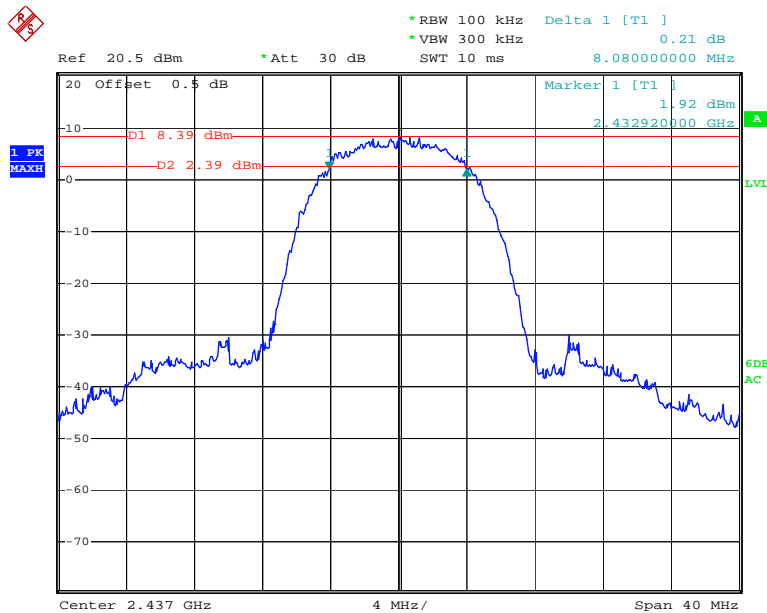
Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Limit (kHz)
802.11b mode				
Low	2412	1	8.00	> 500
Middle	2437	1	8.08	> 500
High	2462	1	8.48	> 500
802.11g mode				
Low	2412	6	16.16	> 500
Middle	2437	6	15.60	> 500
High	2462	6	15.60	> 500
802.11n20 mode				
Low	2412	6.5	16.16	> 500
Middle	2437	6.5	15.28	> 500
High	2462	6.5	15.28	> 500
802.11n40 mode				
Low	2422	13.5	36.72	> 500
Middle	2437	13.5	35.40	> 500
High	2452	13.5	36.72	> 500

802.11b Low Channel



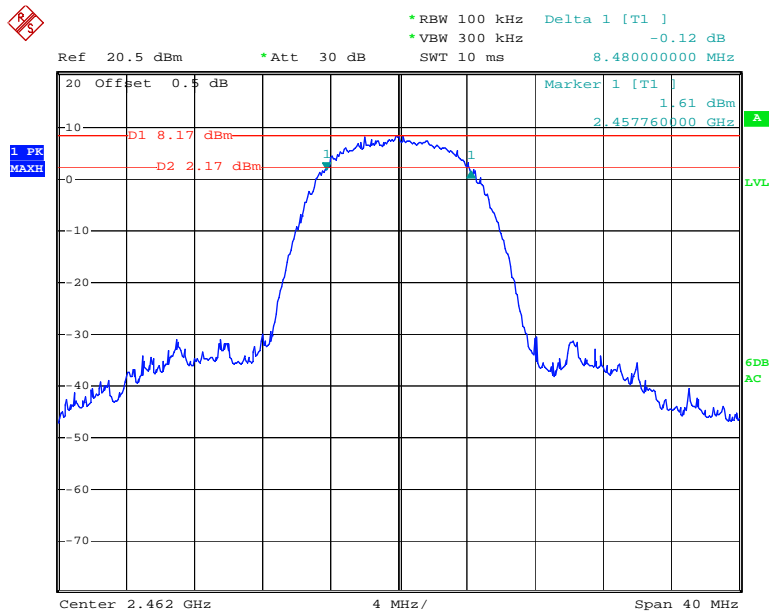
Date: 11.OCT.2011 13:52:39

802.11b Middle Channel



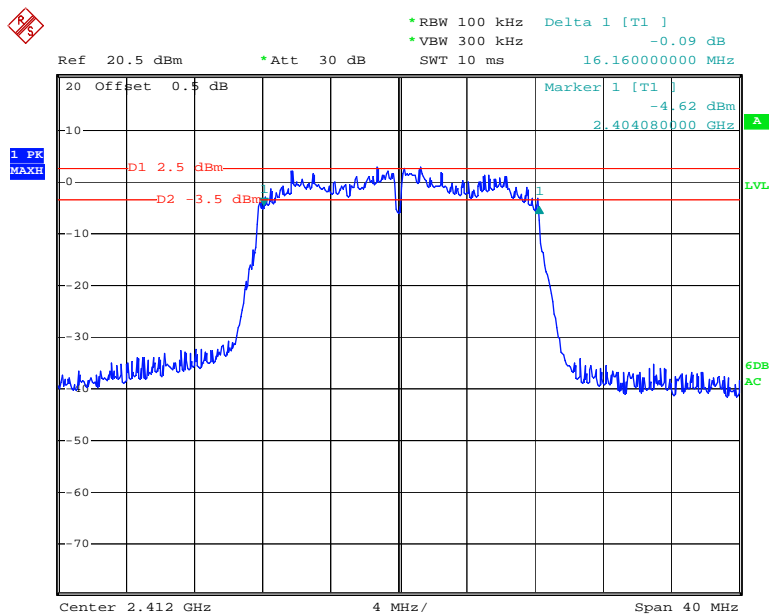
Date: 11.OCT.2011 14:42:06

802.11b High Channel



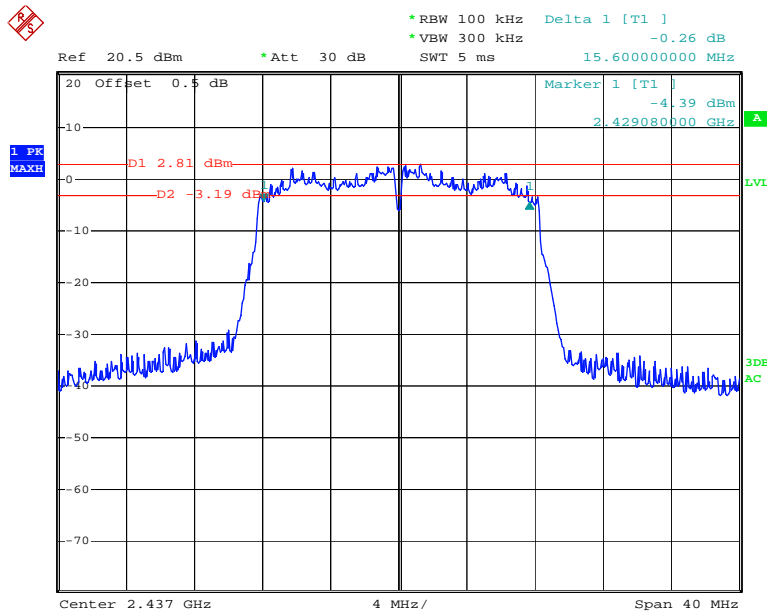
Date: 11.OCT.2011 14:50:36

802.11g Low Channel



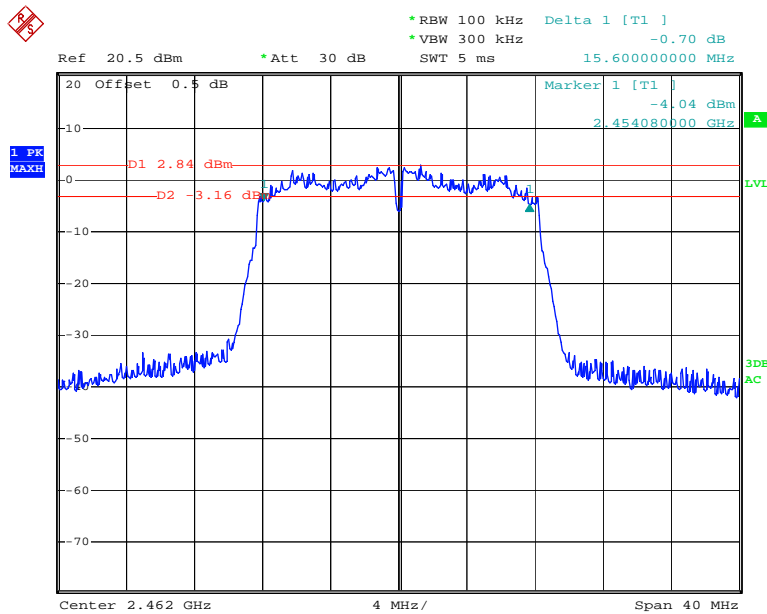
Date: 11.OCT.2011 15:46:26

802.11g Middle Channel



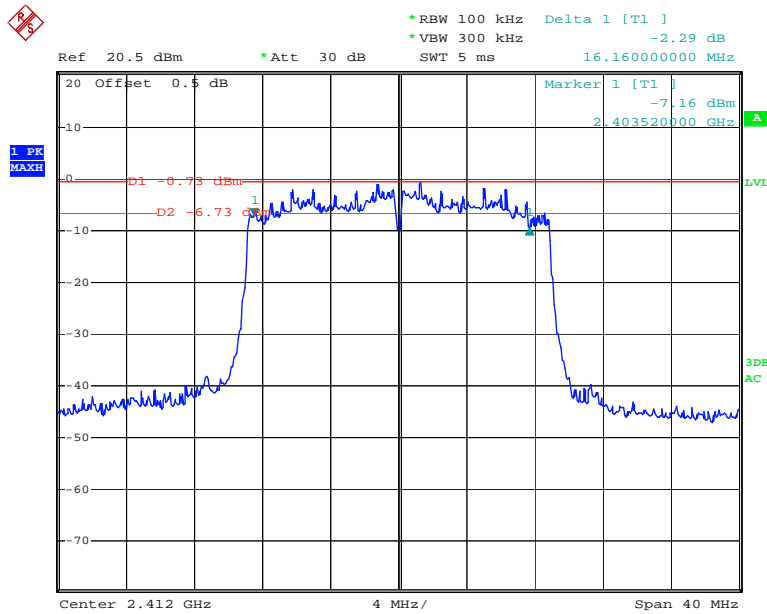
Date: 13.OCT.2011 14:24:35

802.11g High Channel



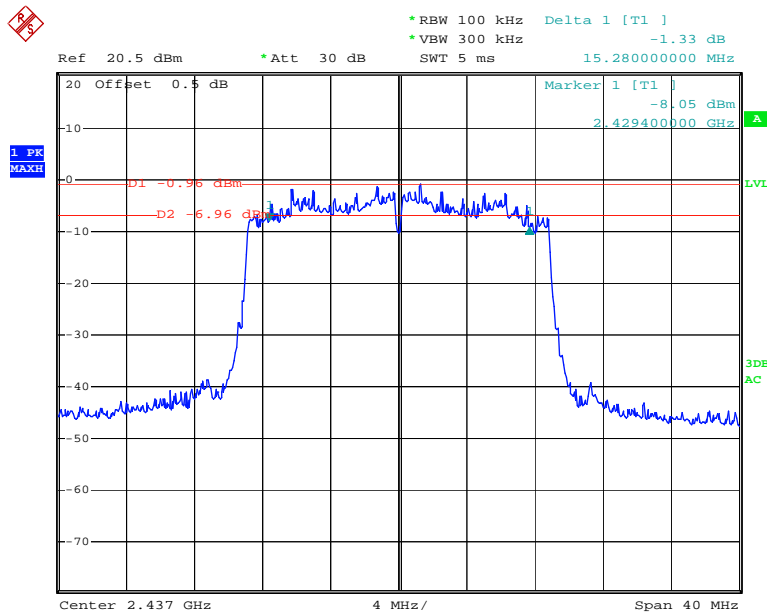
Date: 13.OCT.2011 15:11:40

802.11n20 Low Channel



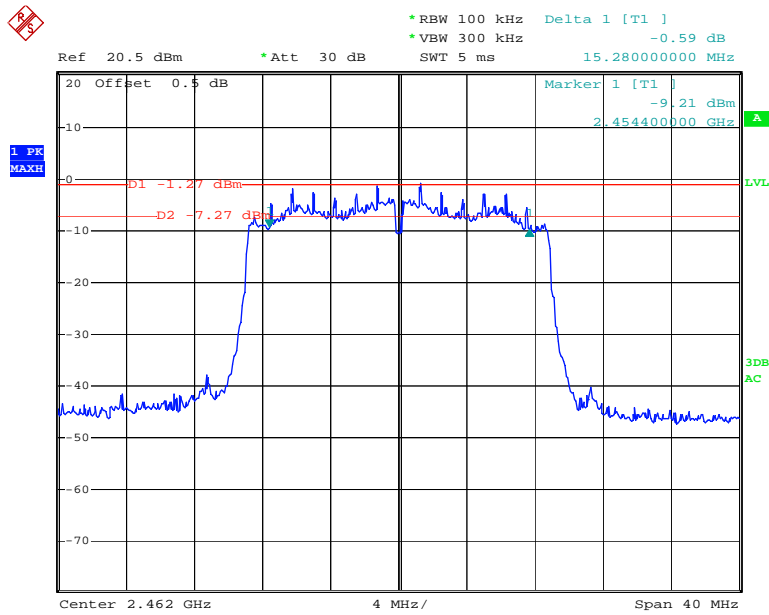
Date: 13.OCT.2011 16:38:07

802.11n20 Middle Channel



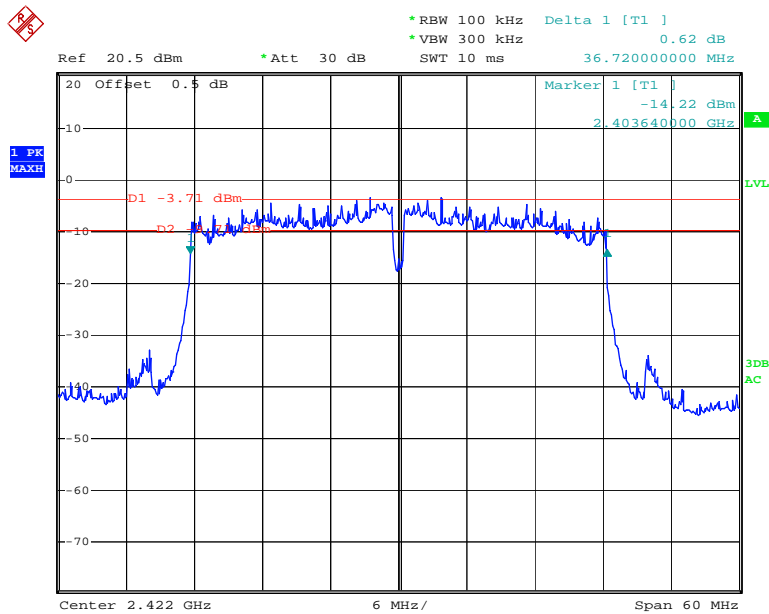
Date: 13.OCT.2011 17:42:43

802.11n20 High Channel



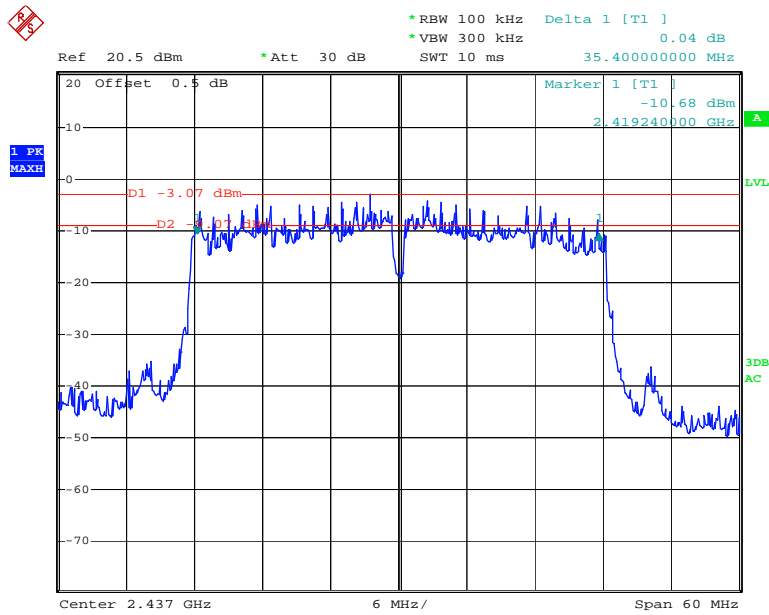
Date: 13.OCT.2011 18:02:26

802.11n40 Low Channel



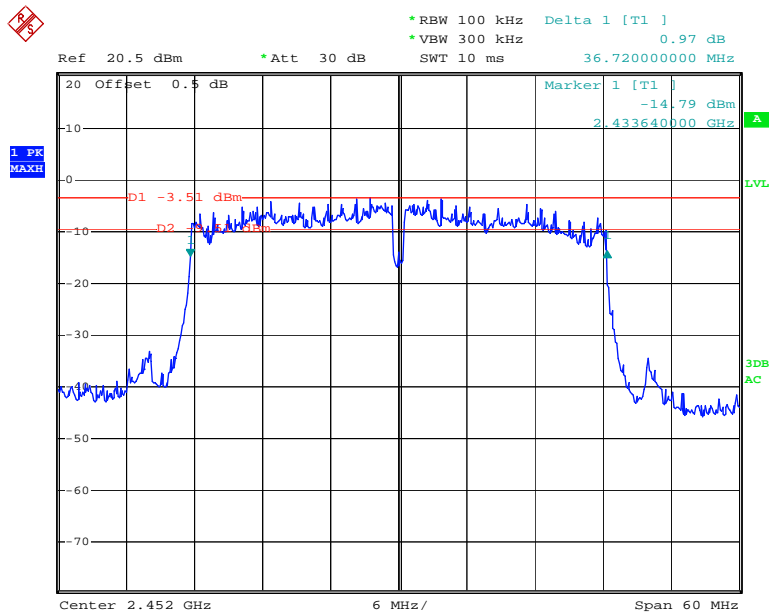
Date: 13.OCT.2011 18:55:30

802.11n40 Middle Channel



Date: 13.OCT.2011 19:11:29

802.11n40 High Channel



Date: 13.OCT.2011 20:05:18

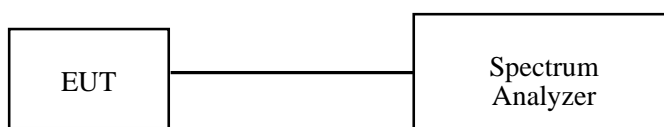
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen from 2011-10-10 to 2011-10-13.

Test Mode: Transmitting

Antenna 0

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)	Limit (dBm)	Result
802.11b					
Low	2412	1	18.00	30	pass
Middle	2437	1	17.38	30	pass
High	2462	1	17.76	30	pass
802.11g					
Low	2412	6	15.01	30	pass
Middle	2437	6	15.14	30	pass
High	2462	6	14.43	30	pass
802.11n20					
Low	2412	6.5	11.52	30	pass
Middle	2437	6.5	11.65	30	pass
High	2462	6.5	12.05	30	pass
802.11n40					
Low	2422	13.5	11.10	30	pass
Middle	2437	13.5	11.39	30	pass
High	2452	13.5	11.42	30	pass

Antenna 1

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)	Limit (dBm)	Result
802.11b					
Low	2412	1	18.55	30	pass
Middle	2437	1	18.69	30	pass
High	2462	1	18.63	30	pass
802.11g					
Low	2412	6	15.32	30	pass
Middle	2437	6	15.14	30	pass
High	2462	6	15.09	30	pass
802.11n20					
Low	2412	6.5	11.39	30	pass
Middle	2437	6.5	11.07	30	pass
High	2462	6.5	11.06	30	pass
802.11n40					
Low	2422	13.5	11.24	30	pass
Middle	2437	13.5	11.42	30	pass
High	2452	13.5	11.51	30	pass

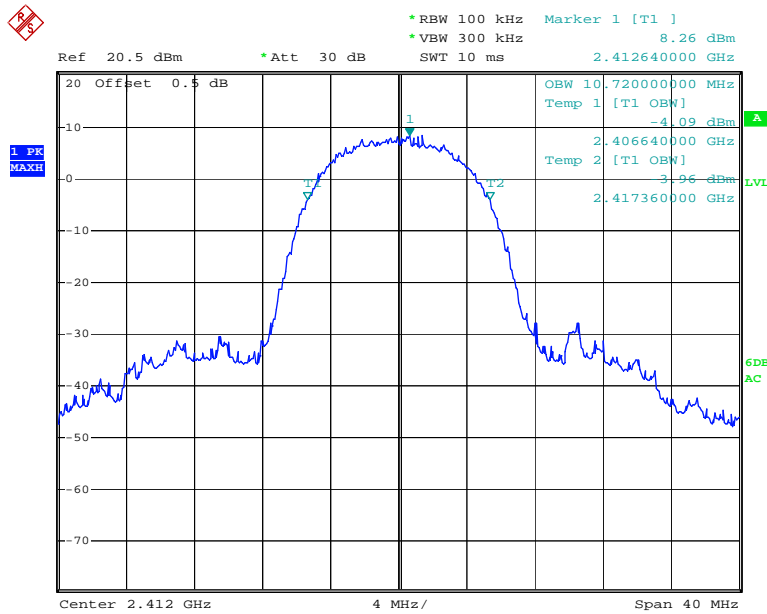
Antenna 0+Antenna 1(MIMO)

Channel	Frequency (MHz)	Data Rate (Mbps)	Total Output Power (dBm)	Limit (dBm)
802.11n20				
Low	2412	6.5	14.47	30
Middle	2437	6.5	14.38	30
High	2462	6.5	14.59	30
802.11n40				
Low	2422	13.5	14.18	30
Middle	2437	13.5	14.42	30
High	2452	13.5	14.48	30

Note: the antenna gain is 2 dBi.

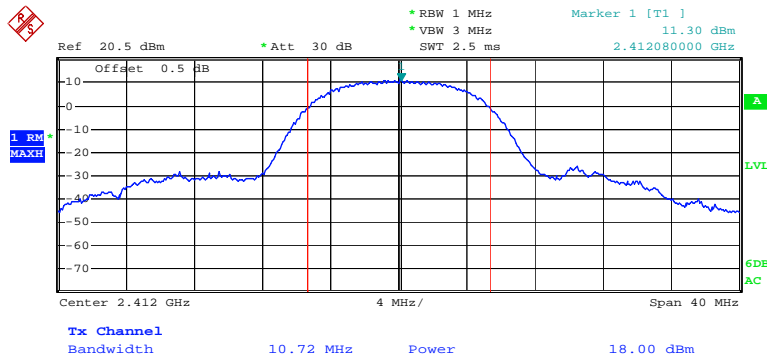
Please refer to the following plots.

802.11b 99% Occupied Bandwidth, Low Channel, Ant 0



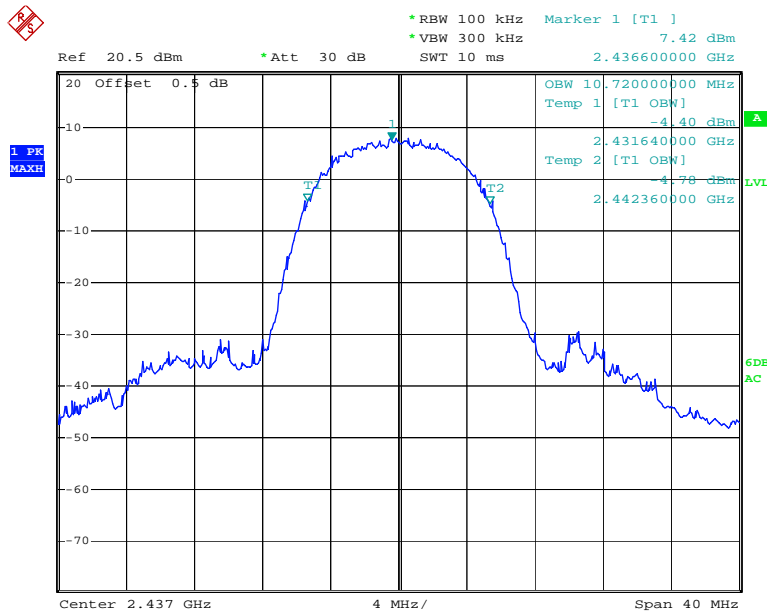
Date: 10.OCT.2011 16:41:50

802.11b RF Output Power, Low Channel, Ant 0



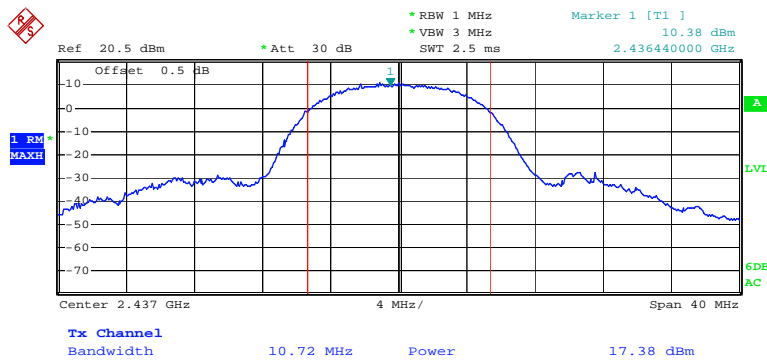
Date: 10.OCT.2011 16:59:06

802.11b 99% Occupied Bandwidth, Middle Channel, Ant 0



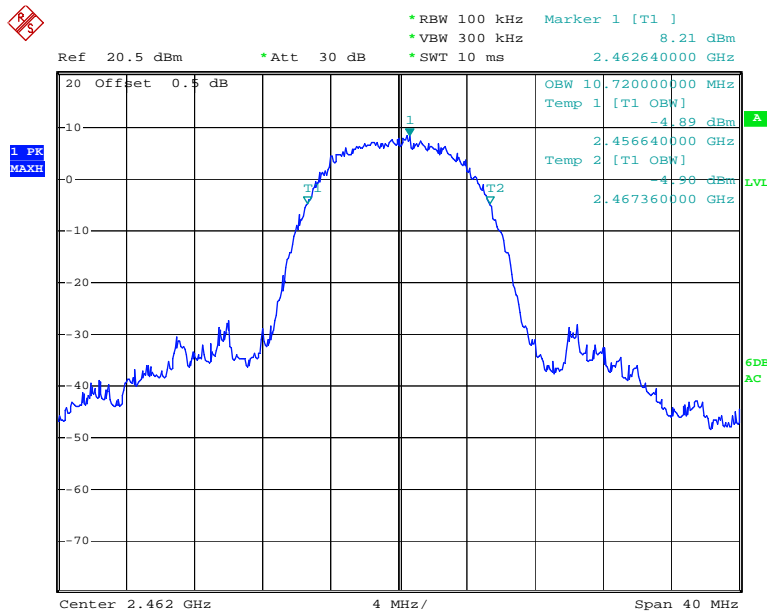
Date: 10.OCT.2011 17:08:15

802.11b RF Output Power, Middle Channel, Ant 0



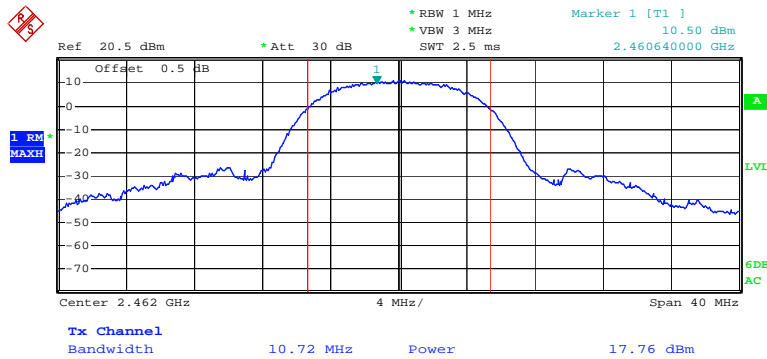
Date: 10.OCT.2011 17:25:08

802.11b 99% Occupied Bandwidth, High Channel, Ant 0



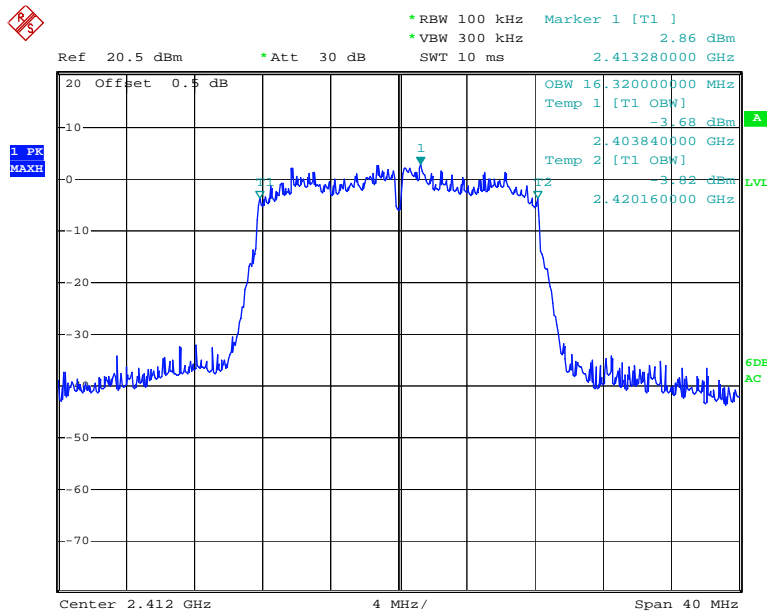
Date: 10.OCT.2011 17:29:58

802.11b RF Output Power, High Channel, Ant 0



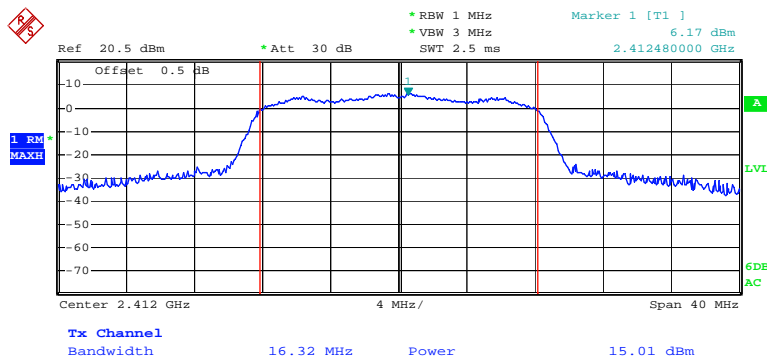
Date: 10.OCT.2011 17:40:38

802.11g 99% Occupied Bandwidth, Low Channel, Ant 0



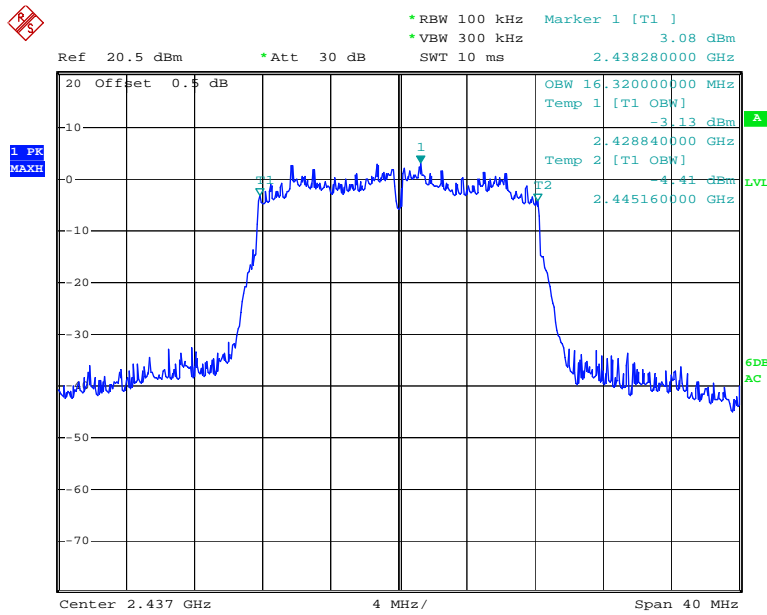
Date: 10.OCT.2011 18:06:08

802.11g RF Output Power, Low Channel, Ant 0



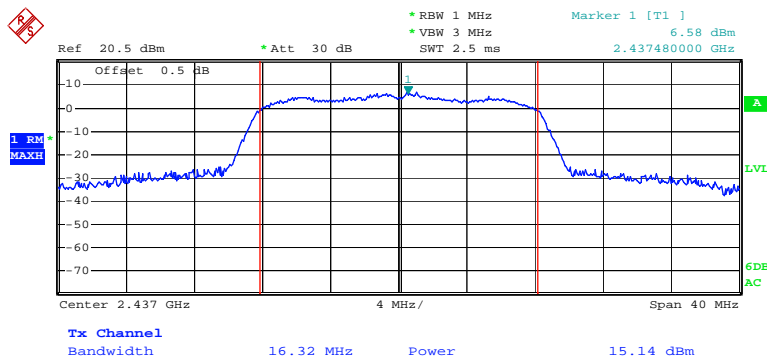
Date: 10.OCT.2011 18:38:53

802.11g 99% Occupied Bandwidth, Middle Channel, Ant 0



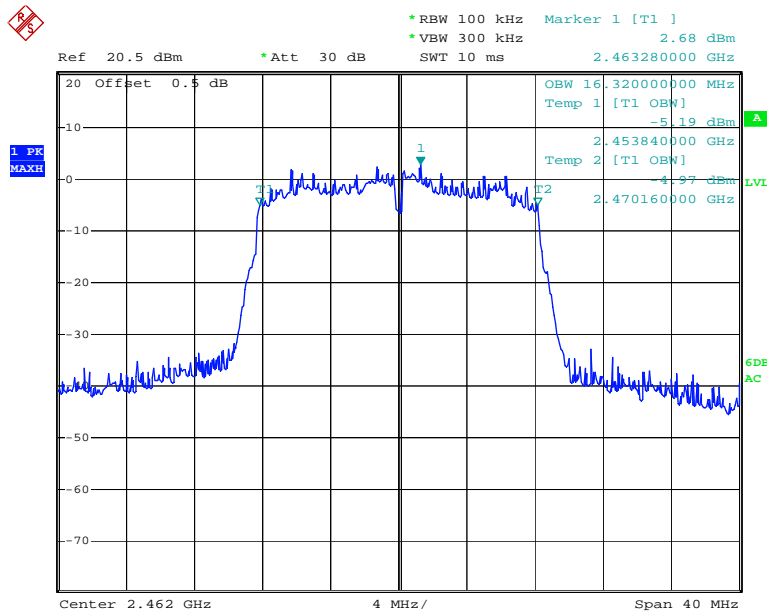
Date: 10.OCT.2011 19:05:55

802.11g RF Output Power, Middle Channel, Ant 0



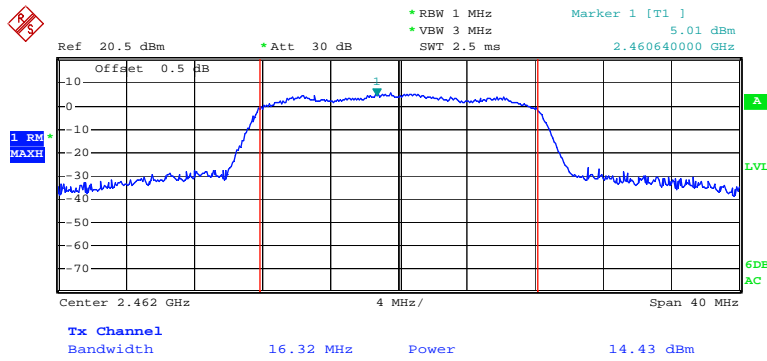
Date: 10.OCT.2011 19:25:41

802.11g 99% Occupied Bandwidth, High Channel, Ant 0



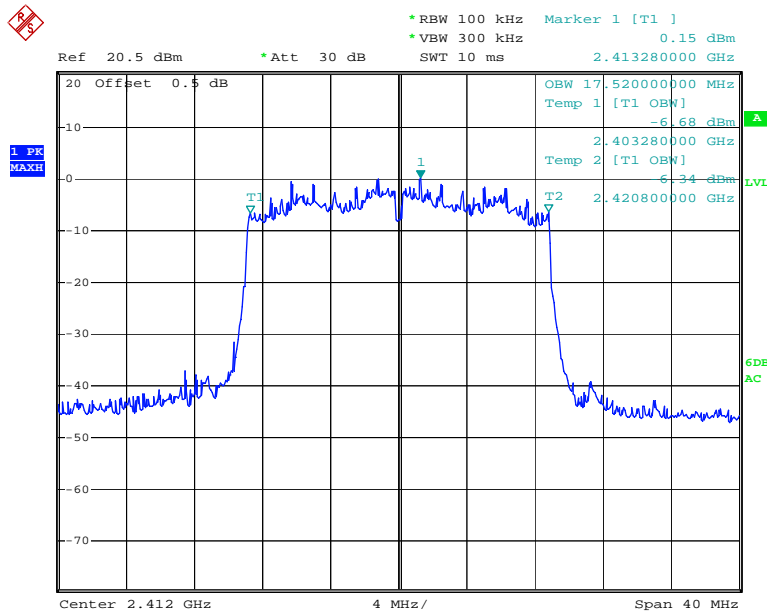
Date: 11.OCT.2011 10:10:20

802.11g RF Output Power, High Channel, Ant 0



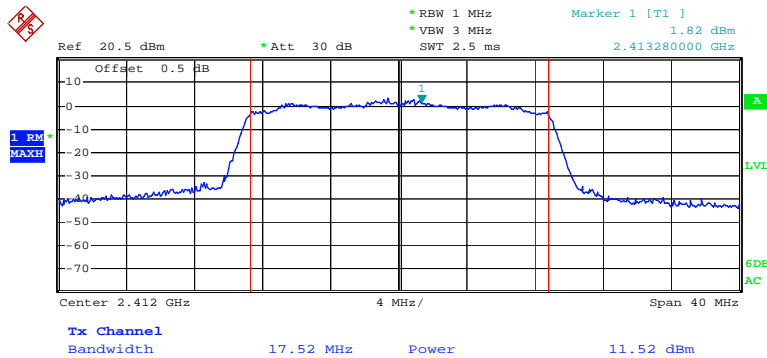
Date: 11.OCT.2011 10:23:15

802.11n20 99% Occupied Bandwidth, Low Channel, Ant 0



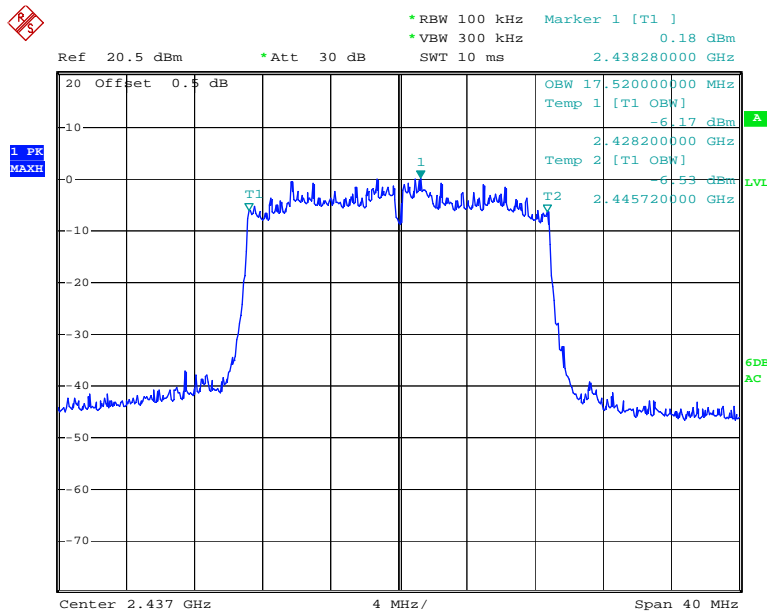
Date: 11.OCT.2011 10:31:43

802.11n20 RF Output Power, Low Channel, Ant 0



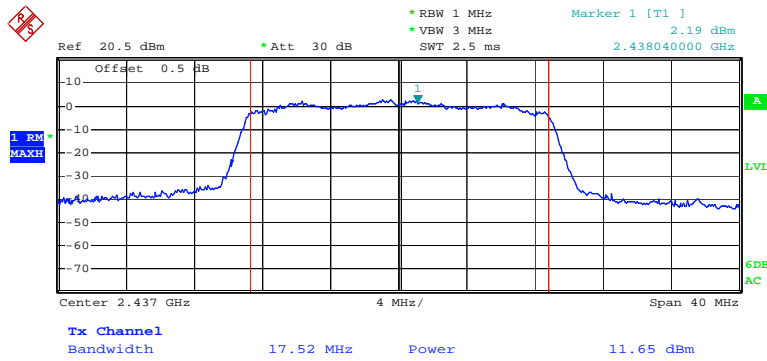
Date: 11.OCT.2011 10:42:41

802.11n20b 99% Occupied Bandwidth, Middle Channel, Ant 0



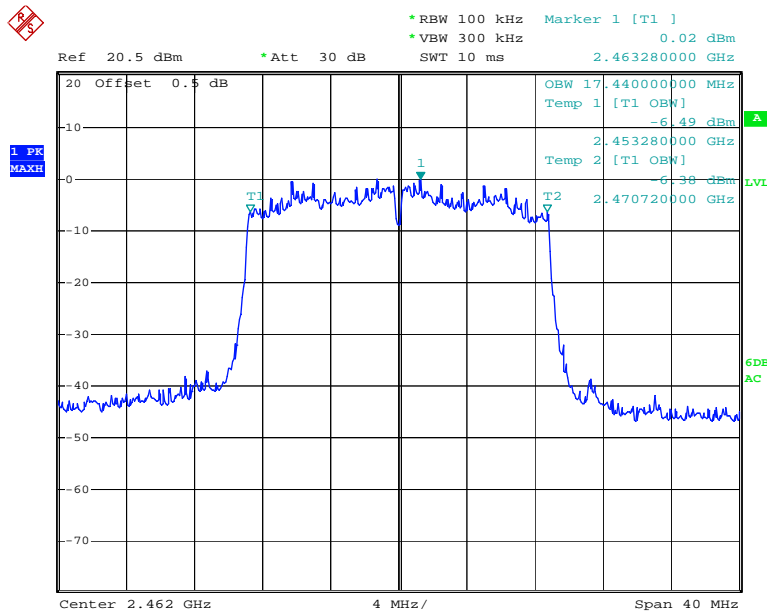
Date: 11.OCT.2011 10:50:53

802.11n20 RF Output Power, Middle Channel, Ant 0



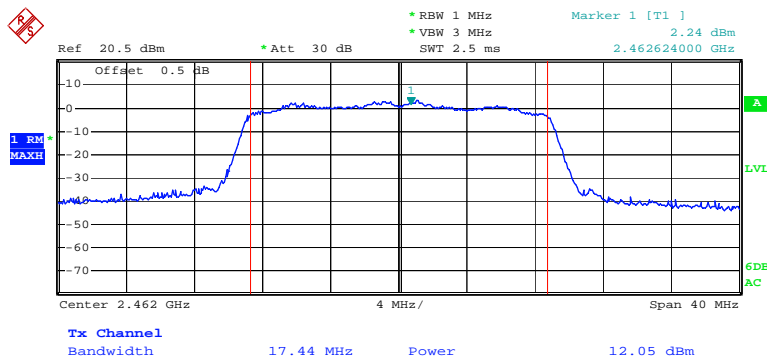
Date: 11.OCT.2011 11:05:11

802.11n20 99% Occupied Bandwidth, High Channel, Ant 0



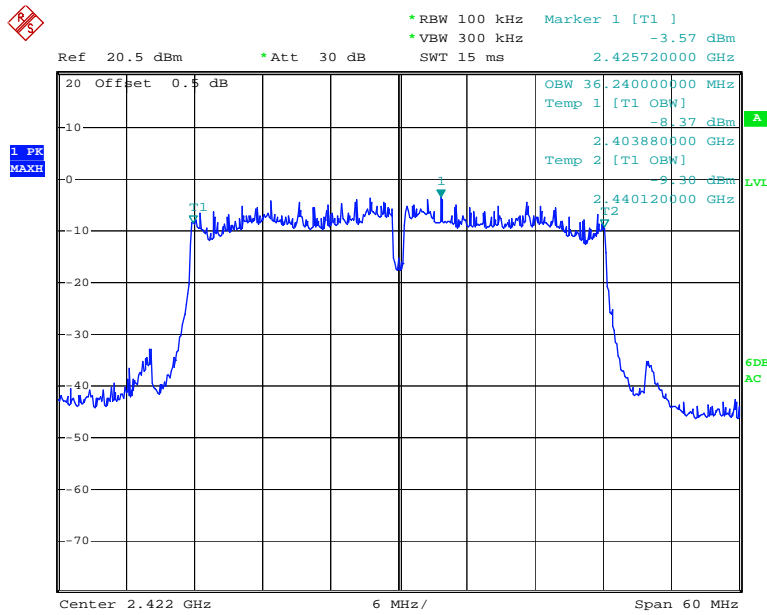
Date: 11.OCT.2011 11:10:04

802.11n20 RF Output Power, High Channel, Ant 0



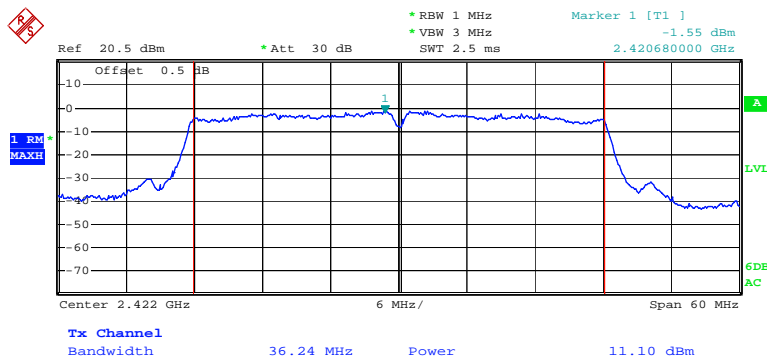
Date: 11.OCT.2011 11:25:57

802.11 n40 99% Occupied Bandwidth, Low Channel, Ant 0



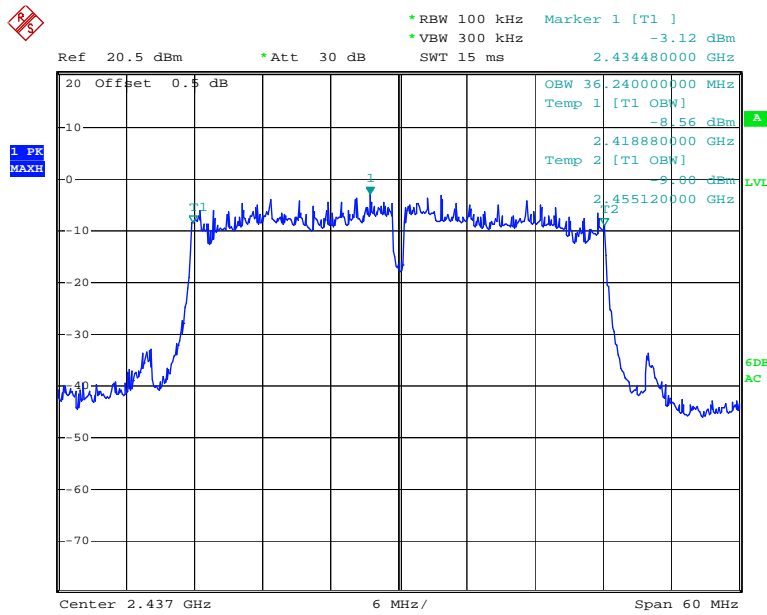
Date: 11.OCT.2011 11:39:53

802.11 n40 RF Output Power, Low Channel, Ant 0



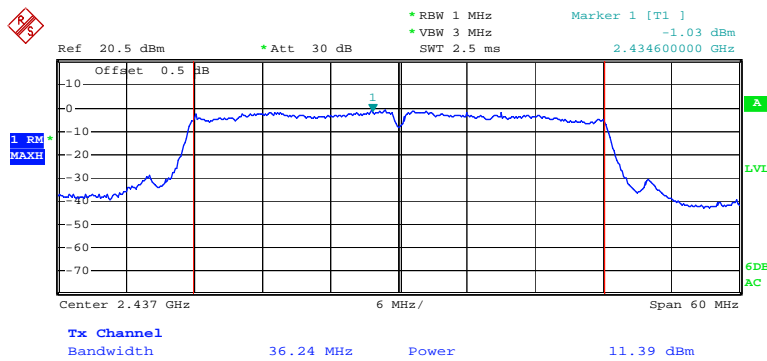
Date: 11.OCT.2011 11:51:39

802.11 n40 99% Occupied Bandwidth, Middle Channel, Ant 0



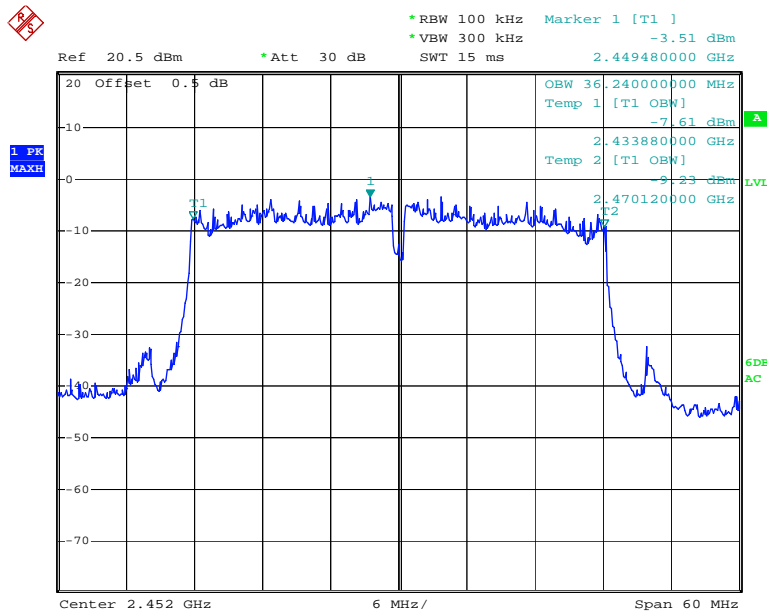
Date: 11.OCT.2011 12:03:35

802.11 n40 RF Output Power, Middle Channel, Ant 0



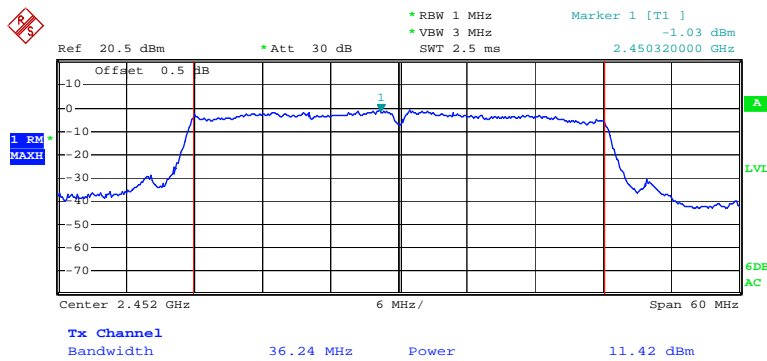
Date: 11.OCT.2011 12:24:49

802.11 n40 99% Occupied Bandwidth, High Channel, Ant 0



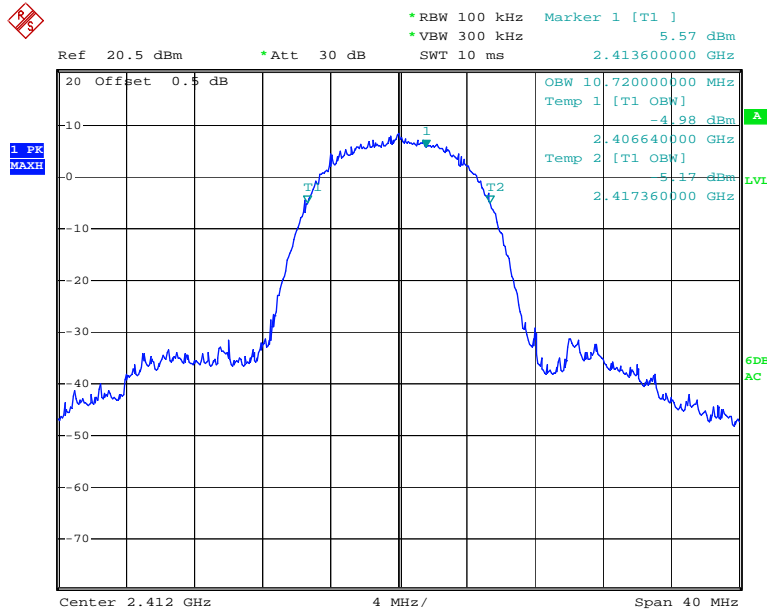
Date: 11.OCT.2011 13:02:52

802.11n40 RF Output Power, High Channel, Ant 0



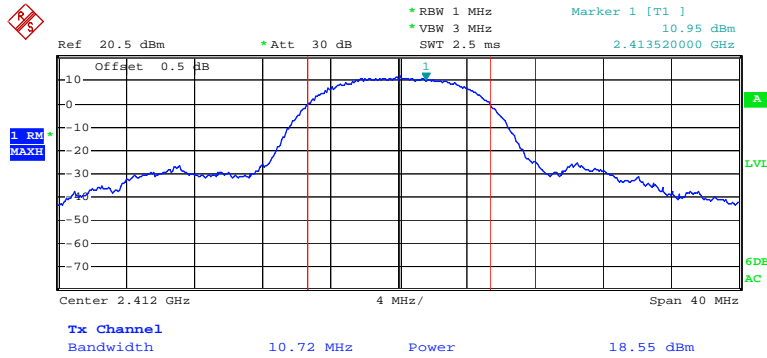
Date: 11.OCT.2011 13:34:44

802.11b 99% Occupied Bandwidth, Low Channel, Ant 1



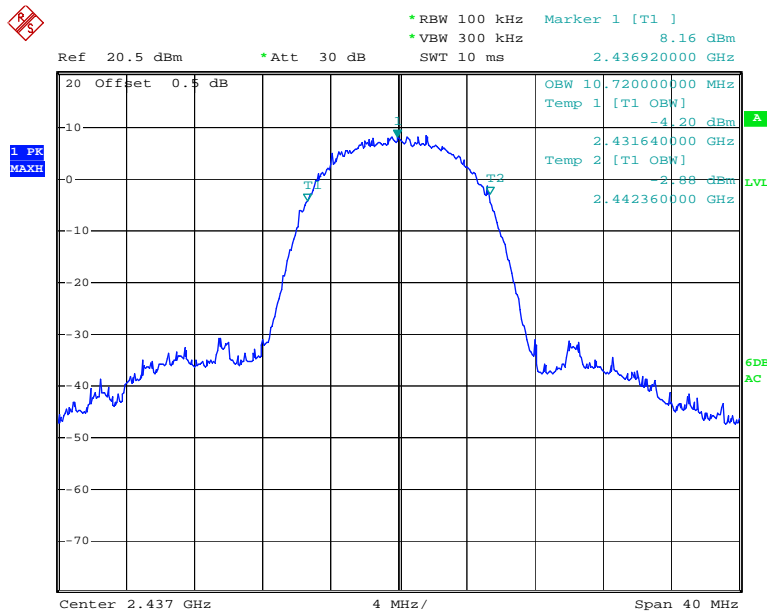
Date: 11.OCT.2011 13:53:08

802.11b RF Output Power, Low Channel, Ant 1



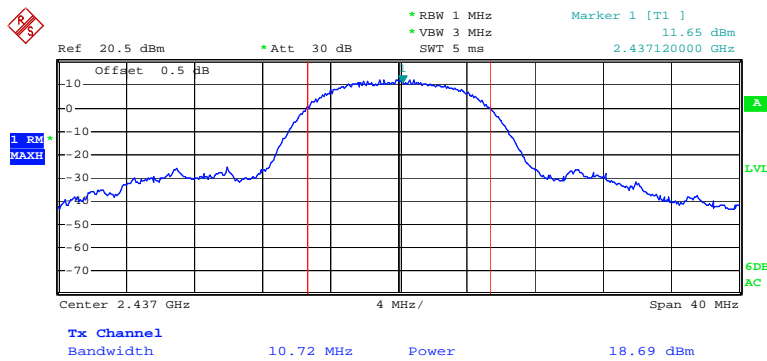
Date: 11.OCT.2011 14:05:15

802.11b 99% Occupied Bandwidth, Middle Channel, Ant 1



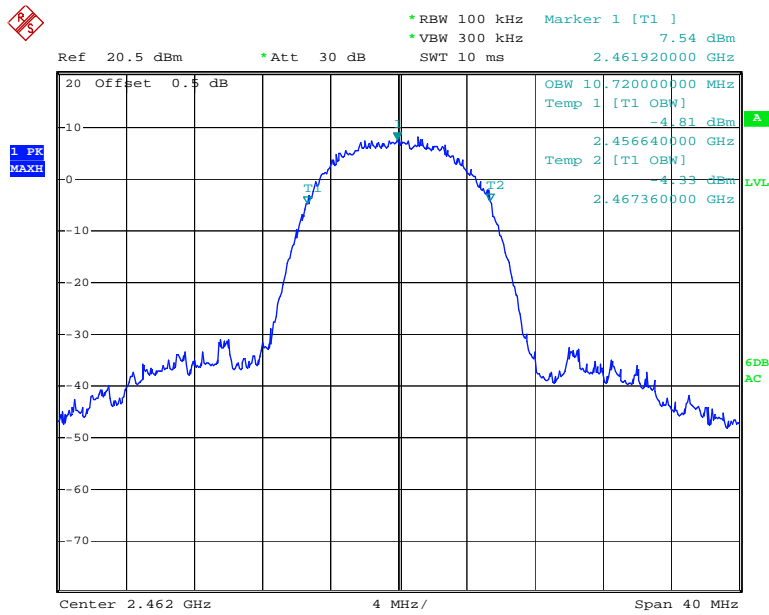
Date: 11.OCT.2011 14:43:58

802.11b RF Output Power, Middle Channel, Ant 1



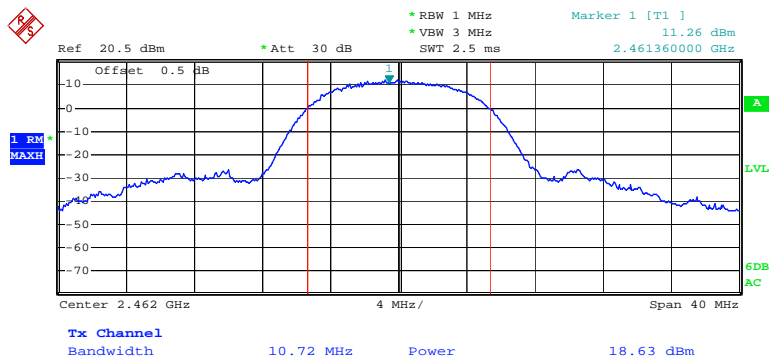
Date: 11.OCT.2011 14:47:18

802.11b 99% Occupied Bandwidth, High Channel, Ant 1



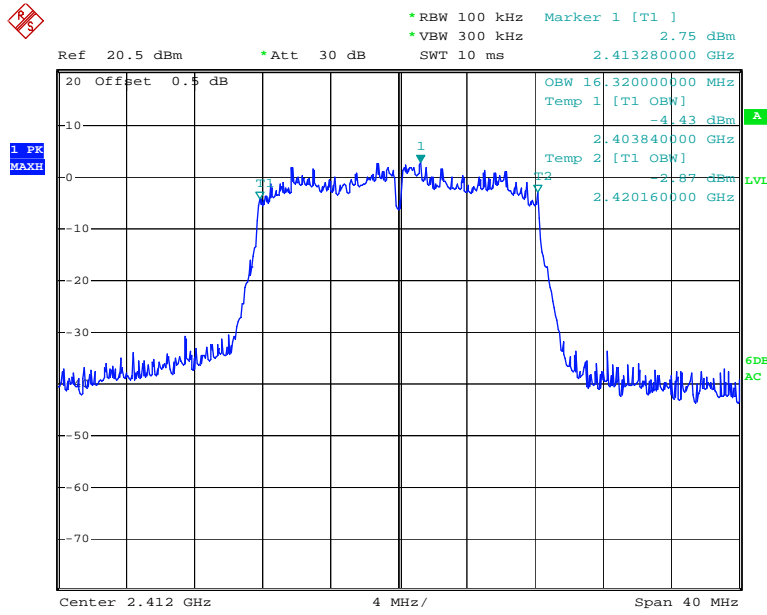
Date: 11.OCT.2011 14:53:28

802.11b RF Output Power, High Channel, Ant 1



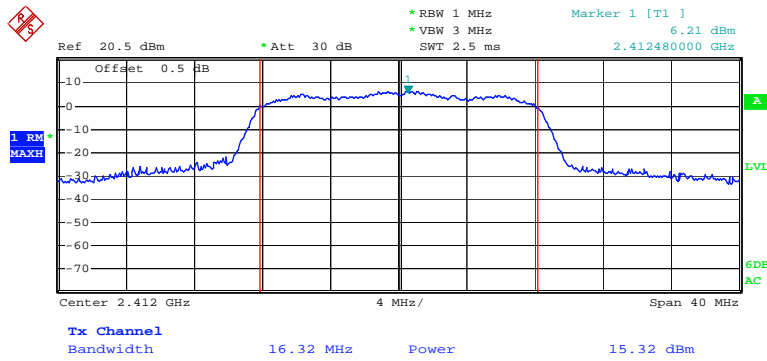
Date: 11.OCT.2011 15:40:29

802.11g 99% Occupied Bandwidth, Low Channel, Ant 1



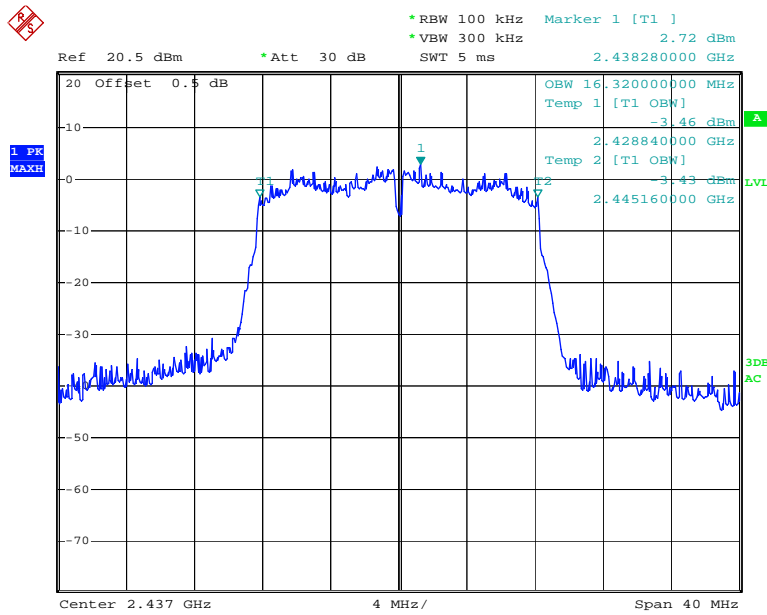
Date: 11.OCT.2011 15:47:10

802.11g RF Output Power, Low Channel, Ant 1



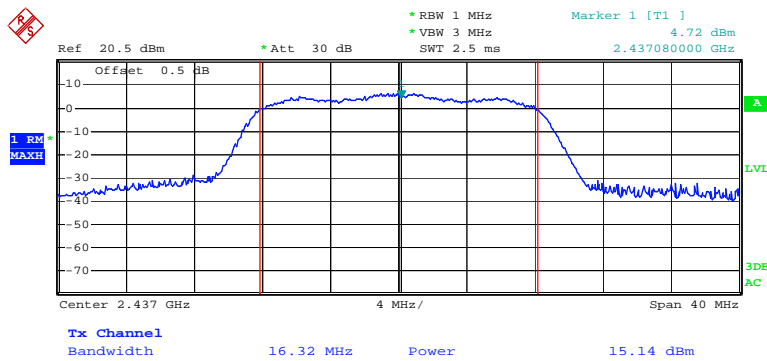
Date: 11.OCT.2011 18:53:50

802.11g 99% Occupied Bandwidth, Middle Channel, Ant 1



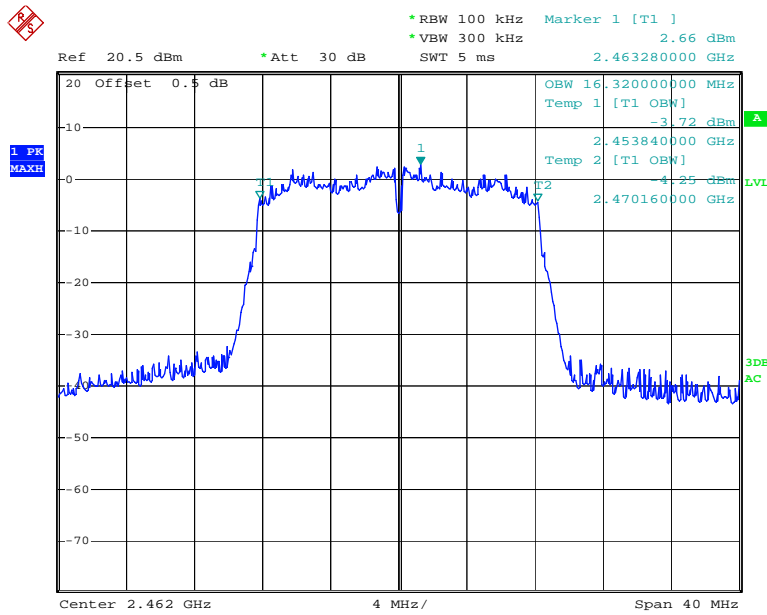
Date: 13.OCT.2011 14:39:59

802.11g RF Output Power, Middle Channel, Ant 1



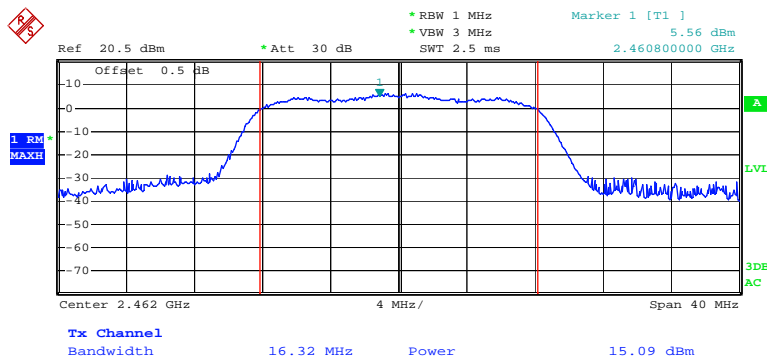
Date: 13.OCT.2011 14:45:04

802.11g 99% Occupied Bandwidth, High Channel, Ant 1



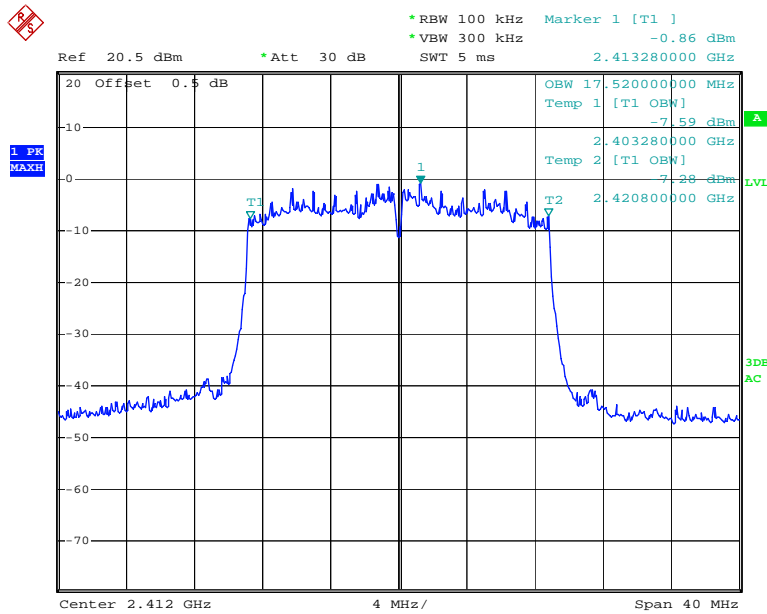
Date: 13.OCT.2011 15:14:22

802.11g RF Output Power, High Channel, Ant 1



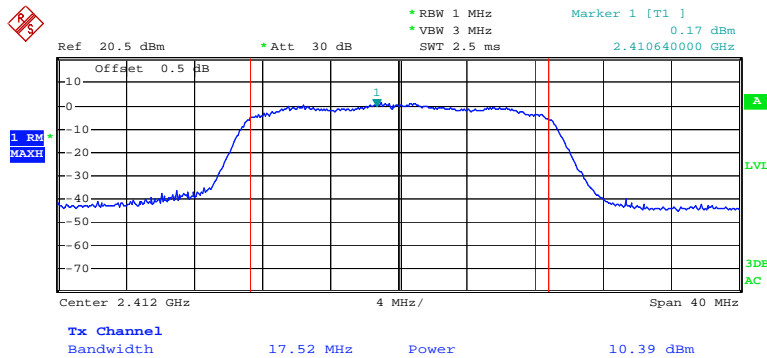
Date: 13.OCT.2011 15:56:52

802.11n20 99% Occupied Bandwidth, Low Channel, Ant 1



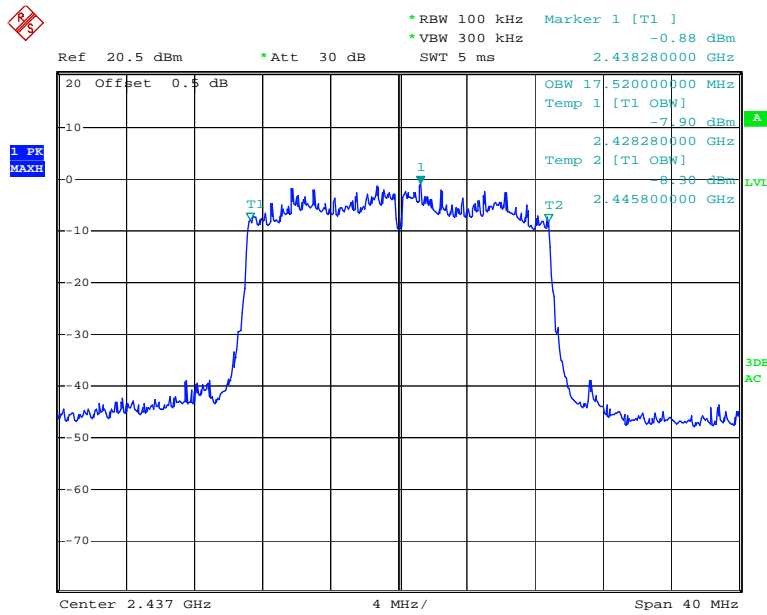
Date: 13.OCT.2011 16:38:48

802.11n20 RF Output Power, Low Channel, Ant 1



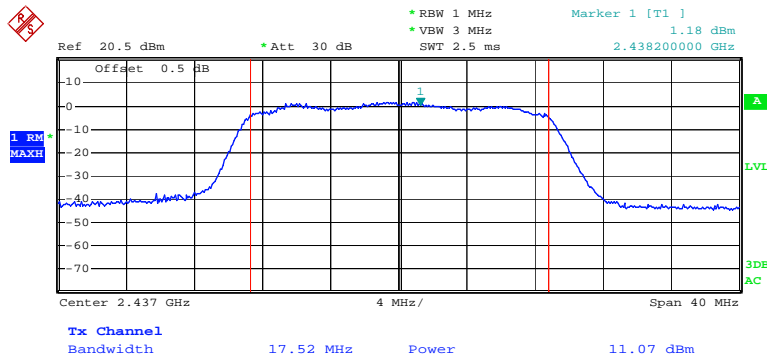
Date: 13.OCT.2011 17:39:14

802.11n20b 99% Occupied Bandwidth, Middle Channel, Ant 1



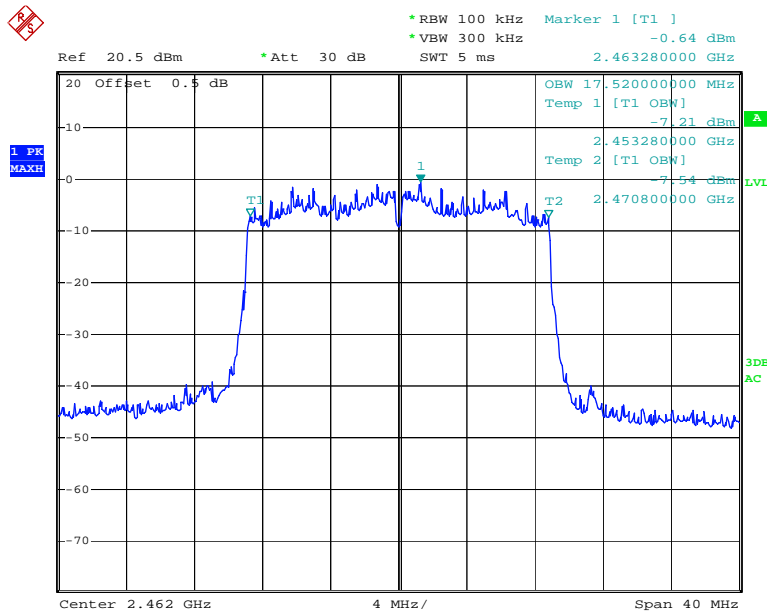
Date: 13.OCT.2011 17:44:04

802.11n20 RF Output Power, Middle Channel, Ant 1



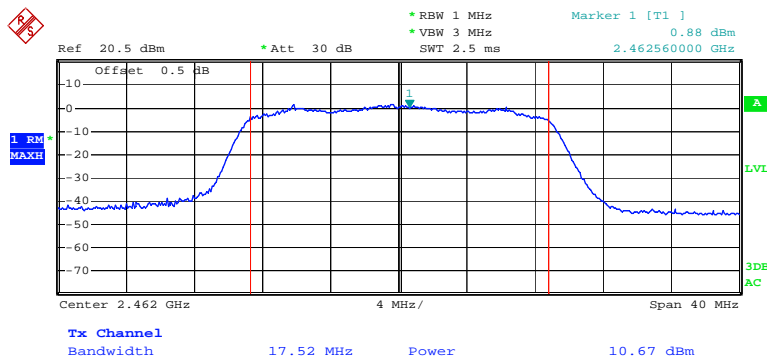
Date: 13.OCT.2011 17:58:59

802.11n20 99% Occupied Bandwidth, High Channel, Ant 1



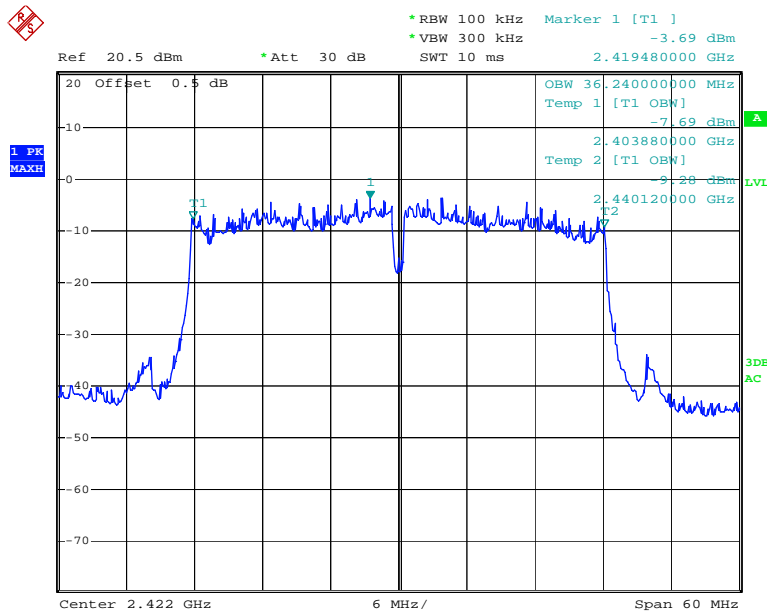
Date: 13.OCT.2011 18:11:48

802.11n20 RF Output Power, High Channel, Ant 1



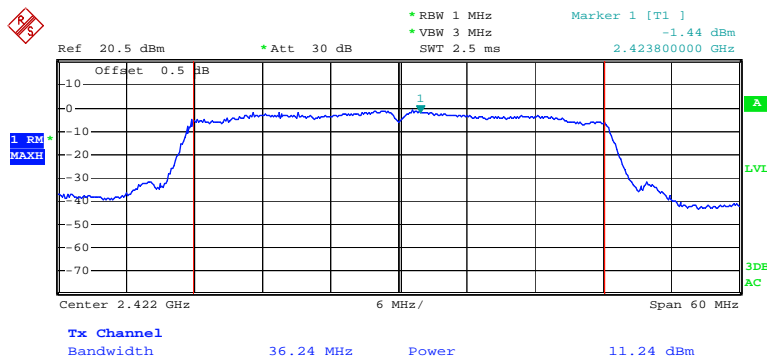
Date: 13.OCT.2011 18:25:27

802.11 n40 99% Occupied Bandwidth, Low Channel, Ant 1



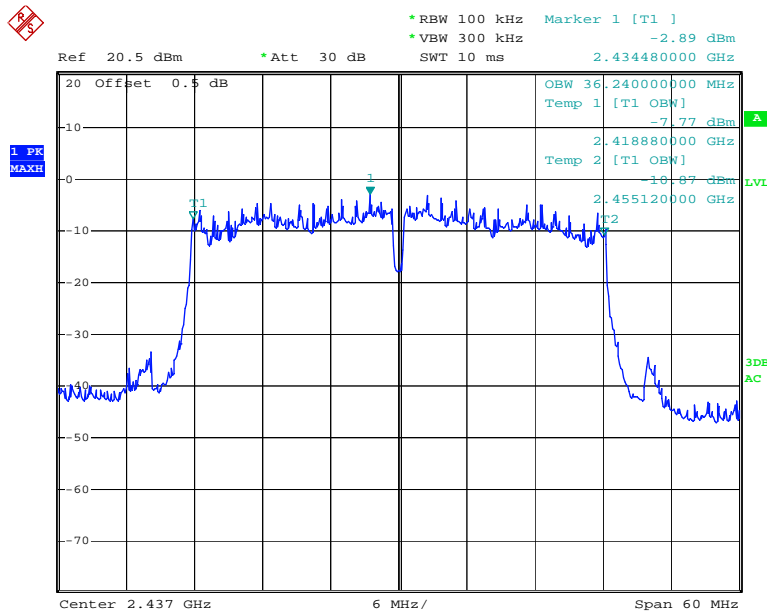
Date: 13.OCT.2011 18:56:34

802.11 n40 RF Output Power, Low Channel, Ant 1



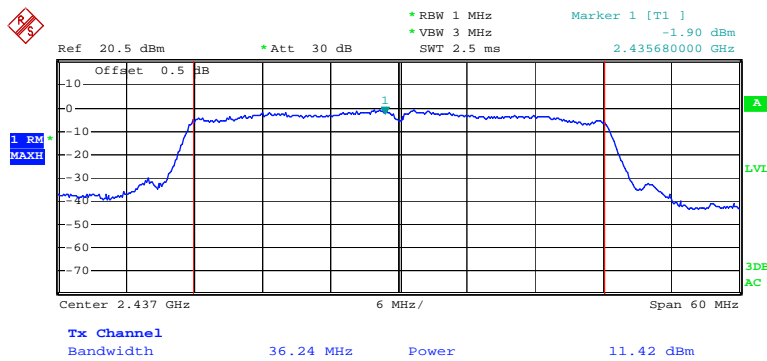
Date: 13.OCT.2011 19:07:07

802.11 n40 99% Occupied Bandwidth, Middle Channel, Ant 1



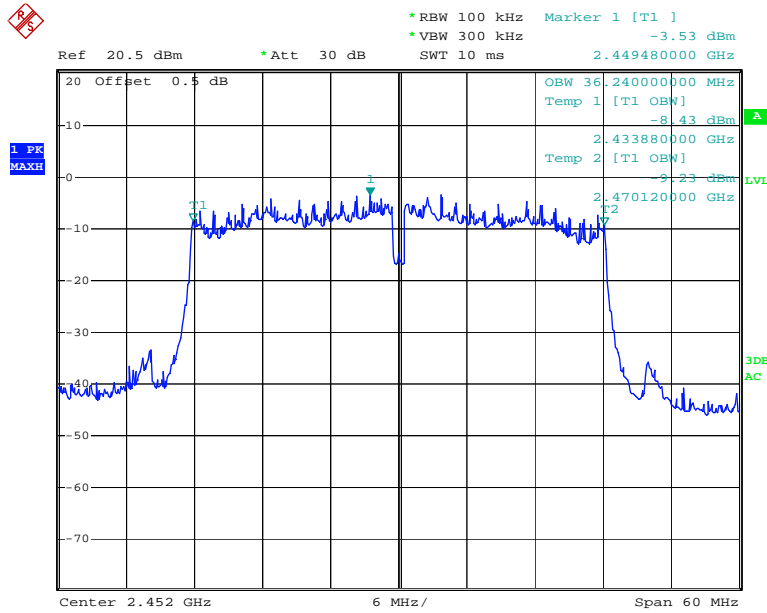
Date: 13.OCT.2011 19:12:25

802.11 n40 RF Output Power, Middle Channel, Ant 1



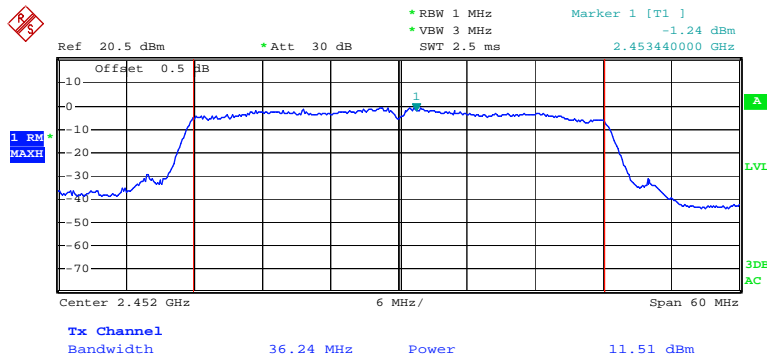
Date: 13.OCT.2011 19:28:57

802.11 n40 99% Occupied Bandwidth, High Channel, Ant 1



Date: 13.OCT.2011 20:05:45

802.11n40 RF Output Power, High Channel, Ant 1



Date: 13.OCT.2011 20:06:33

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

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen from 2011-10-10 to 2011-10-13

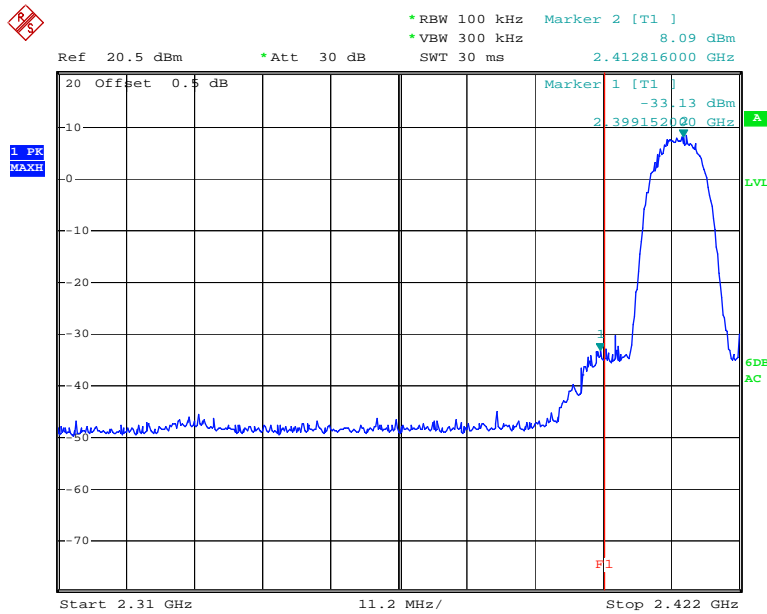
Test Result: *Compliance*

Antenna 0

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
802.11b				
Low	2399.152	41.22	20	Pass
High	2484.544	53.91	20	Pass
802.11g				
Low	2399.376	37.81	20	Pass
High	2483.680	45.30	20	Pass
802.11n20				
Low	2399.600	37.19	20	Pass
High	2488.672	44.33	20	Pass
802.11n40				
Low	2399.496	31.61	20	Pass
High	2484.632	35.93	20	Pass

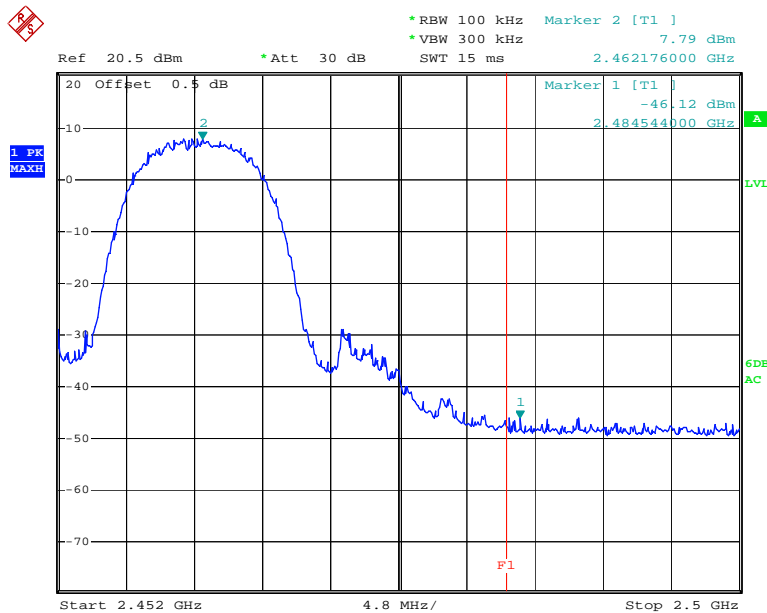
Please refer to following plots.

802.11b: Band Edge, Left Side



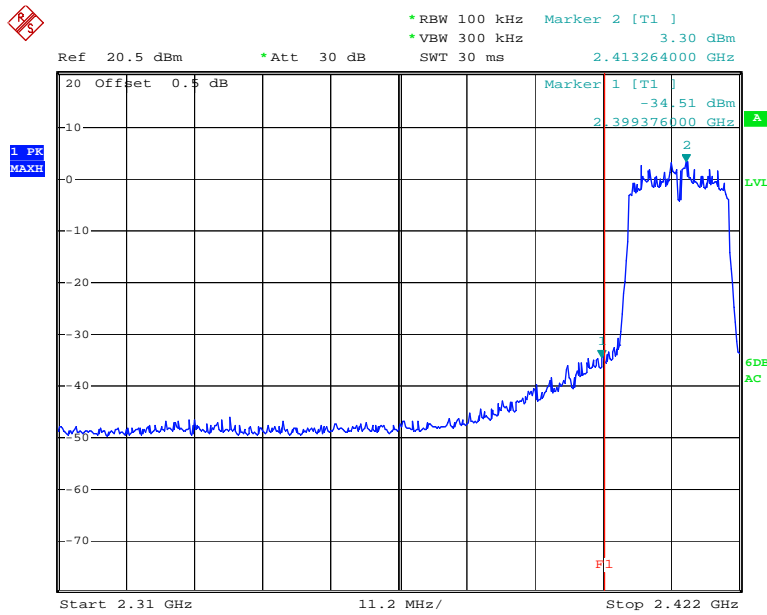
Date: 10.OCT.2011 17:00:02

802.11b: Band Edge, Right Side



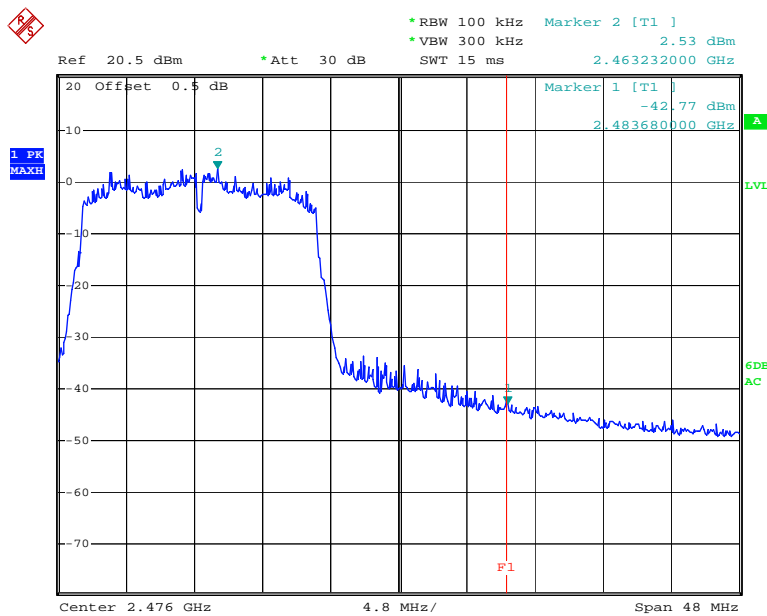
Date: 10.OCT.2011 17:41:34

802.11g: Band Edge, Left Side



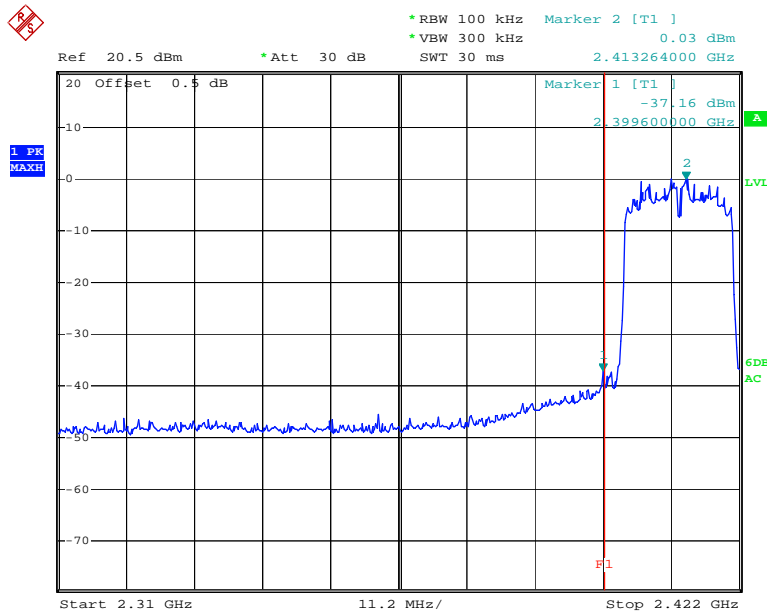
Date: 10.OCT.2011 18:39:49

802.11g: Band Edge, Right Side



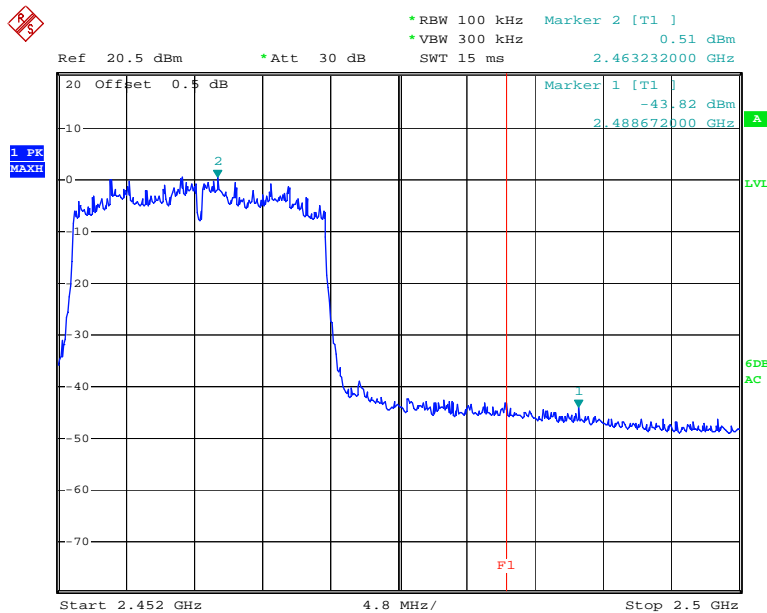
Date: 11.OCT.2011 10:24:24

802.11n20: Band Edge, Left Side



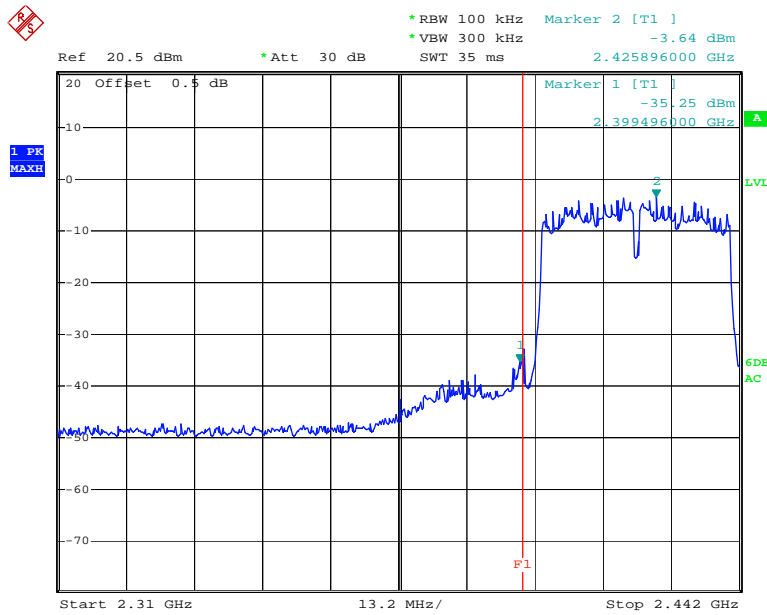
Date: 11.OCT.2011 10:44:41

802.11n20: Band Edge, Right Side



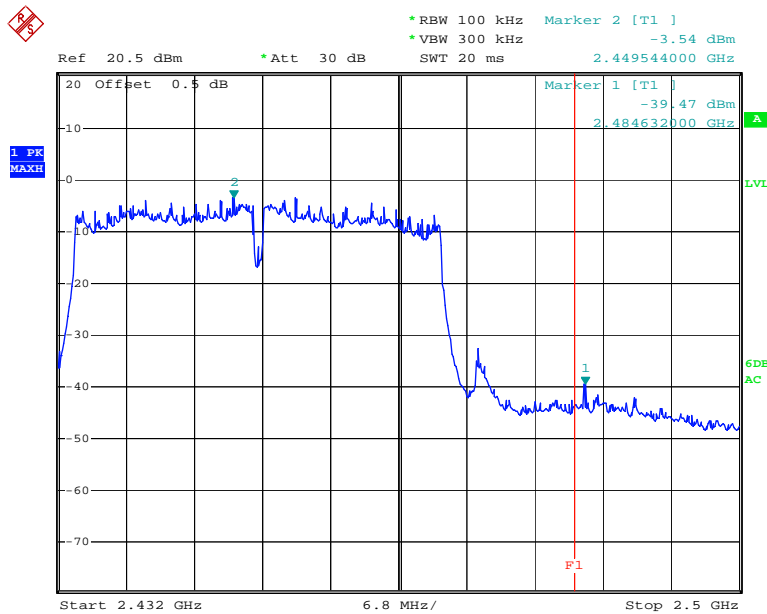
Date: 11.OCT.2011 11:30:23

802.11n40: Band Edge, Left Side



Date: 11.OCT.2011 11:53:22

802.11n40: Band Edge, Right Side



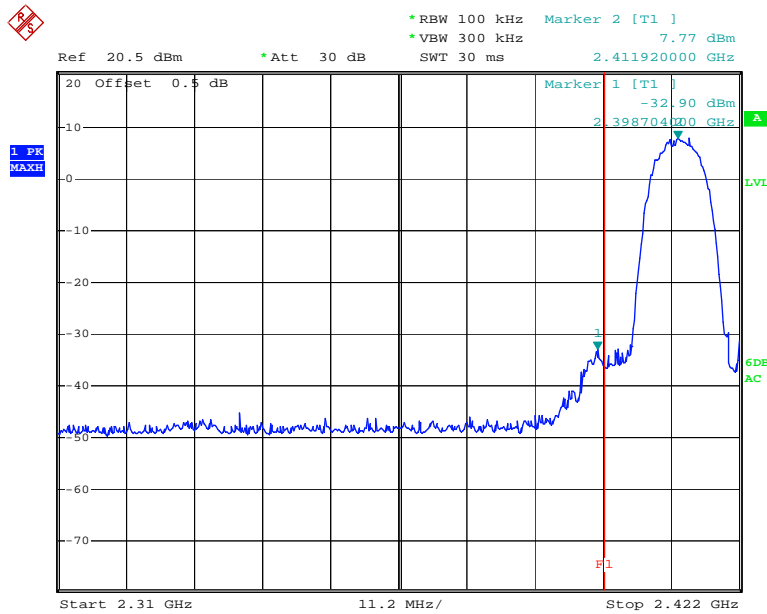
Date: 11.OCT.2011 13:36:25

Antenna 1

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
802.11b				
Low	2398.704	40.67	20	Pass
High	2484.832	54.83	20	Pass
802.11g				
Low	2399.376	34.58	20	Pass
High	2485.984	46.13	20	Pass
802.11n20				
Low	2399.152	41.09	20	Pass
High	2485.696	44.33	20	Pass
802.11n40				
Low	2399.496	31.85	20	Pass
High	2484.496	39.67	20	Pass

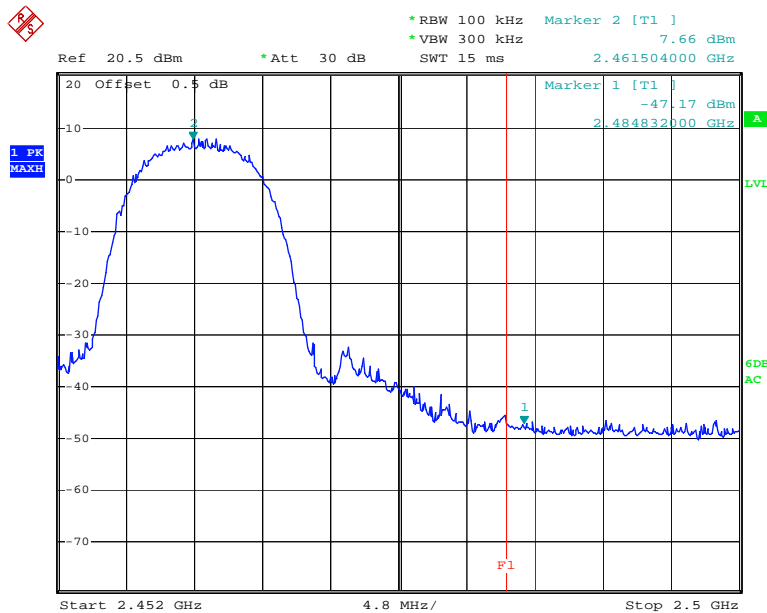
Please refer to following plots.

802.11b: Band Edge, Left Side



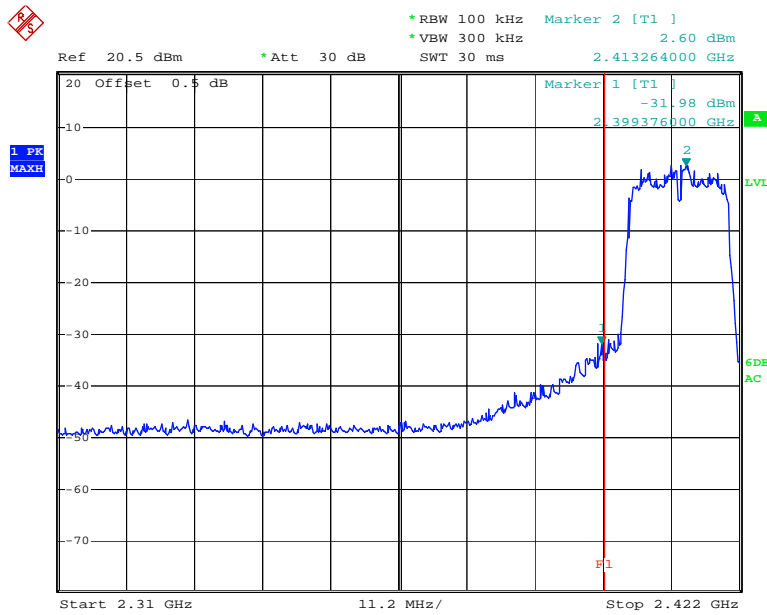
Date: 11.OCT.2011 14:06:29

802.11b: Band Edge, Right Side



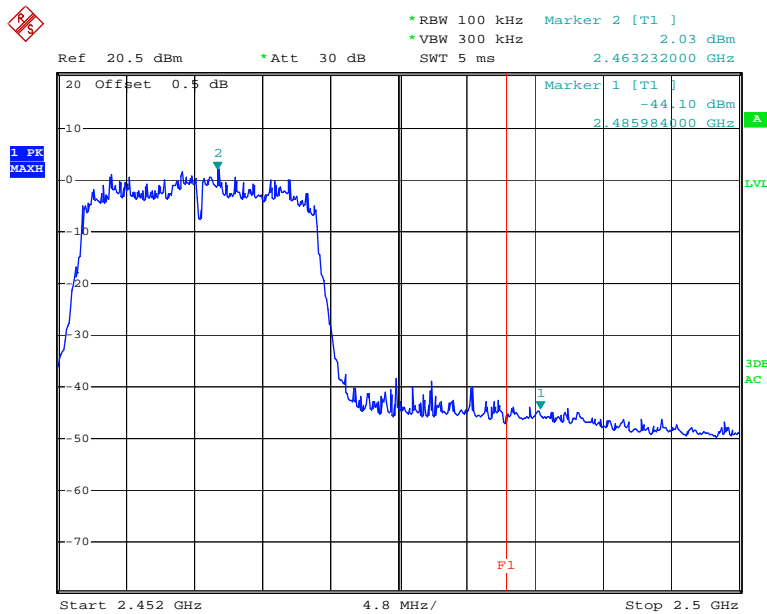
Date: 11.OCT.2011 15:41:10

802.11g: Band Edge, Left Side



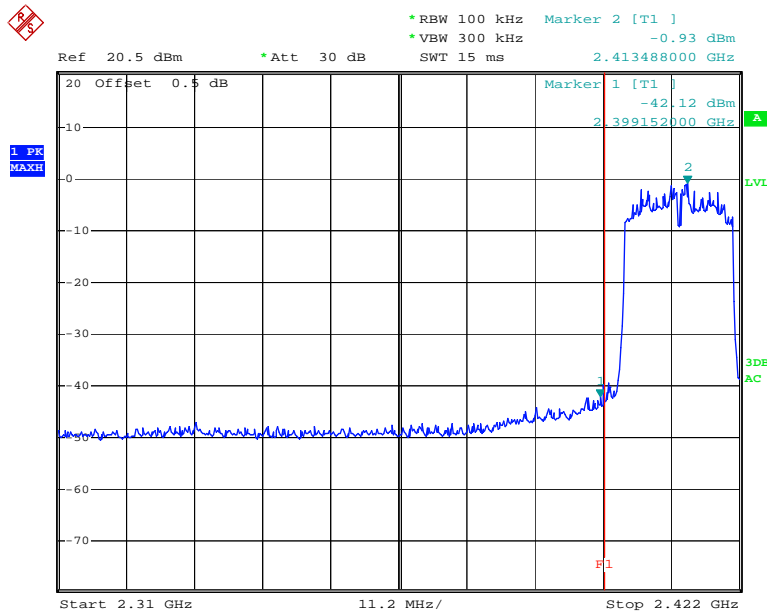
Date: 11.OCT.2011 19:09:31

802.11g: Band Edge, Right Side



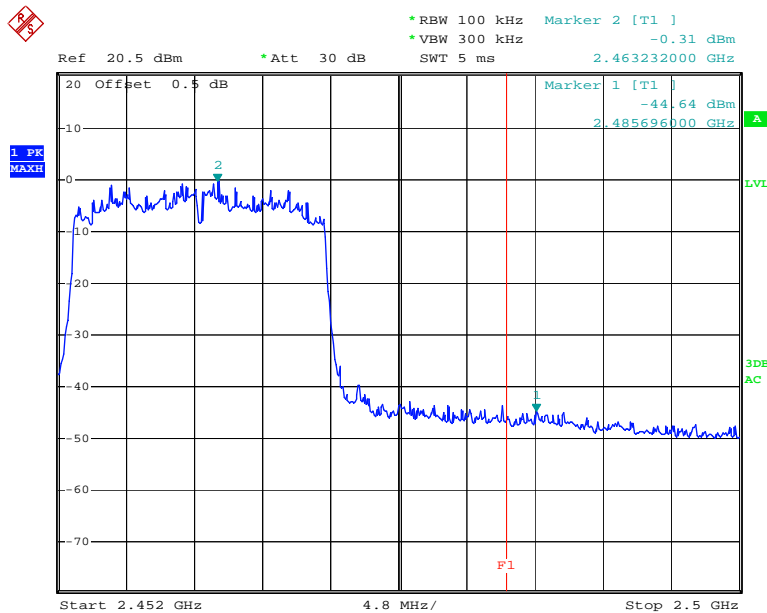
Date: 13.OCT.2011 15:57:45

802.11n20: Band Edge, Left Side



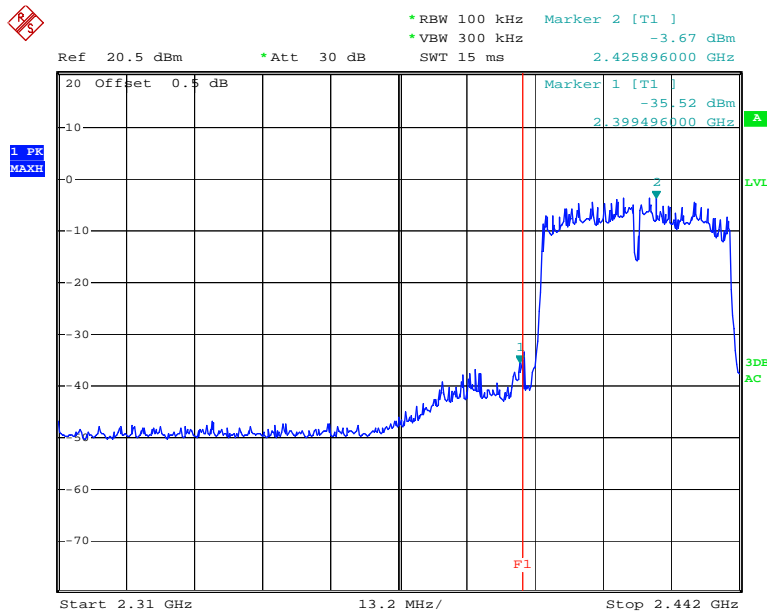
Date: 13.OCT.2011 17:40:21

802.11n20: Band Edge, Right Side



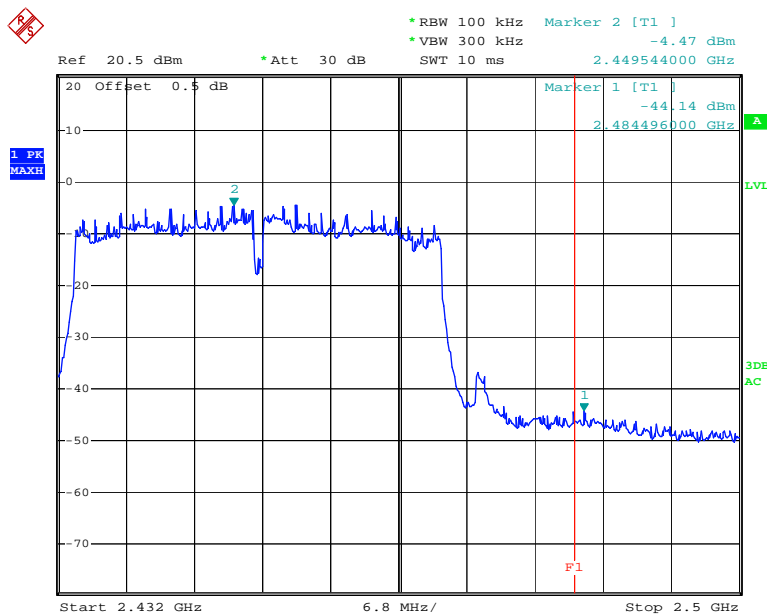
Date: 13.OCT.2011 18:30:23

802.11n40: Band Edge, Left Side



Date: 13.OCT.2011 19:08:16

802.11n40: Band Edge, Right Side



Date: 13.OCT.2011 20:07:28

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Leon Chen from 2011-10-10 to 2011-10-13.

Test Mode: Transmitting

Test Result: Pass

Antenna 0

Channel	Frequency (MHz)	Data Rate (Mbps)	PSD (dBm)	Limit (dBm)	Result
802.11 b					
Low	2412	1	-5.79	8	pass
Middle	2437	1	-6.31	8	pass
High	2462	1	-5.60	8	pass
802.11 g					
Low	2412	6	-10.72	8	pass
Middle	2437	6	-10.22	8	pass
High	2462	6	-10.95	8	pass
802.11n20					
Low	2412	6.5	-14.37	8	pass
Middle	2437	6.5	-14.35	8	pass
High	2462	6.5	-14.00	8	pass
802.11n40					
Low	2422	13.5	-22.03	8	pass
Middle	2437	6135	-21.62	8	pass
High	2452	13.5	-21.65	8	pass

Antenna 1

Channel	Frequency (MHz)	Data Rate (Mbps)	SPD (dBm)	Limit (dBm)	Result
802.11 b					
Low	2412	1	-4.71	8	pass
Middle	2437	1	-4.04	8	pass
High	2462	1	-4.39	8	pass
802.11 g					
Low	2412	6	-10.43	8	pass
Middle	2437	6	-10.72	8	pass
High	2462	6	-10.55	8	pass
802.11n20					
Low	2412	6.5	-15.80	8	pass
Middle	2437	6.5	-15.69	8	pass
High	2462	6.5	-15.47	8	pass
802.11n40					
Low	2422	13.5	-21.92	8	pass
Middle	2437	6135	-21.76	8	pass
High	2452	13.5	-21.64	8	pass

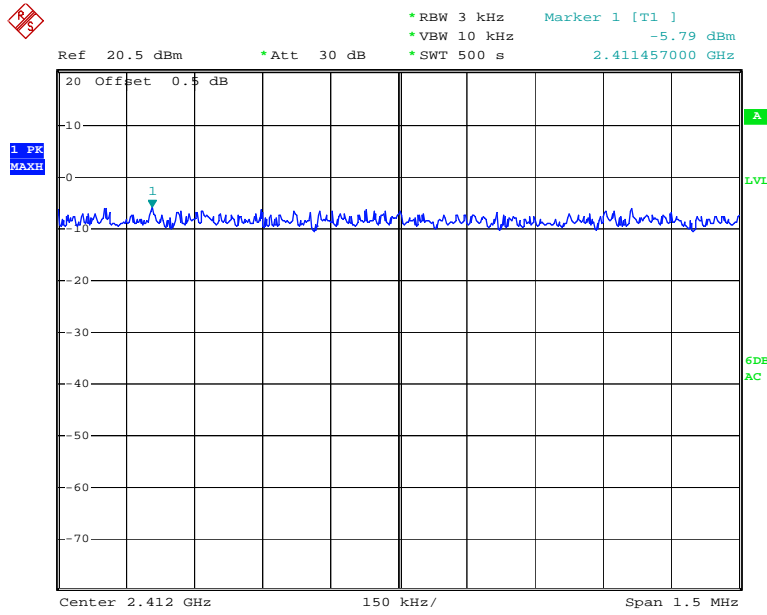
Antenna 0+Antenna 1(MIMO)

Channel	Frequency (MHz)	Data Rate (Mbps)	PSD (dBm)	Limit (dBm)	Result
802.11n20					
Low	2412	6.5	-12.02	8	pass
Middle	2437	6.5	-11.96	8	pass
High	2462	6.5	-11.66	8	pass
802.11n40					
Low	2422	13.5	-18.96	8	pass
Middle	2437	13.5	-18.68	8	pass
High	2452	13.5	-18.63	8	pass

Note: The antenna gain is 2 dBi.

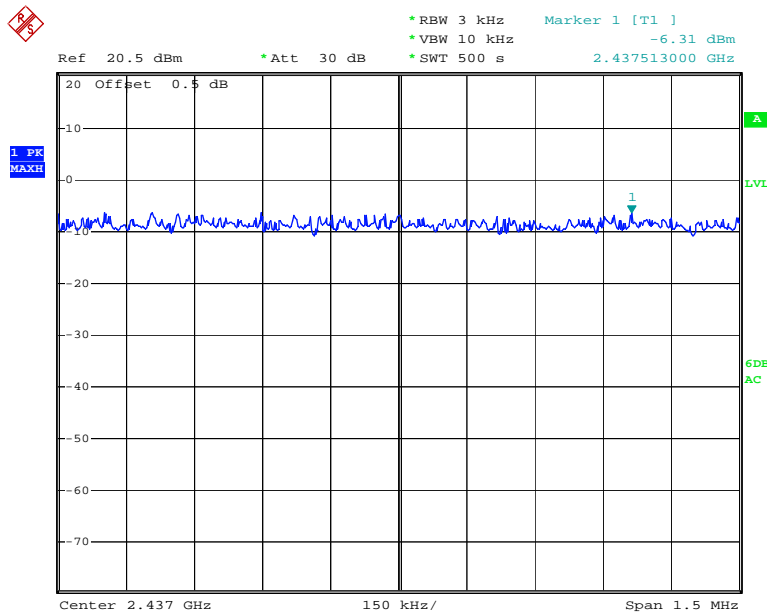
Please refer to the following plots.

Power Spectral Density, 802.11b Low Channel, Ant 0



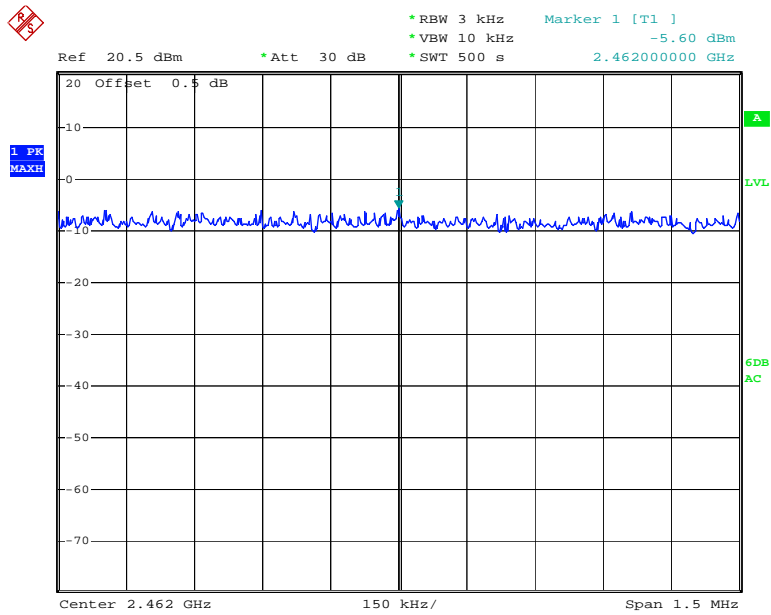
Date: 10.OCT.2011 16:51:42

Power Spectral Density, 802.11b Middle Channel, Ant 0



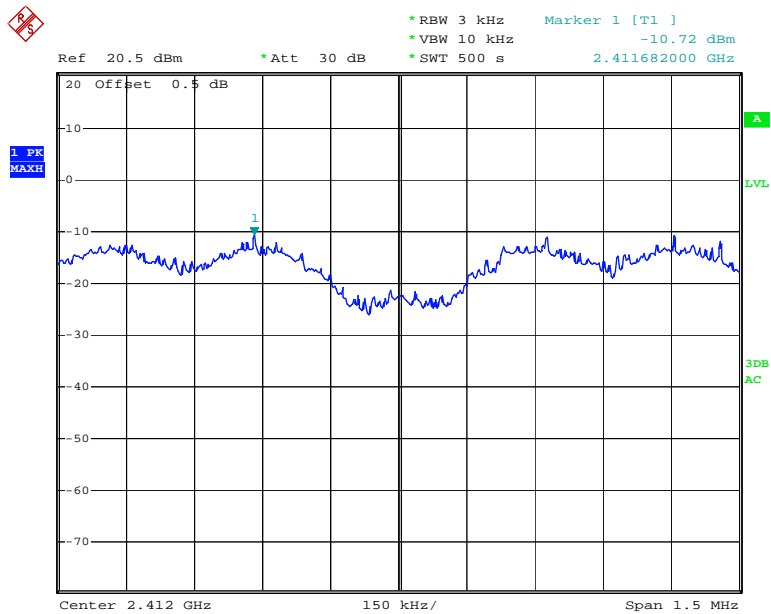
Date: 10.OCT.2011 17:24:32

Power Spectral Density, 802.11b High Channel, Ant 0



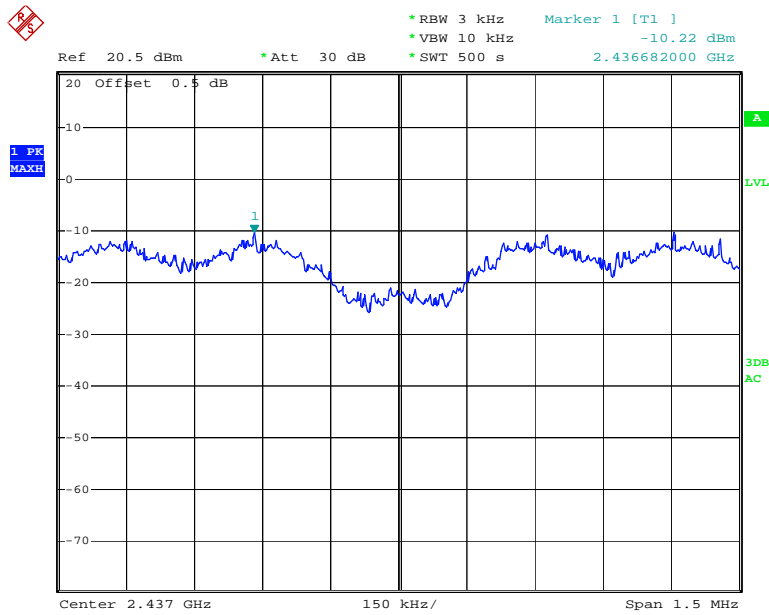
Date: 10.OCT.2011 17:40:02

Power Spectral Density, 802.11g Low Channel, Ant 0



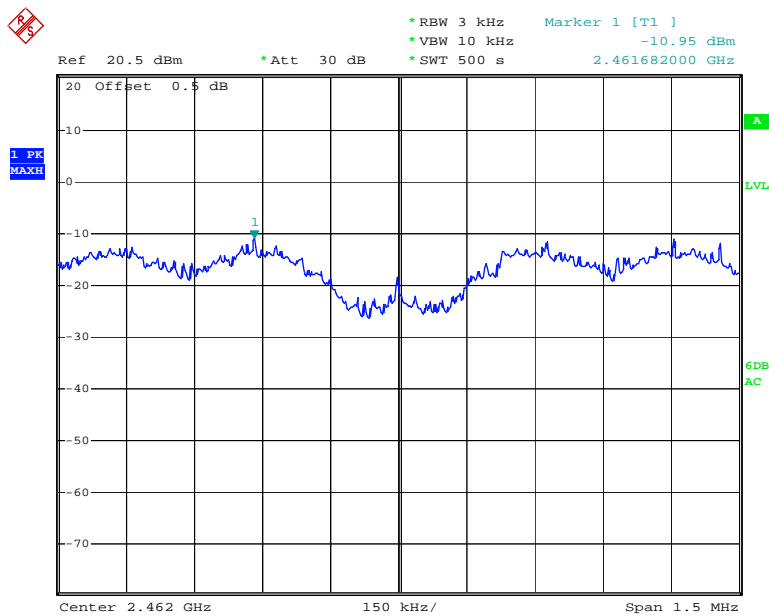
Date: 13.OCT.2011 20:37:13

Power Spectral Density, 802.11g Middle Channel, Ant 0



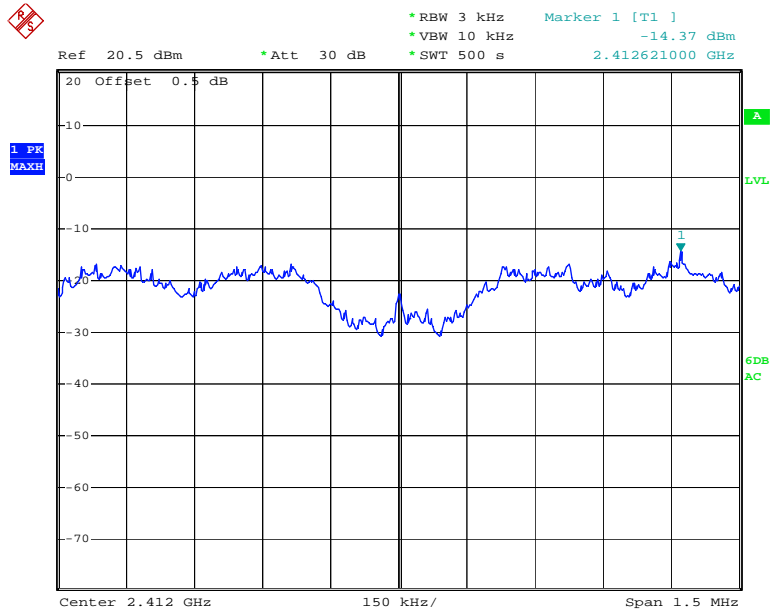
Date: 13.OCT.2011 20:49:16

Power Spectral Density, 802.11g High Channel, Ant 0



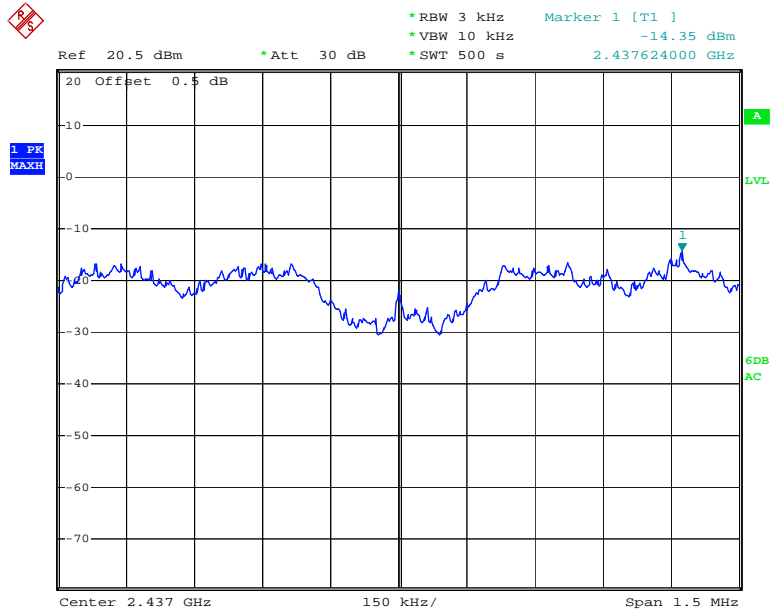
Date: 11.OCT.2011 10:20:46

Power Spectral Density, 802.11n20 Low Channel, Ant 0



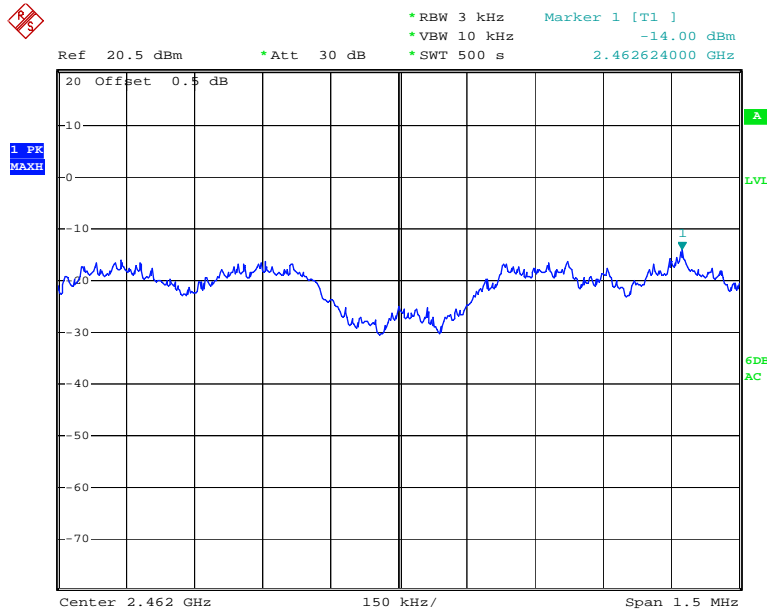
Date: 11.OCT.2011 10:41:11

Power Spectral Density, 802.11n20 Middle Channel, Ant 0



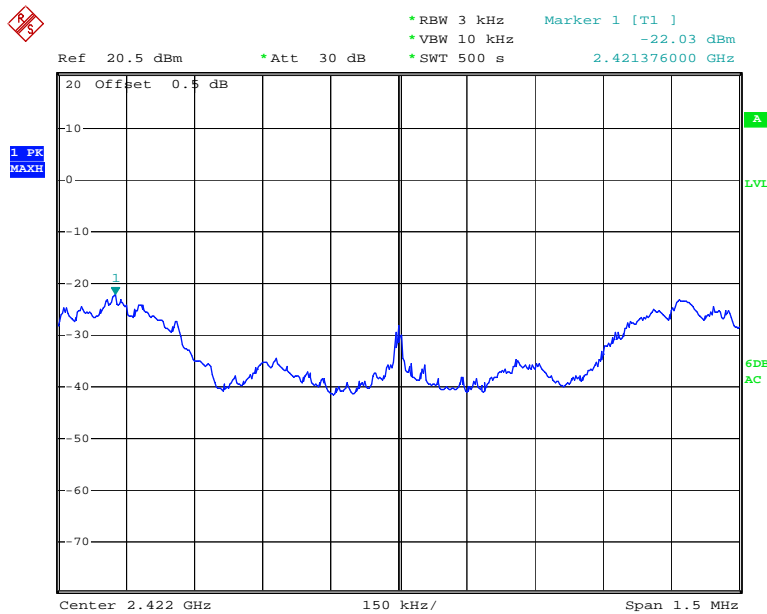
Date: 11.OCT.2011 10:59:58

Power Spectral Density, 802.11n20 High Channel, Ant 0



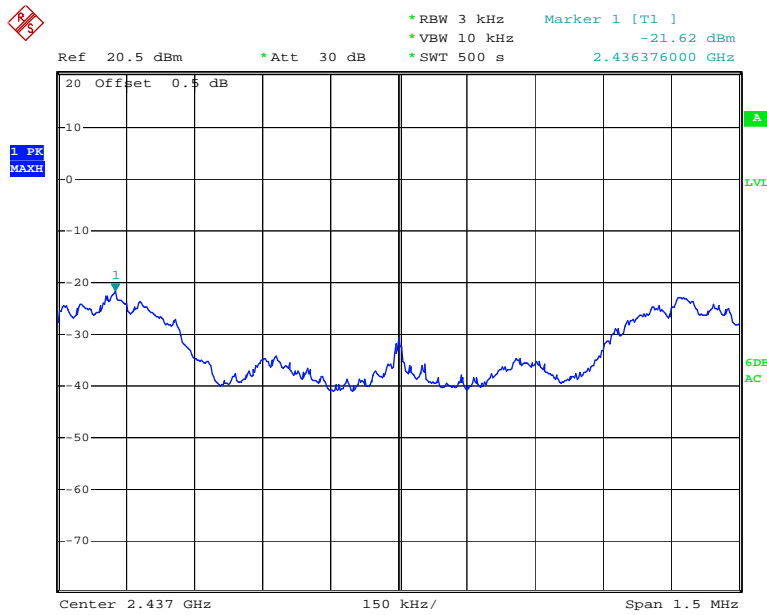
Date: 11.OCT.2011 11:20:17

Power Spectral Density, 802.11n40 Low Channel, Ant 0



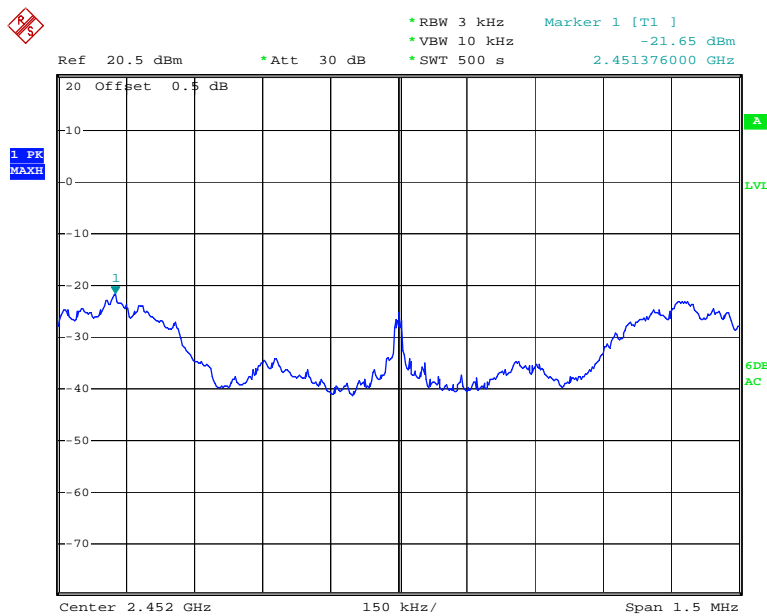
Date: 11.OCT.2011 11:49:10

Power Spectral Density, 802.11n40 Middle Channel, Ant 0



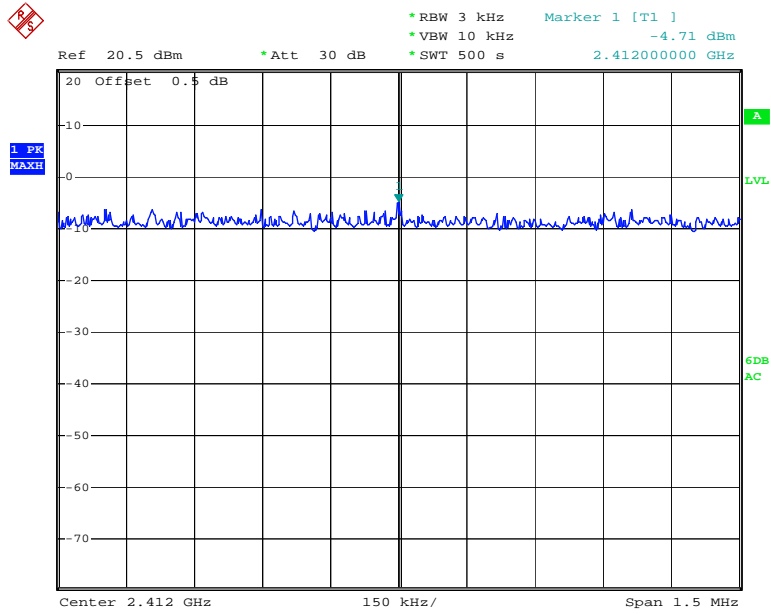
Date: 11.OCT.2011 12:22:53

Power Spectral Density, 802.11n40 High Channel, Ant 0



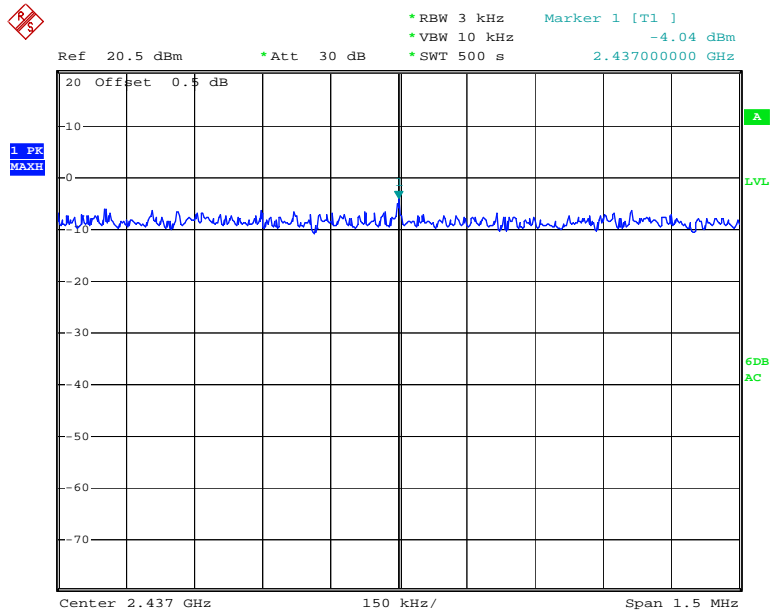
Date: 11.OCT.2011 13:32:53

Power Spectral Density, 802.11b Low Channel, Ant 1



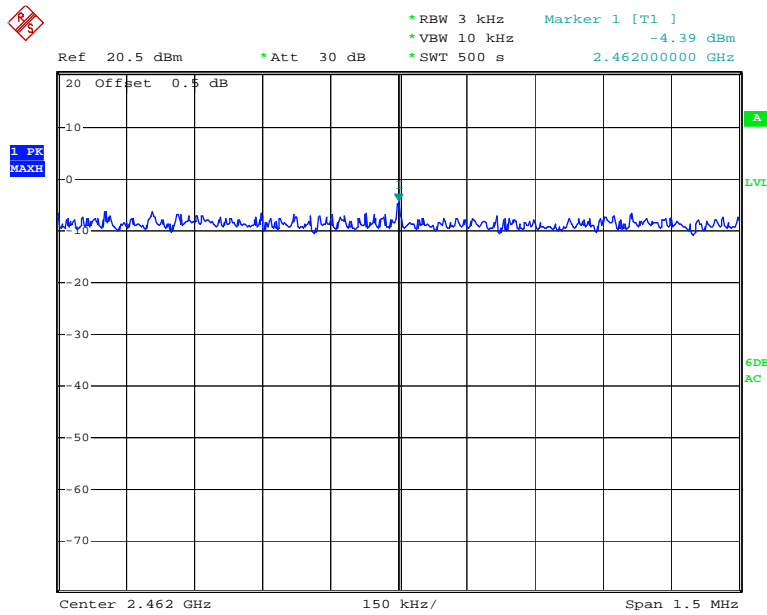
Date: 11.OCT.2011 14:03:03

Power Spectral Density, 802.11b Middle Channel, Ant 1



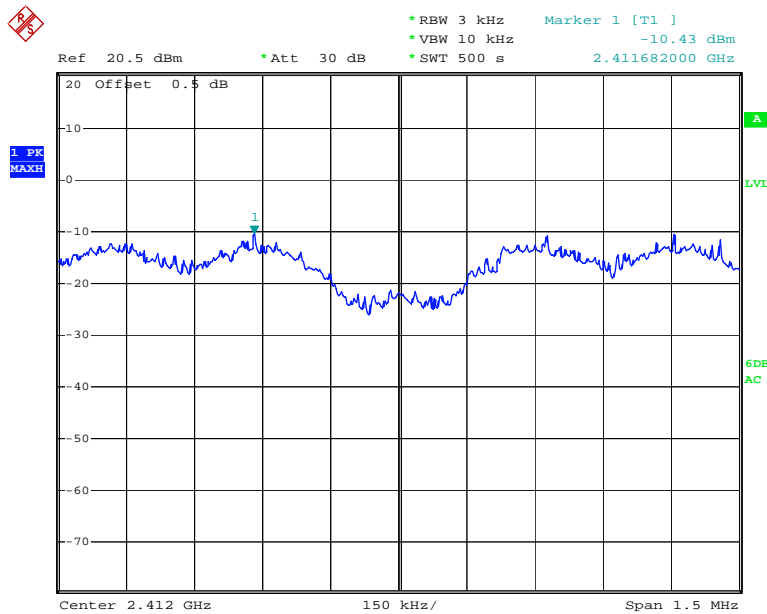
Date: 11.OCT.2011 14:40:48

Power Spectral Density, 802.11b High Channel, Ant 1



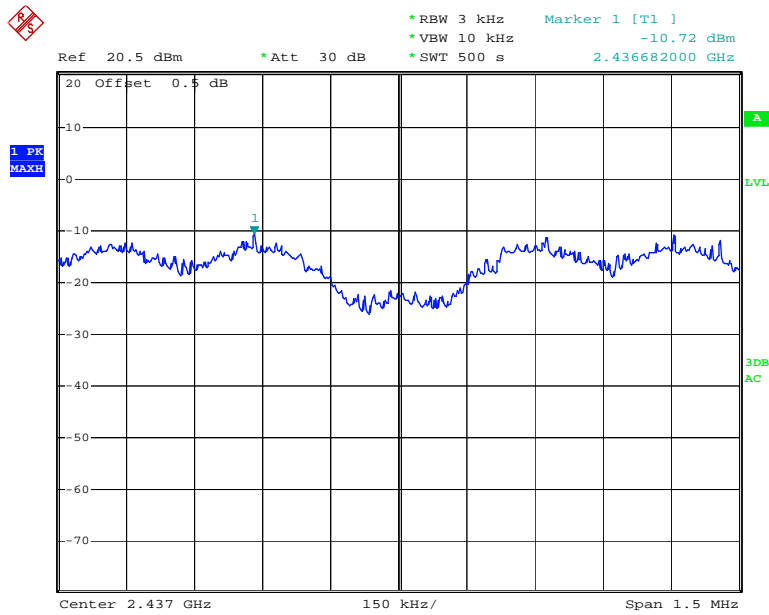
Date: 11.OCT.2011 15:38:39

Power Spectral Density, 802.11g Low Channel, Ant 1



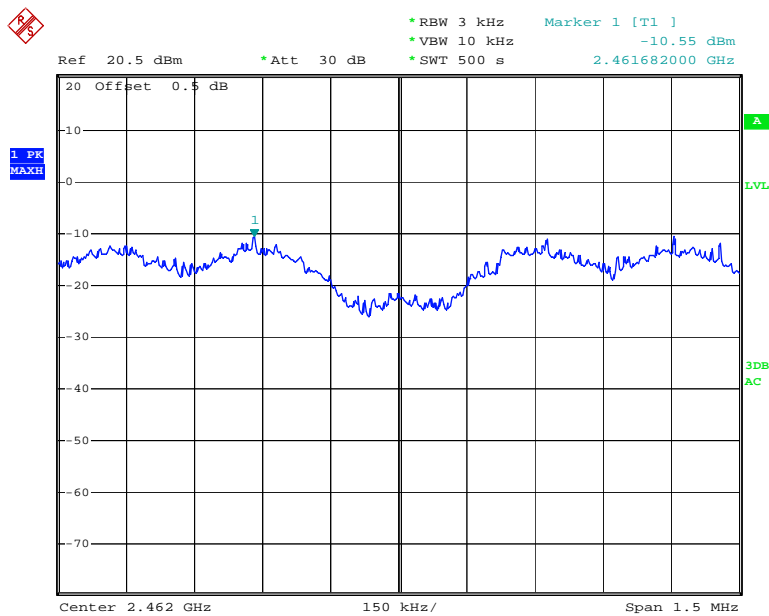
Date: 11.OCT.2011 19:08:39

Power Spectral Density, 802.11g Middle Channel, Ant 1



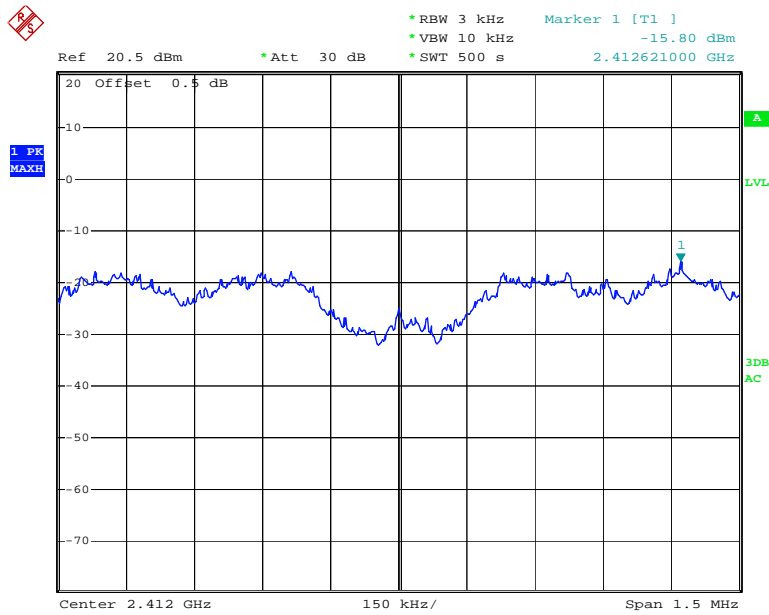
Date: 13.OCT.2011 14:38:53

Power Spectral Density, 802.11g High Channel, Ant 1



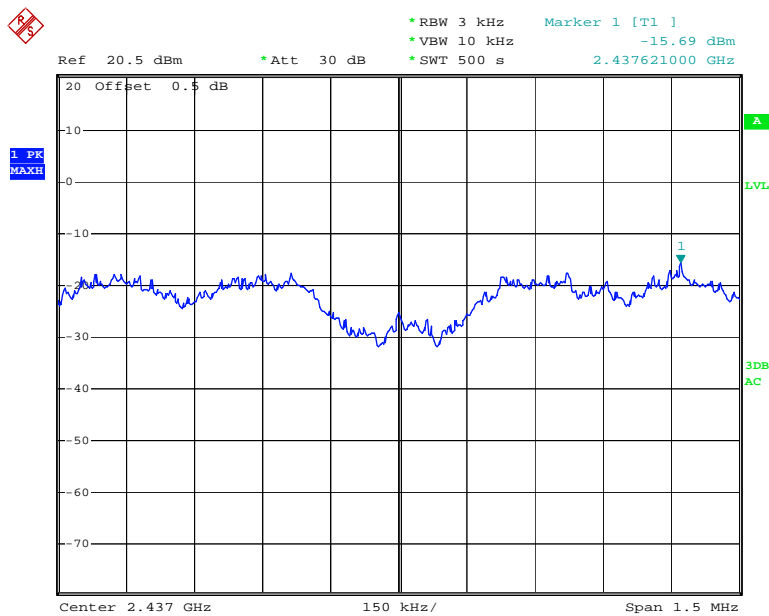
Date: 13.OCT.2011 15:55:31

Power Spectral Density, 802.11n20 Low Channel, Ant 1



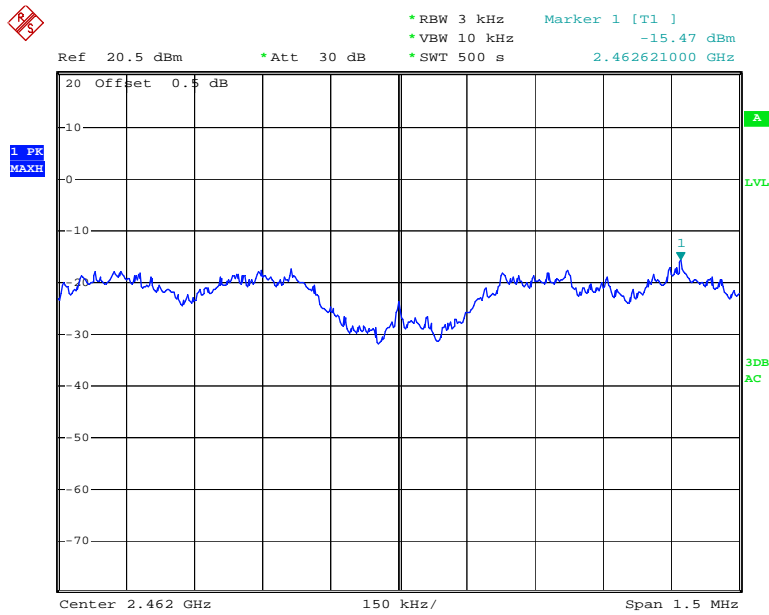
Date: 13.OCT.2011 17:37:26

Power Spectral Density, 802.11n20 Middle Channel, Ant 1



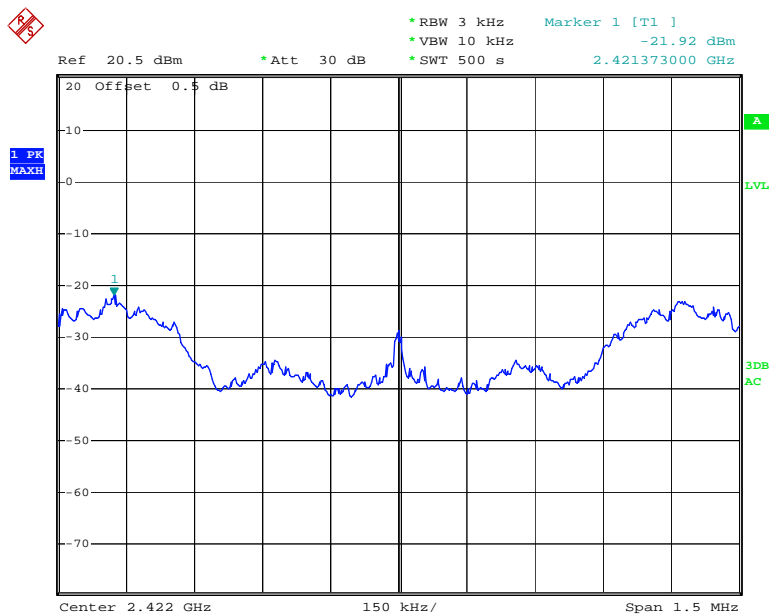
Date: 13.OCT.2011 17:55:58

Power Spectral Density, 802.11n20 High Channel, Ant 1



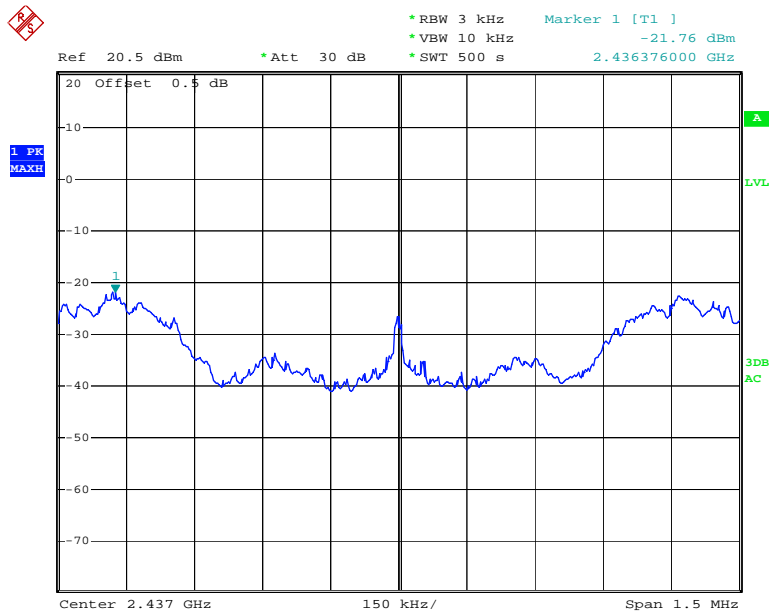
Date: 13.OCT.2011 18:23:40

Power Spectral Density, 802.11n40 Low Channel, Ant 1



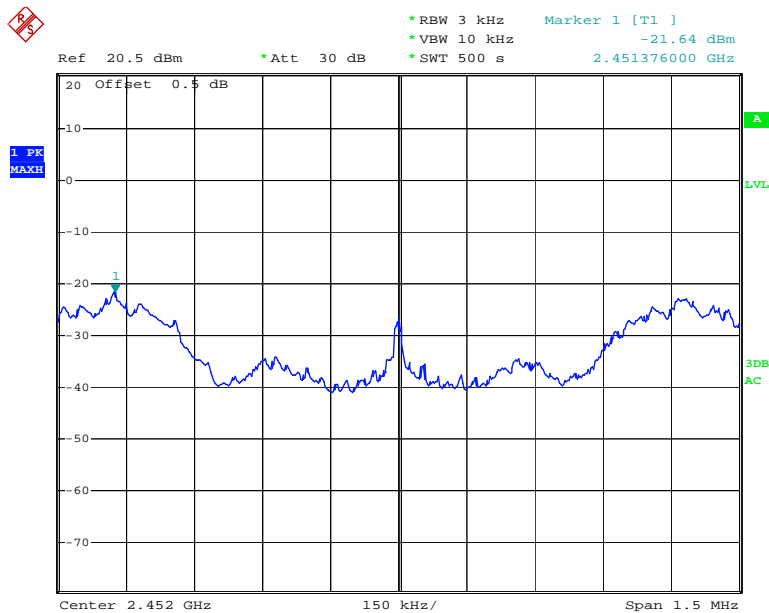
Date: 13.OCT.2011 19:05:58

Power Spectral Density, 802.11n40 Middle Channel, Ant 1



Date: 13.OCT.2011 19:27:59

Power Spectral Density, 802.11n40 High Channel, Ant 1



Date: 13.OCT.2011 20:04:21

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