Lab Code: 200707-0

FCC PART 15.247

TEST REPORT

For

SURGONICS LLC

640 LaSalle St., Suite 540, Chicago, IL 60654 USA

FCC ID: AVOR12010100

Report Type:	**Product Type:**
Original Report	Toy

Test Engineer:	Dean Liu
Report Number:	R1DG120209002-00A
Report Date:	2012-06-12
Reviewed By:	Ivan Cao EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SURGONICS LLC*'s product, model number: *R1201-01 (FCC ID: AVOR12010100) or* ("EUT") in this report is a Toy (named as iRabot by applicant), which was measured approximately: 9.0 cm (L) x 5.0 cm (W) x 10.0 cm (H), rated input voltage: DC 3.7V from lithium battery.

** All measurement and test data in this report was gathered from production sample serial number: 1202094 (Assigned by BACL). The EUT was received on 2012-02-08.*

Objective

This report is prepared on behalf of *SURGONICS LLC* 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. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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.

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 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	/	/

802.11n20 mode, 8 channels are provided to testing:

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

EUT for 802.11b, 802.11g were tested with Channel 1, 6 and 11; and 802.11 n20 modes were tested with Channel 1, 4 and 8.

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 date rates bandwidths, and modulations.

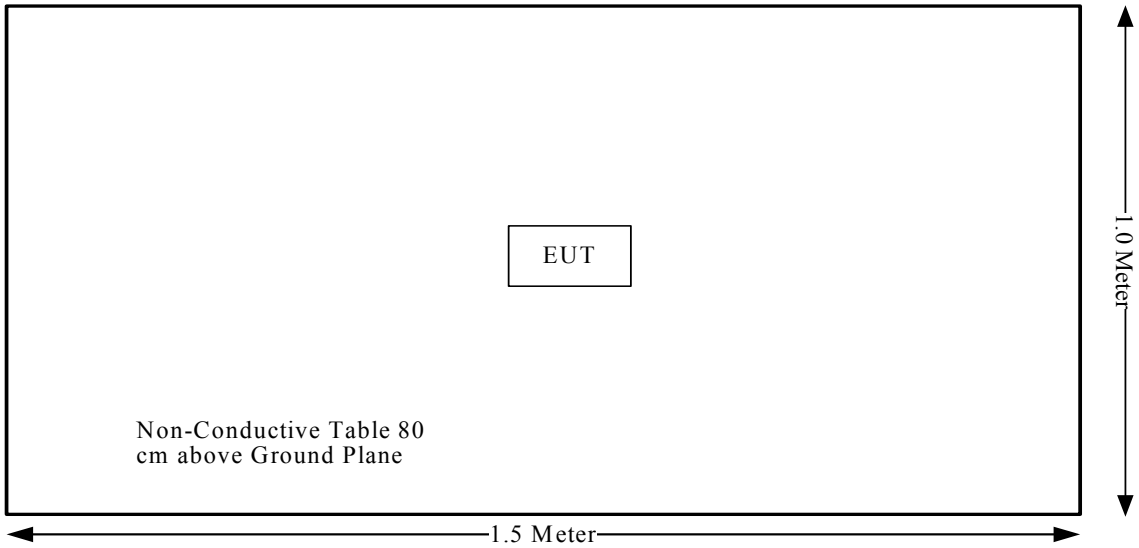
EUT Exercise Software

The test was performed under “cmd.exe”

Equipment Modifications

No modification was made to the EUT tested.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1093	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Not Applicable*
§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

Not applicable*: The EUT was powered by the lithium battery.

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1093- RF EXPOSURE

Applicable Standard

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

According to KDB 447498 D01 Mobile Portable RF Exposure v03r03, no SAR required if power is lower than the flowing threshold:

When routine evaluation is required for SAR and the output power is ≤ 60/f(GHz) mW, the test reduction and test exclusion procedures given herein, or in KDB 616217 or KDB 648474, are applicable.

A device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is ≤ 60/f(GHz) mW or all measured 1-g SAR are < 0.4 W/kg.10 When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.

Measurement Result

Conducted output power = 12.30dBm
Antenna gain = -3.0 dBi
SAR exclusion threshold=60/f=60/2.462=24.37 mW = 13.86 dBm >12.30dBm

So the SAR evaluation is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT has a printed antenna, which complied with 15.203, the maximum gain is -3.0 dBi, please refer to the internal photos.

Result: Compliance.

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

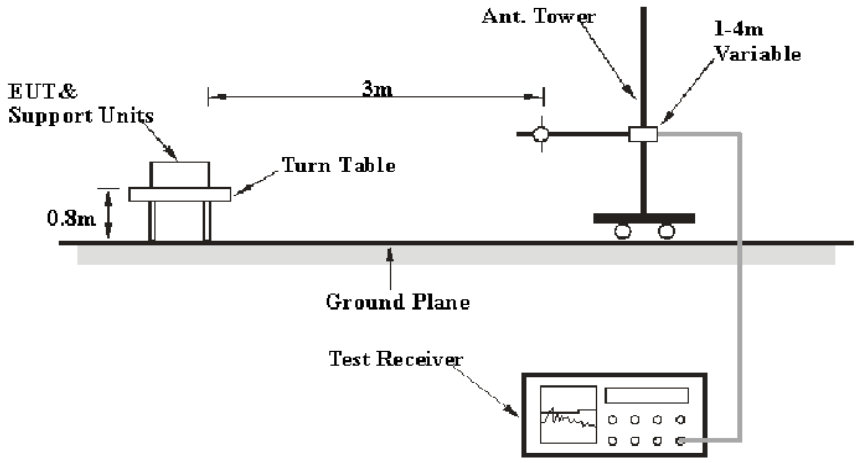
Measurement Uncertainty

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

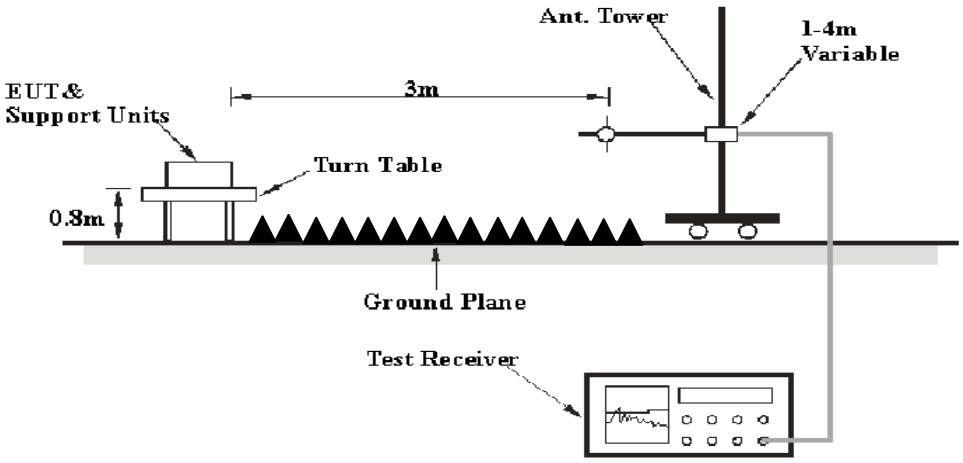
Based on CISPR 16-4-4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB(k=2, 95% level of confidence) .

EUT Setup

Below 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.

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***	***Detector***
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 PC 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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test 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	2011-11-11	2012-11-10
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:

3.21 dB at **172.1 MHz** in the **Horizontal** polarization (802.11g mode)

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Dean Liu on 2012-02-24.

Mode: Transmitting

802.11b Mode:

Frequency (MHz)	Reading (dBµV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412MHz)								
9648	13.87	Ave.	H	34.26	48.13	54	5.87	harmonic
172.1	31.42	QP	V	6.15	37.57	43.5	5.93	spurious
9648	13.69	Ave.	V	34.26	47.95	54	6.05	harmonic
172.1	30.47	QP	H	6.15	36.62	43.5	6.88	spurious
7236	14.25	Ave.	V	32.14	46.39	54	7.61	harmonic
7236	13.48	Ave.	H	32.14	45.62	54	8.38	harmonic
9648	30.71	PK	V	34.26	64.97	74	9.03	harmonic
9648	30.65	PK	H	34.26	64.91	74	9.09	harmonic
248.3	30.05	QP	V	6.78	36.83	46	9.17	spurious
248.3	29.87	QP	H	6.78	36.65	46	9.35	spurious
7236	31.22	PK	H	32.14	63.36	74	10.64	harmonic
4824	13.88	Ave.	H	28.63	42.51	54	11.49	harmonic
7236	30.25	PK	V	32.14	62.39	74	11.61	harmonic
4824	13.70	Ave.	V	28.63	42.33	54	11.67	harmonic
4824	30.71	PK	V	28.63	59.34	74	14.66	harmonic
4824	30.65	PK	H	28.63	59.28	74	14.72	harmonic
2388.39	13.78	Ave.	H	24.17	37.95	54	16.05	spurious
2388.39	13.63	Ave.	V	24.17	37.80	54	16.20	spurious
2388.39	29.67	PK	V	24.17	53.84	74	20.16	spurious
2388.39	28.61	PK	H	24.17	52.78	74	21.22	spurious
2412	57.92	PK	H	31.82	89.74	N/A	N/A	Fundamental
2412	50.13	Ave.	H	31.82	81.95	N/A	N/A	Fundamental
2412	58.32	PK	V	31.82	90.14	N/A	N/A	Fundamental
2412	51.45	Ave.	V	31.82	83.27	N/A	N/A	Fundamental

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Middle Channel (2437MHz)								
172.1	31.42	QP	V	6.15	37.57	43.5	5.93	spurious
9738	14.22	Ave.	V	34.75	48.97	54	5.03	harmonic
9738	13.98	Ave.	H	34.75	48.73	54	5.27	harmonic
172.1	30.47	QP	H	6.15	36.62	43.5	6.88	spurious
7301	14.26	Ave.	V	32.59	46.85	54	7.15	harmonic
7301	13.58	Ave.	H	32.59	46.17	54	7.83	harmonic
9738	30.25	PK	V	34.75	65.00	74	9.00	harmonic
9738	30.14	PK	H	34.75	64.89	74	9.11	harmonic
4874	14.55	Ave.	V	28.79	43.34	54	10.66	harmonic
7301	30.29	PK	H	32.59	62.88	74	11.12	harmonic
7301	30.25	PK	V	32.59	62.84	74	11.16	harmonic
4874	13.88	Ave.	H	28.79	42.67	54	11.33	harmonic
613.4	30.12	QP	V	0.53	30.65	46	15.35	spurious
4874	29.82	PK	V	28.79	58.61	74	15.39	harmonic
4874	29.69	PK	H	28.79	58.48	74	15.52	harmonic
613.4	29.64	QP	H	0.53	30.17	46	15.83	spurious
2437	53.27	PK	H	31.99	85.26	N/A	N/A	Fundamental
2437	47.19	Ave.	H	31.99	79.18	N/A	N/A	Fundamental
2437	52.28	PK	V	31.99	84.27	N/A	N/A	Fundamental
2437	46.72	Ave.	V	31.99	78.71	N/A	N/A	Fundamental
High Channel (2462MHz)								
9848	14.05	Ave.	H	34.79	48.84	54	5.16	spurious
9848	13.99	Ave.	V	34.79	48.78	54	5.22	spurious
7386	14.25	Ave.	V	32.87	47.12	54	6.88	spurious
7386	13.97	Ave.	H	32.87	46.84	54	7.16	spurious
247.6	32.02	QP	H	6.69	38.71	46	7.29	spurious
9848	31.29	PK	V	34.79	66.08	74	7.92	spurious
247.6	31.06	QP	V	6.69	37.75	46	8.25	spurious
9848	30.17	PK	H	34.79	64.96	74	9.04	spurious
325.4	31.58	QP	V	4.36	35.94	46	10.06	spurious
7386	31.02	PK	V	32.87	63.89	74	10.11	spurious
4924	14.88	Ave.	H	28.95	43.83	54	10.17	harmonic
4924	14.68	Ave.	V	28.95	43.63	54	10.37	harmonic
7386	30.29	PK	H	32.87	63.16	74	10.84	spurious
325.4	30.72	QP	H	4.36	35.08	46	10.92	spurious
4924	29.84	PK	V	28.95	58.79	74	15.21	harmonic
4924	29.73	PK	H	28.95	58.68	74	15.32	harmonic
2486.08	14.02	Ave.	V	24.13	38.15	54	15.85	spurious
2486.08	13.95	Ave.	H	24.13	38.08	54	15.92	spurious
2486.08	30.13	PK	V	24.13	54.26	74	19.74	spurious
2486.08	29.97	PK	H	24.13	54.10	74	19.90	spurious
2462	53.86	PK	H	32.15	86.01	N/A	N/A	Fundamental
2462	47.75	Ave.	H	32.15	79.9	N/A	N/A	Fundamental
2462	52.61	PK	V	32.15	84.76	N/A	N/A	Fundamental
2462	47.28	Ave.	V	32.15	79.43	N/A	N/A	Fundamental

802.11g Mode:

Frequency (MHz)	Reading (dBµV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412MHz)								
172.1	34.14	QP	H	6.15	40.29	43.5	3.21*	spurious
9648	14.04	Ave.	H	34.26	48.30	54	5.70	harmonic
9648	13.98	Ave.	V	34.26	48.24	54	5.76	harmonic
172.1	30.25	QP	V	6.15	36.40	43.5	7.10	spurious
7236	13.47	Ave.	V	32.14	45.61	54	8.39	harmonic
7236	13.44	Ave.	H	32.14	45.58	54	8.42	harmonic
9648	31.09	PK	H	34.26	65.35	74	8.65	harmonic
9648	30.25	PK	V	34.26	64.51	74	9.49	harmonic
7236	31.01	PK	H	32.14	63.15	74	10.85	harmonic
7236	30.25	PK	V	32.14	62.39	74	11.61	harmonic
279.5	29.37	QP	V	5.01	34.38	46	11.62	spurious
4824	13.70	Ave.	H	28.63	42.33	54	11.67	harmonic
4824	13.65	Ave.	V	28.63	42.28	54	11.72	harmonic
279.5	28.95	QP	H	5.01	33.96	46	12.04	spurious
4824	29.21	PK	H	28.63	57.84	74	16.16	harmonic
2387.55	13.48	Ave.	H	24.17	37.65	54	16.35	spurious
2387.55	13.48	Ave.	V	24.17	37.65	54	16.35	spurious
4824	28.51	PK	V	28.63	57.14	74	16.86	harmonic
2387.55	29.67	PK	V	24.17	53.84	74	20.16	spurious
2387.55	29.61	PK	H	24.17	53.78	74	20.22	spurious
2412	61.10	PK	H	31.82	92.92	N/A	N/A	Fundamental
2412	41.75	Ave.	H	31.82	73.57	N/A	N/A	Fundamental
2412	59.95	PK	V	31.82	91.77	N/A	N/A	Fundamental
2412	40.12	Ave.	V	31.82	71.94	N/A	N/A	Fundamental

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Middle Channel (2437MHz)								
9738	14.26	Ave.	V	34.75	49.01	54	4.99	harmonic
9738	13.99	Ave.	H	34.75	48.74	54	5.26	harmonic
7301	14.98	Ave.	H	32.59	47.57	54	6.43	harmonic
7301	14.9	Ave.	V	32.59	47.49	54	6.51	harmonic
9738	31.25	PK	V	34.75	66.00	74	8.00	harmonic
9738	31.25	PK	H	34.75	66.00	74	8.00	harmonic
247.6	30.03	QP	V	6.69	36.72	46	9.28	spurious
247.6	29.41	QP	H	6.69	36.10	46	9.90	spurious
7301	32.02	PK	V	32.59	64.61	74	9.39	harmonic
7301	31.25	PK	H	32.59	63.84	74	10.16	harmonic
4874	13.82	Ave.	H	28.79	42.61	54	11.39	harmonic
4874	13.68	Ave.	V	28.79	42.47	54	11.53	harmonic
613.4	31.25	QP	V	0.53	31.78	46	14.22	spurious
613.4	30.69	QP	H	0.53	31.22	46	14.78	spurious
4874	28.7	PK	H	28.79	57.49	74	16.51	harmonic
4874	28.55	PK	V	28.79	57.34	74	16.66	harmonic
2437	58.48	PK	H	31.99	90.47	N/A	N/A	Fundamental
2437	38.94	Ave.	H	31.99	70.93	N/A	N/A	Fundamental
2437	53.15	PK	V	31.99	85.14	N/A	N/A	Fundamental
2437	33.48	Ave.	V	31.99	65.47	N/A	N/A	Fundamental
High Channel (2462MHz)								
9848	14.05	Ave.	H	34.79	48.84	54	5.16	spurious
9848	13.99	Ave.	V	34.79	48.78	54	5.22	spurious
7386	13.89	Ave.	H	32.87	46.76	54	7.24	spurious
7386	13.79	Ave.	V	32.87	46.66	54	7.34	spurious
247.6	31.48	QP	V	6.69	38.17	46	7.83	spurious
9848	31.29	PK	V	34.79	66.08	74	7.92	spurious
247.6	31.25	QP	H	6.69	37.94	46	8.06	spurious
9848	30.17	PK	H	34.79	64.96	74	9.04	spurious
7386	31.02	PK	V	32.87	63.89	74	10.11	spurious
7386	30.29	PK	H	32.87	63.16	74	10.84	spurious
4924	13.78	Ave.	H	28.95	42.73	54	11.27	harmonic
4924	13.68	Ave.	V	28.95	42.63	54	11.37	harmonic
613.4	30.12	QP	V	0.53	30.65	46	15.35	spurious
613.4	29.64	QP	H	0.53	30.17	46	15.83	spurious
2487.22	13.59	Ave.	V	24.13	37.72	54	16.28	spurious
4924	28.76	PK	H	28.95	57.71	74	16.29	harmonic
2487.22	13.52	Ave.	H	24.13	37.65	54	16.35	spurious
4924	28.59	PK	V	28.95	57.54	74	16.46	harmonic
2487.22	29.84	PK	H	24.13	53.97	74	20.03	spurious
2487.22	29.78	PK	V	24.13	53.91	74	20.09	spurious
2462	58.20	PK	H	32.15	90.35	N/A	N/A	Fundamental
2462	38.46	Ave.	H	32.15	70.61	N/A	N/A	Fundamental
2462	55.34	PK	V	32.15	87.49	N/A	N/A	Fundamental
2462	33.13	Ave.	V	32.15	65.28	N/A	N/A	Fundamental

802.11n20 Mode:

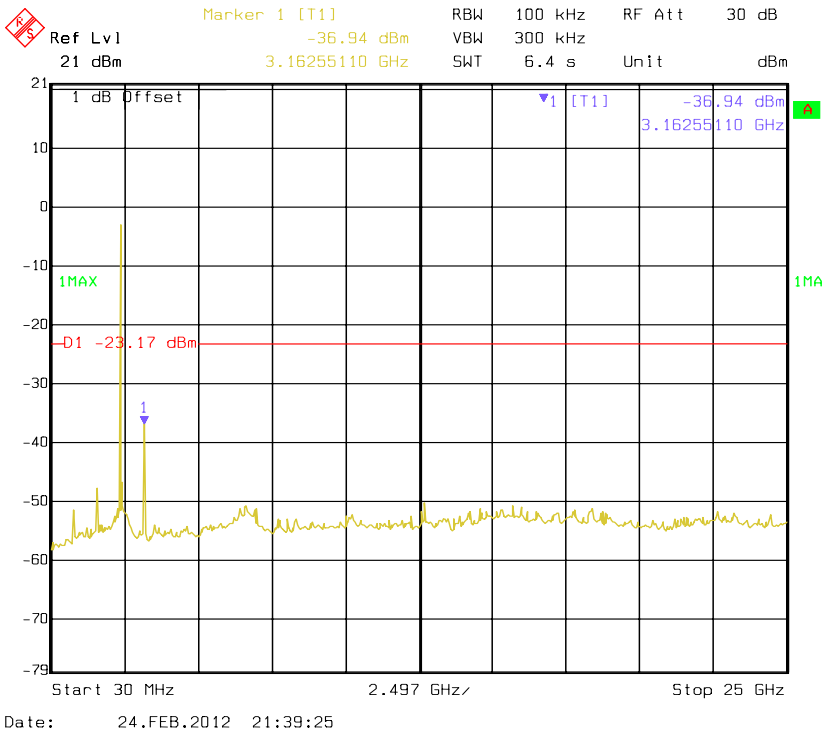
Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2427MHz)								
9708	14.25	Ave.	V	34.78	49.03	54	4.97	harmonic
9708	13.97	Ave.	H	34.78	48.75	54	5.25	harmonic
7281	14.26	Ave.	H	32.89	47.15	54	6.85	harmonic
7281	14.07	Ave.	V	32.89	46.96	54	7.04	harmonic
244.7	30.25	QP	V	6.78	37.03	46	8.97	spurious
244.7	30.15	QP	H	6.78	36.93	46	9.07	spurious
9708	30.11	PK	H	34.78	64.89	74	9.11	harmonic
9708	29.97	PK	V	34.78	64.75	74	9.25	harmonic
7281	31.06	PK	V	32.89	63.95	74	10.05	harmonic
7281	30.27	PK	H	32.89	63.16	74	10.84	harmonic
4854	13.54	Ave.	V	28.63	42.17	54	11.83	harmonic
4854	13.45	Ave.	H	28.63	42.08	54	11.92	harmonic
402.6	30.22	QP	V	0.61	30.83	46	15.17	spurious
402.6	29.57	QP	H	0.61	30.18	46	15.82	spurious
2387.03	13.94	Ave.	H	24.15	38.09	54	15.91	spurious
4854	29.08	PK	H	28.63	57.71	74	16.29	harmonic
2387.03	13.48	Ave.	V	24.15	37.63	54	16.37	spurious
4854	28.72	PK	V	28.63	57.35	74	16.65	harmonic
2387.03	30.00	PK	V	24.15	54.15	74	19.85	spurious
2387.03	29.58	PK	H	24.15	53.73	74	20.27	spurious
2427	58.88	PK	H	31.82	90.7	N/A	N/A	Fundamental
2427	35.41	Ave.	H	31.82	67.23	N/A	N/A	Fundamental
2427	57.64	PK	V	31.82	89.46	N/A	N/A	Fundamental
2427	33.94	Ave.	V	31.82	65.76	N/A	N/A	Fundamental

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Middle Channel (2442MHz)								
9768	14.26	Ave.	H	34.97	49.23	54	4.77	harmonic
9768	14.06	Ave.	V	34.97	49.03	54	4.97	harmonic
7326	14.22	Ave.	V	33.02	47.24	54	6.76	harmonic
7326	14.03	Ave.	H	33.02	47.05	54	6.95	harmonic
9768	30.69	PK	H	34.97	65.66	74	8.34	harmonic
9768	30.54	PK	V	34.97	65.48	74	8.52	harmonic
244.7	29.87	QP	V	6.78	36.65	46	9.35	spurious
244.7	29.01	QP	H	6.78	35.79	46	10.21	spurious
7326	30.15	PK	H	33.02	63.17	74	10.83	harmonic
7326	29.87	PK	V	33.02	62.89	74	11.11	harmonic
4884	13.68	Ave.	V	28.79	42.47	54	11.53	harmonic
4884	13.63	Ave.	H	28.79	42.42	54	11.58	harmonic
402.6	31.58	QP	H	0.61	32.19	46	13.81	spurious
402.6	31.22	QP	V	0.61	31.83	46	14.17	spurious
4884	28.75	PK	H	28.79	57.54	74	16.46	harmonic
4884	28.55	PK	V	28.79	57.34	74	16.66	harmonic
2442	57.54	PK	H	31.99	89.53	N/A	N/A	Fundamental
2442	34.94	Ave.	H	31.99	66.93	N/A	N/A	Fundamental
2442	54.15	PK	V	31.99	86.14	N/A	N/A	Fundamental
2442	34.48	Ave.	V	31.99	66.47	N/A	N/A	Fundamental
High Channel (2462MHz)								
9848	14.05	Ave.	H	34.79	48.84	54	5.16	spurious
9848	13.99	Ave.	V	34.79	48.78	54	5.22	spurious
7386	13.89	Ave.	H	32.87	46.76	54	7.24	spurious
7386	13.79	Ave.	V	32.87	46.66	54	7.34	spurious
9848	31.29	PK	V	34.79	66.08	74	7.92	spurious
9848	30.17	PK	H	34.79	64.96	74	9.04	spurious
7386	31.02	PK	V	32.87	63.89	74	10.11	spurious
7386	30.29	PK	H	32.87	63.16	74	10.84	spurious
4924	13.78	Ave.	H	28.95	42.73	54	11.27	harmonic
4924	13.68	Ave.	V	28.95	42.63	54	11.37	harmonic
612.5	30.51	QP	V	0.64	31.15	46	14.85	spurious
402.6	30.22	QP	V	0.61	30.83	46	15.17	spurious
612.5	29.54	QP	H	0.64	30.18	46	15.82	spurious
402.6	29.57	QP	H	0.61	30.18	46	15.82	spurious
2486.08	14.02	Ave.	V	24.13	38.15	54	15.85	spurious
2486.08	13.95	Ave.	H	24.13	38.08	54	15.92	spurious
4924	28.76	PK	H	28.95	57.71	74	16.29	harmonic
4924	28.59	PK	V	28.95	57.54	74	16.46	harmonic
2486.08	30.13	PK	V	24.13	54.26	74	19.74	spurious
2486.08	28.56	PK	H	24.13	52.69	74	21.31	spurious
2462	57.80	PK	H	32.15	89.95	N/A	N/A	Fundamental
2462	36.31	Ave.	H	32.15	68.46	N/A	N/A	Fundamental
2462	54.28	PK	V	32.15	86.43	N/A	N/A	Fundamental
2462	34.09	Ave.	V	32.15	66.24	N/A	N/A	Fundamental

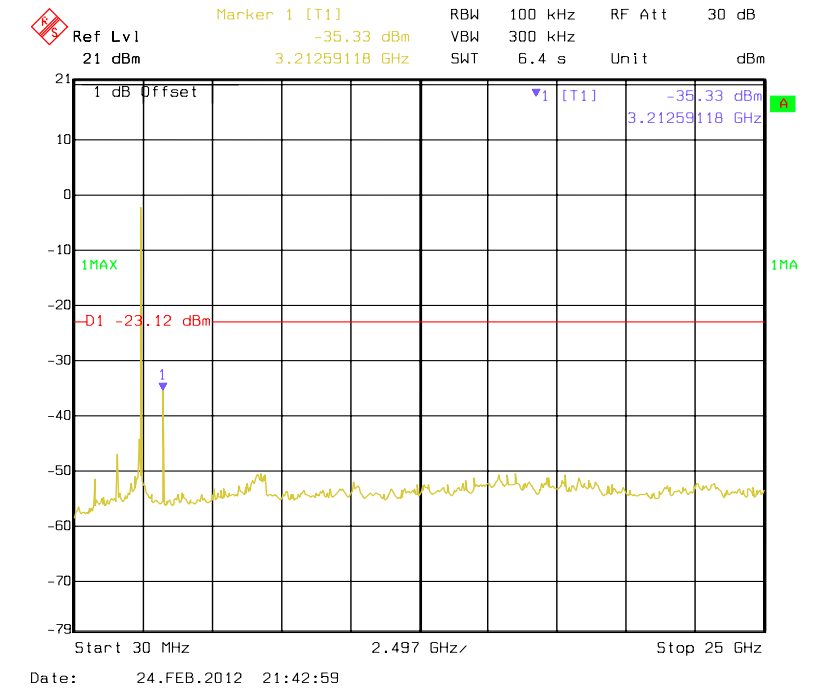
**Within measurement uncertainty!*

Conducted Spurious Emissions at Antenna Port

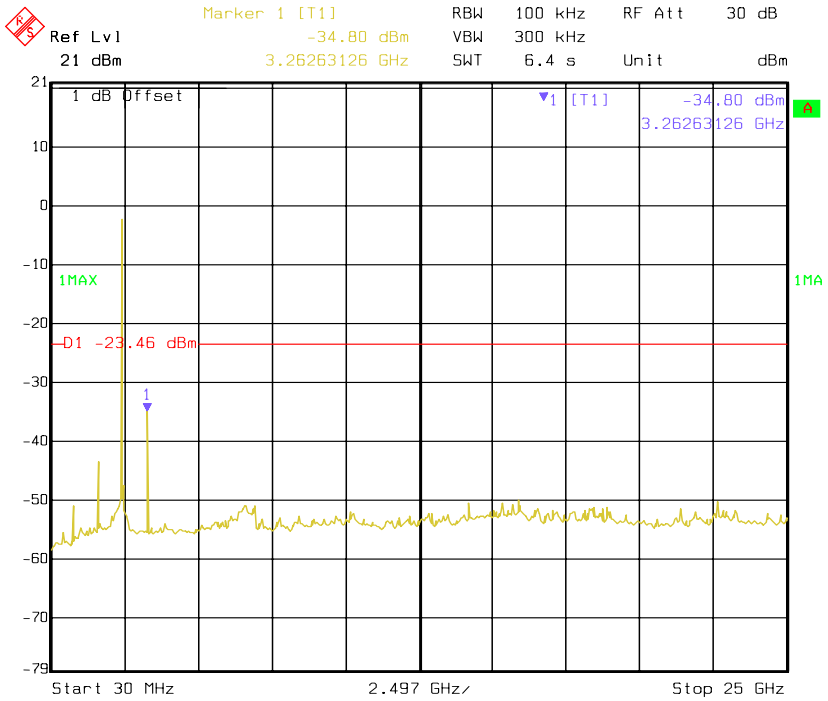
802.11b Low Channel



802.11b Middle Channel

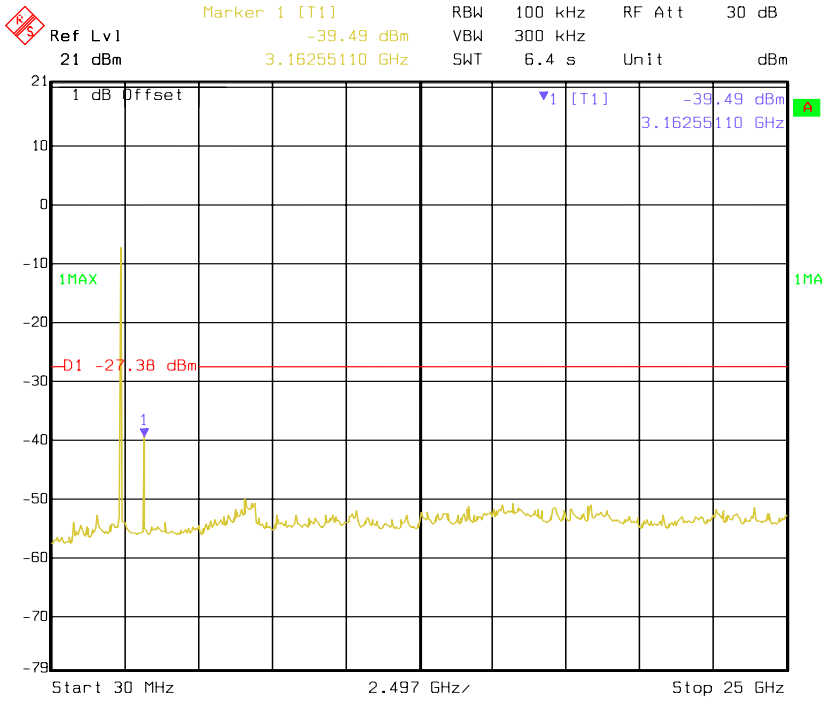


802.11b High Channel



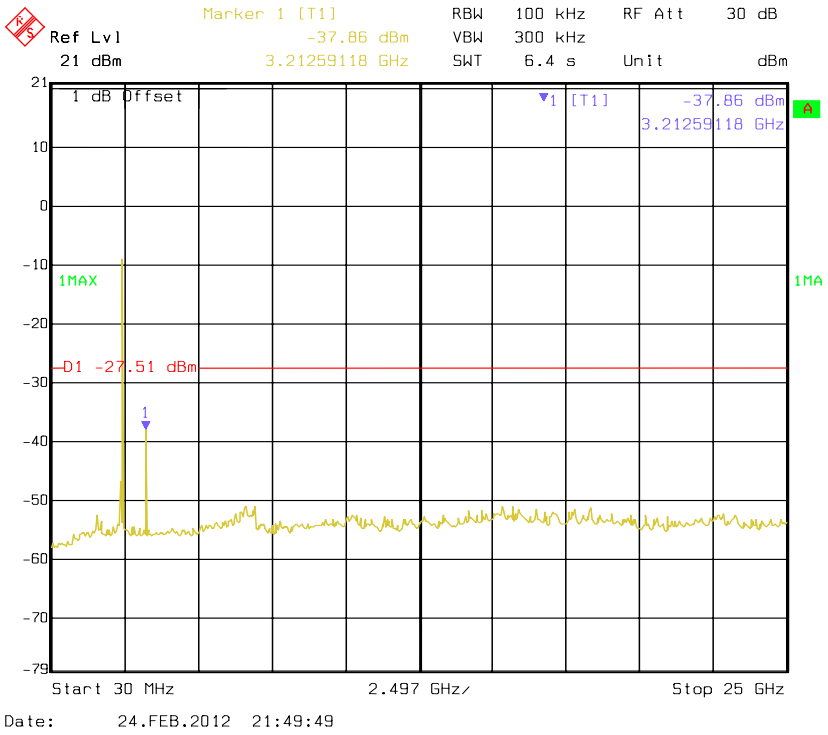
Date: 24.FEB.2012 21:45:12

802.11g Low Channel



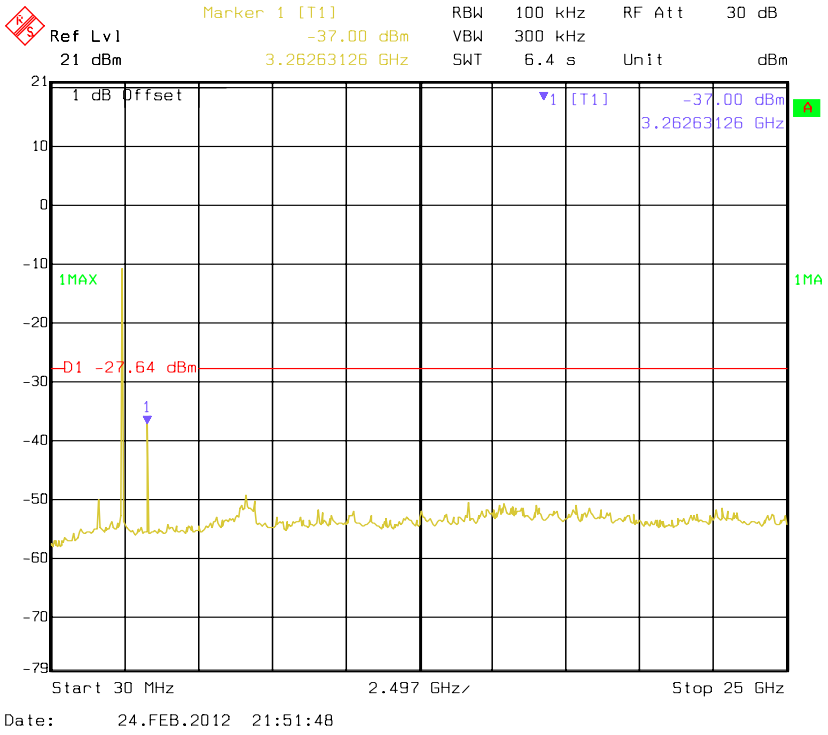
Date: 24.FEB.2012 21:48:09

802.11g Middle Channel



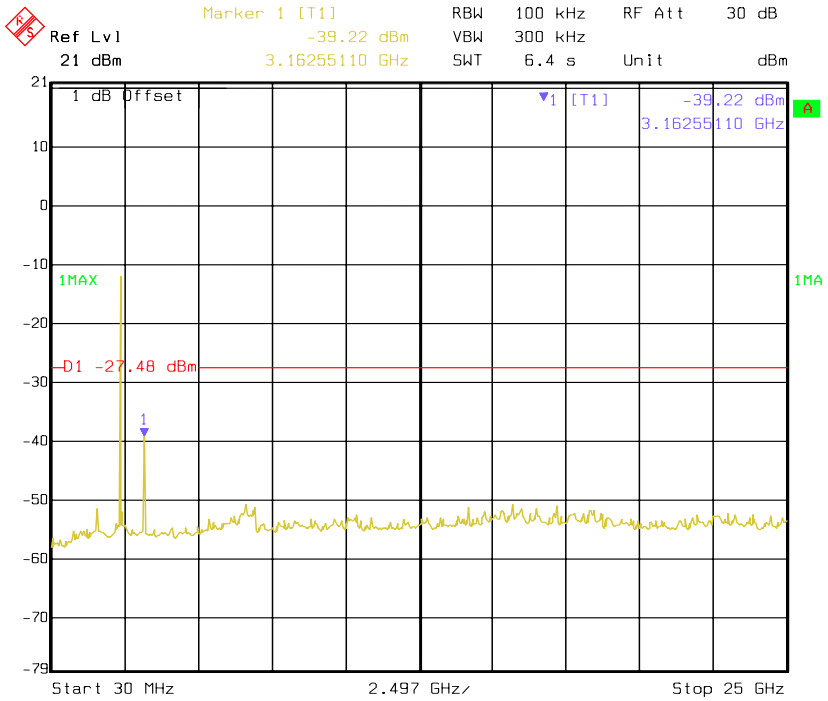
Date: 24.FEB.2012 21:49:49

802.11g High Channel



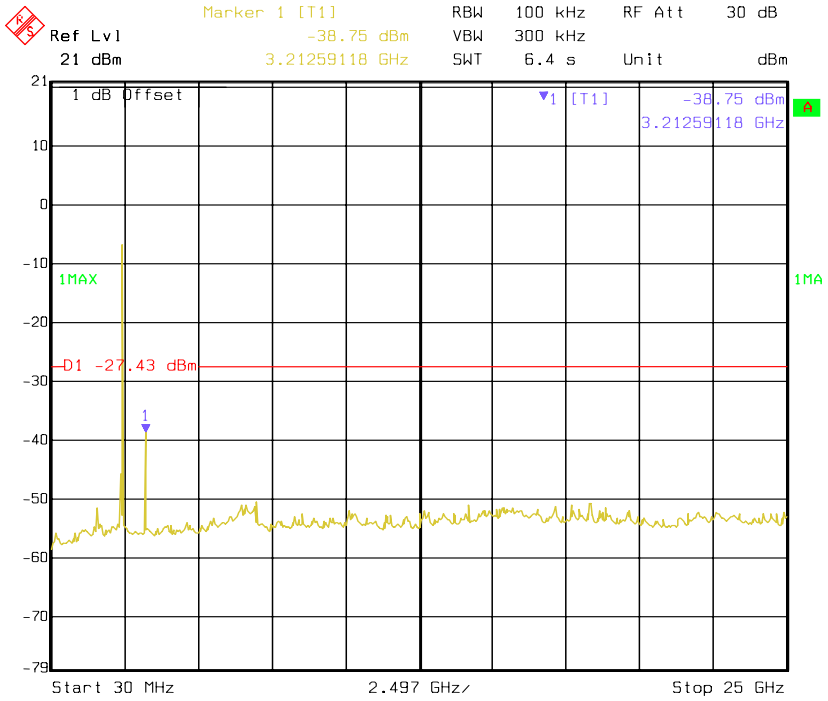
Date: 24.FEB.2012 21:51:48

802.11n20 Low Channel



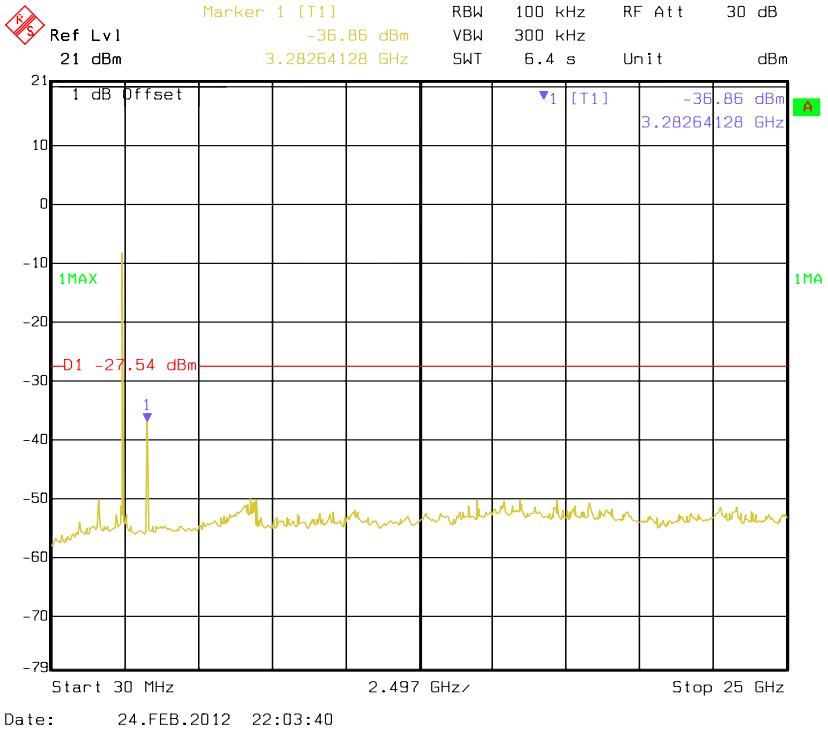
Date: 24.FEB.2012 21:54:43

802.11n20 Middle Channel



Date: 24.FEB.2012 22:00:00

802.11n20 High Channel



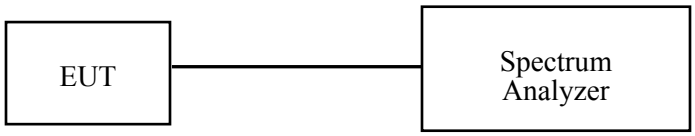
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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

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	2011-11-11	2012-11-10

*** 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:	48 %
ATM Pressure:	100.0kPa

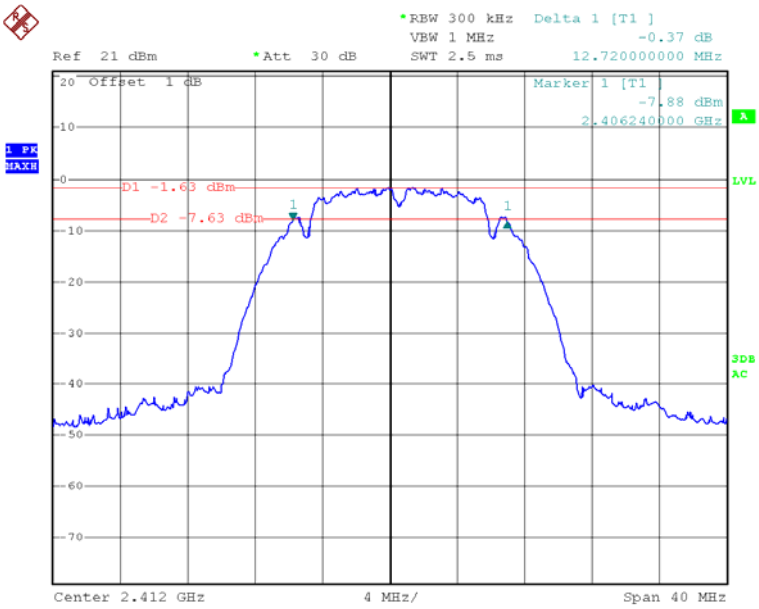
The testing was performed by Dean Liu on 2012-02-24.

Test Result: Pass.

Please refer to the following tables and plots.

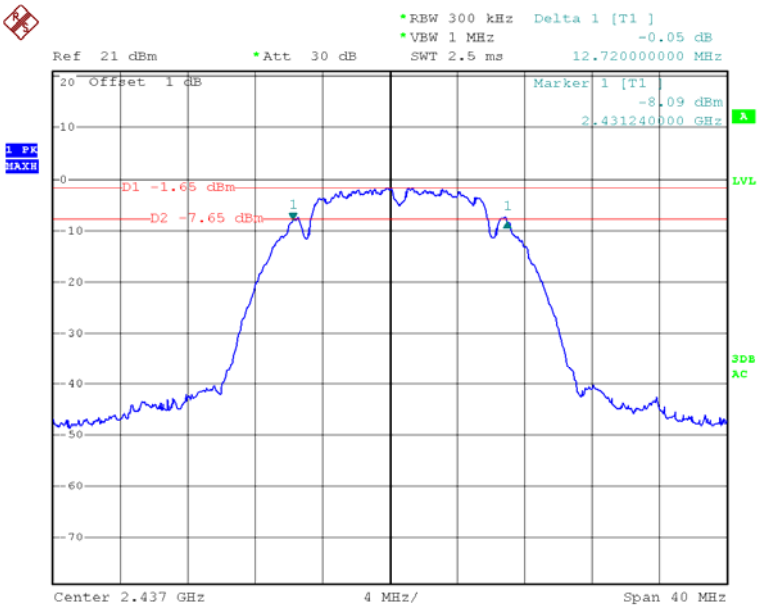
Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Limit (KHz)
802.11b mode				
Low	2412	1	12.72	>500
Middle	2437	1	12.72	>500
High	2462	1	12.72	>500
802.11g mode				
Low	2412	6	16.56	>500
Middle	2437	6	16.64	>500
High	2462	6	16.64	>500
802.11n20 mode				
Low	2427	6.5	17.60	>500
Middle	2442	6.5	17.60	>500
High	2462	6.5	17.60	>500

802.11b Low Channel



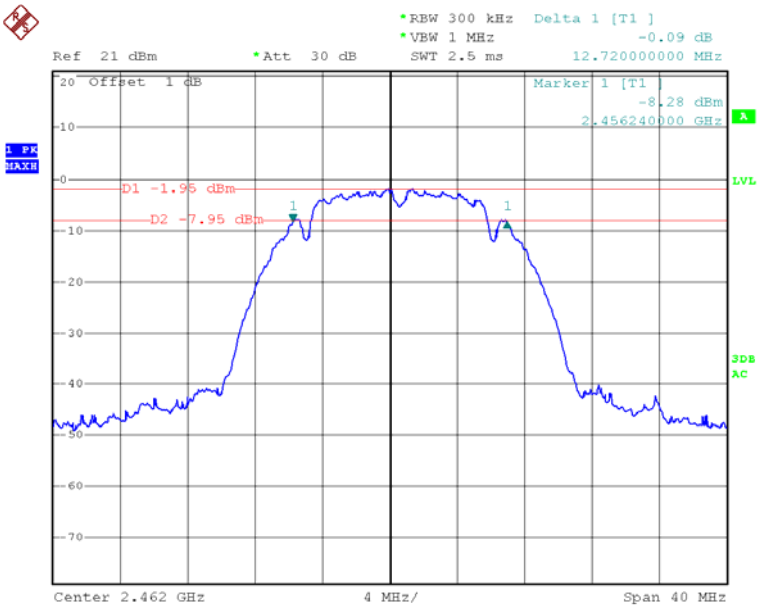
Date: 24.FEB.2012 10:22:44

802.11b Middle Channel



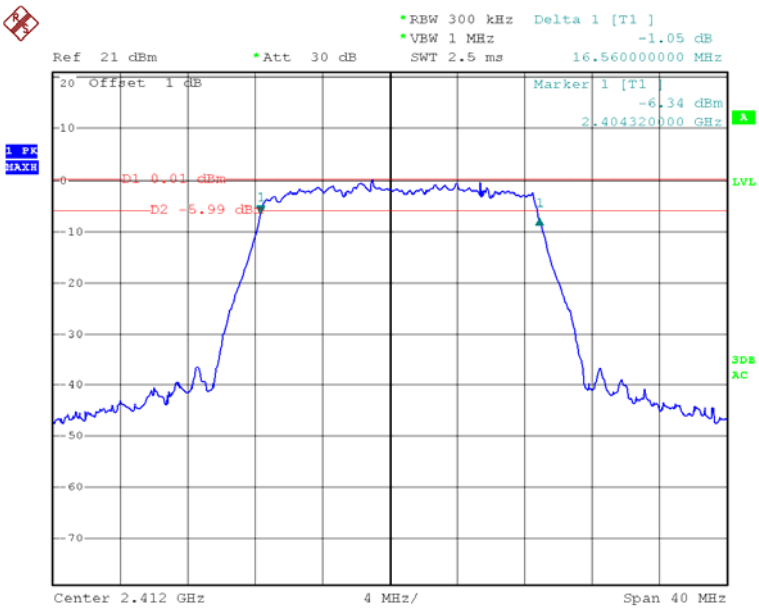
Date: 24.FEB.2012 11:13:49

802.11b High Channel



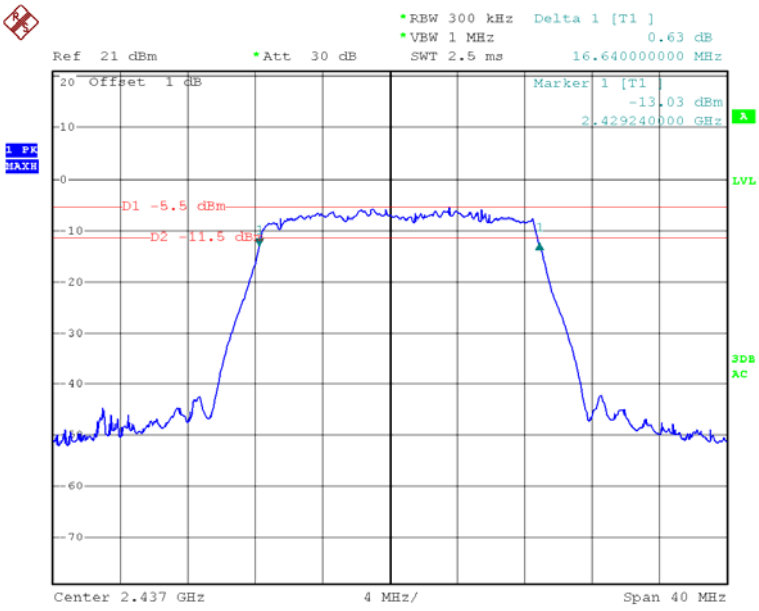
Date: 24.FEB.2012 11:24:10

802.11g Low Channel



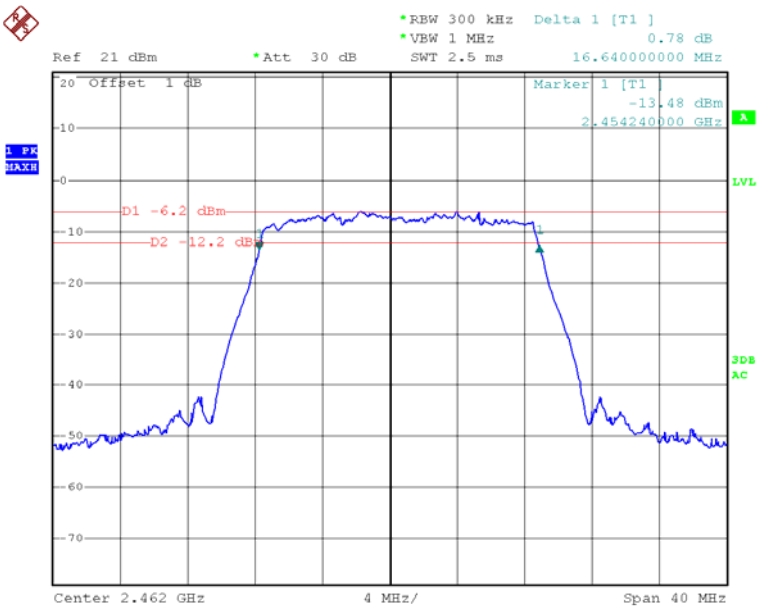
Date: 24.FEB.2012 11:40:46

802.11g Middle Channel



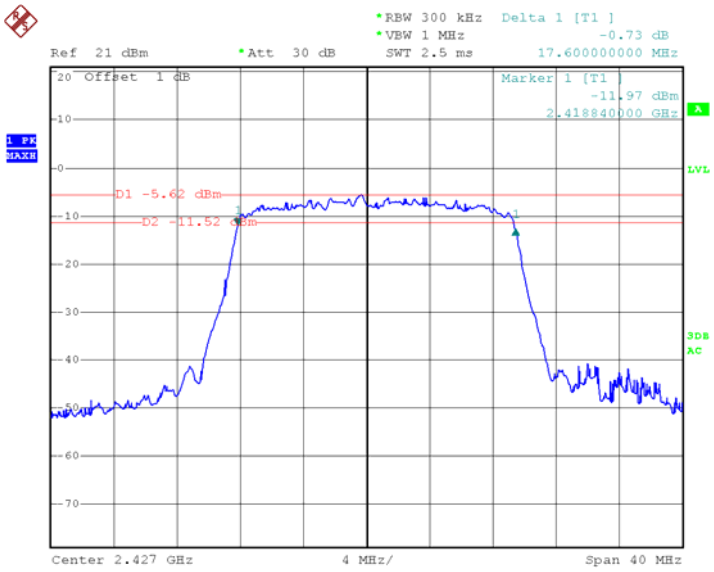
Date: 24.FEB.2012 12:06:40

802.11g High Channel



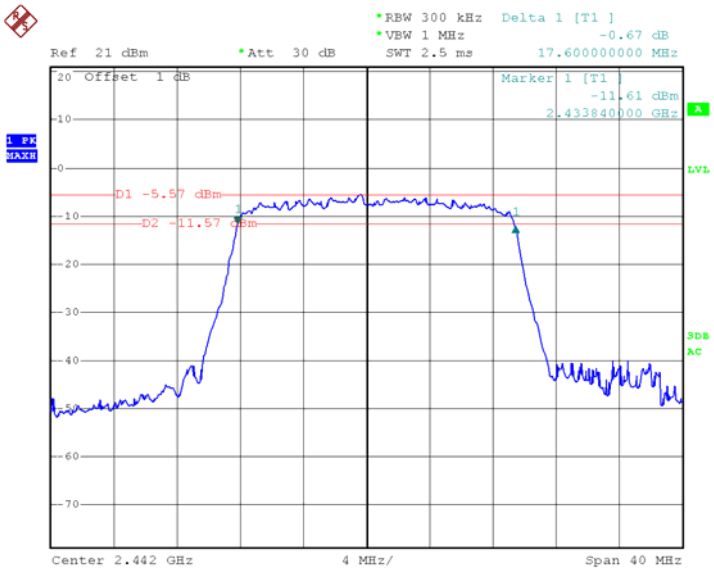
Date: 24.FEB.2012 13:29:37

802.11n20 Low Channel



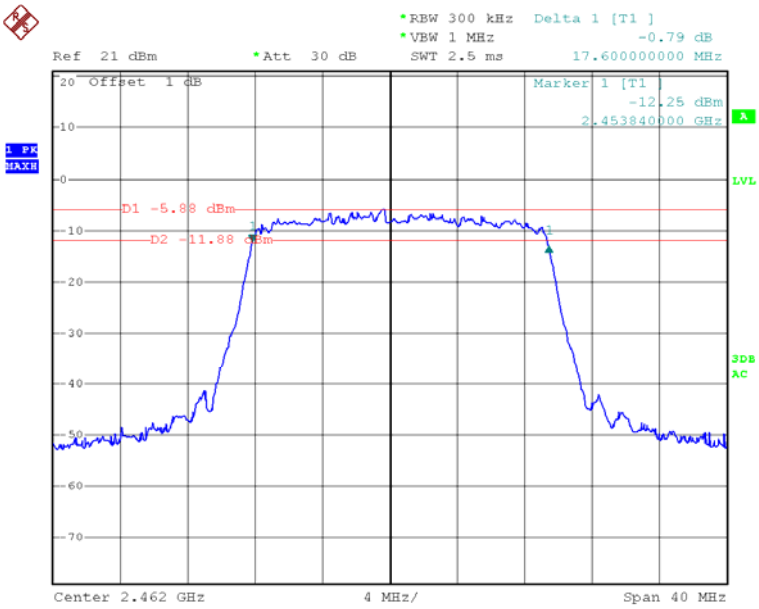
Date: 24.FEB.2012 13:54:08

802.11n20 Middle Channel



Date: 24.FEB.2012 14:17:45

802.11n20 High Channel



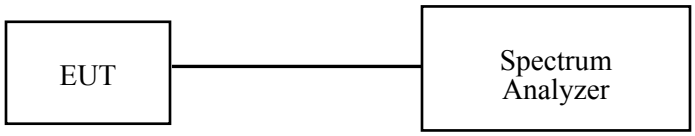
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

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	2011-11-11	2012-11-10

*** 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:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Dean Liu on 2012-03-14.

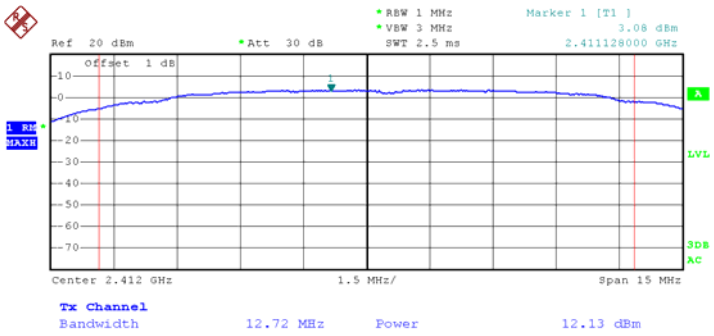
Test Mode: Transmitting

Channel	Frequency (MHz)	Data Rate (Mbps)	Reading Power (dBm)	Limit (dBm)	Result
802.11b					
Low	2412	1	12.13	30	pass
Middle	2437	1	12.30	30	pass
High	2462	1	12.18	30	pass
802.11g					
Low	2412	6	10.43	30	pass
Middle	2437	6	10.62	30	pass
High	2462	6	10.25	30	pass
802.11n20					
Low	2427	6.5	8.67	30	pass
Middle	2442	6.5	8.59	30	pass
High	2462	6.5	8.50	30	pass

Note: the antenna gain is -3.0 dBi.

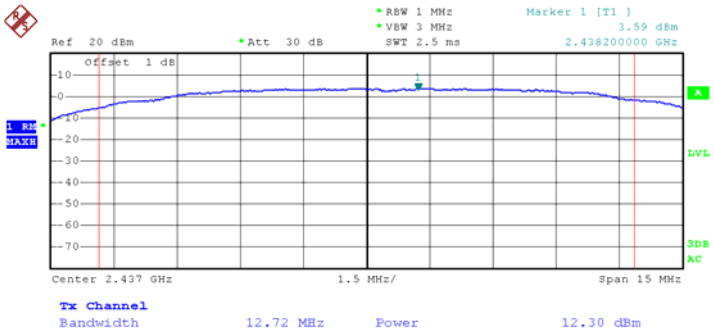
Please refer to the following plots

802.11b RF Output Power, Low Channel



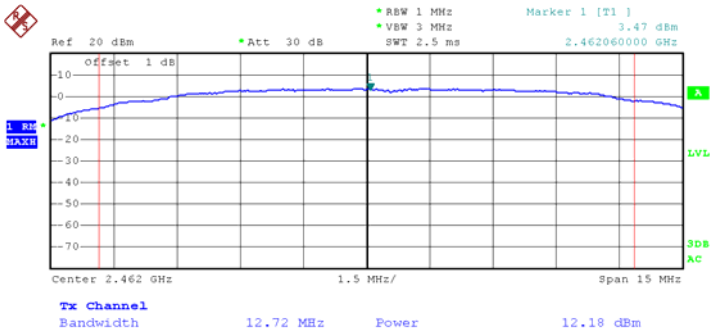
Date: 14.MAR.2012 07:55:53

802.11b RF Output Power, Middle Channel



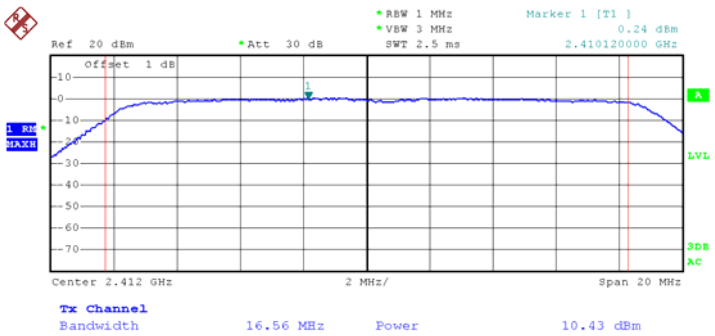
Date: 14.MAR.2012 08:02:17

802.11b RF Output Power, High Channel



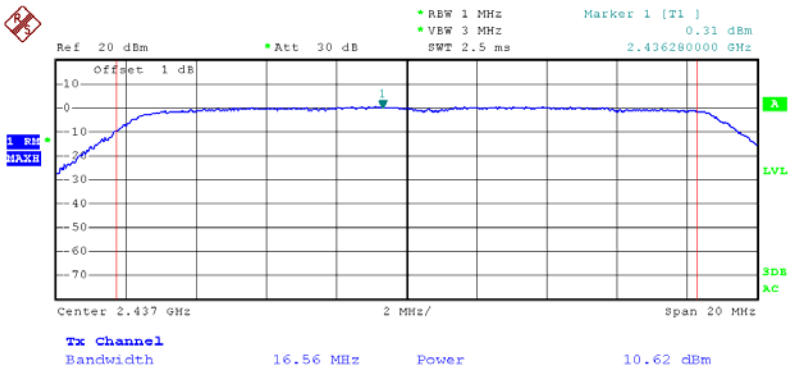
Date: 14.MAR.2012 08:15:55

802.11g RF Output Power, Low Channel



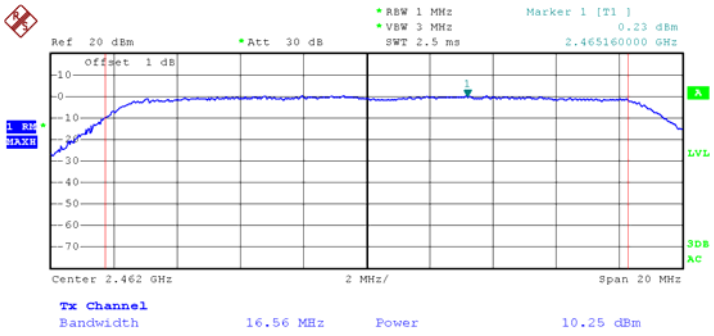
Date: 14.MAR.2012 08:21:22

802.11g RF Output Power, Middle Channel



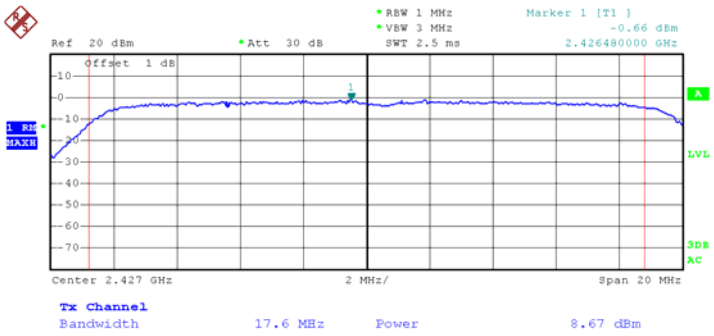
Date: 14.MAR.2012 08:25:54

802.11g RF Output Power, High Channel



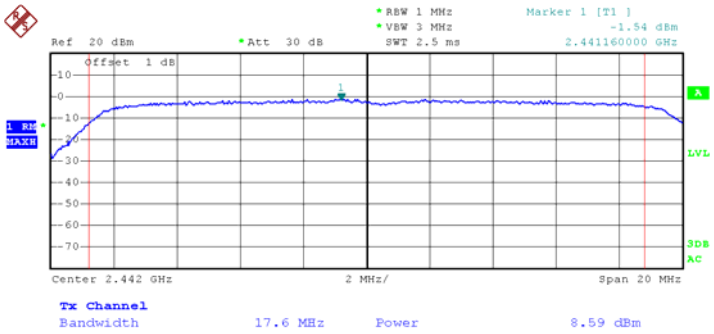
Date: 14.MAR.2012 08:27:13

802.11n20 RF Output Power, Low Channel



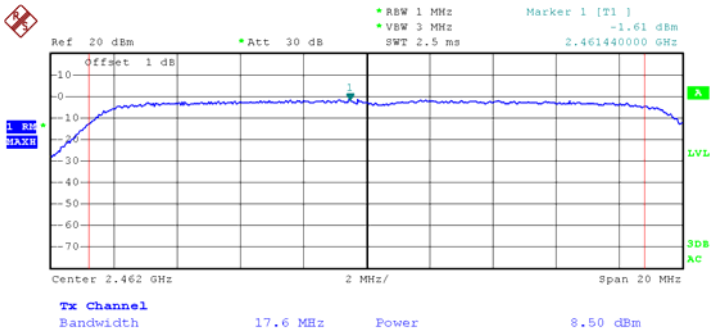
Date: 14.MAR.2012 10:08:17

802.11n20 RF Output Power, Middle Channel



Date: 14.MAR.2012 10:09:01

802.11n20 RF Output Power, High Channel



Date: 14.MAR.2012 10:09:57

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	2011-11-11	2012-11-10

*** 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

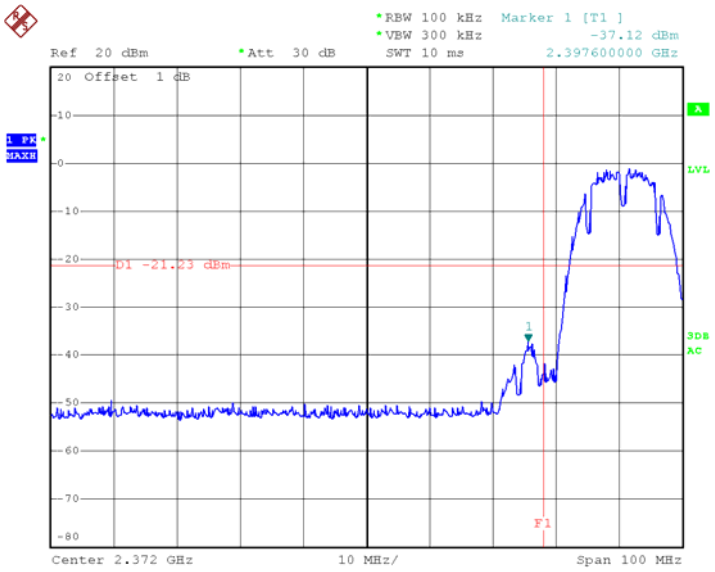
Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Dean Liu on 2012-02-24 and 2012-03-14.

Test Result: *Compliance*

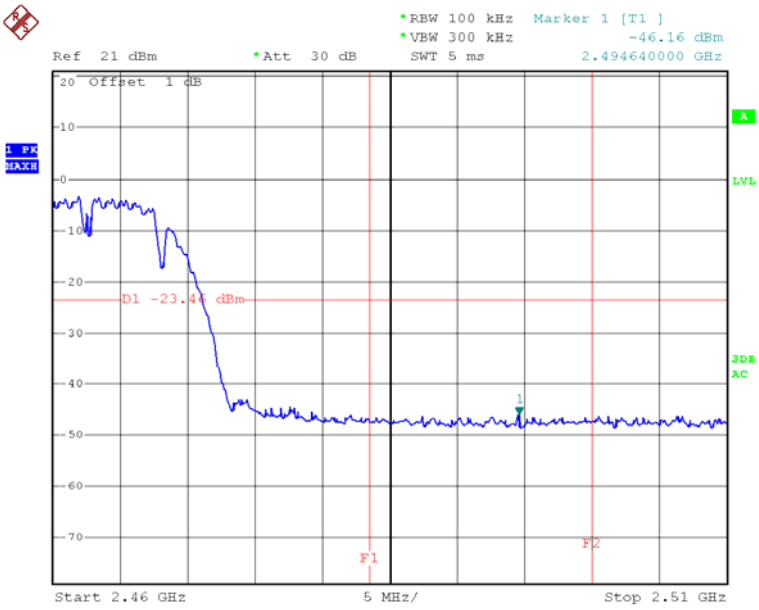
Please refer to following plots.

802.11b: Band Edge, Left Side



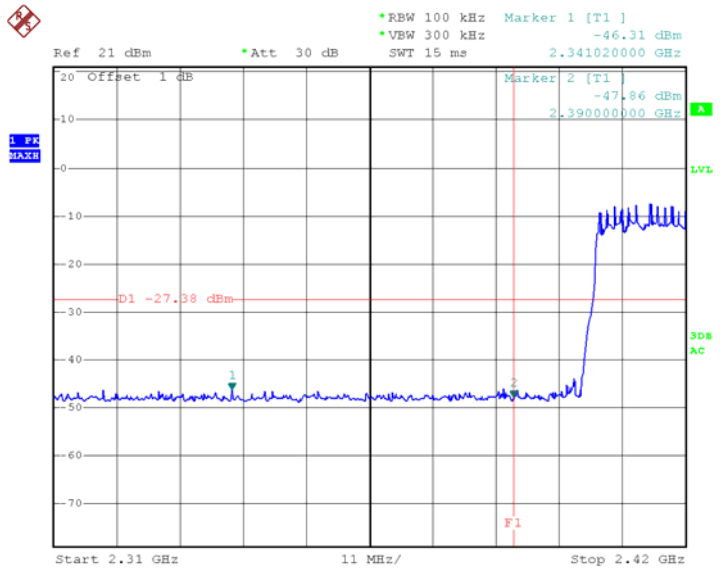
Date: 14.MAR.2012 07:59:41

802.11b: Band Edge, Right Side



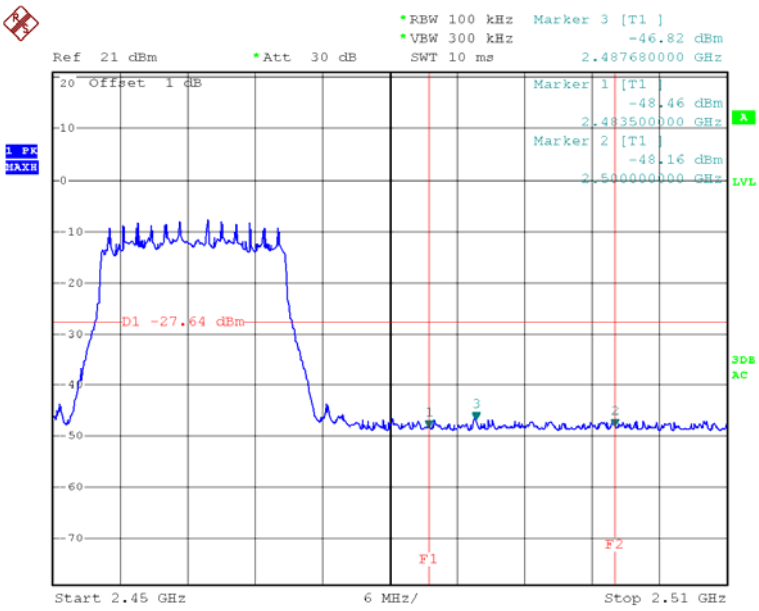
Date: 24.FEB.2012 11:30:18

802.11g: Band Edge, Left Side



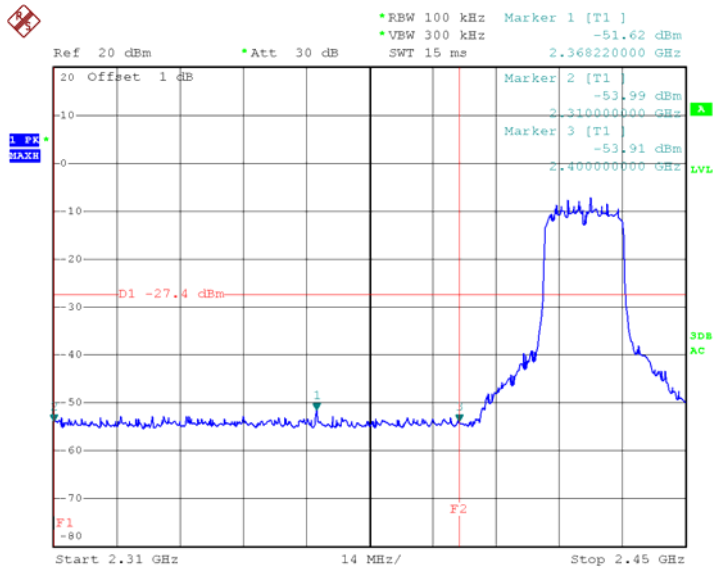
Date: 24.FEB.2012 11:56:21

802.11g: Band Edge, Right Side



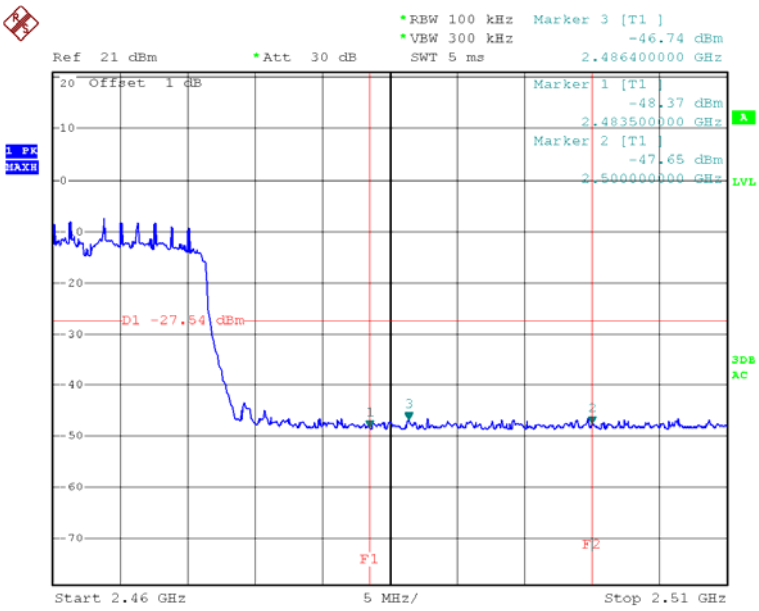
Date: 24.FEB.2012 13:35:30

802.11n20: Band Edge, Left Side



Date: 14.MAR.2012 10:15:03

802.11n20: Band Edge, Right Side



Date: 24.FEB.2012 14:36:42

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. According to KDB 558074 D01 DTS Meas Guidance v01,set the RBW = 100 kHz, VBW ≥ 300 kHz, set the span to 5-30 % greater than the EBW.
4. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
5. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10
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:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Dean Liu on 2012-02-24.

Test Mode: Transmitting

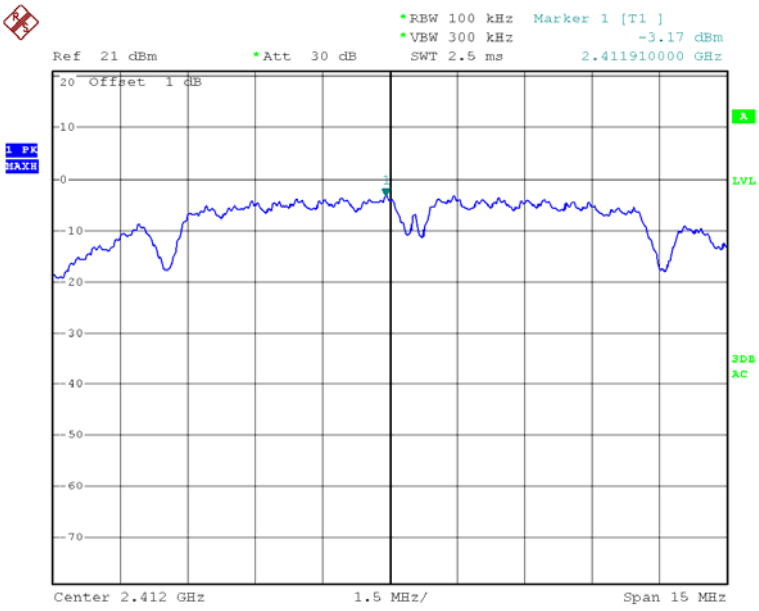
Test Result: Pass

Channel	Frequency (MHz)	Data Rate (Mbps)	Reading Level (dBm)	Maximum Power Spectral Density (dBm)	Limit (dBm)	Result
802.11 b						
Low	2412	1	-3.17	-18.37	8	pass
Middle	2437	1	-3.12	-18.32	8	pass
High	2462	1	-3.46	-18.66	8	pass
802.11 g						
Low	2412	6	-7.38	-22.58	8	pass
Middle	2437	6	-7.51	-22.71	8	pass
High	2462	6	-7.64	-22.84	8	pass
802.11 n20						
Low	2427	6.5	-7.48	-22.68	8	pass
Middle	2442	6.5	-7.43	-22.63	8	pass
High	2462	6.5	-7.54	-22.74	8	pass

Note: the antenna gain is -3.0 dBi.

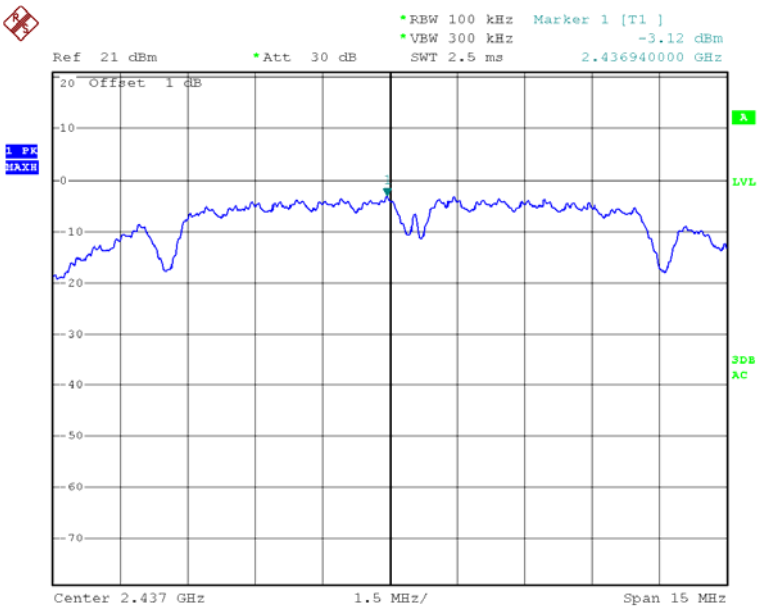
Please refer to the following plots

Power Spectral Density, 802.11b Low Channel



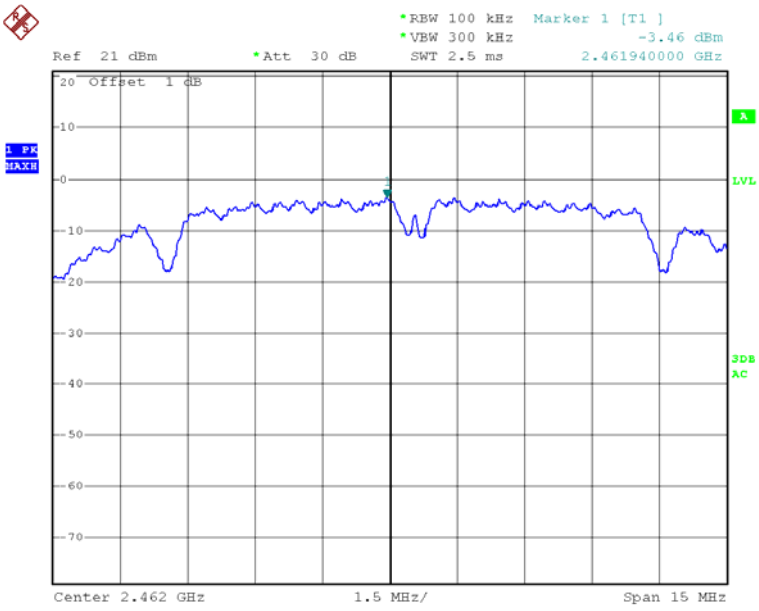
Date: 24.FEB.2012 10:57:51

Power Spectral Density, 802.11b Middle Channel



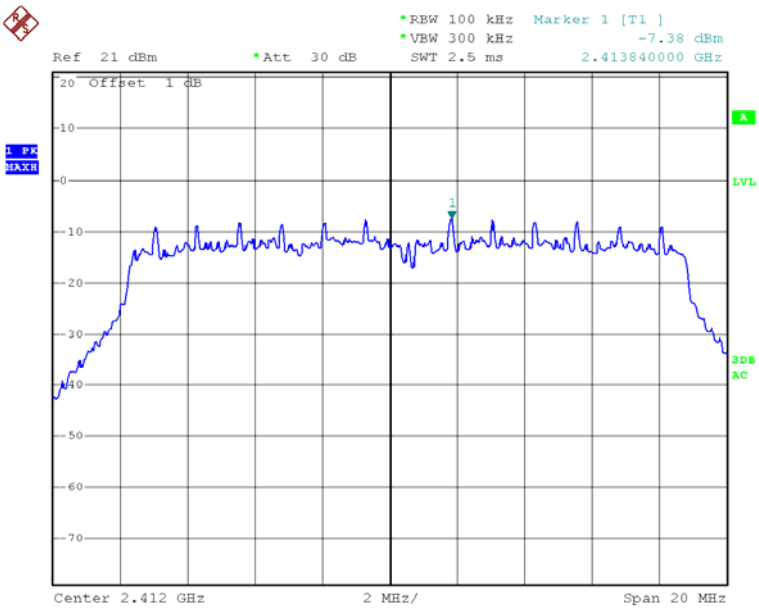
Date: 24.FEB.2012 11:18:22

Power Spectral Density, 802.11b High Channel



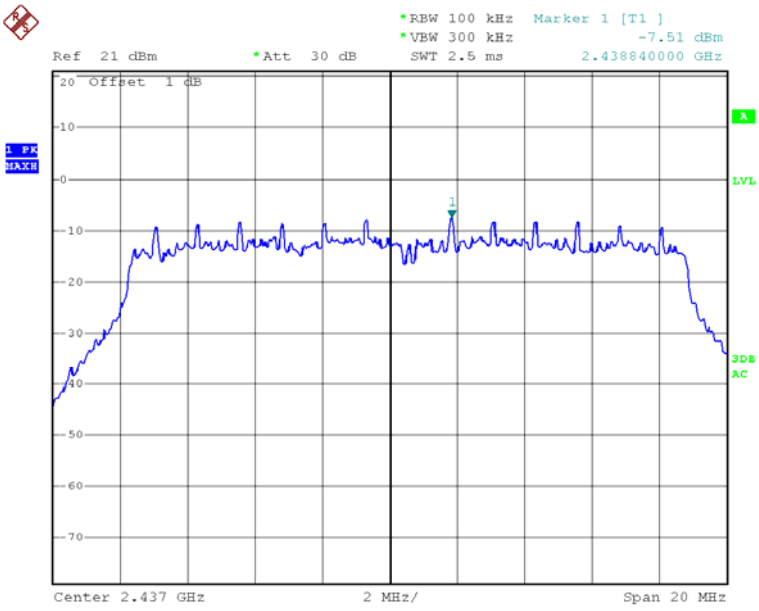
Date: 24.FEB.2012 11:27:49

Power Spectral Density, 802.11g Low Channel



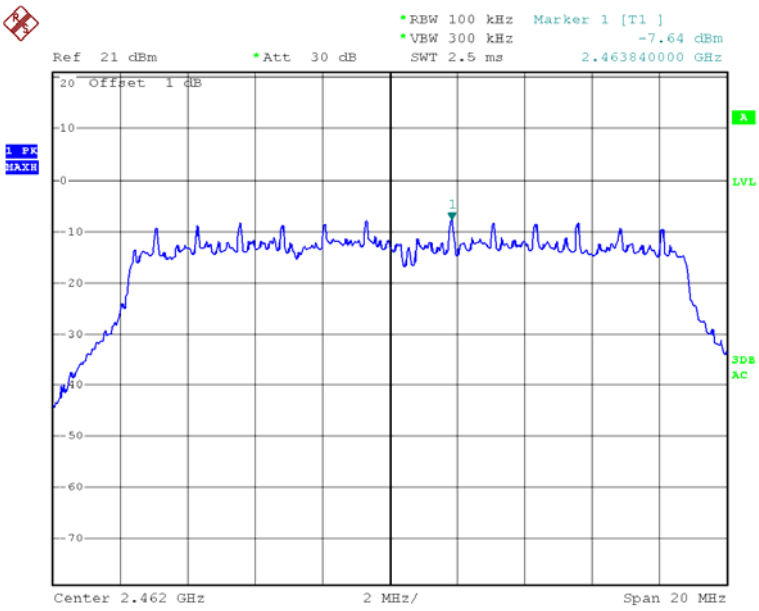
Date: 24.FEB.2012 11:52:34

Power Spectral Density, 802.11g Middle Channel



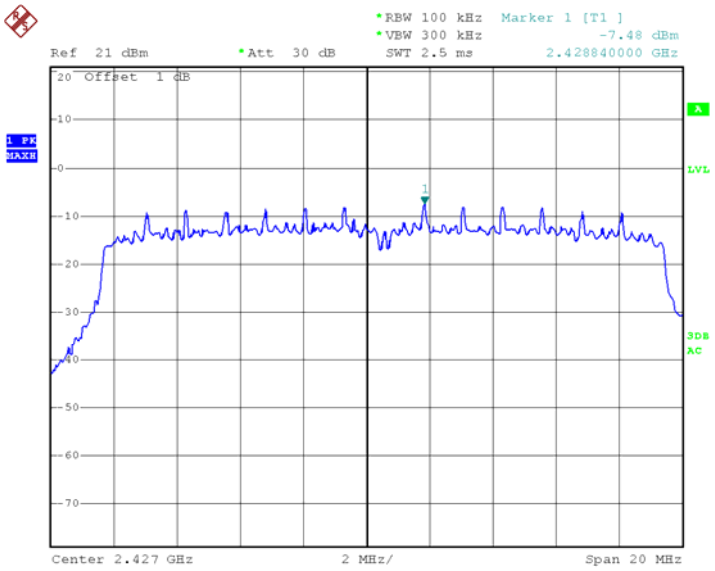
Date: 24.FEB.2012 12:13:33

Power Spectral Density, 802.11g High Channel



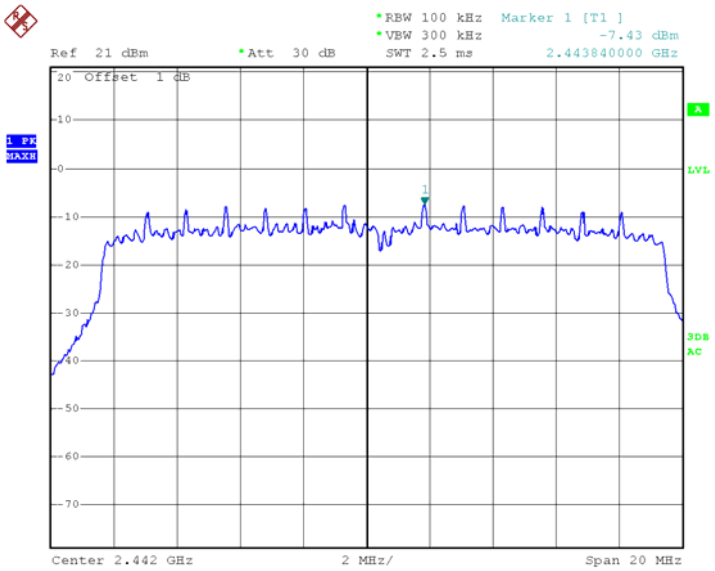
Date: 24.FEB.2012 13:32:42

Power Spectral Density, 802.11n20 Low Channel



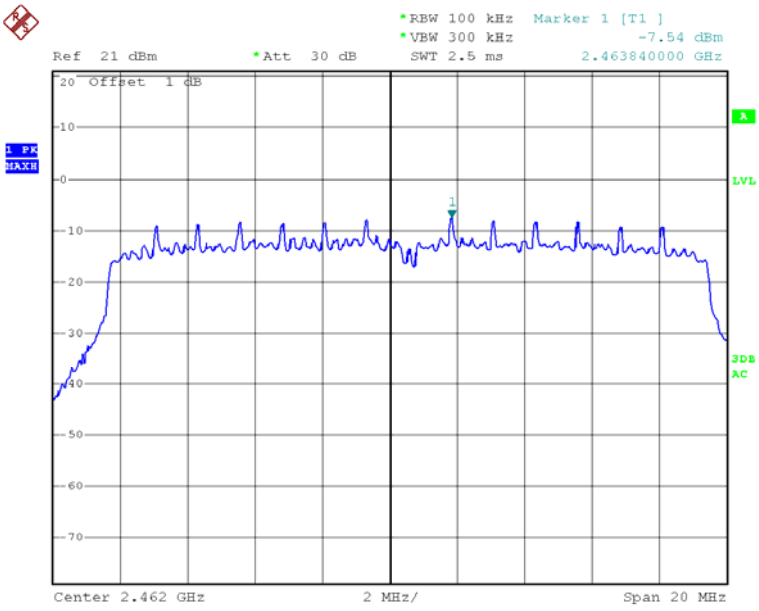
Date: 24.FEB.2012 13:58:39

Power Spectral Density, 802.11n20 Middle Channel



Date: 24.FEB.2012 14:24:33

Power Spectral Density, 802.11n20 High Channel



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