Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

Aztech Technologies Pte Ltd.

31 Ubi Road 1, Aztech Building, Singapore

FCC ID: I38WL556E

Report Type:	Product Type:
Original Report	300Mbps Wireless-N Range Extender

Test Engineer:	Kvass Yang
Report Number:	RSZ10120112
Report Date:	2011-01-11
Reviewed By:	Merry Zhao EMC Engineer
Prepared By:	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

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Aztech Technologies Pte Ltd 's* product, model number: *WL556E (FCC ID: I38WL556E) o*r the "EUT" as referred to in this report is a *300Mbps Wireless-N Range Extender*, which measures approximately: 10.5 cm (L) x 5.8 cm (W) x 4.2 cm (H), rated input voltage: AC 120 V / 60 Hz.

** All measurement and test data in this report was gathered from production sample serial number: 1012019 (Assigned by BACL, Shenzhen). The EUT was received on 2010-12-01.*

Objective

This Type approval report is prepared on behalf of *Aztech Technologies Pte 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 compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

N/A

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.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in 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 a National Institute of Standards and Technology (NIST) accredited laboratory, under the 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	/	/

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

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

EUT Exercise Software

The test was performed under:
802.11b: Data rate: 1 Mbps.
802.11g: Data rate: 6 Mbps.
802.11n20: Data rate: 6.5 Mbps for single antenna port; Data rate: 13 Mbps for Combine;
802.11 n40: Data rate: 13.5 Mbps for single antenna port; Data rate: 27 Mbps for Combine;

Equipment Modifications

No modification was made to the unit tested.

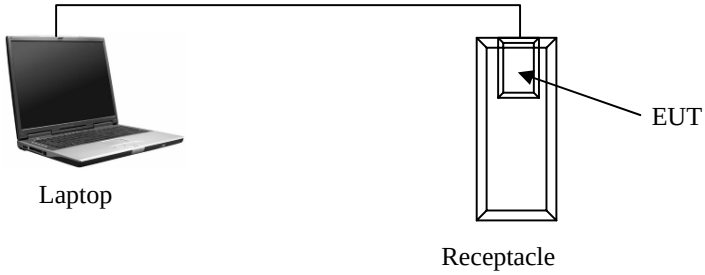
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Compaq	Laptop	PP2040	N/A	N/A

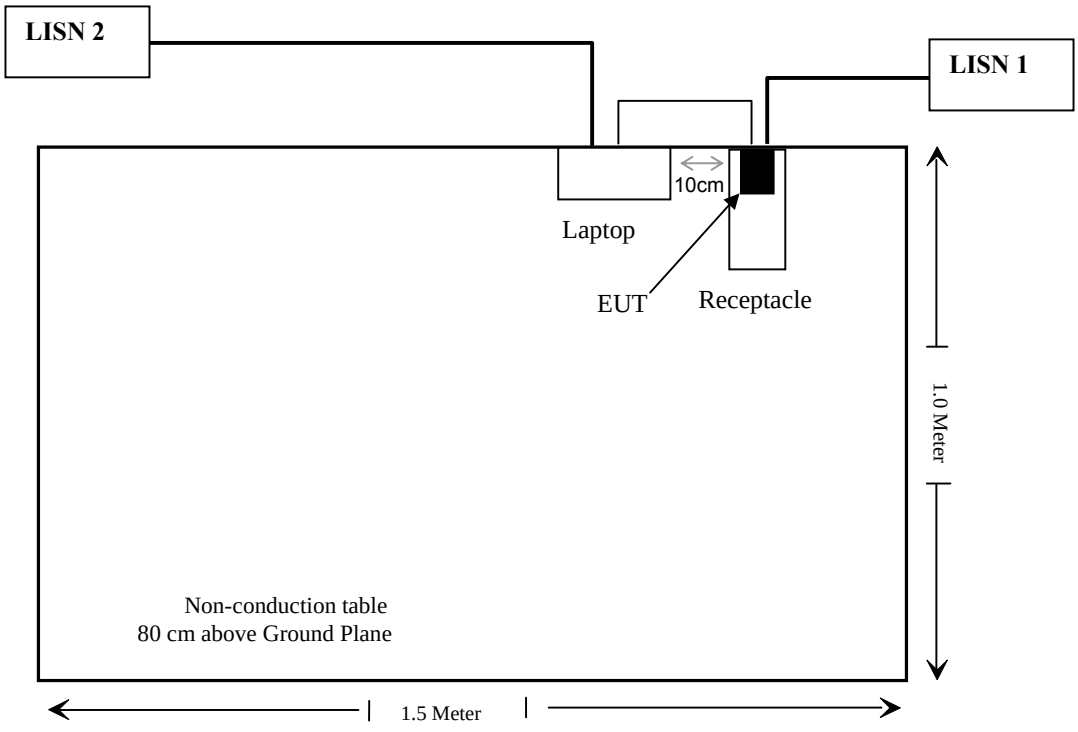
External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable RJ45 Cable	1.8	EUT	PC

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §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)	Radiated Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB 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) & §1.1307 (b) (1) & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 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/cm^2)**	**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;

According to §1.1310 and §2.1091 RF exposure is calculated.

MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

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

Where: S = power density
P = power input to antenna
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

MPE Calculation Results

Radio Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412	2.0	1.58	16.79	47.75	20	0.015	1.0
802.11g	2412	2.0	1.58	13.79	23.93	20	0.008	1.0
802.11n20	2462	2.0	1.58	18.37	68.71	20	0.022	1.0
802.11n40	2452	2.0	1.58	18.32	67.92	20	0.021	1.0

Result: Complies at 20 cm distance.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC §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.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT used an integral antenna, which in accordance to section 15.203, the maximum gain is 2.0 dBi; please refer to the internal photos.

Result: Compliant.

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).
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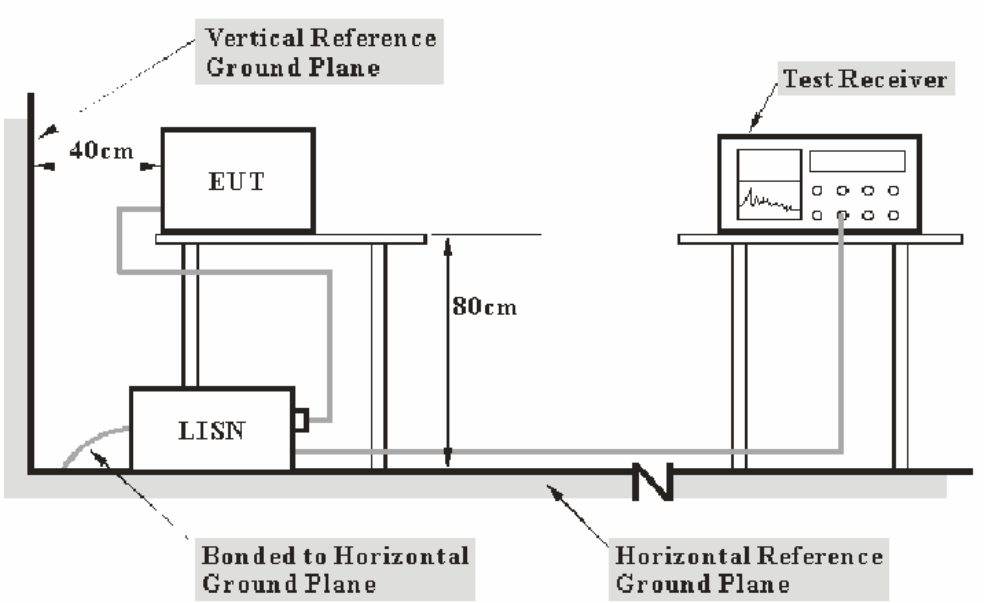
EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

*** 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 Procedure

During the conducted emission test, the EUT was inserted to the receptacle and the receptacle was connected to the first LISN, the PC adapter was connected to the second LISN.

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

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

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:

802.11b (wost case): **13.89 dB** at **0.425 MHz** in the **Neutral** conductor mode
802.11g (wost case): **14.02 dB** at **27.120 MHz** in the **Line** conductor mode
802.11n20 (wost case): **12.78 dB** at **27.120 MHz** in the **Neutral** conductor mode
802.11n40 (wost case): **13.98 dB** at **0.425 MHz** in the **Neutral** conductor mode

Test Data

Environmental Conditions

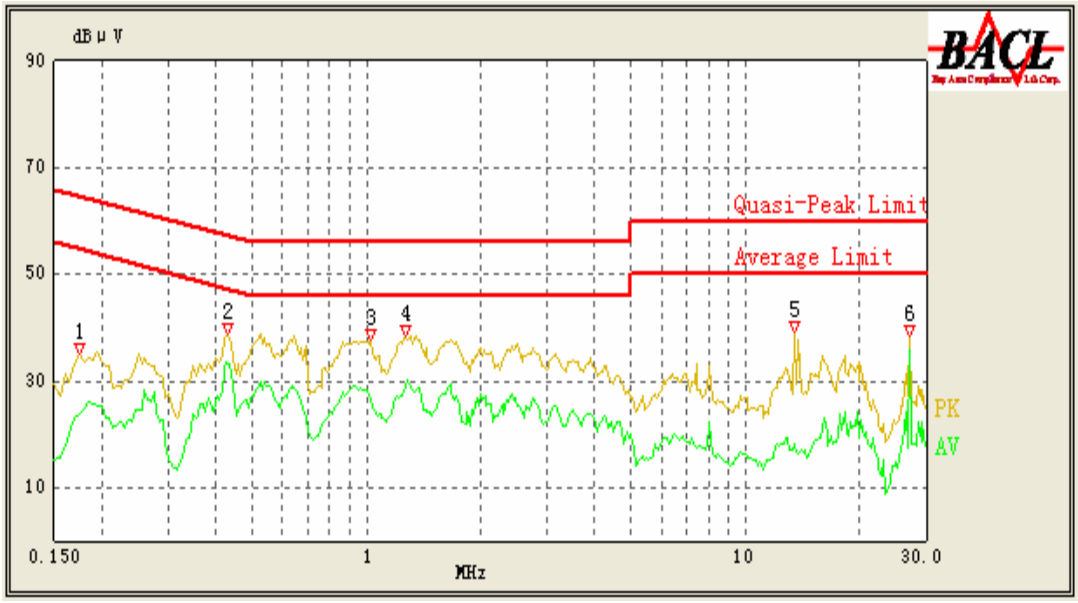
Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Kvass Yang on 2010-12-21.

Test Mode: Transmitting

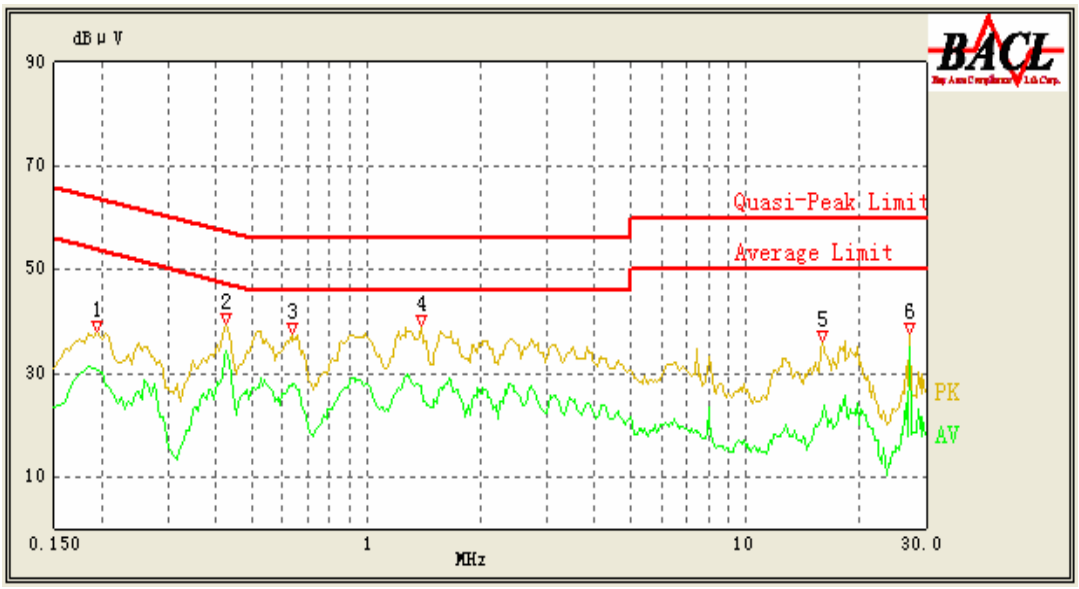
Test Mode: 802.11b

AC 120V / 60Hz - Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBμV)**	**Limit (dBμV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
27.120	35.91	10.13	50.00	14.09	Ave
0.430	33.32	10.13	48.00	14.68	Ave
1.265	29.23	10.13	46.00	16.77	Ave
1.030	26.92	10.10	46.00	19.08	Ave
0.430	36.68	10.13	58.00	21.32	QP
1.265	33.46	10.13	56.00	22.54	QP
27.120	36.83	10.13	60.00	23.17	QP
1.030	31.48	10.10	56.00	24.52	QP
0.175	23.73	10.08	55.29	31.56	Ave
13.420	18.24	10.13	50.00	31.76	Ave
0.175	28.75	10.08	65.29	36.54	QP
13.465	22.02	10.13	60.00	37.98	QP

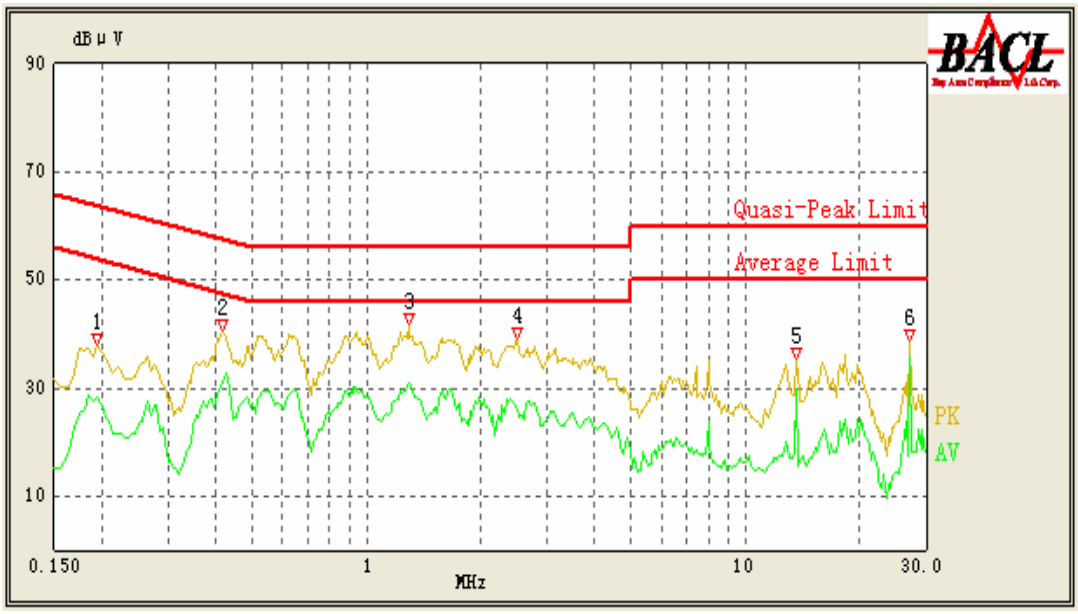
AC 120V / 60Hz - Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
0.425	34.25	10.13	48.14	13.89	Ave
27.120	35.06	10.13	50.00	14.94	Ave
0.635	27.72	10.17	46.00	18.28	Ave
1.390	27.68	10.14	46.00	18.32	Ave
0.425	37.44	10.13	58.14	20.70	QP
0.635	33.37	10.17	56.00	22.63	QP
27.120	37.28	10.13	60.00	22.72	QP
1.395	32.96	10.14	56.00	23.04	QP
0.195	30.47	10.07	54.71	24.24	Ave
16.045	22.06	10.16	50.00	27.94	Ave
0.195	35.41	10.07	64.71	29.30	QP
16.045	29.59	10.16	60.00	30.41	QP

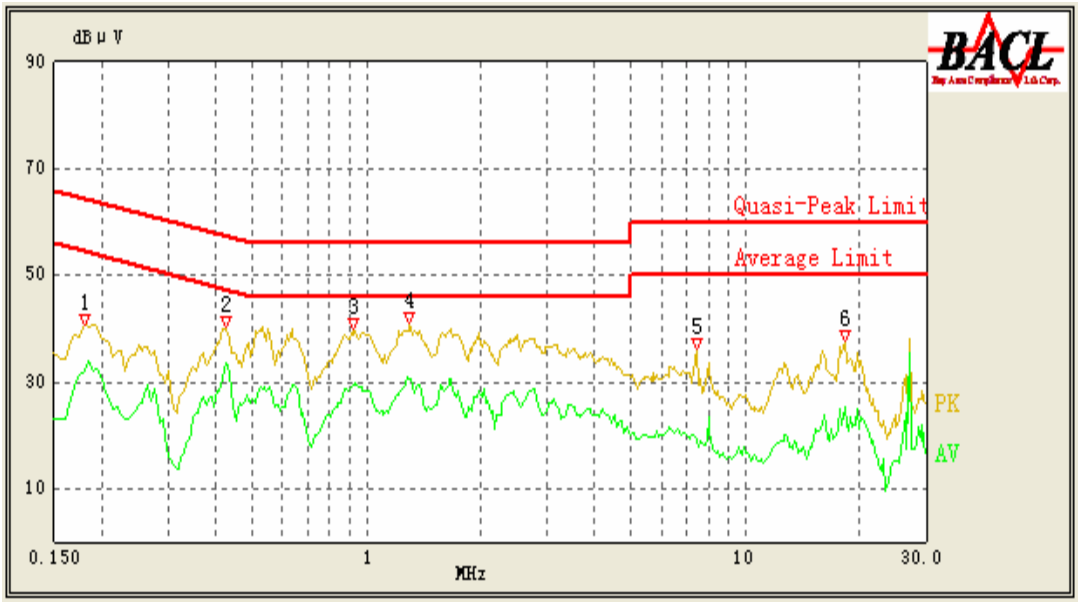
Test Mode: 802.11g

AC 120V / 60Hz - Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBμV)**	**Limit (dBμV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
27.120	35.98	10.13	50.00	14.02	Ave
1.290	31.12	10.13	46.00	14.88	Ave
0.415	31.06	10.11	48.43	17.37	Ave
13.560	29.99	10.14	50.00	20.01	Ave
1.290	35.88	10.13	56.00	20.12	QP
2.515	25.42	10.17	46.00	20.58	Ave
27.120	38.05	10.13	60.00	21.95	QP
0.415	35.87	10.11	58.43	22.56	QP
2.495	32.26	10.18	56.00	23.74	QP
0.195	28.16	10.07	54.71	26.55	Ave
0.195	34.19	10.07	64.71	30.52	QP
13.560	26.23	10.14	60.00	33.77	QP

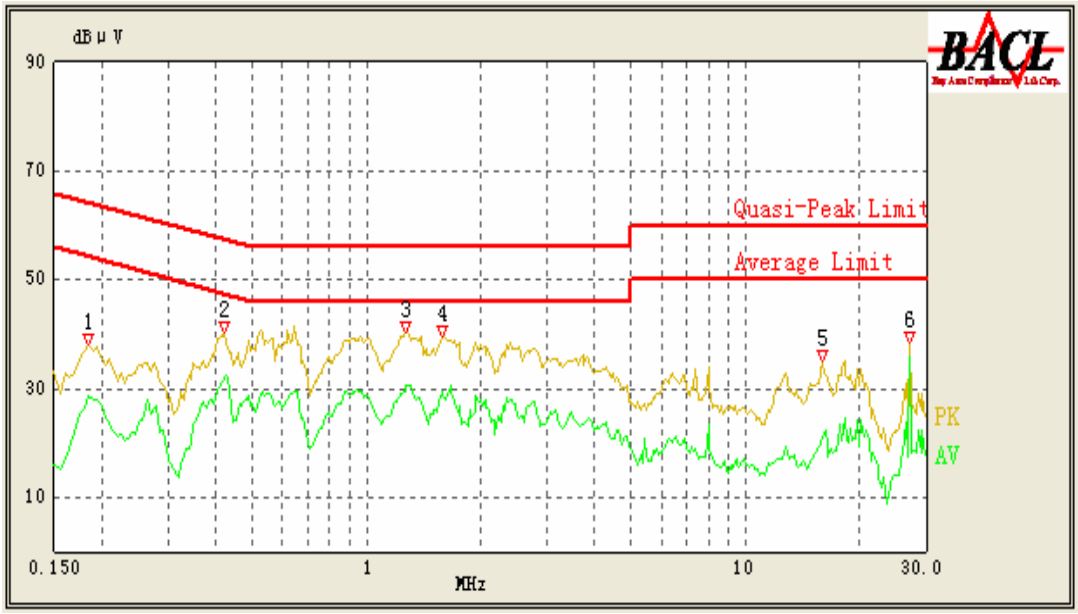
AC 120V / 60Hz - Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
0.425	33.55	10.13	48.14	14.59	Ave
1.305	30.68	10.13	46.00	15.32	Ave
0.920	29.39	10.12	46.00	16.61	Ave
0.920	35.32	10.12	56.00	20.68	QP
1.300	35.26	10.13	56.00	20.74	QP
0.425	36.65	10.13	58.14	21.49	QP
0.180	31.98	10.08	55.14	23.16	Ave
18.245	25.33	10.18	50.00	24.67	Ave
18.305	30.82	10.18	60.00	29.18	QP
0.180	35.42	10.08	65.14	29.72	QP
7.415	19.35	10.10	50.00	30.65	Ave
7.415	25.83	10.10	60.00	34.17	QP

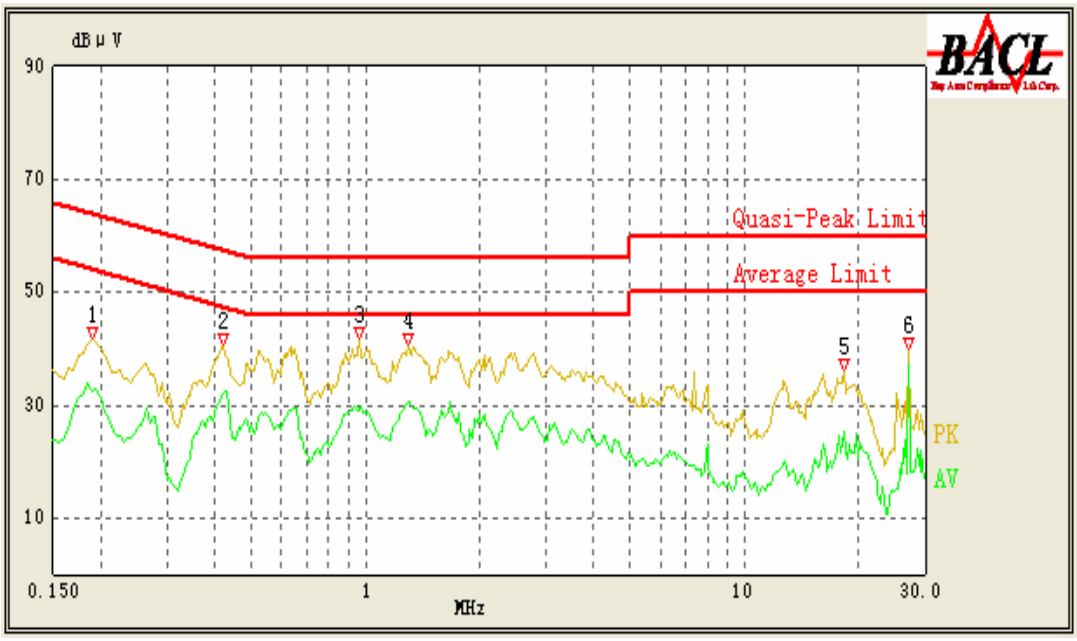
Test Mode: 802.11n-20

AC 120V / 60Hz - Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBμV)**	**Limit (dBμV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
27.120	35.69	10.13	50.00	14.31	Ave
1.275	30.43	10.13	46.00	15.57	Ave
0.420	31.79	10.12	48.29	16.50	Ave
1.590	28.84	10.16	46.00	17.16	Ave
1.590	35.56	10.16	56.00	20.44	QP
1.270	35.13	10.13	56.00	20.87	QP
0.420	36.41	10.12	58.29	21.88	QP
27.120	37.20	10.13	60.00	22.80	QP
0.185	28.71	10.08	55.00	26.29	Ave
16.015	21.09	10.16	50.00	28.91	Ave
0.185	33.80	10.08	65.00	31.20	QP
16.040	27.74	10.16	60.00	32.26	QP

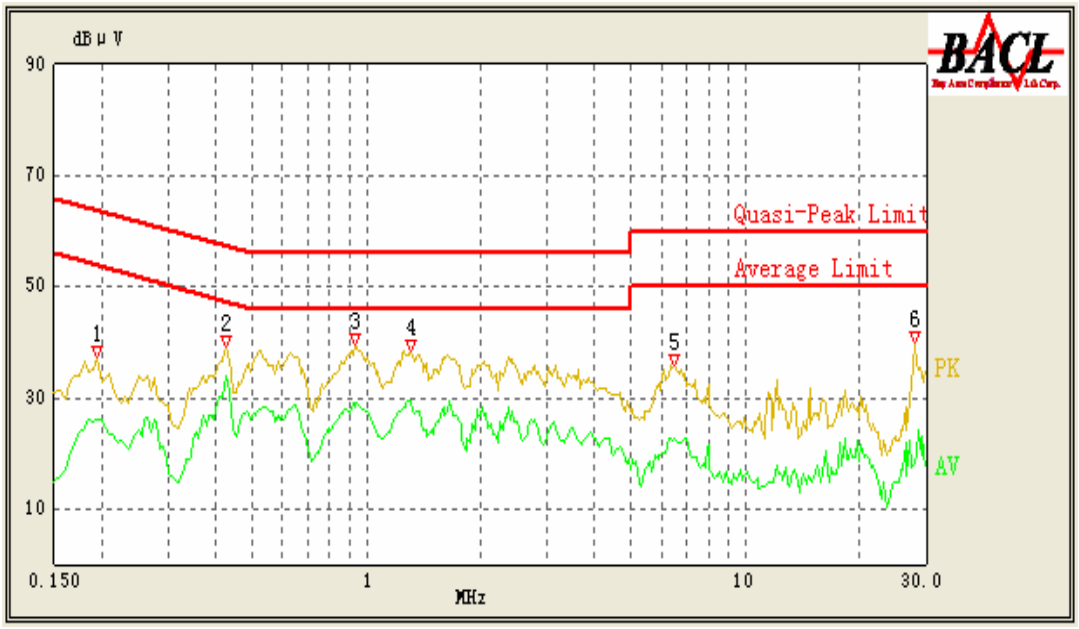
AC 120V / 60Hz - Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
27.120	37.22	10.13	50.00	12.78	Ave
1.290	30.67	10.13	46.00	15.33	Ave
0.420	32.03	10.12	48.29	16.26	Ave
0.960	29.16	10.11	46.00	16.84	Ave
1.295	35.92	10.13	56.00	20.08	QP
0.965	34.60	10.11	56.00	21.40	QP
0.420	36.61	10.12	58.29	21.68	QP
0.190	32.52	10.07	54.86	22.34	Ave
27.120	36.27	10.13	60.00	23.73	QP
18.245	25.39	10.18	50.00	24.61	Ave
0.190	36.65	10.07	64.86	28.21	QP
18.245	31.25	10.18	60.00	28.75	QP

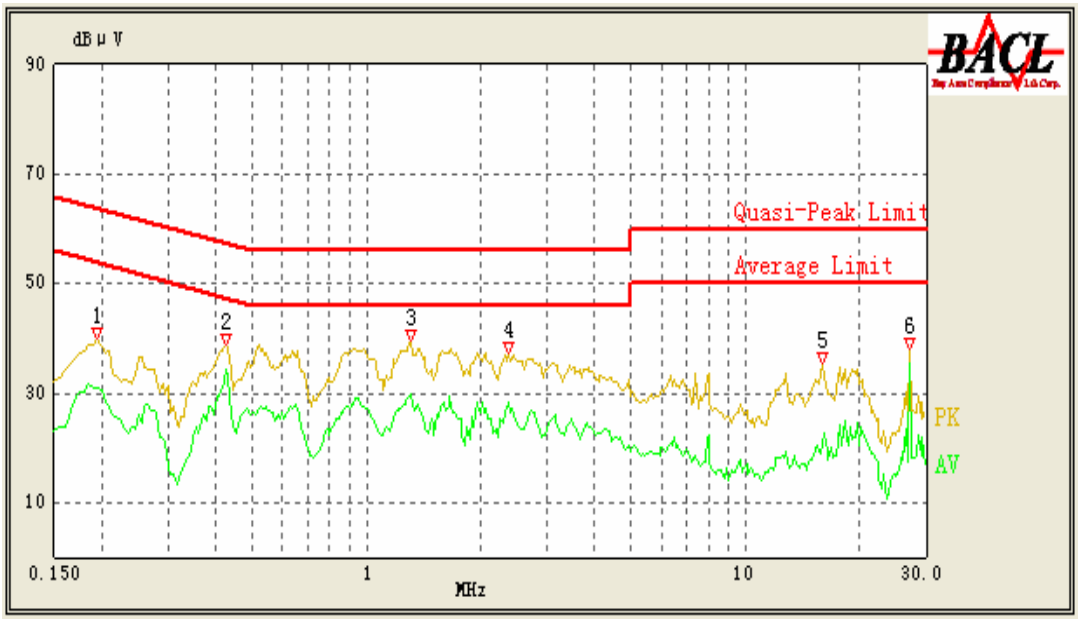
Test Mode: 802.11n-40

AC 120V / 60Hz - Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
0.425	34.03	10.13	48.14	14.11	Ave
1.305	29.56	10.13	46.00	16.44	Ave
0.935	29.16	10.11	46.00	16.84	Ave
0.425	37.38	10.13	58.14	20.76	QP
1.305	34.70	10.13	56.00	21.30	QP
0.935	34.58	10.11	56.00	21.42	QP
6.475	22.75	10.10	50.00	27.25	Ave
0.195	26.18	10.07	54.71	28.53	Ave
27.890	18.25	10.12	50.00	31.75	Ave
0.195	31.69	10.07	64.71	33.02	QP
6.480	21.87	10.10	60.00	38.13	QP
27.900	15.66	10.12	60.00	44.34	QP

AC 120V / 60Hz - Neutral:



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Corrected Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK /QP/Ave)**
0.425	34.16	10.13	48.14	13.98	Ave
27.120	35.54	10.13	50.00	14.46	Ave
1.305	29.88	10.13	46.00	16.12	Ave
2.370	28.25	10.18	46.00	17.75	Ave
0.425	37.50	10.13	58.14	20.64	QP
1.305	34.60	10.13	56.00	21.40	QP
2.370	33.76	10.18	56.00	22.24	QP
0.195	31.03	10.07	54.71	23.68	Ave
27.120	34.64	10.13	60.00	25.36	QP
0.195	35.98	10.07	64.71	28.73	QP
15.985	20.64	10.16	50.00	29.36	Ave
16.015	27.41	10.16	60.00	32.59	QP

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

Applicable Standard

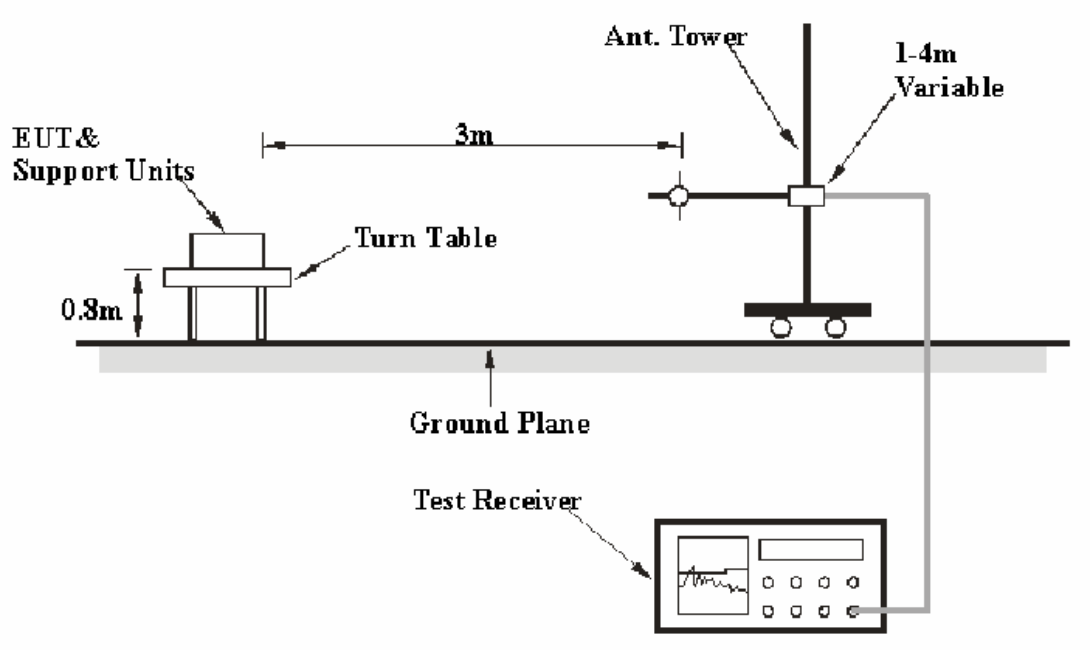
FCC §15.247 (d); §15.209; §15.205;

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



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

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

The spacing between the peripherals was 10 cm.
The EUT was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	***RBW***	***Video B/W***	***Detector***
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	AV

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-11	2011-11-10
Sunol Sciences	Broadband Antenna	At1080	301902	2010-03-11	2011-03-11
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-04	2011-05-03
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2010-07-08	2011-07-08

*** 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 Procedure

For the radiated emissions test, the EUT and other relevant support equipment were 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-1GHz and peak and Average detection modes for frequencies above 1GHz.

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 Results Summary

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

30 -1000 MHz:

802.11b (wost case): **0.3 dB** at **35.012451 MHz** in the **Vertical** polarization
802.11g (wost case): **0.1 dB** at **34.651750 MHz** in the **Vertical** polarization
802.11n20 (wost case): **1.3 dB** at **43.788500 MHz** in the **Vertical** polarization
802.11n40 (wost case): **0.5 dB** at **43.803750 MHz** in the **Vertical** polarization

Above 1 GHz:

802.11b (Low Channel): **6.93 dB** at **4824.00 MHz** in the **Horizontal** polarization
802.11b (Middle Channel): **8.52 dB** at **4874.00 MHz** in the **Horizontal** polarization
802.11b (High Channel): **8.26 dB** at **4924.00 MHz** in the **Horizontal** polarization

802.11g (Low Channel): **8.01 dB** at **4824.00 MHz** in the **Horizontal** polarization
802.11g (Middle Channel): **9.15 dB** at **4874.00 MHz** in the **Horizontal** polarization
802.11g (High Channel): **9.33 dB** at **4924.00 MHz** in the **Horizontal** polarization

802.11n20 (Low Channel): **5.93 dB** at **4824.00 MHz** in the **Horizontal** polarization
802.11n20 (Middle Channel): **7.27 dB** at **4874.00 MHz** in the **Horizontal** polarization
802.11n20 (High Channel): **3.21 dB** at **4924.00 MHz** in the **Horizontal** polarization

802.11n40 (Low Channel): **7.27 dB** at **4844.00 MHz** in the **Vertical** polarization
802.11n40 (Middle Channel): **8.71 dB** at **4874.00 MHz** in **Vertical** the polarization
802.11n40 (High Channel): **10.55 dB** at **4904.00 MHz** in the **Horizontal** polarization

Test Data

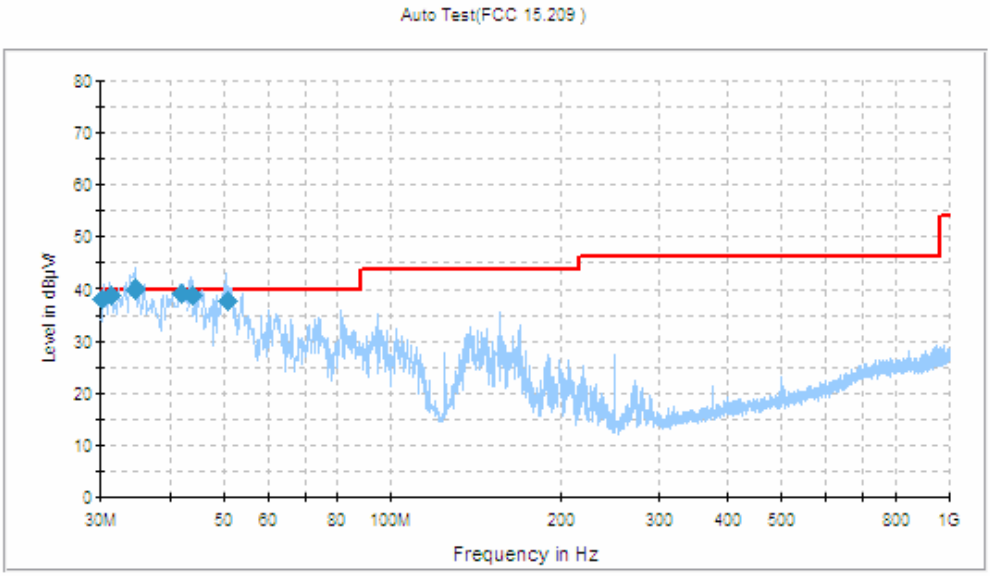
Environmental Conditions

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

The testing was performed by Kvass Yang on 2010-12-20.

30-1000 MHz:

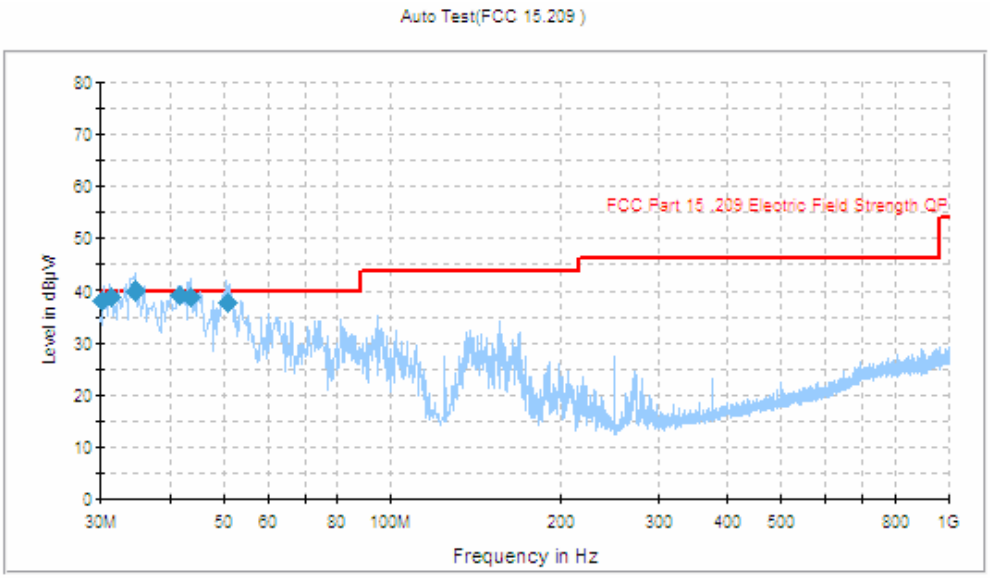
Test Mode: Transmitting (802.11b)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Anttenna Height (cm)	Anttenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
35.012451	39.7	125.0	V	82.0	-14.4	40.0	0.3*
41.785241	39.3	100.0	V	194.0	-17.5	40.0	0.7*
31.578954	39.1	324.0	V	95.0	-13.4	40.0	0.9*
44.021543	39.1	100.0	V	115.0	-17.8	40.0	0.9*
30.356471	39.0	203.0	V	125.0	-12.8	40.0	1.0*
50.957841	38.0	105.0	V	260.0	-18.1	40.0	2.0*

** Within measurement uncertainty.*

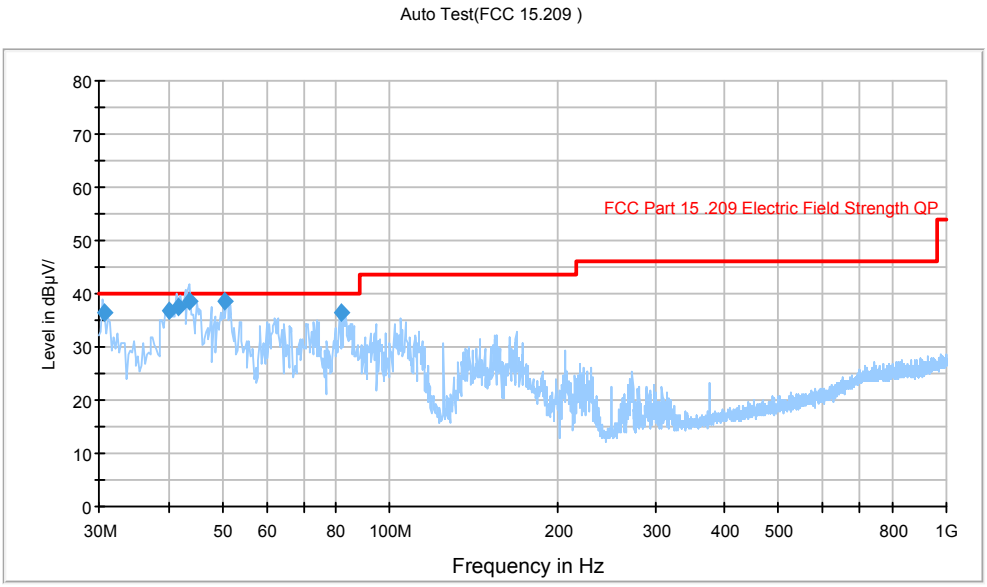
Test Mode: Transmitting (802.11g)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Anttenna Height (cm)	Anttenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
34.651750	39.9	120.0	V	182.0	-14.4	40.0	0.1*
31.526250	39.2	303.0	V	295.0	-13.4	40.0	0.8*
41.630250	39.2	101.0	V	94.0	-17.5	40.0	0.8*
30.315250	39.1	223.0	V	25.0	-12.8	40.0	0.9*
43.815750	38.9	101.0	V	15.0	-17.8	40.0	1.1*
51.064750	37.8	100.0	V	60.0	-18.1	40.0	2.2*

** Within measurement uncertainty.*

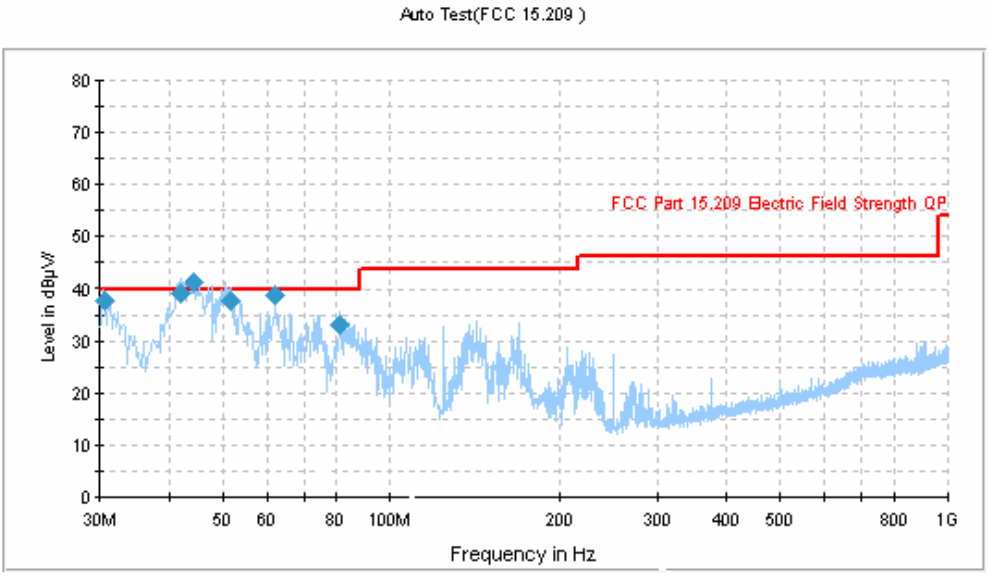
Test Mode: Transmitting (802.11n20 Combine)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
43.788500	38.7	100.0	V	277.0	-14.4	40.0	1.3*
50.455000	38.6	100.0	V	0.0	-15.3	40.0	1.4*
41.602250	37.6	100.0	V	25.0	-13.1	40.0	2.4*
40.185000	36.8	167.0	H	130.0	-13.0	40.0	3.2*
30.649608	36.3	100.0	V	330.0	-12.8	40.0	3.7*
82.056500	36.3	100.0	V	329.0	-16.0	40.0	3.7*

** Within measurement uncertainty.*

Test Mode: Transmitting (802.11n40 Combine)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
43.803750	39.5	101.0	V	344.0	-14.4	40.0	0.5*
42.082000	39.2	101.0	V	329.0	-13.4	40.0	0.8*
61.235400	38.1	103.0	V	64	-17.8	40.0	1.9*
31.610700	38.0	101.0	V	200.0	-12.8	40.0	2.0*
51.801750	37.7	101.0	V	78.0	-17.5	40.0	2.3*
81.217250	33.3	151.0	V	176.0	-18.1	40.0	6.7

** Within measurement uncertainty.*

Above 1 GHz:

802.11b Mode:

Indicated		Detector (PK/Ave)	Table Angle Degree	Test 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. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	33.37	Ave	0	1.1	H	36.2	4.30	26.80	40.92	54	6.93	harmonic
4824	33.00	Ave	15	1.5	V	35.2	4.30	26.80	40.55	54	8.30	harmonic
4824	44.06	PK	0	1.1	H	36.2	4.30	26.80	51.61	74	16.24	harmonic
4824	43.23	PK	15	1.5	V	35.2	4.30	26.80	50.78	74	18.07	harmonic
Middle Channel (2437 MHz)												
4874	32.40	Ave	10	1.2	H	35.5	4.36	26.78	45.48	54	8.52	harmonic
4874	32.97	Ave	310	1.6	V	34.8	4.36	26.78	45.35	54	8.65	harmonic
4874	42.78	PK	10	1.2	H	35.8	4.36	26.78	56.16	74	17.84	harmonic
4874	43.38	PK	310	1.6	V	34.8	4.36	26.78	55.76	74	18.24	harmonic
HighChannel (2462 MHz)												
4924	31.49	Ave	125	1.5	H	36.6	4.40	26.75	45.74	54	8.26	harmonic
4924	31.66	Ave	25	1.4	V	35.4	4.40	26.75	44.71	54	9.29	harmonic
4924	41.47	PK	125	1.5	H	36.6	4.40	26.75	55.72	74	18.28	harmonic
4924	41.67	PK	25	1.4	V	35.4	4.40	26.75	54.72	74	19.28	harmonic

Raidated spurious emission in restricted band

Freq. (MHz)	S.A. Reading (dBµV)	Detector PK /Ave	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Out of left side band (2310-2390 MHz)											
2366.64	37.36	Ave	0	1.3	H	30.3	3.00	26.84	43.82	54	10.18
2366.64	36.02	Ave	125	2.4	V	30.5	3.00	26.84	42.68	54	11.32
2366.64	45.70	PK	0	1.3	H	30.3	3.00	26.84	52.16	74	21.84
2366.64	44.70	PK	125	2.4	V	30.5	3.00	26.84	51.36	74	22.64
Out of right side band (2483.5-2500 MHz)											
2483.95	35.01	Ave	117	1.7	V	30.4	3.00	26.84	41.57	54	12.43
2483.95	35.05	Ave	305	1.7	H	30.2	3.00	26.84	41.41	54	12.59
2483.95	43.69	PK	305	1.7	H	30.2	3.00	26.84	50.05	74	23.95
2483.95	43.40	PK	117	1.7	V	30.4	3.00	26.84	49.96	74	24.04

802.11g Mode:

Indicated		Detector (PK/Ave)	Table Angle Degree	Test 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. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	32.29	Ave	14	1.3	H	36.2	4.30	26.80	45.99	54	8.01	harmonic
4824	30.86	Ave	142	1.5	V	35.2	4.30	26.80	43.56	54	10.44	harmonic
4824	41.51	PK	14	1.3	H	36.2	4.30	26.80	55.21	74	18.79	harmonic
4824	40.42	PK	142	1.5	V	35.2	4.30	26.80	53.12	74	20.88	harmonic
Middle Channel (2437 MHz)												
4874	31.77	Ave	105	1.5	H	35.5	4.36	26.78	44.85	54	9.15	harmonic
4874	30.76	Ave	321	1.4	V	34.8	4.36	26.78	43.14	54	10.86	harmonic
4874	40.90	PK	105	1.5	H	35.8	4.36	26.78	54.28	74	19.72	harmonic
4874	40.39	PK	321	1.4	V	34.8	4.36	26.78	52.77	74	21.23	harmonic
HighChannel (2462 MHz)												
4924	30.42	Ave	0	1.5	H	36.6	4.40	26.75	44.67	54	9.33	harmonic
4924	29.88	Ave	0	1.5	V	35.4	4.40	26.75	42.93	54	11.07	harmonic
4924	42.61	PK	0	1.5	H	36.6	4.40	26.75	56.86	74	17.14	harmonic
4924	39.85	PK	0	1.5	V	35.4	4.40	26.75	52.9	74	21.10	harmonic

Raidated spurious emission in restricted band

Freq. (MHz)	S.A. Reading (dBµV)	Detector PK /Ave	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Out of left side band (2310-2390 MHz)											
2389.20	30.12	Ave	125	2	V	30.5	3.00	26.84	36.78	54	17.22
2389.20	29.06	Ave	25	1.8	H	30.3	3.00	26.84	35.52	54	18.48
2389.20	43.07	PK	125	2	V	30.5	3.00	26.84	49.73	74	24.27
2389.20	42.69	PK	25	1.8	H	30.3	3.00	26.84	49.15	74	24.85
Out of right side band (2483.5-2500 MHz)											
2485.20	31.43	Ave	32	1.5	H	30.2	3.00	26.84	37.79	54	16.21
2485.20	30.19	Ave	0	1.7	V	30.4	3.00	26.84	36.75	54	17.25
2485.20	41.39	PK	0	1.7	V	30.4	3.00	26.84	47.95	74	26.05
2485.20	41.51	PK	32	1.5	H	30.2	3.00	26.84	47.87	74	26.13

802.11n 20 Mode:

Indicated		Detector (PK/Ave)	Table Angle Degree	Test 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. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2412 MHz)												
4824	34.37	Ave	14	1.3	H	36.2	4.30	26.80	48.07	54	5.93	harmonic
4824	34.55	Ave	142	1.5	V	35.2	4.30	26.80	47.25	54	6.75	harmonic
4824	46.70	PK	14	1.3	H	36.2	4.30	26.80	60.4	74	13.6	harmonic
4824	45.79	PK	142	1.5	V	35.2	4.30	26.80	58.49	74	15.51	harmonic
Middle Channel (2437 MHz)												
4874	34.35	Ave	321	1.4	V	34.8	4.36	26.78	46.73	54	7.27	harmonic
4874	31.97	Ave	105	1.5	H	35.5	4.36	26.78	45.05	54	8.95	harmonic
4874	46.60	PK	321	1.4	V	34.8	4.36	26.78	58.98	74	15.02	harmonic
4874	45.21	PK	105	1.5	H	35.8	4.36	26.78	58.59	74	15.41	harmonic
HighChannel (2462 MHz)												
4924	36.54	Ave	0	1.5	H	36.6	4.40	26.75	50.79	54	3.21	harmonic
4924	35.46	Ave	0	1.5	V	35.4	4.40	26.75	48.51	54	5.49	harmonic
4924	47.18	PK	0	1.5	H	36.6	4.40	26.75	61.43	74	12.57	harmonic
4924	46.22	PK	0	1.5	V	35.4	4.40	26.75	59.27	74	14.73	harmonic

Raidated spurious emission in restricted band

Freq. (MHz)	S.A. Reading (dBµV)	Detector PK /Ave	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Out of left side band (2310-2390 MHz)											
2359.53	32.06	Ave	125	2	V	30.5	3.00	26.84	38.72	54	15.28
2359.53	31.80	Ave	25	1.8	H	30.3	3.00	26.84	38.26	54	15.74
2359.53	46.37	PK	125	2	V	30.5	3.00	26.84	53.03	74	20.97
2359.53	44.93	PK	25	1.8	H	30.3	3.00	26.84	51.39	74	22.61
Out of right side band (2483.5-2500 MHz)											
2487.65	31.32	Ave	0	1.7	V	30.4	3.00	26.84	37.88	54	16.12
2487.65	30.34	Ave	32	1.5	H	30.2	3.00	26.84	36.7	54	17.3
2487.65	44.65	PK	0	1.7	V	30.4	3.00	26.84	51.21	74	22.79
2487.65	43.24	PK	32	1.5	H	30.2	3.00	26.84	49.6	74	24.4

802.11n 40 Mode:

Indicated		Detector (PK/Ave)	Table Angle Degree	Test 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. (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
Low Channel (2422 MHz)												
4844	34.03	Ave	142	1.5	V	35.2	4.30	26.80	46.73	54	7.27	harmonic
4844	30.27	Ave	14	1.3	H	36.2	4.30	26.80	43.97	54	10.03	harmonic
4844	47.58	PK	142	1.5	V	35.2	4.30	26.80	60.28	74	13.72	harmonic
4844	45.08	PK	14	1.3	H	36.2	4.30	26.80	58.78	74	15.22	harmonic
Middle Channel (2437 MHz)												
4874	32.91	Ave	321	1.4	V	34.8	4.36	26.78	45.29	54	8.71	harmonic
4874	29.68	Ave	105	1.5	H	35.5	4.36	26.78	42.76	54	11.24	harmonic
4874	46.33	PK	321	1.4	V	34.8	4.36	26.78	58.71	74	15.29	harmonic
4874	43.31	PK	105	1.5	H	35.8	4.36	26.78	56.69	74	17.31	harmonic
HighChannel (2452 MHz)												
4904	30.40	Ave	0	1.5	V	35.4	4.40	26.75	43.45	54	10.55	harmonic
4904	28.25	Ave	0	1.5	H	36.6	4.40	26.75	42.50	54	11.50	harmonic
4904	43.88	PK	0	1.5	V	35.4	4.40	26.75	56.93	74	17.07	harmonic
4904	41.69	PK	0	1.5	H	36.6	4.40	26.75	55.94	74	18.06	harmonic

Raidated spurious emission in restricted band

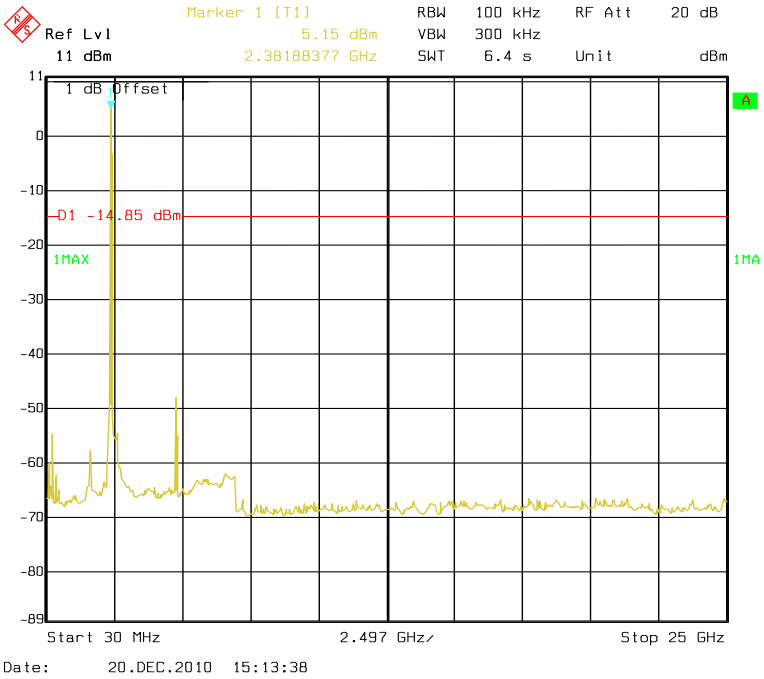
Freq. (MHz)	S.A. Reading (dBµV)	Detector PK /Ave	Direction Degree	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	FCC Part 15.247/209	
				Height (m)	Polar (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)
Out of left side band (2310-2390 MHz)											
2335.81	39.08	Ave	125	2	V	30.5	3.00	26.84	45.74	54	8.26
2335.81	34.71	Ave	25	1.8	H	30.3	3.00	26.84	41.17	54	12.83
2335.81	46.31	PK	125	2	V	30.5	3.00	26.84	52.97	74	21.03
2335.81	46.45	PK	25	1.8	H	30.3	3.00	26.84	52.91	74	21.09
Out of right side band (2483.5-2500 MHz)											
2489.51	37.81	Ave	32	1.5	H	30.2	3.00	26.84	44.17	54	9.83
2489.51	34.41	Ave	0	1.7	V	30.4	3.00	26.84	40.97	54	13.03
2489.51	46.92	PK	0	1.7	V	30.4	3.00	26.84	53.48	74	20.52
2489.51	47.02	PK	32	1.5	H	30.2	3.00	26.84	53.38	74	20.62

Antenna Port Conducted Spurious Emissions

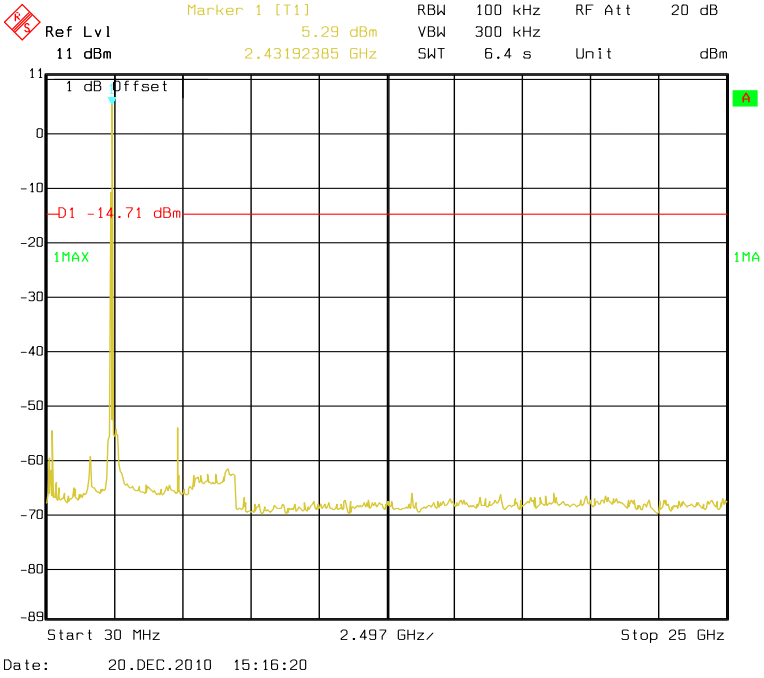
Channel Frequency (MHz)	Data Rate (Mbps)	Limit (dBc)	Ref. Plot	Result
802.11b mode				
2412	1	20	1	Pass
2437	1	20	2	Pass
2462	1	20	3	Pass
802.11g mode				
2412	6	20	4	Pass
2437	6	20	5	Pass
2462	6	20	6	Pass
802.11n-20 mode (with combiner)				
2412	13	20	7	Pass
2437	13	20	8	Pass
2462	13	20	9	Pass
802.11n-20 mode (Antenna 1)				
2422	6.5	20	10	Pass
2437	6.5	20	11	Pass
2452	6.5	20	12	Pass
802.11n-20 mode (Antenna 2)				
2412	6.5	20	13	Pass
2437	6.5	20	14	Pass
2462	6.5	20	15	Pass
802.11n-40 mode (with combiner)				
2422	27	20	16	Pass
2437	27	20	17	Pass
2452	27	20	18	Pass
802.11n-40 mode (Antenna 1)				
2422	13.5	20	19	Pass
2437	13.5	20	20	Pass
2452	13.5	20	21	Pass
802.11n-40 mode (Antenna 2)				
2412	13.5	20	22	Pass
2437	13.5	20	23	Pass
2462	13.5	20	24	Pass

Please refer to the following plots.

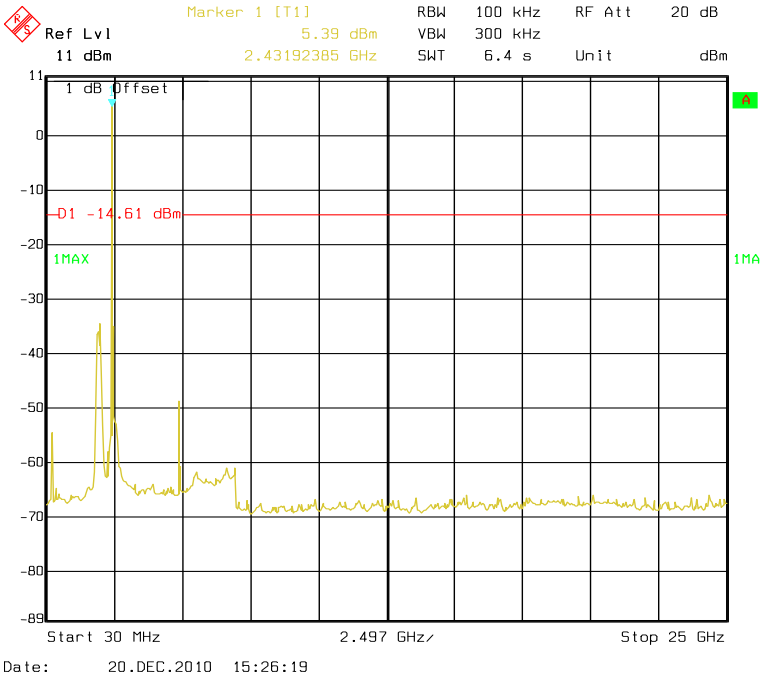
1 - 802.11b Low Channel



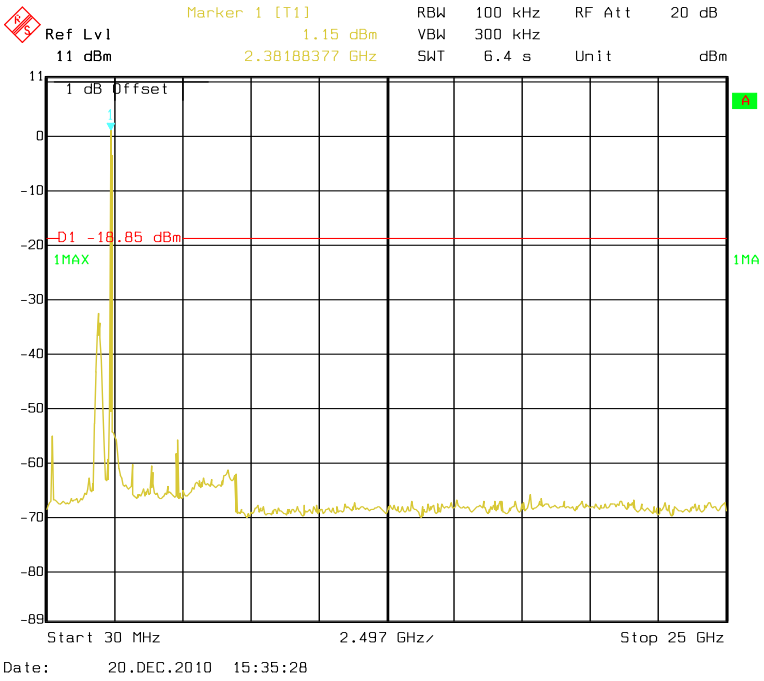
2 - 802.11b Middle Channel



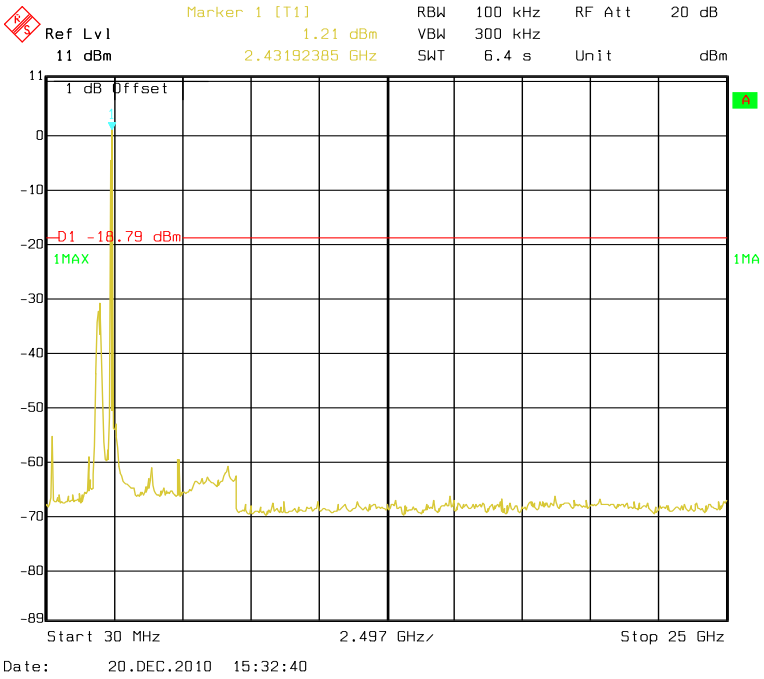
3 - 802.11b High Channel



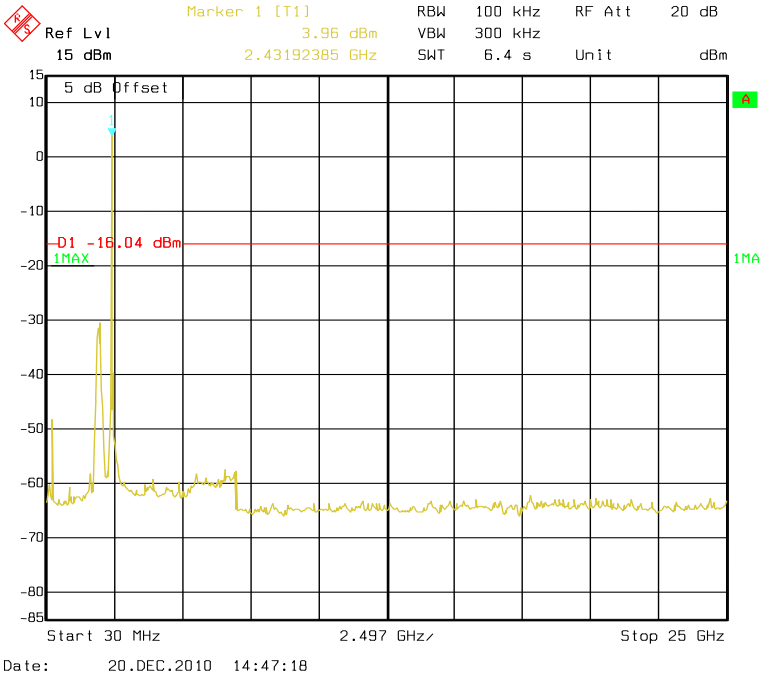
4 - 802.11g Low Channel



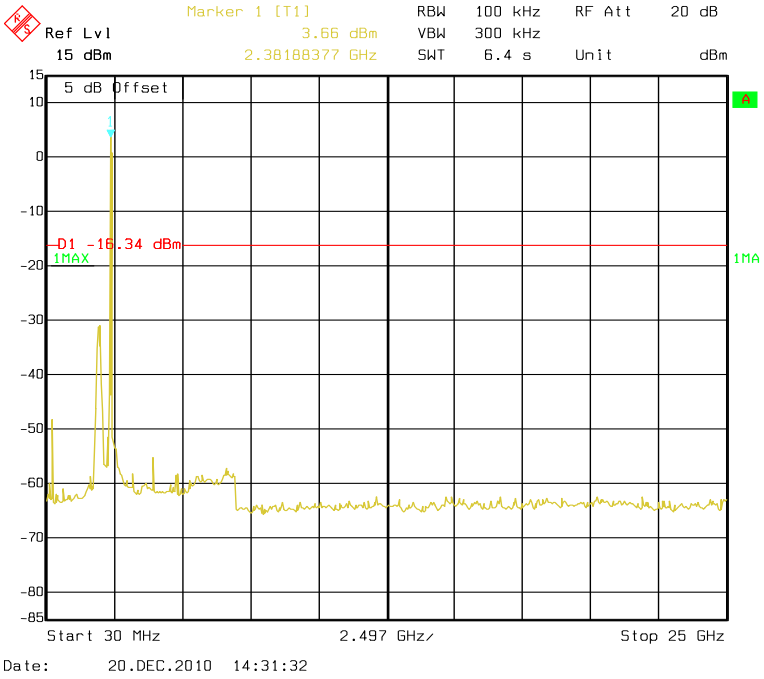
5 - 802.11g Middle Channel



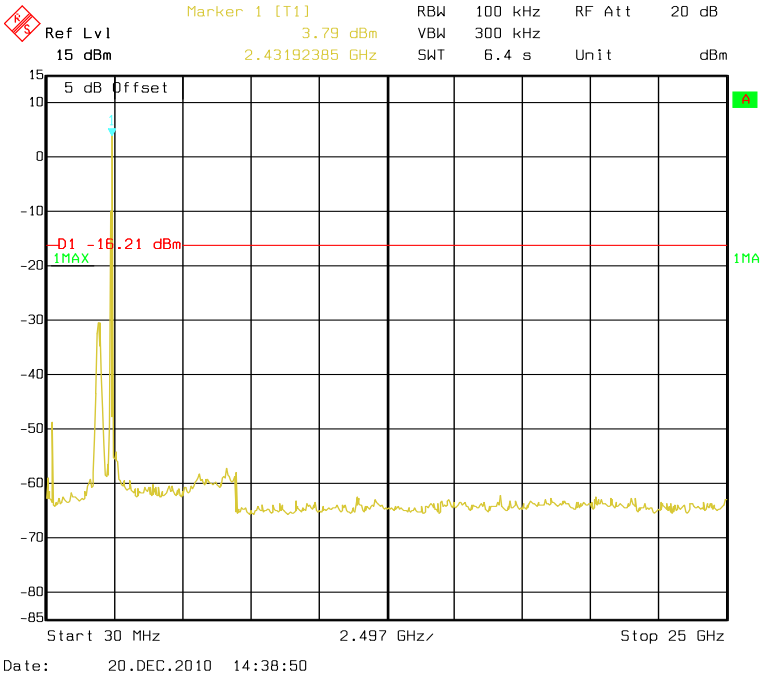
6 - 802.11g High Channel



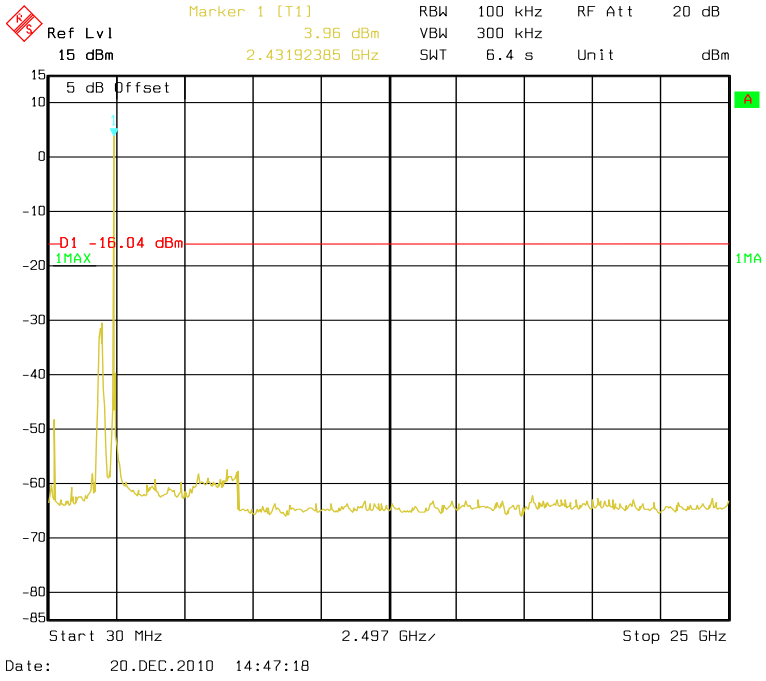
7 - 802.11n20 Low Channel (Combiner)



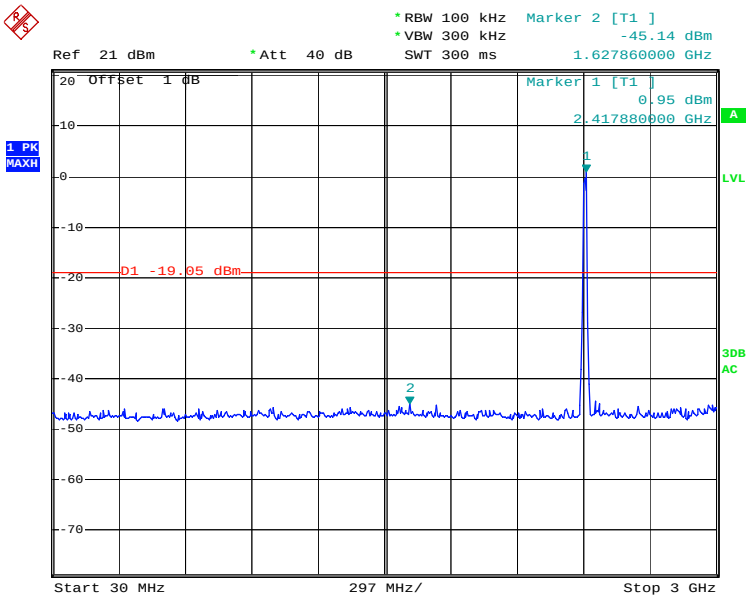
8 - 802.11n20 Middle Channel (Combiner)



9 - 802.11n20 High Channel (Combiner)

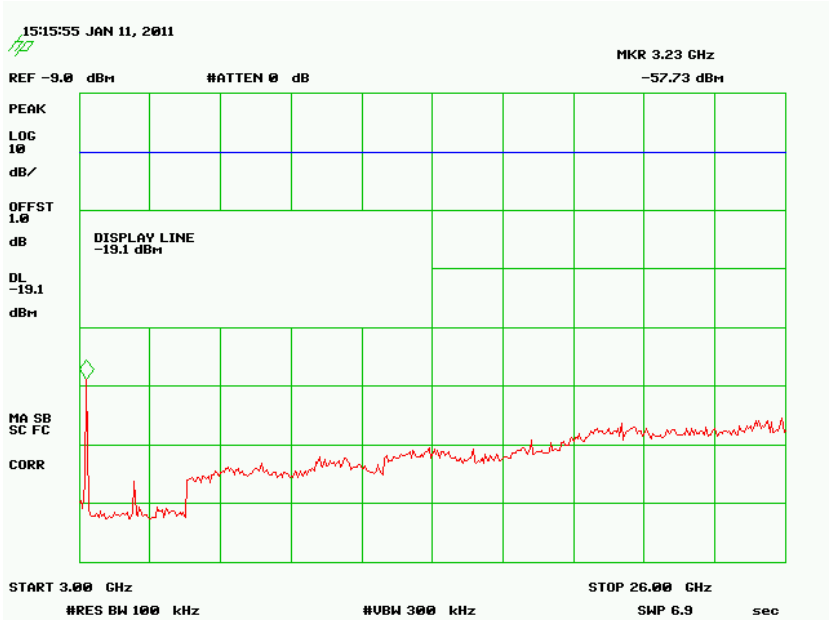


10 - 802.11n20 Low Channel (Antenna 1) 30 MHz-3GHz

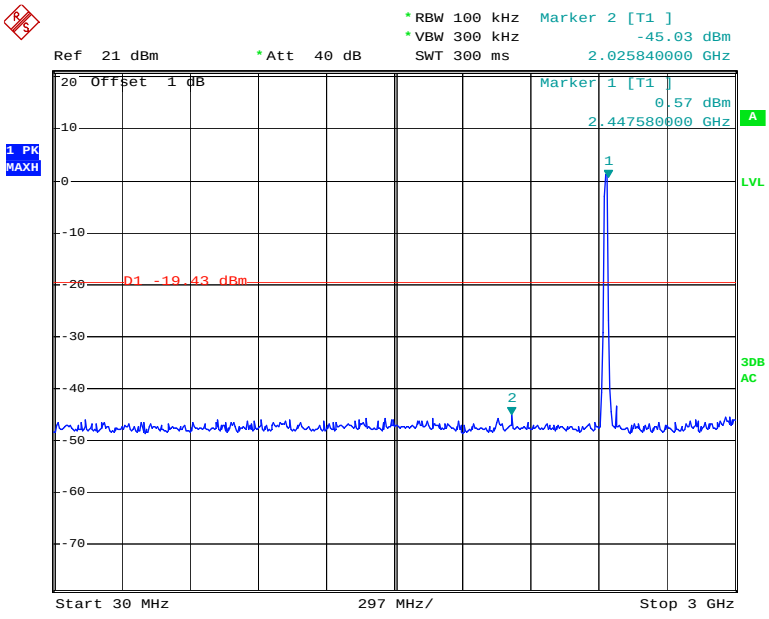


Date: 11.JAN.2011 08:58:08

10 - 802.11n20 Low Channel (Antenna 1) 3GHz-26GHz

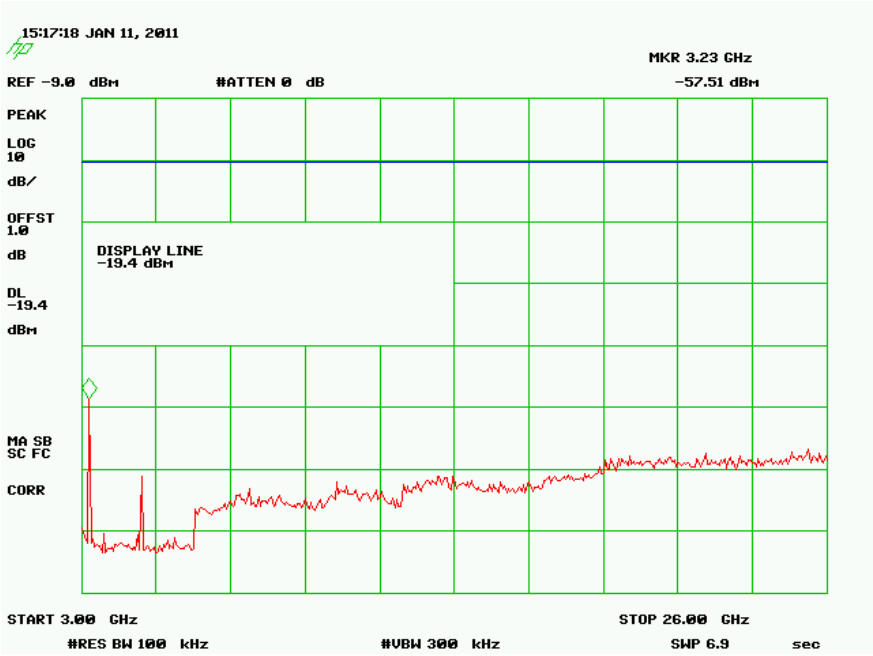


11 - 802.11n20 Middle Channel (Antenna 1) 30 MHz-3GHz

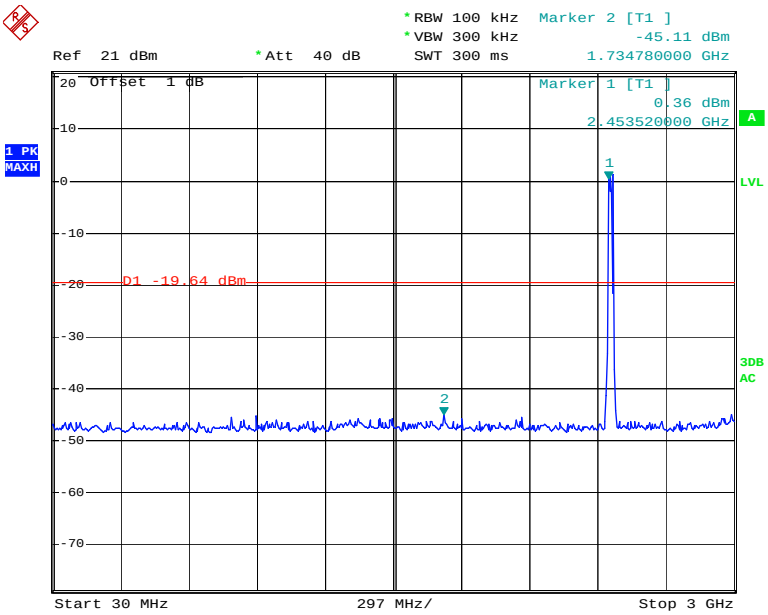


Date: 11.JAN.2011 08:54:09

11 - 802.11n20 Middle Channel (Antenna 1) 3GHz-26GHz

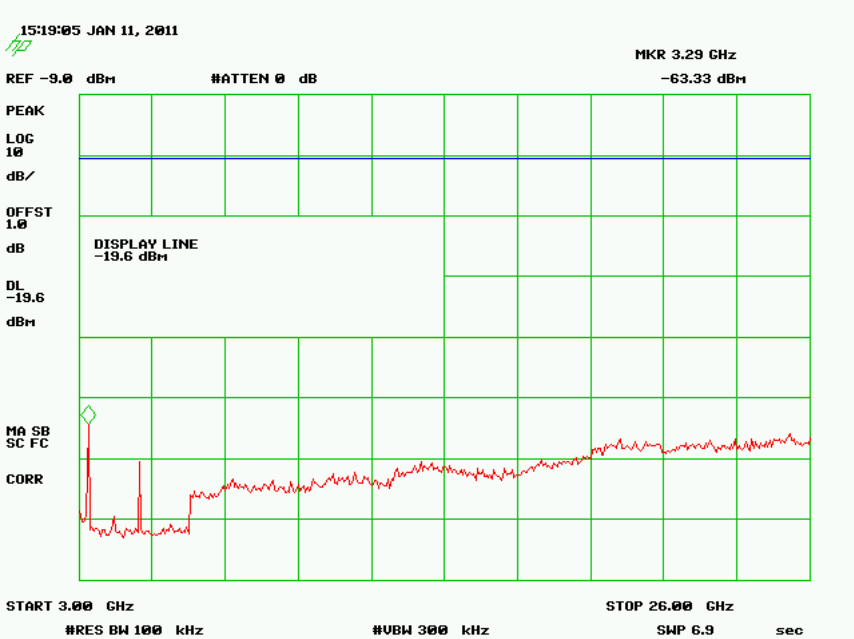


12 - 802.11n20 High Channel (Antenna 1) 30 MHz-3GHz

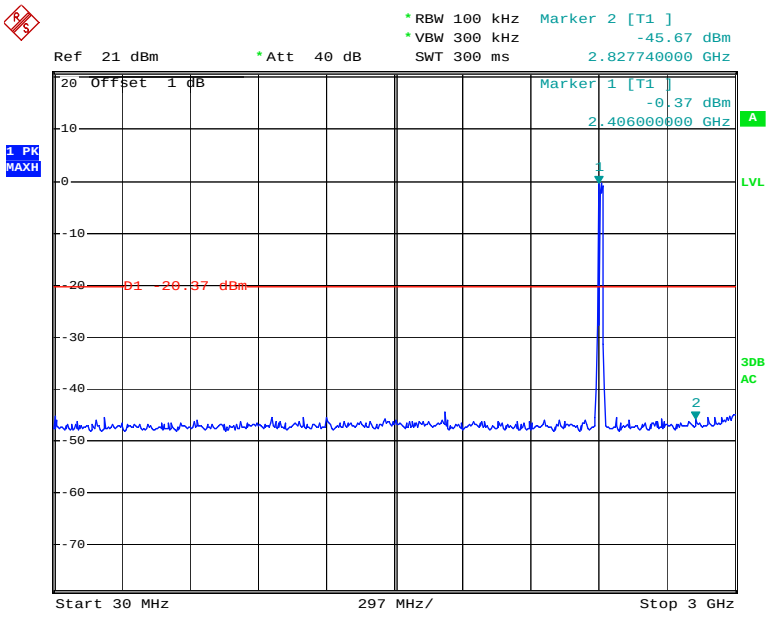


Date: 11.JAN.2011 08:53:09

12 - 802.11n20 High Channel (Antenna 1) 3GHz-26GHz



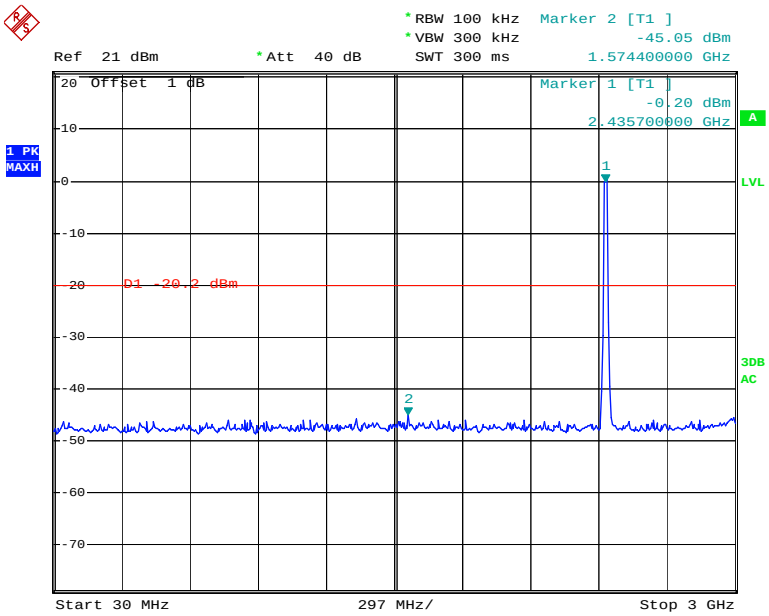
13 - 802.11n20 Low Channel (Antenna 2) 30 MHz-3GHz



Date: 11.JAN.2011 10:03:59

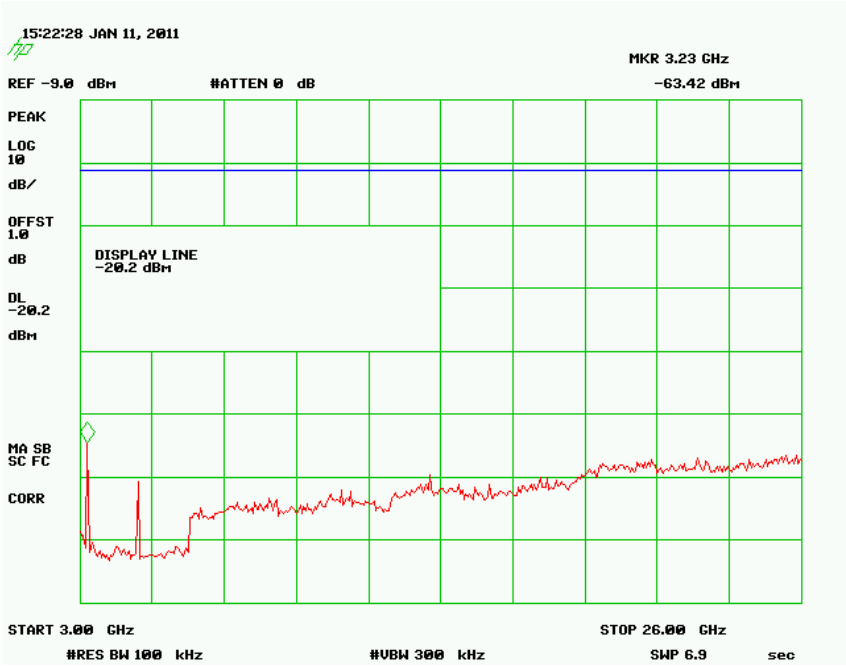
13 - 802.11n20 Low Channel (Antenna 2) 3GHz-26GHz

14 - 802.11n20 Middle Channel (Antenna 2) 30 MHz-3GHz

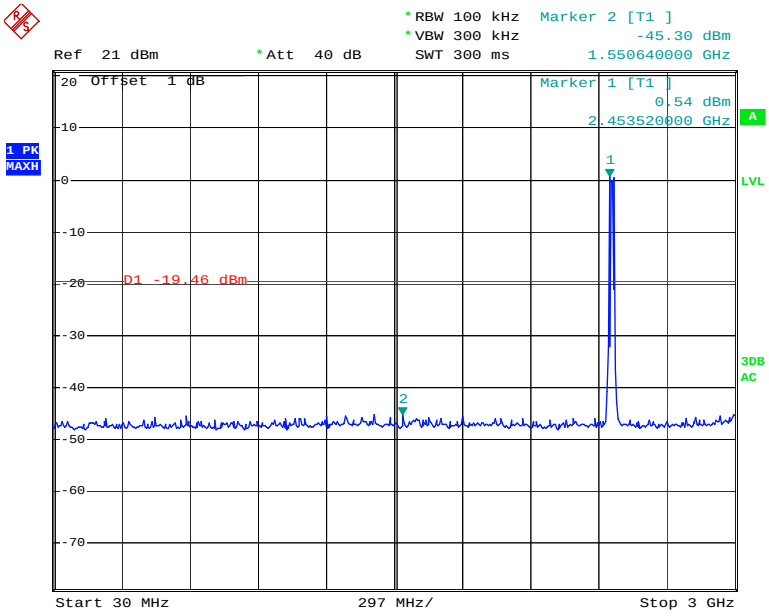


Date: 11.JAN.2011 10:05:35

14 - 802.11n20 Middle Channel (Antenna 2) 3GHz-26GHz

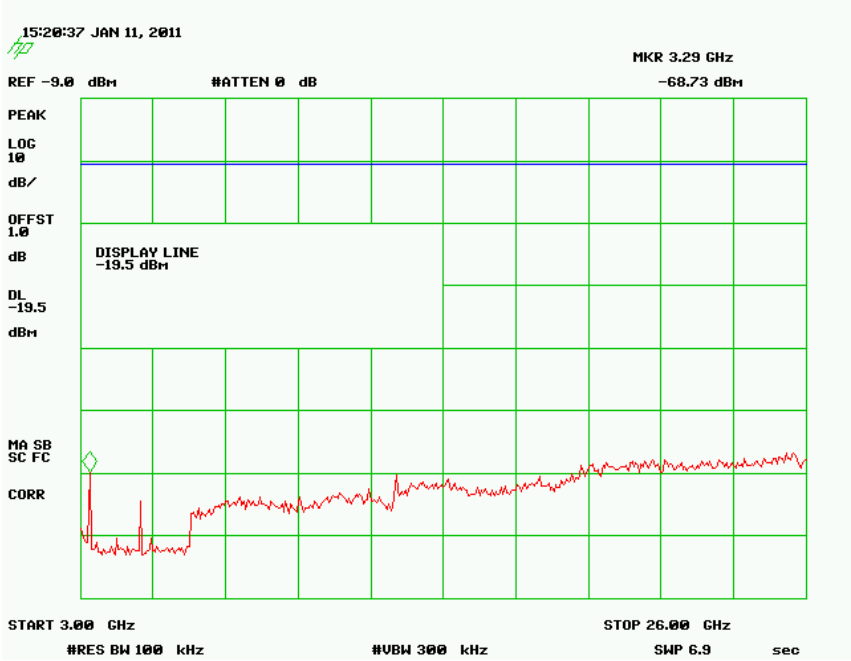


15 - 802.11n20 High Channel (Antenna 2) 30 MHz-3GHz

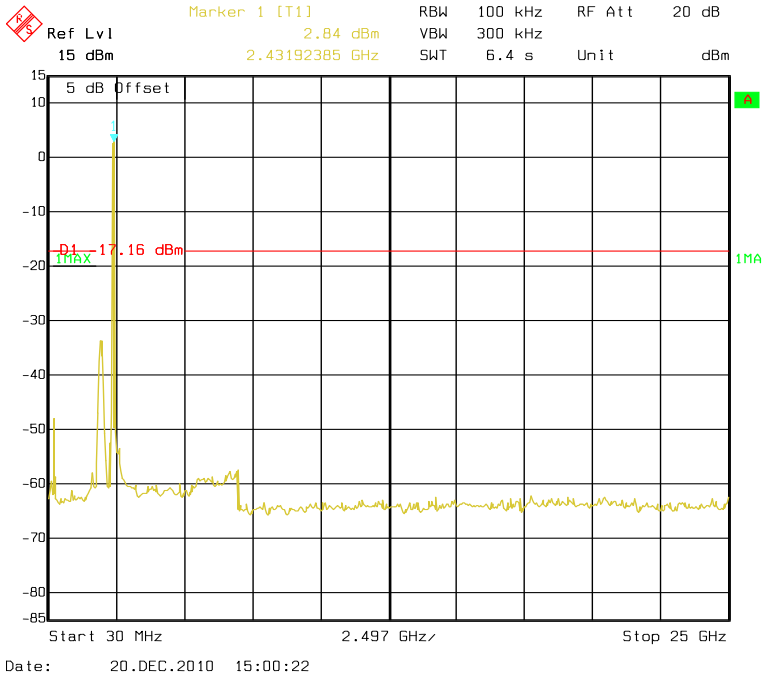


Date: 11.JAN.2011 10:07:38

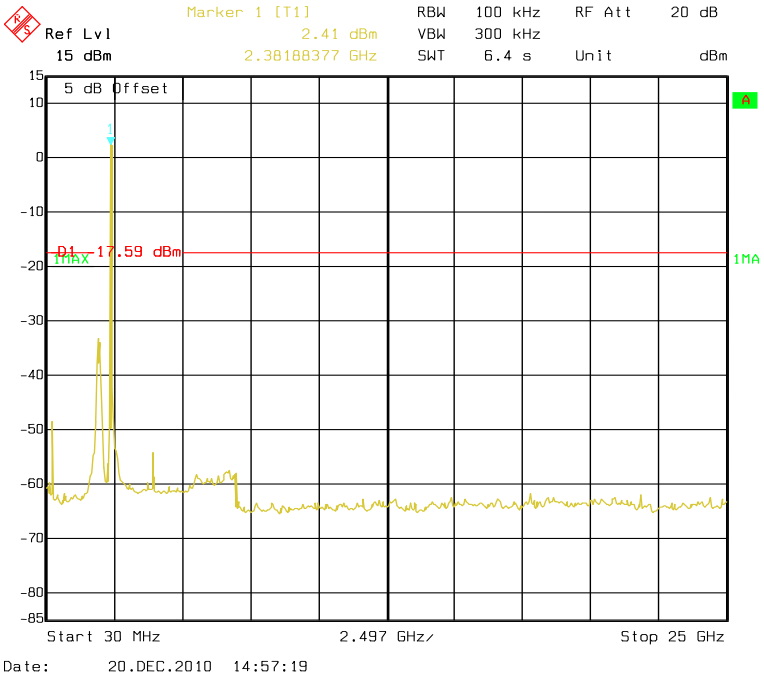
15 - 802.11n20 High Channel (Antenna 2) 3GHz-26GHz



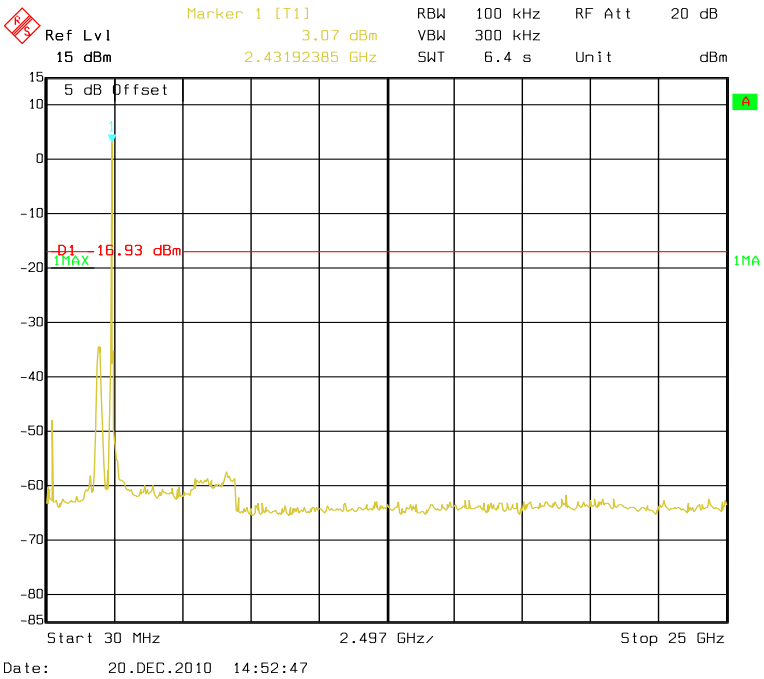
16 - 802.11n40 Low Channel (Combiner)



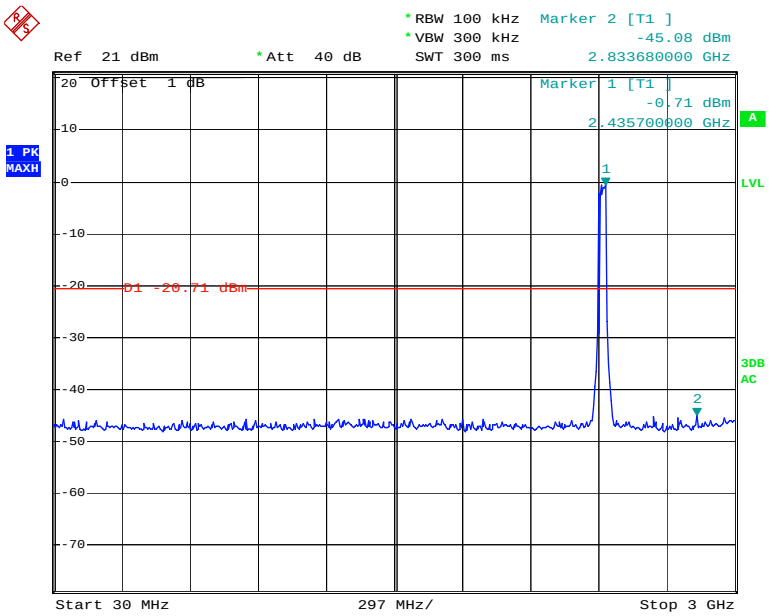
17 - 802.11n40 Middle Channel (Combiner)



18 - 802.11n40 High Channel (Combiner)

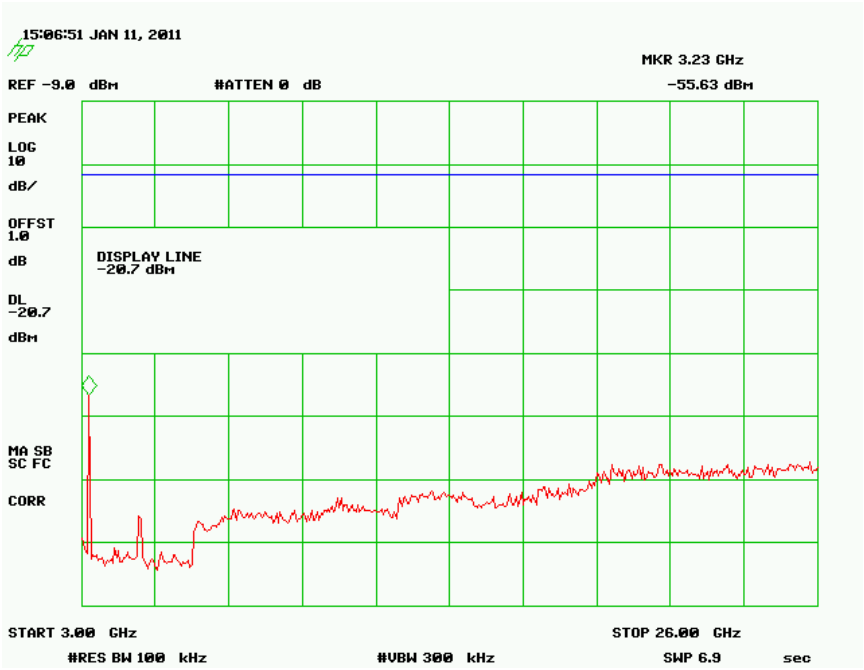


19 - 802.11n40 Low Channel (Antenna 1) 30 MHz-3GHz

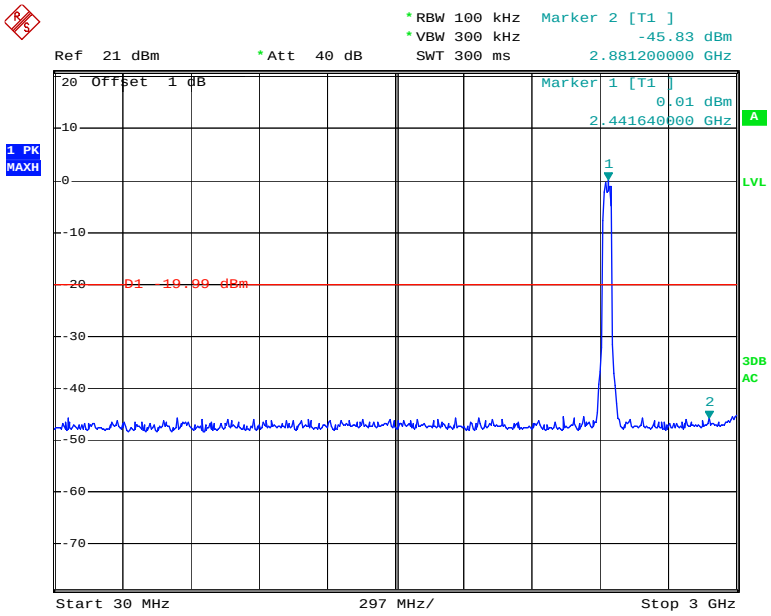


Date: 11.JAN.2011 09:09:28

19 - 802.11n40 Low Channel (Antenna 1) 3GHz-26GHz

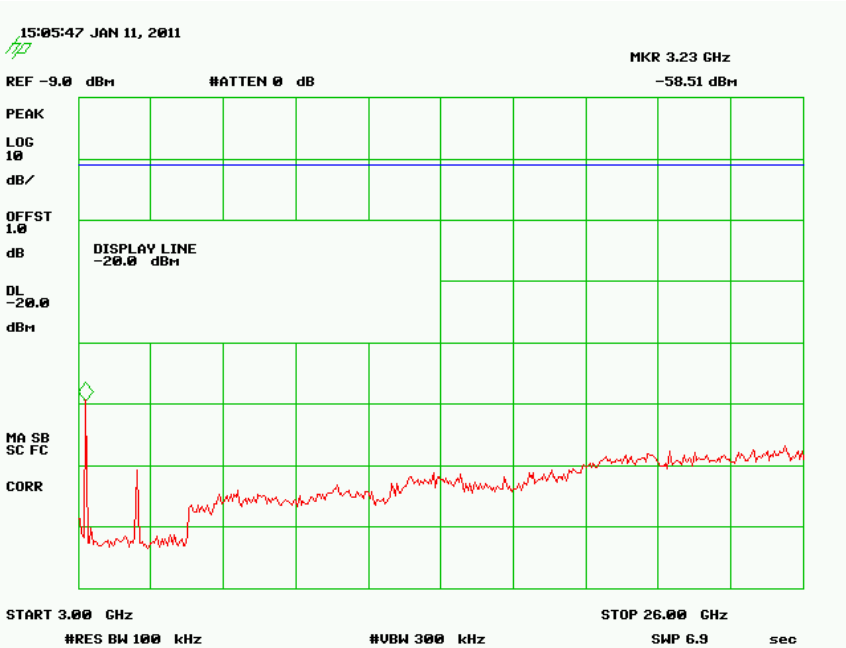


20 - 802.11n40 Middle Channel (Antenna 1) 30 MHz-3GHz

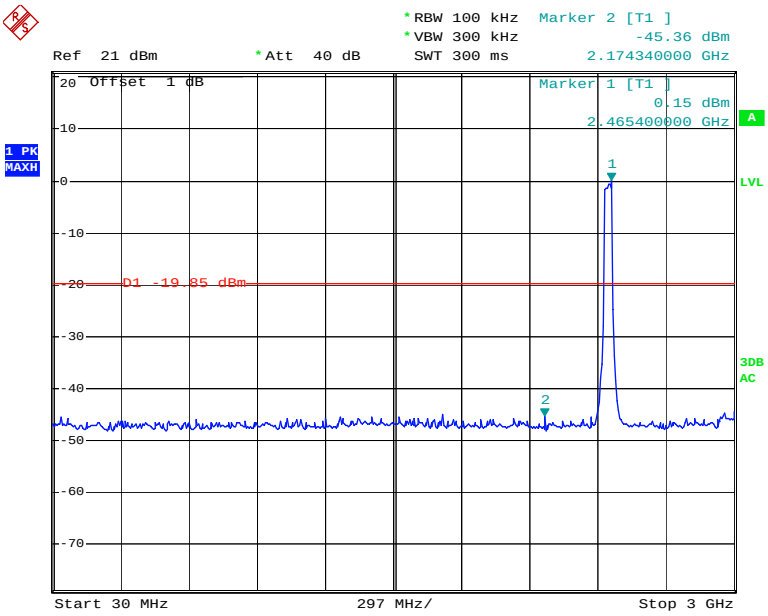


Date: 11.JAN.2011 09:11:05

20 - 802.11n40 Middle Channel (Antenna 1) 3GHz-26GHz

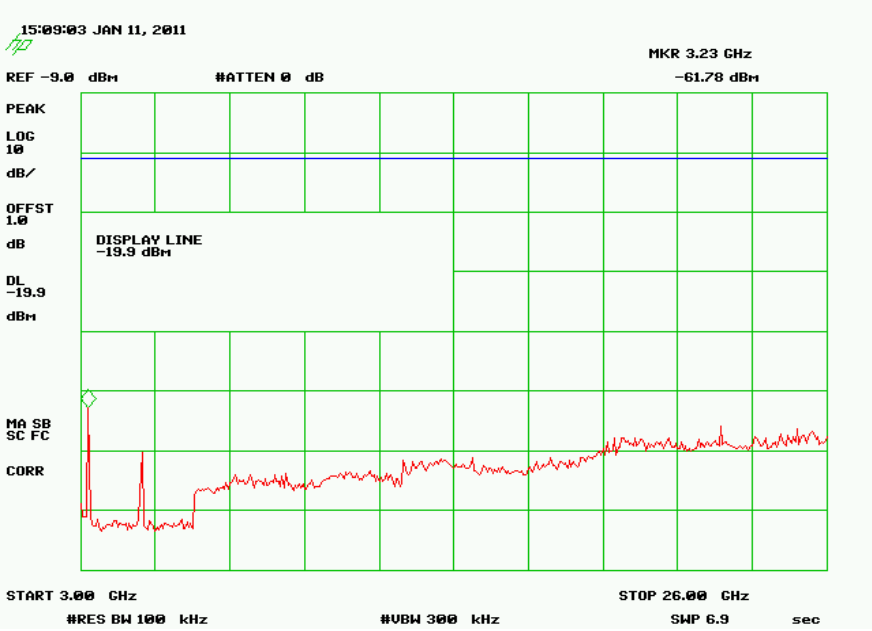


21 - 802.11n40 High Channel (Antenna 1) 30 MHz-3GHz

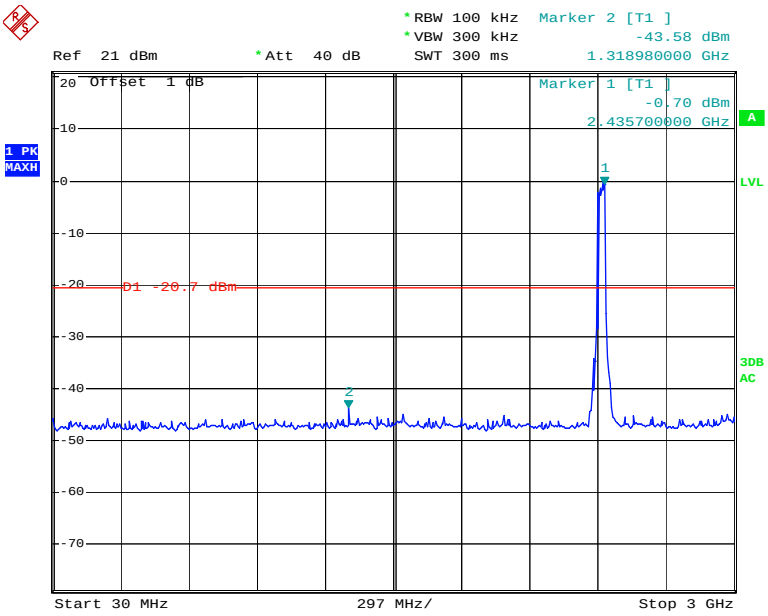


Date: 11.JAN.2011 09:13:47

21 - 802.11n40 High Channel (Antenna 1) 3GHz-26GHz

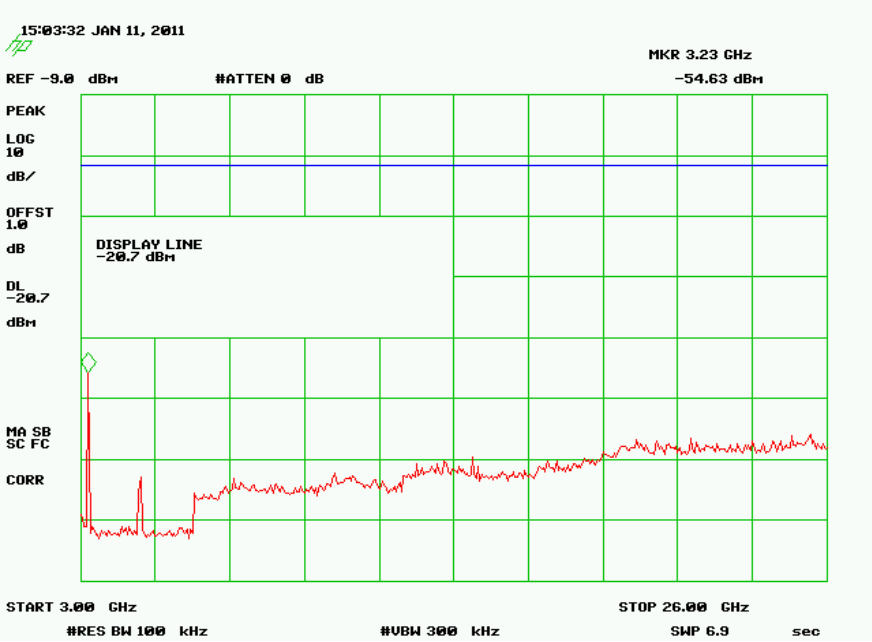


22 - 802.11n40 Low Channel (Antenna 2) 30 MHz-3GHz

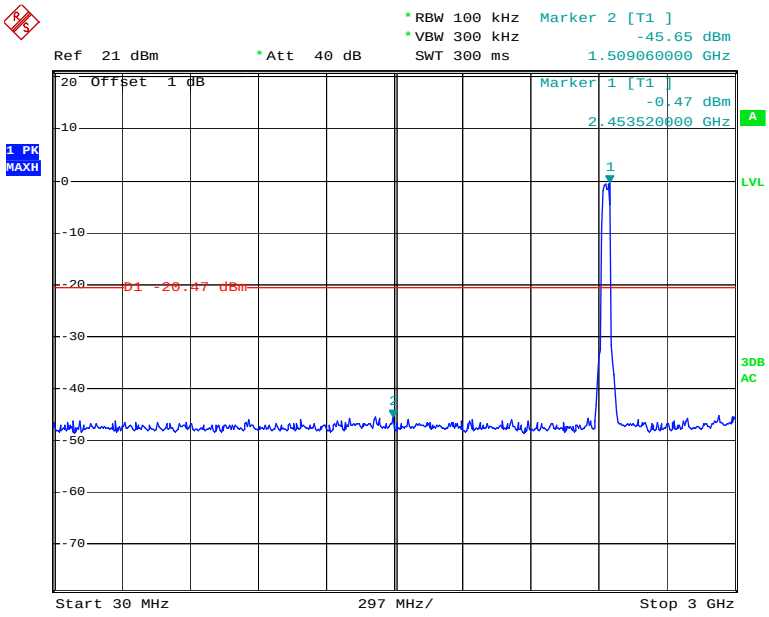


Date: 11.JAN.2011 09:54:20

22 - 802.11n40 Low Channel (Antenna 2) 3GHz-26GHz

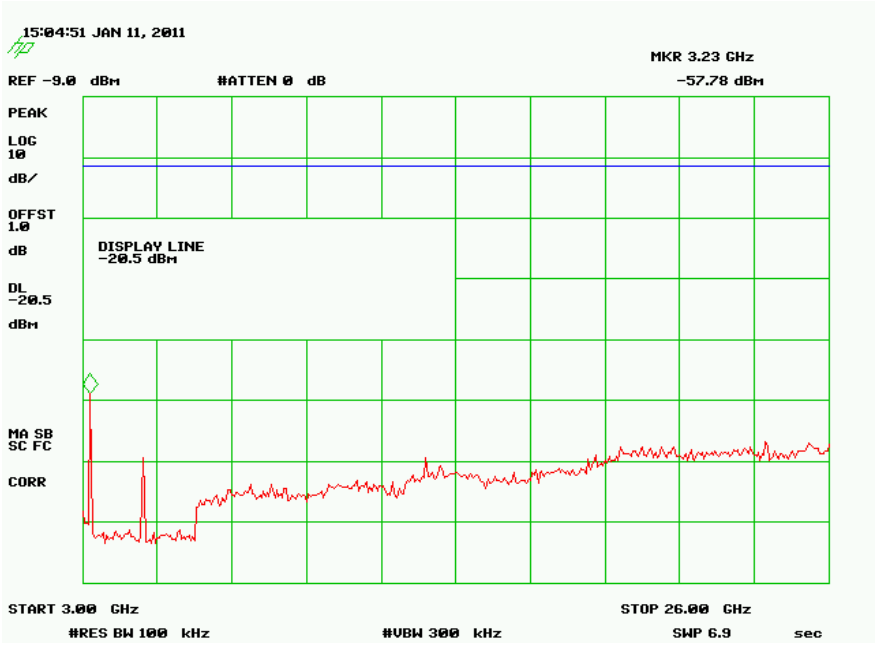


23 - 802.11n40 Middle Channel (Antenna 2) 30 MHz-3GHz

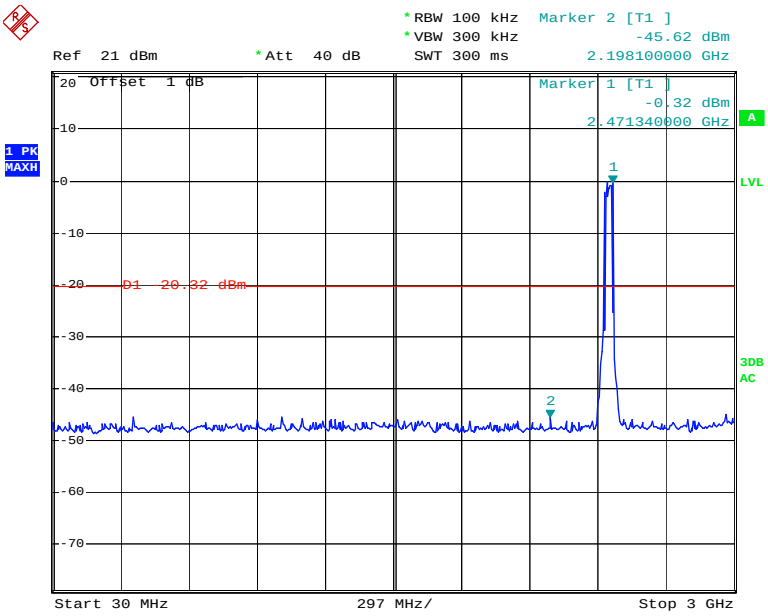


Date: 11.JAN.2011 09:55:42

23 - 802.11n40 Middle Channel (Antenna 2) 3GHz-26GHz

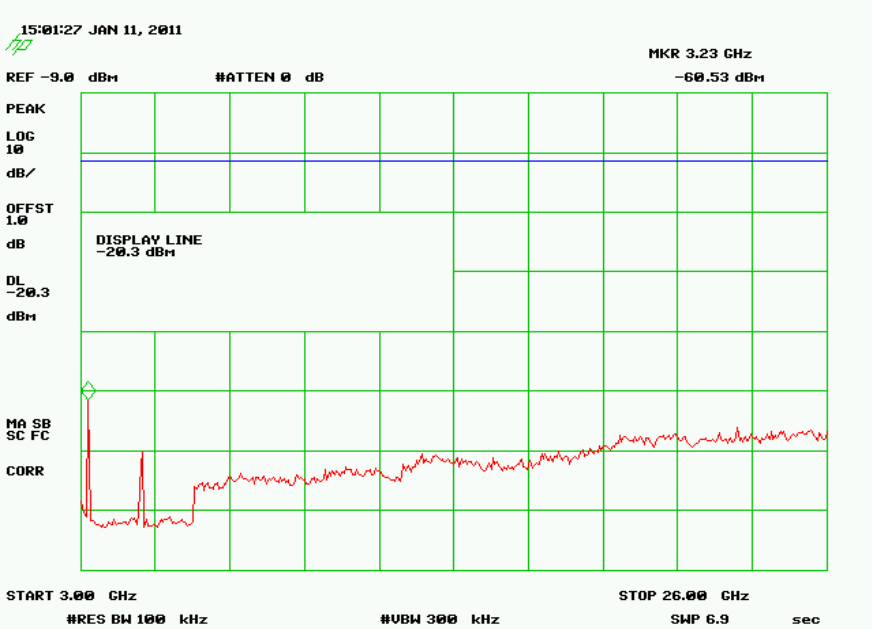


24 - 802.11n40 High Channel (Antenna 2) 30 MHz-3GHz



Date: 11.JAN.2011 09:56:47

24 - 802.11n40 High Channel (Antenna 2) 3GHz-26GHz



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

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.

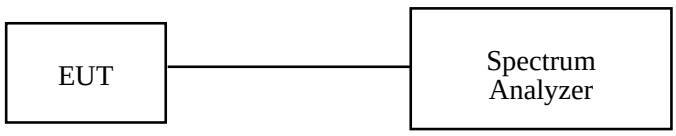
Test Equipment List and Details

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 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 Data

Environmental Conditions

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

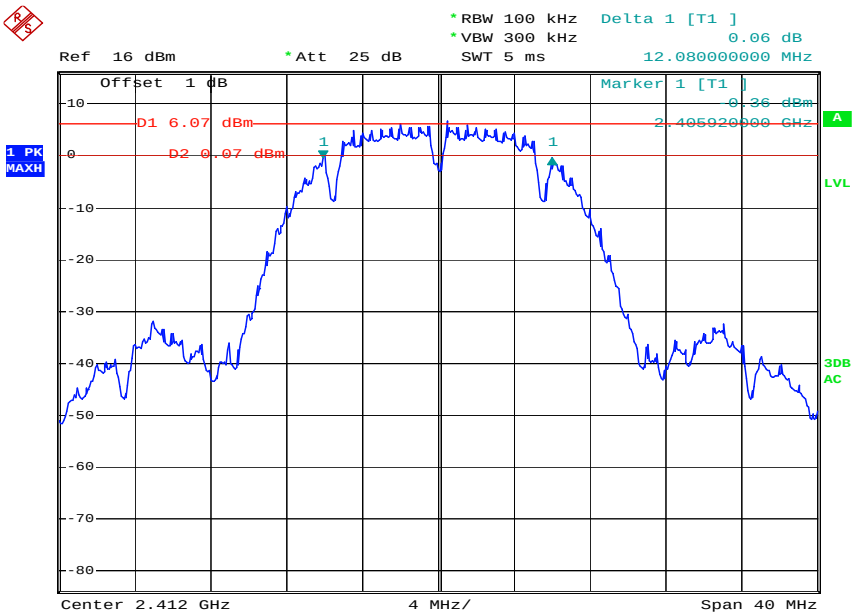
The testing was performed by Kvass Yang on 2010-12-17 and 2010-12-19.

Test Result: Pass.

Please refer to the following tables and plots.

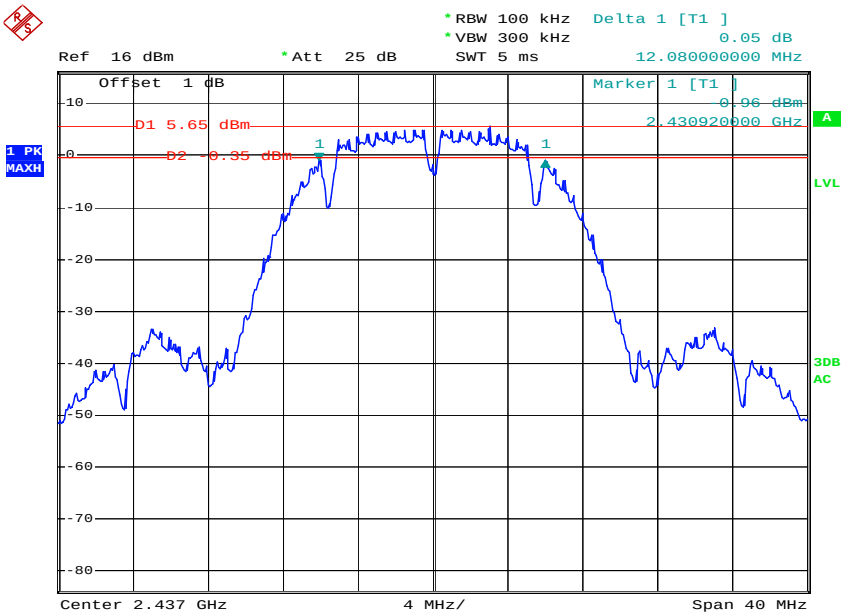
Channel	Channel Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	FCC Part 15.247 Limit (kHz)
Low	2412	1	12.08	> 500
Middle	2437	1	12.08	> 500
High	2462	1	12.16	> 500
802.11g mode				
Low	2412	6	16.40	> 500
Middle	2437	6	16.48	> 500
High	2462	6	16.40	> 500
802.11n-20 mode Antenna #1				
Low	2412	13	17.76	> 500
Middle	2437	13	17.76	> 500
High	2462	13	17.76	> 500
802.11n-20 mode Antenna #2				
Low	2412	13	17.76	> 500
Middle	2437	13	17.76	> 500
High	2462	13	17.76	> 500
802.11n-40 mode Antenna #1				
Low	2422	27	36.48	> 500
Middle	2437	27	36.48	> 500
High	2452	27	36.42	> 500
802.11n-40 mode Antenna #2				
Low	2422	27	36.48	> 500
Middle	2437	27	36.48	> 500
High	2452	27	36.48	> 500

802.11b Low Channel



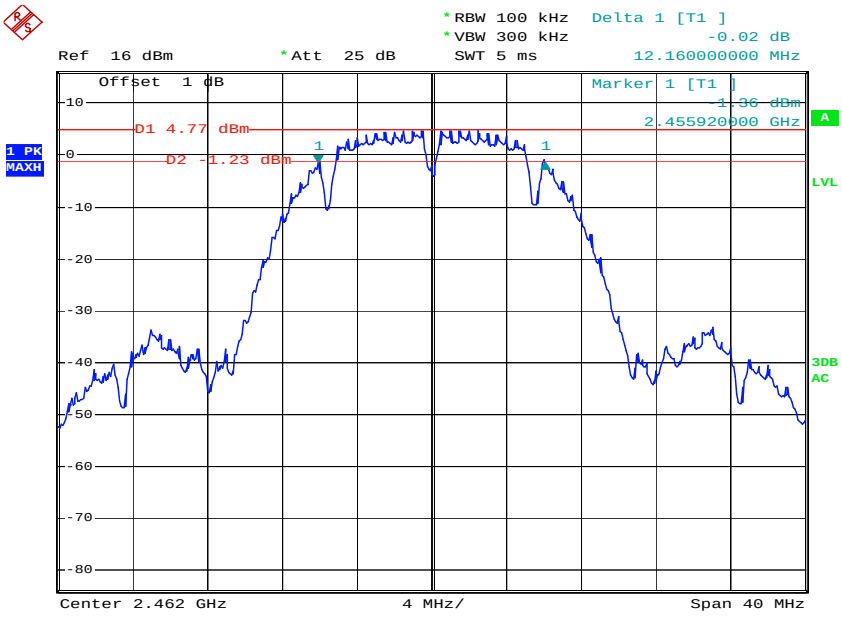
Date: 17.DEC.2010 13:18:44

802.11b Middle Channel



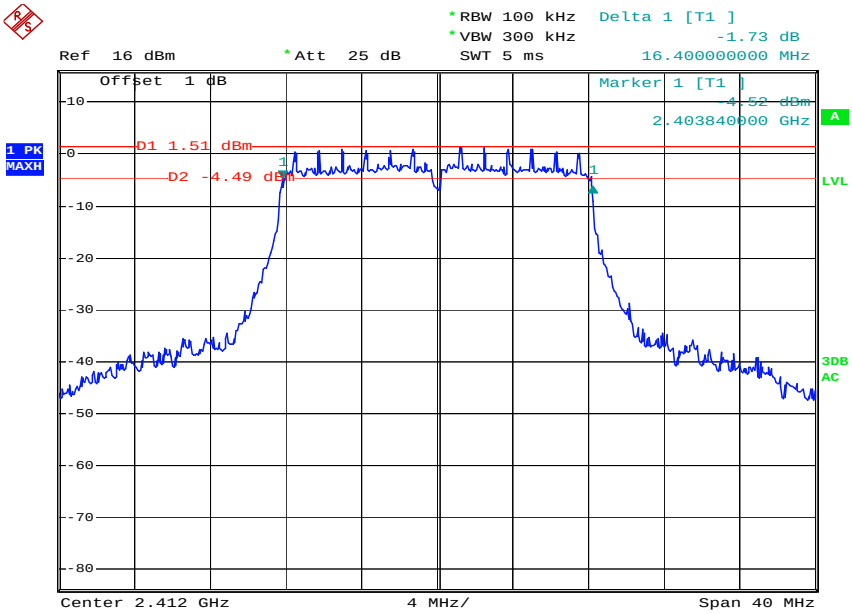
Date: 17.DEC.2010 13:27:54

802.11b High Channel



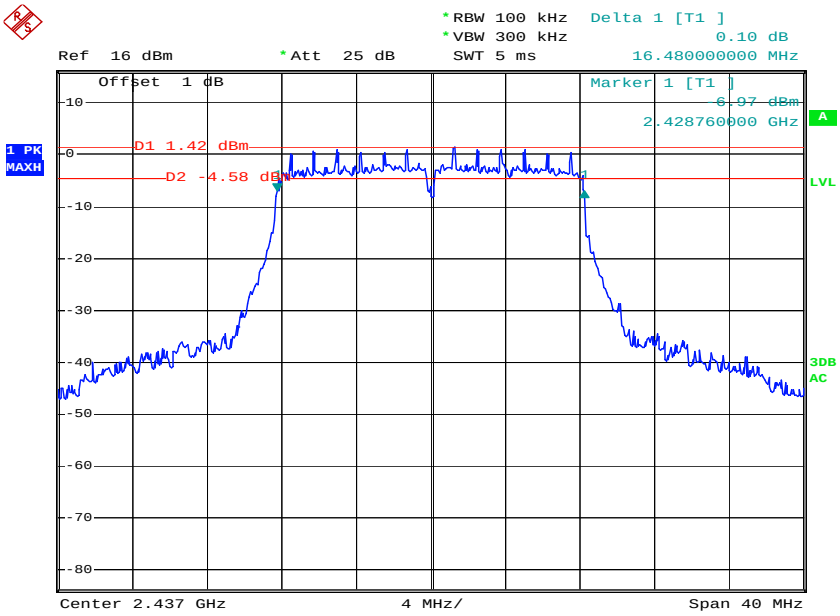
Date: 17.DEC.2010 13:39:15

802.11g Low Channel



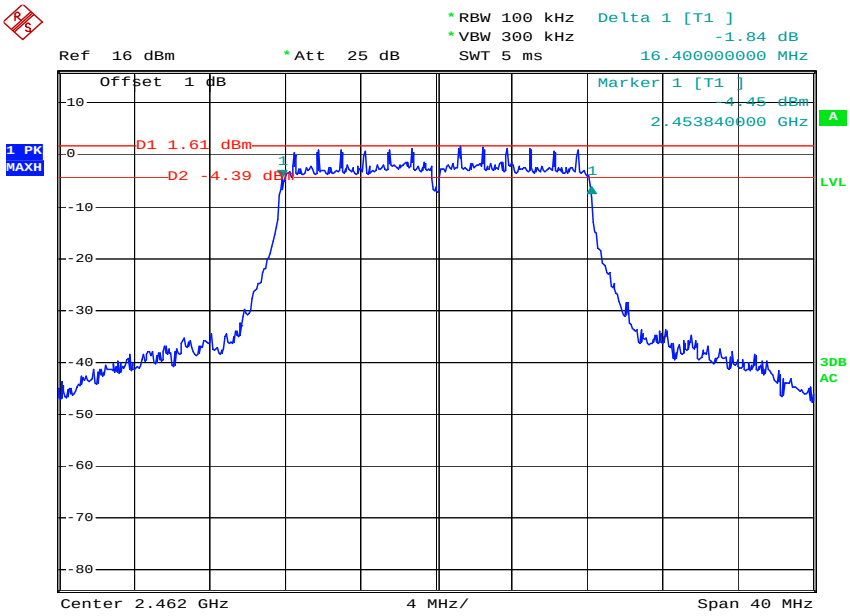
Date: 17.DEC.2010 15:29:30

802.11g Middle Channel



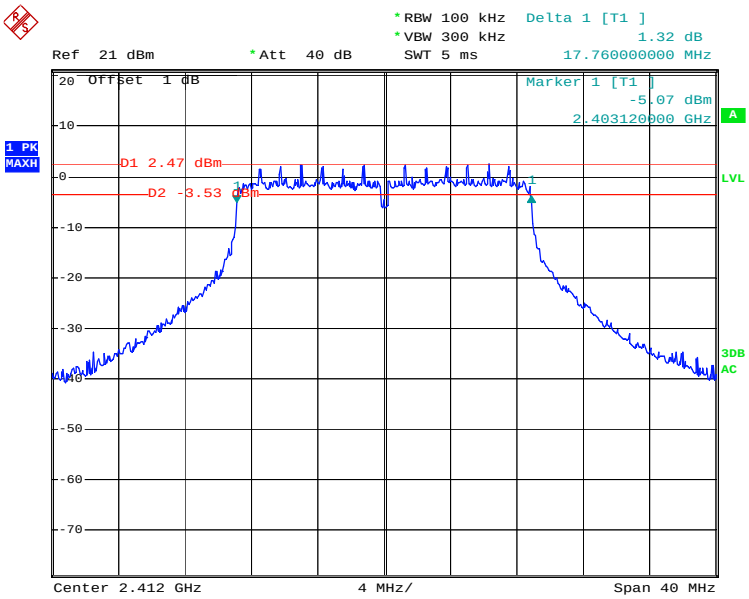
Date: 17.DEC.2010 15:23:43

802.11g High Channel



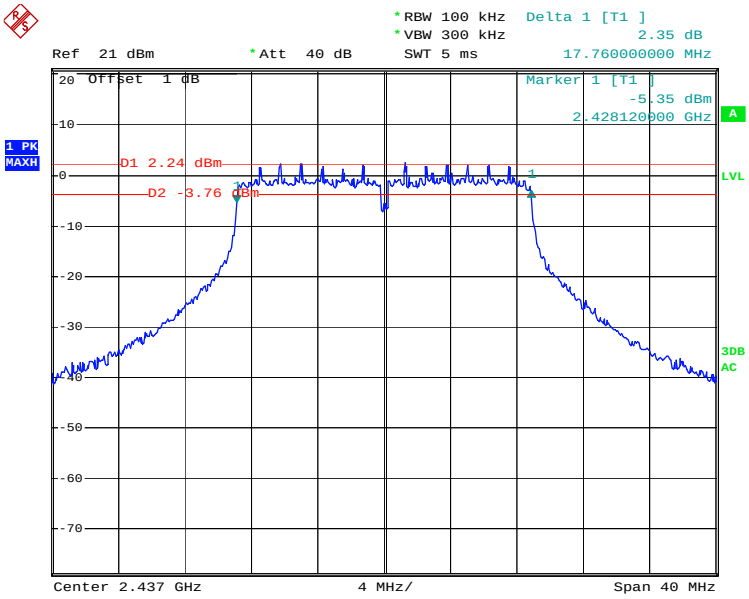
Date: 17.DEC.2010 15:12:39

802.11n20 Antenna #1, Low Channel



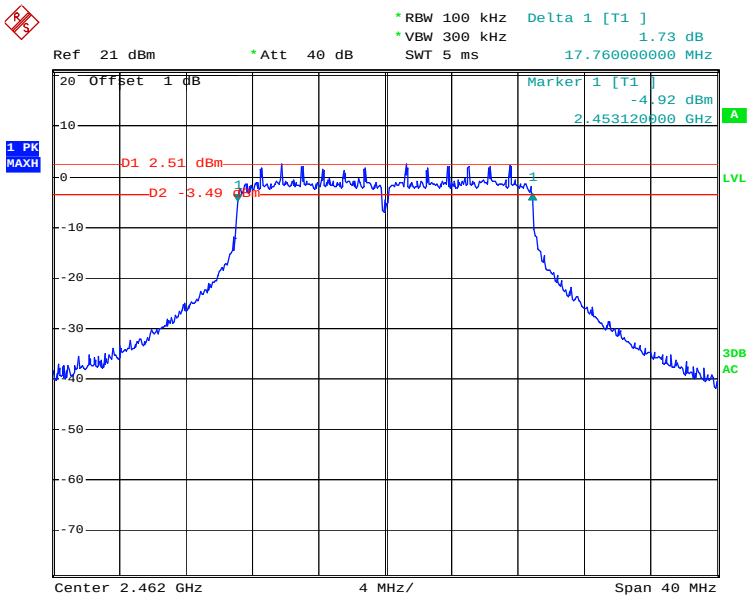
Date: 4.JAN.2011 16:50:28

802.11n20 Antenna #1, Middle Channel



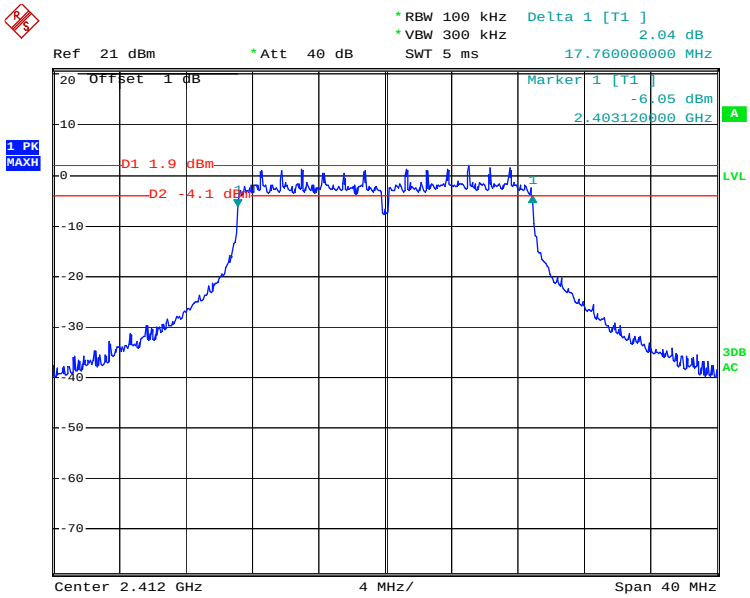
Date: 5.JAN.2011 10:51:57

802.11n20 Antenna #1, High Channel



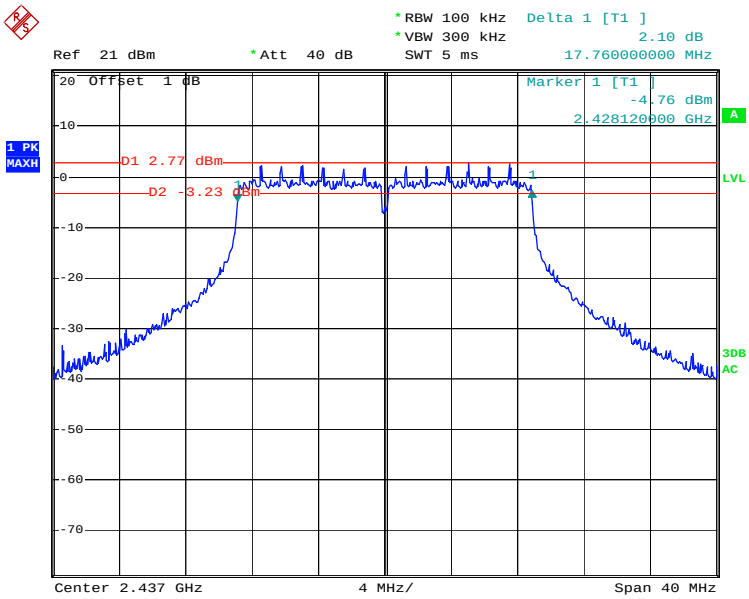
Date: 5.JAN.2011 11:34:22

802.11n20 Antenna #2, Low Channel



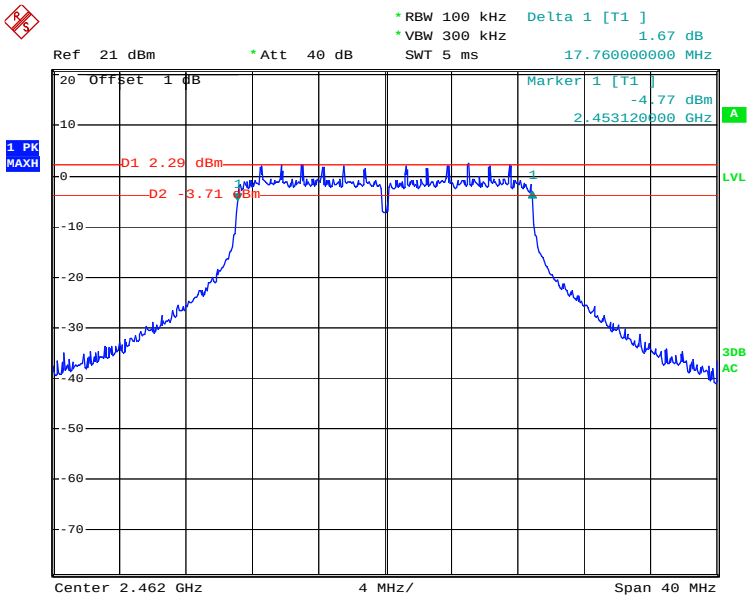
Date: 5.JAN.2011 16:26:26

802.11n20 Antenna #2, Middle Channel



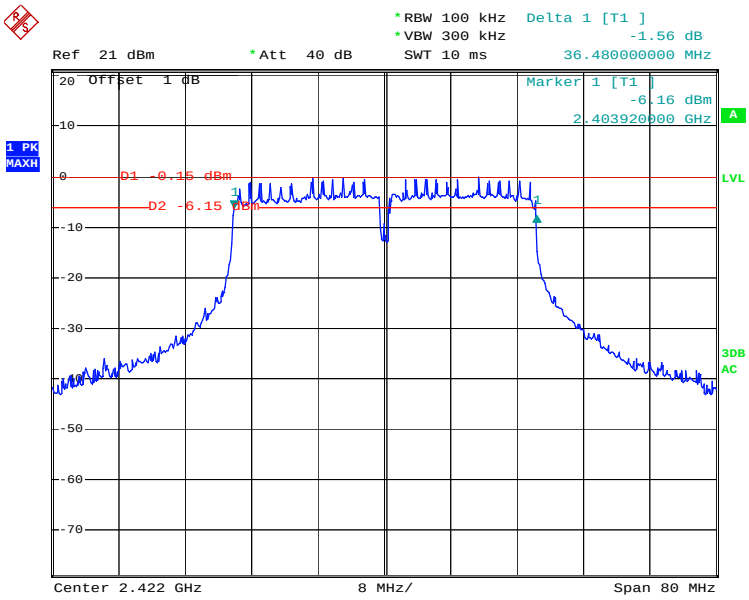
Date: 5.JAN.2011 16:51:22

802.11n20 Antenna #2, High Channel



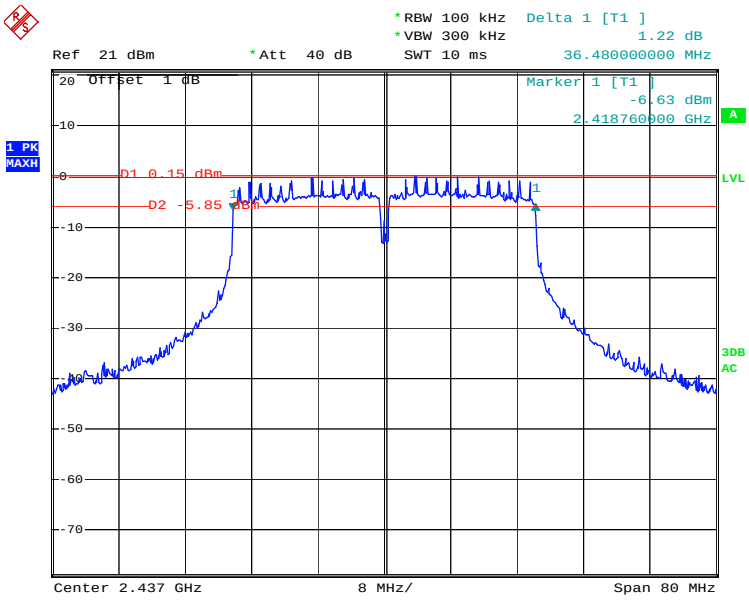
Date: 5.JAN.2011 17:18:02

802.11n40 Antenna #1, Low Channel



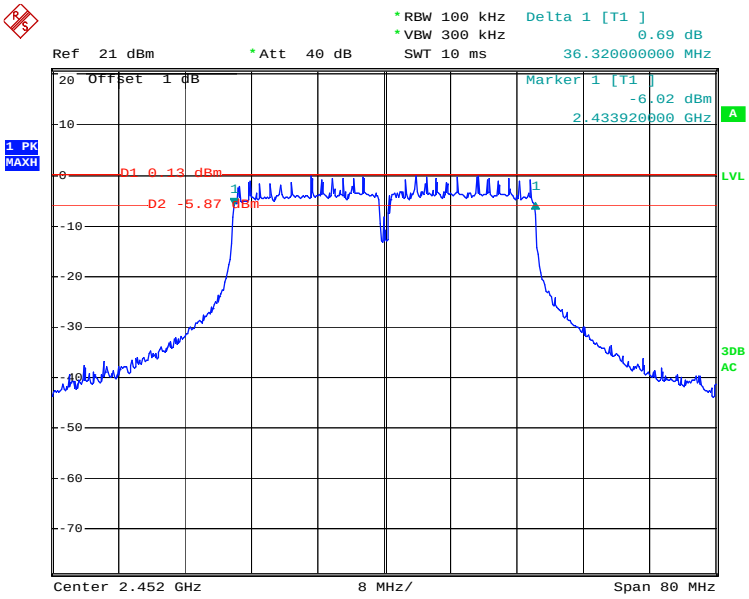
Date: 5.JAN.2011 14:11:42

802.11n40 Antenna #1, Middle Channel



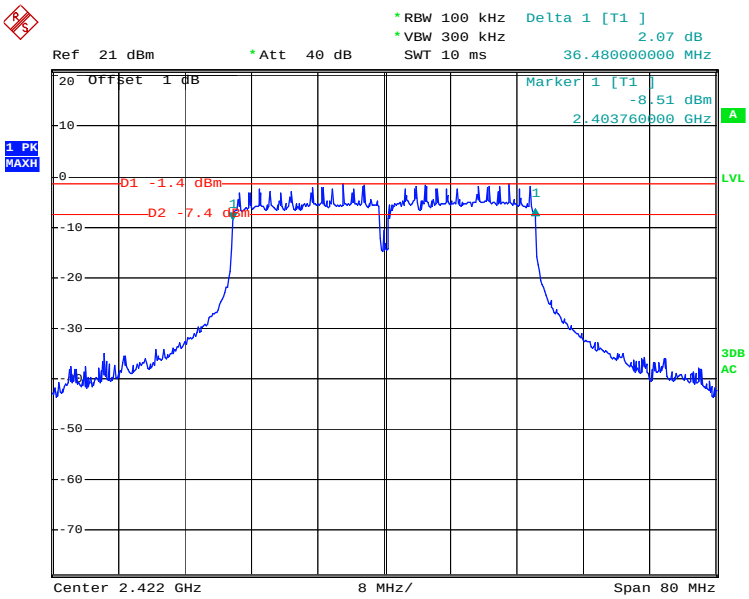
Date: 5.JAN.2011 14:27:25

802.11n40 Antenna #1, High Channel



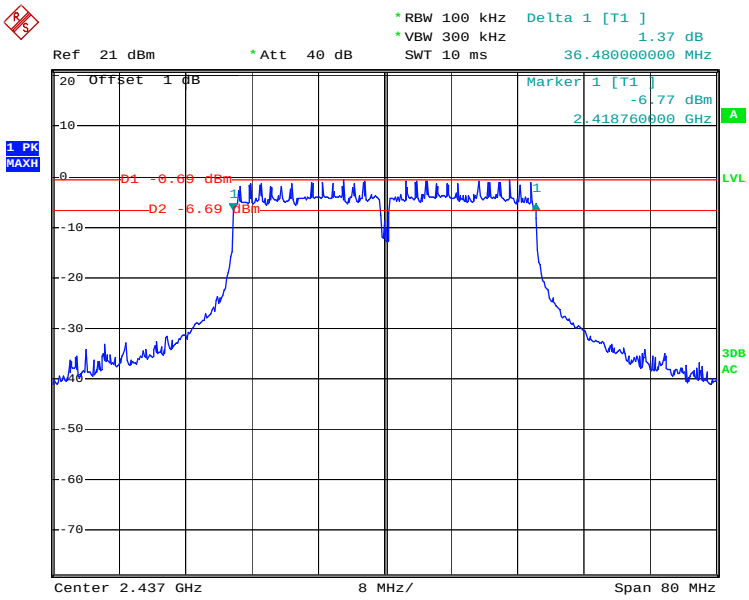
Date: 5.JAN.2011 15:11:59

802.11n40 Antenna #2, Low Channel



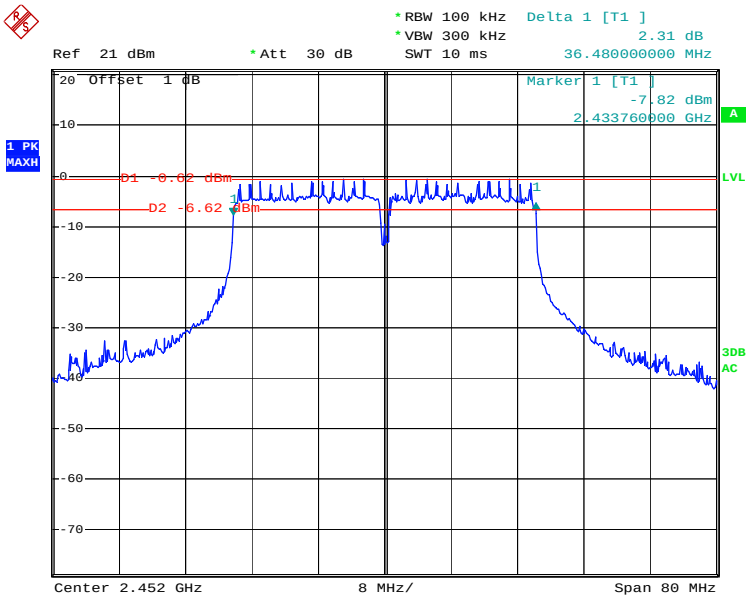
Date: 6.JAN.2011 10:20:29

802.11n40 Antenna #2, Middle Channel



Date: 6.JAN.2011 10:52:04

802.11n40 Antenna #2, High Channel



Date: 10.JAN.2011 08:47:04

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

Applicable Standard

According to §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.

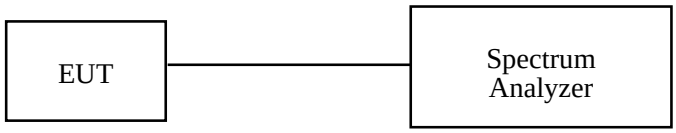
Test Equipment List and Details

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 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 Data

Environmental Conditions

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

The testing was performed by Kvass Yang from 2010-12-17 to 2011-01-11.

Test Mode: Transmitting

802.11 b Mode:

Channel	Frequency (MHz)	Date Rate	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	1.0	16.79	30	-13.21
Mid	2437	1.0	16.07	30	-13.93
High	2462	1.0	15.78	30	-14.22

802.11 g Mode:

Channel	Frequency (MHz)	Date Rate	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	6.0	13.79	30	-16.21
Mid	2437	6.0	13.75	30	-16.25
High	2462	6.0	13.60	30	-16.40

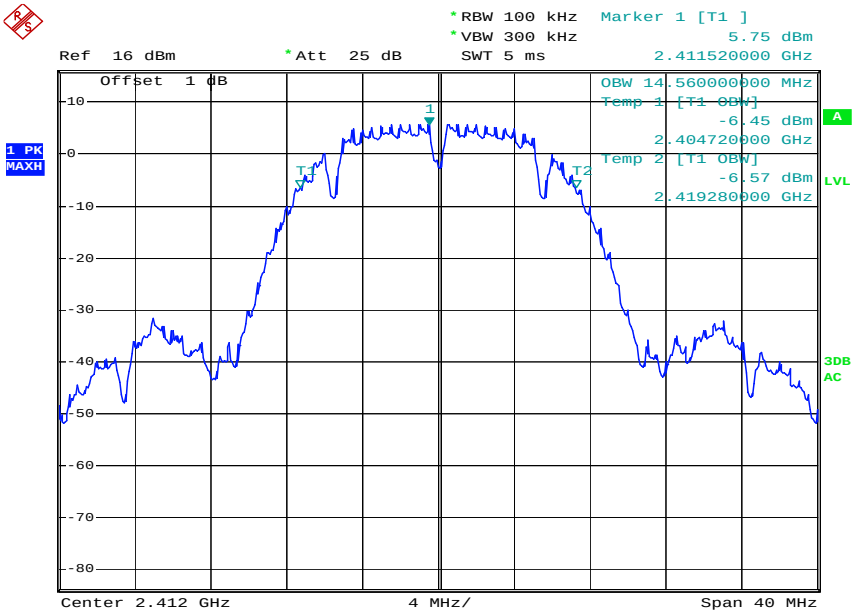
802.11 n 20 MHz Mode:

Channel	Frequency (MHz)	Output Power Antenna 1 (dBm)	Output Power Antenna 2 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	15.31	14.67	18.01	30	-11.99
Mid	2437	15.10	15.25	18.19	30	-11.81
High	2462	15.33	15.38	18.37	30	-11.63

802.11 n 40 MHz Mode:

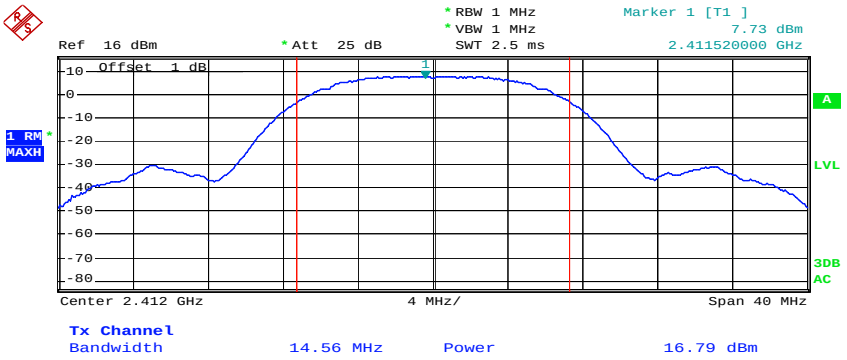
Channel	Frequency (MHz)	Output Power Antenna 1 (dBm)	Output Power Antenna 2 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2422	15.44	14.54	18.02	30	-11.98
Mid	2437	15.42	15.06	18.25	30	-11.75
High	2452	15.41	15.20	18.32	30	-11.68

802.11b 99% Occupied Bandwith, Low Channel



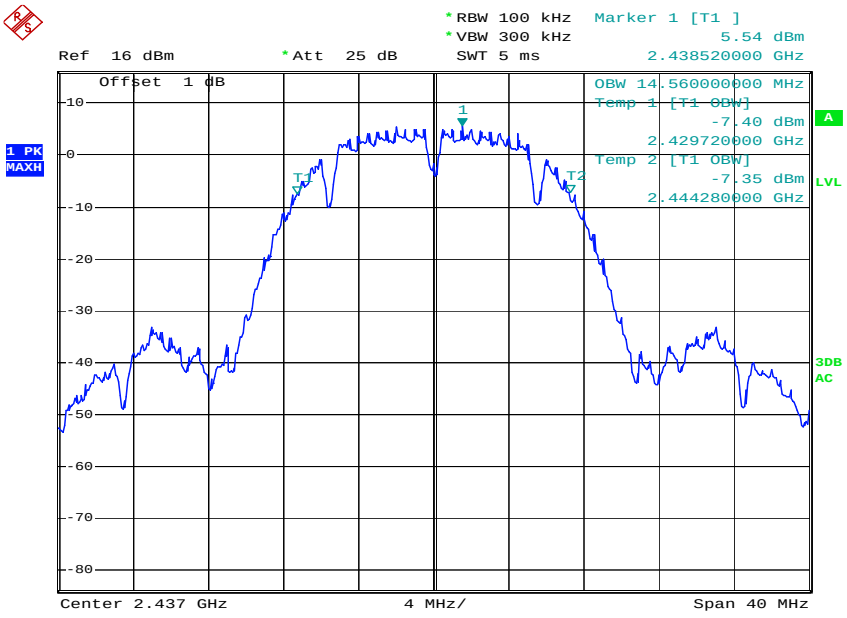
Date: 17.DEC.2010 13:15:52

802.11b RF Output Power, Low Channel



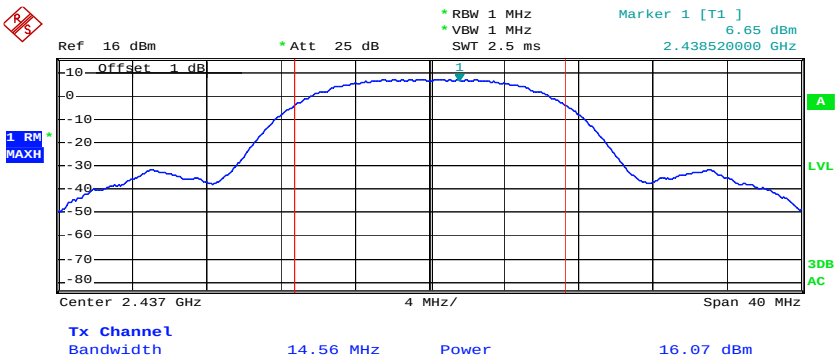
Date: 17.DEC.2010 13:16:40

802.11b 99% Occupied Bandwith, Middle Channel



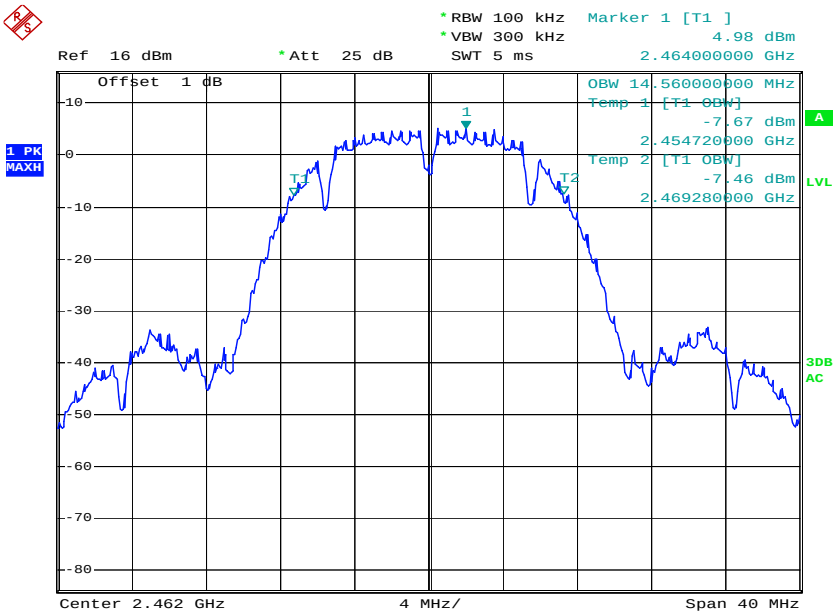
Date: 17.DEC.2010 13:25:20

802.11b RF Output Power, Middle Channel



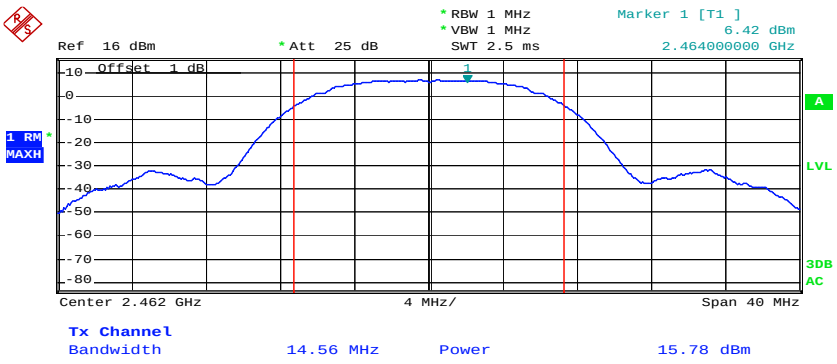
Date: 17.DEC.2010 13:26:07

802.11b 99% Occupied Bandwith, High Channel



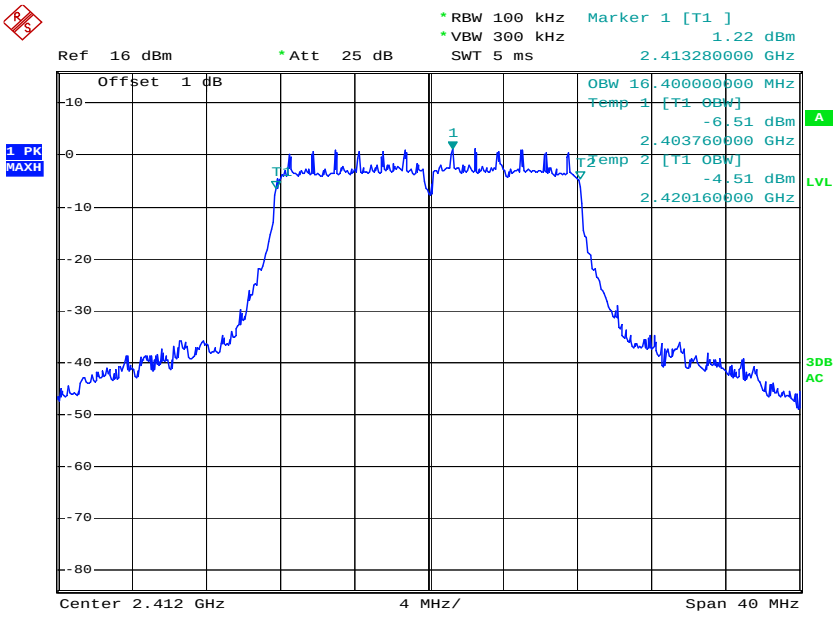
Date: 17.DEC.2010 13:36:29

802.11b RF Output Power, High Channel



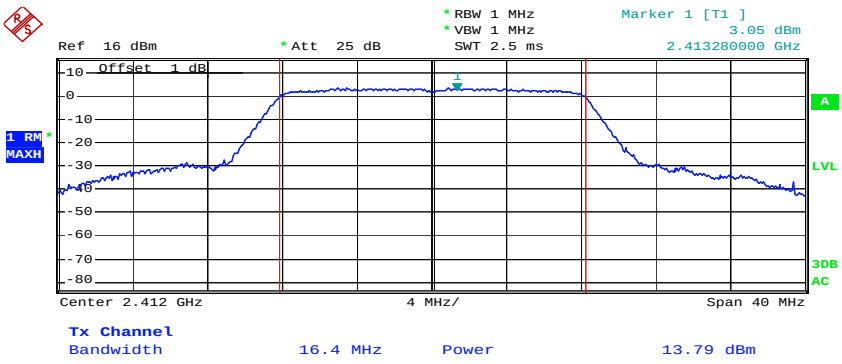
Date: 17.DEC.2010 13:37:12

802.11g 99% Occupied Bandwith, Low Channel



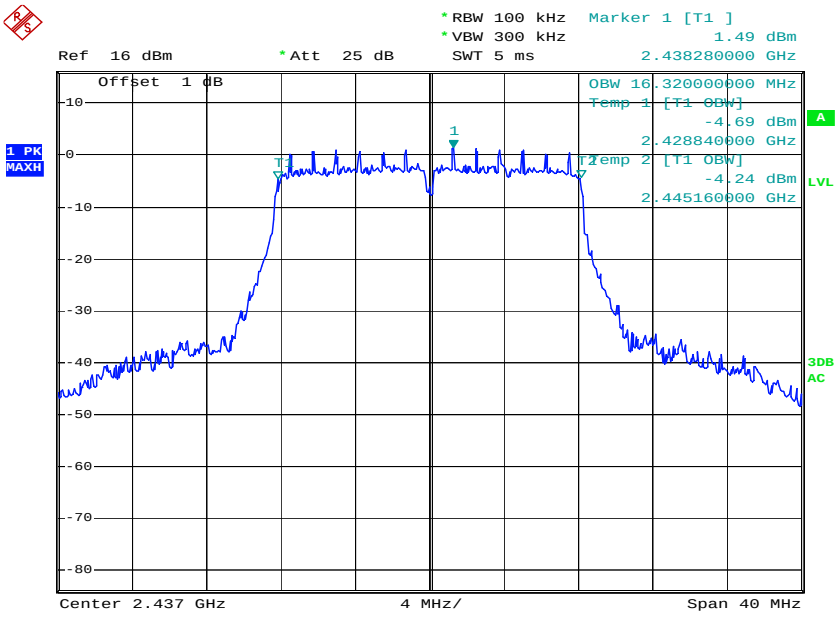
Date: 17.DEC.2010 15:25:04

802.11g RF Output Power, Low Channel



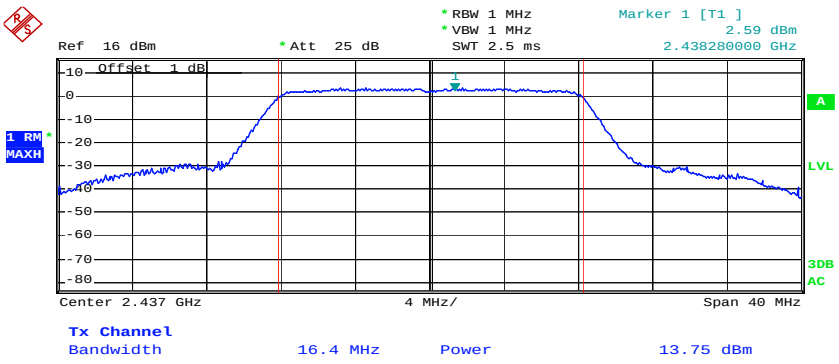
Date: 17.DEC.2010 15:27:20

802.11g 99% Occupied Bandwith, Middle Channel



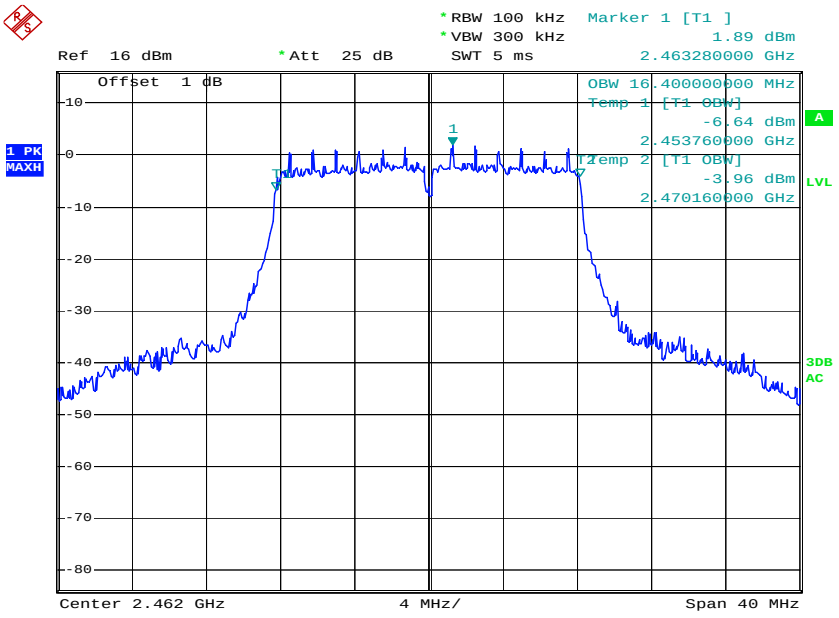
Date: 17.DEC.2010 15:19:04

802.11g RF Output Power, Middle Channel



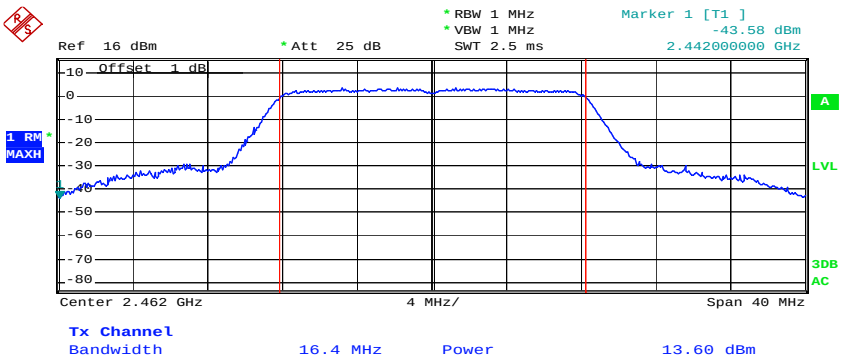
Date: 17.DEC.2010 15:20:47

802.11g 99% Occupied Bandwith, High Channel



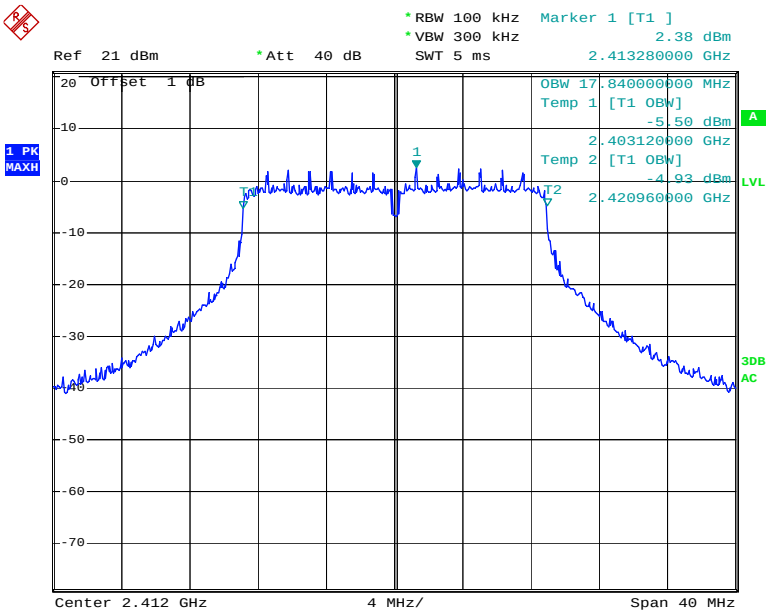
Date: 17.DEC.2010 15:06:45

802.11g RF Output Power, High Channel



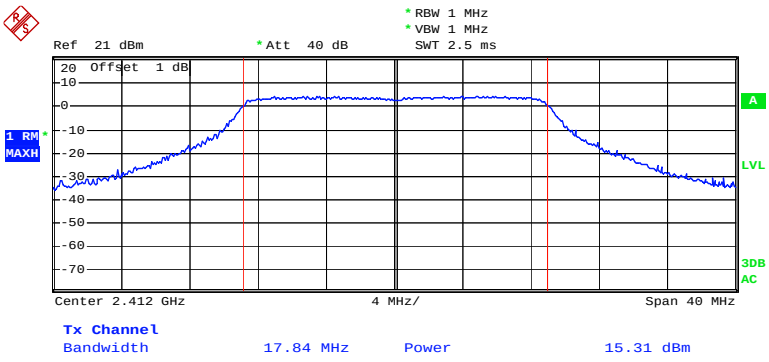
Date: 17.DEC.2010 16:26:00

802.11n20 99% Occupied Bandwith, Low Channel, Antenna 1



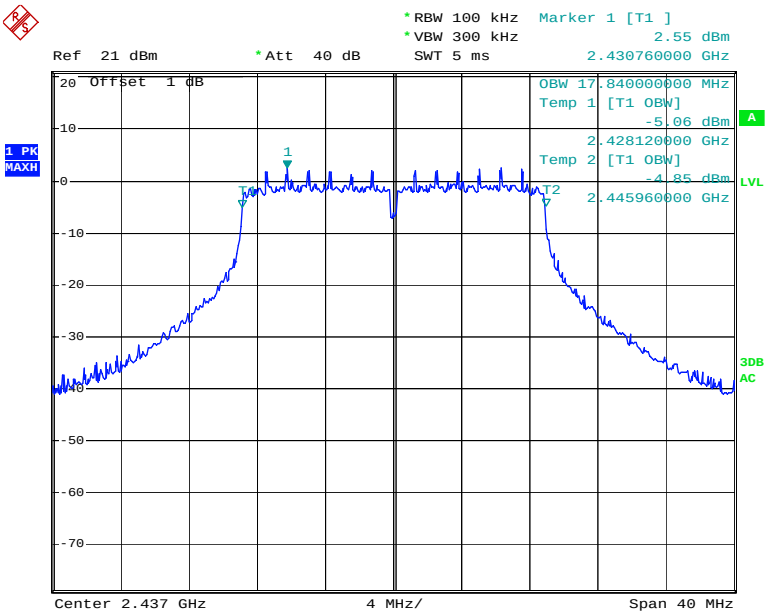
Date: 4.JAN.2011 16:51:25

802.11n20 RF Output Power, Low Channel, Antenna 1



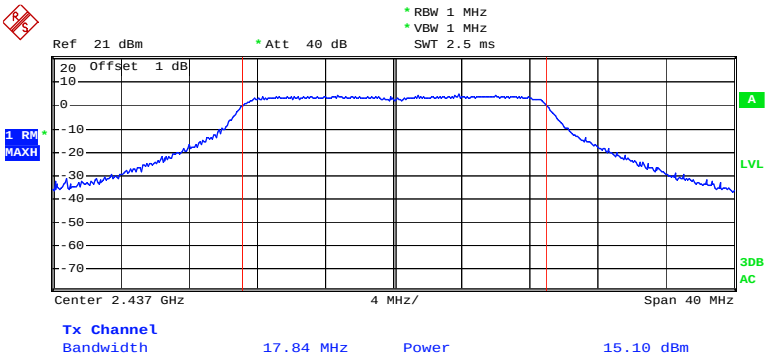
Date: 4.JAN.2011 16:52:48

802.11n20 99% Occupied Bandwith, Middle Channel, Antenna 1



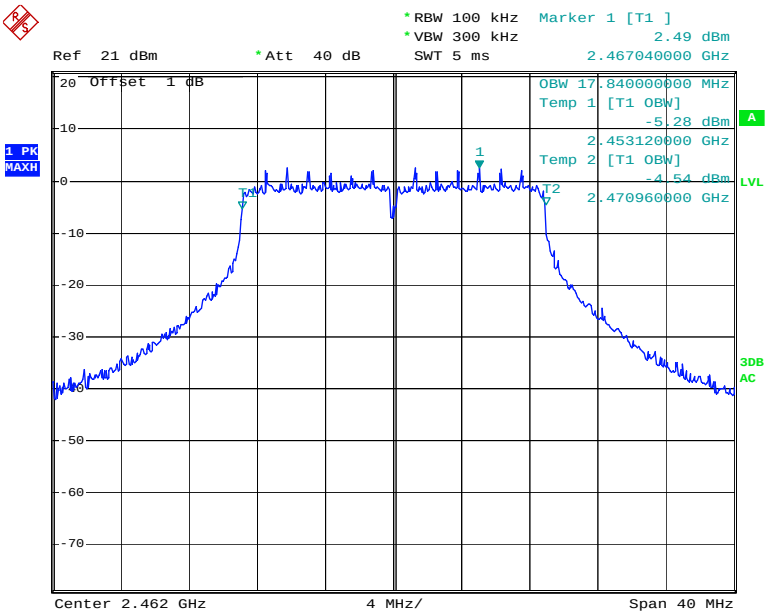
Date: 5.JAN.2011 10:53:25

802.11n20 RF Output Power, Middle Channel, Antenna 1



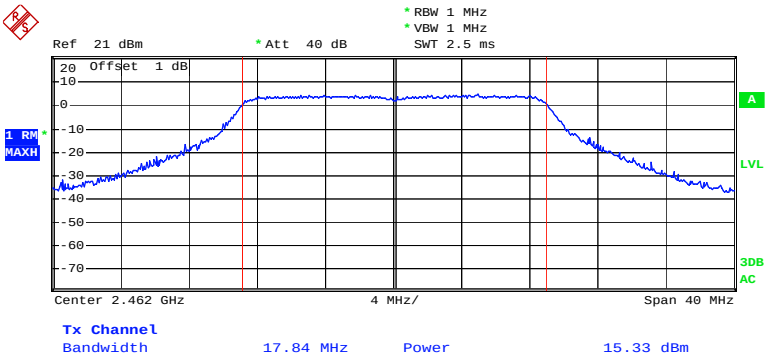
Date: 5.JAN.2011 10:55:45

802.11n20 99% Occupied Bandwith, High Channel, Antenna 1



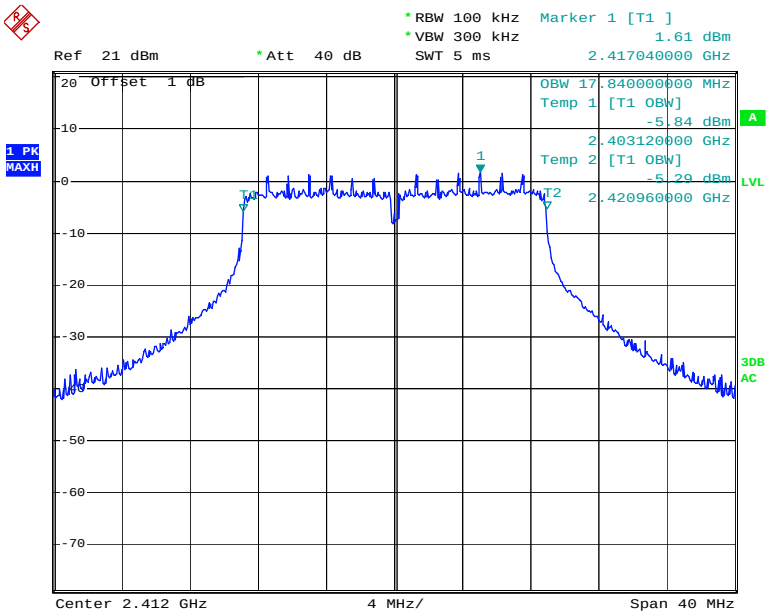
Date: 5.JAN.2011 11:35:32

802.11n20 RF Output Power, High Channel, Antenna 1



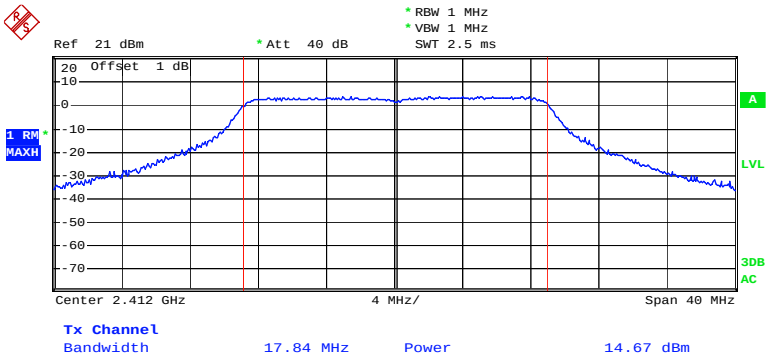
Date: 5.JAN.2011 11:37:01

802.11n20 99% Occupied Bandwith, Low Channel, Antenna 2



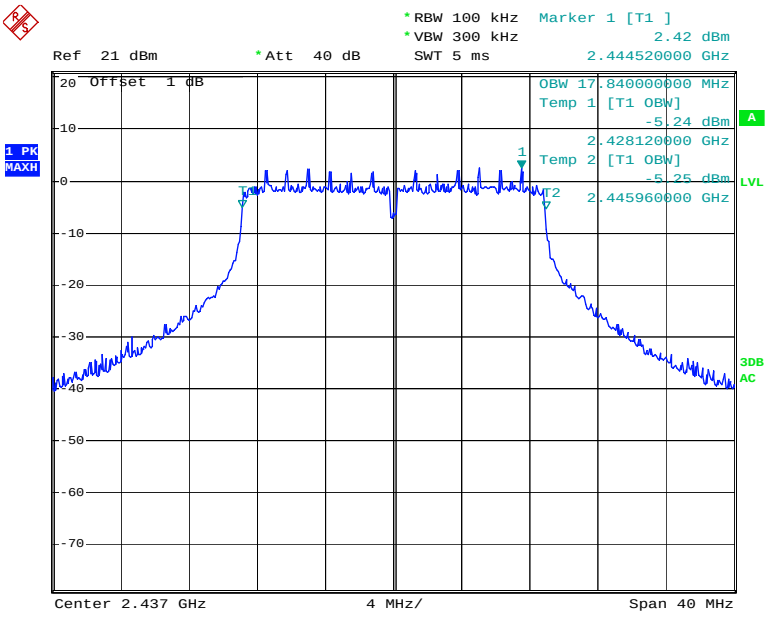
Date: 5.JAN.2011 16:27:33

802.11n20 RF Output Power, Low Channel, Antenna 2



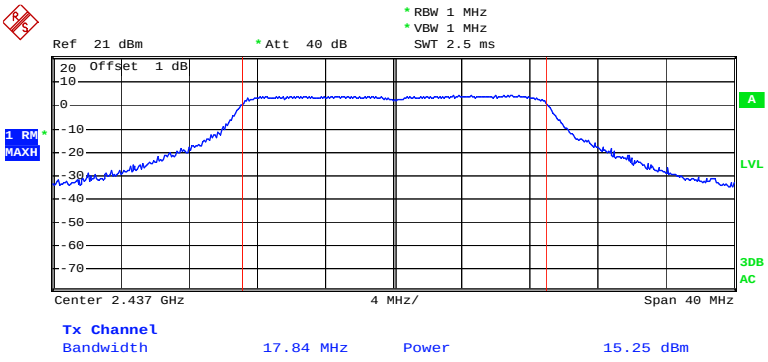
Date: 5.JAN.2011 16:30:23

802.11n20 99% Occupied Bandwith, Middle Channel, Antenna 2



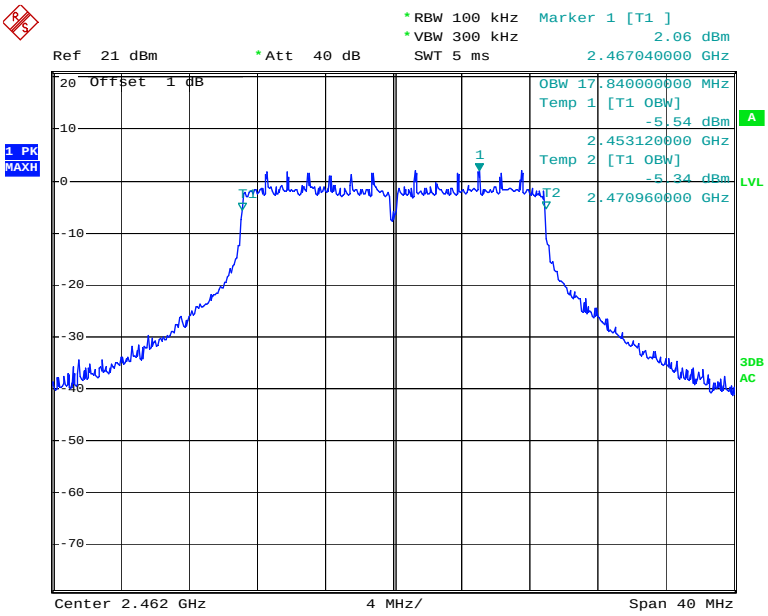
Date: 5.JAN.2011 16:52:19

802.11n20 RF Output Power, Middle Channel, Antenna 2



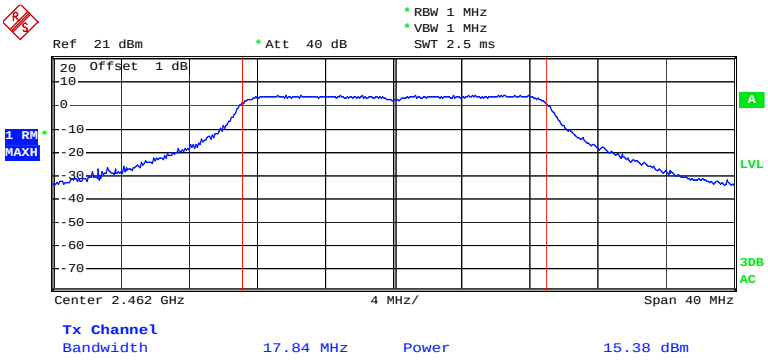
Date: 5.JAN.2011 16:52:53

802.11n20 99% Occupied Bandwith, High Channel, Antenna 2



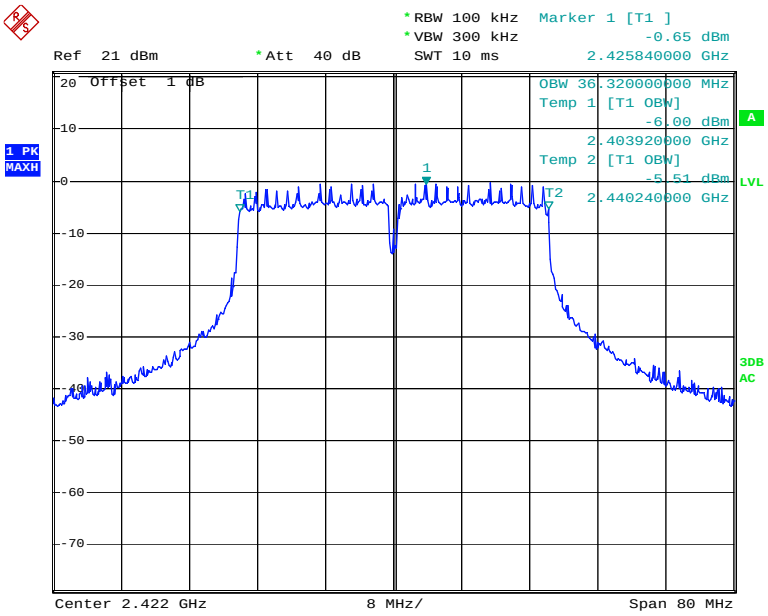
Date: 5.JAN.2011 17:21:00

802.11n20 RF Output Power, High Channel, Antenna 2



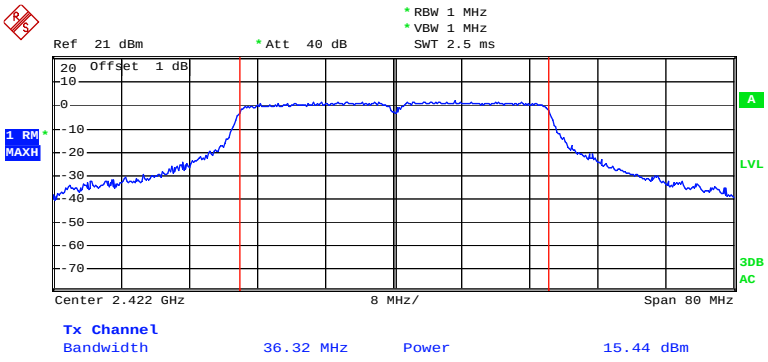
Date: 5.JAN.2011 17:22:16

802.11n40 99% Occupied Bandwith, Low Channel, Antenna 1



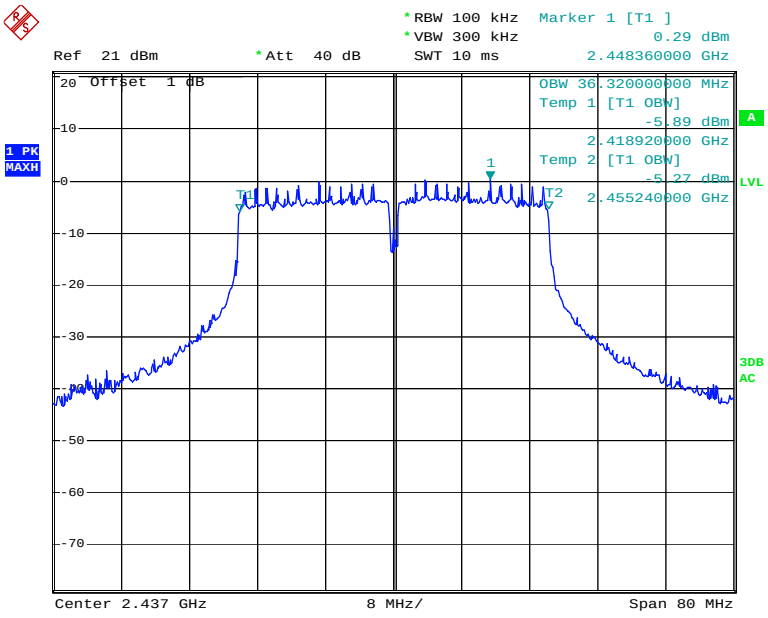
Date: 5.JAN.2011 14:10:29

802.11n40 RF Output Power, Low Channel, Antenna 1



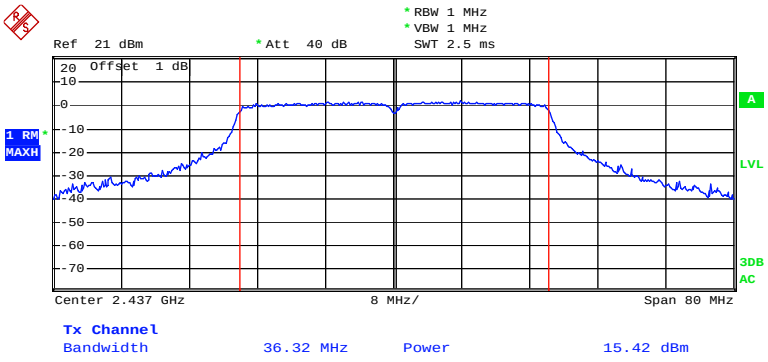
Date: 5.JAN.2011 14:09:09

802.11n40 99% Occupied Bandwith, Middle Channel, Antenna 1



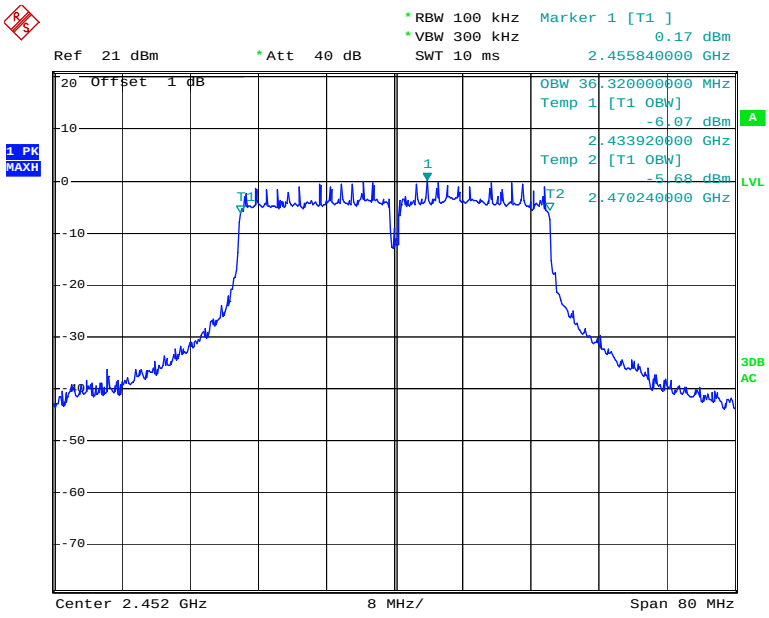
Date: 5.JAN.2011 14:28:48

802.11n40 RF Output Power, Middle Channel, Antenna 1



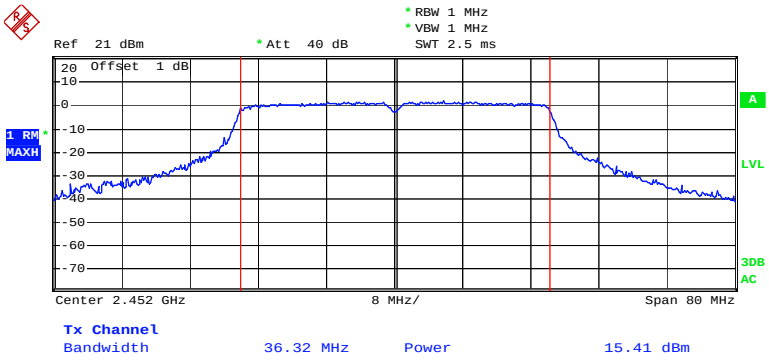
Date: 5.JAN.2011 14:30:10

802.11n40 99% Occupied Bandwith, High Channel, Antenna 1



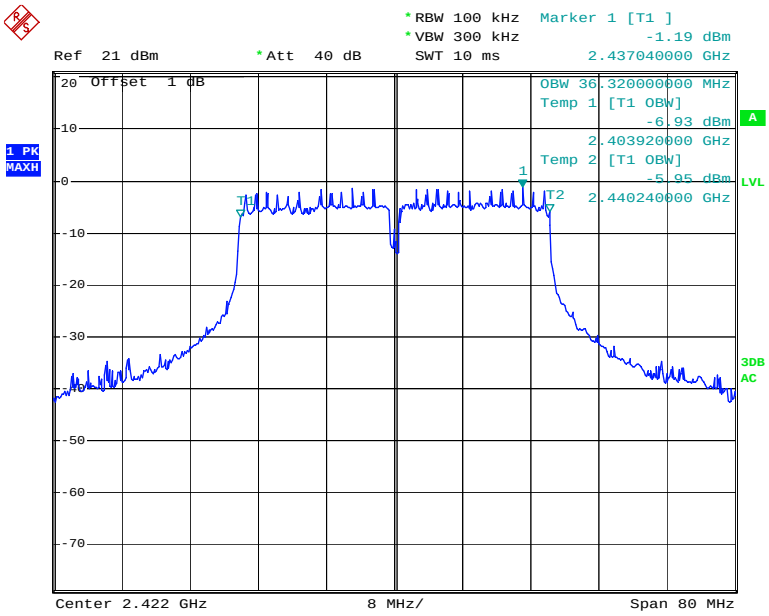
Date: 5.JAN.2011 15:12:31

802.11n40 RF Output Power, High Channel, Antenna 1



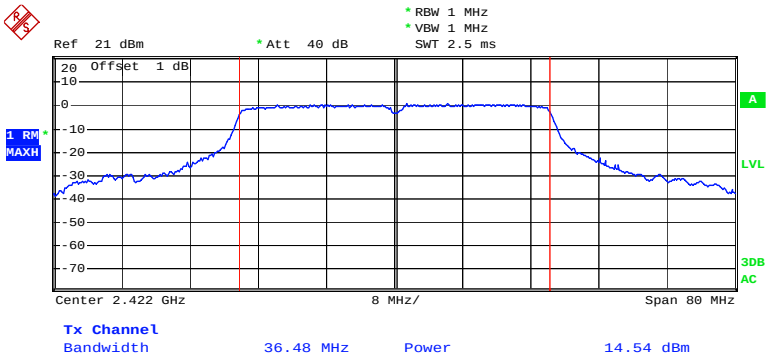
Date: 5.JAN.2011 15:13:07

802.11n40 99% Occupied Bandwith, Low Channel, Antenna 2



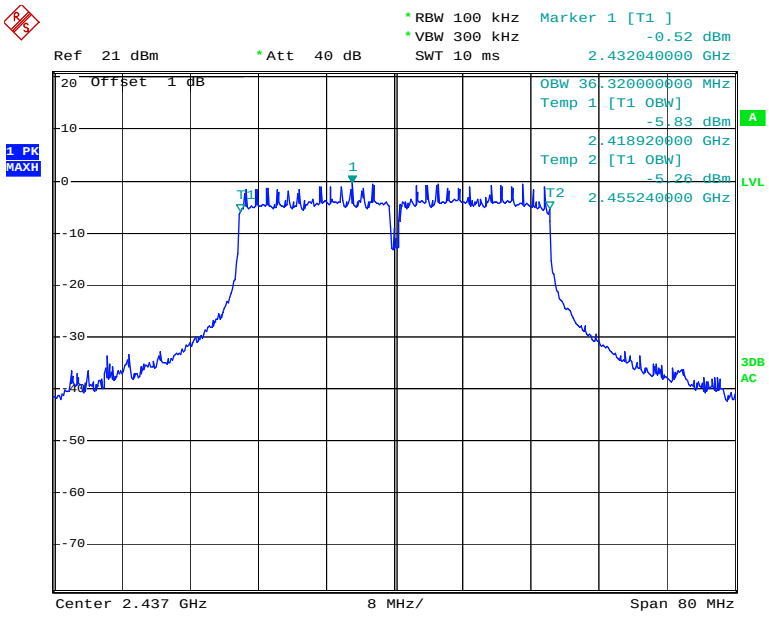
Date: 6.JAN.2011 10:14:50

802.11n40 RF Output Power, Low Channel, Antenna 2



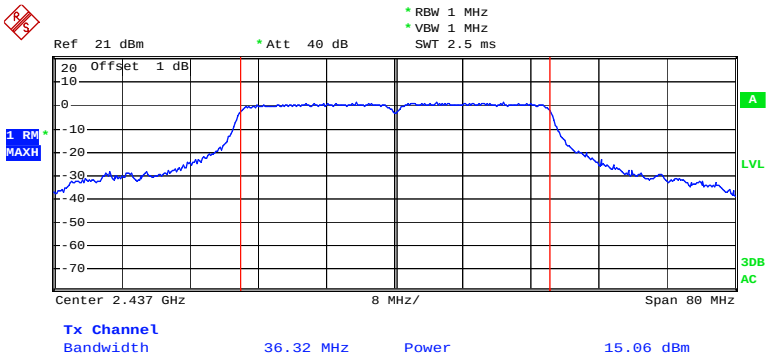
Date: 6.JAN.2011 10:25:07

802.11n40 99% Occupied Bandwith, Middle Channel, Antenna 2



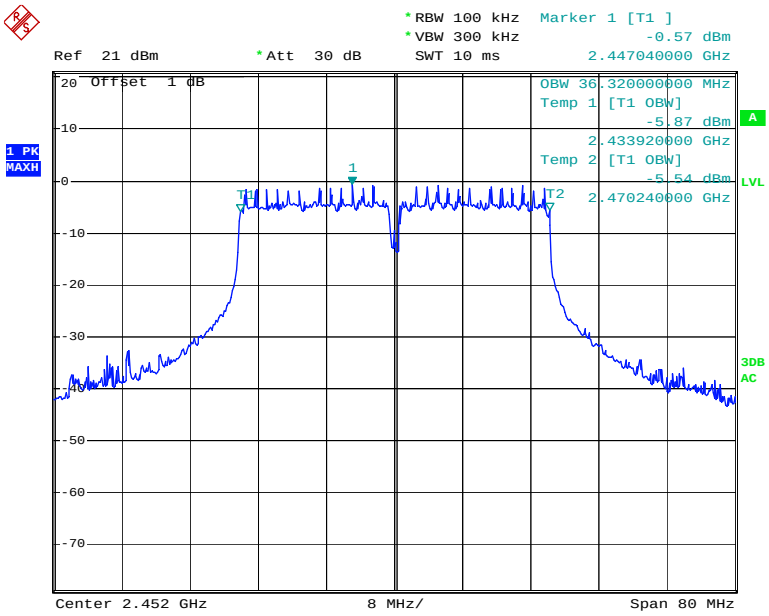
Date: 6.JAN.2011 10:54:30

802.11n40 RF Output Power, Middle Channel, Antenna 2



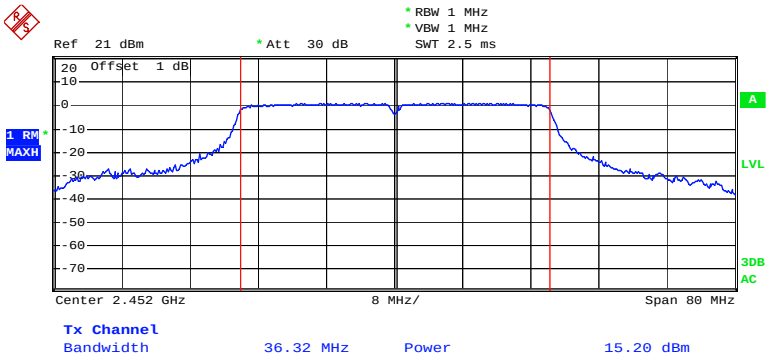
Date: 6.JAN.2011 11:01:48

802.11n40 99% Occupied Bandwith, High Channel, Antenna 2



Date: 10.JAN.2011 08:47:45

802.11n40 RF Output Power, High Channel, Antenna 2



Date: 10.JAN.2011 09:14:20

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 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 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 1 MHz and VBW of spectrum analyzer to 1 MHz 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 Data

Environmental Conditions

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

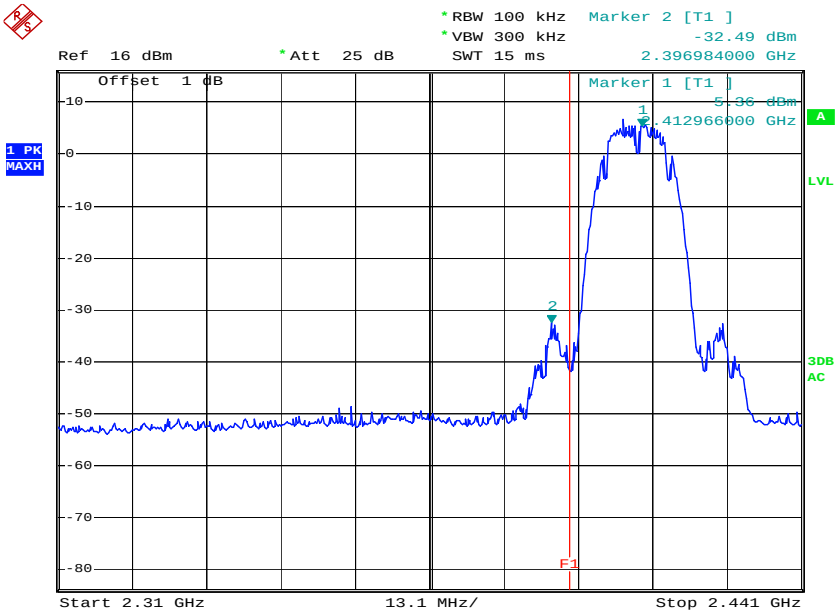
The testing was performed by Kvass Yang from 2010-12-17 to 2011-01-10.

Test Result: *Compliant.*

Frequency (MHz)	Delta Value (dBc)	Limit (dBc)	Result
802.11b mode			
2396.984	37.85	20	Pass
2498.820	54.03	20	Pass
802.11g mode			
2398.818	37.15	20	Pass
2484.306	49.71	20	Pass
802.11n20 mode (with combiner)			
2399.604	38.01	20	Pass
2483.952	47.89	20	Pass
802.11n20 mode (Antenna 1)			
2399.9	29.54	20	Pass
2483.6	46.29	20	Pass
802.11n20 mode (Antenna 2)			
2399.9	30.51	20	Pass
2483.6	45.09	20	Pass
802.11n40 mode (with combiner)			
2399.080	36.20	20	Pass
2485.804	40.21	20	Pass
802.11n40 mode (Antenna 1)			
2399.9	28.28	20	Pass
2485.42	38.91	20	Pass
802.11n40 mode (Antenna 2)			
2399.9	28.69	20	Pass
2484.5	34.71	20	Pass

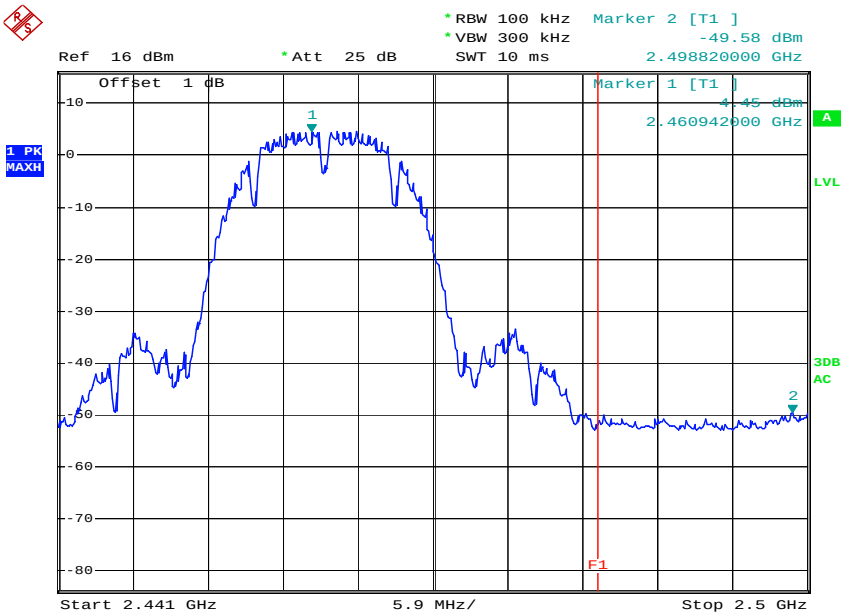
Please refer to following plots.

802.11b: Band Edge, Left Side



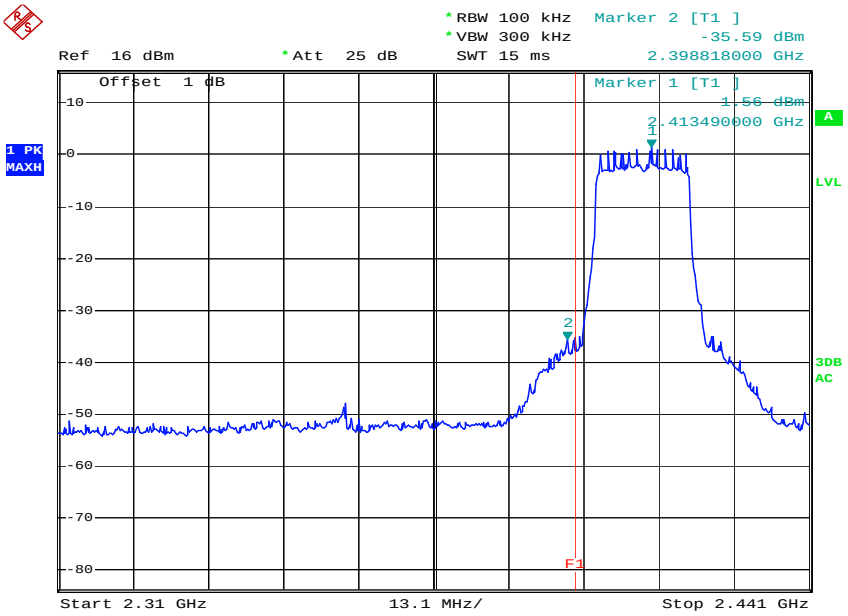
Date: 17.DEC.2010 13:20:36

802.11b: Band Edge, Right Side



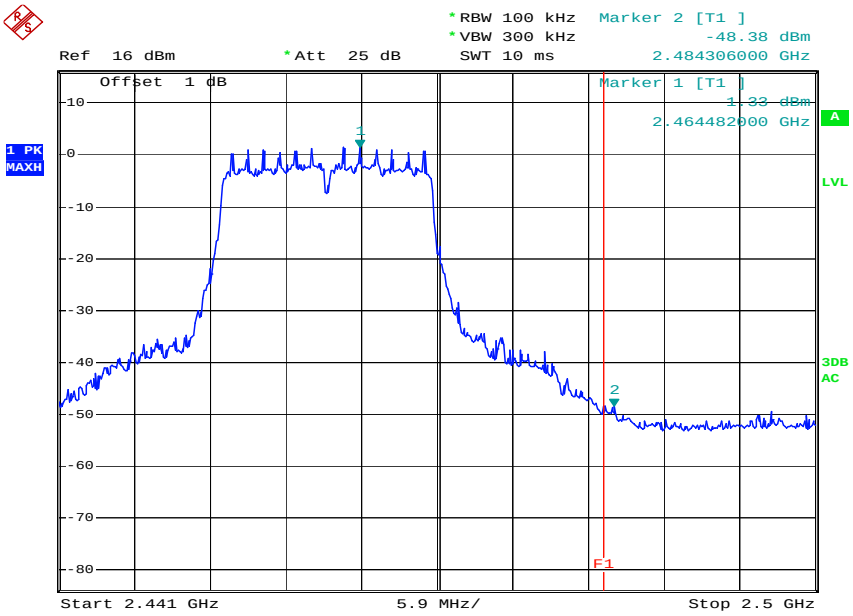
Date: 17.DEC.2010 15:04:53

802.11g: Band Edge, Left Side



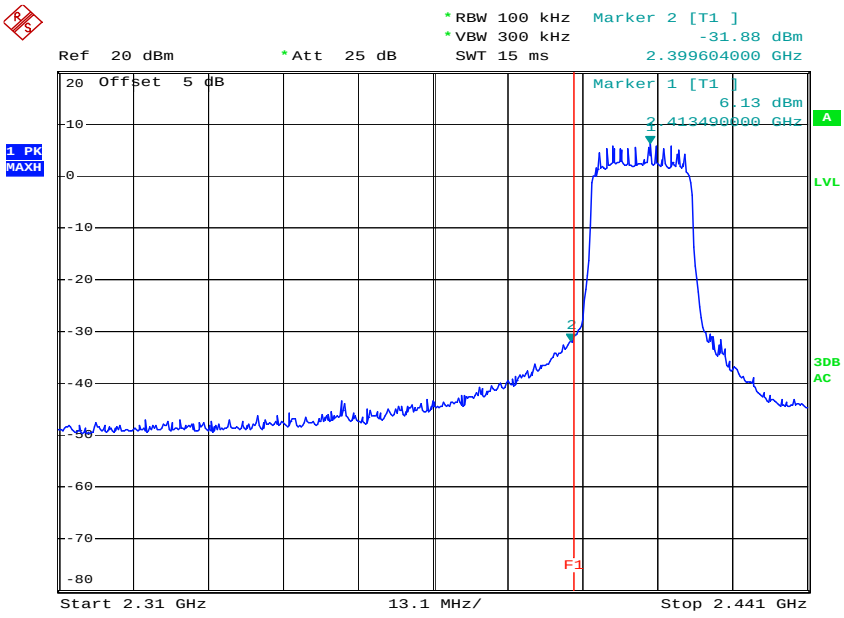
Date: 17.DEC.2010 15:30:54

802.11g: Band Edge, Right Side



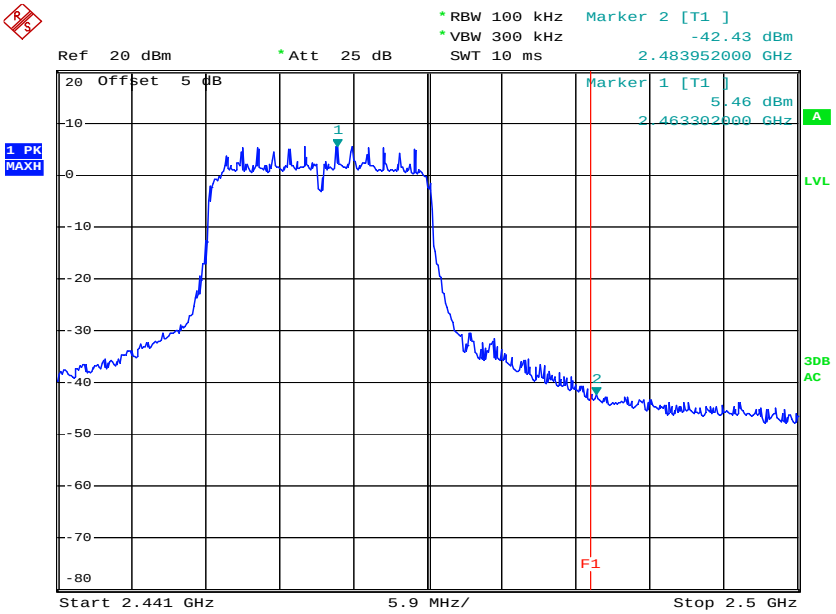
Date: 17.DEC.2010 15:13:50

802.11n20: Band Edge, Left Side (with combiner)



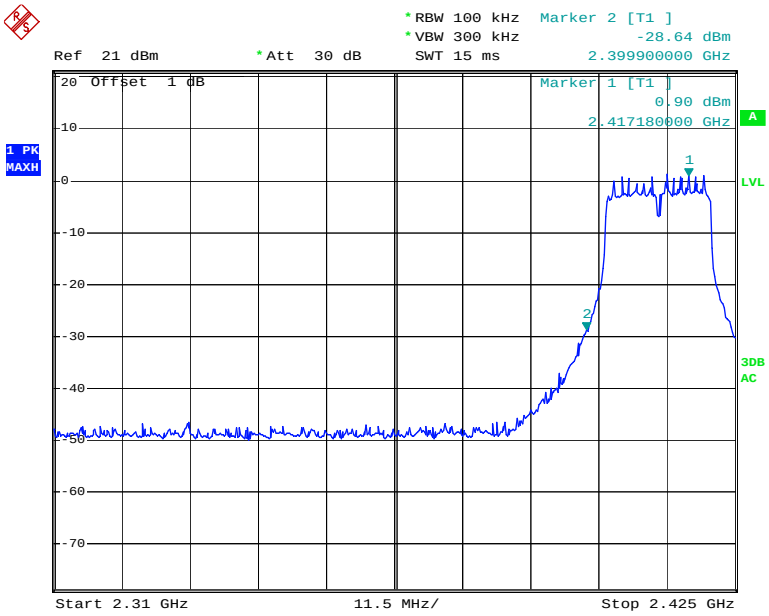
Date: 17.DEC.2010 17:04:01

802.11n20: Band Edge, Right Side (with combiner)



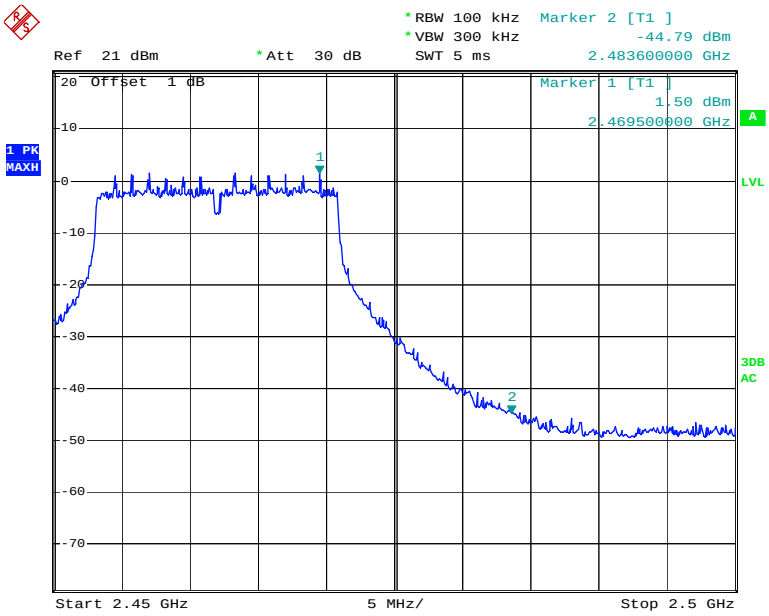
Date: 17.DEC.2010 16:40:25

802.11n20: Band Edge, Left Side (Antenna 1)



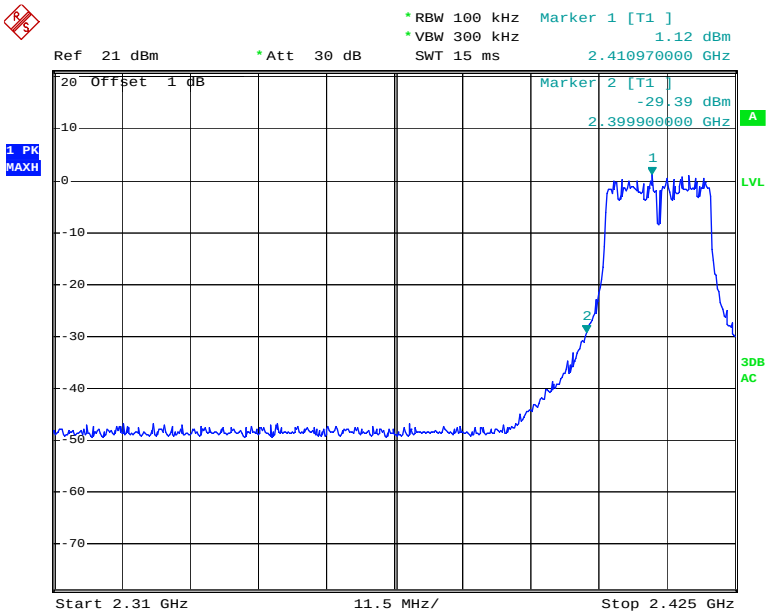
Date: 10.JAN.2011 14:25:00

802.11n20: Band Edge, Right Side (Antenna 1)



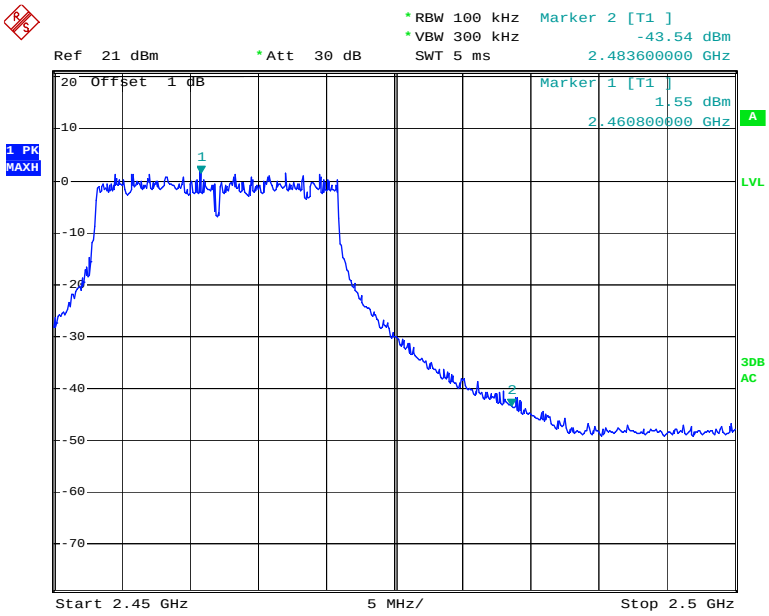
Date: 10.JAN.2011 14:26:43

802.11n20: Band Edge, Left Side (Antenna 2)



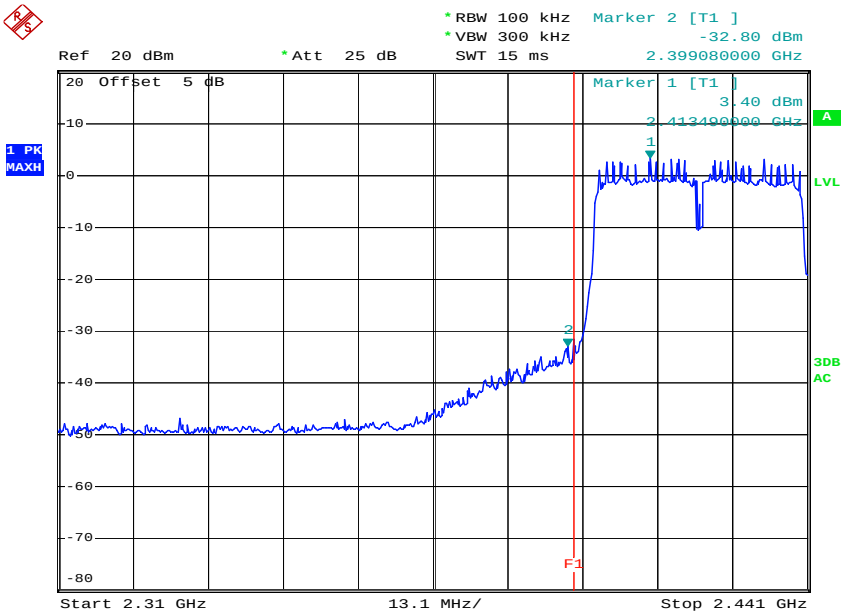
Date: 10.JAN.2011 14:03:02

802.11n20: Band Edge, Right Side (Antenna 2)



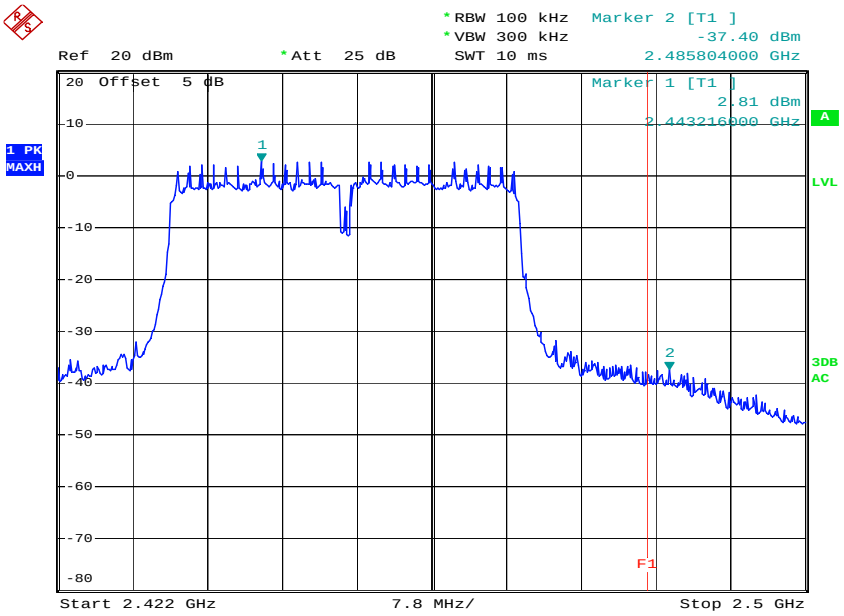
Date: 10.JAN.2011 14:05:27

802.11n40: Band Edge, Left Side (with combiner)



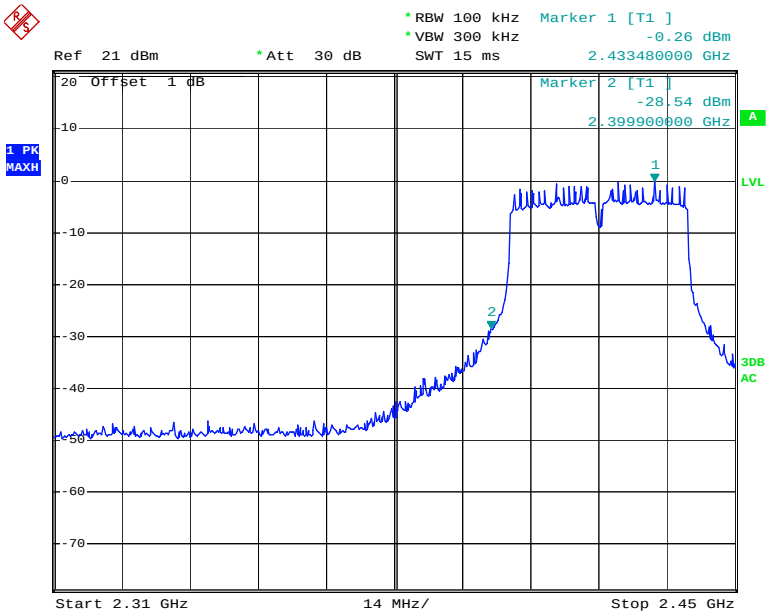
Date: 19.DEC.2010 14:42:40

802.11n40: Band Edge, Right Side (with combiner)



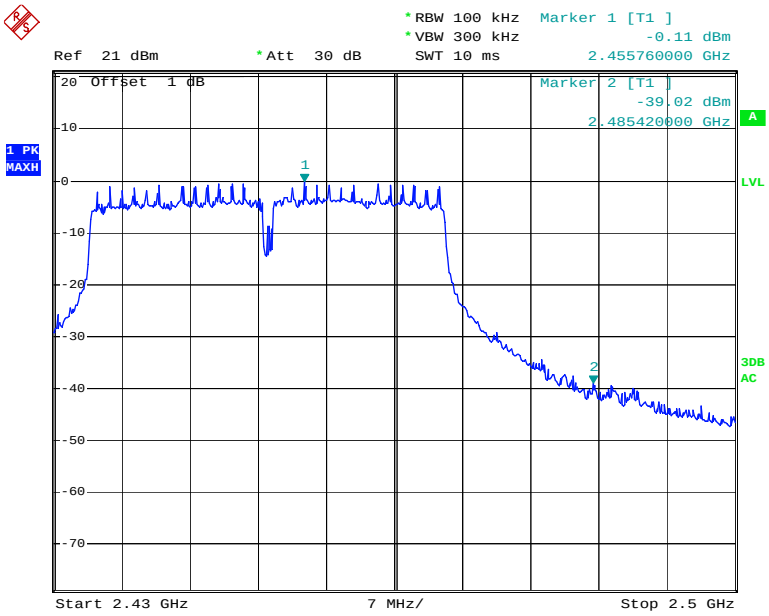
Date: 19.DEC.2010 15:05:25

802.11n40: Band Edge, Left Side (Antenna 1)



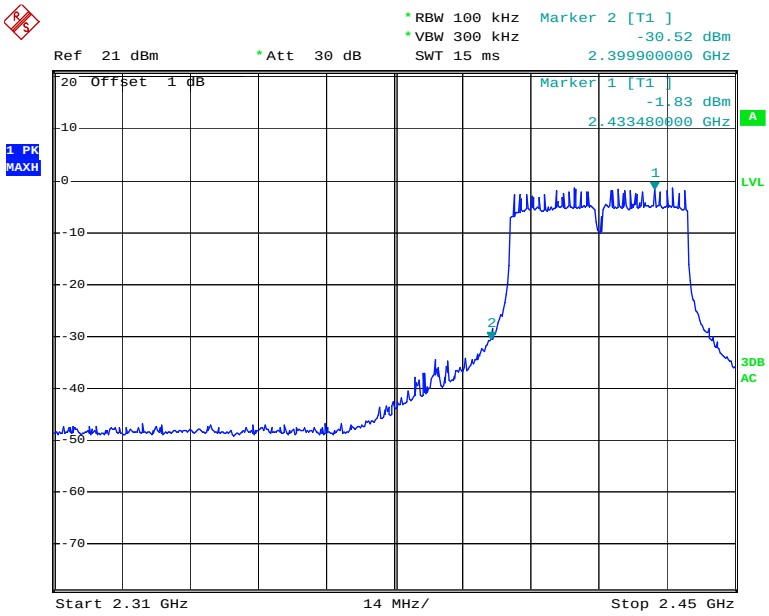
Date: 10.JAN.2011 14:18:34

802.11n40: Band Edge, Right Side (Antenna 1)



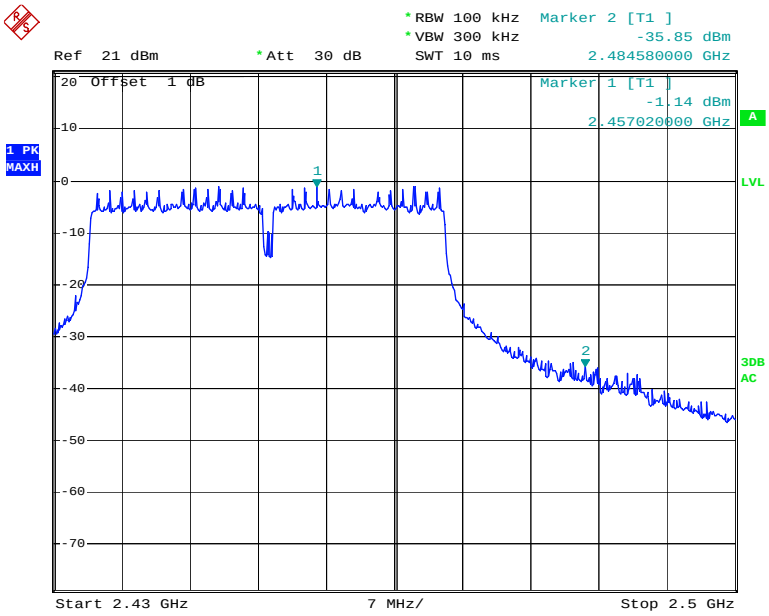
Date: 10.JAN.2011 14:13:57

802.11n40: Band Edge, Left Side (Antenna 2)



Date: 10.JAN.2011 14:00:48

802.11n40: Band Edge, Right Side (Antenna 2)



Date: 10.JAN.2011 14:12:06

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 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 Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

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 Data

Environmental Conditions

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

The testing was performed by Kvass Yang from 2010-12-17 to 2011-01-11.

Test Mode: Transmitting

Test Result: Pass

802.11 b Mode:

Channel	Frequency (MHz)	Date Rate (Mbps)	Power Spectral Density (dBm)	Limit (dBm)	Results
Low	2412	1.0	2.11	8	Pass
Mid	2437	1.0	1.06	8	Pass
High	2462	1.0	0.95	8	Pass

802.11 g Mode:

Channel	Frequency (MHz)	Date Rate (Mbps)	Power Spectral Density (dBm)	Limit (dBm)	Results
Low	2412	6.0	-10.96	8	Pass
Mid	2437	6.0	-11.19	8	Pass
High	2462	6.0	-11.26	8	Pass

802.11 n20 MHz Mode:

Antenna	Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)	Results
#1	Low	2412	-11.22	8	Pass
	Mid	2437	-11.26	8	Pass
	High	2462	-10.32	8	Pass
#2	Low	2412	-11.72	8	Pass
	Mid	2437	-10.86	8	Pass
	High	2462	-11.09	8	Pass

802.11 n20 MHz Antenna #1 + Antenna #2

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)	Results
Low	2412	-8.45	8	Pass
Mid	2437	-8.05	8	Pass
High	2462	-7.68	8	Pass

802.11 n40 MHz Mode:

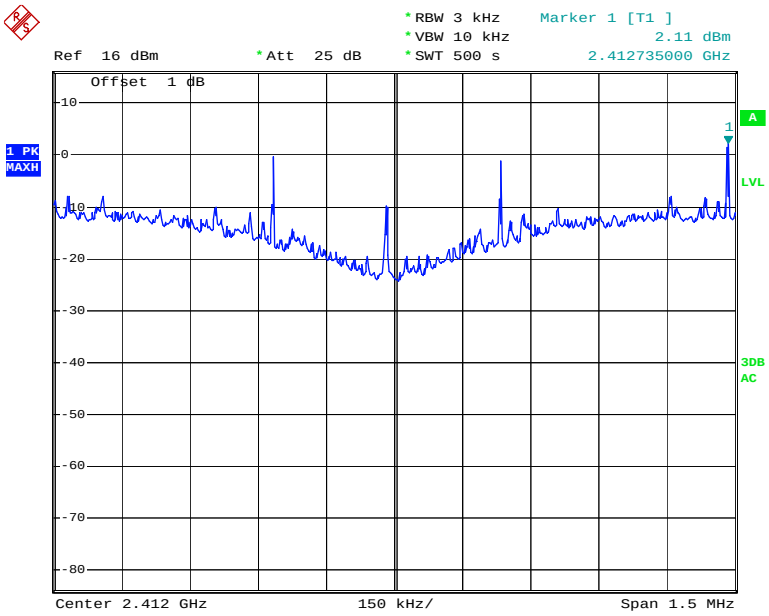
Antenna	Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)	Results
#1	Low	2422	-12.63	8	Pass
	Mid	2437	-11.60	8	Pass
	High	2452	-11.58	8	Pass
#2	Low	2422	-13.67	8	Pass
	Mid	2437	-12.29	8	Pass
	High	2452	-12.94	8	Pass

802.11 n40 MHz Antenna #1 + Antenna #2

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)	Results
Low	2422	-10.11	8	Pass
Mid	2437	-8.92	8	Pass
High	2452	-9.20	8	Pass

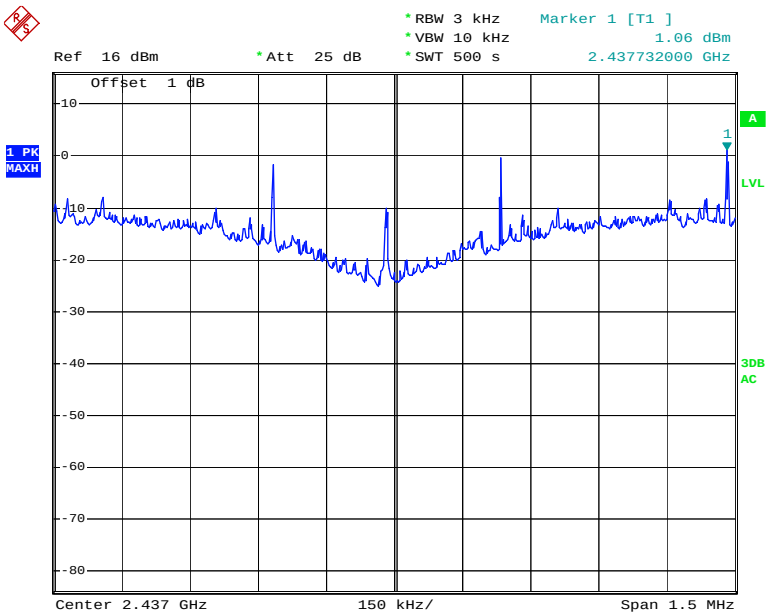
Please refer to the following plots.

Power Spectral Density, 802.11b Low Channel



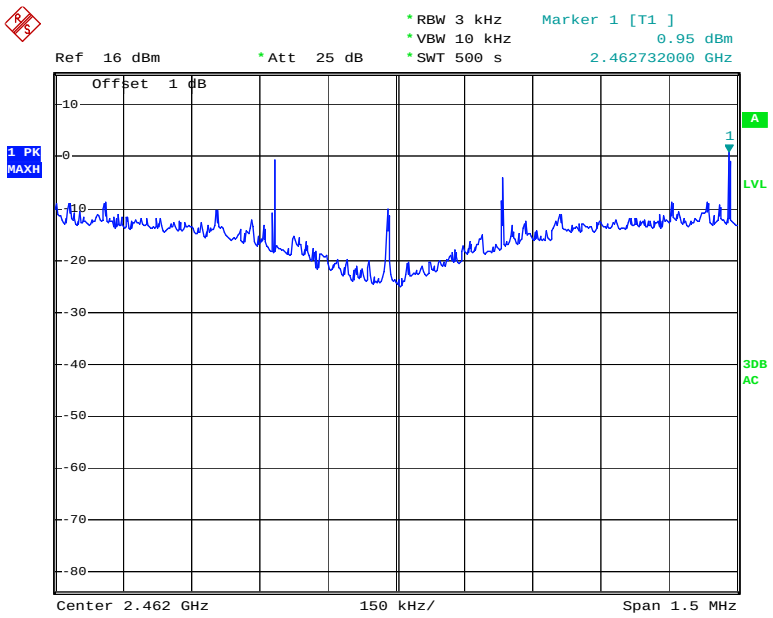
Date: 17.DEC.2010 14:07:30

Power Spectral Density, 802.11b Middle Channel



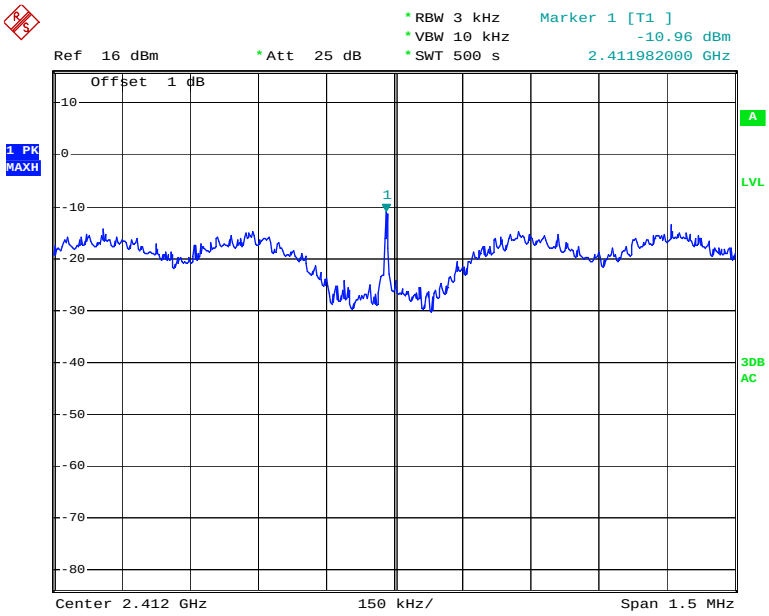
Date: 17.DEC.2010 13:57:33

Power Spectral Density, 802.11b High Channel



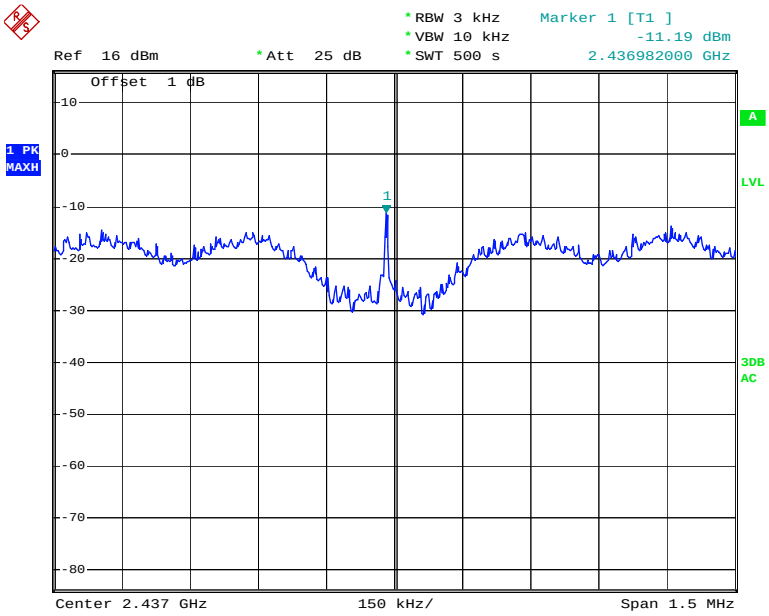
Date: 17.DEC.2010 15:02:38

Power Spectral Density, 802.11g Low Channel



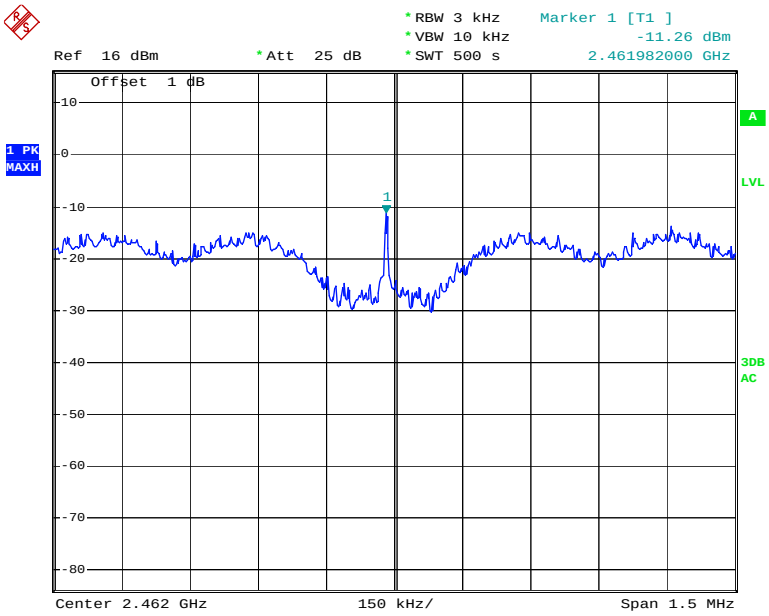
Date: 17.DEC.2010 15:40:10

Power Spectral Density, 802.11g Middle Channel



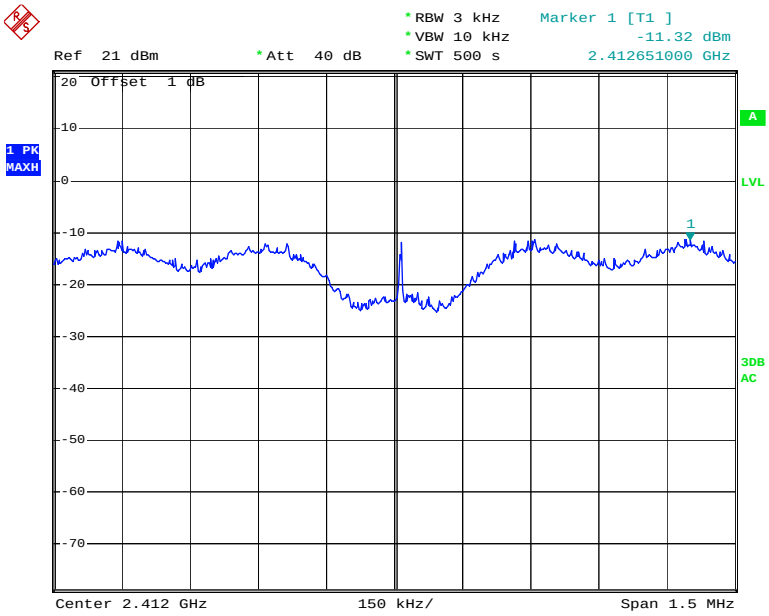
Date: 17.DEC.2010 15:49:18

Power Spectral Density, 802.11g High Channel



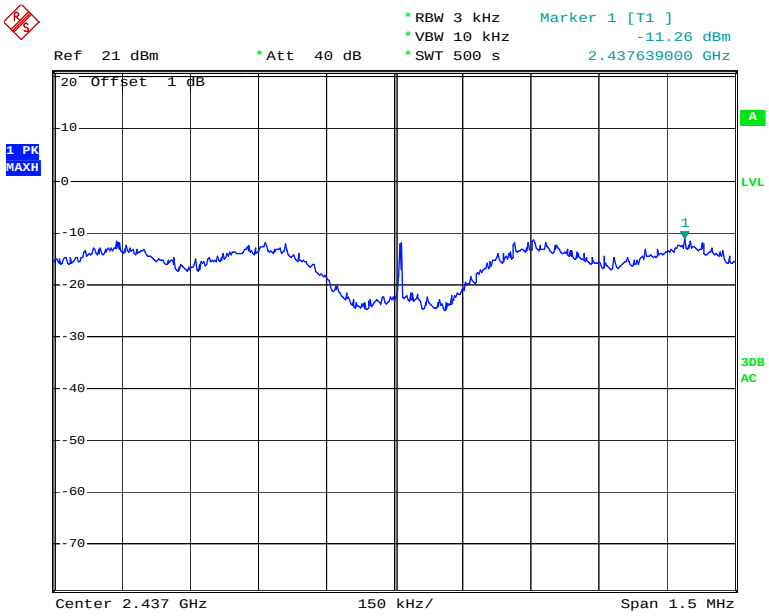
Date: 17.DEC.2010 16:19:18

Power Spectral Density, 802.11n20 Low Channel (Antenna 1)



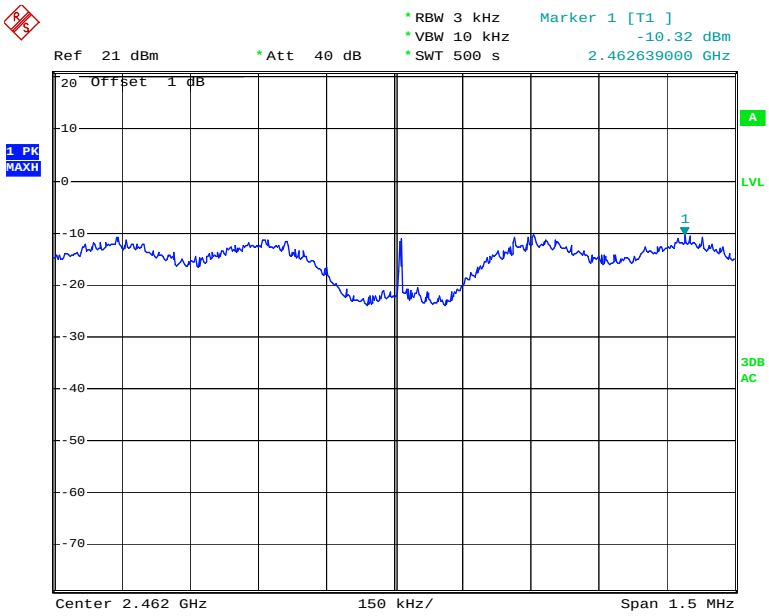
Date: 4.JAN.2011 17:58:26

Power Spectral Density, 802.11n20 Middle Channel (Antenna 1)



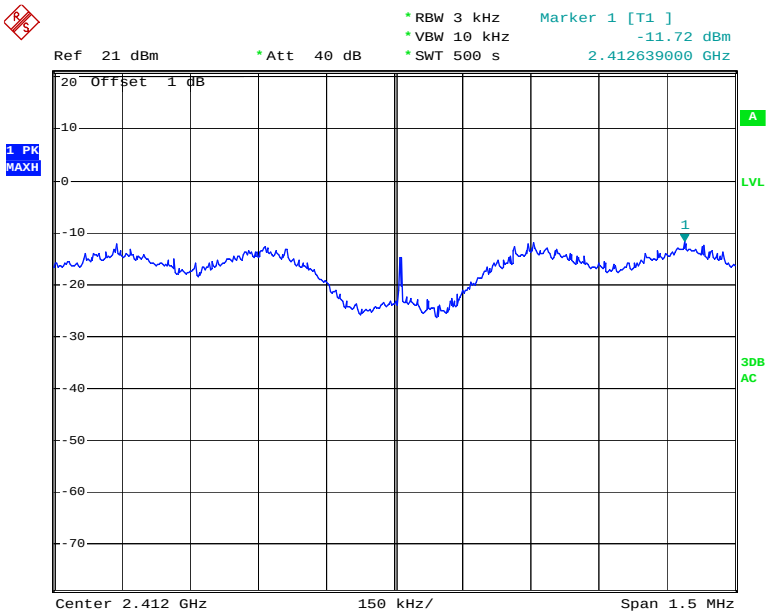
Date: 5.JAN.2011 11:20:35

Power Spectral Density, 802.11n20 High Channel (Antenna 1)



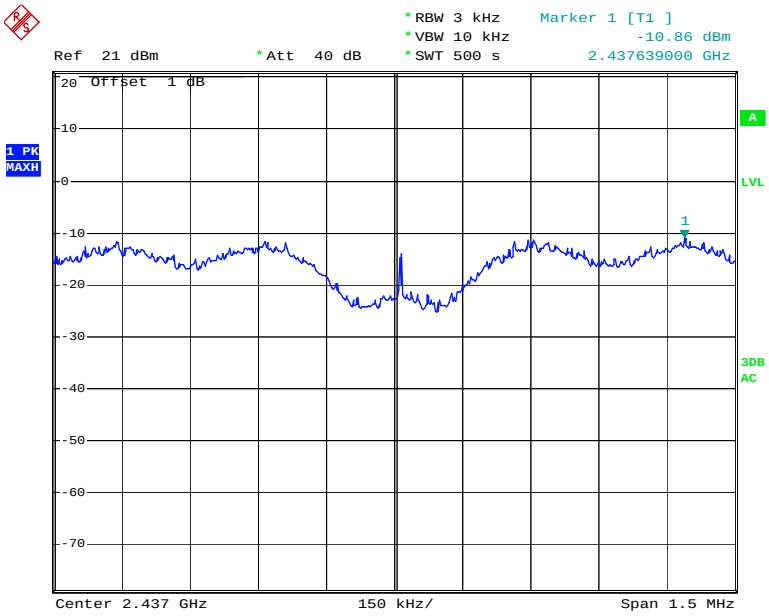
Date: 5.JAN.2011 14:01:02

Power Spectral Density, 802.11n20 Low Channel (Antenna 2)



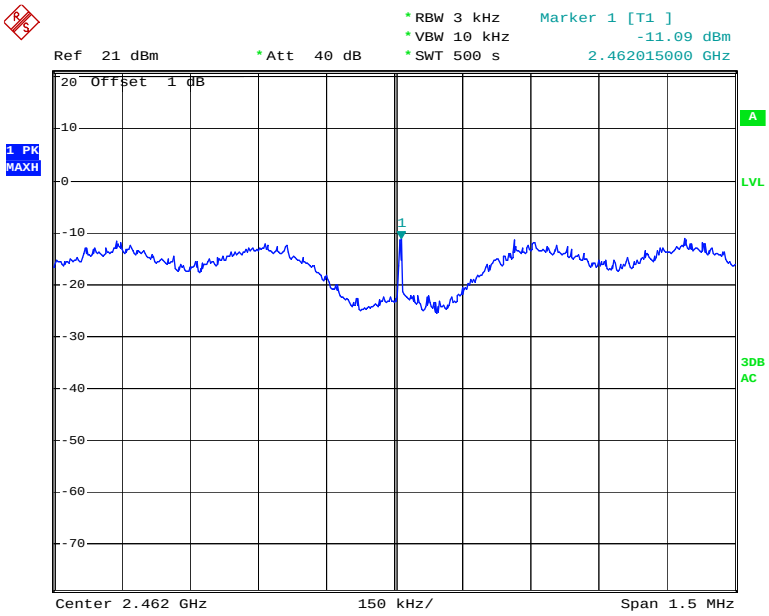
Date: 5.JAN.2011 16:43:15

Power Spectral Density, 802.11n20 Middle Channel (Antenna 2)



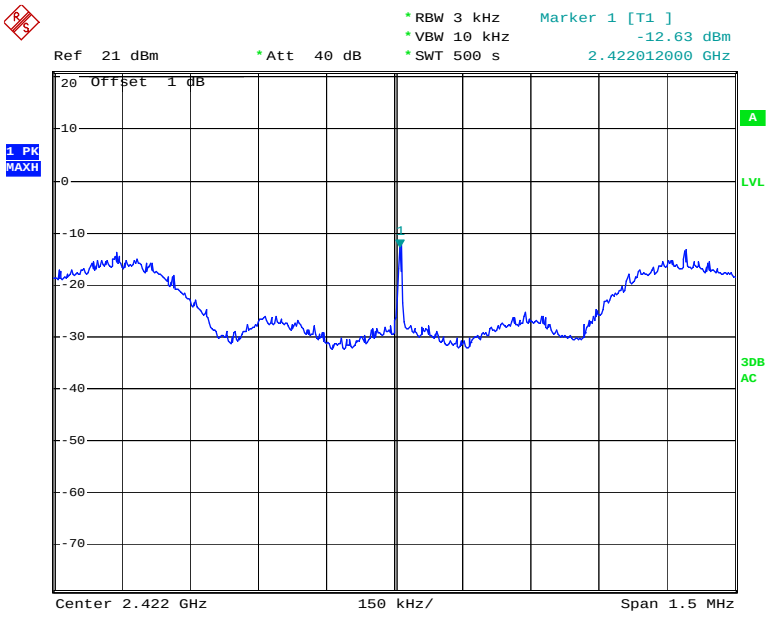
Date: 5.JAN.2011 17:15:56

Power Spectral Density, 802.11n20 High Channel (Antenna 2)



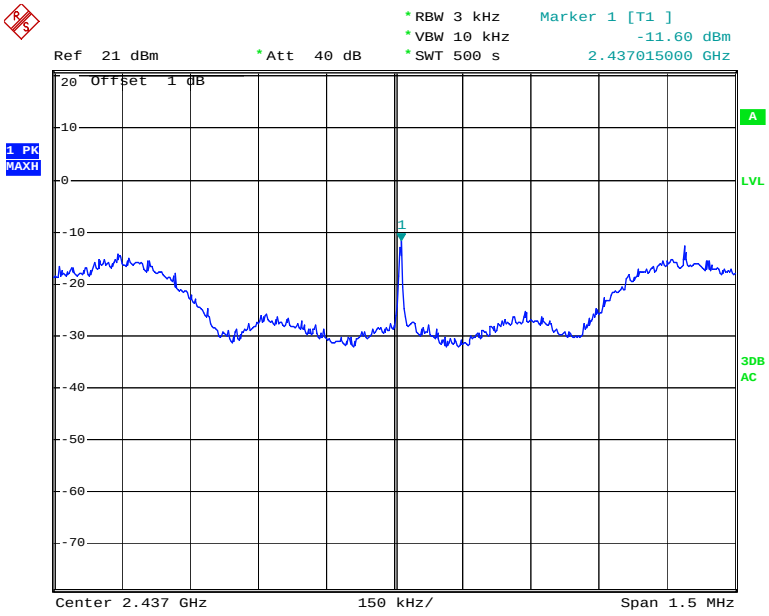
Date: 6.JAN.2011 09:49:38

Power Spectral Density, 802.11n40 Low Channel (Antenna 1)



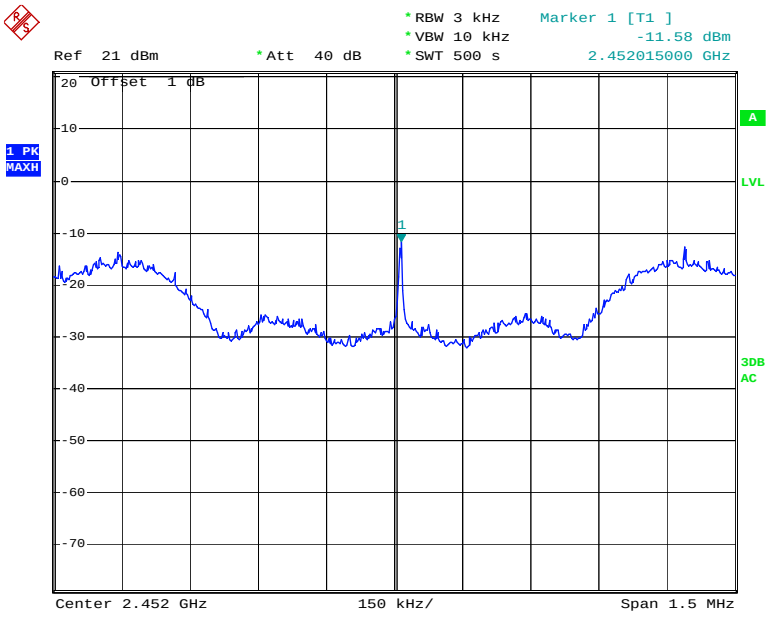
Date: 5.JAN.2011 14:23:17

Power Spectral Density, 802.11n40 Middle Channel (Antenna 1)



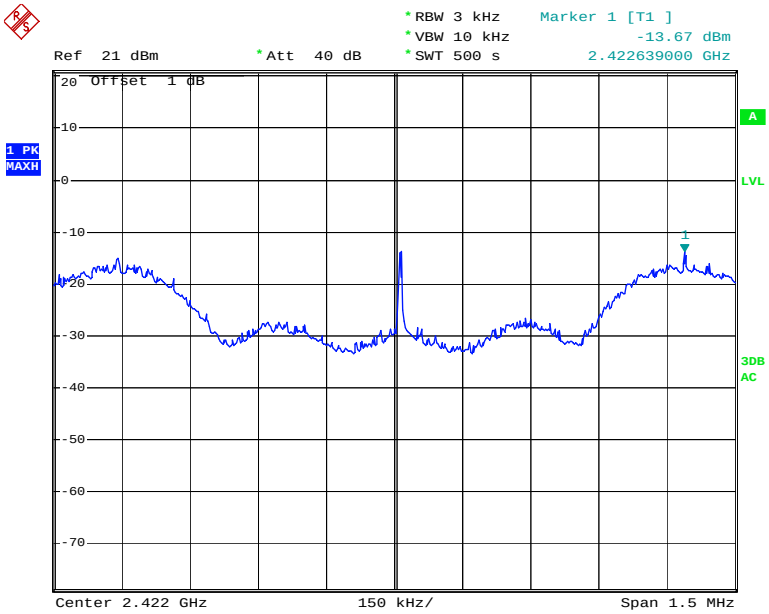
Date: 5.JAN.2011 15:07:34

Power Spectral Density, 802.11n40 High Channel (Antenna 1)



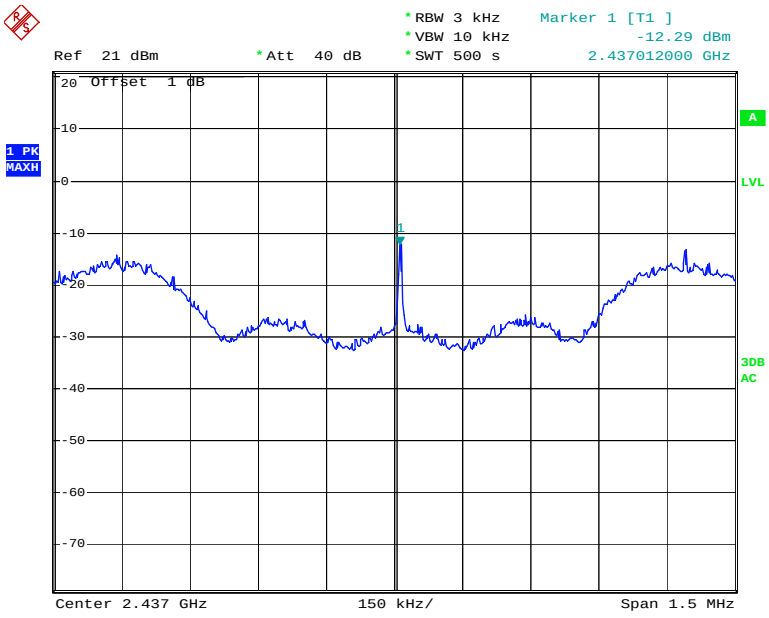
Date: 5.JAN.2011 16:13:00

Power Spectral Density, 802.11n40 Low Channel (Antenna 2)



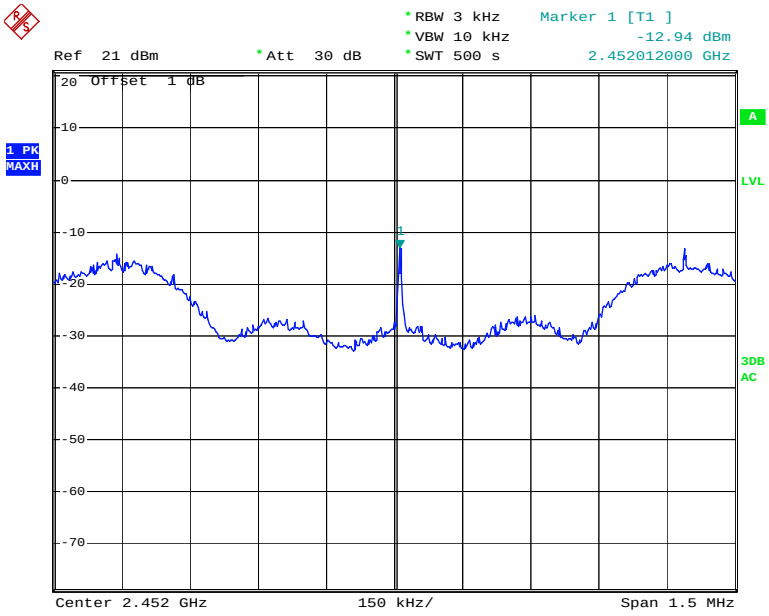
Date: 6.JAN.2011 10:43:13

Power Spectral Density, 802.11n40 Middle Channel (Antenna 2)



Date: 6.JAN.2011 11:22:24

Power Spectral Density, 802.11n40 High Channel (Antenna 2)



Date: 10.JAN.2011 09:43:10

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