Lab Code: 200707-0

FCC PART 15.247

MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-Tech, Industrial Park, Nanshan District,
Shenzhen, Guangdong, P.R.of China

FCC ID: Q78-ZXDSL931WII

Report Type:	**Product Type:**
Original Report	Wireless VDSL CPE

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ZTE Corporation's* product, model number: *ZXDSL 931WII (FCC ID: Q78-ZXDSL931WII)* or the "EUT" as referred to in this report is a *VDSL CPE*, which measures approximately: 21.2 cm (L) x 4.9 cm (W) x 18.8 cm (H), rated input voltage: DC 12V adapter.

Adapter information:
Model: MSP-C2000IC12.0-24W-US;
Input: AC 100-240V 50/60 Hz 0.8A Max;
Output: DC 12.0V 2A.

All measurement and test data in this report was gathered from production sample serial number: 1012071 (Assigned by BACL, Shenzhen). The EUT was received on 2010-12-16.

Objective

This Type approval report is prepared on behalf of *ZTE Corporation* 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)

FCC Part 15 B submission with FCC ID: Q78-ZXDSL931WII.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (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 & 802.11n-HT20 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 was tested with Channel 1, 6 and 11.

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

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

EUT Exercise Software

ART_RUN.

Equipment Modifications

No modification was made to the unit tested.

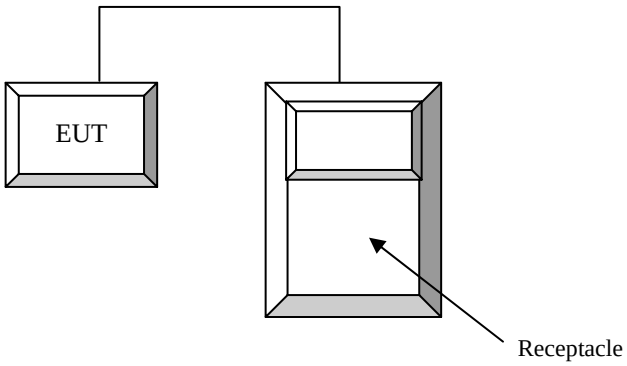
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Laptop	D600	00045-438-852-864	DoC

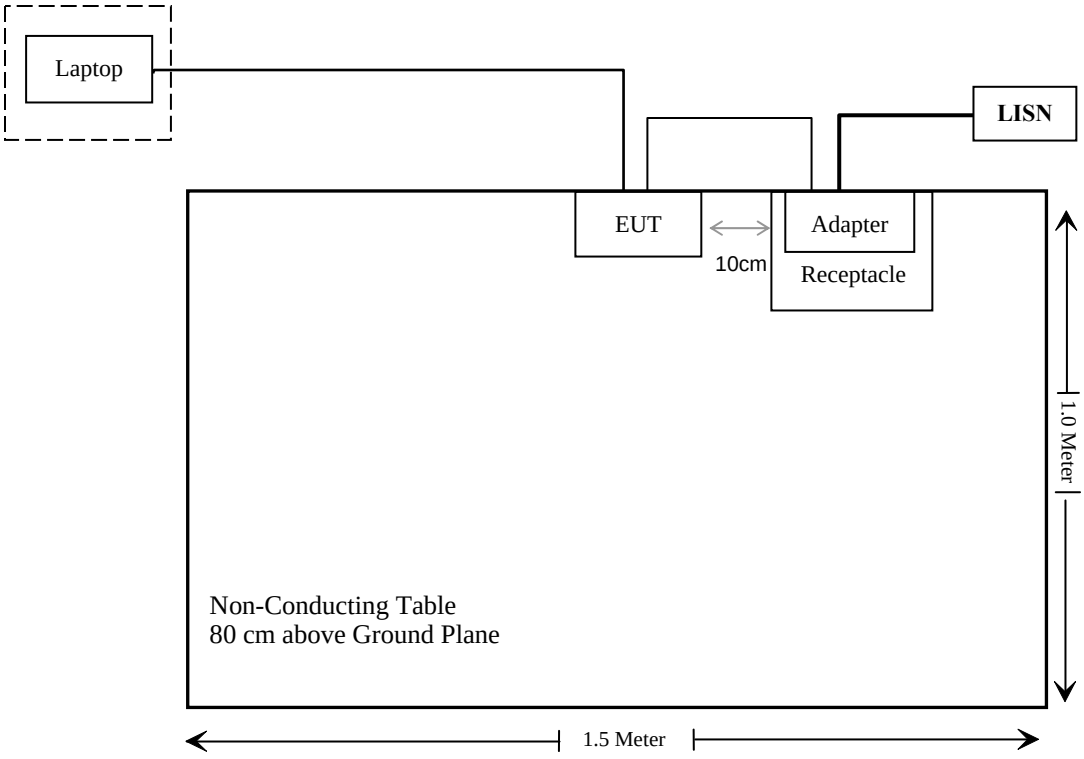
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded detachable Power Line	1.5	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions & Restricted Band of Operation	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC §15.247(i) & §2.1091 - RF EXPOSURE INFORMATION

Applicable Standards

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

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

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/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 Calculation

MPE is calculated at a given distance

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

S= power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Radio Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2462	4.5	2.82	18.44	69.82	20	0.0392	1.0
802.11g	2412	4.5	2.82	15.26	33.57	20	0.0188	1.0

Radio Mode	Frequency (MHz)	Antenna Port	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
			(dBi)	(numeric)	(dBm)	(mW)			
802.11n-HT20	2462	1	4.5	2.82	15.33	34.12	20	0.034	1.0
		2	3.3	2.14	15.38	34.51			
802.11n-HT420	2452	1	4.5	2.82	15.41	34.75	20	0.034	1.0
		2	3.3	2.14	15.20	33.11			

Result: The device meets MPE limit 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 section 15.247 (b), if the transmitting antennas of directional gain greater than 6 dBi 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 has two antennas, which complies with the Part 15.203. The maximum antenna gain one is 4.5 dBi, the other is 3.3 dBi. Please see EUT photo for details.

Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

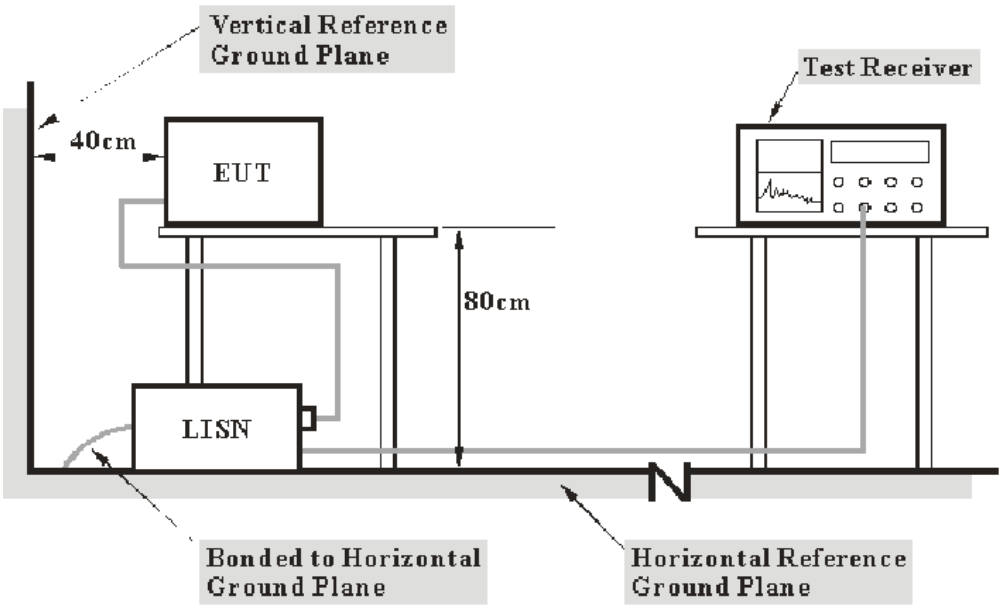
FCC §15.207

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.

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

The adapter of laptop 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	830245/006	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 adapter of laptop was connected to the LISN.

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

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

Test 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:

For 802.11b:

10.05 dB at **0.565 MHz** in the **Neutral** conductor mode

For 802.11g:

12.52 dB at **0.575 MHz** in the **Line** conductor mode

For 802.11n-HT20:

10.34 dB at **0.570 MHz** in the **Neutral** conductor mode

For 802.11n-HT40:

10.88 dB at **0.565 MHz** in the **Line** conductor mode

Test Data

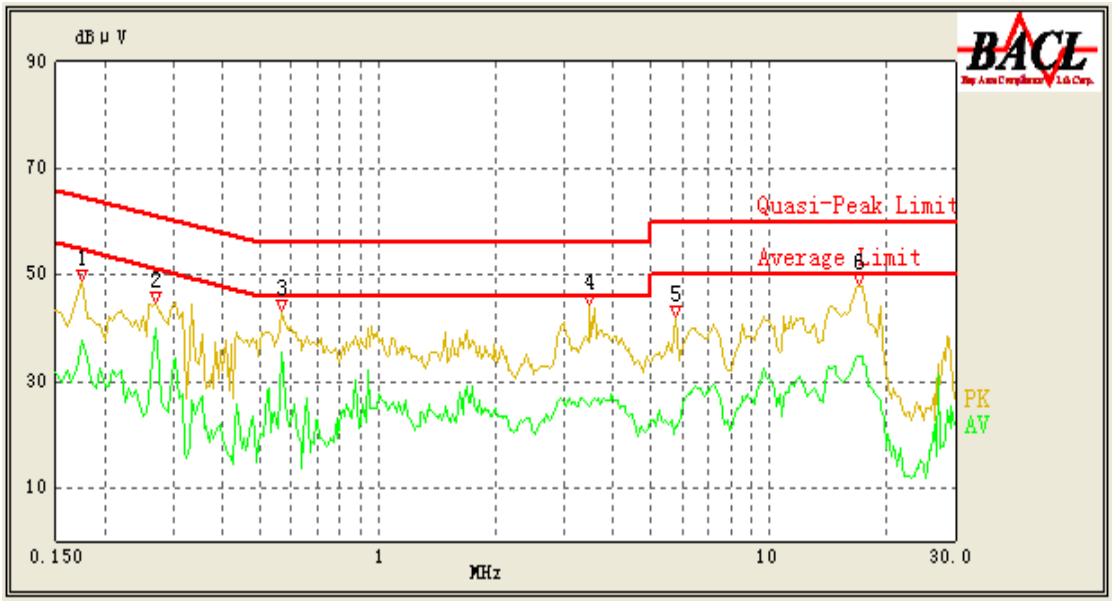
Environmental Conditions

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

The testing was performed by Bruce Zhang on 2011-01-13.

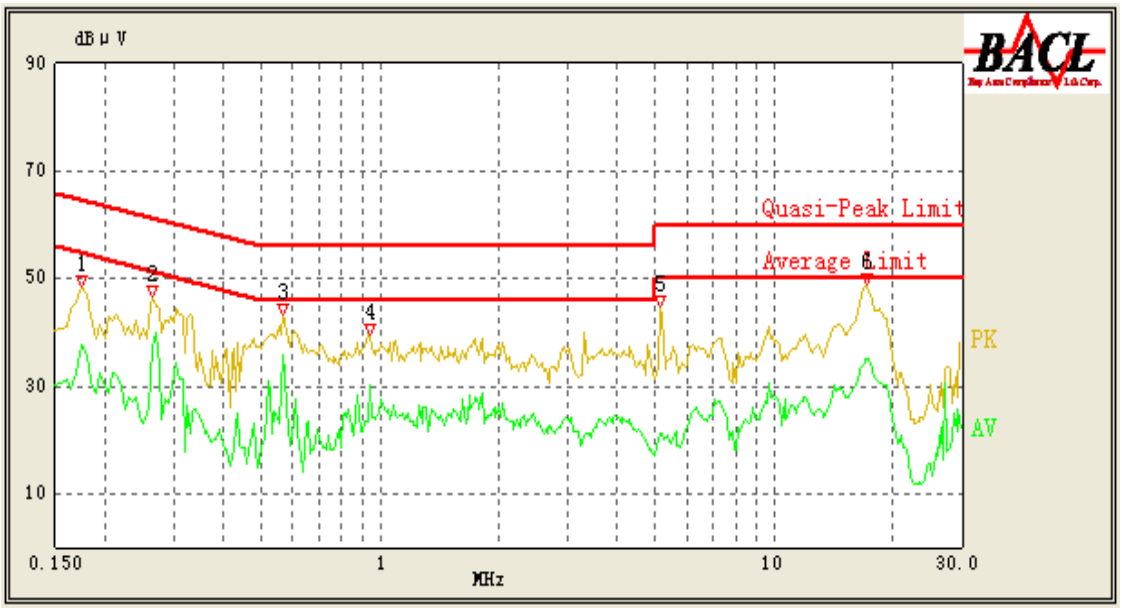
Test Mode: Transmitting (802.11b)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Correction Factor (dB)**	**Cord. Result (dBμV)**	**Limit (dBμV)**	**Margin (dB)**	**Detector (PK/QP/Ave)**
0.565	35.28	10.19	46.00	10.72	Ave
0.270	40.09	10.02	52.57	12.48	Ave
16.870	34.75	10.17	50.00	15.25	Ave
0.570	39.11	10.19	56.00	16.89	QP
16.960	42.62	10.17	60.00	17.38	QP
0.175	37.56	10.08	55.29	17.73	Ave
0.175	45.64	10.08	65.29	19.65	QP
3.485	25.50	10.13	46.00	20.50	Ave
0.270	41.89	10.02	62.57	20.68	QP
3.470	32.54	10.13	56.00	23.46	QP
5.795	21.67	10.10	50.00	28.33	Ave
5.785	29.81	10.10	60.00	30.19	QP

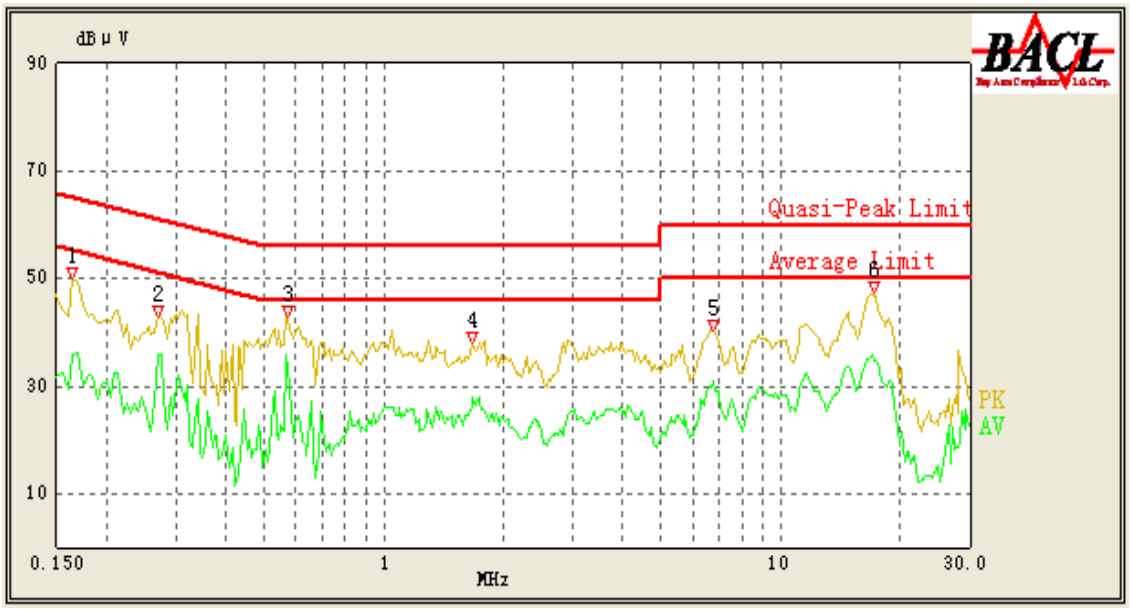
AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave)
0.565	35.95	10.19	46.00	10.05	Ave
17.170	45.74	10.17	60.00	14.26	QP
16.975	34.94	10.17	50.00	15.06	Ave
0.265	37.29	10.02	52.71	15.42	Ave
0.940	30.35	10.11	46.00	15.65	Ave
0.565	38.84	10.19	56.00	17.16	QP
0.175	37.70	10.08	55.29	17.59	Ave
0.175	45.82	10.08	65.29	19.47	QP
0.940	34.40	10.11	56.00	21.60	QP
0.265	40.03	10.02	62.71	22.68	QP
5.130	21.21	10.10	50.00	28.79	Ave
5.130	26.71	10.10	60.00	33.29	QP

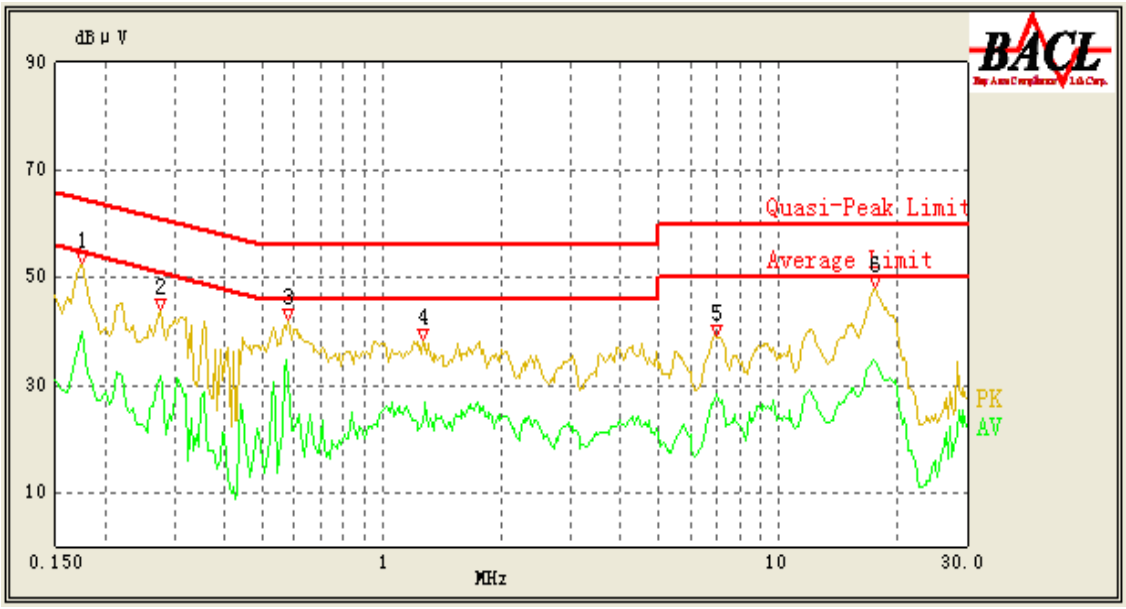
Test Mode: Transmitting (802.11g)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	**Correction Factor (dB)**	**Cord. Result (dBµV)**	**Limit (dBµV)**	**Margin (dB)**	**Detector (PK/QP/Ave)**
0.575	33.48	10.18	46.00	12.52	Ave
17.220	34.71	10.17	50.00	15.29	Ave
0.270	35.92	10.02	52.57	16.65	Ave
0.575	38.00	10.18	56.00	18.00	QP
1.675	27.82	10.17	46.00	18.18	Ave
6.755	30.92	10.10	50.00	19.08	Ave
0.165	45.85	10.09	65.57	19.72	QP
0.165	35.68	10.09	55.57	19.89	Ave
1.675	34.58	10.17	56.00	21.42	QP
17.260	38.38	10.17	60.00	21.62	QP
0.270	40.03	10.02	62.57	22.54	QP
6.800	33.28	10.10	60.00	26.72	QP

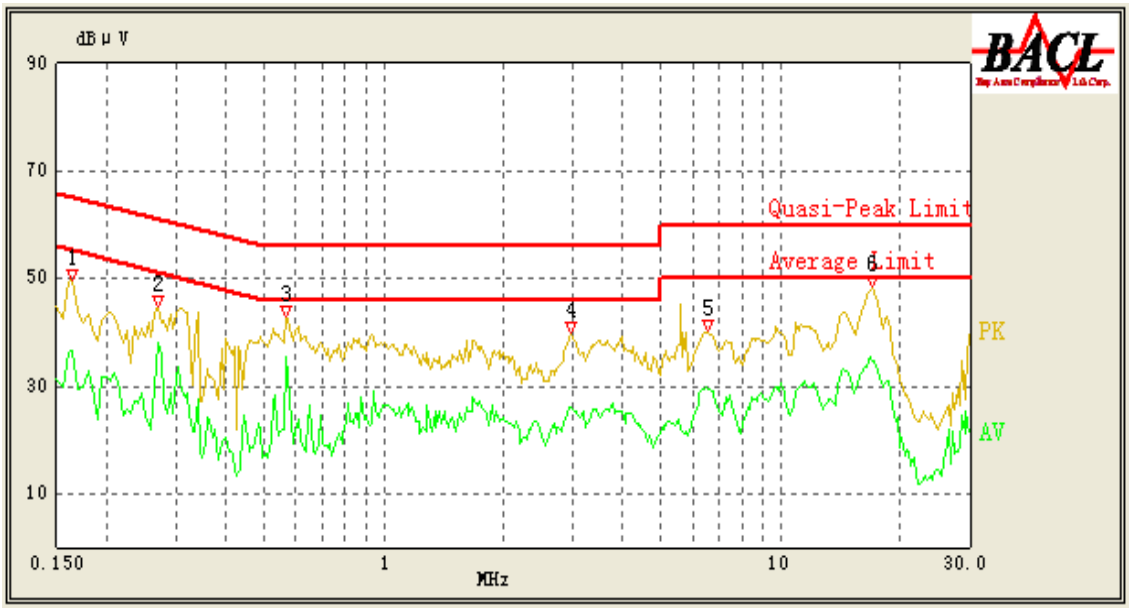
AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.580	30.92	10.18	46.00	15.08	Ave
0.175	40.01	10.08	55.29	15.28	Ave
17.550	34.44	10.18	50.00	15.56	Ave
0.580	36.26	10.18	56.00	19.74	QP
0.275	31.57	10.02	52.43	20.86	Ave
1.280	24.85	10.13	46.00	21.15	Ave
17.505	37.87	10.18	60.00	22.13	QP
6.905	27.22	10.10	50.00	22.78	Ave
0.275	38.92	10.02	62.43	23.51	QP
0.175	41.34	10.08	65.29	23.95	QP
1.270	29.12	10.13	56.00	26.88	QP
6.960	24.84	10.10	60.00	35.16	QP

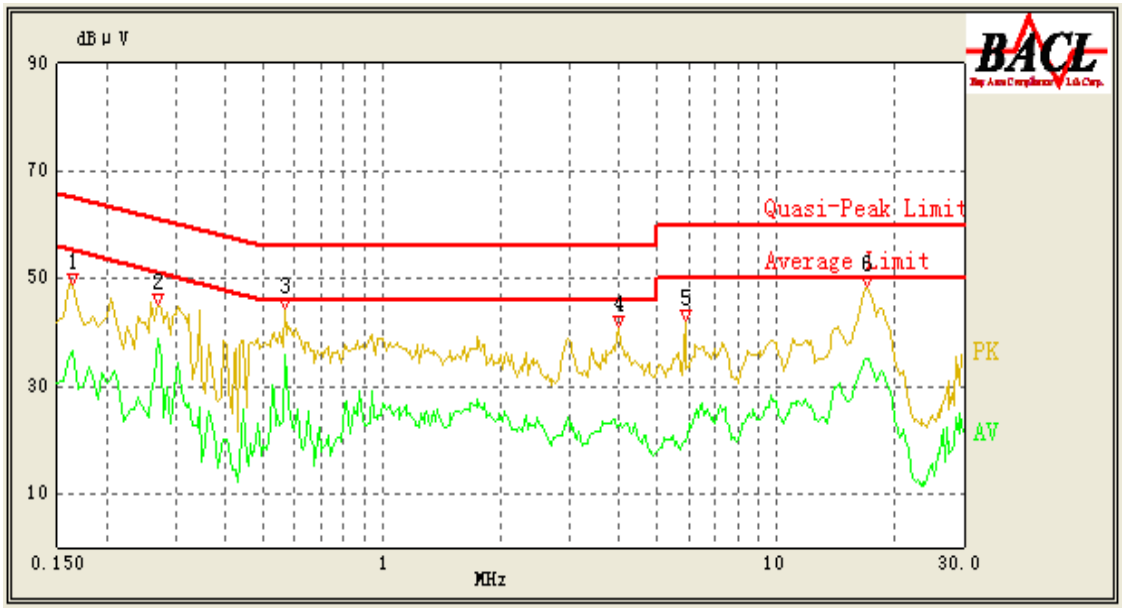
Test Mode: Transmitting (802.11n-HT20)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.570	35.35	10.19	46.00	10.65	Ave
0.270	38.17	10.02	52.57	14.40	Ave
17.025	34.86	10.17	50.00	15.14	Ave
17.015	42.50	10.17	60.00	17.50	QP
0.565	37.51	10.19	56.00	18.49	QP
0.165	47.03	10.09	65.57	18.54	QP
0.165	36.54	10.09	55.57	19.03	Ave
2.975	25.94	10.15	46.00	20.06	Ave
6.490	29.85	10.10	50.00	20.15	Ave
0.270	40.84	10.02	62.57	21.73	QP
2.975	33.04	10.15	56.00	22.96	QP
6.535	36.81	10.10	60.00	23.19	QP

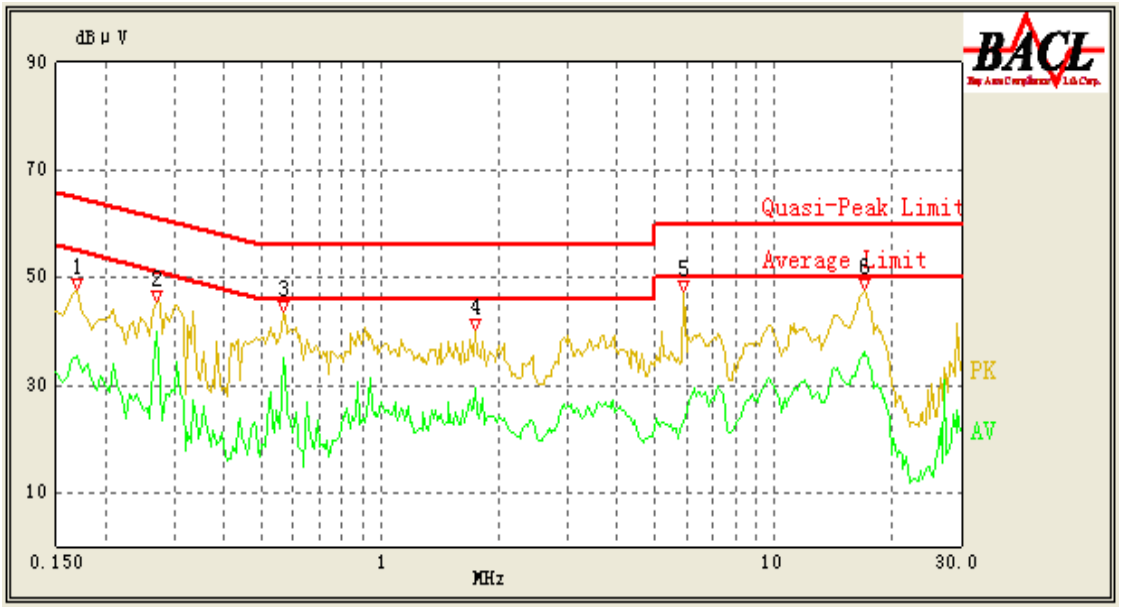
AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.570	35.66	10.19	46.00	10.34	Ave
0.270	38.82	10.02	52.57	13.75	Ave
16.905	35.00	10.17	50.00	15.00	Ave
16.945	44.02	10.17	60.00	15.98	QP
0.570	39.15	10.19	56.00	16.85	QP
0.165	46.97	10.09	65.57	18.60	QP
0.165	36.43	10.09	55.57	19.14	Ave
0.270	41.02	10.02	62.57	21.55	QP
3.955	22.32	10.10	46.00	23.68	Ave
3.970	28.37	10.10	56.00	27.63	QP
5.880	19.79	10.10	50.00	30.21	Ave
5.880	27.85	10.10	60.00	32.15	QP

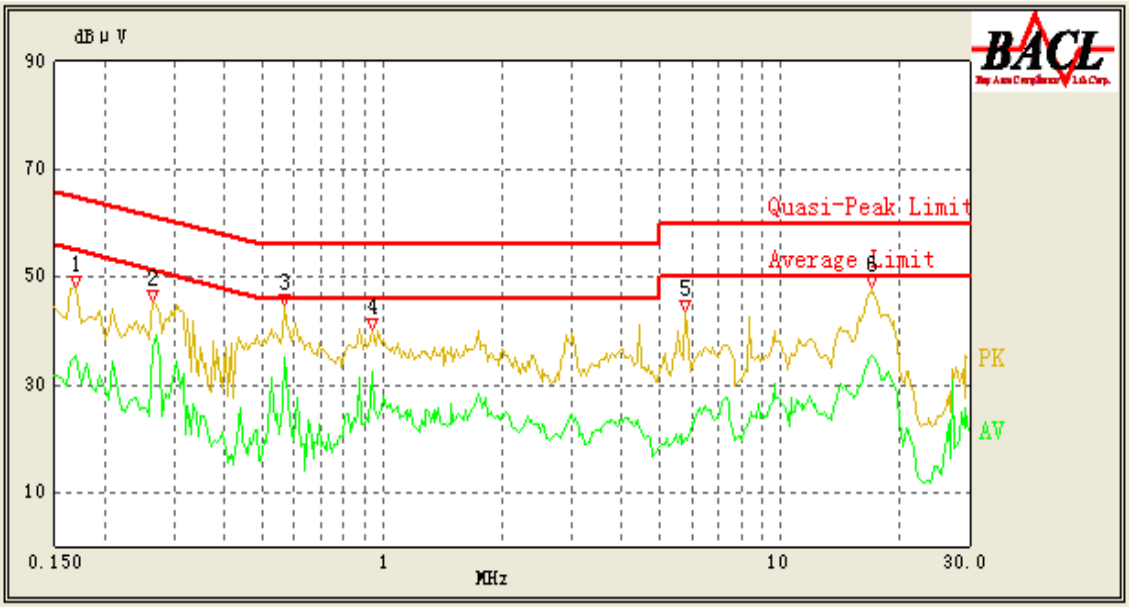
Test Mode: Transmitting (802.11n-HT40)

AC 120 V/ 60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave)
0.565	35.12	10.19	46.00	10.88	Ave
0.270	39.91	10.02	52.57	12.66	Ave
17.090	35.59	10.17	50.00	14.41	Ave
1.750	29.29	10.18	46.00	16.71	Ave
16.980	42.68	10.17	60.00	17.32	QP
0.565	38.04	10.19	56.00	17.96	QP
0.170	45.47	10.09	65.43	19.96	QP
0.170	35.32	10.09	55.43	20.11	Ave
0.270	41.51	10.02	62.57	21.06	QP
1.750	34.49	10.18	56.00	21.51	QP
5.945	23.88	10.10	50.00	26.12	Ave
5.905	27.22	10.10	60.00	32.78	QP

AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Correction Factor (dB)	Cord. Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave)
0.570	35.12	10.19	46.00	10.88	Ave
0.945	32.28	10.11	46.00	13.72	Ave
17.035	35.52	10.17	50.00	14.48	Ave
0.265	36.98	10.02	52.71	15.73	Ave
0.570	38.04	10.19	56.00	17.96	QP
0.170	35.38	10.09	55.43	20.05	Ave
0.940	35.23	10.11	56.00	20.77	QP
0.265	39.12	10.02	62.71	23.59	QP
0.170	41.39	10.09	65.43	24.04	QP
17.035	32.98	10.17	60.00	27.02	QP
5.770	20.12	10.10	50.00	29.88	Ave
5.770	27.48	10.10	60.00	32.52	QP

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

Applicable Standard

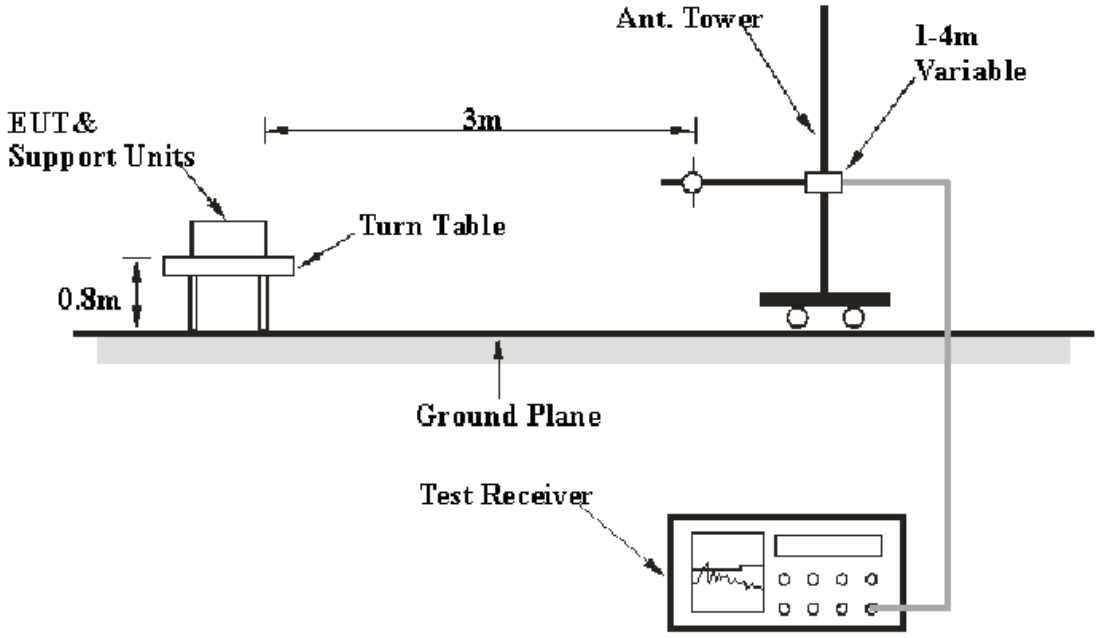
FCC §15.247 (d); §15.209 & §15.205.

Measurement Uncertainty

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

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

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	***RBW***	***Video B/W***	***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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2010-03-08	2011-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
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 adapter was connected to the AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz and 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 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, 15.109, 15.209 and 15.247, with the worst margin reading of:

30 -1000 MHz:

802.11b (wost case): **0.3 dB** at **624.997500 MHz** in the **Vertical** polarization
802.11g (wost case): **0.7 dB** at **624.984000 MHz** in the **Vertical** polarization
802.11n-HT20 (wost case): **1.9 dB** at **625.002250 MHz** in the **Vertical** polarization
802.11n-HT40 (wost case): **0.9 dB** at **625.017750 MHz** in the **Vertical** polarization

Above 1 GHz:

802.11b (Low Channel): **2.03 dB** at **4824.0 MHz** in the **Horizontal** polarization
802.11b (Middle Channel): **2.28 dB** at **4874 MHz** in the **Horizontal** polarization
802.11b (High Channel): **3.05 dB** at **4924.0 MHz** in the **Horizontal** polarization

802.11g (Low Channel): **11.72 dB** at **3216 MHz** in the **Vertical** polarization
802.11g (Middle Channel): **16.91 dB** at **4874 MHz** in the **Horizontal** polarization
802.11g (High Channel): **14.37 dB** at **2483.6 MHz** in the **Vertical** polarization

802.11n-HT20 (Low Channel): **12.07 dB** at **3216 MHz** in the **Vertical** polarization
802.11n-HT20 (Middle Channel): **17.45 dB** at **4874 MHz** in the **Horizontal** polarization
802.11n-HT20 (High Channel): **16.11 dB** at **2483.6 MHz** in the **Vertical** polarization

802.11n-HT40 (Low Channel): **10.47 dB** at **2390 MHz** in the **Vertical** polarization
802.11n-HT40 (Middle Channel): **17.76 dB** at **1696 MHz** in the **Vertical** polarization
802.11n-HT40 (High Channel): **11.74 dB** at **2483.6 MHz** in the **Vertical** polarization

Test Data

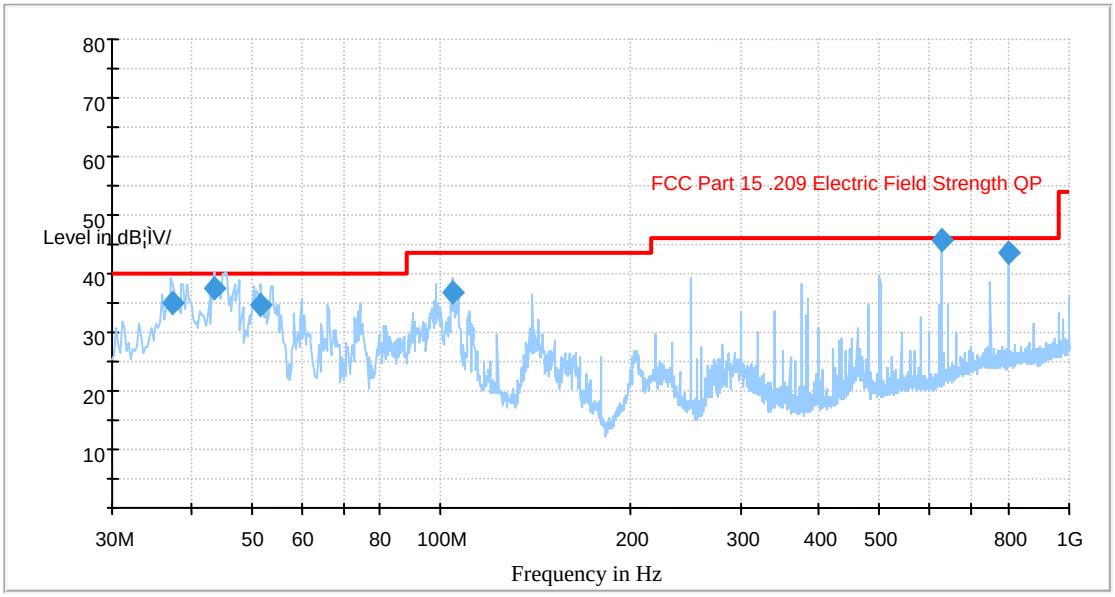
Environmental Conditions

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

The testing was performed by Bruce Zhang on 2011-01-11.

30-1000 MHz:

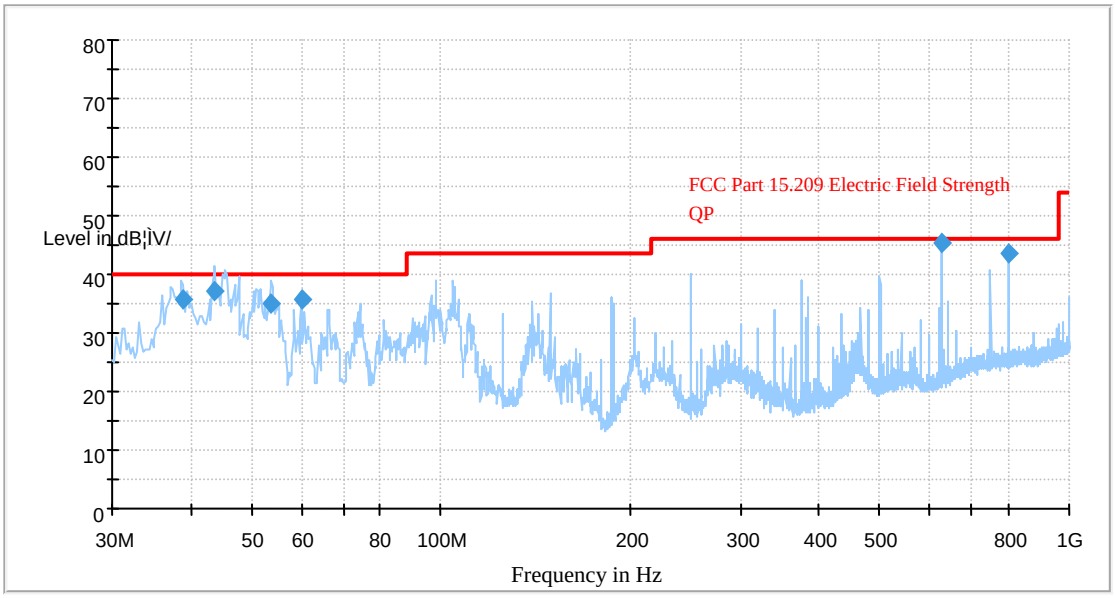
Test Mode: Transmitting (802.11b worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
624.997500	45.7	101.0	V	337.0	-5.7	46.0	0.3*
43.804500	37.6	100.0	V	194.0	-14.4	40.0	2.4*
799.994250	43.6	304.0	H	207.0	-1.8	46.0	2.4*
37.542250	35.1	101.0	V	306.0	-10.5	40.0	4.9
51.829500	34.7	100.0	V	311.0	-17.5	40.0	5.3
104.756000	36.9	100.0	V	130.0	-14.0	43.5	6.6

**Within measurement uncertainty.*

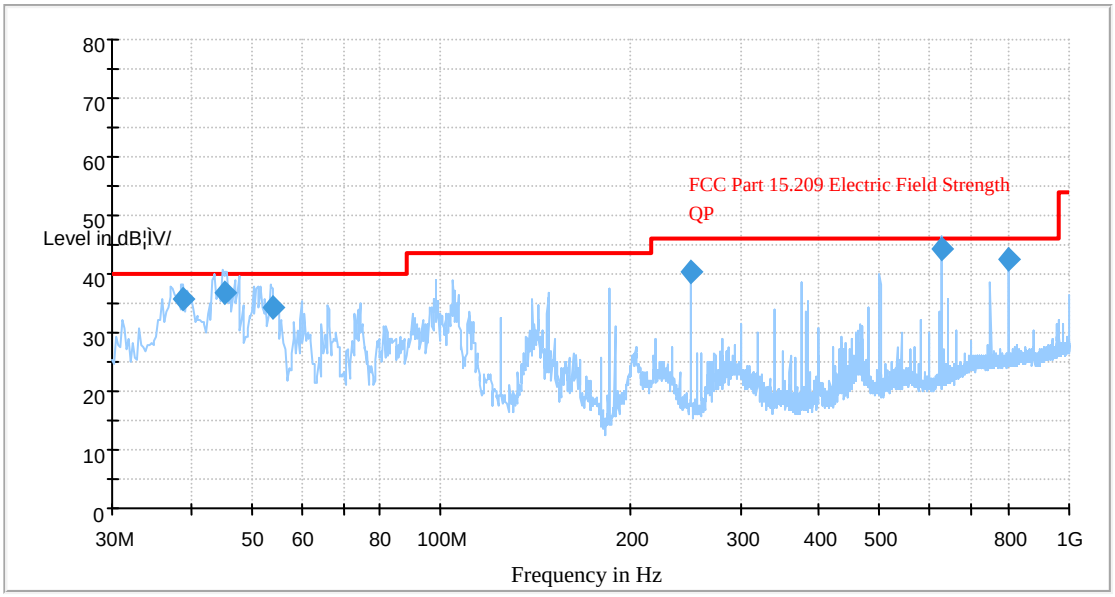
Test Mode: Transmitting (802.11g worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
624.984000	45.3	100.0	V	335.0	-5.7	46.0	0.7*
799.992500	43.5	308.0	H	218.0	-1.8	46.0	2.5*
43.769250	37.0	100.0	V	203.0	-14.4	40.0	3.0*
38.945250	35.9	100.0	V	294.0	-11.4	40.0	4.1
60.227250	35.6	101.0	V	176.0	-18.7	40.0	4.4
53.858750	34.8	101.0	V	332.0	-17.8	40.0	5.2

**Within measurement uncertainty.*

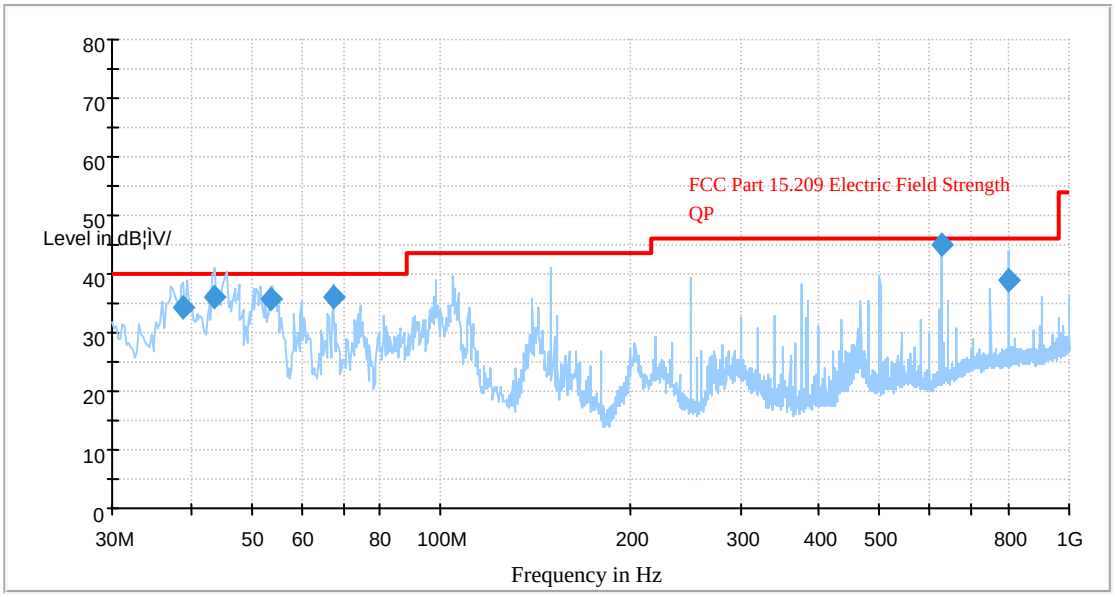
Test Mode: Transmitting (802.11n-HT20 worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
625.002250	44.1	100.0	V	0.0	-5.7	46.0	1.9*
45.289750	36.8	100.0	V	281.0	-15.2	40.0	3.2*
800.180000	42.4	101.0	H	8.0	-1.8	46.0	3.6*
38.973250	35.8	100.0	V	291.0	-11.4	40.0	4.2
249.957000	40.3	101.0	V	162.0	-13.5	46.0	5.7
53.898750	34.2	101.0	V	298.0	-17.8	40.0	5.8

**Within measurement uncertainty.*

Test Mode: Transmitting (802.11n-HT40 worst case)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
625.017750	45.1	101.0	V	342.0	-5.7	46.0	0.9*
43.781000	36.0	121.0	V	219.0	-14.4	40.0	4.0
67.556500	36.0	121.0	V	184.0	-18.4	40.0	4.0
53.834000	35.5	100.0	V	340.0	-17.8	40.0	4.5
38.988750	34.1	100.0	V	345.0	-11.5	40.0	5.9
799.978000	38.9	305.0	H	232.0	-1.8	46.0	7.1

**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. Loss (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)											
4824.0	37.82	AV	250	1.3	H	36.6	4.30	26.75	51.97	54	2.03
4824.0	37.09	AV	272	1.5	V	35.4	4.30	26.75	50.04	54	3.96
3216.0	32.89	AV	285	1.5	V	31.0	3.49	26.68	40.70	54	13.30
3216.0	31.43	AV	160	1.2	H	32.0	3.49	26.88	40.04	54	13.96
4824.0	42.85	PK	250	1.3	H	36.6	4.30	26.75	57.00	74	17.00
2384.8	29.34	AV	216	1.0	V	30.6	2.98	26.83	36.09	54	17.91
4824.0	41.65	PK	272	1.5	V	35.4	4.30	26.75	54.60	74	19.40
2384.8	27.01	AV	230	1.2	H	30.6	2.98	26.83	33.76	54	20.24
2384.8	41.68	PK	130	1.4	V	30.6	2.98	26.83	48.43	74	25.57
3216.0	39.33	PK	285	1.5	V	31.0	3.49	26.88	46.94	74	27.06
2384.8	39.40	PK	230	1.2	H	30.6	2.98	26.83	46.15	74	27.85
3216.0	36.75	PK	160	1.2	H	32.0	3.49	26.88	45.36	74	28.64
Middle Channel (2437 MHz)											
4874	37.51	AV	130	1.5	H	36.6	4.36	26.75	51.72	54	2.28
4874	36.86	AV	65	1.5	V	35.4	4.36	26.75	49.87	54	4.13
1696	42.33	AV	95	1.5	V	29.8	2.44	26.83	47.74	54	6.26
1696	41.53	AV	240	1.5	H	29.7	2.44	26.83	46.84	54	7.16
4874	42.25	PK	130	1.5	H	36.6	4.36	26.75	56.46	74	17.54
4874	41.23	PK	65	1.5	V	35.4	4.36	26.75	54.24	74	19.76
1696	47.15	PK	95	1.5	V	29.8	2.44	26.83	52.56	74	21.44
1696	46.75	PK	240	1.5	H	29.7	2.44	26.83	52.06	74	21.94
High Channel (2462 MHz)											
4924.0	36.70	AV	130	1.5	H	36.6	4.40	26.75	50.95	54	3.05
4924.0	37.24	AV	196	1.5	V	35.4	4.40	26.75	50.29	54	3.71
1732.0	43.78	AV	50	1.6	V	29.8	2.52	26.83	49.27	54	4.73
1732.0	39.42	AV	250	1.5	H	29.7	2.52	26.83	44.81	54	9.19
2488.5	33.65	AV	40	1.5	V	30.6	3.11	26.88	40.48	54	13.52
2488.3	30.55	AV	260	1.6	H	30.6	3.11	26.88	37.38	54	16.62
1732.0	50.59	PK	50	1.6	V	29.8	2.52	26.83	56.08	74	17.92
4924.0	41.40	PK	130	1.5	H	36.6	4.40	26.75	55.65	74	18.35
4924.0	41.86	PK	196	1.5	V	35.4	4.40	26.75	54.91	74	19.09
1732.0	46.23	PK	250	1.5	H	29.7	2.52	26.83	51.62	74	22.38
2488.5	39.40	PK	40	1.5	V	30.6	3.11	26.88	46.23	74	27.77
2488.3	39.34	PK	260	1.6	H	30.6	3.11	26.88	46.17	74	27.83

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. Loss (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)											
3216	34.47	AV	40	1.5	V	31.0	3.49	26.68	42.28	54	11.72
3216	31.01	AV	250	1.5	H	32.0	3.49	26.88	39.62	54	14.38
4824	22.97	AV	130	1.5	H	36.6	4.30	26.75	37.12	54	16.88
4824	22.86	AV	60	1.8	V	35.4	4.30	26.75	35.81	54	18.19
2390	48.89	PK	54	1.5	V	30.6	2.98	26.83	55.64	74	18.36
2390	27.60	AV	250	1.8	H	30.6	2.98	26.83	34.35	54	19.65
2390	27.35	AV	54	1.5	V	30.6	2.98	26.83	34.10	54	19.90
2390	47.22	PK	250	1.8	H	30.6	2.98	26.83	53.97	74	20.03
4824	38.83	PK	130	1.5	H	36.6	4.30	26.75	52.98	74	21.02
4824	38.38	PK	60	1.8	V	35.4	4.30	26.75	51.33	74	22.67
3216	40.18	PK	40	1.5	V	31.0	3.49	26.88	47.79	74	26.21
3216	38.46	PK	250	1.5	H	32.0	3.49	26.88	47.07	74	26.93
Middle Channel (2437 MHz)											
4874	22.88	AV	130	1.5	H	36.6	4.36	26.75	37.09	54	16.91
4874	22.68	AV	60	1.8	V	35.4	4.36	26.75	35.69	54	18.31
4874	38.72	PK	130	1.5	H	36.6	4.36	26.75	52.93	74	21.07
1696	46.83	PK	90	1.5	V	29.8	2.44	26.83	52.24	74	21.76
4874	38.86	PK	60	1.8	V	35.4	4.36	26.75	51.87	74	22.13
1696	45.76	PK	260	1.5	H	29.7	2.44	26.83	51.07	74	22.93
1696	20.36	AV	90	1.0	V	29.8	2.44	26.83	25.77	54	28.23
1696	20.40	AV	260	1.5	H	29.7	2.44	26.83	25.71	54	28.29
High Channel (2462 MHz)											
2483.6	52.80	PK	90	1.5	V	30.6	3.11	26.88	59.63	74	14.37
2483.6	50.91	PK	220	1.5	H	30.6	3.11	26.88	57.74	74	16.26
4924.0	23.12	AV	250	1.8	H	36.6	4.40	26.75	37.37	54	16.63
4924.0	22.75	AV	60	1.8	V	35.4	4.40	26.75	35.80	54	18.20
4924.0	39.08	PK	250	1.8	H	36.6	4.40	26.75	53.33	74	20.67
2483.6	26.33	AV	90	1.5	V	30.6	3.11	26.88	33.16	54	20.84
2483.6	25.67	AV	220	1.5	H	30.6	3.11	26.88	32.50	54	21.50
4924.0	38.87	PK	60	1.8	V	35.4	4.40	26.75	51.92	74	22.08
1732.0	46.33	PK	90	1.5	V	29.8	2.52	26.83	51.82	74	22.18
1732.0	46.06	PK	260	1.5	H	29.7	2.52	26.83	51.45	74	22.55
1732.0	20.44	AV	260	1.5	H	29.7	2.52	26.83	25.83	54	28.17
1732.0	20.03	AV	90	1.5	V	29.8	2.52	26.83	25.52	54	28.48

802.11n-HT20 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. Loss (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)											
3216	34.12	AV	40	1.5	V	31.0	3.49	26.68	41.93	54	12.07
3216	30.05	AV	250	1.5	H	32.0	3.49	26.88	38.66	54	15.34
4824	22.54	AV	130	1.5	H	36.6	4.30	26.75	36.69	54	17.31
4824	22.06	AV	60	1.8	V	35.4	4.30	26.75	35.01	54	18.99
2390	47.57	PK	54	1.5	V	30.6	2.98	26.83	54.32	74	19.68
2390	26.70	AV	250	1.8	H	30.6	2.98	26.83	33.45	54	20.55
2390	26.58	AV	54	1.5	V	30.6	2.98	26.83	33.33	54	20.67
2390	46.22	PK	250	1.8	H	30.6	2.98	26.83	52.97	74	21.03
4824	38.32	PK	130	1.5	H	36.6	4.30	26.75	52.47	74	21.53
4824	37.95	PK	60	1.8	V	35.4	4.30	26.75	50.90	74	23.10
3216	40.04	PK	40	1.5	V	31.0	3.49	26.88	47.65	74	26.35
3216	37.86	PK	250	1.5	H	32.0	3.49	26.88	46.47	74	27.53
Middle Channel (2437 MHz)											
4874	22.34	AV	130	1.5	H	36.6	4.36	26.75	36.55	54	17.45
1696	50.58	PK	90	1.5	V	29.8	2.44	26.83	55.99	74	18.01
4874	22.14	AV	60	1.8	V	35.4	4.36	26.75	35.15	54	18.85
1696	49.66	PK	260	1.5	H	29.7	2.44	26.83	54.97	74	19.03
4874	38.05	PK	130	1.5	H	36.6	4.36	26.75	52.26	74	21.74
4874	38.25	PK	60	1.8	V	35.4	4.36	26.75	51.26	74	22.74
1696	25.57	AV	90	1.0	V	29.8	2.44	26.83	30.98	54	23.02
1696	23.72	AV	260	1.5	H	29.7	2.44	26.83	29.03	54	24.97
High Channel (2462 MHz)											
2483.6	51.06	PK	90	1.5	V	30.6	3.11	26.88	57.89	74	16.11
4924.0	22.56	AV	250	1.8	H	36.6	4.40	26.75	36.81	54	17.19
2483.6	49.61	PK	220	1.5	H	30.6	3.11	26.88	56.44	74	17.56
4924.0	22.03	AV	60	1.8	V	35.4	4.40	26.75	35.08	54	18.92
1732.0	48.28	PK	90	1.5	V	29.8	2.52	26.83	53.77	74	20.23
4924.0	38.54	PK	250	1.8	H	36.6	4.40	26.75	52.79	74	21.21
2483.6	25.33	AV	90	1.5	V	30.6	3.11	26.88	32.16	54	21.84
1732.0	46.51	PK	260	1.5	H	29.7	2.52	26.83	51.90	74	22.10
2483.6	24.67	AV	220	1.5	H	30.6	3.11	26.88	31.50	54	22.50
4924.0	38.05	PK	60	1.8	V	35.4	4.40	26.75	51.10	74	22.90
1732.0	23.64	AV	90	1.5	V	29.8	2.52	26.83	29.13	54	24.87
1732.0	21.01	AV	260	1.5	H	29.7	2.52	26.83	26.40	54	27.60

802.11n-HT40 Mode:

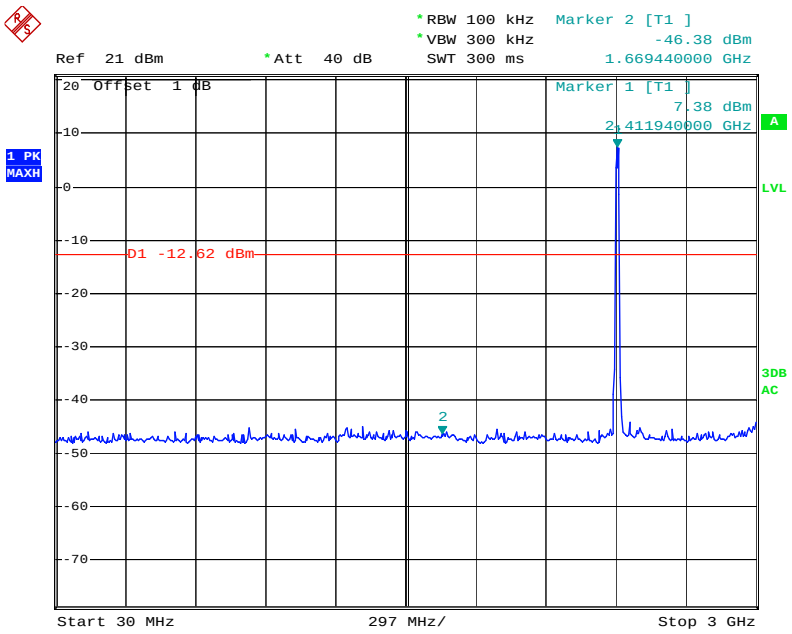
Indicated		Detector (PK/Ave)	Table Angle Degree	Test Antenna		Correction Factor			FCC Part 15.247/15.209		
Frequency (MHz)	S.A. Reading (dBμV)			Height (m)	Polar (H/V)	Ant. Loss (dB/m)	Cable Loss (dB)	Pre-Amp. (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)											
2390	56.78	PK	90	1.5	V	30.6	2.98	26.83	63.53	74	10.47
2390	35.20	AV	90	1.5	V	30.6	2.98	26.83	41.95	54	12.05
2390	55.12	PK	260	1.8	H	30.6	2.98	26.83	61.87	74	12.13
2390	34.27	AV	260	1.8	H	30.6	2.98	26.83	41.02	54	12.98
3216	32.27	AV	90	1.5	V	31.0	3.49	26.68	40.08	54	13.92
3216	29.34	AV	250	1.5	H	32.0	3.49	26.88	37.95	54	16.05
4844	20.58	AV	130	1.5	H	36.6	4.30	26.75	34.73	54	19.27
4844	20.22	AV	60	1.8	V	35.4	4.30	26.75	33.17	54	20.83
4844	37.56	PK	130	1.5	H	36.6	4.30	26.75	51.71	74	22.29
4844	36.95	PK	60	1.8	V	35.4	4.30	26.75	49.9	74	24.10
3216	38.64	PK	90	1.5	V	31.0	3.49	26.88	46.25	74	27.75
3216	36.42	PK	250	1.5	H	32.0	3.49	26.88	45.03	74	28.97
Middle Channel (2437 MHz)											
1696	30.83	AV	90	1.0	V	29.8	2.44	26.83	36.24	54	17.76
1696	50.11	PK	90	1.5	V	29.8	2.44	26.83	55.52	74	18.48
4874	20.42	AV	130	1.5	H	36.6	4.36	26.75	34.63	54	19.37
4874	20.18	AV	60	1.8	V	35.4	4.36	26.75	33.19	54	20.81
4874	36.85	PK	130	1.5	H	36.6	4.36	26.75	51.06	74	22.94
1696	45.40	PK	260	1.5	H	29.7	2.44	26.83	50.71	74	23.29
4874	36.77	PK	60	1.8	V	35.4	4.36	26.75	49.78	74	24.22
1696	22.21	AV	260	1.5	H	29.7	2.44	26.83	27.52	54	26.48
High Channel (2462 MHz)											
2483.6	55.43	PK	90	1.5	V	30.6	3.11	26.88	62.26	74	11.74
2483.6	54.56	PK	220	1.5	H	30.6	3.11	26.88	61.39	74	12.61
2483.6	34.16	AV	90	1.5	V	30.6	3.11	26.88	40.99	54	13.01
2483.6	32.51	AV	220	1.5	H	30.6	3.11	26.88	39.34	54	14.66
4904.0	22.75	AV	60	1.8	V	35.4	4.40	26.75	35.80	54	18.20
4904.0	20.68	AV	250	1.8	H	36.6	4.40	26.75	34.93	54	19.07
1732.0	46.55	PK	90	1.5	V	29.8	2.52	26.83	56.04	74	21.96
1732.0	46.53	PK	260	1.5	H	29.7	2.52	26.83	51.92	74	22.08
4904.0	37.24	PK	250	1.8	H	36.6	4.40	26.75	51.49	74	22.51
4904.0	37.16	PK	60	1.8	V	35.4	4.40	26.75	50.21	74	23.79
1732.0	20.52	AV	260	1.5	H	29.7	2.52	26.83	25.91	54	28.09
1732.0	20.02	AV	90	1.5	V	29.8	2.52	26.83	25.51	54	28.49

Antenna Port Conducted Spurious Emissions

Frequency (MHz)	Data Rate (Mbps)	Delta Value (dBc)	Limit (dBc)	Result
802.11b				
2412	1	*	20	Pass
2437	1	*	20	Pass
2462	1	*	20	Pass
802.11g				
2412	6	*	20	Pass
2437	6	*	20	Pass
2462	6	*	20	Pass
802.11n-HT20				
2412	6.5	*	20	Pass
2437	6.5	*	20	Pass
2462	6.5	*	20	Pass
802.11n-HT40				
2422	13.5	*	20	Pass
2437	13.5	*	20	Pass
2452	13.5	*	20	Pass

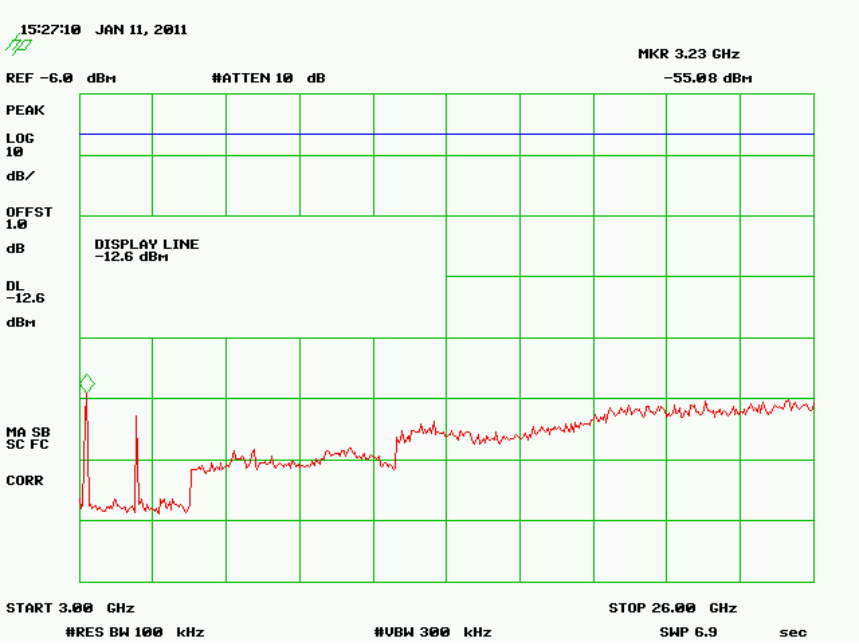
Please refer to the following plots.

802.11b Low Channel (30MHz~3GHz)

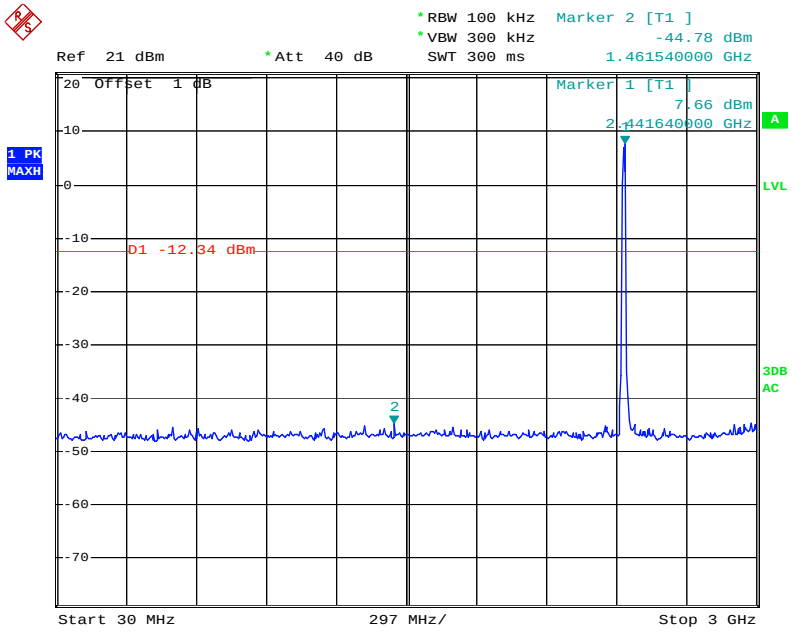


Date: 11.JAN.2011 09:01:05

802.11b Low Channel (3GHz~26GHz)

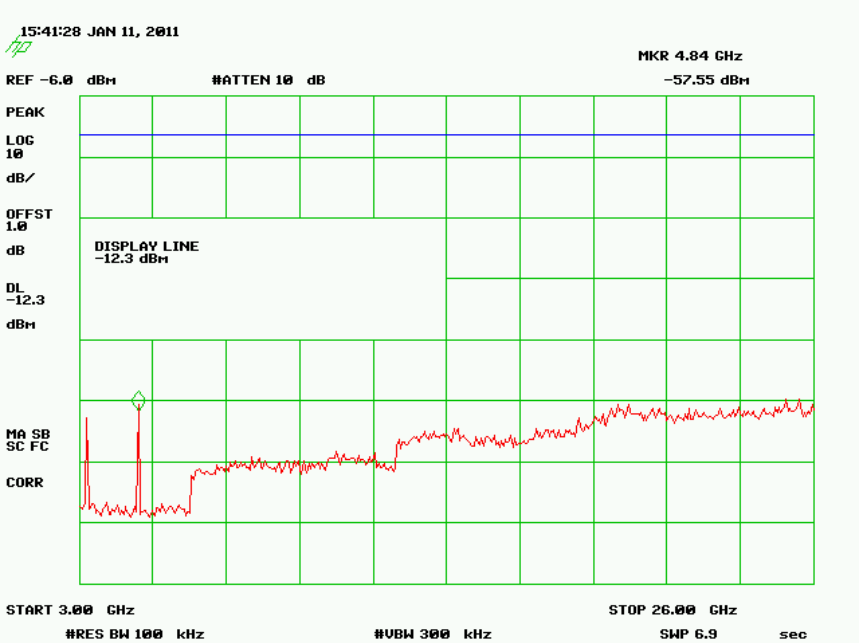


802.11b Middle Channel (30MHz~3GHz)

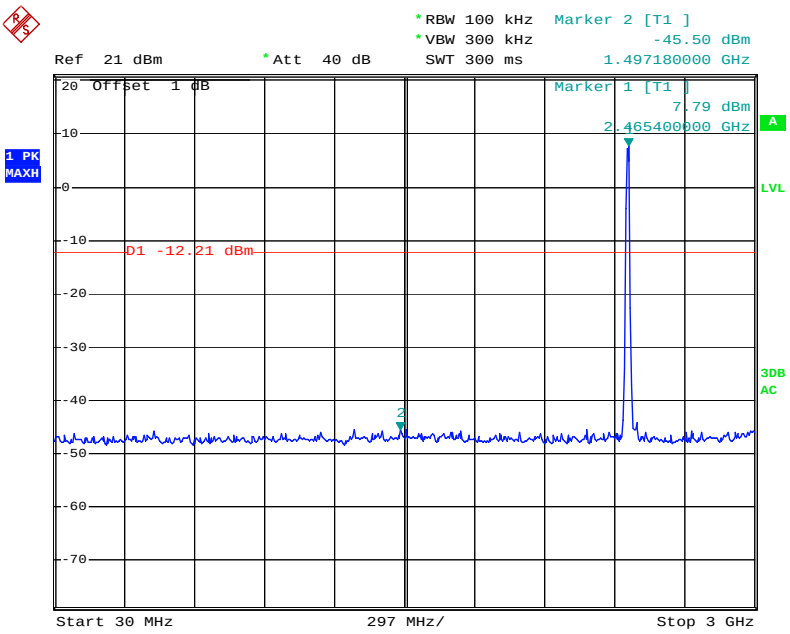


Date: 11.JAN.2011 09:04:17

802.11b Middle Channel (3GHz~26GHz)

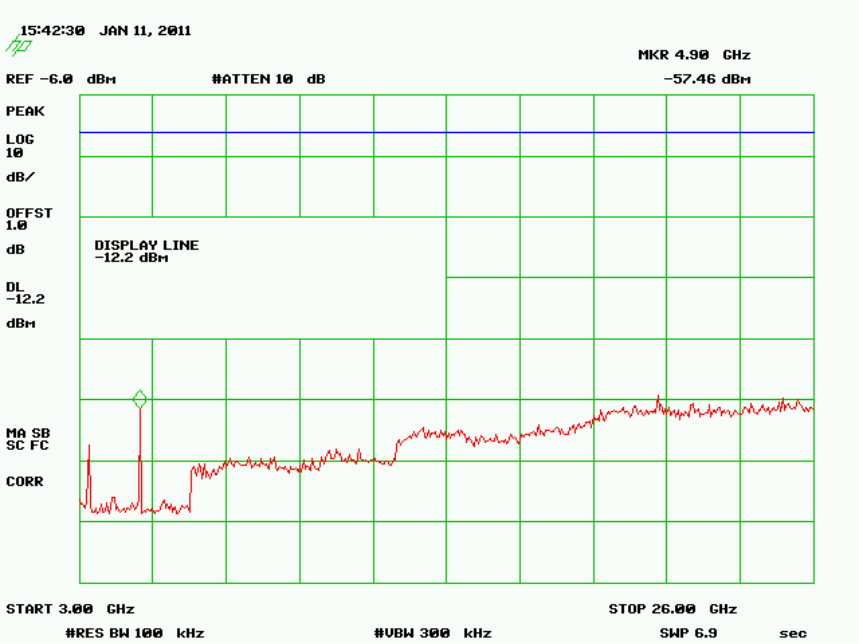


802.11b High Channel (30MHz~3GHz)

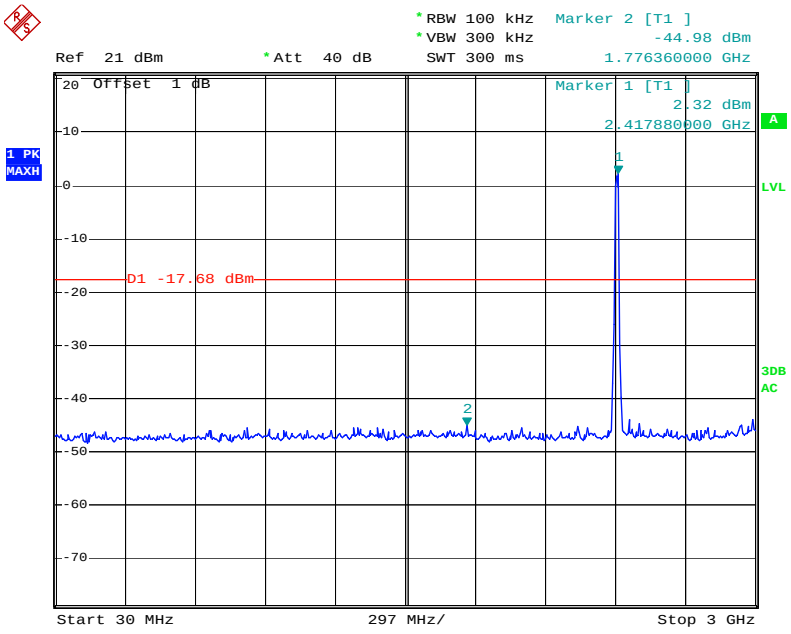


Date: 11.JAN.2011 09:06:14

802.11b High Channel (3GHz~26GHz)

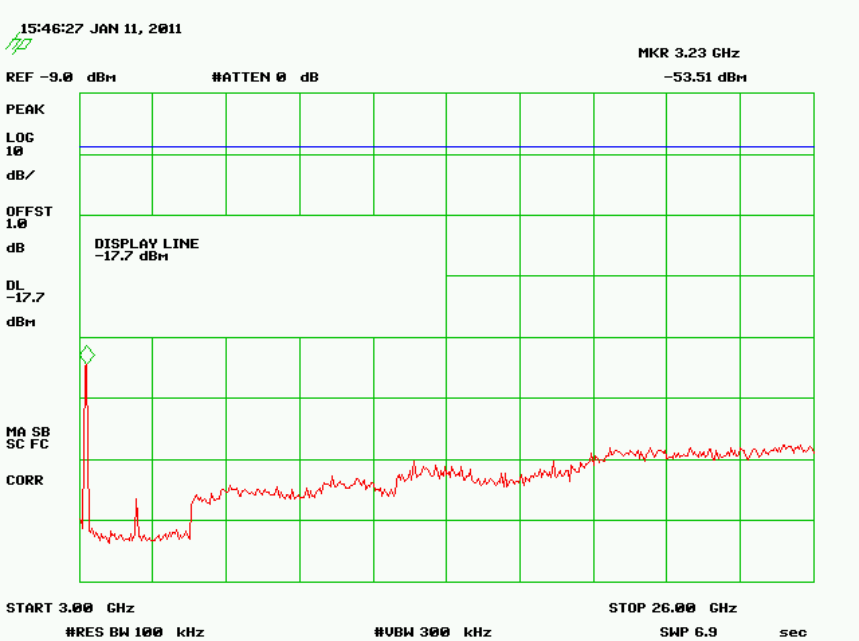


802.11g Low Channel (30MHz~3GHz)

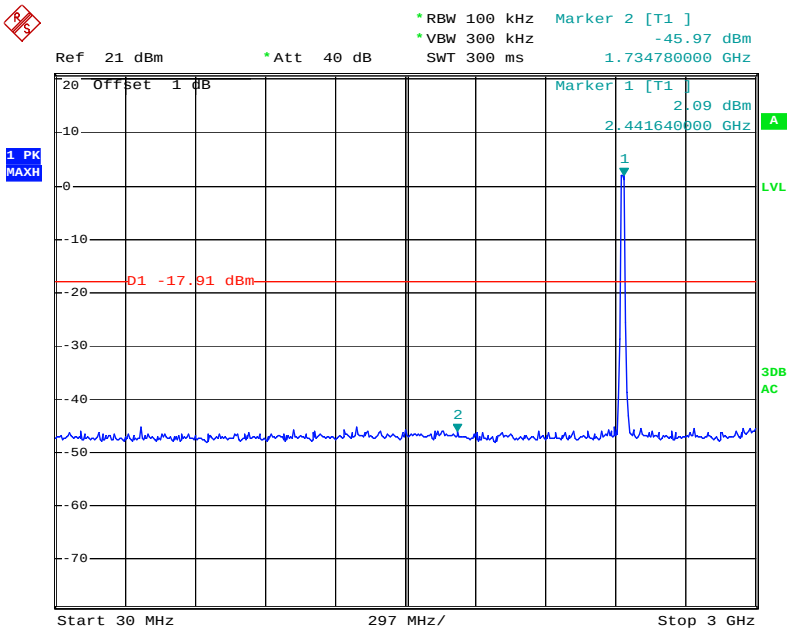


Date: 11.JAN.2011 08:35:24

802.11g Low Channel (3GHz~26GHz)

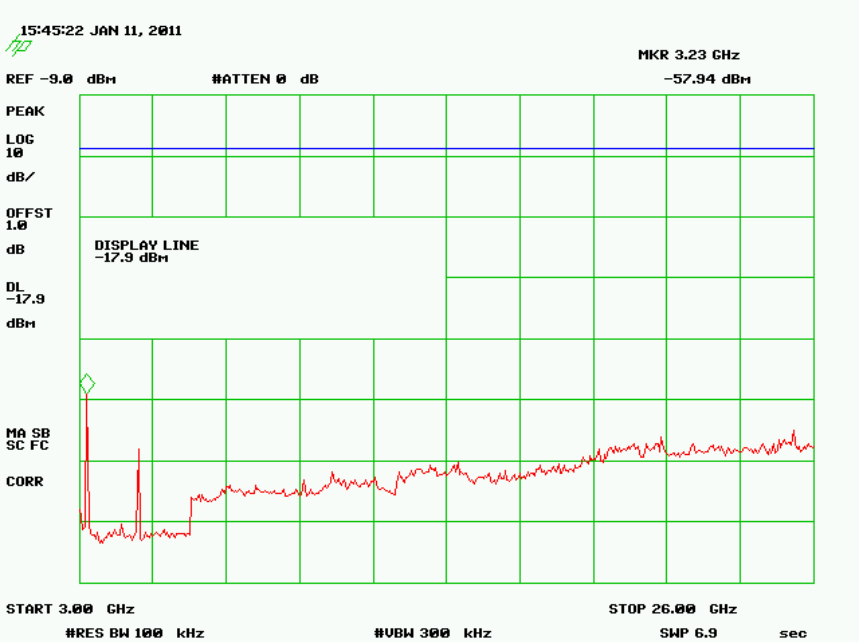


802.11g Middle Channel (30MHz~3GHz)

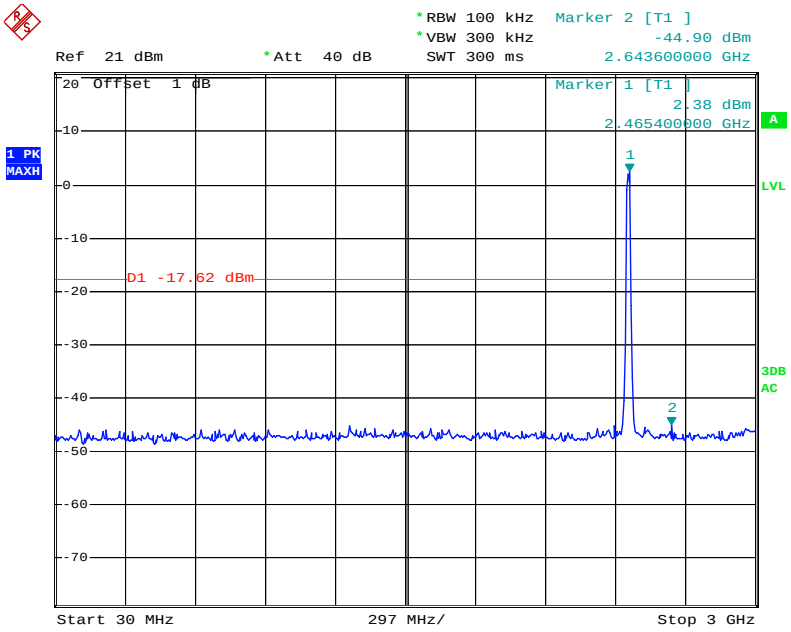


Date: 11.JAN.2011 08:48:59

802.11g Middle Channel (3GHz~26GHz)



802.11g High Channel (30MHz~3GHz)



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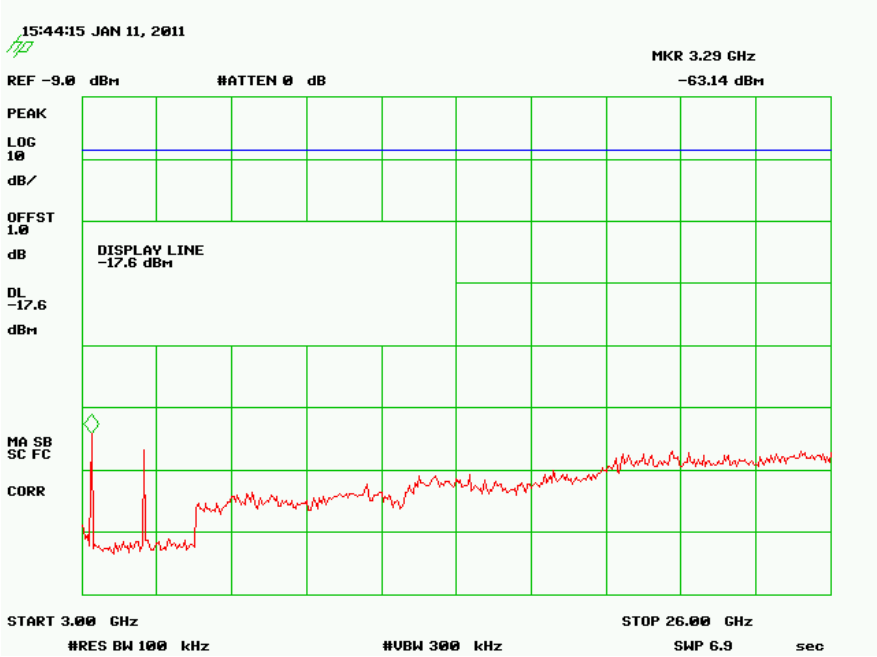
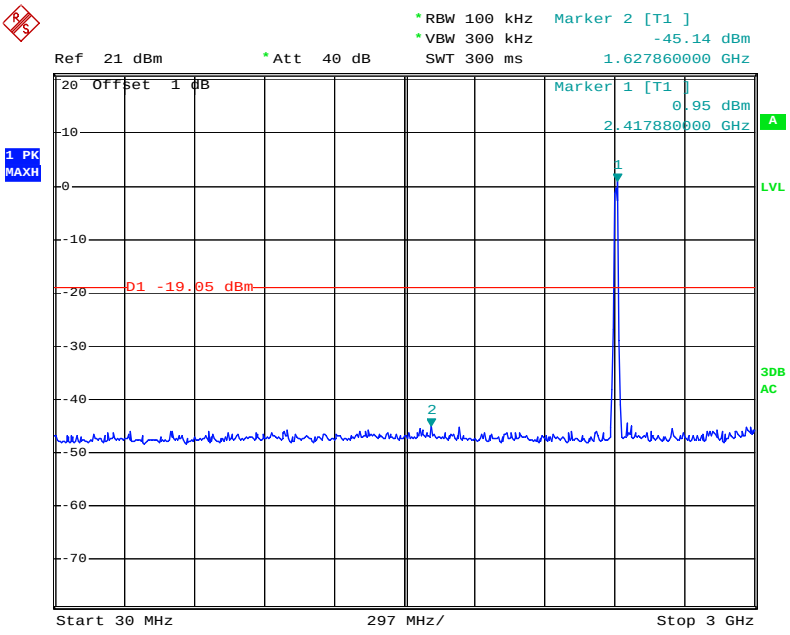
802.11g High Channel (3GHz~26GHz)

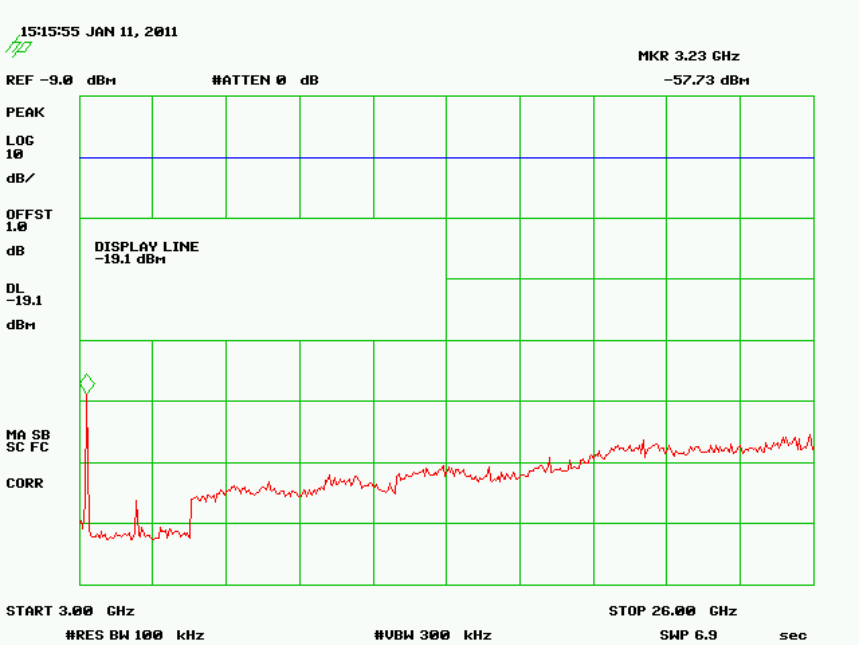


802.11n-HT20 Low Channel, Port 1 (30MHz~3GHz)

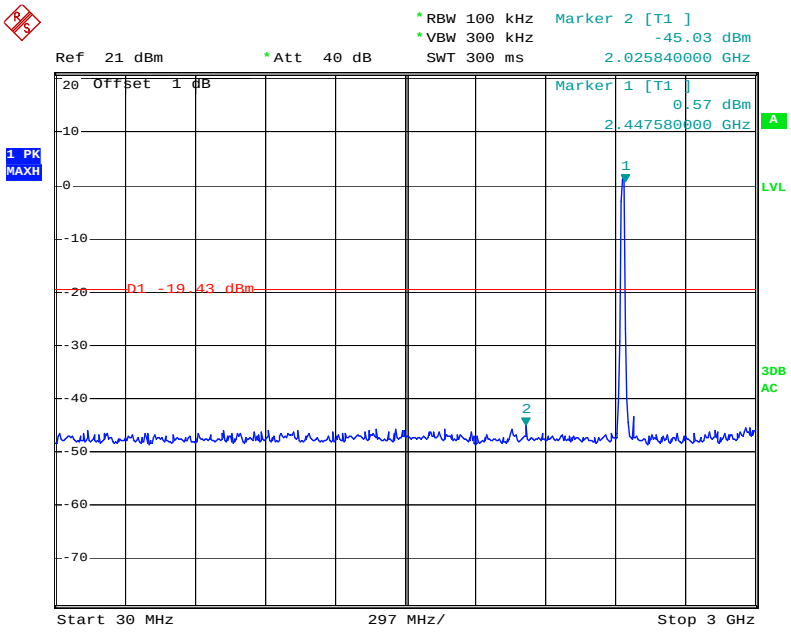


Date: 11.JAN.2011 08:58:08

802.11n-HT20 Low Channel, Port 1 (3GHz~26GHz)



802.11n-HT20 Middle Channel, Port 1 (30MHz~3GHz)



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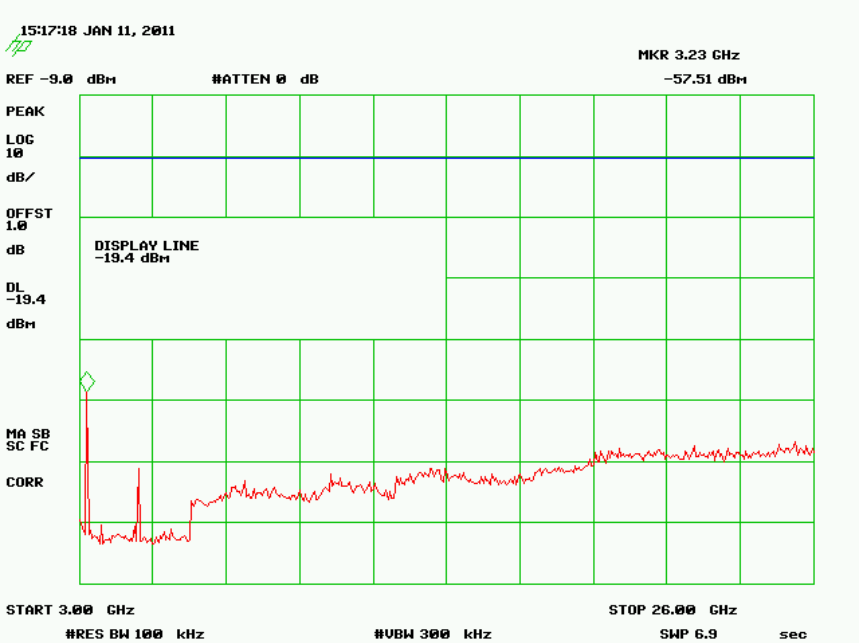
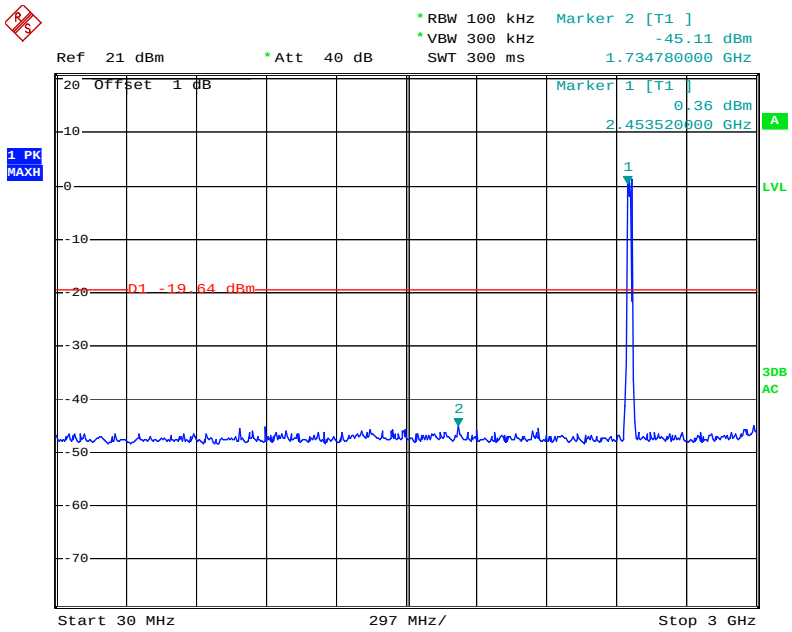
802.11n-HT20 Middle Channel, Port 1 (3GHz~26GHz)



802.11n-HT20 High Channel, Port 1 (30MHz~3GHz)



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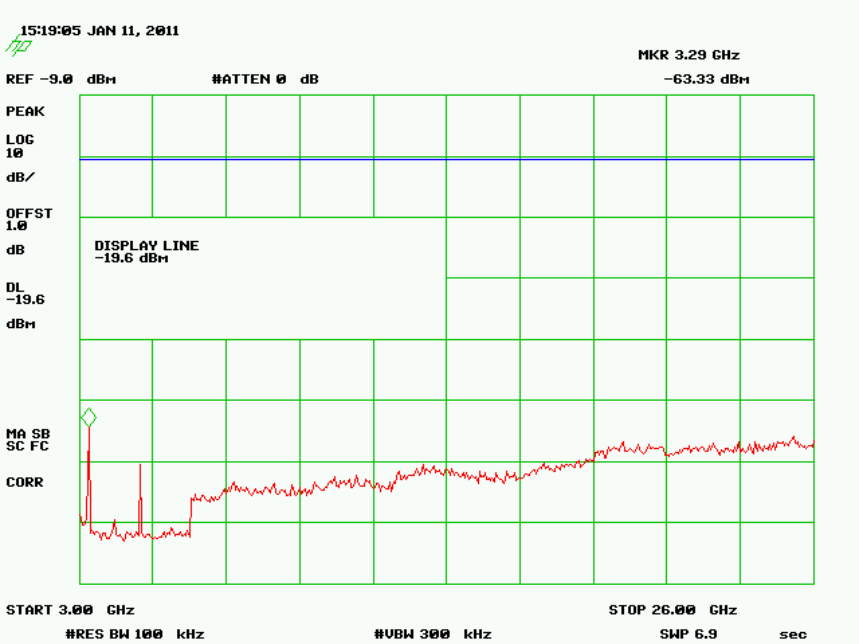
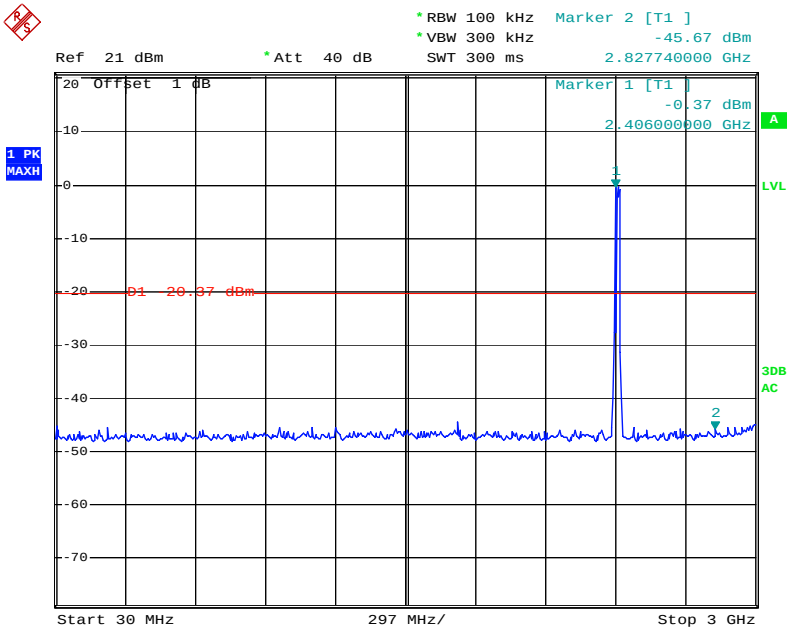
802.11n-HT20 High Channel, Port 1 (3GHz~26GHz)

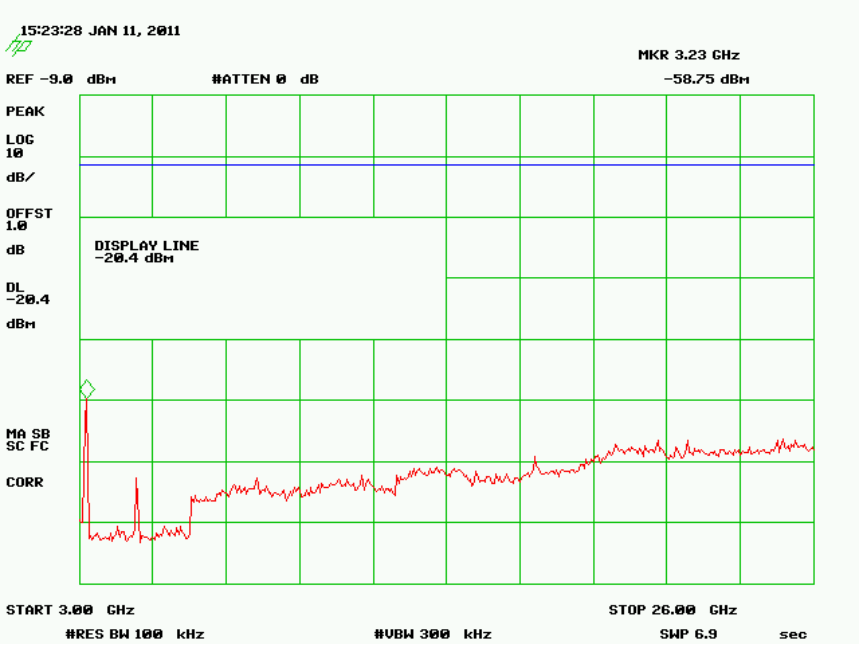


802.11n-HT20 Low Channel, Port 2 (30MHz~3GHz)

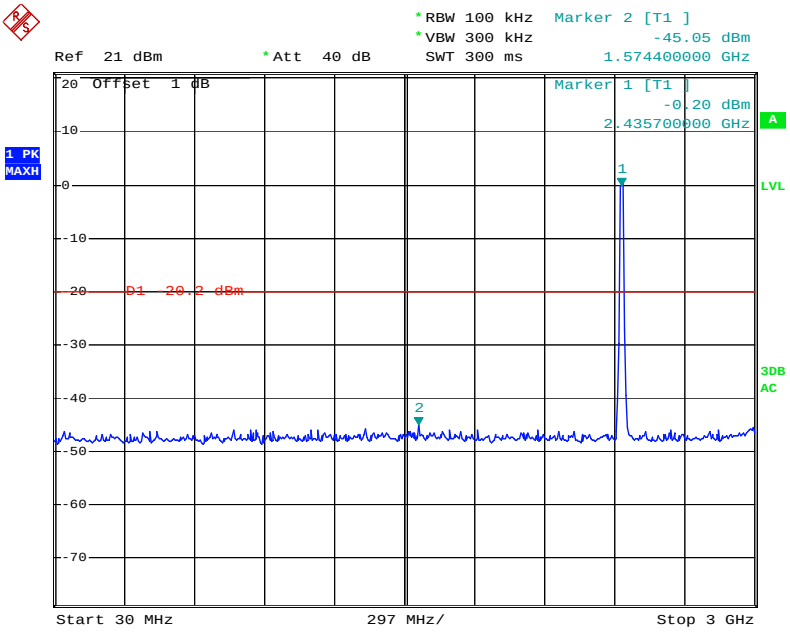


Date: 11.JAN.2011 10:03:59

802.11n-HT20 Low Channel, Port 2 (3GHz~26GHz)

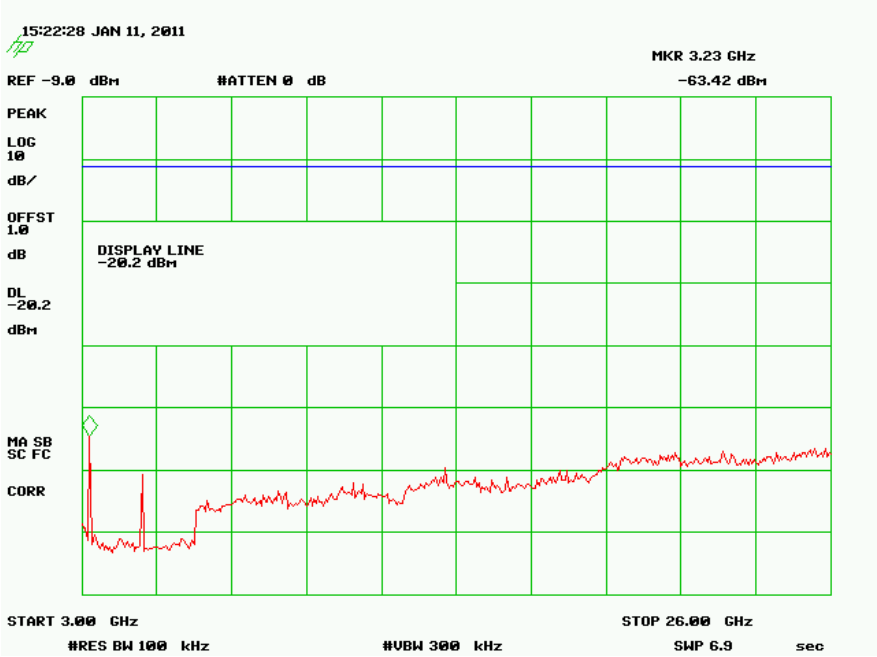


802.11n-HT20 Middle Channel, Port 2 (30MHz~3GHz)

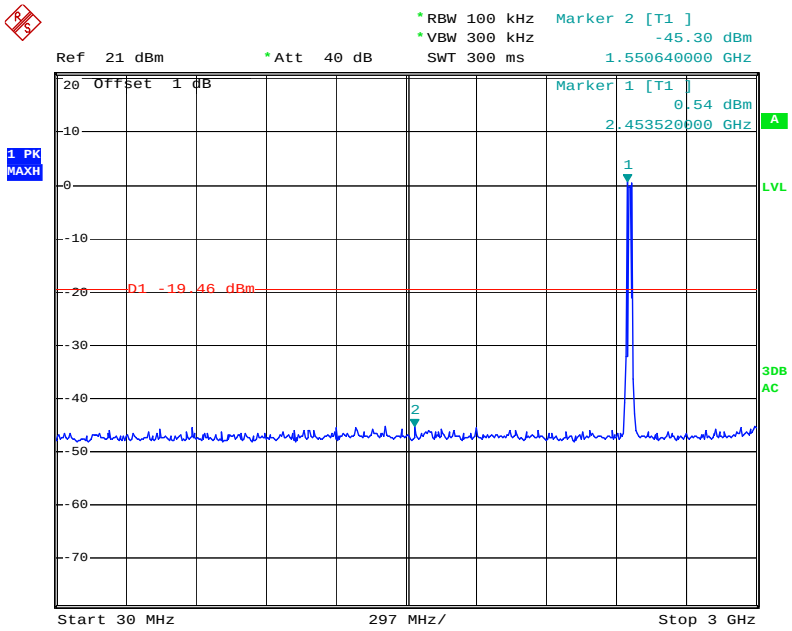


Date: 11.JAN.2011 10:05:35

802.11n-HT20 Middle Channel, Port 2 (3GHz~26GHz)

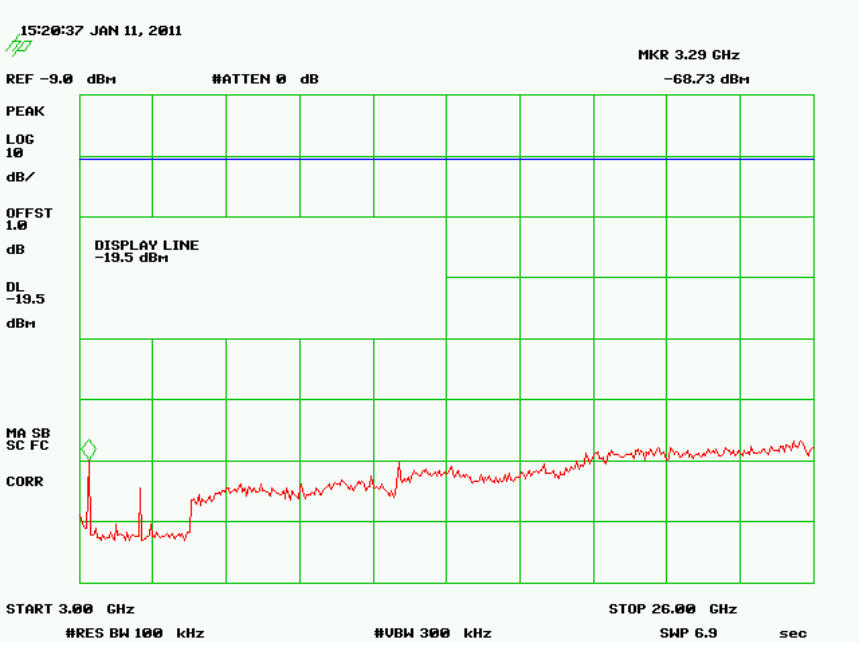


802.11n-HT20 High Channel, Port 2 (30MHz~3GHz)

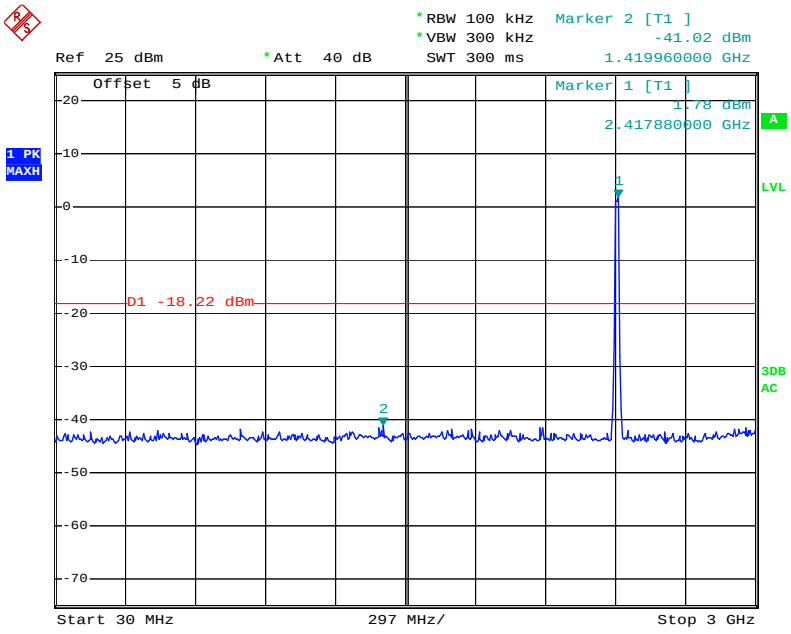


Date: 11.JAN.2011 10:07:38

802.11n-HT20 High Channel, Port 2 (3GHz~26GHz)



802.11n-HT20 Low Channel, with Combiner (30MHz~3GHz)



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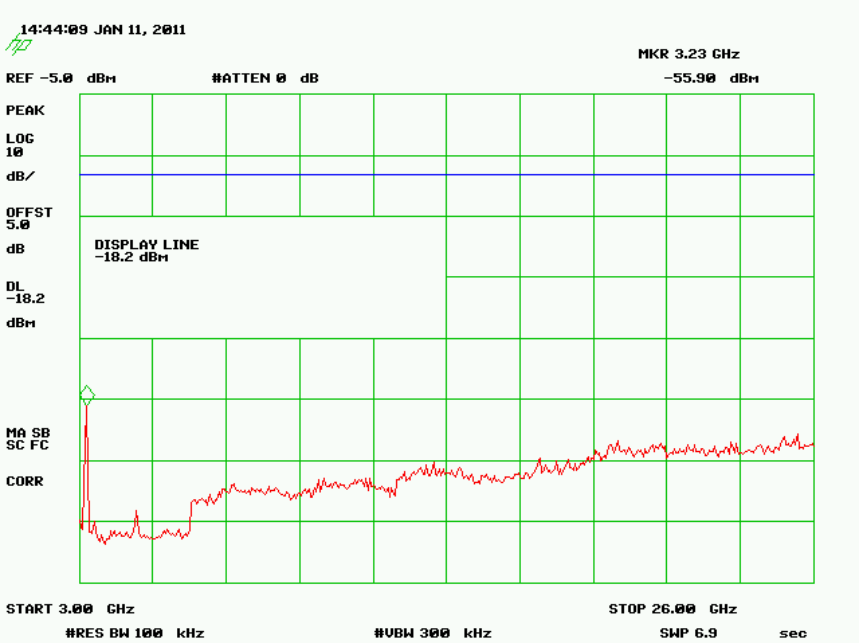
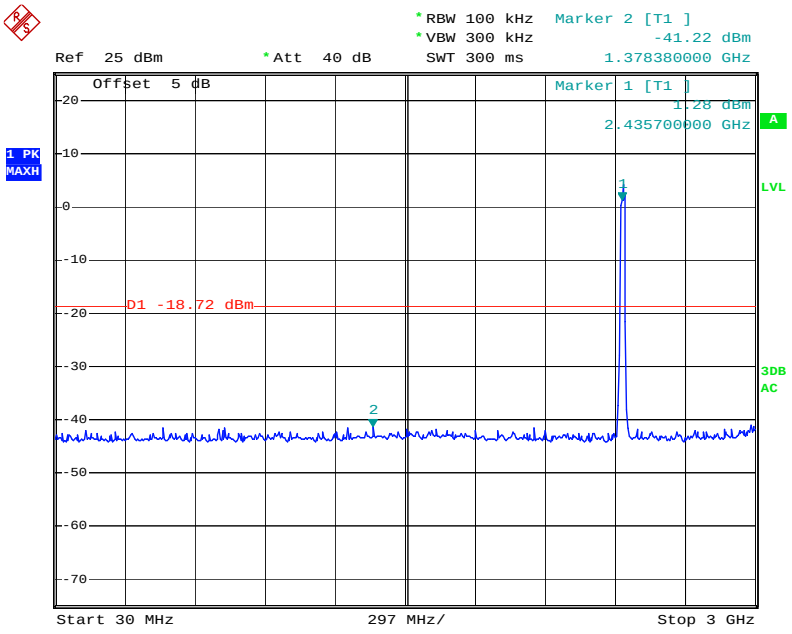
802.11n-HT20 Low Channel, with Combiner (3GHz~26GHz)

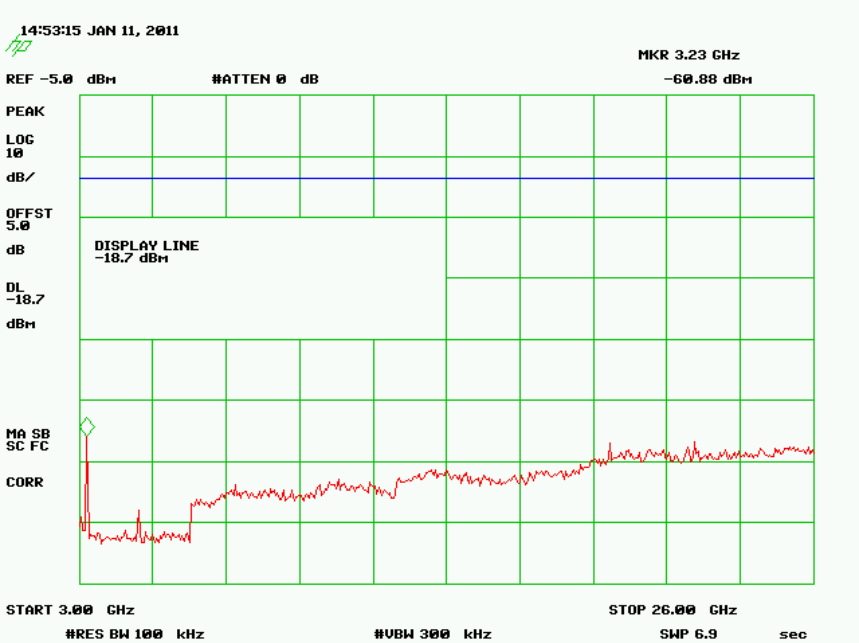


802.11n-HT20 Middle Channel with Combiner (30MHz~3GHz)

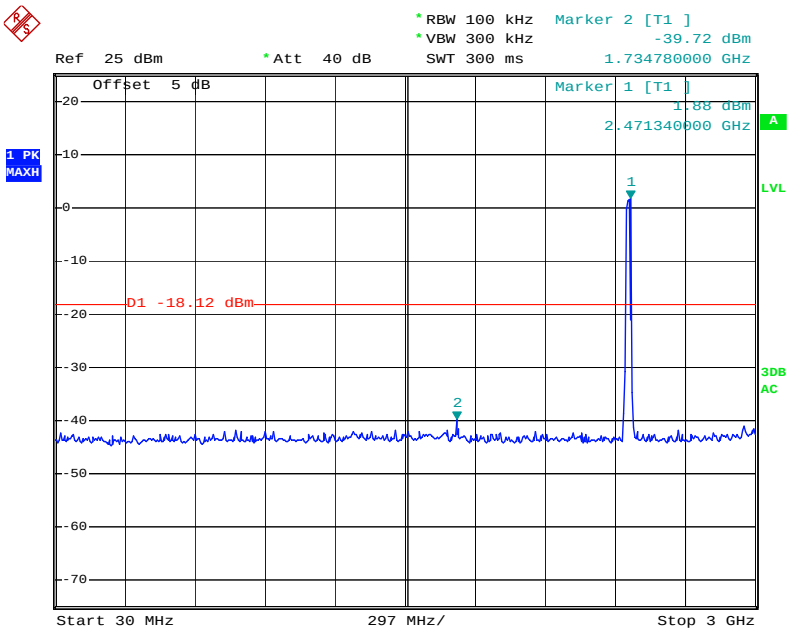


Date: 11.JAN.2011 10:15:26

802.11n-HT20 Middle Channel with Combiner (3GHz~26GHz)

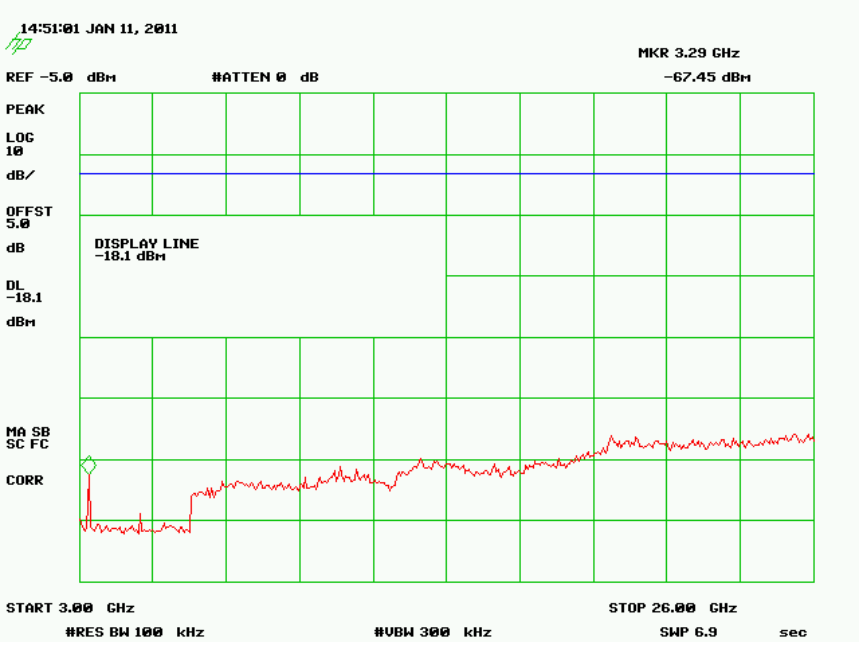


802.11n-HT20 High Channel with Combiner (30MHz~3GHz)

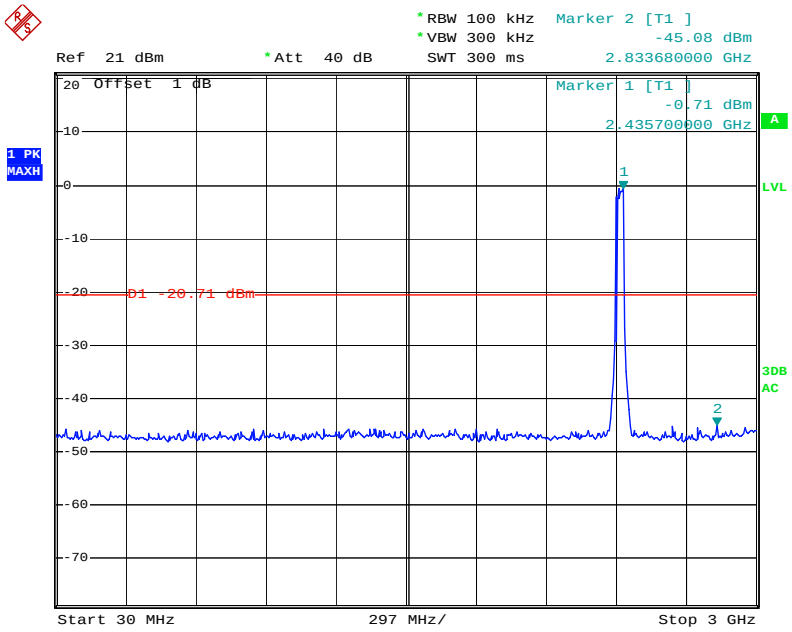


Date: 11.JAN.2011 10:11:03

802.11n-HT20 High Channel with Combiner (3GHz~26GHz)

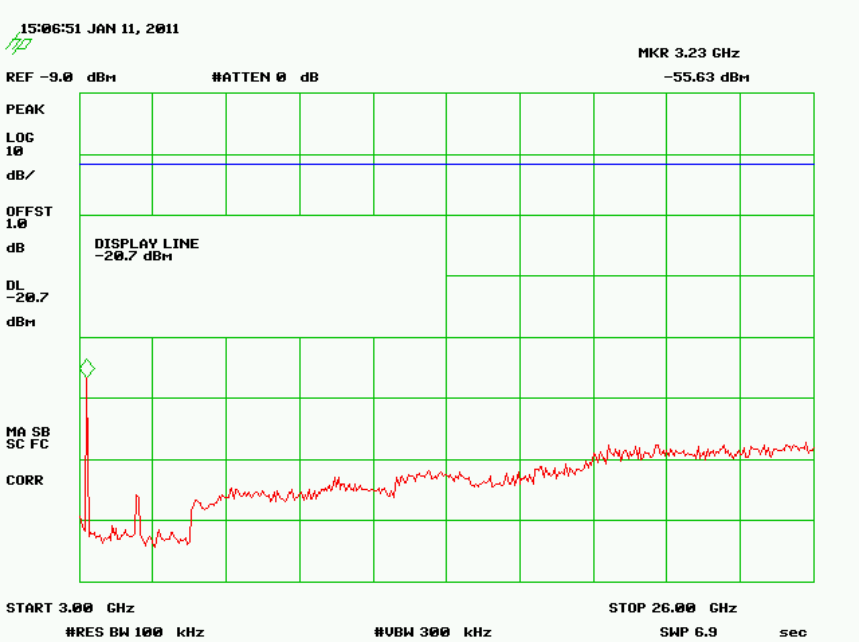


802.11n-HT40 Low Channel, Port 1 (30MHz~3GHz)

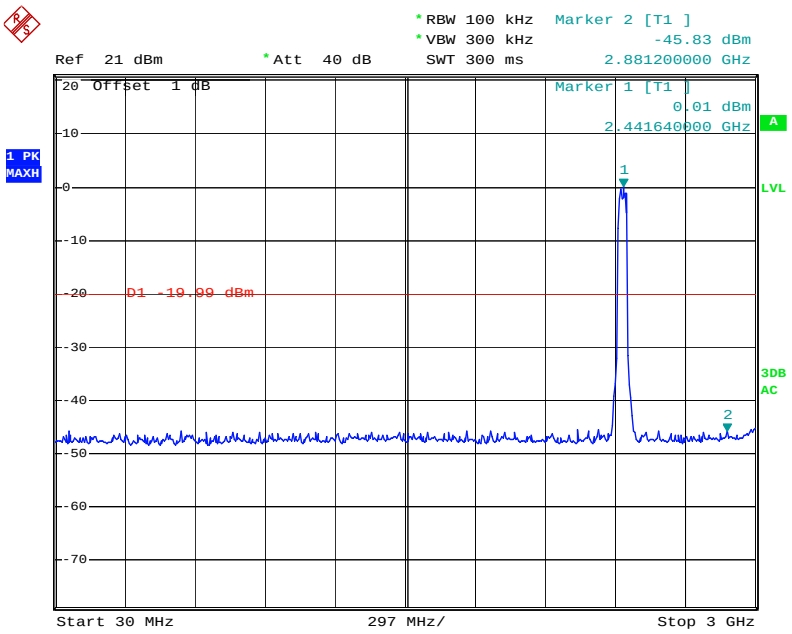


Date: 11.JAN.2011 09:09:28

802.11n-HT40 Low Channel, Port 1 (3GHz~26GHz)

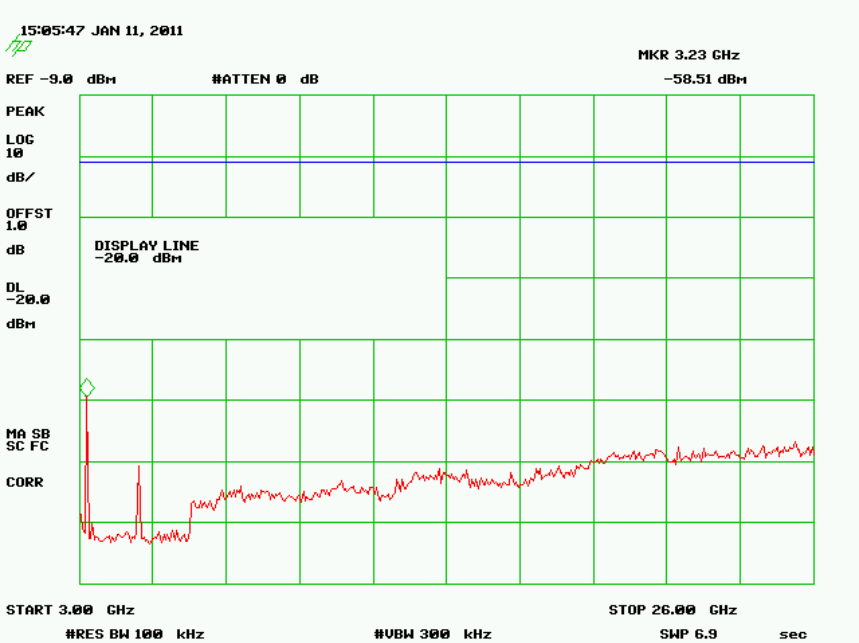


802.11n-HT40 Middle Channel, Port 1 (30MHz~3GHz)

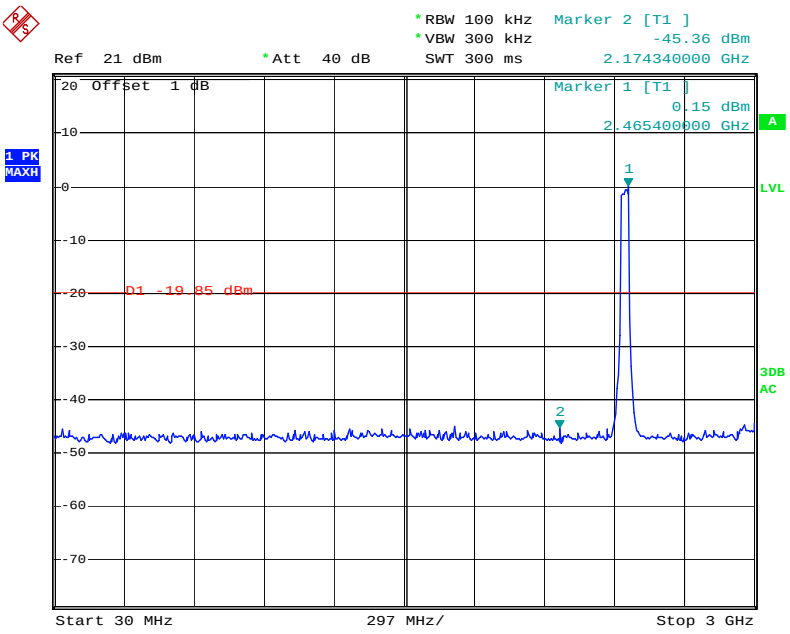


Date: 11.JAN.2011 09:11:05

802.11n-HT40 Middle Channel, Port 1 (3GHz~26GHz)

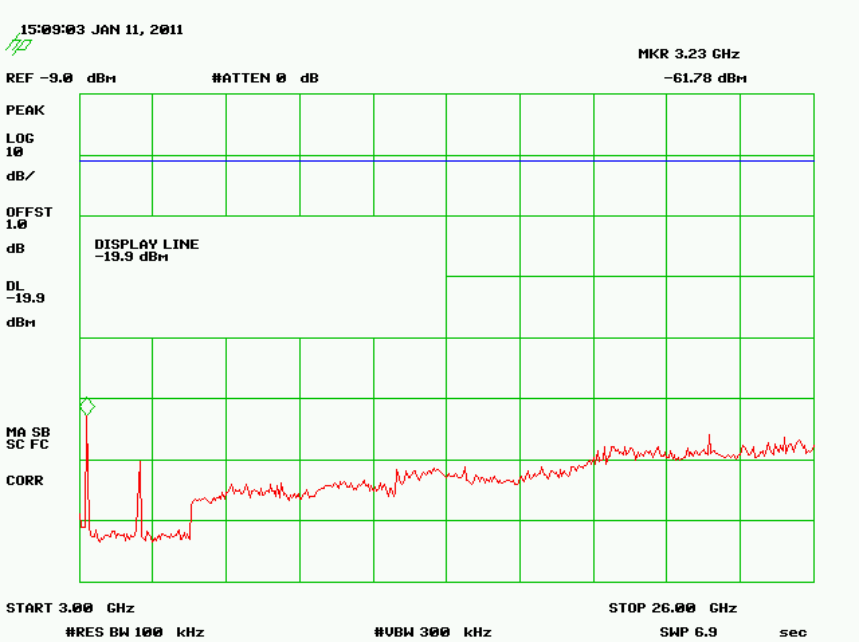


802.11n-HT40 High Channel, Port 1 (30MHz~3GHz)

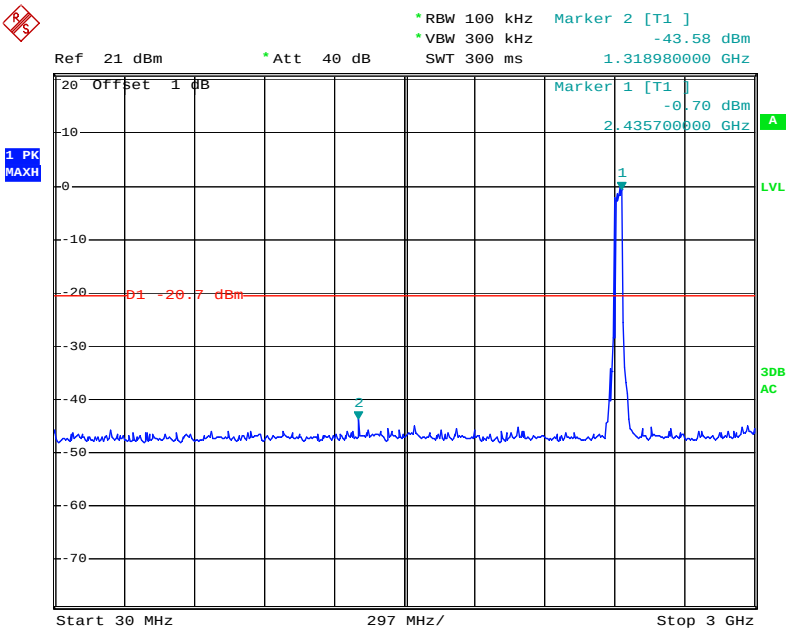


Date: 11.JAN.2011 09:13:47

802.11n-HT40 High Channel, Port 1 (3GHz~26GHz)

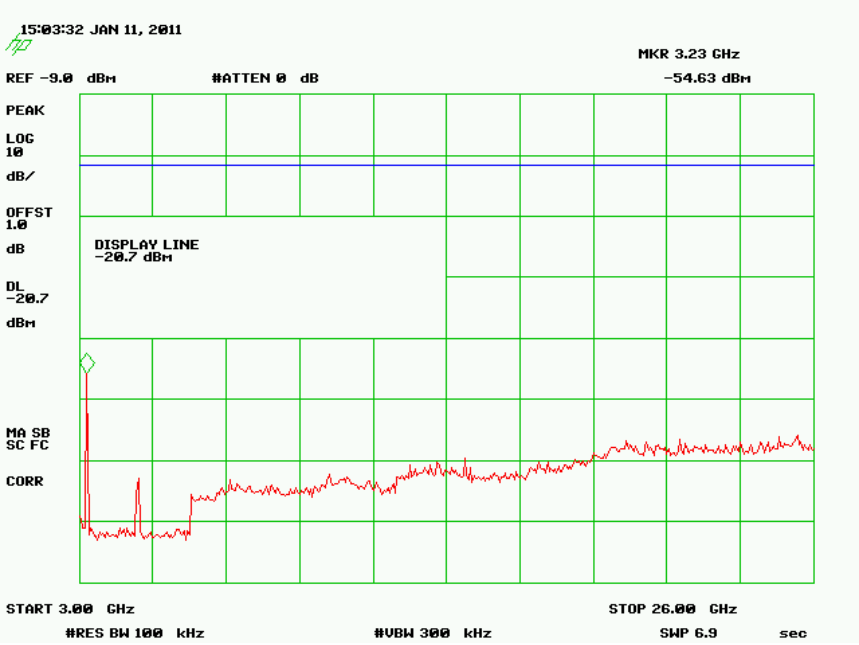


802.11n-HT40 Low Channel, Port 2 (30MHz~3GHz)

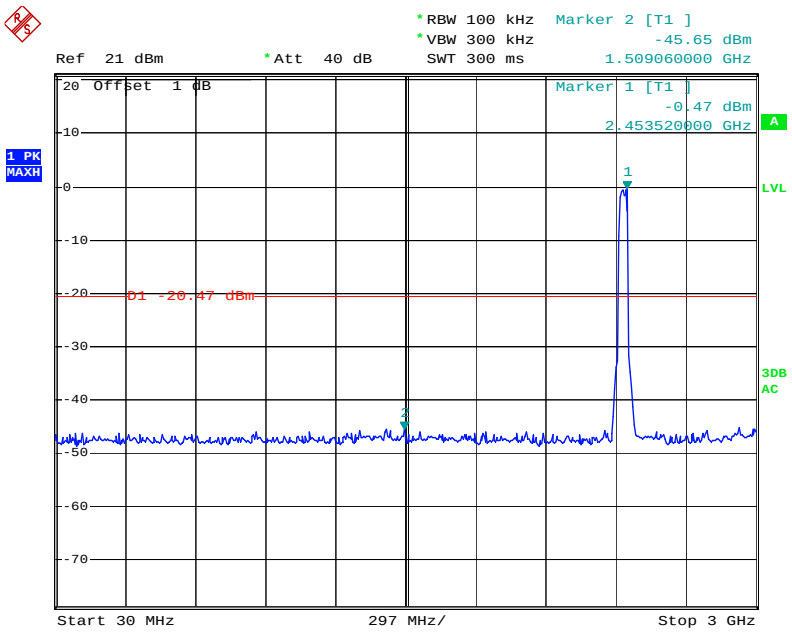


Date: 11.JAN.2011 09:54:20

802.11n-HT40 Low Channel, Port 2 (3GHz~26GHz)

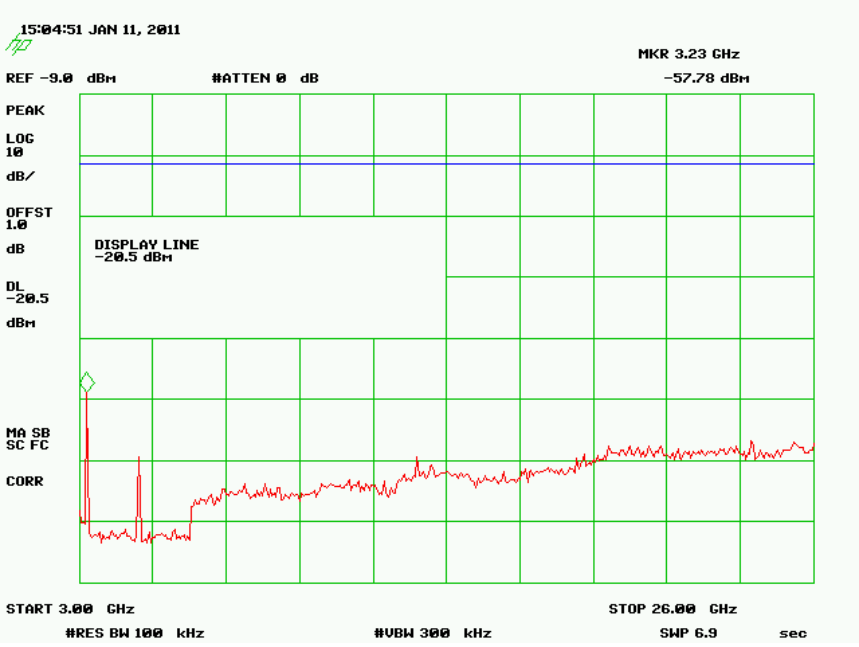


802.11n-HT40 Middle Channel, Port 2 (30MHz~3GHz)

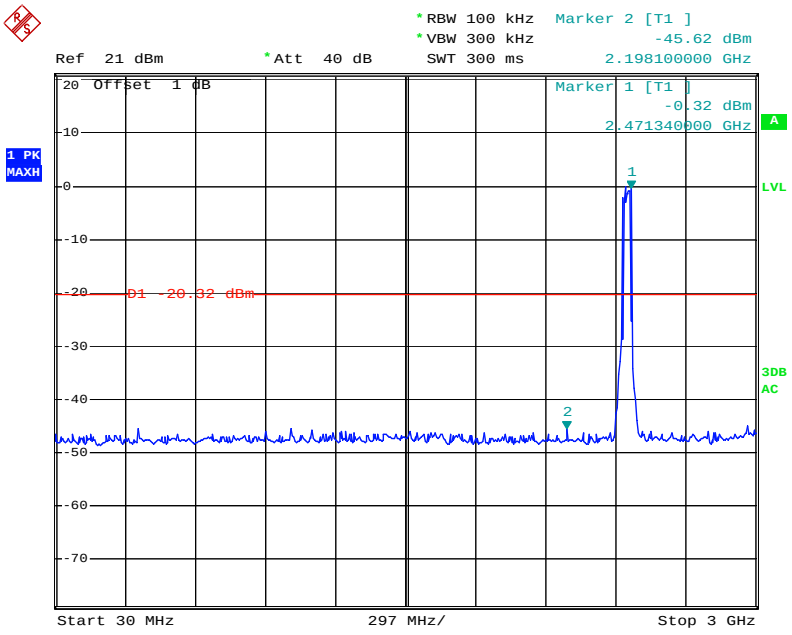


Date: 11.JAN.2011 09:55:42

802.11n-HT40 Middle Channel, Port 2 (3GHz~26GHz)

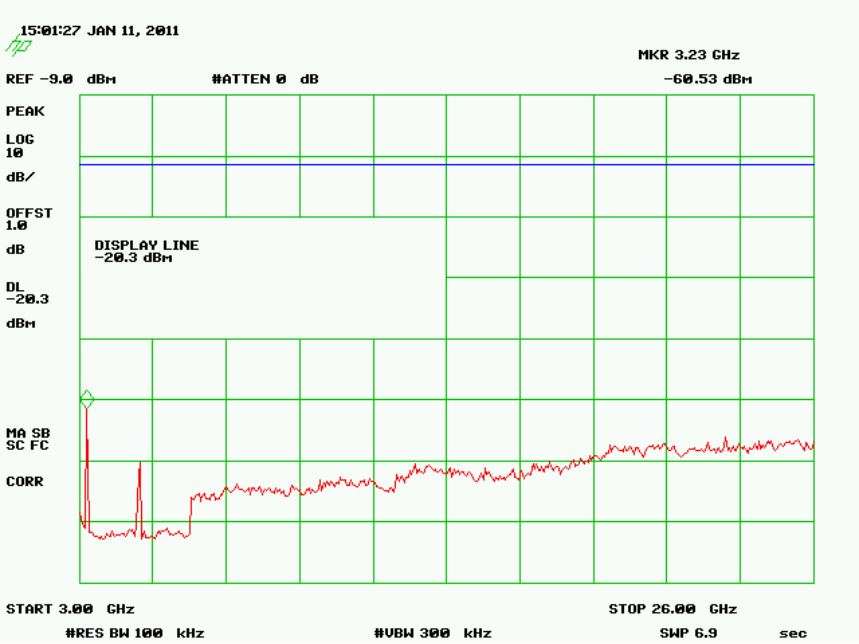


802.11n-HT40 High Channel, Port 2 (30MHz~3GHz)

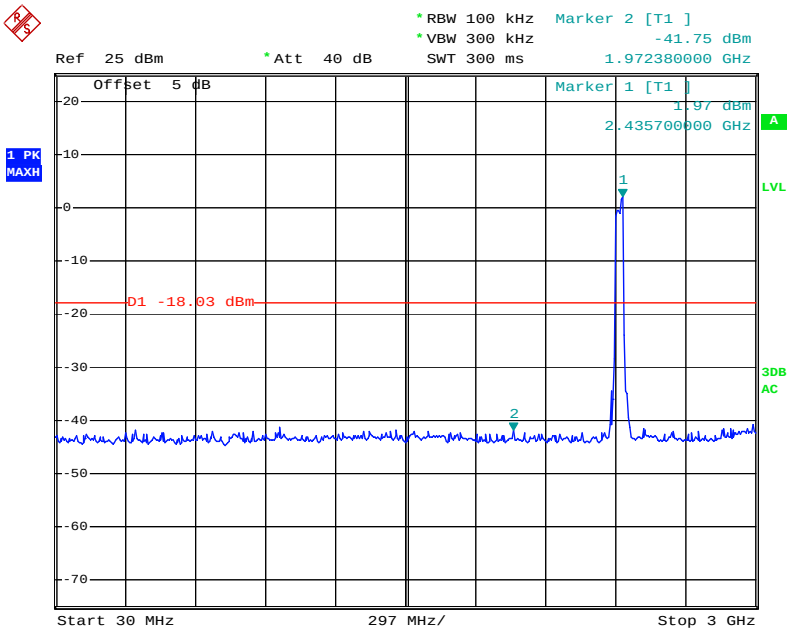


Date: 11.JAN.2011 09:56:47

802.11n-HT40 High Channel, Port 2 (3GHz~26GHz)

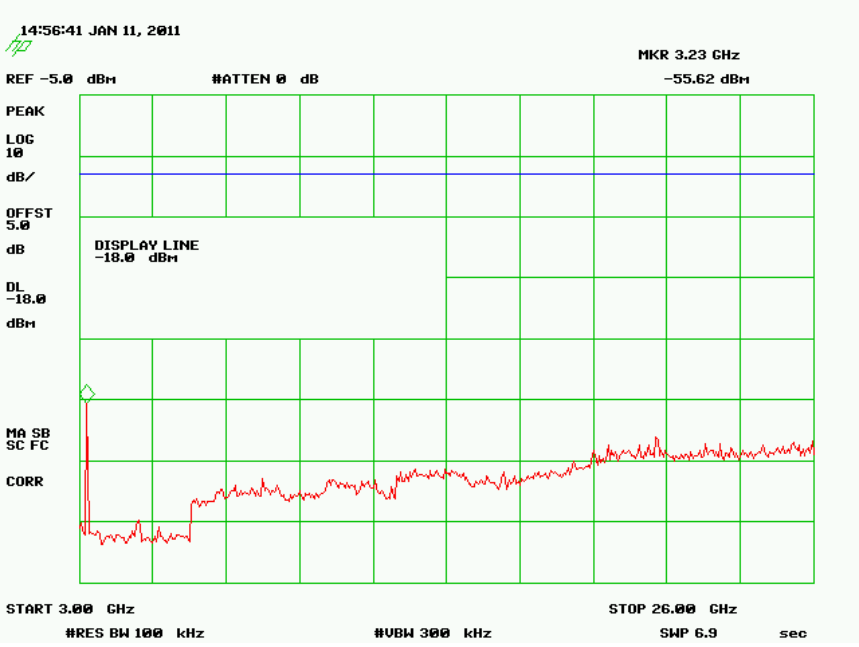


802.11n-HT40 Low Channel with Combiner (30MHz~3GHz)

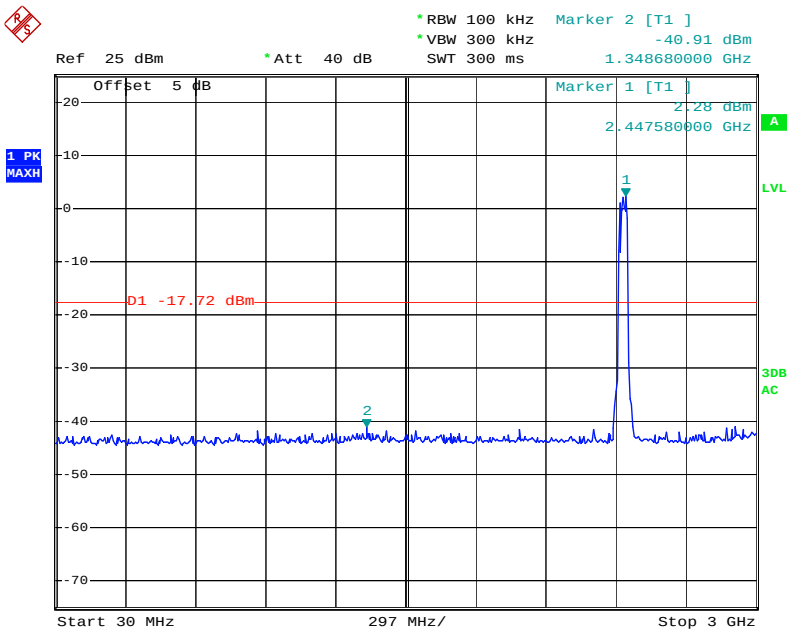


Date: 11.JAN.2011 10:43:03

802.11n-HT40 Low Channel with Combiner (3GHz~26GHz)

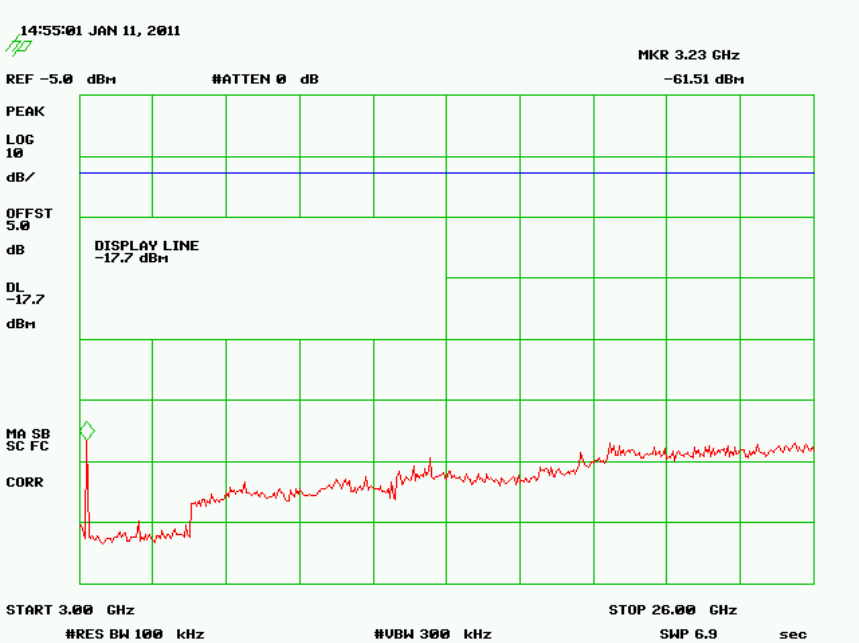


802.11n-HT40 Middle Channel with Combiner (30MHz~3GHz)

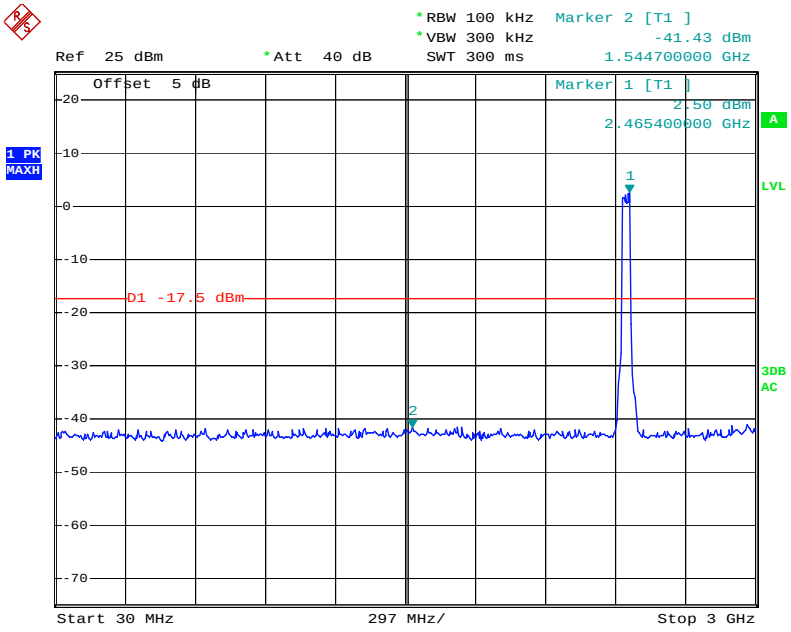


Date: 11.JAN.2011 10:40:29

802.11n-HT40 Middle Channel with Combiner (3GHz~26GHz)

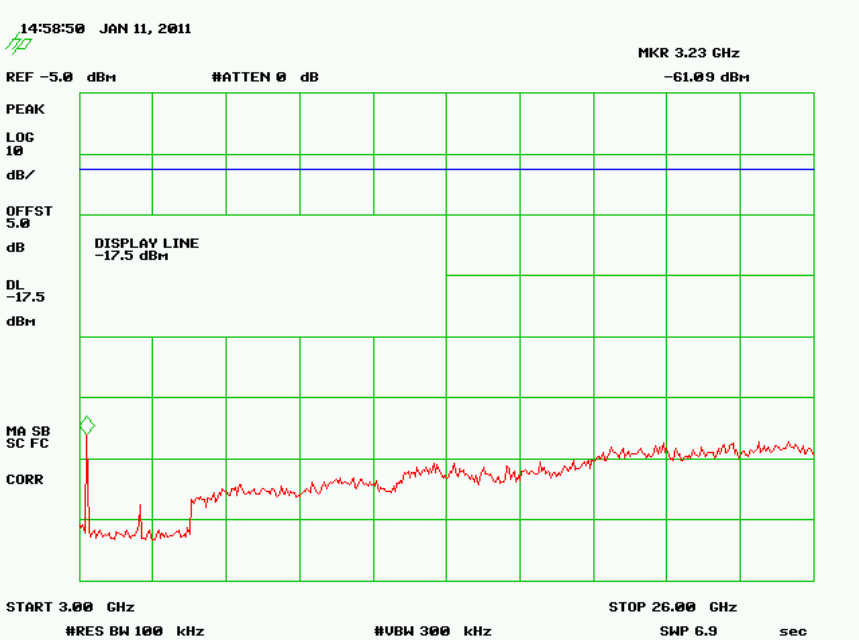


802.11n-HT40 High Channel with Combiner (30MHz~3GHz)



Date: 11.JAN.2011 10:39:15

802.11n-HT40 High Channel with Combiner (3GHz~26GHz)



FCC §15.247(a) (2) – 6 dB EMISSION 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.

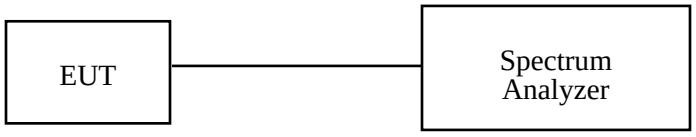
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23

*** 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:	100.0 kPa

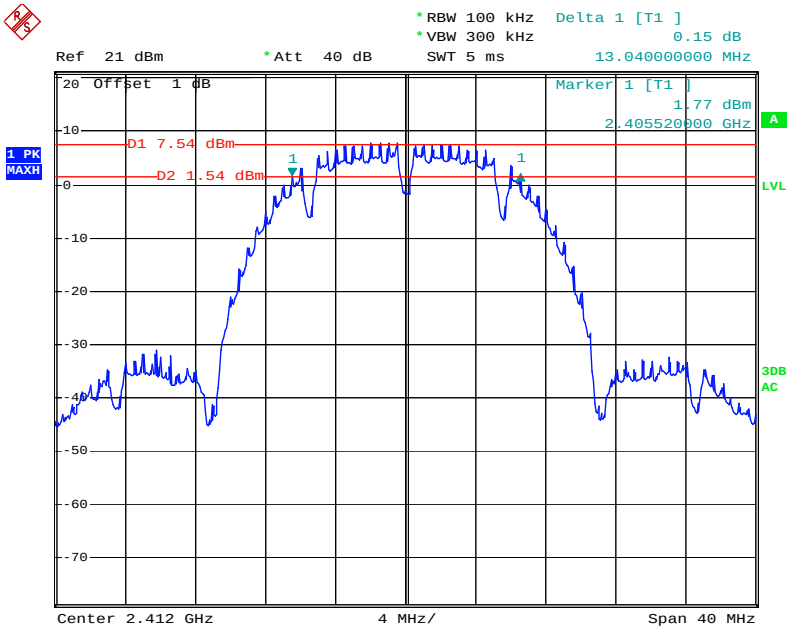
The testing was performed by Bruce Zhang on 2011-01-04 and 2011-01-05.

Test Result: Pass.

Please refer to the following tables and plots.

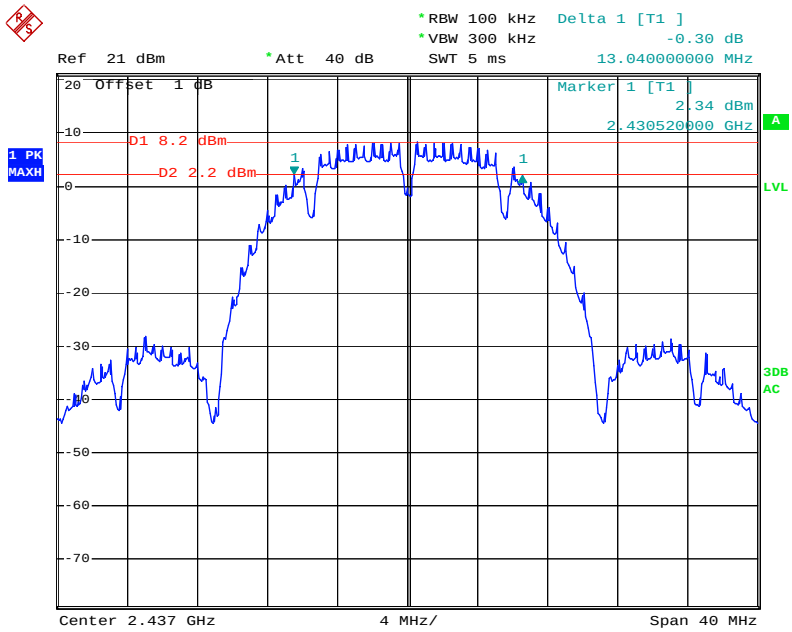
Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Limit (kHz)
802.11b mode				
Low	2412	1	13.04	> 500
Middle	2437	1	13.04	> 500
High	2462	1	13.04	> 500
802.11g mode				
Low	2412	6	16.56	> 500
Middle	2437	6	16.48	> 500
High	2462	6	16.48	> 500
802.11n-HT20 mode				
Low	2412	6.5	17.76	> 500
Middle	2437	6.5	17.76	> 500
High	2462	6.5	17.76	> 500
802.11n-HT40 mode				
Low	2422	13.5	36.48	> 500
Middle	2437	13.5	36.48	> 500
High	2452	13.5	36.32	> 500

802.11b Low Channel



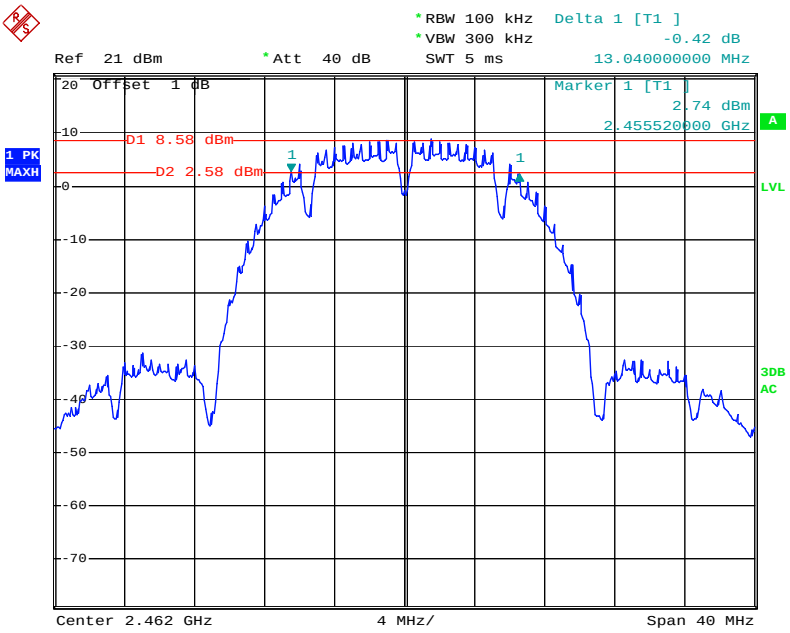
Date: 4.JAN.2011 15:18:20

802.11b Middle Channel



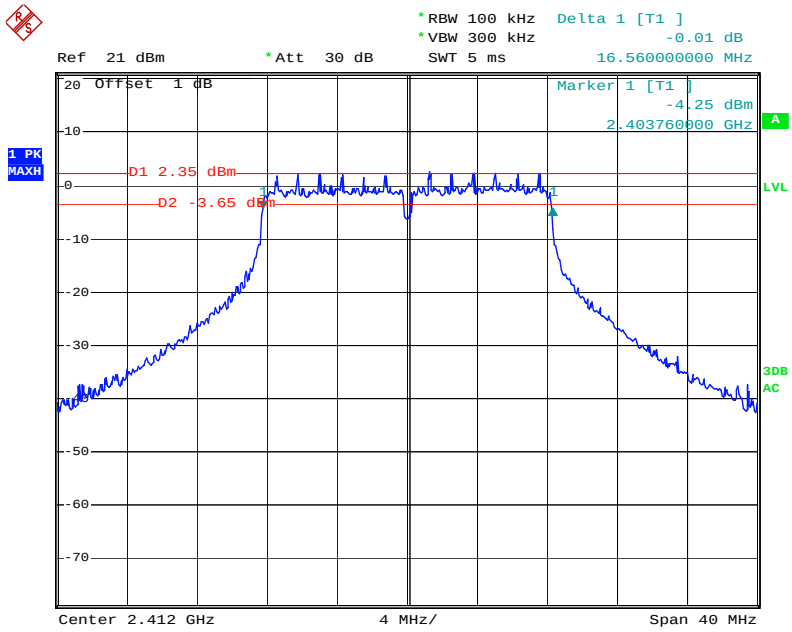
Date: 4.JAN.2011 15:58:15

802.11b High Channel



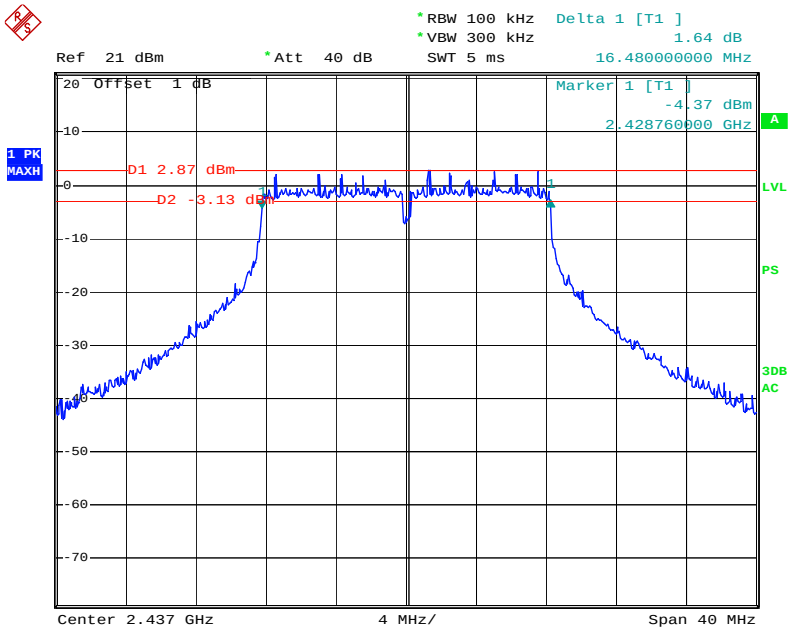
Date: 4.JAN.2011 16:25:04

802.11g Low Channel



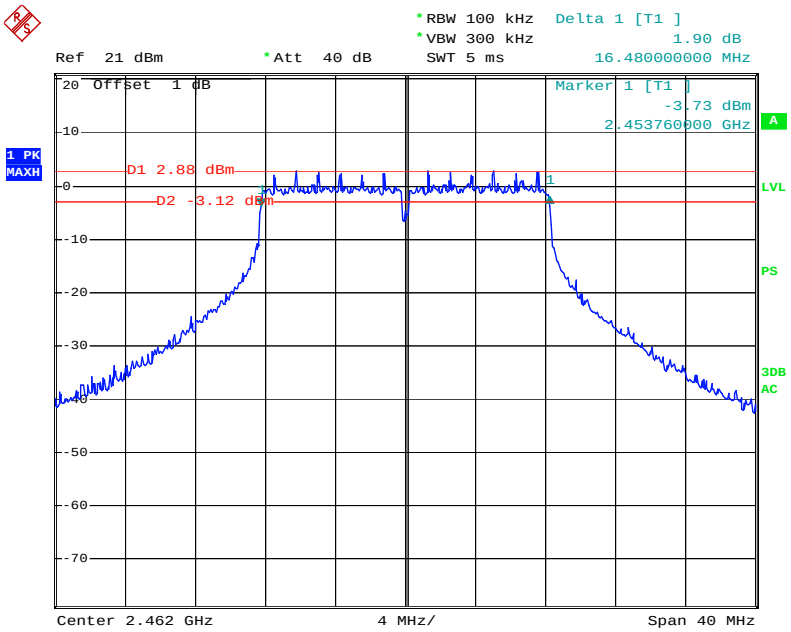
Date: 4.JAN.2011 13:22:42

802.11g Middle Channel



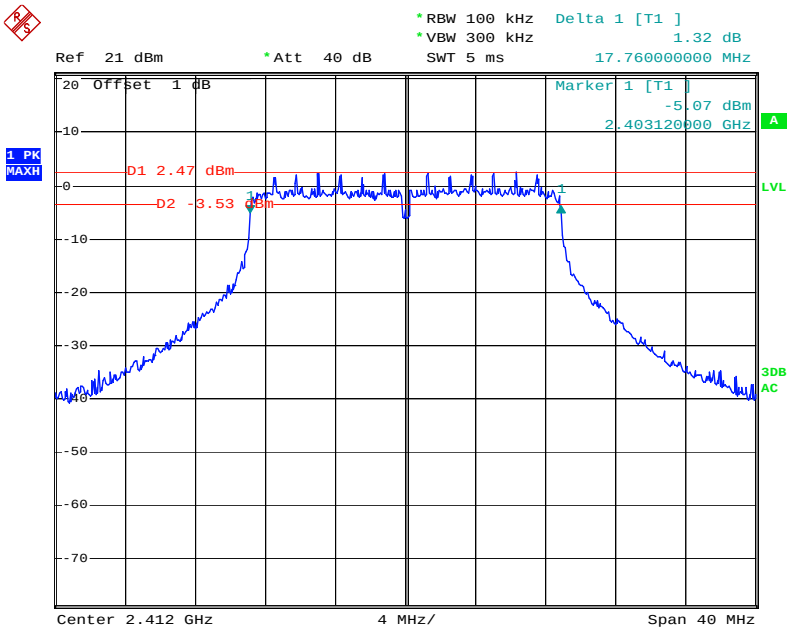
Date: 4.JAN.2011 14:28:23

802.11g High Channel



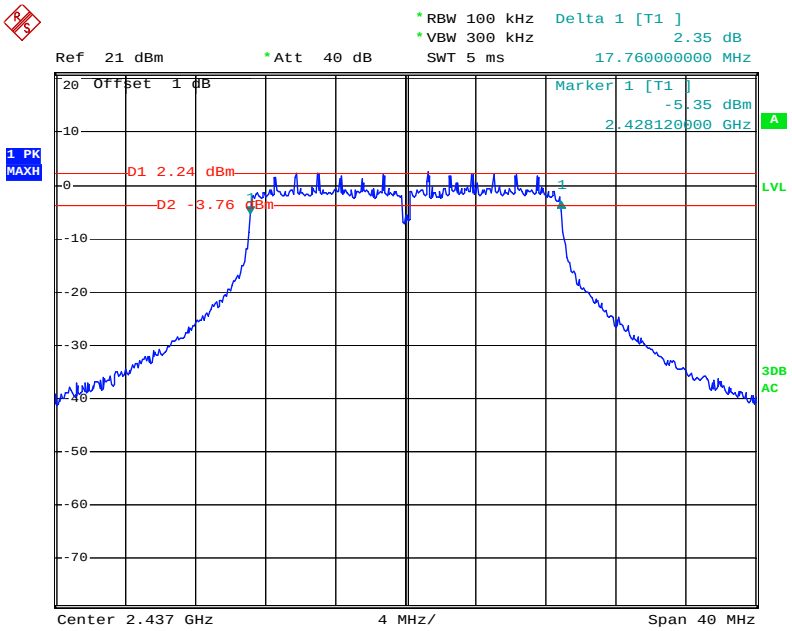
Date: 4.JAN.2011 14:47:38

802.11n-HT20 Low Channel



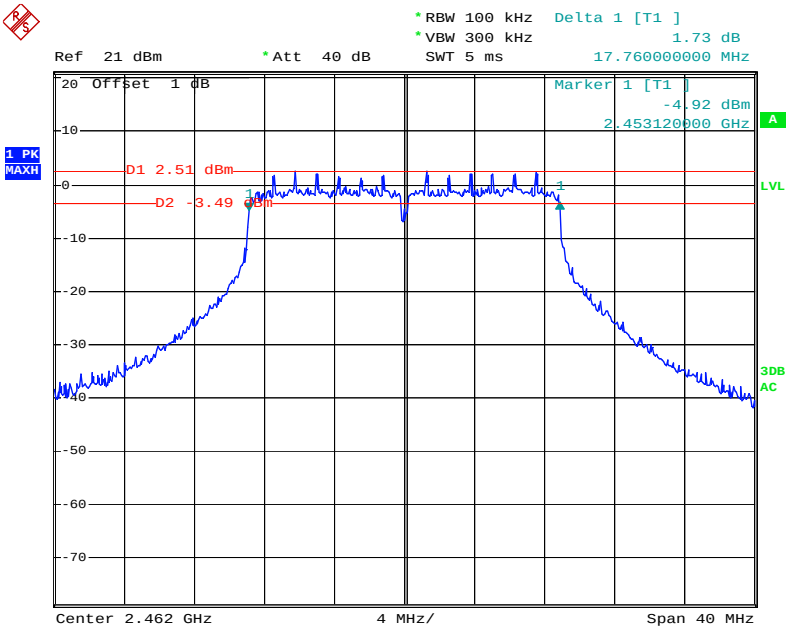
Date: 4.JAN.2011 16:50:28

802.11n-HT20 Middle Channel



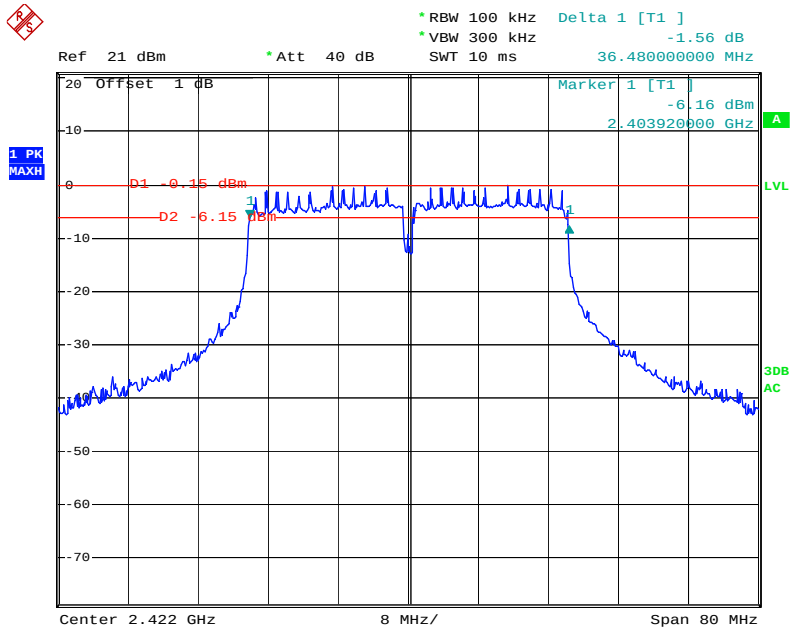
Date: 5.JAN.2011 10:51:57

802.11n-HT20 High Channel



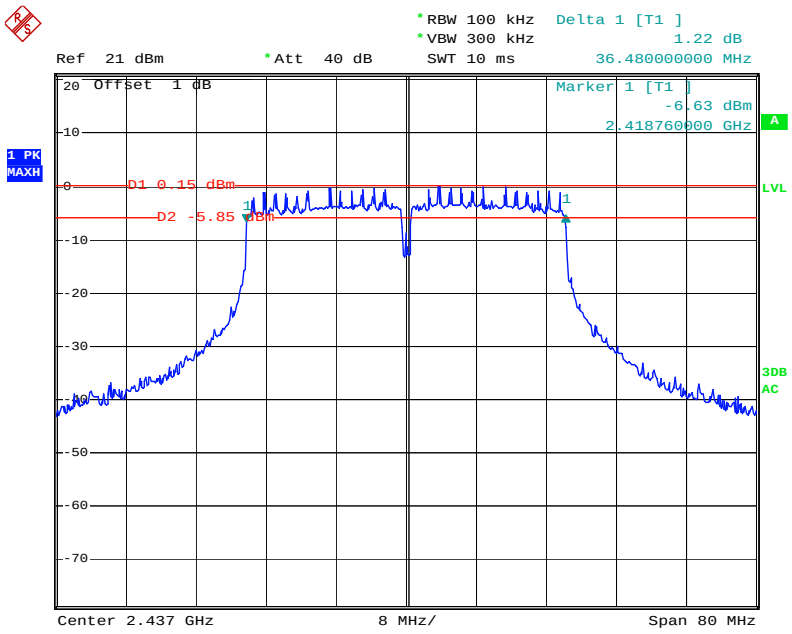
Date: 5.JAN.2011 11:34:22

802.11n-HT40 Low Channel



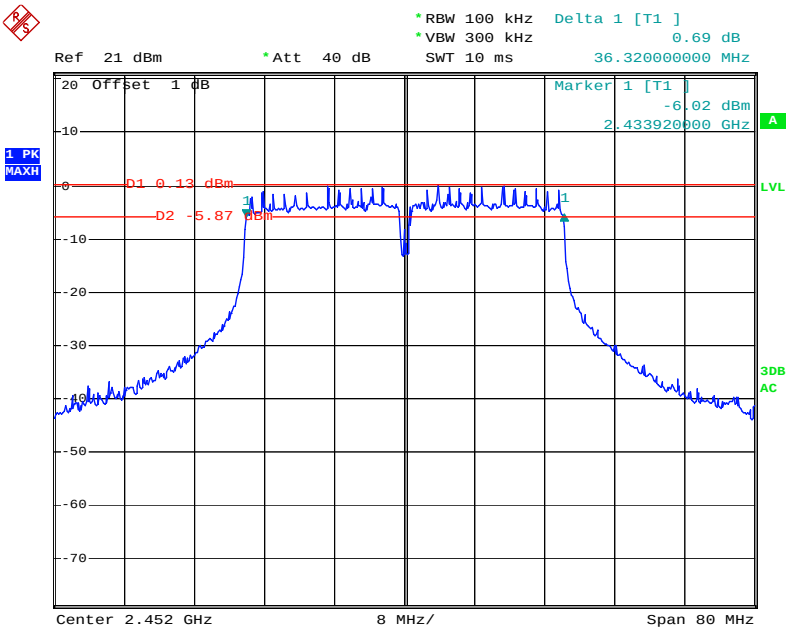
Date: 5.JAN.2011 14:11:42

802.11n-HT40 Middle Channel



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

802.11n-HT40 High Channel



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

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.

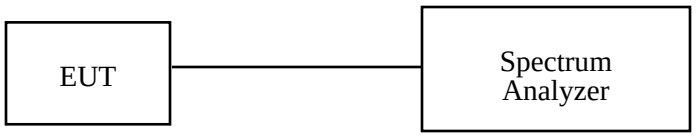
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24

*** 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 Bruce Zhang on 2011-01-04 to 2011-01-10

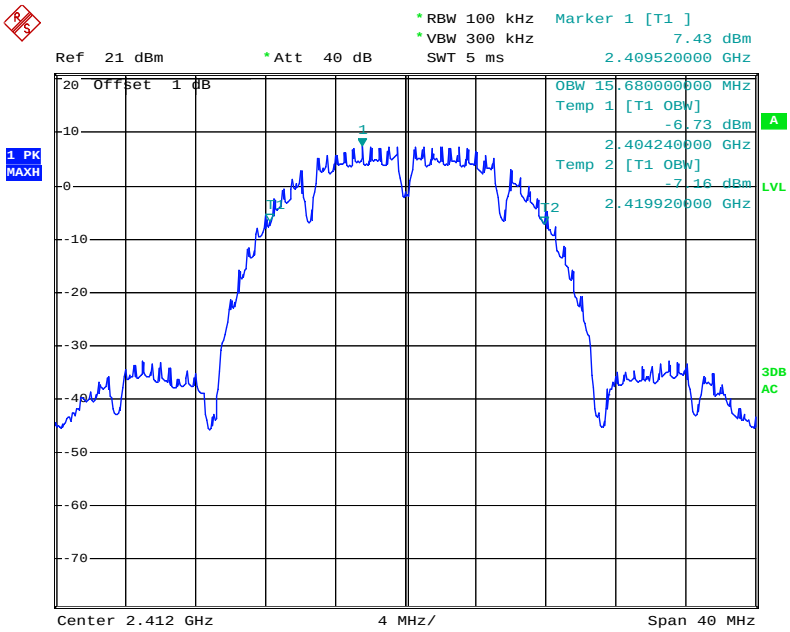
Test Mode: Transmitting

Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)	Limit (dBm)
802.11b				
Low	2412	1	18.36	30
Middle	2437	1	18.15	30
High	2462	1	18.44	30
802.11g				
Low	2412	6	15.26	30
Middle	2437	6	15.10	30
High	2462	6	15.17	30

Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)			Limit (dBm)
			Port 1	Port 2	Total	
802.11n-HT20						
Low	2412	6.5	15.31	14.67	18.01	30
Middle	2437	6.5	15.10	15.25	18.19	30
High	2462	6.5	15.33	15.38	18.37	30
802.11n-HT40						
			Port 1	Port 2	Combine	
Low	2422	13.5	15.44	14.54	18.02	30
Middle	2437	13.5	15.42	15.06	18.25	30
High	2452	13.5	15.41	15.20	18.32	30

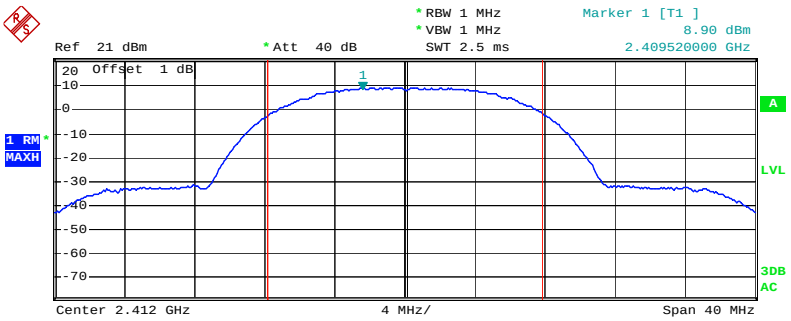
802.11b Mode:

99% Occupied Bandwith, Low Channel



Date: 4.JAN.2011 15:19:02

RF Output Power, Low Channel

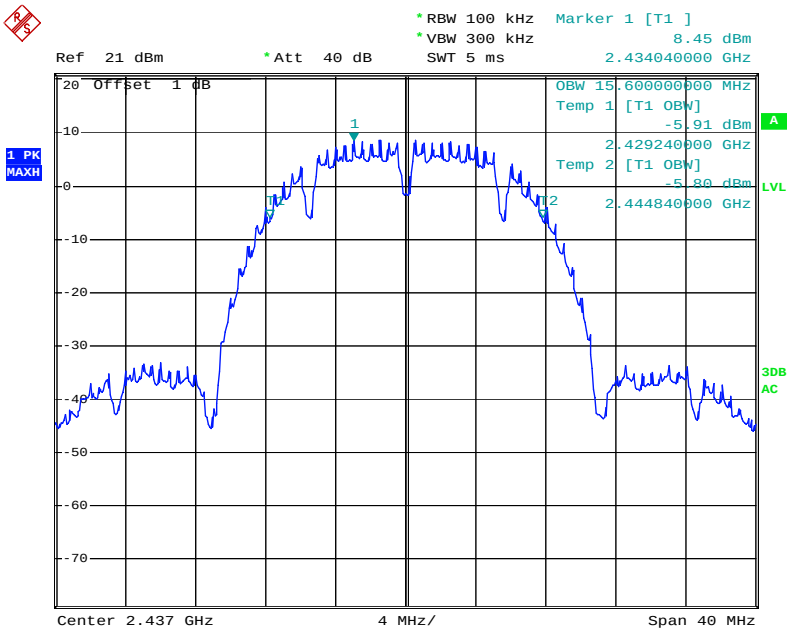


Tx Channel

Bandwidth	15.68 MHz	Power	18.36 dBm

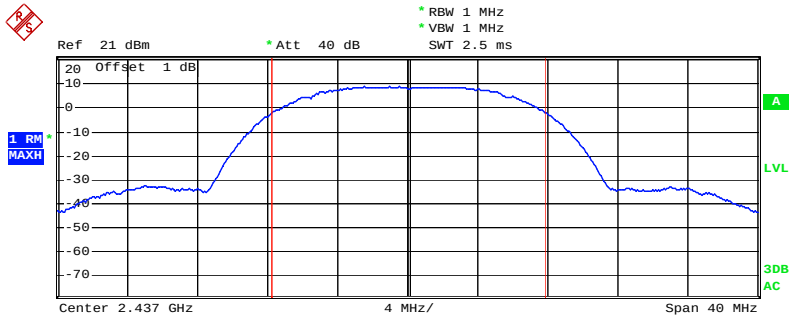
Date: 4.JAN.2011 15:22:50

99% Occupied Bandwith, Middle Channel



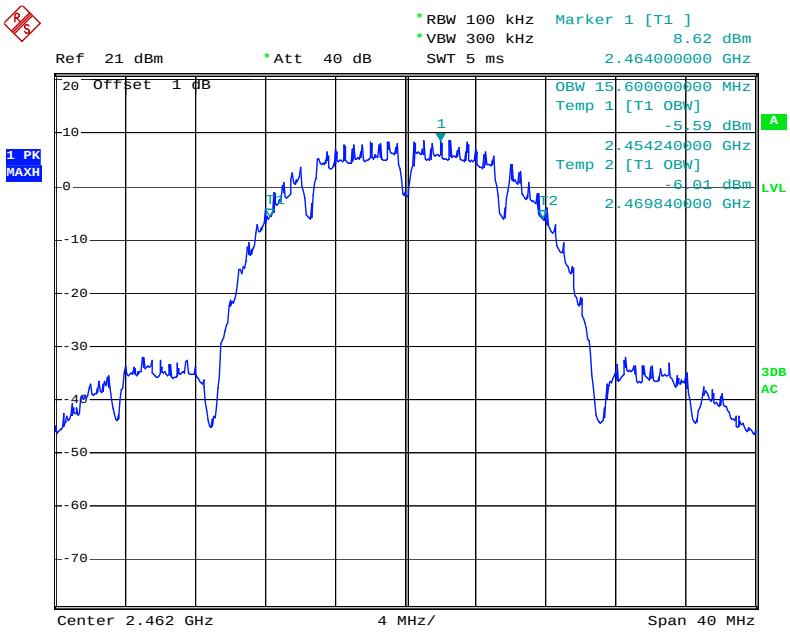
Date: 4.JAN.2011 15:59:37

RF Output Power, Middle Channel



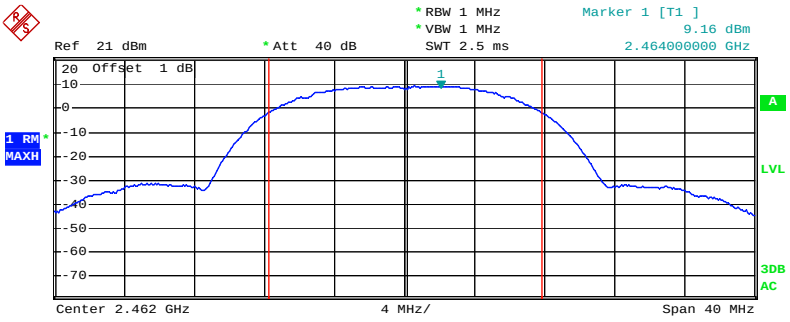
Date: 4.JAN.2011 16:01:27

99% Occupied Bandwith, High Channel



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

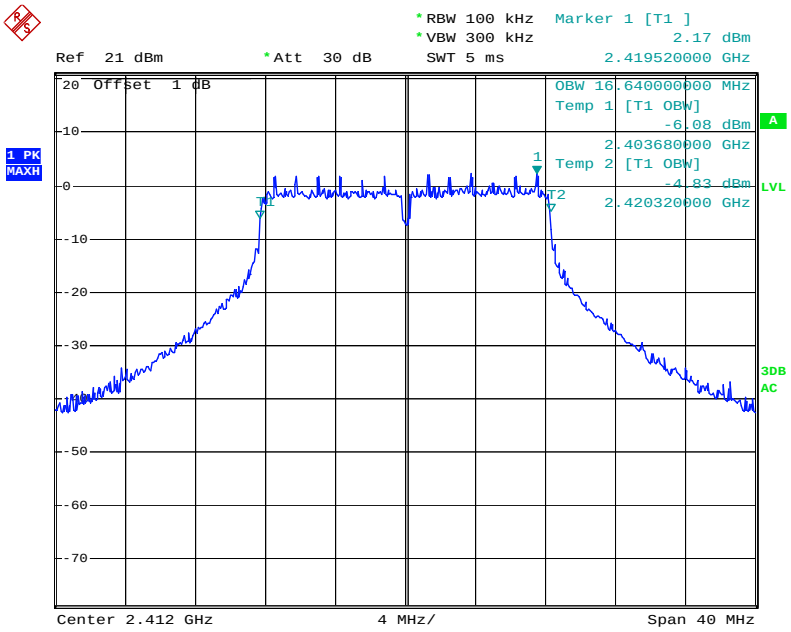
RF Output Power, High Channel



Date: 4.JAN.2011 16:27:10

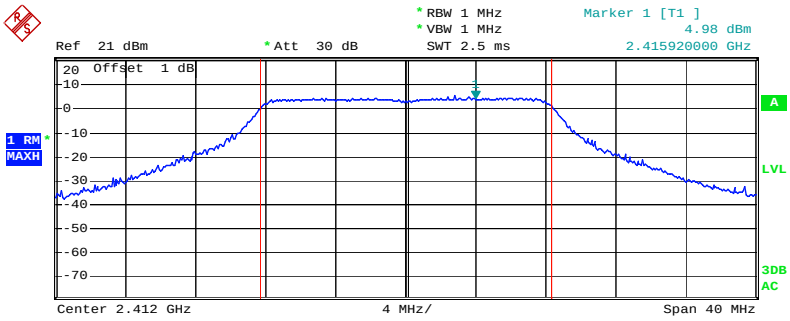
802.11g Mode:

99% Occupied Bandwith, Low Channel



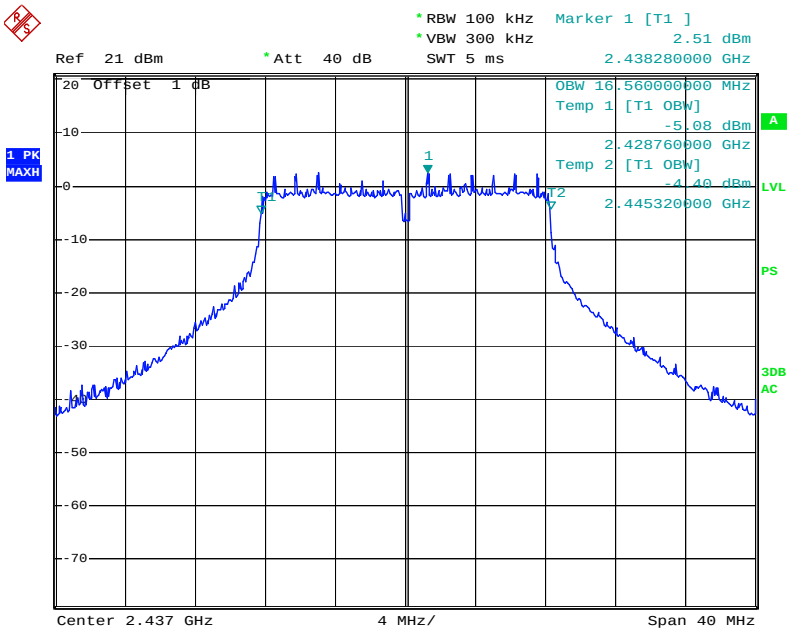
Date: 4.JAN.2011 13:23:22

RF Output Power, Low Channel



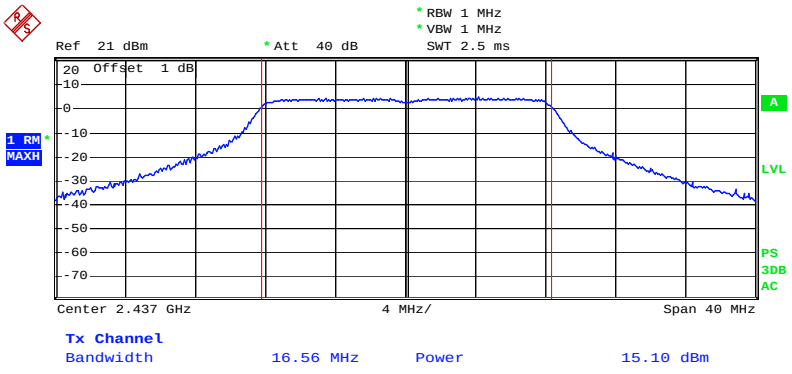
Date: 4.JAN.2011 13:24:48

99% Occupied Bandwith, Middle Channel



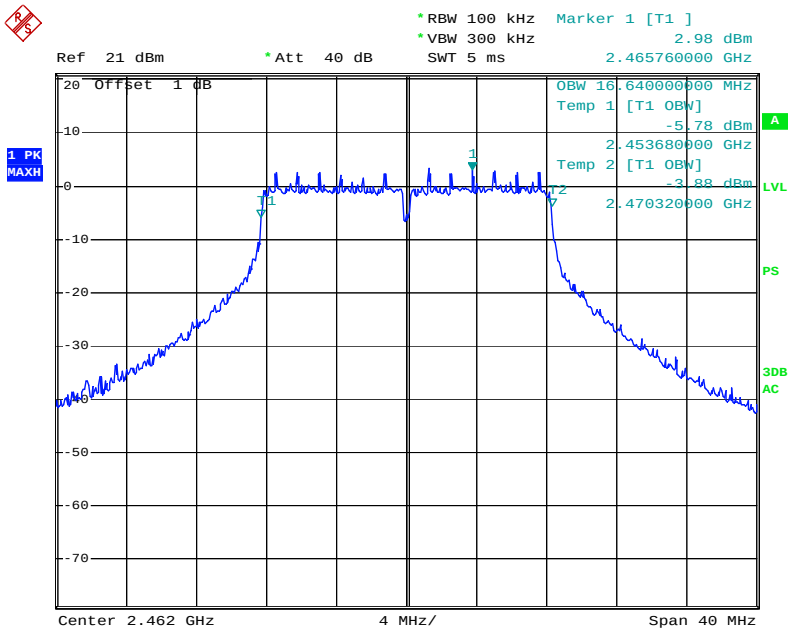
Date: 4.JAN.2011 14:30:56

RF Output Power, Middle Channel



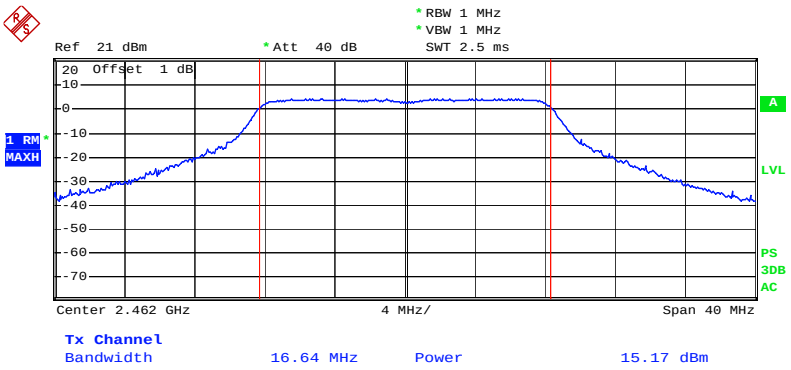
Date: 4.JAN.2011 14:32:40

99% Occupied Bandwith, High Channel



Date: 4.JAN.2011 14:48:23

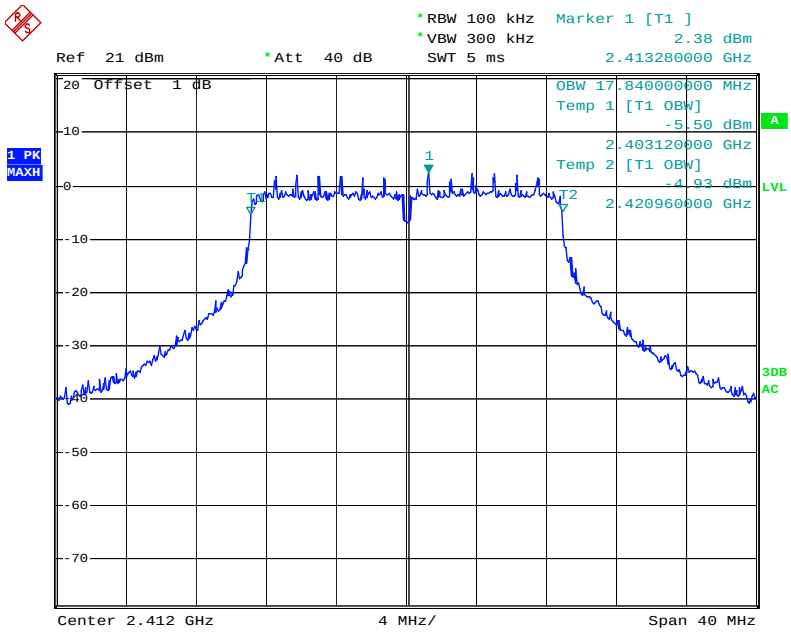
RF Output Power, High Channel



Date: 4.JAN.2011 14:49:48

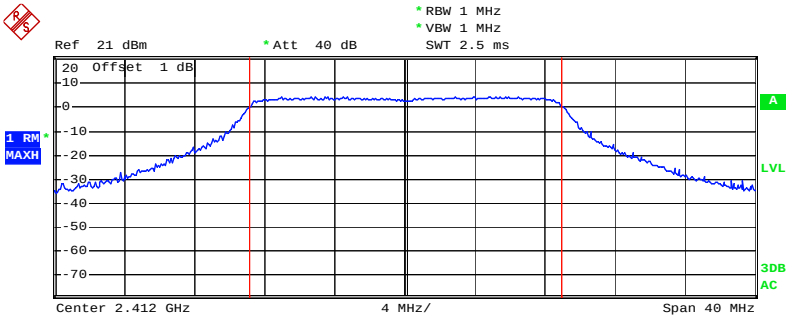
802.11n-HT20 Mode (Port 1):

99% Occupied Bandwith, Low Channel



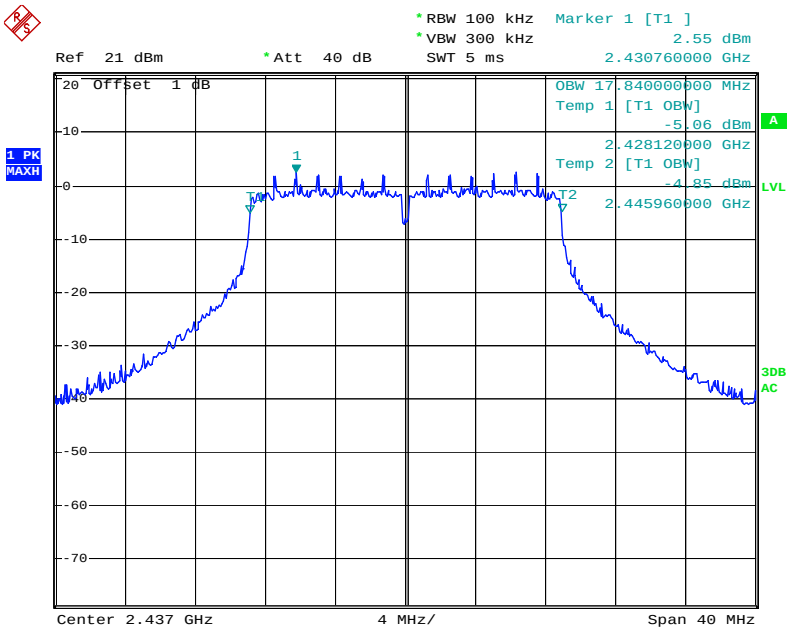
Date: 4.JAN.2011 16:51:25

RF Output Power, Low Channel



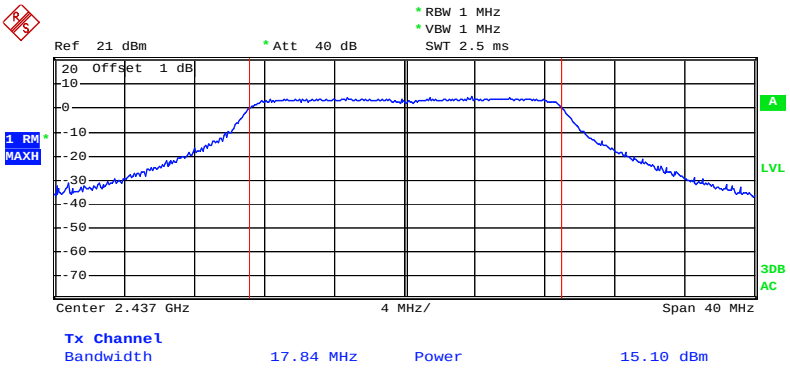
Date: 4.JAN.2011 16:52:48

99% Occupied Bandwith, Middle Channel



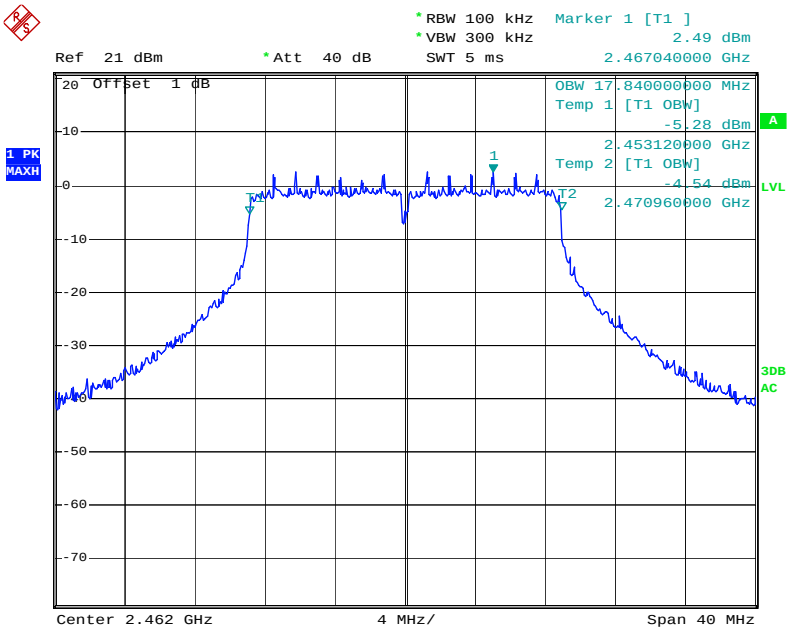
Date: 5.JAN.2011 10:53:25

RF Output Power, Middle Channel



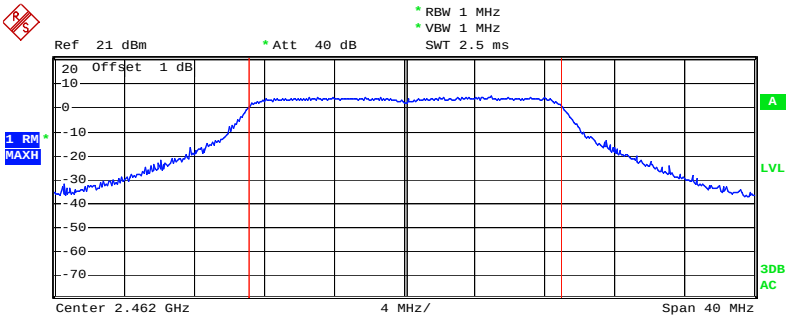
Date: 5.JAN.2011 10:55:45

99% Occupied Bandwith, High Channel



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

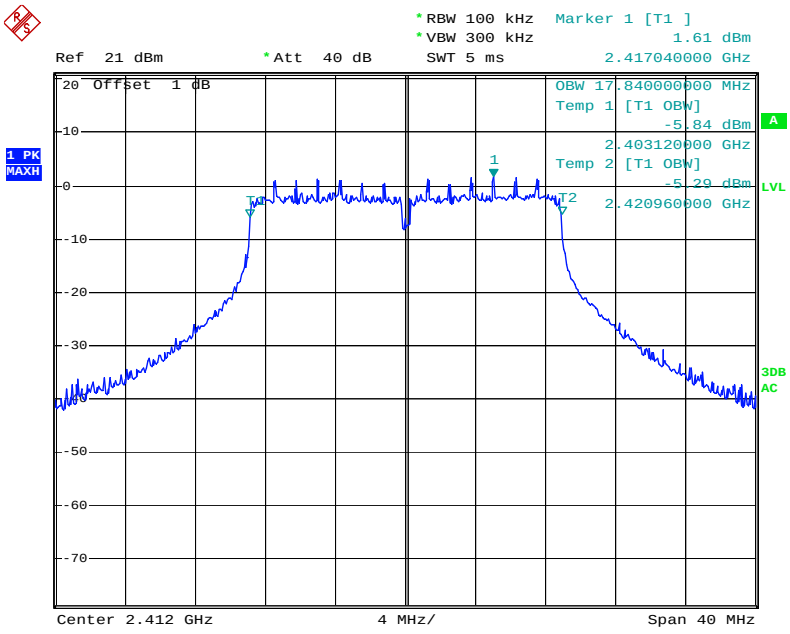
RF Output Power, High Channel



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

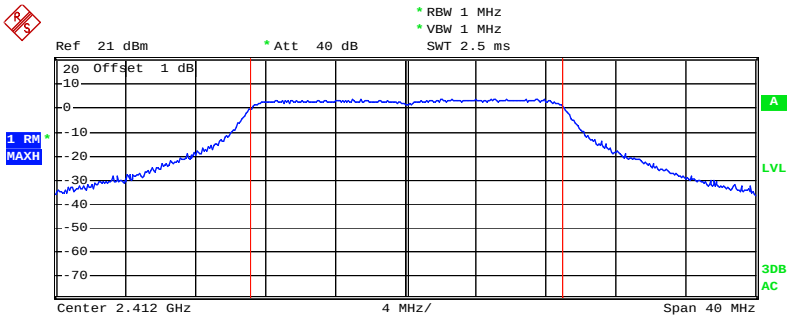
802.11n-HT20 Mode (Port 2):

99% Occupied Bandwith, Low Channel



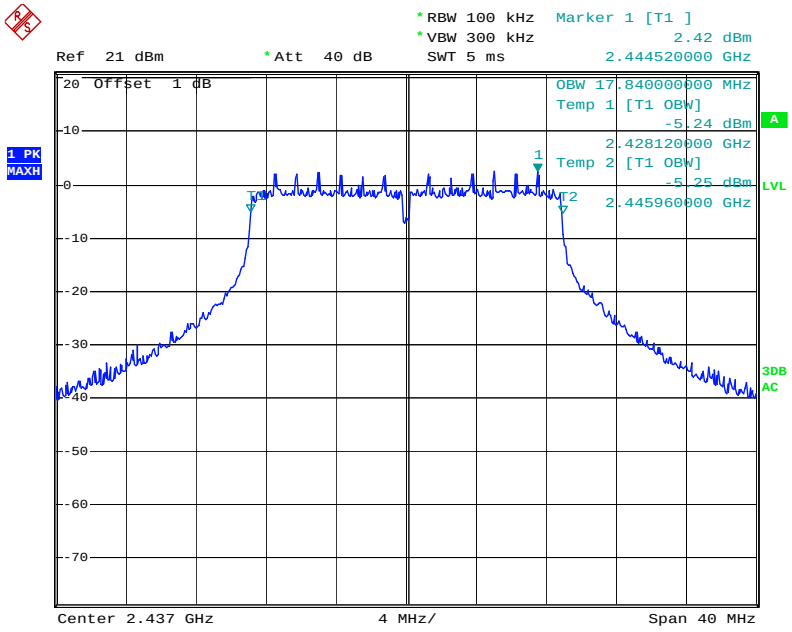
Date: 5.JAN.2011 16:27:33

RF Output Power, Low Channel



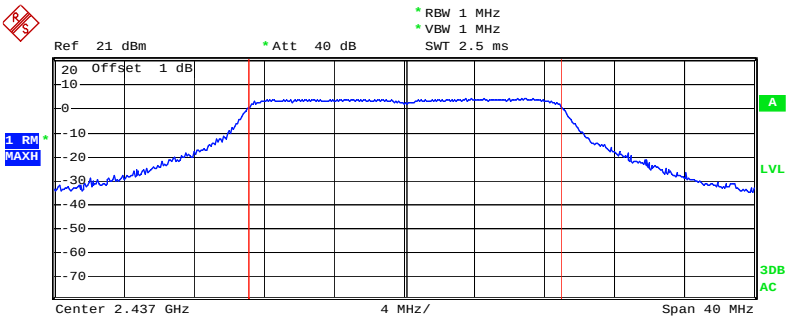
Date: 5.JAN.2011 16:30:23

99% Occupied Bandwith, Middle Channel



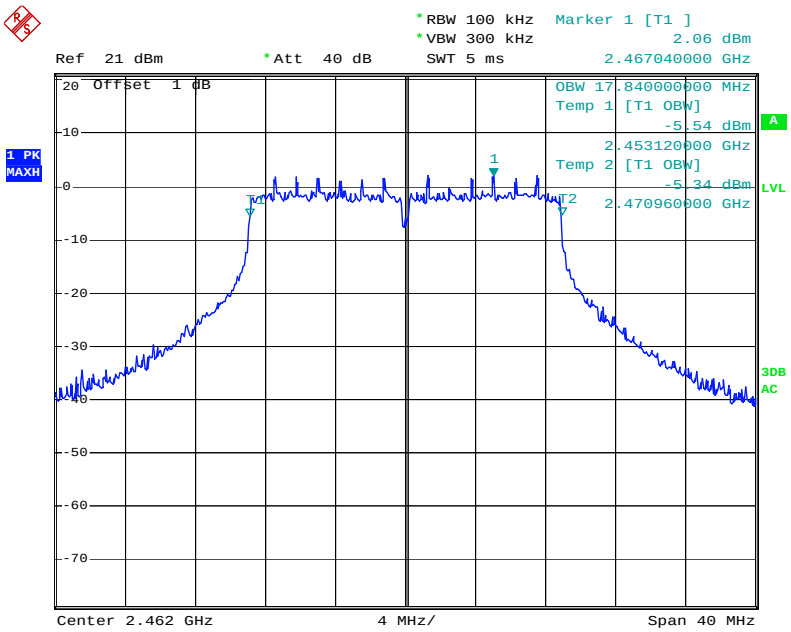
Date: 5.JAN.2011 16:52:19

RF Output Power, Middle Channel



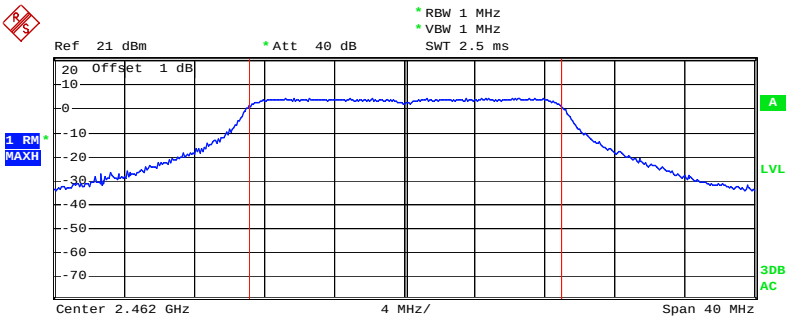
Date: 5.JAN.2011 16:52:53

99% Occupied Bandwith, High Channel



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

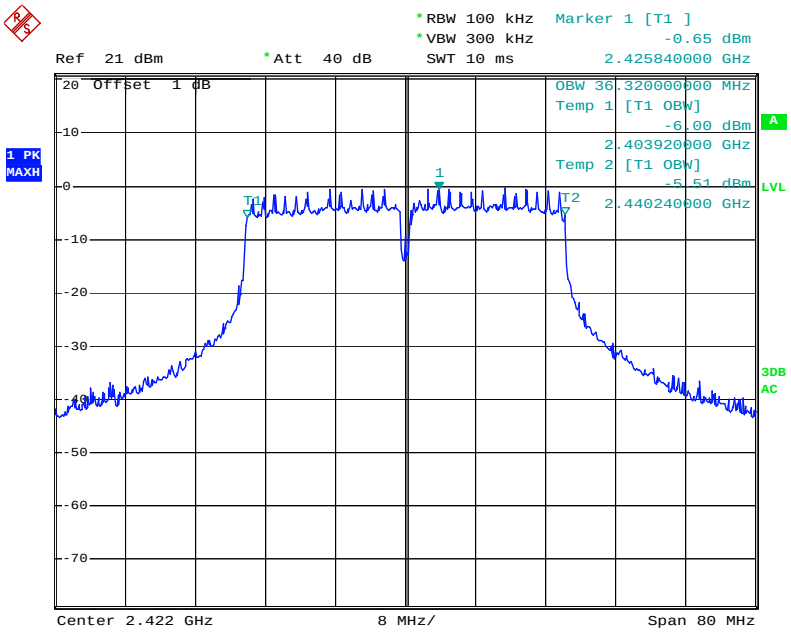
RF Output Power, High Channel



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

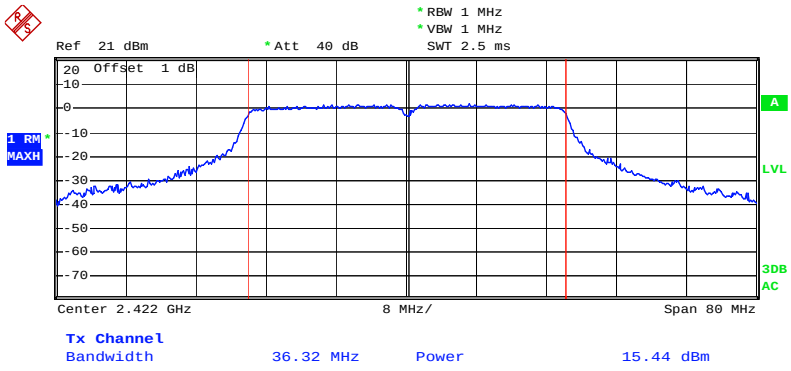
802.11n-HT40 Mode (Port 1):

99% Occupied Bandwith, Low Channel



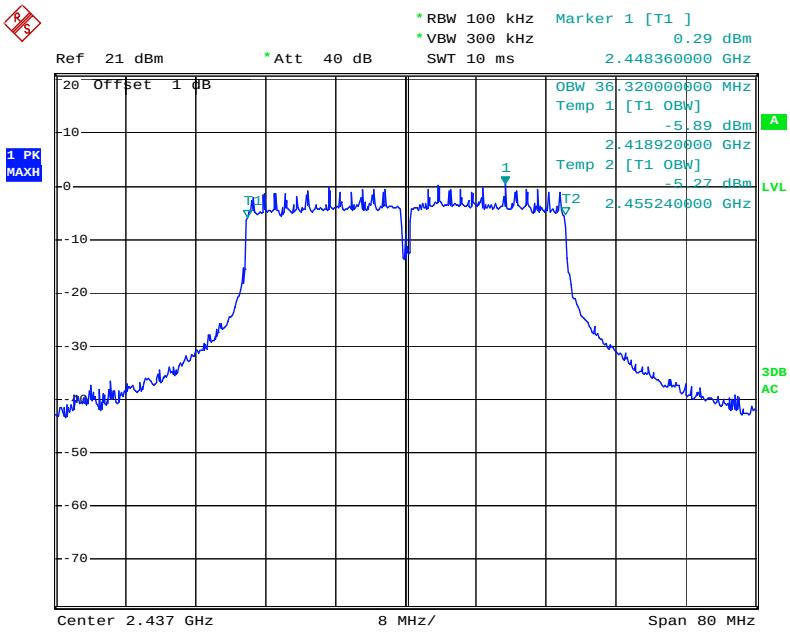
Date: 5.JAN.2011 14:10:29

RF Output Power, Low Channel



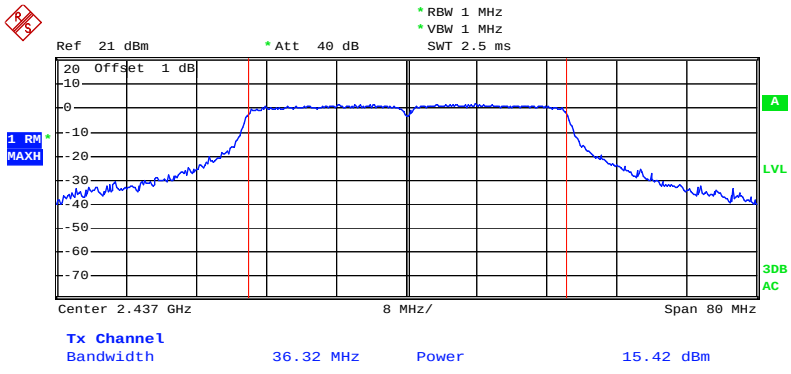
Date: 5.JAN.2011 14:09:09

99% Occupied Bandwith, Middle Channel



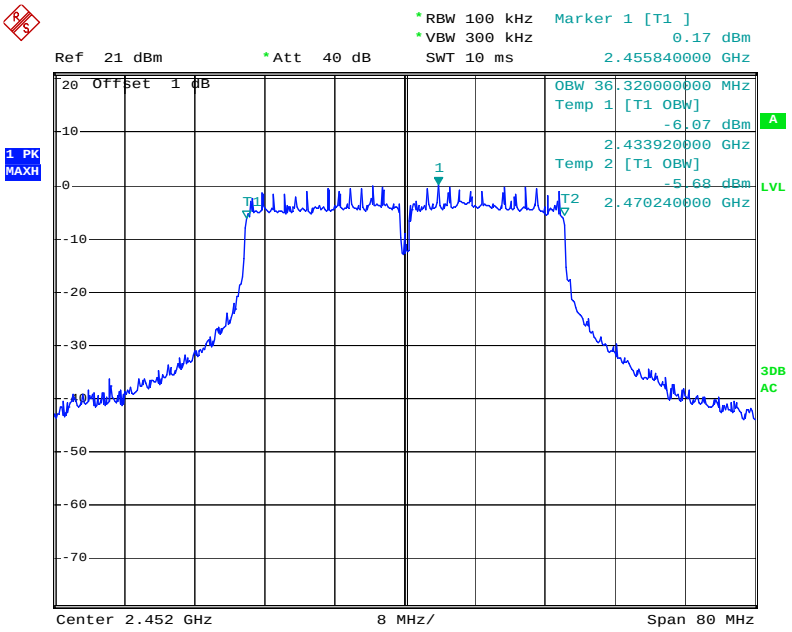
Date: 5.JAN.2011 14:28:48

RF Output Power, Middle Channel



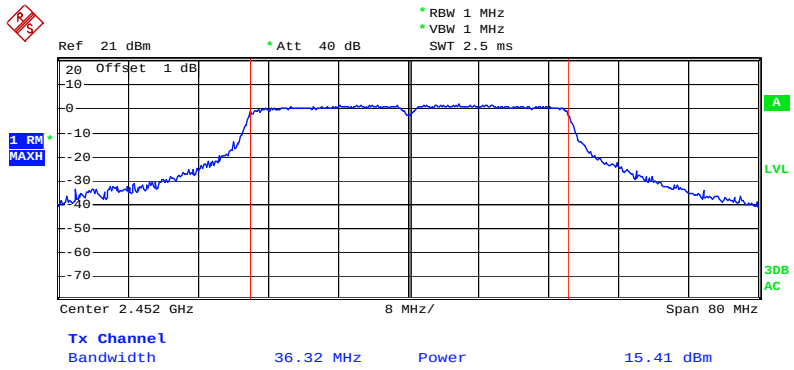
Date: 5.JAN.2011 14:30:10

99% Occupied Bandwith, High Channel



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

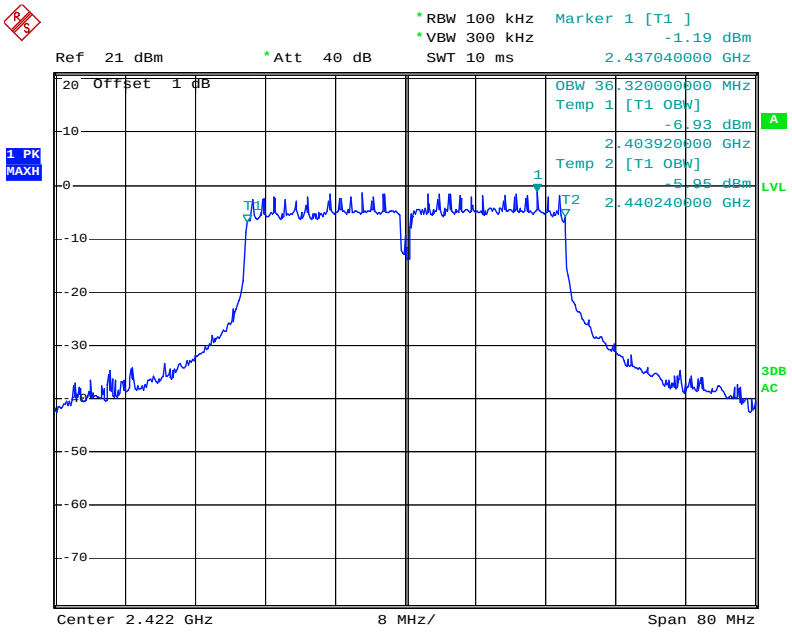
RF Output Power, High Channel



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

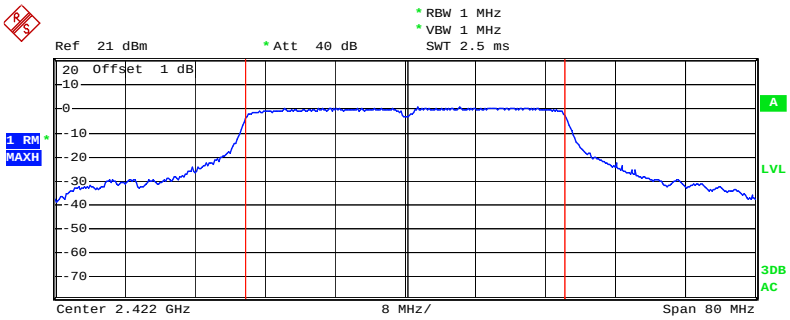
802.11n-HT40 Mode (Port 2):

99% Occupied Bandwith, Low Channel



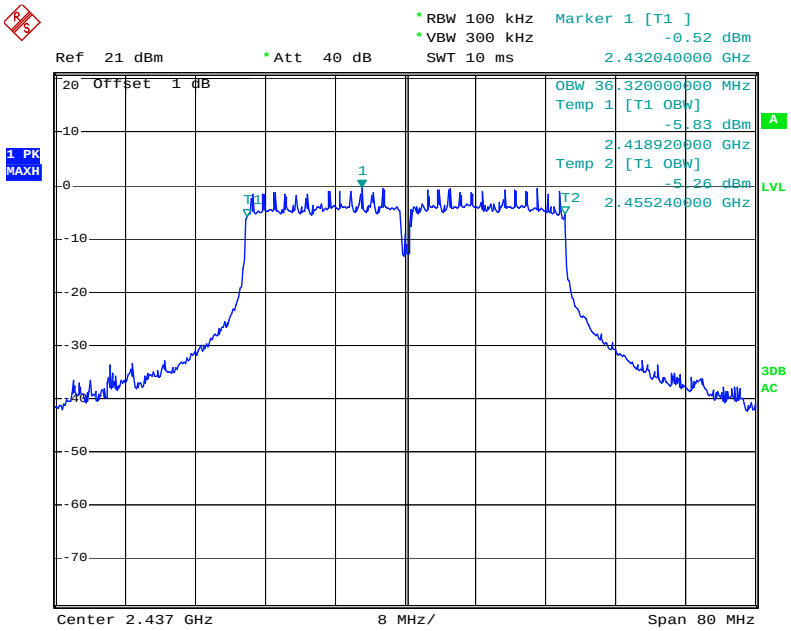
Date: 6.JAN.2011 10:14:50

RF Output Power, Low Channel



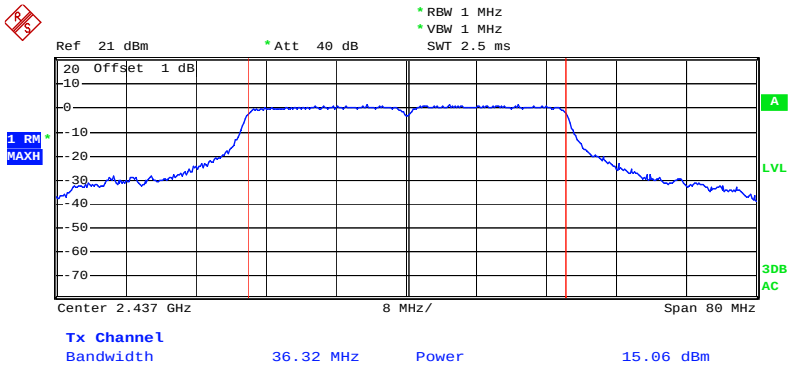
Date: 6.JAN.2011 10:25:07

99% Occupied Bandwith, Middle Channel



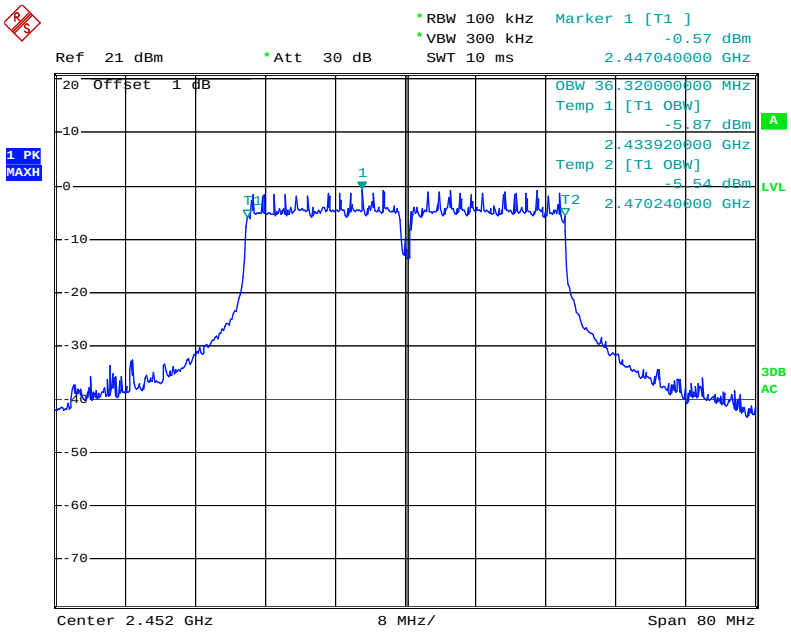
Date: 6.JAN.2011 10:54:30

RF Output Power, Middle Channel



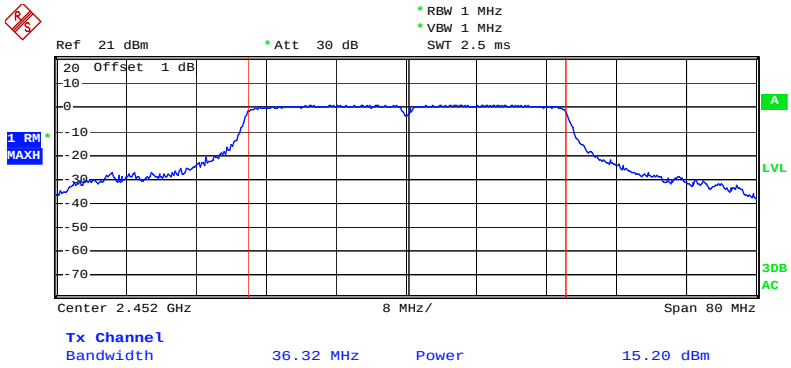
Date: 6.JAN.2011 11:01:48

99% Occupied Bandwith, High Channel



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

RF Output Power, High Channel



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	2010-11-24	2011-11-24

*** 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 Bruce Zhang on 2011-01-10

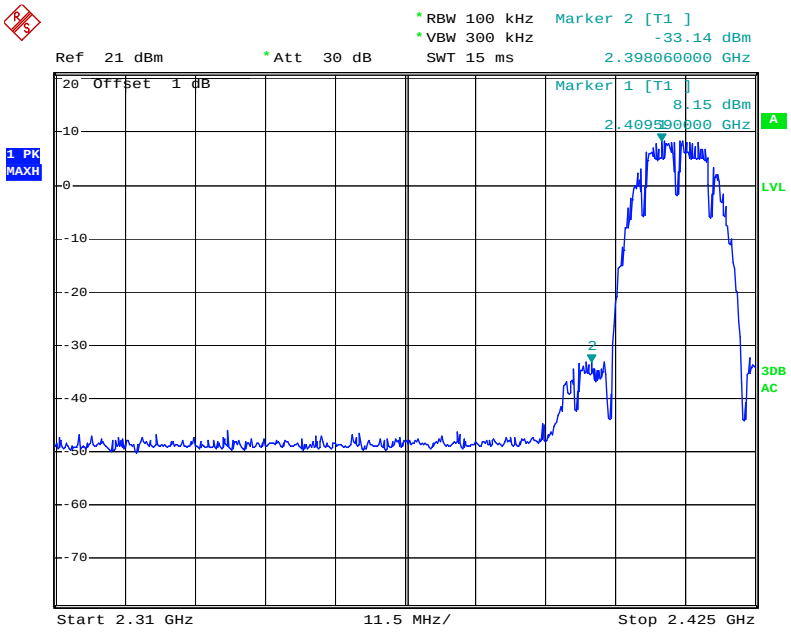
Test Result: *Compliant.*

Frequency (MHz)	Delta Peak to band emission (dBc)	Limit (dBc)
802.11b mode		
2398.06	41.29	20
2484	51.48	20
802.11g mode		
2399.9	29.64	20
2483.9	46.21	20

Frequency (MHz)	Delta Peak to band emission (dBc)			Limit (dBc)
802.11n-HT20 mode				
	Port 1	Port 2	Combine	
2399.9	29.54	30.51	29.92	20
2483.6	46.29	44.99	39.25	20
802.11n-HT40 mode				
	Port 1	Port 2	Combine	
2399.9	28.28	28.69	29.82	20
2485.42	38.91	34.71	35.97	20

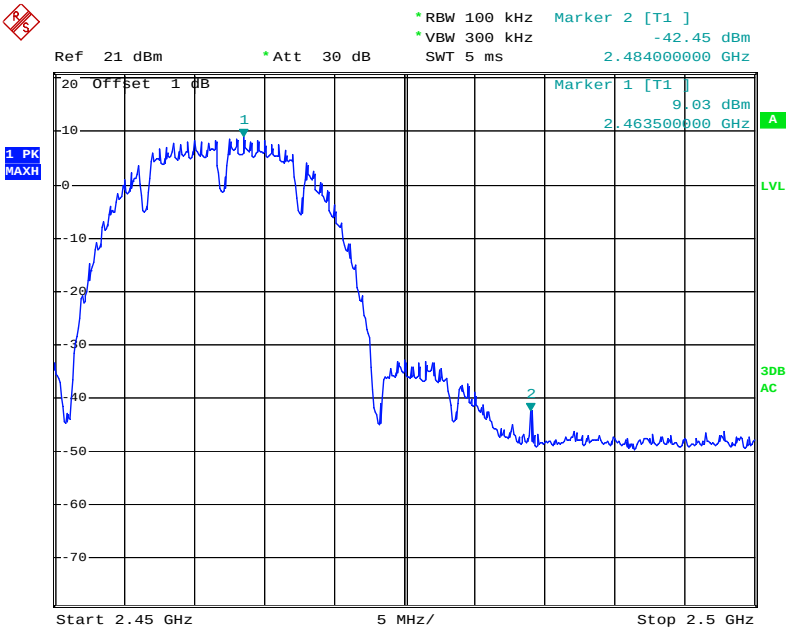
Please refer to following plots.

802.11b: Band Edge, Left Side



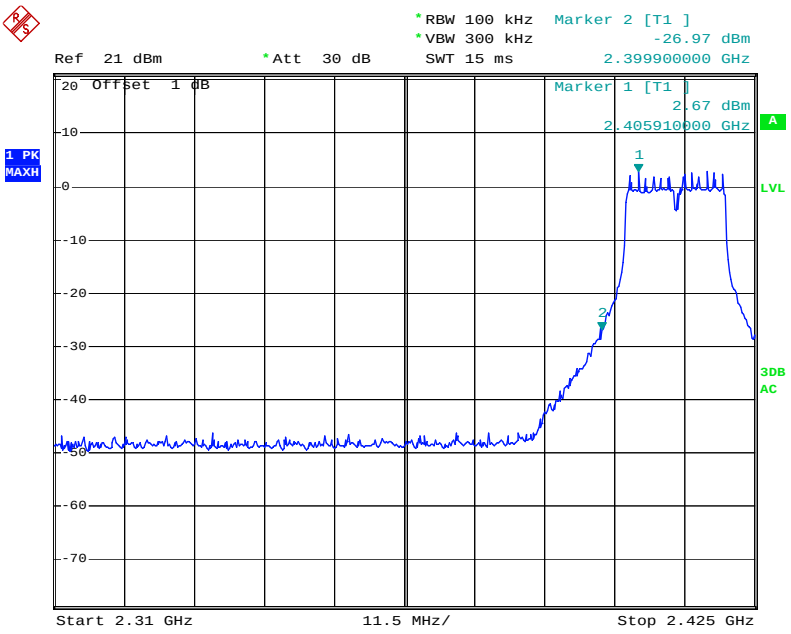
Date: 10.JAN.2011 14:33:44

802.11b: Band Edge, Right Side



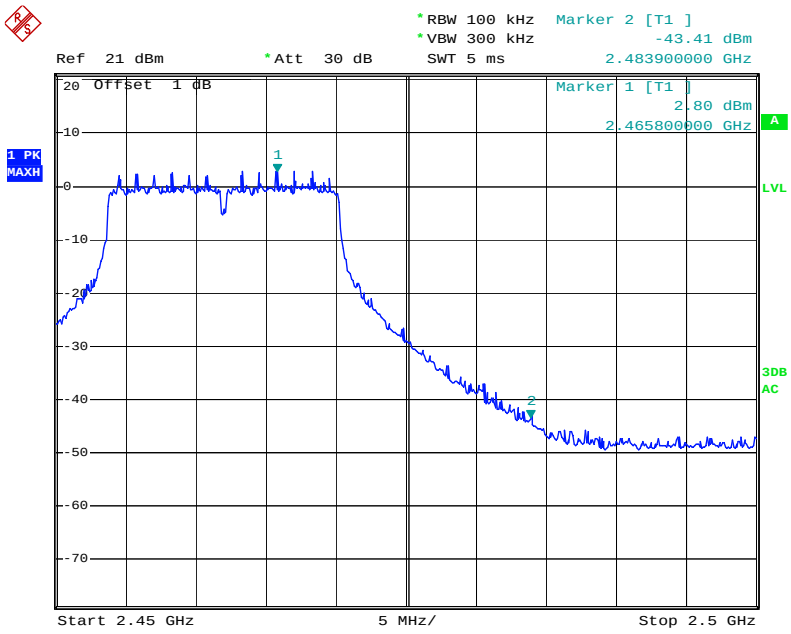
Date: 10.JAN.2011 14:34:50

802.11g: Band Edge, Left Side



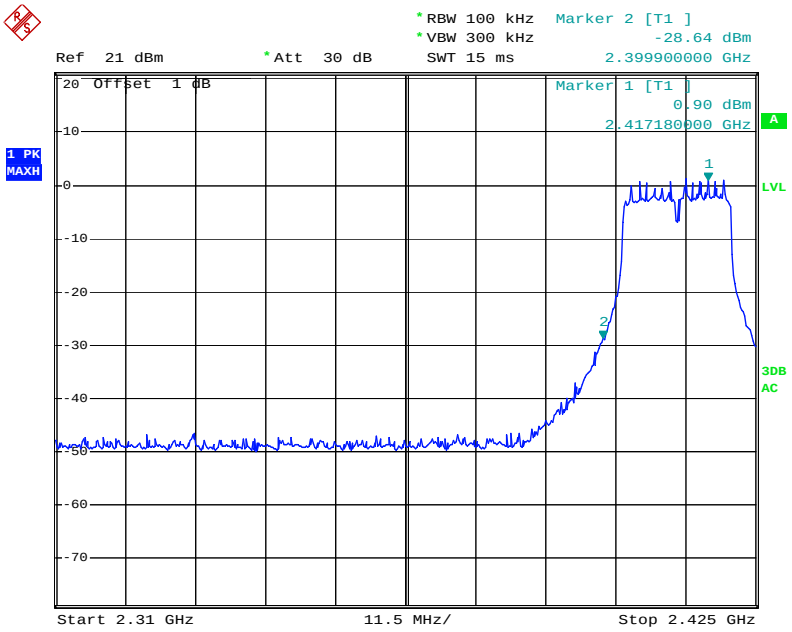
Date: 10.JAN.2011 14:38:57

802.11g: Band Edge, Right Side



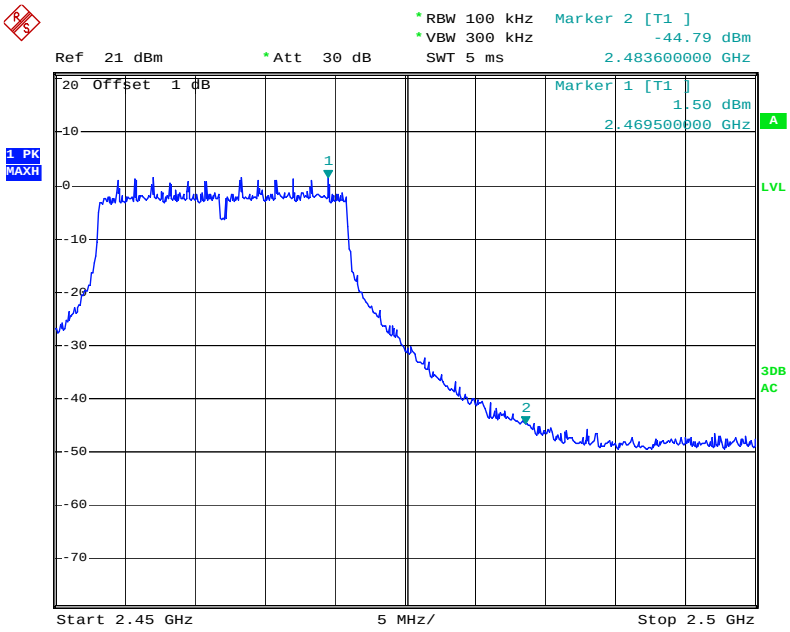
Date: 10.JAN.2011 14:37:37

802.11n-HT20 (Port 1): Band Edge, Left Side



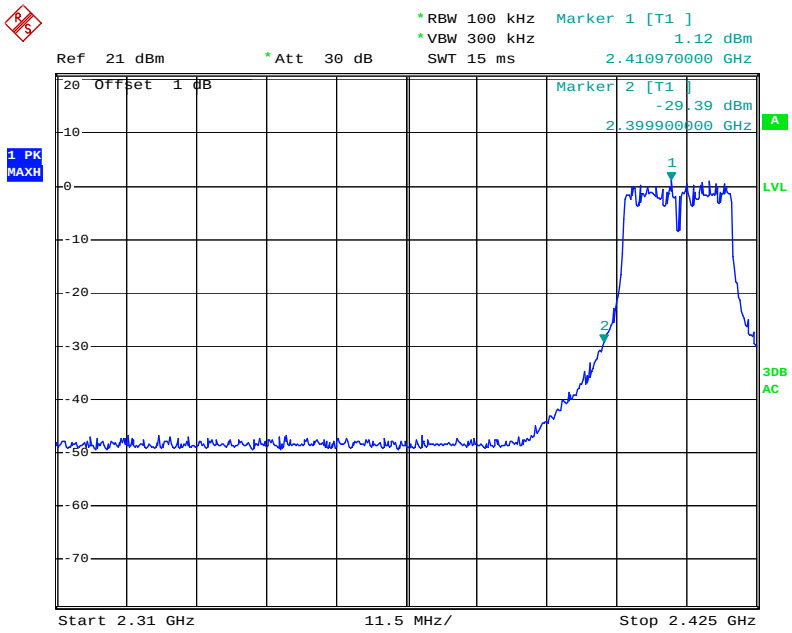
Date: 10.JAN.2011 14:25:00

802.11n-HT20 (Port 1): Band Edge, Right Side



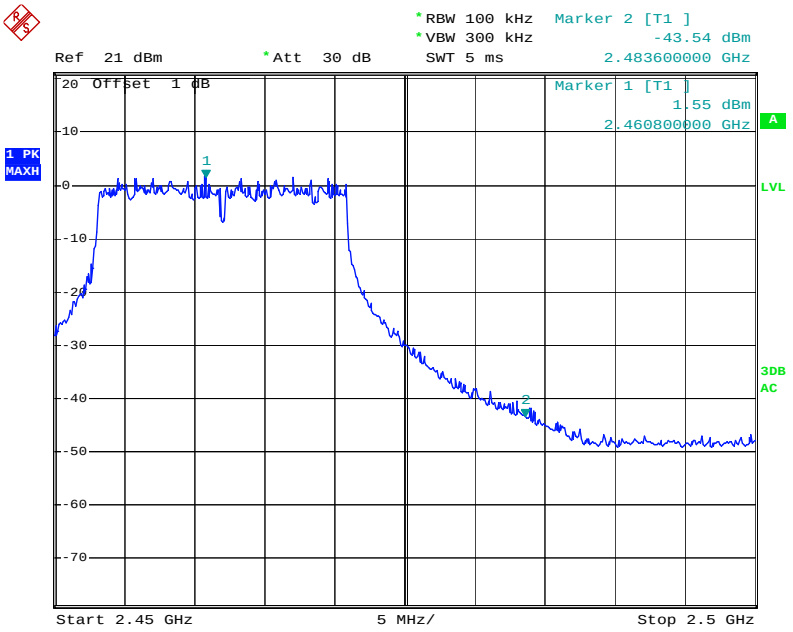
Date: 10.JAN.2011 14:26:43

802.11n-HT20 (Port 2): Band Edge, Left Side



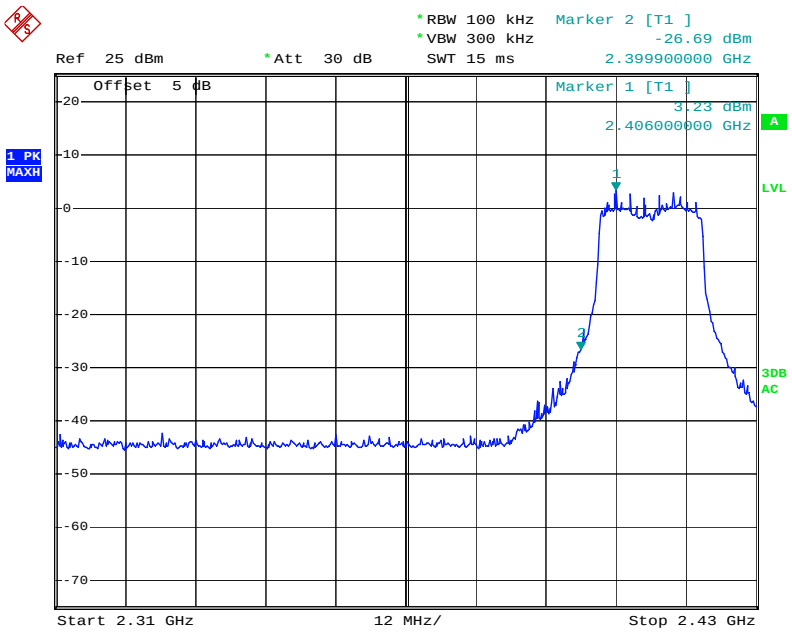
Date: 10.JAN.2011 14:03:02

802.11n-HT20 (Port 2): Band Edge, Right Side



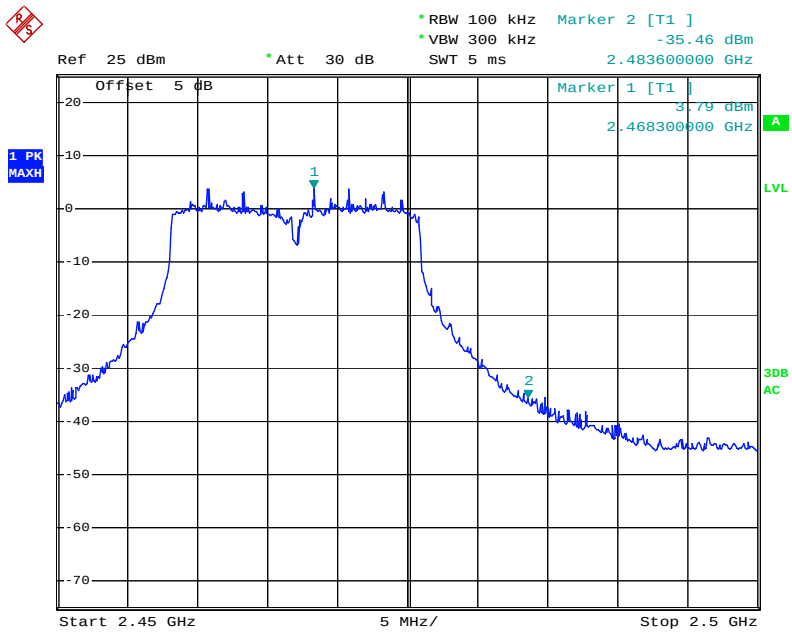
Date: 10.JAN.2011 14:05:27

802.11n-HT20 (Combine): Band Edge, Left Side



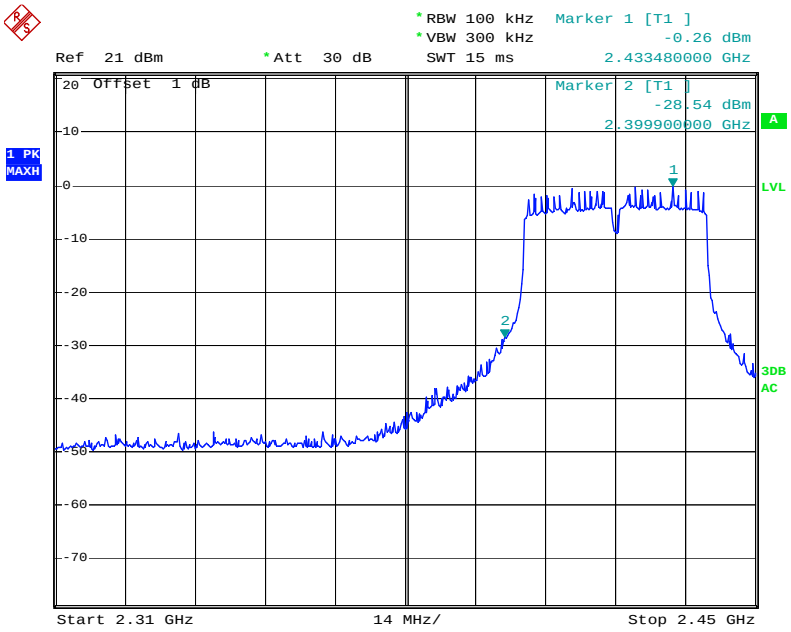
Date: 10.JAN.2011 13:51:04

802.11n-HT20 (Combine): Band Edge, Right Side



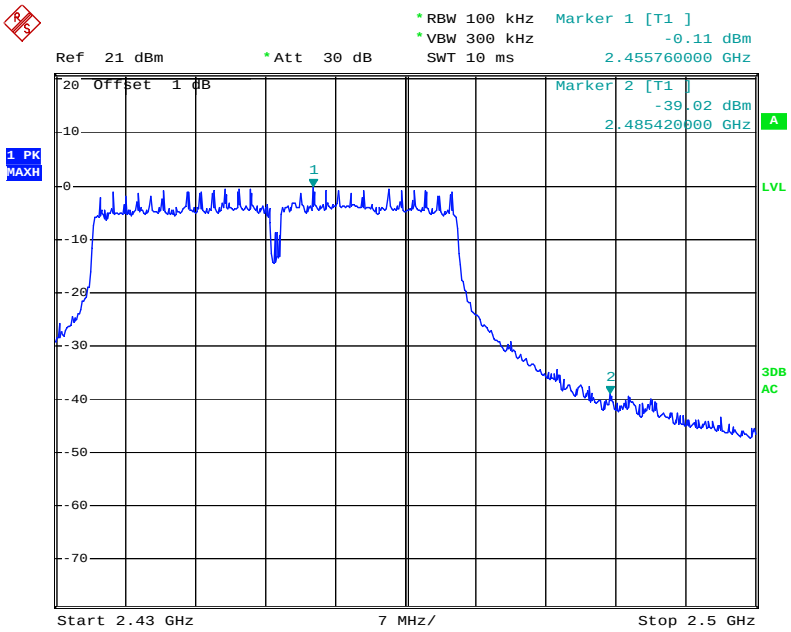
Date: 10.JAN.2011 13:53:07

802.11n-HT40 (Port 1): Band Edge, Left Side



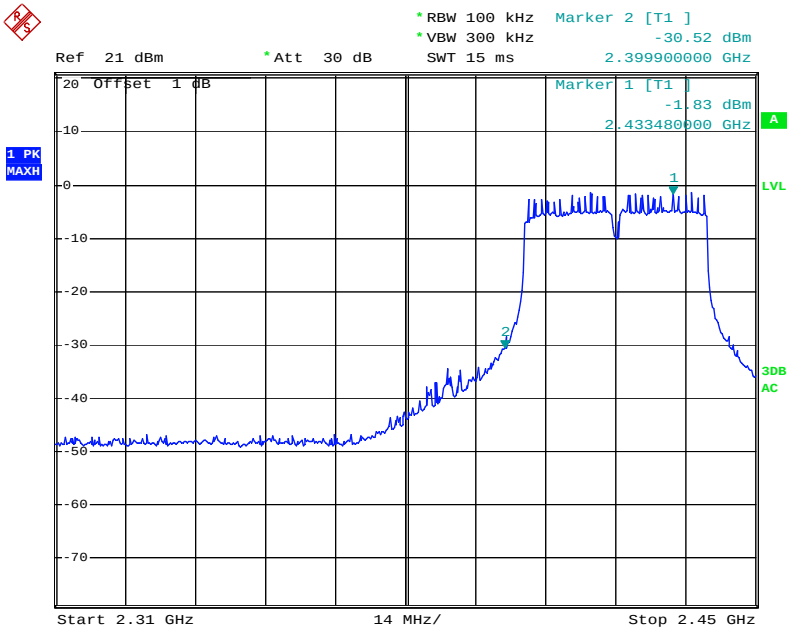
Date: 10.JAN.2011 14:18:34

802.11n-HT40 (Port 1): Band Edge, Right Side



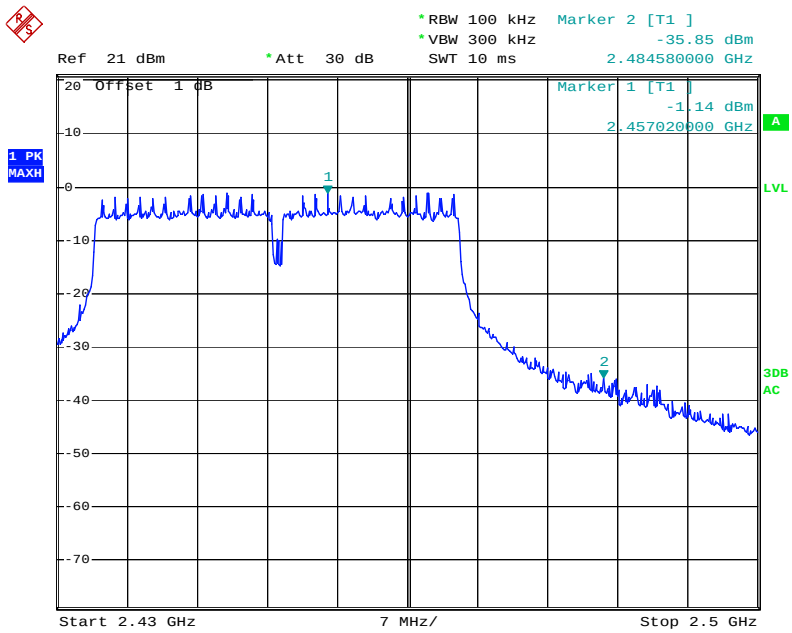
Date: 10.JAN.2011 14:13:57

802.11n-HT40 (Port 2): Band Edge, Left Side



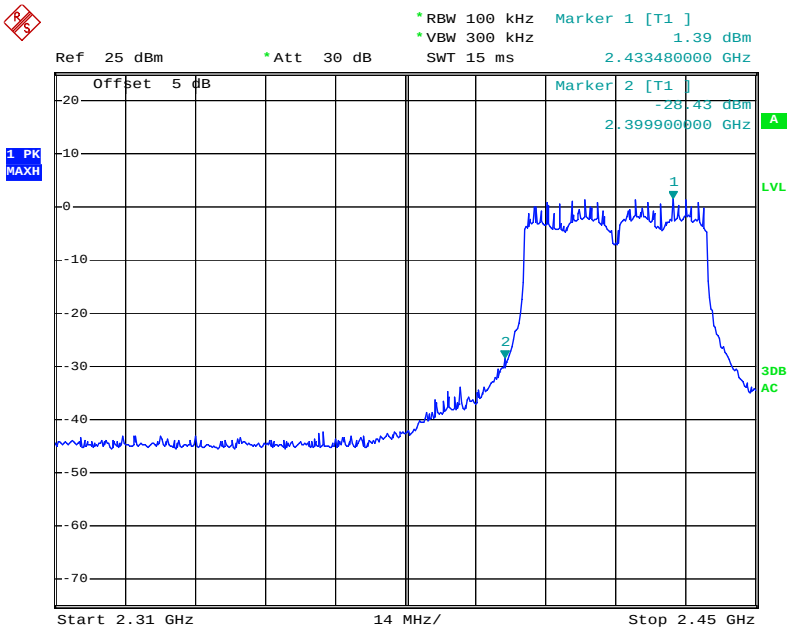
Date: 10.JAN.2011 14:00:48

802.11n-HT40 (Port 2): Band Edge, Right Side



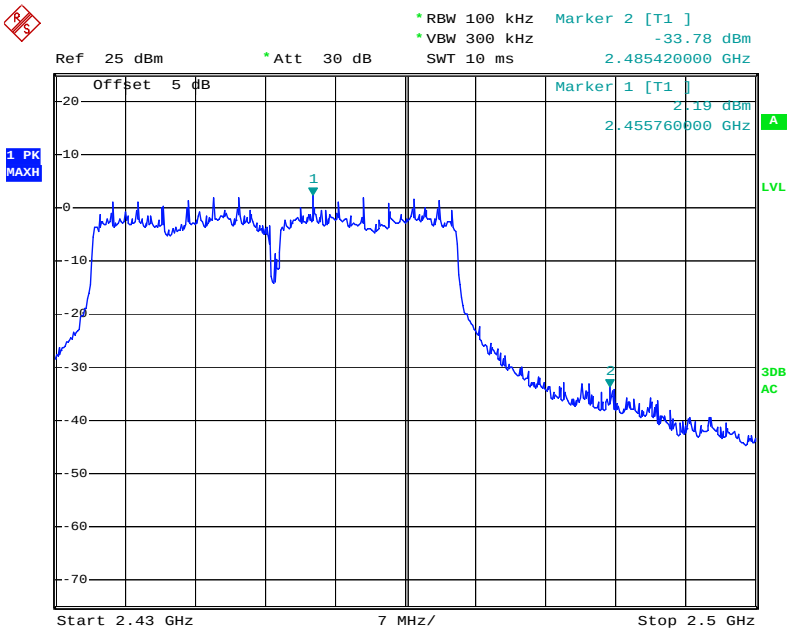
Date: 10.JAN.2011 14:12:06

802.11n-HT40 (Combine): Band Edge, Left Side



Date: 10.JAN.2011 13:57:23

802.11n-HT40 (Combine): Band Edge, Right Side



Date: 10.JAN.2011 13:55:10

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	2010-11-24	2011-11-24

*** 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 Bruce Zhang on 2011-01-04 to 2011-01-10

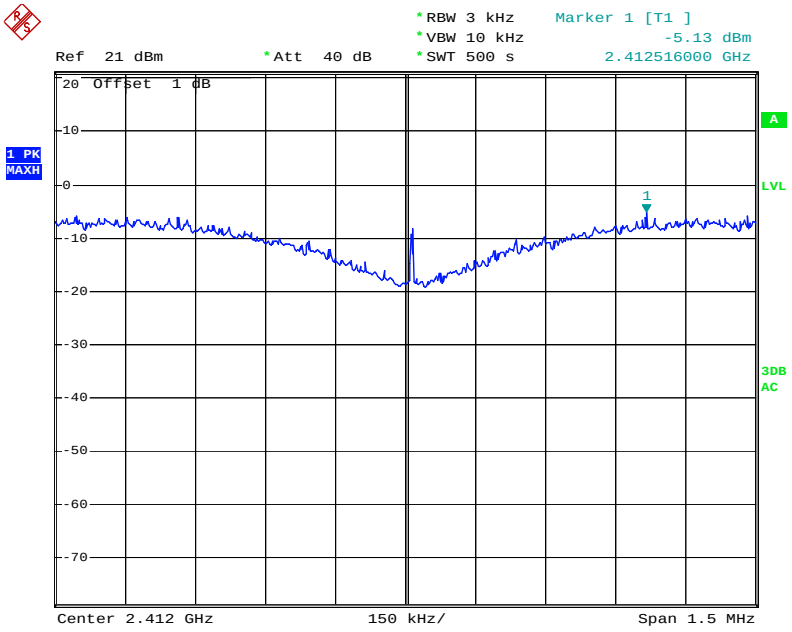
Test Mode: Transmitting

Test Result: Pass

Channel	Frequency (MHz)	Data Rate (Mbps)	PSD (dBm)	Limit (dBm)	Result
802.11b mode					
Low	2412	1	-5.13	8	Pass
Middle	2437	1	-4.52	8	Pass
High	2462	1	-4.20	8	Pass
802.11g mode					
Low	2412	6	-10.76	8	Pass
Middle	2437	6	-10.94	8	Pass
High	2462	6	-10.70	8	Pass

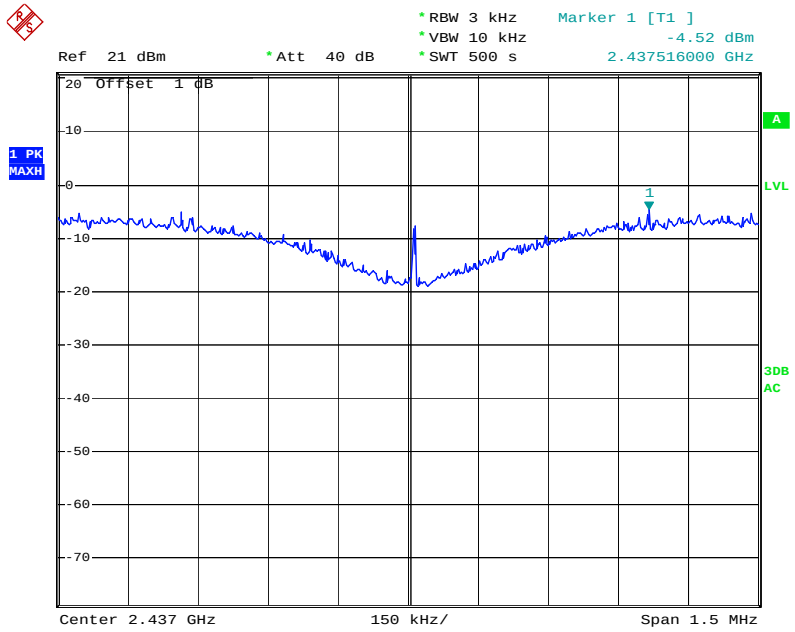
Channel	Frequency (MHz)	Data Rate (Mbps)	PSD (dBm)			Limit (dBm)	Result
			Port 1	Port 2	Total		
802.11n-HT20 mode							
Low	2412	6.5	-11.32	-11.72	-8.04	8	Pass
Middle	2437	6.5	-11.26	-10.86	-8.31	8	Pass
High	2462	6.5	-11.09	-10.32	-8.37	8	Pass
802.11n-HT40 mode							
			Port 1	Port 2	Combine		
Low	2422	13.5	-12.63	-13.67	-8.06	8	Pass
Middle	2437	13.5	-11.60	-12.29	-7.96	8	Pass
High	2452	13.5	-11.59	-12.94	-9.19	8	Pass

Power Spectral Density, 802.11b Low Channel



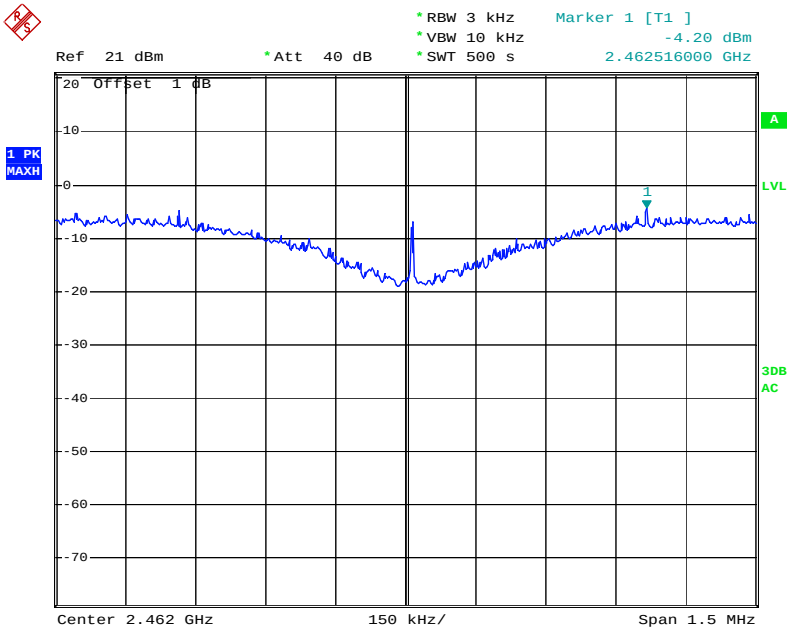
Date: 4.JAN.2011 15:54:33

Power Spectral Density, 802.11b Middle Channel



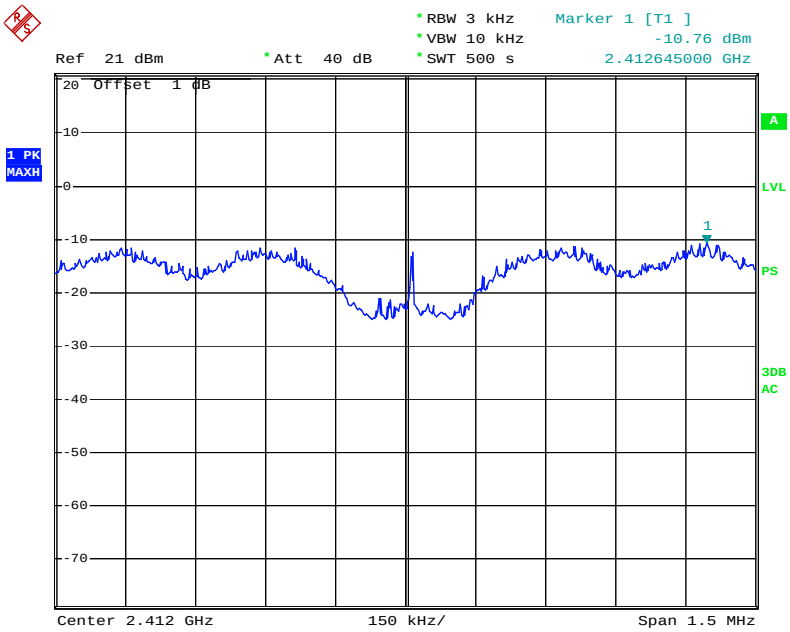
Date: 4.JAN.2011 16:21:43

Power Spectral Density, 802.11b High Channel



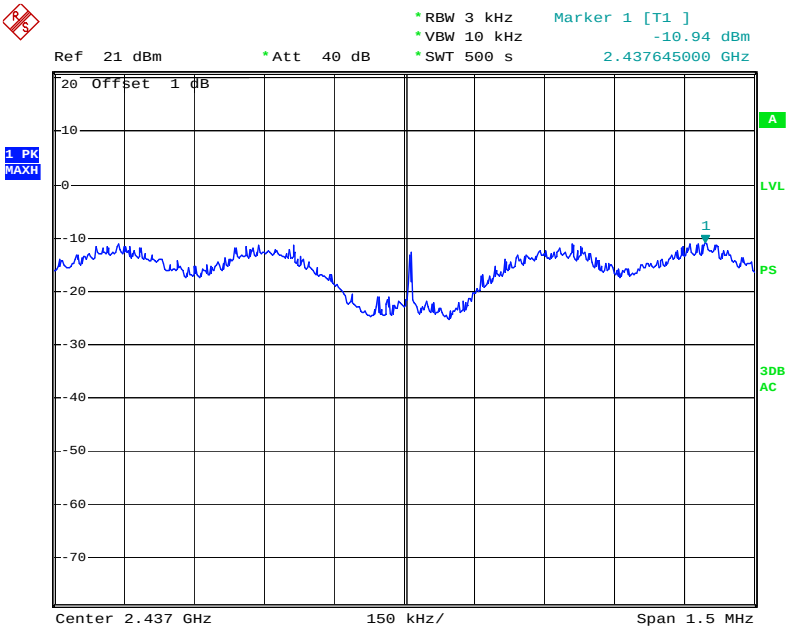
Date: 4.JAN.2011 16:45:55

Power Spectral Density, 802.11g Low Channel



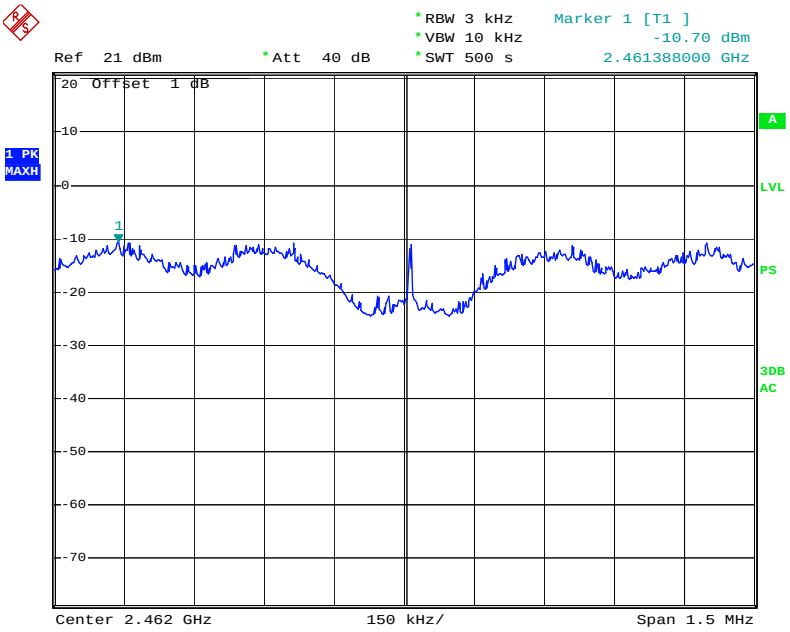
Date: 4.JAN.2011 14:26:45

Power Spectral Density, 802.11g Middle Channel



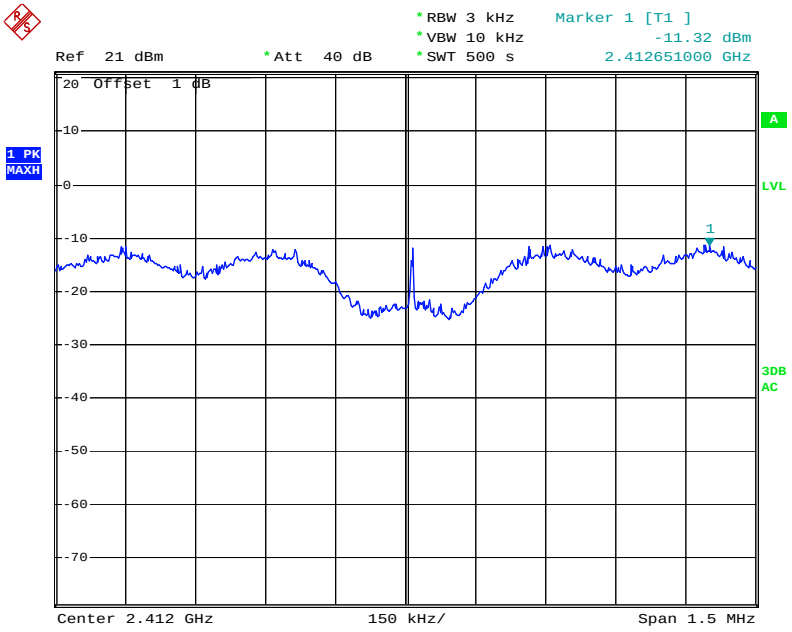
Date: 4.JAN.2011 14:43:53

Power Spectral Density, 802.11g High Channel



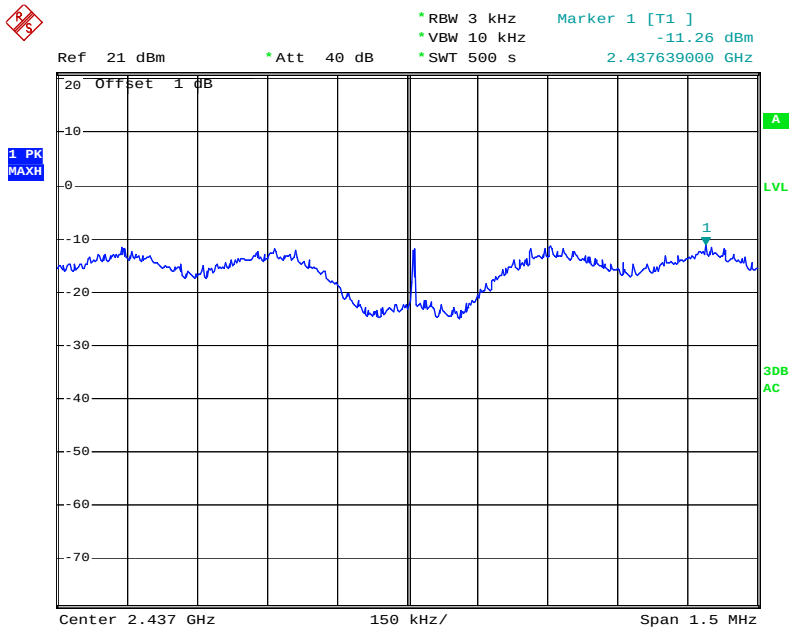
Date: 4.JAN.2011 15:06:44

Power Spectral Density, 802.11n-HT20 (Port 1) Low Channel



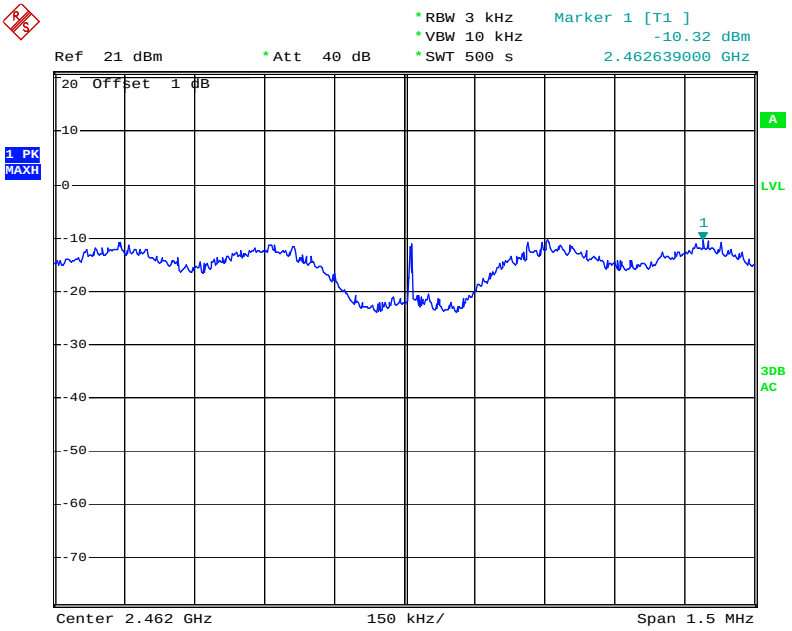
Date: 4.JAN.2011 17:58:26

Power Spectral Density, 802.11n-HT20 (Port 1) Middle Channel



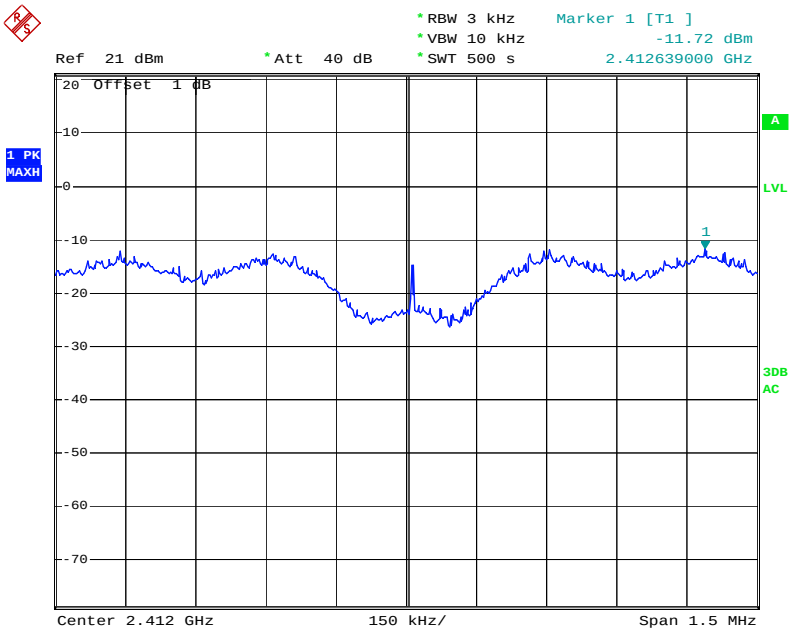
Date: 5.JAN.2011 11:20:35

Power Spectral Density, 802.11n-HT20 (Port 1) High Channel



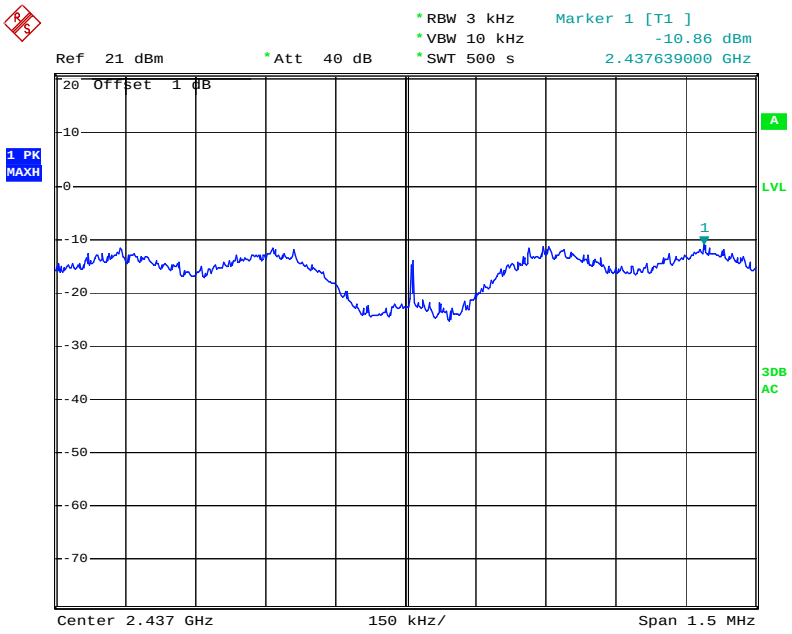
Date: 5.JAN.2011 14:01:02

Power Spectral Density, 802.11n-HT20 (Port 2) Low Channel



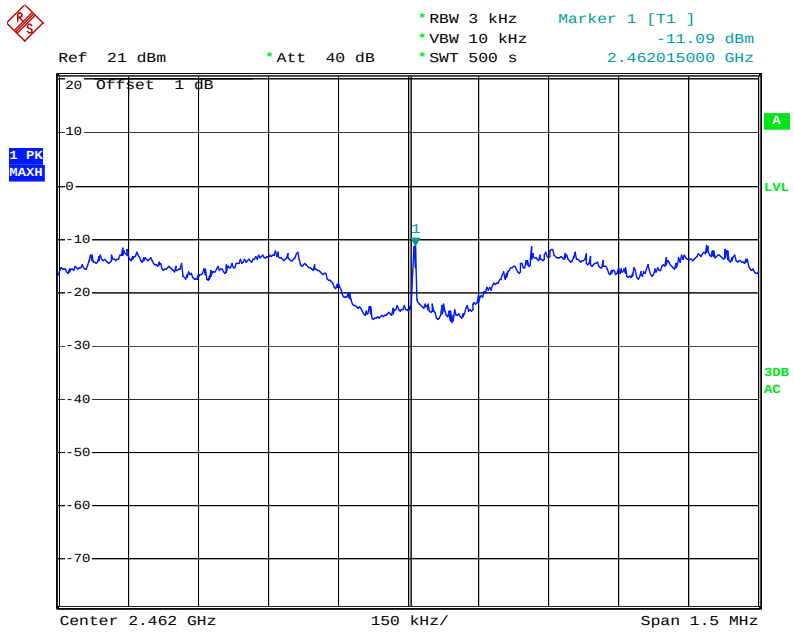
Date: 5.JAN.2011 16:43:15

Power Spectral Density, 802.11n-HT20 (Port 2) Middle Channel



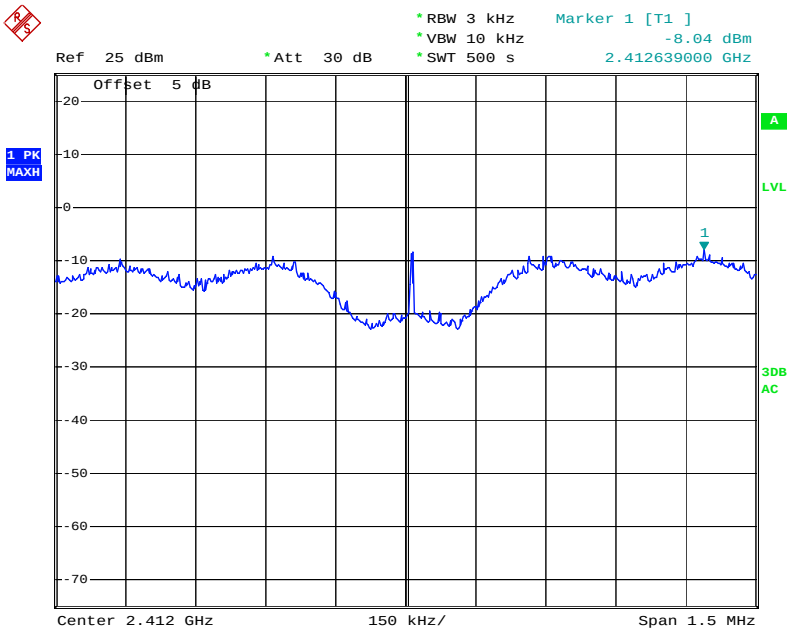
Date: 5.JAN.2011 17:15:56

Power Spectral Density, 802.11n-HT20 (Port 2) High Channel



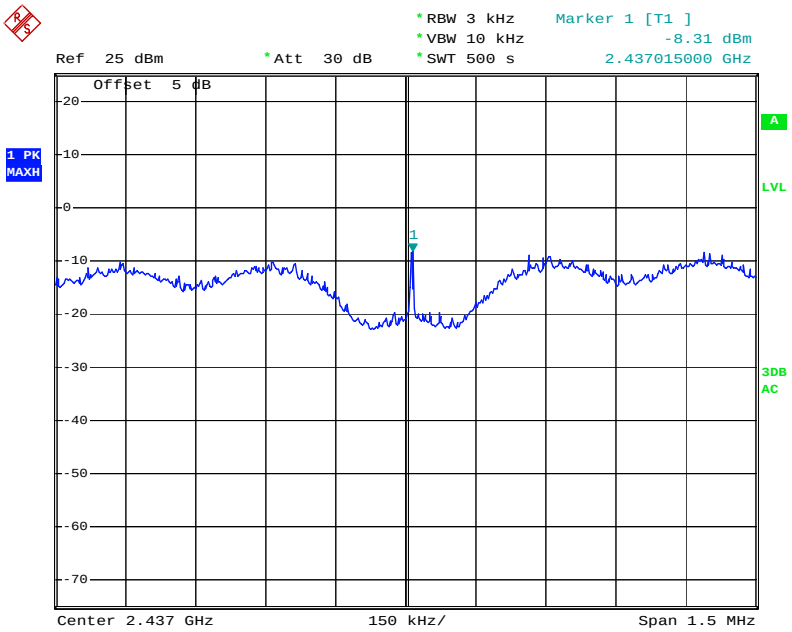
Date: 6.JAN.2011 09:49:38

Power Spectral Density, 802.11n-HT20 (Combine) Low Channel



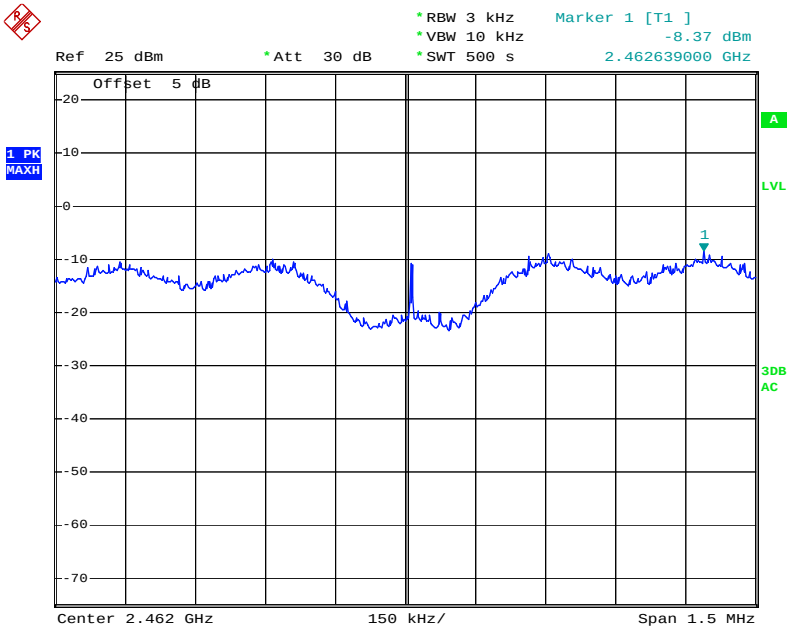
Date: 10.JAN.2011 10:58:00

Power Spectral Density, 802.11n-HT20 (Combine) Middle Channel



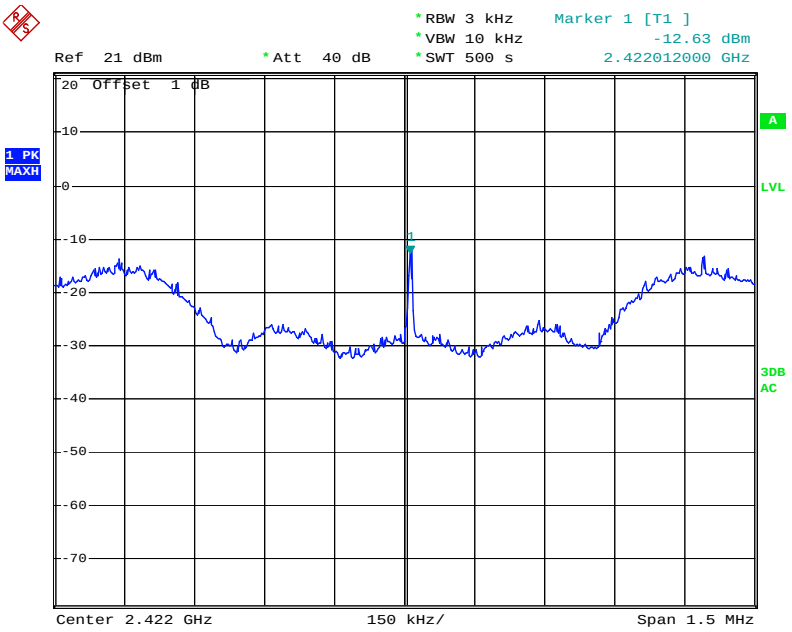
Date: 10.JAN.2011 10:23:43

Power Spectral Density, 802.11n-HT20 (Combine) High Channel



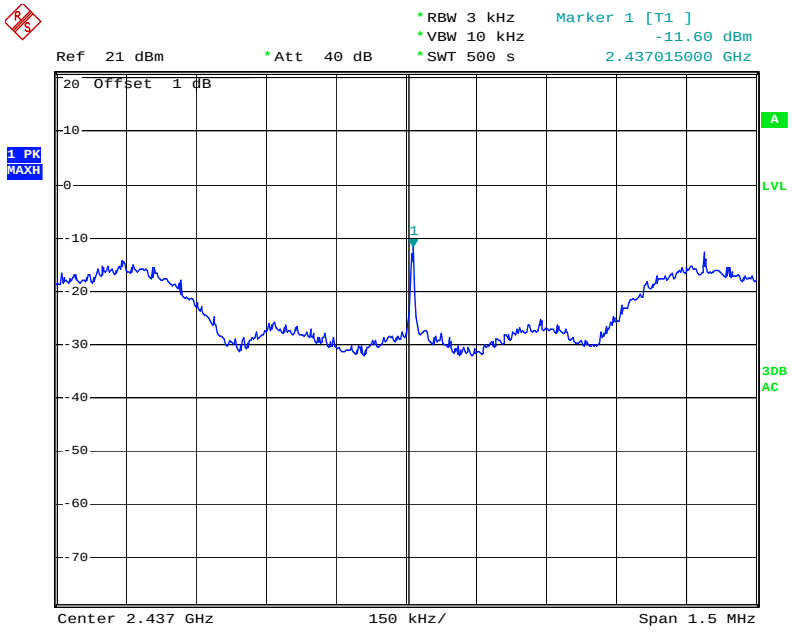
Date: 10.JAN.2011 10:45:37

Power Spectral Density, 802.11n-HT40 (Port 1) Low Channel



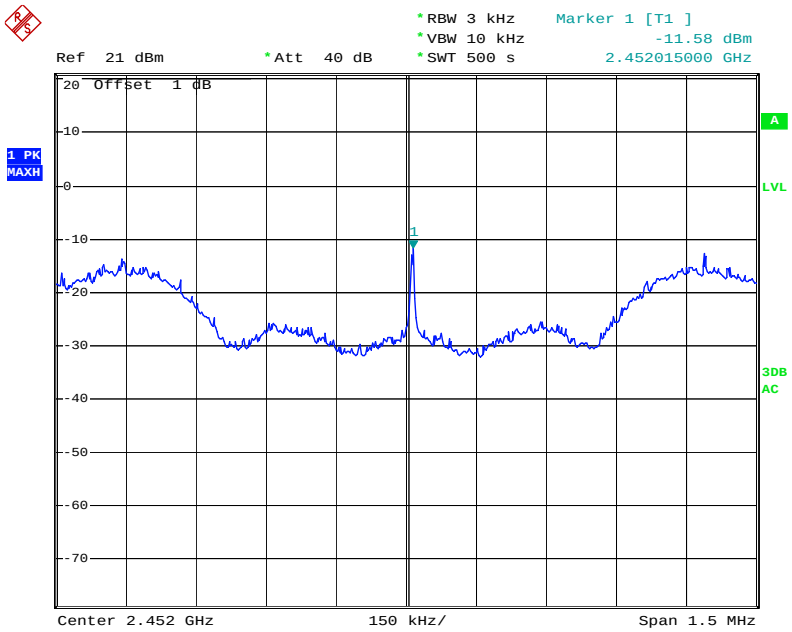
Date: 5.JAN.2011 14:23:17

Power Spectral Density, 802.11n-HT40 (Port 1) Middle Channel



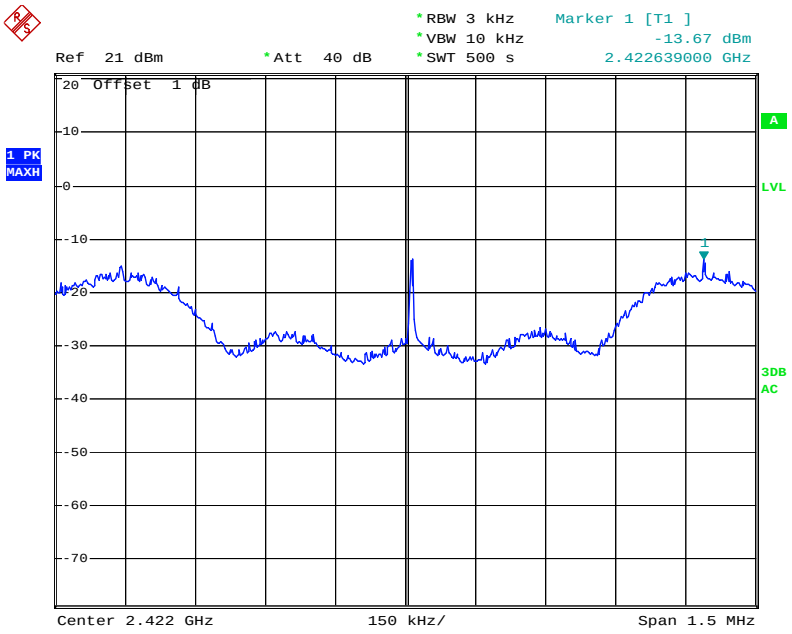
Date: 5.JAN.2011 15:07:34

Power Spectral Density, 802.11n-HT40 (Port 1) High Channel



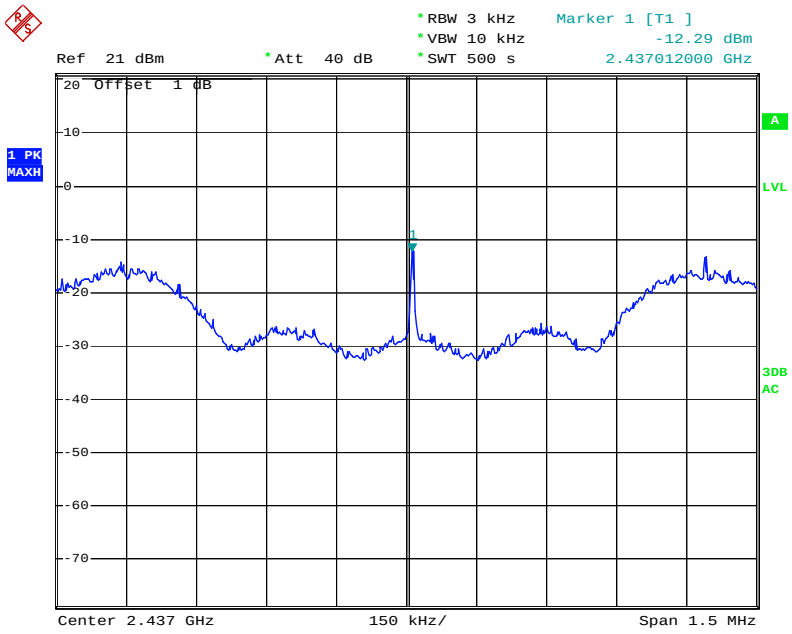
Date: 5.JAN.2011 16:13:00

Power Spectral Density, 802.11n-HT40 (Port 2) Low Channel



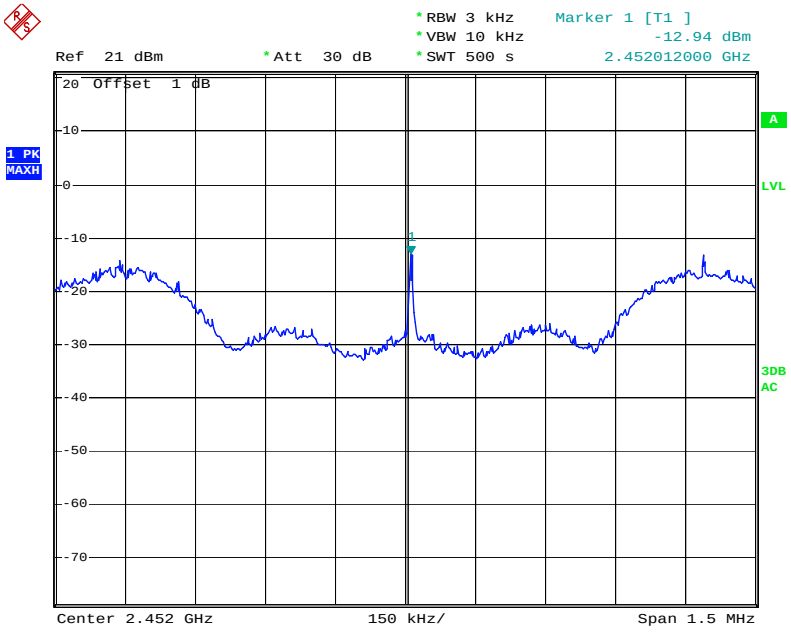
Date: 6.JAN.2011 10:43:13

Power Spectral Density, 802.11n-HT40 (Port 2) Middle Channel



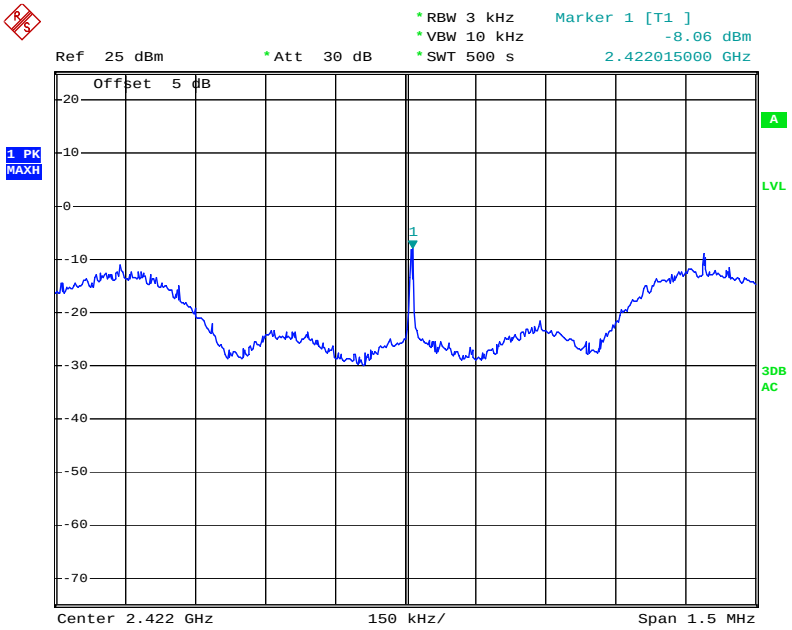
Date: 6.JAN.2011 11:22:24

Power Spectral Density, 802.11n-HT40 (Port 2) High Channel



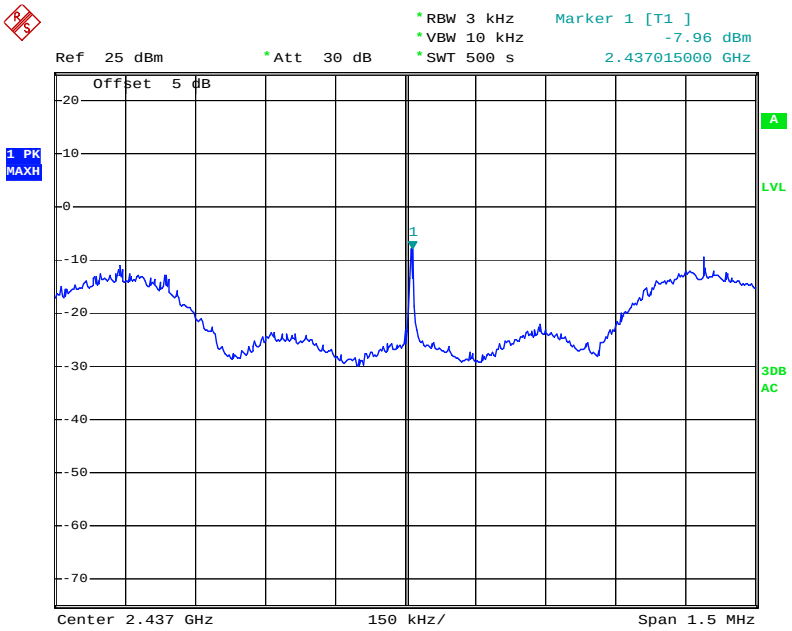
Date: 10.JAN.2011 09:43:10

Power Spectral Density, 802.11n-HT40 (Combine) Low Channel



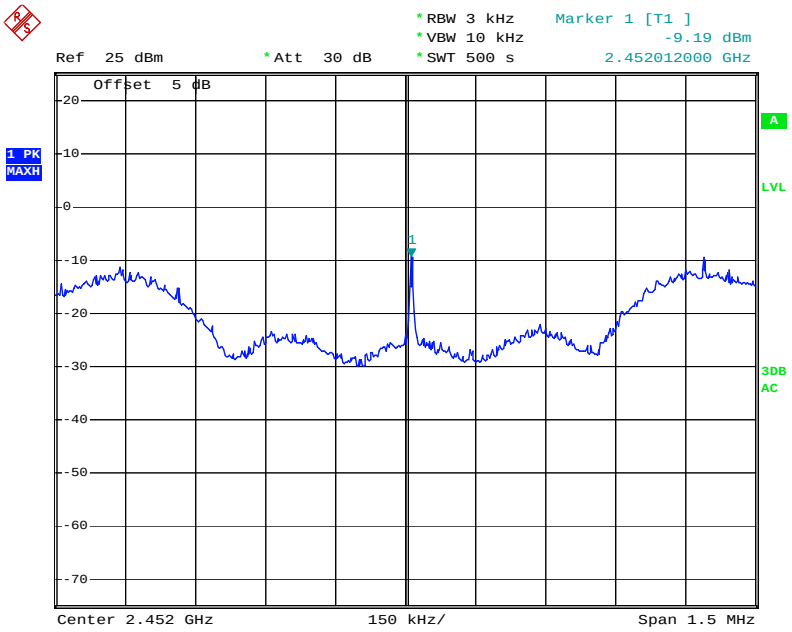
Date: 10.JAN.2011 11:08:26

Power Spectral Density, 802.11n-HT40 (Combine) Middle Channel



Date: 10.JAN.2011 11:29:45

Power Spectral Density, 802.11n-HT40 (Combine) High Channel



Date: 10.JAN.2011 11:52:08

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