



FCC PART 15.247

TEST REPORT

For

Deliberant LLC

138 Mountain Brook Dr., Canton, GA 30115, USA

FCC ID: UB8-APC2M14

| | |
|--|--|
| Report Type: Original Report | Product Type: Broadband Digital Transmission System |
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| Report Number: RSZ110623007-00 | |
| Report Date: 2011-09-13 | |
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* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Deliberant LLC*'s product, model number: APC 2M-14 (FCC ID: UB8-APC2M14) (the "EUT") in this report is a *Broadband Digital Transmission System*, which was measured approximately: 20.5 cm (L) x 20.5 cm (W) x 4.5 cm (H), rated input voltage: DC 18 V adapter.

Adapter information:

Model: VA16A-180100

Input: AC 100-240V, 50-60 Hz

Output: DC 18V, 1.0A

** All measurement and test data in this report was gathered from production sample serial number: 0101104700000019 (Assigned by applicant). The EUT was received on 2011-06-23.*

Objective

This report is prepared on behalf of *Deliberant LLC* in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine 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.

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

Test Facility

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

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

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

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



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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b 802.11g and 802.11n-HT20 mode, 11 channels are provided to testing, 802.11n-HT40 7 channels are provided to testing.

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

EUT for 802.11b 802.11g & 802.11n-HT20 mode were tested with Channel 1, 6 and 11. 802.11n-HT40 mode was tested with channel 3, 6 and 9.

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

EUT Exercise Software

QA_RT3052 V1.0.1.9

The test was performed under:

802.11b: Data rate: 1 Mbps.

802.11g: Data rate: 6 Mbps.

802.11n-HT20: Data rate: 6.5 Mbps

802.11n-HT40: Data rate: 6.5 Mbps

Equipment Modifications

No modification was made to the unit tested.

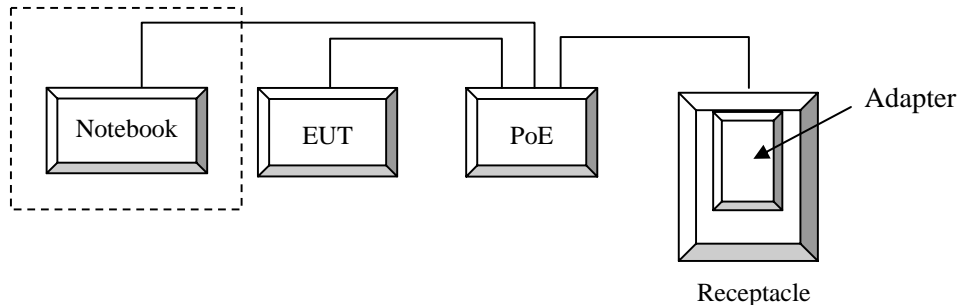
Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|-------|-------------------|
| DELL | Notebook | D600 | 00045-438-852-864 |

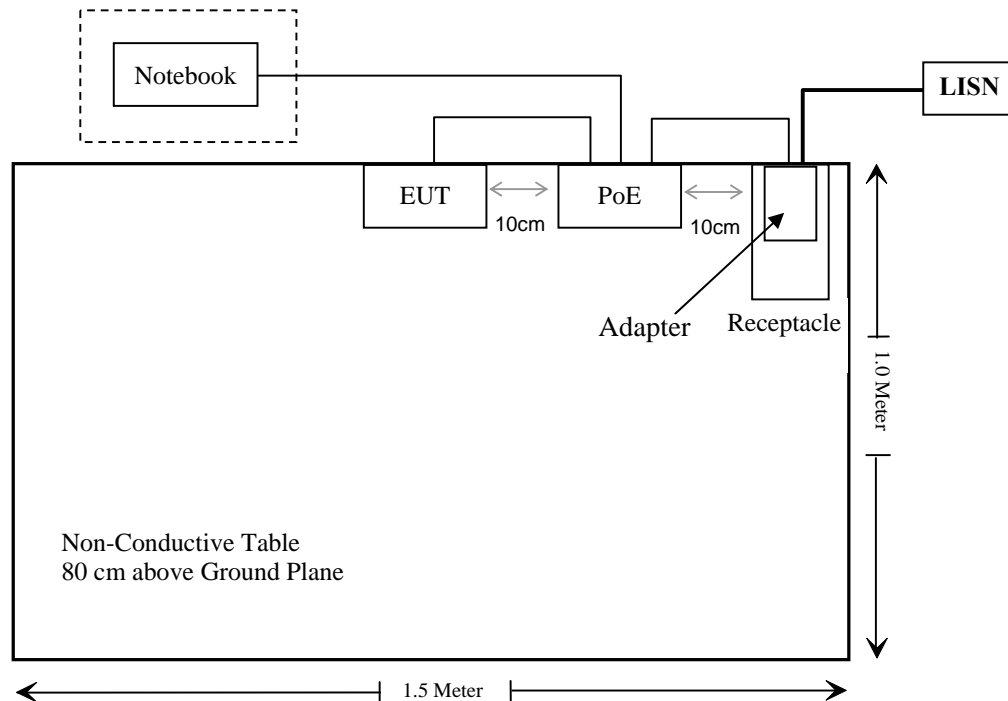
External I/O Cable

| Cable Description | Length (m) | From Port | To |
|-----------------------------------|------------|-----------|-----|
| Unshielded Detachable Power Cable | 1.75 | Adapter | PoE |

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §15.247 (i) & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

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

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

f = frequency in MHz;

* = Plane-wave equivalent power density;

MPE Calculation

Predication of MPE limit at a given distance

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

Where: S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

| Mode | Frequency (MHz) | Antenna Gain | | Conducted Power | | Evaluation Distance (cm) | Power Density (mW/cm²) | MPE Limit (mW/cm²) |
|-------------|------------------------|---------------------|------------------|------------------------|-------------|---------------------------------|--|--------------------------------------|
| | | (dBi) | (numeric) | (dBm) | (mW) | | | |
| 802.11b | 2462 | 14.0 | 25.12 | 15.50 | 35.48 | 20 | 0.177 | 1.0 |
| 802.11g | 2462 | 14.0 | 25.12 | 13.31 | 21.43 | 20 | 0.107 | 1.0 |
| 802.11n20 | 2412 | 14.0 | 25.12 | 15.53 | 35.73 | 20 | 0.179 | 1.0 |
| 802.11n40 | 2422 | 14.0 | 25.12 | 16.21 | 41.78 | 20 | 0.209 | 1.0 |

Result: The device meets FCC 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 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 is professionally installed equipment with an integrated 14 dBi panel antenna, which in accordance to section 15.203, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

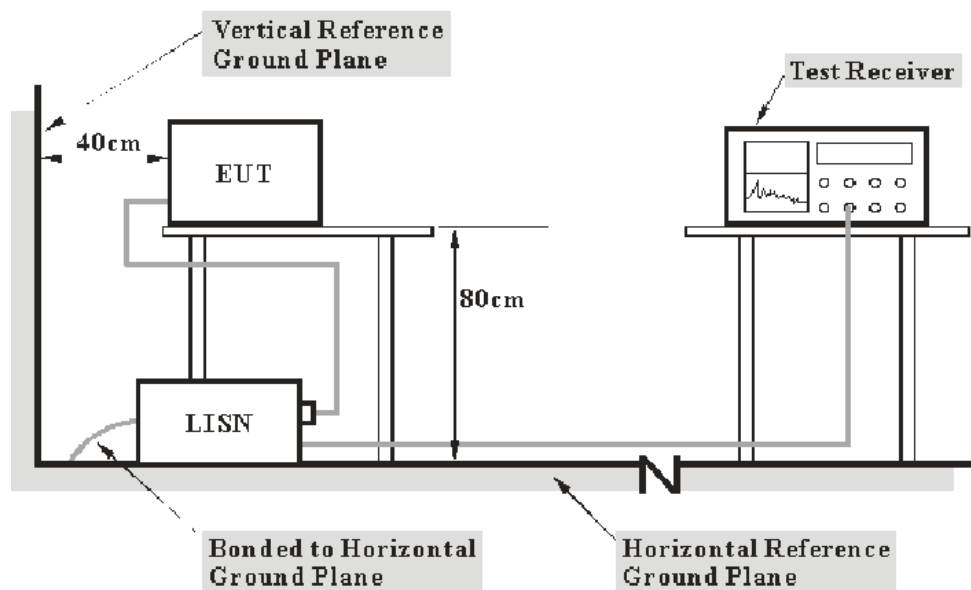
FCC §15.207

Measurement Uncertainty

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

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

EUT Setup



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

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

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

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Test Equipment List and Details

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

* **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 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:

15.06 dB at 0.390 MHz in the Neutral conducted mode

Test Data

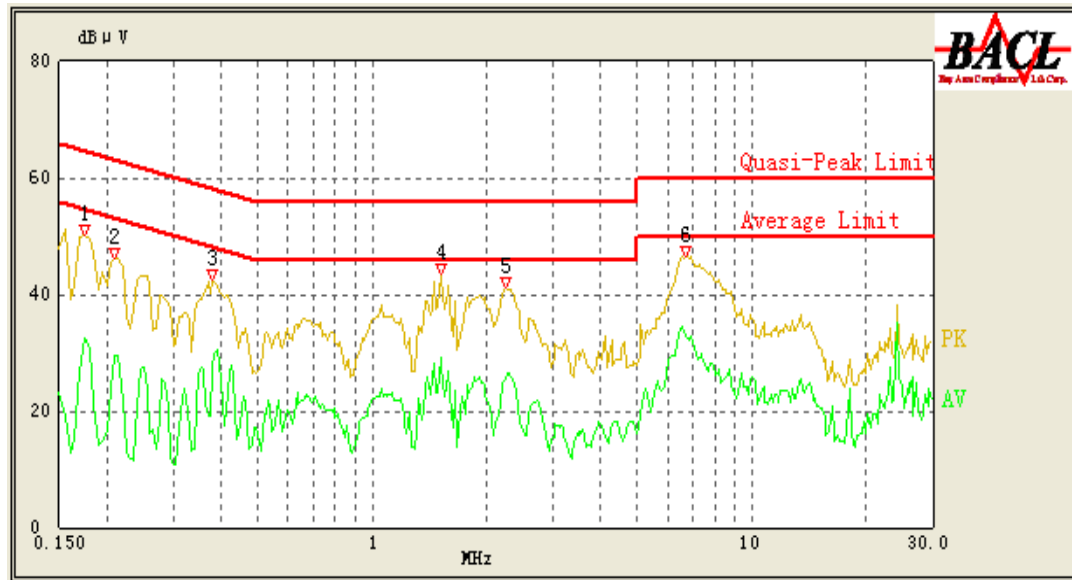
Environmental Conditions

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

The testing was performed by Bruce Zhang on 2011-07-28.

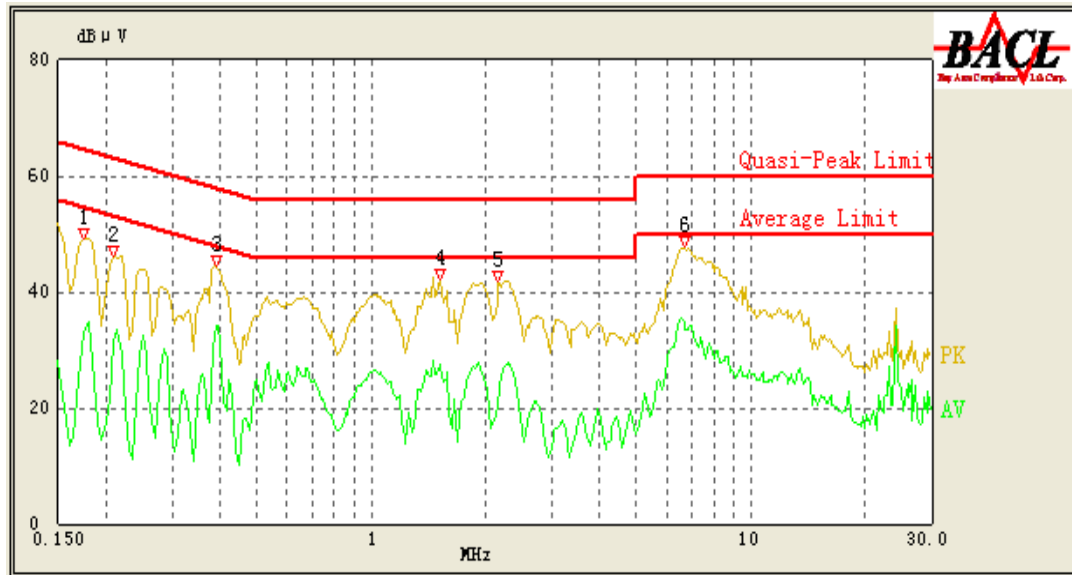
Test Mode: Transmitting

120 V, 60 Hz, Line:



| Conducted Emissions | | | FCC Part 15.207 | | |
|---------------------|-------------------------|------------------------|-----------------|-------------|-----------------------|
| Frequency (MHz) | Corrected Result (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/QP/Ave.) |
| 1.520 | 29.05 | 10.10 | 46.00 | 16.95 | Ave. |
| 1.520 | 38.71 | 10.10 | 56.00 | 17.29 | QP |
| 6.735 | 32.52 | 10.10 | 50.00 | 17.48 | Ave. |
| 0.175 | 46.98 | 10.10 | 65.29 | 18.31 | QP |
| 2.250 | 37.23 | 10.10 | 56.00 | 18.77 | QP |
| 2.265 | 26.30 | 10.10 | 46.00 | 19.70 | Ave. |
| 6.720 | 40.19 | 10.10 | 60.00 | 19.81 | QP |
| 0.380 | 39.26 | 10.10 | 59.43 | 20.17 | QP |
| 0.210 | 43.08 | 10.10 | 64.29 | 21.21 | QP |
| 0.380 | 27.44 | 10.10 | 49.43 | 21.99 | Ave. |
| 0.175 | 32.40 | 10.10 | 55.29 | 22.89 | Ave. |
| 0.210 | 29.47 | 10.10 | 54.29 | 24.82 | Ave. |

120V, 60 Hz, Neutral:



| Conducted Emissions | | | FCC Part 15.207 | | |
|---------------------|-------------------------|------------------------|-----------------|-------------|-----------------------|
| Frequency (MHz) | Corrected Result (dBμV) | Correction Factor (dB) | Limit (dBμV) | Margin (dB) | Detector (PK/QP/Ave.) |
| 0.390 | 34.08 | 10.10 | 49.14 | 15.06 | Ave. |
| 6.670 | 34.74 | 10.10 | 50.00 | 15.26 | Ave. |
| 0.390 | 41.96 | 10.10 | 59.14 | 17.18 | QP |
| 1.520 | 38.57 | 10.10 | 56.00 | 17.43 | QP |
| 6.700 | 41.60 | 10.10 | 60.00 | 18.40 | QP |
| 1.520 | 27.52 | 10.10 | 46.00 | 18.48 | Ave. |
| 2.160 | 36.64 | 10.10 | 56.00 | 19.36 | QP |
| 0.175 | 45.65 | 10.10 | 65.29 | 19.64 | QP |
| 0.175 | 32.98 | 10.10 | 55.29 | 22.31 | Ave. |
| 0.210 | 41.76 | 10.10 | 64.29 | 22.53 | QP |
| 2.175 | 23.40 | 10.10 | 46.00 | 22.60 | Ave. |
| 0.210 | 31.44 | 10.10 | 54.29 | 22.85 | Ave. |

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

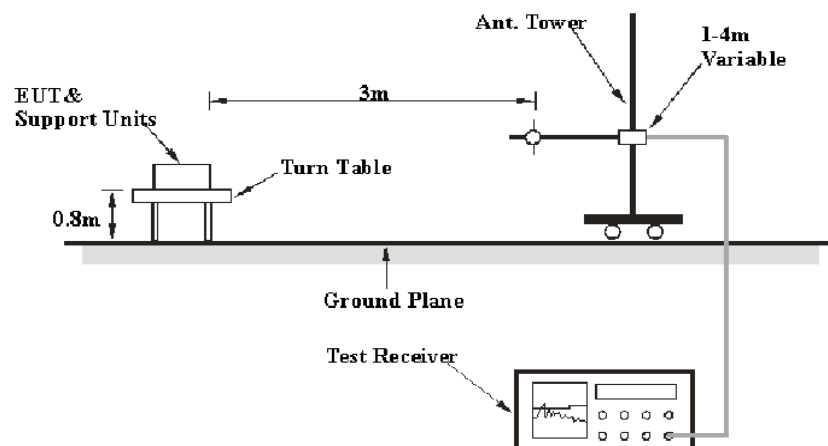
Measurement Uncertainty

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

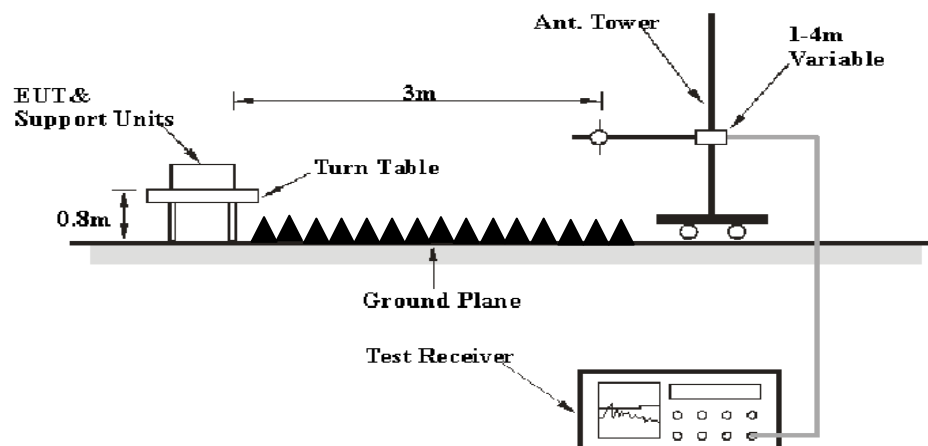
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB(k=2, 95% level of confidence) .

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2003. 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 adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

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

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

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

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-------------------|----------|---------------|------------------|----------------------|
| HP | Amplifier | HP8447D | 2944A09795 | 2011-08-02 | 2012-08-01 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100035 | 2010-11-11 | 2011-11-10 |
| Sunol Sciences | Broadband Antenna | JB1 | A040904-1 | 2011-03-11 | 2012-03-10 |
| HP | Amplifier | ZVA-213+ | T-E27H | 2011-03-08 | 2012-03-07 |
| Sunol Sciences | Horn Antenna | DRH-118 | A052604 | 2011-05-05 | 2012-05-04 |
| Rohde & Schwarz | Spectrum Analyzer | FSEM30 | 849720/019 | 2011-07-08 | 2012-07-07 |

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

Test Results Summary

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

Below 1 GHz:

4.3 dB at 104.754500 MHz in the Horizontal polarization

Above 1 GHz:

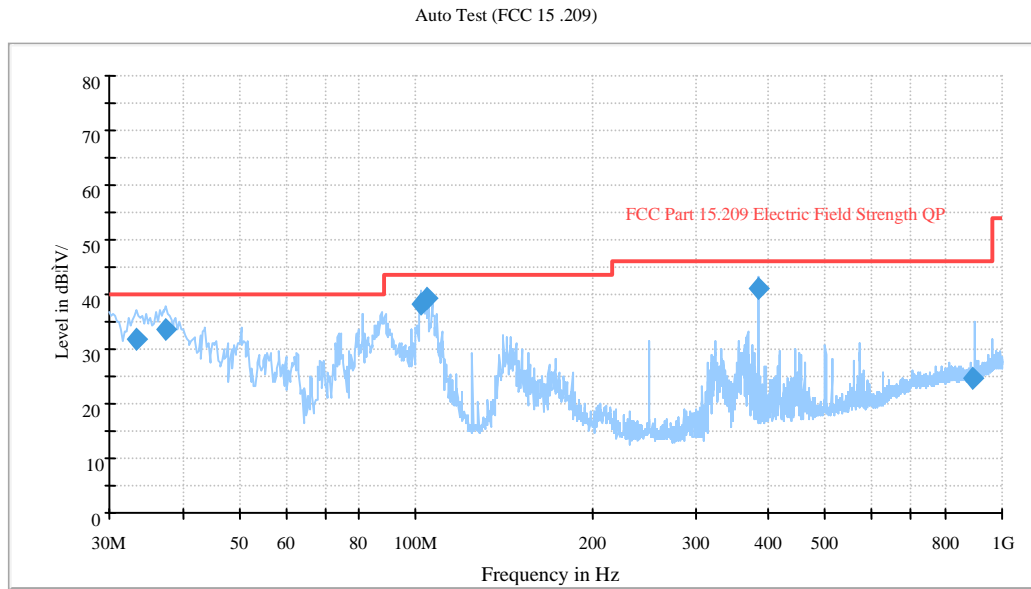
0.14 dB at 4874.00 MHz in the Vertical polarization for 802.11b mode

Test Data

Environmental Conditions

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

The testing was performed by Bruce Zhang on 2011-08-07.

1) Below 1 GHz:*Test Mode: Transmitting*

| Frequency (MHz) | Corrected Amplitude (dBµV/m) | Ant. Height (cm) | Ant. Polarity (H/V) | Turntable Position (degree) | Limit (dBµV/m) | Margin (dB) |
|-----------------|------------------------------|------------------|---------------------|-----------------------------|----------------|-------------|
| 104.754500 | 39.2 | 263.0 | H | 6.0 | 43.5 | 4.3 |
| 383.977000 | 41.0 | 100.0 | H | 239.0 | 46.0 | 5.0 |
| 101.894000 | 38.4 | 301.0 | H | 24.0 | 43.5 | 5.1 |
| 37.509000 | 33.6 | 100.0 | V | 341.0 | 40.0 | 6.4 |
| 33.446000 | 31.7 | 100.0 | V | 0.0 | 40.0 | 8.3 |
| 891.228750 | 24.6 | 333.0 | V | 135.0 | 46.0 | 25.4 |

2) Above 1 GHz

802.11b Mode:

| Indicated | | Detector (PK/Ave.) | Table Angle Degree | Antenna | | Correction Factor | | | FCC Part 15.247/15.209 | | | |
|---------------------------|---------------------------|-----------------------|--------------------------|---------------|----------------|--------------------------|-----------------------|--------------------------|---------------------------|-------------------|----------------|----------|
| Frequency (MHz) | S.A. Reading (dBμV) | | | Height (m) | Polar (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Comment |
| Low Channel (2412 MHz) | | | | | | | | | | | | |
| 4824 | 39.69 | Ave. | 310 | 1.0 | H | 36.6 | 4.3 | 26.75 | 58.84 | 54 | 0.16* | harmonic |
| 4824 | 39.64 | Ave. | 310 | 1.0 | V | 35.4 | 4.3 | 26.75 | 52.59 | 54 | 1.41* | harmonic |
| 2389 | 44.20 | Ave. | 0 | 1.1 | V | 30.6 | 2.98 | 26.83 | 50.95 | 54 | 3.05* | spurious |
| 2389 | 62.88 | PK | 0 | 1.1 | V | 30.6 | 2.98 | 26.83 | 69.63 | 74 | 4.37 | spurious |
| 2385.5 | 31.36 | Ave. | 30 | 1.3 | H | 30.6 | 2.98 | 26.83 | 38.11 | 54 | 15.89 | spurious |
| 4824 | 43.36 | PK | 310 | 1.0 | H | 36.6 | 4.3 | 26.75 | 62.51 | 74 | 16.49 | harmonic |
| 4824 | 42.98 | PK | 310 | 1.0 | V | 35.4 | 4.3 | 26.75 | 55.93 | 74 | 18.07 | harmonic |
| 2385.5 | 48.46 | PK | 30 | 1.3 | H | 30.6 | 2.98 | 26.83 | 55.21 | 74 | 18.79 | spurious |
| Middle Channel (2437 MHz) | | | | | | | | | | | | |
| 4874 | 39.65 | Ave. | 310 | 1.0 | H | 36.6 | 4.36 | 26.75 | 53.86 | 54 | 0.14* | harmonic |
| 4874 | 38.45 | Ave. | 310 | 1.0 | V | 35.4 | 4.36 | 26.75 | 51.46 | 54 | 2.54* | harmonic |
| 4874 | 43.58 | PK | 310 | 1.0 | H | 36.6 | 4.36 | 26.75 | 57.79 | 74 | 16.21 | harmonic |
| 4874 | 42.31 | PK | 310 | 1.0 | V | 35.4 | 4.36 | 26.75 | 55.32 | 74 | 18.68 | harmonic |
| High Channel (2462 MHz) | | | | | | | | | | | | |
| 4924 | 39.26 | Ave. | 330 | 1.0 | H | 36.6 | 4.40 | 26.75 | 53.51 | 54 | 0.49* | harmonic |
| 4924 | 39.38 | Ave. | 330 | 1.0 | V | 35.4 | 4.40 | 26.75 | 52.43 | 54 | 1.57* | harmonic |
| 2484.5 | 37.45 | Ave. | 360 | 1.6 | H | 30.6 | 3.11 | 26.88 | 44.28 | 54 | 9.72 | spurious |
| 2484.4 | 36.36 | Ave. | 360 | 1.0 | V | 30.6 | 3.11 | 26.88 | 43.19 | 54 | 10.81 | spurious |
| 2484.5 | 54.25 | PK | 360 | 1.6 | H | 30.6 | 3.11 | 26.88 | 61.08 | 74 | 12.92 | spurious |
| 2484.1 | 53.93 | PK | 360 | 1.0 | V | 30.6 | 3.11 | 26.88 | 60.76 | 74 | 13.24 | spurious |
| 4924 | 43.45 | PK | 330 | 1.0 | H | 36.6 | 4.40 | 26.75 | 57.7 | 74 | 16.3 | harmonic |
| 4924 | 43.56 | PK | 330 | 1.0 | V | 35.4 | 4.40 | 26.75 | 56.61 | 74 | 17.39 | harmonic |

*Within measurement uncertainty!

802.11g Mode:

| Indicated | | Detector (PK/Ave) | Table Angle Degree | Antenna | | Correction Factor | | | FCC Part 15.247/15.209 | | | |
|---------------------------|---------------------------|----------------------|--------------------------|---------------|----------------|--------------------------|-----------------------|--------------------------|---------------------------|-------------------|----------------|----------|
| Frequency (MHz) | S.A. Reading (dBμV) | | | Height (m) | Polar (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Comment |
| Low Channel (2412 MHz) | | | | | | | | | | | | |
| 2360 | 46.29 | Ave. | 360 | 1.8 | H | 30.6 | 2.98 | 26.83 | 53.04 | 54 | 0.96* | spurious |
| 2360 | 42.28 | Ave. | 0 | 1.0 | V | 30.6 | 2.98 | 26.83 | 49.03 | 54 | 4.97 | spurious |
| 2360 | 61.36 | PK | 360 | 1.8 | H | 30.6 | 2.98 | 26.83 | 68.11 | 74 | 5.89 | spurious |
| 2360 | 61.29 | PK | 0 | 1.0 | V | 30.6 | 2.98 | 26.83 | 68.04 | 74 | 5.96 | spurious |
| 4824 | 23.97 | Ave. | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 38.12 | 54 | 15.88 | harmonic |
| 4824 | 43.83 | PK | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 57.98 | 74 | 16.02 | harmonic |
| 4824 | 23.04 | Ave. | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 35.99 | 54 | 18.01 | harmonic |
| 4824 | 41.35 | PK | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 54.3 | 74 | 19.7 | harmonic |
| Middle Channel (2437 MHz) | | | | | | | | | | | | |
| 4874 | 23.86 | Ave. | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 38.07 | 54 | 15.93 | harmonic |
| 4874 | 43.72 | PK | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 57.93 | 74 | 16.07 | harmonic |
| 4874 | 23.08 | Ave. | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 36.09 | 54 | 17.91 | harmonic |
| 4874 | 41.56 | PK | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 54.57 | 74 | 19.43 | harmonic |
| High Channel (2462 MHz) | | | | | | | | | | | | |
| 2483.8 | 35.40 | Ave. | 0 | 1.8 | H | 30.6 | 3.11 | 26.88 | 42.23 | 54 | 11.77 | spurious |
| 2483.8 | 54.92 | PK | 0 | 1.8 | H | 30.6 | 3.11 | 26.88 | 61.75 | 74 | 12.25 | spurious |
| 2483.8 | 54.31 | PK | 360 | 1.6 | V | 30.6 | 3.11 | 26.88 | 61.14 | 74 | 12.86 | spurious |
| 2483.8 | 34.30 | Ave. | 360 | 1.6 | V | 30.6 | 3.11 | 26.88 | 41.13 | 54 | 12.87 | spurious |
| 4924 | 44.08 | PK | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 58.33 | 74 | 15.67 | harmonic |
| 4924 | 23.86 | Ave. | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 38.11 | 54 | 15.89 | harmonic |
| 4924 | 23.15 | Ave. | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 36.2 | 54 | 17.8 | harmonic |
| 4924 | 41.87 | PK | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 54.92 | 74 | 19.08 | harmonic |

*Within measurement uncertainty!

802.11n20 Mode:

| Indicated | | Detector (PK/Ave) | Table Angle Degree | Antenna | | Correction Factor | | | FCC Part 15.247/15.209 | | | |
|---------------------------|---------------------------|----------------------|--------------------------|---------------|----------------|--------------------------|-----------------------|--------------------------|---------------------------|-------------------|----------------|----------|
| Frequency (MHz) | S.A. Reading (dBμV) | | | Height (m) | Polar (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Comment |
| Low Channel (2412 MHz) | | | | | | | | | | | | |
| 2389.5 | 47.05 | Ave. | 0 | 1.8 | H | 30.6 | 2.98 | 26.83 | 54.2 | 54 | 0.2* | spurious |
| 2389.5 | 66.84 | PK | 0 | 1.8 | H | 30.6 | 2.98 | 26.83 | 73.59 | 74 | 0.41* | spurious |
| 2389.5 | 66.48 | PK | 0 | 1.0 | V | 30.6 | 2.98 | 26.83 | 73.23 | 74 | 0.77* | spurious |
| 2389.5 | 44.58 | Ave. | 0 | 1.0 | V | 30.6 | 2.98 | 26.83 | 51.33 | 54 | 2.67* | spurious |
| 4824 | 23.54 | Ave. | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 37.69 | 54 | 16.31 | harmonic |
| 4824 | 43.32 | PK | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 57.47 | 74 | 16.53 | harmonic |
| 4824 | 23.06 | Ave. | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 36.01 | 54 | 17.99 | harmonic |
| 4824 | 40.95 | PK | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 53.9 | 74 | 20.10 | harmonic |
| Middle Channel (2437 MHz) | | | | | | | | | | | | |
| 4874 | 44.05 | PK | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 58.26 | 74 | 15.74 | harmonic |
| 4874 | 23.34 | Ave. | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 37.55 | 54 | 16.45 | harmonic |
| 4874 | 41.25 | PK | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 54.26 | 74 | 19.74 | harmonic |
| 4874 | 23.14 | Ave. | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 36.15 | 54 | 17.85 | harmonic |
| High Channel (2462 MHz) | | | | | | | | | | | | |
| 2484.2 | 63.55 | PK | 0 | 1.7 | H | 30.6 | 3.11 | 26.88 | 70.38 | 74 | 3.62* | spurious |
| 2484.7 | 63.52 | PK | 360 | 1.5 | V | 30.6 | 3.11 | 26.88 | 70.35 | 74 | 3.65* | spurious |
| 2484.2 | 34.91 | Ave. | 0 | 1.7 | H | 30.6 | 3.11 | 26.88 | 41.74 | 54 | 12.26 | spurious |
| 2484.7 | 34.13 | Ave. | 360 | 1.5 | V | 30.6 | 3.11 | 26.88 | 40.96 | 54 | 13.04 | spurious |
| 4924 | 23.56 | Ave. | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 37.81 | 54 | 16.19 | harmonic |
| 4924 | 43.54 | PK | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 57.79 | 74 | 16.21 | harmonic |
| 4924 | 23.03 | Ave. | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 36.08 | 54 | 17.92 | harmonic |
| 4924 | 41.05 | PK | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 54.1 | 74 | 19.90 | harmonic |

*Within measurement uncertainty!

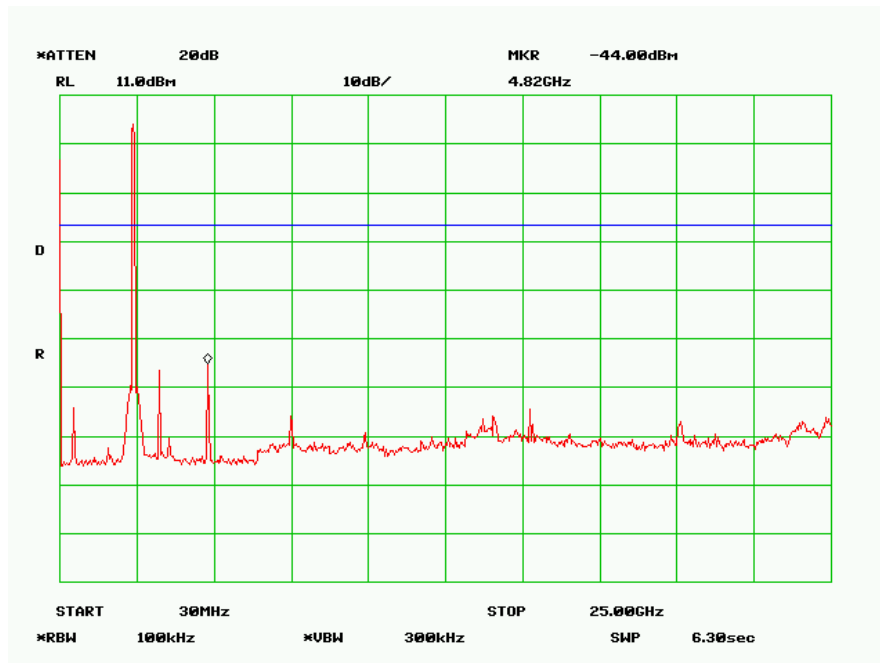
802.11n40 Mode:

| Indicated | | Detector (PK/Ave) | Table Angle Degree | Antenna | | Correction Factor | | | FCC Part 15.247/15.209 | | | |
|---------------------------|---------------------------|----------------------|--------------------------|---------------|----------------|--------------------------|-----------------------|--------------------------|---------------------------|-------------------|----------------|----------|
| Frequency (MHz) | S.A. Reading (dBμV) | | | Height (m) | Polar (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Comment |
| Low Channel (2422 MHz) | | | | | | | | | | | | |
| 2386.8 | 66.52 | PK | 42 | 1.0 | V | 30.6 | 2.98 | 26.83 | 73.27 | 74 | 0.73* | spurious |
| 2386.8 | 46.44 | Ave. | 42 | 1.0 | V | 30.6 | 2.98 | 26.83 | 53.19 | 54 | 0.81* | spurious |
| 2390 | 39.83 | Ave. | 110 | 1.0 | H | 30.6 | 2.98 | 26.83 | 46.58 | 54 | 7.42 | spurious |
| 2390 | 59.12 | PK | 110 | 1.0 | H | 30.6 | 2.98 | 26.83 | 65.87 | 74 | 8.13 | spurious |
| 4844 | 20.58 | Ave. | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 34.73 | 54 | 19.27 | harmonic |
| 4844 | 20.22 | Ave. | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 33.17 | 54 | 20.83 | harmonic |
| 4844 | 37.56 | PK | 130 | 1.5 | H | 36.6 | 4.3 | 26.75 | 51.71 | 74 | 22.29 | harmonic |
| 4844 | 36.95 | PK | 60 | 1.8 | V | 35.4 | 4.3 | 26.75 | 49.9 | 74 | 24.1 | harmonic |
| Middle Channel (2437 MHz) | | | | | | | | | | | | |
| 4874 | 20.42 | Ave. | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 34.63 | 54 | 19.37 | harmonic |
| 4874 | 20.18 | Ave. | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 33.19 | 54 | 20.81 | harmonic |
| 4874 | 37.85 | PK | 130 | 1.5 | H | 36.6 | 4.36 | 26.75 | 52.06 | 74 | 21.94 | harmonic |
| 4874 | 37.77 | PK | 60 | 1.8 | V | 35.4 | 4.36 | 26.75 | 50.78 | 74 | 23.22 | harmonic |
| High Channel (2452 MHz) | | | | | | | | | | | | |
| 2483.6 | 66.40 | PK | 37 | 1.0 | V | 30.6 | 3.11 | 26.88 | 73.23 | 74 | 0.77* | spurious |
| 2483.6 | 64.14 | PK | 270 | 1.0 | H | 30.6 | 3.11 | 26.88 | 70.97 | 74 | 3.03* | spurious |
| 2483.6 | 41.94 | Ave. | 37 | 1.0 | V | 30.6 | 3.11 | 26.88 | 48.77 | 54 | 5.23 | spurious |
| 2483.6 | 40.88 | Ave. | 270 | 1.0 | H | 30.6 | 3.11 | 26.88 | 47.71 | 54 | 6.29 | spurious |
| 4904 | 22.75 | Ave. | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 35.8 | 54 | 18.2 | harmonic |
| 4904 | 20.68 | Ave. | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 34.93 | 54 | 19.07 | harmonic |
| 4904 | 37.24 | PK | 250 | 1.8 | H | 36.6 | 4.40 | 26.75 | 51.49 | 74 | 22.51 | harmonic |
| 4904 | 37.16 | PK | 60 | 1.8 | V | 35.4 | 4.40 | 26.75 | 50.21 | 74 | 23.79 | harmonic |

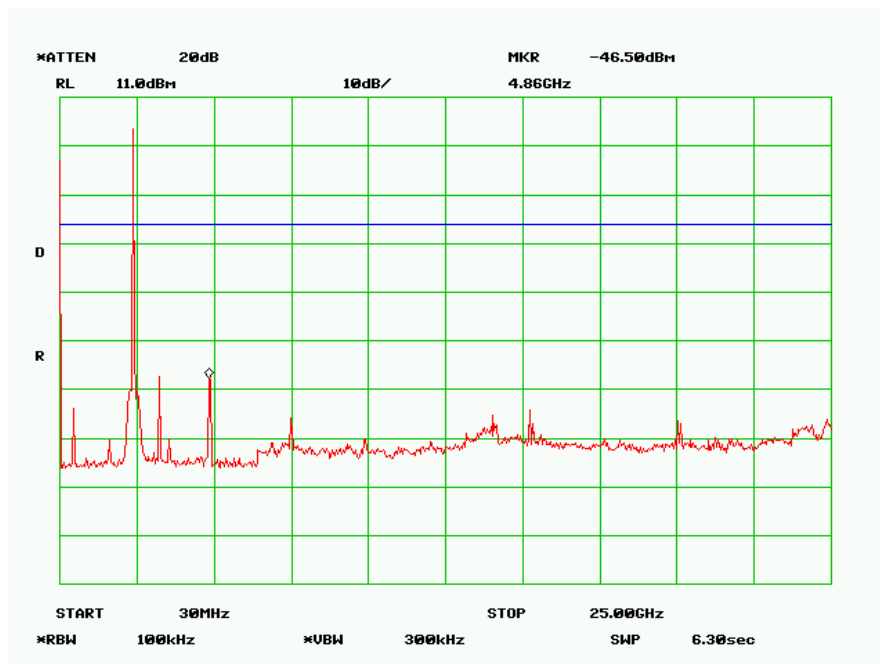
*Within measurement uncertainty!

Antenna Port Conducted Spurious Emissions:

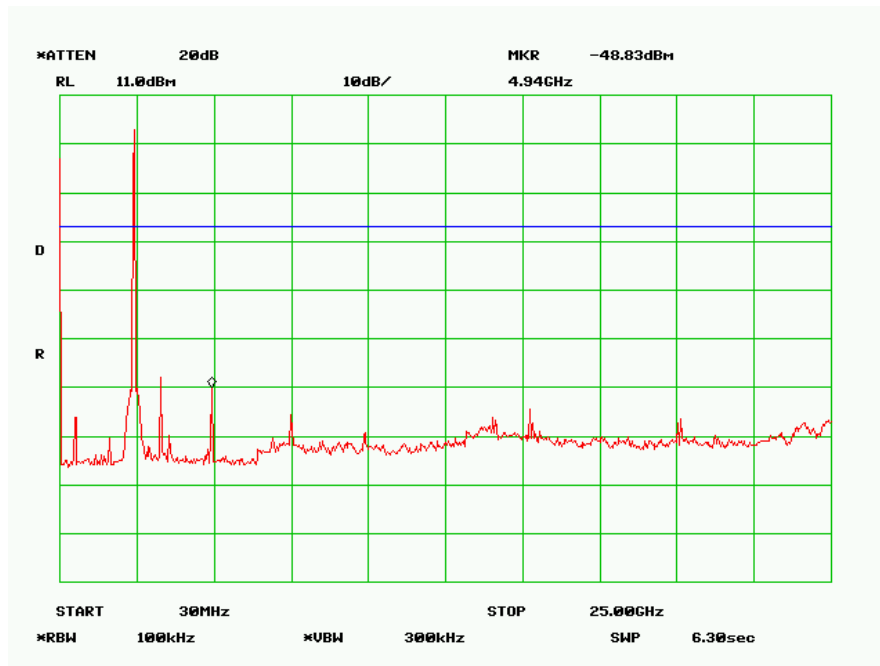
802.11b Low Channel



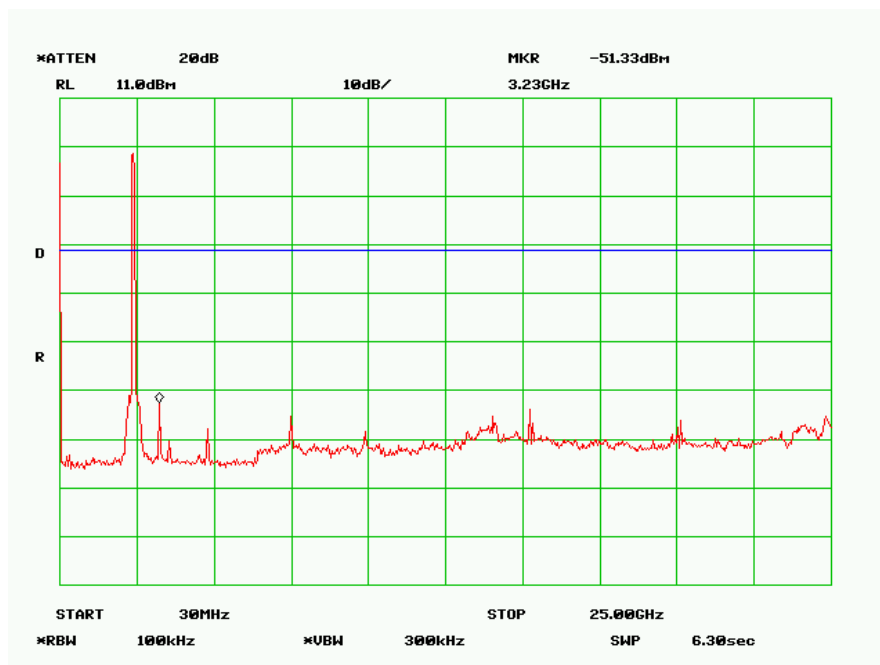
802.11b Middle Channel

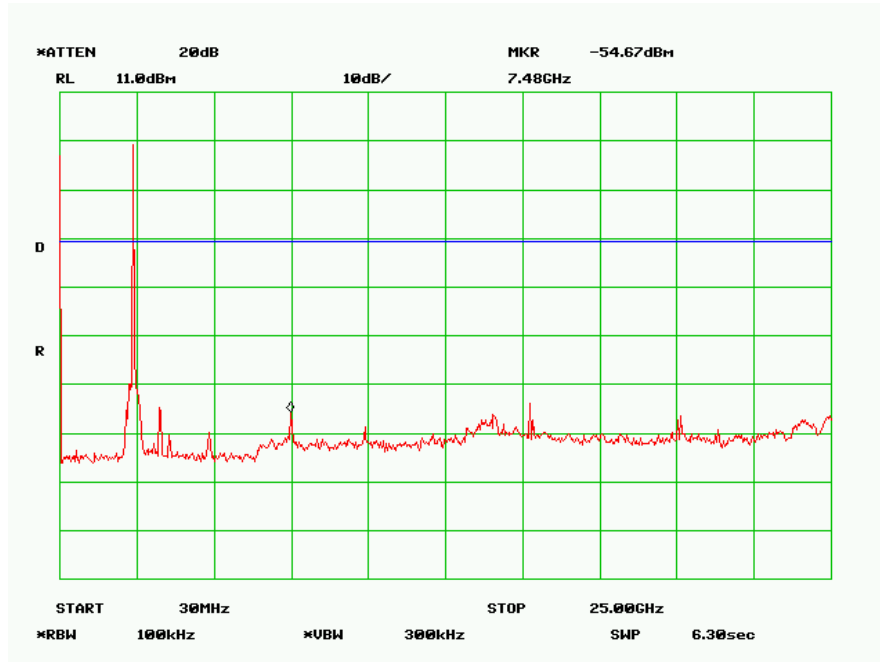


802.11b High Channel

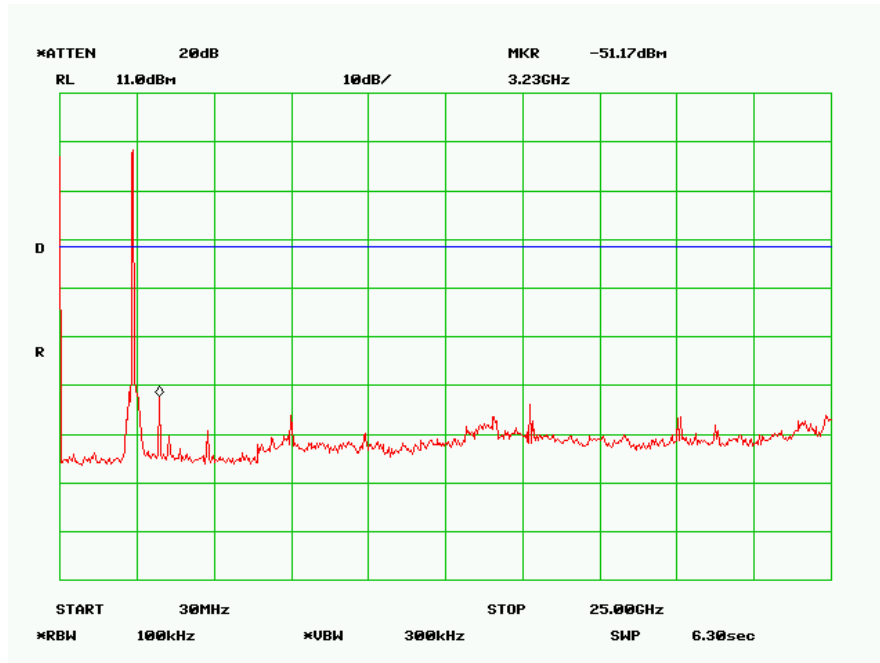


802.11g Low Channel

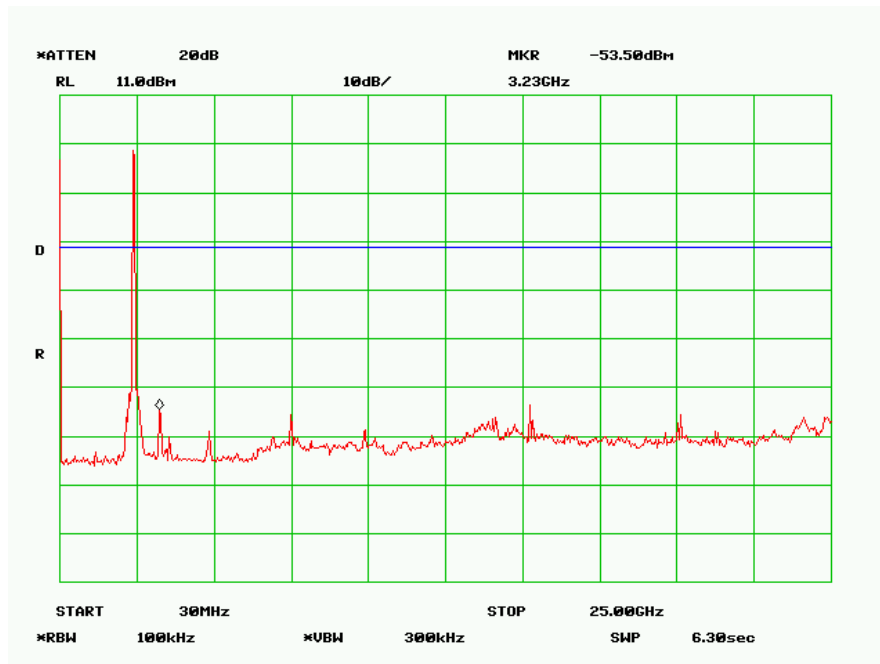


802.11g Middle Channel**802.11g High Channel**

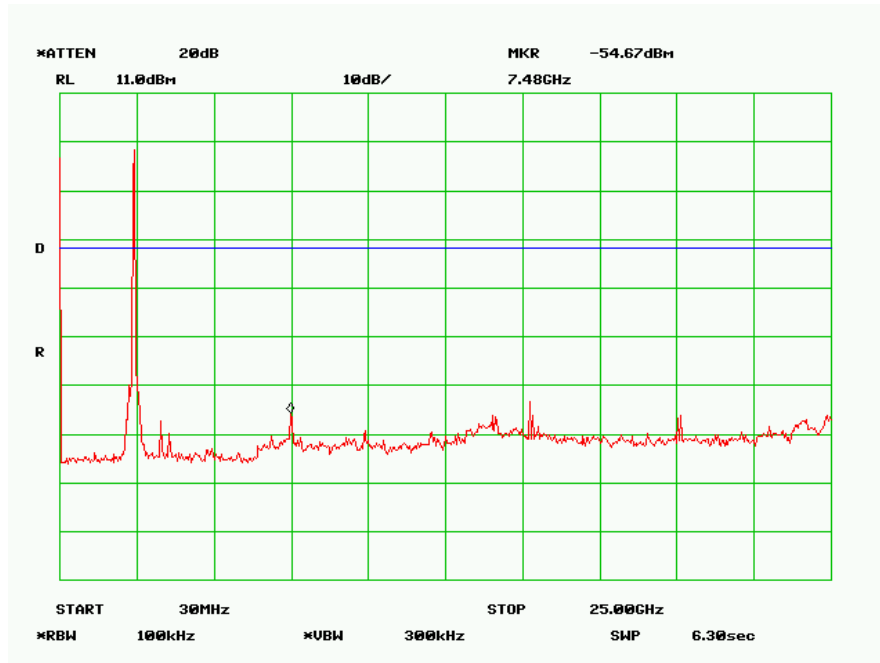
802.11n20 Low Channel, TX0



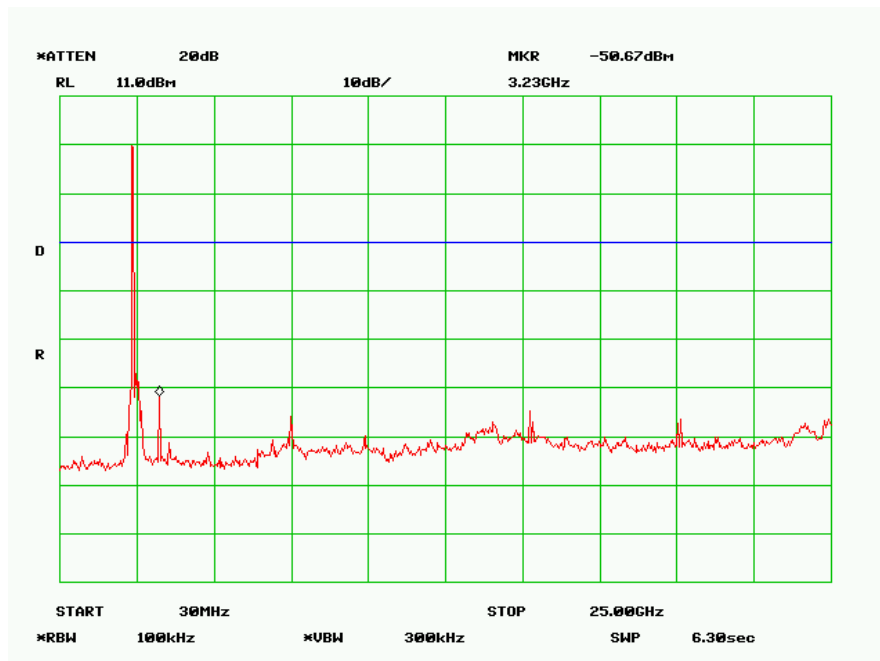
802.11n20 Middle Channel, TX0



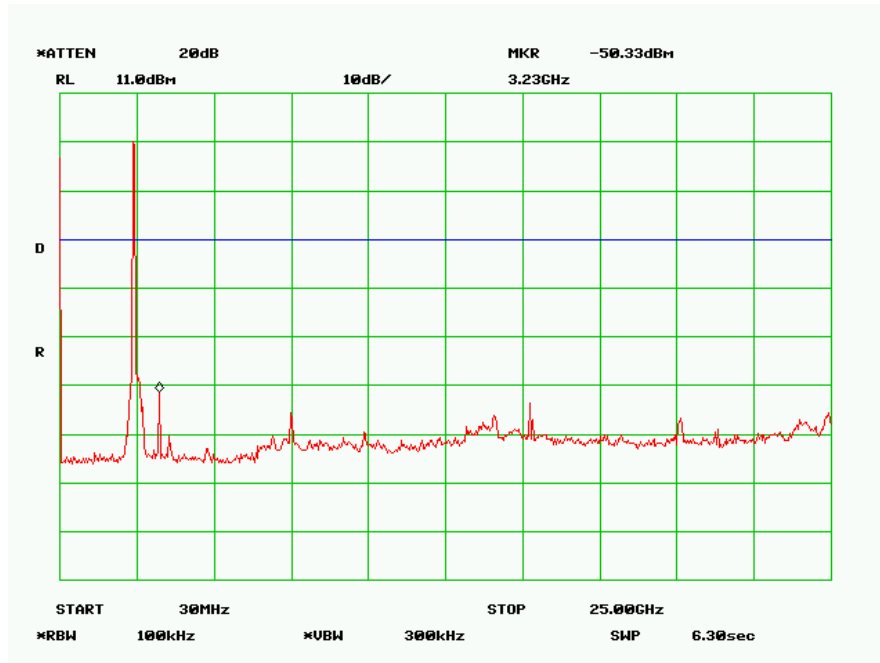
802.11n20 High Channel, TX0



802.11n20 Low Channel, TX2



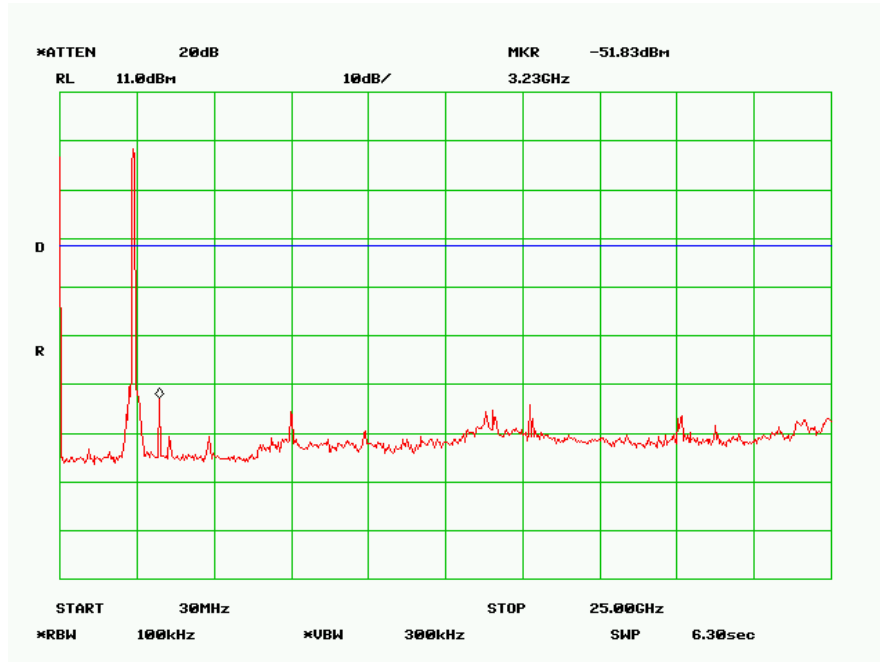
802.11n20 Middle Channel, TX2



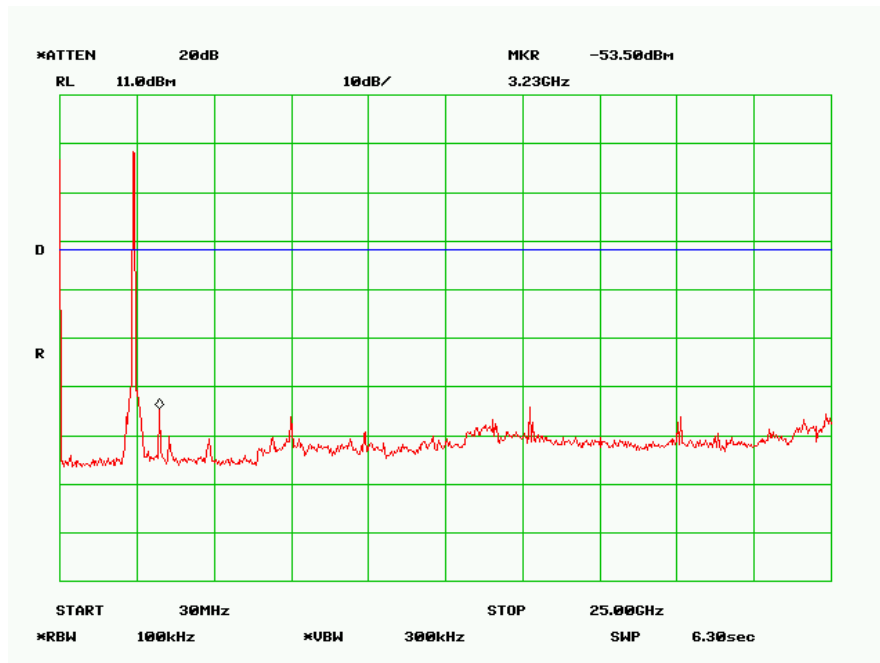
802.11n20 High Channel, TX2



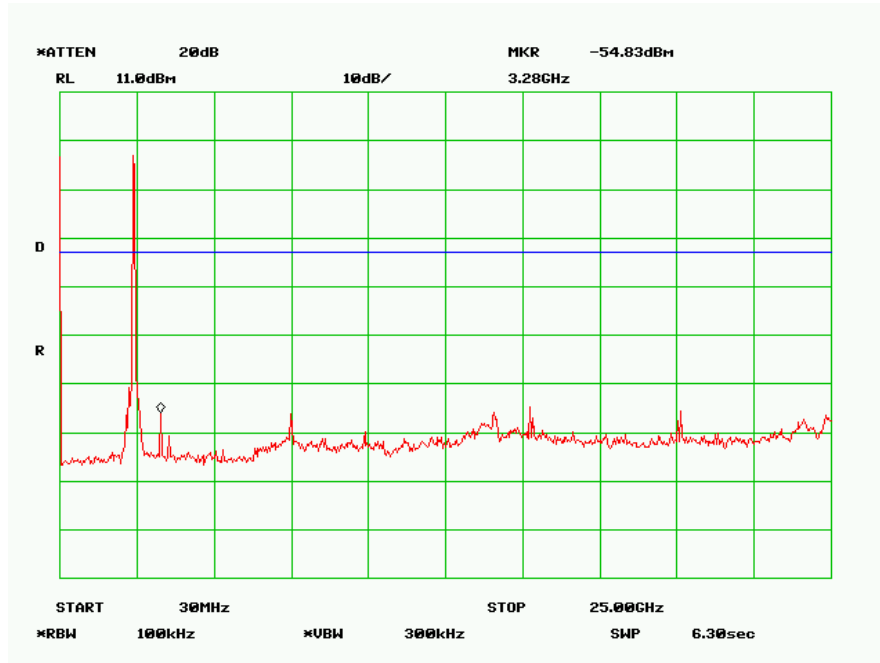
802.11n40 Low Channel, TX0



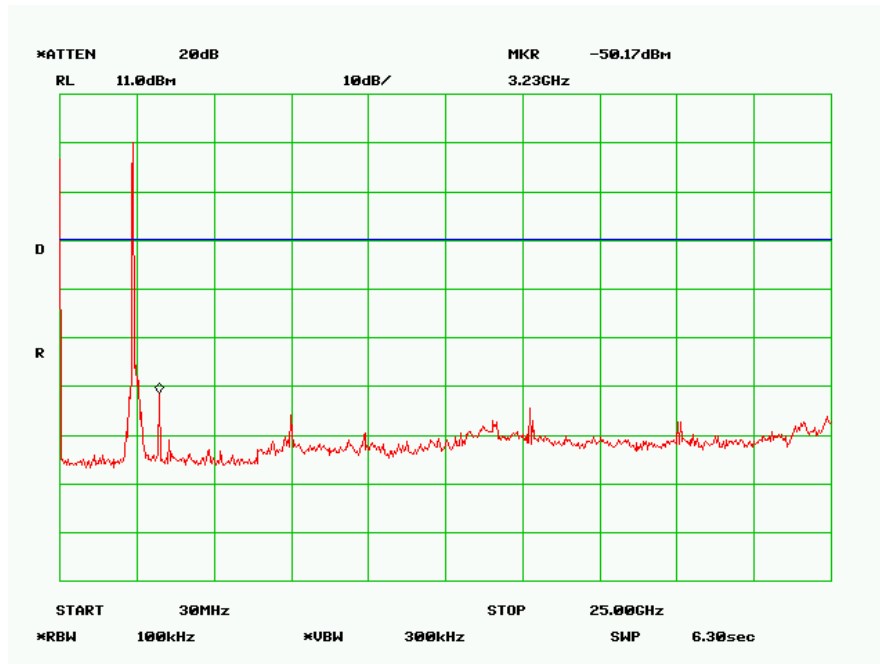
802.11n40 Middle Channel, TX0



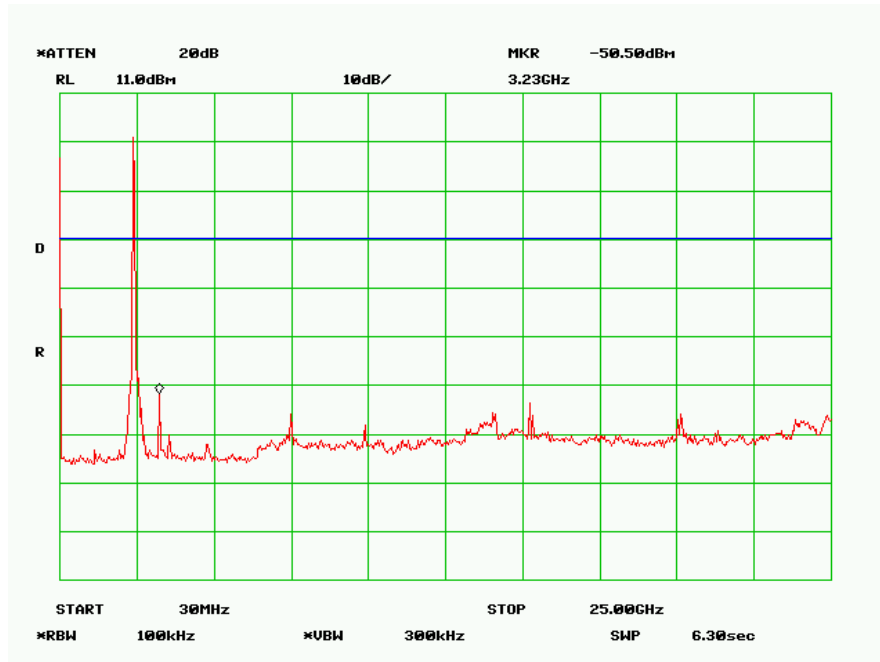
802.11n40 High Channel, TX0



802.11n40 Low Channel, TX2



802.11n40 Middle Channel, TX2



802.11n40 High Channel, TX2



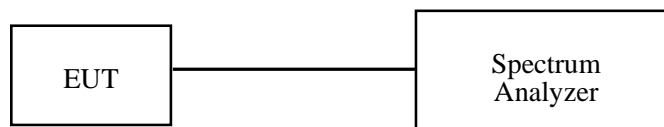
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

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

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

Test Data

Environmental Conditions

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

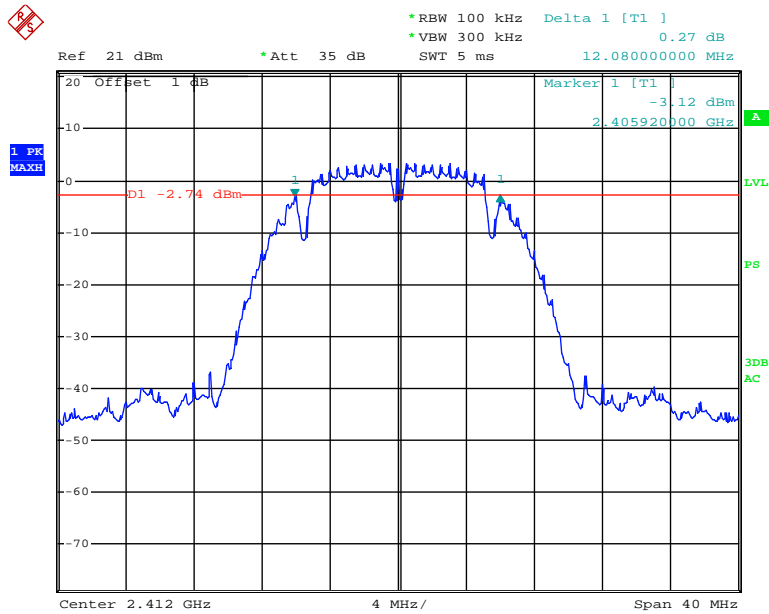
The testing was performed by Bruce Zhang on 2011-07-19 and 2011-9-12.

Test Result: Pass.

Please refer to the following tables and plots.

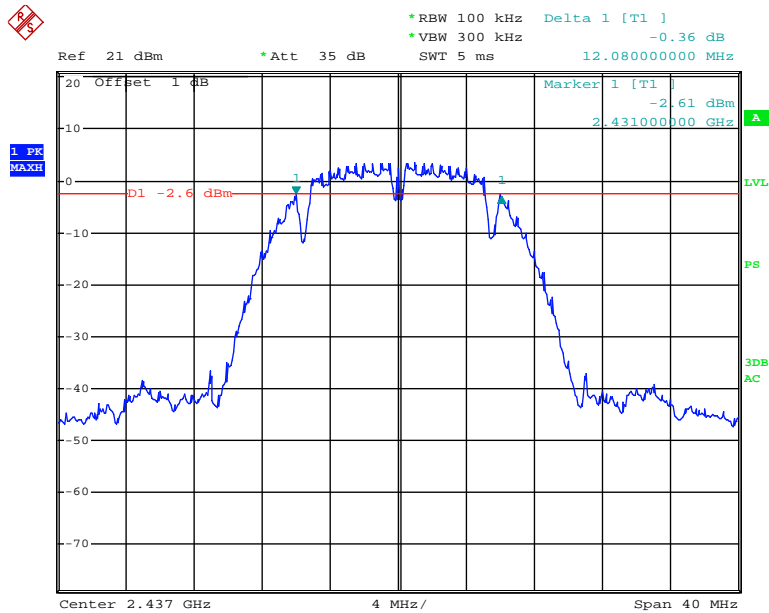
| Channel | Frequency (MHz) | Antenna Port | Data Rate (Mbps) | 6 dB Emission Bandwidth (MHz) | FCC Part 15.247 Limit (kHz) |
|----------------|-----------------|--------------|------------------|-------------------------------|-----------------------------|
| 802.11b mode | | | | | |
| Low | 2412 | TX0 | 1 | 12.08 | > 500 |
| Middle | 2437 | TX0 | 1 | 12.08 | > 500 |
| High | 2462 | TX0 | 1 | 12.08 | > 500 |
| 802.11g mode | | | | | |
| Low | 2412 | TX0 | 6 | 16.32 | > 500 |
| Middle | 2437 | TX0 | 6 | 16.16 | > 500 |
| High | 2462 | TX0 | 6 | 15.92 | > 500 |
| 802.11n20 mode | | | | | |
| Low | 2412 | TX0 | 6.5 | 16.64 | > 500 |
| | | TX1 | 6.5 | 16.80 | > 500 |
| Middle | 2437 | TX0 | 6.5 | 16.40 | > 500 |
| | | TX1 | 6.5 | 16.80 | > 500 |
| High | 2462 | TX0 | 6.5 | 16.64 | > 500 |
| | | TX1 | 6.5 | 16.56 | > 500 |
| 802.11n40 mode | | | | | |
| Low | 2422 | TX0 | 6.5 | 35.36 | > 500 |
| | | TX1 | 6.5 | 35.20 | > 500 |
| Middle | 2437 | TX0 | 6.5 | 35.36 | > 500 |
| | | TX1 | 6.5 | 35.36 | > 500 |
| High | 2452 | TX0 | 6.5 | 35.36 | > 500 |
| | | TX1 | 6.5 | 35.20 | > 500 |

802.11b Low Channel



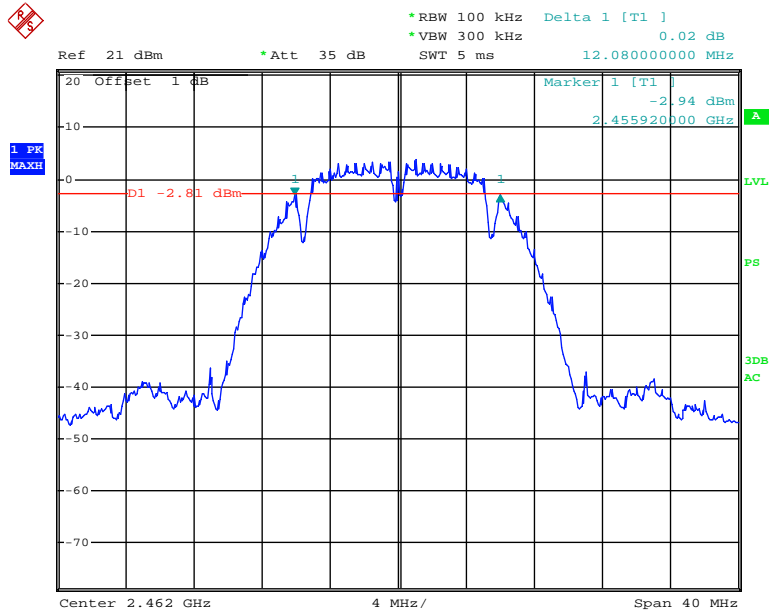
Date: 21.JUL.2011 10:12:08

802.11b Middle Channel



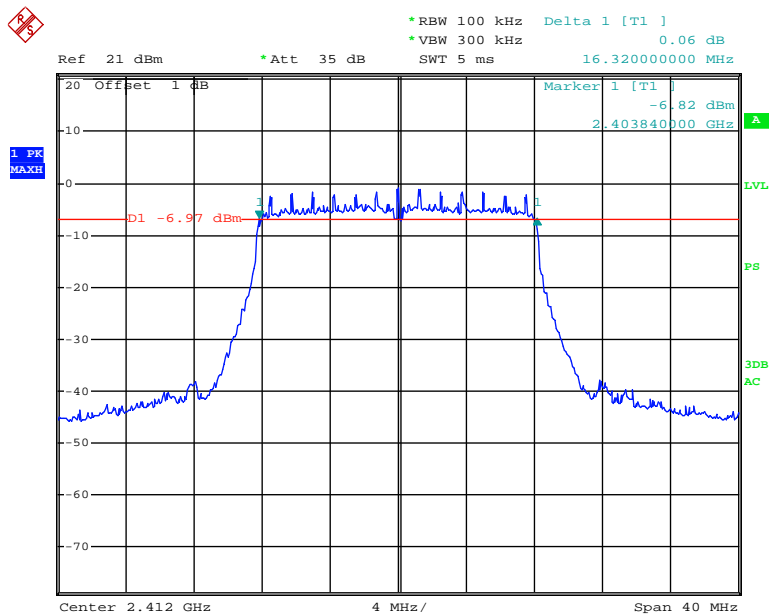
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802.11b High Channel



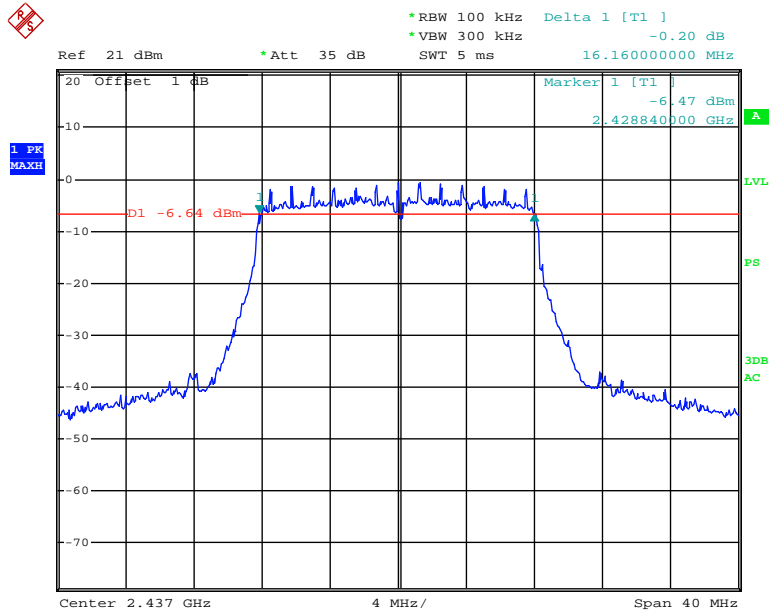
Date: 21.JUL.2011 10:36:20

802.11g Low Channel



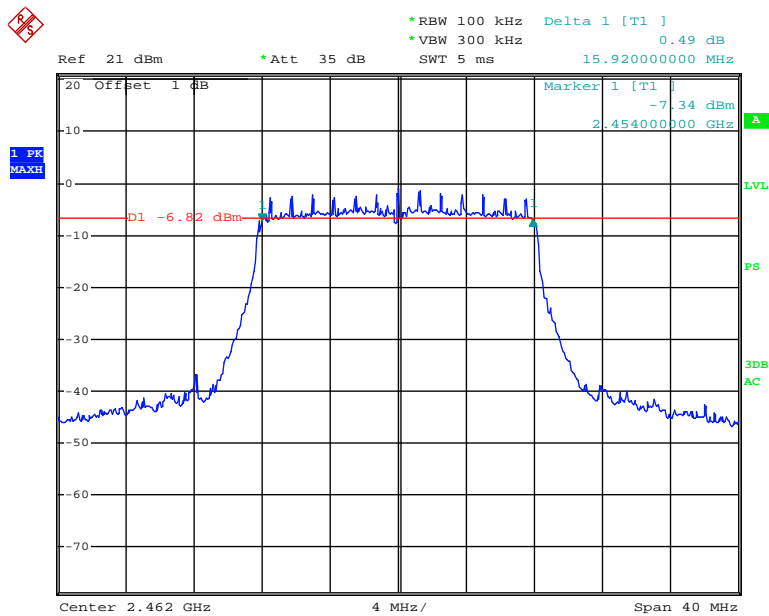
Date: 21.JUL.2011 10:56:52

802.11g Middle Channel



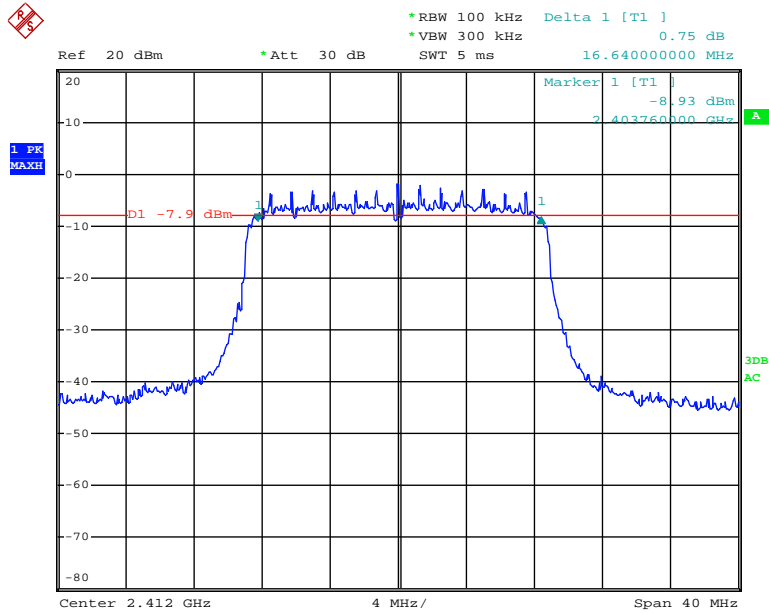
Date: 21.JUL.2011 10:43:38

802.11g High Channel



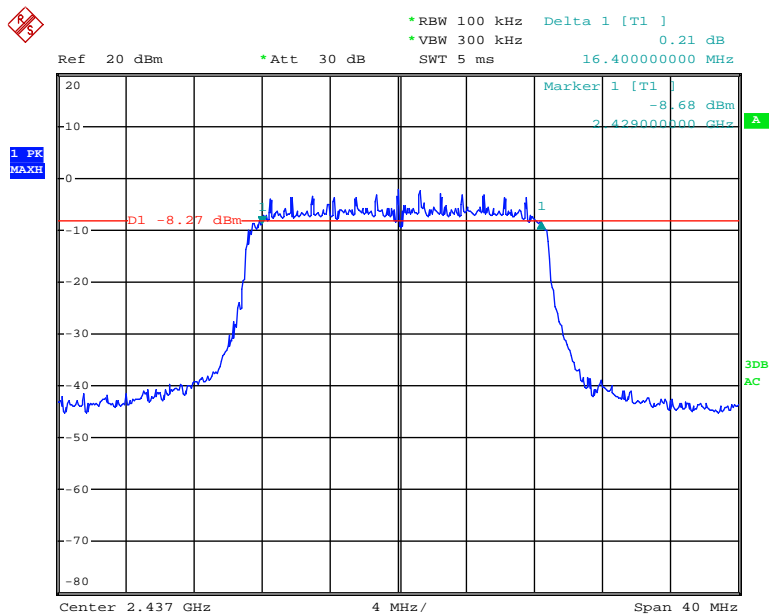
Date: 21.JUL.2011 10:38:20

802.11n20 Low Channel, TX0



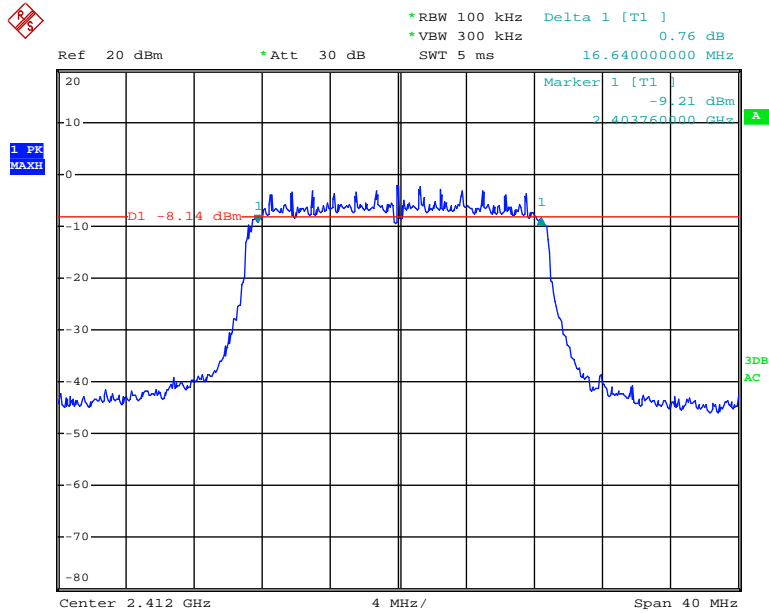
Date: 19.JUL.2011 11:54:04

802.11n20 Middle Channel, TX0



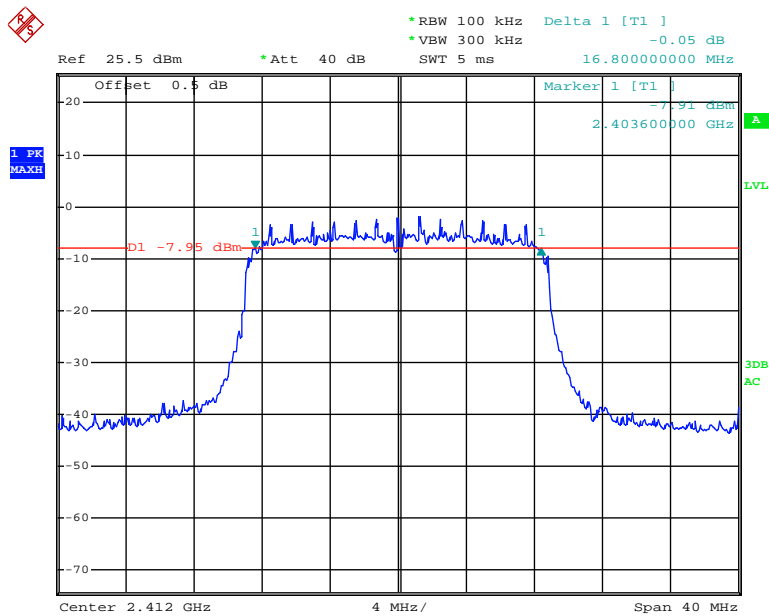
Date: 19.JUL.2011 11:56:46

802.11n20 High Channel, TX0



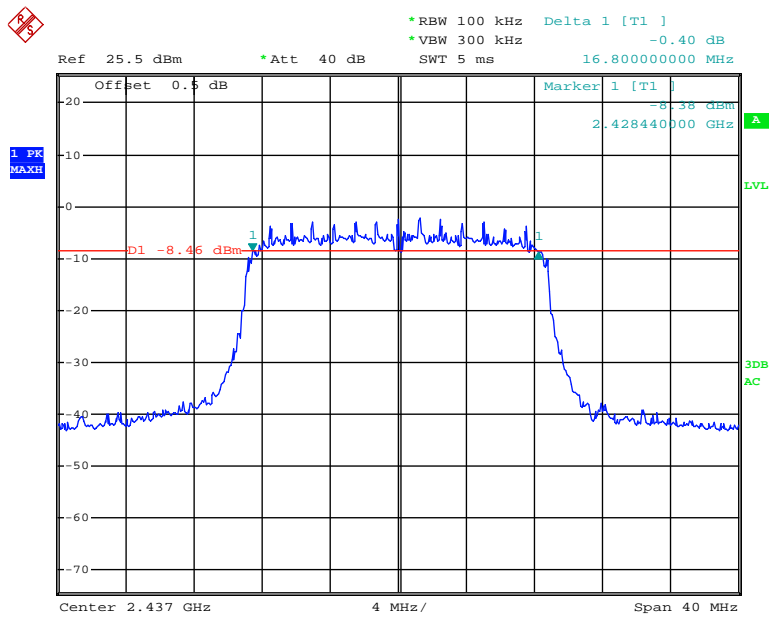
Date: 19.JUL.2011 11:58:13

802.11n20 Low Channel, TX1



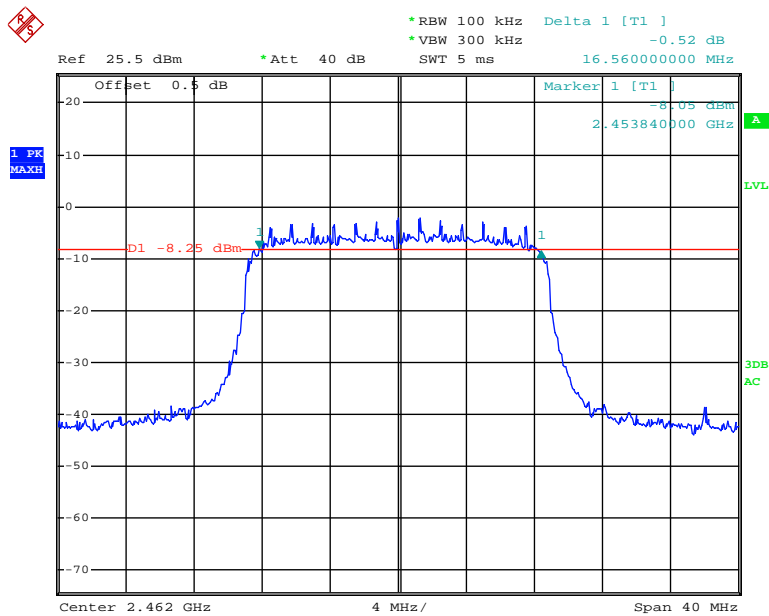
Date: 12.SEP.2011 09:36:45

802.11n20 Middle Channel, TX1



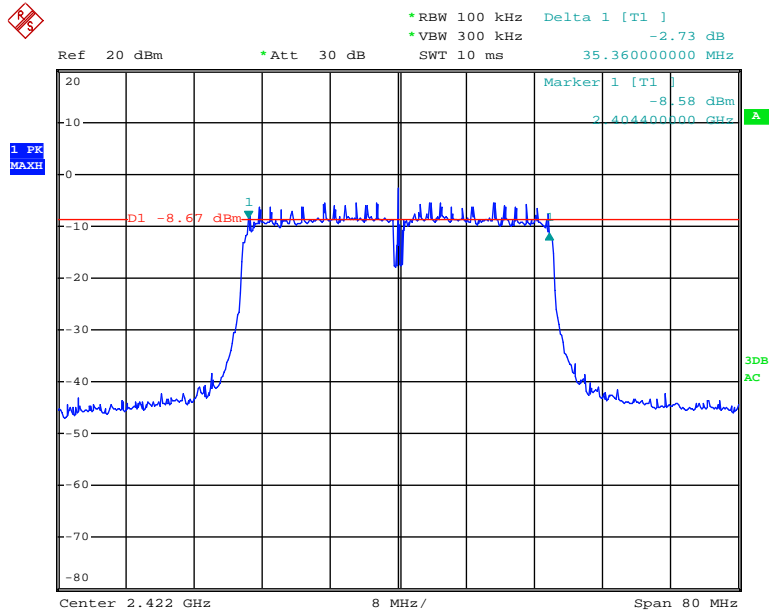
Date: 12.SEP.2011 09:43:05

802.11n20 High Channel, TX1



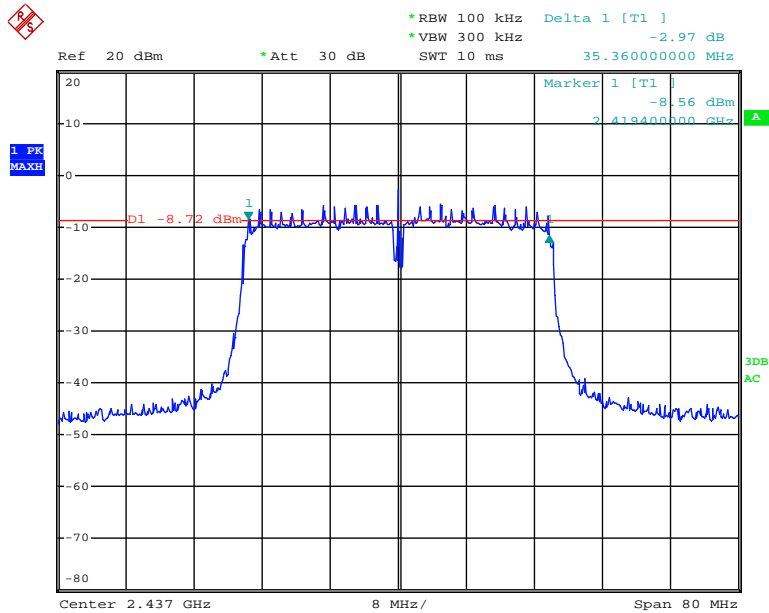
Date: 12.SEP.2011 09:45:38

802.11n40 Low Channel, TX0



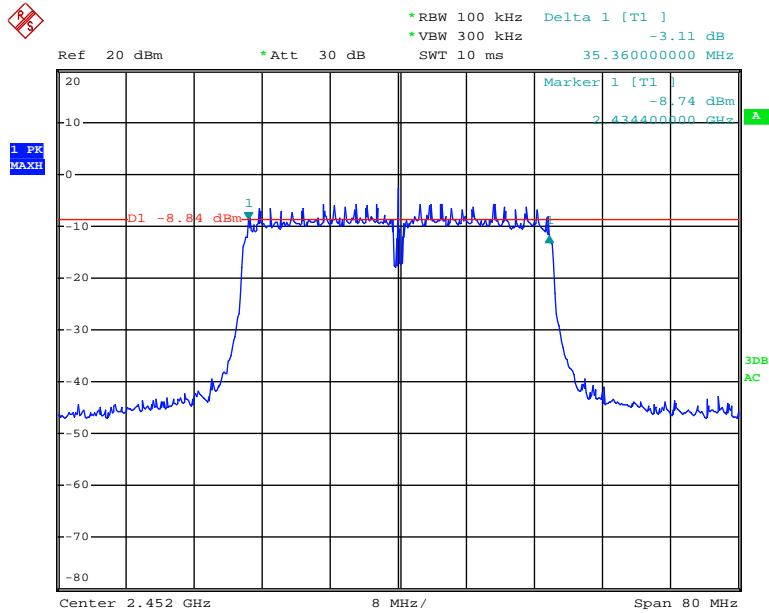
Date: 19.JUL.2011 11:48:46

802.11n40 Middle Channel, TX0



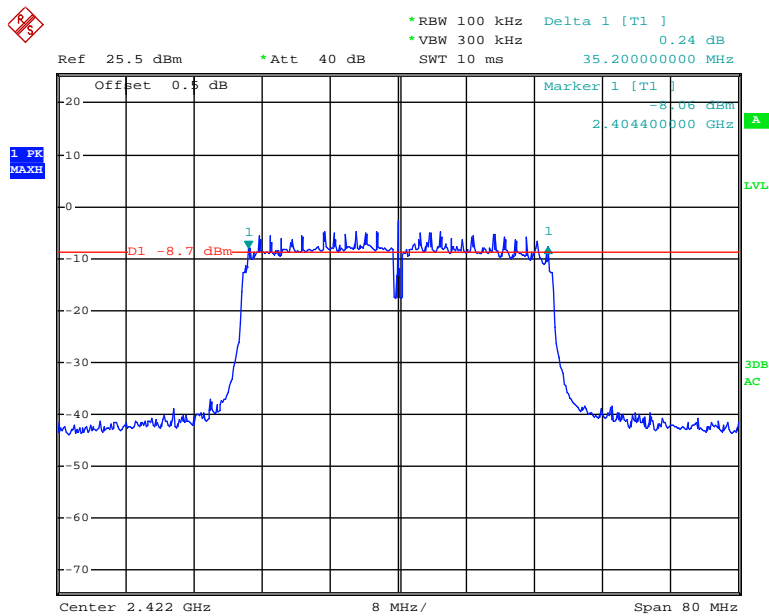
Date: 19.JUL.2011 11:50:01

802.11n40 High Channel, TX0



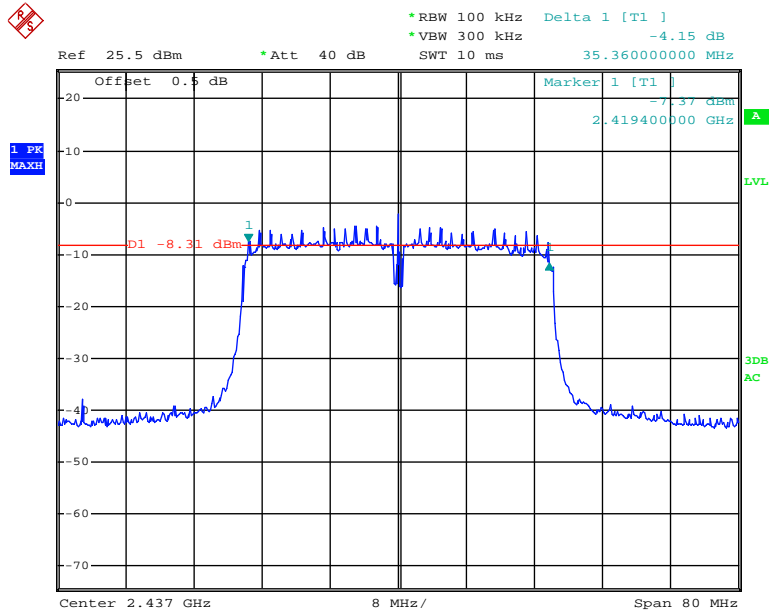
Date: 19.JUL.2011 11:52:31

802.11n40 Low Channel, TX1



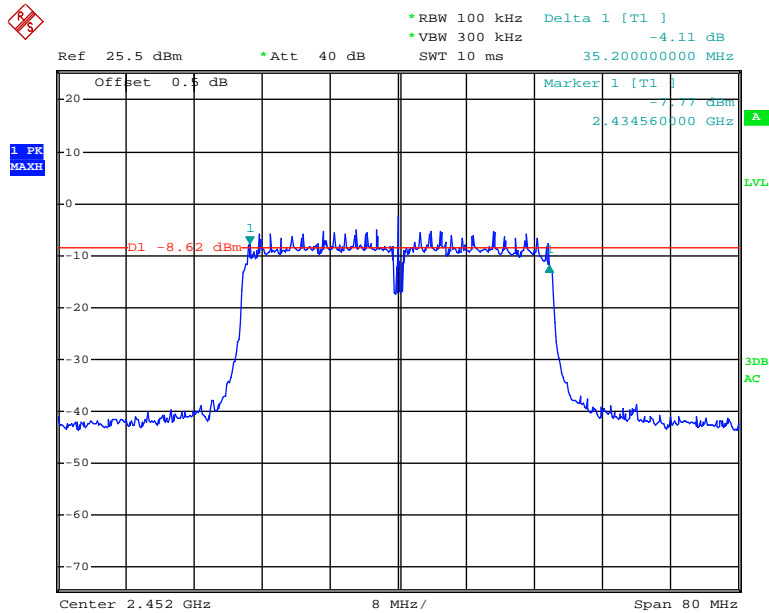
Date: 12.SEP.2011 09:47:39

802.11n40 Middle Channel, TX1



Date: 12.SEP.2011 09:49:28

802.11n40 High Channel, TX1



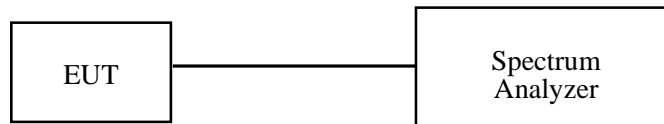
Date: 12.SEP.2011 09:50:56

FCC §15.247(b) - MAXIMUM PEAK OUTPUT POWER**Applicable Standard**

According to FCC §15.247(b)

Test Procedure

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

**Test Equipment List and Details**

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

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

Test Data**Environmental Conditions**

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

The testing was performed by Bruce Zhang on 2011-07-11.

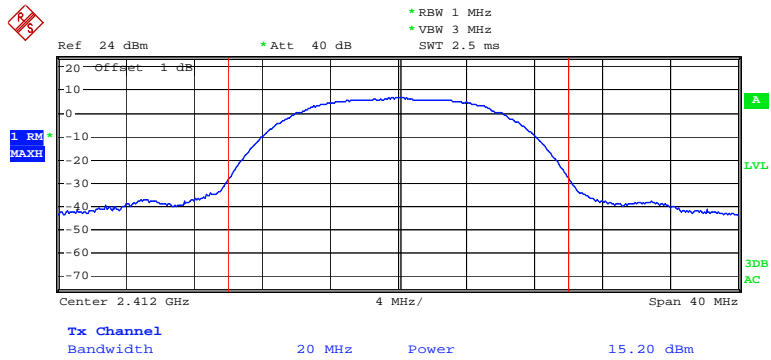
Test Mode: Transmitting

| Channel | Frequency (MHz) | Data Rate (Mbps) | Antenna Port | Conducted Output Power (dBm) | Total Power (dBm) | Limit (dBm) | Result |
|----------------|-----------------|------------------|--------------|------------------------------|-------------------|-------------|--------|
| 802.11b mode | | | | | | | |
| Low | 2412 | 1 | TX0 | 15.20 | / | 27 | Pass |
| Middle | 2437 | 1 | TX0 | 15.30 | / | 27 | Pass |
| High | 2462 | 1 | TX0 | 15.50 | / | 27 | Pass |
| 802.11g mode | | | | | | | |
| Low | 2412 | 6 | TX0 | 13.22 | / | 27 | Pass |
| Middle | 2437 | 6 | TX0 | 13.31 | / | 27 | Pass |
| High | 2462 | 6 | TX0 | 13.31 | / | 27 | Pass |
| 802.11n20 mode | | | | | | | |
| Low | 2412 | 6.5 | TX0 | 12.64 | 15.53 | 27 | Pass |
| Low | 2412 | 6.5 | TX1 | 12.39 | | | |
| Middle | 2437 | 6.5 | TX0 | 12.28 | 15.45 | 27 | Pass |
| Middle | 2437 | 6.5 | TX1 | 12.59 | | | |
| High | 2462 | 6.5 | TX0 | 12.29 | 15.50 | 27 | Pass |
| High | 2462 | 6.5 | TX1 | 12.68 | | | |
| 802.11n40 mode | | | | | | | |
| Low | 2422 | 6.5 | TX0 | 13.24 | 16.21 | 27 | Pass |
| Low | 2422 | 6.5 | TX1 | 13.16 | | | |
| Middle | 2437 | 6.5 | TX0 | 12.87 | 16.04 | 27 | Pass |
| Middle | 2437 | 6.5 | TX1 | 13.18 | | | |
| High | 2452 | 6.5 | TX0 | 12.77 | 15.91 | 27 | Pass |
| High | 2452 | 6.5 | TX1 | 13.02 | | | |

Note: The Antenna gain of EUT is 14 dBi, According to FCC § 15.247(b), for P-to-P operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

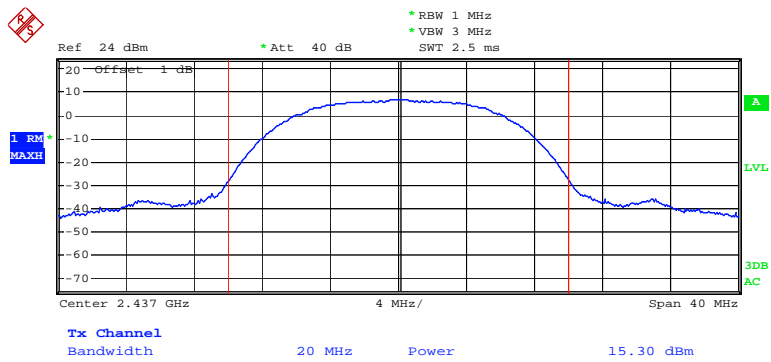
The power limit is $30 - 3 = 27$ dBm.

802.11b RF Output Power, Low Channel



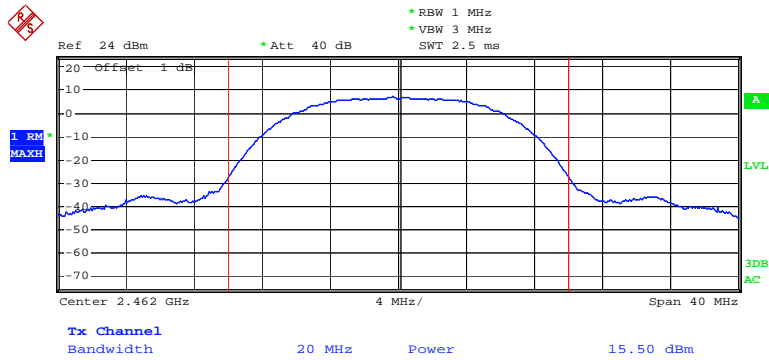
Date: 11.JUL.2011 08:35:09

802.11b RF Output Power, Middle Channel



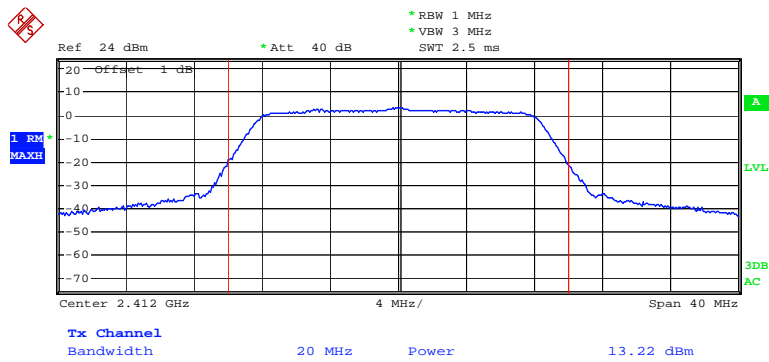
Date: 11.JUL.2011 08:34:12

802.11b RF Output Power, High Channel



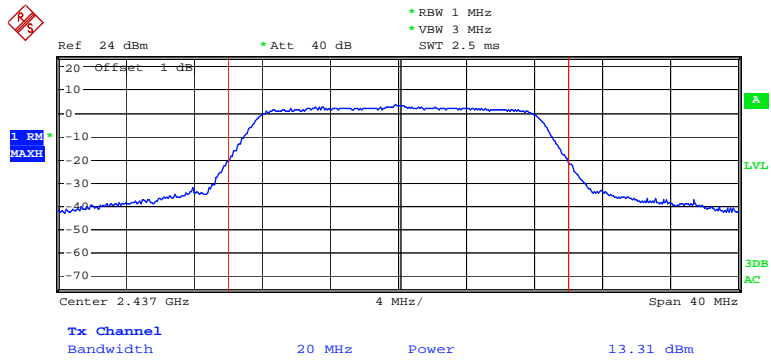
Date: 11.JUL.2011 08:36:04

802.11g RF Output Power, Low Channel



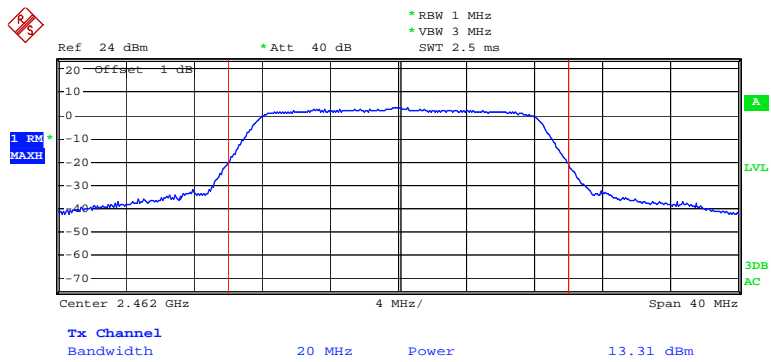
Date: 11.JUL.2011 08:45:38

802.11g RF Output Power, Middle Channel



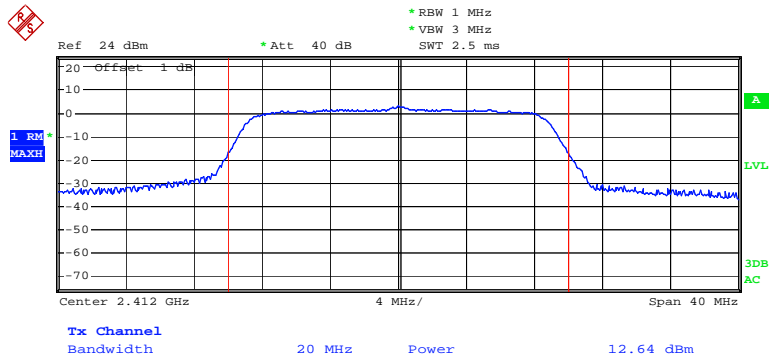
Date: 11.JUL.2011 08:44:23

802.11g RF Output Power, High Channel



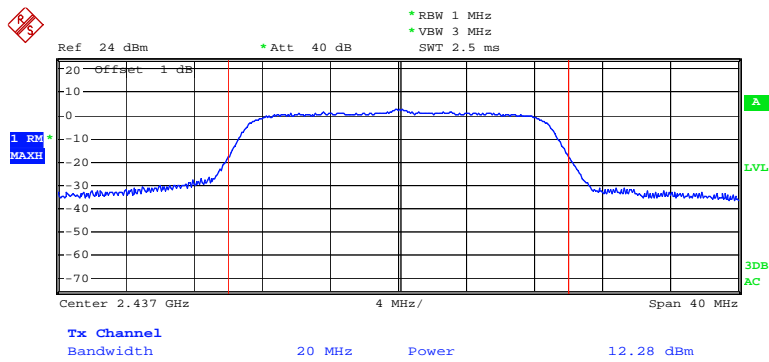
Date: 11.JUL.2011 08:47:45

802.11n20 RF Output Power, Low Channel, TX0



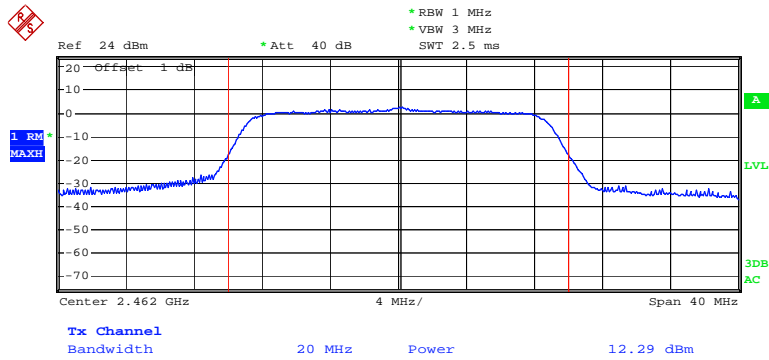
Date: 11.JUL.2011 09:01:48

802.11n20 RF Output Power, Middle Channel, TX0



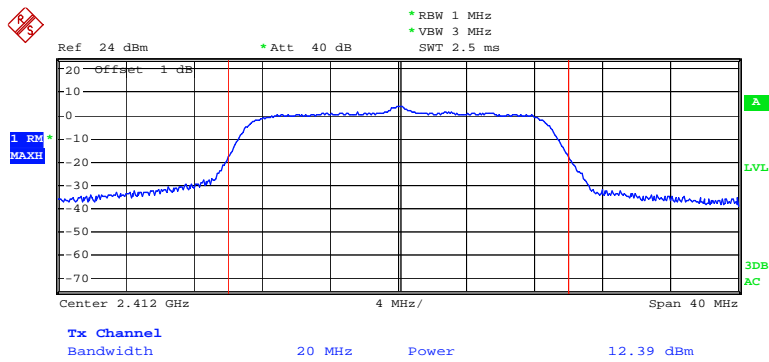
Date: 11.JUL.2011 09:06:00

802.11n20 RF Output Power, High Channel, TX0



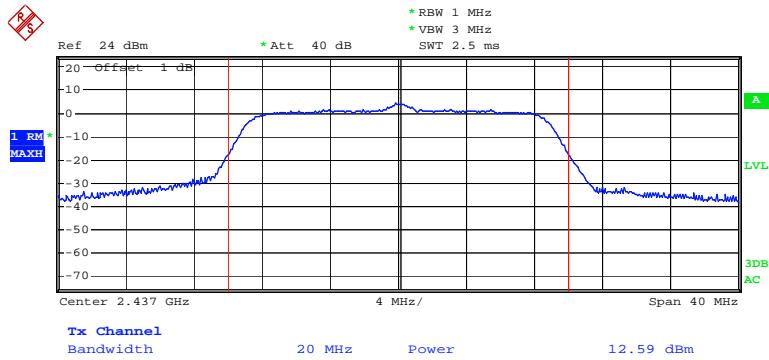
Date: 11.JUL.2011 09:09:33

802.11n20 RF Output Power, Low Channel, TX1



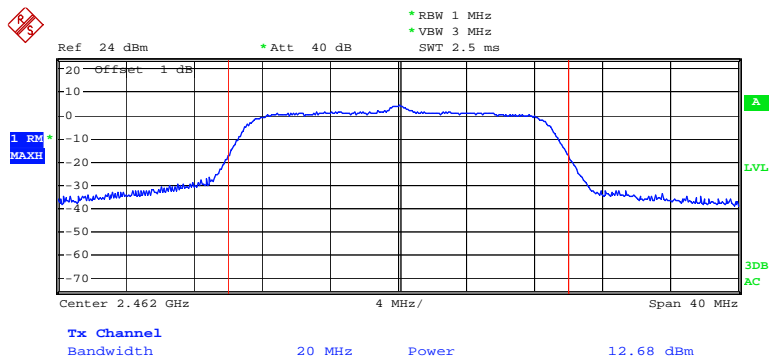
Date: 11.JUL.2011 09:29:13

802.11n20 RF Output Power, Middle Channel, TX1



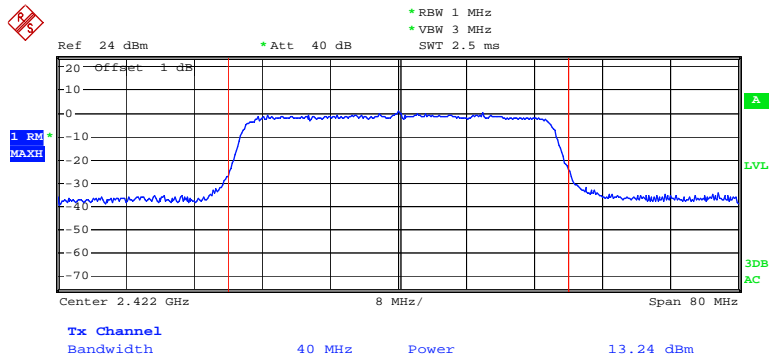
Date: 11.JUL.2011 09:25:27

802.11n20 RF Output Power, High Channel, TX1



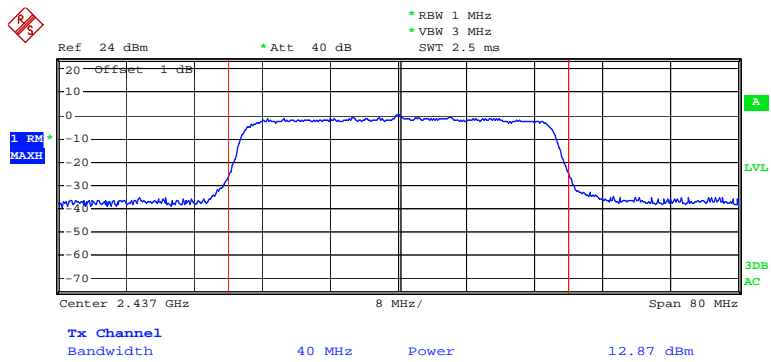
Date: 11.JUL.2011 09:23:00

802.11n40 RF Output Power, Low Channel, TX0



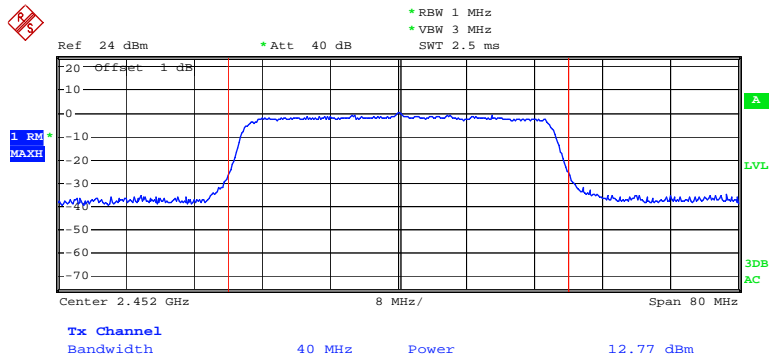
Date: 11.JUL.2011 09:14:39

802.11n40 RF Output Power, Middle Channel, TX0



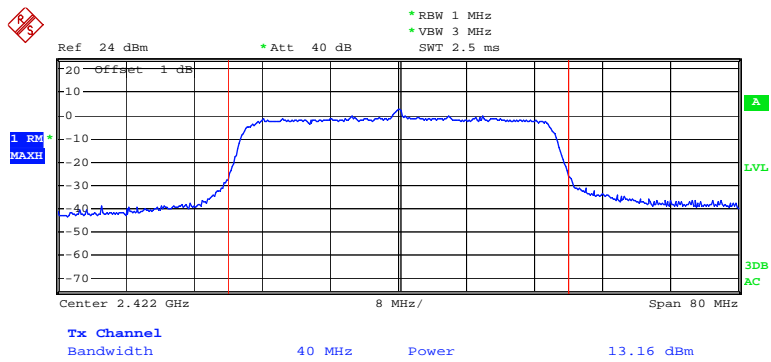
Date: 11.JUL.2011 09:12:53

802.11n40 RF Output Power, High Channel, TX0



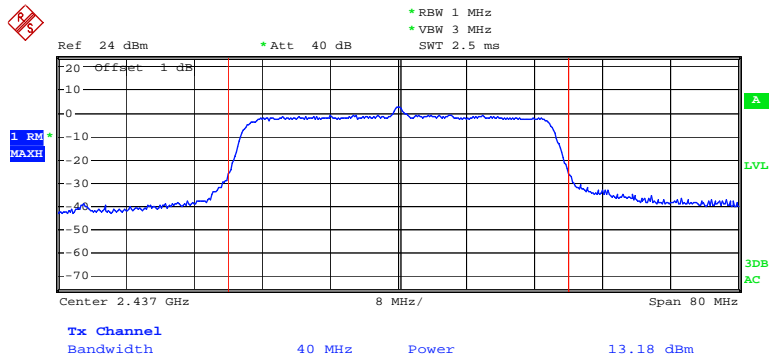
Date: 11.JUL.2011 09:11:42

802.11n40 RF Output Power, Low Channel, TX1



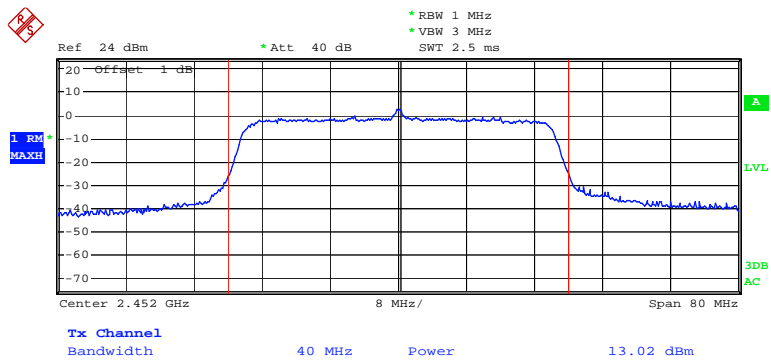
Date: 11.JUL.2011 09:17:05

802.11n40 RF Output Power, Middle Channel, TX1



Date: 11.JUL.2011 09:18:47

802.11n40 RF Output Power, High Channel, TX1



Date: 11.JUL.2011 09:20:59

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

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 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 Equipment List and Details

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

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

Test Data

Environmental Conditions

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

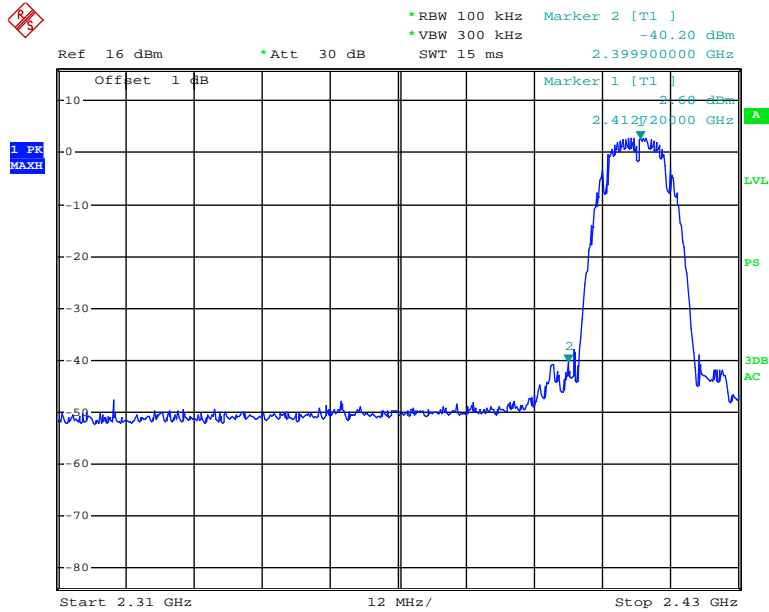
The testing was performed by Bruce Zhang on 2011-07-21 and 2011-09-12.

Test Result: *Compliance*

| Frequency (MHz) | Antenna Port | Delta Peak to Band Emission (dBc) | Limit (dBc) | Result |
|--------------------|-----------------|---|----------------|--------|
| 802.11b mode | | | | |
| 2399.9 | TX0 | 42.80 | 20 | Pass |
| 2483.6 | TX0 | 51.38 | 20 | Pass |
| 802.11g mode | | | | |
| 2399.9 | TX0 | 38.45 | 20 | Pass |
| 2483.6 | TX0 | 48.11 | 20 | Pass |
| 802.11n20 mode | | | | |
| 2399.9 | TX0 | 37.08 | 20 | Pass |
| 2399.9 | TX1 | 35.95 | 20 | Pass |
| 2483.6 | TX0 | 43.43 | 20 | Pass |
| 2483.6 | TX1 | 41.92 | 20 | Pass |
| 802.11n40 mode | | | | |
| 2399.9 | TX0 | 40.01 | 20 | Pass |
| 2399.9 | TX1 | 36.73 | 20 | Pass |
| 2483.6 | TX0 | 43.18 | 20 | Pass |
| 2483.6 | TX1 | 39.77 | 20 | Pass |

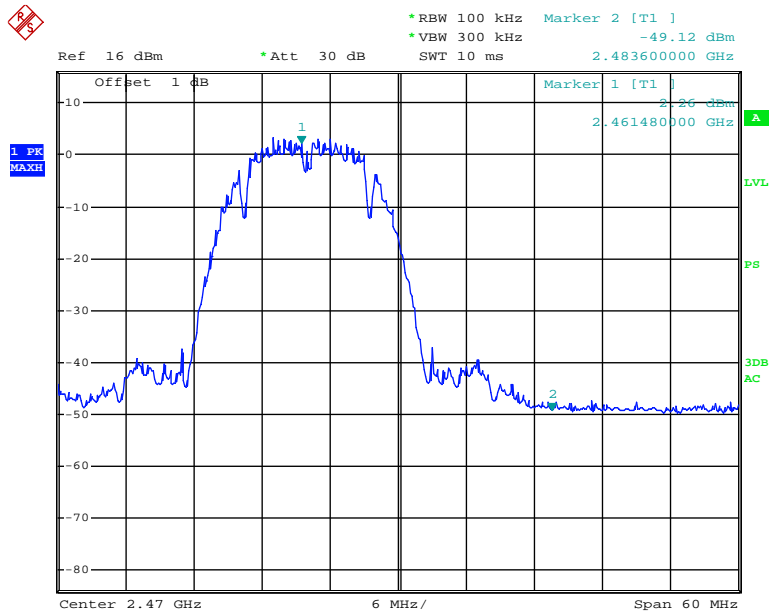
Please refer to following plots.

802.11b: Band Edge, Left Side



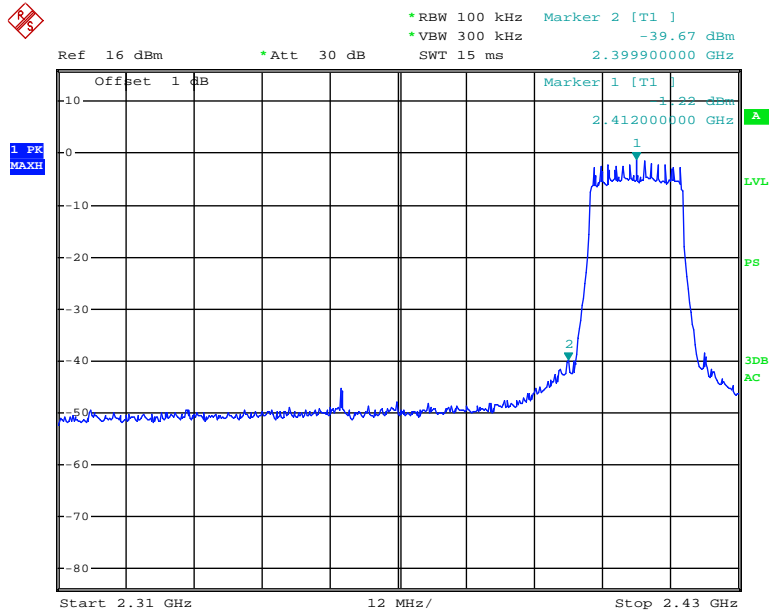
Date: 21.JUL.2011 11:19:51

802.11b: Band Edge, Right Side



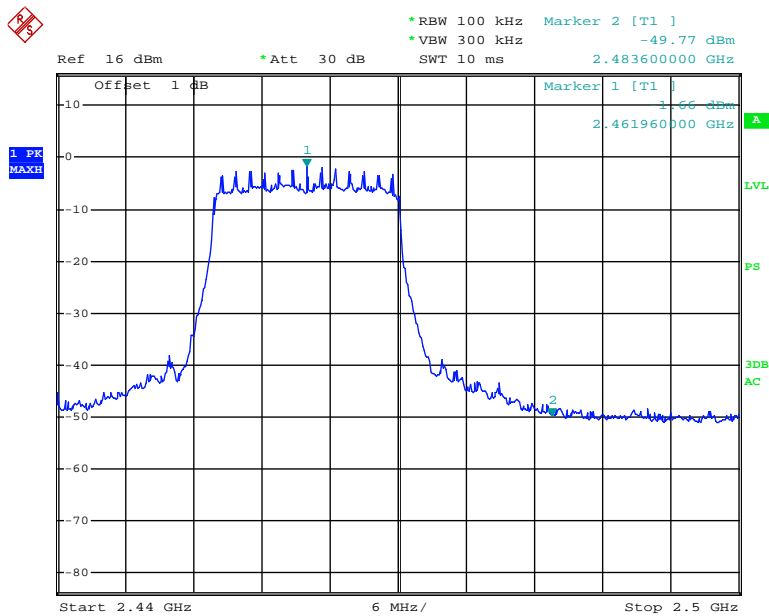
Date: 21.JUL.2011 11:18:54

802.11g: Band Edge, Left Side



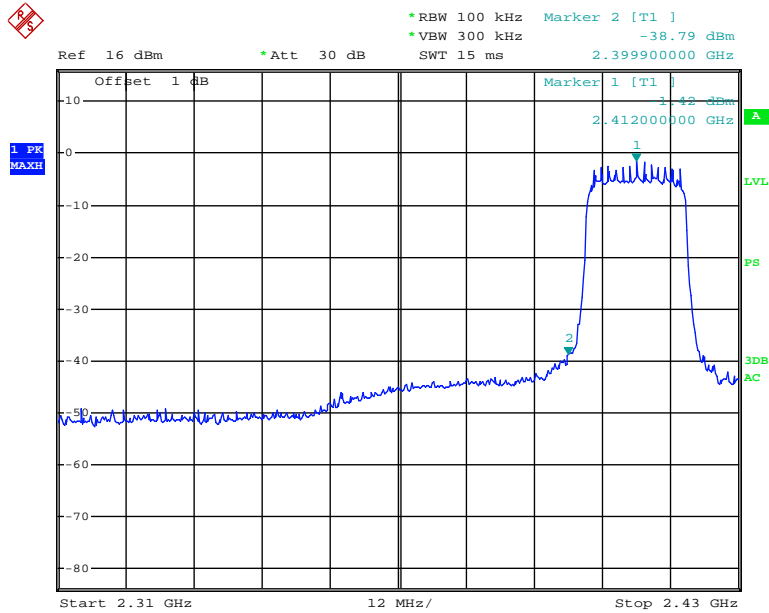
Date: 21.JUL.2011 11:04:17

802.11g: Band Edge, Right Side



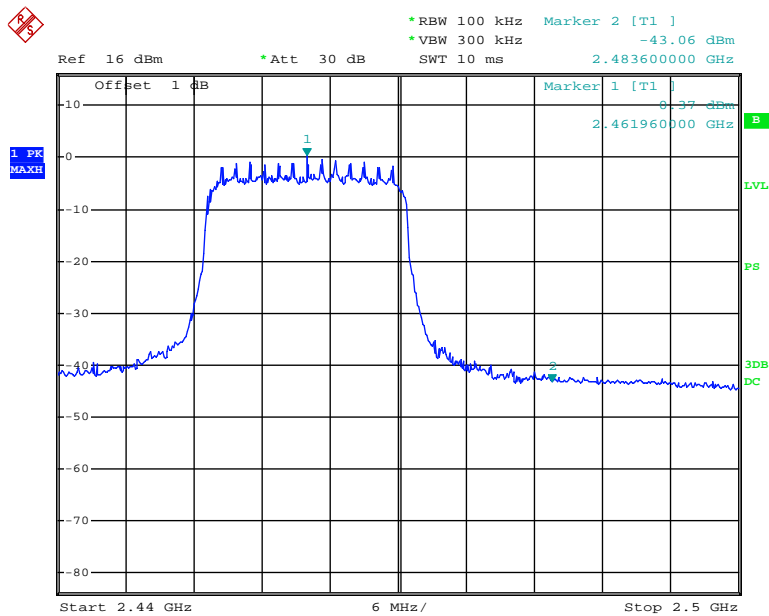
Date: 21.JUL.2011 11:05:58

802.11n20: Band Edge, Left Side, TX0



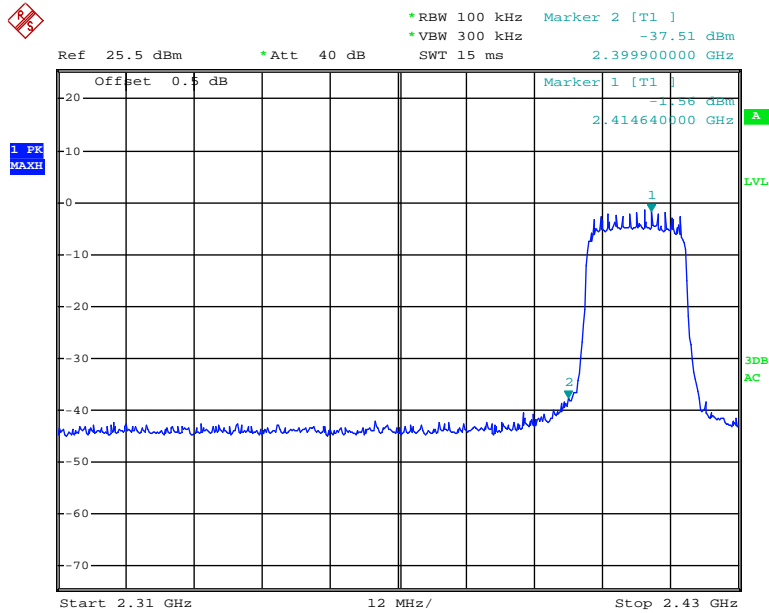
Date: 21.JUL.2011 11:31:23

802.11n20: Band Edge, Right Side, TX0



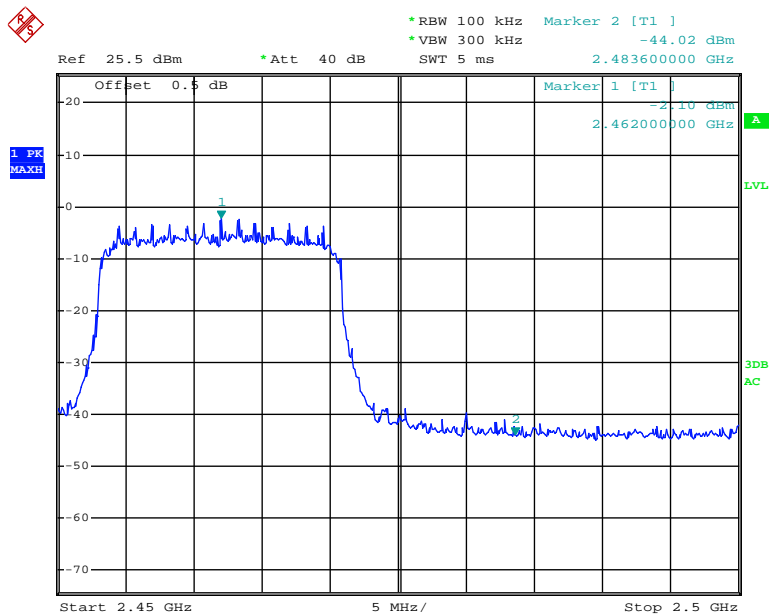
Date: 21.JUL.2011 13:30:35

802.11n20: Band Edge, Left Side, TX1



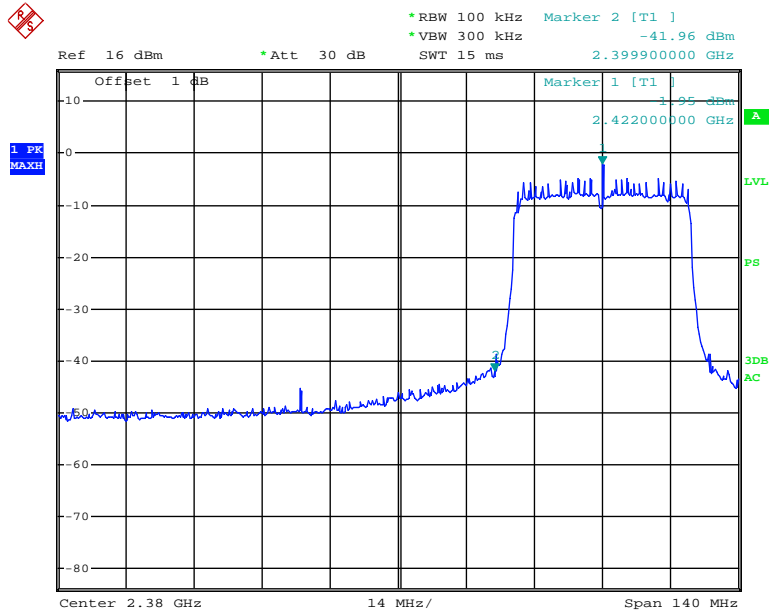
Date: 12.SEP.2011 09:56:40

802.11n20: Band Edge, Right Side, TX1



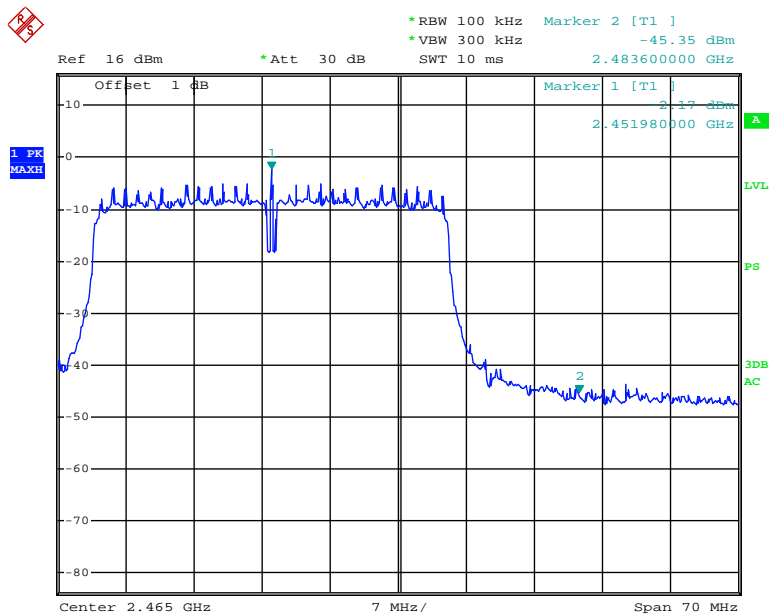
Date: 12.SEP.2011 09:57:53

802.11n40: Band Edge, Left Side, TX0



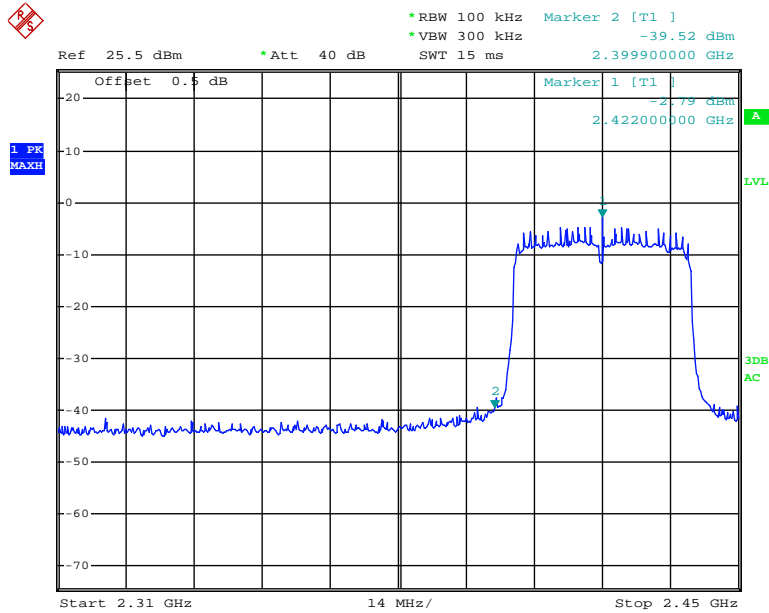
Date: 21.JUL.2011 11:37:03

802.11n40: Band Edge, Right Side, TX0



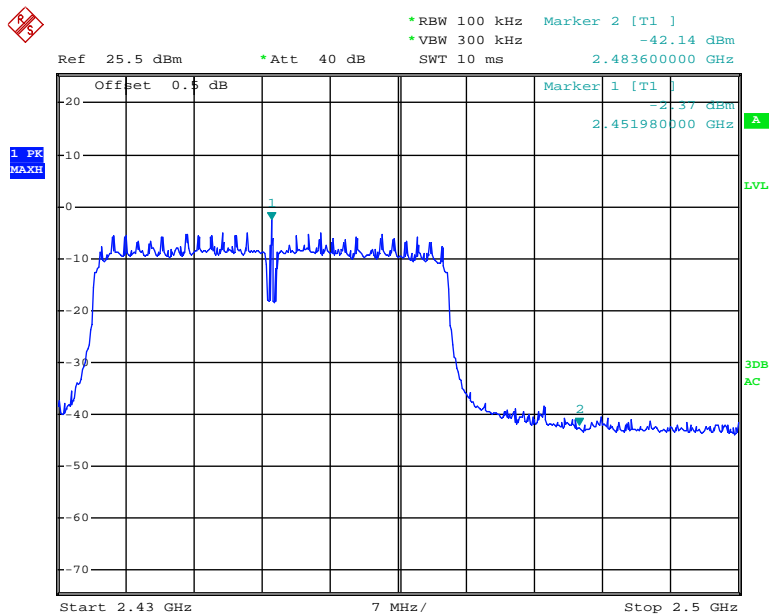
Date: 21.JUL.2011 11:39:19

802.11n40: Band Edge, Left Side, TX1



Date: 12.SEP.2011 09:55:38

802.11n40: Band Edge, Right Side, TX1



Date: 12.SEP.2011 09:54:03

FCC §15.247(e) - POWER SPECTRAL DENSITY**Applicable Standard**

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

Test Procedure

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

Test Equipment List and Details

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

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

Test Data**Environmental Conditions**

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

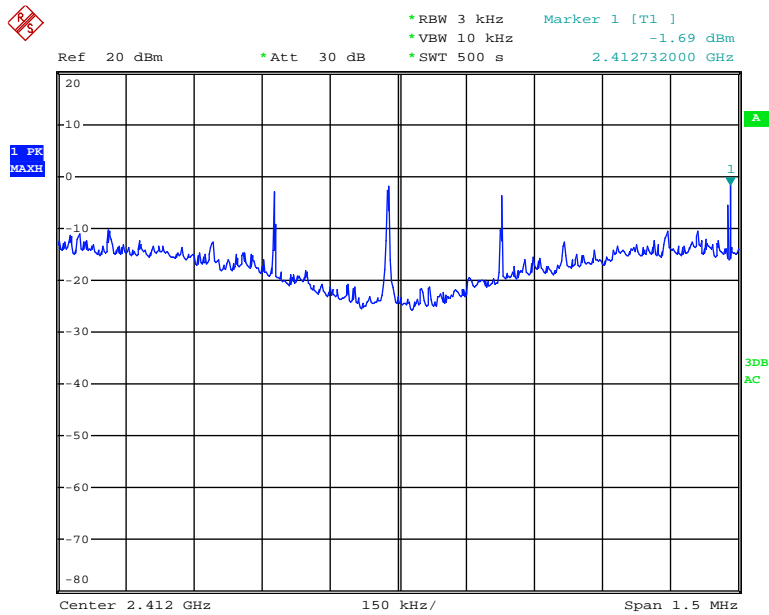
The testing was performed by Bruce Zhang on 2011-07-11 to 2011-09-12.

Test Mode: Transmitting

Test Result: Pass

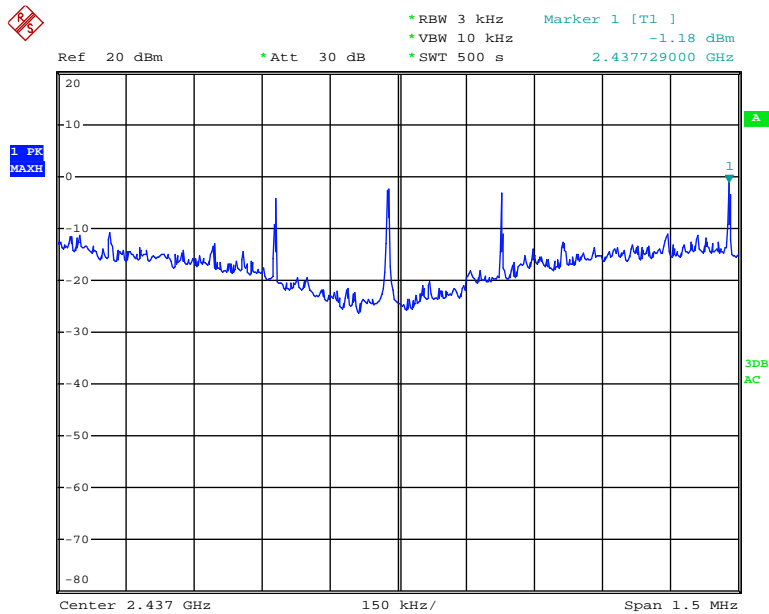
| Channel | Frequency (MHz) | Data Rate (Mbps) | Antenna Port | PSD (dBm) | Total PSD (dBm) | Limit (dBm) | Result |
|----------------|-----------------|------------------|--------------|-----------|-----------------|-------------|--------|
| 802.11b mode | | | | | | | |
| Low | 2412 | 1 | TX0 | -1.69 | / | 8 | Pass |
| Middle | 2437 | 1 | TX0 | -1.18 | / | 8 | Pass |
| High | 2462 | 1 | TX0 | 0.29 | / | 8 | Pass |
| 802.11g mode | | | | | | | |
| Low | 2412 | 6 | TX0 | -3.68 | / | 8 | Pass |
| Middle | 2437 | 6 | TX0 | -3.83 | / | 8 | Pass |
| High | 2462 | 6 | TX0 | -3.88 | / | 8 | Pass |
| 802.11n20 mode | | | | | | | |
| Low | 2412 | 6.5 | TX0 | -3.48 | -0.49 | 8 | Pass |
| Low | 2412 | 6.5 | TX1 | -3.52 | | | |
| Middle | 2437 | 6.5 | TX0 | -3.67 | -0.31 | 8 | Pass |
| Middle | 2437 | 6.5 | TX1 | -2.99 | | | |
| High | 2462 | 6.5 | TX0 | -3.94 | -0.77 | 8 | Pass |
| High | 2462 | 6.5 | TX1 | -3.62 | | | |
| 802.11n40 mode | | | | | | | |
| Low | 2422 | 6.5 | TX0 | -3.62 | -0.60 | 8 | Pass |
| Low | 2422 | 6.5 | TX1 | -3.61 | | | |
| Middle | 2437 | 6.5 | TX0 | -3.70 | -0.43 | 8 | Pass |
| Middle | 2437 | 6.5 | TX1 | -2.97 | | | |
| High | 2452 | 6.5 | TX0 | -3.81 | -0.57 | 8 | Pass |
| High | 2452 | 6.5 | TX1 | -3.37 | | | |

Power Spectral Density, 802.11b Low Channel



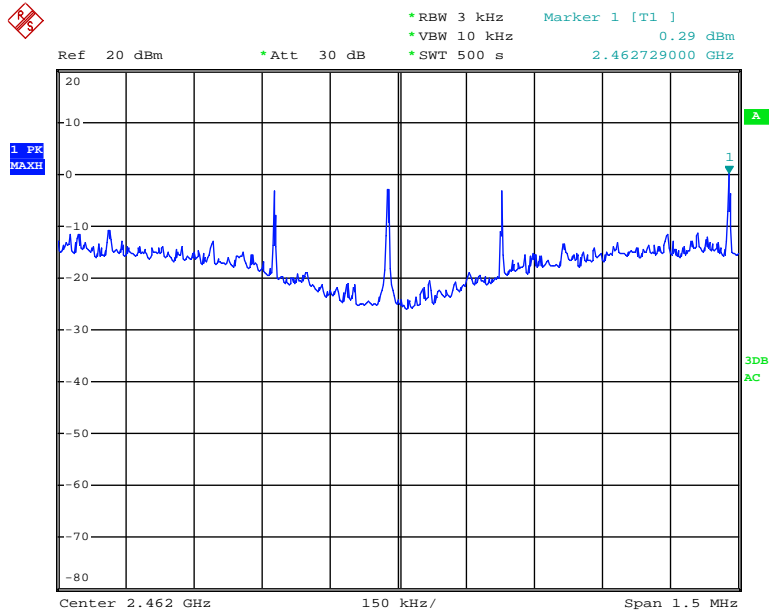
Date: 19.JUL.2011 08:56:19

Power Spectral Density, 802.11b Middle Channel



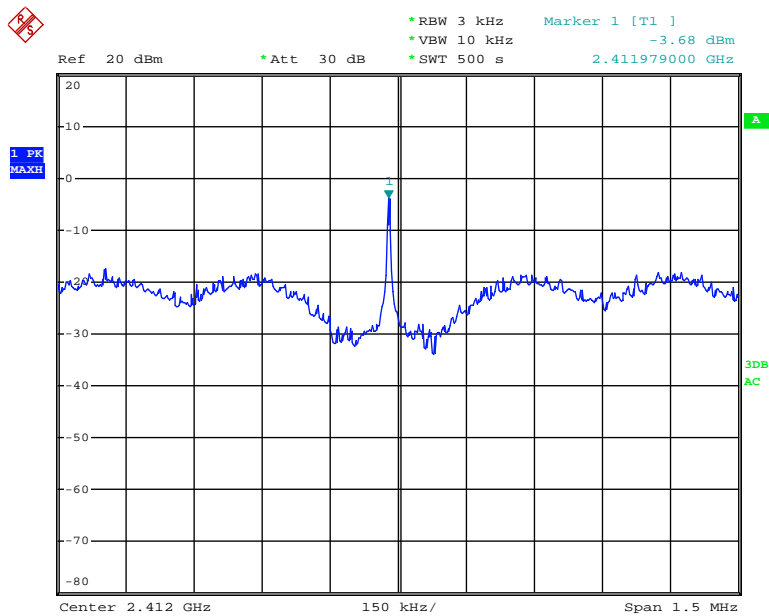
Date: 19.JUL.2011 09:34:06

Power Spectral Density, 802.11b High Channel



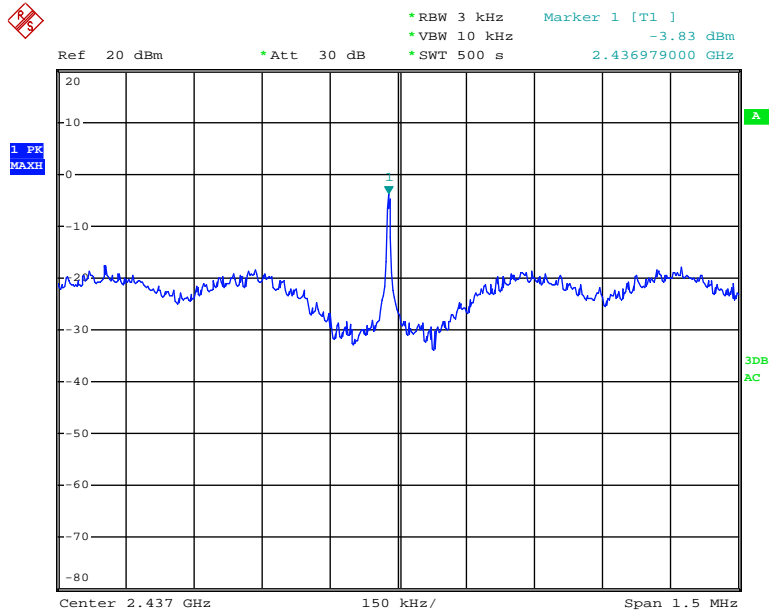
Date: 19.JUL.2011 09:52:24

Power Spectral Density, 802.11g Low Channel



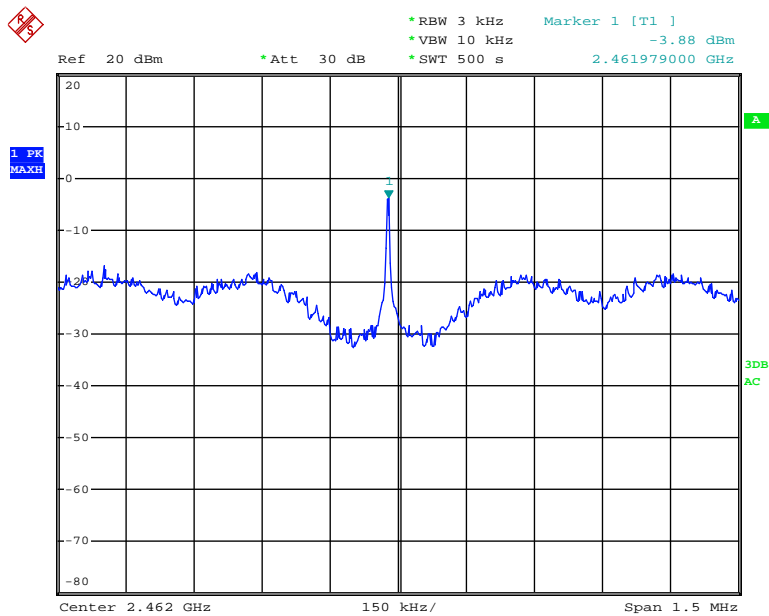
Date: 19.JUL.2011 10:21:18

Power Spectral Density, 802.11g Middle Channel



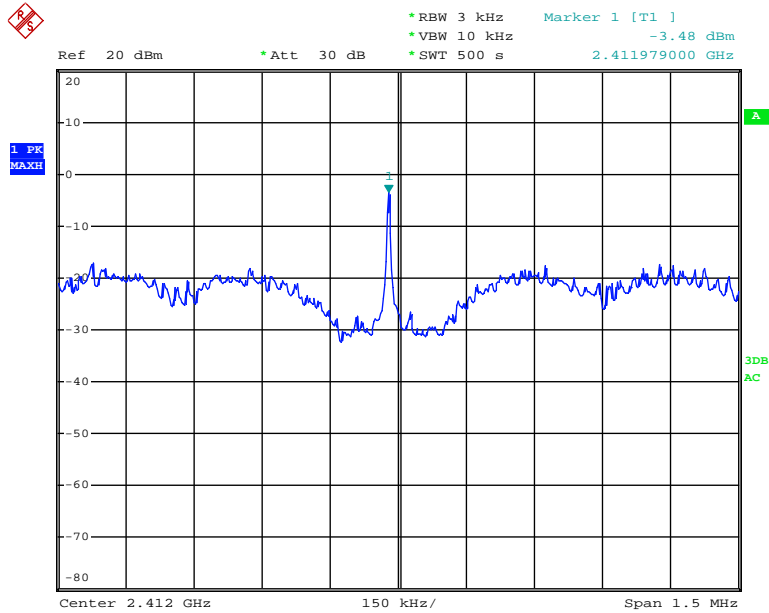
Date: 19.JUL.2011 10:10:55

Power Spectral Density, 802.11g High Channel



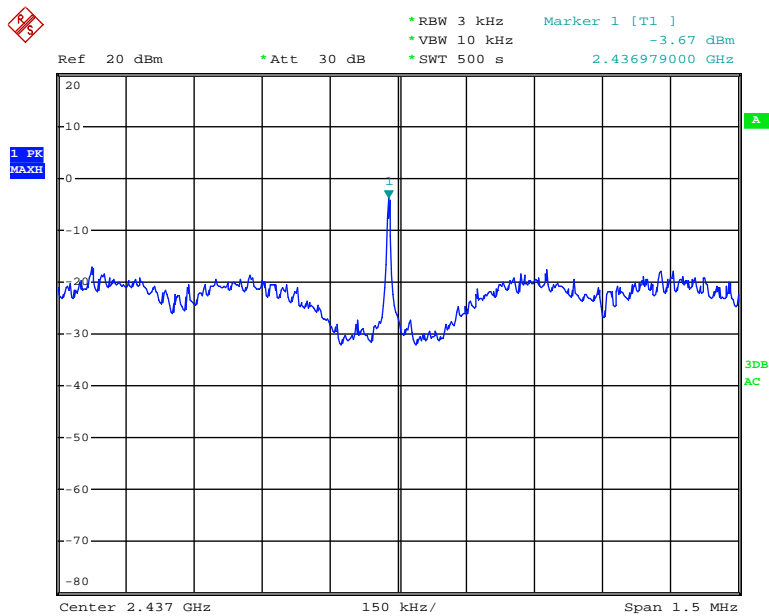
Date: 19.JUL.2011 10:01:54

Power Spectral Density, 802.11n20 Low Channel, TX0



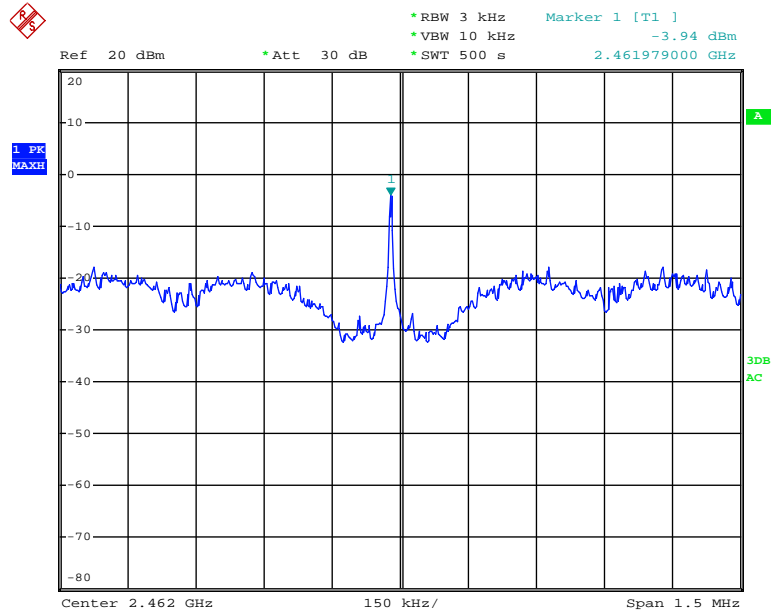
Date: 19.JUL.2011 10:38:52

Power Spectral Density, 802.11n20 Middle Channel, TX0



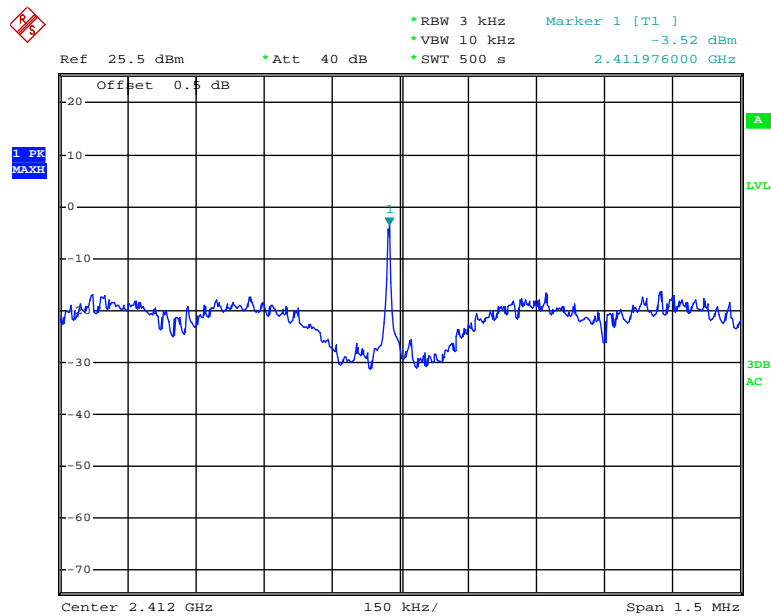
Date: 19.JUL.2011 10:48:46

Power Spectral Density, 802.11n20 High Channel, TX0



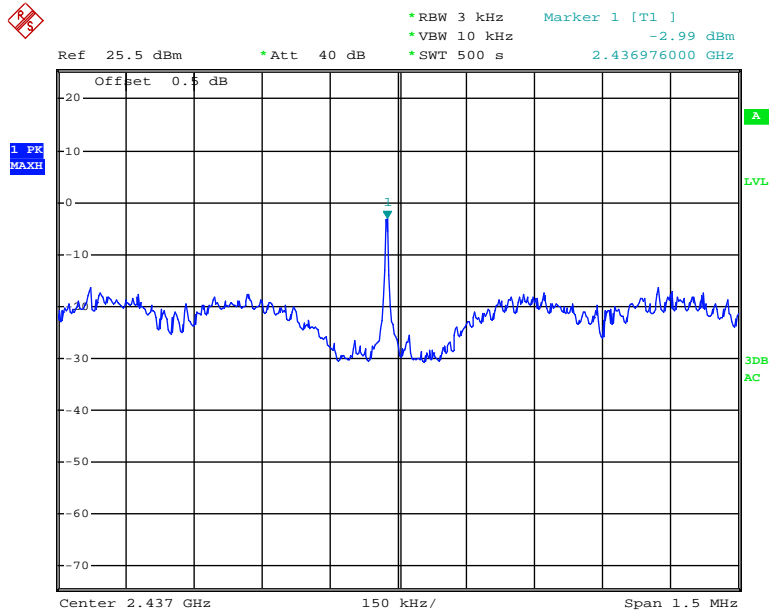
Date: 19.JUL.2011 10:58:26

Power Spectral Density, 802.11n20 Low Channel, TX1



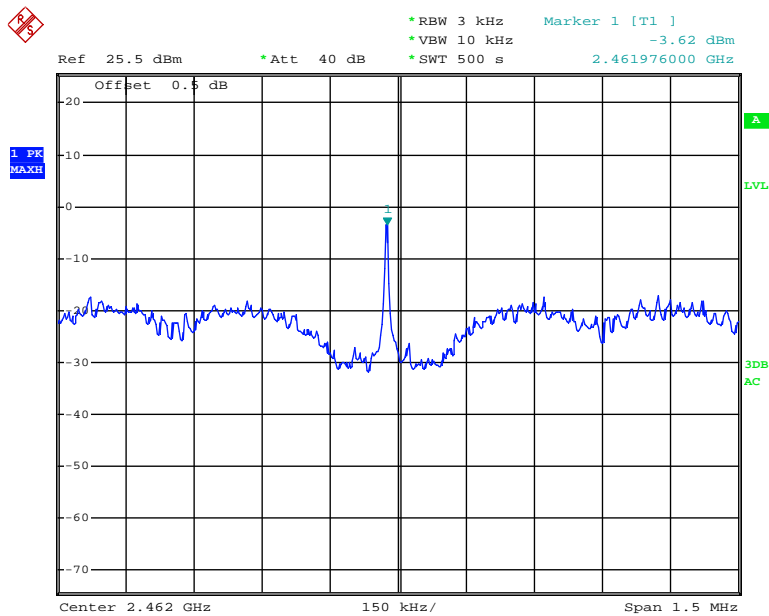
Date: 12.SEP.2011 10:35:40

Power Spectral Density, 802.11n20 Middle Channel, TX1



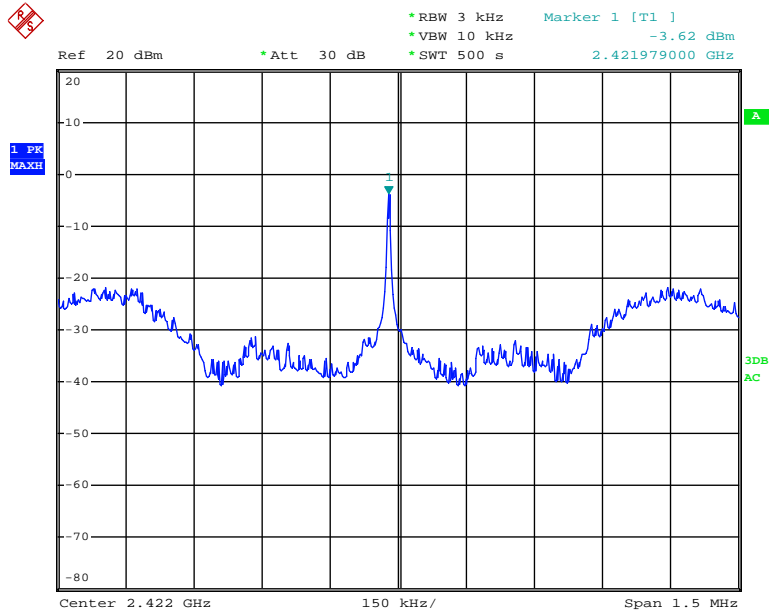
Date: 12.SEP.2011 10:21:42

Power Spectral Density, 802.11n20 High Channel, TX1



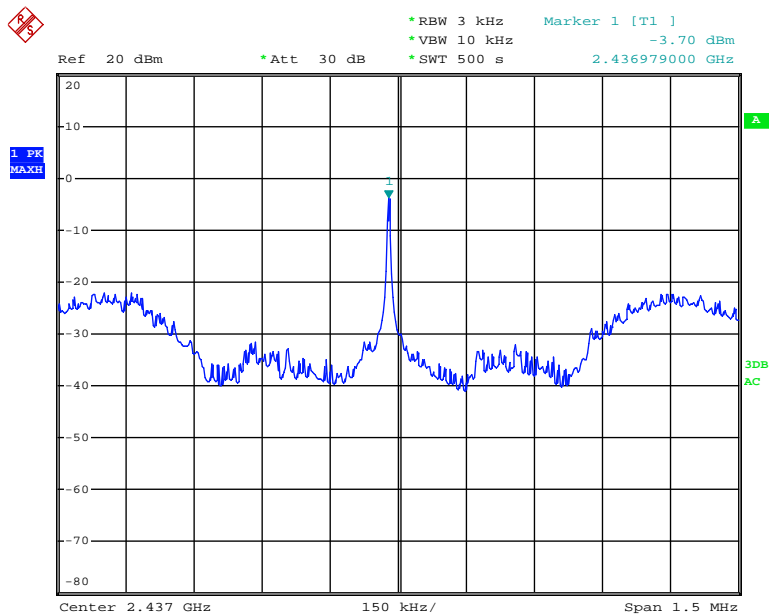
Date: 12.SEP.2011 10:12:12

Power Spectral Density, 802.11n40 Low Channel, TX0



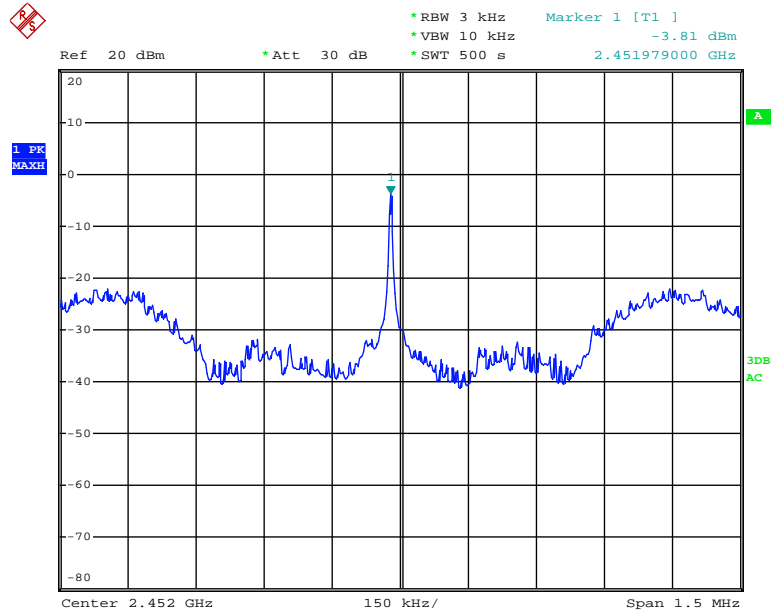
Date: 19.JUL.2011 11:40:46

Power Spectral Density, 802.11n40 Middle Channel, TX0



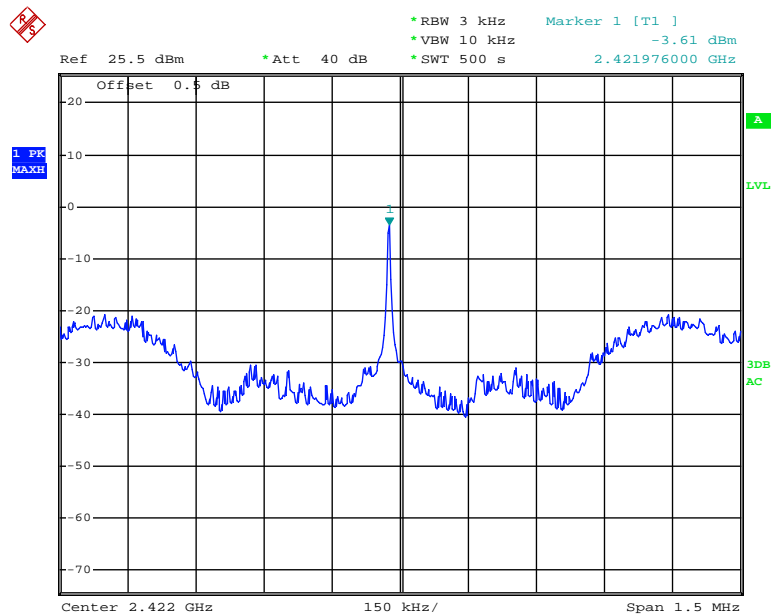
Date: 19.JUL.2011 11:30:11

Power Spectral Density, 802.11n40 High Channel, TX0



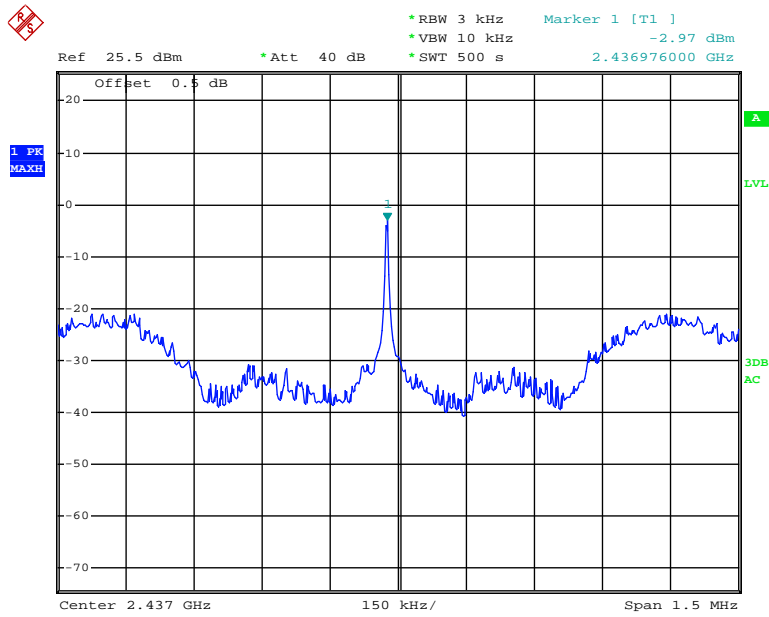
Date: 19.JUL.2011 11:19:36

Power Spectral Density, 802.11n40 Low Channel, TX1



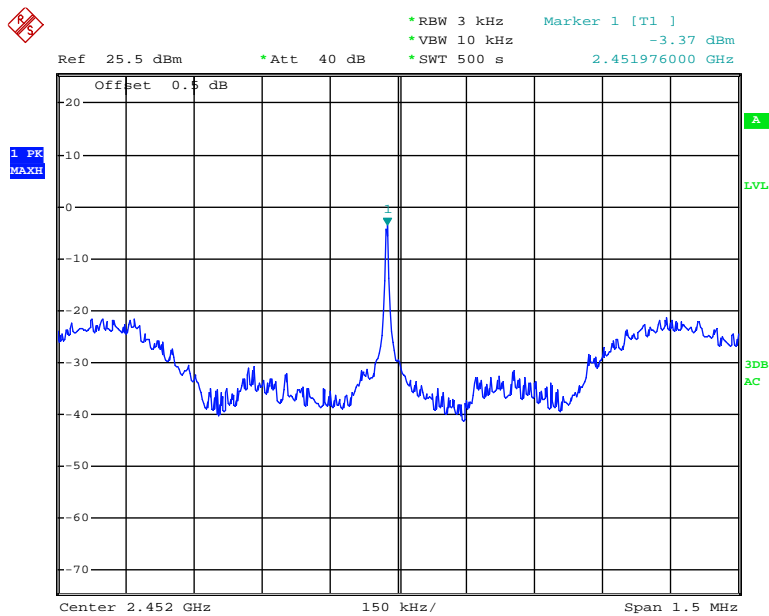
Date: 12.SEP.2011 10:47:50

Power Spectral Density, 802.11n40 Middle Channel, TX1



Date: 12.SEP.2011 10:57:20

Power Spectral Density, 802.11n40 High Channel, TX1



Date: 12.SEP.2011 11:07:35

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