

FCC PART 15.247

TEST REPORT

For

Nexpro International Limitada

San Jose-Goicoechea, Guadalupe, Barrio Tournon, frente Al Hotel Villas Tournon, Oficinas Del
Bufete Facio Y Canas, Costa Rica

FCC ID: ZYPQ28

Report Type: Original Report	Product Type: GSM Mobile Phone
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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 *Nexpro International Limitada*'s product, model number: *Q28 (FCC ID: ZYPQ28)* or ("EUT") in this report is a GSM Mobile Phone, which was measured approximately: 11.5 cm (L) x 5.6cm (W) x 1.2cm (H), rated input voltage: DC 3.7V Lithium battery or DC 5.0V from adapter for charging.

Adapter Information:

Trade name : Sendtel

Modelo : Q28

ENTRADA: AC100-240V 50/60 Hz 0.2A

SALIDA: DC5V 500mA

** All measurement and test data in this report was gathered from production sample serial number: 1202061 (Assigned by BACL, Shenzhen). The EUT was received on 2012-02-17.*

Objective

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

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 22H&24E PCE submissions with FCC ID: ZYPQ28.

FCC Part 15B JBP submissions with FCC ID: ZYPQ28.

FCC Part 15C DSS submissions with FCC ID: ZYPQ28 for BT.

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., and KDB 558074 D01 DTS Meas Guidance v01, Guidance for Performing Compliance Measurements on Digital Transmission System(DTS) Operating Under §15.247.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

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

Test Facility

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

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

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

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



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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

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

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

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

EUT was tested with Channel 1, 4 and 7.

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

EUT Exercise Software

No EUT Exercise Software

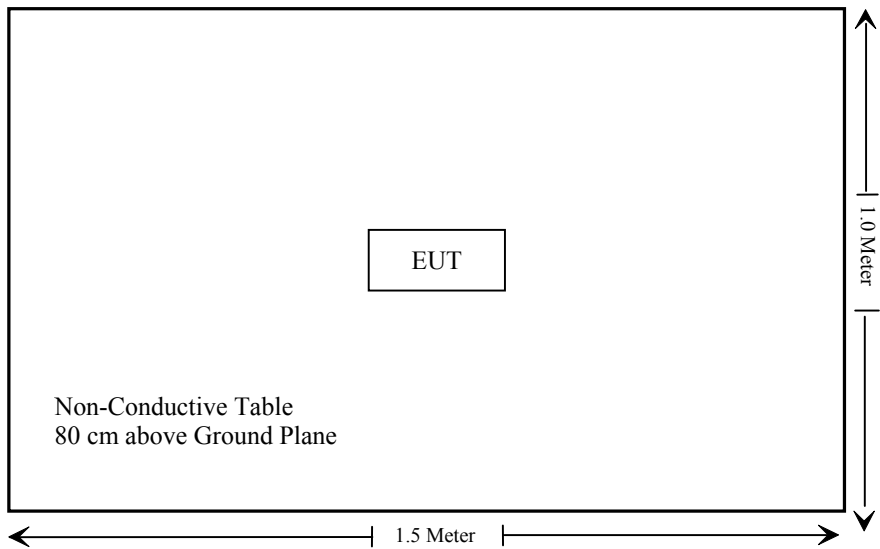
Equipment Modifications

No modification was made to EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
-	-	-	-

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b)(1), §2.1091	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

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

Applicable Standard

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

According to KDB 447498 D01 Mobile Portable RF Exposure v04, no SAR required if power is lower than the flowing threshold:

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

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

Measurement Result

Compliance, please refer to the SAR report: R1DG120206001-20

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT has 2 PIFA antenna, BT antenna and WIFI antenna, which complied with 15.203, the maximum gain is -2.0dBi, please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

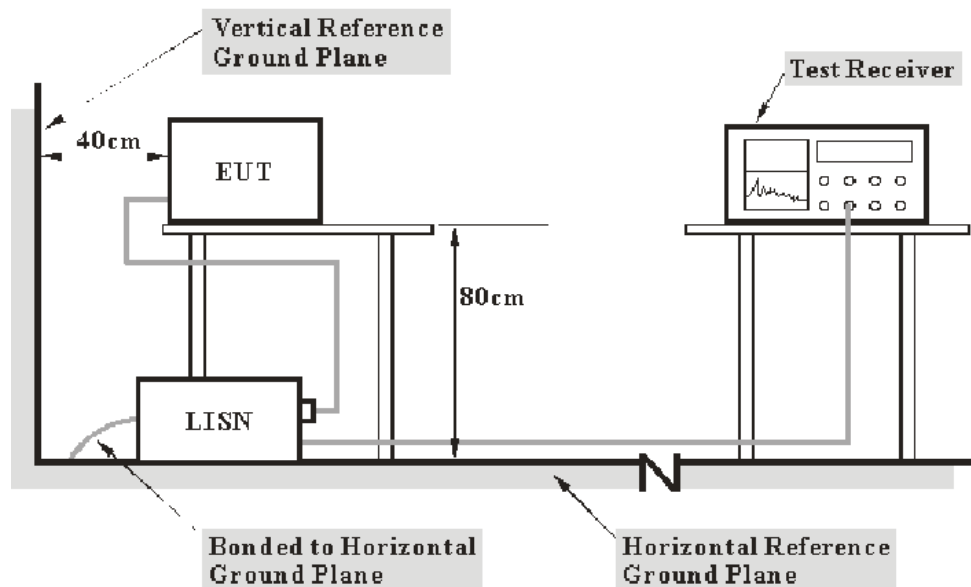
FCC§15.207

Measurement Uncertainty

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

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ± 2.4 dB (k=2, 95% level of confidence).

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

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 BW</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	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16

* **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:

15.64 dB at 1.740 MHz in the Neutral mode

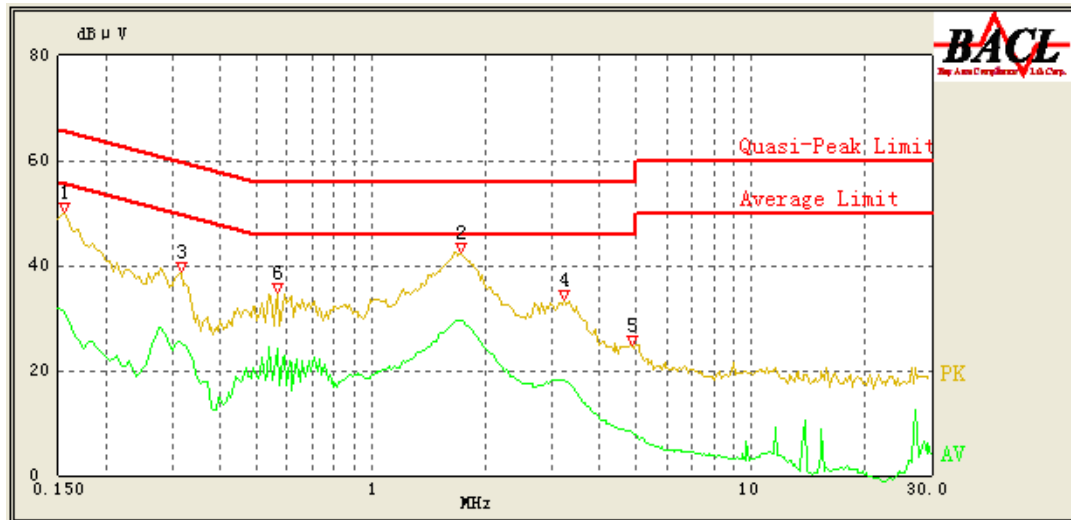
Test Data

Environmental Conditions

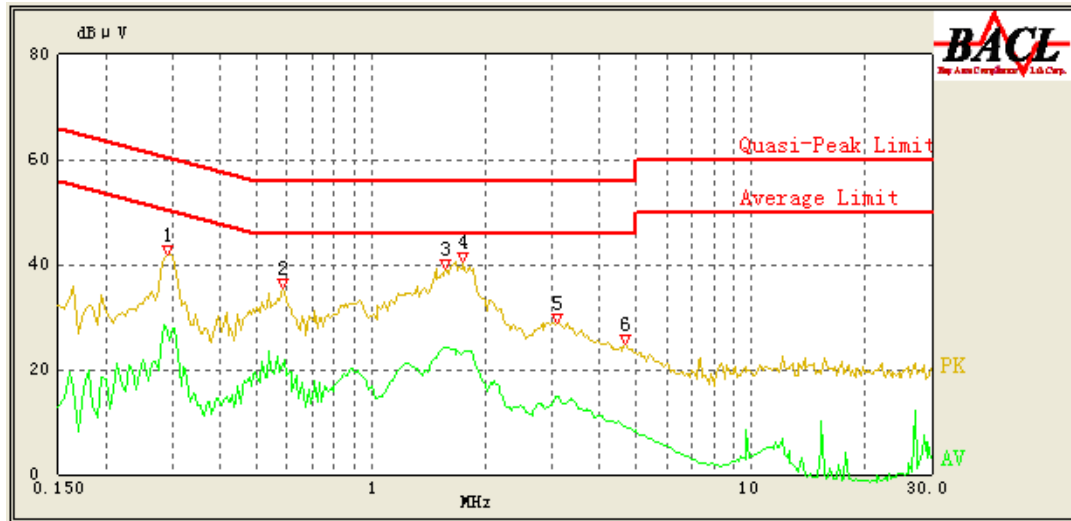
Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

The testing was performed by Lion Cai on 2012-02-16.

Test Mode: Transmitting

120 V, 60 Hz, Line:

Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave.)
0.155	27.41	1.10	65.86	38.45	QP
0.155	31.33	1.10	55.86	24.53	Ave
1.725	32.57	1.10	56.00	23.43	QP
1.735	29.37	1.10	46.00	16.63	Ave
0.315	26.18	1.10	61.29	35.11	QP
0.315	25.20	1.10	51.29	26.09	Ave
3.230	19.70	1.10	56.00	36.30	QP
3.205	18.14	1.10	46.00	27.86	Ave
4.875	14.15	1.10	56.00	41.85	QP
4.870	8.08	1.10	46.00	37.92	Ave
0.565	30.48	1.10	56.00	25.52	QP
0.565	24.29	1.10	46.00	21.71	Ave

120V, 60 Hz, Neutral:

Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.290	41.87	1.10	62.00	20.13	QP
0.290	27.66	1.10	52.00	24.34	Ave
0.585	35.56	1.10	56.00	20.44	QP
0.585	20.76	1.10	46.00	25.24	Ave
1.575	39.31	1.10	56.00	16.69	QP
1.575	24.23	1.10	46.00	21.77	Ave
1.740	40.36	1.10	56.00	15.64	QP
1.755	23.48	1.10	46.00	22.52	Ave
3.090	28.87	1.10	56.00	27.13	QP
3.075	14.87	1.10	46.00	31.13	Ave
4.655	24.73	1.10	56.00	31.27	QP
4.640	9.33	1.10	46.00	36.67	Ave

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

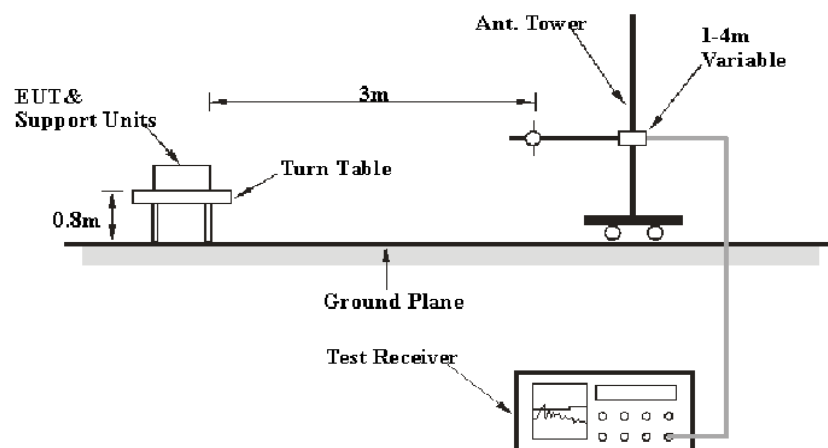
Measurement Uncertainty

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.

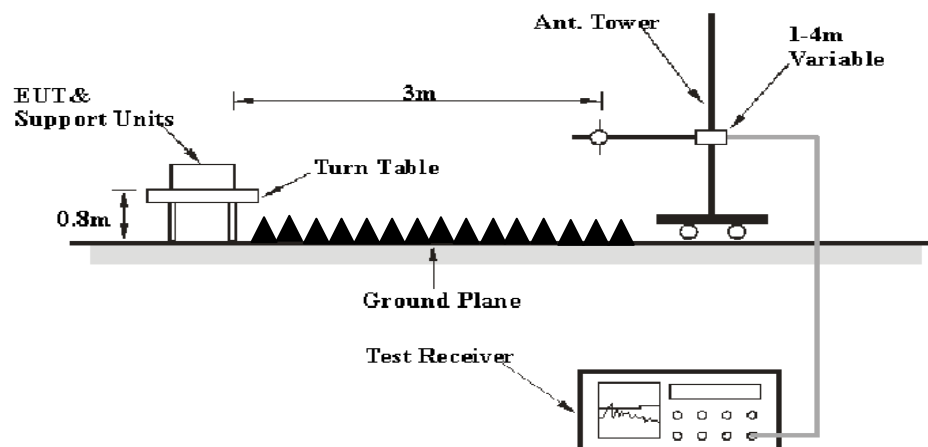
Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB(k=2, 95% level of confidence) .

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.

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

The spacing between the peripherals was 10 cm.

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 BW</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave

Test Procedure

During the radiated emission test, the adapter was connected to 120 VAC/60 Hz power source.

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

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

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27
DUCOMMUN Technologies	Pre-amp	ALN-09173030-01	991396-01	2011-11-24	2012-12-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
HP	Spectrum Analyzer	8593A	2919A00242	2011-04-09	2012-04-08
Rohde & Schwarz	Signal Analyzer	FSIQ 26	8386001028	2011-11-24	2012-11-23

* **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 Results Summary

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

2.67 dB at 4874 MHz in the Horizontal polarization (802.11b mode)

Test Data**Environmental Conditions**

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

The testing was performed by Lion Cai on 2012-02-28.

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

802.11b Mode:

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dB/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412MHz)								
109.78	31.23	QP	H	-8.61	22.62	43.5	20.88	spurious
109.78	30.15	QP	V	-8.61	21.54	43.5	21.96	spurious
2389.54	35.40	peak	H	23.23	58.63	74	15.37	spurious
2389.54	31.01	peak	V	23.23	54.24	74	19.76	spurious
2389.54	25.52	AVG	H	23.23	48.75	54	5.25	spurious
2389.54	19.50	AVG	V	23.23	42.73	54	11.27	spurious
2412	81.97	peak	H	23.37	105.34	N/A	N/A	Fundamental
2412	73.79	peak	V	23.37	97.16	N/A	N/A	Fundamental
2412	77.07	AVG	H	23.37	100.44	N/A	N/A	Fundamental
2412	68.96	AVG	V	23.37	92.33	N/A	N/A	Fundamental
4824	35.40	peak	H	28.63	64.03	74	9.97	Harmonic
4824	30.52	peak	V	28.63	59.15	74	14.85	Harmonic
4824	22.15	AVG	H	28.63	50.78	54	3.22	Harmonic
4824	17.00	AVG	V	28.63	45.63	54	8.37	Harmonic
Middle Channel (2437MHz)								
401.8	20.35	QP	H	-3.22	17.13	46	28.87	spurious
401.8	21.52	QP	V	-3.22	18.30	46	27.70	spurious
2437	84.58	peak	H	23.64	108.22	N/A	N/A	Fundamental
2437	80.87	peak	V	23.64	104.51	N/A	N/A	Fundamental
2437	80.08	AVG	H	23.64	103.72	N/A	N/A	Fundamental
2437	75.81	AVG	V	23.64	99.45	N/A	N/A	Fundamental
4874	35.44	peak	H	28.79	64.23	74	9.77	Harmonic
4874	30.86	peak	V	28.79	59.65	74	14.35	Harmonic
4874	22.54	AVG	H	28.79	51.33	54	2.67*	Harmonic
4874	20.26	AVG	V	28.79	49.05	54	4.95	Harmonic
High Channel (2462MHz)								
612.73	22.42	QP	H	4.96	27.38	46	18.62	spurious
612.73	22.31	QP	V	4.96	27.27	46	18.73	spurious
2462	84.79	peak	H	23.9	108.69	N/A	N/A	Fundamental
2462	83.1	peak	V	23.9	107	N/A	N/A	Fundamental
2462	79.07	AVG	H	23.9	102.97	N/A	N/A	Fundamental
2462	76.61	AVG	V	23.9	100.51	N/A	N/A	Fundamental
2483.69	36.95	peak	H	24.12	61.07	74	12.93	spurious
2483.69	36.93	peak	V	24.12	61.05	74	12.95	spurious
2483.69	19.73	AVG	H	24.12	43.85	54	10.15	spurious
2483.69	19.67	AVG	V	24.12	43.79	54	10.21	spurious
4924	32.44	peak	H	28.95	61.39	74	12.61	Harmonic
4924	29.14	peak	V	28.95	58.09	74	15.91	Harmonic
4924	20.36	AVG	H	28.95	49.31	54	4.69	Harmonic
4924	18.48	AVG	V	28.95	47.43	54	6.57	Harmonic

802.11g Mode:

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dBμV/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412MHz)								
114.39	26.74	QP	H	-6.08	20.66	43.5	22.84	spurious
114.39	27.84	QP	V	-6.08	21.76	43.5	21.74	spurious
2389.38	34.37	peak	H	23.24	57.61	74	16.39	spurious
2389.38	37.13	peak	V	23.24	60.37	74	13.63	spurious
2389.38	18.33	AVG	H	23.24	41.57	54	12.43	spurious
2389.38	19.49	AVG	V	23.24	42.73	54	11.27	spurious
2412	74.5	peak	H	23.37	97.87	N/A	N/A	Fundamental
2412	73.6	peak	V	23.37	96.97	N/A	N/A	Fundamental
2412	62.75	AVG	H	23.37	86.12	N/A	N/A	Fundamental
2412	63.28	AVG	V	23.37	86.65	N/A	N/A	Fundamental
4824	29.47	peak	H	28.63	58.1	74	15.9	Harmonic
4824	29.04	peak	V	28.63	57.67	74	16.33	Harmonic
4824	13.48	AVG	H	28.63	42.11	54	11.89	Harmonic
4824	13.48	AVG	V	28.63	42.11	54	11.89	Harmonic
Middle Channel (2437MHz)								
325.85	23.00	QP	H	-4.28	18.72	46	27.28	spurious
325.85	24.50	QP	V	-4.28	20.22	46	25.78	spurious
2437	77.72	peak	H	23.64	101.36	N/A	N/A	Fundamental
2437	75.26	peak	V	23.64	98.9	N/A	N/A	Fundamental
2437	68.17	AVG	H	23.64	91.81	N/A	N/A	Fundamental
2437	65.73	AVG	V	23.64	89.37	N/A	N/A	Fundamental
4874	29.60	peak	H	28.79	58.39	74	15.61	Harmonic
4874	28.92	peak	V	28.79	57.71	74	16.29	Harmonic
4874	13.48	AVG	H	28.79	42.27	54	11.73	Harmonic
4874	13.48	AVG	V	28.79	42.27	54	11.73	Harmonic
High Channel (2462MHz)								
975.31	22.08	QP	H	5.11	27.19	54	26.81	spurious
975.31	23.15	QP	V	5.11	28.26	54	25.74	spurious
2462	76.63	peak	H	23.9	100.53	N/A	N/A	Fundamental
2462	76.65	peak	V	23.9	100.55	N/A	N/A	Fundamental
2462	66.53	AVG	H	23.9	90.43	N/A	N/A	Fundamental
2462	67.25	AVG	V	23.9	91.15	N/A	N/A	Fundamental
2483.76	37.99	peak	H	24.12	62.11	74	11.89	spurious
2483.76	38.50	peak	V	24.12	62.62	74	11.38	spurious
2483.76	18.34	AVG	H	24.12	42.46	54	11.54	spurious
2483.76	19.50	AVG	V	24.12	43.62	54	10.38	spurious
4924	30.16	peak	H	28.95	59.11	74	14.89	Harmonic
4924	29.12	peak	V	28.95	58.07	74	15.93	Harmonic
4924	13.48	AVG	H	28.95	42.43	54	11.57	Harmonic
4924	13.48	AVG	V	28.95	42.43	54	11.57	Harmonic

802.11n20 Mode:

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dBμV/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2412MHz)								
112.63	27.15	QP	H	-6.08	21.07	43.5	22.43	spurious
112.63	27.84	QP	V	-6.08	21.76	43.5	21.74	spurious
2389.23	30.81	peak	H	23.24	54.05	74	19.95	Spurious
2389.23	29.5	peak	V	23.24	52.74	74	21.26	Spurious
2389.23	17	AVG	H	23.24	40.24	54	13.76	Spurious
2389.23	15.41	AVG	V	23.24	38.65	54	15.35	Spurious
2412	72.88	peak	H	23.37	96.25	N/A	N/A	Fundamental
2412	68.35	peak	V	23.37	91.72	N/A	N/A	Fundamental
2412	62.99	AVG	H	23.37	86.36	N/A	N/A	Fundamental
2412	57.96	AVG	V	23.37	81.33	N/A	N/A	Fundamental
4824	29.38	peak	H	28.63	58.01	74	15.99	Harmonic
4824	29.15	peak	V	28.63	57.78	74	16.22	Harmonic
4824	13.48	AVG	H	28.63	42.11	54	11.89	Harmonic
4824	13.48	AVG	V	28.63	42.11	54	11.89	Harmonic
Middle Channel (2437MHz)								
322.74	24.08	QP	H	-3.22	20.86	46	25.41	spurious
322.74	24.50	QP	V	-3.22	21.28	46	24.72	spurious
2437	74.36	peak	H	23.64	98.00	N/A	N/A	Fundamental
2437	72.88	peak	V	23.64	96.52	N/A	N/A	Fundamental
2437	64.07	AVG	H	23.64	87.71	N/A	N/A	Fundamental
2437	63.36	AVG	V	23.64	87.00	N/A	N/A	Fundamental
4874	29.78	peak	H	28.79	58.57	74	15.43	Harmonic
4874	30.11	peak	V	28.79	58.90	74	15.10	Harmonic
4874	13.48	AVG	H	28.79	42.27	54	11.73	Harmonic
4874	13.48	AVG	V	28.79	42.27	54	11.73	Harmonic
High Channel (2462MHz)								
964.81	22.28	QP	H	5.11	27.39	54	26.61	spurious
964.81	23.06	QP	V	5.11	28.17	54	25.83	spurious
2462	76.29	peak	H	23.9	100.19	N/A	N/A	Fundamental
2462	75.65	peak	V	23.9	99.55	N/A	N/A	Fundamental
2462	66.43	AVG	H	23.9	90.33	N/A	N/A	Fundamental
2462	64.94	AVG	V	23.9	88.84	N/A	N/A	Fundamental
2483.76	39.51	peak	H	24.12	63.63	74	10.37	Spurious
2483.76	38.97	peak	V	24.12	63.09	74	10.91	Spurious
2483.76	18.34	AVG	H	24.12	42.46	54	11.54	Spurious
2483.76	18.34	AVG	V	24.12	42.46	54	11.54	Spurious
4924	29.48	peak	H	28.95	58.43	74	15.57	Harmonic
4924	29.76	peak	V	28.95	58.71	74	15.29	Harmonic
4924	13.48	AVG	H	28.95	42.43	54	11.57	Harmonic
4924	13.48	AVG	V	28.95	42.43	54	11.57	Harmonic

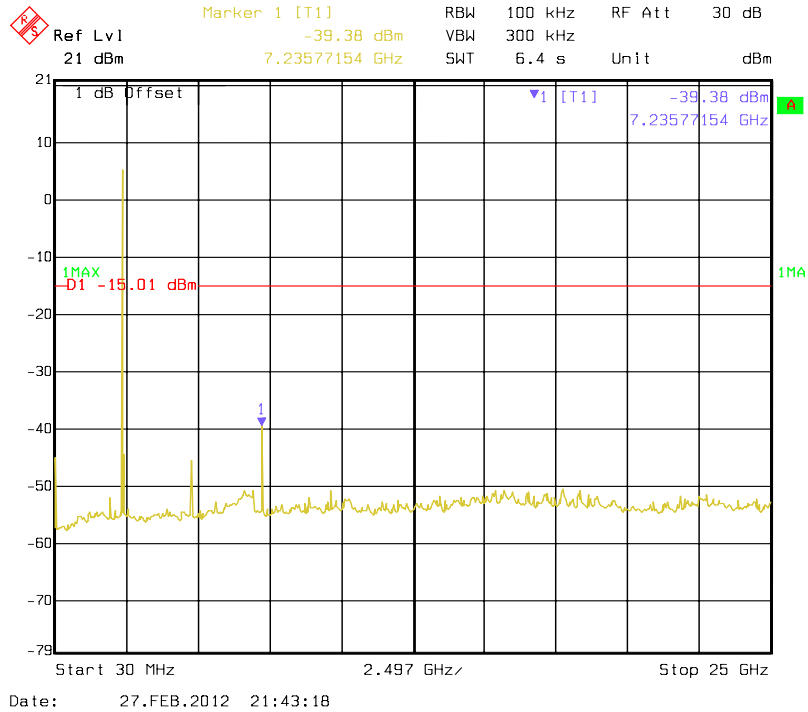
802.11n40 Mode:

Frequency (MHz)	Reading (dBμV)	Detector (PK/QP /Ave.)	Polar (H/V)	Corrected Amplitude (dBμV/m)	Correction Data (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Comment
Low Channel (2422MHz)								
961.06	21.86	QP	H	4.68	26.54	54	27.46	spurious
961.06	22.83	QP	V	4.68	27.51	54	26.49	spurious
2387.25	30.30	peak	H	23.21	53.51	74	20.49	spurious
2387.25	29.76	peak	V	23.21	52.97	74	21.03	spurious
2387.25	15.41	AVG	H	23.21	38.62	54	15.38	spurious
2387.25	15.41	AVG	V	23.21	38.62	54	15.38	spurious
2422	69.28	peak	H	23.47	92.75	N/A	N/A	Fundamental
2422	69.57	peak	V	23.47	93.04	N/A	N/A	Fundamental
2422	59.51	AVG	H	23.47	82.98	N/A	N/A	Fundamental
2422	59.9	AVG	V	23.47	83.37	N/A	N/A	Fundamental
4844	28.61	peak	H	28.7	57.31	74	16.69	Harmonic
4844	28.56	peak	V	28.7	57.26	74	16.74	Harmonic
4844	13.56	AVG	H	28.7	42.26	54	11.74	Harmonic
4844	13.56	AVG	V	28.7	42.26	54	11.74	Harmonic
Middle Channel (2437MHz)								
322.58	22.59	QP	H	1.74	24.33	46	21.67	spurious
322.58	23.34	QP	V	1.74	25.08	46	20.92	spurious
2437	68.45	peak	H	23.64	92.09	N/A	N/A	Fundamental
2437	70.04	peak	V	23.64	93.68	N/A	N/A	Fundamental
2437	58.61	AVG	H	23.64	82.25	N/A	N/A	Fundamental
2437	59.84	AVG	V	23.64	83.48	N/A	N/A	Fundamental
4874	28.61	peak	H	28.79	57.40	74	16.60	Harmonic
4874	28.57	peak	V	28.79	57.36	74	16.64	Harmonic
4874	13.48	AVG	H	28.79	42.27	54	11.73	Harmonic
4874	13.48	AVG	V	28.79	42.27	54	11.73	Harmonic
High Channel (2452MHz)								
964.81	21.61	QP	H	3.31	24.92	54	30.08	spurious
964.81	21.78	QP	V	3.31	25.09	54	29.91	spurious
2452	70.99	peak	H	23.79	94.78	N/A	N/A	Fundamental
2452	72.59	peak	V	23.79	96.38	N/A	N/A	Fundamental
2452	59.94	AVG	H	23.79	83.73	N/A	N/A	Fundamental
2452	63.03	AVG	V	23.79	86.82	N/A	N/A	Fundamental
2483.86	31.35	peak	H	24.12	55.47	74	18.53	spurious
2483.86	32.97	peak	V	24.12	57.09	74	16.91	spurious
2483.86	15.41	AVG	H	24.12	39.53	54	14.47	spurious
2483.86	17.00	AVG	V	24.12	41.12	54	12.88	spurious
4904	28.78	peak	H	28.89	57.67	74	16.33	Harmonic
4904	28.43	peak	V	28.89	57.32	74	16.68	Harmonic
4904	13.48	AVG	H	28.89	42.37	54	11.63	Harmonic
4904	13.48	AVG	V	28.89	42.37	54	11.63	Harmonic

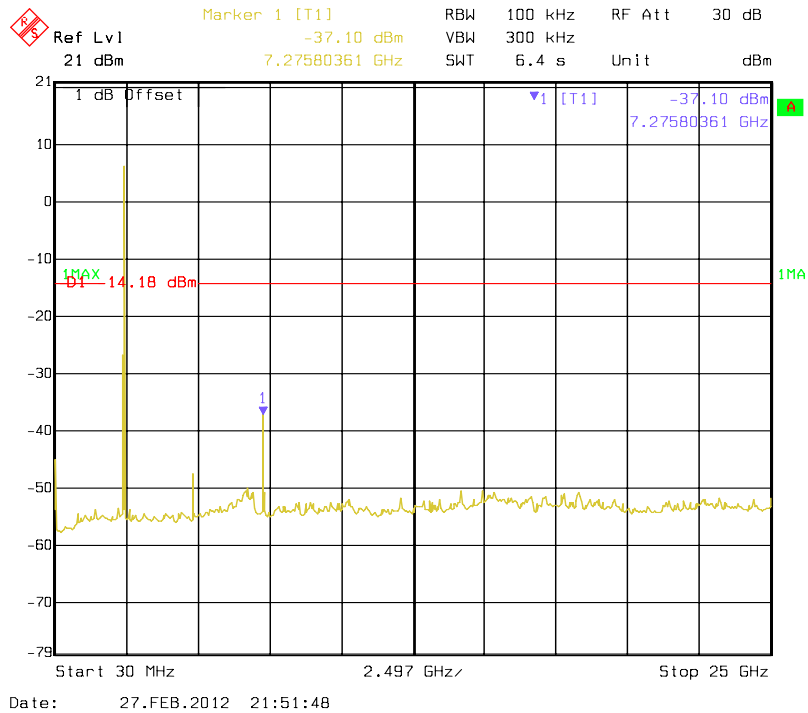
*Within measurement uncertainty!

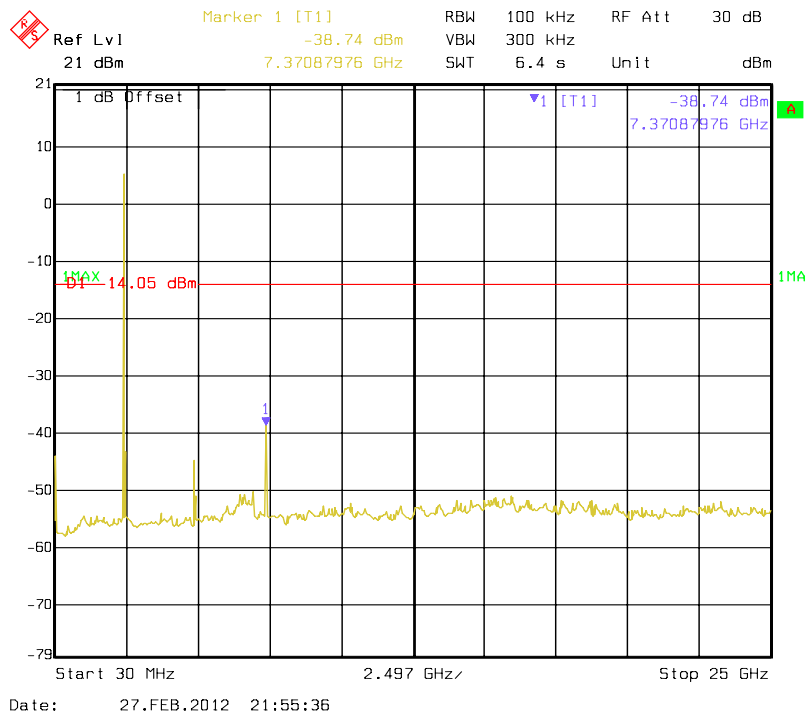
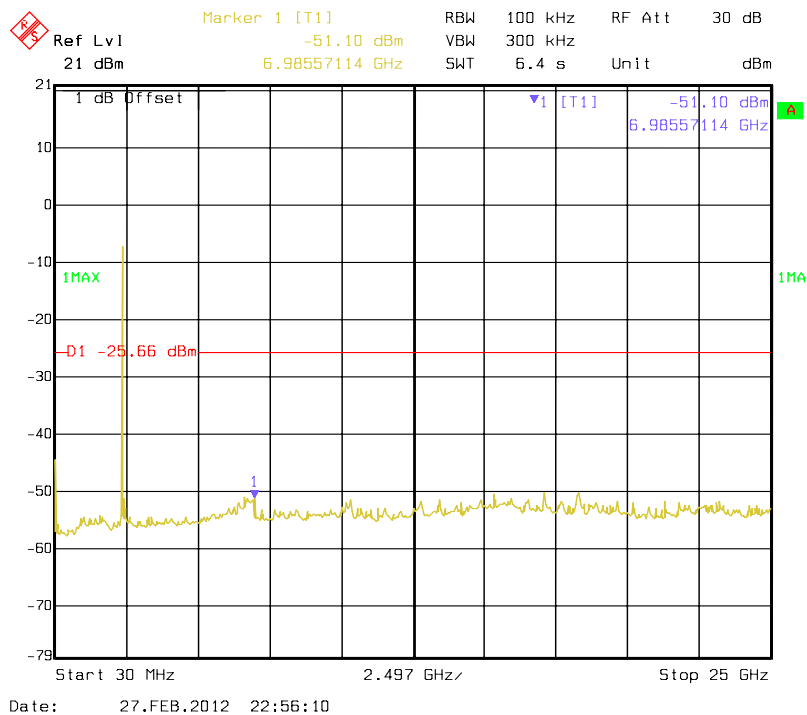
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel

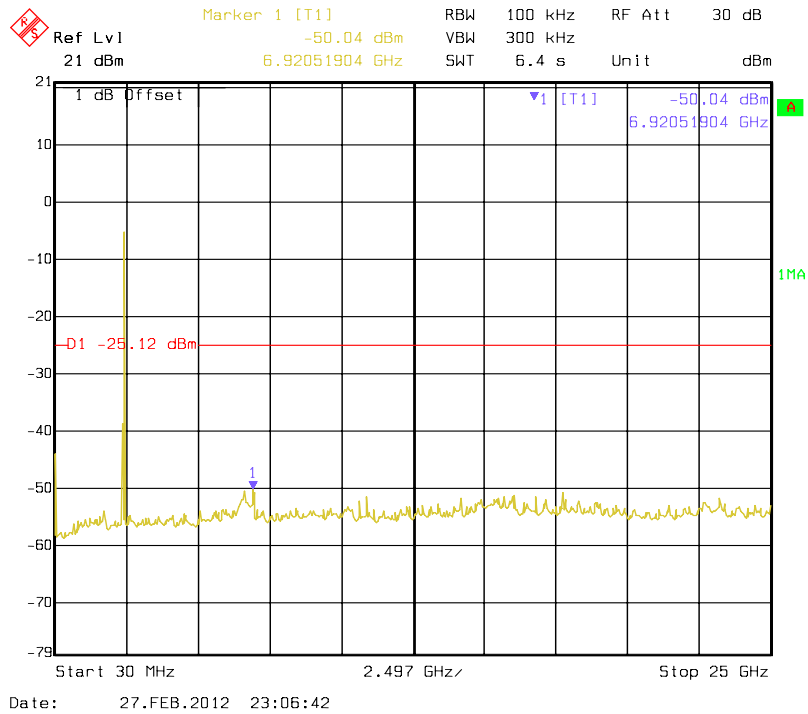


802.11b Middle Channel

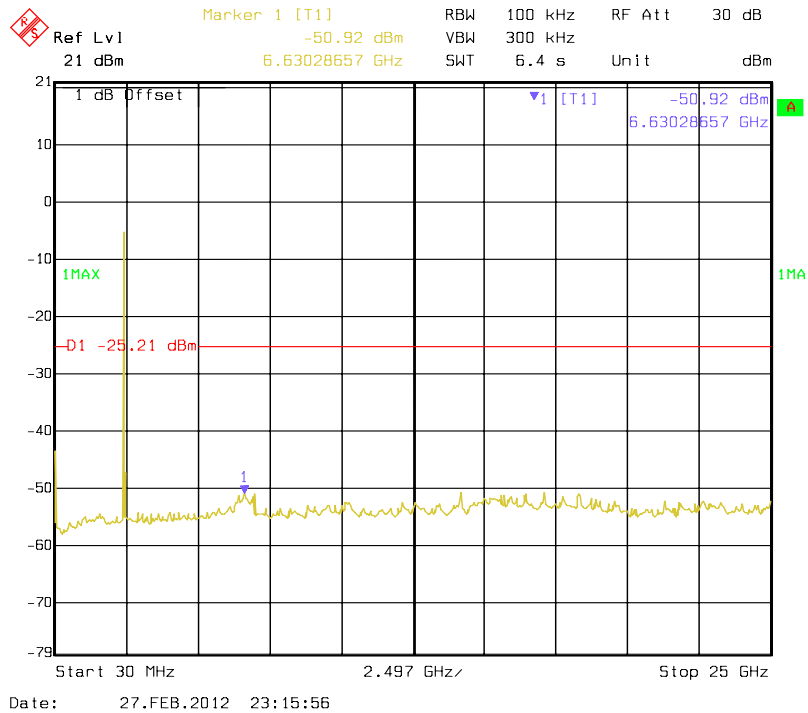


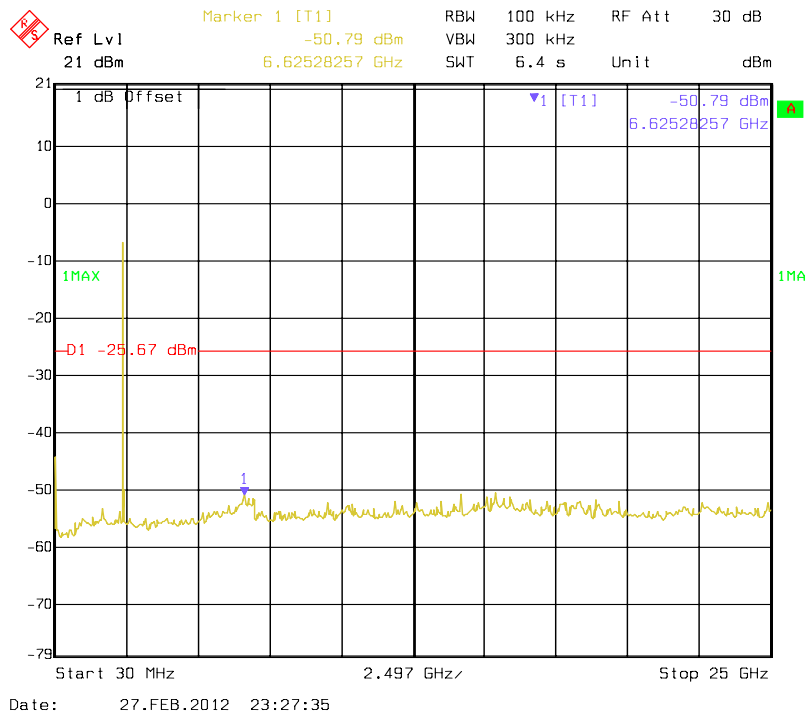
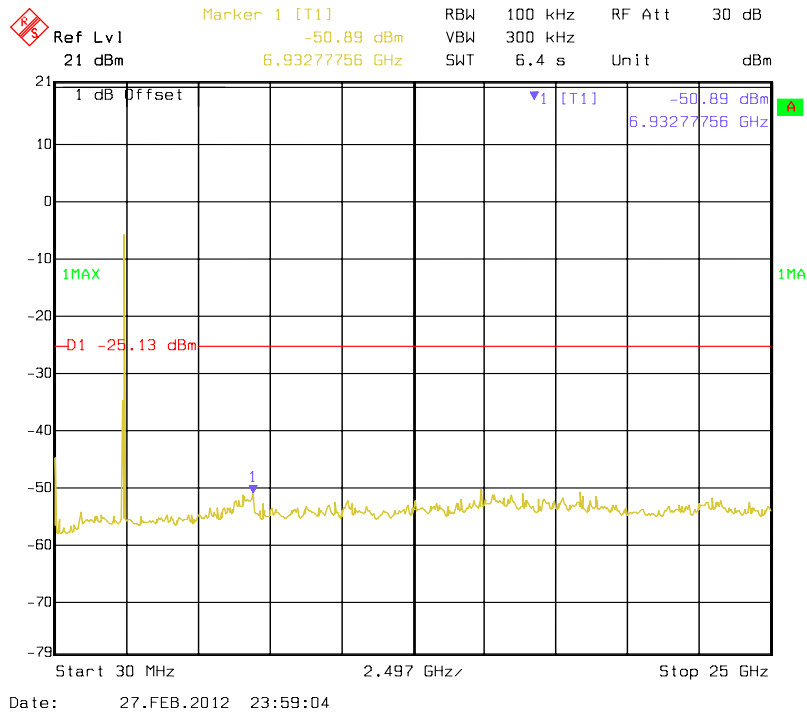
802.11b High Channel**802.11g Low Channel**

802.11g Middle Channel

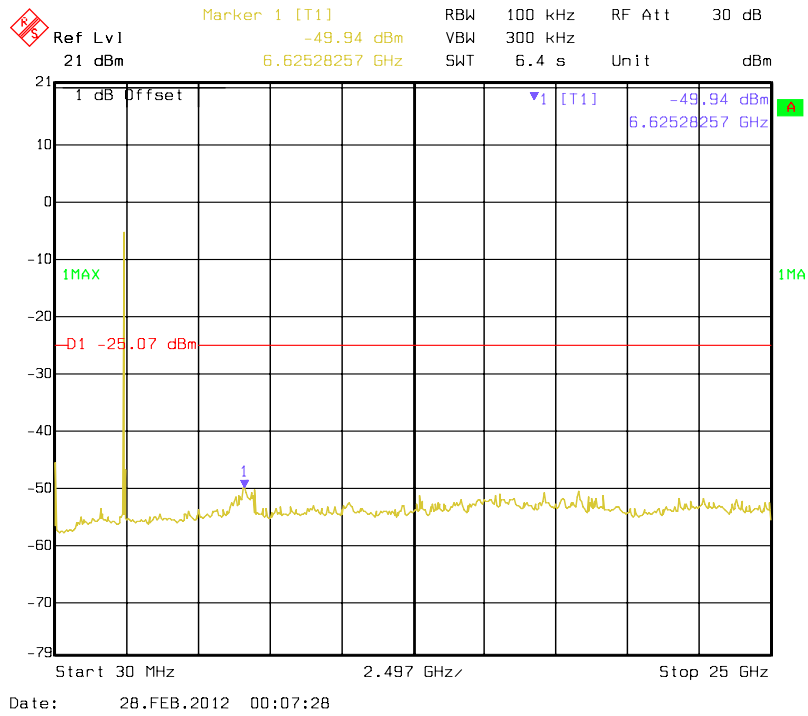


802.11g High Channel

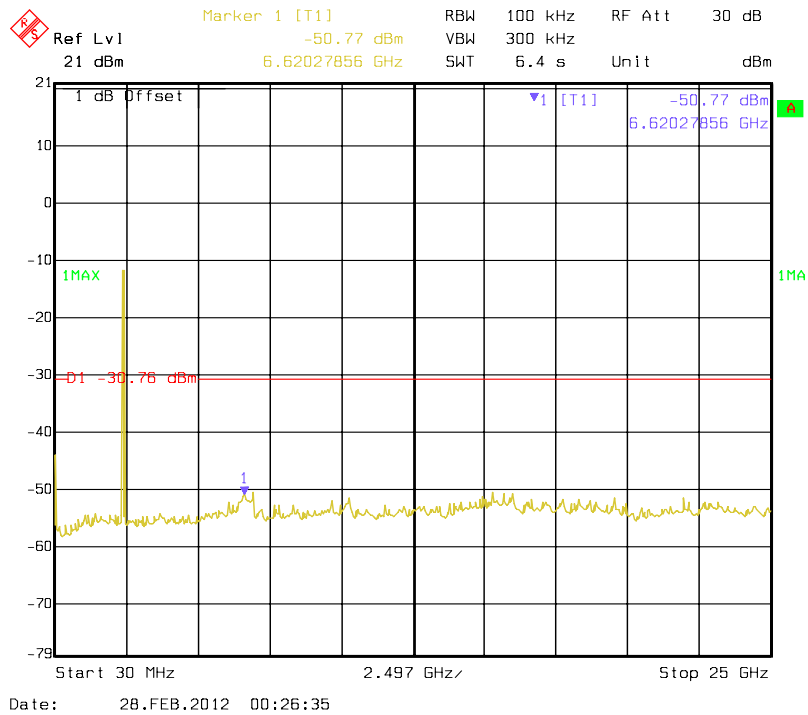


802.11n20 Low Channel**802.11n20 Middle Channel**

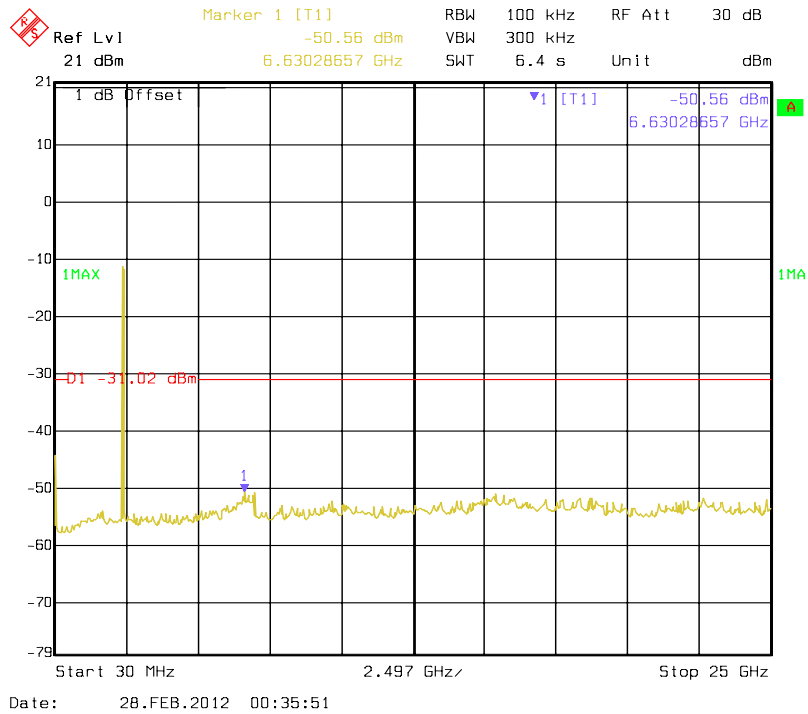
802.11n20 High Channel



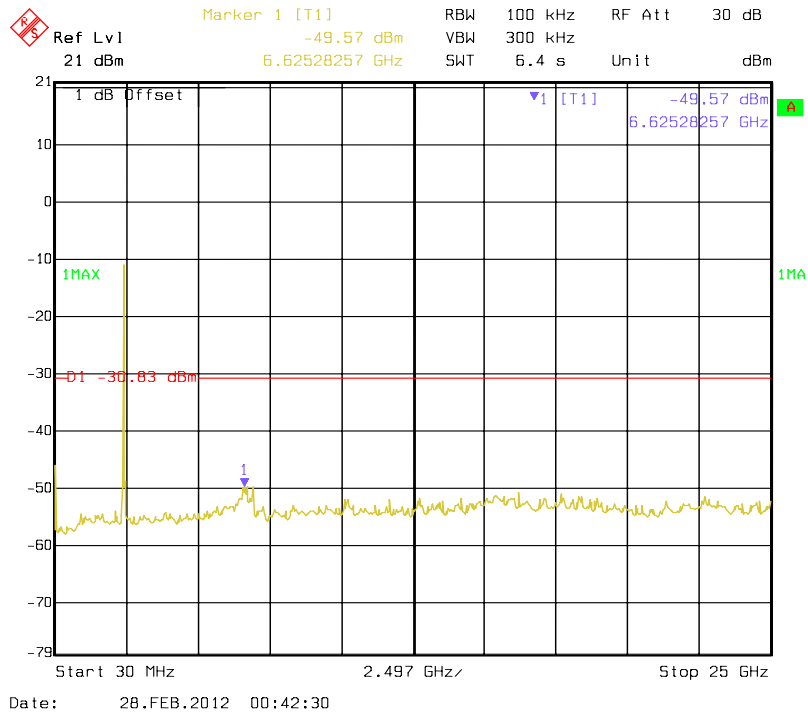
802.11n40 Low Channel



802.11n40 Middle Channel



802.11n40 High Channel

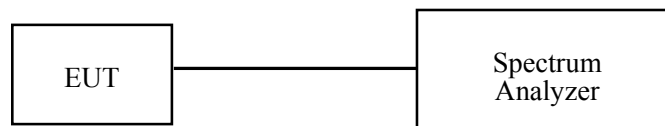


FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH**Applicable Standard**

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

Test Procedure

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

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16

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

Test Data**Environmental Conditions**

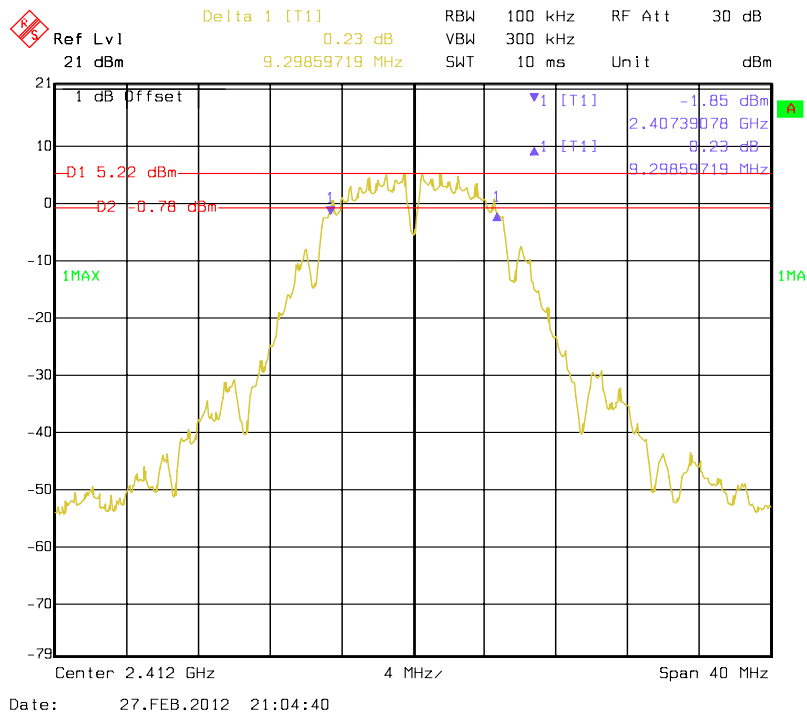
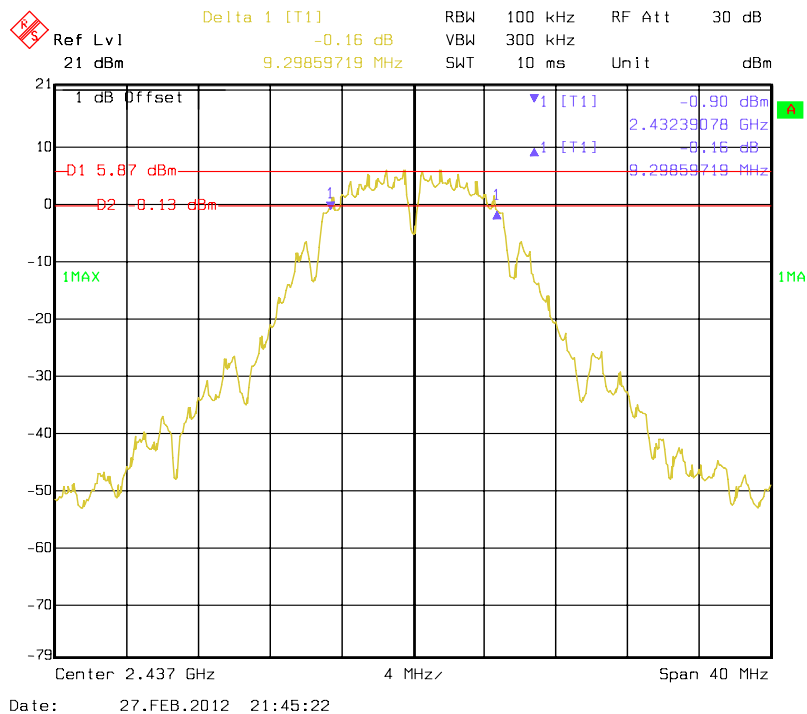
Temperature:	25 ° C
Relative Humidity:	48 %
ATM Pressure:	100.0kPa

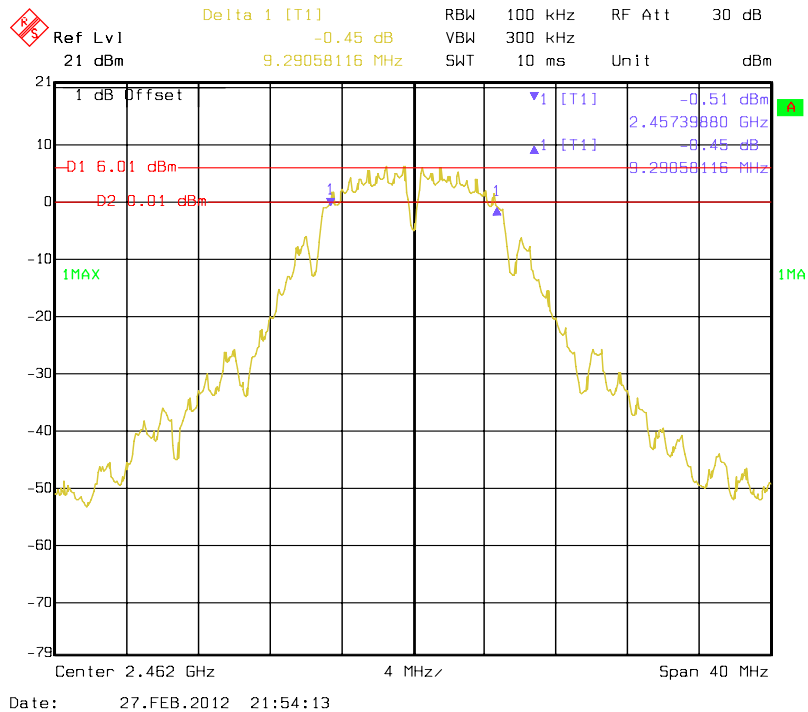
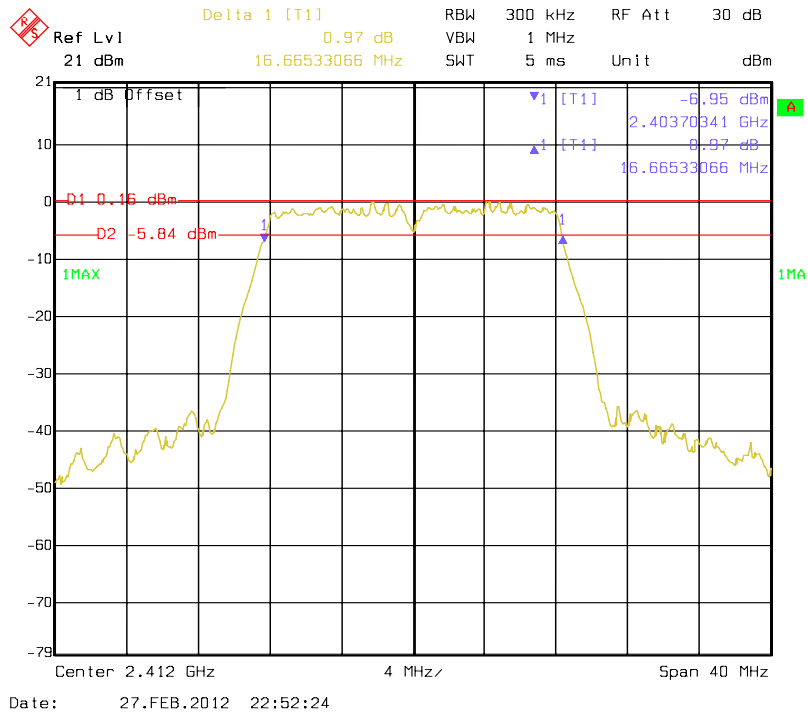
The testing was performed by Lion Cai on 2012-02-27.

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	9.29	>500
Middle	2437	1	9.29	>500
High	2462	1	9.29	>500
802.11g mode				
Low	2412	6	16.66	>500
Middle	2437	6	16.66	>500
High	2462	6	16.80	>500
802.11n20 mode				
Low	2412	6.5	17.92	>500
Middle	2437	6.5	17.92	>500
High	2462	6.5	17.91	>500
802.11n40 mode				
Low	2422	13.5	36.96	>500
Middle	2437	13.5	36.96	>500
High	2452	13.5	36.95	>500

802.11b Low Channel**802.11b Middle Channel**

802.11b High Channel**802.11g Low Channel**

Ref Lvl 21 dBm Delta 1 [T1] 0.08 dB RBW 300 kHz RF Att 30 dB
 1 dB Offset 16.66533066 MHz VBW 1 MHz Unit dBm
 D1 0.46 dBm D2 -5.54 dBm
 1MAX 1MA
 Center 2.437 GHz 4 MHz/ Span 40 MHz
 Date: 27.FEB.2012 23:01:23

Ref Lvl 21 dBm Delta 1 [T1] 0.63 dB RBW 300 kHz RF Att 30 dB
 16.80961924 MHz VBW 1 MHz Unit dBm
 5 ms

1 dB Offset

21
10
0
-10
-20
-30
-40
-50
-60
-70
-75

1 [T1] -6.67 dBm
 2.45356713 GHz
 0.63 dB
 16.80961924 MHz

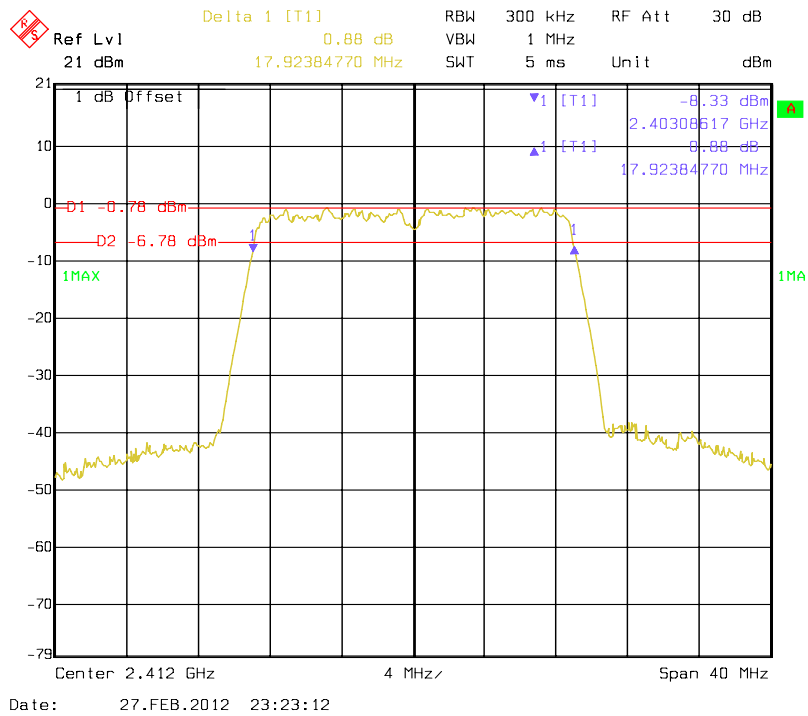
D1 -8.19 dBm
 D2 -6.19 dBm

1MAX
1MA

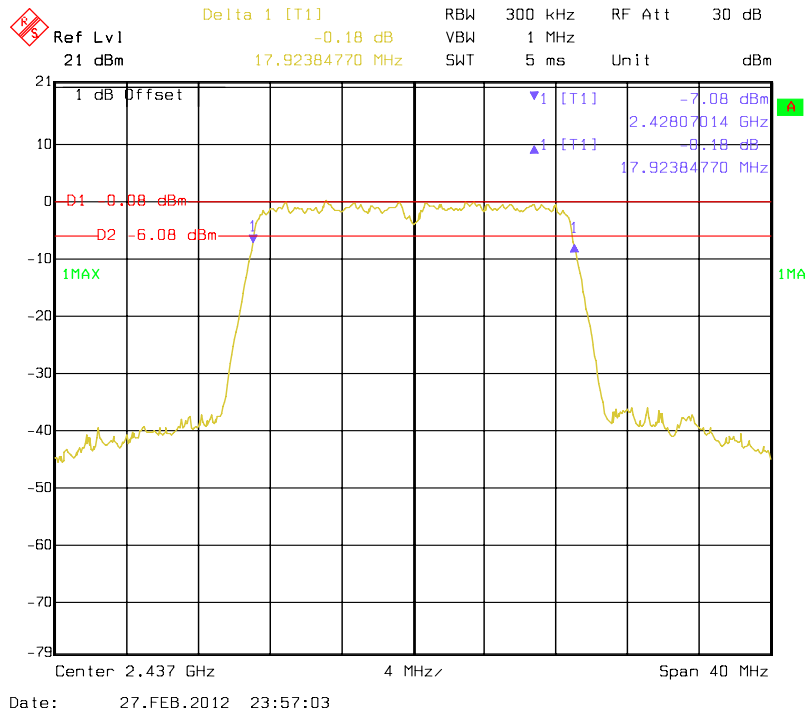
Center 2.462 GHz 4 MHz/ Span 40 MHz

Date: 27.FEB.2012 23:11:11

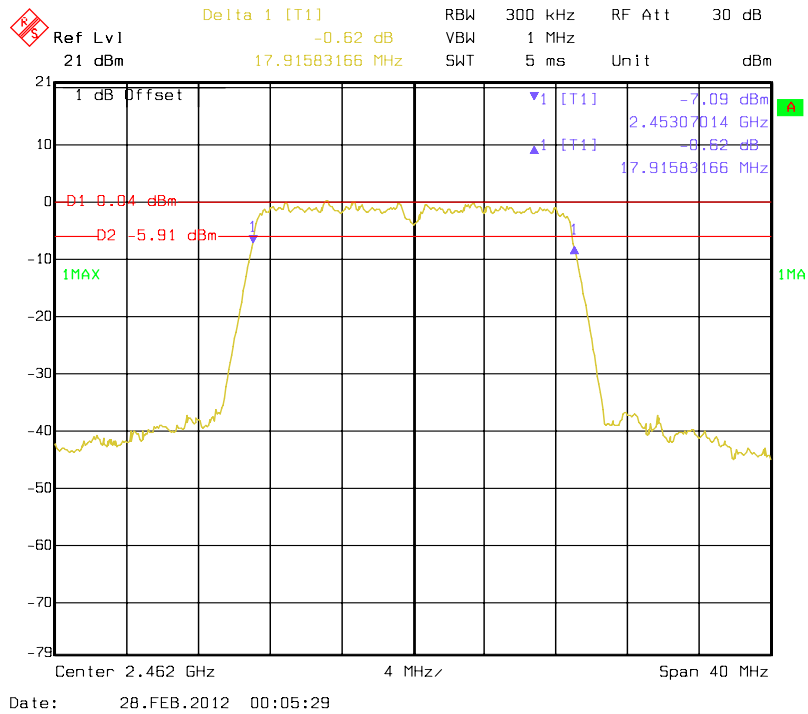
802.11n20 Low Channel



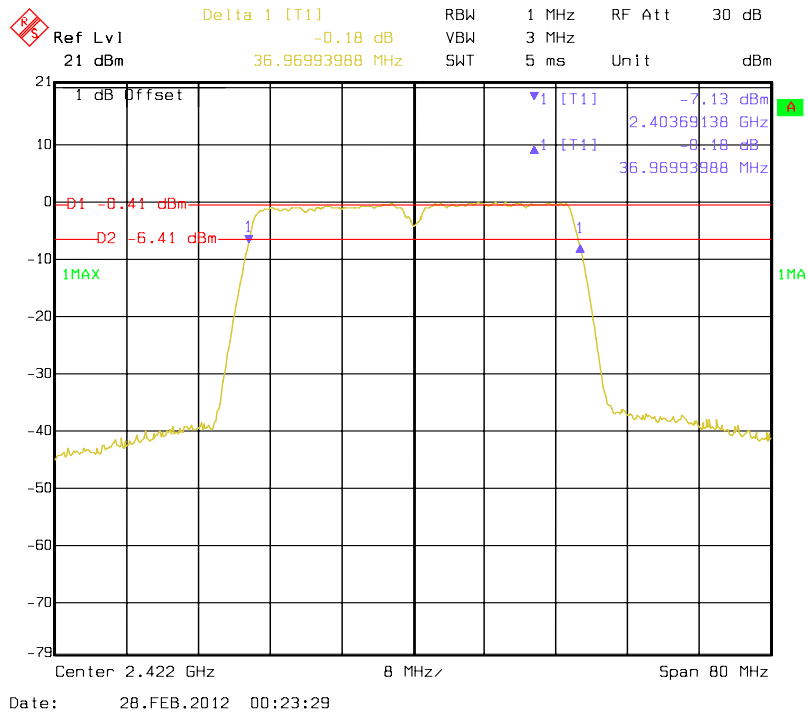
802.11n20 Middle Channel



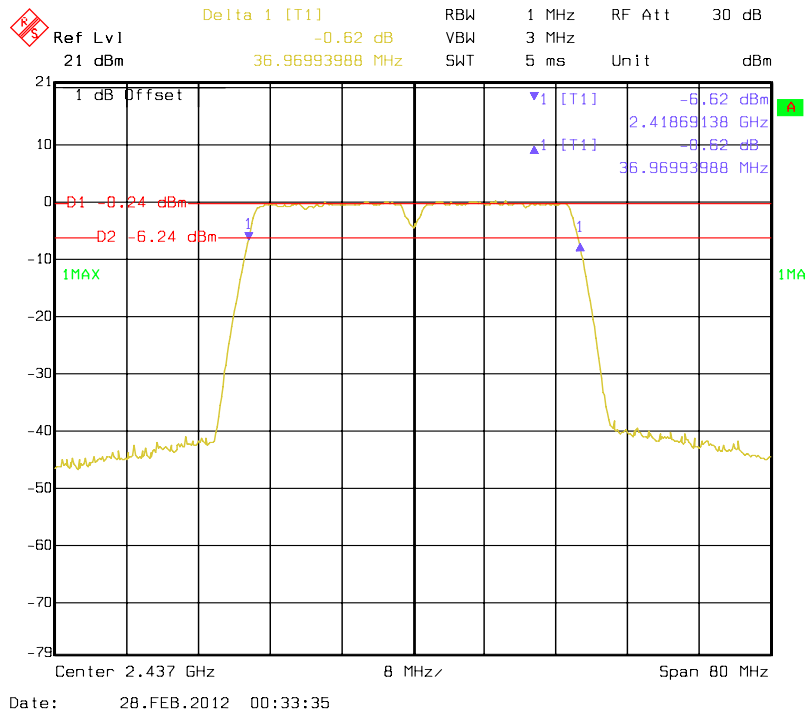
802.11n20 High Channel



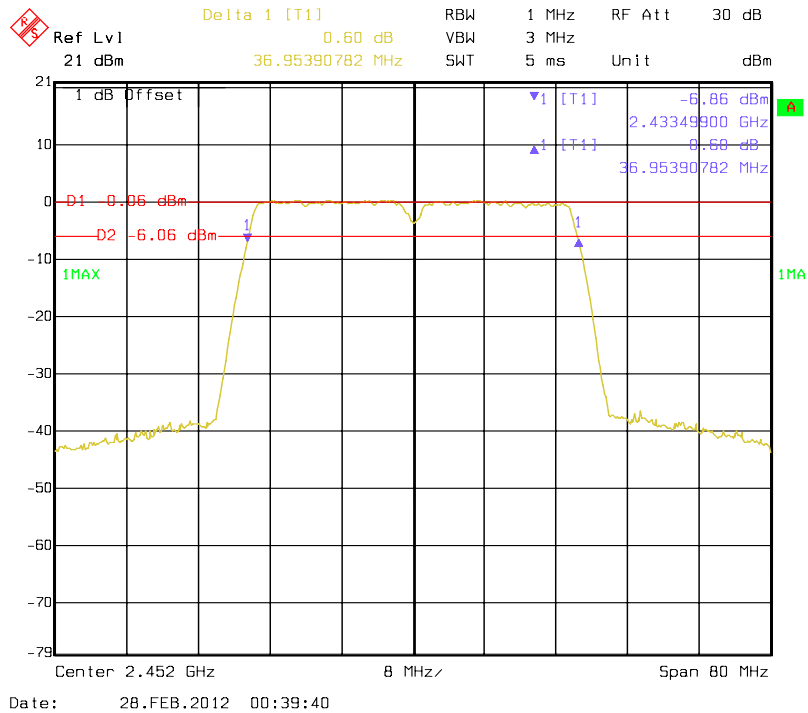
802.11n40 Low Channel



802.11n40 Middle Channel



802.11n40 High Channel



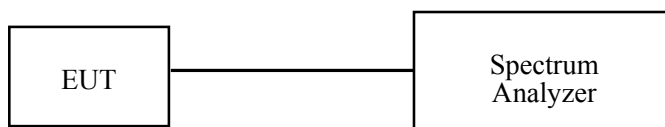
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

Applicable Standard

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

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an Spectrum Analyzer.
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	101122	2011-11-17	2012-11-16

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

Test Data

Environmental Conditions

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

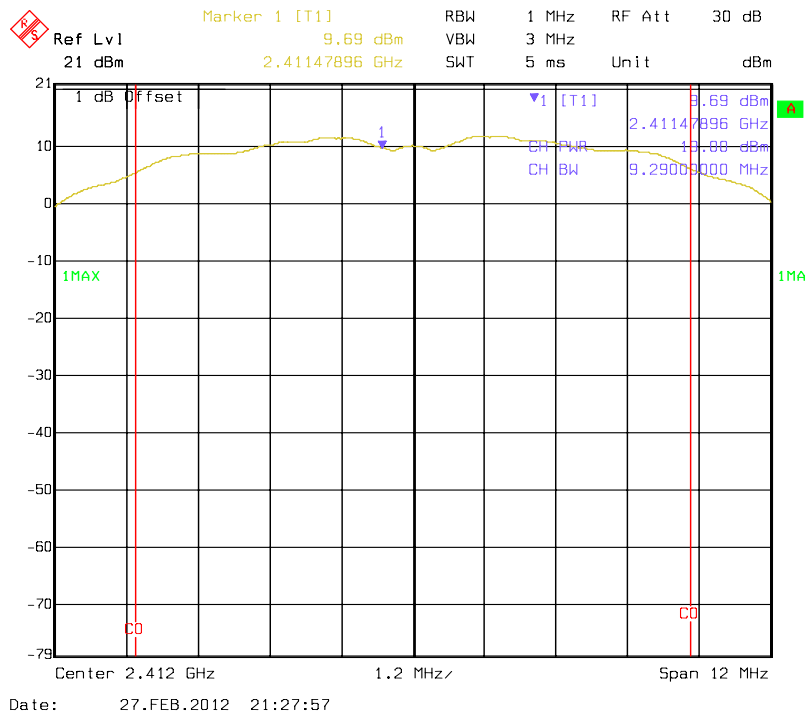
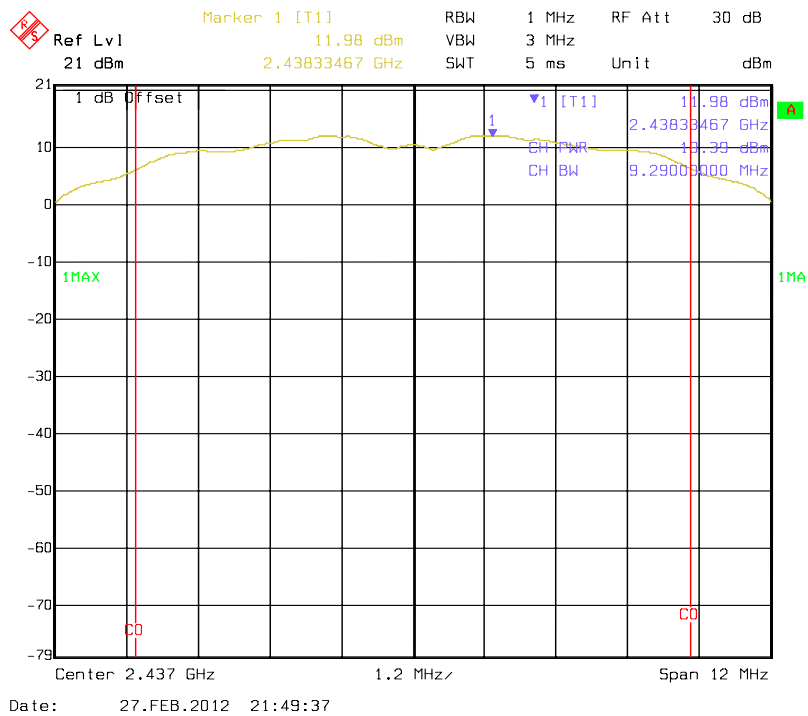
The testing was performed by Lion Cai on 2012-02-28.

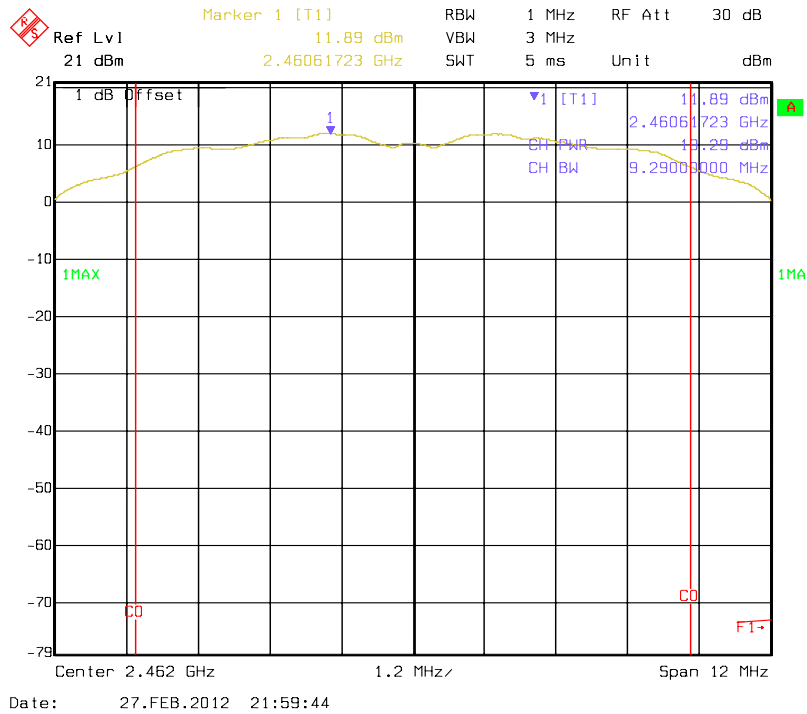
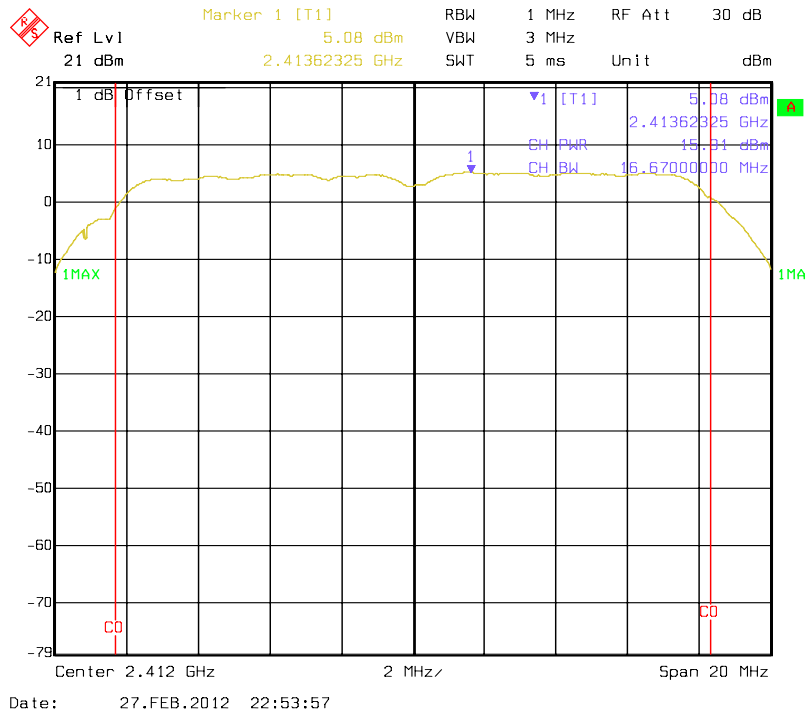
Test Mode: Transmitting

Channel	Frequency (MHz)	Data Rate (Mbps)	Reading Power (dBm)	Limit (dBm)	Result
802.11b					
Low	2412	1	19.00	30	pass
Middle	2437	1	19.39	30	pass
High	2462	1	19.29	30	pass
802.11g					
Low	2412	6	15.91	30	pass
Middle	2437	6	16.16	30	pass
High	2462	6	16.24	30	pass
802.11n20					
Low	2412	6.5	16.04	30	pass
Middle	2437	6.5	16.14	30	pass
High	2462	6.5	16.41	30	pass
802.11n40					
Low	2422	13.5	13.87	30	pass
Middle	2437	13.5	14.10	30	pass
High	2452	13.5	14.28	30	pass

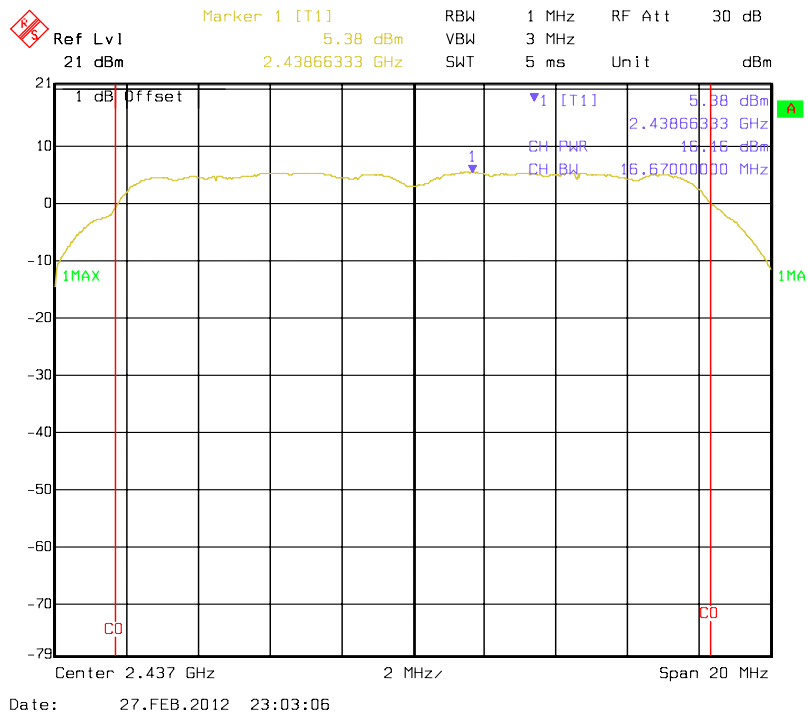
Note: the antenna gain is -2.0 dBi.

Please refer to the following plots

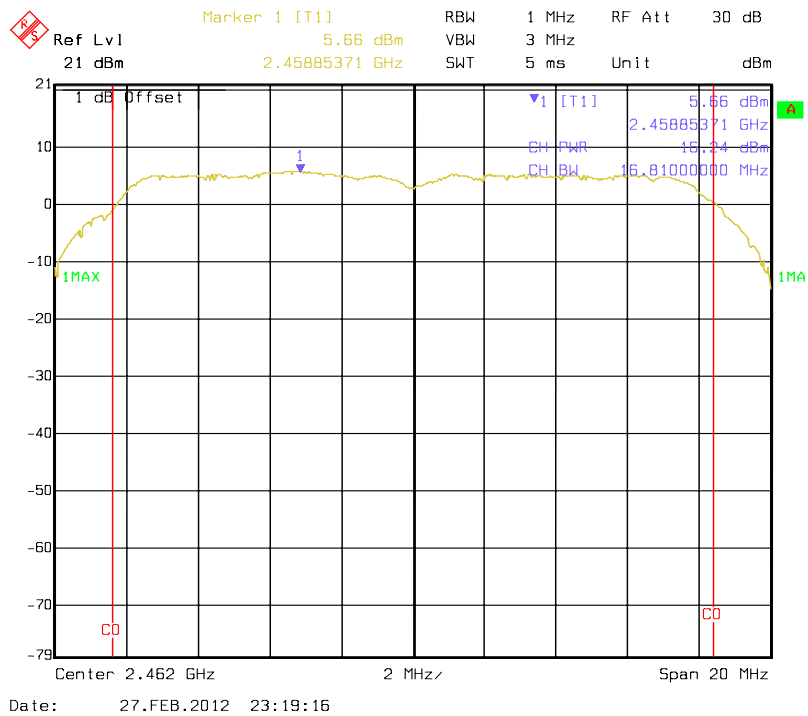
802.11b RF Output Power, Low Channel**802.11b RF Output Power, Middle Channel**

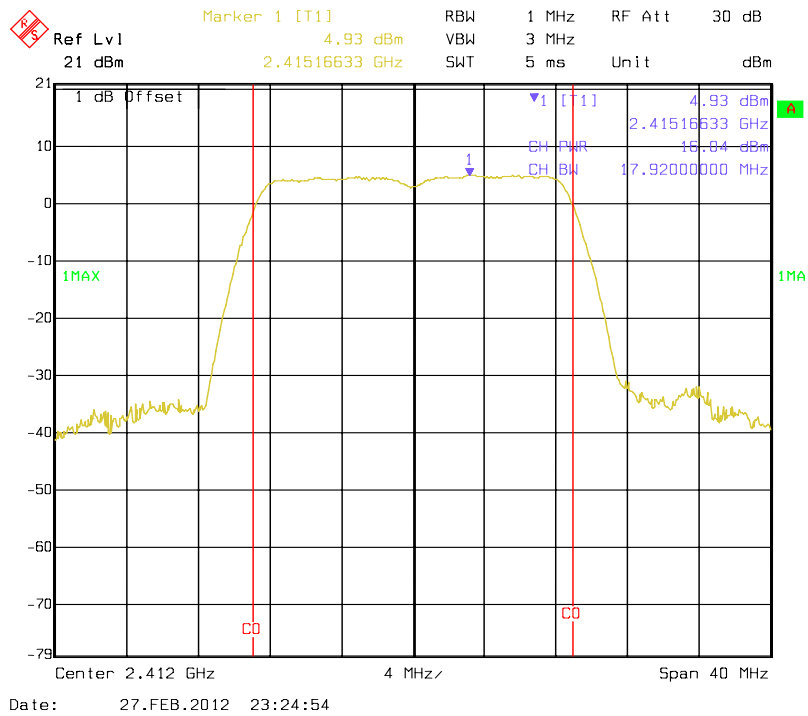
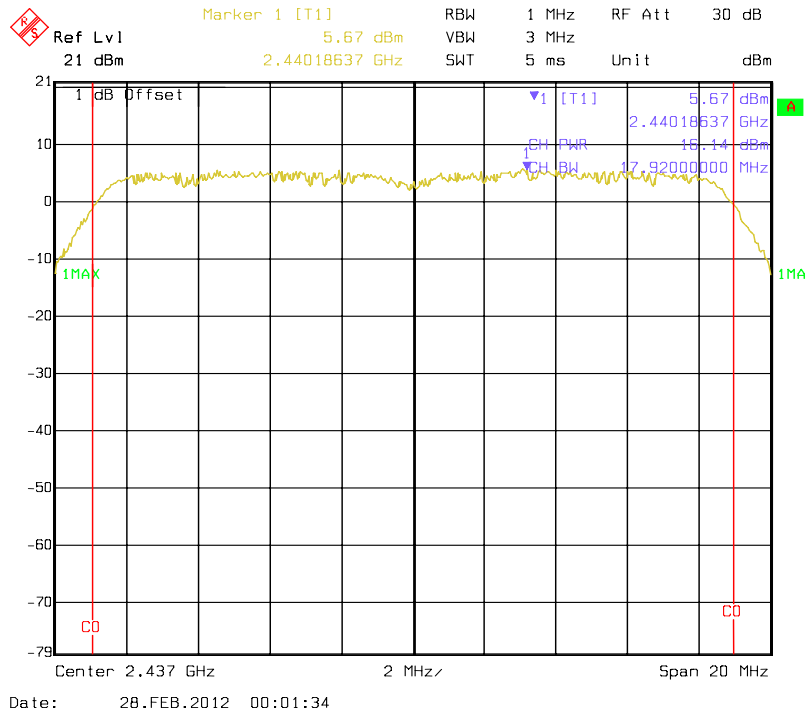
802.11b RF Output Power, High Channel**802.11g RF Output Power, Low Channel**

802.11g RF Output Power, Middle Channel

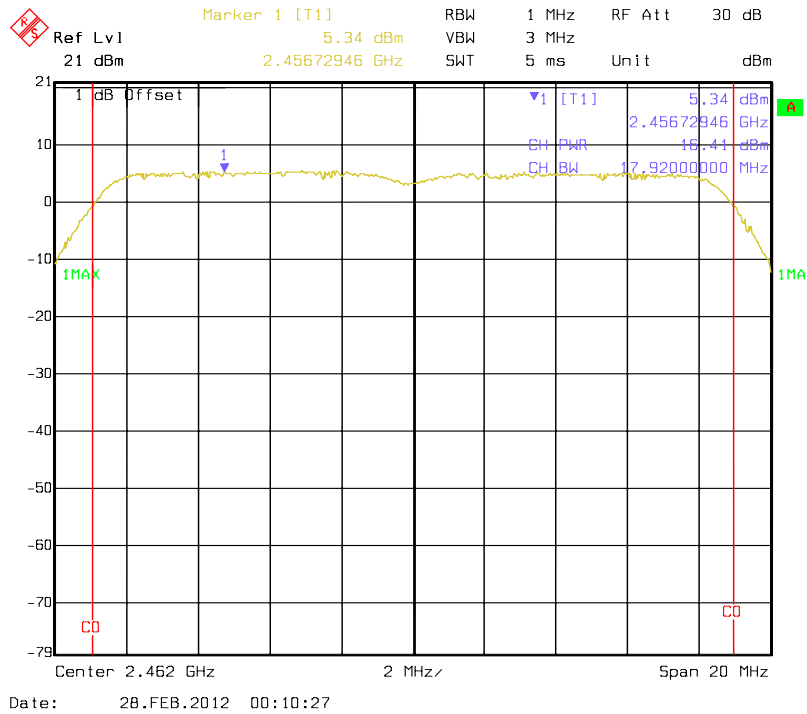


802.11g RF Output Power, High Channel

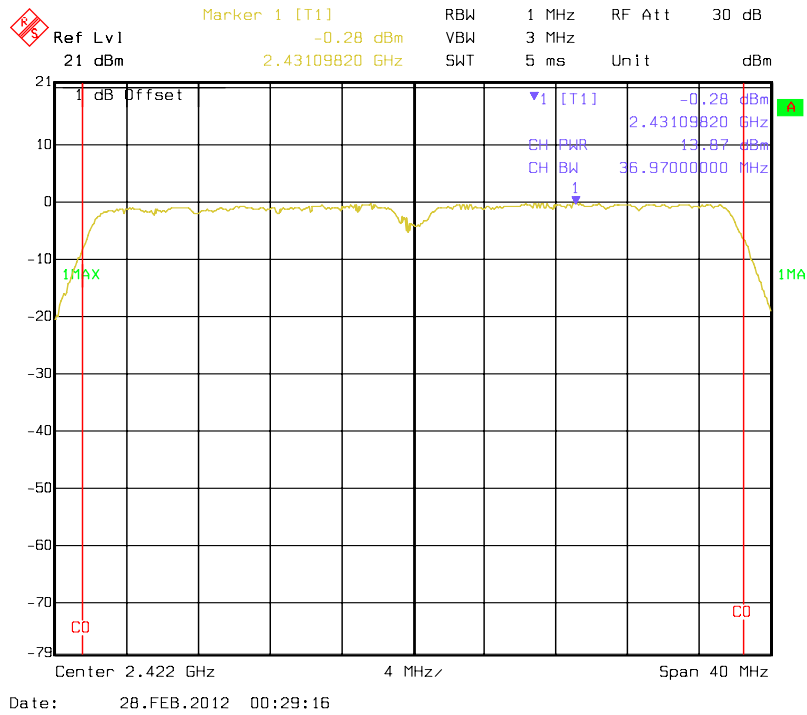


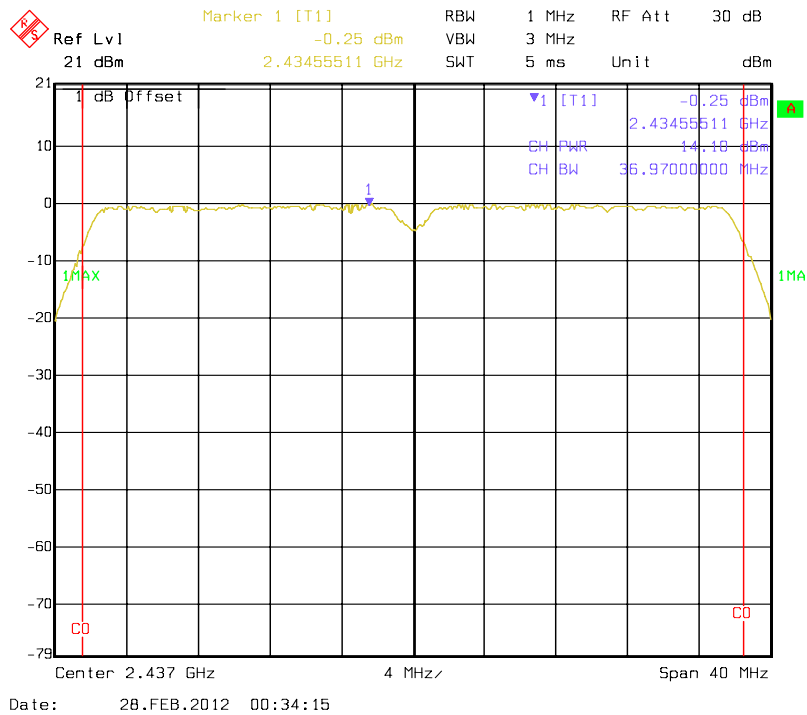
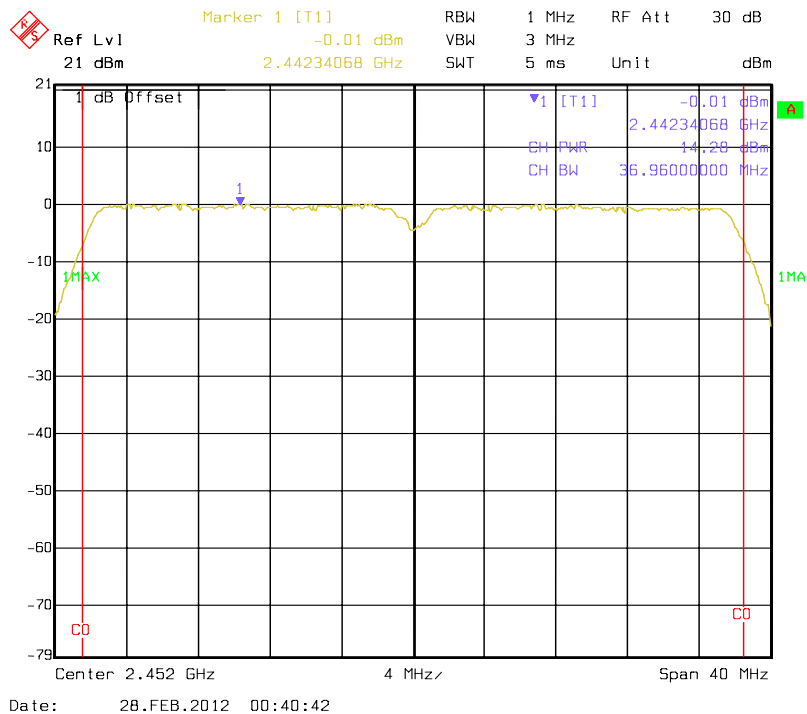
802.11n20 RF Output Power, Low Channel**802.11n20 RF Output Power, Middle Channel**

802.11n20 RF Output Power, High Channel



802.11n40 RF Output Power, Low Channel



802.11n40 RF Output Power, Middle Channel**802.11n40 RF Output Power, High Channel**

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

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16

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

Test Data

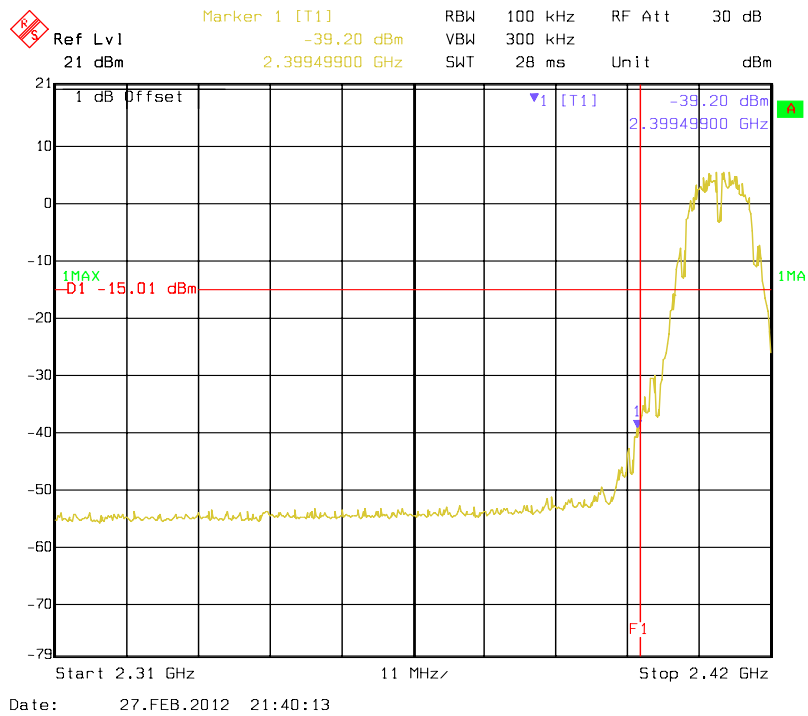
Environmental Conditions

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

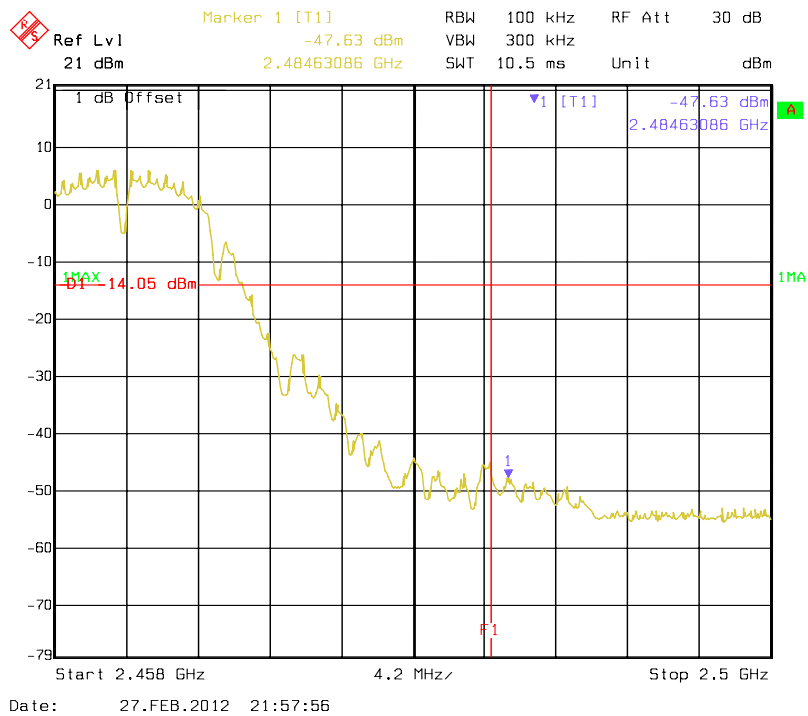
The testing was performed by Lion Cai on 2012-02-28

Test Result: *Compliance*

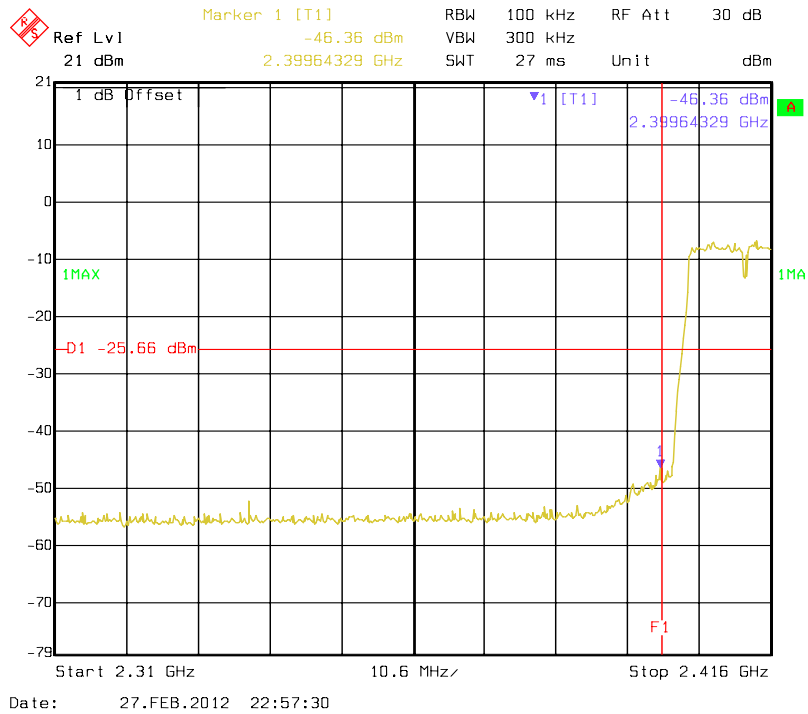
802.11b: Band Edge, Left Side



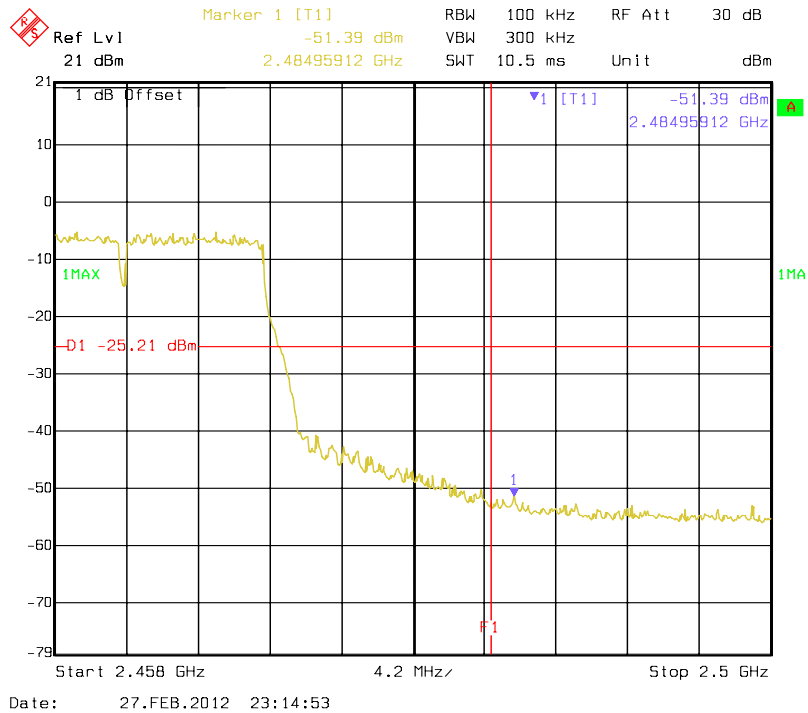
802.11b: Band Edge, Right Side



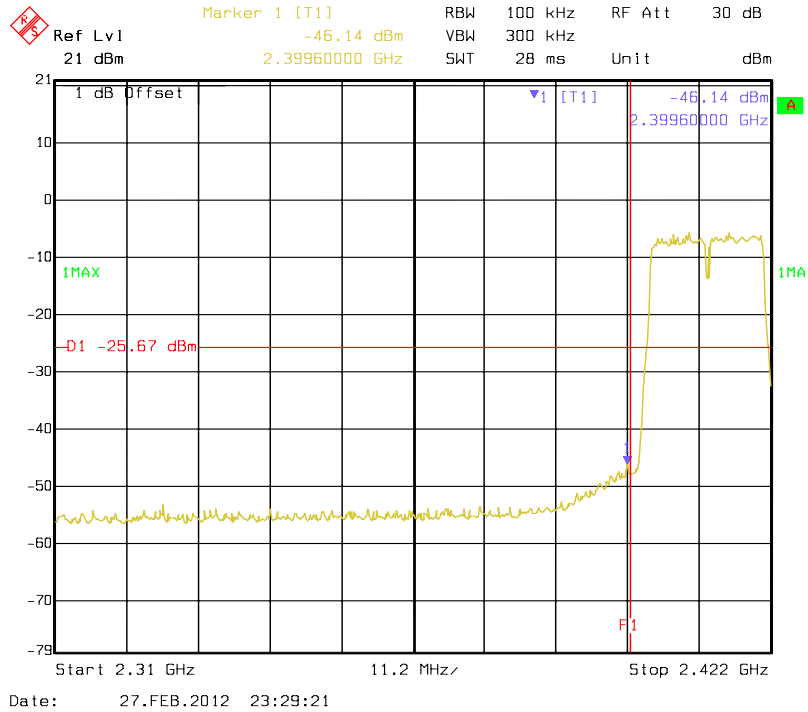
802.11g: Band Edge, Left Side



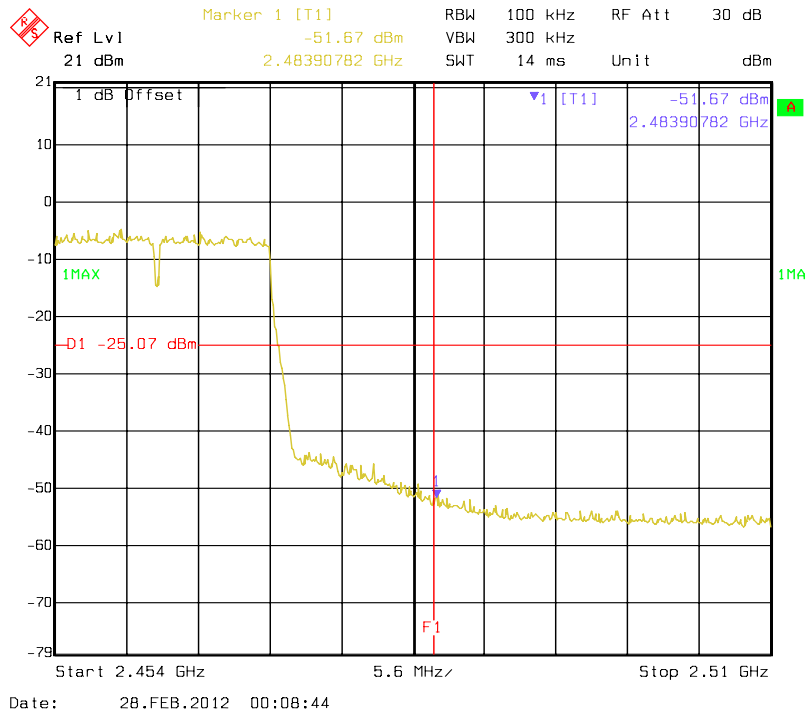
802.11g: Band Edge, Right Side



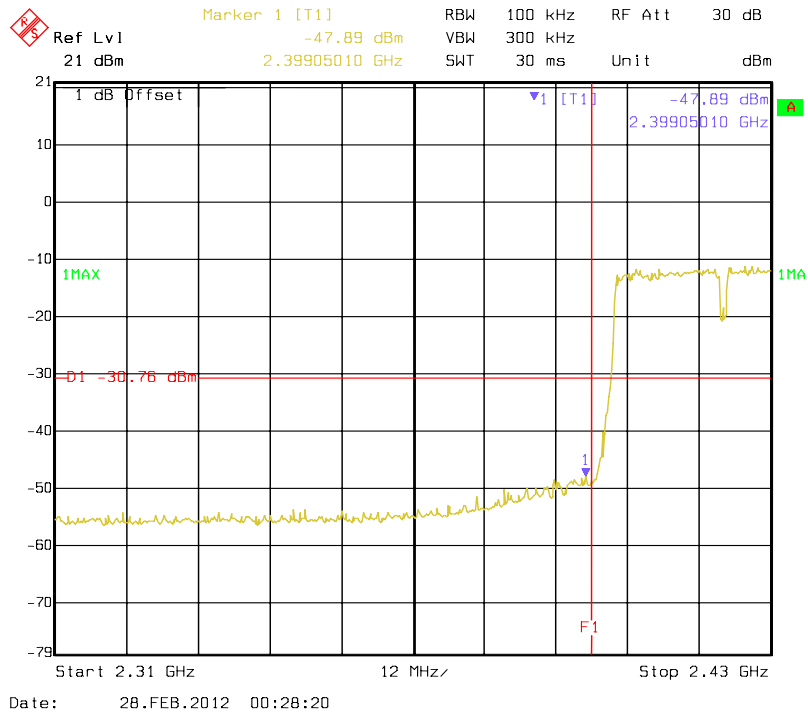
802.11n20: Band Edge, Left Side



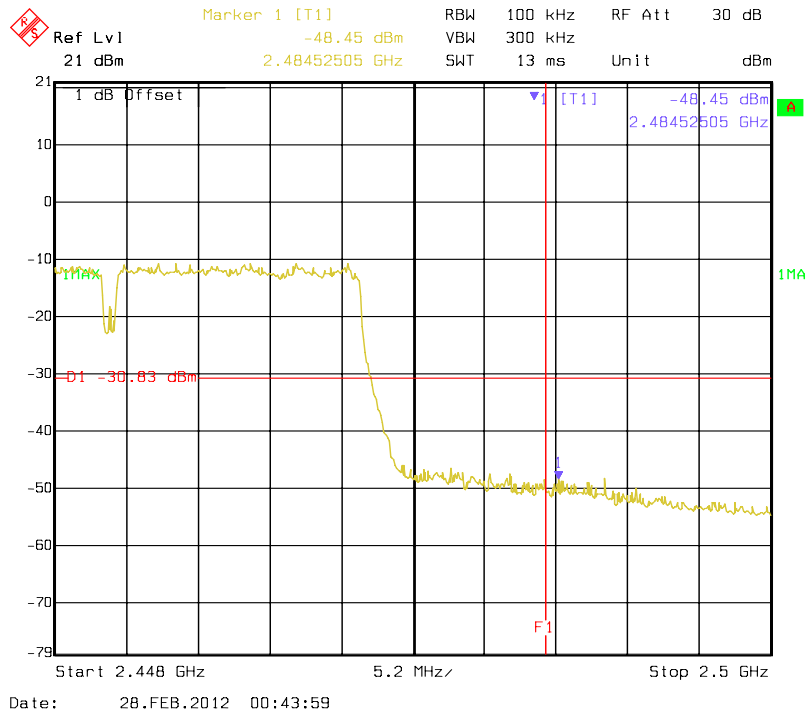
802.11n20: Band Edge, Right Side



802.11n40: Band Edge, Left Side



802.11n40: Band Edge, Right Side



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. Set the RBW = 100 kHz, VBW \geq 300 kHz, set the span to 5-30 % greater than the EBW.
4. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
5. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{dB}$.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ 26	8386001028	2011-11-24	2012-11-23

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

Test Data

Environmental Conditions

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

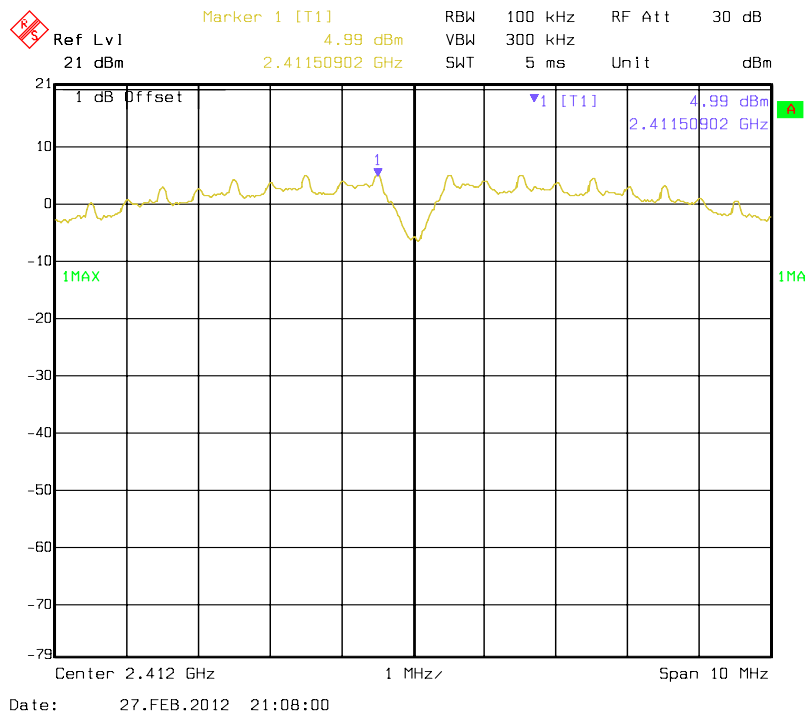
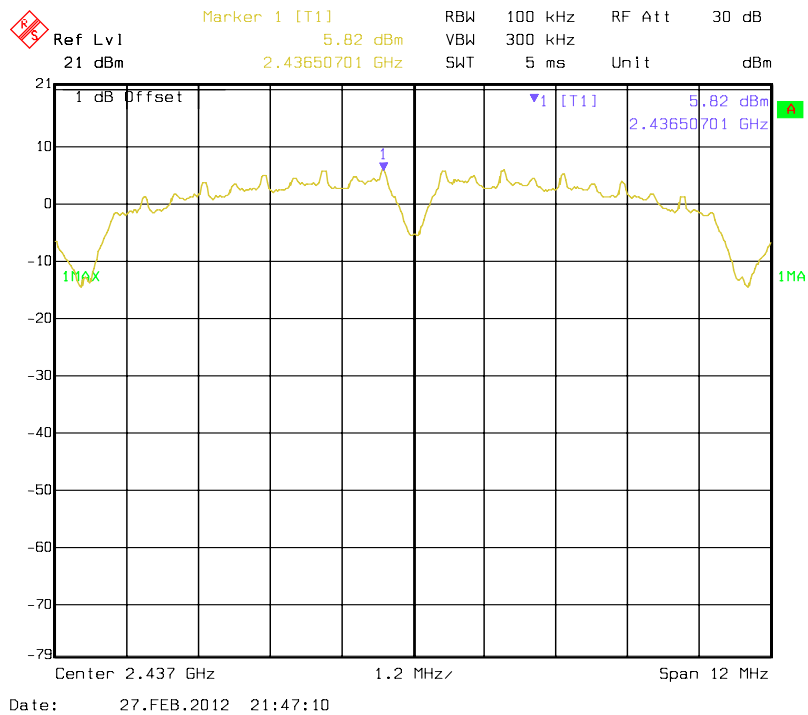
The testing was performed by Lion Cai on 2012-02-27.

Test Mode: Transmitting

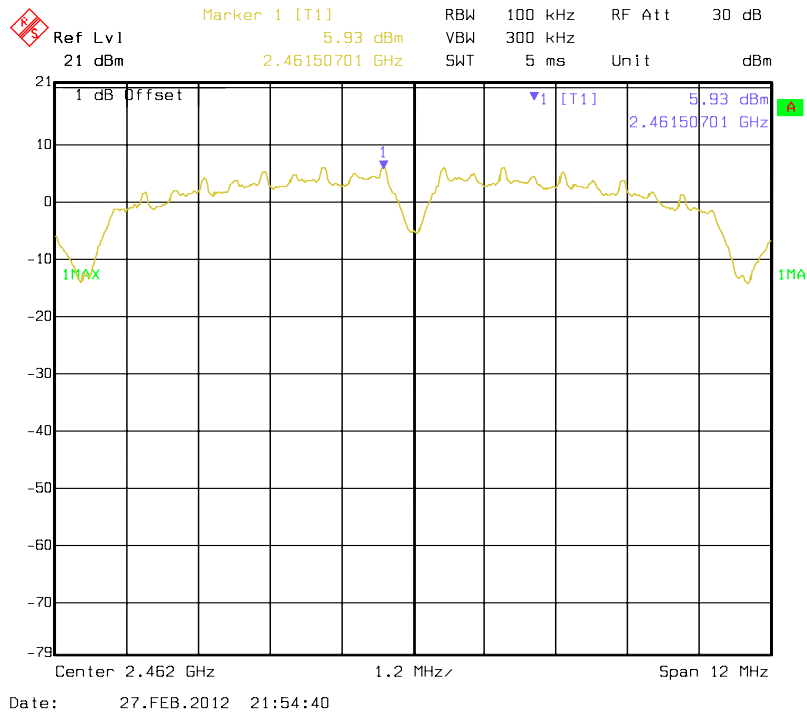
Test Result: Pass

Channel	Frequency (MHz)	Data Rate (Mbps)	Reading Power Spectral Density (dBm)	Limit (dBm)	Result
802.11 b					
Low	2412	1	-10.21	8	pass
Middle	2437	1	-9.38	8	pass
High	2462	1	-9.27	8	pass
802.11 g					
Low	2412	6	-20.86	8	pass
Middle	2437	6	-20.32	8	pass
High	2462	6	-20.41	8	pass
802.11n20					
Low	2412	6.5	-20.87	8	pass
Middle	2437	6.5	-20.33	8	pass
High	2462	6.5	-20.27	8	pass
802.11n40					
Low	2422	13.5	-25.96	8	pass
Middle	2437	13.5	-26.22	8	pass
High	2452	13.5	-26.03	8	pass

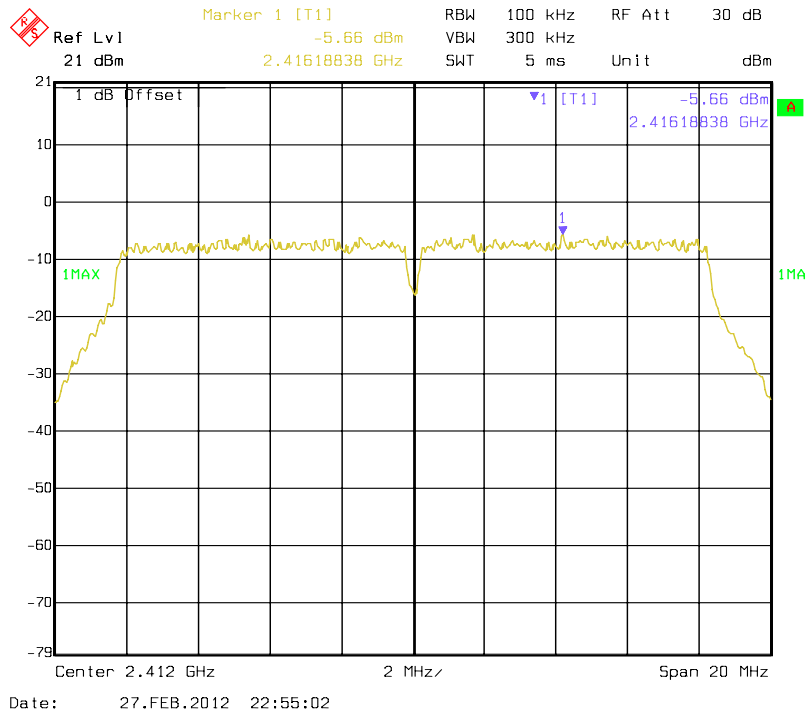
Please refer to the following plots

Power Spectral Density, 802.11b Low Channel**Power Spectral Density, 802.11b Middle Channel**

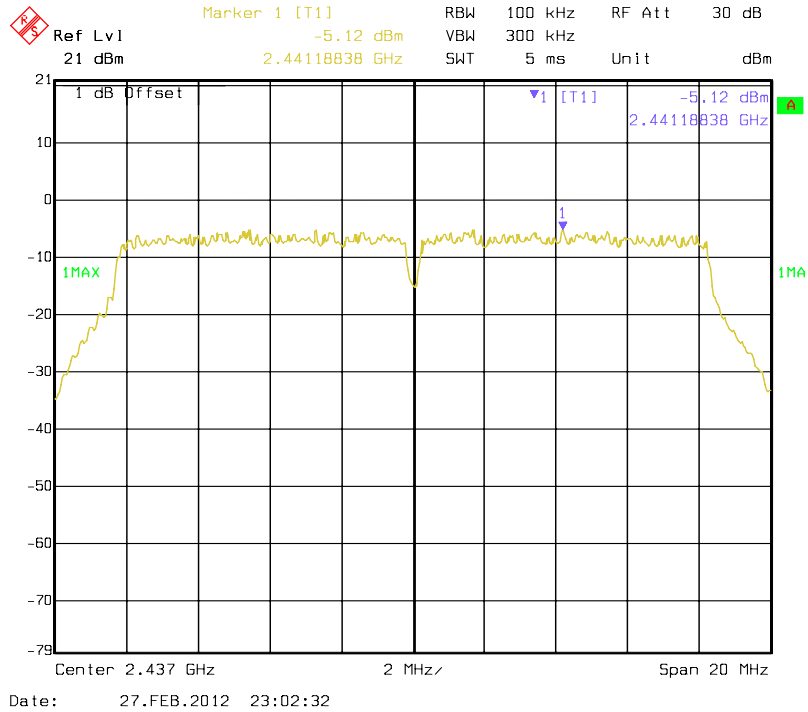
Power Spectral Density, 802.11b High Channel



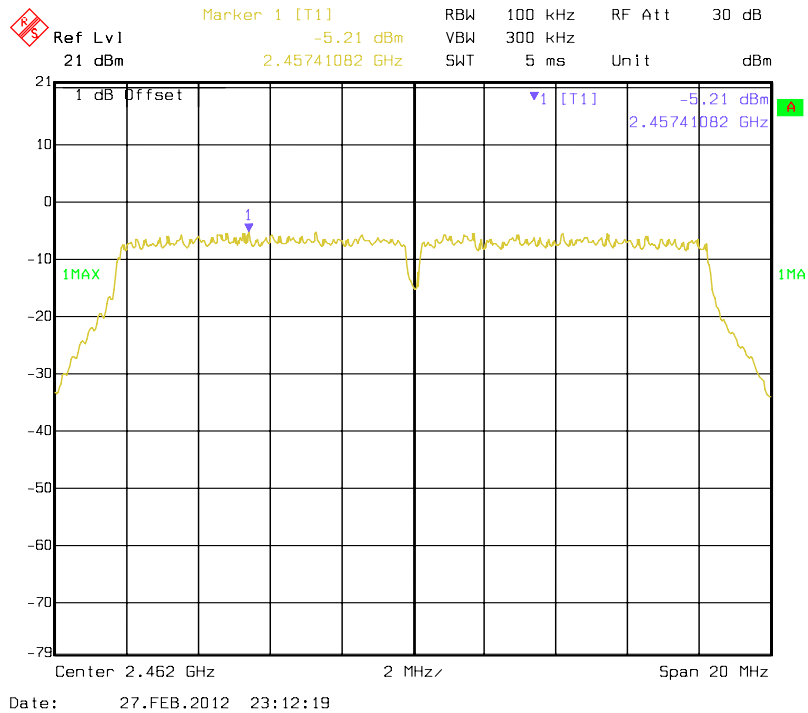
Power Spectral Density, 802.11g Low Channel



Power Spectral Density, 802.11g Middle Channel



Power Spectral Density, 802.11g High Channel



1 dB Offset

Marker 1 [T1]
-5.67 dBm
2.41542685 GHz

Ref Lvl
21 dBm

RBW 100 kHz
VBW 300 kHz
SWT 5 ms

RF Att 30 dB
Unit dBm

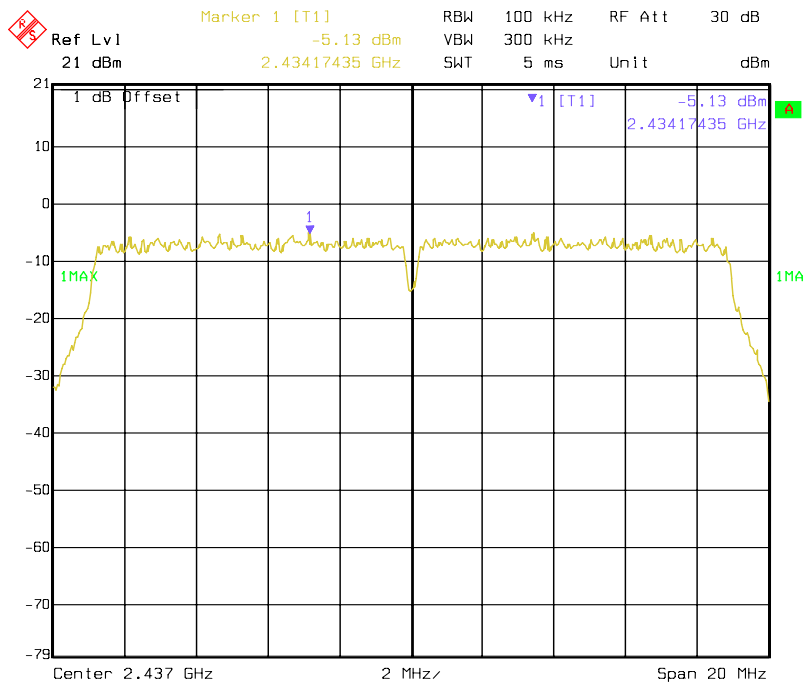
1MAX

1 [T1]

1MA

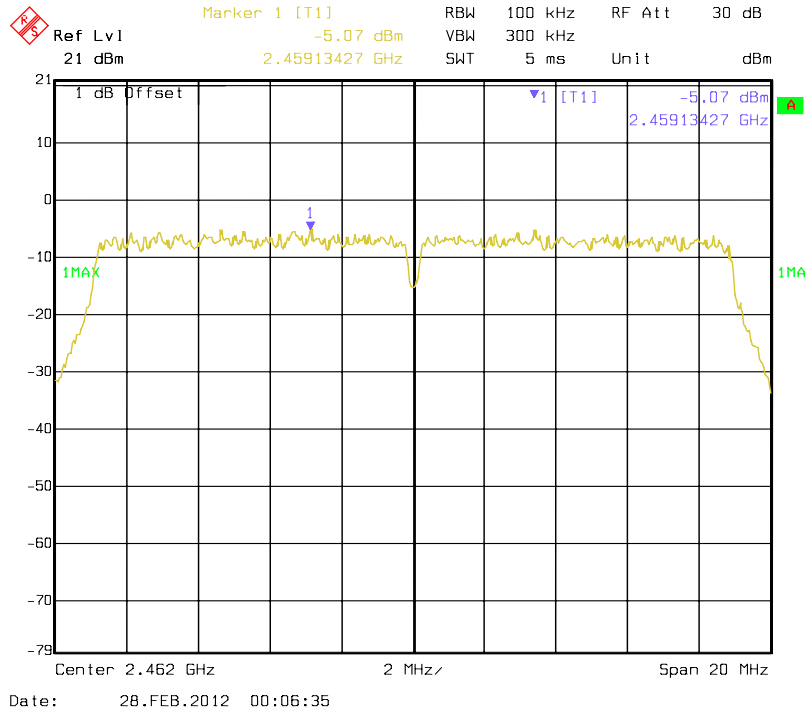
Center 2.412 GHz 2 MHz Span 20 MHz

Power Spectral Density, 802.11n20 Middle Channel

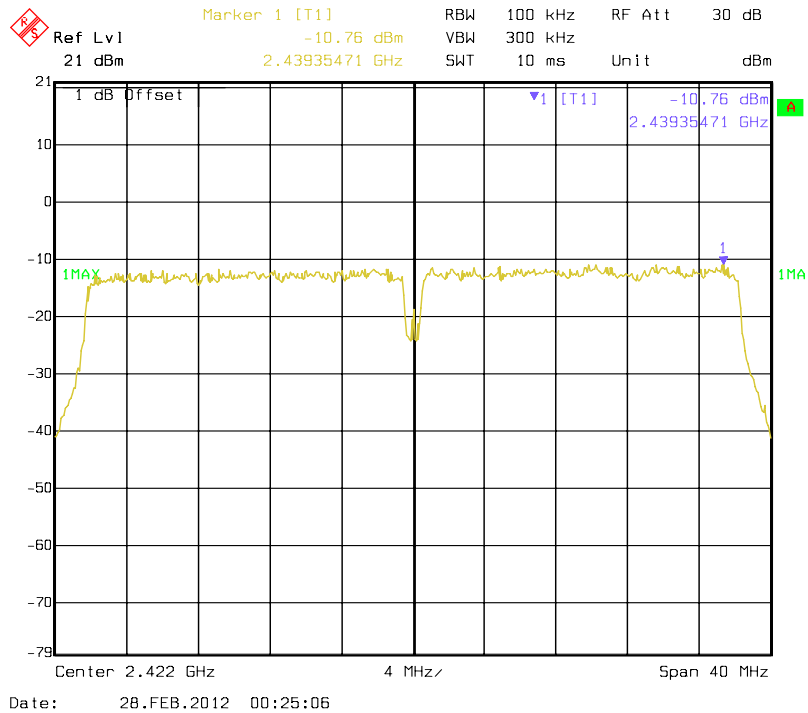


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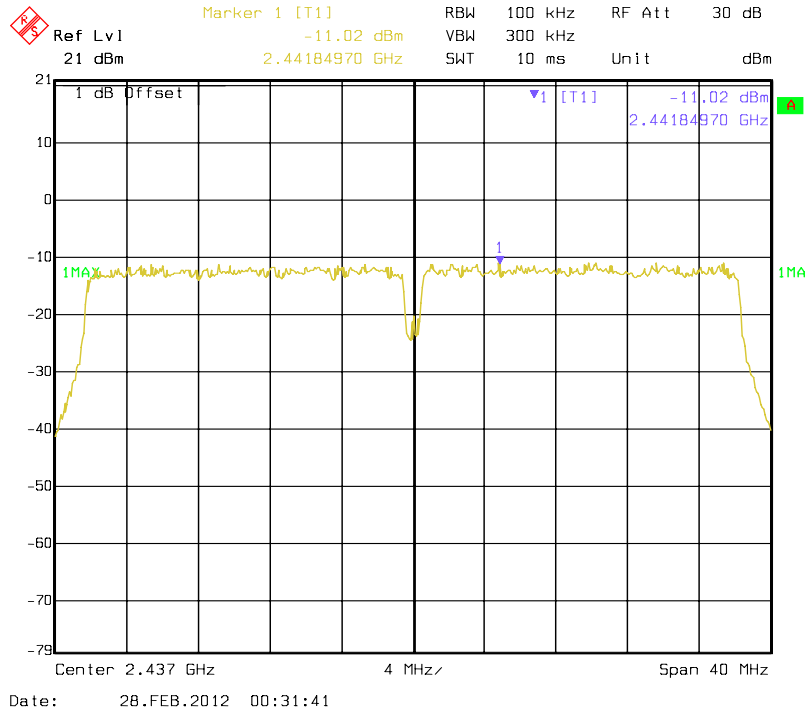
Power Spectral Density, 802.11n20 High Channel



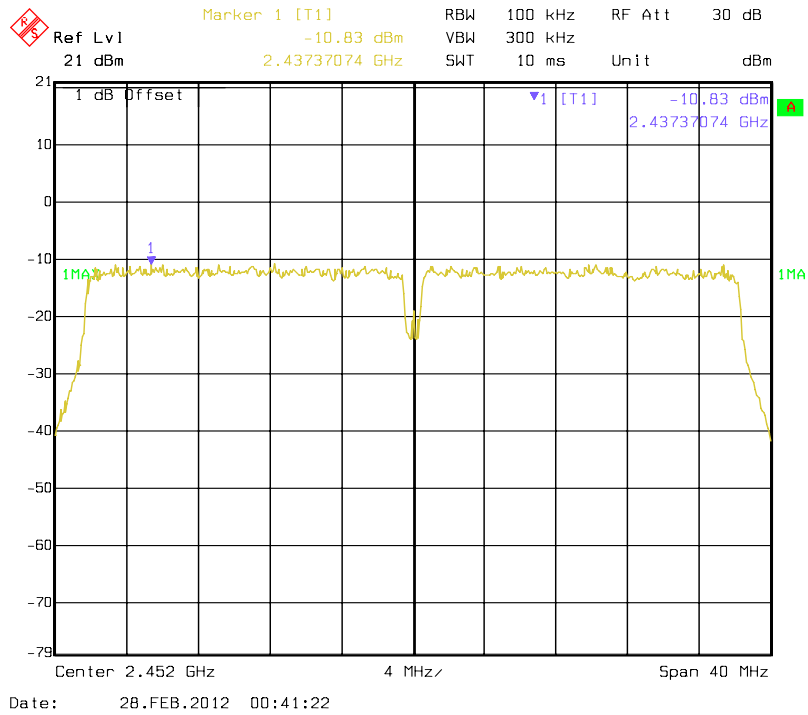
Power Spectral Density, 802.11n40 Low Channel



Power Spectral Density, 802.11n40 Middle Channel



Power Spectral Density, 802.11n40 High Channel



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