

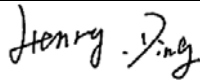

FCC PART 15.247  
MEASUREMENT AND TEST REPORT

For

**Aztech Technologies Pte Ltd**

31 Ubi Road 1, Aztech Building, Singapore 408694

**FCC ID: I38WL559E**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Wi-Fi device
<b>Test Engineer:</b> Henry Ding	
<b>Report Number:</b> RSZ120606001-00	
<b>Report Date:</b> 2012-06-21	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, NIST, or any agency of the Federal Government.

\* 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

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### Product Description for Equipment under Test (EUT)

The *Aztech Technologies Pte Ltd* 's product, model number: *WL559E (FCC ID: I38WL559E)* or the "EUT" as referred to in this report is a *Wi-Fi device*, named as *Aztech WL559E Wall Plugged 300Mbps High Speed Wireless-N Range Extender* by applicant, which measures approximately: 11.5 cm (L) x 5.8 cm (W) x 5.8 cm (H), rated input voltage: AC 120V/60Hz.

*\* All measurement and test data in this report was gathered from production sample serial number: 1206015 (Assigned by BACL, Shenzhen). The EUT was received on 2012-06-06.*

### Objective

This Type approval report is prepared on behalf of *Aztech Technologies Pte Ltd* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

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

### Related Submittal(s)/Grant(s)

N/A

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

### Test Facility

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

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

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

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



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

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

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

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

EUT for 802.11b, 802.11g and 802.11 n20 modes were tested with Channel 1, 6 and 11. 802.11 n40 modes were tested with Channel 3, 6 and 9.

### EUT Exercise Software

Test software: RT3352 AP V1.0.1.9

The test was performed under:

802.11b: Data rate: 1 Mbps.

802.11g: Data rate: 6 Mbps.

802.11n20: Data rate: 6.5 Mbps.

802.11 n40: Data rate: 6.5 Mbps.

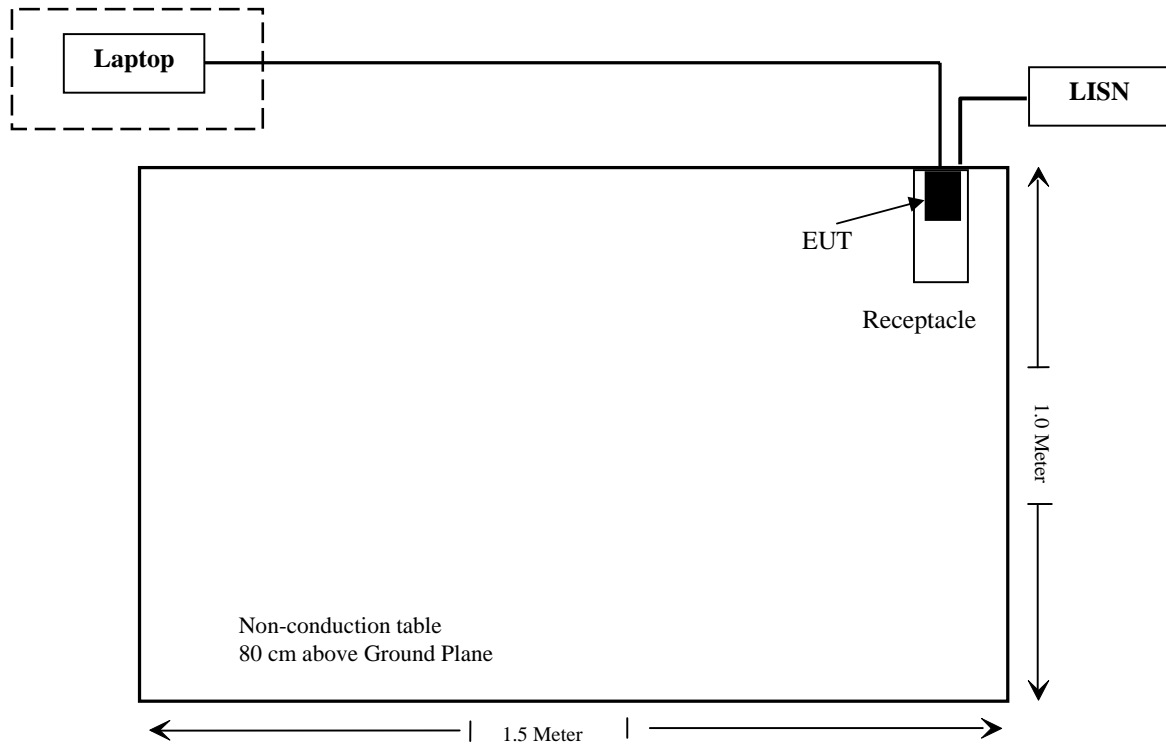
### Equipment Modifications

No modification was made to the unit tested.

### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	D260	N/A

**Block Diagram of Test Setup**



**SUMMARY OF TEST RESULTS**

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



**FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

**Applicable Standard**

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

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

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

f = frequency in MHz; \* = Plane-wave equivalent power density;

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

**Calculated Formulary:**

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

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, the power gain factor, is normally numeric gain;

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

**Calculated Data:**

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412	2	1.58	17.74	59.43	20	0.0187	1
802.11g	2437	2	1.58	17.23	52.84	20	0.0166	1
802.11n20	2437	2	1.58	17.44	55.46	20	0.0174	1
802.11n40	2437	2	1.58	16.99	50.00	20	0.0157	1

**Result: Compliance**

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## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **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.

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

### **Antenna Connector Construction**

The EUT used 2T2R fixed antennas, which in accordance to section 15.203, the maximum gain is 2 dBi; please refer to the internal photos.

**Result:** Compliant.

## FCC §15.207 (a) - CONDUCTED EMISSIONS

### Applicable Standard

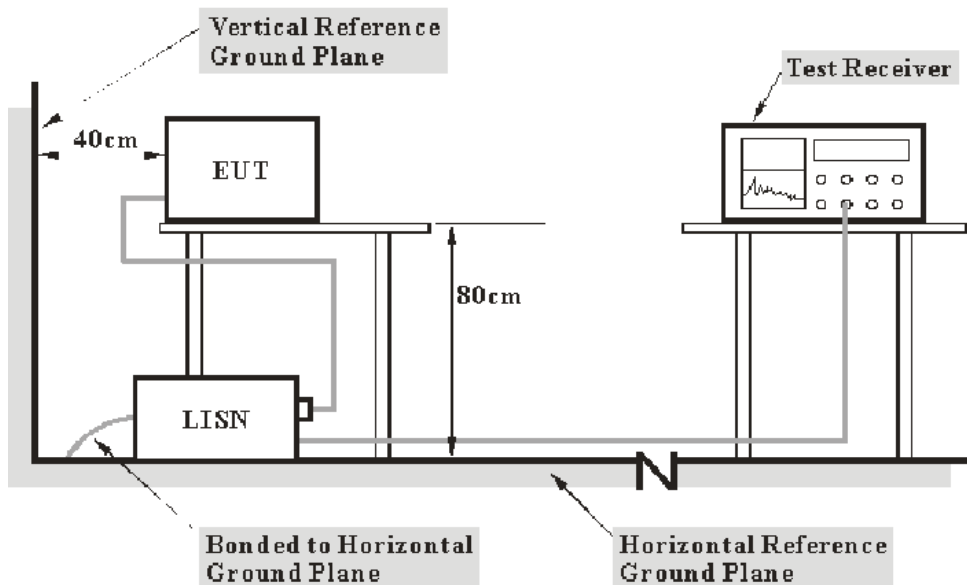
FCC§15.207

### 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 CISPR 16-4-4, 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.

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

## EMI Test Receiver Setup

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

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

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

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2011-11-24	2012-11-23
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-11-17	2012-11-16
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2011-07-08	2012-07-07

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

## Test Procedure

During the conducted emission test, the EUT was connected to the first LISN, and laptop was connected to the second LISN.

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

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

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

**18.66 dB at 0.605 MHz** in the **Neutral** conductor mode

## Test Data

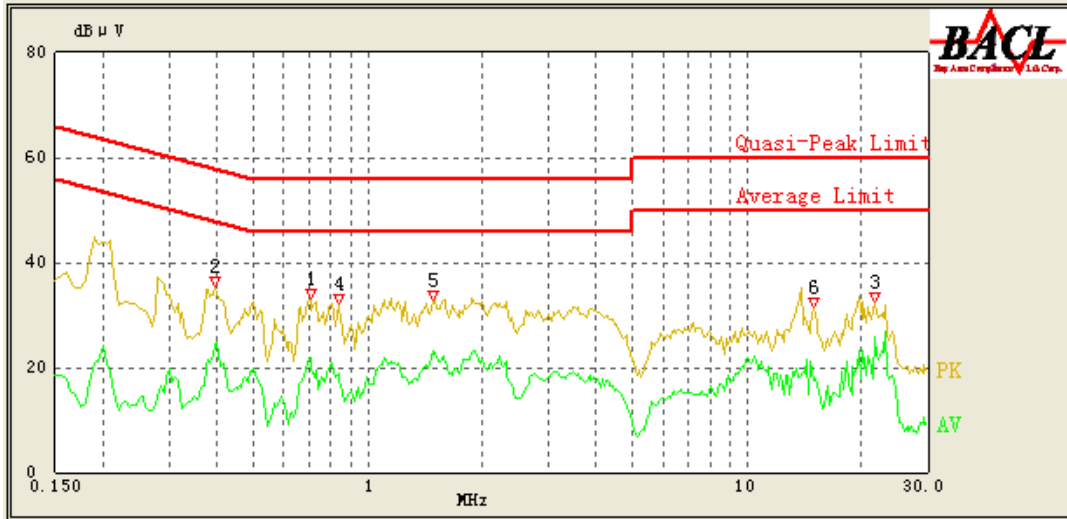
### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Henry Ding on 2012-06-14.*

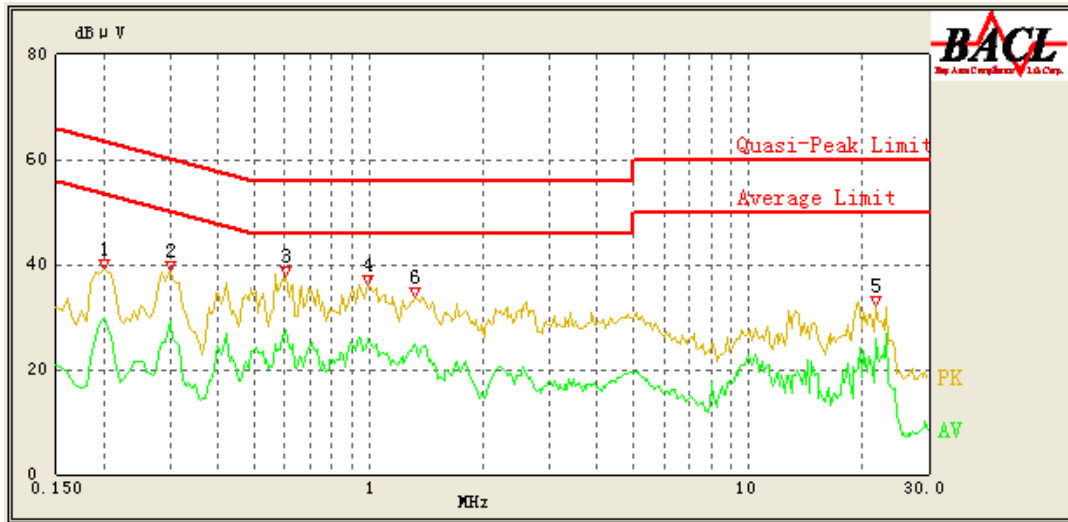
Test Mode: Transmitting

AC 120V / 60Hz - Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Result (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
1.485	22.66	9.88	46.00	23.34	Ave.
0.705	32.23	9.78	56.00	23.77	QP
0.705	21.90	9.78	46.00	24.10	Ave.
21.665	25.71	12.29	50.00	24.29	Ave.
0.395	24.03	9.68	49.00	24.97	Ave.
0.835	18.85	9.82	46.00	27.15	Ave.
1.490	27.98	9.88	56.00	28.02	QP
0.835	27.97	9.82	56.00	28.03	QP
0.395	30.31	9.68	59.00	28.69	QP
21.660	27.95	12.29	60.00	32.05	QP
14.955	17.49	11.03	50.00	32.51	Ave.
14.990	20.63	11.04	60.00	39.37	QP

**Neutral:**



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Corrected Result (dBμV)	Corrected Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK /QP/Ave)
0.605	27.34	9.75	46.00	18.66	Ave.
0.990	25.75	9.87	46.00	20.25	Ave.
1.325	24.68	9.88	46.00	21.32	Ave.
0.605	34.09	9.75	56.00	21.91	QP
0.300	29.30	9.65	51.71	22.41	Ave.
21.665	25.87	12.29	50.00	24.13	Ave.
0.990	31.61	9.87	56.00	24.39	QP
0.200	29.98	9.64	54.57	24.59	Ave.
1.325	30.14	9.88	56.00	25.86	QP
0.300	35.31	9.65	61.71	26.40	QP
0.200	35.62	9.64	64.57	28.95	QP
21.665	29.88	12.29	60.00	30.12	QP

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

### Applicable Standard

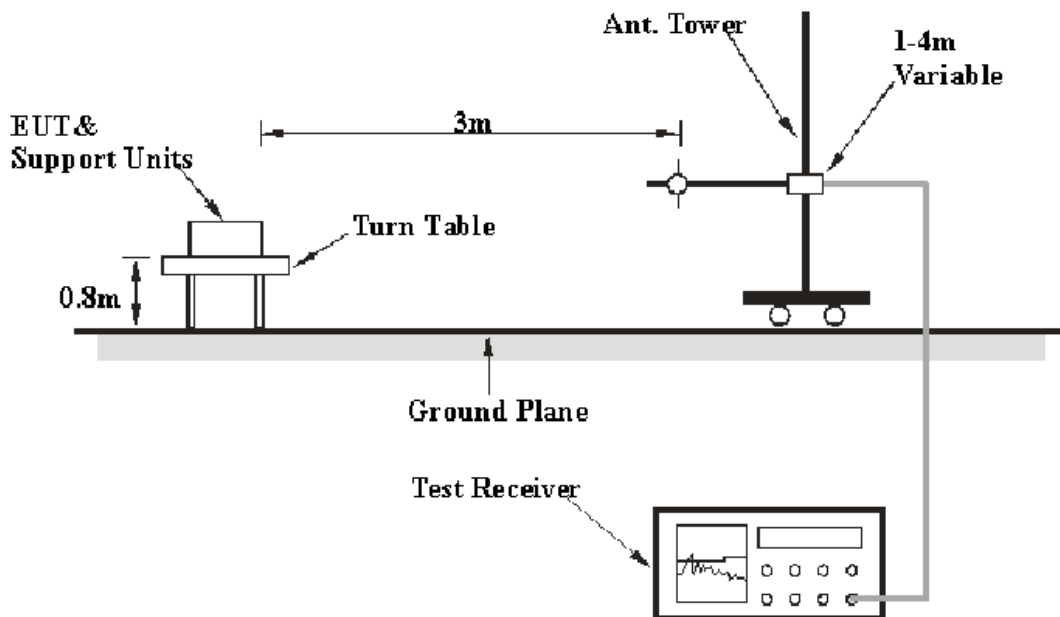
FCC §15.247 (d); §15.209; §15.205;

### Measurement Uncertainty

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

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

### EUT Setup



The radiated emission tests were performed in the 3 meters 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 EUT was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

## 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	A040904-1	2012-03-17	2013-03-16
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2012-03-08	2013-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Agilent	Spectrum Analyzer	8564E	3943A01781	2012-04-12	2013-04-11
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2011-10-14	2012-10-13

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

## Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

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

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



## Corrected Amplitude & Margin Calculation

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

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

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 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:

**3.97 dB** at **3249.3 MHz** in the **Vertical** polarization for mode 802.11b

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Henry Ding from 2012-06-15 to 2012-06-16.*

*Test Mode: Transmitting*

**30 MHz-25 GHz**

**802.11b mode:**

Indicated		Detector (PK/QP/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.205/15.209			
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)												
2412.0	89.36	PK	36	1.4	H	29.60	3.03	26.50	95.49	N/A	N/A	Fund.
2412.0	81.26	Ave.	36	1.4	H	29.60	3.03	26.50	87.39	N/A	N/A	Fund.
3216.0	38.69	Ave.	68	1.3	V	32.40	3.49	26.50	48.08	54.00	5.92	Spurious
58.86	49.22	QP	63.0	1.0	V	6.10	0.38	25.80	29.90	40.00	10.10	Spurious
48.04	44.17	QP	7.0	1.0	V	9.60	0.33	25.90	28.20	40.00	11.80	Spurious
4824.0	24.03	Ave.	239	1.5	H	34.60	4.30	26.50	36.43	54.00	17.57	Harmonic
4824.0	42.11	PK	239	1.5	H	34.60	4.30	26.50	54.51	74.00	19.49	Harmonic
7236.0	17.14	Ave.	44	1.5	H	37.90	5.22	26.50	33.76	54.00	20.24	Harmonic
3216.0	41.68	PK	68	1.3	V	32.40	3.49	26.50	51.07	74.00	22.93	Spurious
7236.0	33.65	PK	44	1.5	H	37.90	5.22	26.50	50.27	74.00	23.73	Harmonic
2485.0	21.08	Ave.	8	1.3	H	30.80	3.10	26.50	28.48	54.00	25.52	Spurious
2382.0	22.17	Ave.	63	1.4	H	29.60	3.03	26.50	28.30	54.00	25.70	Spurious
2386.6	21.34	Ave.	38	1.4	V	29.60	3.03	26.50	27.47	54.00	26.53	Spurious
2485.0	36.67	PK	8	1.3	H	30.80	3.10	26.50	44.07	74.00	29.93	Spurious
2382.0	37.28	PK	63	1.4	H	29.60	3.03	26.50	43.41	74.00	30.59	Spurious
2386.6	36.65	PK	38	1.4	V	29.60	3.03	26.50	42.78	74.00	31.22	Spurious
Middle Channel (2437 MHz)												
2437.0	88.21	PK	89	1.4	H	29.60	3.03	26.50	94.34	N/A	N/A	Fund.
2437.0	80.02	Ave.	89	1.4	H	29.60	3.03	26.50	86.15	N/A	N/A	Fund.
3249.3	40.64	Ave.	23	1.5	V	32.40	3.49	26.50	50.03	54.00	3.97*	Spurious
58.86	48.82	QP	65.0	1.0	V	6.10	0.38	25.80	29.50	40.00	10.50	Spurious
48.04	44.47	QP	10.0	1.0	V	9.60	0.33	25.90	28.50	40.00	11.50	Spurious
4874.0	27.23	Ave.	56	1.4	H	34.60	4.36	26.50	39.69	54.00	14.31	Harmonic
7311.0	17.32	Ave.	202	1.4	H	37.90	5.09	26.50	33.81	54.00	20.19	Harmonic
3249.3	42.48	PK	23	1.5	V	32.40	3.49	26.50	51.87	74.00	22.13	Spurious
4874.0	38.26	PK	56	1.4	H	34.60	4.36	26.50	50.72	74.00	23.28	Harmonic
7311.0	33.64	PK	202	1.4	H	37.90	5.09	26.50	50.13	74.00	23.87	Harmonic
2490.5	21.28	Ave.	268	1.5	H	30.60	3.11	26.50	28.49	54.00	25.51	Spurious
2377.1	22.11	Ave.	38	1.6	H	29.60	3.03	26.50	28.24	54.00	25.76	Spurious
2382.7	21.21	Ave.	25	1.6	V	29.60	3.03	26.50	27.34	54.00	26.66	Spurious
2377.1	37.69	PK	38	1.6	H	29.60	3.03	26.50	43.82	74.00	30.18	Spurious
2490.5	36.61	PK	268	1.5	H	30.60	3.11	26.50	43.82	74.00	30.18	Spurious
2382.7	36.67	PK	25	1.6	V	29.60	3.03	26.50	42.80	74.00	31.20	Spurious
High Channel (2462 MHz)												
2462.0	87.58	PK	88	1.4	H	30.60	3.11	26.50	94.79	N/A	N/A	Fund.
2462.0	80.02	Ave.	88	1.4	H	30.60	3.11	26.50	87.23	N/A	N/A	Fund.
4924.0	36.26	Ave.	46	1.3	H	34.60	4.40	26.50	48.76	54.00	5.24	Harmonic
3282.7	37.74	Ave.	26	1.3	V	32.40	3.62	26.50	47.26	54.00	6.74	Spurious
58.86	49.12	QP	57.0	1.0	V	6.10	0.38	25.80	29.80	40.00	10.20	Spurious
48.04	43.57	QP	11.0	1.0	V	9.60	0.33	25.90	27.60	40.00	12.40	Spurious
7386.0	17.55	Ave.	7	1.4	H	37.20	5.21	26.50	33.46	54.00	20.54	Harmonic
4924.0	40.86	PK	46	1.3	H	34.60	4.40	26.50	53.36	74.00	20.64	Harmonic
3282.7	41.84	PK	26	1.3	V	32.40	3.62	26.50	51.36	74.00	22.64	Spurious
7386.0	33.98	PK	7	1.4	H	37.20	5.21	26.50	49.89	74.00	24.11	Harmonic

2490.6	21.28	Ave.	223	1.4	H	30.60	3.11	26.50	28.49	54.00	25.51	Spurious
2376.8	22.31	Ave.	26	1.4	H	29.60	3.03	26.50	28.44	54.00	25.56	Spurious
2493.8	21.23	Ave.	48	1.4	V	30.20	3.11	26.50	28.04	54.00	25.96	Spurious
2376.8	37.85	PK	26	1.4	H	29.60	3.03	26.50	43.98	74.00	30.02	Spurious
2490.6	36.67	PK	223	1.4	H	30.60	3.11	26.50	43.88	74.00	30.12	Spurious
2493.8	36.67	PK	48	1.4	V	30.20	3.11	26.50	43.48	74.00	30.52	Spurious

\*Within measurement uncertainty.

**802.11g mode:**

Indicated		Detector (PK/QP/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.205/15.209			
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)												
2412.0	85.14	PK	46	1.5	H	29.60	3.03	26.50	91.27	N/A	N/A	Fund.
2412.0	67.29	Ave.	46	1.5	H	29.60	3.03	26.50	73.42	N/A	N/A	Fund.
3216.1	35.36	Ave.	23	1.4	V	32.40	3.49	26.50	44.75	54.00	9.25	Spurious
58.86	48.08	QP	75.0	1.0	V	6.10	0.38	25.80	28.76	40.00	11.24	Spurious
48.04	44.31	QP	18.2	1.0	V	9.60	0.33	25.90	28.34	40.00	11.66	Spurious
4824.0	46.29	PK	126	1.5	H	34.60	4.30	26.50	58.69	74.00	15.31	Harmonic
4824.0	25.77	Ave.	126	1.5	H	34.60	4.30	26.50	38.17	54.00	15.83	Harmonic
7236.0	17.38	Ave.	56	1.3	H	37.90	5.22	26.50	34.00	54.00	20.00	Harmonic
3216.1	41.42	PK	23	1.4	V	32.40	3.49	26.50	50.81	74.00	23.19	Spurious
7236.0	33.94	PK	56	1.3	H	37.90	5.22	26.50	50.56	74.00	23.44	Harmonic
2490.8	21.27	Ave.	68	1.4	H	30.60	3.11	26.50	28.48	54.00	25.52	Spurious
2386.9	22.24	Ave.	23	1.3	H	29.60	3.03	26.50	28.37	54.00	25.63	Spurious
2370.4	21.37	Ave.	2	1.5	V	29.00	2.98	26.50	26.85	54.00	27.15	Spurious
2386.9	37.89	PK	23	1.3	H	29.60	3.03	26.50	44.02	74.00	29.98	Spurious
2490.8	36.41	PK	68	1.4	H	30.60	3.11	26.50	43.62	74.00	30.38	Spurious
2370.4	36.94	PK	2	1.5	V	29.00	2.98	26.50	42.42	74.00	31.58	Spurious
Middle Channel (2437 MHz)												
2437.0	84.37	PK	63	1.4	H	29.60	3.03	26.50	90.50	N/A	N/A	Fund.
2437.0	67.66	Ave.	63	1.4	H	29.60	3.03	26.50	73.79	N/A	N/A	Fund.
3249.3	35.27	Ave.	235	1.3	V	32.40	3.49	26.50	44.66	54.00	9.34	Spurious
58.86	48.69	QP	60	1.0	V	6.10	0.38	25.80	29.37	40.00	10.63	Spurious
48.04	44.74	QP	13	1.0	V	9.60	0.33	25.90	28.77	40.00	11.23	Spurious
4874.0	24.84	Ave.	238	1.2	H	34.60	4.36	26.50	37.30	54.00	16.70	Harmonic
4874.0	43.29	PK	238	1.2	H	34.60	4.36	26.50	55.75	74.00	18.25	Harmonic
7311.0	17.82	Ave.	56	1.4	H	37.90	5.09	26.50	34.31	54.00	19.69	Harmonic
3249.3	41.39	PK	235	1.3	V	32.40	3.49	26.50	50.78	74.00	23.22	Spurious
7311.0	33.64	PK	56	1.4	H	37.90	5.09	26.50	50.13	74.00	23.87	Harmonic
2496.4	21.37	Ave.	126	1.5	H	30.60	3.11	26.50	28.58	54.00	25.42	Spurious
2369.3	22.94	Ave.	225	1.4	H	29.00	2.98	26.50	28.42	54.00	25.58	Spurious
2489.5	21.37	Ave.	46	1.4	V	30.20	3.11	26.50	28.18	54.00	25.82	Spurious
2496.4	36.91	PK	126	1.5	H	30.60	3.11	26.50	44.12	74.00	29.88	Spurious
2369.3	38.61	PK	225	1.4	H	29.00	2.98	26.50	44.09	74.00	29.91	Spurious
2489.5	36.93	PK	46	1.4	V	30.20	3.11	26.50	43.74	74.00	30.26	Spurious
High Channel (2462 MHz)												
2462.0	86.69	PK	68	1.5	H	30.60	3.11	26.50	93.90	N/A	N/A	Fund.
2462.0	68.49	Ave.	68	1.5	H	30.60	3.11	26.50	75.70	N/A	N/A	Fund.
3283.1	35.69	Ave.	7	1.5	V	32.40	3.62	26.50	45.21	54.00	8.79	Spurious
58.86	48.87	QP	51.0	1.0	V	6.10	0.38	25.80	29.55	40.00	10.45	Spurious
48.04	43.81	QP	24.3	1.0	V	9.60	0.33	25.90	27.84	40.00	12.16	Spurious
4924.0	25.96	Ave.	5	1.4	H	34.60	4.40	26.50	38.46	54.00	15.54	Harmonic
4924.0	45.25	PK	5	1.4	H	34.60	4.40	26.50	57.75	74.00	16.25	Harmonic
7386.0	17.92	Ave.	252	1.4	H	37.20	5.21	26.50	33.83	54.00	20.17	Harmonic
3283.1	42.52	PK	7	1.5	V	32.40	3.62	26.50	52.04	74.00	21.96	Spurious
7386.0	34.29	PK	252	1.4	H	37.20	5.21	26.50	50.20	74.00	23.80	Harmonic

2491.2	21.64	Ave.	45	1.4	H	30.60	3.11	26.50	28.85	54.00	25.15	Spurious
2497.5	21.93	Ave.	28	1.5	V	30.20	3.11	26.50	28.74	54.00	25.26	Spurious
2384.6	22.51	Ave.	68	1.3	H	29.60	3.03	26.50	28.64	54.00	25.36	Spurious
2384.6	37.94	PK	68	1.3	H	29.60	3.03	26.50	44.07	74.00	29.93	Spurious
2491.2	36.75	PK	45	1.4	H	30.60	3.11	26.50	43.96	74.00	30.04	Spurious
2497.5	36.94	PK	28	1.5	V	30.20	3.11	26.50	43.75	74.00	30.25	Spurious

**802.11n20 mode:**

Indicated		Detector (PK/QP/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.205/15.209			
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)												
2412.0	85.67	PK	56	1.4	H	29.60	3.03	26.50	91.80	N/A	N/A	Fund.
2412.0	68.34	Ave.	56	1.4	H	29.60	3.03	26.50	74.47	N/A	N/A	Fund.
4824.0	36.89	Ave.	57	1.4	H	34.60	4.30	26.50	49.29	54.00	4.71	Harmonic
3216.1	35.29	Ave.	236	1.5	V	32.40	3.49	26.50	44.68	54.00	9.32	Spurious
58.85	48.45	QP	35	1.0	V	6.10	0.38	25.80	29.13	40.00	10.87	Spurious
48.04	44.98	QP	715	1.0	V	9.60	0.33	25.90	29.01	40.00	10.99	Spurious
4824.0	43.64	PK	57	1.4	H	34.60	4.30	26.50	56.04	74.00	17.96	Harmonic
7236.0	17.63	Ave.	68	1.4	H	37.90	5.22	26.50	34.25	54.00	19.75	Harmonic
3216.1	41.35	PK	236	1.5	V	32.40	3.49	26.50	50.74	74.00	23.26	Spurious
7236.0	33.96	PK	68	1.4	H	37.90	5.22	26.50	50.58	74.00	23.42	Harmonic
2497.6	21.33	Ave.	68	1.4	H	30.60	3.11	26.50	28.54	54.00	25.46	Spurious
2369.8	22.65	Ave.	4	1.6	H	29.00	2.98	26.50	28.13	54.00	25.87	Spurious
2373.8	21.55	Ave.	255	1.3	V	29.60	3.03	26.50	27.68	54.00	26.32	Spurious
2369.8	38.91	PK	4	1.6	H	29.00	2.98	26.50	44.39	74.00	29.61	Spurious
2497.6	36.64	PK	68	1.4	H	30.60	3.11	26.50	43.85	74.00	30.15	Spurious
2373.8	37.12	PK	255	1.3	V	29.60	3.03	26.50	43.25	74.00	30.75	Spurious
Middle Channel (2437 MHz)												
2437.0	85.67	PK	26	1.4	H	29.60	3.03	26.50	91.80	N/A	N/A	Fund.
2437.0	69.34	Ave.	26	1.4	H	29.60	3.03	26.50	75.47	N/A	N/A	Fund.
3249.3	38.39	Ave.	138	1.4	V	32.40	3.49	26.50	47.78	54.00	6.22	Spurious
58.85	48.31	QP	102	1.0	V	6.10	0.38	25.80	28.99	40.00	11.01	Spurious
48.04	44.58	QP	60	1.0	V	9.60	0.33	25.90	28.61	40.00	11.39	Spurious
4874.0	24.69	Ave.	138	1.3	H	34.60	4.36	26.50	37.15	54.00	16.85	Harmonic
4874.0	43.75	PK	138	1.3	H	34.60	4.36	26.50	56.21	74.00	17.79	Harmonic
7311.0	17.54	Ave.	167	1.5	H	37.90	5.09	26.50	34.03	54.00	19.97	Harmonic
3249.3	42.06	PK	138	1.4	V	32.40	3.49	26.50	51.45	74.00	22.55	Spurious
7311.0	34.29	PK	167	1.5	H	37.90	5.09	26.50	50.78	74.00	23.22	Harmonic
2499.4	21.21	Ave.	46	1.3	H	30.60	3.11	26.50	28.42	54.00	25.58	Spurious
2387.5	21.28	Ave.	58	1.4	H	29.60	3.03	26.50	27.41	54.00	26.59	Spurious
2369.8	21.05	Ave.	222	1.4	V	29.00	2.98	26.50	26.53	54.00	27.47	Spurious
2499.4	36.45	PK	46	1.3	H	30.60	3.11	26.50	43.66	74.00	30.34	Spurious
2387.5	36.67	PK	58	1.4	H	29.60	3.03	26.50	42.80	74.00	31.20	Spurious
2369.8	36.64	PK	222	1.4	V	29.00	2.98	26.50	42.12	74.00	31.88	Spurious
High Channel (2462 MHz)												
2462.0	86.61	PK	8	1.4	H	30.60	3.11	26.50	93.82	N/A	N/A	Fund.
2462.0	68.34	Ave.	8	1.4	H	30.60	3.11	26.50	75.55	N/A	N/A	Fund.
3283.1	35.65	Ave.	53	1.6	V	32.40	3.62	26.50	45.17	54.00	8.83	Spurious
58.85	48.48	QP	57	1.0	V	6.10	0.38	25.80	29.16	40.00	10.84	Spurious
48.04	44.66	QP	15	1.0	V	9.60	0.33	25.90	28.69	40.00	11.31	Spurious
4924.0	23.89	Ave.	68	1.3	H	34.60	4.40	26.50	36.39	54.00	17.61	Harmonic
4924.0	42.15	PK	68	1.3	H	34.60	4.40	26.50	54.65	74.00	19.35	Harmonic
7386.0	17.21	Ave.	57	1.5	H	37.20	5.21	26.50	33.12	54.00	20.88	Harmonic
3283.1	42.63	PK	53	1.6	V	32.40	3.62	26.50	52.15	74.00	21.85	Spurious
7386.0	33.67	PK	57	1.5	H	37.20	5.21	26.50	49.58	74.00	24.42	Harmonic

2497.6	22.36	Ave.	38	1.3	H	30.60	3.11	26.50	29.57	54.00	24.43	Spurious
2496.3	21.93	Ave.	87	1.4	V	30.20	3.11	26.50	28.74	54.00	25.26	Spurious
2378.9	21.06	Ave.	125	1.4	H	29.60	3.03	26.50	27.19	54.00	26.81	Spurious
2497.6	37.66	PK	38	1.3	H	30.60	3.11	26.50	44.87	74.00	29.13	Spurious
2496.3	36.67	PK	87	1.4	V	30.20	3.11	26.50	43.48	74.00	30.52	Spurious
2378.9	36.34	PK	125	1.4	H	29.60	3.03	26.50	42.47	74.00	31.53	Spurious

**802.11n40 mode:**

Indicated		Detector (PK/QP/Ave.)	Table Angle Degree	Antenna		Correction Factor			FCC Part 15.247/15.205/15.209			
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)												
2422.0	83.24	PK	23	1.4	H	29.60	3.03	26.50	89.37	N/A	N/A	Fund.
2422.0	62.67	Ave.	23	1.4	H	29.60	3.03	26.50	68.80	N/A	N/A	Fund.
3229.3	37.93	Ave.	26	1.4	V	32.40	3.49	26.50	47.32	54.00	6.68	Spurious
58.85	47.99	QP	45	1.0	V	6.10	0.38	25.80	28.67	40.00	11.33	Spurious
48.04	43.88	QP	23	1.0	V	9.60	0.33	25.90	27.91	40.00	12.09	Spurious
4844.0	21.87	Ave.	288	1.3	H	34.60	4.30	26.50	34.27	54.00	19.73	Harmonic
7266.0	17.56	Ave.	8	1.3	H	37.90	5.22	26.50	34.18	54.00	19.82	Harmonic
3229.3	42.28	PK	26	1.4	V	32.40	3.49	26.50	51.67	74.00	22.33	Spurious
4844.0	39.23	PK	288	1.3	H	34.60	4.30	26.50	51.63	74.00	22.37	Harmonic
7266.0	33.67	PK	8	1.3	H	37.90	5.22	26.50	50.29	74.00	23.71	Harmonic
2498.9	21.06	Ave.	56	1.4	H	30.60	3.11	26.50	28.27	54.00	25.73	Spurious
2369.8	22.15	Ave.	3	1.3	H	29.00	2.98	26.50	27.63	54.00	26.37	Spurious
2353.4	21.57	Ave.	68	1.5	V	29.00	2.98	26.50	27.05	54.00	26.95	Spurious
2498.9	36.67	PK	56	1.4	H	30.60	3.11	26.50	43.88	74.00	30.12	Spurious
2369.8	37.61	PK	3	1.3	H	29.00	2.98	26.50	43.09	74.00	30.91	Spurious
2353.4	36.91	PK	68	1.5	V	29.00	2.98	26.50	42.39	74.00	31.61	Spurious
Middle Channel (2437 MHz)												
2437.0	84.14	PK	78	1.4	H	29.60	3.03	26.50	90.27	N/A	N/A	Fund.
2437.0	63.37	Ave.	78	1.4	H	29.60	3.03	26.50	69.50	N/A	N/A	Fund.
3249.2	35.86	Ave.	23	1.4	V	32.40	3.49	26.50	45.25	54.00	8.75	Spurious
58.86	48.44	QP	79	1.0	V	6.10	0.38	25.80	29.12	40.00	10.88	Spurious
48.04	44.50	QP	21	1.0	V	9.60	0.33	25.90	28.53	40.00	11.47	Spurious
4874.0	23.56	Ave.	68	1.3	H	34.60	4.36	26.50	36.02	54.00	17.98	Harmonic
4874.0	42.62	PK	68	1.3	H	34.60	4.36	26.50	55.08	74.00	18.92	Harmonic
7311.0	17.43	Ave.	7	1.3	H	37.90	5.09	26.50	33.92	54.00	20.08	Harmonic
3249.2	42.39	PK	23	1.4	V	32.40	3.49	26.50	51.78	74.00	22.22	Spurious
7311.0	33.84	PK	7	1.3	H	37.90	5.09	26.50	50.33	74.00	23.67	Harmonic
2496.5	21.56	Ave.	96	1.4	H	30.60	3.11	26.50	28.77	54.00	25.23	Spurious
2357.8	21.21	Ave.	54	1.5	H	29.00	2.98	26.50	26.69	54.00	27.31	Spurious
2363.7	21.08	Ave.	67	1.4	V	29.00	2.98	26.50	26.56	54.00	27.44	Spurious
2496.5	36.64	PK	96	1.4	H	30.60	3.11	26.50	43.85	74.00	30.15	Spurious
2363.7	36.67	PK	67	1.4	V	29.00	2.98	26.50	42.15	74.00	31.85	Spurious
2357.8	36.34	PK	54	1.5	H	29.00	2.98	26.50	41.82	74.00	32.18	Spurious
High Channel (2452 MHz)												
2452.0	83.34	PK	256	1.3	H	30.60	3.11	26.50	90.55	N/A	N/A	Fund.
2452.0	62.31	Ave.	256	1.3	H	30.60	3.11	26.50	69.52	N/A	N/A	Fund.
3269.4	35.64	Ave.	58	1.3	V	32.40	3.49	26.50	45.03	54.00	8.97	Spurious
48.04	44.31	QP	15	1.0	V	9.60	0.33	25.90	28.34	40.00	11.66	Spurious
58.86	47.18	QP	81	1.0	V	6.10	0.38	25.80	27.86	40.00	12.14	Spurious
4904.0	23.16	Ave.	35	1.3	H	34.60	4.36	26.50	35.62	54.00	18.38	Harmonic
4904.0	41.46	PK	35	1.3	H	34.60	4.36	26.50	53.92	74.00	20.08	Harmonic
7356.0	17.51	Ave.	65	1.4	H	37.20	5.21	26.50	33.42	54.00	20.58	Harmonic
3269.4	42.89	PK	58	1.3	V	32.40	3.49	26.50	52.28	74.00	21.72	Spurious
2498.8	22.31	Ave.	218	1.5	H	30.60	3.11	26.50	29.52	54.00	24.48	Spurious

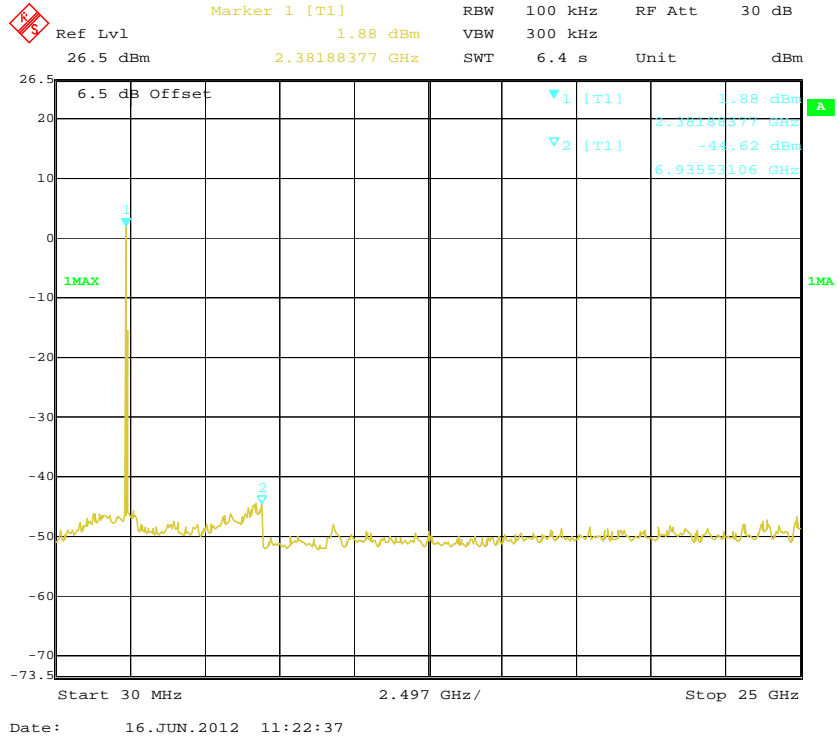


7356.0	33.25	PK	65	1.4	H	37.20	5.21	26.50	49.16	74.00	24.84	Harmonic
2493.5	21.56	Ave.	66	1.4	V	30.20	3.11	26.50	28.37	54.00	25.63	Spurious
2363.0	21.54	Ave.	255	1.4	H	29.00	2.98	26.50	27.02	54.00	26.98	Spurious
2498.8	37.68	PK	218	1.5	H	30.60	3.11	26.50	44.89	74.00	29.11	Spurious
2493.5	36.69	PK	66	1.4	V	30.20	3.11	26.50	43.50	74.00	30.50	Spurious
2363.0	36.21	PK	255	1.4	H	29.00	2.98	26.50	41.69	74.00	32.31	Spurious

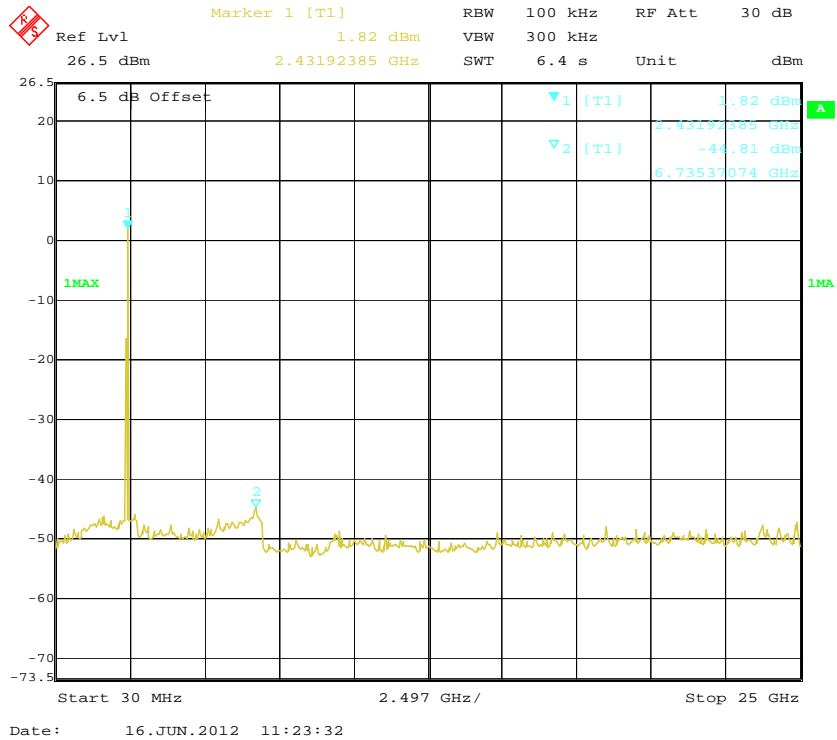
Remark:	
(1)	Measuring frequencies from 30 MHz to the 25GHz.
(2)	Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

**Antenna Port Conducted Spurious Emissions:**

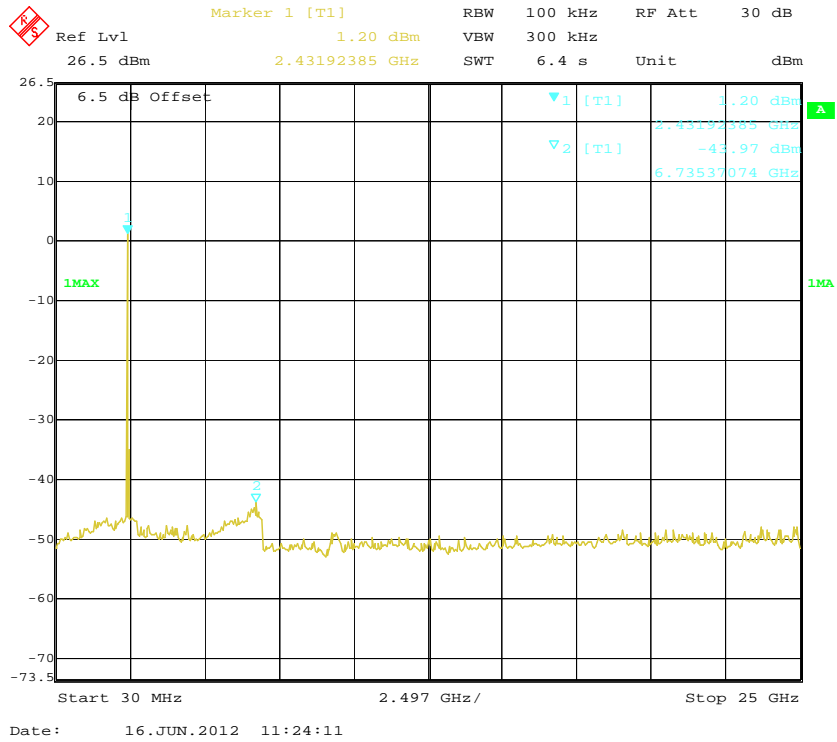
**802.11b Low Channel, Antenna 1**



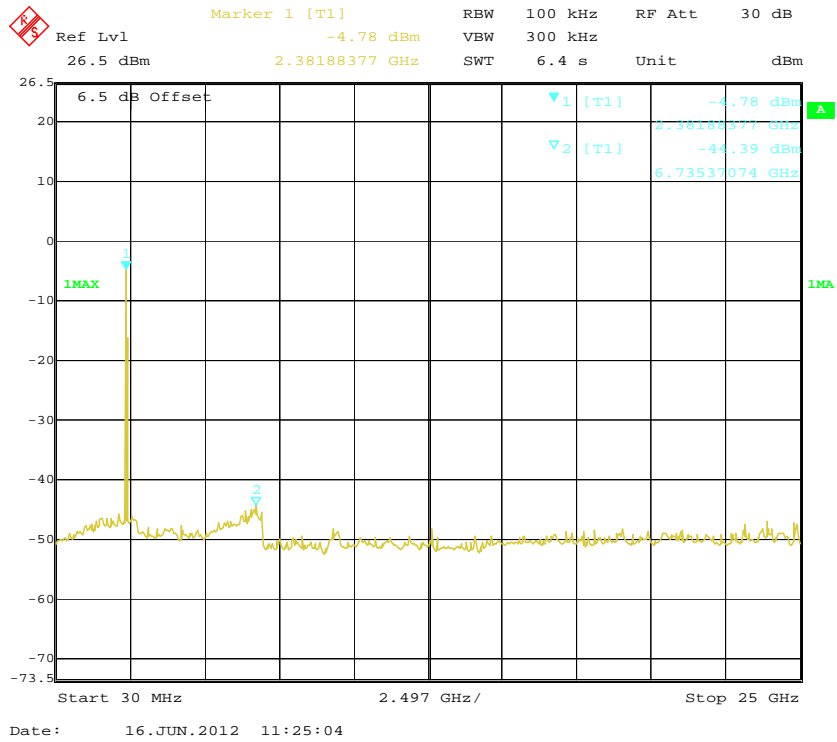
**802.11b Middle Channel, Antenna 1**



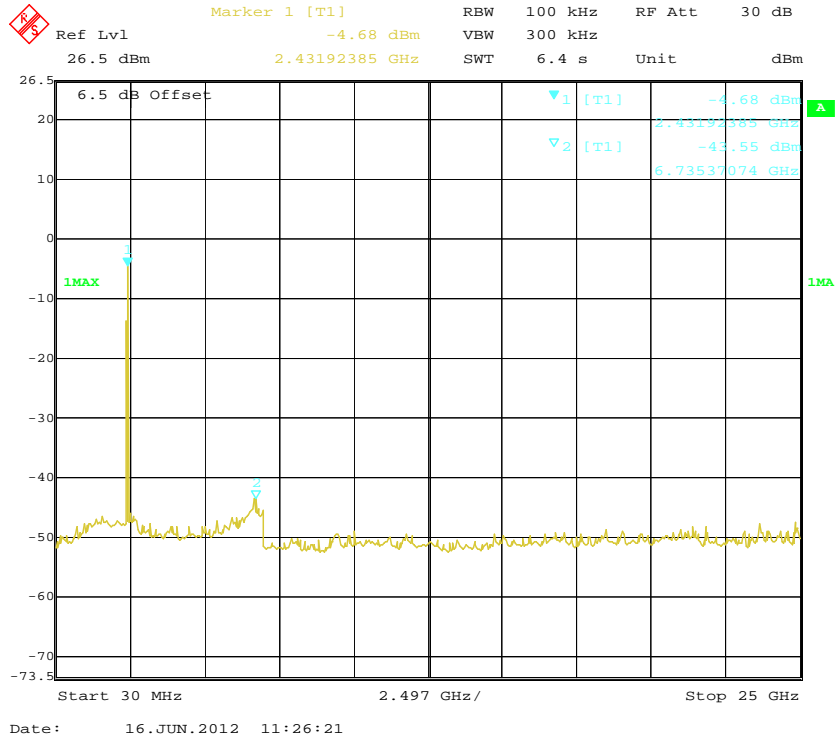
### 802.11b High Channel, Antenna 1



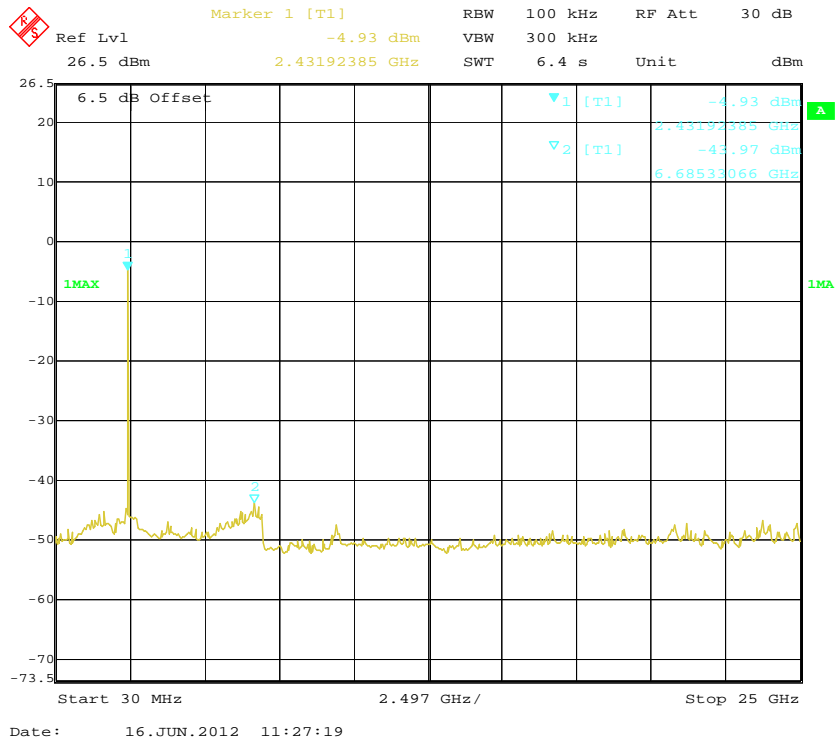
### 802.11g Low Channel, Antenna 1



### 802.11g Middle Channel, Antenna 1

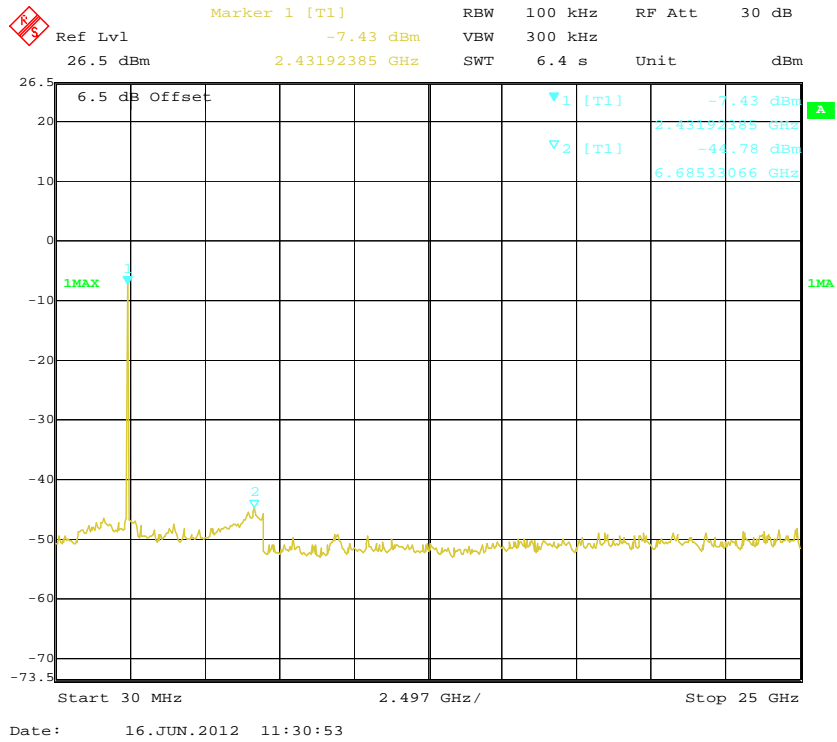


### 802.11g High Channel, Antenna 1

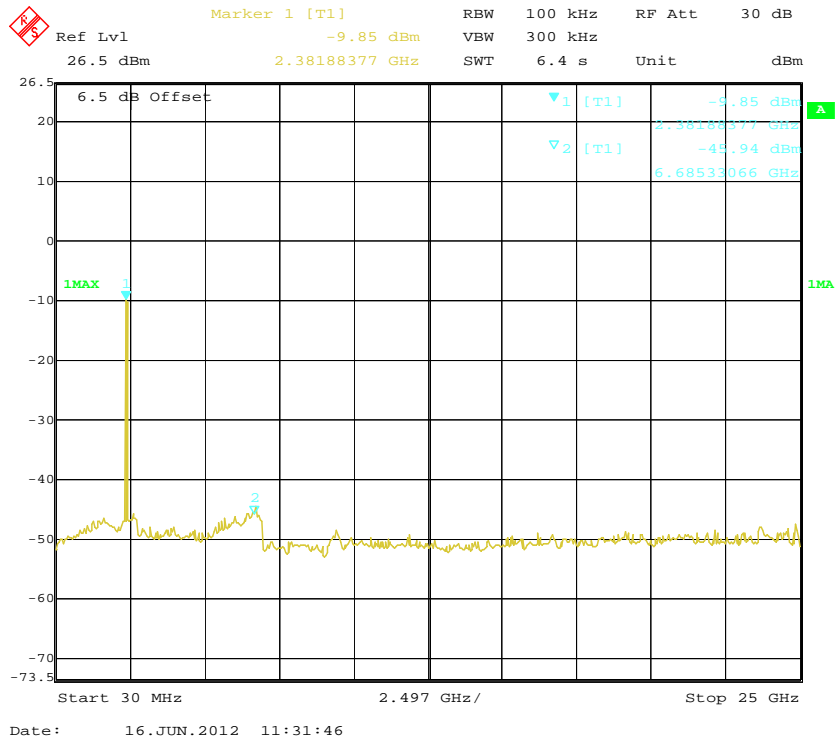




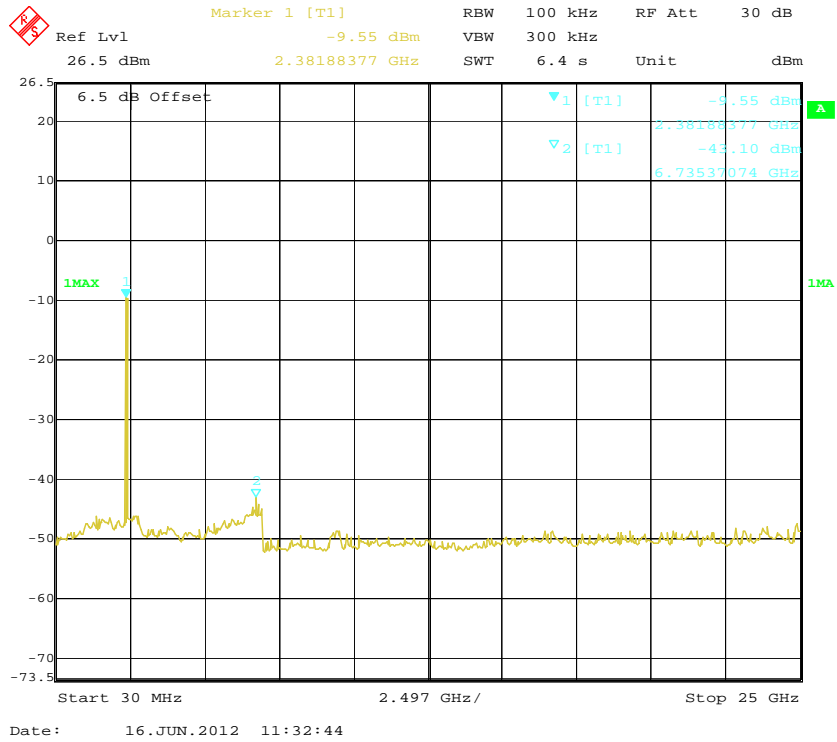
**802.11n20 High Channel, Antenna 1**



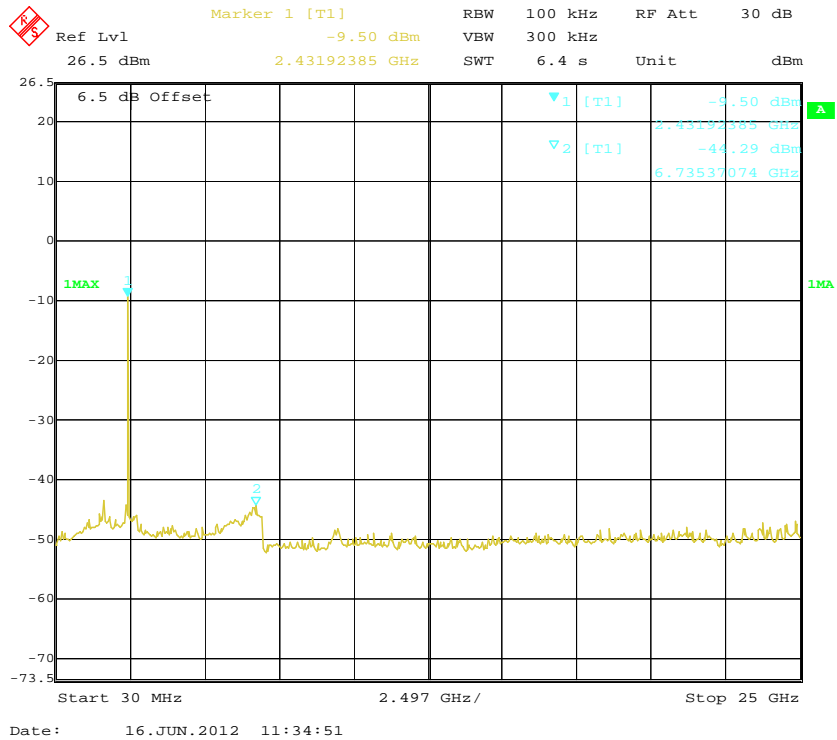
**802.11n40 Low Channel, Antenna 1**



**802.11n40 Middle Channel, Antenna 1**



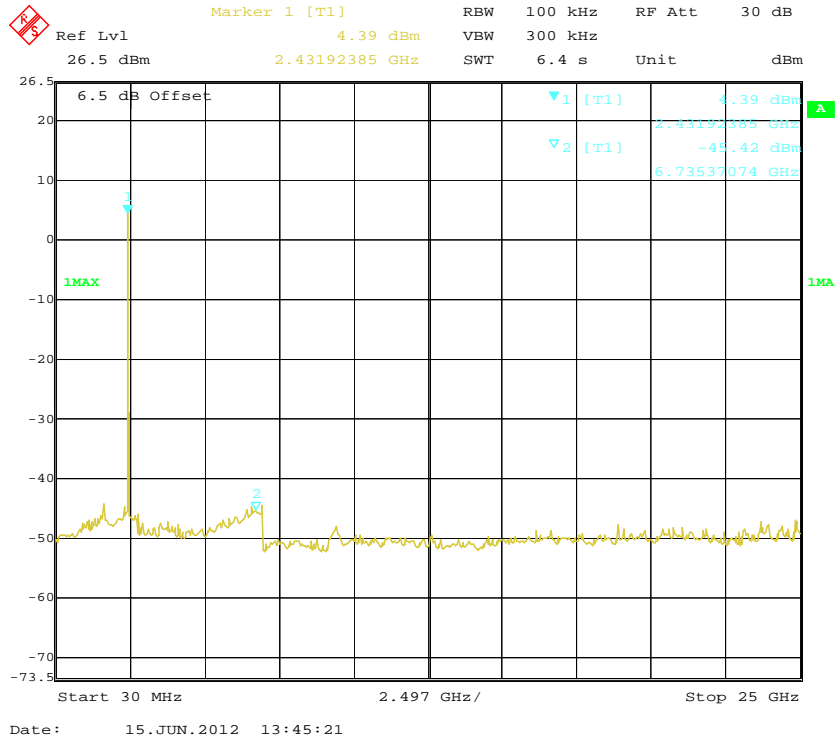
**802.11n40 High Channel, Antenna 1**



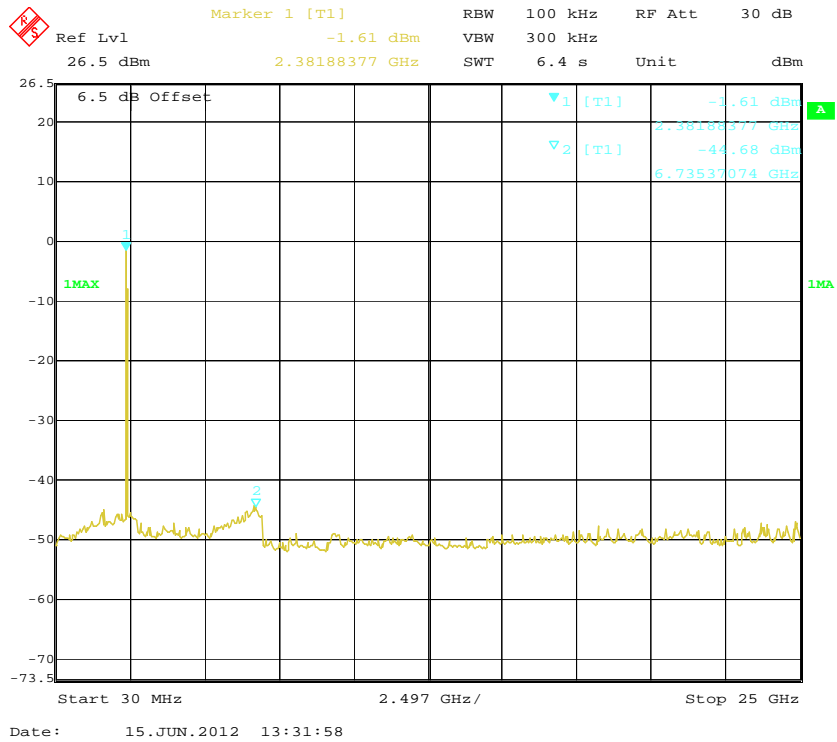




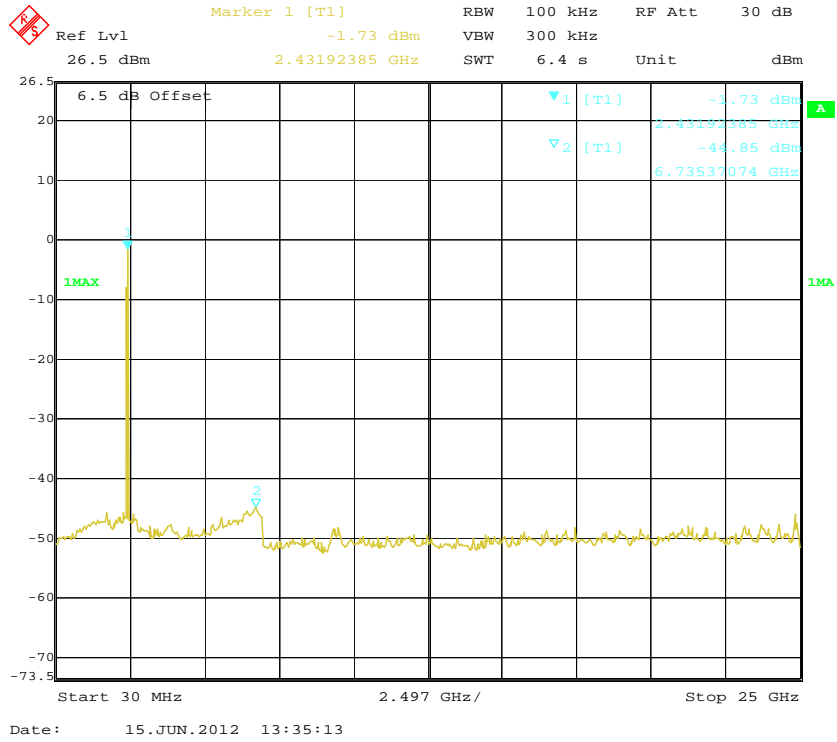
### 802.11b High Channel, Antenna 2



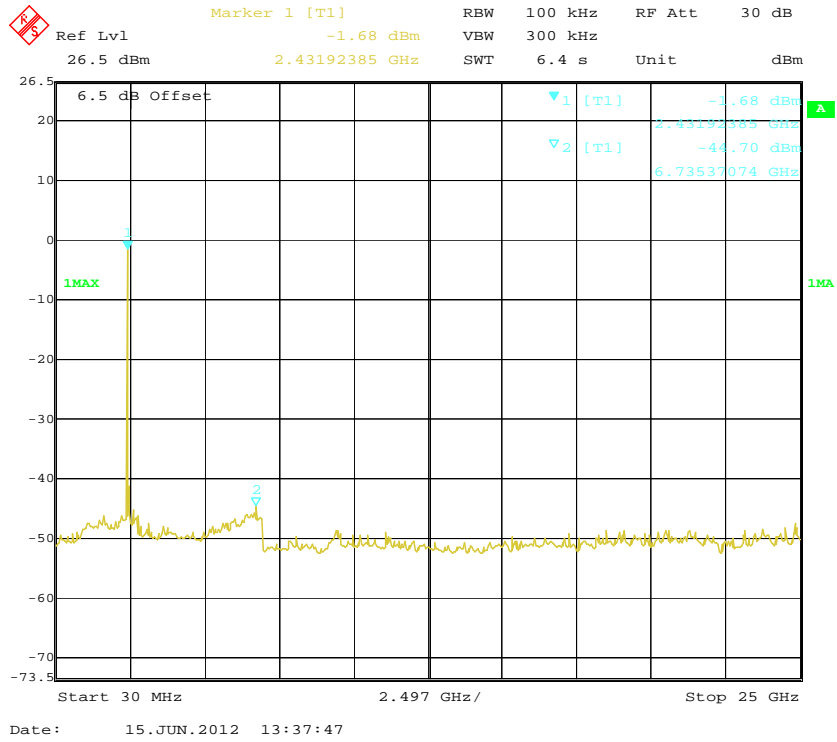
### 802.11g Low Channel, Antenna 2



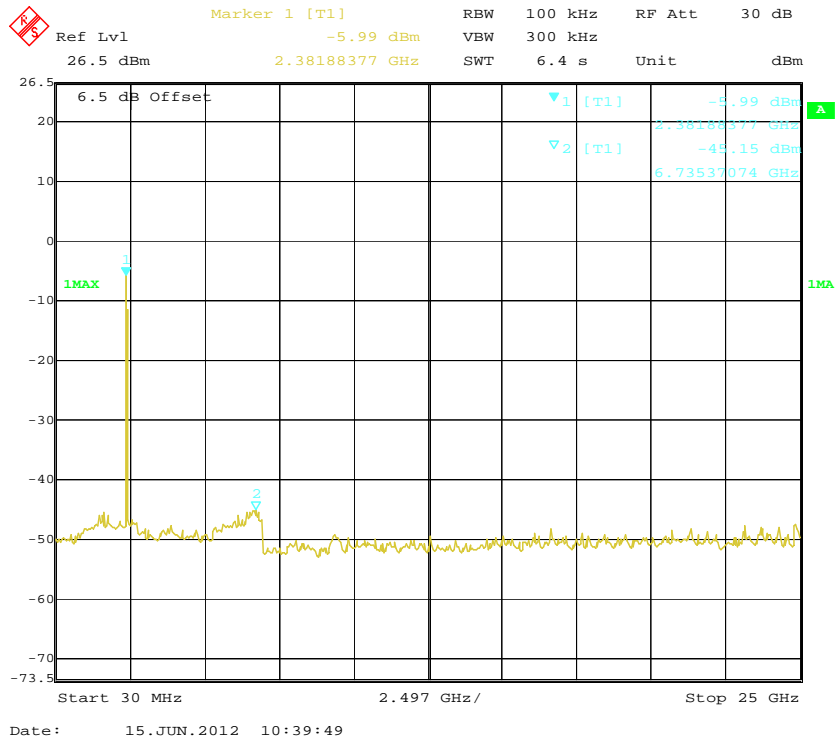
### 802.11g Middle Channel, Antenna 2



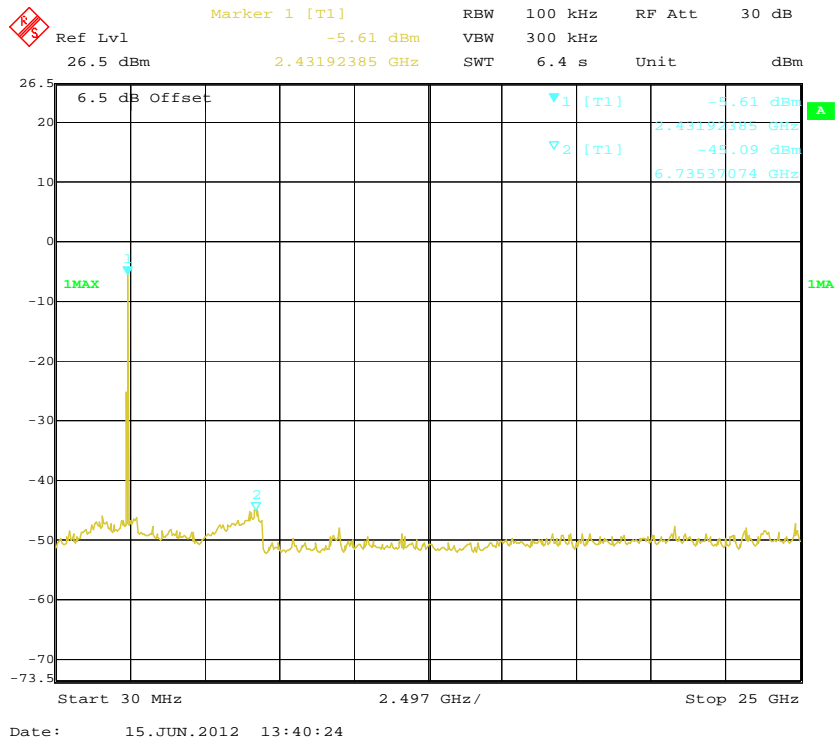
### 802.11g High Channel, Antenna 2



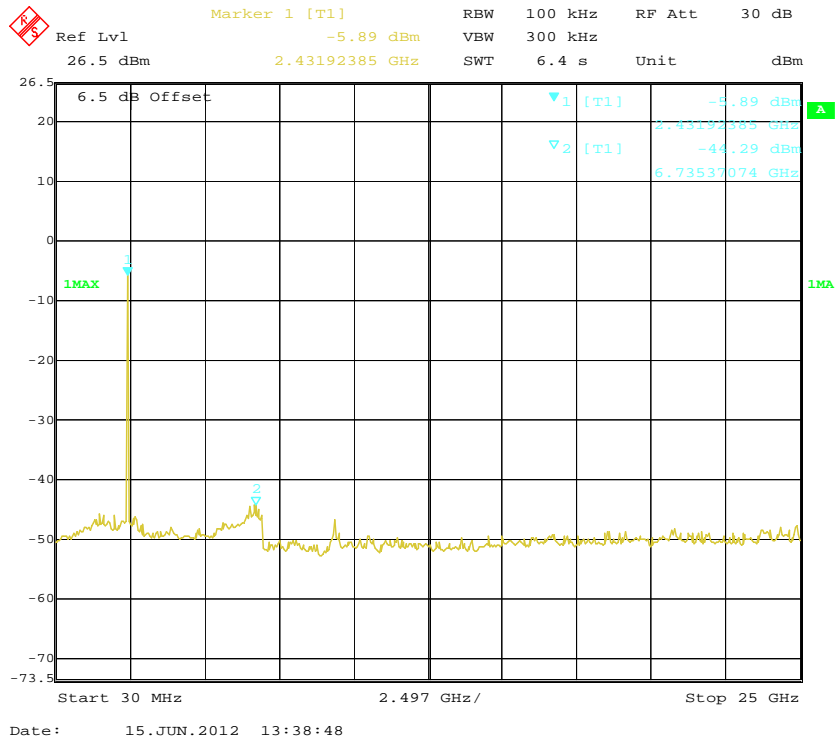
**802.11n20 Low Channel, Antenna 2**



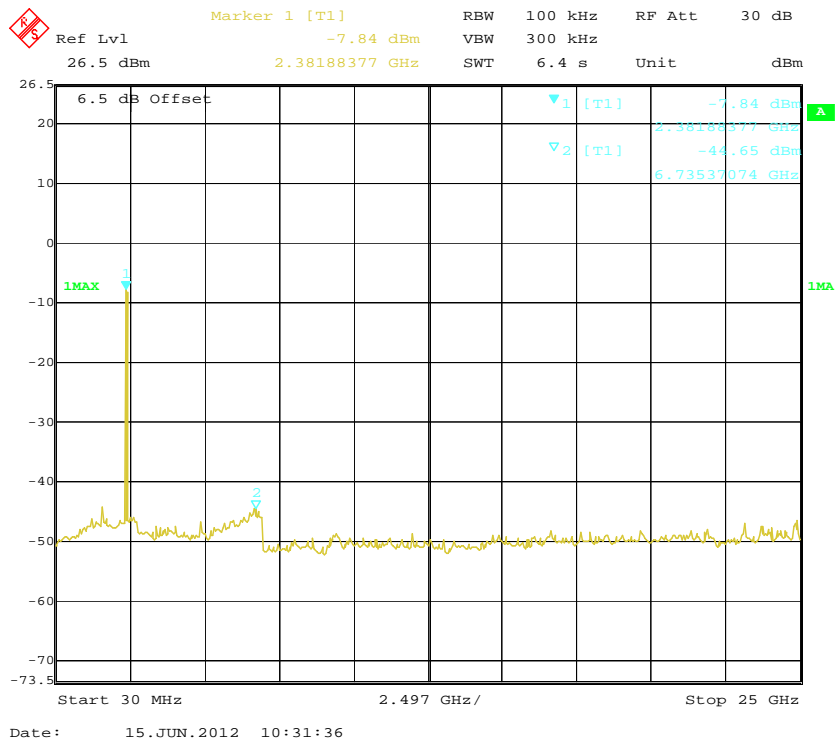
**802.11n20 Middle Channel, Antenna 2**



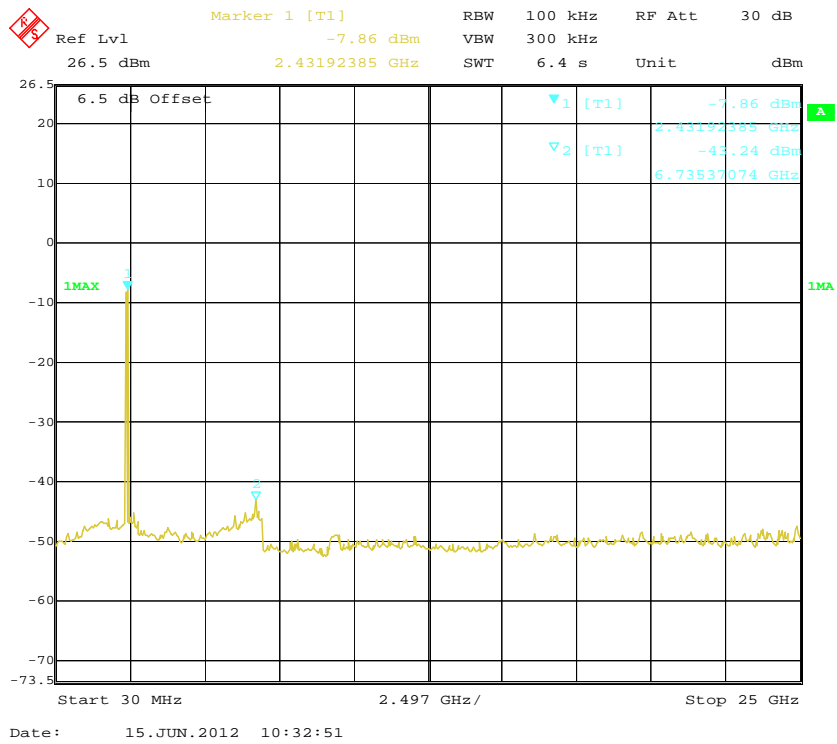
**802.11n20 High Channel, Antenna 2**



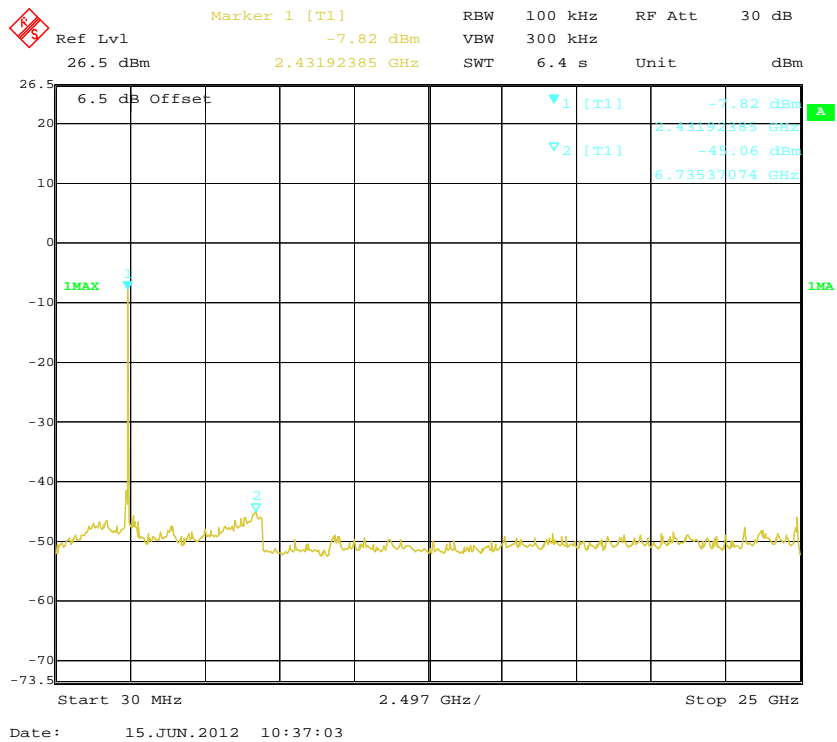
**802.11n40 Low Channel, Antenna 2**



**802.11n40 Middle Channel, Antenna 2**



**802.11n40 High Channel, Antenna 2**



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

### Applicable Standard

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

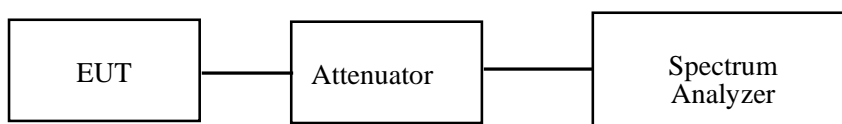
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	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 Procedure

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



### Test Data

#### Environmental Conditions

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

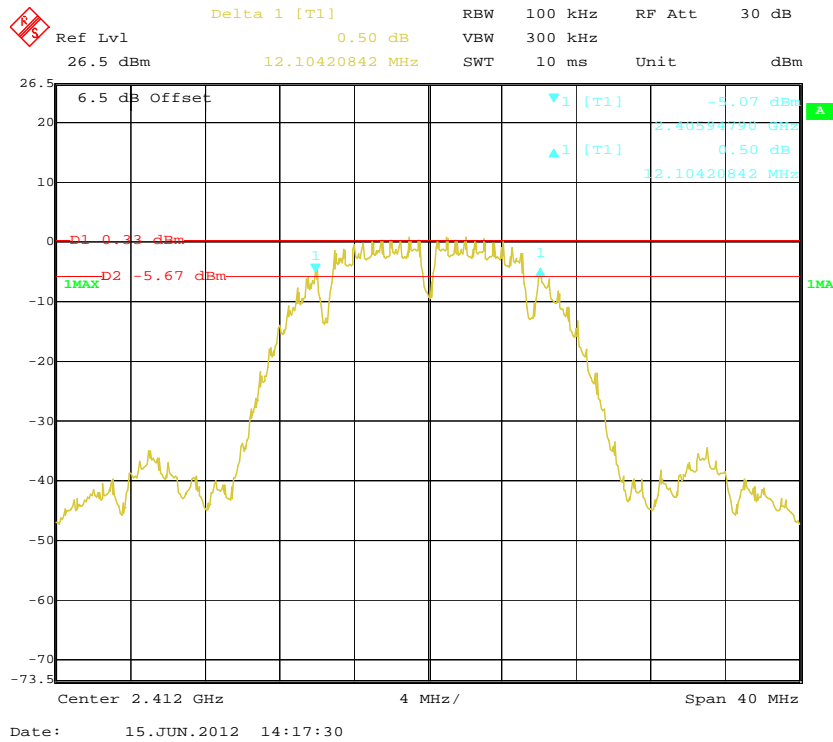
*The testing was performed by Henry Ding on 2012-06-12 and 2012-06-15*

**Test Result:** Pass.

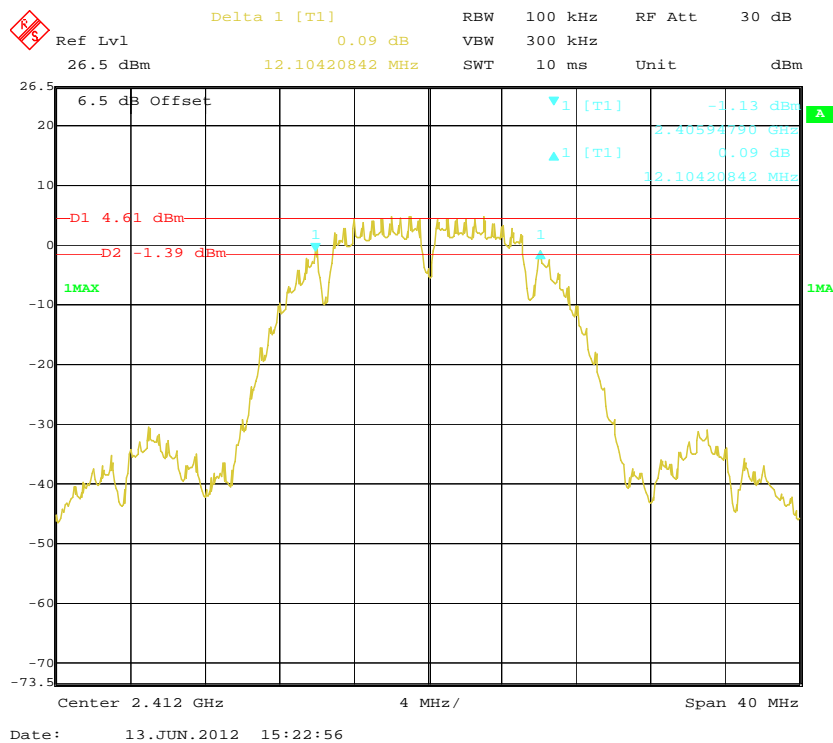
Please refer to the following tables and plots.

Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna port	6dB bandwidth (MHz)	Limit (kHz)	Result
<b>802.11b mode</b>						
Low	2412	1	1	12.10	>500	Pass
Low	2412	1	2	12.10	>500	Pass
Middle	2437	1	1	12.10	>500	Pass
Middle	2437	1	2	12.10	>500	Pass
High	2462	1	1	12.10	>500	Pass
High	2462	1	2	12.10	>500	Pass
<b>802.11g mode</b>						
Low	2412	6	1	16.35	>500	Pass
Low	2412	6	2	16.35	>500	Pass
Middle	2437	6	1	16.35	>500	Pass
Middle	2437	6	2	16.35	>500	Pass
High	2462	6	1	16.35	>500	Pass
High	2462	6	2	16.35	>500	Pass
<b>802.11n20 mode</b>						
Low	2412	6.5	1	17.64	>500	Pass
Low	2412	6.5	2	17.64	>500	Pass
Middle	2437	6.5	1	17.64	>500	Pass
Middle	2437	6.5	2	17.64	>500	Pass
High	2462	6.5	1	17.64	>500	Pass
High	2462	6.5	2	17.64	>500	Pass
<b>802.11n40 mode</b>						
Low	2422	13.5	1	36.19	>500	Pass
Low	2422	13.5	2	36.19	>500	Pass
Middle	2437	13.5	1	36.19	>500	Pass
Middle	2437	13.5	2	36.19	>500	Pass
High	2452	13.5	1	36.19	>500	Pass
High	2452	13.5	2	36.19	>500	Pass

### 802.11b Low Channel, Antenna 1

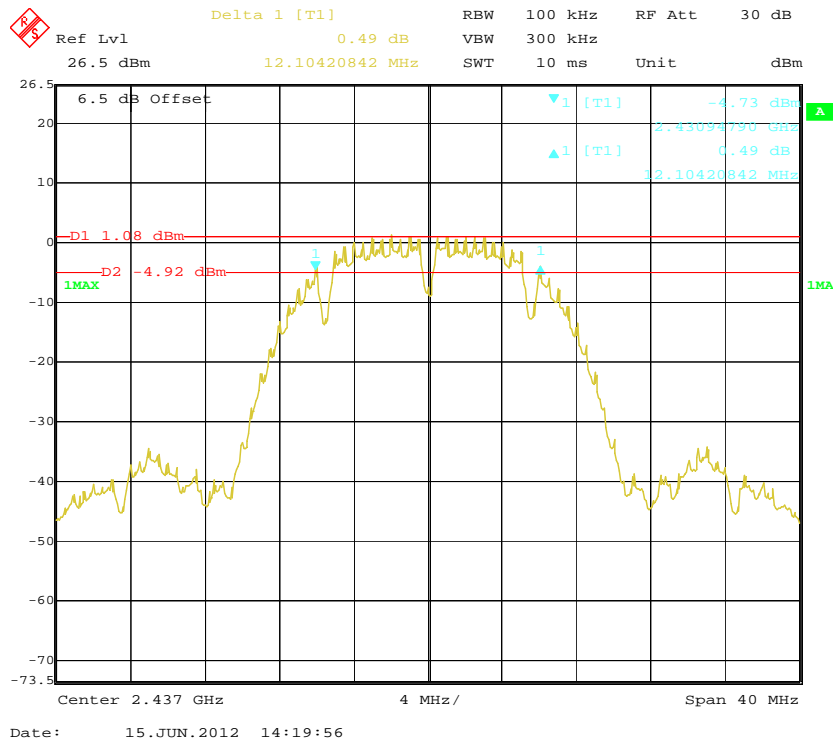


### 802.11b Low Channel, Antenna 2

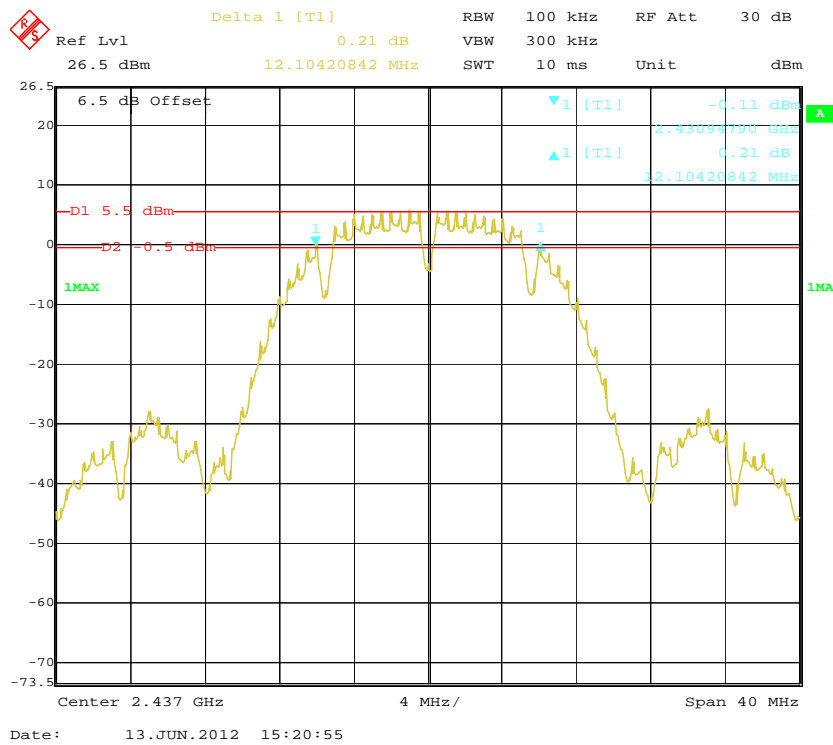




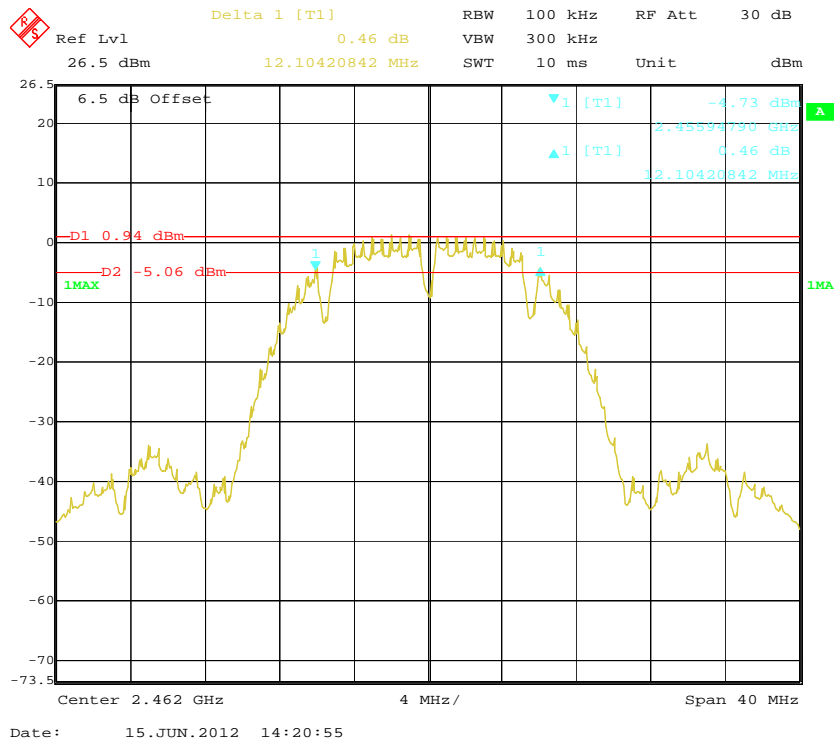
### 802.11b Middle Channel, Antenna 1



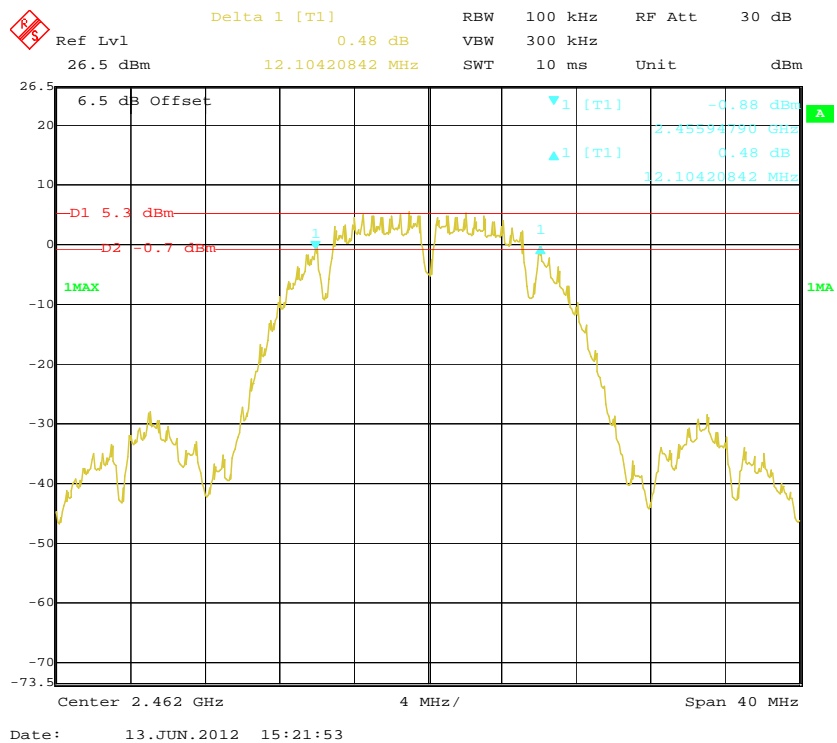
### 802.11b Middle Channel, Antenna 2



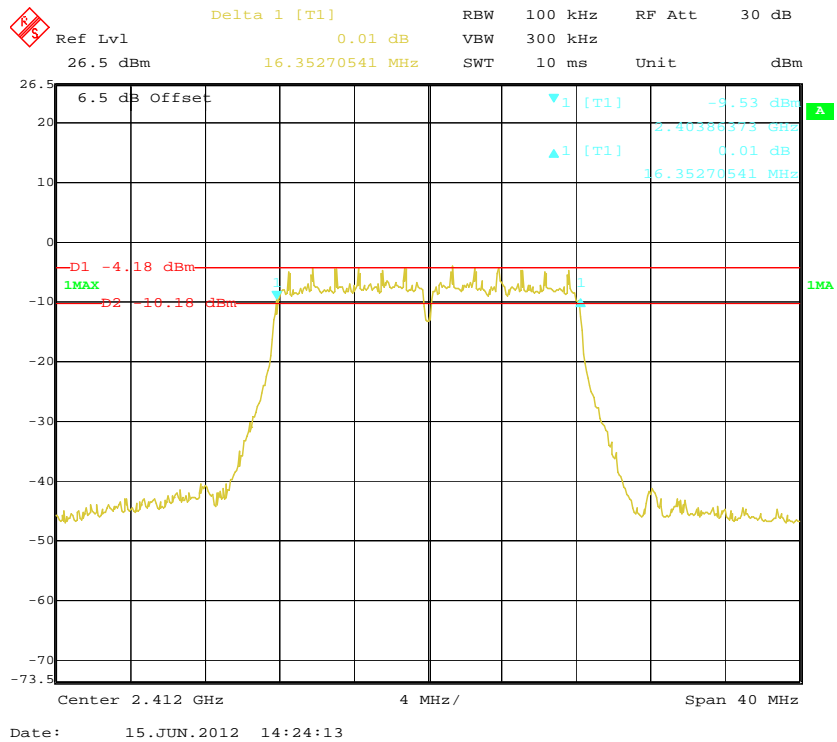
### 802.11b High Channel, Antenna 1



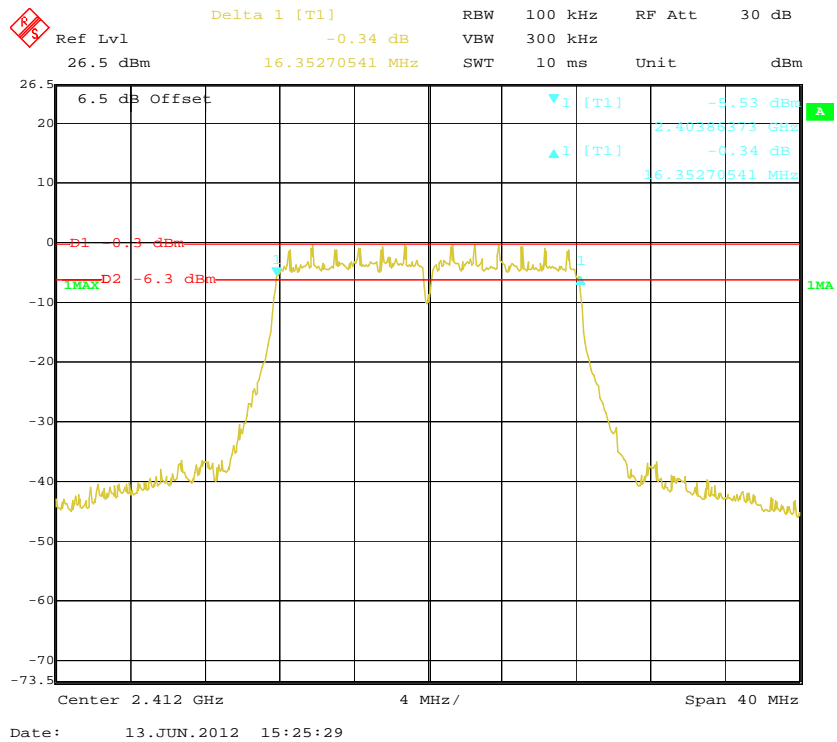
### 802.11b High Channel, Antenna 2



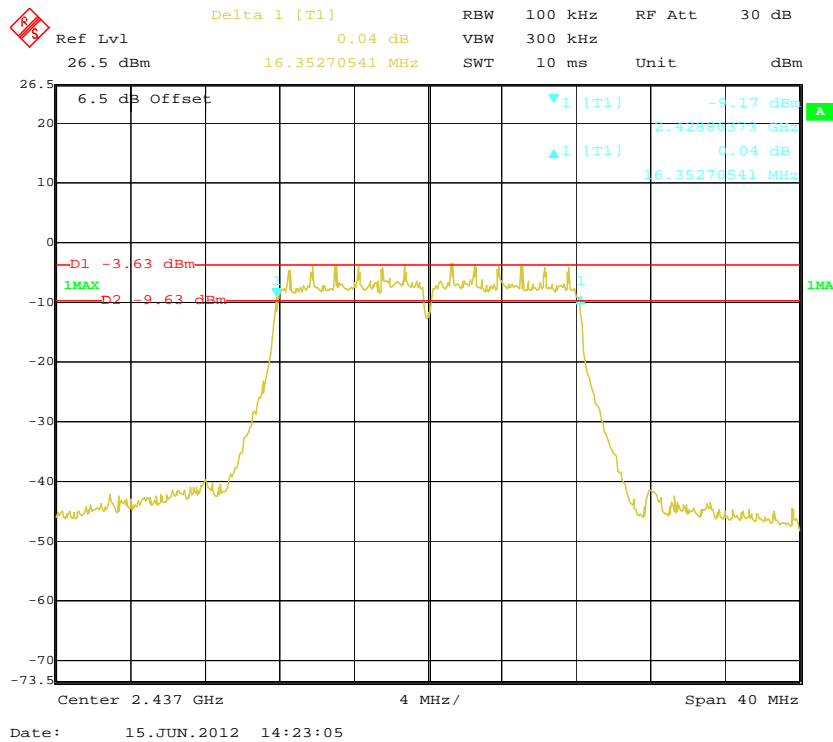
### 802.11g Low Channel, Antenna 1



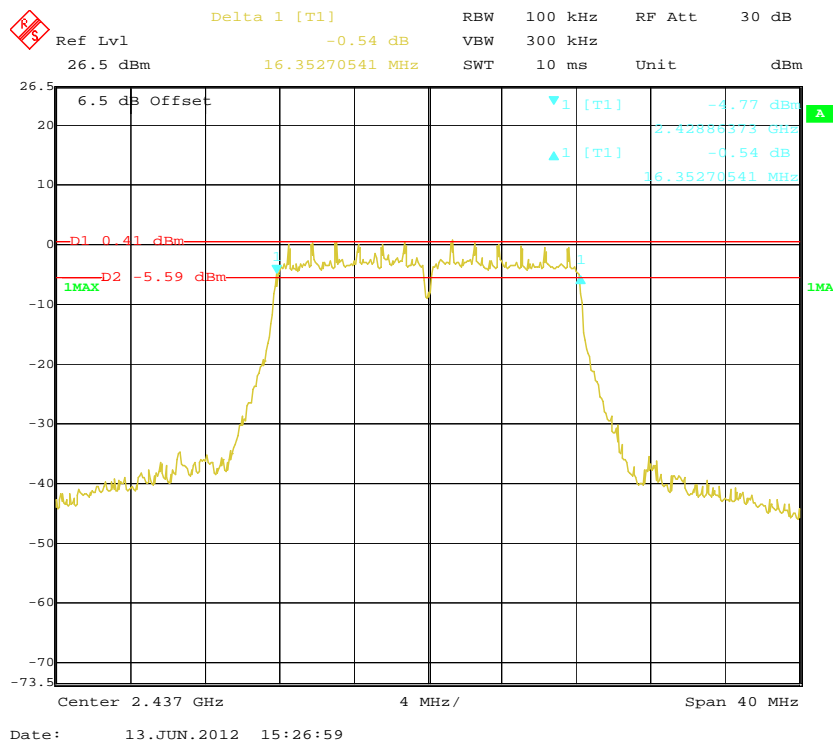
### 802.11g Low Channel, Antenna 2



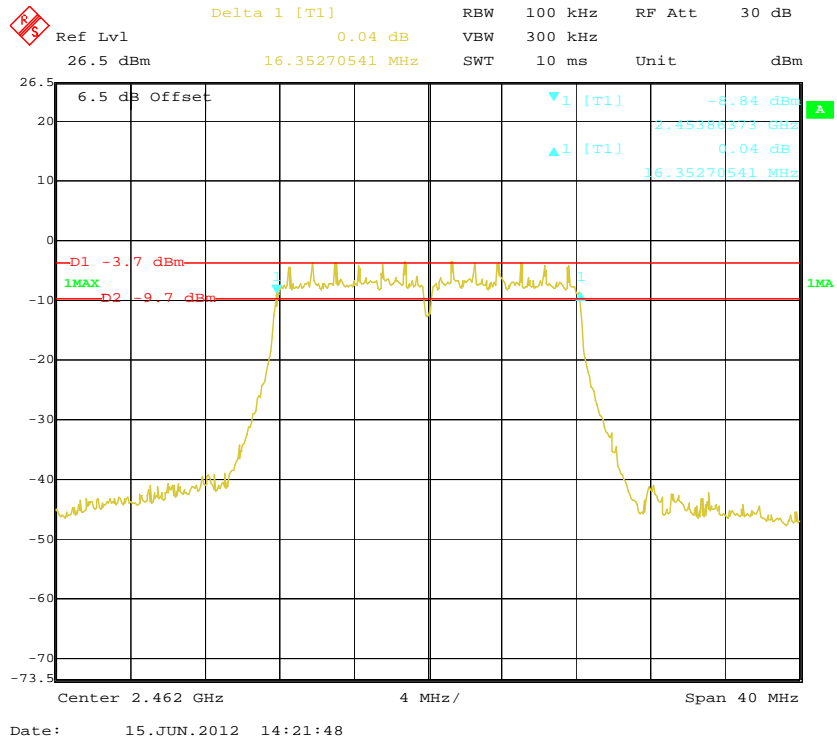
### 802.11g Middle Channel, Antenna 1



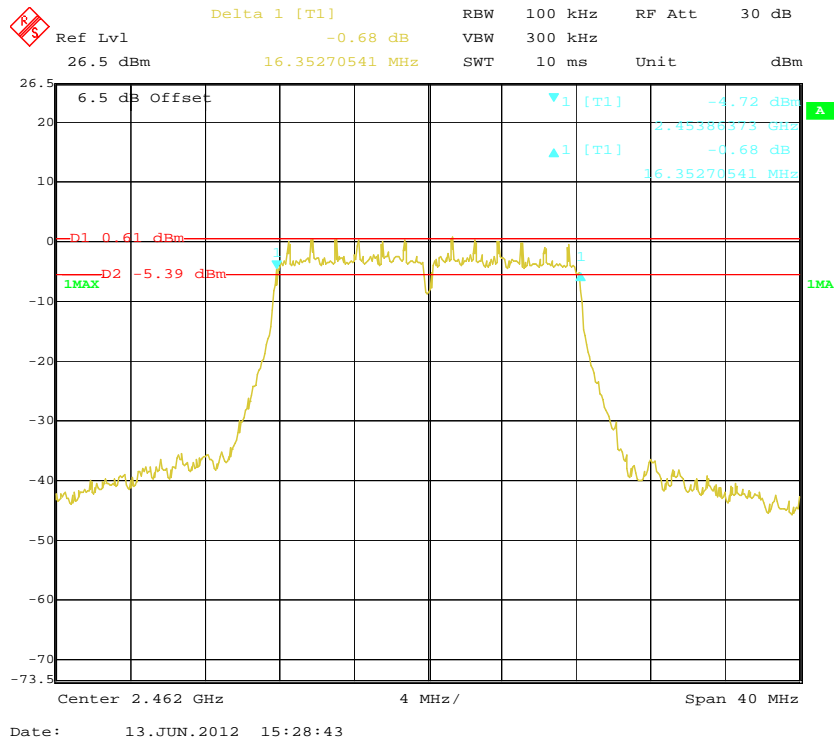
### 802.11g Middle Channel, Antenna 2



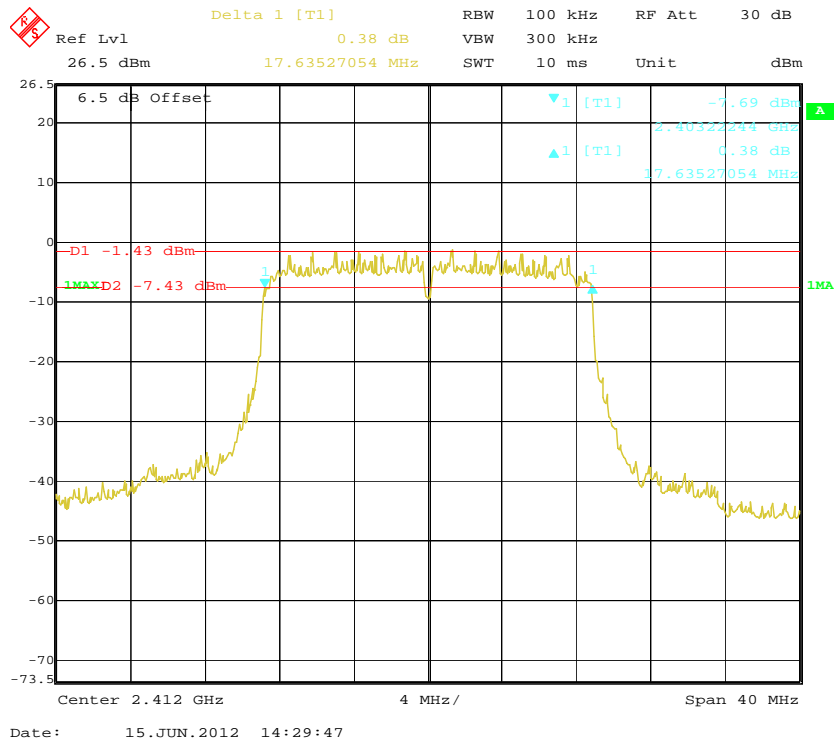
### 802.11g High Channel, Antenna 1



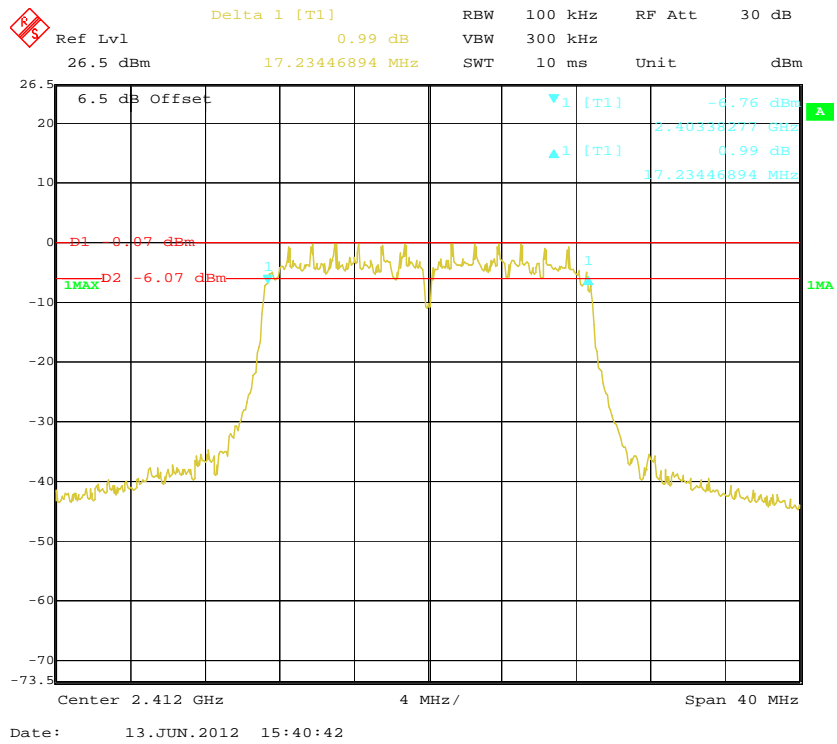
### 802.11g High Channel, Antenna 2



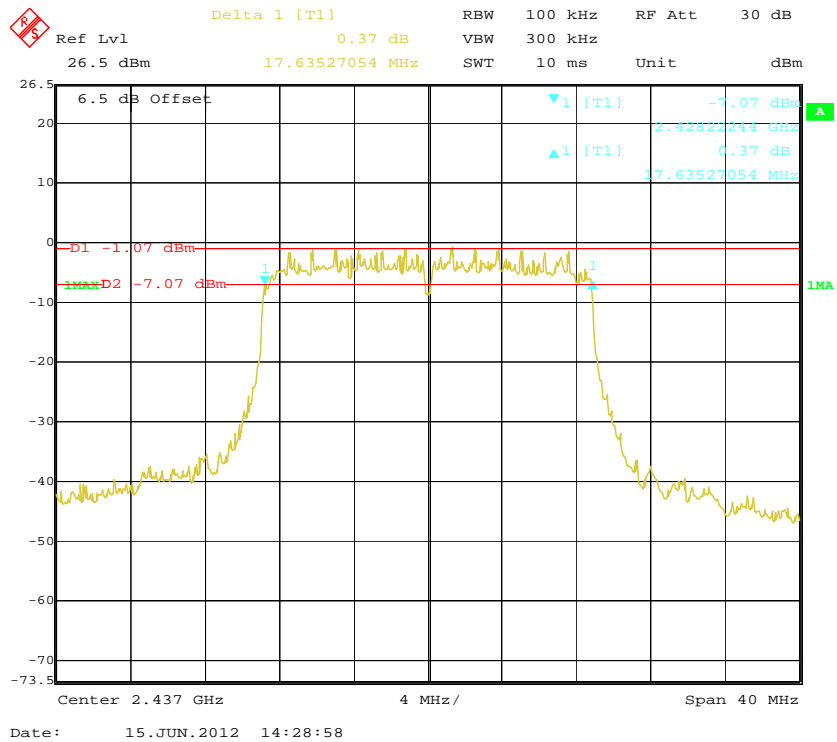
**802.11n20 Low Channel, Antenna 1**



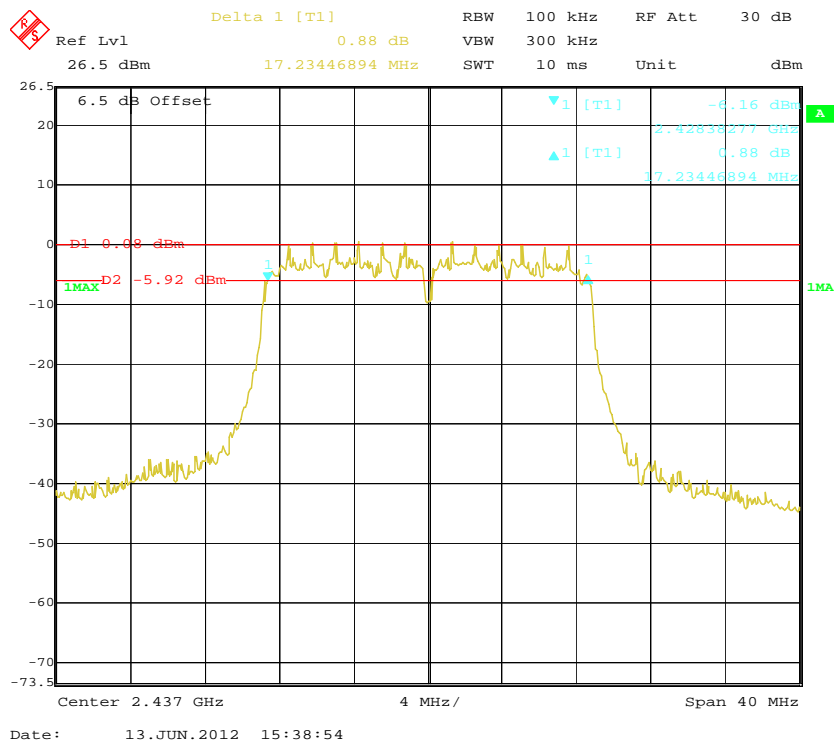
**802.11 n20 Low Channel, Antenna 2**



### 802.11 n20 Middle Channel, Antenna 1



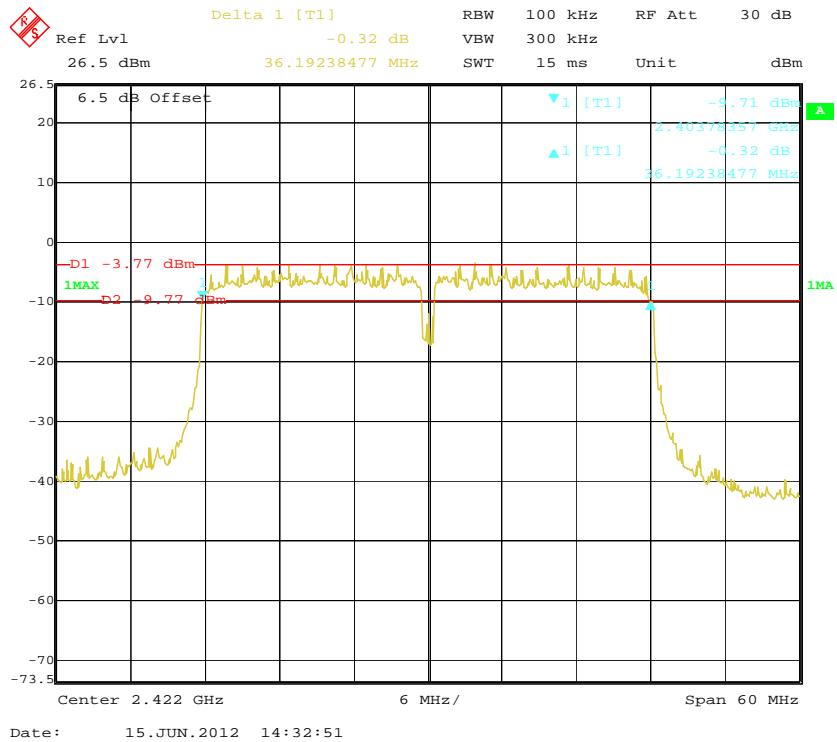
### 802.11 n20 Middle Channel, Antenna 2



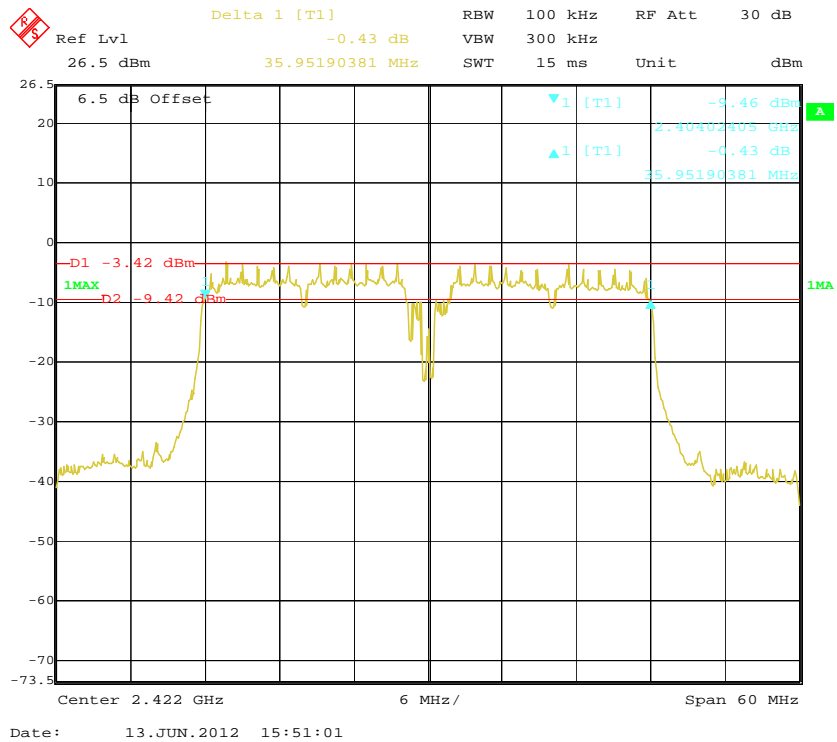




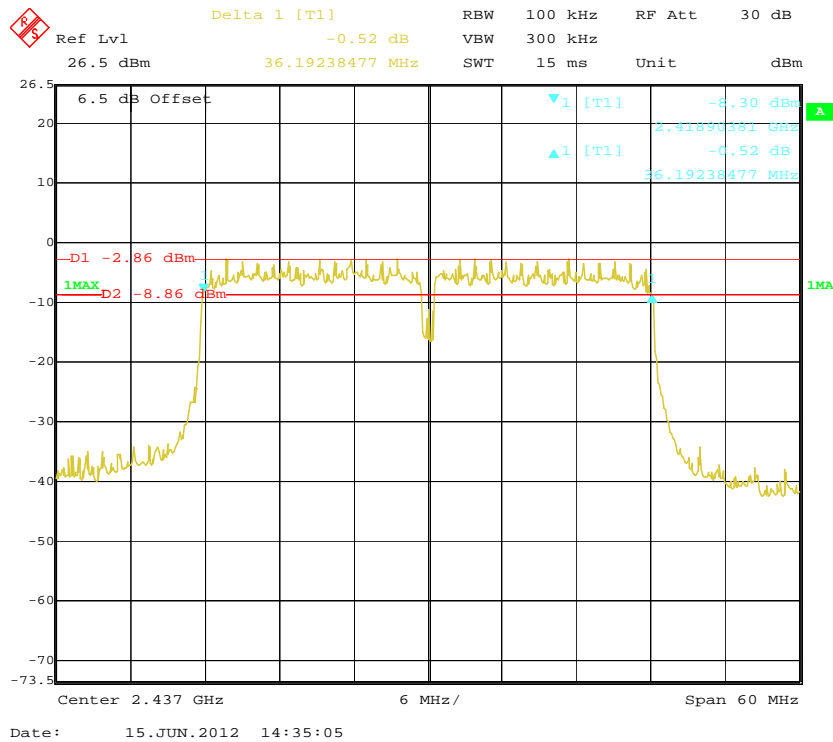
**802.11n40 Low Channel, Antenna 1**



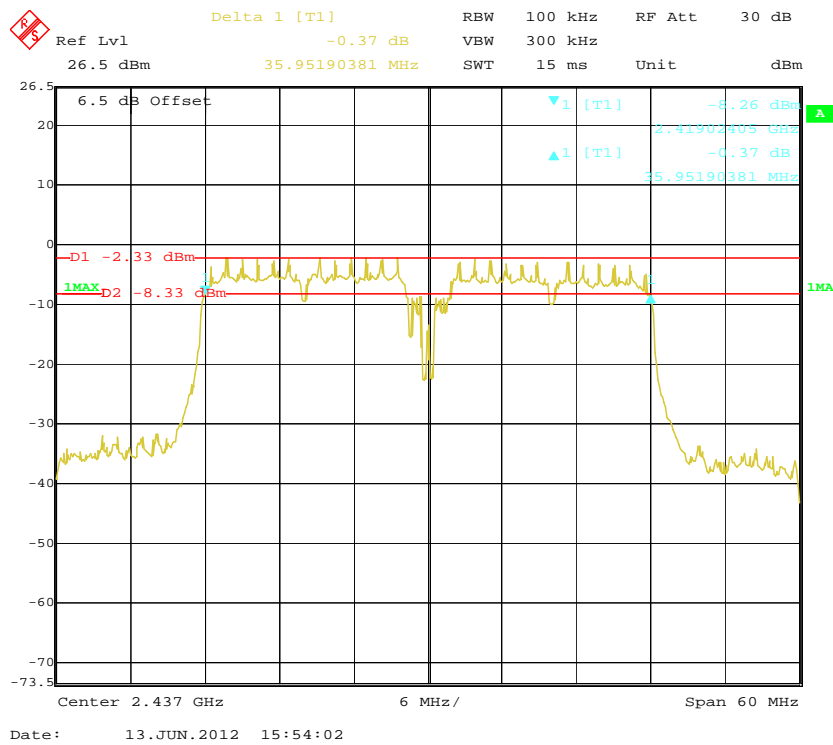
**802.11 n40 Low Channel, Antenna 2**



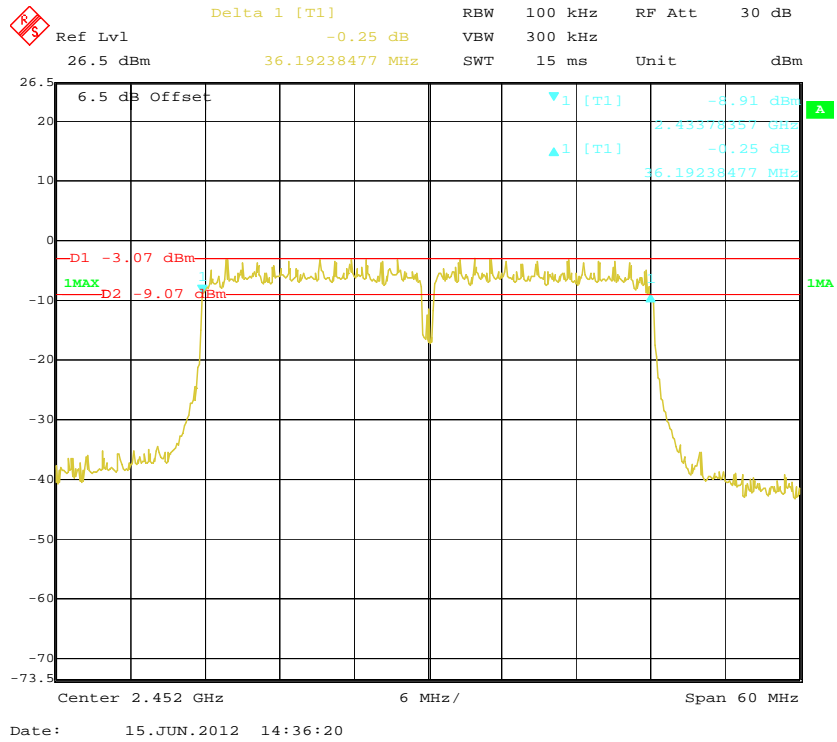
802.11 n40 Middle Channel, Antenna 1



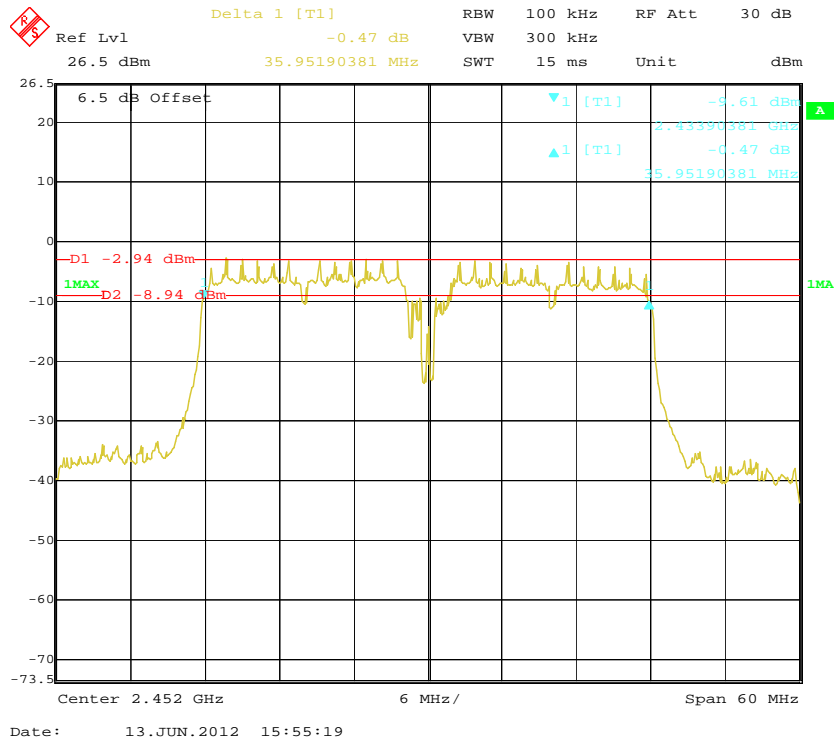
802.11 n40 Middle Channel, Antenna 2



### 802.11 n40 High Channel, Antenna 1



### 802.11 n40 High Channel, Antenna 2



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

### Applicable Standard

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

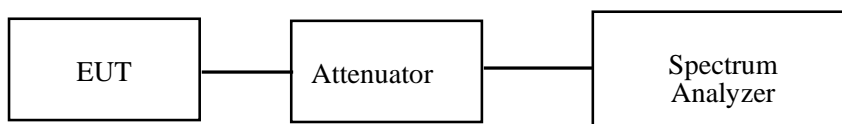
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	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 Procedure

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



### Test Data

#### Environmental Conditions

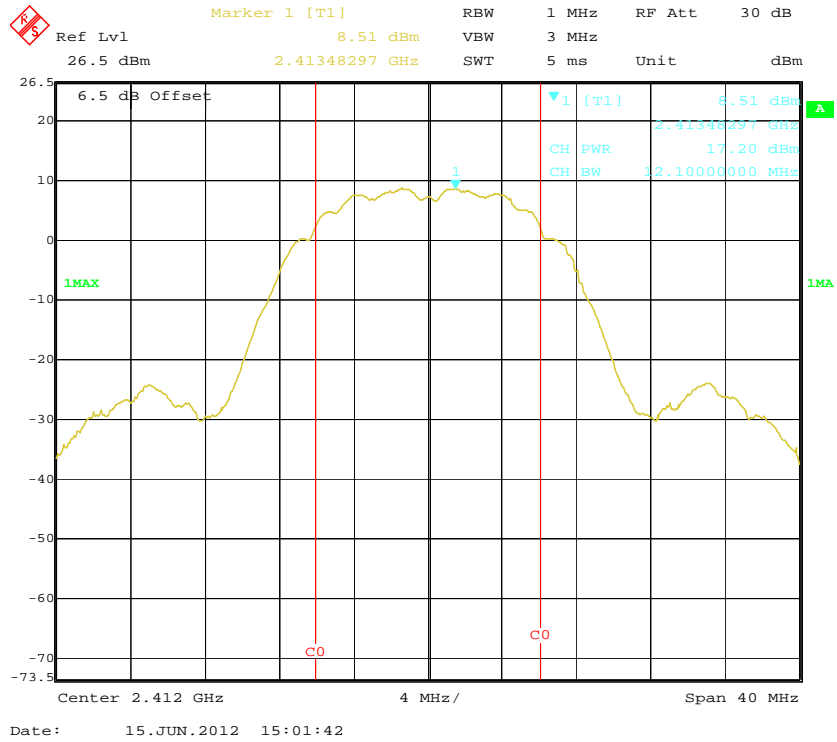
Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

*The testing was performed by Henry Ding on 2012-06-15.*

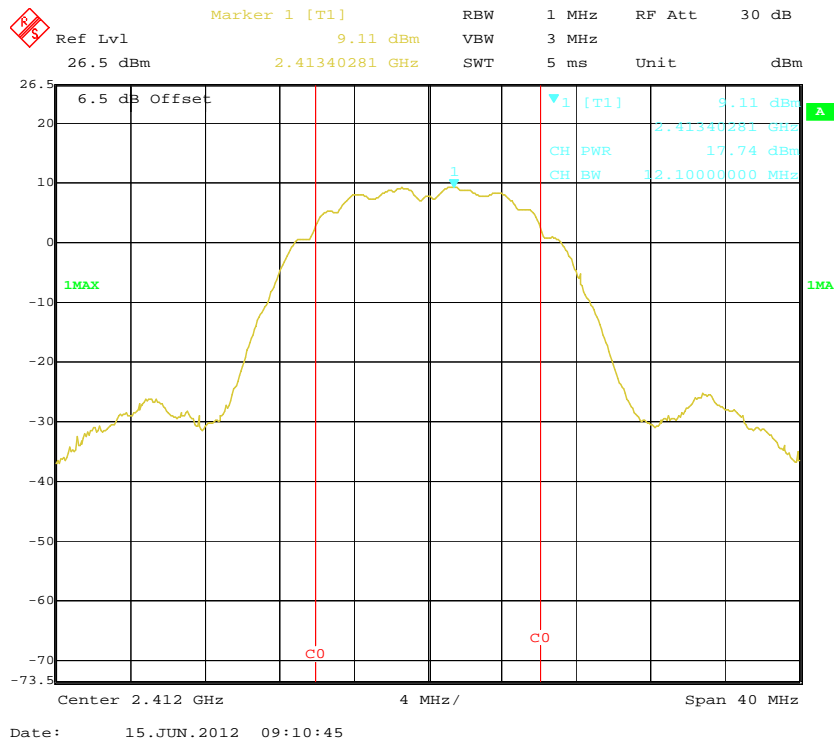
*Test Mode: Transmitting*

Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna Port	Output Power (dBm)	Limit (dBm)	Result	
<b>802.11b mode</b>							
Low	2412	1	1	17.20	30	Pass	
Low	2412	1	2	17.74			
Middle	2437	1	1	17.18	30	Pass	
Middle	2437	1	2	17.29			
High	2462	1	1	17.02	30	Pass	
High	2462	1	2	17.60			
<b>802.11g mode</b>							
Low	2412	6	1	17.05	30	Pass	
Low	2412	6	2	17.10			
Middle	2437	6	1	17.12	30	Pass	
Middle	2437	6	2	17.23			
High	2462	6	1	17.03	30	Pass	
High	2462	6	2	17.23			
<b>802.11n20 mode</b>							
Low	2412	6.5	1	14.39	17.38	30	Pass
Low	2412	6.5	2	14.35			
Middle	2437	6.5	1	14.38	17.44	30	Pass
Middle	2437	6.5	2	14.48			
High	2462	6.5	1	14.28	17.38	30	Pass
High	2462	6.5	2	14.46			
<b>802.11n40 mode</b>							
Low	2422	13.5	1	13.78	16.92	30	Pass
Low	2422	13.5	2	14.03			
Middle	2437	13.5	1	13.73	16.99	30	Pass
Middle	2437	13.5	2	14.22			
High	2452	13.5	1	13.67	16.86	30	Pass
High	2452	13.5	2	14.03			

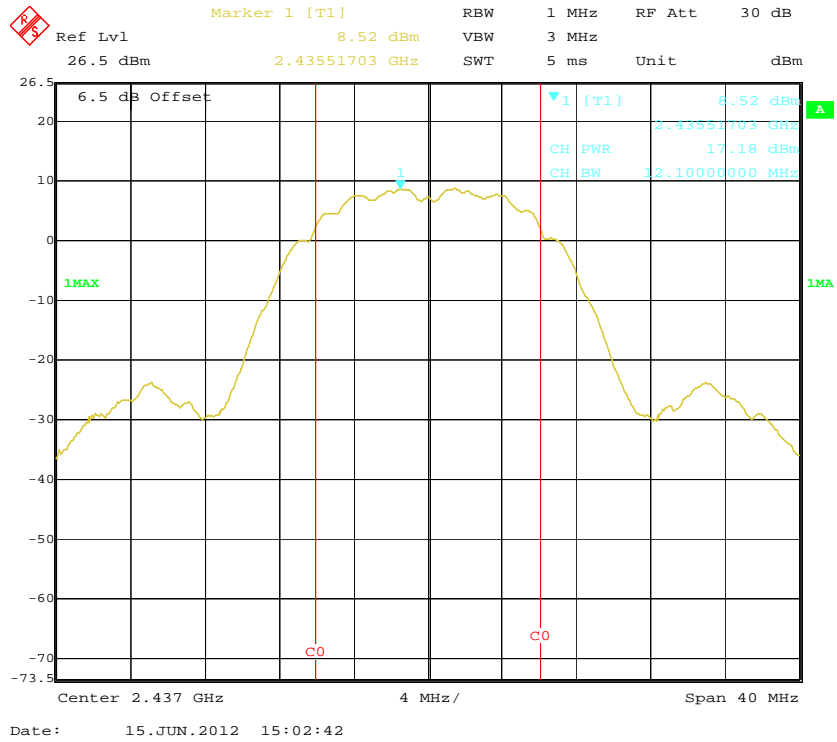
### 802.11b RF Output Power, Low Channel, Antenna 1



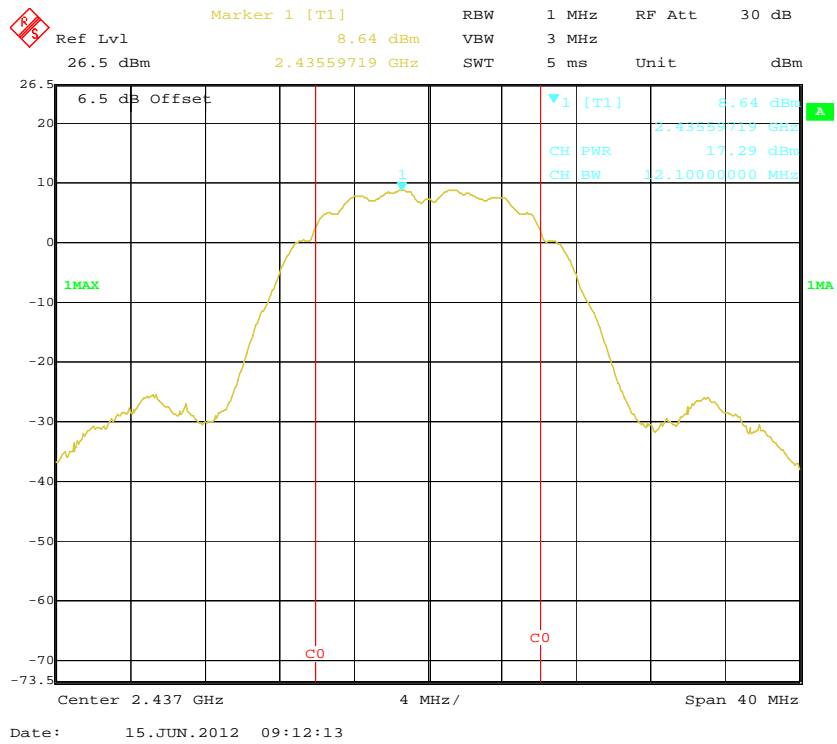
### 802.11b RF Output Power, Low Channel, Antenna 2



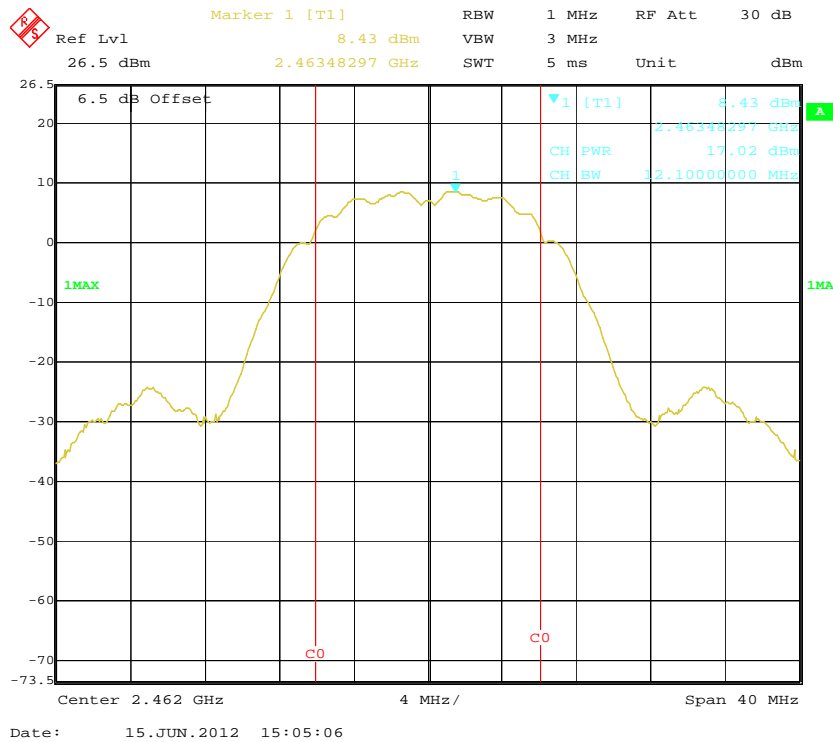
**RF Output Power, Middle Channel, Antenna 1**



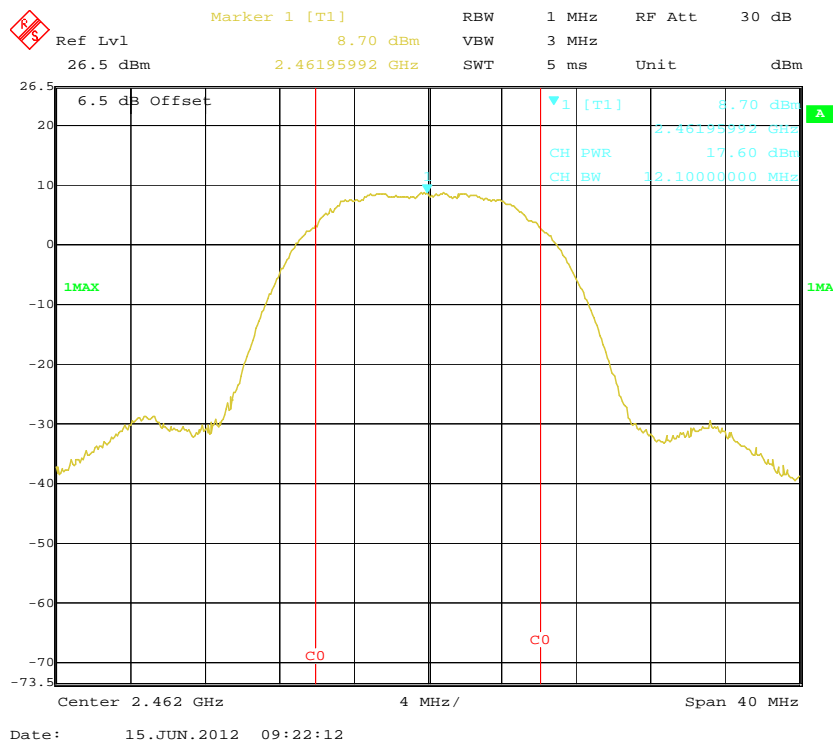
**802.11b RF Output Power, Middle Channel, Antenna 2**



### 802.11b RF Output Power, High Channel, Antenna 1

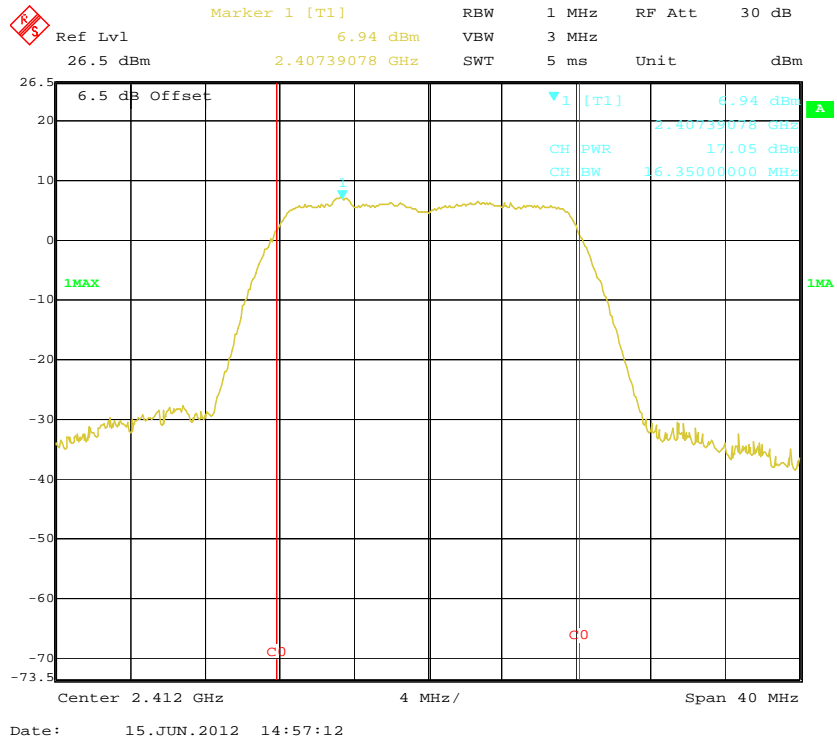


### 802.11b RF Output Power, High Channel, Antenna 2

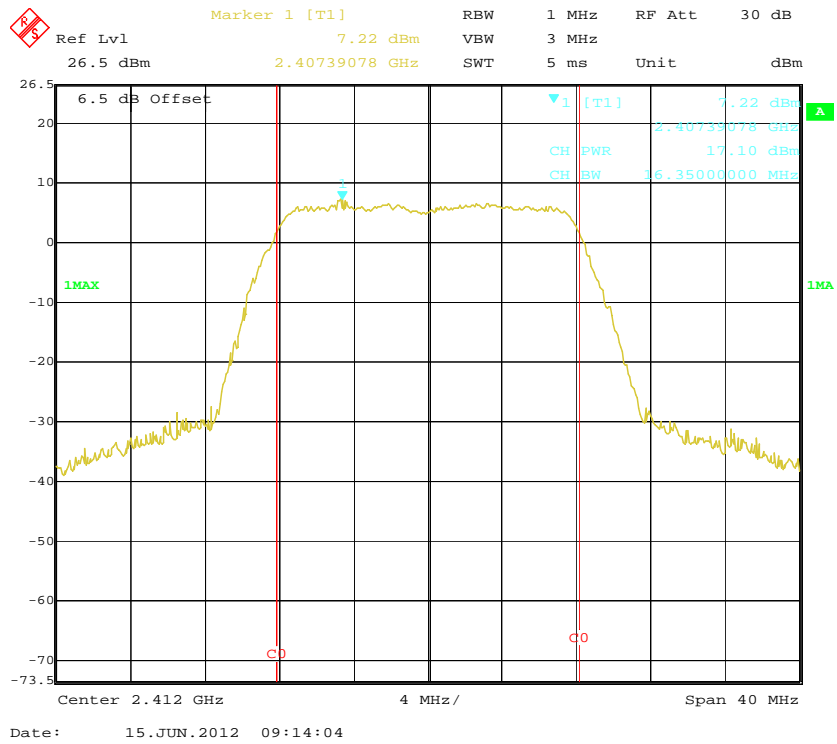




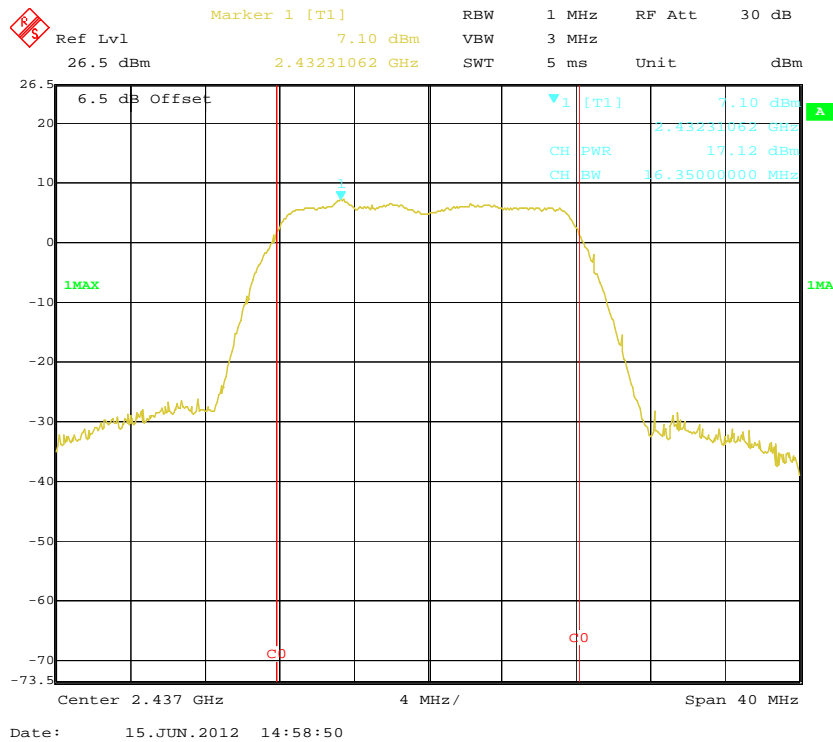
**802.11g RF Output Power, Low Channel, Antenna 1**



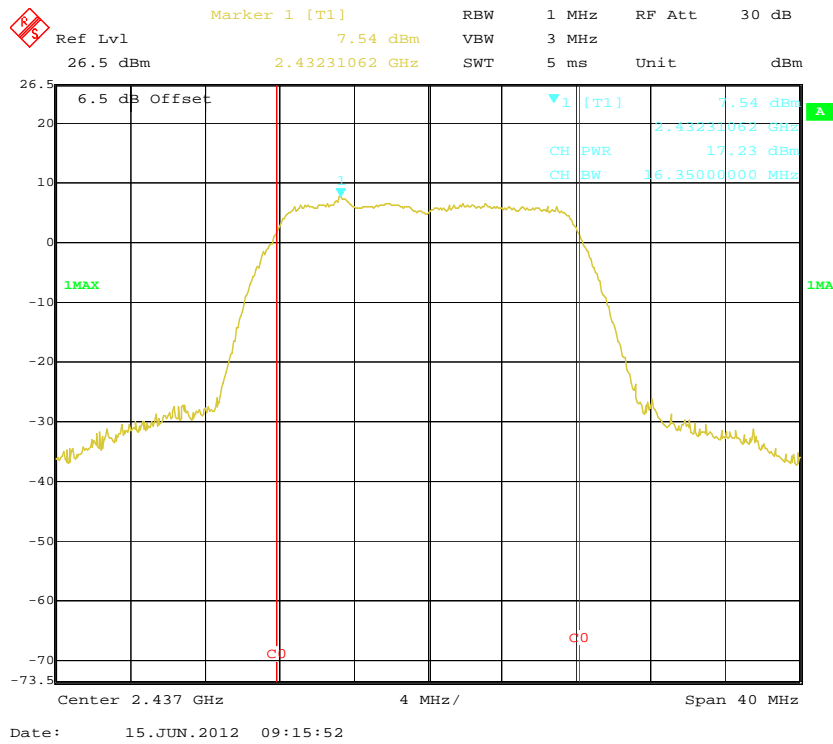
**802.11g RF Output Power, Low Channel, Antenna 2**



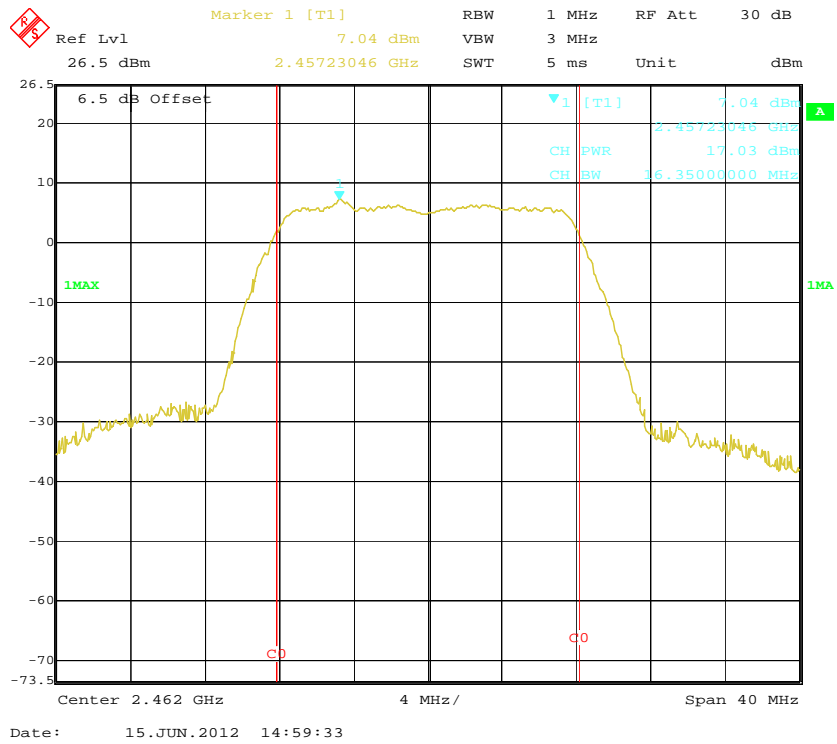
### 802.11g RF Output Power, Middle Channel, Antenna 1



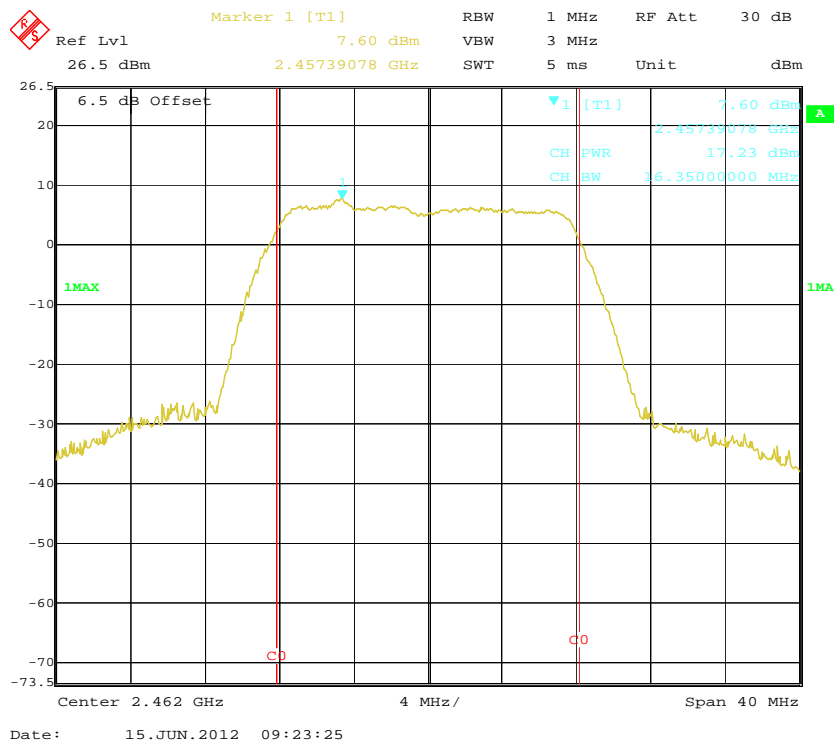
### 802.11g RF Output Power, Middle Channel, Antenna 2



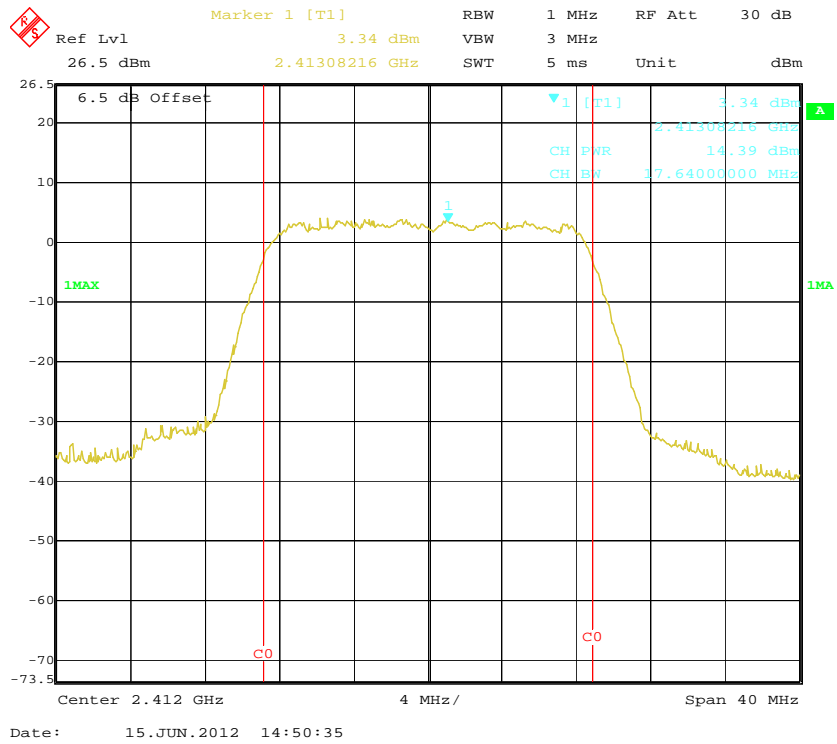
### 802.11g RF Output Power, High Channel, Antenna 1



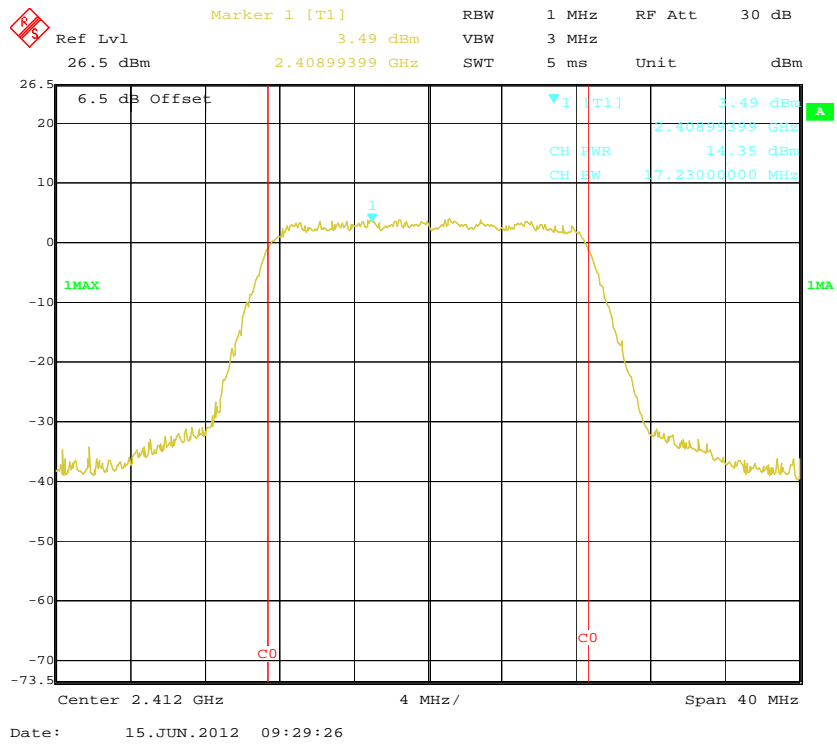
### 802.11g RF Output Power, High Channel, Antenna 2



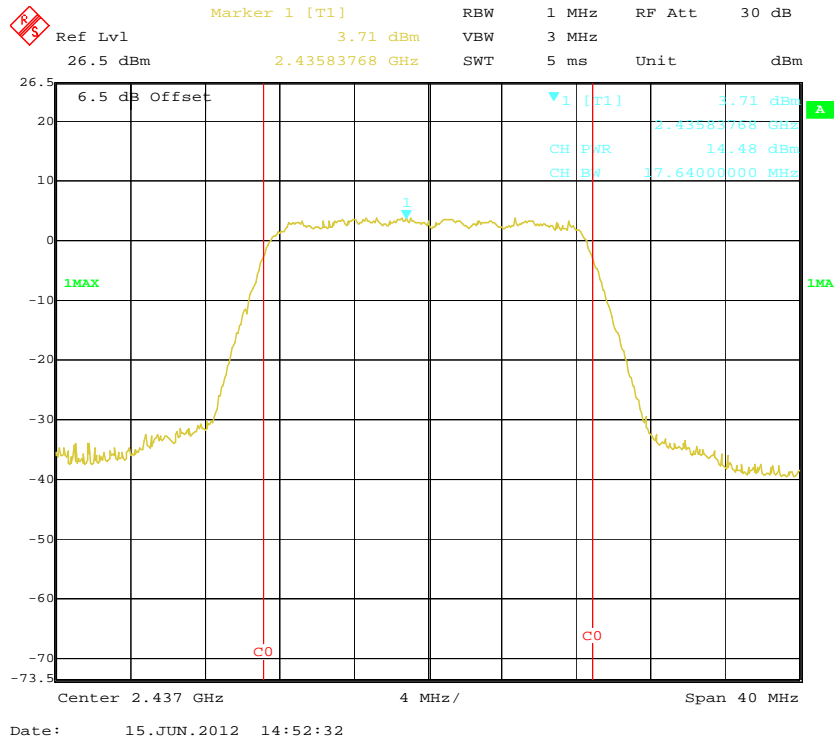
### 802.11n20 RF Output Power, Low Channel, Antenna 1



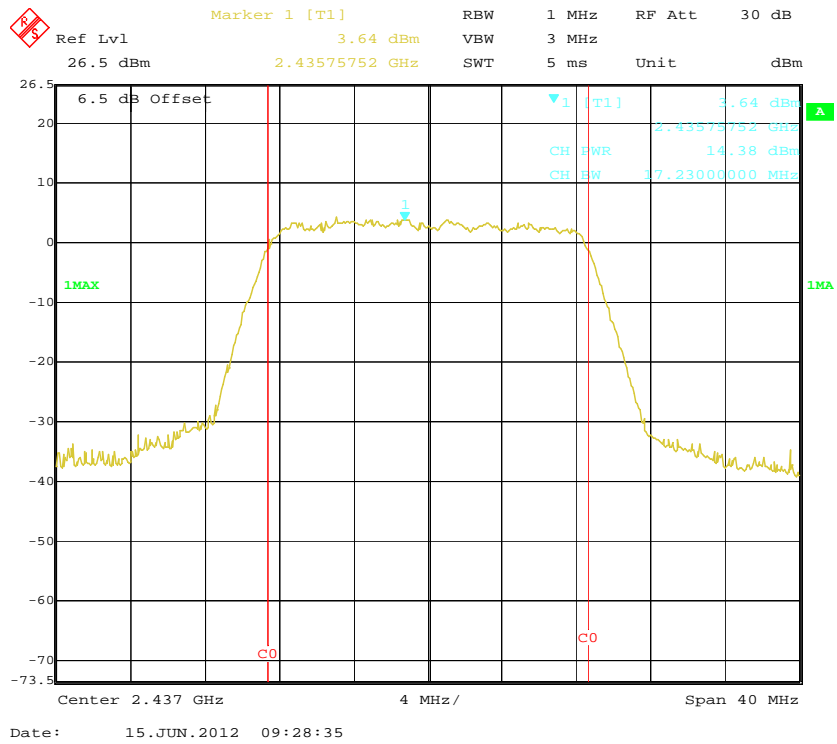
### 802.11n20 RF Output Power, Low Channel, Antenna 2



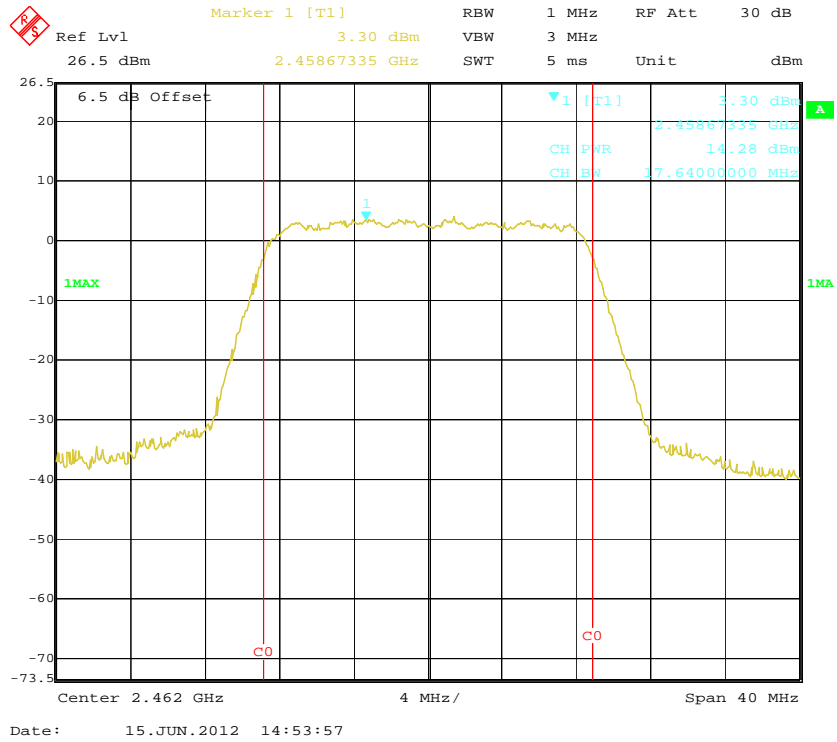
**802.11n20 RF Output Power, Middle Channel, Antenna 1**



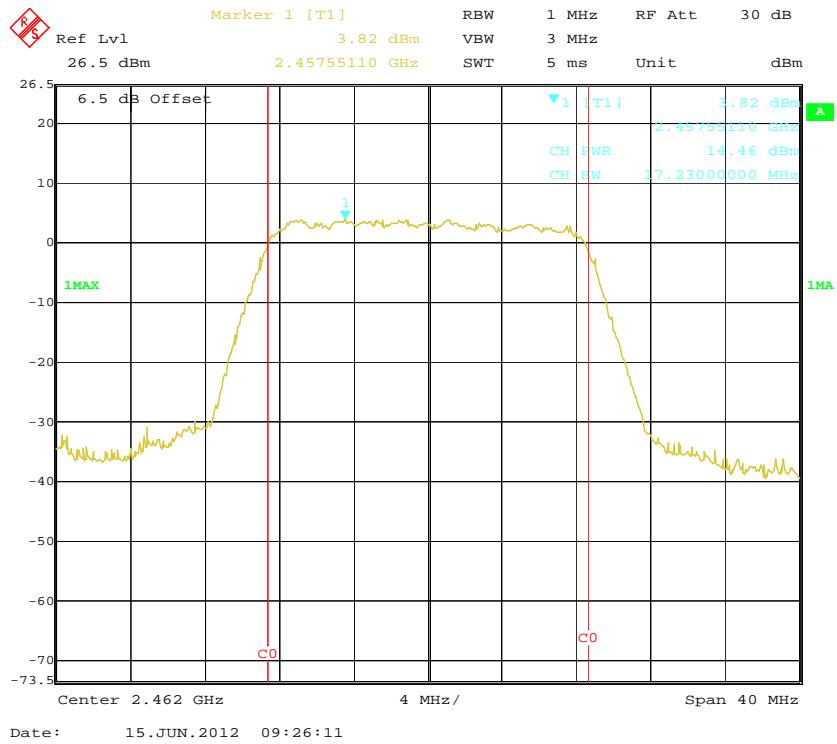
**802.11n20 RF Output Power, Middle Channel, Antenna 2**



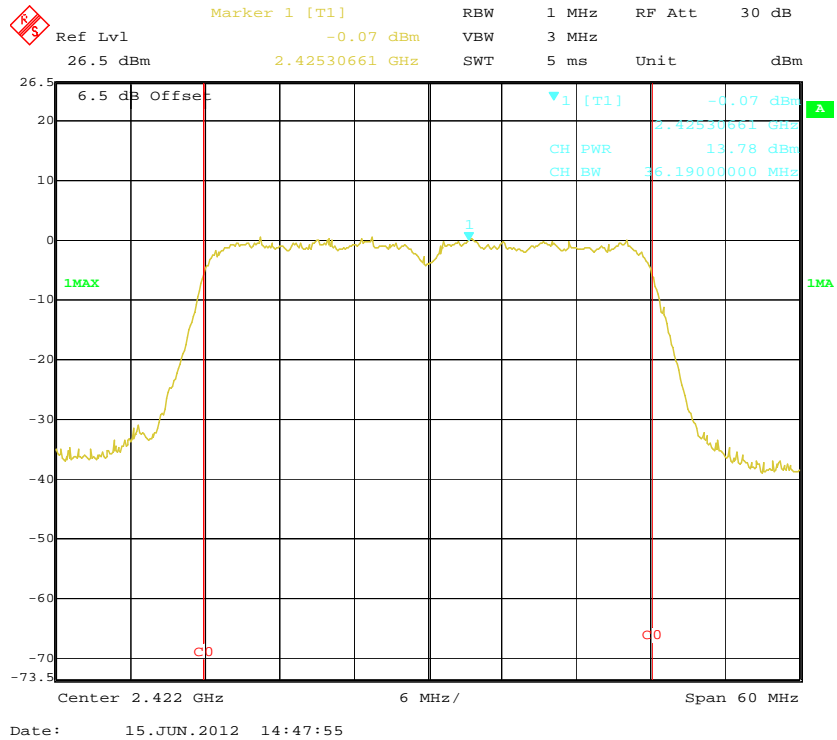
### 802.11n20 RF Output Power, High Channel, Antenna 1



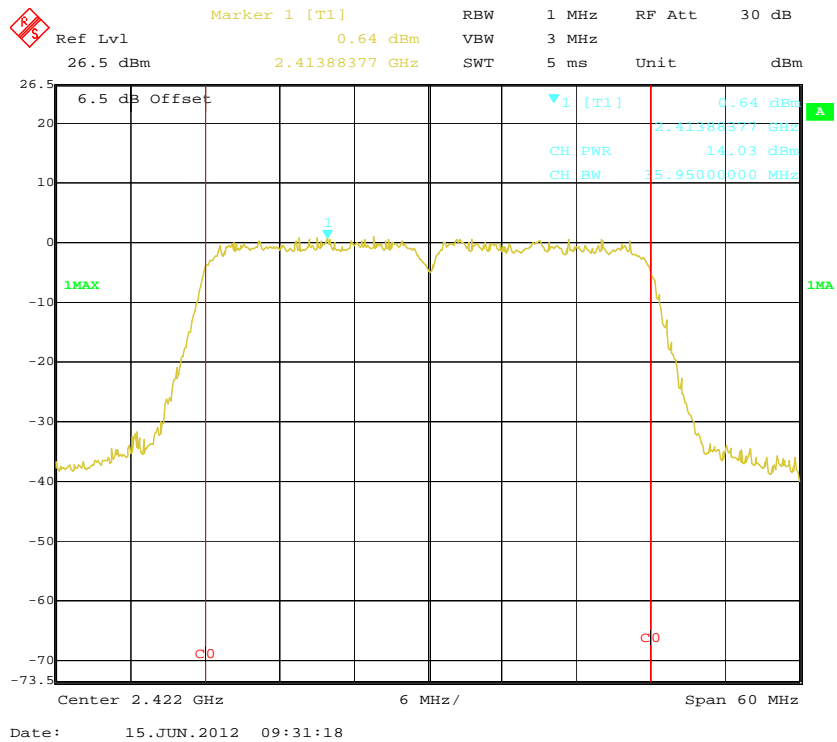
### 802.11n20 RF Output Power, High Channel, Antenna 2



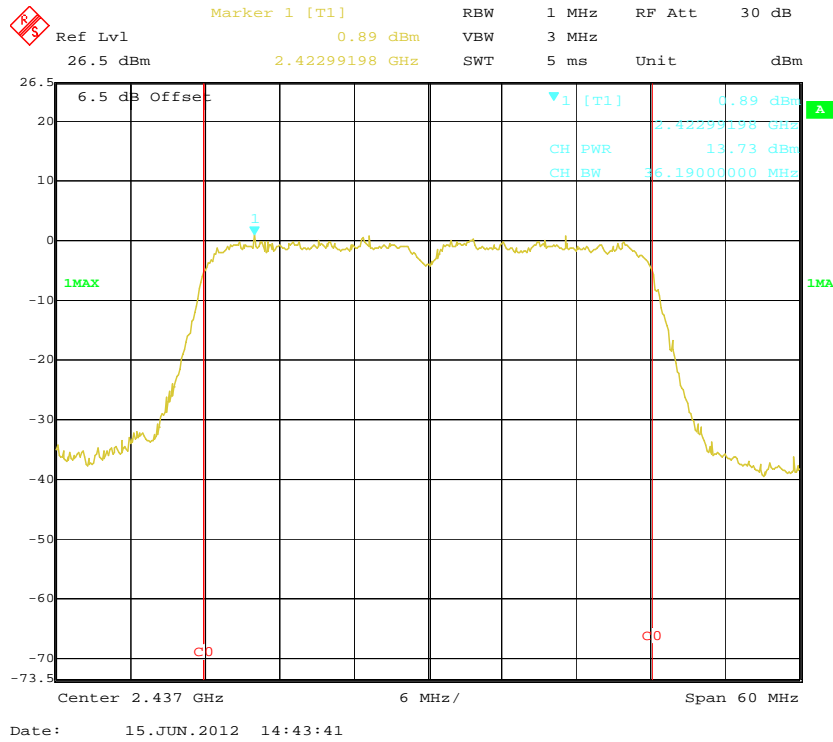
**802.11n40 RF Output Power, Low Channel, Antenna 1**



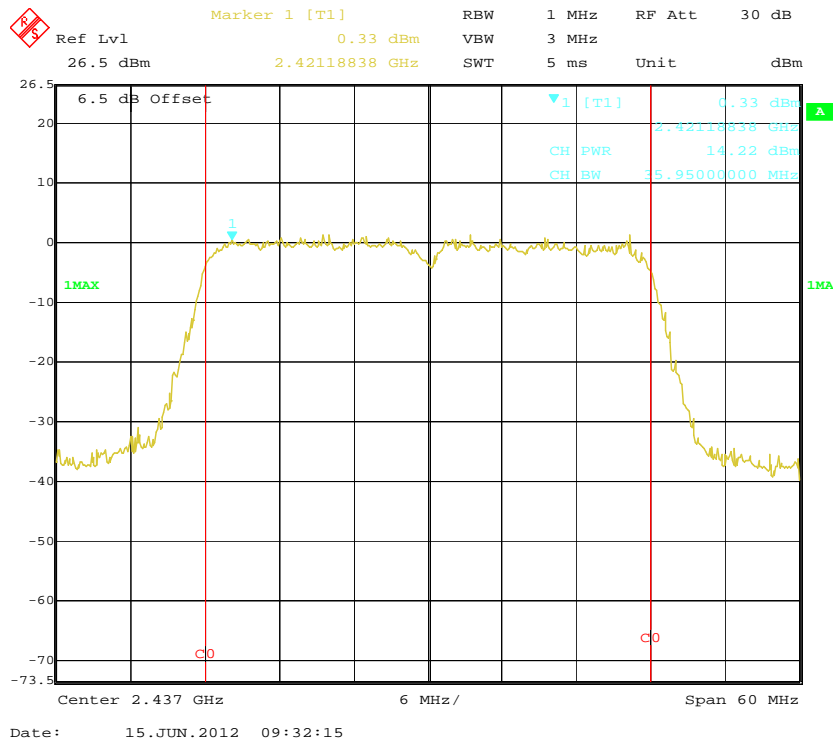
**802.11n40 RF Output Power, Low Channel, Antenna 2**



**802.11n40 RF Output Power, Middle Channel, Antenna 1**

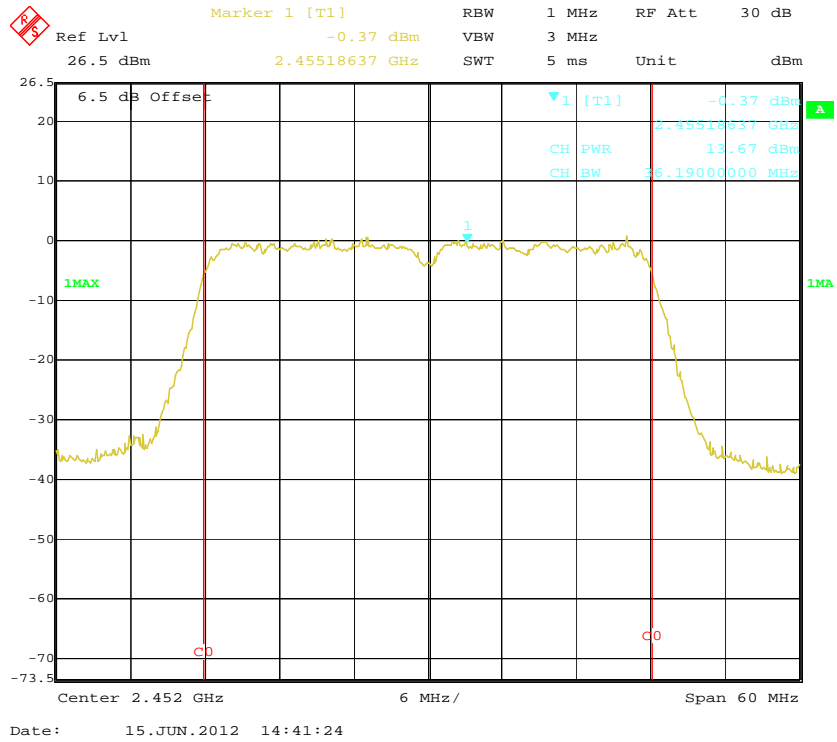


**802.11n40 RF Output Power, Middle Channel, Antenna 2**

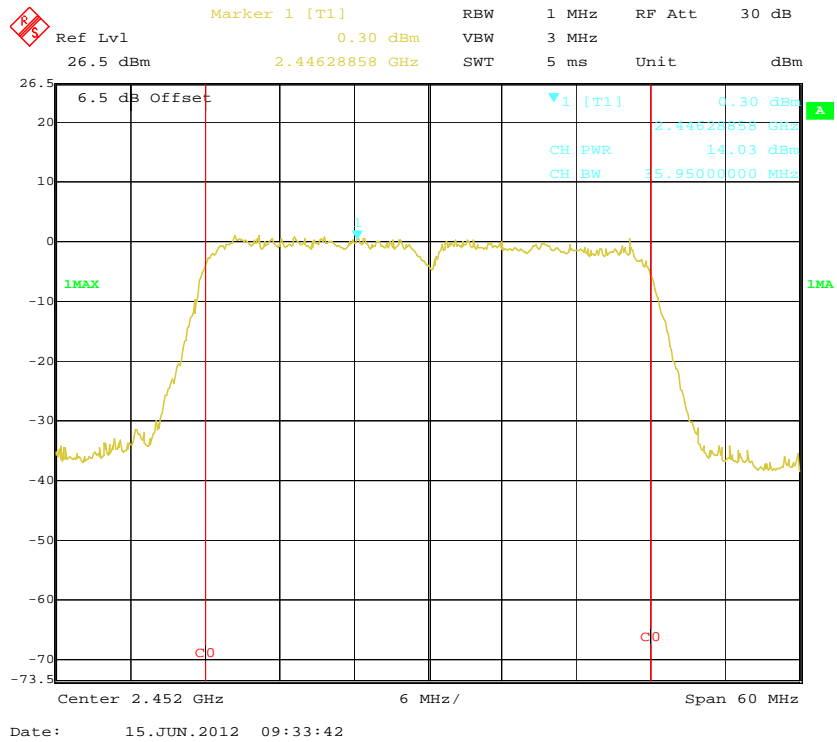




### 802.11n40 RF Output Power, High Channel, Antenna 1



### 802.11n40 RF Output Power, High Channel, Antenna 2



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

### Applicable Standard

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

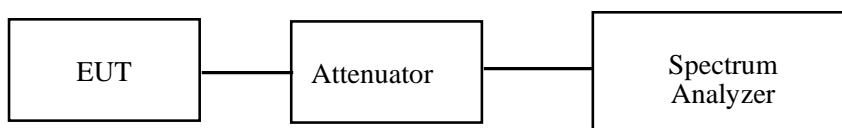
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	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 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 Data

#### Environmental Conditions

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

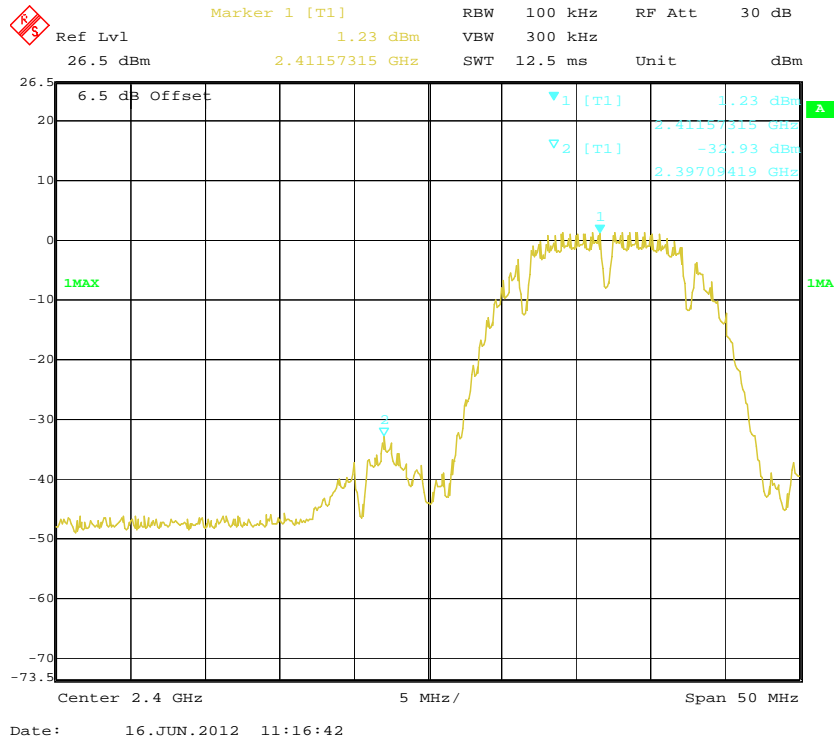
*The testing was performed by Henry Ding from 2012-06-15 to 2012-06-16.*

**Test Result:** *Compliance.*

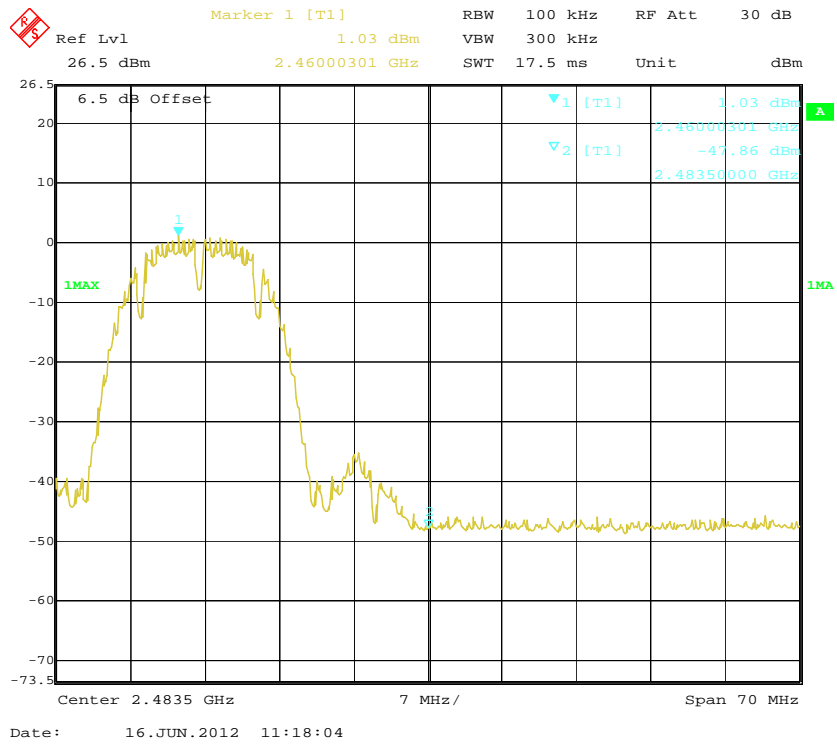
Channel	Frequency (MHz)	Antenna port	Delta Peak to band emission (dBc)	Limit (dBc)	Result
<b>802.11b mode</b>					
Low	2397.09	1	34.16	20	Pass
Low	2396.99	2	35.25	20	Pass
High	2483.50	1	48.89	20	Pass
High	2484.76	2	49.93	20	Pass
<b>802.11g mode</b>					
Low	2400.00	1	38.23	20	Pass
Low	2400.10	2	37.31	20	Pass
High	2483.50	1	43.56	20	Pass
High	2484.62	2	45.64	20	Pass
<b>802.11n20 mode</b>					
Low	2400.00	1	34.69	20	Pass
Low	2400.10	2	34.12	20	Pass
High	2483.50	1	40.06	20	Pass
High	2483.92	2	42.66	20	Pass
<b>802.11n40 mode</b>					
Low	2400.00	1	32.75	20	Pass
Low	2400.00	2	32.18	20	Pass
High	2483.50	1	37.12	20	Pass
High	2483.92	2	39.33	20	Pass

Please refer to following plots.

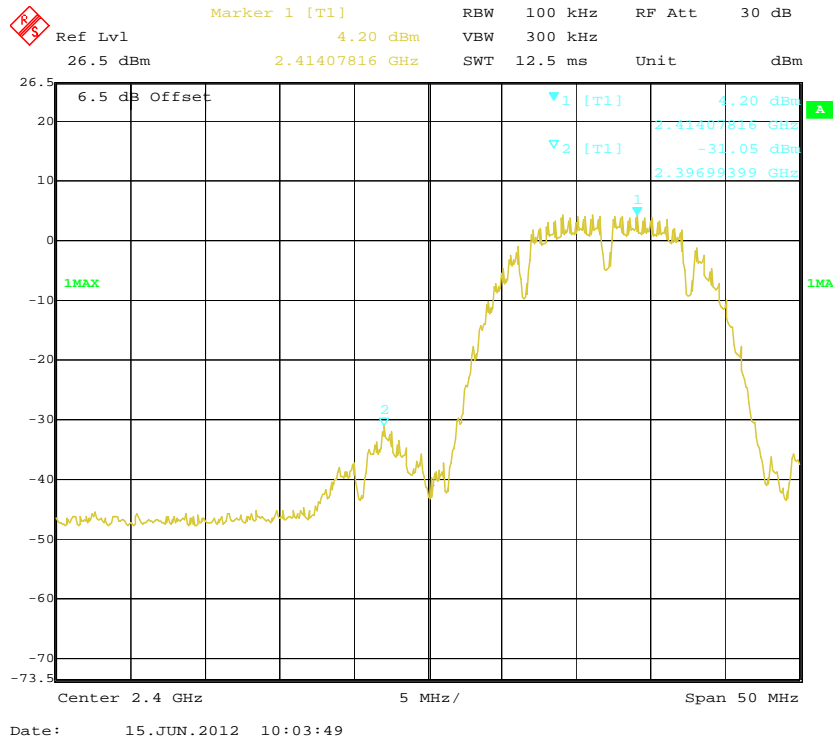
**802.11b Band Edge, Left Side, Antenna 1**



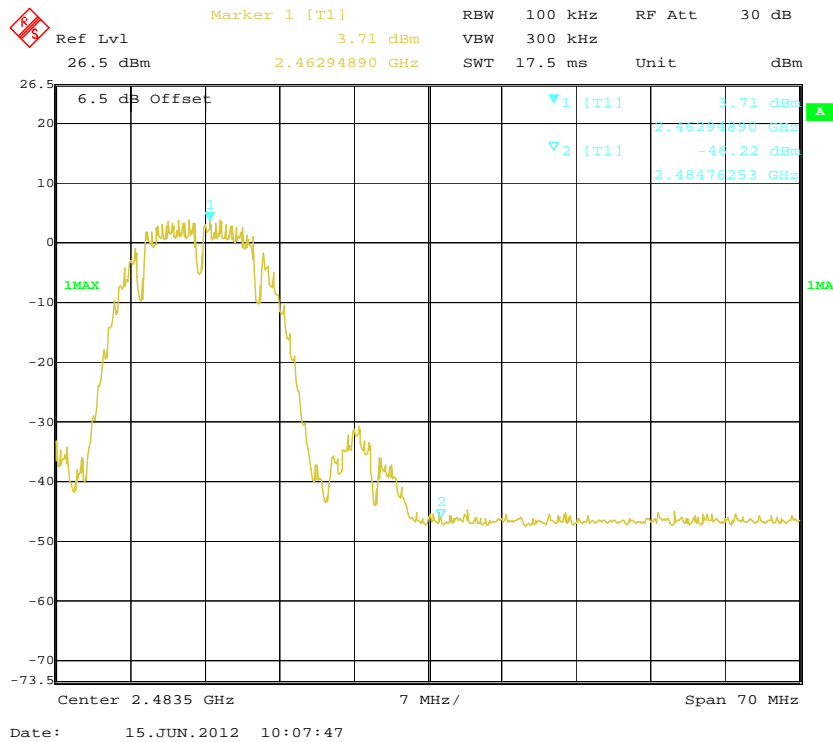
**802.11b Band Edge, Right Side, Antenna 1**



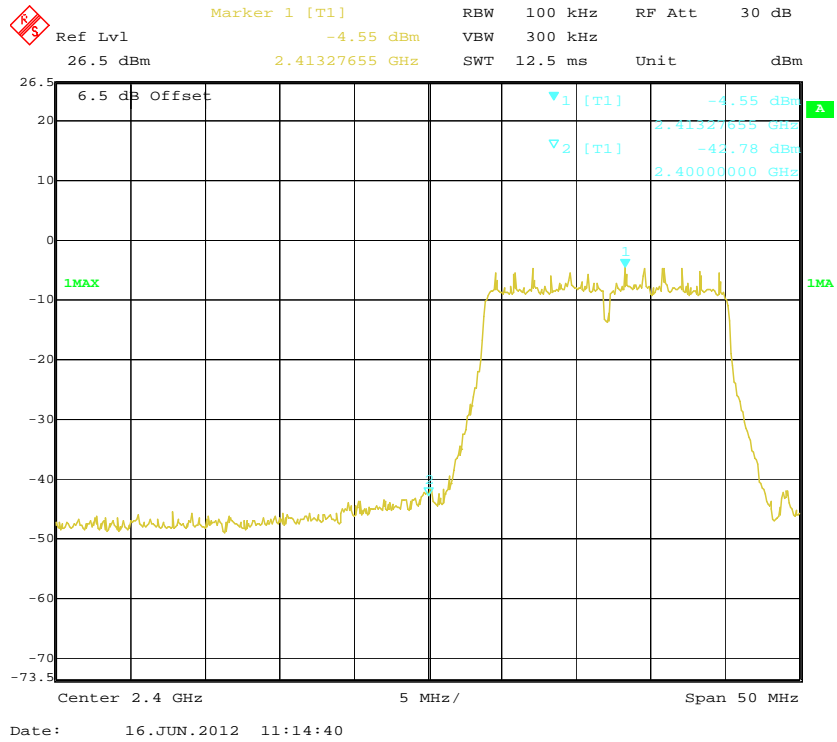
**802.11b Band Edge, Left Side, Antenna 2**



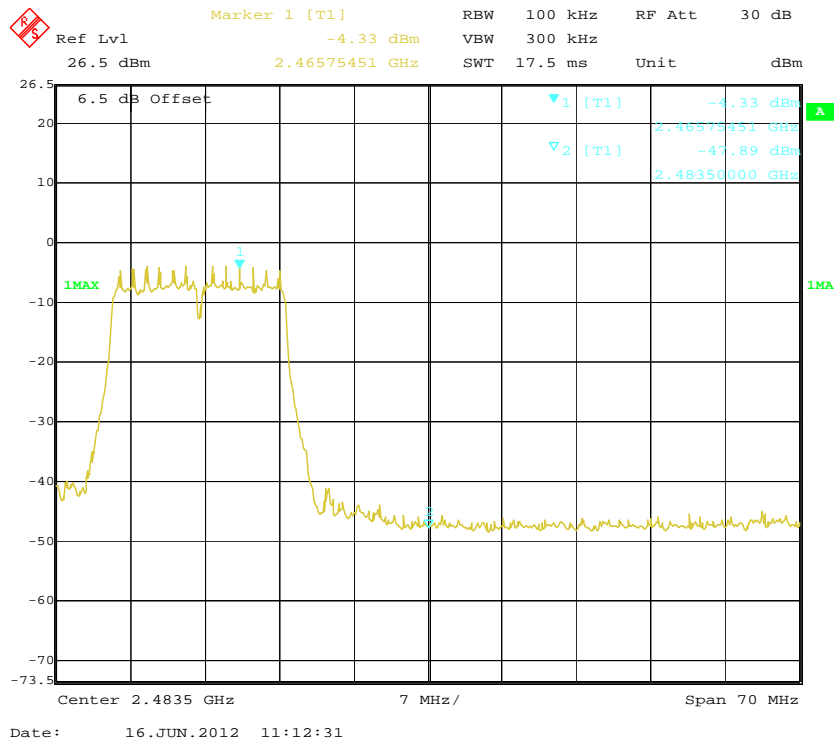
**802.11b Band Edge, Right Side, Antenna 2**



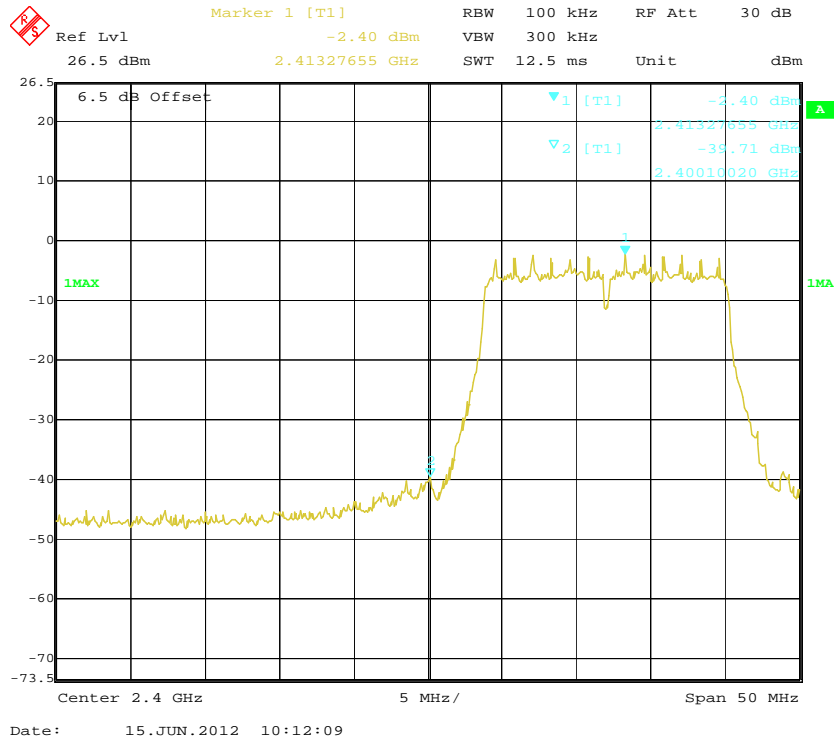
**802.11g Band Edge, Left Side, Antenna 1**



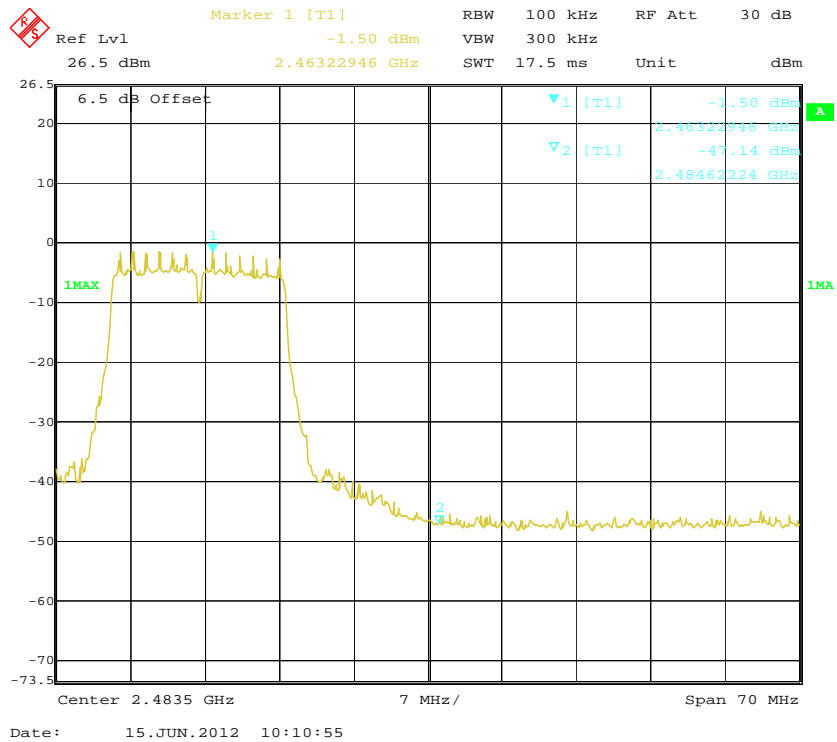
**802.11g Band Edge, Right Side, Antenna 1**



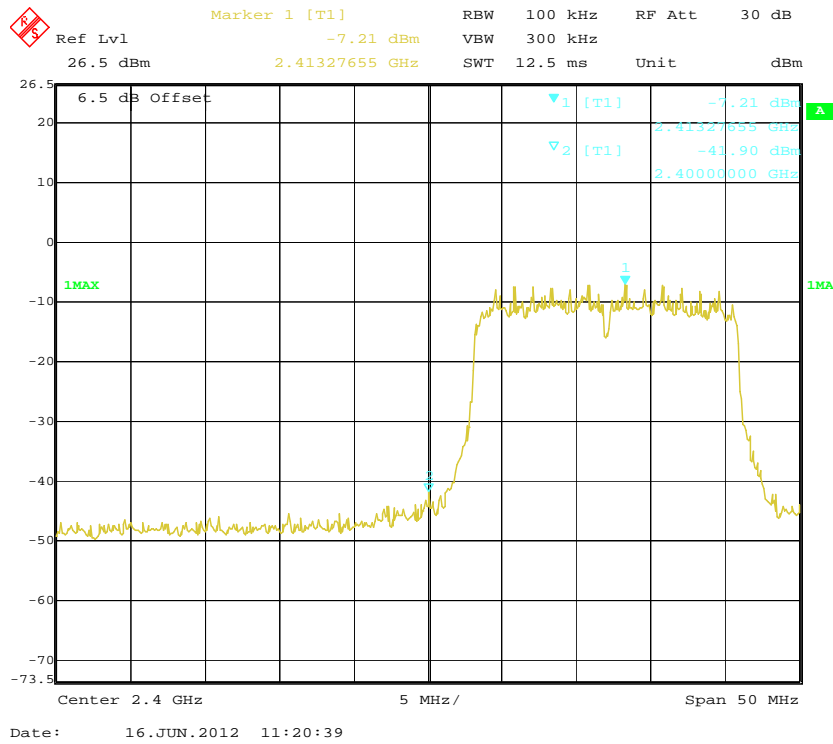
802.11g Band Edge, Left Side, Antenna 2



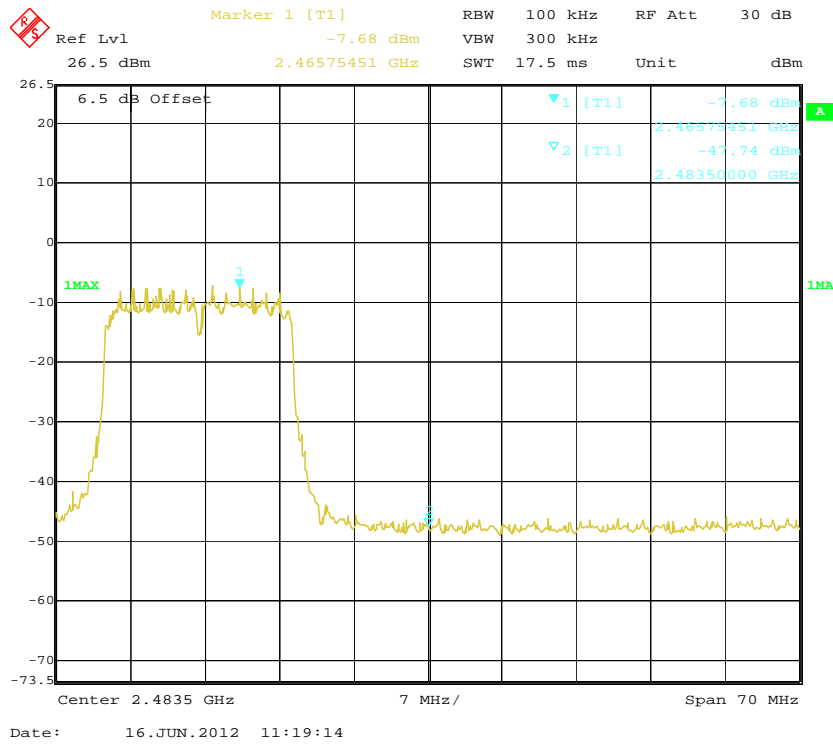
802.11g Band Edge, Right Side, Antenna 2



**802.11n20 Band Edge, Left Side, Antenna 1**

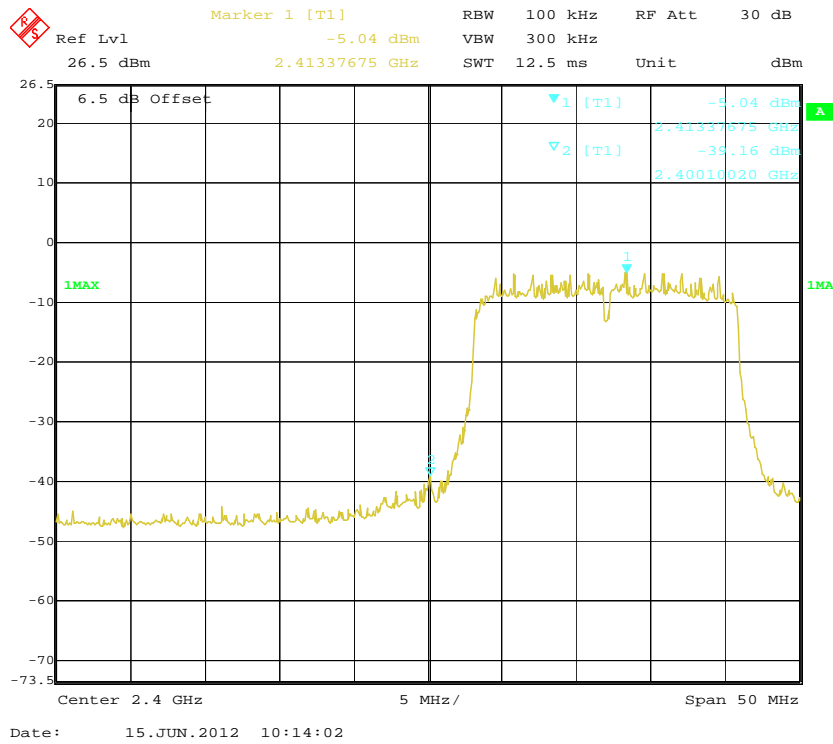


**802.11n20 Band Edge, Right Side, Antenna 1**

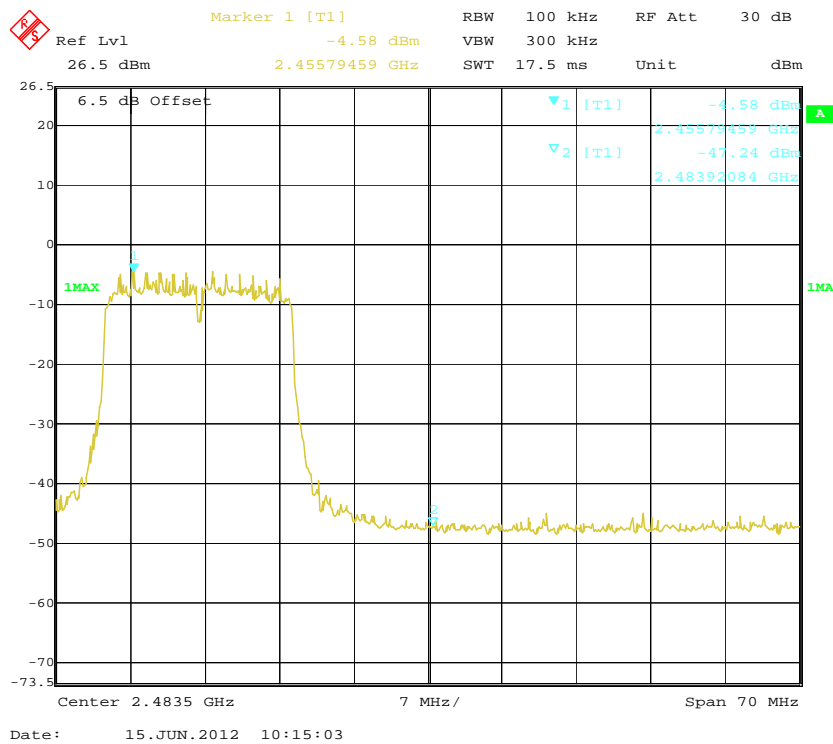




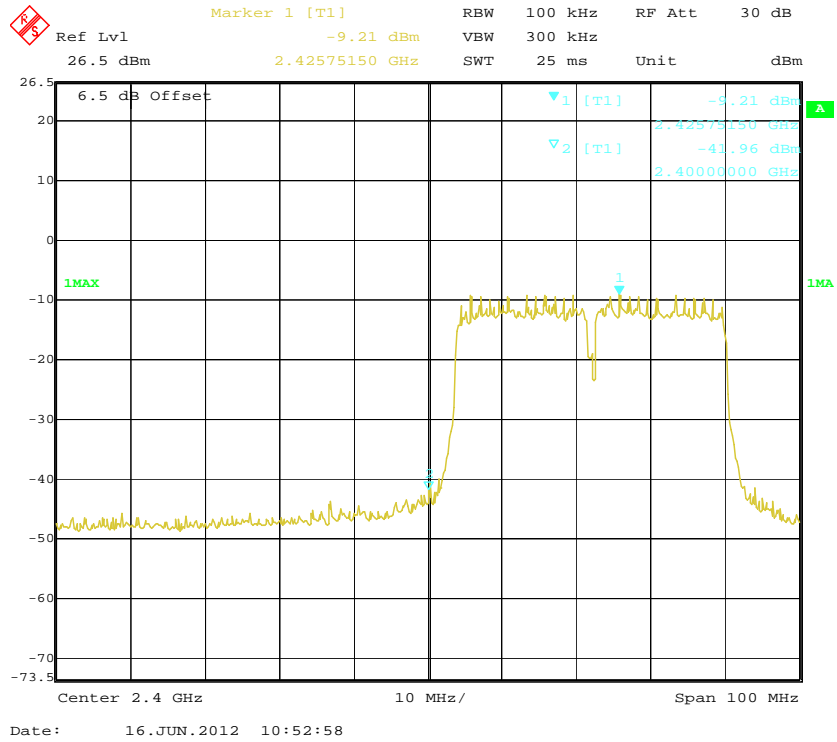
**802.11n20 Band Edge, Left Side, Antenna 2**



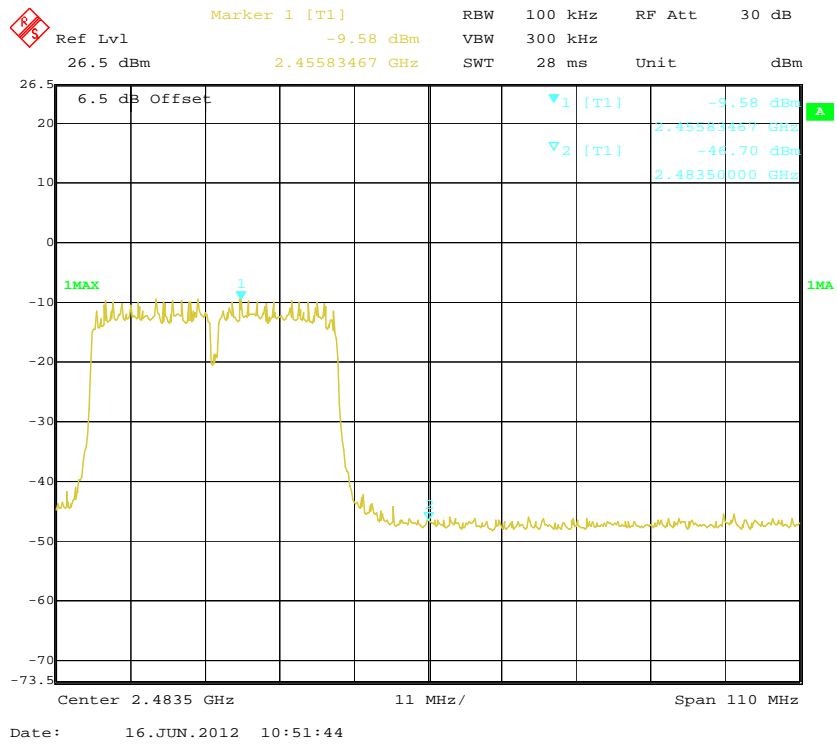
**802.11n20 Band Edge, Right Side, Antenna 2**



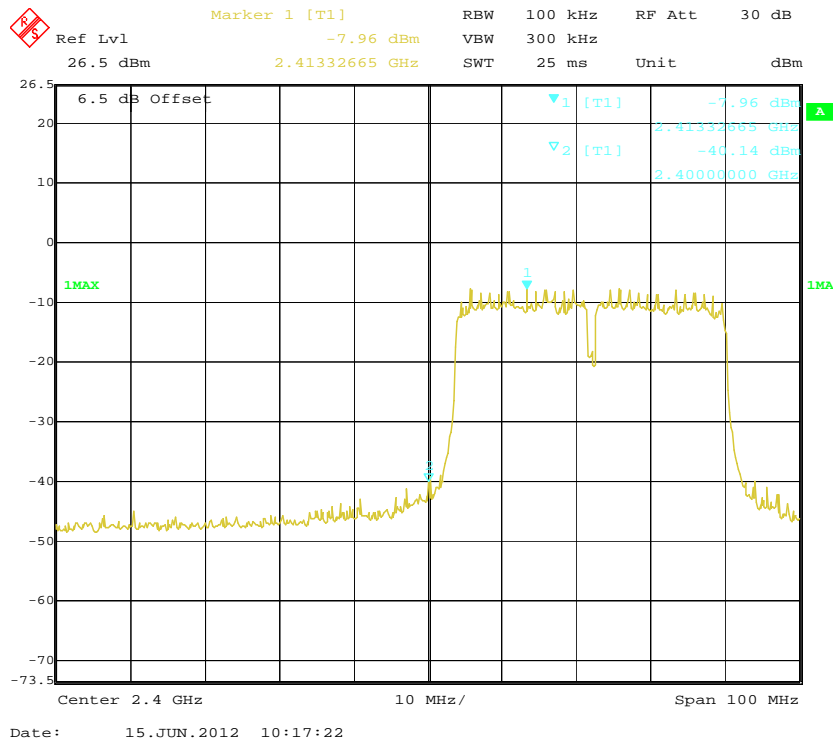
**802.11n40 Band Edge, Left Side, Antenna 1**



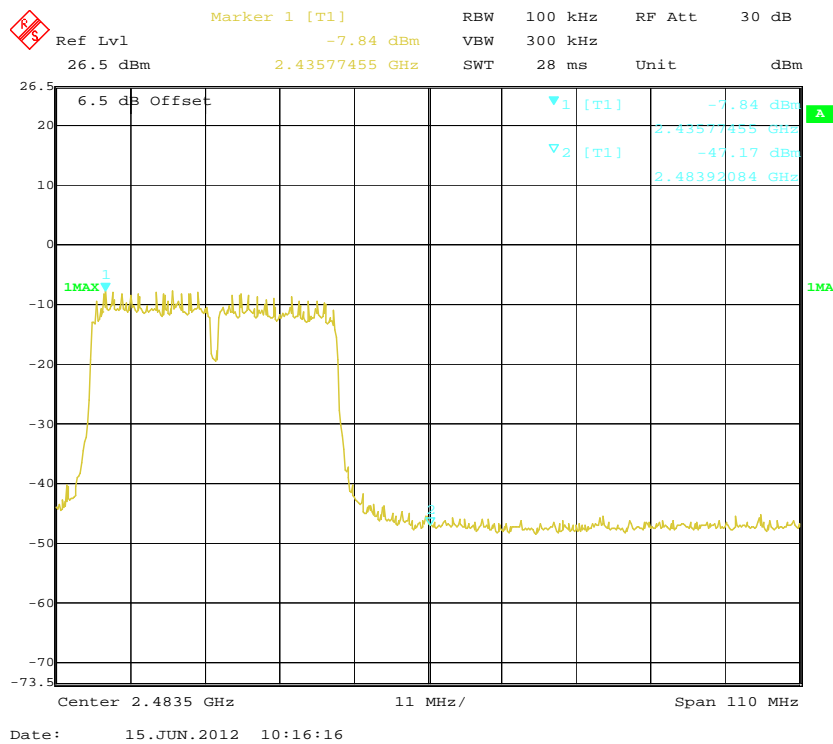
**802.11n40 Band Edge, Right Side, Antenna 1**



802.11n40 Band Edge, Left Side, Antenna 2



802.11n40 Band Edge, Right Side, Antenna 2



## FCC §15.247(e) - POWER SPECTRAL DENSITY

### Applicable Standard

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

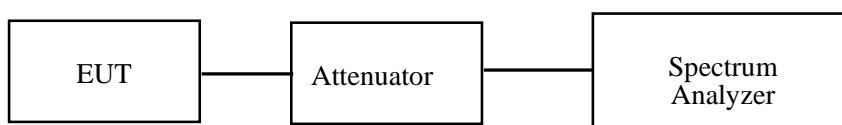
### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	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 Procedure

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



### Test Data

#### Environmental Conditions

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

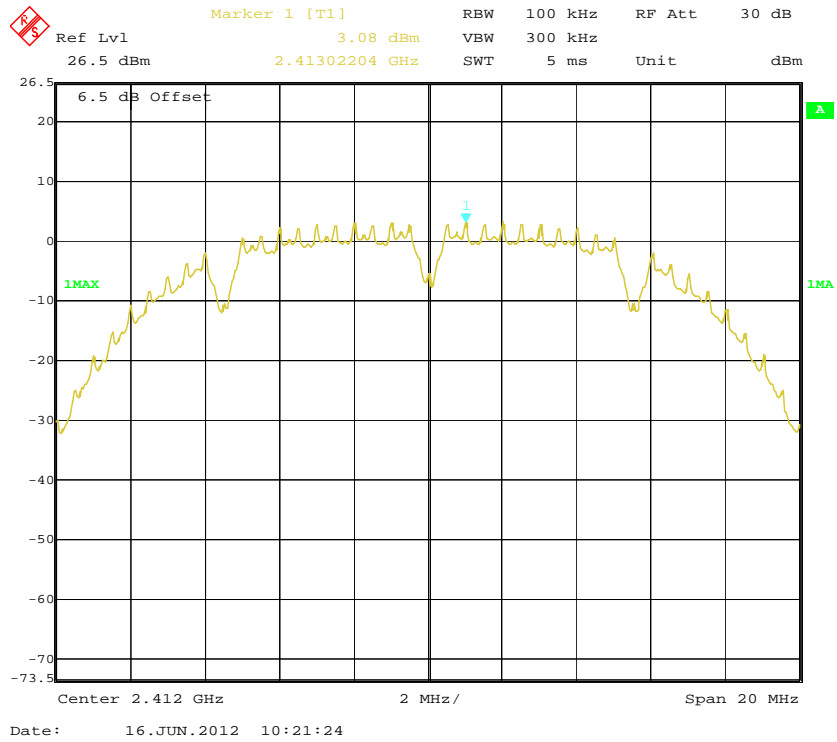
The testing was performed by Henry Ding from 2012-06-15 to 2012-06-16.

Test Mode: Transmitting

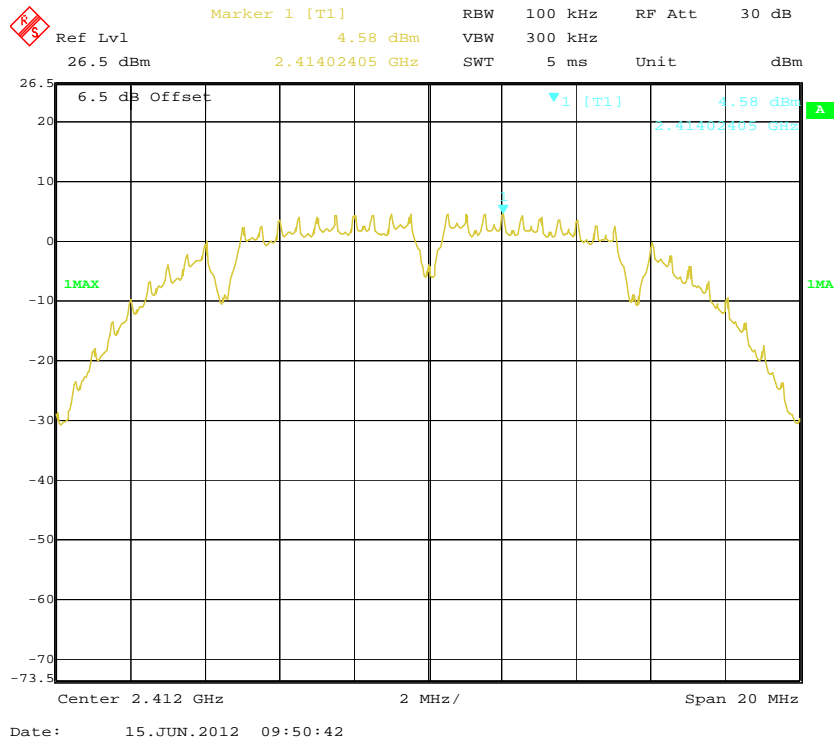
**Test Result:** Pass

Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna port	Power spectral density (dBm/100kHz)	BWCF (dB)	Power spectral density (dBm/3kHz)	Limit (dBm/3 kHz)	
<b>802.11b</b>								
Low	2412	1	1	3.08	-15.2	-12.12	8	
Low	2412	1	2	4.58	-15.2	-10.62		
Middle	2437	1	1	2.46	-15.2	-12.74	8	
Middle	2437	1	2	4.26	-15.2	-10.94		
High	2462	1	1	1.36	-15.2	-13.84	8	
High	2462	1	2	4.32	-15.2	-10.88		
<b>802.11g</b>								
Low	2412	6	1	-4.06	-15.2	-19.26	8	
Low	2412	6	2	-1.20	-15.2	-16.4		
Middle	2437	6	1	-3.98	-15.2	-19.18	8	
Middle	2437	6	2	-1.04	-15.2	-16.24		
High	2462	6	1	-4.28	-15.2	-19.48	8	
High	2462	6	2	0.56	-15.2	-14.64		
<b>802.11n20 mode</b>								
Low	2412	6.5	1	-7.46	-15.2	-22.66	-9.5	8
Low	2412	6.5	2	-4.28	-15.2	-19.48		
Middle	2437	6.5	1	-7.45	-15.2	-22.65	-7.9	8
Middle	2437	6.5	2	-4.46	-15.2	-19.66		
High	2462	6.5	1	-7.44	-15.2	-22.64	-10.2	8
High	2462	6.5	2	-4.03	-15.2	-19.23		
<b>802.11n40 mode</b>								
Low	2422	13.5	1	-9.55	-15.2	-24.75	-20.61	8
Low	2422	13.5	2	-7.52	-15.2	-22.72		
Middle	2437	13.5	1	-9.23	-15.2	-24.43	-20.48	8
Middle	2437	13.5	2	-7.51	-15.2	-22.71		
High	2452	13.5	1	-9.75	-15.2	-24.95	-20.69	8
High	2452	13.5	2	-7.53	-15.2	-22.73		

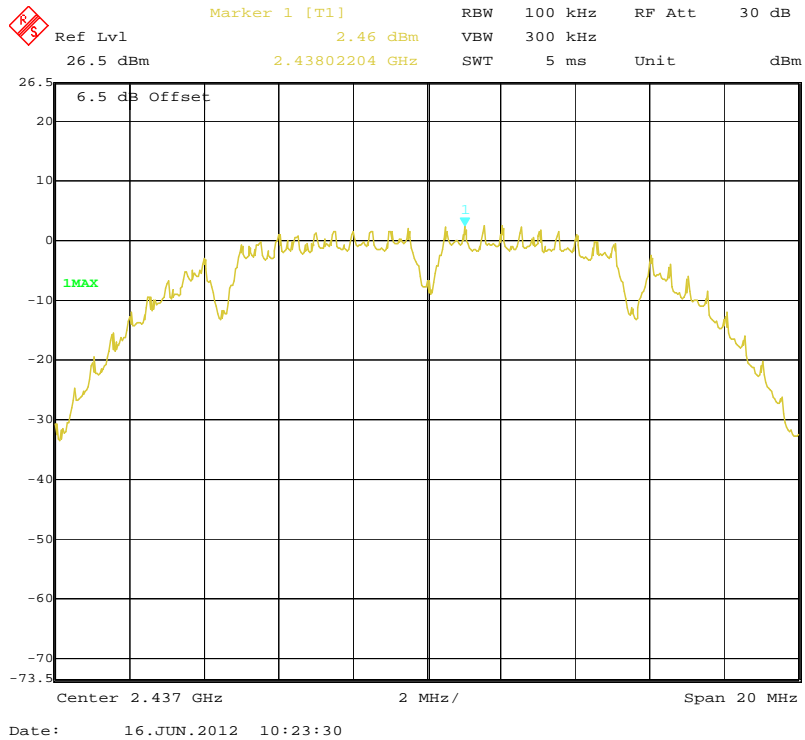
### Power Spectral Density, 802.11b Low Channel, Antenna 1



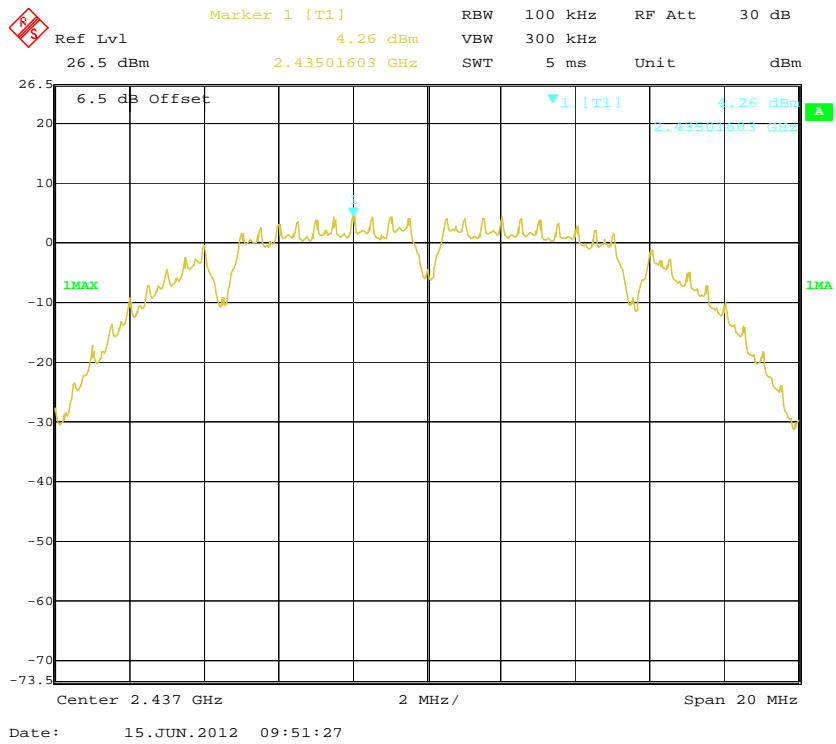
### Power Spectral Density, 802.11b Low Channel, Antenna 2



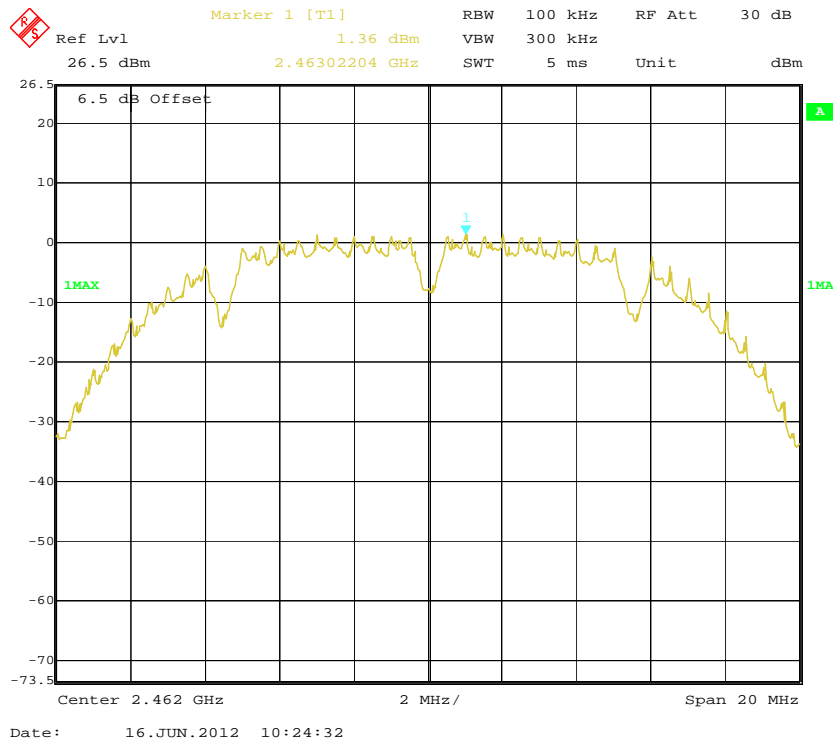
**Power Spectral Density, 802.11b Middle Channel, Antenna 1**



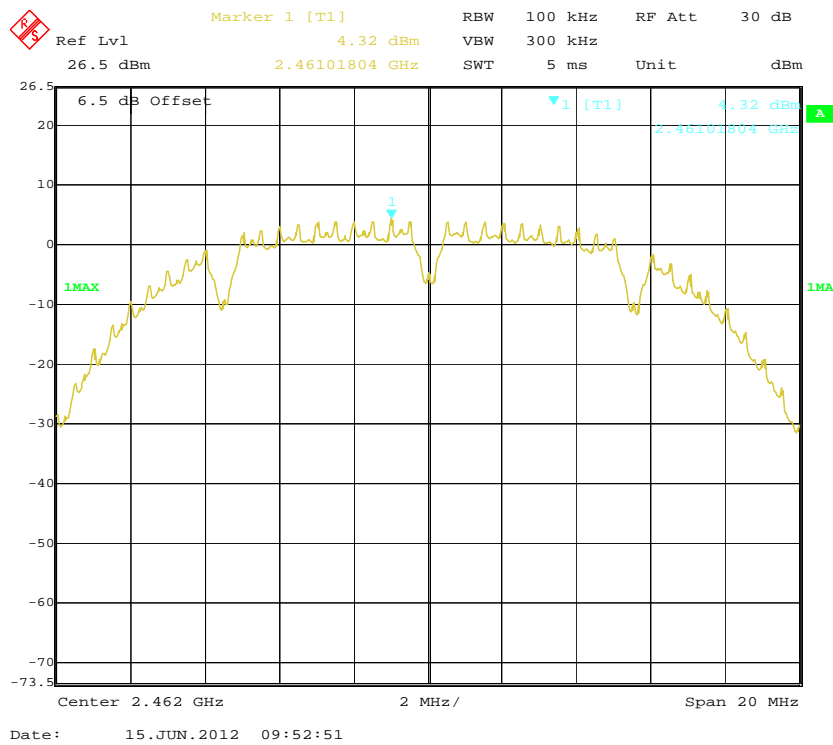
**Power Spectral Density, 802.11b Middle Channel, Antenna 2**



**Power Spectral Density, 802.11b High Channel, Antenna 1**

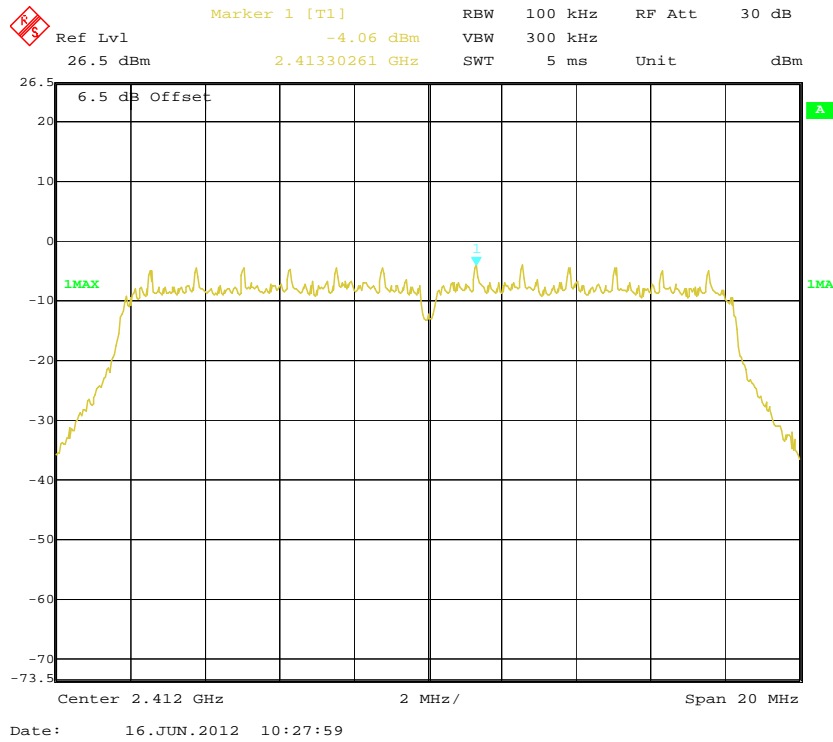


**Power Spectral Density, 802.11b High Channel, Antenna 2**

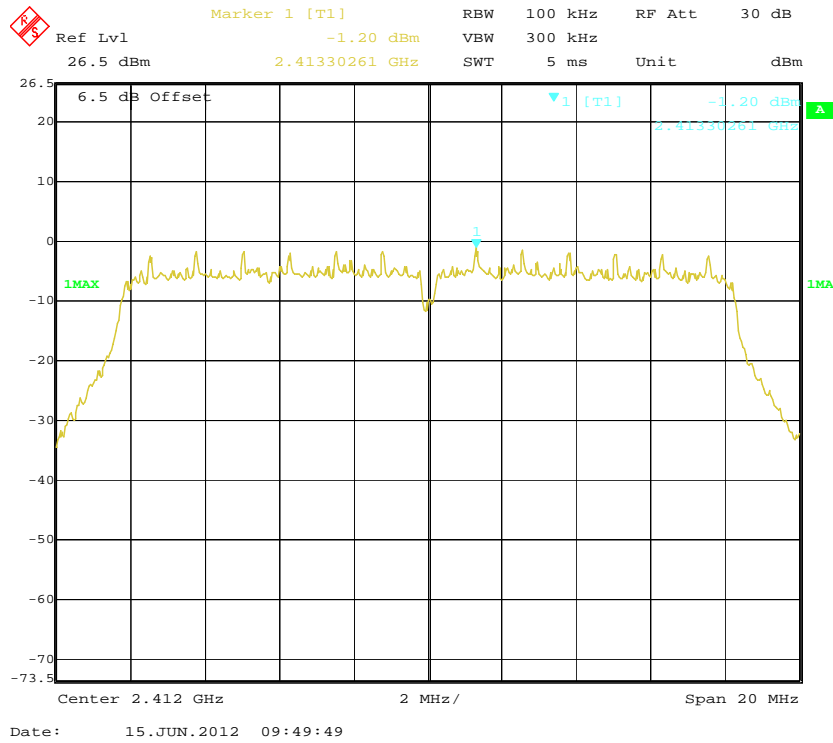




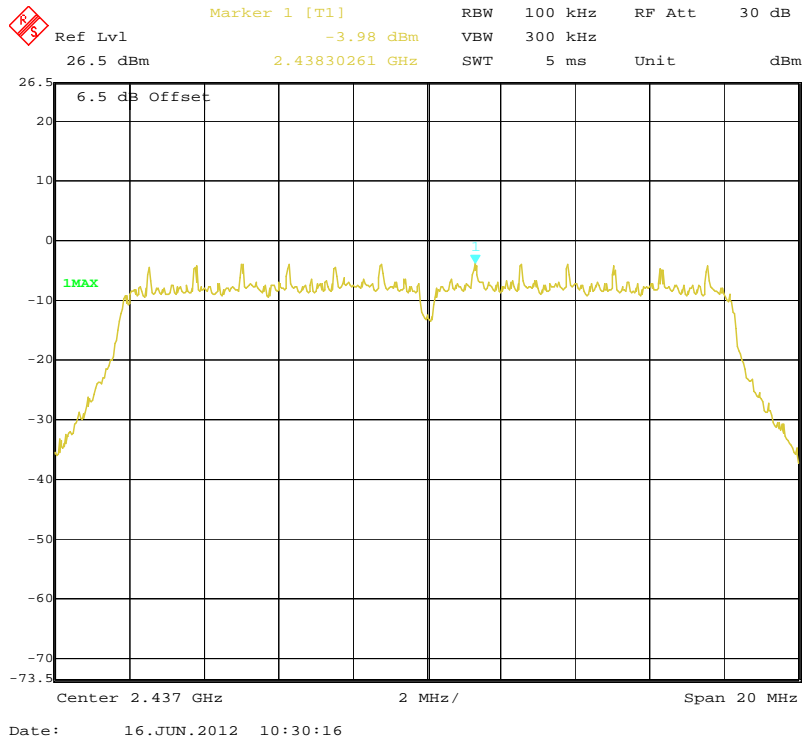
### Power Spectral Density, 802.11g Low Channel, Antenna 1



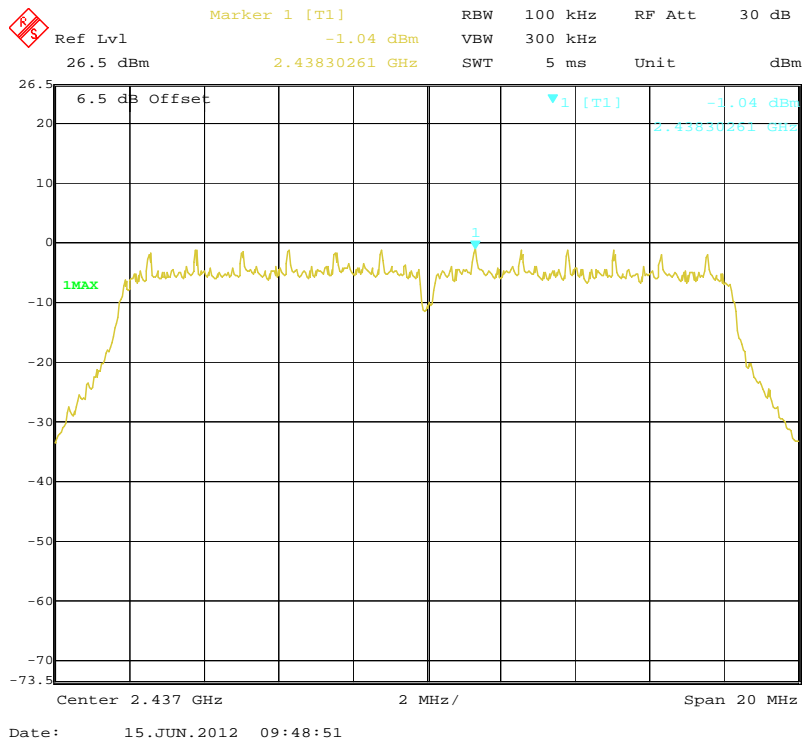
### Power Spectral Density, 802.11g Low Channel, Antenna 2



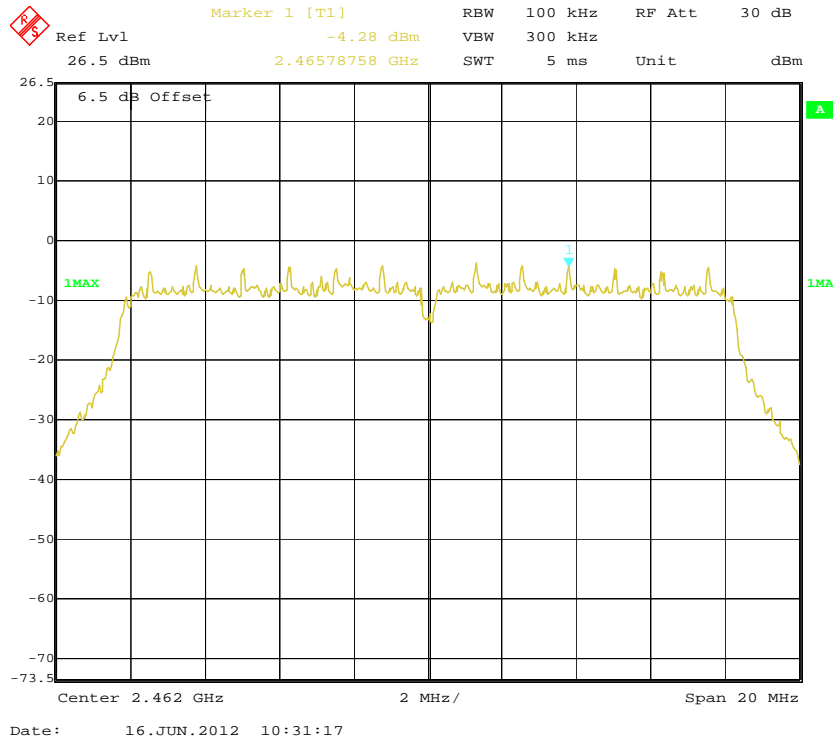
**Power Spectral Density, 802.11g Middle Channel, Antenna 1**



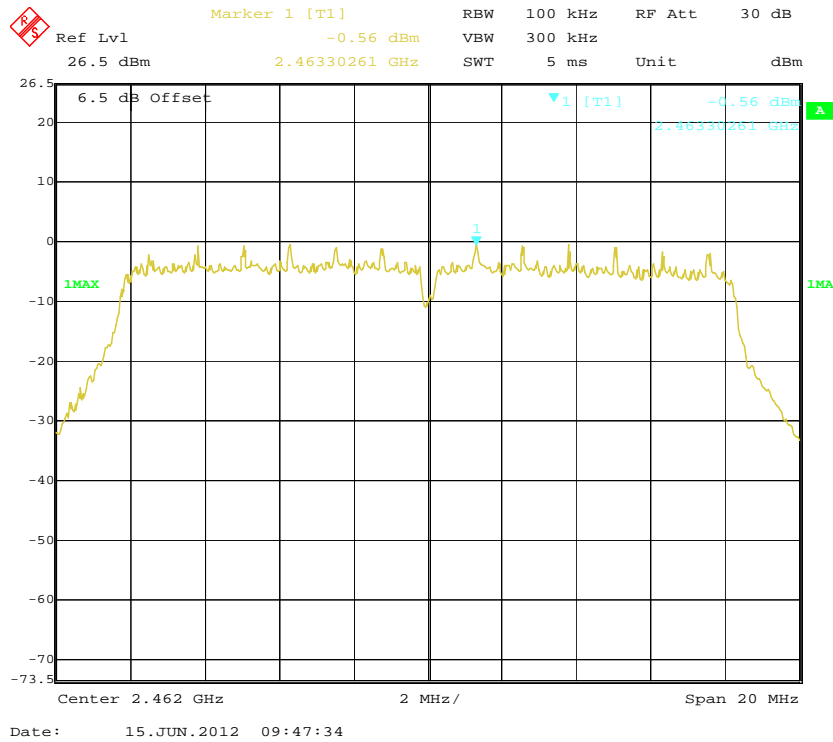
**Power Spectral Density, 802.11g Middle Channel, Antenna 2**



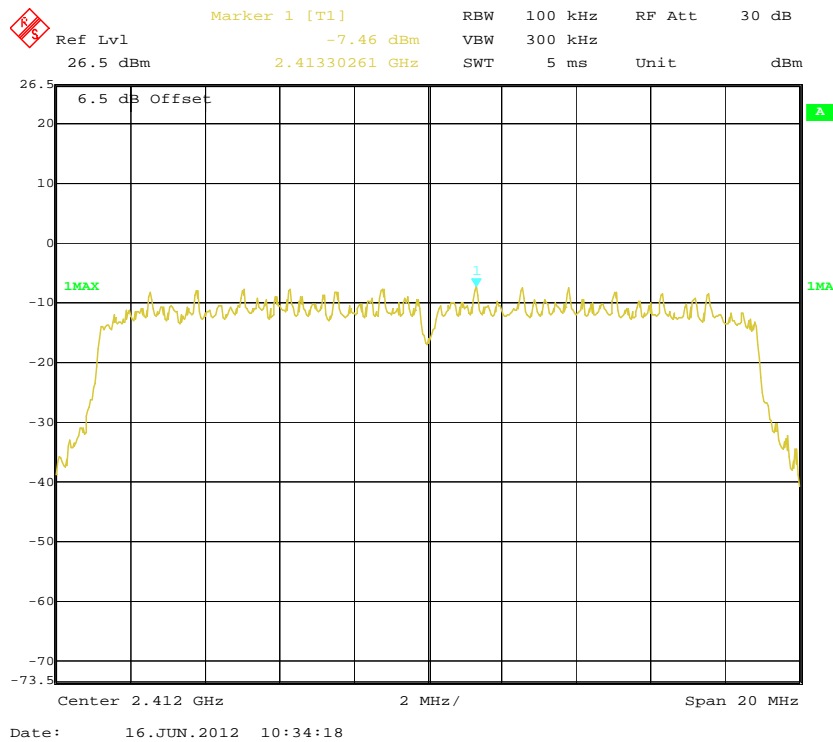
### Power Spectral Density, 802.11g High Channel, Antenna 1



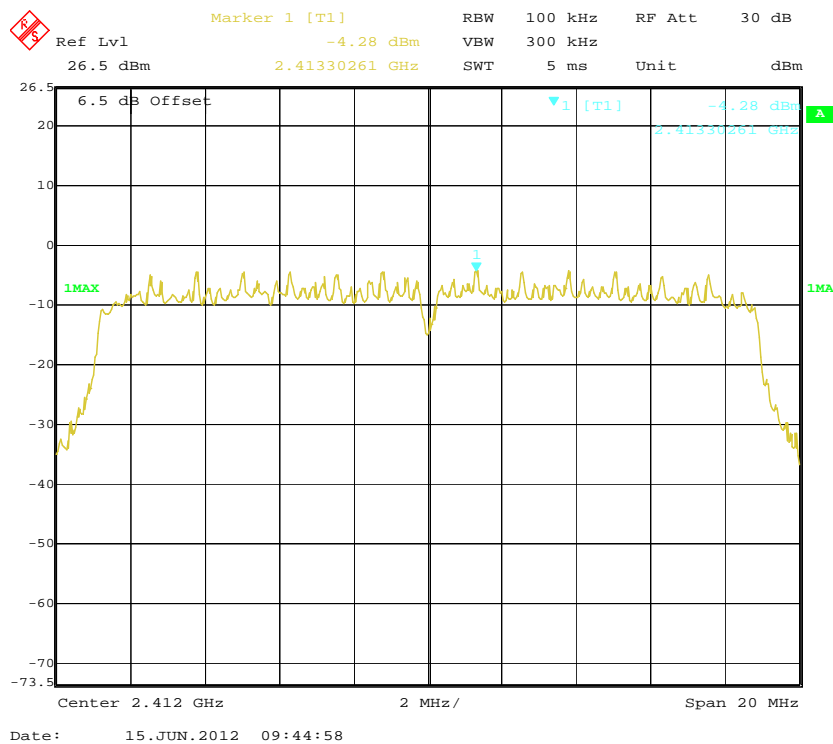
### Power Spectral Density, 802.11g High Channel, Antenna 2



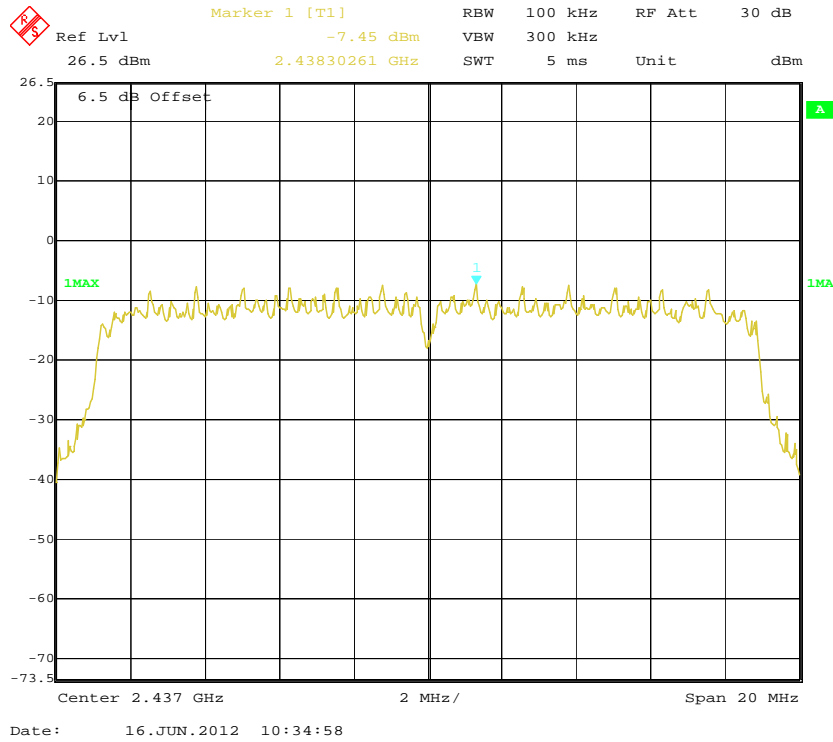
**Power Spectral Density, 802.11n20 Low Channel, Antenna 1**



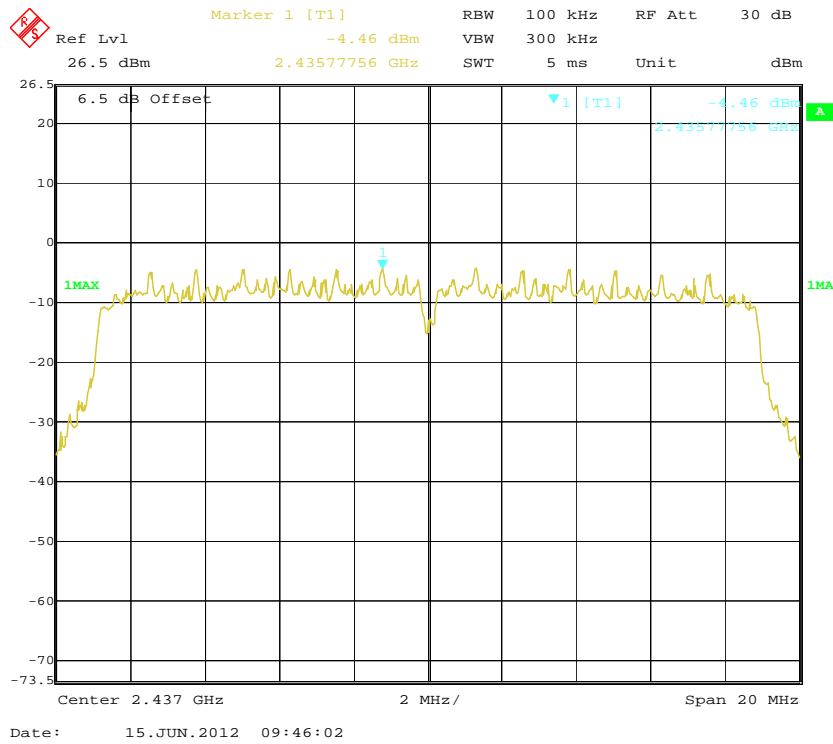
**Power Spectral Density, 802.11n20 Low Channel, Antenna 2**



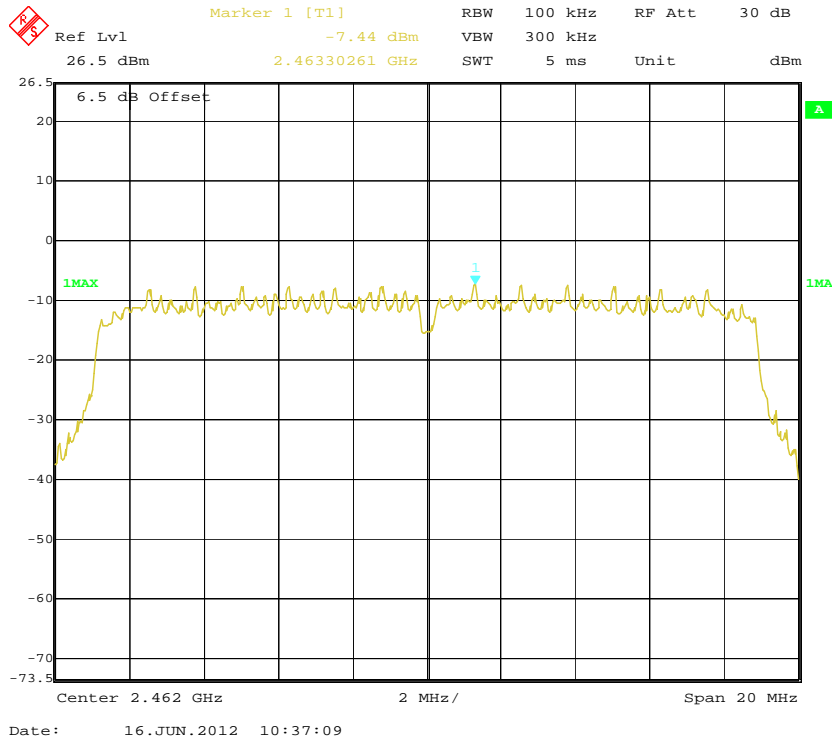
**Power Spectral Density, 802.11n20 Middle Channel, Antenna 1**



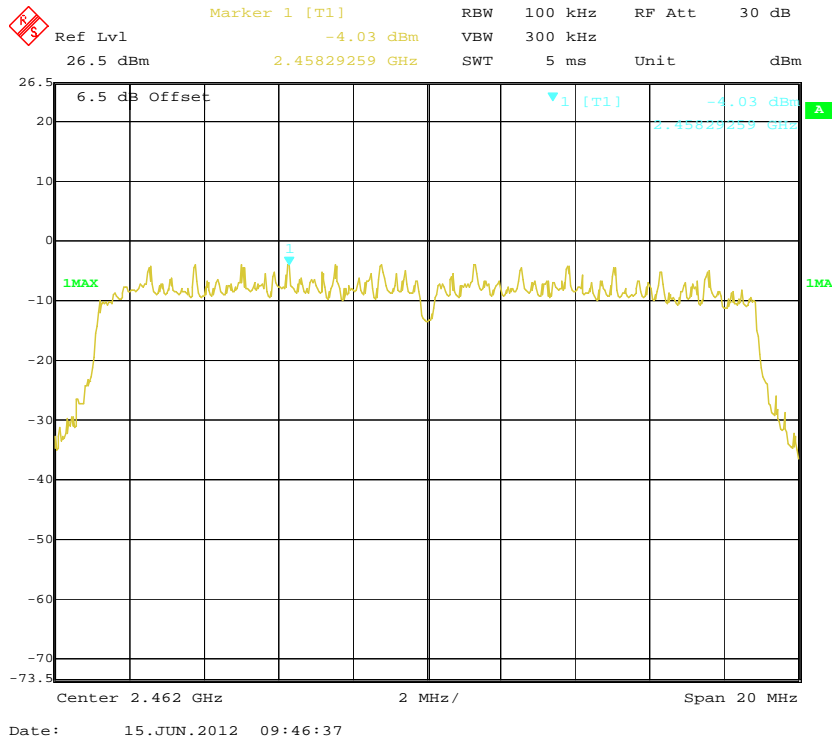
**Power Spectral Density, 802.11n20 Middle Channel, Antenna 2**



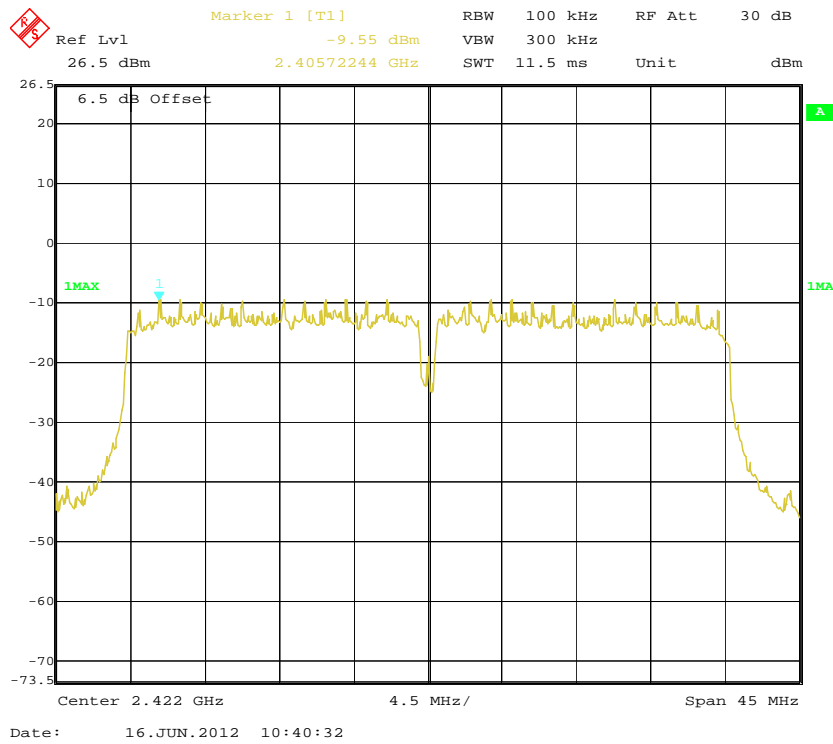
### Power Spectral Density, 802.11n20 High Channel, Antenna 1



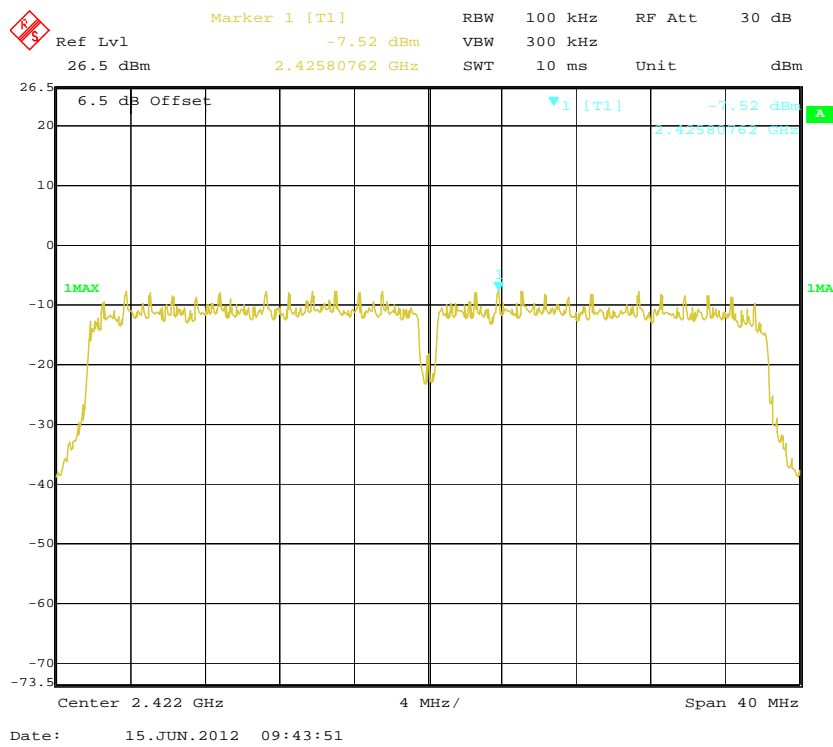
### Power Spectral Density, 802.11n20 High Channel, Antenna 2



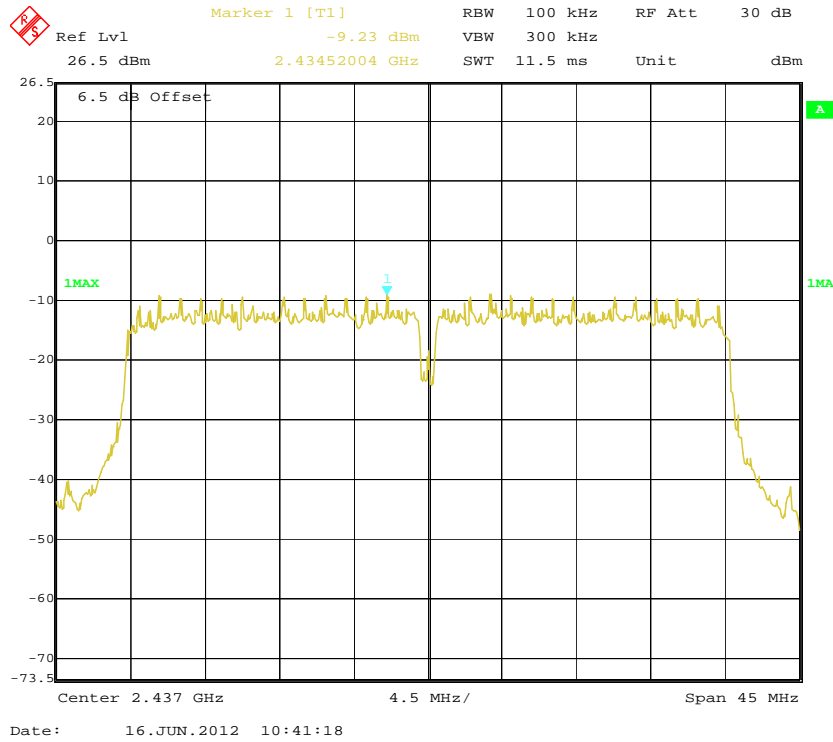
### Power Spectral Density, 802.11n40 Low Channel1, Antenna 1



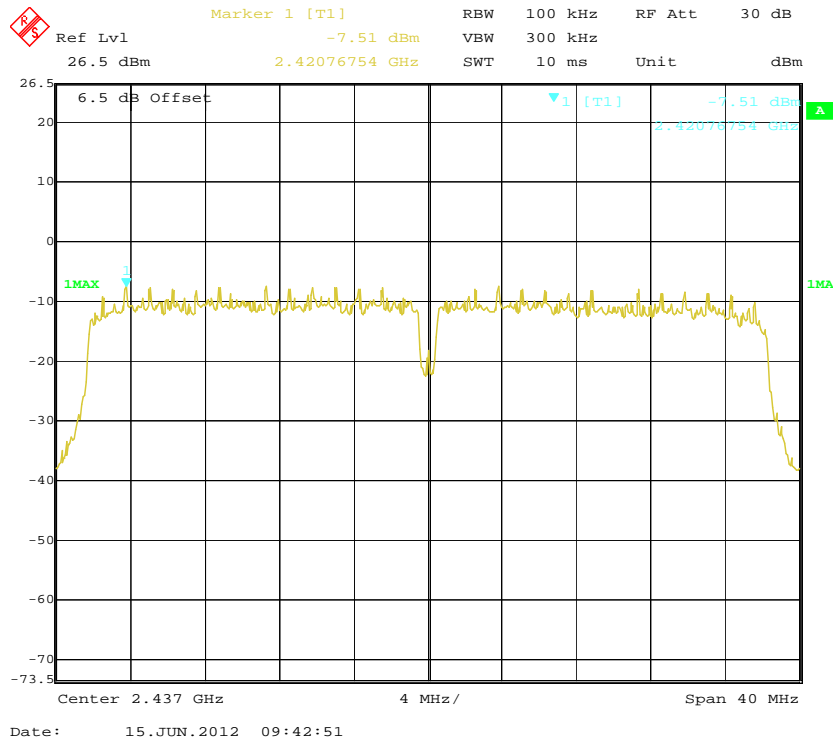
### Power Spectral Density, 802.11n40 Low Channel, Antenna 2



**Power Spectral Density, 802.11n40 Middle Channel, Antenna 1**

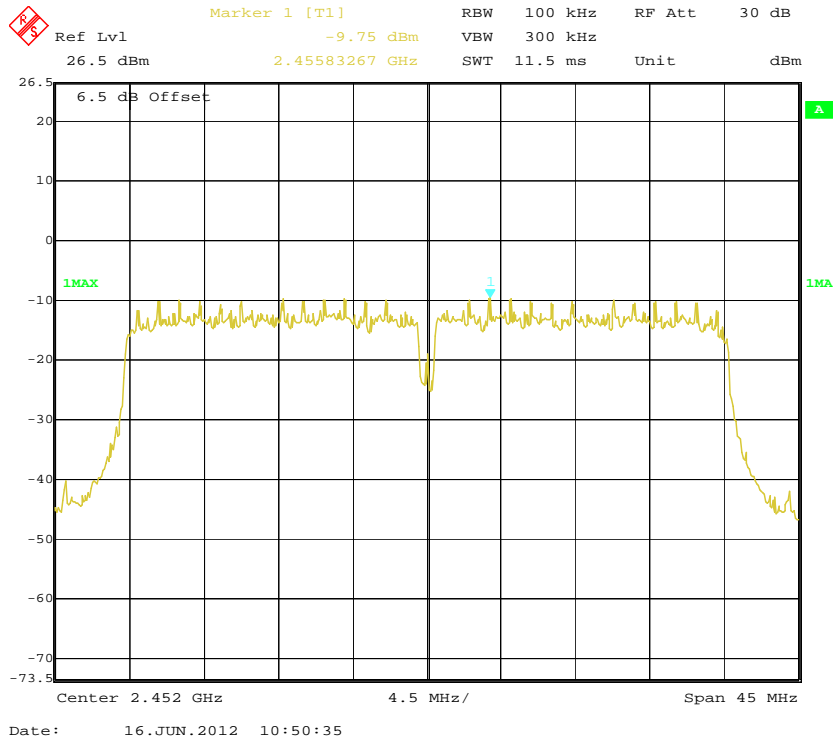


**Power Spectral Density, 802.11n40 Middle Channel, Antenna 2**

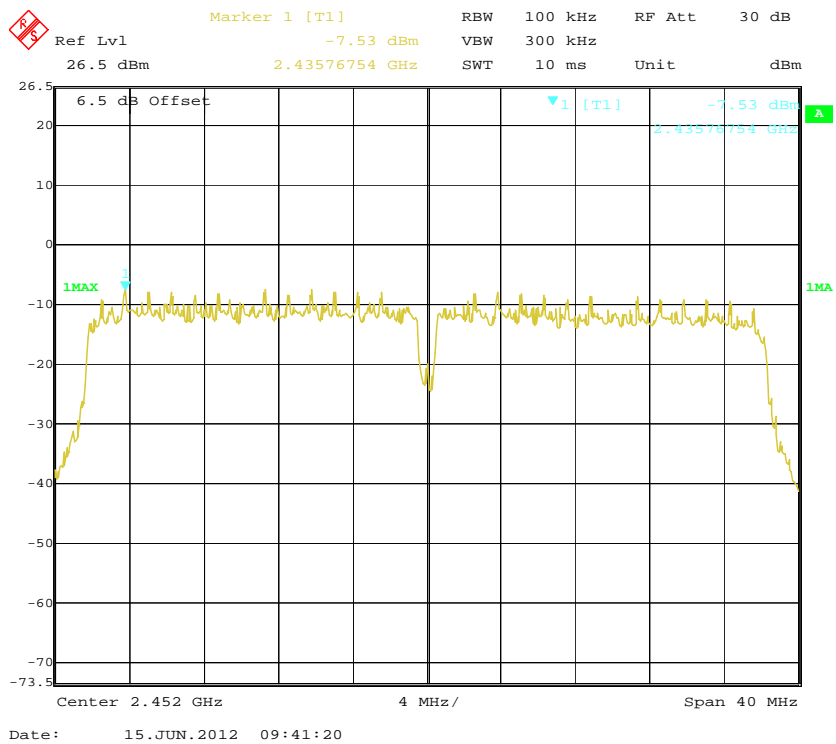




### Power Spectral Density, 802.11n40 High Channel, Antenna 1



### Power Spectral Density, 802.11n40 High Channel, Antenna 2



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