

FCC PART 15.247

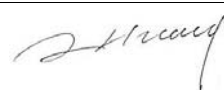
TEST REPORT

For

Kasda Digital Technology Co., Ltd.

B-31 Building, Tanglang Industry Zone, XiLi, Nanshan, Shenzhen, China

FCC ID: OWI-KW5212

Report Type: Original Report	Product Type: 802.11b/g/n 4 port VDSL2 Router
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Kasda Digital Technology Co., LTD*'s product, model number: *KW5212H (FCC ID: OWI-KW5212)* or the "EUT" in this report was a *802.11b/g/n 4 port VDSL2 Router*, which was measured approximately: 19.0 cm (L) x 6.0 cm (W) x 30.0 cm (H), rated input voltage: DC 12V adapter.

Adapter Information:

Model: ADS012PM-W 120100

Input: AC 100-240 V, 50/60Hz, 0.5A

Output: DC 12V, 1.0A

Note: The serial models KW5212H, KW5212, NG11VO and NG11VH are electrically identical, the differences among them is whether supporting USB function, model KW5212H was selected for fully testing, the details was explained in the attached product similarity declaration letter provided and guaranteed by applicant.

** All measurement and test data in this report was gathered from production sample serial number: 1307080 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-07-25.*

Objective

This report is prepared on behalf of *Kasda Digital Technology Co., 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)

FCC Part 15B JBP submission with FCC ID: OWI-KW5212.

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.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

For 802.11b, 802.11g, 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11.

For 802.11n-HT40 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.

EUT Exercise Software

CMD command control

The test was performed at worst condition (maximum power) under:

802.11b: Data rate: 1 Mbps.

802.11g: Data rate: 6 Mbps.

802.11n-HT20: Data rate: MCS0

802.11n-HT40: Data rate: MCS0

Equipment Modifications

No modification was made to the EUT tested.

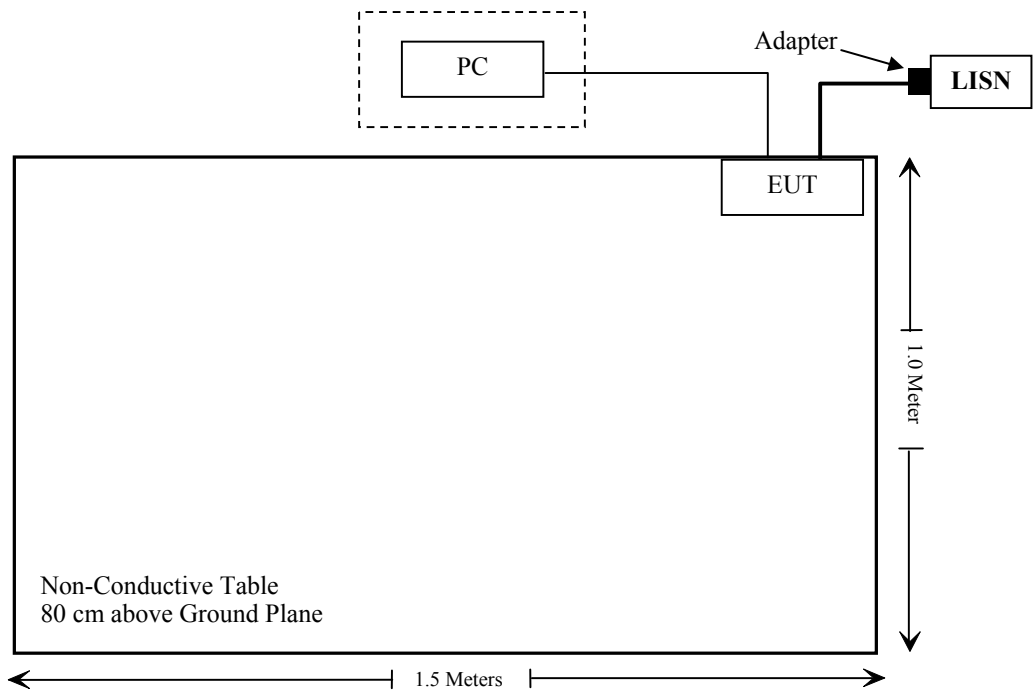
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable DC Power Cable	1.5	EUT	Adapter
Unshielding Detachable RJ45 Cable	1.5	EUT	PC

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) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**Applicable Standard**

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

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

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

f = frequency in MHz;

* = Plane-wave equivalent power density;

MPE Calculation**Predication of MPE limit at a given distance**

$$S = \frac{PG}{4\pi R^2}$$

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

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

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, 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, worst case as below:

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limit (mW/cm²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2462	3	2.0	16.00	39.81	20	0.0158	1.0
802.11g	2462	3	2.0	16.05	40.27	20	0.0160	1.0
802.11n-HT20	2462	3	2.0	18.84	76.56	20	0.0305	1.0
802.11n-HT40	2452	3	2.0	18.21	66.22	20	0.0264	1.0

FCC Radiation Exposure Statement:

To comply with FCC RF exposure requirements, a minimum separation distance of 20 cm is required between the antenna and all public persons.

Result: Compliance

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 have two omni-directional antennas arrangement for Wi-Fi, which were inverse port, the antenna gain is 3dBi, fulfill the requirement of this section. Please refer to the external photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

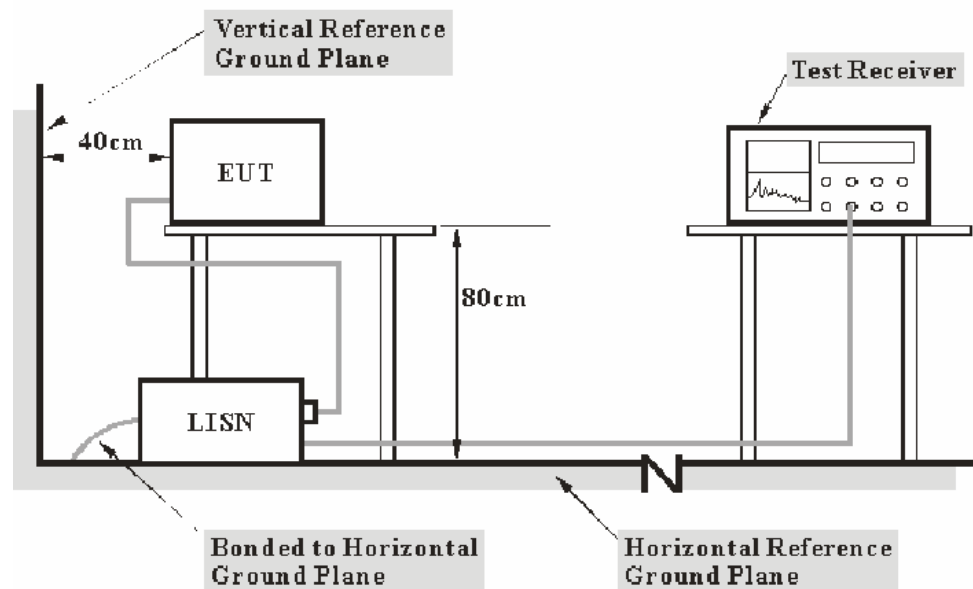
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements may be receiver reading, attenuation of the connection between AMN/ISN and receiver, AMN/ISN voltage division factor, AMN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

EUT Setup



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

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

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

EMI Test Receiver Setup

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

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

Frequency Range	IF B/W
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	2013-06-17	2014-06-17
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2013-08-09	2014-08-09
Rohde & Schwarz	CE Test software	EMC 32	8.95	-	-

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the recorded data in following table, with the worst margin reading of:

11.8 dB at 0.206000 MHz in the Line conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data**Environmental Conditions**

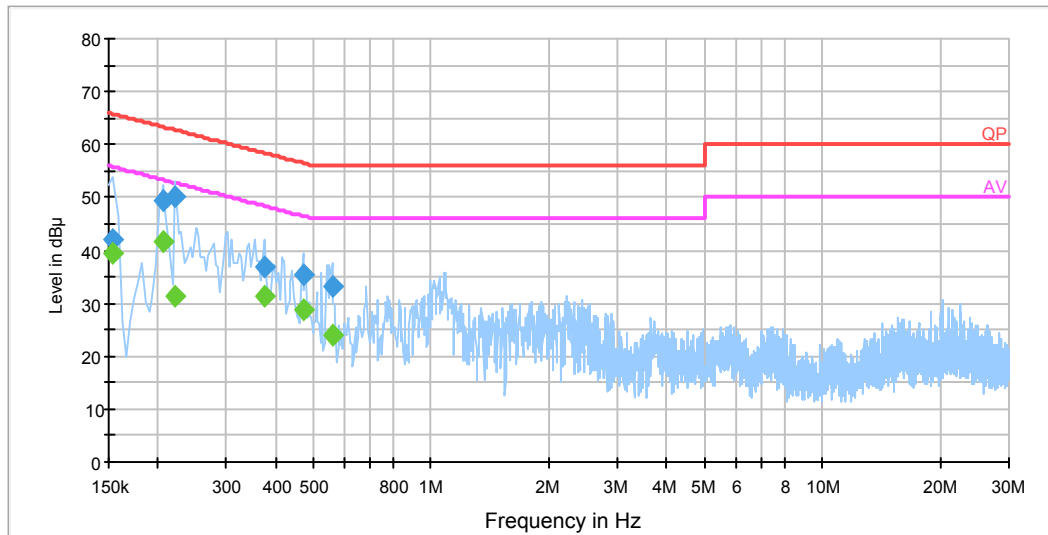
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2013-08-13.

Test mode: Transmitting

AC 120V/60Hz, Line:

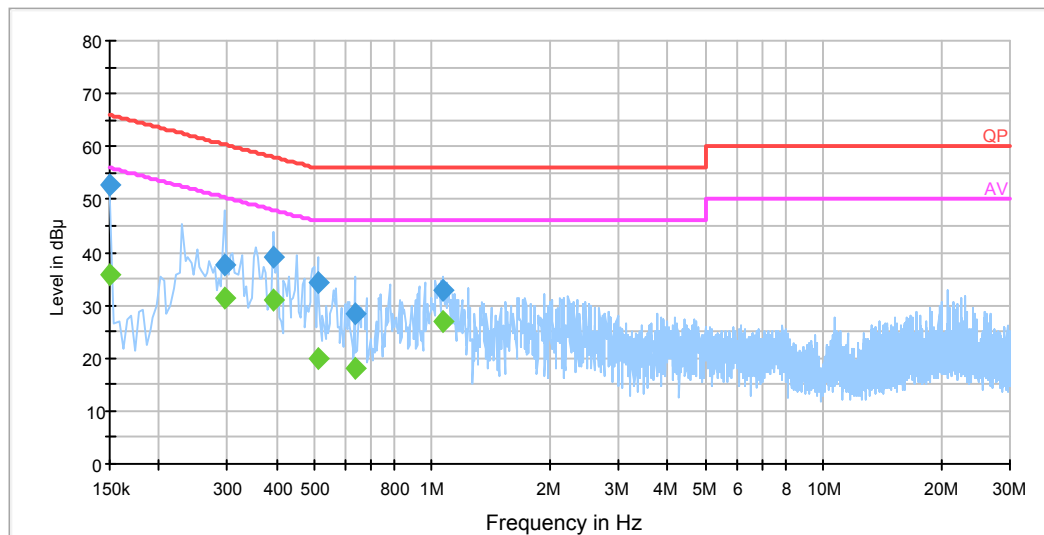
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/Ave./QP)
0.206000	41.6	19.5	53.4	11.8	Ave.
0.222000	50.1	19.5	62.7	12.6	QP
0.206000	49.6	19.5	63.4	13.8	QP
0.154000	39.3	19.5	55.8	16.5	Ave.
0.374000	31.4	19.5	48.4	17.0	Ave.
0.470000	28.9	19.5	46.5	17.6	Ave.
0.470000	35.4	19.5	56.5	21.1	QP
0.222000	31.3	19.5	52.7	21.4	Ave.
0.374000	36.9	19.5	58.4	21.5	QP
0.558000	23.9	19.5	46.0	22.1	Ave.
0.558000	33.1	19.5	56.0	22.9	QP
0.154000	42.1	19.5	65.8	23.7	QP

AC 120V/60Hz, Neutral:

EMI Auto Test N



Frequency (MHz)	Corrected Amplitude (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/Ave./QP)
0.150000	52.7	19.5	66.0	13.3	QP
0.394000	31.0	19.5	48.0	17.0	Ave.
1.070000	27.0	19.5	46.0	19.0	Ave.
0.394000	38.9	19.5	58.0	19.1	QP
0.294000	31.2	19.5	50.4	19.2	Ave.
0.150000	35.9	19.5	56.0	20.1	Ave.
0.510000	34.2	19.5	56.0	21.8	QP
0.294000	37.5	19.5	60.4	22.9	QP
1.070000	32.7	19.5	56.0	23.3	QP
0.510000	20.0	19.5	46.0	26.0	Ave.
0.634000	28.3	19.5	56.0	27.7	QP
0.634000	18.1	19.5	46.0	27.9	Ave.

Note:

- 1) Correction Factor = LISN/ISN VDF (Voltage Division Factor) + Cable Loss + Pulse Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

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

Applicable Standard

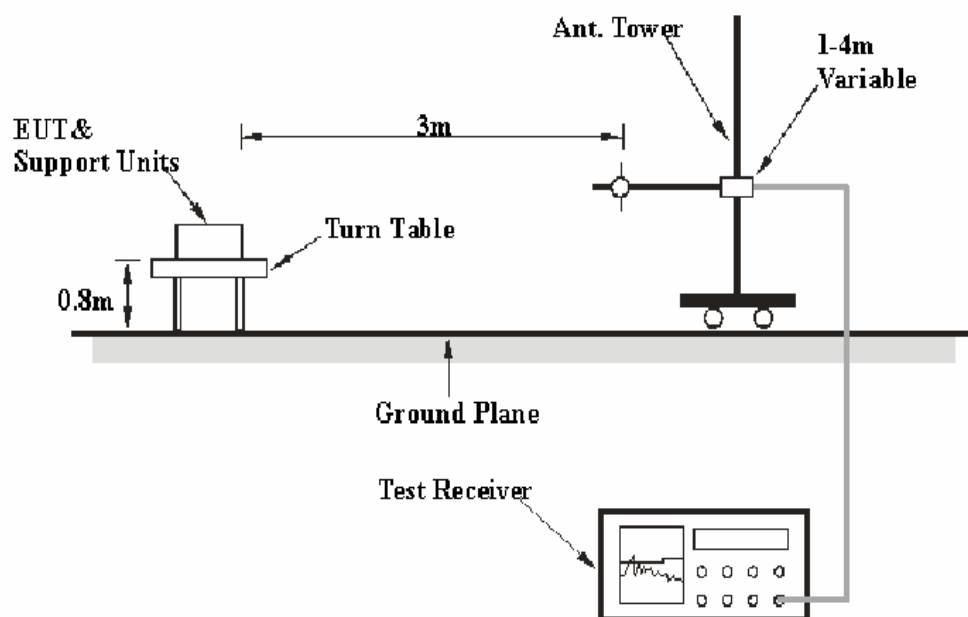
FCC §15.247 (d); §15.209; §15.205;

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 16-4-2:2011, the expanded combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) will not be taken into consideration for the test data recorded in the report

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 adapter was connected to an AC 120V/60 Hz power source

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

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	8447E	1937A01046	2013-08-09	2014-08-09
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-05-09	2014-05-09
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2010-10-14	2013-10-13

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, with the worst margin reading of:

5.49 dB at 2387.6 MHz in the Vertical polarization

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data**Environmental Conditions**

Temperature:	20 ~ 25 °C
Relative Humidity:	50 ~ 56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2013-08-10 and 2013-08-13.

Test Mode: Transmitting

Note: For 802.11b/g, test with two antenna port transmit separately and worst case as below.
For 802.11n-HT20, 802.11n-HT40, test with two antenna ports transmit simultaneously.

30 MHz-25 GHz:**802.11b Mode:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBuV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBuV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412.0	87.03	PK	310	1.3	H	6.13	93.16	/	/
2412.0	79.71	Ave.	310	1.3	H	6.13	85.84	/	/
2412.0	104.52	PK	292	1.3	V	6.13	110.65	/	/
2412.0	90.35	Ave.	292	1.3	V	6.13	96.48	/	/
2387.0	42.34	Ave.	268	1.4	V	6.13	48.47	54	5.53
2387.0	60.37	PK	268	1.4	V	6.13	66.50	74	7.50
4824.0	33.57	Ave.	6	1.3	H	12.40	45.97	54	8.03
7236.0	23.54	Ave.	330	1.5	V	16.62	40.16	54	13.84
175.8	45.40	QP	98	1.4	H	-16	29.40	43.5	14.10
9648.0	20.20	Ave.	289	1.3	V	19.29	39.49	54	14.51
4824.0	45.64	PK	6	1.3	H	12.40	58.04	74	15.96
9648.0	34.07	PK	289	1.3	V	19.29	53.36	74	20.64
7236.0	36.27	PK	330	1.5	V	16.62	52.89	74	21.11
2493.5	20.27	Ave.	63	1.3	H	7.21	27.48	54	26.52
2356.8	20.34	Ave.	283	1.3	V	5.48	25.82	54	28.18
2493.5	36.27	PK	63	1.3	H	7.21	43.48	74	30.52
2356.8	35.40	PK	283	1.3	V	5.48	40.88	74	33.12
Middle Channel (2437 MHz)									
2437.0	88.62	PK	188	1.2	H	6.13	94.75	/	/
2437.0	80.02	Ave.	188	1.2	H	6.13	86.15	/	/
2437.0	103.68	PK	29	1.2	V	6.13	109.81	/	/
2437.0	89.93	Ave.	29	1.2	V	6.13	96.06	/	/
4874.0	31.27	Ave.	59	1.2	V	12.46	43.73	54	10.27
175.8	46.16	QP	95	1.2	H	-16	30.16	43.5	13.34
9748.0	21.25	Ave.	270	1.2	H	19.40	40.65	54	13.35
7311.0	23.26	Ave.	215	1.3	V	16.49	39.75	54	14.25
4874.0	45.68	PK	59	1.2	V	12.46	58.14	74	15.86
9748.0	35.35	PK	270	1.2	H	19.40	54.75	74	19.25
7311.0	36.59	PK	215	1.3	V	16.49	53.08	74	20.92
2496.5	20.13	Ave.	339	1.3	H	7.21	27.34	54	26.66
2486.7	19.67	Ave.	87	1.4	H	7.21	26.88	54	27.12
2368.2	19.20	Ave.	256	1.2	V	5.48	24.68	54	29.32
2496.5	36.01	PK	339	1.3	H	7.21	43.22	74	30.78
2486.7	34.62	PK	87	1.4	H	7.21	41.83	74	32.17
2368.2	35.34	PK	256	1.2	V	5.48	40.82	74	33.18

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
2462.0	89.59	PK	143	1.2	H	7.21	96.80	/	/
2462.0	80.35	Ave.	143	1.2	H	7.21	87.56	/	/
2462.0	104.36	PK	85	1.3	V	7.21	111.57	/	/
2462.0	95.19	Ave.	85	1.3	V	7.21	102.40	/	/
4912.0	32.23	Ave.	12	1.2	V	12.46	44.69	54	9.31
175.8	47.10	QP	75	1.2	H	-16	31.10	43.5	12.40
2485.0	33.74	Ave.	222	1.4	V	7.21	40.95	54	13.05
9848.0	21.16	Ave.	256	1.4	V	19.39	40.55	54	13.45
2492.0	32.21	Ave.	252	1.5	V	7.21	39.42	54	14.58
4912.0	46.21	PK	12	1.2	V	12.46	58.67	74	15.33
7386.0	22.64	Ave.	25	1.4	H	15.91	38.55	54	15.45
2485.0	47.60	PK	222	1.4	V	7.21	54.81	74	19.19
9848.0	34.27	PK	256	1.4	V	19.39	53.66	74	20.34
2492.0	46.24	PK	252	1.5	V	7.21	53.45	74	20.55
7386.0	36.57	PK	25	1.4	H	15.91	52.48	74	21.52
2372.8	20.15	Ave.	284	1.4	H	6.13	26.28	54	27.72
2372.8	36.57	PK	284	1.4	H	6.13	42.70	74	31.30

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412.0	88.67	PK	256	1.5	H	6.13	94.80	/	/
2412.0	75.10	Ave.	256	1.5	H	6.13	81.23	/	/
2412.0	101.95	PK	322	1.3	V	6.13	108.08	/	/
2412.0	87.93	Ave.	322	1.3	V	6.13	94.06	/	/
2386.0	40.38	Ave.	210	1.3	V	6.13	46.51	54	7.49
4824.0	33.03	Ave.	243	1.3	H	12.40	45.43	54	8.57
2386.0	56.37	PK	210	1.3	V	6.13	62.50	74	11.50
7236.0	24.52	Ave.	32	1.3	V	16.62	41.14	54	12.86
9648.0	21.10	Ave.	122	1.4	V	19.29	40.39	54	13.61
175.8	44.90	QP	98	1.4	H	-16	28.90	43.5	14.60
4824.0	45.24	PK	243	1.3	H	12.40	57.64	74	16.36
9648.0	34.23	PK	122	1.4	V	19.29	53.52	74	20.48
7236.0	36.57	PK	32	1.3	V	16.62	53.19	74	20.81
2493.4	20.35	Ave.	112	1.3	V	7.21	27.56	54	26.44
2376.2	20.15	Ave.	108	1.5	H	6.13	26.28	54	27.72
2493.4	36.74	PK	112	1.3	V	7.21	43.95	74	30.05
2376.2	35.67	PK	108	1.5	H	6.13	41.80	74	32.20
Middle Channel (2437 MHz)									
2437.0	86.59	PK	19	1.3	H	7.21	93.80	/	/
2437.0	74.08	Ave.	19	1.3	H	7.21	81.29	/	/
2437.0	103.54	PK	69	1.3	V	7.21	110.75	/	/
2437.0	89.21	Ave.	69	1.3	V	7.21	96.42	/	/
4874.0	32.43	Ave.	18	1.4	V	12.46	44.89	54	9.11
9748.0	21.93	Ave.	219	1.2	H	19.40	41.33	54	12.67
175.8	46.21	QP	152	1.3	H	-16	30.21	43.5	13.29
7311.0	23.25	Ave.	186	1.2	V	16.49	39.74	54	14.26
4874.0	45.68	PK	18	1.4	V	12.46	58.14	74	15.86
9748.0	35.19	PK	219	1.2	H	19.40	54.59	74	19.41
7311.0	36.84	PK	186	1.2	V	16.49	53.33	74	20.67
2492.8	21.56	Ave.	289	1.5	H	7.21	28.77	54	25.23
2484.0	19.43	Ave.	17	1.4	H	7.21	26.64	54	27.36
2362.84	19.38	Ave.	227	1.3	V	5.48	24.86	54	29.14
2492.8	36.39	PK	289	1.5	H	7.21	43.60	74	30.40
2484.0	35.27	PK	17	1.4	H	7.21	42.48	74	31.52
2362.84	35.24	PK	227	1.3	V	5.48	40.72	74	33.28

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
2462.0	103.06	PK	232	1.3	V	7.21	110.27	/	/
2462.0	87.63	Ave.	232	1.3	V	7.21	94.84	/	/
2462.0	89.37	PK	180	1.4	H	7.21	96.58	/	/
2462.0	72.30	Ave.	180	1.4	H	7.21	79.51	/	/
2485.1	58.67	PK	234	1.2	V	7.21	65.88	74	8.12
2485.1	38.10	Ave.	234	1.2	V	7.21	45.31	54	8.69
2492.0	37.71	Ave.	357	1.5	V	7.21	44.92	54	9.08
4912.0	32.26	Ave.	285	1.2	V	12.46	44.72	54	9.28
2492.0	57.32	PK	357	1.5	V	7.21	64.53	74	9.47
175.8	49.21	QP	27	1.2	H	-16	33.21	43.5	10.29
7386.0	27.34	Ave.	2	1.3	H	15.91	43.25	54	10.75
4912.0	50.64	PK	285	1.2	V	12.46	63.10	74	10.90
9848.0	22.23	Ave.	15	1.4	V	19.39	41.62	54	12.38
7386.0	39.64	PK	2	1.3	H	15.91	55.55	74	18.45
9848.0	35.26	PK	15	1.4	V	19.39	54.65	74	19.35
2362.8	20.03	Ave.	287	1.2	H	5.48	25.51	54	28.49
2362.8	35.21	PK	287	1.2	H	5.48	40.69	74	33.31

802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
2412.0	86.50	PK	118	1.5	H	6.13	92.63	/	/
2412.0	71.96	Ave.	118	1.5	H	6.13	78.09	/	/
2412.0	100.78	PK	281	1.2	V	6.13	106.91	/	/
2412.0	86.36	Ave.	281	1.2	V	6.13	92.49	/	/
2387.6	42.38	Ave.	191	1.4	V	6.13	48.51	54	5.49
4824.0	33.63	Ave.	17	1.4	V	12.40	46.03	54	7.97
2387.6	57.86	PK	191	1.4	V	6.13	63.99	74	10.01
7236.0	25.42	Ave.	129	1.5	V	16.62	42.04	54	11.96
175.8	45.50	QP	210	1.1	H	-16	29.50	43.5	14.00
9648.0	20.22	Ave.	178	1.4	H	19.29	39.51	54	14.49
4824.0	43.27	PK	17	1.4	V	12.40	55.67	74	18.33
7236.0	38.65	PK	129	1.5	V	16.62	55.27	74	18.73
9648.0	34.18	PK	178	1.4	H	19.29	53.47	74	20.53
2490.8	21.39	Ave.	207	1.5	H	7.21	28.60	54	25.40
2376.8	20.35	Ave.	286	1.5	H	6.13	26.48	54	27.52
2490.8	36.27	PK	207	1.5	H	7.21	43.48	74	30.52
2376.8	35.27	PK	286	1.5	H	6.13	41.40	74	32.60
Middle Channel (2437 MHz)									
2437.0	87.62	PK	357	1.5	H	7.21	94.83	/	/
2437.0	72.35	Ave.	357	1.5	H	7.21	79.56	/	/
2437.0	102.24	PK	8	1.5	V	7.21	109.45	/	/
2437.0	88.17	Ave.	8	1.5	V	7.21	95.38	/	/
4874.0	33.76	Ave.	301	1.4	V	12.46	46.22	54	7.78
7311.0	26.11	Ave.	54	1.2	V	16.49	42.60	54	11.40
9748.0	22.75	Ave.	51	1.4	H	19.40	42.15	54	11.85
175.8	47.35	QP	12	1.0	H	-16	31.35	43.5	12.15
4874.0	45.98	PK	301	1.4	V	12.46	58.44	74	15.56
7311.0	39.26	PK	54	1.2	V	16.49	55.75	74	18.25
9748.0	35.62	PK	51	1.4	H	19.40	55.02	74	18.98
2490.3	20.26	Ave.	202	1.2	H	7.21	27.47	54	26.53
2485.2	20.03	Ave.	19	1.2	H	7.21	27.24	54	26.76
2368.9	20.34	Ave.	28	1.4	V	5.48	25.82	54	28.18
2485.2	35.21	PK	19	1.2	H	7.21	42.42	74	31.58
2490.3	35.18	PK	202	1.2	H	7.21	42.39	74	31.61
2368.9	35.17	PK	28	1.4	V	5.48	40.65	74	33.35

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBuV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBuV/m)	Margin (dB)
High Channel (2462 MHz)									
2462.0	86.32	PK	62	1.5	H	7.21	93.53	/	/
2462.0	72.40	Ave.	62	1.5	H	7.21	79.61	/	/
2462.0	101.35	PK	127	1.3	V	7.21	108.56	/	/
2462.0	87.51	Ave.	127	1.3	V	7.21	94.72	/	/
2485.5	39.37	Ave.	110	1.4	V	7.21	46.58	54	7.42
4912.0	32.39	Ave.	348	1.2	H	12.46	45.70	54	8.30
2492.0	38.26	Ave.	28	1.5	V	7.21	45.47	54	8.53
2485.5	55.38	PK	110	1.4	V	7.21	62.59	74	11.41
175.8	47.15	QP	144	1.0	H	-16	31.15	43.5	12.35
2492.0	54.26	PK	28	1.5	V	7.21	61.47	74	12.53
7386.0	25.37	Ave.	297	1.5	H	15.91	41.28	54	12.72
9848.0	21.66	Ave.	48	1.4	V	19.39	41.05	54	12.95
4912.0	46.60	PK	348	1.2	H	12.46	59.08	74	14.92
7386.0	38.26	PK	297	1.5	H	15.91	54.17	74	19.83
9848.0	34.28	PK	48	1.4	V	19.39	53.67	74	20.33
2362.8	20.24	Ave.	6	1.3	H	5.48	25.72	54	28.28
2362.8	35.24	PK	6	1.3	H	5.48	40.72	74	33.28

802.11n-HT40 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2422 MHz)									
2422.0	84.62	PK	239	1.3	H	6.13	90.75	/	/
2422.0	72.20	Ave.	239	1.3	H	6.13	78.33	/	/
2422.0	97.81	PK	119	1.4	V	6.13	103.94	/	/
2422.0	85.53	Ave.	119	1.4	V	6.13	91.66	/	/
2386.8	42.18	Ave.	74	1.4	V	6.13	48.31	54	5.69
4844.0	34.20	Ave.	189	1.5	H	12.40	46.60	54	7.40
2386.8	59.01	PK	74	1.4	V	6.13	65.14	74	8.86
175.8	47.20	QP	120	1.1	H	-16	31.20	43.5	12.30
9688.0	22.23	Ave.	234	1.4	V	19.29	41.52	54	12.48
7266.0	24.86	Ave.	235	1.5	V	16.62	41.48	54	12.52
4844.0	46.57	PK	189	1.5	H	12.40	58.97	74	15.03
7266.0	38.24	PK	235	1.5	V	16.62	54.86	74	19.14
9688.0	35.02	PK	234	1.4	V	19.29	54.31	74	19.69
2490.5	21.30	Ave.	346	1.3	H	7.21	28.51	54	25.49
2356.8	19.78	Ave.	11	1.4	H	5.48	25.26	54	28.74
2490.5	36.55	PK	346	1.3	H	7.21	43.76	74	30.24
2356.8	36.83	PK	11	1.4	H	5.48	42.31	74	31.69
Middle Channel (2437 MHz)									
2437.0	86.37	PK	356	1.5	H	7.21	93.58	/	/
2437.0	75.10	Ave.	356	1.5	H	7.21	82.31	/	/
2437.0	99.53	PK	357	1.3	V	7.21	106.74	/	/
2437.0	87.27	Ave.	357	1.3	V	7.21	94.48	/	/
4874.0	33.24	Ave.	45	1.3	V	12.46	45.70	54	8.30
9748.0	21.32	Ave.	10	1.5	H	19.40	40.72	54	13.28
175.8	46.04	QP	126	1.3	H	-16	30.04	43.5	13.41
7311.0	23.26	Ave.	96	1.3	V	16.49	39.75	54	14.25
4874.0	46.62	PK	45	1.3	V	12.46	59.08	74	14.92
9748.0	35.30	PK	10	1.5	H	19.40	54.70	74	19.30
7311.0	35.30	PK	96	1.3	V	16.49	51.79	74	22.21
2489.4	21.55	Ave.	216	1.2	H	7.21	28.76	54	25.24
2484.1	19.28	Ave.	167	1.3	H	7.21	26.49	54	27.51
2366.2	20.14	Ave.	51	1.4	V	5.48	25.62	54	28.38
2489.4	36.12	PK	216	1.2	H	7.21	43.33	74	30.67
2484.1	34.72	PK	167	1.3	H	7.21	41.93	74	32.07
2366.2	36.30	PK	51	1.4	V	5.48	41.78	74	32.22

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBuV/m)	FCC Part 15.247/205/209	
	Reading (dBuV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBuV/m)	Margin (dB)
High Channel (2452 MHz)									
2452.0	87.62	PK	119	1.2	H	7.21	94.83	/	/
2452.0	75.89	Ave.	119	1.2	H	7.21	83.10	/	/
2452.0	99.68	PK	75	1.5	V	7.21	106.89	/	/
2452.0	87.28	Ave.	75	1.5	V	7.21	94.49	/	/
4904.0	33.39	Ave.	286	1.5	V	12.46	45.85	54	8.15
2484.6	37.49	Ave.	138	1.4	V	7.21	44.70	54	9.30
2492.0	37.32	Ave.	202	1.4	V	7.21	44.53	54	9.47
2484.6	55.26	PK	138	1.4	V	7.21	62.47	74	11.53
175.8	47.34	QP	241	1.2	H	-16	31.34	43.5	12.16
7356.0	25.81	Ave.	59	1.4	H	15.91	41.72	54	12.28
2492.0	54.20	PK	202	1.4	V	7.21	61.41	74	12.59
9808.0	21.17	Ave.	341	1.3	V	19.29	40.46	54	13.54
4904.0	46.60	PK	286	1.5	V	12.46	59.06	74	14.94
7356.0	39.60	PK	59	1.4	H	15.91	55.51	74	18.49
9808.0	35.31	PK	341	1.3	V	19.29	54.60	74	19.40
2362.7	20.32	Ave.	321	1.3	H	5.48	25.80	54	28.20
2362.7	35.62	PK	321	1.3	H	5.48	41.10	74	32.90

Note:

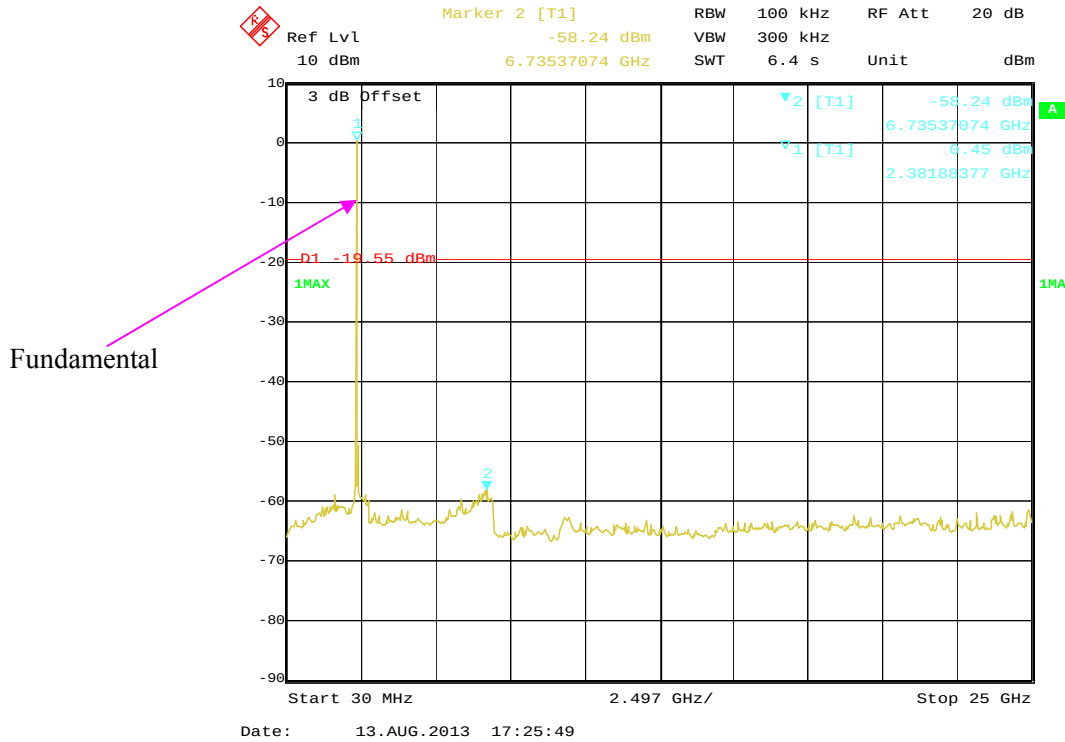
Corrected Amplitude = Corrected Factor + Reading

Corrected Factor=Antenna factor (RX) +cable loss – amplifier factor

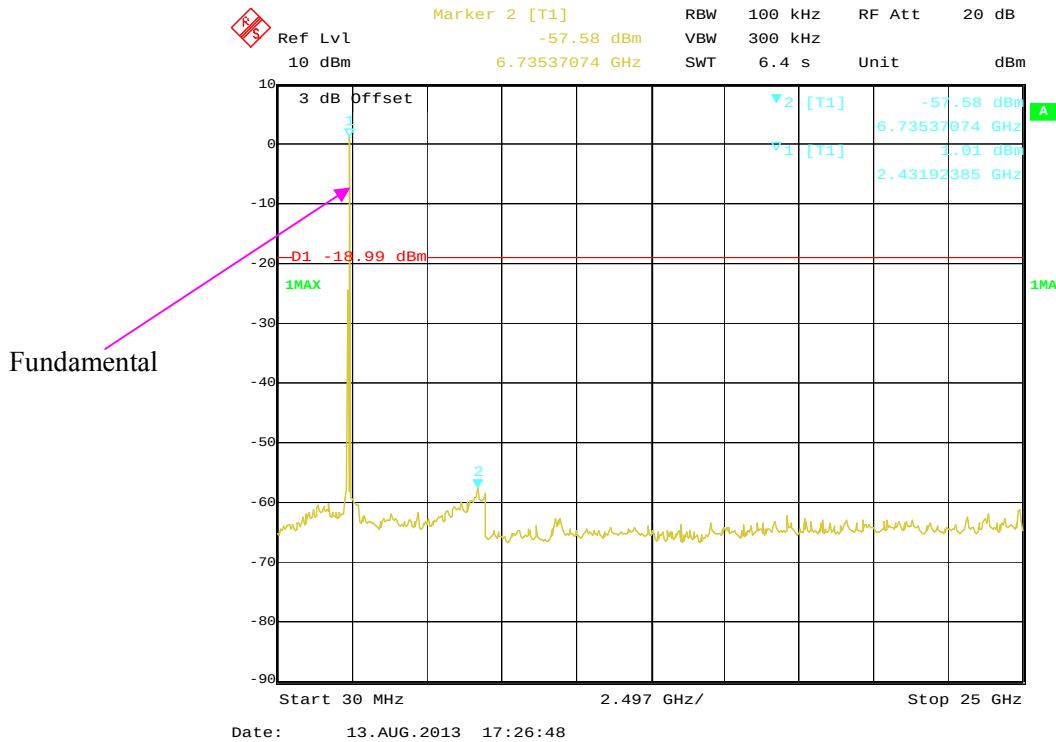
Margin = Limit- Corr. Amplitude

Conducted Spurious Emissions at Antenna Port:

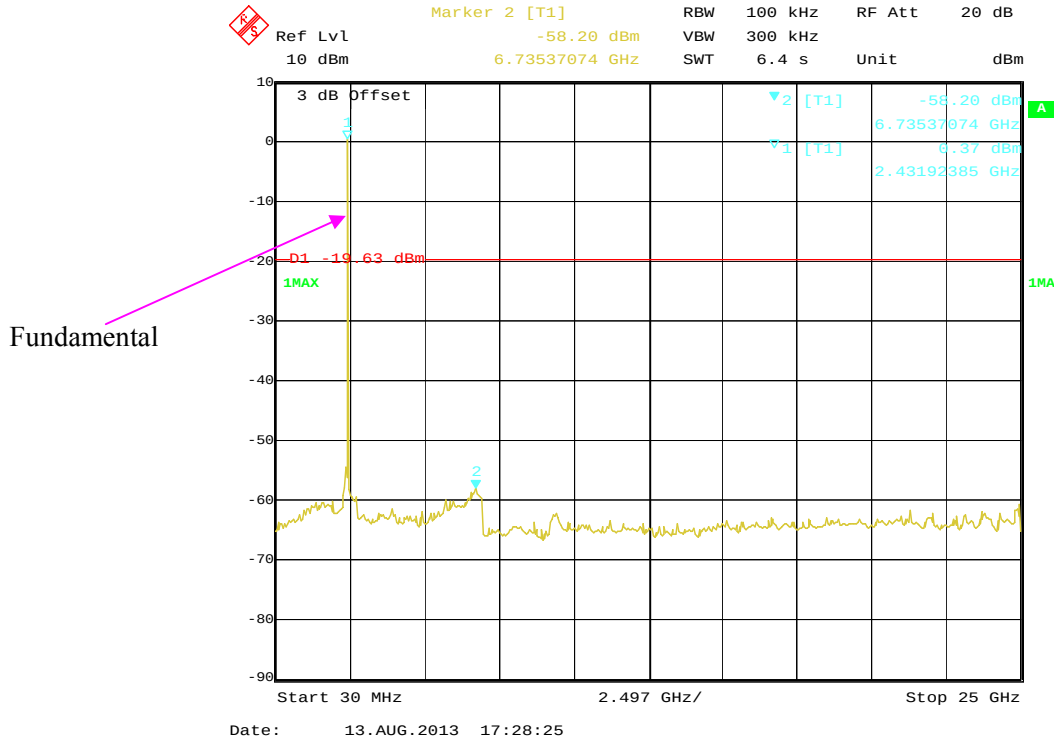
802.11b Low Channel, Antenna 0



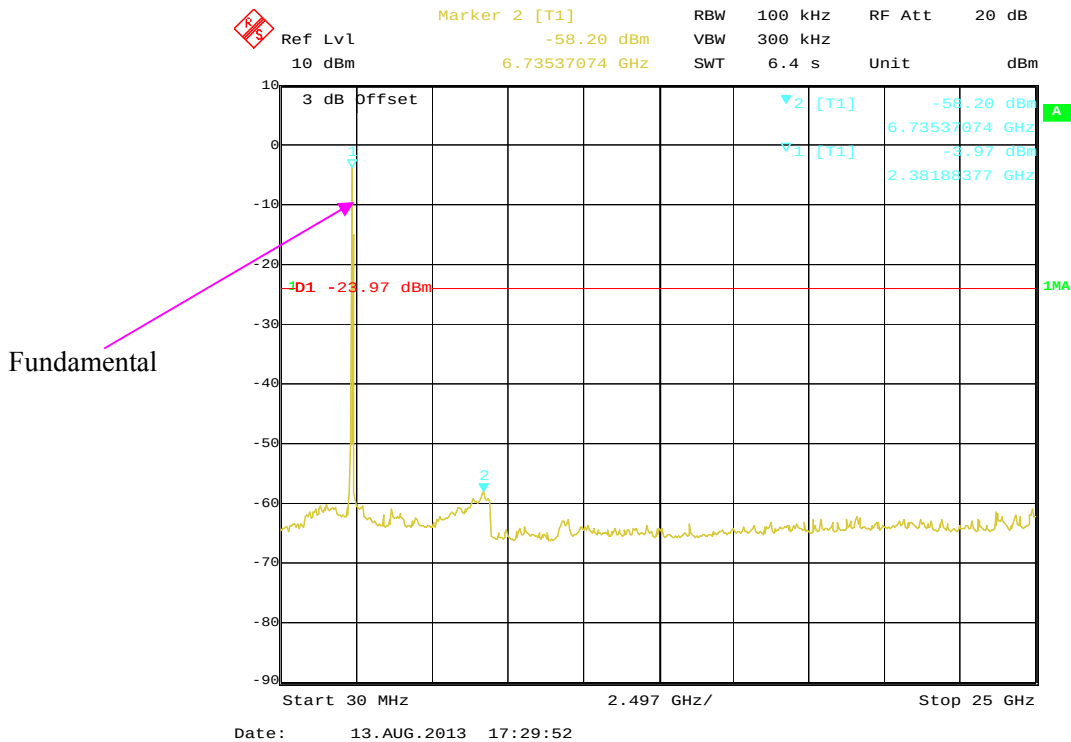
802.11b Middle Channel, Antenna 0



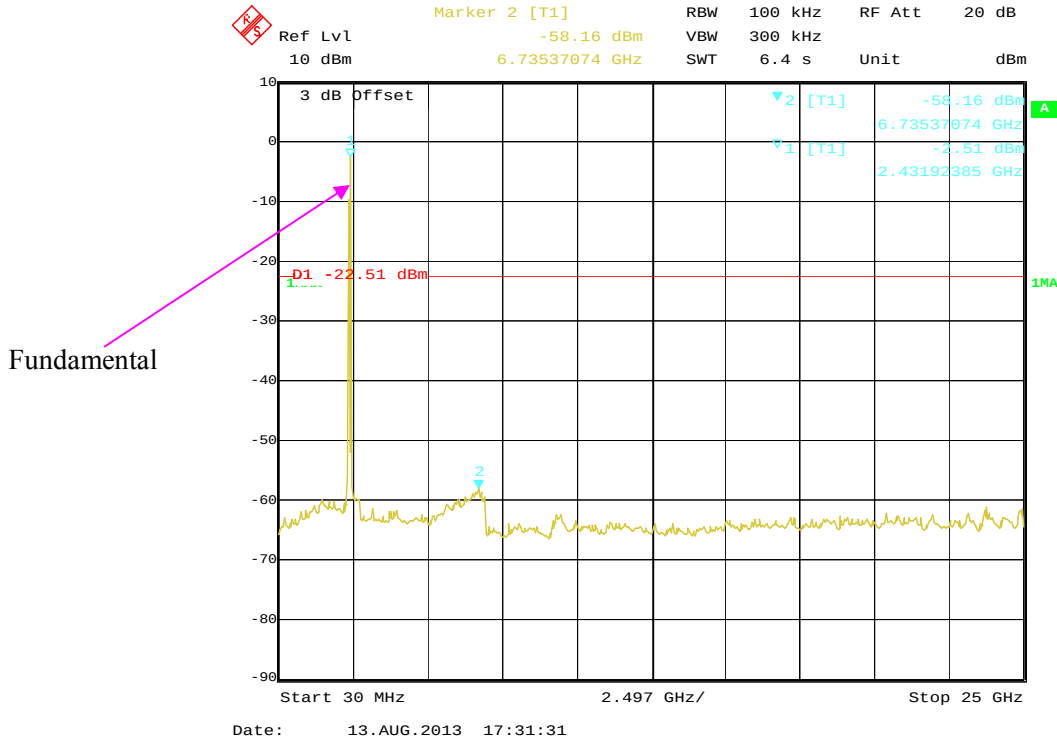
802.11b High Channel, Antenna 0



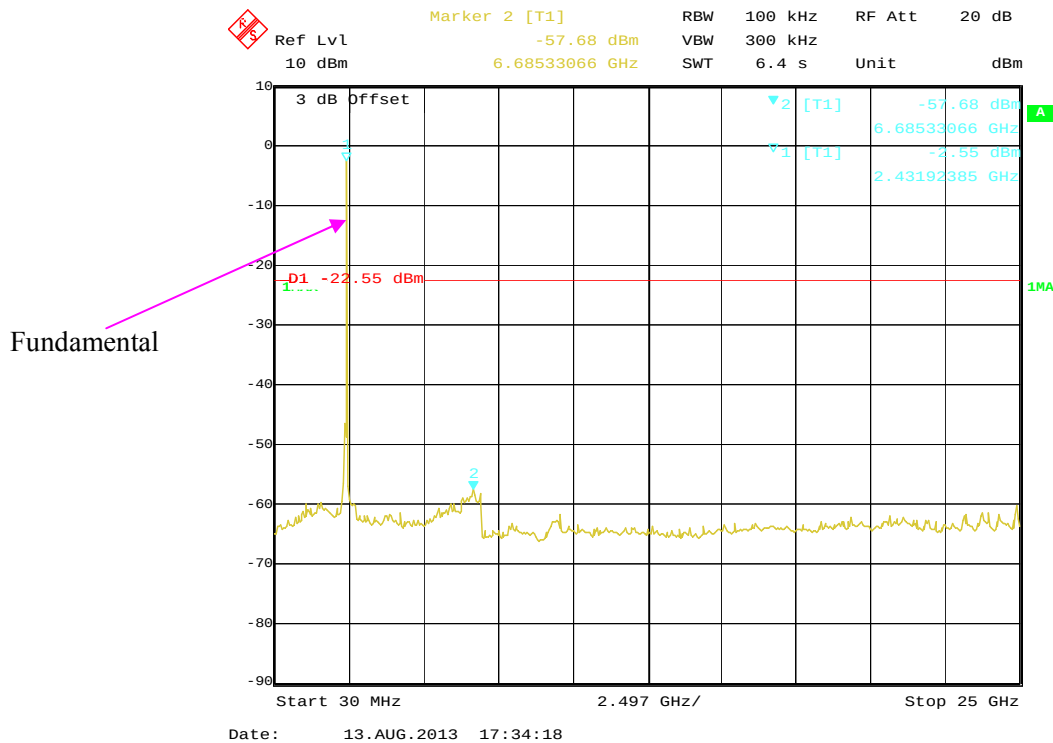
802.11g Low Channel, Antenna 0



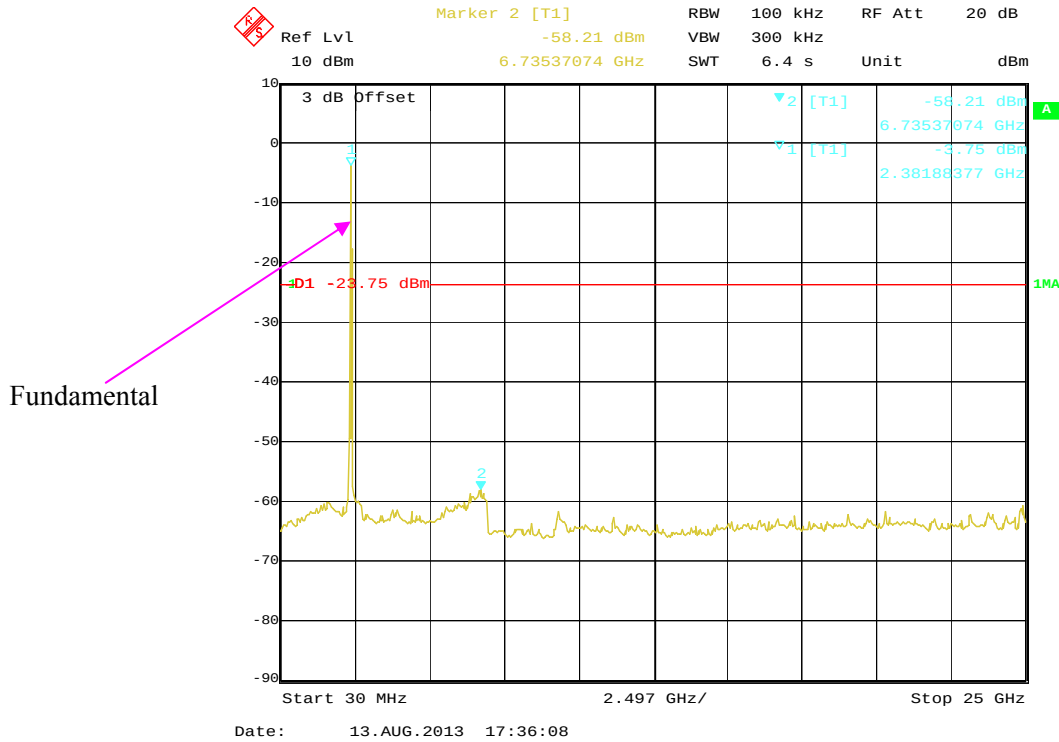
802.11g Middle Channel, Antenna 0



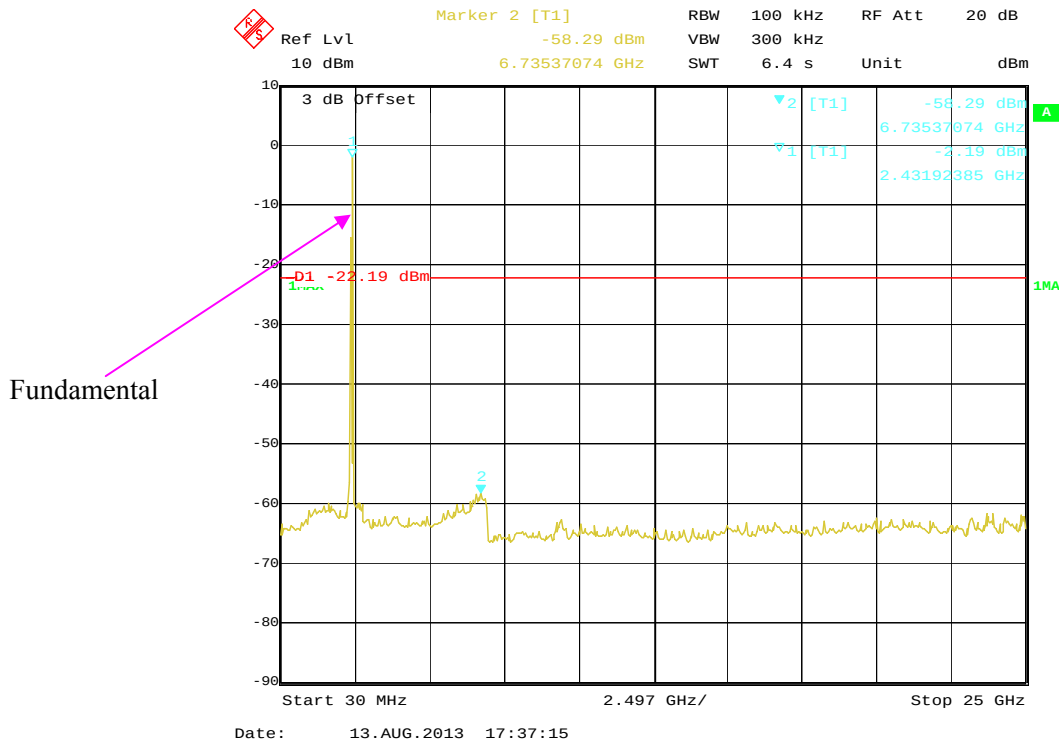
802.11g High Channel, Antenna 0



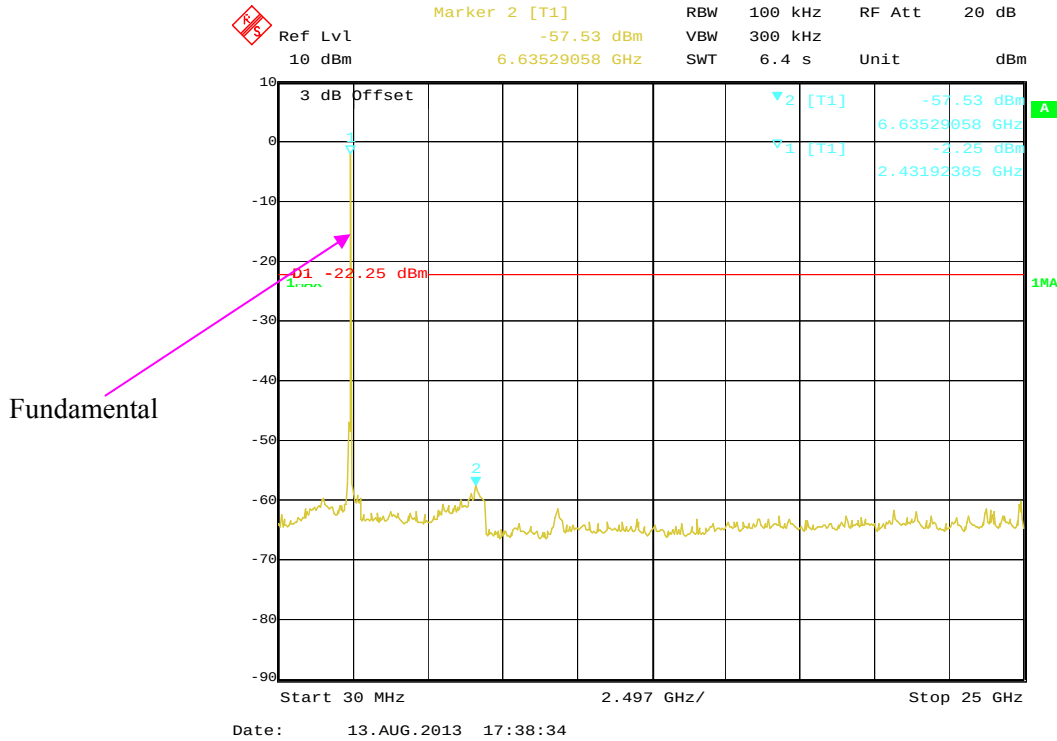
802.11n-HT20 Low Channel, Antenna 0



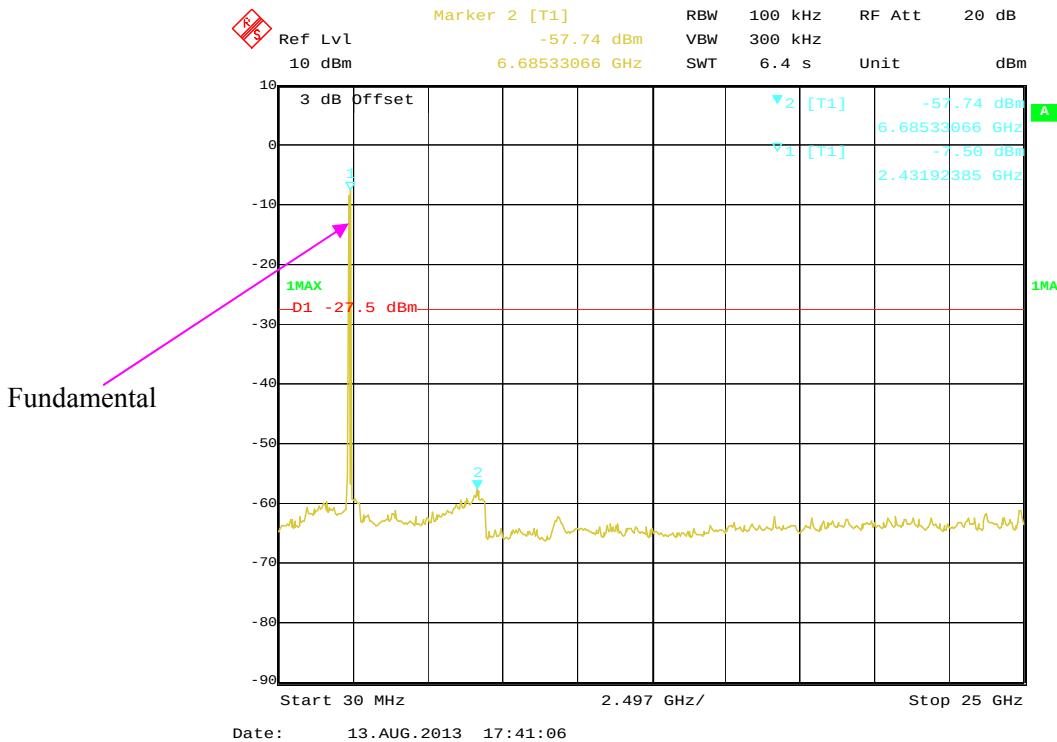
802.11n-HT20 Middle Channel, Antenna 0



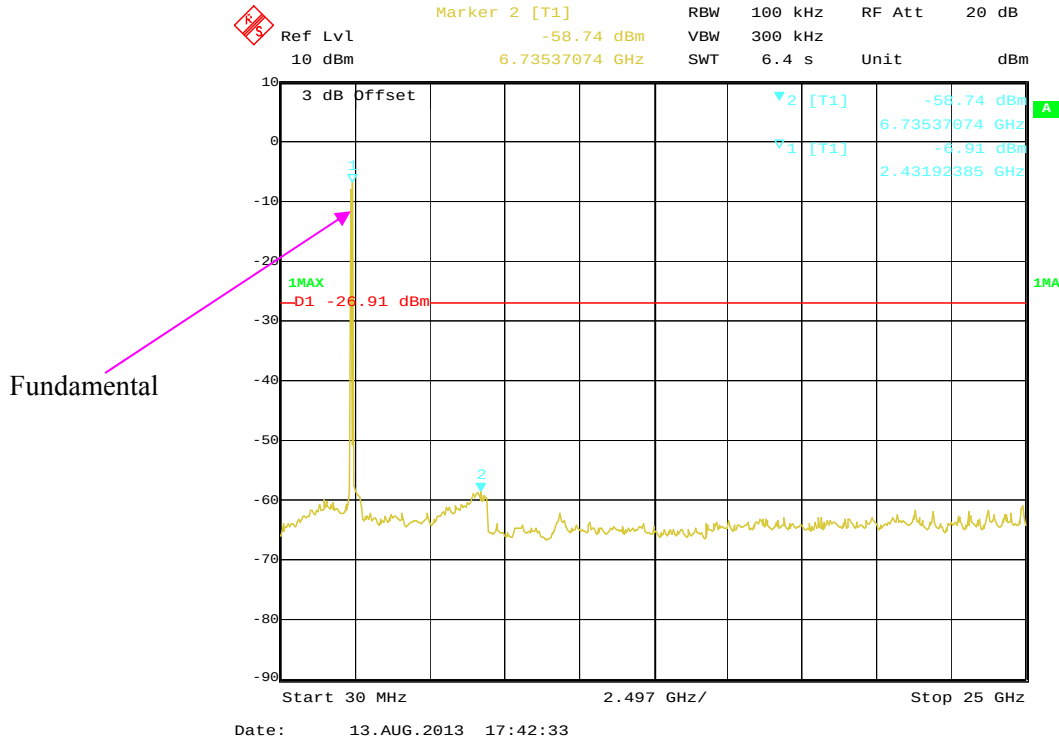
802.11n-HT20 High Channel, Antenna 0



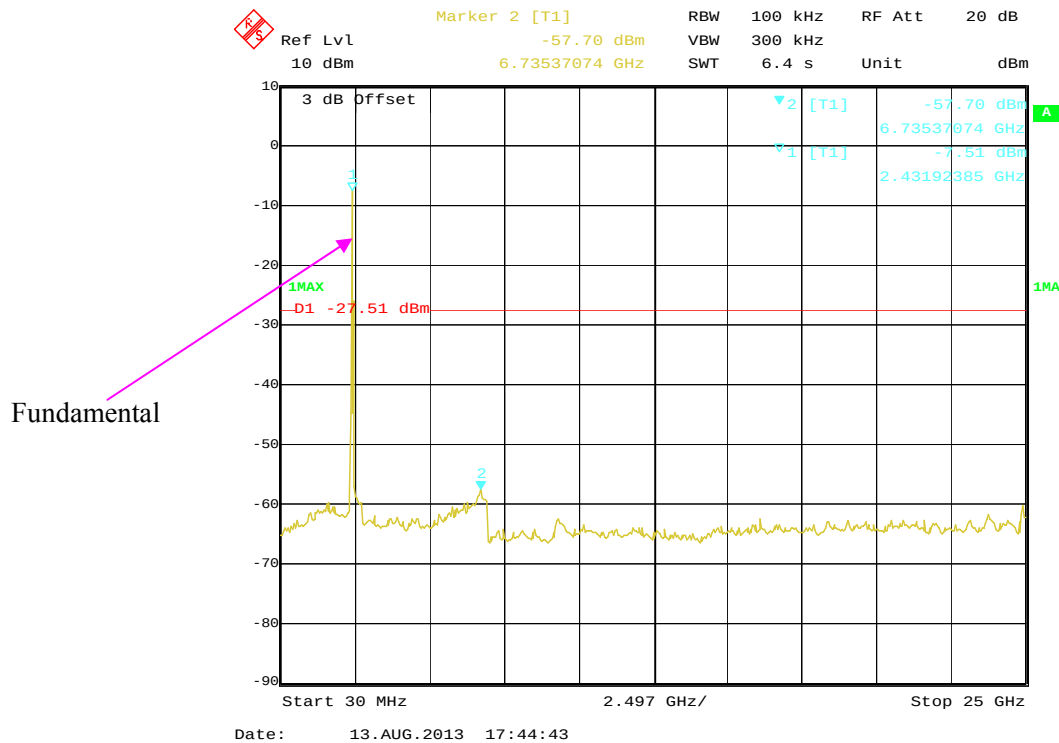
802.11n-HT40 Low Channel, Antenna 0



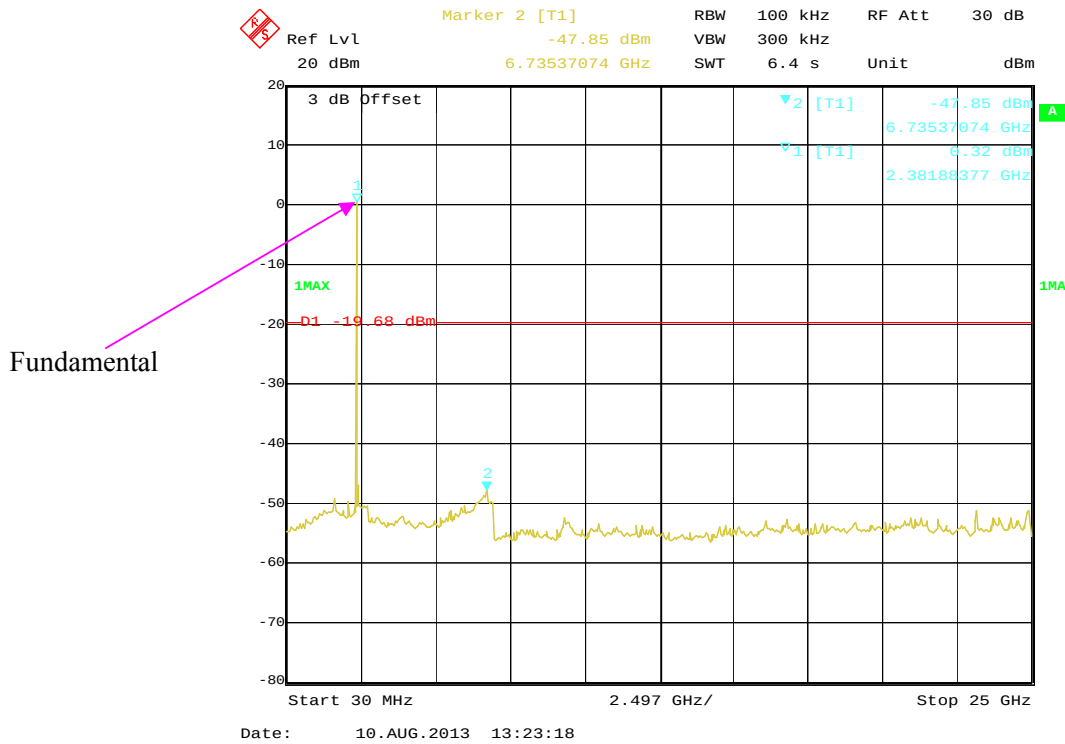
802.11n-HT40 Middle Channel, Antenna 0



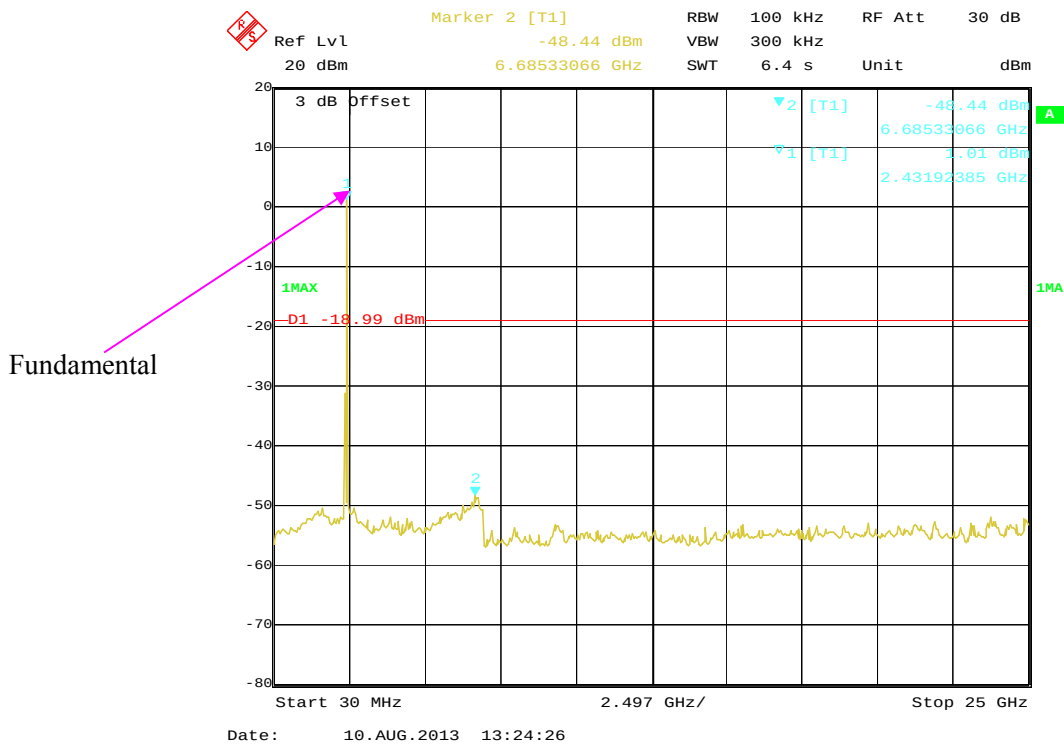
802.11n-HT40 High Channel, Antenna 0



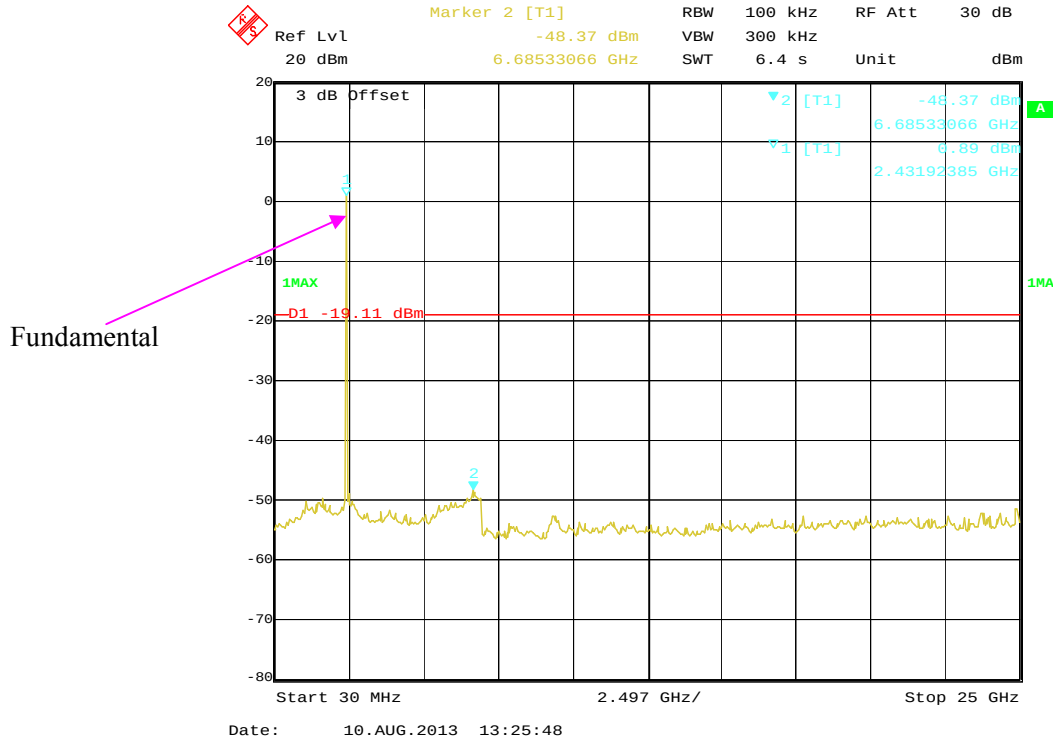
802.11b Low Channel, Antenna 1



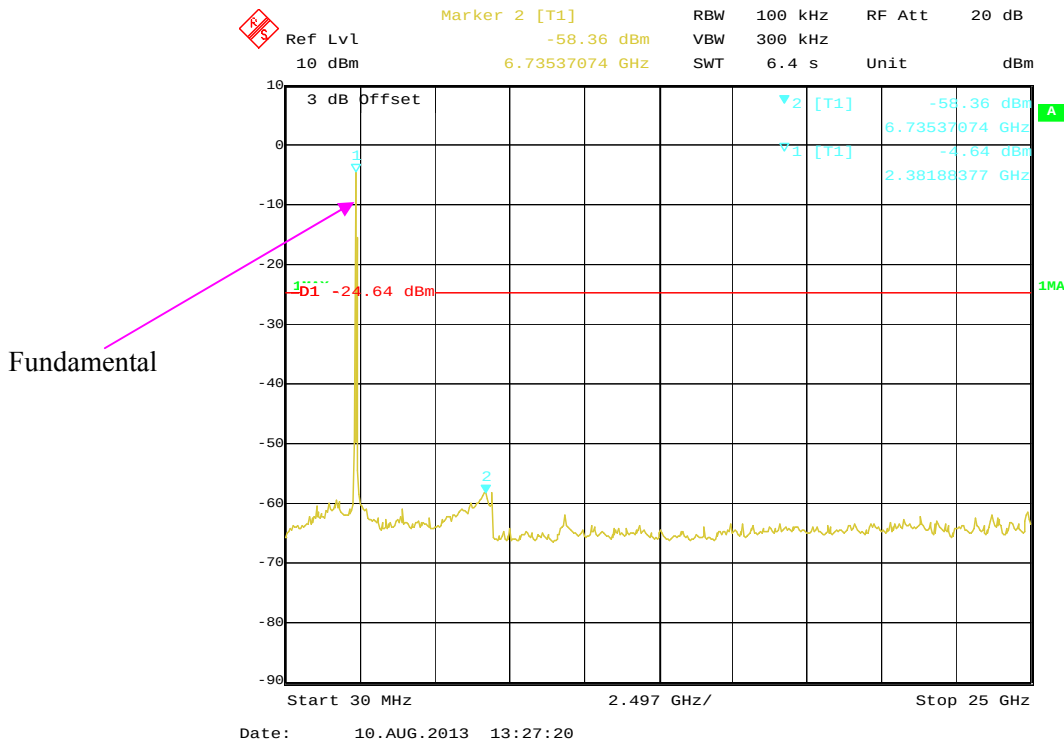
802.11b Middle Channel, Antenna 1



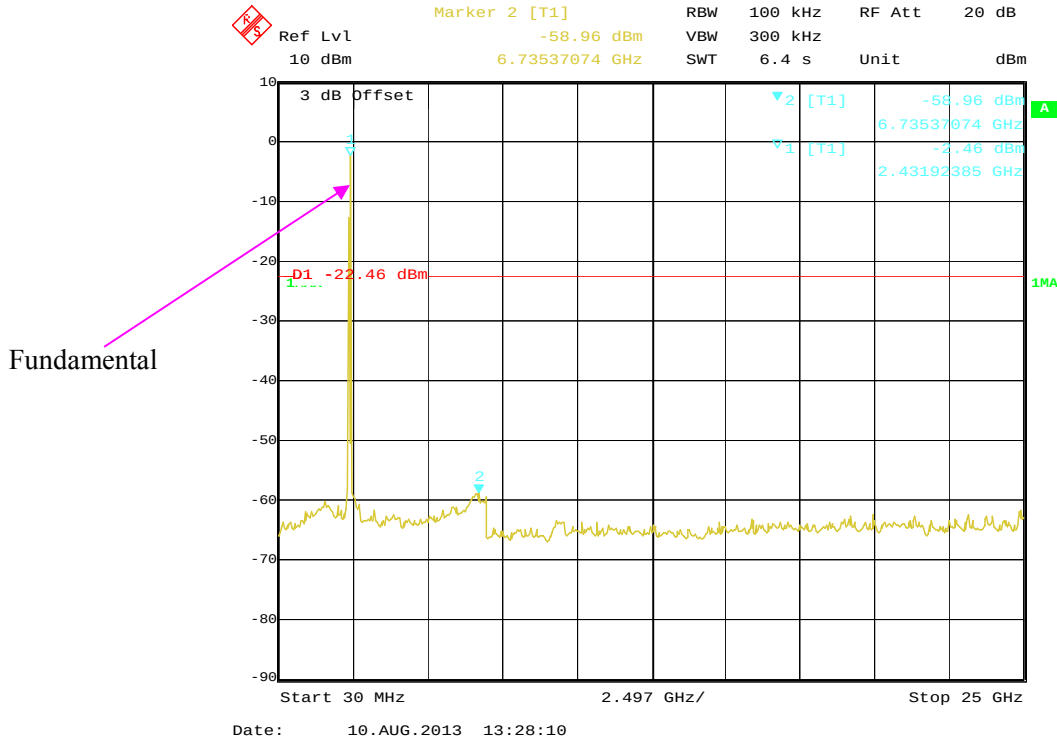
802.11b High Channel, Antenna 1



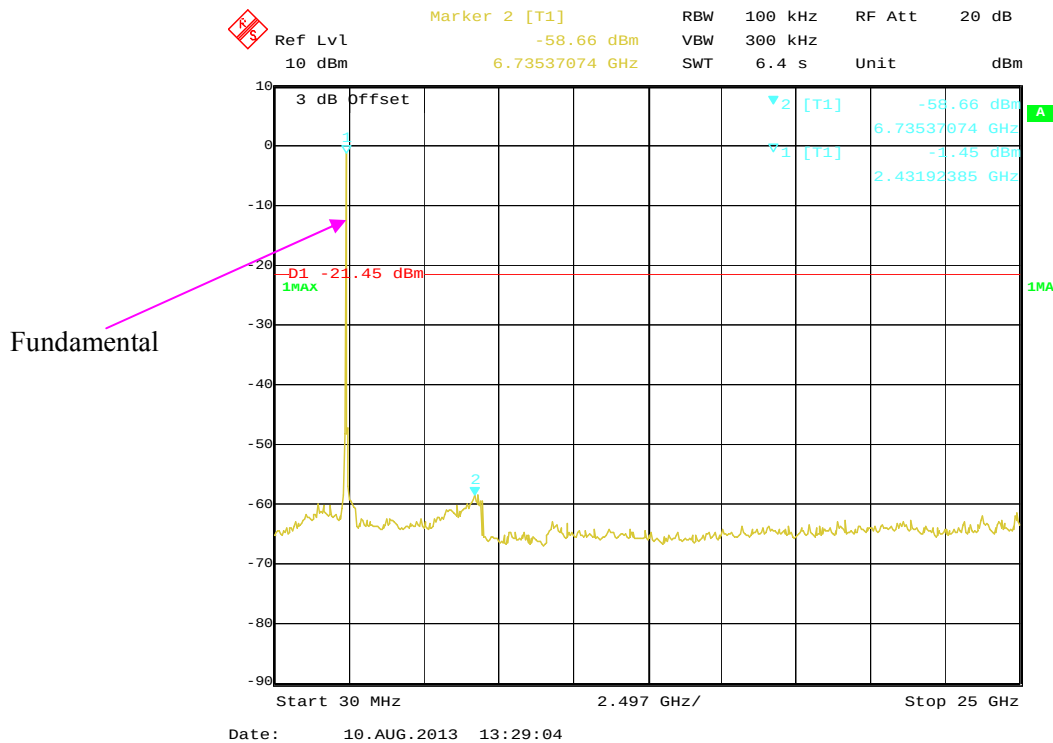
802.11g Low Channel, Antenna 1



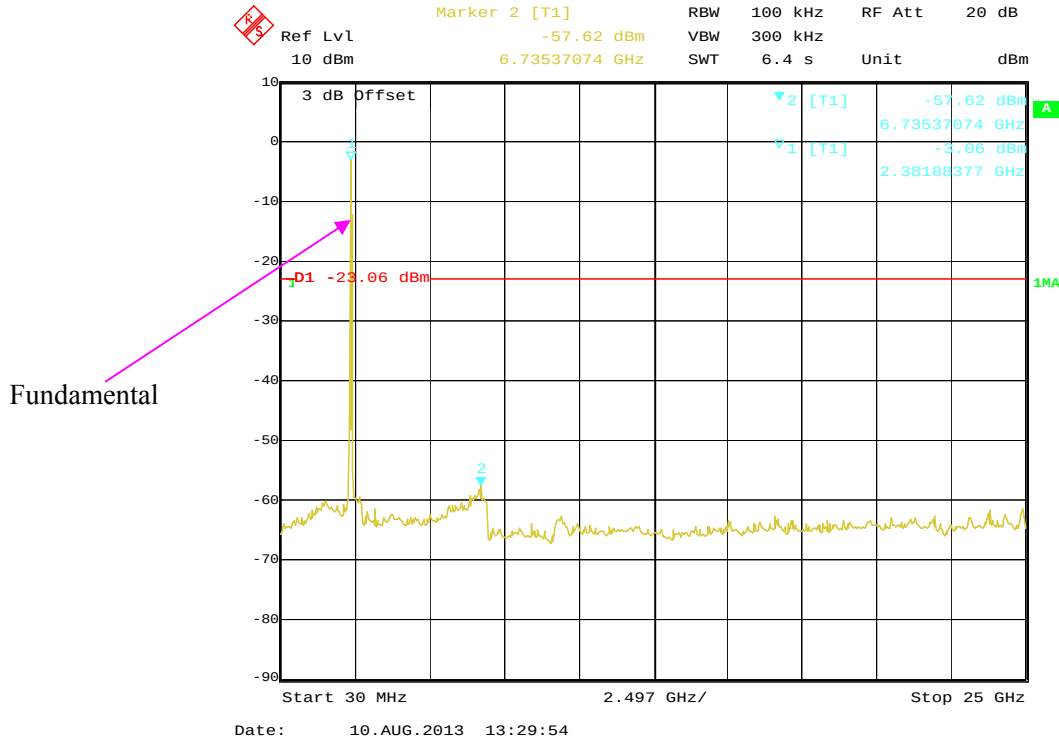
802.11g Middle Channel, Antenna 1



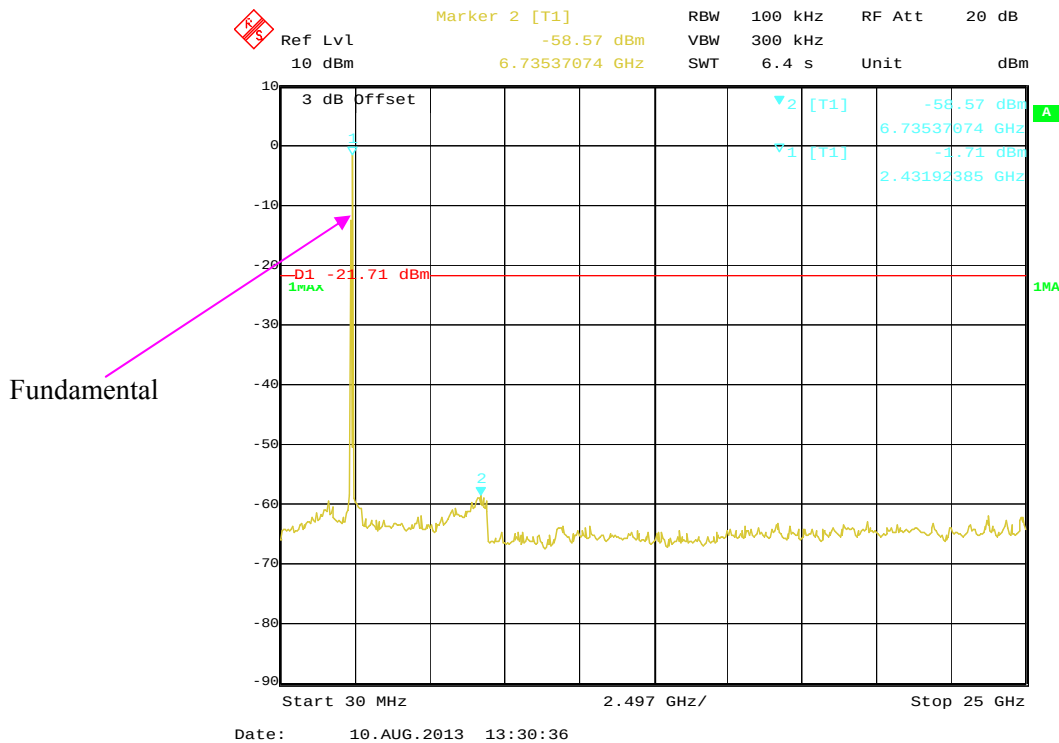
802.11g High Channel, Antenna 1



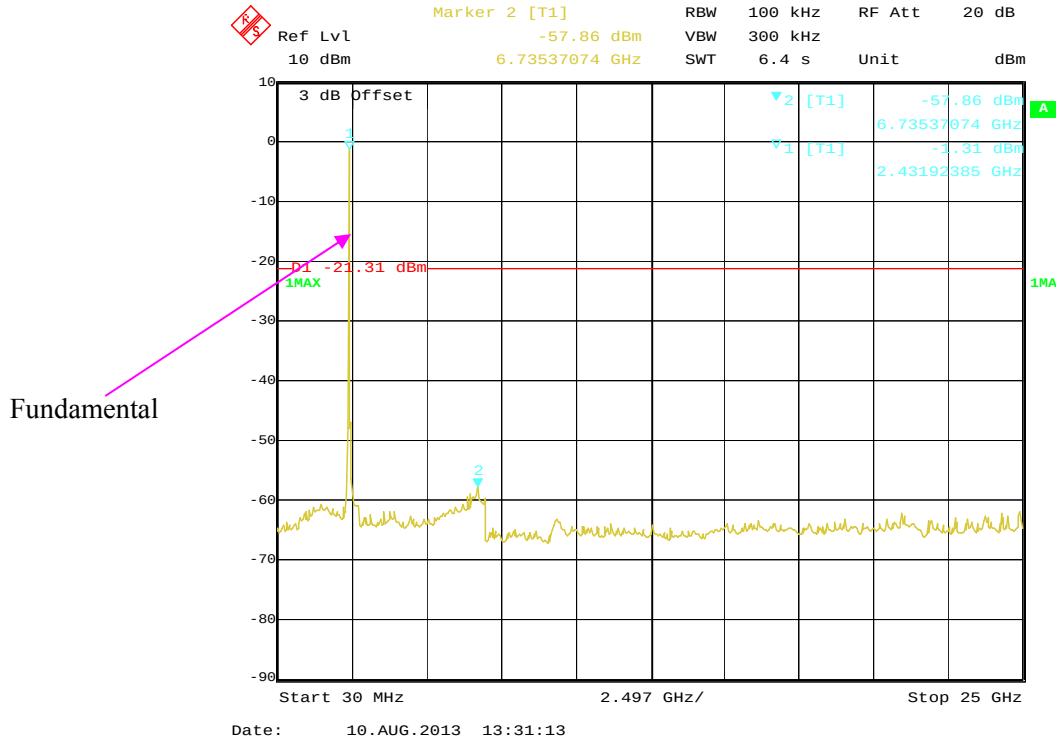
802.11n-HT20 Low Channel, Antenna 1



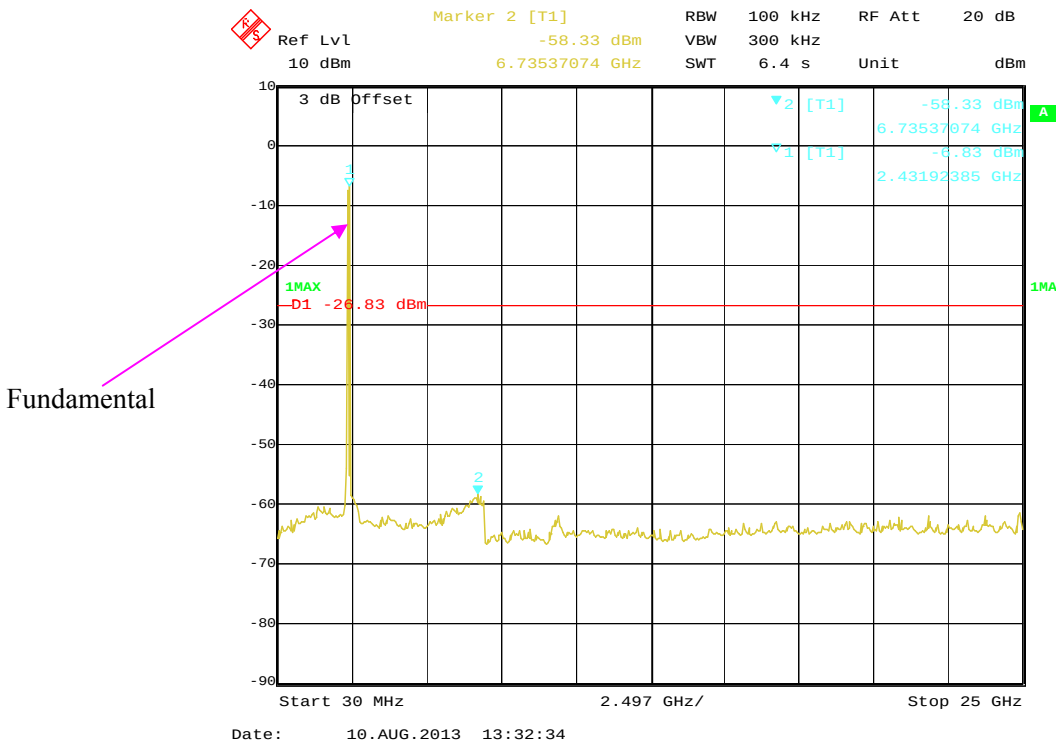
802.11n-HT20 Middle Channel, Antenna 1



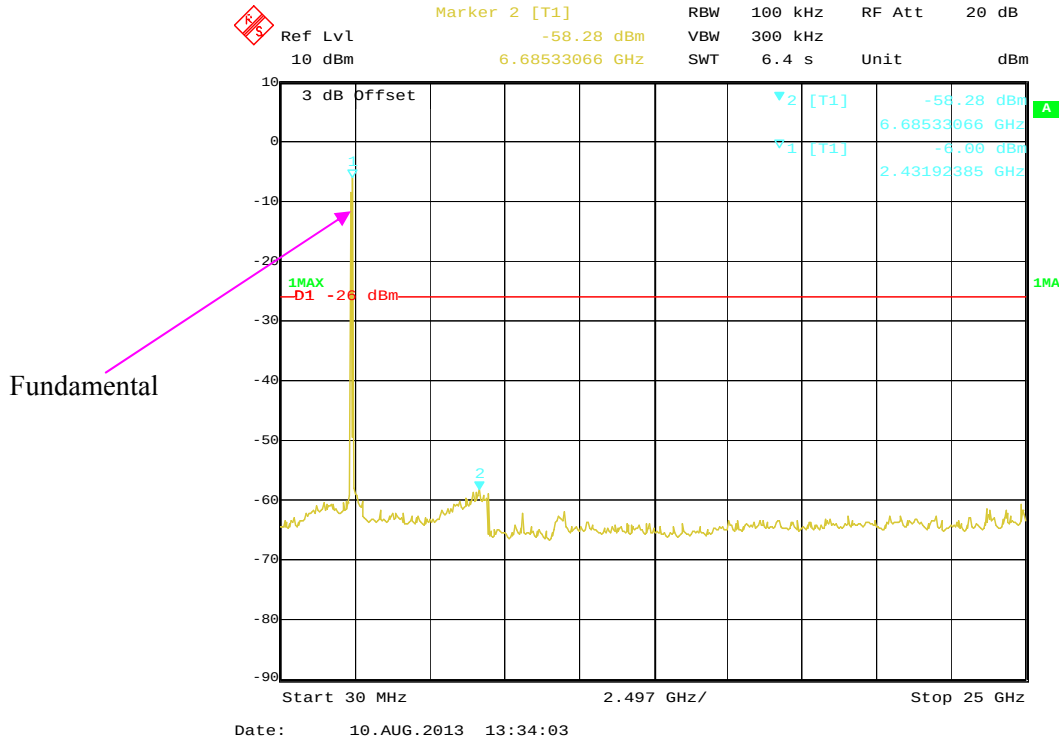
802.11n-HT20 High Channel, Antenna 1



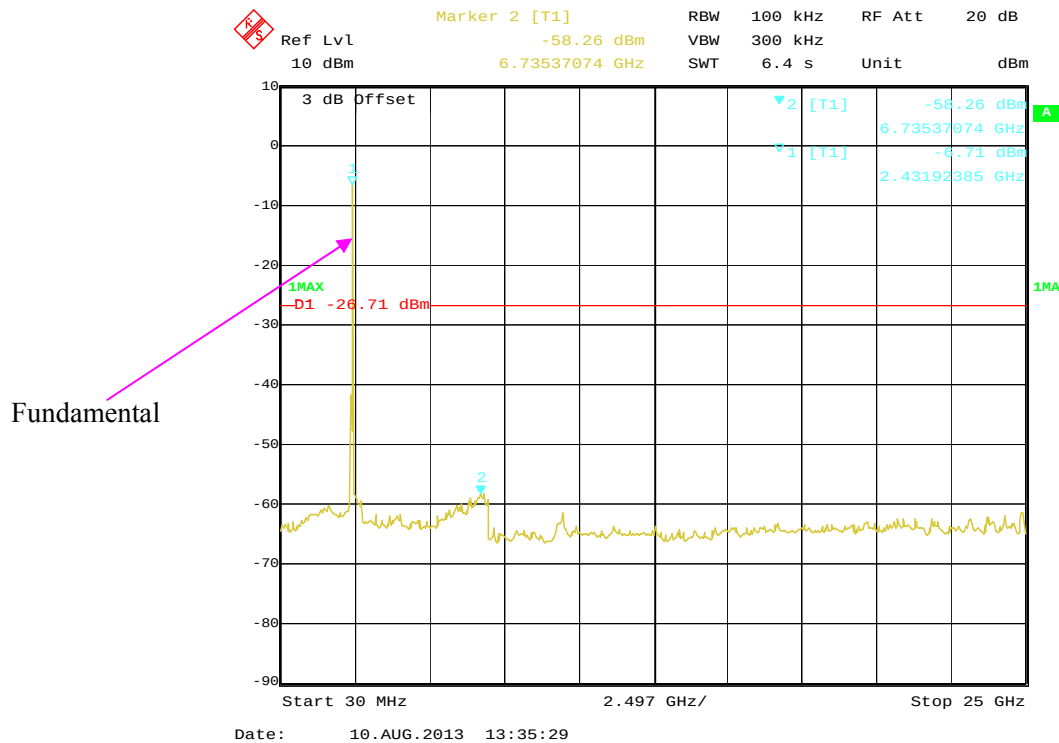
802.11n-HT40 Low Channel, Antenna 1



802.11n-HT40 Middle Channel, Antenna 1



802.11n-HT40 High Channel, Antenna 1



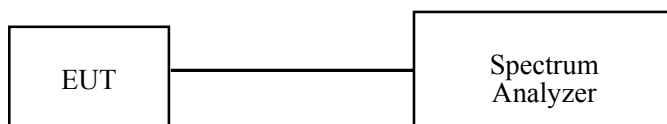
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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 emission 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	21 ~ 26 °C
Relative Humidity:	50 ~ 56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2013-08-06 and 2013-08-13.

Test Mode: Transmitting

Test Result: Pass.

Please refer to the following tables and plots.

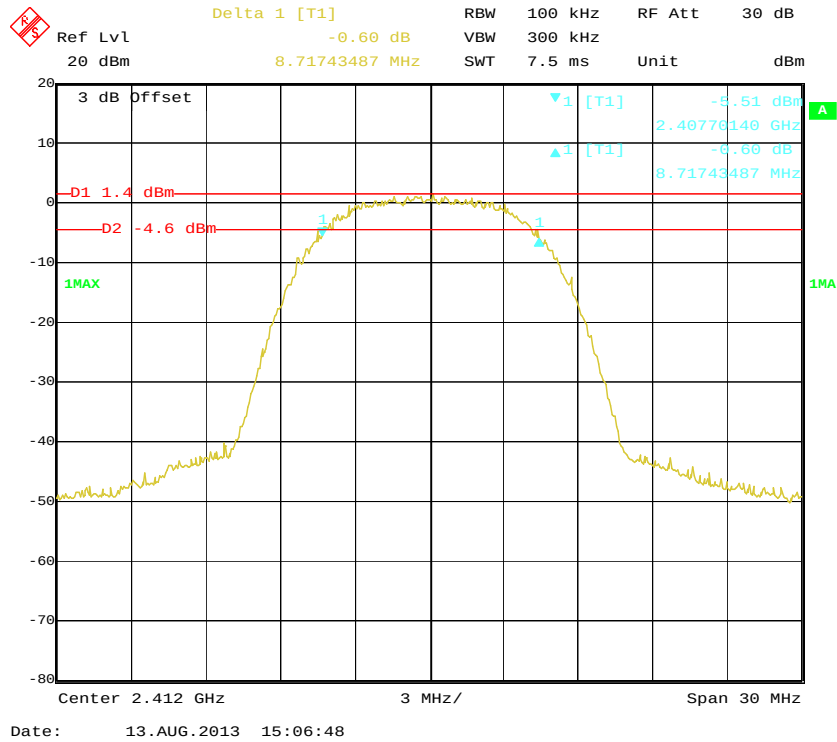
Antenna 0:

Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Emissions Bandwidth (MHz)	Limit (MHz)
802.11b mode				
Low	2412	1	8.72	>0.5
Middle	2437	1	8.72	>0.5
High	2462	1	8.72	>0.5
802.11g mode				
Low	2412	6	15.27	>0.5
Middle	2437	6	15.27	>0.5
High	2462	6	15.27	>0.5
802.11n-HT20 mode				
Low	2412	MCS0	16.47	>0.5
Middle	2437	MCS0	16.47	>0.5
High	2462	MCS0	16.47	>0.5
802.11n-HT40 mode				
Low	2422	MCS0	36.56	>0.5
Middle	2437	MCS0	36.56	>0.5
High	2452	MCS0	36.56	>0.5

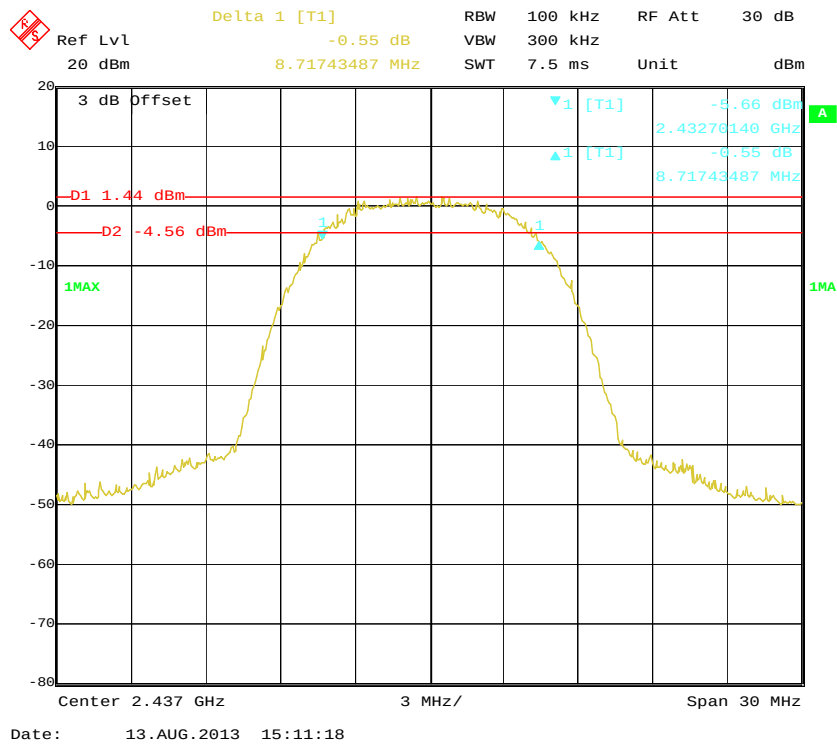
Antenna 1:

Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Emissions Bandwidth (MHz)	Limit (MHz)
802.11b mode				
Low	2412	1	8.36	>0.5
Middle	2437	1	8.36	>0.5
High	2462	1	8.36	>0.5
802.11g mode				
Low	2412	6	15.27	>0.5
Middle	2437	6	15.27	>0.5
High	2462	6	15.27	>0.5
802.11n-HT20 mode				
Low	2412	MCS0	17.37	>0.5
Middle	2437	MCS0	17.37	>0.5
High	2462	MCS0	17.37	>0.5
802.11n-HT40 mode				
Low	2422	MCS0	36.52	>0.5
Middle	2437	MCS0	36.52	>0.5
High	2452	MCS0	36.52	>0.5

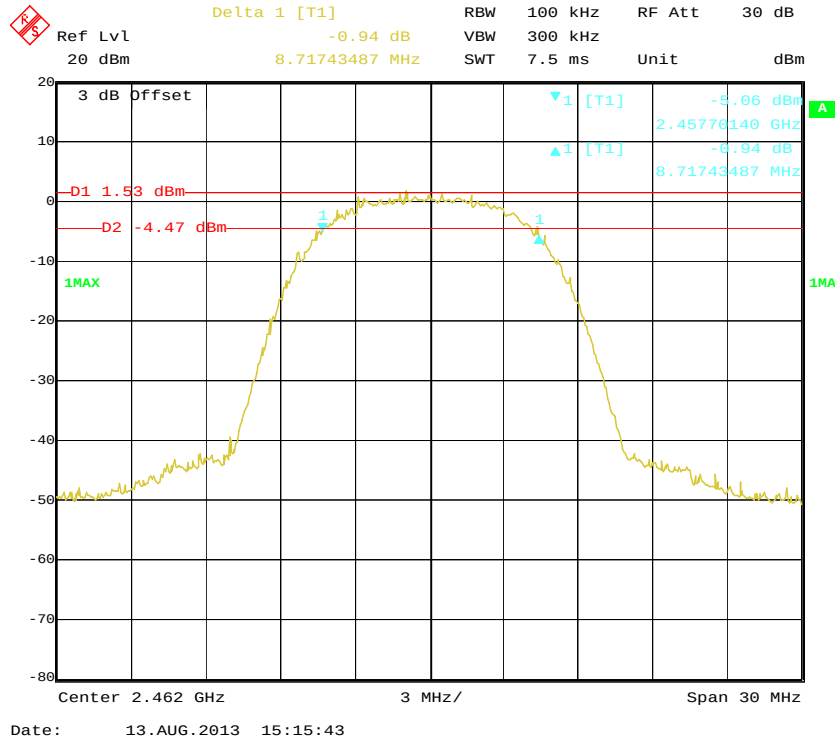
802.11b Low Channel, Antenna 0



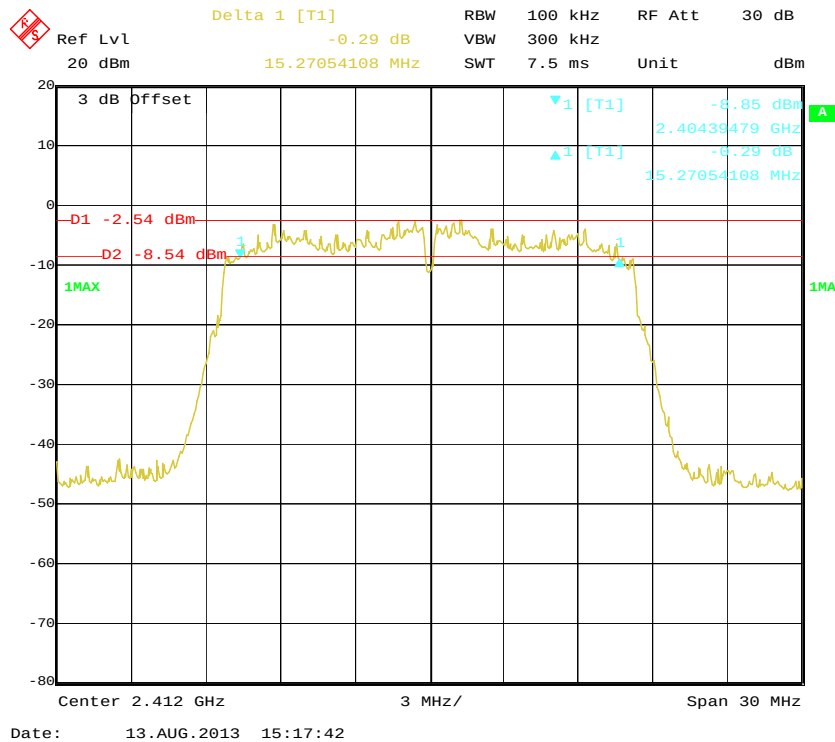
802.11b Middle Channel, Antenna 0



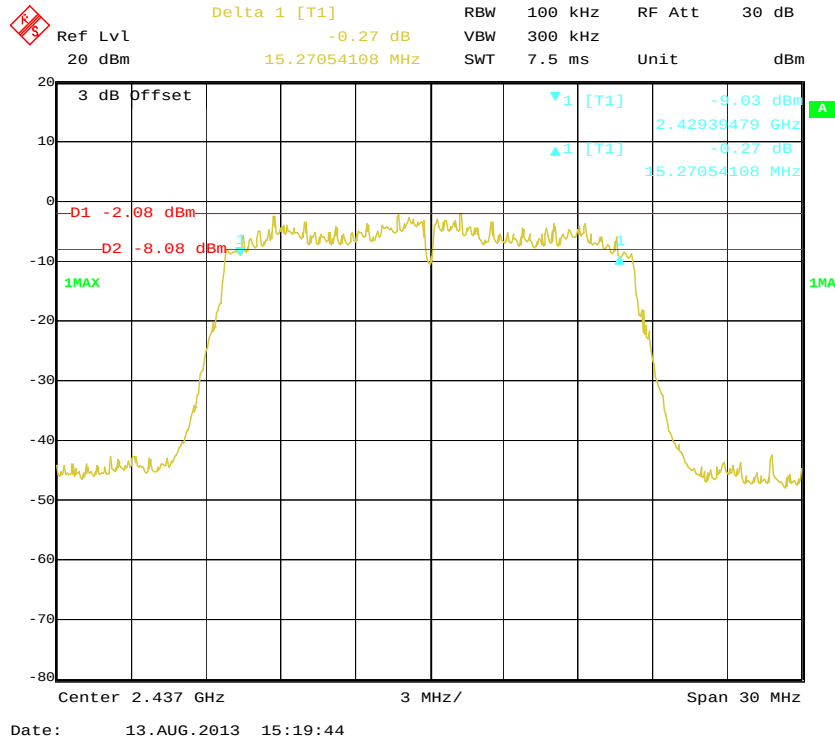
802.11b High Channel, Antenna 0



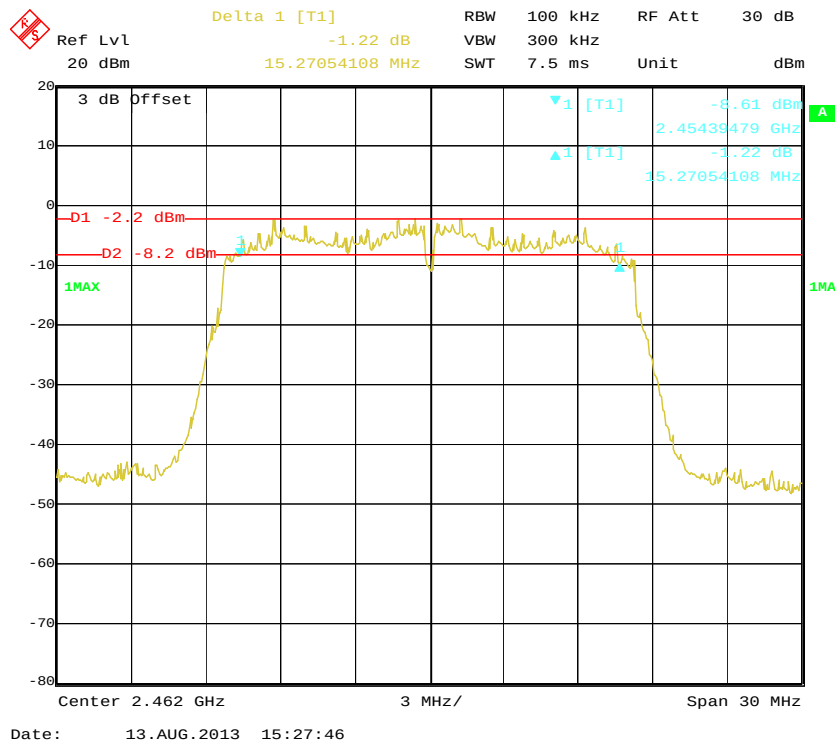
802.11g Low Channel, Antenna 0



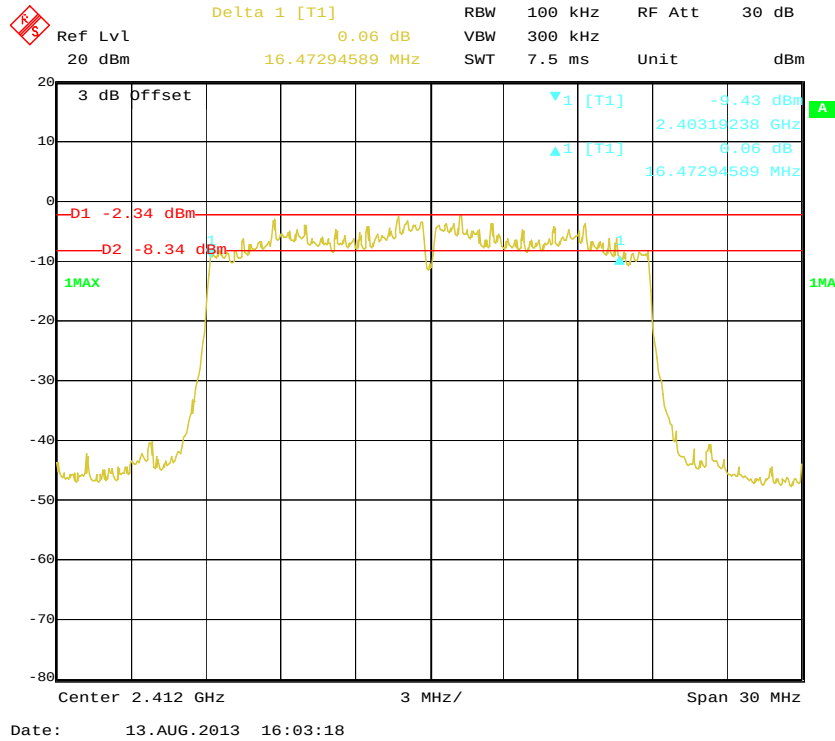
802.11g Middle Channel, Antenna 0



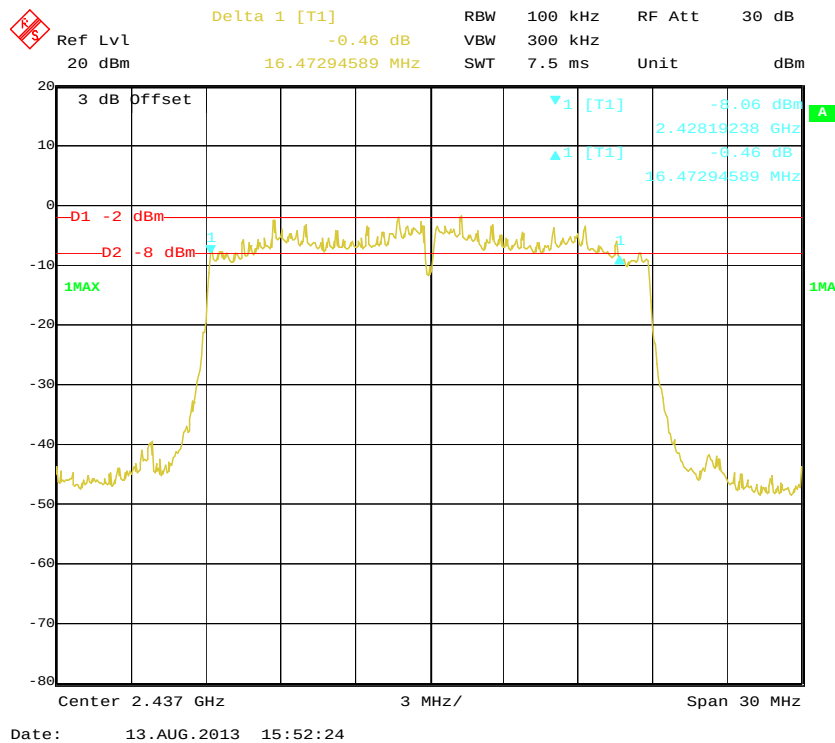
802.11g High Channel, Antenna 0



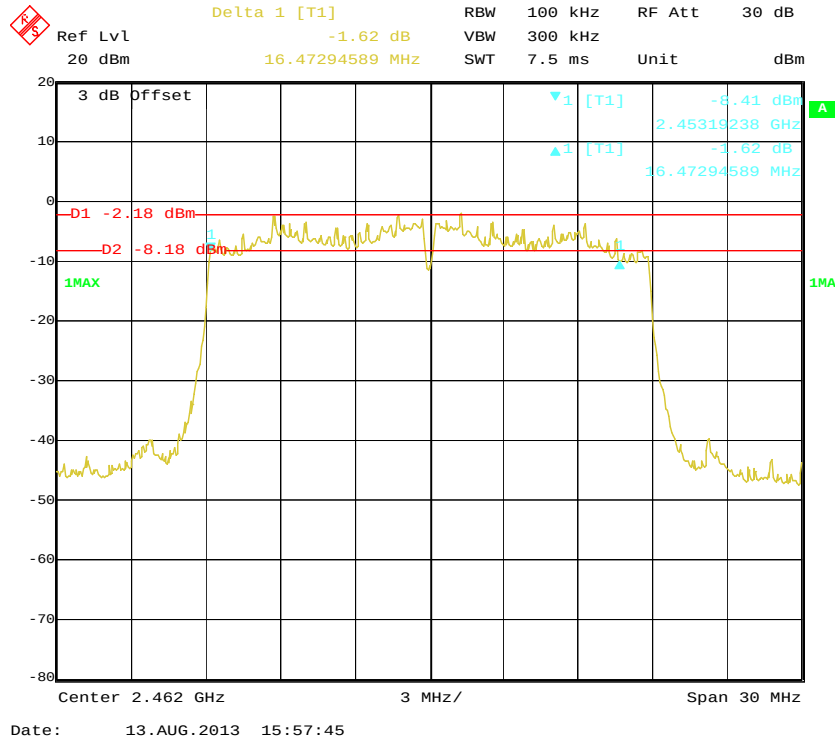
802.11n-HT20 Low Channel, Antenna 0



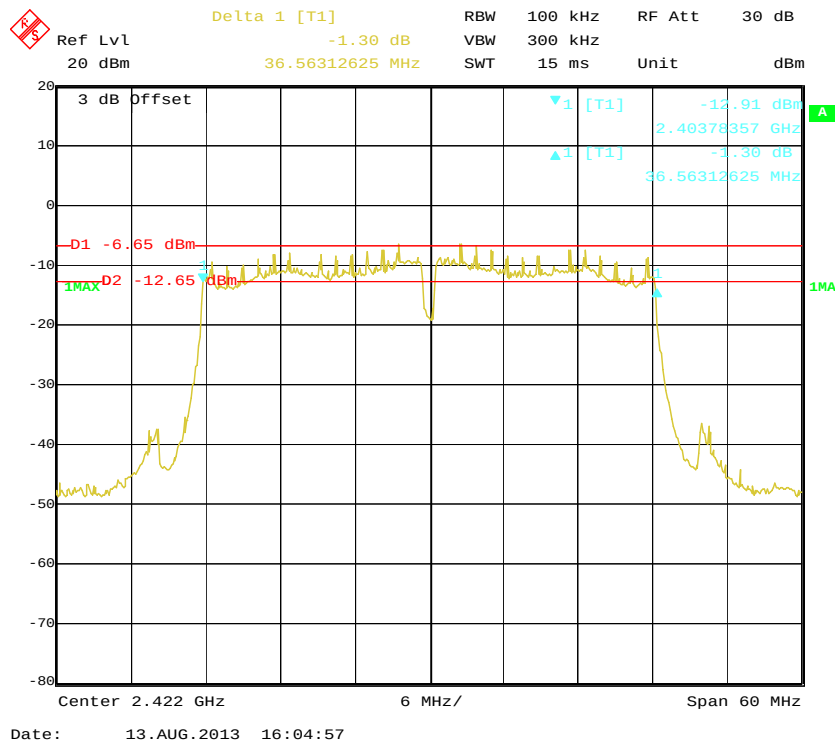
802.11n-HT20 Middle Channel, Antenna 0



802.11n-HT20 High Channel, Antenna 0



802.11n-HT40 Low Channel, Antenna 0



Ref Lvl 20 dBm Delta 1 [T1] -1.08 dB RBW 100 kHz VBW 300 kHz RF Att 30 dB Unit dBm

3 dB Offset

1 [T1] -12.48 dBm 2.41878357 GHz

1 [T1] -1.08 dB 36.56312625 MHz

D1 -6.37 dBm

D2 -12.37 dBm

1MAX

Center 2.437 GHz 6 MHz/ Span 60 MHz

Date: 13.AUG.2013 16:07:45

Ref Lvl 20 dBm Delta 1 [T1] -0.81 dB RBW 100 kHz RF Att 30 dB

3 dB Offset 36.56312625 MHz SWT 15 ms Unit dBm

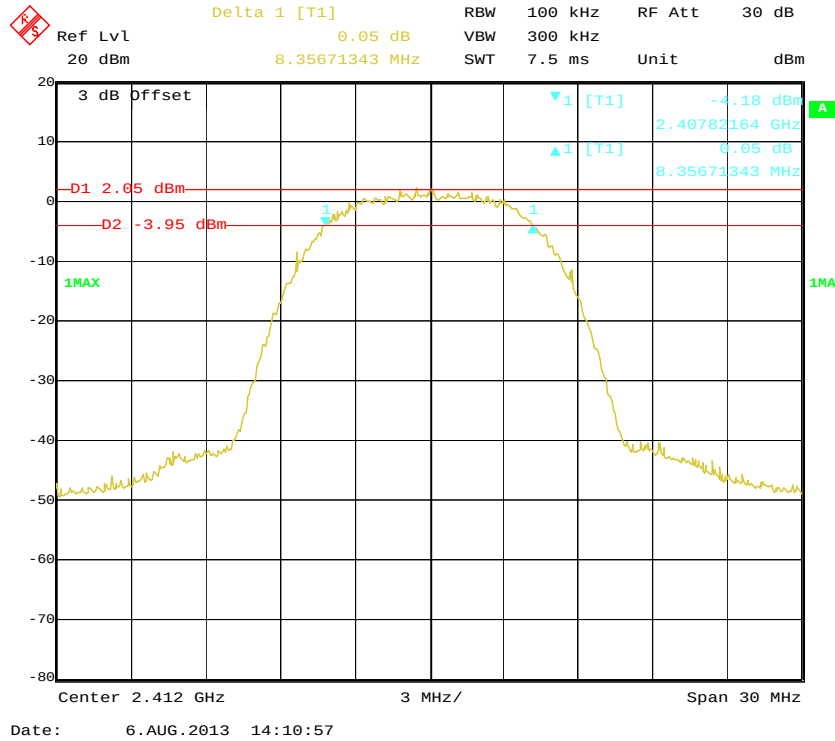
1 [T1] -12.62 dBm 2.43378357 GHz -0.81 dB 36.56312625 MHz

D1 -6.31 dBm D2 -12.31 dBm 1MAX 1MA

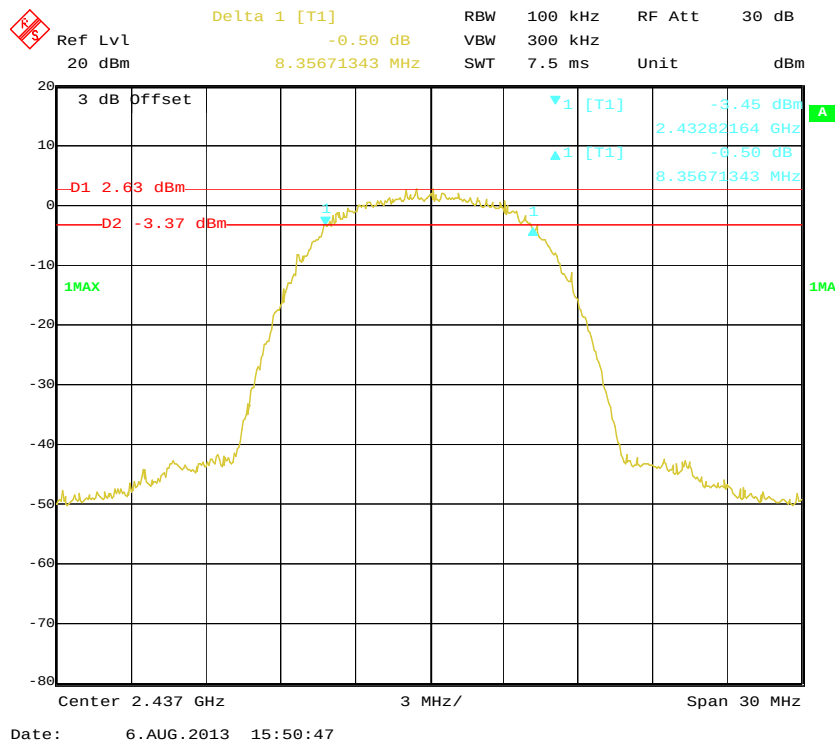
Center 2.452 GHz 6 MHz/ Span 60 MHz

Date: 13.AUG.2013 16:10:24

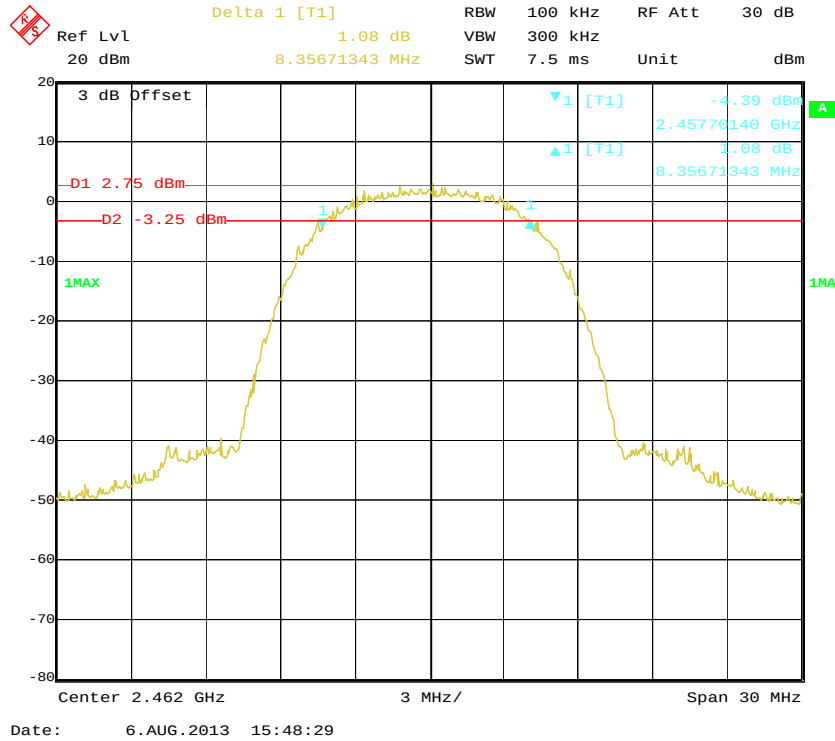
802.11b Low Channel, Antenna 1



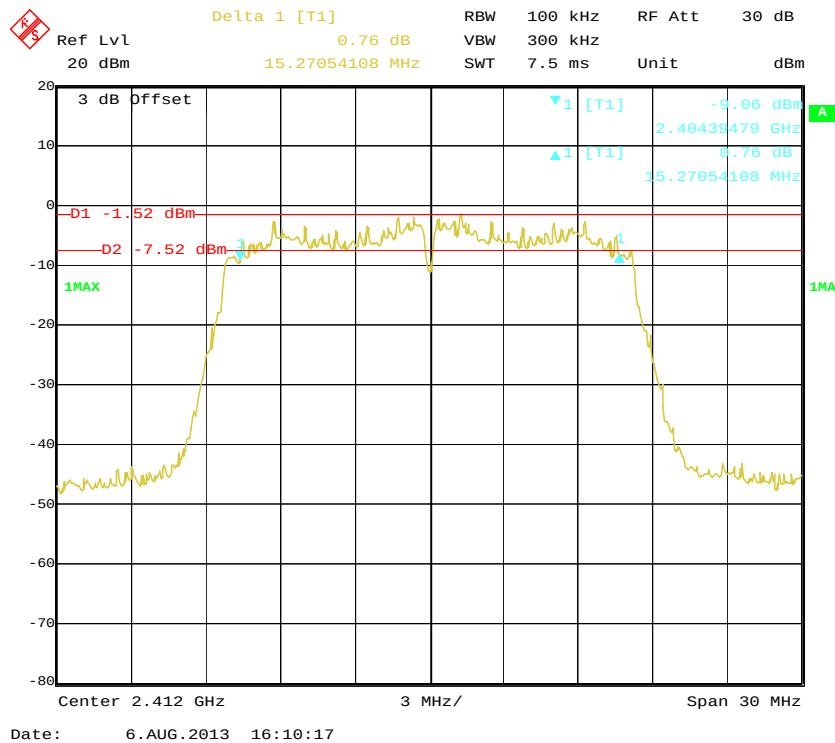
802.11b Middle Channel, Antenna 1



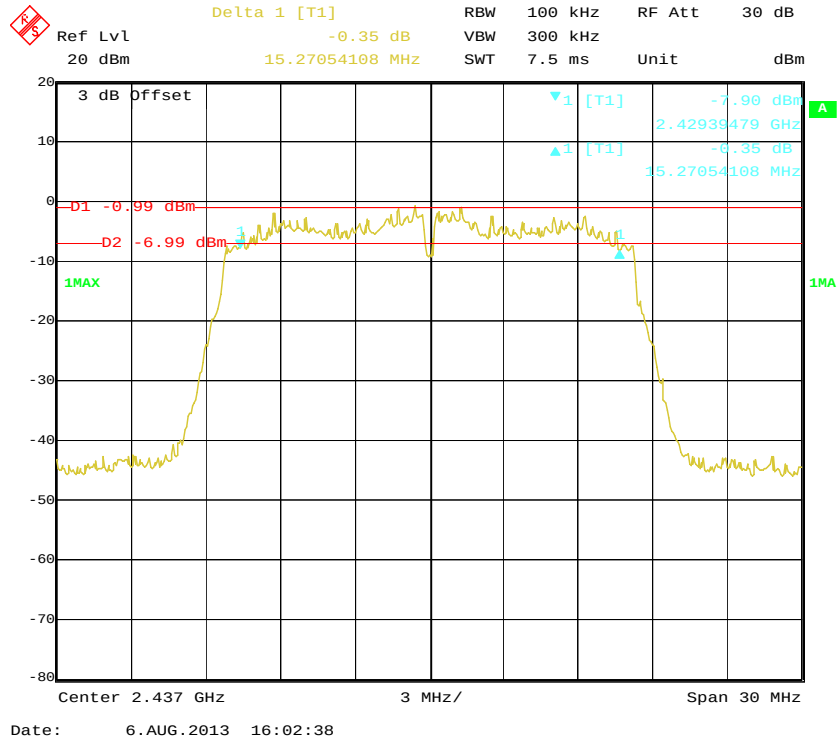
802.11b High Channel, Antenna 1



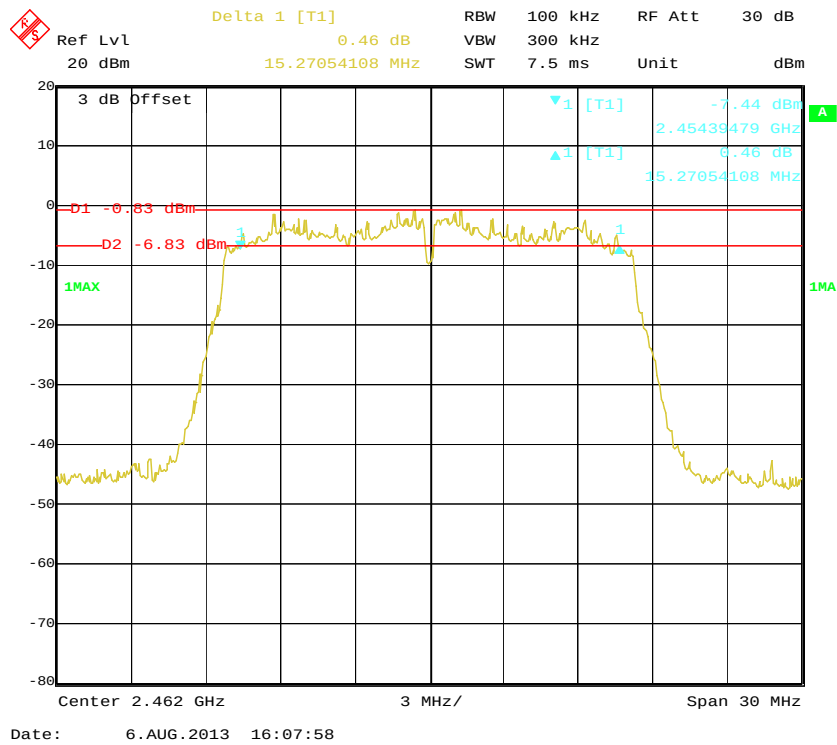
802.11g Low Channel, Antenna 1



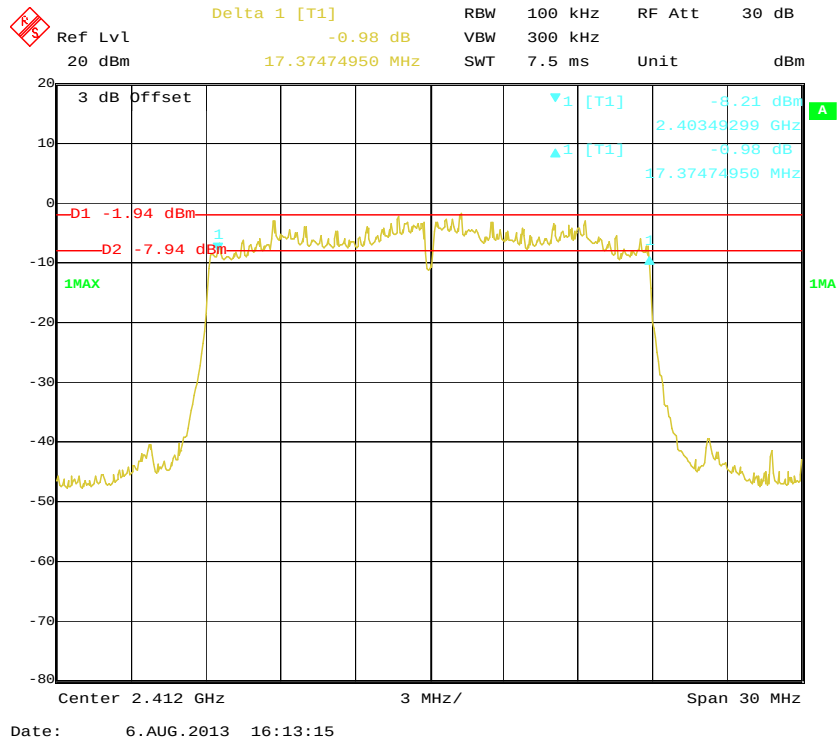
802.11g Middle Channel, Antenna 1



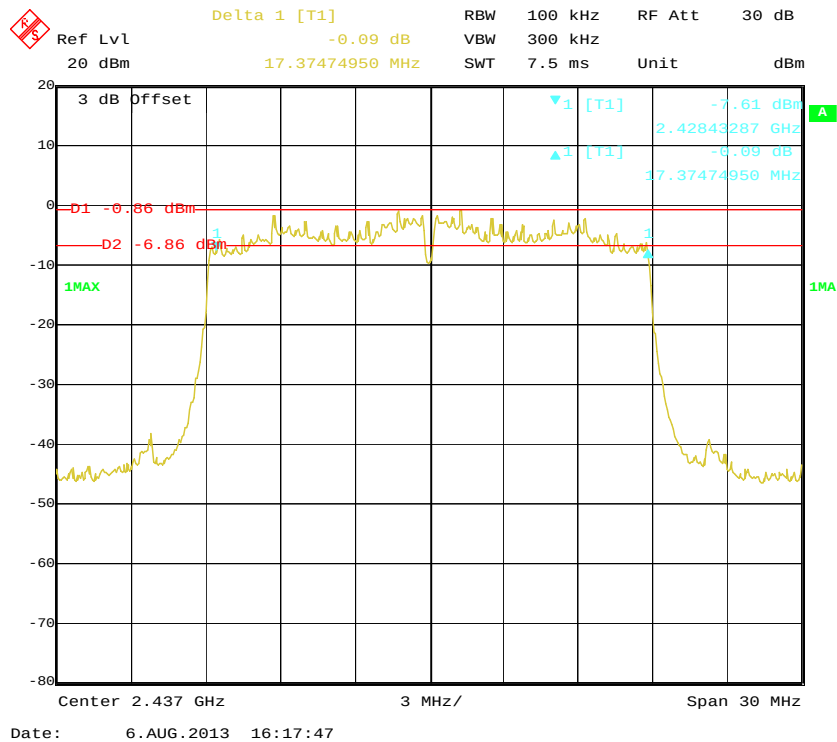
802.11g High Channel, Antenna 1



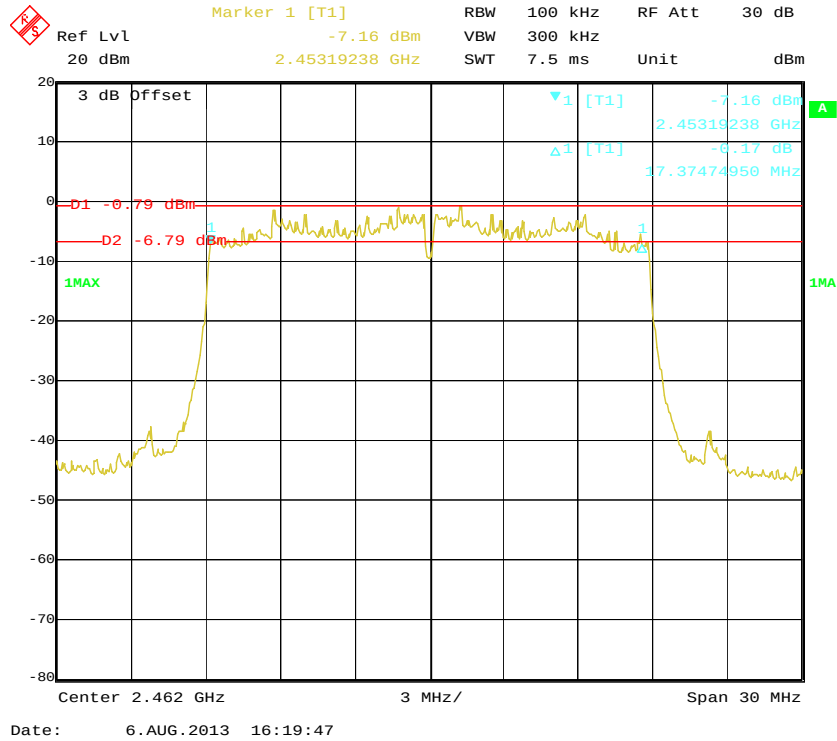
802.11n-HT20 Low Channel, Antenna 1



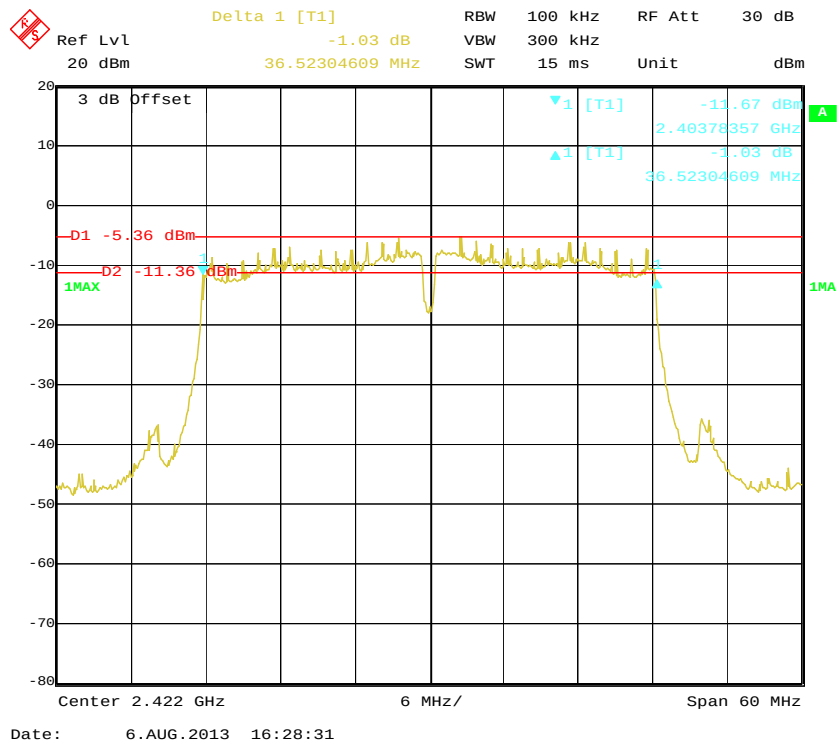
802.11n-HT20 Middle Channel, Antenna 1



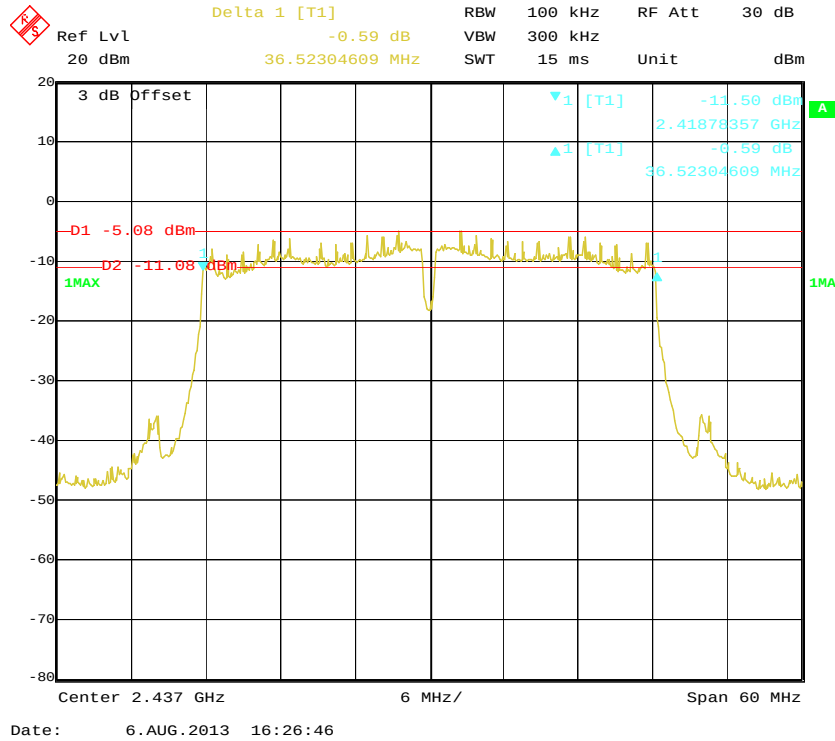
802.11n-HT20 High Channel, Antenna 1



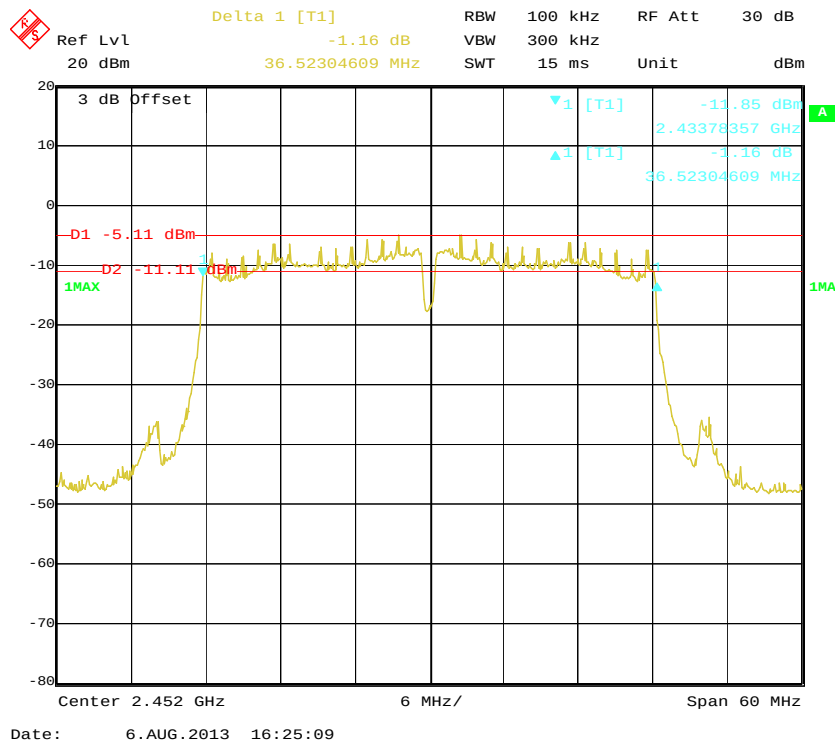
802.11n-HT40 Low Channel, Antenna 1



802.11n-HT40 Middle Channel, Antenna 1



802.11n-HT40 High Channel, Antenna 1



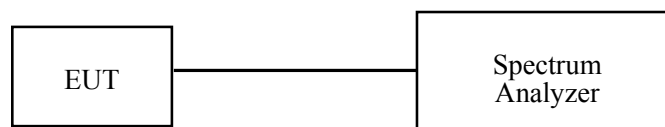
FCC §15.247(b) (3) - MAXIMUM PEAK OUTPUT POWER

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 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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

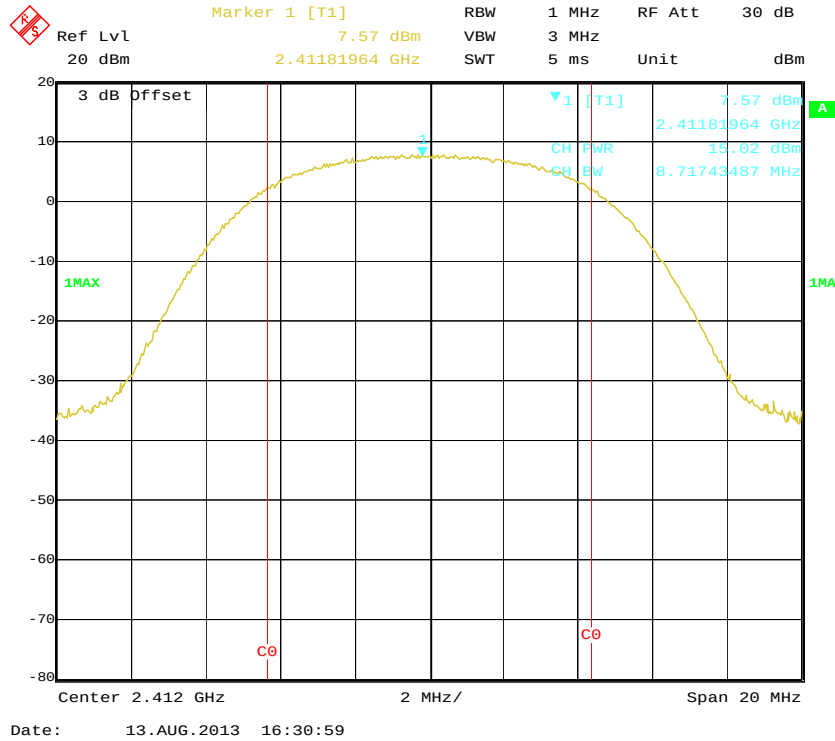
Temperature:	20 ~ 25 °C
Relative Humidity:	50 ~ 56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang from 2013-08-06 to 2013-08-19.

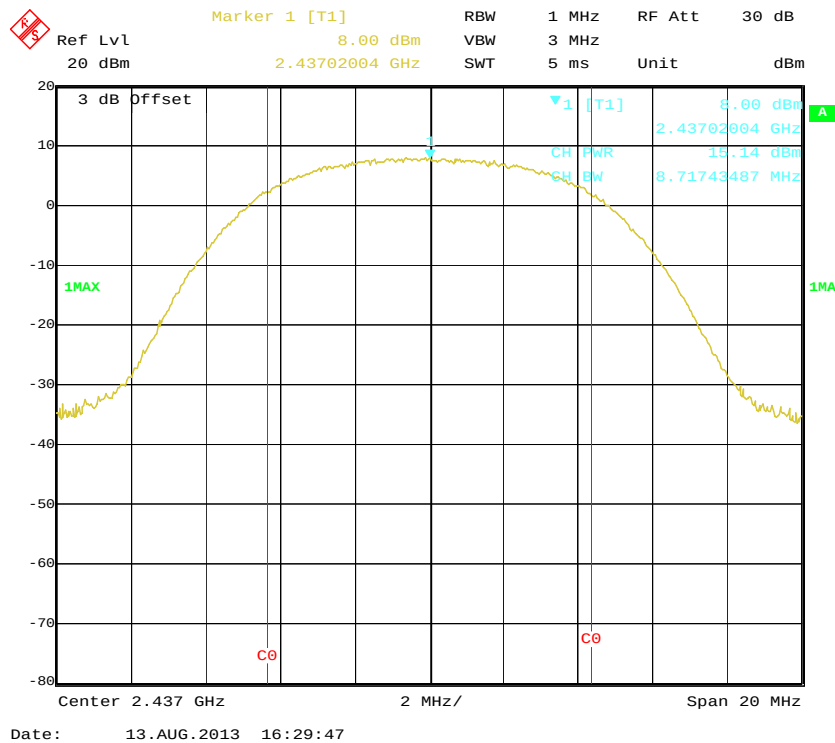
Test mode: Transmitting

Channel	Frequency (MHz)	Antenna Port	Output Power (dBm)	Limit (dBm)	
802.11b mode					
Low	2412	0	15.02	30	
		1	15.17		
Middle	2437	0	15.14	30	
		1	15.43		
High	2462	0	15.19	30	
		1	16.00		
802.11g mode					
Low	2412	0	15.39	30	
		1	15.67		
Middle	2437	0	15.51	30	
		1	16.02		
High	2462	0	15.68	30	
		1	16.05		
802.11n-HT20 mode					
Low	2412	0	15.27	18.52	30
		1	15.73		
Middle	2437	0	15.45	18.80	30
		1	16.11		
High	2462	0	15.60	18.84	30
		1	16.04		
802.11n-HT40 mode					
Low	2422	0	14.84	17.95	30
		1	15.03		
Middle	2437	0	15.07	18.11	30
		1	15.12		
High	2452	0	15.20	18.21	30
		1	15.20		

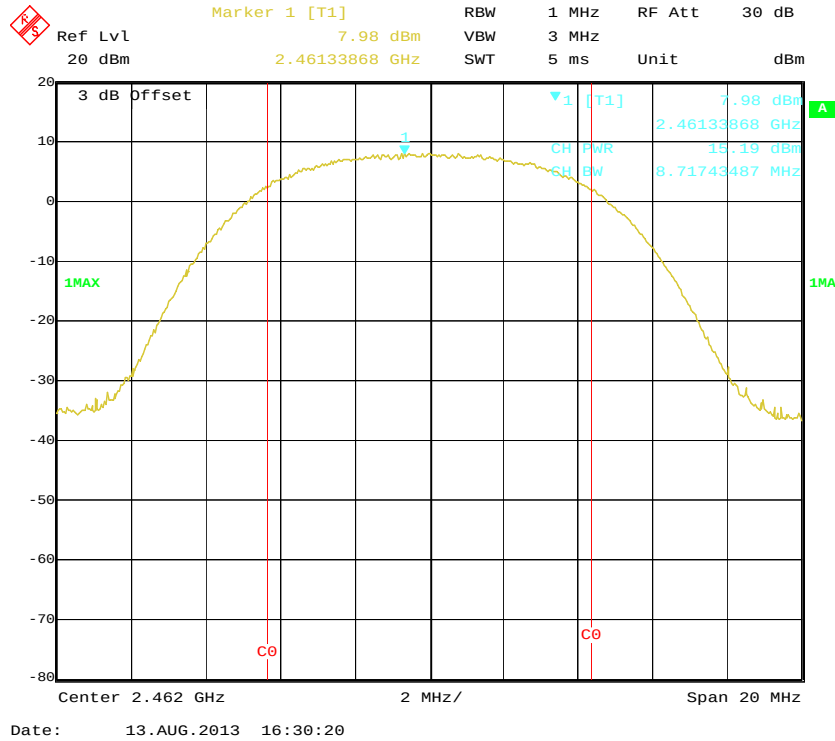
802.11b RF Output Power, Low Channel, Antenna 0



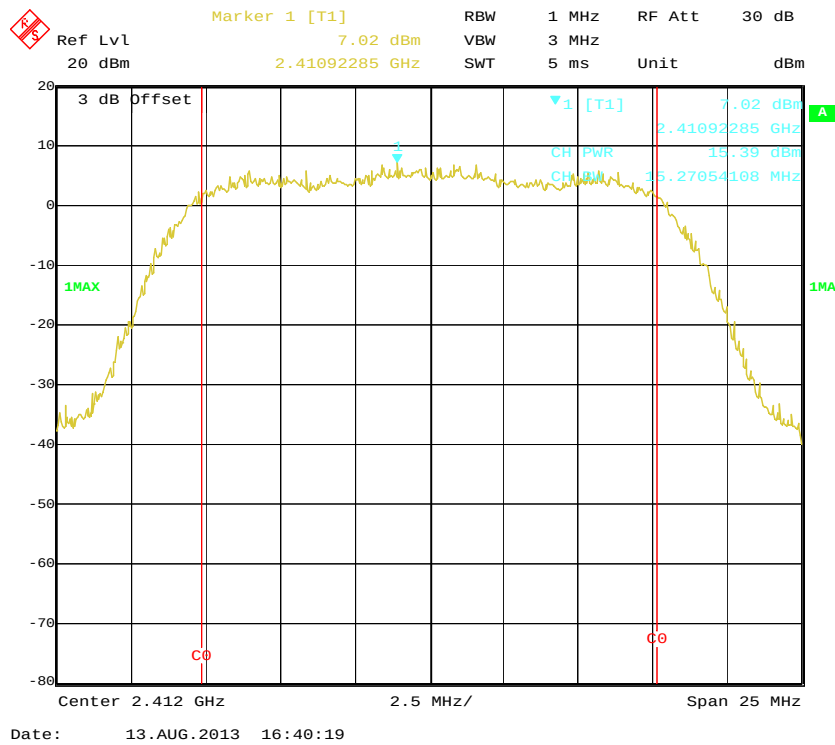
802.11b RF Output Power, Middle Channel, Antenna 0



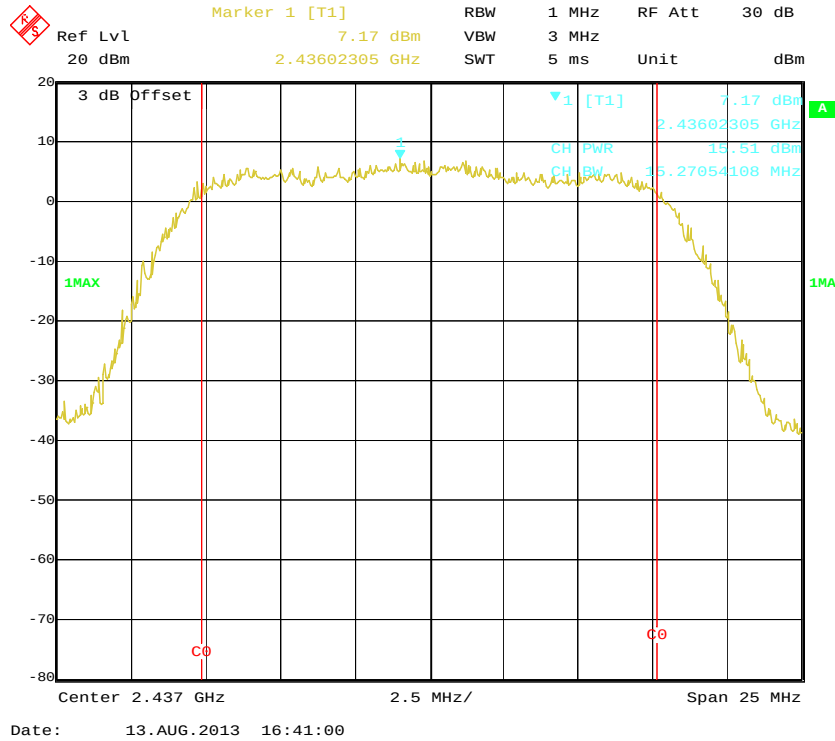
802.11b RF Output Power, High Channel, Antenna 0



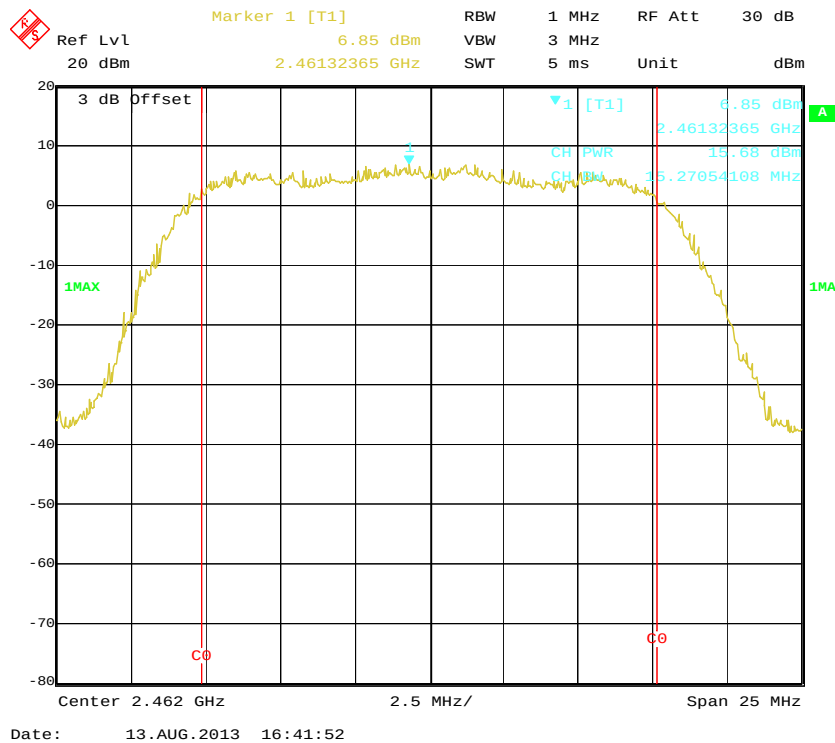
802.11g RF Output Power, Low Channel, Antenna 0



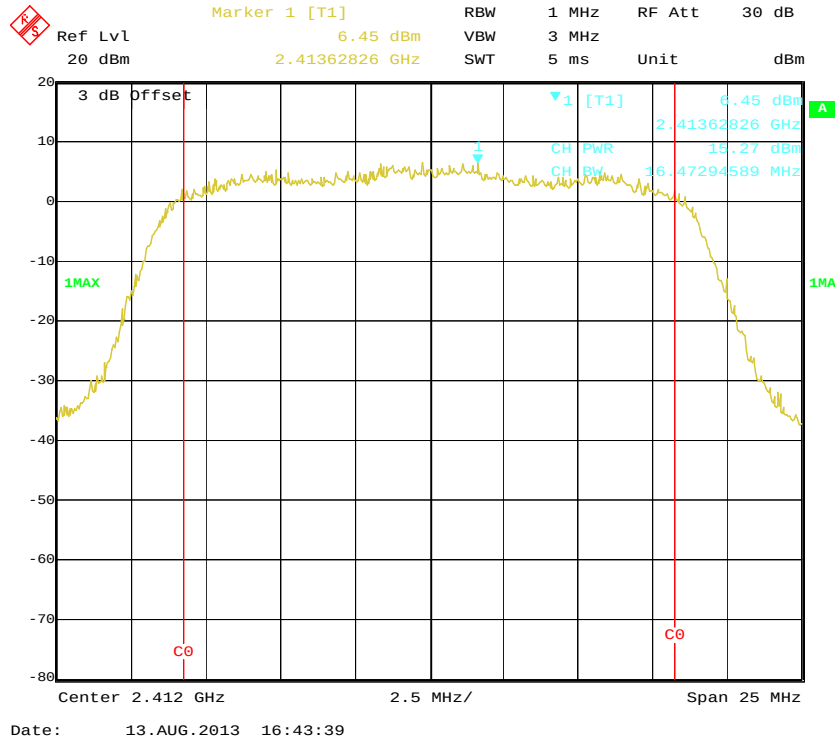
802.11g RF Output Power, Middle Channel, Antenna 0



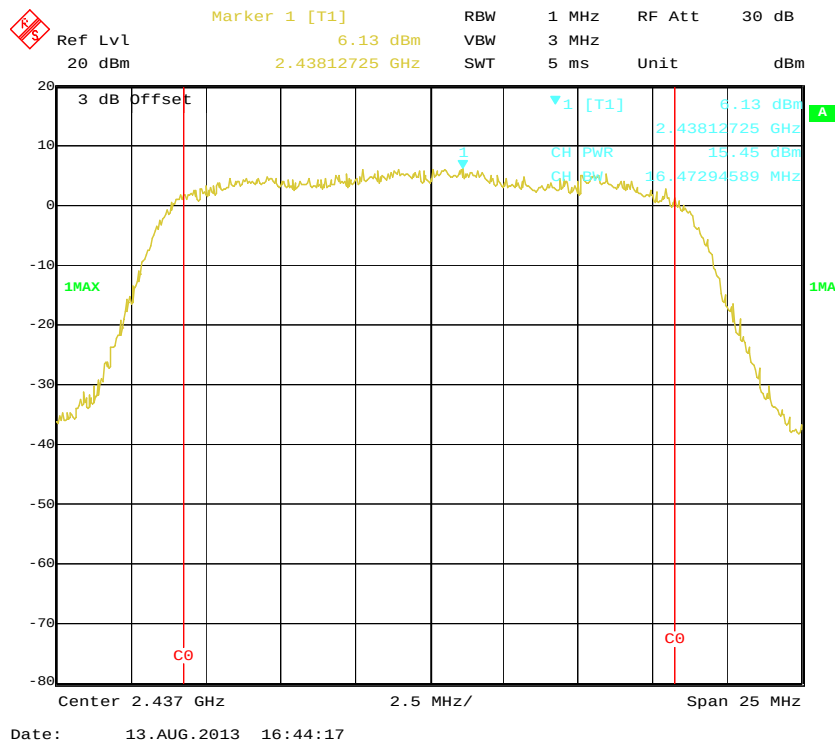
802.11g RF Output Power, High Channel, Antenna 0



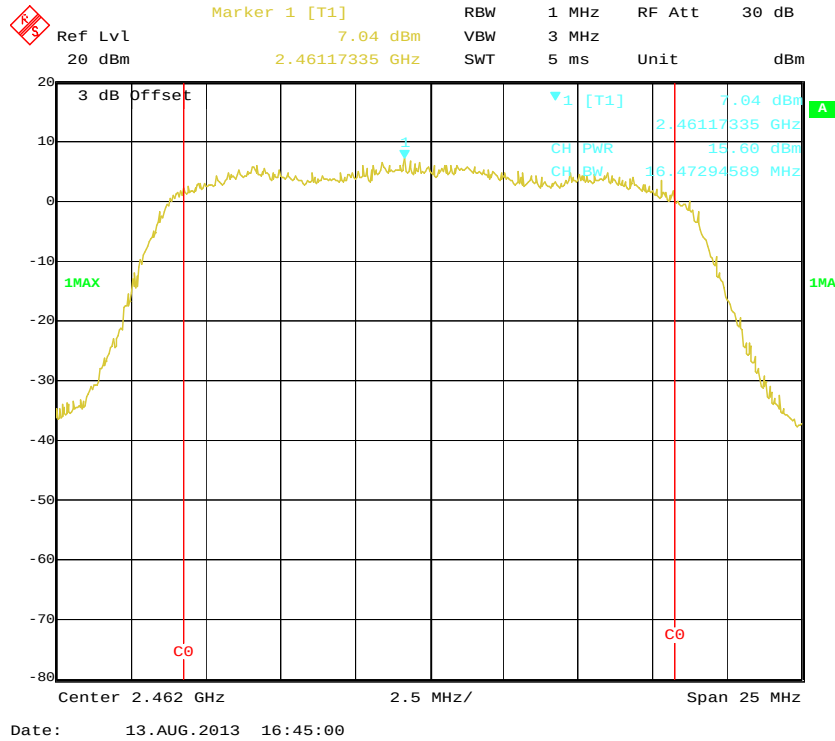
802.11n-HT20 RF Output Power, Low Channel, Antenna 0



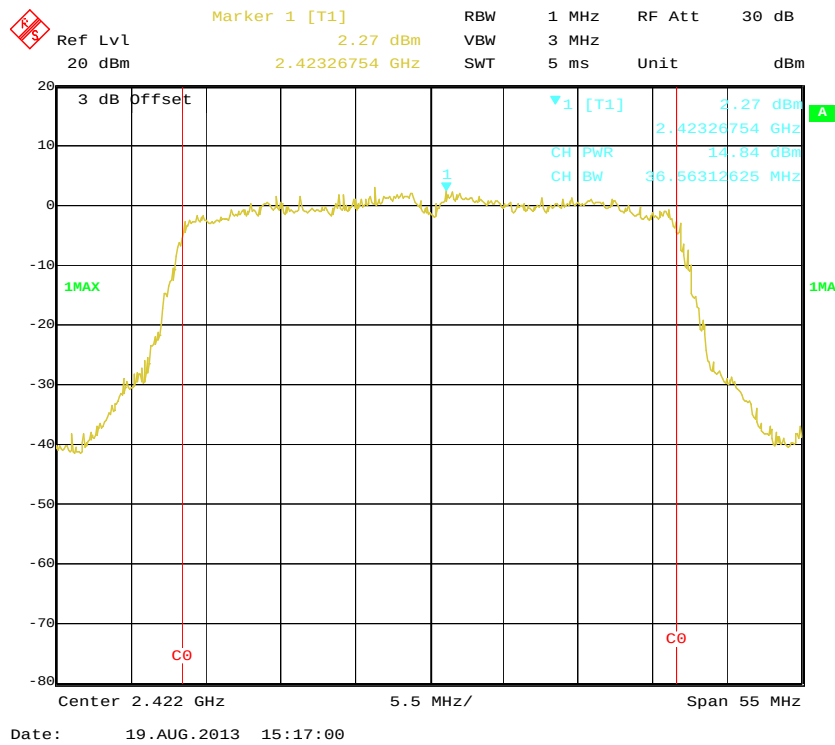
802.11n-HT20 RF Output Power, Middle Channel, Antenna 0



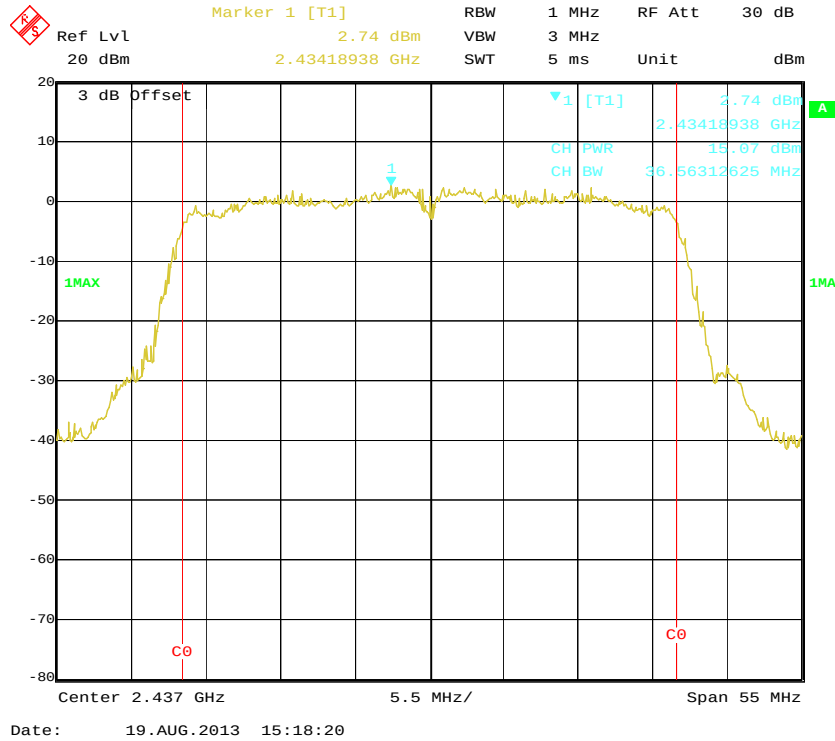
802.11n-HT20 RF Output Power, High Channel, Antenna 0



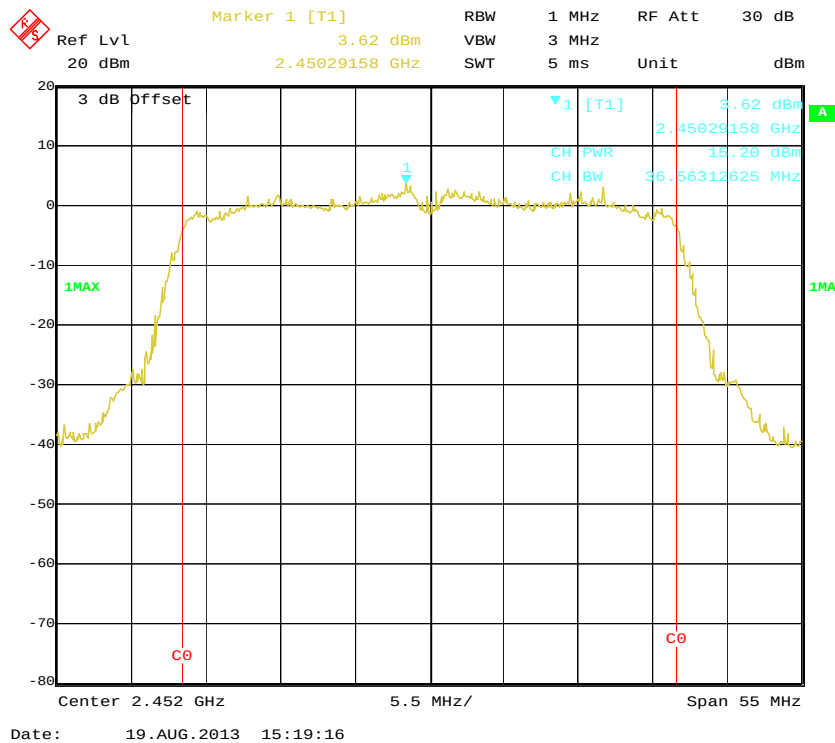
802.11n-HT40 RF Output Power, Low Channel, Antenna 0



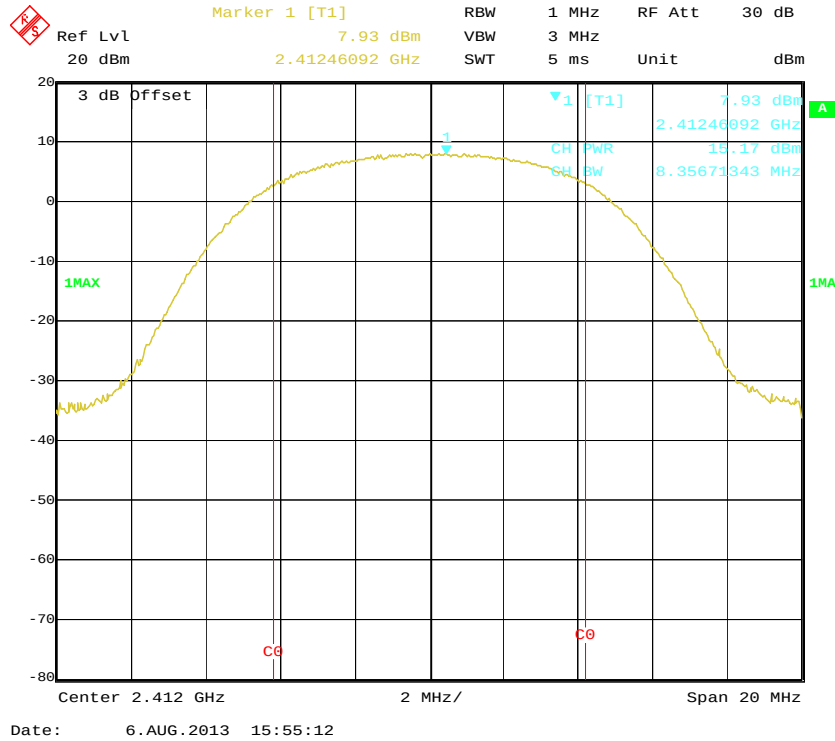
802.11n-HT40 RF Output Power, Middle Channel, Antenna 0



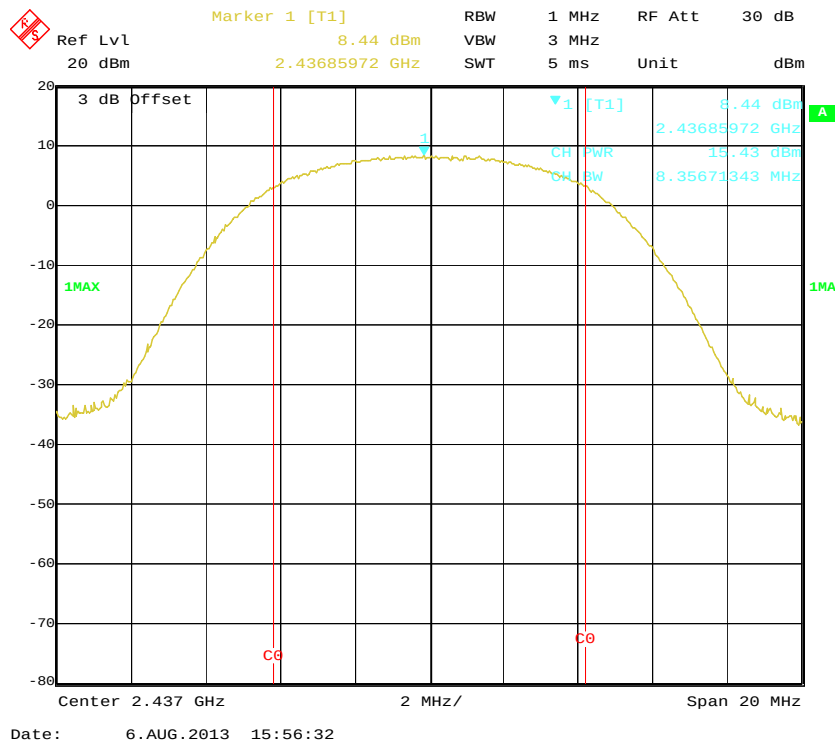
802.11n-HT40 RF Output Power, High Channel, Antenna 0



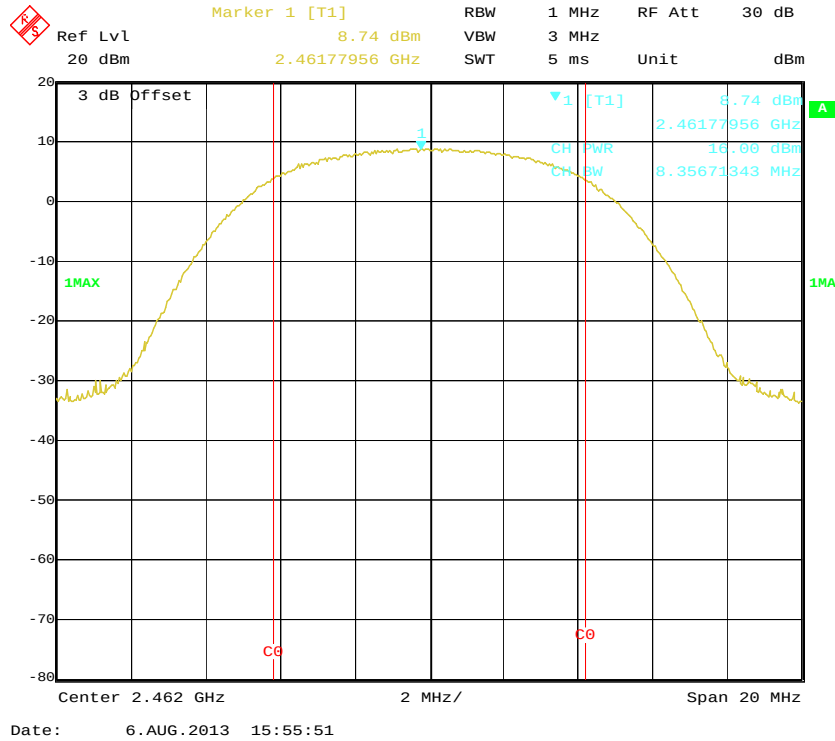
802.11b RF Output Power, Low Channel, Antenna 1



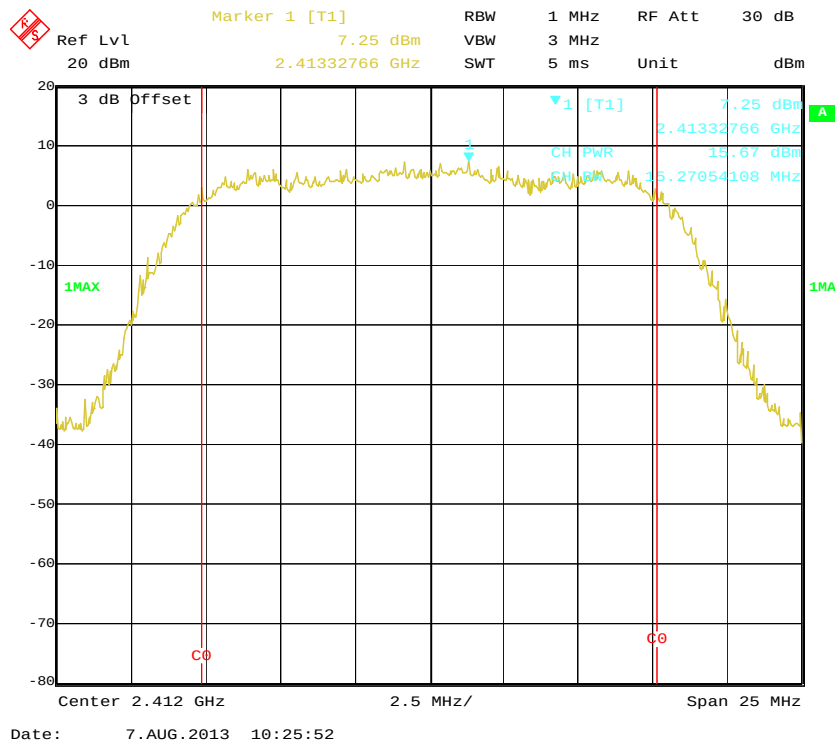
802.11b RF Output Power, Middle Channel, Antenna 1



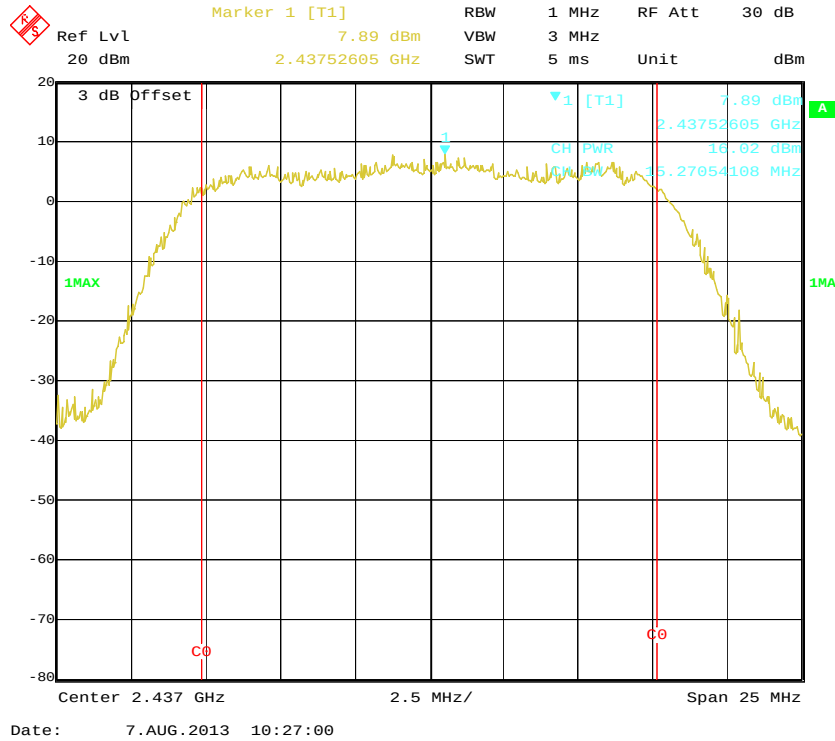
802.11b RF Output Power, High Channel, Antenna 1



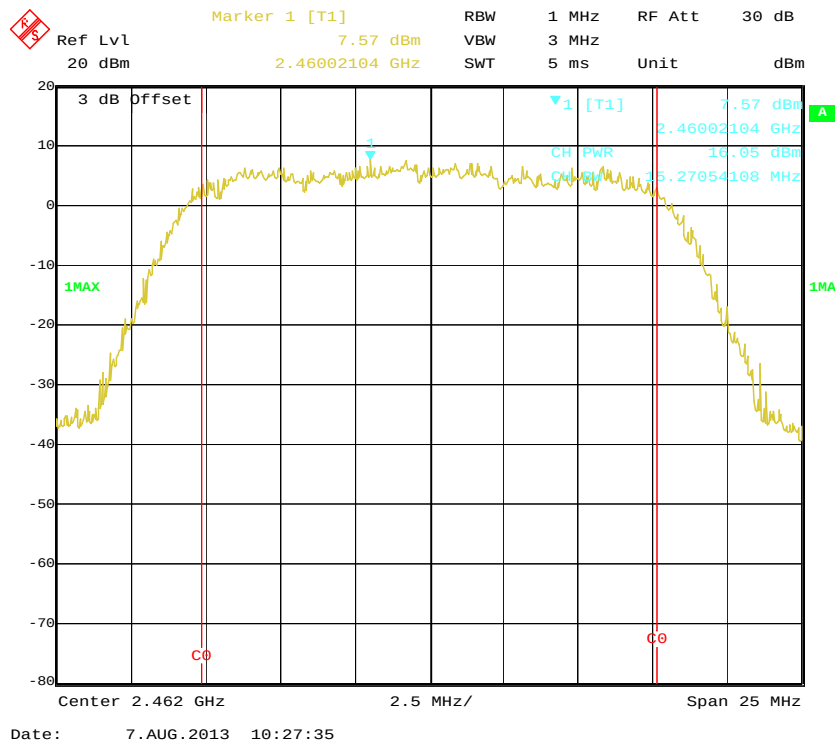
802.11g RF Output Power, Low Channel, Antenna 1



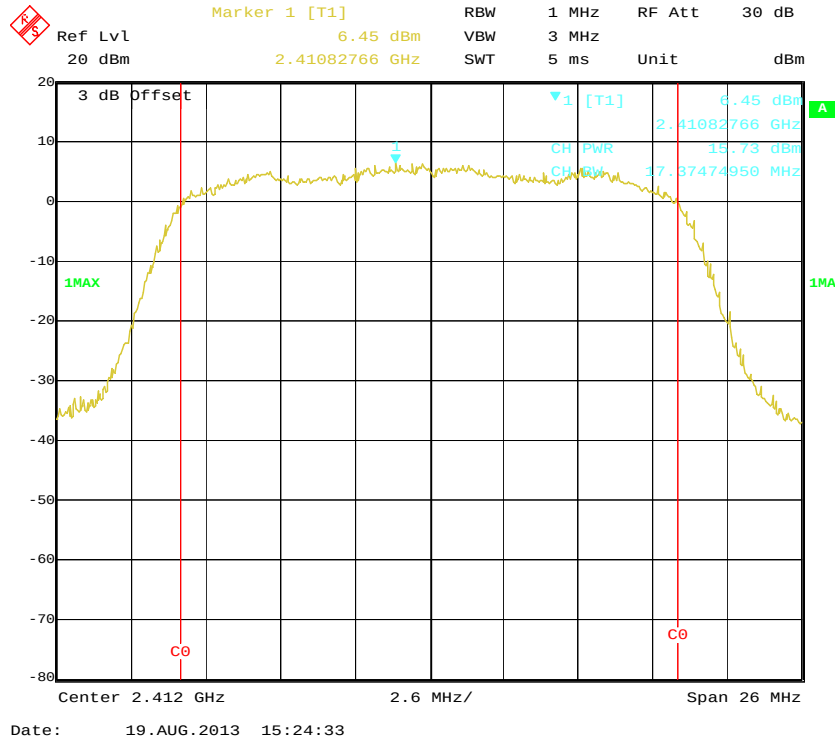
802.11g RF Output Power, Middle Channel, Antenna 1



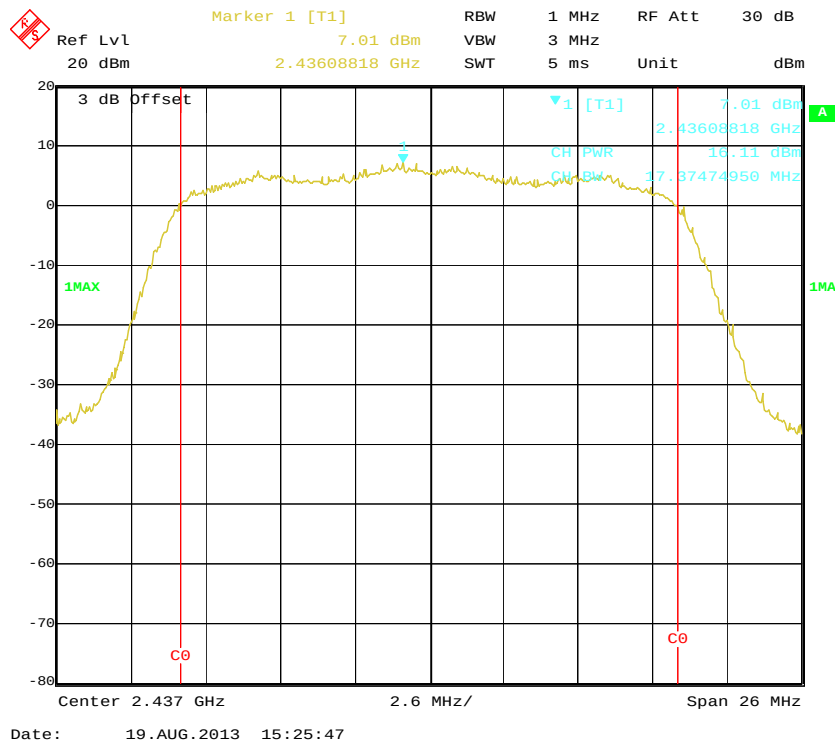
802.11g RF Output Power, High Channel, Antenna 1



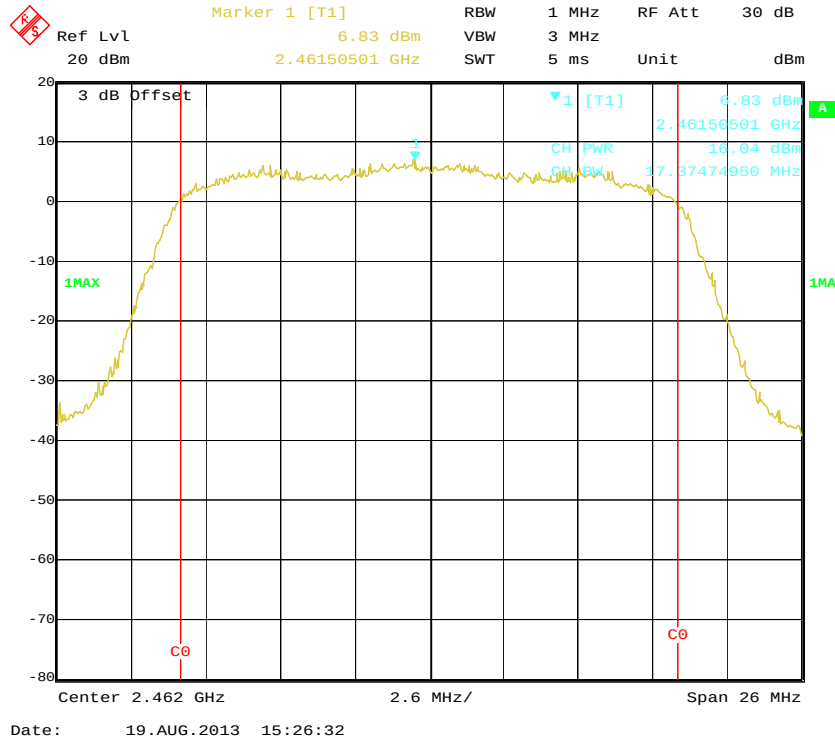
802.11n-HT20 RF Output Power, Low Channel, Antenna 1



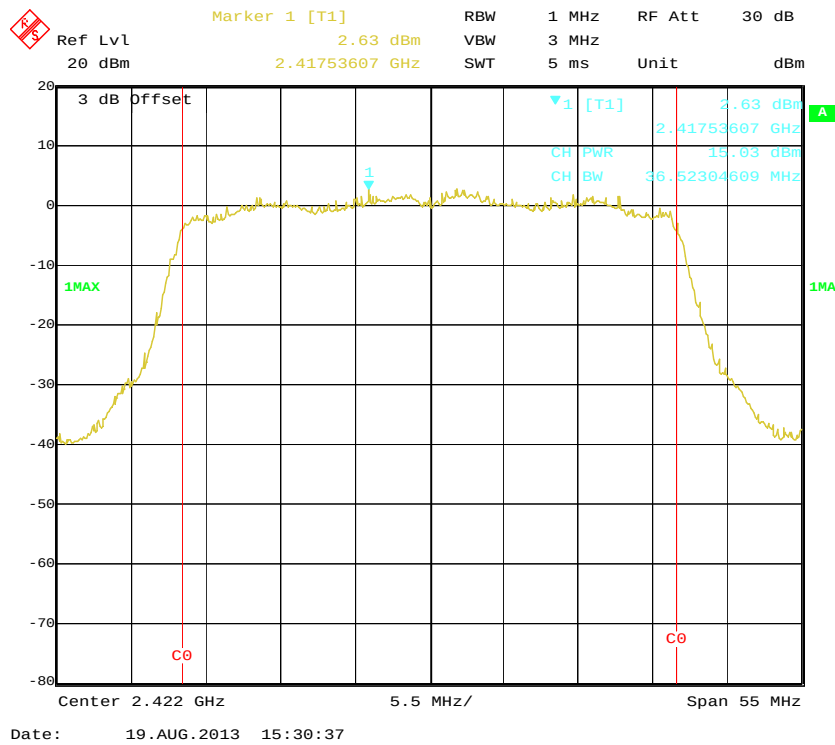
802.11n-HT20 RF Output Power, Middle Channel, Antenna 1



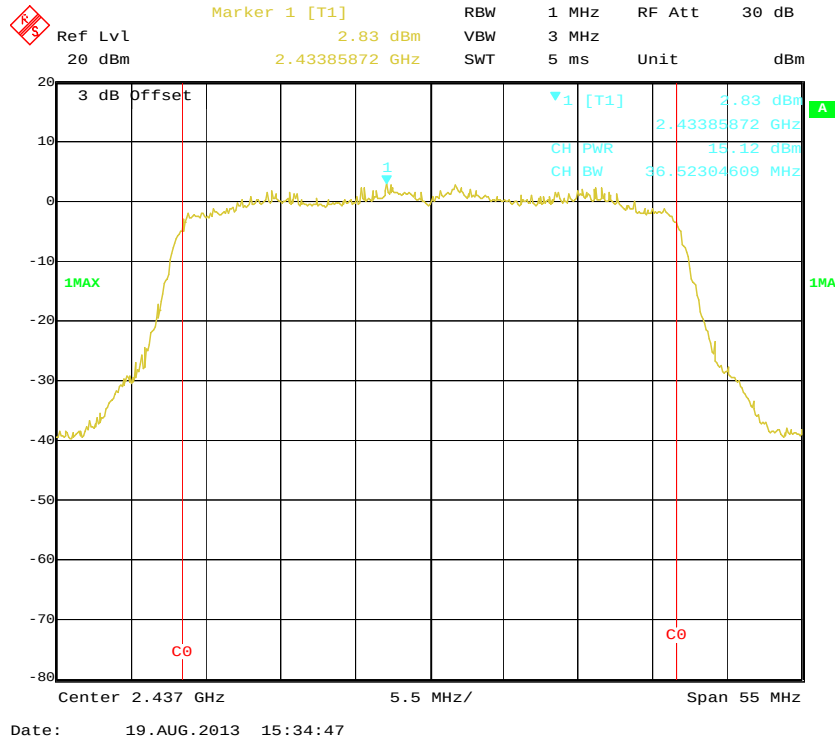
802.11n-HT20 RF Output Power, High Channel, Antenna 1



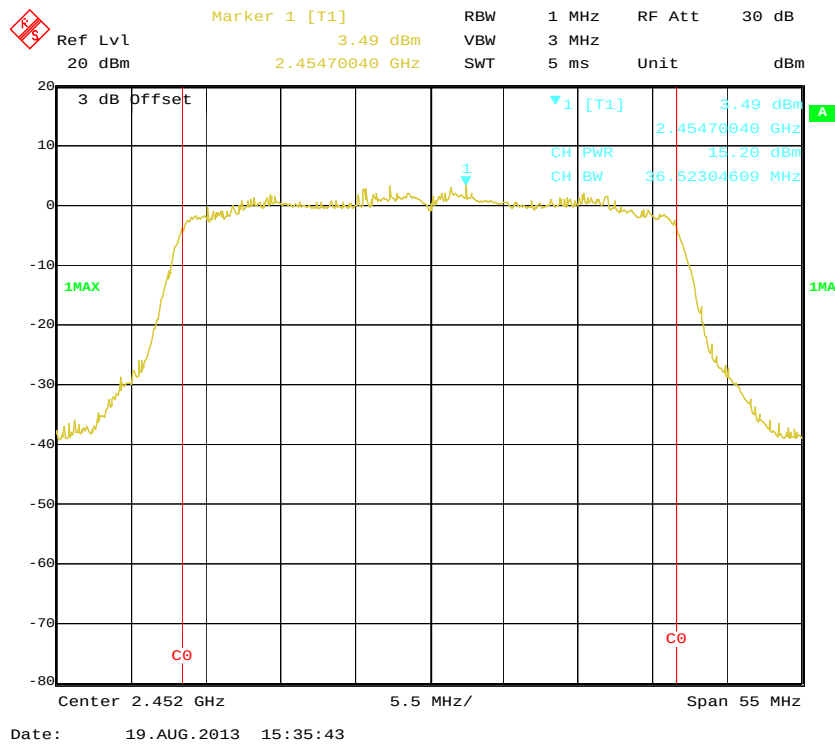
802.11n-HT40 RF Output Power, Low Channel, Antenna 1



802.11n-HT40 RF Output Power, Middle Channel, Antenna 1



802.11n-HT40 RF Output Power, High Channel, Antenna 1



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	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	20 ~ 25°C
Relative Humidity:	50 ~ 56 %
ATM Pressure:	101.0 kPa

The testing was performed by Gardon Zhang on 2013-08-10 and 2013-08-13.

Test Result: Compliance

Antenna 0:

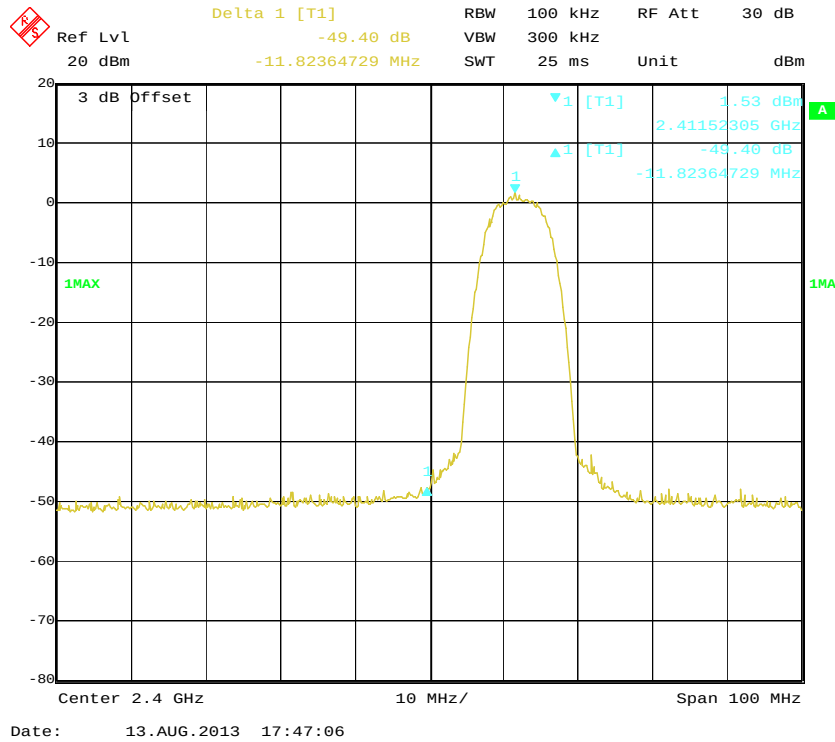
Frequency Band	Delta Peak to band Emission (dBc)	Limit (dBc)	Result
802.11b mode			
Left-band	49.40	20	Pass
Right-band	50.63	20	Pass
802.11g mode			
Left-band	41.08	20	Pass
Right-band	43.63	20	Pass
802.11n-HT20 mode			
Left-band	41.44	20	Pass
Right-band	43.82	20	Pass
802.11n-HT40 mode			
Left-band	31.55	20	Pass
Right-band	39.97	20	Pass

Antenna 1:

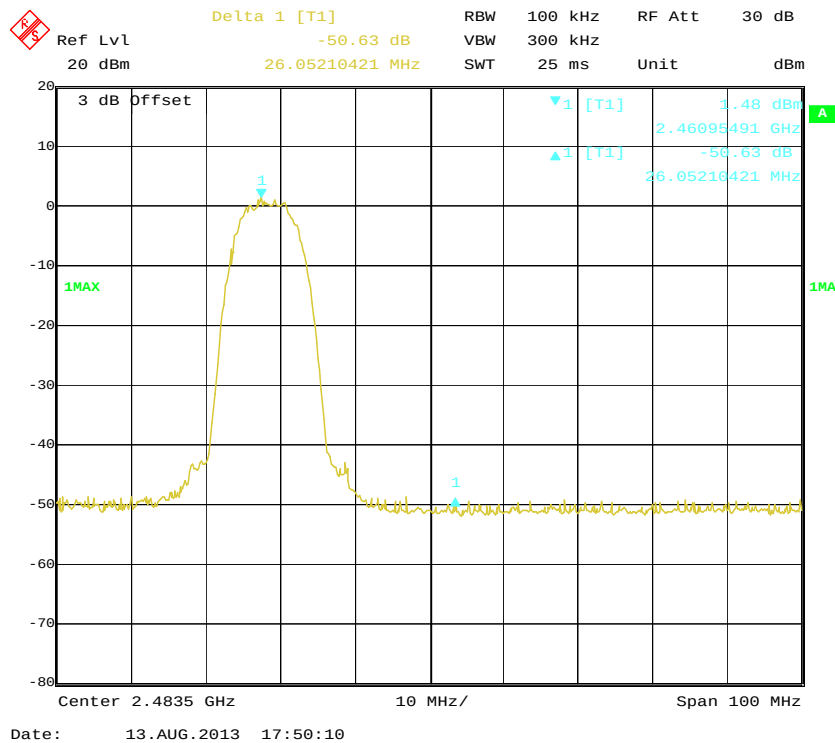
Frequency Band	Delta Peak to band Emission (dBc)	Limit (dBc)	Result
802.11b mode			
Left-band	49.30	20	Pass
Right-band	51.23	20	Pass
802.11g mode			
Left-band	42.02	20	Pass
Right-band	43.25	20	Pass
802.11n-HT20 mode			
Left-band	41.29	20	Pass
Right-band	44.11	20	Pass
802.11n-HT40 mode			
Left-band	32.45	20	Pass
Right-band	39.54	20	Pass

Please refer to following plots.

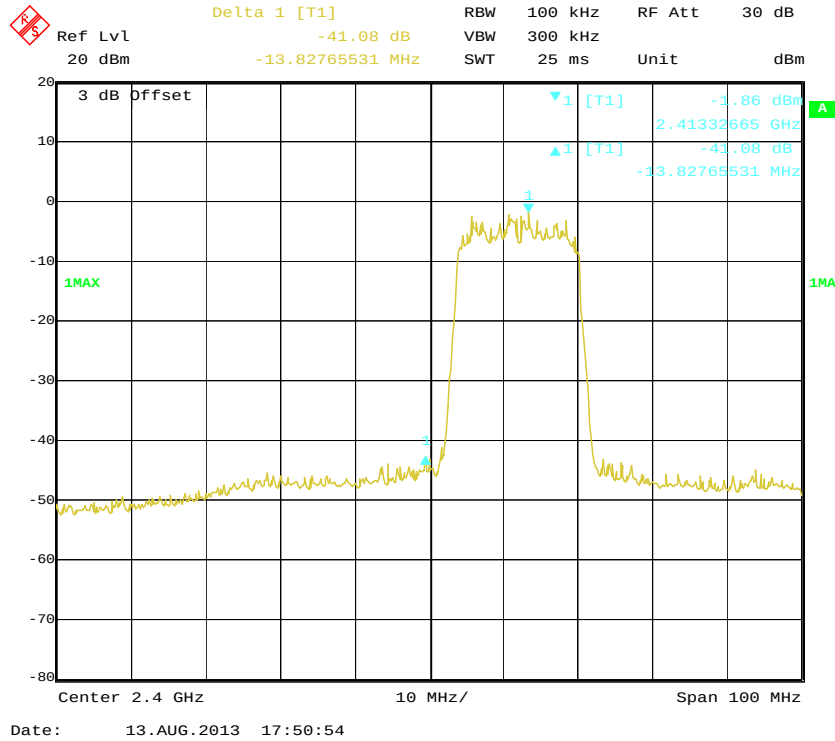
802.11b: Band Edge, Left Side, Antenna 0



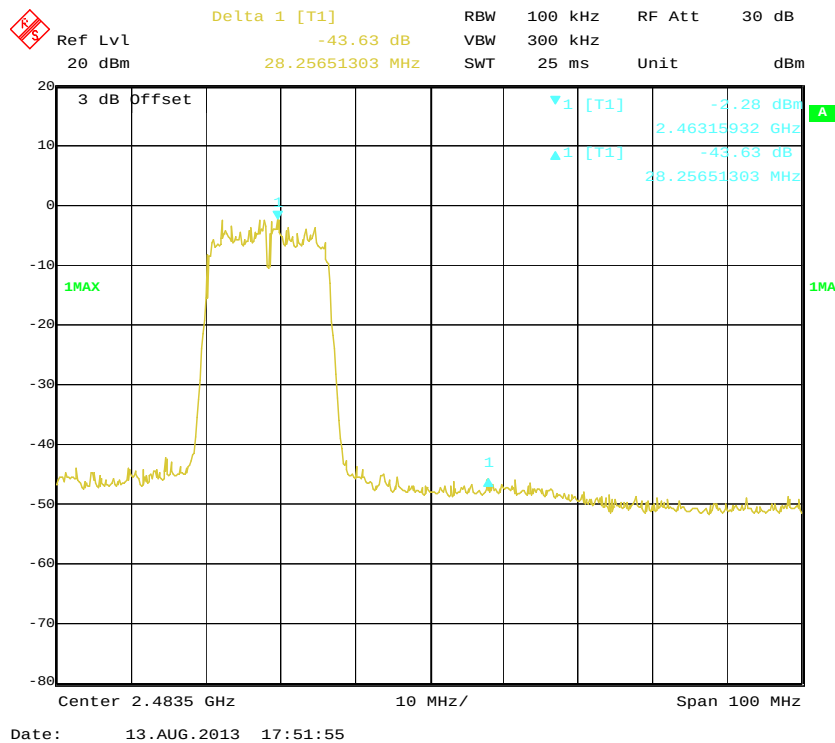
802.11b: Band Edge, Right Side, Antenna 0



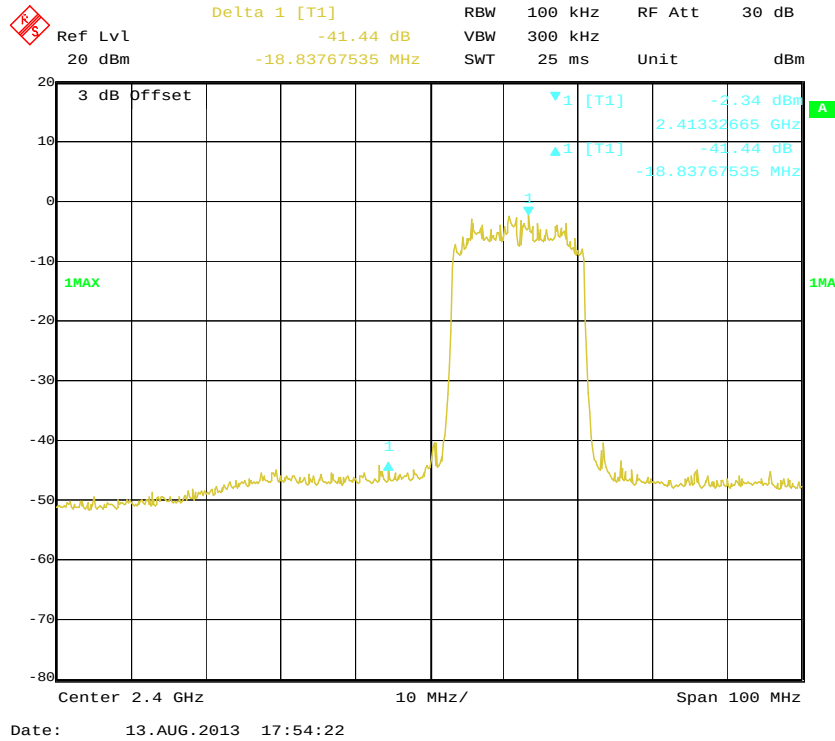
802.11g: Band Edge, Left Side, Antenna 0



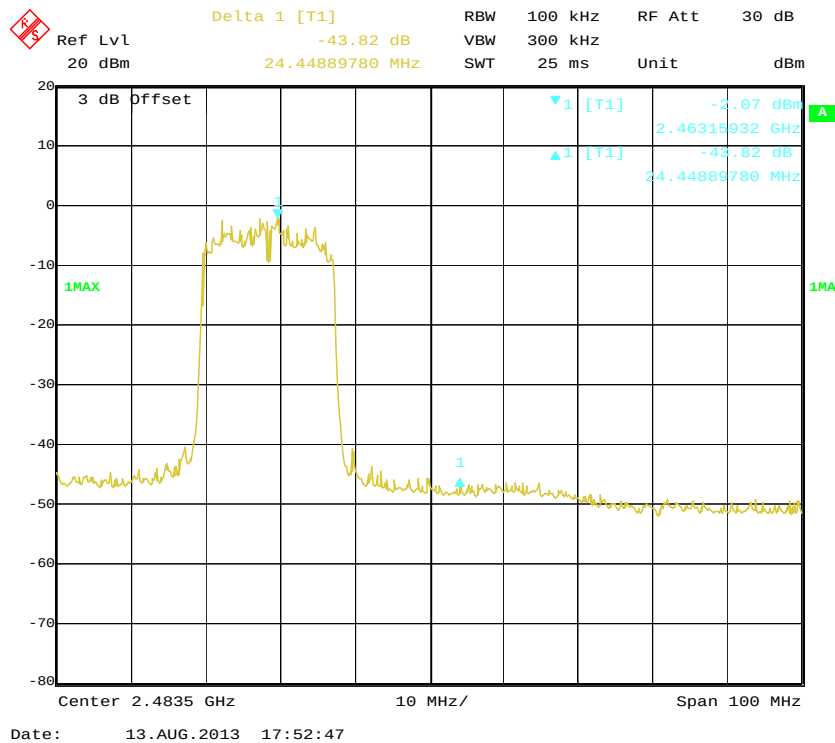
802.11g: Band Edge, Right Side, Antenna 0



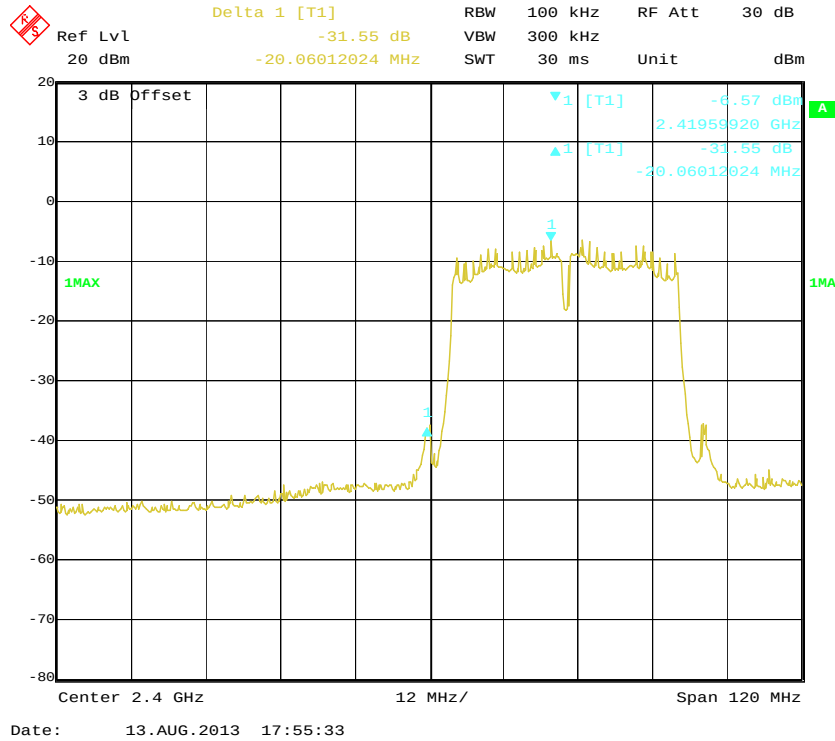
802.11n-HT20: Band Edge, Left Side, Antenna 0



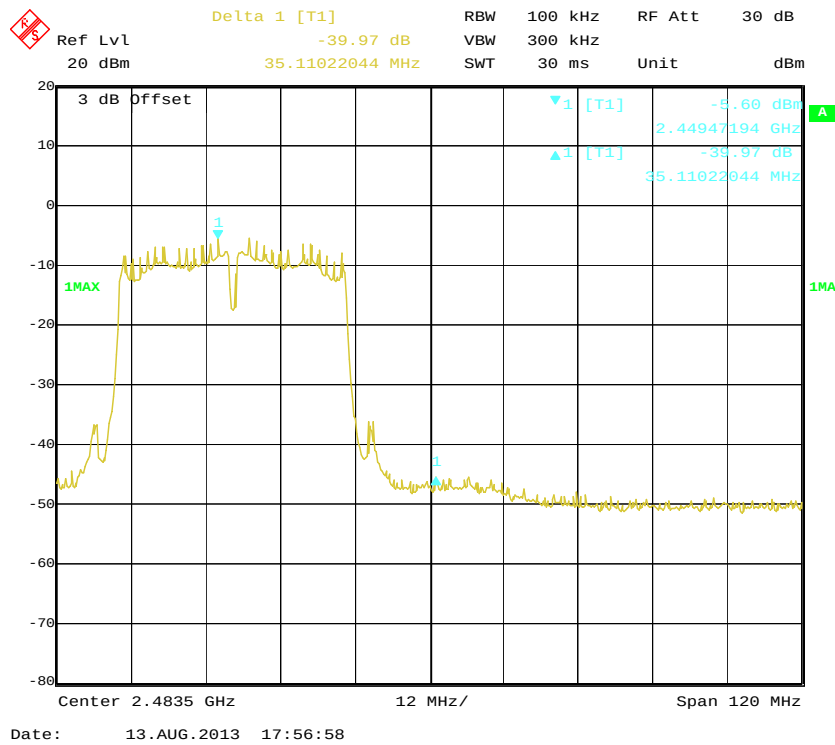
802.11n-HT20: Band Edge, Right Side, Antenna 0



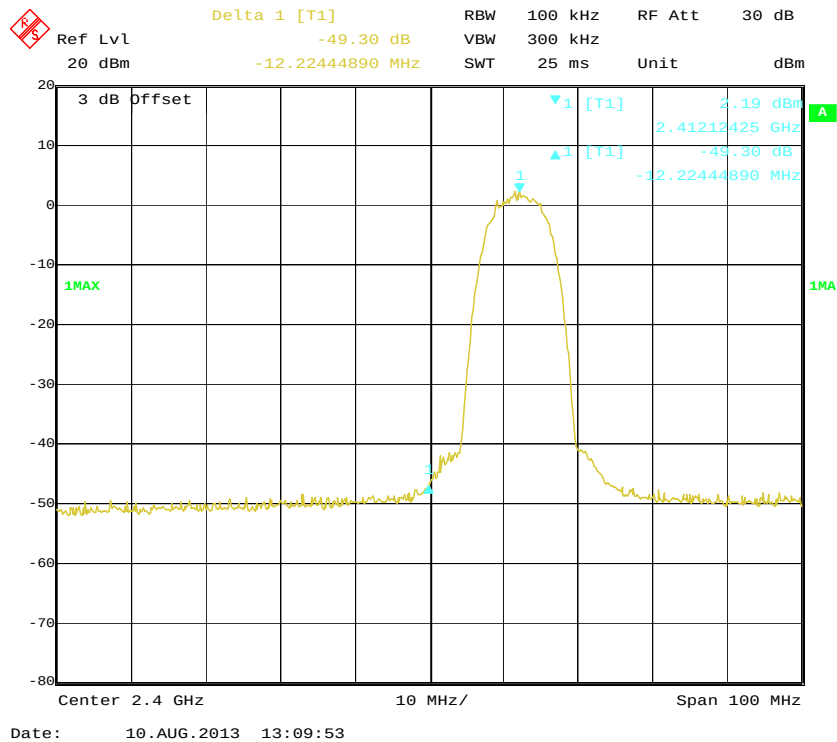
802.11n-HT40: Band Edge, Left Side, Antenna 0



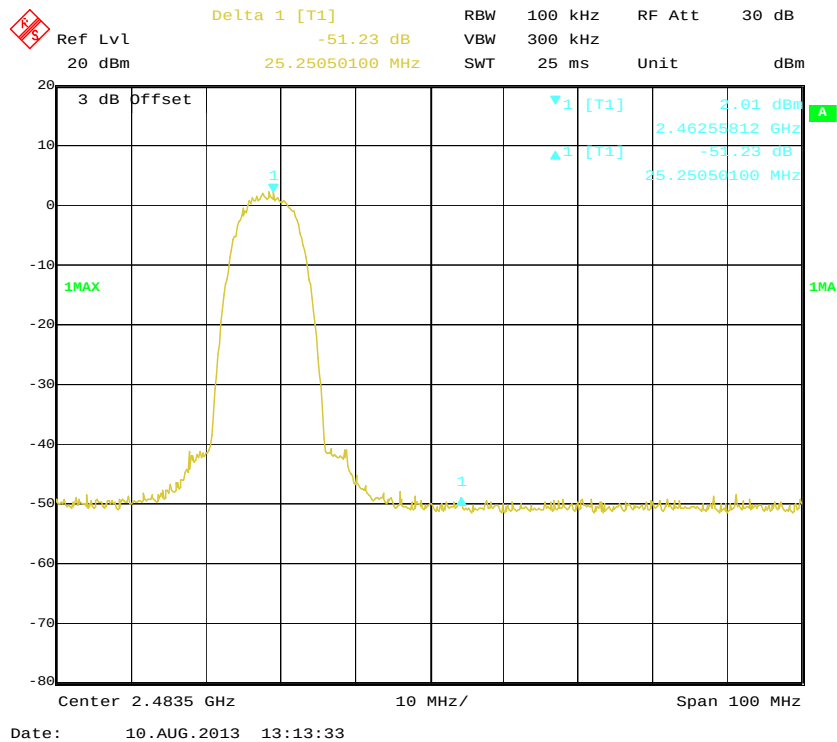
802.11n-HT40: Band Edge, Right Side, Antenna 0



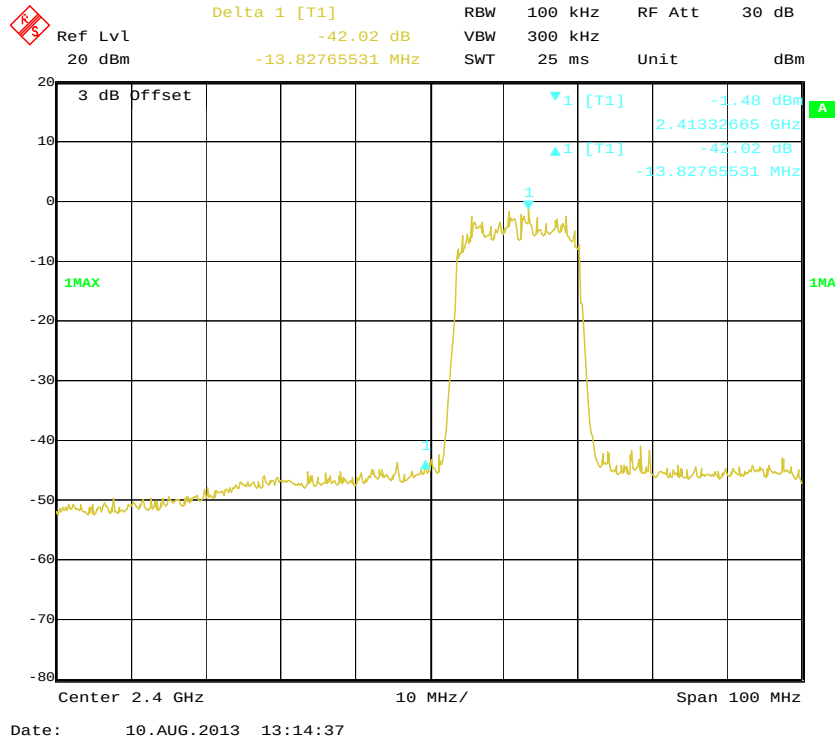
802.11b: Band Edge, Left Side, Antenna 1



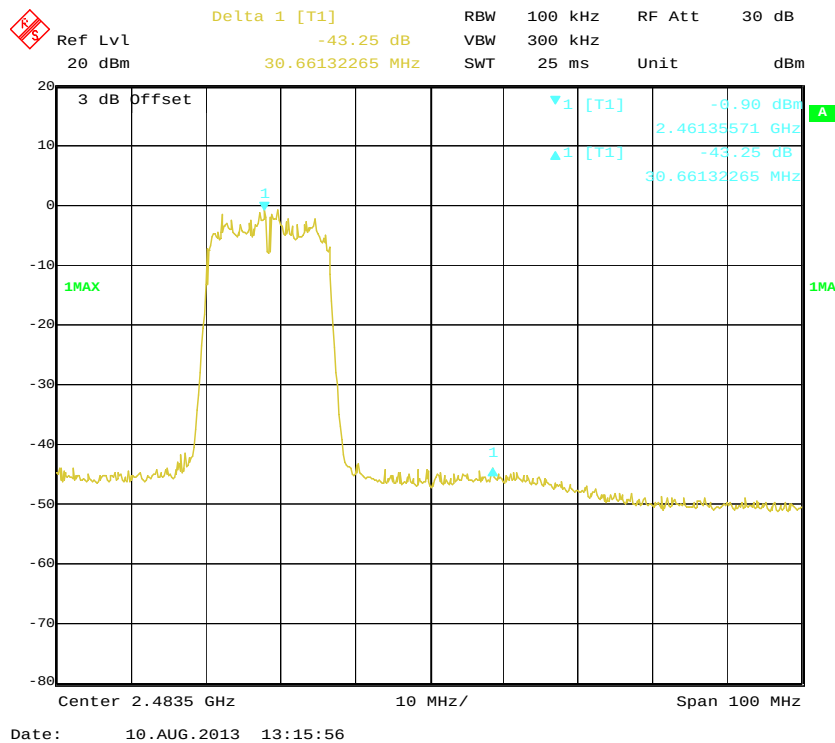
802.11b: Band Edge, Right Side, Antenna 1



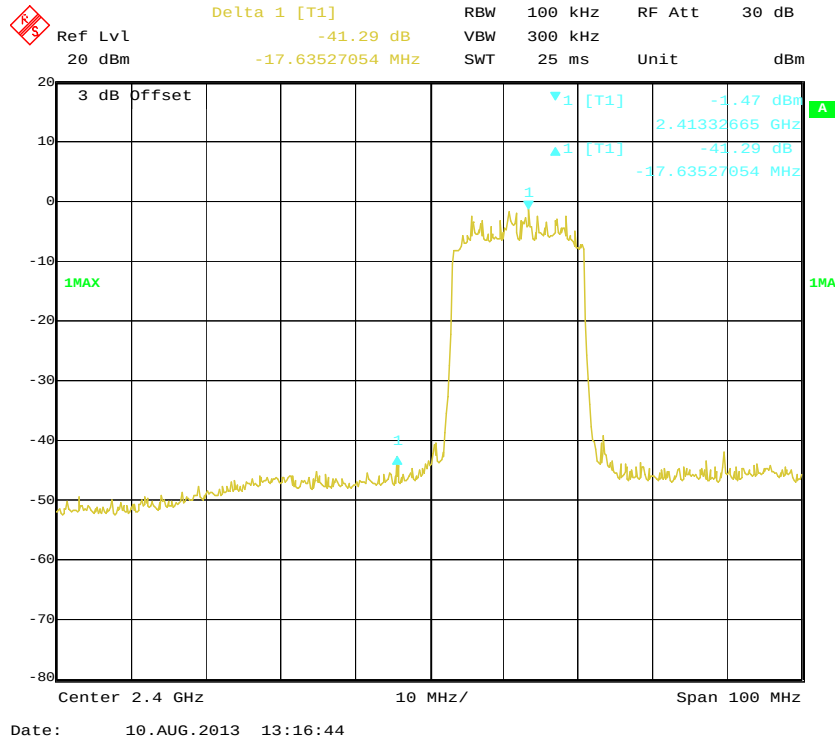
802.11g: Band Edge, Left Side, Antenna 1



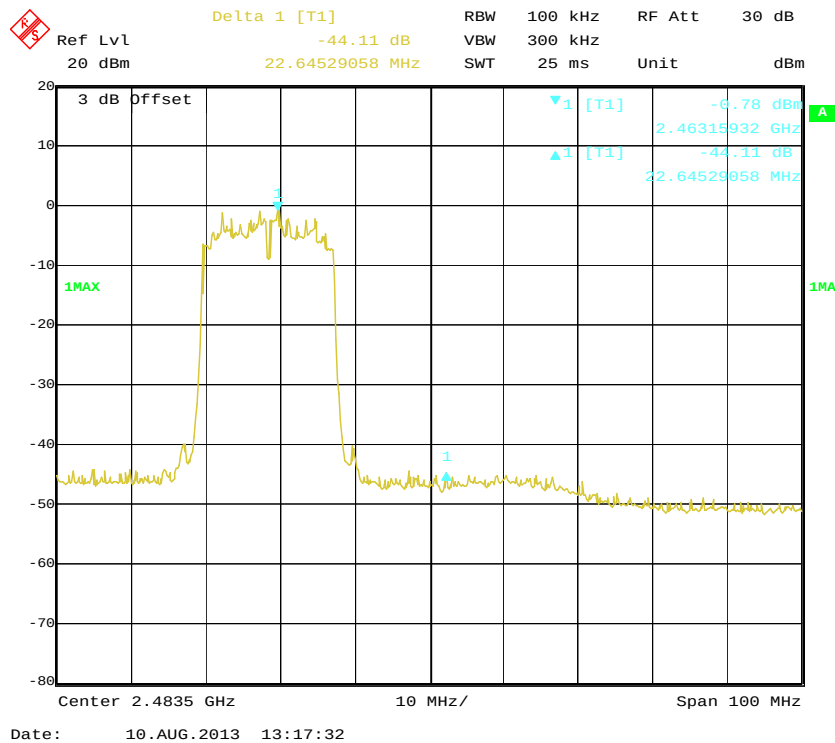
802.11g: Band Edge, Right Side, Antenna 1



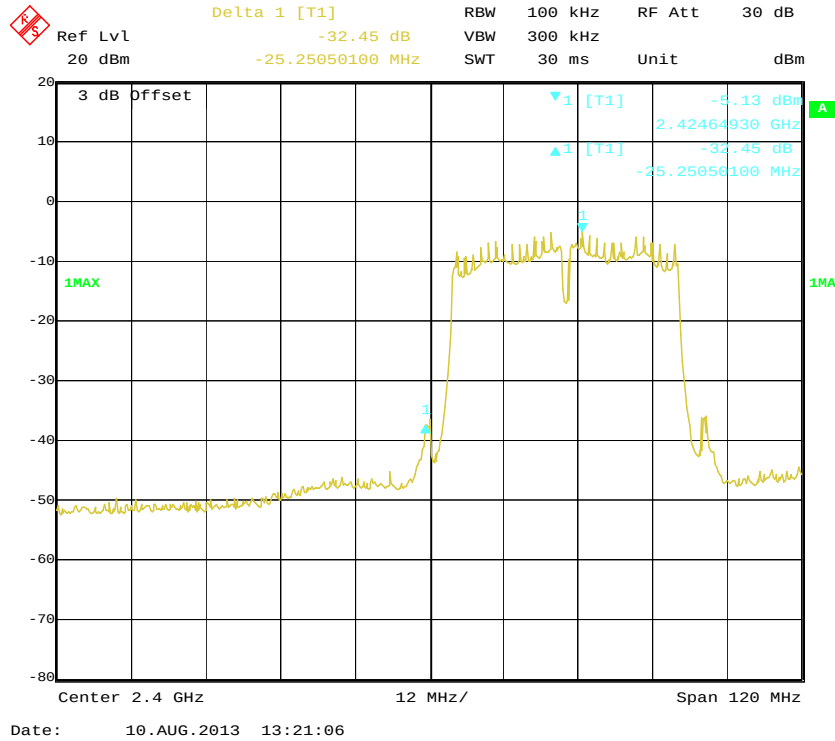
802.11n-HT20: Band Edge, Left Side, Antenna 1



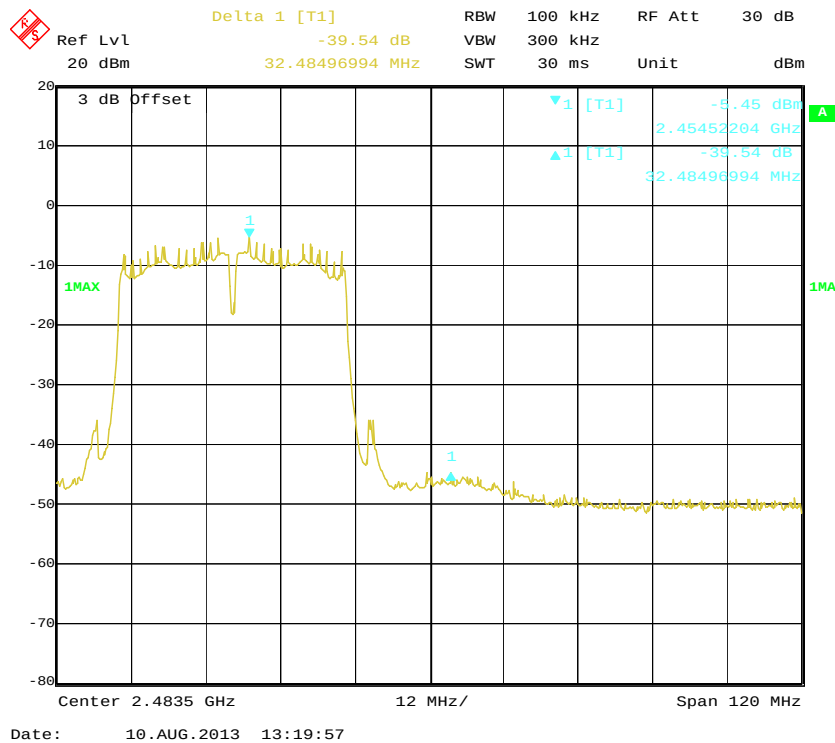
802.11n-HT20: Band Edge, Right Side, Antenna 1



802.11n-HT40: Band Edge, Left Side, Antenna 1



802.11n-HT40: Band Edge, Right Side, Antenna 1



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

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

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

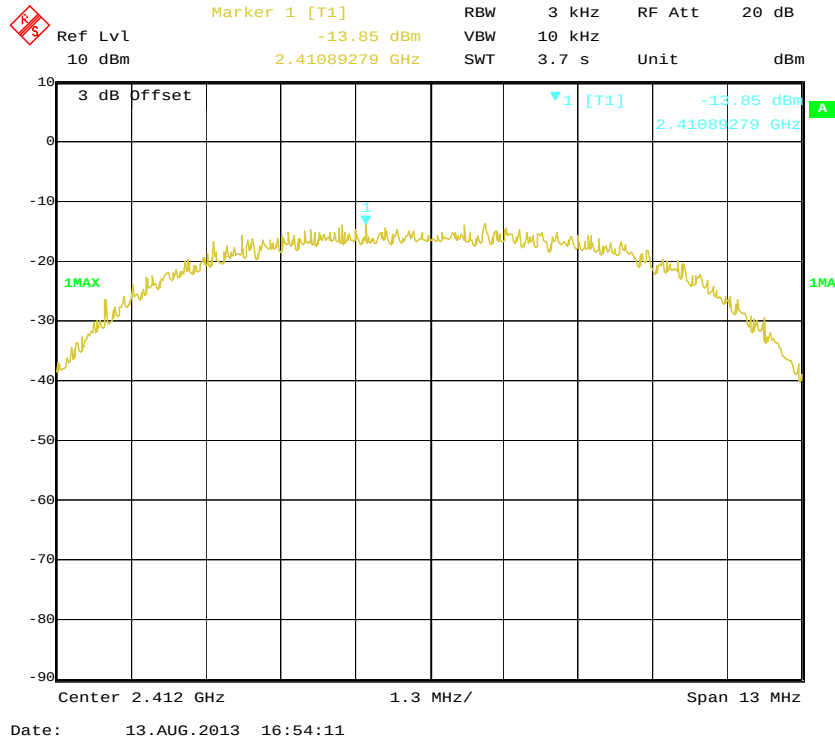
The testing was performed by Gardon Zhang on 2013-08-07 and 2013-08-13.

EUT operation mode: Transmitting

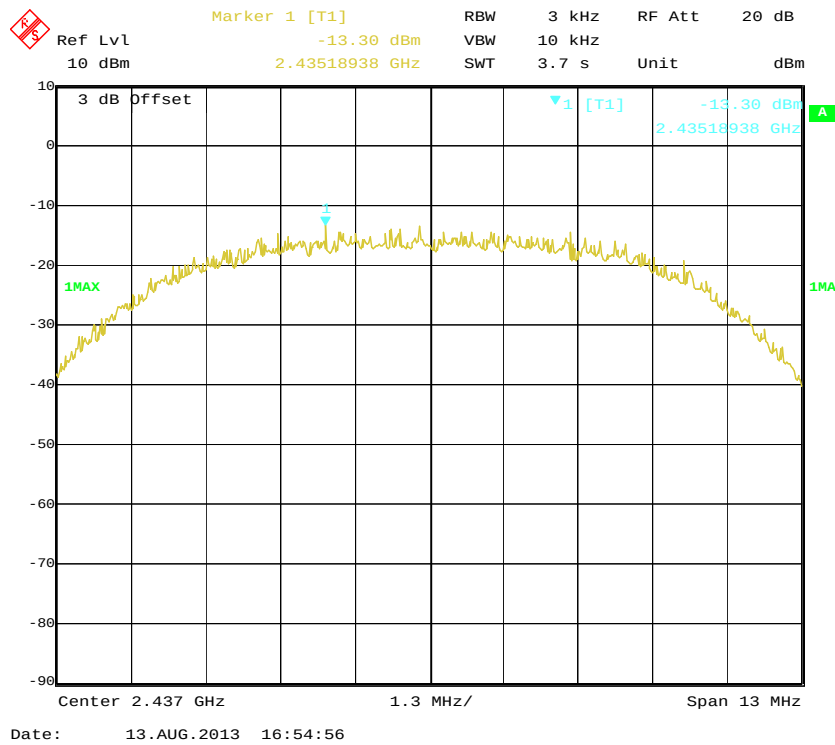
Test Result: Pass

Channel	Frequency (MHz)	Antenna Port	Data Rate (Mbps)	Correct Power spectral density (dBm)		Limit (dBm)	Result
802.11b mode							
Low	2412	0	1	-13.85		8	Pass
		1		-13.12		8	Pass
Middle	2437	0	1	-13.30		8	Pass
		1		-12.62		8	Pass
High	2462	0	1	-14.18		8	Pass
		1		-12.67		8	Pass
802.11g mode							
Low	2412	0	6	-17.77		8	Pass
		1		-17.30		8	Pass
Middle	2437	0	6	-17.13		8	Pass
		1		-17.06		8	Pass
High	2462	0	6	-16.69		8	Pass
		1		-16.30		8	Pass
802.11n-HT20 mode							
Low	2412	0	MCS0	-18.09	-14.56	8	Pass
		1		-17.11		8	Pass
Middle	2437	0	MCS0	-17.29	-14.23	8	Pass
		1		-17.20		8	Pass
High	2462	0	MCS0	-17.55	-13.98	8	Pass
		1		-16.49		8	Pass
802.11n-HT40 mode							
Low	2422	0	MCS0	-21.57	-18.14	8	Pass
		1		-20.76		8	Pass
Middle	2437	0	MCS0	-21.55	-17.40	8	Pass
		1		-19.51		8	Pass
High	2452	0	MCS0	-21.84	-17.61	8	Pass
		1		-19.67		8	Pass

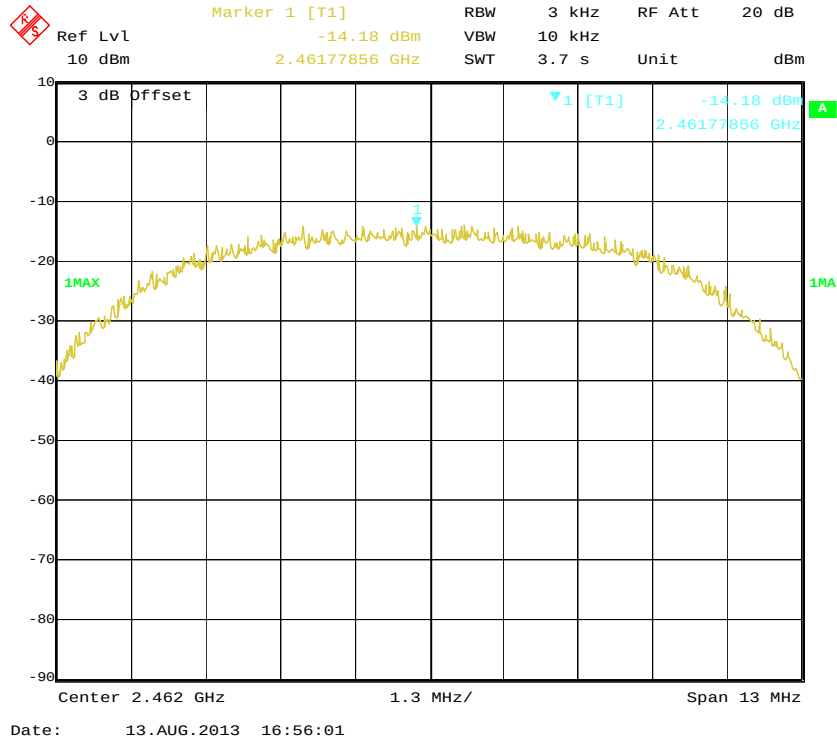
Power Spectral Density, 802.11b Low Channel, Antenna 0



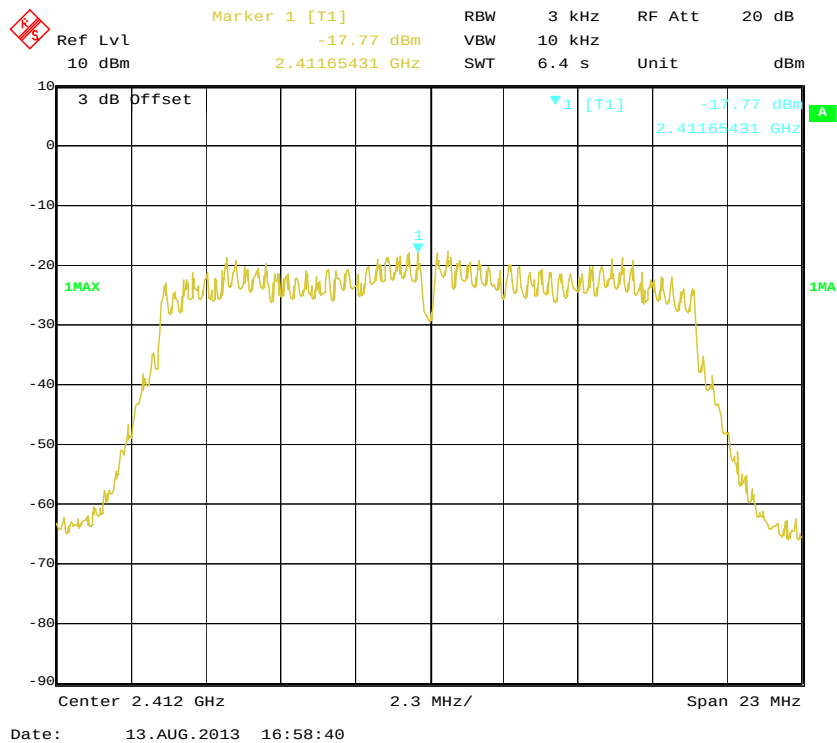
Power Spectral Density, 802.11b Middle Channel, Antenna 0



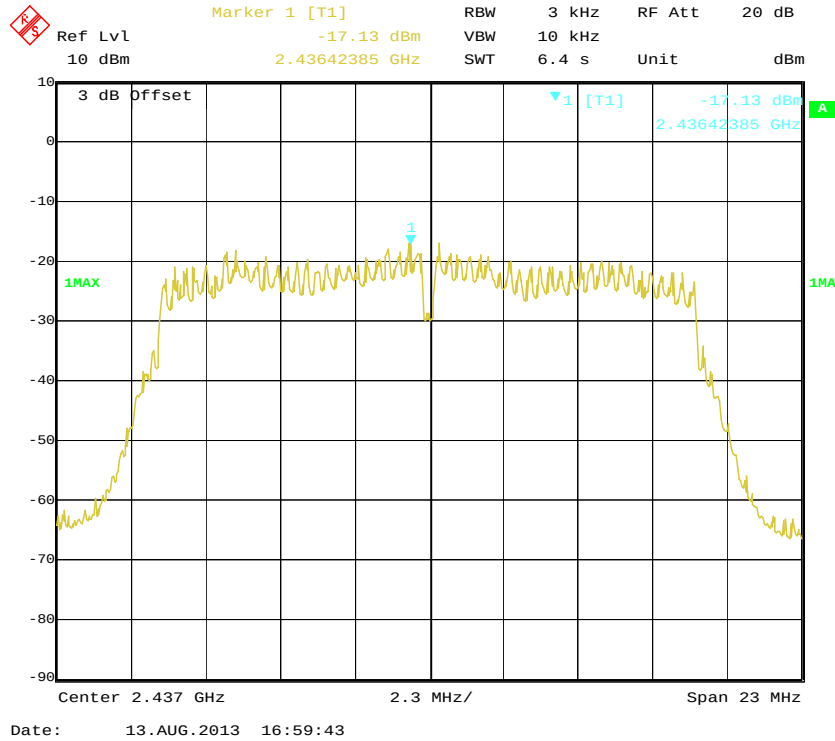
Power Spectral Density, 802.11b High Channel, Antenna 0



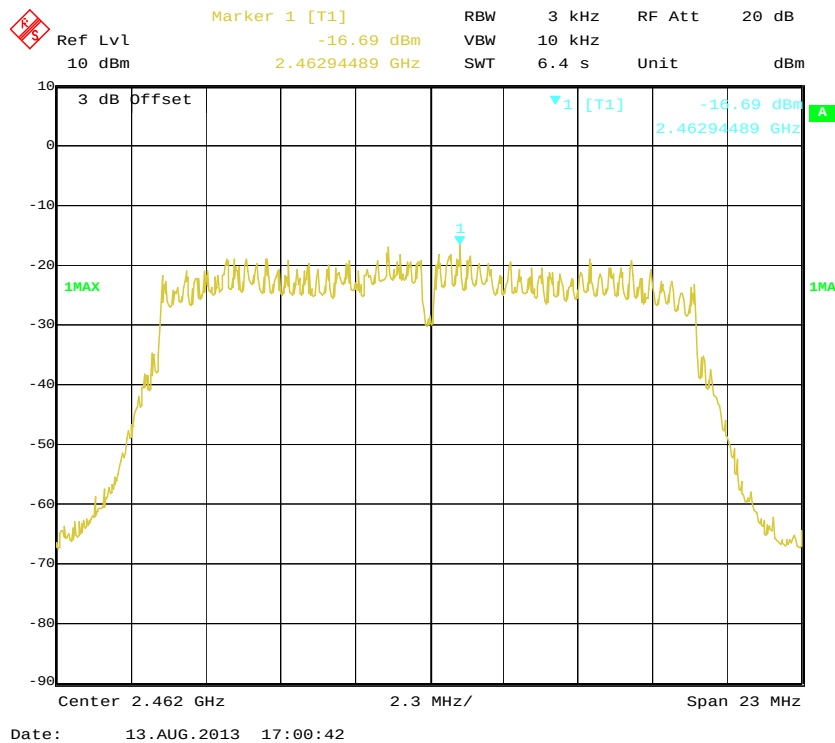
Power Spectral Density, 802.11g Low Channel, Antenna 0



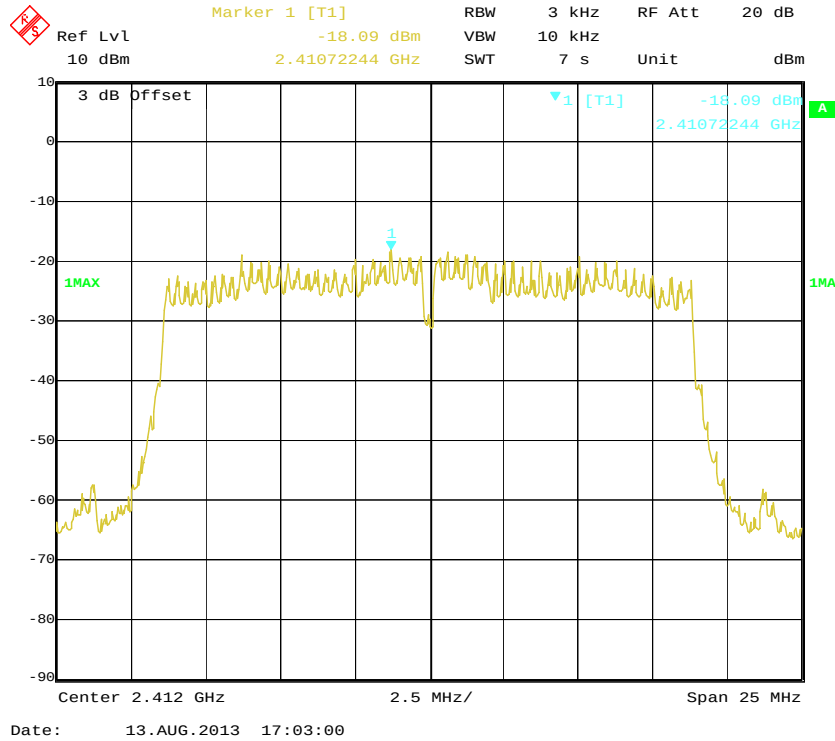
Power Spectral Density, 802.11g Middle Channel, Antenna 0



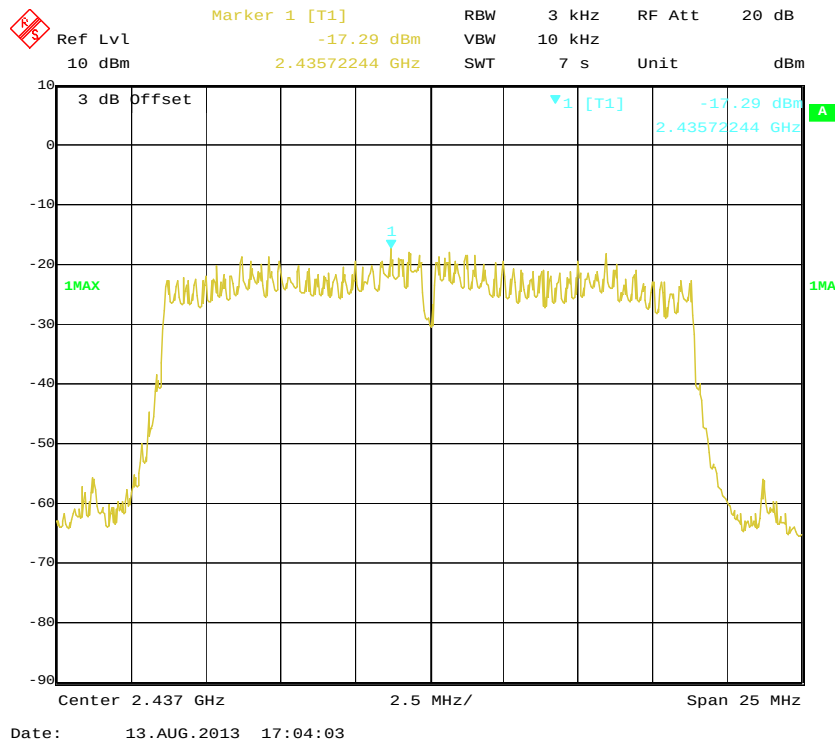
Power Spectral Density, 802.11g High Channel, Antenna 0



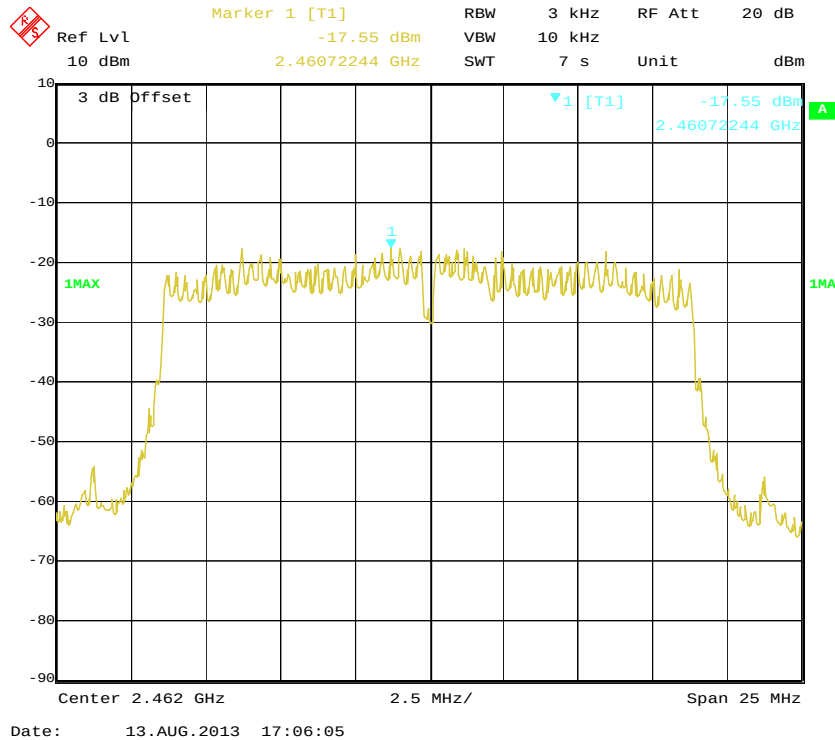
Power Spectral Density, 802.11n-HT20 Low Channel, Antenna 0



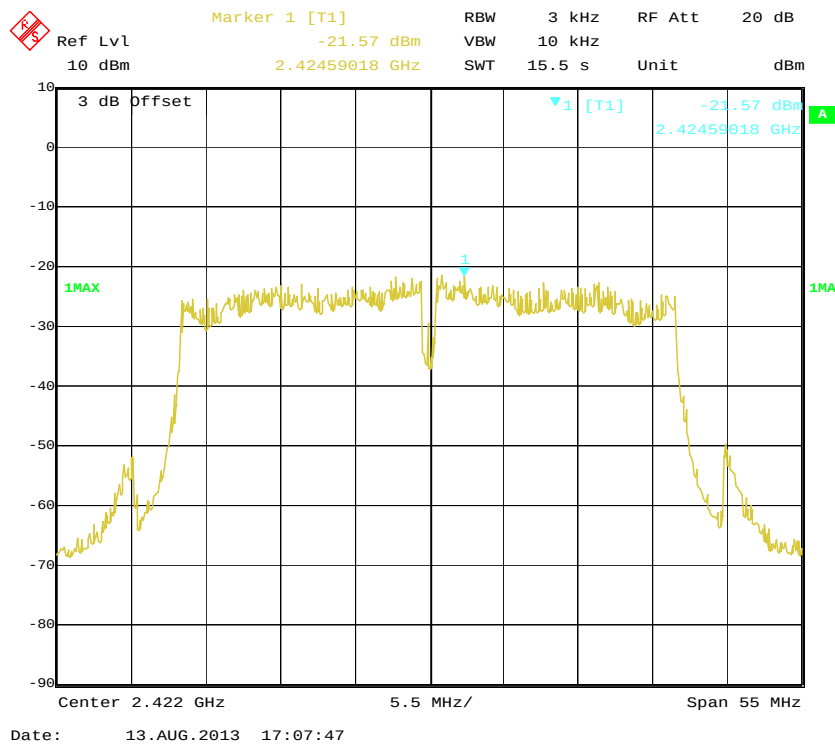
Power Spectral Density, 802.11n-HT20 Middle Channel, Antenna 0



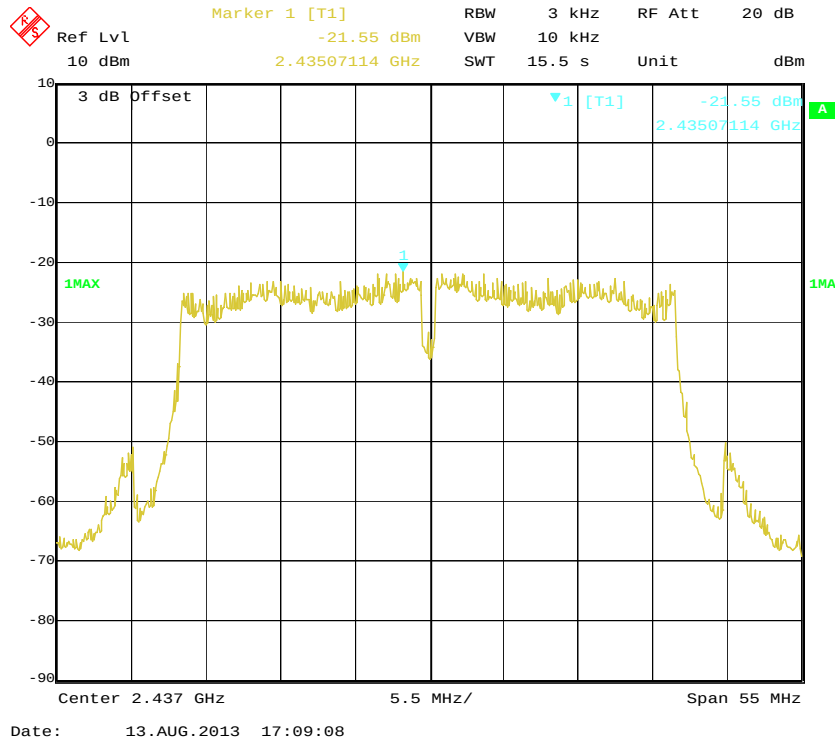
Power Spectral Density, 802.11n-HT20 High Channel, Antenna 0



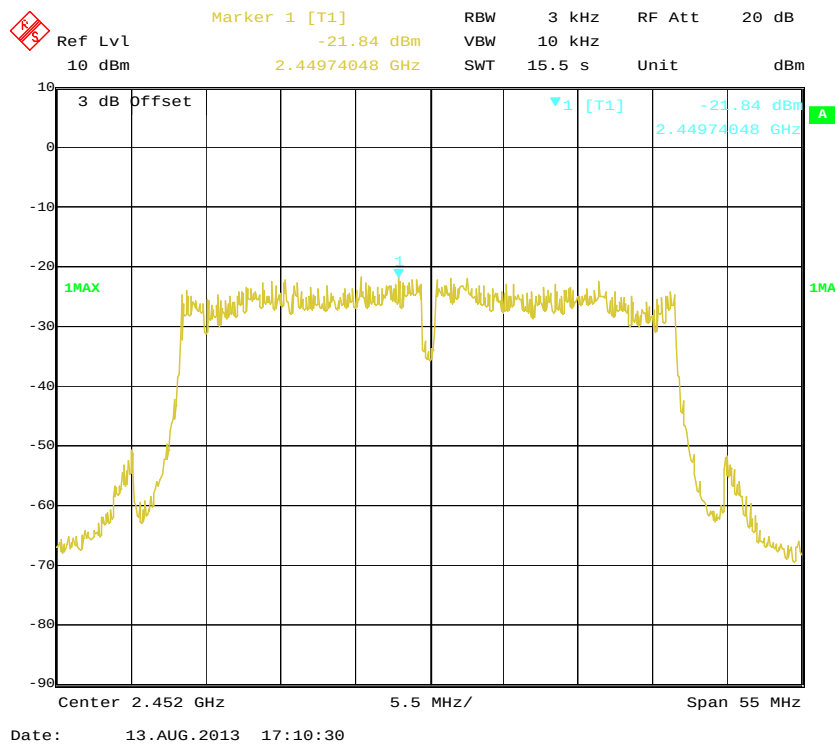
Power Spectral Density, 802.11n-HT40 Low Channel, Antenna 0



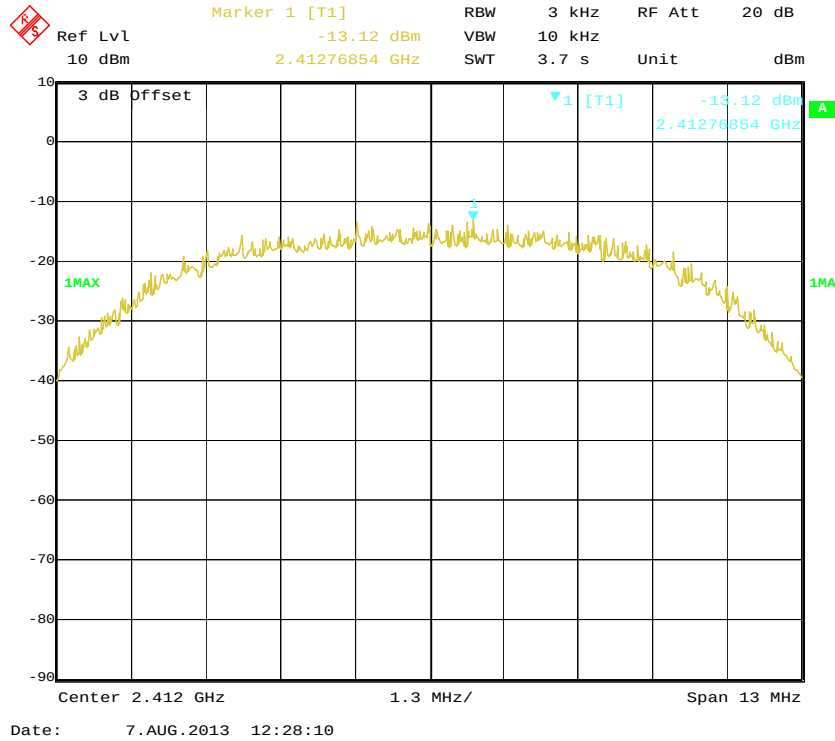
Power Spectral Density, 802.11n-HT40 Middle Channel, Antenna 0



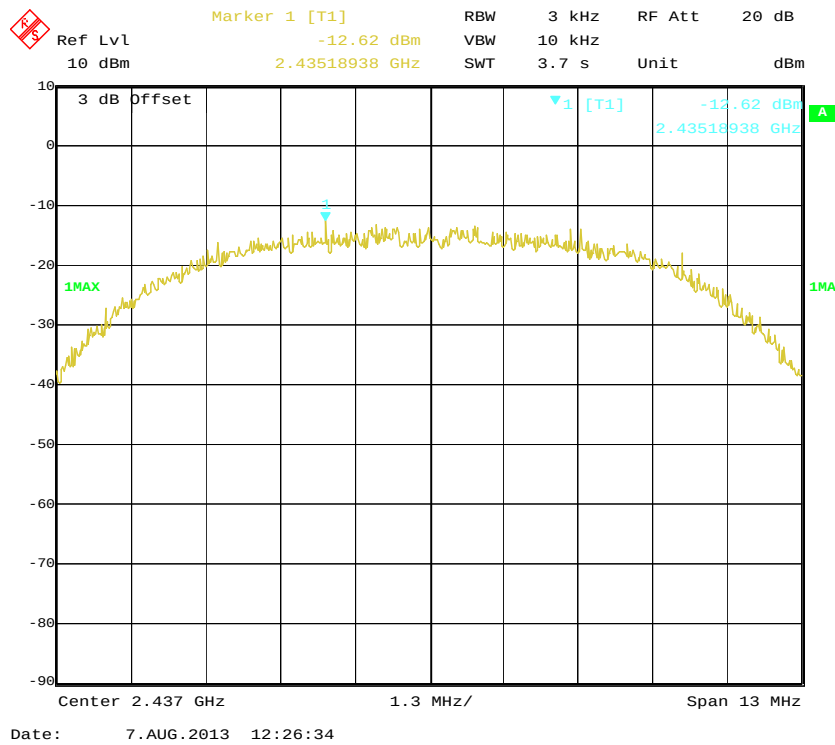
Power Spectral Density, 802.11n-HT40 High Channel, Antenna 0



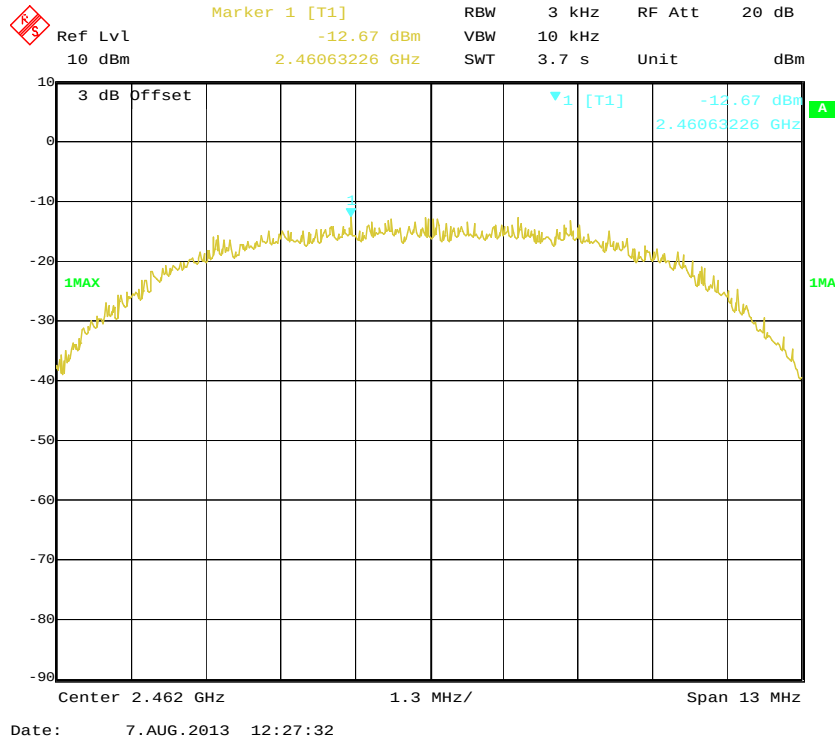
Power Spectral Density, 802.11b Low Channel, Antenna 1



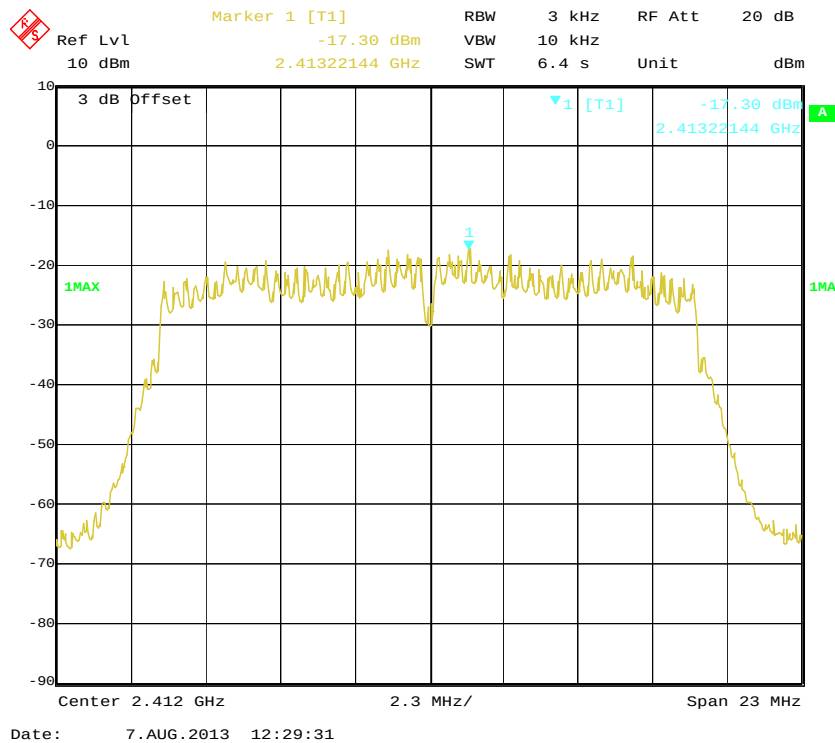
Power Spectral Density, 802.11b Middle Channel, Antenna 1



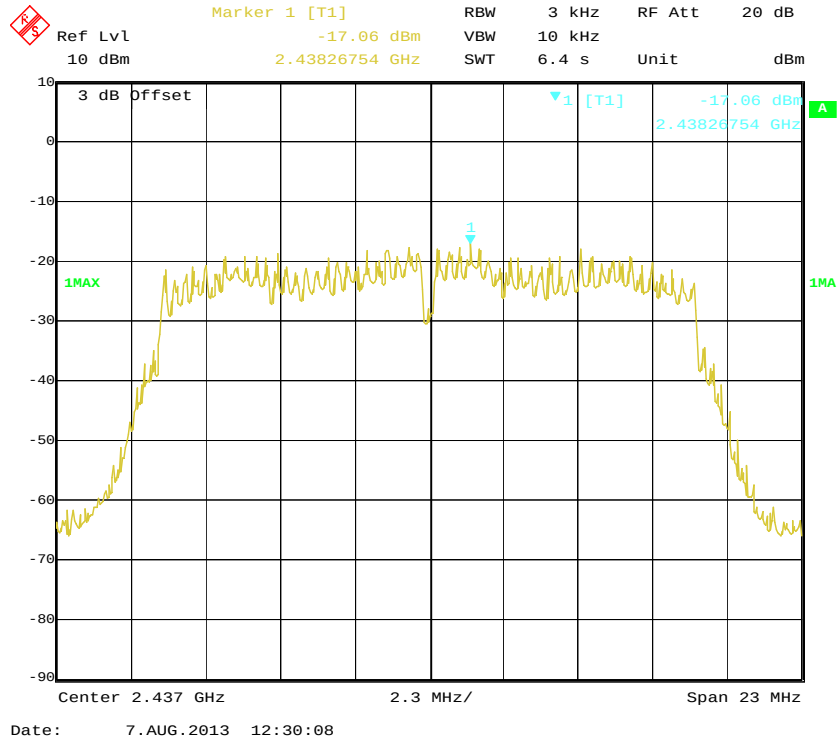
Power Spectral Density, 802.11b High Channel, Antenna 1



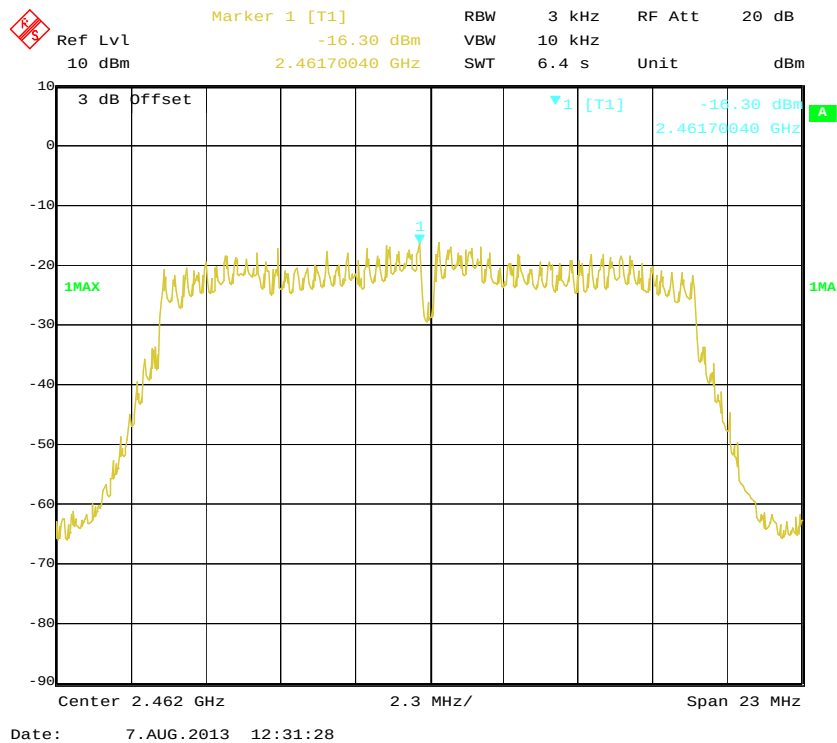
Power Spectral Density, 802.11g Low Channel, Antenna 1



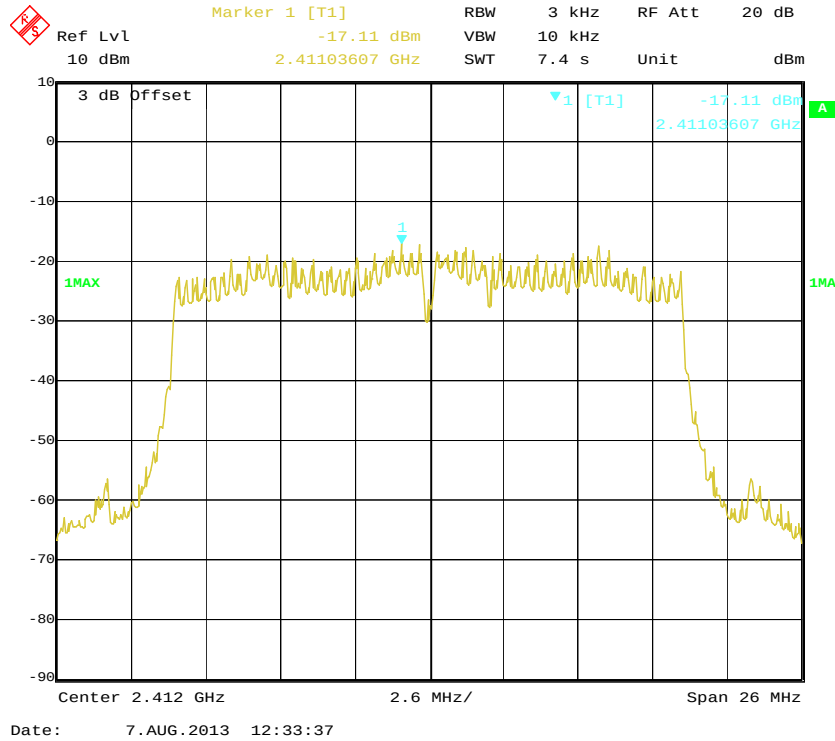
Power Spectral Density, 802.11g Middle Channel, Antenna 1



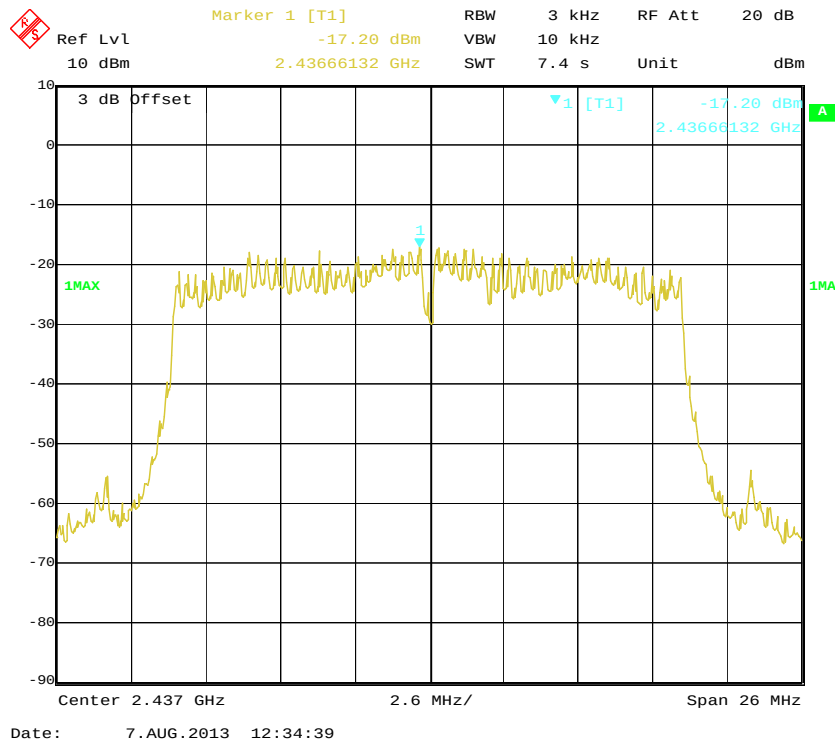
Power Spectral Density, 802.11g High Channel, Antenna 1



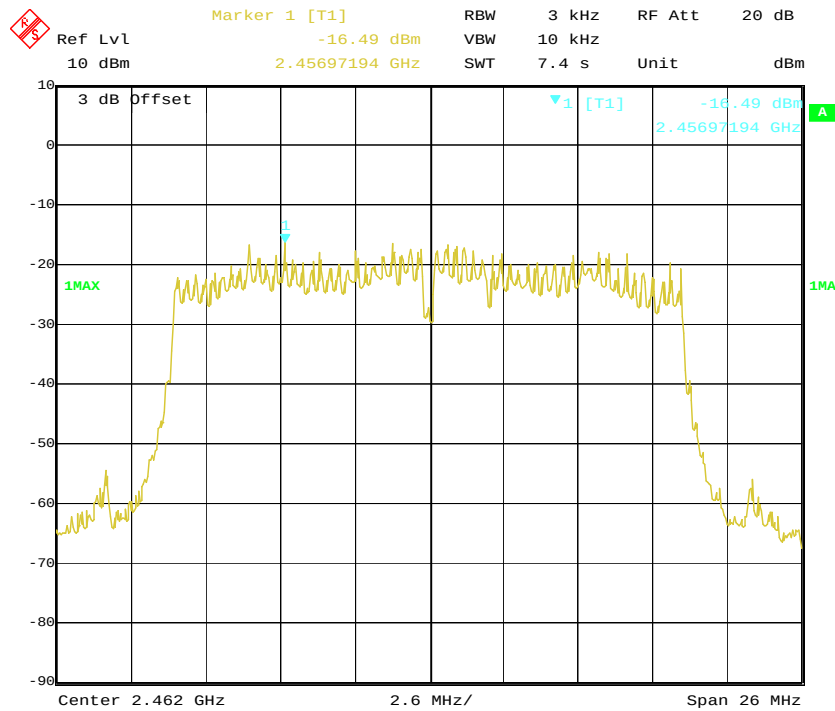
Power Spectral Density, 802.11n-HT20 Low Channel, Antenna 1



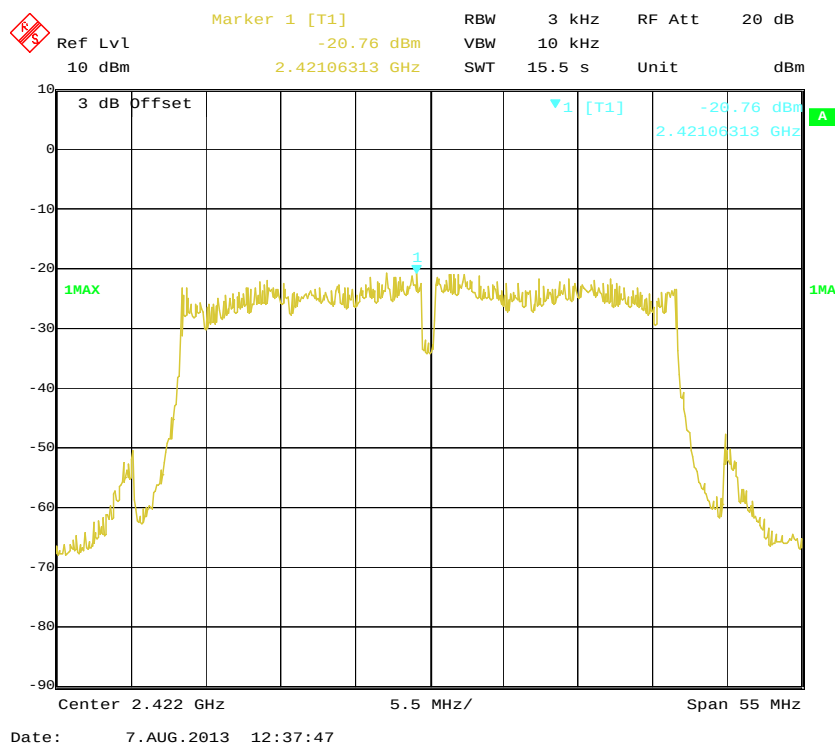
Power Spectral Density, 802.11n-HT20 Middle Channel, Antenna 1



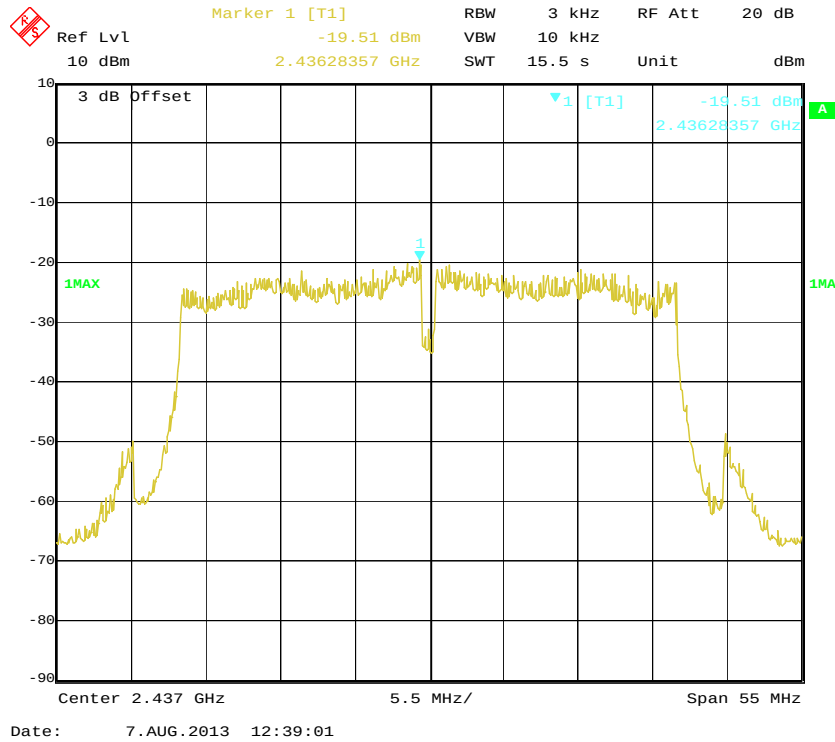
Power Spectral Density, 802.11n-HT20 High Channel, Antenna 1



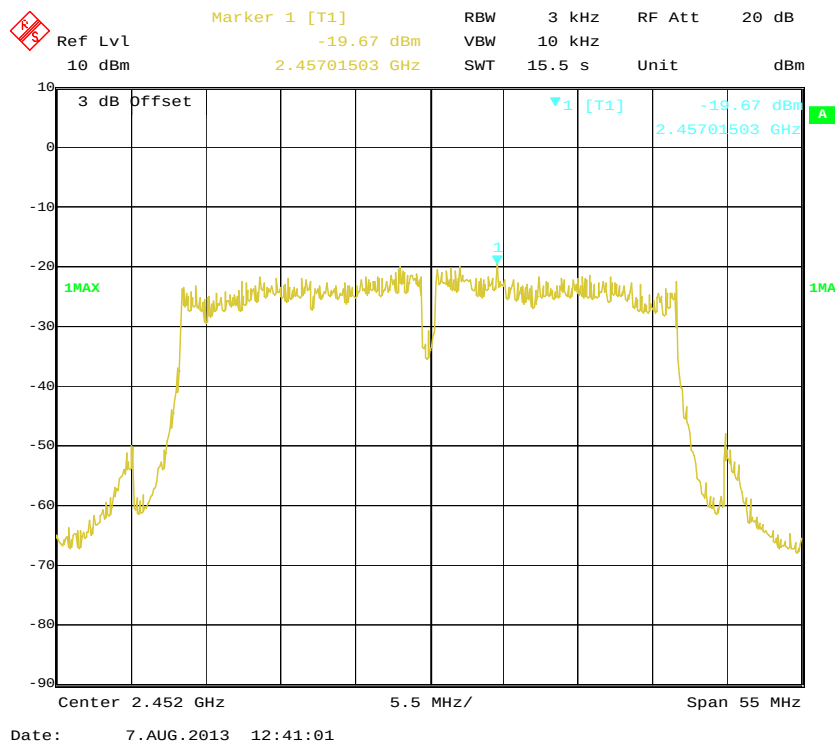
Power Spectral Density, 802.11n-HT40 Low Channel, Antenna 1



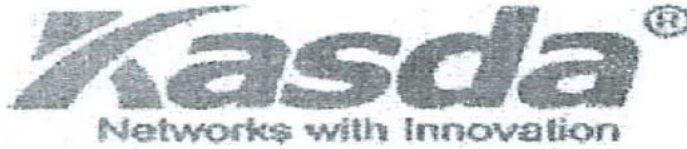
Power Spectral Density, 802.11n-HT40 Middle Channel, Antenna 1



Power Spectral Density, 802.11n-HT40 High Channel, Antenna 1



PRODUCT SIMILARITY DECLARATION LETTER



Kasda Digital Technology Co.,LTD
B-31 Building,Tunglang Industry Zone,XiLi,Nanshan,Shenzhen,China
Tel: 0755-86096689 Fax: 0755-86106137

2013-7-26

Product Similarity Declaration

To Whom It May Concern,

We, Kasda Digital Technology Co.,LTD hereby declare that our 802.11b/g/n 4 port VDSL2 Router, Model Number: KW5212H was tested by BACL for FCC approval, and for our marketing purpose we would like to list another three models on reports, there are : KW5212, NG11VO, NG11VH, the differences between these models for details as below:

The test model: KW5212H supports USB function; NG11VO and NG11VH share the identical schematics with KW5212H, so these three models named differently due to different clients.

As to KW5212, is not support USB function, other functions and schematics are the same as test model: KW5212H.

Please contact me if you have any question.

Signature:

A handwritten signature in black ink, appearing to read "Ying Xiong", written over a light blue horizontal line.

Ying Xiong

Manager

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