FCC PART 15.247

TEST REPORT

For

Suga Electronics Limited

22/F., TowerB, Billion Centre, 1 Wang Kwong Road, Kowloon Bay, Kowloon, Hong Kong

FCC ID: VZFSWP23MA3

Report Type:	**Product Type:**
Original Report	Wifi module 802.11 b/g/n with AP (Access Point) / Router function

Test Engineer:	August He
Report Number:	RSZ140509002-00
Report Date:	2014-05-26
Reviewed By:	Alvin Huang RF Leader
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Suga Electronics Limited*'s product, model number: *SWP23MA-3 (FCC ID: VZFSWP23MA3)* (the "EUT") in this report was a *Wifi module 802.11 b/g/n with AP (Access Point) / Router function*, which was measured approximately: 6.0 cm (L) x 5.0 cm (W) x 2.0 cm (H), rated with input voltage: DC 3.3V (Typical).

** All measurement and test data in this report was gathered from production sample serial number: 1405063 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-05-09.*

Objective

This Type approval report is prepared on behalf of *Suga Electronics Limited 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)

No related submitted(s).

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.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

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

EUT was tested with Channel 1, 6 and 11.

For 802.11n-HT40 mode, 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

RT3352 QA Tools

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

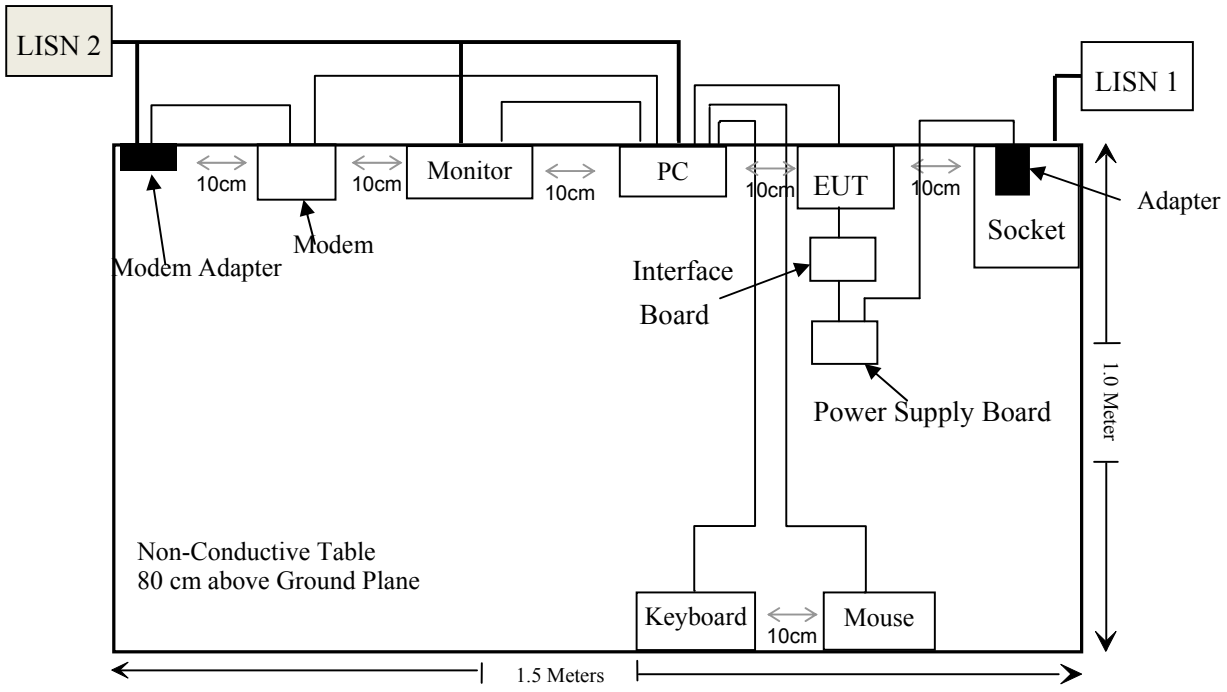
Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
SAST	Modem	AEM-2100	0293
Suga	Test fixture	/	/

External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielding Detachable USB Cable	1.5	Host PC	Mouse
Shielding Detachable Serial Cable	1.2	Host PC	Modem
Shielding Detachable K/B Cable	1.5	Host PC	Keyboard
Shielding Detachable VGA Cable	1.5	Host PC	LCD Monitor
Unshielding Detachable LAN Cable	2.1	EUT	PC
Unshielding Undetachable Adapter Cable	1.5	Adapter	Power Supply Board

Block Diagram of Test Setup

For Conducted Emission:



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),	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), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

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

Calculated Formulary:

Predication of MPE limit at a given distance

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

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = 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/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
Limits for General Population/Uncontrolled Exposure								
802.11n-HT20	2437	2.0	1.58	23.90	245.47	20	0.0772	1.0

Result: The device meets FCC MPE limit at 20 cm distance as a mobile device specified in §2.1091. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by §2.1093.

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.

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

Antenna Connector Construction

This product used two 2.4 GHz TX/RX antennas which were connected to the mainboard with I-PEX socket, and the maximum gain is 2.0 dBi, which fulfill the requirement of this section, and please refer to the internal photos.

Result: Compliance.

FCC §15.207 (a) - CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

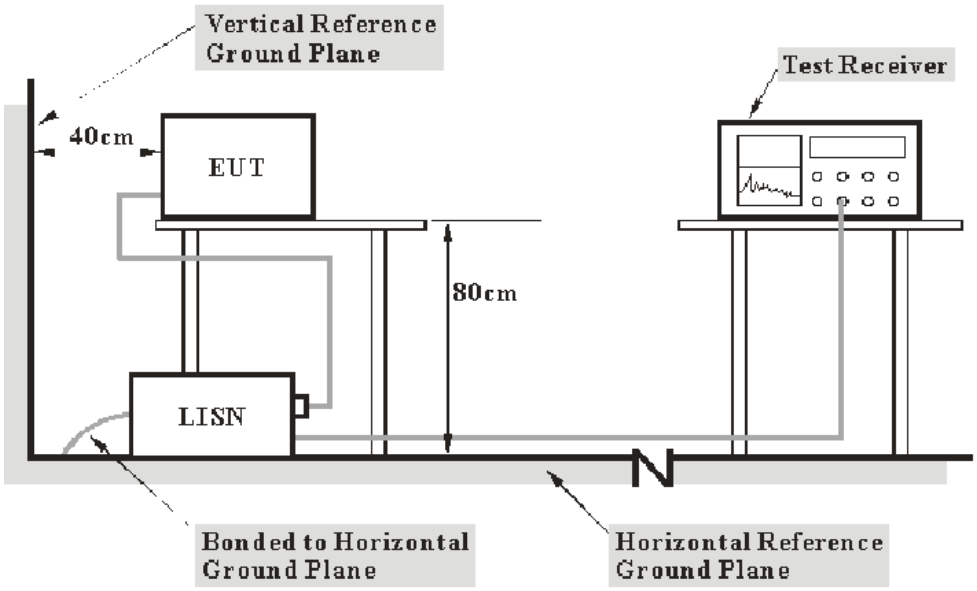
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe 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 Socket 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 first 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	ESCI	101122	2013-09-25	2014-09-25
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2014-05-07	2015-05-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	--	--

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

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:

8.9 dB at **0.671950 MHz** in the **Neutral** conductor 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 our lab., $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

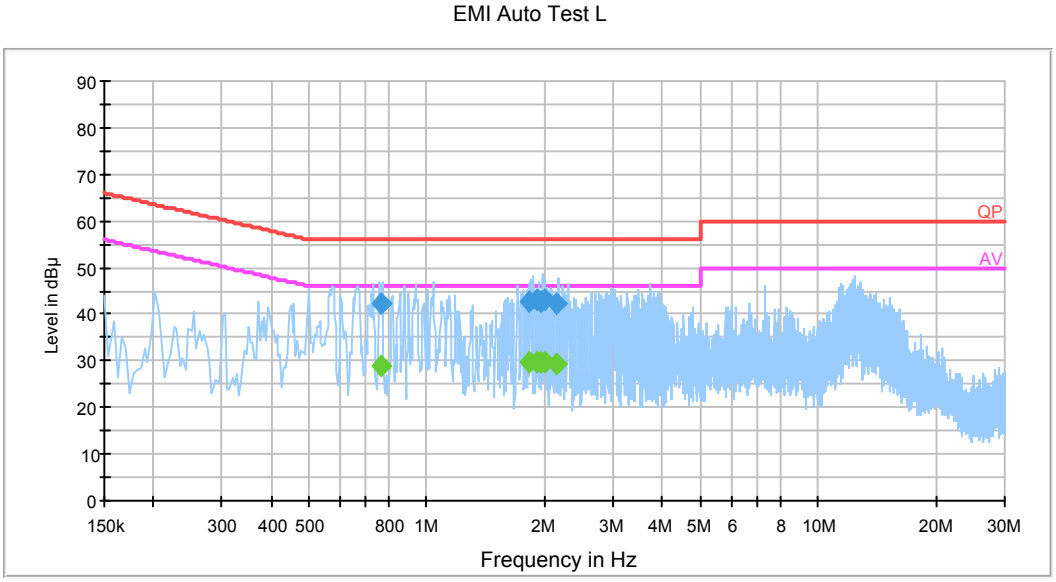
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by August He on 2014-05-18.

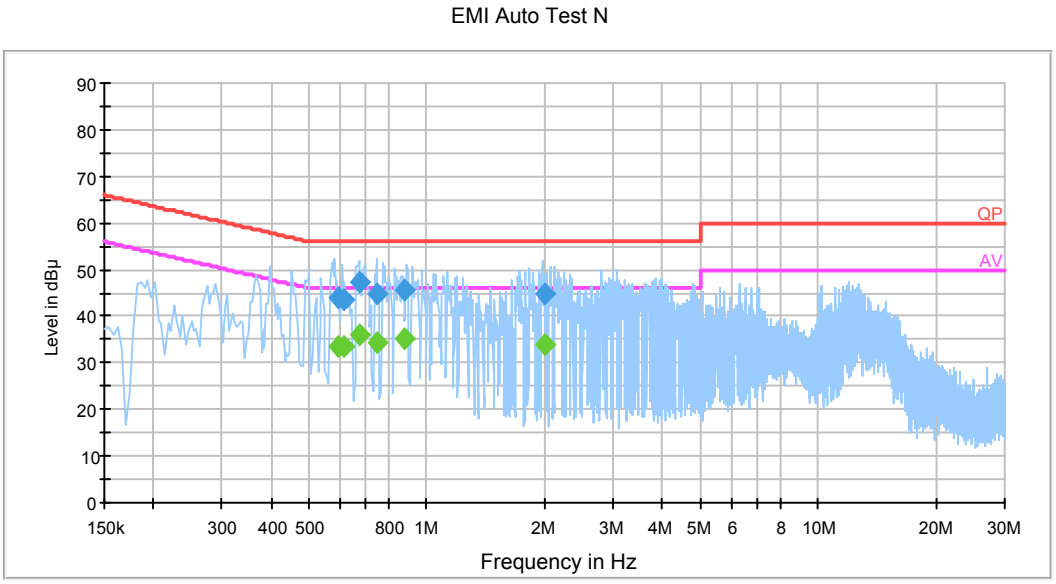
Test Mode: Transmitting

AC 120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.766450	42.4	19.5	56.0	13.6	QP
0.766450	28.8	19.5	46.0	17.2	Ave.
1.826370	42.6	19.5	56.0	13.4	QP
1.826370	29.7	19.5	46.0	16.3	Ave.
1.906170	43.2	19.6	56.0	12.8	QP
1.906170	29.8	19.6	46.0	16.2	Ave.
1.948390	42.7	19.6	56.0	13.3	QP
1.948390	29.7	19.6	46.0	16.3	Ave.
2.004210	43.0	19.6	56.0	13.0	QP
2.004210	29.9	19.6	46.0	16.1	Ave.
2.145330	42.3	19.6	56.0	13.7	QP
2.145330	29.4	19.6	46.0	16.6	Ave.

AC 120V, 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/QP/Ave.)
0.590730	44.1	19.6	56.0	11.9	QP
0.590730	33.4	19.6	46.0	12.6	Ave.
0.612850	43.6	19.6	56.0	12.4	QP
0.612850	33.5	19.6	46.0	12.5	Ave.
0.671950	47.1	19.6	56.0	8.9	QP
0.671950	36.1	19.6	46.0	9.9	Ave.
0.746810	44.7	19.6	56.0	11.3	QP
0.746810	34.5	19.6	46.0	11.5	Ave.
0.876650	45.8	19.5	56.0	10.2	QP
0.876650	35.2	19.5	46.0	10.8	Ave.
1.999550	44.7	19.6	56.0	11.3	QP
1.999550	33.8	19.6	46.0	12.2	Ave.

Note:
1) Corrected Amplitude = Reading + Correction Factor
2) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss
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;

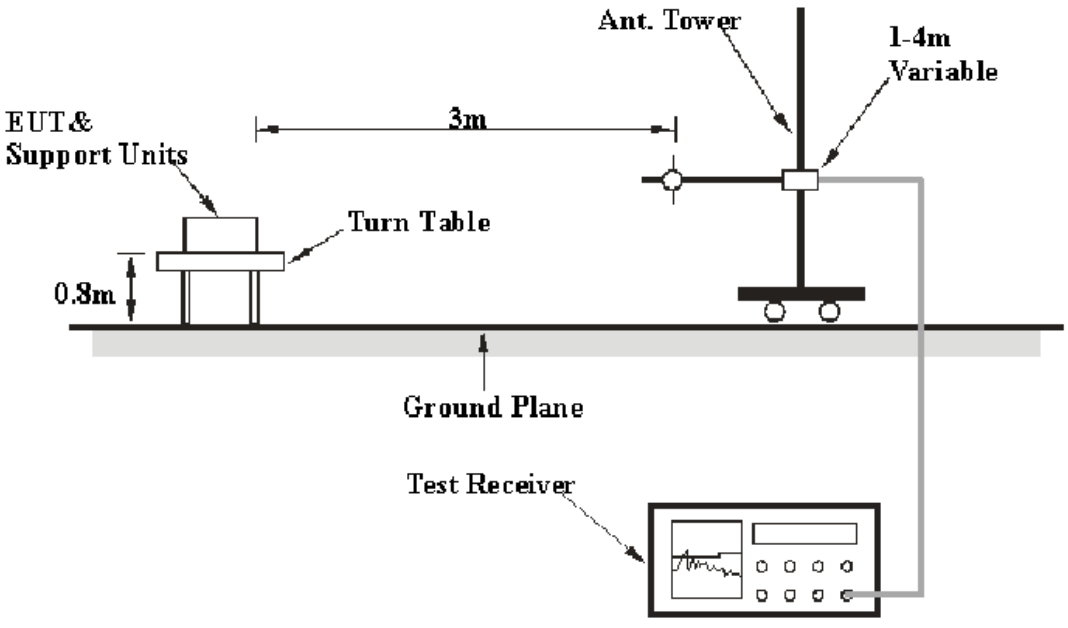
Measurement Uncertainty

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 expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30MHz~200MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200MHz~1GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal / Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal / Vertical	4.92 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 socket was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

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.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-25	2014-09-25
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2014-04-03	2015-04-03
Sunol Sciences	Horn Antenna	DRH-118	A052304	2013-11-30	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
DUCOMMUN	Pre-amplifier	ALN-22093530-01	991373-01	2013-08-03	2014-08-03
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13

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

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test Results Summary

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

3.17 dB at **2495.66 MHz** in the **Horizontal** polarization for mode 802.11n-HT40

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 our lab., $U_{(Lm)}$ 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:	25~26 ℃
Relative Humidity:	50~55 %
ATM Pressure:	101.0 kPa

The testing was performed by August He from 2014-05-21 to 2014-05-26.

Test Mode: Transmitting

Note: For 802.11b/g, test with two antenna ports transmit separately, the worst case is from antenna 0; for 802.11n-HT20, 802.11n-HT40, test with two antenna ports transmit simultaneously, and the worst case as below:

30 MHz-25 GHz

802.11b mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	40.07	QP	40	1.3	H	-14.6	25.47	46	20.53
2412.00	105.84	PK	302	1.9	H	6.13	111.97	/	/
2412.00	95.15	Ave.	302	1.9	H	6.13	101.28	/	/
2412.00	96.13	PK	321	2.1	V	6.13	102.26	/	/
2412.00	90.56	Ave.	321	2.1	V	6.13	96.69	/	/
2384.67	60.82	PK	325	2.3	H	5.48	66.30	74	7.70
2384.67	44.57	Ave.	325	2.3	H	5.48	50.05	54	3.95
2489.06	60.24	PK	289	1.3	H	7.21	67.45	74	6.55
2489.06	42.92	Ave.	289	1.3	H	7.21	50.13	54	3.87
3218.44	56.09	PK	48	2.1	H	9.43	65.52	91.97	26.45
3218.44	50.46	Ave.	48	2.1	H	9.43	59.89	81.28	21.39
4824.00	39.10	PK	254	1.1	H	12.44	51.54	74	22.46
4824.00	25.78	Ave.	254	1.1	H	12.44	38.22	54	15.78
7236.00	34.93	PK	251	2.4	V	17.06	51.99	74	22.01
7236.00	20.04	Ave.	251	2.4	V	17.06	37.10	54	16.90
9648.00	35.36	PK	208	1.5	H	19.28	54.64	74	19.36
9648.00	20.82	Ave.	208	1.5	H	19.28	40.10	54	13.90
Middle Channel (2437 MHz)									
249.99	41.25	QP	137	2.3	V	-14.6	26.65	46	19.35
2437.00	106.53	PK	83	1.4	H	6.13	112.66	/	/
2437.00	94.02	Ave.	83	1.4	H	6.13	100.15	/	/
2437.00	95.26	PK	162	1.3	V	6.13	101.39	/	/
2437.00	90.64	Ave.	162	1.3	V	6.13	96.77	/	/
2385.23	58.00	PK	72	1.3	H	5.48	63.48	74	10.52
2385.23	44.72	Ave.	72	1.3	H	5.48	50.20	54	3.80
2491.60	58.20	PK	153	2.0	H	7.21	65.41	74	8.59
2491.60	42.93	Ave.	153	2.0	H	7.21	50.14	54	3.86
3250.50	55.24	PK	11	1.7	H	9.39	64.63	92.66	28.03
3250.50	50.72	Ave.	11	1.7	H	9.39	60.11	80.15	20.04
4874.00	39.05	PK	232	1.2	H	12.4	51.45	74	22.55
4874.00	24.04	Ave.	232	1.2	H	12.4	36.44	54	17.56
7311.00	34.59	PK	275	1.6	H	16.62	51.21	74	22.79
7311.00	20.68	Ave.	275	1.6	H	16.62	37.3	54	16.70
9748.00	35.23	PK	68	2.0	V	19.4	54.63	74	19.37
9748.00	20.98	Ave.	68	2.0	V	19.4	40.38	54	13.62

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	40.36	QP	95	1.8	V	-14.6	25.76	46	20.24
2462.00	105.29	PK	176	1.4	H	6.13	111.42	/	/
2462.00	94.17	Ave.	176	1.4	H	6.13	100.30	/	/
2462.00	95.76	PK	0	1.3	V	6.13	101.89	/	/
2462.00	91.43	Ave.	0	1.3	V	6.13	97.56	/	/
2386.81	60.03	PK	291	2.4	H	5.48	65.51	74	8.49
2386.81	44.61	Ave.	291	2.4	H	5.48	50.09	54	3.91
2484.36	58.89	PK	347	2.2	H	7.21	66.10	74	7.90
2484.36	43.22	Ave.	347	2.2	H	7.21	50.43	54	3.57
3282.56	55.97	PK	280	2.0	H	9.39	65.36	91.42	26.06
3282.56	50.64	Ave.	280	2.0	H	9.39	60.03	80.30	20.27
4924.00	39.32	PK	241	1.8	V	12.46	51.78	74	22.22
4924.00	25.17	Ave.	241	1.8	V	12.46	37.63	54	16.37
7386.00	34.51	PK	47	2.3	V	15.91	50.42	74	23.58
7386.00	21.62	Ave.	47	2.3	V	15.91	37.53	54	16.47
9848.00	35.19	PK	178	2.0	H	19.29	54.48	74	19.52
9848.00	19.31	Ave.	178	2.0	H	19.29	38.60	54	15.40

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	40.63	QP	134	2.4	V	-14.6	26.03	46	19.97
2412.00	105.11	PK	340	2.4	H	6.13	111.24	/	/
2412.00	94.62	Ave.	340	2.4	H	6.13	100.75	/	/
2412.00	95.79	PK	298	1.2	V	6.13	101.92	/	/
2412.00	90.26	Ave.	298	1.2	V	6.13	96.39	/	/
2376.29	59.52	PK	325	1.3	H	5.48	65.00	74	9.00
2376.29	44.79	Ave.	325	1.3	H	5.48	50.27	54	3.73
2497.37	60.39	PK	343	1.3	H	7.21	67.60	74	6.40
2497.37	42.90	Ave.	343	1.3	H	7.21	50.11	54	3.89
3218.44	56.80	PK	122	2.5	H	9.43	66.23	91.24	25.01
3218.44	50.49	Ave.	122	2.5	H	9.43	59.92	80.75	20.83
4824.00	37.71	PK	204	1.9	V	12.44	50.15	74	23.85
4824.00	24.50	Ave.	204	1.9	V	12.44	36.94	54	17.06
7236.00	34.75	PK	177	1.9	V	17.06	51.81	74	22.19
7236.00	21.78	Ave.	177	1.9	V	17.06	38.84	54	15.16
9648.00	35.58	PK	284	2.3	H	19.28	54.86	74	19.14
9648.00	19.36	Ave.	284	2.3	H	19.28	38.64	54	15.36
Middle Channel (2437 MHz)									
249.99	39.32	QP	39	1.3	V	-14.6	24.72	46	21.28
2437.00	106.31	PK	143	2.1	H	6.13	112.44	/	/
2437.00	95.88	Ave.	143	2.1	H	6.13	102.01	/	/
2437.00	96.00	PK	255	1.1	V	6.13	102.13	/	/
2437.00	91.85	Ave.	255	1.1	V	6.13	97.98	/	/
2370.15	57.10	PK	225	1.2	H	5.48	62.58	74	11.42
2370.15	44.86	Ave.	225	1.2	H	5.48	50.34	54	3.66
2497.70	58.56	PK	327	1.8	H	7.21	65.77	74	8.23
2497.70	43.34	Ave.	327	1.8	H	7.21	50.55	54	3.45
3250.50	55.72	PK	16	1.4	H	9.39	65.11	92.44	27.33
3250.50	50.62	Ave.	16	1.4	H	9.39	60.01	82.01	22.00
4874.00	37.65	PK	339	1.0	H	12.4	50.05	74	23.95
4874.00	23.59	Ave.	339	1.0	H	12.4	35.99	54	18.01
7311.00	34.69	PK	253	1.6	H	16.62	51.31	74	22.69
7311.00	20.25	Ave.	253	1.6	H	16.62	36.87	54	17.13
9748.00	35.62	PK	81	2.4	H	19.4	55.02	74	18.98
9748.00	20.46	Ave.	81	2.4	H	19.4	39.86	54	14.14

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	40.92	QP	341	2.2	V	-14.6	26.32	46	19.68
2462.00	105.80	PK	322	1.4	H	6.13	111.93	/	/
2462.00	95.34	Ave.	322	1.4	H	6.13	101.47	/	/
2462.00	96.75	PK	340	2.2	V	6.13	102.88	/	/
2462.00	91.94	Ave.	340	2.2	V	6.13	98.07	/	/
2387.57	58.41	PK	52	2.2	H	5.48	63.89	74	10.11
2387.57	44.72	Ave.	52	2.2	H	5.48	50.20	54	3.80
2488.81	57.53	PK	39	1.9	H	7.21	64.74	74	9.26
2488.81	43.44	Ave.	39	1.9	H	7.21	50.65	54	3.35
3282.56	56.70	PK	52	1.3	H	9.39	66.09	91.93	25.84
3282.56	50.54	Ave.	52	1.3	H	9.39	59.93	81.47	21.54
4924.00	38.89	PK	301	1.3	H	12.46	51.35	74	22.65
4924.00	25.63	Ave.	301	1.3	H	12.46	38.09	54	15.91
7386.00	36.37	PK	150	1.6	V	15.91	52.28	74	21.72
7386.00	20.18	Ave.	150	1.6	V	15.91	36.09	54	17.91
9848.00	35.00	PK	204	1.5	V	19.29	54.29	74	19.71
9848.00	20.43	Ave.	204	1.5	V	19.29	39.72	54	14.28

802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	39.17	QP	91	2.4	H	-14.6	24.57	46	21.43
2412.00	106.50	PK	132	2.4	H	6.13	112.63	/	/
2412.00	95.08	Ave.	132	2.4	H	6.13	101.21	/	/
2412.00	95.33	PK	56	1.4	V	6.13	101.46	/	/
2412.00	90.15	Ave.	56	1.4	V	6.13	96.28	/	/
2376.86	57.53	PK	158	1.3	H	5.48	63.01	74	10.99
2376.86	44.89	Ave.	158	1.3	H	5.48	50.37	54	3.63
2493.57	56.65	PK	148	2.1	H	7.21	63.86	74	10.14
2493.57	43.34	Ave.	148	2.1	H	7.21	50.55	54	3.45
3218.44	55.15	PK	223	1.6	H	9.43	64.58	92.63	28.05
3218.44	51.79	Ave.	223	1.6	H	9.43	61.22	81.21	19.99
4824.00	39.22	PK	75	1.4	H	12.44	51.66	74	22.34
4824.00	25.79	Ave.	75	1.4	H	12.44	38.23	54	15.77
7236.00	36.00	PK	334	1.4	V	17.06	53.06	74	20.94
7236.00	20.11	Ave.	334	1.4	V	17.06	37.17	54	16.83
9648.00	34.58	PK	70	1.2	H	19.28	53.86	74	20.14
9648.00	20.52	Ave.	70	1.2	H	19.28	39.80	54	14.20
Middle Channel (2437 MHz)									
249.99	40.44	QP	287	2.3	V	-14.6	25.84	46	20.16
2437.00	105.55	PK	348	1.4	H	6.13	111.68	/	/
2437.00	95.09	Ave.	348	1.4	H	6.13	101.22	/	/
2437.00	96.49	PK	284	1.8	V	6.13	102.62	/	/
2437.00	90.42	Ave.	284	1.8	V	6.13	96.55	/	/
2380.57	57.74	PK	100	1.5	H	5.48	63.22	74	10.78
2380.57	44.81	Ave.	100	1.5	H	5.48	50.29	54	3.71
2490.81	56.94	PK	45	2.1	H	7.21	64.15	74	9.85
2490.81	43.31	Ave.	45	2.1	H	7.21	50.52	54	3.48
3250.50	56.41	PK	342	2.2	H	9.39	65.80	91.68	25.88
3250.50	50.79	Ave.	342	2.2	H	9.39	60.18	81.22	21.04
4874.00	38.29	PK	26	1.1	V	12.4	50.69	74	23.31
4874.00	24.07	Ave.	26	1.1	V	12.4	36.47	54	17.53
7311.00	35.95	PK	116	1.9	V	16.62	52.57	74	21.43
7311.00	21.49	Ave.	116	1.9	V	16.62	38.11	54	15.89
9748.00	35.35	PK	245	1.1	V	19.4	54.75	74	19.25
9748.00	20.90	Ave.	245	1.1	V	19.4	40.30	54	13.70

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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)									
249.99	39.47	QP	310	1.2	V	-14.6	24.87	46	21.13
2462.00	106.30	PK	353	1.6	H	6.13	112.43	/	/
2462.00	94.78	Ave.	353	1.6	H	6.13	100.91	/	/
2462.00	95.20	PK	236	1.0	V	6.13	101.33	/	/
2462.00	91.79	Ave.	236	1.0	V	6.13	97.92	/	/
2386.52	57.09	PK	87	1.9	H	5.48	62.57	74	11.43
2386.52	44.70	Ave.	87	1.9	H	5.48	50.18	54	3.82
2495.10	57.28	PK	39	1.3	H	7.21	64.49	74	9.51
2495.10	43.37	Ave.	39	1.3	H	7.21	50.58	54	3.42
3282.56	55.47	PK	309	2.0	H	9.39	64.86	92.43	27.57
3282.56	51.46	Ave.	309	2.0	H	9.39	60.85	80.91	20.06
4924.00	37.07	PK	272	2.1	H	12.46	49.53	74	24.47
4924.00	23.82	Ave.	272	2.1	H	12.46	36.28	54	17.72
7386.00	36.29	PK	321	2.0	V	15.91	52.20	74	21.80
7386.00	21.14	Ave.	321	2.0	V	15.91	37.05	54	16.95
9848.00	35.65	PK	219	2.3	H	19.29	54.94	74	19.06
9848.00	19.56	Ave.	219	2.3	H	19.29	38.85	54	15.15

802.11n-HT40 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/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(2422MHz)									
249.99	38.02	QP	319	2.3	H	-14.6	23.42	46	22.58
2422.00	105.73	PK	305	2.2	H	6.13	111.86	/	/
2422.00	94.23	Ave.	305	2.2	H	6.13	100.36	/	/
2422.00	95.91	PK	340	1.7	V	6.13	102.04	/	/
2422.00	91.71	Ave.	340	1.7	V	6.13	97.84	/	/
2379.51	55.83	PK	181	1.7	H	5.48	61.31	74	12.69
2379.51	44.86	Ave.	181	1.7	H	5.48	50.34	54	3.66
2493.37	57.46	PK	113	2.1	H	7.21	64.67	74	9.33
2493.37	43.12	Ave.	113	2.1	H	7.21	50.33	54	3.67
3230.46	56.14	PK	194	1.5	H	9.43	65.57	91.86	26.29
3230.46	50.14	Ave.	194	1.5	H	9.43	59.57	80.36	20.79
4844.00	39.33	PK	292	2.2	V	12.4	51.73	74	22.27
4844.00	23.21	Ave.	292	2.2	V	12.4	35.61	54	18.39
7266.00	35.56	PK	171	1.2	H	16.62	52.18	74	21.82
7266.00	21.15	Ave.	171	1.2	H	16.62	37.77	54	16.23
9688.00	35.09	PK	67	1.4	V	19.29	54.38	74	19.62
9688.00	19.50	Ave.	67	1.4	V	19.29	38.79	54	15.21
Middle Channel(2437MHz)									
249.99	38.63	QP	32	1.1	V	-14.6	24.03	46	21.97
2437.00	106.26	PK	281	2.2	H	6.13	112.39	/	/
2437.00	94.98	Ave.	281	2.2	H	6.13	101.11	/	/
2437.00	95.54	PK	343	1.3	V	6.13	101.67	/	/
2437.00	90.56	Ave.	343	1.3	V	6.13	96.69	/	/
2388.30	57.53	PK	202	1.9	H	5.48	63.01	74	10.99
2388.30	44.79	Ave.	202	1.9	H	5.48	50.27	54	3.73
2494.52	58.37	PK	315	2.3	V	7.21	65.58	74	8.42
2494.52	42.82	Ave.	315	2.3	V	7.21	50.03	54	3.97
3250.50	55.54	PK	300	1.2	H	9.39	64.93	92.39	27.46
3250.50	50.24	Ave.	300	1.2	H	9.39	59.63	81.11	21.48
4874.00	37.17	PK	82	2.0	V	12.4	49.57	74	24.43
4874.00	23.93	Ave.	82	2.0	V	12.4	36.33	54	17.67
7311.00	36.08	PK	135	2.1	V	16.62	52.70	74	21.30
7311.00	21.35	Ave.	135	2.1	V	16.62	37.97	54	16.03
9748.00	34.92	PK	234	1.2	V	19.4	54.32	74	19.68
9748.00	20.33	Ave.	234	1.2	V	19.4	39.73	54	14.27

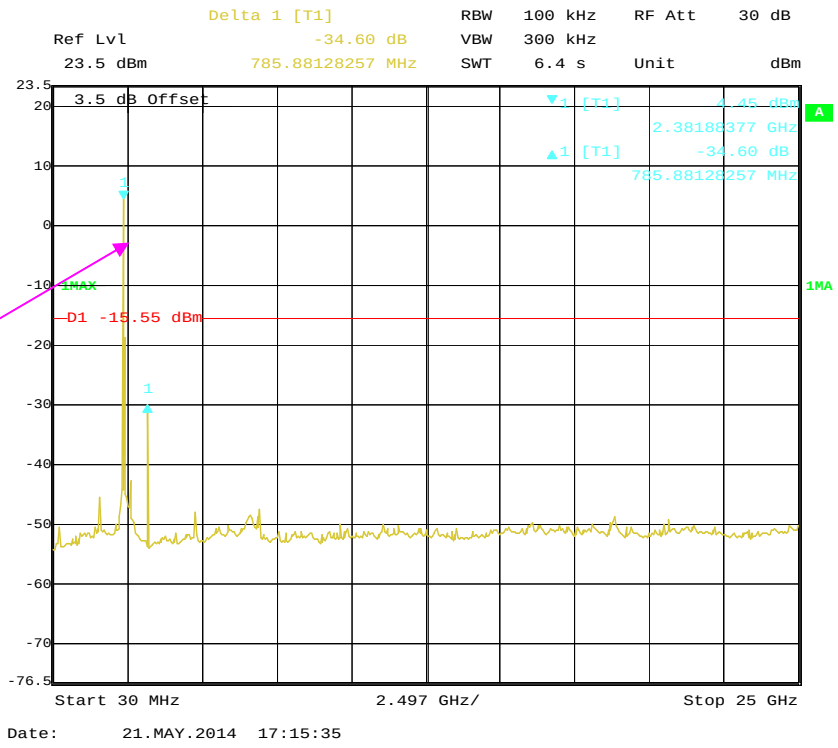
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel(2452 MHz)									
249.99	40.45	QP	211	1.4	V	-14.6	25.85	46	20.15
2452.00	105.13	PK	98	1.9	H	6.13	111.26	/	/
2452.00	95.27	Ave.	98	1.9	H	6.13	101.40	/	/
2452.00	96.96	PK	22	1.6	V	6.13	103.09	/	/
2452.00	90.70	Ave.	22	1.6	V	6.13	96.83	/	/
2375.80	57.57	PK	152	1.1	H	5.48	63.05	74	10.95
2375.80	44.91	Ave.	152	1.1	H	5.48	50.39	54	3.61
2495.66	58.59	PK	200	1.5	H	7.21	65.80	74	8.20
2495.66	43.62	Ave.	200	1.5	H	7.21	50.83	54	3.17
3270.54	56.10	PK	327	1.3	H	9.39	65.49	91.26	25.77
3270.54	51.83	Ave.	327	1.3	H	9.39	61.22	81.40	20.18
4904.00	38.40	PK	62	1.9	V	12.46	50.86	74	23.14
4904.00	23.18	Ave.	62	1.9	V	12.46	35.64	54	18.36
7356.00	35.55	PK	147	1.9	V	16.49	52.04	74	21.96
7356.00	21.77	Ave.	147	1.9	V	16.49	38.26	54	15.74
9808.00	35.93	PK	342	1.9	H	19.29	55.22	74	18.78
9808.00	20.80	Ave.	342	1.9	H	19.29	40.09	54	13.91

Note:

Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + Cable loss – Amplifier Factor
Margin = Limit - Corrected Amplitude

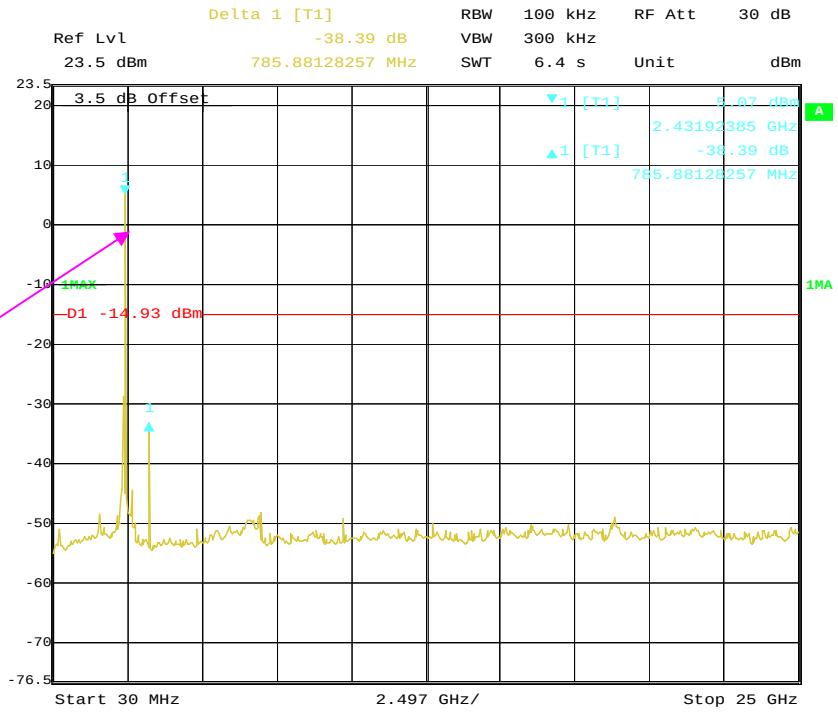
Conducted Spurious Emissions at Antenna Port:

802.11b Low Channel, Antenna 0



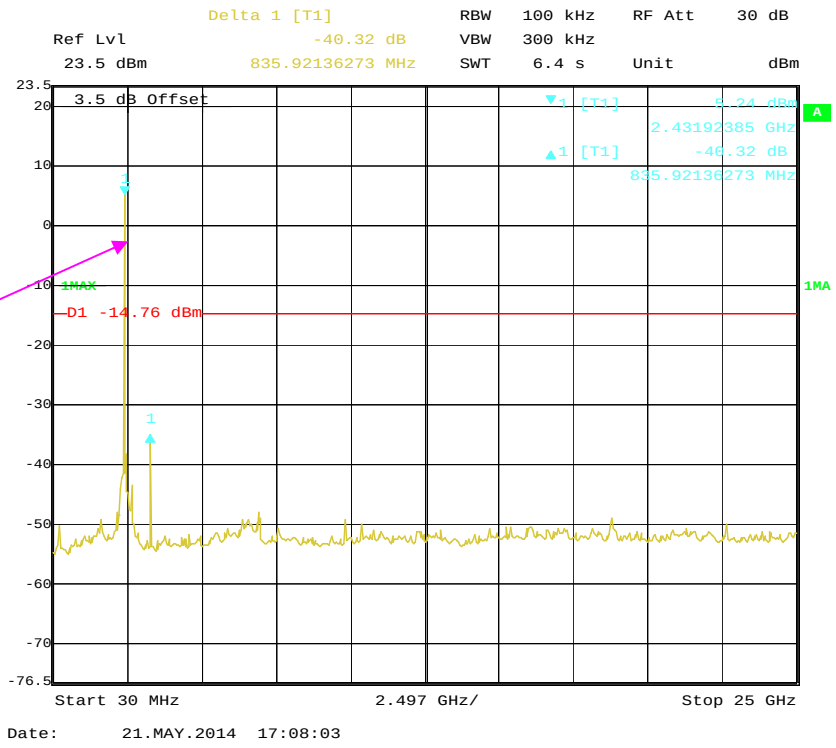
Fundamental

802.11b Middle Channel, Antenna 0



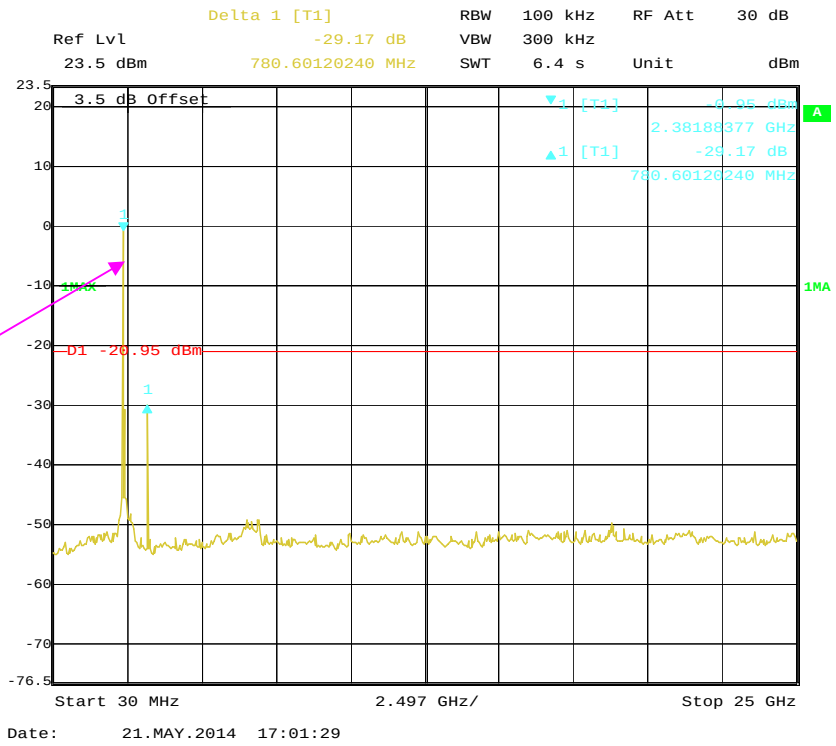
Fundamental

802.11b High Channel, Antenna 0



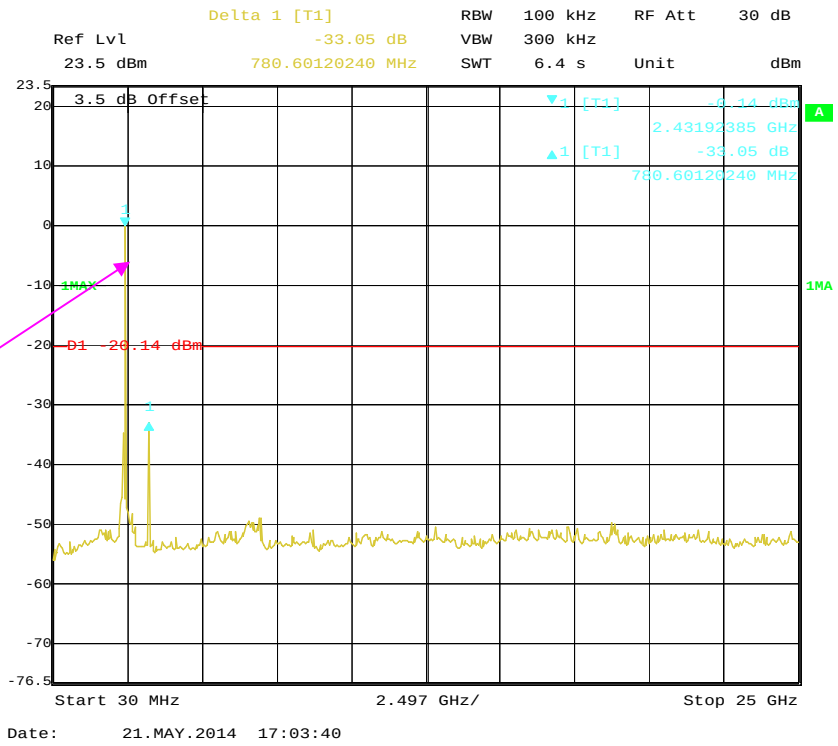
Fundamental

802.11g Low Channel, Antenna 0



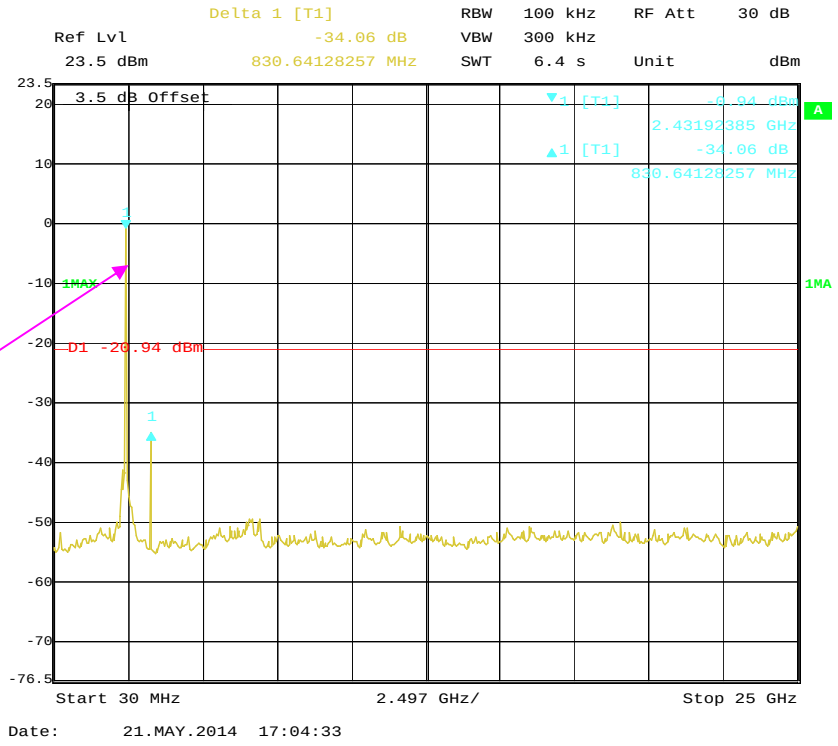
Fundamental

802.11g Middle Channel, Antenna 0



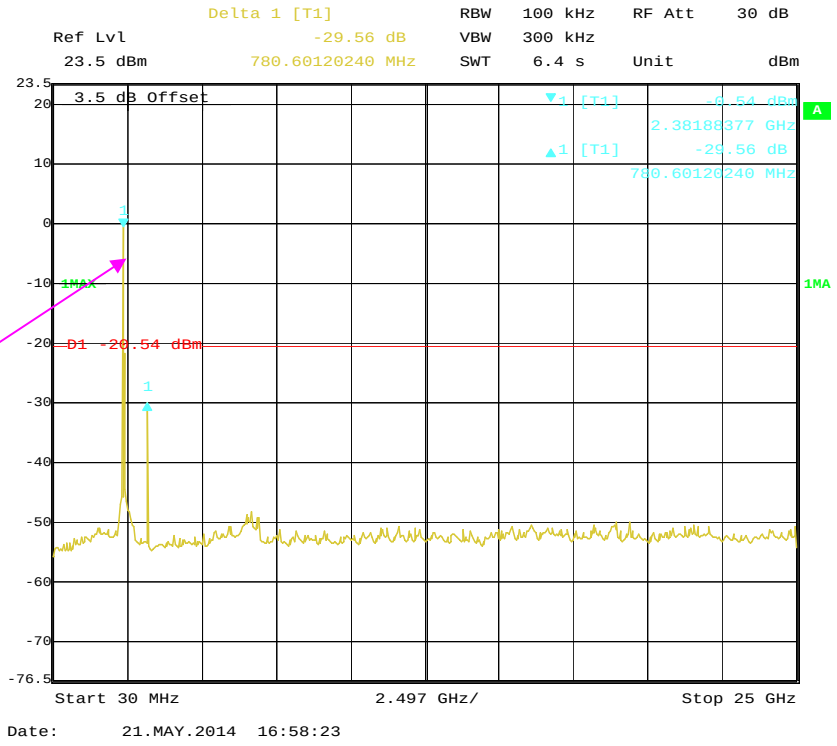
Fundamental

802.11g High Channel, Antenna 0



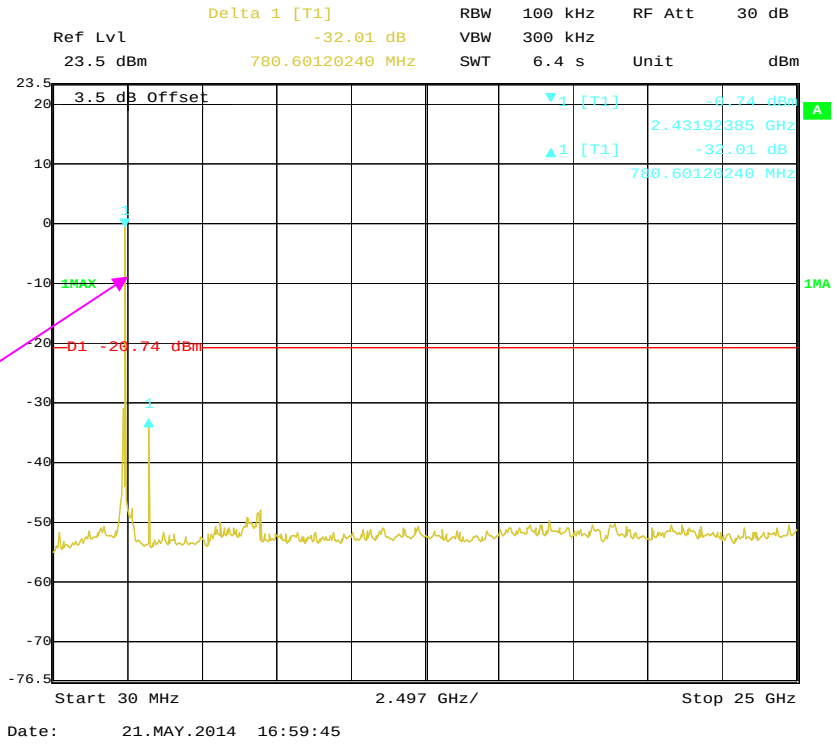
Fundamental

802.11n-HT20 Low Channel, Antenna 0



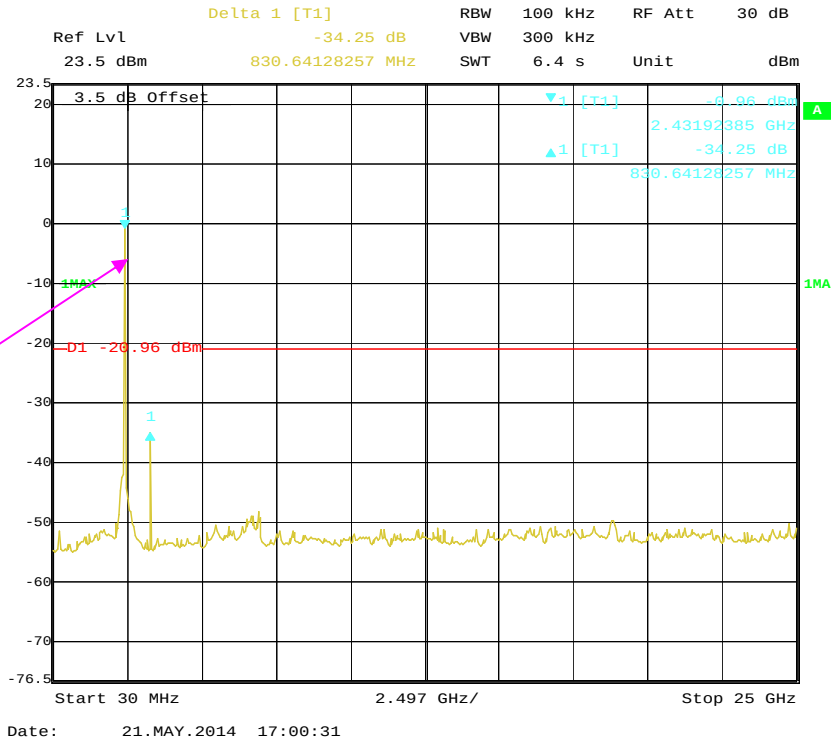
Fundamental

802.11n-HT20 Middle Channel, Antenna 0



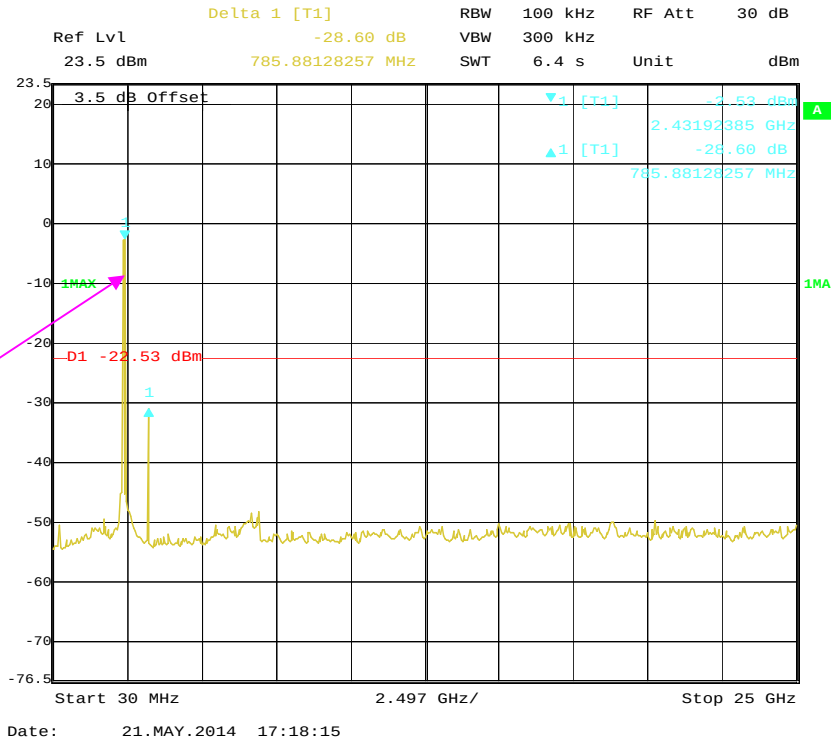
Fundamental

802.11n-HT20 High Channel, Antenna 0



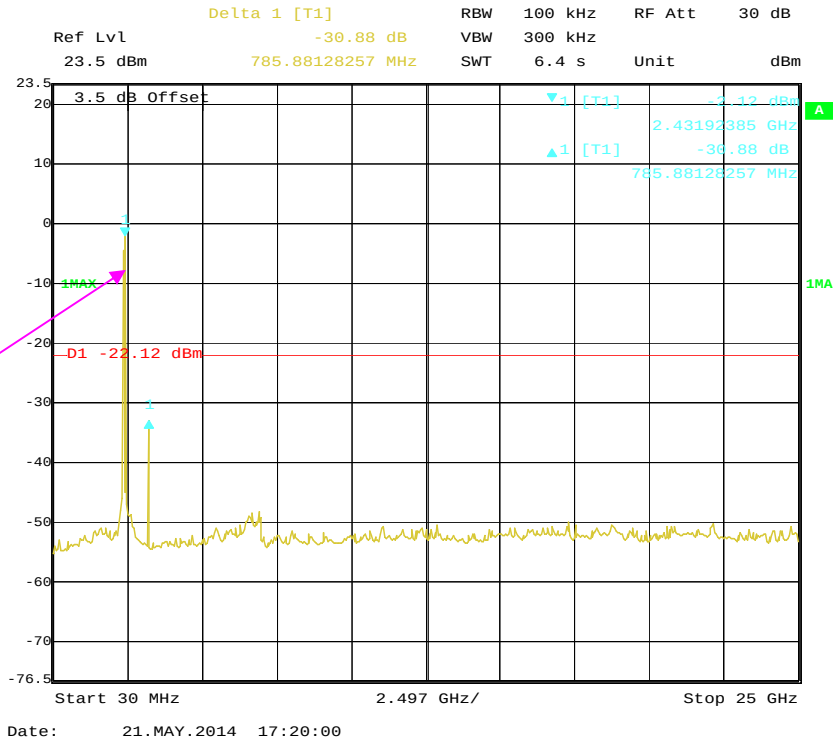
Fundamental

802.11n-HT40 Low Channel, Antenna 0



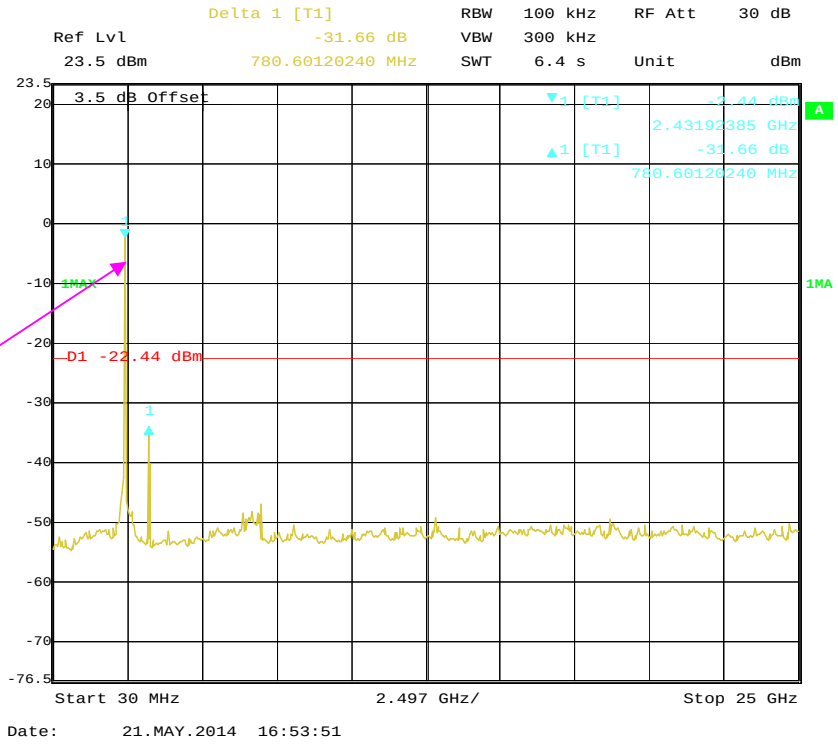
Fundamental

802.11n-HT40 Middle Channel, Antenna 0



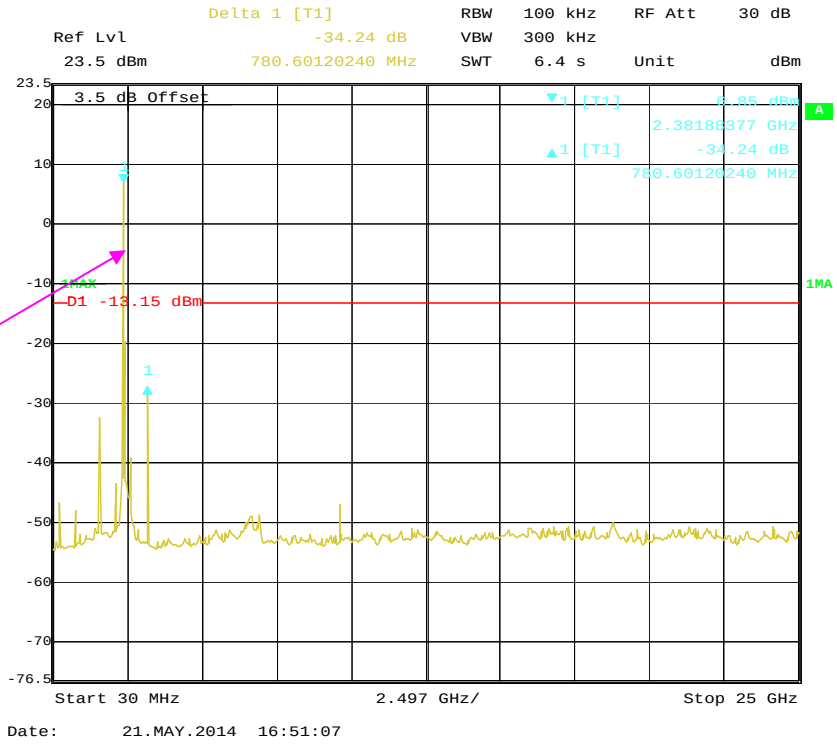
Fundamental

802.11n-HT40 High Channel, Antenna 0



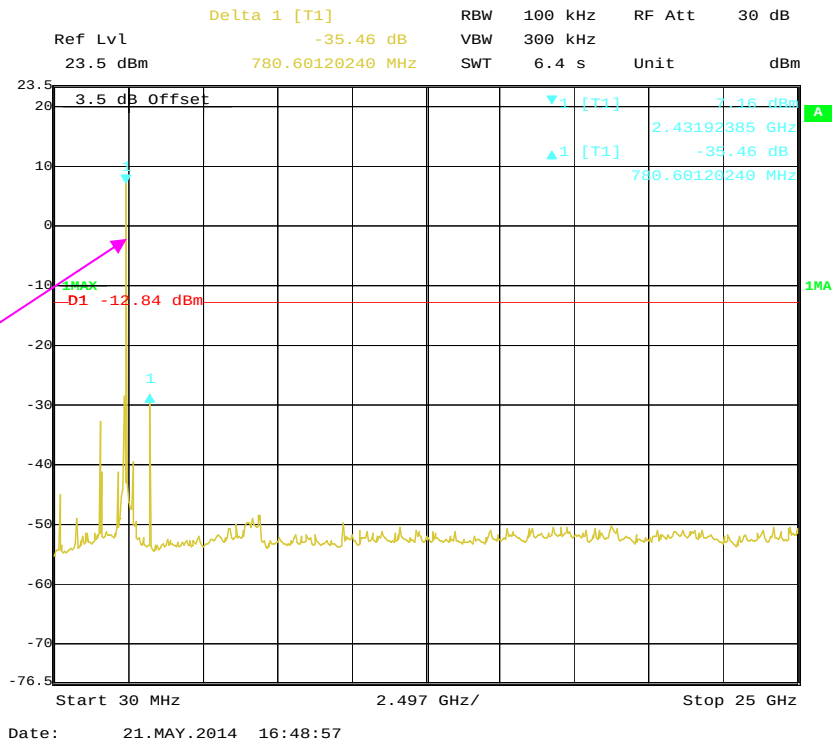
Fundamental

802.11b Low Channel, Antenna 1



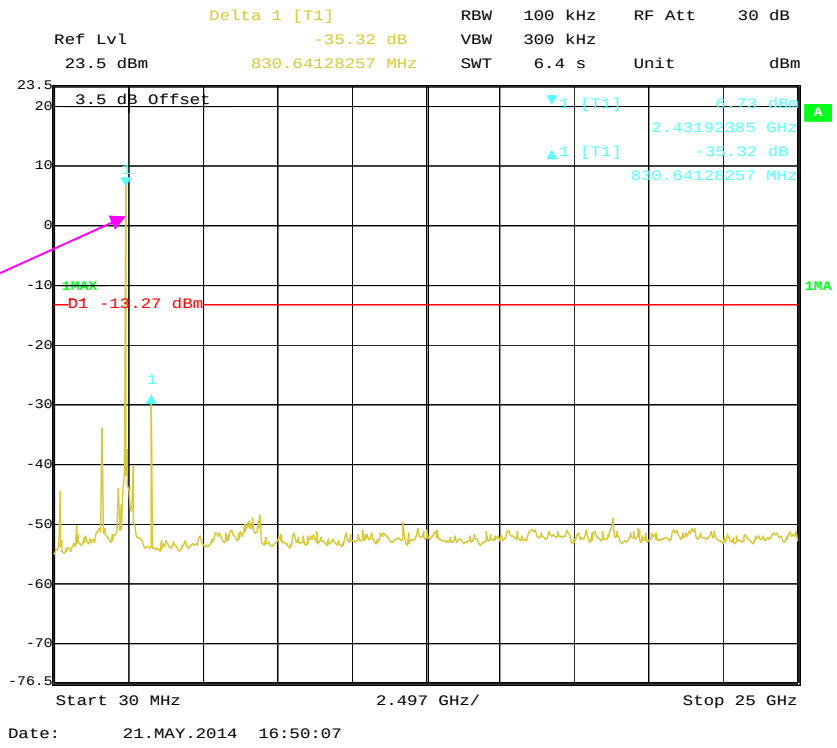
Fundamental

802.11b Middle Channel, Antenna 1



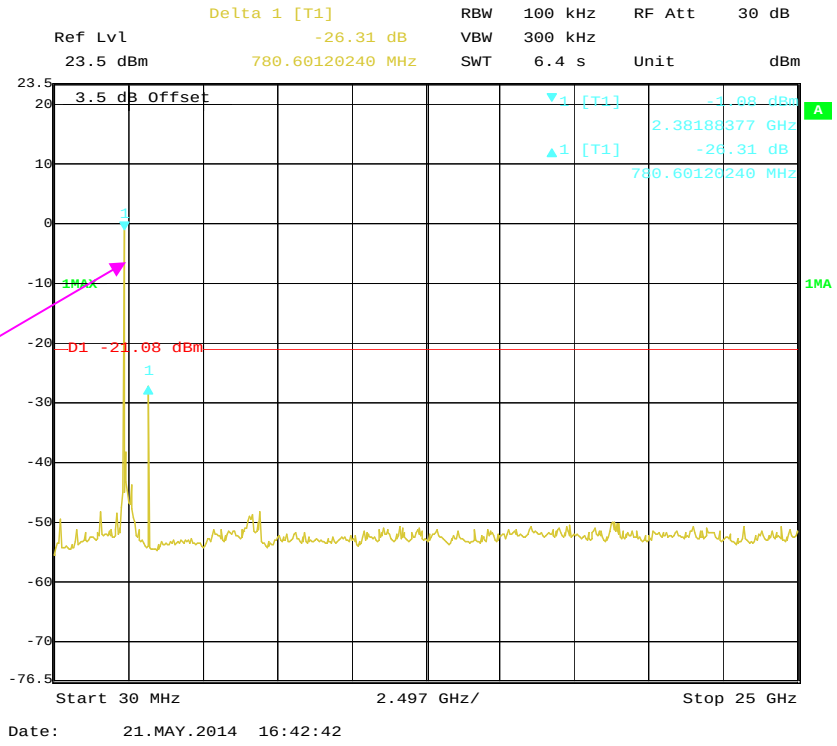
Fundamental

802.11b High Channel, Antenna 1



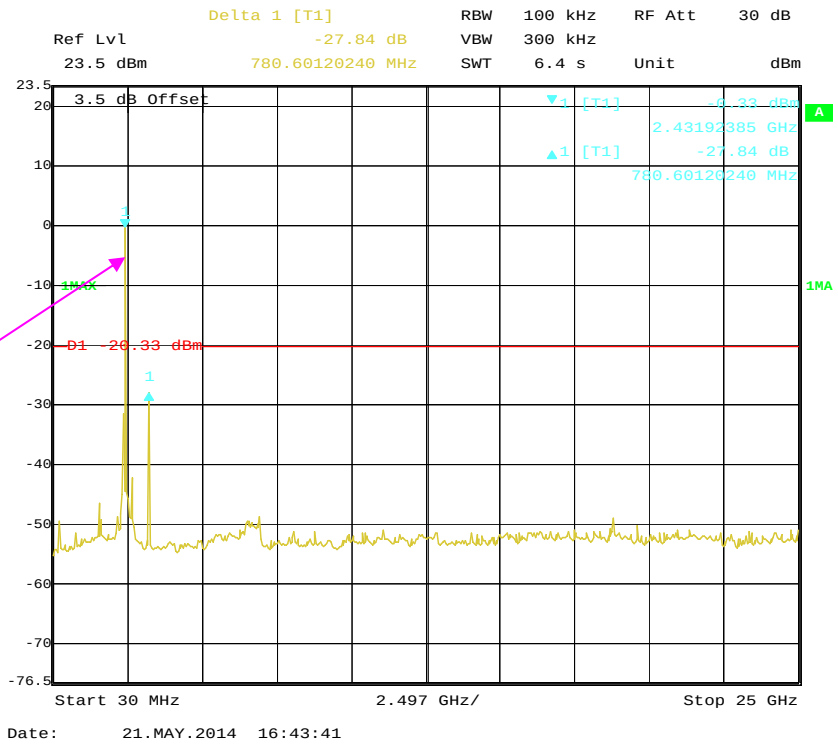
Fundamental

802.11g Low Channel, Antenna 1



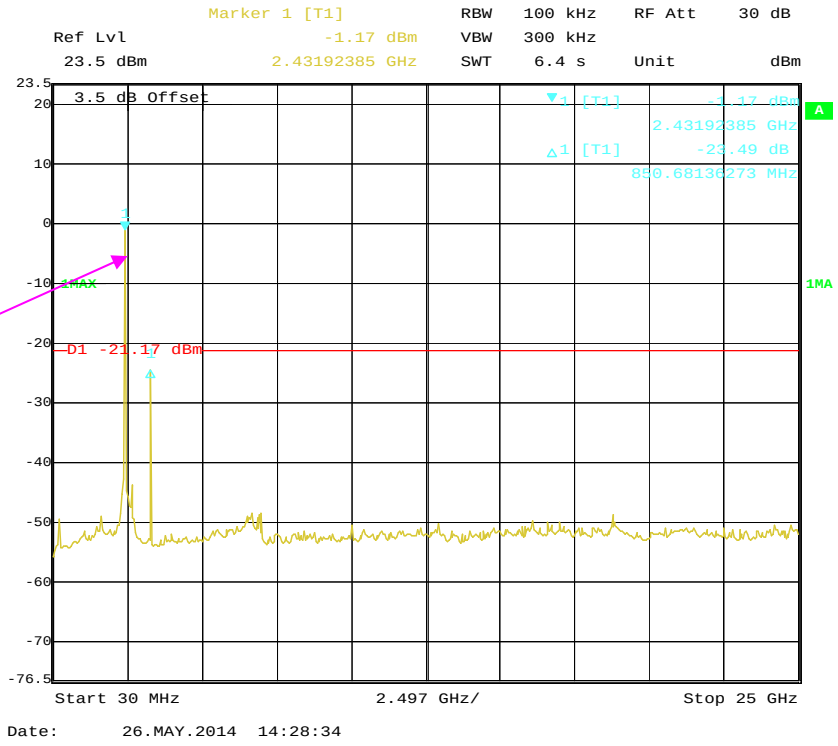
Fundamental

802.11g Middle Channel, Antenna 1



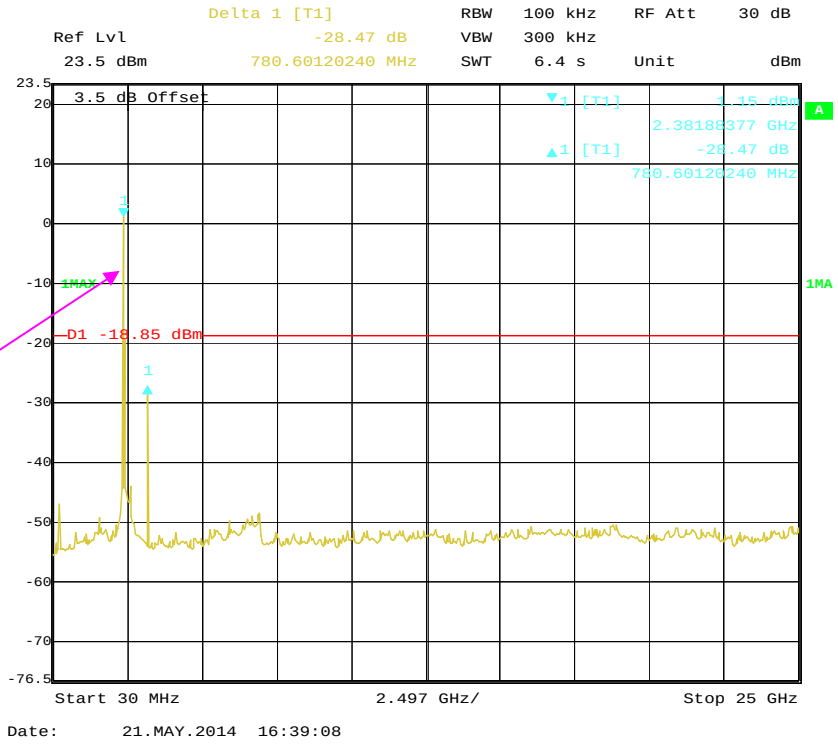
Fundamental

802.11g High Channel, Antenna 1



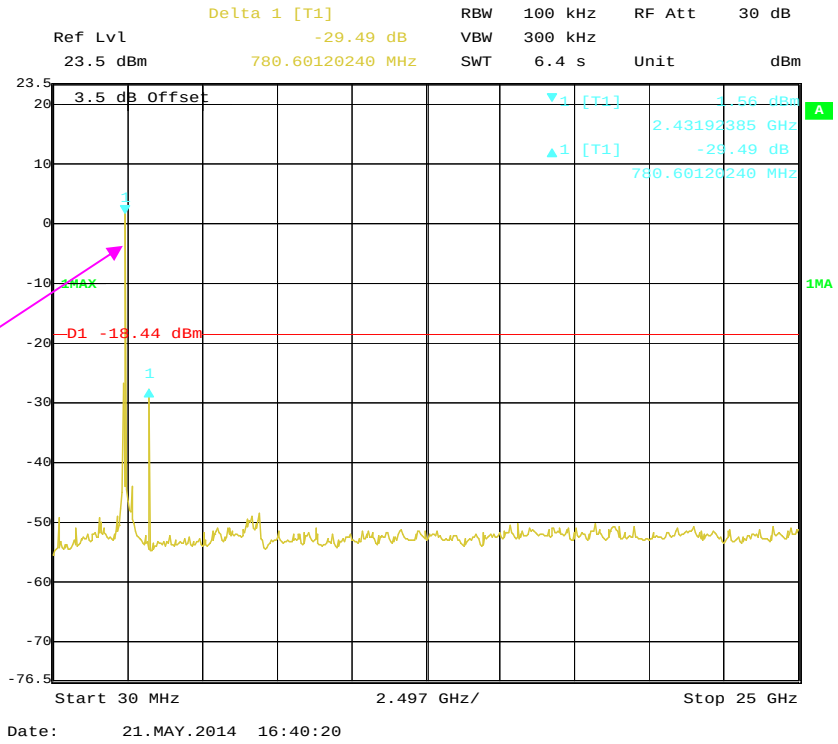
Fundamental

802.11n-HT20 Low Channel, Antenna 1



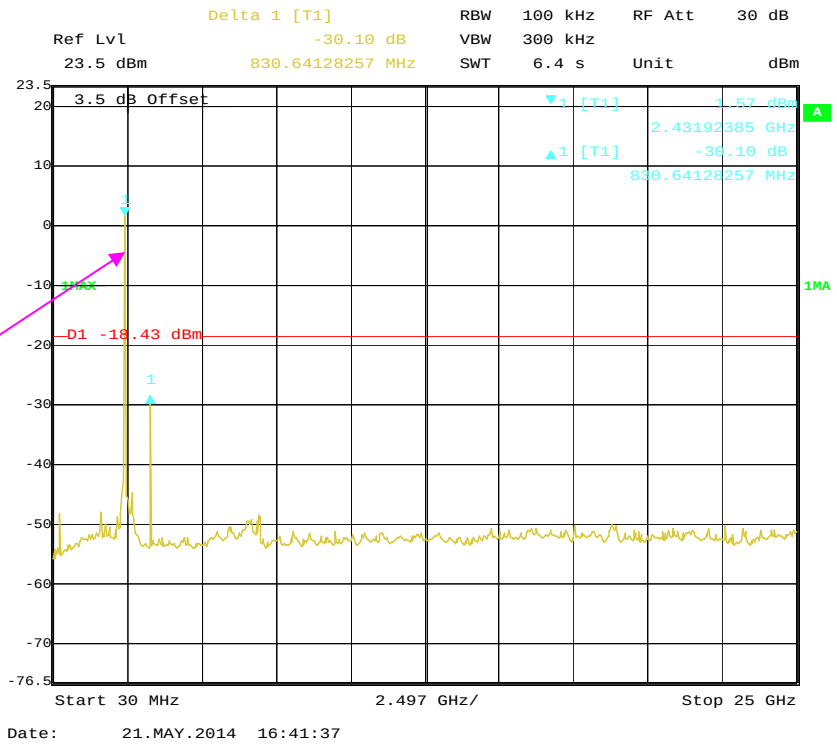
Fundamental

802.11n-HT20 Middle Channel, Antenna 1



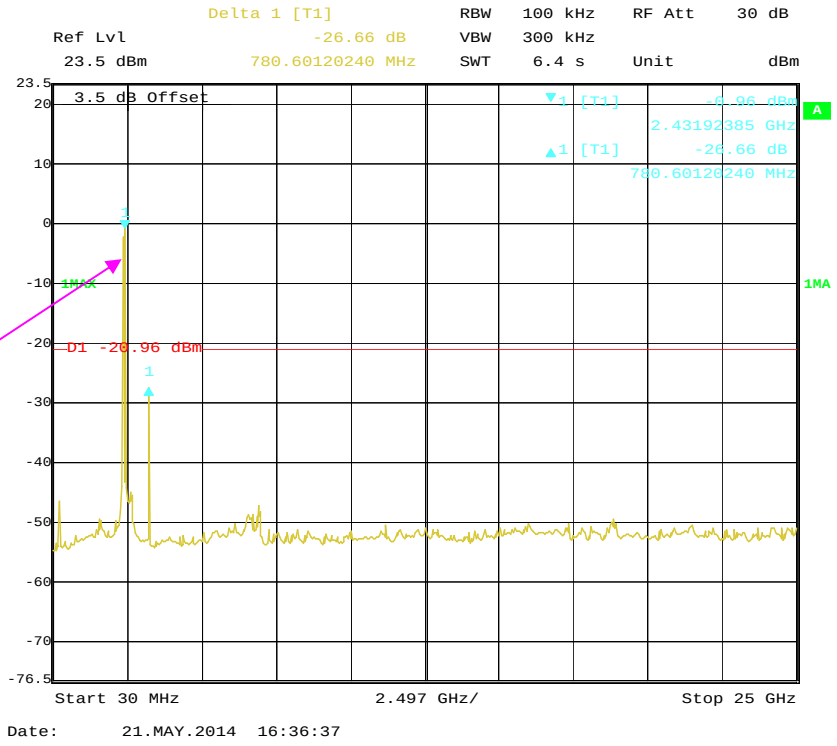
Fundamental

802.11n-HT20 High Channel, Antenna 1



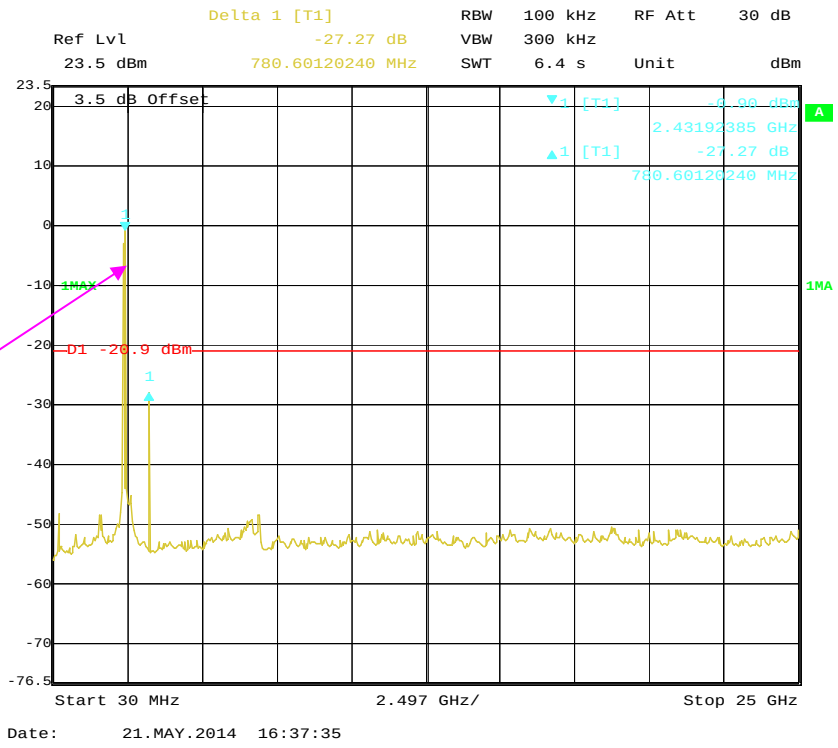
Fundamental

802.11n-HT40 Low Channel, Antenna 1



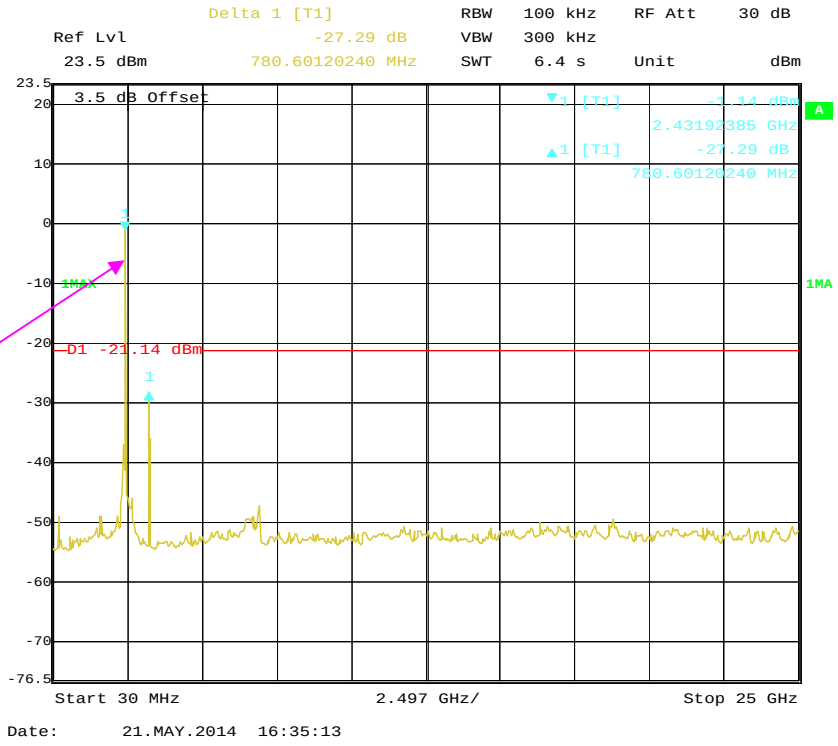
Fundamental

802.11n-HT40 Middle Channel, Antenna 1



Fundamental

802.11n-HT40 High Channel, Antenna 1



Fundamental

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

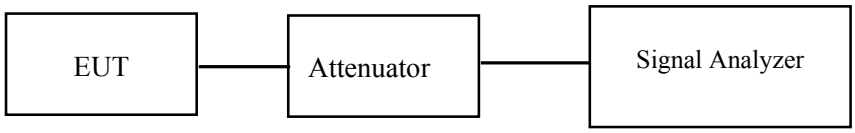
Applicable Standard

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 Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r01

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	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

Temperature:	25~26 ℃
Relative Humidity:	52~55 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by August He on 2014-05-16 and 20143-05-26

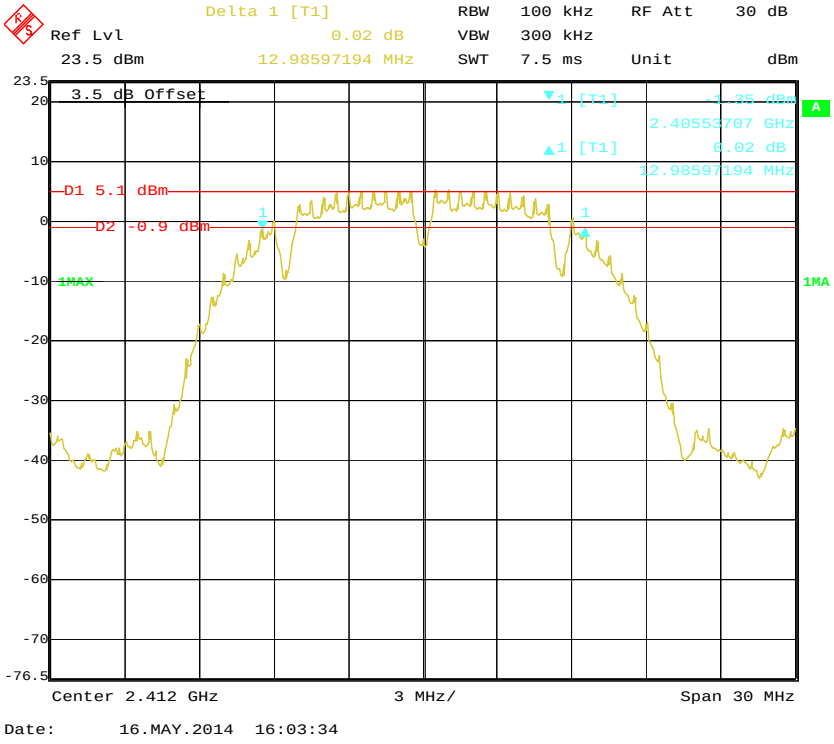
Test Mode: Transmitting

Test Result: Pass.

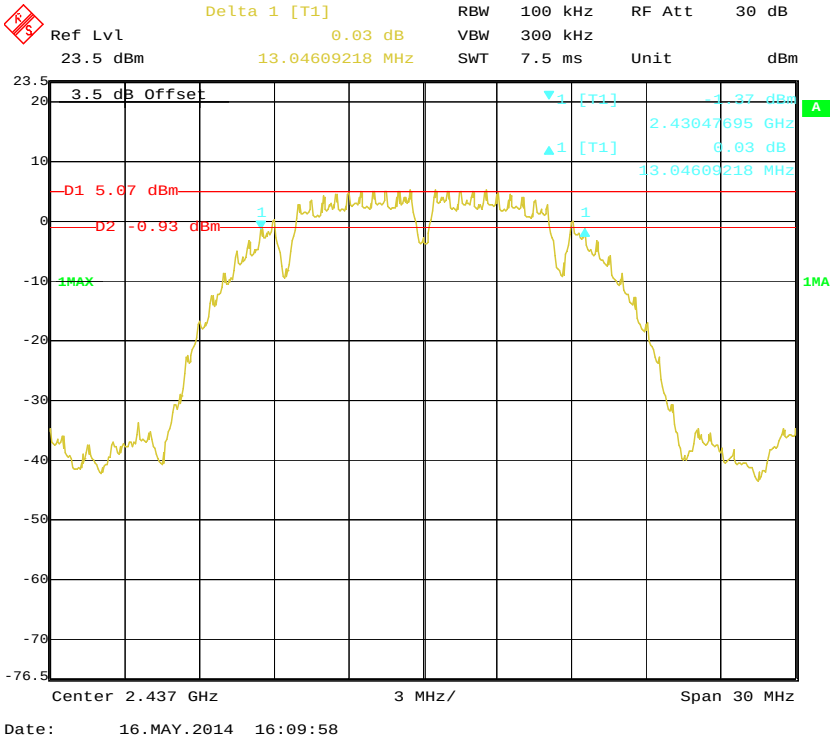
Please refer to the following tables and plots.

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)		Limit (kHz)	Result
		Antenna 0	Antenna 1		
802.11b mode					
Low	2412	12.98	12.14	≥500	Pass
Middle	2437	13.05	12.14	≥500	Pass
High	2462	12.63	12.14	≥500	Pass
802.11g mode					
Low	2412	16.41	16.47	≥500	Pass
Middle	2437	16.41	16.47	≥500	Pass
High	2462	16.41	16.47	≥500	Pass
802.11n-HT20 mode					
Low	2412	17.13	17.13	≥500	Pass
Middle	2437	17.13	17.13	≥500	Pass
High	2462	17.13	17.13	≥500	Pass
802.11n-HT40 mode					
Low	2422	35.67	35.47	≥500	Pass
Middle	2437	35.67	35.50	≥500	Pass
High	2452	35.70	35.43	≥500	Pass

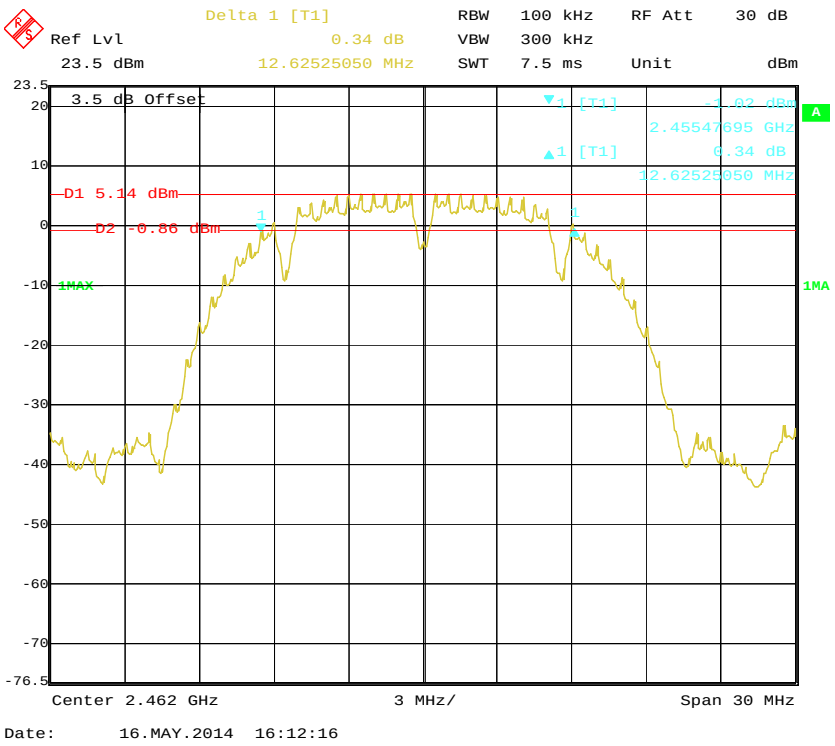
802.11b Low Channel, Antenna 0



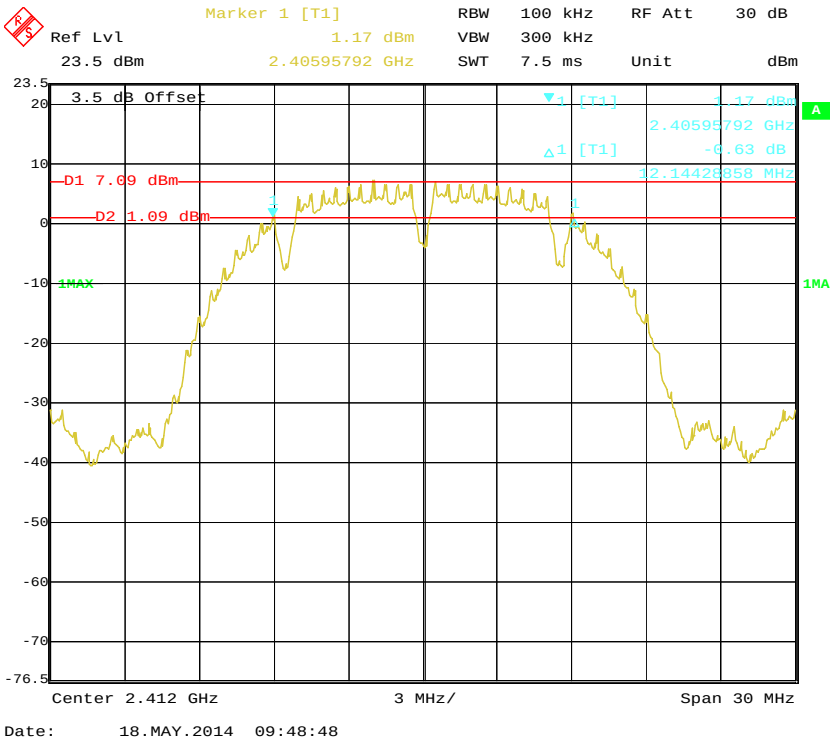
802.11b Middle Channel, Antenna 0



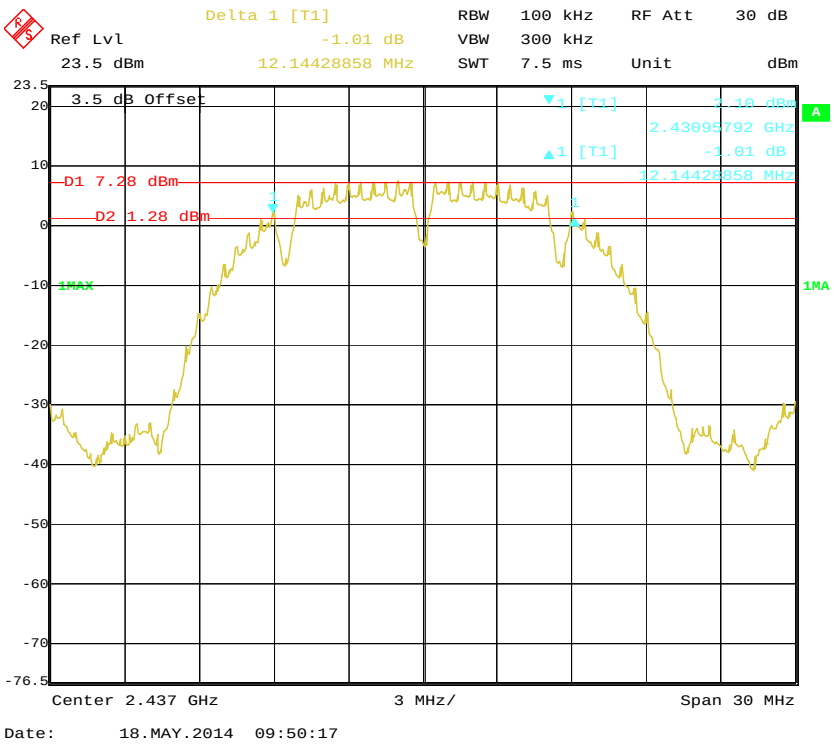
802.11b High Channel, Antenna 0



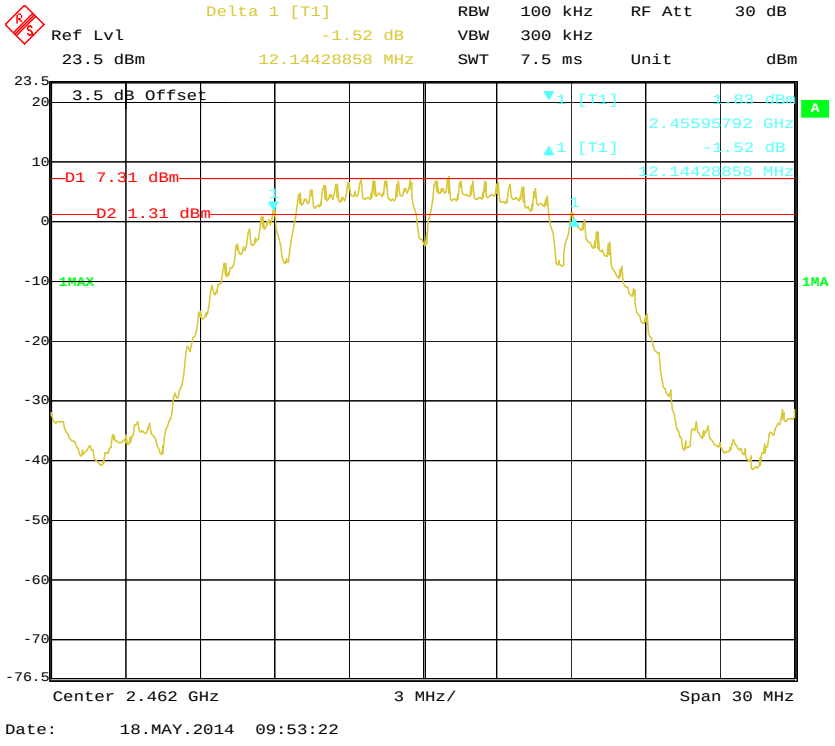
802.11b Low Channel, Antenna 1



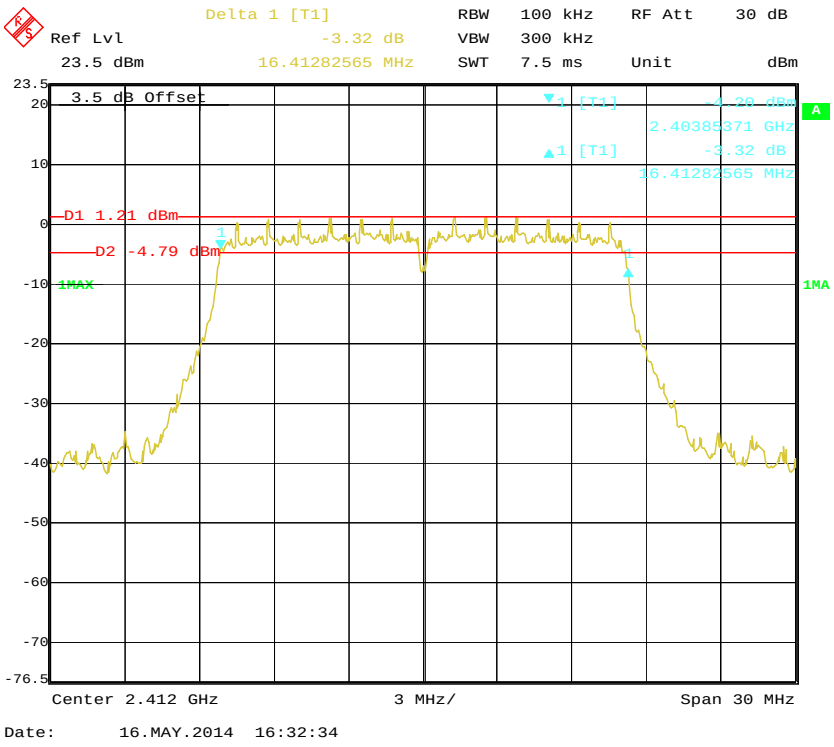
802.11b Middle Channel, Antenna 1



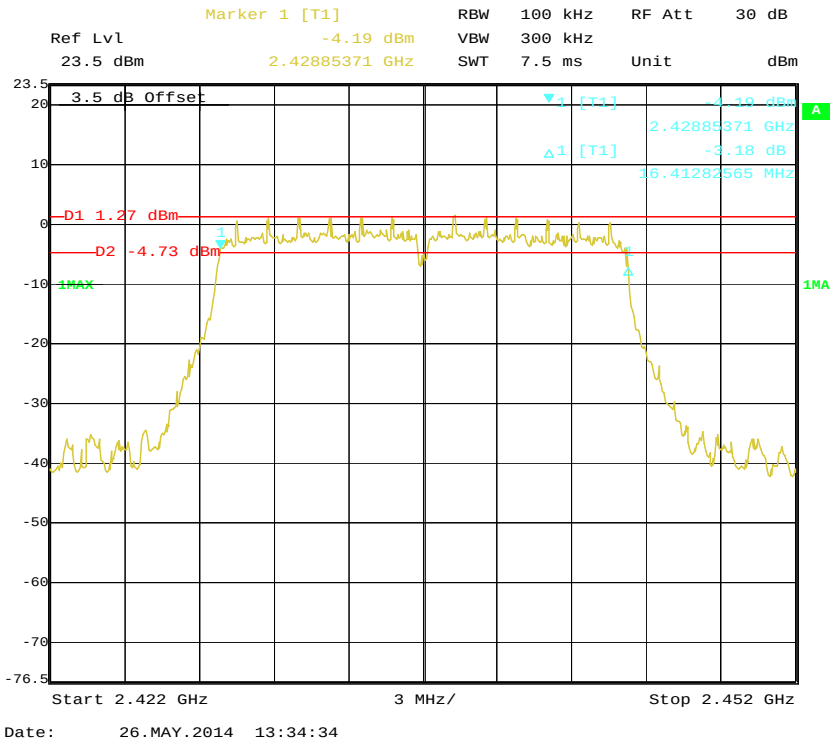
802.11b High Channel, Antenna 1



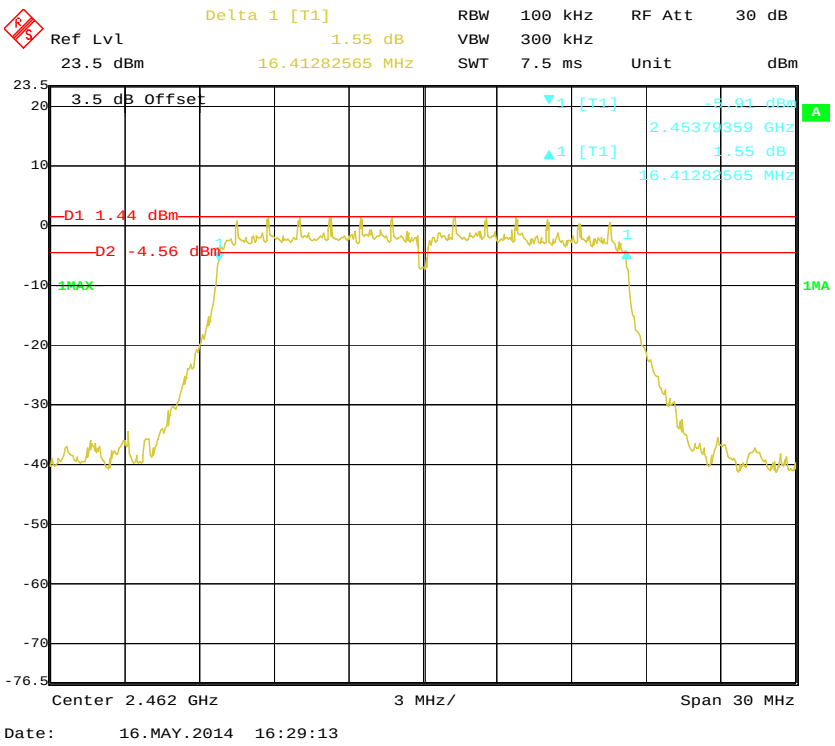
802.11g Low Channel, Antenna 0



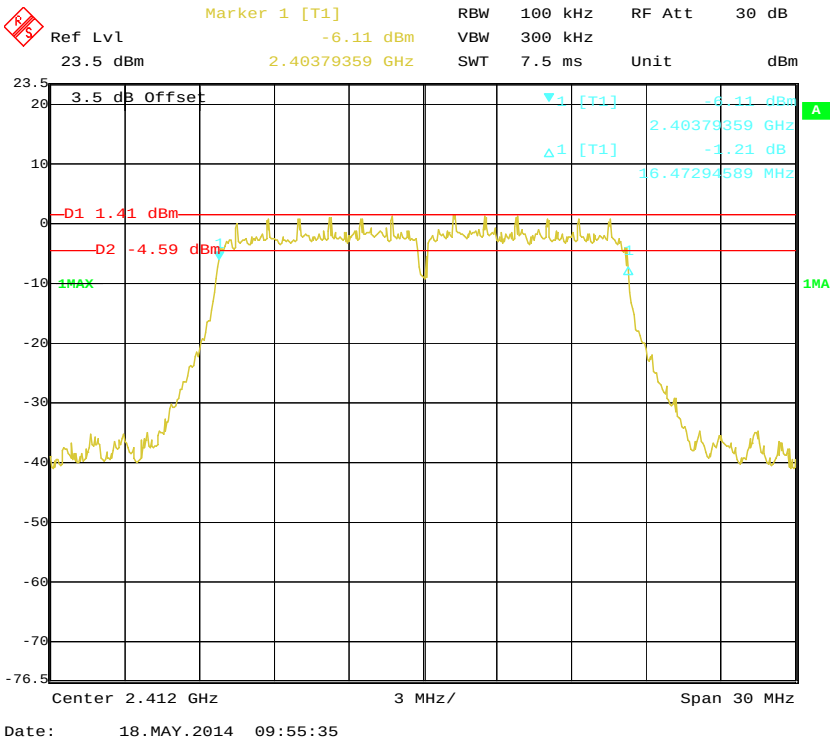
802.11g Middle Channel, Antenna 0



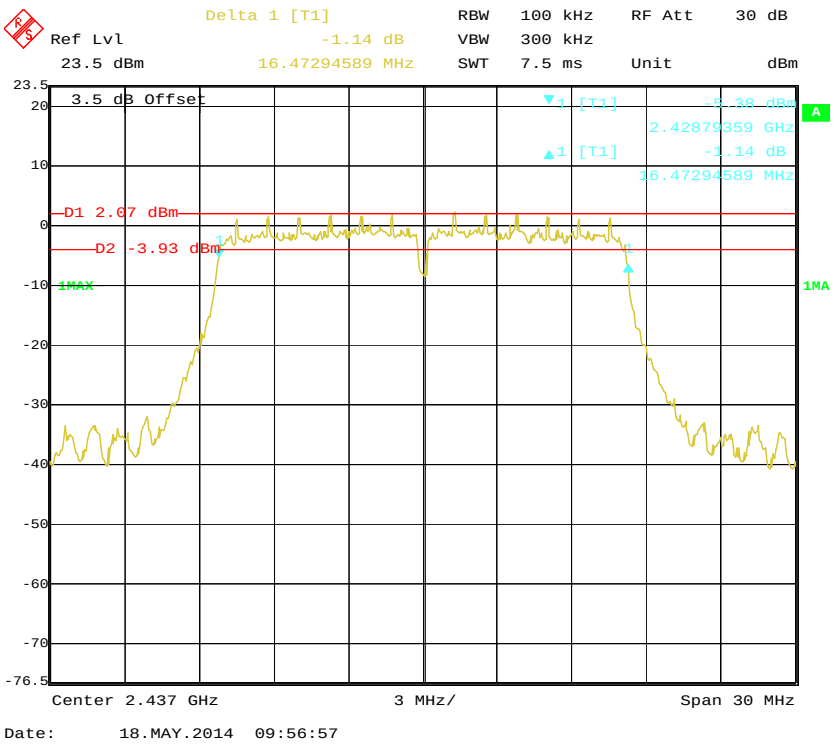
802.11g High Channel, Antenna 0



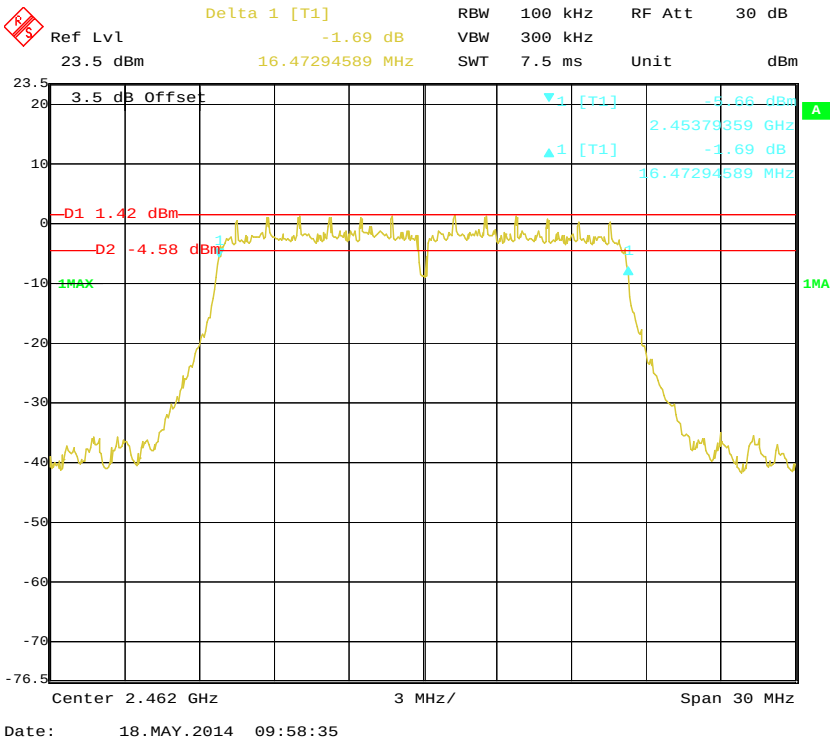
802.11g Low Channel, Antenna 1



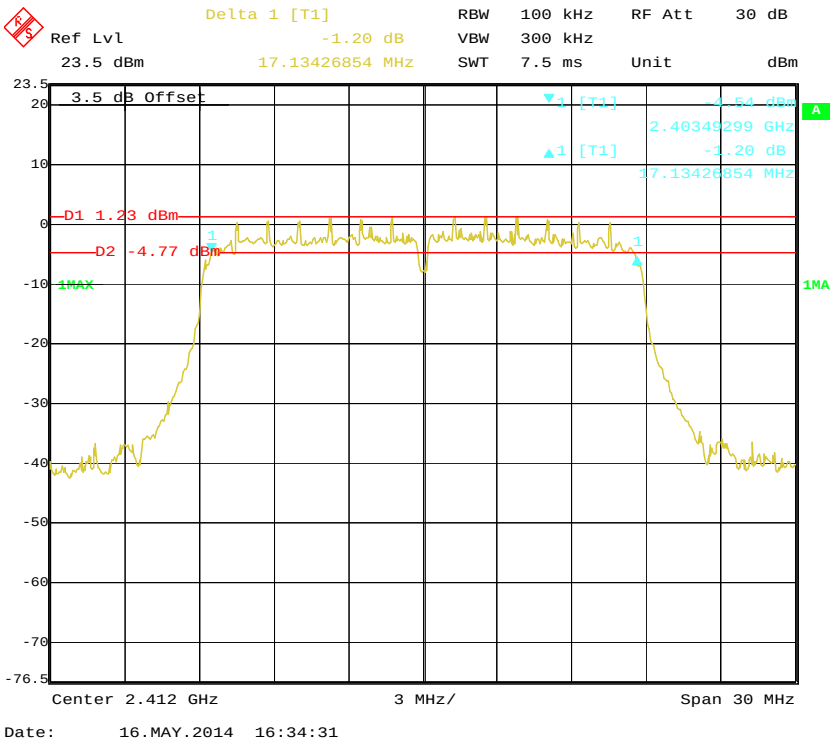
802.11g Middle Channel, Antenna 1



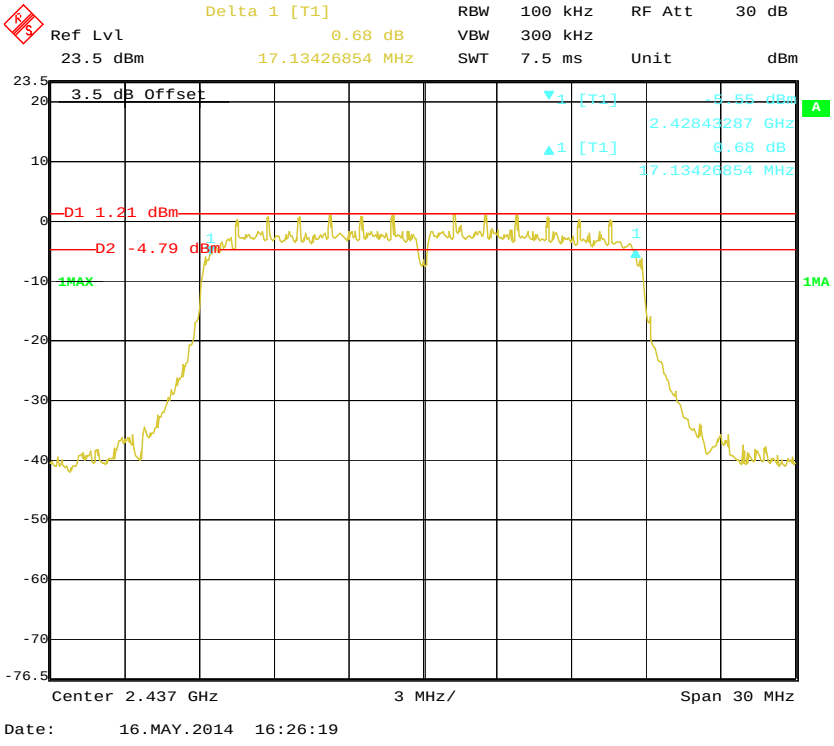
802.11g High Channel, Antenna 1



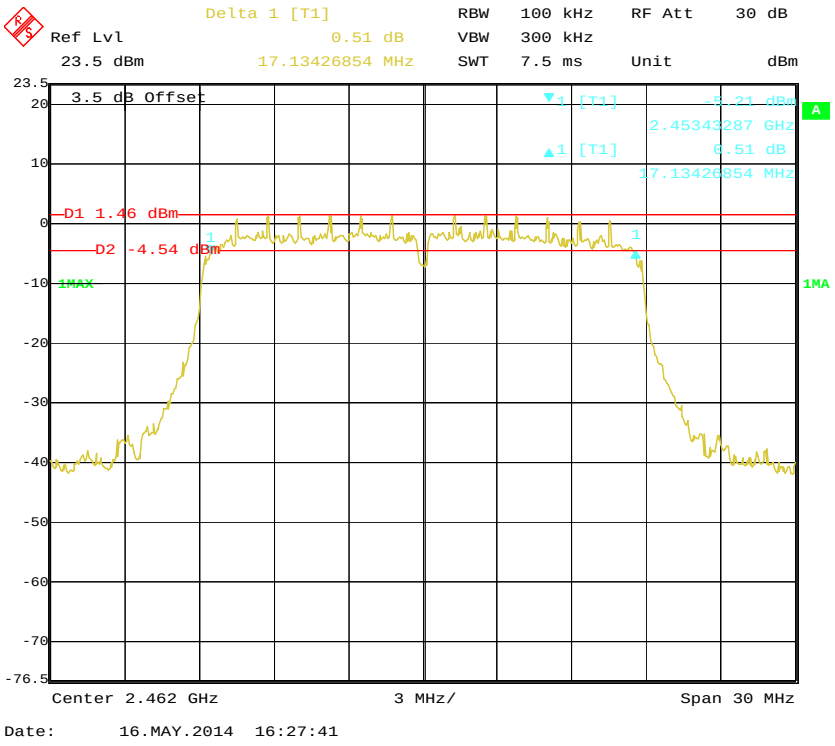
802.11n-HT20 Low Channel, Antenna 0



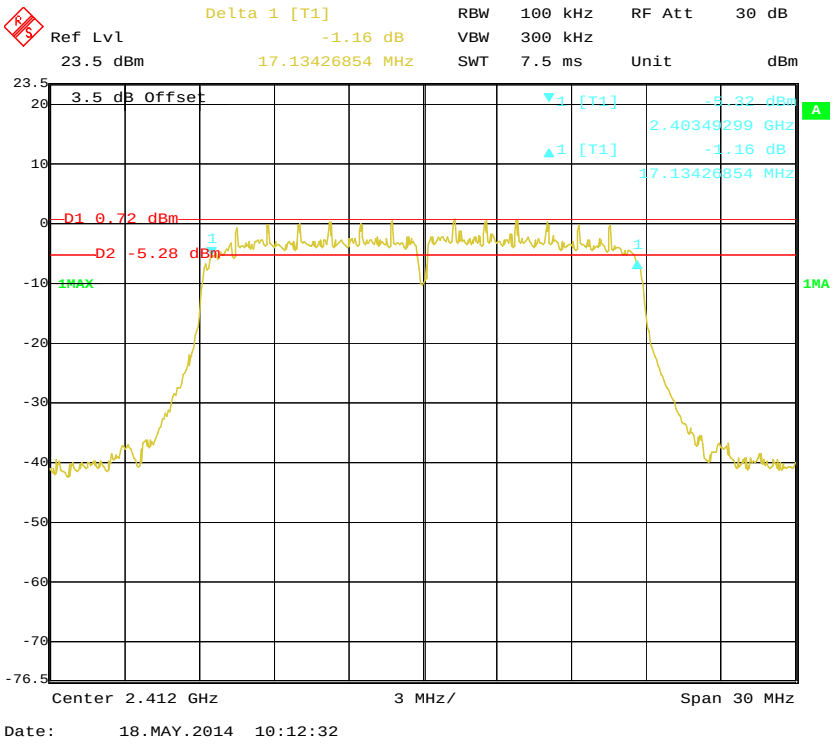
802.11n-HT20 Middle Channel, Antenna 0



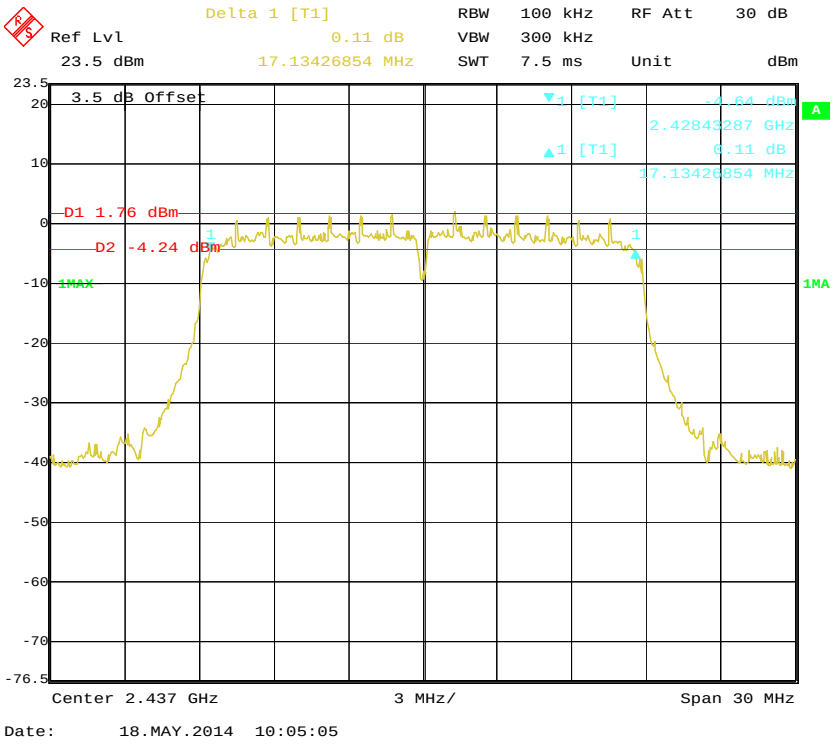
802.11n-HT20 High Channel, Antenna 0



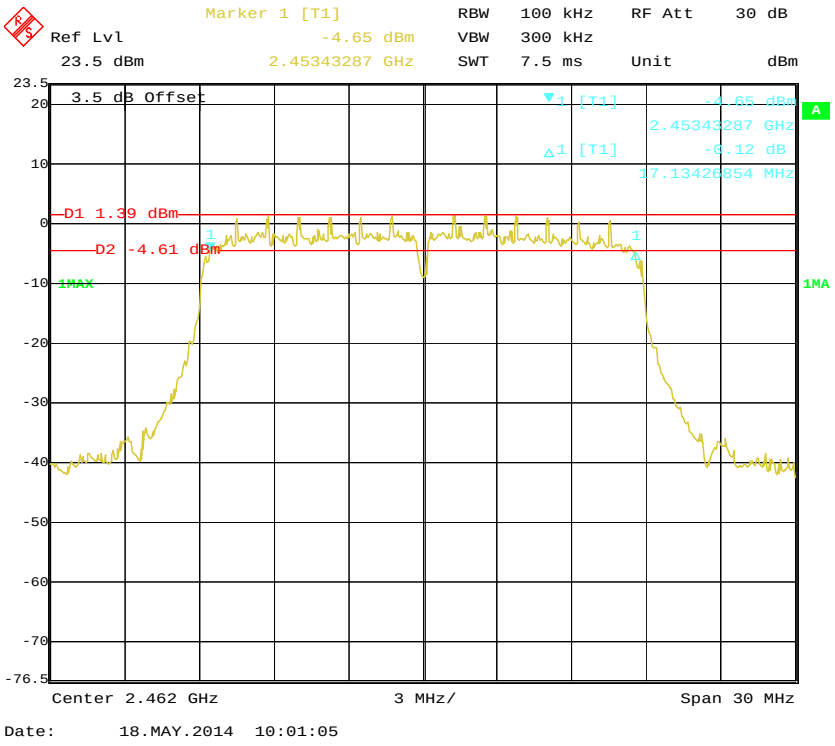
802.11n-HT20 Low Channel, Antenna 1



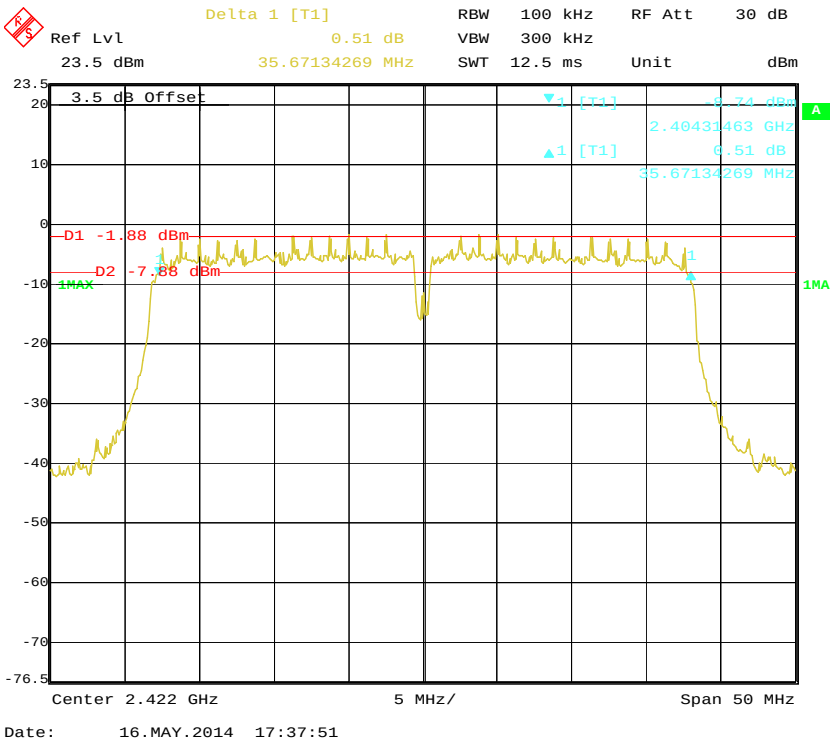
802.11n-HT20 Middle Channel, Antenna 1



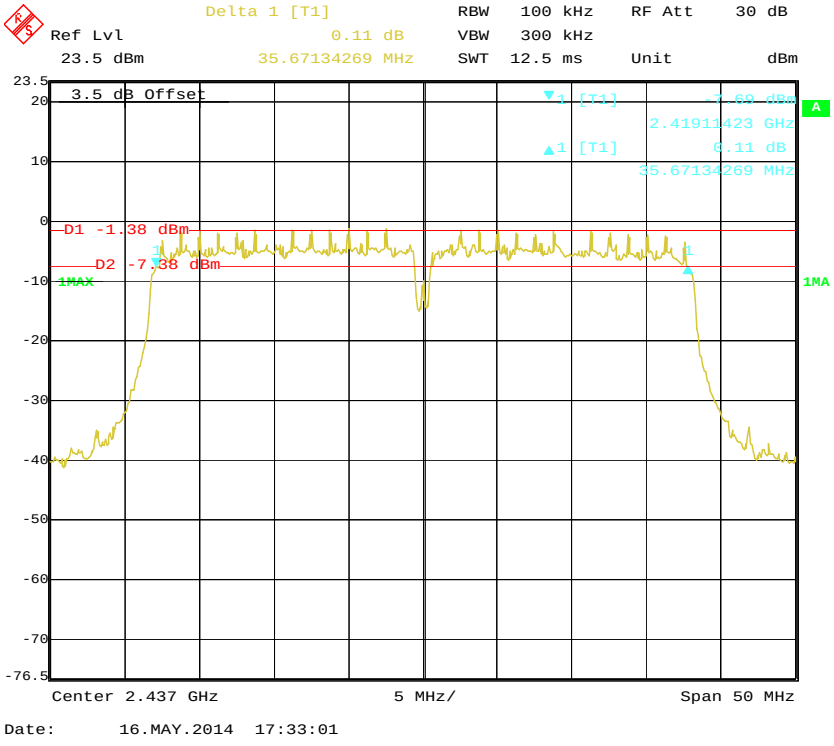
802.11n-HT20 High Channel, Antenna 1



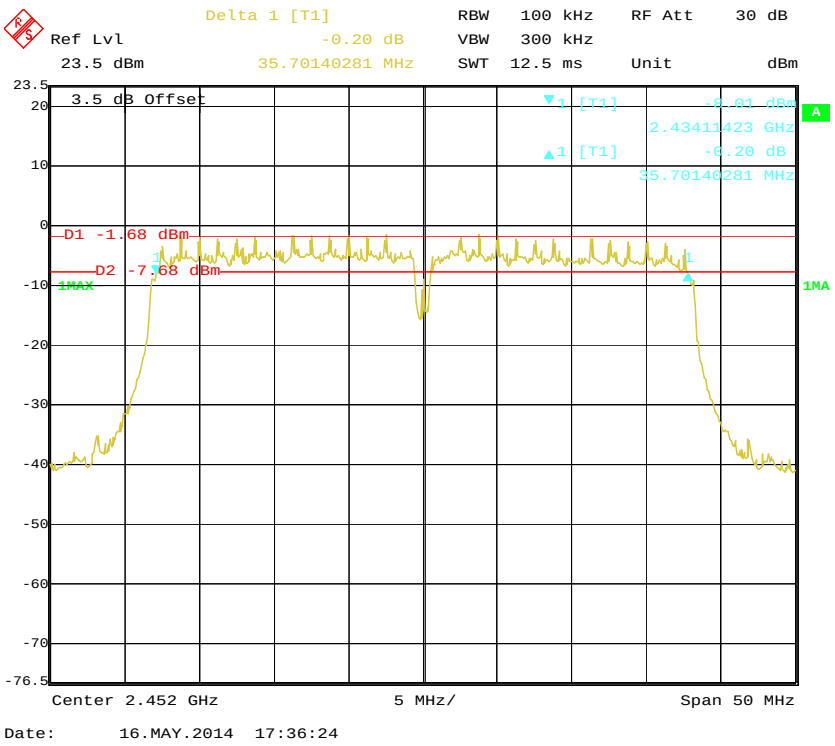
802.11n-HT40 Low Channel, Antenna 0



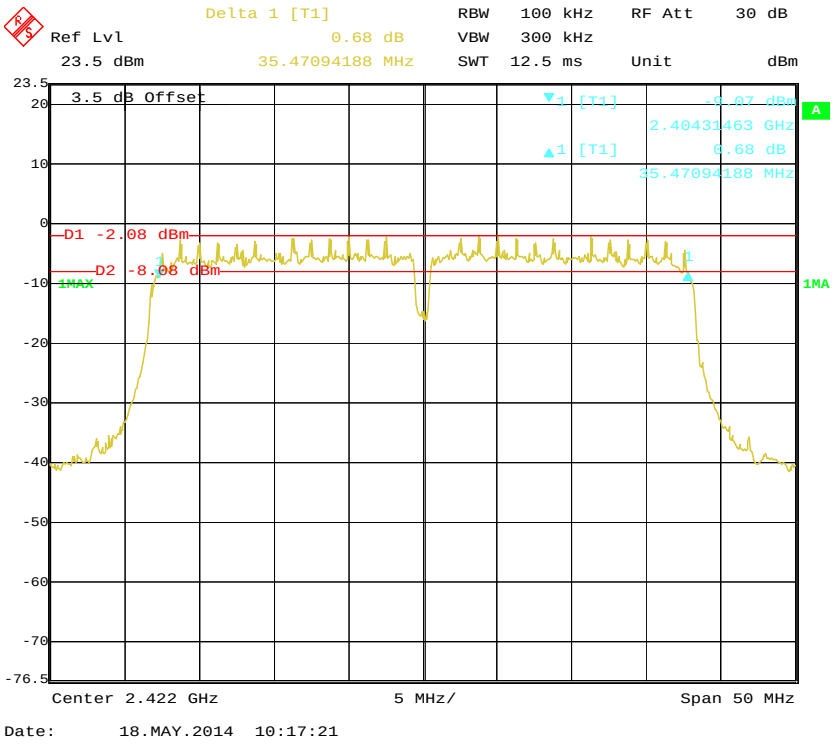
802.11n-HT40 Middle Channel, Antenna 0



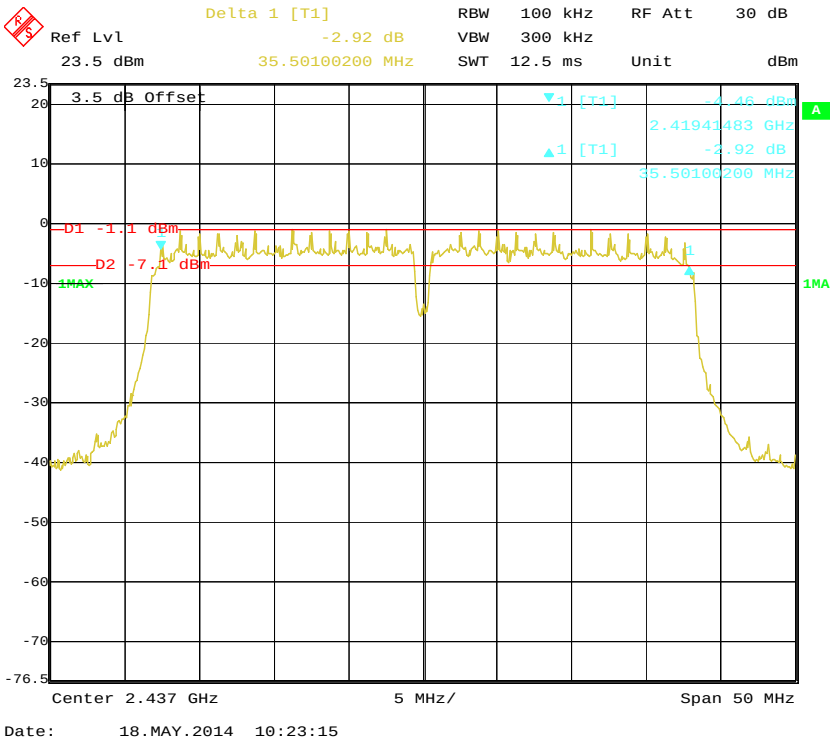
802.11n-HT40 High Channel, Antenna 0



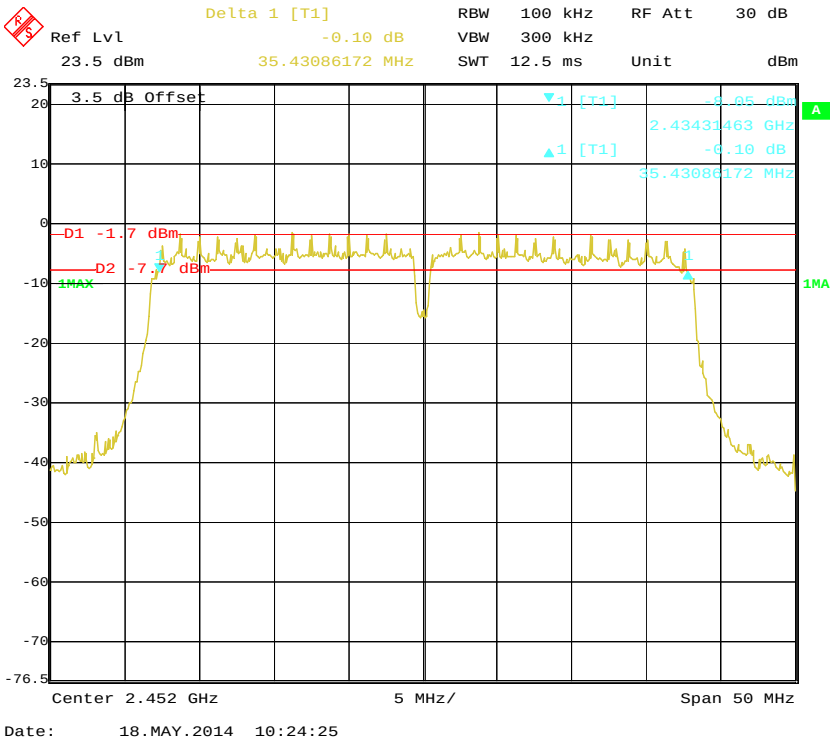
802.11n-HT40 Low Channel, Antenna 1



802.11n-HT40 Middle Channel, Antenna 1



802.11n-HT40 High Channel, Antenna 1



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

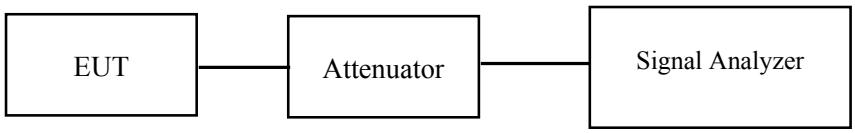
Applicable Standard

According to §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

According to KDB 558074 D01 DTS Meas Guidance v03r01

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

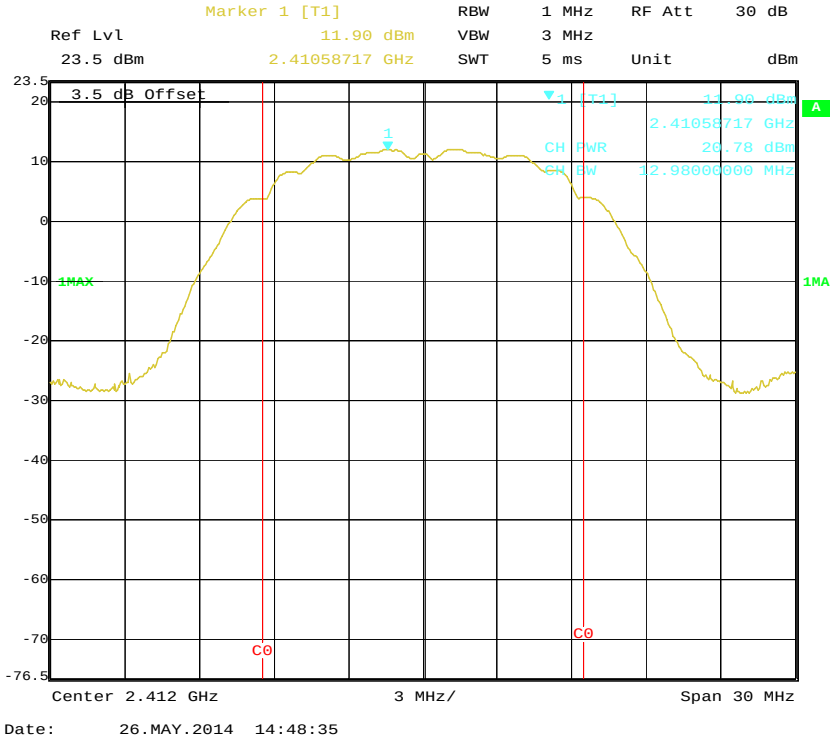
Temperature:	26 ℃
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by August He on 2014-05-26.

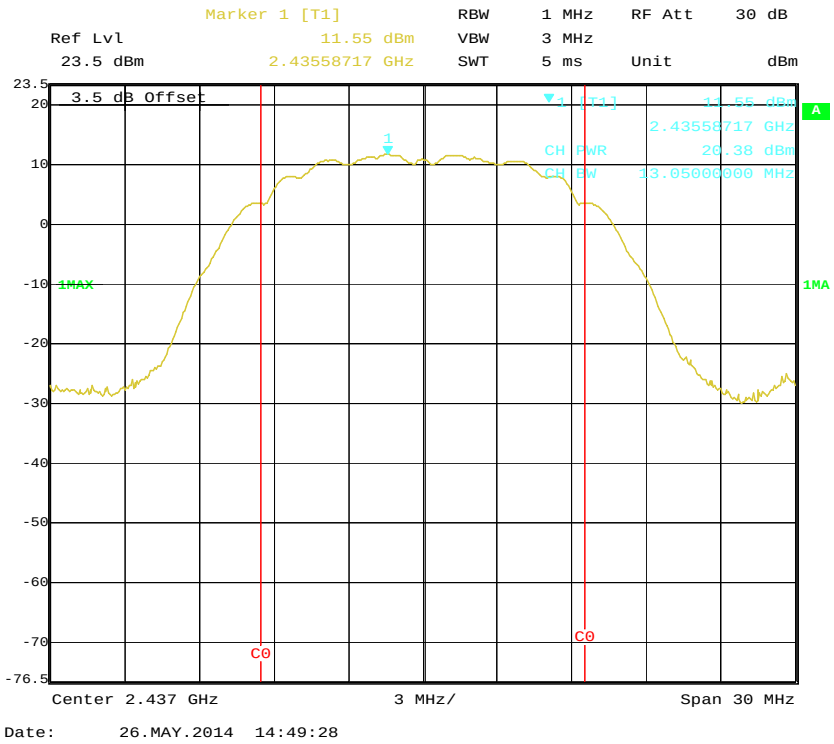
Test Mode: Transmitting

Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)			Limit (dBm)
		Antenna 0	Antenna 1	Antenna 0 +Antenna 1	
802.11b mode					
Low	2412	20.78	19.92	\	30
Middle	2437	20.38	19.73	\	30
High	2462	20.34	19.56	\	30
802.11g mode					
Low	2412	21.06	19.83	\	30
Middle	2437	21.65	20.06	\	30
High	2462	21.44	19.90	\	30
802.11n-HT20 mode					
Low	2412	21.20	19.91	23.61	30
Middle	2437	21.64	19.98	23.90	30
High	2462	20.97	19.95	23.50	30
802.11n-HT40 mode					
Low	2422	20.80	19.93	23.40	30
Middle	2437	21.53	20.01	23.85	30
High	2452	21.33	19.78	23.63	30

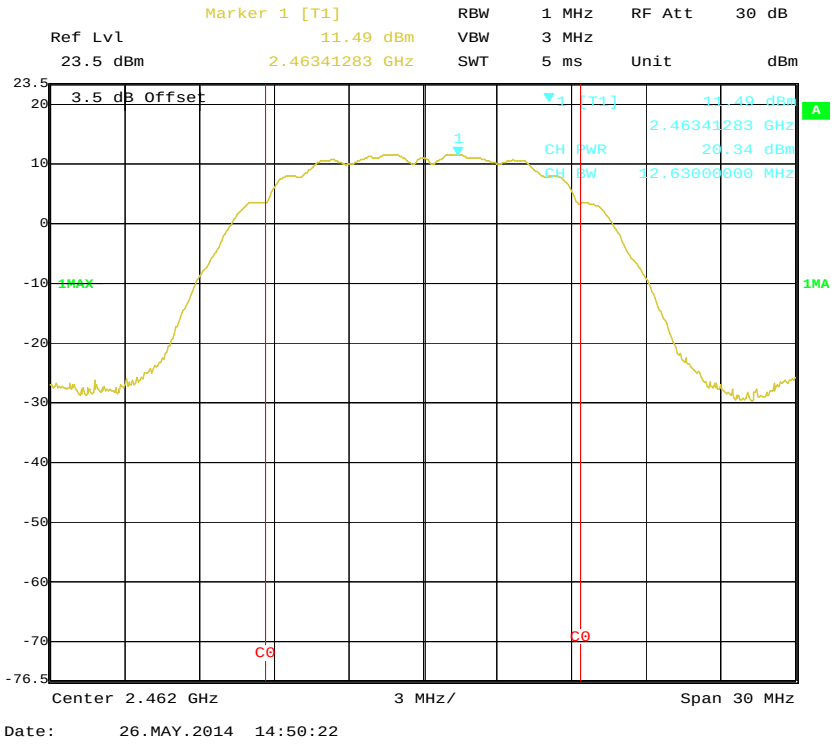
802.11b RF Output Power, Low Channel, Antenna 0



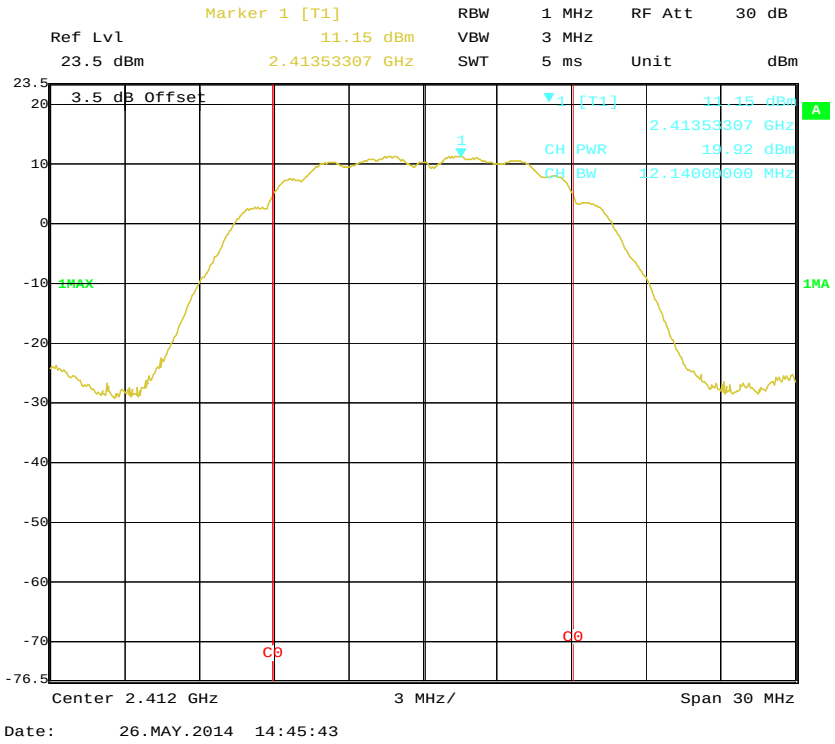
802.11b RF Output Power, Middle Channel, Antenna 0



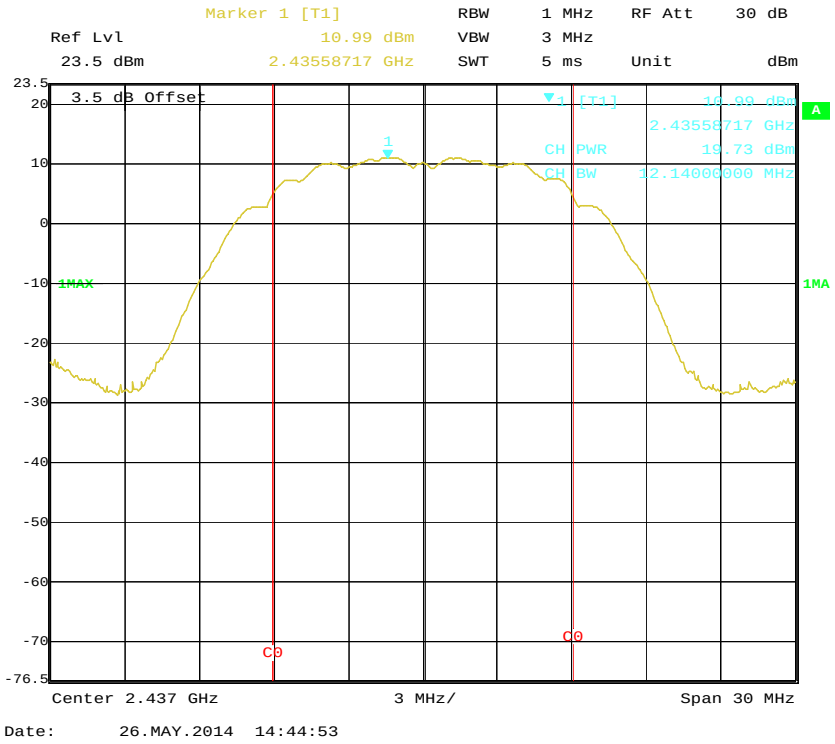
802.11b RF Output Power, High Channel, Antenna 0



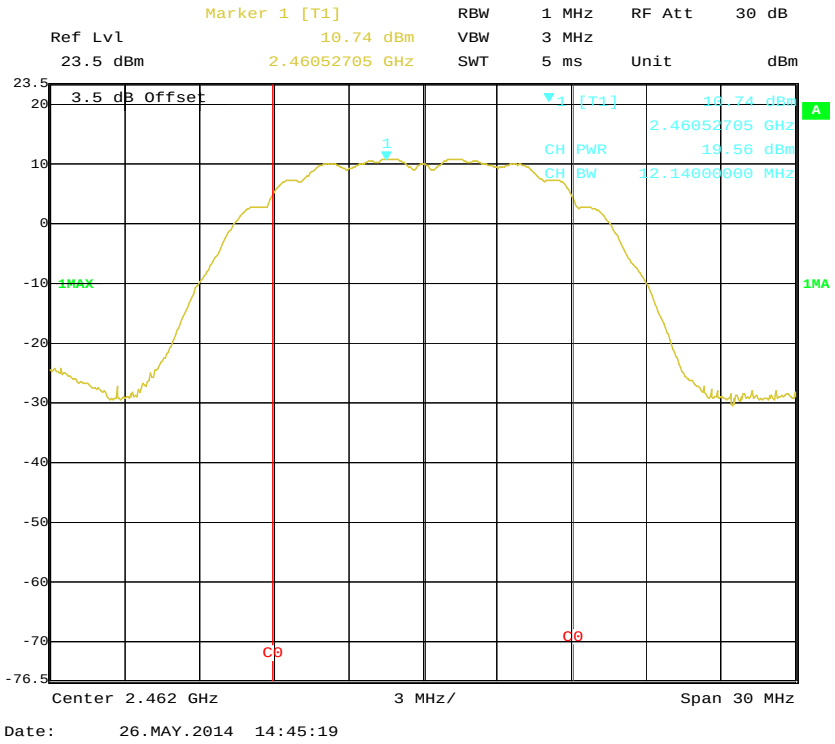
802.11b RF Output Power, Low Channel, Antenna 1



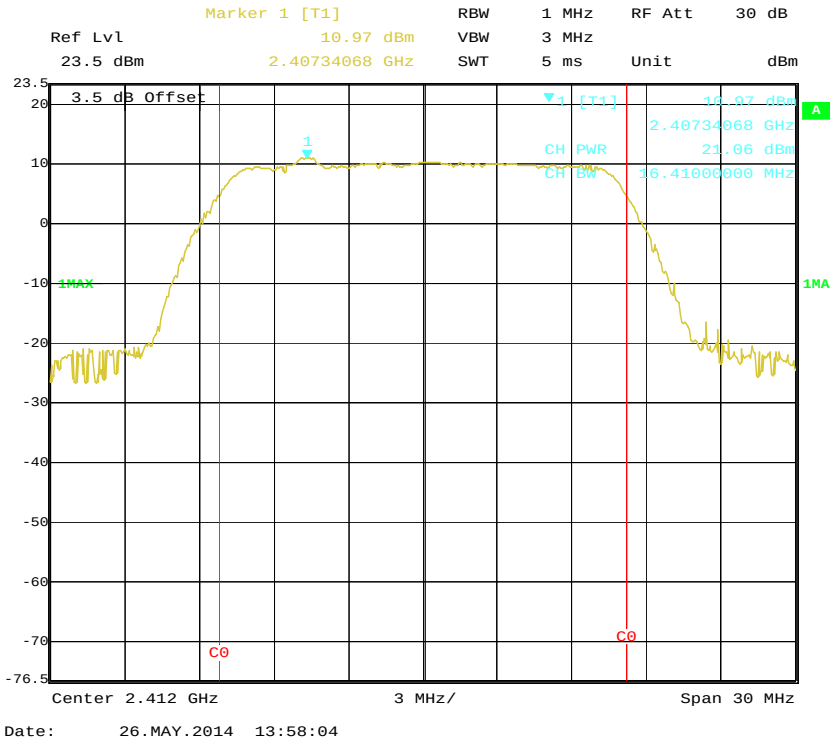
802.11b RF Output Power, Middle Channel, Antenna 1



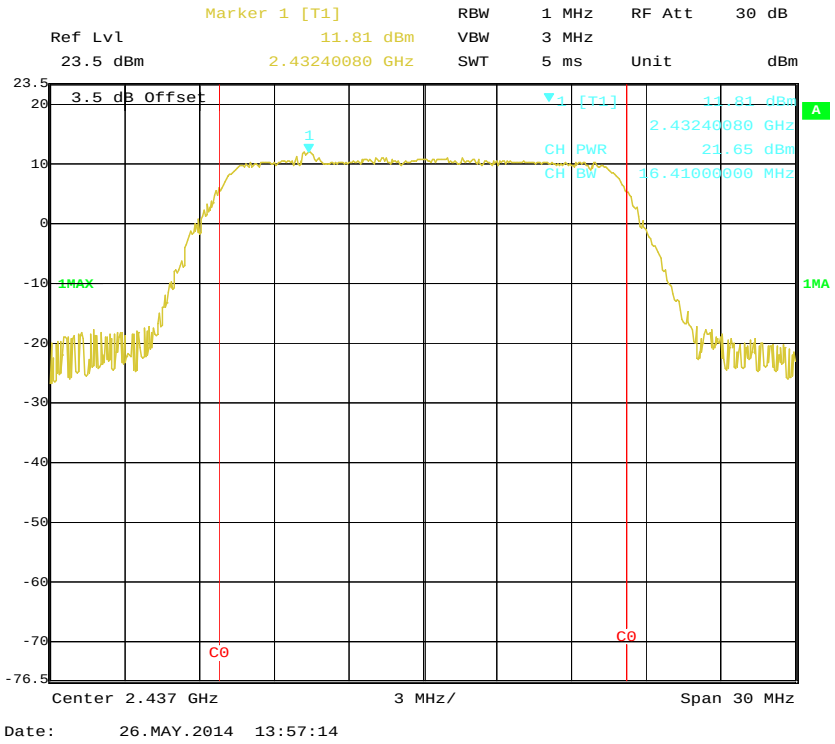
802.11b RF Output Power, High Channel, Antenna 1



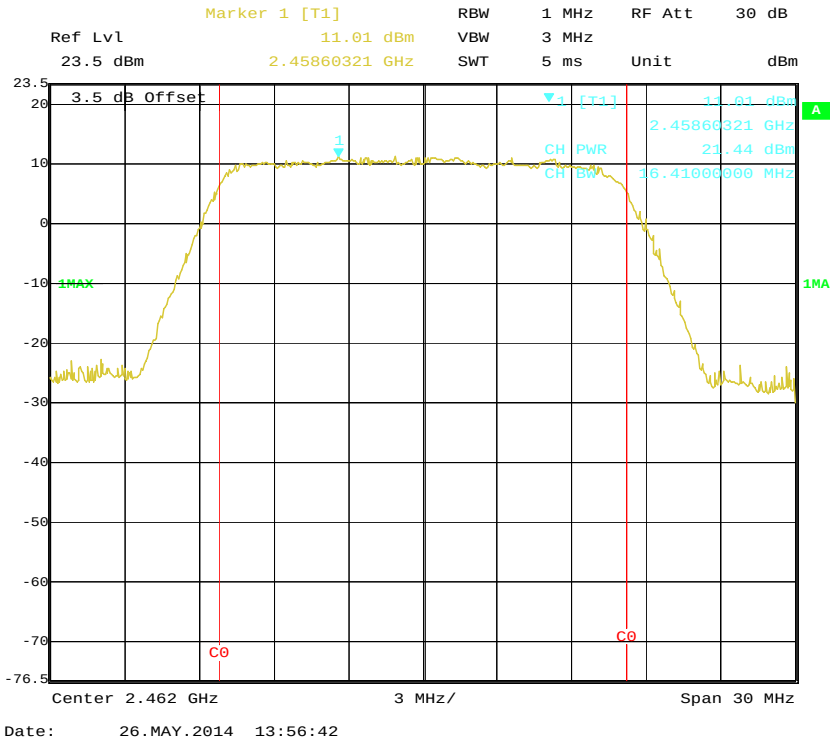
802.11g RF Output Power, Low Channel, Antenna 0



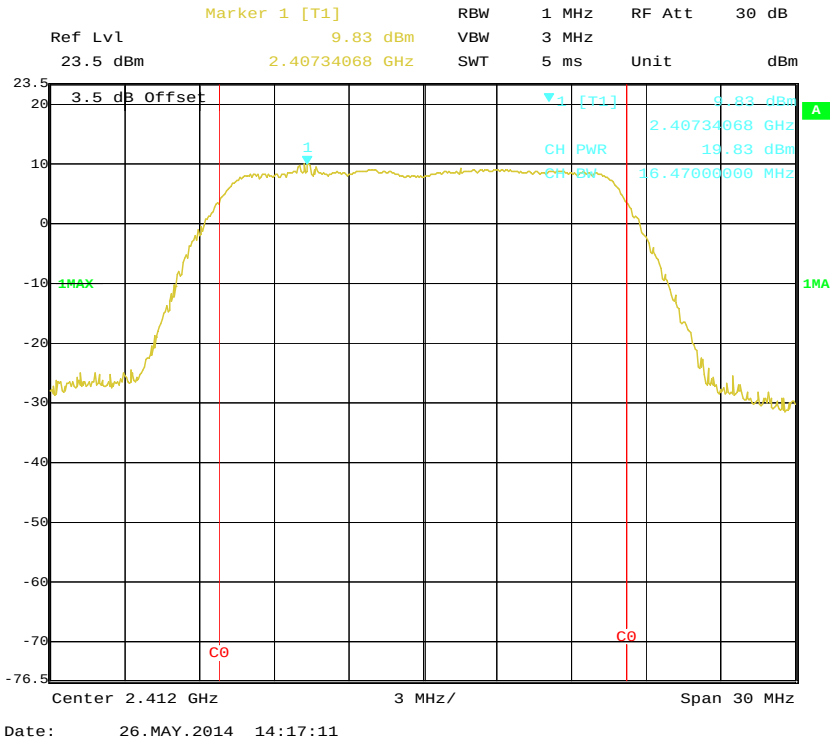
802.11g RF Output Power, Middle Channel, Antenna 0



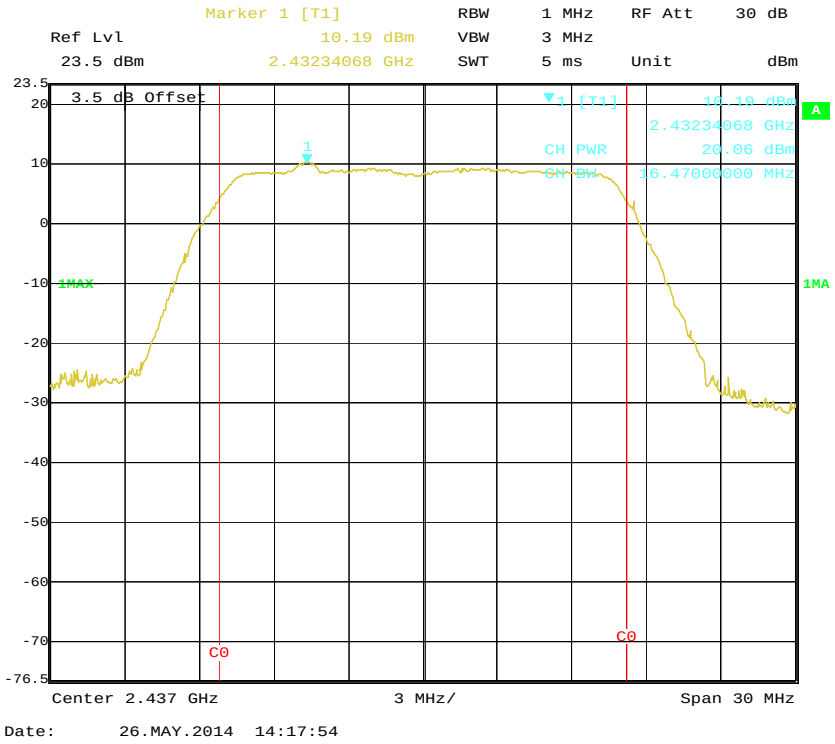
802.11g RF Output Power, High Channel, Antenna 0



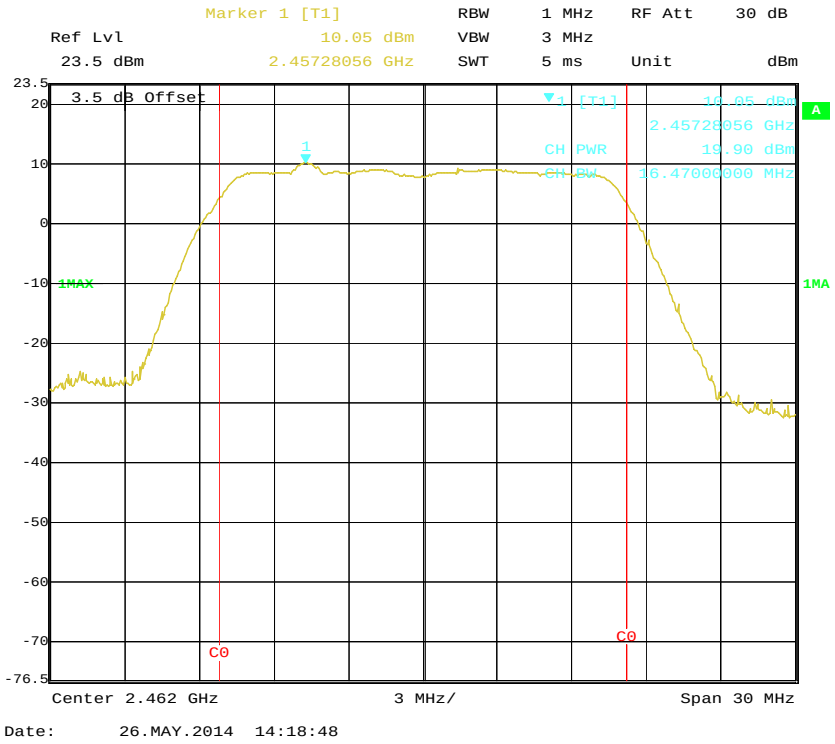
802.11g RF Output Power, Low Channel, Antenna 1



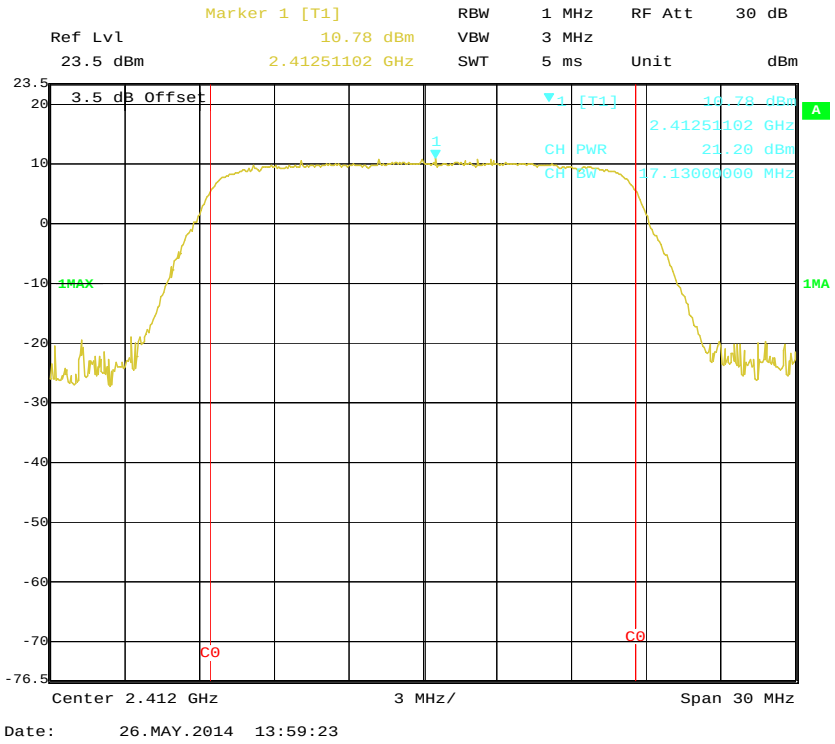
802.11g RF Output Power, Middle Channel, Antenna 1



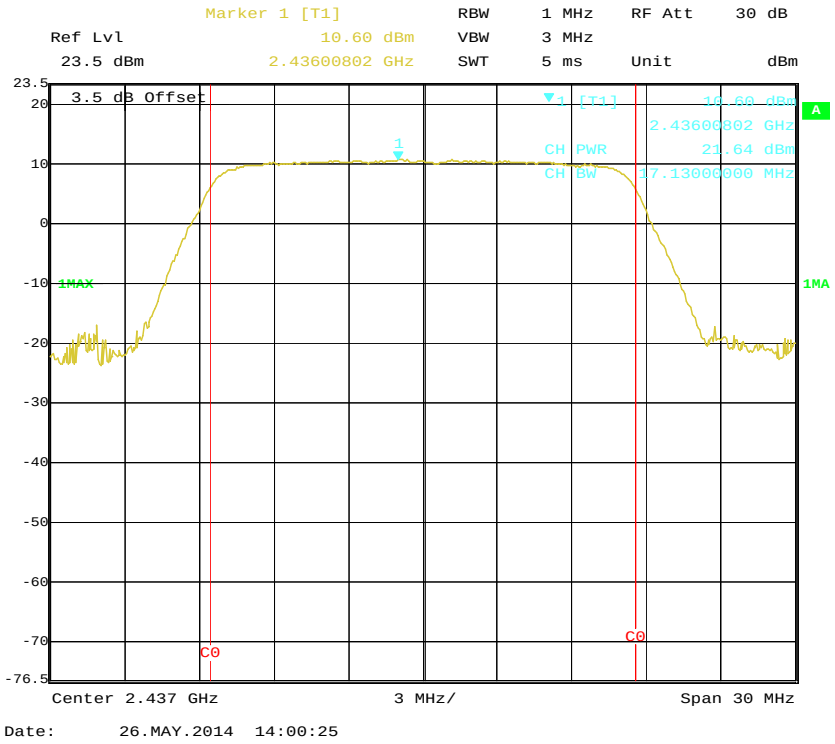
802.11g RF Output Power, High Channel, Antenna 1



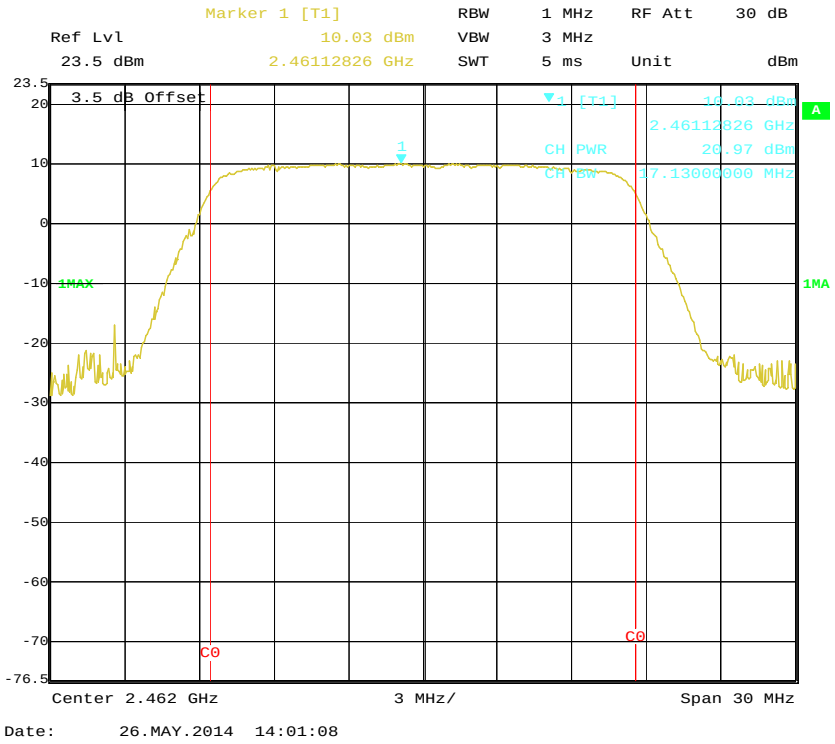
802.11n-HT20 RF Output Power, Low Channel, Antenna 0



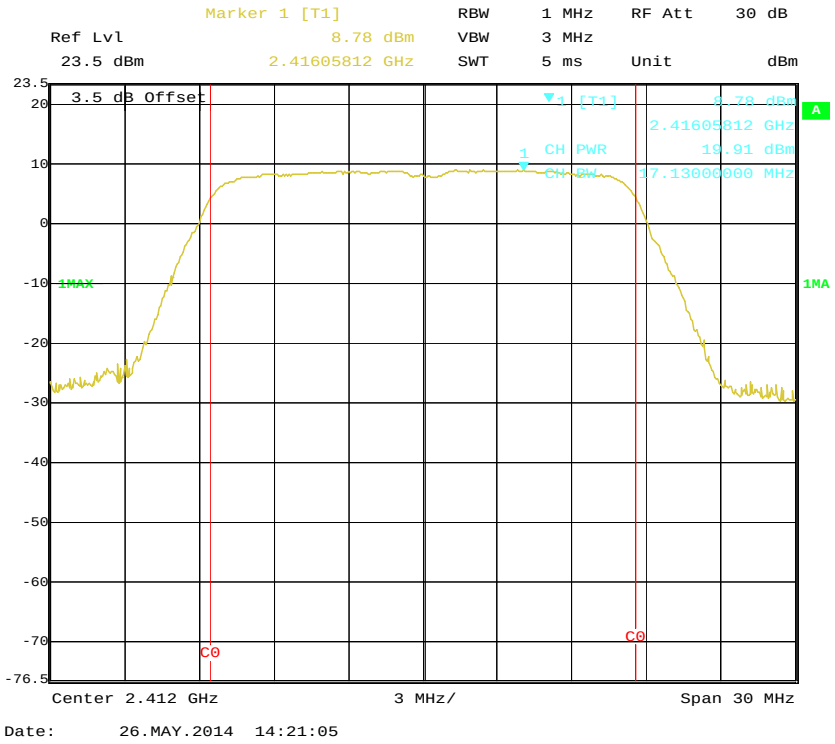
802.11n-HT20 RF Output Power, Middle Channel, Antenna 0



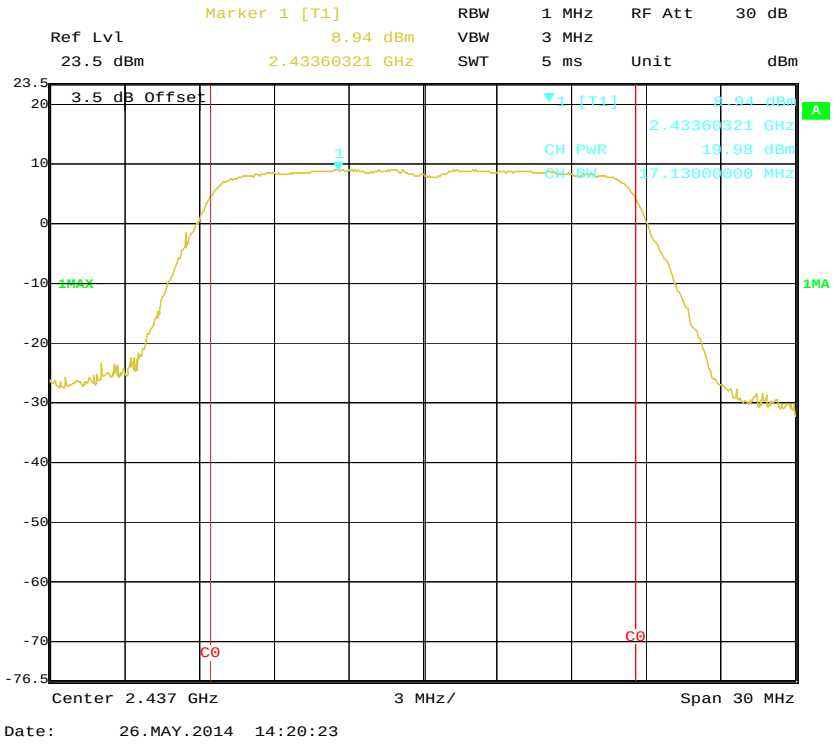
802.11n-HT20 RF Output Power, High Channel, Antenna 0



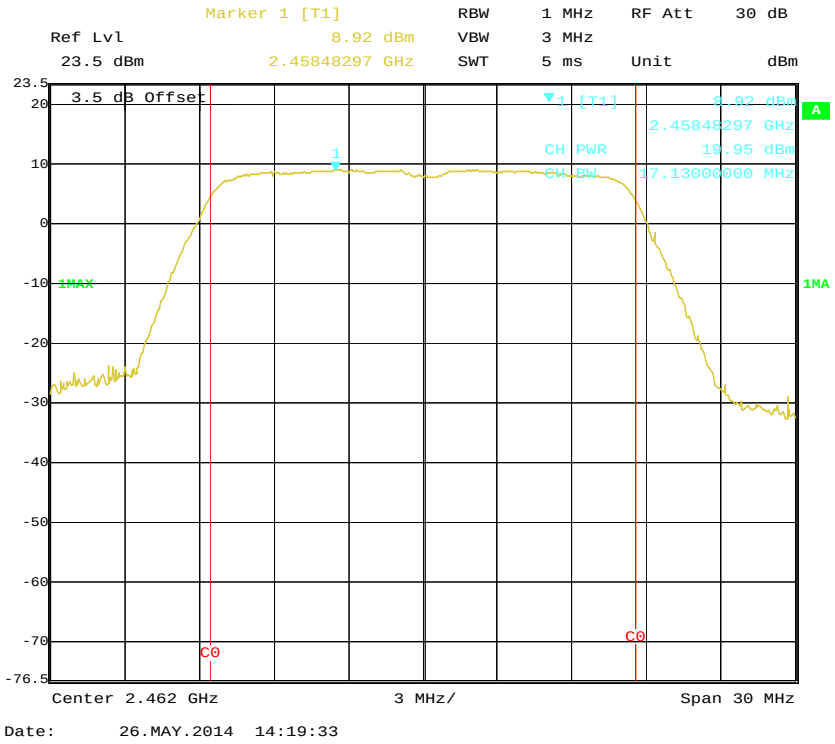
802.11n-HT20 RF Output Power, Low Channel, Antenna 1



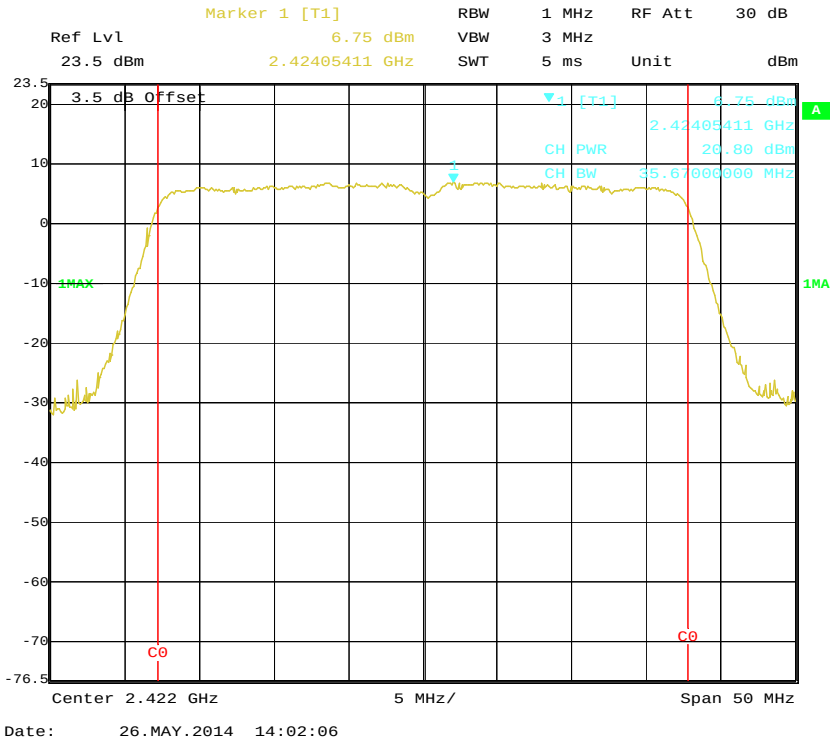
802.11n-HT20 RF Output Power, Middle Channel, Antenna 1



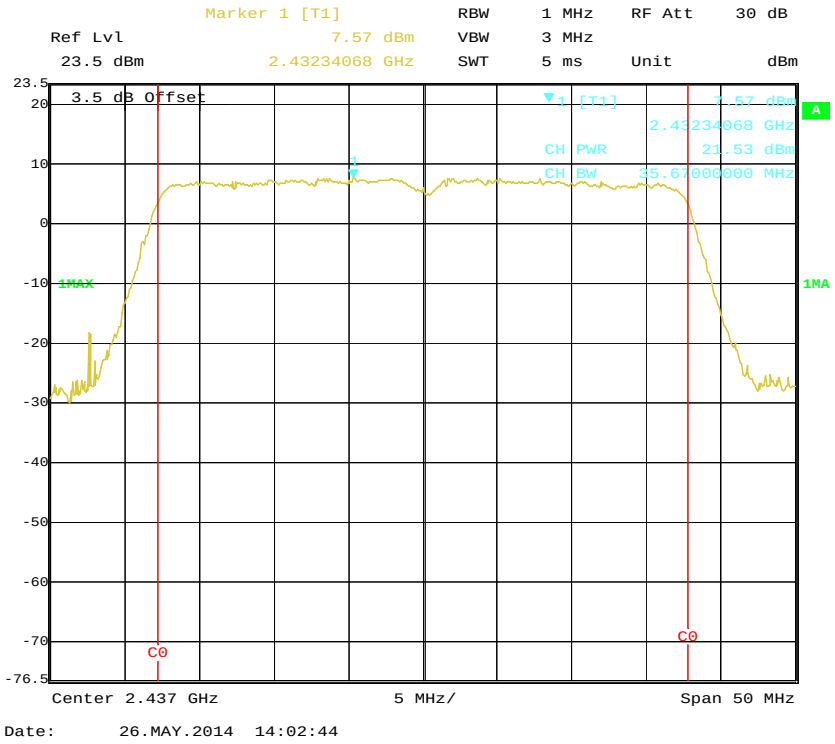
802.11n-HT20 RF Output Power, High Channel, Antenna 1



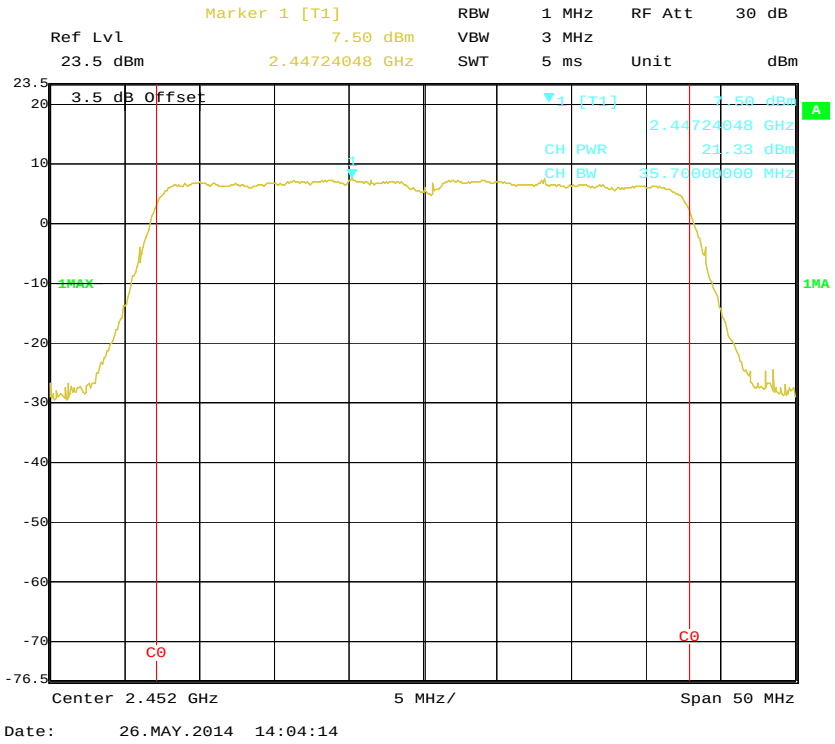
802.11n-HT40 RF Output Power, Low Channel, Antenna 0



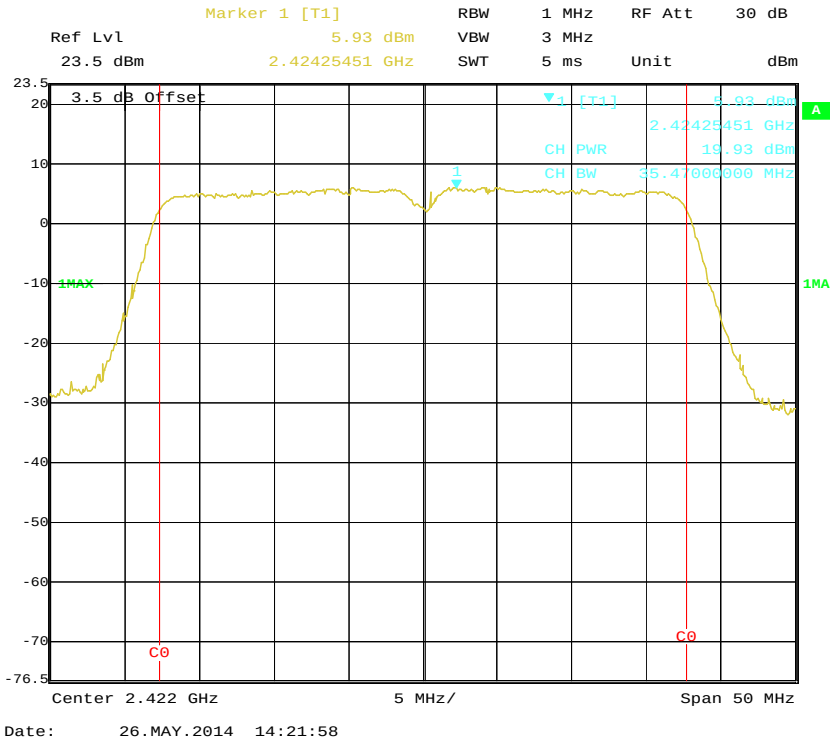
802.11n-HT40 RF Output Power, Middle Channel, Antenna 0



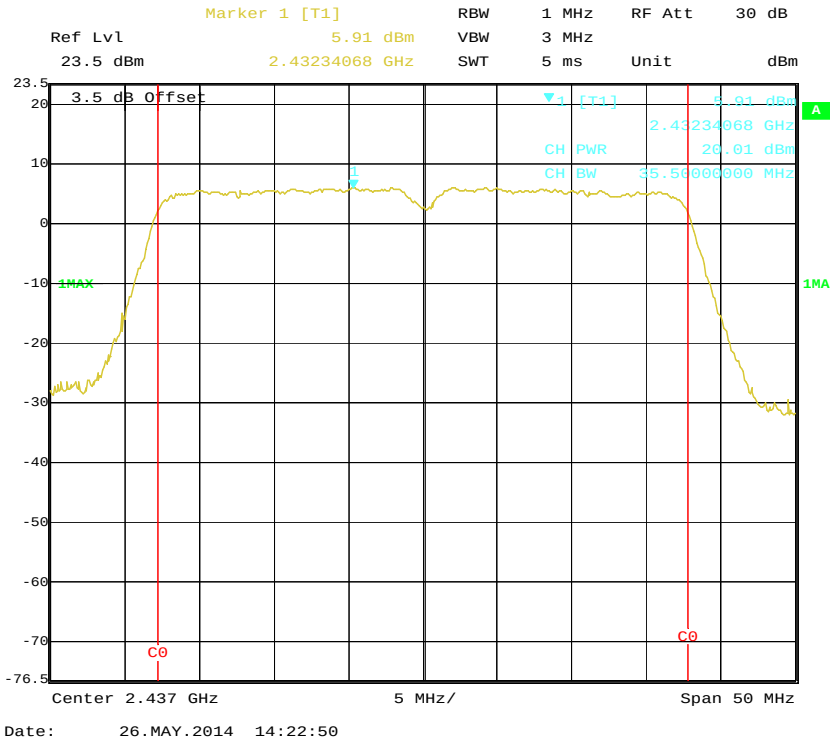
802.11n-HT40 RF Output Power, High Channel, Antenna 0



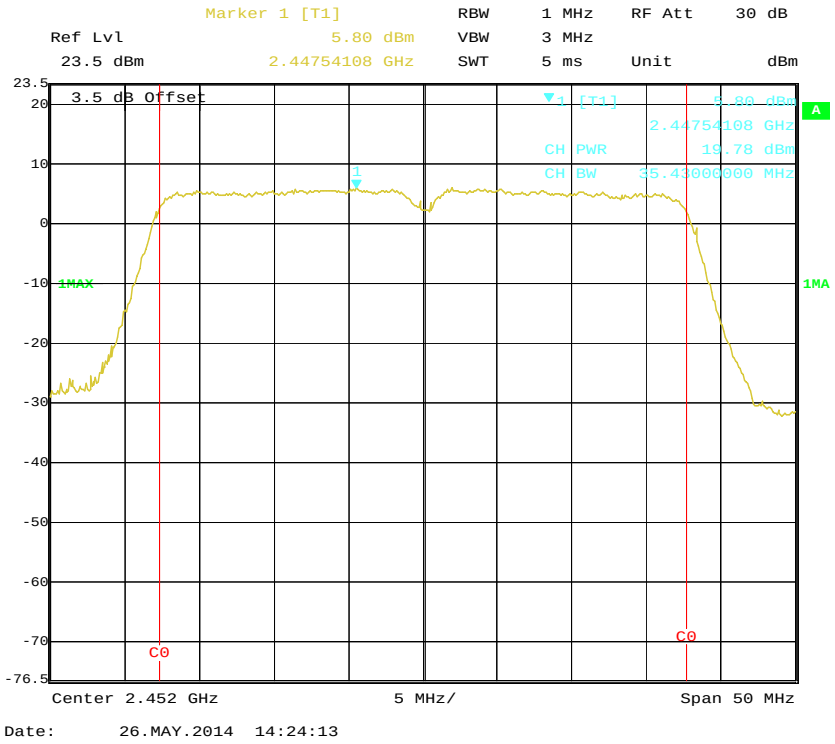
802.11n-HT40 RF Output Power, Low Channel, Antenna 1



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

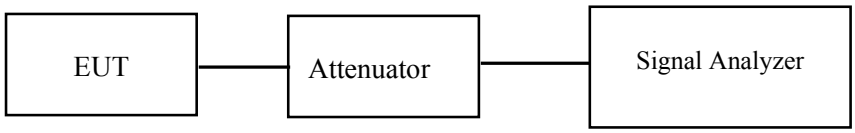
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v03r01

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	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

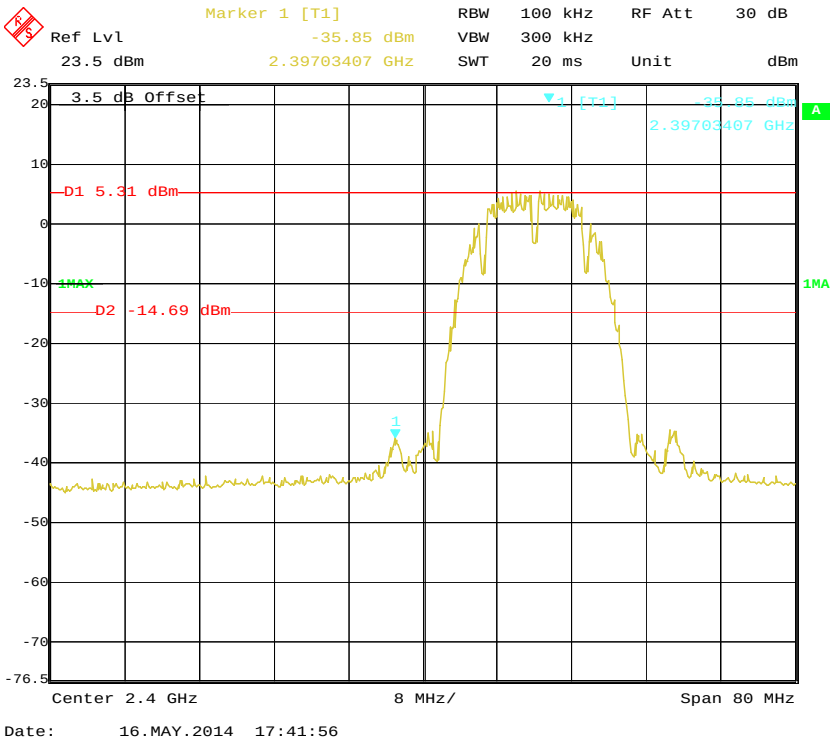
Temperature:	25~26 ℃
Relative Humidity:	52~53 %
ATM Pressure:	101.0 kPa

The testing was performed by August He from 2014-05-16 to2014-05-23.

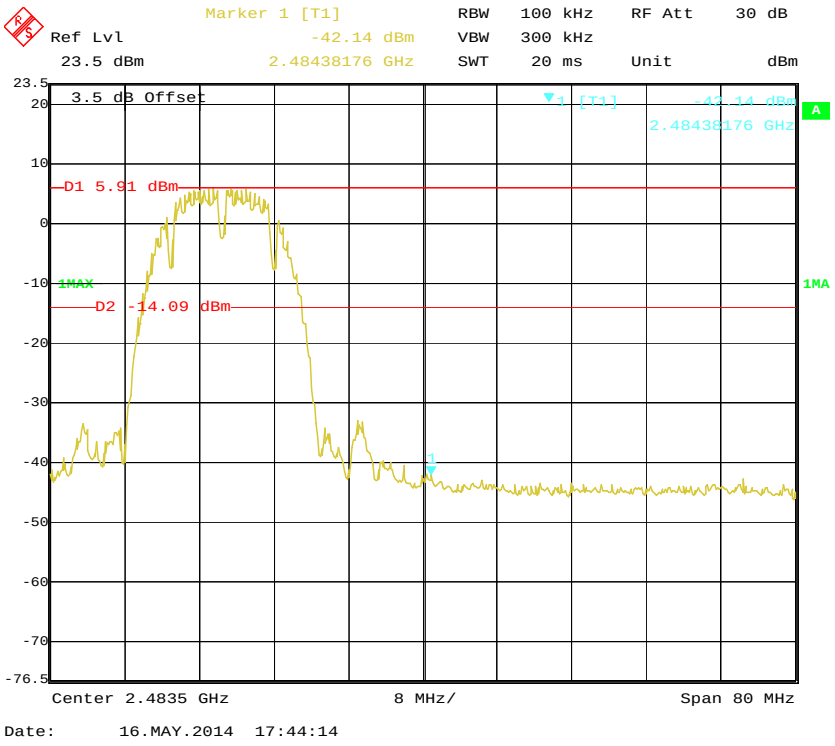
Test Mode: Transmitting

Test Result: *Compliance.* Please refer to following plots.

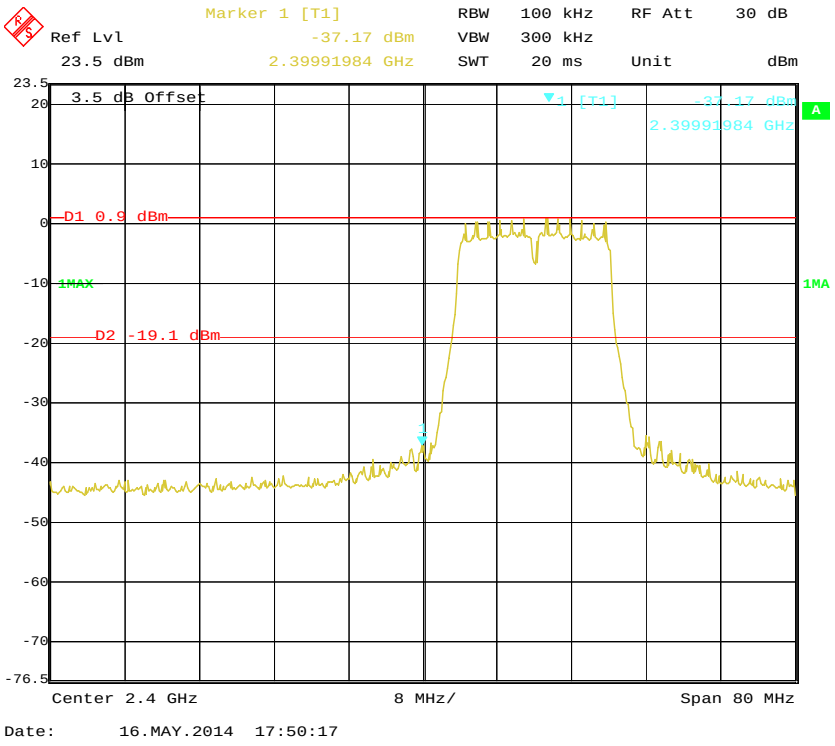
802.11b: Band Edge, Left Side, Antenna 0



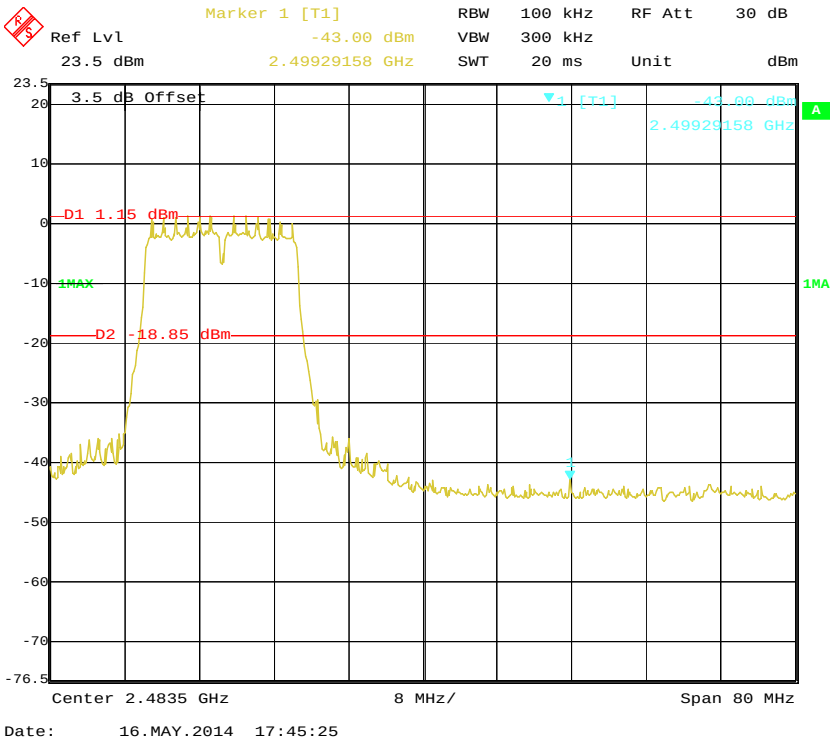
802.11b: Band Edge, Right Side, Antenna 0



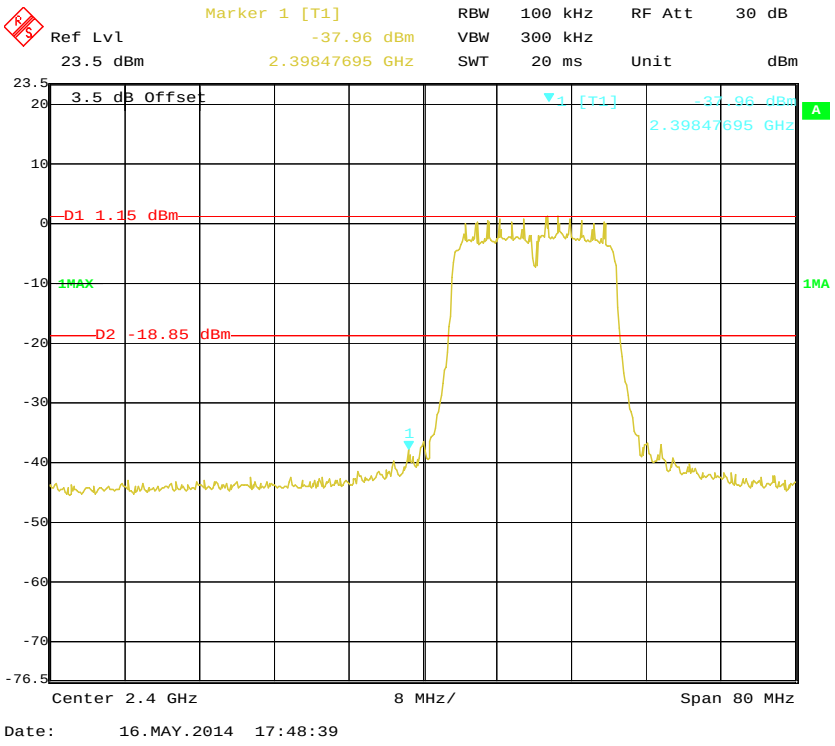
802.11g: Band Edge, Left Side, Antenna 0



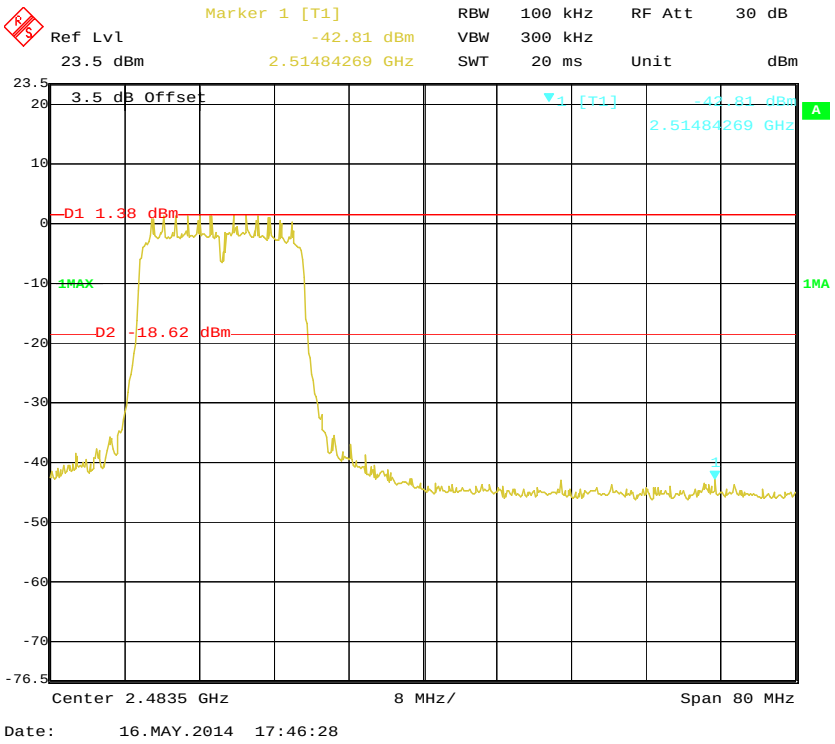
802.11g: Band Edge, Right Side, Antenna 0



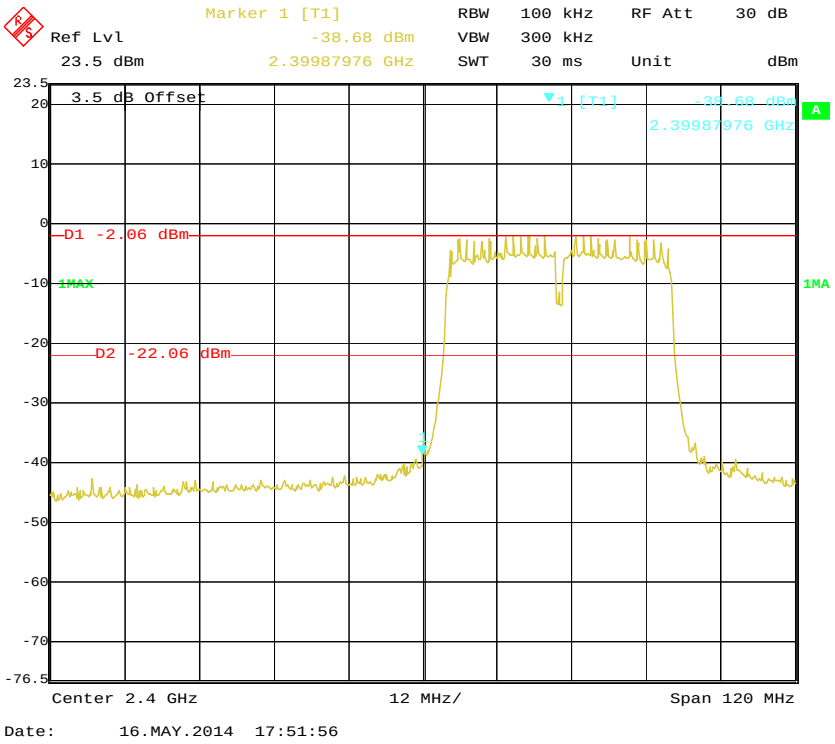
802.11n-HT20: Band Edge, Left Side, Antenna 0



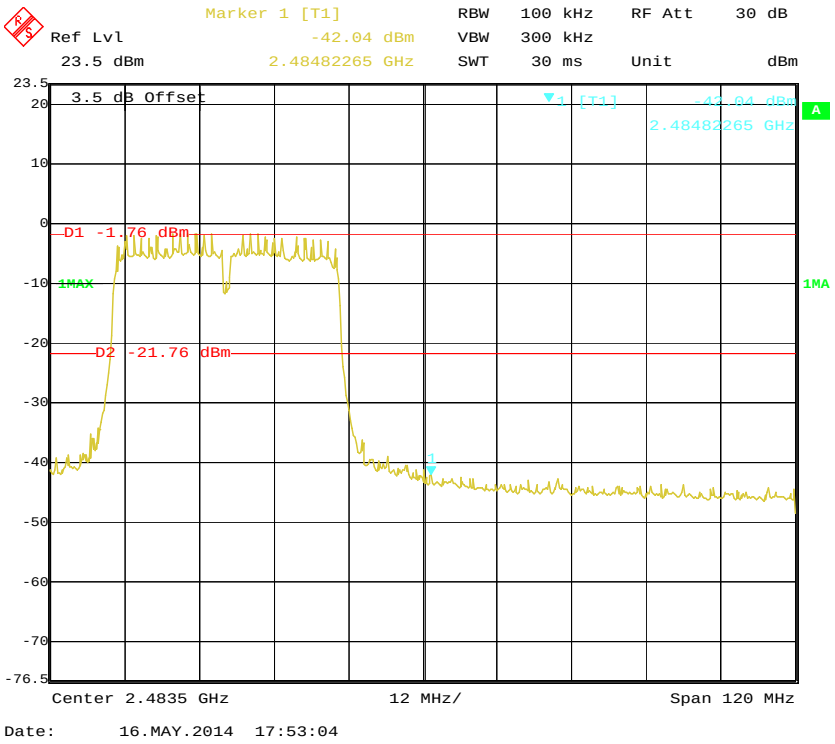
802.11n-HT20: Band Edge, Right Side, Antenna 0



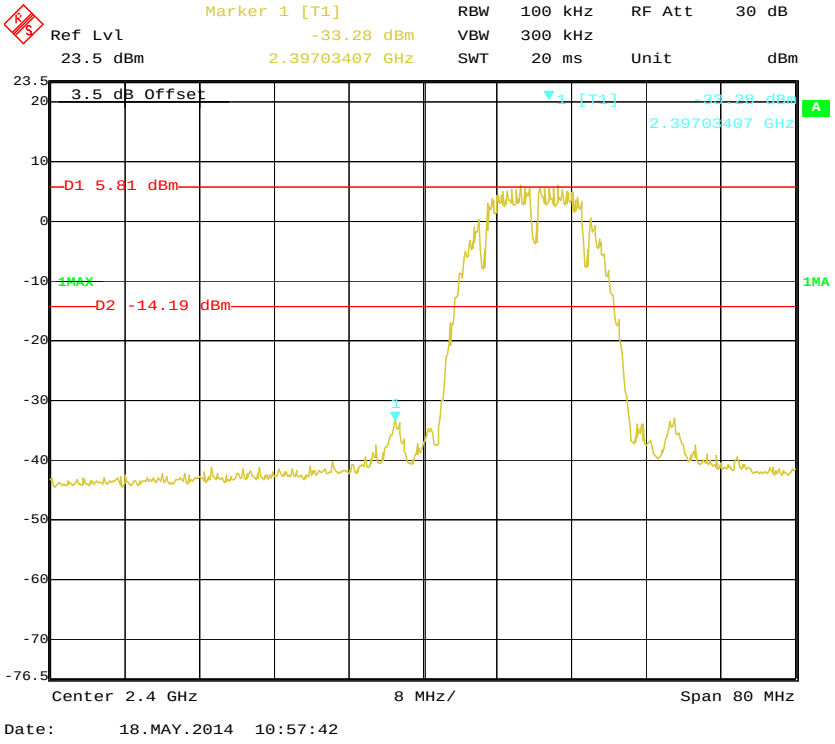
802.11n-HT40: Band Edge, Left Side, Antenna 0



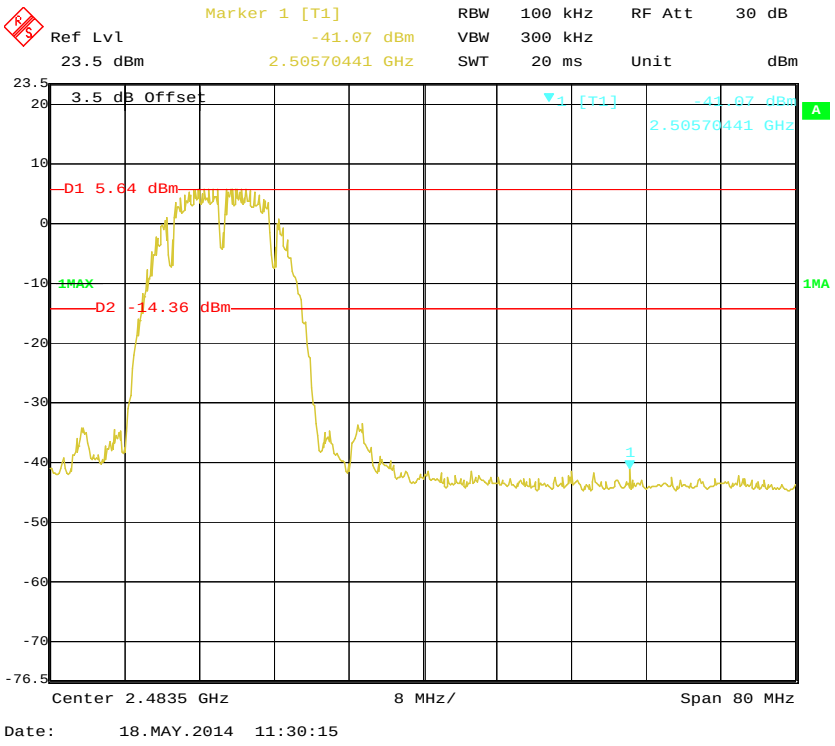
802.11n-HT40: Band Edge, Right Side, Antenna 0



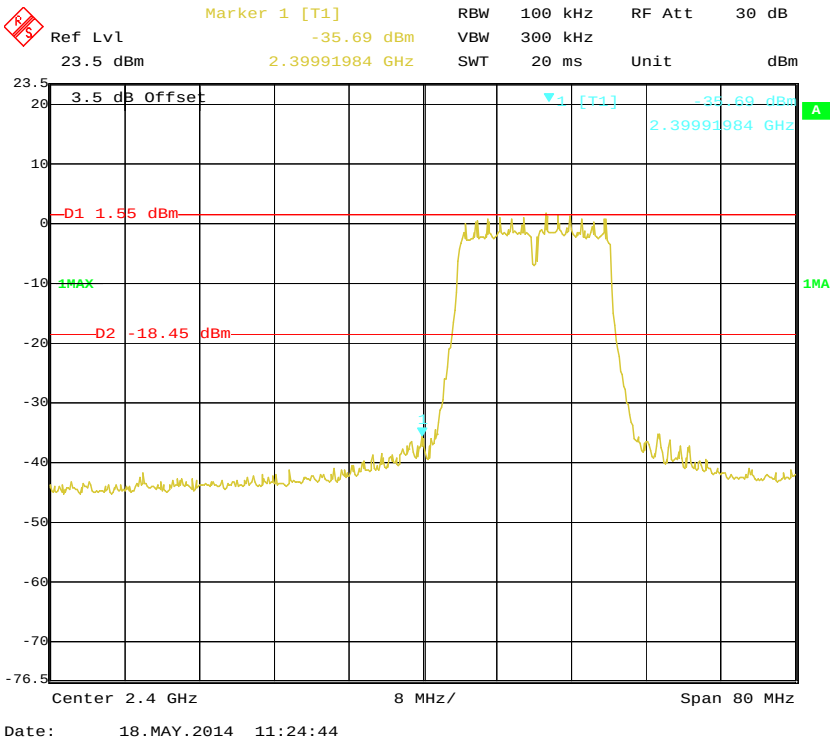
802.11b: Band Edge, Left Side, Antenna 1



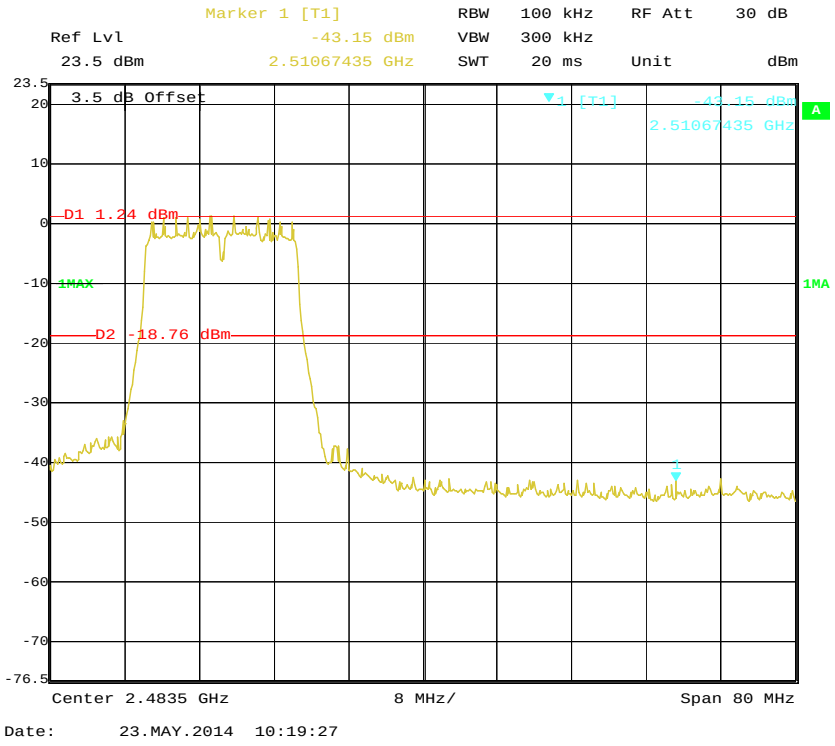
802.11b: Band Edge, Right Side, Antenna 1



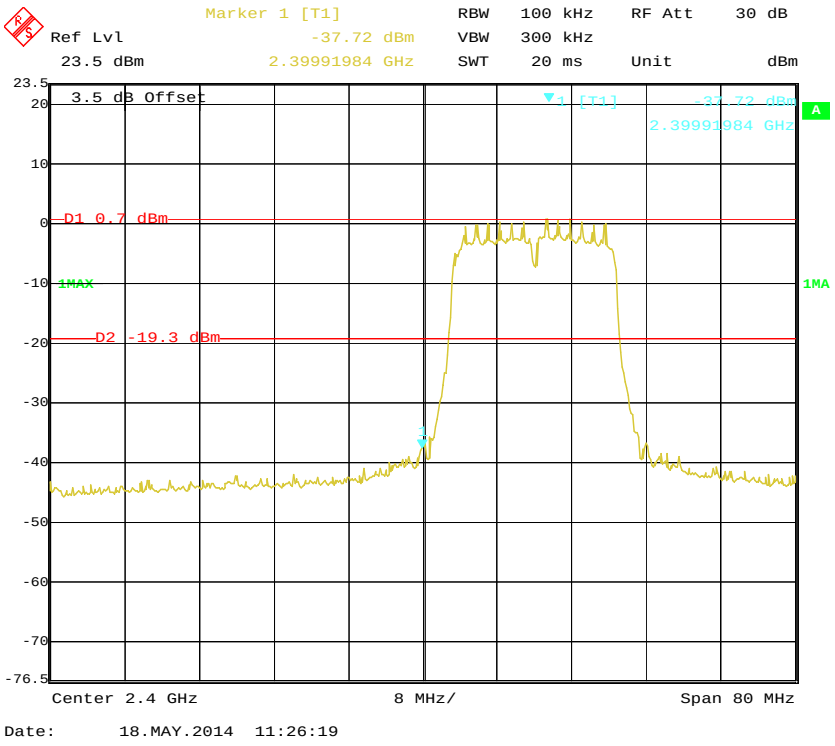
802.11g: Band Edge, Left Side, Antenna 1



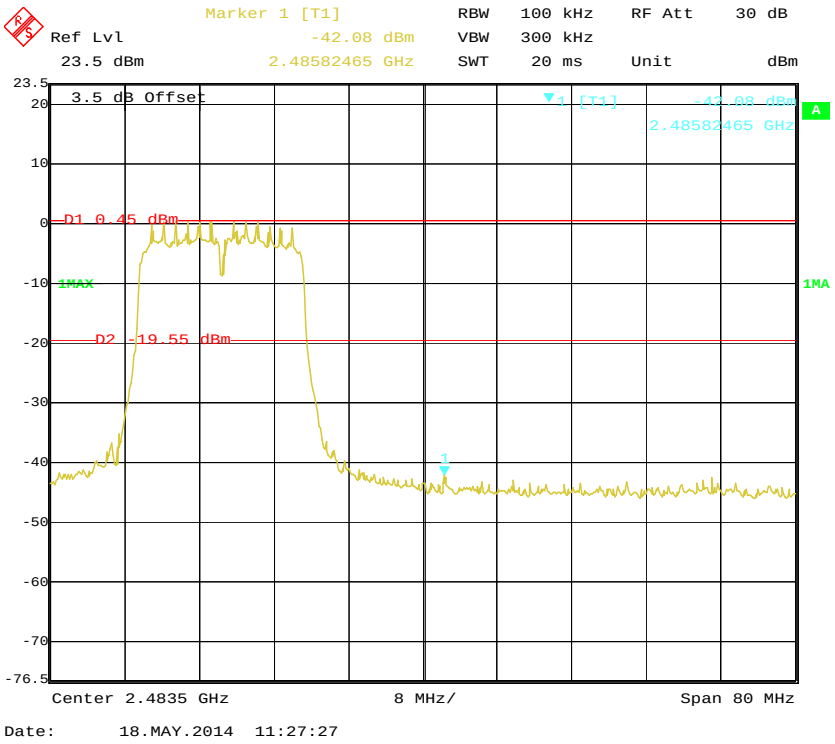
802.11g: Band Edge, Right Side, Antenna 1



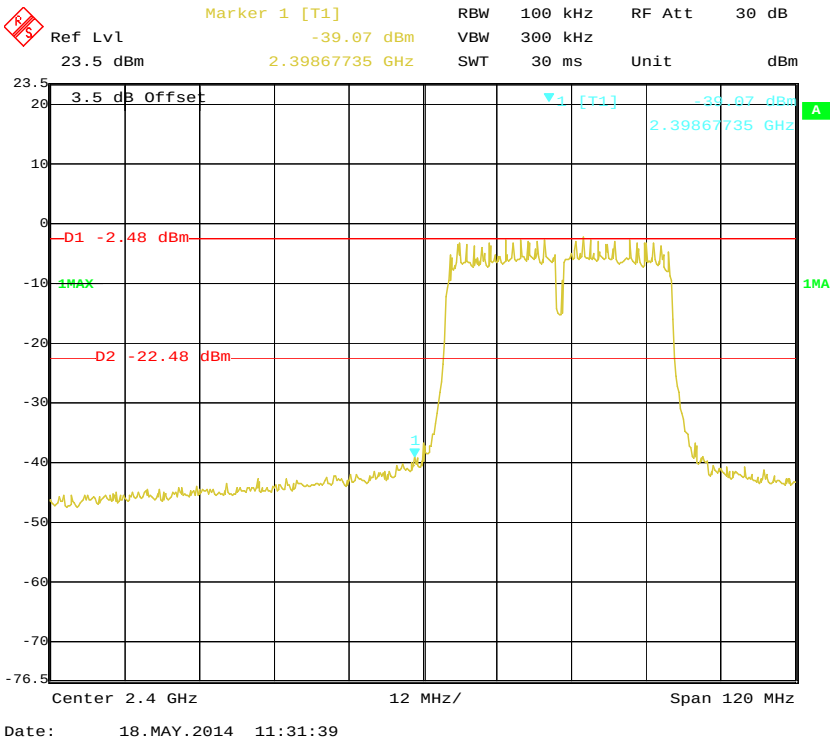
802.11n-HT20: Band Edge, Left Side, Antenna 1



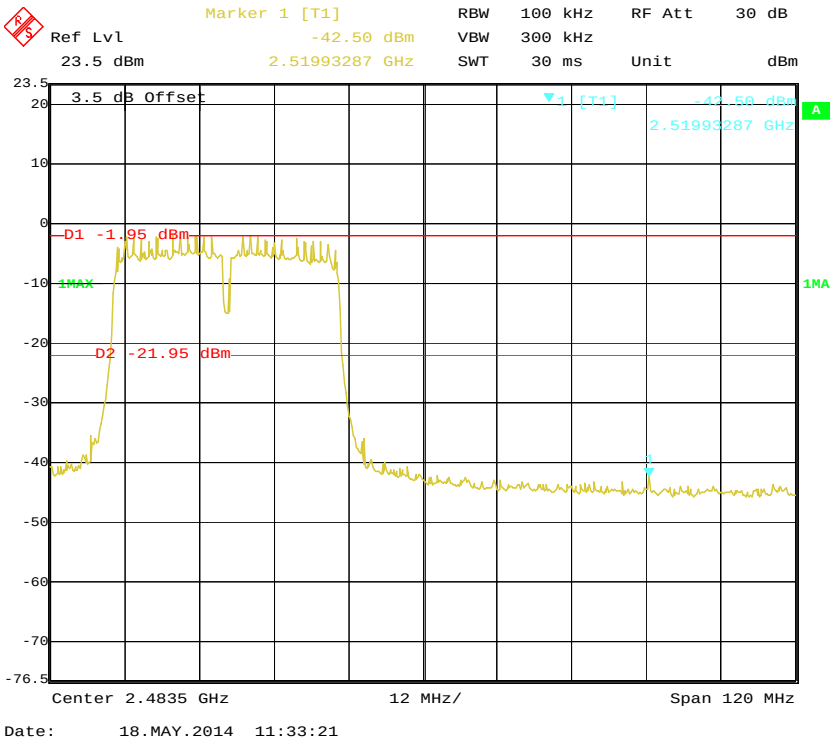
802.11n-HT20: Band Edge, Right Side, Antenna 1



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 (KDB558074 D01 DTS Meas Guidance v03r01 sub-clause 10.2)

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: 3kHz≤ RBW≤100 kHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit，reduce RBW（no less than 3 kHz）and repeat.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12

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

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

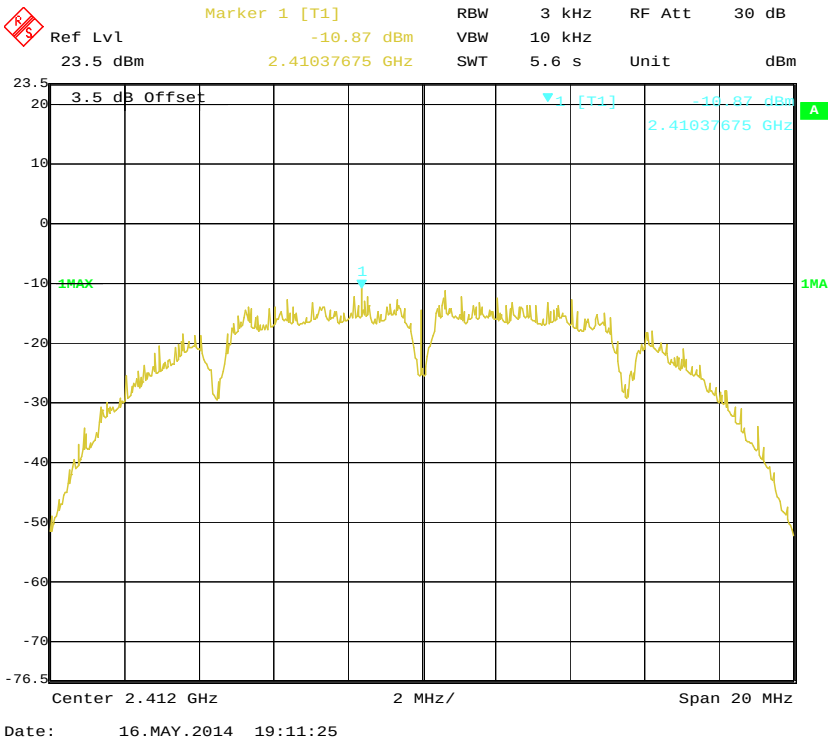
The testing was performed by August He from 2014-05-16 to 2014-05-23.

Test Mode: Transmitting

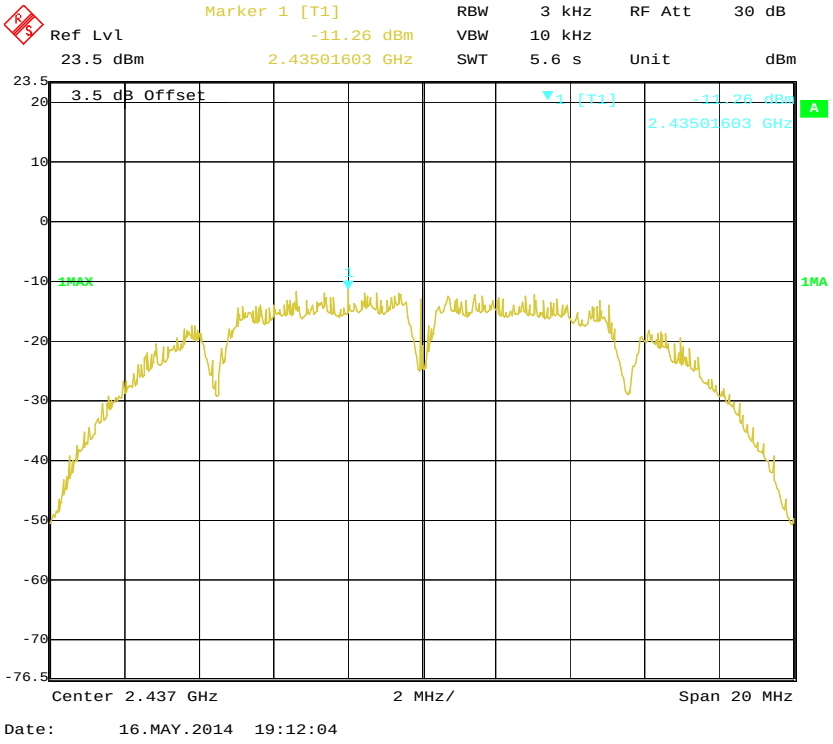
Test Result: Pass

Channel	Frequency (MHz)	PSD(dBm/3kHz)			Limit (dBm/3kHz)
		Antenna 0	Antenna 1	Antenna 0 +Antenna 1	
802.11b mode					
Low	2412	-10.87	-10.38	\	≤8
Middle	2437	-11.26	-9.64	\	≤8
High	2462	-10.78	-10.61	\	≤8
802.11g mode					
Low	2412	-15.91	-15.38	\	≤8
Middle	2437	-14.77	-14.15	\	≤8
High	2462	-14.97	-15.40	\	≤8
802.11n-HT20 mode					
Low	2412	-15.29	-15.51	-12.39	≤8
Middle	2437	-14.75	-14.77	-11.75	≤8
High	2462	-14.61	-15.70	-12.11	≤8
802.11n-HT40 mode					
Low	2422	-16.07	-17.50	-13.72	≤8
Middle	2437	-14.09	-17.97	-12.60	≤8
High	2452	-14.56	-18.05	-12.95	≤8

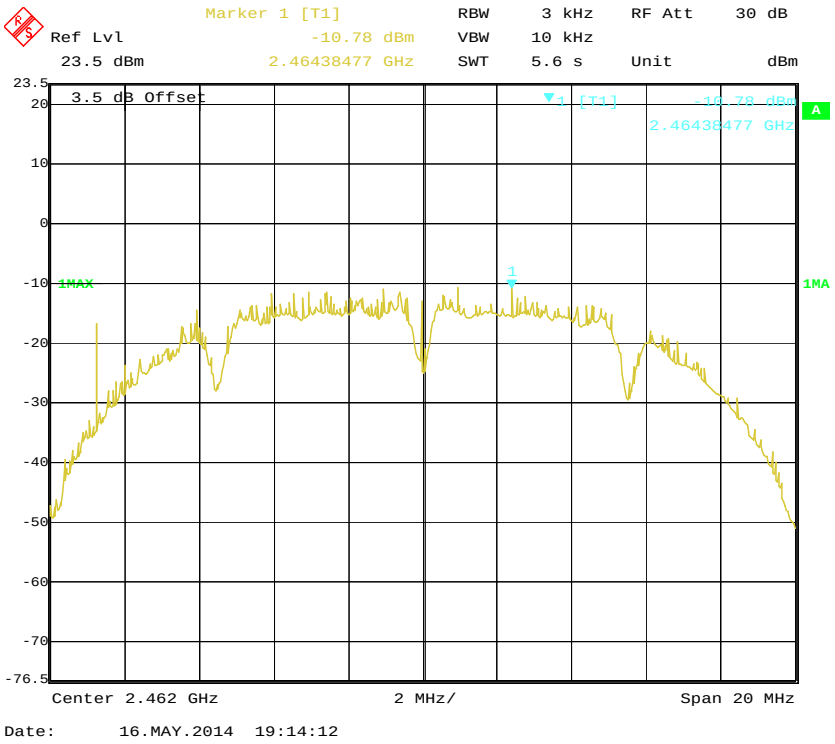
Power Spectral Density, 802.11b Low Channel, Antenna 0



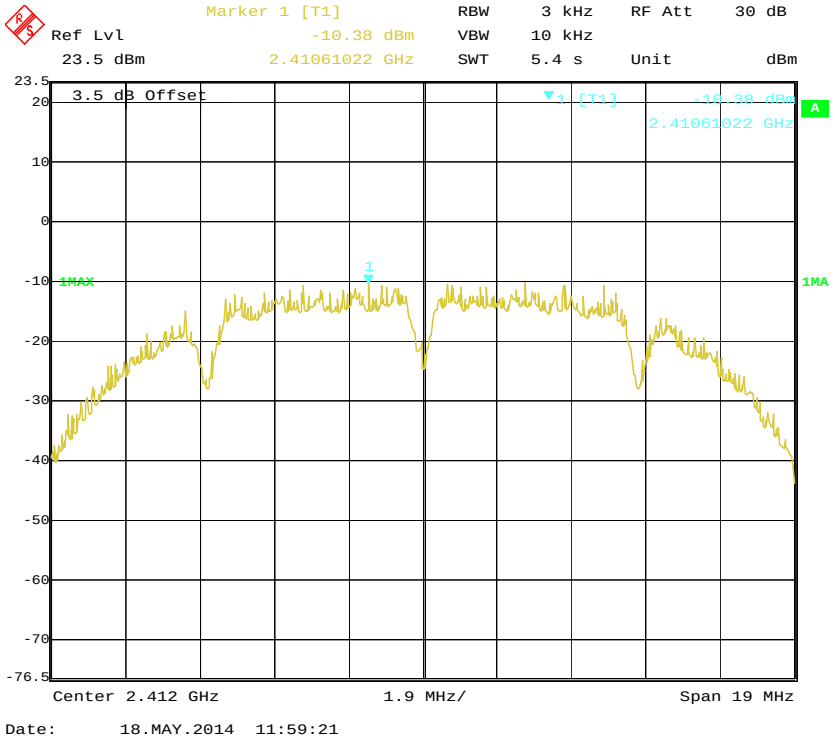
Power Spectral Density, 802.11b Middle Channel, Antenna 0



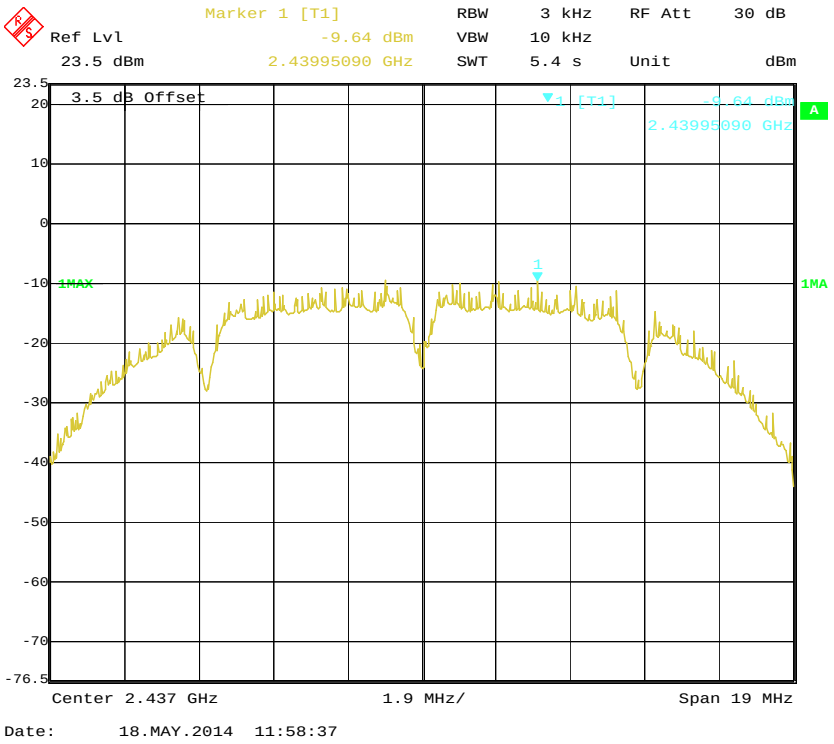
Power Spectral Density, 802.11b High Channel, Antenna 0



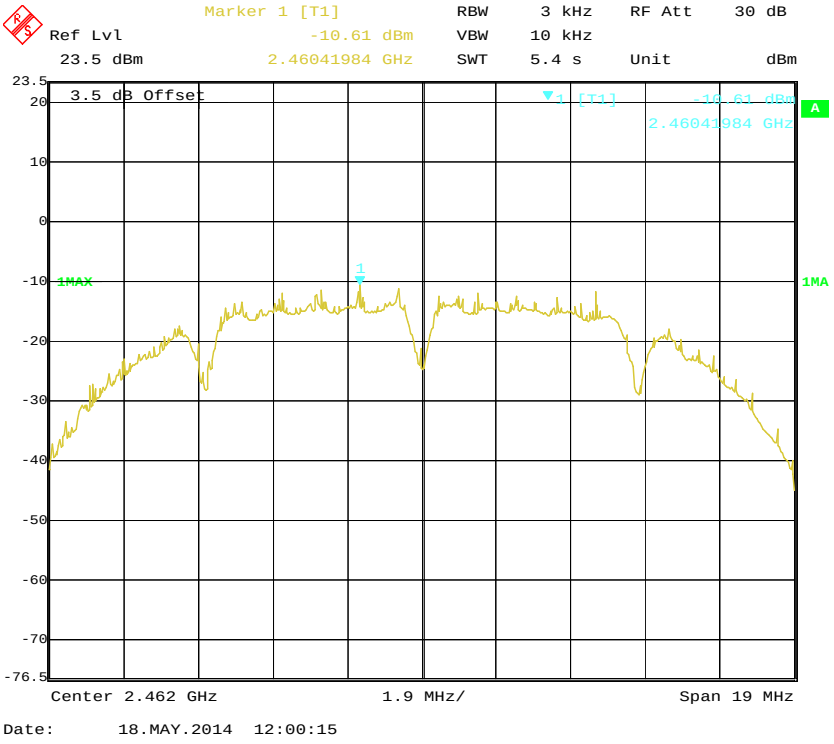
Power Spectral Density, 802.11b Low Channel, Antenna 1



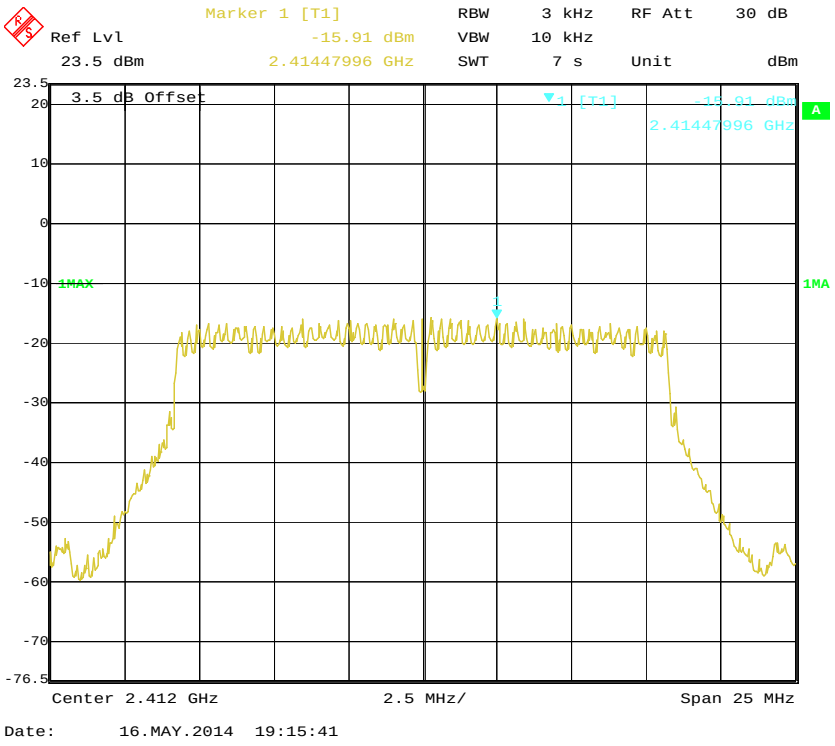
Power Spectral Density, 802.11b Middle Channel, Antenna 1



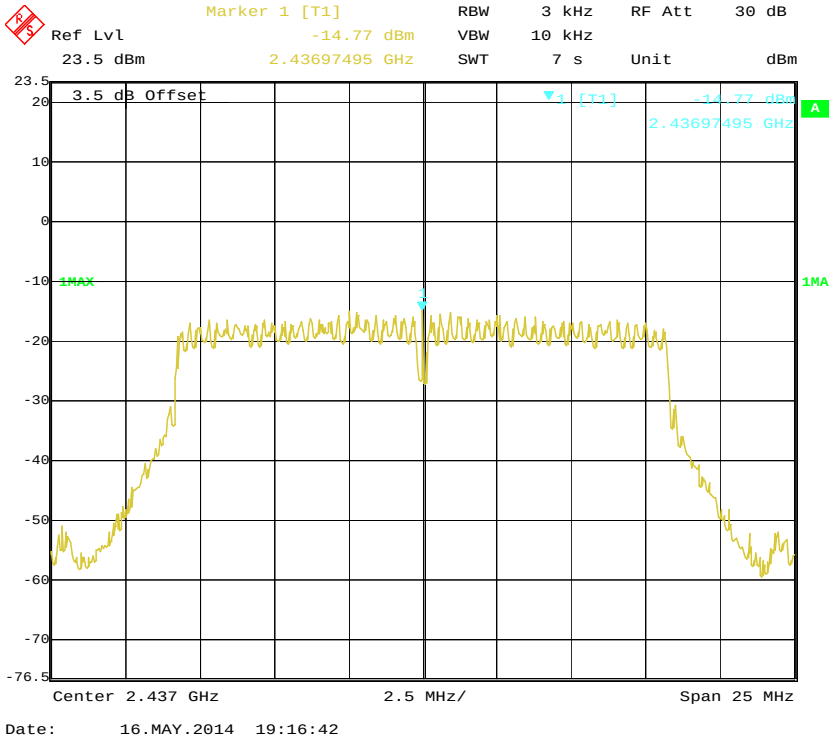
Power Spectral Density, 802.11b High Channel, Antenna 1



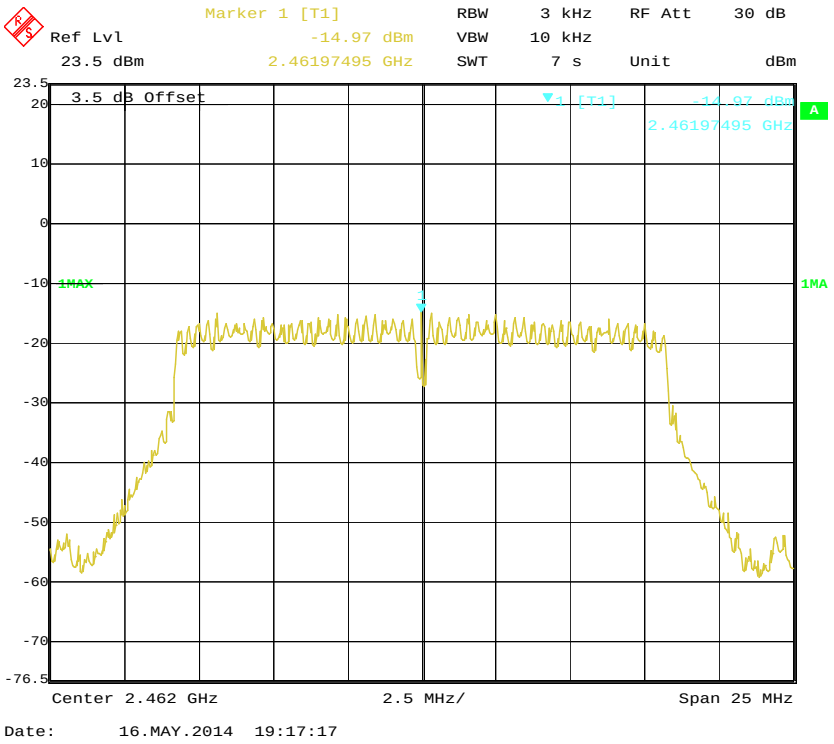
Power Spectral Density, 802.11g Low Channel, Antenna 0



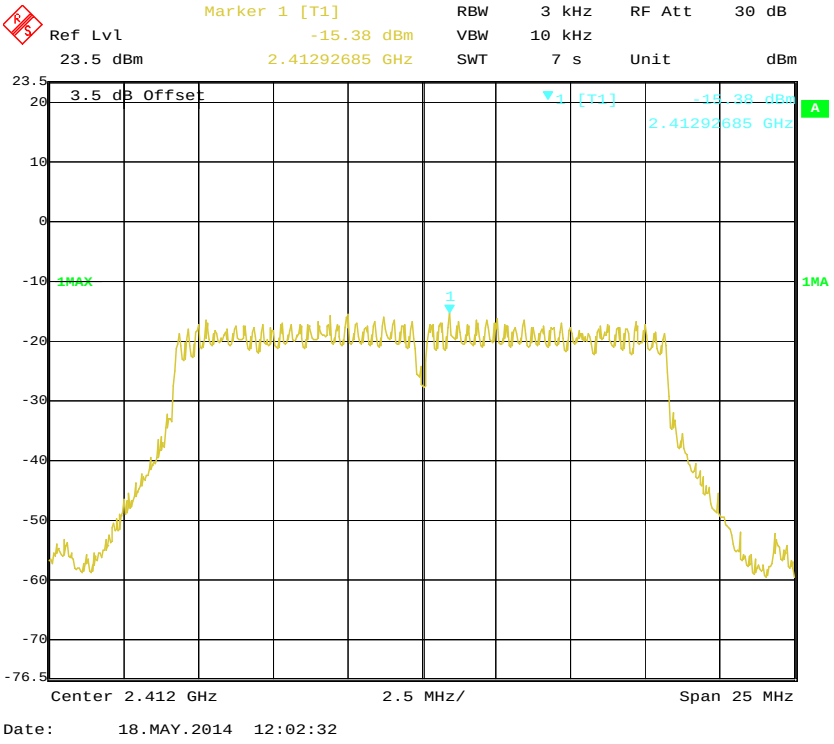
Power Spectral Density, 802.11g Middle Channel, Antenna 0



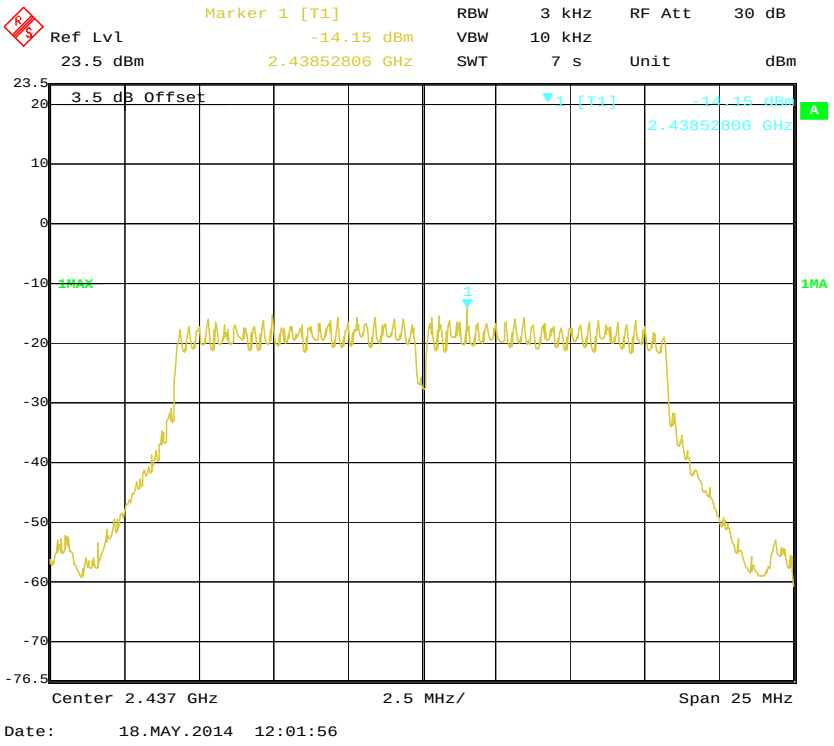
Power Spectral Density, 802.11g High Channel, Antenna 0



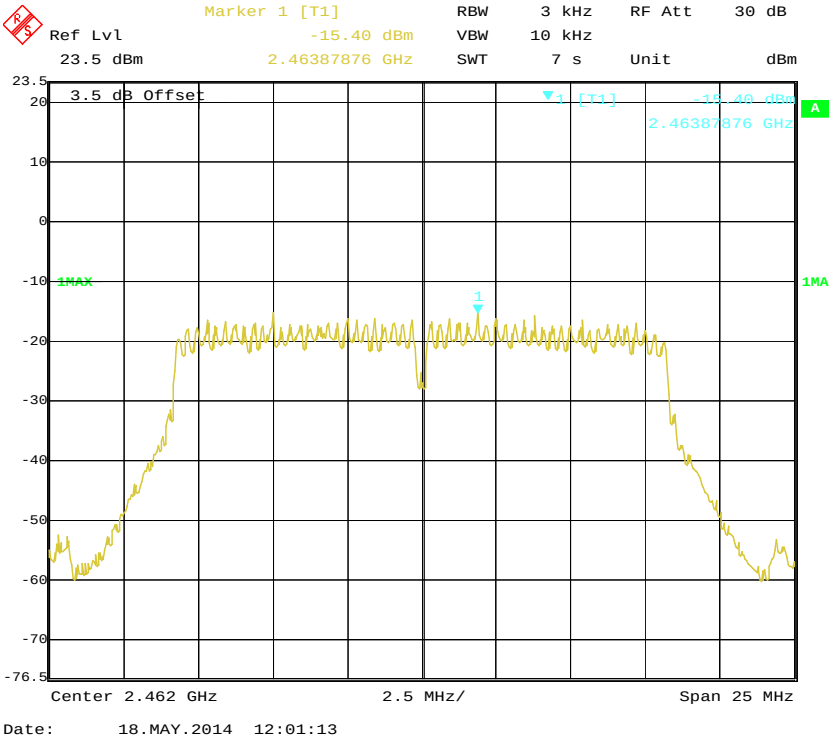
Power Spectral Density, 802.11g Low Channel, Antenna 1



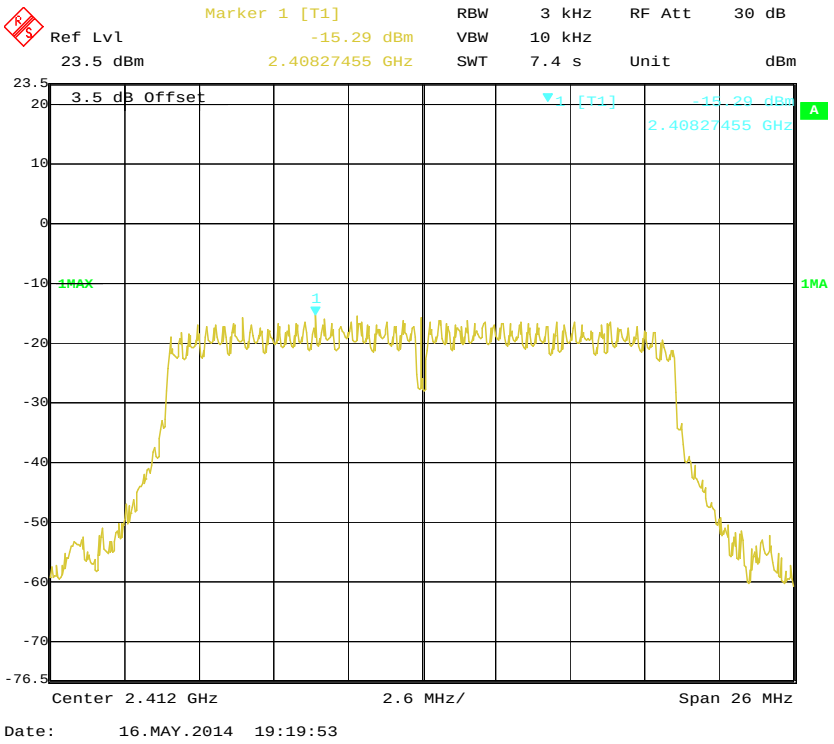
Power Spectral Density, 802.11g Middle Channel, Antenna 1



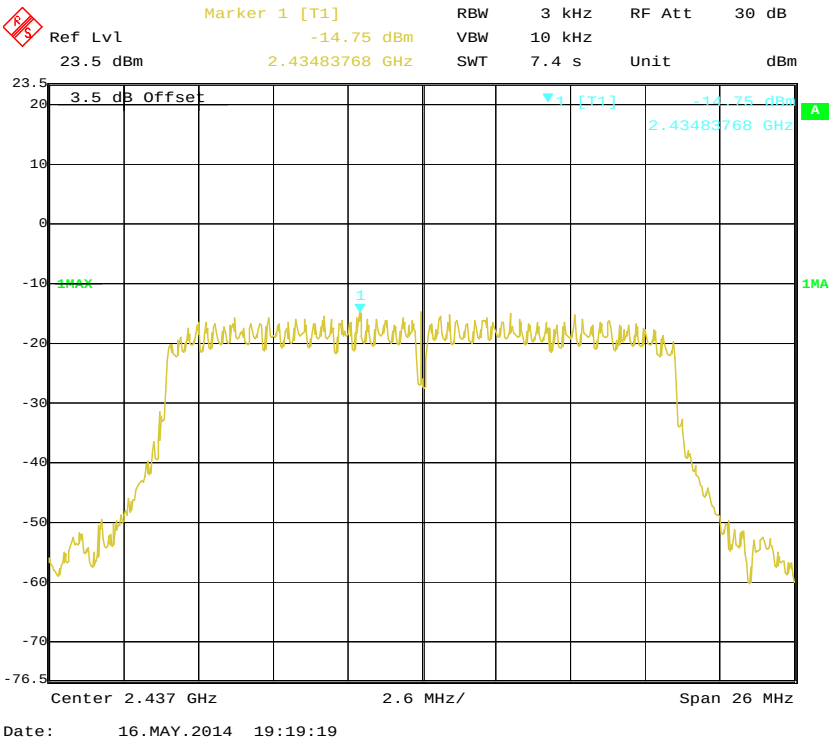
Power Spectral Density, 802.11g High Channel, Antenna 1



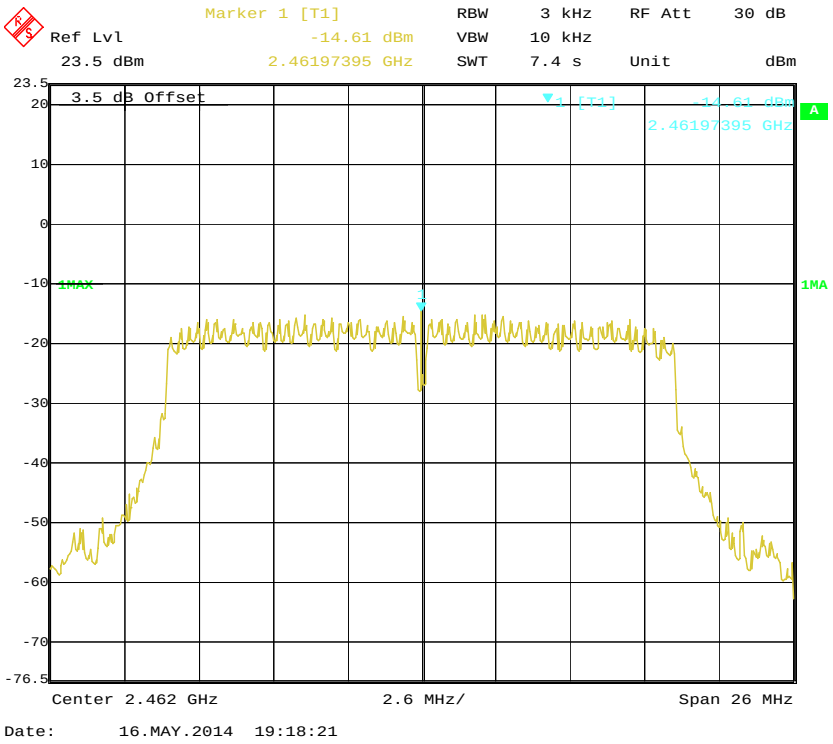
Power Spectral Density, 802.11n-HT20 Low Channel, Antenna 0



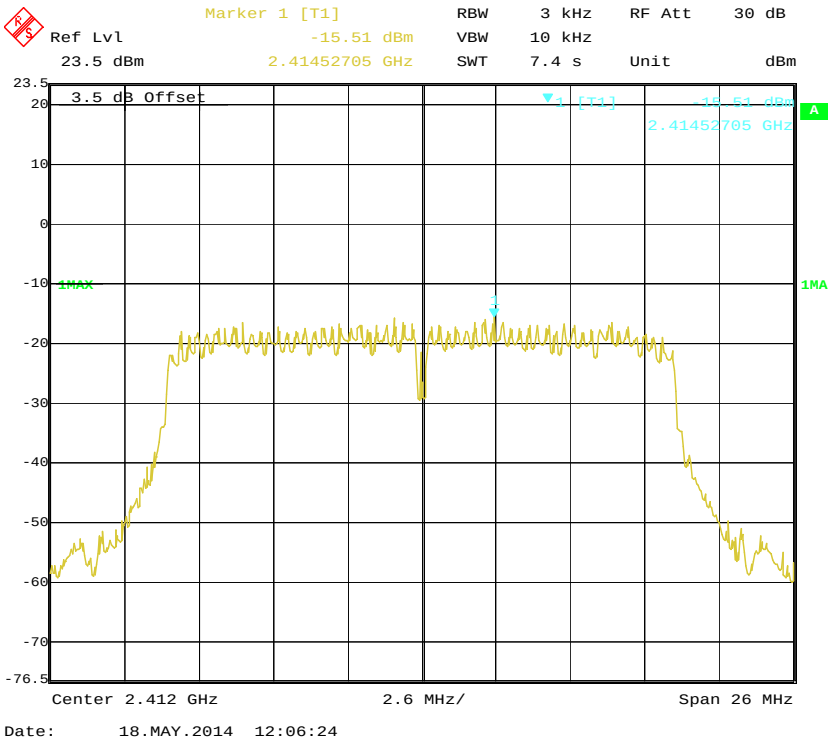
Power Spectral Density, 802.11n-HT20 Middle Channel, Antenna 0



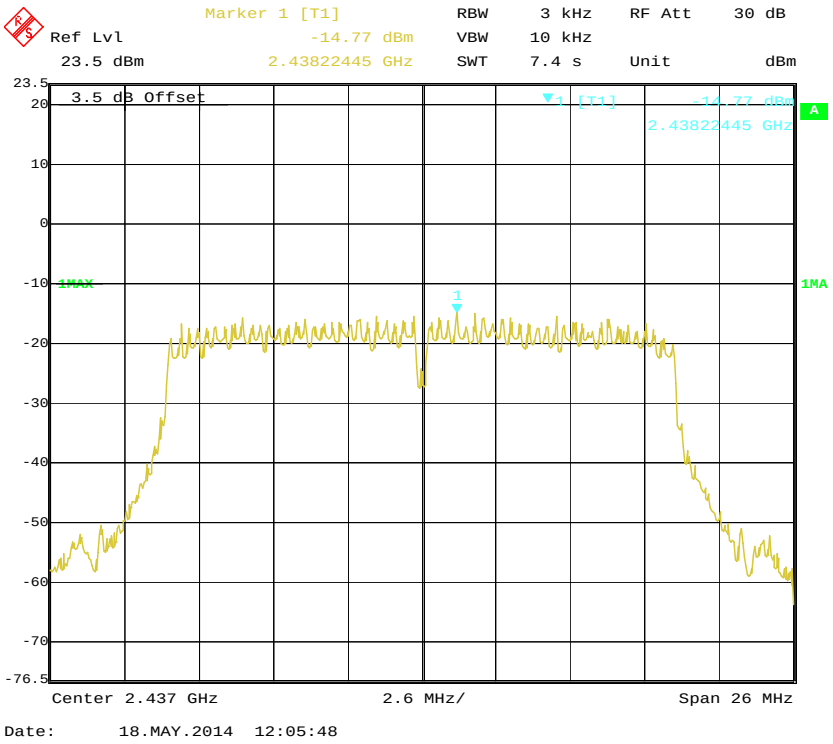
Power Spectral Density, 802.11n-HT20 High Channel, Antenna 0



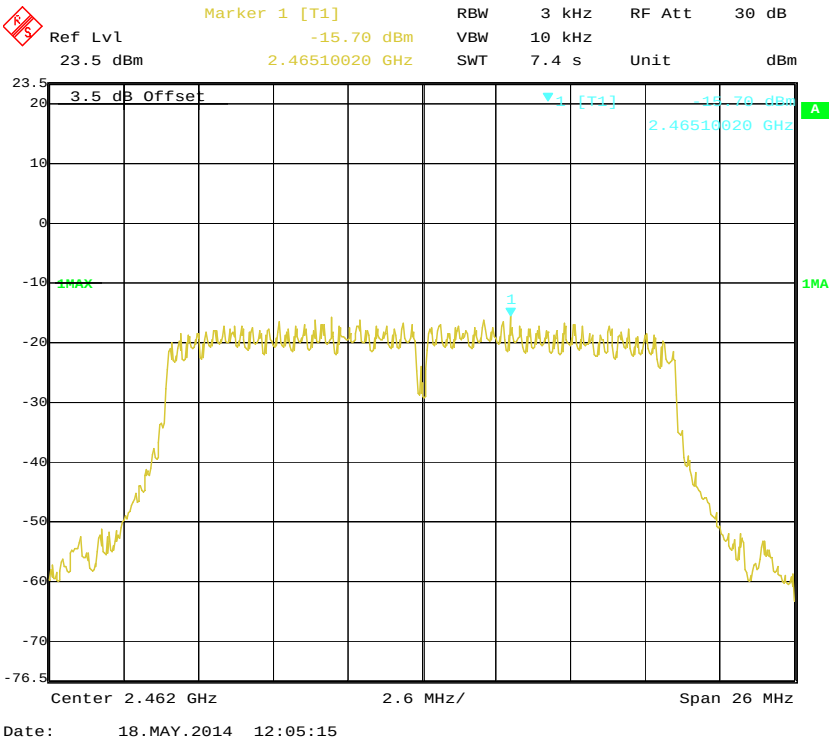
Power Spectral Density, 802.11n-HT20 Low Channel, Antenna 1



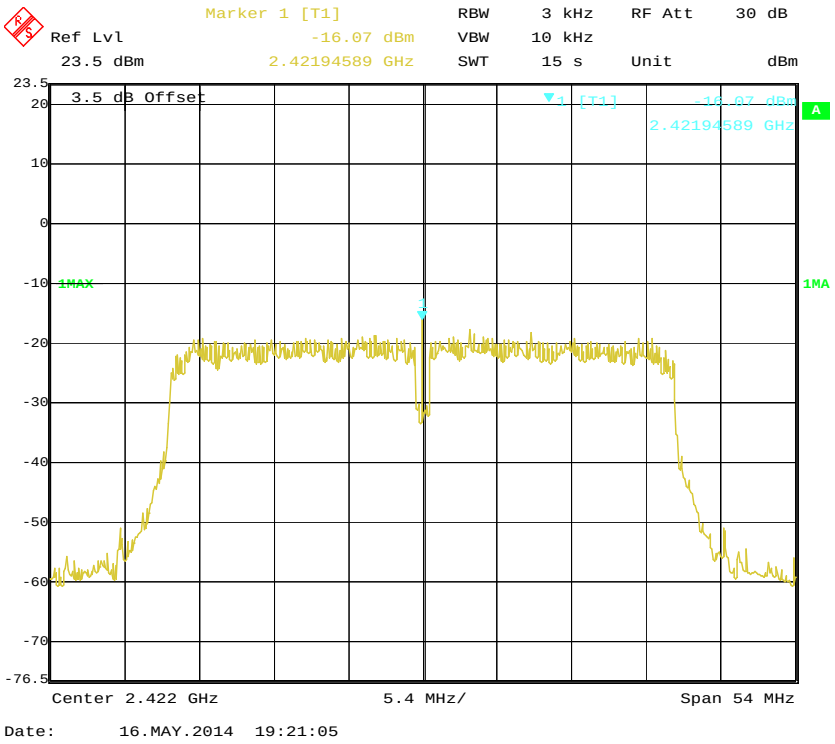
Power Spectral Density, 802.11n-HT20 Middle Channel, Antenna 1



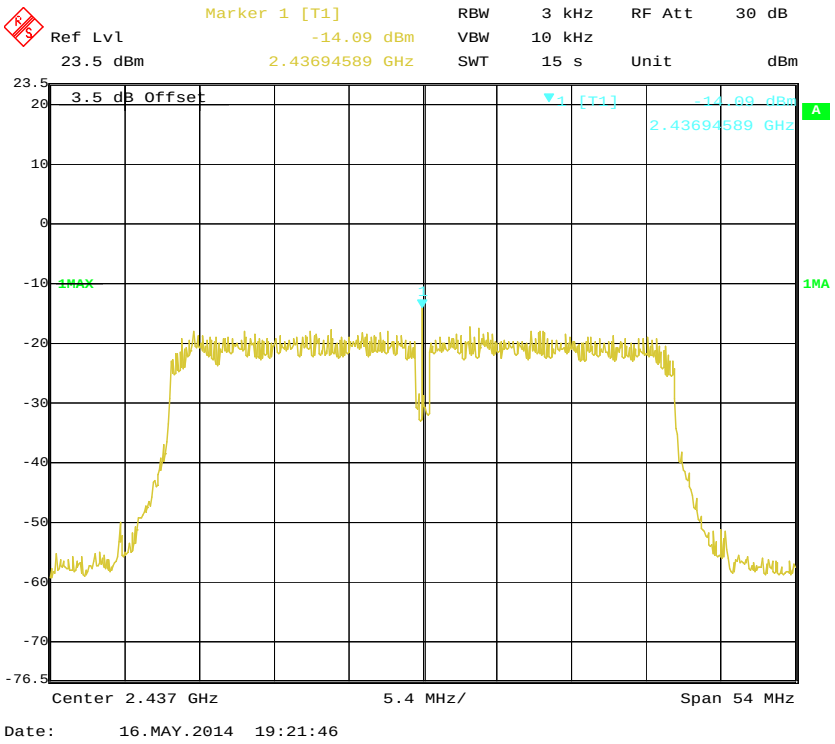
Power Spectral Density, 802.11n-HT20 High Channel, Antenna 1



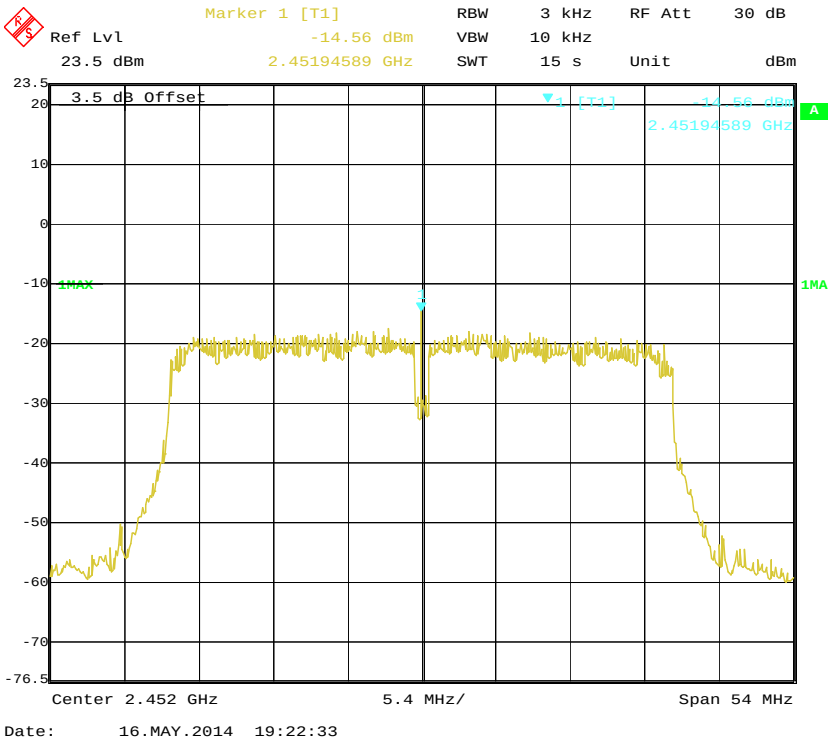
Power Spectral Density, 802.11n-HT40 Low Channel, Antenna 0



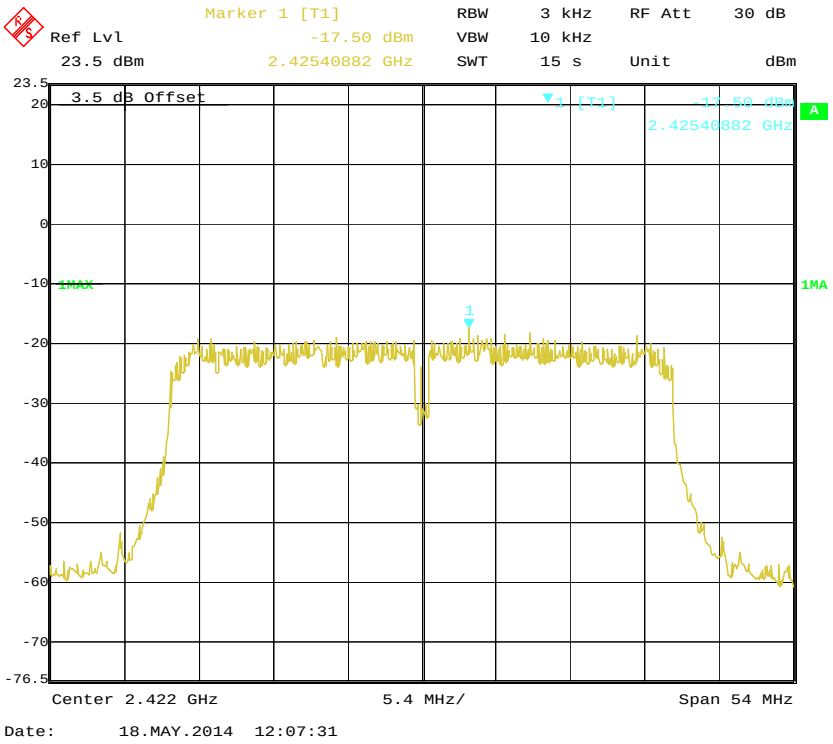
Power Spectral Density, 802.11n-HT40 Middle Channel, Antenna 0



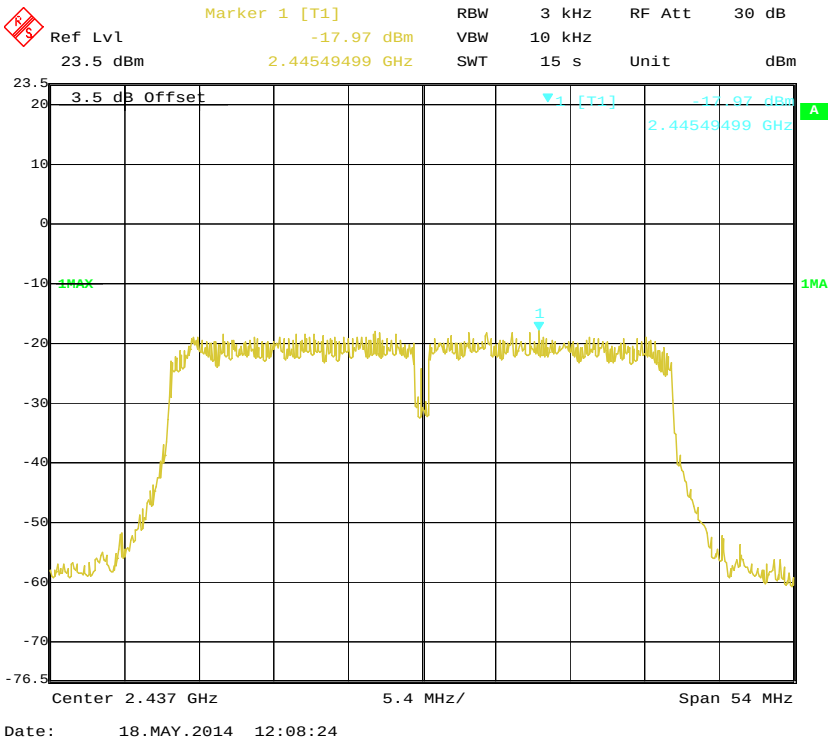
Power Spectral Density, 802.11n-HT40 High Channel, Antenna 0



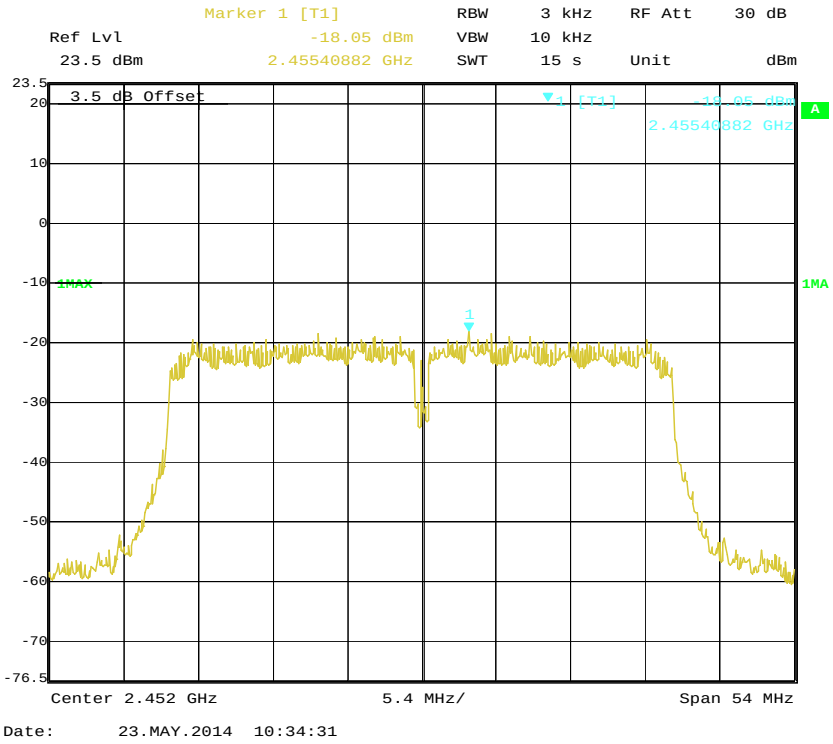
Power Spectral Density, 802.11n-HT40 Low Channel, Antenna 1



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



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



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