

FCC PART 15.247

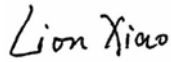

TEST REPORT

For

SHENZHEN TENDA TECHNOLOGY CO.,LTD.

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FCC ID: V7TD305

Report Type: Original Report	Product Type: 4 Antennas Wireless N300 ADSL2+ Modem Router
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Report Number:	RDG151104001-00
Report Date:	2015-11-19
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SHENZHEN TENDA TECHNOLOGY CO.,LTD.*'s product, model number: *D305 (FCC ID: V7TD305)* (the "EUT") in this report was a *4 Antennas Wireless N300 ADSL2+ Modem Router*, which was measured approximately: 19.1cm (L) x 12.5 cm (W) x 3.3 cm (H), rated input voltage: DC12V from adapter.

Adapter Information:

Model Name: BN036-A12012U

Input: 100-240V AC 50/60Hz 0.4A

Output: 12V, 1.0A

All measurement and test data in this report was gathered from production sample serial number: E6161011530000218 (Assigned by applicant). The EUT was received on 2015-11-05.

Objective

This report is prepared on behalf of *SHENZHEN TENDA TECHNOLOGY CO.,LTD.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

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

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications 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 February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. 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

The system was configured for testing in testing mode, which was provided by manufacturer.
For 2.4GHz band, 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, and 802.11n ht20 modes were tested with channel 1, 6 and 11.
For 802.11n ht40 mode were tested with Channel 3, 6 and 9.

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

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

The worst condition (maximum power with 100% duty cycle) was setting by the software as following table:

Test Mode	Test Software Version	Mtool 2.0.0.3					
802.11b	Test Frequency	2412 MHz		2437 MHz		2462 MHz	
	Data Rate	(CCK)1Mbps		(CCK)1Mbps		(CCK)1Mbps	
	Chain	0	1	0	1	0	1
	Power Level Setting	72	72	72	72	72	72
802.11g	Test Frequency	2412 MHz		2437 MHz		2462 MHz	
	Data Rate	(OFDM)6Mbps		(OFDM)6Mbps		(OFDM)6Mbps	
	Chain	0	1	0	1	0	1
	Power Level Setting	66	66	66	66	66	66
802.11n ht20	Test Frequency	2412 MHz		2437 MHz		2462 MHz	
	Data Rate	(HTMixmode)MCS8		(HTMixmode)MCS8		(HTMixmode)MCS8	
	Chain	0	1	0	1	0	1
	Power Level Setting	60	60	60	60	60	60
802.11n ht40	Test Frequency	2422 MHz		2437 MHz		2452 MHz	
	Data Rate	(HTMixmode)MCS8		(HTMixmode)MCS8		(HTMixmode)MCS8	
	Chain	0	1	0	1	0	1
	Power Level Setting	45	45	45	45	45	45

Remote Support Equipment List and Details

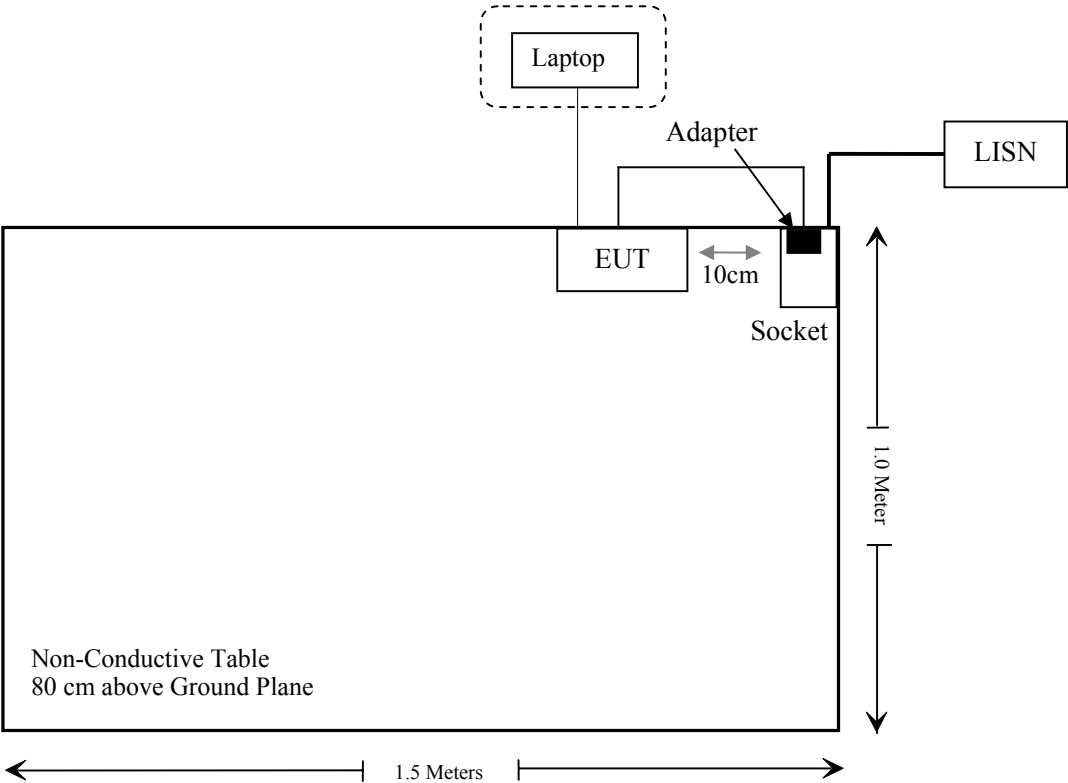
Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP11L	QDS-BRCM1017

External I/O Cable

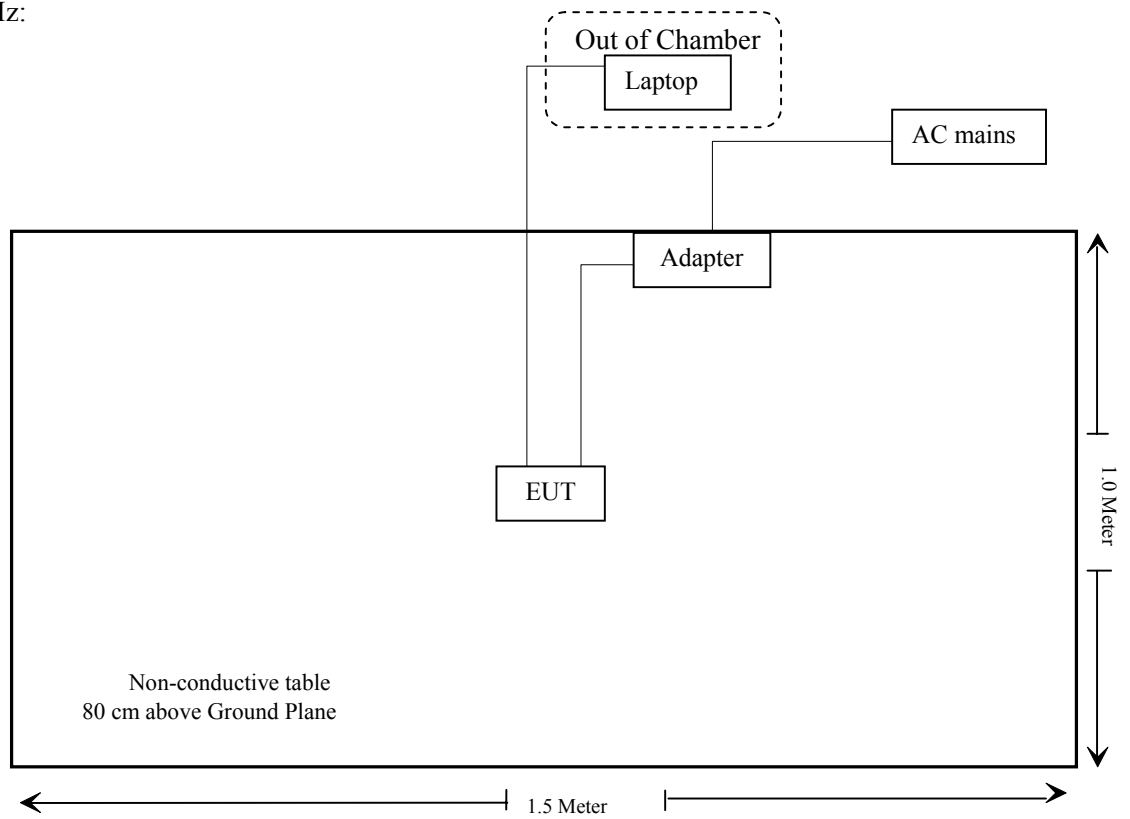
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45	No	No	10	LAN port of EUT	Laptop

Block Diagram of Test Setup

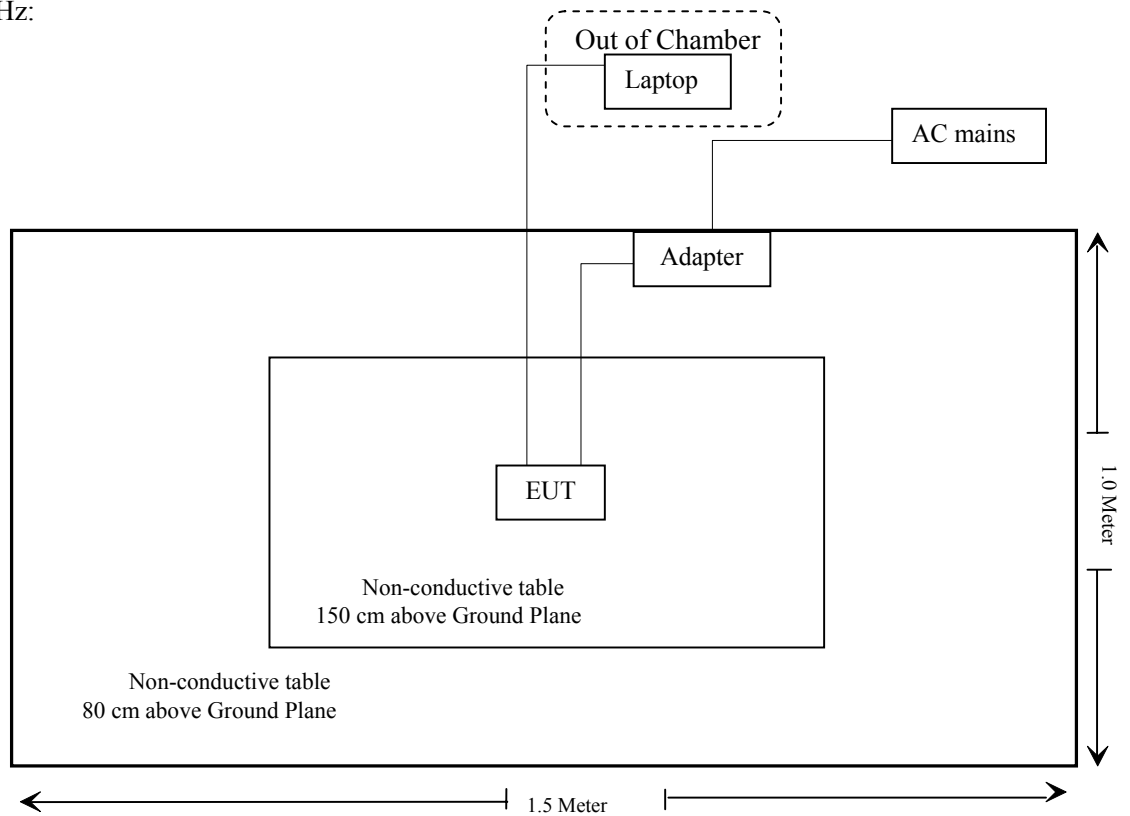
AC Line Conducted Emissions



Below 1 GHz:



Above 1 GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure	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 conducted output power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC §15.247 (I) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, 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/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;

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

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/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:

Frequency Range (MHz)	Antenna Gain		Tune-up Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
	(dBi)	(numeric)	(dBm)	(mW)			
2412-2462	5.0	3.16	27	501.19	20	0.315	1.0

Note: The tune-up power and tolerance is 26 ± 1.0 dBm.

Result: The device meet FCC MPE at 20 cm distance.

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

This product used four external undetachable 2.4G antennas, two of them (chain0, chain1) are active, the other two (chain 3, chain 4) is passive, and each one antenna gain is 5dBi, which fulfill the requirement of this section, please refer to the EUT photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

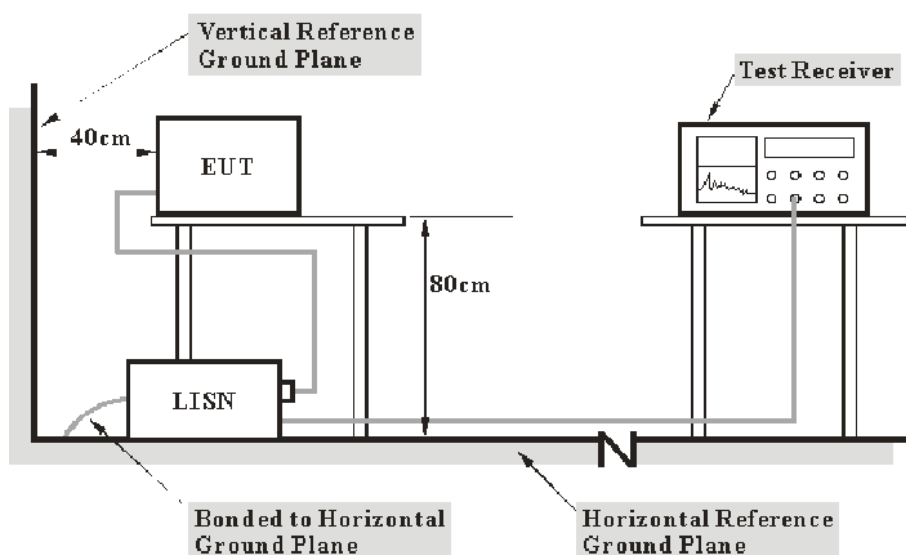
Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.4 dB

Note: The $U_{lab} > U_{cispr}$, so the U_{lab} is add in the calculation.

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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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 first LISN, and the other support equipments were connected to the second LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum 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
R&S	EMI Test Receiver	ESCS 30	830245/006	2015-10-20	2016-10-20
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-07-16	2016-07-15
R&S	Two-line V-network	ENV 216	3560.6550.12	2014-12-11	2015-12-11
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, 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:

8.0 dB at 0.572086 MHz in the **Neutral** conducted mode.

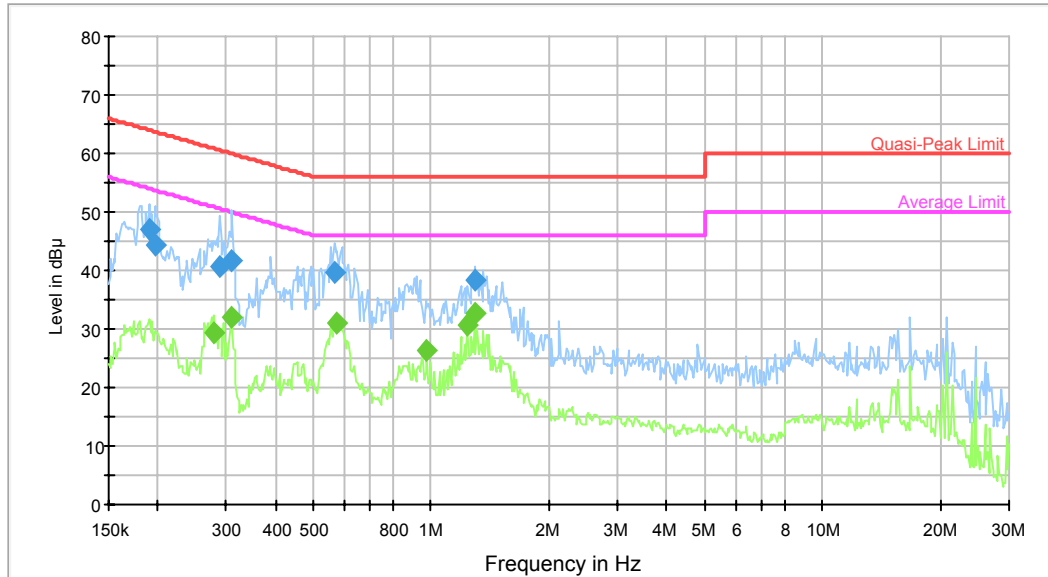
Test Data**Environmental Conditions**

Temperature:	27°C
Relative Humidity:	53 %
ATM Pressure:	101 kPa

The testing was performed by Lion Xiao on 2015-11-09.

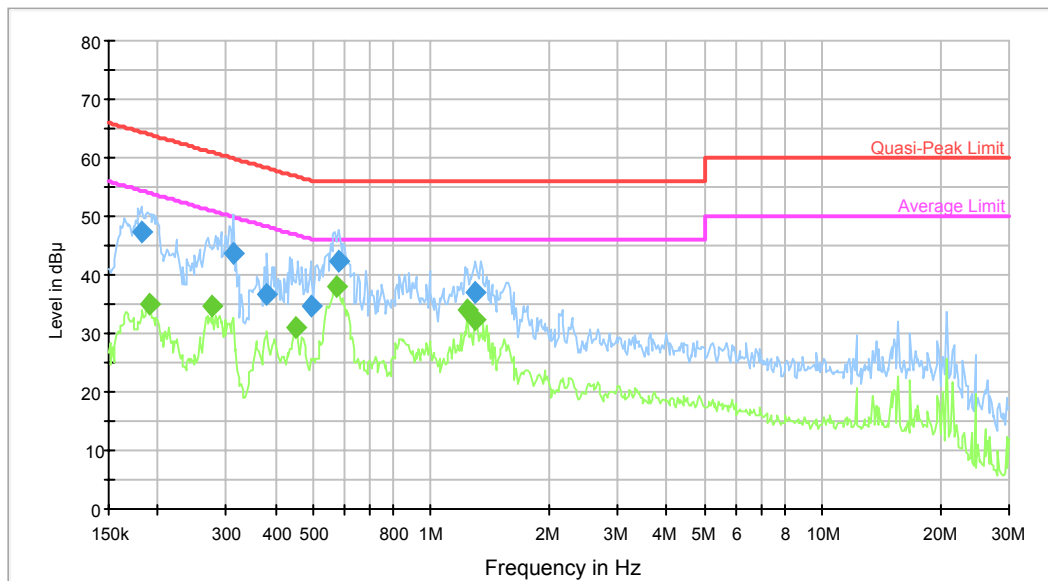
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190505	46.9	9.000	L1	9.8	17.2	64.0	Compliance
0.196675	44.2	9.000	L1	9.8	19.6	63.7	Compliance
0.288307	40.6	9.000	L1	9.8	20.0	60.6	Compliance
0.309742	41.8	9.000	L1	9.8	18.2	60.0	Compliance
0.567545	39.6	9.000	L1	9.8	16.4	56.0	Compliance
1.289541	38.4	9.000	L1	9.8	17.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.279263	29.3	9.000	L1	9.8	21.5	50.8	Compliance
0.309742	32.0	9.000	L1	9.8	17.9	50.0	Compliance
0.576662	31.1	9.000	L1	9.8	14.9	46.0	Compliance
0.975701	26.2	9.000	L1	9.8	19.8	46.0	Compliance
1.239175	30.8	9.000	L1	9.8	15.2	46.0	Compliance
1.289541	32.7	9.000	L1	9.8	13.3	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.181612	47.5	9.000	N	9.8	17.0	64.4	Compliance
0.312220	43.6	9.000	N	9.8	16.3	59.9	Compliance
0.381043	36.6	9.000	N	9.8	21.7	58.3	Compliance
0.491712	34.8	9.000	N	9.8	21.3	56.1	Compliance
0.581275	42.4	9.000	N	9.8	13.6	56.0	Compliance
1.299858	37.0	9.000	N	9.8	19.0	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190505	34.9	9.000	N	9.8	19.1	54.0	Compliance
0.277046	34.8	9.000	N	9.8	16.1	50.9	Compliance
0.450448	31.0	9.000	N	9.8	15.9	46.9	Compliance
0.572086	38.0	9.000	N	9.8	8.0	46.0	Compliance
1.239175	34.2	9.000	N	9.8	11.8	46.0	Compliance
1.289541	32.3	9.000	N	9.8	13.7	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cisp} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

30M~200MHz: 5.0 dB

200M~1GHz: 6.2 dB

1G~6GHz: 4.45 dB

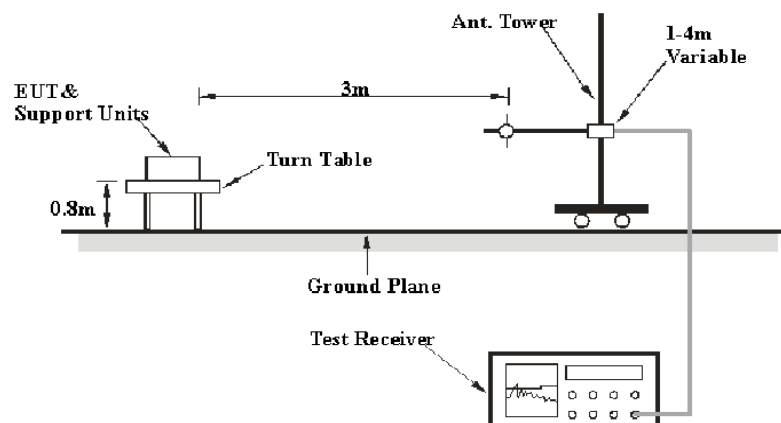
6G~18GHz: 5.23 dB

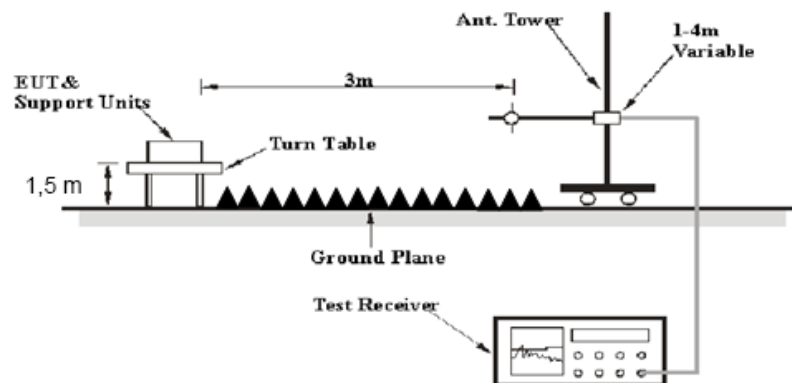
Table 2 – Values of U_{cisp}

Measurement	U_{cisp}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits. The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second 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, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

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

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
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2014-12-04	2015-12-04
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2015-09-06	2016-09-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, 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 Title 47, Part 15, Section 15.205, 15.209 and 15.247, with the worst margin reading of:

1.05 dB at 2483.5 MHz in the Vertical polarization

Test Data

Environmental Conditions

Temperature:	28.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

* The testing was performed by Lion Xiao on 2015-11-10

Test Mode: Transmitting

802.11b Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Frequency: 2412 MHz									
2412	65.51	PK	H	25.67	3.68	0.00	94.86	N/A	N/A
2412	61.05	AV	H	25.67	3.68	0.00	90.40	N/A	N/A
2412	79.8	PK	V	25.67	3.68	0.00	109.15	N/A	N/A
2412	75.34	AV	V	25.67	3.68	0.00	104.69	N/A	N/A
2390	32.41	PK	V	25.61	3.63	0.00	61.65	74.00	12.35
2390	20.8	AV	V	25.61	3.63	0.00	50.04	54.00	3.96*
4824	47.49	PK	V	30.64	5.03	27.41	55.75	74.00	18.25
4824	44.56	AV	V	30.64	5.03	27.41	52.82	54.00	1.18*
7236	37.25	PK	V	34.17	6.65	25.90	52.17	74.00	21.83
7236	28.61	AV	V	34.17	6.65	25.90	43.53	54.00	10.47
9648	31.89	PK	V	36.06	8.55	27.46	49.04	74.00	24.96
9648	23.35	AV	V	36.06	8.55	27.46	40.50	54.00	13.50
3220	37.38	PK	V	27.90	6.17	27.35	44.10	74.00	29.90
3220	24.21	AV	V	27.90	6.17	27.35	30.93	54.00	23.07
233.4	36.7	QP	V	12.05	1.84	21.48	29.11	46.00	16.89
Frequency: 2437 MHz									
2437	66.91	PK	H	25.74	3.75	0.00	96.40	N/A	N/A
2437	62.43	AV	H	25.74	3.75	0.00	91.92	N/A	N/A
2437	80.22	PK	V	25.74	3.75	0.00	109.71	N/A	N/A
2437	76.74	AV	V	25.74	3.75	0.00	106.23	N/A	N/A
4874	47.82	PK	V	30.77	5.14	27.42	56.31	74.00	17.69
4874	44.39	AV	V	30.77	5.14	27.42	52.88	54.00	1.12*
7311	37.46	PK	V	34.35	6.74	25.88	52.67	74.00	21.33
7311	28.86	AV	V	34.35	6.74	25.88	44.07	54.00	9.93
9748	32.14	PK	V	36.30	8.61	27.24	49.81	74.00	24.19
9748	23.49	AV	V	36.30	8.61	27.24	41.16	54.00	12.84
3220	37.5	PK	V	27.90	6.17	27.35	44.22	74.00	29.78
3220	24.51	AV	V	27.90	6.17	27.35	31.23	54.00	22.77
3610	37.61	PK	V	29.04	4.61	27.28	43.98	74.00	30.02
3610	24.42	AV	V	29.04	4.61	27.28	30.79	54.00	23.21
233.4	36.9	QP	V	12.05	1.84	21.48	29.31	46.00	16.69
Frequency: 2462 MHz									
2462	65.78	PK	H	25.80	3.75	0.00	95.33	N/A	N/A
2462	61.24	AV	H	25.80	3.75	0.00	90.79	N/A	N/A
2462	80.01	PK	V	25.80	3.75	0.00	109.56	N/A	N/A
2462	75.68	AV	V	25.80	3.75	0.00	105.23	N/A	N/A
2483.5	32.39	PK	V	25.86	3.67	0.00	61.92	74.00	12.08
2483.5	20.46	AV	V	25.86	3.67	0.00	49.99	54.00	4.01*
4924	47.17	PK	V	30.90	5.34	27.43	55.98	74.00	18.02
4924	44.09	AV	V	30.90	5.34	27.43	52.90	54.00	1.10*
7386	36.48	PK	V	34.53	6.83	25.86	51.98	74.00	22.02
7386	27.16	AV	V	34.53	6.83	25.86	42.66	54.00	11.34
9848	32.44	PK	V	36.54	8.66	26.94	50.70	74.00	23.30
9848	23.39	AV	V	36.54	8.66	26.94	41.65	54.00	12.35
3220	37.69	PK	V	27.90	6.17	27.35	44.41	74.00	29.59
3220	24.47	AV	V	27.90	6.17	27.35	31.19	54.00	22.81
233.4	36.2	QP	V	12.05	1.84	21.48	28.61	46.00	17.39

*within uncertainty measurement!

802.11g Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Frequency: 2412 MHz									
2412	68.48	PK	H	25.67	3.68	0.00	97.83	N/A	N/A
2412	58.76	AV	H	25.67	3.68	0.00	88.11	N/A	N/A
2412	80.63	PK	V	25.67	3.68	0.00	109.98	N/A	N/A
2412	70.91	AV	V	25.67	3.68	0.00	100.26	N/A	N/A
2390	40.17	PK	V	25.61	3.63	0.00	69.41	74.00	4.59
2390	22.94	AV	V	25.61	3.63	0.00	52.18	54.00	1.82*
4824	48.11	PK	V	30.64	5.03	27.41	56.37	74.00	17.63
4824	32.84	AV	V	30.64	5.03	27.41	41.10	54.00	12.90
7236	41.01	PK	V	34.17	6.65	25.90	55.93	74.00	18.07
7236	23.49	AV	V	34.17	6.65	25.90	38.41	54.00	15.59
9648	31.51	PK	V	36.06	8.55	27.46	48.66	74.00	25.34
9648	17.27	AV	V	36.06	8.55	27.46	34.42	54.00	19.58
3265	38.26	PK	V	28.05	5.96	27.31	44.96	74.00	29.04
3265	25.02	AV	V	28.05	5.96	27.31	31.72	54.00	22.28
233.4	36.5	QP	V	12.05	1.84	21.48	28.91	46.00	17.09
Frequency: 2437 MHz									
2437	69.78	PK	H	25.74	3.75	0.00	99.27	N/A	N/A
2437	59.02	AV	H	25.74	3.75	0.00	88.51	N/A	N/A
2437	81.09	PK	V	25.74	3.75	0.00	110.58	N/A	N/A
2437	71.27	AV	V	25.74	3.75	0.00	100.76	N/A	N/A
4874	48.47	PK	V	30.77	5.14	27.42	56.96	74.00	17.04
4874	33.1	AV	V	30.77	5.14	27.42	41.59	54.00	12.41
7311	41.17	PK	V	34.35	6.74	25.88	56.38	74.00	17.62
7311	23.77	AV	V	34.35	6.74	25.88	38.98	54.00	15.02
9748	31.62	PK	V	36.30	8.61	27.24	49.29	74.00	24.71
9748	17.38	AV	V	36.30	8.61	27.24	35.05	54.00	18.95
3265	38.4	PK	V	28.05	5.96	27.31	45.10	74.00	28.90
3265	35.31	AV	V	28.05	5.96	27.31	42.01	54.00	11.99
3610	37.86	PK	V	29.04	4.61	27.28	44.23	74.00	29.77
3610	24.71	AV	V	29.04	4.61	27.28	31.08	54.00	22.92
233.4	36.1	QP	V	12.05	1.84	21.48	28.51	46.00	17.49
Frequency: 2462 MHz									
2462	67.03	PK	H	25.80	3.75	0.00	96.58	N/A	N/A
2462	57.32	AV	H	25.80	3.75	0.00	86.87	N/A	N/A
2462	80.26	PK	V	25.80	3.75	0.00	109.81	N/A	N/A
2462	70.59	AV	V	25.80	3.75	0.00	100.14	N/A	N/A
2483.5	40.89	PK	V	25.86	3.67	0.00	70.42	74.00	3.58
2483.5	22.58	AV	V	25.86	3.67	0.00	52.11	54.00	1.89*
4924	49.66	PK	V	30.90	5.34	27.43	58.47	74.00	15.53
4924	34.24	AV	V	30.90	5.34	27.43	43.05	54.00	10.95
7386	42.74	PK	V	34.53	6.83	25.86	58.24	74.00	15.76
7386	25.21	AV	V	34.53	6.83	25.86	40.71	54.00	13.29
9848	30.32	PK	V	36.54	8.66	26.94	48.58	74.00	25.42
9848	16.76	AV	V	36.54	8.66	26.94	35.02	54.00	18.98
3265	38.63	PK	V	28.05	5.96	27.31	45.33	74.00	28.67
3265	25.52	AV	V	28.05	5.96	27.31	32.22	54.00	21.78
233.4	36.8	QP	V	12.05	1.84	21.48	29.21	46.00	16.79

*within uncertainty measurement!

802.11 n ht20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Frequency: 2412 MHz									
2412	69.28	PK	H	25.67	3.68	0.00	98.63	N/A	N/A
2412	57.58	AV	H	25.67	3.68	0.00	86.93	N/A	N/A
2412	81.56	PK	V	25.67	3.68	0.00	110.91	N/A	N/A
2412	69.82	AV	V	25.67	3.68	0.00	99.17	N/A	N/A
2390	42.88	PK	V	25.61	3.63	0.00	72.12	74.00	1.88*
2390	23.25	AV	V	25.61	3.63	0.00	52.49	54.00	1.51*
4824	45.48	PK	V	30.64	5.03	27.41	53.74	74.00	20.26
4824	29.42	AV	V	30.64	5.03	27.41	37.68	54.00	16.32
7236	36.07	PK	V	34.17	6.65	25.90	50.99	74.00	23.01
7236	20.85	AV	V	34.17	6.65	25.90	35.77	54.00	18.23
9648	29.94	PK	V	36.06	8.55	27.46	47.09	74.00	26.91
9648	16.47	AV	V	36.06	8.55	27.46	33.62	54.00	20.38
3265	36.47	PK	V	28.05	5.96	27.31	43.17	74.00	30.83
3265	23.31	AV	V	28.05	5.96	27.31	30.01	54.00	23.99
233.4	36.3	QP	V	12.05	1.84	21.48	28.71	46.00	17.29
Frequency: 2437 MHz									
2437	70.04	PK	H	25.74	3.75	0.00	99.53	N/A	N/A
2437	58.35	AV	H	25.74	3.75	0.00	87.84	N/A	N/A
2437	82.33	PK	V	25.74	3.75	0.00	111.82	N/A	N/A
2437	70.68	AV	V	25.74	3.75	0.00	100.17	N/A	N/A
4874	45.98	PK	V	30.77	5.14	27.42	54.47	74.00	19.53
4874	29.82	AV	V	30.77	5.14	27.42	38.31	54.00	15.69
7311	36.28	PK	V	34.35	6.74	25.88	51.49	74.00	22.51
7311	21.04	AV	V	34.35	6.74	25.88	36.25	54.00	17.75
9748	30.09	PK	V	36.30	8.61	27.24	47.76	74.00	26.24
9748	16.63	AV	V	36.30	8.61	27.24	34.30	54.00	19.70
3265	36.7	PK	V	28.05	5.96	27.31	43.40	74.00	30.60
3265	23.58	AV	V	28.05	5.96	27.31	30.28	54.00	23.72
3610	36.33	PK	V	29.04	4.61	27.28	42.70	74.00	31.30
3610	23.12	AV	V	29.04	4.61	27.28	29.49	54.00	24.51
233.4	36.7	QP	V	12.05	1.84	21.48	29.11	46.00	16.89
Frequency: 2462 MHz									
2462	69.14	PK	H	25.80	3.75	0.00	98.69	N/A	N/A
2462	57.42	AV	H	25.80	3.75	0.00	86.97	N/A	N/A
2462	81.45	PK	V	25.80	3.75	0.00	111.00	N/A	N/A
2462	69.74	AV	V	25.80	3.75	0.00	99.29	N/A	N/A
2483.5	42.54	PK	V	25.86	3.67	0.00	72.07	74.00	1.93*
2483.5	22.83	AV	V	25.86	3.67	0.00	52.36	54.00	1.64 *
4924	48.67	PK	V	30.90	5.34	27.43	57.48	74.00	16.52
4924	32.84	AV	V	30.90	5.34	27.43	41.65	54.00	12.35
7386	36.49	PK	V	34.53	6.83	25.86	51.99	74.00	22.01
7386	20.95	AV	V	34.53	6.83	25.86	36.45	54.00	17.55
9848	30.25	PK	V	36.54	8.66	26.94	48.51	74.00	25.49
9848	16.56	AV	V	36.54	8.66	26.94	34.82	54.00	19.18
3265	37.14	PK	V	28.05	5.96	27.31	43.84	74.00	30.16
3265	24.02	AV	V	28.05	5.96	27.31	30.72	54.00	23.28
233.4	36.5	QP	V	12.05	1.84	21.48	28.91	46.00	17.09

*within uncertainty measurement!

802.11 n ht40 Mode

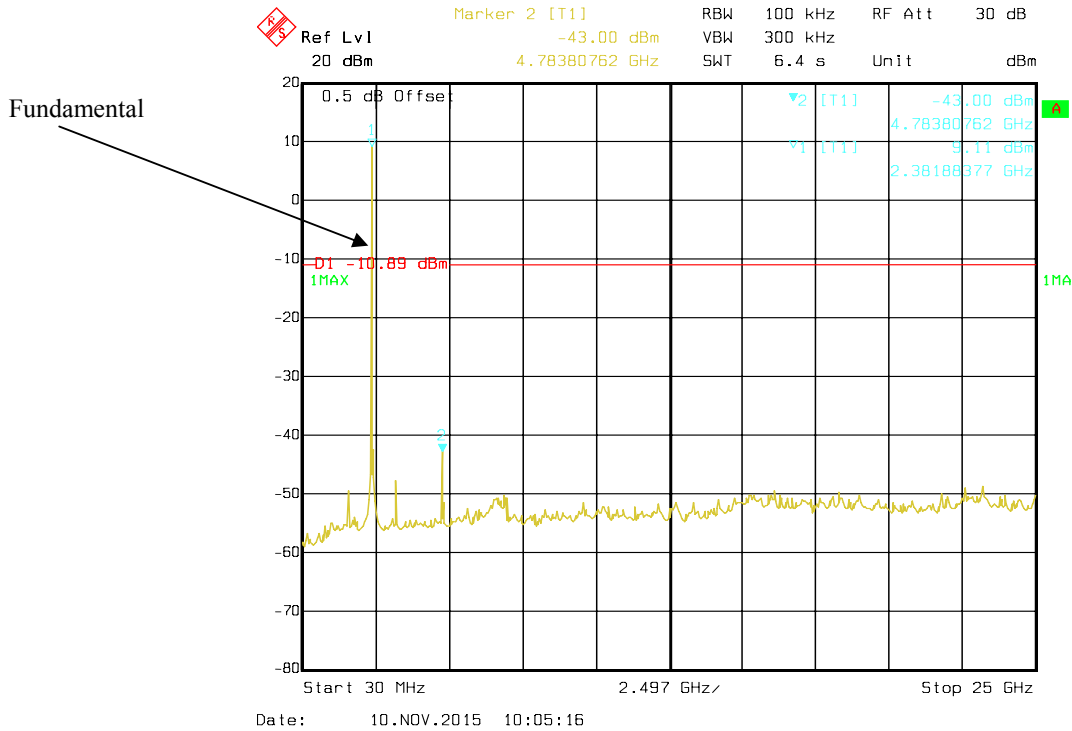
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Frequency: 2422 MHz									
2422	65.59	PK	H	25.70	3.71	0.00	95.00	N/A	N/A
2422	53.54	AV	H	25.70	3.71	0.00	82.95	N/A	N/A
2422	77.71	PK	V	25.70	3.71	0.00	107.12	N/A	N/A
2422	65.78	AV	V	25.70	3.71	0.00	95.19	N/A	N/A
2390	36.88	PK	V	25.61	3.63	0.00	66.12	74.00	7.88
2390	23.43	AV	V	25.61	3.63	0.00	52.67	54.00	1.33*
4844	38.07	PK	V	30.69	4.99	27.42	46.33	74.00	27.67
4844	22.65	AV	V	30.69	4.99	27.42	30.91	54.00	23.09
7266	32.31	PK	V	34.24	6.68	25.89	47.34	74.00	26.66
7266	18.9	AV	V	34.24	6.68	25.89	33.93	54.00	20.07
9688	29.75	PK	V	36.15	8.58	27.37	47.11	74.00	26.89
9688	16.53	AV	V	36.15	8.58	27.37	33.89	54.00	20.11
3265	35.14	PK	V	28.05	5.96	27.31	41.84	74.00	32.16
3265	22.06	AV	V	28.05	5.96	27.31	28.76	54.00	25.24
233.4	36.6	QP	V	12.05	1.84	21.48	29.01	46.00	16.99
Frequency: 2437 MHz									
2437	66.56	PK	H	25.74	3.75	0.00	96.05	N/A	N/A
2437	54.62	AV	H	25.74	3.75	0.00	84.11	N/A	N/A
2437	78.73	PK	V	25.74	3.75	0.00	108.22	N/A	N/A
2437	66.79	AV	V	25.74	3.75	0.00	96.28	N/A	N/A
4874	38.42	PK	V	30.77	5.14	27.42	46.91	74.00	27.09
4874	22.89	AV	V	30.77	5.14	27.42	31.38	54.00	22.62
7311	32.61	PK	V	34.35	6.74	25.88	47.82	74.00	26.18
7311	19.01	AV	V	34.35	6.74	25.88	34.22	54.00	19.78
9748	29.96	PK	V	36.30	8.61	27.24	47.63	74.00	26.37
9748	16.79	AV	V	36.30	8.61	27.24	34.46	54.00	19.54
3265	35.27	PK	V	28.05	5.96	27.31	41.97	74.00	32.03
3265	22.33	AV	V	28.05	5.96	27.31	29.03	54.00	24.97
3610	36.04	PK	V	29.04	4.61	27.28	42.41	74.00	31.59
3610	22.85	AV	V	29.04	4.61	27.28	29.22	54.00	24.78
233.4	36.5	QP	V	12.05	1.84	21.48	28.91	46.00	17.09
Frequency: 2452 MHz									
2452	65.81	PK	H	25.78	3.78	0.00	95.37	N/A	N/A
2452	53.86	AV	H	25.78	3.78	0.00	83.42	N/A	N/A
2452	78.12	PK	V	25.78	3.78	0.00	107.68	N/A	N/A
2452	66.12	AV	V	25.78	3.78	0.00	95.68	N/A	N/A
2483.5	35.74	PK	V	25.86	3.67	0.00	65.27	74.00	8.73
2483.5	23.42	AV	V	25.86	3.67	0.00	52.95	54.00	1.05*
4904	37.62	PK	V	30.85	5.31	27.43	46.35	74.00	27.65
4904	21.37	AV	V	30.85	5.31	27.43	30.10	54.00	23.90
7356	30.94	PK	V	34.45	6.79	25.87	46.31	74.00	27.69
7356	18.79	AV	V	34.45	6.79	25.87	34.16	54.00	19.84
9808	29.45	PK	V	36.44	8.64	27.09	47.44	74.00	26.56
9808	16.47	AV	V	36.44	8.64	27.09	34.46	54.00	19.54
3265	35.93	PK	V	28.05	5.96	27.31	42.63	74.00	31.37
3265	22.87	AV	V	28.05	5.96	27.31	29.57	54.00	24.43
233.4	36.9	QP	V	12.05	1.84	21.48	29.31	46.00	16.69

*within uncertainty measurement!

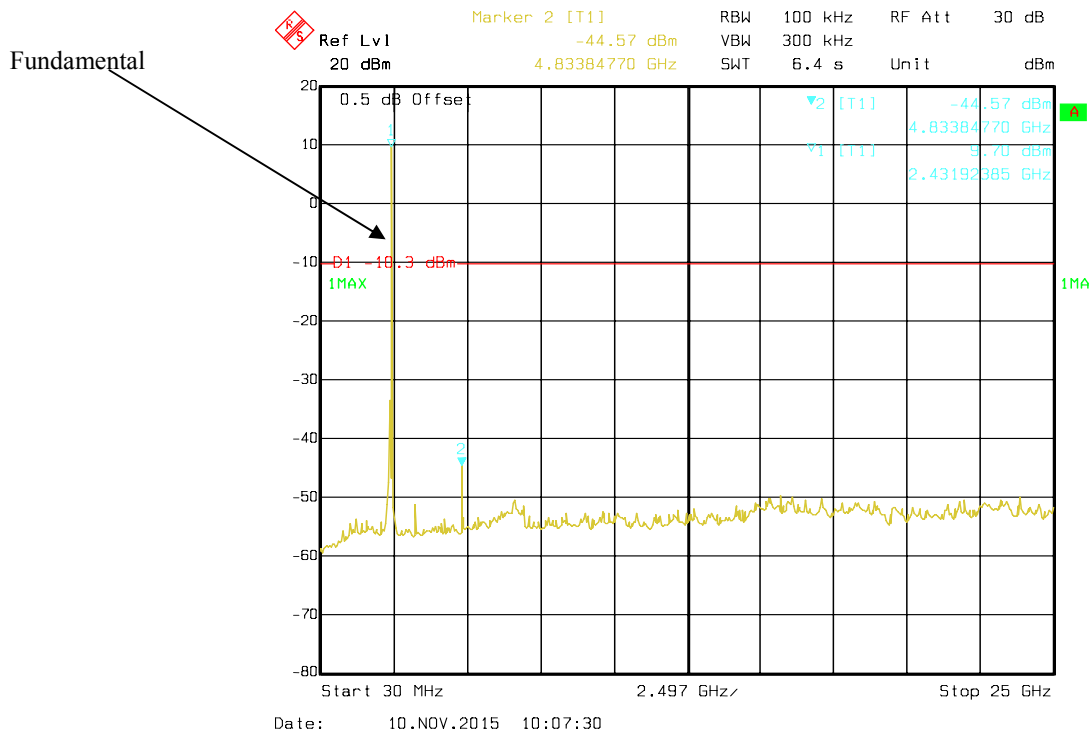
Conducted Spurious Emissions at Antenna Port

Chain 0

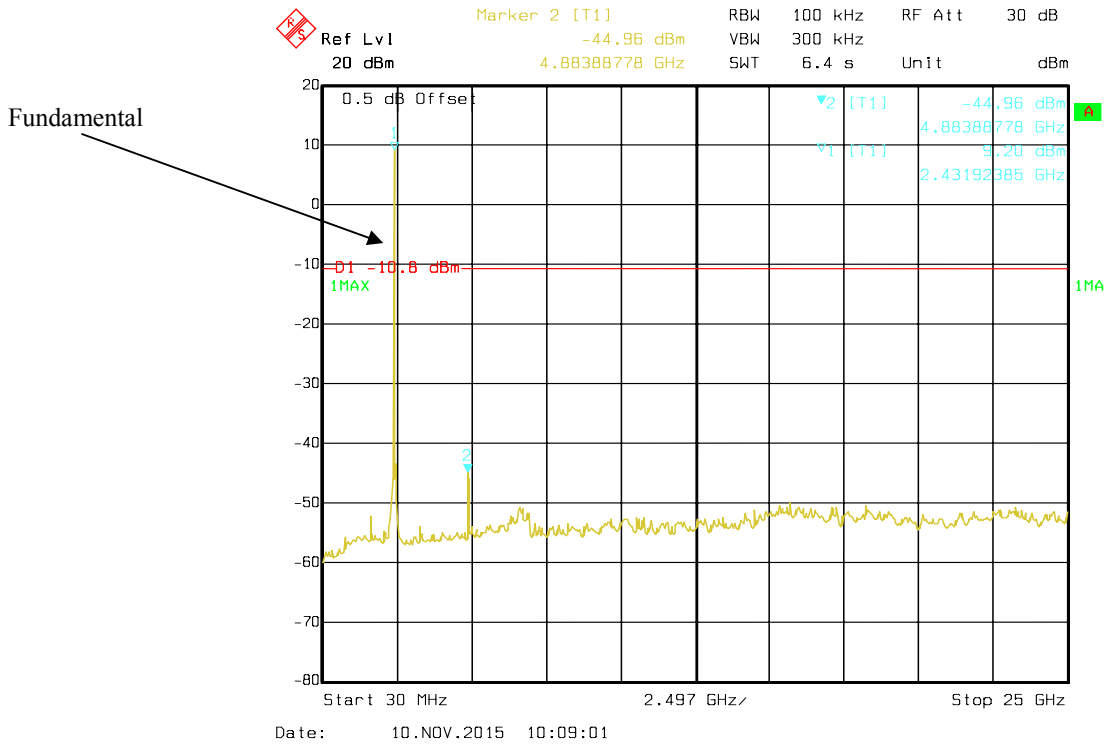
802.11b Channel:2412MHz



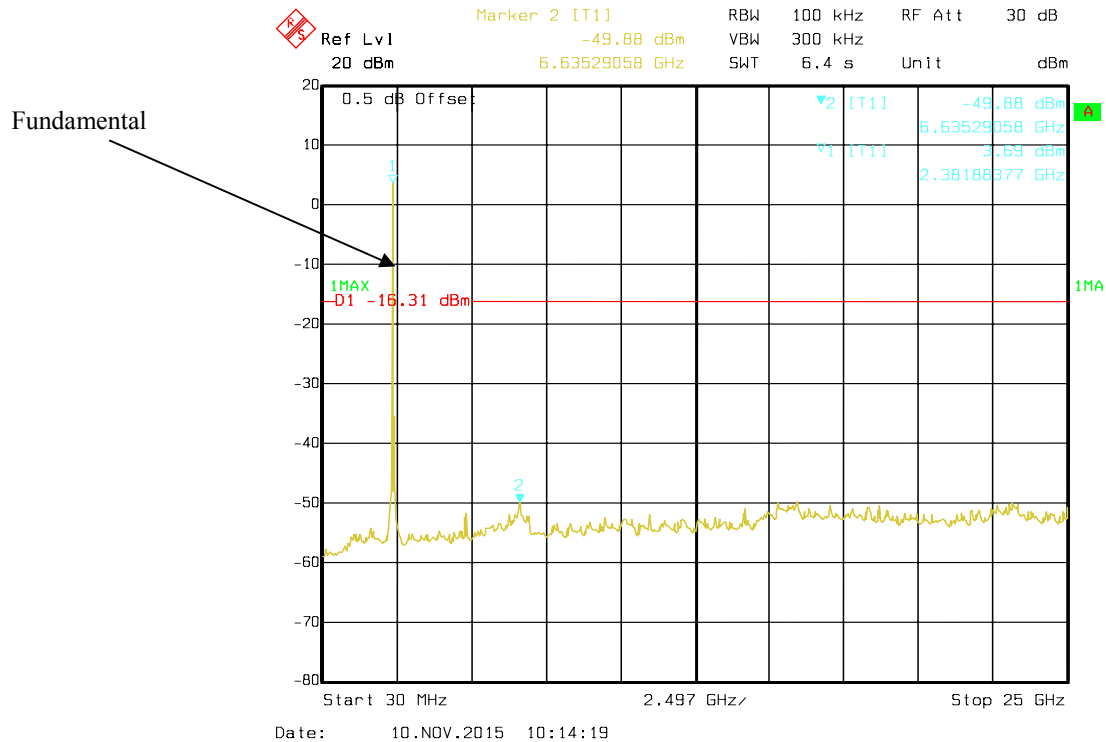
802.11b Channel:2437MHz



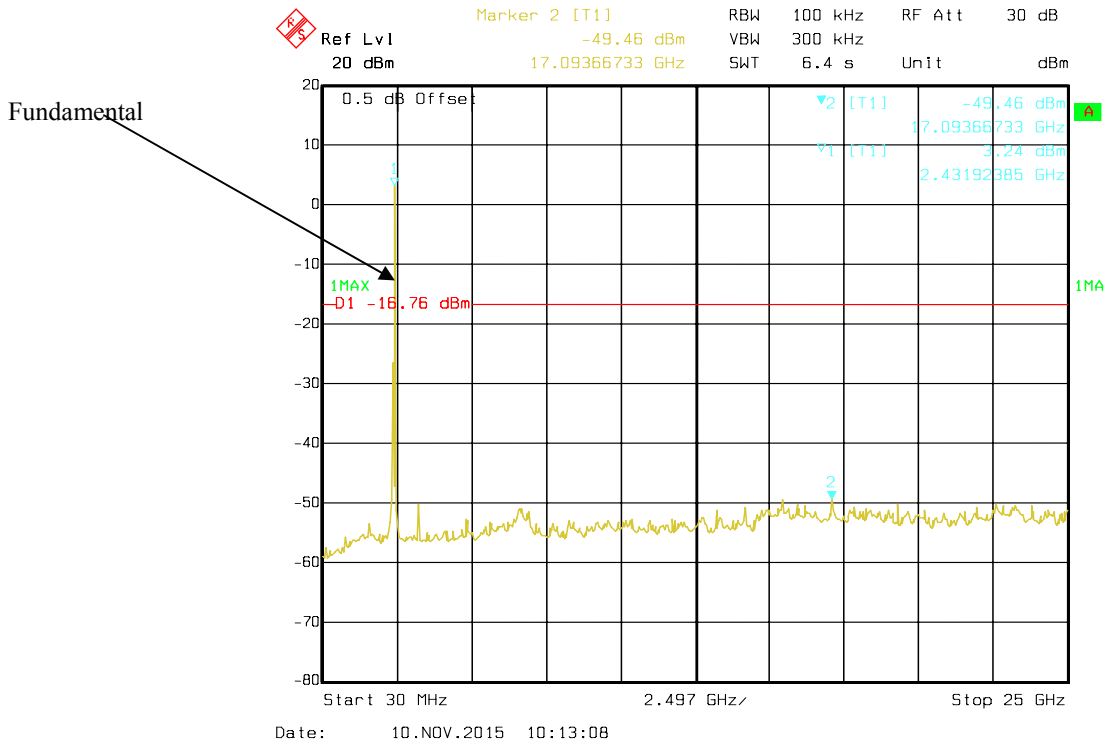
802.11b Channel:2462MHz



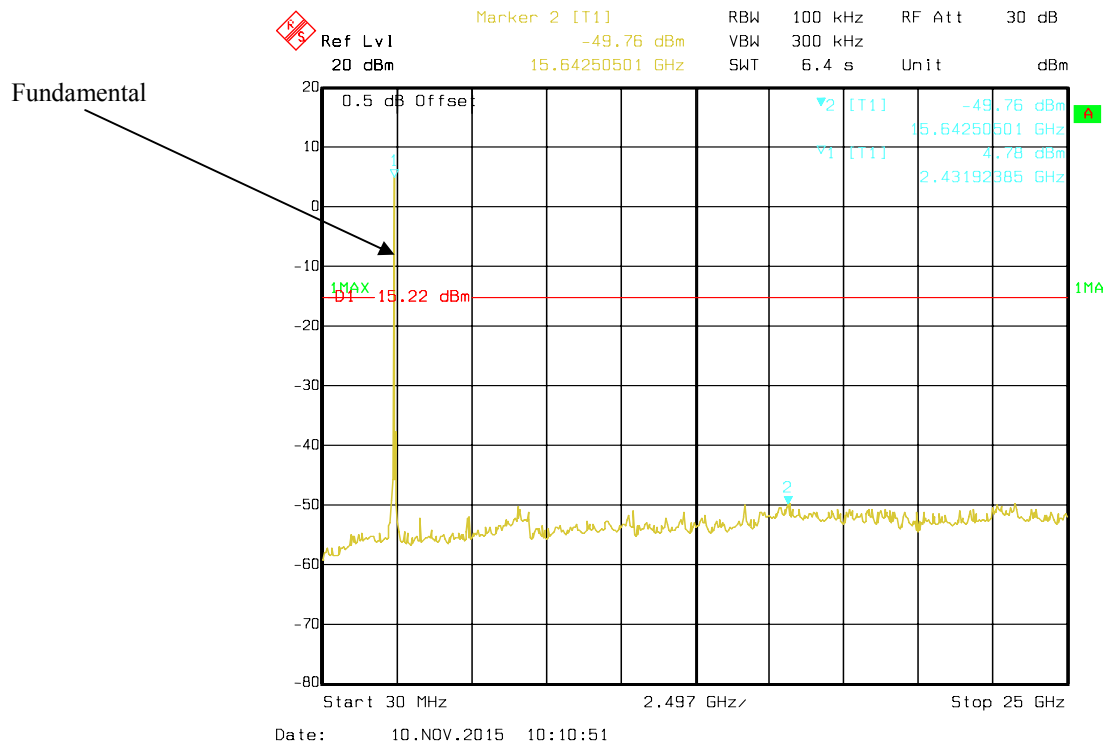
802.11g Channel:2412 MHz



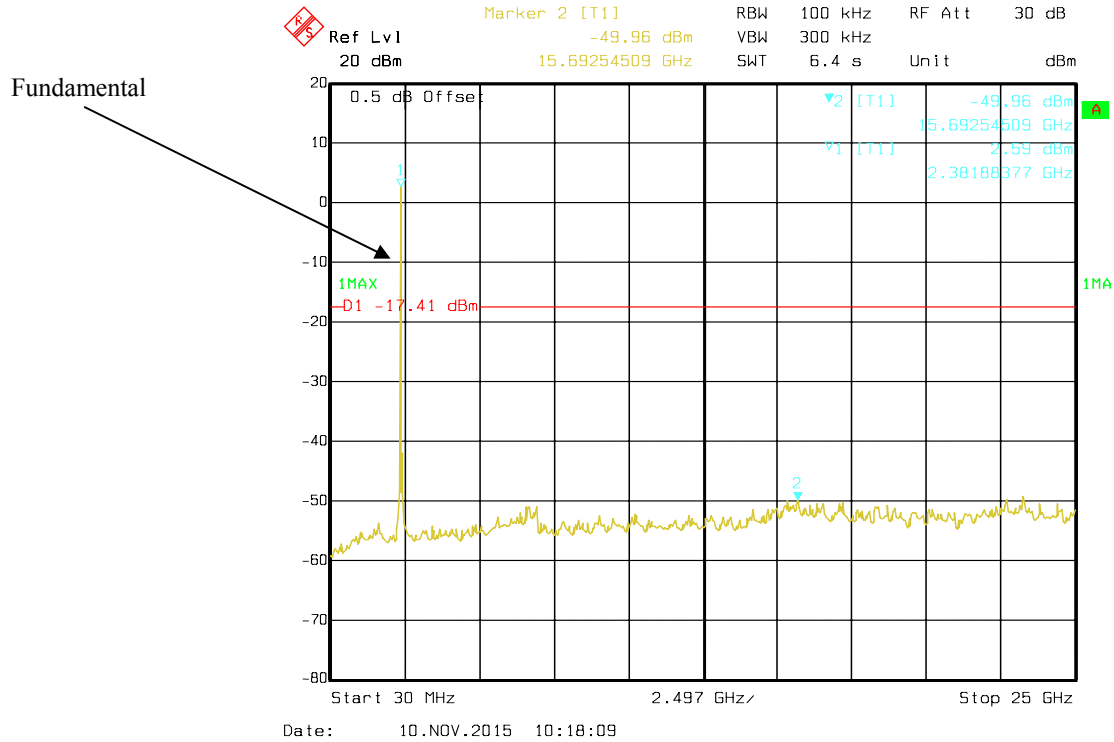
802.11g Channel:2437 MHz



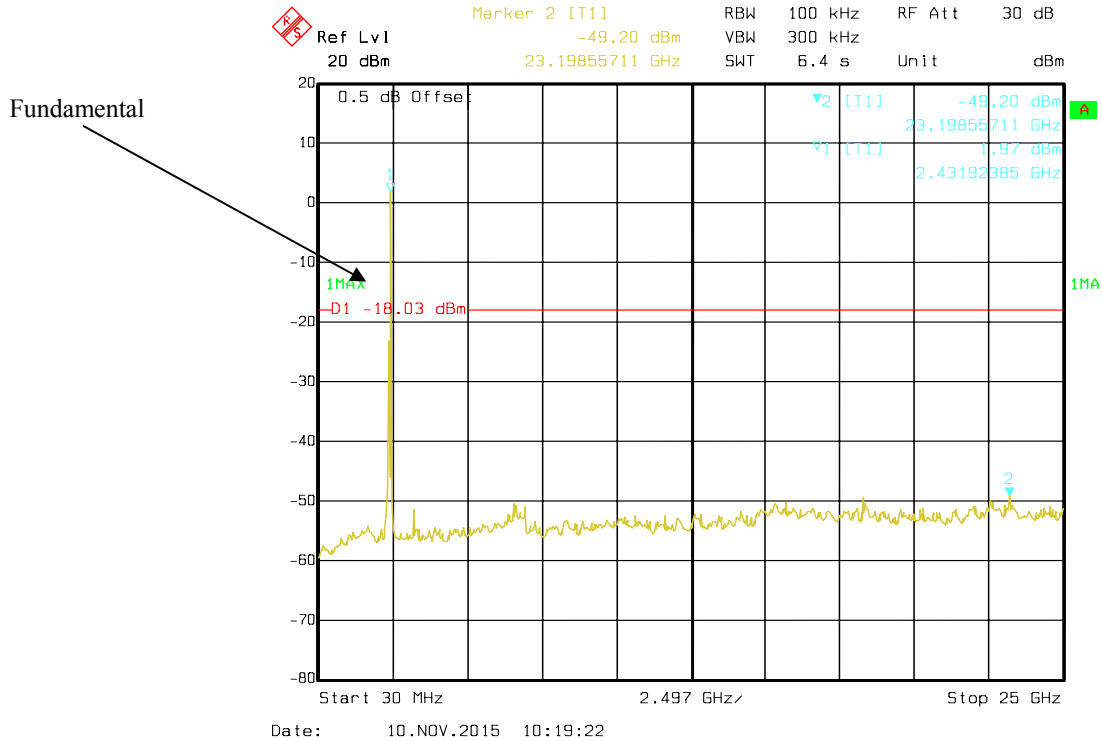
802.11g Channel:2462 MHz



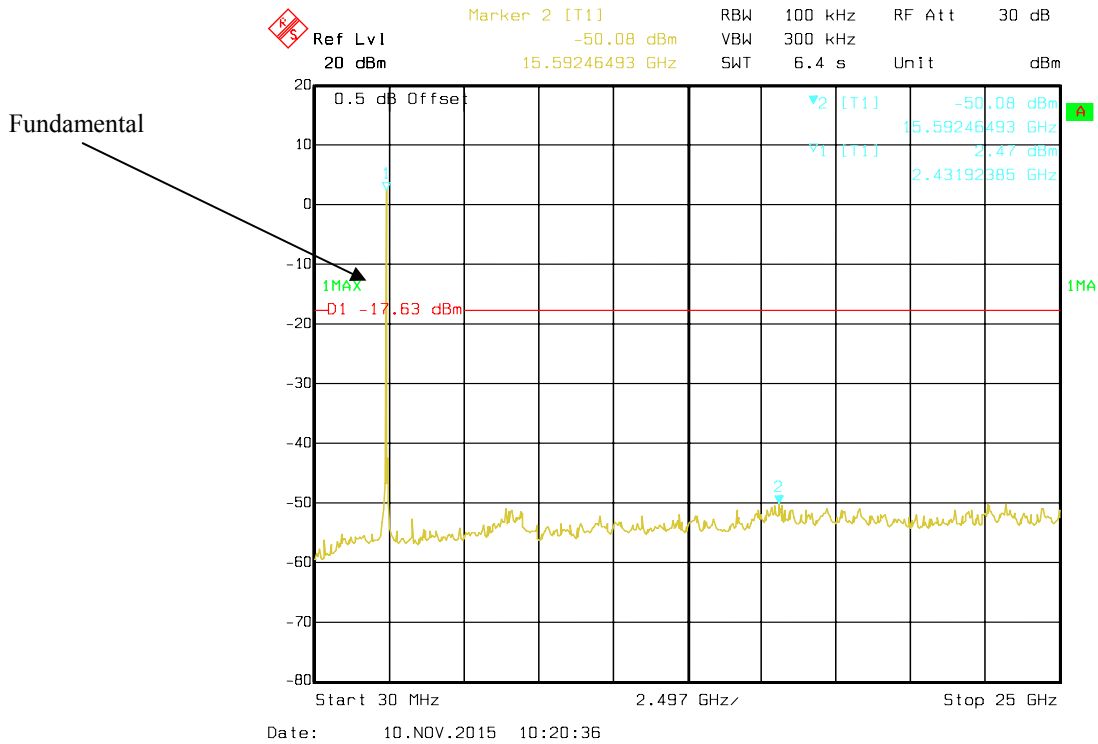
802.11n ht20 Channel:2412 MHz



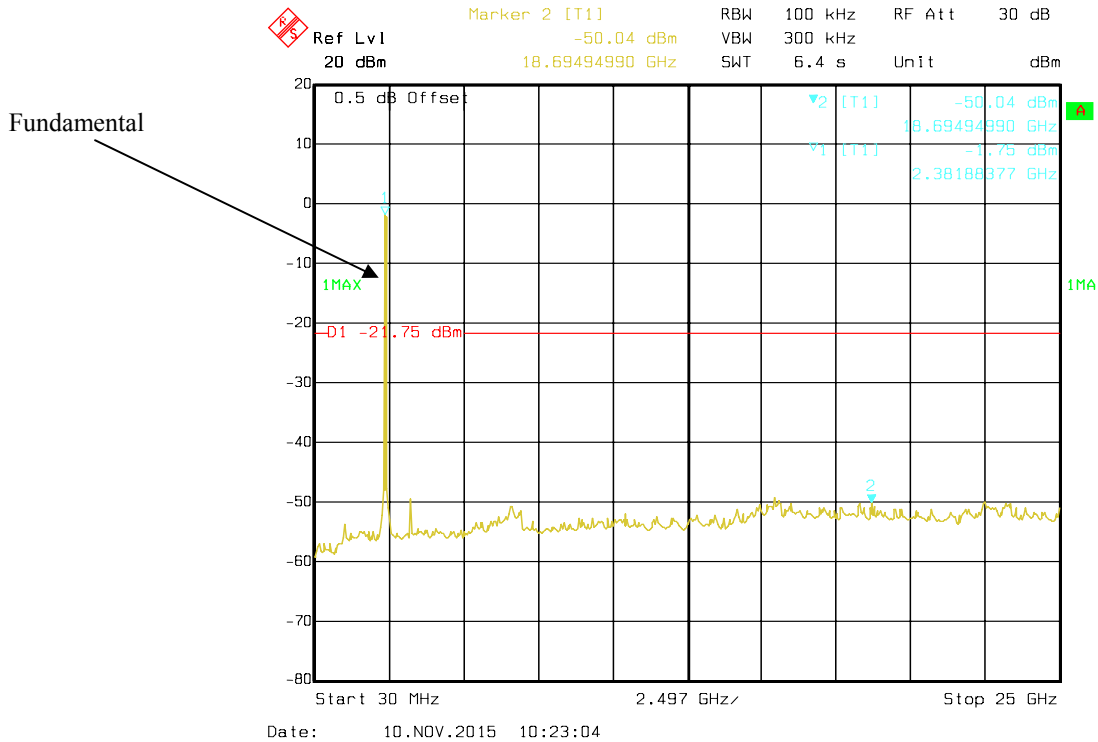
802.11n ht20 Channel:2437 MHz



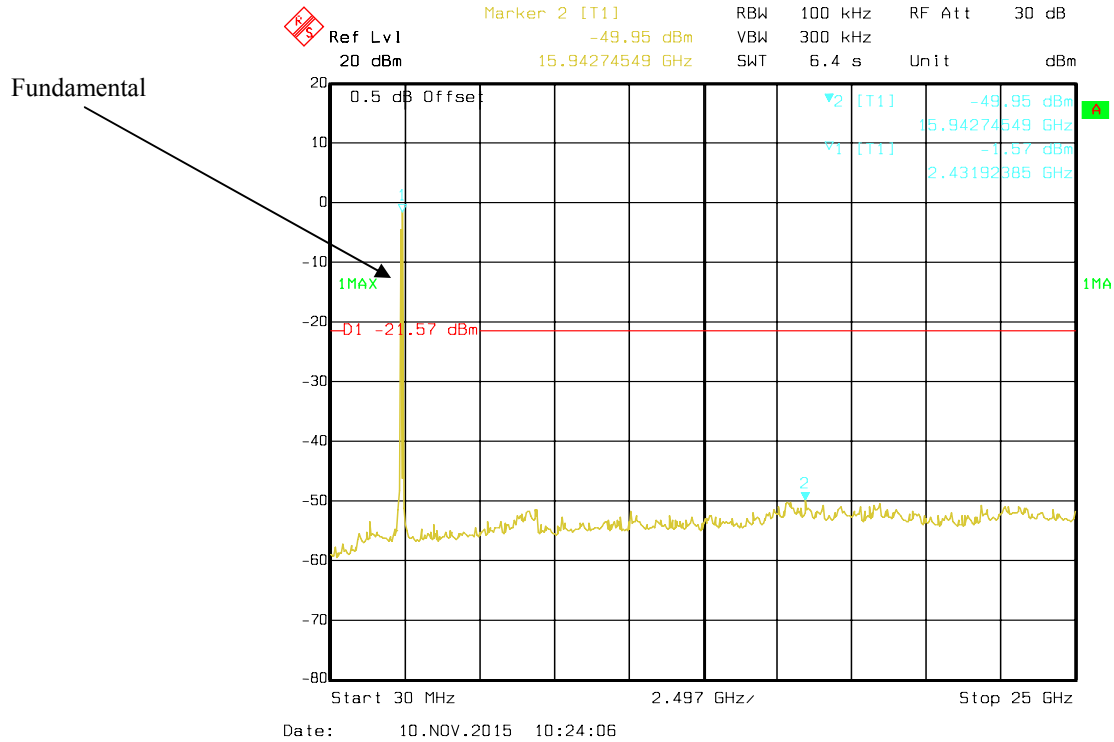
802.11n ht20 Channel:2462 MHz



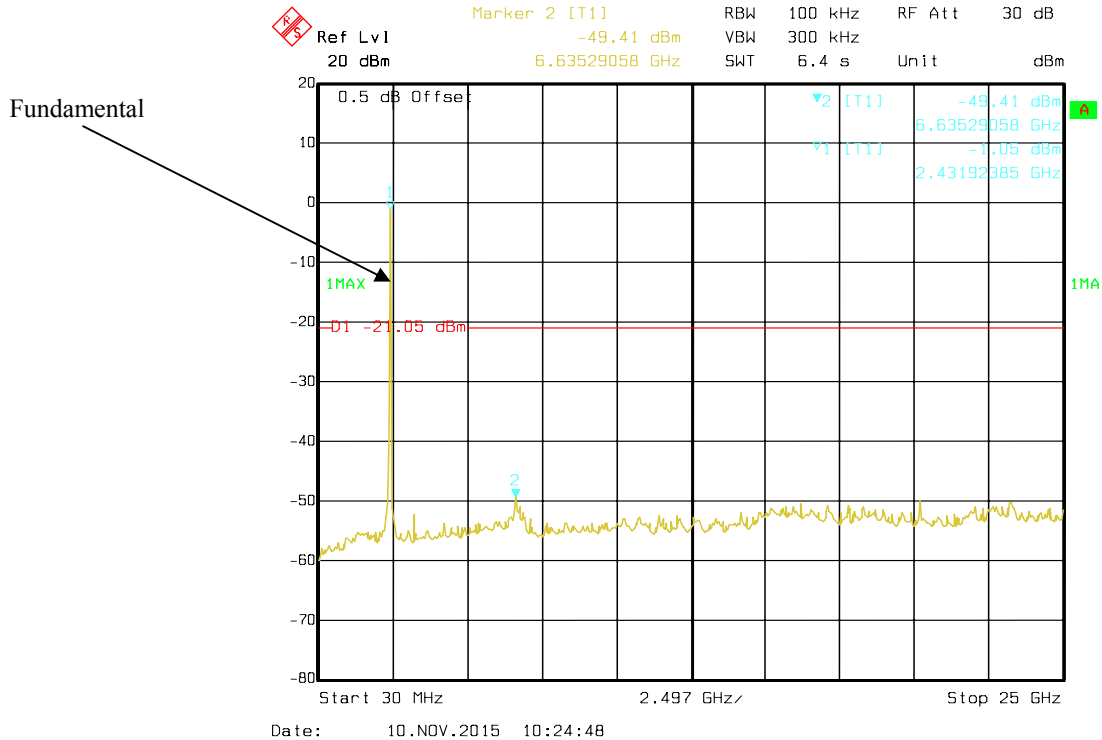
802.11n ht40 Channel:2422 MHz



802.11n ht40 Channel:2437 MHz

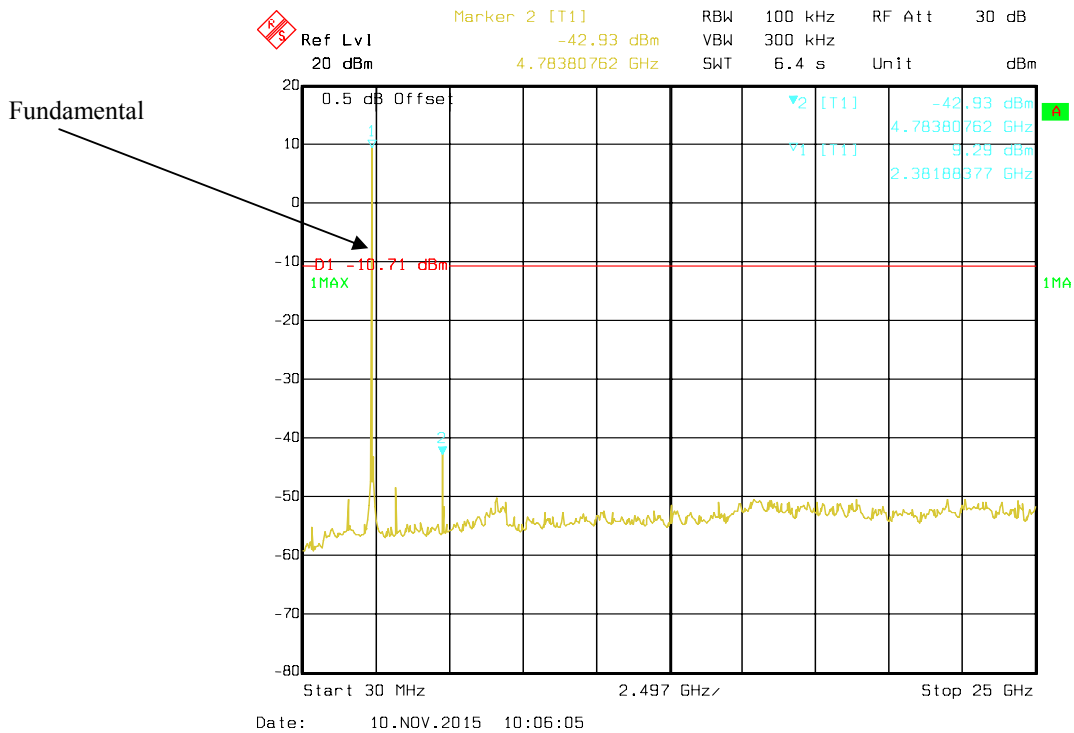


802.11n ht40 Channel:2452 MHz

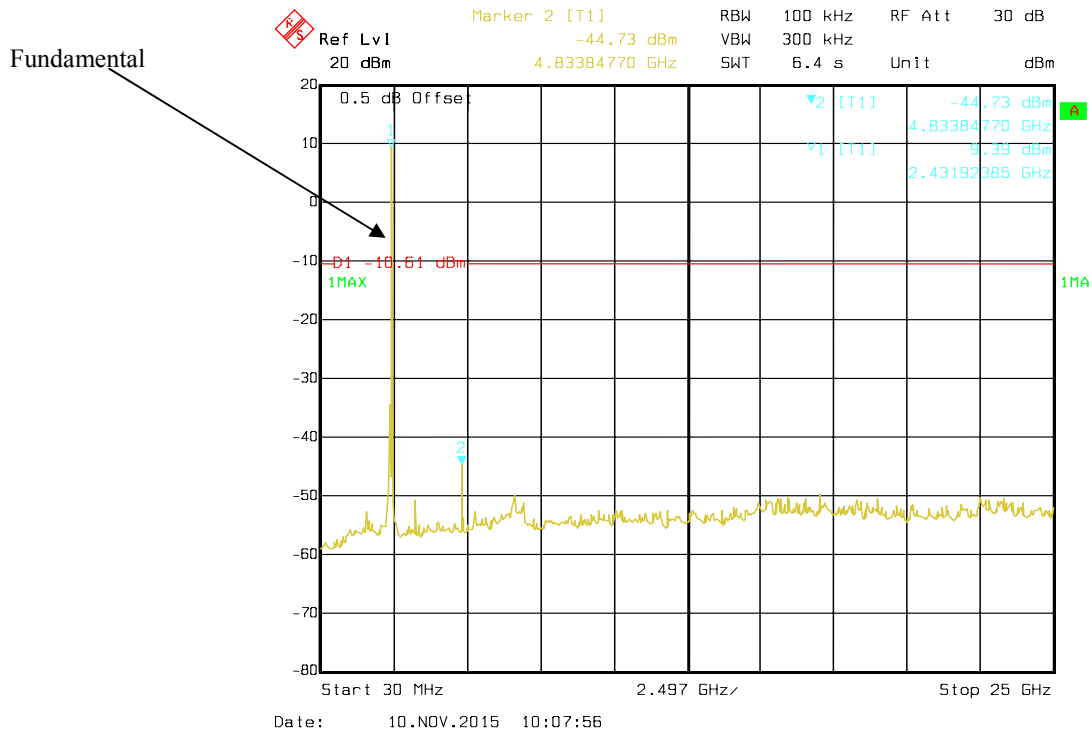


Chain 1

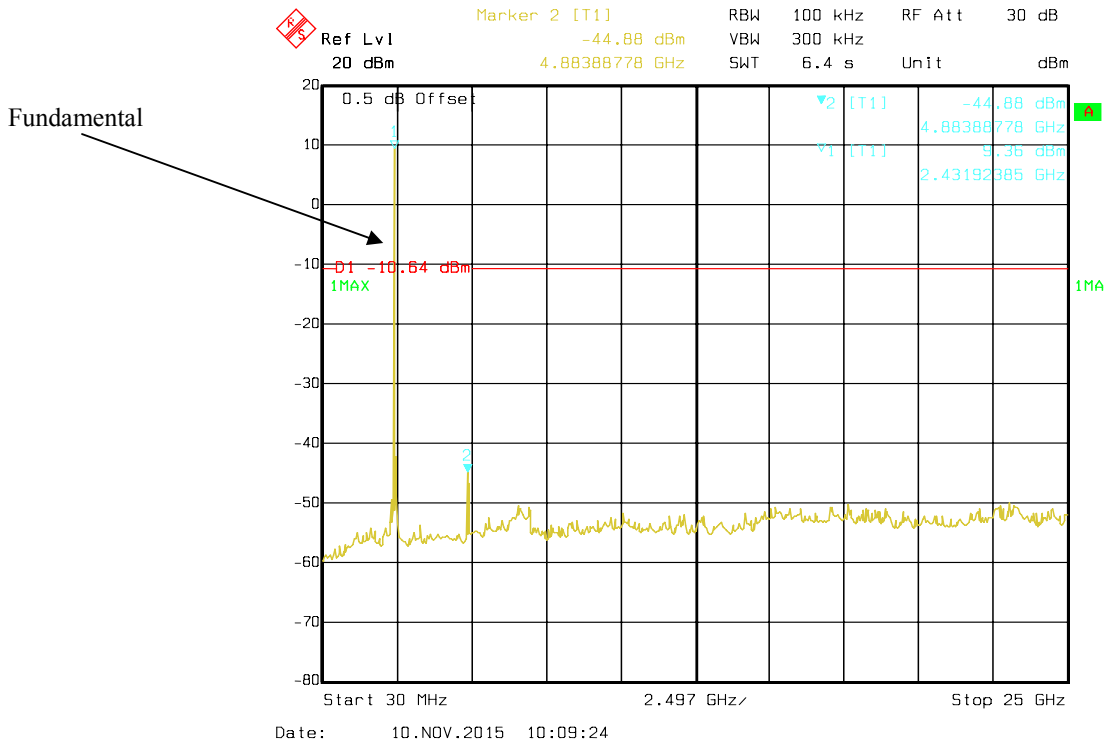
802.11b Channel:2412 MHz



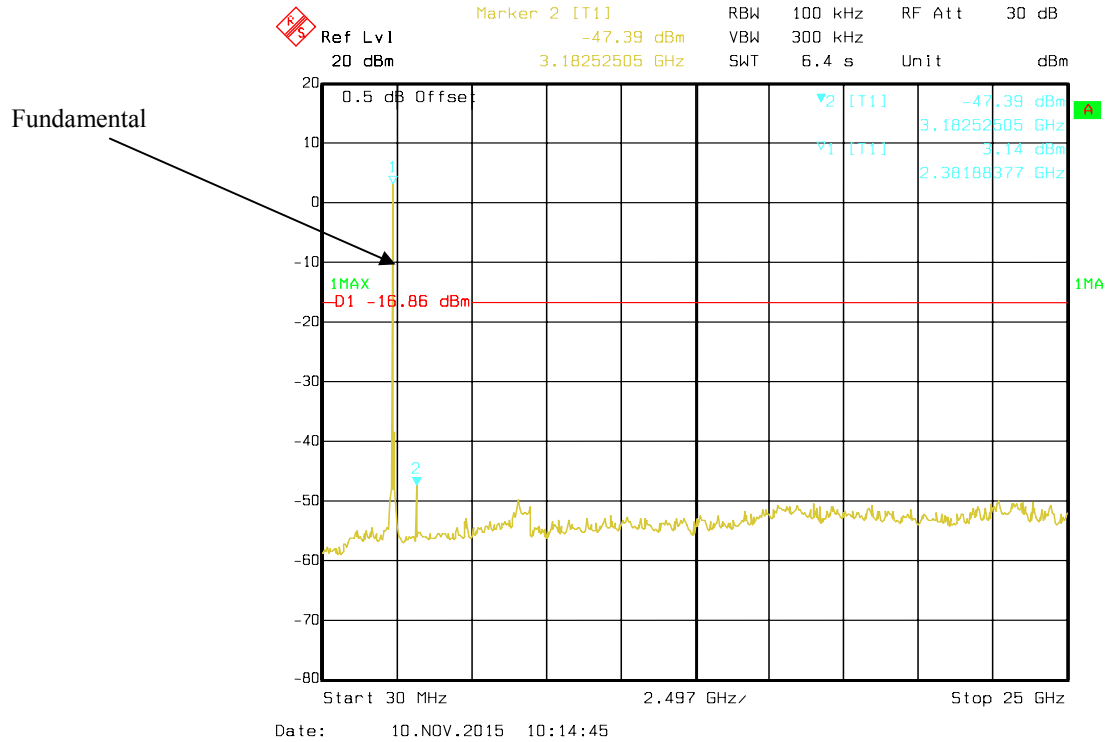
802.11b Channel:2437 MHz



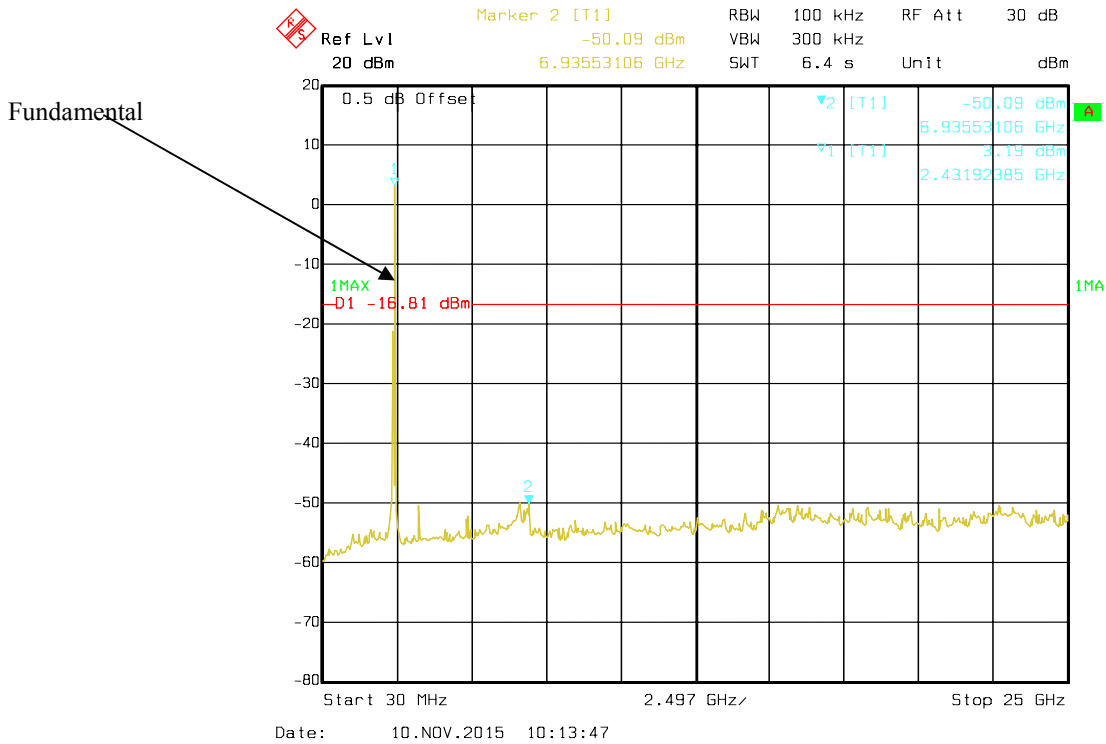
802.11b Channel:2462 MHz



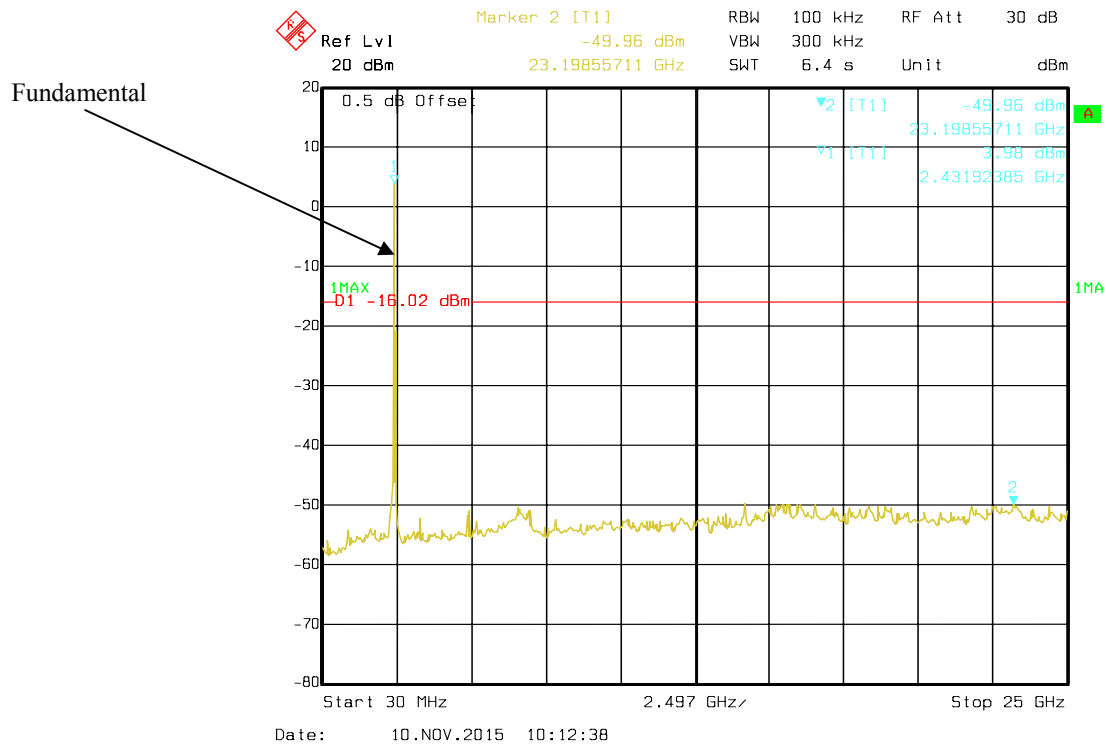
802.11g Channel:2412 MHz



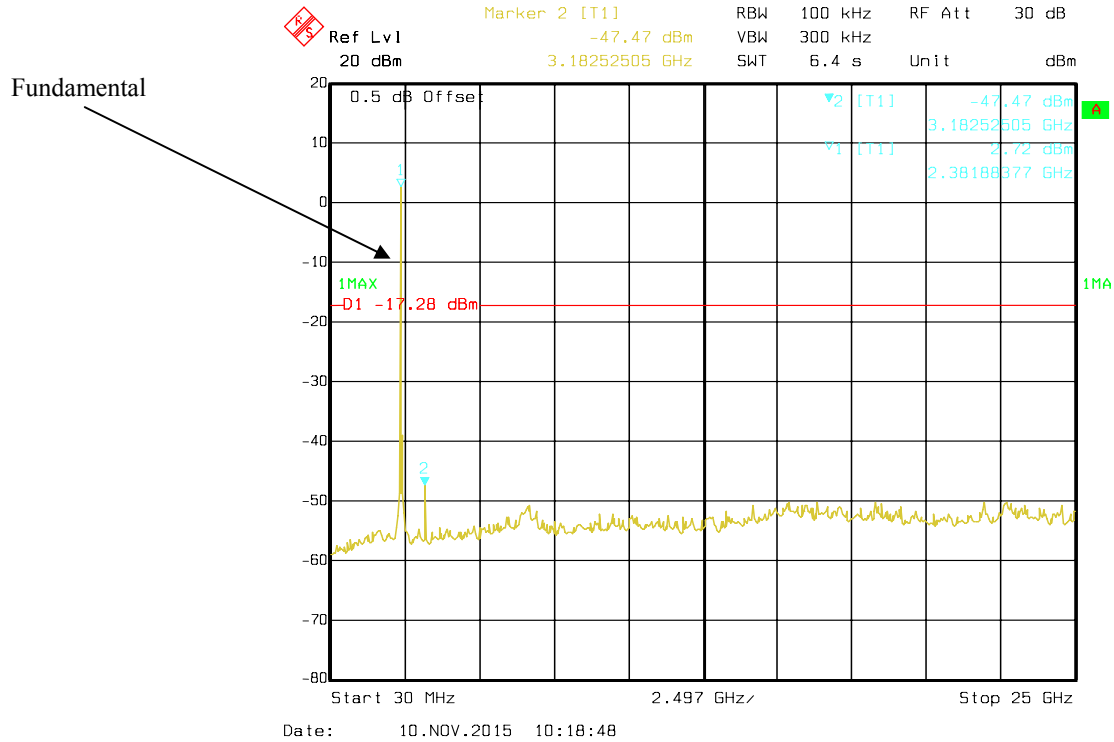
802.11g Channel:2437 MHz



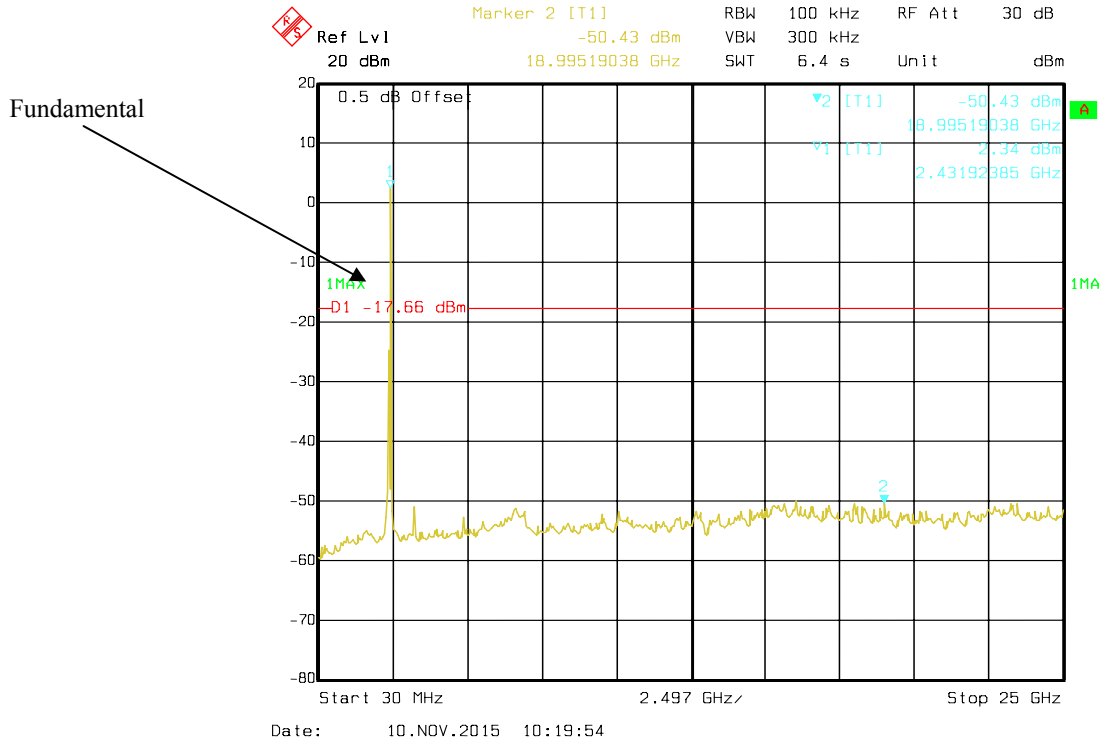
802.11g Channel:2462 MHz



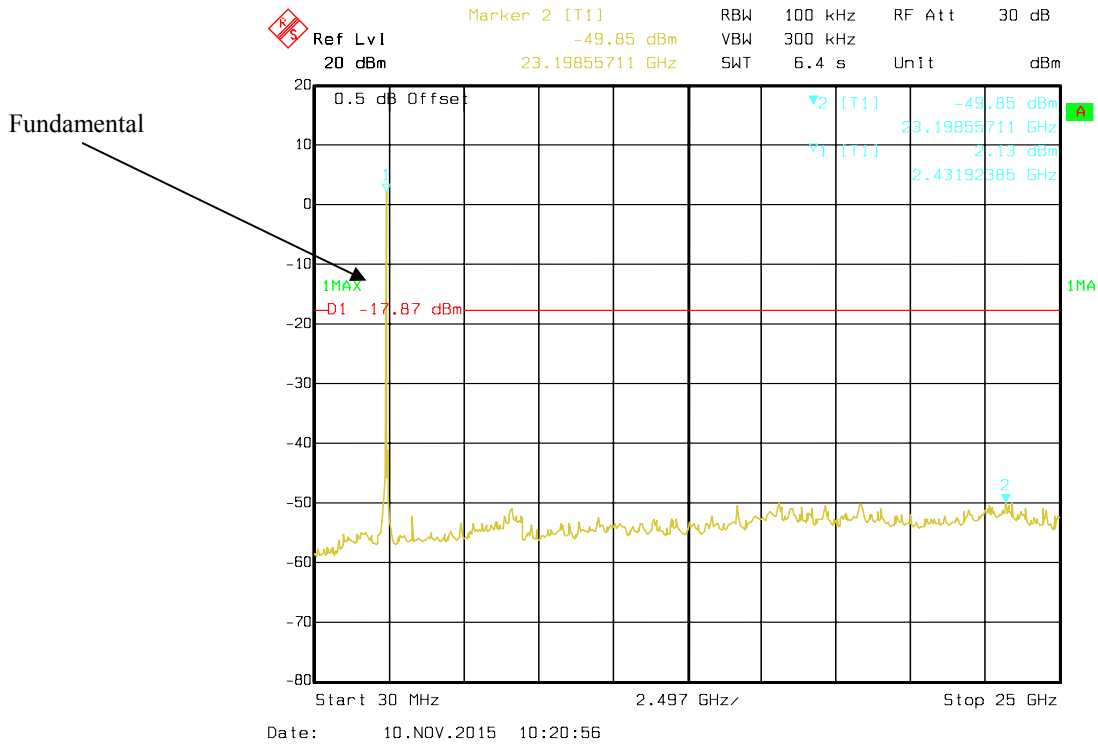
802.11n ht20 Channel:2412MHz



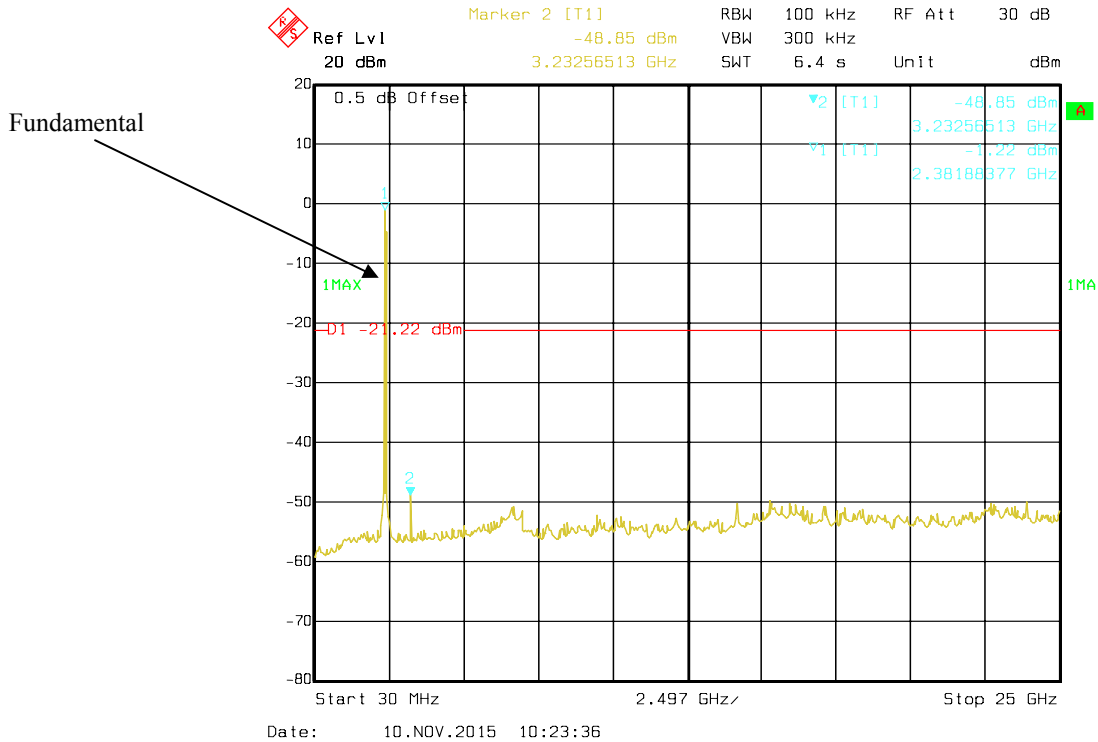
802.11n ht20 Channel:2437 MHz



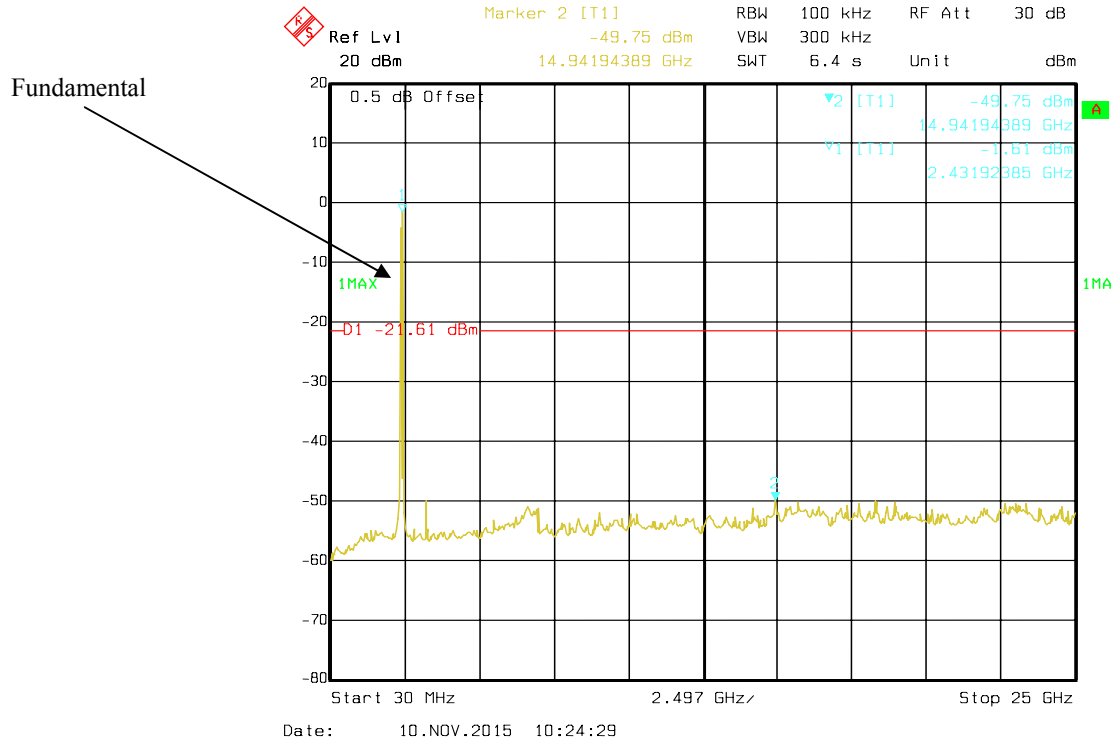
802.11n ht20 Channel:2462 MHz



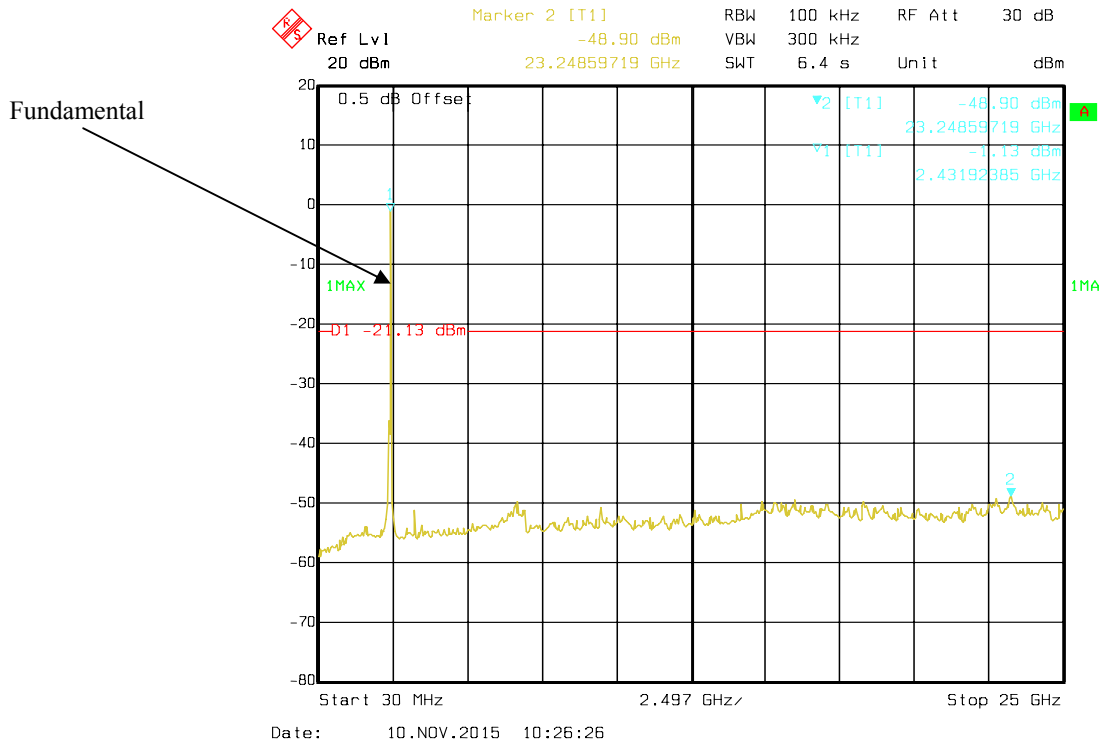
802.11n ht40 Channel:2422MHz



802.11n ht40 Channel:2437 MHz



802.11n ht40 Channel:2452 MHz



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

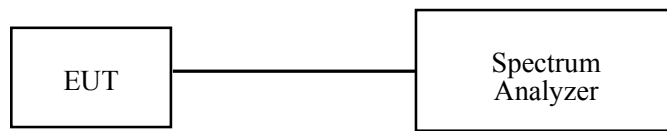
Applicable Standard

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

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r03

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09

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

Test Data

Environmental Conditions

Temperature:	29 °C
Relative Humidity:	61%
ATM Pressure:	101 kPa

* The testing was performed by Lion Xiao on 2015-11-09

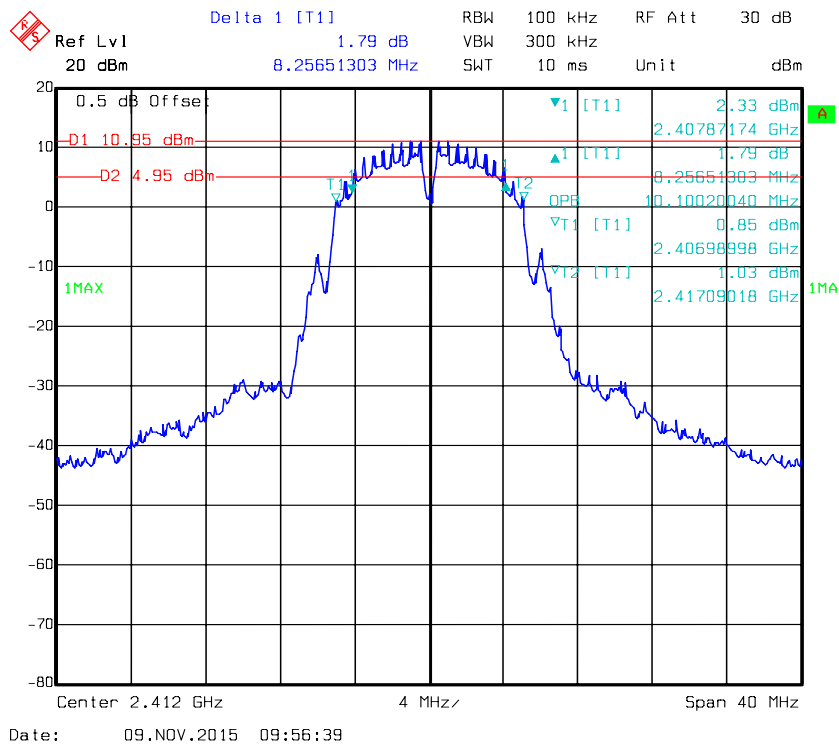
Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

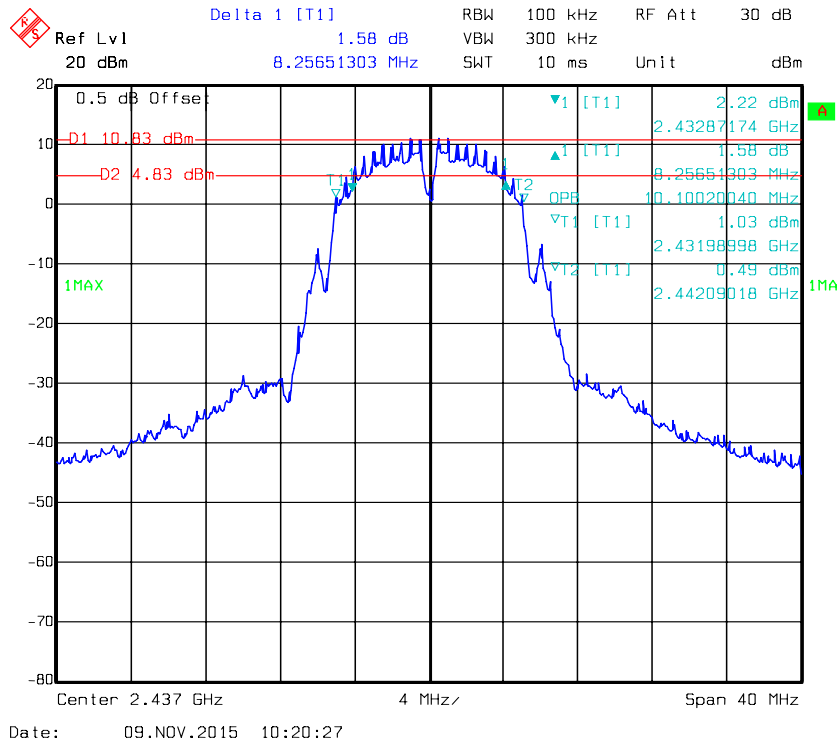
Test mode	Frequency (MHz)	6 dB Bandwidth (MHz)		Limit (MHz)
		Chain 0	Chain 1	
802.11b	2412	8.257	8.257	≥ 0.5
	2437	8.257	8.257	≥ 0.5
	2462	8.257	8.257	≥ 0.5
802.11g	2412	16.673	16.673	≥ 0.5
	2437	16.673	16.673	≥ 0.5
	2462	16.673	16.673	≥ 0.5
802.11n20	2412	17.796	17.796	≥ 0.5
	2437	17.796	17.796	≥ 0.5
	2462	17.796	17.796	≥ 0.5
802.11n40	2422	36.713	36.713	≥ 0.5
	2437	36.713	36.713	≥ 0.5
	2452	36.713	36.713	≥ 0.5

Chain 0

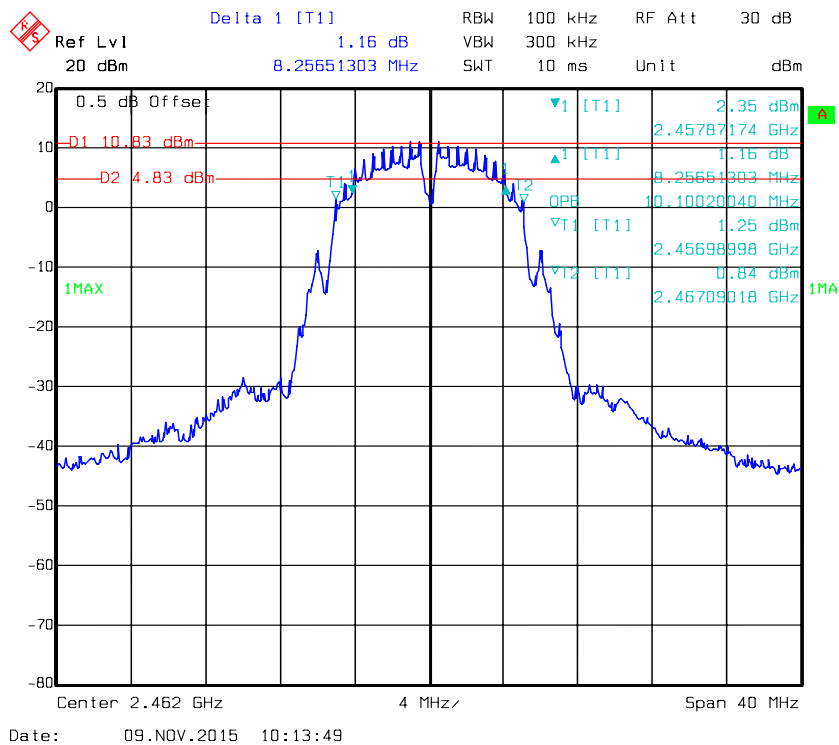
802.11b Channel: 2412 MHz



802.11b Channel: 2437 MHz



802.11b Channel: 2462 MHz



Ref Lvl 20 dBm

Delta 1 [T1] -1.37 dB

RBW 100 kHz

VBW 300 kHz

SWT 10 ms

RF Att 30 dB

Unit dBm

0.5 dB Offset

D1 5.33 dBm

D2 -0.67 dBm

1MAX

1MAX

Center 2.412 GHz

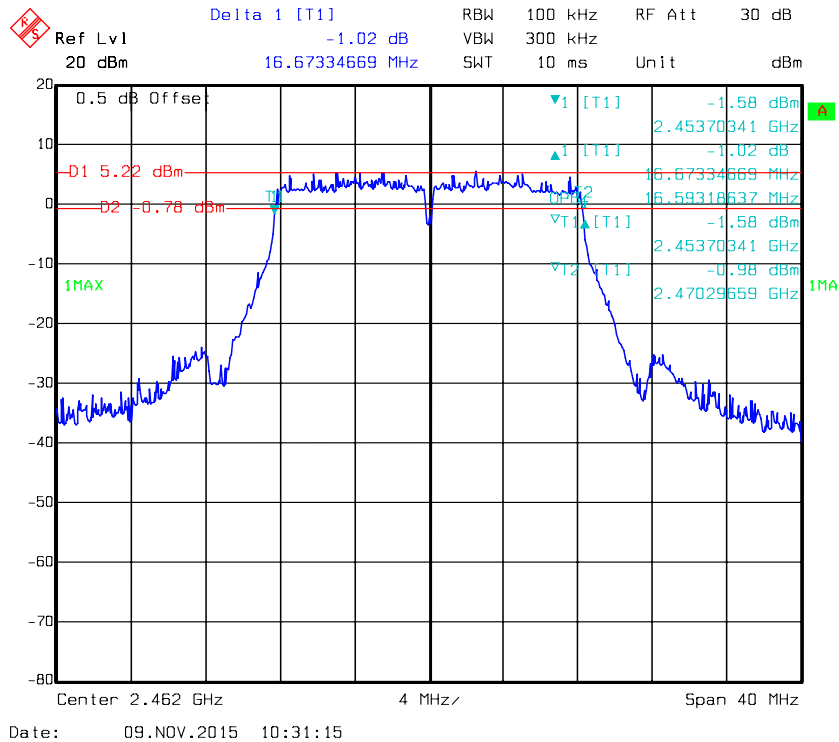
4 MHz

Span 40 MHz

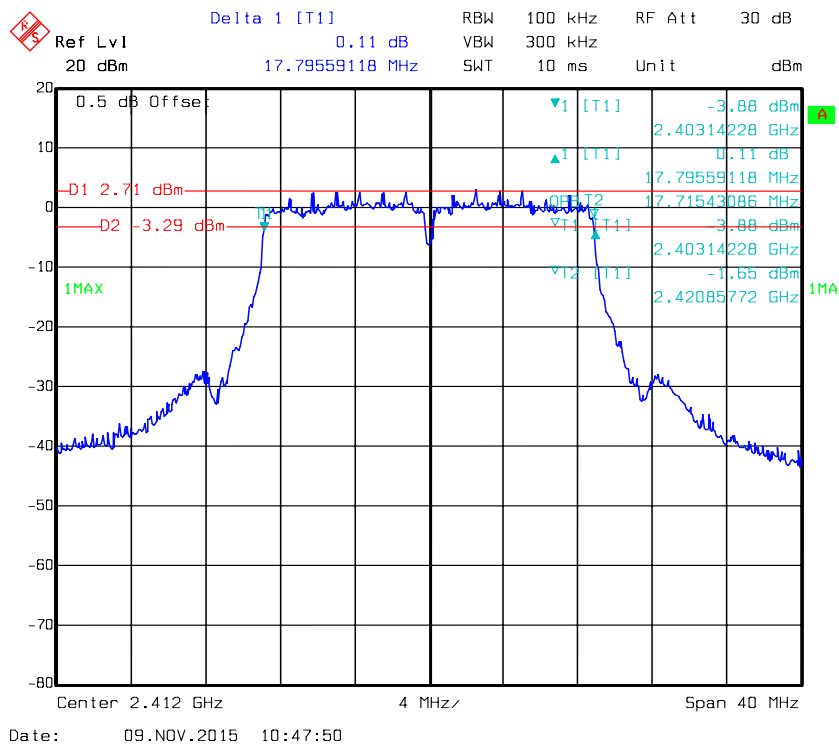
Date: 09.NOV.2015 10:24:21

[illegible]

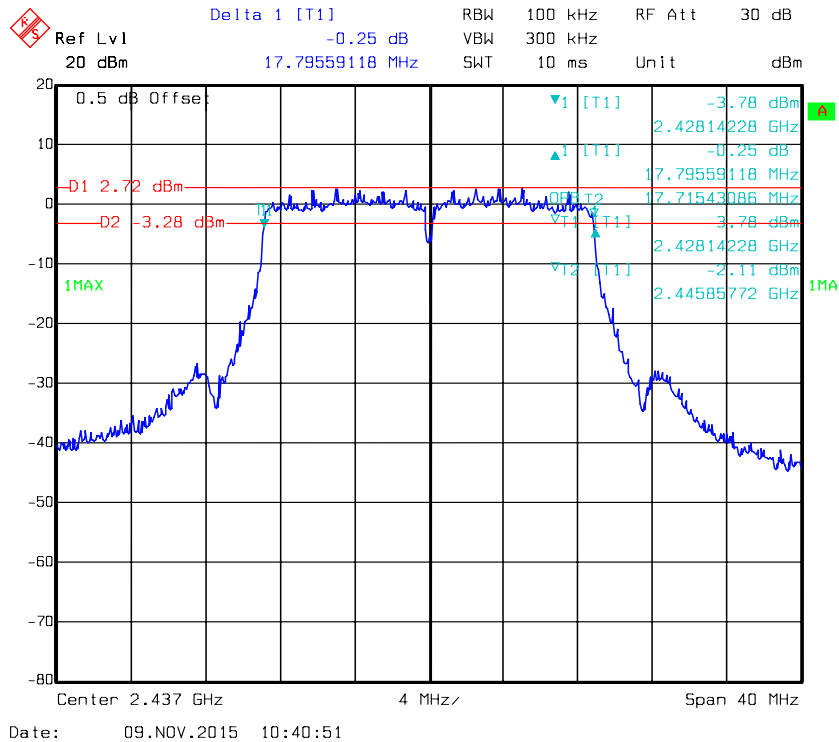
802.11g Channel: 2462 MHz



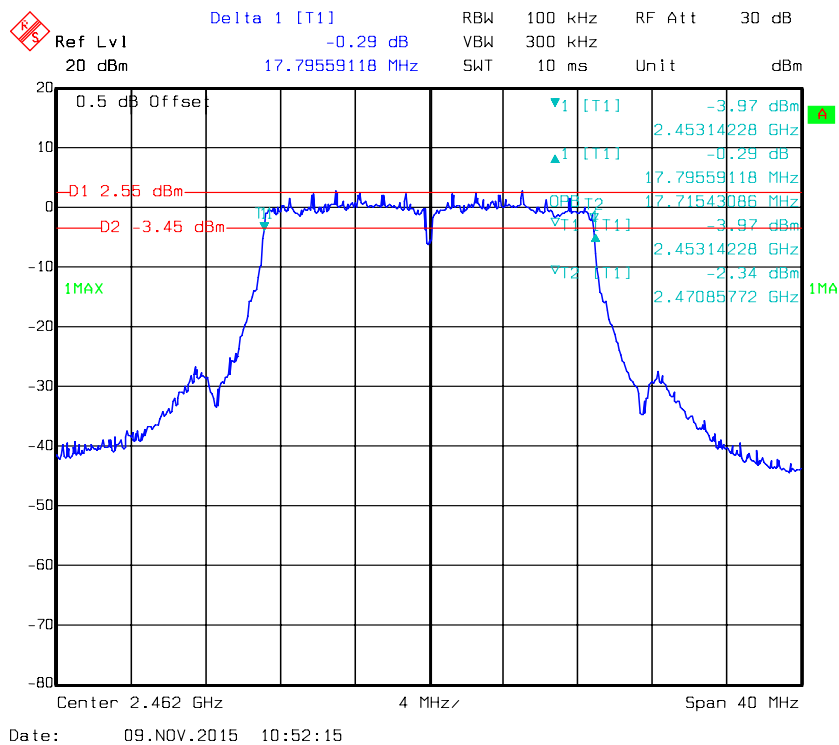
802.11n ht20 Channel: 2412 MHz



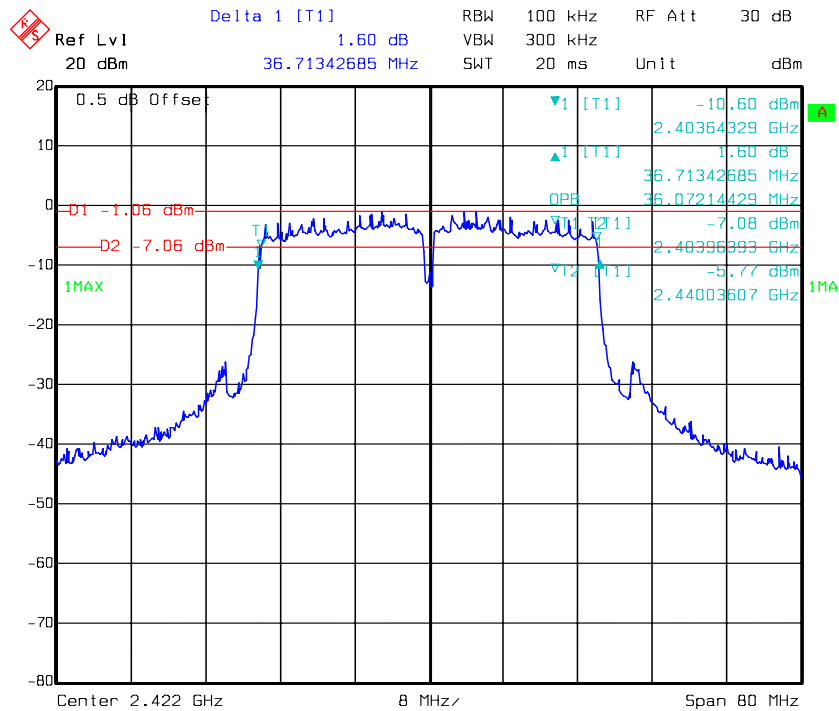
802.11n ht20 Channel: 2437 MHz



802.11n ht20 Channel: 2462 MHz

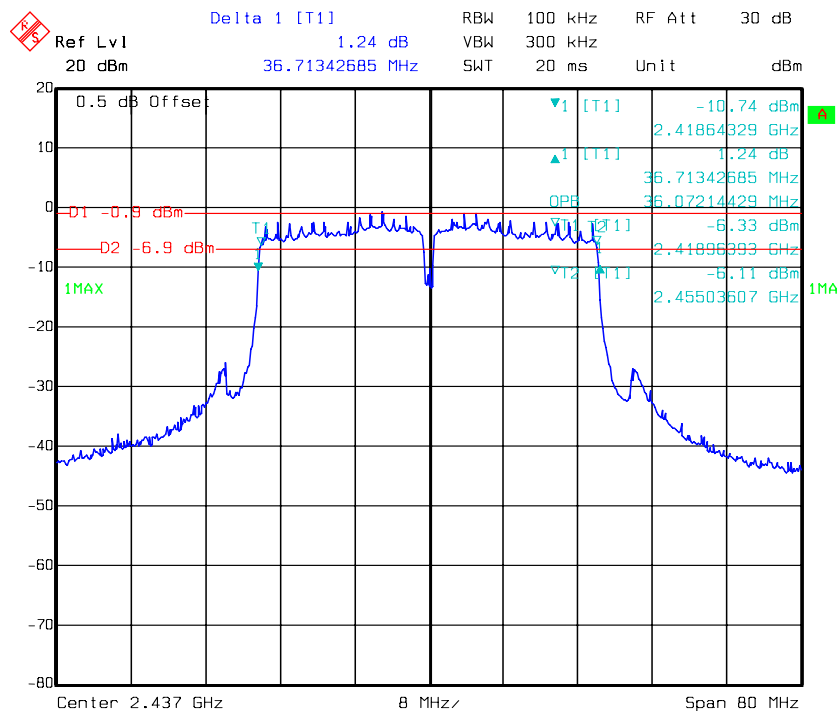


802.11n ht40 Channel: 2422 MHz

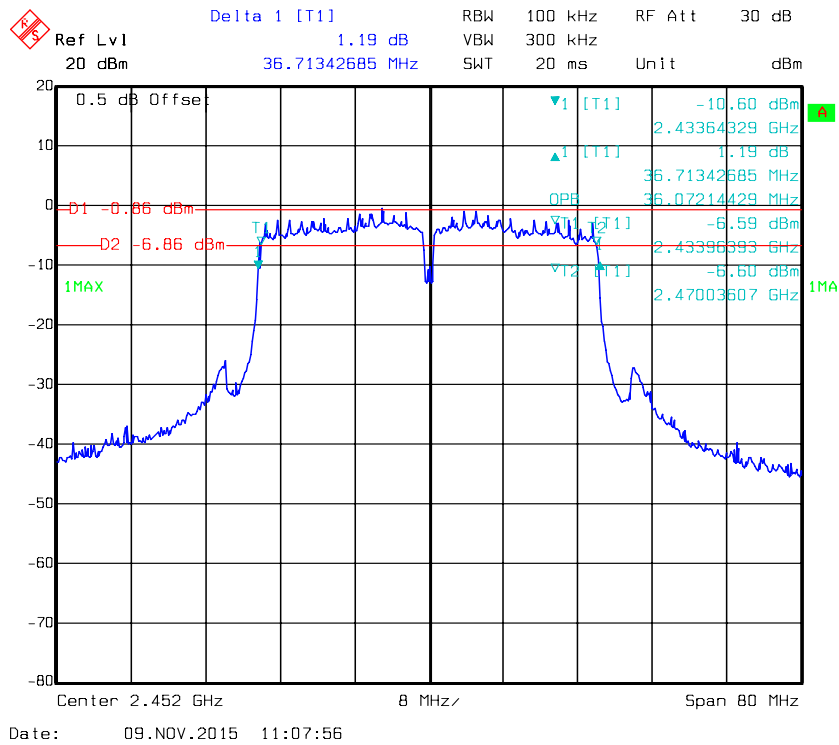
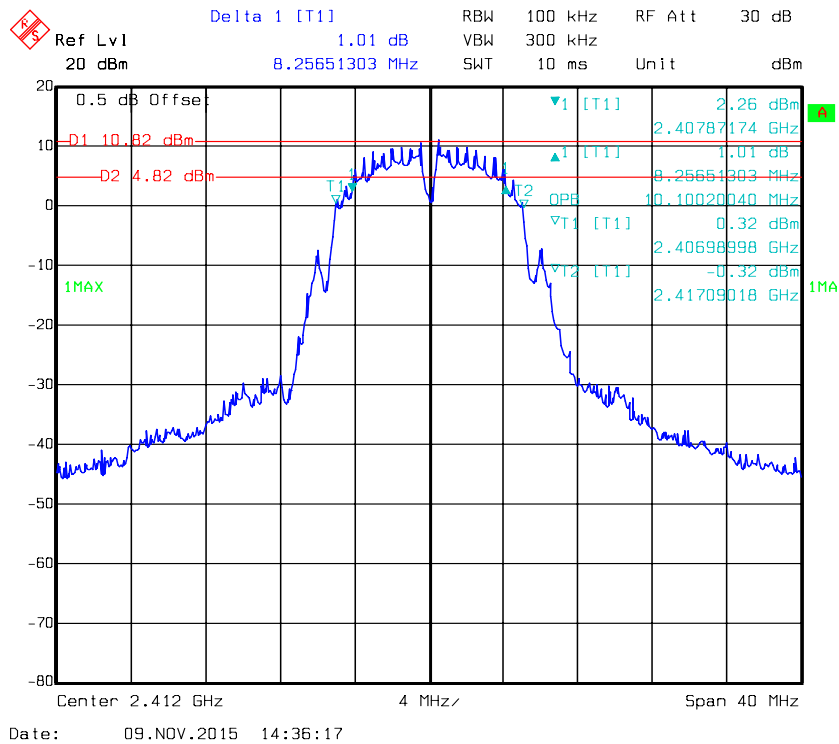


Date: 09.NOV.2015 10:55:38

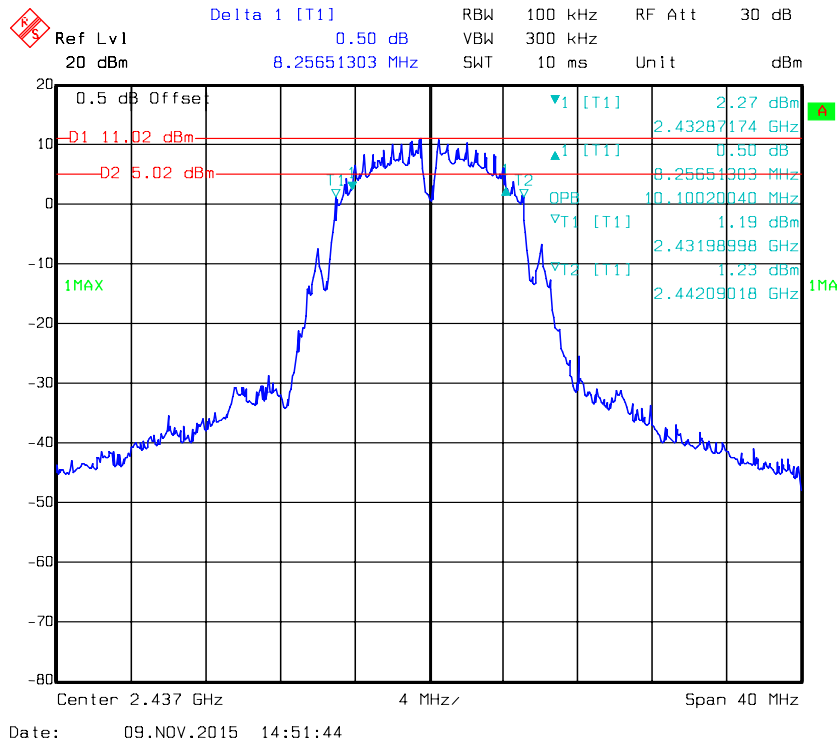
802.11n ht40 Channel: 2437 MHz



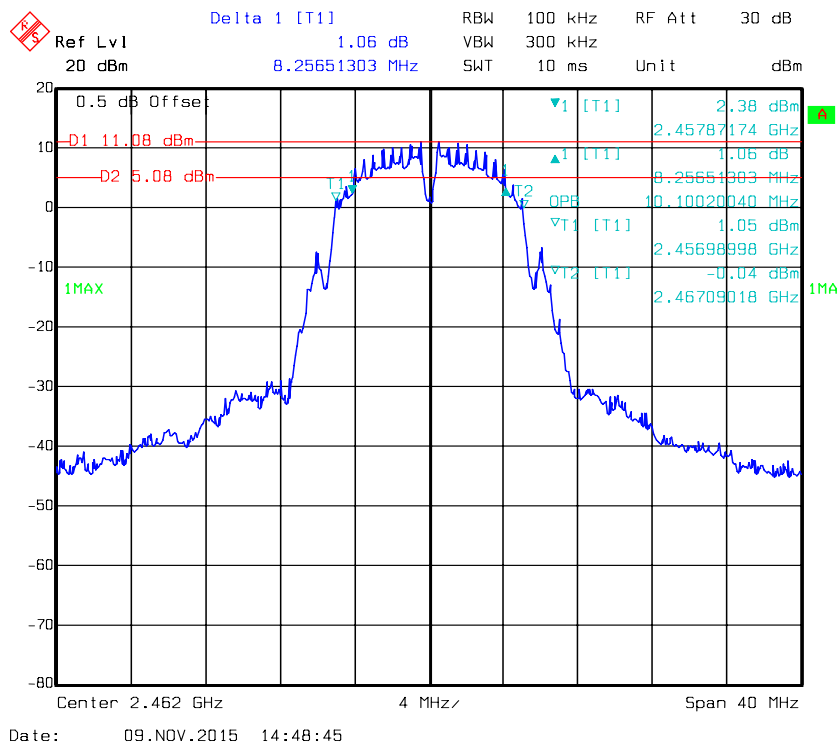
Date: 09.NOV.2015 11:11:13

802.11n ht40 Channel: 2452 MHz**Chain 1****802.11b Channel: 2412 MHz**

802.11b Channel: 2437 MHz



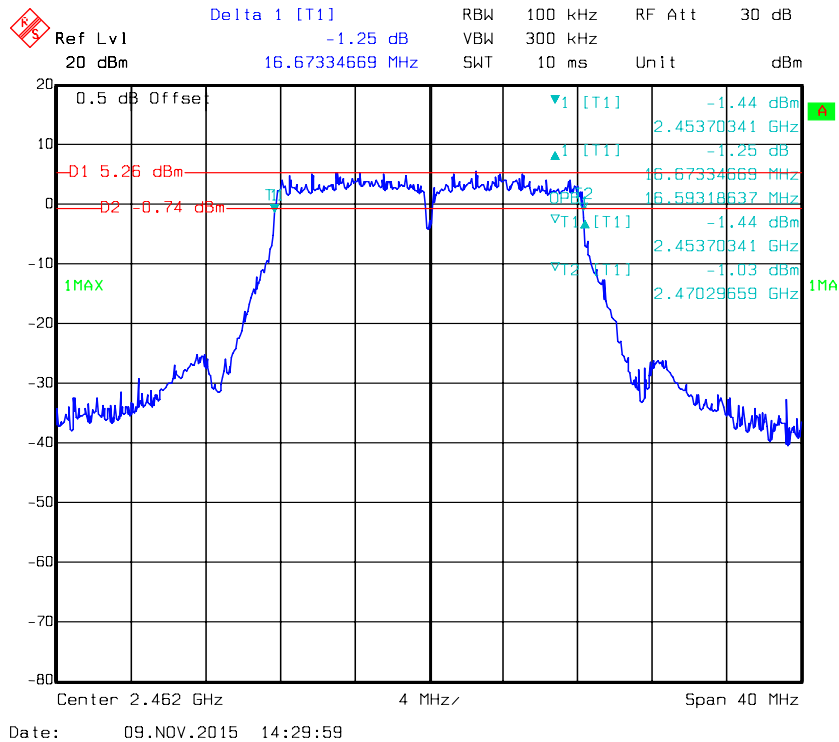
802.11b Channel: 2462 MHz



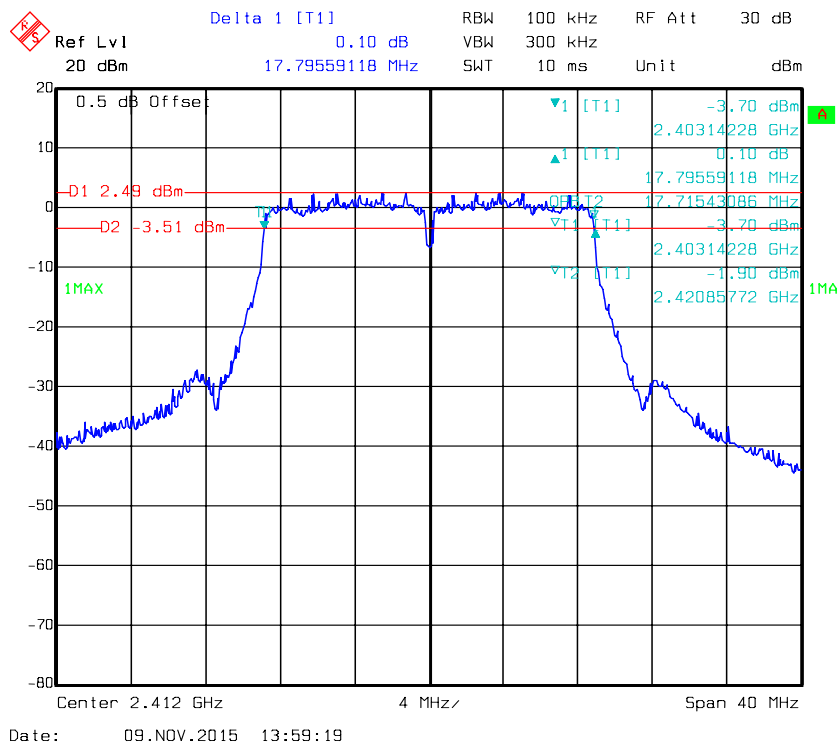
Ref Lvl 20 dBm Delta 1 [T1] -0.58 dB RBW 100 kHz RF Att 30 dB
 0.5 dB Offset 16.67334669 MHz VBW 300 kHz Unit dBm
 D1 5.18 dBm D2 -0.84 dBm
 1MAX 1MA
 Center 2.412 GHz 4 MHz/ Span 40 MHz
 Date: 09.NOV.2015 14:32:16

Ref Lvl 20 dBm Delta 1 [T1] -0.75 dB RBW 100 kHz RF Att 30 dB
 0.5 dB Offset 16.67334669 MHz VBW 300 kHz Unit dBm
 1MAX 0.48 dBm 1MIN -0.75 dBm
 T1 [T1] -1.38 dBm 2.42870341 GHz
 T1 [T1] -0.53 dBm 2.44529659 GHz
 Center 2.437 GHz 4 MHz/ Span 40 MHz
 Date: 09.NOV.2015 14:21:24

802.11g Channel: 2462 MHz



802.11n ht20 Channel: 2412 MHz



Ref Lvl 20 dBm

Delta 1 [T1] -0.45 dB

VBW 300 kHz

SWT 10 ms

Unit dBm

0.5 dB Offset

D1 2.72 dBm

D2 -3.28 dBm

1MAX

1MA

Center 2.437 GHz

4 MHz/

Span 40 MHz

1 [T1] -4.06 dBm

2.42814228 GHz

1 [T1] -0.45 dBm

17.79559118 MHz

1 [T1] -4.06 dBm

17.71543086 MHz

1 [T1] -4.06 dBm

2.42814228 GHz

1 [T1] -1.67 dBm

2.44585772 GHz

[illegible]

Delta 1 [T1] 0.64 dB 36.71342685 MHz

Ref Lvl 20 dBm

RBW 100 kHz VBW 300 kHz

SWT 20 ms RF Att 30 dB

Unit dBm

0.5 dB Offset

-01 -0.42 dBm

-02 -6.42 dBm

1MAX

Center 2.422 GHz 8 MHz/ Span 80 MHz

1MAX

1 [T1] -10.32 dBm 2.40364329 GHz

1 [T1] 0.64 dB 36.71342685 MHz

OPR 36.07214429 MHz

1 [T1] -6.53 dBm 2.40396393 GHz

1 [T1] -6.03 dBm 2.44003607 GHz

Date: 09.NOV.2015 11:44:59

Ref Lvl 20 dBm Delta 1 [T1] 1.49 dB RBW 100 kHz RF Att 30 dB VBW 300 kHz Unit dBm SWT 20 ms

0.5 dB Offset

D1 -0.74 dBm D2 -6.74 dBm

1MAX

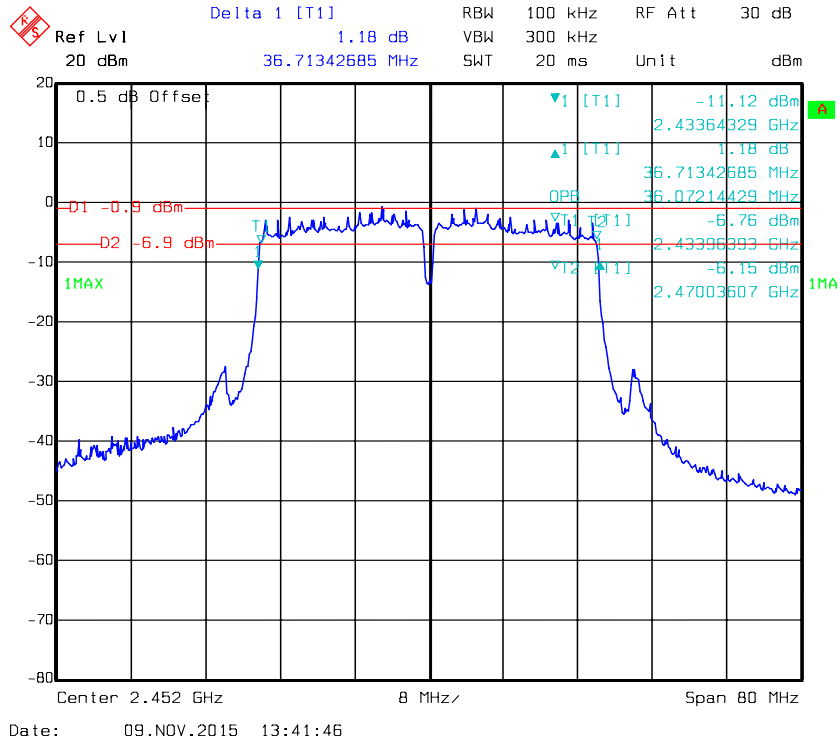
1 [T1] -10.50 dBm 2.41864329 GHz 1.49 dB 36.71342685 MHz 36.07214429 MHz

12 [T1] -6.47 dBm 2.41896993 GHz -6.08 dBm 2.45503607 GHz

Center 2.437 GHz 8 MHz/ Span 80 MHz

Date: 09.NOV.2015 13:51:15

802.11n ht40 Channel: 2452 MHz



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

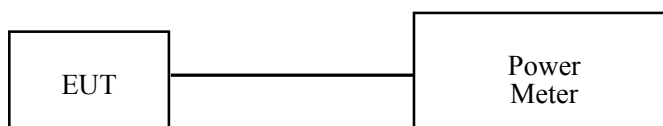
Applicable Standard

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

According to KDB 558074 D01 DTS Meas Guidance v03r03

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 test equipment.
3. Add a correction factor to the display.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2015-11-03	2016-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2015-11-03	2016-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2015-11-03	2016-11-03

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

Test Data

Environmental Conditions

Temperature:	29 °C
Relative Humidity:	61 %
ATM Pressure:	101 kPa

* The testing was performed by Lion Xiao on 2015-11-09

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table.

Mode	Channel	Frequency	Max Peak Conducted Output Power (dBm)			Limit
		MHz	Chain 0	Chain 1	Total	dBm
802.11b	Low	2412	22.70	22.78	/	30
	Middle	2437	22.74	22.81	/	30
	High	2462	22.86	22.67	/	30
802.11g	Low	2412	25.10	25.18	/	30
	Middle	2437	25.25	25.13	/	30
	High	2462	25.00	25.06	/	30
802.11n20	Low	2412	22.89	22.81	25.86	28
	Middle	2437	22.71	22.75	25.74	28
	High	2462	22.86	22.62	25.75	28
802.11n40	Low	2422	22.78	22.85	25.83	28
	Middle	2437	22.72	22.60	25.67	28
	High	2452	22.67	22.91	25.80	28

Mode	Channel	Frequency	Max Conducted Average Output Power (dBm)			Limit
		MHz	Chain 0	Chain 1	Total	dBm
802.11b	Low	2412	19.29	19.35	/	30
	Middle	2437	19.32	19.37	/	30
	High	2462	19.39	19.28	/	30
802.11g	Low	2412	17.66	17.70	/	30
	Middle	2437	17.74	17.69	/	30
	High	2462	17.57	17.64	/	30
802.11n20	Low	2412	15.00	14.96	17.99	28
	Middle	2437	14.91	14.93	17.93	28
	High	2462	14.98	14.85	17.93	28
802.11n40	Low	2422	13.20	13.23	16.23	28
	Middle	2437	13.18	13.11	16.16	28
	High	2452	13.14	13.30	16.23	28

Note: 1. Directional gain = $G_{ANT} + 10 \log (N_{ANT})$ dBi = $5 + 10 \log (2) = 8$ dBi, so the limit shall be reduced to $30 - 2 = 28$ dBm

2. Duty cycle is 100%.

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
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09

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

Test Data**Environmental Conditions**

Temperature:	29°C
Relative Humidity:	61 %
ATM Pressure:	101 kPa

* The testing was performed by Lion Xiao on 2015-11-09

Test mode: Transmitting

Test Result: Compliant. Please refer to following plots.

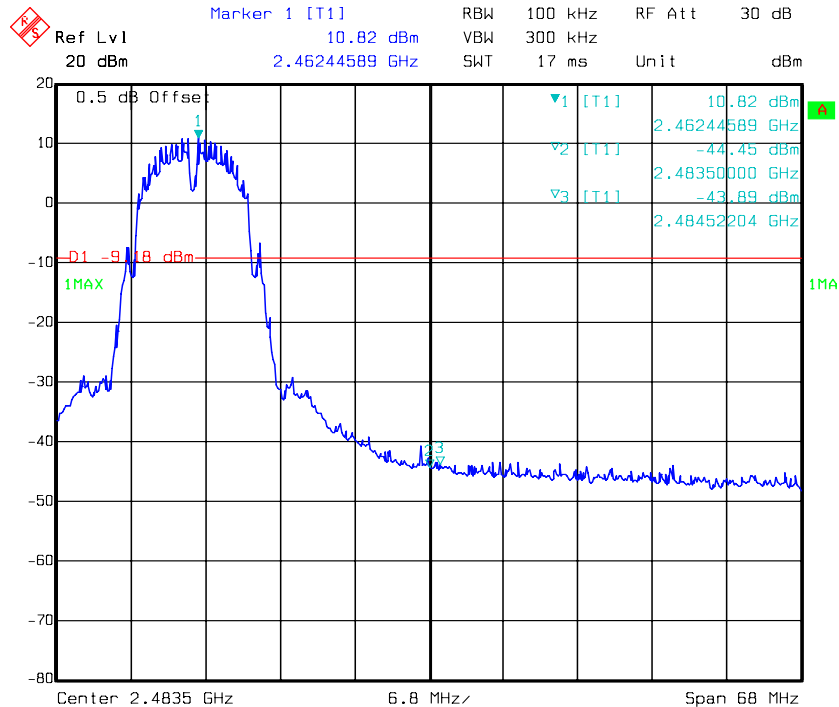
Chain 0

802.11b: Band Edge, Left Side



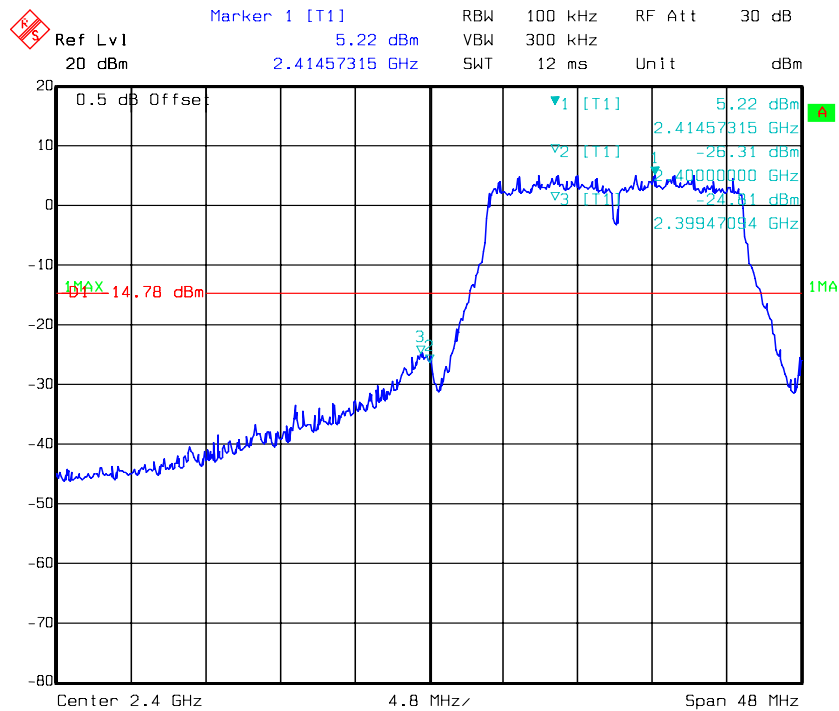
Date: 09.NOV.2015 09:59:05

802.11b: Band Edge, Right Side



Date: 09.NOV.2015 10:14:34

802.11g: Band Edge, Left Side



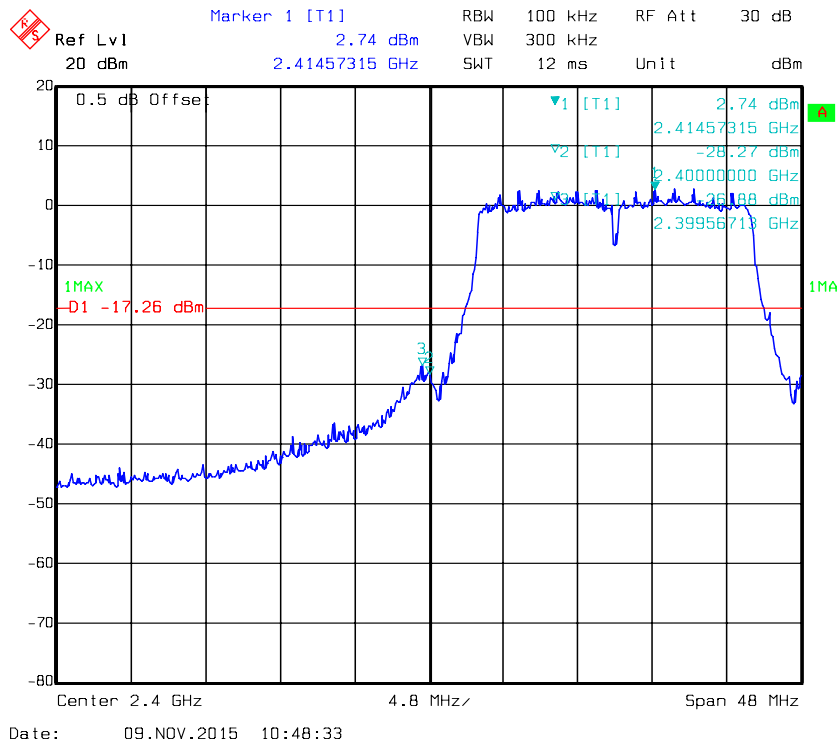
Date: 09.NOV.2015 10:25:25

802.11g: Band Edge, Right Side

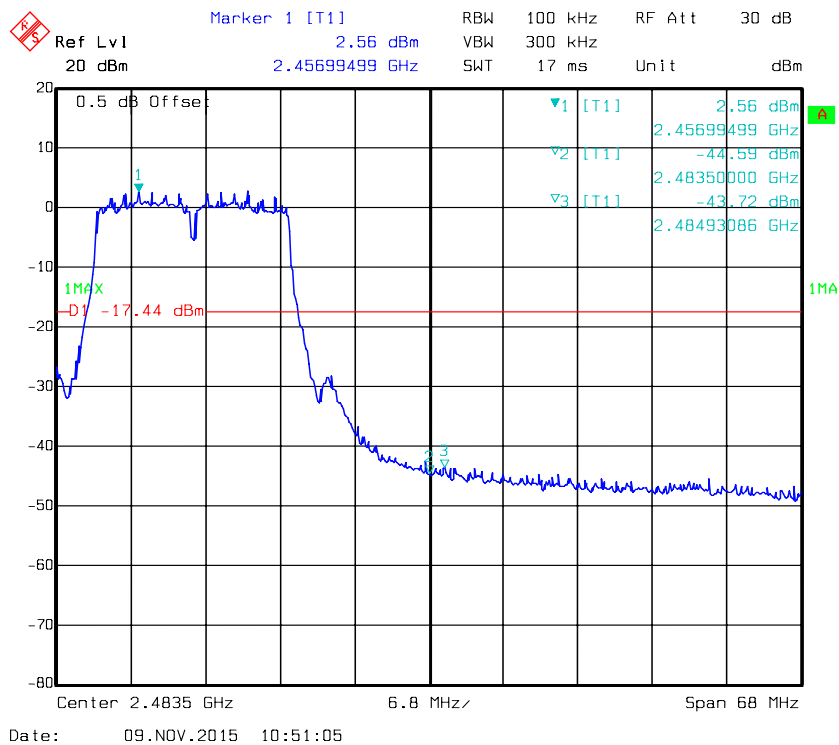


Date: 09.NOV.2015 10:31:59

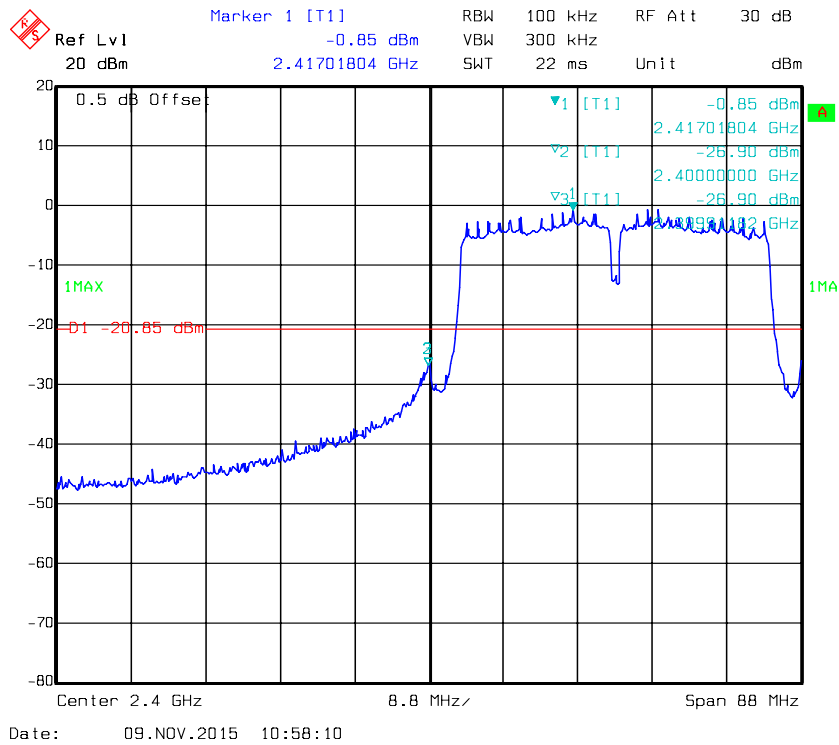
802.11n ht20 Band Edge, Left Side



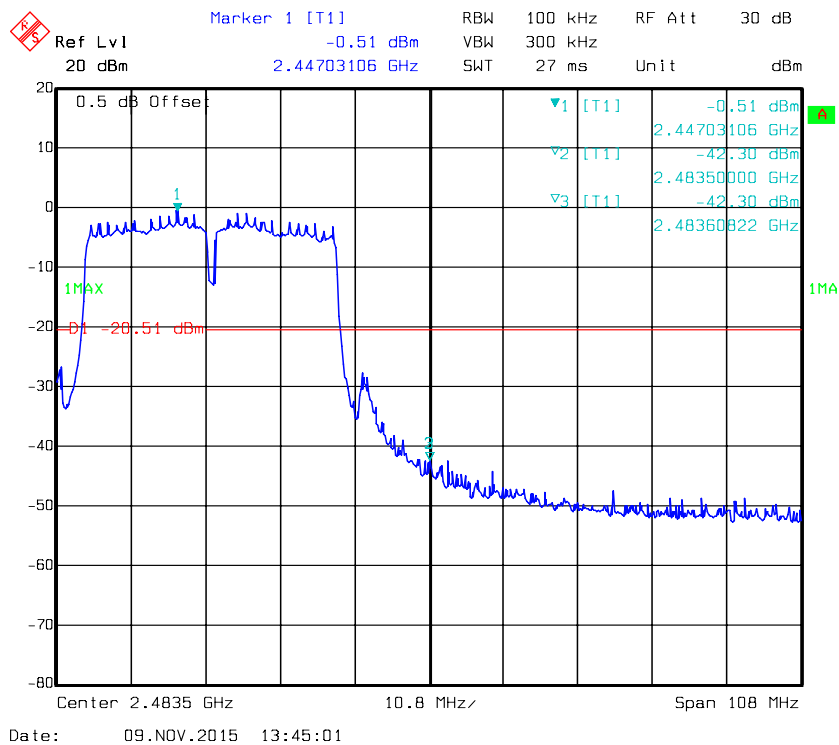
802.11n ht20 Band Edge, Right Side



802.11n ht40 Band Edge, Left Side

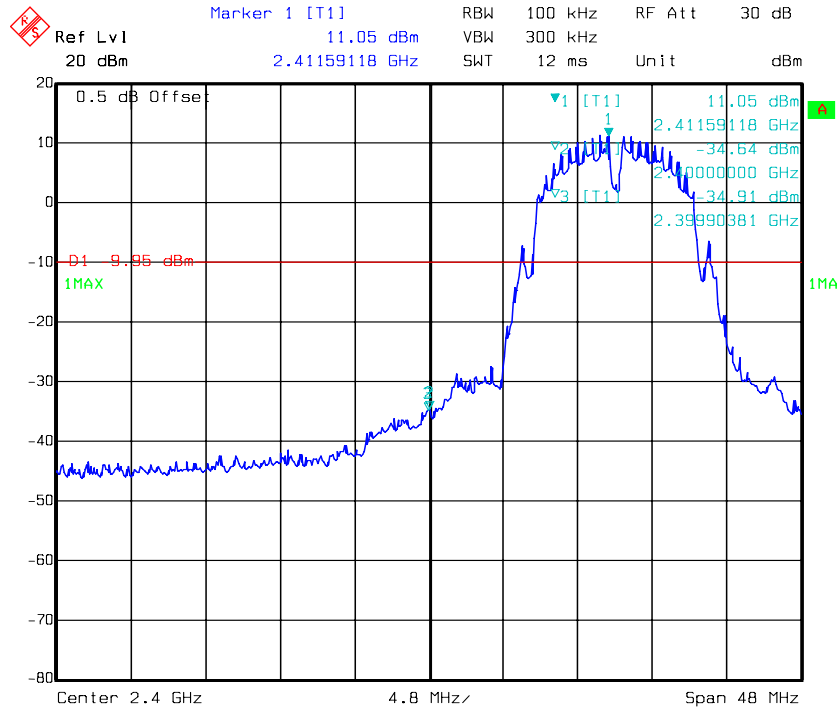


802.11n ht40 Band Edge, Right Side



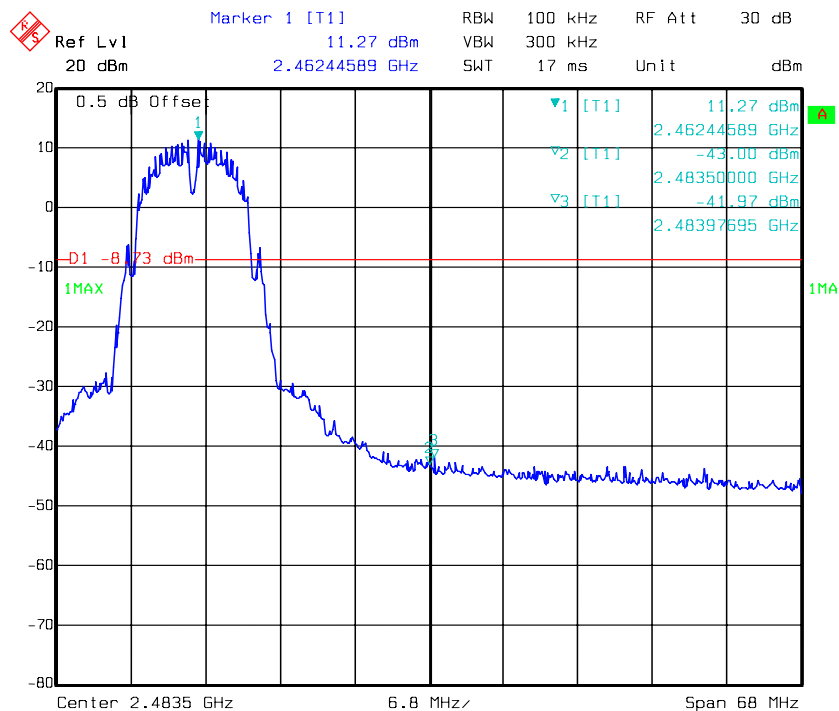
Chain 1

802.11b: Band Edge, Left Side



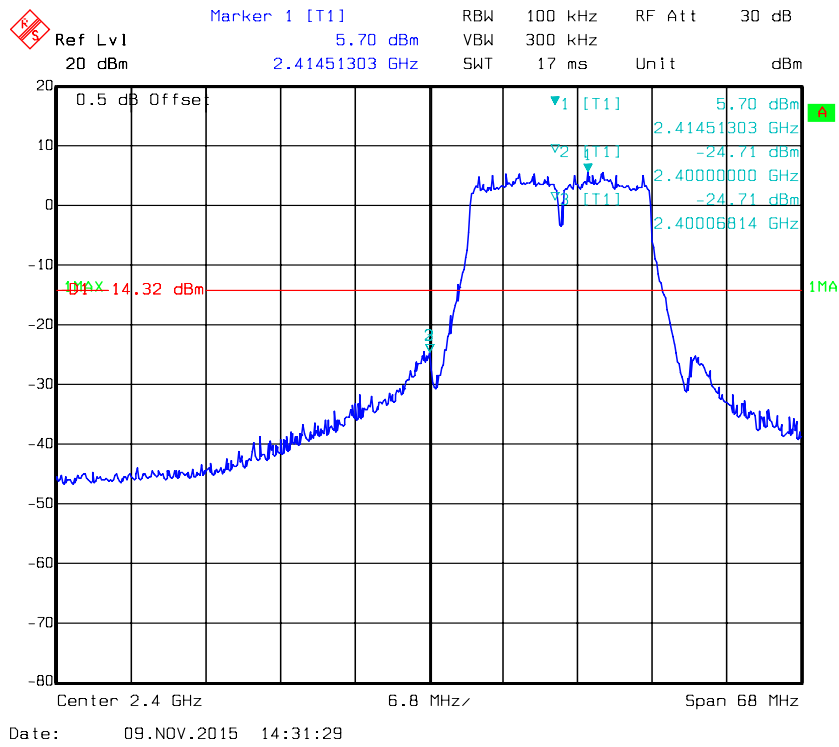
Date: 09.NOV.2015 14:36:59

802.11b: Band Edge, Right Side

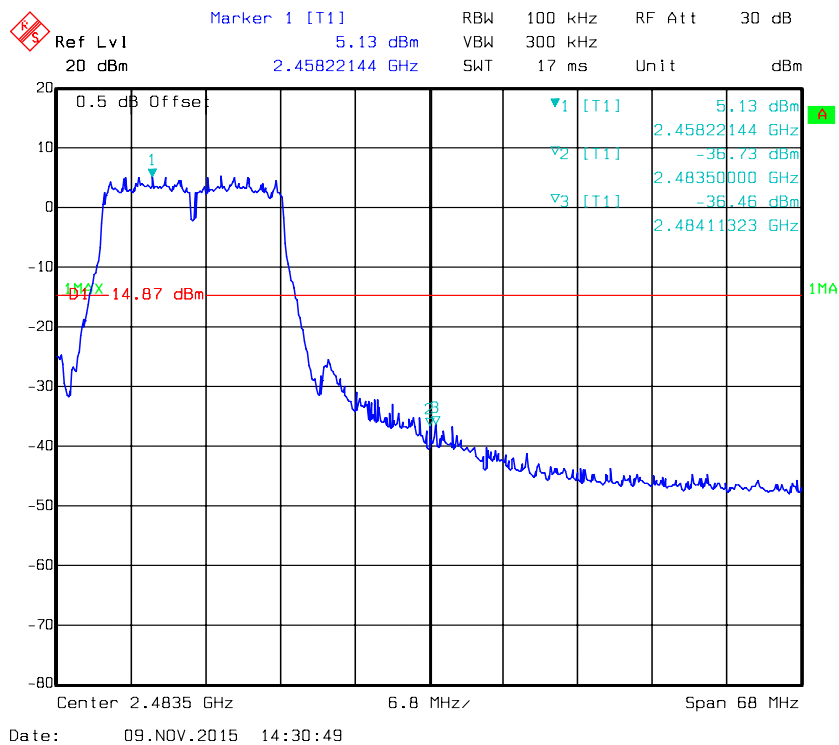


Date: 09.NOV.2015 14:49:57

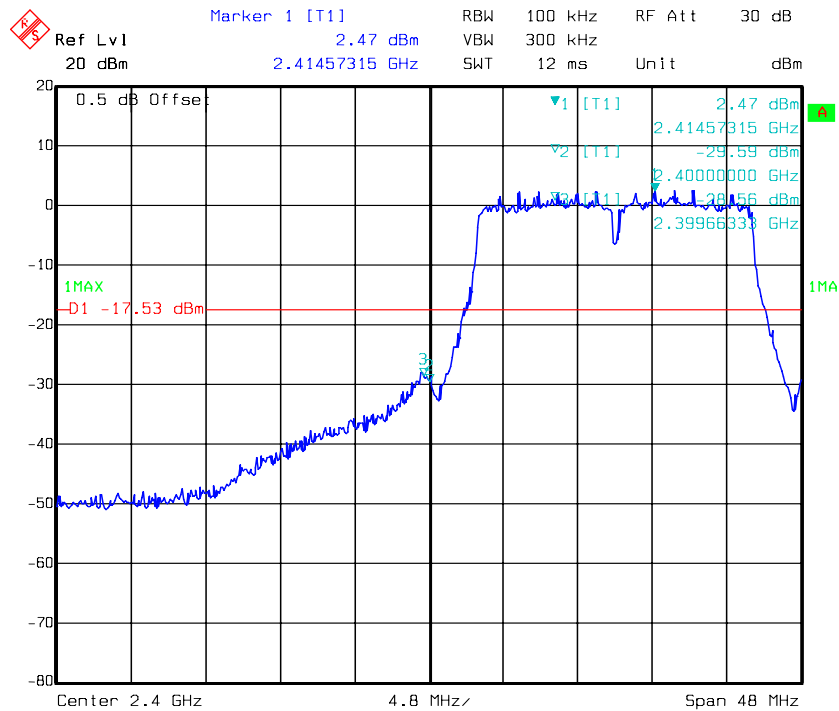
802.11g: Band Edge, Left Side



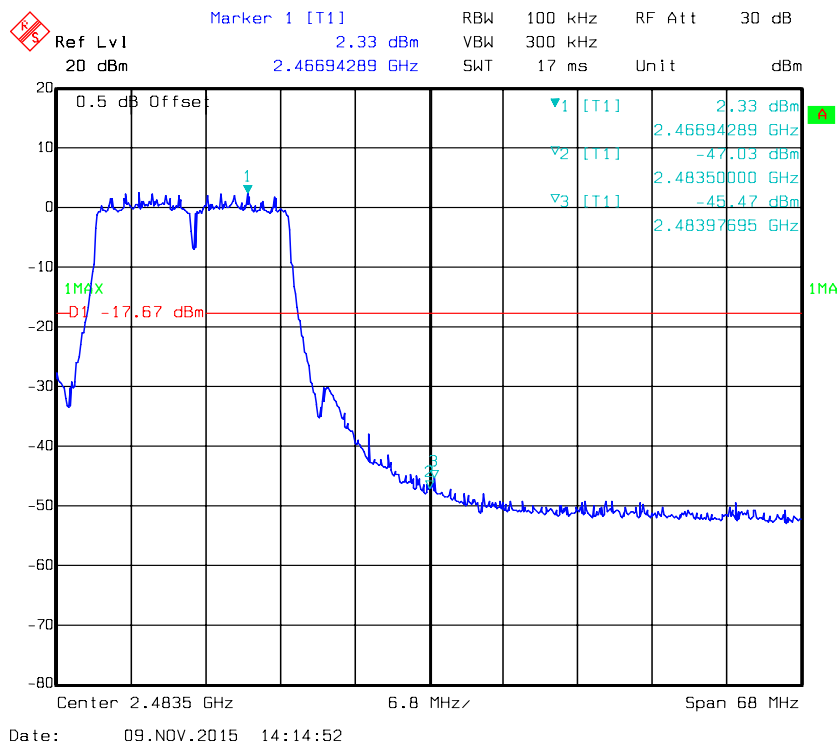
802.11g: Band Edge, Right Side



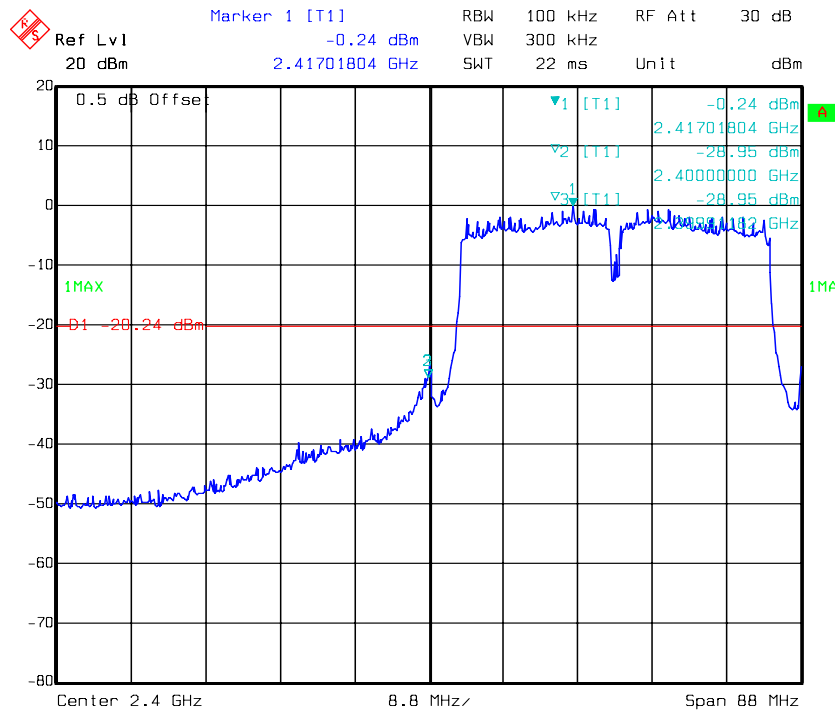
802.11n ht20 Band Edge, Left Side



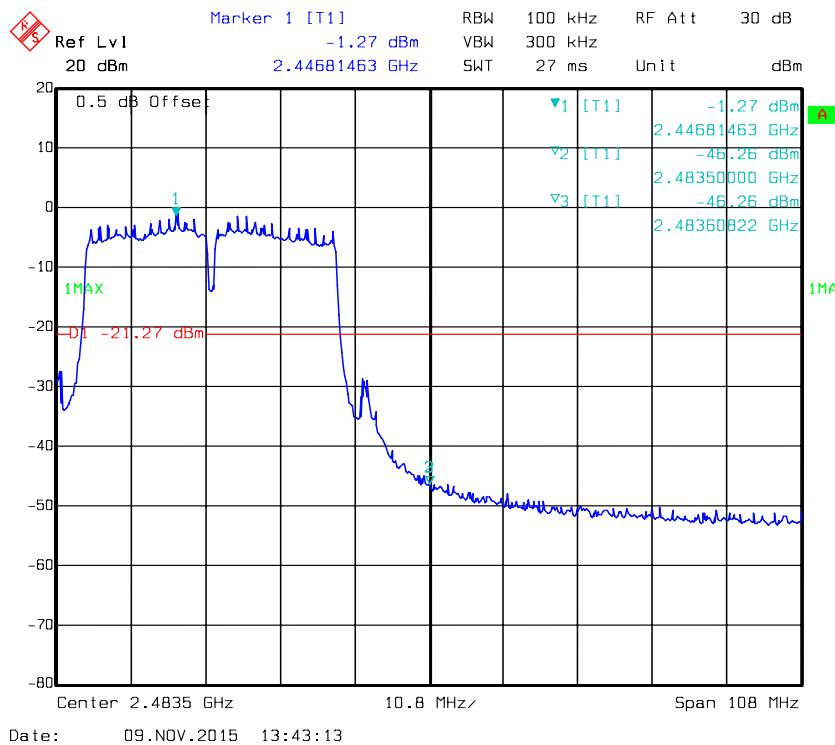
802.11n ht20 Band Edge, Right Side



802.11n ht40 Band Edge, Left Side



802.11n ht40 Band Edge, Right Side



FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r03

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- 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
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09

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

Test Data

Environmental Conditions

Temperature:	29 °C
Relative Humidity:	61%
ATM Pressure:	101 kPa

* The testing was performed by Lion Xiao on 2015-11-09

Test Mode: Transmitting

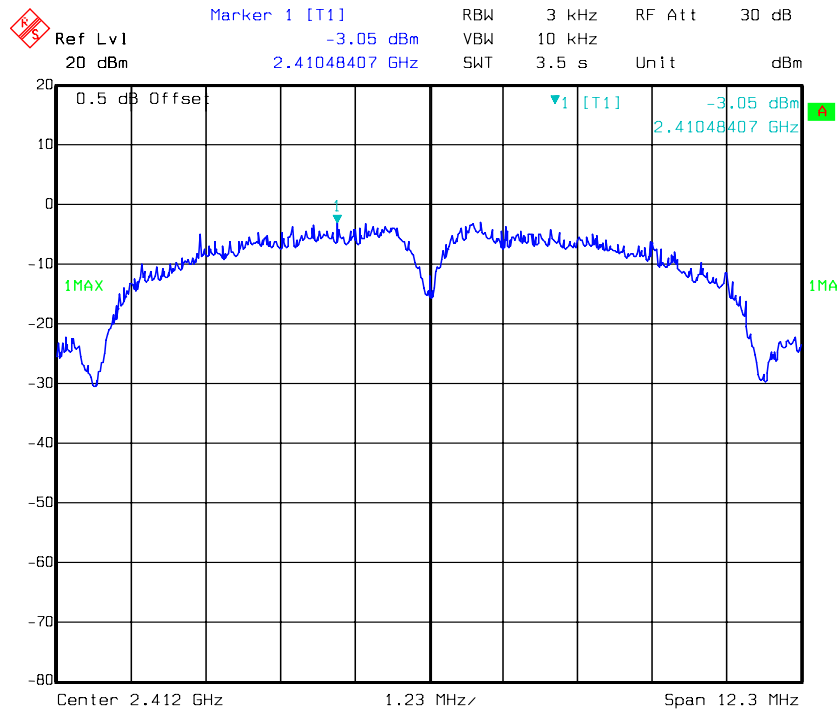
Test Result: Compliant. Please refer to the following table and plots

Mode	Channel	Frequency	PSD (dBm/3kHz)			Limit (dBm/3kHz)
		MHz	Chain 0	Chain 1	Total	
802.11b	Low	2412	-3.05	-3.03	/	≤ 8
	Middle	2437	-3.04	-3.02	/	≤ 8
	High	2462	-3.02	-3.05	/	≤ 8
802.11g	Low	2412	-8.40	-8.37	/	≤ 8
	Middle	2437	-8.31	-8.38	/	≤ 8
	High	2462	-8.49	-8.41	/	≤ 8
802.11n20	Low	2412	-11.03	-11.08	-8.04	≤ 6
	Middle	2437	-11.13	-11.11	-8.11	≤ 6
	High	2462	-11.07	-11.18	-8.11	≤ 6
802.11n40	Low	2422	-14.72	-14.70	-11.70	≤ 6
	Middle	2437	-14.73	-14.77	-11.74	≤ 6
	High	2452	-14.75	-14.65	-11.69	≤ 6

Note: 1. Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi = $5 + 10 \log(2) = 8$ dBi, so the limit shall be reduced to $8 - 2 = 6$ dBm
 2. Duty cycle is 100%.

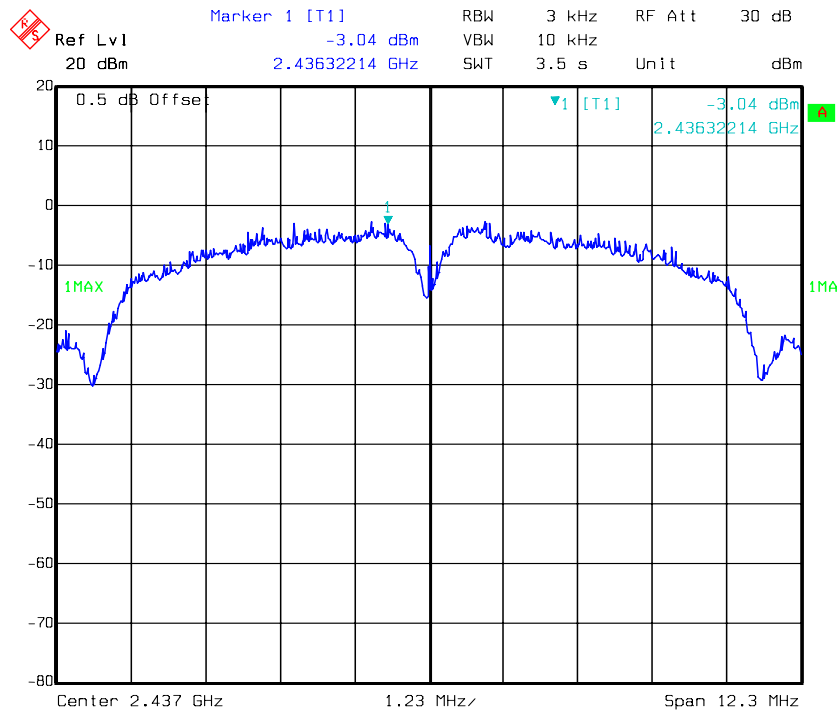
Chain 0

Power Spectral Density, 802.11b 2412 MHz



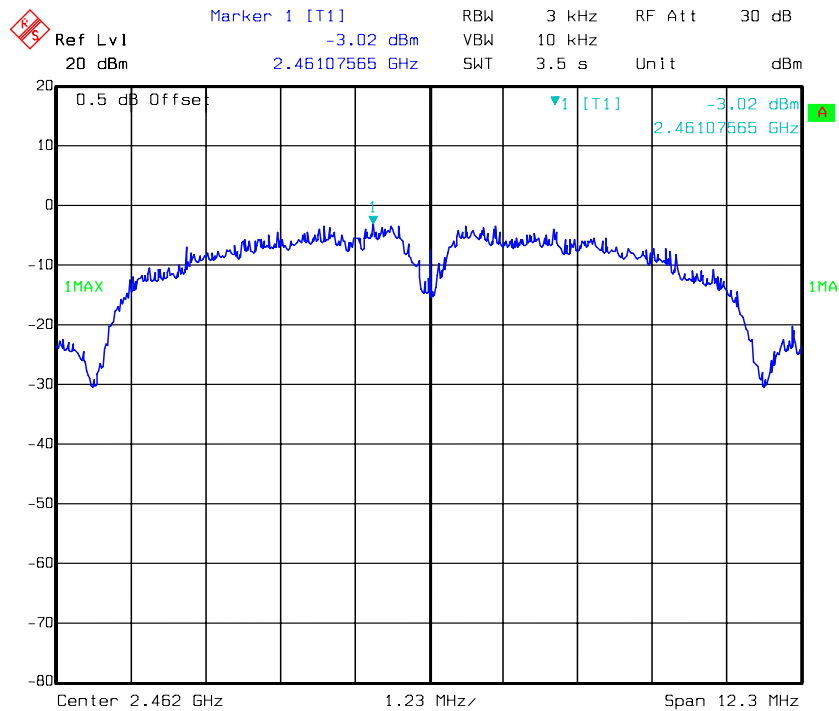
Date: 09.NOV.2015 10:03:37

Power Spectral Density, 802.11b 2437 MHz

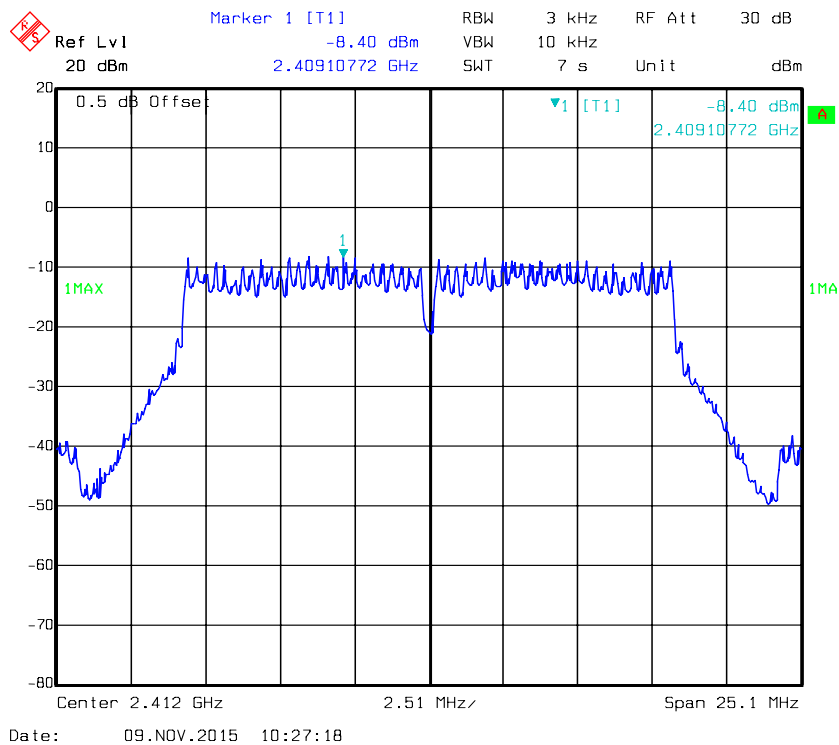


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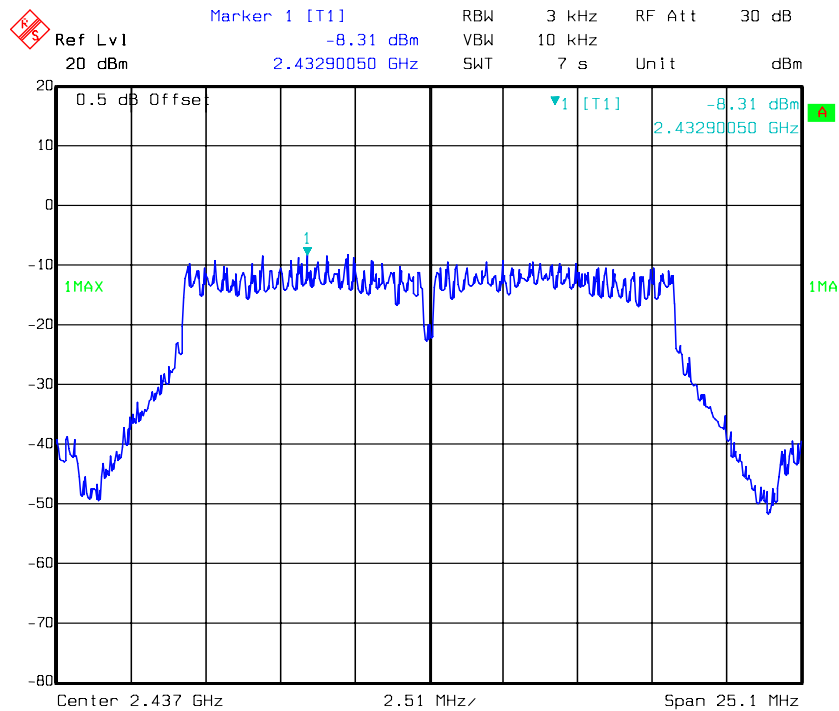
Power Spectral Density, 802.11b 2462 MHz



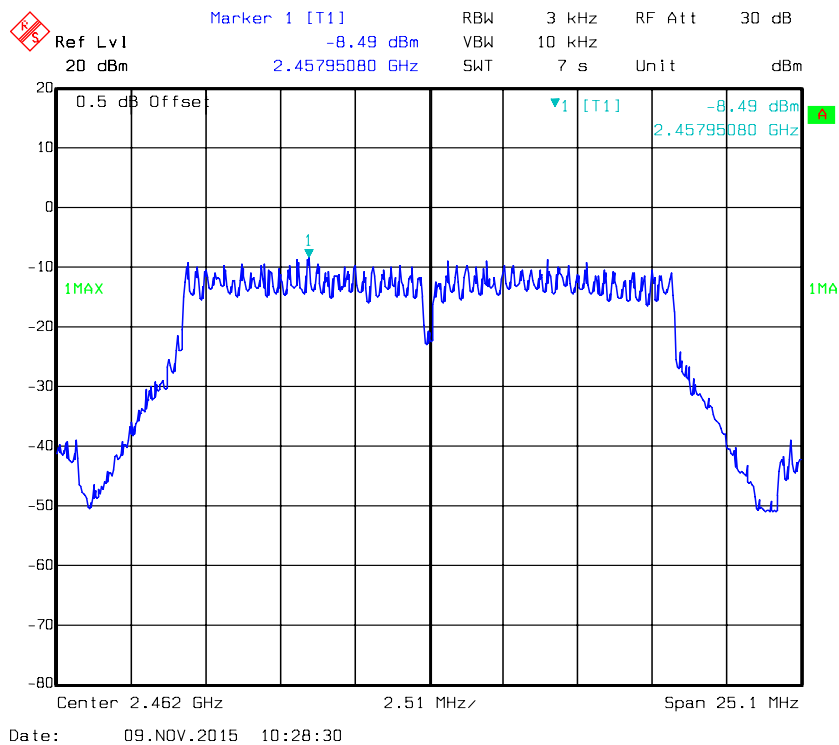
Power Spectral Density, 802.11g 2412 MHz



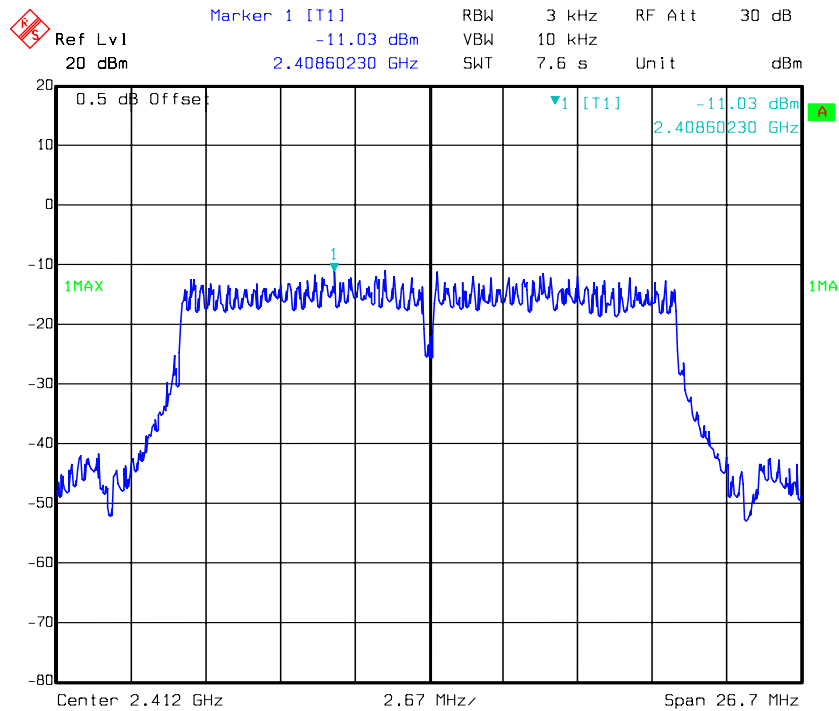
Power Spectral Density, 802.11g 2437 MHz



Power Spectral Density, 802.11g 2462 MHz

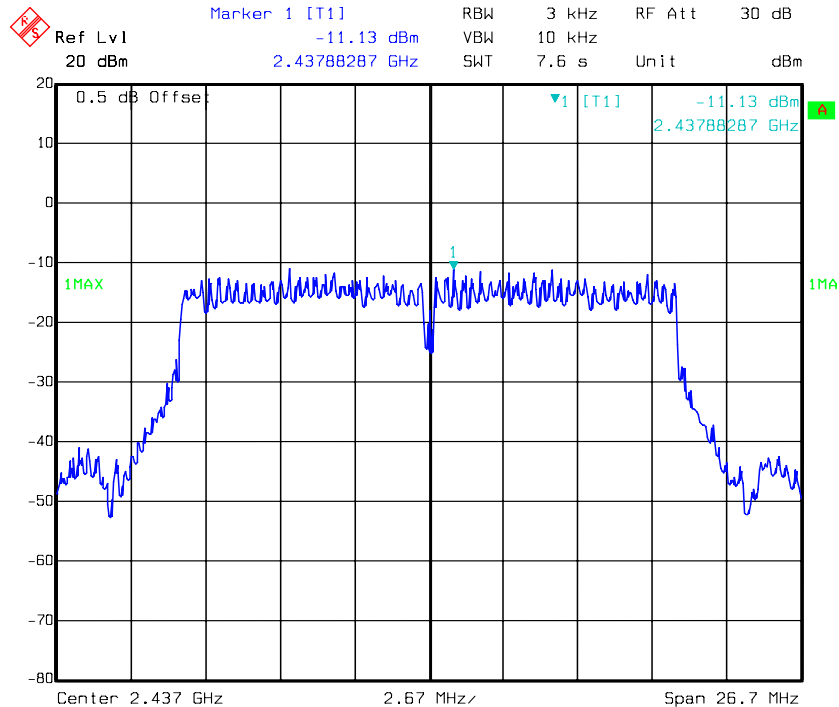


Power Spectral Density, 802.11n ht20 2412 MHz



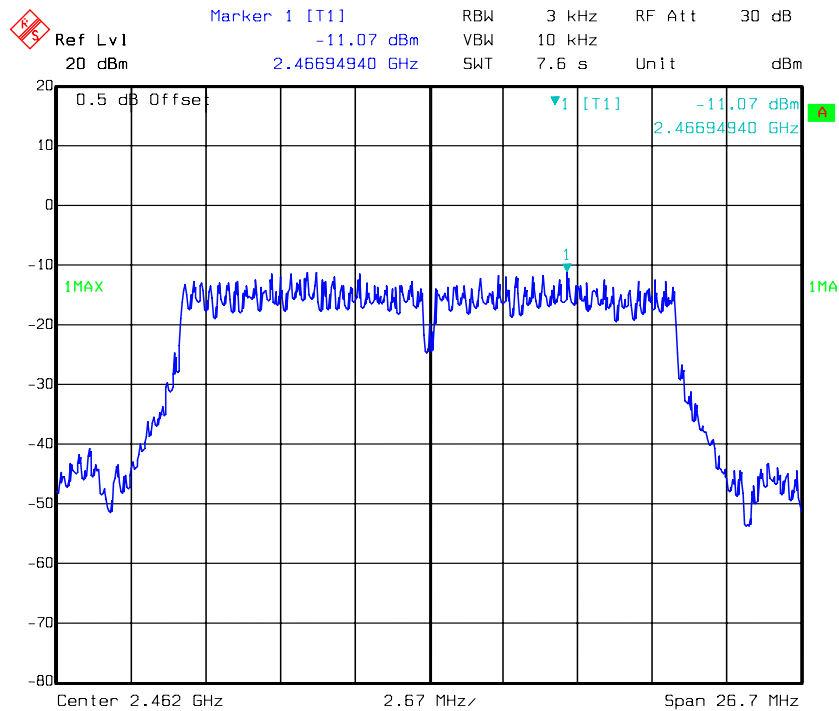
Date: 09.NOV.2015 10:45:30

Power Spectral Density, 802.11n ht20 2437 MHz

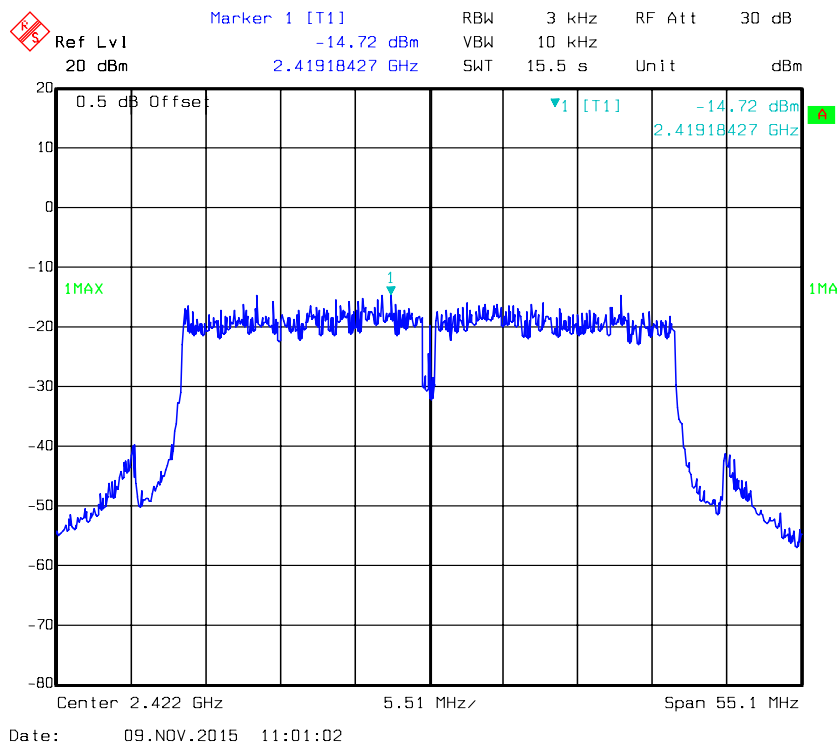


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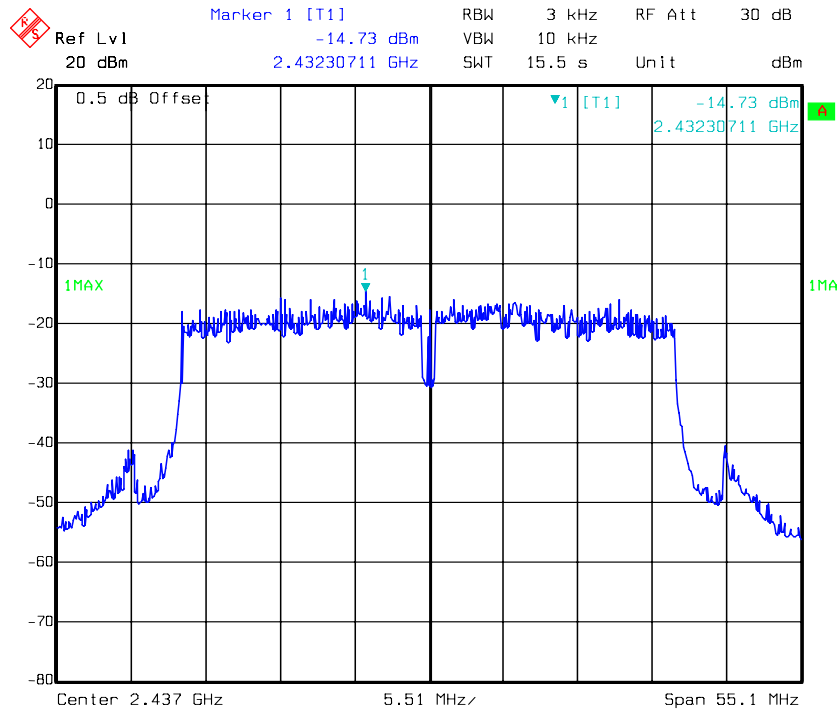
Power Spectral Density, 802.11n ht20 2462 MHz



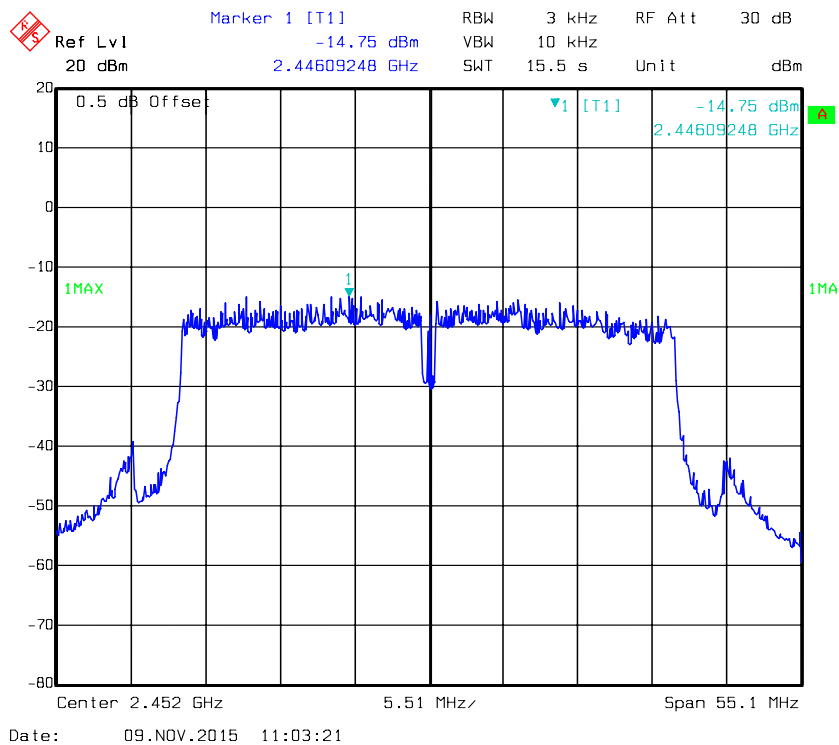
Power Spectral Density, 802.11n ht40 2422 MHz



Power Spectral Density, 802.11n ht40 2437 MHz

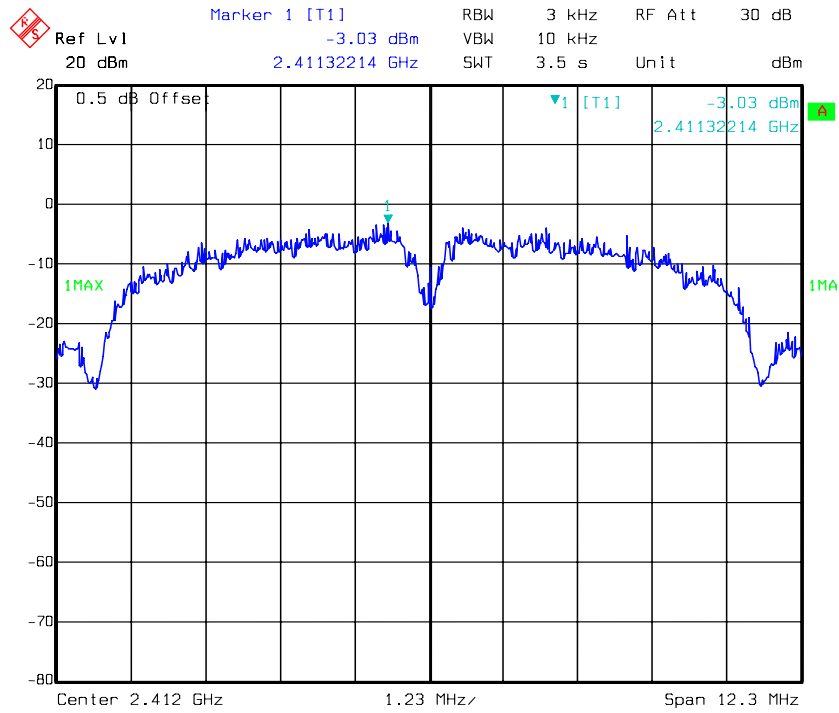


Power Spectral Density, 802.11n ht40 2452 MHz

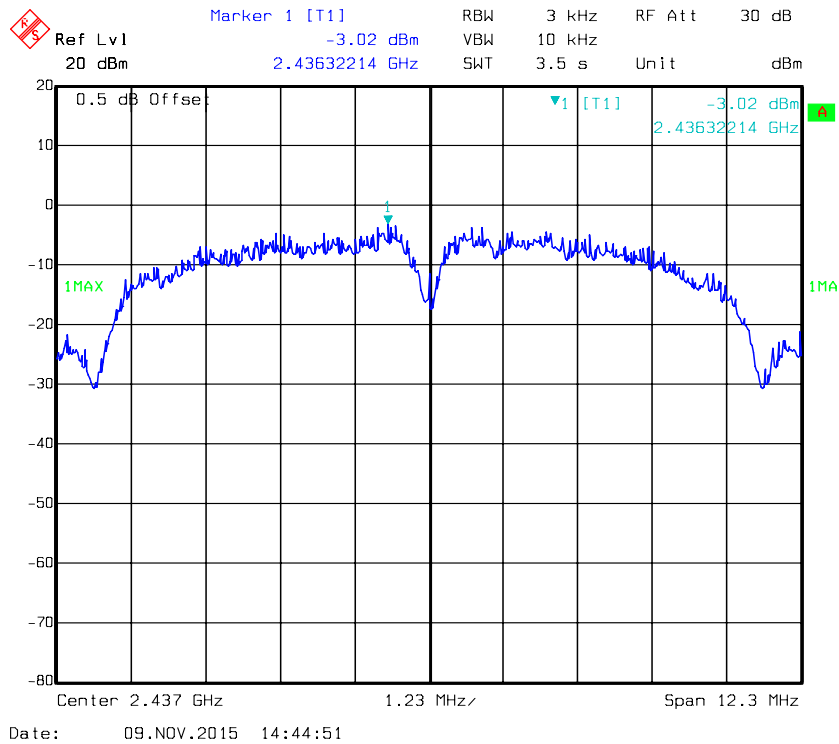


Chain 1

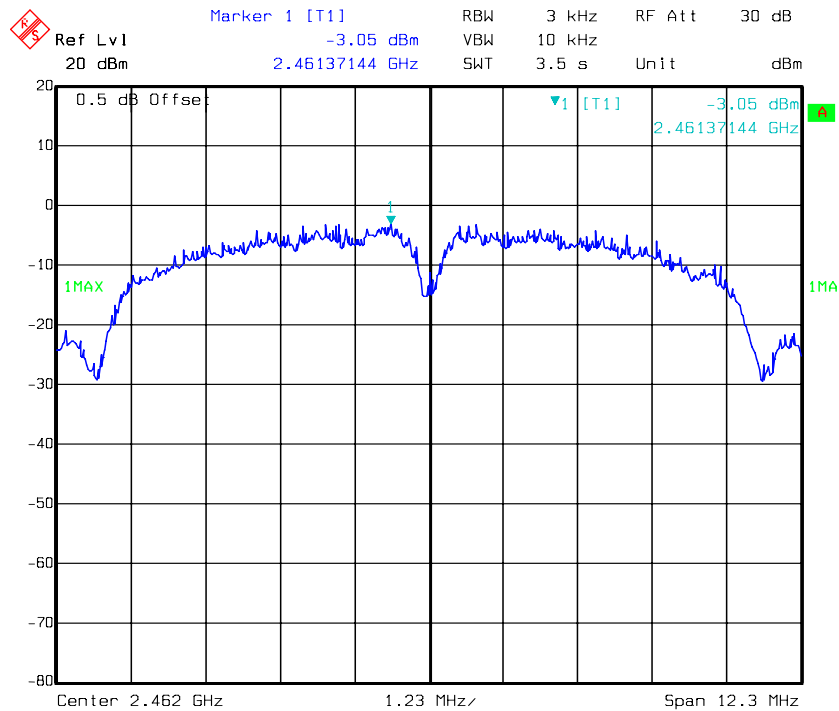
Power Spectral Density, 802.11b 2412 MHz



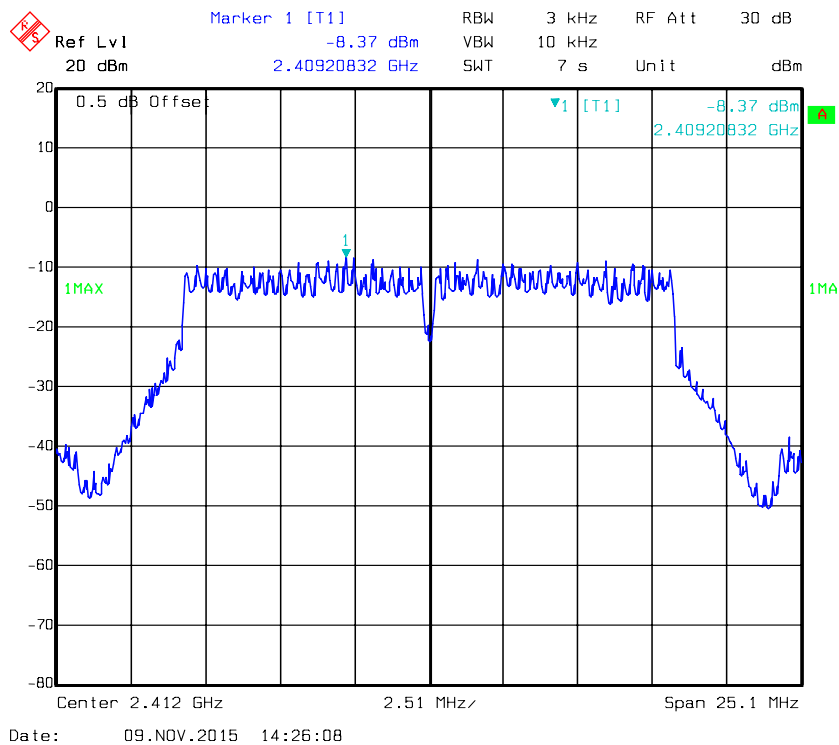
Power Spectral Density, 802.11b 2437 MHz



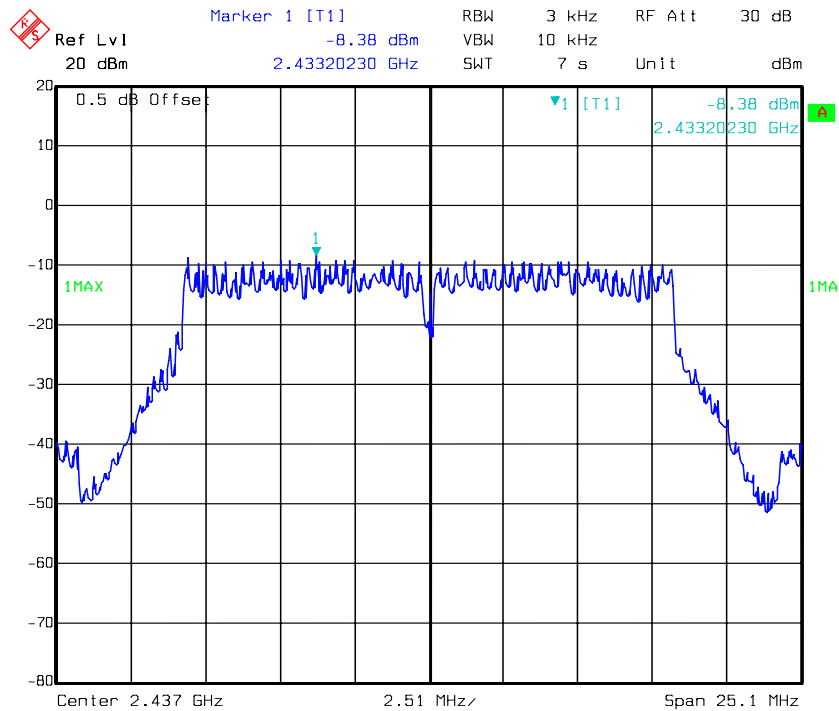
Power Spectral Density, 802.11b 2462 MHz



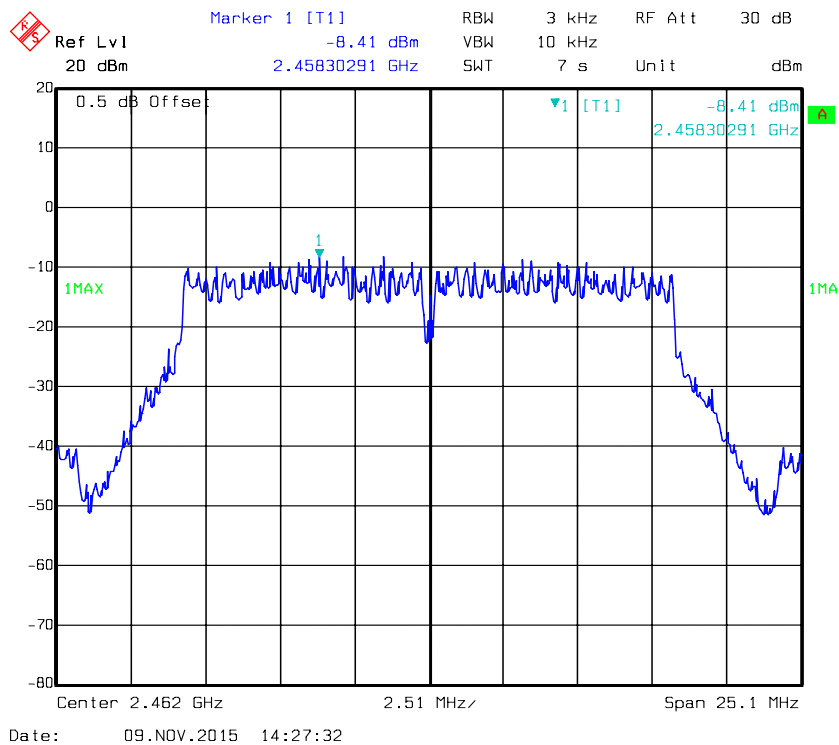
Power Spectral Density, 802.11g 2412 MHz



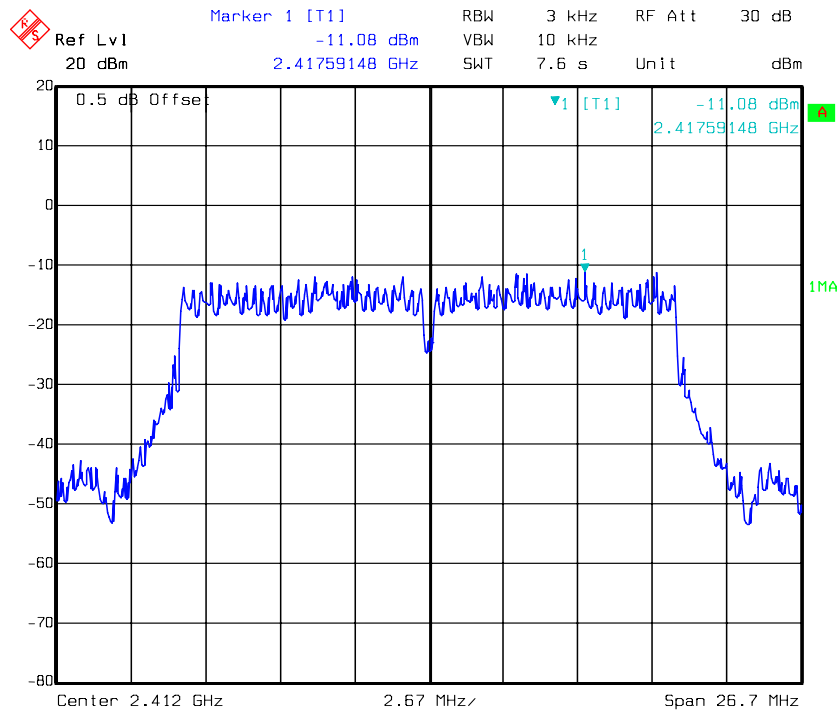
Power Spectral Density, 802.11g 2437 MHz



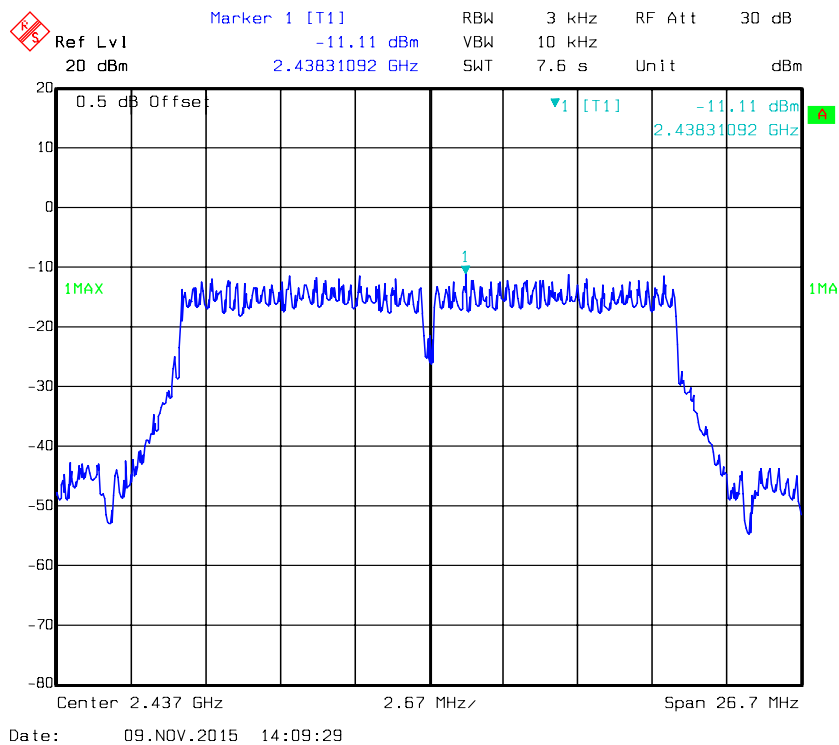
Power Spectral Density, 802.11g 2462 MHz



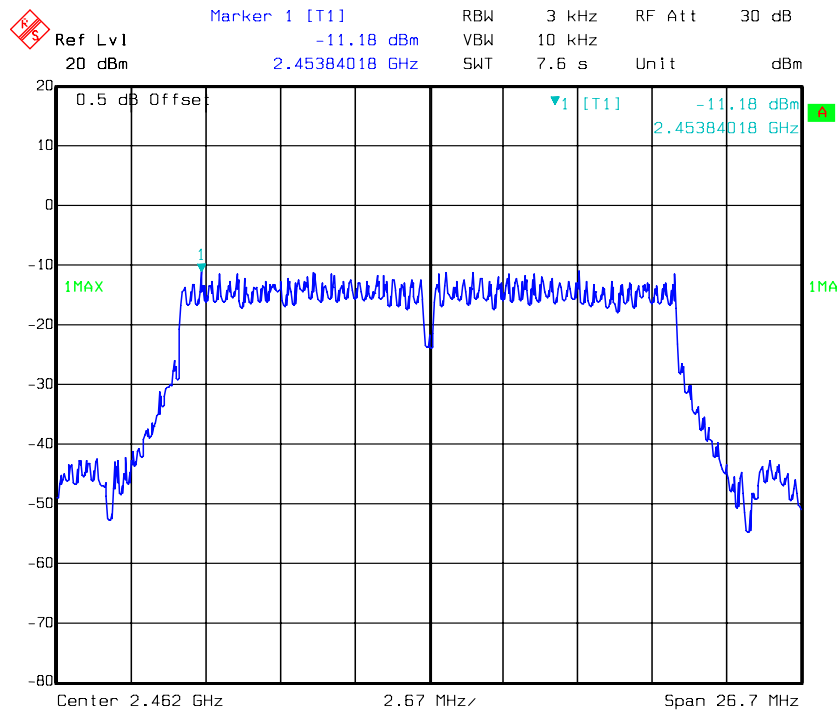
Power Spectral Density, 802.11n ht20 2412 MHz



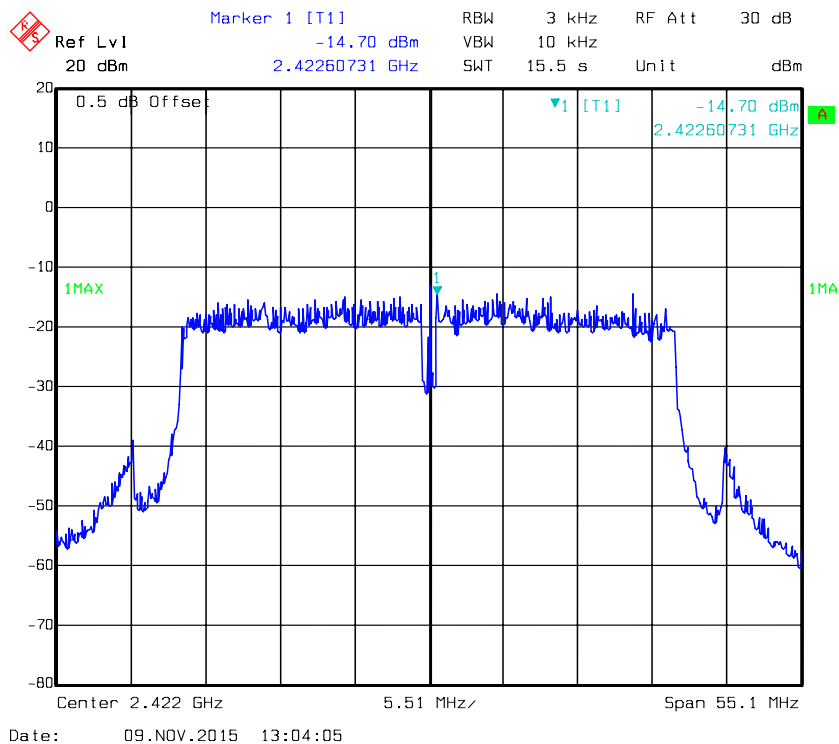
Power Spectral Density, 802.11n ht20 2437 MHz



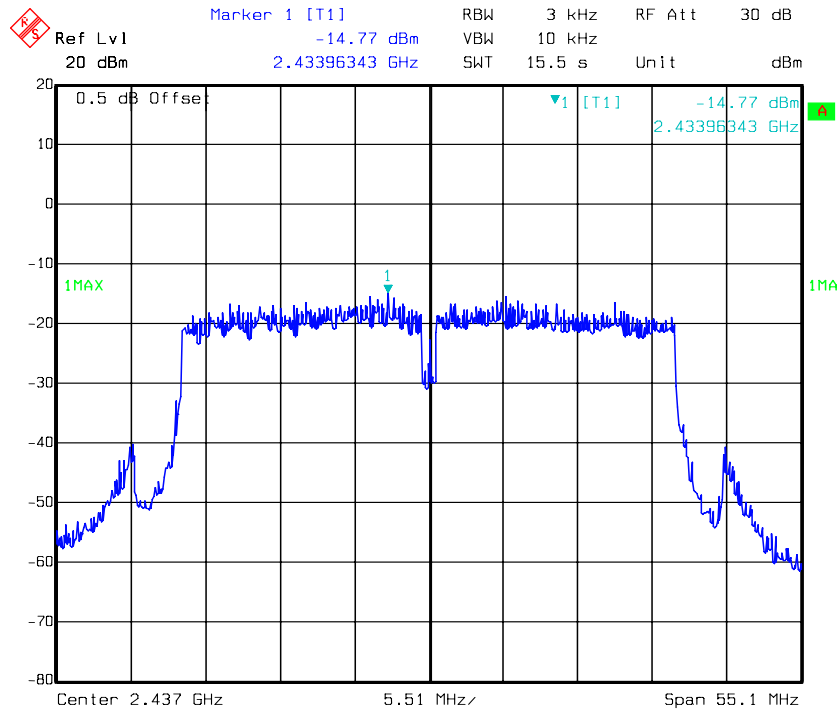
Power Spectral Density, 802.11n ht20 2462 MHz



Power Spectral Density, 802.11n ht40 2422 MHz

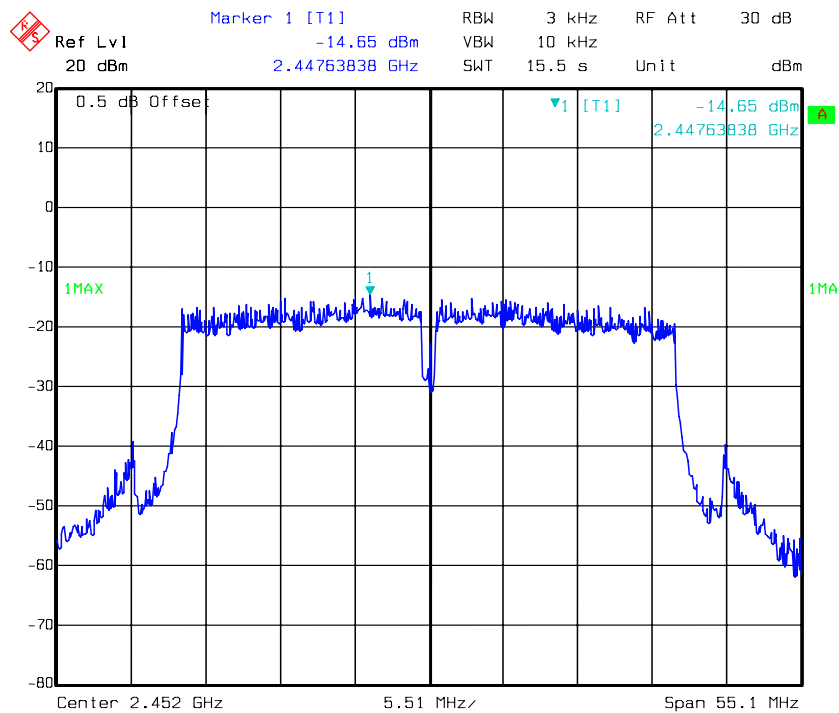


Power Spectral Density, 802.11n ht40 2437 MHz



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Power Spectral Density, 802.11n ht40 2452 MHz



Date: 09.NOV.2015 13:48:29

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