FCC PART 15.247

TEST REPORT

For

Fujian Landi Commercial Equipment Co., Ltd.

No.68, Hong Shan Yuan Road, Gulou District, Fuzhou Municipality, Fujian Province, P.R. China.

FCC ID: 2AG6N-E820RFWDWF

Report Type:	**Product Type:**
Original Report	POS Payment Terminal

Test Engineer:	Lion Xiao
Report Number:	RXM160127053-00C
Report Date:	2016-03-10
Reviewed By:	Sula Huang RF Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Fujian Landi Commercial Equipment Co., Ltd.*'s product, model number: *E820* (the "EUT") in this report was a *POS Payment Terminal*, which was measured approximately: 14.6 cm (L) x 8.0cm (W) x 3.6 cm (H), rated input voltage: DC3.6V rechargeable Li-ion battery or DC5.0V charging from adapter or base.

Adapter#1 information:
Model: HKA04824018-8D
Input: AC100-240V, 50/60 Hz, 1.2A
Output: DC24.0V, 1.8A

Adapter#2 information:
Model: HKA00505010-XA
Input: AC100-240V, 50/60 Hz, 0.2A
Output: DC 5.0V, 1.0A

All measurement and test data in this report was gathered from production sample serial number: 160127053 (Assigned by BACL, Dongguan). The EUT was received on 2016-02-16.

Objective

This report is prepared on behalf of *Fujian Landi Commercial Equipment 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)

FCC Part 15C DXX submissions with FCC ID: 2AG6N-E820RFWDWF.
FCC Part 22H, 24E PCB submissions with FCC ID: 2AG6N-E820RFWDWF.
FCC Part15B JBP submissions with FCC ID: 2AG6N-E820RFWDWF.

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 WLAN, 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.

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	Engineering Mode		
802.11b	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	N/A	N/A	N/A
802.11g	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	N/A	N/A	N/A
802.11n ht20	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	N/A	N/A	N/A

Support Equipment List and Details

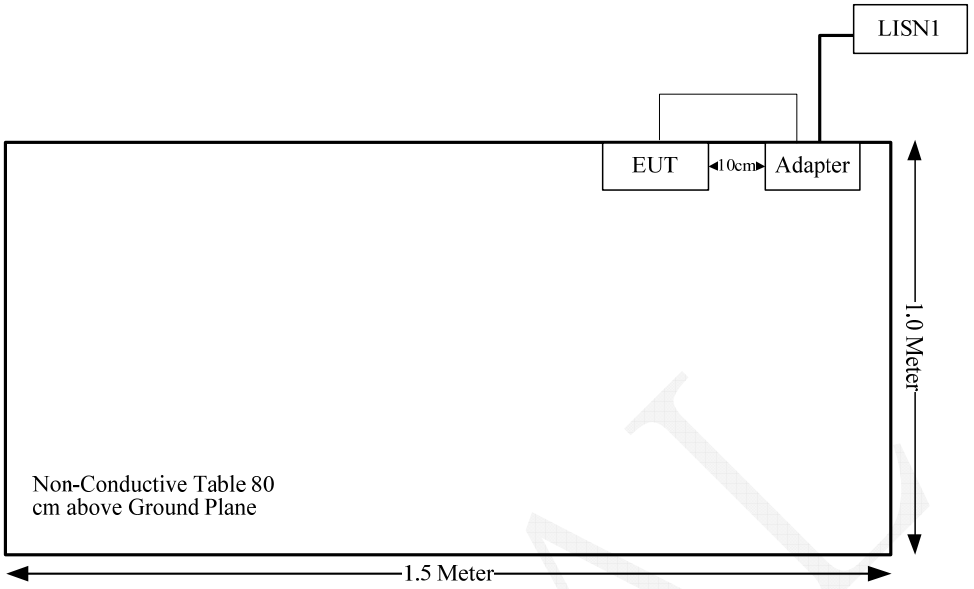
Manufacturer	Description	Model	Serial Number
/	/	/	/

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Adapter#1 Cable	no	yes	1.5	Adapter	EUT
Adapter#2 Cable	no	no	1.8	Adapter	EUT

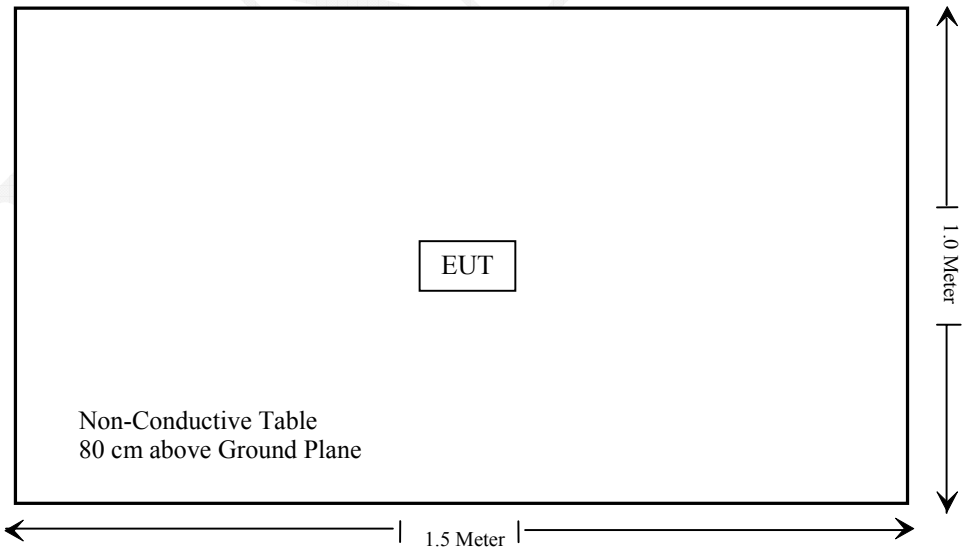
Block Diagram of Test Setup

AC power-line conducted emissions:

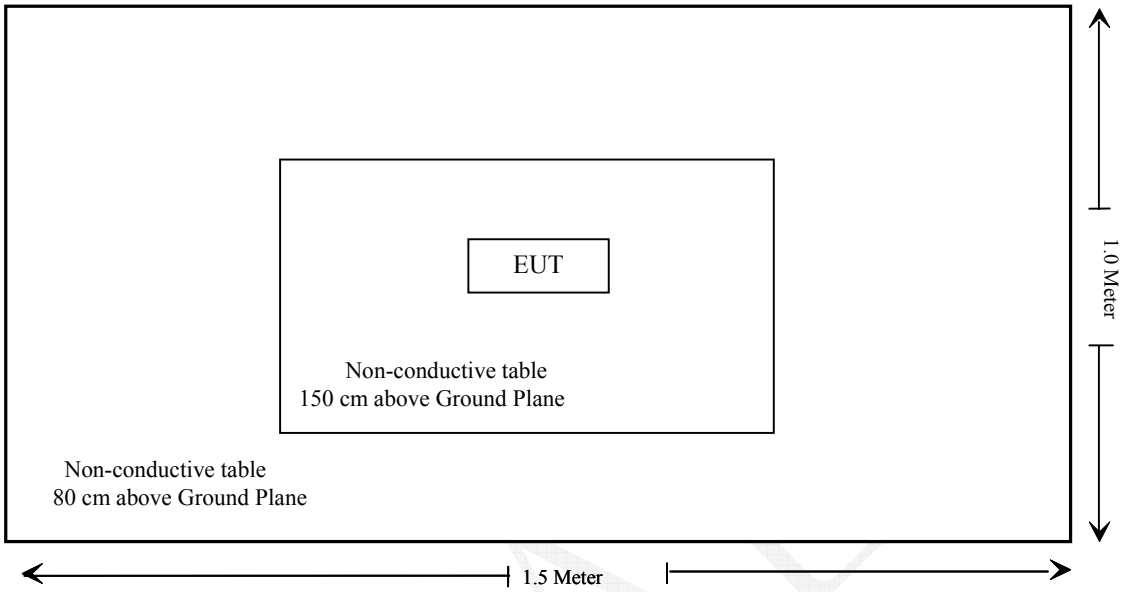


Radiated Emissions:

Below 1GHz:



Above 1GHz:


EUT
Non-conductive table
150 cm above Ground Plane
Non-conductive table
80 cm above Ground Plane
1.0 Meter
1.5 Meter

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1093	RF 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 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Test Result

Compliance, please refer to the SAR report: RXM160127055-20.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT has one integral antenna arrangement for Wi-Fi, which was permanently attached and the antenna gain is 1.7dBi, 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.

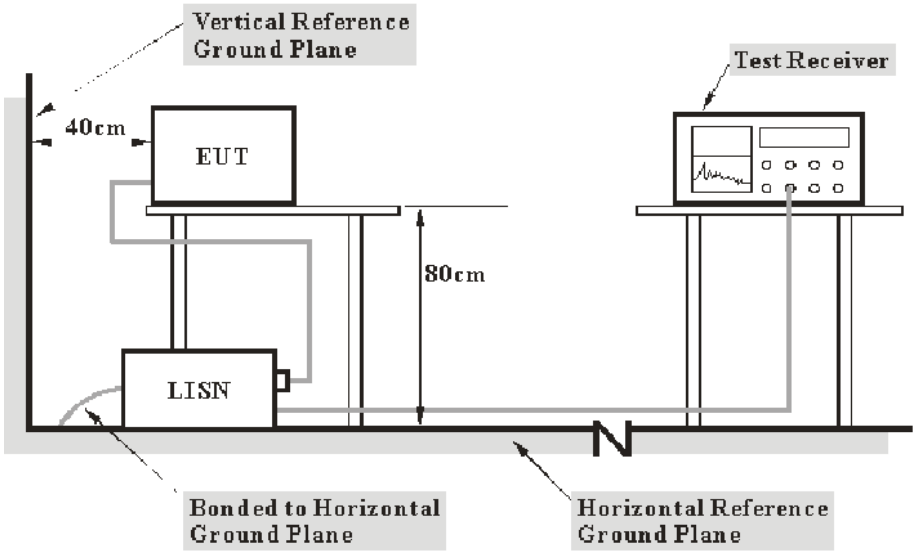
If U_{lab} is greater than U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), 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 3.12 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

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.

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:

Margin = Limit – 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	2015-12-10	2016-12-09
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	2015-11-26	2016-11-25
N/A	Coaxial Cable	1.8m	N/A	2015-05-06	2016-05-06
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:

10.90 dB at **0.922769 MHz** in the **Line** conducted mode

Test Data

Environmental Conditions

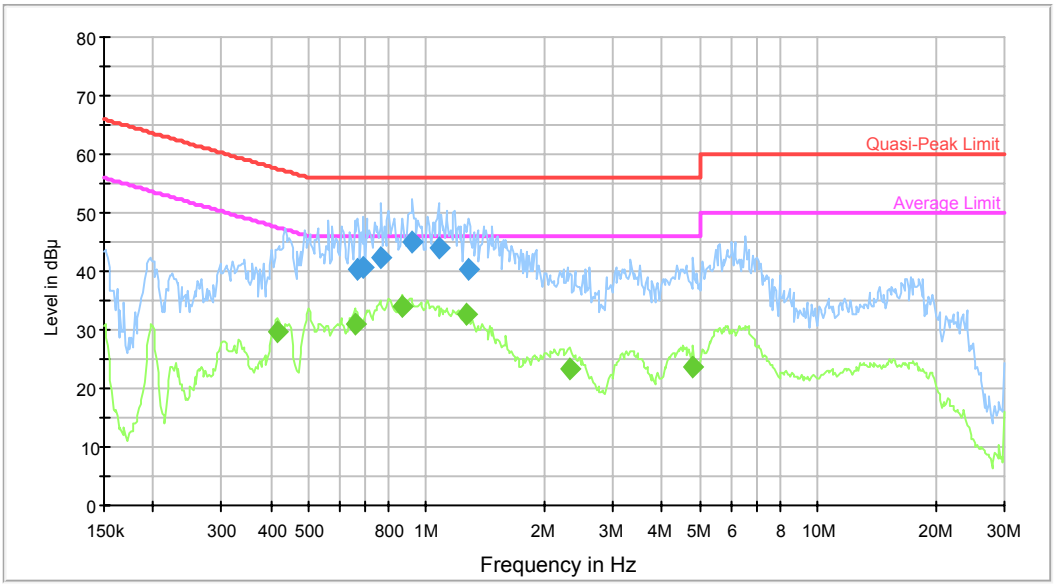
Temperature:	23.4°C
Relative Humidity:	42 %
ATM Pressure:	101.7 kPa

The testing was performed by Lion Xiao on 2016-02-23.

Test Mode: Transmitting

Adapter#1

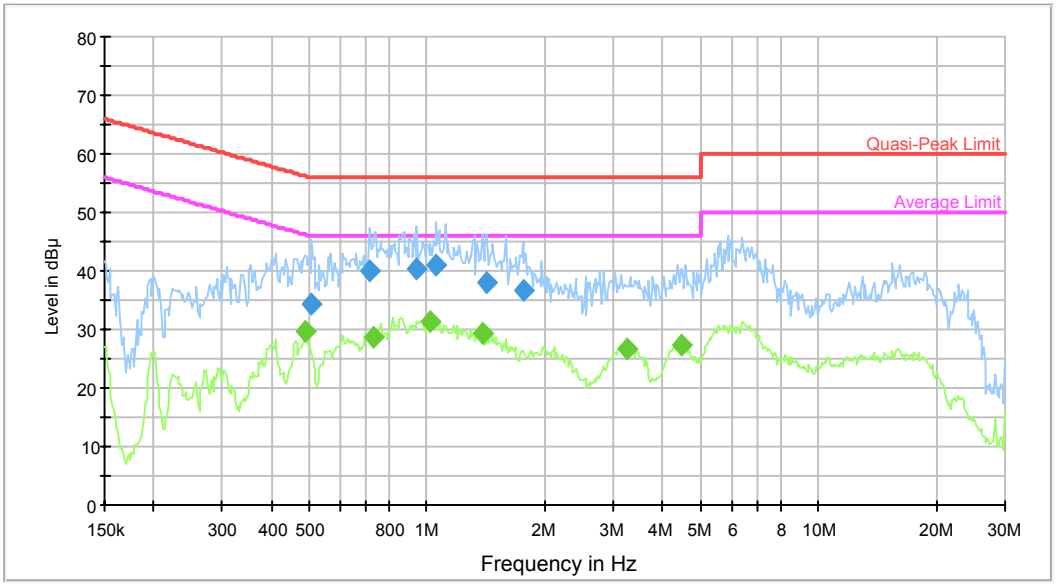
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.665597	40.3	9.000	L1	9.8	15.7	56.0	Compliance
0.692650	40.6	9.000	L1	9.8	15.4	56.0	Compliance
0.768247	42.2	9.000	L1	9.8	13.8	56.0	Compliance
0.922769	45.1	9.000	L1	9.8	10.9	56.0	Compliance
1.073601	43.9	9.000	L1	9.8	12.1	56.0	Compliance
1.279307	40.3	9.000	L1	9.8	15.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.415949	29.7	9.000	L1	9.8	17.8	47.5	Compliance
0.655073	30.9	9.000	L1	9.8	15.1	46.0	Compliance
0.865782	34.0	9.000	L1	9.8	12.0	46.0	Compliance
1.269154	32.5	9.000	L1	9.8	13.5	46.0	Compliance
2.325491	23.3	9.000	L1	9.8	22.7	46.0	Compliance
4.802010	23.8	9.000	L1	9.9	22.2	46.0	Compliance

AC120 V, 60 Hz, Neutral:

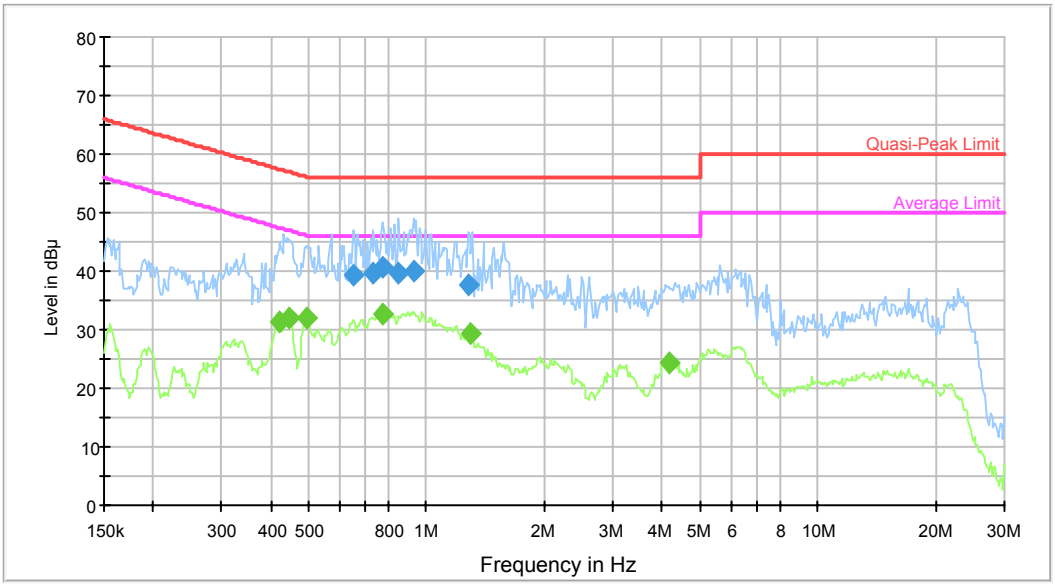


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.507637	34.4	9.000	N	9.7	21.6	56.0	Compliance
0.715082	39.9	9.000	N	9.7	16.1	56.0	Compliance
0.945093	40.3	9.000	N	9.8	15.7	56.0	Compliance
1.056628	40.8	9.000	N	9.8	15.2	56.0	Compliance
1.418932	37.8	9.000	N	9.8	18.2	56.0	Compliance
1.759527	36.6	9.000	N	9.8	19.4	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.487810	29.8	9.000	N	9.7	16.4	46.2	Compliance
0.732382	28.6	9.000	N	9.7	17.4	46.0	Compliance
1.023481	31.3	9.000	N	9.8	14.7	46.0	Compliance
1.385415	29.4	9.000	N	9.8	16.6	46.0	Compliance
3.249802	26.8	9.000	N	9.8	19.2	46.0	Compliance
4.469698	27.4	9.000	N	9.9	18.6	46.0	Compliance

Adapter#2

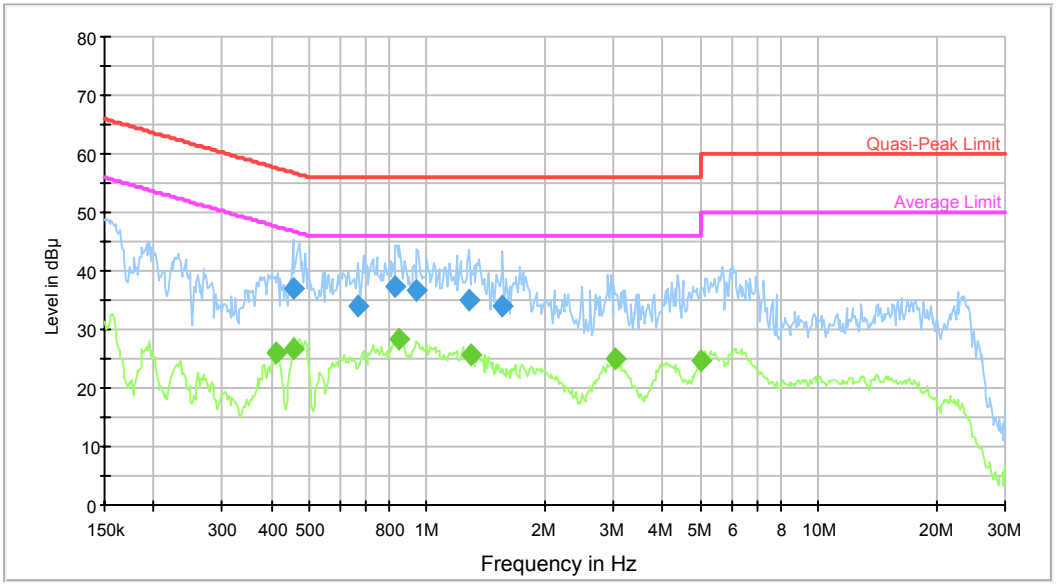
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.649874	39.2	9.000	L1	9.8	16.8	56.0	Compliance
0.732382	39.5	9.000	L1	9.8	16.5	56.0	Compliance
0.774393	40.6	9.000	L1	9.8	15.4	56.0	Compliance
0.852094	39.7	9.000	L1	9.8	16.3	56.0	Compliance
0.930151	39.9	9.000	L1	9.8	16.1	56.0	Compliance
1.279307	37.8	9.000	L1	9.8	18.2	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.419276	31.4	9.000	L1	9.8	16.1	47.5	Compliance
0.446873	32.0	9.000	L1	9.8	14.9	46.9	Compliance
0.491712	32.1	9.000	L1	9.8	14.0	46.1	Compliance
0.774393	32.8	9.000	L1	9.8	13.2	46.0	Compliance
1.289541	29.5	9.000	L1	9.8	16.5	46.0	Compliance
4.160384	24.4	9.000	L1	9.9	21.6	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.454052	36.9	9.000	N	9.7	19.9	56.8	Compliance
0.665597	34.1	9.000	N	9.7	21.9	56.0	Compliance
0.831967	37.2	9.000	N	9.7	18.8	56.0	Compliance
0.945093	36.6	9.000	N	9.8	19.4	56.0	Compliance
1.279307	35.0	9.000	N	9.8	21.0	56.0	Compliance
1.561306	34.1	9.000	N	9.8	21.9	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.409372	26.2	9.000	N	9.7	21.5	47.7	Compliance
0.457684	26.7	9.000	N	9.7	20.0	46.7	Compliance
0.845331	28.3	9.000	N	9.8	17.7	46.0	Compliance
1.289541	25.6	9.000	N	9.8	20.4	46.0	Compliance
3.024908	24.8	9.000	N	9.8	21.2	46.0	Compliance
4.997188	24.5	9.000	N	9.9	21.5	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_{cispr} 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_{cispr} of Table 2, 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.

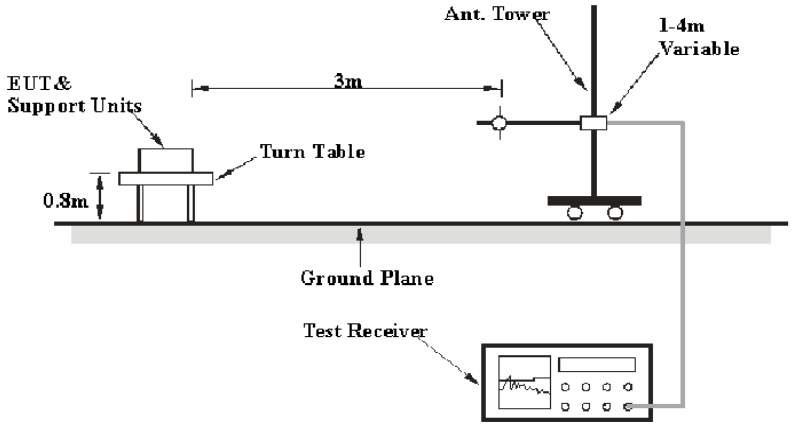
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

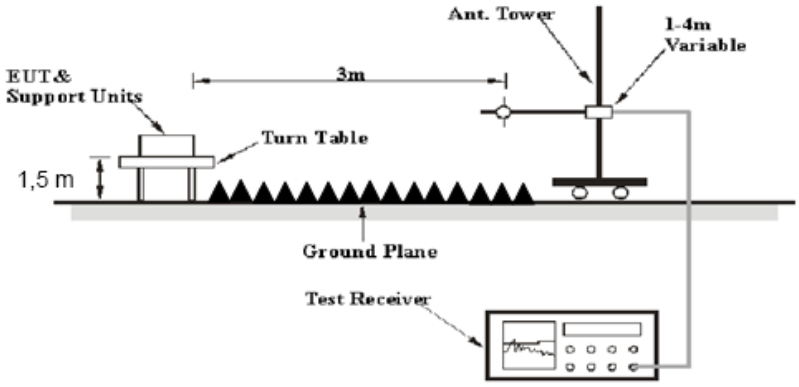
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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.

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	/	AV

Test Procedure

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

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

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Loss + 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 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	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2016-02-19	2017-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
Ducommun Technolagies	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
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06

*** 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:

1.62 dB at **7236 MHz i**n the **Vertical** polarization for **802.11 b** Mode

Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	44 %
ATM Pressure:	101.4kPa

** The testing was performed by Lion Xiao on 2016-02-22.*

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)					
Low Channel: 2412 MHz									
2412	66.62	PK	H	25.67	3.68	0.00	95.97	N/A	N/A
2412	62.76	AV	H	25.67	3.68	0.00	92.11	N/A	N/A
2412	72.02	PK	V	25.67	3.68	0.00	101.37	N/A	N/A
2412	68.57	AV	V	25.67	3.68	0.00	97.92	N/A	N/A
2400	27.13	PK	V	25.64	3.65	0.00	56.42	74.00	17.58
2400	15.47	AV	V	25.64	3.65	0.00	44.76	54.00	9.24
4824	40.89	PK	V	30.64	5.03	27.41	49.15	74.00	24.85
4824	32.81	AV	V	30.64	5.03	27.41	41.07	54.00	12.93
7236	42.91	PK	V	34.17	6.65	25.90	57.83	74.00	16.17
7236	37.46	AV	V	34.17	6.65	25.90	52.38	54.00	1.62
9648	31.51	PK	V	36.06	8.55	27.46	48.66	74.00	25.34
9648	19.28	AV	V	36.06	8.55	27.46	36.43	54.00	17.57
3445	37.84	PK	V	28.62	4.96	27.22	44.20	74.00	29.80
3445	25.33	AV	V	28.62	4.96	27.22	31.69	54.00	22.31
279.5	37.9	QP	V	13.77	2.02	21.51	32.18	46.00	13.82
Middle Channel: 2437 MHz									
2437	65.54	PK	H	25.74	3.75	0.00	95.03	N/A	N/A
2437	61.68	AV	H	25.74	3.75	0.00	91.17	N/A	N/A
2437	70.84	PK	V	25.74	3.75	0.00	100.33	N/A	N/A
2437	67.25	AV	V	25.74	3.75	0.00	96.74	N/A	N/A
4874	40.84	PK	V	30.77	5.14	27.42	49.33	74.00	24.67
4874	32.53	AV	V	30.77	5.14	27.42	41.02	54.00	12.98
7311	40.19	PK	V	34.35	6.74	25.88	55.40	74.00	18.60
7311	33.05	AV	V	34.35	6.74	25.88	48.26	54.00	5.74
9748	29.6	PK	V	36.30	8.61	27.24	47.27	74.00	26.73
9748	16.43	AV	V	36.30	8.61	27.24	34.10	54.00	19.90
3445	37.68	PK	V	28.62	4.96	27.22	44.04	74.00	29.96
3445	25.56	AV	V	28.62	4.96	27.22	31.92	54.00	22.08
3690	35.51	PK	V	29.22	4.62	27.32	42.03	74.00	31.97
3690	23.36	AV	V	29.22	4.62	27.32	29.88	54.00	24.12
279.5	37.1	QP	V	13.77	2.02	21.51	31.38	46.00	14.62
High Channel: 2462 MHz									
2462	64.12	PK	H	25.80	3.75	0.00	93.67	N/A	N/A
2462	60.5	AV	H	25.80	3.75	0.00	90.05	N/A	N/A
2462	69.49	PK	V	25.80	3.75	0.00	99.04	N/A	N/A
2462	65.86	AV	V	25.80	3.75	0.00	95.41	N/A	N/A
2483.5	27.7	PK	V	25.86	3.67	0.00	57.23	74.00	16.77
2483.5	15.91	AV	V	25.86	3.67	0.00	45.44	54.00	8.56
4924	39.46	PK	V	30.90	5.34	27.43	48.27	74.00	25.73
4924	32.17	AV	V	30.90	5.34	27.43	40.98	54.00	13.02
7386	41.37	PK	V	34.53	6.83	25.86	56.87	74.00	17.13
7386	34.69	AV	V	34.53	6.83	25.86	50.19	54.00	3.81
9848	29.38	PK	V	36.54	8.66	26.94	47.64	74.00	26.36
9848	16.21	AV	V	36.54	8.66	26.94	34.47	54.00	19.53
3445	37.98	PK	V	28.62	4.96	27.22	44.34	74.00	29.66
3445	25.62	AV	V	28.62	4.96	27.22	31.98	54.00	22.02
279.5	37.7	QP	V	13.77	2.02	21.51	31.98	46.00	14.02

802.11g Mode

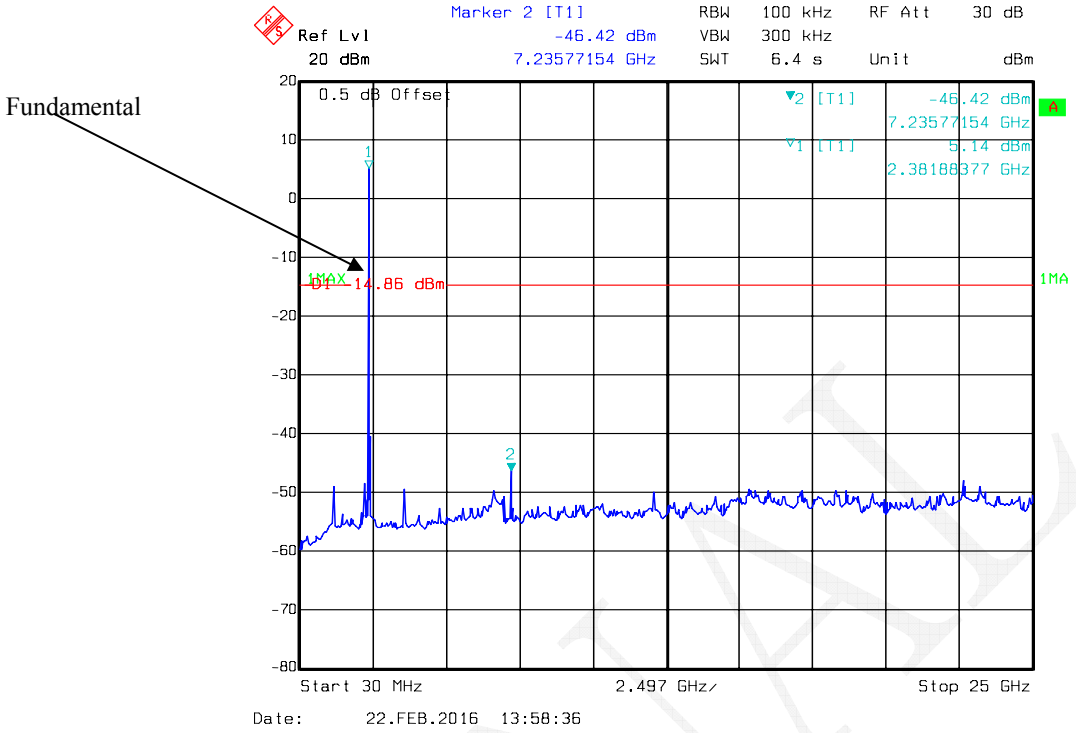
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	65.41	PK	H	25.67	3.68	0.00	94.76	N/A	N/A
2412	54.53	AV	H	25.67	3.68	0.00	83.88	N/A	N/A
2412	70.82	PK	V	25.67	3.68	0.00	100.17	N/A	N/A
2412	59.91	AV	V	25.67	3.68	0.00	89.26	N/A	N/A
2400	30.96	PK	V	25.64	3.65	0.00	60.25	74.00	13.75
2400	17.61	AV	V	25.64	3.65	0.00	46.90	54.00	7.10
4824	38.78	PK	V	30.64	5.03	27.41	47.04	74.00	26.96
4824	28.27	AV	V	30.64	5.03	27.41	36.53	54.00	17.47
7236	44.88	PK	V	34.17	6.65	25.90	59.80	74.00	14.20
7236	32.9	AV	V	34.17	6.65	25.90	47.82	54.00	6.18
9648	30.98	PK	V	36.06	8.55	27.46	48.13	74.00	25.87
9648	18.82	AV	V	36.06	8.55	27.46	35.97	54.00	18.03
3445	37.74	PK	V	28.62	4.96	27.22	44.10	74.00	29.90
3445	25.1	AV	V	28.62	4.96	27.22	31.46	54.00	22.54
279.5	37	QP	V	13.77	2.02	21.51	31.28	46.00	14.72
Middle Channel: 2437 MHz									
2437	64.43	PK	H	25.74	3.75	0.00	93.92	N/A	N/A
2437	53.54	AV	H	25.74	3.75	0.00	83.03	N/A	N/A
2437	69.85	PK	V	25.74	3.75	0.00	99.34	N/A	N/A
2437	58.94	AV	V	25.74	3.75	0.00	88.43	N/A	N/A
4874	38.57	PK	V	30.77	5.14	27.42	47.06	74.00	26.94
4874	28.03	AV	V	30.77	5.14	27.42	36.52	54.00	17.48
7311	43.14	PK	V	34.35	6.74	25.88	58.35	74.00	15.65
7311	31.19	AV	V	34.35	6.74	25.88	46.40	54.00	7.60
9748	30.83	PK	V	36.30	8.61	27.24	48.50	74.00	25.50
9748	18.71	AV	V	36.30	8.61	27.24	36.38	54.00	17.62
3445	37.81	PK	V	28.62	4.96	27.22	44.17	74.00	29.83
3445	25.37	AV	V	28.62	4.96	27.22	31.73	54.00	22.27
3690	35.31	PK	V	29.22	4.62	27.32	41.83	74.00	32.17
3690	23.52	AV	V	29.22	4.62	27.32	30.04	54.00	23.96
279.5	37.6	QP	V	13.77	2.02	21.51	31.88	46.00	14.12
High Channel: 2462 MHz									
2462	63.35	PK	H	25.80	3.75	0.00	92.90	N/A	N/A
2462	52.47	AV	H	25.80	3.75	0.00	82.02	N/A	N/A
2462	68.72	PK	V	25.80	3.75	0.00	98.27	N/A	N/A
2462	57.84	AV	V	25.80	3.75	0.00	87.39	N/A	N/A
2483.5	30.53	PK	V	25.86	3.67	0.00	60.06	74.00	13.94
2483.5	17.92	AV	V	25.86	3.67	0.00	47.45	54.00	6.55
4924	36.29	PK	V	30.90	5.34	27.43	45.10	74.00	28.90
4924	24.8	AV	V	30.90	5.34	27.43	33.61	54.00	20.39
7386	38.37	PK	V	34.53	6.83	25.86	53.87	74.00	20.13
7386	26.45	AV	V	34.53	6.83	25.86	41.95	54.00	12.05
9848	30.7	PK	V	36.54	8.66	26.94	48.96	74.00	25.04
9848	18.56	AV	V	36.54	8.66	26.94	36.82	54.00	17.18
3445	37.81	PK	V	28.62	4.96	27.22	44.17	74.00	29.83
3445	25.5	AV	V	28.62	4.96	27.22	31.86	54.00	22.14
279.5	37.4	QP	V	13.77	2.02	21.51	31.68	46.00	14.32

802.11 n ht20 Mode

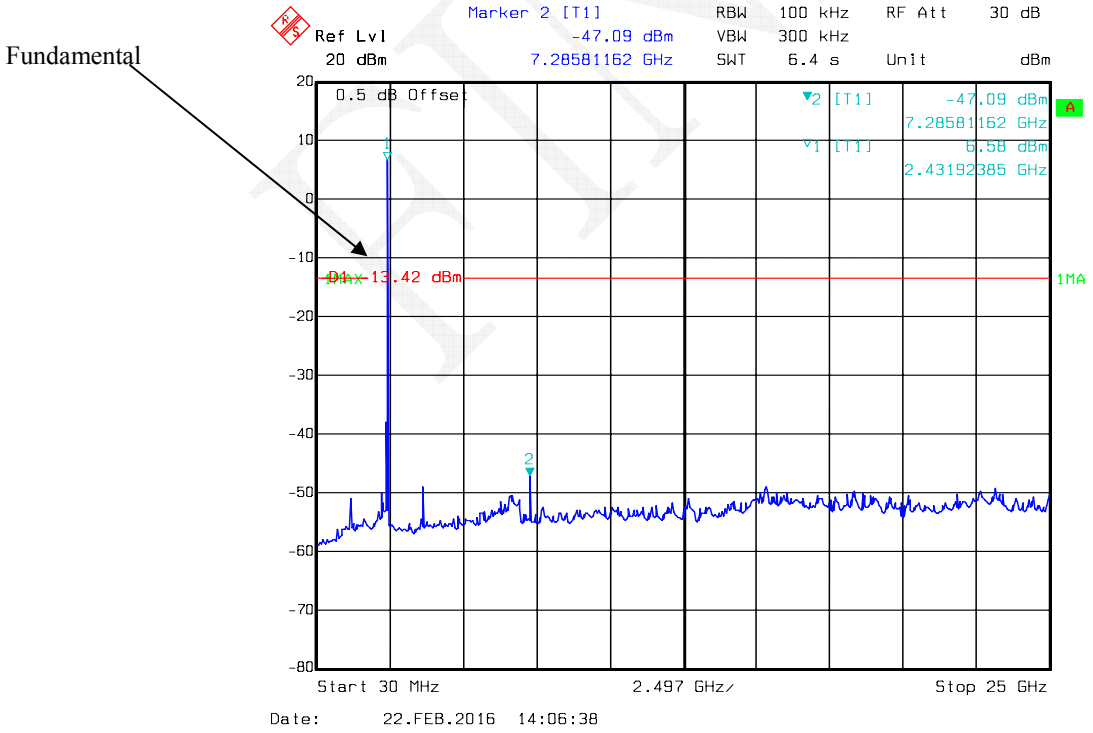
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	63.19	PK	H	25.67	3.68	0.00	92.54	N/A	N/A
2412	53.24	AV	H	25.67	3.68	0.00	82.59	N/A	N/A
2412	68.57	PK	V	25.67	3.68	0.00	97.92	N/A	N/A
2412	58.62	AV	V	25.67	3.68	0.00	87.97	N/A	N/A
2400	29.17	PK	V	25.64	3.65	0.00	58.46	74.00	15.54
2400	17.02	AV	V	25.64	3.65	0.00	46.31	54.00	7.69
4824	36.43	PK	V	30.64	5.03	27.41	44.69	74.00	29.31
4824	24.86	AV	V	30.64	5.03	27.41	33.12	54.00	20.88
7236	32.02	PK	V	34.17	6.65	25.90	46.94	74.00	27.06
7236	20.03	AV	V	34.17	6.65	25.90	34.95	54.00	19.05
9648	30.69	PK	V	36.06	8.55	27.46	47.84	74.00	26.16
9648	18.56	AV	V	36.06	8.55	27.46	35.71	54.00	18.29
3445	37.93	PK	V	28.62	4.96	27.22	44.29	74.00	29.71
3445	25.06	AV	V	28.62	4.96	27.22	31.42	54.00	22.58
279.5	37.2	QP	V	13.77	2.02	21.51	31.48	46.00	14.52
Middle Channel: 2437 MHz									
2437	62.18	PK	H	25.74	3.75	0.00	91.67	N/A	N/A
2437	52.31	AV	H	25.74	3.75	0.00	81.80	N/A	N/A
2437	67.6	PK	V	25.74	3.75	0.00	97.09	N/A	N/A
2437	57.68	AV	V	25.74	3.75	0.00	87.17	N/A	N/A
4874	36.29	PK	V	30.77	5.14	27.42	44.78	74.00	29.22
4874	24.73	AV	V	30.77	5.14	27.42	33.22	54.00	20.78
7311	32.85	PK	V	34.35	6.74	25.88	48.06	74.00	25.94
7311	20.9	AV	V	34.35	6.74	25.88	36.11	54.00	17.89
9748	30.66	PK	V	36.30	8.61	27.24	48.33	74.00	25.67
9748	18.51	AV	V	36.30	8.61	27.24	36.18	54.00	17.82
3445	37.07	PK	V	28.62	4.96	27.22	43.43	74.00	30.57
3445	25.05	AV	V	28.62	4.96	27.22	31.41	54.00	22.59
3690	35.49	PK	V	29.22	4.62	27.32	42.01	74.00	31.99
3690	23.34	AV	V	29.22	4.62	27.32	29.86	54.00	24.14
279.5	37.8	QP	V	13.77	2.02	21.51	32.08	46.00	13.92
High Channel: 2462 MHz									
2462	61.11	PK	H	25.80	3.75	0.00	90.66	N/A	N/A
2462	51.27	AV	H	25.80	3.75	0.00	80.82	N/A	N/A
2462	66.51	PK	V	25.80	3.75	0.00	96.06	N/A	N/A
2462	56.6	AV	V	25.80	3.75	0.00	86.15	N/A	N/A
2483.5	29.05	PK	V	25.86	3.67	0.00	58.58	74.00	15.42
2483.5	17.79	AV	V	25.86	3.67	0.00	47.32	54.00	6.68
4924	36.12	PK	V	30.90	5.34	27.43	44.93	74.00	29.07
4924	24.61	AV	V	30.90	5.34	27.43	33.42	54.00	20.58
7386	32.67	PK	V	34.53	6.83	25.86	48.17	74.00	25.83
7386	20.72	AV	V	34.53	6.83	25.86	36.22	54.00	17.78
9848	30.61	PK	V	36.54	8.66	26.94	48.87	74.00	25.13
9848	18.47	AV	V	36.54	8.66	26.94	36.73	54.00	17.27
3445	37.79	PK	V	28.62	4.96	27.22	44.15	74.00	29.85
3445	25.14	AV	V	28.62	4.96	27.22	31.50	54.00	22.50
279.5	37.3	QP	V	13.77	2.02	21.51	31.58	46.00	14.42

Conducted Spurious Emissions at Antenna Port

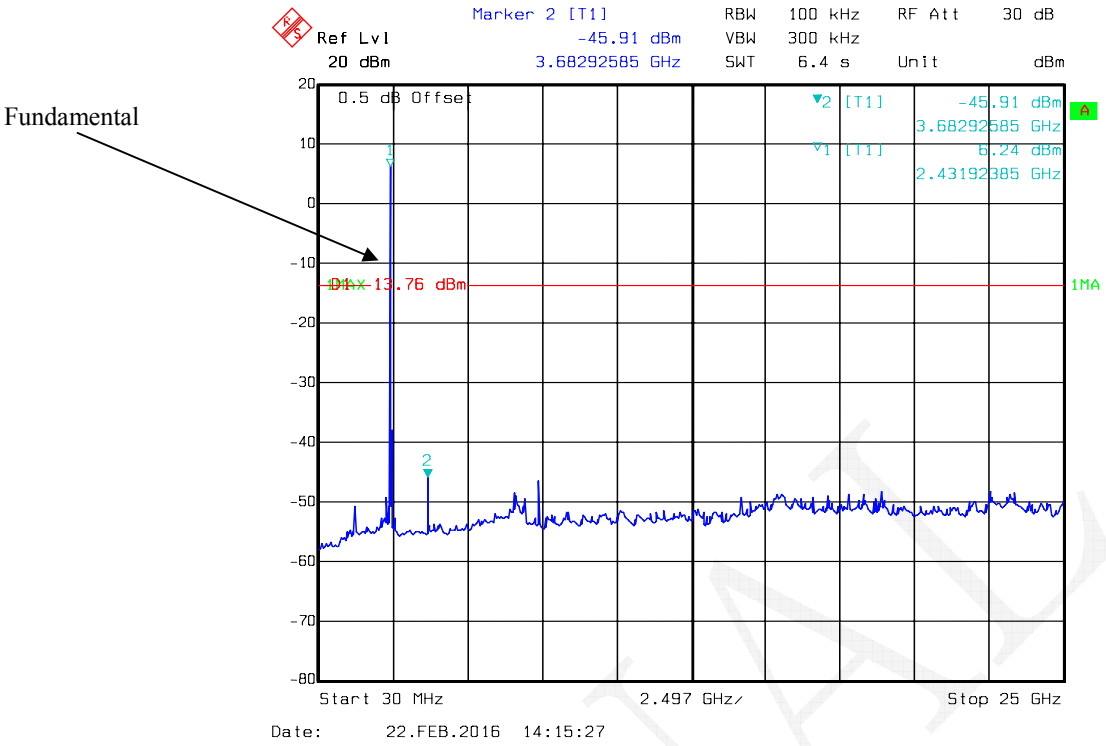
802.11b Low Channel



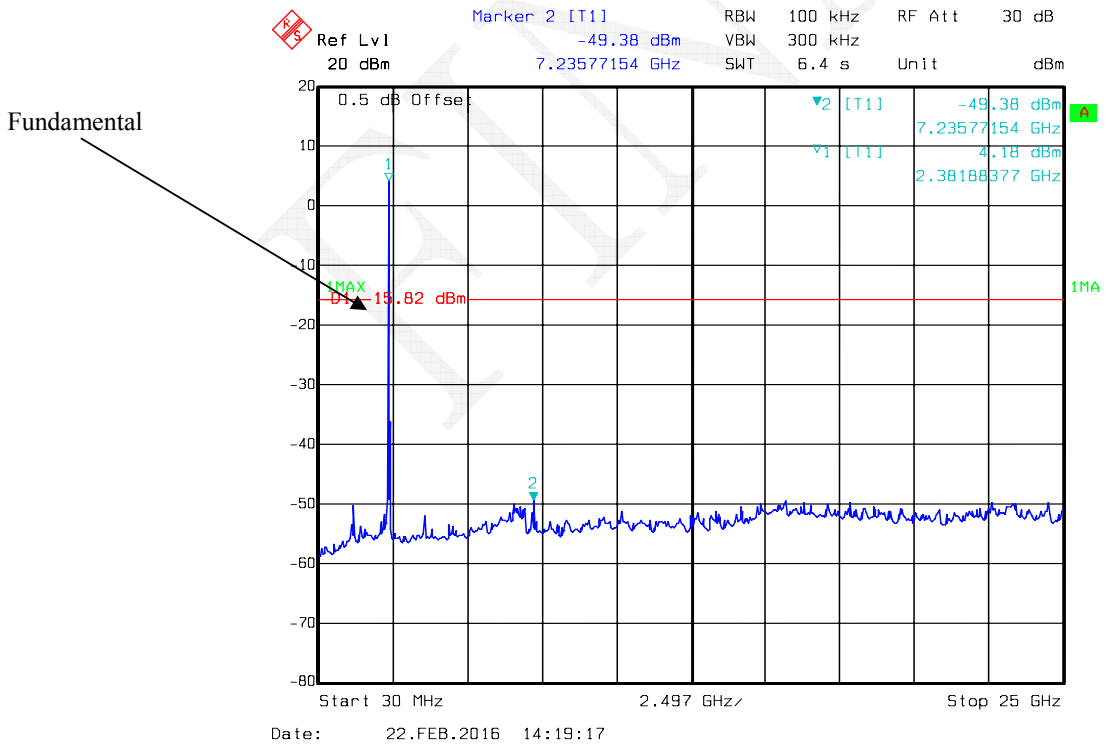
802.11b Middle Channel



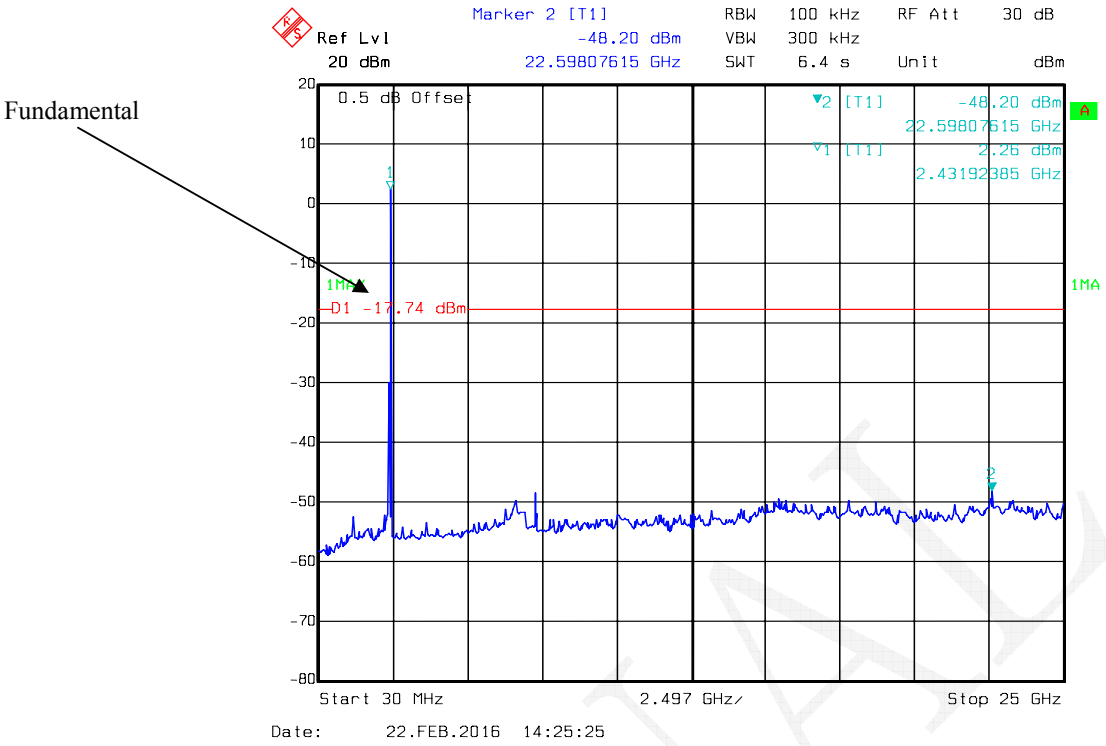
802.11b High Channel



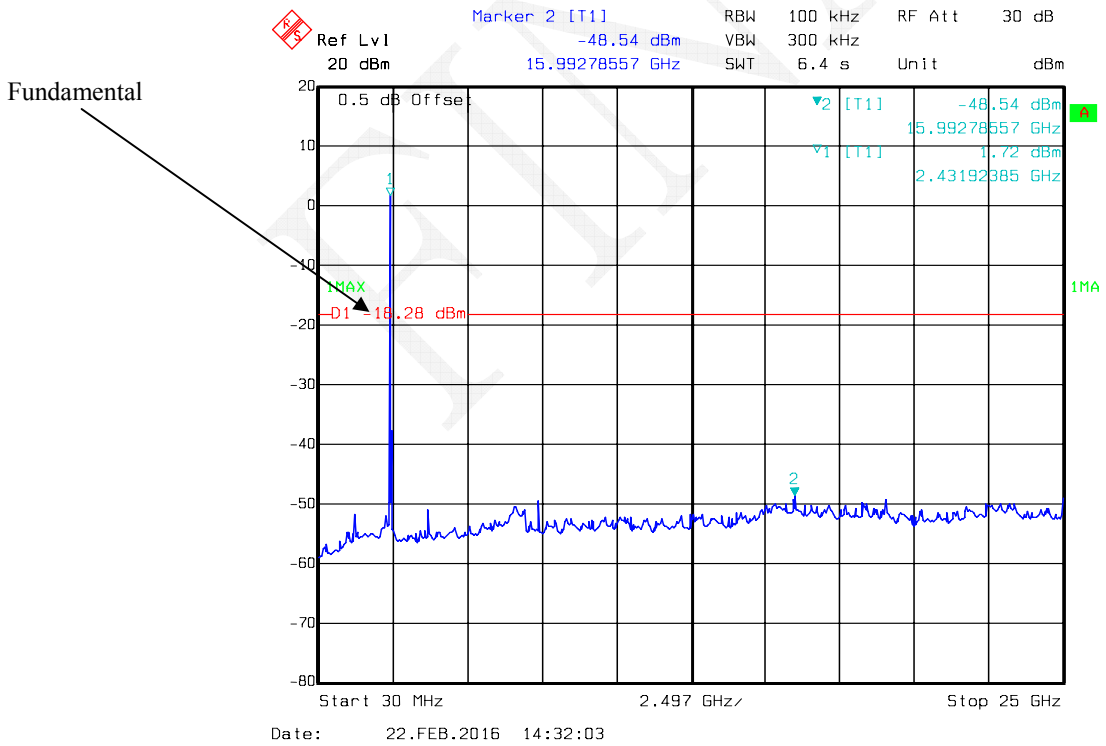
802.11g Low Channel



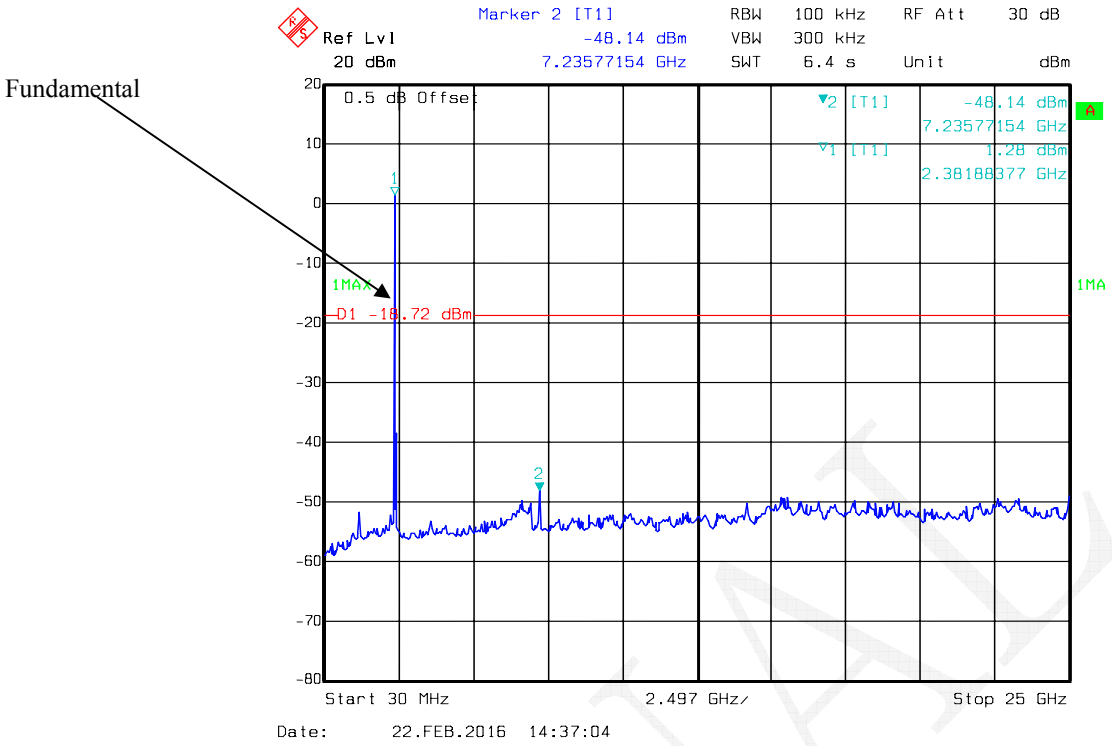
802.11g Middle Channel



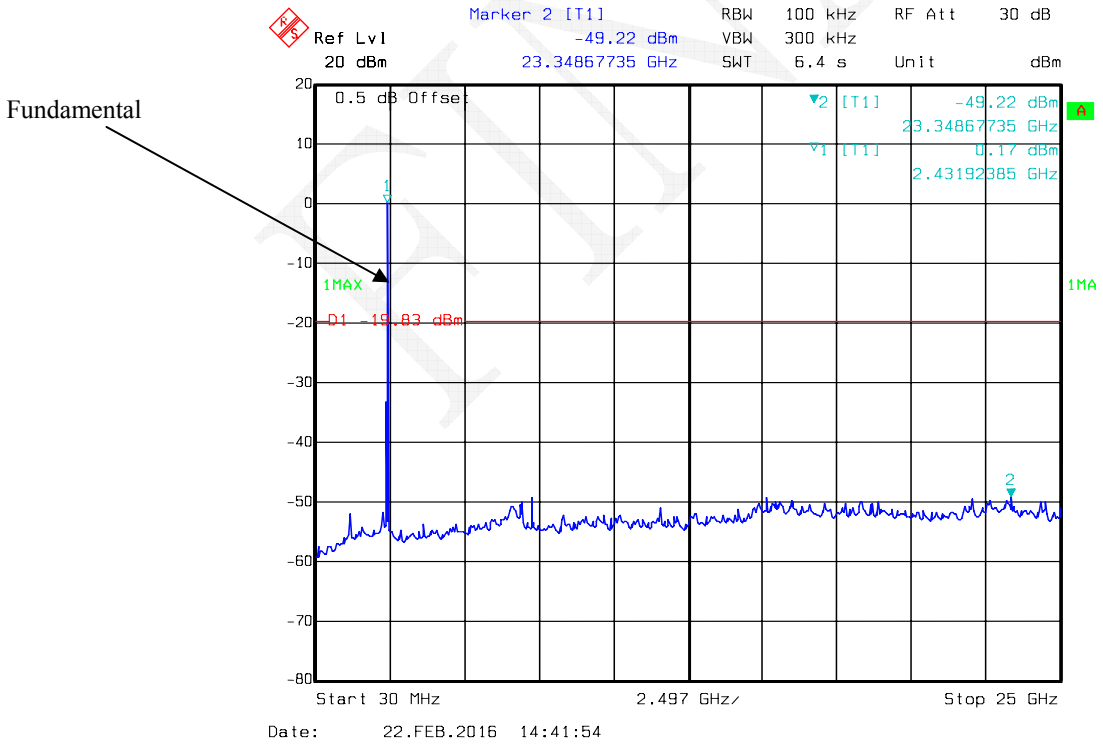
802.11g High Channel



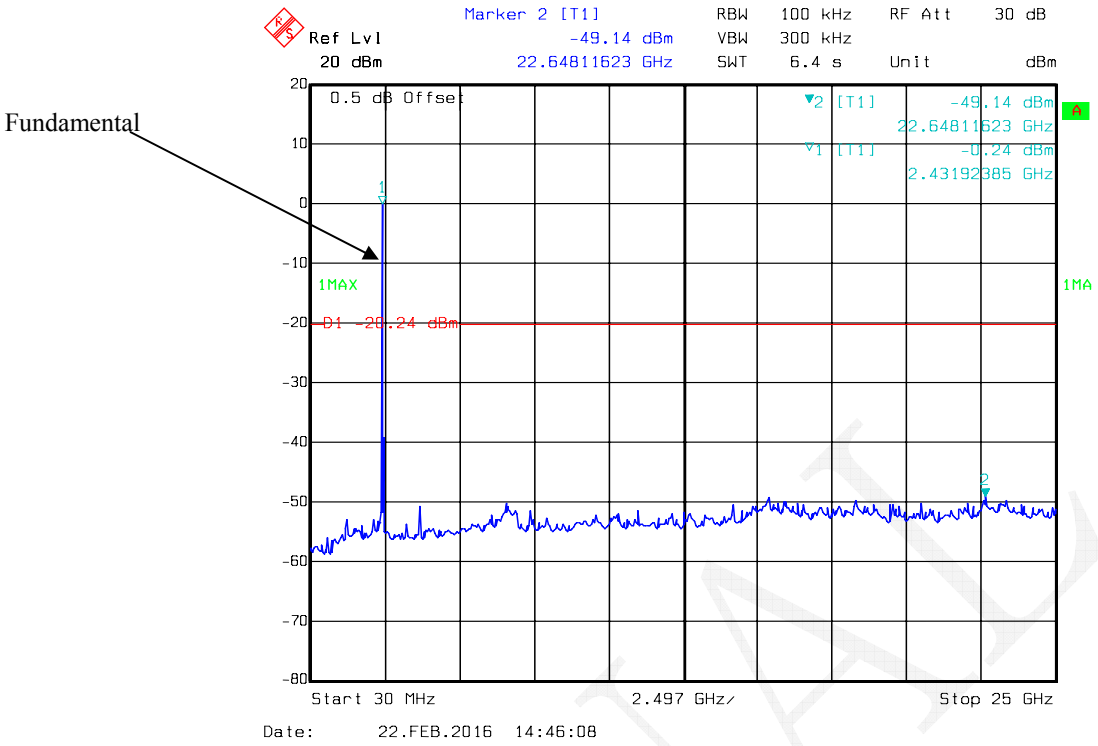
802.11n ht20 Low Channel



802.11n ht20 Middle Channel



802.11n ht20 High Channel



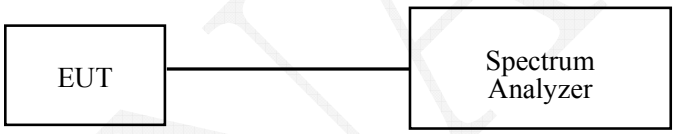
FCC §15.247(A) (2) – 6 DB EMISSION BANDWIDTH

Applicable Standard

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

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06

*** 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 Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	44%
ATM Pressure:	101.4 kPa

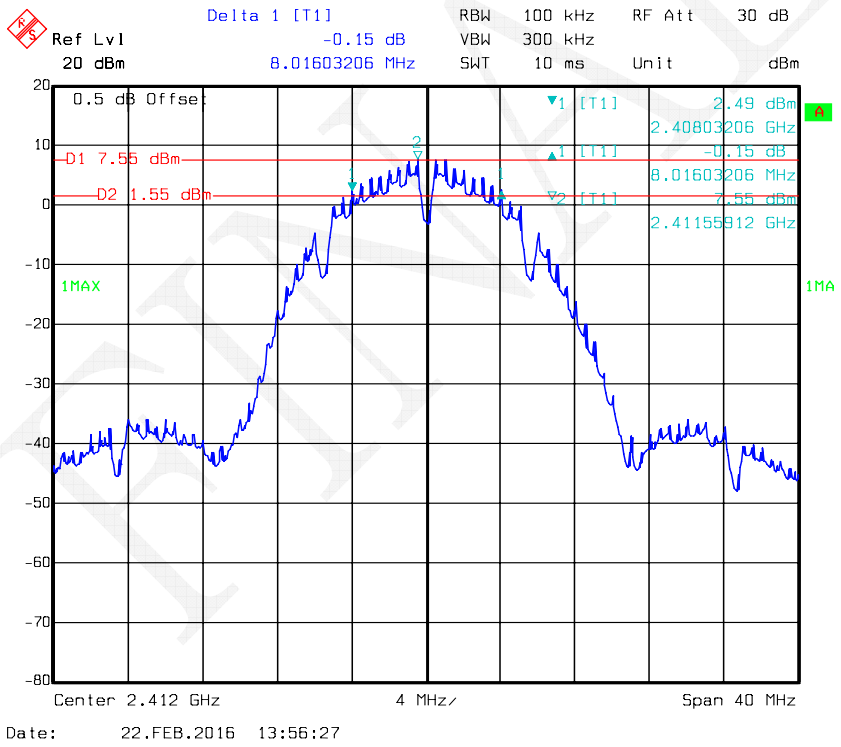
** The testing was performed by Lion Xiao on 2016-02-22.*

Test Mode: Transmitting

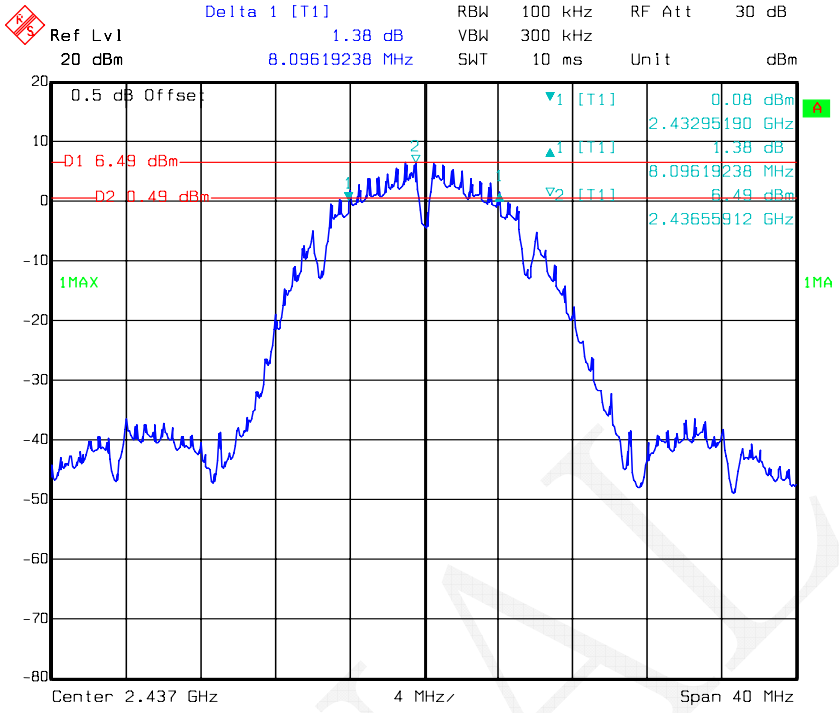
Test Result: Compliant. Please refer to the following table and plots.

Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	8.02	≥0.5
	Middle	2437	8.10	≥0.5
	High	2462	7.13	≥0.5
802.11g	Low	2412	15.23	≥0.5
	Middle	2437	15.31	≥0.5
	High	2462	15.47	≥0.5
802.11n20	Low	2412	16.11	≥0.5
	Middle	2437	16.27	≥0.5
	High	2462	16.11	≥0.5

802.11b Low Channel

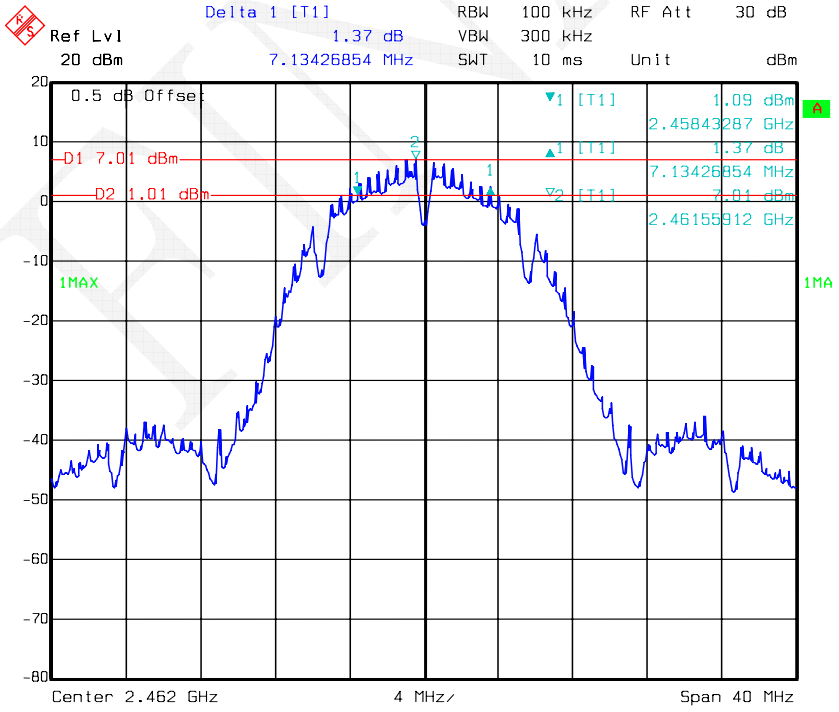


802.11b Middle Channel



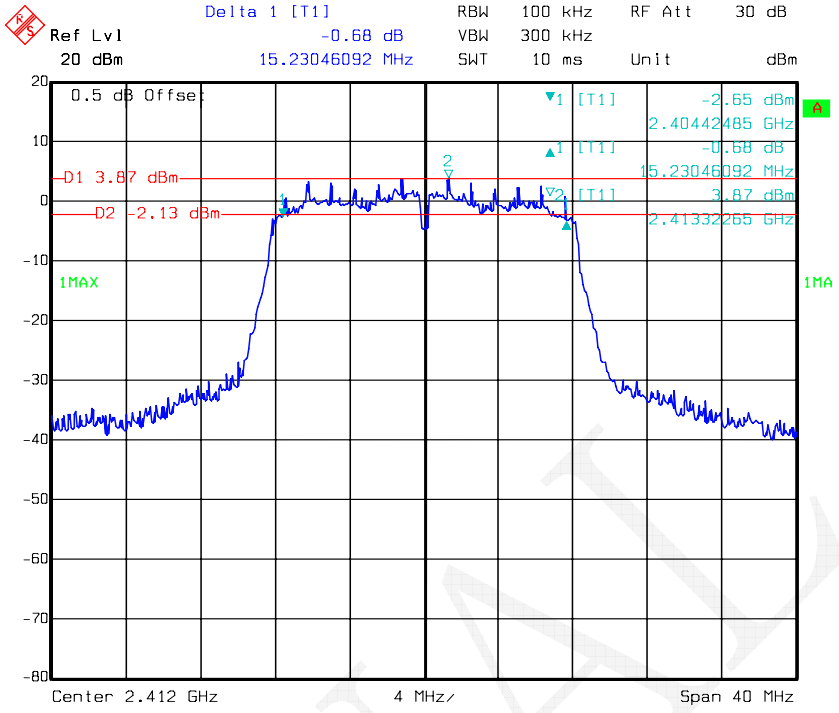
Date: 22.FEB.2016 14:04:31

802.11b High Channel

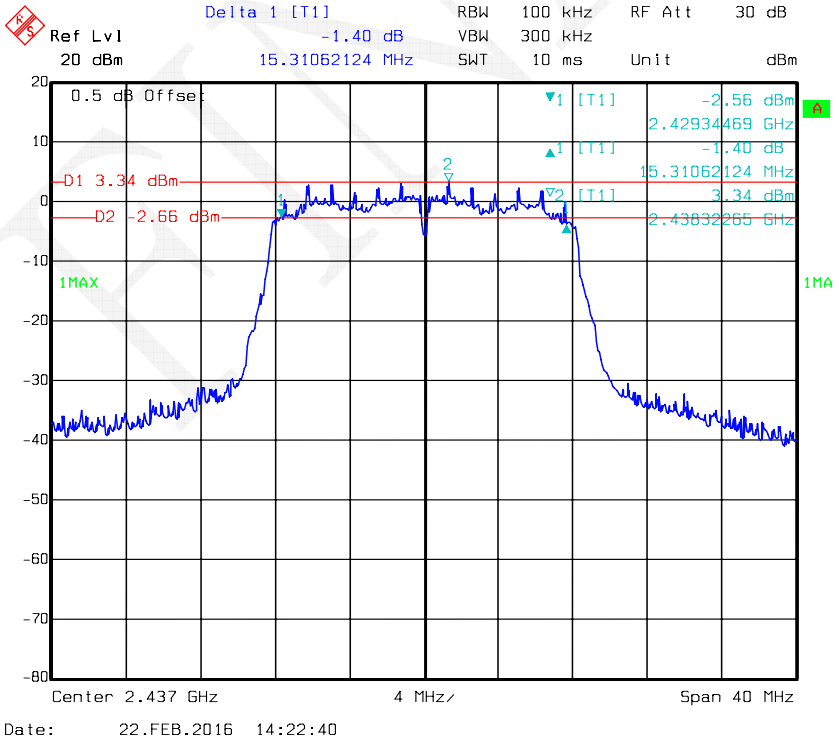


Date: 22.FEB.2016 14:11:20

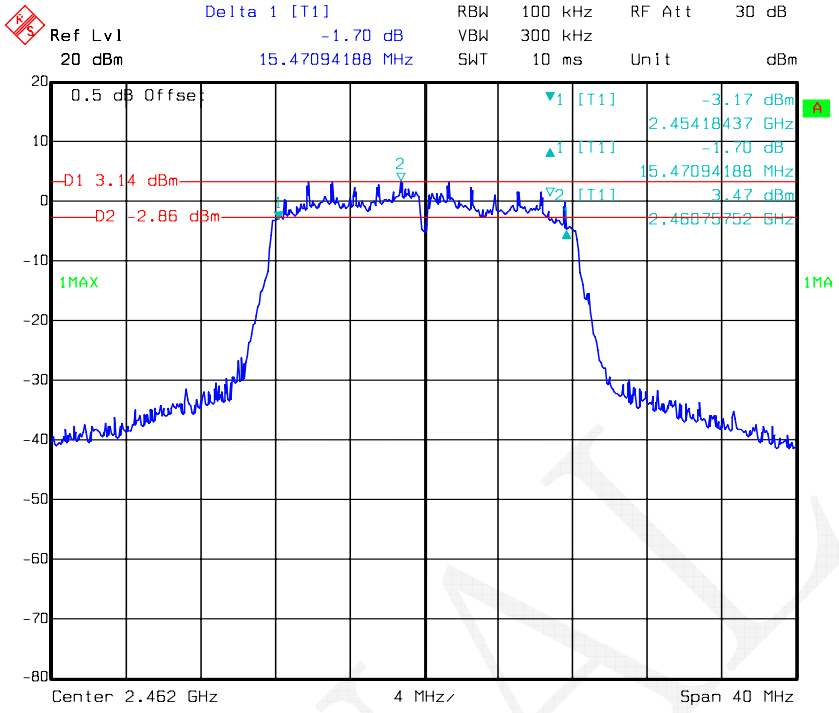
802.11g Low Channel



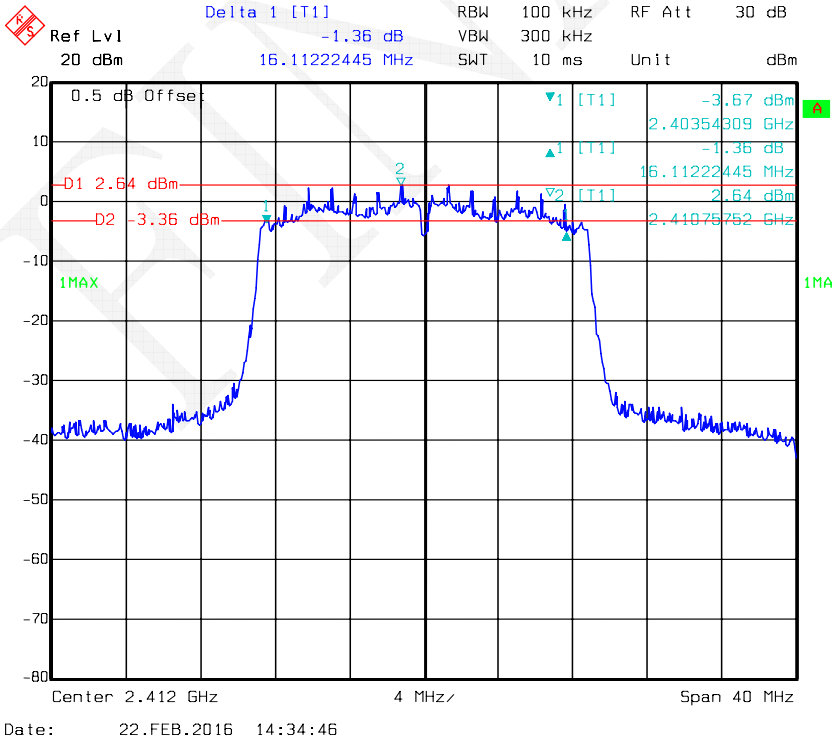
802.11g Middle Channel



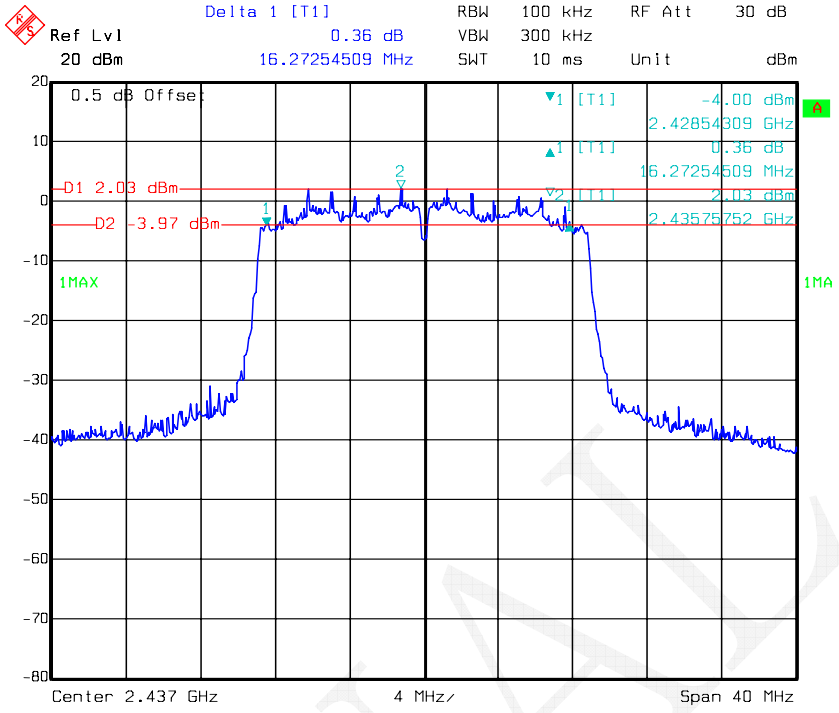
802.11g High Channel



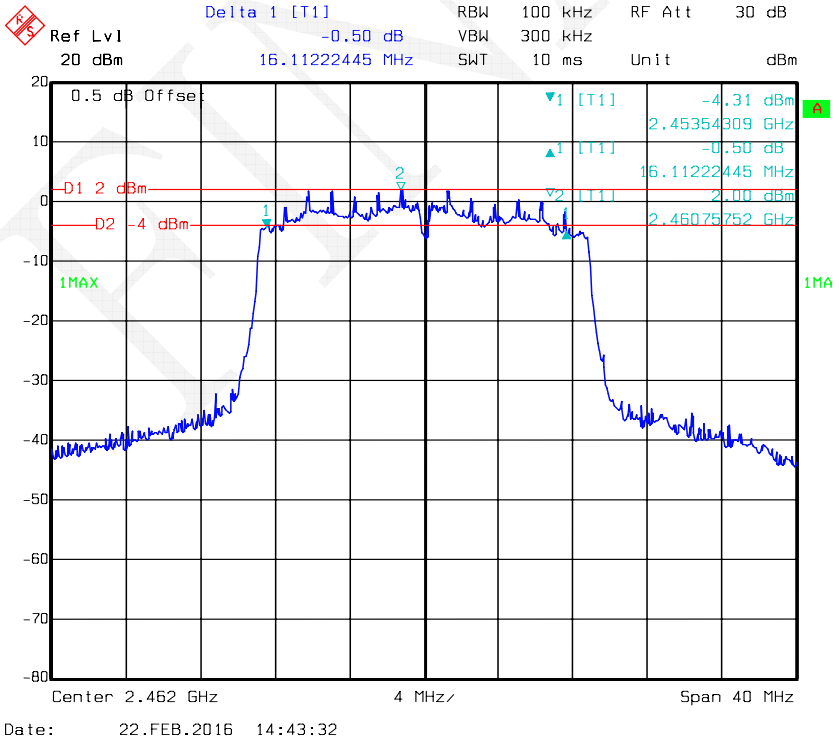
802.11n ht20 Low Channel



802.11n ht20 Middle Channel



802.11n ht20 High Channel



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

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
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
Mini-Circuits	Attenuator	UNAT-6+	15541	2015-05-06	2016-05-06

*** 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 Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	44 %
ATM Pressure:	101.4 kPa

** The testing was performed by Lion Xiao on 2016-02-22.*

Test Mode: Transmitting

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

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Max Conducted Average Output Power	Limit
		(MHz)	(dBm)	(dBm)	(dBm)
802.11b	Low	2412	19.28	17.4	30
	Middle	2437	18.31	16.62	30
	High	2462	18.85	17.05	30
802.11g	Low	2412	21.33	16.61	30
	Middle	2437	20.45	15.89	30
	High	2462	20.2	15.64	30
802.11n20	Low	2412	20.03	15.34	30
	Middle	2437	19.44	14.76	30
	High	2462	19.57	14.91	30

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
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06

*** 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 Data

Environmental Conditions

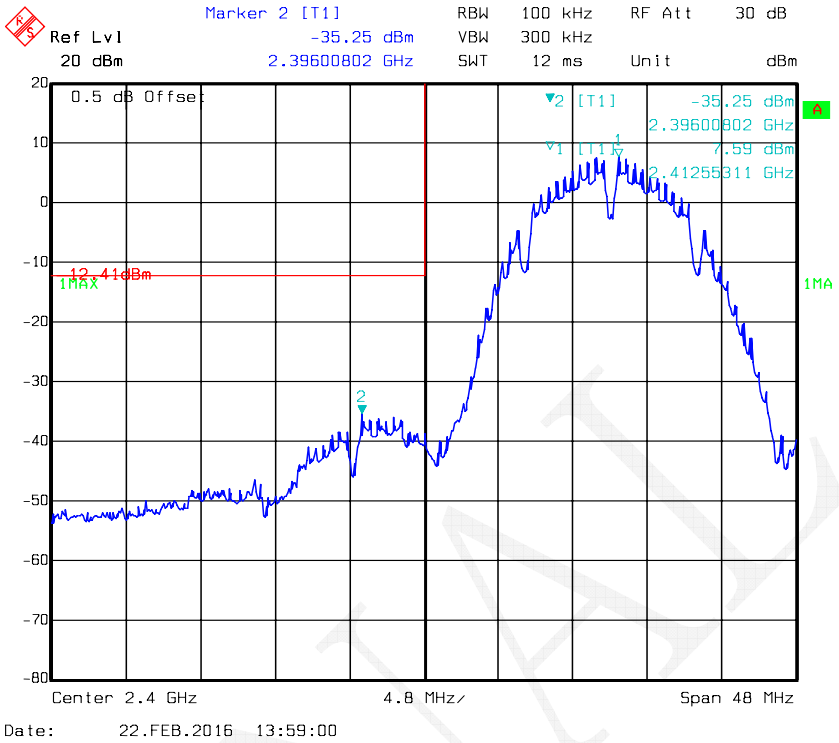
Temperature:	23.5°C
Relative Humidity:	44 %
ATM Pressure:	101.4 kPa

** The testing was performed by Lion Xiao on 2016-02-22..*

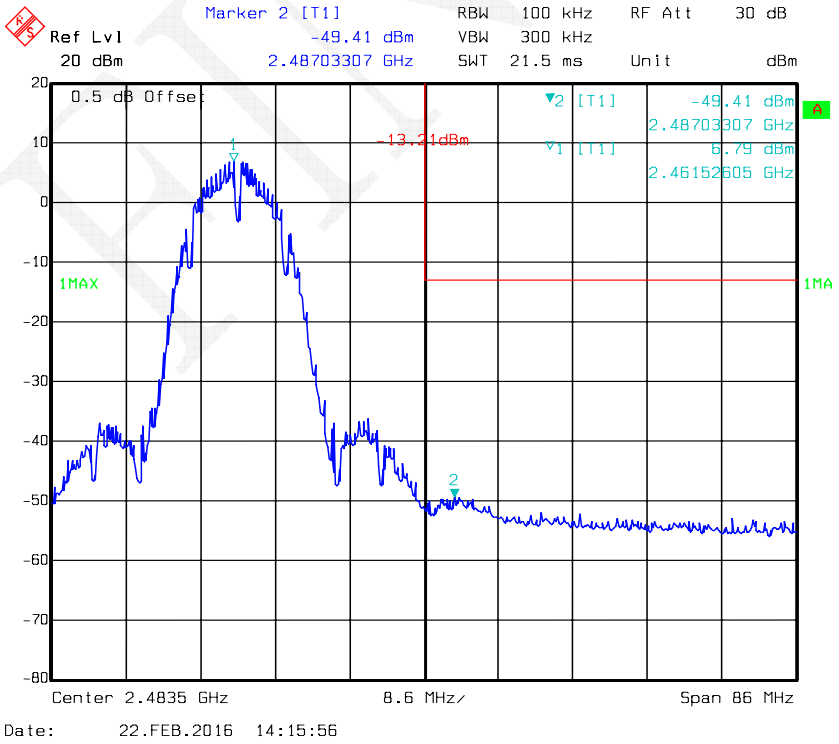
Test mode: Transmitting

Test Result: Compliant. Please refer to following plots.

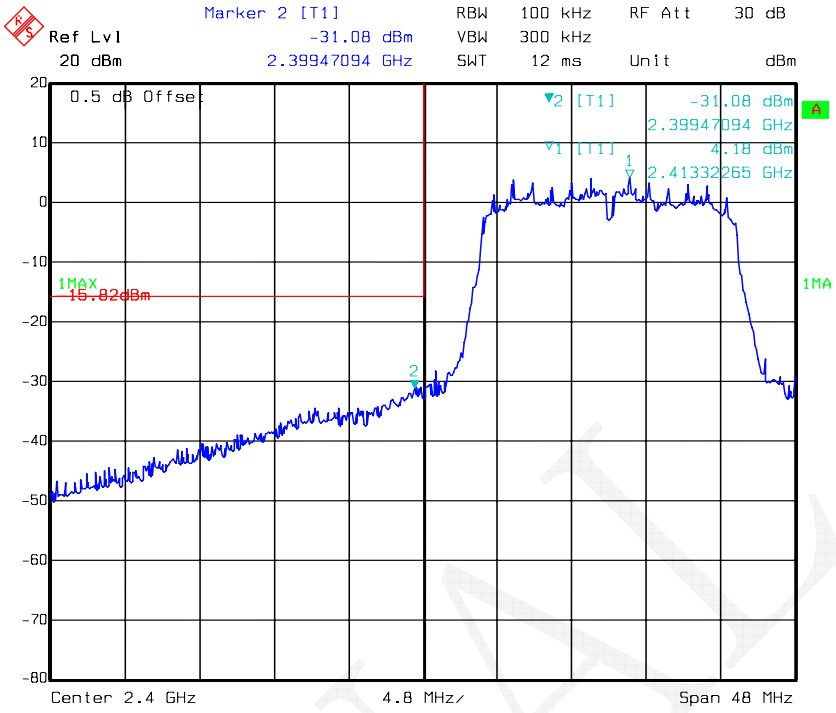
802.11b: Band Edge, Left Side



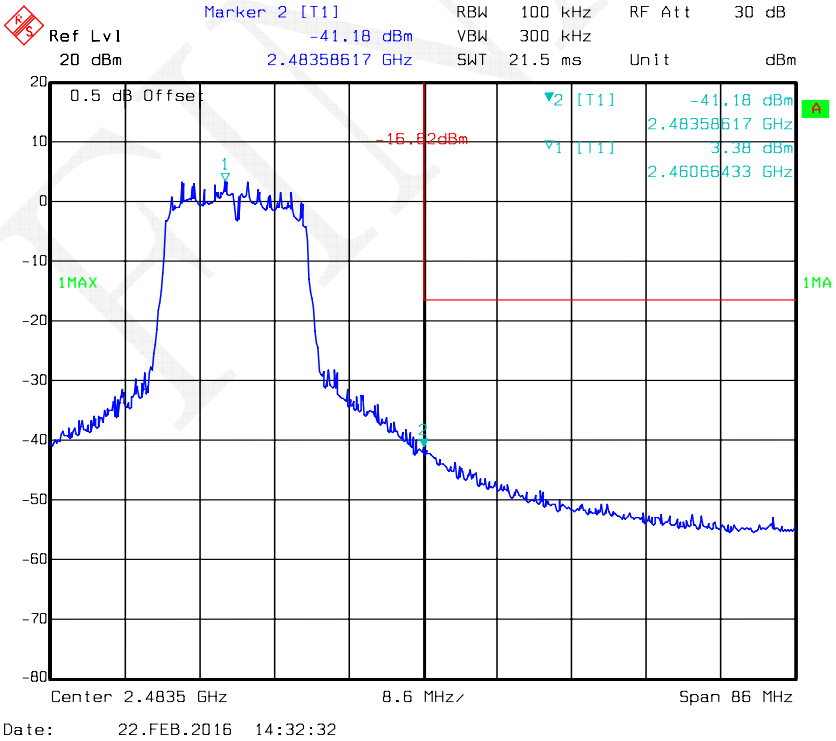
802.11b: Band Edge, Right Side



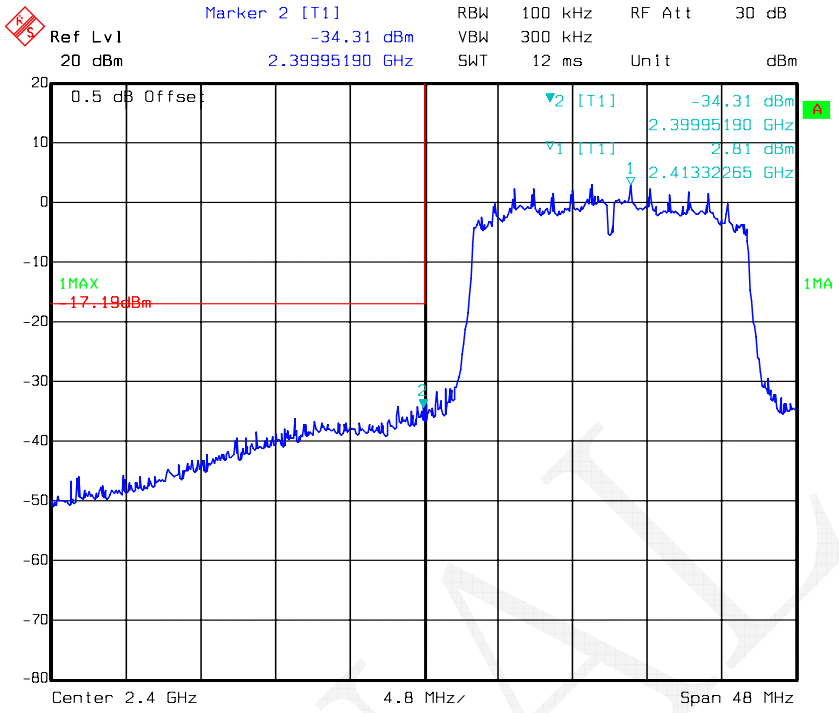
802.11g: Band Edge, Left Side



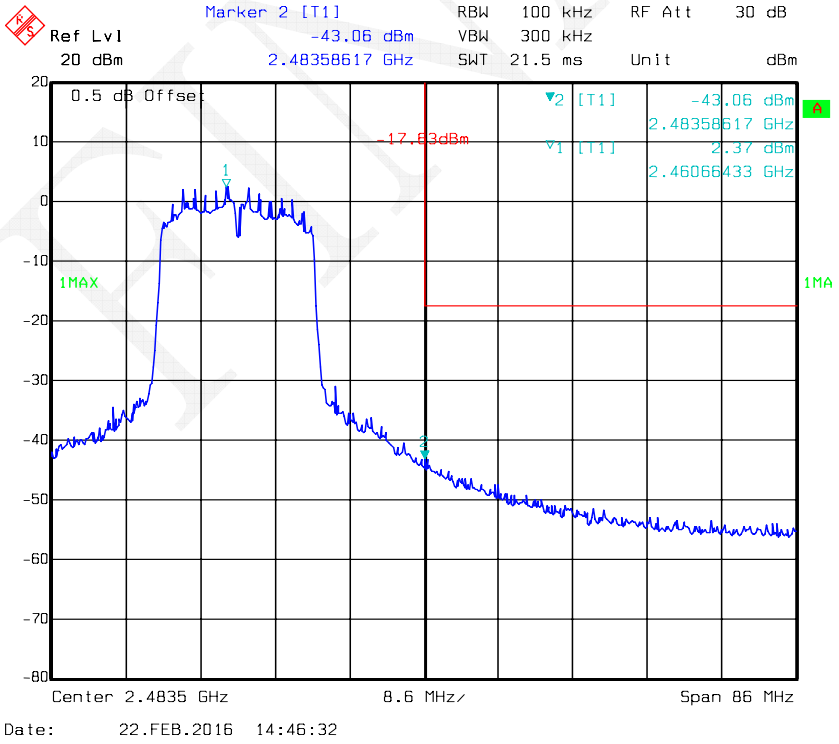
802.11g: Band Edge, Right Side



802.11n ht20 Band Edge, Left Side



802.11n ht20 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

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3×RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) 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
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06

*** 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 Data

Environmental Conditions

Temperature:	23.5°C
Relative Humidity:	44 %
ATM Pressure:	101.4 kPa

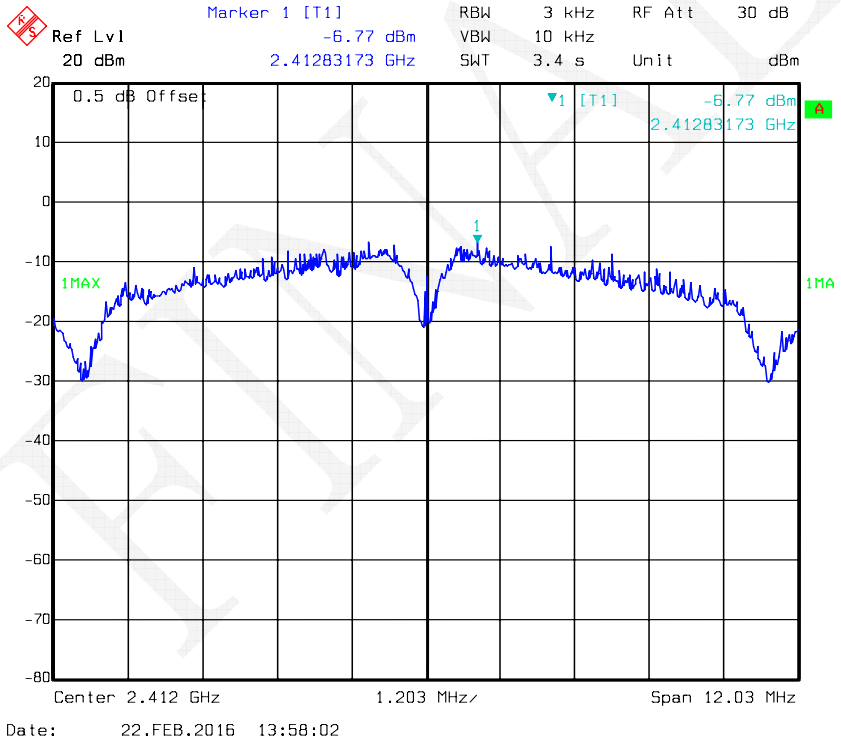
** The testing was performed by Lion Xiao on 2016-02-22.*

Test Mode: Transmitting

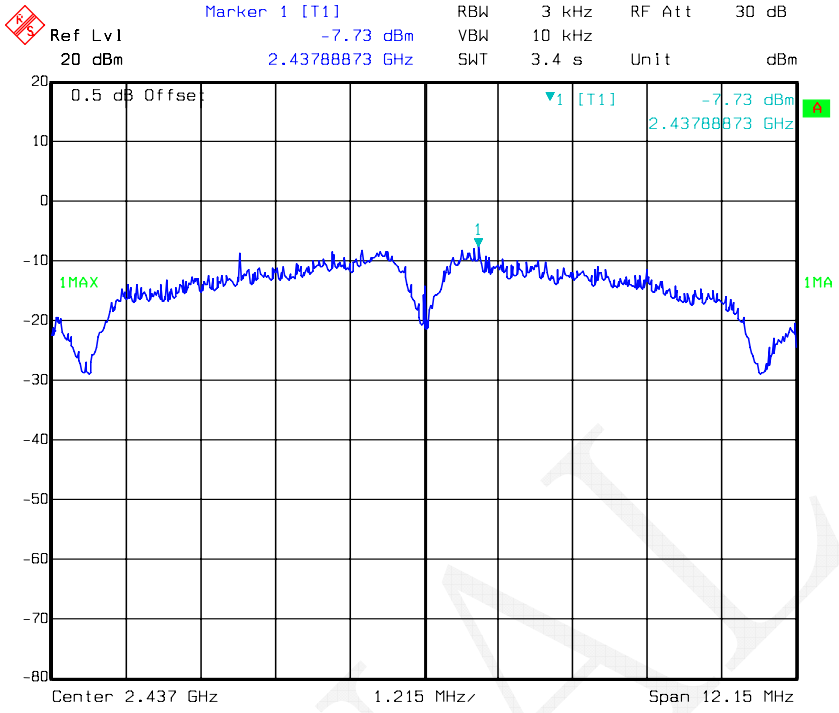
Test Result: Compliant. Please refer to the following table and plots

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-6.77	≤8
	Middle	2437	-7.73	≤8
	High	2462	-7.28	≤8
802.11g	Low	2412	-9.59	≤8
	Middle	2437	-10.26	≤8
	High	2462	-10.47	≤8
802.11n20	Low	2412	-11.77	≤8
	Middle	2437	-11.99	≤8
	High	2462	-11.32	≤8

Power Spectral Density, 802.11b Low Channel

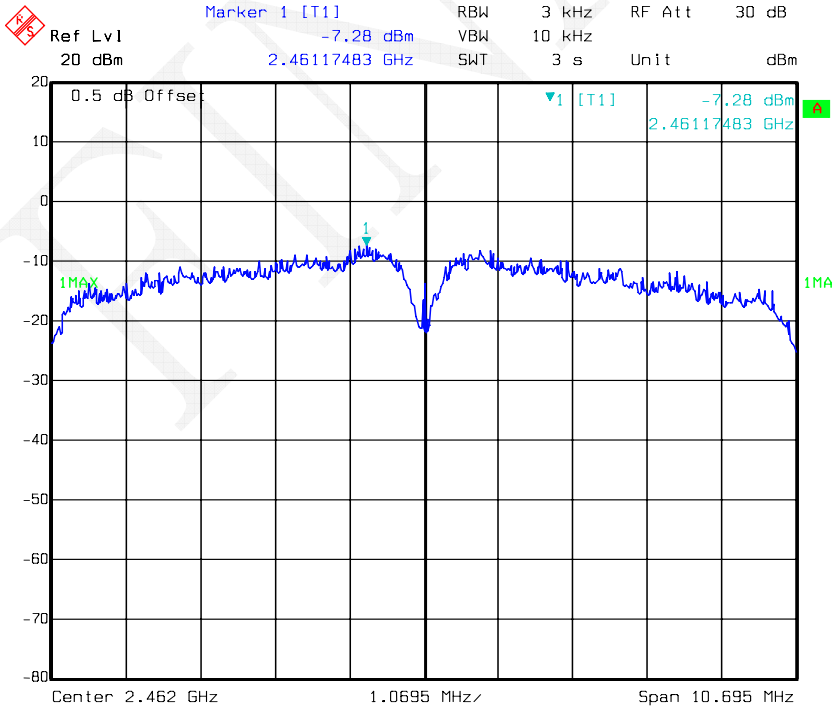


Power Spectral Density, 802.11b Middle Channel



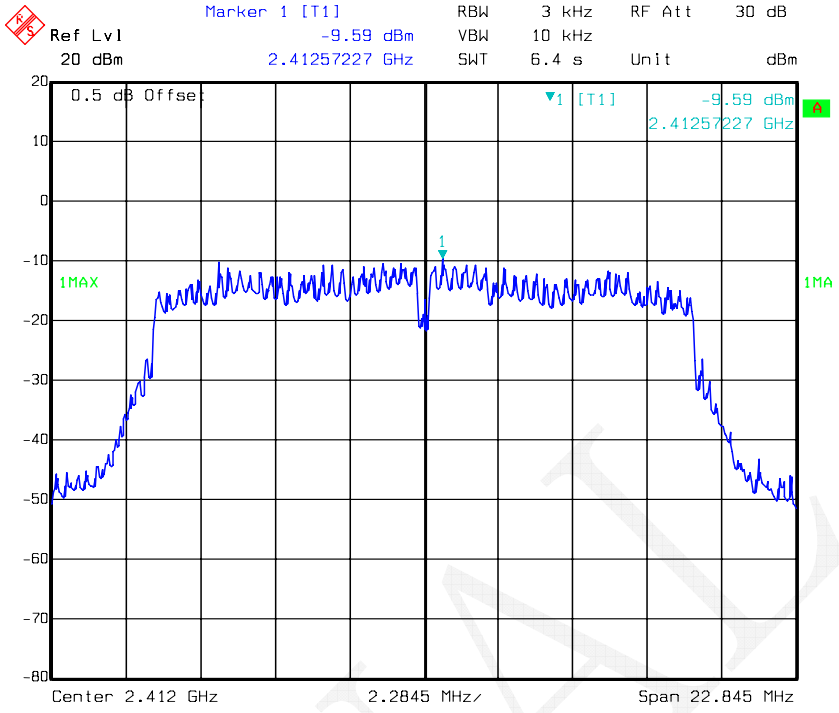
Date: 22.FEB.2016 14:06:13

Power Spectral Density, 802.11b High Channel

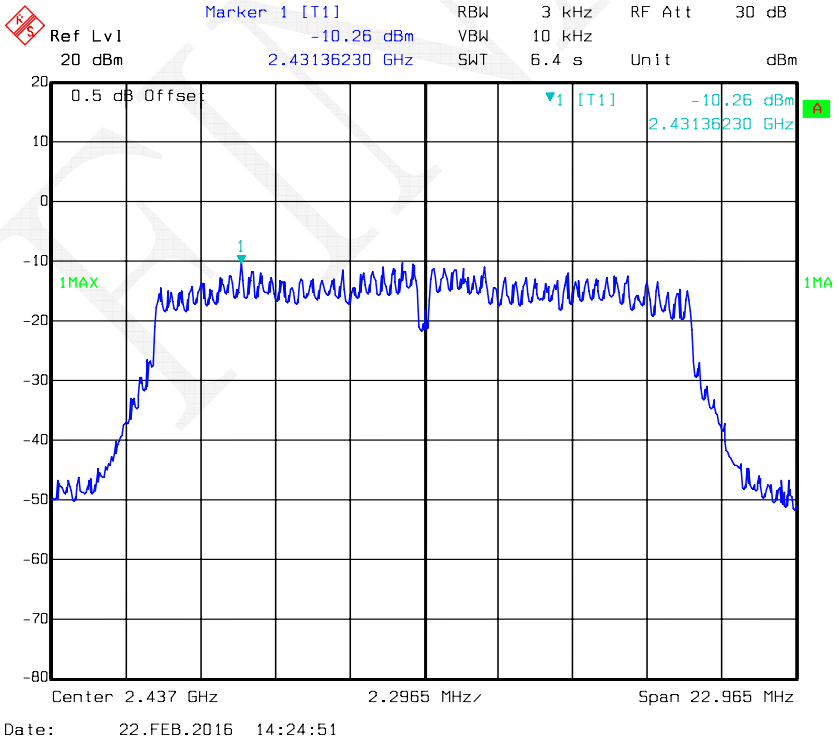


Date: 22.FEB.2016 14:51:50

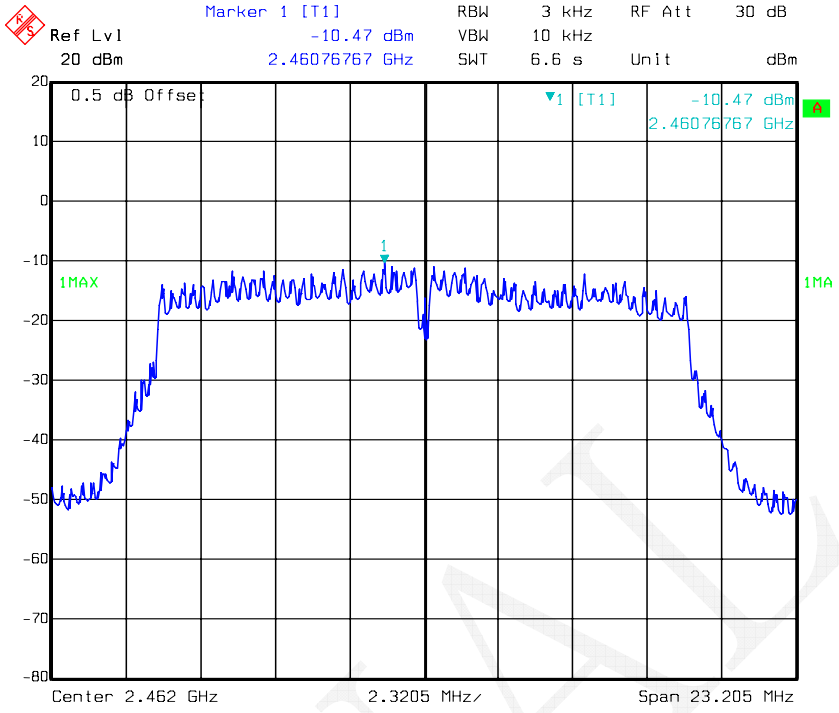
Power Spectral Density, 802.11g Low Channel



Power Spectral Density, 802.11g Middle Channel

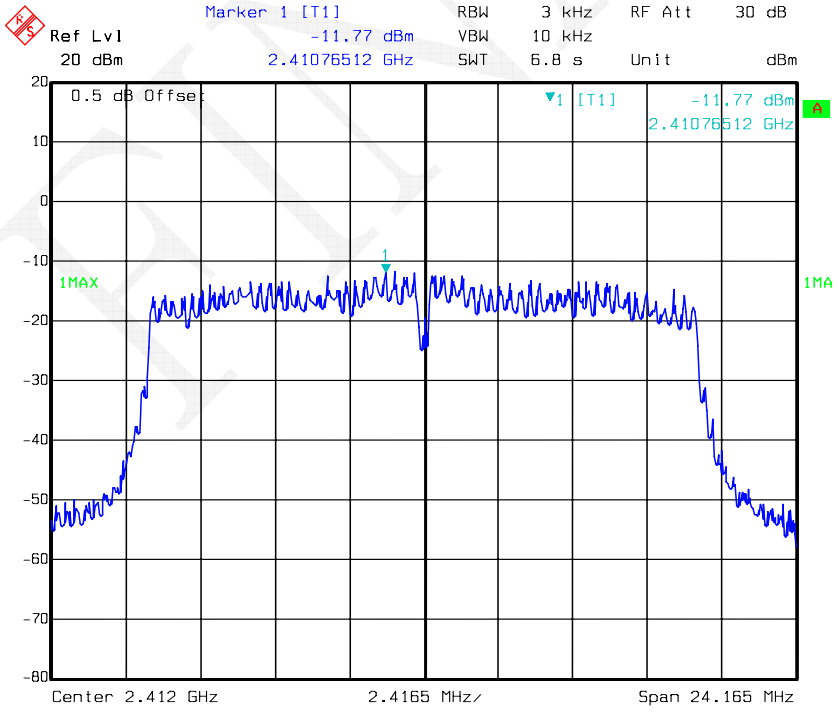


Power Spectral Density, 802.11g High Channel



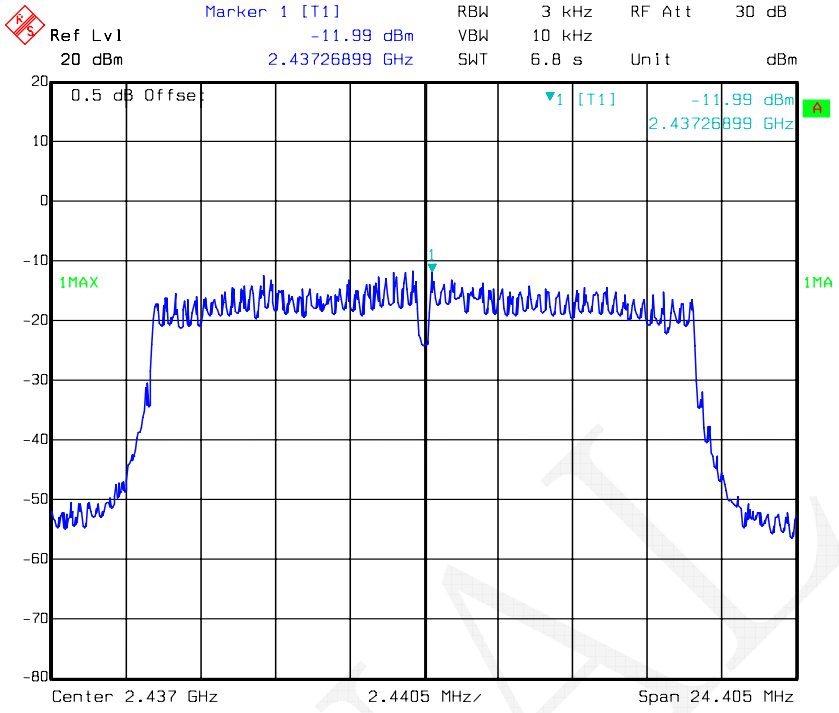
Date: 22.FEB.2016 14:28:25

Power Spectral Density, 802.11n ht20 Low Channel



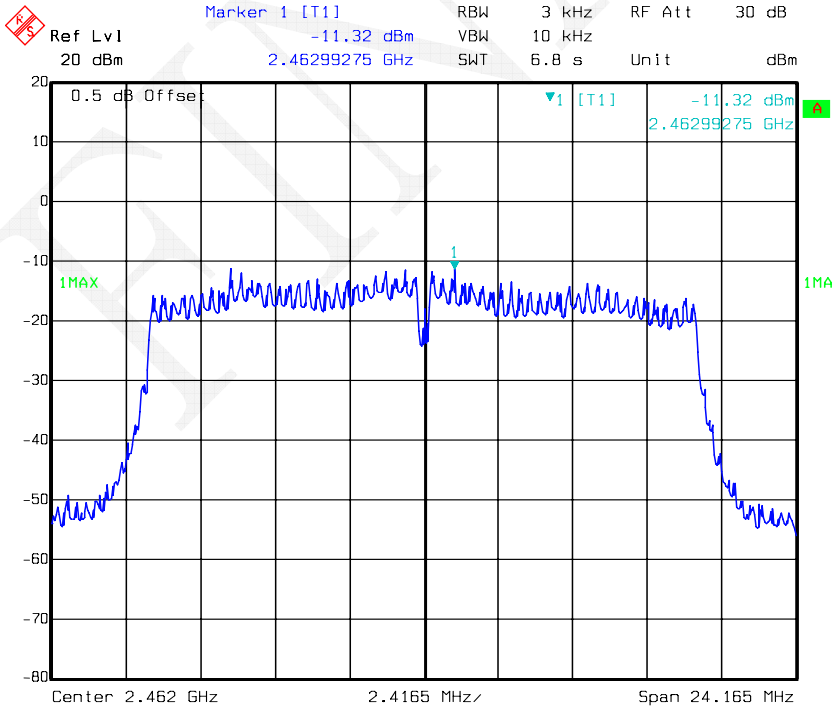
Date: 22.FEB.2016 14:36:24

Power Spectral Density, 802.11n ht20 Middle Channel



Date: 22.FEB.2016 14:41:19

Power Spectral Density, 802.11n ht20 High Channel



Date: 22.FEB.2016 14:45:34

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