FCC PART 15.247

TEST REPORT

For

SZ DJI TECHNOLOGY CO., LTD

14th floor, West Wing, Skyworth Semiconductor Design Building NO.18 Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China

FCC ID: SS3-GL300E1609

Report Type:	**Product Type:**
Original Report	C1

Report Number:	RDG160820008-00A
Report Date:	2016-09-28
Reviewed By:	Allen Qiao RF Engineer
Approved 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

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Dongguan). This report may contain data or test methods that are not covered by the NVLAP accreditation scope and shall be marked with an asterisk "*" and noted.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SZ DJI TECHNOLOGY CO., LTD*'s product, model number: *GL300E (FCC ID: SS3-GL300E1609)* (the "EUT") in this report was a *C1,* which was measured approximately: 18.2 cm (L) x17.14 cm (W) x 10.52 cm(H), rated input voltage: DC 7.4V from lithium battery, or DC17.5V from adapter.

Adapter Information:
MODEL: PH4C100
INPUT:100-240V~1.4A ,50-60Hz
OUTPUT:17.5V, 5.7A(Total)

** All measurement and test data in this report was gathered from production sample serial number: 160820008 (Assigned by BACL Dongguan). The EUT was received on 2016-08-13.*

Objective

This report is prepared on behalf of *SZ DJI 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)

FCC Part 15E NII submissions with FCC ID: SS3-GL300E1609.

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 Engineering Mode, which was provided by the manufacturer.

The device employed LB mode, and 802.11a/b/g/n ht20 modes, 2.4GHz band, LB and wifi can`t transmit Simultaneously; and 5GHz band, LB and wifi can`t transmit Simultaneously.

For LB mode, 45 channels are provided at 2.4GHz band:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2404	24	2443.1
2	2405.7	…	…
…	…	…	…
…	…	44	2477.1
…	…	45	2478.8
23	2441.4	/	/

For 802.11b, 802.11g, and 802.11n20 modes, 11 channels are provided at 2.4GHz band:

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

EUT Exercise Software

The software “DJI-RF Certification” was used for testing, which was provided by manufacturer. 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 date rates bandwidths, and modulations.

For 802.11b/g/n mode, the maximum power was as below setting, the power setting was provided by the manufacturer:

Antenna 0&1				
Test Mode	Test Software Version	DJI-RF Certification		
802.11b	Frequency (MHz)	2412	2437	2462
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	10	10	10
802.11g	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	10	10	10
HT20	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	10	10	10

For LB mode, the maximum power was configured by system default setting. The default setting level as below:

Antenna 0					
Test Software Version	DJI-RF Certification				
Frequency (MHz)	2404	2405.8	2407.4~2475.4	2477.1	2478.8
Power Level Setting	18	20	23	20	18

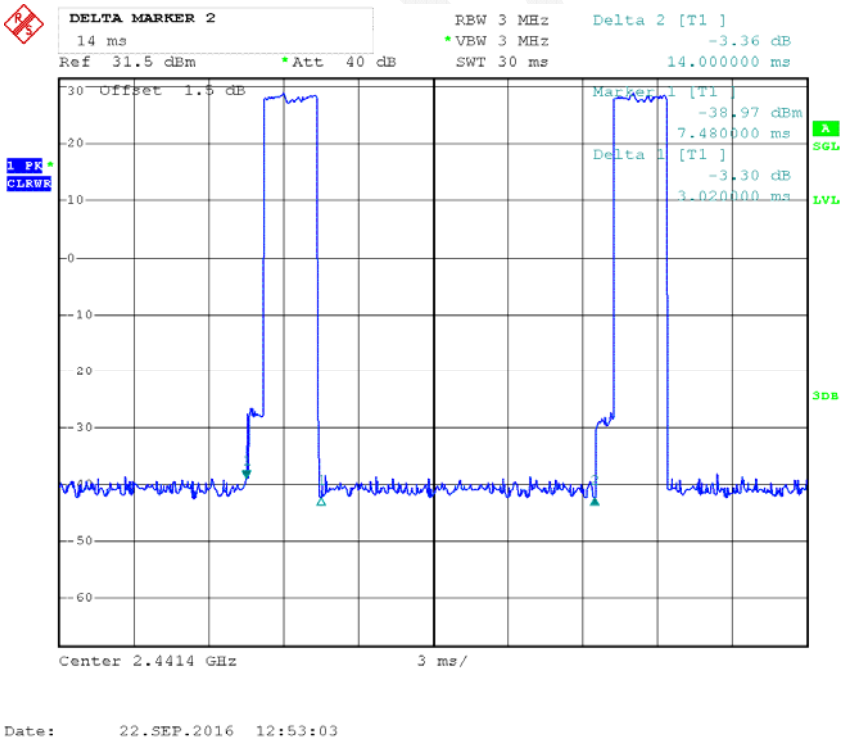
All test items performed at Low, Middle and High Channel, and for difference power level setting configured (LB mode),output power, radiation bandedge test with additional channels according to the power setting and power test results.

The software configured maximum duty cycle as below:

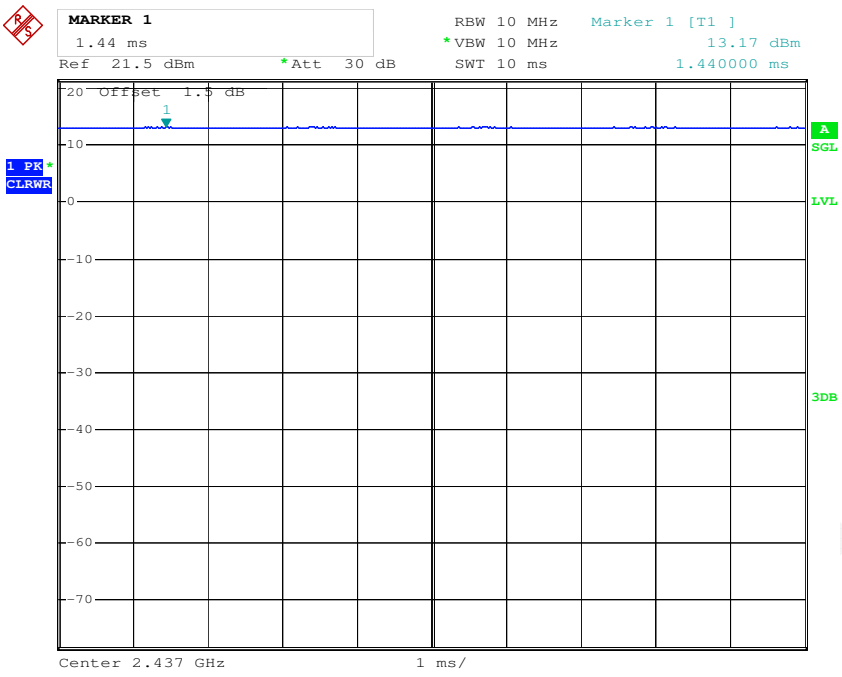
Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
LB	3.02	14	21.57
802.11b	100	100	100
802.11g	2.05	2.12	96.70
802.11n ht20	1.91	1.98	96.46

The minimum transmission duration(T) is 3.02ms in LB mode, 2.05ms in 802.11g mode, and 1.98ms in 802.11n mode.

LB mode



802.11b mode



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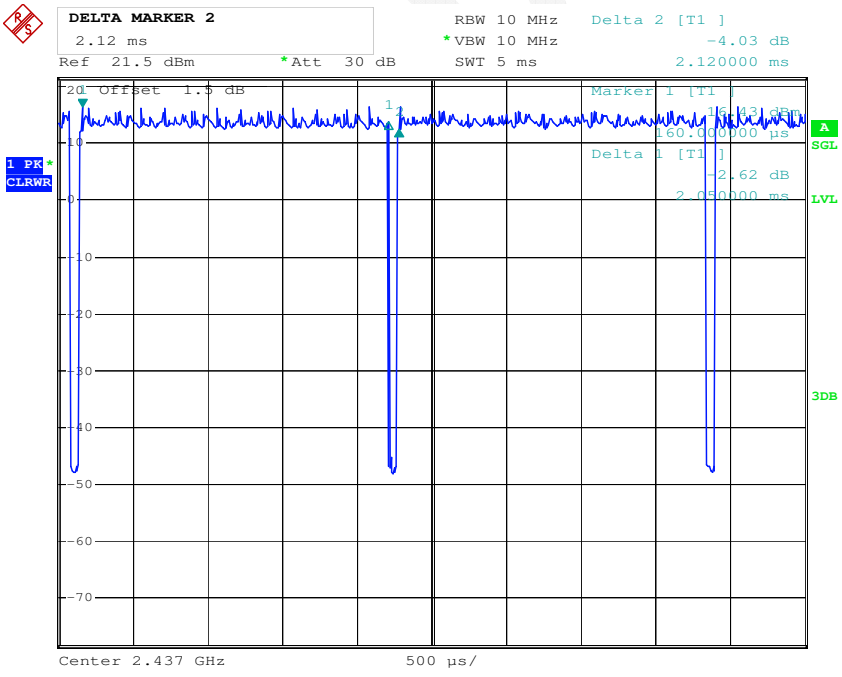
802.11g mode



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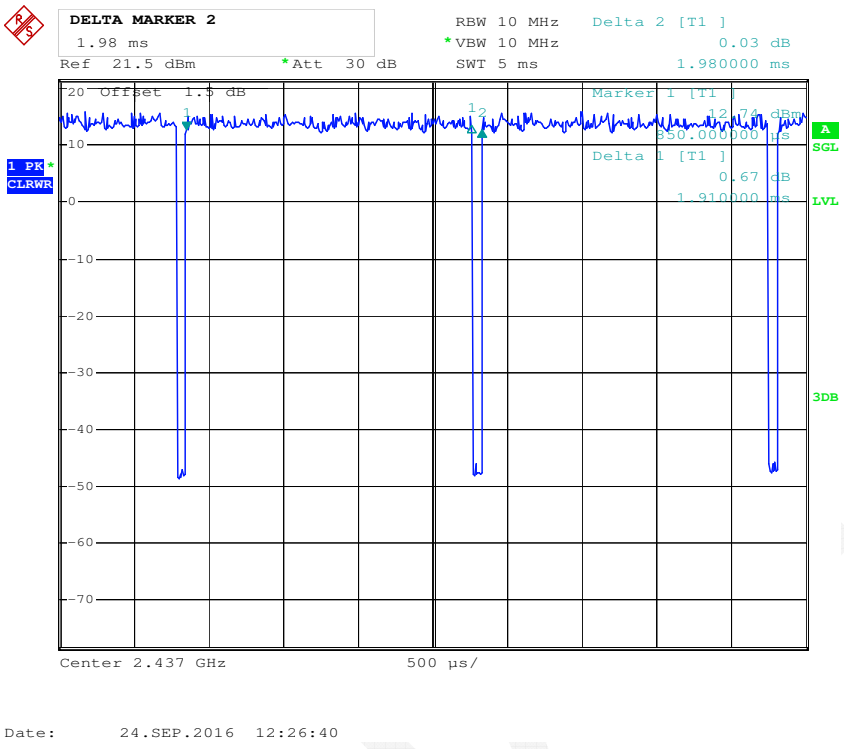
802.11n20 mode



Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

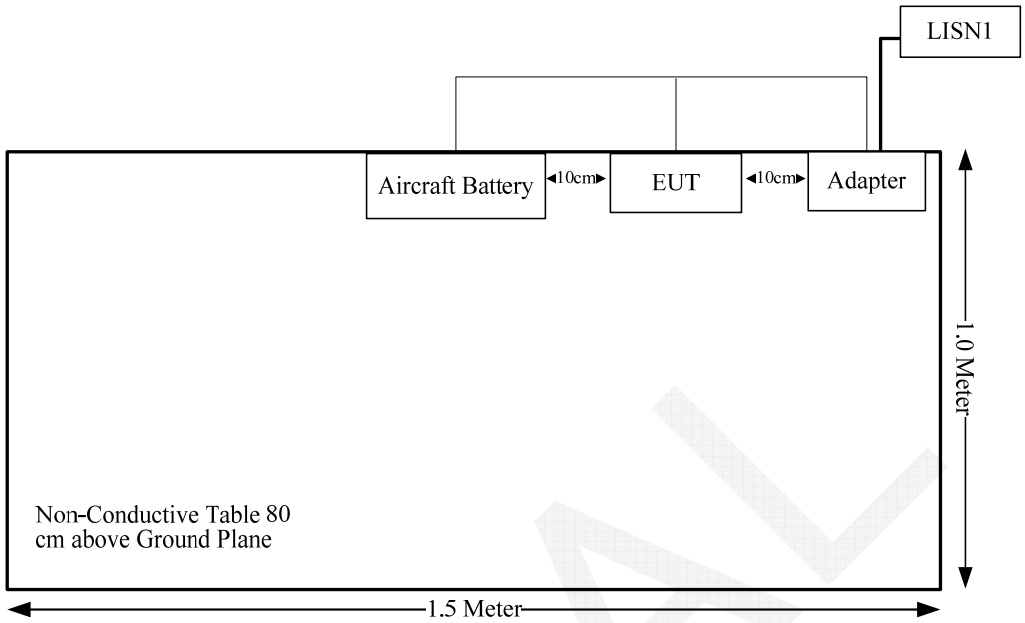
Manufacturer	Description	Model	Serial Number
DJI	Aircraft Battery	PH4	/

External Cable

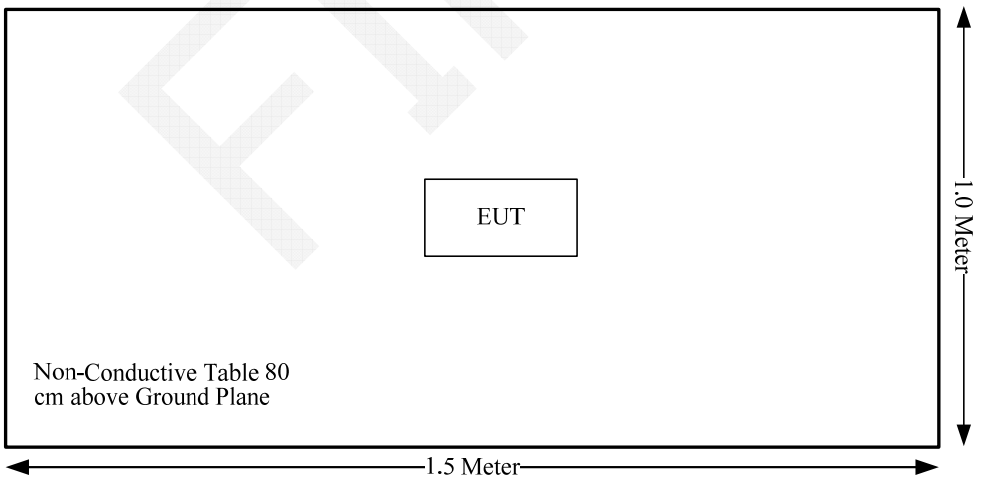
Cable Description	Shielding Type	Ferrite Core	Length(m)	From Port	To
DC cable	Yes	Yes	1	Adapter	Battery& Remote

Block Diagram of Test Setup

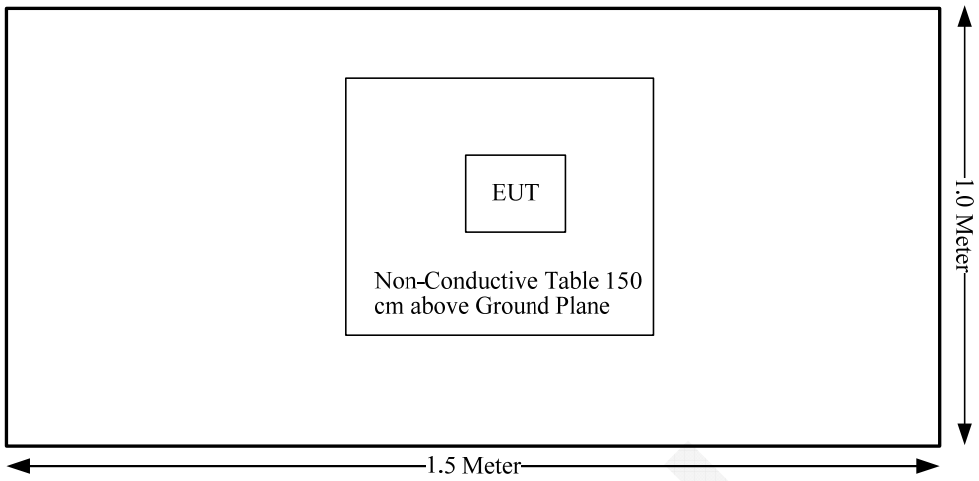
AC Line Conducted Test：



Radiation test below 1GHz:



Radiation test above 1GHz:



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 Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

Test Time: 2016-09-20~2016-09-25.

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.247(i),§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RDG160820008-20C.

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.
c. 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 2 internal antennas arrangement for 802.11a/b/g/n, and the antennas gain are 4.9dBi@2.4GHz, 6.07 dBi@5GHz, 2 un-detachable external antenna for LB, one for Transmitting, one for receiving, the antenna gain is 3.3dBi@ 2.4GHz band, 4.48dBi @ 5.8GHz band, that fulfill the requirement of the item. Please refer to the internal photos.

Result: Compliance.

§15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

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.

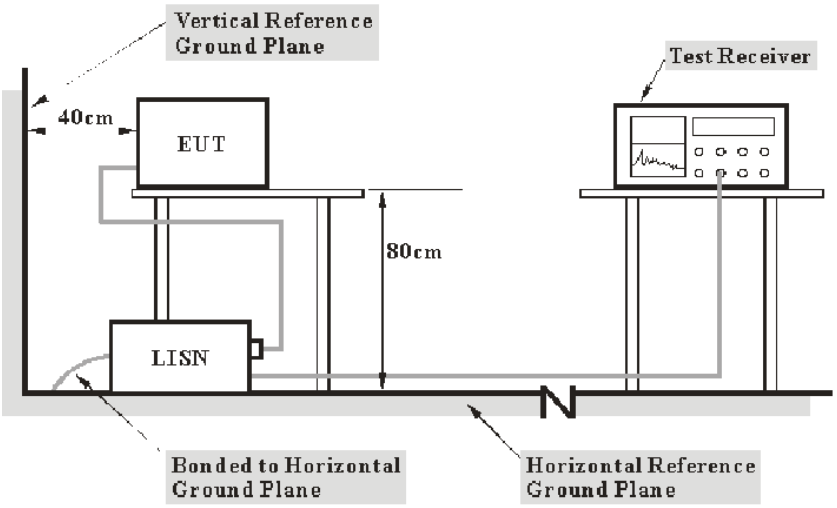
If U_{lab} is greater than U_{cispr} of Table 1, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$),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

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	2016-09-01	2017-08-31
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	2016-09-01	2017-09-01
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 in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the adapter was connected to thefirst LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Test Data

Environmental Conditions

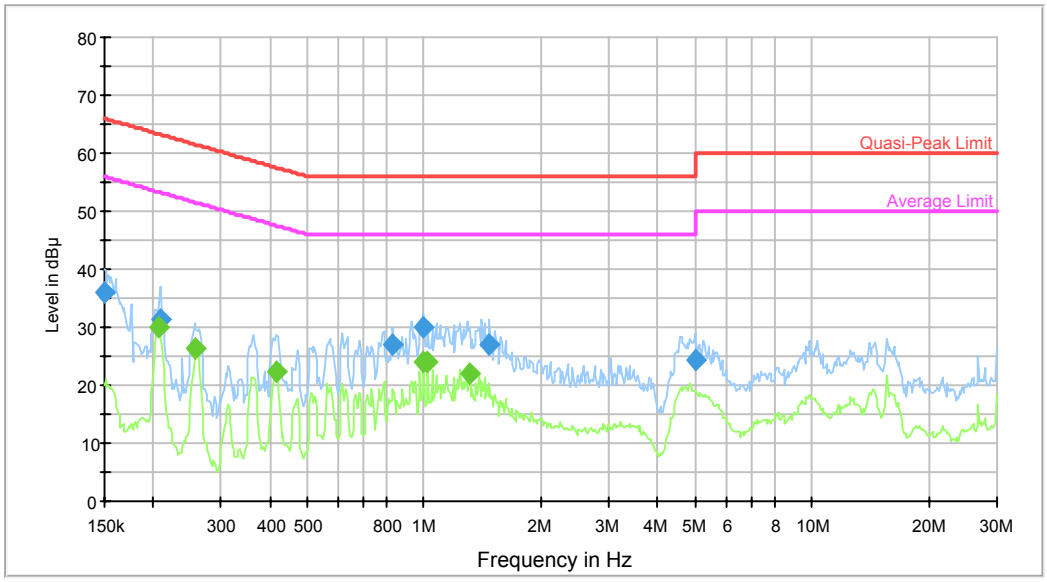
Temperature:	29.6 °C
Relative Humidity:	49 %
ATM Pressure:	100 kPa

The testing was performed by David Huang on 2016-09-22.

Test Result: Compliance, please refer to the below data and plots.

Test Mode: Charging

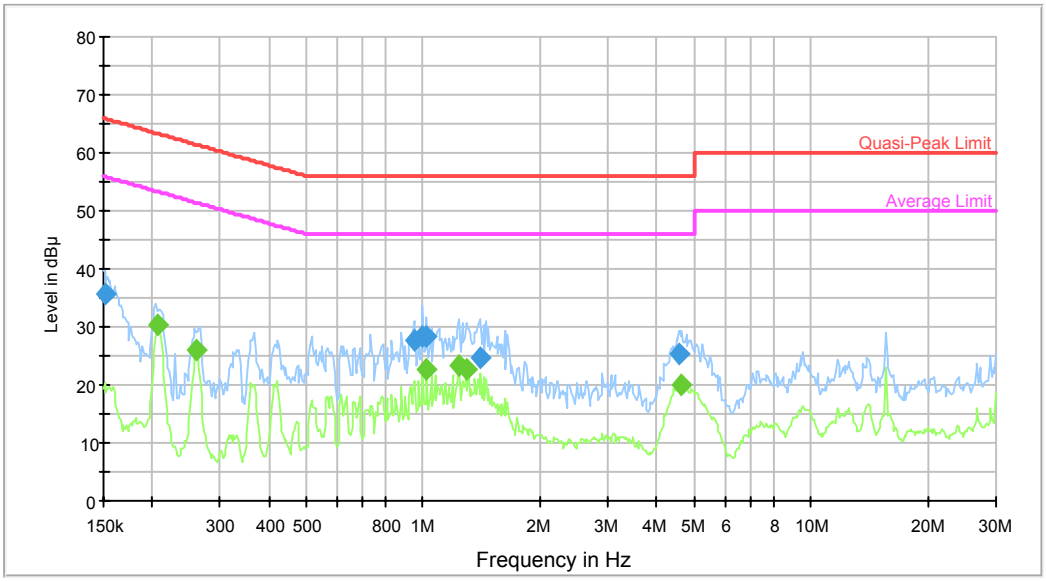
AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	36.0	9.000	L1	9.7	30.0	66.0	Compliance
0.209621	31.2	9.000	L1	9.6	32.0	63.2	Compliance
0.831967	26.9	9.000	L1	9.7	29.1	56.0	Compliance
0.999305	29.9	9.000	L1	9.7	26.1	56.0	Compliance
1.476605	27.0	9.000	L1	9.7	29.0	56.0	Compliance
4.997188	24.2	9.000	L1	9.7	31.8	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.206306	30.0	9.000	L1	9.6	23.4	53.4	Compliance
0.257874	26.2	9.000	L1	9.6	25.3	51.5	Compliance
0.415949	22.5	9.000	L1	9.7	25.0	47.5	Compliance
0.999305	24.2	9.000	L1	9.7	21.8	46.0	Compliance
1.023481	24.1	9.000	L1	9.7	21.9	46.0	Compliance
1.310256	22.0	9.000	L1	9.7	24.0	46.0	Compliance

AC120V, 60Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.151200	35.6	9.000	N	9.6	30.3	65.9	Compliance
0.952654	27.8	9.000	N	9.7	28.2	56.0	Compliance
0.999305	28.4	9.000	N	9.7	27.6	56.0	Compliance
1.023481	28.4	9.000	N	9.7	27.6	56.0	Compliance
1.396499	24.7	9.000	N	9.7	31.3	56.0	Compliance
4.577832	25.3	9.000	N	9.7	30.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.207957	30.3	9.000	N	9.6	23.0	53.3	Compliance
0.259937	26.0	9.000	N	9.6	25.4	51.4	Compliance
1.023481	22.6	9.000	N	9.7	23.4	46.0	Compliance
1.239175	23.4	9.000	N	9.7	22.6	46.0	Compliance
1.289541	22.6	9.000	N	9.7	23.4	46.0	Compliance
4.651370	20.0	9.000	N	9.7	26.0	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.

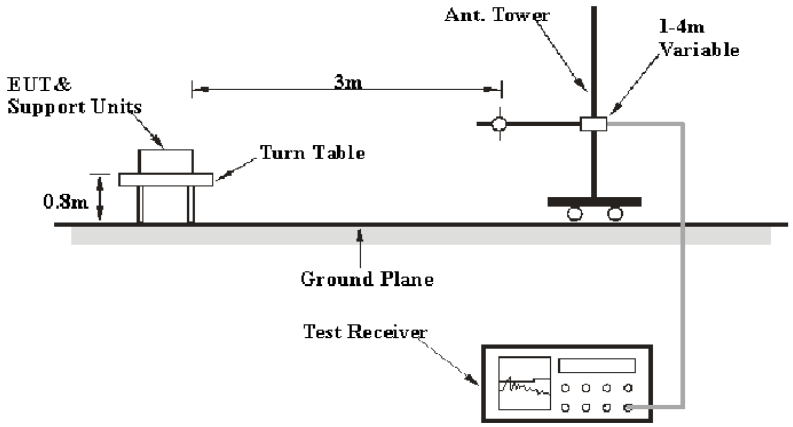
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

Table 2 – Values of U_{cispr}

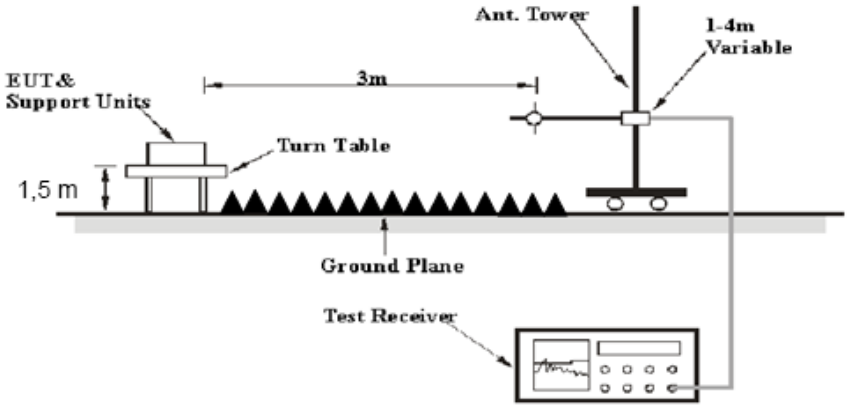
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

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 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:

30MHz-1000MHz:

Detector	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 25GHz:

Detector	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

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	2016-09-01	2017-09-01
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2016-09-01	2017-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2016-01-05	2019-01-04
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2016-02-19	2017-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2016-05-09	2017-05-09
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2016-09-06	2017-09-06
N/A	Coaxial Cable	14m	N/A	2016-05-06	2017-05-06
N/A	Coaxial Cable	8m	N/A	2016-05-06	2017-05-06
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

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

Test Data

Environmental Conditions

Temperature:	26.3 °C
Relative Humidity:	35 %
ATM Pressure:	100.9 kPa

The testing was performed by Meixiang Chen on 2016-09-25.

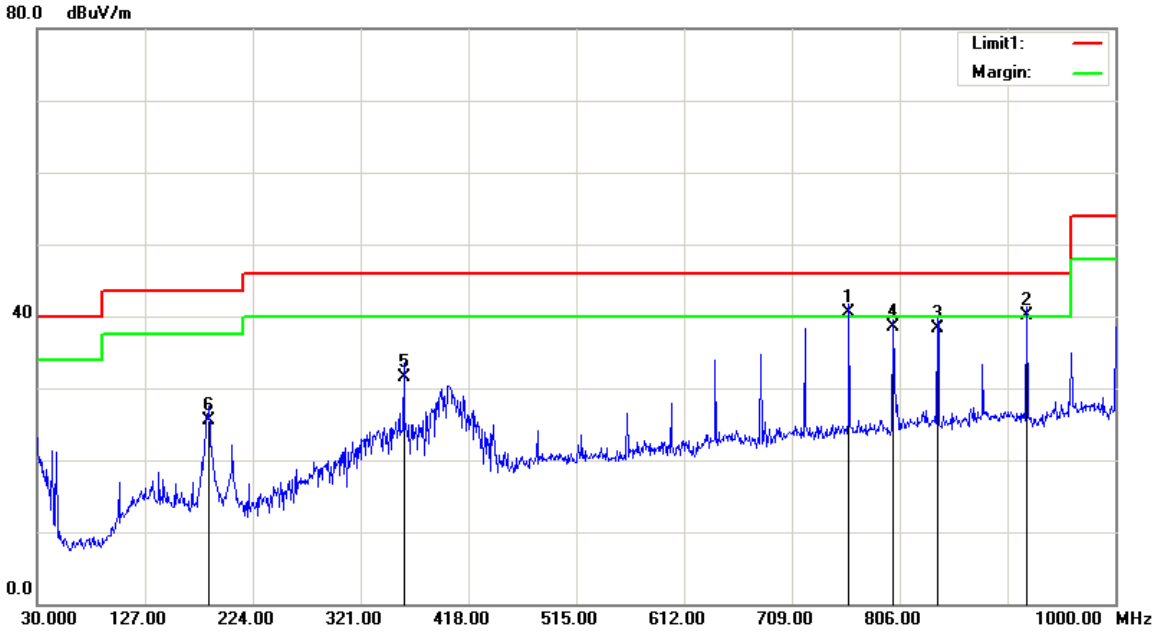
Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting

Below 1GHz

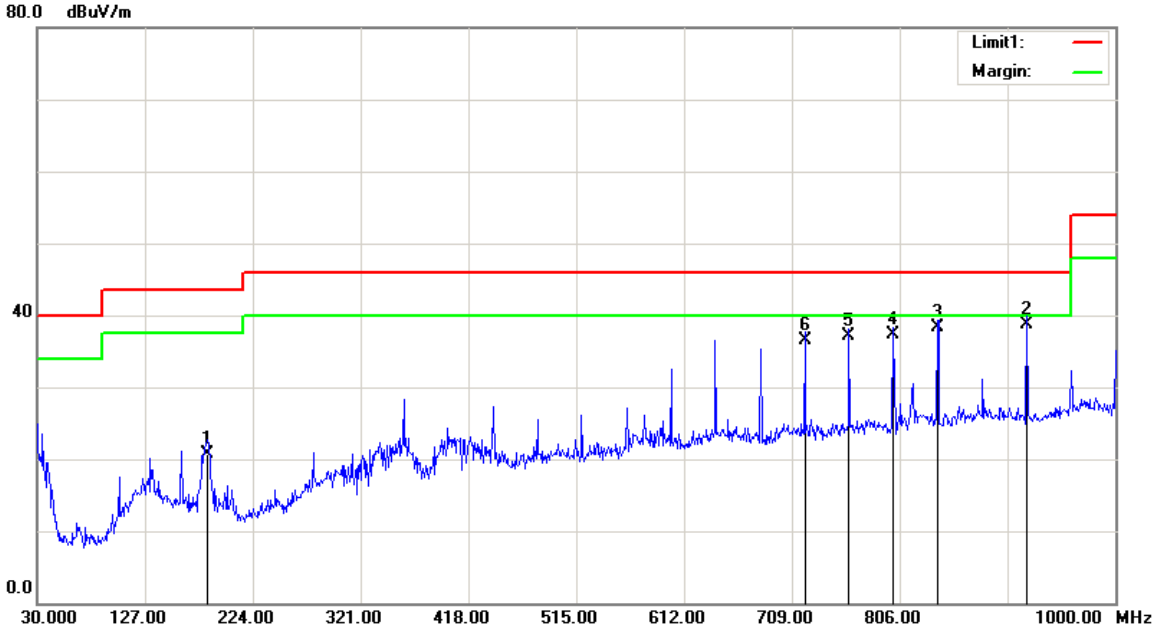
(Pretest all modes, 2.4G LB middle channel+ 5.8G 802.11a high channel was the worst)

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
760.4100	38.33	QP	2.17	40.50	46.00	5.50
920.4600	35.69	QP	4.51	40.20	46.00	5.80
839.9500	35.43	QP	2.97	38.40	46.00	7.60
800.1800	35.91	QP	2.69	38.60	46.00	7.40
359.8000	36.05	QP	-4.45	31.60	46.00	14.40
184.2300	34.27	QP	-8.77	25.50	43.50	18.00

Vertical:



Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/QP/Ave)	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
183.2600	29.58	QP	-8.78	20.80	43.50	22.70
920.4600	34.29	QP	4.51	38.80	46.00	7.20
839.9500	35.33	QP	2.97	38.30	46.00	7.70
800.1800	34.71	QP	2.69	37.40	46.00	8.60
760.4100	34.93	QP	2.17	37.10	46.00	8.90
720.6400	34.91	QP	1.69	36.60	46.00	9.40

1GHz-25GHz:

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	69.46	PK	H	25.67	3.68	0.00	98.81	N/A	N/A
2412	66.48	AV	H	25.67	3.68	0.00	95.83	N/A	N/A
2412	70	PK	V	25.67	3.68	0.00	99.35	N/A	N/A
2412	67.03	AV	V	25.67	3.68	0.00	96.38	N/A	N/A
2390	24.72	PK	V	25.61	3.63	0.00	53.96	74.00	20.04
2390	13.55	AV	V	25.61	3.63	0.00	42.79	54.00	11.21
4824	33.25	PK	V	30.64	5.03	27.41	41.51	74.00	32.49
4824	26.31	AV	V	30.64	5.03	27.41	34.57	54.00	19.43
7236	33.58	PK	V	34.17	6.65	25.90	48.50	74.00	25.50
7236	26.42	AV	V	34.17	6.65	25.90	41.34	54.00	12.66
3222	38.63	PK	V	27.91	6.18	27.35	45.37	74.00	28.63
3222	30.24	AV	V	27.91	6.18	27.35	36.98	54.00	17.02
Middle Channel: 2437 MHz									
2437	71.55	PK	H	25.74	3.75	0.00	101.04	N/A	N/A
2437	68.58	AV	H	25.74	3.75	0.00	98.07	N/A	N/A
2437	72.87	PK	V	25.74	3.75	0.00	102.36	N/A	N/A
2437	69.78	AV	V	25.74	3.75	0.00	99.27	N/A	N/A
4874	33.66	PK	V	30.77	5.14	27.42	42.15	74.00	31.85
4874	27.34	AV	V	30.77	5.14	27.42	35.83	54.00	18.17
7311	33.84	PK	V	34.35	6.74	25.88	49.05	74.00	24.95
7311	27.43	AV	V	34.35	6.74	25.88	42.64	54.00	11.36
3505	33.57	PK	V	28.81	4.52	27.24	39.66	74.00	34.34
3505	27.39	AV	V	28.81	4.52	27.24	33.48	54.00	20.52
3222	35.26	PK	V	27.91	6.18	27.35	42.00	74.00	32.00
3222	28.49	AV	V	27.91	6.18	27.35	35.23	54.00	18.77
High Channel: 2462 MHz									
2462	72.65	PK	H	25.80	3.75	0.00	102.20	N/A	N/A
2462	69.53	AV	H	25.80	3.75	0.00	99.08	N/A	N/A
2462	73.73	PK	V	25.80	3.75	0.00	103.28	N/A	N/A
2462	70.67	AV	V	25.80	3.75	0.00	100.22	N/A	N/A
2483.5	26.4	PK	V	25.86	3.67	0.00	55.93	74.00	18.07
2483.5	14.9	AV	V	25.86	3.67	0.00	44.43	54.00	9.57
4924	33.26	PK	V	30.90	5.34	27.43	42.07	74.00	31.93
4924	27.18	AV	V	30.90	5.34	27.43	35.99	54.00	18.01
7386	33.49	PK	V	34.53	6.83	25.86	48.99	74.00	25.01
7386	27.68	AV	V	34.53	6.83	25.86	43.18	54.00	10.82
3280	35.64	PK	V	28.10	5.61	27.30	42.05	74.00	31.95
3280	28.37	AV	V	28.10	5.61	27.30	34.78	54.00	19.22

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	73.7	PK	H	25.67	3.68	0.00	103.05	N/A	N/A
2412	64.18	AV	H	25.67	3.68	0.00	93.53	N/A	N/A
2412	73.08	PK	V	25.67	3.68	0.00	102.43	N/A	N/A
2412	63.22	AV	V	25.67	3.68	0.00	92.57	N/A	N/A
2390	30.83	PK	H	25.61	3.63	0.00	60.07	74.00	13.93
2390	15.69	AV	H	25.61	3.63	0.00	44.93	54.00	9.07
4824	33.68	PK	H	30.64	5.03	27.41	41.94	74.00	32.06
4824	22.25	AV	H	30.64	5.03	27.41	30.51	54.00	23.49
7236	33.34	PK	H	34.17	6.65	25.90	48.26	74.00	25.74
7236	22.18	AV	H	34.17	6.65	25.90	37.10	54.00	16.90
3222	35.39	PK	H	27.91	6.18	27.35	42.13	74.00	31.87
3222	24.42	AV	H	27.91	6.18	27.35	31.16	54.00	22.84
Middle Channel: 2437 MHz									
2437	76.81	PK	H	25.74	3.75	0.00	106.30	N/A	N/A
2437	66.51	AV	H	25.74	3.75	0.00	96.00	N/A	N/A
2437	75.74	PK	V	25.74	3.75	0.00	105.23	N/A	N/A
2437	64.99	AV	V	25.74	3.75	0.00	94.48	N/A	N/A
4874	33.46	PK	H	30.77	5.14	27.42	41.95	74.00	32.05
4874	22.19	AV	H	30.77	5.14	27.42	30.68	54.00	23.32
7311	33.42	PK	H	34.35	6.74	25.88	48.63	74.00	25.37
7311	22.06	AV	H	34.35	6.74	25.88	37.27	54.00	16.73
3245	38.51	PK	H	27.98	6.29	27.33	45.45	74.00	28.55
3245	27.96	AV	H	27.98	6.29	27.33	34.90	54.00	19.10
3642	32.88	PK	H	29.11	4.55	27.29	39.25	74.00	34.75
3642	21.45	AV	H	29.11	4.55	27.29	27.82	54.00	26.18
High Channel: 2462 MHz									
2462	78.09	PK	H	25.80	3.75	0.00	107.64	N/A	N/A
2462	67.53	AV	H	25.80	3.75	0.00	97.08	N/A	N/A
2462	76.56	PK	V	25.80	3.75	0.00	106.11	N/A	N/A
2462	65.41	AV	V	25.80	3.75	0.00	94.96	N/A	N/A
2483.5	43.61	PK	H	25.86	3.67	0.00	73.14	74.00	0.86
2483.5	23.76	AV	H	25.86	3.67	0.00	53.29	54.00	0.71
4924	32.59	PK	H	30.90	5.34	27.43	41.40	74.00	32.60
4924	21.72	AV	H	30.90	5.34	27.43	30.53	54.00	23.47
7386	33.05	PK	H	34.53	6.83	25.86	48.55	74.00	25.45
7386	22.49	AV	H	34.53	6.83	25.86	37.99	54.00	16.01
3280	35.91	PK	H	28.10	5.61	27.30	42.32	74.00	31.68
3280	24.33	AV	H	28.10	5.61	27.30	30.74	54.00	23.26

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	74.06	PK	H	25.67	3.68	0.00	103.41	N/A	N/A
2412	63.76	AV	H	25.67	3.68	0.00	93.11	N/A	N/A
2412	72.87	PK	V	25.67	3.68	0.00	102.22	N/A	N/A
2412	62.91	AV	V	25.67	3.68	0.00	92.26	N/A	N/A
2390	35.48	PK	H	25.61	3.63	0.00	64.72	74.00	9.28
2390	17.24	AV	H	25.61	3.63	0.00	46.48	54.00	7.52
4824	32.85	PK	H	30.64	5.03	27.41	41.11	74.00	32.89
4824	20.56	AV	H	30.64	5.03	27.41	28.82	54.00	25.18
7236	32.22	PK	H	34.17	6.65	25.90	47.14	74.00	26.86
7236	19.95	AV	H	34.17	6.65	25.90	34.87	54.00	19.13
3222	38.86	PK	H	27.91	6.18	27.35	45.60	74.00	28.40
3222	26.21	AV	H	27.91	6.18	27.35	32.95	54.00	21.05
Middle Channel: 2437 MHz									
2437	76.19	PK	H	25.74	3.75	0.00	105.68	N/A	N/A
2437	66.02	AV	H	25.74	3.75	0.00	95.51	N/A	N/A
2437	75.39	PK	V	25.74	3.75	0.00	104.88	N/A	N/A
2437	64.93	AV	V	25.74	3.75	0.00	94.42	N/A	N/A
4874	33.24	PK	H	30.77	5.14	27.42	41.73	74.00	32.27
4874	22.49	AV	H	30.77	5.14	27.42	30.98	54.00	23.02
7311	33.18	PK	H	34.35	6.74	25.88	48.39	74.00	25.61
7311	22.24	AV	H	34.35	6.74	25.88	37.45	54.00	16.55
3245	38.49	PK	H	27.98	6.29	27.33	45.43	74.00	28.57
3245	27.62	AV	H	27.98	6.29	27.33	34.56	54.00	19.44
3642	32.49	PK	H	29.11	4.55	27.29	38.86	74.00	35.14
3642	21.98	AV	H	29.11	4.55	27.29	28.35	54.00	25.65
High Channel: 2462 MHz									
2462	76.26	PK	H	25.80	3.75	0.00	105.81	N/A	N/A
2462	64.32	AV	H	25.80	3.75	0.00	93.87	N/A	N/A
2462	76.03	PK	V	25.80	3.75	0.00	105.58	N/A	N/A
2462	64.99	AV	V	25.80	3.75	0.00	94.54	N/A	N/A
2483.5	34.08	PK	H	25.86	3.67	0.00	63.61	74.00	10.39
2483.5	23.59	AV	H	25.86	3.67	0.00	53.12	54.00	0.88
4924	32.85	PK	H	30.90	5.34	27.43	41.66	74.00	32.34
4924	20.13	AV	H	30.90	5.34	27.43	28.94	54.00	25.06
7386	32.59	PK	H	34.53	6.83	25.86	48.09	74.00	25.91
7386	19.78	AV	H	34.53	6.83	25.86	35.28	54.00	18.72
3280	36.38	PK	H	28.10	5.61	27.30	42.79	74.00	31.21
3280	24.59	AV	H	28.10	5.61	27.30	31.00	54.00	23.00

LB Mode (additional channel bandedge test performed at worst polarization):

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: 2404 MHz									
2404	83.54	PK	H	25.65	3.66	0.00	112.85	N/A	N/A
2404	73.41	AV	H	25.65	3.66	0.00	102.72	N/A	N/A
2404	88.6	PK	V	25.65	3.66	0.00	117.91	N/A	N/A
2404	78.03	AV	V	25.65	3.66	0.00	107.34	N/A	N/A
2390	31.98	PK	V	25.61	3.63	0.00	61.22	74.00	12.78
2390	13.36	AV	V	25.61	3.63	0.00	42.60	54.00	11.40
4808	51.92	PK	V	30.60	5.06	27.41	60.17	74.00	13.83
4808	41.93	AV	V	30.60	5.06	27.41	50.18	54.00	3.82
7212	38.24	PK	V	34.11	6.62	25.91	53.06	74.00	20.94
7212	28.41	AV	V	34.11	6.62	25.91	43.23	54.00	10.77
3432	45.24	PK	V	28.58	5.02	27.21	51.63	74.00	22.37
3432	31.74	AV	V	28.58	5.02	27.21	38.13	54.00	15.87
Middle Channel: 2441.4 MHz									
2441.1	86.36	PK	H	25.75	3.77	0.00	115.88	N/A	N/A
2441.1	76.54	AV	H	25.75	3.77	0.00	106.06	N/A	N/A
2441.1	92.02	PK	V	25.75	3.77	0.00	121.54	N/A	N/A
2441.1	82.49	AV	V	25.75	3.77	0.00	112.01	N/A	N/A
4882.2	56.96	PK	V	30.79	5.19	27.42	65.52	74.00	8.48
4882.2	38.48	AV	V	30.79	5.19	27.42	47.04	54.00	6.96
7323.3	36.98	PK	V	34.38	6.75	25.88	52.23	74.00	21.77
7323.3	21.41	AV	V	34.38	6.75	25.88	36.66	54.00	17.34
3445	33.3	PK	V	28.62	4.96	27.22	39.66	74.00	34.34
3445	20.41	AV	V	28.62	4.96	27.22	26.77	54.00	27.23
4038	34.01	PK	V	29.89	4.65	27.18	41.37	74.00	32.63
4038	21.87	AV	V	29.89	4.65	27.18	29.23	54.00	24.77
High Channel: 2478.8 MHz									
2478.8	81.91	PK	H	25.84	3.69	0.00	111.44	N/A	N/A
2478.8	72.02	AV	H	25.84	3.69	0.00	101.55	N/A	N/A
2478.8	88.61	PK	V	25.84	3.69	0.00	118.14	N/A	N/A
2478.8	78.79	AV	V	25.84	3.69	0.00	108.32	N/A	N/A
2483.5	30.86	PK	V	25.86	3.67	0.00	60.39	74.00	13.61
2483.5	13.74	AV	V	25.86	3.67	0.00	43.27	54.00	10.73
4957.6	48.53	PK	V	30.99	5.35	27.43	57.44	74.00	16.56
4957.6	33.07	AV	V	30.99	5.35	27.43	41.98	54.00	12.02
7436.4	34.58	PK	V	34.65	6.88	25.96	50.15	74.00	23.85
7436.4	19.21	AV	V	34.65	6.88	25.96	34.78	54.00	19.22
3175	34.18	PK	V	27.76	6.53	27.39	41.08	74.00	32.92
3175	21.57	AV	V	27.76	6.53	27.39	28.47	54.00	25.53

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)					
Additional Channel: 2405.7 MHz									
2405.7	90.13	PK	V	25.65	3.67	0.00	119.45	N/A	N/A
2405.7	80.55	AV	V	25.65	3.67	0.00	109.87	N/A	N/A
2390	27.94	PK	V	25.61	3.63	0.00	57.18	74.00	16.82
2390	13.31	AV	V	25.61	3.63	0.00	42.55	54.00	11.45
Additional Channel: 2407.4MHz									
2407.4	91.78	PK	V	25.66	3.67	0.00	121.11	N/A	N/A
2407.4	81.49	AV	V	25.66	3.67	0.00	110.82	N/A	N/A
2390	32.35	PK	V	25.61	3.63	0.00	61.59	74.00	12.41
2390	13.54	AV	V	25.61	3.63	0.00	42.78	54.00	11.22
Additional Channel: 2475.4 MHz									
2475.4	91.88	PK	V	25.84	3.70	0.00	121.42	N/A	N/A
2475.4	81.2	AV	V	25.84	3.70	0.00	110.74	N/A	N/A
2484.3	35.53	PK	V	25.86	3.67	0.00	65.06	74.00	8.94
2484.3	14.25	AV	V	25.86	3.67	0.00	43.78	54.00	10.22
Additional Channel: 2477.1MHz									
2477.1	90.14	PK	V	25.84	3.69	0.00	119.67	N/A	N/A
2477.1	80.33	AV	V	25.84	3.69	0.00	109.86	N/A	N/A
2484.5	36.46	PK	V	25.86	3.67	0.00	65.99	74.00	8.01
2484.5	13.56	AV	V	25.86	3.67	0.00	43.09	54.00	10.91

Transmitting Simultaneously:

(Pretest all modes, 2.4G LB middle channel+5.8G 802.11a high channel was the worst)

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector	Polar	Factor					
MHz	dBµV	PK/QP/AV	H/V	dB(1/m)	dB	dB	dBµV/m	dBµV/m	dB
1440	46.94	PK	H	23.44	2.96	27.16	46.18	74.00	27.82
1440	38.58	AV	H	23.44	2.96	27.16	37.82	54.00	16.18
1440.28	46.94	PK	V	23.44	2.96	27.16	46.18	74.00	27.82
1440.28	37.69	AV	V	23.44	2.96	27.16	36.93	54.00	17.07
1920	43.53	PK	H	24.44	3.02	27.50	43.49	74.00	30.51
1920	34.69	AV	H	24.44	3.02	27.50	34.65	54.00	19.35
1920	42.59	PK	V	24.44	3.02	27.50	42.55	74.00	31.45
1920	36.71	AV	V	24.44	3.02	27.50	36.67	54.00	17.33
1594.93	54.91	PK	H	23.79	2.55	27.79	53.46	74.00	20.54
1594.93	23.41	AV	H	23.79	2.55	27.79	21.96	54.00	32.04
1594.69	64.3	PK	V	23.79	2.55	27.79	62.85	74.00	11.15
1594.69	23.14	AV	V	23.79	2.55	27.79	21.69	54.00	32.31
3338.9	47.67	PK	H	28.28	4.87	27.25	53.57	74.00	20.43
3338.9	30.68	AV	H	28.28	4.87	27.25	36.58	54.00	17.42
3348.72	48.68	PK	V	28.32	4.80	27.24	54.56	74.00	19.44
3348.72	32.06	AV	V	28.32	4.80	27.24	37.94	54.00	16.06
4882.92	56.62	PK	H	30.80	5.20	27.42	65.20	74.00	8.80
4882.92	42.02	AV	H	30.80	5.20	27.42	50.60	54.00	3.40
4882.92	59.6	PK	V	30.80	5.20	27.42	68.18	74.00	5.82
4882.92	44.89	AV	V	30.80	5.20	27.42	53.47	54.00	0.53
7324.21	38.84	PK	H	34.38	6.75	25.88	54.09	74.00	19.91
7324.21	25.67	AV	H	34.38	6.75	25.88	40.92	54.00	13.08
7324.33	37.86	PK	V	34.38	6.75	25.88	53.11	74.00	20.89
7324.33	24.85	AV	V	34.38	6.75	25.88	40.10	54.00	13.90

FCC §15.247(a) (2) – 6dB 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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Test Receiver	ESPI	100120	2015-12-10	2016-12-09
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

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

Test Data

Environmental Conditions

Temperature:	24.9~27.5 °C
Relative Humidity:	33~34 %
ATM Pressure:	100.5~100.7 kPa

The testing was performed by Robin Zheng from 2016-09-20 to 2016-09-23.

Test Result: Compliance.

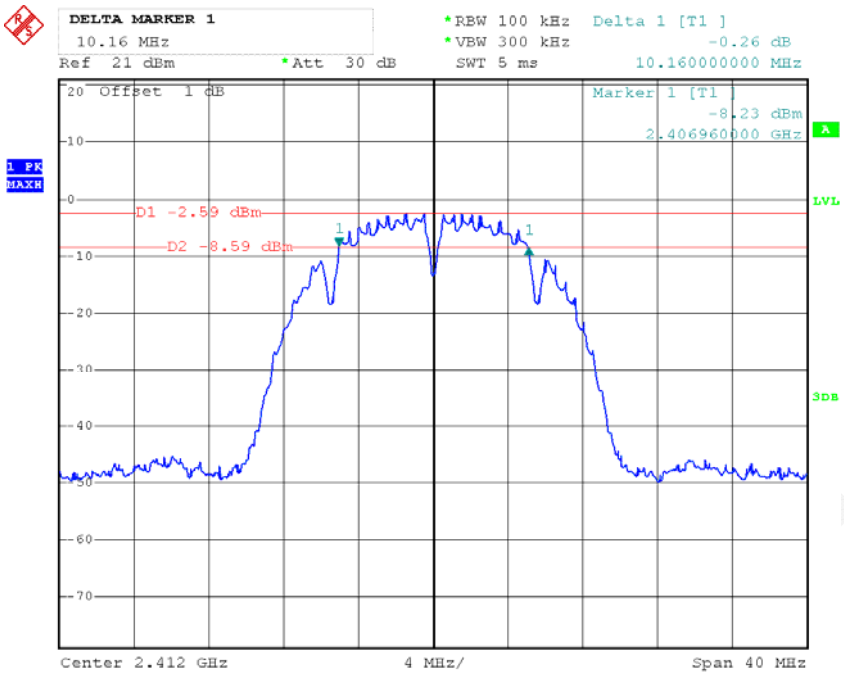
Please refer to the following tables and plots.

Test Mode: Transmitting (Test performed at Chain 0)

Test mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.16	≥0.5
	Middle	2437	10.16	≥0.5
	High	2462	10.08	≥0.5
802.11g	Low	2412	16.40	≥0.5
	Middle	2437	16.40	≥0.5
	High	2462	16.48	≥0.5
802.11n20	Low	2412	17.60	≥0.5
	Middle	2437	17.60	≥0.5
	High	2462	17.60	≥0.5
LB	Low	2404	1.206	≥0.5
	Middle	2441.4	1.200	≥0.5
	High	2478.8	1.206	≥0.5

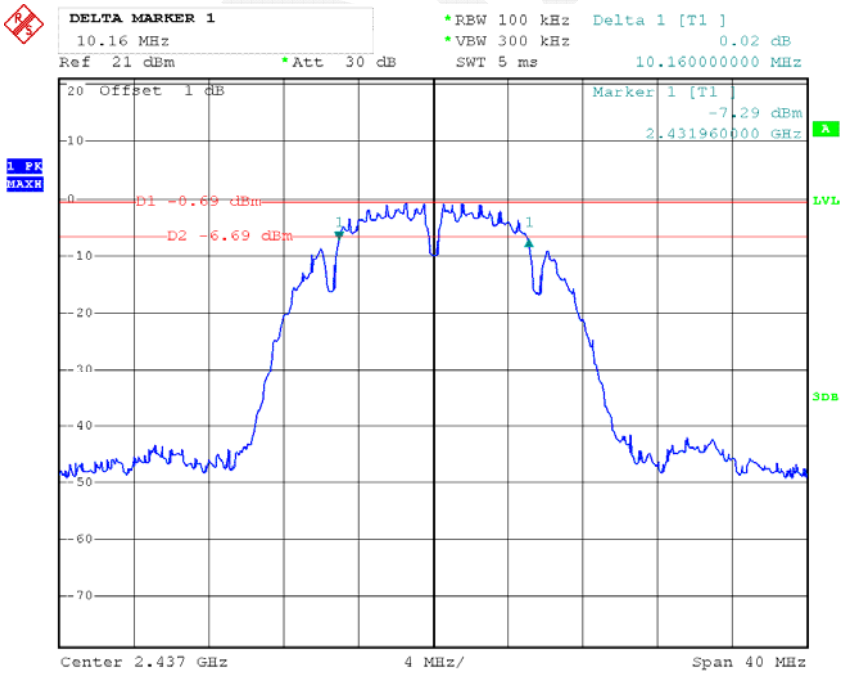
Chain 0

802.11b Low Channel



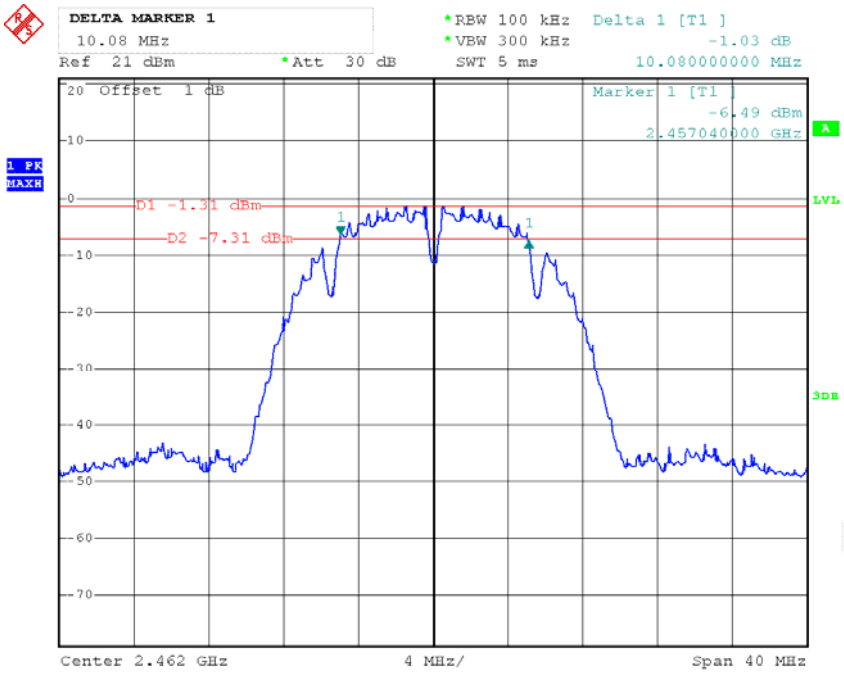
Date: 20.SEP.2016 14:51:13

802.11b Middle Channel



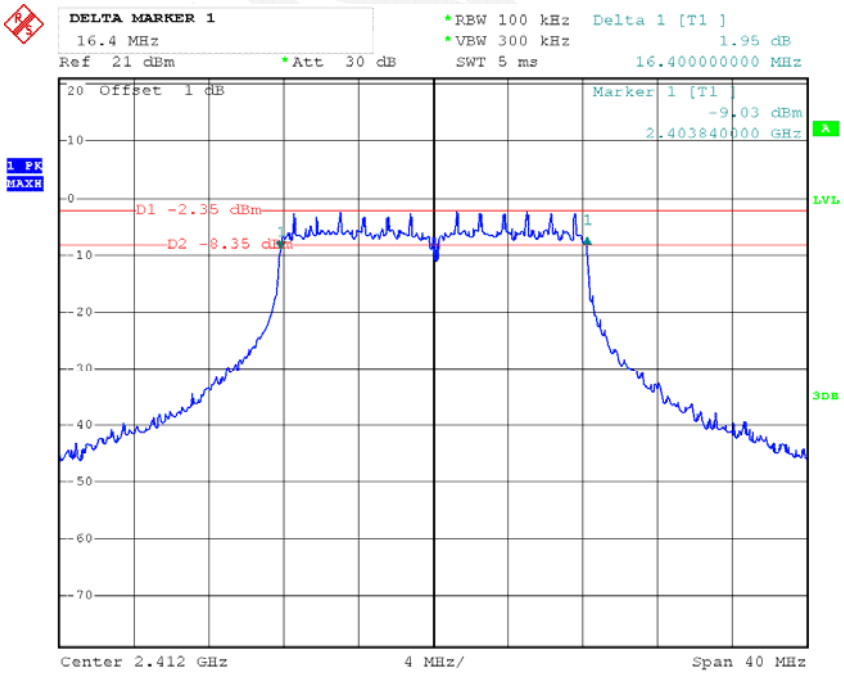
Date: 20.SEP.2016 14:51:49

802.11b High Channel



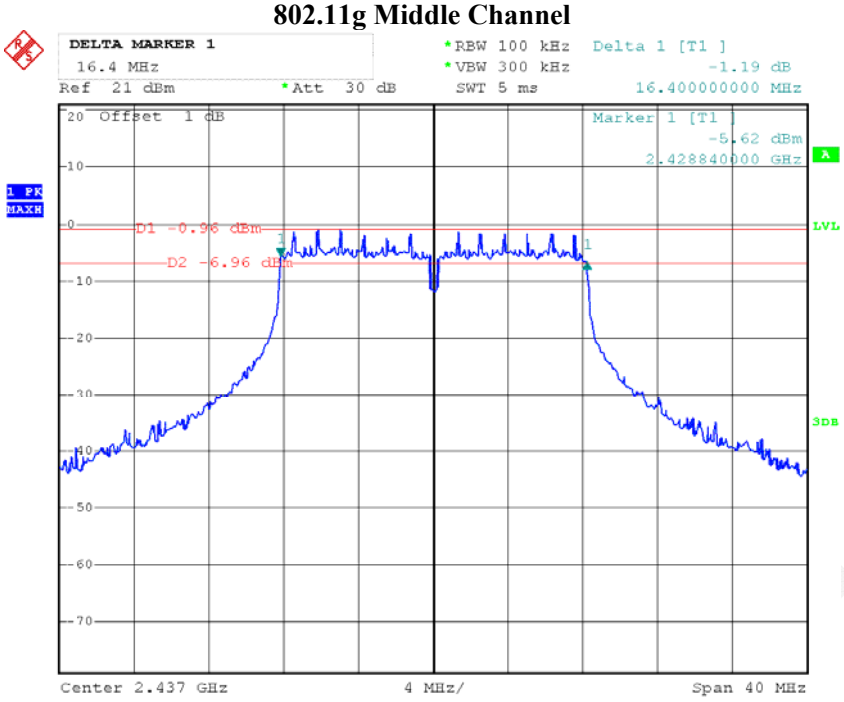
Date: 20.SEP.2016 14:52:36

802.11g Low Channel



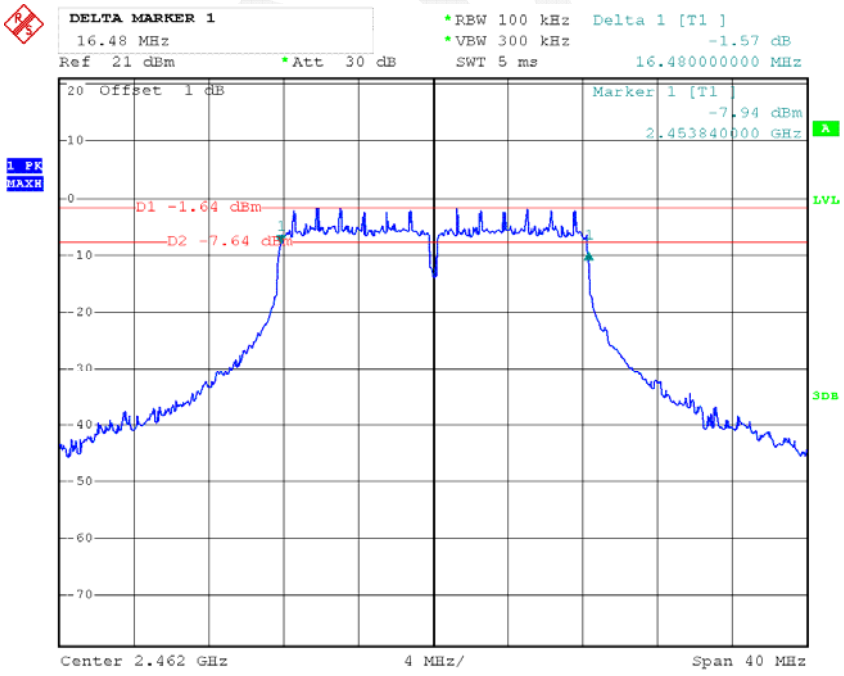
Date: 20.SEP.2016 14:54:55

802.11g Middle Channel



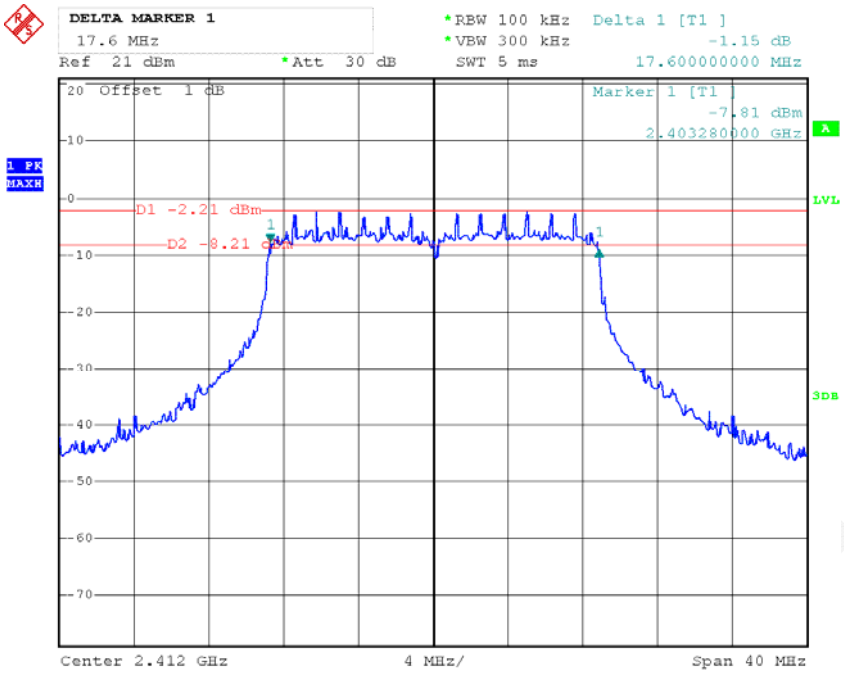
Date: 20.SEP.2016 14:53:57

802.11g High Channel



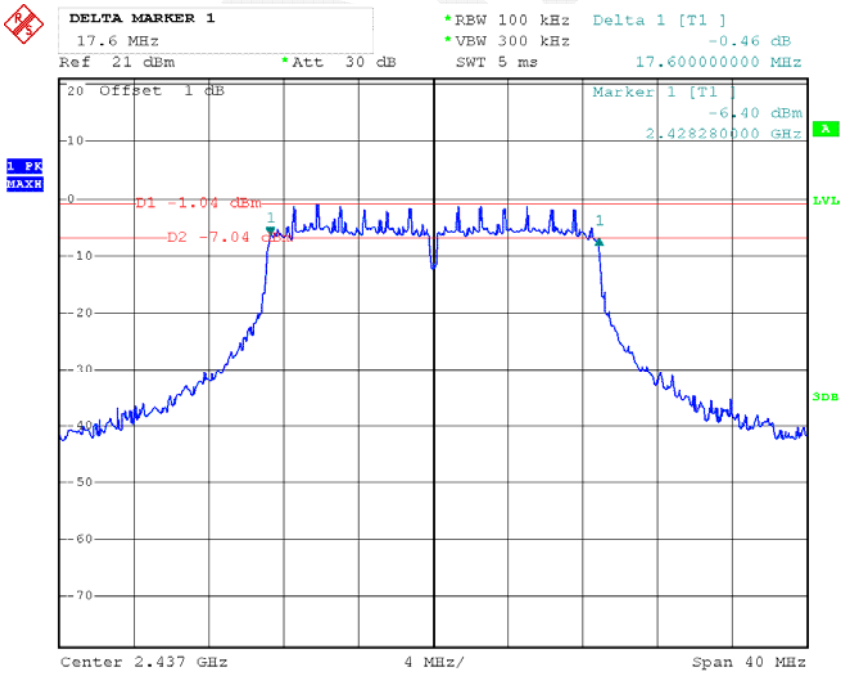
Date: 20.SEP.2016 14:53:21

802.11n ht20 Low Channel



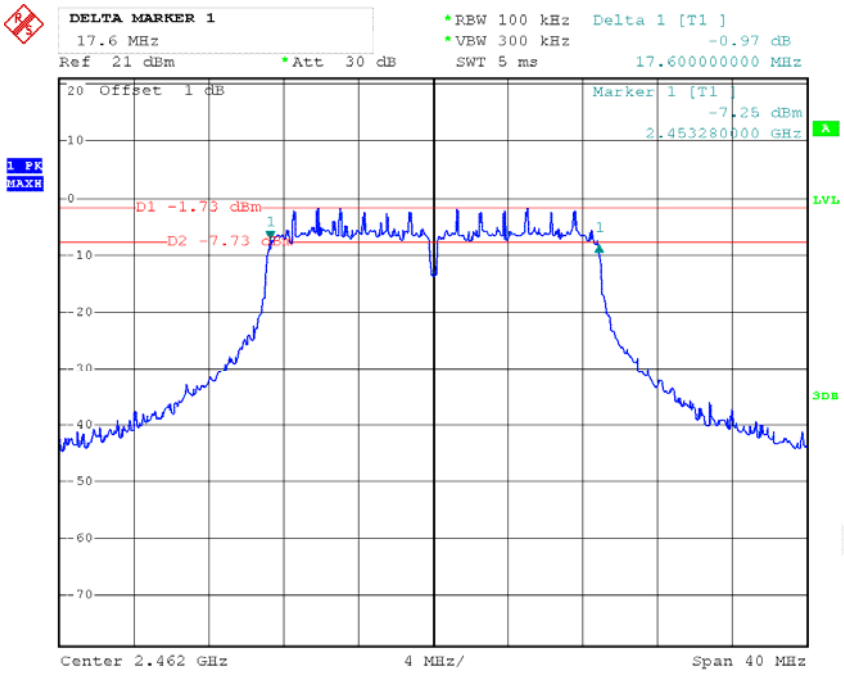
Date: 20.SEP.2016 14:55:35

802.11n ht20 Middle Channel



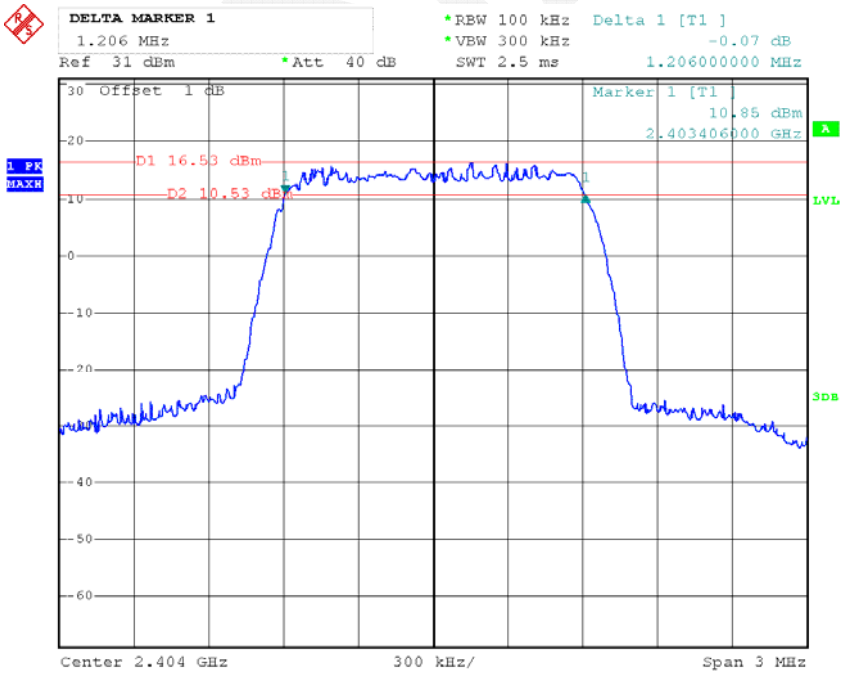
Date: 20.SEP.2016 14:56:15

802.11n ht20 High Channel



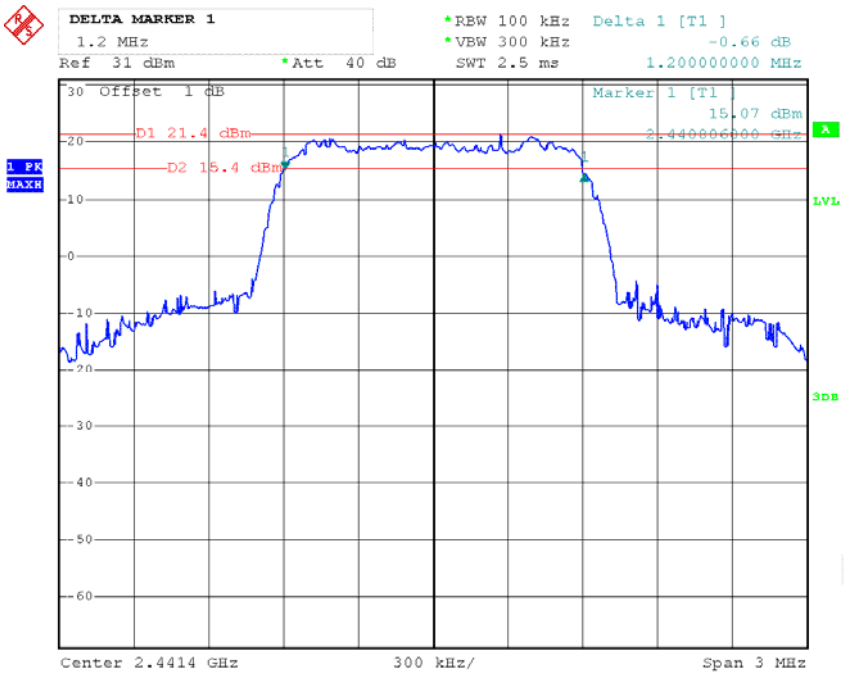
Date: 20.SEP.2016 14:56:56

LB Mode, Low Channel



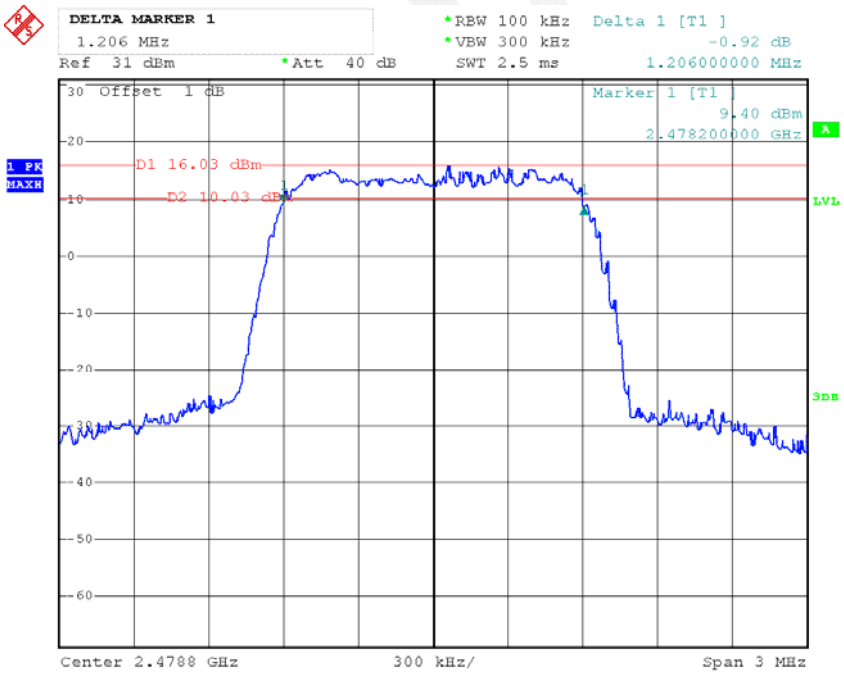
Date: 22.SEP.2016 11:07:21

LB Mode, Middle Channel



Date: 23.SEP.2016 15:23:12

LB Mode, High Channel



Date: 22.SEP.2016 11:25:38

FCC §15.247(b) (3) - MAXIMUM PEAK 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

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 a Test Equipment.

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	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

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

Test Data

Environmental Conditions

Temperature:	28.9 °C
Relative Humidity:	39 %
ATM Pressure:	100.9 kPa

The testing was performed by Robin Zheng on 2016-09-21

Test Mode: Transmitting

Test Mode	Frequency	Conducted Peak Output Power (dBm)			Limits
	(MHz)	Chain 0	Chain 1	Total	(dBm)
802.11b	2412	15.59	15.13	18.38	30
	2437	16.7	16.94	19.83	30
	2462	15.86	16.48	19.19	30
802.11g	2412	16.07	16.37	19.23	30
	2437	17.15	17.45	20.31	30
	2462	16.39	17.07	19.75	30
802.11n 20	2412	16.03	16.43	19.24	30
	2437	17.16	17.75	20.48	30
	2462	15.41	16.21	18.84	30
LB	2404	26.91	/	/	30
	2405.7	27.84	/	/	30
	2407.4	28.32	/	/	30
	2441.4	28.41	/	/	30
	2475.4	28.08	/	/	30
	2477.1	27.43	/	/	30
	2478.8	26.15	/	/	30

Test Mode	Frequency	Conducted Average Output Power (dBm)			Limits
	(MHz)	Chain 0	Chain 1	Total	(dBm)
802.11b	2412	8.91	9.36	12.15	30
	2437	9.47	9.89	12.7	30
	2462	9.08	9.88	12.51	30
802.11g	2412	9.44	9.55	12.51	30
	2437	9.92	10.09	13.02	30
	2462	9.71	10.04	12.89	30
802.11n 20	2412	9.3	9.51	12.42	30
	2437	9.77	10.18	12.99	30
	2462	8.4	9.17	11.81	30
LB	2404	18.74	/	/	30
	2405.7	20.12	/	/	30
	2407.4	23.05	/	/	30
	2441.4	23.08	/	/	30
	2475.4	22.78	/	/	30
	2477.1	19.87	/	/	30
	2478.8	18.22	/	/	30

Note: For 802.11b/g/n mode, the device employed Cyclic Delay Diversity (CDD) for MIMO transmitting, Per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

So:

Directional gain = GANT + Array Gain = 4.9dBi < 6dBi

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	Test Receiver	ESPI	100120	2015-12-10	2016-12-09
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

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

Test Data

Environmental Conditions

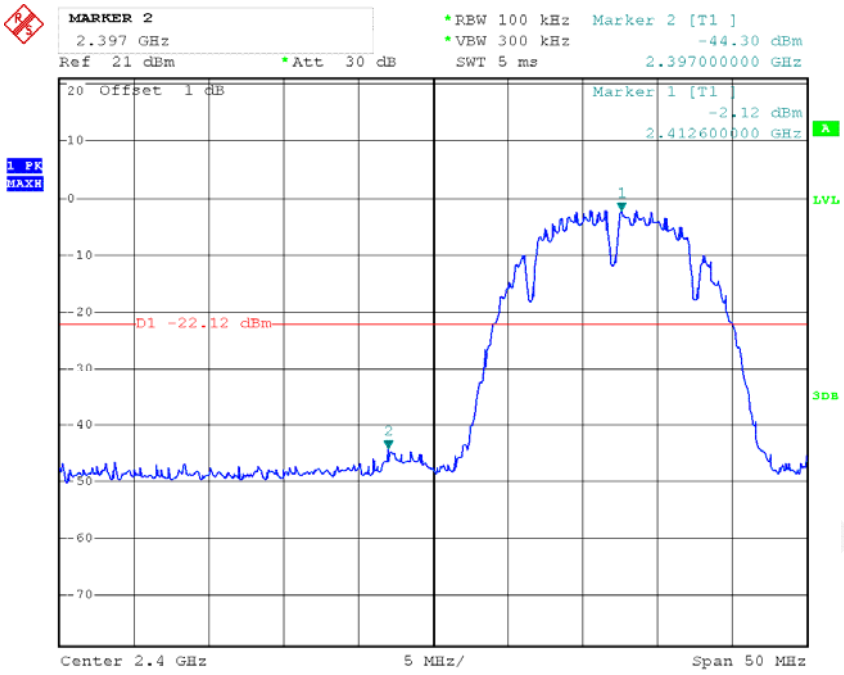
Temperature:	24.9~27.4 °C
Relative Humidity:	33~34%
ATM Pressure:	100.5~100.7 kPa

The testing was performed by Robin Zheng from 2016-09-20 to 2016-09-22.

Test mode: Transmitting

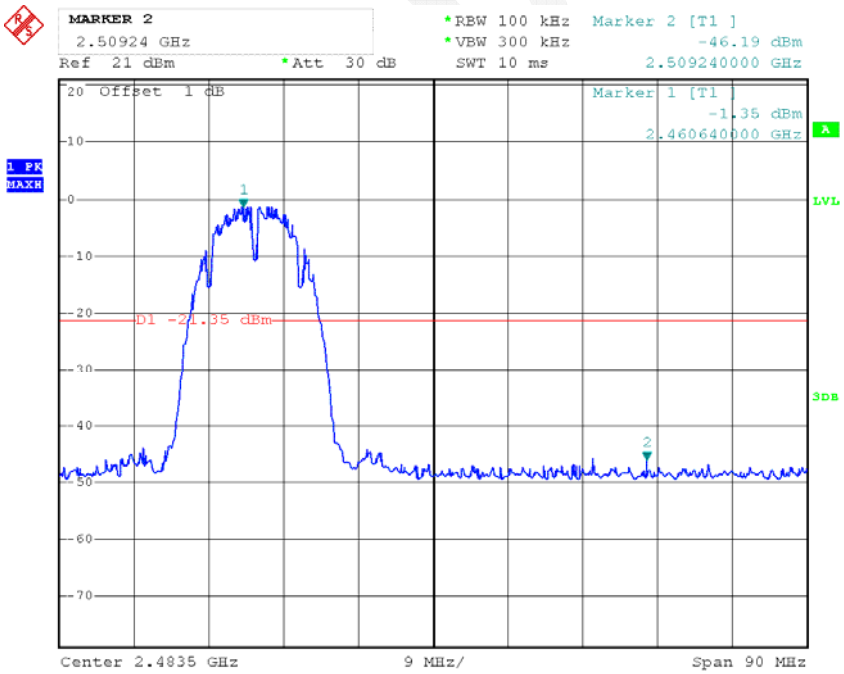
Test Result: Compliant. Please refer to following plots.

Chain 0-802.11b Band Edge, Left Side



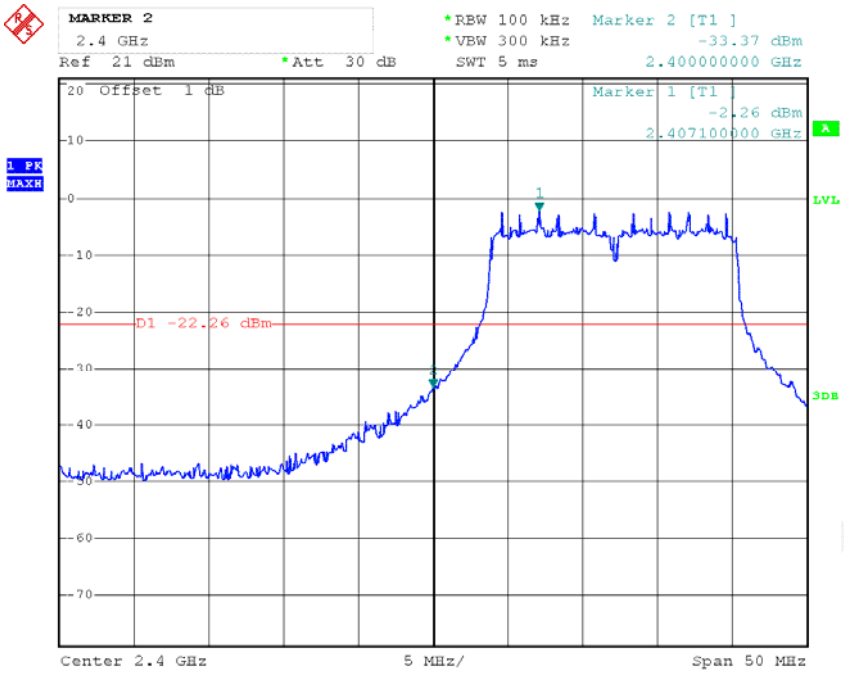
Date: 20.SEP.2016 12:49:16

Chain 0-802.11b Band Edge, Right Side



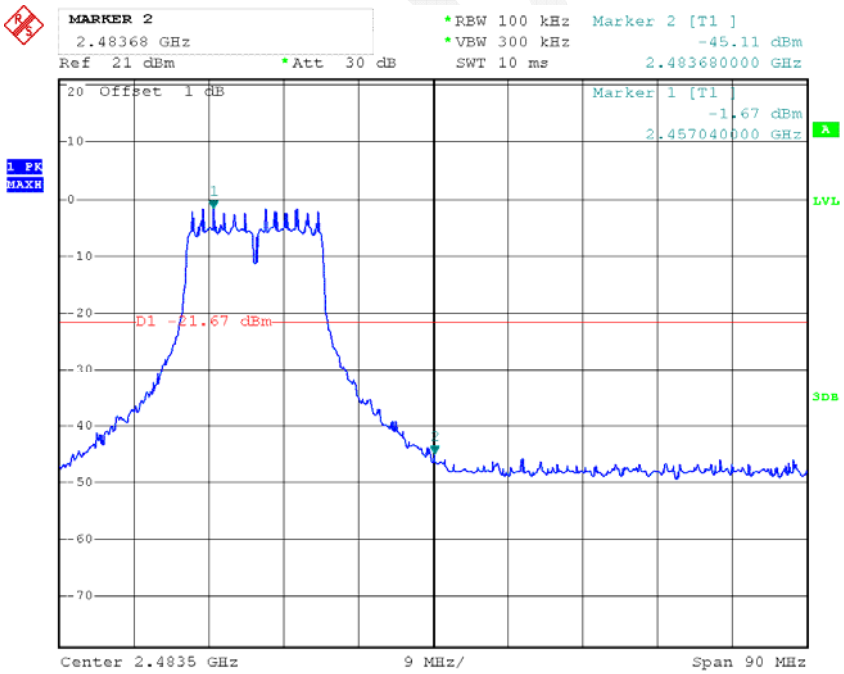
Date: 20.SEP.2016 12:19:11

Chain 0-802.11g Band Edge, Left Side



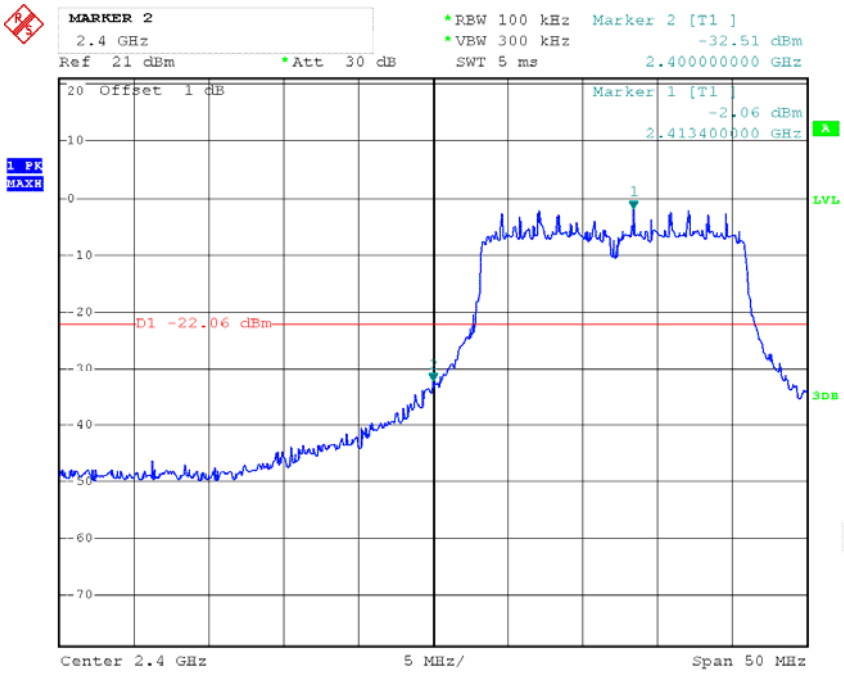
Date: 20.SEP.2016 12:16:11

Chain 0-802.11g Band Edge, Right Side



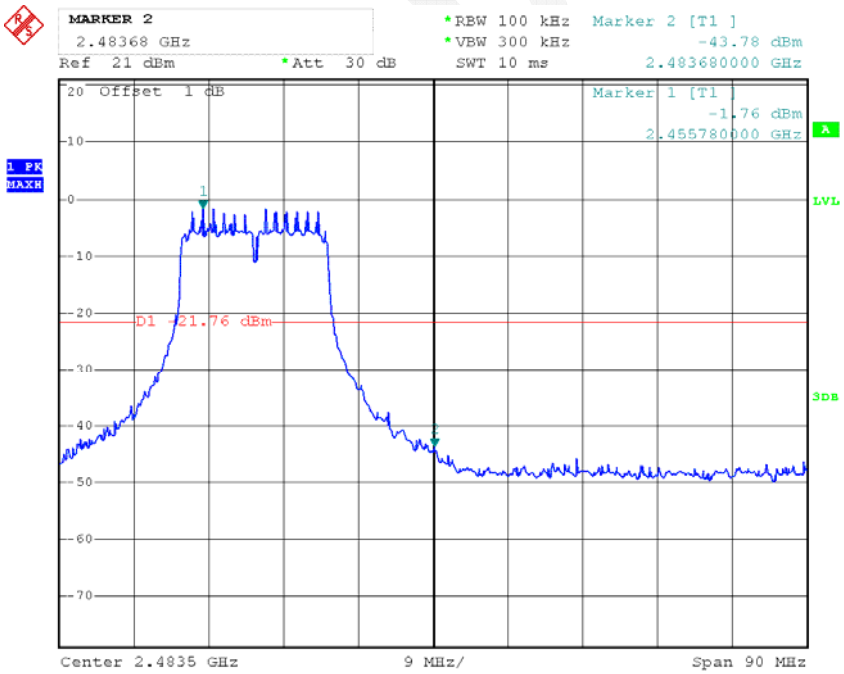
Date: 20.SEP.2016 12:18:33

Chain 0-802.11n ht20 Band Edge, Left Side



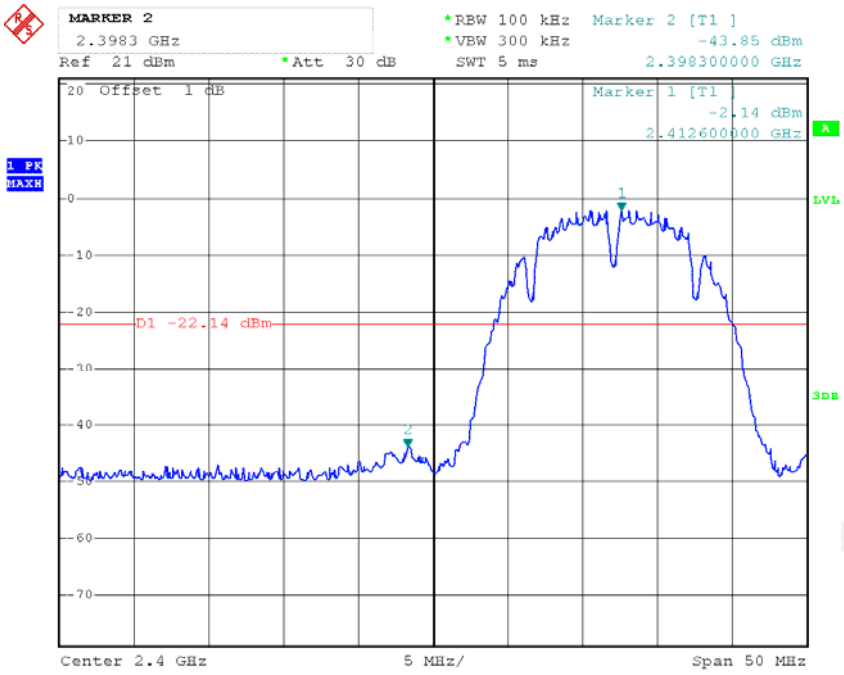
Date: 20.SEP.2016 12:16:43

Chain 0-802.11n ht20 Band Edge, Right Side



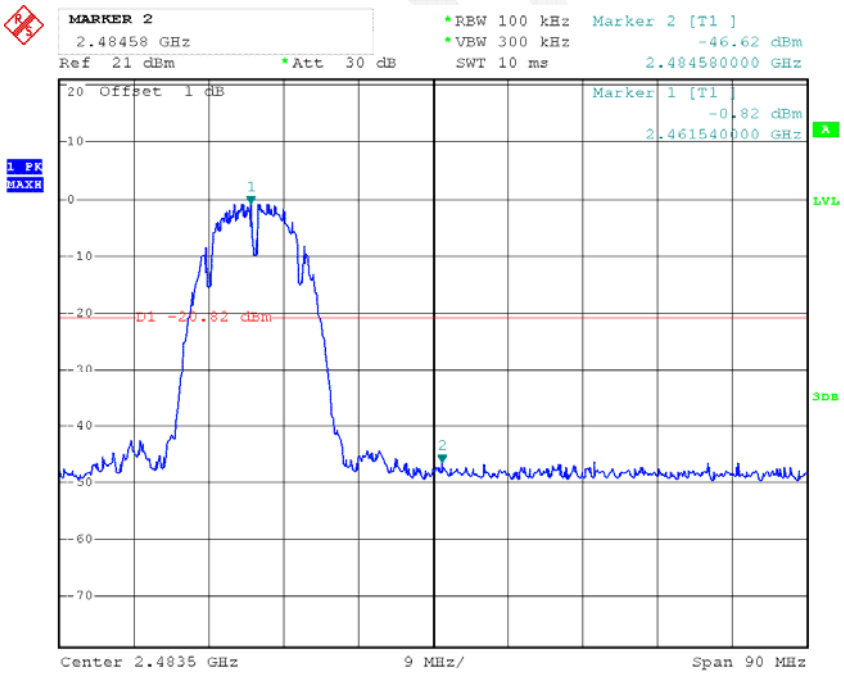
Date: 20.SEP.2016 12:17:35

Chain 1-802.11b Band Edge, Left Side



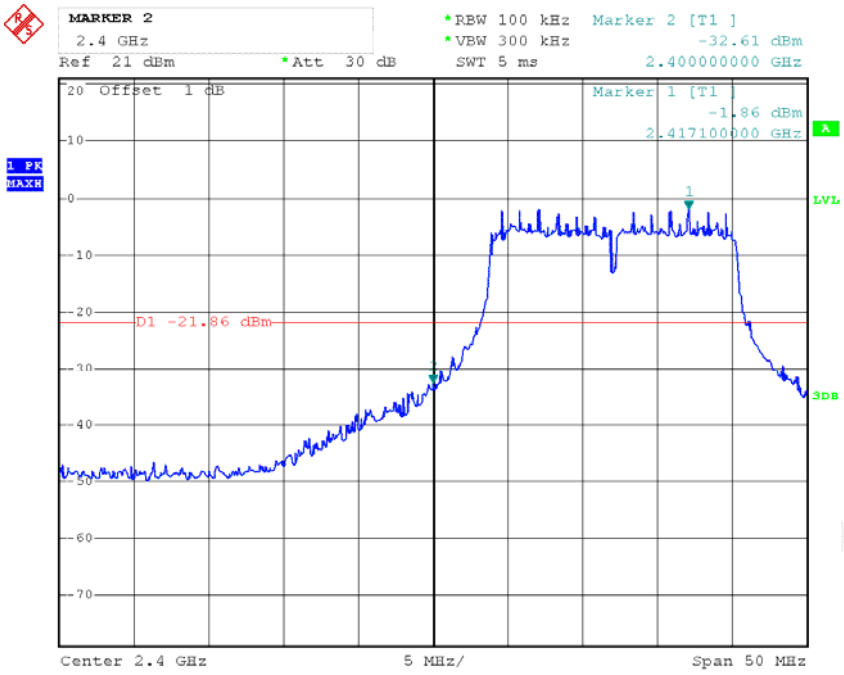
Date: 20.SEP.2016 12:10:10

Chain 1-802.11b Band Edge, Right Side



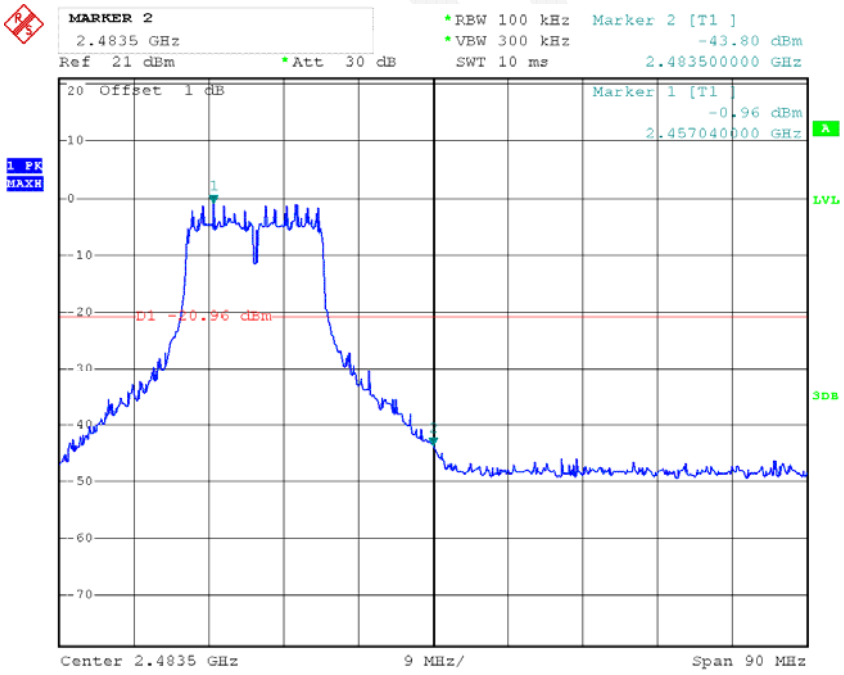
Date: 20.SEP.2016 12:09:17

Chain 1-802.11g Band Edge, Left Side



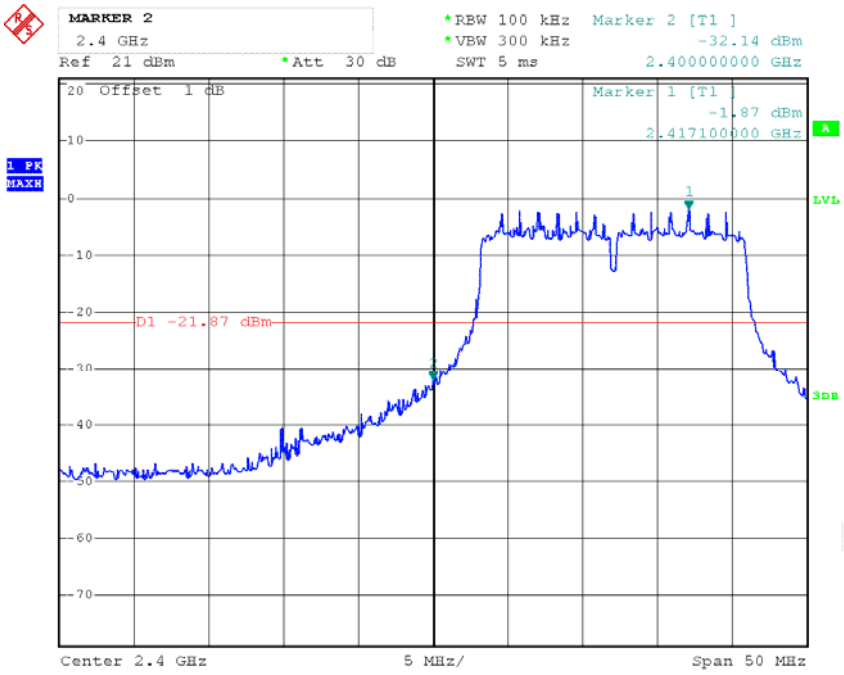
Date: 20.SEP.2016 12:10:49

Chain 1-802.11g Band Edge, Right Side



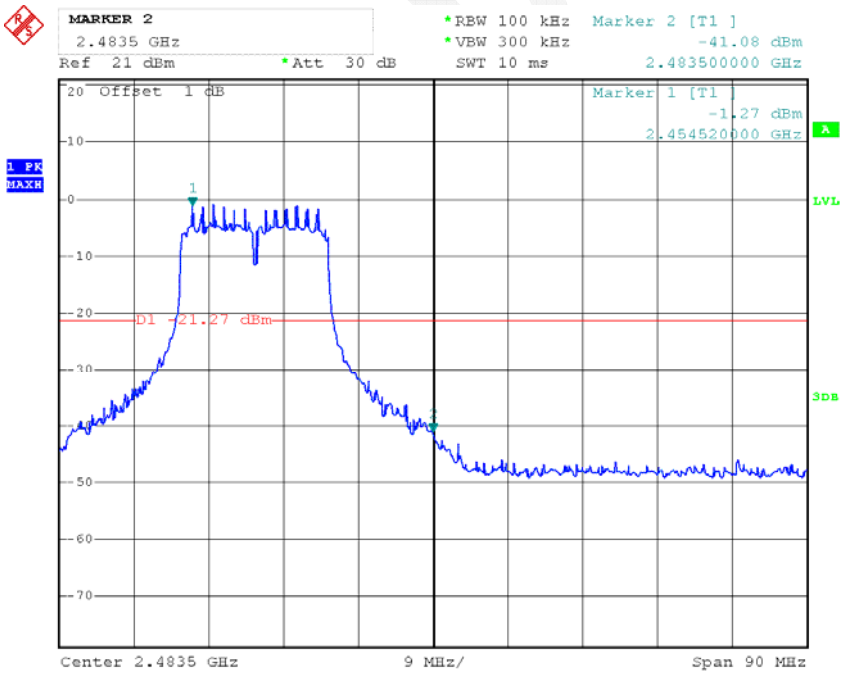
Date: 20.SEP.2016 12:08:41

Chain 1-802.11n ht20 Band Edge, Left Side



Date: 20.SEP.2016 12:11:40

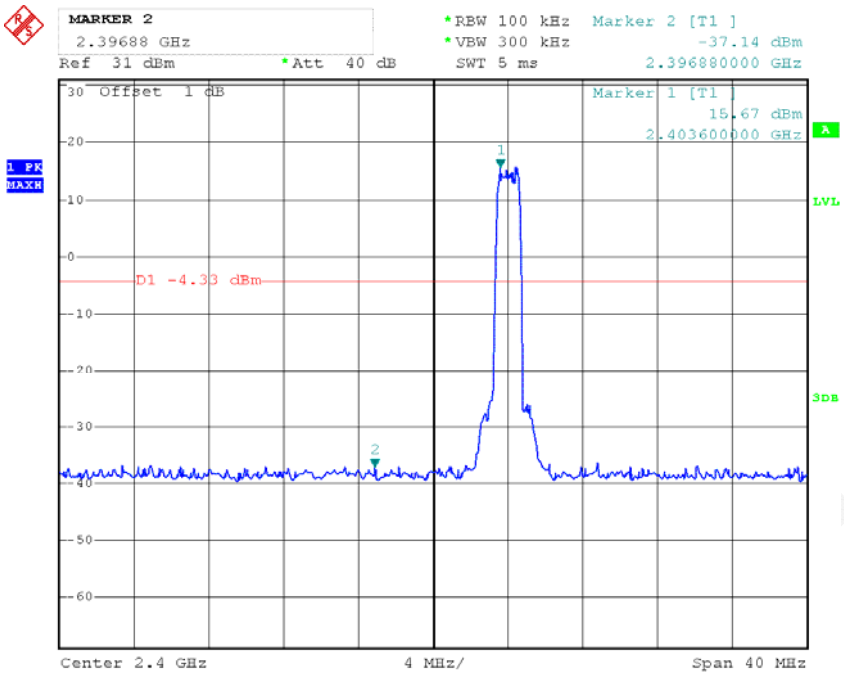
Chain 1-802.11n ht20 Band Edge, Right Side



Date: 20.SEP.2016 12:07:33

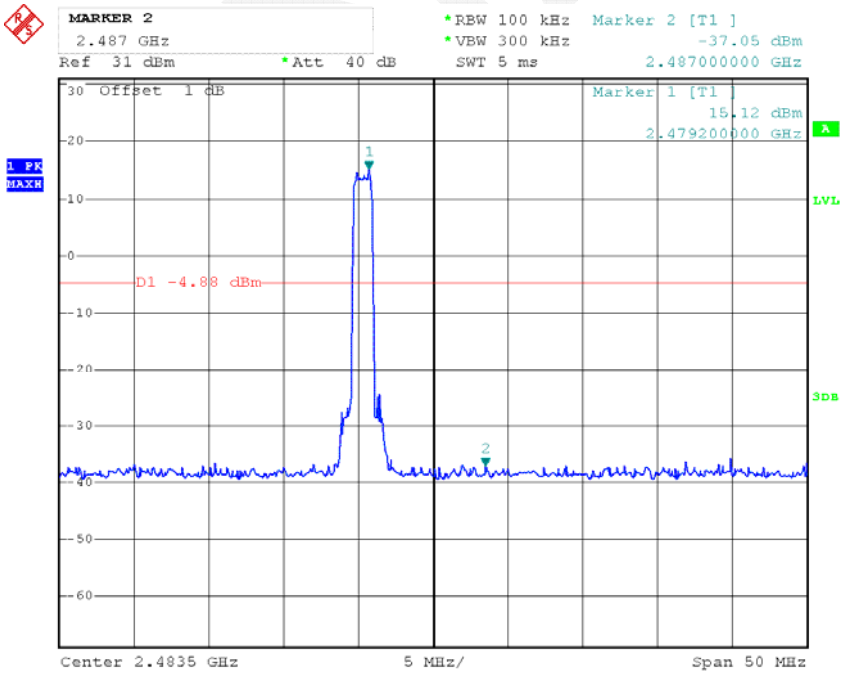
LB 2.4G

Band Edge, Left Side



Date: 22.SEP.2016 11:08:56

Band Edge, Right Side



Date: 22.SEP.2016 11:35:57

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW = 3 kHz, VBW = 10 kHz, Set the span to 1.5 times the DTS bandwidth.
4. Use the peak marker function to determine the maximum amplitude level.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Test Receiver	ESPI	100120	2015-12-10	2016-12-09
N/A	Coaxial Cable	0.1m	N/A	2016-05-06	2017-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2016-05-06	2017-05-06

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

Test Data

Environmental Conditions

Temperature:	24.9~27.5 °C
Relative Humidity:	33~34 %
ATM Pressure:	100.7~100.9 kPa

The testing was performed by Robin Zheng from 2016-09-20 to 2016-09-24.

Test Result: Compliance

Test Mode: Transmitting

Test mode	Channel	Frequency	Power Spectral Density (dBm/3kHz)			Limits	Result
		MHz	Chain 0	Chain 1	Total	dBm/3kHz	
802.11b	Low	2412	-18	-17.61	-14.79	6.1	Compliance
	Middle	2437	-15.71	-15.37	-12.53	6.1	Compliance
	High	2462	-15.92	-16.44	-13.16	6.1	Compliance
802.11g	Low	2412	-18.64	-18.43	-15.52	6.1	Compliance
	Middle	2437	-17.71	-17.07	-14.37	6.1	Compliance
	High	2462	-18.73	-17.19	-14.88	6.1	Compliance
802.11n20	Low	2412	-18.25	-18.54	-15.38	6.1	Compliance
	Middle	2437	-17.15	-16.91	-14.02	6.1	Compliance
	High	2462	-19.24	-18.52	-15.85	6.1	Compliance
LB	Low	2404	-0.15	/	/	8.0	Compliance
	Middle	2441.4	4.86	/	/	8.0	Compliance
	High	2478.8	-0.83	/	/	8.0	Compliance

Note: the device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

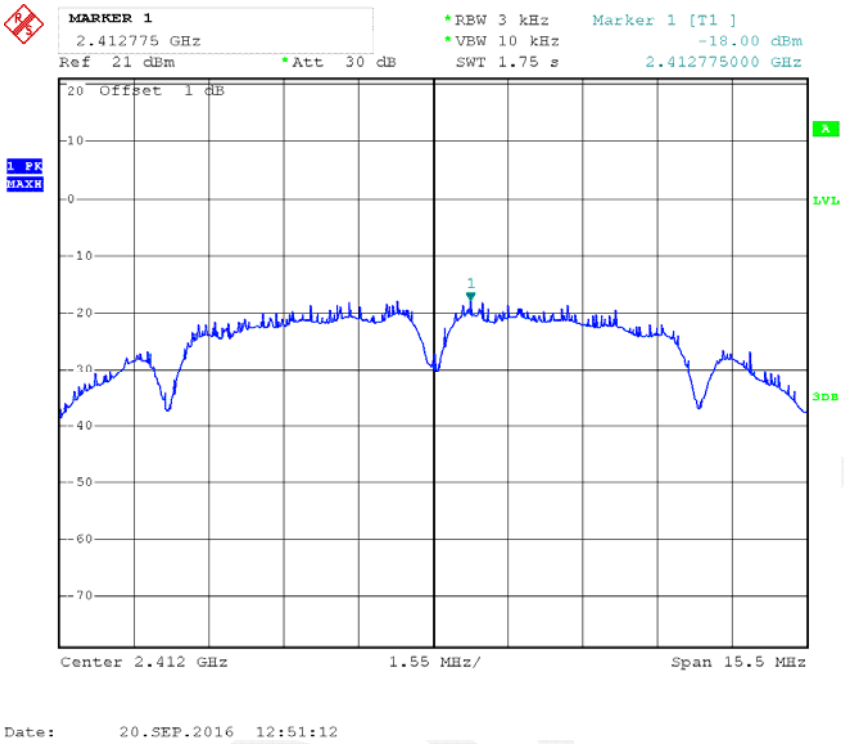
So:

Directional gain = GANT + Array Gain = 4.9+10*log(2) =7.9 dBi

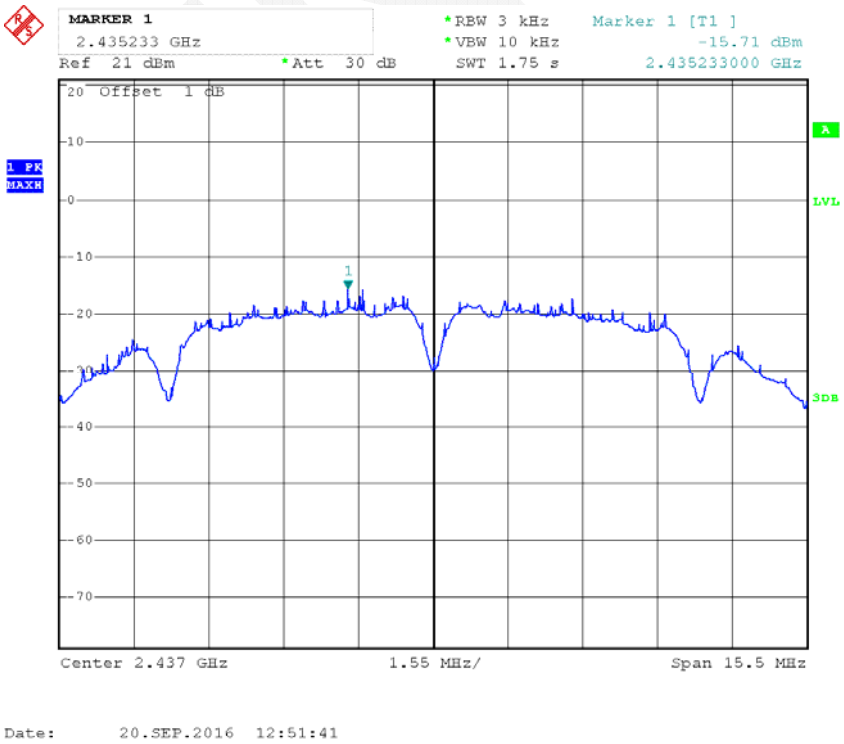
The Power density Limits was reduce 1.9dB

Please refer to the following plots

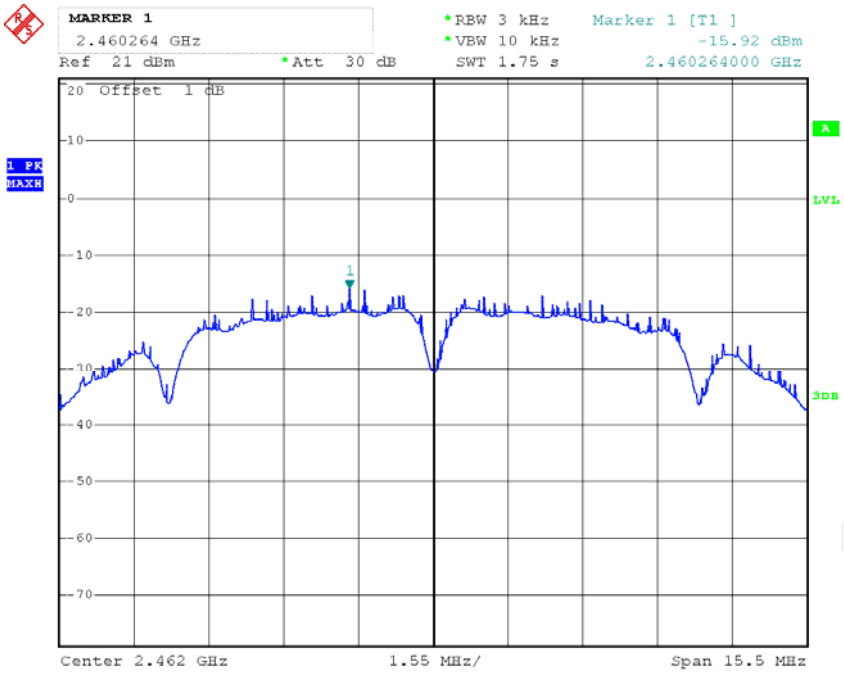
Chain 0-Power Spectral Density, 802.11b Low Channel



Chain 0-Power Spectral Density, 802.11b Middle Channel

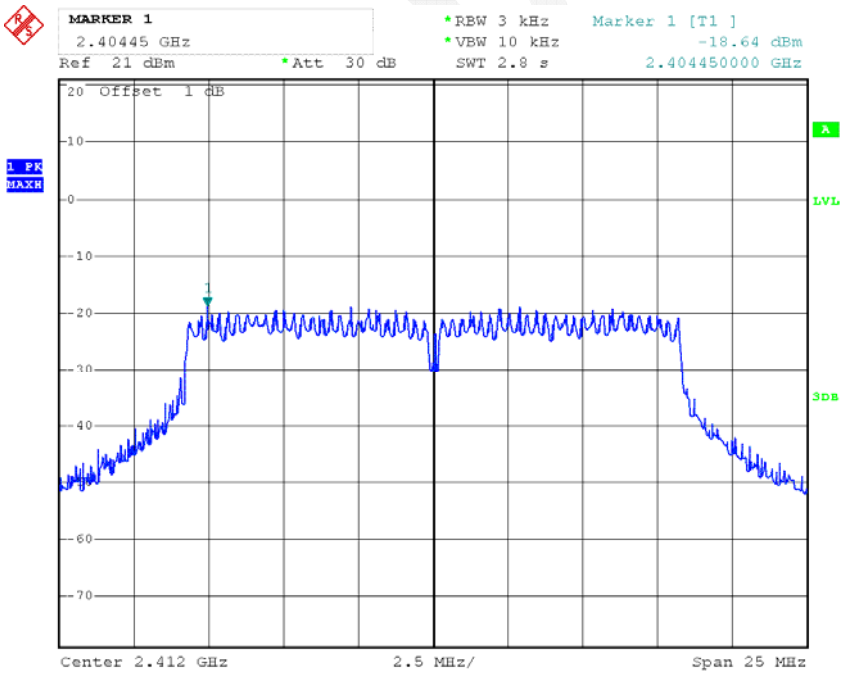


Chain 0-Power Spectral Density, 802.11b High Channel



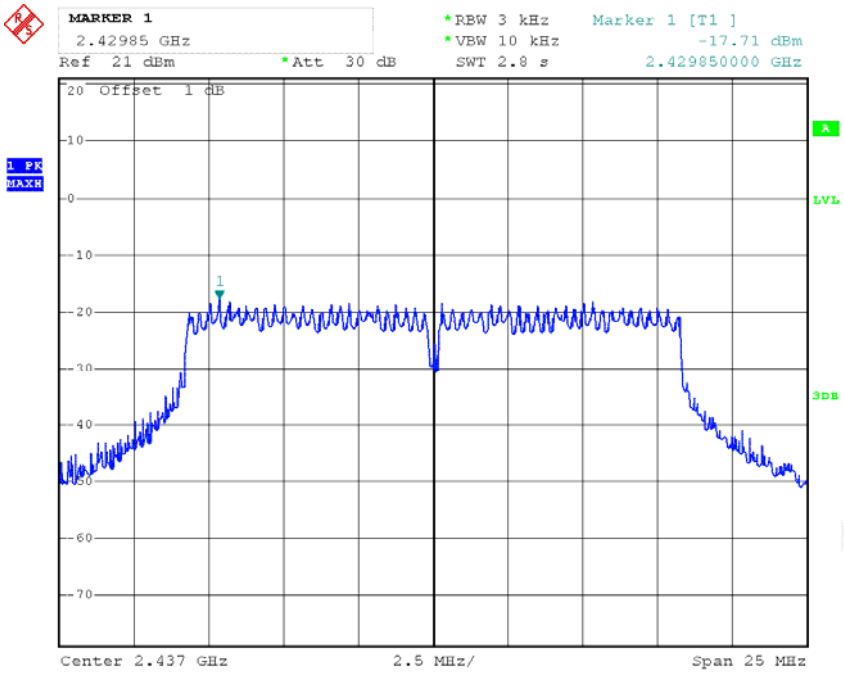
Date: 20.SEP.2016 12:52:24

Chain 0-Power Spectral Density, 802.11g Low Channel



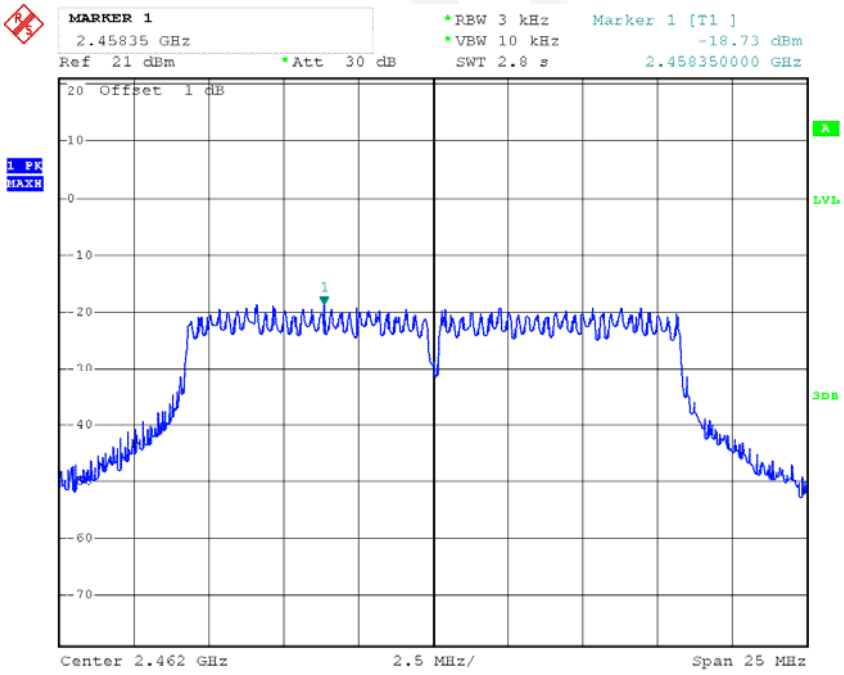
Date: 20.SEP.2016 12:57:31

Chain 0-Power Spectral Density, 802.11g Middle Channel



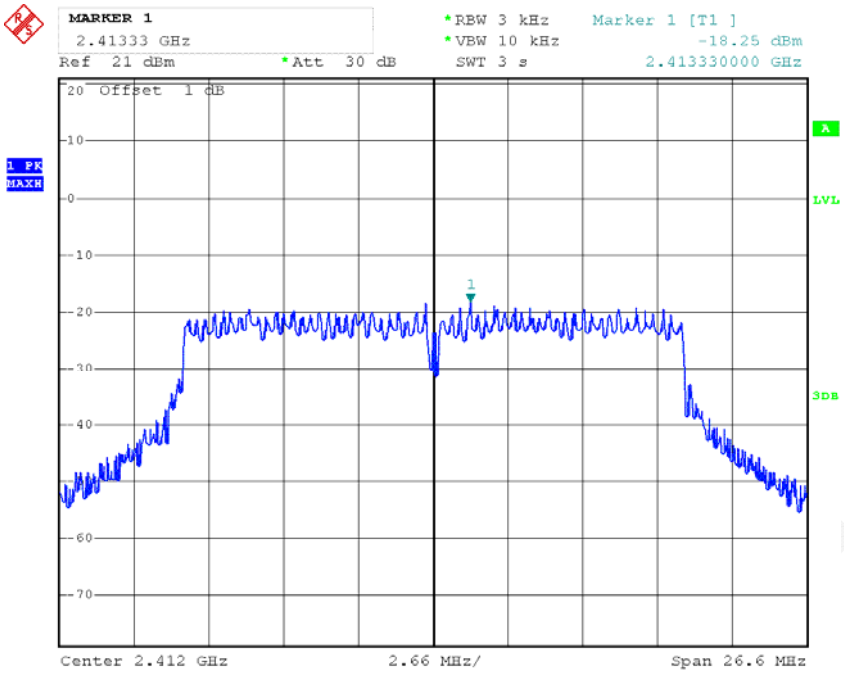
Date: 20.SEP.2016 12:57:06

Chain 0-Power Spectral Density, 802.11g High Channel



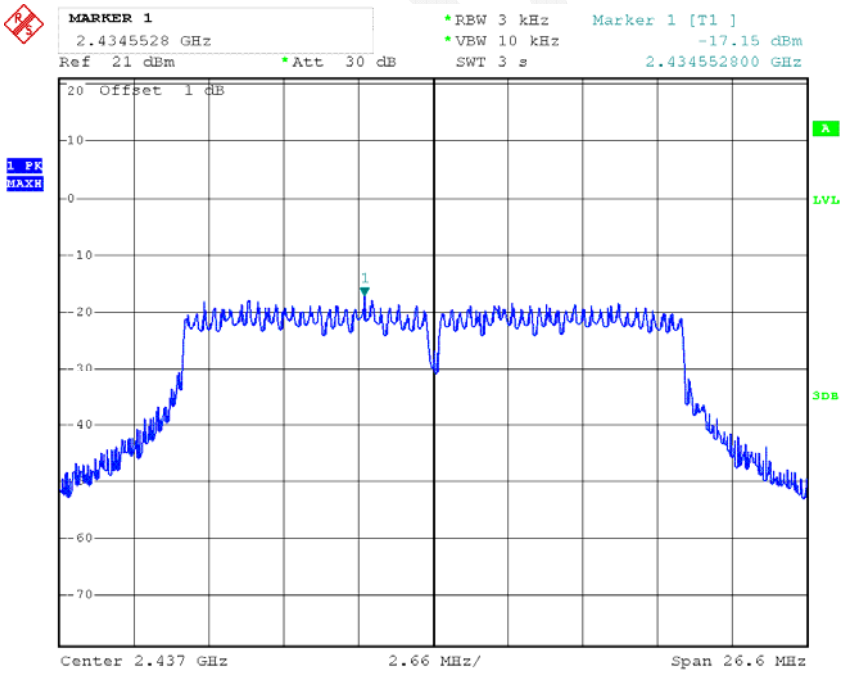
Date: 20.SEP.2016 12:56:44

Chain 0-Power Spectral Density, 802.11n ht20 Low Channel



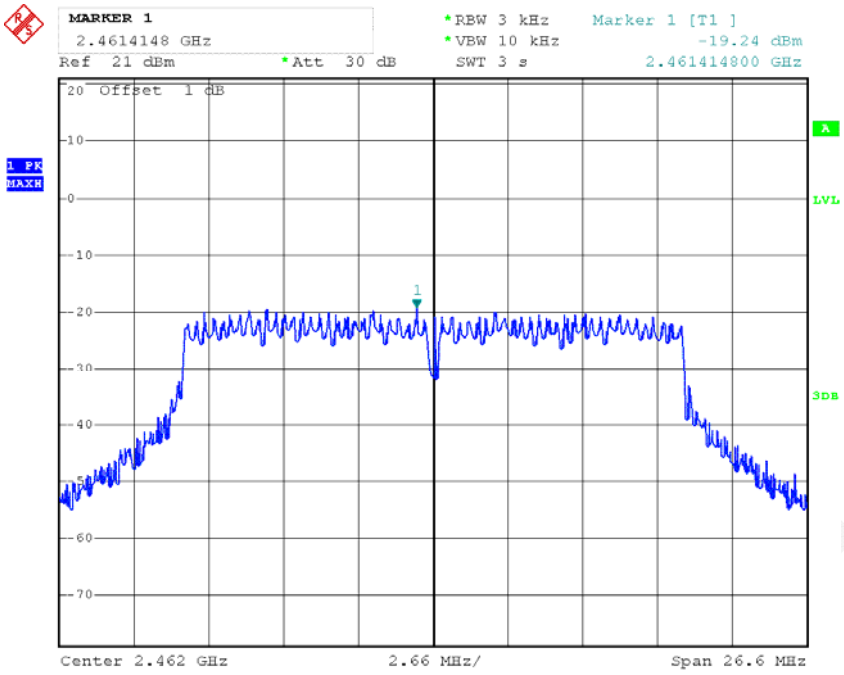
Date: 20.SEP.2016 12:55:11

Chain 0-Power Spectral Density, 802.11n ht20 Middle Channel



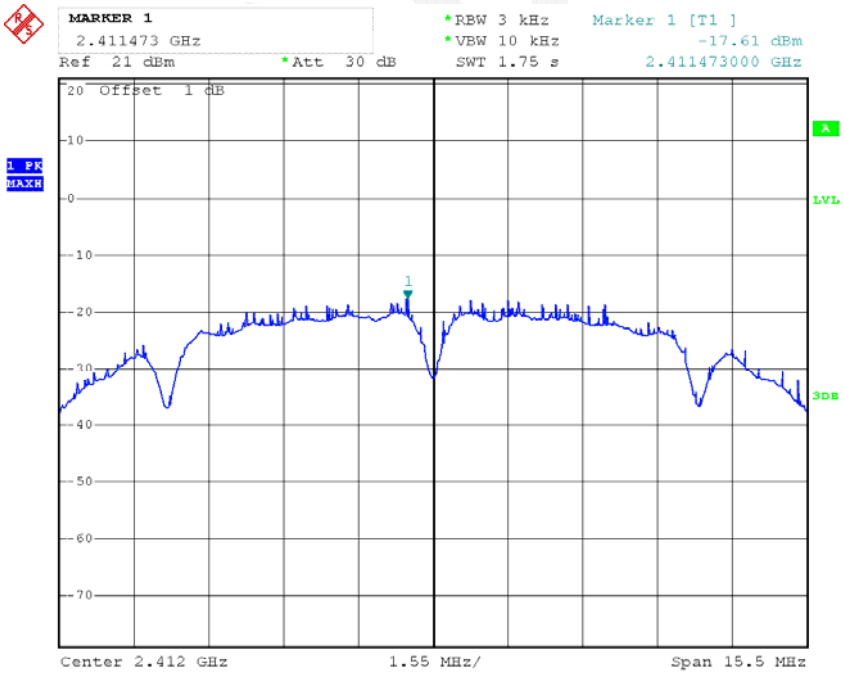
Date: 20.SEP.2016 12:55:34

Chain 0-Power Spectral Density, 802.11n ht20 High Channel



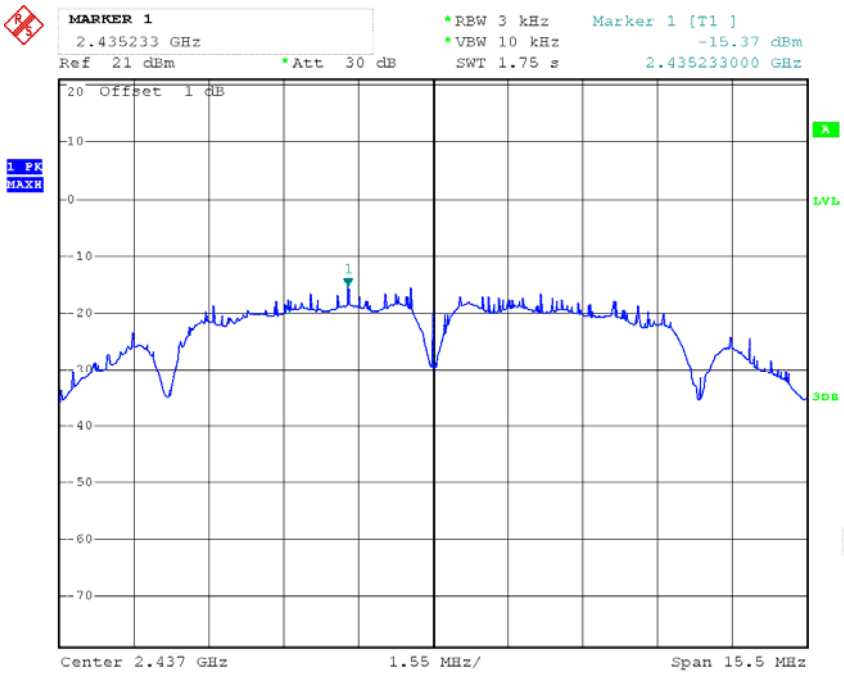
Date: 24.SEP.2016 15:25:29

Chain 1-Power Spectral Density, 802.11b Low Channel

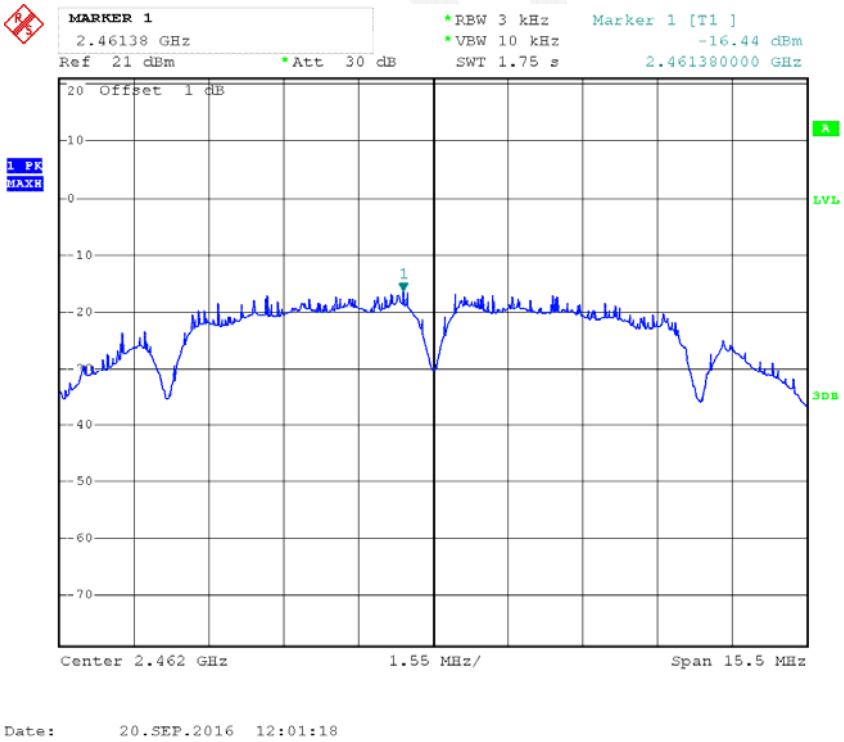


Date: 20.SEP.2016 12:00:05

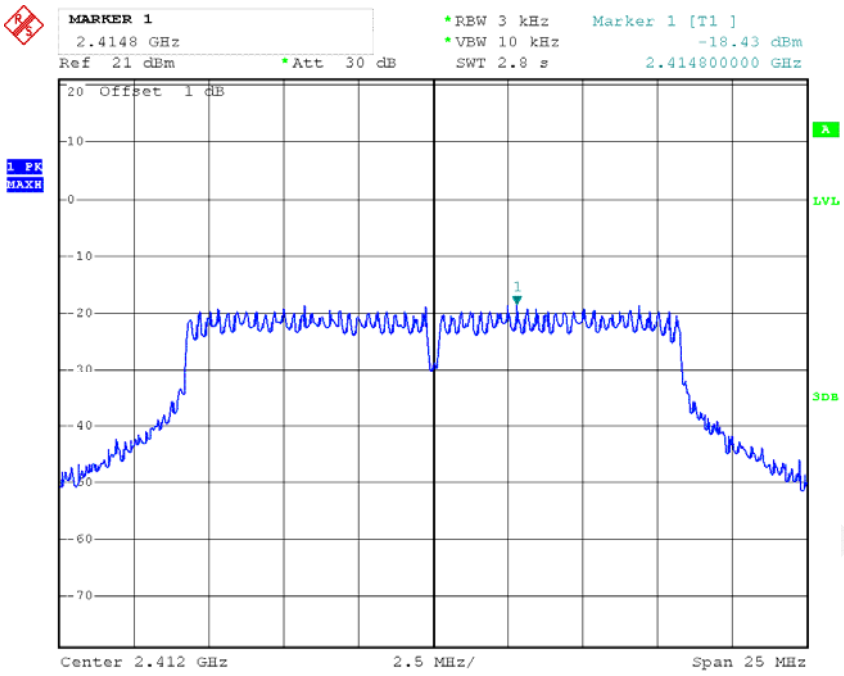
Chain 1-Power Spectral Density, 802.11b Middle Channel



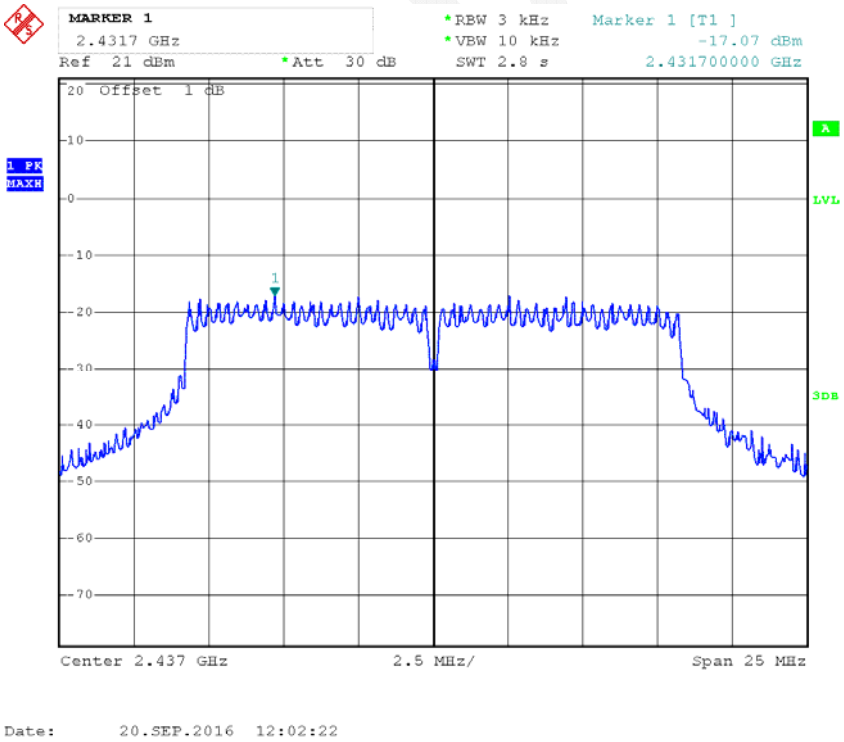
Chain 1-Power Spectral Density, 802.11b High Channel



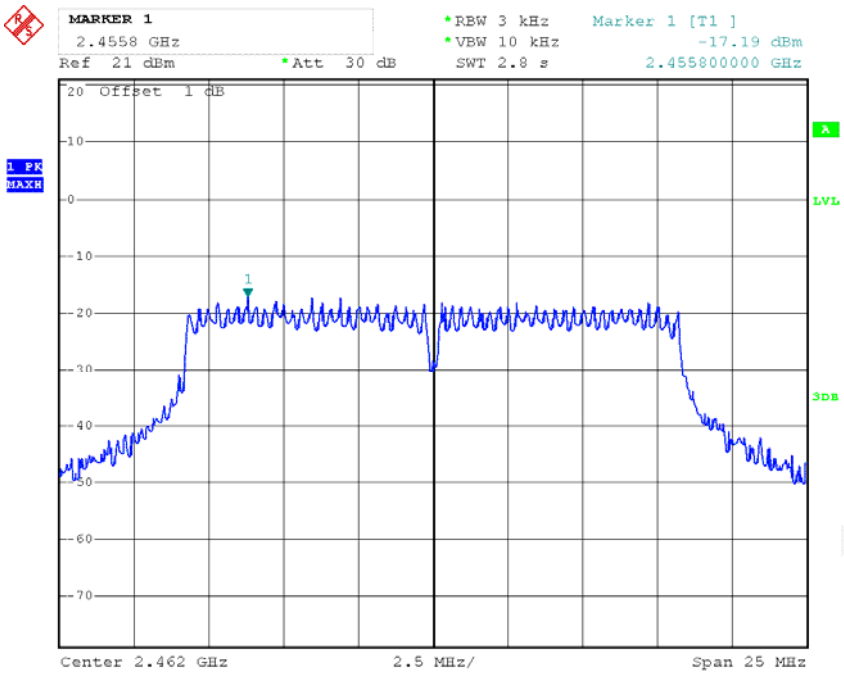
Chain 1-Power Spectral Density, 802.11g Low Channel



Chain 1-Power Spectral Density, 802.11g Middle Channel

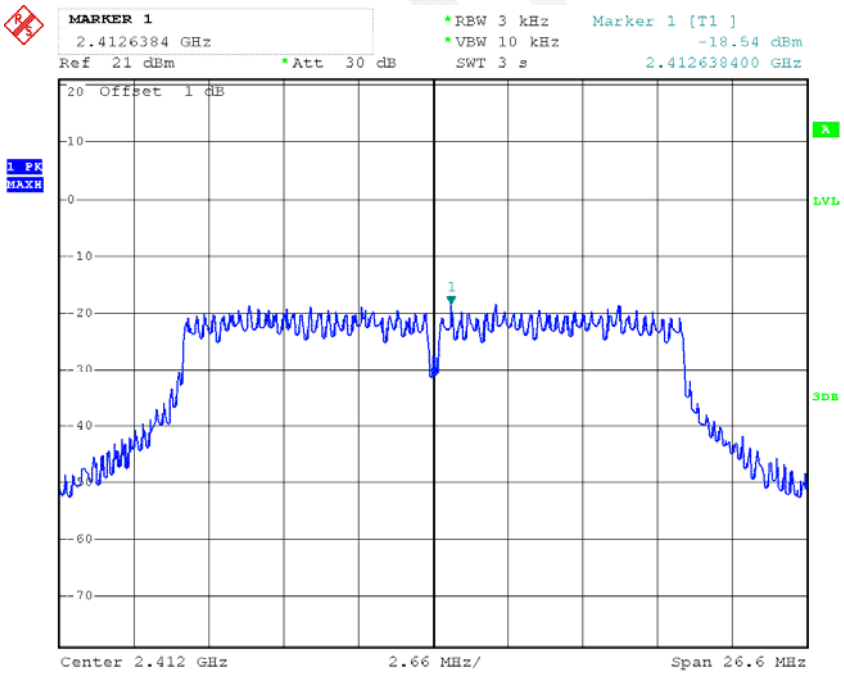


Chain 1-Power Spectral Density, 802.11g High Channel



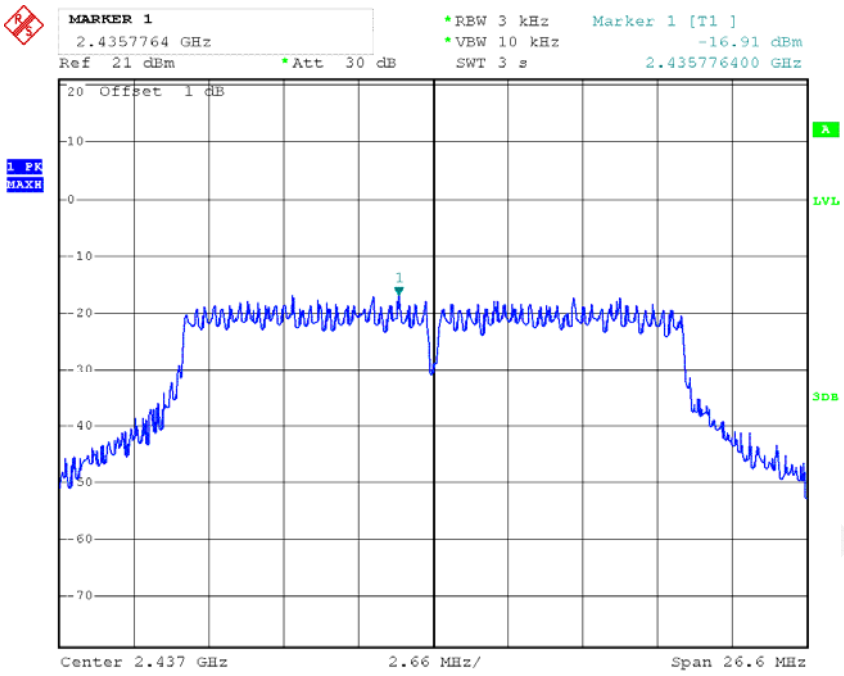
Date: 20.SEP.2016 12:01:59

Chain 1-Power Spectral Density, 802.11n ht20 Low Channel



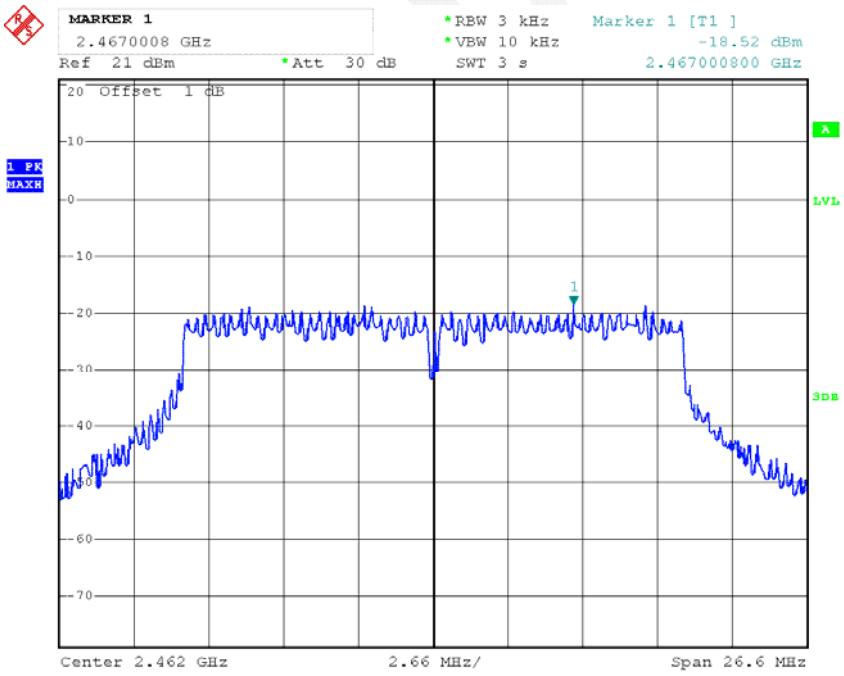
Date: 20.SEP.2016 12:04:20

Chain 1-Power Spectral Density, 802.11n ht20 Middle Channel



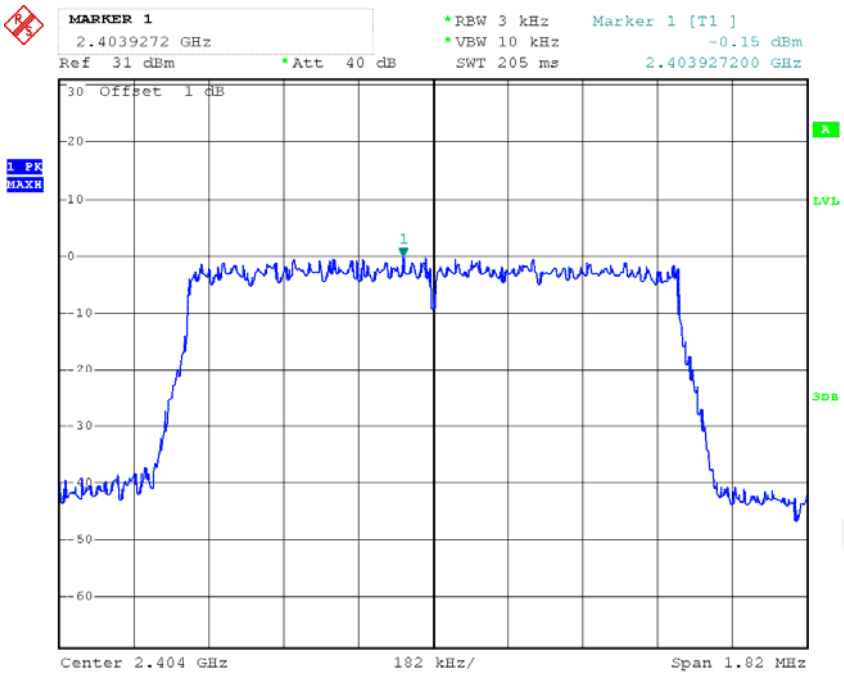
Date: 20.SEP.2016 12:05:09

Chain 1-Power Spectral Density, 802.11n ht20 High Channel



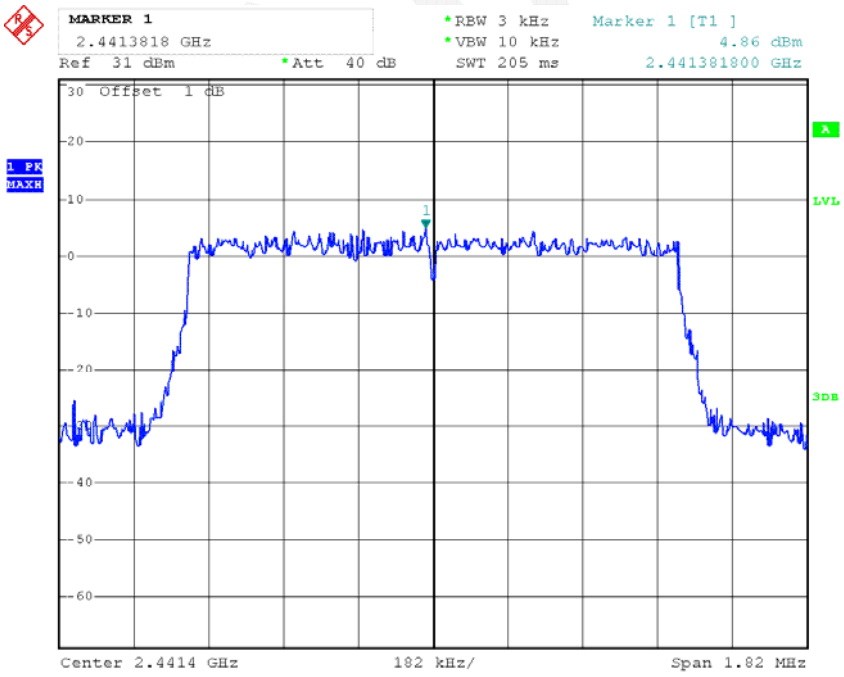
Date: 24.SEP.2016 15:23:35

Power Spectral Density, LB 2.4G Low Channel



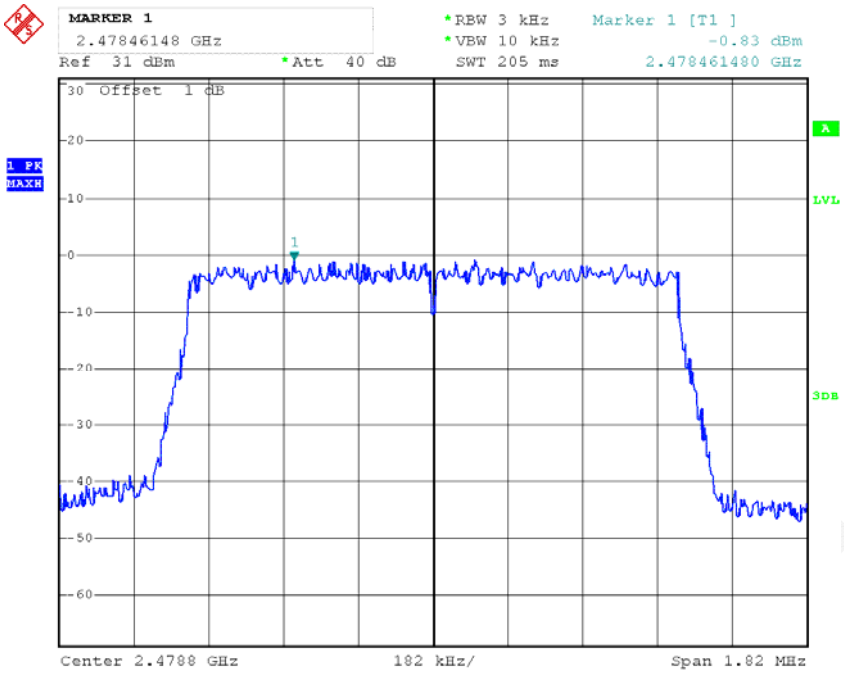
Date: 22.SEP.2016 11:13:16

Chain 0-Power Spectral Density, LB 2.4G Middle Channel



Date: 22.SEP.2016 11:15:07

Chain 0-Power Spectral Density, LB 2.4G High Channel



Date: 22.SEP.2016 11:28:41

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