FCC PART 15.247

TEST REPORT

For

Collage Investments LLC.

11437 NW 34 STREET,Doral,Florida,United States

FCC ID:GAO-MAX5PRO

Report Type:	**Product Name:**
Original Report	Mobile phone

Report Number:	RDG170721007-00C
Report Date:	2017-09-20
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Collage Investments LLC.***'s product, model number: ***Max 5 Pro(FCC ID:GAO-MAX5PRO)*** (the "EUT") in this report was a ***Mobile phone,*** which was measured approximately: 14.8 cm (L) x 7.3 cm (W) x 0.8 cm (H), DC3.7V from Battery or DC 5V from adapter.

Adapter Information:
Input: AC100-240V,50/60Hz,0.15A
Output: DC5V, 800mA

**All measurement and test data in this report was gathered from production sample serial number: 170721007 (Assigned by BACL, Dongguan). The EUT was received on 2017-07-21.*

Objective

This report is prepared on behalf of ***Collage Investments LLC.*** in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communications Commission's rules.

The tests were performed in order to determine the compliance of the EUT with FCC Rules 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 DSS submissions with FCC ID:GAO-MAX5PRO.
FCC Part 15B JBP submissions with FCC ID:GAO-MAX5PRO.
FCC Part 22H, 24E PCE submissions with FCC ID:GAO-MAX5PRO.

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).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	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~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

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 Industry Area, Tangxia, Dongguan, Guangdong, China

Bay Area Compliance Laboratories Corp. (Dongguan) has been accredited to ISO 17025 by CNAS(Lab code: L5662). And accredited to ISO 17025 by NVLAP(Test Laboratory Accreditation Certificate Number 500069-0), the FCC Designation No. CN5002 under the KDB 974614 D01.

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.

Bay Area Compliance Laboratories Corp. (Dongguan) was registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

For 2.4GHz band, total 11 channels are provided:

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 test with channel 1,6,11.

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.

EUT Exercise Software

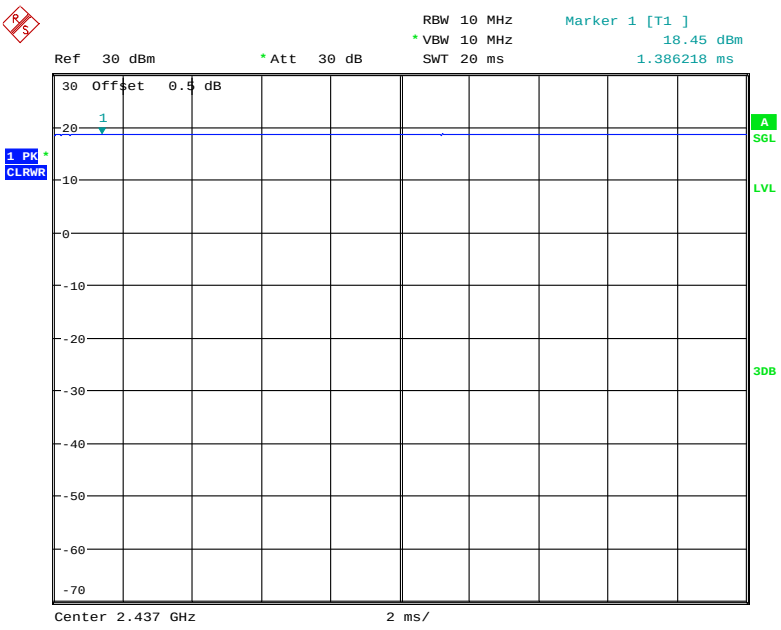
The “Engineer Mode” was used for testing, which was provided by manufacturer. The maximum power was configured as below table, that provided by the manufacturer:

Test Mode	Test Software Version	Engineer Mode		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	1Mbps	1Mbps	1Mbps
	Power Level Setting	80	80	80
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	6Mbps	6Mbps	6Mbps
	Power Level Setting	80	80	80
802.11n 20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting	80	80	80

The maximum duty cycle as following table:

Test mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11b	20	20	100
802.11g	5.53	5.54	99.8
802.11n ht20	4.62	4.63	99.8

802.11b



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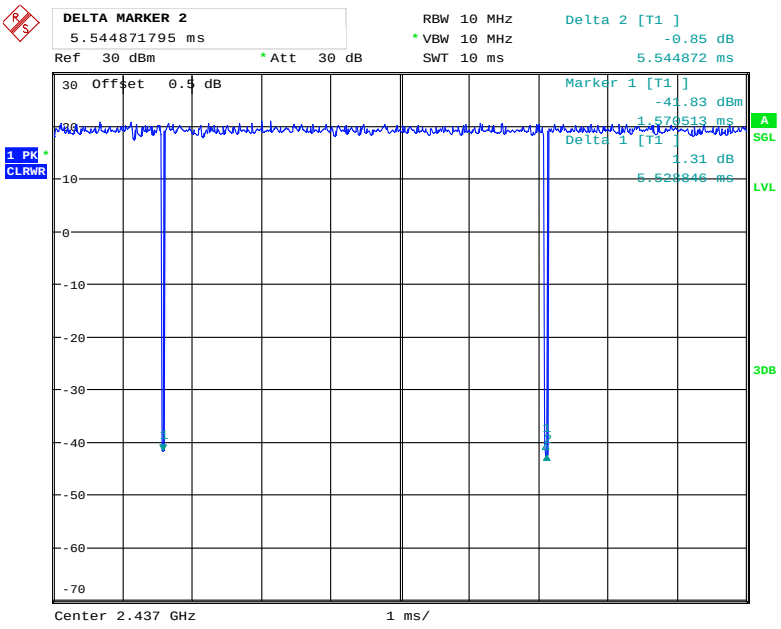
802.11g



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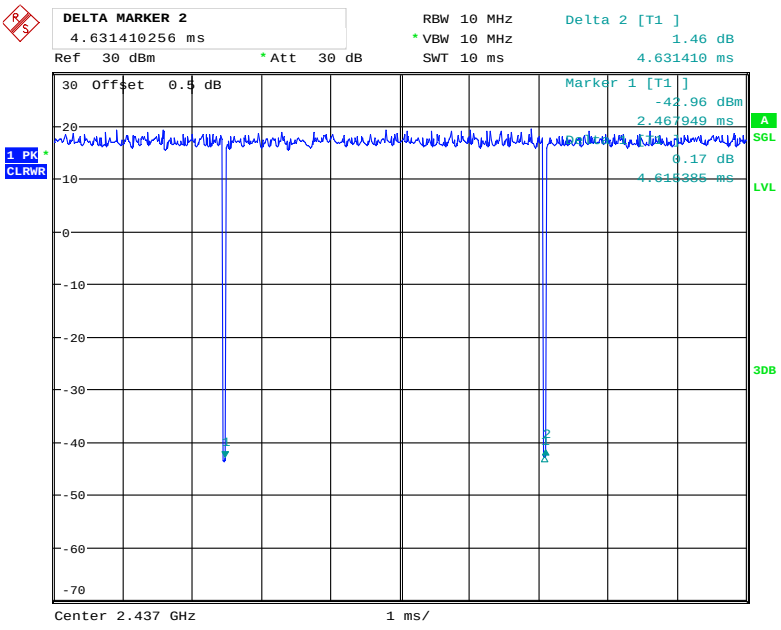
802.11n ht20



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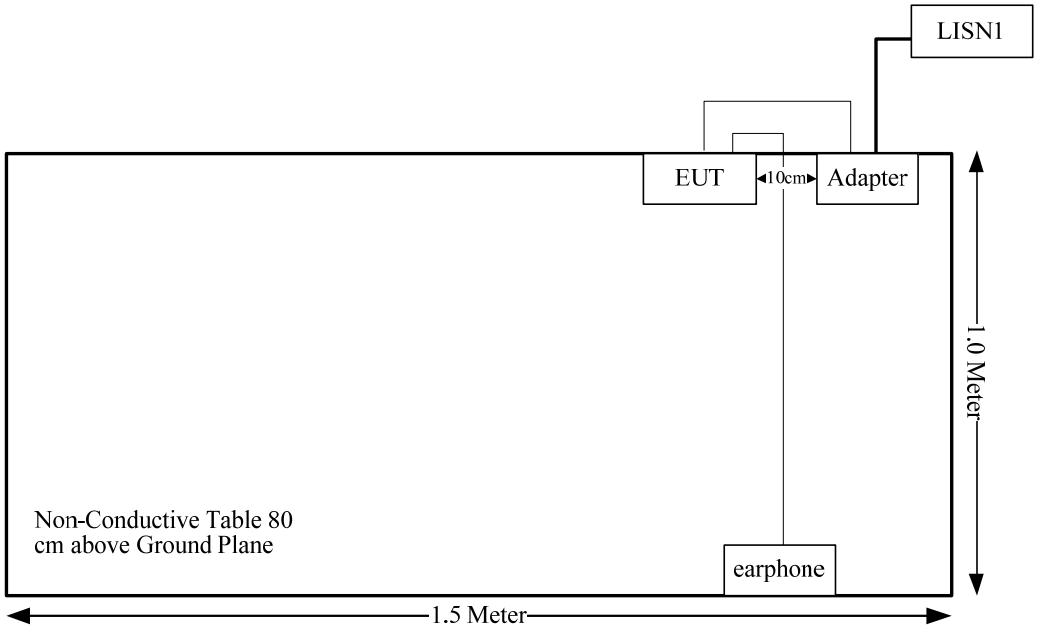
Equipment Modifications

No modification was made to the EUT.

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (cm)	From Port	To
Adapter Cable	Yes	No	100	Adapter	EUT
Earphone Cable	No	No	100	EUT	Earphone

Block Diagram of Test Setup



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
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB 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.

Result

Compliance, Please refer to the SAR report: RDG170721007-20

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.
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 one internal antenna arrangement for BT and WIFI, and the antenna gain is 1.8 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

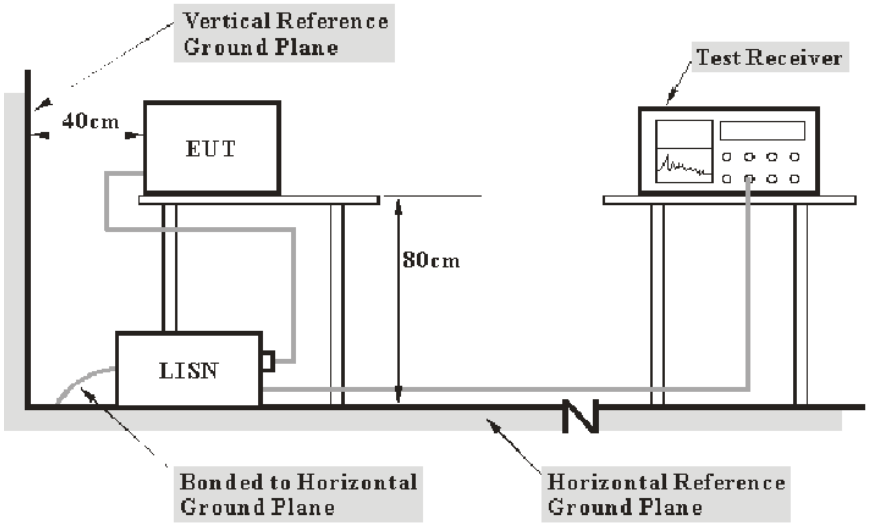
Result: Compliance.

FCC §15.207 (a)– AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a)

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.

The spacing between the peripherals was 10 cm.

The EUT was connected to the main LISN with a 120 V/60 Hz AC 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 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	2016-12-08	2017-12-08
R&S	L.I.S.N	ESH2-Z5	892107/021	2016-09-01	2017-09-01
R&S	Two-line V-network	ENV 216	3560.6550.12	2016-12-08	2017-12-08
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
Unknown	Coaxial Cable	2m	Con-1	2016-09-01	2017-09-01

*** 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

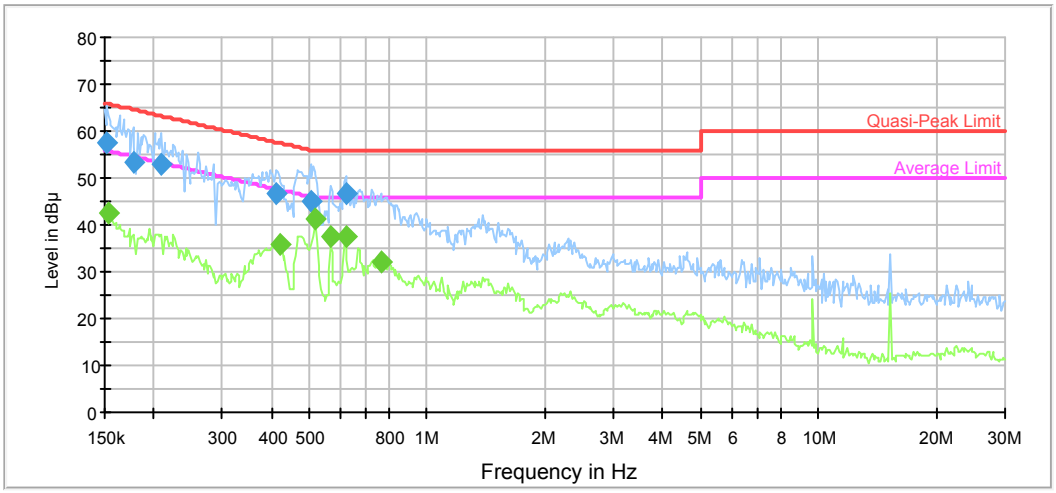
Environmental Conditions

Temperature:	25.4 °C
Relative Humidity:	53 %
ATM Pressure:	99.6 kPa

The testing was performed by Emily Wang on 2017-08-03.

Test Mode: Transmitting (Wi-Fi mode was the worst)

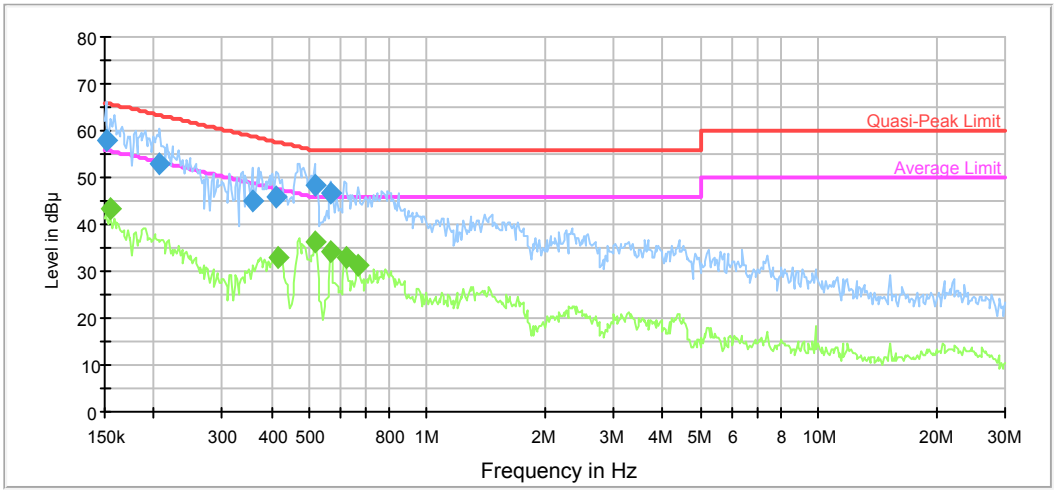
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.152410	57.7	9.000	L1	11.1	8.2	65.9	Compliance
0.177322	53.1	9.000	L1	10.8	11.5	64.6	Compliance
0.209621	52.8	9.000	L1	10.6	10.4	63.2	Compliance
0.412647	46.5	9.000	L1	9.9	11.1	57.6	Compliance
0.503608	45.0	9.000	L1	9.9	11.0	56.0	Compliance
0.619536	46.7	9.000	L1	9.8	9.3	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.153629	42.4	9.000	L1	11.1	13.4	55.8	Compliance
0.419276	36.0	9.000	L1	9.9	11.5	47.5	Compliance
0.519918	41.4	9.000	L1	9.9	4.6	46.0	Compliance
0.567545	37.6	9.000	L1	9.8	8.4	46.0	Compliance
0.619536	37.5	9.000	L1	9.8	8.5	46.0	Compliance
0.762149	32.0	9.000	L1	9.8	14.0	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.151200	57.8	9.000	N	11.1	8.1	65.9	Compliance
0.207957	53.0	9.000	N	10.6	10.3	63.3	Compliance
0.357511	44.8	9.000	N	10.0	14.0	58.8	Compliance
0.412647	45.9	9.000	N	9.9	11.7	57.6	Compliance
0.515791	48.3	9.000	N	9.9	7.7	56.0	Compliance
0.567545	46.8	9.000	N	9.8	9.2	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154858	43.1	9.000	N	11.1	12.6	55.7	Compliance
0.415949	33.0	9.000	N	9.9	14.5	47.5	Compliance
0.515791	36.1	9.000	N	9.9	9.9	46.0	Compliance
0.567545	34.0	9.000	N	9.8	12.0	46.0	Compliance
0.619536	33.0	9.000	N	9.8	13.0	46.0	Compliance
0.665597	31.4	9.000	N	9.8	14.6	46.0	Compliance

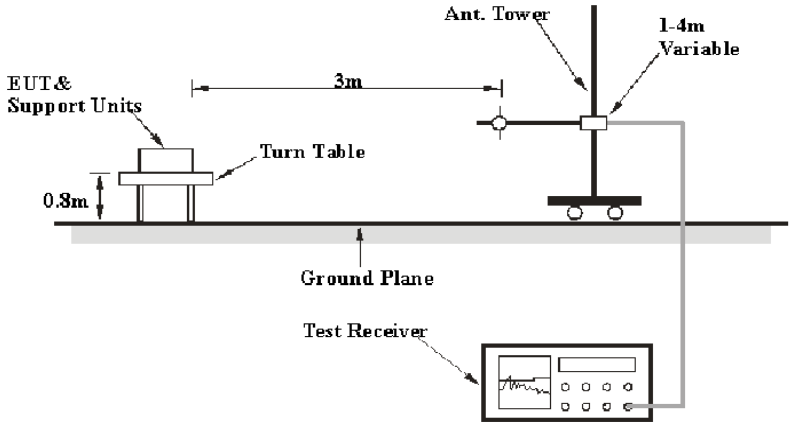
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

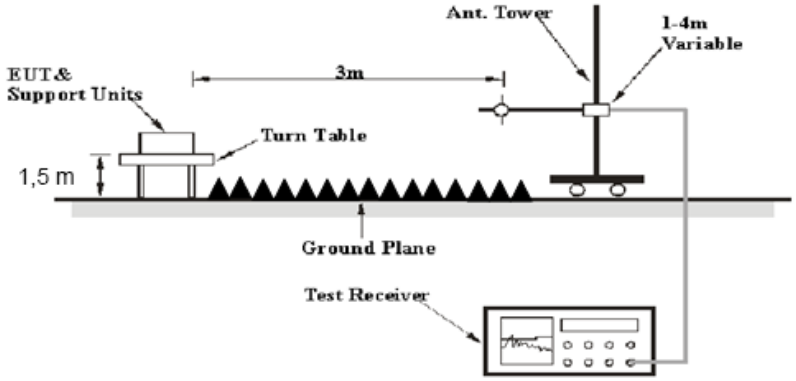
FCC §15.247 (d); §15.209; §15.205;

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 Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

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

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2016-09-01	2017-08-31
Sunol Sciences	Antenna	JB3	A060611-1	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2016-09-01	2017-09-01
R&S	Spectrum Analyzer	FSU 26	200256	2016-12-08	2017-12-08
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2017-06-16	2020-06-15
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2016-09-05	2017-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2016-09-06	2017-09-06
Unknown	Coaxial Cable	Chamber A-1	4m	2016-09-01	2017-09-01
Unknown	Coaxial Cable	Chamber B-1	0.75m	2016-09-01	2017-09-01
Unknown	Coaxial Cable	Chamber A-2	10m	2016-09-01	2017-09-01
Unknown	Coaxial Cable	Chamber B-2	8m	2016-09-01	2017-09-01
Farad	Test Software	EZ-EMC	V1.1.4.2	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 Data

Environmental Conditions

Temperature:	28.4 °C
Relative Humidity:	30 %
ATM Pressure:	100.3 kPa

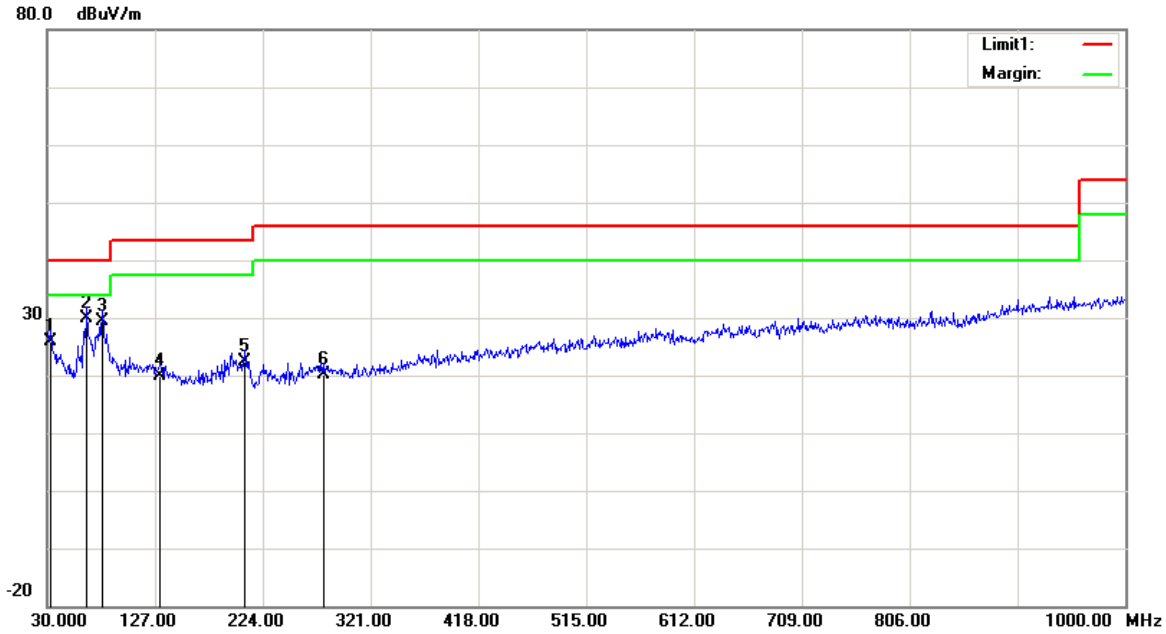
** The testing was performed by Emily Wang on 2017-08-16.*

Test Result: Compliance, please Refer to the following data

Test Mode: Transmitting

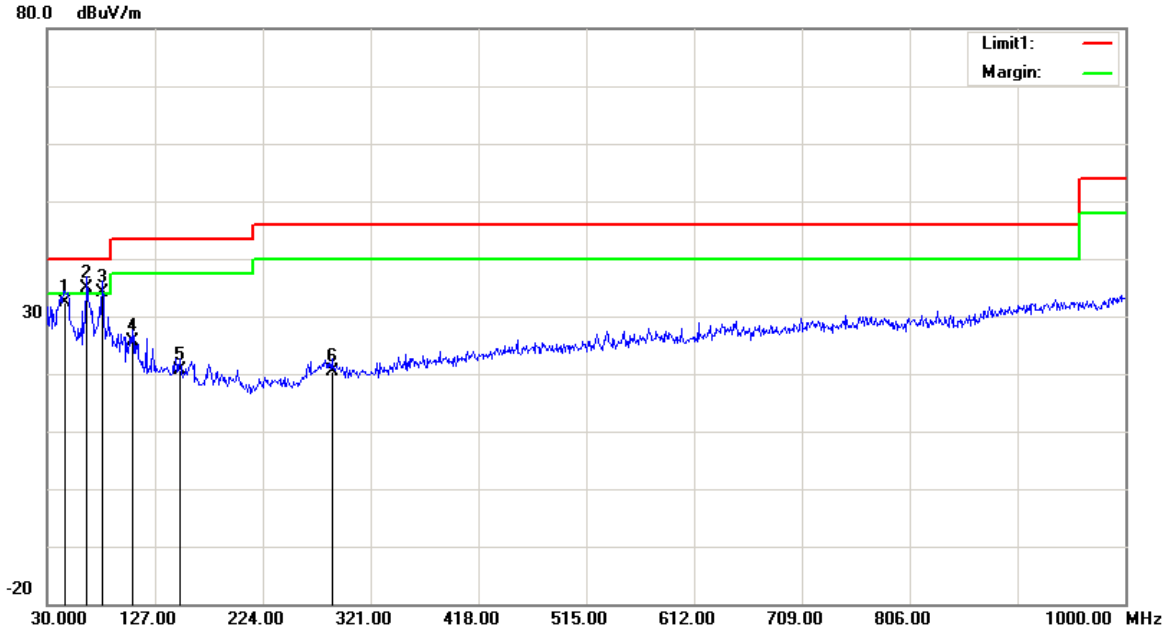
1) 30MHz-1GHz(802.11g mode high channel was the worst)

Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.9100	27.09	QP	-1.10	25.99	40.00	14.01
65.8900	41.67	QP	-11.87	29.80	40.00	10.20
79.4700	40.52	QP	-11.22	29.30	40.00	10.70
131.8500	25.33	QP	-5.33	20.00	43.50	23.50
207.5100	29.86	QP	-7.46	22.40	43.50	21.10
278.3200	23.92	QP	-3.82	20.10	46.00	25.90

Vertical:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
45.5200	42.30	QP	-10.00	32.30	40.00	7.70
65.8900	46.67	QP	-11.87	34.80	40.00	5.20
79.4700	45.32	QP	-11.22	34.10	40.00	5.90
106.6300	32.45	QP	-6.85	25.60	43.50	17.90
149.3100	27.30	QP	-6.70	20.60	43.50	22.90
286.0800	24.52	QP	-4.02	20.50	46.00	25.50

2) 1-25GHz:

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	63.77	PK	H	28.12	3.11	0.00	95.00	N/A	N/A
2412	59.69	AV	H	28.12	3.11	0.00	90.92	N/A	N/A
2412	64.29	PK	V	28.12	3.11	0.00	95.52	N/A	N/A
2412	60.32	AV	V	28.12	3.11	0.00	91.55	N/A	N/A
2390	25.71	PK	V	28.08	3.10	0.00	56.89	74.00	17.11
2390	14.28	AV	V	28.08	3.10	0.00	45.46	54.00	8.54
4824	52.15	PK	V	32.95	4.33	35.49	53.94	74.00	20.06
4824	44.62	AV	V	32.95	4.33	35.49	46.41	54.00	7.59
7236	47.92	PK	V	35.81	5.47	35.97	53.23	74.00	20.77
7236	38.37	AV	V	35.81	5.47	35.97	43.68	54.00	10.32
3394	47.15	PK	V	31.05	3.57	35.10	46.67	74.00	27.33
3394	37.29	AV	V	31.05	3.57	35.10	36.81	54.00	17.19
Middle Channel: 2437 MHz									
2437	65.58	PK	H	28.17	3.11	0.00	96.86	N/A	N/A
2437	59.05	AV	H	28.17	3.11	0.00	90.33	N/A	N/A
2437	66.25	PK	V	28.17	3.11	0.00	97.53	N/A	N/A
2437	60.61	AV	V	28.17	3.11	0.00	91.89	N/A	N/A
4874	48.03	PK	V	33.05	4.39	35.53	49.94	74.00	24.06
4874	37.99	AV	V	33.05	4.39	35.53	39.90	54.00	14.10
7311	48.29	PK	V	36.01	5.52	35.97	53.85	74.00	20.15
7311	38.41	AV	V	36.01	5.52	35.97	43.97	54.00	10.03
4125	47.09	PK	V	32.38	4.00	35.33	48.14	74.00	25.86
4125	37.12	AV	V	32.38	4.00	35.33	38.17	54.00	15.83
6247	46.88	PK	V	34.25	4.97	35.80	50.30	74.00	23.70
6247	36.98	AV	V	34.25	4.97	35.80	40.40	54.00	13.60
High Channel: 2462 MHz									
2462	61.96	PK	H	28.22	3.10	0.00	93.28	N/A	N/A
2462	59.79	AV	H	28.22	3.10	0.00	91.11	N/A	N/A
2462	63.99	PK	V	28.22	3.10	0.00	95.31	N/A	N/A
2462	60.31	AV	V	28.22	3.10	0.00	91.63	N/A	N/A
2483.5	30.28	PK	V	28.27	3.10	0.00	61.65	74.00	12.35
2483.5	14.59	AV	V	28.27	3.10	0.00	45.96	54.00	8.04
4924	51.35	PK	V	33.15	4.42	35.57	53.35	74.00	20.65
4924	44.35	AV	V	33.15	4.42	35.57	46.35	54.00	7.65
7386	49.92	PK	V	36.20	5.57	35.98	55.71	74.00	18.29
7386	41.26	AV	V	36.20	5.57	35.98	47.05	54.00	6.95
5426	47.36	PK	V	33.98	4.52	35.82	50.04	74.00	23.96
5426	38.09	AV	V	33.98	4.52	35.82	40.77	54.00	13.23

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	60.22	PK	H	28.12	3.11	0.00	91.45	N/A	N/A
2412	52.15	AV	H	28.12	3.11	0.00	83.38	N/A	N/A
2412	61.23	PK	V	28.12	3.11	0.00	92.46	N/A	N/A
2412	53.58	AV	V	28.12	3.11	0.00	84.81	N/A	N/A
2390	36.26	PK	V	28.08	3.10	0.00	67.44	74.00	6.56
2390	13.75	AV	V	28.08	3.10	0.00	44.93	54.00	9.07
4824	51.35	PK	V	32.95	4.33	35.49	53.14	74.00	20.86
4824	38.61	AV	V	32.95	4.33	35.49	40.40	54.00	13.60
7236	50.89	PK	V	35.81	5.47	35.97	56.20	74.00	17.80
7236	37.18	AV	V	35.81	5.47	35.97	42.49	54.00	11.51
4629	47.16	PK	V	32.56	4.41	35.34	48.79	74.00	25.21
4629	37.45	AV	V	32.56	4.41	35.34	39.08	54.00	14.92
Middle Channel: 2437 MHz									
2437	60.29	PK	H	28.17	3.11	0.00	91.57	N/A	N/A
2437	52.15	AV	H	28.17	3.11	0.00	83.43	N/A	N/A
2437	60.44	PK	V	28.17	3.11	0.00	91.72	N/A	N/A
2437	52.95	AV	V	28.17	3.11	0.00	84.23	N/A	N/A
4874	49.88	PK	V	33.05	4.39	35.53	51.79	74.00	22.21
4874	38.61	AV	V	33.05	4.39	35.53	40.52	54.00	13.48
7311	48.67	PK	V	36.01	5.52	35.97	54.23	74.00	19.77
7311	37.59	AV	V	36.01	5.52	35.97	43.15	54.00	10.85
5816	47.15	PK	V	34.23	4.70	35.85	50.23	74.00	23.77
5816	36.69	AV	V	34.23	4.70	35.85	39.77	54.00	14.23
4756	46.39	PK	V	32.81	4.27	35.44	48.03	74.00	25.97
4756	36.41	AV	V	32.81	4.27	35.44	38.05	54.00	15.95
High Channel: 2462 MHz									
2462	61.12	PK	H	28.22	3.10	0.00	92.44	N/A	N/A
2462	53.16	AV	H	28.22	3.10	0.00	84.48	N/A	N/A
2462	62.96	PK	V	28.22	3.10	0.00	94.28	N/A	N/A
2462	54.43	AV	V	28.22	3.10	0.00	85.75	N/A	N/A
2483.5	30.23	PK	V	28.27	3.10	0.00	61.60	74.00	12.40
2483.5	14.38	AV	V	28.27	3.10	0.00	45.75	54.00	8.25
4924	49.21	PK	V	33.15	4.42	35.57	51.21	74.00	22.79
4924	38.58	AV	V	33.15	4.42	35.57	40.58	54.00	13.42
7386	51.38	PK	V	36.20	5.57	35.98	57.17	74.00	16.83
7386	38.91	AV	V	36.20	5.57	35.98	44.70	54.00	9.30
5689	47.08	PK	V	34.18	4.64	35.85	50.05	74.00	23.95
5689	37.25	AV	V	34.18	4.64	35.85	40.22	54.00	13.78

802.11n20 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	60.14	PK	H	28.12	3.11	0.00	91.37	N/A	N/A
2412	47.28	AV	H	28.12	3.11	0.00	78.51	N/A	N/A
2412	60.39	PK	V	28.12	3.11	0.00	91.62	N/A	N/A
2412	47.26	AV	V	28.12	3.11	0.00	78.49	N/A	N/A
2390	31.46	PK	V	28.08	3.10	0.00	62.64	74.00	11.36
2390	14.65	AV	V	28.08	3.10	0.00	45.83	54.00	8.17
4824	50.69	PK	V	32.95	4.33	35.49	52.48	74.00	21.52
4824	39.51	AV	V	32.95	4.33	35.49	41.30	54.00	12.70
7236	48.02	PK	V	35.81	5.47	35.97	53.33	74.00	20.67
7236	37.21	AV	V	35.81	5.47	35.97	42.52	54.00	11.48
4526	47.33	PK	V	32.35	4.17	35.26	48.59	74.00	25.41
4526	36.69	AV	V	32.35	4.17	35.26	37.95	54.00	16.05
Middle Channel: 2437 MHz									
2437	59.22	PK	H	28.17	3.11	0.00	90.50	N/A	N/A
2437	46.95	AV	H	28.17	3.11	0.00	78.23	N/A	N/A
2437	59.85	PK	V	28.17	3.11	0.00	91.13	N/A	N/A
2437	46.63	AV	V	28.17	3.11	0.00	77.91	N/A	N/A
4874	47.94	PK	V	33.05	4.39	35.53	49.85	74.00	24.15
4874	36.66	AV	V	33.05	4.39	35.53	38.57	54.00	15.43
7311	47.55	PK	V	36.01	5.52	35.97	53.11	74.00	20.89
7311	36.59	AV	V	36.01	5.52	35.97	42.15	54.00	11.85
4635	47.08	PK	V	32.57	4.39	35.35	48.69	74.00	25.31
4635	36.85	AV	V	32.57	4.39	35.35	38.46	54.00	15.54
5245	47.05	PK	V	33.69	4.69	35.74	49.69	74.00	24.31
5245	36.77	AV	V	33.69	4.69	35.74	39.41	54.00	14.59
High Channel: 2462 MHz									
2462	59.05	PK	H	28.22	3.10	0.00	90.37	N/A	N/A
2462	46.21	AV	H	28.22	3.10	0.00	77.53	N/A	N/A
2462	60.23	PK	V	28.22	3.10	0.00	91.55	N/A	N/A
2462	47.99	AV	V	28.22	3.10	0.00	79.31	N/A	N/A
2483.5	32.58	PK	V	28.27	3.10	0.00	63.95	74.00	10.05
2483.5	14.21	AV	V	28.27	3.10	0.00	45.58	54.00	8.42
4924	50.09	PK	V	33.15	4.42	35.57	52.09	74.00	21.91
4924	40.16	AV	V	33.15	4.42	35.57	42.16	54.00	11.84
7386	49.58	PK	V	36.20	5.57	35.98	55.37	74.00	18.63
7386	38.25	AV	V	36.20	5.57	35.98	44.04	54.00	9.96
4636	47.48	PK	V	32.57	4.39	35.35	49.09	74.00	24.91
4636	36.87	AV	V	32.57	4.39	35.35	38.48	54.00	15.52

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

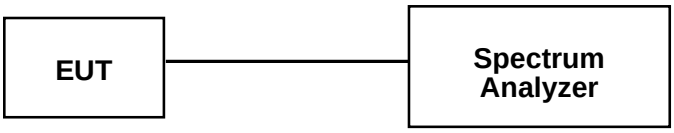
Applicable Standard

According to FCC §15.247(a) (2)

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

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	FSP 38	100478	2016-12-08	2017-12-08
Unknown	RF Cable	Unknown	C-4	Each Time	/

*** 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:	28 °C
Relative Humidity:	59 %
ATM Pressure:	99.1 kPa

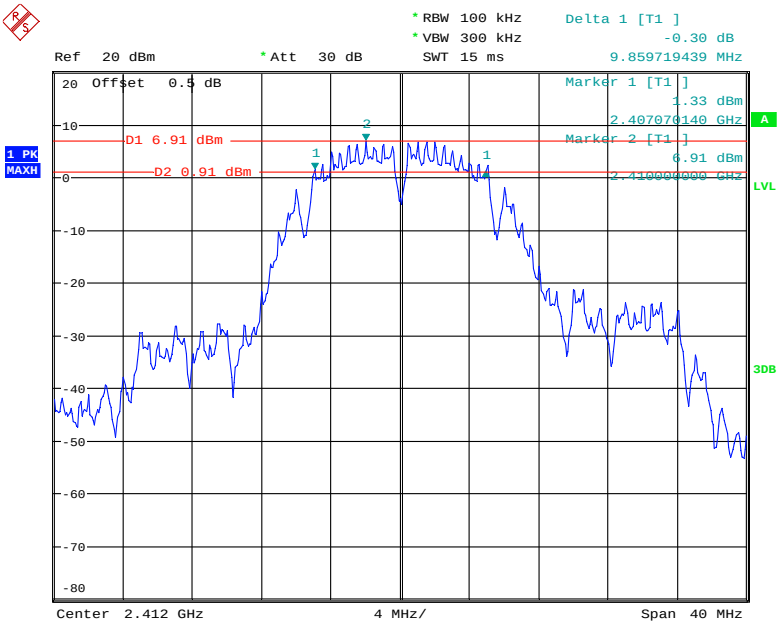
The testing was performed by Emily Wang on 2017-07-31.

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	9.86	≥0.5
	Middle	2437	9.94	≥0.5
	High	2462	9.54	≥0.5
802.11g	Low	2412	15.39	≥0.5
	Middle	2437	15.31	≥0.5
	High	2462	15.71	≥0.5
802.11n20	Low	2412	17.07	≥0.5
	Middle	2437	16.91	≥0.5
	High	2462	16.83	≥0.5

802.11b Low Channel



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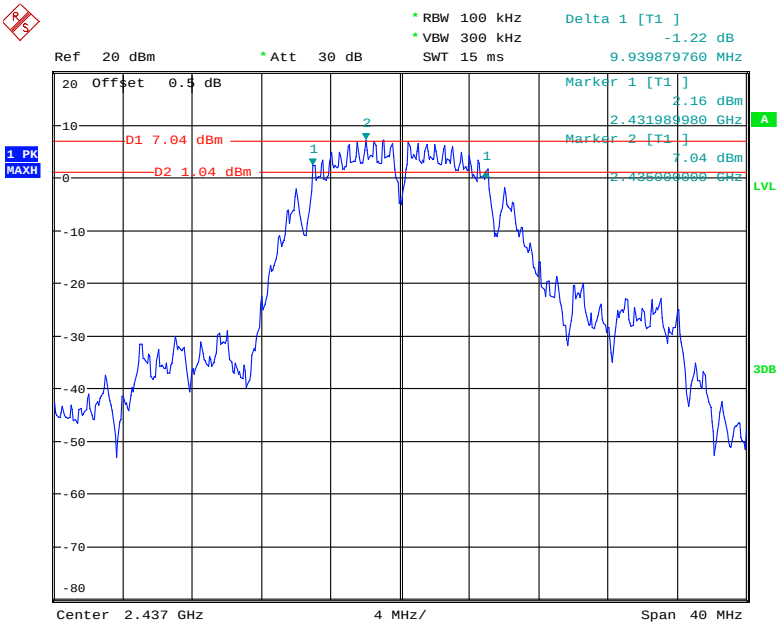
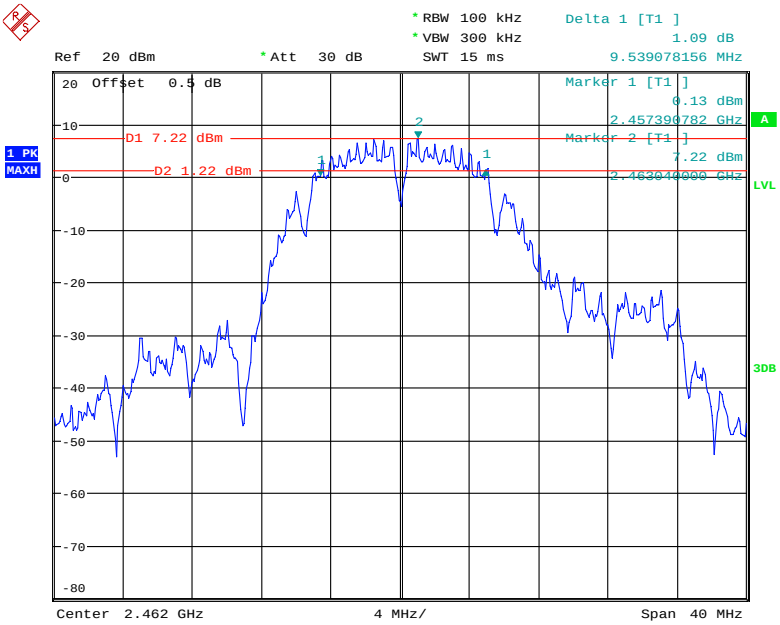
802.11b Middle Channel



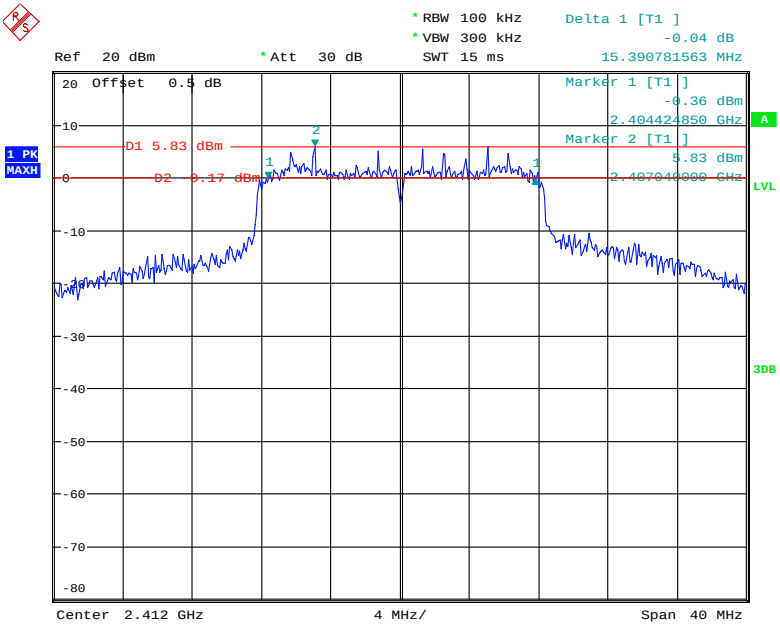
Date: 31.JUL.2017 11:52:43

802.11b High Channel



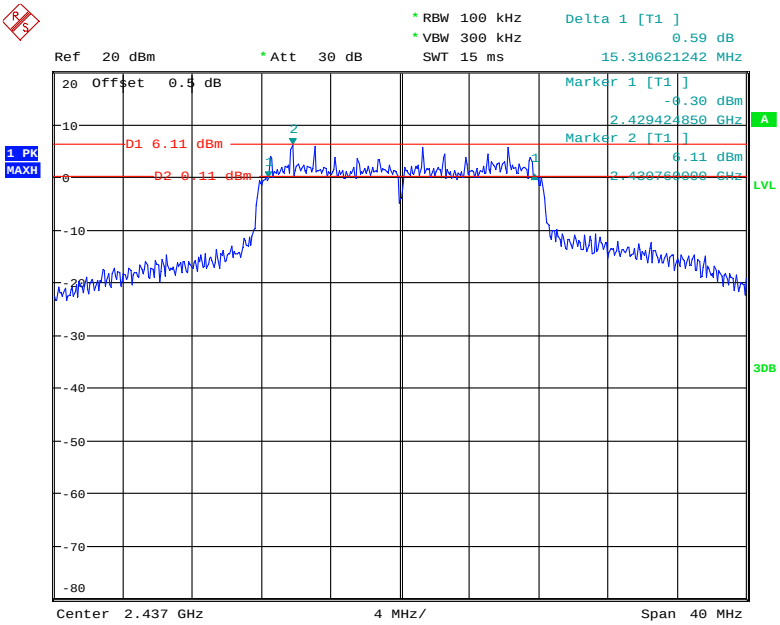
Date: 31.JUL.2017 11:54:43

802.11g Low Channel



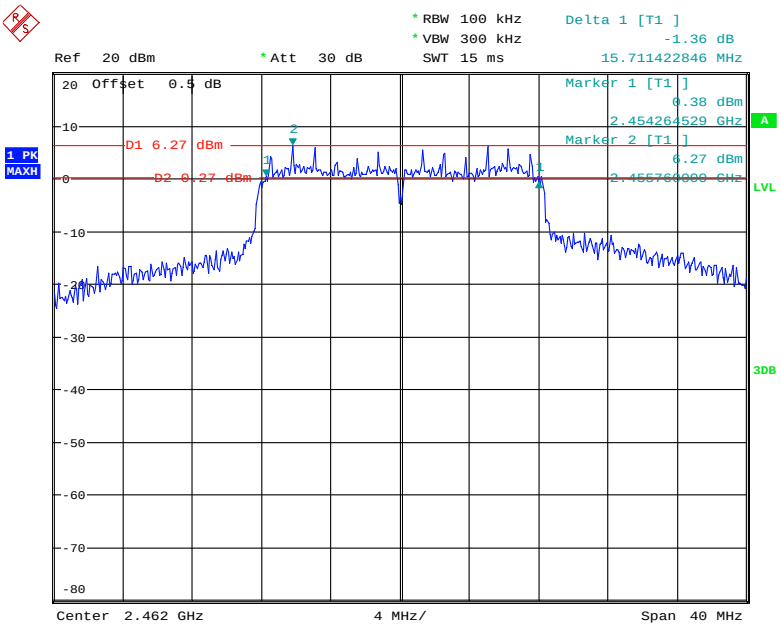
Date: 31.JUL.2017 13:32:05

802.11g Middle Channel



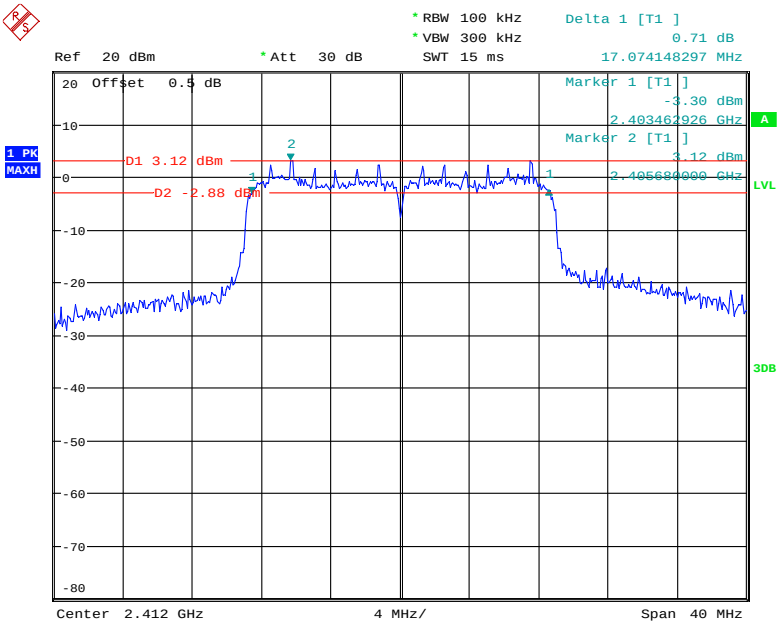
Date: 31.JUL.2017 13:36:27

802.11g High Channel



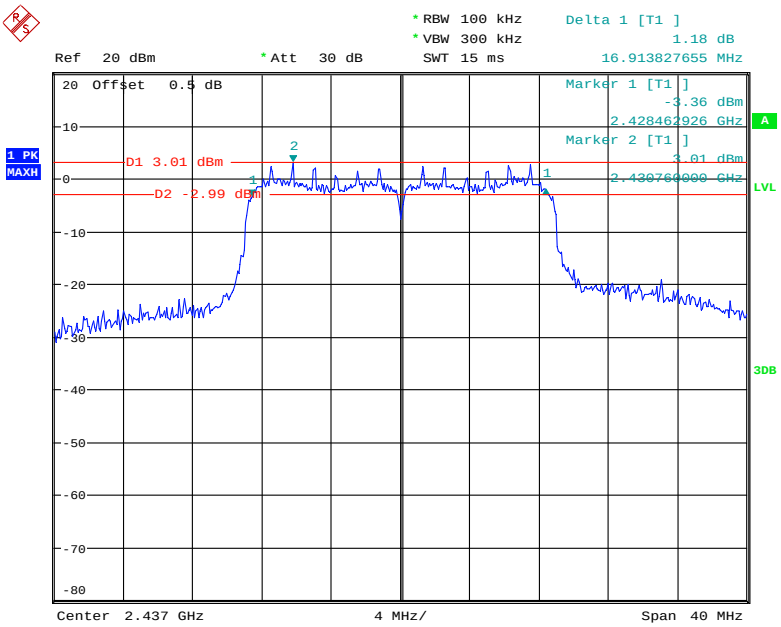
Date: 31.JUL.2017 13:39:51

802.11n ht20 Low Channel



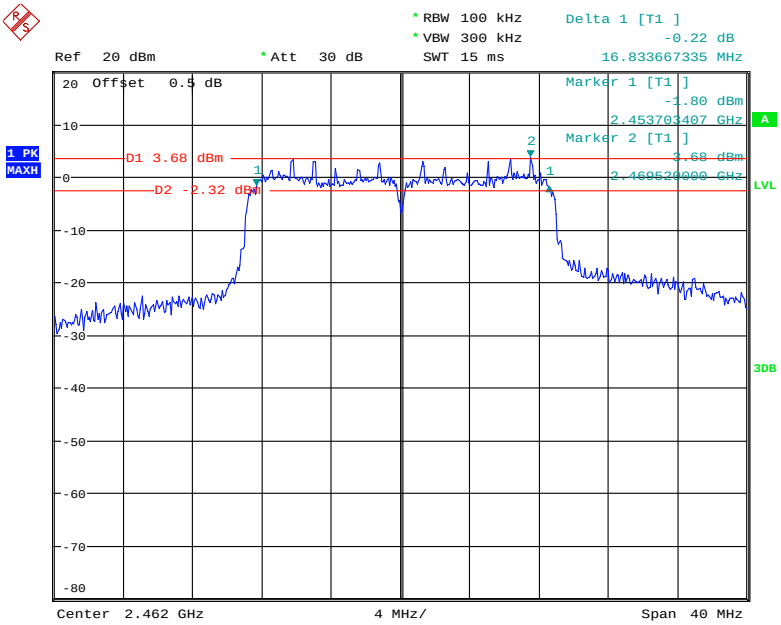
Date: 31.JUL.2017 13:49:26

802.11n ht20 Middle Channel



Date: 31.JUL.2017 13:46:57

802.11n ht20 High Channel



Date: 31.JUL.2017 13:44:08

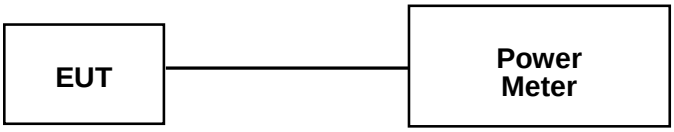
FCC §15.247(b) (3) - MAXIMUM PEAK CONDUCTED OUTPUT POWER

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 test equipment.
3. Add a correction factor to the display.
4. Set the power Meter to test Peak output power, record the result as peak power.
5. Set the power meter to test average output power, record the result as average power.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2016-11-03	2017-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2016-11-03	2017-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2016-11-03	2017-11-03
Unknown	RF Cable	Unknown	C-4	Each Time	/

*** 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:	28 °C
Relative Humidity:	59 %
ATM Pressure:	99.1 kPa

The testing was performed by Emily Wang on 2017-07-31.

Test Mode: Transmitting

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

Test mode	Channel	Frequency (MHz)	Max Peak Conducted Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b	Low	2412	16.20	14.14	30
	Middle	2437	16.35	14.25	30
	High	2462	16.43	14.08	30
802.11g	Low	2412	22.44	14.81	30
	Middle	2437	22.59	14.82	30
	High	2462	22.98	15.08	30
802.11n20	Low	2412	20.88	11.64	30
	Middle	2437	20.66	11.38	30
	High	2462	21.52	12.42	30

FCC §15.247(d)– 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

According to FCC§15.247(d):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	FSP 38	100478	2016-12-08	2017-12-08
Unknown	RF Cable	Unknown	C-4	Each Time	/

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

Test Data

Environmental Conditions

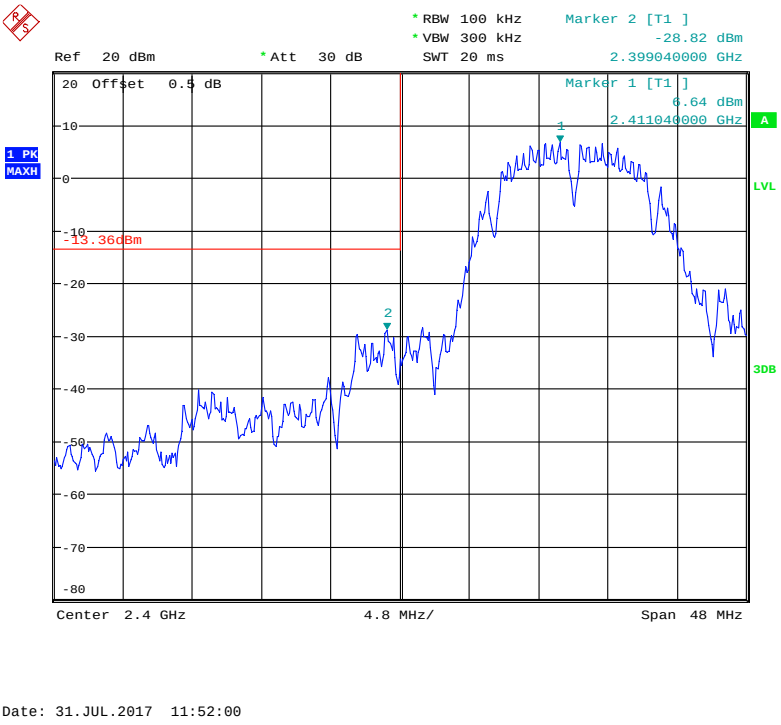
Temperature:	29.3 °C
Relative Humidity:	48 %
ATM Pressure:	99.1 kPa

The testing was performed by Emily Wang on 2017-07-31.

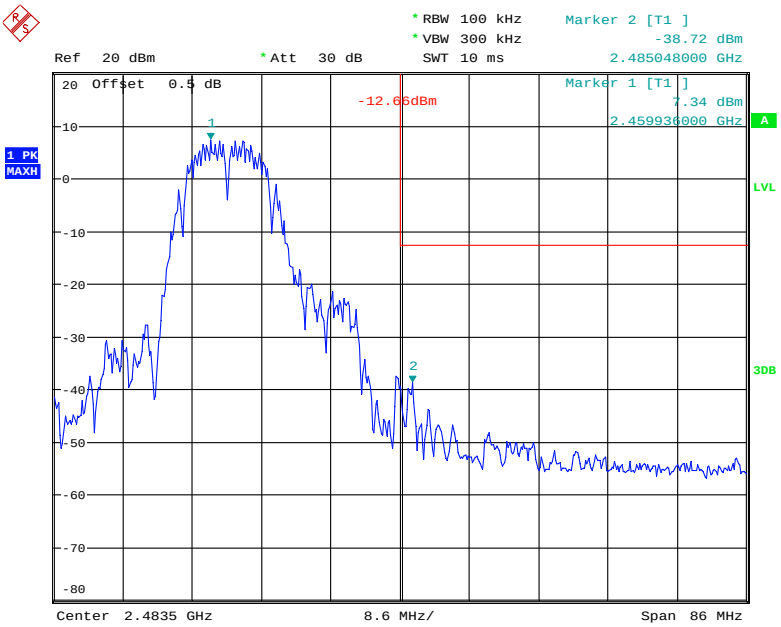
Test mode: Transmitting

Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side



802.11b: Band Edge, Right Side



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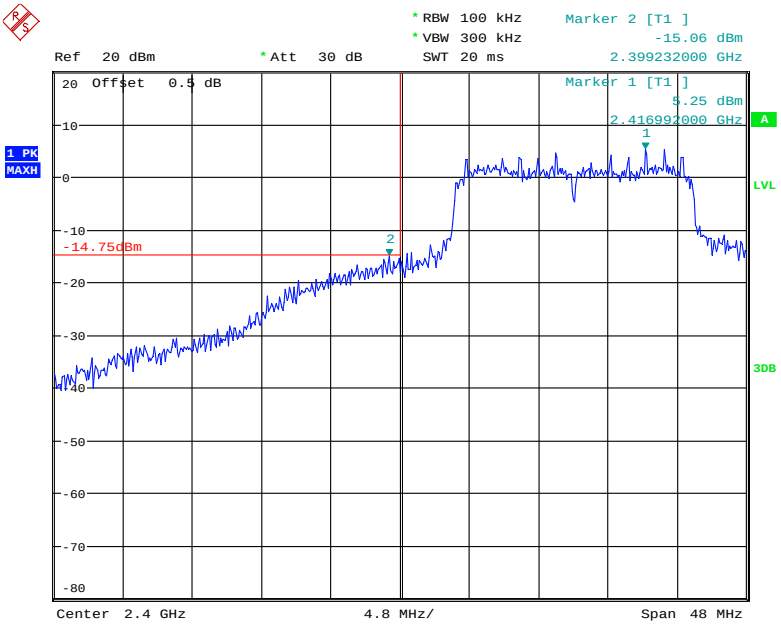
802.11g: Band Edge, Left Side



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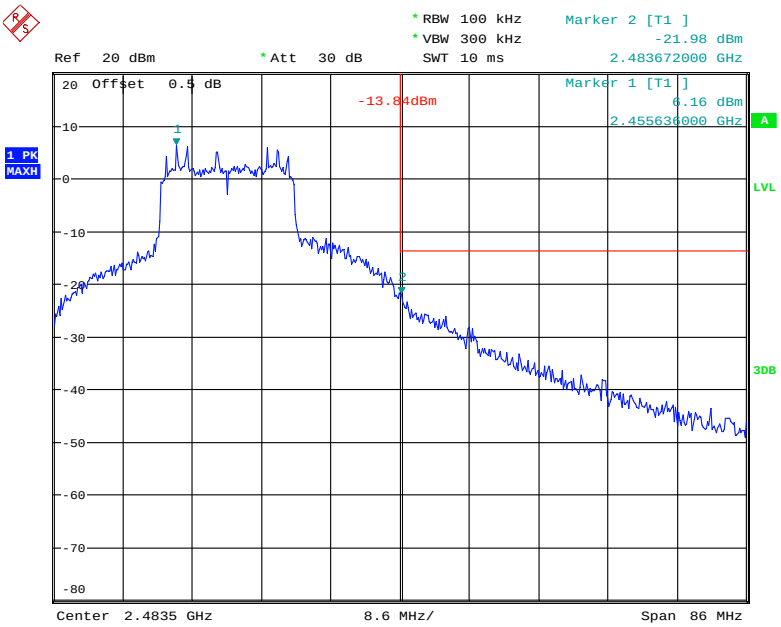
802.11g: Band Edge, Right Side



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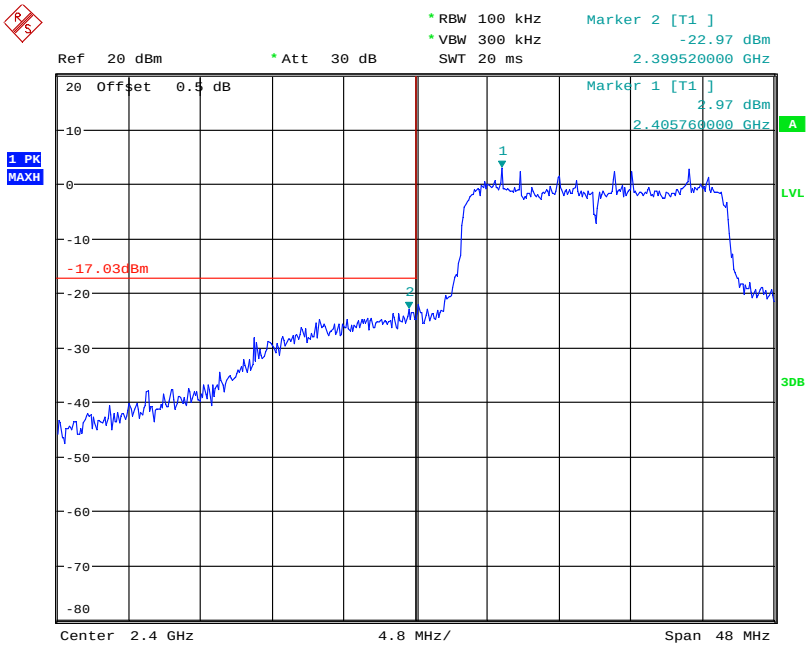
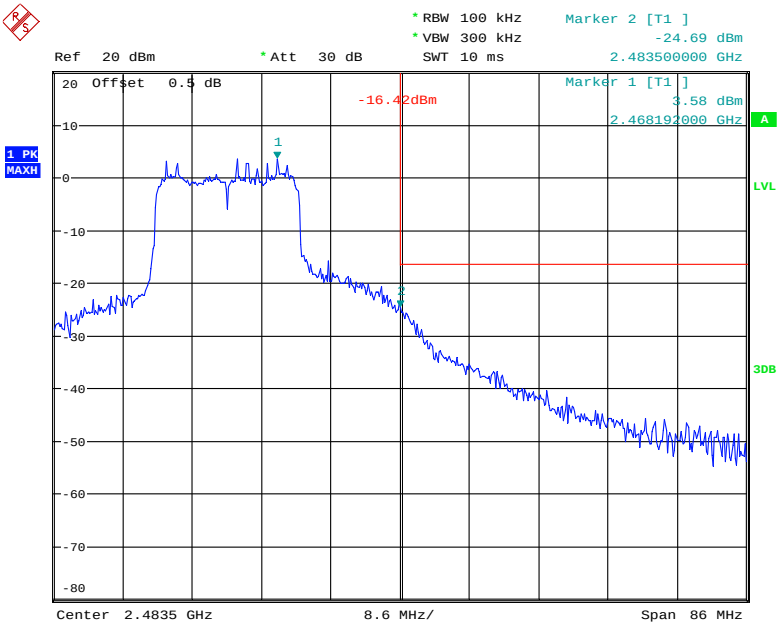
802.11n ht20 Band Edge, Left Side



Date: 31.JUL.2017 13:51:08

802.11n ht20 Band Edge, Right Side



Date: 31.JUL.2017 13:45:55

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	Spectrum Analyzer	FSP 38	100478	2016/12/08	2017/12/08
Unknown	RF Cable	Unknown	C-4	Each Time	/

*** 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:	28 °C
Relative Humidity:	59 %
ATM Pressure:	99.1 kPa

The testing was performed by Emily Wang on 2017-07-31.

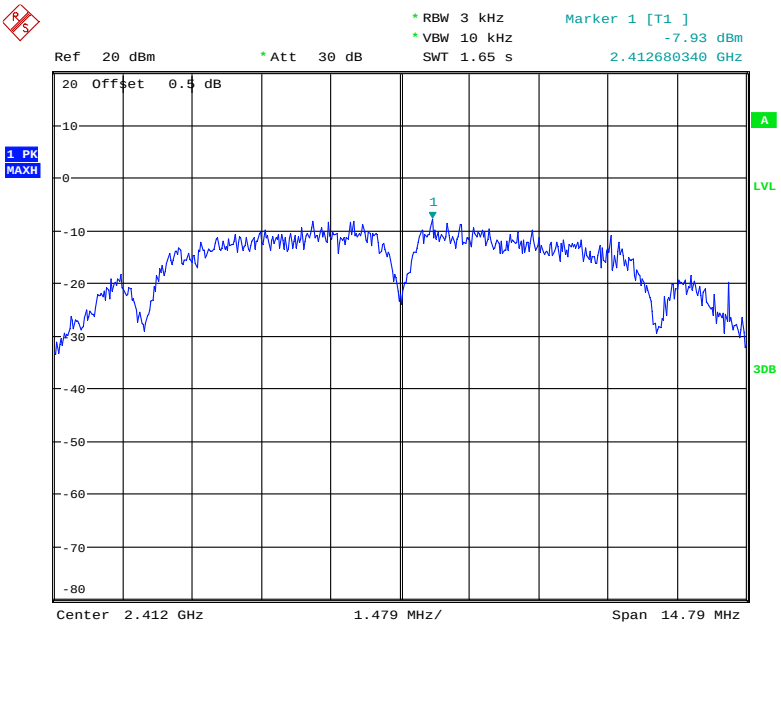
Test Result: Compliance

Test Mode: Transmitting

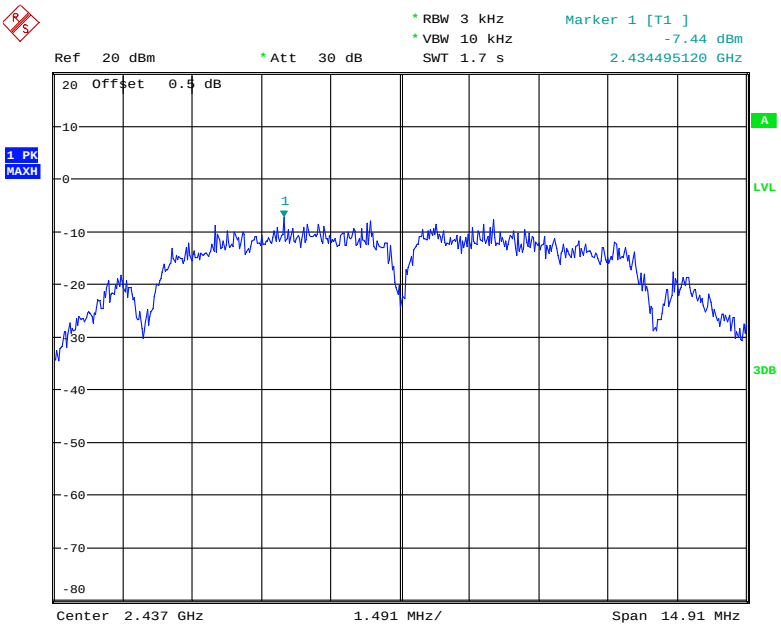
Test Result: Compliant. Please refer to the following table and plots

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-7.93	≤8
	Middle	2437	-7.44	≤8
	High	2462	-4.07	≤8
802.11g	Low	2412	-10.61	≤8
	Middle	2437	-9.49	≤8
	High	2462	-8.33	≤8
802.11n20	Low	2412	-11.16	≤8
	Middle	2437	-10.18	≤8
	High	2462	-11.17	≤8

Power Spectral Density, 802.11b Low Channel

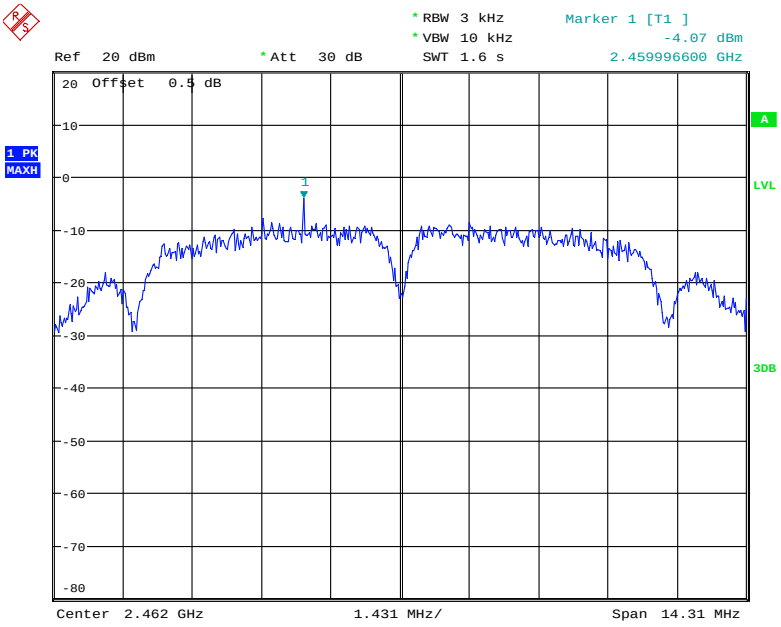


Power Spectral Density, 802.11b Middle Channel



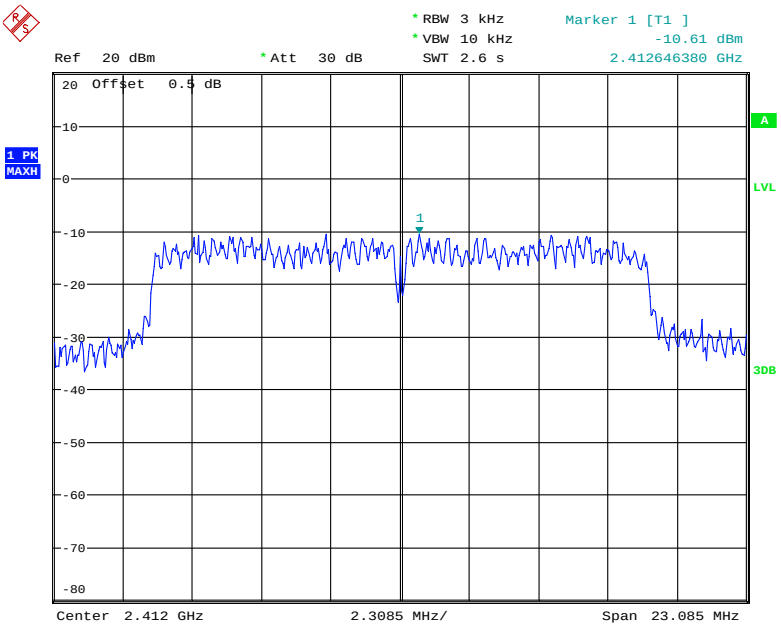
Date: 31.JUL.2017 11:53:34

Power Spectral Density, 802.11b High Channel



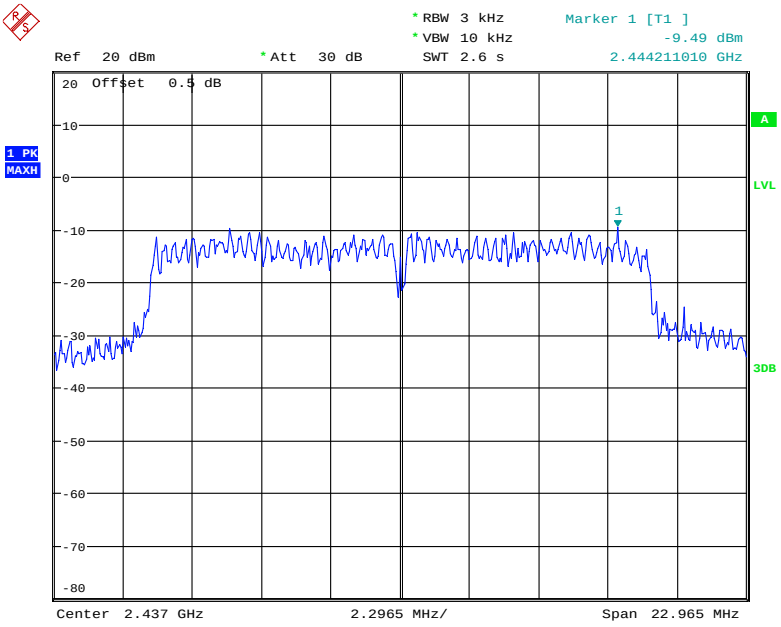
Date: 31.JUL.2017 11:55:37

Power Spectral Density, 802.11g Low Channel



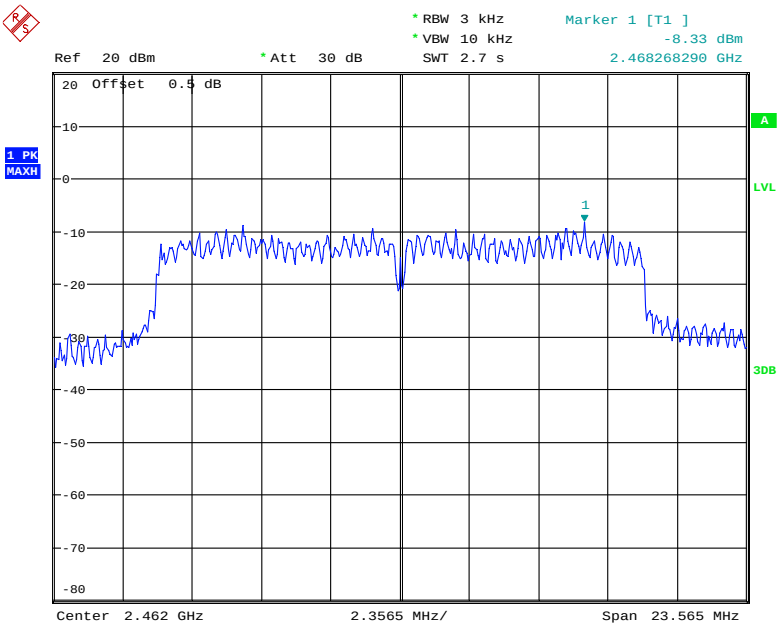
Date: 31.JUL.2017 13:33:07

Power Spectral Density, 802.11g Middle Channel



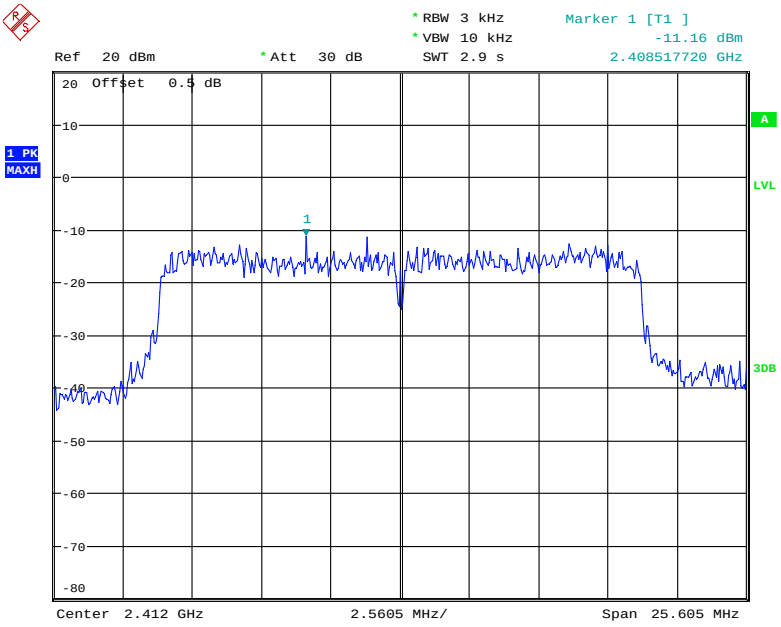
Date: 31.JUL.2017 13:37:24

Power Spectral Density, 802.11g High Channel



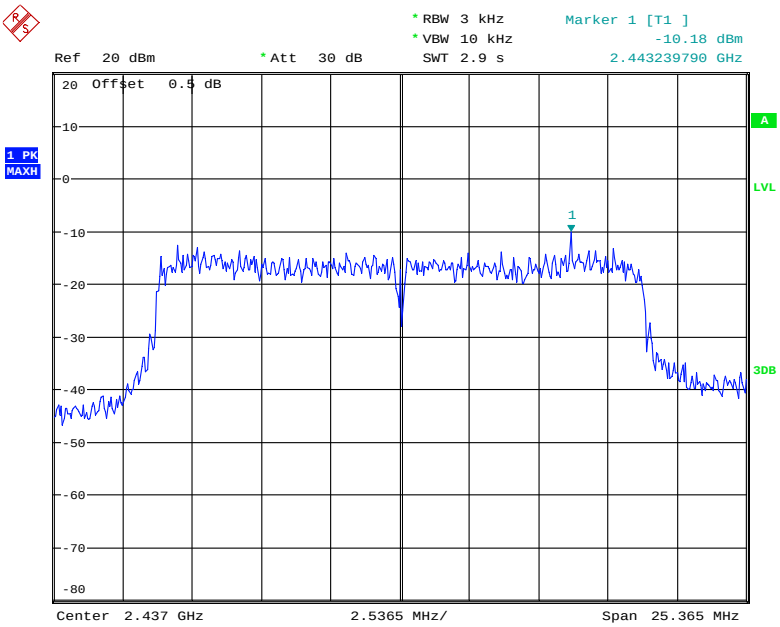
Date: 31.JUL.2017 13:40:59

Power Spectral Density, 802.11n ht20 Low Channel



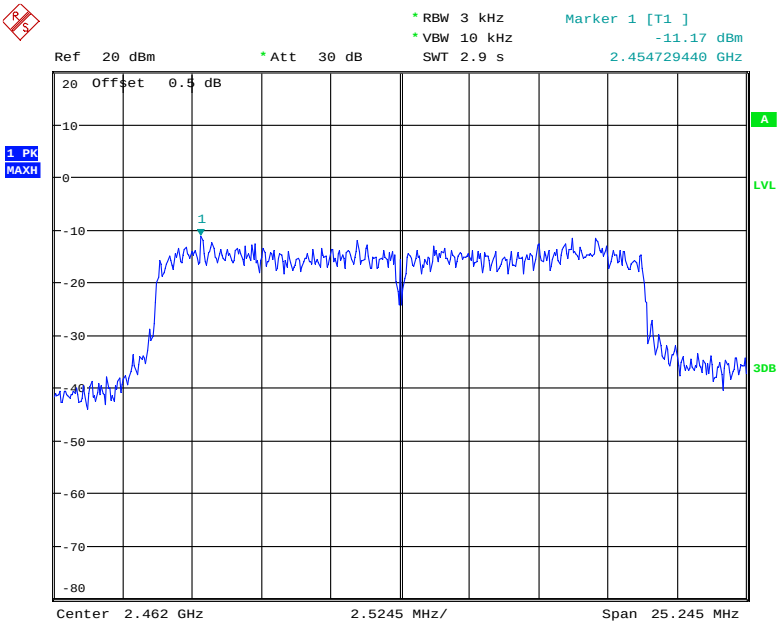
Date: 31.JUL.2017 13:50:28

Power Spectral Density, 802.11n ht20 Middle Channel



Date: 31.JUL.2017 13:47:53

Power Spectral Density, 802.11n ht20 High Channel



Date: 31.JUL.2017 13:45:07

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