

FCC PART 15.247

TEST REPORT

For

HONG KONG IPRO TECHNOLOGY CO.,LIMITED

FLAT/RM A3, 9/F SILVERCORP INT TOWER 707-713 NATHAN RD MONGKOK,
HONG KONG

FCC ID: PQ4IPROKYLIN40

Report Type: Original Report	Product Type: Mobile Phone
Report Number: RDG160908009-00C	
Report Date: 2016-09-23	
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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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FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *HONG KONG IPRO TECHNOLOGY CO., LIMITED*'s product, model number: *Kylin 4.0(FCC ID: PQ4IPROKYLIN40)* (the "EUT") in this report was a *Mobile Phone*, which was measured approximately: 12.1 cm (L) x 6.3cm (W) x1.0 cm (H), rated input voltage: DC 3.7V rechargeable Li-ion battery or DC5.0V charging from adapter.

Adapter information:

Model: NTR-S01

Input: AC100-240V-50/60 Hz,150mA

Output: DC5.0V, 700mA

All measurement and test data in this report was gathered from production sample serial number: 160908009 (Assigned by BACL, Dongguan). The EUT was received on 2016-09-09.

Objective

This report is prepared on behalf of *HONG KONG IPRO TECHNOLOGY CO., LIMITED* 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 15B JBP submissions with FCC ID: PQ4IPROKYLIN40.

FCC Part 15C DSS submissions with FCC ID: PQ4IPROKYLIN40.

FCC Part 22H, 24E PCE submissions with FCC ID: PQ4IPROKYLIN40.

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 manufacturer. For 2.4GHz band, 11 channels are provided to testing:

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

For 802.11b, 802.11g, and 802.11n ht20 modes were tested with channel 1, 6 and 11.

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

Equipment Modifications

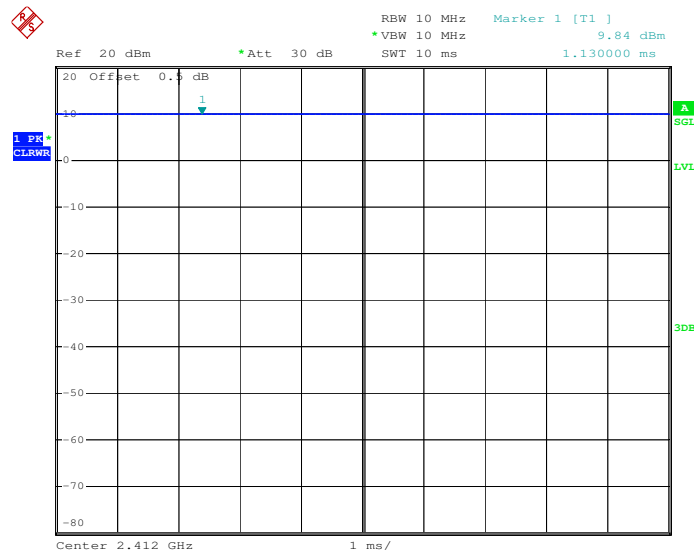
No modification was made to the EUT tested.

EUT Exercise Software

The maximum duty cycle was setting in engineering mode as following table:

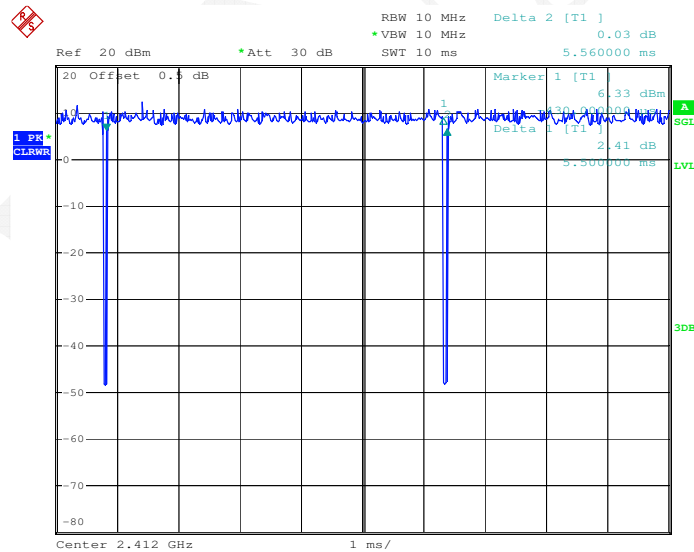
Test mode	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)
802.11b	10	10	100%
802.11g	5.50	5.56	98.9%
802.11n ht20	4.58	4.60	99.6%

802.11b Low Channel



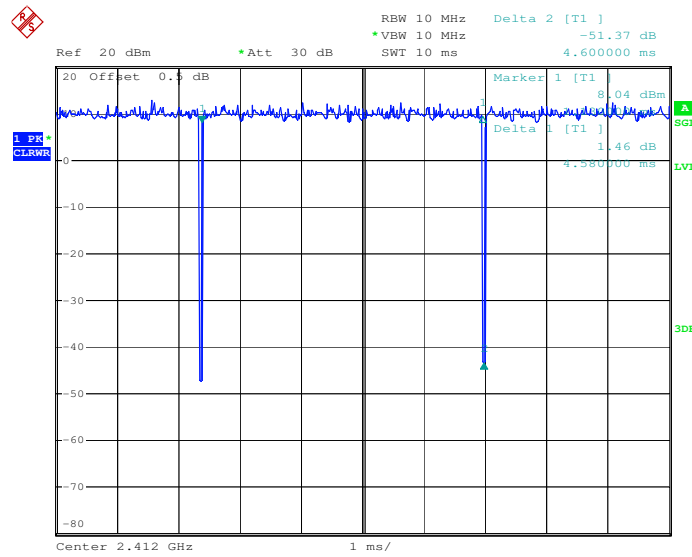
Date: 21.SEP.2016 21:43:22

802.11g Low Channel



Date: 21.SEP.2016 21:38:01

802.11n ht20 Low Channel



Date: 21.SEP.2016 21:41:00

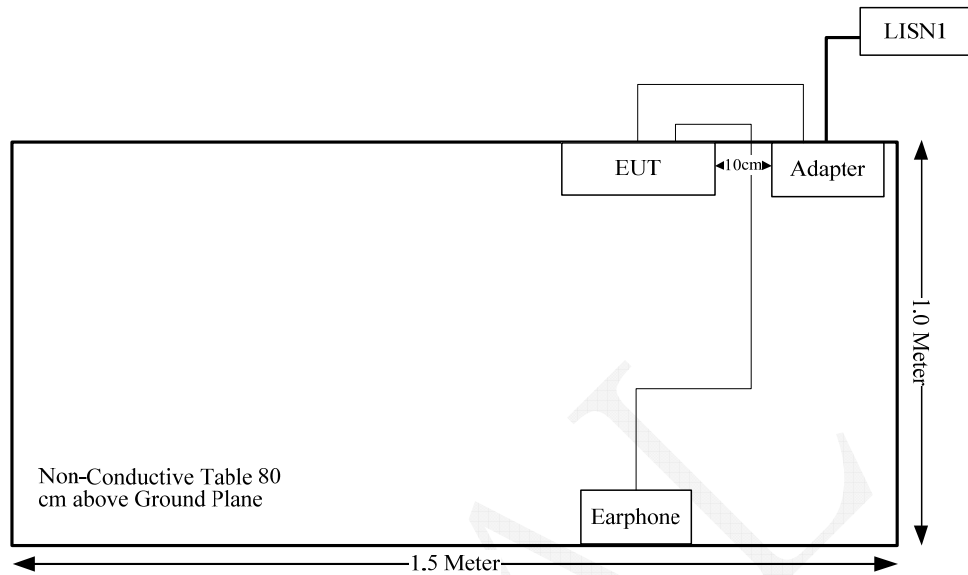
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (cm)	From Port	To
USB Cable	Yes	No	0.9	USB Port of Adapter	EUT
Earphone	No	No	1.2	Audio Port of EUT	N/A

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
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum conducted output power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

Test Time: 2016-09-09 ~ 2016-09-23

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.

According to KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

The tune-up conducted average power is 9.8 dBm (9.55mW).

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 9.55/5 \cdot (\sqrt{2.462}) = 2.997 < 3.0$

So the stand-alone SAR evaluation is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT has one integral antenna arrangement for WiFi/BT, and the antenna gain is 2 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

Measurement Uncertainty

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

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

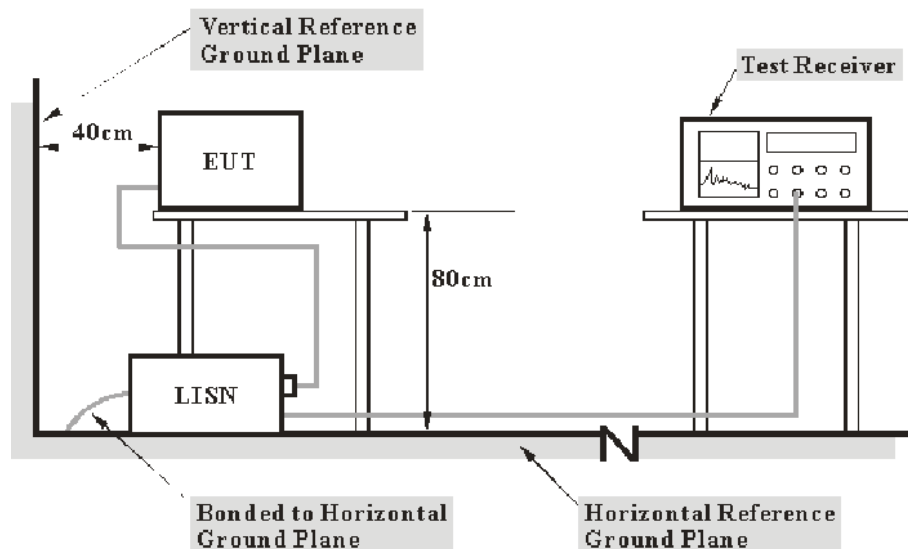
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of 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_{cisp}

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

EUT Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the first LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2015-12-10	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	2016-05-06	2017-05-06
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207

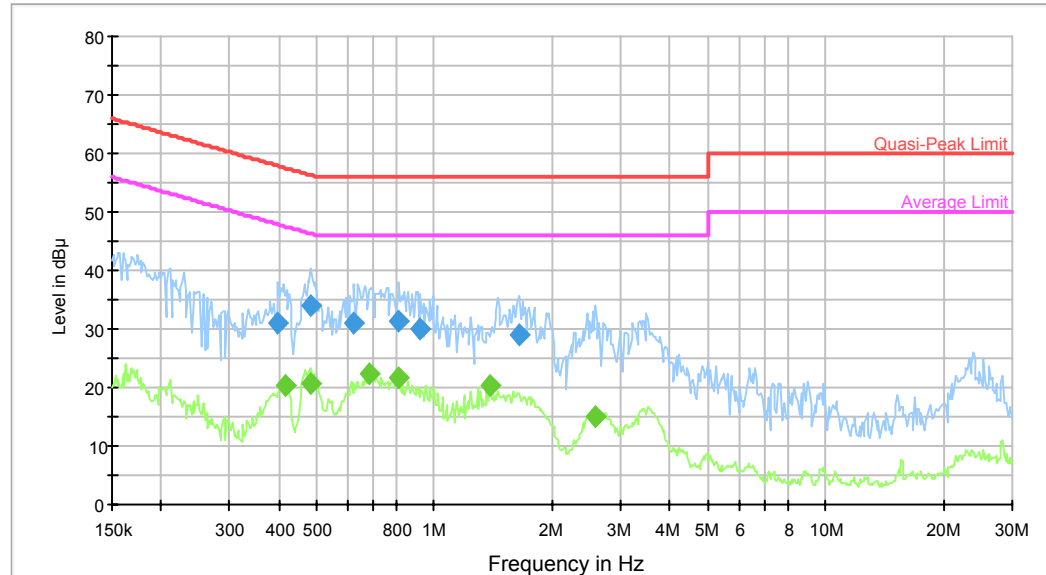
Test Data**Environmental Conditions**

Temperature:	29.1°C
Relative Humidity:	58 %
ATM Pressure:	100.2 kPa

The testing was performed by Robin Zheng on 2016-09-13.

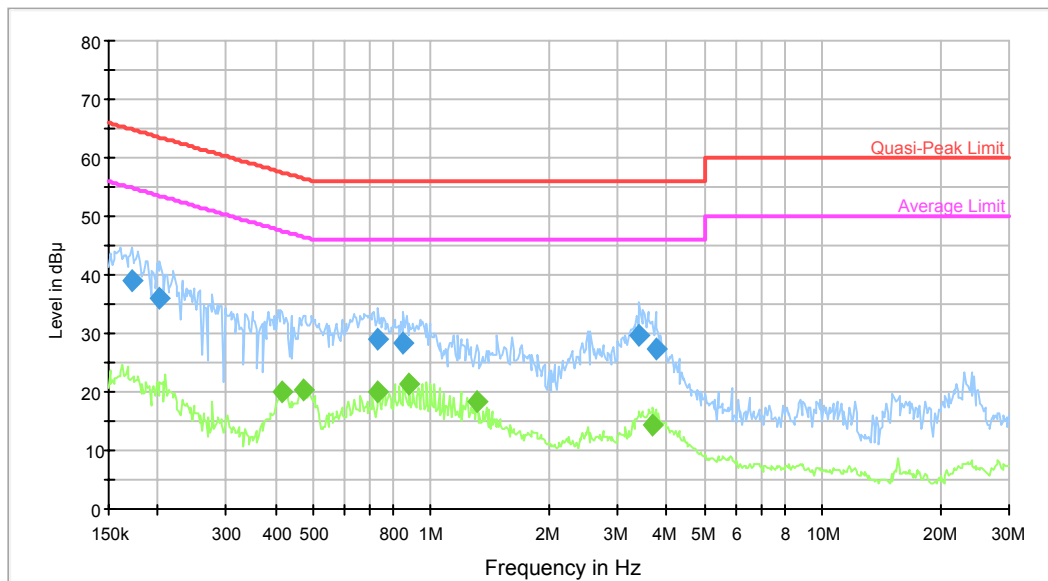
Test Mode: Transmitting

AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.399703	30.9	9.000	L1	9.7	27.0	57.9	Compliance
0.483938	34.0	9.000	L1	9.7	22.3	56.3	Compliance
0.624492	31.2	9.000	L1	9.7	24.8	56.0	Compliance
0.812315	31.3	9.000	L1	9.7	24.7	56.0	Compliance
0.922769	30.0	9.000	L1	9.7	26.0	56.0	Compliance
1.650866	29.0	9.000	L1	9.7	27.0	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.415949	20.3	9.000	L1	9.7	27.2	47.5	Compliance
0.483938	20.8	9.000	L1	9.7	25.5	46.3	Compliance
0.681699	22.4	9.000	L1	9.7	23.6	46.0	Compliance
0.805868	21.8	9.000	L1	9.7	24.2	46.0	Compliance
1.385415	20.3	9.000	L1	9.7	25.7	46.0	Compliance
2.579298	14.9	9.000	L1	9.7	31.1	46.0	Compliance

AC120 V, 60 Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171759	38.9	9.000	N	9.6	25.9	64.8	Compliance
0.203045	35.9	9.000	N	9.6	27.6	63.5	Compliance
0.732382	29.1	9.000	N	9.6	26.9	56.0	Compliance
0.852094	28.4	9.000	N	9.6	27.6	56.0	Compliance
3.408946	29.6	9.000	N	9.7	26.4	56.0	Compliance
3.750995	27.4	9.000	N	9.7	28.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.415949	20.0	9.000	N	9.6	27.5	47.5	Compliance
0.472507	20.3	9.000	N	9.6	26.2	46.5	Compliance
0.732382	20.1	9.000	N	9.6	25.9	46.0	Compliance
0.879690	21.4	9.000	N	9.6	24.6	46.0	Compliance
1.310256	18.4	9.000	N	9.7	27.6	46.0	Compliance
3.691692	14.4	9.000	N	9.7	31.6	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

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

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

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

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

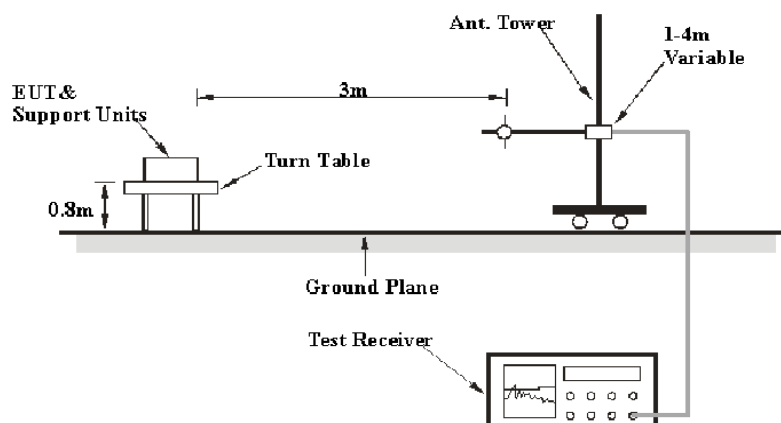
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated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

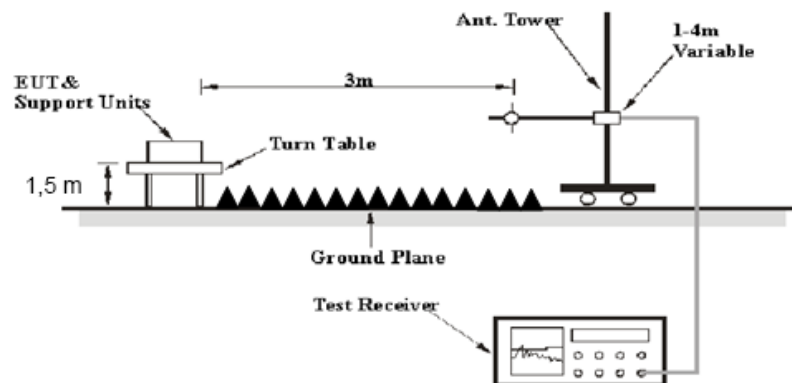
Table 2 – Values of U_{cisp}

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

EUT Setup

Below 1GHz:



Above 1GHz:

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

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

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

Corrected Amplitude & Margin Calculation

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

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

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2016-09-01	2017-09-01
Sunol Sciences	Antenna	JB3	A060611-1	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	000 527 35	2016-01-05	2019-01-04
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2016-02-19	2017-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
Ducommun Technologies	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

* **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 Results Summary

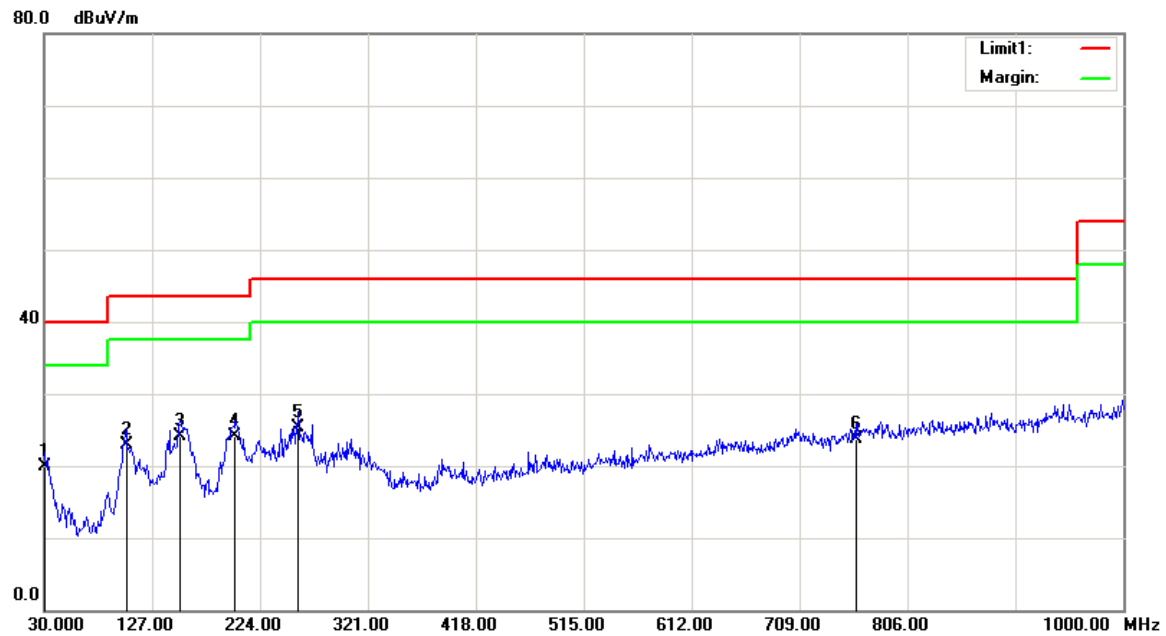
According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247

Test Data

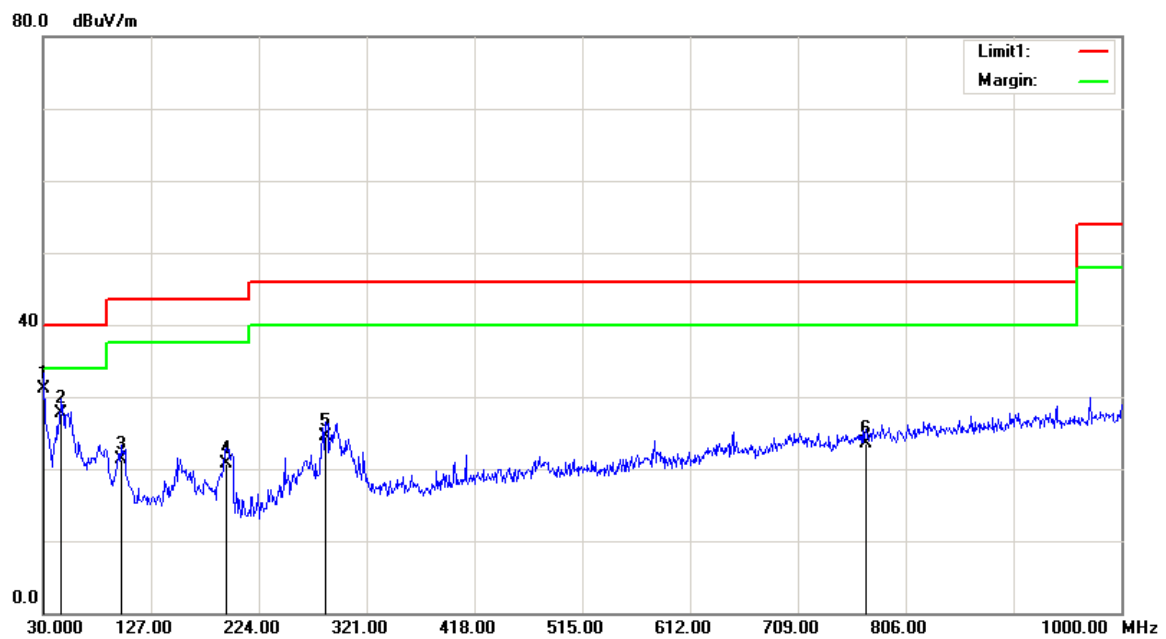
Environmental Conditions

Temperature:	27.1°C
Relative Humidity:	43 %
ATM Pressure:	100.7 kPa

* The testing was performed by Robin Zheng on 2016-09-19.

1) Below 1GHz:*Test Mode: Transmitting***Horizontal**

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	18.87	QP	1.03	19.90	40.00	20.10
103.7200	31.89	QP	-8.89	23.00	43.50	20.50
152.2200	31.39	QP	-7.19	24.20	43.50	19.30
201.6900	31.65	QP	-7.45	24.20	43.50	19.30
257.9500	32.84	QP	-7.44	25.40	46.00	20.60
759.4400	21.64	QP	2.16	23.80	46.00	22.20

Vertical

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.9700	30.93	QP	0.27	31.20	40.00	8.80
46.4900	38.45	QP	-10.75	27.70	40.00	12.30
99.8400	31.11	QP	-9.81	21.30	43.50	22.20
194.9000	28.90	QP	-8.10	20.80	43.50	22.70
284.1400	30.73	QP	-6.23	24.50	46.00	21.50
770.1100	21.21	QP	2.29	23.50	46.00	22.50

Test Mode: Transmitting

802.11b Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	62.09	PK	H	25.67	3.68	0.00	91.44	N/A	N/A
2412	59.01	AV	H	25.67	3.68	0.00	88.36	N/A	N/A
2412	61.48	PK	V	25.67	3.68	0.00	90.83	N/A	N/A
2412	58.5	AV	V	25.67	3.68	0.00	87.85	N/A	N/A
2390	25.34	PK	H	25.61	3.63	0.00	54.58	74.00	19.42
2390	13.49	AV	H	25.61	3.63	0.00	42.73	54.00	11.27
4824	37.94	PK	H	30.64	5.03	27.41	46.20	74.00	27.80
4824	33.62	AV	H	30.64	5.03	27.41	41.88	54.00	12.12
7236	33.14	PK	H	34.17	6.65	25.90	48.06	74.00	25.94
7236	29.61	AV	H	34.17	6.65	25.90	44.53	54.00	9.47
3257	32.88	PK	H	28.02	6.15	27.32	39.73	74.00	34.27
3257	20.41	AV	H	28.02	6.15	27.32	27.26	54.00	26.74
Middle Channel: 2437 MHz									
2437	63.25	PK	H	25.74	3.75	0.00	92.74	N/A	N/A
2437	60.31	AV	H	25.74	3.75	0.00	89.80	N/A	N/A
2437	61.95	PK	V	25.74	3.75	0.00	91.44	N/A	N/A
2437	58.85	AV	V	25.74	3.75	0.00	88.34	N/A	N/A
4874	40.47	PK	H	30.77	5.14	27.42	48.96	74.00	25.04
4874	37.1	AV	H	30.77	5.14	27.42	45.59	54.00	8.41
7311	35.61	PK	H	34.35	6.74	25.88	50.82	74.00	23.18
7311	31.49	AV	H	34.35	6.74	25.88	46.70	54.00	7.30
3128	33.28	PK	H	27.61	6.92	27.43	40.38	74.00	33.62
3128	21.43	AV	H	27.61	6.92	27.43	28.53	54.00	25.47
3455	32.69	PK	H	28.66	4.90	27.22	39.03	74.00	34.97
3455	20.17	AV	H	28.66	4.90	27.22	26.51	54.00	27.49
High Channel: 2462 MHz									
2462	64.28	PK	H	25.80	3.75	0.00	93.83	N/A	N/A
2462	61.29	AV	H	25.80	3.75	0.00	90.84	N/A	N/A
2462	61.93	PK	V	25.80	3.75	0.00	91.48	N/A	N/A
2462	58.97	AV	V	25.80	3.75	0.00	88.52	N/A	N/A
2483.5	25.93	PK	H	25.86	3.67	0.00	55.46	74.00	18.54
2483.5	14.22	AV	H	25.86	3.67	0.00	43.75	54.00	10.25
4924	42.1	PK	H	30.90	5.34	27.43	50.91	74.00	23.09
4924	39.14	AV	H	30.90	5.34	27.43	47.95	54.00	6.05
7386	35.11	PK	H	34.53	6.83	25.86	50.61	74.00	23.39
7386	31.4	AV	H	34.53	6.83	25.86	46.90	54.00	7.10
3210	33.83	PK	H	27.87	6.13	27.36	40.47	74.00	33.53
3210	21.04	AV	H	27.87	6.13	27.36	27.68	54.00	26.32

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	62.47	PK	H	25.67	3.68	0.00	91.82	N/A	N/A
2412	49.55	AV	H	25.67	3.68	0.00	78.90	N/A	N/A
2412	63.18	PK	V	25.67	3.68	0.00	92.53	N/A	N/A
2412	50.71	AV	V	25.67	3.68	0.00	80.06	N/A	N/A
2390	40.25	PK	V	25.61	3.63	0.00	69.49	74.00	4.51
2390	19.18	AV	V	25.61	3.63	0.00	48.42	54.00	5.58
4824	37.02	PK	V	30.64	5.03	27.41	45.28	74.00	28.72
4824	26.29	AV	V	30.64	5.03	27.41	34.55	54.00	19.45
7236	35.3	PK	V	34.17	6.65	25.90	50.22	74.00	23.78
7236	24.38	AV	V	34.17	6.65	25.90	39.30	54.00	14.70
3245	32.28	PK	V	27.98	6.29	27.33	39.22	74.00	34.78
3245	20.49	AV	V	27.98	6.29	27.33	27.43	54.00	26.57
Middle Channel: 2437 MHz									
2437	61.42	PK	H	25.74	3.75	0.00	90.91	N/A	N/A
2437	48.59	AV	H	25.74	3.75	0.00	78.08	N/A	N/A
2437	62.58	PK	V	25.74	3.75	0.00	92.07	N/A	N/A
2437	49.37	AV	V	25.74	3.75	0.00	78.86	N/A	N/A
4874	37.04	PK	V	30.77	5.14	27.42	45.53	74.00	28.47
4874	26.56	AV	V	30.77	5.14	27.42	35.05	54.00	18.95
7311	35.41	PK	V	34.35	6.74	25.88	50.62	74.00	23.38
7311	24.96	AV	V	34.35	6.74	25.88	40.17	54.00	13.83
3120	32.31	PK	V	27.58	6.90	27.43	39.36	74.00	34.64
3120	20.22	AV	V	27.58	6.90	27.43	27.27	54.00	26.73
3258	32.58	PK	V	28.03	6.12	27.32	39.41	74.00	34.59
3258	20.11	AV	V	28.03	6.12	27.32	26.94	54.00	27.06
High Channel: 2462 MHz									
2462	60.89	PK	H	25.80	3.75	0.00	90.44	N/A	N/A
2462	48.37	AV	H	25.80	3.75	0.00	77.92	N/A	N/A
2462	62.39	PK	V	25.80	3.75	0.00	91.94	N/A	N/A
2462	50.19	AV	V	25.80	3.75	0.00	79.74	N/A	N/A
2483.5	35.22	PK	V	25.86	3.67	0.00	64.75	74.00	9.25
2483.5	18.13	AV	V	25.86	3.67	0.00	47.66	54.00	6.34
4924	36.91	PK	V	30.90	5.34	27.43	45.72	74.00	28.28
4924	26.39	AV	V	30.90	5.34	27.43	35.20	54.00	18.80
7386	36.2	PK	V	34.53	6.83	25.86	51.70	74.00	22.30
7386	24.48	AV	V	34.53	6.83	25.86	39.98	54.00	14.02
3225	32.67	PK	V	27.92	6.20	27.35	39.44	74.00	34.56
3225	20.49	AV	V	27.92	6.20	27.35	27.26	54.00	26.74

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	65.19	PK	H	25.67	3.68	0.00	94.54	N/A	N/A
2412	54.35	AV	H	25.67	3.68	0.00	83.70	N/A	N/A
2412	66.51	PK	V	25.67	3.68	0.00	95.86	N/A	N/A
2412	57.25	AV	V	25.67	3.68	0.00	86.60	N/A	N/A
2390	36.16	PK	V	25.61	3.63	0.00	65.40	74.00	8.60
2390	17.07	AV	V	25.61	3.63	0.00	46.31	54.00	7.69
4824	35.86	PK	V	30.64	5.03	27.41	44.12	74.00	29.88
4824	25.94	AV	V	30.64	5.03	27.41	34.20	54.00	19.80
7236	34.86	PK	V	34.17	6.65	25.90	49.78	74.00	24.22
7236	24.52	AV	V	34.17	6.65	25.90	39.44	54.00	14.56
3175	32.17	PK	V	27.76	6.53	27.39	39.07	74.00	34.93
3175	20.02	AV	V	27.76	6.53	27.39	26.92	54.00	27.08
Middle Channel: 2437 MHz									
2437	66.35	PK	H	25.74	3.75	0.00	95.84	N/A	N/A
2437	56.4	AV	H	25.74	3.75	0.00	85.89	N/A	N/A
2437	66.28	PK	V	25.74	3.75	0.00	95.77	N/A	N/A
2437	55.45	AV	V	25.74	3.75	0.00	84.94	N/A	N/A
4874	36.11	PK	H	30.77	5.14	27.42	44.60	74.00	29.40
4874	26.18	AV	H	30.77	5.14	27.42	34.67	54.00	19.33
7311	35.13	PK	H	34.35	6.74	25.88	50.34	74.00	23.66
7311	24.78	AV	H	34.35	6.74	25.88	39.99	54.00	14.01
2950	32.3	PK	H	27.07	6.61	27.54	38.44	74.00	35.56
2950	20.14	AV	H	27.07	6.61	27.54	26.28	54.00	27.72
3610	33.86	PK	H	29.04	4.61	27.28	40.23	74.00	33.77
3610	21.46	AV	H	29.04	4.61	27.28	27.83	54.00	26.17
High Channel: 2462 MHz									
2462	67.05	PK	H	25.80	3.75	0.00	96.60	N/A	N/A
2462	56.36	AV	H	25.80	3.75	0.00	85.91	N/A	N/A
2462	66.04	PK	V	25.80	3.75	0.00	95.59	N/A	N/A
2462	55.49	AV	V	25.80	3.75	0.00	85.04	N/A	N/A
2483.5	40.76	PK	H	25.86	3.67	0.00	70.29	74.00	3.71
2483.5	21.53	AV	H	25.86	3.67	0.00	51.06	54.00	2.94
4924	36.47	PK	H	30.90	5.34	27.43	45.28	74.00	28.72
4924	26.49	AV	H	30.90	5.34	27.43	35.30	54.00	18.70
7386	35.42	PK	H	34.53	6.83	25.86	50.92	74.00	23.08
7386	25.06	AV	H	34.53	6.83	25.86	40.56	54.00	13.44
3285	32.49	PK	H	28.11	5.49	27.30	38.79	74.00	35.21
3285	20.29	AV	H	28.11	5.49	27.30	26.59	54.00	27.41

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

Applicable Standard

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

Test Procedure

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ 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	2015-11-23	2016-11-22
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:	28.8 ~ 30.1°C
Relative Humidity:	35~ 52 %
ATM Pressure:	100.1 ~ 100.9 kPa

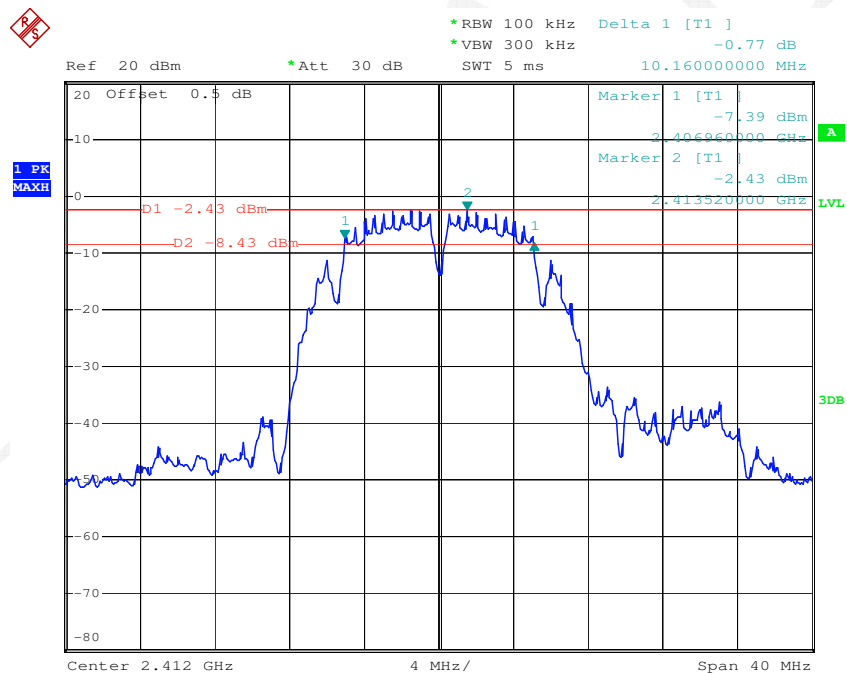
* The testing was performed by Robin Zheng from 2016-09-13 to 2016-09-21.

Test Mode: Transmitting

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

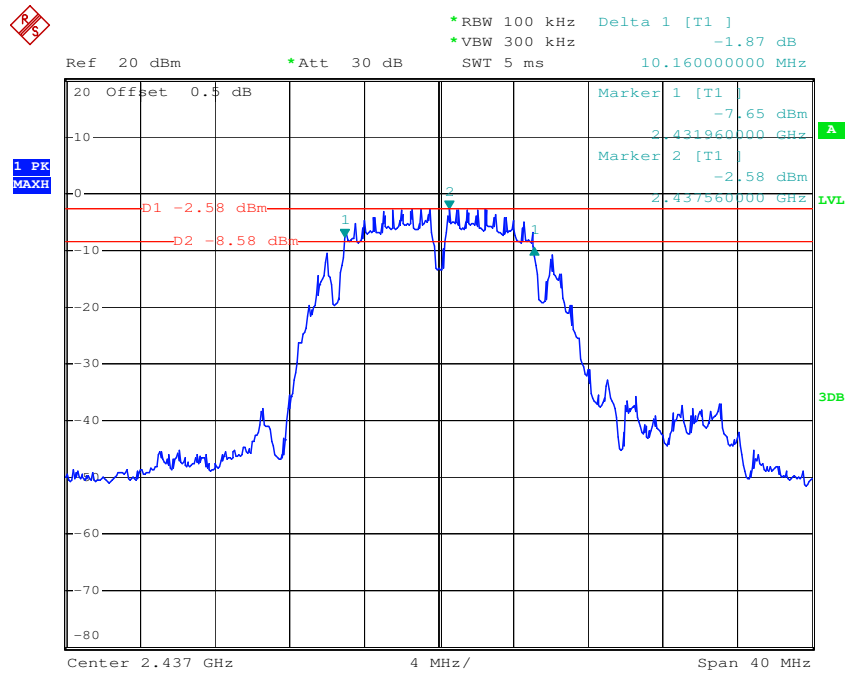
Test mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.16	≥ 0.5
	Middle	2437	10.16	≥ 0.5
	High	2462	10.16	≥ 0.5
802.11g	Low	2412	16.40	≥ 0.5
	Middle	2437	16.16	≥ 0.5
	High	2462	16.32	≥ 0.5
802.11n20	Low	2412	17.36	≥ 0.5
	Middle	2437	17.44	≥ 0.5
	High	2462	17.44	≥ 0.5

802.11b Low Channel



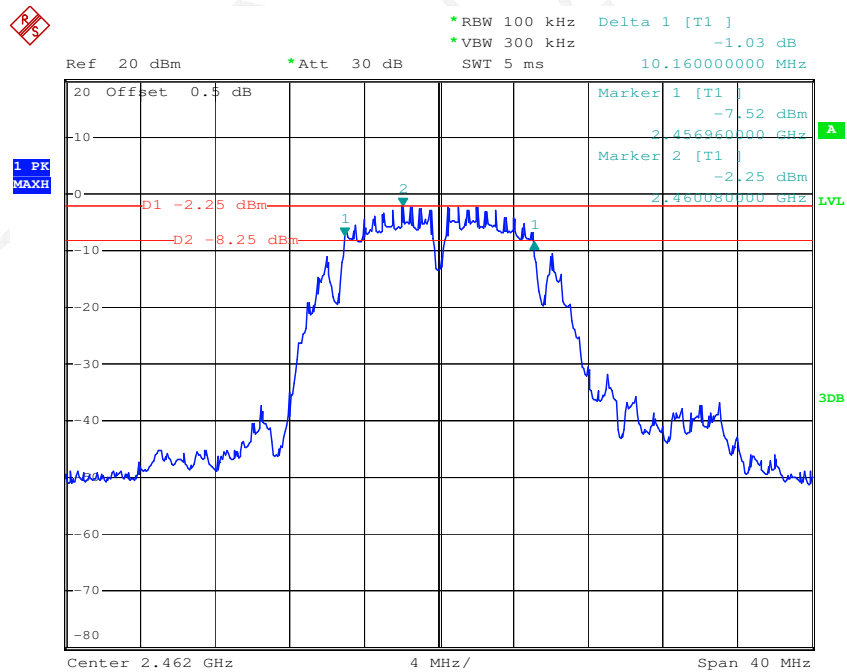
Date: 13.SEP.2016 11:12:09

802.11b Middle Channel



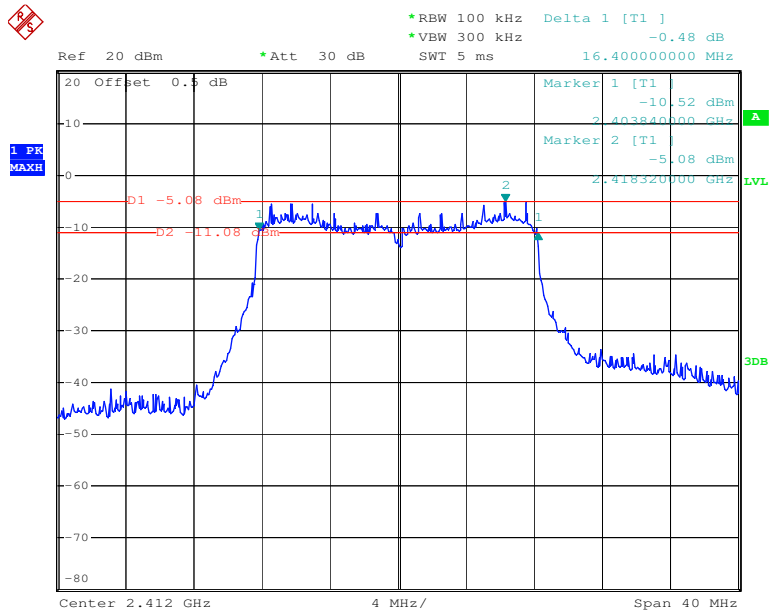
Date: 13.SEP.2016 11:16:46

802.11b High Channel



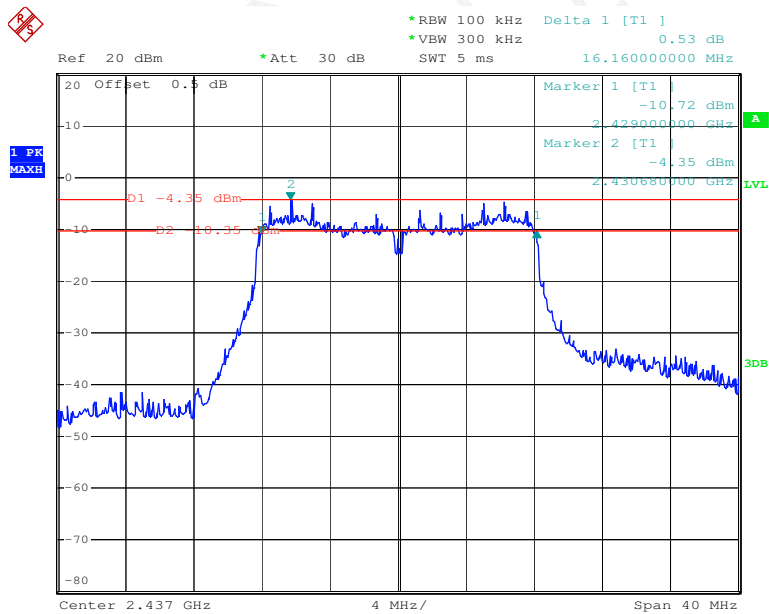
Date: 13.SEP.2016 11:21:34

802.11g Low Channel



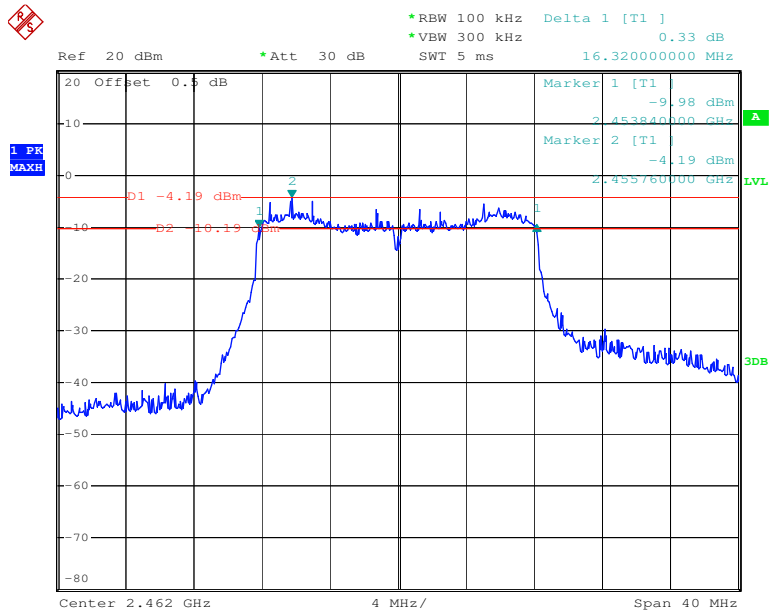
Date: 21.SEP.2016 22:12:06

802.11g Middle Channel



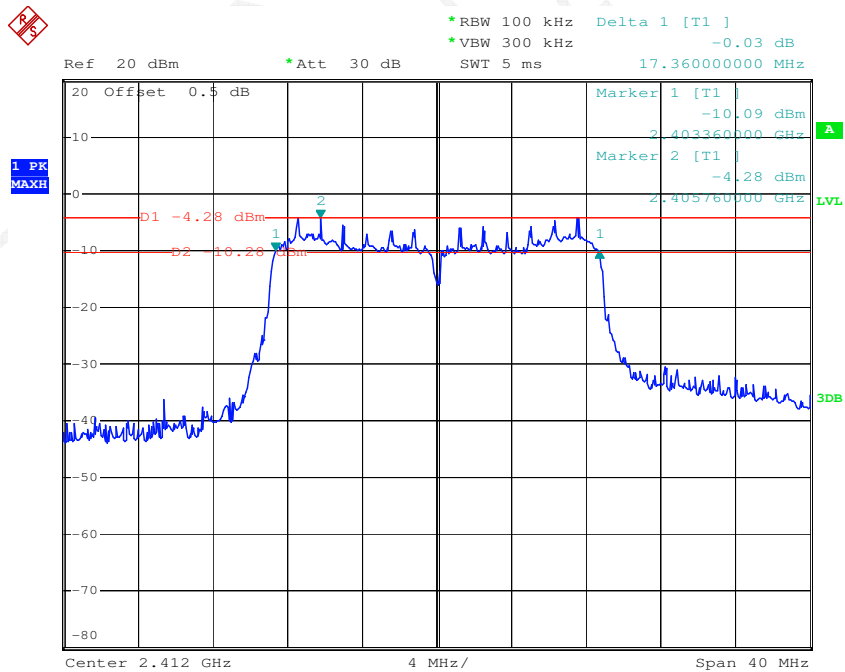
Date: 21.SEP.2016 22:06:47

802.11g High Channel



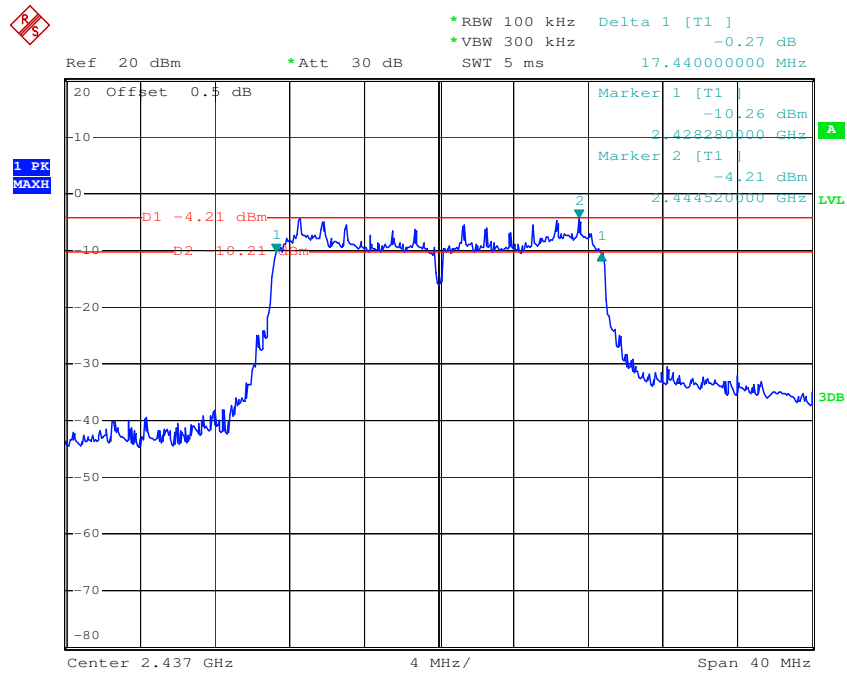
Date: 21.SEP.2016 22:09:29

802.11n ht20 Low Channel



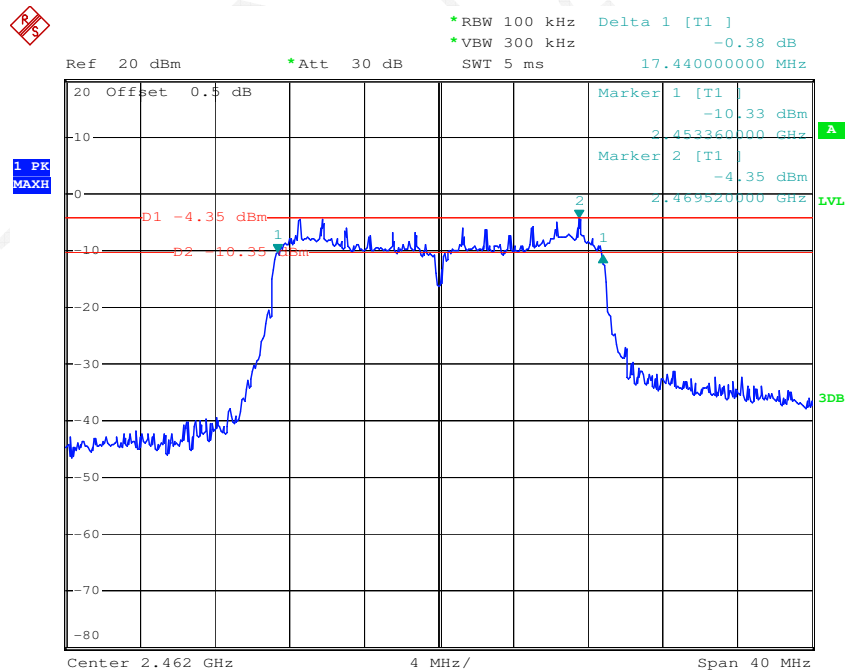
Date: 13.SEP.2016 11:58:28

802.11n ht20 Middle Channel



Date: 13.SEP.2016 13:32:14

802.11n ht20 High Channel



Date: 13.SEP.2016 13:27:11

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

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r05

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2015-11-03	2016-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2015-11-03	2016-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2015-11-03	2016-11-03
N/A	Coaxial Cable	0.1m	N/A	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:	29.6 °C
Relative Humidity:	52 %
ATM Pressure:	100.2 kPa

* The testing was performed by Robin Zheng on 2016-09-13.

Test Mode: Transmitting

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

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	10.55	30	Compliance
	Middle	2437	10.38	30	Compliance
	High	2462	10.52	30	Compliance
802.11g	Low	2412	12.45	30	Compliance
	Middle	2437	12.65	30	Compliance
	High	2462	12.90	30	Compliance
802.11n20	Low	2412	13.01	30	Compliance
	Middle	2437	13.07	30	Compliance
	High	2462	12.90	30	Compliance

Test mode	Channel	Frequency	Max Conducted Average Output Power	Limit	Result
		(MHz)	(dBm)	(dBm)	
802.11b	Low	2412	9.64	30	Compliance
	Middle	2437	9.47	30	Compliance
	High	2462	9.58	30	Compliance
802.11g	Low	2412	8.99	30	Compliance
	Middle	2437	9.19	30	Compliance
	High	2462	9.47	30	Compliance
802.11n20	Low	2412	9.45	30	Compliance
	Middle	2437	9.65	30	Compliance
	High	2462	9.52	30	Compliance

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

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
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

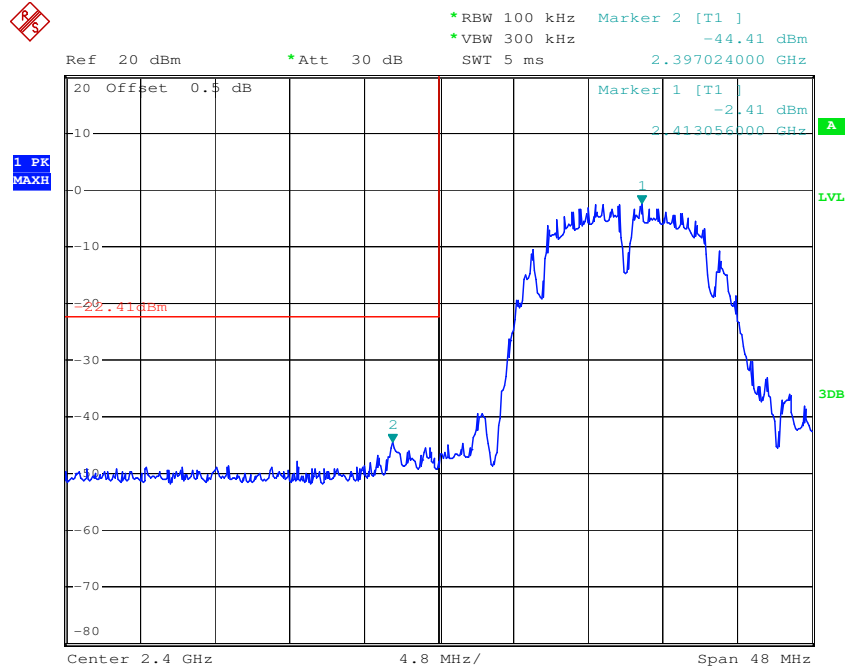
Temperature:	28.8 ~ 30.1°C
Relative Humidity:	35 ~ 52 %
ATM Pressure:	100.1 ~ 100.9 kPa

* The testing was performed by Robin Zheng from 2016-09-13 to 2016-09-21.

Test mode: Transmitting

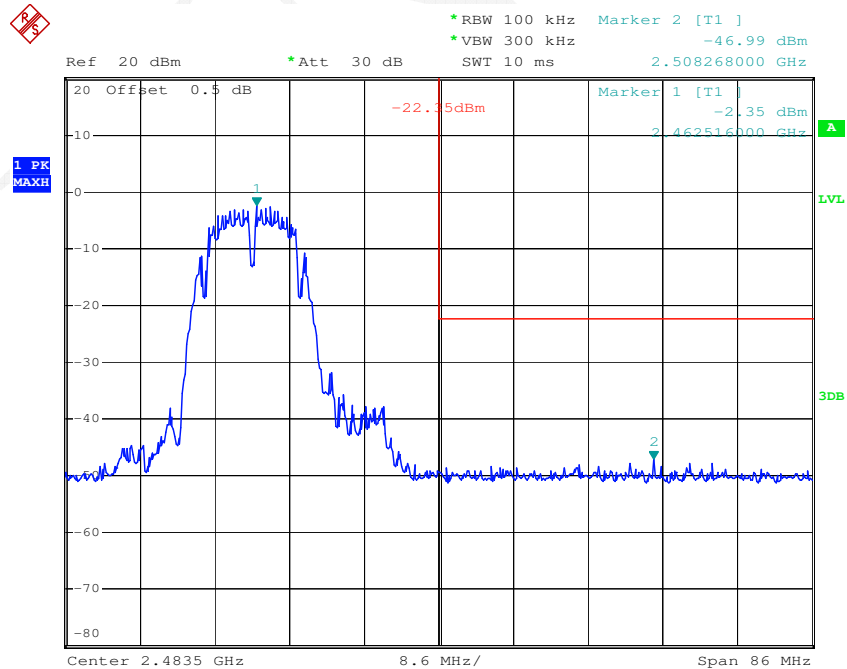
Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side



Date: 13.SEP.2016 11:13:40

802.11b: Band Edge, Right Side



Date: 13.SEP.2016 11:23:13

1 PK MAXH

Ref 20 dBm *Att 30 dB

*RBW 100 kHz *VBW 300 kHz

SWT 5 ms

Marker 1 [T1] -5.87 dBm

2.396832000 GHz

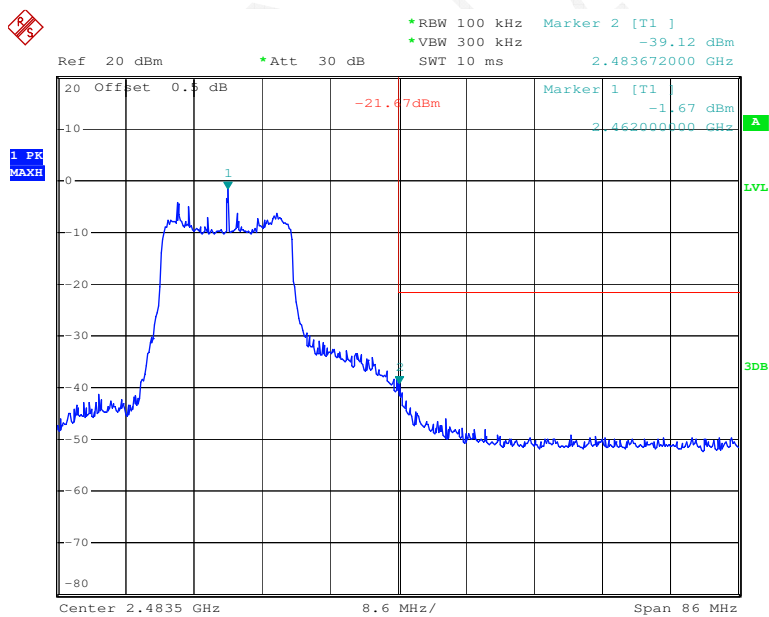
20 Offset 0.5 dB

-25.87 dBm

3dB

Center 2.4 GHz 4.8 MHz/ Span 48 MHz

802.11g: Band Edge, Right Side



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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

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
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:	28.8 ~ 30.1 °C
Relative Humidity:	35 ~ 52 %
ATM Pressure:	100.1 ~ 100.9 kPa

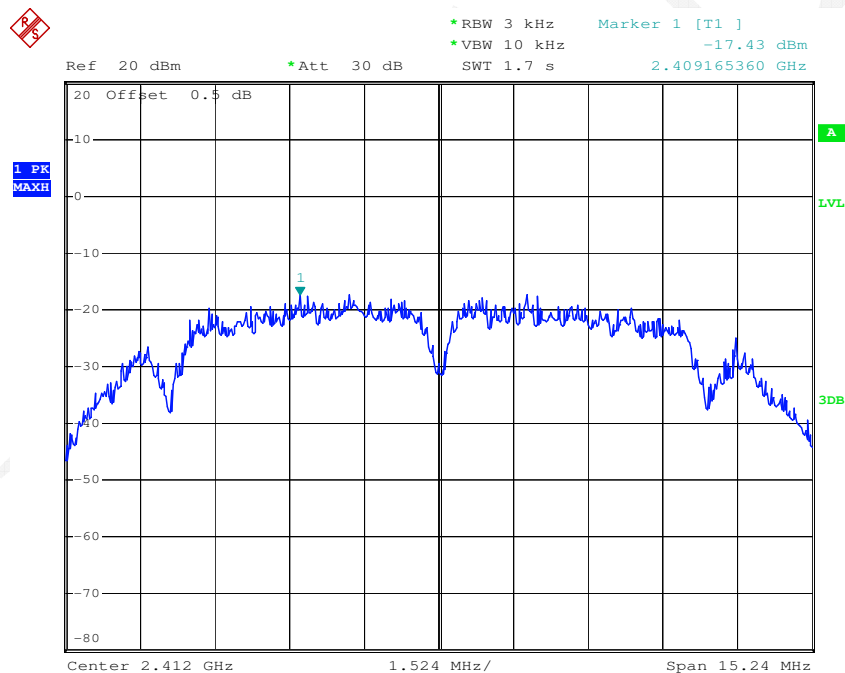
** The testing was performed by Robin Zheng from 2016-09-13 to 2016-09-21.*

Test Mode: Transmitting

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

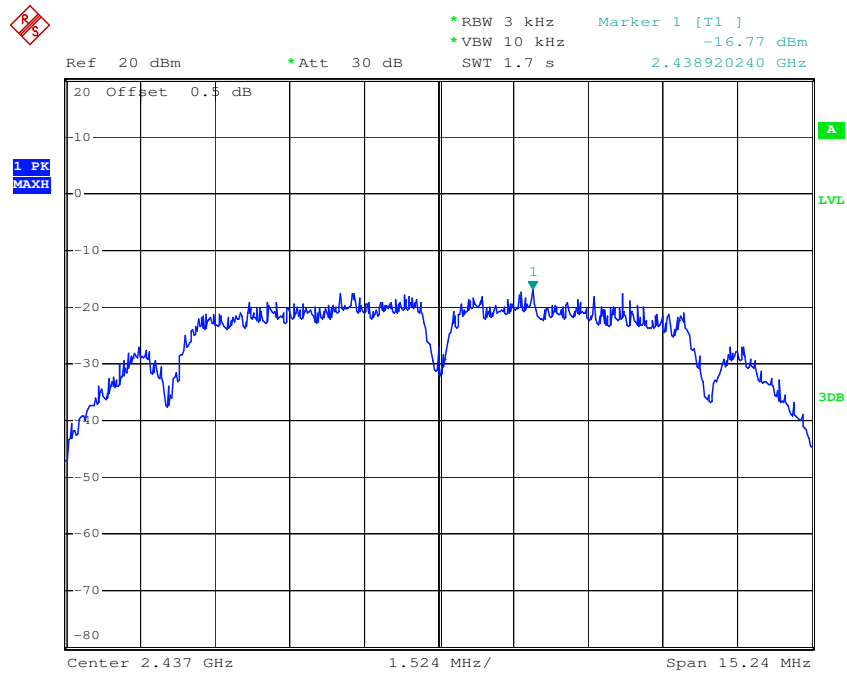
Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-17.43	≤ 8
	Middle	2437	-16.77	≤ 8
	High	2462	-17.22	≤ 8
802.11g	Low	2412	-17.17	≤ 8
	Middle	2437	-17.23	≤ 8
	High	2462	-17.38	≤ 8
802.11n20	Low	2412	-20.04	≤ 8
	Middle	2437	-19.41	≤ 8
	High	2462	-19.85	≤ 8

Power Spectral Density, 802.11b Low Channel



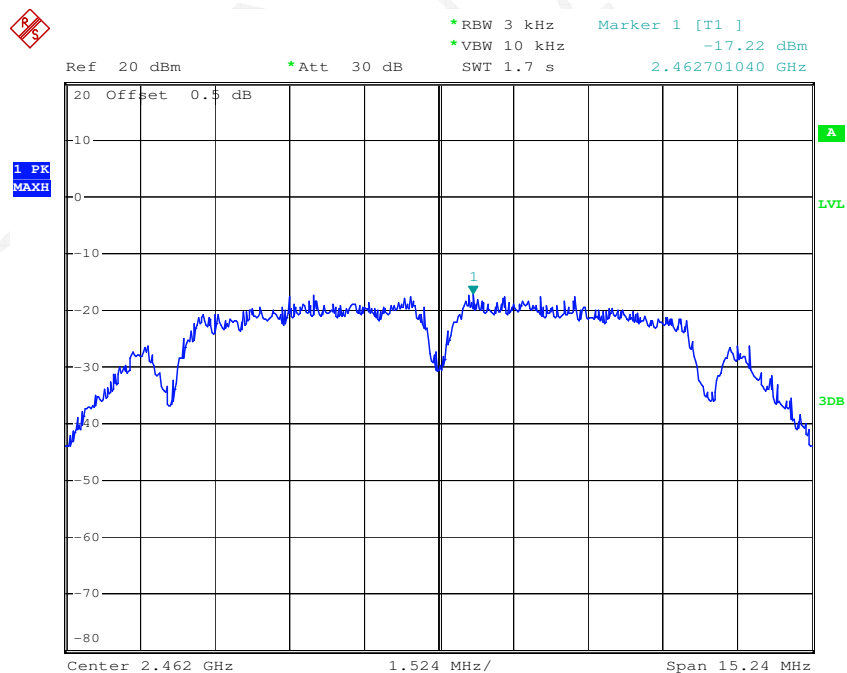
Date: 13.SEP.2016 11:13:22

Power Spectral Density, 802.11b Middle Channel



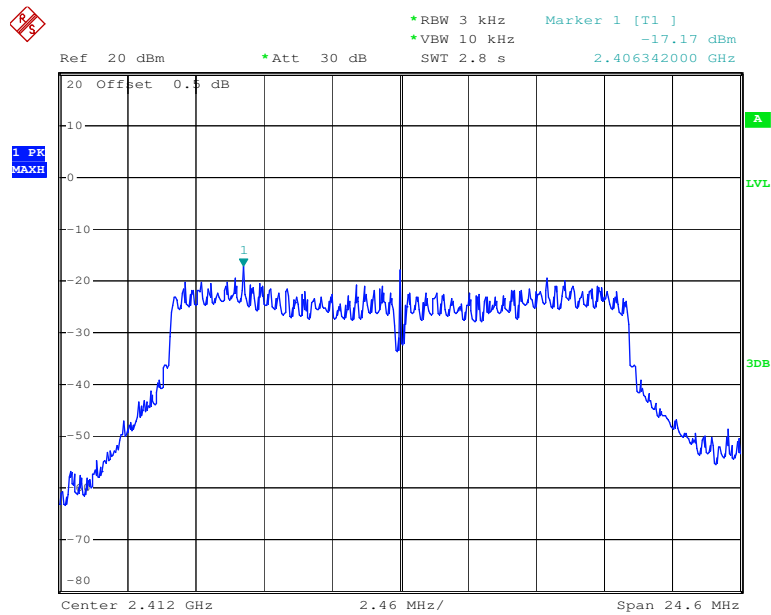
Date: 13.SEP.2016 11:18:02

Power Spectral Density, 802.11b High Channel



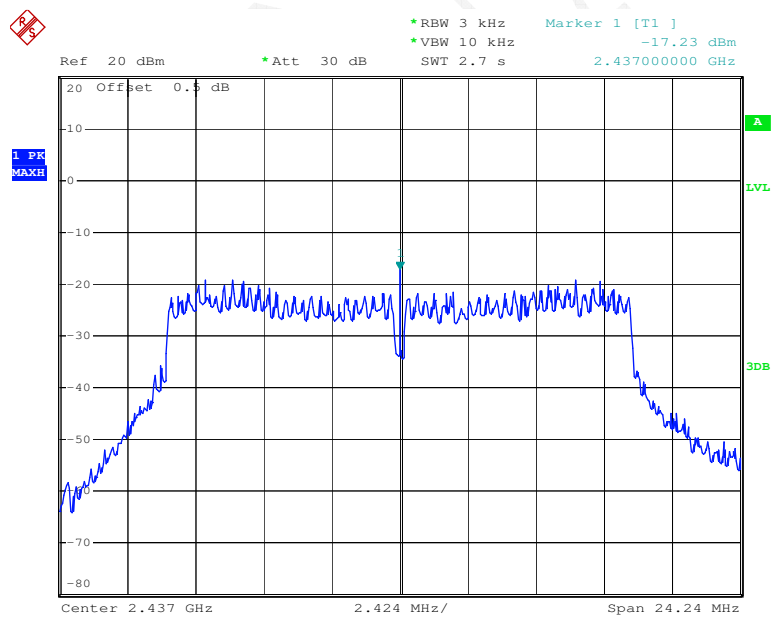
Date: 13.SEP.2016 11:22:54

Power Spectral Density, 802.11g Low Channel



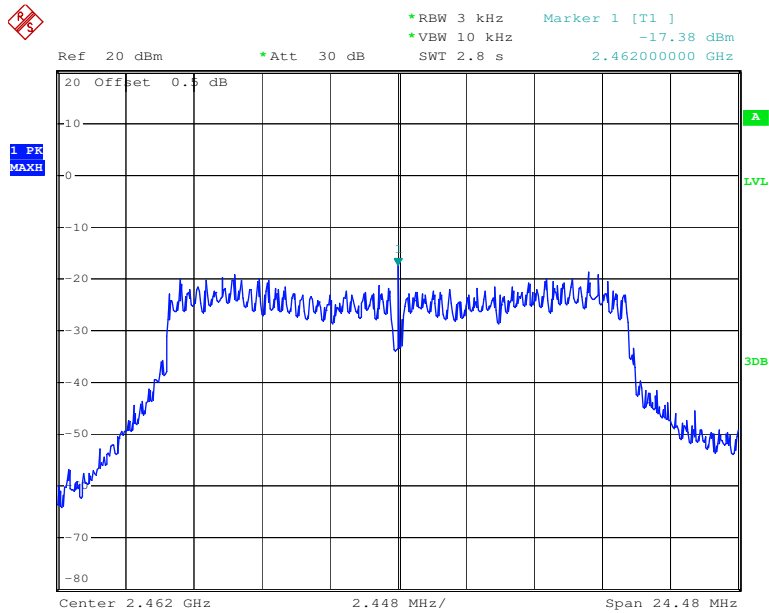
Date: 21.SEP.2016 22:13:44

Power Spectral Density, 802.11g Middle Channel



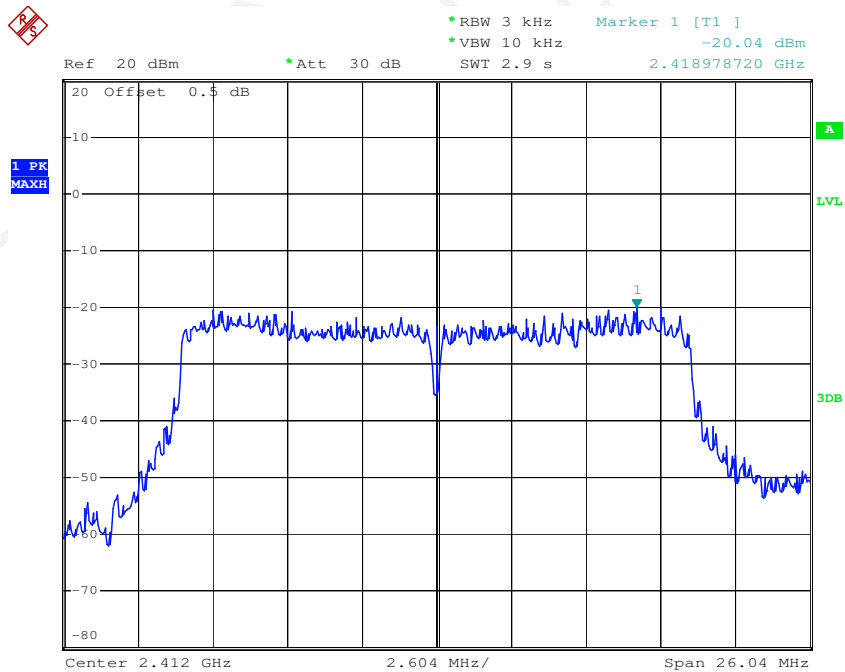
Date: 21.SEP.2016 22:08:20

Power Spectral Density, 802.11g High Channel



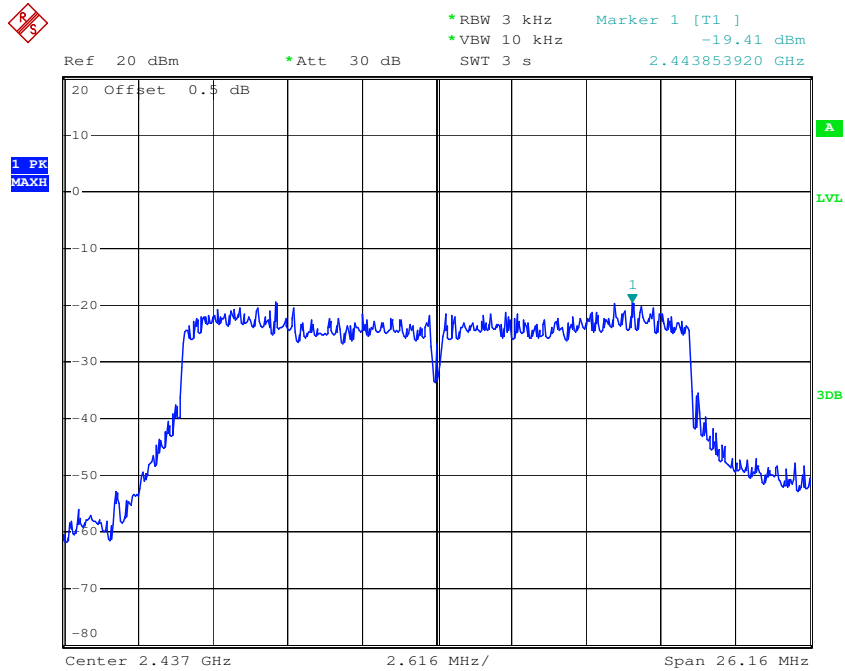
Date: 21.SEP.2016 22:11:00

Power Spectral Density, 802.11n ht20 Low Channel



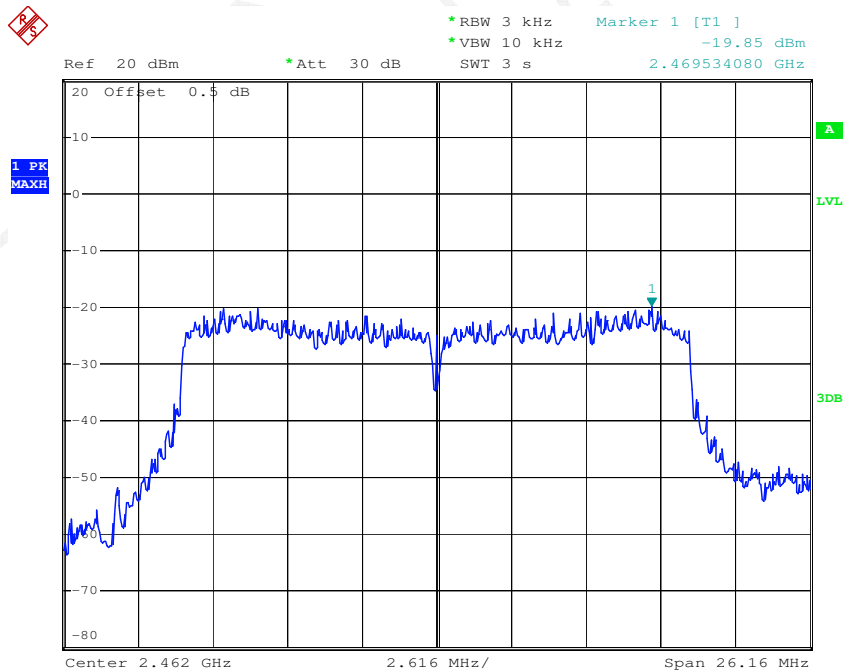
Date: 13.SEP.2016 12:00:00

Power Spectral Density, 802.11n ht20 Middle Channel



Date: 13.SEP.2016 13:32:32

Power Spectral Density, 802.11n ht20 High Channel



Date: 13.SEP.2016 13:28:38

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