

# FCC PART 15.247 TEST REPORT

For

# Sakar International Inc.

195 Carter Drive Edison, New Jersey Edison, NJ 08817

FCC ID: XKK-CAM760V2

Report Type: Product Type:

Original Report MID

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Report Number: RDG151202004-00A

**Report Date:** 2015-12-24

Reviewed By: Sula Huang RF Leader

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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).

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### **GENERAL INFORMATION**

#### **Product Description for Equipment under Test (EUT)**

The *Sakar International Inc.* 's product, model number: *CAM760V2 (FCC ID: M7C-PAD842IW)* (the "EUT") in this report was a *MID*, which was measured approximately: 19.2cm (L) x11.6cm (W) x 1.1 cm (H), rated input voltage: DC 3.7 V rechargeable Li-ion battery or DC5.0V charging from adapter.

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Adapter information: Model:WLC050150UU

Input: AC100-240V, 50/60 Hz, 0.3A;

Output: DC 5V, 1.5A

All measurement and test data in this report was gathered from production sample serial number: 151202004 (Assigned by BACL Dongguan). The EUT was received on 2015-12-04.

## **Objective**

This report is prepared on behalf of *Sakar International Inc.* 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: XKK-CAM760V2. FCC Part 15C DSS submissions with FCC ID: XKK-CAM760V2.

#### **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.

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## SYSTEM TEST CONFIGURATION

#### **Description of Test Configuration**

The system was configured for testing in testing mode, which was provided by manufacturer. For 2.4GHz WLAN, 11 channels are provided to testing:

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

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For 802.11b, 802.11g, and 802.11n ht20 modes were tested with channel 1, 6 and 11. For 802.11n ht40 mode were tested with Channel 3, 6 and 9.

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

#### **Equipment Modifications**

No modification was made to the EUT tested.

#### **EUT Exercise Software**

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

Test Mode	Test Software Version	Engineering Mode		
	Test Frequency	2412MHz	2437MHz	2462MHz
802.11b	Data Rate	1Mbps	1Mbps	1Mbps
0021115	Power Level Setting	- 1 X		18
	Test Frequency	2412MHz	2437MHz	2462MHz
802.11g	Data Rate	6Mbps	6Mbps	6Mbps
002.11g	Power Level Setting	34	34	33
	Test Frequency	2412MHz	2437MHz	2462MHz
802.11n	Data Rate	MCS0	MCS0	MCS0
ht20	Power Level Setting	32	32	32
	Test Frequency	2422MHz	2437MHz	2452MHz
802.11n ht40	Data Rate	MCS0	MCS0	MCS0
00201111111010	Power Level Setting	39	39	38

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# **Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
/	/	/	/

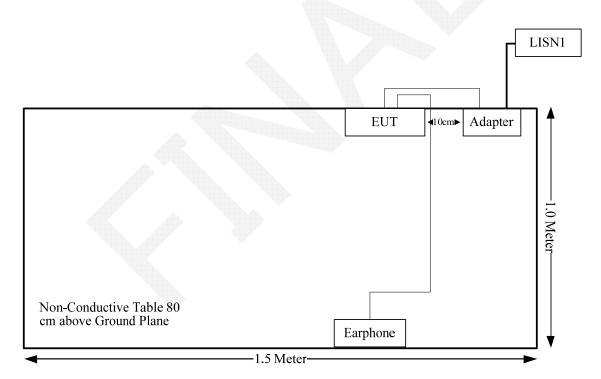
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## **Support Cable List and Details**

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	То
USB Cable	no	no	0.84	USB Port of Adapter	EUT
Earphone Cable	no	no	1.2	Audio Port of EUT	EUT

# **Block Diagram of Test Setup**

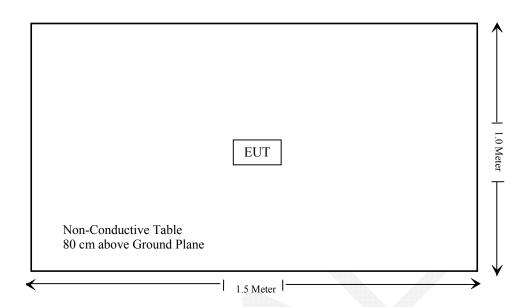
## AC power-line conducted emissions:



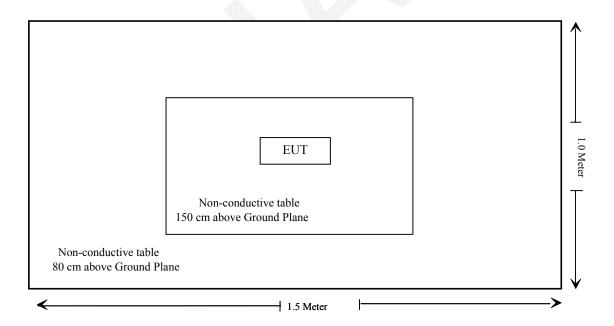
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#### **Radiated Emissions:**

Below 1GHz:



Above 1GHz:



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# 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

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# 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.

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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  $\leq$  50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance,

mm)]  $\cdot [\sqrt{f(GHz)}] \le 3.0$  for 1-g SAR and  $\le 7.5$  for 10-g extremity SAR, where

- f(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  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $\leq 5$  mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

#### **Measurement Result**

The max tune-up conducted average power is 9.3 dBm (8.51mW). [(max. power of channel, mW)/(min. test separation distance, mm)][ $\sqrt{f(GHz)}$ ] = 8.51/5\*( $\sqrt{2.462}$ ) = 2.67 < 3.0

So the stand-alone for BLE SAR evaluation is not necessary.

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# 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:

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- 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 and the antenna gain is 1.5dBi, which fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

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# 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:

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If  $U_{\text{lab}}$  is less than or equal to  $U_{\text{cispr}}$  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  $U_{\text{lab}}$  is greater than  $U_{\text{cispr}}$  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  $(U_{\text{lab}} U_{\text{cispr}})$ , exceeds the disturbance limit.

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

Table 1 – Values of  $U_{\text{cispr}}$ 

Measurement	$U_{ m cispr}$
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.

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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.

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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<sub>C</sub> (cord. Reading): corrected voltage amplitude

V<sub>R</sub>: reading voltage amplitude A<sub>c</sub>: attenuation caused by cable loss VDF: voltage division factor of AMN

C<sub>f</sub>: 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

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## **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2015-12-20	2016-12-09
R&S	L.I.S.N	ESH2-Z5	892107/021	2015-07-16	2016-07-15
R&S	Two-line V-network	ENV 216	3560.6550.12	2015-11-26	2016-11-25
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

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## **Test Results Summary**

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

## 4.0 dB at 0.687153 MHz in the Neutral conducted

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23.7°C	
Relative Humidity:	51 %	
ATM Pressure:	101.2kPa	

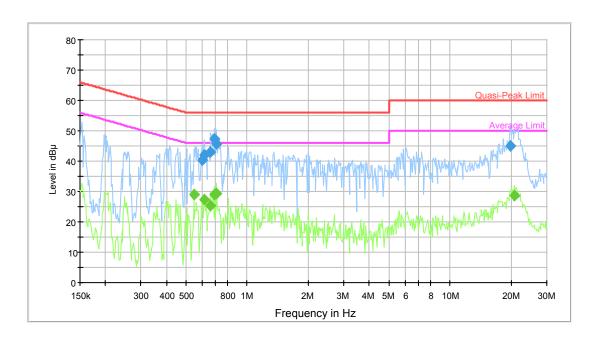
The testing was performed by Allen Qiao on 2015-12-09

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<sup>\*</sup> 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 Mode: Transmitting

## AC120 V, 60 Hz, Line:



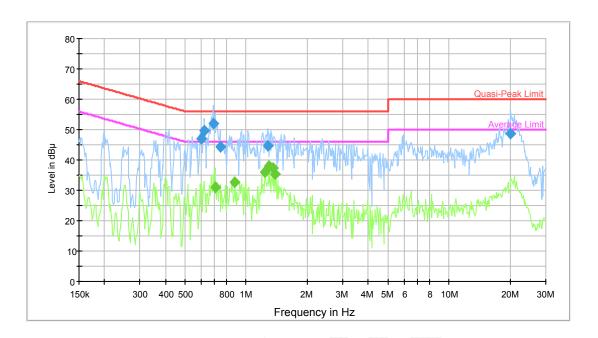
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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.600101	40.3	9.000	L1	9.8	15.7	56.0	Compliance
0.614619	41.9	9.000	L1	9.8	14.1	56.0	Compliance
0.660314	43.1	9.000	L1	9.8	12.9	56.0	Compliance
0.692650	47.3	9.000	L1	9.8	8.7	56.0	Compliance
0.709407	45.8	9.000	L1	9.8	10.2	56.0	Compliance
19.833426	44.9	9.000	L1	10.0	15.1	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.545378	29.0	9.000	L1	9.8	17.0	46.0	Compliance
0.614619	27.5	9.000	L1	9.8	18.5	46.0	Compliance
0.660314	25.4	9.000	L1	9.8	20.6	46.0	Compliance
0.692650	28.9	9.000	L1	9.8	17.1	46.0	Compliance
0.709407	29.3	9.000	L1	9.8	16.7	46.0	Compliance
20.804674	28.8	9.000	L1	10.0	21.2	50.0	Compliance

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# AC120 V, 60 Hz, Neutral:



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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.600101	46.9	9.000	N	9.8	9.1	56.0	Compliance
0.619536	49.6	9.000	N	9.8	6.4	56.0	Compliance
0.687153	52.0	9.000	N	9.8	4.0	56.0	Compliance
0.744147	44.2	9.000	N	9.8	11.8	56.0	Compliance
1.279307	44.6	9.000	N	9.8	11.4	56.0	Compliance
20.152030	48.5	9.000	N	10.1	11.5	60.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.703777	31.1	9.000	N	9.8	14.9	46.0	Compliance
0.879690	32.5	9.000	N	9.8	13.5	46.0	Compliance
1.239175	36.1	9.000	N	9.8	9.9	46.0	Compliance
1.289541	38.1	9.000	N	9.8	7.9	46.0	Compliance
1.363512	37.2	9.000	N	9.8	8.8	46.0	Compliance
1.385415	35.4	9.000	N	9.8	10.6	46.0	Compliance

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#### **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:

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If  $U_{\text{lab}}$  is less than or equal to  $U_{\text{cispr}}$  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  $U_{\text{lab}}$  is greater than  $U_{\text{cispr}}$  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  $(U_{\text{lab}} U_{\text{cispr}})$ , 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:

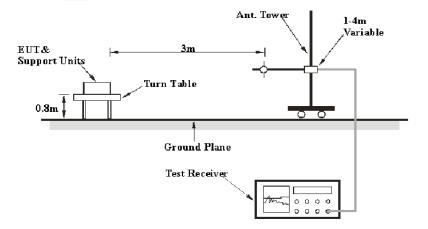
30M~200MHz: 5.0 dB 200M~1GHz: 6.2 dB 1G~6GHz: 4.45 dB 6G~18GHz: 5.23 dB

Table 2 – Values of  $U_{\text{cispr}}$ 

Measurement	$U_{ m cispr}$
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:**



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**Above 1GHz:** 

#### ay may compliance Eurotavories corp. (201884441)



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

The spacing between the peripherals was 10 cm.

# **EMI Test Receiver & Spectrum Analyzer Setup**

The system was investigated from 30 MHz to 25 GHz.

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

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

#### **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.

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### **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:

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

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

Margin = Limit –Corrected Amplitude

## **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
Agilent	Spectrum Analyzer	E4440A	SG43360054	2015-11-23	2016-11-22
ETS-Lindgren	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-11-23	2016-11-22
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW- 18405536-JO	15964001001	2015-09-06	2016-09-06

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

### **Test Results Summary**

According to the recorded data in following table, the EUT complied with the <u>FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247</u>, with the worst margin reading of:

#### 10.34 dB at 3131 MHz in the Horizontal polarization

#### **Test Data**

#### **Environmental Conditions**

Temperature:	20.5 °C
Relative Humidity:	57 %
ATM Pressure:	102.2kPa

<sup>\*</sup> The testing was performed by Allen Qiao on 2015-12-18.

Test Mode: Transmitting

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802.11b Mode

	Re	eceiver	Rx A	ntenna	Cable	Amplifier	Corrected		
Frequency (MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	loss (dB)	Gain (dB)	Amplitude (dBµV/m)	Limit (dBμV/m)	Margin (dB)
			L	ow Chanr	nel: 2412	MHz			
2412	61.41	PK	Н	25.67	3.68	0.00	90.76	N/A	N/A
2412	57.92	AV	Н	25.67	3.68	0.00	87.27	N/A	N/A
2412	58.45	PK	V	25.67	3.68	0.00	87.80	N/A	N/A
2412	54.86	AV	V	25.67	3.68	0.00	84.21	N/A	N/A
2390	26.19	PK	Н	25.61	3.63	0.00	55.43	74.00	18.57
2390	13.32	AV	Н	25.61	3.63	0.00	42.56	54.00	11.44
4824	32.48	PK	Н	30.64	5.03	27.41	40.74	74.00	33.26
4824	20.92	AV	Н	30.64	5.03	27.41	29.18	54.00	24.82
7236	32.24	PK	Н	34.17	6.65	25.90	47.16	74.00	26.84
7236	19.1	AV	Н	34.17	6.65	25.90	34.02	54.00	19.98
9648	30.44	PK	Н	36.06	8.55	27.46	47.59	74.00	26.41
9648	19.76	AV	Н	36.06	8.55	27.46	36.91	54.00	17.09
3235	49.34	PK	Н	27.95	6.24	27.34	56.19	74.00	17.81
3235	36.28	AV	Н	27.95	6.24	27.34	43.13	54.00	10.87
258.6	30.8	QP	Н	12.59	1.94	21.50	23.83	46.00	22.17
				ddle Char	1001001001001				
2437	61.96	PK	Н	25.74	3.75	0.00	91.45	N/A	N/A
2437	58.48	AV	Н	25.74	3.75	0.00	87.97	N/A	N/A
2437	58.77	PK	V	25.74	3.75	0.00	88.26	N/A	N/A
2437	55.24	AV	V	25.74	3.75	0.00	84.73	N/A	N/A
4874	32.95	PK	Н	30.77	5.14	27.42	41.44	74.00	32.56
4874	21.18	AV	Н	30.77	5.14	27.42	29.67	54.00	24.33
7311	32.35	PK	Н	34.35	6.74	25.88	47.56	74.00	26.44
7311	19.38	AV	Н	34.35	6.74	25.88	34.59	54.00	19.41
9748	30.7	PK	Н	36.30	8.61	27.24	48.37	74.00	25.63
9748	20.05	AV	Н	36.30	8.61	27.24	37.72	54.00	16.28
3131	49.54	PK	Н	27.62	6.93	27.43	56.66	74.00	17.34
3131	36.39	AV	Н	27.62	6.93	27.43	43.51	54.00	10.49
3955	43.26	PK	Н	29.80	4.86	27.24	50.68	74.00	23.32
3955	30.03	AV	Н	29.80	4.86	27.24	37.45	54.00	16.55
258.6	30.1	QP	Н	12.59	1.94	21.50	23.13	46.00	22.87
2462	62.22	DΨ		igh Chanı			01.00	NI/A	NT/A
2462	62.33 58.84	PK	Н	25.80	3.75	0.00	91.88	N/A N/A	N/A
2462	58.84	AV PK	H V	25.80	3.75	0.00	88.39 88.94	N/A N/A	N/A N/A
2462 2462		AV	V	25.80	3.75	0.00			
2483.5	55.86 25.93	PK	H	25.80 25.86	3.75 3.67	0.00	85.41 55.46	N/A 74.00	N/A 18.54
2483.5	13.91	AV				0.00	43.44	54.00	10.56
4924	32.86	PK	H H	25.86 30.90	3.67 5.34	27.43	43.44	74.00	32.33
4924	21.19	AV	Н	30.90	5.34	27.43	30.00	54.00	24.00
7386	32.41	PK	Н	34.53	6.83	25.86	47.91	74.00	26.09
7386	19.25	AV	Н	34.53	6.83	25.86	34.75	54.00	19.25
9848	30.56	PK	Н	36.54	8.66	26.94	48.82	74.00	25.18
9848	19.88	AV	Н	36.54	8.66	26.94	38.14	54.00	15.86
3131	49.61	PK	Н	27.62	6.93	27.43	56.73	74.00	17.27
3131	36.54	AV	Н	27.62	6.93	27.43	43.66	54.00	10.34
258.6	30.6	QP	H	12.59	1.94	21.50	23.63	46.00	22.37
230.0	30.0	Ųr	11	14.39	1.74	41.30	45.05	40.00	44.31

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802.11g Mode

802.11g		eceiver	Rx A	Antenna	Cable	Amplifier	Corrected	**	
Frequency (MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	loss (dB)	Gain (dB)	Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
			I	Low Channe	1: 2412 M	lНz			
2412	63.59	PK	Н	25.67	3.68	0.00	92.94	N/A	N/A
2412	55.3	AV	Н	25.67	3.68	0.00	84.65	N/A	N/A
2412	60.28	PK	V	25.67	3.68	0.00	89.63	N/A	N/A
2412	51.94	AV	V	25.67	3.68	0.00	81.29	N/A	N/A
2390	26.42	PK	Н	25.61	3.63	0.00	55.66	74.00	18.34
2390	13.47	AV	Н	25.61	3.63	0.00	42.71	54.00	11.29
4824	32.65	PK	Н	30.64	5.03	27.41	40.91	74.00	33.09
4824	19.96	AV	Н	30.64	5.03	27.41	28.22	54.00	25.78
7236	32.25	PK	Н	34.17	6.65	25.90	47.17	74.00	26.83
7236	19.17	AV	Н	34.17	6.65	25.90	34.09	54.00	19.91
9648	30.37	PK	H	36.06	8.55	27.46	47.52	74.00	26.48
9648	19.8	AV	H	36.06	8.55	27.46	36.95	54.00	17.05
3235	49.92	PK	H	27.95	6.24	27.34	56.77	74.00	17.23
3235	36.85	AV	H	27.95	6.24	27.34	43.70	54.00	10.30
258.6	30.4	QP	Н	12.59 Tiddle Chann	1.94	21.50	23.43	46.00	22.57
2437	63.39	PK	Н	25.74	3.75	0.00	92.88	N/A	N/A
2437	55.14	AV	Н	25.74	3.75	0.00	84.63	N/A N/A	N/A
2437	60.11	PK	V	25.74	3.75	0.00	89.60	N/A	N/A
2437	51.75	AV	V	25.74	3.75	0.00	81.24	N/A	N/A
4874	32.98	PK	H	30.77	5.14	27.42	41.47	74.00	32.53
4874	20.21	AV	Н	30.77	5.14	27.42	28.70	54.00	25.30
7311	32.36	PK	Н	34.35	6.74	25.88	47.57	74.00	26.43
7311	19.43	AV	Н	34.35	6.74	25.88	34.64	54.00	19.36
9748	30.57	PK	Н	36.30	8.61	27.24	48.24	74.00	25.76
9748	19.92	AV	Н	36.30	8.61	27.24	37.59	54.00	16.41
2950	50.22	PK	Н	27.07	6.61	27.54	56.36	74.00	17.64
2950	37.01	AV	Н	27.07	6.61	27.54	43.15	54.00	10.85
3955	45.28	PK	Н	29.80	4.86	27.24	52.70	74.00	21.30
3955	32.09	AV	Н	29.80	4.86	27.24	39.51	54.00	14.49
258.6	30.9	QP	Н	12.59	1.94	21.50	23.93	46.00	22.07
			I	ligh Channe	1: 2462 N	ſHz			
2462	63.76	PK	Н	25.80	3.75	0.00	93.31	N/A	N/A
2462	55.46	AV	Н	25.80	3.75	0.00	85.01	N/A	N/A
2462	60.45	PK	V	25.80	3.75	0.00	90.00	N/A	N/A
2462	52.11	AV	V	25.80	3.75	0.00	81.66	N/A	N/A
2483.5	26.59	PK	Н	25.86	3.67	0.00	56.12	74.00	17.88
2483.5	13.95	AV	H	25.86	3.67	0.00	43.48	54.00	10.52
4924	32.99	PK	H	30.90	5.34	27.43	41.80	74.00	32.20
4924	20.29	AV	H	30.90	5.34	27.43	29.10	54.00	24.90
7386	32.37	PK	Н	34.53	6.83	25.86	47.87	74.00	26.13
7386	19.44	AV	H	34.53	6.83	25.86	34.94	54.00	19.06
9848	30.63	PK	H	36.54	8.66	26.94	48.89	74.00	25.11
9848	19.93	AV	Н	36.54	8.66	26.94	38.19	54.00	15.81
2950	50.07 36.97	PK AV	Н	27.07	6.61	27.54	56.21	74.00	17.79
2950		AV	Н	27.07	6.61	27.54	43.11	54.00	10.89
258.6	30.3	QP	Н	12.59	1.94	21.50	23.33	46.00	22.67

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802 11 n ht20 Mode

802.11 11 1	t20 Mode		r .		1		Г	F	,
Frequency	Re	eceiver	Rx A	ntenna	Cable	Amplifier	Corrected	Limit	Mangin
(MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	loss (dB)	Gain (dB)	Amplitude (dBµV/m)	(dBµV/m)	Margin (dB)
	( , ,		` /	ow Chann	el: 2412	MHz.			
2412	62.88	PK	Н	25.67	3.68	0.00	92.23	N/A	N/A
2412	54.13	AV	Н	25.67	3.68	0.00	83.48	N/A	N/A
2412	59.17	PK	V	25.67	3.68	0.00	88.52	N/A	N/A
2412	50.4	AV	V	25.67	3.68	0.00	79.75	N/A	N/A
2390	25.34	PK	H	25.61	3.63	0.00	54.58	74.00	19.42
2390	13.44	AV	Н	25.61	3.63	0.00	42.68	54.00	11.32
4824	32.94	PK	Н	30.64	5.03	27.41	41.20	74.00	32.80
4824	20.21	AV	Н	30.64	5.03	27.41	28.47	54.00	25.53
7236	32.39	PK	Н	34.17	6.65	25.90	47.31	74.00	26.69
7236	19.31	AV	Н	34.17	6.65	25.90	34.23	54.00	19.77
9648	30.64	PK	Н	36.06	8.55	27.46	47.79	74.00	26.21
9648	19.97	AV	Н	36.06	8.55	27.46	37.12	54.00	16.88
2950	49.83	PK	Н	27.07	6.61	27.54	55.97	74.00	18.03
2950	36.72	AV	Н	27.07	6.61	27.54	42.86	54.00	11.14
258.6	30.6	OP	Н	12.59	1.94	21.50	23.63	46.00	22.37
		<u> </u>		ddle Chan					
2437	62.64	PK	Н	25.74	3.75	0.00	92.13	N/A	N/A
2437	53.92	AV	Н	25.74	3.75	0.00	83.41	N/A	N/A
2437	58.69	PK	V	25.74	3.75	0.00	88.18	N/A	N/A
2437	50.03	AV	V	25.74	3.75	0.00	79.52	N/A	N/A
4874	33.28	PK	H	30.77	5.14	27.42	41.77	74.00	32.23
4874	20.47	AV	Н	30.77	5.14	27.42	28.96	54.00	25.04
7311	32.56	PK	Н	34.35	6.74	25.88	47.77	74.00	26.23
7311	19.54	AV	Н	34.35	6.74	25.88	34.75	54.00	19.25
9748	30.85	PK	Н	36.30	8.61	27.24	48.52	74.00	25.48
9748	20.1	AV	Н	36.30	8.61	27.24	37.77	54.00	16.23
2950	50.09	PK	Н	27.07	6.61	27.54	56.23	74.00	17.77
2950	36.92	AV	Н	27.07	6.61	27.54	43.06	54.00	10.94
3610	44.53	PK	Н	29.04	4.61	27.28	50.90	74.00	23.10
3610	31.39	AV	Н	29.04	4.61	27.28	37.76	54.00	16.24
258.6	31.1	QP	Н	12.59	1.94	21.50	24.13	46.00	21.87
230.0	31.1	Qı		igh Chann			24.13	40.00	21.07
2462	62.5	PK	Н	25.80	3.75	0.00	92.05	N/A	N/A
2462	54.01	AV	Н	25.80	3.75	0.00	83.56	N/A	N/A
2462	59.04	PK	V	25.80	3.75	0.00	88.59	N/A	N/A
2462	50.32	AV	V	25.80	3.75	0.00	79.87	N/A	N/A
2483.5	26.41	PK	H	25.86	3.67	0.00	55.94	74.00	18.06
2483.5	13.93	AV	Н	25.86	3.67	0.00	43.46	54.00	10.54
4924	33.32	PK	Н	30.90	5.34	27.43	42.13	74.00	31.87
4924	20.64	AV	Н	30.90	5.34	27.43	29.45	54.00	24.55
7386	32.56	PK	Н	34.53	6.83	25.86	48.06	74.00	25.94
7386	19.43	AV	Н	34.53	6.83	25.86	34.93	54.00	19.07
9848	30.87	PK	Н	36.54	8.66	26.94	49.13	74.00	24.87
9848	20.08	AV	Н	36.54	8.66	26.94	38.34	54.00	15.66
2950	50.03	PK	Н	27.07	6.61	27.54	56.17	74.00	17.83
2950	36.86	AV	Н	27.07	6.61	27.54	43.00	54.00	11.00
258.6	30.8	QP	Н	12.59	1.94	21.50	23.83	46.00	22.17

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802 11 n ht40 Mode

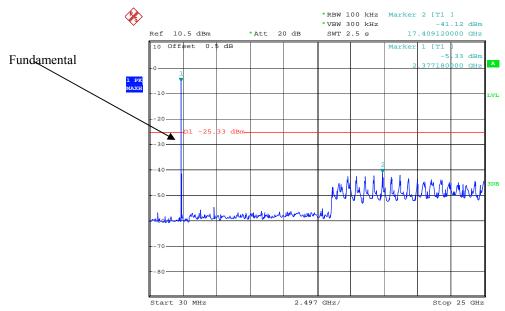
802.11 n f	nt40 Mode					r	r	<del></del>	
E	Re	eceiver	Rx A	ntenna	Cable	Amplifier	Corrected	T ::4	M
Frequency (MHz)	Reading (dBµV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	loss (dB)	Gain (dB)	Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	/	, _ ,	L	ow Chann	el: 2422	MHz			
2422	61.83	PK	Н	25.70	3.71	0.00	91.24	N/A	N/A
2422	53.21	AV	Н	25.70	3.71	0.00	82.62	N/A	N/A
2422	58.3	PK	V	25.70	3.71	0.00	87.71	N/A	N/A
2422	49.77	AV	V	25.70	3.71	0.00	79.18	N/A	N/A
2390	26.27	PK	H	25.61	3.63	0.00	55.51	74.00	18.49
2390	13.99	AV	Н	25.61	3.63	0.00	43.23	54.00	10.77
4844	32.53	PK	Н	30.69	4.99	27.42	40.79	74.00	33.21
4844	19.83	AV	Н	30.69	4.99	27.42	28.09	54.00	25.91
7266	32.17	PK	Н	34.24	6.68	25.89	47.20	74.00	26.80
7266	19.08	AV	Н	34.24	6.68	25.89	34.11	54.00	19.89
9688	30.46	PK	Н	36.15	8.58	27.37	47.82	74.00	26.18
9688	19.85	AV	Н	36.15	8.58	27.37	37.21	54.00	16.79
3235	49.65	PK	Н	27.95	6.24	27.34	56.50	74.00	17.50
3235	36.51	AV	Н	27.95	6.24	27.34	43.36	54.00	10.64
258.6	30.3	QP	Н	12.59	1.94	21.50	23.33	46.00	22.67
			Mi	ddle Chan	nel: 2437				
2437	61.58	PK	Н	25.74	3.75	0.00	91.07	N/A	N/A
2437	52.86	AV	Н	25.74	3.75	0.00	82.35	N/A	N/A
2437	57.97	PK	V	25.74	3.75	0.00	87.46	N/A	N/A
2437	49.39	AV	V	25.74	3.75	0.00	78.88	N/A	N/A
4874	32.87	PK	Н	30.77	5.14	27.42	41.36	74.00	32.64
4874	20.03	AV	Н	30.77	5.14	27.42	28.52	54.00	25.48
7311	32.37	PK	Н	34.35	6.74	25.88	47.58	74.00	26.42
7311	19.19	AV	Н	34.35	6.74	25.88	34.40	54.00	19.60
9748	30.62	PK	Н	36.30	8.61	27.24	48.29	74.00	25.71
9748	20.02	AV	Н	36.30	8.61	27.24	37.69	54.00	16.31
2950	49.93	PK	Н	27.07	6.61	27.54	56.07	74.00	17.93
2950	36.69	AV	Н	27.07	6.61	27.54	42.83	54.00	11.17
3955	44.64	PK	Н	29.80	4.86	27.24	52.06	74.00	21.94
3955	31.55	AV	Н	29.80	4.86	27.24	38.97	54.00	15.03
258.6	30.5	QP	Н	12.59	1.94	21.50	23.53	46.00	22.47
2472	(1.5)	777		igh Chann			01.00	27/4	37/4
2452	61.76	PK	H	25.78	3.78	0.00	91.32	N/A	N/A
2452	53.32	AV	H	25.78	3.78	0.00	82.88	N/A	N/A
2452	58.21	PK	V	25.78	3.78	0.00	87.77	N/A	N/A
2452	49.69	AV	V	25.78	3.78	0.00	79.25	N/A	N/A
2483.5	25.95	PK	H	25.86	3.67	0.00	55.48	74.00	18.52
2483.5	14.12	AV	H	25.86	3.67	0.00	43.65	54.00	10.35
4904	33.02	PK	Н	30.85	5.31	27.43	41.75	74.00	32.25
4904	19.43	AV	Н	30.85	5.31	27.43	28.16	54.00	25.84
7356	32.34	PK	Н	34.45	6.79	25.87	47.71	74.00	26.29
7356	19.23	AV	Н	34.45	6.79	25.87	34.60	54.00	19.40
9808	30.61	PK	Н	36.44	8.64	27.09	48.60	74.00	25.40
9808	20.13	AV	Н	36.44	8.64	27.09	38.12	54.00	15.88
2950	49.76	PK	Н	27.07	6.61	27.54	55.90	74.00	18.10
2950	36.79	AV	H	27.07	6.61	27.54	42.93	54.00	11.07
258.6	30.7	QP	Н	12.59	1.94	21.50	23.73	46.00	22.27

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## **Conducted Spurious Emissions at Antenna Port**

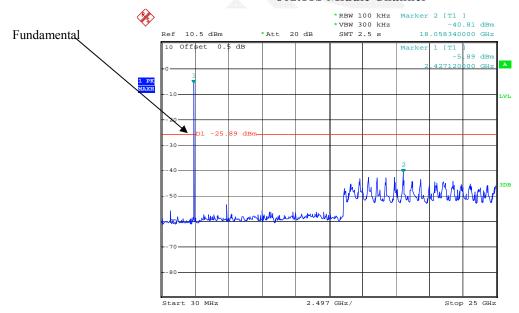
Report No.: RDG151202004-00A

## 802.11b Low Channel



Date: 18.DEC.2015 13:39:09

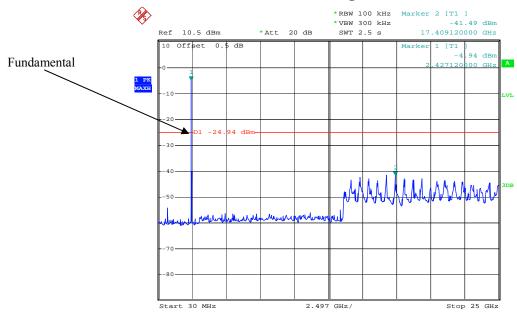
#### 802.11b Middle Channel



Date: 18.DEC.2015 13:40:45

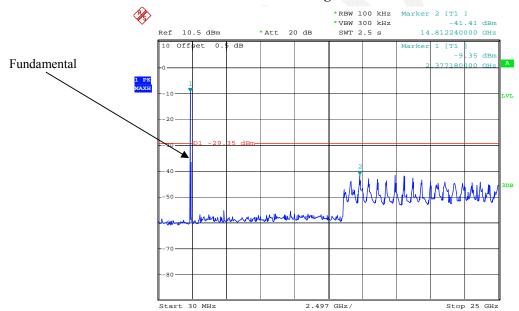
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## 802.11b High Channel



Date: 18.DEC.2015 13:41:51

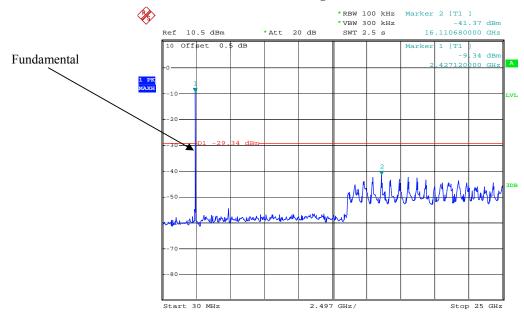
## 802.11g Low Channel



Date: 18.DEC.2015 13:44:01

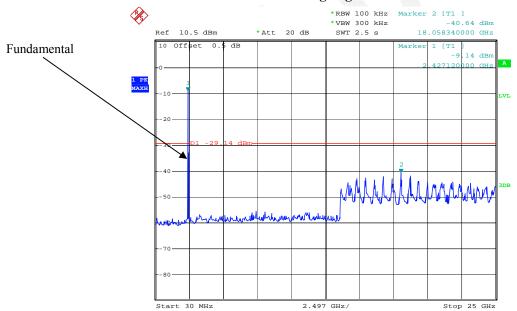
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#### 802.11g Middle Channel



Date: 18.DEC.2015 13:45:24

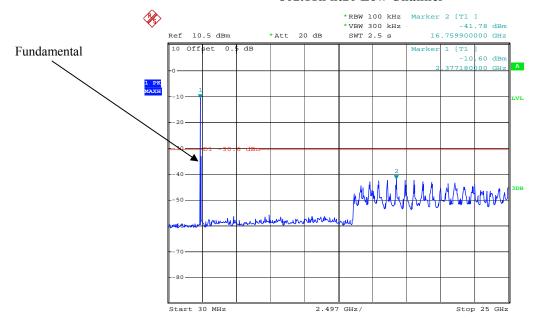
## 802.11g High Channel



Date: 18.DEC.2015 13:46:41

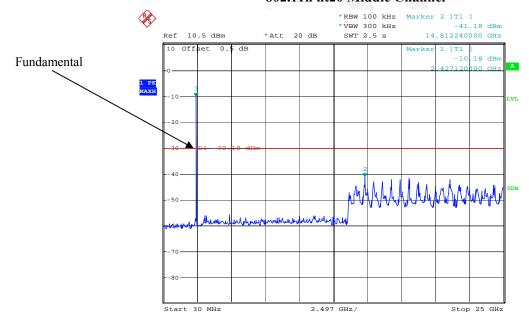
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#### 802.11n ht20 Low Channel



Date: 18.DEC.2015 13:49:01

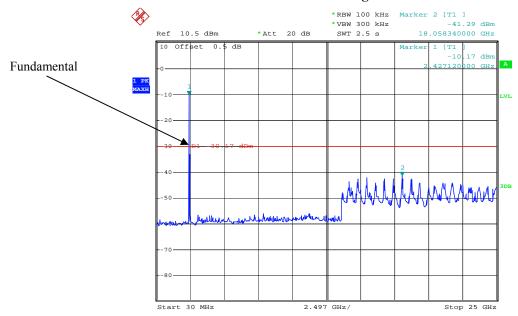
#### 802.11n ht20 Middle Channel



Date: 18.DEC.2015 13:50:36

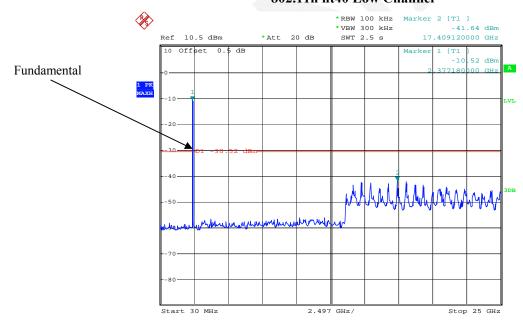
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#### 802.11n ht20 High Channel



Date: 18.DEC.2015 13:51:39

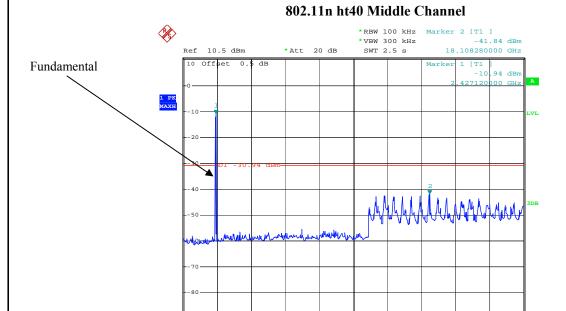
# 802.11n ht40 Low Channel



Date: 18.DEC.2015 13:31:53

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Stop 25 GHz

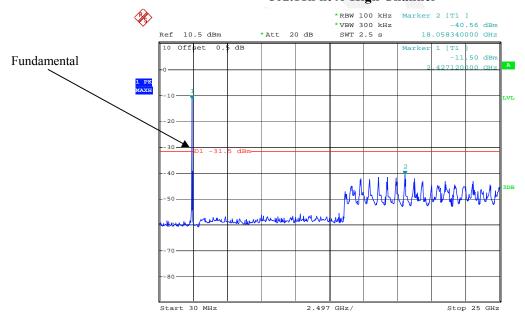


Date: 18.DEC.2015 13:35:01

Start 30 MHz

## 802.11n ht40 High Channel

2.497 GHz/



Date: 18.DEC.2015 13:36:26

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# 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.

Report No.: RDG151202004-00A

#### **Test Procedure**

According to KDB 558074 D01 DTS Meas Guidance v03r03

- 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

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

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23.1~23.7 °C
Relative Humidity:	22~24 %
ATM Pressure:	102.2 kPa

<sup>\*</sup> The testing was performed by Allen Qiao from 2015-12-17 to 2015-12-18

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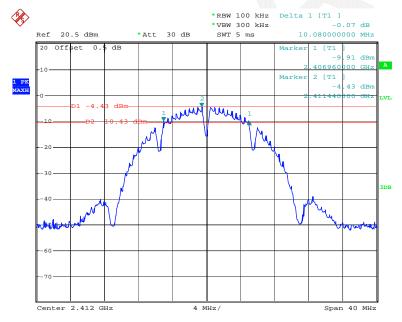
Test Mode: Transmitting

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	10.08	≥0.5
	Middle	2437	10.16	≥0.5
	High	2462	10.08	≥0.5
802.11g	Low	2412	16.64	≥0.5
	Middle	2437	16.64	≥0.5
	High	2462	16.64	≥0.5
802.11n20	Low	2412	17.92	≥0.5
	Middle	2437	17.84	≥0.5
	High	2462	17.92	≥0.5
802.11n40	Low	2422	36.80	≥0.5
	Middle	2437	36.64	≥0.5
	High	2452	36.48	≥0.5

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## 802.11b Low Channel

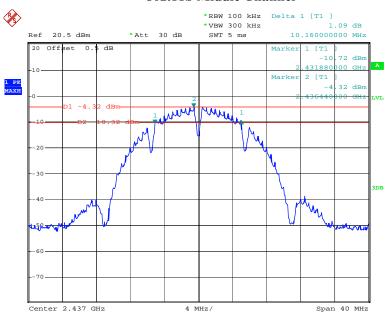


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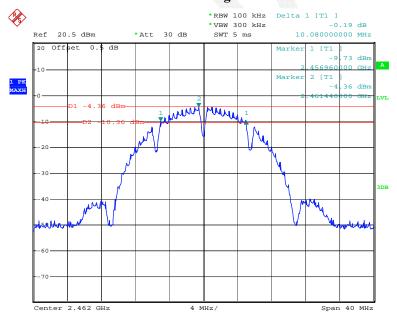
#### **802.11b Middle Channel**

Report No.: RDG151202004-00A



Date: 17.DEC.2015 13:30:50

# 802.11b High Channel

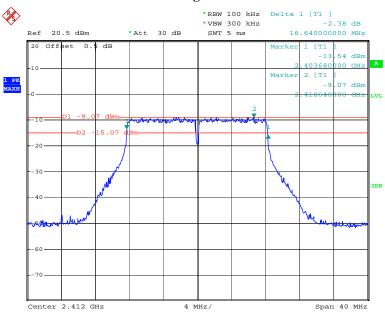


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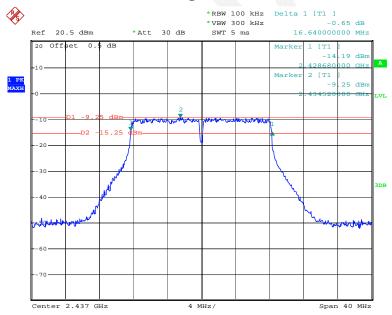
## 802.11g Low Channel

Report No.: RDG151202004-00A



Date: 17.DEC.2015 14:00:55

## 802.11g Middle Channel

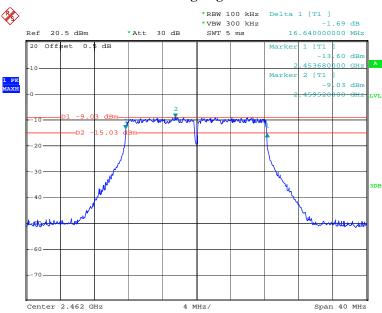


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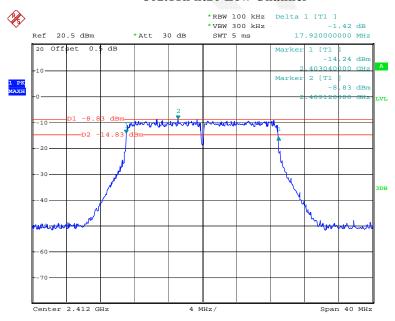
## 802.11g High Channel

Report No.: RDG151202004-00A



Date: 17.DEC.2015 14:16:21

#### 802.11n ht20 Low Channel

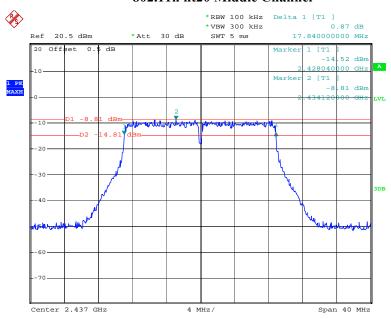


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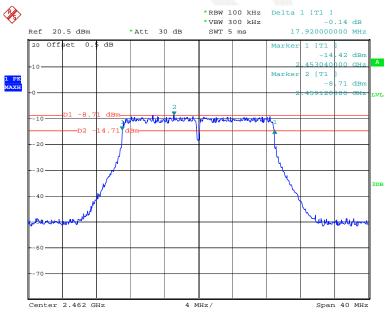
## 802.11n ht20 Middle Channel

Report No.: RDG151202004-00A



Date: 18.DEC.2015 12:41:44

### 802.11n ht20 High Channel

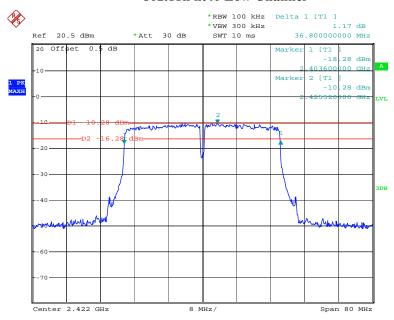


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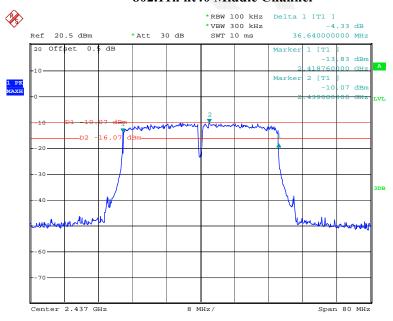
#### 802.11n ht40 Low Channel

Report No.: RDG151202004-00A



Date: 18.DEC.2015 13:15:29

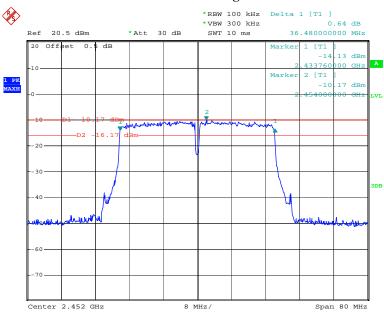
#### 802.11n ht40 Middle Channel



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## 802.11n ht40 High Channel



Date: 18.DEC.2015 12:53:55

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# 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.

Report No.: RDG151202004-00A

### **Test Procedure**

According to KDB 558074 D01 DTS Meas Guidance v03r03

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



### **Test Equipment List and Details**

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

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

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23.1°C
Relative Humidity:	22 %
ATM Pressure:	102.2 kPa

<sup>\*</sup> The testing was performed by Allen Qiao on 2015-12-18

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Test Mode: Transmitting

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

Test mode	Channel	Frequency	Max Peak Conducted Output Power	Max Conducted Average Output Power	Limit
		(MHz)	(dBm)	(dBm)	(dBm)
	Low	2412	9.85	8.93	30
802.11b	Middle	2437	9.99	9.09	30
	High	2462	10.00	9.08	30
	Low	2412	12.63	9.06	30
802.11g	Middle	2437	12.43	8.97	30
	High	2462	12.59	9.09	30
	Low	2412	12.58	8.96	30
802.11n20	Middle	2437	12.64	9.07	30
	High	2462	12.67	9.07	30
	Low	2422	15.30	9.04	30
802.11n40	Middle	2437	15.45	9.20	30
	High	2452	15.25	9.05	30

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

Report No.: RDG151202004-00A

# **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

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

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23.1~23.7°C
Relative Humidity:	22~24 %
ATM Pressure:	102.2 kPa

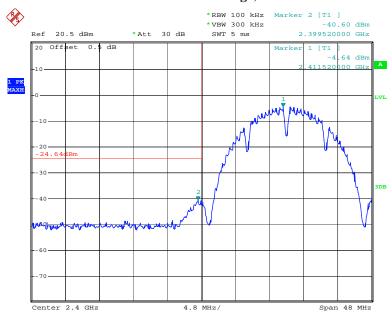
<sup>\*</sup> The testing was performed by Allen Qiao from 2015-12-17 to 2015-12-18

Test mode: Transmitting

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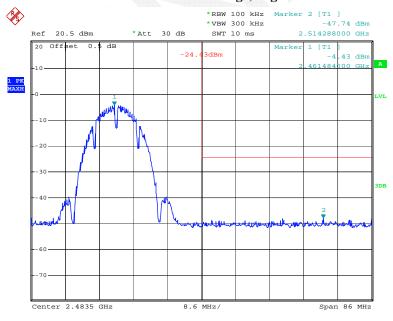
Test Result: Compliant. Please refer to following plots.

802.11b: Band Edge, Left Side



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802.11b: Band Edge, Right Side

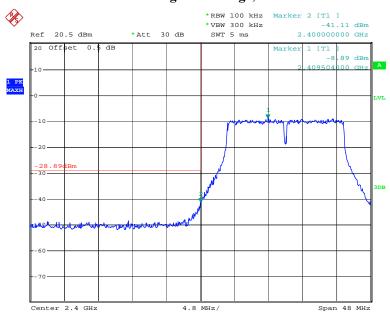


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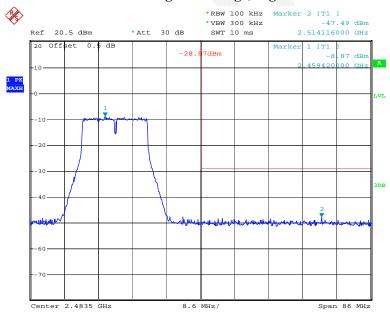
# 802.11g: Band Edge, Left Side

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Date: 17.DEC.2015 14:02:53

# 802.11g: Band Edge, Right Side

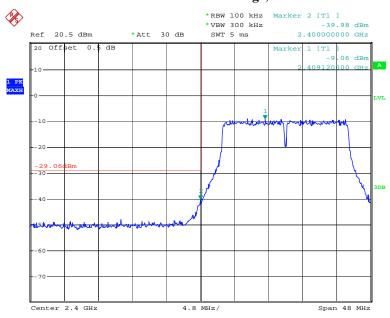


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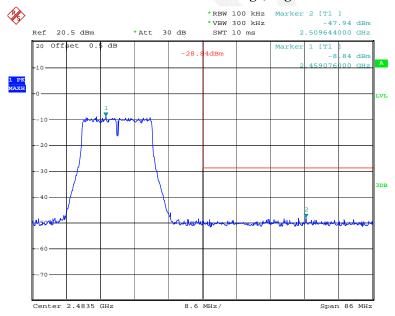
## 802.11n ht20 Band Edge, Left Side

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Date: 18.DEC.2015 12:40:20

### 802.11n ht20 Band Edge, Right Side

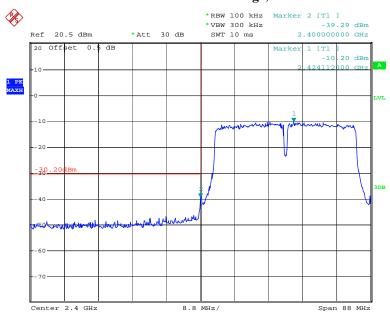


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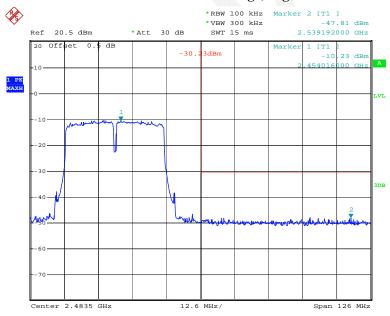
# 802.11n ht40 Band Edge, Left Side

Report No.: RDG151202004-00A



Date: 18.DEC.2015 13:17:42

### 802.11n ht40 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.

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#### **Test Procedure**

According to KDB 558074 D01 DTS Meas Guidance v03r03

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

# **Test Equipment List and Details**

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

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

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23.1~23.7°C
Relative Humidity:	22~24 %
ATM Pressure:	102.2kPa

<sup>\*</sup> The testing was performed by Allen Qiao from 2015-12-17 to 2015-12-18

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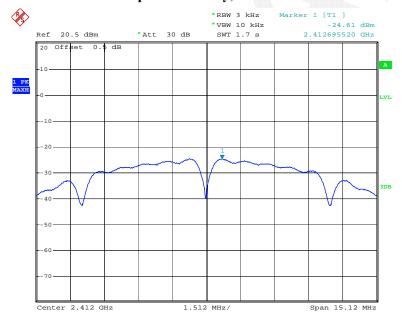
Test Mode: Transmitting

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

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
	Low	2412	-24.61	≪8
802.11b	Middle	2437	-24.41	≪8
	High	2462	-24.52	≤8
	Low	2412	-23.28	≪8
802.11g	Middle	2437	-23.38	≪8
	High	2462	-23.28	≤8
	Low	2412	-23.23	≤8
802.11n20	Middle	2437	-23.07	≤8
	High	2462	-23.31	≤8
802.11n40	Low	2422	-23.11	€8
	Middle	2437	-23.37	€8
	High	2452	-23.08	€8

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# Power Spectral Density, 802.11b Low Channel



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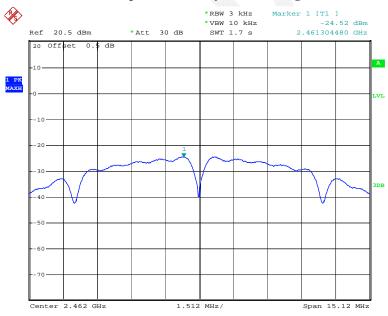
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Date: 17.DEC.2015 13:32:09

# Power Spectral Density, 802.11b High Channel

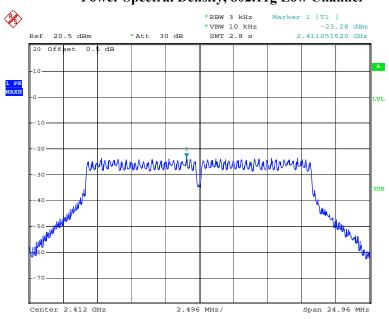


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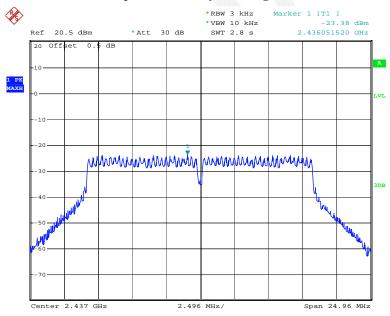
# Power Spectral Density, 802.11g Low Channel

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Date: 17.DEC.2015 14:02:17

# Power Spectral Density, 802.11g Middle Channel

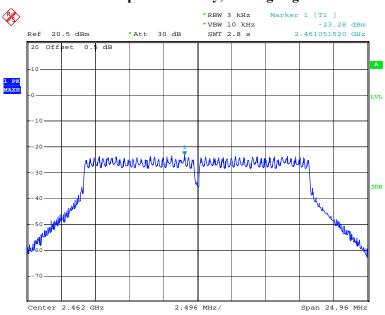


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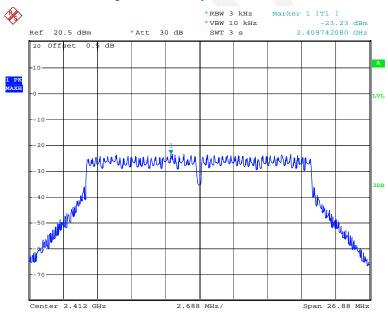
# Power Spectral Density, 802.11g High Channel

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Date: 17.DEC.2015 14:17:46

# Power Spectral Density, 802.11n ht20 Low Channel

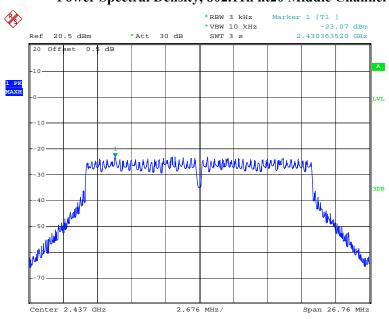


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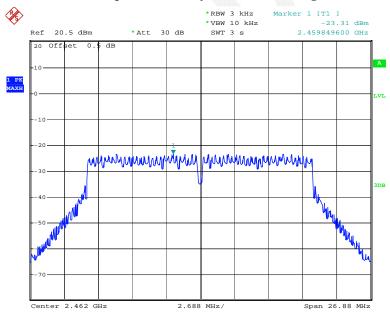
# Power Spectral Density, 802.11n ht20 Middle Channel

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Date: 18.DEC.2015 12:43:10

# Power Spectral Density, 802.11n ht20 High Channel

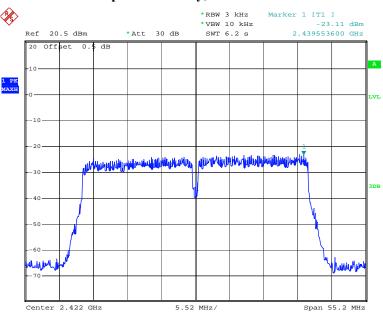


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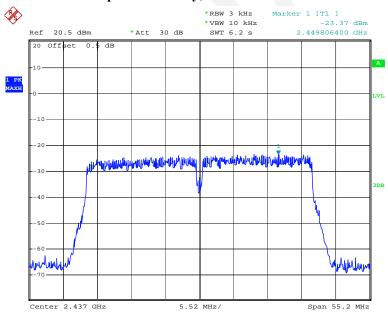
# Power Spectral Density, 802.11n ht40 Low Channel

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Date: 18.DEC.2015 15:19:44

### Power Spectral Density, 802.11n ht40 Middle Channel

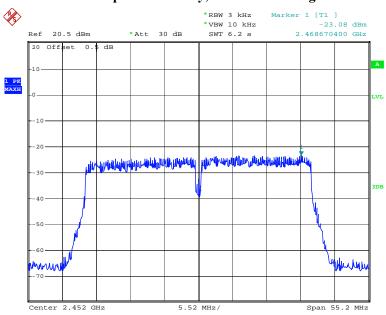


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# Power Spectral Density, 802.11n ht40 High Channel

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

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