FCC PART 15, SUBPART C
ISED RSS-247, ISSUE 1, MAY 2015
TEST AND MEASUREMENT REPORT

For

GainSpan Corporation

3590 N First Street, Suite 300,

San Jose, CA 95134, USA

FCC ID: YOPGS2200M
IC: 9154A-GS2200M

Report Type:	**Product Type:**
Original Report	Low Power 802.11b/g/n20 Wi-Fi Module

Prepared By:	Jin Yang Associate Engineer
Report Number:	R1606202-247
Report Date:	2016-08-17
Reviewed By:	Bo Li RF Lead

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue,
Sunnyvale, CA 94089, USA
Tel: (408) 732-9162
Fax: (408) 732-9164

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1606202-247	Original	2016-08-17

General Description

Product Description for Equipment Under Test (EUT)

This test and measurement report has been compiled on behalf of *GainSpan Corporation,* and their product, *FCC ID: YOPGS2200M, IC: 9154A-GS2200M*, model number: *GS2200MIZ/GS2200MIE*, which henceforth is referred to as the EUT (Equipment Under Test), the EUT is *a Wi-Fi Module with 802.11b/g/n20 technology*.

Mechanical Description of EUT

The EUT measures approximately *17.85 mm (L) x13.5 mm (W) x 2.1 mm (H)* and weighs approximately *1.5 g*.

The data gathered are from a typical production sample provided by the manufacturer with serial number
GS2200MIZ (built-in antenna):74DFBF16DC9A
GS2200MIE (uFL connector with external antenna):C8FF2896E787

Objective

This report is prepared on behalf of *GainSpan Corporation* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commission's rules and ISED RSS-247 Issue 1, May 2015.

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, 15.247 and ISED RSS-247, RSS-Gen rules.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v03r05: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

Test Facility

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3279.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.03)*** to certify

- For the USA (Federal Communications Commission):
    1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
    2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
    3- All Telephone Terminal Equipment within FCC Scope C.
- For Canada (Industry Canada):
    1 All Scope 1-Licence-Exempt Radio Frequency Devices;
    2 All Scope 2-Licensed Personal Mobile Radio Services;
    3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
    4 All Scope 4-Licensed Maritime & Aviation Radio Services;
    5 All Scope 5-Licensed Fixed Microwave Radio Services
    6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.

- For Singapore (Info-Communications Development Authority (IDA)):
    1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
    2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2
- For the Hong Kong Special Administrative Region:
    1 All Radio Equipment, per KHCA 10XX-series Specifications;
    2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
    3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
    1 MIC Telecommunication Business Law (Terminal Equipment):
        - All Scope A1 - Terminal Equipment for the Purpose of Calls;
        - All Scope A2 - Other Terminal Equipment
    2 Radio Law (Radio Equipment):
        - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
        - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
        - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). 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 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.10-2013, ANSI C63.4-2014, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

System Test Configuration

Justification

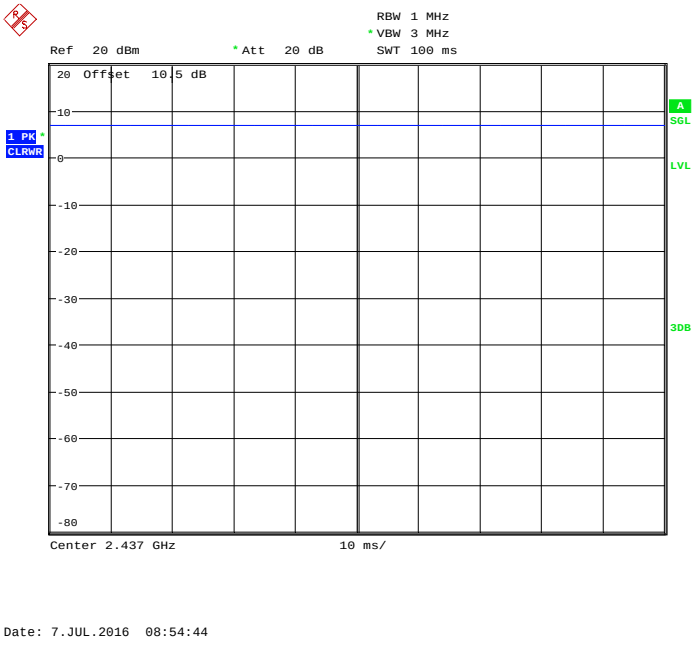
The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

EUT Exercise Software

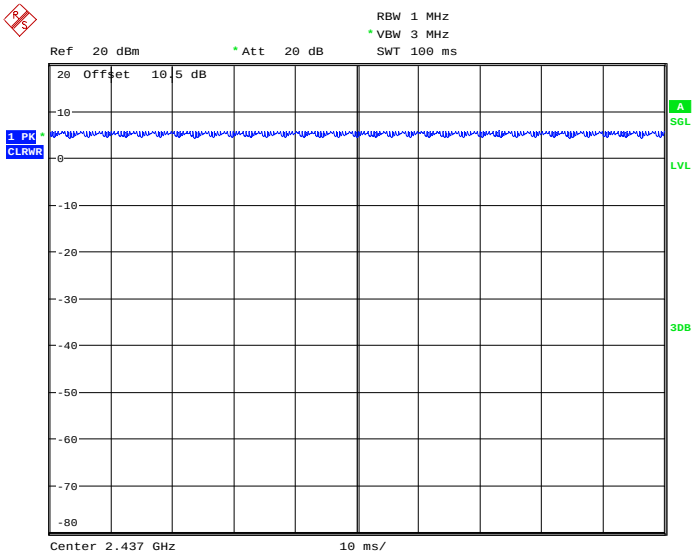
The worst condition (maximum power with 100% duty cycle) was setting by the software as following table:

Radio Mode	Test Software Version	IPOP v4.1		
802.11b	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	1 Mbps	1 Mbps	1 Mbps
	Power Level	15	15	15
802.11g	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	6 Mbps	6 Mbps	6 Mbps
	Power Level	21	21	21
802.11n HT20	Test Frequency	2412 MHz	2437 MHz	2462 MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level	21	21	21

Duty Cycle (100%) 802.11b

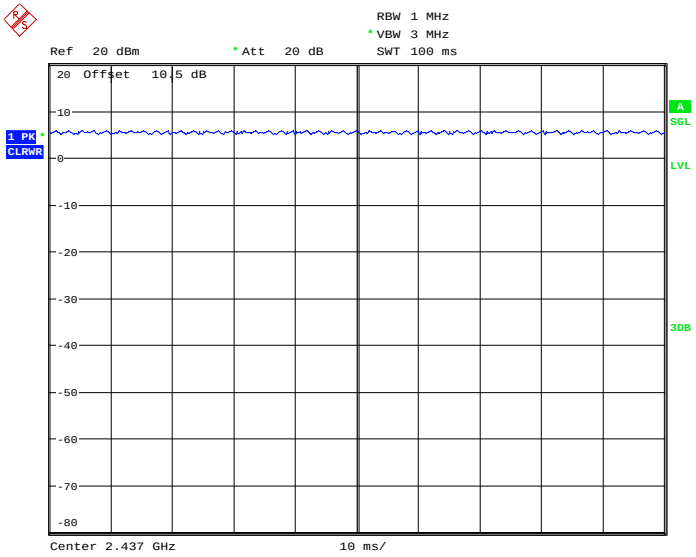


Duty Cycle (100%) 802.11g



Date: 7.JUL.2016 08:57:48

Duty Cycle (100%) 802.11nHT20



Date: 7.JUL.2016 08:58:34

Special Equipment

There were no special accessories were required, included, or intended for use with EUT during test.

Equipment Modifications

No modifications were made to the EUT.

Support Equipment

Manufacturer	Description	Type	Serial Number
DELL	Laptop	E6410	FFXR4Q1
GainSpan	Test Jig	GS2200M_EVB3_REV1-0	/

EUT Internal Configuration Details

Manufacturer	Description	Type	Serial Number
GainSpan	Module	GS2200MIE REV 1.0 GS2200MIZ REV 1.0	/
GainSpan	MCU	GS2000-CSP-D1	/

Interface Ports and Cables

Cable Description	Length (cm)	From	To
USB Cable	93	Test Jig	Laptop
Adapter Cable	115	Test Jig	AC ADAPTER

Power Supply List and Details

Manufacturer	Description	Type	Serial Number
Kaga Electronics(USA)Inc.	AC ADAPTER	KTPS05-03315U	/

Summary of Test Results

Results reported relate only to the product tested.

FCC & ISED Rules	Description of Test	Results
FCC §15.203 ISED RSS-GEN §8.3	Antenna Requirement	Compliant
FCC §15.207(a) ISED RSS-GEN §8.8	AC Line Conducted Emissions	Compliant
FCC §15.247(i) ISED RSS-102	RF Exposure	Compliant
FCC §15.247 (d) ISED RSS-247 §5.5	Spurious Emissions at Antenna Port	Compliant
FCC §15.205 ISED RSS-Gen §8.10	Restricted Bands	Compliant
FCC §15.209, §15.247 (d) ISED RSS-247 §5.5 RSS-Gen §8.9	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2) ISED RSS-247 §5.2 RSS-Gen §6.6	6 dB & 99% Emission Bandwidth	Compliant
FCC §15.247(b)(3) ISED RSS-247 §5.4	Maximum Peak Output Power	Compliant
FCC §15.247(d) ISED RSS-247 §5.5	100 kHz Bandwidth of Frequency Band Edge	Compliant
FCC §15.247(e) ISED RSS-247 §5.2	Power Spectral Density	Compliant

Note: 3.35 dBi antenna (built-in antenna) and 2.5 dBi antenna (external antenna) has same conducted power level setting, therefore, all the conducted results for both antenna were shared.

FCC §15.203 & ISED RSS-GEN §8.3 – Antenna Requirements

Applicable Standard

According to FCC §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 use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to ISED RSS-GEN §8.3: Transmitter Antenna for Licence-Exempt Radio Apparatus

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. 9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

Antenna Connector Construction

Antenna Type/Pattern	Model number	Antenna Gain @ 2.4 GHz
Integrated ceramic chip	ANT8010LL04R2400A	3.35 dBi (Max)
Dipole with I-PEX connector	RFA-02-L2H1	2.5 dBi (Max)

FCC §15.247(i) & ISED RSS §102 - RF Exposure

Applicable Standards

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of RSS-102 must be followed concerning the exposure of humans to RF field.

According to ISED RSS-102 Issue 5 §2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where:
S = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

MPE Results

Maximum tune-up peak output power at antenna input terminal (dBm):	20.0
Maximum tune-up peak output power at antenna input terminal (mW):	100
Prediction distance (cm):	20
Prediction frequency (MHz):	2437
Maximum Antenna Gain, typical (dBi):	3.35
Maximum Antenna Gain (numeric):	2.16
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.043
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

Note: Since 3.35 dBi antenna and 2.5 dBi antenna has same conducted power level, therefore, RF exposure evaluation was based on the highest gain 3.35 dBi.

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.043 mW/cm^2. Limit is 1.0 mW/cm^2.

RF exposure evaluation exemption for IC

The max tune-up peak conducted output power is 20.0 dBm at 2437 MHz and the antenna gain is 3.35 dBi, so the e.i.r.p is 23.35 dBm (0.216W).

Exemption from Routine Evaluation Limit is:
$1.31 \times 10^{-2} f^{0.6834} = 1.31 \times 10^{-2} \times 2437^{0.6834} = 2.70 > 0.216$

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

Result: The device meets exemption limits at greater than 20 cm distance as a mobile device specified in RSS-102 §2.5.2.

Note: If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by §2.1093 and RSS-102 §2.5.1.

FCC §15.207 & ISED RSS-Gen §8.8 - AC Power Line Conducted Emissions

Applicable Standards

Per FCC §15.207 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1 Decreases with the logarithm of the frequency.

Per RSS-Gen §8.8 AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table 3.
Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 3 below. The more stringent limit applies at the frequency range boundaries.
The conducted emissions shall be measured in accordance with the reference publication mentioned in Section 3.

Table 3 - AC Power Lines Conducted Emission Limits		
Frequency range (MHz)	Conducted limit (dBµV)	
	Quasi-Peak	Average**
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Note: * The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.10-2013 measurement procedure. The specification used was FCC §15.207/ RSS-247/RSS-Gen limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

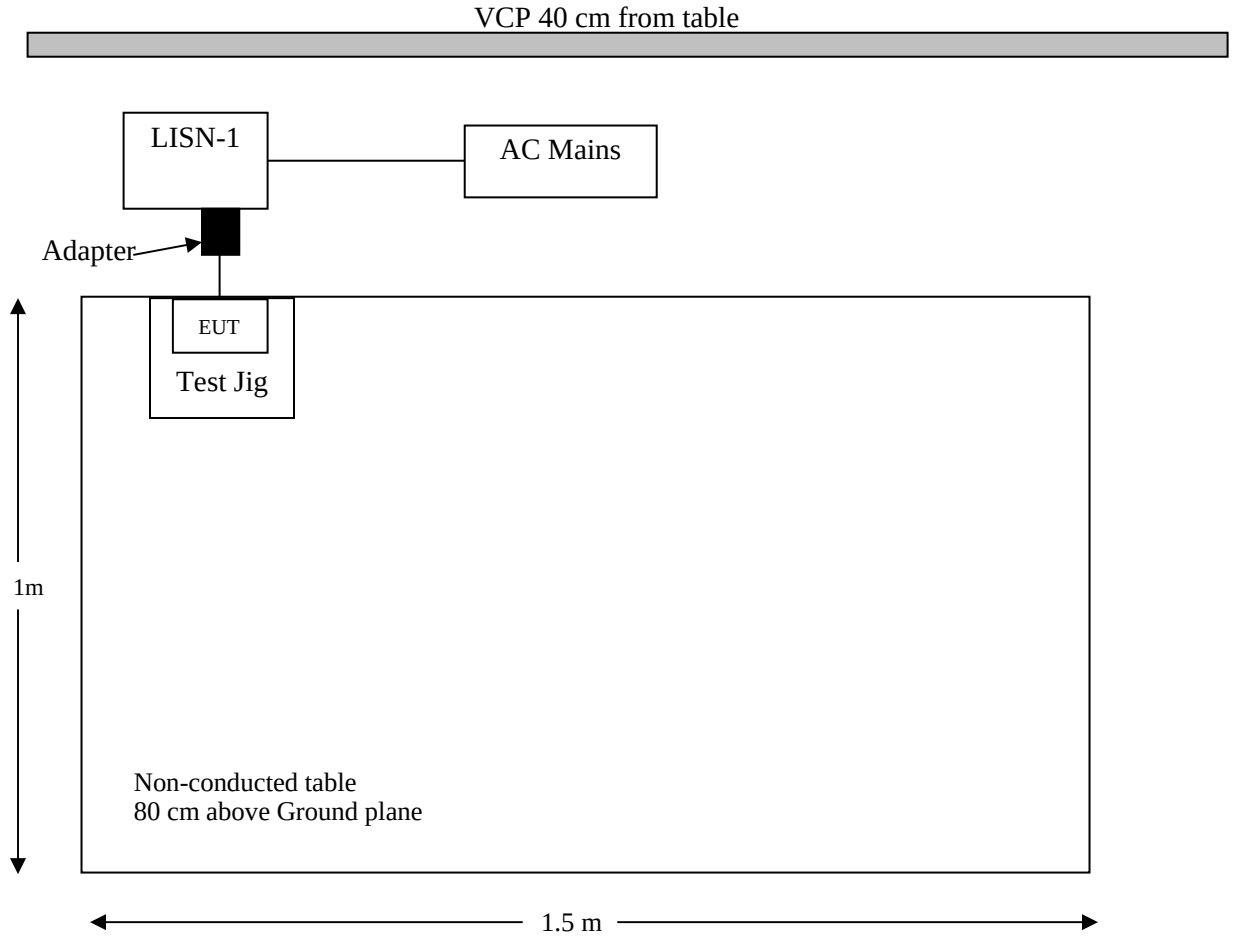
The switching power supply was connected with LISN-1 which provided 120 V / 60 Hz AC power.

Test Procedure

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

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a "QP." Average readings are distinguished with an "Ave".

Test Setup Block Diagram



Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL), the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + CL + Atten

For example, a corrected amplitude of 46.2 dBµV = Indicated Reading (32.5 dBµV) + Cable Loss (3.7 dB) + Attenuator (10 dB)

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

Margin = Corrected Amplitude - Limit

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160130	2016-04-12	1 year
Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101962	2016-07-14	1 year
Solar Electronics Company	High Pass Filter	Type 7930-100	7930150203	2016-02-26	1 year
Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950K03	100338	2016-02-04	2 years
Wireless Solutions	Conducted Emission Cable	LMR 400	691	2016-07-01	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed according to A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	48 %
ATM Pressure:	101.42 kPa

The testing was performed by Jin Yang on 2016-07-21.

Summary of Test Results

According to the recorded data, the EUT complied with FCC 15.207/RSS-247/RSS-Gen, and the worst margin reading of:

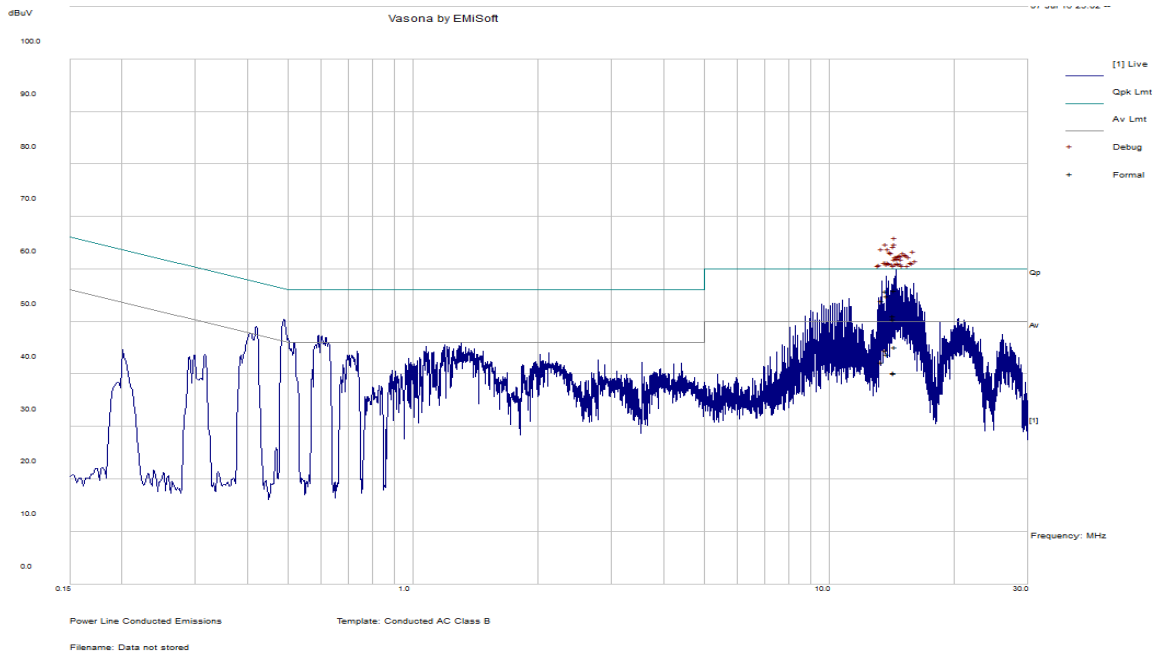
Connection: AC120 V/60 Hz (Integrated Ceramic Chip Antenna)			
Margin (dB)	**Frequency (MHz)**	**Conductor (Live/Neutral)**	**Range (MHz)**
-4.01	14.43711	Live	0.15-30

Connection: AC120 V/60 Hz (Dipole Antenna)			
Margin (dB)	**Frequency (MHz)**	**Conductor (Live/Neutral)**	**Range (MHz)**
-3.34	14.5571	Live	0.15-30

Conducted Emissions Test Plots and Data

Transmitting Mode: (Integrated Ceramic Chip Antenna)

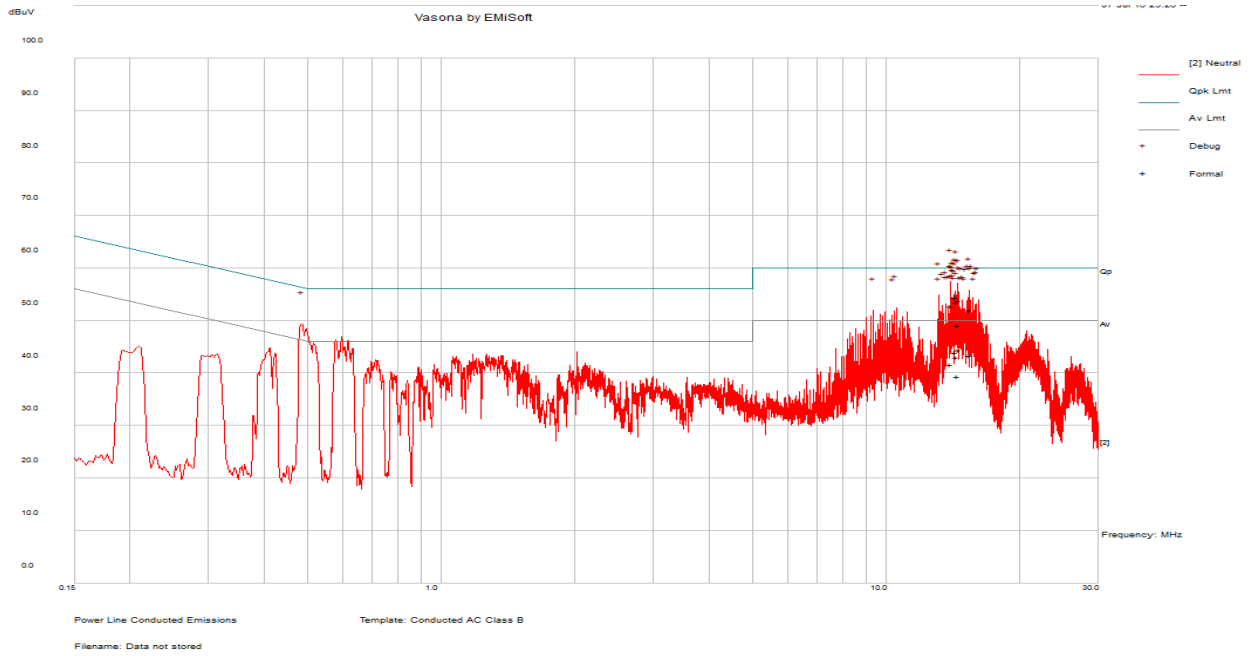
AC120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
14.43711	55.99	Line	60	-4.01	QP
13.72771	55.88	Line	60	-4.12	QP
14.35592	50.47	Line	60	-9.53	QP
14.30392	51.16	Line	60	-8.84	QP
13.85174	54.86	Line	60	-5.14	QP
13.37135	53.94	Line	60	-6.06	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
14.43711	45.14	Line	50	-4.86	Ave.
13.72771	44.59	Line	50	-5.41	Ave.
14.35592	40.21	Line	50	-9.79	Ave.
14.30392	40.23	Line	50	-9.77	Ave.
13.85174	43.75	Line	50	-6.25	Ave.
13.37135	42.31	Line	50	-7.69	Ave.

AC120 V, 60 Hz – Neutral

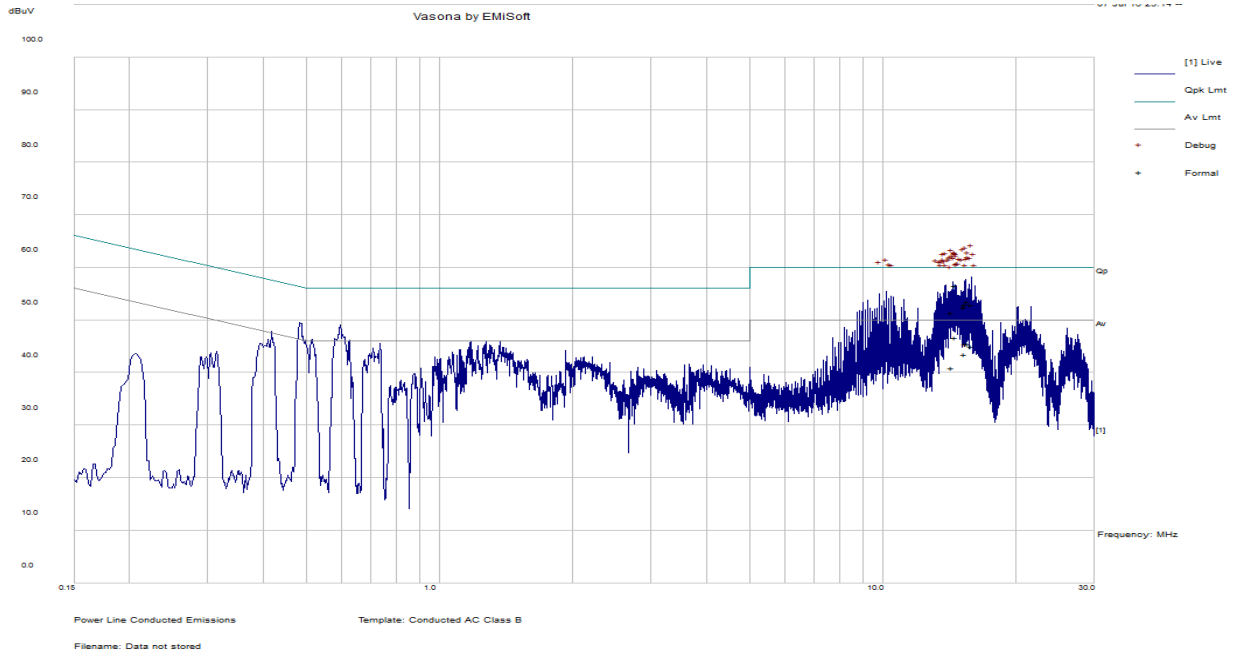


Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
13.96144	52.81	Neutral	60	-7.19	QP
14.43675	53.46	Neutral	60	-6.54	QP
15.38415	51.97	Neutral	60	-8.03	QP
14.32285	54.47	Neutral	60	-5.53	QP
14.47051	49.12	Neutral	60	-10.88	QP
14.55713	53.88	Neutral	60	-6.12	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Livn/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
13.96144	41.61	Neutral	50	-8.39	Ave.
14.43675	43.05	Neutral	50	-6.95	Ave.
15.38415	43.4	Neutral	50	-6.6	Ave.
14.32285	43.88	Neutral	50	-6.12	Ave.
14.47051	39.38	Neutral	50	-10.62	Ave.
14.55713	44.33	Neutral	50	-5.67	Ave.

Transmitting Mode: (Dipole Antenna)

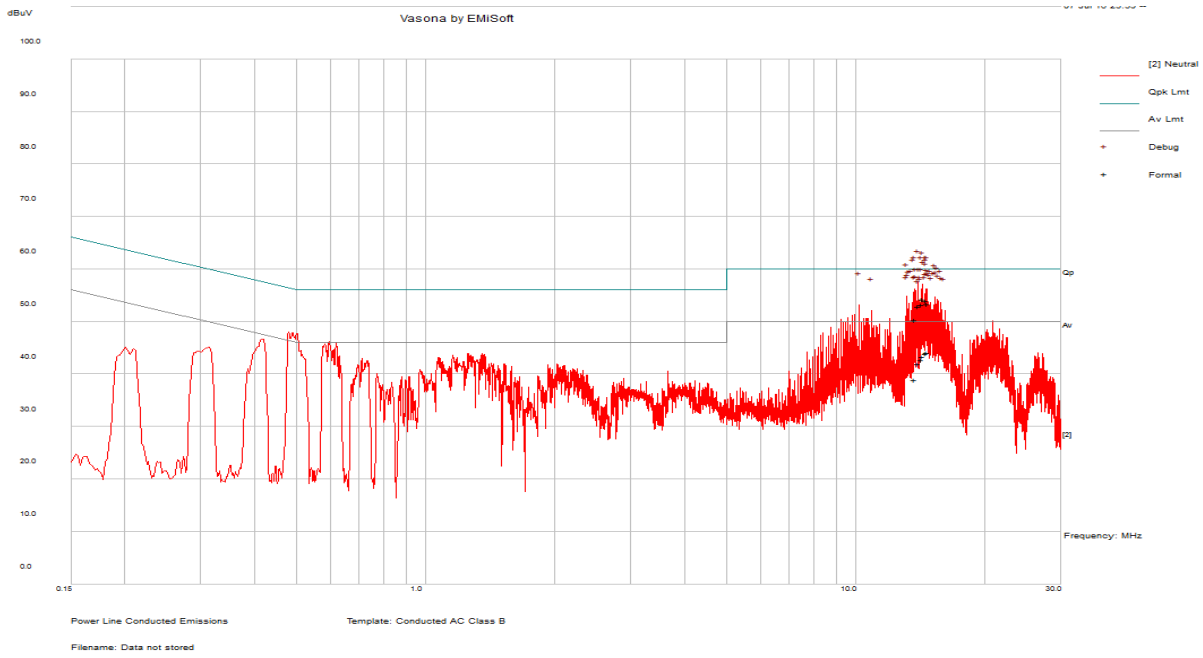
AC120 V, 60 Hz – Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
14.33544	51.46	Line	60	-8.54	QP
14.5571	56.57	Line	60	-3.43	QP
15.26662	52.53	Line	60	-7.47	QP
15.38751	52.92	Line	60	-7.08	QP
15.61933	53.47	Line	60	-6.53	QP
15.85974	52.86	Line	60	-7.14	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
14.33544	40.92	Line	50	-9.08	Ave.
14.5571	46.66	Line	50	-3.34	Ave.
15.26662	43.48	Line	50	-6.52	Ave.
15.38751	45.5	Line	50	-4.5	Ave.
15.61933	45.42	Line	50	-4.58	Ave.
15.85974	45.06	Line	50	-4.94	Ave.

AC120 V, 60 Hz – Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
13.96786	52.99	Neutral	60	-7.01	QP
14.31855	54.22	Neutral	60	-5.78	QP
13.71952	50.27	Neutral	60	-9.73	QP
14.55502	53.94	Neutral	60	-6.06	QP
14.20366	53.26	Neutral	60	-6.74	QP
14.675	53.45	Neutral	60	-6.55	QP

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)	Detector (QP/Ave.)
13.96786	41.91	Neutral	50	-8.09	Ave.
14.31855	43.39	Neutral	50	-6.61	Ave.
13.71952	38.86	Neutral	50	-11.14	Ave.
14.55502	44.02	Neutral	50	-5.98	Ave.
14.20366	42.73	Neutral	50	-7.27	Ave.
14.675	44.04	Neutral	50	-5.96	Ave.

FCC §15.247(d), §15.209 & ISED RSS-247 §5.5, RSS-Gen §8.9, §8.10 - Spurious Radiated Emissions

Applicable Standards

Per FCC §15.247 (d); §15.209; §15.205; ISED RSS-247 §5.5; RSS-Gen §8.9, §8.10

Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart C and RSS-247.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

Test Procedure

For the radiated emissions test, the switching power supply was connected to the AC floor outlet.

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

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter for below 1GHz and 1.5 meter for above 1GHz above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

30 MHz-1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBµV/m = Indicated Reading (32.5 dBµV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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

Margin = Corrected Amplitude - Limit

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2015-06-18	2 year
Agilent	Spectrum Analyzer	E4440A	US45303156	2016-01-19	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Science Corp	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 year
Sunol Sciences	Antenna, Horn	DRH-118	A052704	2015-03-09	2 year
Agilent	Pre-amplifier	8447D	2944A10187	2016-03-23	1 year
Suirong	30 ft conductive emission cable	LMR 400	-	2015-08-05	1 year
IW Microwave	High Frequency Cable	DC-1438	SPS-2303-3840-SPS	2015-09-23	1 year
Hewlett-Packard	5 ft N-type RF cable	-	1268	2016-06-15	1 year
Hewlett	Pre-Amplifier	8449B	3008A01978	2015-12-11	1 year
Keysight Technologies	RF Limiter	11867A	MY42243052	2016-01-18	2 year
PASTERNACK	Attenuator	6 dB	PE7390-6	2016-07-05	1 year
Mini-Circuits	Reject Band Filter	2.4-2.5G	/	2016-01-18	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Statement of Traceability: BACL *attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

Test Environmental Conditions

Temperature:	24~25° C
Relative Humidity:	46~48 %
ATM Pressure:	101.3~101.5 kPa

Testing was performed by Jin Yang from 2016-07-13 and 2016-07-22 on 5m3.

Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Title 47, Part 15, Section 15.205, 15.209, 15.247and RSS-247/RSS-Gen standard's radiated emissions limits, and had the worst margin of:

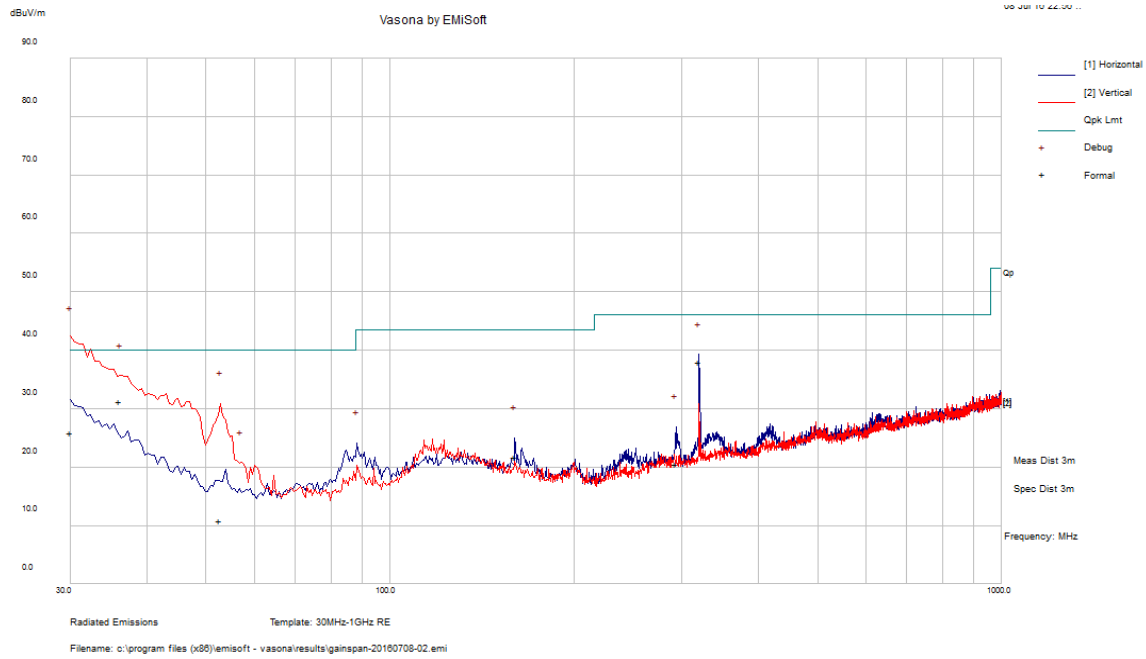
Mode: Transmitting (Integrated Ceramic Chip Antenna)			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode**
-2.46	2390	Horizontal	802.11n20

Mode: Transmitting (Dipole Antenna)			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode**
-0.98	2390	Vertical	802.11n20

Please refer to the following table and plots for specific test result details

Test Results (Integrated Ceramic Chip Antenna)

1) 30 MHz – 1 GHz Worst Case, Measured at 3 meter



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments
30.00421	25.96	229	V	264	40	-14.04	QP
36.18025	31.23	107	V	278	40	-8.77	QP
319.9955	38.04	100	H	196	46	-7.96	QP
52.7025	10.88	136	V	343	40	-29.12	QP
159.9703	21.73	168	H	204	43.5	-21.77	QP
293.2403	20.49	101	H	322	46	-25.51	QP

2) 1–25 GHz Measured at 3 meters

802.11b Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	65.83	151	289	V	28.45	5.22	0.00	99.50	-	-	Peak
2412	62.87	151	289	V	28.45	5.22	0.00	96.54	-	-	Ave
2412	65.68	339	228	H	29.04	5.22	0.00	99.94	-	-	Peak
2412	62.79	339	228	H	29.04	5.22	0.00	97.05	-	-	Ave
2390	26.78	151	289	V	28.45	5.22	0.00	60.45	74.00	-13.56	Peak
2390	15.61	151	289	V	28.45	5.22	0.00	49.28	54.00	-4.73	Ave
2390	26.36	339	228	H	29.04	5.22	0.00	60.62	74.00	-13.38	Peak
2390	15.44	339	228	H	29.04	5.22	0.00	49.70	54.00	-4.30	Ave
4824	48.49	323	100	H	32.47	7.76	38.01	50.71	74.00	-23.29	Peak
4824	35.79	323	100	H	32.47	7.76	38.01	38.01	54.00	-15.99	Ave
7236	46.51	326	114	H	36.16	9.71	37.53	54.85	74.00	-19.15	Peak
7236	34.84	326	114	H	36.16	9.71	37.53	43.18	54.00	-10.82	Ave
9648	46.66	358	121	H	37.17	11.37	38.00	57.20	74.00	-16.80	Peak
9648	35.77	358	121	H	37.17	11.37	38.00	46.31	54.00	-7.69	Ave
Middle Channel 2437 MHz											
2437	64.58	155	282	V	28.45	5.22	0.00	98.25	-	-	Peak
2437	61.62	155	282	V	28.45	5.22	0.00	95.29	-	-	Ave
2437	65.09	320	151	H	29.04	5.22	0.00	99.35	-	-	Peak
2437	62.18	320	151	H	29.04	5.22	0.00	96.44	-	-	Ave
4874	48.04	344	300	H	32.59	7.93	37.92	50.64	74.00	-23.36	Peak
4874	35.77	344	300	H	32.59	7.93	37.92	38.37	54.00	-15.63	Ave
7311	46.17	4	123	H	36.41	9.86	37.53	54.90	74.00	-19.10	Peak
7311	34.79	4	123	H	36.41	9.86	37.53	43.52	54.00	-10.48	Ave
9748	47.96	16	136	H	37.10	11.48	38.27	58.27	74.00	-15.73	Peak
9748	36.03	16	136	H	37.10	11.48	38.27	46.34	54.00	-7.66	Ave
High Channel 2462 MHz											
2462	63.52	155	278	V	28.91	5.47	0.00	97.91	-	-	Peak
2462	60.52	155	278	V	28.91	5.47	0.00	94.91	-	-	Ave
2462	65.35	320	105	H	29.41	5.47	0.00	100.24	-	-	Peak
2462	62.37	320	105	H	29.41	5.47	0.00	97.26	-	-	Ave
2483.5	27.28	155	278	V	29.41	5.47	0.00	62.17	74.00	-11.83	Peak
2483.5	15.25	155	278	V	29.41	5.47	0.00	50.14	54.00	-3.86	Ave
2483.5	27.28	320	105	H	28.91	5.47	0.00	61.67	74.00	-12.33	Peak
2483.5	16.53	320	105	H	28.91	5.47	0.00	50.92	54.00	-3.08	Ave
4924	48.36	294	280	H	32.72	7.93	37.85	51.16	74.00	-22.84	Peak
4924	37.52	294	280	H	32.72	7.93	37.85	40.32	54.00	-13.68	Ave
7386	46.28	13	138	H	36.31	9.86	37.62	54.82	74.00	-19.18	Peak
7386	34.83	13	138	H	36.31	9.86	37.62	43.37	54.00	-10.63	Ave
9848	47.98	22	156	H	37.18	11.59	38.38	58.37	74.00	-15.63	Peak
9848	36.26	22	156	H	37.18	11.59	38.38	46.65	54.00	-7.35	Ave

802.11g Mode

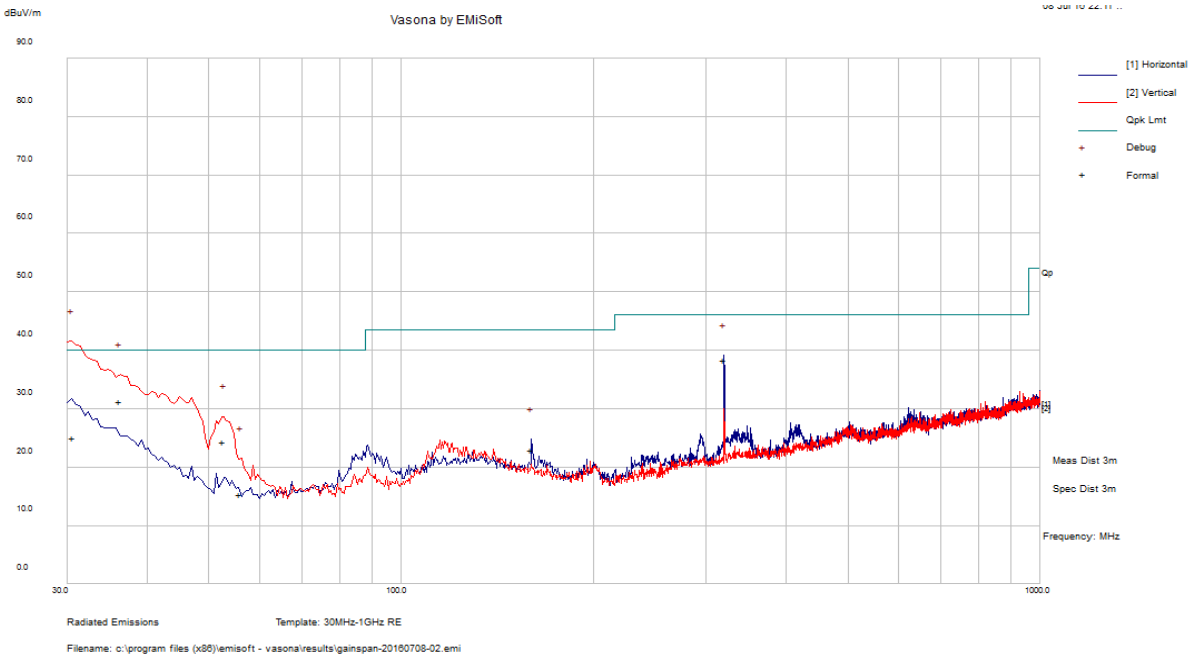
Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	66.82	151	289	V	28.45	5.22	0.00	100.49	-	-	Peak
2412	59.14	151	289	V	28.45	5.22	0.00	92.81	-	-	Ave
2412	66.97	339	228	H	29.04	5.22	0.00	101.23	-	-	Peak
2412	58.98	339	228	H	29.04	5.22	0.00	93.24	-	-	Ave
2390	31.32	151	289	V	28.45	5.22	0.00	64.99	74.00	-9.02	Peak
2390	16.57	151	289	V	28.45	5.22	0.00	50.24	54.00	-3.77	Ave
2390	30.49	339	228	H	29.04	5.22	0.00	64.75	74.00	-9.25	Peak
2390	16.41	339	228	H	29.04	5.22	0.00	50.67	54.00	-3.33	Ave
4824	45.99	323	100	H	32.47	7.76	38.01	48.21	54.00	-5.79	Peak
4824	35.44	323	100	H	32.47	7.76	38.01	37.66	54.00	-16.34	Ave
7236	46.17	326	114	H	36.16	9.71	37.53	54.51	74.00	-19.49	Peak
7236	34.85	326	114	H	36.16	9.71	37.53	43.19	54.00	-10.81	Ave
9648	46.84	358	121	H	37.17	11.37	38.00	57.38	74.00	-16.62	Peak
9648	35.75	358	121	H	37.17	11.37	38.00	46.29	54.00	-7.71	Ave
Middle Channel 2437 MHz											
2437	65.08	155	282	V	28.45	5.22	0.00	98.75	-	-	Peak
2437	57.24	155	282	V	28.45	5.22	0.00	90.91	-	-	Ave
2437	65.44	320	151	H	29.04	5.22	0.00	99.70	-	-	Peak
2437	57.74	320	151	H	29.04	5.22	0.00	92.00	-	-	Ave
4874	47.52	344	300	H	32.59	7.93	37.92	50.12	74.00	-23.88	Peak
4874	35.75	344	300	H	32.59	7.93	37.92	38.35	54.00	-15.65	Ave
7311	46.38	4	123	H	36.41	9.86	37.53	55.11	74.00	-18.89	Peak
7311	34.87	4	123	H	36.41	9.86	37.53	43.60	54.00	-10.40	Ave
9748	47.64	16	136	H	37.10	11.48	38.27	57.95	74.00	-16.05	Peak
9748	36.08	16	136	H	37.10	11.48	38.27	46.39	54.00	-7.61	Ave
High Channel 2462 MHz											
2462	63.81	155	278	V	28.91	5.47	0.00	98.20	-	-	Peak
2462	55.85	155	278	V	28.91	5.47	0.00	90.24	-	-	Ave
2462	65.35	320	105	H	29.41	5.47	0.00	100.24	-	-	Peak
2462	57.49	320	105	H	29.41	5.47	0.00	92.38	-	-	Ave
2483.5	26.73	155	278	V	28.91	5.47	0.00	61.12	74.00	-12.88	Peak
2483.5	15.34	155	278	V	28.91	5.47	0.00	49.73	54.00	-4.27	Ave
2483.5	27.61	320	105	H	29.41	5.47	0.00	62.50	74.00	-11.50	Peak
2483.5	15.61	320	105	H	29.41	5.47	0.00	50.50	54.00	-3.50	Ave
4924	46.80	294	280	H	32.72	7.93	37.85	49.60	74.00	-24.40	Peak
4924	36.17	294	280	H	32.72	7.93	37.85	38.97	54.00	-15.03	Ave
7386	46.39	13	138	H	36.31	9.86	37.62	54.93	74.00	-19.07	Peak
7386	34.89	13	138	H	36.31	9.86	37.62	43.43	54.00	-10.57	Ave
9848	47.51	22	156	H	37.18	11.59	38.38	57.90	74.00	-16.10	Peak
9848	35.76	22	156	H	37.18	11.59	38.38	46.15	54.00	-7.85	Ave

802.11nHT20 Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	66.67	151	289	V	28.45	5.22	0.00	100.34	-	-	Peak
2412	58.85	151	289	V	28.45	5.22	0.00	92.52	-	-	Ave
2412	66.43	339	228	H	29.04	5.22	0.00	100.69	-	-	Peak
2412	58.66	339	228	H	29.04	5.22	0.00	92.92	-	-	Ave
2390	33.12	151	289	V	28.45	5.22	0.00	66.79	74.00	-7.22	Peak
2390	17.38	151	289	V	28.45	5.22	0.00	51.05	54.00	-2.96	Ave
2390	32.12	339	228	H	29.04	5.22	0.00	66.38	74.00	-7.62	Peak
2390	17.28	339	228	H	29.04	5.22	0.00	51.54	54.00	-2.46	Ave
4824	46.88	323	100	H	32.47	7.76	38.01	49.10	74.00	-24.90	Peak
4824	35.43	323	100	H	32.47	7.76	38.01	37.65	54.00	-16.35	Ave
7236	46.27	326	114	H	36.16	9.71	37.53	54.61	74.00	-19.39	Peak
7236	34.82	326	114	H	36.16	9.71	37.53	43.16	54.00	-10.84	Ave
9648	47.29	358	121	H	37.17	11.37	38.00	57.83	74.00	-16.17	Peak
9648	35.75	358	121	H	37.17	11.37	38.00	46.29	54.00	-7.71	Ave
Middle Channel 2437 MHz											
2437	64.77	155	282	V	28.45	5.22	0.00	98.44	-	-	Peak
2437	57.02	155	282	V	28.45	5.22	0.00	90.69	-	-	Ave
2437	65.16	320	151	H	29.04	5.22	0.00	99.42	-	-	Peak
2437	57.28	320	151	H	29.04	5.22	0.00	91.54	-	-	Ave
4874	46.91	344	300	H	32.59	7.93	37.92	49.51	74.00	-24.49	Peak
4874	35.62	344	300	H	32.59	7.93	37.92	38.22	54.00	-15.78	Ave
7311	46.66	4	123	H	36.41	9.86	37.53	55.39	74.00	-18.61	Peak
7311	34.81	4	123	H	36.41	9.86	37.53	43.54	54.00	-10.46	Ave
9748	47.82	16	136	H	37.10	11.48	38.27	58.13	74.00	-15.87	Peak
9748	36.08	16	136	H	37.10	11.48	38.27	46.39	54.00	-7.61	Ave
High Channel 2462 MHz											
2462	63.52	175	300	V	28.91	5.47	0.00	97.91	-	-	Peak
2462	55.56	175	300	V	28.91	5.47	0.00	89.95	-	-	Ave
2462	65.04	320	105	H	29.41	5.47	0.00	99.93	-	-	Peak
2462	57.26	320	105	H	29.41	5.47	0.00	92.15	-	-	Ave
2483.5	27.32	175	300	V	28.91	5.47	0.00	61.71	74.00	-12.29	Peak
2483.5	15.45	175	300	V	28.91	5.47	0.00	49.84	54.00	-4.16	Ave
2483.5	28.91	320	105	H	29.41	5.47	0.00	63.80	74.00	-10.20	Peak
2483.5	15.72	320	105	H	29.41	5.47	0.00	50.61	54.00	-3.39	Ave
4924	46.85	294	280	H	32.72	7.93	37.85	49.65	74.00	-24.35	Peak
4924	36.24	294	280	H	32.72	7.93	37.85	39.04	54.00	-14.96	Ave
7386	46.56	13	138	H	36.31	9.86	37.62	55.10	74.00	-18.90	Peak
7386	34.81	13	138	H	36.31	9.86	37.62	43.35	54.00	-10.65	Ave
9848	47.15	22	156	H	37.18	11.59	38.38	57.54	74.00	-16.46	Peak
9848	35.78	22	156	H	37.18	11.59	38.38	46.17	54.00	-7.83	Ave

Test Results (Dipole Antenna)

1) 30 MHz – 1 GHz Worst Case, Measured at 3 meter



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments
30.646	25.09	253	V	310	40	-14.91	QP
36.3225	31.26	101	V	309	40	-8.74	QP
320.0095	38.28	117	H	68	46	-7.72	QP
52.65075	24.28	111	V	152	40	-15.72	QP
55.9675	15.39	198	V	96	40	-24.61	QP
160.0085	23.02	160	H	212	43.5	-20.48	QP

2) 1-25 GHz Measured at 3 meters

802.11b Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	70.92	30	242	V	28.45	5.22	0.00	104.59	-	-	Peak
2412	68.11	30	242	V	28.45	5.22	0.00	101.78	-	-	Ave
2412	61.07	50	282	H	29.04	5.22	0.00	95.33	-	-	Peak
2412	57.88	50	282	H	29.04	5.22	0.00	92.14	-	-	Ave
2390	27.11	30	242	V	28.45	5.22	0.00	60.78	74.00	-13.23	Peak
2390	16.65	30	242	V	28.45	5.22	0.00	50.32	54.00	-3.69	Ave
2390	25.96	339	300	H	29.04	5.22	0.00	60.22	74.00	-13.78	Peak
2390	15.22	339	300	H	29.04	5.22	0.00	49.48	54.00	-4.52	Ave
4824	52.51	118	273	V	32.42	7.76	38.01	54.68	74.00	-19.32	Peak
4824	47.88	118	273	V	32.42	7.76	38.01	50.05	54.00	-3.95	Ave
4824	51.17	111	277	H	32.47	7.76	38.01	53.39	74.00	-20.61	Peak
4824	46.15	111	277	H	32.47	7.76	38.01	48.37	54.00	-5.63	Ave
7236	45.73	246	257	V	36.16	9.71	37.53	54.07	74.00	-19.93	Peak
7236	32.54	246	257	V	36.16	9.71	37.53	40.88	54.00	-13.12	Ave
9648	46.19	358	116	V	37.17	11.37	38.00	56.73	74.00	-17.27	Peak
9648	32.94	358	116	V	37.17	11.37	38.00	43.48	54.00	-10.52	Ave
Middle Channel 2437 MHz											
2437	70.36	319	236	V	28.45	5.22	0.00	104.03	-	-	Peak
2437	67.43	319	236	V	28.45	5.22	0.00	101.10	-	-	Ave
2437	62.11	104	158	H	29.04	5.22	0.00	96.37	-	-	Peak
2437	59.09	104	158	H	29.04	5.22	0.00	93.35	-	-	Ave
4874	52.53	119	267	V	32.61	7.93	37.92	55.15	74.00	-18.85	Peak
4874	48.26	119	267	V	32.61	7.93	37.92	50.88	54.00	-3.12	Ave
4874	52.21	111	300	H	32.59	7.93	37.92	54.81	74.00	-19.19	Peak
4874	48.17	111	300	H	32.59	7.93	37.92	50.77	54.00	-3.23	Ave
7311	46.24	248	260	V	36.41	9.86	37.53	54.97	74.00	-19.03	Peak
7311	31.16	248	260	V	36.41	9.86	37.53	39.89	54.00	-14.11	Ave
9748	46.11	182	118	V	37.10	11.48	38.27	56.42	74.00	-17.58	Peak
9748	33.04	182	118	V	37.10	11.48	38.27	43.35	54.00	-10.65	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	69.96	6	233	V	28.91	5.47	0.00	104.35	-	-	Peak
2462	67.06	6	233	V	28.91	5.47	0.00	101.45	-	-	Ave
2462	62.27	351	162	H	29.41	5.47	0.00	97.16	-	-	Peak
2462	59.34	351	162	H	29.41	5.47	0.00	94.23	-	-	Ave
2483.5	26.81	38	301	V	28.91	5.47	0.00	61.20	74.00	-12.80	Peak
2483.5	16.21	38	301	V	28.91	5.47	0.00	50.60	54.00	-3.40	Ave
2483.5	30.86	351	162	H	29.41	5.47	0.00	65.75	74.00	-8.25	Peak
2483.5	17.43	351	162	H	29.41	5.47	0.00	52.32	54.00	-1.68	Ave
4924	52.85	118	263	V	32.61	7.93	37.85	55.54	74.00	-18.46	Peak
4924	48.31	118	263	V	32.61	7.93	37.85	51.00	54.00	-3.00	Ave
4924	52.75	112	297	H	32.72	7.93	37.85	55.55	74.00	-18.45	Peak
4924	48.72	112	297	H	32.72	7.93	37.85	51.52	54.00	-2.48	Ave
7386	46.06	252	238	V	36.31	9.86	37.62	54.60	74.00	-19.40	Peak
7386	33.03	252	238	V	36.31	9.86	37.62	41.57	54.00	-12.43	Ave
9848	45.65	354	112	V	37.18	11.59	38.38	56.04	74.00	-17.96	Peak
9848	32.39	354	112	V	37.18	11.59	38.38	42.78	54.00	-11.22	Ave

802.11g Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	71.31	30	242	V	28.45	5.22	0.00	104.98	-	-	Peak
2412	59.17	30	242	V	28.45	5.22	0.00	92.84	-	-	Ave
2412	65.11	339	300	H	29.04	5.22	0.00	99.37	-	-	Peak
2412	57.31	339	300	H	29.04	5.22	0.00	91.57	-	-	Ave
2390	31.22	30	242	V	28.45	5.22	0.00	64.89	74.00	-9.11	Peak
2390	18.02	30	242	V	28.45	5.22	0.00	51.69	54.00	-2.32	Ave
2390	27.53	339	300	H	29.04	5.22	0.00	61.79	74.00	-12.21	Peak
2390	15.65	339	300	H	29.04	5.22	0.00	49.91	54.00	-4.09	Ave
4824	51.23	118	273	V	32.42	7.76	38.01	53.40	74.00	-20.60	Peak
4824	46.34	118	273	V	32.42	7.76	38.01	48.51	54.00	-5.49	Ave
4824	50.83	111	277	H	32.47	7.76	38.01	53.05	74.00	-20.95	Peak
4824	45.53	111	277	H	32.47	7.76	38.01	47.75	54.00	-6.25	Ave
7236	45.560	246	257	V	36.16	9.71	37.53	53.90	74.00	-20.10	Peak
7236	32.510	246	257	V	36.16	9.71	37.53	40.85	54.00	-13.15	Ave
9648	46.510	358	116	V	37.17	11.37	38.00	57.05	74.00	-16.95	Peak
9648	33.080	358	116	V	37.17	11.37	38.00	43.62	54.00	-10.38	Ave
Middle Channel 2437 MHz											
2437	70.82	319	236	V	28.45	5.22	0.00	104.49	-	-	Peak
2437	62.97	319	236	V	28.45	5.22	0.00	96.64	-	-	Ave
2437	62.02	104	158	H	29.04	5.22	0.00	96.28	-	-	Peak
2437	54.28	104	158	H	29.04	5.22	0.00	88.54	-	-	Ave
4874	52.13	111	300	H	32.59	7.93	37.92	54.73	74.00	-19.27	Peak
4874	47.25	111	301	H	32.59	7.93	37.92	49.85	54.00	-4.15	Ave
4874	52.34	119	267	V	32.61	7.93	37.92	54.96	74.00	-19.04	Peak
4874	47.25	119	267	V	32.61	7.93	37.92	49.87	54.00	-4.13	Ave
7311	45.84	248	260	V	36.41	9.86	37.53	54.57	74.00	-19.43	Peak
7311	31.26	248	260	V	36.41	9.86	37.53	39.99	54.00	-14.01	Ave
9748	46.19	182	118	V	37.10	11.48	38.27	56.50	74.00	-17.50	Peak
9748	32.96	182	118	V	37.10	11.48	38.27	43.27	54.00	-10.73	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	70.66	6	233	V	28.91	5.47	0.00	105.05	-	-	Peak
2462	60.98	6	233	V	28.91	5.47	0.00	95.37	-	-	Ave
2462	62.76	351	162	H	29.41	5.47	0.00	97.65	-	-	Peak
2462	55.05	351	162	H	29.41	5.47	0.00	89.94	-	-	Ave
2483.5	32.18	6	233	V	28.91	5.47	0.00	66.57	74.00	-7.43	Peak
2483.5	17.29	6	233	V	28.91	5.47	0.00	51.68	54.00	-2.32	Ave
2483.5	26.87	351	162	H	29.41	5.47	0.00	61.76	74.00	-12.24	Peak
2483.5	15.24	351	162	H	29.41	5.47	0.00	50.13	54.00	-3.87	Ave
4924	52.320	118	263	V	32.61	7.93	37.85	55.01	74.00	-18.99	Peak
4924	47.570	118	263	V	32.61	7.93	37.85	50.26	54.00	-3.74	Ave
4924	52.120	112	297	H	32.72	7.93	37.85	54.92	74.00	-19.08	Peak
4924	48.110	112	297	H	32.72	7.93	37.85	50.91	54.00	-3.09	Ave
7386	46.110	252	238	V	36.31	9.86	37.62	54.65	74.00	-19.35	Peak
7386	32.980	252	238	V	36.31	9.86	37.62	41.52	54.00	-12.48	Ave
9848	45.910	354	112	V	37.18	11.59	38.38	56.30	74.00	-17.70	Peak
9848	32.420	354	112	V	37.18	11.59	38.38	42.81	54.00	-11.19	Ave

802.11nHT20 Mode

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 2412 MHz											
2412	71.03	30	242	V	28.45	5.22	0.00	104.70	-	-	Peak
2412	63.25	30	242	V	28.45	5.22	0.00	96.92	-	-	Ave
2412	65.31	339	300	H	29.04	5.22	0.00	99.57	-	-	Peak
2412	57.56	339	300	H	29.04	5.22	0.00	91.82	-	-	Ave
2390	36.23	30	242	V	28.45	5.22	0.00	69.90	74.00	-4.11	Peak
2390	19.36	30	242	V	28.45	5.22	0.00	53.03	54.00	-0.98	Ave
2390	32.76	339	300	H	29.04	5.22	0.00	67.02	74.00	-6.98	Peak
2390	16.52	339	300	H	29.04	5.22	0.00	50.78	54.00	-3.22	Ave
4824	51.56	118	273	V	32.42	7.76	38.01	53.73	74.00	-20.27	Peak
4824	46.62	118	273	V	32.42	7.76	38.01	48.79	54.00	-5.21	Ave
4824	50.85	111	277	H	32.47	7.76	38.01	53.07	74.00	-20.93	Peak
4824	45.44	111	277	H	32.47	7.76	38.01	47.66	54.00	-6.34	Ave
7236	45.64	246	257	V	36.16	9.71	37.53	53.98	74.00	-20.02	Peak
7236	32.55	246	257	V	36.16	9.71	37.53	40.89	54.00	-13.11	Ave
9648	45.85	358	116	V	37.17	11.37	38.00	56.39	74.00	-17.61	Peak
9648	33.12	358	116	V	37.17	11.37	38.00	43.66	54.00	-10.34	Ave
Middle Channel 2437 MHz											
2437	70.44	319	236	V	28.45	5.22	0.00	104.11	-	-	Peak
2437	62.67	319	236	V	28.45	5.22	0.00	96.34	-	-	Ave
2437	63.11	104	158	H	29.04	5.22	0.00	97.37	-	-	Peak
2437	53.12	104	158	H	29.04	5.22	0.00	87.38	-	-	Ave
4874	52.51	119	267	V	32.61	7.93	37.92	55.13	74.00	-18.87	Peak
4874	47.29	119	267	V	32.61	7.93	37.92	49.91	54.00	-4.09	Ave
4874	52.21	111	300	H	32.59	7.93	37.92	54.81	74.00	-19.19	Peak
4874	47.23	111	300	H	32.59	7.93	37.92	49.83	54.00	-4.17	Ave
7311	45.78	248	260	V	36.41	9.86	37.53	54.51	74.00	-19.49	Peak
7311	32.63	248	260	V	36.41	9.86	37.53	41.36	54.00	-12.64	Ave
9748	46.54	182	118	V	37.10	11.48	38.27	56.85	74.00	-17.15	Peak
9748	33	182	118	V	37.10	11.48	38.27	43.31	54.00	-10.69	Ave

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 2462 MHz											
2462	70.32	6	233	V	28.91	5.47	0.00	104.71	-	-	Peak
2462	62.48	6	233	V	28.91	5.47	0.00	96.87	-	-	Ave
2462	62.43	351	162	H	29.41	5.47	0.00	97.32	-	-	Peak
2462	54.62	351	162	H	29.41	5.47	0.00	89.51	-	-	Ave
2483.5	34.61	6	233	V	28.91	5.47	0.00	69.00	74.00	-5.00	Peak
2483.5	18.31	6	233	V	28.91	5.47	0.00	52.70	54.00	-1.30	Ave
2483.5	27.00	351	162	H	29.41	5.47	0.00	61.89	74.00	-12.11	Peak
2483.5	15.42	351	162	H	29.41	5.47	0.00	50.31	54.00	-3.69	Ave
4924	52.120	118	263	V	32.61	7.93	37.85	54.81	74.00	-19.19	Peak
4924	47.540	118	263	V	32.61	7.93	37.85	50.23	54.00	-3.77	Ave
4924	52.55	112	297	H	32.72	7.93	37.85	55.35	74.00	-18.65	Peak
4924	48.05	112	297	H	32.72	7.93	37.85	50.85	54.00	-3.15	Ave
7386	46.130	252	238	V	36.31	9.86	37.62	54.67	74.00	-19.33	Peak
7386	33.040	252	238	V	36.31	9.86	37.62	41.58	54.00	-12.42	Ave
9848	45.730	354	112	V	37.18	11.59	38.38	56.12	74.00	-17.88	Peak
9848	32.460	354	112	V	37.18	11.59	38.38	42.85	54.00	-11.15	Ave

FCC §2.1051, §15.247(d) & ISED RSS-247 §5.5 – Spurious Emissions at Antenna Terminals

Applicable Standards

According to FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

For RSS-247 §5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure

The measurements are based on ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Signal Analyzer	FSQ26	200749	2016-04-07	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	10 dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	44 %
ATM Pressure:	102.3 kPa

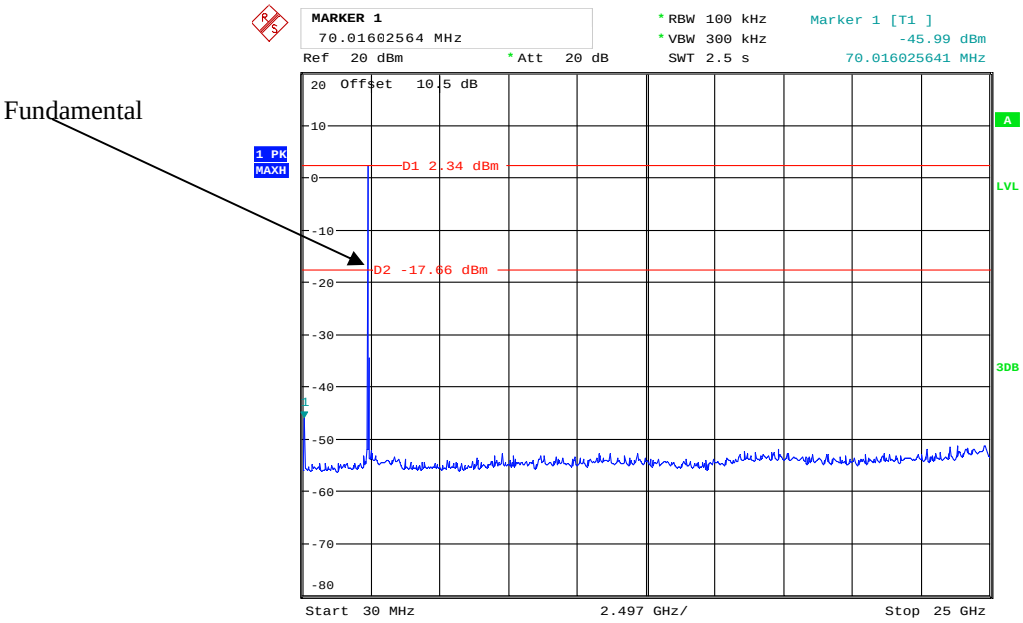
The testing was performed by Jin Yang on 2016-07-07 at RF site.

Test Results

Compliant, please refer to the following plots

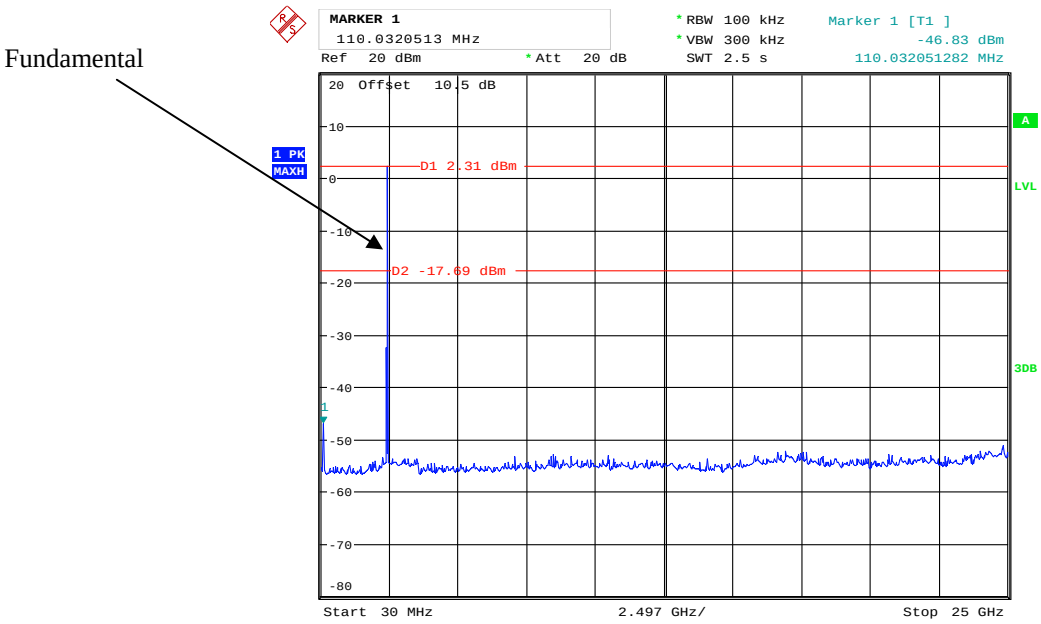
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



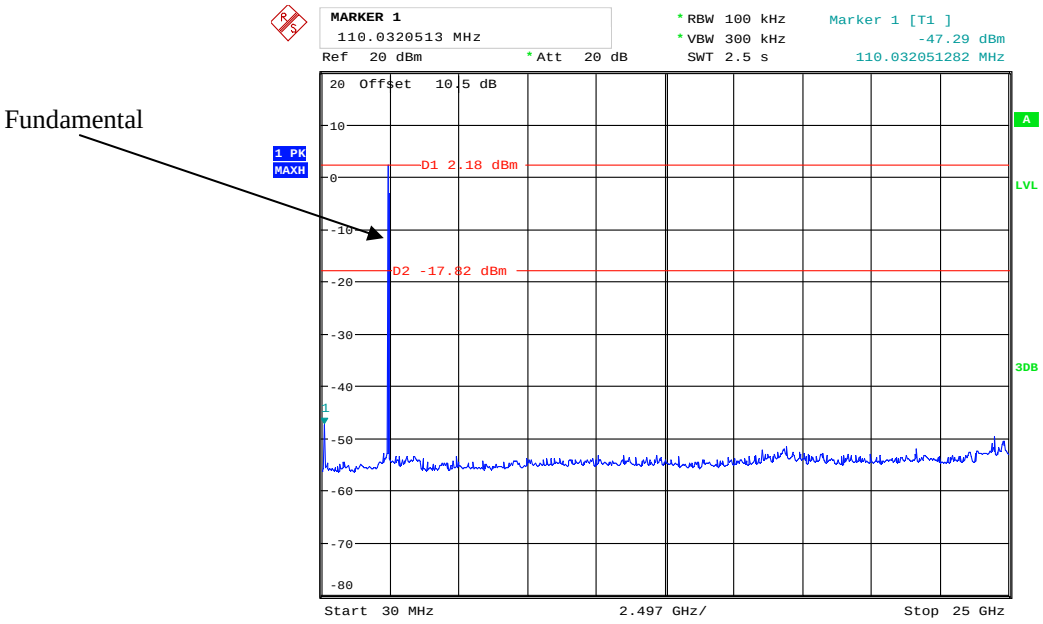
Date: 7.JUL.2016 07:51:27

802.11b Middle Channel



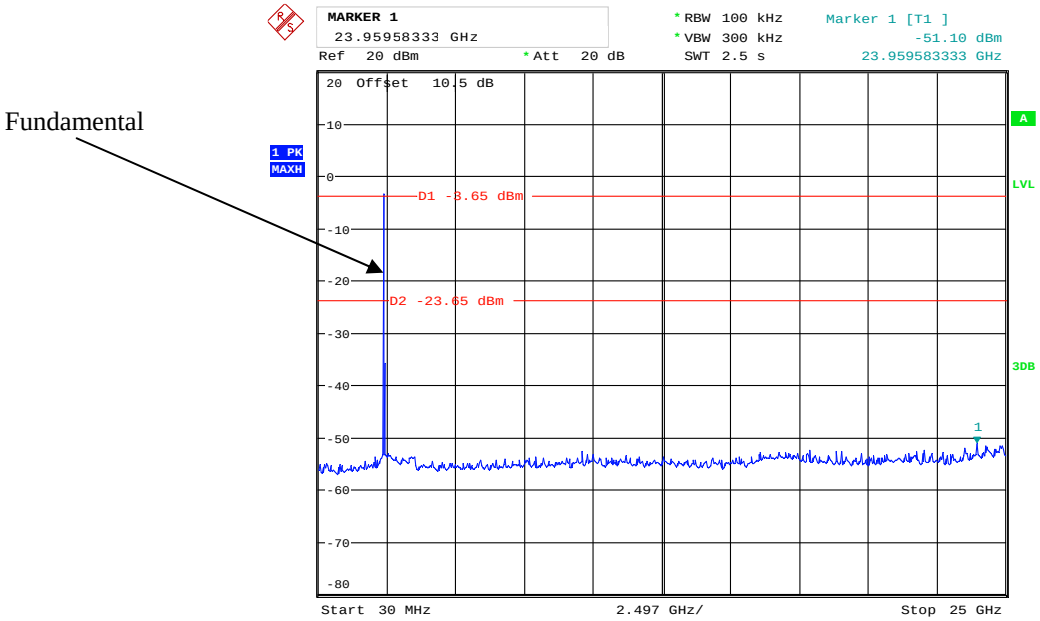
Date: 7.JUL.2016 07:52:54

802.11b High Channel



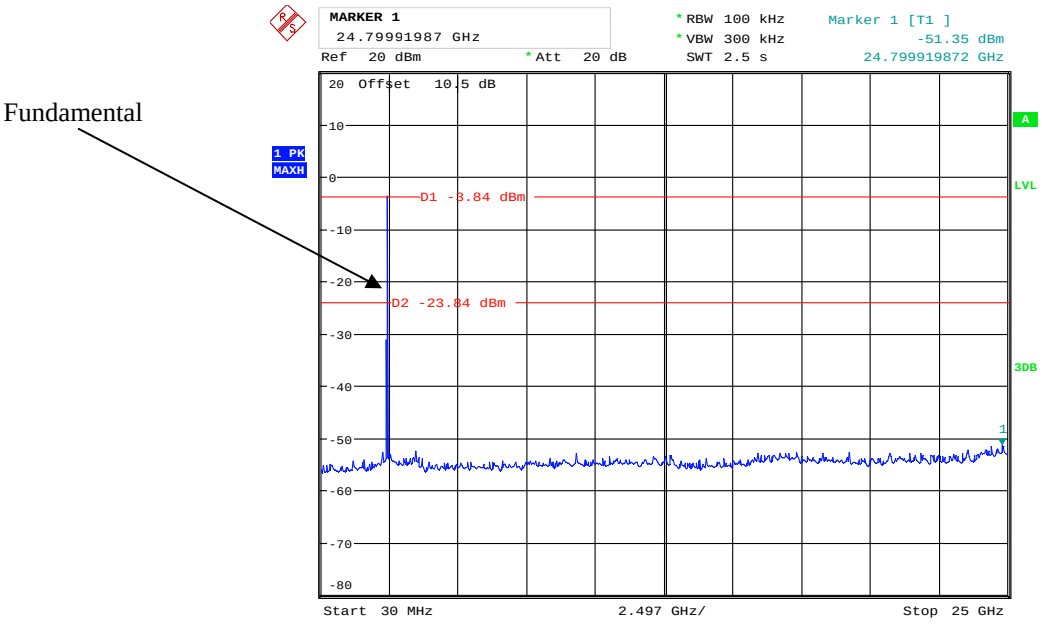
Date: 7.JUL.2016 07:54:28

802.11g Low Channel



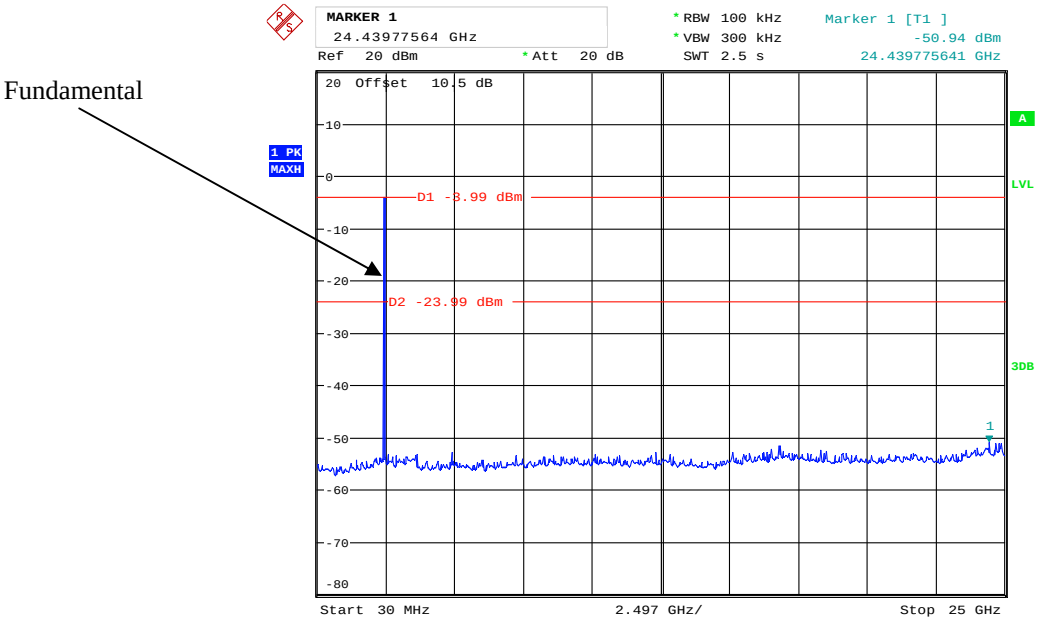
Date: 7.JUL.2016 07:55:39

802.11g Middle Channel



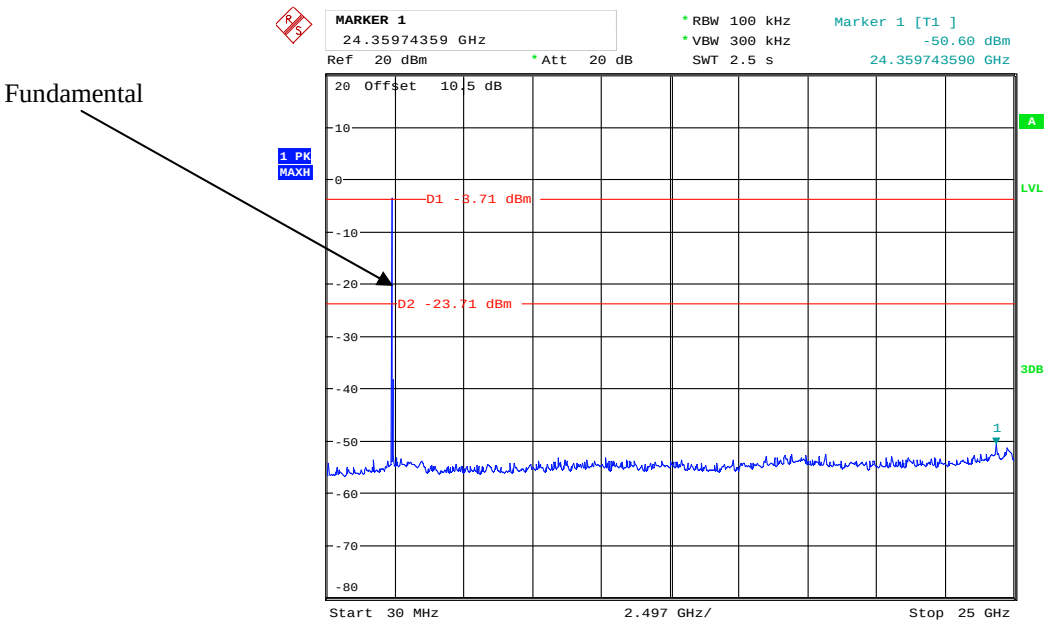
Date: 7.JUL.2016 07:56:51

802.11g High Channel

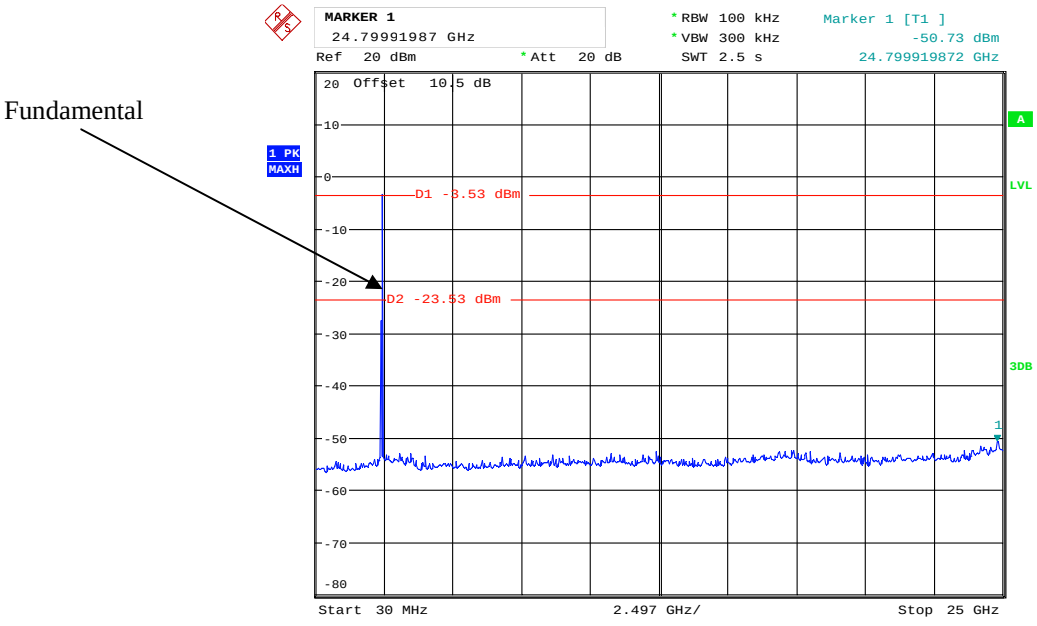


Date: 7.JUL.2016 08:02:09

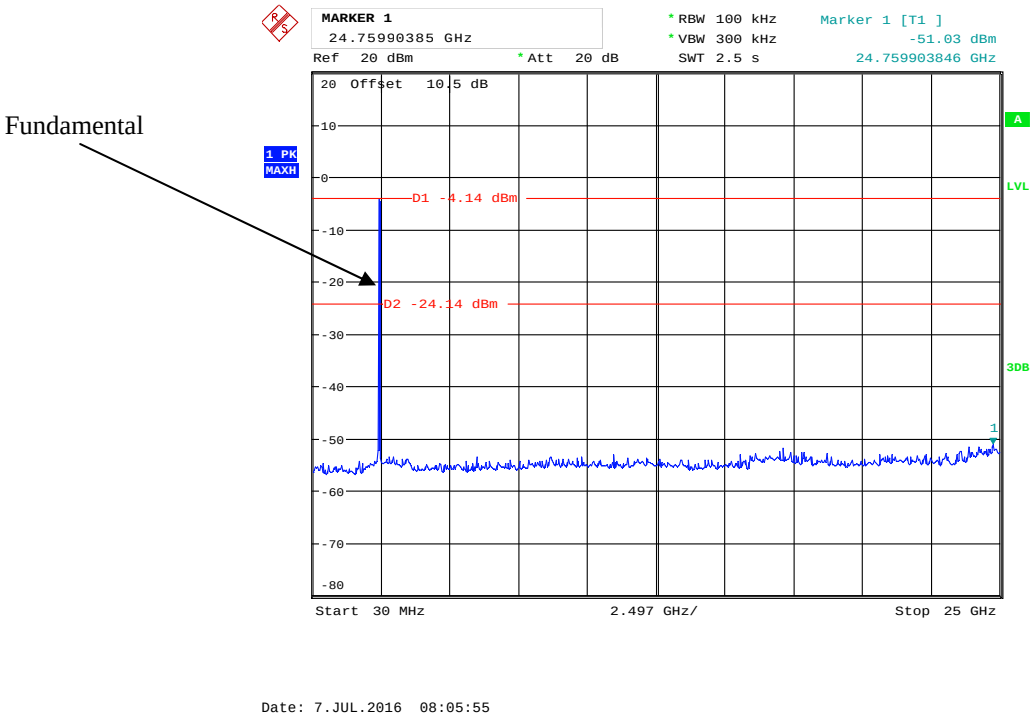
802.11nHT20 Low Channel



802.11nHT20 Middle Channel



802.11nHT20 High Channel



FCC §15.247(a)(2) & ISED RSS-247 §5.2, RSS-Gen §6.6 – Emission Bandwidth

Applicable Standards

According to FCC §15.247(a)(2), systems using digital modulation techniques may operate in the 902~928 MHz, 2400~2483.5 MHz, and 5725~5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

According to ISED RSS-247 5.2 (1), DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The minimum 6 dB bandwidth shall be 500 kHz for bands 902 -928 MHz and 2400 – 2483.5 MHz.

Measurement Procedure

The measurements are based on ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Signal Analyzer	FSQ26	200749	2016-04-07	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	10 dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	44 %
ATM Pressure:	102.3 kPa

The testing was performed by Jin Yang on 2016-07-07 at RF site.

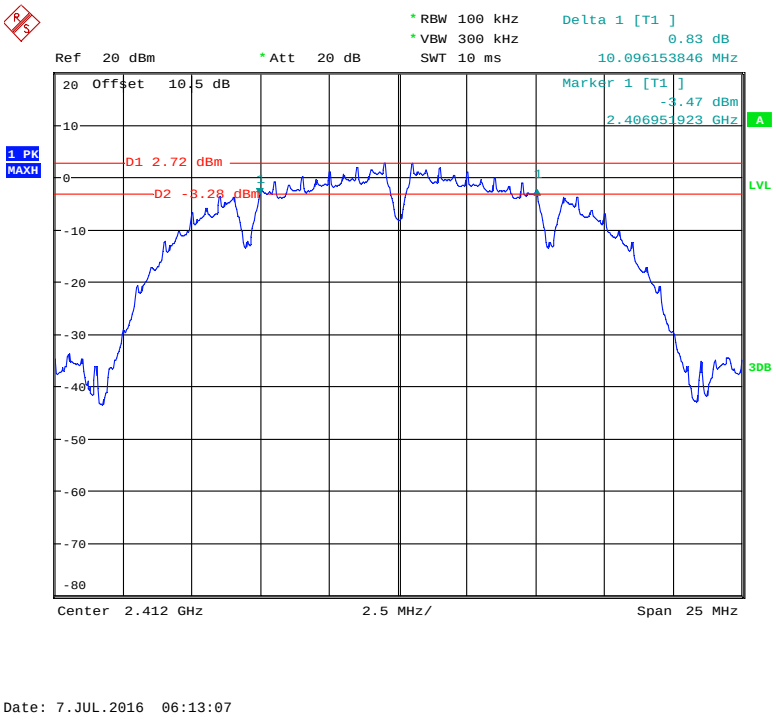
Test Results

Compliant, Please refer to the following table and plots

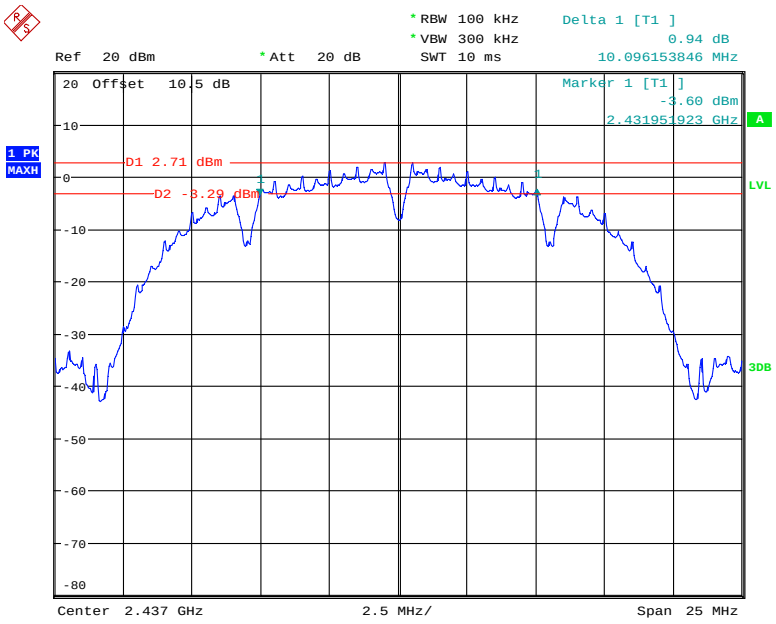
Radio Mode	Channel	Frequency (MHz)	99% OBW (MHz)	6 dB OBW (MHz)	Limit (MHz)
802.11b	Low	2412	16.15	10.10	⩾0.5
	Middle	2437	16.15	10.10	⩾0.5
	High	2462	16.15	10.10	⩾0.5
802.11g	Low	2412	16.67	16.44	⩾0.5
	Middle	2437	16.71	16.44	⩾0.5
	High	2462	16.71	16.44	⩾0.5
802.11n20	Low	2412	17.35	17.16	⩾0.5
	Middle	2437	17.35	17.16	⩾0.5
	High	2462	17.35	17.07	⩾0.5

6 dB Emission Bandwidth

802.11b Low Channel

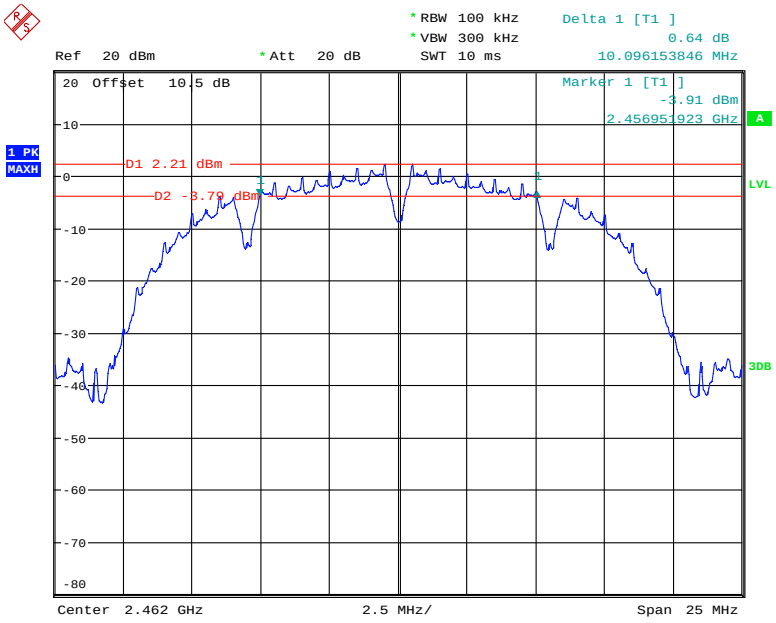


802.11b Middle Channel



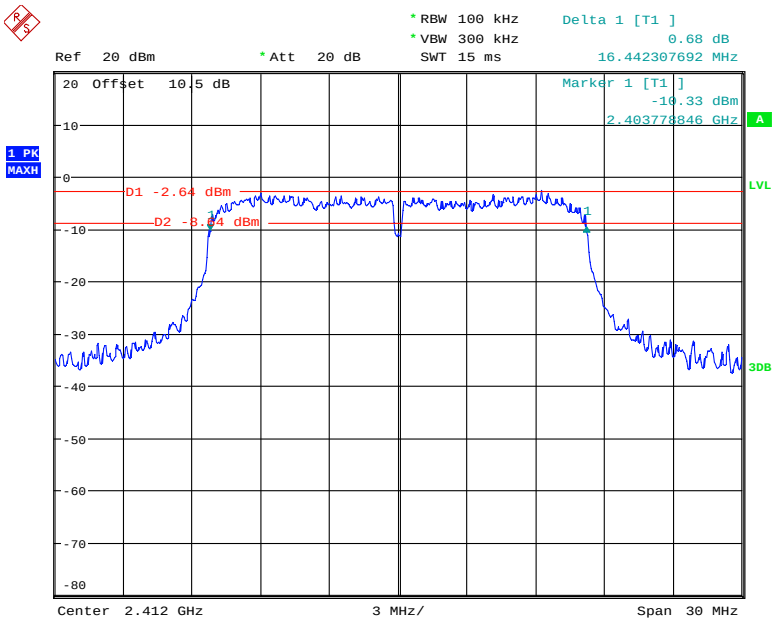
Date: 7.JUL.2016 06:18:55

802.11b High Channel



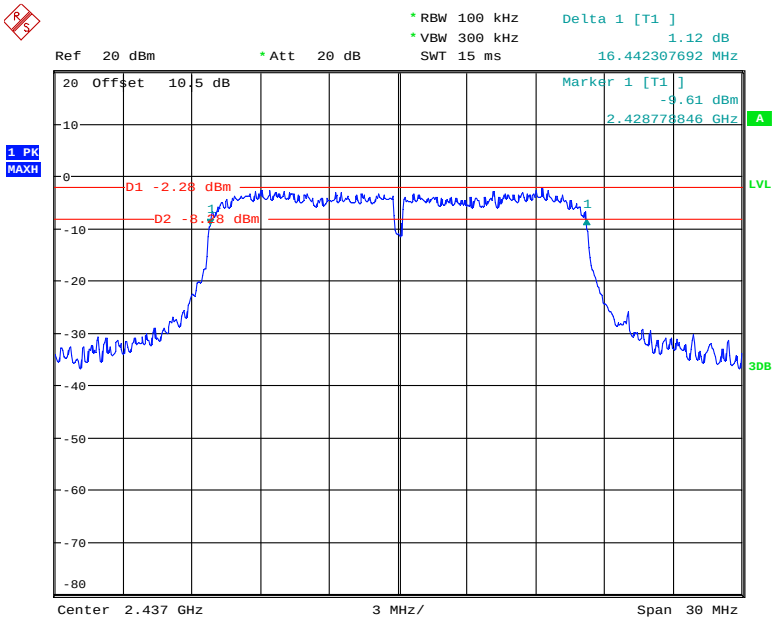
Date: 7.JUL.2016 06:21:42

802.11g Low Channel



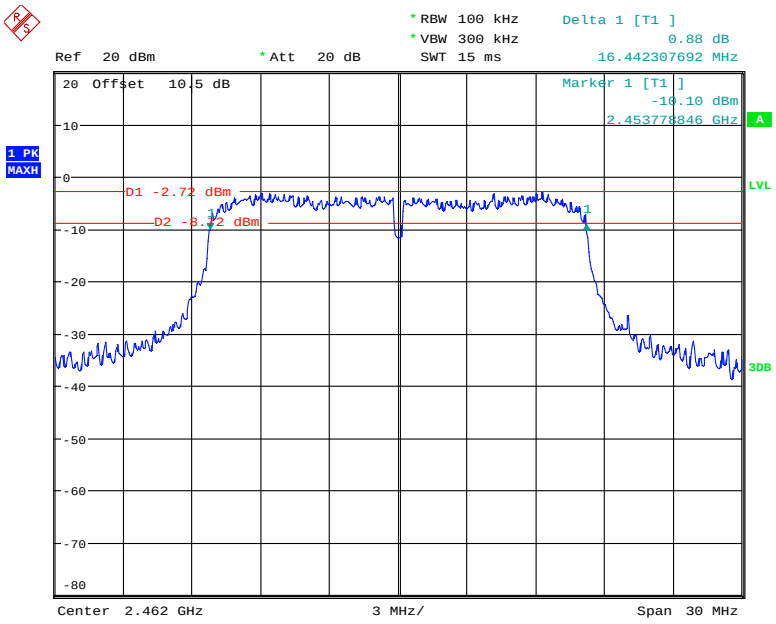
Date: 7.JUL.2016 06:25:05

802.11g Middle Channel



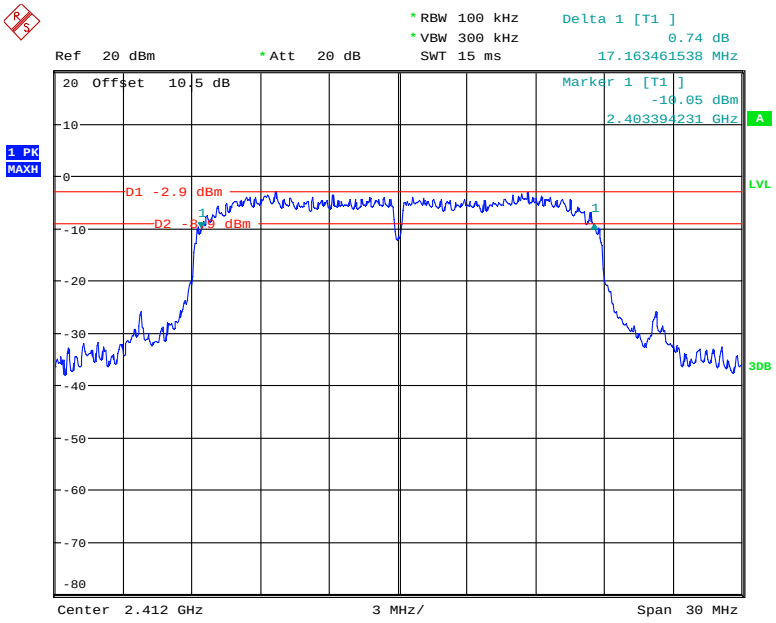
Date: 7.JUL.2016 06:27:14

802.11g High Channel



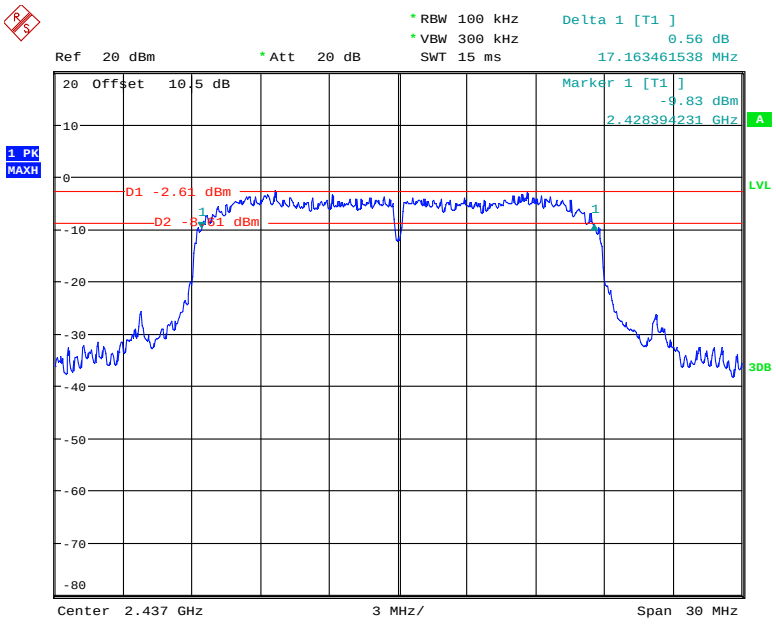
Date: 7.JUL.2016 06:28:54

802.11nHT20 Low Channel



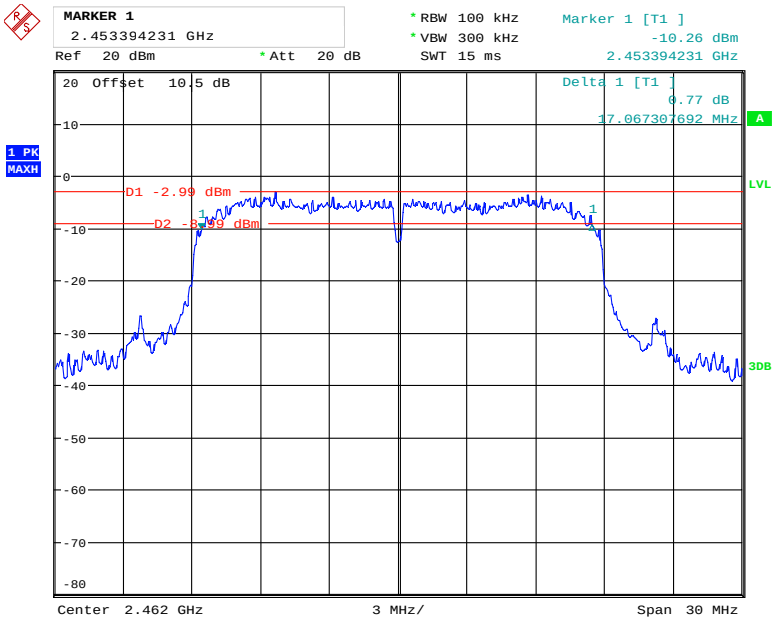
Date: 7.JUL.2016 06:34:15

802.11nHT20 Middle Channel



Date: 7.JUL.2016 06:38:05

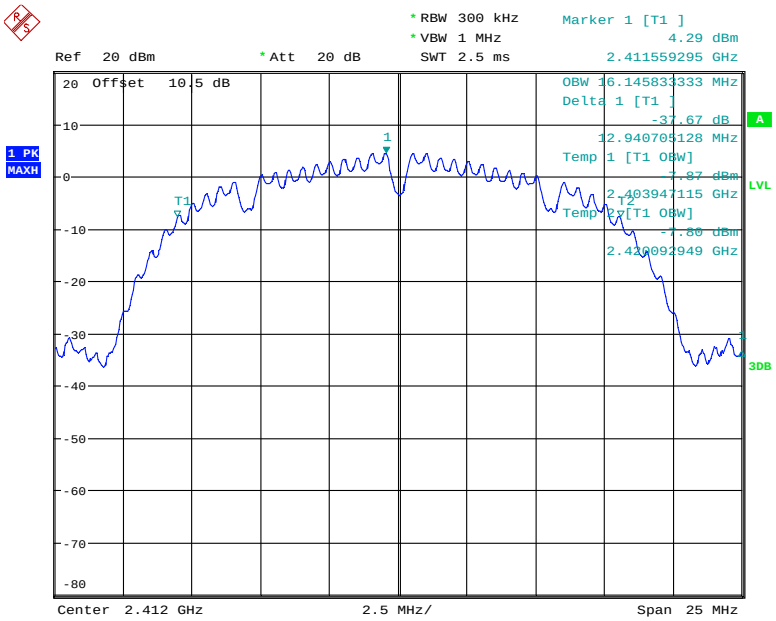
802.11nHT20 High Channel



Date: 7.JUL.2016 06:49:09

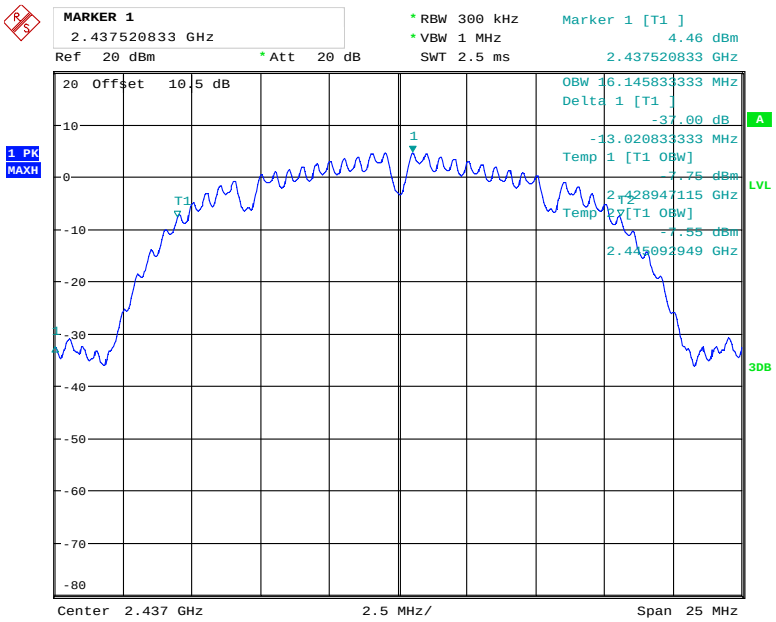
99% Occupied Bandwidth

802.11b Low Channel



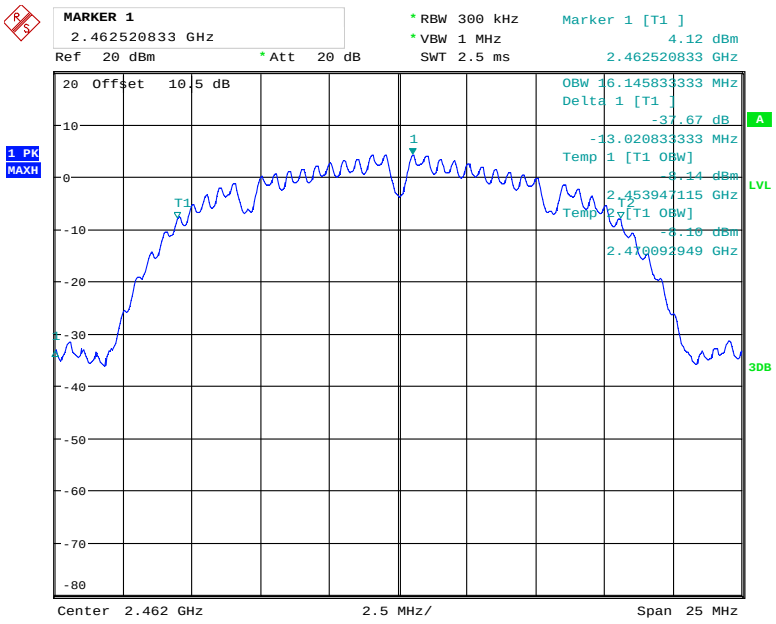
Date: 7.JUL.2016 06:58:20

802.11b Middle Channel



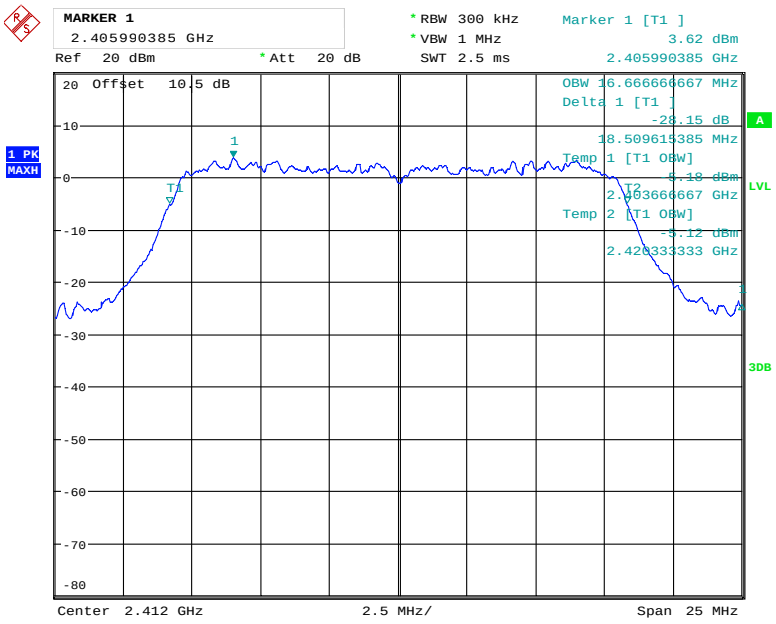
Date: 7.JUL.2016 06:57:01

802.11b High Channel



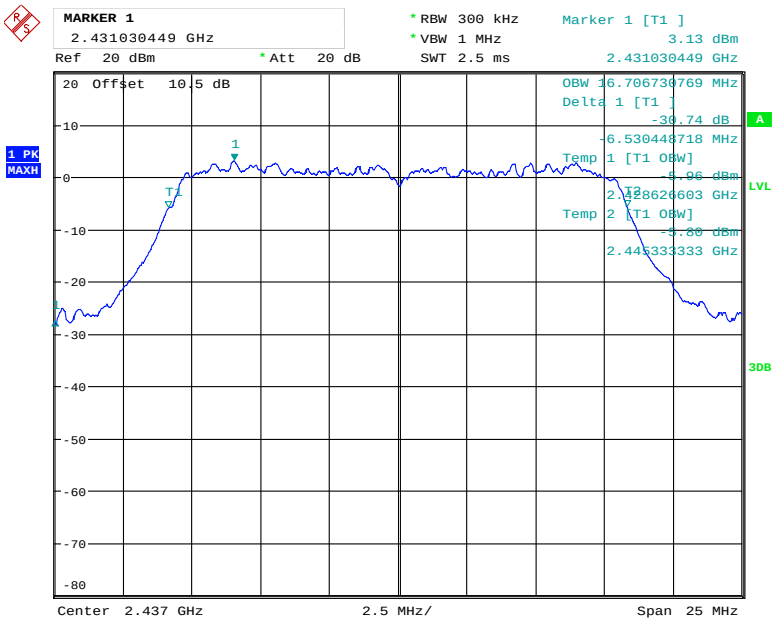
Date: 7.JUL.2016 06:59:28

802.11g Low Channel



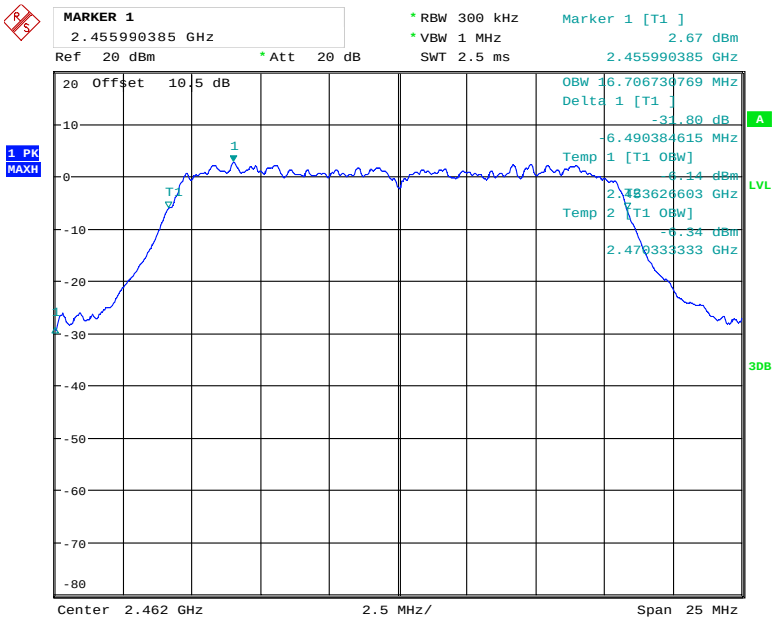
Date: 7.JUL.2016 07:43:15

802.11g Middle Channel



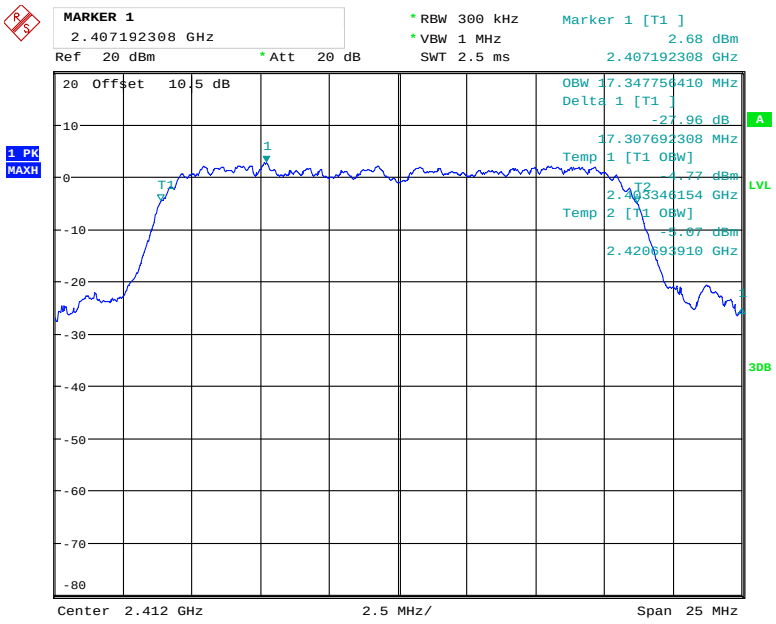
Date: 7.JUL.2016 07:44:24

802.11g High Channel



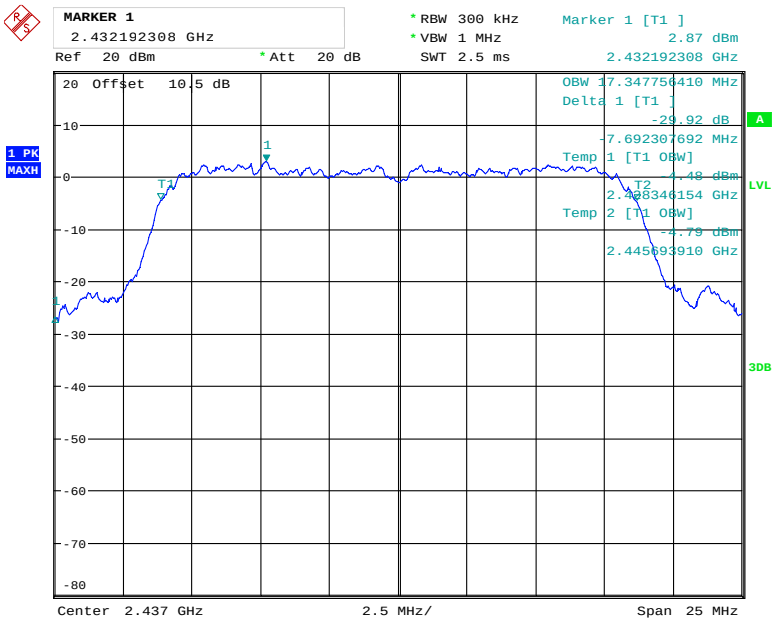
Date: 7.JUL.2016 07:45:23

802.11nHT20 Low Channel



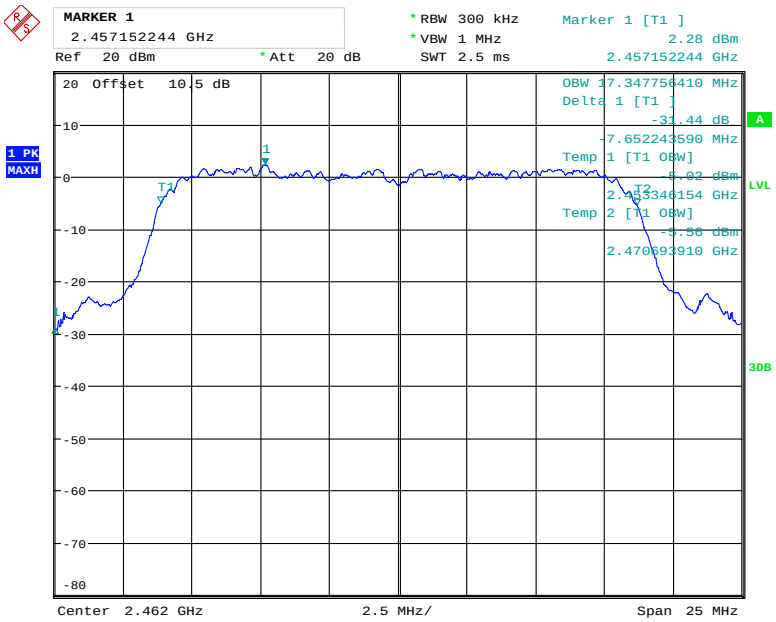
Date: 7.JUL.2016 07:46:18

802.11nHT20 Middle Channel



Date: 7.JUL.2016 07:47:24

802.11nHT20 High Channel



Date: 7.JUL.2016 07:48:19

FCC §15.247(b) & ISED RSS-247 §5.4 - Output Power Measurement

Applicable Standards

According to FCC §15.247(b) for systems using digital modulation in the 902~928 MHz, 2400~2483.5 MHz, and 5725~5850 MHz bands: 1 Watt.

According to RSS-247 §5.4 (4), for DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

Measurement Procedure

The measurements are based on ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Signal Analyzer	FSQ26	200749	2016-04-07	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	10 dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	44 %
ATM Pressure:	102.3 kPa

The testing was performed by Jin Yang on 2016-07-07 at RF site.

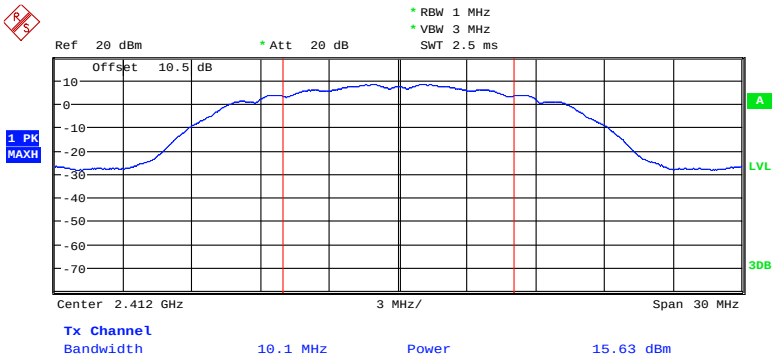
Test Results

Compliant, Please refer to the following table and plots

Radio mode	Channel	Frequency (MHz)	Conducted Output Power (dBm)		Limit (dBm)
			Peak	Average	
802.11b	Low	2412	15.63	13.23	30
	Middle	2437	15.30	12.97	30
	High	2462	15.11	12.90	30
802.11g	Low	2412	18.91	11.55	30
	Middle	2437	18.58	11.35	30
	High	2462	18.20	11.11	30
802.11n20	Low	2412	19.39	11.28	30
	Middle	2437	19.43	11.18	30
	High	2462	19.07	10.80	30

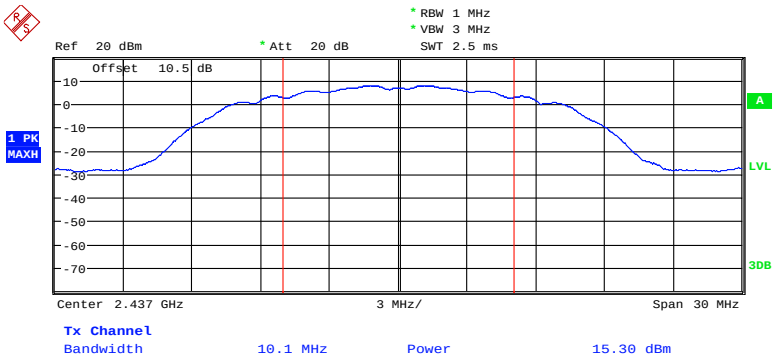
Max Peak Conducted Output Power

802.11b Low Channel



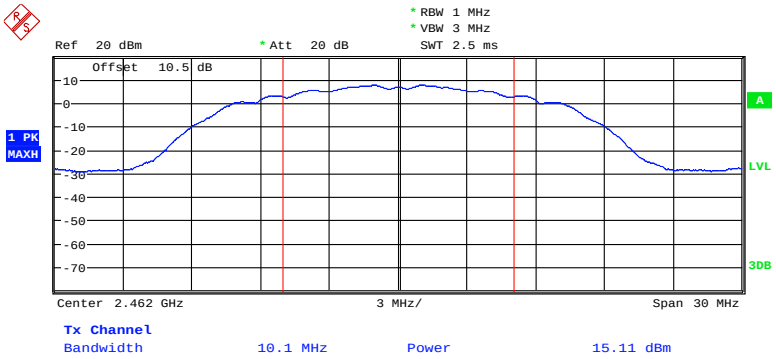
Date: 7.JUL.2016 09:01:13

802.11b Middle Channel



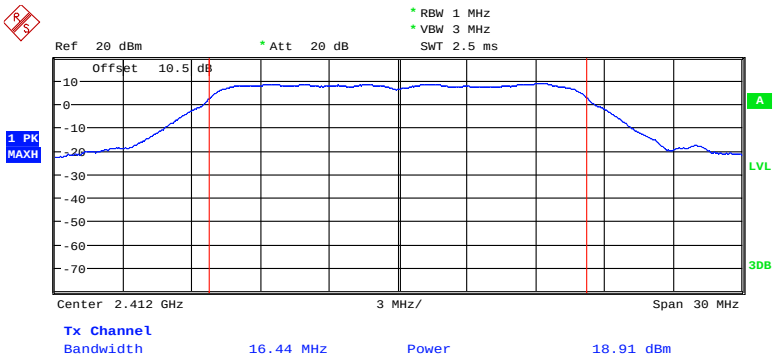
Date: 7.JUL.2016 09:02:55

802.11b High Channel



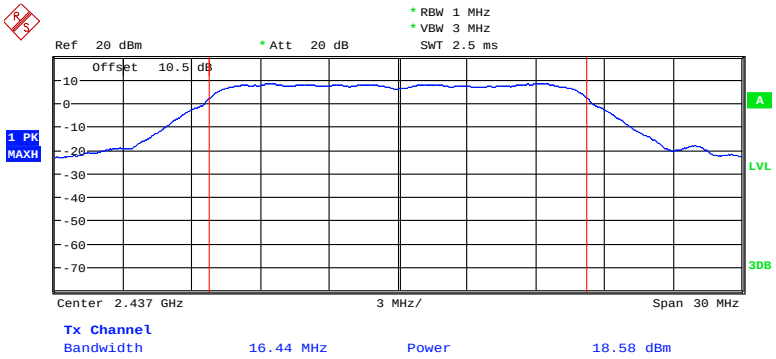
Date: 7.JUL.2016 09:03:55

802.11g Low Channel



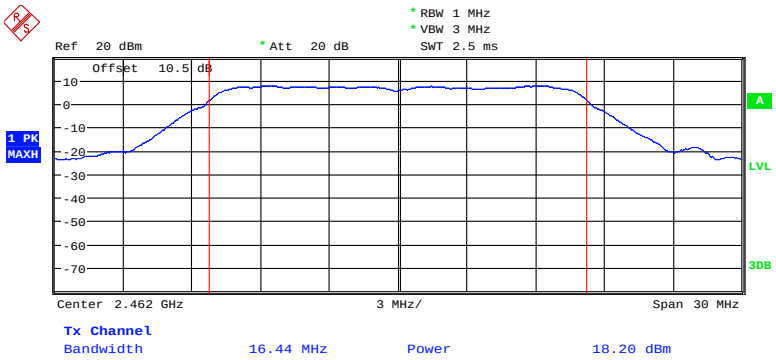
Date: 7.JUL.2016 09:05:33

802.11g Middle Channel



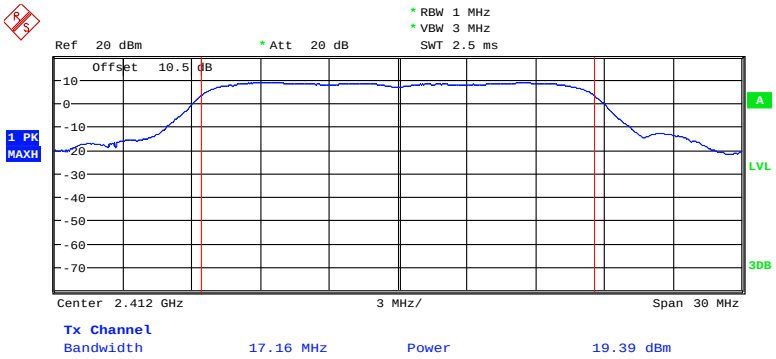
Date: 7.JUL.2016 09:06:48

802.11g High Channel



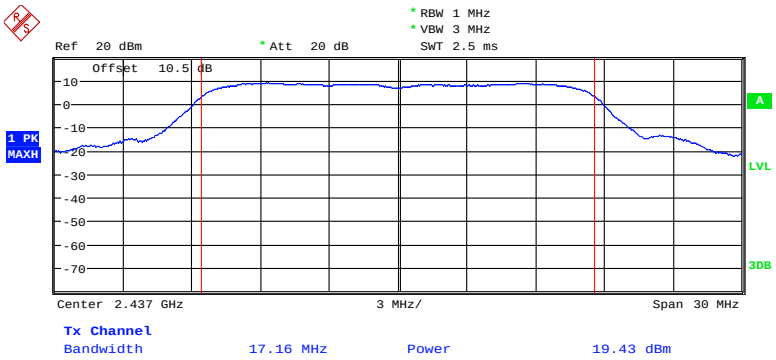
Date: 7.JUL.2016 09:08:19

802.11nHT20 Low Channel



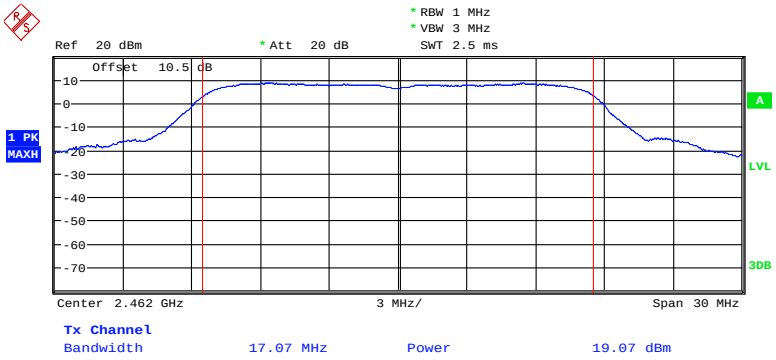
Date: 7.JUL.2016 10:16:58

802.11nHT20 Middle Channel



Date: 7.JUL.2016 10:18:25

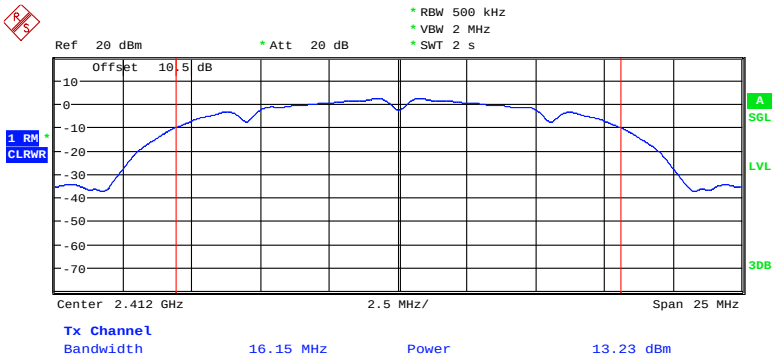
802.11nHT20 High Channel



Date: 7.JUL.2016 10:20:12

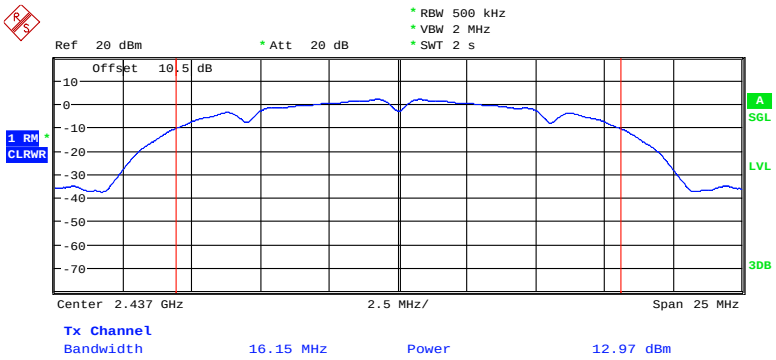
Max Conducted Average Output Power

802.11b Low Channel



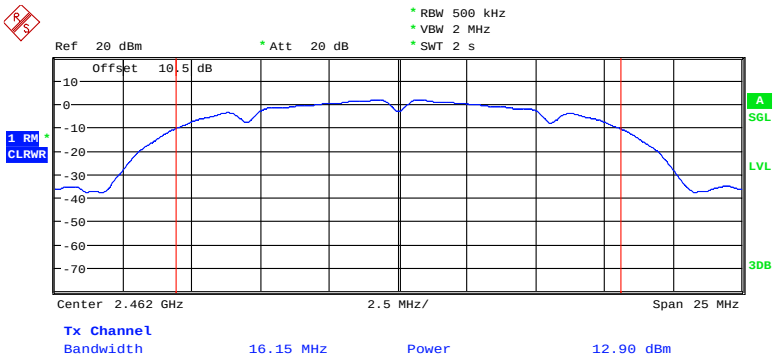
Date: 7.JUL.2016 09:17:41

802.11b Middle Channel



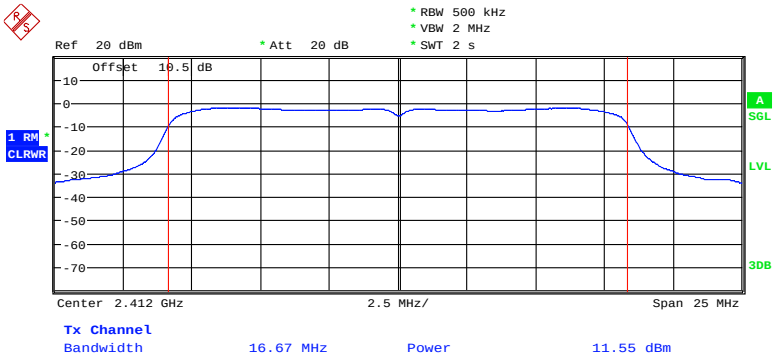
Date: 7.JUL.2016 09:19:43

802.11b High Channel



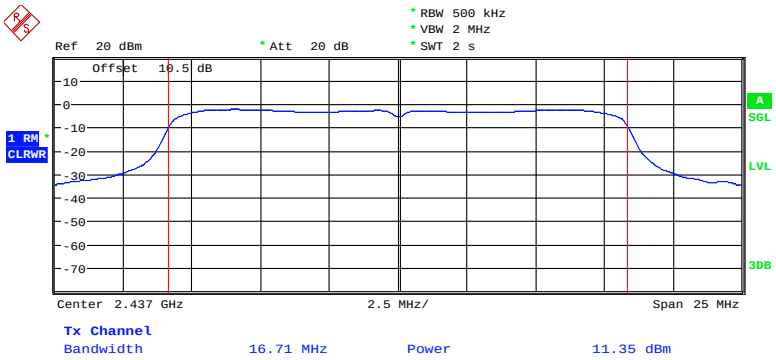
Date: 7.JUL.2016 09:21:08

802.11g Low Channel



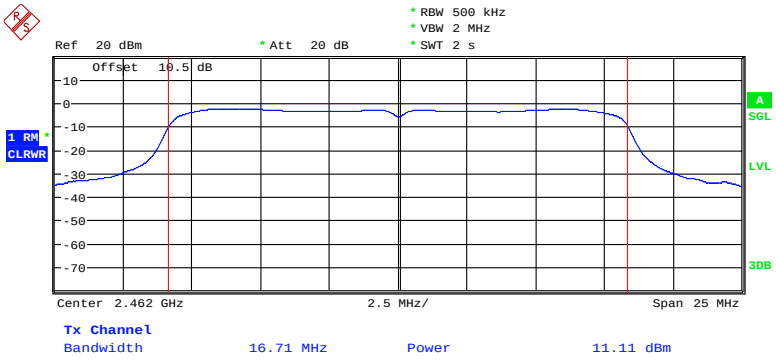
Date: 7.JUL.2016 09:22:48

802.11g Middle Channel



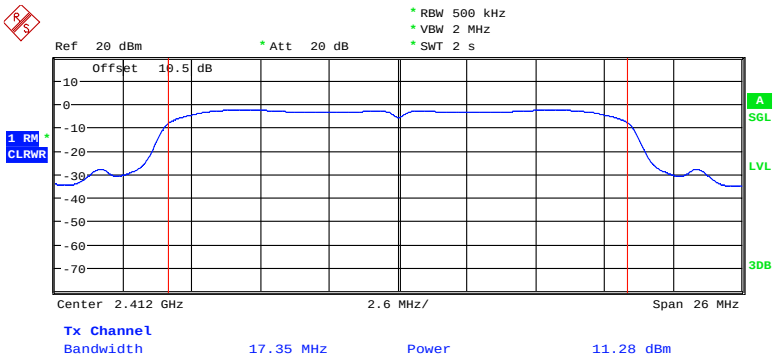
Date: 7.JUL.2016 09:25:59

802.11g High Channel



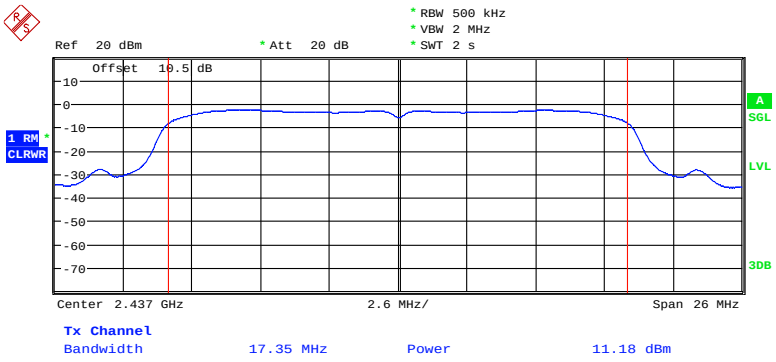
Date: 7.JUL.2016 09:27:06

802.11nHT20 Low Channel



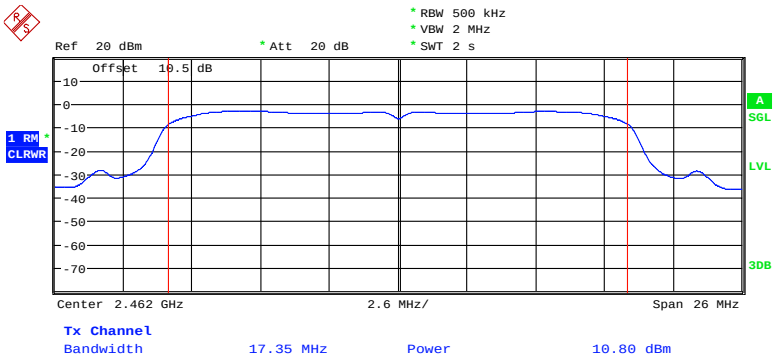
Date: 7.JUL.2016 09:28:51

802.11nHT20 Middle Channel



Date: 7.JUL.2016 09:29:49

802.11nHT20 High Channel



Date: 7.JUL.2016 09:31:54

FCC §15.247(d) & ISED RSS-247 §5.5 - 100 kHz Bandwidth of Band Edges

Applicable Standards

According to FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

For RSS-247 §5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Measurement Procedure

The measurements are based on ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Signal Analyzer	FSQ26	200749	2016-04-07	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	10 dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

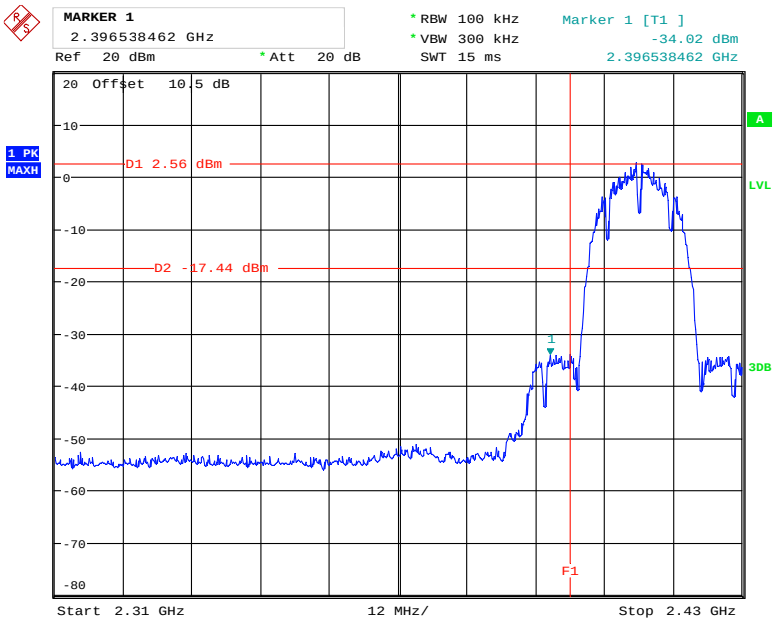
Temperature:	24º C
Relative Humidity:	44 %
ATM Pressure:	102.3 kPa

The testing was performed by Jin Yang on 2016-07-07 at RF site.

Test Results

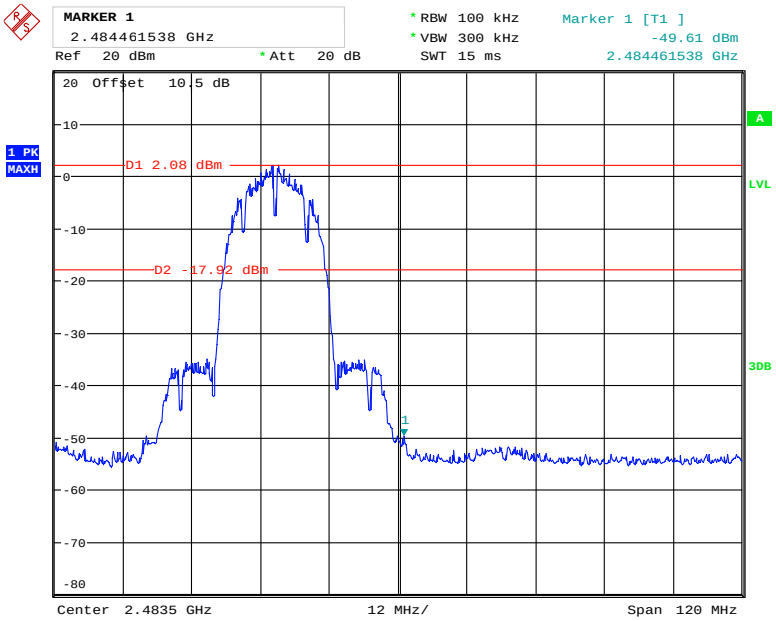
Compliant, Please refer to following plots.

802.11b: Band Edge, Left Side



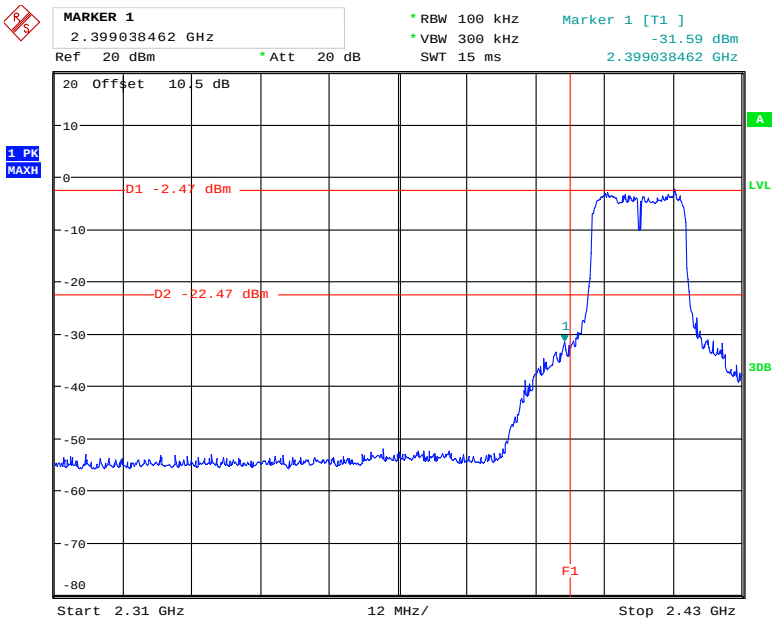
Date: 7.JUL.2016 08:27:32

802.11b: Band Edge, Right Side



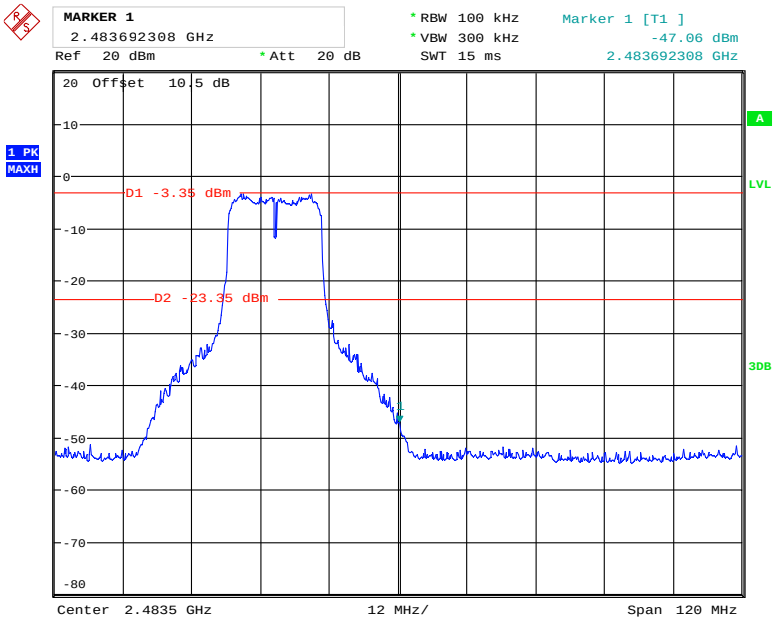
Date: 7.JUL.2016 08:36:51

802.11g: Band Edge, Left Side



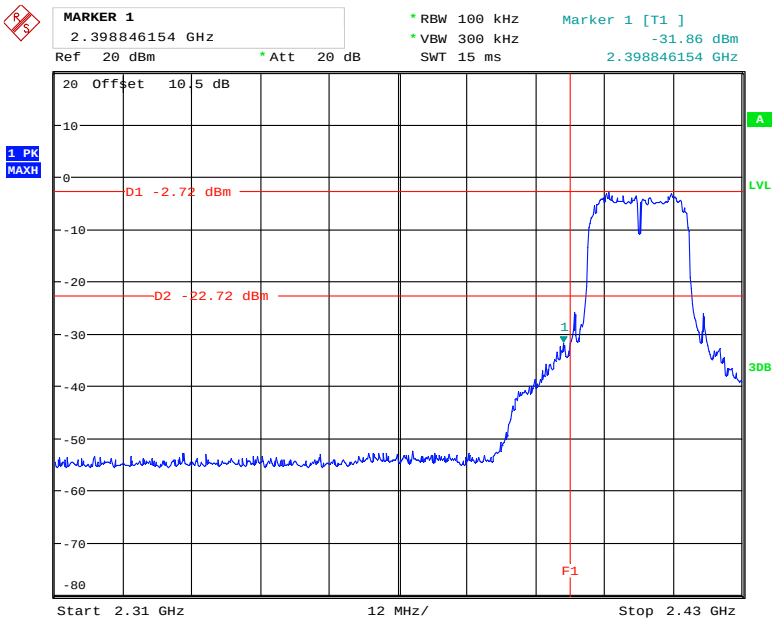
Date: 7.JUL.2016 08:28:54

802.11g: Band Edge, Right Side



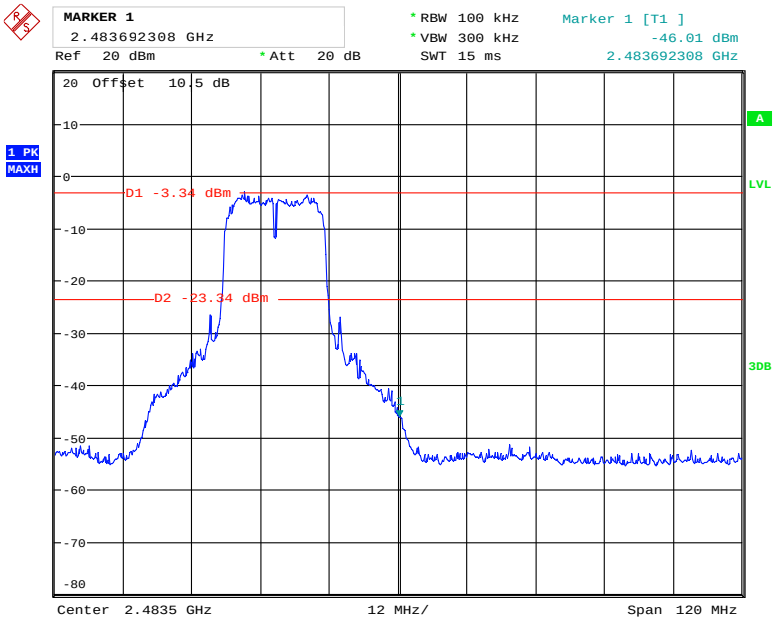
Date: 7.JUL.2016 08:35:31

802.11nHT20 Band Edge, Left Side



Date: 7.JUL.2016 08:31:03

802.11nHT20 Band Edge, Right Side



Date: 7.JUL.2016 08:38:49

FCC §15.247(e) & ISED RSS-247 §5.2 – Power Spectral Density

Applicable Standards

According to FCC §15.247(e), 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.

According to ISED RSS-247 §5.2(2), DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400- 2483.5 MHz1 : The transmitter power spectral density conducted from the transmitter 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 Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

Measurement Procedure

The measurements are based on ANSI C63.10-2013 and FCC KDB 558074 D01 DTS Meas Guidance v03r05.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde & Schwarz	Signal Analyzer	FSQ26	200749	2016-04-07	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	10 dB attenuator	-	-	Each time[1]	N/A

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

Test Environmental Conditions

Temperature:	24º C
Relative Humidity:	44 %
ATM Pressure:	102.3 kPa

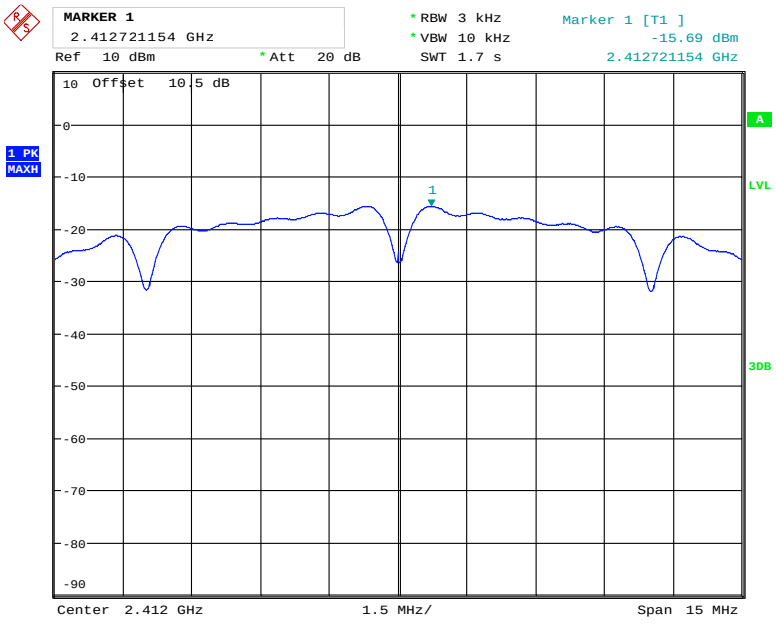
The testing was performed by Jin Yang on 2016-07-07 at RF site.

Test Results

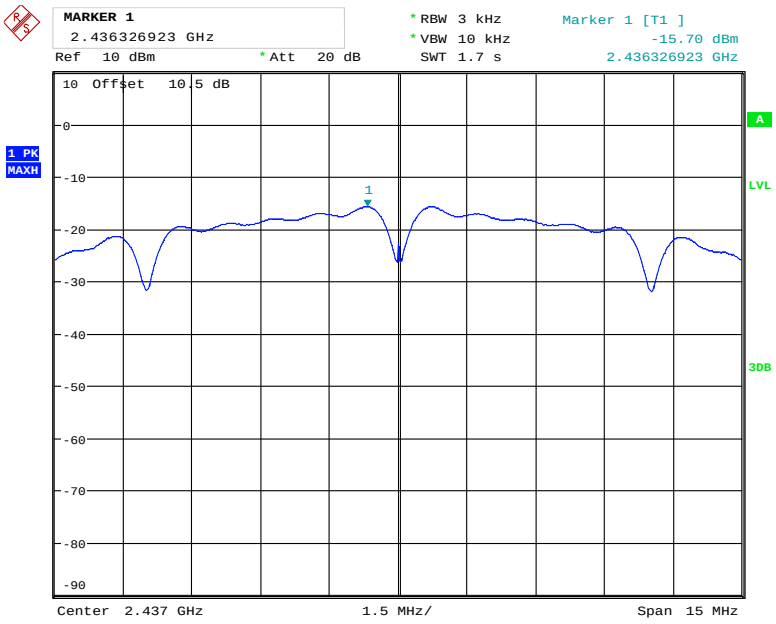
Compliant, Please refer to the following table and plots

Radio mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	Low	2412	-15.69	⩽8
	Middle	2437	-15.70	⩽8
	High	2462	-15.96	⩽8
802.11g	Low	2412	-16.52	⩽8
	Middle	2437	-17.05	⩽8
	High	2462	-17.53	⩽8
802.11n20	Low	2412	-16.00	⩽8
	Middle	2437	-16.10	⩽8
	High	2462	-16.49	⩽8

Power Spectral Density, 802.11b Low Channel

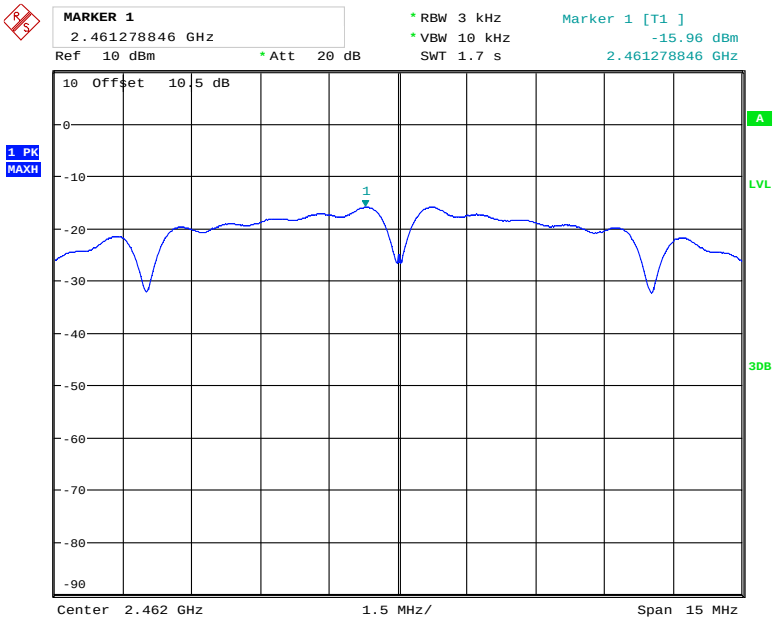


Power Spectral Density, 802.11b Middle Channel



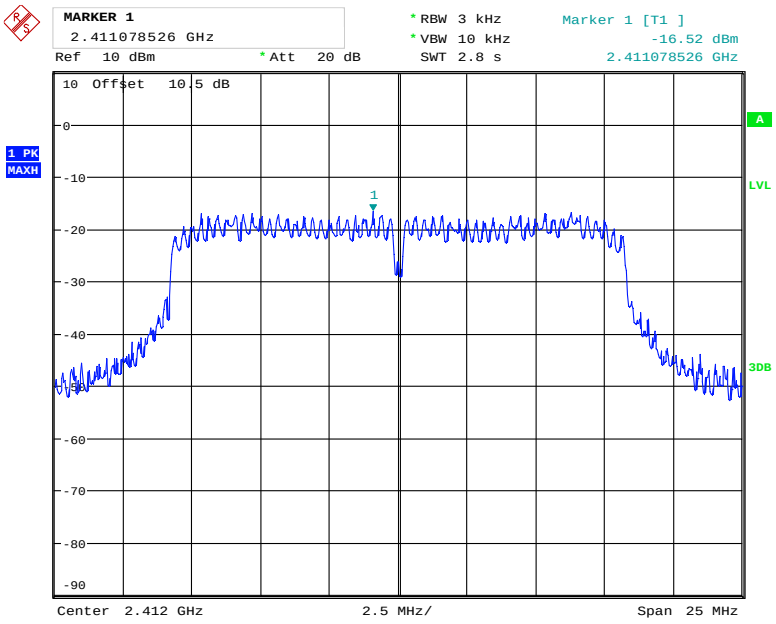
Date: 7.JUL.2016 08:14:36

Power Spectral Density, 802.11b High Channel



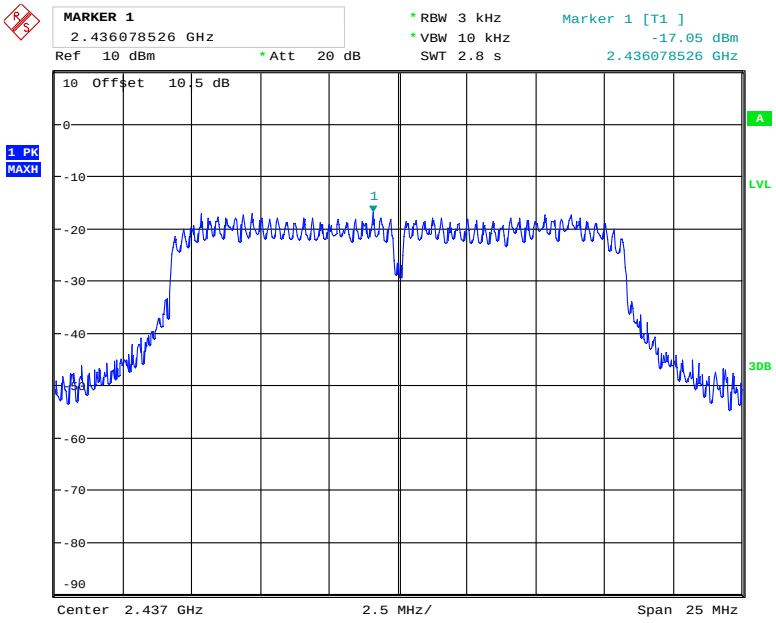
Date: 7.JUL.2016 08:15:41

Power Spectral Density, 802.11g Low Channel



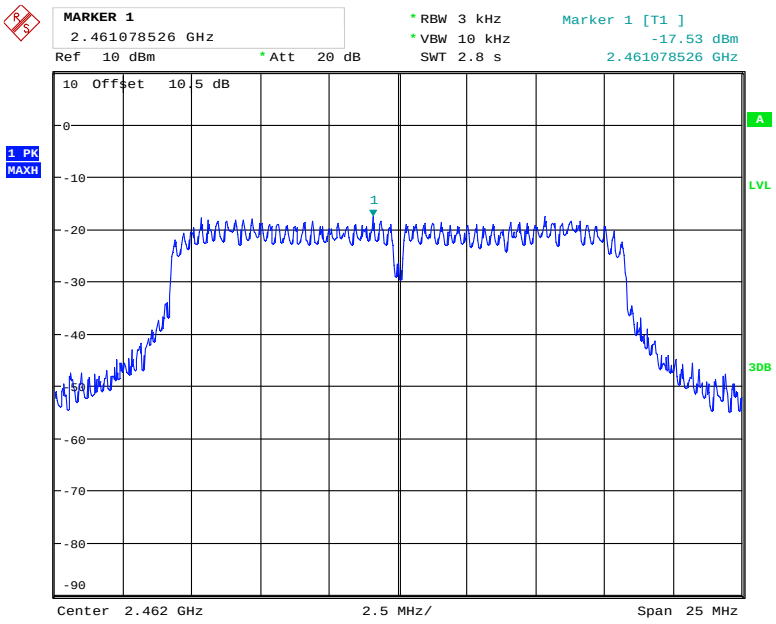
Date: 7.JUL.2016 08:17:28

Power Spectral Density, 802.11g Middle Channel



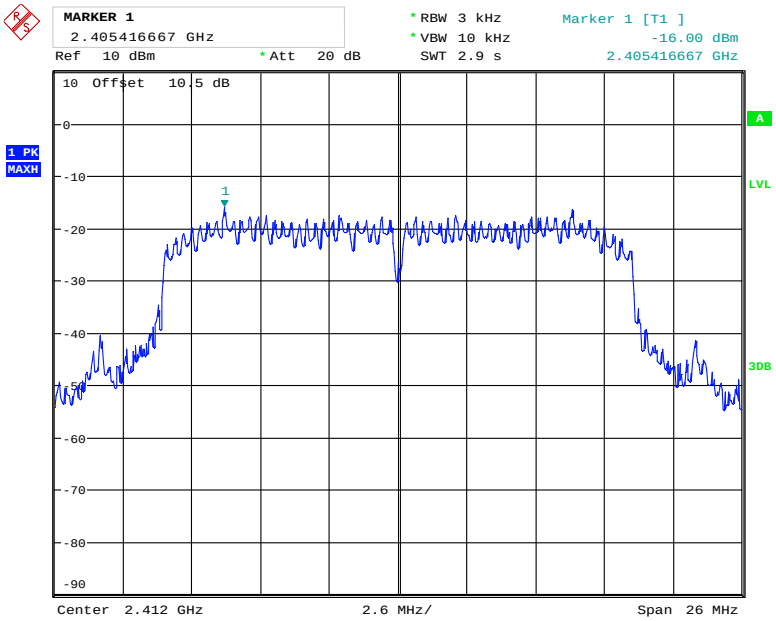
Date: 7.JUL.2016 08:19:12

Power Spectral Density, 802.11g High Channel



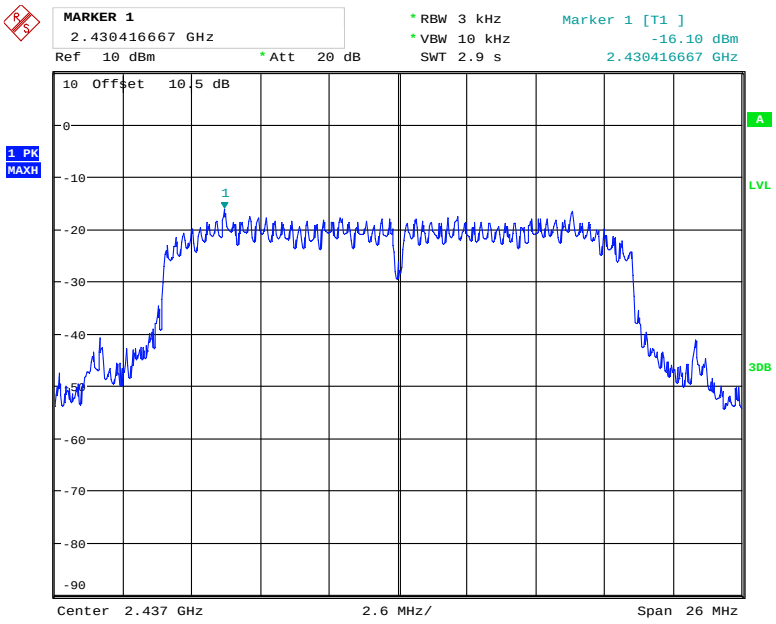
Date: 7.JUL.2016 08:20:10

Power Spectral Density, 802.11nHT20 Low Channel



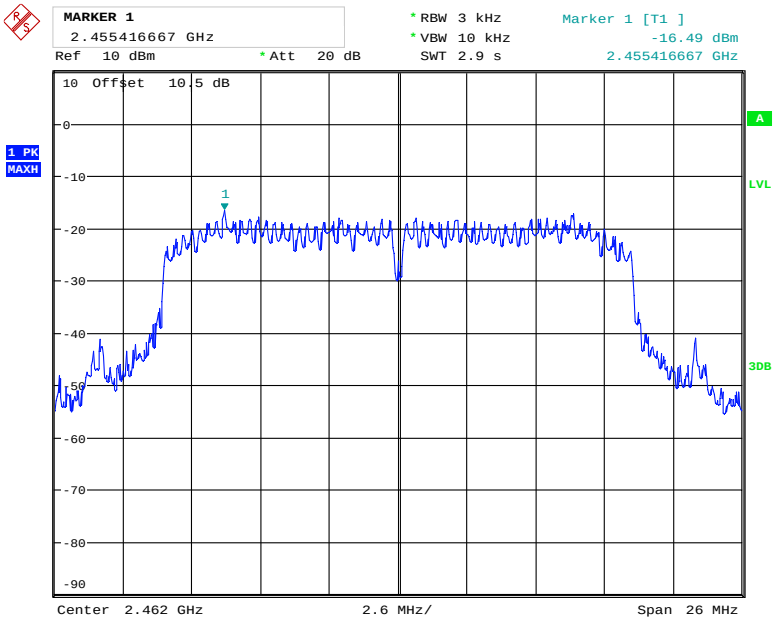
Date: 7.JUL.2016 08:21:55

Power Spectral Density, 802.11nHT20 Middle Channel



Date: 7.JUL.2016 08:23:11

Power Spectral Density, 802.11nHT20 High Channel



Date: 7.JUL.2016 08:24:50