FCC PART 15.247

TEST REPORT

For

Chengdu Vantron Technology, Ltd.

No.5 GaoPeng Road, Hi-Tech Zone, Chengdu,
SiChuan, P.R. China 610045

FCC ID: 2AAGEVTM2M-LV

Report Type:	**Product Name:**
Original Report	M2M Gateway

Test Engineer:	Kevin Tao
Report Number:	RSC150128002
Report Date:	2015-02-09
Reviewed By:	Harry Wu Technical Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Chengdu Vantron Technology, Ltd.*'s product, model number: *VT-M2M-LV (FCC ID: 2AAGEVTM2M-LV)* (the "EUT") in this report was the M2M Gateway, which was measured approximately: 170 mm L x 130 mm W x 50 mm H, rated input voltage: DC 12V.

Adapter 1:
Manufacturer: Anthin
Model: API315-1212
Input: AC 100--240V, 50/60Hz, 0.3A
Output: DC 12V, 1.25A

Adapter 2:
Model: ZF120A-1203000
Input: AC 100--240V, 50/60Hz, 1.2A MAX
Output: DC 12V, 3.0A

**All measurement and test data in this report were gathered from final production sample, serial number: V14498-007 (provided by Applicant). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2015-01-27, and EUT complied with test requirement.*

Objective

This report is prepared on behalf of *Chengdu Vantron Technology, Ltd.* accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions 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 submissions with FCC ID: 2AAGEVTM2M-LV.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

The uncertainty of any RF tests which use conducted method measurement is ±3.17 dB, the uncertainty of any radiation on emissions measurement is:

30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G-6GHz:: ±5.13 dB；
6G~25GHz: ±5.47 dB；

And the uncertainty will not be taken into consideration for all test data recorded in the report.

Test Facility

The test site used by BACL to collect test data is located in the 5040, HuiLongWan Plaza, No. 1, ShaWan Road, JinNiu District, ChengDu, China

Test site at BACL has been fully described in reports submitted to the Federal Communication 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 July 31, 2009. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

WIFI Module:

The system was configured for test in testing mode, which was provided by manufacturer. 11 channels are provided to testing:

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

For 802.11b, 802.11g, and 802.11n HT20 modes were tested with Channel 1, 6 and 11.
For 802.11n HT40 mode were tested with Channel 3, 6 and 9.

Zigbee Module:

The system was configured for testing in testing mode, which was provided by manufacturer.
For Zigbee mode were tested with Channel 2405MHz, 2440MHz, 2475MHz and 2480MHz.

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

EUT Exercise Software

The software "putty_V0.63.0.0.43510830.exe" was used for testing, which was provided by manufacturer.

WIFI Module:

Test Mode	Test Software Version	putty_V0.63.0.0.43510830.exe		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	CCK 1M	CCK 1M	CCK 1M
	Power Level Setting Antenna	17	17	17
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	OFDM 6M	OFDM 6M	OFDM 6M
	Power Level Setting Antenna	15	15	15
802.11n HT20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Antenna	9	9	9
802.11n HT40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Antenna	9	9	9

Zigbee Module:

The test was performed under "*putty_V0.63.0.0.43510830.exe*" which was provided by the manufacturer.

Test Software Version	putty_V0.63.0.0.43510830.exe			
Test Frequency	2405 MHz	2440 MHz	2475 MHz	2480 MHz
Power Level Setting	Maximum output power level			

Equipment Modifications

No modification was made to the EUT.

Local Support Equipment List and Details

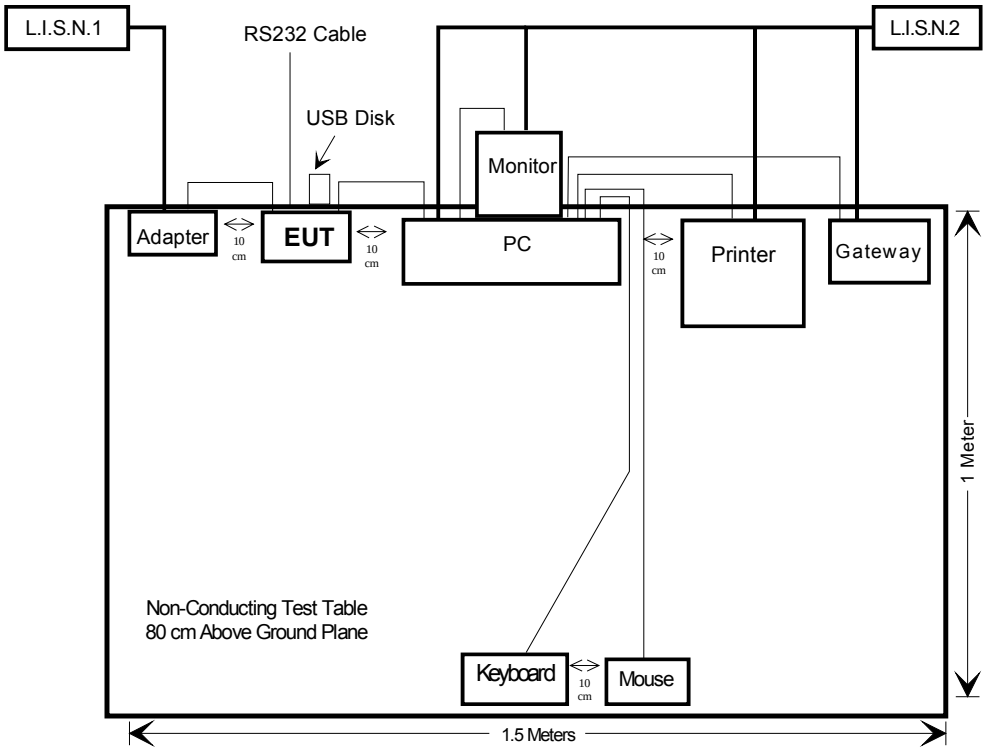
Manufacturer	Description	Model Number	Serial Number	Grants
IBM	PC	8176	99Y7315	DOC
ESPON	Printer	STYLUS PHOTO700	A2U0002196	DOC
DELL	Monitor	E157FPb	CN-OWH339-74261-894-3LOU	DOC
ANTEK	Gateway	EGW-802	05083500	DOC
Genius	Keyboard	KM-110X	XBK133000993	DOC
Genius	Mouse	Netscroll 120	33C83137305720	DOC
Kingsdom	USB Disk	None	None	DOC

External I/O Cable

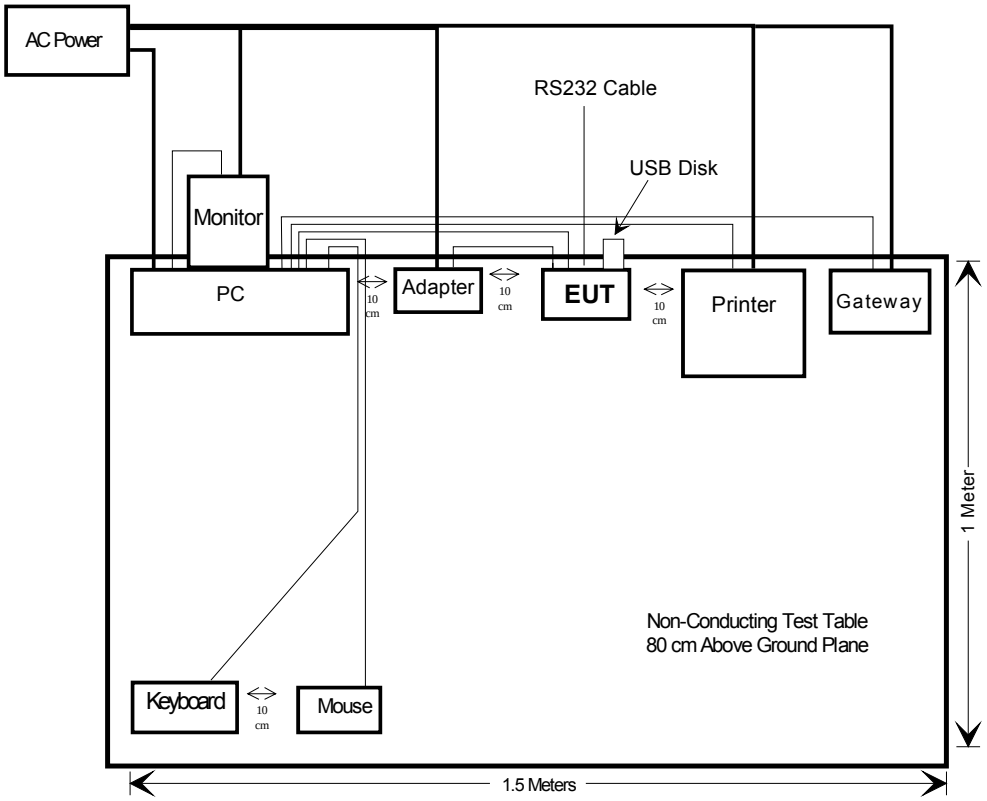
Cable Description	Length (m)	From	To
Unshielded VGA Cable	1.5	PC/VGA Port	Monitor/VGA Port
Unshielded USB Cable	1.5	PC / USB Port	Keyboard
Unshielded USB Cable	1.5	PC/ USB Port	Mouse
Unshielded RS232 Cable	1.5	PC/ RS232 Port	Gateway/ RS232 Port
Unshielded LPT Cable	1.5	PC/ LPT Port	Printer/ LPT Port
Unshielded RJ45 Cable	3	EUT	PC

Block Diagram of Test Setup

Conducted emission:



Spurious Emissions:



SUMMARY OF TEST RESULTS

WIFI Module:

FCC Rules	Description of Test	Result
§15.247(i), §2.1091 & §1.1307(b)(1)	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Conducted 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 Peak Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

Zigbee Module:

FCC Rules	Description of Test	Result
§15.247(i), §2.1091 & §1.1307(b)(1)	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Conducted 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 Peak Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Compliance*: Please refer to the certified Zigbee module with FCC ID: MCQ-XBS2C.

FCC §15.247 (i), §2.1091 & §1.1307(b)(1) - Maximum Permissible Exposure (MPE)

Applicable Standard

According to subpart 15.247(i)and subpart §1.1310, 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 Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) 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)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

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

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);

The host VT-M2M-LV may contain 3 RF modules: one 3G module (FCC ID: RI7HE910, FCC ID: R17DE910-DUAL & FCC ID: R17GE910Q3), one Zigbee module (FCC ID: MCQ-XBS2C) & one WLAN module. The rated output power and antenna gain in the below table:

WIFI+Zigbee+GSM (FCC ID: RI7HE910)

Mode	Frequency	Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz	dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462	2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452	2	1.58	14.03	25.29	20	0.010	1.0	1.0
Zigbee	2405-2480	2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
GSM	824-849	1	1.26	24.00	251.19	20	0.063	0.55	**11.5**
	1850-1910	1	1.26	20.90	123.03	20	0.031	1.0	3.1
Total sum of MPE ratios (%)									**13.5**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For GSM mode, the worst case for MPE was chosen to be added up
Result: 13.5%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+EGPRS (FCC ID: RI7HE910)

Mode	Frequency		Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz		dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462		2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452		2	1.58	14.03	25.29	20	0.010	1.0	1.0
Zigbee	2405-2480		2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
EGPRS	824-849	slot 1	1	1.26	20.90	123.03	20	0.031	0.55	5.6
		slot 2	1	1.26	23.70	234.42	20	0.059	0.55	10.7
		slot 3	1	1.26	24.50	281.84	20	0.071	0.55	12.9
		slot 4	1	1.26	25.50	354.81	20	0.089	0.55	**16.2**
	1850-1910	slot 1	1	1.26	19.60	91.20	20	0.023	1.0	2.3
		slot 2	1	1.26	22.40	173.78	20	0.044	1.0	4.4
		slot 3	1	1.26	23.50	223.87	20	0.056	1.0	5.6
		slot 4	1	1.26	24.20	263.03	20	0.066	1.0	6.6
Total sum of MPE ratios (%)										**18.2**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For EGPRS mode, the worst case for MPE was chosen to be added up
Result: 18.2%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+WCDMA (FCC ID: RI7HE910)

Mode	Frequency	Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz	dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462	2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452	2	1.58	14.03	25.29	20	0.008	1.0	0.8
Zigbee	2405-2480	2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
WCDMA	1850-1910	1	1.26	26.39	435.51	20	0.109	1.0	10.9
	824-849	1	1.26	26.63	460.26	20	0.115	0.55	**20.9**
Total sum of MPE ratios (%)									**22.9**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For WCDMA mode, the worst case for MPE was chosen to be added up
Result: 22.9%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+GPRS(FCC ID: RI7HE910)

Mode	Frequency		Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz		dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462		2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452		2	1.58	14.03	25.29	20	0.010	1.0	1.0
Zigbee	2405-2480		2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
GPRS	824-849	slot 1	1	1.26	24.00	251.19	20	0.063	0.55	11.5
		slot 2	1	1.26	26.40	436.52	20	0.109	0.55	19.8
		slot 3	1	1.26	27.40	549.54	20	0.138	0.55	25.1
		slot 4	1	1.26	27.80	602.56	20	0.151	0.55	**27.5**
	1850-1910	slot 1	1	1.26	20.90	123.03	20	0.031	1.0	3.1
		slot 2	1	1.26	23.40	218.78	20	0.055	1.0	5.5
		slot 3	1	1.26	24.50	281.84	20	0.071	1.0	7.1
		slot 4	1	1.26	24.80	302.00	20	0.076	1.0	7.6
Total sum of MPE ratios (%)										**29.5**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For GPRS mode, the worst case for MPE was chosen to be added up
Result: 29.5%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+CDMA (FCC ID: RI7DE910-DUAL)

Mode	Frequency	Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz	dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462	2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452	2	1.58	14.03	25.29	20	0.008	1.0	0.8
Zigbee	2405-2480	2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
CDMA	1850-1910	1	1.26	24.74	297.85	20	0.075	1.0	7.5
	824-849	1	1.26	24.37	273.53	20	0.069	0.55	**12.5**
Total sum of MPE ratios (%)									**14.5**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For CDMA mode, the worst case for MPE was chosen to be added up
Result: 14.5%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+GSM (FCC ID: RI7GE910Q3)

Mode	Frequency	Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz	dBi	numeric	dBm	mW	cm	mW/cm_2	mW/cm^2	(%)
WIFI	2412-2462	2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452	2	1.58	14.03	25.29	20	0.008	1.0	0.8
Zigbee	2405-2480	2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
GSM	824-849	1	1.26	23.13	205.59	20	0.052	0.55	**9.5**
Total sum of MPE ratios (%)									**11.5**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For GSM mode, the worst case for MPE was chosen to be added up
Result: 11.5%<1, the device meet FCC MPE at 20 cm distance.

WIFI+Zigbee+GPRS (FCC ID: RI7GE910Q3)

Mode	Frequency		Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz		dBi	numeric	dBm	mW	cm	mW/cm_2	mW/cm^2	(%)
WIFI	2412-2462		2	1.58	17.26	53.21	20	0.017	1.0	**1.7**
	2422-2452		2	1.58	14.03	25.29	20	0.008	1.0	0.8
Zigbee	2405-2480		2	1.58	10.08	10.19	20	0.003	1.0	**0.3**
GPRS	824-849	slot 1	1	1.26	23.10	204.17	20	0.051	0.55	9.3
		slot 2	1	1.26	25.68	369.83	20	0.093	0.55	**16.9**
	1850-1910	slot 1	1	1.26	20.93	123.88	20	0.031	1.0	3.1
		slot 2	1	1.26	23.72	235.50	20	0.059	1.0	5.9
Total sum of MPE ratios (%)										**18.9**

For WIFI and Zigbee module transmit simultaneously, the worst case for MPE was chosen to be added up.
For GPRS mode, the worst case for MPE was chosen to be added up
Result: 18.9%<1, the device meet FCC MPE at 20 cm distance.

FCC §15.203 - Antenna Requirement

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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

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

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

Antenna Connector Construction

The EUT has four external antennas, which are attached to the EUT, and complied with 15.203, please refer to EUT external photos and following table:

RF Module	Manufacturer	Model Name	Connector Type	Max. Antenna Gain
WIFI	Dongguan Guoxu Electronics Communication Co.,Ltd.	GX042S.100001.S01	SMA Female	2400-2483MHz: 2 dBi
Zigbee	Dongguan Guoxu Electronics Communication Co.,Ltd.	GX042S.100001.S01	SMA Female	2.4GHz – 2.4835GHz:2 dBi
GPS	Shenzhen Norminson Technology CO.,LTD.	NP002	SMA Male	1575.42Mhz+/-3Mhz: 28dBi+/-3dBi(LNA)
3G Antenna	Dongguan Guoxu Electronics Communication Co., Ltd.	GX042S.100002.S01	SMA Male	GSM850: PCS1900: WCDMA 1900: WCDMA1700: WCDMA2100: EGSM900: DCS1800: WCDMA850: WCDMA900: CDMA Cellular(850): CDMA PCS(1900): 1dBi

Result: Compliance.

FCC §15.207 (a) – AC Line Conducted Emissions

Applicable Standard

FCC§15.207

Measurement Uncertainty

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

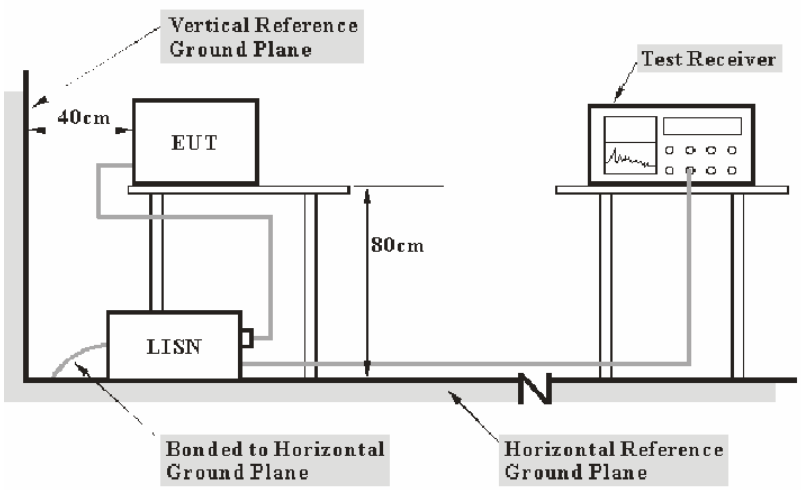
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of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

Based on CISPR 16-4-2: 2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Chengdu) is ±3.17 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

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

EUT Setup



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

The setup of EUT was according to ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The power cables and 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.

DC 12V power source was provided to EUT through 120V/60Hz AC adapter.

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 EUT's adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN or ISN

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2014-06-23	2015-06-22
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2014-06-23	2015-06-22
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.12	2014-02-08	2015-02-07

*** Statement of Traceability:** BACL (Chengdu) attested 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 FCC Part 15.207, with the worst margin reading of:

2.2 dB at **0.203626 MHz** in the **Neutral** conducted mode.

Test Data

Environmental Conditions

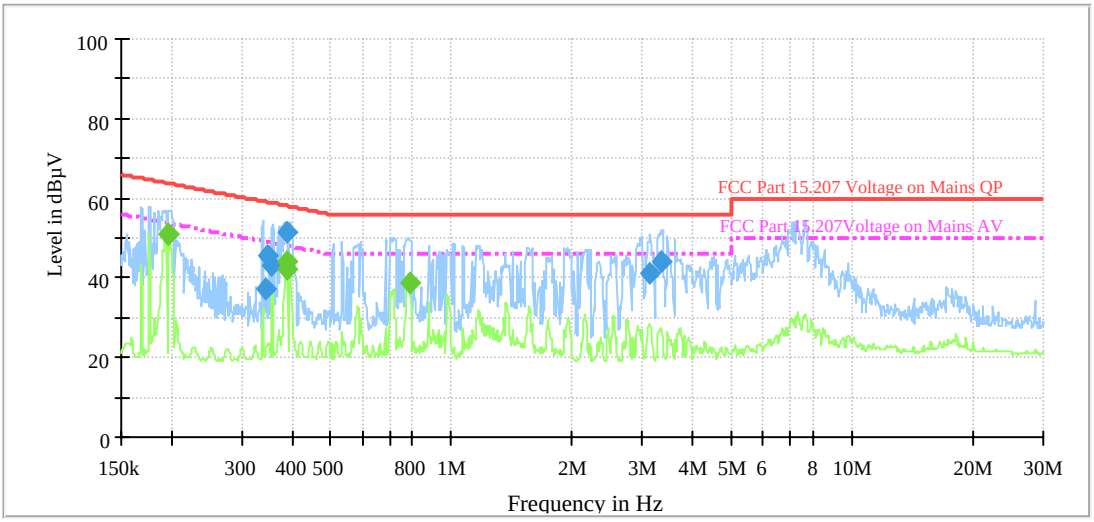
Temperature:	17 °C
Relative Humidity:	48 %
ATM Pressure:	96.5 kPa

The testing was performed by Kevin Tao on 2015-02-06.

Test Mode: WIFI + Zigbee + 3G transmitting simultaneously

For Adapter 1:

Line

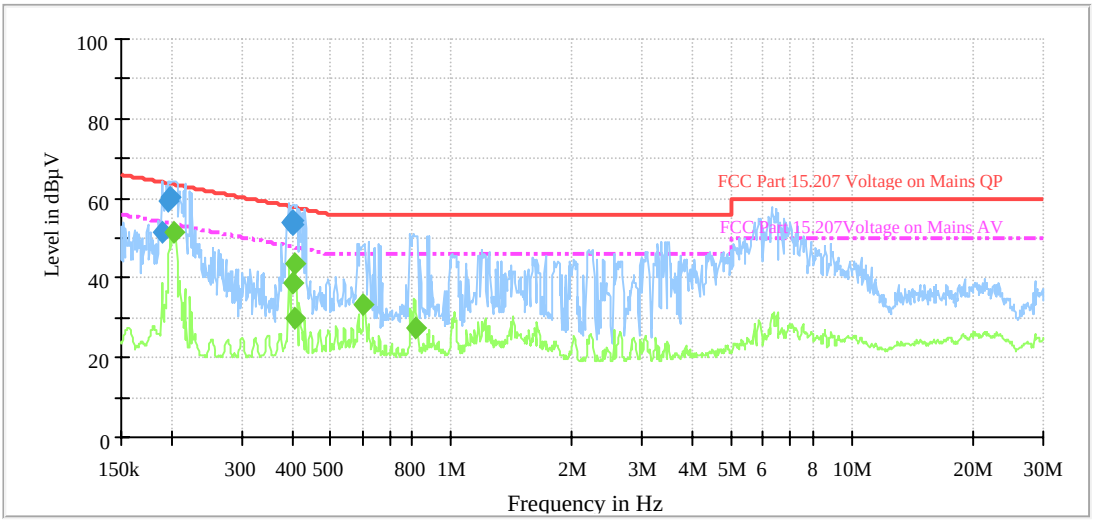


Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.344508	37.4	9.000	L1	19.9	21.7	59.1
0.348767	45.4	9.000	L1	19.9	13.6	59.0
0.356361	43.2	9.000	L1	19.9	15.7	58.8
0.389823	51.3	9.000	L1	20.0	6.7	58.1
3.121456	41.3	9.000	L1	20.4	14.7	56.0
3.330158	44.3	9.000	L1	20.4	11.7	56.0

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.195216	51.1	9.000	L1	19.1	*2.7	53.8
0.195997	50.9	9.000	L1	19.1	*2.9	53.8
0.196747	50.9	9.000	L1	19.1	*2.8	53.7
0.389823	42.2	9.000	L1	20.0	5.9	48.1
0.390429	44.1	9.000	L1	20.0	3.9	48.1
0.783707	38.7	9.000	L1	20.2	7.3	46.0

** Within Measurement Uncertainty.*

Neutral



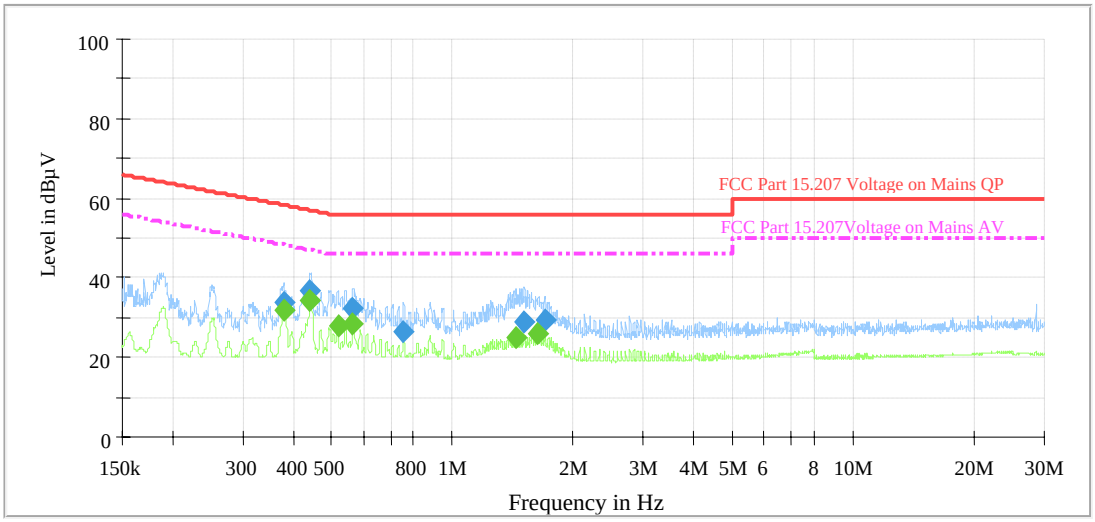
Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Neutral	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190596	51.2	9.000	N	19.1	12.8	64.0
0.197294	59.3	9.000	N	19.1	4.4	63.7
0.199257	60.3	9.000	N	19.1	3.3	63.6
0.398301	54.1	9.000	N	20.1	3.8	57.9
0.401091	54.3	9.000	N	20.1	3.5	57.8
0.401200	53.2	9.000	N	20.1	4.6	57.8

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Neutral	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.203626	51.3	9.000	N	19.2	*2.2	53.5
0.403319	38.7	9.000	N	20.1	9.1	47.8
0.404306	43.6	9.000	N	20.1	4.2	47.8
0.406121	29.7	9.000	N	20.1	18.0	47.7
0.603615	33.6	9.000	N	20.1	12.4	46.0
0.817189	27.6	9.000	N	20.2	18.4	46.0

** Within Measurement Uncertainty.*

For Adapter 2:

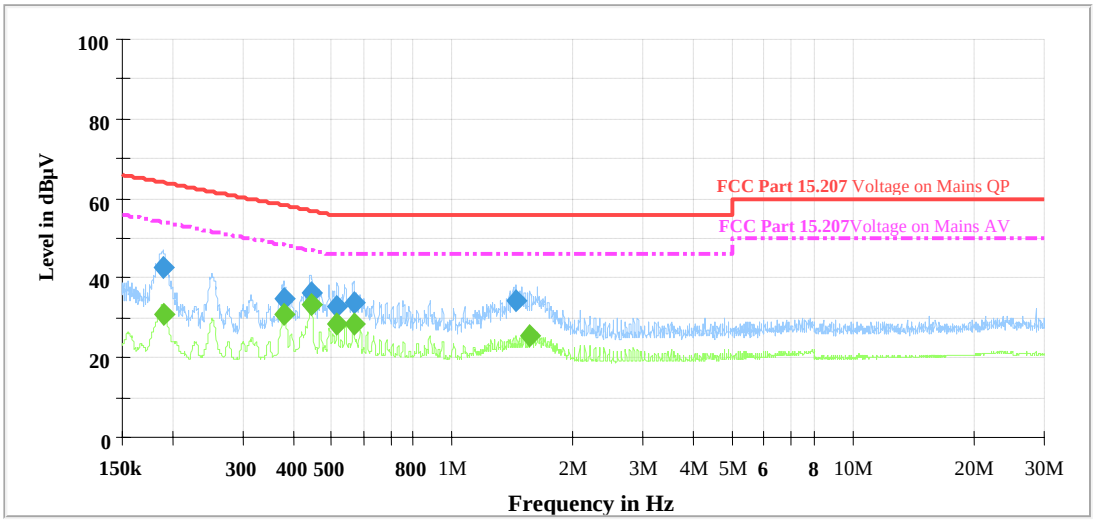
Line



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.379065	33.7	9.000	L1	20.0	24.6	58.3
0.442108	36.8	9.000	L1	20.1	20.2	57.0
0.565273	32.5	9.000	L1	20.1	23.5	56.0
0.755228	26.7	9.000	L1	20.2	29.3	56.0
1.513718	29.0	9.000	L1	20.3	27.0	56.0
1.696310	29.6	9.000	L1	20.3	26.4	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.379823	31.8	9.000	L1	20.0	16.5	48.3
0.442108	34.1	9.000	L1	20.1	12.9	47.0
0.517701	28.1	9.000	L1	20.1	17.9	46.0
0.565273	28.3	9.000	L1	20.1	17.7	46.0
1.445731	24.9	9.000	L1	20.2	21.1	46.0
1.636388	26.1	9.000	L1	20.3	19.9	46.0

Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Neutral	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.189502	42.4	9.000	N	19.0	21.7	64.1
0.378309	35.7	9.000	N	20.0	22.6	58.3
0.444766	36.1	9.000	N	20.1	20.9	57.0
0.516667	33.0	9.000	N	20.1	23.0	56.0
0.566404	33.6	9.000	N	20.1	22.4	56.0
1.442845	34.1	9.000	N	20.2	21.9	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Neutral	Corr. (dB)	Margin (dB)	Limit (dBµV
0.189502	30.5	9.000	N	19.0	23.6	54.1
0.378309	31.1	9.000	N	20.0	17.2	48.3
0.442992	33.2	9.000	N	20.1	13.8	47.0
0.516667	28.2	9.000	N	20.1	17.8	46.0
0.566404	28.5	9.000	N	20.1	17.5	46.0
1.636388	26.6	9.000	N	20.3	19.4	46.0

FCC §15.209, §15.205 & §15.247(d) - Spurious Emissions

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 2, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

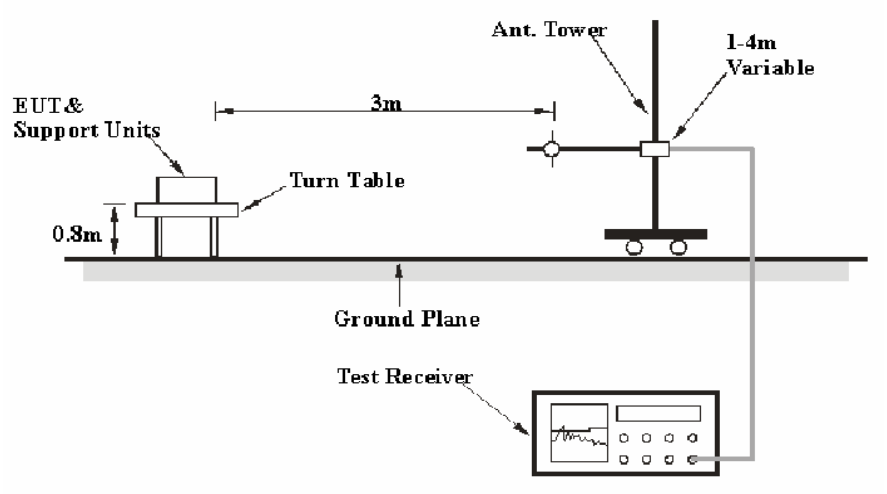
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB ;
200M~1GHz: ±6.0 dB ;
1G-6GHz: ±5.13dB;
6G~25GHz: ±5.47 dB;

Table 2 – Values of U_{cispr}

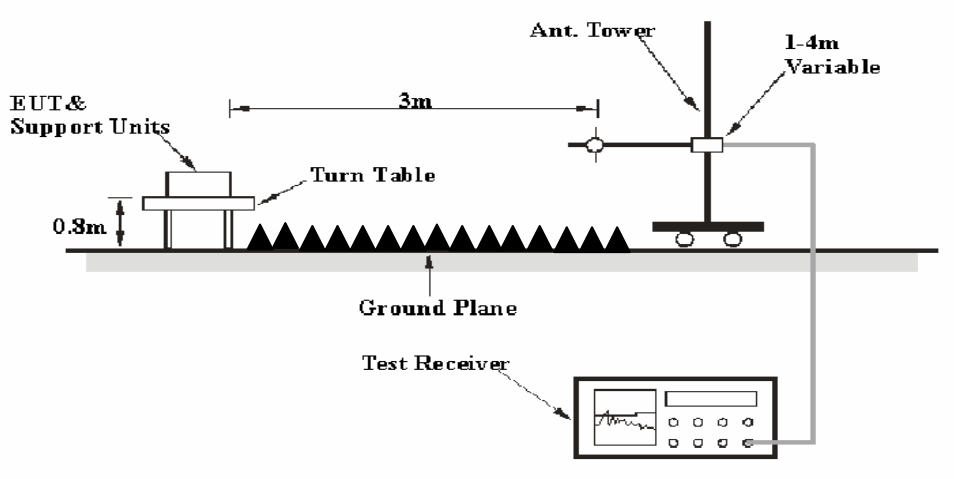
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters Semi-Anechoic Chamber, using the setup in accordance with the ANSI C63.4-2003. 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.

DC 12V power source was provided to EUT through 120V/60Hz AC adapter.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

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

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Receiver Reading + Cable loss + Antenna Factor – 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 Number	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2014-06-23	2015-06-22
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2014-06-23	2015-06-22
Sunol Sciences	Broadband Antenna	JB3	A101808	2013-04-10	2015-04-09
Rohde & Schwarz	Spectrum Analyzer	FSL18	100180	2014-06-23	2015-06-22
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2014-10-17	2015-10-16
EM TEST	Horn Antenna	3115	003-6076	2013-04-09	2015-04-08
HP	Amplifier	8449B	3008A00277	2014-06-23	2015-06-22
EMCT	Semi-Anechoic Chamber	966	N/A	2013-03-13	2016-03-12

*** Statement of Traceability:** BACL (Chengdu) attested 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 FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247, with the worst margin reading of:

2.86 dB at **52.89 MHz** in the **Vertical** polarization for 802.11n HT40 mode

Test Data

Environmental Conditions

Temperature:	15 °C & 16 °C
Relative Humidity:	47 % & 45 %
ATM Pressure:	96.2 kPa & 96.8 kPa

The testing was performed by Kevin Tao on 2015-02-04 & 2015-02-06.

Test Mode: Transmitting

WIFI Module:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
802.11b mode, Low Channel: 2412 MHz									
2412	57.64	PK	H	23.14	5.75	0.00	86.53	N/A	N/A
2412	52.18	AV	H	23.14	5.75	0.00	81.07	N/A	N/A
2412	69.26	PK	V	23.14	5.75	0.00	98.15	N/A	N/A
2412	64.28	AV	V	23.14	5.75	0.00	93.17	N/A	N/A
2395.3	31.04	PK	V	23.08	5.68	0.00	59.80	74.00	14.20
2395.3	20.29	AV	V	23.08	5.68	0.00	49.05	54.00	*4.95
4824	32.55	PK	V	30.76	7.86	26.81	44.36	74.00	29.64
4824	17.88	AV	V	30.76	7.86	26.81	29.69	54.00	24.31
7236	29.94	PK	V	34.35	10.52	26.62	48.19	74.00	25.81
7236	16.72	AV	V	34.35	10.52	26.62	34.97	54.00	19.03
9648	29.88	PK	V	37.08	12.95	26.35	53.56	74.00	20.44
9648	16.13	AV	V	37.08	12.95	26.35	39.81	54.00	14.19
2779	34.75	PK	V	26.63	6.05	26.81	40.62	74.00	33.38
2779	21.42	AV	V	26.63	6.05	26.81	27.29	54.00	26.71
52.89	45.8	QP	V	11.71	0.94	21.41	37.04	40.00	*2.96
802.11b mode, Middle Channel: 2437 MHz									
2437	56.16	PK	H	25.74	5.79	0.00	87.69	N/A	N/A
2437	50.06	AV	H	25.74	5.79	0.00	81.59	N/A	N/A
2437	68.15	PK	V	25.74	5.79	0.00	99.68	N/A	N/A
2437	63.51	AV	V	25.74	5.79	0.00	95.04	N/A	N/A
4874	32.24	PK	V	30.77	7.90	26.78	44.13	74.00	29.87
4874	19.17	AV	V	30.77	7.90	26.78	31.06	54.00	22.94
7311	30.44	PK	V	34.35	10.57	26.56	48.80	74.00	25.20
7311	16.68	AV	V	34.35	10.57	26.56	35.04	54.00	18.96
9748	29.49	PK	V	36.30	12.98	26.32	52.45	74.00	21.55
9748	16.19	AV	V	36.30	12.98	26.32	39.15	54.00	14.85
2779	35.08	PK	V	26.63	6.05	26.81	40.95	74.00	33.05
2779	21.41	AV	V	26.63	6.05	26.81	27.28	54.00	26.72
3472	29.14	PK	V	28.71	6.05	26.81	37.09	74.00	36.91
3472	19.35	AV	V	28.71	6.05	26.81	27.30	54.00	26.70
53.12	45.7	QP	V	11.71	0.94	21.41	36.94	40.00	*3.06
802.11b mode, High Channel: 2462 MHz									
2462	55.25	PK	H	25.80	3.93	0.00	84.98	N/A	N/A
2462	49.82	AV	H	25.80	3.93	0.00	79.55	N/A	N/A
2462	66.57	PK	V	25.80	3.93	0.00	96.30	N/A	N/A
2462	61.39	AV	V	25.80	3.93	0.00	91.12	N/A	N/A
2483.5	25.96	PK	V	25.86	3.80	0.00	55.62	74.00	18.38
2483.5	13.32	AV	V	25.86	3.80	0.00	42.98	54.00	11.02
4924	33.04	PK	V	30.90	4.70	26.71	41.93	74.00	32.07
4924	20.32	AV	V	30.90	4.70	26.71	29.21	54.00	24.79
7386	30.87	PK	V	34.53	6.84	26.53	45.71	74.00	28.29
7386	16.87	AV	V	34.53	6.84	26.53	31.71	54.00	22.29
9848	31.25	PK	V	36.54	8.49	26.30	49.98	74.00	24.02
9848	19.31	AV	V	36.54	8.49	26.30	38.04	54.00	15.96
2779	35.91	PK	V	26.63	6.05	26.81	41.78	74.00	32.22
2779	21.41	AV	V	26.63	6.05	26.81	27.28	54.00	26.72
52.79	45.2	QP	V	11.71	0.94	21.41	36.44	40.00	*3.56

** Within Measurement Uncertainty.*

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
802.11g mode, Low Channel: 2412 MHz									
2412	57.18	PK	H	23.14	5.75	0.00	86.07	N/A	N/A
2412	46.07	AV	H	23.14	5.75	0.00	74.96	N/A	N/A
2412	67.26	PK	V	23.14	5.75	0.00	96.15	N/A	N/A
2412	56.34	AV	V	23.14	5.75	0.00	85.23	N/A	N/A
2395.3	41.17	PK	V	23.08	5.68	0.00	69.93	74.00	*4.07
2395.3	17.93	AV	V	23.08	5.68	0.00	46.69	54.00	7.31
4824	31.86	PK	V	30.76	7.86	26.81	43.67	74.00	30.33
4824	19.26	AV	V	30.76	7.86	26.81	31.07	54.00	22.93
7236	30.21	PK	V	34.35	10.52	26.62	48.46	74.00	25.54
7236	16.58	AV	V	34.35	10.52	26.62	34.83	54.00	19.17
9648	29.86	PK	V	37.08	12.95	26.35	53.54	74.00	20.46
9648	15.54	AV	V	37.08	12.95	26.35	39.22	54.00	14.78
2657	35.16	PK	V	26.31	6.05	26.81	40.71	74.00	33.29
2657	21.32	AV	V	26.31	6.05	26.81	26.87	54.00	27.13
53.2	45.1	QP	V	11.71	0.94	21.41	36.34	40.00	*3.66
802.11g mode, Middle Channel: 2437 MHz									
2437	55.76	PK	H	25.74	5.79	0.00	87.29	N/A	N/A
2437	45.13	AV	H	25.74	5.79	0.00	76.66	N/A	N/A
2437	66.27	PK	V	25.74	5.79	0.00	97.80	N/A	N/A
2437	55.21	AV	V	25.74	5.79	0.00	86.74	N/A	N/A
4874	47.26	PK	V	30.77	7.90	26.78	59.15	74.00	14.85
4874	34.68	AV	V	30.77	7.90	26.78	46.57	54.00	7.43
7311	28.36	PK	V	34.35	10.57	26.56	46.72	74.00	27.28
7311	16.25	AV	V	34.35	10.57	26.56	34.61	54.00	19.39
9748	23.58	PK	V	36.30	12.98	26.32	46.54	74.00	27.46
9748	13.26	AV	V	36.30	12.98	26.32	36.22	54.00	17.78
2779	40.6	PK	V	26.63	6.05	26.81	46.47	74.00	27.53
2779	26.35	AV	V	26.63	6.05	26.81	32.22	54.00	21.78
3472	28.25	PK	V	28.71	6.05	26.81	36.20	74.00	37.80
3472	13.2	AV	V	28.71	6.05	26.81	21.15	54.00	32.85
52.91	45.6	QP	V	11.71	0.94	21.41	36.84	40.00	*3.16
802.11g mode, High Channel: 2462 MHz									
2462	54.26	PK	H	25.80	3.93	0.00	83.99	N/A	N/A
2462	43.35	AV	H	25.80	3.93	0.00	73.08	N/A	N/A
2462	64.72	PK	V	25.80	3.93	0.00	94.45	N/A	N/A
2462	54.03	AV	V	25.80	3.93	0.00	83.76	N/A	N/A
2483.5	26.97	PK	V	25.86	3.80	0.00	56.63	74.00	17.37
2483.5	13.85	AV	V	25.86	3.80	0.00	43.51	54.00	10.49
4924	34.21	PK	V	30.90	4.70	26.71	43.10	74.00	30.90
4924	19.69	AV	V	30.90	4.70	26.71	28.58	54.00	25.42
7386	32.59	PK	V	34.53	6.84	26.53	47.43	74.00	26.57
7386	18.35	AV	V	34.53	6.84	26.53	33.19	54.00	20.81
9848	29.64	PK	V	36.54	8.49	26.30	48.37	74.00	25.63
9848	16.87	AV	V	36.54	8.49	26.30	35.60	54.00	18.40
2779	35.68	PK	V	26.63	6.05	26.81	41.55	74.00	32.45
2779	21.26	AV	V	26.63	6.05	26.81	27.13	54.00	26.87
52.87	45.7	QP	V	11.71	0.94	21.41	36.94	40.00	*3.06

** Within Measurement Uncertainty.*

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
802.11n HT20 mode, Low Channel: 2412 MHz									
2412	51.61	PK	H	23.14	5.75	0.00	80.50	N/A	N/A
2412	39.92	AV	H	23.14	5.75	0.00	68.81	N/A	N/A
2412	62.39	PK	V	23.14	5.75	0.00	91.28	N/A	N/A
2412	51.32	AV	V	23.14	5.75	0.00	80.21	N/A	N/A
2395.3	25.84	PK	V	23.08	5.68	0.00	54.60	74.00	19.40
2395.3	14.19	AV	V	23.08	5.68	0.00	42.95	54.00	11.05
4824	35.86	PK	V	30.76	7.86	26.81	47.67	74.00	26.33
4824	20.31	AV	V	30.76	7.86	26.81	32.12	54.00	21.88
7236	32.68	PK	V	34.35	10.52	26.62	50.93	74.00	23.07
7236	18.65	AV	V	34.35	10.52	26.62	36.90	54.00	17.10
9648	29.98	PK	V	37.08	12.95	26.35	53.66	74.00	20.34
9648	15.94	AV	V	37.08	12.95	26.35	39.62	54.00	14.38
2779	35.85	PK	V	26.63	6.05	26.81	41.72	74.00	32.28
2779	20.38	AV	V	26.63	6.05	26.81	26.25	54.00	27.75
52.89	45.8	QP	V	11.71	0.94	21.41	37.04	40.00	*2.96
802.11n HT20mode, Middle Channel: 2437 MHz									
2437	50.35	PK	H	25.74	5.79	0.00	81.88	N/A	N/A
2437	39.12	AV	H	25.74	5.79	0.00	70.65	N/A	N/A
2437	60.38	PK	V	25.74	5.79	0.00	91.91	N/A	N/A
2437	49.54	AV	V	25.74	5.79	0.00	81.07	N/A	N/A
4874	35.67	PK	V	30.77	7.90	26.78	47.56	74.00	26.44
4874	21.36	AV	V	30.77	7.90	26.78	33.25	54.00	20.75
7311	32.16	PK	V	34.35	10.57	26.56	50.52	74.00	23.48
7311	18.54	AV	V	34.35	10.57	26.56	36.90	54.00	17.10
9748	29.68	PK	V	36.30	12.98	26.32	52.64	74.00	21.36
9748	17.46	AV	V	36.30	12.98	26.32	40.42	54.00	13.58
2779	34.25	PK	V	26.63	6.05	26.81	40.12	74.00	33.88
2779	19.28	AV	V	26.63	6.05	26.81	25.15	54.00	28.85
3472	35.16	PK	V	28.71	6.05	26.81	43.11	74.00	30.89
3472	20.14	AV	V	28.71	6.05	26.81	28.09	54.00	25.91
52.89	45.4	QP	V	11.71	0.94	21.41	36.64	40.00	*3.36
802.11n HT20 mode, High Channel: 2462 MHz									
2462	55.25	PK	H	25.80	3.93	0.00	84.98	N/A	N/A
2462	49.82	AV	H	25.80	3.93	0.00	79.55	N/A	N/A
2462	59.65	PK	V	25.80	3.93	0.00	89.38	N/A	N/A
2462	49.01	AV	V	25.80	3.93	0.00	78.74	N/A	N/A
2483.5	24.71	PK	V	25.86	3.80	0.00	54.37	74.00	19.63
2483.5	14.12	AV	V	25.86	3.80	0.00	43.78	54.00	10.22
4924	36.68	PK	V	30.90	4.70	26.71	45.57	74.00	28.43
4924	20.35	AV	V	30.90	4.70	26.71	29.24	54.00	24.76
7386	31.58	PK	V	34.53	6.84	26.53	46.42	74.00	27.58
7386	17.47	AV	V	34.53	6.84	26.53	32.31	54.00	21.69
9848	29.59	PK	V	36.54	8.49	26.30	48.32	74.00	25.68
9848	16.67	AV	V	36.54	8.49	26.30	35.40	54.00	18.60
2779	33.57	PK	V	26.63	6.05	26.81	39.44	74.00	34.56
2779	20.31	AV	V	26.63	6.05	26.81	26.18	54.00	27.82
53.18	45.6	QP	V	11.71	0.94	21.41	36.84	40.00	*3.16

** Within Measurement Uncertainty.*

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
802.11n HT40 mode, Low Channel: 2422 MHz									
2422	47.99	PK	H	23.14	5.75	0.00	76.88	N/A	N/A
2422	36.85	AV	H	23.14	5.75	0.00	65.74	N/A	N/A
2422	59.11	PK	V	23.14	5.75	0.00	88.00	N/A	N/A
2422	48.18	AV	V	23.14	5.75	0.00	77.07	N/A	N/A
2395.3	26.91	PK	V	23.08	5.68	0.00	55.67	74.00	18.33
2395.3	13.93	AV	V	23.08	5.68	0.00	42.69	54.00	11.31
4844	35.52	PK	V	30.76	7.86	26.81	47.33	74.00	26.67
4844	20.35	AV	V	30.76	7.86	26.81	32.16	54.00	21.84
7266	33.45	PK	V	34.35	10.52	26.62	51.70	74.00	22.30
7266	18.63	AV	V	34.35	10.52	26.62	36.88	54.00	17.12
9688	29.36	PK	V	37.08	12.95	26.35	53.04	74.00	20.96
9688	18.26	AV	V	37.08	12.95	26.35	41.94	54.00	12.06
2779	35.25	PK	V	26.63	6.05	26.81	41.12	74.00	32.88
2779	20.47	AV	V	26.63	6.05	26.81	26.34	54.00	27.66
52.89	45.9	QP	V	11.71	0.94	21.41	37.14	40.00	*2.86
802.11n HT40 mode, Middle Channel: 2437 MHz									
2437	47.12	PK	H	25.74	5.79	0.00	78.65	N/A	N/A
2437	36.08	AV	H	25.74	5.79	0.00	67.61	N/A	N/A
2437	58.81	PK	V	25.74	5.79	0.00	90.34	N/A	N/A
2437	46.54	AV	V	25.74	5.79	0.00	78.07	N/A	N/A
4874	36.25	PK	V	30.77	7.90	26.78	48.14	74.00	25.86
4874	20.05	AV	V	30.77	7.90	26.78	31.94	54.00	22.06
7311	33.52	PK	V	34.35	10.57	26.56	51.88	74.00	22.12
7311	19.15	AV	V	34.35	10.57	26.56	37.51	54.00	16.49
9748	29.25	PK	V	36.30	12.98	26.32	52.21	74.00	21.79
9748	18.02	AV	V	36.30	12.98	26.32	40.98	54.00	13.02
2779	35.02	PK	V	26.63	6.05	26.81	40.89	74.00	33.11
2779	19.68	AV	V	26.63	6.05	26.81	25.55	54.00	28.45
3472	34.74	PK	V	28.71	6.05	26.81	42.69	74.00	31.31
3472	20.25	AV	V	28.71	6.05	26.81	28.20	54.00	25.80
52.89	45.3	QP	V	11.71	0.94	21.41	36.54	40.00	*3.46
802.11n HT40 mode, High Channel: 2452 MHz									
2452	46.62	PK	H	25.80	3.93	0.00	76.35	N/A	N/A
2452	35.28	AV	H	25.80	3.93	0.00	65.01	N/A	N/A
2452	56.87	PK	V	25.80	3.93	0.00	86.60	N/A	N/A
2452	46.13	AV	V	25.80	3.93	0.00	75.86	N/A	N/A
2483.5	27.05	PK	V	25.86	3.80	0.00	56.71	74.00	17.29
2483.5	13.34	AV	V	25.86	3.80	0.00	43.00	54.00	11.00
4904	51.12	PK	V	30.90	4.70	26.71	60.01	74.00	13.99
4904	41.02	AV	V	30.90	4.70	26.71	49.91	54.00	*4.09
7356	30.25	PK	V	34.53	6.84	26.53	45.09	74.00	28.91
7356	15.25	AV	V	34.53	6.84	26.53	30.09	54.00	23.91
9808	23.25	PK	V	36.54	8.49	26.30	41.98	74.00	32.02
9808	12.36	AV	V	36.54	8.49	26.30	31.09	54.00	22.91
2779	34.58	PK	V	26.63	6.05	26.81	40.45	74.00	33.55
2779	18.25	AV	V	26.63	6.05	26.81	24.12	54.00	29.88
53.17	44.9	QP	V	11.71	0.94	21.41	36.14	40.00	*3.86

** Within Measurement Uncertainty.*

Zigbee Module:

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
2405 MHz									
2405	54.83	PK	H	23.14	5.75	0.00	83.72	N/A	N/A
2405	49.98	AV	H	23.14	5.75	0.00	78.87	N/A	N/A
2405	65.03	PK	V	23.14	5.75	0.00	93.92	N/A	N/A
2405	59.05	AV	V	23.14	5.75	0.00	87.94	N/A	N/A
2399.4	37.54	PK	V	23.08	5.63	0.00	66.25	74.00	7.75
2399.4	22.13	AV	V	23.08	5.63	0.00	50.84	54.00	*3.16
4810	36.88	PK	V	30.76	7.86	26.81	48.69	74.00	25.31
4810	22.46	AV	V	30.76	7.86	26.81	34.27	54.00	19.73
7215	31.58	PK	V	34.35	10.52	26.62	49.83	74.00	24.17
7215	18.06	AV	V	34.35	10.52	26.62	36.31	54.00	17.69
9620	33.89	PK	V	37.08	12.95	26.35	57.57	74.00	16.43
9620	20.36	AV	V	37.08	12.95	26.35	44.04	54.00	9.96
2984	36.54	PK	V	27.16	6.05	26.81	42.94	74.00	31.06
2984	21.83	AV	V	27.16	6.05	26.81	28.23	54.00	25.77
135.02	43.7	QP	V	14.86	0.76	28.02	31.30	43.50	12.20
2440 MHz									
2440	53.89	PK	H	25.74	5.79	0.00	85.42	N/A	N/A
2440	50.26	AV	H	25.74	5.79	0.00	81.79	N/A	N/A
2440	63.58	PK	V	25.74	5.79	0.00	95.11	N/A	N/A
2440	58.73	AV	V	25.74	5.79	0.00	90.26	N/A	N/A
4880	38.26	PK	V	30.79	7.90	26.78	50.17	74.00	23.83
4880	24.08	AV	V	30.79	7.90	26.78	35.99	54.00	18.01
7320	32.51	PK	V	34.37	10.57	26.56	50.89	74.00	23.11
7320	19.56	AV	V	34.37	10.57	26.56	37.94	54.00	16.06
9760	35.58	PK	V	36.32	12.98	26.32	58.56	74.00	15.44
9760	21.34	AV	V	36.32	12.98	26.32	44.32	54.00	9.68
2984	35.16	PK	V	27.16	6.05	26.81	41.56	74.00	32.44
2984	23.08	AV	V	27.16	6.05	26.81	29.48	54.00	24.52
3526	35.49	PK	V	28.86	6.05	26.81	43.59	74.00	30.41
3526	22.31	AV	V	28.86	6.05	26.81	30.41	54.00	23.59
135.02	43.9	QP	V	14.86	0.76	28.02	31.50	43.50	12.00
2475 MHz									
2475	55.68	PK	H	25.84	3.85	0.00	85.37	N/A	N/A
2475	51.26	AV	H	25.84	3.85	0.00	80.95	N/A	N/A
2475	62.83	PK	V	25.84	3.85	0.00	92.52	N/A	N/A
2475	58.91	AV	V	25.84	3.85	0.00	88.60	N/A	N/A
4950	37.84	PK	V	30.97	4.68	26.71	46.78	74.00	27.22
4950	22.86	AV	V	30.97	4.68	26.71	31.80	54.00	22.20
7425	31.56	PK	V	34.62	6.92	26.53	46.57	74.00	27.43
7425	18.23	AV	V	34.62	6.92	26.53	33.24	54.00	20.76
9900	34.65	PK	V	36.66	8.44	26.30	53.45	74.00	20.55
9900	21.06	AV	V	36.66	8.44	26.30	39.86	54.00	14.14
2984	35.13	PK	V	27.16	6.05	26.81	41.53	74.00	32.47
2984	23.08	AV	V	27.16	6.05	26.81	29.48	54.00	24.52
135.02	44.7	QP	V	14.86	0.76	28.02	32.30	43.50	11.20

** Within Measurement Uncertainty.*

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
2480 MHz									
2480	51.05	PK	H	25.85	3.82	0.00	80.72	N/A	N/A
2480	46.15	AV	H	25.85	3.82	0.00	75.82	N/A	N/A
2480	57.63	PK	V	25.85	3.82	0.00	87.30	N/A	N/A
2480	53.39	AV	V	25.85	3.82	0.00	83.06	N/A	N/A
2483.4	35.67	PK	V	25.86	3.80	0.00	65.33	74.00	8.67
2483.4	21.06	AV	V	25.86	3.80	0.00	50.72	54.00	*3.28
4960	37.84	PK	V	31.00	4.70	26.71	46.83	74.00	27.17
4960	23.56	AV	V	31.00	4.70	26.71	32.55	54.00	21.45
7440	31.99	PK	V	34.66	6.95	26.53	47.07	74.00	26.93
7440	19.56	AV	V	34.66	6.95	26.53	34.64	54.00	19.36
9920	34.58	PK	V	36.71	8.41	26.30	53.40	74.00	20.60
9920	21.64	AV	V	36.71	8.41	26.30	40.46	54.00	13.54
2984	33.07	PK	V	27.16	6.05	26.81	39.47	74.00	34.53
2984	18.69	AV	V	27.16	6.05	26.81	25.09	54.00	28.91
135.02	45.8	QP	V	14.86	0.76	28.02	33.40	43.50	10.10

** Within Measurement Uncertainty.*

3G Module, FCC ID: RI7HE910
For co-location evaluation data (WIFI + Zigbee + GSM transmitting simultaneously)
Worst case

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
4824	46.56	PK	V	31.40	4.50	26.82	55.64	74.00	18.36
4824	35.14	AV	V	31.40	4.50	26.82	44.22	54.00	9.78
7236	45.38	PK	V	35.30	5.15	27.00	58.83	74.00	15.17
7236	34.33	AV	V	35.30	5.15	27.00	47.78	54.00	6.22
9648	47.48	PK	V	37.00	6.25	25.65	65.08	74.00	8.92
9648	31.23	AV	V	37.00	6.25	25.65	48.83	54.00	5.17
53.13	52.12	QP	V	13.37	0.26	26.20	39.55	43.50	3.95
2398.95	58.28	PK	V	23.20	2.56	26.85	57.19	74.00	16.81
2398.95	44.86	AV	V	23.20	2.56	26.85	43.77	54.00	10.23
2483.6	47.36	PK	V	23.20	2.57	26.85	46.28	74.00	27.72
2483.6	33.59	AV	V	23.20	2.57	26.85	32.51	54.00	21.49
4810	43.32	PK	V	38.00	6.34	23.80	63.86	74.00	10.14
4810	28.15	AV	V	38.00	6.34	23.80	48.69	54.00	5.31
7215	35.18	PK	V	43.00	6.45	22.40	62.23	74.00	11.77
7215	21.54	AV	V	43.00	6.45	22.40	48.59	54.00	5.41
9620	44.63	PK	V	37.00	0.26	26.20	55.69	74.00	18.31
9620	30.51	AV	V	37.00	4.10	26.55	45.06	54.00	8.94

Multi-listing Module 1, FCC ID: RI7DE910-DUAL
For co-location evaluation data (WIFI + Zigbee + CDMA transmitting simultaneously)

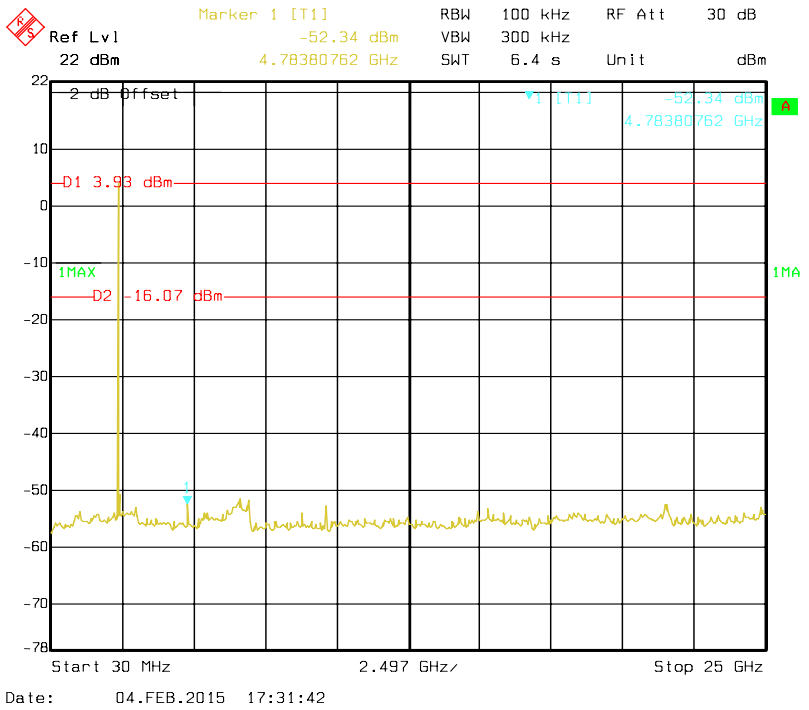
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
4824	43.65	PK	V	31.40	4.50	26.82	52.73	74.00	21.27
4824	32.43	AV	V	31.40	4.50	26.82	41.51	54.00	12.49
7236	42.84	PK	V	35.30	5.15	27.00	56.29	74.00	17.71
7236	31.91	AV	V	35.30	5.15	27.00	45.36	54.00	8.64
9648	40.56	PK	V	37.00	6.25	25.65	58.16	74.00	15.84
9648	29.34	AV	V	37.00	6.25	25.65	46.94	54.00	7.06
53.13	50.7	QP	V	13.37	0.26	26.20	38.13	43.50	5.37
2398.95	59.36	PK	V	23.20	2.56	26.85	58.27	74.00	15.73
2398.95	45.78	AV	V	23.20	2.56	26.85	44.69	54.00	9.31
2483.6	46.15	PK	V	23.20	2.57	26.85	45.07	74.00	28.93
2483.6	32.89	AV	V	23.20	2.57	26.85	31.81	54.00	22.19
4810	43.15	PK	V	38.00	6.34	23.80	63.69	74.00	10.31
4810	29.08	AV	V	38.00	6.34	23.80	49.62	54.00	4.38
7215	36.24	PK	V	43.00	6.45	22.40	63.29	74.00	10.71
7215	20.46	AV	V	43.00	6.45	22.40	47.51	54.00	6.49
9620	42.17	PK	V	37.00	0.26	26.20	53.23	74.00	20.77
9620	28.74	AV	V	37.00	4.10	26.55	43.29	54.00	10.71

Multi-listing Module 2, FCC ID: RI7GE910Q3
For co-location evaluation data (WIFI + Zigbee + GSM transmitting simultaneously)

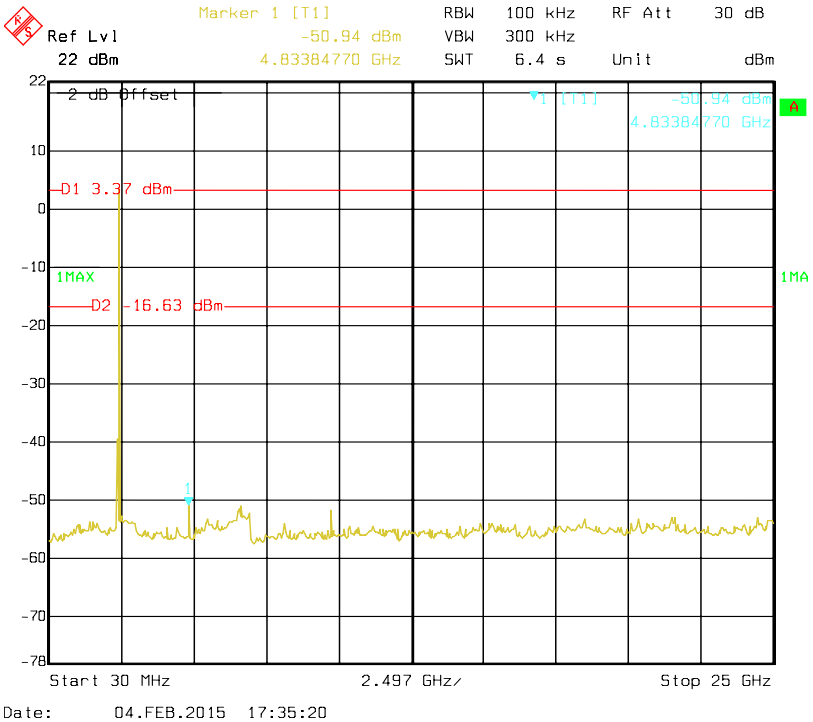
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)				Limit (dBμV/m)	Margin (dB)
4824	44.98	PK	V	31.40	4.50	26.82	54.06	74.00	19.94
4824	32.89	AV	V	31.40	4.50	26.82	41.97	54.00	12.03
7236	44.35	PK	V	35.30	5.15	27.00	57.80	74.00	16.20
7236	30.19	AV	V	35.30	5.15	27.00	43.64	54.00	10.36
9648	46.17	PK	V	37.00	6.25	25.65	63.77	74.00	10.23
9648	30.54	AV	V	37.00	6.25	25.65	48.14	54.00	5.86
53.13	51.1	QP	V	13.37	0.26	26.20	38.53	43.50	4.97
2398.95	57.81	PK	V	23.20	2.56	26.85	56.72	74.00	17.28
2398.95	43.16	AV	V	23.20	2.56	26.85	42.07	54.00	11.93
2483.6	46.15	PK	V	23.20	2.57	26.85	45.07	74.00	28.93
2483.6	31.69	AV	V	23.20	2.57	26.85	30.61	54.00	23.39
4810	42.15	PK	V	38.00	6.34	23.80	62.69	74.00	11.31
4810	29.11	AV	V	38.00	6.34	23.80	49.65	54.00	4.35
7215	34.06	PK	V	43.00	6.45	22.40	61.11	74.00	12.89
7215	20.41	AV	V	43.00	6.45	22.40	47.46	54.00	6.54
9620	42.16	PK	V	37.00	0.26	26.20	53.22	74.00	20.78
9620	29.14	AV	V	37.00	4.10	26.55	43.69	54.00	10.31

WIFI Module:
Conducted Spurious Emissions at Antenna Port

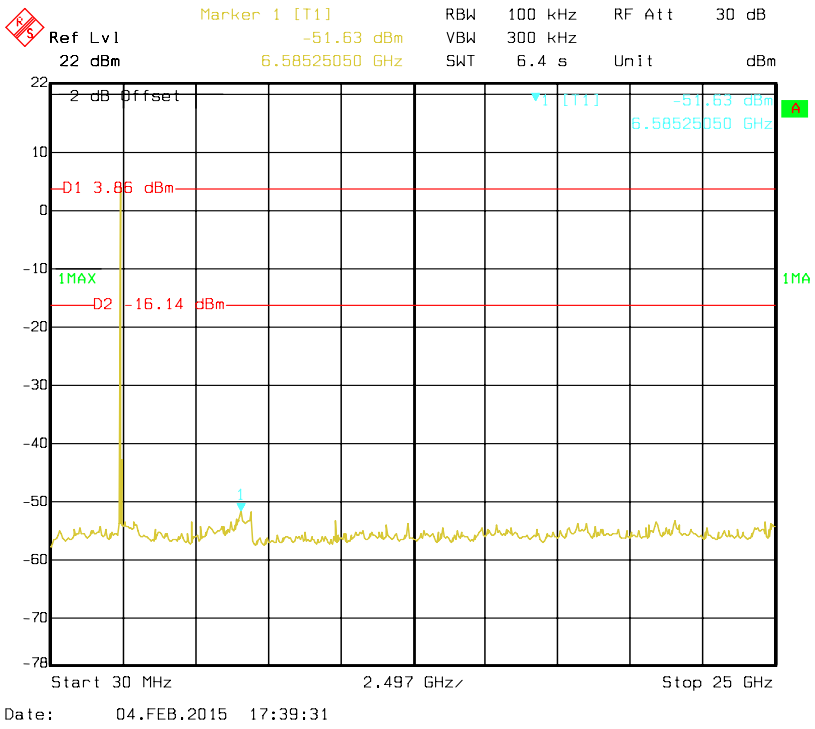
802.11b, Low Channel



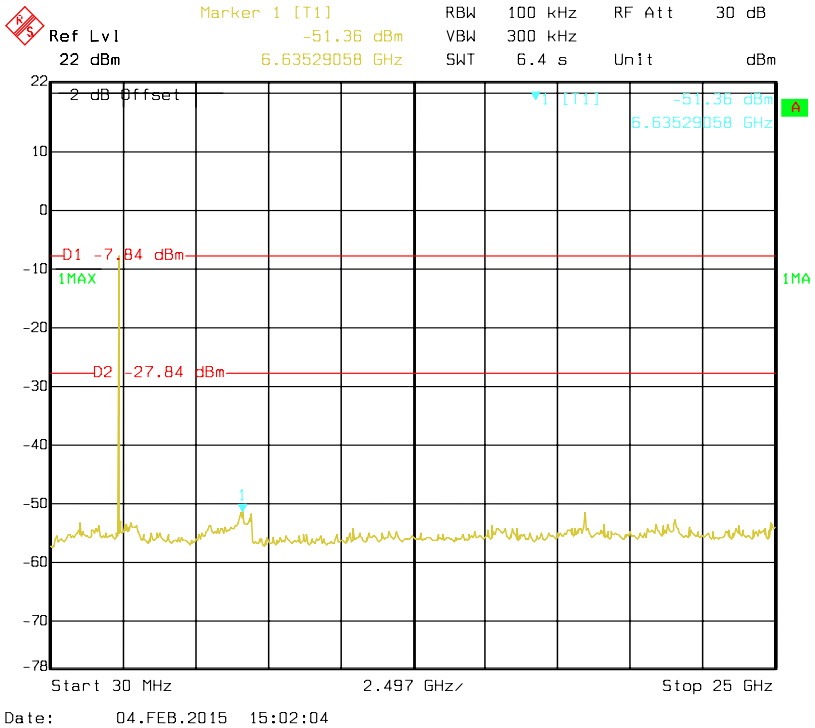
802.11b, Middle Channel



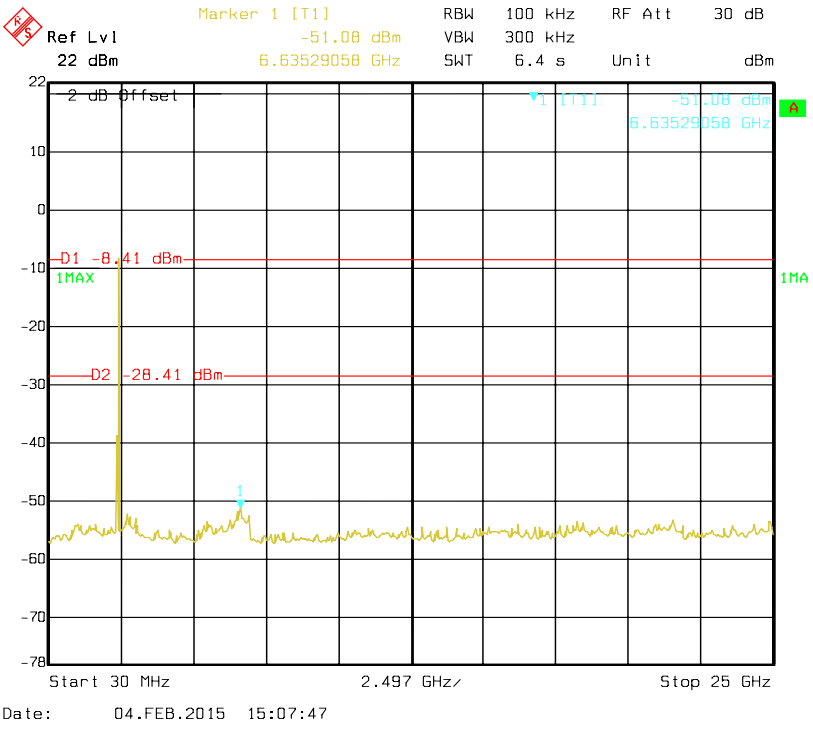
802.11b, High Channel



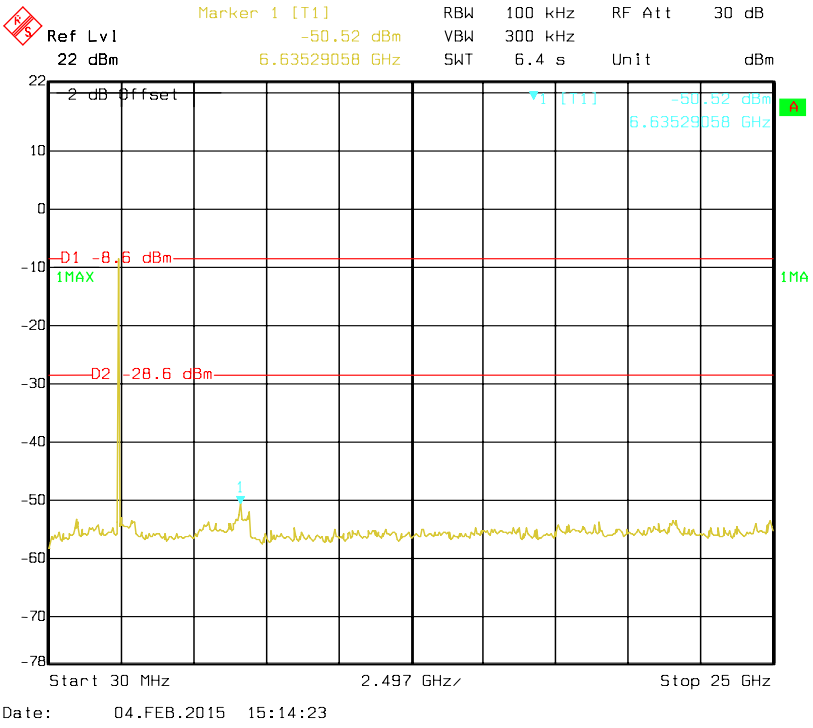
802.11g, Low Channel



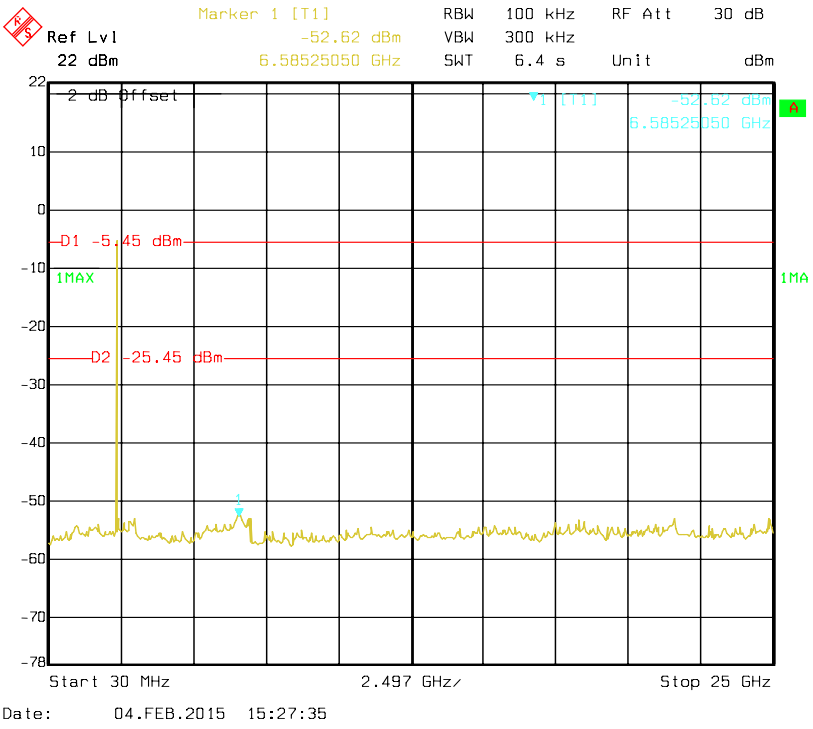
802.11g, Middle Channel



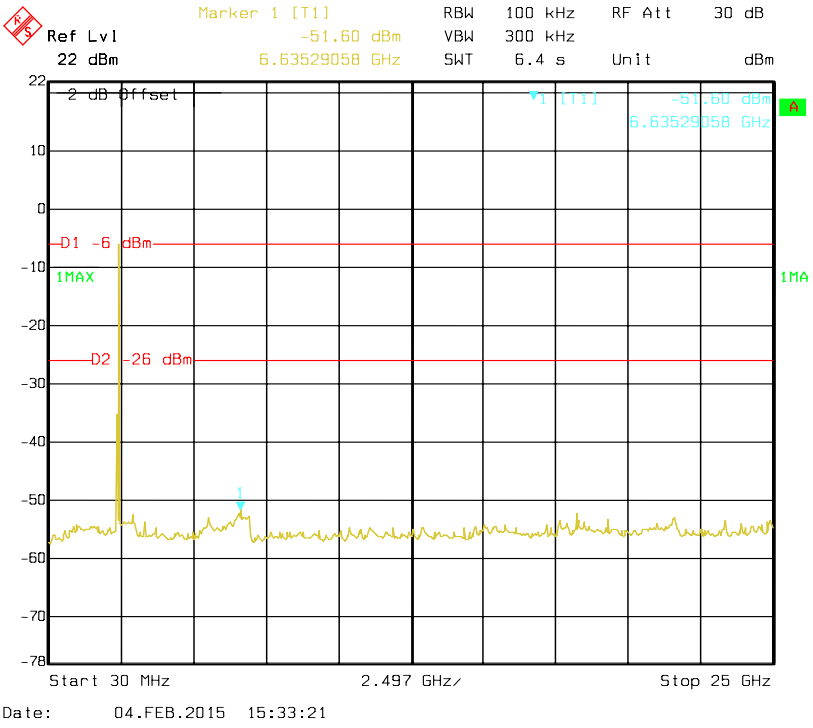
802.11g, High Channel



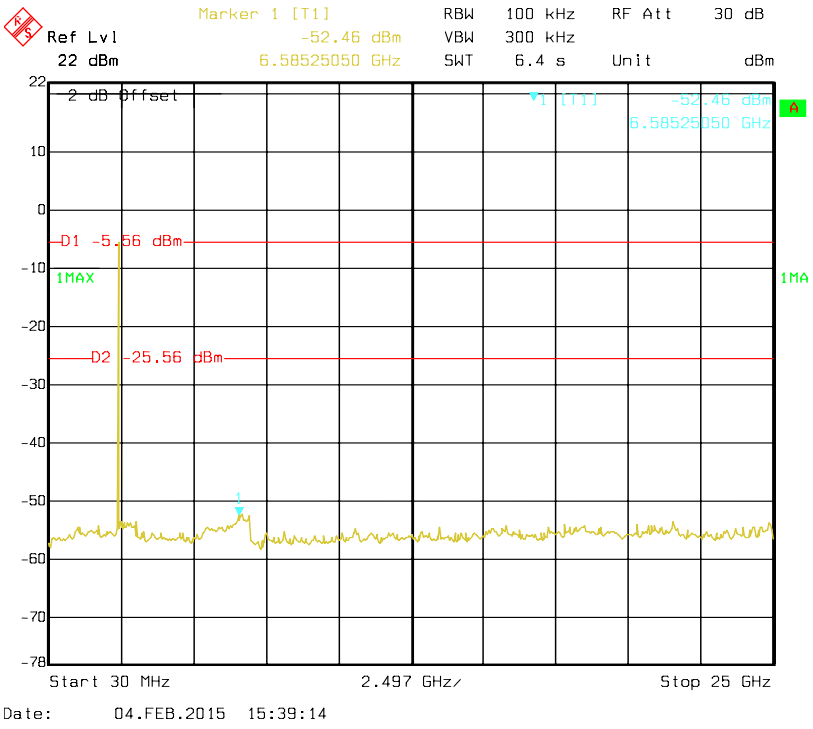
802.11n HT20, Low Channel



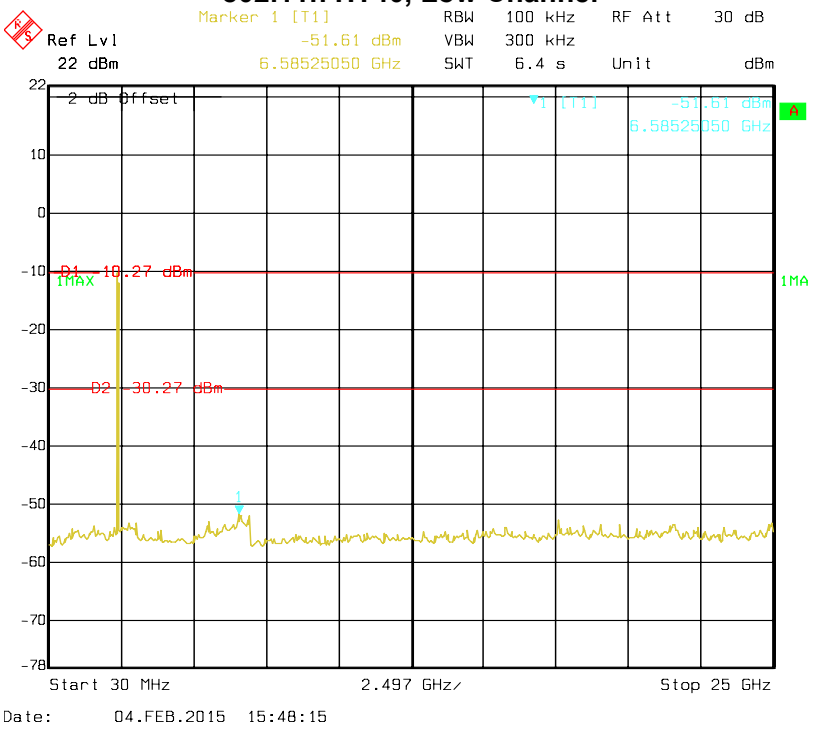
802.11n HT20, Middle Channel



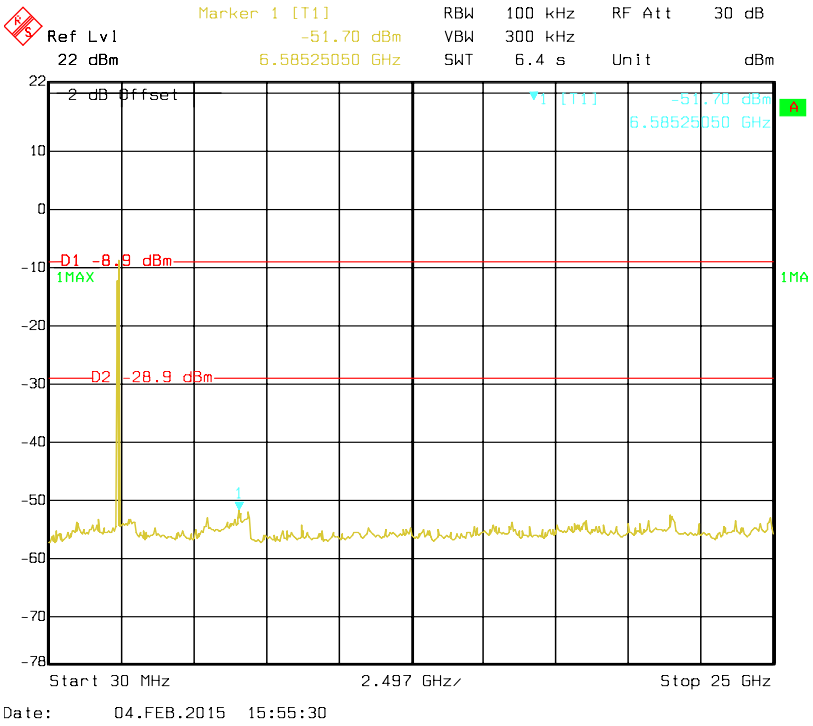
802.11n HT20, High Channel



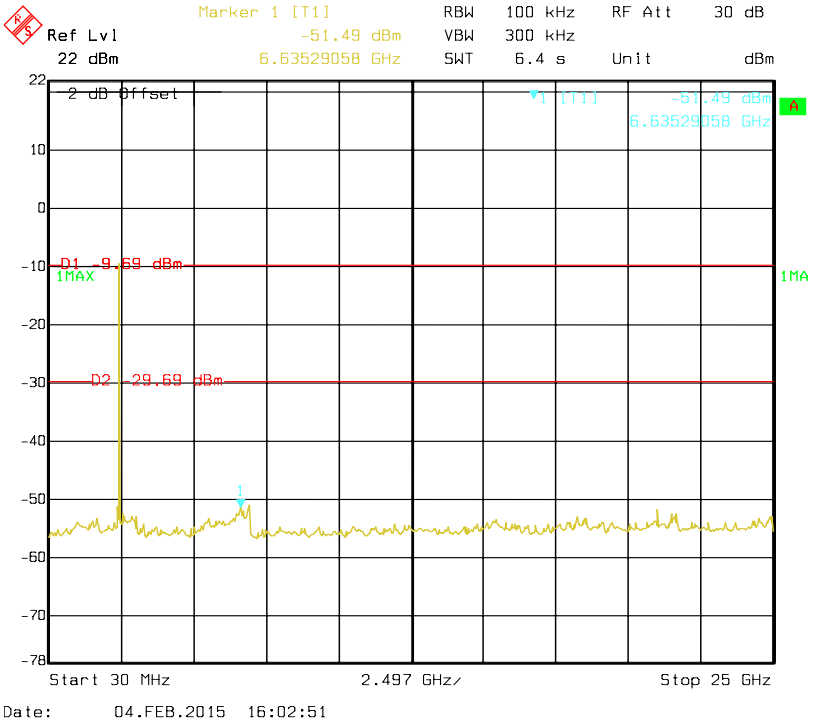
802.11n HT40, Low Channel



802.11n HT40, Middle Channel



802.11n HT40, High Channel



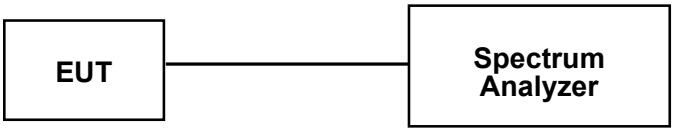
FCC §15.247(a) (2) – 6 dB Emission Bandwidth

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2014-10-17	2015-10-16

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	15 °C
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

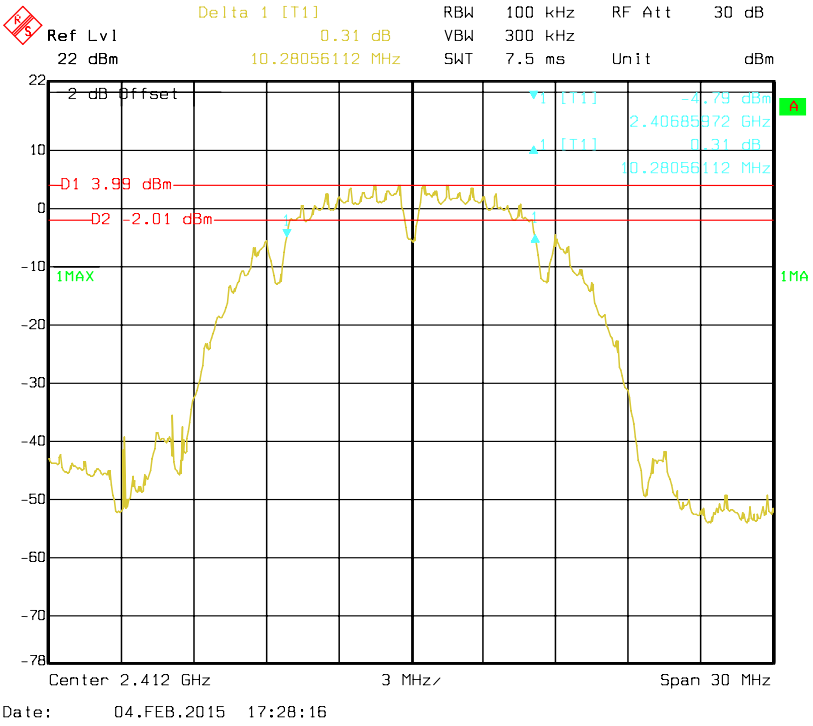
The testing was performed by Kevin Tao on 2015-02-04.

Test Mode: Transmitting (WIFI Module)

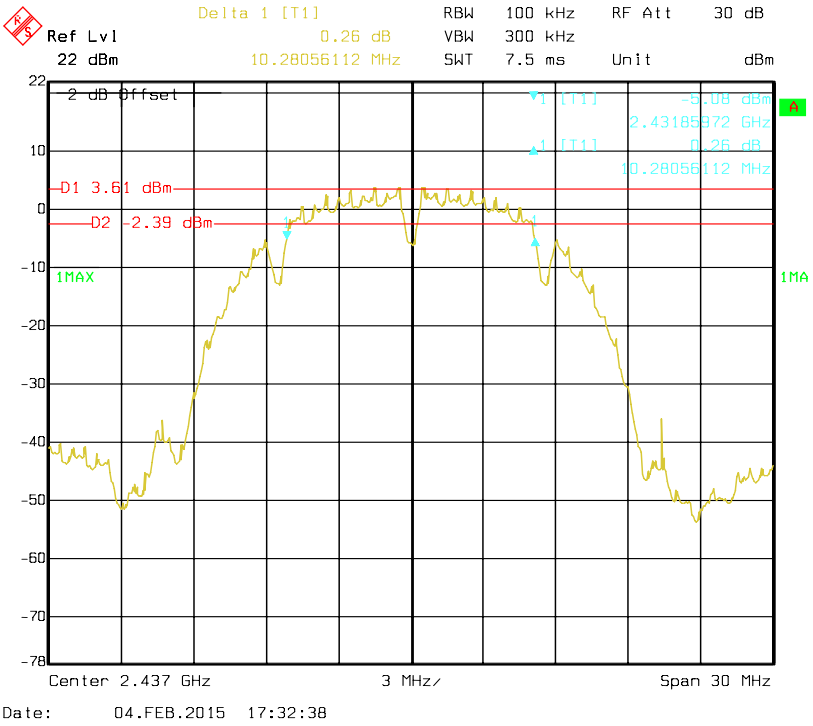
Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	FCC Limit (kHz)
2.4G band 802.11b	Low	2412	10.28	> 500
	Middle	2437	10.28	> 500
	High	2462	10.28	> 500
2.4G band 802.11 g	Low	2412	16.59	> 500
	Middle	2437	16.59	> 500
	High	2462	16.59	> 500
2.4G band 802.11n HT20	Low	2412	17.79	> 500
	Middle	2437	17.79	> 500
	High	2462	17.79	> 500
2.4G band 802.11n HT40	Low	2422	36.67	> 500
	Middle	2437	36.67	> 500
	High	2452	36.67	> 500

Please refer to the following plots:

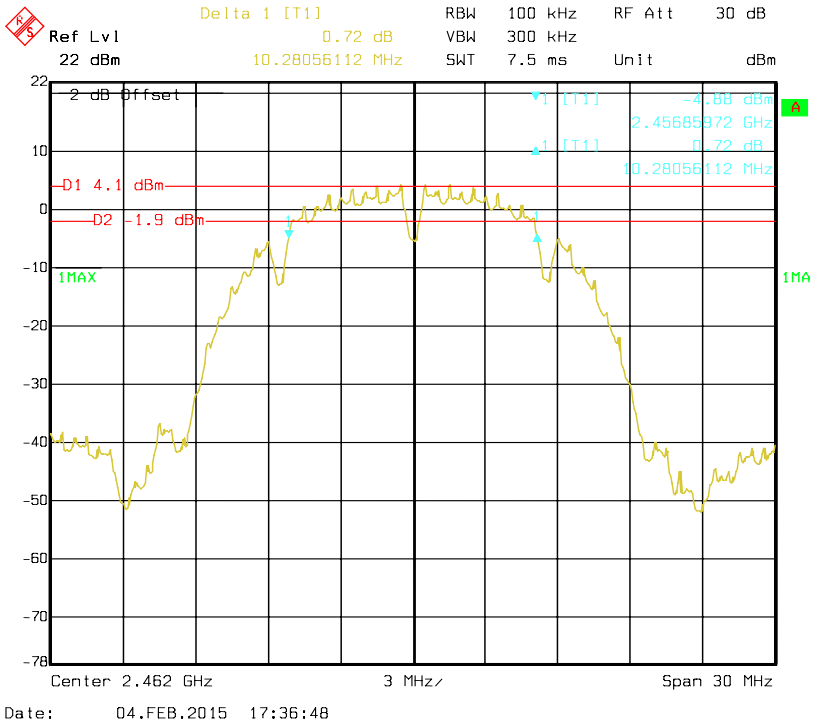
802.11b Low Channel



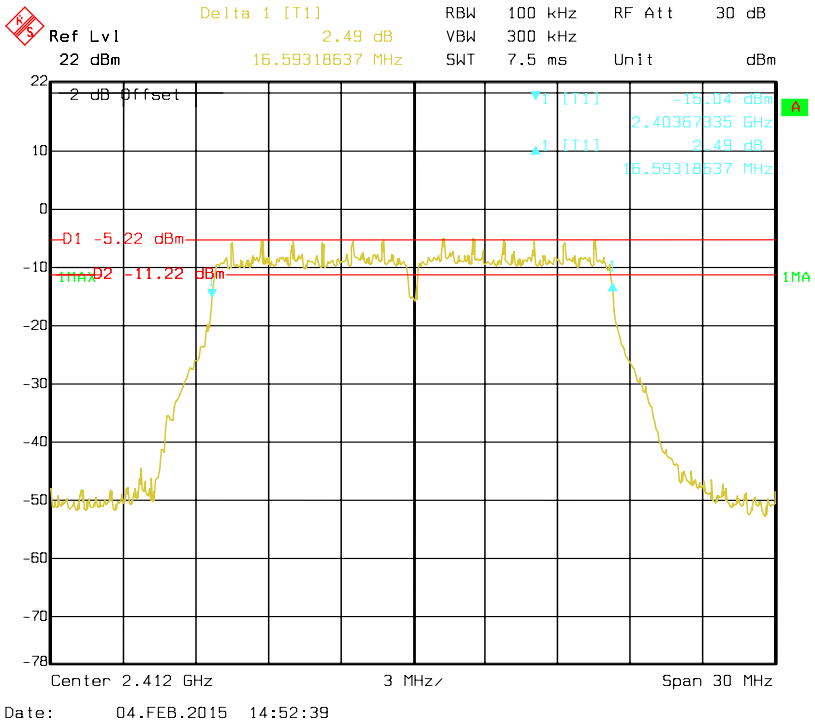
802.11b Middle Channel



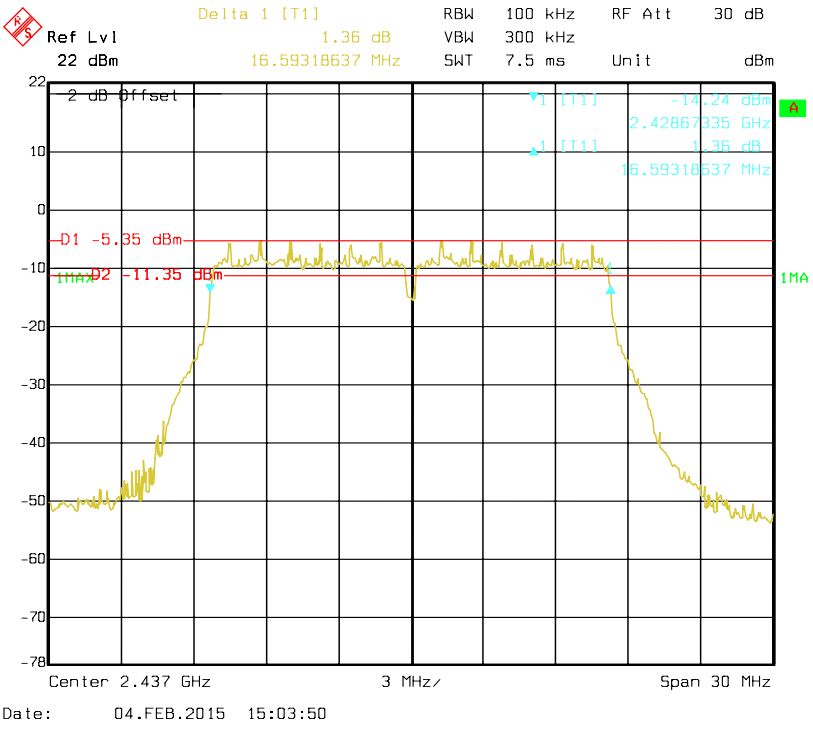
802.11b High Channel



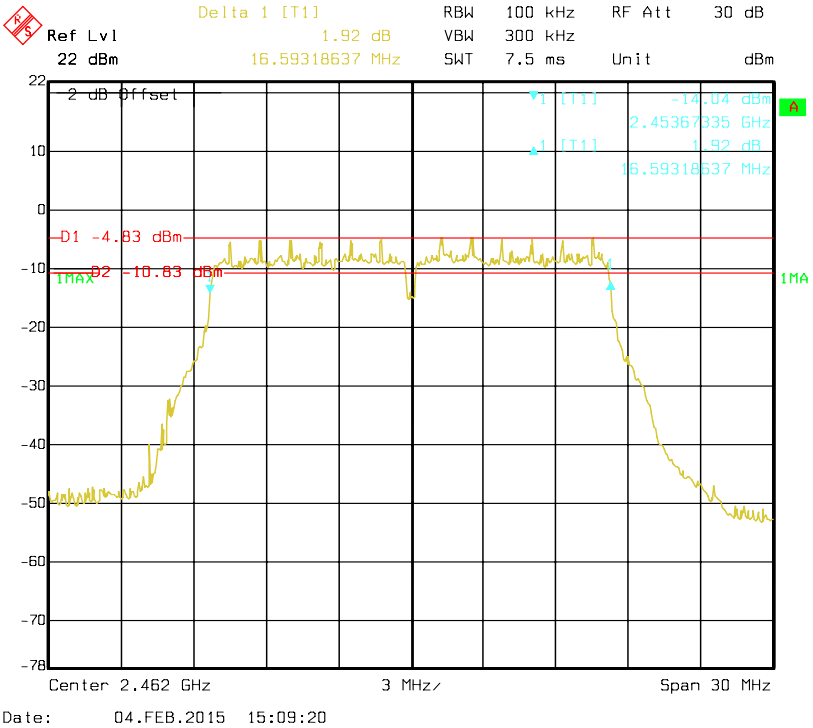
802.11g Low Channel



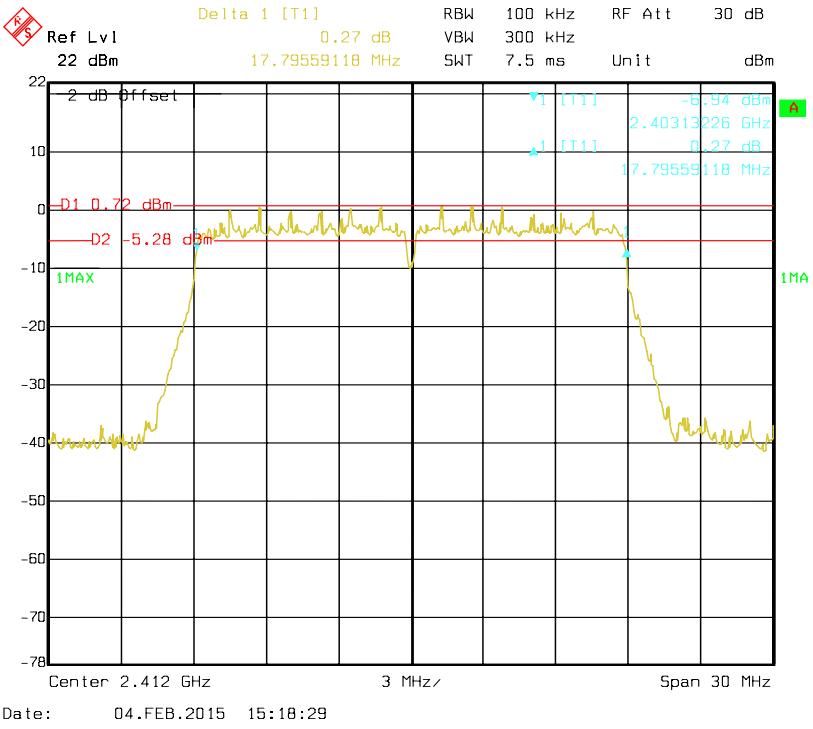
802.11g Middle Channel



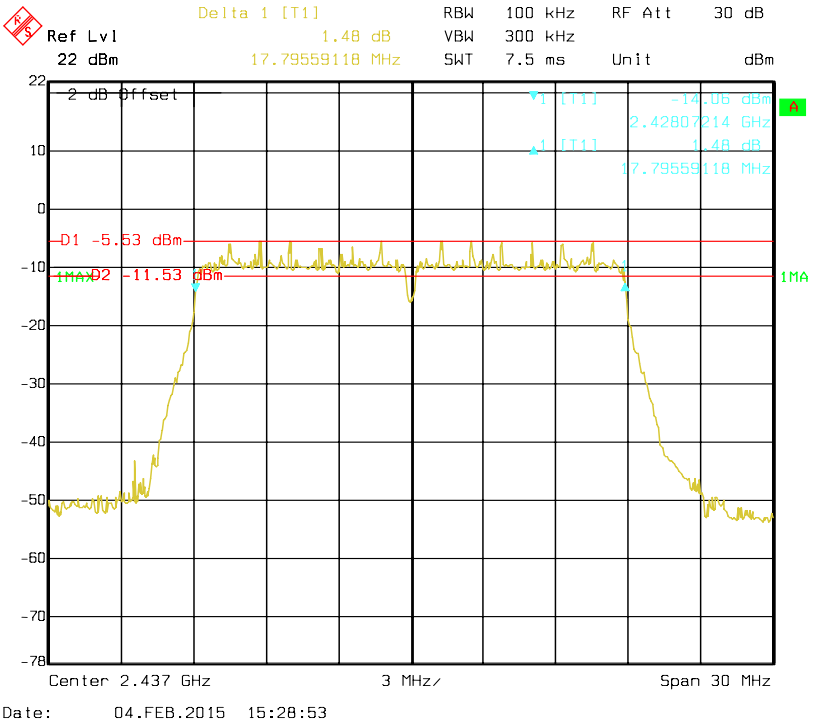
802.11g High Channel



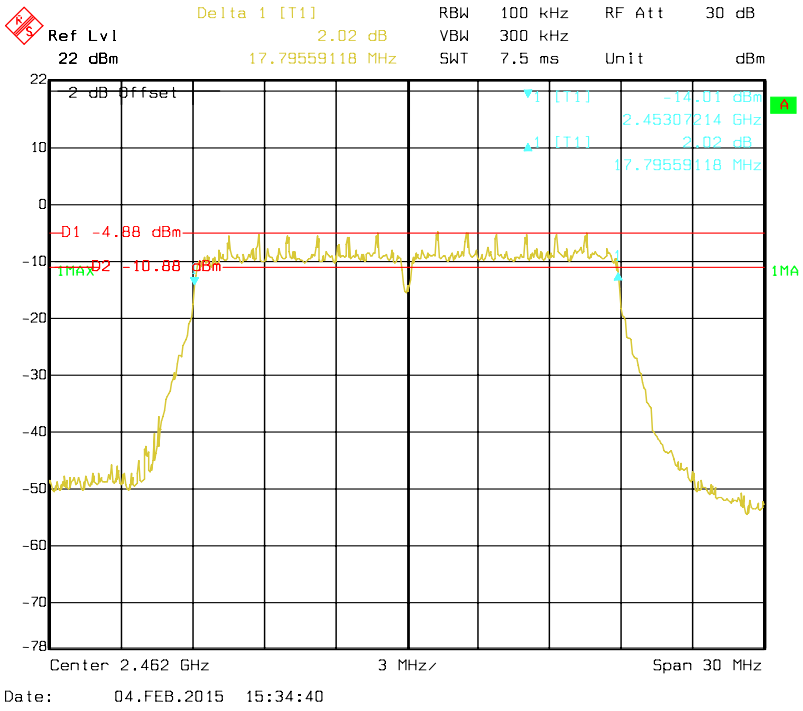
802.11n HT20 Low Channel



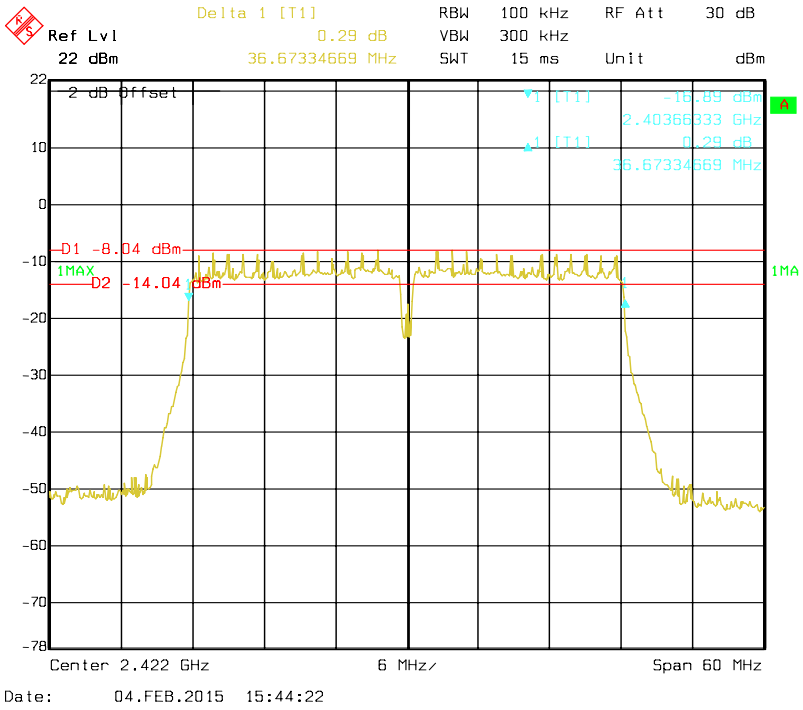
802.11n HT20 Middle Channel



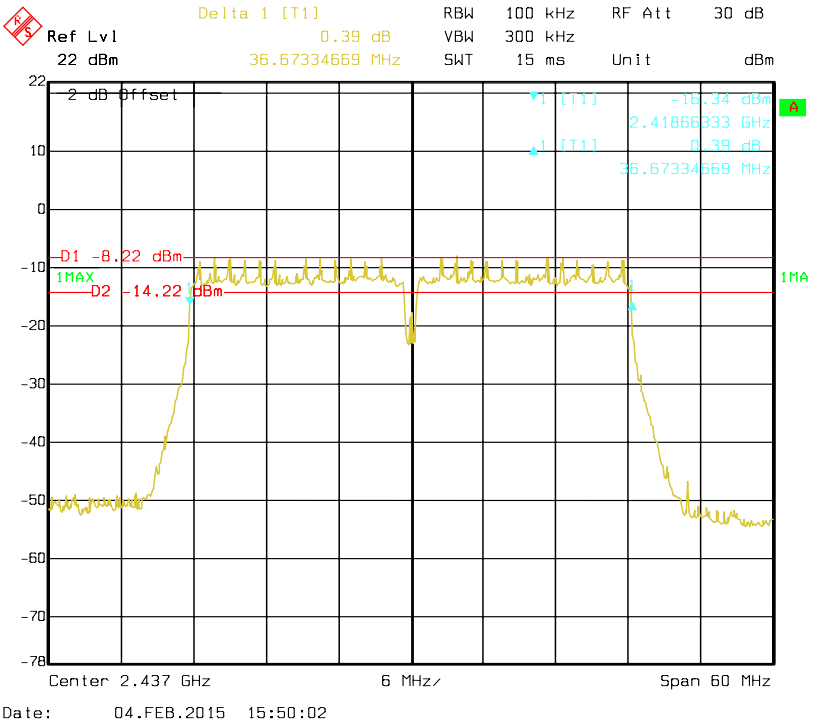
802.11n HT20 High Channel



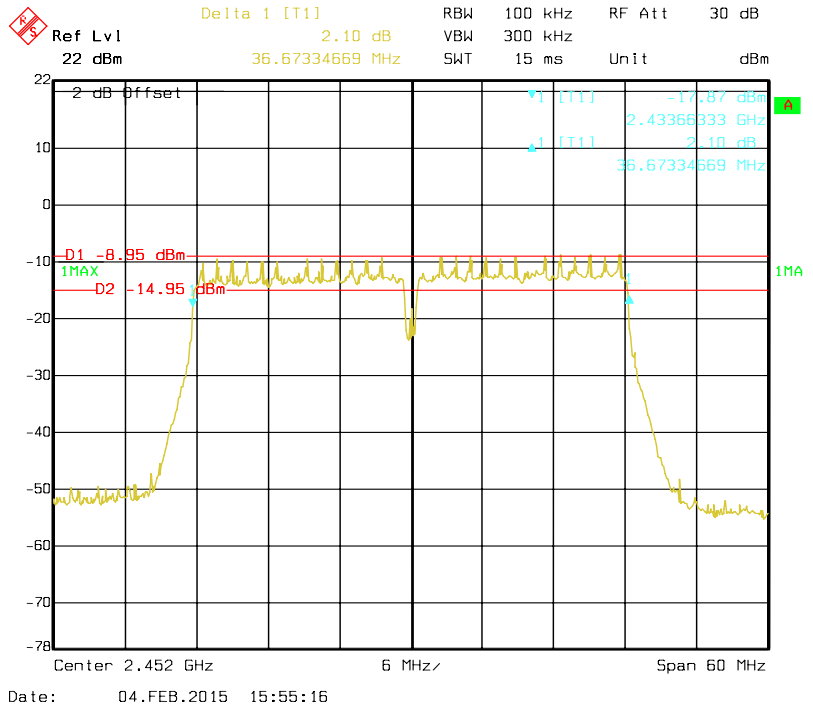
802.11n HT40 Low Channel



802.11n HT40 Middle Channel



802.11n HT40 High Channel



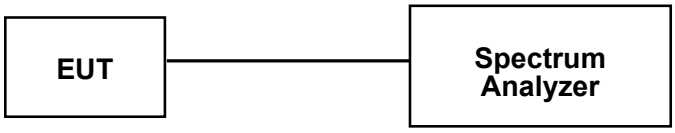
FCC §15.247(b) (3) - Maximum Peak Output Power

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2014-10-17	2015-10-16

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	15 °C
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

The testing was performed by Kevin Tao on 2015-02-04.

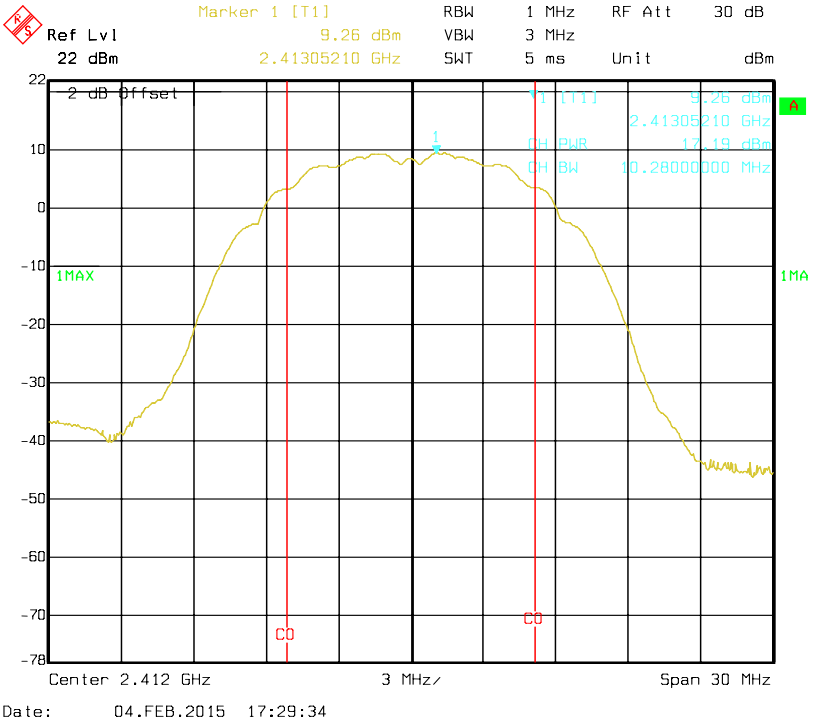
Test Mode: Transmitting (WIFI Module)

Mode	Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Result
2.4G band 802.11b	Low	2412	17.19	30	Pass
	Middle	2437	16.73	30	Pass
	High	2462	17.26	30	Pass
2.4G band 802.11 g	Low	2412	14.04	30	Pass
	Middle	2437	13.83	30	Pass
	High	2462	14.31	30	Pass
2.4G band 802.11n HT20	Low	2412	14.21	30	Pass
	Middle	2437	14.06	30	Pass
	High	2462	14.49	30	Pass
2.4G band 802.11n HT40	Low	2422	14.03	30	Pass
	Middle	2437	14.02	30	Pass
	High	2452	13.46	30	Pass

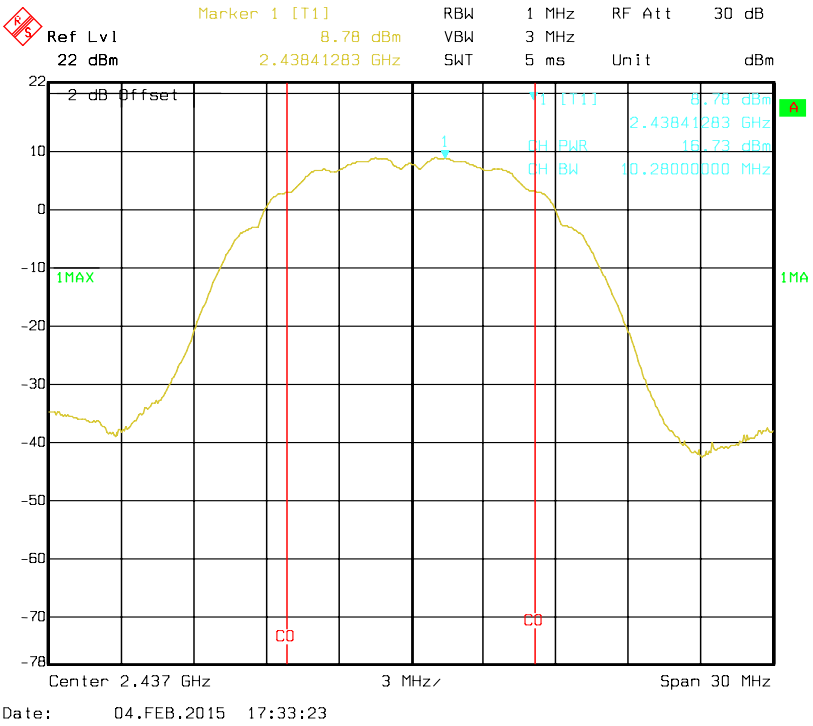
Note: Duty cycle is more than 98%.

Please refer to the following plots

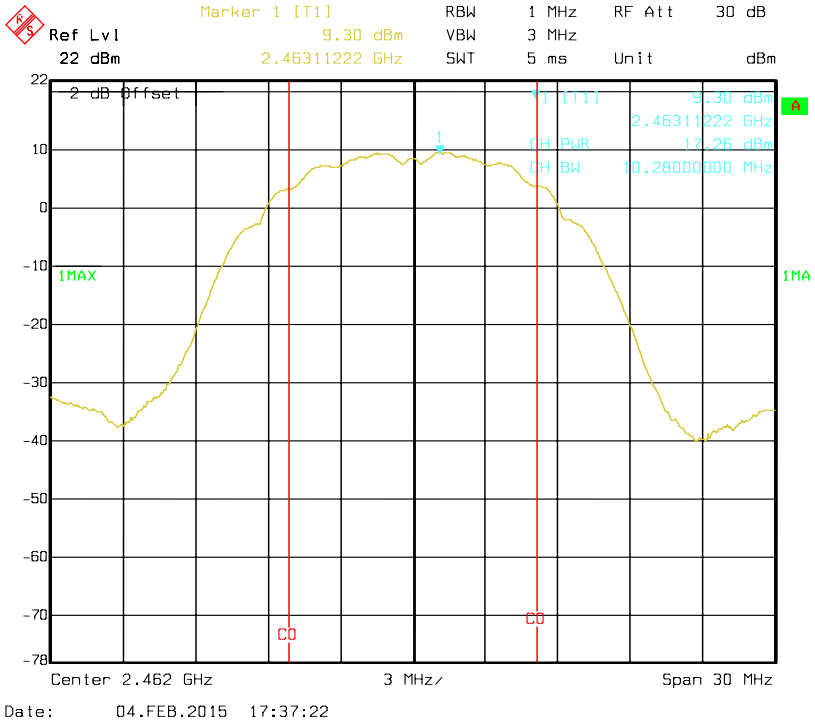
802.11b RF Output Power, Low Channel



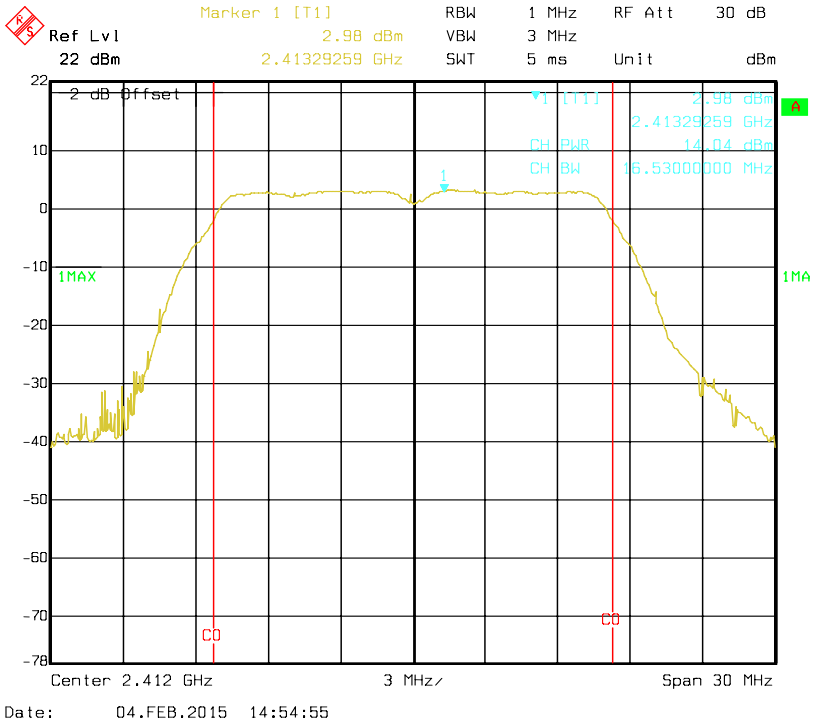
802.11b RF Output Power, Middle Channel



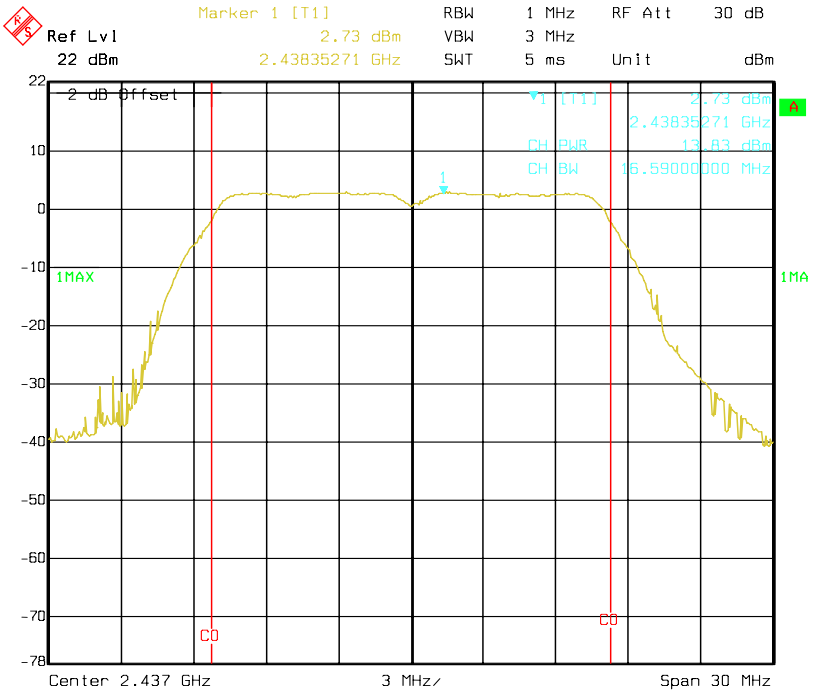
802.11b RF Output Power, High Channel



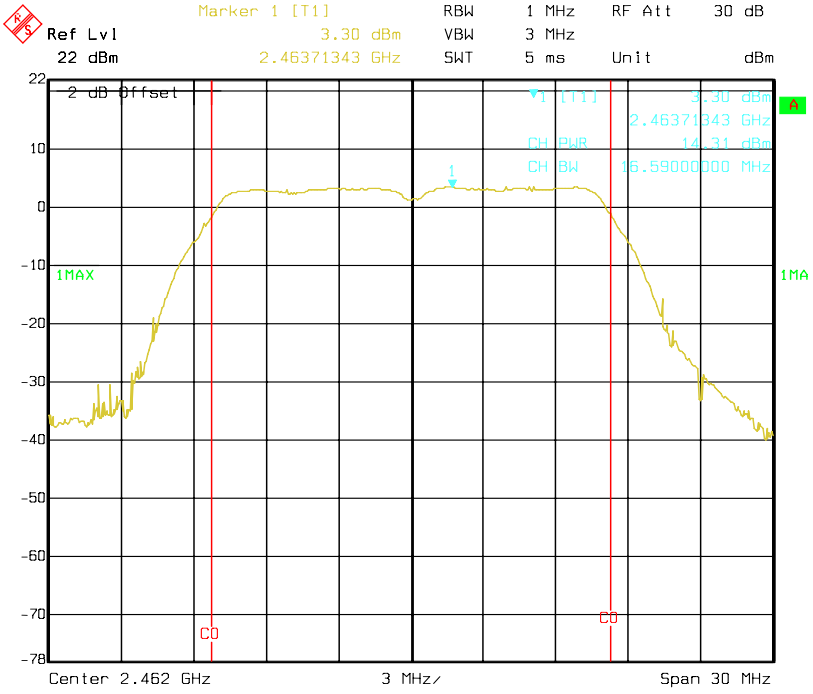
802.11g RF Output Power, Low Channel



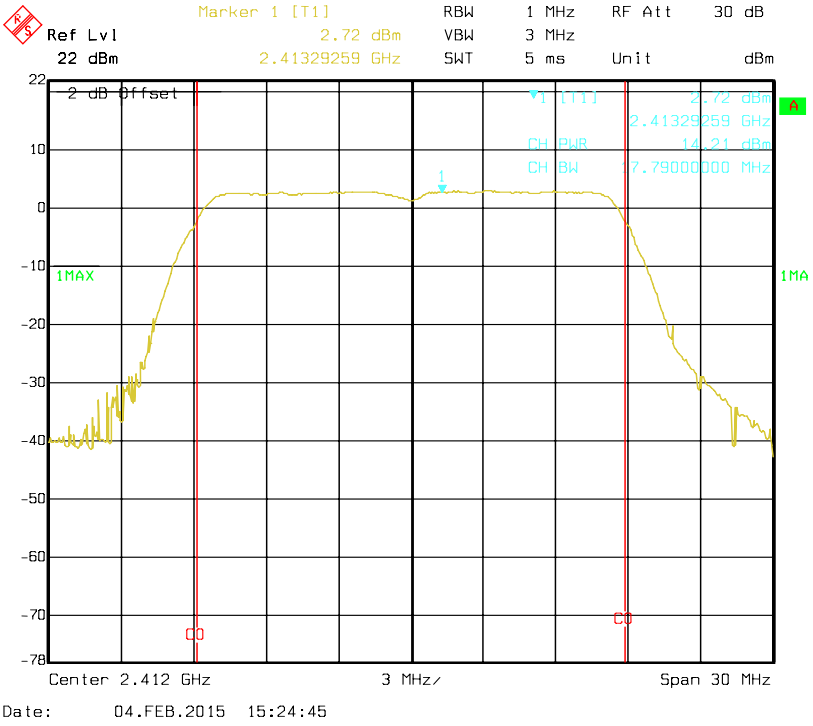
802.11g RF Output Power, Middle Channel



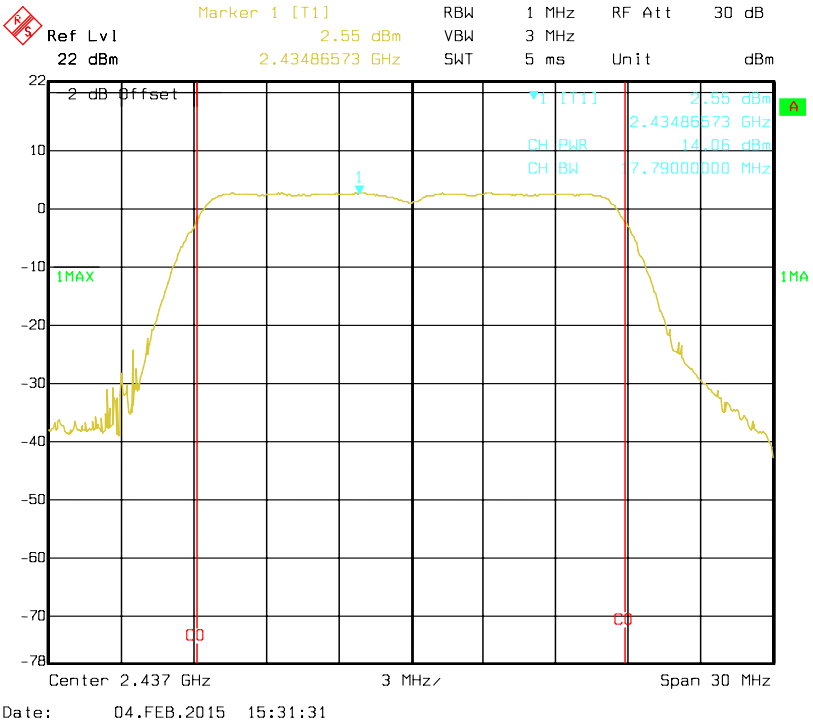
802.11g RF Output Power, High Channel



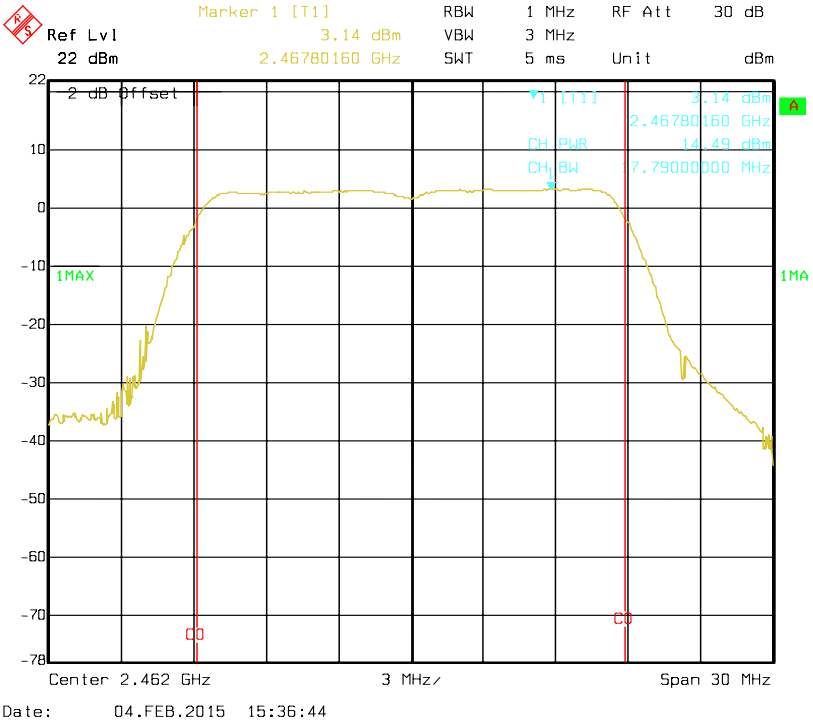
802.11n HT20 RF Output Power, Low Channel



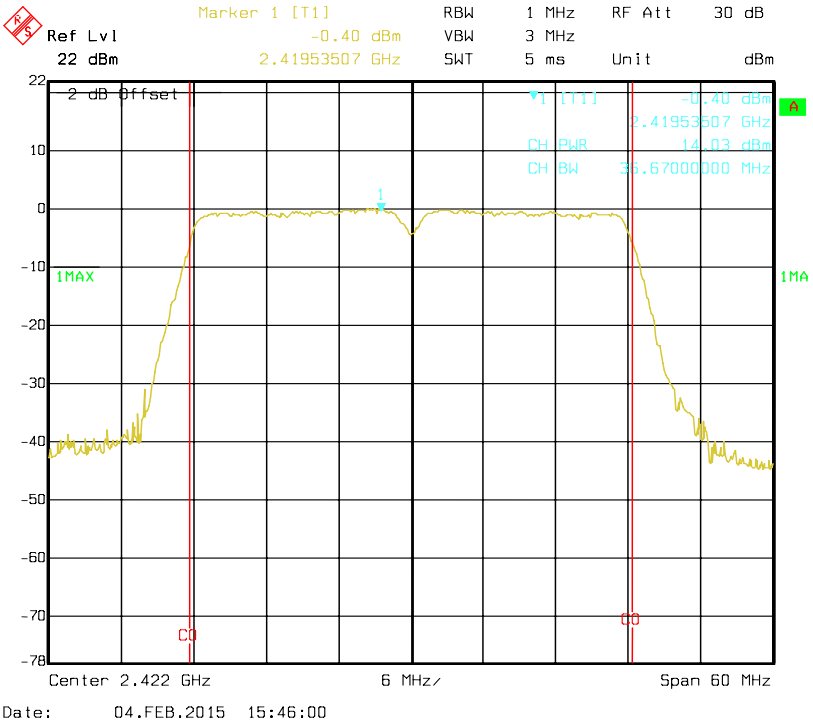
802.11n HT20 RF Output Power, Middle Channel



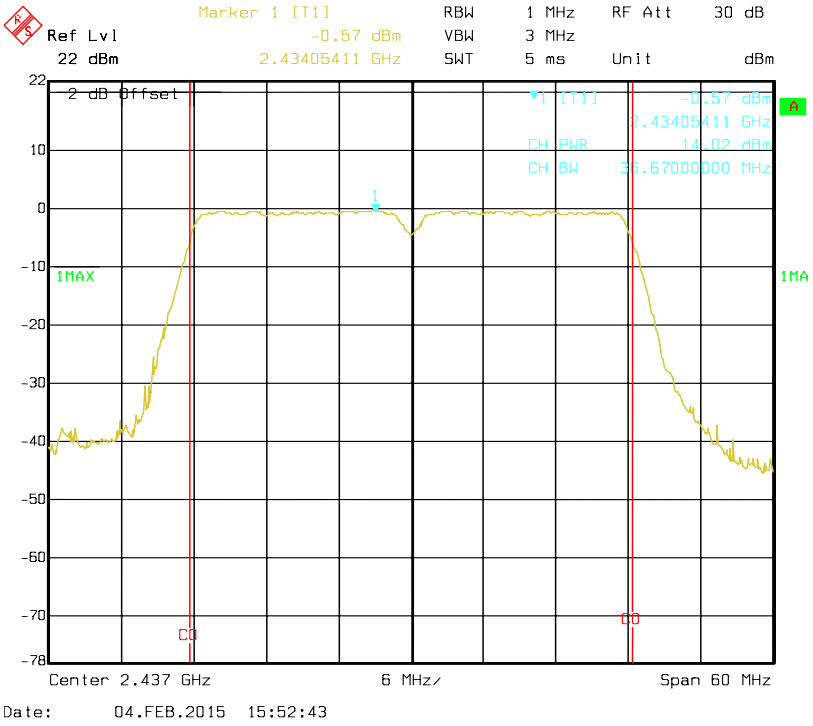
802.11n HT20 RF Output Power, High Channel



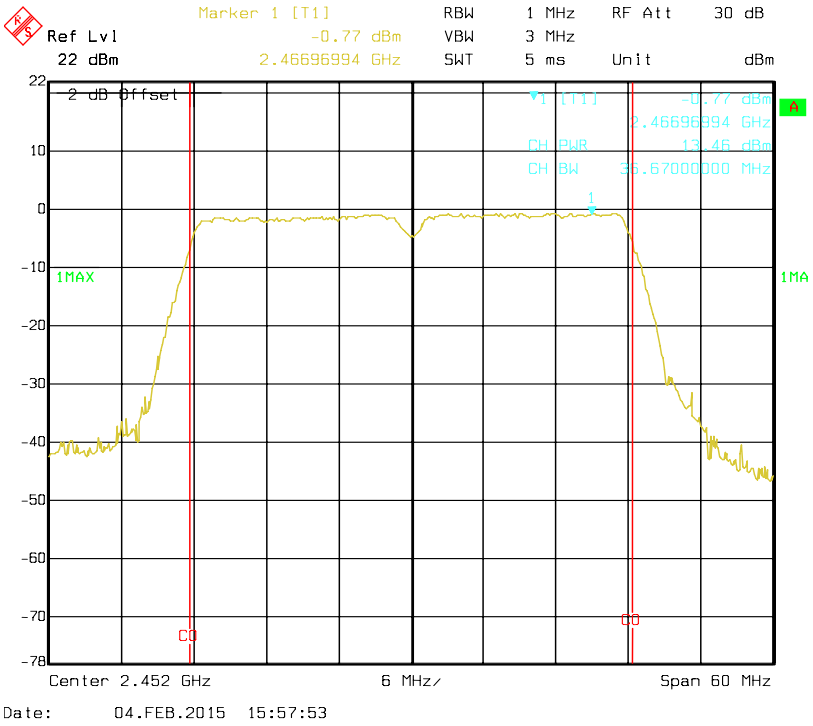
802.11n HT40 RF Output Power, Low Channel



802.11n HT40 RF Output Power, Middle Channel



802.11n HT40 RF Output Power, High Channel



FCC §15.247(d) – 100 kHz Bandwidth of Frequency Band Edge

Applicable Standard

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

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2014-10-17	2015-10-16

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

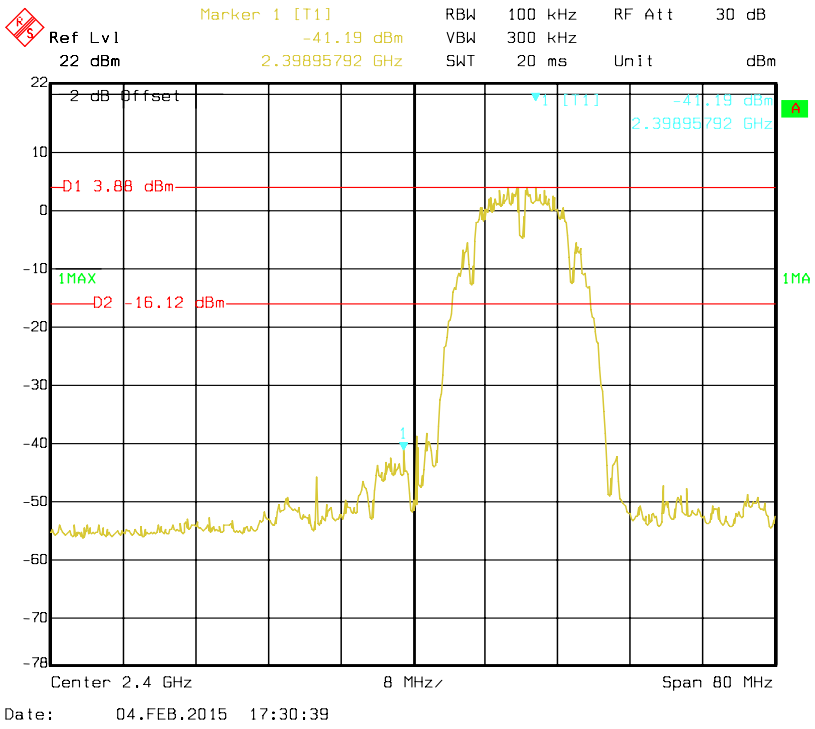
Temperature:	15 °C
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

The testing was performed by Kevin Tao on 2015-02-04.

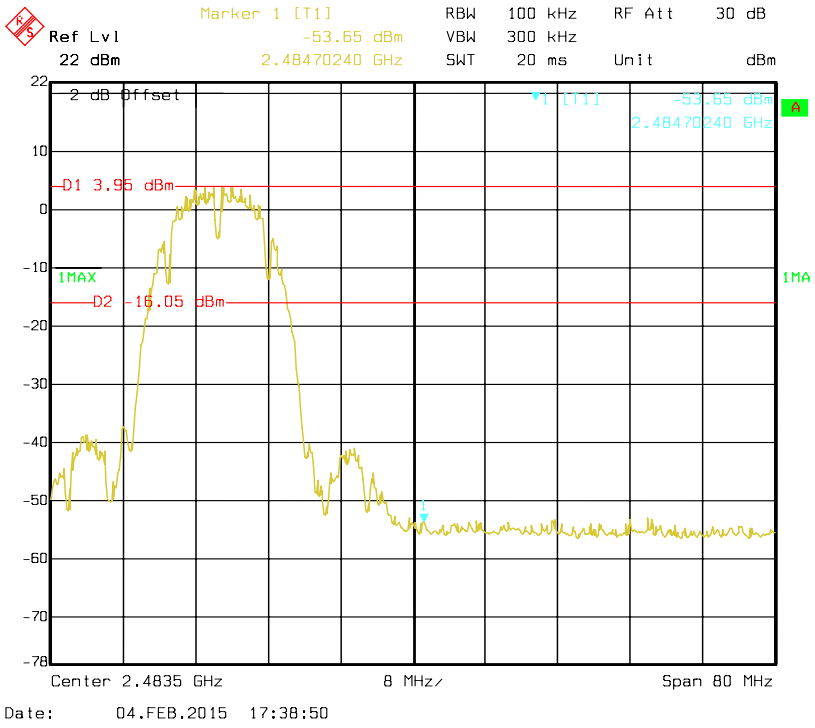
Test Mode: Transmitting (WIFI Module)

Test Result: Compliance, Please refer to following table and plots.

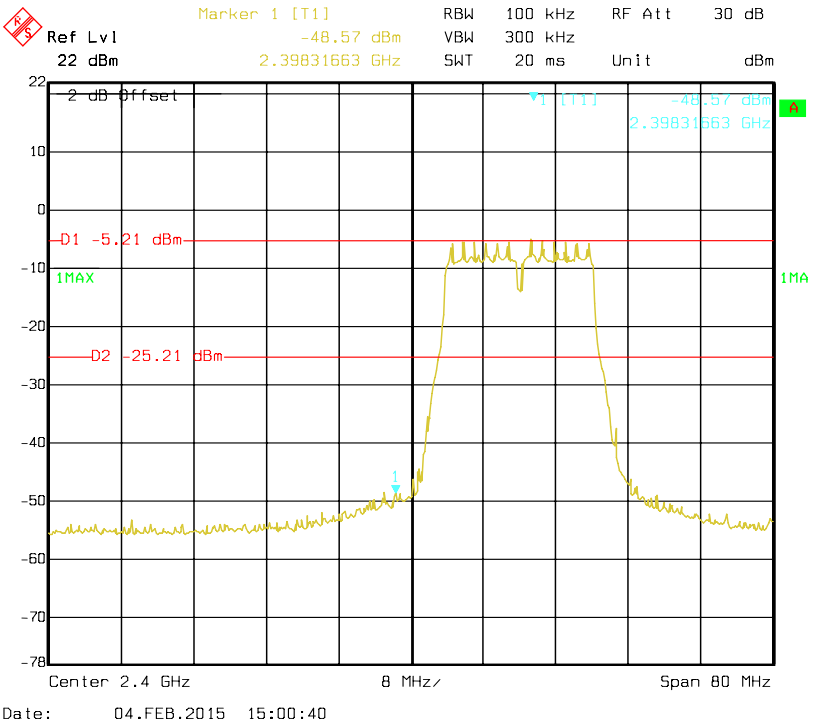
802.11b: Band Edge, Left Side



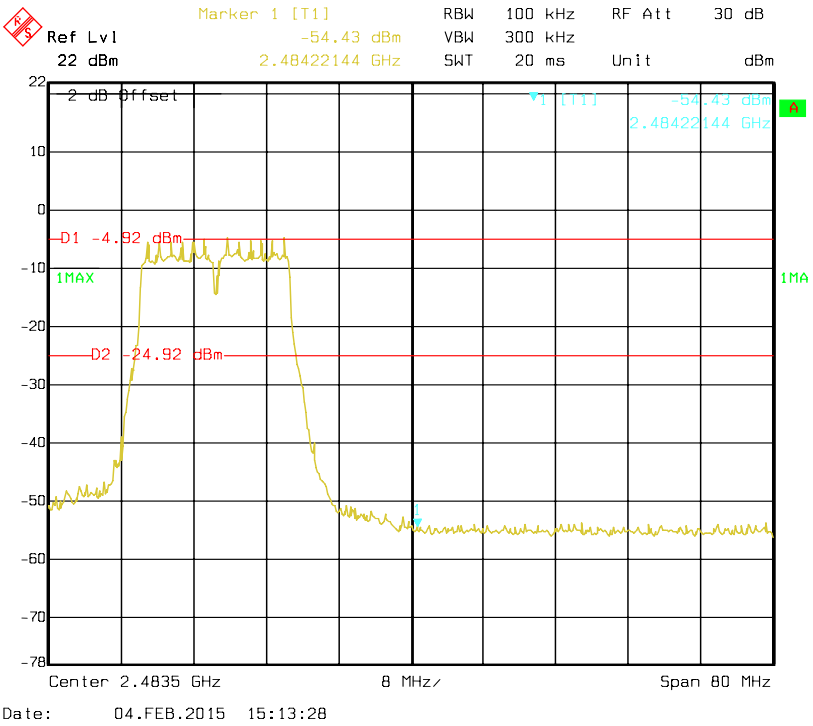
802.11b: Band Edge, Right Side



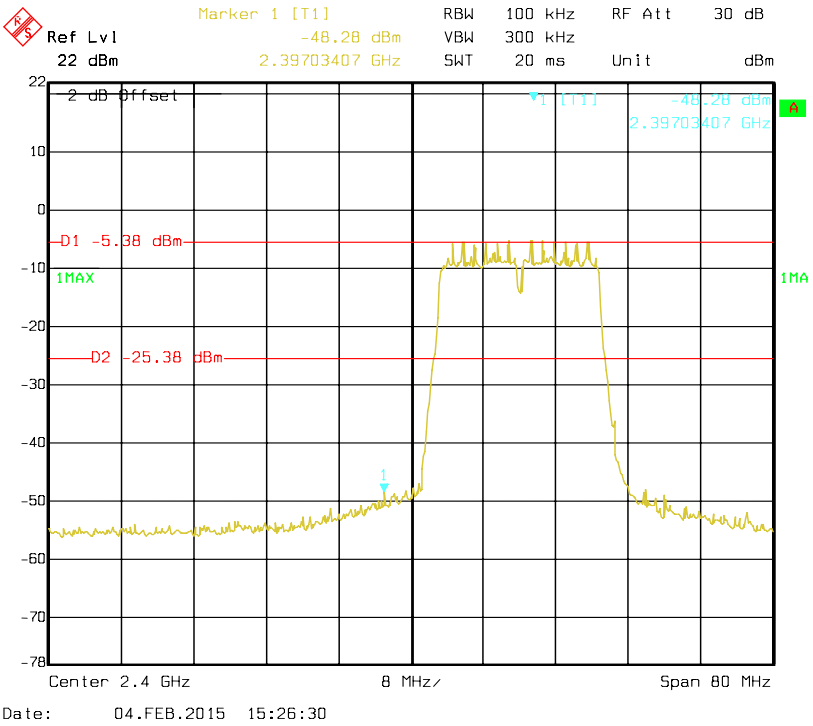
802.11g: Band Edge, Left Side



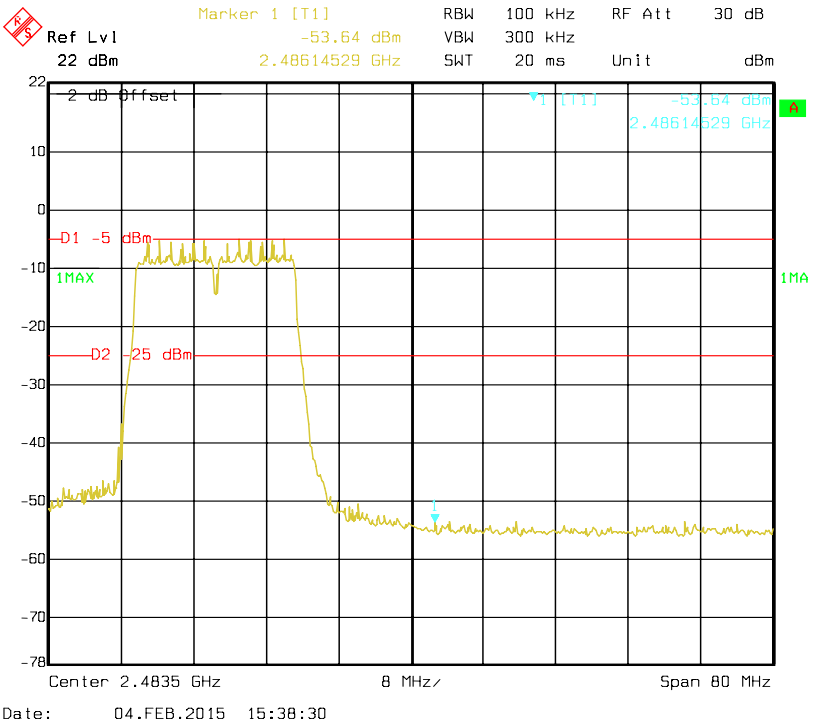
802.11g: Band Edge, Right Side



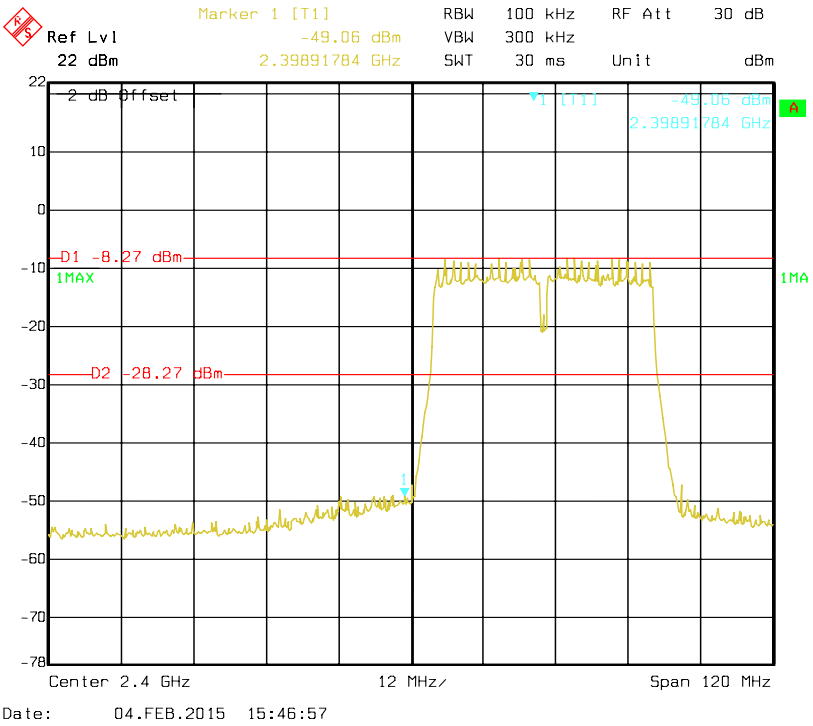
802.11n HT20 Band Edge, Left Side



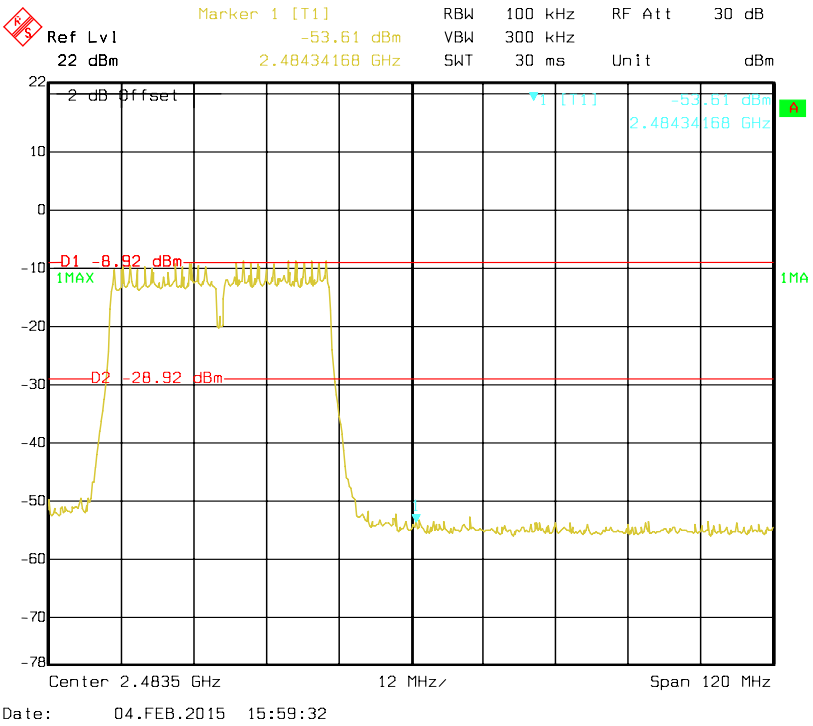
802.11n HT20 Band Edge, Right Side



802.11n HT40 Band Edge, Left Side



802.11n HT40 Band Edge, Right Side



FCC §15.247(e) - Power Spectral Density

Applicable Standard

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

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. According to KDB 558074 D01 DTS Meas Guidance v03v02, set the RBW = 3 kHz, VBW = 10 kHz, Set the span to 1.5 times the DTS channel bandwidth.
4. Use the peak marker function to determine the maximum power level in any 3 kHz band segment within the fundamental EBW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2014-10-17	2015-10-16

*** Statement of Traceability:** BACL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	15 °C
Relative Humidity:	61 %
ATM Pressure:	96.2 kPa

The testing was performed by Kevin Tao on 2015-02-04.

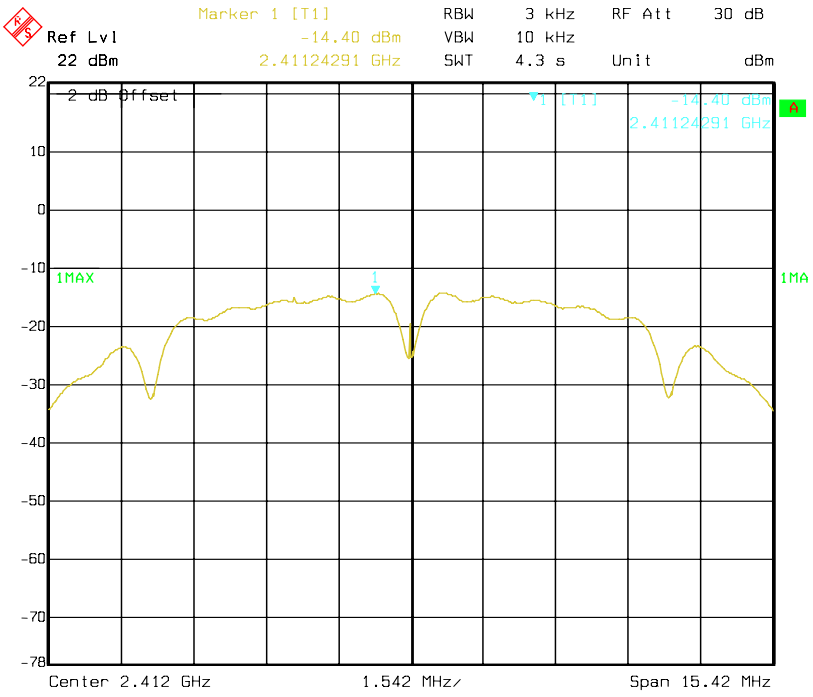
Test Mode: Transmitting (WIFI Module)

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm)	Result
2.4G band 802.11b	Low	2412	-14.40	8	Pass
	Middle	2437	-14.84	8	Pass
	High	2462	-14.30	8	Pass
2.4G band 802.11 g	Low	2412	-21.24	8	Pass
	Middle	2437	-21.94	8	Pass
	High	2462	-21.89	8	Pass
2.4G band 802.11nHT20	Low	2412	-21.80	8	Pass
	Middle	2437	-20.77	8	Pass
	High	2462	-20.53	8	Pass
2.4G band 802.11n HT40	Low	2422	-24.12	8	Pass
	Middle	2437	-24.23	8	Pass
	High	2452	-23.79	8	Pass

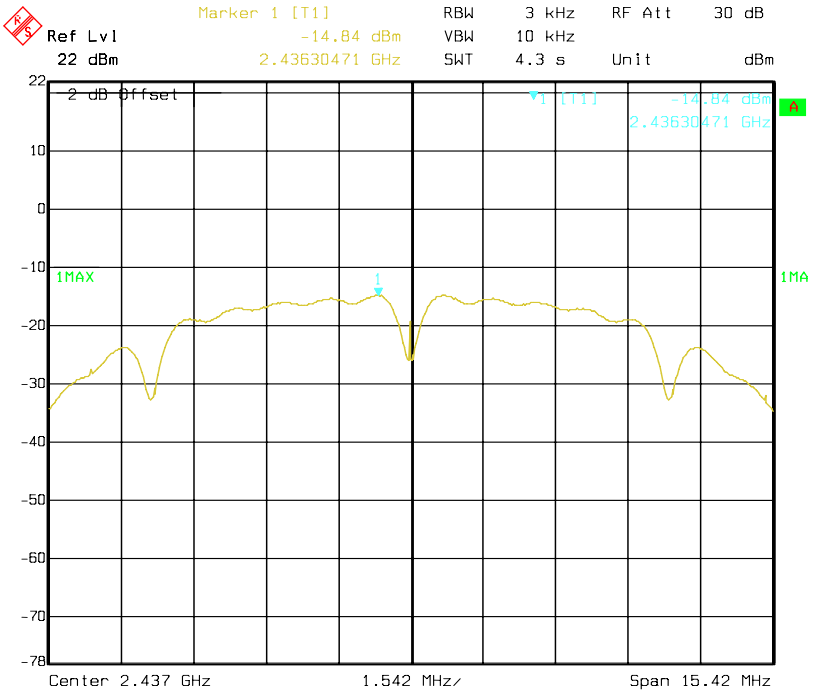
Note: Duty cycle is more than 98%.

Please refer to the following plots.

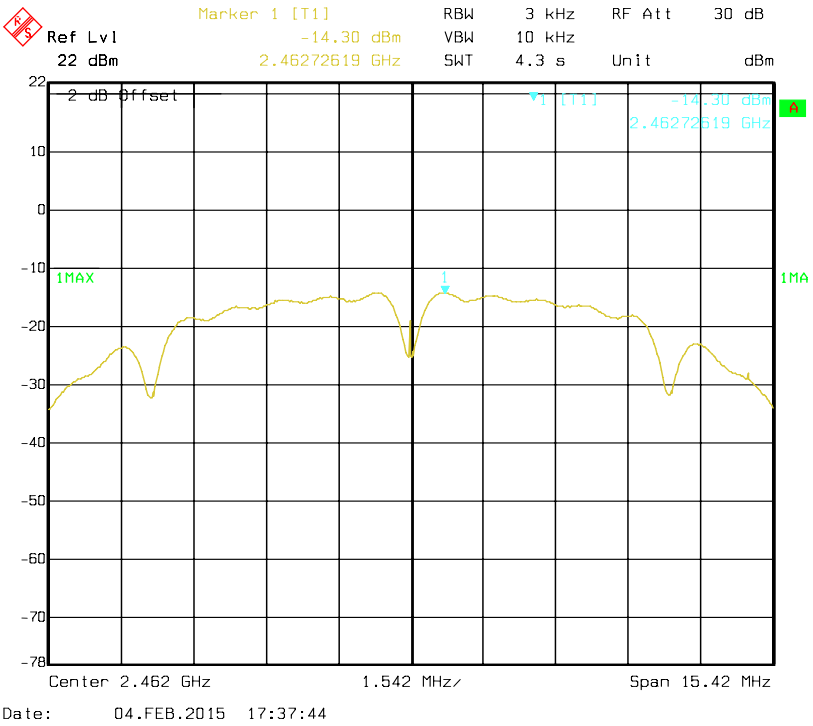
Power Spectral Density, 802.11b Low Channel



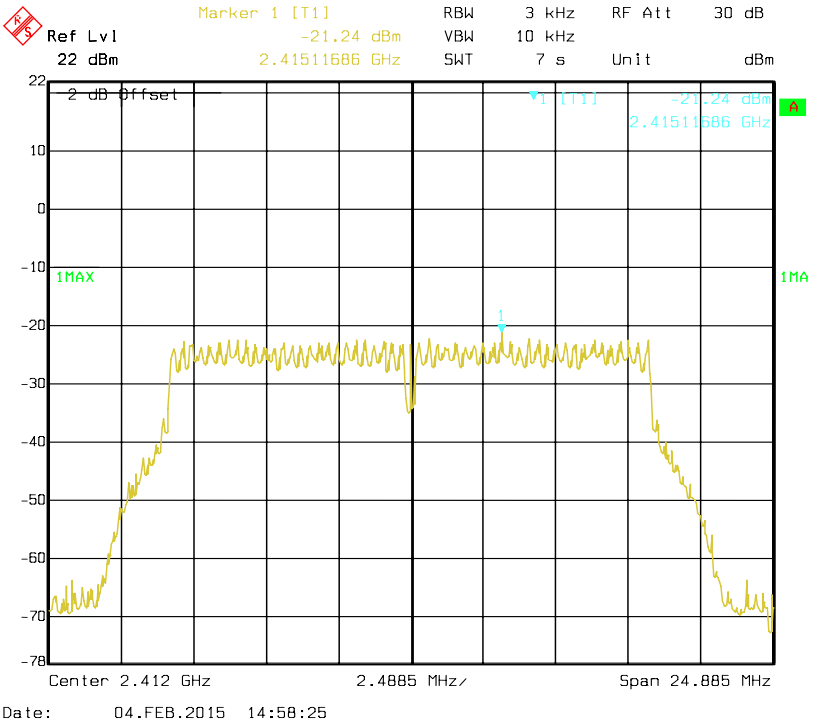
Power Spectral Density, 802.11b Middle Channel



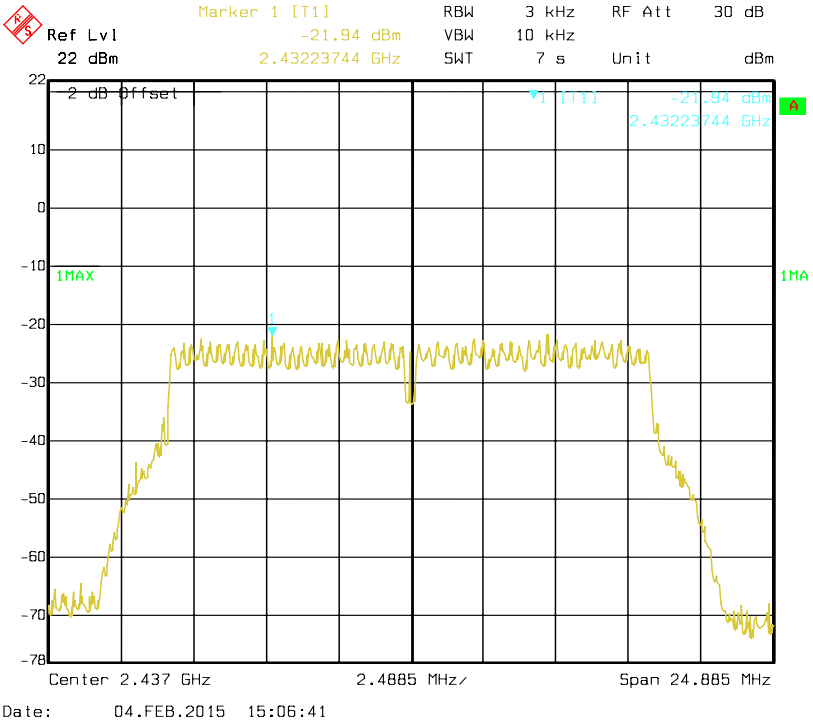
Power Spectral Density, 802.11b High Channel



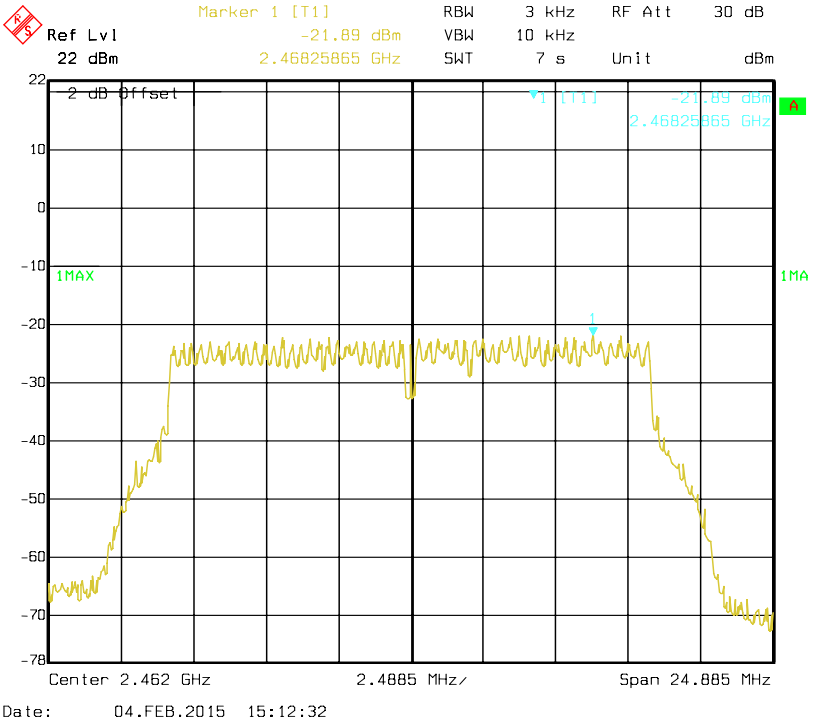
Power Spectral Density, 802.11g Low Channel



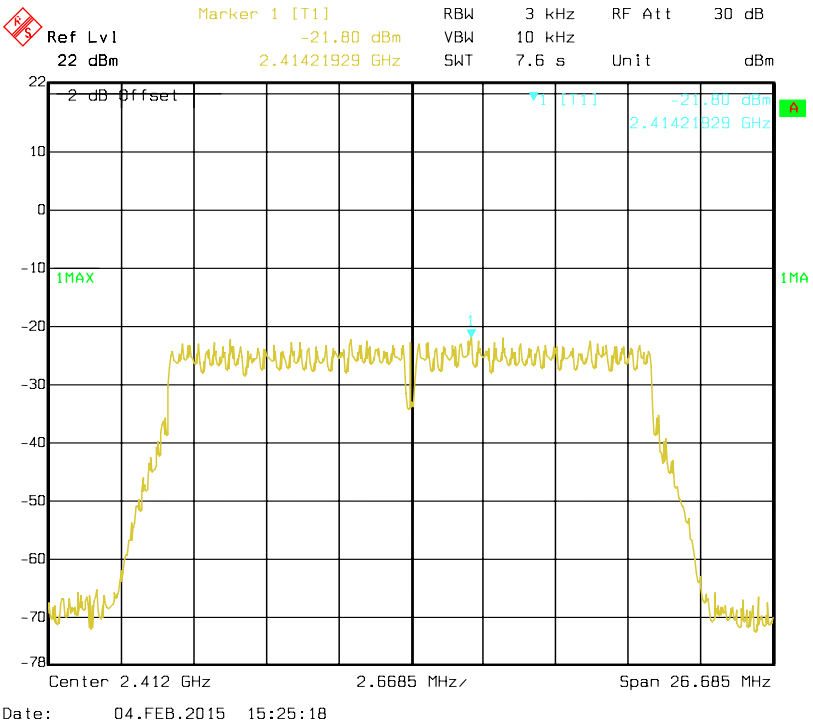
Power Spectral Density, 802.11g Middle Channel



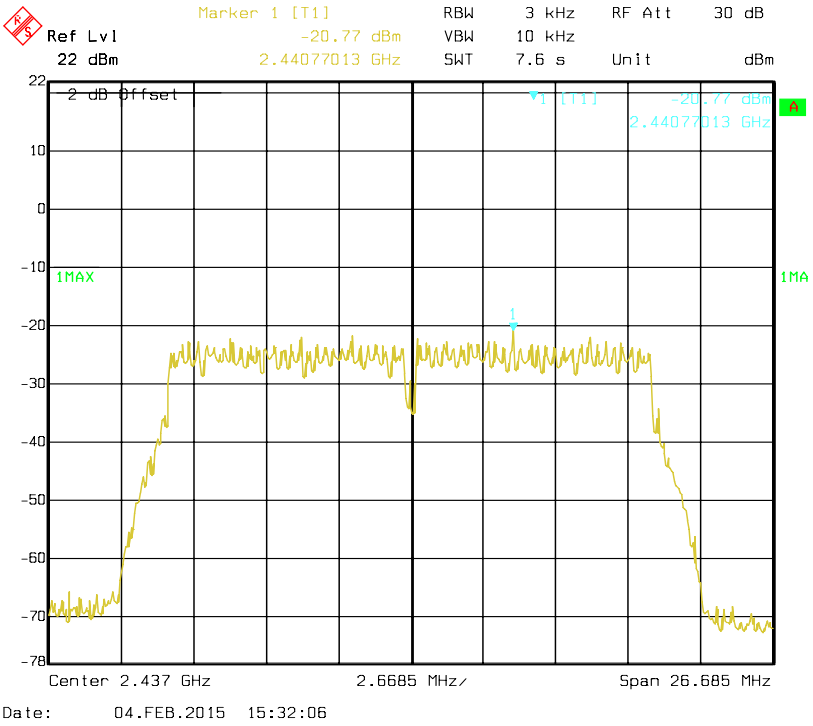
Power Spectral Density, 802.11g High Channel



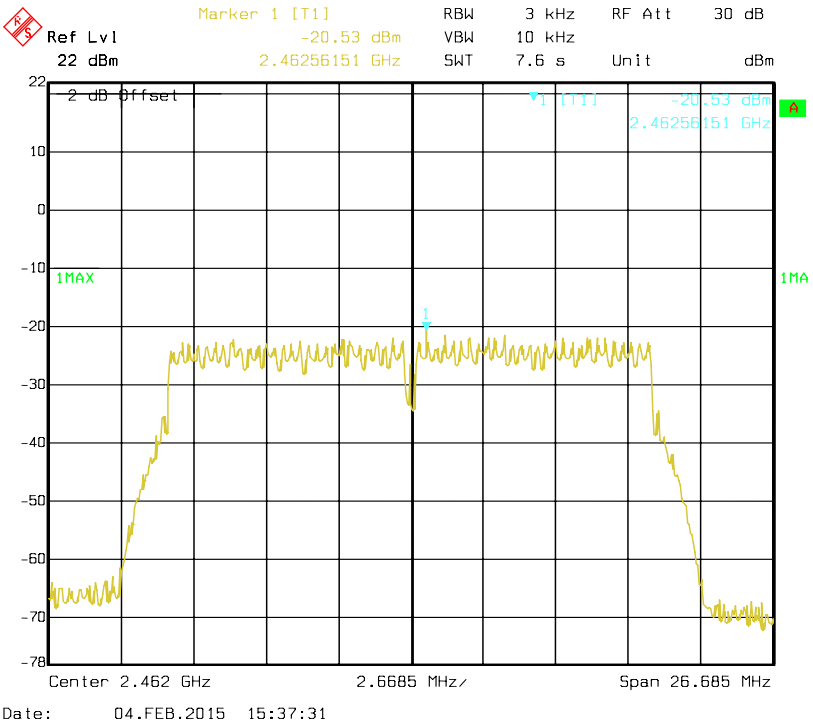
Power Spectral Density, 802.11n HT20 Low Channel



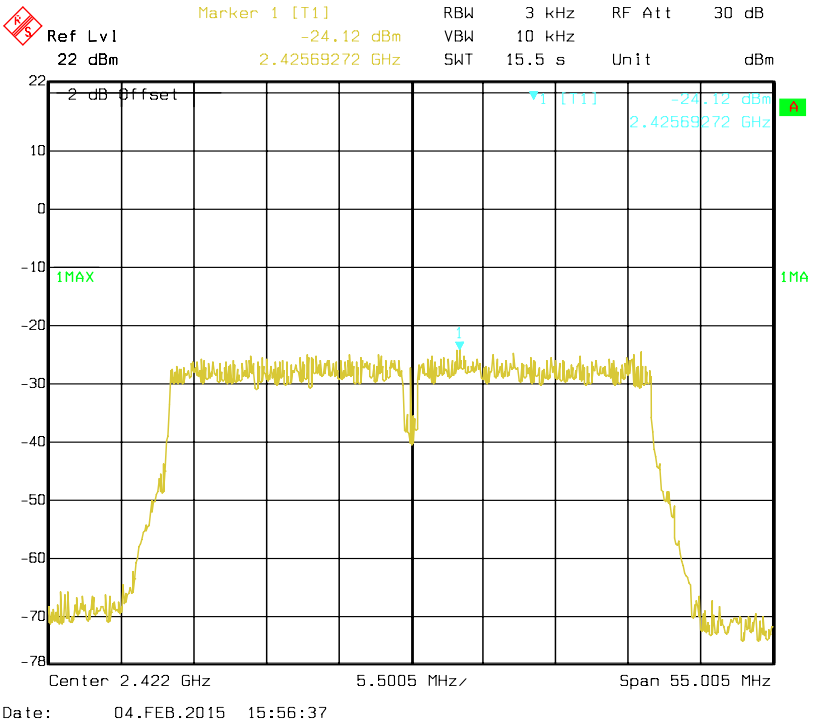
Power Spectral Density, 802.11n HT20 Middle Channel



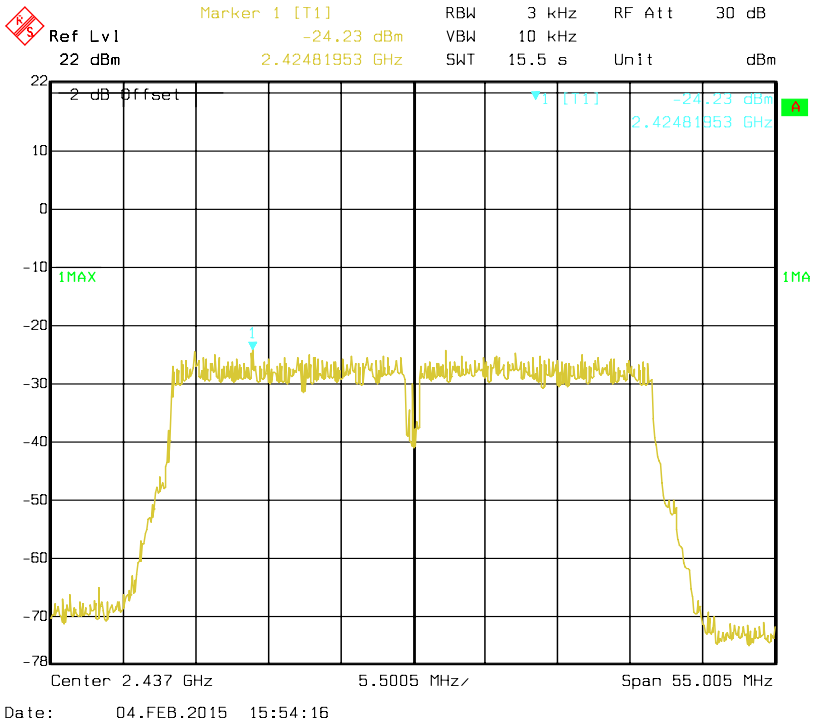
Power Spectral Density, 802.11n HT20 High Channel



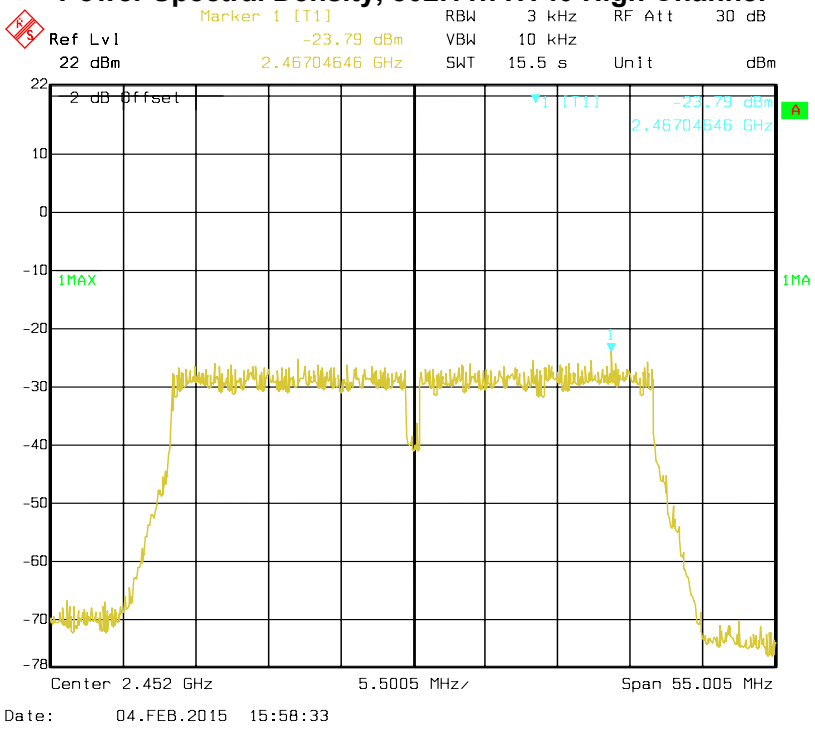
Power Spectral Density, 802.11n HT40 Low Channel



Power Spectral Density, 802.11n HT40 Middle Channel



Power Spectral Density, 802.11n HT40 High Channel



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