FCC PART 15.247

TEST REPORT

For

Iconnect

No.9, Aly. 58, Ln. 112, Ruiguang Rd., Neihu Dist.,Taipei City,Taiwan

FCC ID: 2AB878814

Report Type:	Product Name:
Original Report	802.11ac Long-Range USB Adapter Dual-Band 2.4GHz/5GHz

Test Engineer:	*Tom Tang*
Report Number:	RDG170103003A
Report Date:	2017-02-06
Reviewed By:	Henry Ding EMC Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: 028-65523123, Fax: 028-65525125 www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Iconnect***'s product, model number: ***AWUS1900 (FCC ID: 2AB878814)*** (the "EUT") in this report was a ***802.11ac Long-Range USB Adapter Dual-Band 2.4GHz/5GHz***, which was measured approximately: 8.5 cm (L) x 6.2 cm (W) x 2 cm (H), rated input voltage: DC 5V from USB port.

Note: The series product, model AWUS1900, AC1900U, AC1900UH, AWUS1900H, NU1900, UBDo-1900, AWUS036AC-1900, Tube-UAC, ID-1900AC, ID-1900ACH, AWUS036ACM, AWUS036ACHM are electrically identical, the difference between them is the model name, we selected AWUS1900 for fully testing, the details was explained in the attached declaration letter.

**All measurement and test data in this report was gathered from final production sample, serial number: 170103003 (assigned by the BACL, Chengdu). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-01-04, and EUT conformed to test requirement.*

Objective

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

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15E NII submissions with FCC ID: 2AB878814.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (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: ±5.13dB;
6G~25GHz: ±5.47dB;

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 No.5040, Huilongwan Plaza, No.1, Shawan Road, Jinniu District, Chengdu, Sichuan, 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 April 24, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

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

The system was configured for testing in testing mode, which was provided by manufacturer.

For 2.4G band, the device support SISO, 2 x 2 MIMO, 3x3 MIMO at 802.11 n system, and 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 802.11n20 modes were tested with Channel 1, 6 and 11.
For 802.11n40 mode were tested with Channel 3, 6 and 9.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.Preliminary tests were perfrmed in difference data rate and all the possible configurations, the worst cases as below table and shown in the report.

Configurations	Test Mode	Data Rate	Channel	Antenna Chain
SISO	802.11b	1Mbps	1,6,11	0, 1, 2
	802.11g	6Mbps	1,6,11	0, 1, 2
	802.11 ht20	MCS0	1,6,11	0, 1, 2
	802.11 ht40	MCS0	3,6,9	0, 1, 2
2*2 MIMO	802.11 ht20	MCS8	1,6,11	1+2
	802.11 ht40	MCS8	3,6,9	1+2
3*3 MIMO	802.11 ht20	MCS16	1,6,11	0+1+2
	802.11 ht40	MCS16	3,6,9	0+1+2

EUT Exercise Software

The software “MP_Kit_RTL11ac_8814AU_USB_v2.24_20151117(BETA)” was used for testing, and the commands were provided by manufacturer. The maximum power and duty cycle was set by commands as following table:

SISO:

Software and version			MP_Kit_RTL11ac_8814AU_USB_v2.24_20151117(BETA)			
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Level		
				Chain 0	Chain 1	Chain 2
802.11 b	Low	2412	CCK1M	38	38	40
	Middle	2437	CCK1M	38	38	40
	High	2462	CCK1M	38	38	40
802.11 g	Low	2412	OFDM6	42	42	44
	Middle	2437	OFDM6	42	42	44
	High	2462	OFDM6	42	42	44
802.11n ht20	Low	2412	MCS0	47	47	49
	Middle	2437	MCS0	47	47	49
	High	2462	MCS0	47	47	49
802.11n ht40	Low	2422	MCS0	46	46	48
	Middle	2437	MCS0	46	46	48
	High	2452	MCS0	45	45	48

MIMO 2T2R:

Software and version			MP_Kit_RTL11ac_8814AU_USB_v2.24_20151117(BETA)	
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Level (Chain 1+2)
802.11n ht20	Low	2412	MCS8	47&47
	Middle	2437	MCS8	47&47
	High	2462	MCS8	47&47
802.11n ht40	Low	2422	MCS8	46&46
	Middle	2437	MCS8	46&46
	High	2452	MCS8	45&45

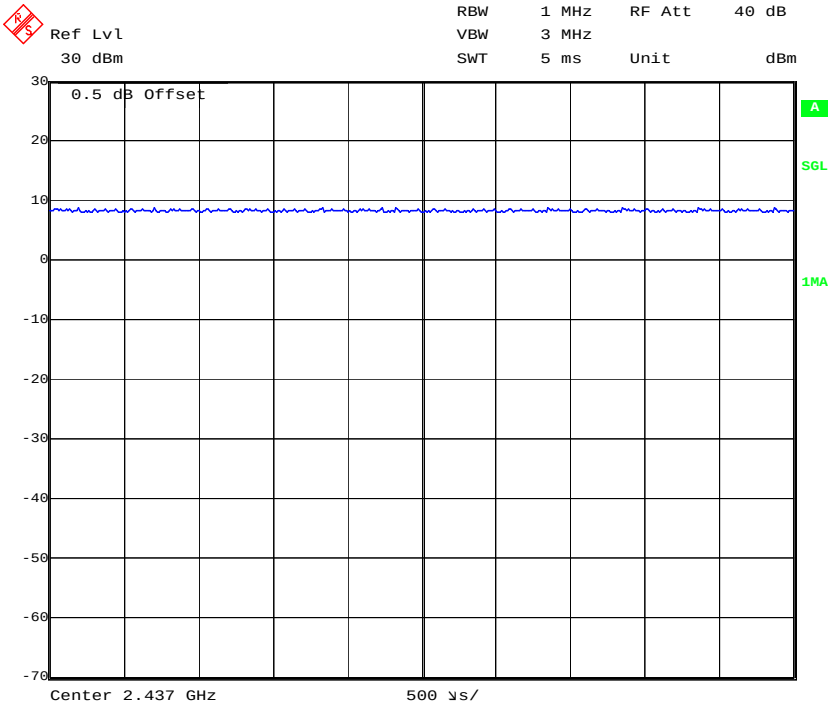
MIMO 3T3R:

Software and version			MP_Kit_RTL11ac_8814AU_USB_v2.24_20151117(BETA)	
Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Level (Chain 0+1+2)
802.11n ht20	Low	2412	MCS16	47&47&49
	Middle	2437	MCS16	47&47&49
	High	2462	MCS16	47&47&49
802.11n ht40	Low	2422	MCS16	46&46&48
	Middle	2437	MCS16	46&46&48
	High	2452	MCS16	45&45&48

The duty cycle as below:

Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)	Minimum Transmission Duration (T) (ms)
802.11 b	5	5	100	/
802.11 g	5	5	100	/
802.11n ht20_MCS0	5	5	100	/
802.11n ht40_MCS0	5	5	100	/
802.11n ht20_MCS8	5	5	100	/
802.11n ht40_MCS8	5	5	100	/
802.11n ht20_MCS16	5	5	100	/
802.11n ht40_MCS16	5	5	100	/

802.11b



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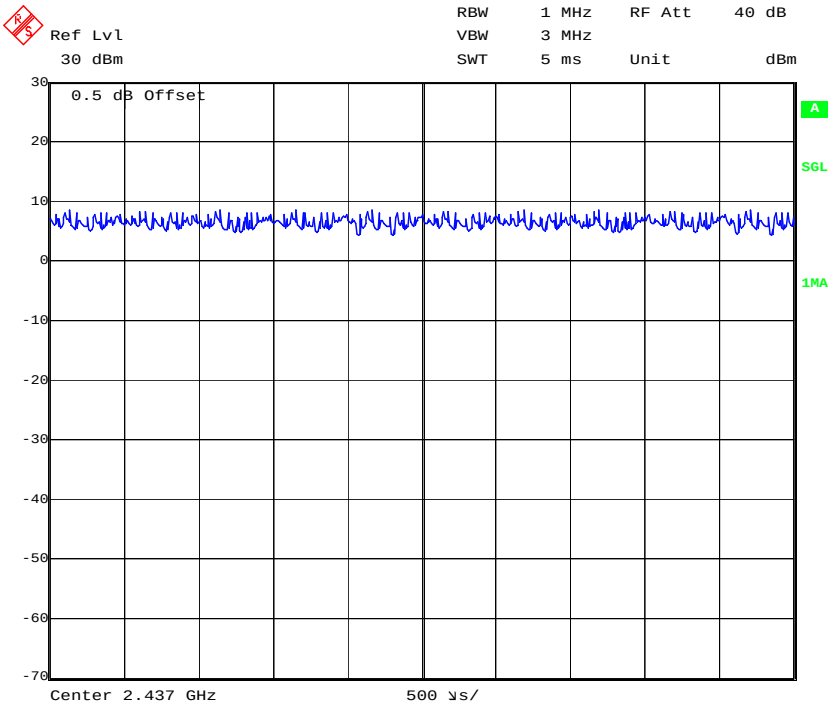
802.11g



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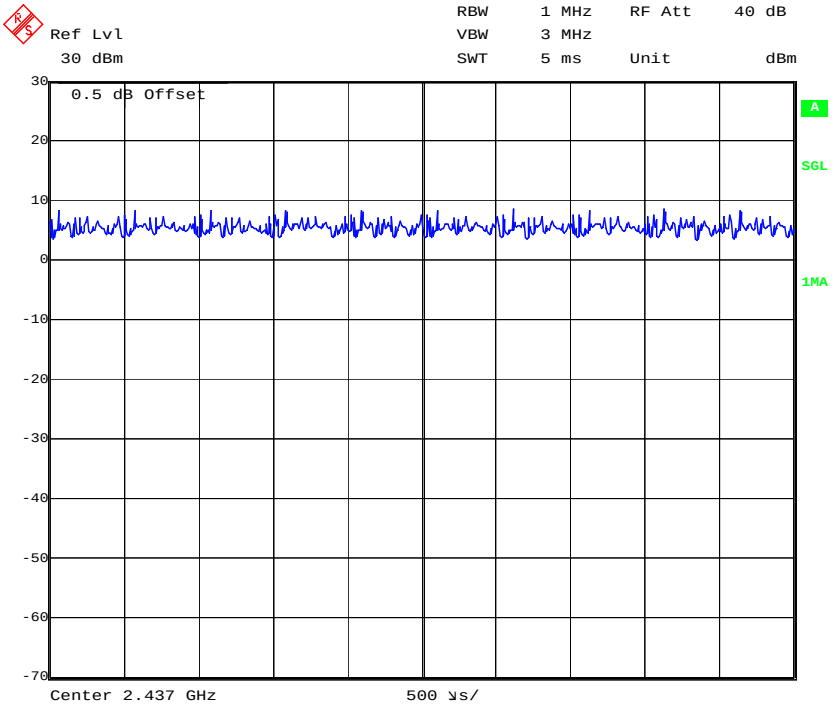
802.11n ht20_MCS0



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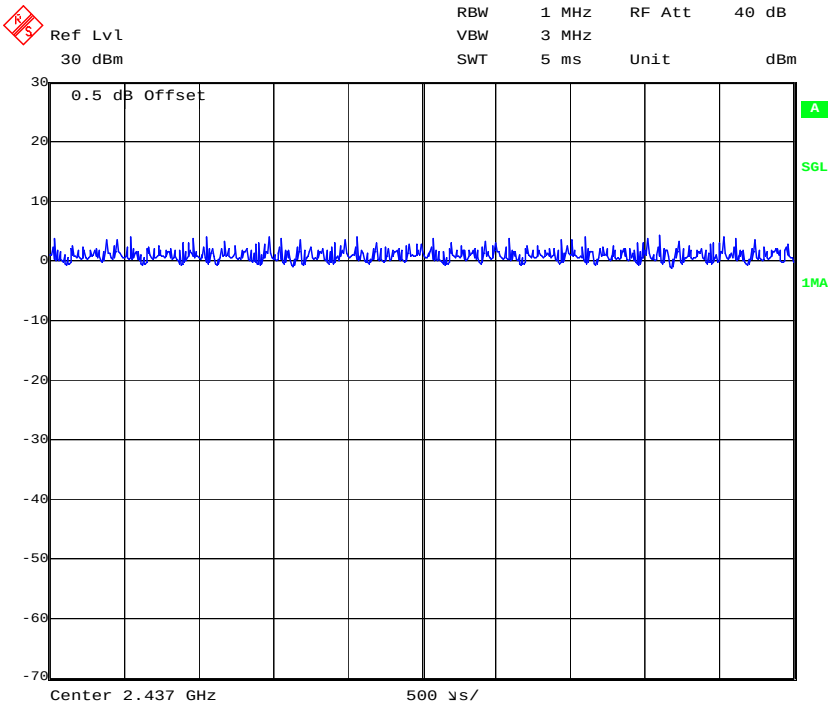
802.11n ht40_MCS0



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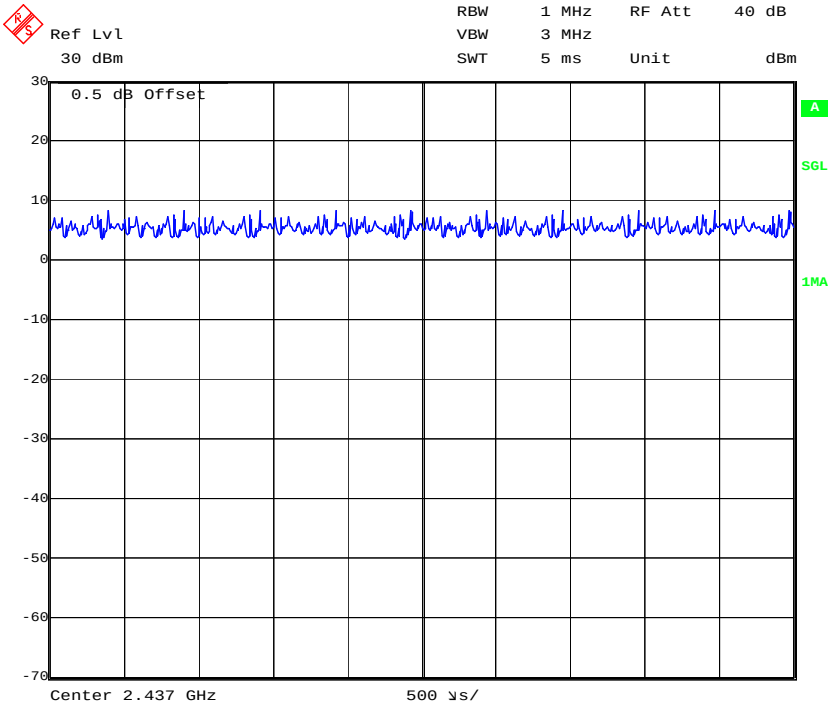
802.11n ht20_MCS8



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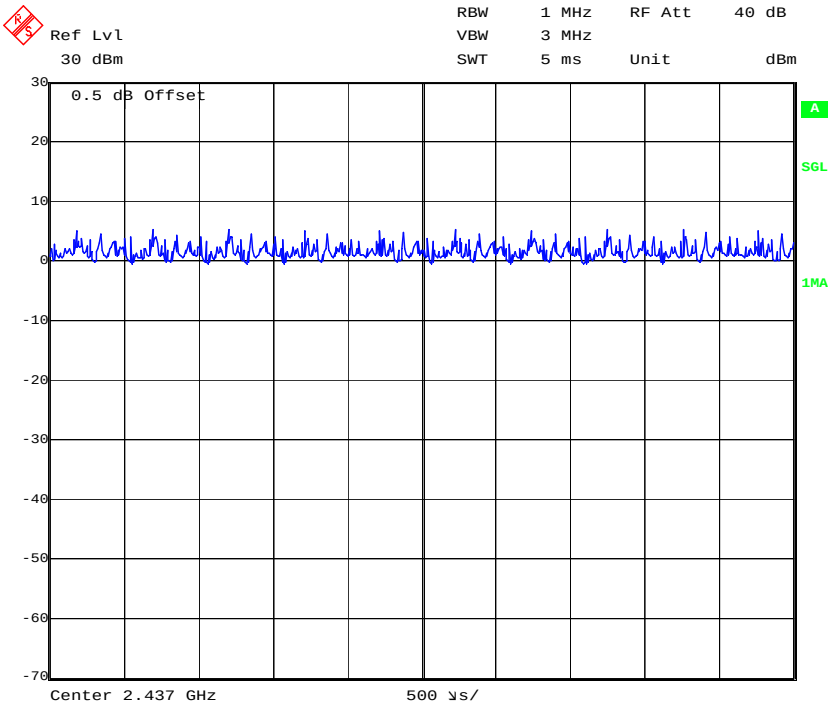

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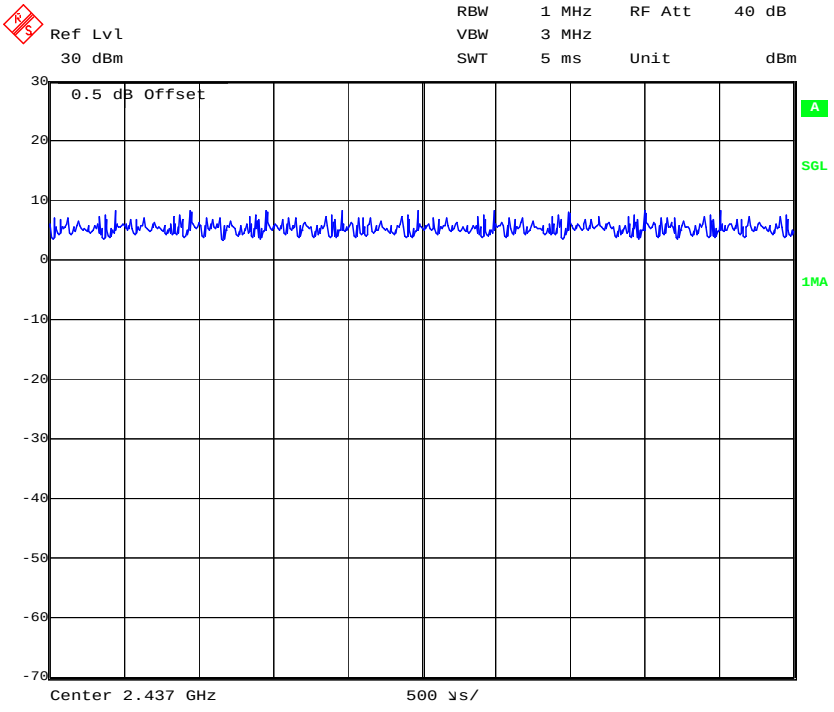
802.11n ht20_MCS16



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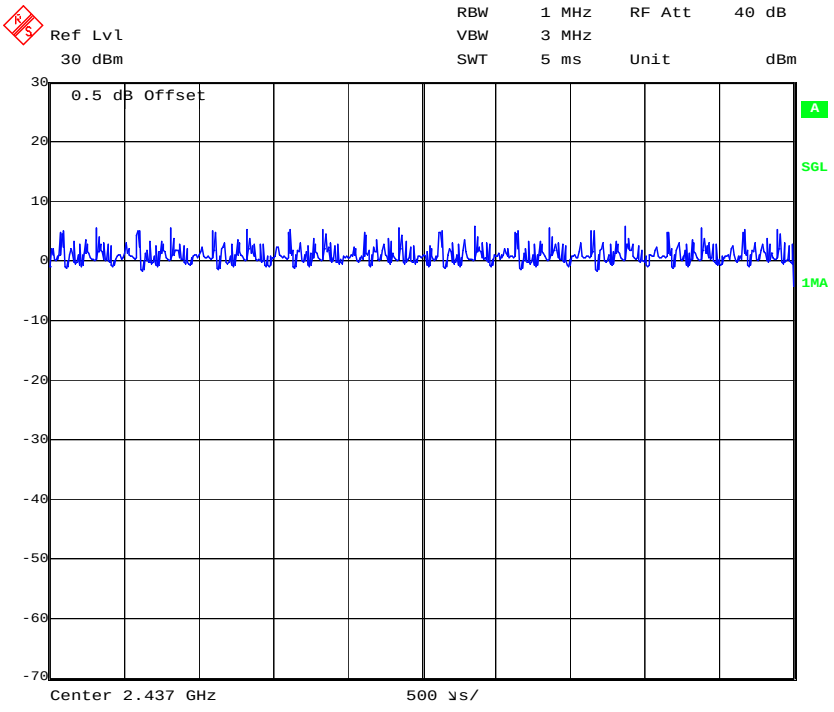
802.11n ht40_MCS16



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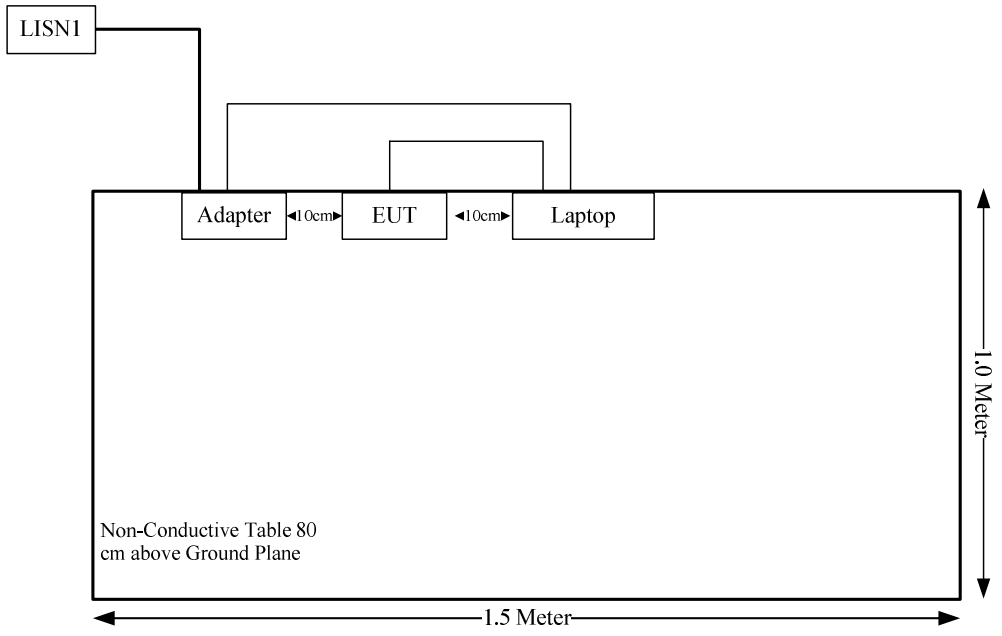
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	Inspiron	DD6SX23112221

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
DC Cable	yes	No	1.3	Adapter	Laptop
USB Cable	yes	No	1.0	USB Port of PC	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1310 & §2.1091	Maximum Permissable Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum conducted output power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

FCC §15.247 (i) & §1.1310 & §2.1091- 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
$S = PG/4\pi R^2$ = 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);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \le 1$$

Calculated Data:

Frequency (MHz)	Antenna Gain		Tune-up Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2400-2483.5	3	2.00	27	501.19	20.00	0.20	1.0
5150-5850	4	2.51	22	158.49	20.00	0.08	1.0

The 2.4GHz and 5GHz band can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$=S_{2.4}/S_{limit\text{-}2.4} + S_5/S_{limit\text{-}5}$

=0.20/1+0.08/1

=0.28

< 1.0

Result: The device meet FCC MPE at 20 cm distance

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

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

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

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

Antenna Connector Construction

The EUT have 4 dipole antennas with RP-SMA connector, all the antenna gains are 3.0 dBi in 2.4G band, 4dBi in 5GHz bands, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a)

Measurement Uncertainty

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

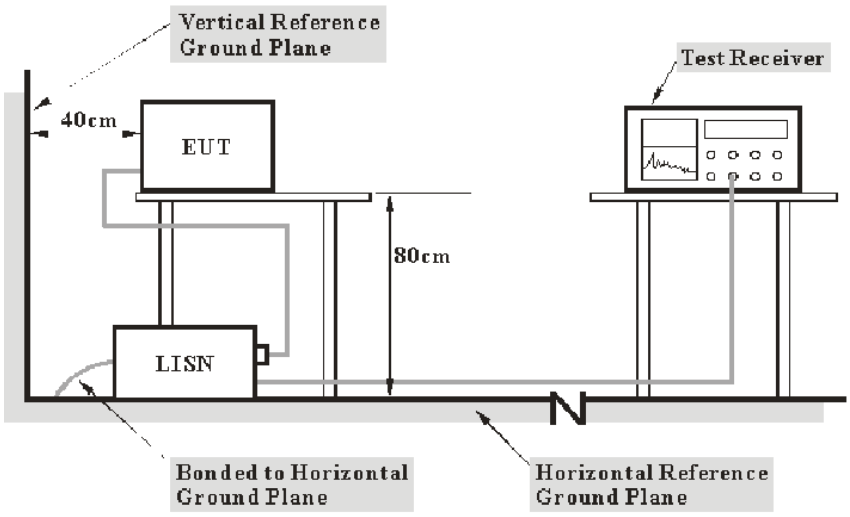
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of 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 is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2016-12-02	2017-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6550.06	2016-12-02	2017-12-01
Rohde & Schwarz	PULSE LIMITER	ESH3Z2	357.8810.52	2016-10-31	2017-10-30
N/A	Conducted Cable	NO.5	N/A	2016-11-10	2017-11-09
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A

*** 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.

Test Data

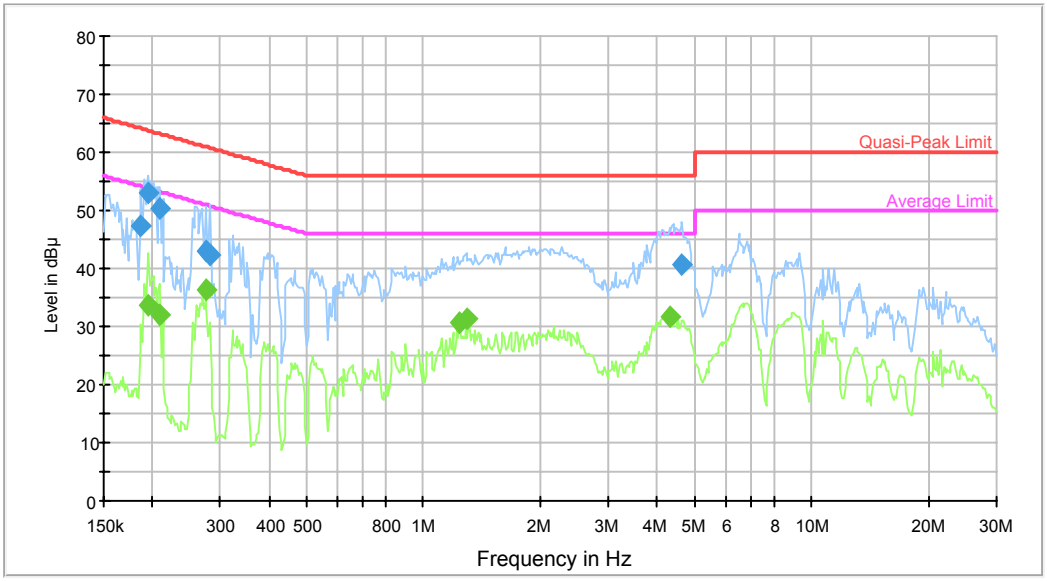
Environmental Conditions

Temperature:	23 °C
Relative Humidity:	41 %
ATM Pressure:	95.6 kPa

The testing was performed by Tom Tang on 2017-01-14.

Test Mode: Transmitting

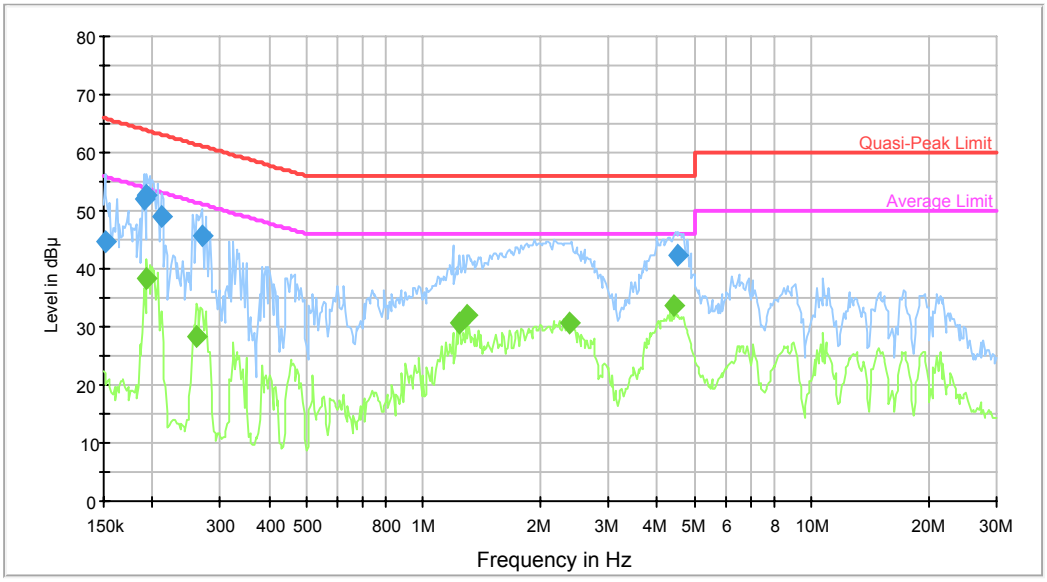
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.187494	47.5	9.000	L1	19.7	16.6	64.1	Compliance
0.195114	52.9	9.000	L1	19.7	10.9	63.8	Compliance
0.209621	50.4	9.000	L1	19.7	12.8	63.2	Compliance
0.274848	42.8	9.000	L1	19.7	18.2	61.0	Compliance
0.281497	42.3	9.000	L1	19.7	18.5	60.8	Compliance
4.651370	40.5	9.000	L1	19.7	15.5	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.195114	33.7	9.000	L1	19.7	20.1	53.8	Compliance
0.209621	32.0	9.000	L1	19.7	21.2	53.2	Compliance
0.274848	36.4	9.000	L1	19.7	14.6	51.0	Compliance
1.239175	30.8	9.000	L1	19.7	15.2	46.0	Compliance
1.289541	31.4	9.000	L1	19.7	14.6	46.0	Compliance
4.329484	31.6	9.000	L1	19.7	14.4	46.0	Compliance

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.151200	44.8	9.000	N	19.7	21.1	65.9	Compliance
0.190505	52.0	9.000	N	19.6	12.0	64.0	Compliance
0.193566	52.8	9.000	N	19.6	11.1	63.9	Compliance
0.211298	49.1	9.000	N	19.6	14.1	63.2	Compliance
0.268355	45.6	9.000	N	19.6	15.6	61.2	Compliance
4.541500	42.3	9.000	N	19.7	13.7	56.0	Compliance

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.193566	38.2	9.000	N	19.6	15.7	53.9	Compliance
0.259937	28.3	9.000	N	19.6	23.1	51.4	Compliance
1.239175	30.7	9.000	N	19.6	15.3	46.0	Compliance
1.289541	32.0	9.000	N	19.6	14.0	46.0	Compliance
2.381750	30.8	9.000	N	19.7	15.2	46.0	Compliance
4.399032	33.7	9.000	N	19.7	12.3	46.0	Compliance

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

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

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

If U_{lab} is less than or equal to U_{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.

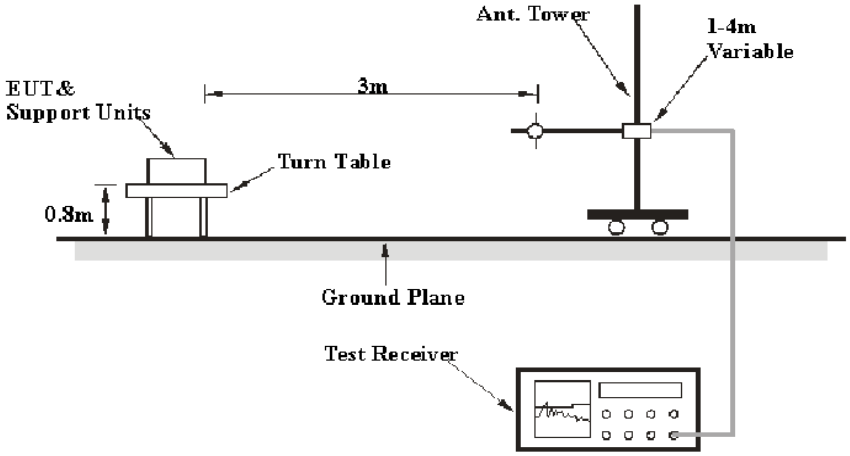
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Chengdu) is:
30M~200MHz: ±4.7 dB;
200M~1GHz: ±6.0 dB;
1G~6GHz: ±5.13dB;
6G~25GHz: ±5.47 dB;

Table 2 – Values of U_{cispr}

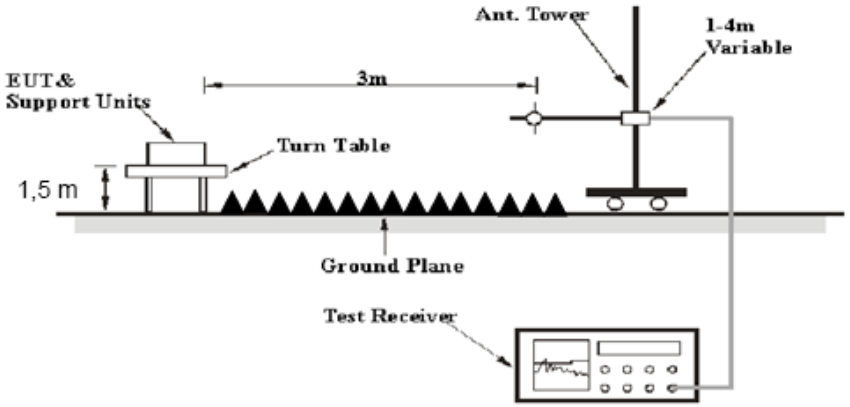
Measurement		U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

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

30-1000MHz:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP

1GHz- 25GHz:

Detector	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

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

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

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

Margin = Limit –Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Amplifier	8447D	2944A10442	2016-12-02	2017-12-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2016-12-02	2017-12-01
Sunol Sciences	Broadband Antenna	JB3	A101808	2016-04-10	2019-04-09
Rohde & Schwarz	Spectrum Analyzer	FSEM30	100018	2016-12-02	2017-12-01
ETS	Horn Antenna	3115	003-6076	2016-12-02	2017-12-01
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-0113024	2014-06-16	2017-06-15
Mini-circuits	Amplifier	ZVA-183-S+	771001215	2016-05-20	2017-05-19
HP	Amplifier	8449B	3008A00277	2016-12-02	2017-12-01
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2016-11-10	2017-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2016-11-10	2017-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2016-11-10	2017-11-09

*** 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.

Test Data

Environmental Conditions

Temperature:	20.9~22.3 °C
Relative Humidity:	47~49 %
ATM Pressure:	94.8~95.2 kPa

** The testing was performed by Tom Tang from 2017-01-15 to 2017-01-17.*

Test Mode: Transmitting

SISO:
802.11b Mode (Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	75.50	PK	H	23.50	3.00	0.00	102	N/A	N/A
2412	71.95	AV	H	23.50	3.00	0.00	98.45	N/A	N/A
2412	78.06	PK	V	23.50	3.00	0.00	104.56	N/A	N/A
2412	74.53	AV	V	23.50	3.00	0.00	101.03	N/A	N/A
2390	29.48	PK	V	23.57	3.00	0.00	56.05	74	17.95
2390	16.84	AV	V	23.57	3.00	0.00	43.41	54	10.59
4824	31.94	PK	V	30.84	5.11	26.87	41.02	74	32.98
4824	19.35	AV	V	30.84	5.11	26.87	28.43	54	25.57
7236	32.87	PK	V	34.77	6.18	26.36	47.46	74	26.54
7236	20.69	AV	V	34.77	6.18	26.36	35.28	54	18.72
9648	32.00	PK	V	37.09	7.79	26.20	50.68	74	23.32
9648	20.18	AV	V	37.09	7.79	26.20	38.86	54	15.14
298.69	47.69	QP	H	14.09	1.04	27.54	35.28	46.00	10.72
506.27	38.34	QP	H	18.16	1.63	28.82	29.31	46.00	16.69
Middle Channel: 2437 MHz									
2437	74.91	PK	H	23.41	3.00	0.00	101.32	N/A	N/A
2437	71.10	AV	H	23.41	3.00	0.00	97.51	N/A	N/A
2437	78.22	PK	V	23.41	3.00	0.00	104.63	N/A	N/A
2437	74.93	AV	V	23.41	3.00	0.00	101.34	N/A	N/A
4874	32.06	PK	V	31.00	5.09	26.87	41.28	74	32.72
4874	19.75	AV	V	31.00	5.09	26.87	28.97	54	25.03
7311	33.64	PK	V	34.92	6.21	26.40	48.37	74	25.63
7311	21.50	AV	V	34.92	6.21	26.40	36.23	54	17.77
9748	33.77	PK	V	37.15	7.72	26.26	52.38	74	21.62
9748	22.31	AV	V	37.15	7.72	26.26	40.92	54	13.08
3310	36.12	PK	V	25.94	3.90	26.52	39.44	74	34.56
3310	24.63	AV	V	25.94	3.90	26.52	27.95	54	26.05
298.69	47.96	QP	H	14.09	1.04	27.54	35.55	46.00	10.45
506.27	38.48	QP	H	18.16	1.63	28.82	29.45	46.00	16.55
High Channel: 2462 MHz									
2462	75.02	PK	H	23.33	2.99	0.00	101.34	N/A	N/A
2462	70.77	AV	H	23.33	2.99	0.00	97.09	N/A	N/A
2462	79.64	PK	V	23.33	2.99	0.00	105.96	N/A	N/A
2462	76.21	AV	V	23.33	2.99	0.00	102.53	N/A	N/A
2483.5	30.61	PK	V	23.26	2.99	0.00	56.86	74	17.14
2483.5	18.81	AV	V	23.26	2.99	0.00	45.06	54	8.94
4924	32.61	PK	V	31.16	5.07	26.88	41.96	74	32.04
4924	21.14	AV	V	31.16	5.07	26.88	30.49	54	23.51
7386	33.50	PK	V	35.07	6.25	26.43	48.39	74	25.61
7386	21.04	AV	V	35.07	6.25	26.43	35.93	54	18.07
9848	33.28	PK	V	37.21	7.65	26.33	51.81	74	22.19
9848	21.06	AV	V	37.21	7.65	26.33	39.59	54	14.41
3215	37.14	PK	V	25.40	3.75	26.49	39.8	74	34.2
3215	25.73	AV	V	25.40	3.75	26.49	28.39	54	25.61
298.69	48.8	QP	H	14.09	1.04	27.54	36.39	46.00	9.61
506.27	38.9	QP	H	18.16	1.63	28.82	29.87	46.00	16.13

802.11g Mode (Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	75.97	PK	H	23.50	3.00	0.00	102.47	N/A	N/A
2412	67.73	AV	H	23.50	3.00	0.00	94.23	N/A	N/A
2412	78.60	PK	V	23.50	3.00	0.00	105.1	N/A	N/A
2412	70.32	AV	V	23.50	3.00	0.00	96.82	N/A	N/A
2390	32.15	PK	V	23.57	3.00	0.00	58.72	74	15.28
2390	17.62	AV	V	23.57	3.00	0.00	44.19	54	9.81
4824	33.46	PK	V	30.84	5.11	26.87	42.54	74	31.46
4824	20.72	AV	V	30.84	5.11	26.87	29.8	54	24.2
7236	34.49	PK	V	34.77	6.18	26.36	49.08	74	24.92
7236	21.81	AV	V	34.77	6.18	26.36	36.4	54	17.6
9648	33.86	PK	V	37.09	7.79	26.20	52.54	74	21.46
9648	21.24	AV	V	37.09	7.79	26.20	39.92	54	14.08
3274	38.70	PK	V	25.73	3.84	26.51	41.76	74	32.24
3274	26.61	AV	V	25.73	3.84	26.51	29.67	54	24.33
298.69	48.33	QP	H	14.09	1.04	27.54	35.92	46.00	10.08
506.27	39.34	QP	H	18.16	1.63	28.82	30.31	46.00	15.69
Middle Channel: 2437 MHz									
2437	75.36	PK	H	23.41	3.00	0.00	101.77	N/A	N/A
2437	66.60	AV	H	23.41	3.00	0.00	93.01	N/A	N/A
2437	78.24	PK	V	23.41	3.00	0.00	104.65	N/A	N/A
2437	69.10	AV	V	23.41	3.00	0.00	95.51	N/A	N/A
4874	33.53	PK	V	31.00	5.09	26.87	42.75	74	31.25
4874	20.60	AV	V	31.00	5.09	26.87	29.82	54	24.18
7311	34.67	PK	V	34.92	6.21	26.40	49.4	74	24.6
7311	22.15	AV	V	34.92	6.21	26.40	36.88	54	17.12
9748	34.69	PK	V	37.15	7.72	26.26	53.3	74	20.7
9748	22.24	AV	V	37.15	7.72	26.26	40.85	54	13.15
3421	37.40	PK	V	26.56	4.06	26.56	41.46	74	32.54
3421	25.18	AV	V	26.56	4.06	26.56	29.24	54	24.76
298.69	47.86	QP	H	14.09	1.04	27.54	35.45	46.00	10.55
506.27	39.78	QP	H	18.16	1.63	28.82	30.75	46.00	15.25
High Channel: 2462 MHz									
2462	73.54	PK	H	23.33	2.99	0.00	99.86	N/A	N/A
2462	65.12	AV	H	23.33	2.99	0.00	91.44	N/A	N/A
2462	79.15	PK	V	23.33	2.99	0.00	105.47	N/A	N/A
2462	70.84	AV	V	23.33	2.99	0.00	97.16	N/A	N/A
2483.5	34.07	PK	V	23.26	2.99	0.00	60.32	74	13.68
2483.5	19.36	AV	V	23.26	2.99	0.00	45.61	54	8.39
4924	32.94	PK	V	31.16	5.07	26.88	42.29	74	31.71
4924	19.83	AV	V	31.16	5.07	26.88	29.18	54	24.82
7386	33.55	PK	V	35.07	6.25	26.43	48.44	74	25.56
7386	20.43	AV	V	35.07	6.25	26.43	35.32	54	18.68
9848	32.76	PK	V	37.21	7.65	26.33	51.29	74	22.71
9848	19.45	AV	V	37.21	7.65	26.33	37.98	54	16.02
3010	38.44	PK	V	24.26	3.45	26.41	39.74	74	34.26
3010	25.63	AV	V	24.26	3.45	26.41	26.93	54	27.07
298.69	48.74	QP	H	14.09	1.04	27.54	36.33	46.00	9.67
506.27	39.58	QP	H	18.16	1.63	28.82	30.55	46.00	15.45

802.11 n ht20 Mode (Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	78.12	PK	H	23.50	3.00	0.00	104.62	N/A	N/A
2412	69.86	AV	H	23.50	3.00	0.00	96.36	N/A	N/A
2412	80.31	PK	V	23.50	3.00	0.00	106.81	N/A	N/A
2412	71.89	AV	V	23.50	3.00	0.00	98.39	N/A	N/A
2390	41.53	PK	V	23.57	3.00	0.00	68.1	74	5.9
2390	20.37	AV	V	23.57	3.00	0.00	46.94	54	7.06
4824	32.89	PK	V	30.84	5.11	26.87	41.97	74	32.03
4824	19.42	AV	V	30.84	5.11	26.87	28.5	54	25.5
7236	33.57	PK	V	34.77	6.18	26.36	48.16	74	25.84
7236	21.64	AV	V	34.77	6.18	26.36	36.23	54	17.77
9648	32.29	PK	V	37.09	7.79	26.20	50.97	74	23.03
9648	20.41	AV	V	37.09	7.79	26.20	39.09	54	14.91
3230	38.22	PK	V	25.49	3.78	26.49	41	74	33
3230	26.00	AV	V	25.49	3.78	26.49	28.78	54	25.22
298.69	49.01	QP	H	14.09	1.04	27.54	36.60	46.00	9.40
506.27	39.72	QP	H	18.16	1.63	28.82	30.69	46.00	15.31
Middle Channel: 2437 MHz									
2437	76.89	PK	H	23.41	3.00	0.00	103.3	N/A	N/A
2437	68.42	AV	H	23.41	3.00	0.00	94.83	N/A	N/A
2437	81.51	PK	V	23.41	3.00	0.00	107.92	N/A	N/A
2437	72.45	AV	V	23.41	3.00	0.00	98.86	N/A	N/A
4874	33.46	PK	V	31.00	5.09	26.87	42.68	74	31.32
4874	20.68	AV	V	31.00	5.09	26.87	29.9	54	24.1
7311	34.31	PK	V	34.92	6.21	26.40	49.04	74	24.96
7311	22.00	AV	V	34.92	6.21	26.40	36.73	54	17.27
9748	33.92	PK	V	37.15	7.72	26.26	52.53	74	21.47
9748	21.83	AV	V	37.15	7.72	26.26	40.44	54	13.56
3348	36.78	PK	V	26.15	3.95	26.54	40.34	74	33.66
3348	25.26	AV	V	26.15	3.95	26.54	28.82	54	25.18
298.69	49.85	QP	H	14.09	1.04	27.54	37.44	46.00	8.56
506.27	40.14	QP	H	18.16	1.63	28.82	31.11	46.00	14.89
High Channel: 2462 MHz									
2462	76.50	PK	H	23.33	2.99	0.00	102.82	N/A	N/A
2462	68.25	AV	H	23.33	2.99	0.00	94.57	N/A	N/A
2462	81.59	PK	V	23.33	2.99	0.00	107.91	N/A	N/A
2462	73.20	AV	V	23.33	2.99	0.00	99.52	N/A	N/A
2483.5	43.11	PK	V	23.26	2.99	0.00	69.36	74	4.64
2483.5	22.58	AV	V	23.26	2.99	0.00	48.83	54	5.17
4924	33.57	PK	V	31.16	5.07	26.88	42.92	74	31.08
4924	22.20	AV	V	31.16	5.07	26.88	31.55	54	22.45
7386	34.47	PK	V	35.07	6.25	26.43	49.36	74	24.64
7386	22.05	AV	V	35.07	6.25	26.43	36.94	54	17.06
9848	34.08	PK	V	37.21	7.65	26.33	52.61	74	21.39
9848	21.77	AV	V	37.21	7.65	26.33	40.3	54	13.7
3128	39.18	PK	V	24.92	3.62	26.46	41.26	74	32.74
3128	27.36	AV	V	24.92	3.62	26.46	29.44	54	24.56
298.69	49.38	QP	H	14.09	1.04	27.54	36.97	46.00	9.03
506.27	40.58	QP	H	18.16	1.63	28.82	31.55	46.00	14.45

802.11 n ht40 Mode (Chain 0 was the worst)

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	74.05	PK	H	23.47	3.00	0.00	100.52	N/A	N/A
2422	65.81	AV	H	23.47	3.00	0.00	92.28	N/A	N/A
2422	77.20	PK	V	23.47	3.00	0.00	103.67	N/A	N/A
2422	68.50	AV	V	23.47	3.00	0.00	94.97	N/A	N/A
2390	39.72	PK	V	23.57	3.00	0.00	66.29	74	7.71
2390	19.68	AV	V	23.57	3.00	0.00	46.25	54	7.75
4844	33.81	PK	V	30.90	5.10	26.87	42.94	74	31.06
4844	21.87	AV	V	30.90	5.10	26.87	31	54	23
7266	34.57	PK	V	34.83	6.19	26.38	49.21	74	24.79
7266	23.06	AV	V	34.83	6.19	26.38	37.7	54	16.3
9688	33.34	PK	V	37.11	7.76	26.23	51.98	74	22.02
9688	20.93	AV	V	37.11	7.76	26.23	39.57	54	14.43
2932	39.16	PK	V	24.06	3.37	26.48	40.11	74	33.89
2932	26.38	AV	V	24.06	3.37	26.48	27.33	54	26.67
298.69	48.91	QP	H	14.09	1.04	27.54	36.50	46.00	9.50
506.27	41.02	QP	H	18.16	1.63	28.82	31.99	46.00	14.01
Middle Channel: 2437 MHz									
2437	72.83	PK	H	23.41	3.00	0.00	99.24	N/A	N/A
2437	63.66	AV	H	23.41	3.00	0.00	90.07	N/A	N/A
2437	76.75	PK	V	23.41	3.00	0.00	103.16	N/A	N/A
2437	67.36	AV	V	23.41	3.00	0.00	93.77	N/A	N/A
4874	33.50	PK	V	31.00	5.09	26.87	42.72	74	31.28
4874	21.24	AV	V	31.00	5.09	26.87	30.46	54	23.54
7311	34.24	PK	V	34.92	6.21	26.40	48.97	74	25.03
7311	20.66	AV	V	34.92	6.21	26.40	35.39	54	18.61
9748	33.93	PK	V	37.15	7.72	26.26	52.54	74	21.46
9748	21.08	AV	V	37.15	7.72	26.26	39.69	54	14.31
3510	36.59	PK	V	27.04	4.19	26.59	41.23	74	32.77
3510	24.21	AV	V	27.04	4.19	26.59	28.85	54	25.15
298.69	49.77	QP	H	14.09	1.04	27.54	37.36	46.00	8.64
506.27	38.96	QP	H	18.16	1.63	28.82	29.93	46.00	16.07
High Channel: 2452 MHz									
2452	71.62	PK	H	23.36	3.00	0.00	97.98	N/A	N/A
2452	63.38	AV	H	23.36	3.00	0.00	89.74	N/A	N/A
2452	76.67	PK	V	23.36	3.00	0.00	103.03	N/A	N/A
2452	68.13	AV	V	23.36	3.00	0.00	94.49	N/A	N/A
2483.5	40.79	PK	V	23.26	2.99	0.00	67.04	74	6.96
2483.5	25.47	AV	V	23.26	2.99	0.00	51.72	54	2.28
4904	33.70	PK	V	31.09	5.08	26.87	43	74	31
4904	20.92	AV	V	31.09	5.08	26.87	30.22	54	23.78
7356	34.71	PK	V	35.01	6.23	26.42	49.53	74	24.47
7356	22.65	AV	V	35.01	6.23	26.42	37.47	54	16.53
9808	33.46	PK	V	37.18	7.68	26.30	52.02	74	21.98
9808	21.19	AV	V	37.18	7.68	26.30	39.75	54	14.25
3362	36.82	PK	V	26.23	3.97	26.54	40.48	74	33.52
3362	23.74	AV	V	26.23	3.97	26.54	27.4	54	26.6
298.69	50.04	QP	H	14.09	1.04	27.54	37.63	46.00	8.37
506.27	39.1	QP	H	18.16	1.63	28.82	30.07	46.00	15.93

MIMO-2TX (Chain 1+2):
802.11n ht20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	77.00	PK	H	23.50	3.00	0.00	103.5	N/A	N/A
2412	67.72	AV	H	23.50	3.00	0.00	94.22	N/A	N/A
2412	82.53	PK	V	23.50	3.00	0.00	109.03	N/A	N/A
2412	72.35	AV	V	23.50	3.00	0.00	98.85	N/A	N/A
2390	31.42	PK	V	23.57	3.00	0.00	57.99	74	16.01
2390	18.66	AV	V	23.57	3.00	0.00	45.23	54	8.77
4824	33.80	PK	V	30.84	5.11	26.87	42.88	74	31.12
4824	21.03	AV	V	30.84	5.11	26.87	30.11	54	23.89
7236	34.70	PK	V	34.77	6.18	26.36	49.29	74	24.71
7236	22.34	AV	V	34.77	6.18	26.36	36.93	54	17.07
9648	34.09	PK	V	37.09	7.79	26.20	52.77	74	21.23
9648	20.93	AV	V	37.09	7.79	26.20	39.61	54	14.39
3110	38.73	PK	V	24.82	3.60	26.45	40.7	74	33.3
3110	26.64	AV	V	24.82	3.60	26.45	28.61	54	25.39
298.69	50.88	QP	H	14.09	1.04	27.54	38.47	46.00	7.53
506.27	39.52	QP	H	18.16	1.63	28.82	30.49	46.00	15.51
Middle Channel: 2437 MHz									
2437	77.34	PK	H	23.41	3.00	0.00	103.75	N/A	N/A
2437	67.46	AV	H	23.41	3.00	0.00	93.87	N/A	N/A
2437	82.50	PK	V	23.41	3.00	0.00	108.91	N/A	N/A
2437	72.22	AV	V	23.41	3.00	0.00	98.63	N/A	N/A
4874	33.60	PK	V	31.00	5.09	26.87	42.82	74	31.18
4874	21.22	AV	V	31.00	5.09	26.87	30.44	54	23.56
7311	35.12	PK	V	34.92	6.21	26.40	49.85	74	24.15
7311	22.99	AV	V	34.92	6.21	26.40	37.72	54	16.28
9748	33.85	PK	V	37.15	7.72	26.26	52.46	74	21.54
9748	21.44	AV	V	37.15	7.72	26.26	40.05	54	13.95
3270	38.58	PK	V	25.71	3.84	26.51	41.62	74	32.38
3270	26.65	AV	V	25.71	3.84	26.51	29.69	54	24.31
298.69	50.41	QP	H	14.09	1.04	27.54	38.00	46.00	8.00
506.27	39.96	QP	H	18.16	1.63	28.82	30.93	46.00	15.07
High Channel: 2462 MHz									
2462	77.06	PK	H	23.33	2.99	0.00	103.38	N/A	N/A
2462	66.80	AV	H	23.33	2.99	0.00	93.12	N/A	N/A
2462	83.40	PK	V	23.33	2.99	0.00	109.72	N/A	N/A
2462	72.69	AV	V	23.33	2.99	0.00	99.01	N/A	N/A
2483.5	37.79	PK	V	23.26	2.99	0.00	64.04	74	9.96
2483.5	22.16	AV	V	23.26	2.99	0.00	48.41	54	5.59
4924	34.15	PK	V	31.16	5.07	26.88	43.5	74	30.5
4924	21.60	AV	V	31.16	5.07	26.88	30.95	54	23.05
7386	34.92	PK	V	35.07	6.25	26.43	49.81	74	24.19
7386	21.77	AV	V	35.07	6.25	26.43	36.66	54	17.34
9848	33.92	PK	V	37.21	7.65	26.33	52.45	74	21.55
9848	21.44	AV	V	37.21	7.65	26.33	39.97	54	14.03
3050	39.82	PK	V	24.48	3.51	26.43	41.38	74	32.62
3050	27.24	AV	V	24.48	3.51	26.43	28.8	54	25.2
298.69	49.94	QP	H	14.09	1.04	27.54	37.53	46.00	8.47
506.27	40.4	QP	H	18.16	1.63	28.82	31.37	46.00	14.63

802.11n ht40 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	73.35	PK	H	23.47	3.00	0.00	99.82	N/A	N/A
2422	62.87	AV	H	23.47	3.00	0.00	89.34	N/A	N/A
2422	77.14	PK	V	23.47	3.00	0.00	103.61	N/A	N/A
2422	67.62	AV	V	23.47	3.00	0.00	94.09	N/A	N/A
2390	32.81	PK	V	23.57	3.00	0.00	59.38	74	14.62
2390	19.09	AV	V	23.57	3.00	0.00	45.66	54	8.34
4844	33.86	PK	V	30.90	5.10	26.87	42.99	74	31.01
4844	20.63	AV	V	30.90	5.10	26.87	29.76	54	24.24
7266	34.67	PK	V	34.83	6.19	26.38	49.31	74	24.69
7266	21.78	AV	V	34.83	6.19	26.38	36.42	54	17.58
9688	33.11	PK	V	37.11	7.76	26.23	51.75	74	22.25
9688	20.37	AV	V	37.11	7.76	26.23	39.01	54	14.99
3120	40.16	PK	V	24.87	3.61	26.45	42.19	74	31.81
3120	27.39	AV	V	24.87	3.61	26.45	29.42	54	24.58
298.69	49.58	QP	H	14.09	1.04	27.54	37.17	46.00	8.83
506.27	40.37	QP	H	18.16	1.63	28.82	31.34	46.00	14.66
Middle Channel: 2437 MHz									
2437	73.94	PK	H	23.41	3.00	0.00	100.35	N/A	N/A
2437	62.71	AV	H	23.41	3.00	0.00	89.12	N/A	N/A
2437	77.83	PK	V	23.41	3.00	0.00	104.24	N/A	N/A
2437	67.02	AV	V	23.41	3.00	0.00	93.43	N/A	N/A
4874	33.56	PK	V	31.00	5.09	26.87	42.78	74	31.22
4874	20.61	AV	V	31.00	5.09	26.87	29.83	54	24.17
7311	35.34	PK	V	34.92	6.21	26.40	50.07	74	23.93
7311	21.90	AV	V	34.92	6.21	26.40	36.63	54	17.37
9748	33.51	PK	V	37.15	7.72	26.26	52.12	74	21.88
9748	20.63	AV	V	37.15	7.72	26.26	39.24	54	14.76
3521	36.30	PK	V	27.08	4.21	26.59	41	74	33
3521	23.05	AV	V	27.08	4.21	26.59	27.75	54	26.25
298.69	49.85	QP	H	14.09	1.04	27.54	37.44	46.00	8.56
506.27	40.51	QP	H	18.16	1.63	28.82	31.48	46.00	14.52
High Channel: 2452 MHz									
2452	73.78	PK	H	23.36	3.00	0.00	100.14	N/A	N/A
2452	63.57	AV	H	23.36	3.00	0.00	89.93	N/A	N/A
2452	78.48	PK	V	23.36	3.00	0.00	104.84	N/A	N/A
2452	68.01	AV	V	23.36	3.00	0.00	94.37	N/A	N/A
2483.5	37.67	PK	V	23.26	2.99	0.00	63.92	74	10.08
2483.5	23.54	AV	V	23.26	2.99	0.00	49.79	54	4.21
4904	34.11	PK	V	31.09	5.08	26.87	43.41	74	30.59
4904	20.60	AV	V	31.09	5.08	26.87	29.9	54	24.1
7356	35.65	PK	V	35.01	6.23	26.42	50.47	74	23.53
7356	23.90	AV	V	35.01	6.23	26.42	38.72	54	15.28
9808	34.38	PK	V	37.18	7.68	26.30	52.94	74	21.06
9808	21.65	AV	V	37.18	7.68	26.30	40.21	54	13.79
2981	40.26	PK	V	24.16	3.41	26.43	41.4	74	32.6
2981	28.32	AV	V	24.16	3.41	26.43	29.46	54	24.54
298.69	50.69	QP	H	14.09	1.04	27.54	38.28	46.00	7.72
506.27	40.93	QP	H	18.16	1.63	28.82	31.90	46.00	14.10

MIMO-3TX (Chain 0+1+2):
802.11n ht20 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2412 MHz									
2412	78.18	PK	H	23.50	3.00	0.00	104.68	N/A	N/A
2412	67.40	AV	H	23.50	3.00	0.00	93.9	N/A	N/A
2412	82.87	PK	V	23.50	3.00	0.00	109.37	N/A	N/A
2412	72.86	AV	V	23.50	3.00	0.00	99.36	N/A	N/A
2390	35.01	PK	V	23.57	3.00	0.00	61.58	74	12.42
2390	19.90	AV	V	23.57	3.00	0.00	46.47	54	7.53
4824	33.85	PK	V	30.84	5.11	26.87	42.93	74	31.07
4824	21.34	AV	V	30.84	5.11	26.87	30.42	54	23.58
7236	34.45	PK	V	34.77	6.18	26.36	49.04	74	24.96
7236	21.99	AV	V	34.77	6.18	26.36	36.58	54	17.42
9648	32.82	PK	V	37.09	7.79	26.20	51.5	74	22.5
9648	19.91	AV	V	37.09	7.79	26.20	38.59	54	15.41
3310	37.48	PK	V	25.94	3.90	26.52	40.8	74	33.2
3310	24.69	AV	V	25.94	3.90	26.52	28.01	54	25.99
298.69	50.22	QP	H	14.09	1.04	27.54	37.81	46.00	8.19
506.27	41.37	QP	H	18.16	1.63	28.82	32.34	46.00	13.66
Middle Channel: 2437 MHz									
2437	78.76	PK	H	23.41	3.00	0.00	105.17	N/A	N/A
2437	68.20	AV	H	23.41	3.00	0.00	94.61	N/A	N/A
2437	84.32	PK	V	23.41	3.00	0.00	110.73	N/A	N/A
2437	73.94	AV	V	23.41	3.00	0.00	100.35	N/A	N/A
4874	33.50	PK	V	31.00	5.09	26.87	42.72	74	31.28
4874	21.01	AV	V	31.00	5.09	26.87	30.23	54	23.77
7311	34.54	PK	V	34.92	6.21	26.40	49.27	74	24.73
7311	22.61	AV	V	34.92	6.21	26.40	37.34	54	16.66
9748	33.42	PK	V	37.15	7.72	26.26	52.03	74	21.97
9748	19.91	AV	V	37.15	7.72	26.26	38.52	54	15.48
3467	36.15	PK	V	26.82	4.13	26.58	40.52	74	33.48
3467	23.82	AV	V	26.82	4.13	26.58	28.19	54	25.81
298.69	49.75	QP	H	14.09	1.04	27.54	37.34	46.00	8.66
506.27	41.81	QP	H	18.16	1.63	28.82	32.78	46.00	13.22
High Channel: 2462 MHz									
2462	78.66	PK	H	23.33	2.99	0.00	104.98	N/A	N/A
2462	68.59	AV	H	23.33	2.99	0.00	94.91	N/A	N/A
2462	84.61	PK	V	23.33	2.99	0.00	110.93	N/A	N/A
2462	73.77	AV	V	23.33	2.99	0.00	100.09	N/A	N/A
2483.5	30.58	PK	V	23.26	2.99	0.00	56.83	74	17.17
2483.5	18.18	AV	V	23.26	2.99	0.00	44.43	54	9.57
4924	34.59	PK	V	31.16	5.07	26.88	43.94	74	30.06
4924	21.60	AV	V	31.16	5.07	26.88	30.95	54	23.05
7386	34.48	PK	V	35.07	6.25	26.43	49.37	74	24.63
7386	22.29	AV	V	35.07	6.25	26.43	37.18	54	16.82
9848	34.25	PK	V	37.21	7.65	26.33	52.78	74	21.22
9848	22.04	AV	V	37.21	7.65	26.33	40.57	54	13.43
3002	40.59	PK	V	24.21	3.43	26.41	41.82	74	32.18
3002	28.33	AV	V	24.21	3.43	26.41	29.56	54	24.44
298.69	50.17	QP	H	14.09	1.04	27.54	37.76	46.00	8.24
506.27	41.08	QP	H	18.16	1.63	28.82	32.05	46.00	13.95

802.11n ht40 Mode

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
Low Channel: 2422 MHz									
2422	74.17	PK	H	23.47	3.00	0.00	100.64	N/A	N/A
2422	63.53	AV	H	23.47	3.00	0.00	90	N/A	N/A
2422	78.95	PK	V	23.47	3.00	0.00	105.42	N/A	N/A
2422	68.54	AV	V	23.47	3.00	0.00	95.01	N/A	N/A
2390	36.97	PK	V	23.57	3.00	0.00	63.54	74	10.46
2390	20.65	AV	V	23.57	3.00	0.00	47.22	54	6.78
4844	34.24	PK	V	30.90	5.10	26.87	43.37	74	30.63
4844	19.66	AV	V	30.90	5.10	26.87	28.79	54	25.21
7266	35.15	PK	V	34.83	6.19	26.38	49.79	74	24.21
7266	22.07	AV	V	34.83	6.19	26.38	36.71	54	17.29
9688	33.64	PK	V	37.11	7.76	26.23	52.28	74	21.72
9688	21.42	AV	V	37.11	7.76	26.23	40.06	54	13.94
2973	41.69	PK	V	24.15	3.41	26.44	42.81	74	31.19
2973	28.54	AV	V	24.15	3.41	26.44	29.66	54	24.34
298.69	50.44	QP	H	14.09	1.04	27.54	38.03	46.00	7.97
506.27	41.22	QP	H	18.16	1.63	28.82	32.19	46.00	13.81
Middle Channel: 2437 MHz									
2437	74.39	PK	H	23.41	3.00	0.00	100.8	N/A	N/A
2437	64.36	AV	H	23.41	3.00	0.00	90.77	N/A	N/A
2437	79.80	PK	V	23.41	3.00	0.00	106.21	N/A	N/A
2437	68.89	AV	V	23.41	3.00	0.00	95.3	N/A	N/A
4874	33.45	PK	V	31.00	5.09	26.87	42.67	74	31.33
4874	21.94	AV	V	31.00	5.09	26.87	31.16	54	22.84
7311	35.67	PK	V	34.92	6.21	26.40	50.4	74	23.6
7311	23.32	AV	V	34.92	6.21	26.40	38.05	54	15.95
9748	33.83	PK	V	37.15	7.72	26.26	52.44	74	21.56
9748	21.27	AV	V	37.15	7.72	26.26	39.88	54	14.12
3622	35.34	PK	V	27.49	4.36	26.58	40.61	74	33.39
3622	22.06	AV	V	27.49	4.36	26.58	27.33	54	26.67
298.69	51.28	QP	H	14.09	1.04	27.54	38.87	46.00	7.13
506.27	41.64	QP	H	18.16	1.63	28.82	32.61	46.00	13.39
High Channel: 2452 MHz									
2452	74.68	PK	H	23.36	3.00	0.00	101.04	N/A	N/A
2452	63.83	AV	H	23.36	3.00	0.00	90.19	N/A	N/A
2452	80.78	PK	V	23.36	3.00	0.00	107.14	N/A	N/A
2452	69.94	AV	V	23.36	3.00	0.00	96.3	N/A	N/A
2483.5	42.11	PK	V	23.26	2.99	0.00	68.36	74	5.64
2483.5	25.61	AV	V	23.26	2.99	0.00	51.86	54	2.14
4904	34.64	PK	V	31.09	5.08	26.87	43.94	74	30.06
4904	21.60	AV	V	31.09	5.08	26.87	30.9	54	23.1
7356	35.37	PK	V	35.01	6.23	26.42	50.19	74	23.81
7356	23.06	AV	V	35.01	6.23	26.42	37.88	54	16.12
9808	33.28	PK	V	37.18	7.68	26.30	51.84	74	22.16
9808	19.97	AV	V	37.18	7.68	26.30	38.53	54	15.47
3237	38.77	PK	V	25.53	3.79	26.50	41.59	74	32.41
3237	25.13	AV	V	25.53	3.79	26.50	27.95	54	26.05
298.69	50.81	QP	H	14.09	1.04	27.54	38.40	46.00	7.60
506.27	42.08	QP	H	18.16	1.63	28.82	33.05	46.00	12.95

2.4GHz band and 5 GHz band transmit simultaneously

(2.4GHz 3x3 N20 2437MHz + 5.8GHz 2x2 AC80 5775MHz was the worst, Test at 3m distance):

Frequency	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)					
11550	33.29	PK	H	38.02	8.21	26.01	53.51	74.00	20.49
11550	22.18	AV	H	38.02	8.21	26.01	42.40	54.00	11.60
17325	30.74	PK	H	43.40	10.98	26.12	59.00	74.00	15.00
17325	21.69	AV	H	43.40	10.98	26.12	49.95	54.00	4.05
4874	34.59	PK	V	31.00	5.09	26.87	43.81	74.00	30.19
4874	22.15	AV	V	31.00	5.09	26.87	31.37	54.00	22.63
7311	32.47	PK	V	34.92	6.21	26.40	47.20	74.00	26.80
7311	19.82	AV	V	34.92	6.21	26.40	34.55	54.00	19.45
3254	43.26	PK	H	25.62	3.81	26.50	46.19	74.00	27.81
3254	34.77	AV	H	25.62	3.81	26.50	37.70	54.00	16.30
506.27	46.69	QP	V	18.16	1.63	28.82	37.66	46.00	8.34

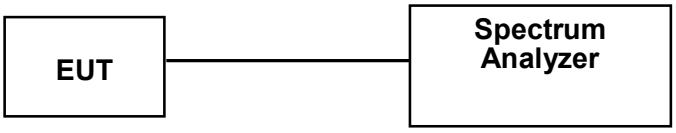
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

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

Test Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** 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:	25 °C
Relative Humidity:	35 %
ATM Pressure:	94.8 kPa

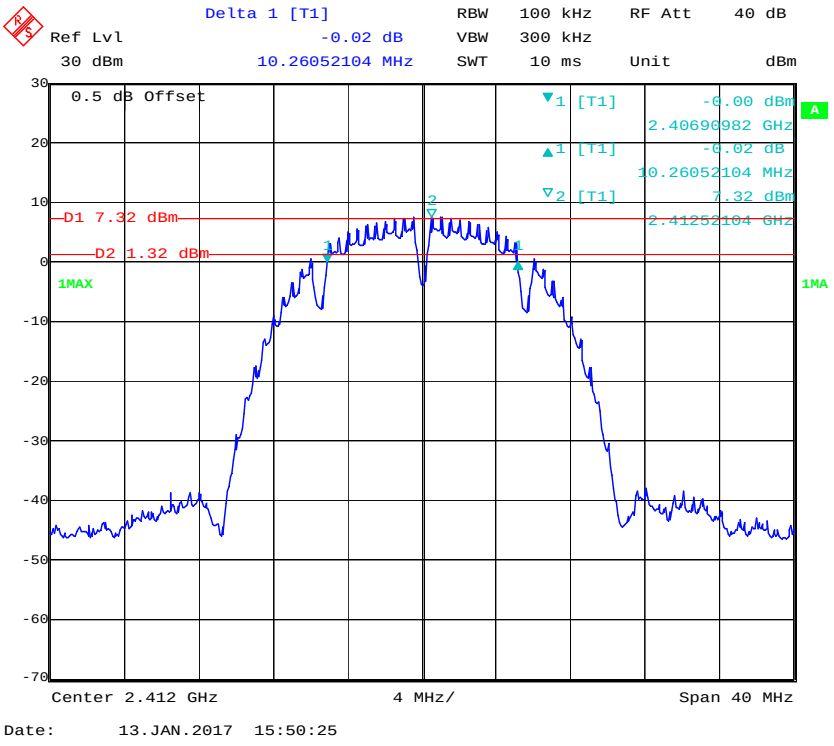
** The testing was performed by Tom Tang on 2017-01-13.*

Test Mode: Transmitting (Test performed at SISO mode chain 0)

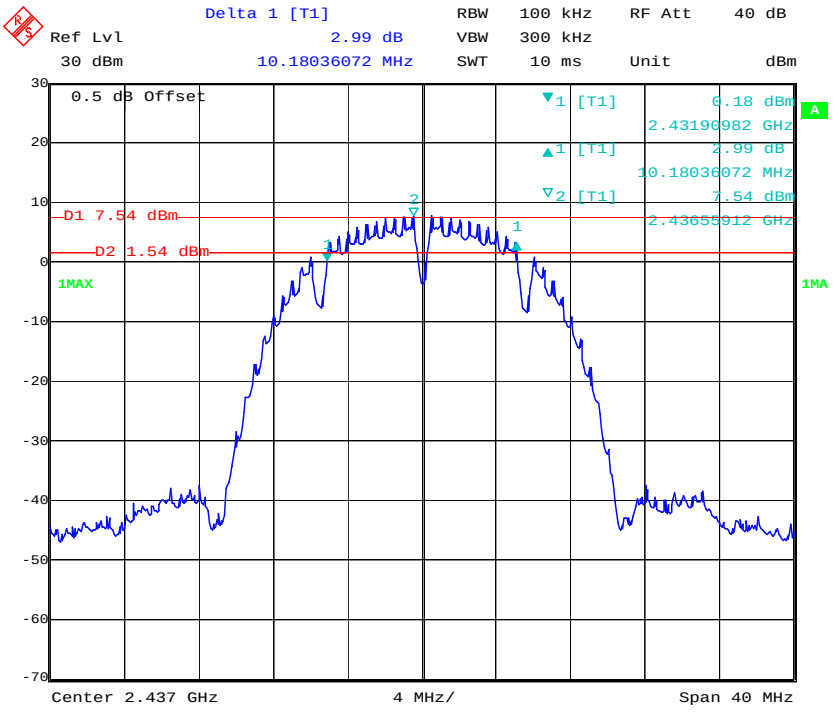
Test Result: Compliant. Please refer to the following table and plots.

Test mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
802.11b	Low	2412	10.26	≥0.5
	Middle	2437	10.18	≥0.5
	High	2462	10.18	≥0.5
802.11g	Low	2412	16.51	≥0.5
	Middle	2437	16.43	≥0.5
	High	2462	16.51	≥0.5
802.11n ht20	Low	2412	17.15	≥0.5
	Middle	2437	17.15	≥0.5
	High	2462	17.23	≥0.5
802.11n ht40	Low	2422	35.75	≥0.5
	Middle	2437	35.91	≥0.5
	High	2452	35.59	≥0.5

802.11b Low Channel

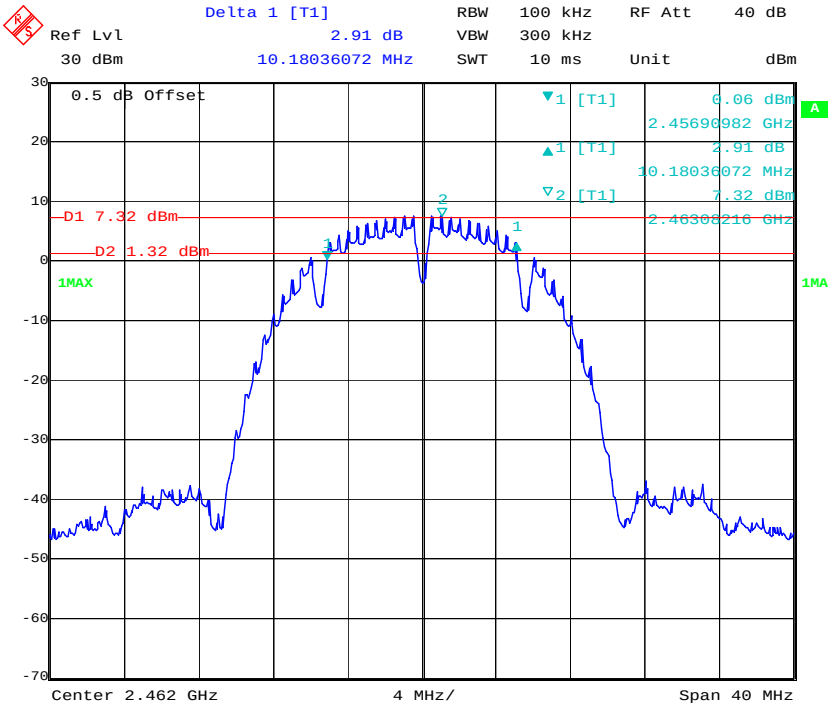


802.11b Middle Channel



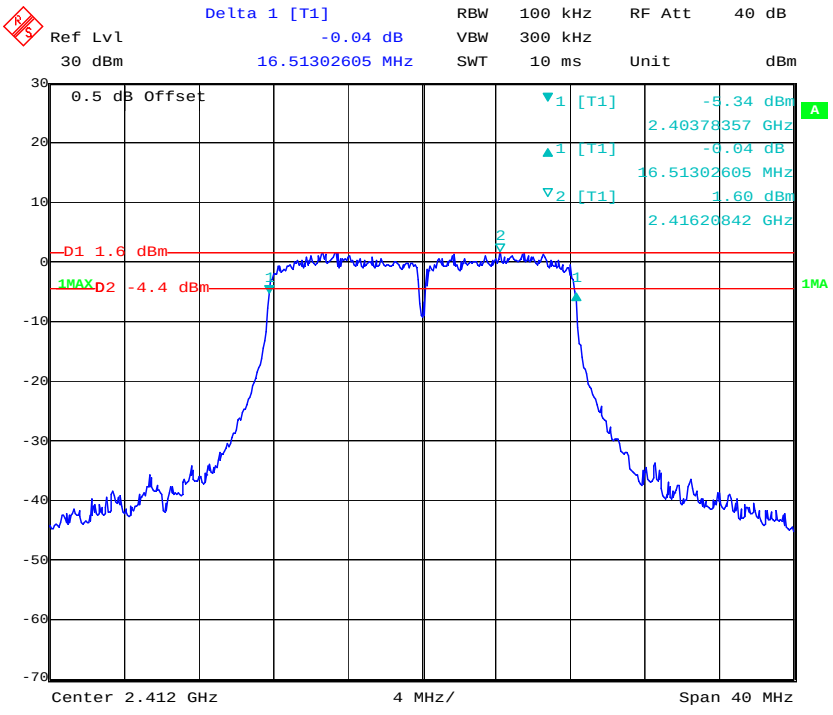
Date: 13.JAN.2017 15:51:46

802.11b High Channel



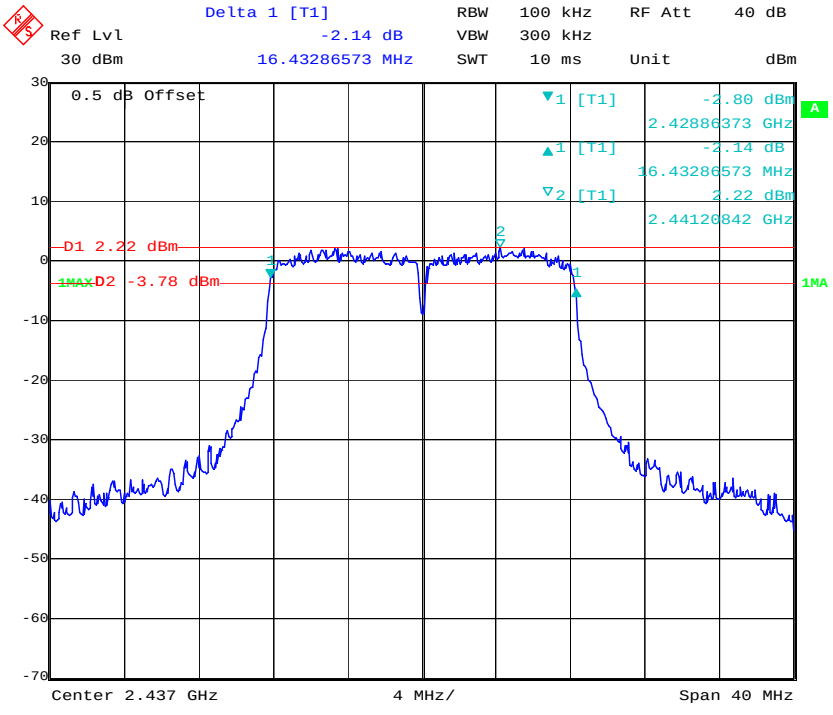
Date: 13.JAN.2017 15:54:17

802.11g Low Channel



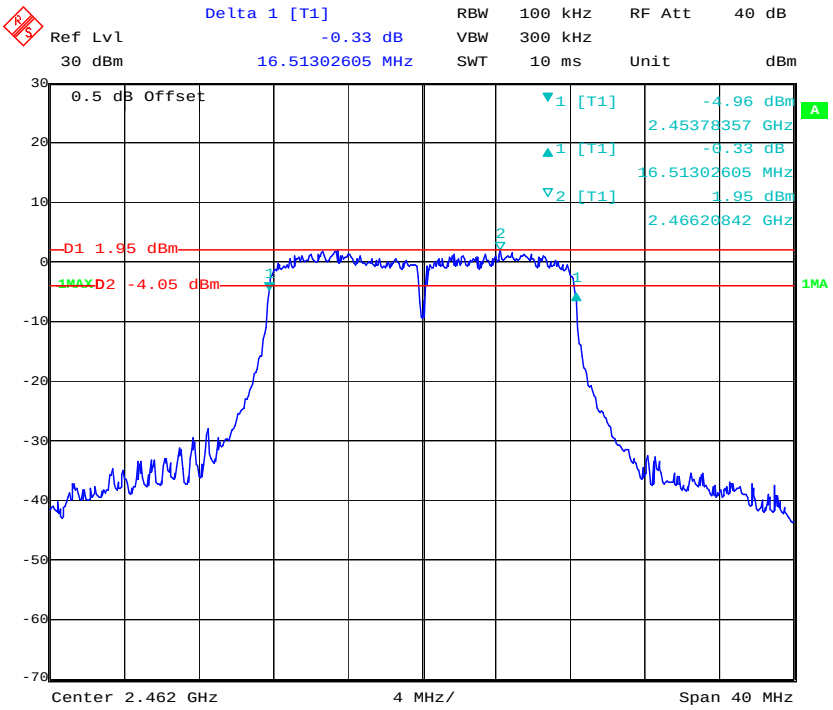
Date: 13.JAN.2017 17:17:09

802.11g Middle Channel

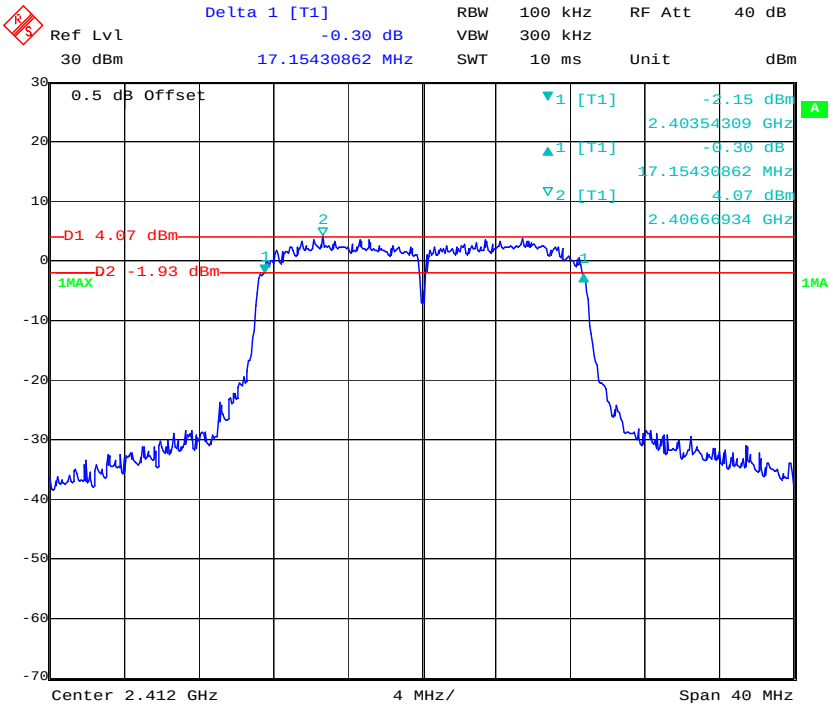


Date: 13.JAN.2017 17:21:44

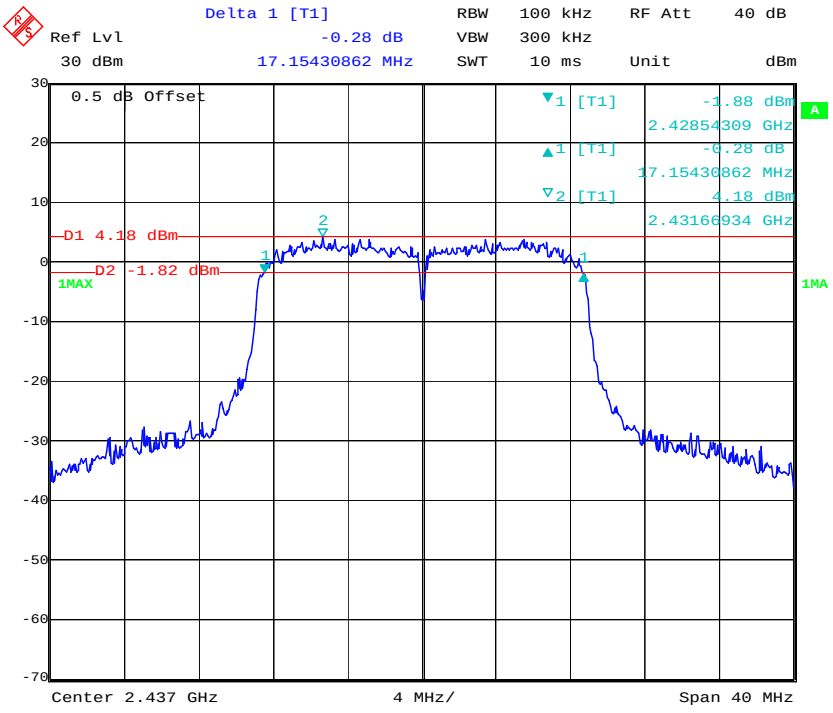
802.11g High Channel



802.11n ht20 Low Channel

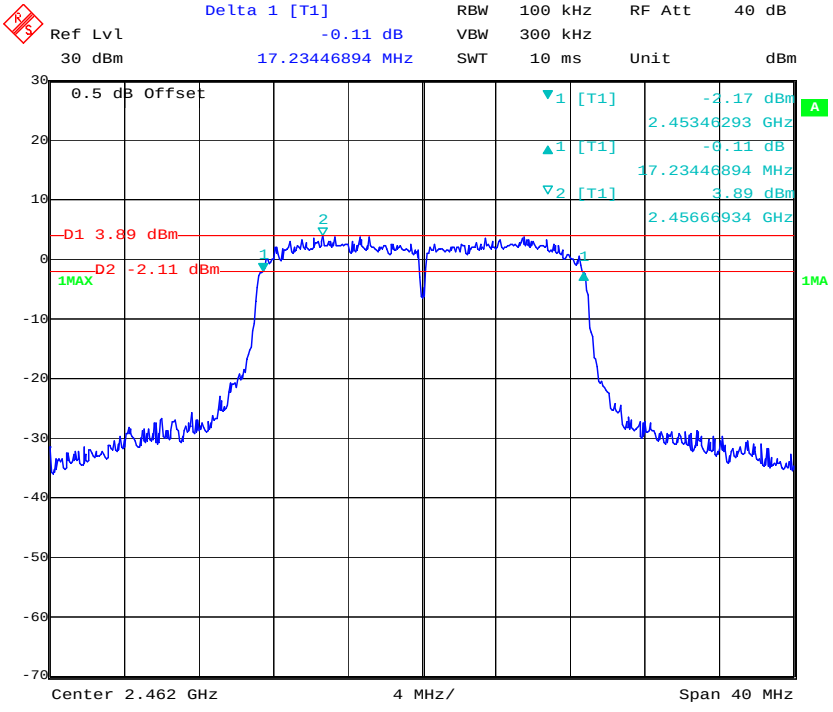


802.11n ht20 Middle Channel



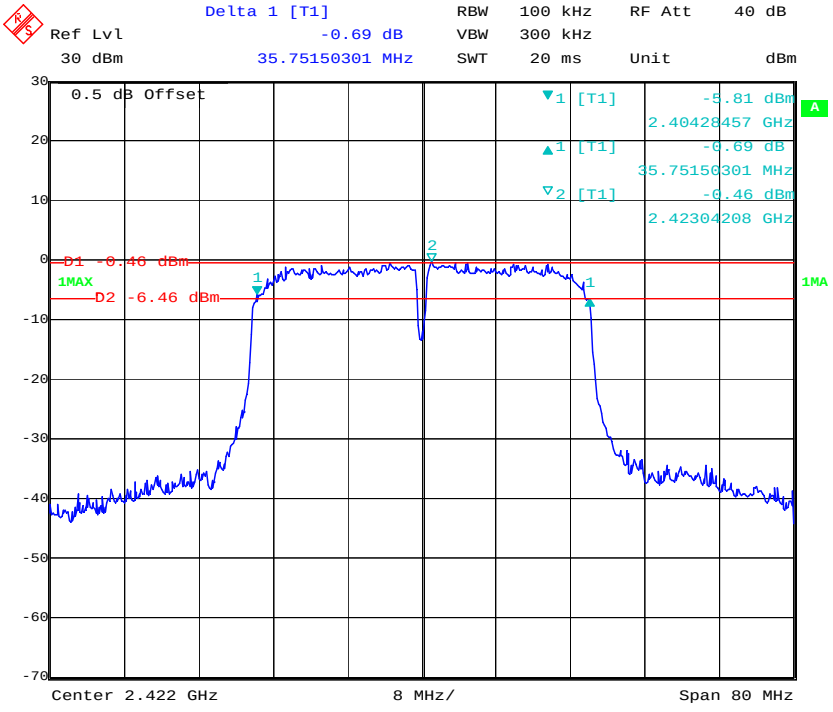
Date: 13.JAN.2017 16:09:46

802.11n ht20 High Channel

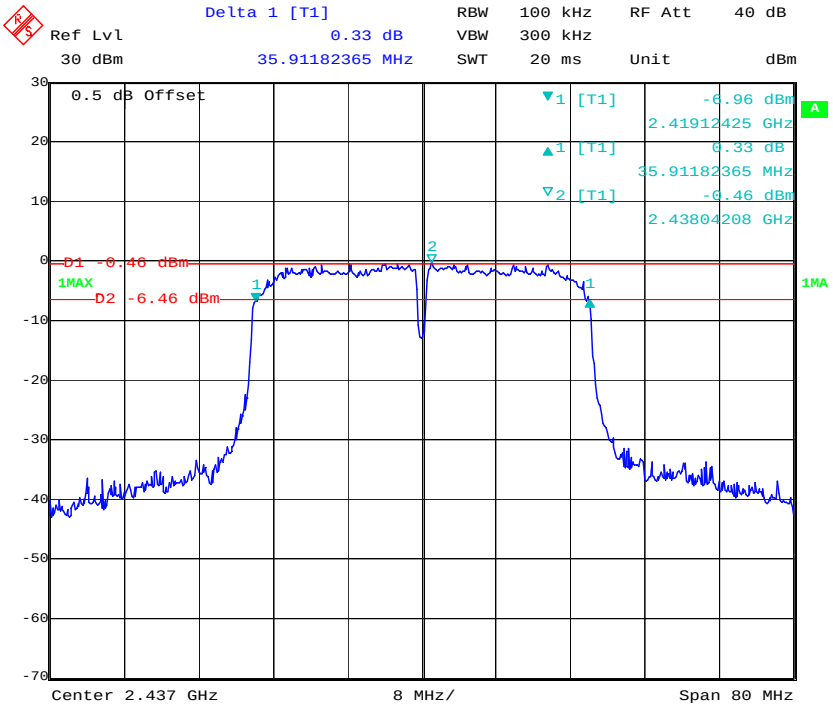


Date: 13.JAN.2017 16:11:12

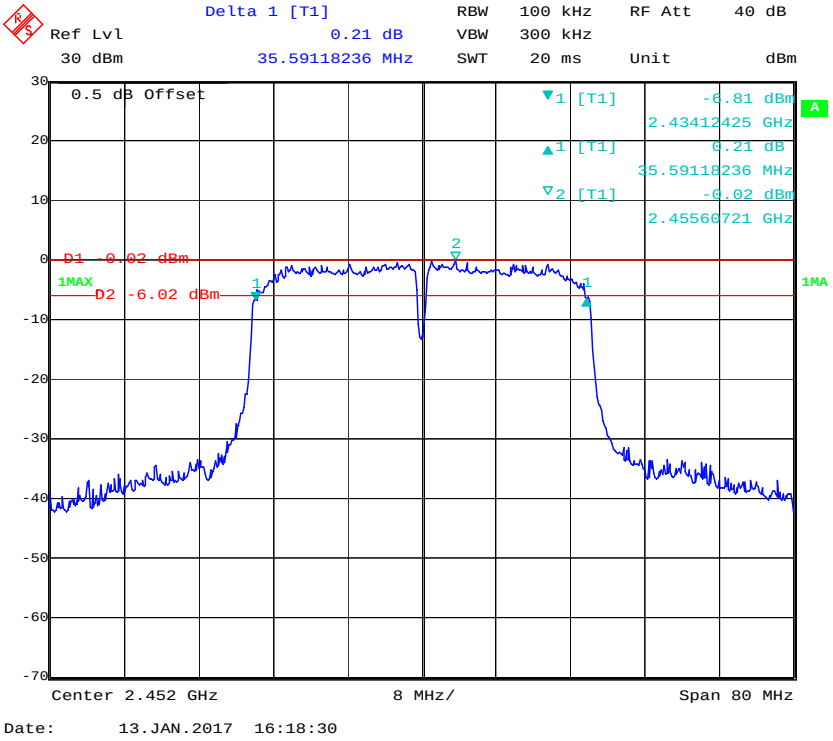
802.11n ht40 Low Channel



802.11n ht40 Middle Channel



802.11n ht40 High Channel



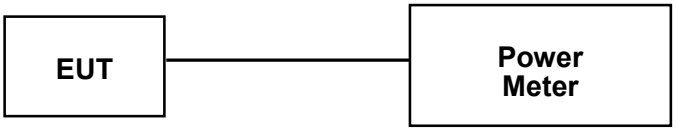
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54170074	2017-01-03	2018-01-03
Agilent	P-Series Power Meter	N1912A	MY5000798	2017-01-03	2018-01-03
N/A	RF Cable	N/A	N/A	Each Time	/

*** 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:	29.3 °C
Relative Humidity:	47 %
ATM Pressure:	95.6 kPa

** The testing was performed by Tom Tang on 2017-01-14.*

Test Mode: Transmitting

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

SISO:

Test mode	Channel	Frequency (MHz)	Max Peak Conducted Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Chain 2	
802.11b	Low	2412	21.03	20.98	20.42	30
	Middle	2437	21.37	21.31	20.95	30
	High	2462	21.49	21.33	21.23	30
802.11g	Low	2412	21.86	21.71	21.23	30
	Middle	2437	22.15	22.11	21.78	30
	High	2462	21.94	21.92	22.01	30
802.11n ht20	Low	2412	23.89	23.76	23.42	30
	Middle	2437	24.28	24.09	23.9	30
	High	2462	24.24	24.03	24.17	30
802.11n ht40	Low	2422	24.18	24.08	23.92	30
	Middle	2437	24.43	24.28	24.21	30
	High	2452	24.39	24.34	24.09	30

Test mode	Channel	Frequency (MHz)	Max Average Conducted Output Power (dBm)			Limit (dBm)
			Chain 0	Chain 1	Chain 2	
802.11b	Low	2412	19.71	19.42	18.77	30
	Middle	2437	19.81	19.67	19.35	30
	High	2462	19.73	19.71	19.65	30
802.11g	Low	2412	16.98	16.88	16.46	30
	Middle	2437	17.32	17.28	16.99	30
	High	2462	17.15	17.18	17.21	30
802.11n ht20	Low	2412	19.21	18.96	18.69	30
	Middle	2437	19.33	19.31	19.13	30
	High	2462	19.35	19.2	19.34	30
802.11n ht40	Low	2422	17.15	17.06	16.84	30
	Middle	2437	17.29	17.21	17.13	30
	High	2452	17.22	17.33	17.14	30

MIMO 2TX:

Test mode	Channel	Frequency (MHz)	Max Peak Conducted Output Power (dBm)		Total (dBm)	Limit (dBm)
			Chain 1	Chain 2		
802.11n ht20	Low	2412	22.38	22.97	25.7	30
	Middle	2437	22.67	23.37	26.04	30
	High	2462	22.69	23.34	26.04	30
802.11n ht40	Low	2422	23.1	23.31	26.22	30
	Middle	2437	23.2	23.52	26.37	30
	High	2452	23.2	23.48	26.35	30

Test mode	Channel	Frequency (MHz)	Max Average Conducted Output Power (dBm)		Total (dBm)	Limit (dBm)
			Chain 1	Chain 2		
802.11n ht20	Low	2412	17.69	18.24	20.98	30
	Middle	2437	18.04	18.65	21.37	30
	High	2462	17.95	18.56	21.28	30
802.11n ht40	Low	2422	15.88	16.24	19.07	30
	Middle	2437	15.99	16.38	19.20	30
	High	2452	15.92	16.37	19.16	30

MIMO 3TX:

Test mode	Channel	Frequency (MHz)	Max Peak Conducted Output Power (dBm)			Total (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2		
802.11n ht20	Low	2412	21.46	21.7	22.08	26.53	30
	Middle	2437	21.56	21.99	22.43	26.78	30
	High	2462	21.39	21.94	22.58	26.77	30
802.11n ht40	Low	2422	21.45	21.65	21.97	26.47	30
	Middle	2437	21.54	21.71	22.12	26.57	30
	High	2452	19.98	21.7	22.3	26.2	30

Test mode	Channel	Frequency (MHz)	Max Average Conducted Output Power (dBm)			Total (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2		
802.11n ht20	Low	2412	16.67	16.78	17.14	21.64	30
	Middle	2437	16.84	17.13	17.47	21.93	30
	High	2462	16.54	17.04	17.67	21.88	30
802.11n ht40	Low	2422	14.48	14.76	15.01	19.53	30
	Middle	2437	14.55	14.84	15.25	19.66	30
	High	2452	13.02	14.8	15.32	19.26	30

Note: the device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

So:

Directional gain = GANT + Array Gain = 4dBi < 6dBi

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	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** 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

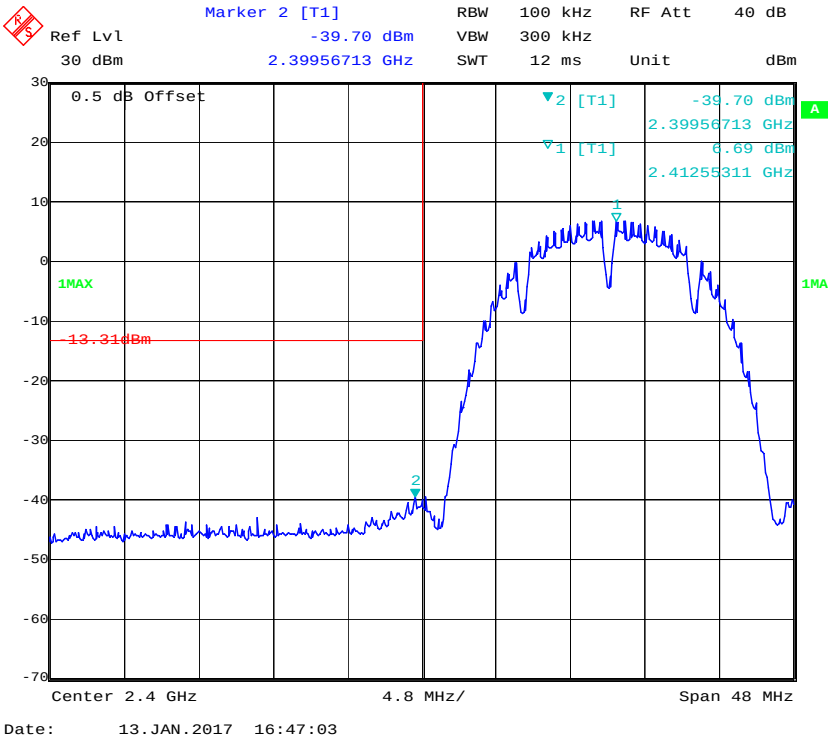
Temperature:	25 °C
Relative Humidity:	35 %
ATM Pressure:	94.8 kPa

** The testing was performed by Tom Tang on 2017-01-13.*

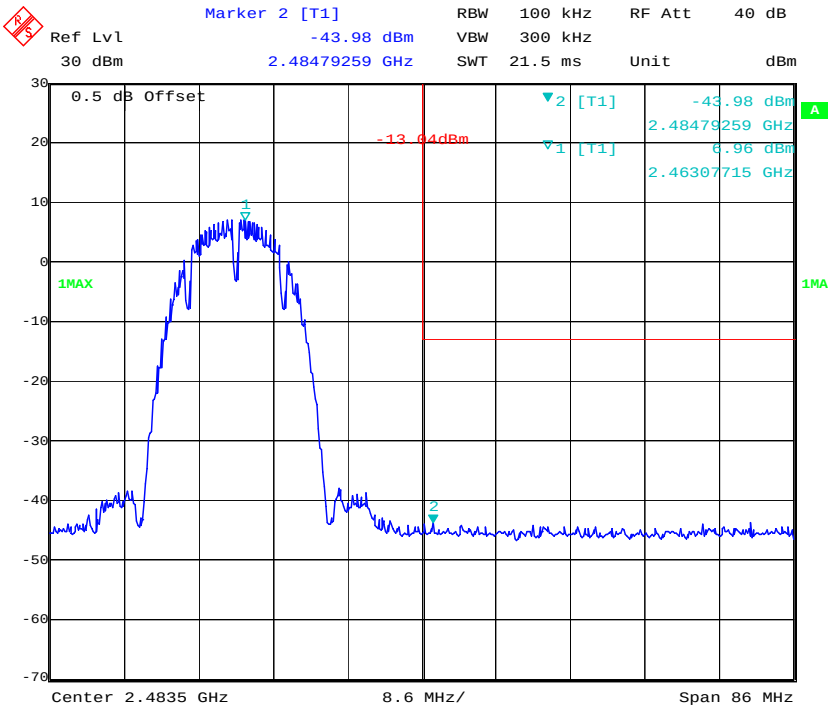
Test mode: Transmitting (SISO mode was tested since the maximum power per chain)

Test Result: Compliant. Please refer to following plots.

Chain 0, 802.11b: Band Edge, Left Side

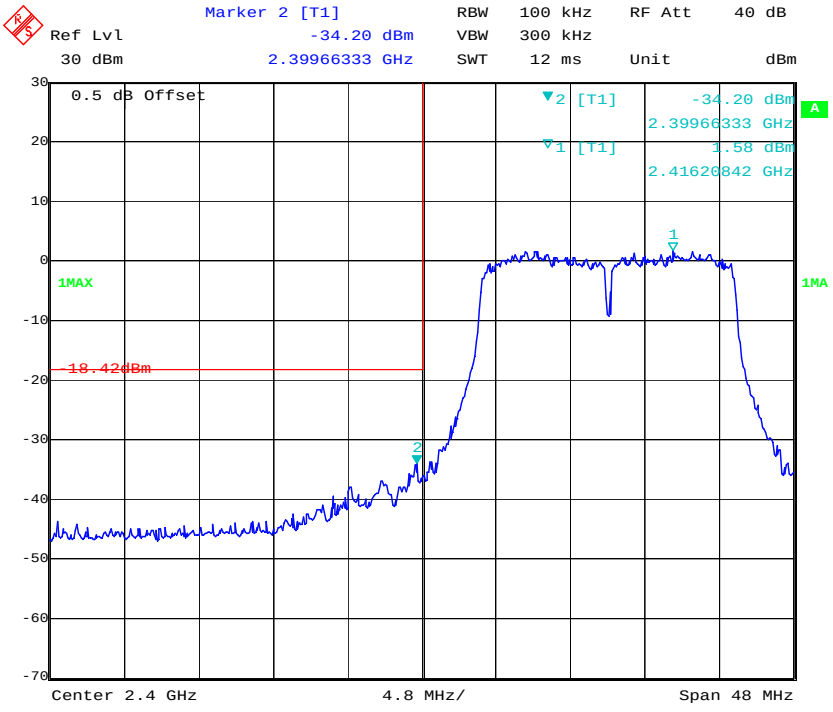


Chain 0, 802.11b: Band Edge, Right Side



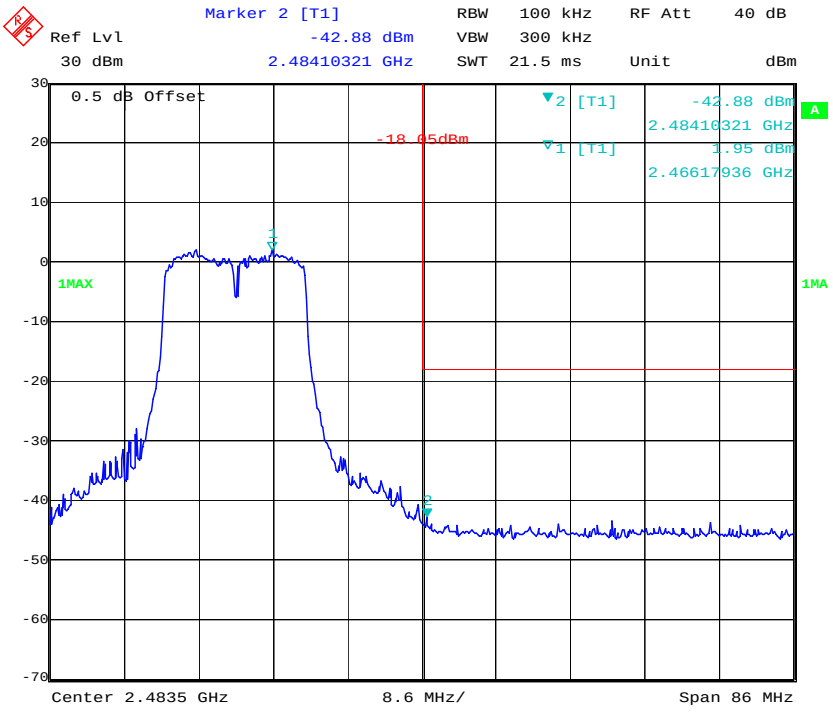
Date: 13.JAN.2017 16:53:36

Chain 0, 802.11g: Band Edge, Left Side

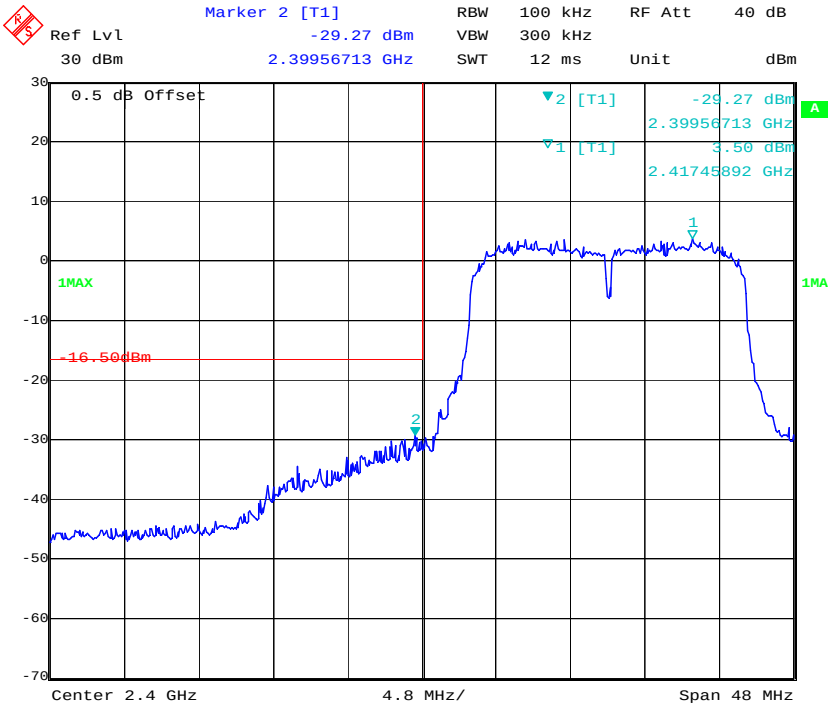


Date: 13.JAN.2017 17:19:16

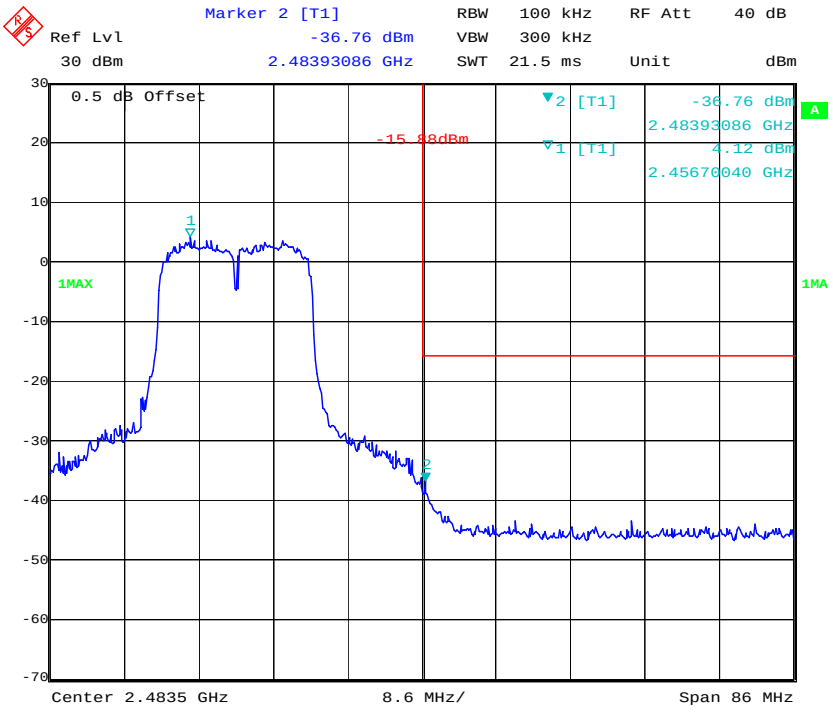
Chain 0, 802.11g: Band Edge, Right Side



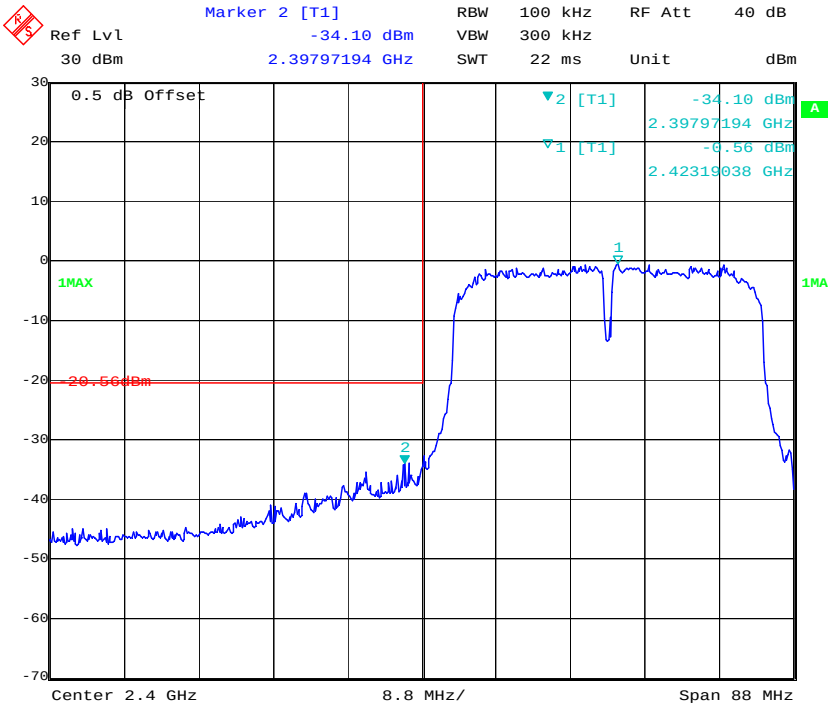
Chain 0, 802.11n ht20 Band Edge, Left Side



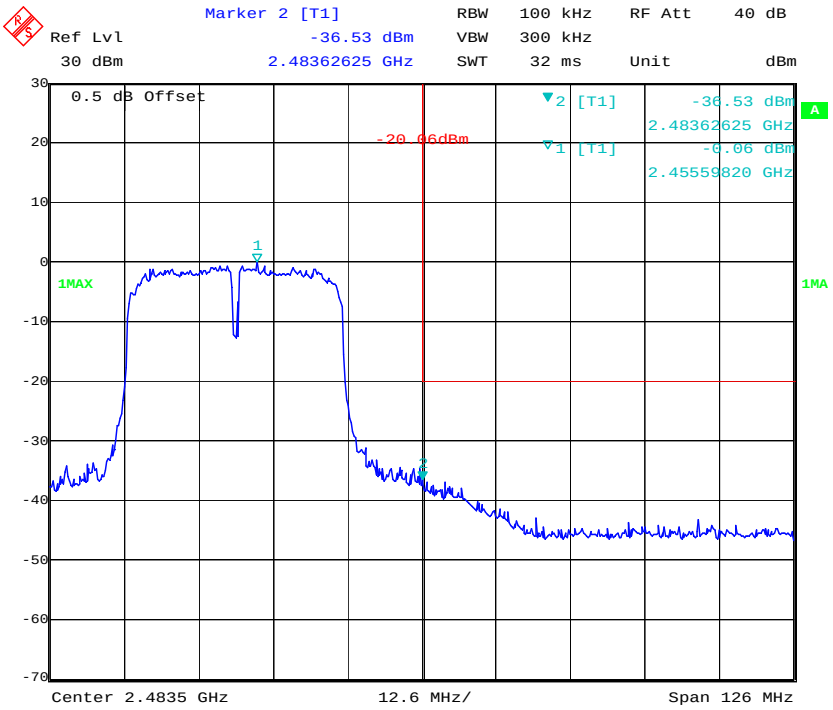
Chain 0, 802.11n ht20 Band Edge, Right Side



Chain 0, 802.11n ht40 Band Edge, Left Side

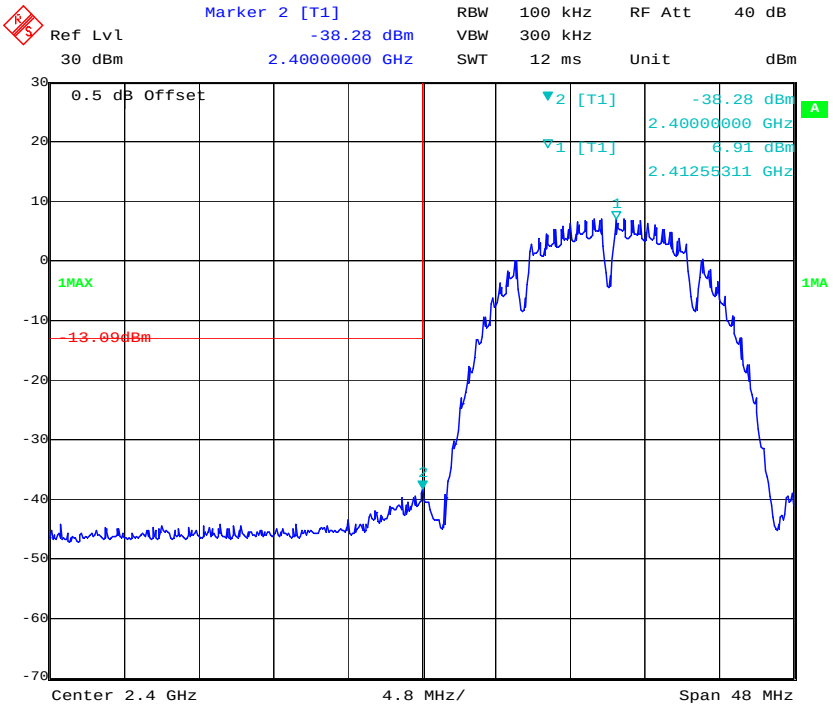


Chain 0, 802.11n ht40 Band Edge, Right Side



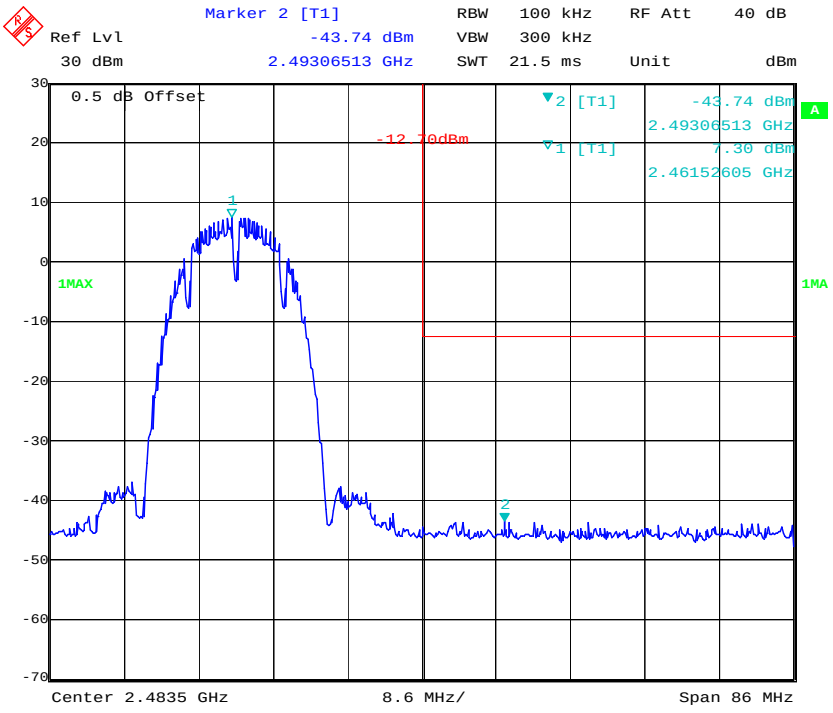
Date: 13.JAN.2017 16:22:34

Chain 1, 802.11b: Band Edge, Left Side



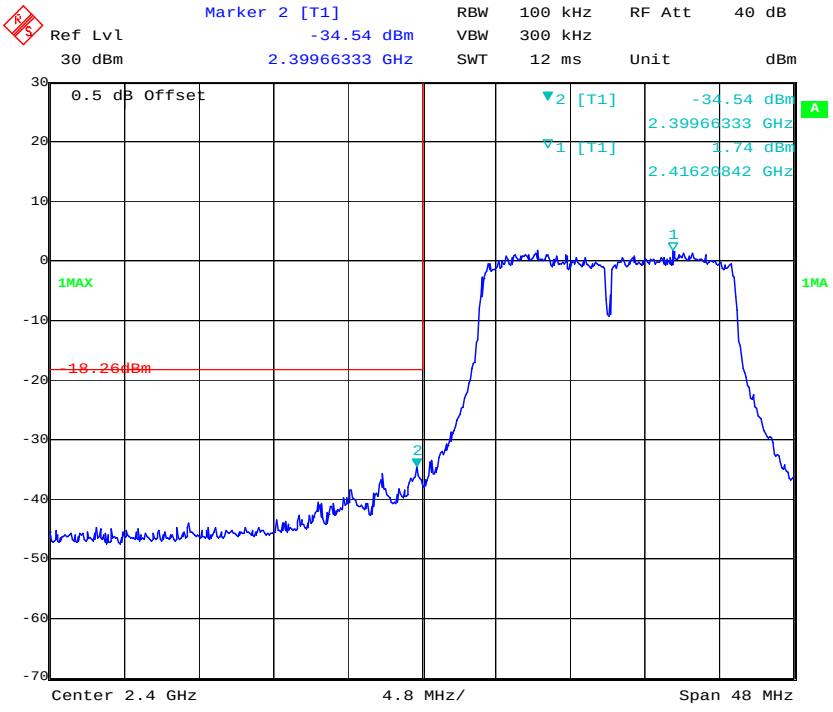
Date: 13.JAN.2017 17:08:32

Chain 1, 802.11b: Band Edge, Right Side



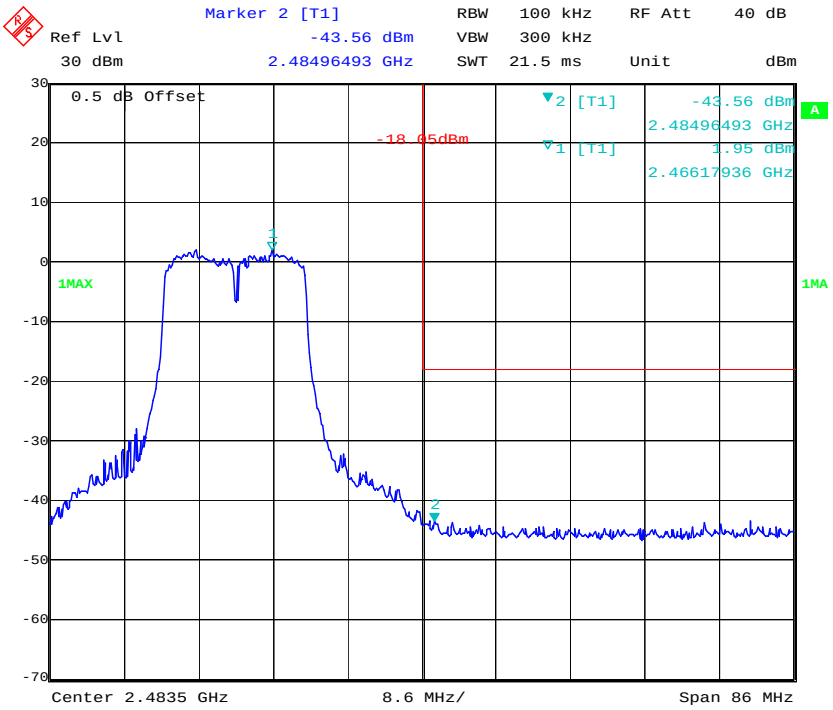
Date: 13.JAN.2017 17:02:23

Chain 1, 802.11g: Band Edge, Left Side

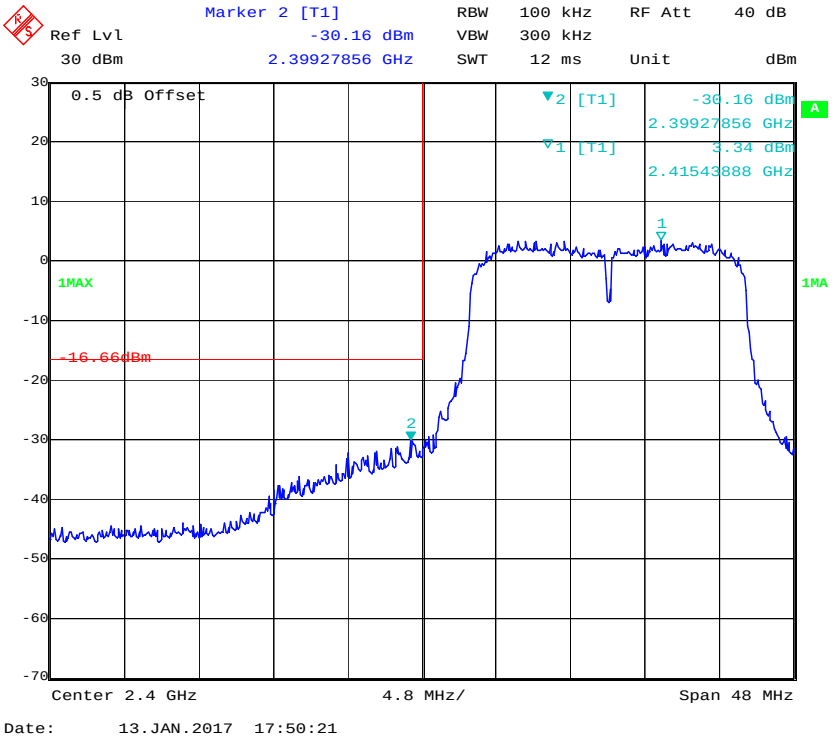


Date: 13.JAN.2017 17:45:06

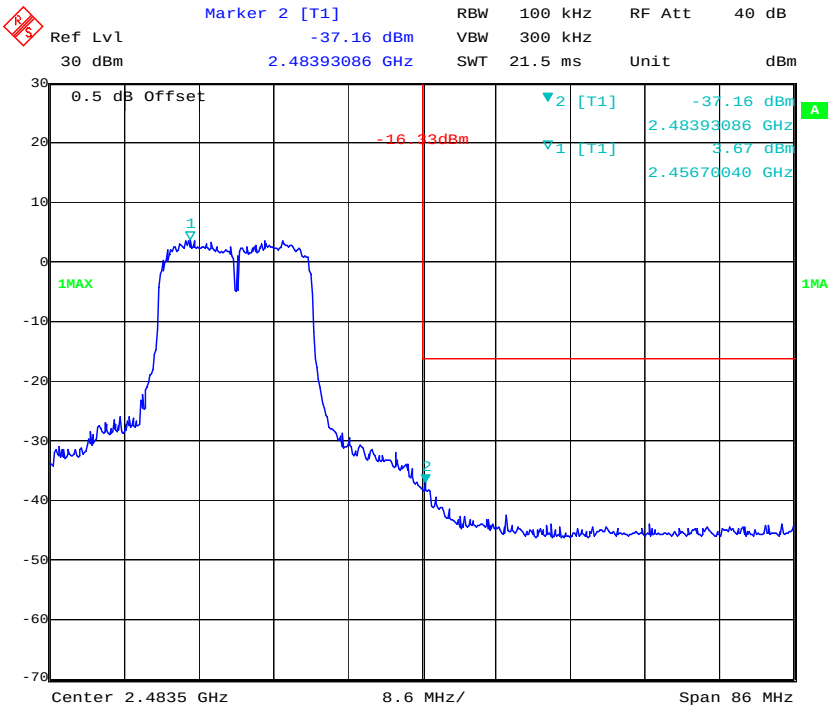
Chain 1, 802.11g: Band Edge, Right Side



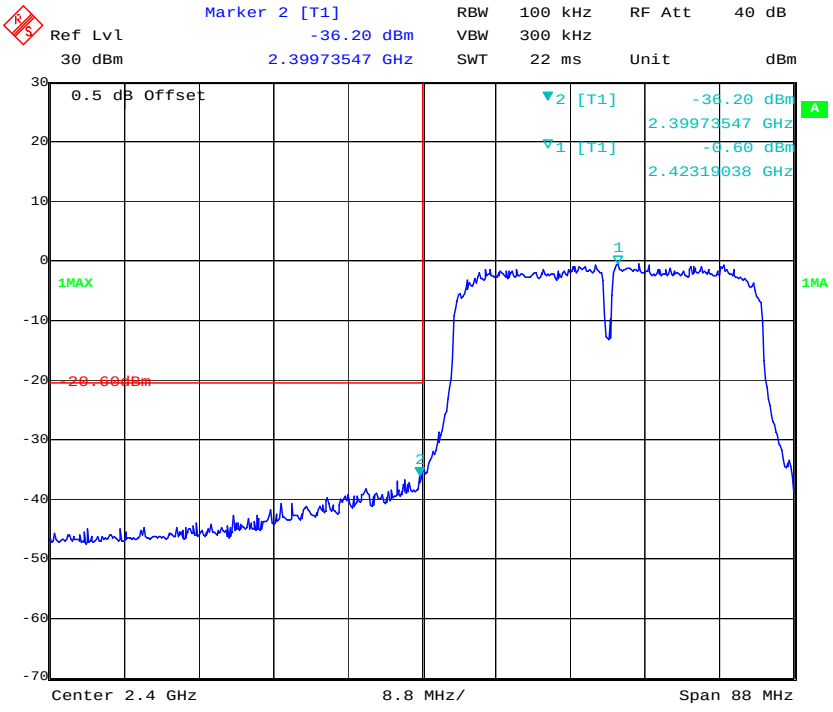
Chain 1, 802.11n ht20 Band Edge, Left Side



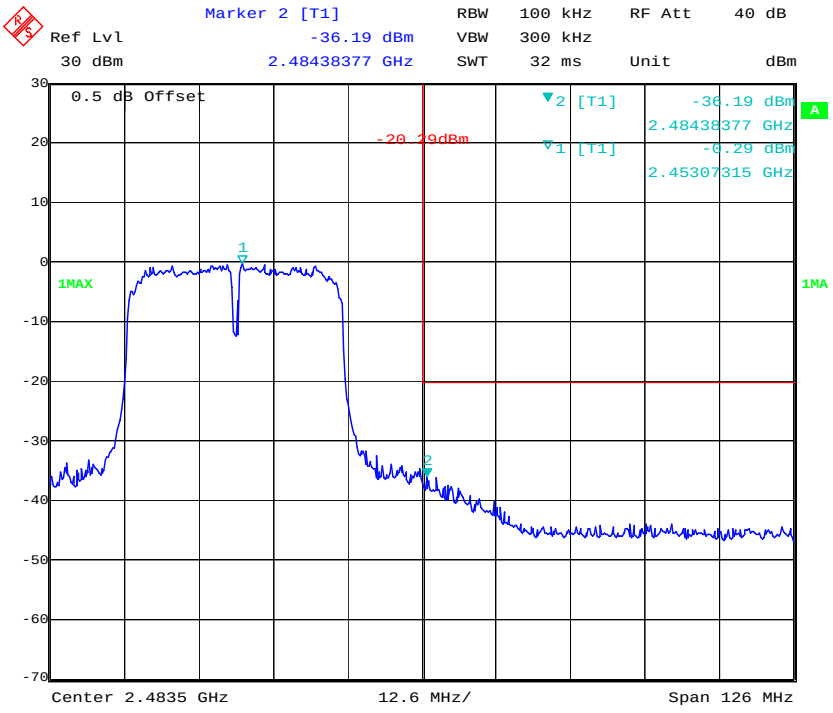
Chain 1, 802.11n ht20 Band Edge, Right Side



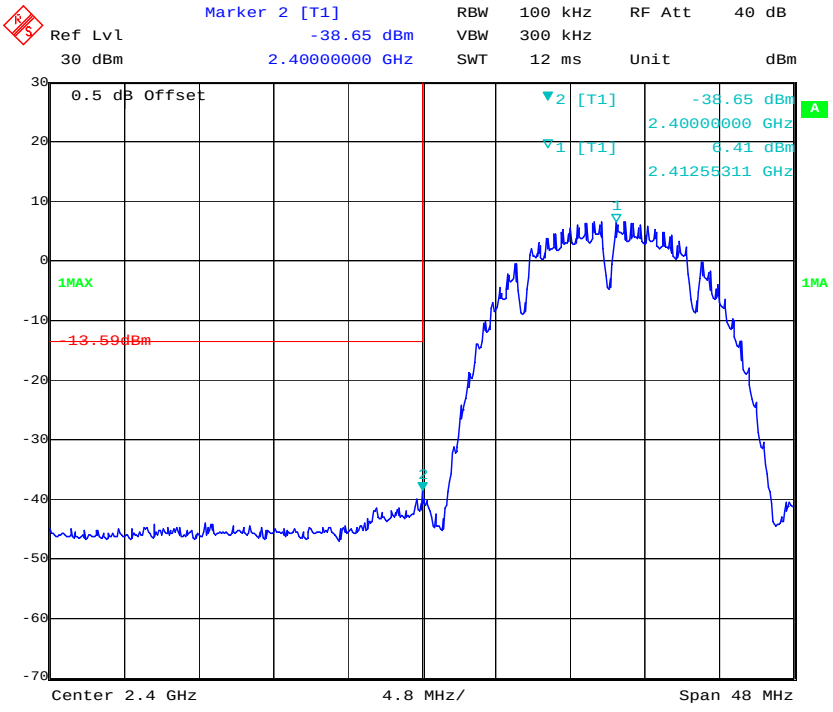
Chain 1, 802.11n ht40 Band Edge, Left Side



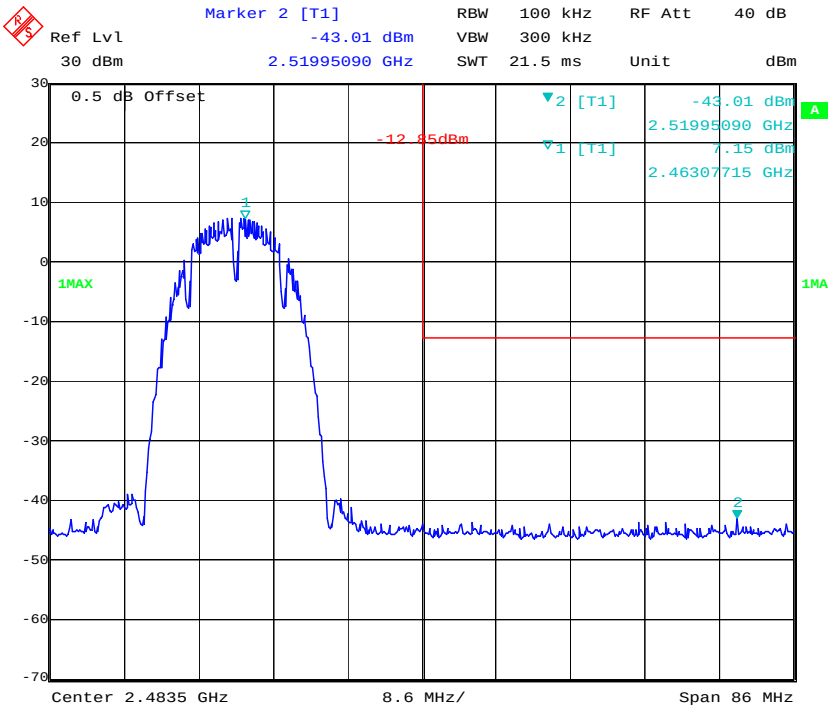
Chain 1, 802.11n ht40 Band Edge, Right Side



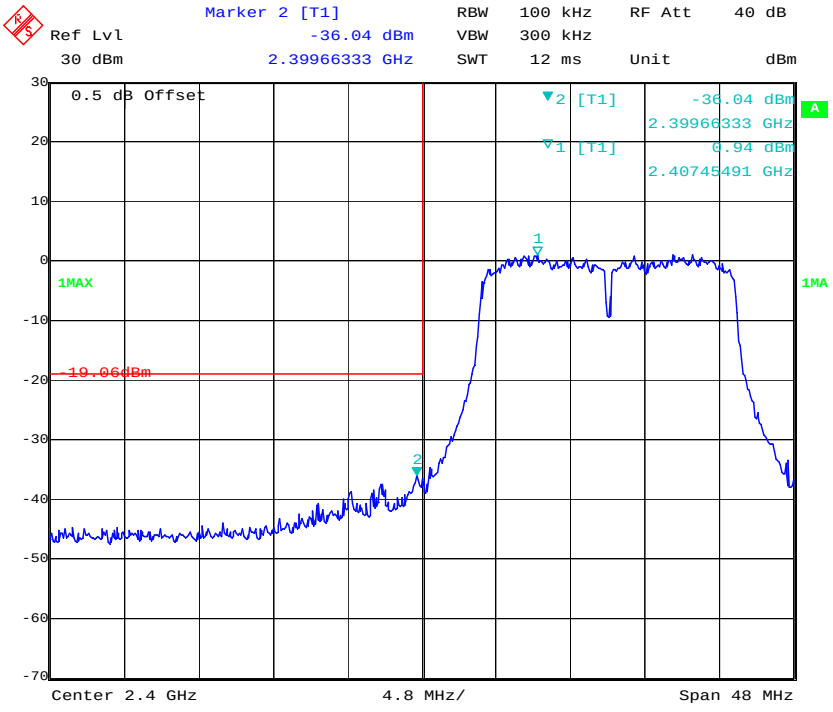
Chain 2, 802.11b: Band Edge, Left Side



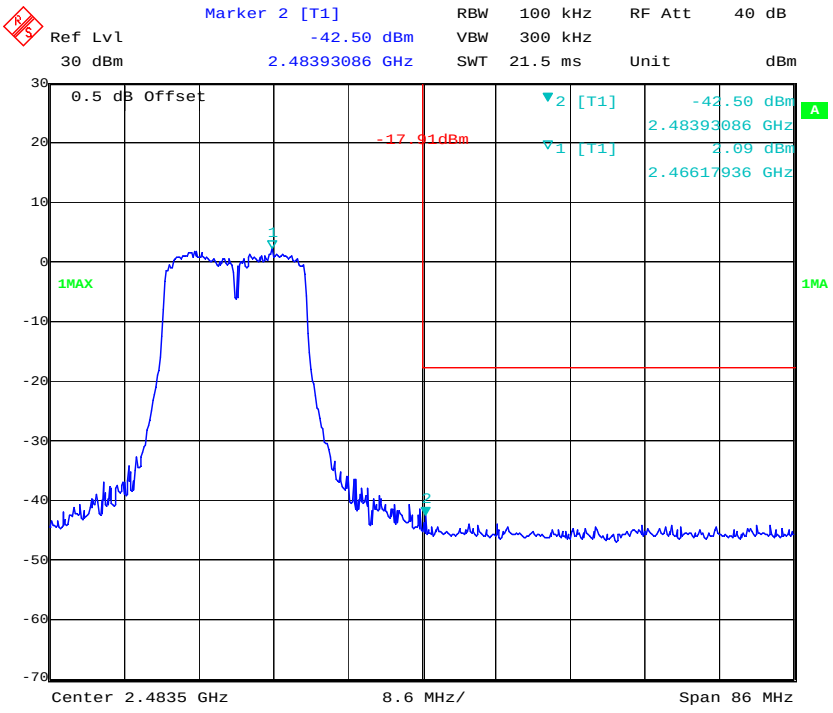
Chain 2, 802.11b: Band Edge, Right Side



Chain 2, 802.11g: Band Edge, Left Side

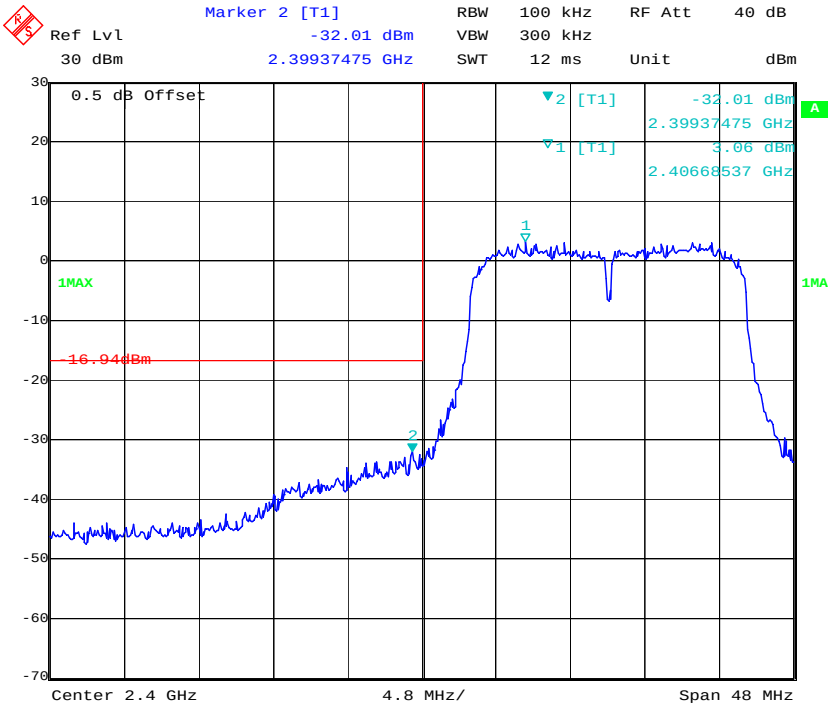


Chain 2, 802.11g: Band Edge, Right Side



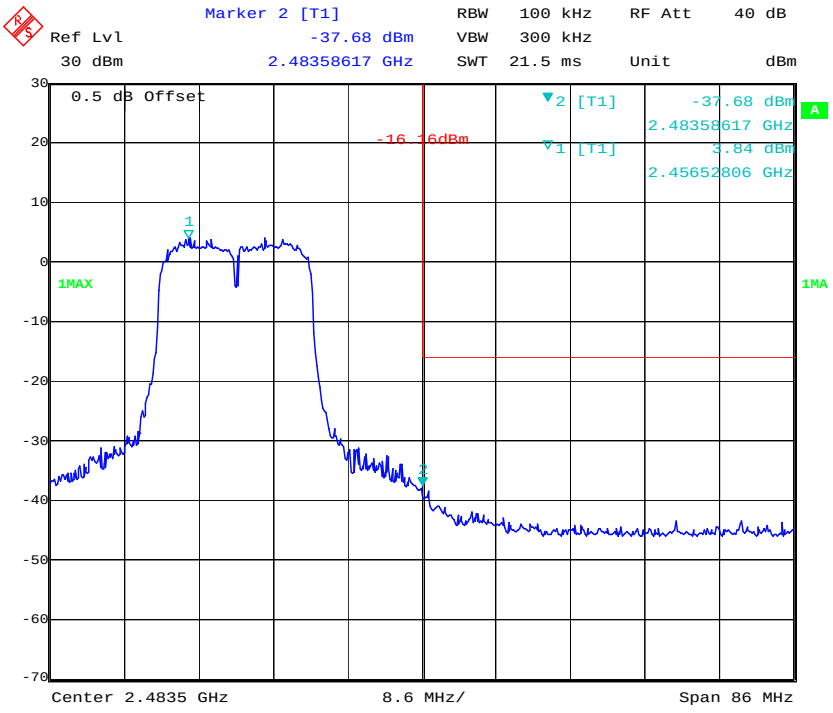
Date: 13.JAN.2017 21:39:30

Chain 2, 802.11n ht20 Band Edge, Left Side



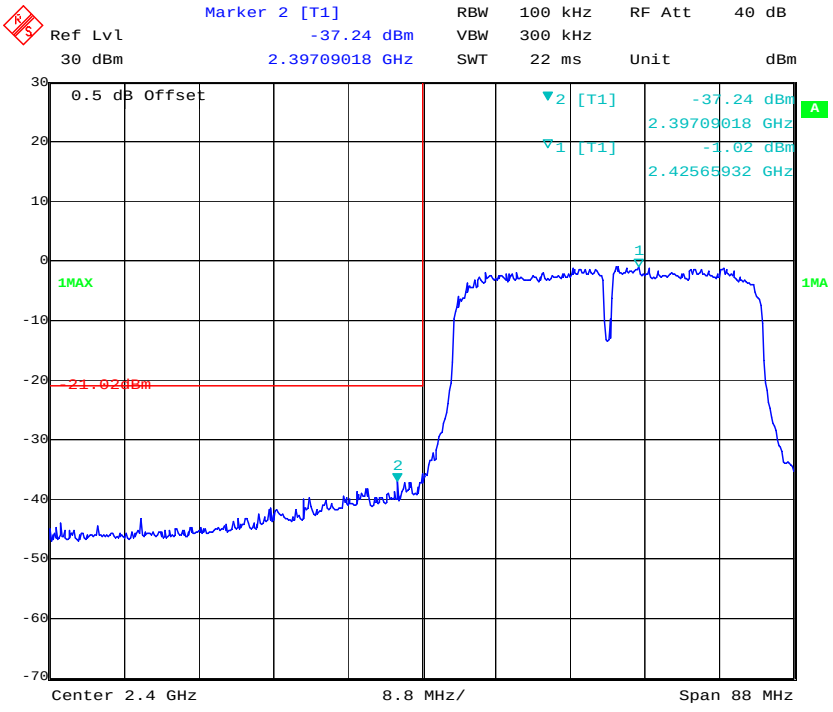
Date: 13.JAN.2017 20:45:36

Chain 2, 802.11n ht20 Band Edge, Right Side



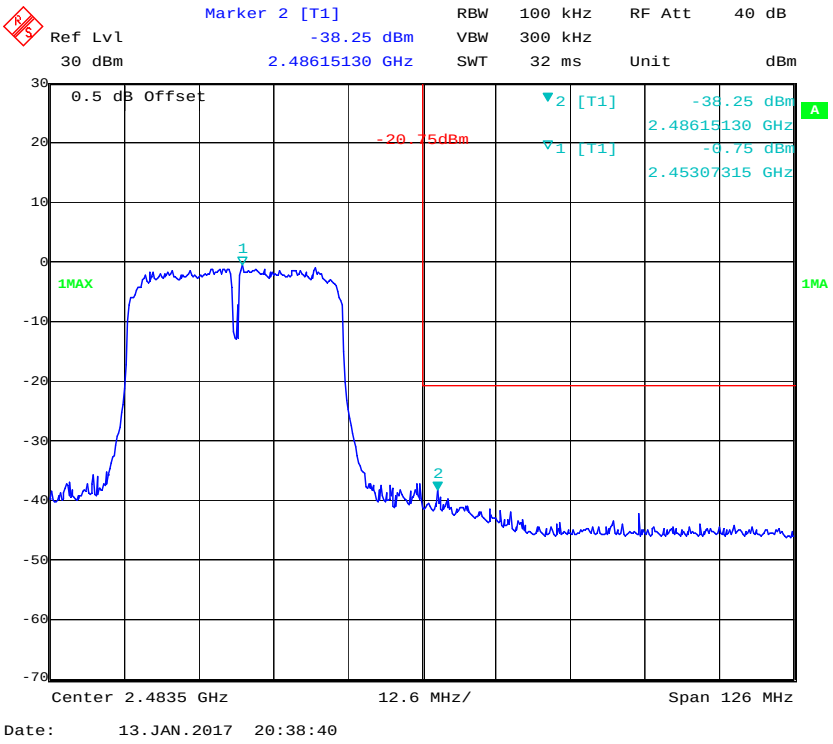
Date: 13.JAN.2017 20:57:31

Chain 2, 802.11n ht40 Band Edge, Left Side



Date: 13.JAN.2017 19:59:04

Chain 2, 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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2016-09-21	2017-09-20
N/A	RF Cable	N/A	N/A	Each Time	/

*** 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:	25 °C
Relative Humidity:	35 %
ATM Pressure:	94.8 kPa

** The testing was performed by Tom Tang on 2017-01-13.*

Test Mode: Transmitting (SISO mode was the maximum power mode per chain, so the MIMO modes PSD is less than SISO mode per chain)

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

Test mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)				Limit (dBm/3kHz)
			Chain 0	Chain 1	Chain 2	Total	
802.11b	Low	2412	-12.82	-12.53	-12.98	-8.00	≤6.23
	Middle	2437	-12.48	-12.19	-12.56	-7.64	≤6.23
	High	2462	-12.5	-12.15	-12.28	-7.54	≤6.23
802.11g	Low	2412	-13.31	-13.41	-13.64	-8.68	≤6.23
	Middle	2437	-13.07	-13.15	-13.25	-8.38	≤6.23
	High	2462	-12.56	-12.6	-12.68	-7.84	≤6.23
802.11n ht20	Low	2412	-10	-9.7	-10.62	-5.32	≤6.23
	Middle	2437	-10.21	-10.01	-10.11	-5.34	≤6.23
	High	2462	-9.95	-9.91	-10.12	-5.22	≤6.23
802.11n ht40	Low	2422	-13.67	-12.52	-14.81	-8.80	≤6.23
	Middle	2437	-12.64	-14.1	-13.44	-8.58	≤6.23
	High	2452	-11.94	-13.06	-12.33	-7.65	≤6.23

Note: the device is a master device. the 3 antenna maximum atenna gain are 3.0dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

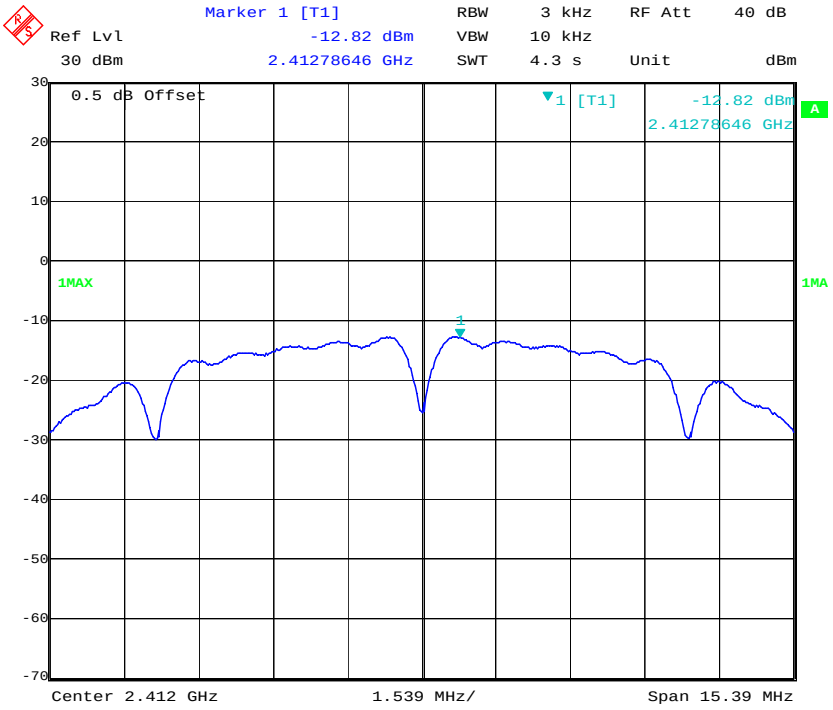
So:

Directional gain = GANT + Array Gain = 3+10*log(3) =7.77 dBi

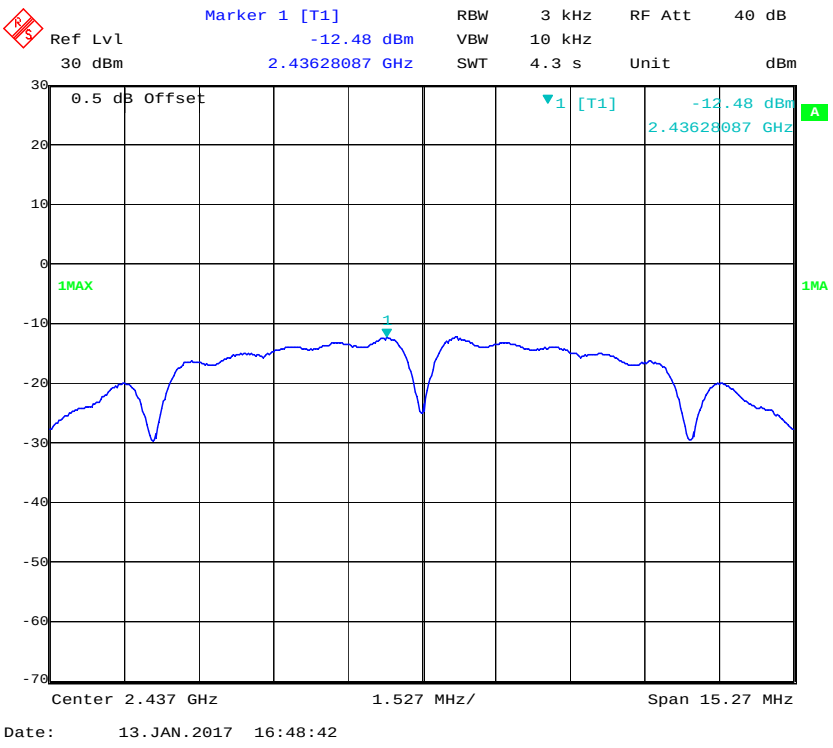
The Power density Limits was reduce 1.77dB

Chain 0

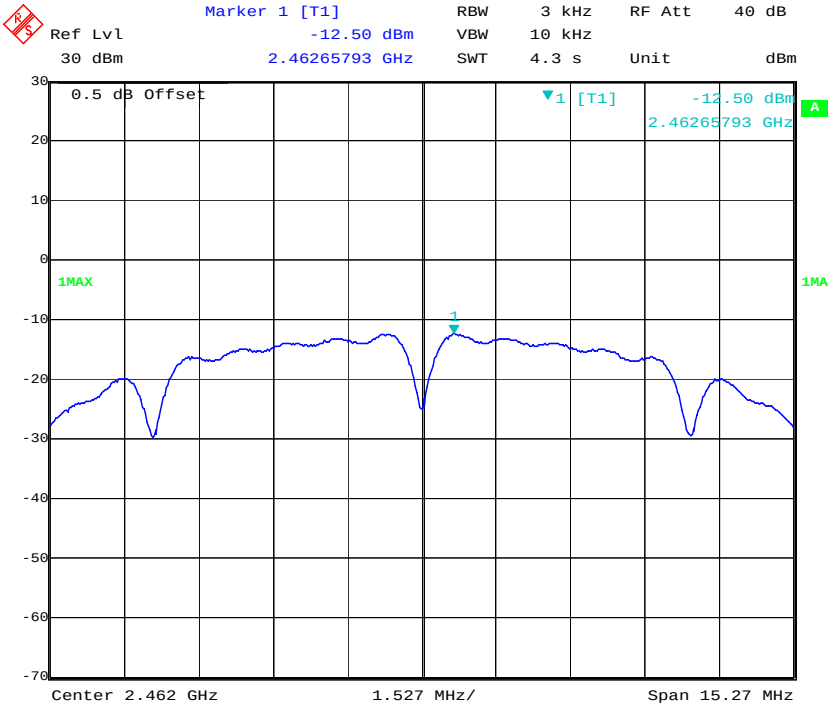
Power Spectral Density, 802.11b Low Channel



Power Spectral Density, 802.11b Middle Channel

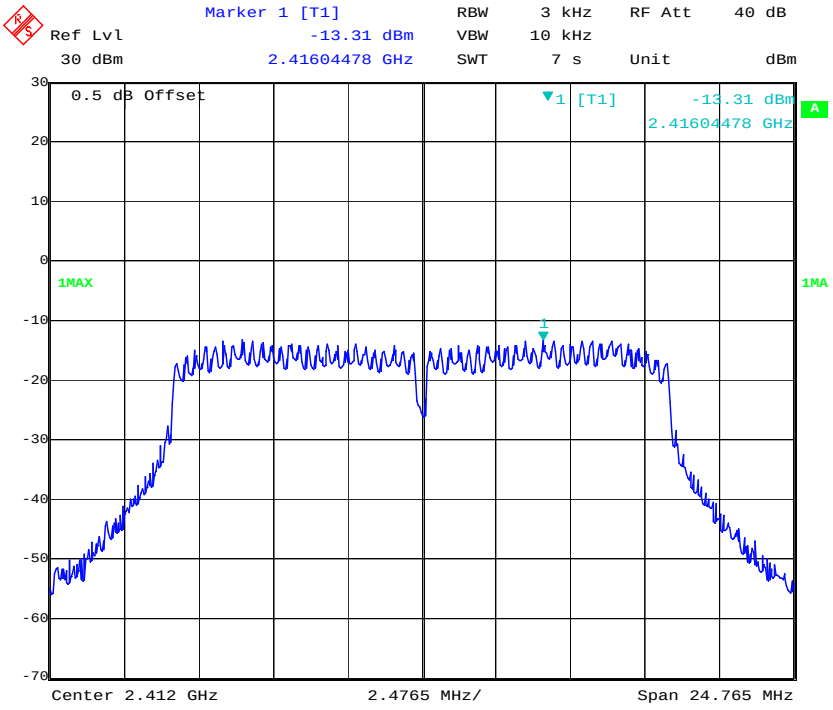


Power Spectral Density, 802.11b High Channel



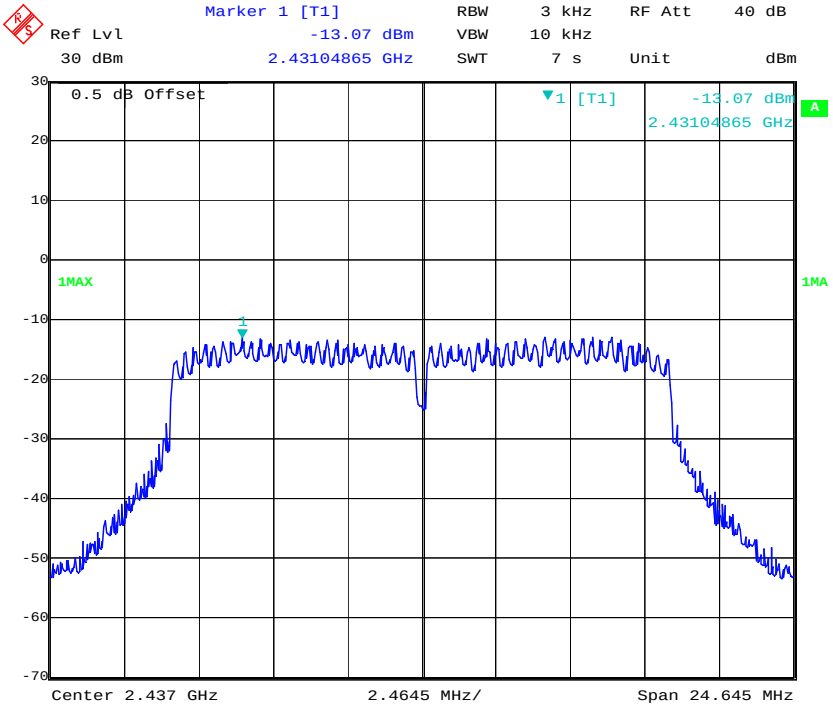
Date: 13.JAN.2017 16:53:08

Power Spectral Density, 802.11g Low Channel



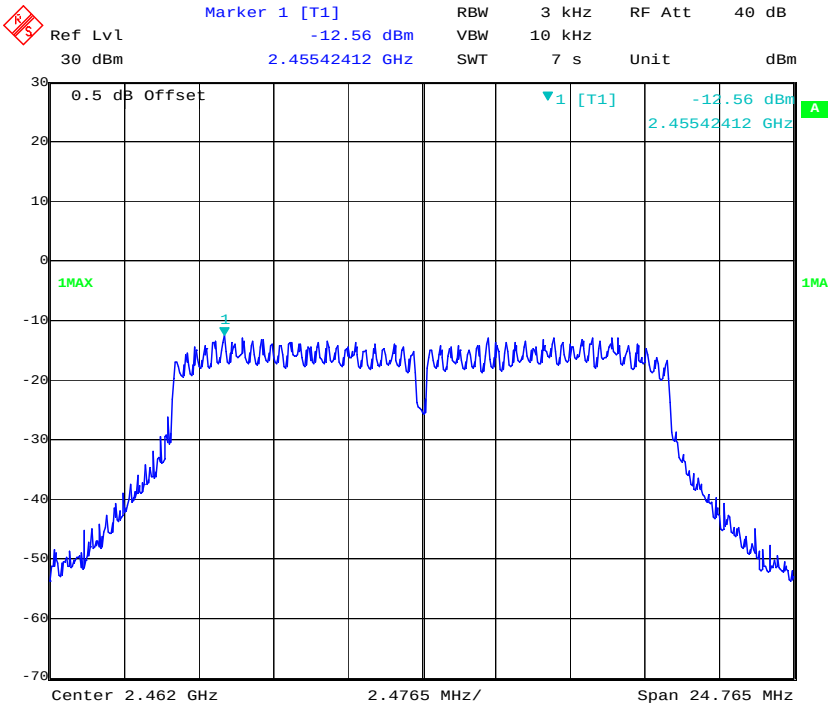
Date: 13.JAN.2017 17:18:50

Power Spectral Density, 802.11g Middle Channel



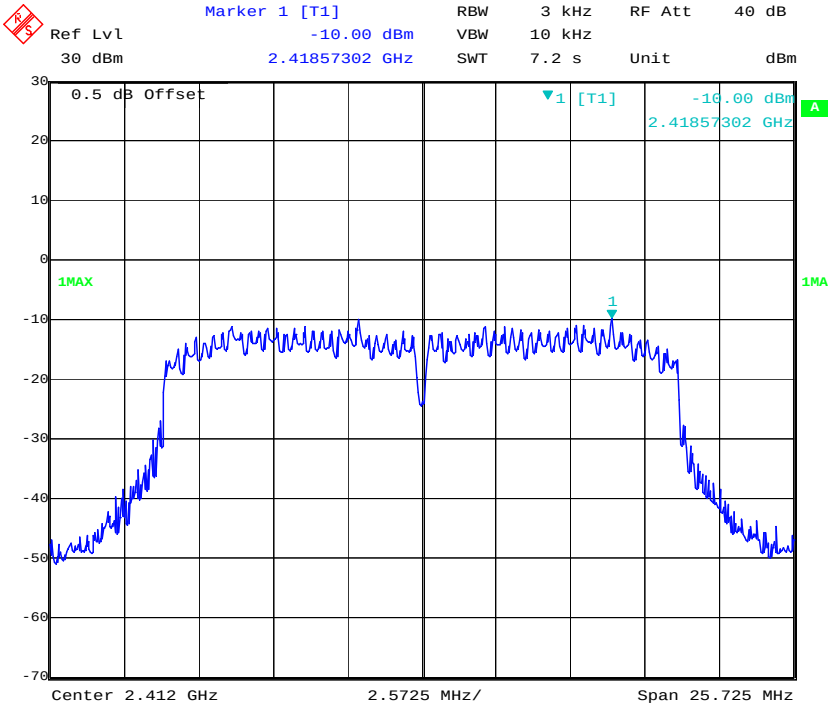
Date: 13.JAN.2017 17:23:50

Power Spectral Density, 802.11g High Channel



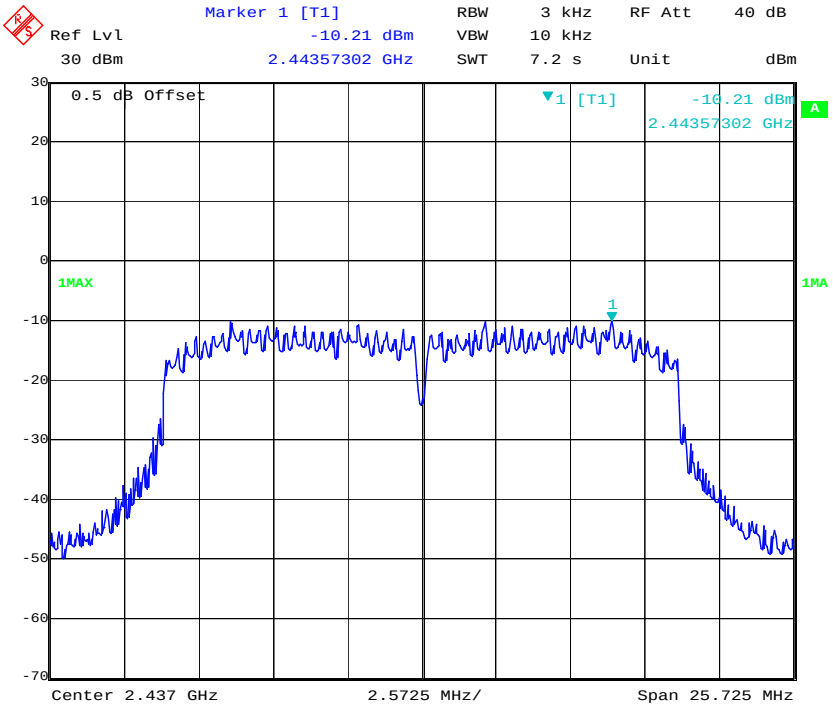
Date: 13.JAN.2017 17:28:38

Power Spectral Density, 802.11n ht20 Low Channel



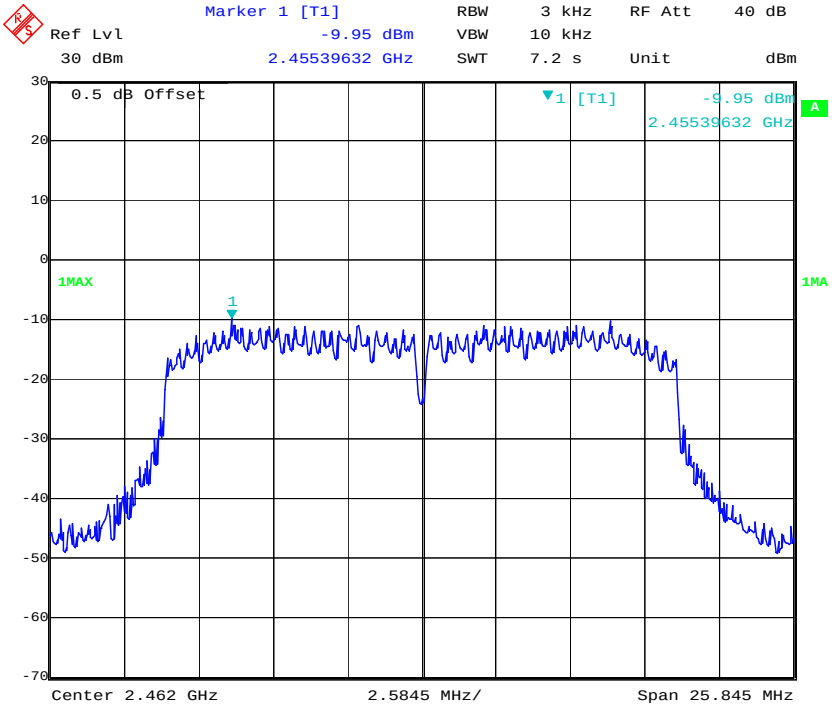
Date: 13.JAN.2017 16:29:05

Power Spectral Density, 802.11n ht20 Middle Channel



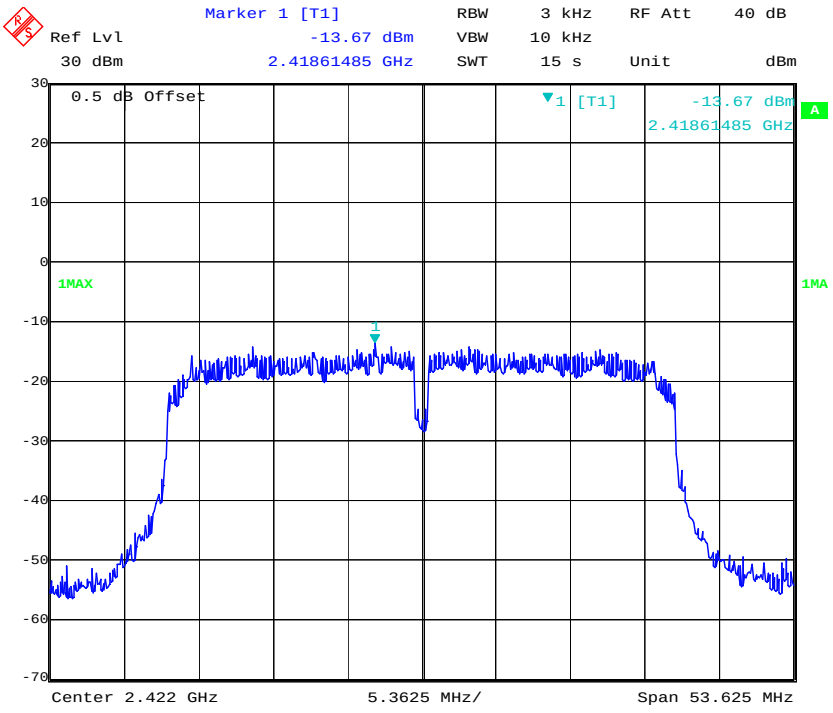
Date: 13.JAN.2017 16:31:09

Power Spectral Density, 802.11n ht20 High Channel



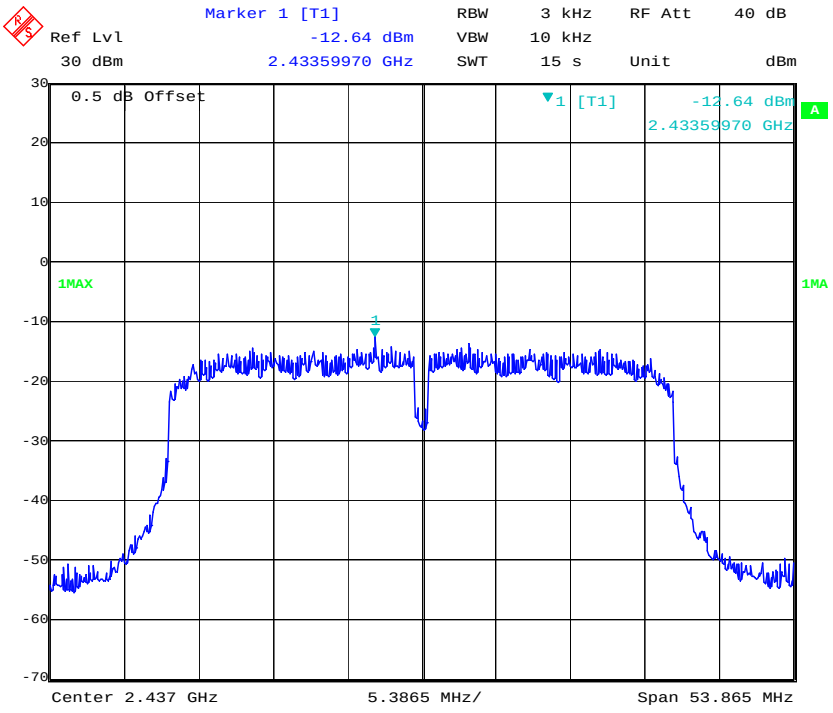
Date: 13.JAN.2017 16:33:22

Power Spectral Density, 802.11n ht40 Low Channel



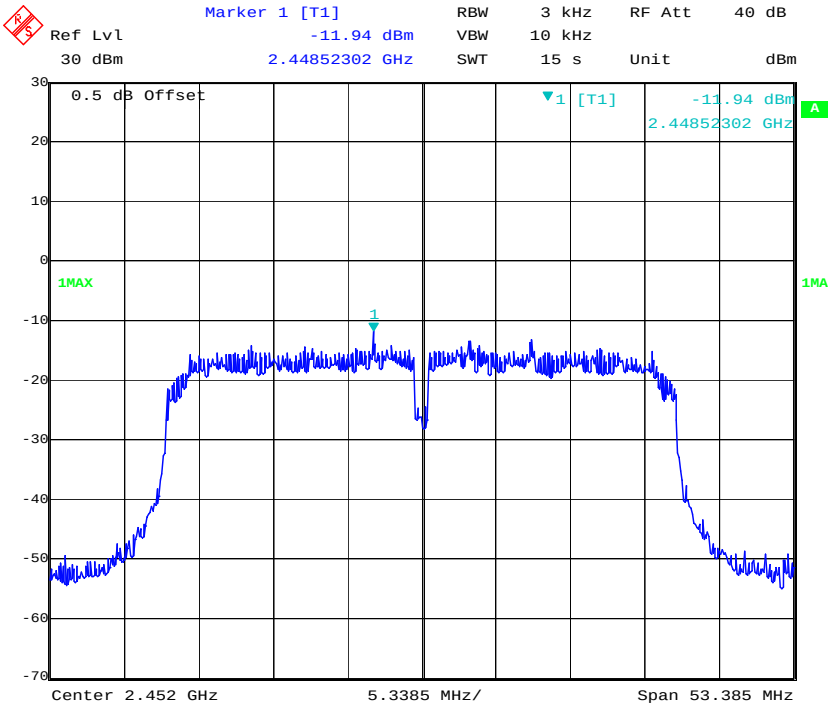
Date: 13.JAN.2017 16:26:56

Power Spectral Density, 802.11n ht40 Middle Channel



Date: 13.JAN.2017 16:24:51

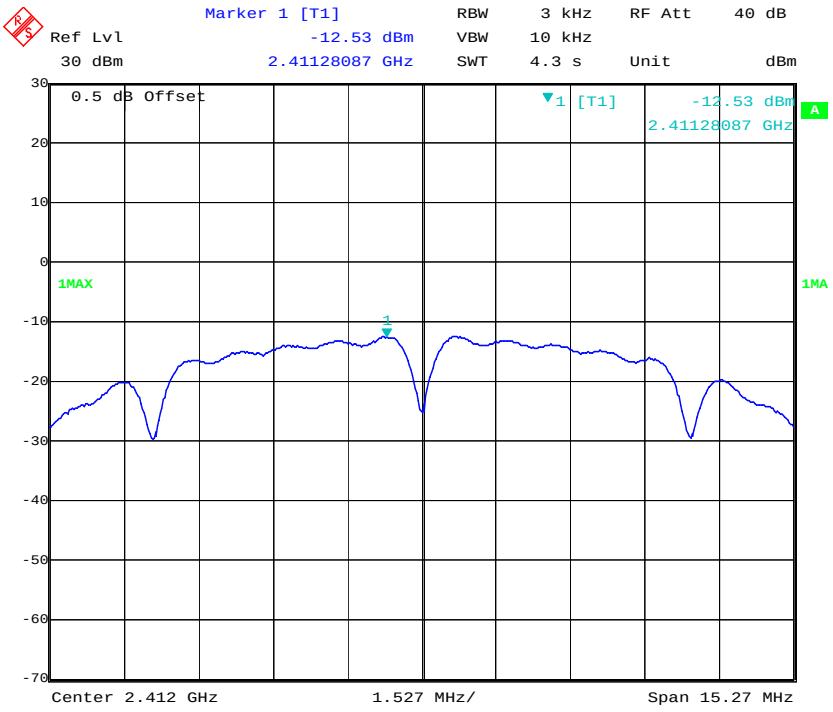
Power Spectral Density, 802.11n ht40 High Channel



Date: 13.JAN.2017 16:22:13

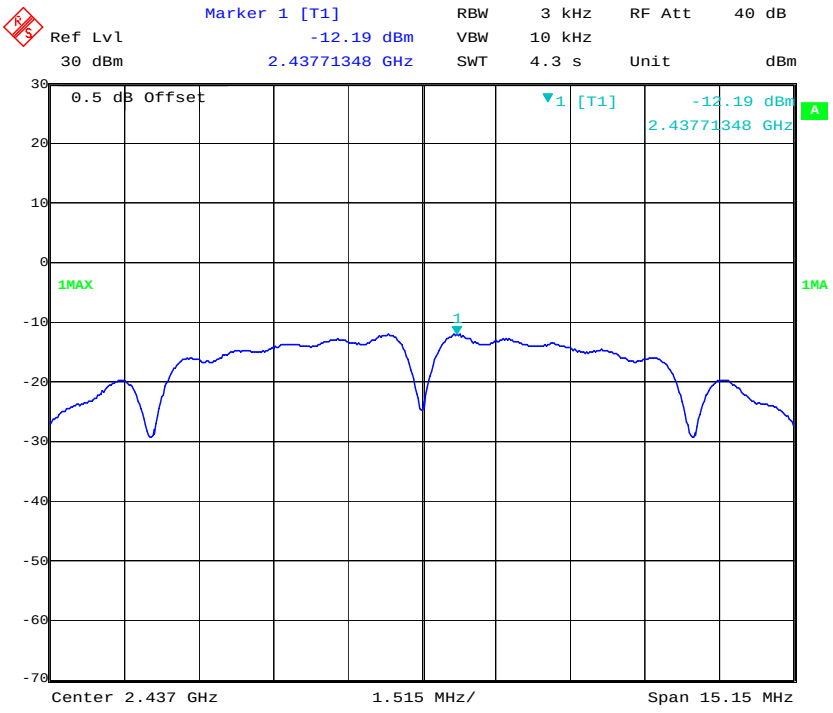
Chain 1

Power Spectral Density, 802.11b Low Channel



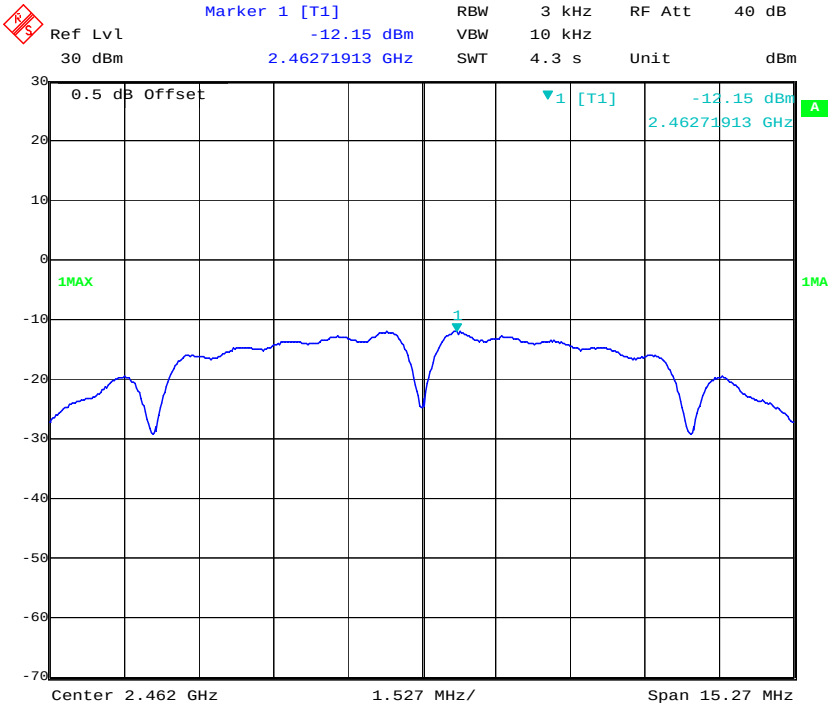
Date: 13.JAN.2017 17:08:13

Power Spectral Density, 802.11b Middle Channel



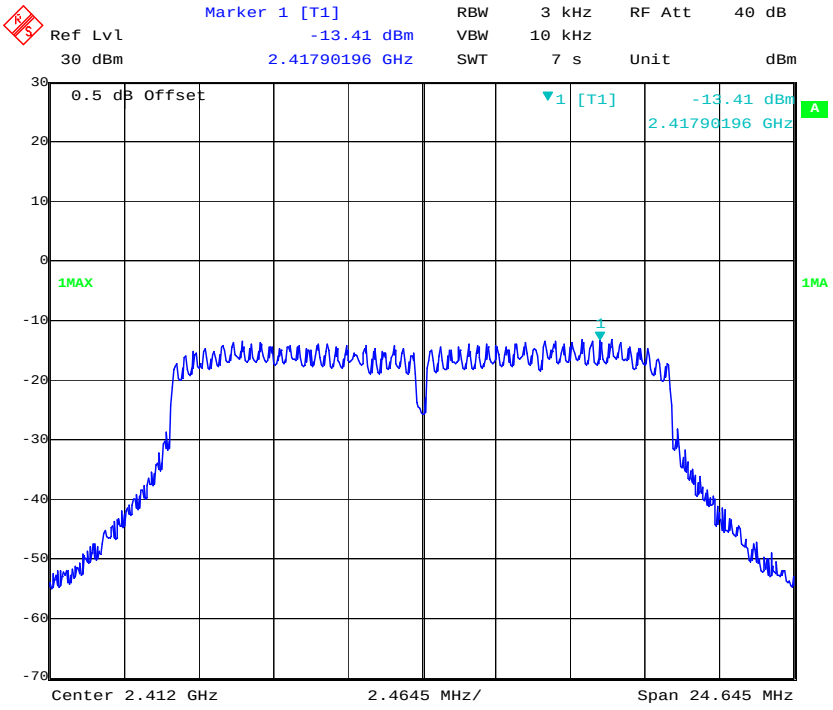
Date: 13.JAN.2017 17:05:43

Power Spectral Density, 802.11b High Channel



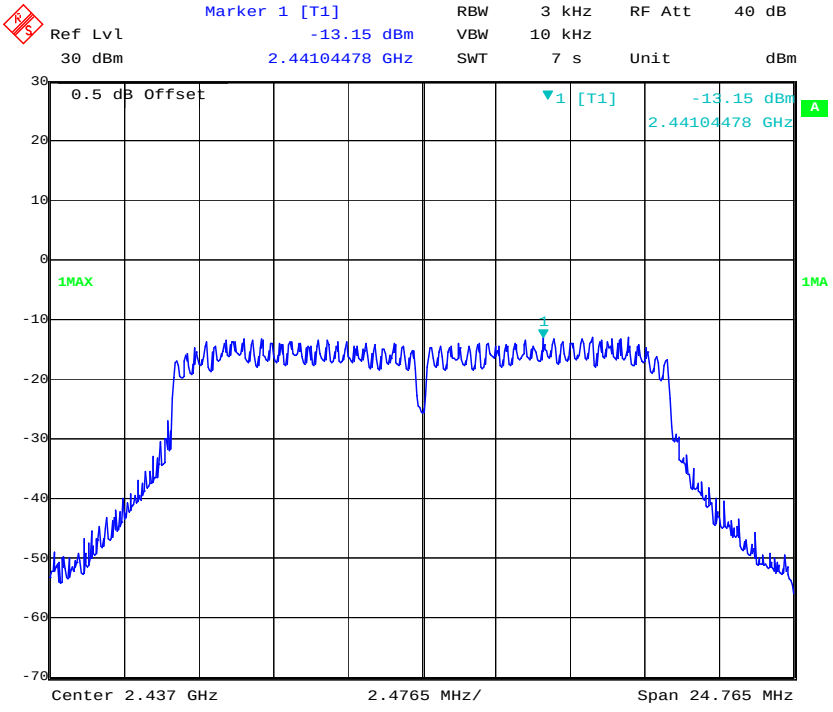
Date: 13.JAN.2017 17:02:02

Power Spectral Density, 802.11g Low Channel



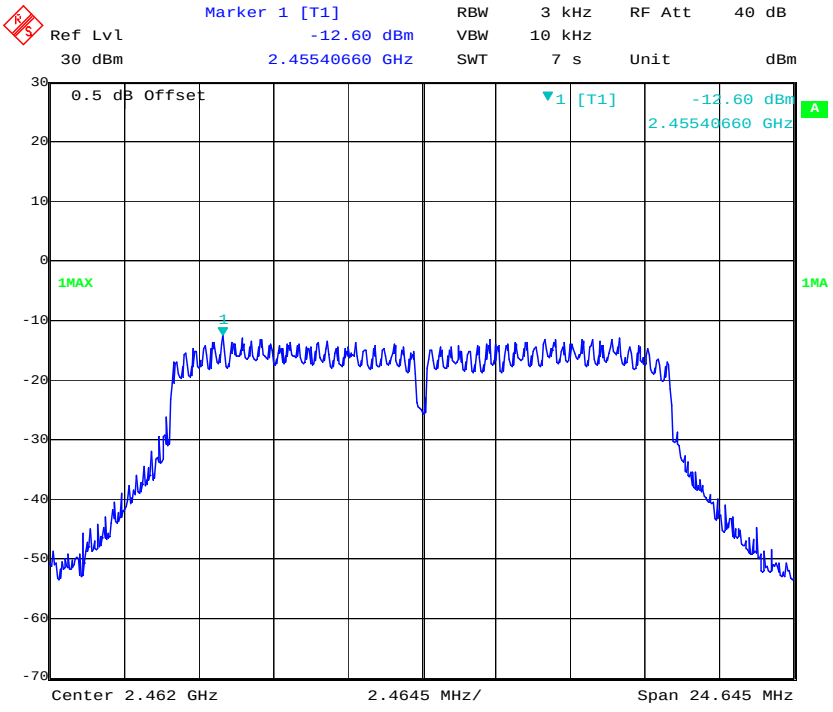
Date: 13.JAN.2017 17:44:46

Power Spectral Density, 802.11g Middle Channel



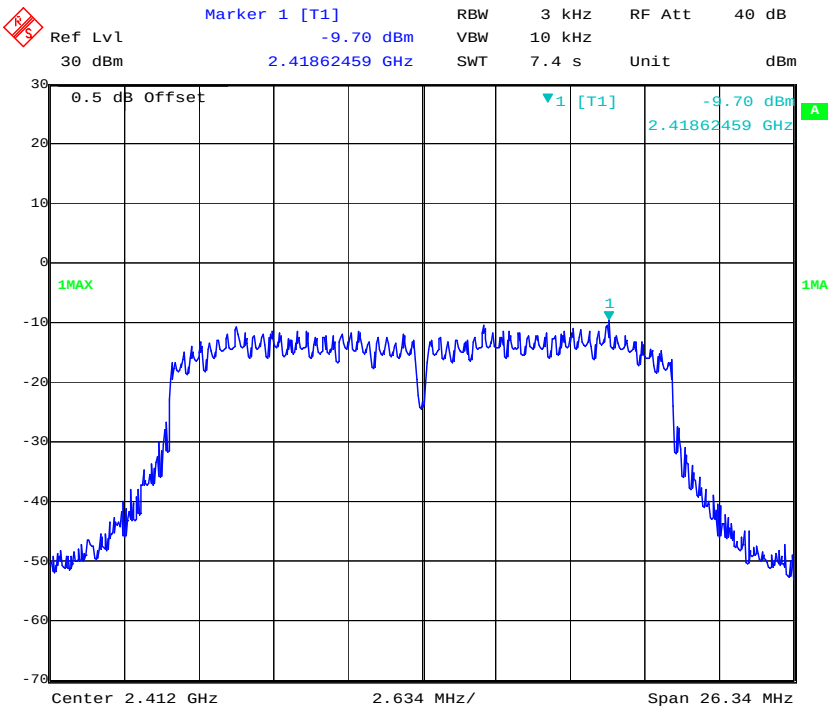
Date: 13.JAN.2017 17:41:30

Power Spectral Density, 802.11g High Channel



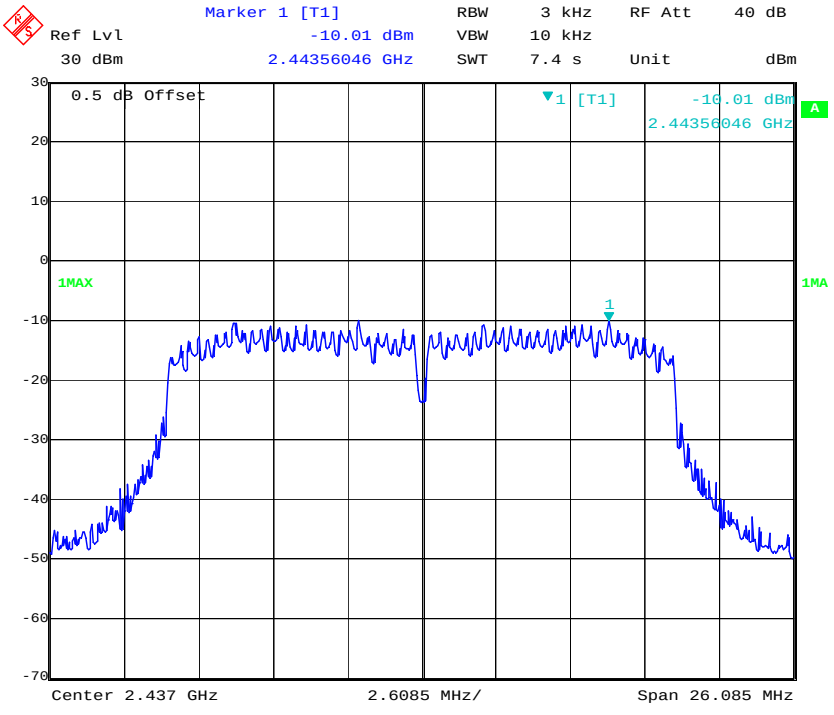
Date: 13.JAN.2017 17:32:05

Power Spectral Density, 802.11n ht20 Low Channel



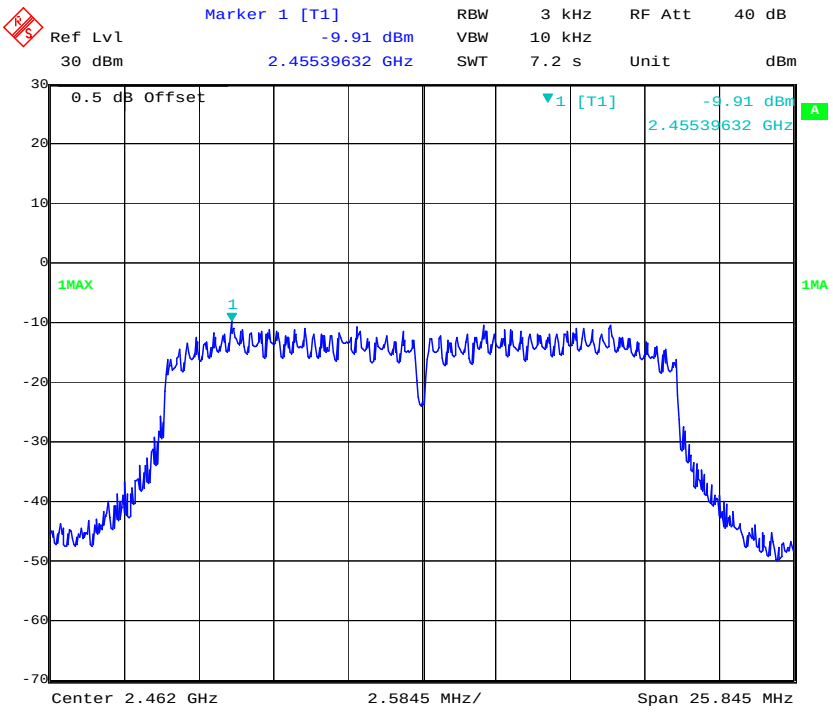
Date: 13.JAN.2017 17:50:00

Power Spectral Density, 802.11n ht20 Middle Channel



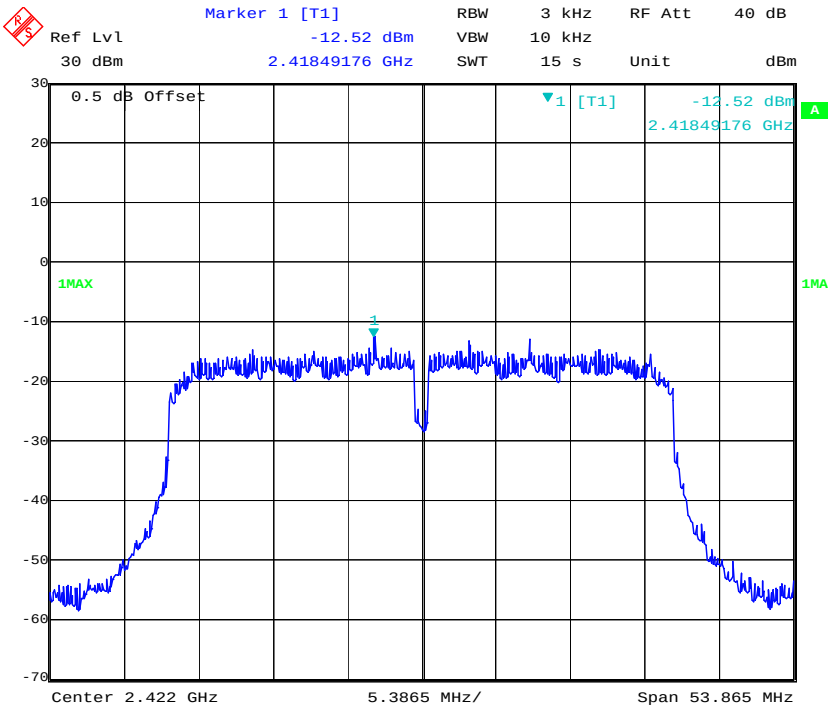
Date: 13.JAN.2017 17:54:00

Power Spectral Density, 802.11n ht20 High Channel



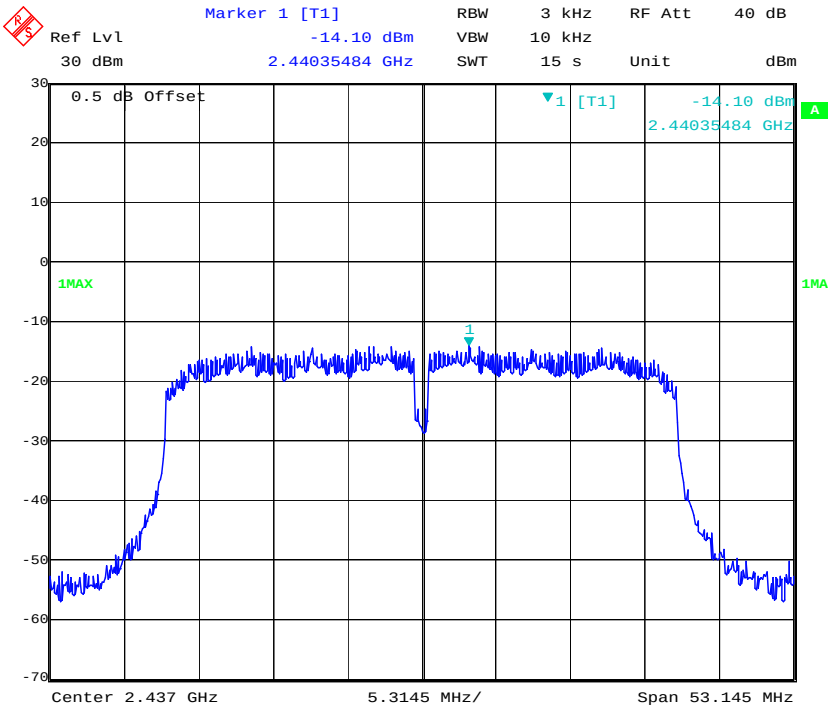
Date: 13.JAN.2017 17:59:11

Power Spectral Density, 802.11n ht40 Low Channel



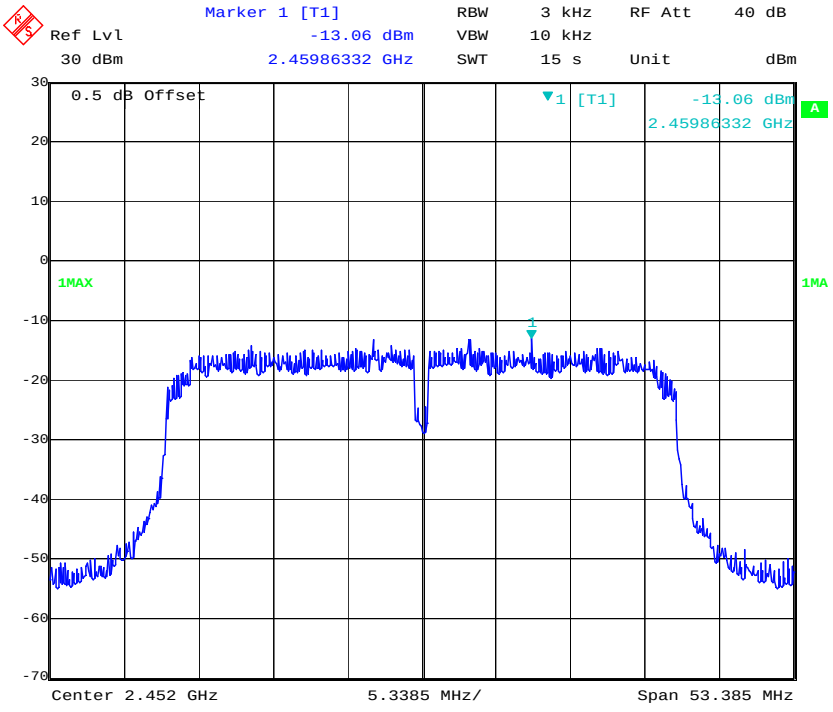
Date: 13.JAN.2017 18:03:06

Power Spectral Density, 802.11n ht40 Middle Channel



Date: 13.JAN.2017 18:06:16

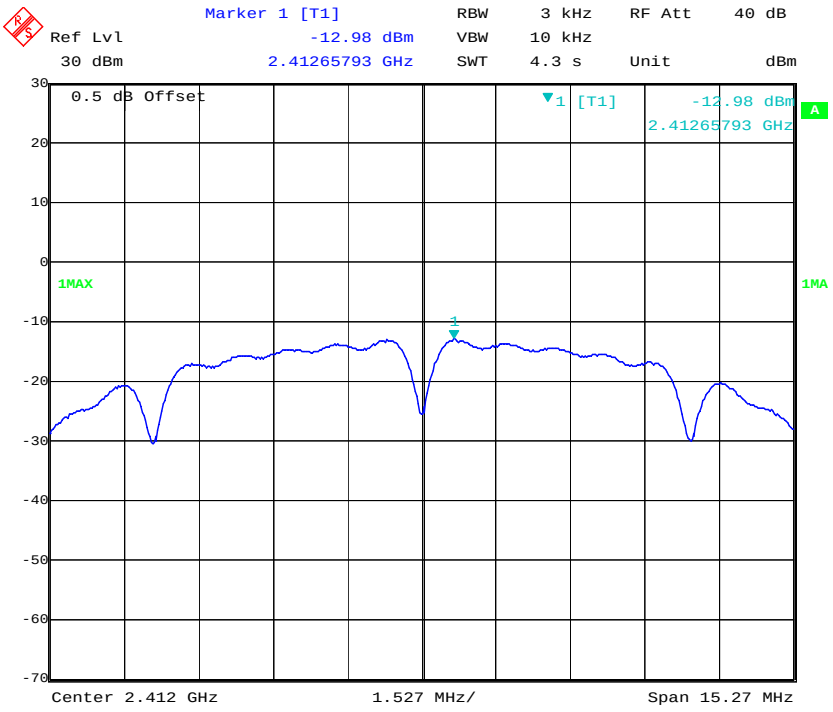
Power Spectral Density, 802.11n ht40 High Channel



Date: 13.JAN.2017 18:09:00

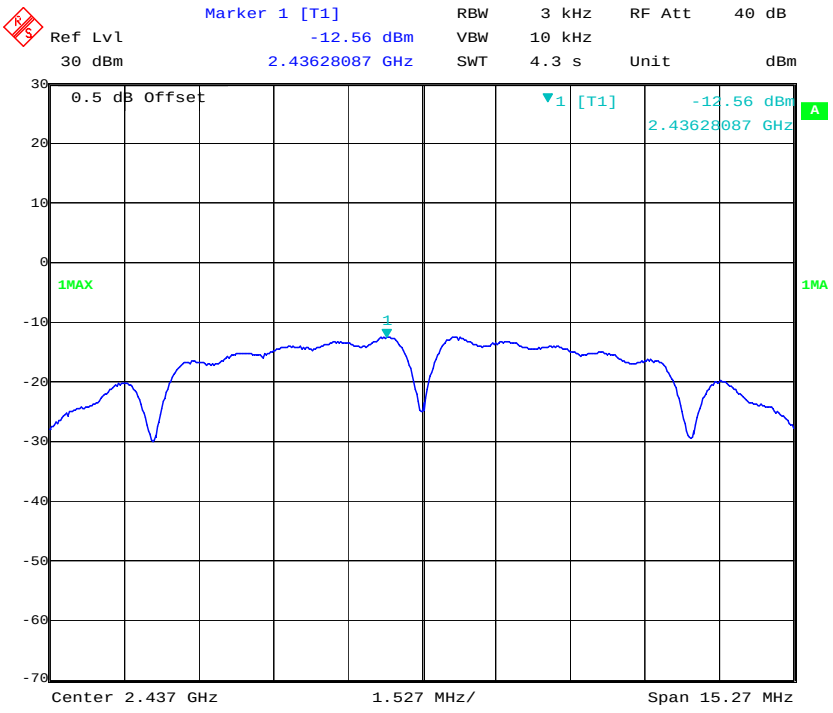
Chain 2

Power Spectral Density, 802.11b Low Channel



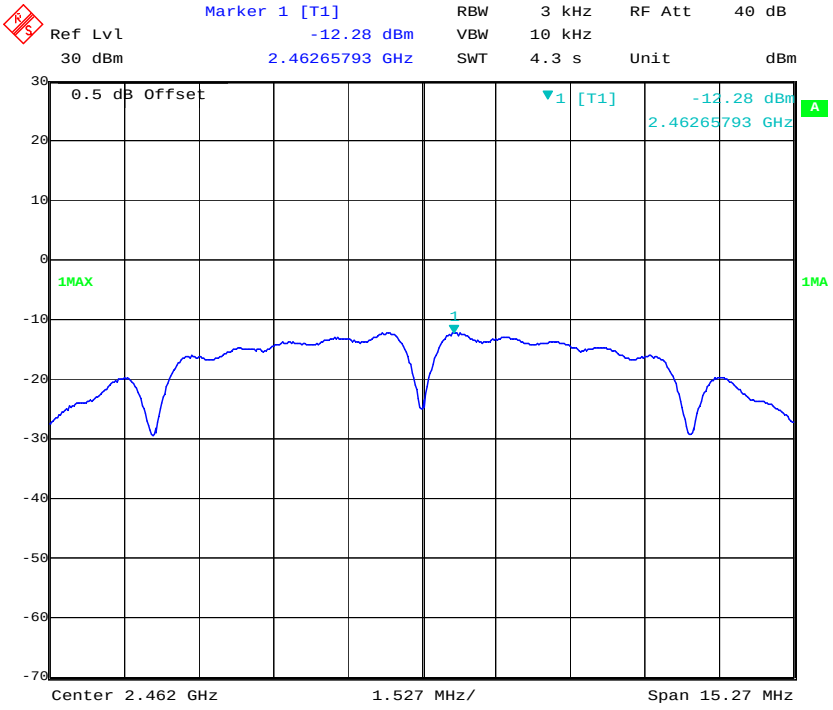
Date: 13.JAN.2017 21:24:19

Power Spectral Density, 802.11b Middle Channel



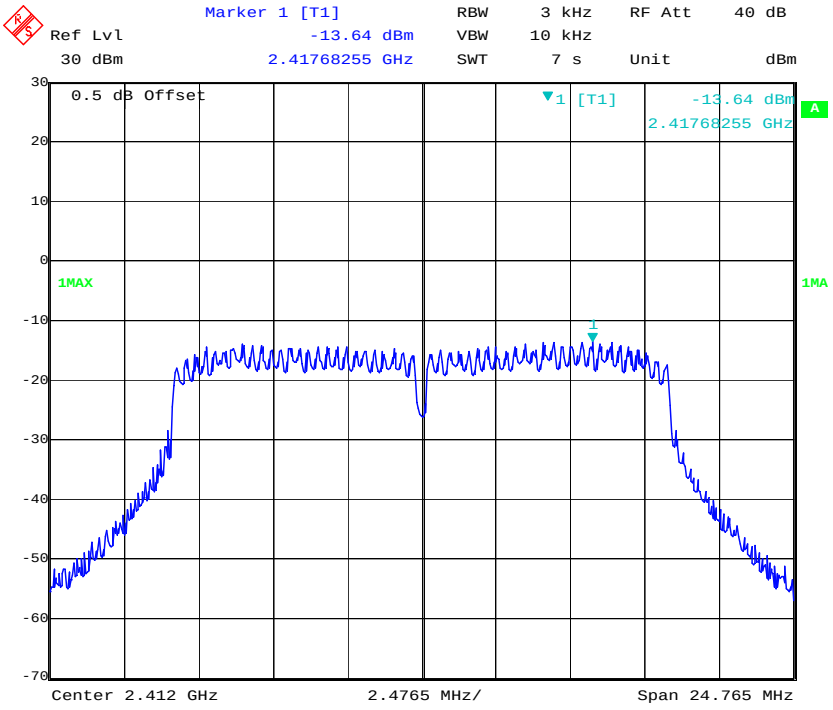
Date: 13.JAN.2017 21:21:41

Power Spectral Density, 802.11b High Channel



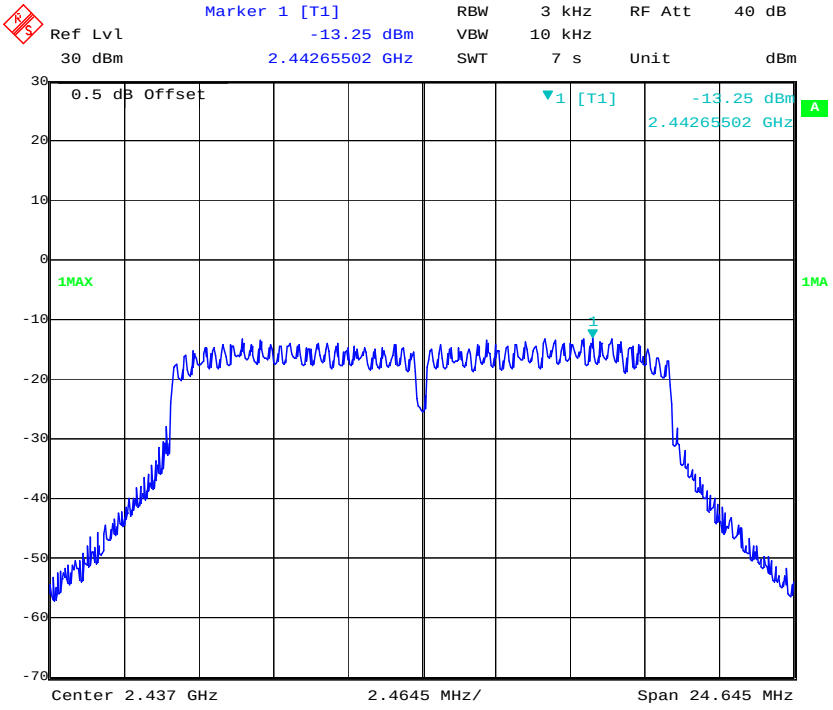
Date: 13.JAN.2017 21:18:17

Power Spectral Density, 802.11g Low Channel



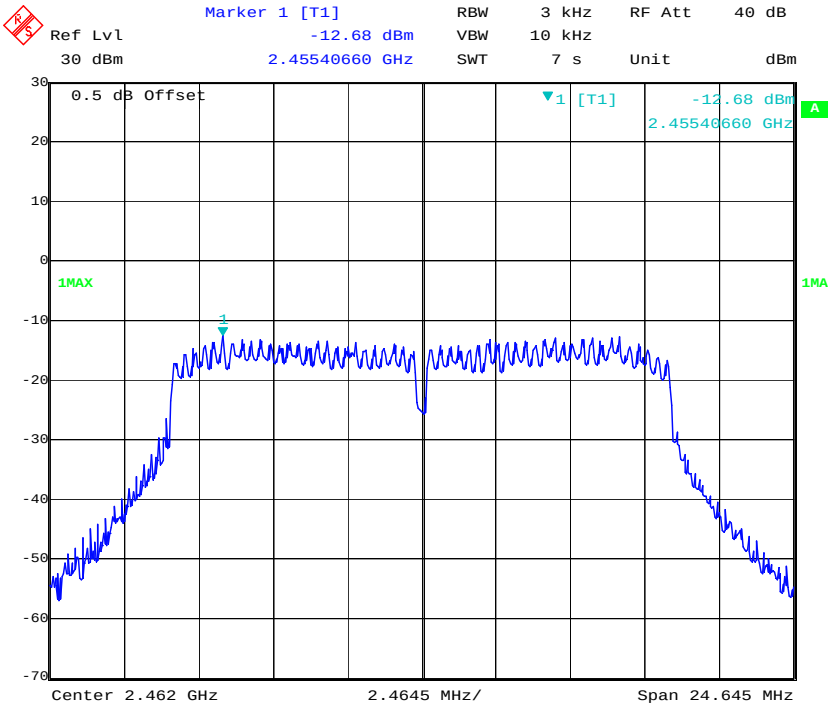
Date: 13.JAN.2017 21:33:09

Power Spectral Density, 802.11g Middle Channel



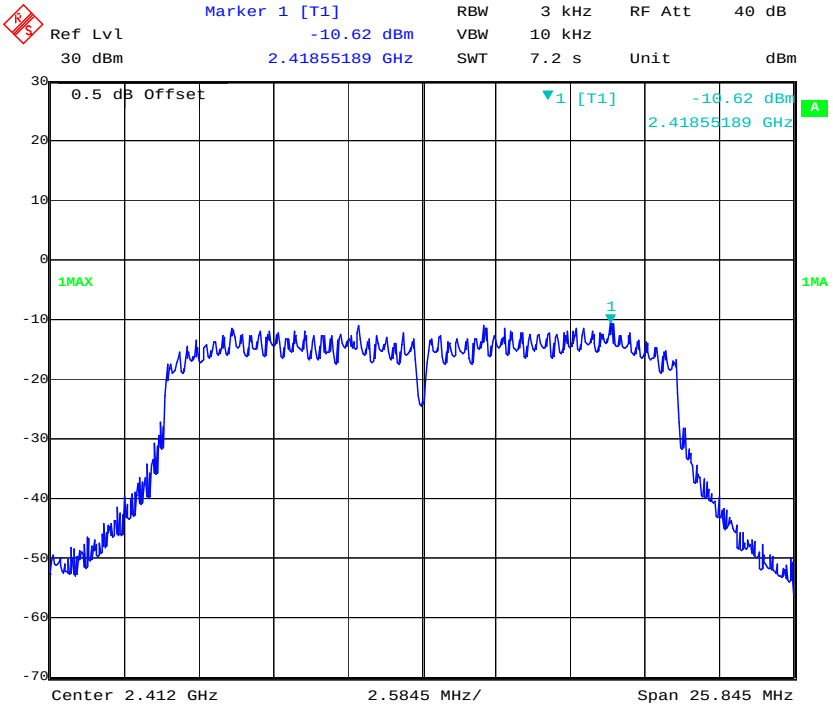
Date: 13.JAN.2017 21:36:28

Power Spectral Density, 802.11g High Channel



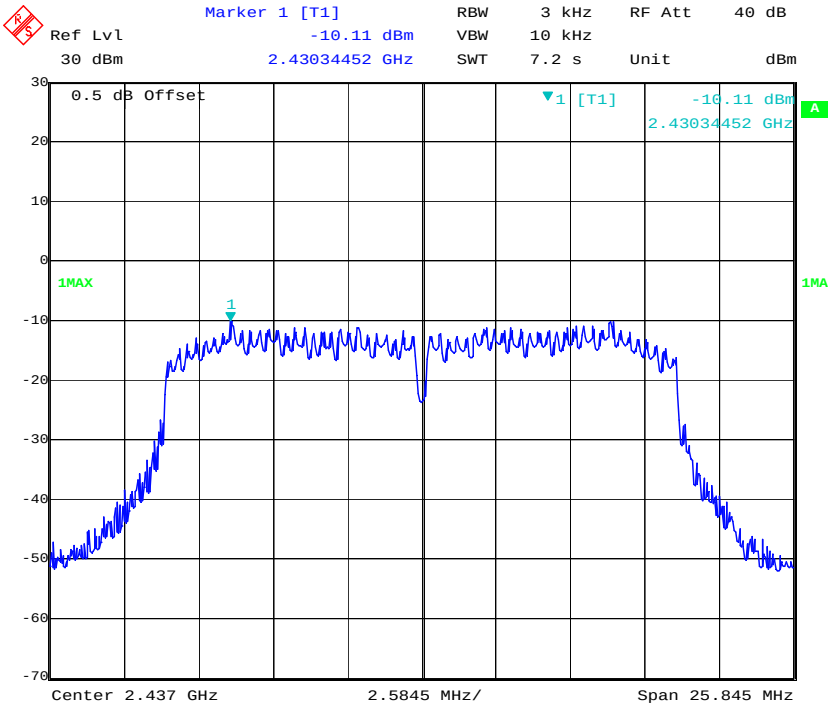
Date: 13.JAN.2017 21:39:10

Power Spectral Density, 802.11n ht20 Low Channel



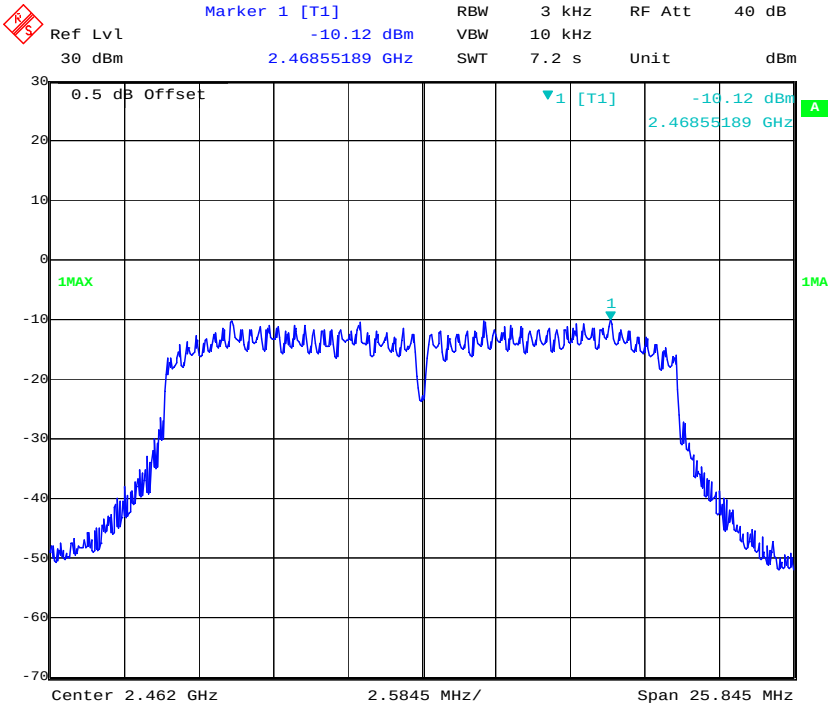
Date: 13.JAN.2017 20:45:14

Power Spectral Density, 802.11n ht20 Middle Channel



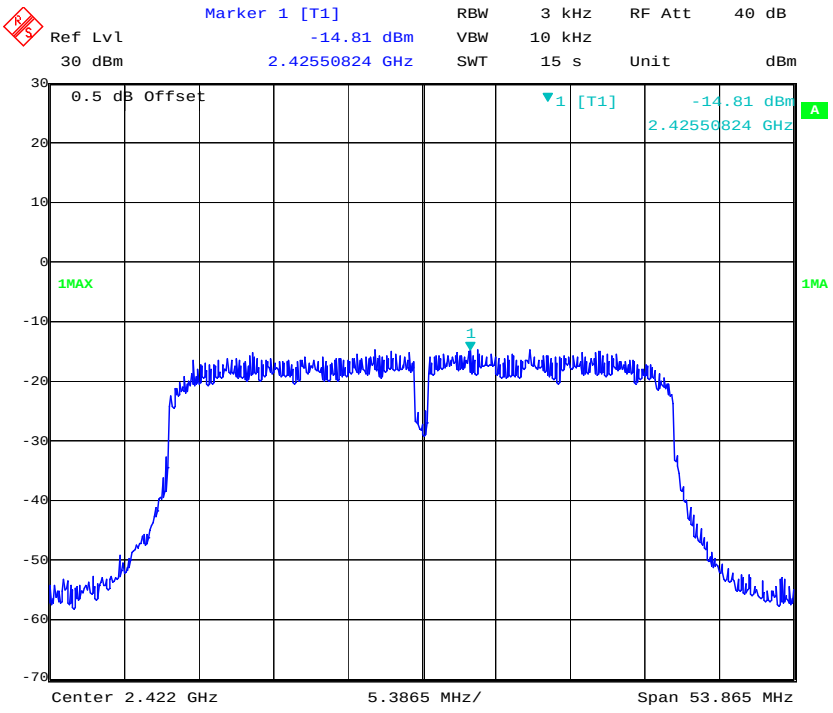
Date: 13.JAN.2017 20:53:59

Power Spectral Density, 802.11n ht20 High Channel



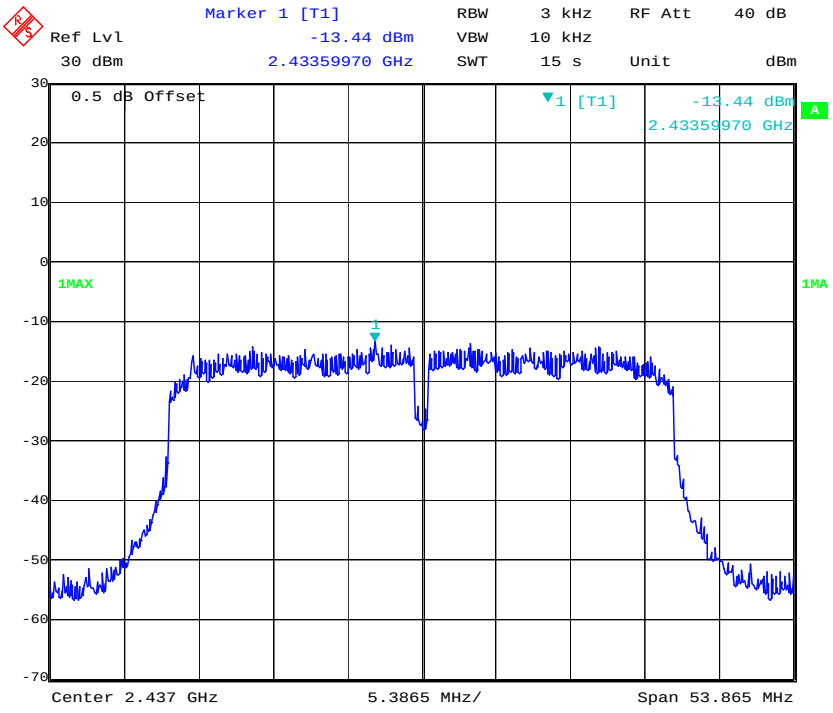
Date: 13.JAN.2017 20:57:04

Power Spectral Density, 802.11n ht40 Low Channel



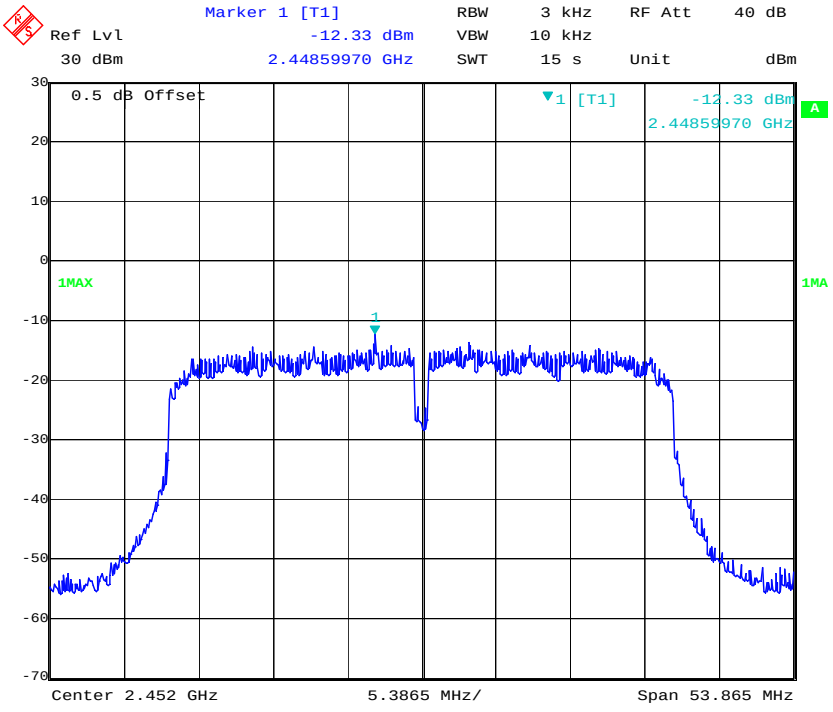
Date: 13.JAN.2017 21:42:41

Power Spectral Density, 802.11n ht40 Middle Channel



Date: 13.JAN.2017 21:45:26

Power Spectral Density, 802.11n ht40 High Channel



Date: 13.JAN.2017 20:38:11

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