FCC PART 15.247

TEST REPORT

For

Elanview Technology Co., Ltd

Room 605, Building F, No 7001, Zhongchun Road, Minhang District, Shanghai, P.R.China

FCC ID: 2AEKJ-MORE

Report Type:	Product Type:
Original Report	Elan Selfie

Test Engineer:	Chris Wang
Report Number:	RSHA170915003-00B
Report Date:	2017-10-10
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Elanview Technology Co., Ltd
Tested Model	More
Product Type	Elan Selfie
Dimension	97.5 mm(L)×70.4 mm(W)×13.6 mm(H)
Power Supply	DC7.4V by battery and DC 5.0V from USB port

**All measurement and test data in this report was gathered from production sample serial number: 20170915003. (Assigned by the BACL. The EUT supplied by the applicant was received on 2017-09-15)*

Objective

This report is prepared on behalf of Elanview Technology Co., Ltd in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

N/A

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 and FCC KDB558074 D01 DTS Meas Guidance v04.

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

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	4.88dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. 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.: 815570. 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

Test channel list is as below:

For 802.11b, 802.11g and 802.11n-HT20 mode, EUT was tested with Channel 1, 6 and 11;

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

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	/	/

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

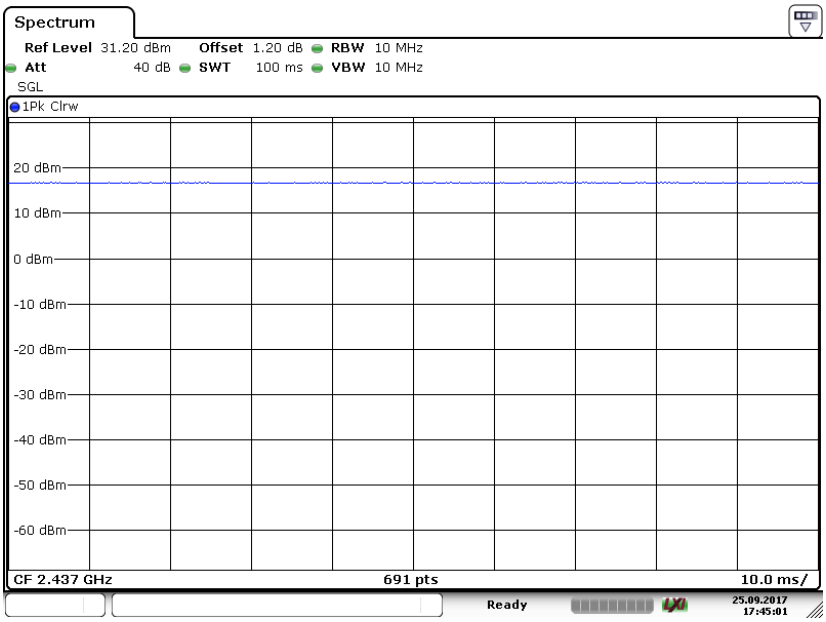
RF test tool: iwpriv wlan0 MTest

Pre-scan with all the data rates, and the worst case was performed as below:

Mode	Data rate	Power level
802.11b	1 Mbps	45
802.11g	6 Mbps	45
802.11n-HT20	MCS0	45
802.11n-HT40	MCS0	45

Duty Cycle:

802.11b Mode Middle Channel



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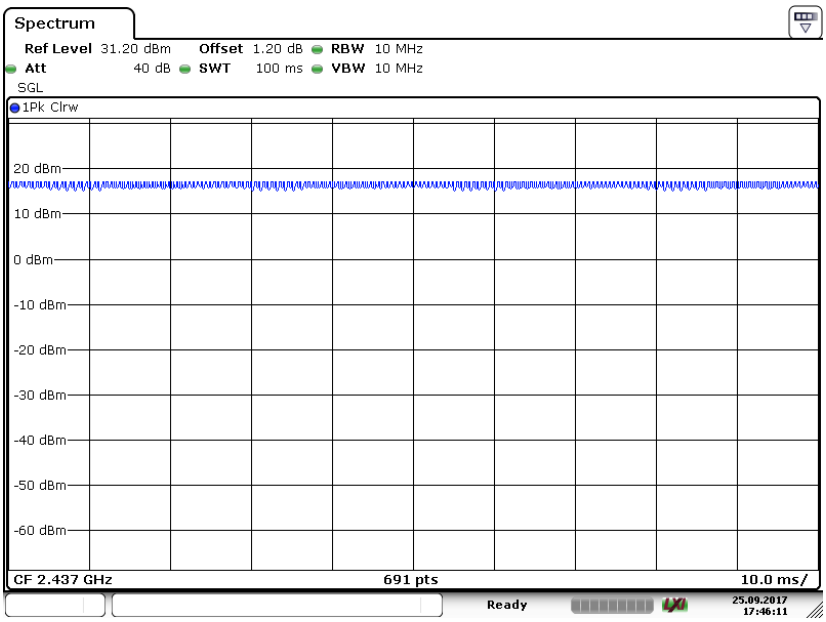
802.11g Mode Middle Channel



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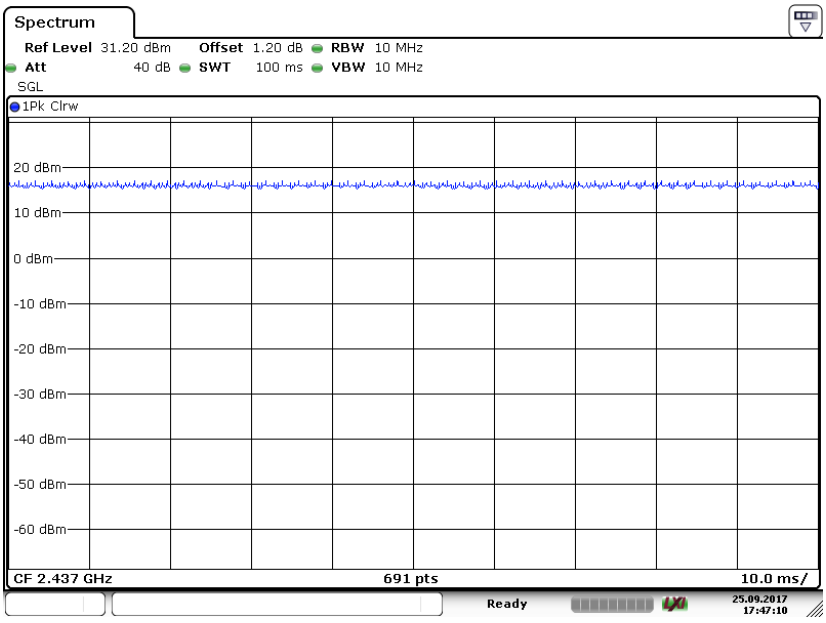
802.11n-HT20 Mode Middle Channel



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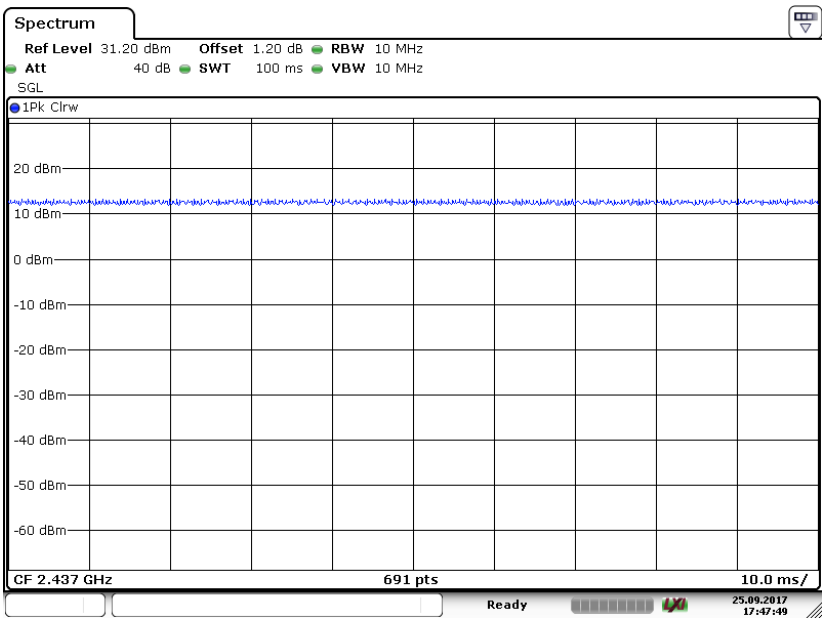
802.11n-HT40 Mode Middle Channel



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Mode	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	10log(1/x)
802.11b	100	/	/	10Hz	0
802.11g	100	/	/	10Hz	0
802.11n-HT20	100	/	/	10Hz	0
802.11n-HT40	100	/	/	10Hz	0

Support Equipment List and Details

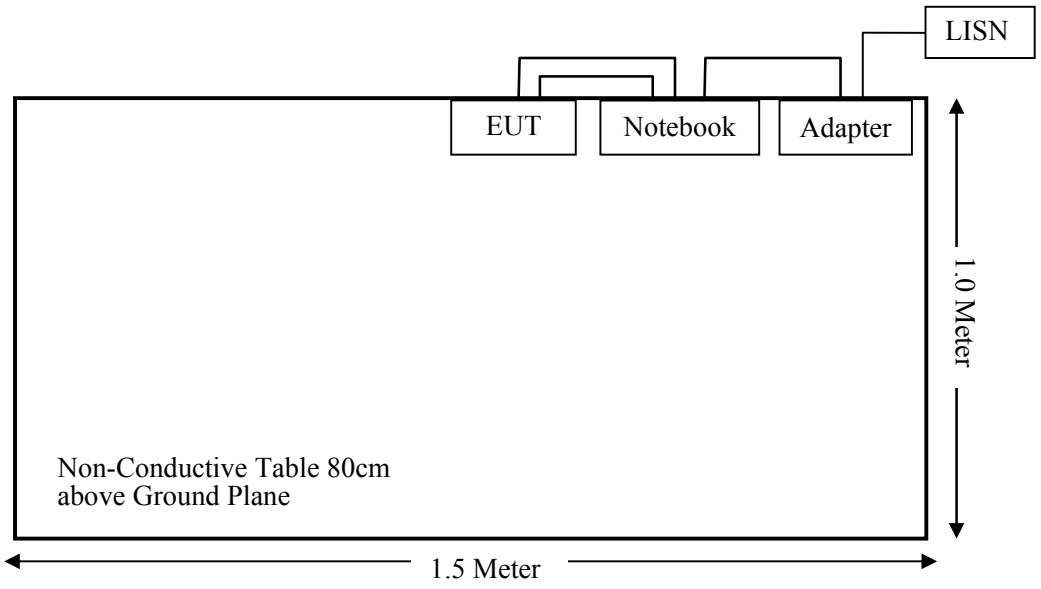
Manufacturer	Description	Model	Serial Number
DELL	Notebook	GX620	D65874152
DELL	Adapter	LA65NS0-00	DF263

External I/O Cable

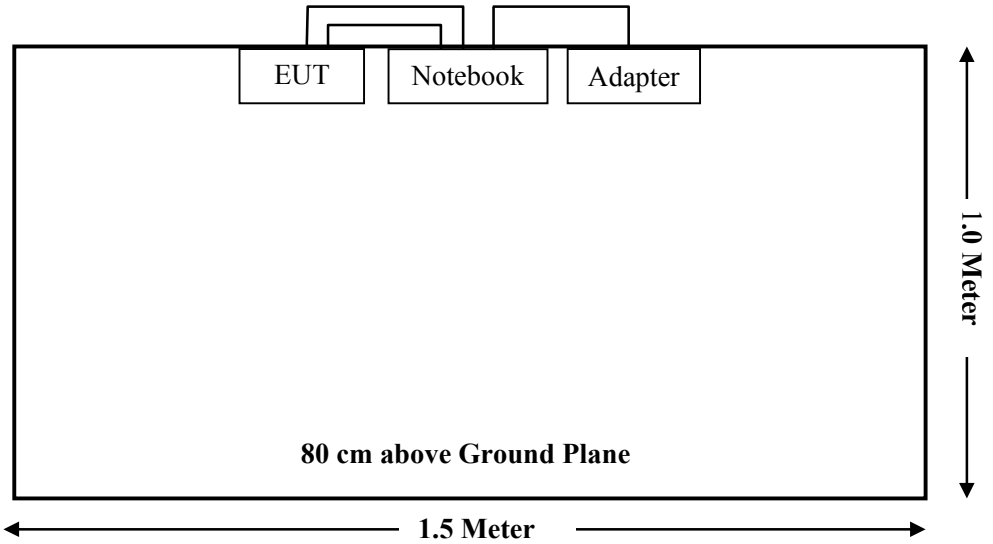
Cable Description	Shielding Type	Length (m)	From Port	To
USB Cable	Un-shielding	1.0	EUT	Notebook
Serial Port Cable	Un-shielding	0.3	EUT	Notebook

Block Diagram of Test Setup

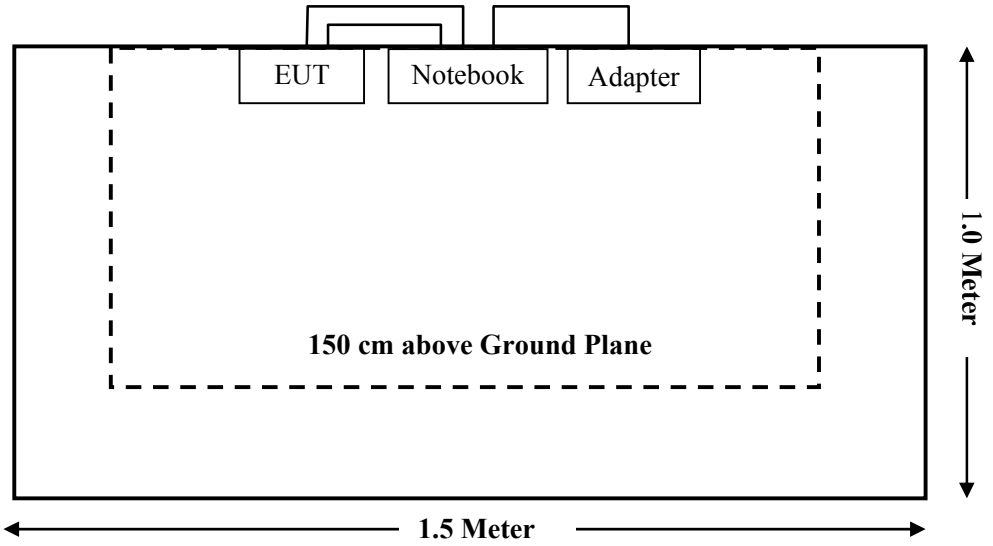
For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A040914-2	2016-01-09	2019-01-08
Sonoma Instrunent	Pre-amplifier	310N	171205	2017-08-15	2018-08-14
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-8	008	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2017-08-15	2018-08-14
Radiated Emission Test（Chamber 2#）					
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-10-18	2019-10-17
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Heatsink Required	Amplifier	QLW-18405536-J0	15964001009	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2017-08-15	2018-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2017-08-15	2018-08-14
RF Conducted Test					
Rohde & Schwarz	FSV40 Signal Analyzer	FSV40	101116	2017-07-22	2018-07-21
Agilent	Power Meter	N1912A	MY5000492	2016-11-18	2017-11-17
Agilent	Power Sensor	N1921A	MY54210024	2016-11-18	2017-11-17
Elanview	RF Cable	N/A	N/A	2017-09-25	2018-09-24
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-09
Rohde & Schwarz	LISN	ENV216	3560655016	2016-11-25	2017-11-24
BACL	BACL-EMC	V1.0	CE001	/	/
Narda	Attenuator/6dB	10690812-2	26850-6	2017-01-10	2018-01-09
MICRO-COAX	Coaxial Cable	Cable-15	015	2017-08-15	2018-08-14

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

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/f^2)	30
30-300	27.5	0.073	0.2	30
300-1500	/		f/1500	30
1500-100,000	/		1.0	30

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

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);

Calculated Data:

Mode	Frequency Range	Antenna Gain		Target Output Power		Evaluation Distance	Power Density	MPE Limit
	(MHz)	(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm^2)	(mW/cm^2)
802.11b	2412~2462	2.00	1.58	18.00	63.10	20	0.0199	1
802.11g		2.00	1.58	17.50	56.23	20	0.0177	1
802.11 n-HT20		2.00	1.58	17.50	56.23	20	0.0177	1
802.11 n-HT40	2422-2452	2.00	1.58	17.00	50.12	20	0.0158	1

Note: For the above target output power are all declared by the manufacturer.

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.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has a PCB inverted-F antenna arrangement for Wi-Fi, which the antenna gain is 2dBi; fulfill the requirement of this section. Please refer to the EUT photos.

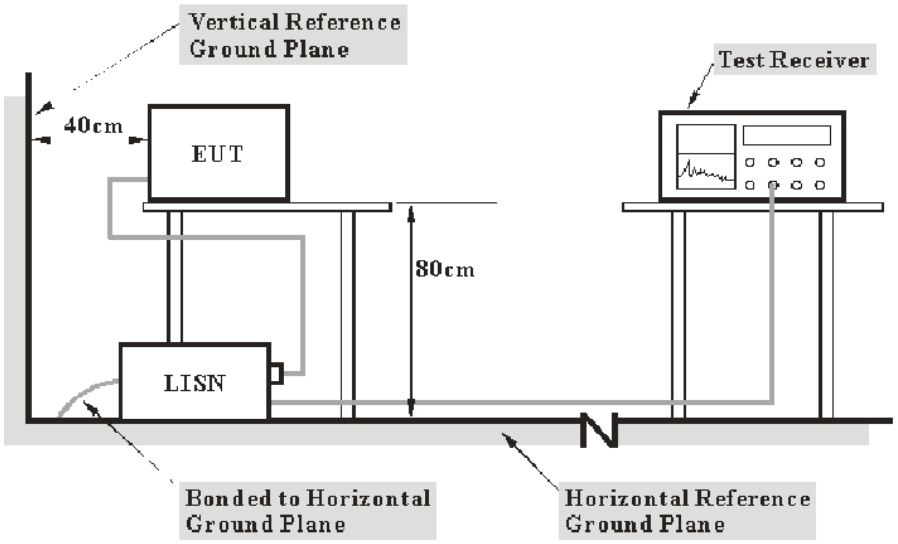
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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.

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 outlet of the 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 Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss

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

Margin = Limit – Reading

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:	24.5 ℃
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

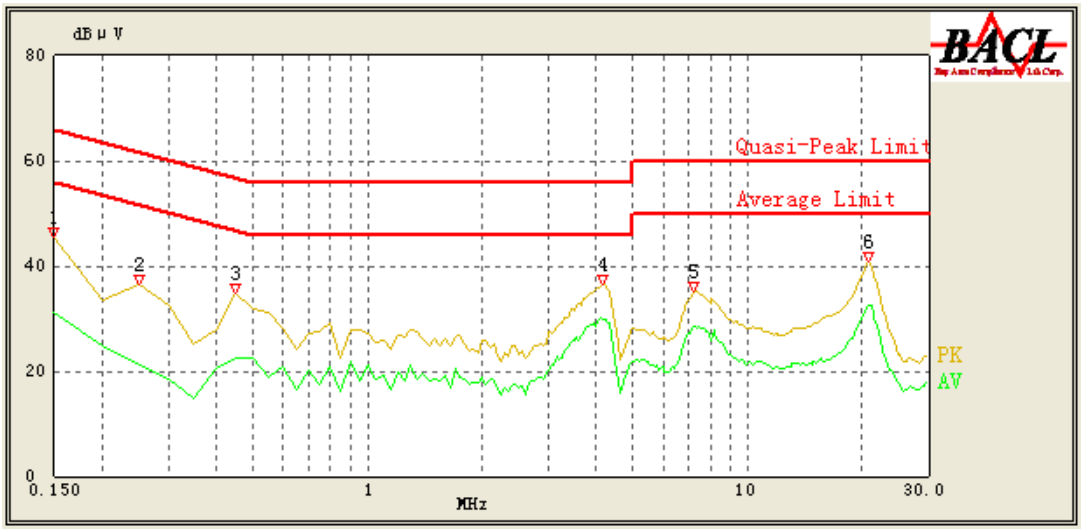
The testing was performed by Chris Wang on 2017-09-26.

EUT operation mode: Transmitting in 802.11b mode high channel. (worst case)

AC 120V/60 Hz, Line

Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.150	45.46	QP	9.000	L1	16.06	66.00	20.54	Compliance
0.150	33.17	AV	9.000	L1	16.06	56.00	22.83	Compliance
0.250	37.29	QP	9.000	L1	16.02	63.14	25.85	Compliance
0.250	22.72	AV	9.000	L1	16.02	53.14	30.42	Compliance
0.450	35.57	QP	9.000	L1	16.07	57.43	21.86	Compliance
0.450	17.02	AV	9.000	L1	16.07	47.43	30.41	Compliance
4.300	35.91	QP	9.000	L1	15.85	56.00	20.09	Compliance
4.300	29.51	AV	9.000	L1	15.85	46.00	16.49	Compliance
6.300	34.93	QP	9.000	L1	15.93	60.00	25.07	Compliance
6.350	19.71	AV	9.000	L1	15.94	50.00	30.29	Compliance
20.850	38.85	QP	9.000	L1	16.44	60.00	21.15	Compliance
20.750	32.04	AV	9.000	L1	16.44	50.00	17.96	Compliance

AC 120V/60 Hz, Neutral



Frequency (MHz)	Reading (dBµV)	Detector (PK/AV/QP)	Bandwidth (kHz)	Line	Corr. (dB)	Limit (dBµV)	Margin (dB)	Comment
0.150	45.59	QP	9.000	N	16.06	66.00	20.41	Compliance
0.150	31.26	AV	9.000	N	16.06	56.00	24.74	Compliance
0.250	36.41	QP	9.000	N	16.06	63.14	26.73	Compliance
0.250	21.31	AV	9.000	N	16.06	53.14	31.83	Compliance
0.450	35.00	QP	9.000	N	16.10	57.43	22.43	Compliance
0.450	22.58	AV	9.000	N	16.10	47.43	24.85	Compliance
4.150	36.57	QP	9.000	N	15.88	56.00	19.43	Compliance
4.150	29.98	AV	9.000	N	15.88	46.00	16.02	Compliance
7.250	35.04	QP	9.000	N	15.93	60.00	24.96	Compliance
7.250	28.42	AV	9.000	N	15.93	50.00	21.58	Compliance
20.850	40.69	QP	9.000	N	16.17	60.00	19.31	Compliance
20.750	32.65	AV	9.000	N	16.17	50.00	17.35	Compliance

Note:
1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
2) Margin = Limit – Reading

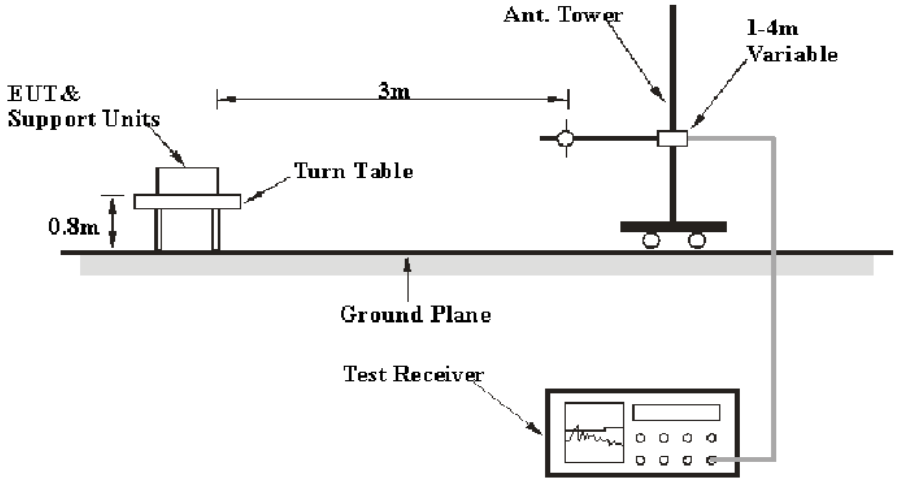
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

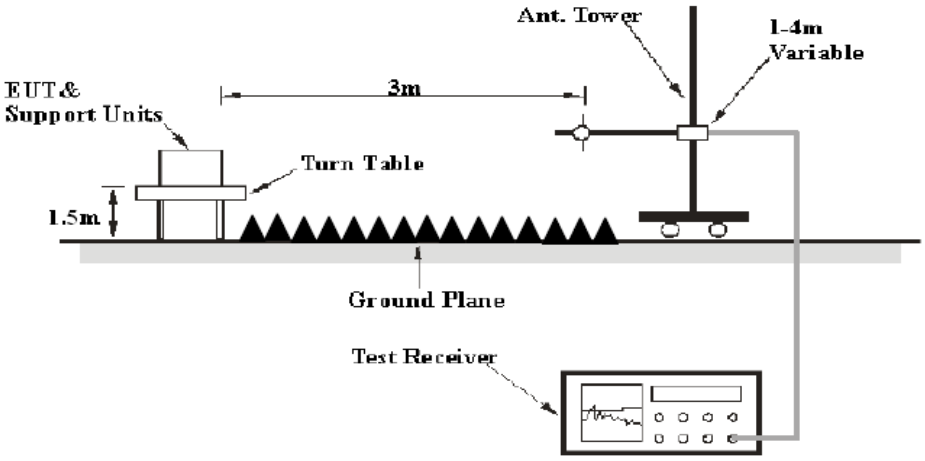
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



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.

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

Frequency Range	RBW	Video B/W	Duty cycle	Detector
1GHz – 25GHz	1MHz	3 MHz	Any	PK
	1MHz	10 Hz	>98%	Ave.
	1MHz	1/T	<98%	

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 = Meter Reading + Antenna Factor + 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 Results Summary

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

Test Data

Environmental Conditions

Temperature:	24.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Chris Wang on 2017-09-25 to 2017-10-08.

EUT operation mode: Transmitting (Scan with X-Axis, Y-Axis and Z-Axis position, the worst case X-Axis was recorded)

30MHz-25GHz

802.11b Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
118.27	47.43	QP	328	186	V	-11.94	35.49	43.50	8.01
2412.00	110.69	PK	142	169	V	-4.90	105.79	/	/
2412.00	106.73	Ave	142	169	V	-4.90	101.83	/	/
2412.00	110.18	PK	155	239	H	-4.90	105.28	/	/
2412.00	106.22	Ave	155	239	H	-4.90	101.32	/	/
2390.00	44.54	PK	261	128	V	-4.96	39.58	74.00	34.42
2390.00	34.10	Ave	261	128	V	-4.96	29.14	54.00	24.86
1594.07	48.34	PK	201	248	V	-7.67	40.67	74.00	33.33
1594.07	35.18	Ave	201	248	V	-7.67	27.51	54.00	26.49
3072.00	45.93	PK	285	213	V	-1.88	44.05	74.00	29.95
3072.00	41.40	Ave	285	213	V	-1.88	39.52	54.00	14.48
4824.00	44.47	PK	327	105	V	2.52	46.99	74.00	27.01
4824.00	37.11	Ave	327	105	V	2.52	39.63	54.00	14.37
7236.00	36.23	PK	18	212	V	9.83	46.06	74.00	27.94
7236.00	25.79	Ave	18	212	V	9.83	35.62	54.00	18.38

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Middle Channel (2437 MHz)									
118.27	47.44	QP	292	193	V	-11.94	35.50	43.50	8.00
2437.00	111.25	PK	151	197	V	-4.83	106.42	/	/
2437.00	107.29	Ave	151	197	V	-4.83	102.46	/	/
2437.00	110.80	PK	303	168	H	-4.83	105.97	/	/
2437.00	106.84	Ave	303	168	H	-4.83	102.01	/	/
1594.07	48.41	PK	18	212	V	-7.67	40.74	74.00	33.26
1594.07	35.26	Ave	18	212	V	-7.67	27.59	54.00	26.41
3072.00	45.91	PK	17	218	V	-1.88	44.03	74.00	29.97
3072.00	41.39	Ave	17	218	V	-1.88	39.51	54.00	14.49
4874.00	44.43	PK	168	208	V	2.63	47.06	74.00	26.94
4874.00	37.03	Ave	168	208	V	2.63	39.66	54.00	14.34
6565.23	39.21	PK	7	209	V	8.43	47.64	74.00	26.36
6565.23	27.06	Ave	7	209	V	8.43	35.49	54.00	18.51
7311.00	35.96	PK	197	233	V	9.95	45.91	74.00	28.09
7311.00	25.59	Ave	197	233	V	9.95	35.54	54.00	18.46
High Channel (2462 MHz)									
118.27	47.48	QP	176	247	V	-11.94	35.54	43.50	7.96
2462.00	111.53	PK	206	229	V	-4.76	106.77	/	/
2462.00	107.57	Ave	206	229	V	-4.76	102.81	/	/
2462.00	111.02	PK	213	223	H	-4.76	106.26	/	/
2462.00	107.06	Ave	213	223	H	-4.76	102.30	/	/
2483.50	50.37	PK	241	237	V	-4.71	45.66	74.00	28.34
2483.50	43.41	Ave	241	237	V	-4.71	38.70	54.00	15.30
3072.00	45.99	PK	328	203	V	-1.88	44.11	74.00	29.89
3072.00	41.46	Ave	328	203	V	-1.88	39.58	54.00	14.42
4924.00	44.34	PK	345	101	V	2.74	47.08	74.00	26.92
4924.00	36.91	Ave	345	101	V	2.74	39.65	54.00	14.35
6565.23	39.24	PK	205	238	V	8.43	47.67	74.00	26.33
6565.23	27.11	Ave	205	238	V	8.43	35.54	54.00	18.46
7386.00	35.72	PK	314	102	V	10.06	45.78	74.00	28.22
7386.00	25.31	Ave	314	102	V	10.06	35.37	54.00	18.63

802.11g Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
118.27	47.46	QP	5	189	V	-11.94	35.52	43.50	7.98
2412.00	103.37	PK	210	101	V	-4.90	98.47	/	/
2412.00	95.08	Ave	210	101	V	-4.90	90.18	/	/
2412.00	101.31	PK	141	100	H	-4.90	96.41	/	/
2412.00	93.02	Ave	141	100	H	-4.90	88.12	/	/
2390.00	58.12	PK	22	171	V	-4.96	53.16	74.00	20.84
2390.00	41.53	Ave	22	171	V	-4.96	36.57	54.00	17.43
1594.30	49.65	PK	325	186	V	-7.67	41.98	74.00	32.02
1594.30	34.62	Ave	325	186	V	-7.67	26.95	54.00	27.05
3072.00	44.73	PK	109	185	V	-1.88	42.85	74.00	31.15
3072.00	39.67	Ave	109	185	V	-1.88	37.79	54.00	16.21
4824.00	42.06	PK	50	248	V	2.52	44.58	74.00	29.42
4824.00	33.08	Ave	50	248	V	2.52	35.60	54.00	18.40
7236.00	34.79	PK	21	129	H	9.83	44.62	74.00	29.38
7236.00	24.51	Ave	21	129	H	9.83	34.34	54.00	19.66
Middle Channel (2437 MHz)									
118.27	47.52	QP	174	106	V	-11.94	35.58	43.50	7.92
2437.00	104.07	PK	270	172	V	-4.83	99.24	/	/
2437.00	95.78	Ave	270	172	V	-4.83	90.95	/	/
2437.00	102.11	PK	259	126	H	-4.83	97.28	/	/
2437.00	93.82	Ave	259	126	H	-4.83	88.99	/	/
1594.30	49.67	PK	78	169	V	-7.67	42.00	74.00	32.00
1594.30	34.67	Ave	78	169	V	-7.67	27.00	54.00	27.00
3072.00	44.76	PK	8	232	V	-1.88	42.88	74.00	31.12
3072.00	39.71	Ave	8	232	V	-1.88	37.83	54.00	16.17
4874.00	42.72	PK	73	142	V	2.63	45.35	74.00	28.65
4874.00	33.71	Ave	73	142	V	2.63	36.34	54.00	17.66
6804.87	36.85	PK	98	167	H	9.01	45.86	74.00	28.14
6804.87	26.38	Ave	98	167	H	9.01	35.39	54.00	18.61
7311.00	35.24	PK	57	199	H	9.95	45.19	74.00	28.81
7311.00	24.81	Ave	57	199	H	9.95	34.76	54.00	19.24

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2462 MHz)									
118.27	47.53	QP	313	167	V	-11.94	35.59	43.50	7.91
2462.00	103.39	PK	138	141	V	-4.76	98.63	/	/
2462.00	95.10	Ave	138	141	V	-4.76	90.34	/	/
2462.00	101.45	PK	5	175	H	-4.76	96.69	/	/
2462.00	93.16	Ave	5	175	H	-4.76	88.40	/	/
2483.50	58.89	PK	263	240	V	-4.71	54.18	74.00	19.82
2483.50	43.71	Ave	263	240	V	-4.71	39.00	54.00	15.00
3072.00	44.64	PK	57	193	V	-1.88	42.76	74.00	31.24
3072.00	39.61	Ave	57	193	V	-1.88	37.73	54.00	16.27
4924.00	42.29	PK	36	122	V	2.74	45.03	74.00	28.97
4924.00	33.31	Ave	36	122	V	2.74	36.05	54.00	17.95
6804.87	36.83	PK	227	188	H	9.01	45.84	74.00	28.16
6804.87	26.37	Ave	227	188	H	9.01	35.38	54.00	18.62
7386.00	34.86	PK	348	103	H	10.06	44.92	74.00	29.08
7386.00	24.52	Ave	348	103	H	10.06	34.58	54.00	19.42

802.11n-HT20 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2412 MHz)									
118.27	47.50	QP	357	134	V	-11.94	35.56	43.50	7.94
2412.00	103.36	PK	174	120	V	-4.90	98.46	/	/
2412.00	95.22	Ave	174	120	V	-4.90	90.32	/	/
2412.00	102.12	PK	44	238	H	-4.90	97.22	/	/
2412.00	93.98	Ave	44	238	H	-4.90	89.08	/	/
2390.00	58.00	PK	169	233	V	-4.96	53.04	74.00	20.96
2390.00	37.68	Ave	169	233	V	-4.96	32.72	54.00	21.28
1507.97	47.97	PK	313	137	V	-8.02	39.95	74.00	34.05
1507.97	36.77	Ave	313	137	V	-8.02	28.75	54.00	25.25
3960.30	39.56	PK	135	194	V	0.66	40.22	74.00	33.78
3960.30	28.48	Ave	135	194	V	0.66	29.14	54.00	24.86
4824.00	42.01	PK	341	151	V	2.52	44.53	74.00	29.47
4824.00	33.73	Ave	341	151	V	2.52	36.25	54.00	17.75
7236.00	36.32	PK	87	169	H	9.83	46.15	74.00	27.85
7236.00	24.49	Ave	87	169	H	9.83	34.32	54.00	19.68

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Middle Channel (2437 MHz)									
118.27	47.55	QP	69	227	V	-11.94	35.61	43.50	7.89
2437.00	103.73	PK	72	220	V	-4.83	98.90	/	/
2437.00	95.59	Ave	72	220	V	-4.83	90.76	/	/
2437.00	102.49	PK	325	207	H	-4.83	97.66	/	/
2437.00	94.35	Ave	325	207	H	-4.83	89.52	/	/
1507.97	47.99	PK	117	188	V	-8.02	39.97	74.00	34.03
1507.97	36.77	Ave	117	188	V	-8.02	28.75	54.00	25.25
3960.30	39.59	PK	111	145	V	0.66	40.25	74.00	33.75
3960.30	28.47	Ave	111	145	V	0.66	29.13	54.00	24.87
4874.00	42.37	PK	304	140	V	2.63	45.00	74.00	29.00
4874.00	34.11	Ave	304	140	V	2.63	36.74	54.00	17.26
6493.60	39.61	PK	56	181	H	8.24	47.85	74.00	26.15
6493.60	27.54	Ave	56	181	H	8.24	35.78	54.00	18.22
7311.00	36.49	PK	57	194	H	9.95	46.44	74.00	27.56
7311.00	24.66	Ave	57	194	H	9.95	34.61	54.00	19.39
High Channel (2462 MHz)									
118.27	47.53	QP	237	233	V	-11.94	35.59	43.50	7.91
2462.00	103.49	PK	63	147	V	-4.76	98.73	/	/
2462.00	95.35	Ave	63	147	V	-4.76	90.59	/	/
2462.00	102.28	PK	24	108	H	-4.76	97.52	/	/
2462.00	94.14	Ave	24	108	H	-4.76	89.38	/	/
2483.50	60.65	PK	44	248	V	-4.71	55.94	74.00	18.06
2483.50	43.30	Ave	44	248	V	-4.71	38.59	54.00	15.41
3960.30	39.58	PK	116	170	V	0.66	40.24	74.00	33.76
3960.30	28.46	Ave	116	170	V	0.66	29.12	54.00	24.88
4924.00	42.09	PK	323	195	V	2.74	44.83	74.00	29.17
4924.00	33.84	Ave	323	195	V	2.74	36.58	54.00	17.42
6493.60	39.58	PK	3	135	H	8.24	47.82	74.00	26.18
6493.60	27.46	Ave	3	135	H	8.24	35.70	54.00	18.30
7386.00	36.22	PK	352	191	H	10.06	46.28	74.00	27.72
7386.00	24.38	Ave	352	191	H	10.06	34.44	54.00	19.56

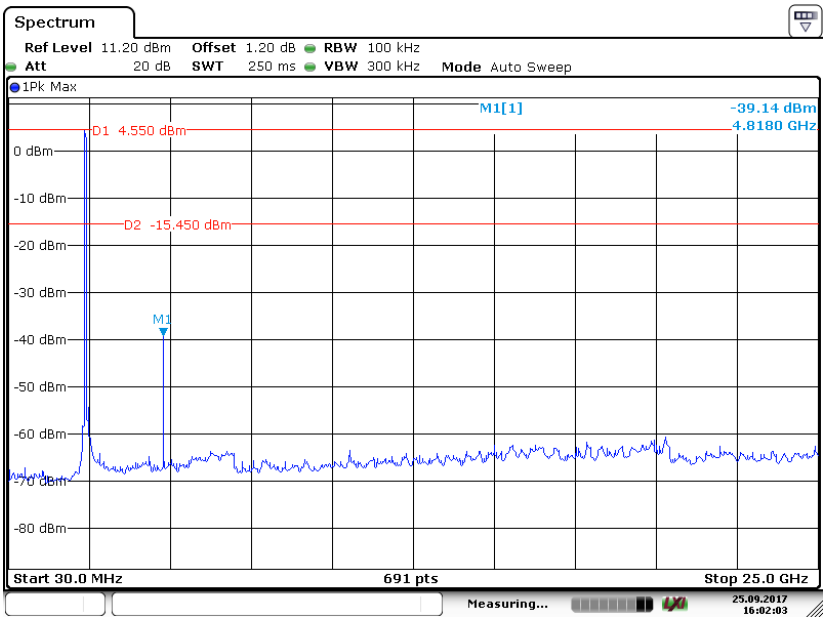
802.11n-HT40 Mode:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2422 MHz)									
118.27	47.41	QP	125	140	V	-11.94	35.47	43.50	8.03
2422.00	99.75	PK	346	165	V	-4.88	94.87	/	/
2422.00	90.99	Ave	346	165	V	-4.88	86.11	/	/
2422.00	96.42	PK	287	211	H	-4.88	91.54	/	/
2422.00	87.66	Ave	287	211	H	-4.88	82.78	/	/
2390.00	61.47	PK	184	166	V	-4.96	56.51	74.00	17.49
2390.00	40.38	Ave	184	166	V	-4.96	35.42	54.00	18.58
1594.07	49.50	PK	257	212	V	-7.67	41.83	74.00	32.17
1594.07	34.40	Ave	257	212	V	-7.67	26.73	54.00	27.27
3072.00	44.69	PK	345	244	V	-1.88	42.81	74.00	31.19
3072.00	39.63	Ave	345	244	V	-1.88	37.75	54.00	16.25
4844.00	39.38	PK	109	125	H	2.56	41.94	74.00	32.06
4844.00	30.00	Ave	109	125	H	2.56	32.56	54.00	21.44
7266.00	30.31	PK	327	131	H	9.88	40.19	74.00	33.81
7266.00	21.47	Ave	327	131	H	9.88	31.35	54.00	22.65
Middle Channel (2437 MHz)									
118.27	47.45	QP	11	121	V	-11.94	35.51	43.50	7.99
2437.00	99.84	PK	349	186	V	-4.83	95.01	/	/
2437.00	91.08	Ave	349	186	V	-4.83	86.25	/	/
2437.00	96.54	PK	292	212	H	-4.83	91.71	/	/
2437.00	87.78	Ave	292	212	H	-4.83	82.95	/	/
1594.07	49.58	PK	120	147	V	-7.67	41.91	74.00	32.09
1594.07	34.46	Ave	120	147	V	-7.67	26.79	54.00	27.21
3072.00	44.71	PK	83	227	V	-1.88	42.83	74.00	31.17
3072.00	39.65	Ave	83	227	V	-1.88	37.77	54.00	16.23
4874.00	39.48	PK	317	142	H	2.63	42.11	74.00	31.89
4874.00	30.08	Ave	317	142	H	2.63	32.71	54.00	21.29
6493.60	39.64	PK	16	250	H	8.24	47.88	74.00	26.12
6493.60	27.51	Ave	16	250	H	8.24	35.75	54.00	18.25
7311.00	30.40	PK	15	164	H	9.95	40.35	74.00	33.65
7311.00	21.56	Ave	15	164	H	9.95	31.51	54.00	22.49

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.247/205/209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (cm)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2452 MHz)									
118.27	47.49	QP	208	102	V	-11.94	35.55	43.50	7.95
2452.00	100.51	PK	88	229	V	-4.79	95.72	/	/
2452.00	91.75	Ave	88	229	V	-4.79	86.96	/	/
2452.00	97.24	PK	32	220	H	-4.79	92.45	/	/
2452.00	88.48	Ave	32	220	H	-4.79	83.69	/	/
2483.50	62.59	PK	306	108	V	-4.71	57.88	74.00	16.12
2483.50	43.08	Ave	306	108	V	-4.71	38.37	54.00	15.63
3072.00	44.70	PK	94	112	V	-1.88	42.82	74.00	31.18
3072.00	39.60	Ave	94	112	V	-1.88	37.72	54.00	16.28
4904.00	39.66	PK	97	174	H	2.70	42.36	74.00	31.64
4904.00	30.25	Ave	97	174	H	2.70	32.95	54.00	21.05
6493.60	39.70	PK	131	130	H	8.24	47.94	74.00	26.06
6493.60	27.54	Ave	131	130	H	8.24	35.78	54.00	18.22
7356.00	30.64	PK	311	234	H	10.01	40.65	74.00	33.35
7356.00	21.81	Ave	311	234	H	10.01	31.82	54.00	22.18

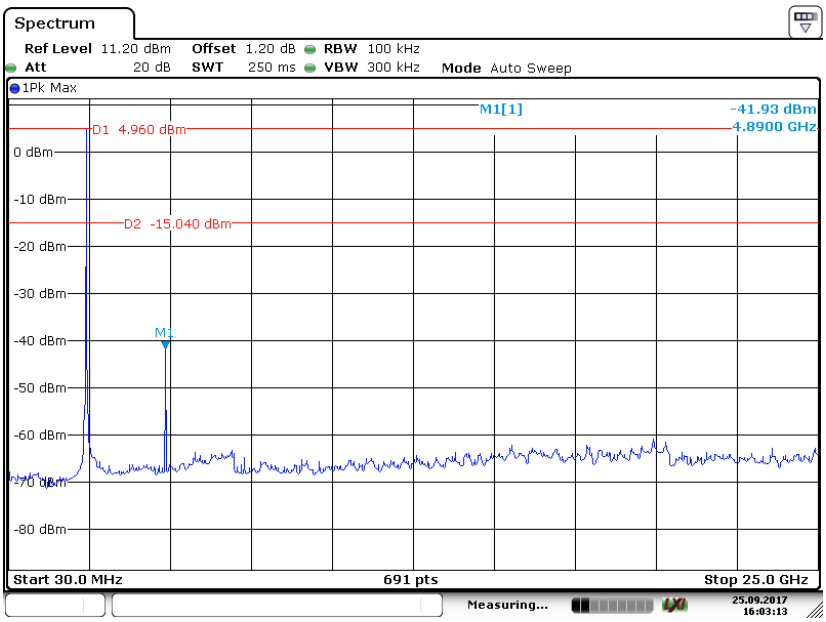
Conducted Spurious Emissions at Antenna Port

802.11b Low Channel



Date: 25.SEP.2017 16:02:03

802.11b Middle Channel



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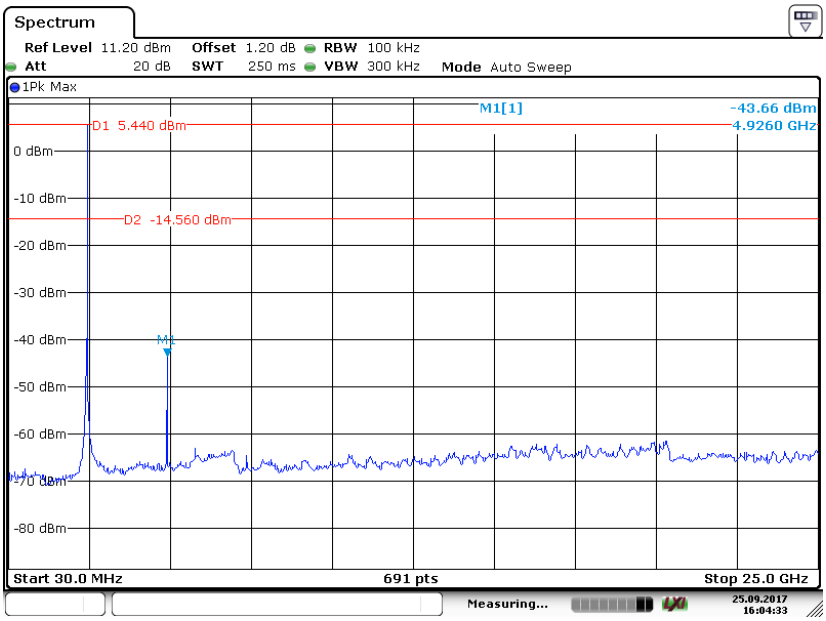
802.11b High Channel



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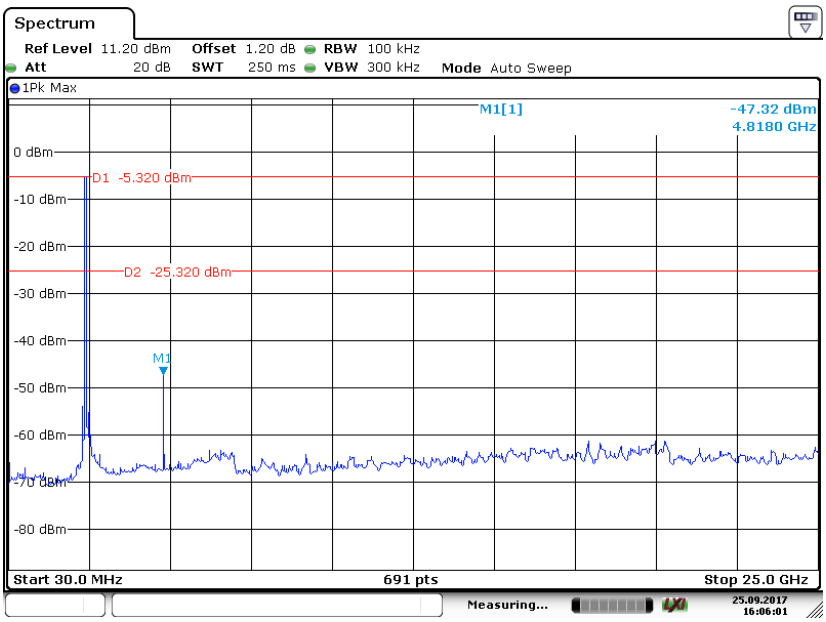
802.11g Low Channel



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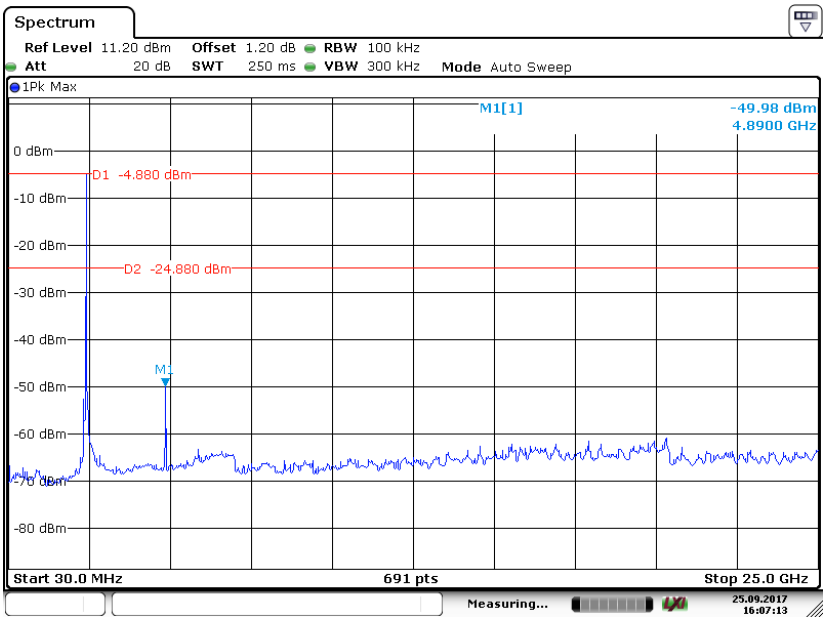
802.11g Middle Channel



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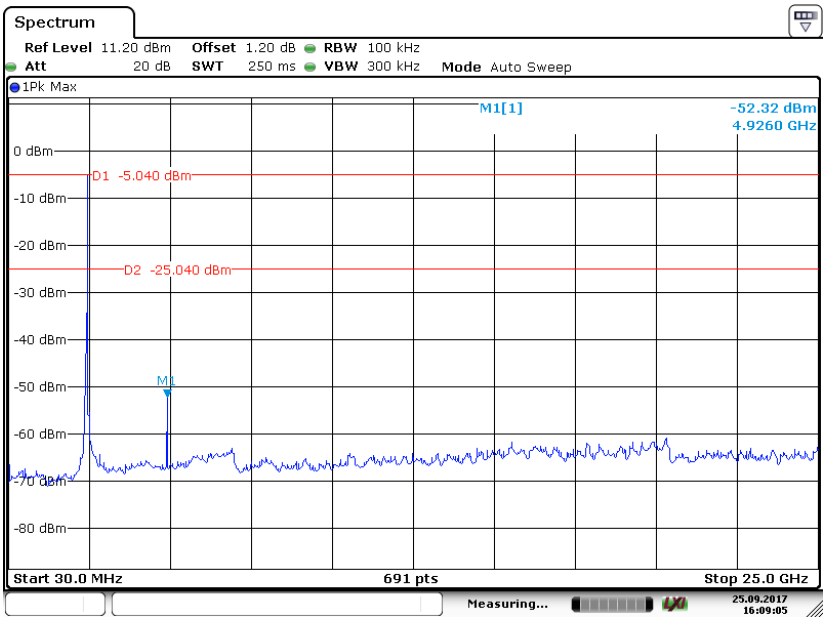
802.11g High Channel



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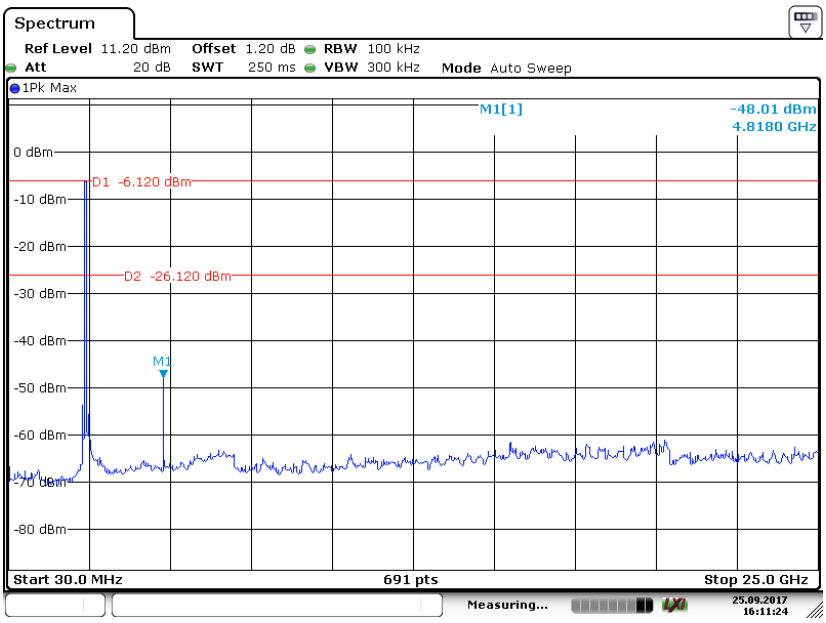
802.11n-HT20 Low Channel



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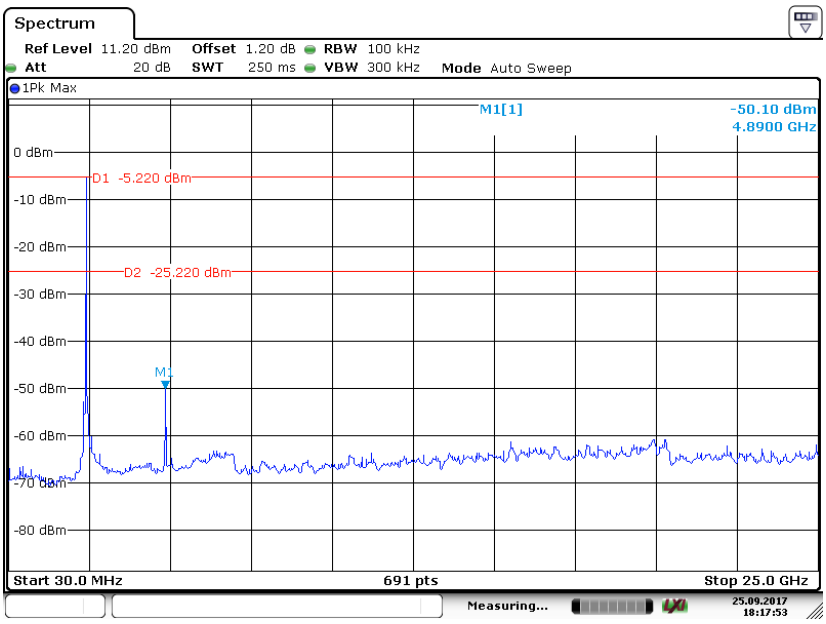
802.11n-HT20 Middle Channel



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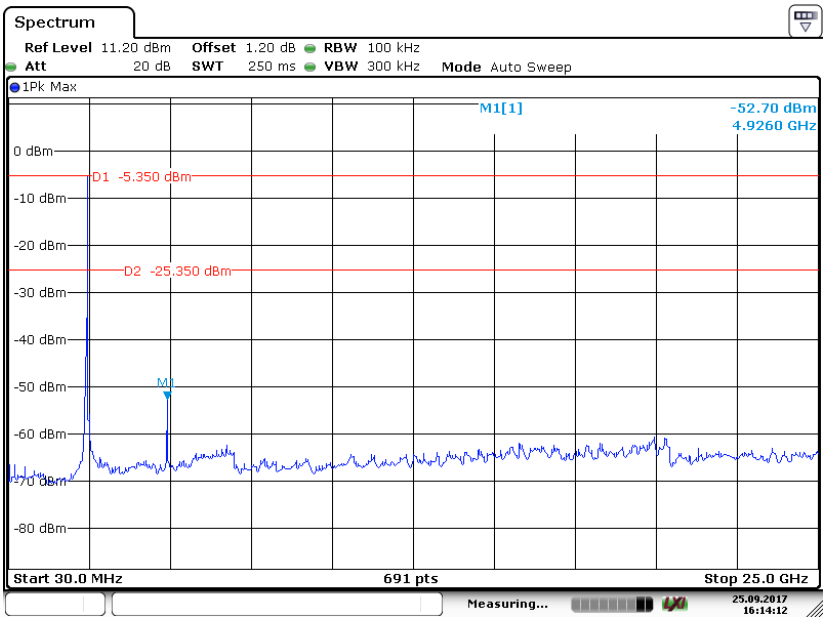
802.11n-HT20 High Channel



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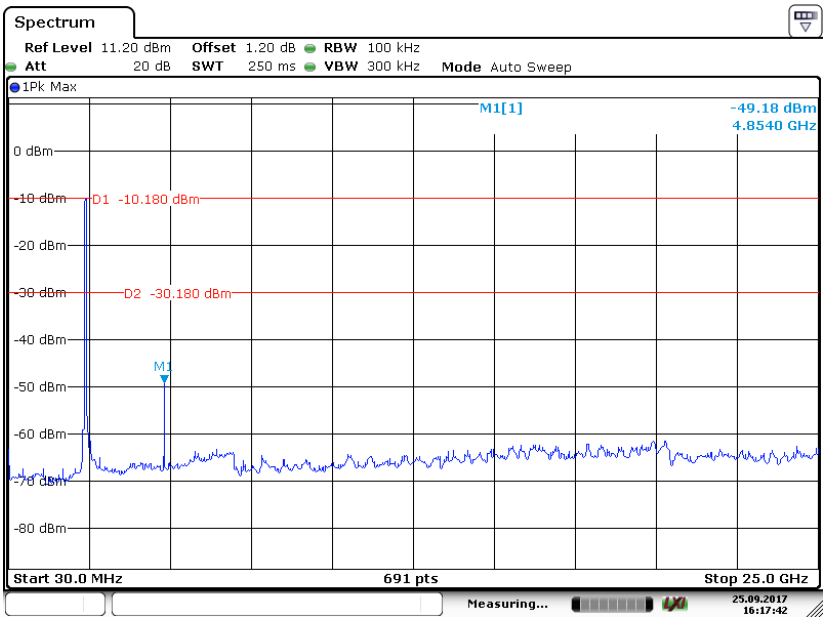
802.11n-HT40 Low Channel



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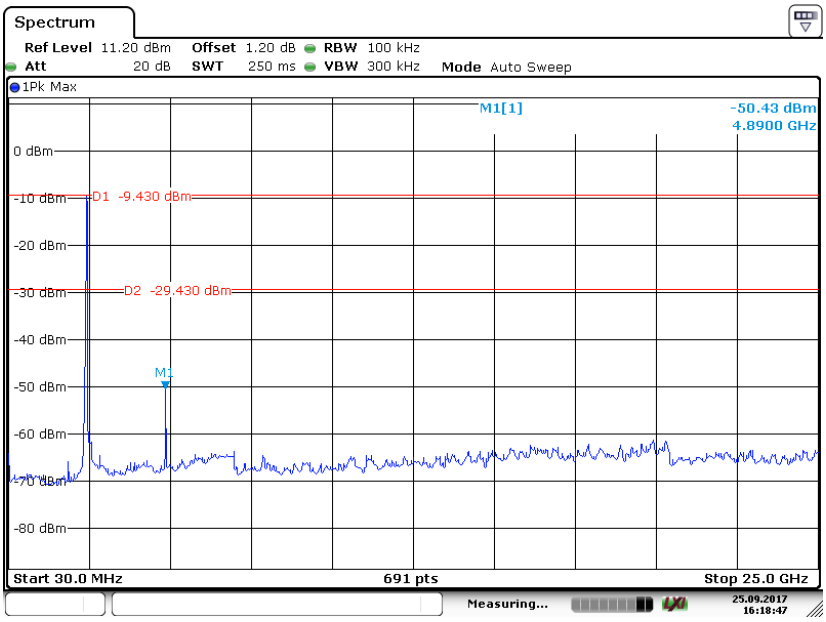
802.11n-HT40 Middle Channel



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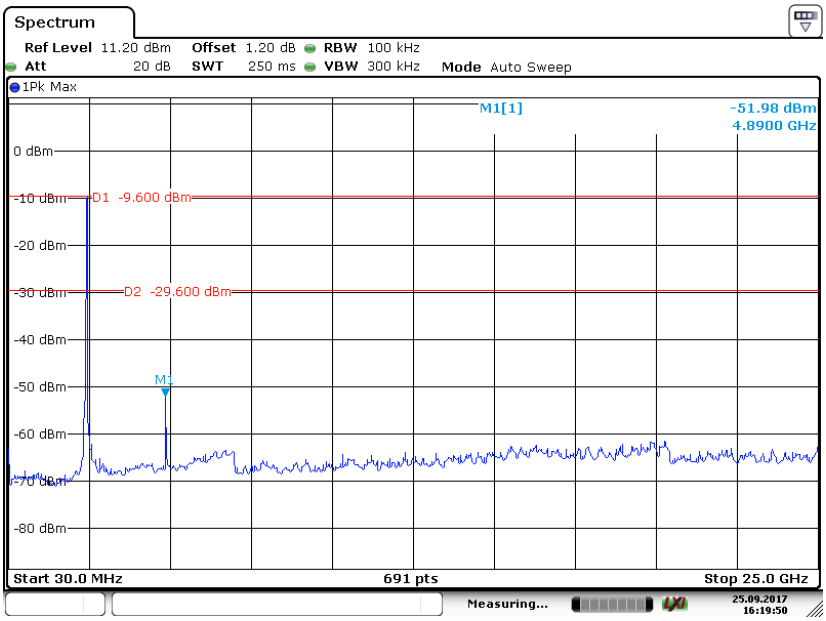
802.11n-HT40 High Channel



Date: 25.SEP.2017 16:19:50

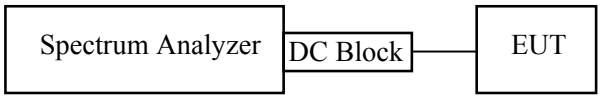
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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 Data

Environmental Conditions

Temperature:	24.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.1 kPa

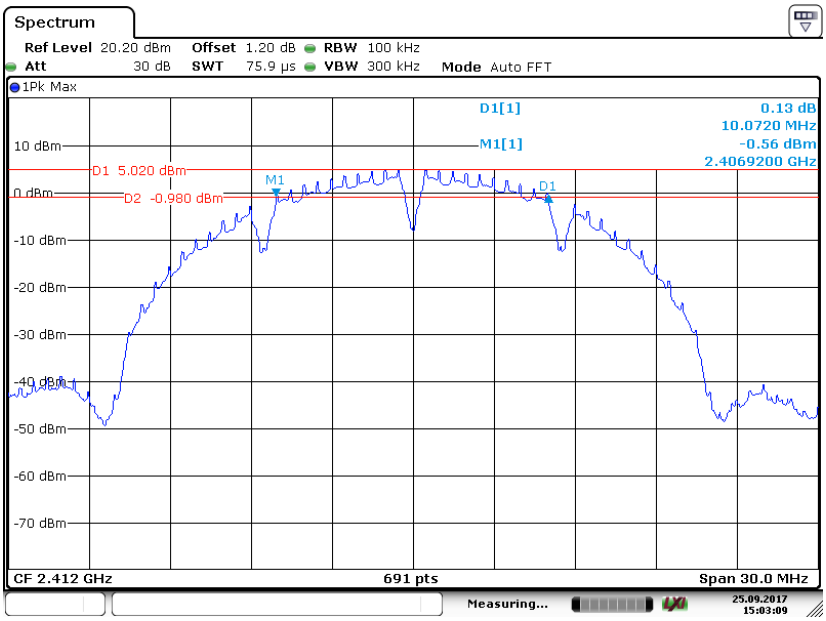
The testing was performed by Chris Wang on 2017-09-25.

EUT operation mode: Transmitting

Test Result: Pass.

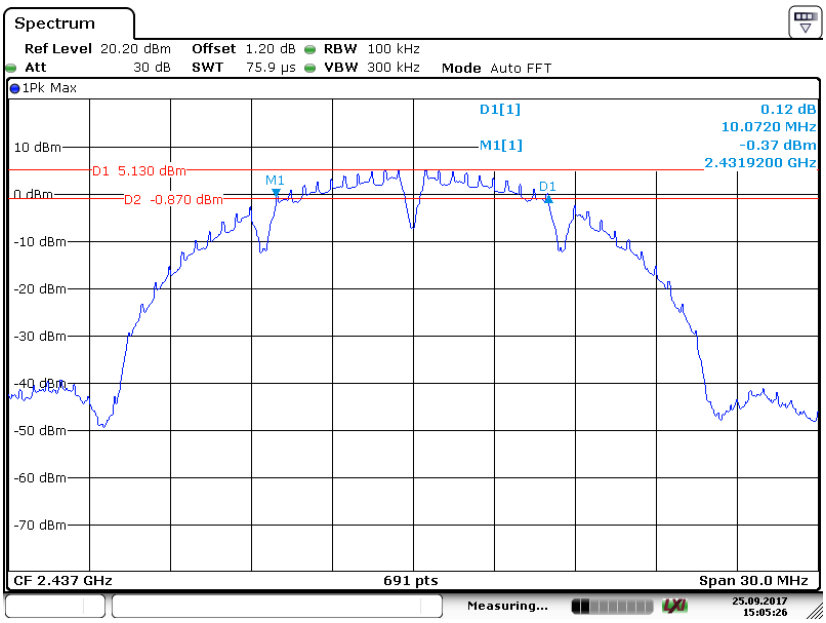
Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
802.11b mode			
Low	2412	10.072	≥0.5
Middle	2437	10.072	≥0.5
High	2462	10.072	≥0.5
802.11g mode			
Low	2412	16.585	≥0.5
Middle	2437	16.585	≥0.5
High	2462	16.585	≥0.5
802.11n-HT20 mode			
Low	2412	17.757	≥0.5
Middle	2437	17.800	≥0.5
High	2462	17.800	≥0.5
802.11n-HT40 mode			
Low	2422	36.382	≥0.5
Middle	2437	36.382	≥0.5
High	2452	36.382	≥0.5

802.11b Low Channel



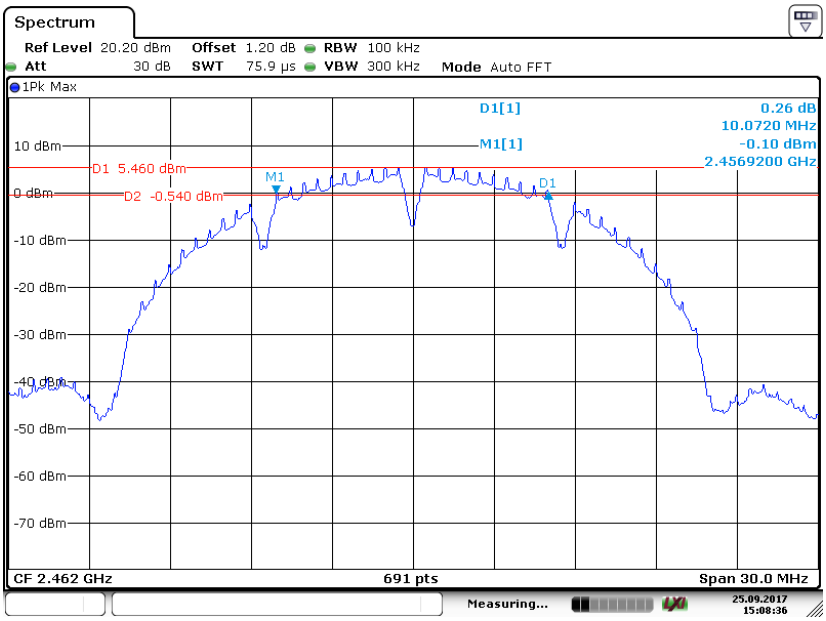
Date: 25.SEP.2017 15:03:09

802.11b Middle Channel



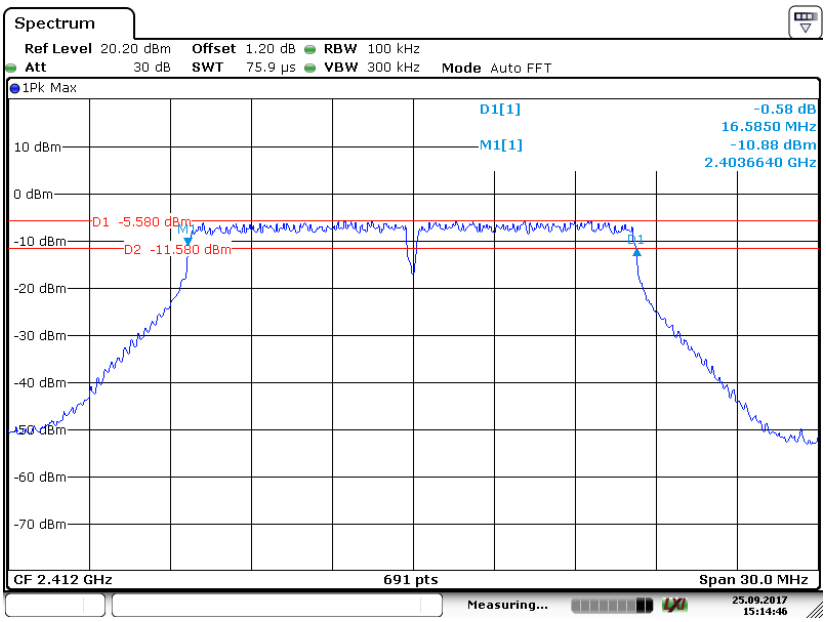
Date: 25.SEP.2017 15:05:26

802.11b High Channel



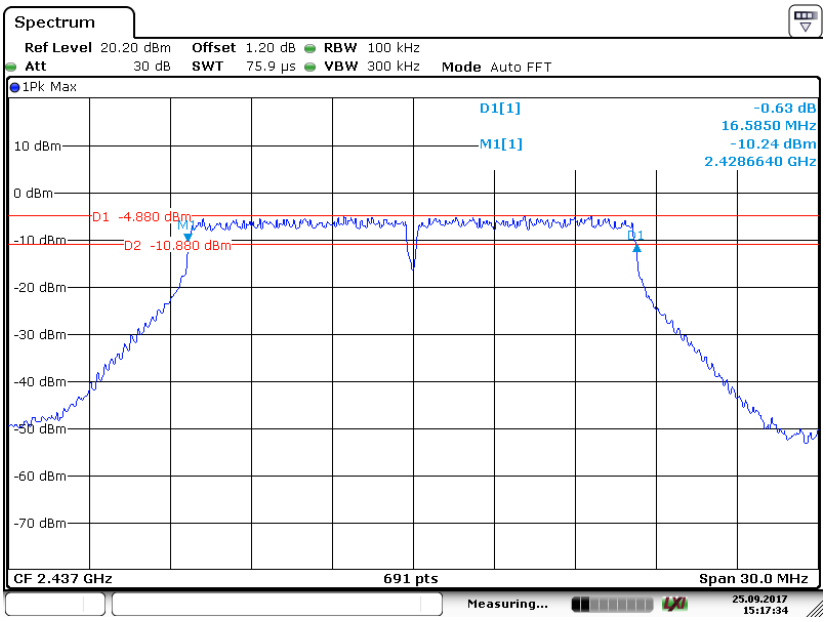
Date: 25.SEP.2017 15:08:36

802.11g Low Channel



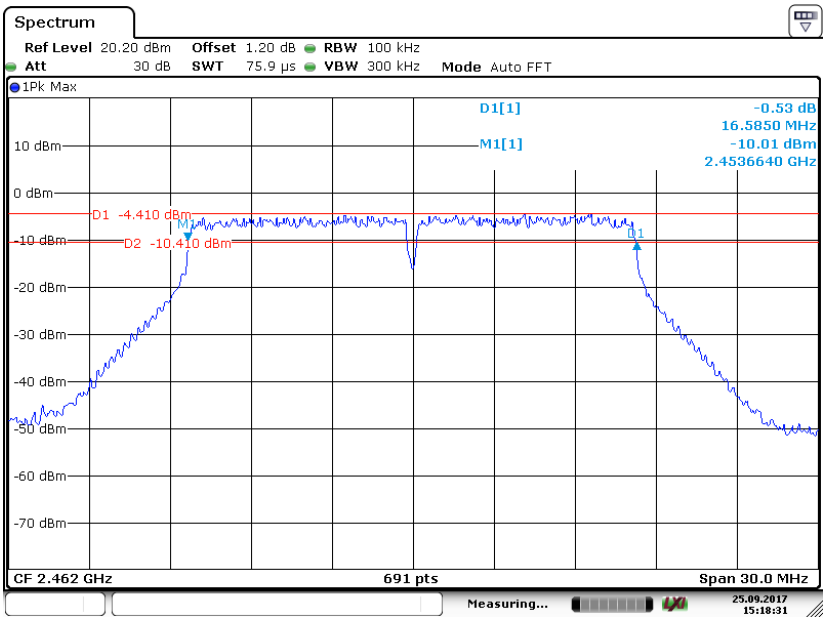
Date: 25.SEP.2017 15:14:46

802.11g Middle Channel



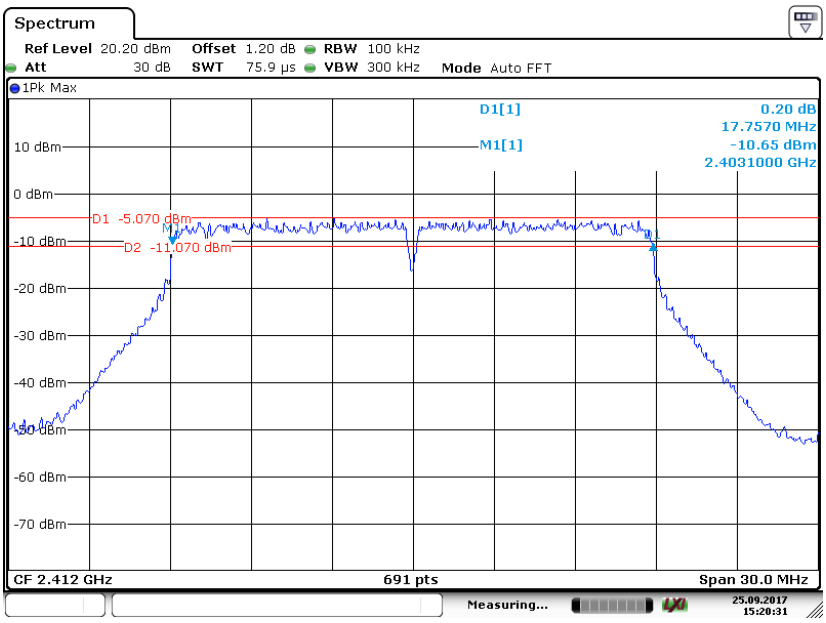
Date: 25.SEP.2017 15:17:34

802.11g High Channel



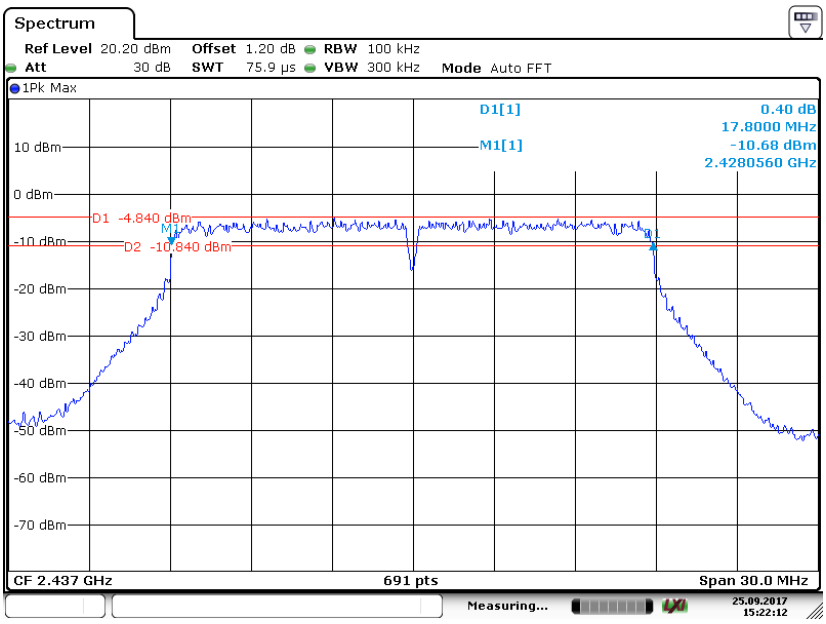
Date: 25.SEP.2017 15:18:32

802.11n-HT20 Low Channel



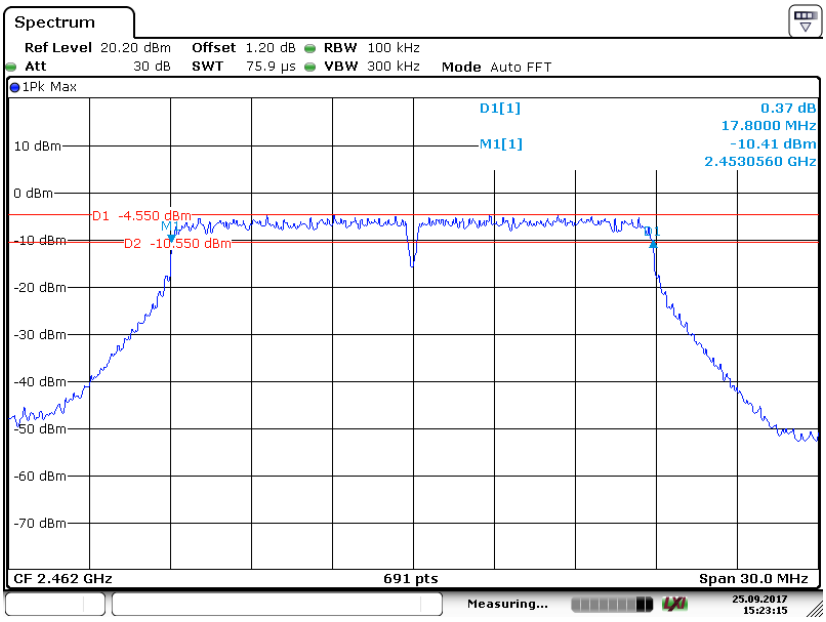
Date: 25.SEP.2017 15:20:31

802.11n-HT20 Middle Channel



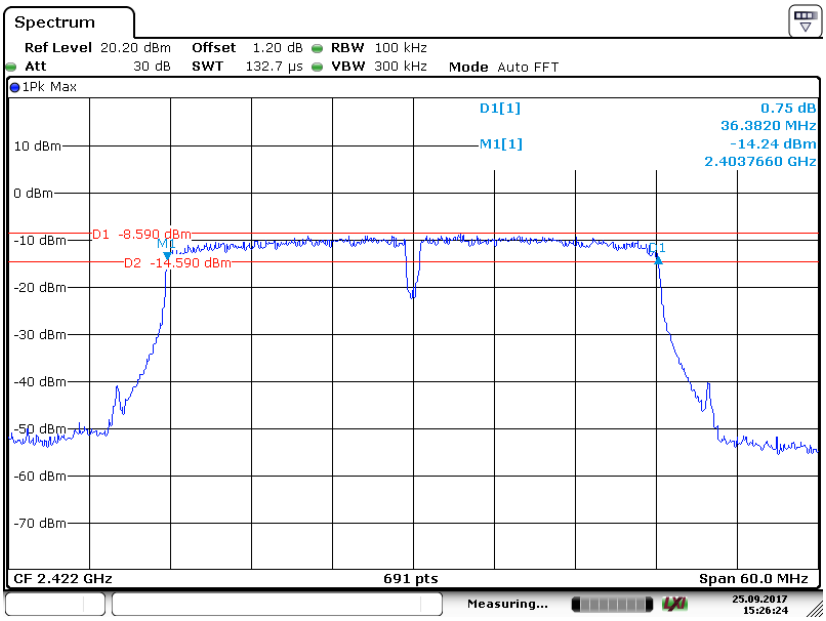
Date: 25.SEP.2017 15:22:13

802.11n-HT20 High Channel



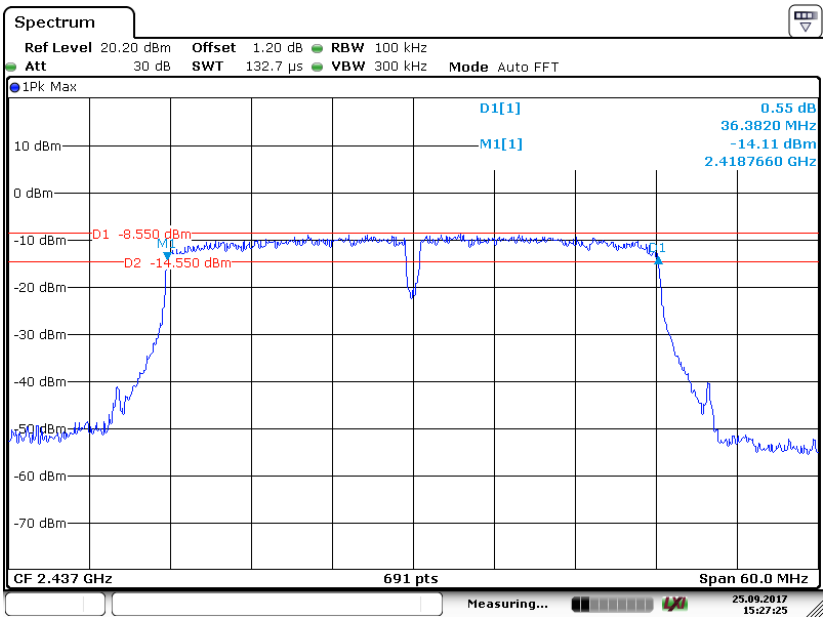
Date: 25.SEP.2017 15:23:15

802.11n-HT40 Low Channel



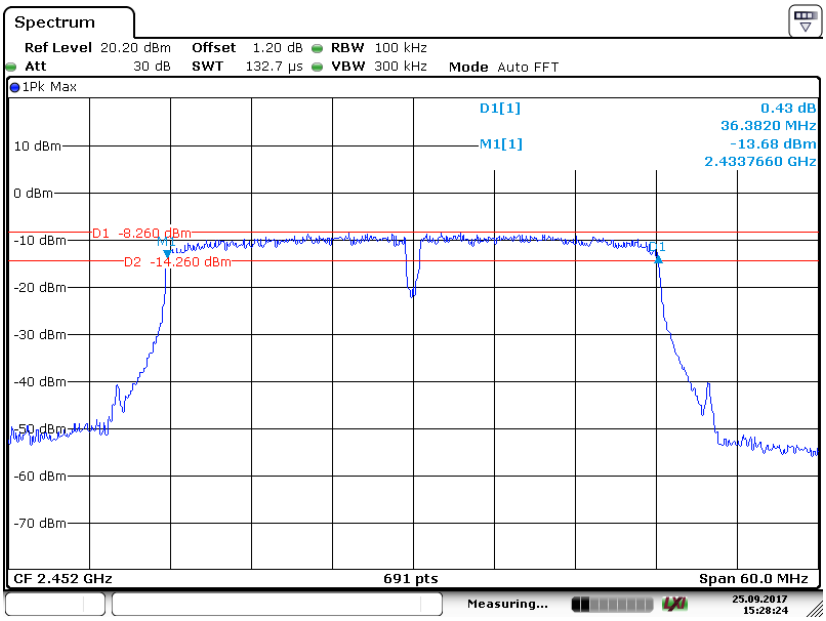
Date: 25.SEP.2017 15:26:25

802.11n-HT40 Middle Channel



Date: 25.SEP.2017 15:27:25

802.11n-HT40 High Channel



Date: 25.SEP.2017 15:28:25

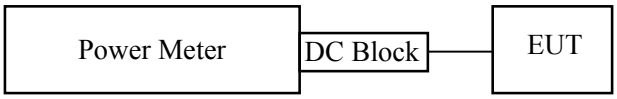
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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 one test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	24.5 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Chris Wang on 2017-09-25.

EUT operation mode: Transmitting

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)	Result
802.11b				
Low	2412	16.60	30	Pass
Middle	2437	17.21	30	Pass
High	2462	17.56	30	Pass
802.11g				
Low	2412	16.53	30	Pass
Middle	2437	17.28	30	Pass
High	2462	16.66	30	Pass
802.11n-HT20				
Low	2412	16.86	30	Pass
Middle	2437	17.28	30	Pass
High	2462	17.12	30	Pass
802.11n-HT40				
Low	2422	16.01	30	Pass
Middle	2437	16.19	30	Pass
High	2452	16.88	30	Pass

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 Data

Environmental Conditions

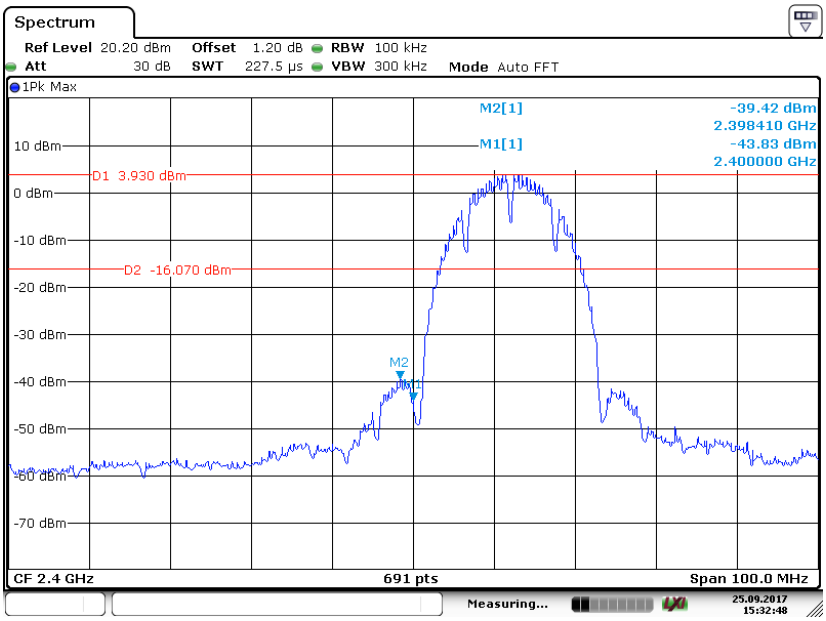
Temperature:	24.5 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Chris Wang on 2017-09-25.

Test Result: *Compliance*

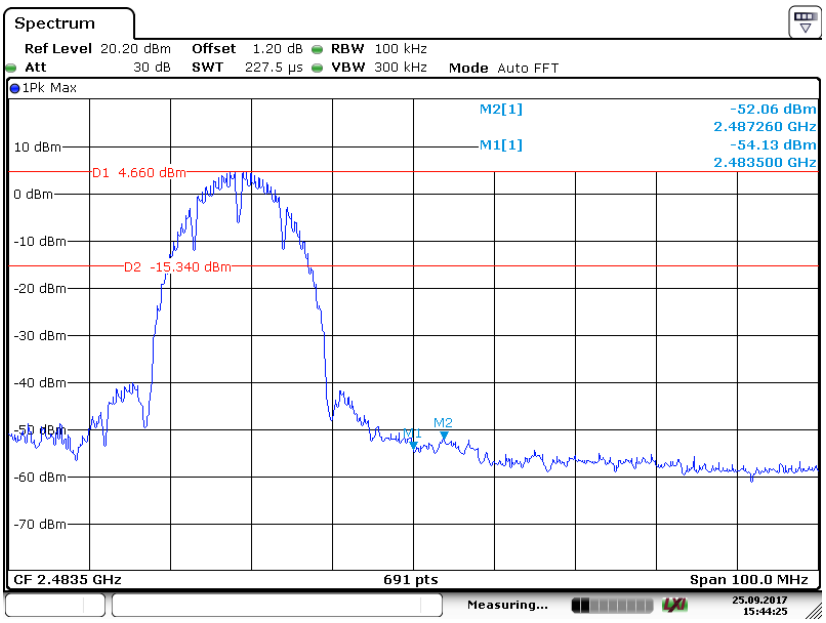
Band Edge

802.11b Mode Left Side



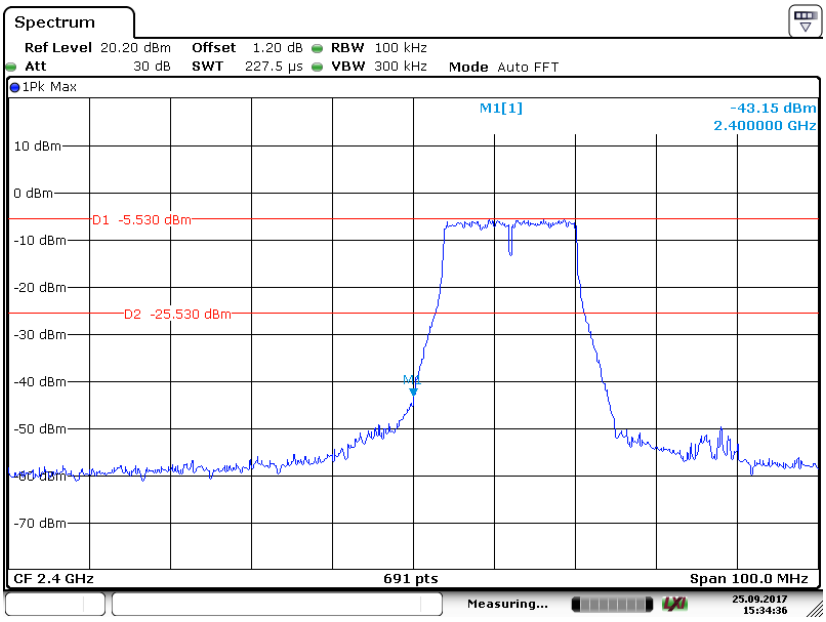
Date: 25.SEP.2017 15:32:48

802.11b Mode Right Side



Date: 25.SEP.2017 15:44:26

802.11g Mode Left Side



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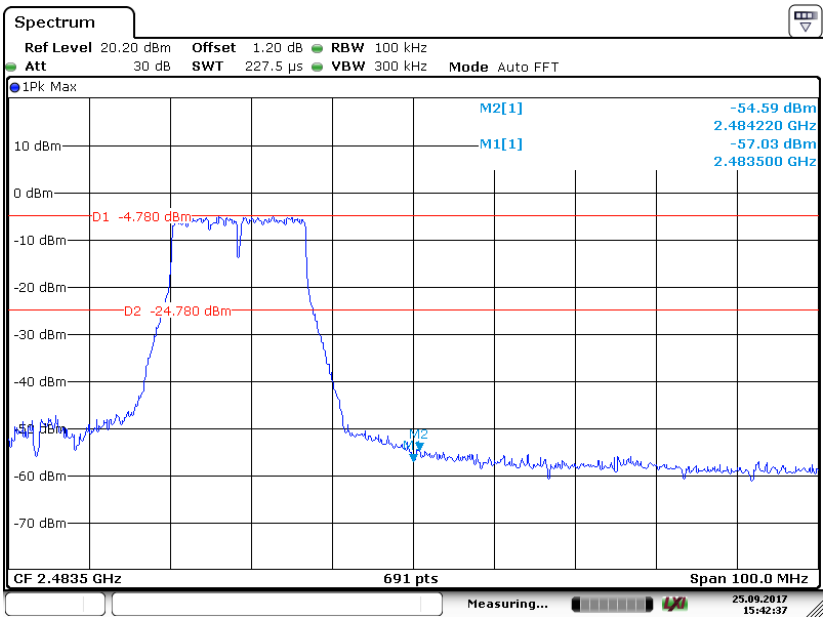
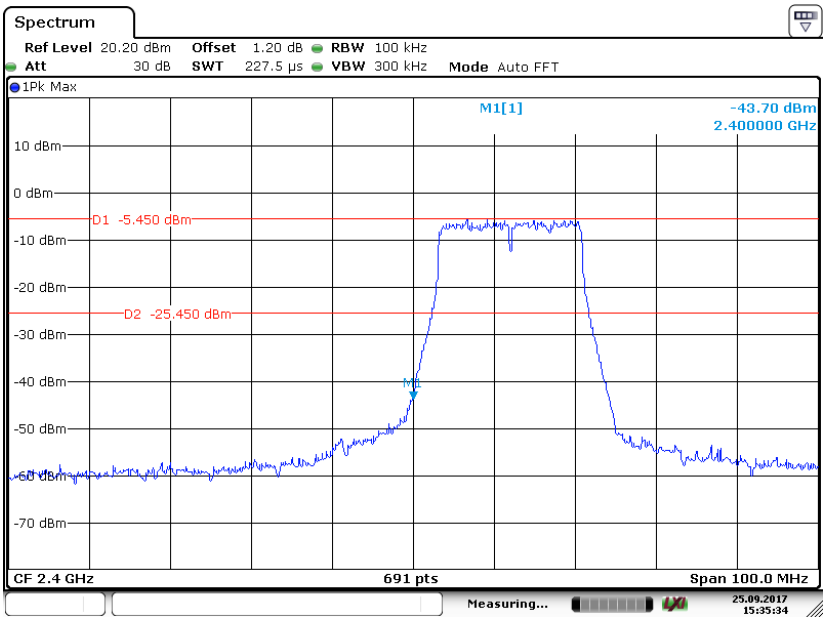
802.11g Mode Right Side



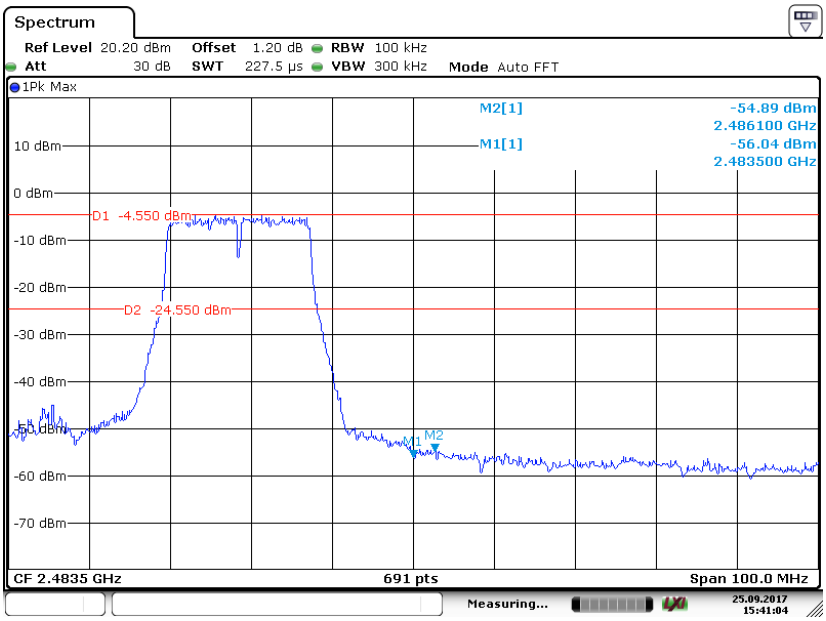
Date: 25.SEP.2017 15:42:37

802.11n-HT20 Mode Left Side



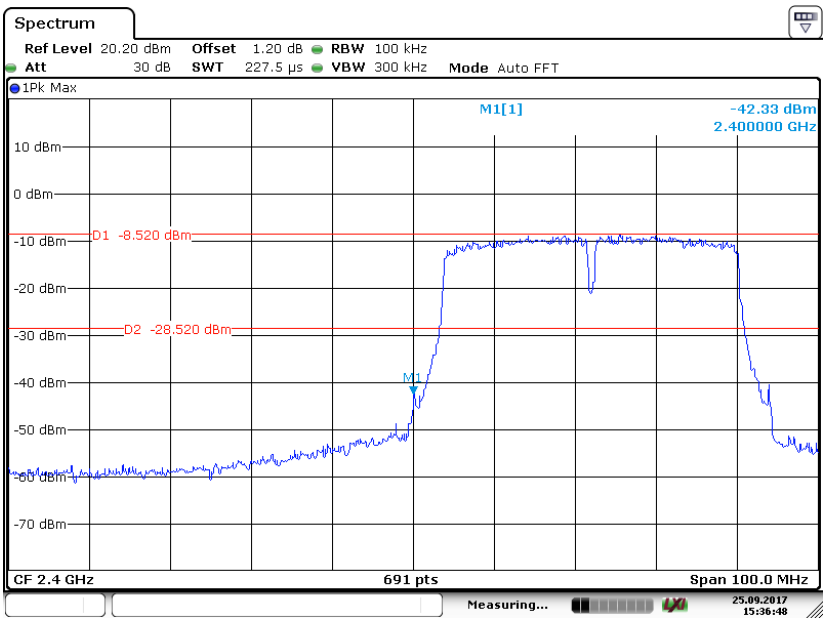
Date: 25.SEP.2017 15:35:34

802.11n-HT20 Mode Right Side



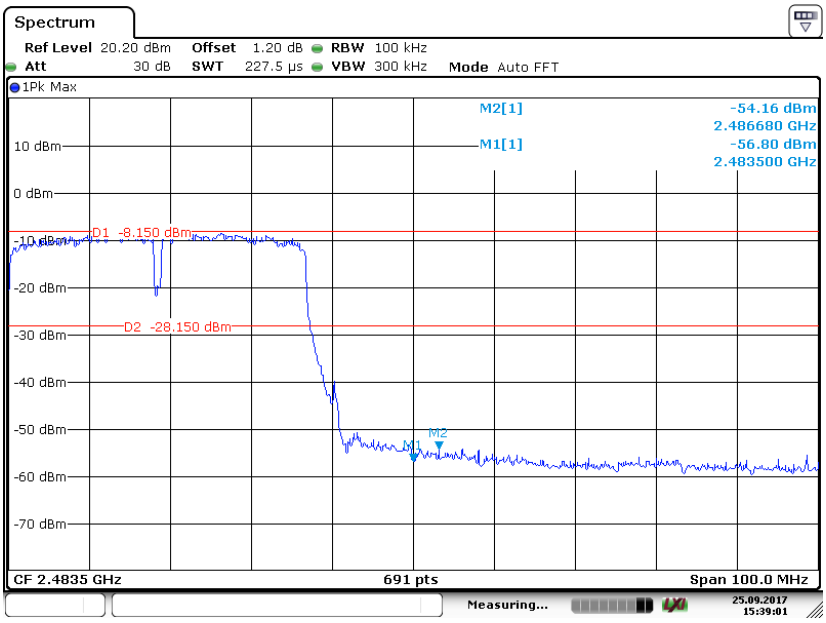
Date: 25.SEP.2017 15:41:04

802.11n-HT40 Mode Left Side



Date: 25.SEP.2017 15:36:49

802.11n-HT40 Mode Right Side



Date: 25.SEP.2017 15:39:01

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

According to KDB558074 D01 DTS Meas Guidance v04 sub-clause 10.2

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: 3kHz≤ RBW≤100 kHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Data

Environmental Conditions

Temperature:	24.6℃
Relative Humidity:	51 %
ATM Pressure:	101.1 kPa

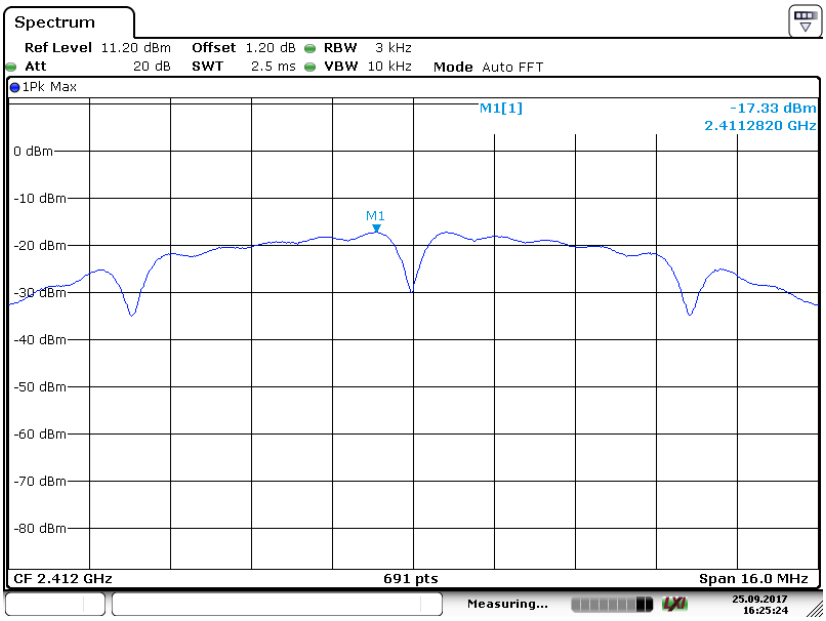
The testing was performed by Chris Wang on 2017-09-25.

EUT operation mode: Transmitting

Test Result: Pass

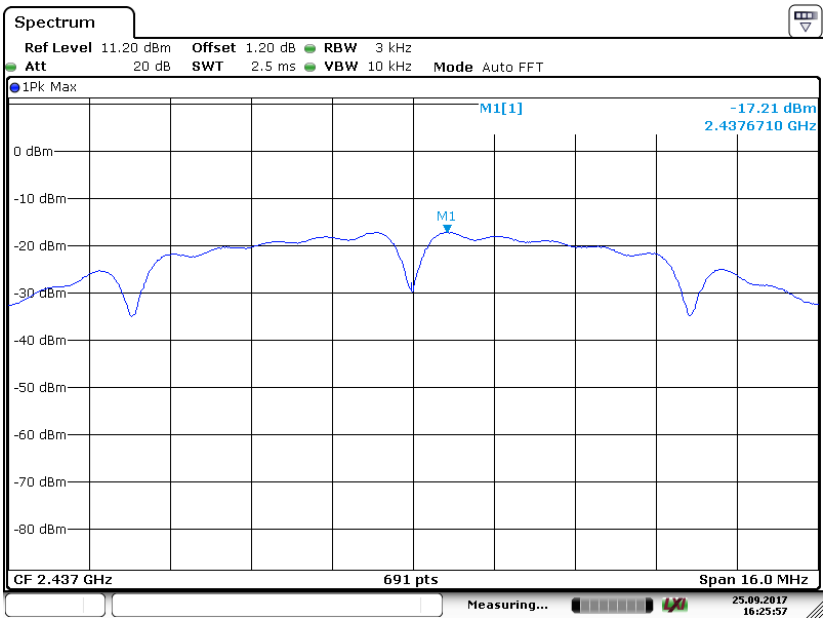
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode			
Low	2412	-17.33	≤8
Middle	2437	-17.21	≤8
High	2462	-17.09	≤8
802.11g mode			
Low	2412	-22.75	≤8
Middle	2437	-22.25	≤8
High	2462	-21.24	≤8
802.11n-HT20 mode			
Low	2412	-22.06	≤8
Middle	2437	-21.48	≤8
High	2462	-20.64	≤8
802.11n-HT40 mode			
Low	2422	-22.40	≤8
Middle	2437	-21.89	≤8
High	2452	-21.24	≤8

802.11b Low Channel



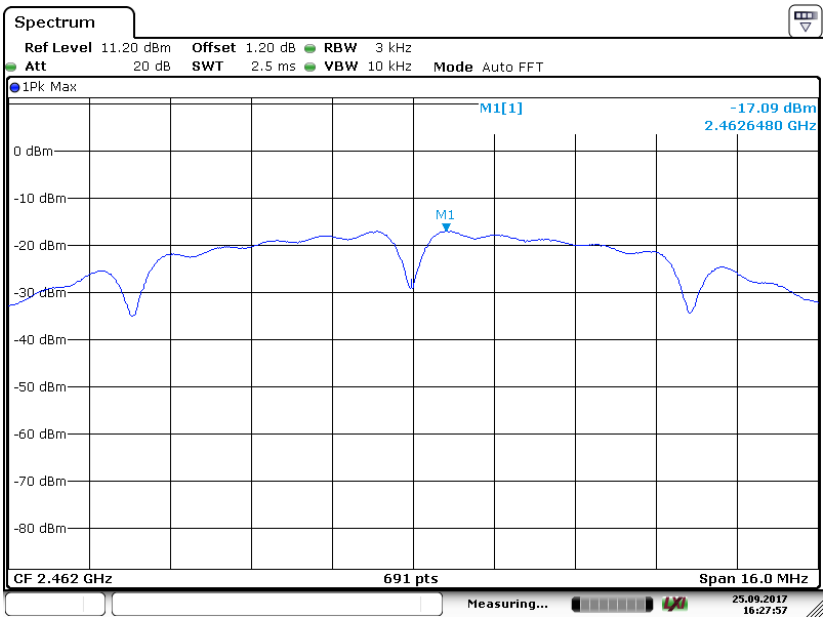
Date: 25.SEP.2017 16:25:24

802.11b Middle Channel



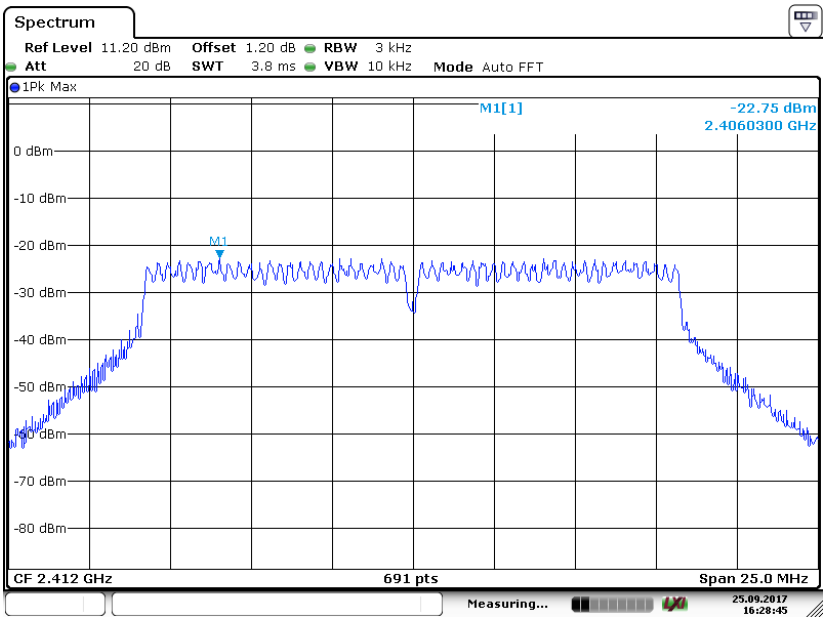
Date: 25.SEP.2017 16:25:57

802.11b High Channel



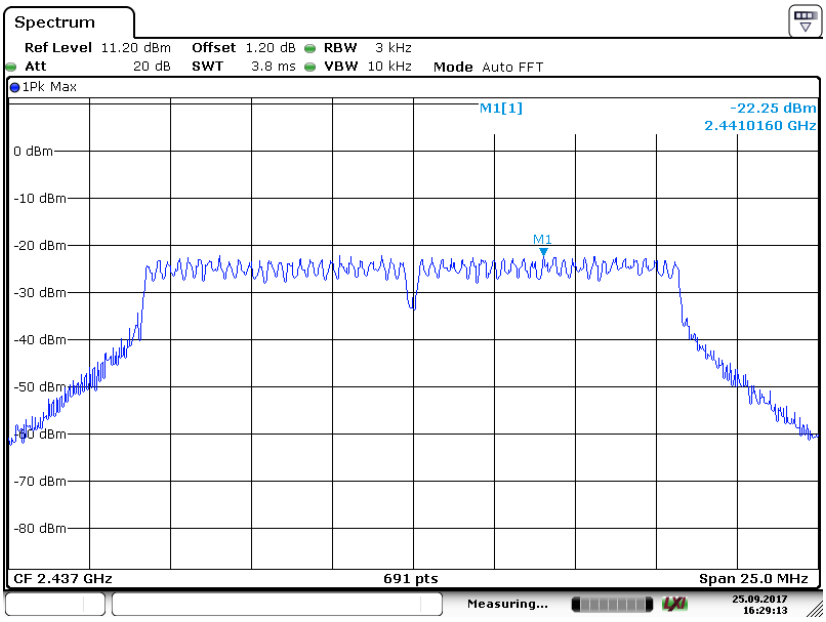
Date: 25.SEP.2017 16:27:58

802.11g Low Channel



Date: 25.SEP.2017 16:28:45

802.11g Middle Channel



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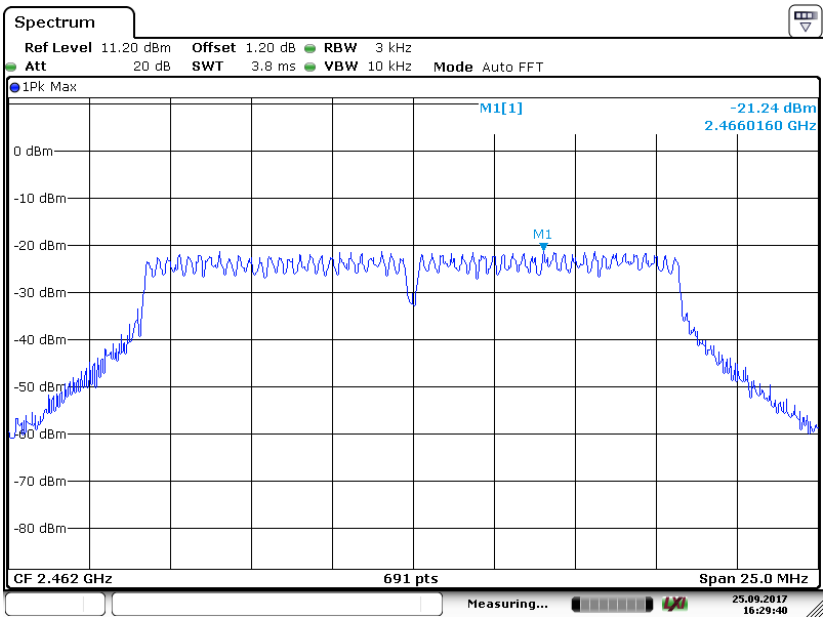
802.11g High Channel



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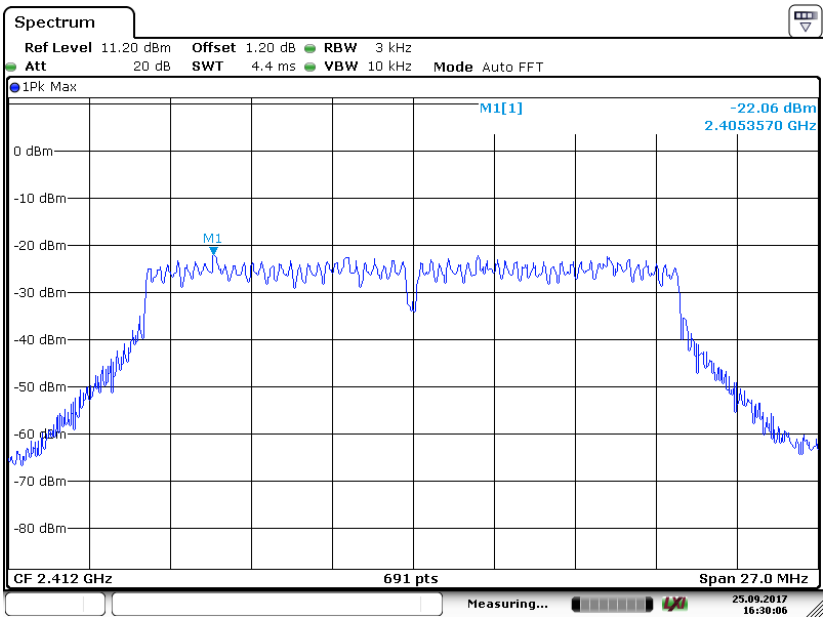
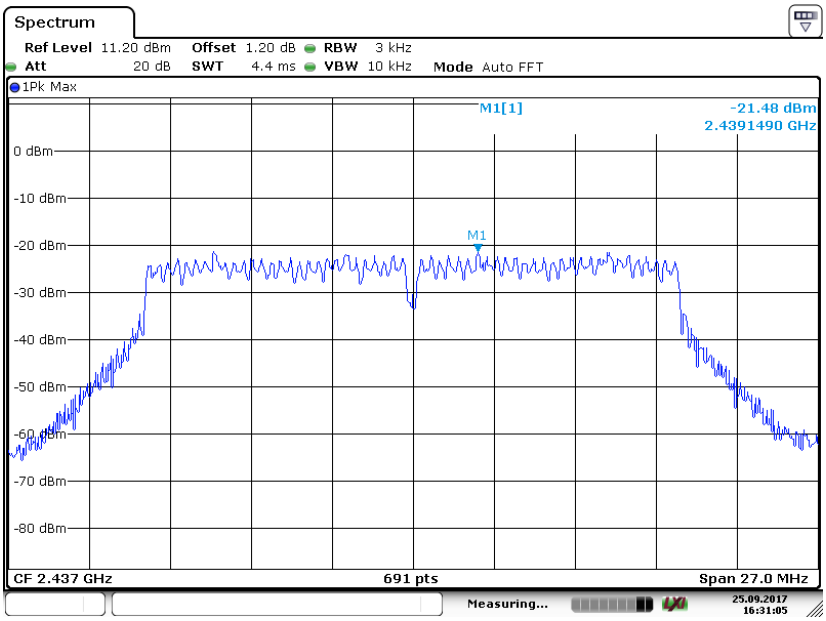
802.11n-HT20 Low Channel



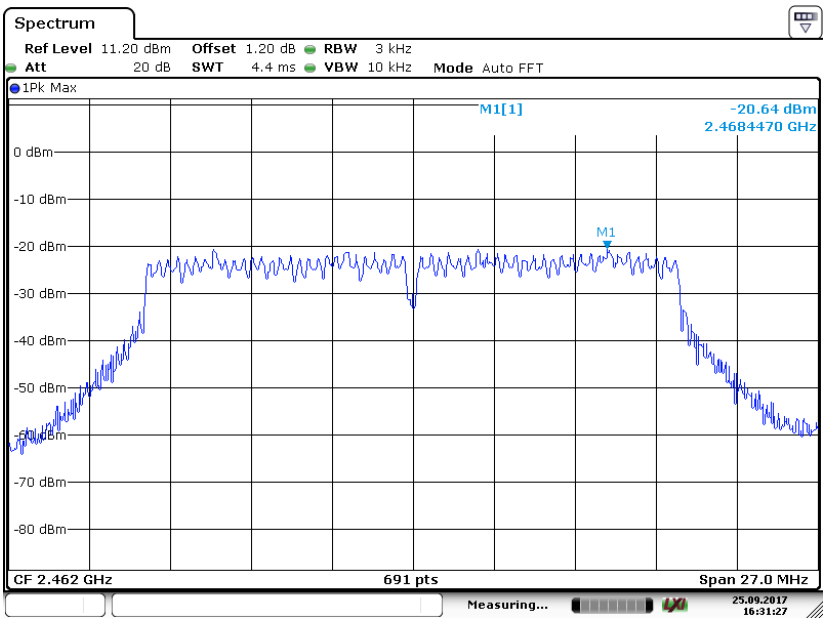
Date: 25.SEP.2017 16:30:07

802.11n-HT20 Middle Channel



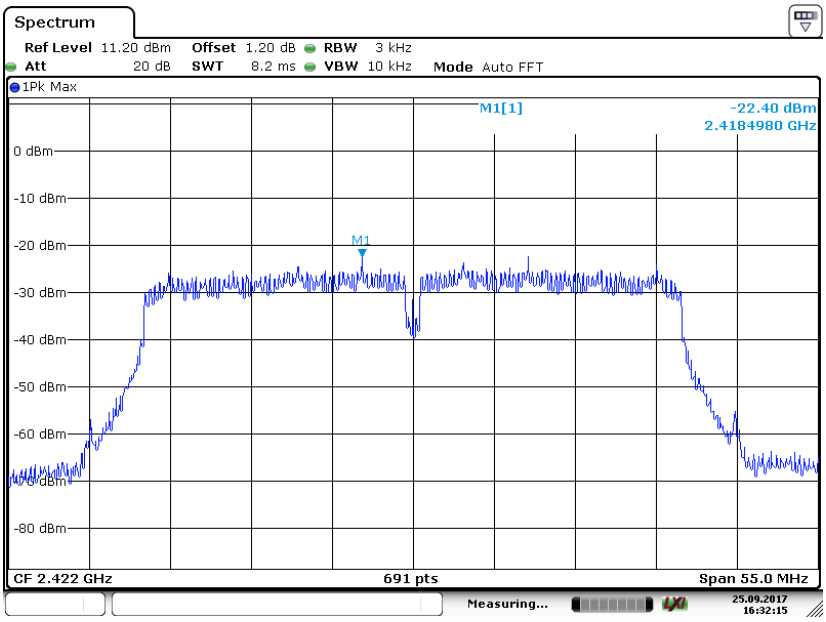
Date: 25.SEP.2017 16:31:05

802.11n-HT20 High Channel



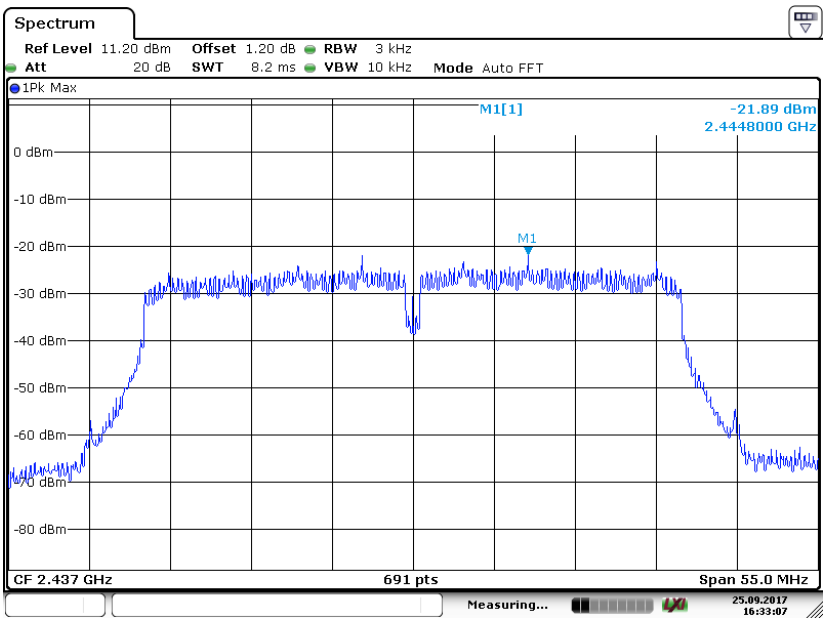
Date: 25.SEP.2017 16:31:28

802.11n-HT40 Low Channel



Date: 25.SEP.2017 16:32:15

802.11n-HT40 Middle Channel



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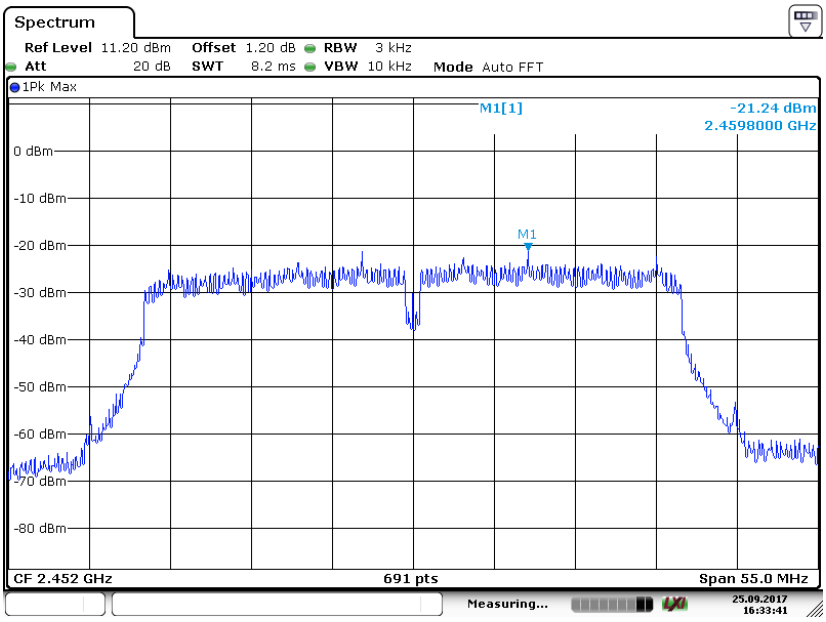
802.11n-HT40 High Channel



Date: 25.SEP.2017 16:33:42

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