FCC PART 15.247

TEST REPORT

For

Grandstream Networks, Inc.

126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

FCC ID: YZZGWN7600LR

Report Type:	**Product Type:**
Original Report	Long Range WiFi Access Point

Report Number:	RSZ170620008-00B
Report Date:	2017-09-18
Reviewed By:	Rocky Kang RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Grandstream Networks, Inc.'s* product, model number: *GWN7600LR (FCC ID: YZZGWN7600LR)* or the "EUT" in this report was a *Long Range WiFi Access Point,* which was measured approximately: 290 mm (L) × 150 mm (W) × 56 mm (H), rated with input voltage: DC 48 V powered by POE supply.

**All measurement and test data in this report was gathered from production sample serial number: 1701427 (Assigned by BACL, shenzhen).The EUT supplied by the applicant was received on 2017-06-20.*

Objective

This report is prepared on behalf of *Grandstream Networks, Inc.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's 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)

FCC Part 15B JBP, Part 15.407 NII submissions with FCC ID: YZZGWN7600LR.

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

Measurement Uncertainty

Parameter	uncertainty
Occupied Channel Bandwidth	±5%
RF Output Power with Power meter	±0.5dB
RF conducted test with spectrum	±1.5dB
AC Power Lines Conducted Emissions	±1.95dB
All emissions, radiated	±4.88dB
Temperature	-30~60 ℃
Humidity	±6%
Supply voltages	±0.4%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

Bay Area Compliance Laboratories Corp. (Shenzhen) has been accredited to ISO/IEC 17025 by CNAS (Lab code: L2408). And accredited to ISO/IEC 17025 by NVLAP (Lab code: 200707-0), the FCC Designation No. CN5001 under the KDB 974614 D01.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Bay Area Compliance Laboratories Corp. (Shenzhen) was registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b, 802.11g and 802.11n-HT20 mode, 11 channels are provided to testing:

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

For 802.11n-HT40 mode, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2422	6	2447
2	2427	7	2452
3	2432	/	/
4	2437	/	/
5	2442	/	/

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"QRCT" software was used during test.

The device was tested with 100% duty cycle and the worst case was performed as below:

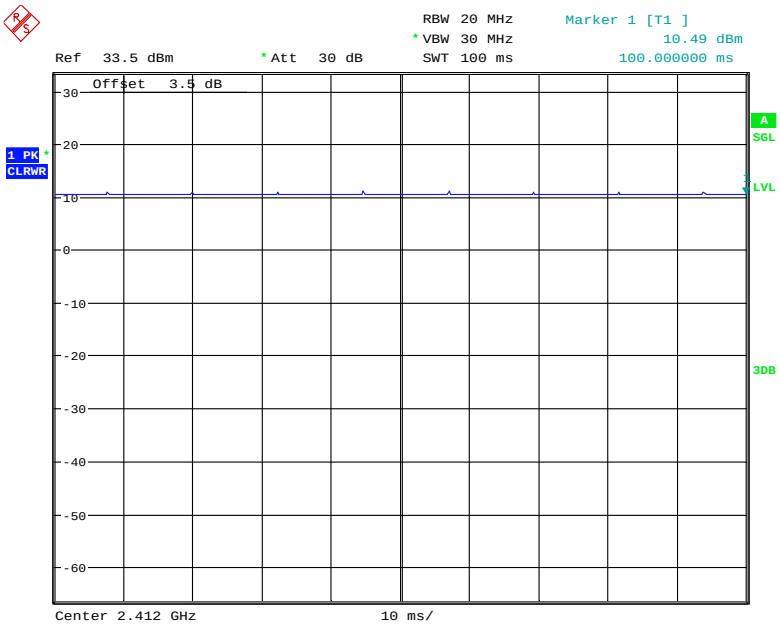
Antenna 0 & Antenna 1, set EUT to MIMO mode:

Mode	Data rate	Power level									
		Low channel	2417	2422	2427	2432	2437MHz	2447	2452	2457	High channel
802.11b	1 Mbps	20	20	21	Default	Default	Default	Default	20	20	20
802.11g	6 Mbps	16	16	16	16	19	Default	18	18	16	16
802.11n-HT20	MCS0	16	16	16	16	19	Default	18	18	16	16
802.11n-HT40	MCS0	N/A	N/A	15	15	17	20	16	16	N/A	N/A

Pre-scan with all the date rates, the above date rate is the worst case for Wi-Fi test.

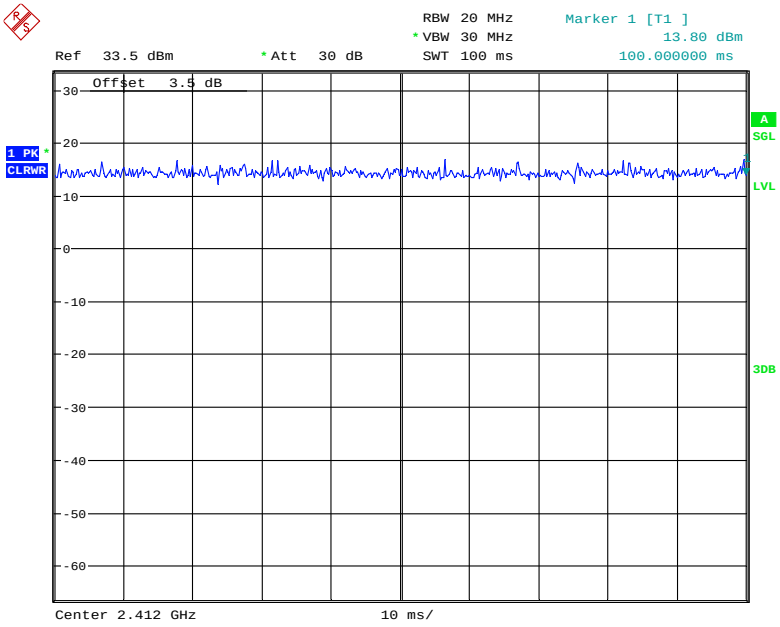
Duty cycle

802.11b mode



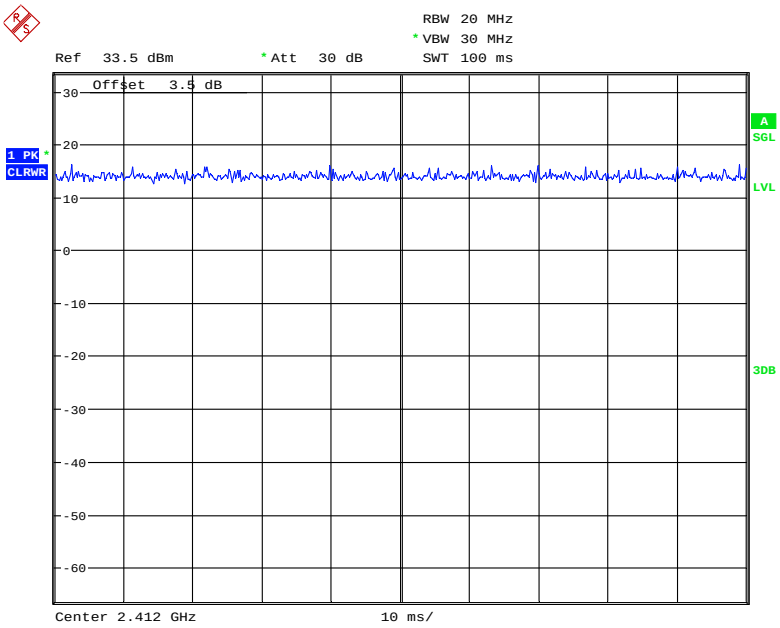
Date: 5.SEP.2017 17:20:21

802.11g mode



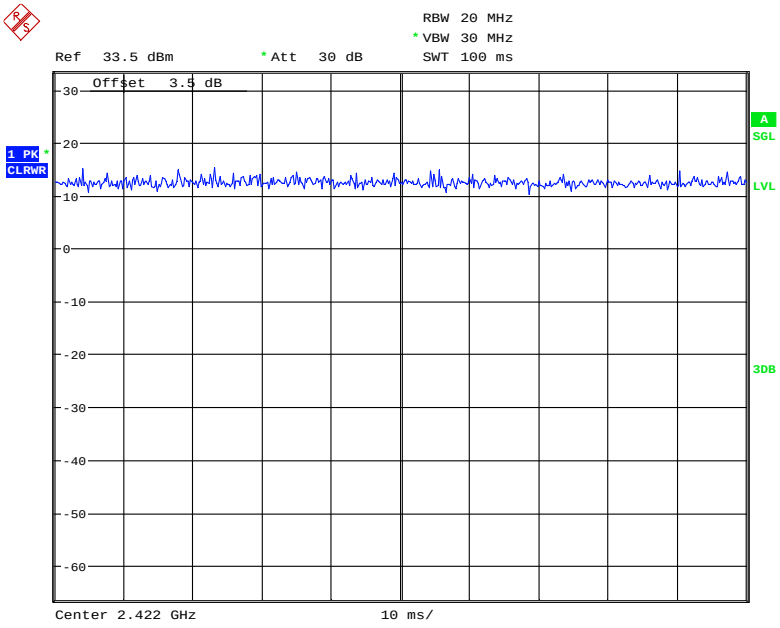
Date: 5.SEP.2017 17:20:58

802.11n-HT20 Mode



Date: 5.SEP.2017 17:22:03

802.11n-HT40 Mode



Date: 5.SEP.2017 17:22:20

Band	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

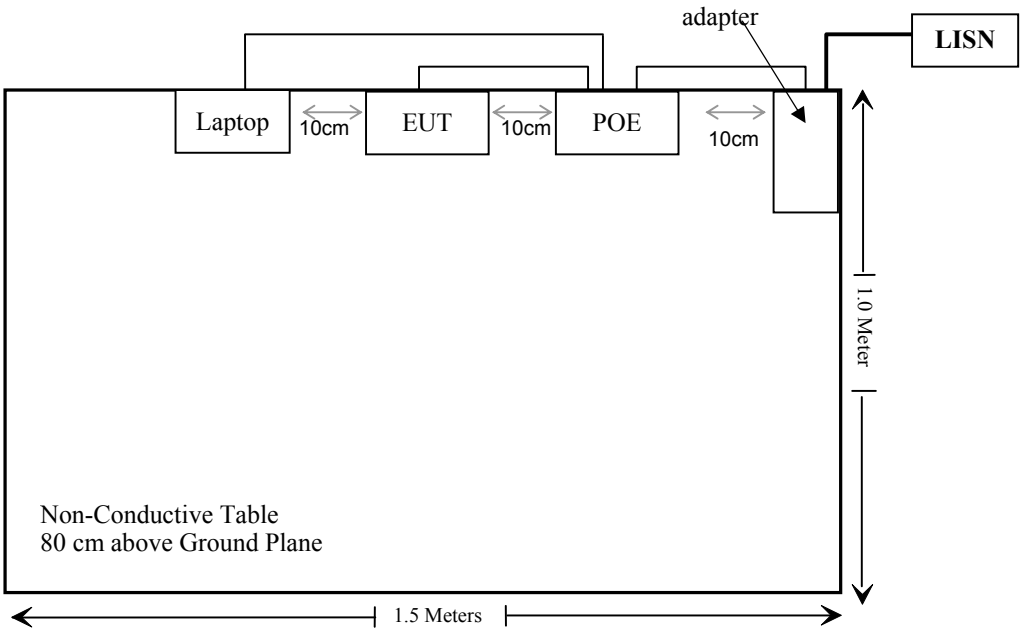
Manufacturer	Description	Model	Serial Number
NETGEAR	POE	FS108P	1DL294310006A
HP	Laptop	516	Gjh511644g
MASS POWER	Adapter	NBS24J240100VU	N/A

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-Shielding Detachable RJ45 Cable	1.0	EUT	POE
Un-shielding detachable AC cable	0.9	LISN	Adapter
Un-Shielding Detachable RJ45 Cable	1.0	Laptop	POE
Unshielded un-detachable DC cable	1.4	POE	Adapter

Block Diagram of Test Setup

For conducted emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i) & §1.1307 (b) (1) & §2.1091	MaximuM Permissible 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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2016-10-19	2017-10-19
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2016-12-07	2017-12-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2017-05-21	2017-11-19
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
N/A	Conducted Emission Cable	N/A	UF A210B-1-0720-504504	2017-05-12	2017-11-12
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14
HP	Amplifier	HP8447E	1937A01046	2017-05-21	2017-11-19
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2014-12-17	2017-12-16
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	104PEA	218124002	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	RG-214	1	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	RG-214	2	2017-05-22	2017-11-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2014-12-29	2017-12-28
Ducommun Technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03
RF Conducted Test					
Agilent	P-Series Power Meter	N1912A	MY5000448	2016-12-05	2017-12-05
Agilent	Wideband Power Sensor	N1921A	MY54210016	2016-12-05	2017-12-05
WEINSCHEL	6dB Attenuator	50-6	R4376	2017-05-23	2017-11-22
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2017-04-24	2018-04-24
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2016-12-05	2017-12-05
WEINSCHEL	3dB Attenuator	N/A	N/A	2017-05-23	2017-11-22
Ducommun technologies	RF Cable	RG-214	3	2017-05-22	2017-11-22

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm2)
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:

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

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2412-2462	4	2.51	26	398.11	20	0.2	1

Simultaneous transmitting consideration: (referring to the NII report, the highest MPE for 5G band is $0.28mW/cm^2$)

The ratio=$MPE/limit_{DTS}+MPE/limit_{NII}=0.20+0.28=0.48<1.0$, simultaneous exposure is not required.

Note: The conducted power is the tune-up power of the Max Conducted Average Output Power

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

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 two PCB antenna arrangement, which ware permanently attached and the antenna gain is 4.0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

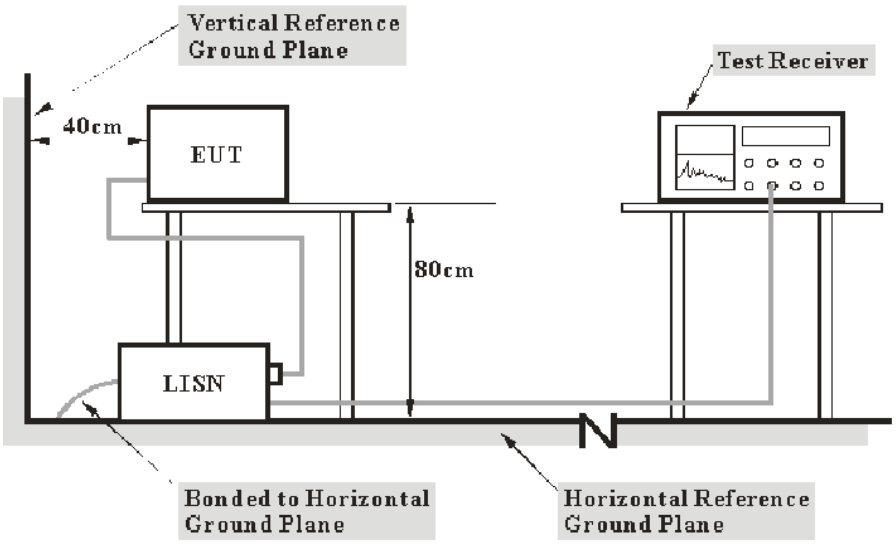
Result: Compliance.

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.

The spacing between the peripherals was 10 cm.

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 POE was connected to the outlet of the LISN.

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

All final 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 + Transient Limiter Attenuation

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 – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

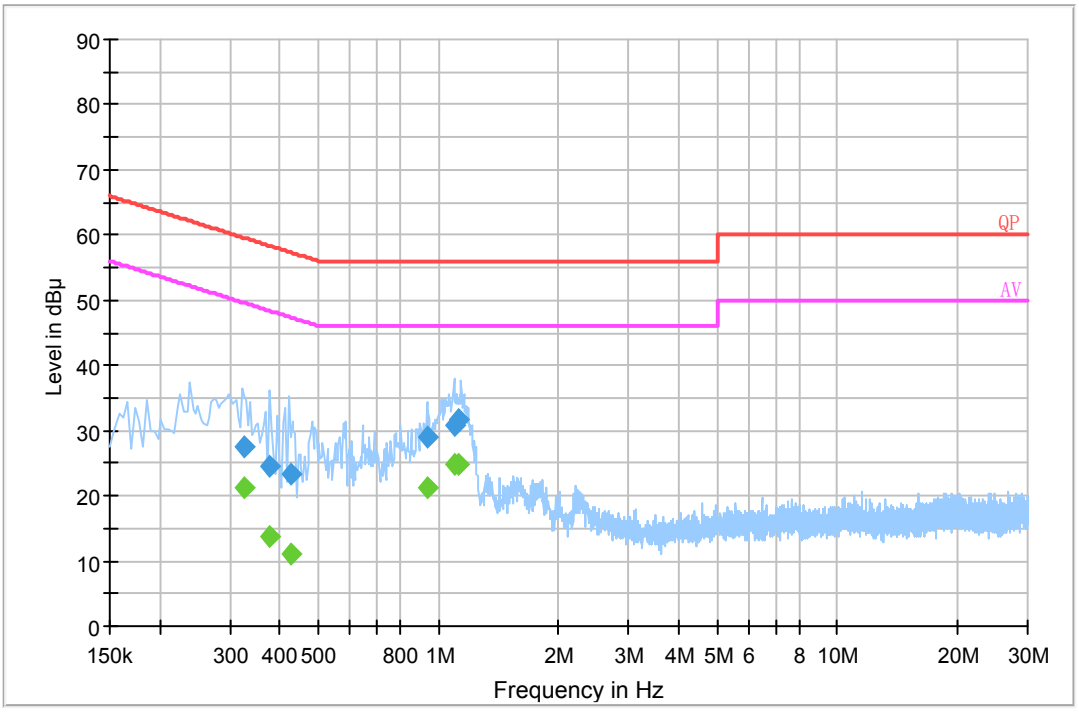
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng on 2017-08-30.

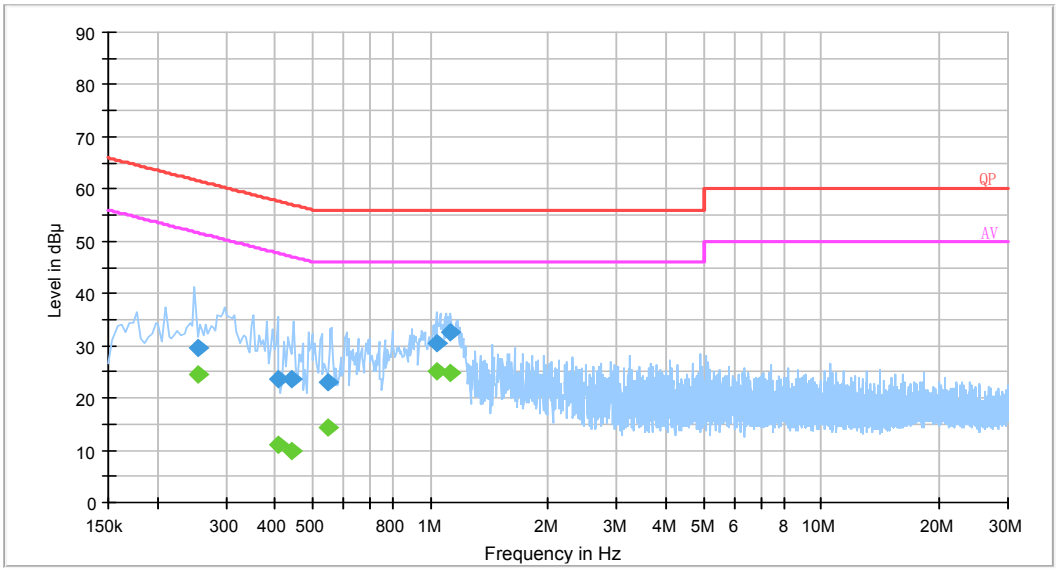
EUT operation mode: Transmitting

AC 120 V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.326830	27.5	20.2	59.5	32.0	QP
0.376330	24.4	20.2	58.4	34.0	QP
0.427670	23.4	20.2	57.3	33.9	QP
0.939990	28.9	20.1	56.0	27.1	QP
1.101590	30.9	20.1	56.0	25.1	QP
1.128870	31.6	20.1	56.0	24.4	QP
0.326830	21.2	20.2	49.5	28.3	Ave.
0.376330	13.7	20.2	48.4	34.7	Ave.
0.427670	11.0	20.2	47.3	36.3	Ave.
0.939990	21.3	20.1	46.0	24.7	Ave.
1.101590	24.7	20.1	46.0	21.3	Ave.
1.128870	24.8	20.1	46.0	21.2	Ave.

AC 120V/ 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.254500	29.7	20.2	61.6	31.9	QP
0.407910	23.5	20.2	57.7	34.2	QP
0.439310	23.6	20.2	57.1	33.5	QP
0.549630	23.0	20.2	56.0	33.0	QP
1.042490	30.6	20.1	56.0	25.4	QP
1.125110	32.6	20.1	56.0	23.4	QP
0.254500	24.4	20.2	51.6	27.2	Ave.
0.407910	11.0	20.2	47.7	36.7	Ave.
0.439310	9.8	20.2	47.1	37.3	Ave.
0.549630	14.4	20.2	46.0	31.6	Ave.
1.042490	25.1	20.1	46.0	20.9	Ave.
1.125110	24.8	20.1	46.0	21.2	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

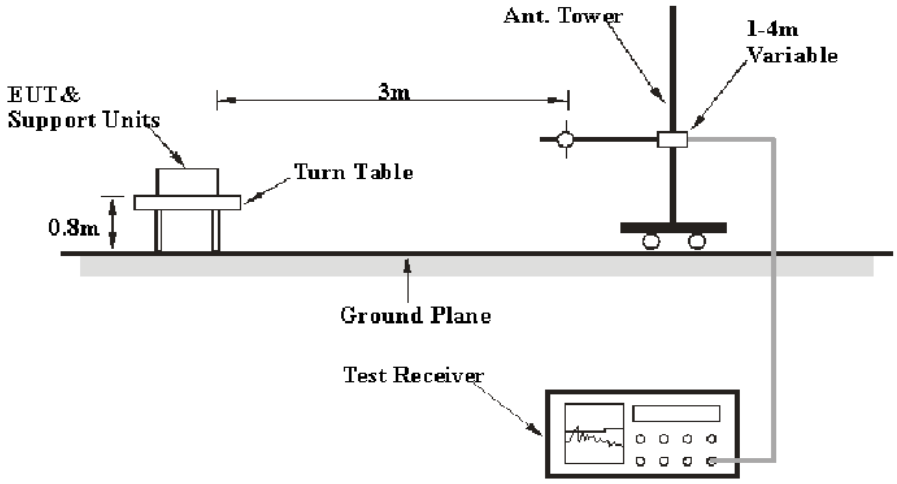
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

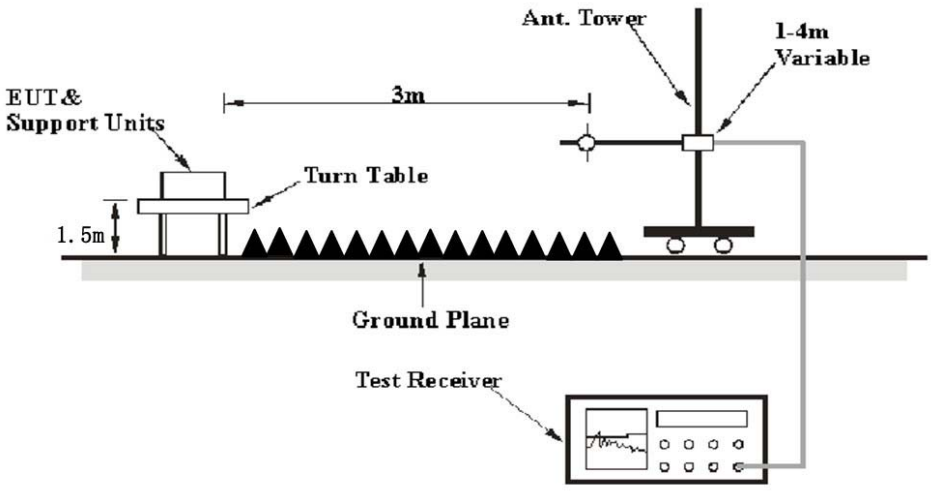
FCC §15.247 (d); §15.209; §15.205;

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	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Ave.
	1MHz	＞1/T Note 2	/	Ave.

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 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.

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng on 2017-08-30 and 2017-08-31.

EUT operation mode: Transmitting (worst case: simultaneous transmission for all the two antennas)

30 MHz-25 GHz:
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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2412 MHz									
467.96	28.14	QP	148	1.2	H	-1.40	26.74	46	19.26
2412.00	74.18	PK	172	2.4	H	33.92	108.10	/	/
2412.00	69.87	Ave.	172	2.4	H	33.92	103.79	/	/
2412.00	85.50	PK	360	2.3	V	33.92	119.42	/	/
2412.00	80.36	Ave.	360	2.3	V	33.92	114.28	/	/
2372.85	26.91	PK	66	1.1	V	33.92	60.83	74	13.17
2372.85	13.22	Ave.	66	1.1	V	33.92	47.14	54	6.86
2382.30	27.34	PK	256	1.3	V	33.92	61.26	74	12.74
2382.30	13.58	Ave.	256	1.3	V	33.92	47.50	54	6.50
2487.03	27.18	PK	160	1.6	V	34.08	61.26	74	12.74
2487.03	13.28	Ave.	160	1.6	V	34.08	47.36	54	6.64
4824.00	44.32	PK	207	1.8	V	5.84	50.16	74	23.84
4824.00	28.74	Ave.	207	1.8	V	5.84	34.58	54	19.42
2417MHz									
467.96	29.23	QP	341	1.1	H	-1.40	27.83	46	18.17
2417.00	77.92	PK	152	1.2	H	33.92	111.84	/	/
2417.00	71.83	Ave.	152	1.2	H	33.92	105.75	/	/
2417.00	85.06	PK	231	1.6	V	33.92	118.98	/	/
2417.00	80.53	Ave.	231	1.6	V	33.92	114.45	/	/
2371.05	26.93	PK	44	1.7	V	33.92	60.85	74	13.15
2371.05	13.22	Ave.	44	1.7	V	33.92	47.14	54	6.86
2377.84	27.28	PK	216	1.4	V	33.92	61.20	74	12.80
2377.84	13.34	Ave.	216	1.4	V	33.92	47.26	54	6.74
2487.76	27.52	PK	12	2.0	V	34.08	61.60	74	12.40
2487.76	13.73	Ave.	12	2.0	V	34.08	47.81	54	6.19
4834.00	43.96	PK	139	2.3	V	5.84	49.80	74	24.20
4834.00	28.72	Ave.	139	2.3	V	5.84	34.56	54	19.44

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2422 MHz									
467.96	28.78	QP	151	2.2	H	-1.40	27.38	46	18.62
2422.00	76.77	PK	280	1.8	H	33.92	110.69	/	/
2422.00	72.76	Ave.	280	1.8	H	33.92	106.68	/	/
2422.00	87.32	PK	260	2.5	V	33.92	121.24	/	/
2422.00	82.75	Ave.	260	2.5	V	33.92	116.67	/	/
2350.72	27.16	PK	226	1.7	V	33.92	61.08	74	12.92
2350.72	13.34	Ave.	226	1.7	V	33.92	47.26	54	6.74
2364.28	26.44	PK	295	1.4	V	33.92	60.36	74	13.64
2364.28	13.11	Ave.	295	1.4	V	33.92	47.03	54	6.97
2493.55	26.46	PK	205	2.1	V	34.08	60.54	74	13.46
2493.55	13.14	Ave.	205	2.1	V	34.08	47.22	54	6.78
4844.00	44.61	PK	129	1.2	V	5.84	50.45	74	23.55
4844.00	28.64	Ave.	129	1.2	V	5.84	34.48	54	19.52
2437MHz									
467.96	28.48	QP	28	1.3	H	-1.40	27.08	46	18.92
2437.00	83.68	PK	313	1.2	H	33.92	117.60	/	/
2437.00	66.94	Ave.	313	1.2	H	33.92	100.86	/	/
2437.00	87.55	PK	73	2.3	V	33.92	121.47	/	/
2437.00	74.83	Ave.	73	2.3	V	33.92	108.75	/	/
2379.55	29.77	PK	287	1.4	V	33.92	63.69	74	10.31
2379.55	15.26	Ave.	287	1.4	V	33.92	49.18	54	4.82
2385.97	28.16	PK	75	2.0	V	33.92	62.08	74	11.92
2385.97	14.08	Ave.	75	2.0	V	33.92	48.00	54	6.00
2491.58	28.54	PK	65	1.4	V	34.08	62.62	74	11.38
2491.58	13.96	Ave.	65	1.4	V	34.08	48.04	54	5.96
4874.00	47.85	PK	270	2.1	V	6.84	54.69	74	19.31
4874.00	32.09	Ave.	270	2.1	V	6.22	38.31	54	15.69

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2452 MHz									
467.96	28.38	QP	242	1.2	H	-1.40	26.98	46	19.02
2452.00	79.23	PK	93	1.1	H	34.08	113.31	/	/
2452.00	75.62	Ave.	93	1.1	H	34.08	109.70	/	/
2452.00	87.67	PK	282	1.7	V	34.08	121.75	/	/
2452.00	83.23	Ave.	282	1.7	V	34.08	117.31	/	/
2322.29	26.86	PK	193	1.4	V	33.83	60.69	74	13.31
2322.29	13.23	Ave.	193	1.4	V	33.83	47.06	54	6.94
2490.64	27.92	PK	131	2.3	V	34.08	62.00	74	12.00
2490.64	14.12	Ave.	131	2.3	V	34.08	48.20	54	5.80
2493.25	26.89	PK	181	1.4	V	34.08	60.97	74	13.03
2493.25	13.26	Ave.	181	1.4	V	34.08	47.34	54	6.66
4904.00	45.10	PK	81	1.2	V	6.21	51.31	74	22.69
4904.00	28.92	Ave.	81	1.2	V	6.21	35.13	54	18.87
2462 MHz									
467.96	29.30	QP	330	1.4	H	-1.40	27.90	46	18.10
2462.00	85.34	PK	119	2.3	H	34.08	119.42	/	/
2462.00	69.82	Ave.	119	2.3	H	34.08	103.90	/	/
2462.00	87.42	PK	49	1.0	V	34.08	121.50	/	/
2462.00	72.11	Ave.	49	1.0	V	34.08	106.19	/	/
2379.47	27.46	PK	156	1.2	V	33.92	61.38	74	12.62
2379.47	13.92	Ave.	156	1.2	V	33.92	47.84	54	6.16
2495.73	28.40	PK	325	1.1	V	34.08	62.48	74	11.52
2495.73	14.47	Ave.	325	1.1	V	34.08	48.55	54	5.45
2483.55	29.57	PK	129	1.5	V	34.08	63.65	74	10.35
2483.55	14.73	Ave.	129	1.5	V	34.08	48.81	54	5.19
4924.00	45.04	PK	314	2.1	V	6.21	51.25	74	22.75
4924.00	30.27	Ave.	314	2.1	V	6.21	36.48	54	17.52

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2412 MHz									
467.96	28.09	QP	295	1.0	H	-1.40	26.69	46	19.31
2412.00	71.12	PK	146	1.8	H	33.92	105.04	/	/
2412.00	61.32	Ave.	146	1.8	H	33.92	95.24	/	/
2412.00	82.75	PK	219	2.5	V	33.92	116.67	/	/
2412.00	72.63	Ave.	219	2.5	V	33.92	106.55	/	/
2370.92	28.00	PK	356	1.5	V	33.92	61.92	74	12.08
2370.92	13.94	Ave.	356	1.5	V	33.92	47.86	54	6.14
2384.38	28.87	PK	78	1.9	V	33.92	62.79	74	11.21
2384.38	13.89	Ave.	78	1.9	V	33.92	47.81	54	6.19
2495.96	27.76	PK	289	2.4	V	34.08	61.84	74	12.16
2495.96	13.36	Ave.	289	2.4	V	34.08	47.44	54	6.56
4824.00	44.07	PK	236	1.8	V	5.84	49.91	74	24.09
4824.00	28.93	Ave.	236	1.8	V	5.84	34.77	54	19.23
2417MHz									
467.96	27.67	QP	148	2.3	H	-1.40	26.27	46	19.73
2417.00	73.12	PK	120	1.4	H	33.92	107.04	/	/
2417.00	62.57	Ave.	120	1.4	H	33.92	96.49	/	/
2417.00	80.37	PK	181	1.1	V	33.92	114.29	/	/
2417.00	70.35	Ave.	181	1.1	V	33.92	104.27	/	/
2323.46	28.58	PK	47	1.7	V	33.83	62.41	74	11.59
2323.46	14.47	Ave.	47	1.7	V	33.83	48.30	54	5.70
2339.81	26.38	PK	239	1.4	V	33.83	60.21	74	13.79
2339.81	13.22	Ave.	239	1.4	V	33.83	47.05	54	6.95
2494.17	26.82	PK	214	1.2	V	34.08	60.90	74	13.10
2494.17	13.11	Ave.	214	1.2	V	34.08	47.19	54	6.81
4834.00	43.19	PK	343	2.5	V	5.84	49.03	74	24.97
4834.00	28.45	Ave.	343	2.5	V	5.84	34.29	54	19.71

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2422 MHz									
467.96	28.35	QP	243	2.0	H	-1.40	26.95	46	19.05
2422.00	74.86	PK	96	1.5	H	33.92	108.78	/	/
2422.00	64.23	Ave.	96	1.5	H	33.92	98.15	/	/
2422.00	82.98	PK	50	2.1	V	33.92	116.90	/	/
2422.00	71.79	Ave.	50	2.1	V	33.92	105.71	/	/
2376.05	26.89	PK	67	1.8	V	33.92	60.81	74	13.19
2376.05	13.24	Ave.	67	1.8	V	33.92	47.16	54	6.84
2382.94	27.47	PK	313	1.3	V	33.92	61.39	74	12.61
2382.94	13.64	Ave.	313	1.3	V	33.92	47.56	54	6.44
2491.23	27.31	PK	240	1.9	V	34.08	61.39	74	12.61
2491.23	13.56	Ave.	240	1.9	V	34.08	47.64	54	6.36
4844.00	43.62	PK	351	2.4	V	5.84	49.46	74	24.54
4844.00	28.57	Ave.	351	2.4	V	5.84	34.41	54	19.59
2427 MHz									
467.96	28.54	QP	146	1.8	H	-1.40	27.14	46	18.86
2427.00	76.97	PK	211	1.8	H	33.92	110.89	/	/
2427.00	65.28	Ave.	211	1.8	H	33.92	99.20	/	/
2427.00	83.33	PK	116	1.5	V	33.92	117.25	/	/
2427.00	73.49	Ave.	116	1.5	V	33.92	107.41	/	/
2367.39	27.84	PK	198	2.4	V	33.92	61.76	74	12.24
2367.39	14.11	Ave.	198	2.4	V	33.92	48.03	54	5.97
2374.75	27.34	PK	65	1.0	V	33.92	61.26	74	12.74
2374.75	13.58	Ave.	65	1.0	V	33.92	47.50	54	6.50
2496.35	27.11	PK	344	1.2	V	34.08	61.19	74	12.81
2496.35	13.36	Ave.	344	1.2	V	34.08	47.44	54	6.56
4854.00	43.77	PK	13	1.8	V	6.21	49.98	74	24.02
4854.00	28.49	Ave.	13	1.8	V	6.21	34.70	54	19.30

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2432 MHz									
467.96	28.27	QP	181	2.4	H	-1.40	26.87	46	19.13
2432.00	71.87	PK	1	1.6	H	33.92	105.79	/	/
2432.00	62.26	Ave.	1	1.6	H	33.92	96.18	/	/
2432.00	84.97	PK	211	2.3	V	33.92	118.89	/	/
2432.00	74.67	Ave.	211	2.3	V	33.92	108.59	/	/
2364.55	27.52	PK	76	2.4	V	33.92	61.44	74	12.56
2364.55	13.78	Ave.	76	2.4	V	33.92	47.70	54	6.30
2384.43	26.94	PK	278	1.7	V	33.92	60.86	74	13.14
2384.43	13.27	Ave.	278	1.7	V	33.92	47.19	54	6.81
2485.21	27.11	PK	92	1.3	V	34.08	61.19	74	12.81
2485.21	13.26	Ave.	92	1.3	V	34.08	47.34	54	6.66
4864.00	44.15	PK	146	1.6	V	6.21	50.36	74	23.64
4864.00	28.57	Ave.	146	1.6	V	6.21	34.78	54	19.22
2437MHz									
467.96	27.96	QP	175	1.9	H	-1.40	26.56	46	19.44
2437.00	72.68	PK	193	2.1	H	33.92	106.60	/	/
2437.00	65.87	Ave.	193	2.1	H	33.92	99.79	/	/
2437.00	86.06	PK	196	2.2	V	33.92	119.98	/	/
2437.00	76.16	Ave.	196	2.2	V	33.92	110.08	/	/
2385.94	28.11	PK	317	1.8	V	33.92	62.03	74	11.97
2385.94	14.05	Ave.	317	1.8	V	33.92	47.97	54	6.03
2393.69	27.08	PK	173	2.5	V	33.92	61.00	74	13.00
2393.69	13.11	Ave.	173	2.5	V	33.92	47.03	54	6.97
2495.76	27.89	PK	2	2.1	V	34.08	61.97	74	12.03
2495.76	14.06	Ave.	2	2.1	V	34.08	48.14	54	5.86
4874.00	48.09	PK	222	2.3	V	6.84	54.93	74	19.07
4874.00	33.51	Ave.	222	2.3	V	6.22	39.73	54	14.27

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2447 MHz									
467.96	27.68	QP	139	1.1	H	-1.40	26.28	46	19.72
2447.00	74.74	PK	25	2.2	H	33.92	108.66	/	/
2447.00	62.43	Ave.	25	2.2	H	33.92	96.35	/	/
2447.00	83.80	PK	97	1.5	V	33.92	117.72	/	/
2447.00	71.25	Ave.	97	1.5	V	33.92	105.17	/	/
2351.36	28.73	PK	283	1.4	V	33.92	62.65	74	11.35
2351.36	14.06	Ave.	283	1.4	V	33.92	47.98	54	6.02
2483.55	28.66	PK	138	2.3	V	34.08	62.74	74	11.26
2483.55	14.70	Ave.	138	2.3	V	34.08	48.78	54	5.22
2484.63	27.10	PK	185	1.8	V	34.08	61.18	74	12.82
2484.63	13.83	Ave.	185	1.8	V	34.08	47.91	54	6.09
4894.00	43.86	PK	319	1.8	V	6.21	50.07	74	23.93
4894.00	28.73	Ave.	319	1.8	V	6.21	34.94	54	19.06
2452 MHz									
467.96	29.00	QP	14	1.5	H	-1.40	27.60	46	18.40
2452.00	76.61	PK	135	1.5	H	34.08	110.69	/	/
2452.00	66.52	Ave.	135	1.5	H	34.08	100.60	/	/
2452.00	82.70	PK	257	1.9	V	34.08	116.78	/	/
2452.00	70.36	Ave.	257	1.9	V	34.08	104.44	/	/
2360.98	27.46	PK	311	1.5	V	33.92	61.38	74	12.62
2360.98	13.69	Ave.	311	1.5	V	33.92	47.61	54	6.39
2484.72	33.18	PK	67	1.0	V	34.08	67.26	74	6.74
2484.72	16.12	Ave.	67	1.0	V	34.08	50.20	54	3.80
2485.51	32.11	PK	136	2.3	V	34.08	66.19	74	7.81
2485.51	14.80	Ave.	136	2.3	V	34.08	48.88	54	5.12
4904.00	43.12	PK	247	1.2	V	6.21	49.33	74	24.67
4904.00	27.85	Ave.	247	1.2	V	6.21	34.06	54	19.94

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2457 MHz									
467.96	28.27	QP	345	1.4	H	-1.40	26.87	46	19.13
2457.00	73.52	PK	44	2.0	H	34.08	107.60	/	/
2457.00	63.14	Ave.	44	2.0	H	34.08	97.22	/	/
2457.00	83.68	PK	18	1.2	V	34.08	117.76	/	/
2457.00	72.83	Ave.	18	1.2	V	34.08	106.91	/	/
2327.63	27.55	PK	346	1.7	V	33.83	61.38	74	12.62
2327.63	13.78	Ave.	346	1.7	V	33.83	47.61	54	6.39
2490.11	31.19	PK	211	1.0	V	34.08	65.27	74	8.73
2490.11	15.56	Ave.	211	1.0	V	34.08	49.64	54	4.36
2491.13	29.19	PK	155	1.1	V	34.08	63.27	74	10.73
2491.13	14.60	Ave.	155	1.1	V	34.08	48.68	54	5.32
4914.00	44.04	PK	194	2.0	V	6.21	50.25	74	23.75
4914.00	28.61	Ave.	194	2.0	V	6.21	34.82	54	19.18
2462 MHz									
467.96	29.23	QP	303	2.3	H	-1.40	27.83	46	18.17
2462.00	72.17	PK	64	1.9	H	34.08	106.25	/	/
2462.00	61.94	Ave.	64	1.9	H	34.08	96.02	/	/
2462.00	81.05	PK	195	1.2	V	34.08	115.13	/	/
2462.00	70.26	Ave.	195	1.2	V	34.08	104.34	/	/
2386.83	28.09	PK	141	1.6	V	33.92	62.01	74	11.99
2386.83	13.93	Ave.	141	1.6	V	33.92	47.85	54	6.15
2483.56	28.14	PK	133	2.0	V	34.08	62.22	74	11.78
2483.56	13.86	Ave.	133	2.0	V	34.08	47.94	54	6.06
2490.21	28.42	PK	44	2.0	V	34.08	62.50	74	11.50
2490.21	14.02	Ave.	44	2.0	V	34.08	48.10	54	5.90
4924.00	43.68	PK	19	2.5	V	6.21	49.89	74	24.11
4924.00	28.55	Ave.	19	2.5	V	6.21	34.76	54	19.24

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2412 MHz									
467.96	28.60	QP	138	1.4	H	-1.40	27.20	46	18.80
2412.00	70.45	PK	120	2.2	H	33.92	104.37	/	/
2412.00	59.11	Ave.	120	2.2	H	33.92	93.03	/	/
2412.00	81.12	PK	152	2.4	V	33.92	115.04	/	/
2412.00	70.73	Ave.	152	2.4	V	33.92	104.65	/	/
2387.45	29.01	PK	354	2.4	V	33.92	62.93	74	11.07
2387.45	15.74	Ave.	354	2.4	V	33.92	49.66	54	4.34
2389.11	28.94	PK	35	2.0	V	33.92	62.86	74	11.14
2389.11	15.36	Ave.	35	2.0	V	33.92	49.28	54	4.72
2486.21	27.06	PK	257	1.4	V	34.08	61.14	74	12.86
2486.21	13.34	Ave.	257	1.4	V	34.08	47.42	54	6.58
4824.00	43.71	PK	136	1.2	V	5.84	49.55	74	24.45
4824.00	28.47	Ave.	136	1.2	V	5.84	34.31	54	19.69
2417MHz									
467.96	28.43	QP	308	2.1	H	-1.40	27.03	46	18.97
2417.00	70.75	PK	265	1.7	H	33.92	104.67	/	/
2417.00	61.34	Ave.	265	1.7	H	33.92	95.26	/	/
2417.00	82.25	PK	196	2.0	V	33.92	116.17	/	/
2417.00	71.98	Ave.	196	2.0	V	33.92	105.90	/	/
2383.62	31.65	PK	303	2.2	V	33.92	65.57	74	8.43
2383.62	14.64	Ave.	303	2.2	V	33.92	48.56	54	5.44
2386.32	32.14	PK	32	1.7	V	33.92	66.06	74	7.94
2386.32	14.84	Ave.	32	1.7	V	33.92	48.76	54	5.24
2483.66	26.84	PK	330	1.7	V	34.08	60.92	74	13.08
2483.66	13.26	Ave.	330	1.7	V	34.08	47.34	54	6.66
4834.00	43.51	PK	147	1.2	V	5.84	49.35	74	24.65
4834.00	28.28	Ave.	147	1.2	V	5.84	34.12	54	19.88

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2422 MHz									
467.96	28.70	QP	196	1.7	H	-1.40	27.30	46	18.70
2422.00	72.68	PK	281	1.4	H	33.92	106.60	/	/
2422.00	62.54	Ave.	281	1.4	H	33.92	96.46	/	/
2422.00	81.31	PK	58	2.3	V	33.92	115.23	/	/
2422.00	69.08	Ave.	58	2.3	V	33.92	103.00	/	/
2381.34	28.11	PK	163	1.7	V	33.92	62.03	74	11.97
2381.34	14.27	Ave.	163	1.7	V	33.92	48.19	54	5.81
2388.39	30.90	PK	228	1.6	V	33.92	64.82	74	9.18
2388.39	14.32	Ave.	228	1.6	V	33.92	48.24	54	5.76
2489.05	27.09	PK	21	2.3	V	34.08	61.17	74	12.83
2489.05	13.24	Ave.	21	2.3	V	34.08	47.32	54	6.68
4844.00	44.09	PK	125	2.3	V	5.84	49.93	74	24.07
4844.00	28.57	Ave.	125	2.3	V	5.84	34.41	54	19.59
2427 MHz									
467.96	29.23	QP	185	2.1	H	-1.40	27.83	46	18.17
2427.00	71.51	PK	111	2.4	H	33.92	105.43	/	/
2427.00	60.93	Ave.	111	2.4	H	33.92	94.85	/	/
2427.00	81.12	PK	271	1.2	V	33.92	115.04	/	/
2427.00	70.12	Ave.	271	1.2	V	33.92	104.04	/	/
2385.03	32.17	PK	67	2.1	V	33.92	66.09	74	7.91
2385.03	15.55	Ave.	67	2.1	V	33.92	49.47	54	4.53
2387.27	32.57	PK	281	1.6	V	33.92	66.49	74	7.51
2387.27	15.79	Ave.	281	1.6	V	33.92	49.71	54	4.29
2484.26	30.64	PK	159	2.3	V	34.08	64.72	74	9.28
2484.26	14.50	Ave.	159	2.3	V	34.08	48.58	54	5.42
4854.00	43.92	PK	341	1.7	V	6.21	50.13	74	23.87
4854.00	28.53	Ave.	341	1.7	V	6.21	34.74	54	19.26

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2432 MHz									
467.96	28.74	QP	113	1.1	H	-1.40	27.34	46	18.66
2432.00	72.61	PK	118	1.2	H	33.92	106.53	/	/
2432.00	58.41	Ave.	118	1.2	H	33.92	92.33	/	/
2432.00	83.12	PK	41	2.1	V	33.92	117.04	/	/
2432.00	69.06	Ave.	41	2.1	V	33.92	102.98	/	/
2387.75	36.34	PK	71	1.7	V	33.92	70.26	74	3.74
2387.75	16.02	Ave.	71	1.7	V	33.92	49.94	54	4.06
2389.19	37.73	PK	207	1.1	V	33.92	71.65	74	2.35
2389.19	16.37	Ave.	207	1.1	V	33.92	50.29	54	3.71
2487.15	31.54	PK	334	2.3	V	34.08	65.62	74	8.38
2487.15	14.68	Ave.	334	2.3	V	34.08	48.76	54	5.24
4864.00	31.04	PK	164	1.9	V	6.21	37.25	74	36.75
4864.00	29.37	Ave.	164	1.9	V	6.21	35.58	54	18.42
2437MHz									
467.96	29.17	QP	142	2.2	H	-1.40	27.77	46	18.23
2437.00	82.05	PK	249	2.0	H	33.92	115.97	/	/
2437.00	74.92	Ave.	249	2.0	H	33.92	108.84	/	/
2437.00	85.55	PK	163	1.5	V	33.92	119.47	/	/
2437.00	78.82	Ave.	163	1.5	V	33.92	112.74	/	/
2386.97	29.06	PK	260	1.3	V	33.92	62.98	74	11.02
2386.97	15.24	Ave.	260	1.3	V	33.92	49.16	54	4.84
2392.58	28.34	PK	142	2.3	V	33.92	62.26	74	11.74
2392.58	14.05	Ave.	142	2.3	V	33.92	47.97	54	6.03
2493.67	28.24	PK	175	2.4	V	34.08	62.32	74	11.68
2493.67	13.05	Ave.	175	2.4	V	34.08	47.13	54	6.87
4874.00	47.24	PK	22	1.2	V	6.84	54.08	74	19.92
4874.00	31.05	Ave.	22	1.2	V	6.22	37.27	54	16.73

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2447MHz									
467.96	29.22	QP	203	2.3	H	-1.40	27.82	46	18.18
2447.00	76.64	PK	1	2.0	H	33.92	110.56	/	/
2447.00	64.09	Ave.	1	2.0	H	33.92	98.01	/	/
2447.00	84.04	PK	100	2.2	V	33.92	117.96	/	/
2447.00	73.56	Ave.	100	2.2	V	33.92	107.48	/	/
2385.67	30.31	PK	324	1.6	V	33.92	64.23	74	9.77
2385.67	15.67	Ave.	324	1.6	V	33.92	49.59	54	4.41
2483.96	32.27	PK	22	1.8	V	34.08	66.35	74	7.65
2483.96	16.92	Ave.	22	1.8	V	34.08	51.00	54	3.00
2485.31	34.65	PK	229	2.4	V	34.08	68.73	74	5.27
2485.31	16.27	Ave.	229	2.4	V	34.08	50.35	54	3.65
4894.00	44.82	PK	180	1.9	V	6.21	51.03	74	22.97
4894.00	28.74	Ave.	180	1.9	V	6.21	34.95	54	19.05
2452 MHz									
467.96	27.86	QP	20	1.5	H	-1.40	26.46	46	19.54
2452.00	71.63	PK	39	1.6	H	34.08	105.71	/	/
2452.00	61.43	Ave.	39	1.6	H	34.08	95.51	/	/
2452.00	81.99	PK	288	1.8	V	34.08	116.07	/	/
2452.00	70.37	Ave.	288	1.8	V	34.08	104.45	/	/
2358.41	27.18	PK	311	2.2	V	33.92	61.10	74	12.90
2358.41	13.36	Ave.	311	2.2	V	33.92	47.28	54	6.72
2484.69	36.06	PK	191	2.0	V	34.08	70.14	74	3.86
2484.69	15.84	Ave.	191	2.0	V	34.08	49.92	54	4.08
2485.71	32.41	PK	348	1.8	V	34.08	66.49	74	7.51
2485.71	15.77	Ave.	348	1.8	V	34.08	49.85	54	4.15
4904.00	45.37	PK	136	1.6	V	6.21	51.58	74	22.42
4904.00	28.49	Ave.	136	1.6	V	6.21	34.70	54	19.30

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2457 MHz									
467.96	28.05	QP	89	1.8	H	-1.40	26.65	46	19.35
2457.00	73.72	PK	62	1.4	H	34.08	107.80	/	/
2457.00	60.36	Ave.	62	1.4	H	34.08	94.44	/	/
2457.00	81.16	PK	196	1.6	V	34.08	115.24	/	/
2457.00	68.63	Ave.	196	1.6	V	34.08	102.71	/	/
2355.69	27.35	PK	99	1.6	V	33.92	61.27	74	12.73
2355.69	13.48	Ave.	99	1.6	V	33.92	47.40	54	6.60
2484.42	31.64	PK	180	1.6	V	34.08	65.72	74	8.28
2484.42	15.75	Ave.	180	1.6	V	34.08	49.83	54	4.17
2488.06	31.54	PK	99	1.0	V	34.08	65.62	74	8.38
2488.06	15.69	Ave.	99	1.0	V	34.08	49.77	54	4.23
4914.00	43.62	PK	11	1.1	V	6.21	49.83	74	24.17
4914.00	28.23	Ave.	11	1.1	V	6.21	34.44	54	19.56
2462 MHz									
467.96	29.30	QP	116	2.1	H	-1.40	27.90	46	18.10
2462.00	71.70	PK	302	1.3	H	34.08	105.78	/	/
2462.00	61.12	Ave.	302	1.3	H	34.08	95.20	/	/
2462.00	80.68	PK	230	1.4	V	34.08	114.76	/	/
2462.00	69.37	Ave.	230	1.4	V	34.08	103.45	/	/
2375.41	29.63	PK	280	1.4	V	33.92	63.55	74	10.45
2375.41	13.94	Ave.	280	1.4	V	33.92	47.86	54	6.14
2483.57	28.97	PK	30	2.0	V	34.08	63.05	74	10.95
2483.57	15.68	Ave.	30	2.0	V	34.08	49.76	54	4.24
2486.52	28.66	PK	113	2.2	V	34.08	62.74	74	11.26
2486.52	14.99	Ave.	113	2.2	V	34.08	49.07	54	4.93
4924.00	44.19	PK	148	1.3	V	6.21	50.40	74	23.60
4924.00	28.94	Ave.	148	1.3	V	6.21	35.15	54	18.85

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2422 MHz									
467.96	28.56	QP	212	2.4	H	-1.40	27.16	46	18.84
2422.00	70.49	PK	120	2.2	H	33.92	104.41	/	/
2422.00	58.56	Ave.	120	2.2	H	33.92	92.48	/	/
2422.00	79.41	PK	191	2.2	V	33.92	113.33	/	/
2422.00	66.70	Ave.	191	2.2	V	33.92	100.62	/	/
2375.73	28.61	PK	345	2.2	V	33.92	62.53	74	11.47
2375.73	13.85	Ave.	345	2.2	V	33.92	47.77	54	6.23
2355.85	27.16	PK	55	2.3	V	33.92	61.08	74	12.92
2355.85	13.82	Ave.	55	2.3	V	33.92	47.74	54	6.26
2495.61	27.18	PK	267	2.3	V	34.08	61.26	74	12.74
2495.61	13.27	Ave.	267	2.3	V	34.08	47.35	54	6.65
4844.00	44.18	PK	318	2.0	V	5.84	50.02	74	23.98
4844.00	28.74	Ave.	318	2.0	V	5.84	34.58	54	19.42
2427 MHz									
467.96	27.98	QP	133	1.4	H	-1.40	26.58	46	19.42
2427.00	67.56	PK	213	2.4	H	33.92	101.48	/	/
2427.00	54.34	Ave.	213	2.4	H	33.92	88.26	/	/
2427.00	81.02	PK	99	1.0	V	33.92	114.94	/	/
2427.00	65.36	Ave.	99	1.0	V	33.92	99.28	/	/
2384.86	28.50	PK	264	1.8	V	33.92	62.42	74	11.58
2384.86	17.25	Ave.	264	1.8	V	33.92	51.17	54	2.83
2388.23	31.64	PK	260	1.9	V	33.92	65.56	74	8.44
2388.23	18.06	Ave.	260	1.9	V	33.92	51.98	54	2.02
2488.69	27.10	PK	196	1.6	V	34.08	61.18	74	12.82
2488.69	13.32	Ave.	196	1.6	V	34.08	47.40	54	6.60
4854.00	43.84	PK	90	2.1	V	6.21	50.05	74	23.95
4854.00	28.56	Ave.	90	2.1	V	6.21	34.77	54	19.23

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2432 MHz									
467.96	27.85	QP	143	1.5	H	-1.40	26.45	46	19.55
2432.00	70.04	PK	347	1.1	H	33.92	103.96	/	/
2432.00	59.29	Ave.	347	1.1	H	33.92	93.21	/	/
2432.00	81.37	PK	272	2.3	V	33.92	115.29	/	/
2432.00	69.48	Ave.	272	2.3	V	33.92	103.40	/	/
2387.27	27.51	PK	43	1.8	V	33.92	61.43	74	12.57
2387.27	16.53	Ave.	43	1.8	V	33.92	50.45	54	3.55
2389.51	31.54	PK	196	2.2	V	33.92	65.46	74	8.54
2389.51	17.70	Ave.	196	2.2	V	33.92	51.62	54	2.38
2487.63	27.43	PK	131	1.7	V	34.08	61.51	74	12.49
2487.63	13.68	Ave.	131	1.7	V	34.08	47.76	54	6.24
4864.00	43.85	PK	250	1.3	V	6.21	50.06	74	23.94
4864.00	28.50	Ave.	250	1.3	V	6.21	34.71	54	19.29
2437 MHz									
467.96	28.42	QP	52	2.3	H	-1.40	27.02	46	18.98
2437.00	72.28	PK	50	1.9	H	33.92	106.20	/	/
2437.00	61.56	Ave.	50	1.9	H	33.92	95.48	/	/
2437.00	83.44	PK	193	2.2	V	33.92	117.36	/	/
2437.00	71.82	Ave.	193	2.2	V	33.92	105.74	/	/
2384.22	31.27	PK	318	1.9	V	33.92	65.19	74	8.81
2384.22	15.73	Ave.	318	1.9	V	33.92	49.65	54	4.35
2386.79	30.97	PK	82	1.1	V	33.92	64.89	74	9.11
2386.79	15.67	Ave.	82	1.1	V	33.92	49.59	54	4.41
2483.86	32.80	PK	281	1.9	V	34.08	66.88	74	7.12
2483.86	17.45	Ave.	281	1.9	V	34.08	51.53	54	2.47
4874.00	43.85	PK	131	1.9	V	6.21	50.06	74	23.94
4874.00	28.27	Ave.	131	1.9	V	6.21	34.48	54	19.52

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2442MHz									
467.96	27.79	QP	35	2.5	H	-1.4	26.39	46	19.61
2442	70.36	PK	177	1.5	H	33.92	104.28	/	/
2442	59.1	Ave.	177	1.5	H	33.92	93.02	/	/
2442	81.93	PK	122	2.1	V	33.92	115.85	/	/
2442	69.15	Ave.	122	2.1	V	33.92	103.07	/	/
2368.99	27.4	PK	146	1.6	V	33.92	61.32	74	12.68
2368.99	14.29	Ave.	146	1.6	V	33.92	48.21	54	5.79
2388.87	28.45	PK	131	1.4	V	33.92	62.37	74	11.63
2388.87	14.54	Ave.	131	1.4	V	33.92	48.46	54	5.54
2485.84	33.96	PK	176	1.6	V	34.08	68.04	74	5.96
2485.84	18.01	Ave.	176	1.6	V	34.08	52.09	54	1.91
4884	44.21	PK	258	1.5	V	6.21	50.42	74	23.58
4884	28.32	Ave.	258	1.5	V	6.21	34.53	54	19.47
2447MHz									
467.96	30.15	QP	344	1.6	H	-1.4	26.62	46	19.38
2447	70.18	PK	192	2	H	33.92	104.1	/	/
2447	57.84	Ave.	192	2	H	33.92	91.76	/	/
2447	78.71	PK	113	1.1	V	33.92	112.63	/	/
2447	65.49	Ave.	113	1.1	V	33.92	99.41	/	/
2388.87	27.28	PK	86	2.1	V	33.92	61.2	74	12.8
2388.87	13.46	Ave.	86	2.1	V	33.92	47.38	54	6.62
2483.56	29.11	PK	54	1.4	V	34.08	63.19	74	10.81
2483.56	15.66	Ave.	54	1.4	V	34.08	49.74	54	4.26
2484.88	29.56	PK	168	2.4	V	34.08	63.64	74	10.36
2484.88	14.97	Ave.	168	2.4	V	34.08	49.05	54	4.95
4894	44.34	PK	281	2.1	V	6.21	50.55	74	23.45
4894	28.47	Ave.	281	2.1	V	6.21	34.68	54	19.32

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 (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
2452 MHz									
467.96	29.21	QP	157	1.4	H	-1.40	27.81	46	18.19
2452.00	70.11	PK	3	1.4	H	34.08	104.19	/	/
2452.00	57.83	Ave.	3	1.4	H	34.08	91.91	/	/
2452.00	78.87	PK	345	2.0	V	34.08	112.95	/	/
2452.00	67.43	Ave.	345	2.0	V	34.08	101.51	/	/
2356.62	27.54	PK	61	2.5	V	33.92	61.46	74	12.54
2356.62	13.84	Ave.	61	2.5	V	33.92	47.76	54	6.24
2483.53	29.12	PK	296	2.2	V	34.08	63.20	74	10.80
2483.53	14.62	Ave.	296	2.2	V	34.08	48.70	54	5.30
2484.61	28.52	PK	193	1.6	V	34.08	62.60	74	11.40
2484.61	14.13	Ave.	193	1.6	V	34.08	48.21	54	5.79
4904.00	43.97	PK	257	1.7	V	6.21	50.18	74	23.82
4904.00	28.60	Ave.	257	1.7	V	6.21	34.81	54	19.19

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude
The other spurious emission which is 20dB to the limit was not recorded.

For 2.4G (802.11n-HT40 mode -2442MHz) & 5G (802.11ac20 mode -5785MHz)simultaneous transmission:
According the data of above the 802.11n-HT40 mode -2442MHz is the worst case of 2.4G
And the 5G report had shown the worst case is 802.11ac20 mode -5785MHz.

Frequency	Receiver		Turntable	Rx Antenna		Corrected Factor （dB/m）	Corrected Amplitude (dBuV/m)	FCC Part 15.209	
(MHz)	Reading (dBμV)	Detector (PK/QP/ Ave.)	Degree	Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
31.69	28.61	QP	10	1.09	V	-1.7	26.91	40.00	13.09
62.15	42.11	QP	205	1.84	V	-13.7	28.41	40.00	11.59
169.05	38.27	QP	71	1.24	H	-6.7	31.57	43.50	11.93
173.55	37.72	QP	45	1.13	H	-6.9	30.82	43.50	12.68
837.04	26.91	QP	179	2.49	H	9.8	36.71	46.00	9.29
853.06	23.99	QP	327	1.73	V	11	34.99	46.00	11.01
2476.99	46.81	PK	270	2.3	V	-0.62	46.19	74	27.81
2476.99	27.82	Ave.	270	2.3	V	-0.62	27.20	54	26.80
1942.76	48.95	PK	192	1.1	V	-5.17	43.78	74	30.22
1942.76	29.55	Ave.	192	1.1	V	-5.17	24.38	54	29.62

Note：
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor（RX）+cable loss – amplifier factor
Margin = Limit- Corr. Amplitude

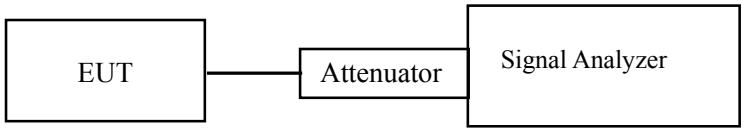
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng from 2017-07-22 to 2017-08-23.

Test Result: Pass.

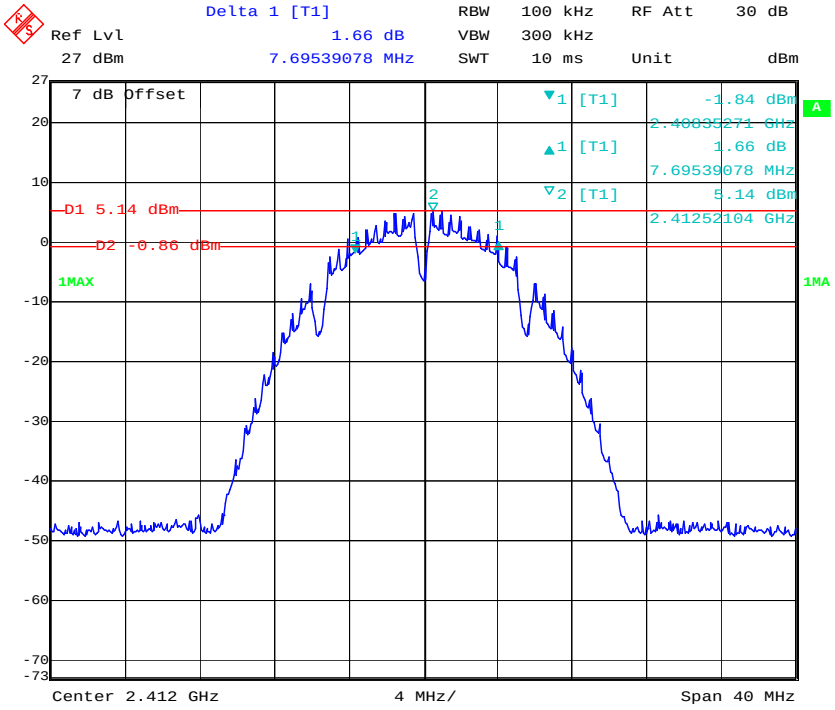
Please refer to the following table and plots.

EUT operation mode: Transmitting

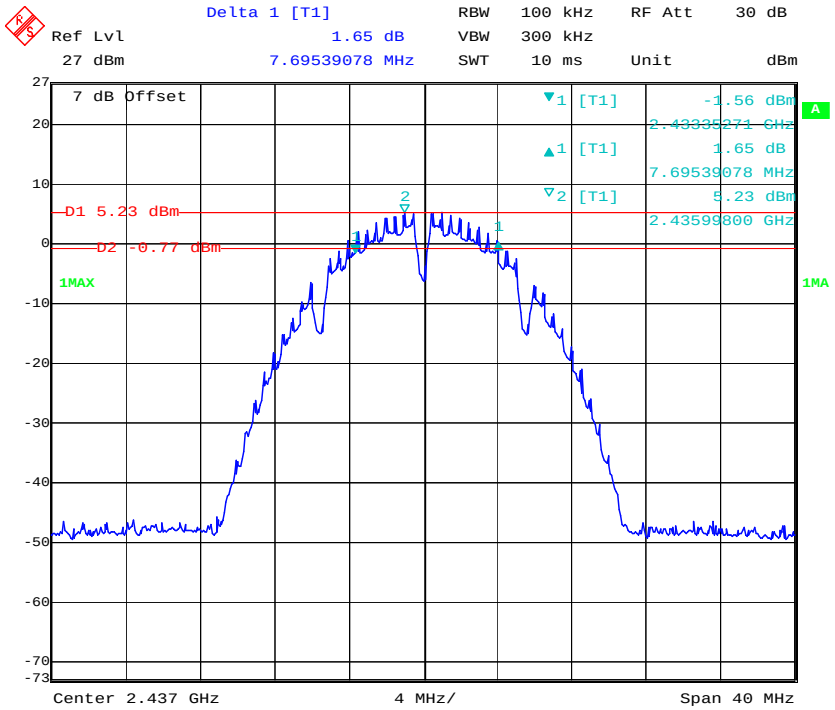
Antenna 0

Channel	Frequency (MHz)	6 dB Emission Bandwidth	99% Occupied Bandwidth	Limit (kHz)
		(MHz)		
802.11b mode				
Low	2412	7.70	12.91	≥500
Middle	2437	7.70	12.83	≥500
High	2462	8.10	12.91	≥500
802.11g				
Low	2412	16.43	16.91	≥500
Middle	2437	16.43	16.91	≥500
High	2462	16.43	16.91	≥500
802.11n-HT20 mode				
Low	2412	17.64	18.04	≥500
Middle	2437	17.72	18.04	≥500
High	2462	17.64	18.04	≥500
802.11n-HT40 mode				
Low	2422	35.91	37.19	≥500
Middle	2437	35.91	37.19	≥500
High	2452	35.91	37.19	≥500

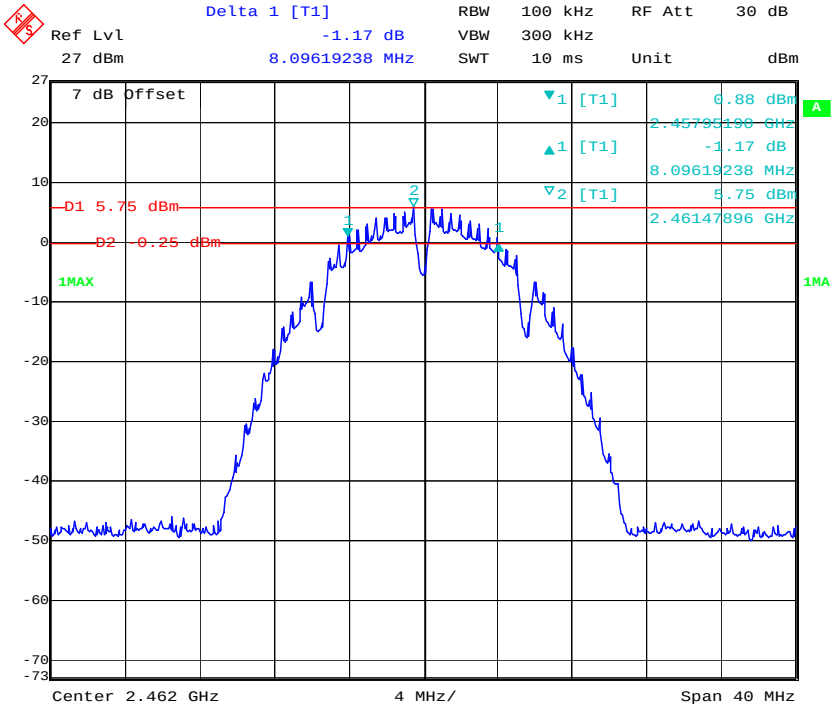
6 dB Emission Bandwidth, 802.11b Low Channel



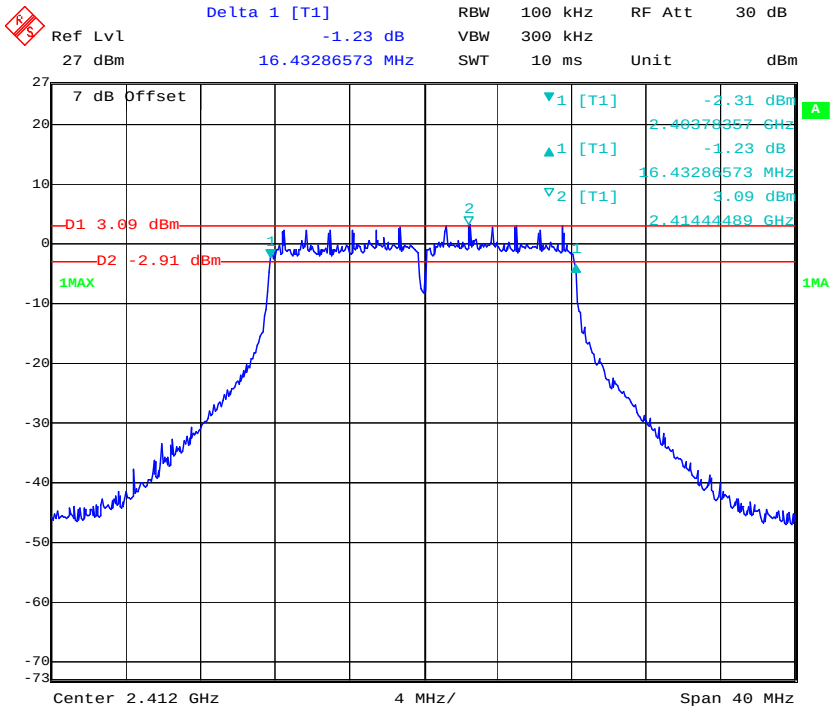
6 dB Emission Bandwidth, 802.11b Middle Channel



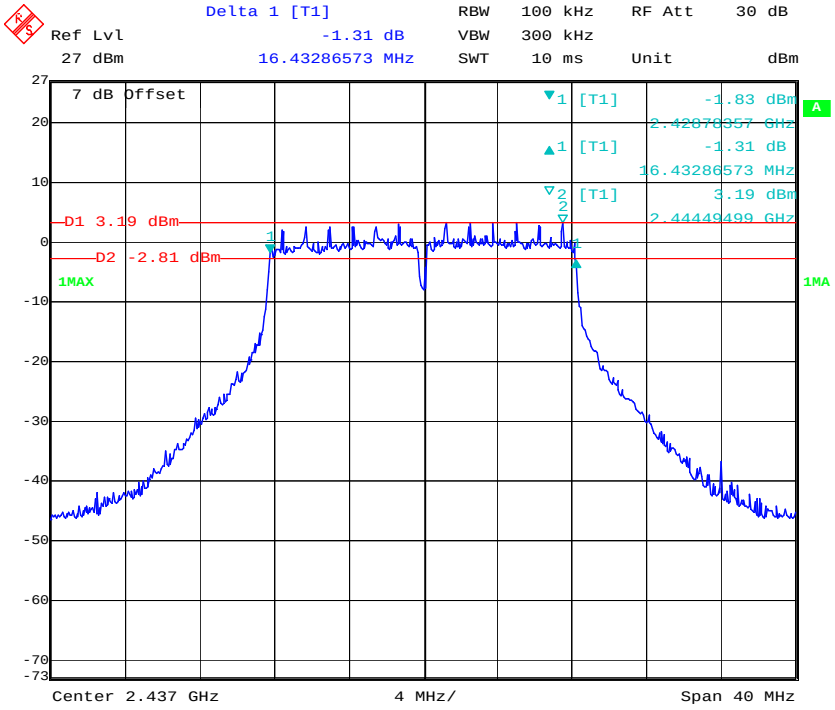
6 dB Emission Bandwidth, 802.11b High Channel



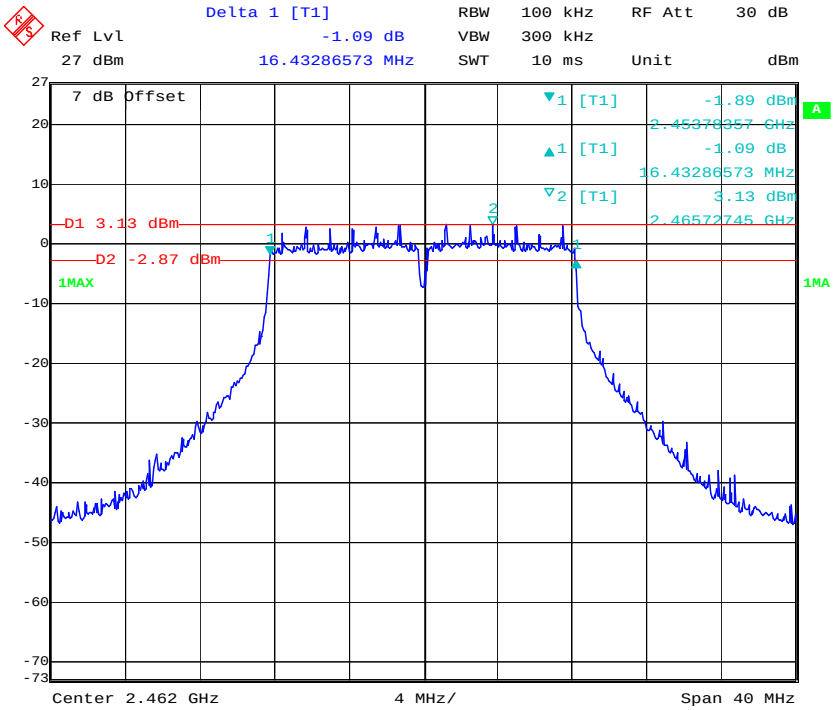
6 dB Emission Bandwidth, 802.11g Low Channel



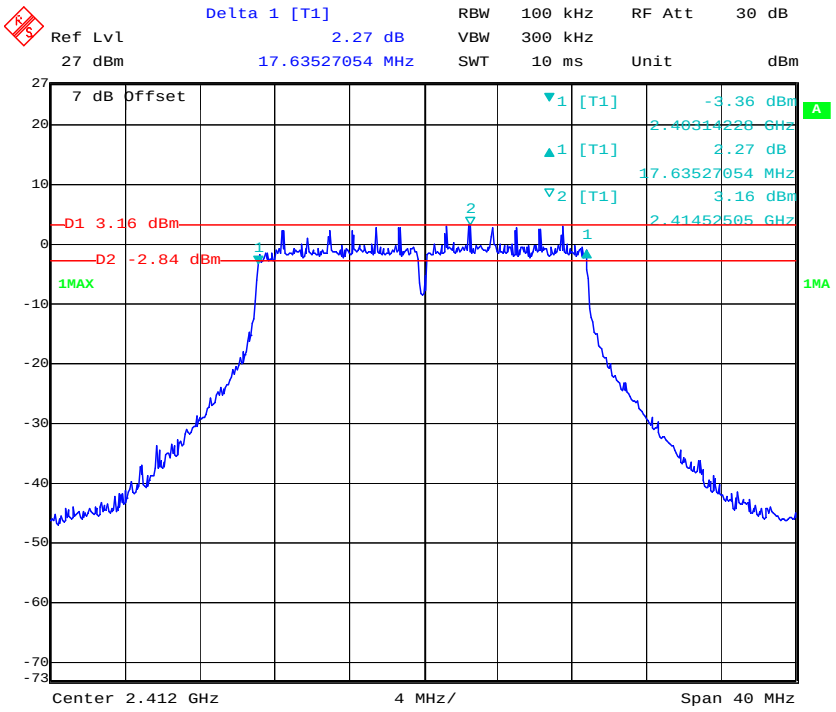
6 dB Emission Bandwidth, 802.11g Middle Channel



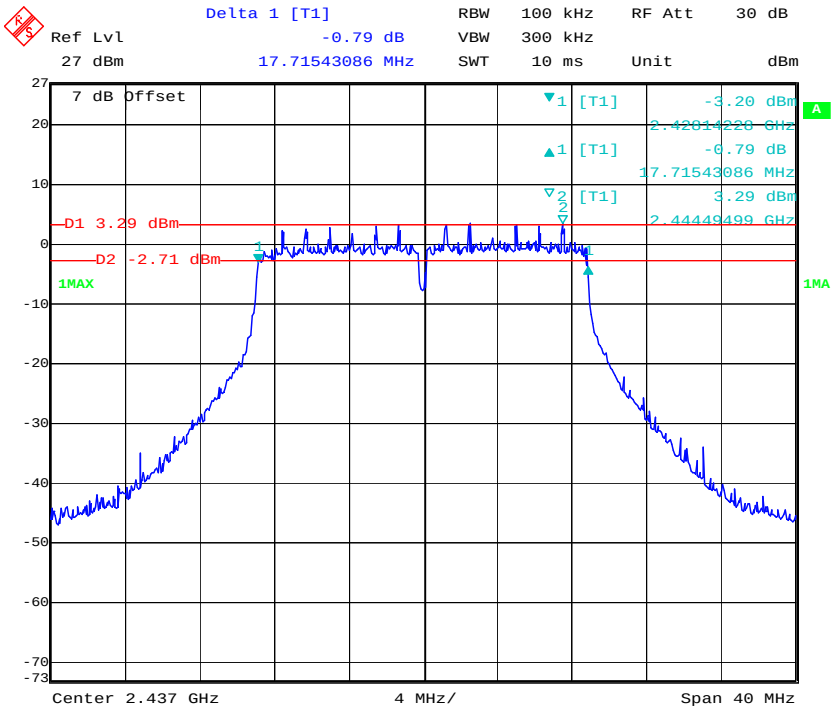
6 dB Emission Bandwidth, 802.11g High Channel



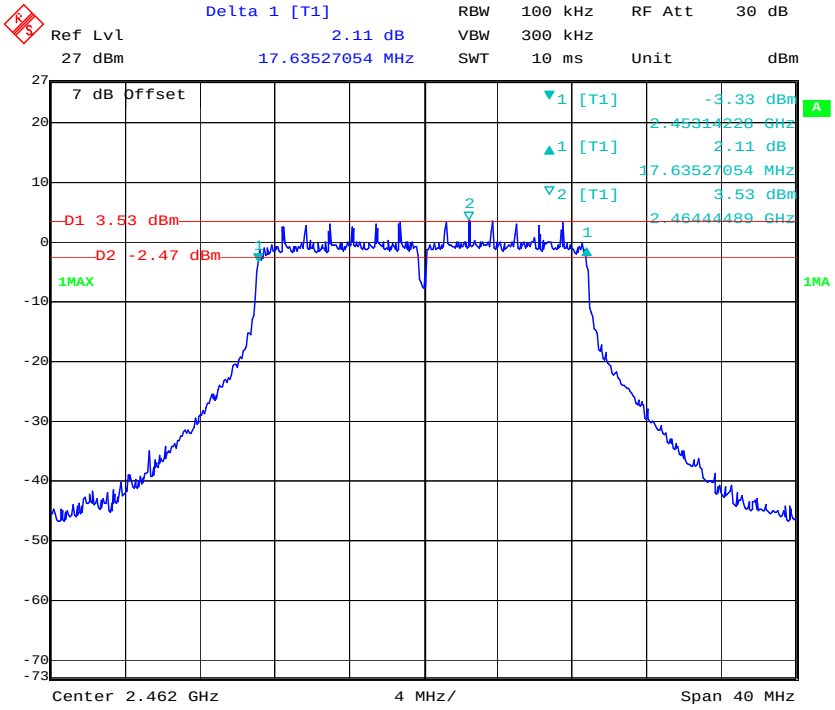
6 dB Emission Bandwidth, 802.11n-HT20 Low Channel



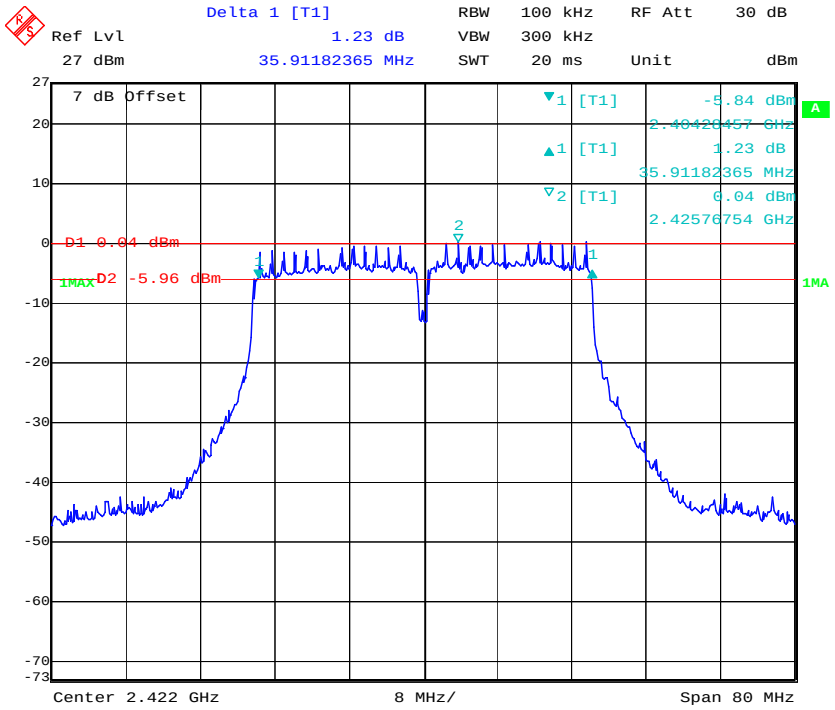
6 dB Emission Bandwidth, 802.11n-HT20 Middle Channel



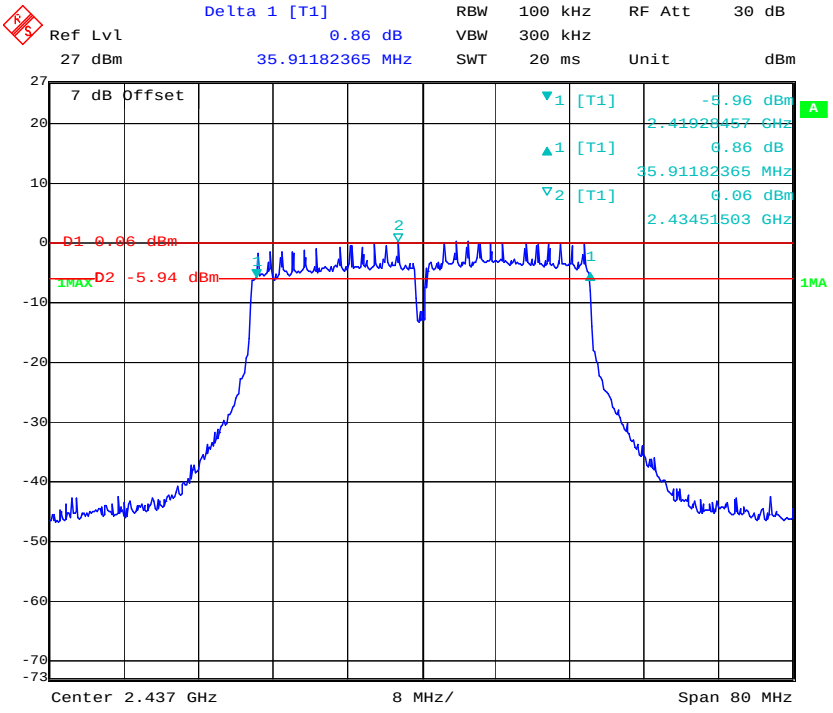
6 dB Emission Bandwidth, 802.11n-HT20 High Channel



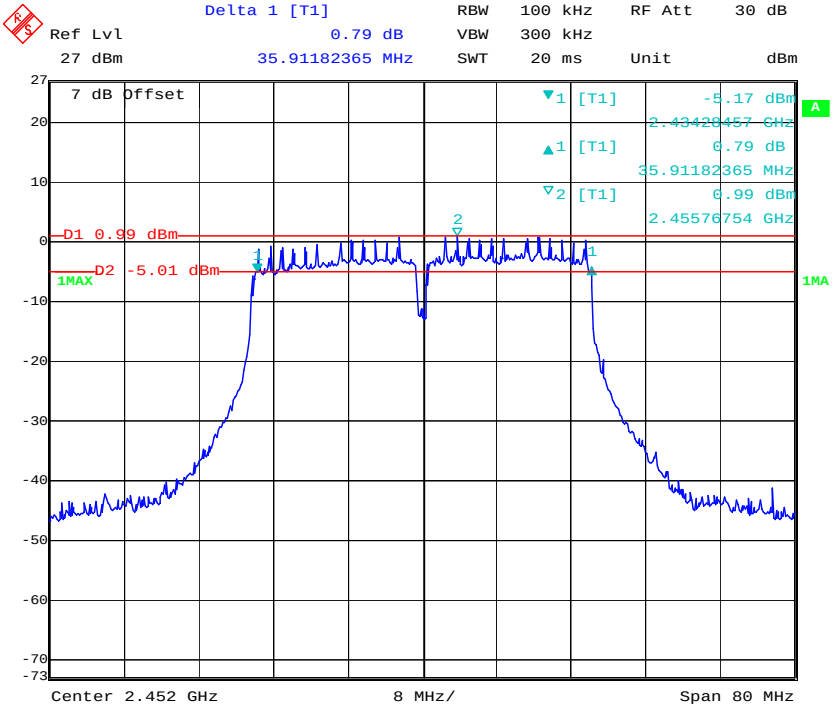
6 dB Emission Bandwidth, 802.11n-HT40 Low Channel



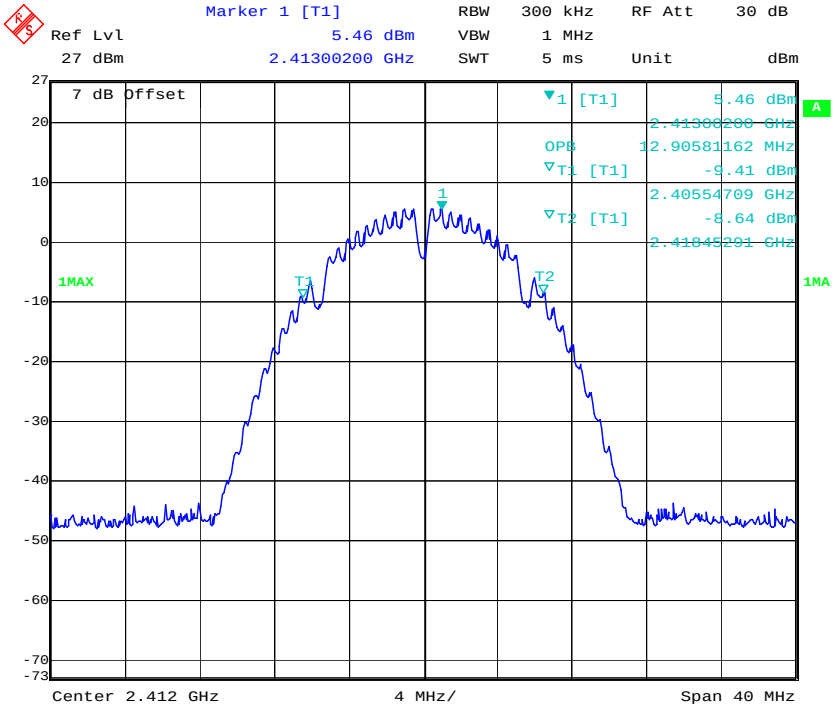
6 dB Emission Bandwidth, 802.11n-HT40 Middle Channel



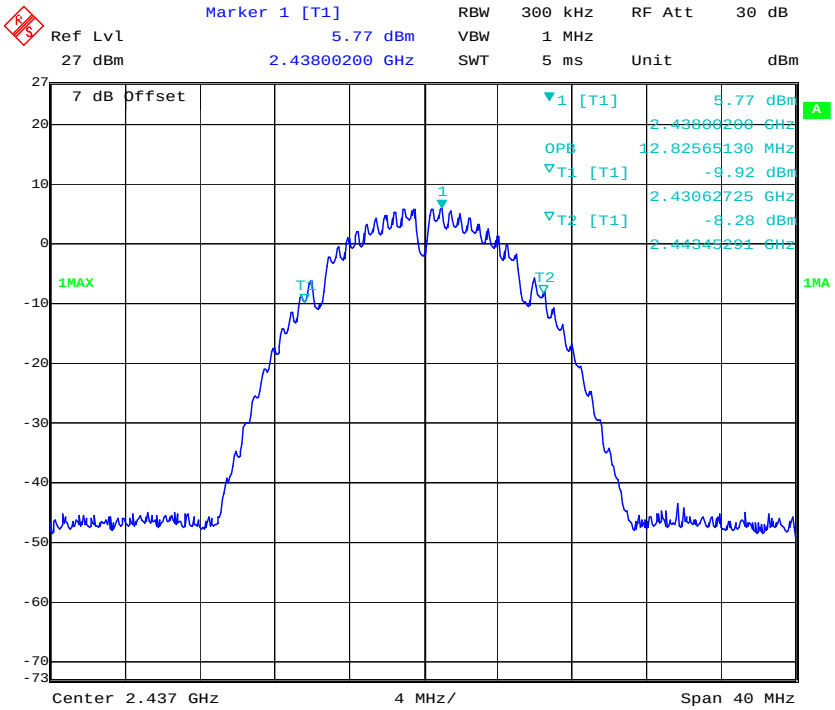
6 dB Emission Bandwidth, 802.11n-HT40 High Channel



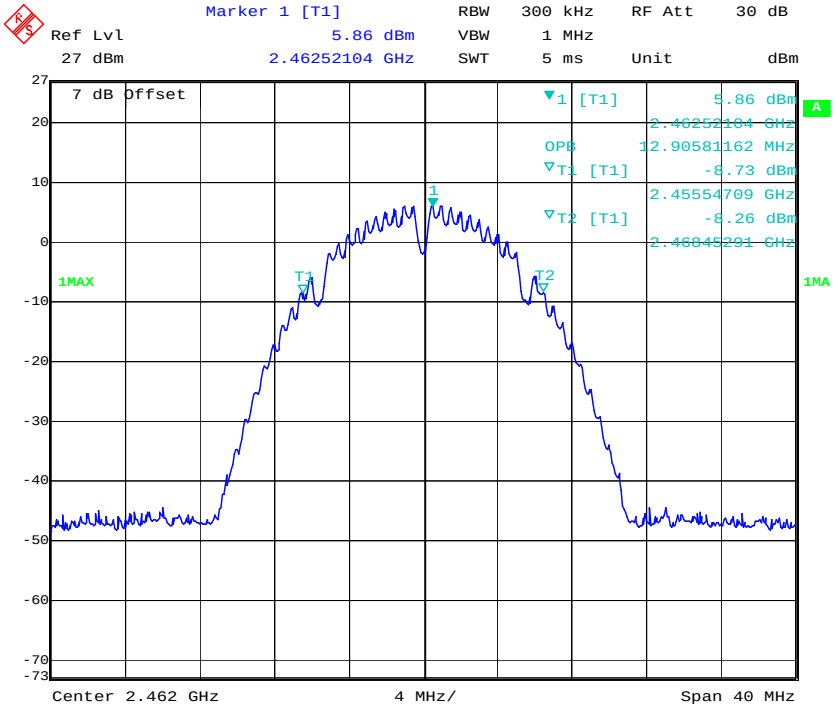
99% Occupied Bandwidth, 802.11b Low Channel



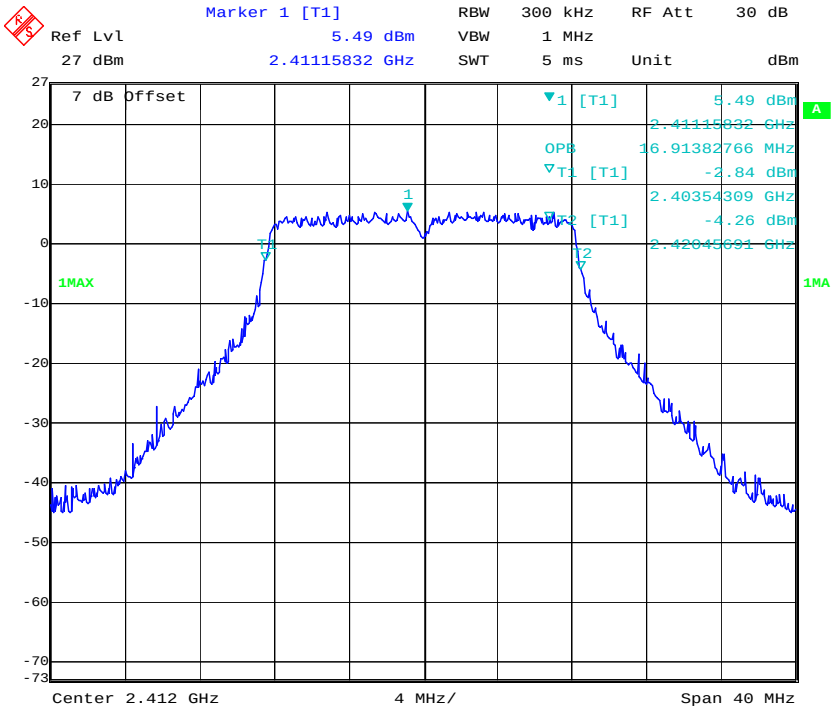
99% Occupied Bandwidth, 802.11b Middle Channel



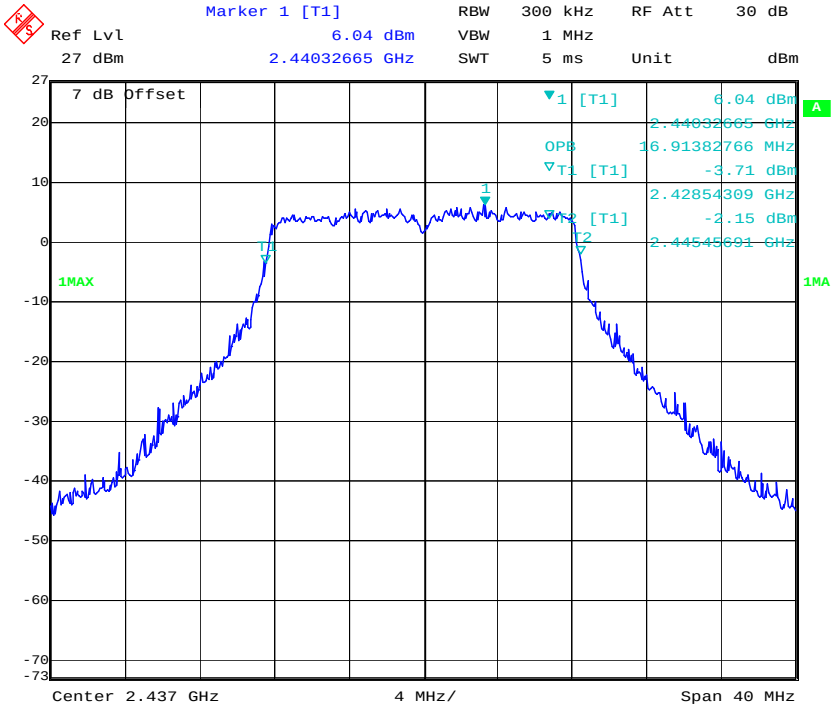
99% Occupied Bandwidth, 802.11b High Channel



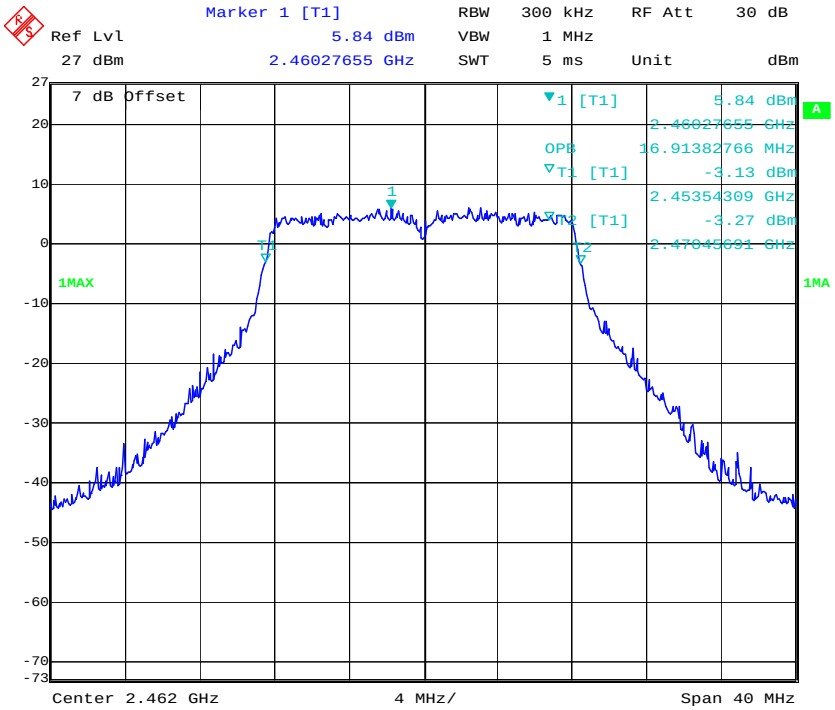
99% Occupied Bandwidth, 802.11g Low Channel



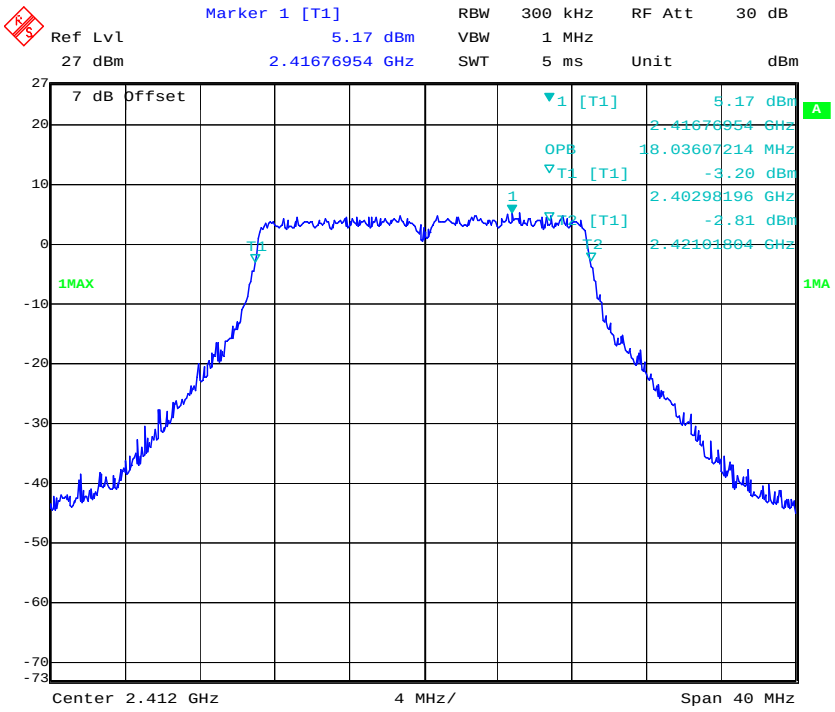
99% Occupied Bandwidth, 802.11g Middle Channel



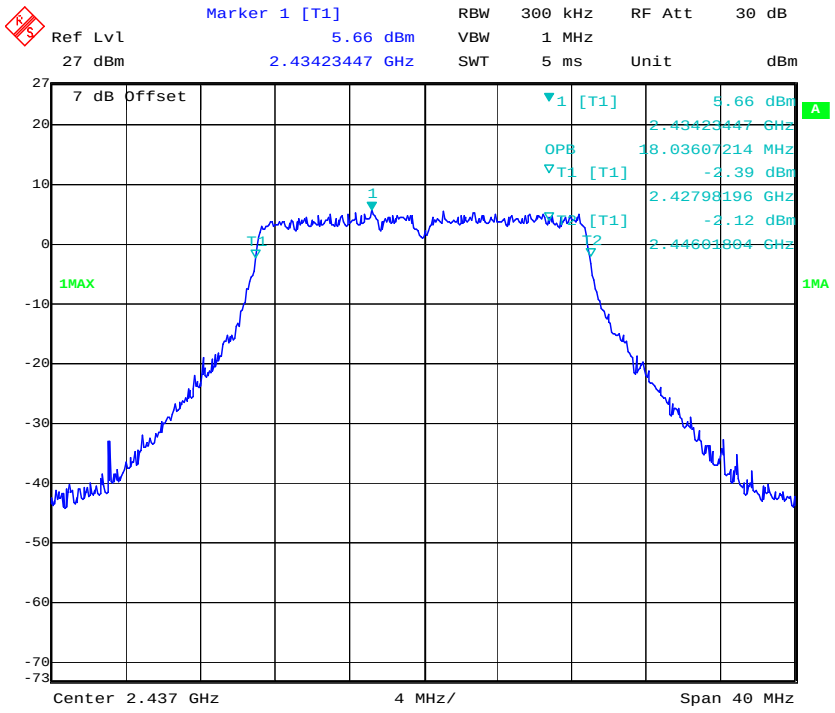
99% Occupied Bandwidth, 802.11g High Channel



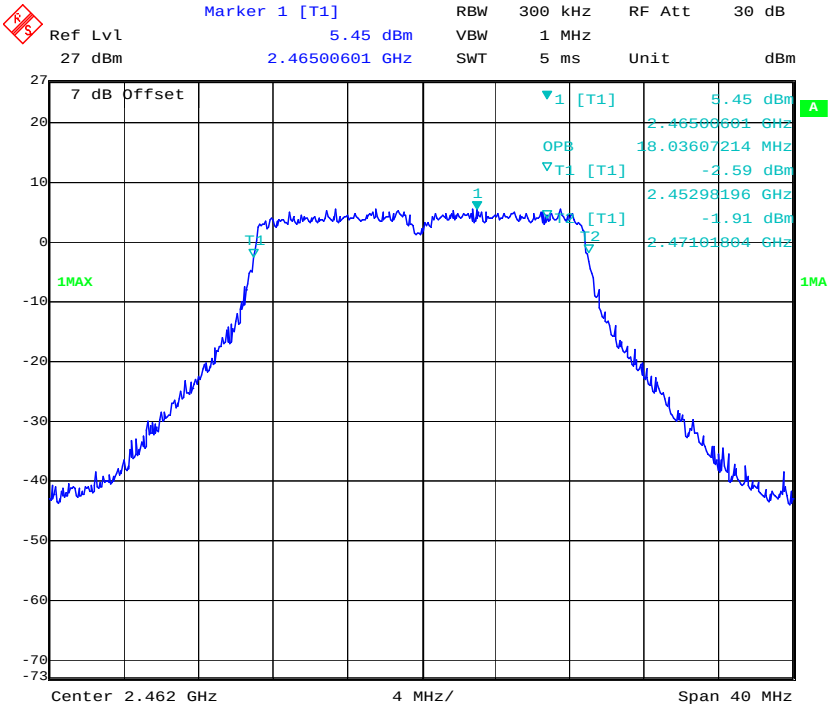
99% Occupied Bandwidth, 802.11n-HT20 Low Channel



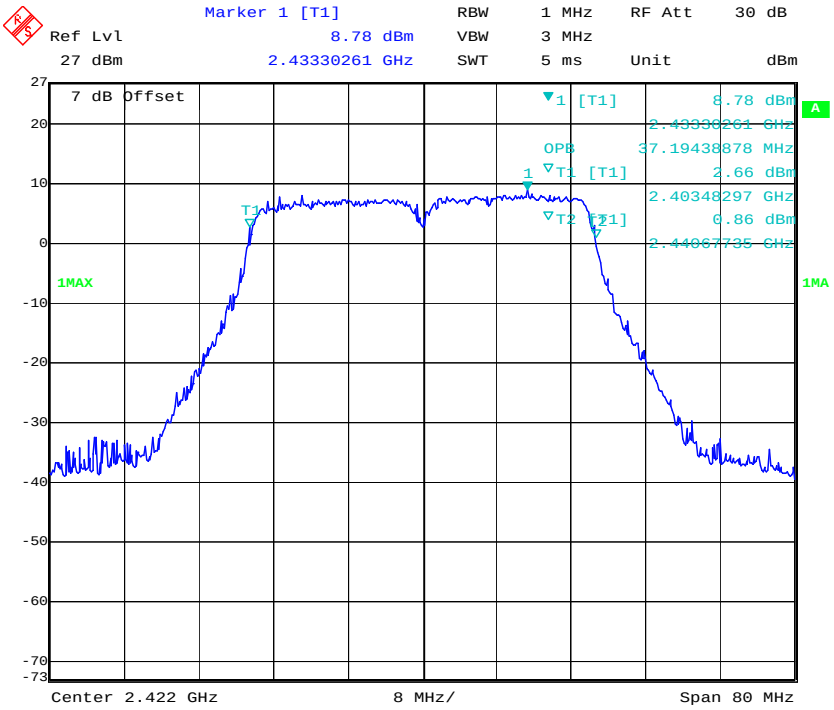
99% Occupied Bandwidth, 802.11n-HT20 Middle Channel



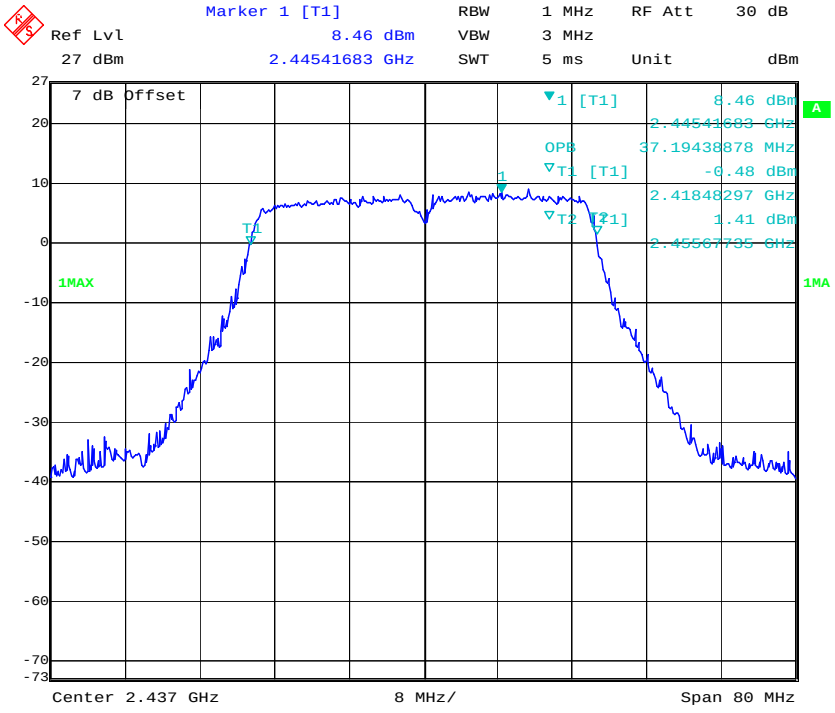
99% Occupied Bandwidth, 802.11n-HT20 High Channel



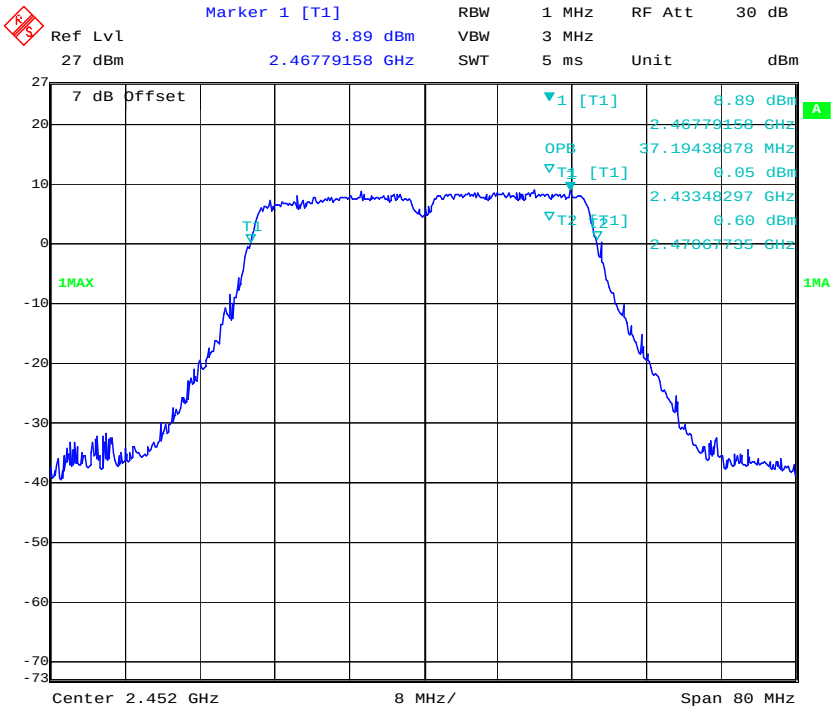
99% Occupied Bandwidth, 802.11n-HT40 Low Channel



99% Occupied Bandwidth, 802.11n-HT40 Middle Channel



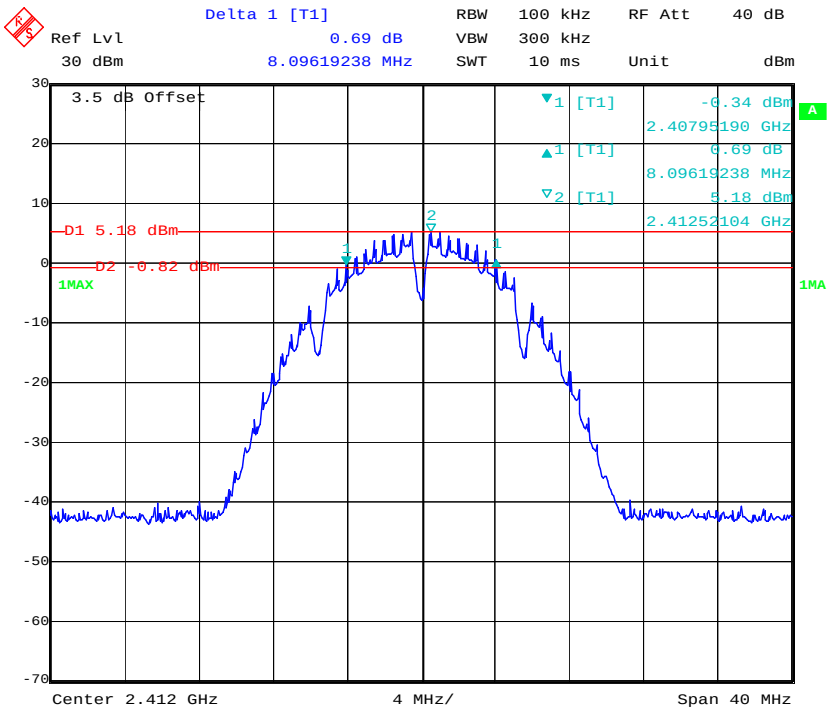
99% Occupied Bandwidth, 802.11n-HT40 High Channel



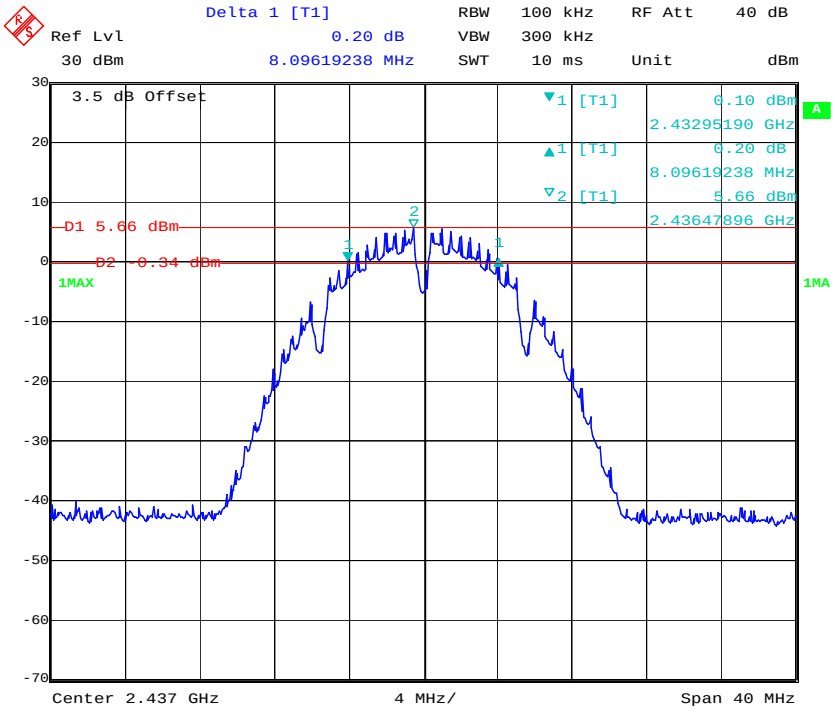
Antenna 1

Channel	Frequency (MHz)	6 dB Emission Bandwidth	99% Occupied Bandwidth	Limit (kHz)
		(MHz)		
802.11b mode				
Low	2412	8.10	12.91	≥500
Middle	2437	8.10	12.83	≥500
High	2462	8.10	12.91	≥500
802.11g				
Low	2412	16.43	16.91	≥500
Middle	2437	16.43	16.83	≥500
High	2462	16.43	16.91	≥500
802.11n-HT20 mode				
Low	2412	17.64	18.04	≥500
Middle	2437	17.56	18.04	≥500
High	2462	17.56	18.04	≥500
802.11n-HT40 mode				
Low	2422	35.43	36.87	≥500
Middle	2437	35.43	36.71	≥500
High	2452	35.43	37.03	≥500

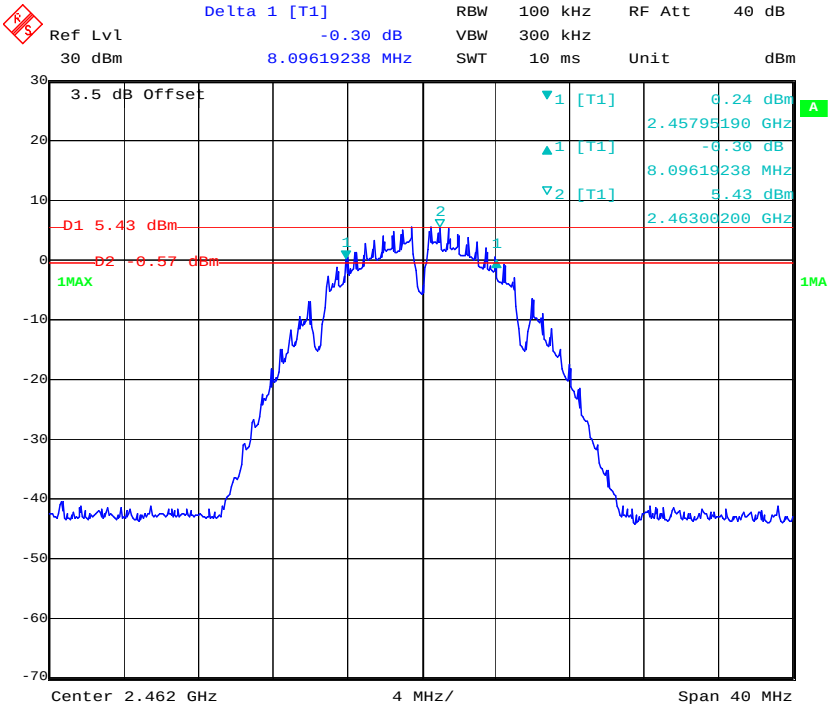
6 dB Emission Bandwidth, 802.11b Low Channel



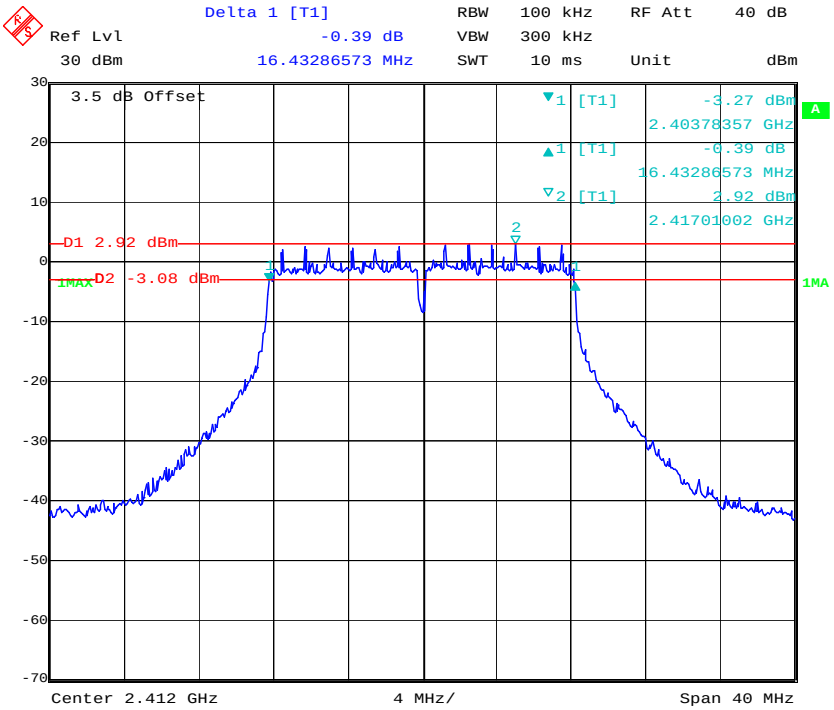
6 dB Emission Bandwidth, 802.11b Middle Channel



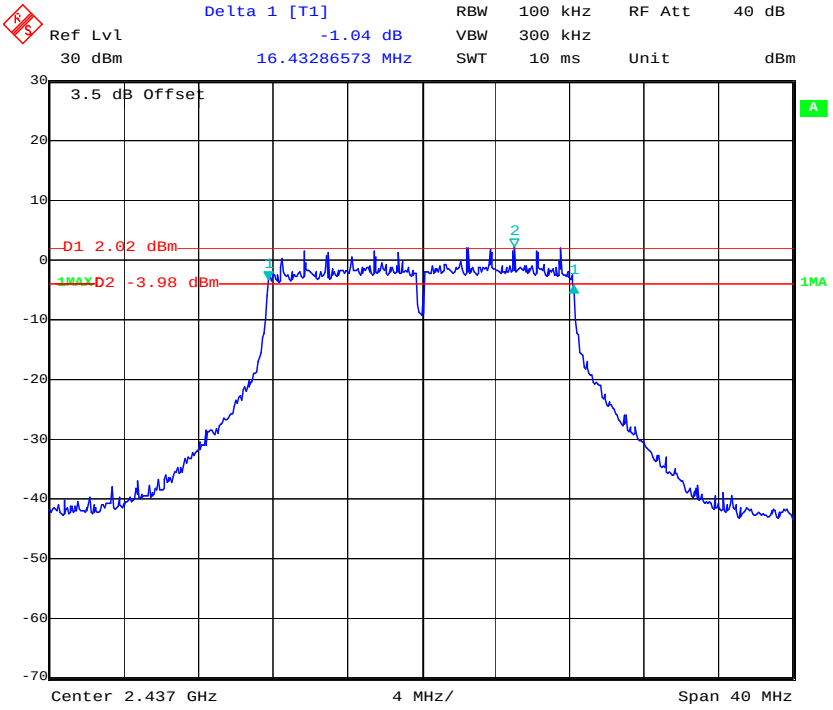
6 dB Emission Bandwidth, 802.11b High Channel



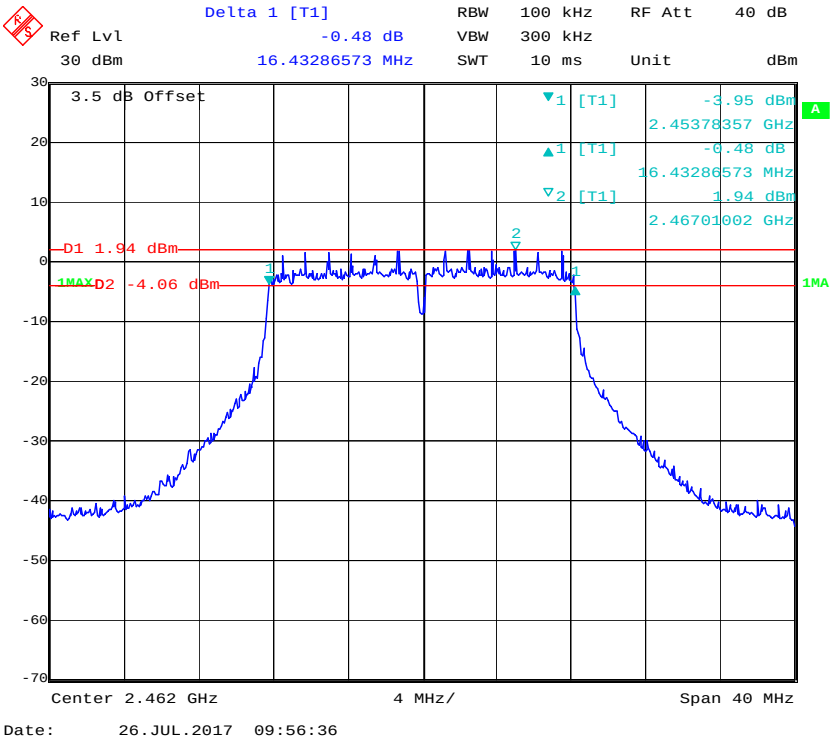
6 dB Emission Bandwidth, 802.11g Low Channel



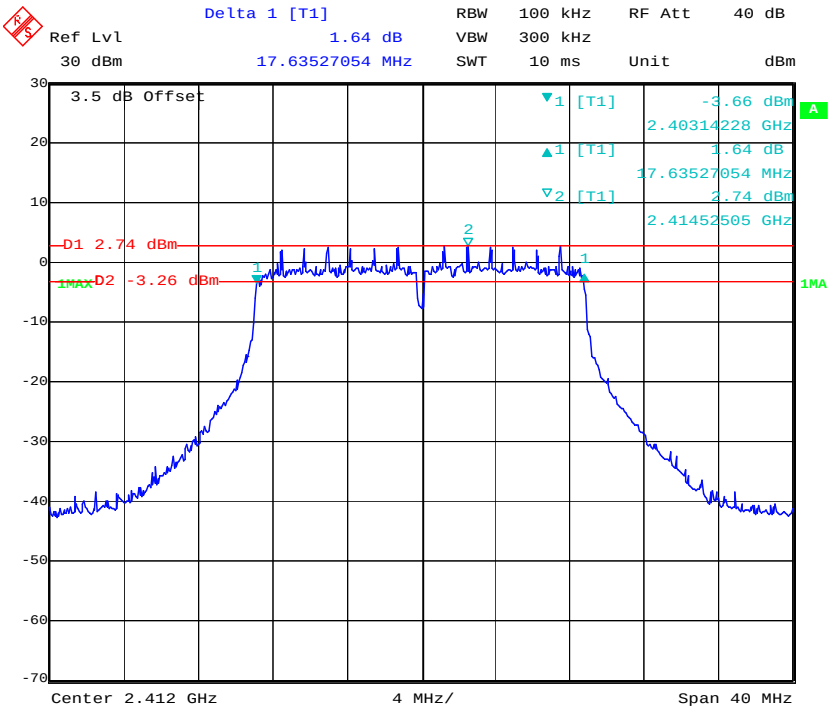
6 dB Emission Bandwidth, 802.11g Middle Channel



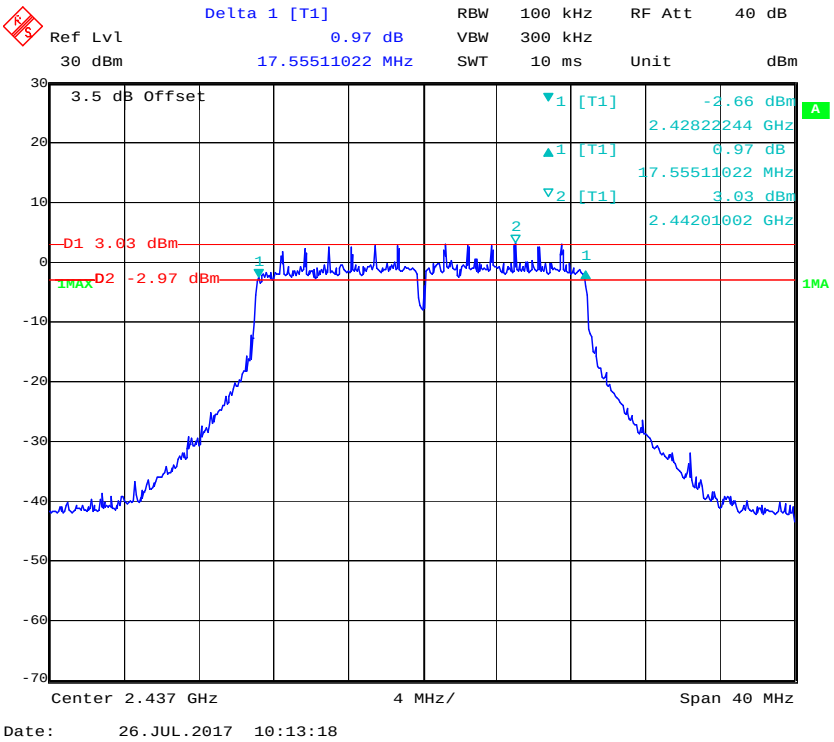
6 dB Emission Bandwidth, 802.11g High Channel



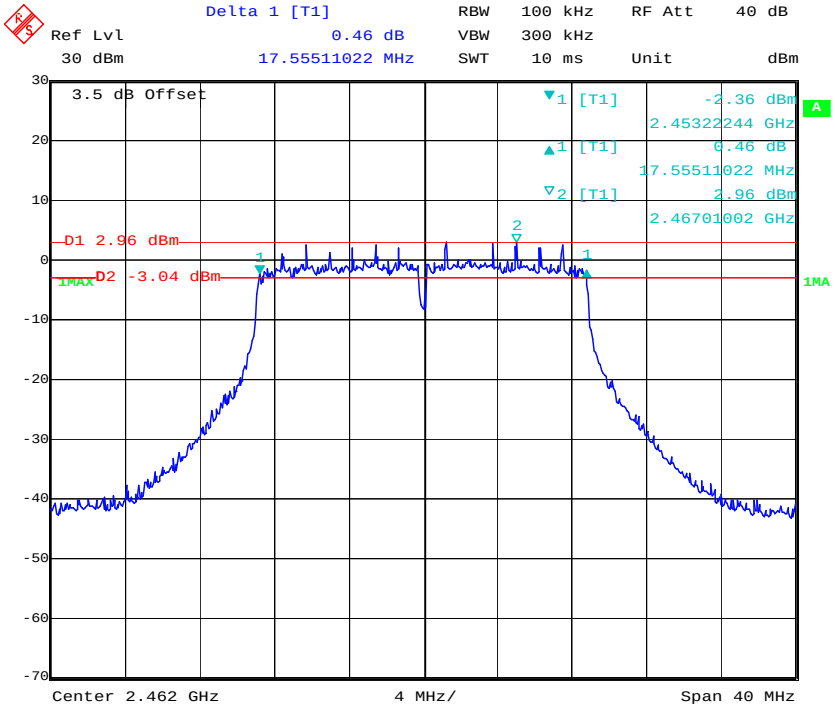
6 dB Emission Bandwidth, 802.11n-HT20 Low Channel



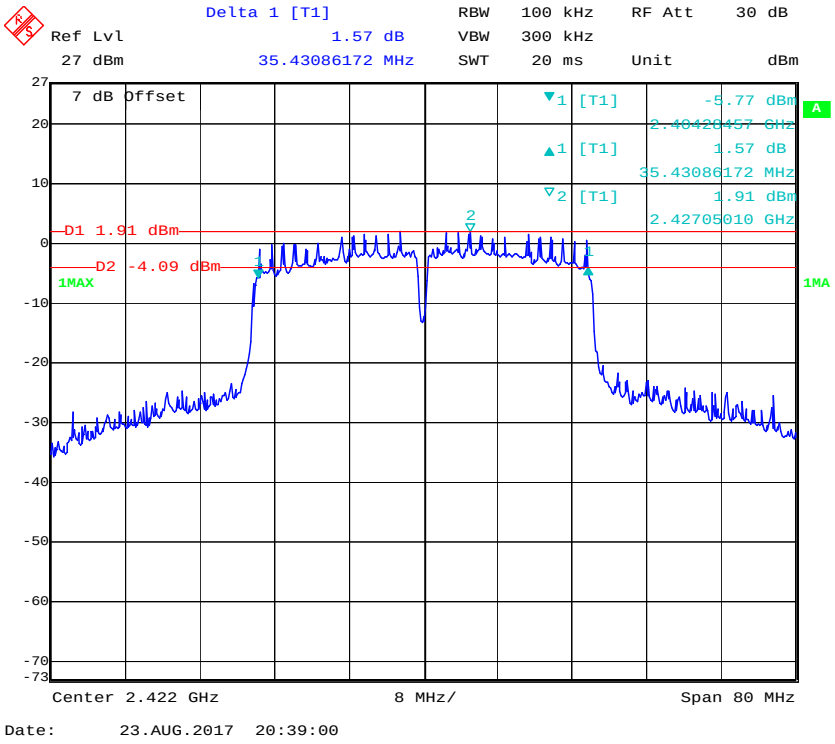
6 dB Emission Bandwidth, 802.11n-HT20 Middle Channel



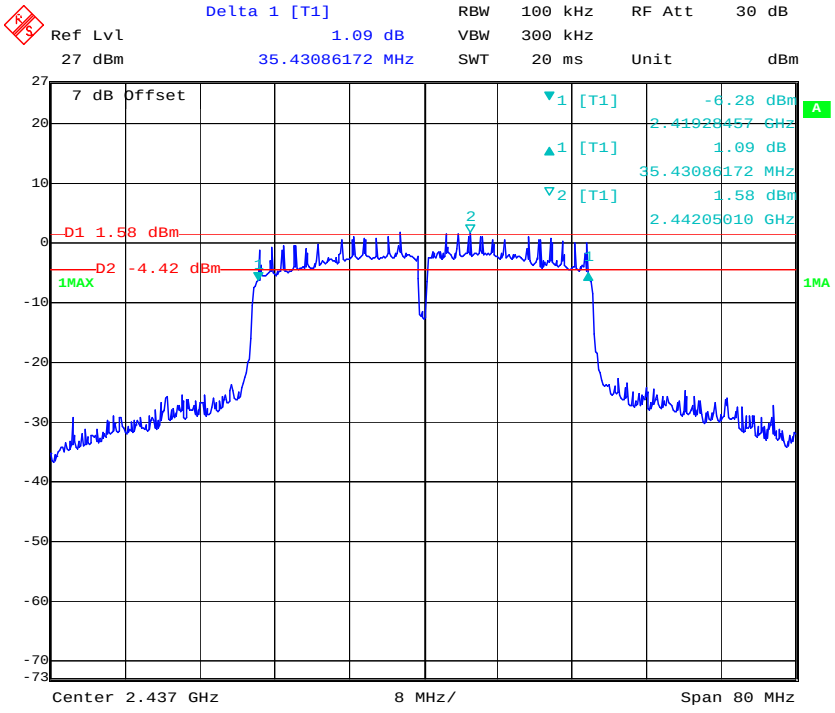
6 dB Emission Bandwidth, 802.11n-HT20 High Channel



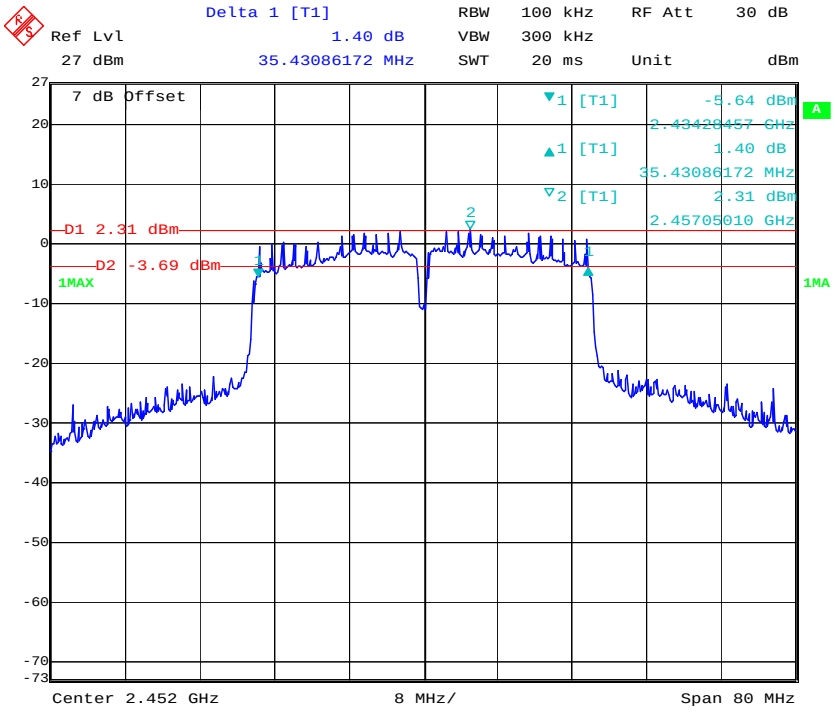
6 dB Emission Bandwidth, 802.11n-HT40 Low Channel



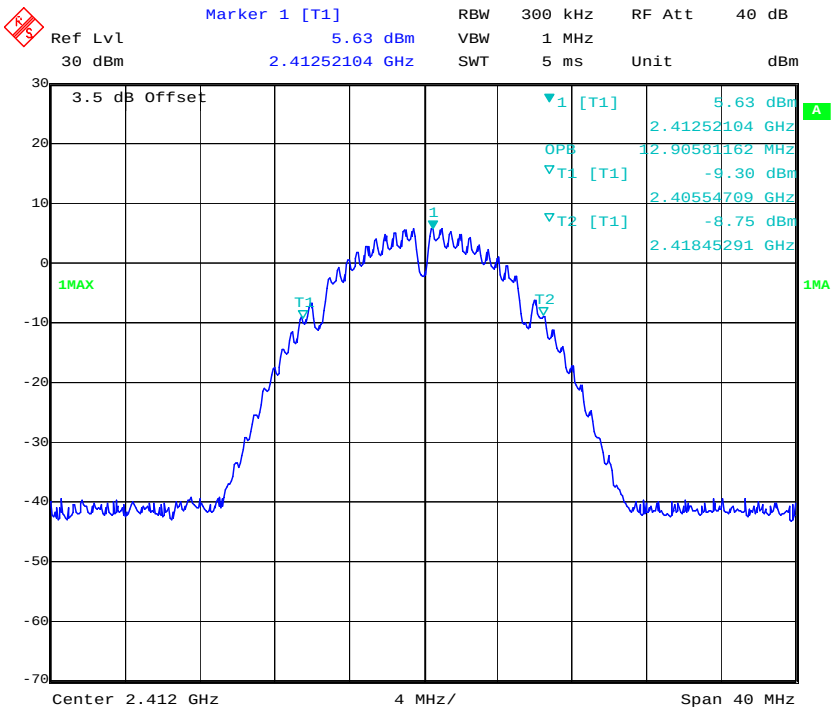
6 dB Emission Bandwidth, 802.11n-HT40 Middle Channel



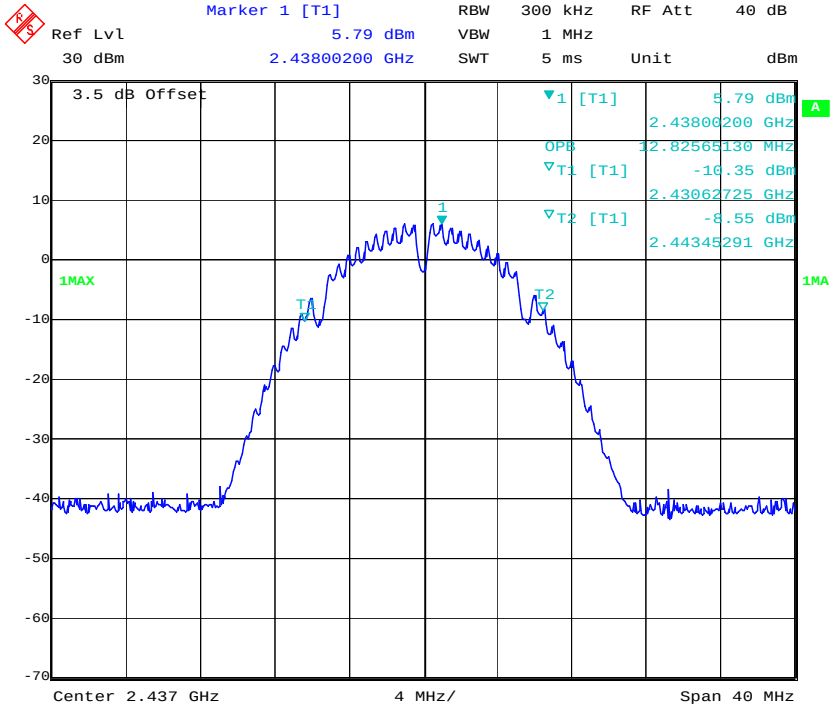
6 dB Emission Bandwidth, 802.11n-HT40 High Channel



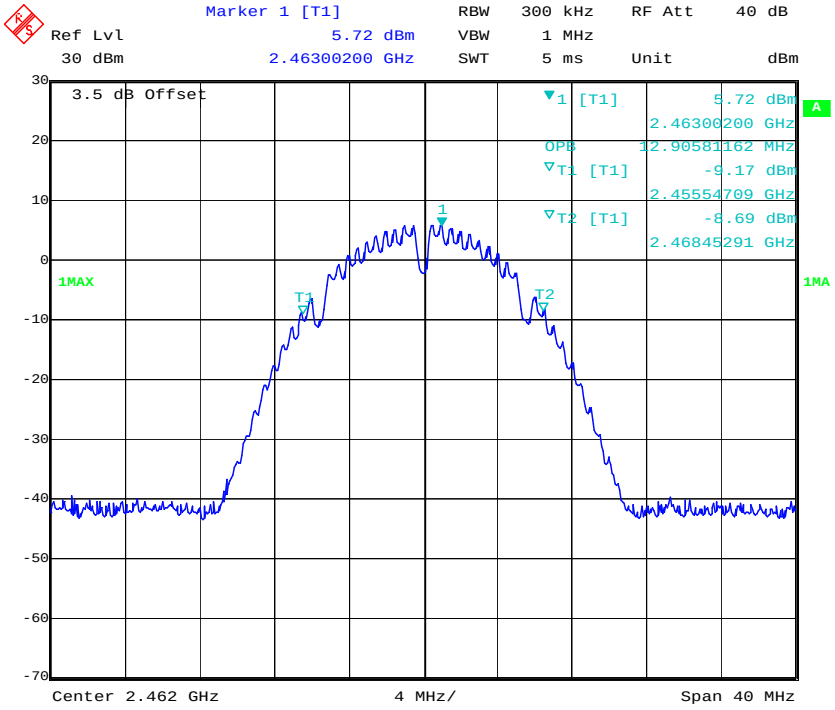
99% Occupied Bandwidth, 802.11b Low Channel



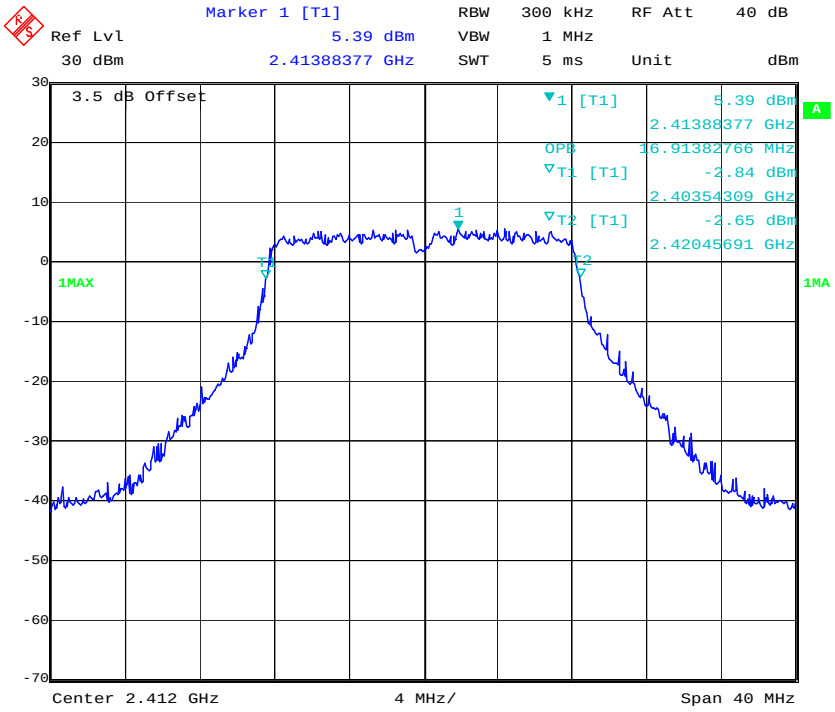
99% Occupied Bandwidth, 802.11b Middle Channel



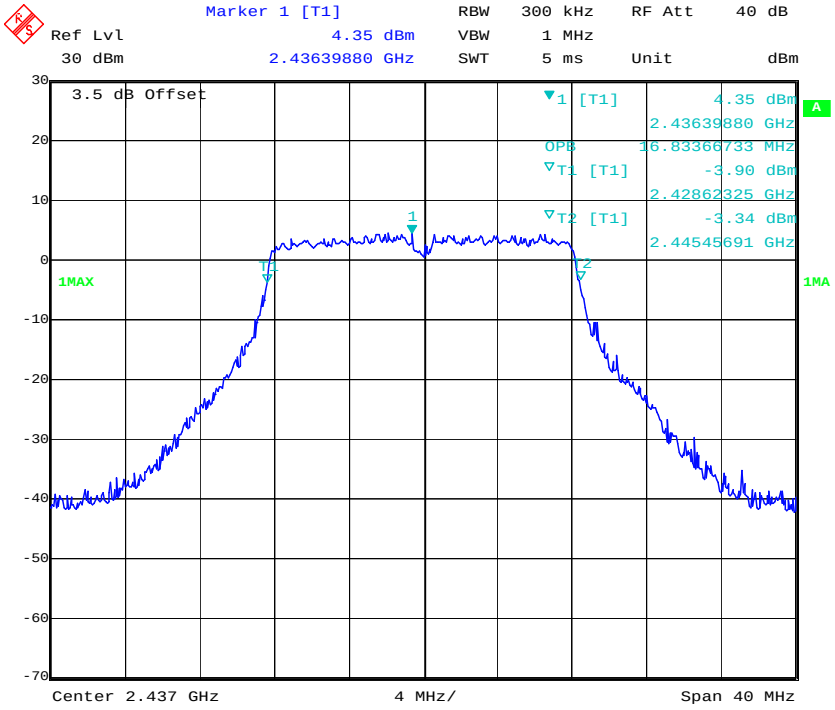
99% Occupied Bandwidth, 802.11b High Channel



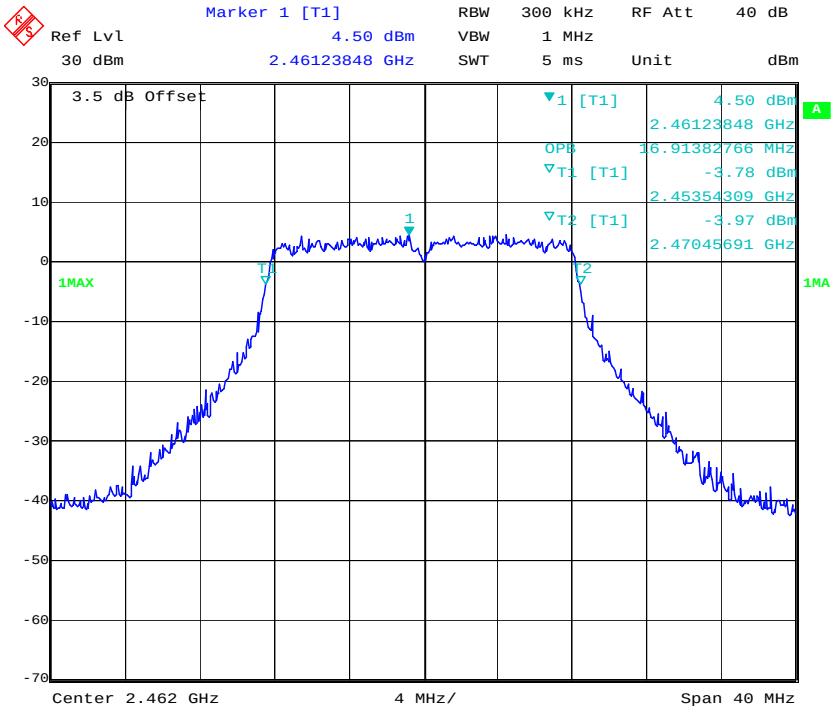
99% Occupied Bandwidth, 802.11g Low Channel



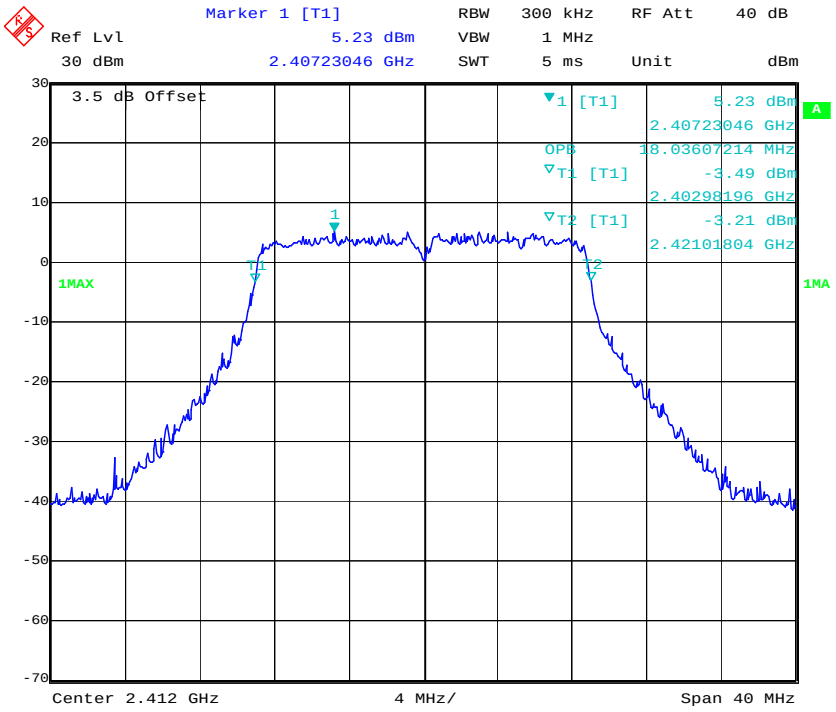
99% Occupied Bandwidth, 802.11g Middle Channel



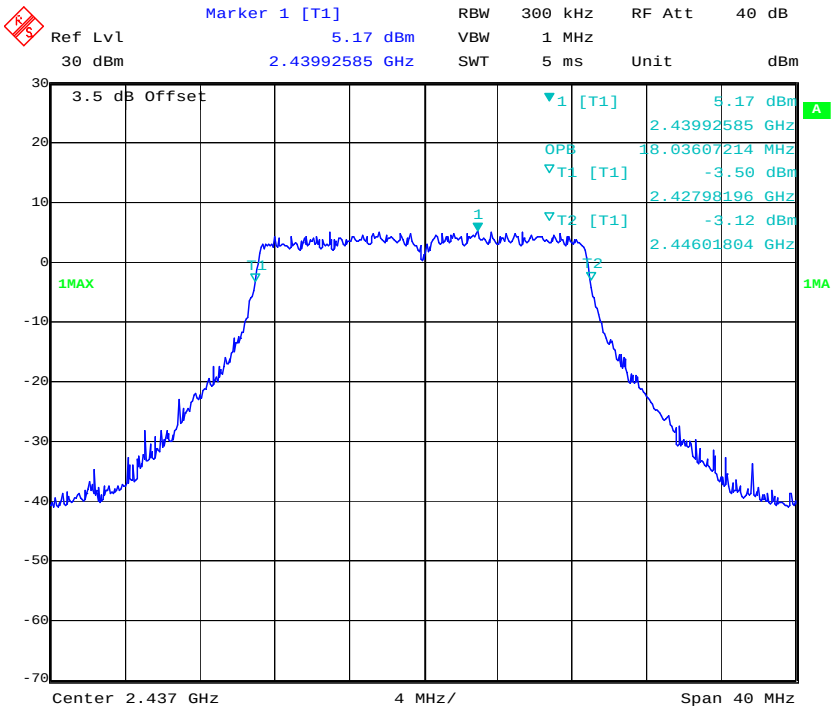
99% Occupied Bandwidth, 802.11g High Channel



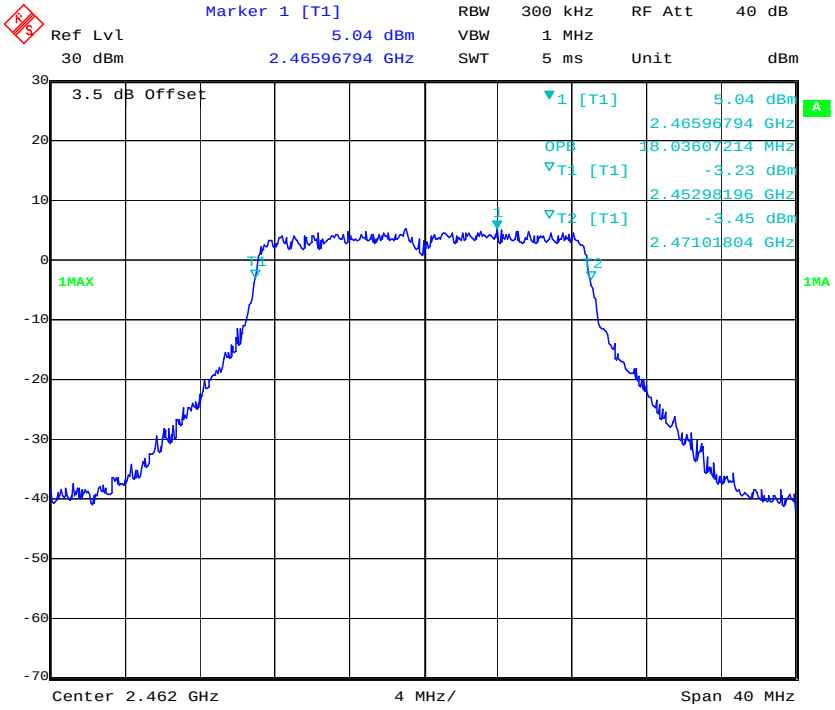
99% Occupied Bandwidth, 802.11n-HT20 Low Channel



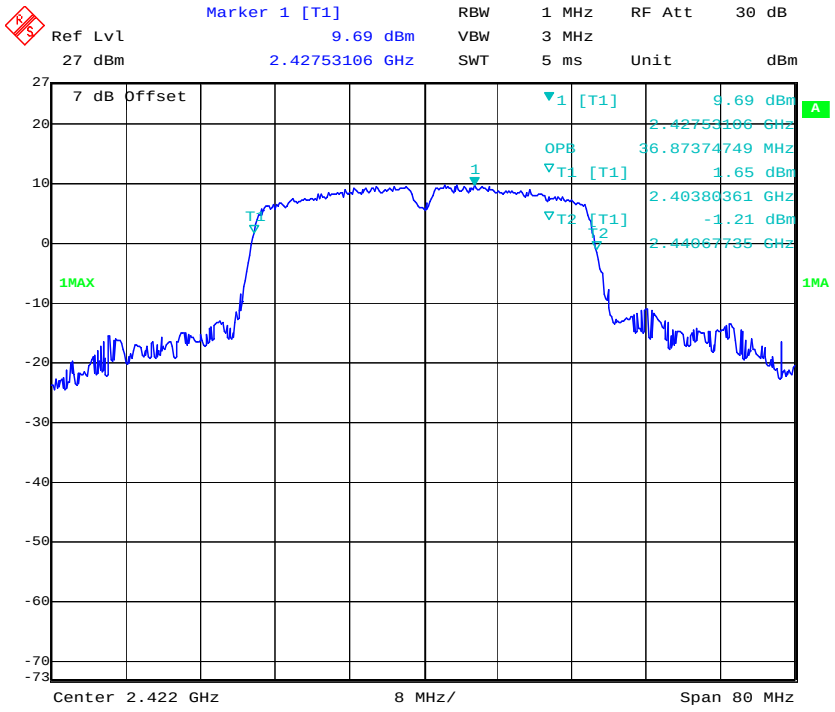
99% Occupied Bandwidth, 802.11n-HT20 Middle Channel



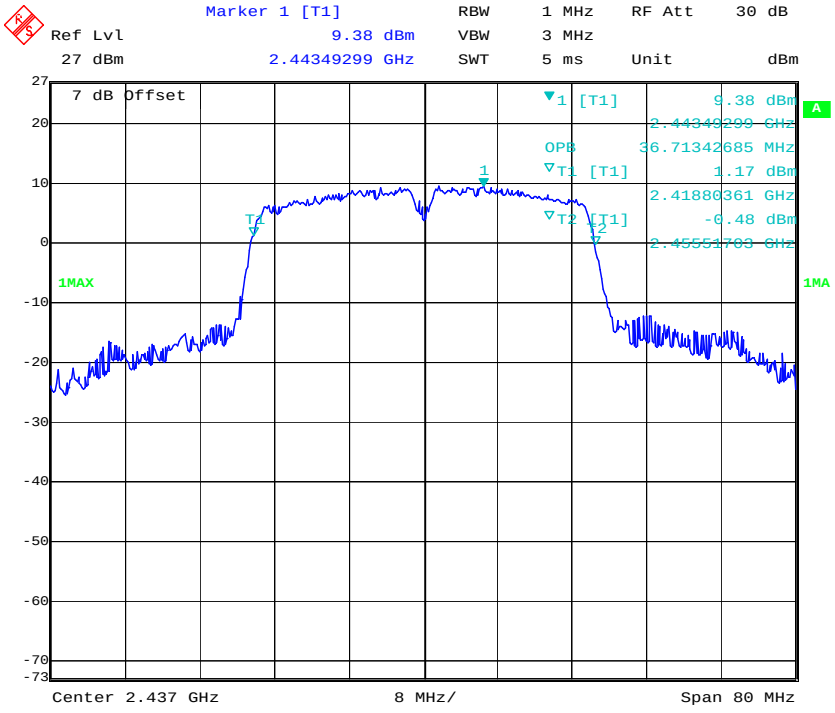
99% Occupied Bandwidth, 802.11n-HT20 High Channel



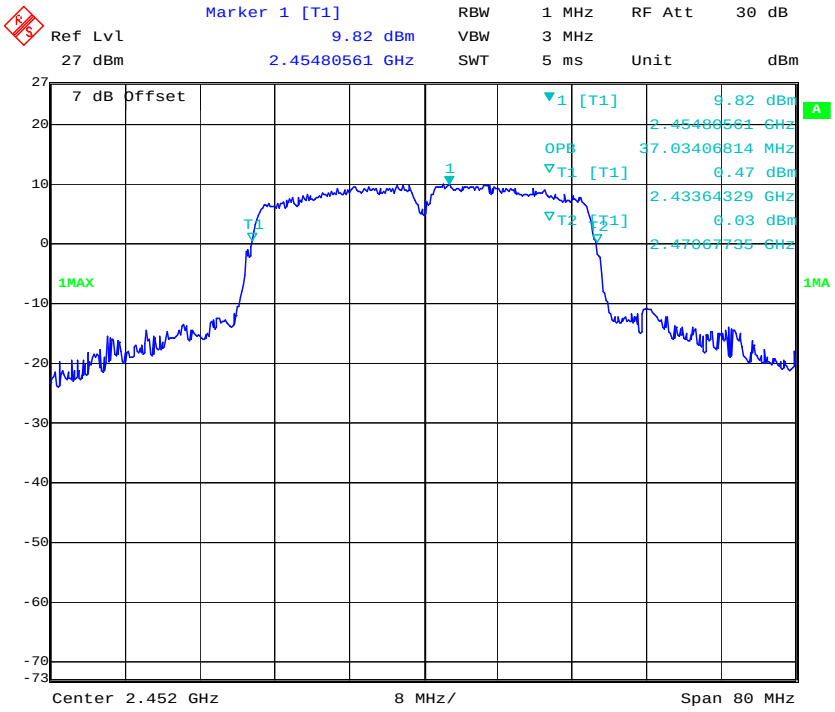
99% Occupied Bandwidth, 802.11n-HT40 Low Channel



99% Occupied Bandwidth, 802.11n-HT40 Middle Channel



99% Occupied Bandwidth, 802.11n-HT40 High Channel



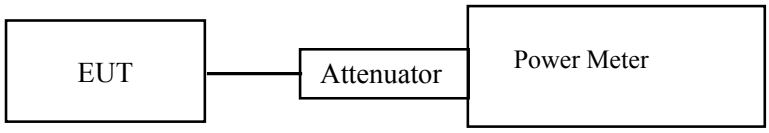
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

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



Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng on 2017-08-28.

EUT operation mode: Transmitting

Note: This Device Emploies Cyclic Delay Diversity.
When determining reductions in conducted power limits, array gain is calculated as follows:
As to this device, $N_{ANT} \leq 4$, Array Gain = 0 dB.
Total directional gain (dBi) = gain of individual transmit antennas (dBi) + 0 (dB) =4dBi.

Antenna 0

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b			
2412	22.06	20.51	30
2417	23.49	21.35	30
2422	23.84	21.25	30
2437	24.57	22.85	30
2452	23.17	20.96	30
2457	22.53	20.83	30
2462	22.17	20.39	30
802.11g			
2412	20.88	16.12	30
2417	20.83	16.76	30
2422	21.09	16.98	30
2427	20.38	16.15	30
2432	23.76	19.36	30
2437	26.82	22.09	30
2447	22.59	18.45	30
2452	22.17	18.35	30
2457	20.51	16.12	30
2462	21.18	16.48	30
802.11n HT20			
2412	20.91	16.26	30
2417	20.68	16.24	30
2422	20.73	16.76	30
2427	20.25	16.33	30
2432	23.74	19.26	30
2437	26.82	22.35	30
2447	23.19	18.87	30
2452	22.83	18.42	30
2457	21.08	16.22	30
2462	21.14	16.46	30
802.11n HT40			
2422	19.83	14.8	30
2427	20.84	15.56	30
2432	23.16	17.53	30
2437	26.63	21.15	30
2442	22.87	18.06	30
2447	21.68	16.75	30
2452	19.35	15.47	30

Antenna 1

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b			
2412	22.49	20.65	30
2417	23.56	21.72	30
2422	24.11	21.15	30
2437	24.73	22.87	30
2452	23.20	20.84	30
2457	22.86	21.09	30
2462	22.57	20.38	30
802.11g			
2412	20.73	15.91	30
2417	20.92	16.65	30
2422	20.93	17.16	30
2427	20.10	16.27	30
2732	24.07	19.02	30
2437	26.63	22.13	30
2447	22.90	18.39	30
2452	22.15	18.27	30
2457	20.42	16.05	30
2462	19.89	15.16	30
802.11n HT20			
2412	20.73	15.91	30
2417	20.83	15.97	30
2422	20.91	16.55	30
2427	20.94	16.23	30
2432	24.11	19.14	30
2437	26.98	22.33	30
2447	23.05	18.76	30
2452	22.89	18.68	30
2457	21.04	16.47	30
2462	20.80	16.05	30
802.11n HT40			
2422	20.12	16.08	30
2427	21.33	15.75	30
2432	22.78	17.22	30
2437	26.02	21.49	30
2442	22.75	17.96	30
2447	21.42	16.99	30
2452	20.85	16.33	30

Total power= 10*log(antenna 0 power(mW)+ antenna 1 power(mW)) dBm

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Max Conducted Average Output Power (dBm)	Limit (dBm)
802.11b			
2412	25.29	23.59	30
2417	26.54	24.55	30
2422	26.99	24.21	30
2437	27.66	25.87	30
2452	26.20	23.91	30
2457	25.71	23.97	30
2462	25.38	23.40	30
802.11g			
2412	23.82	19.03	30
2417	23.89	19.72	30
2422	24.02	20.08	30
2427	23.25	19.22	30
2432	26.93	22.20	30
2437	29.74	25.12	30
2447	25.76	21.43	30
2452	25.17	21.32	30
2457	23.48	19.10	30
2462	23.59	18.88	30
802.11n HT20			
2412	23.83	19.10	30
2417	23.77	19.12	30
2422	23.83	19.67	30
2427	23.62	19.29	30
2432	26.94	22.21	30
2437	29.91	25.35	30
2447	26.13	21.83	30
2452	25.87	21.56	30
2457	24.07	19.36	30
2462	23.98	19.27	30
802.11n HT40			
2422	22.99	18.50	30
2427	24.10	18.67	30
2432	25.98	20.39	30
2437	29.35	24.33	30
2442	25.82	21.02	30
2447	24.56	19.88	30
2452	23.17	18.93	30

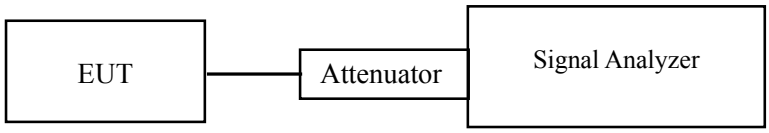
FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng from 2017-07-22 to 2017-08-23.

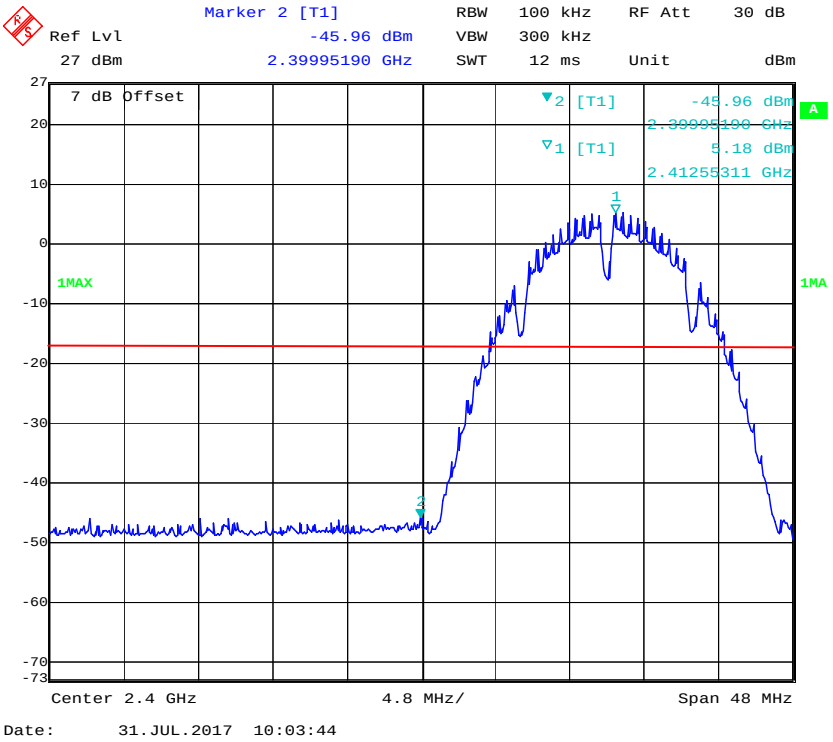
EUT operation mode: Transmitting

Test Result: Compliance

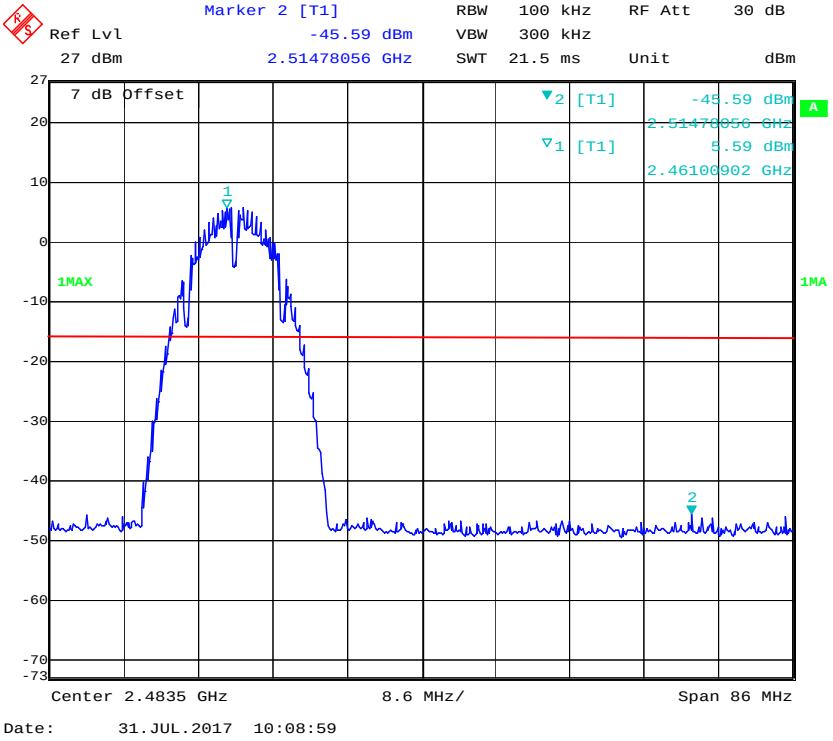
Please refer to the following plots.

Antenna 0

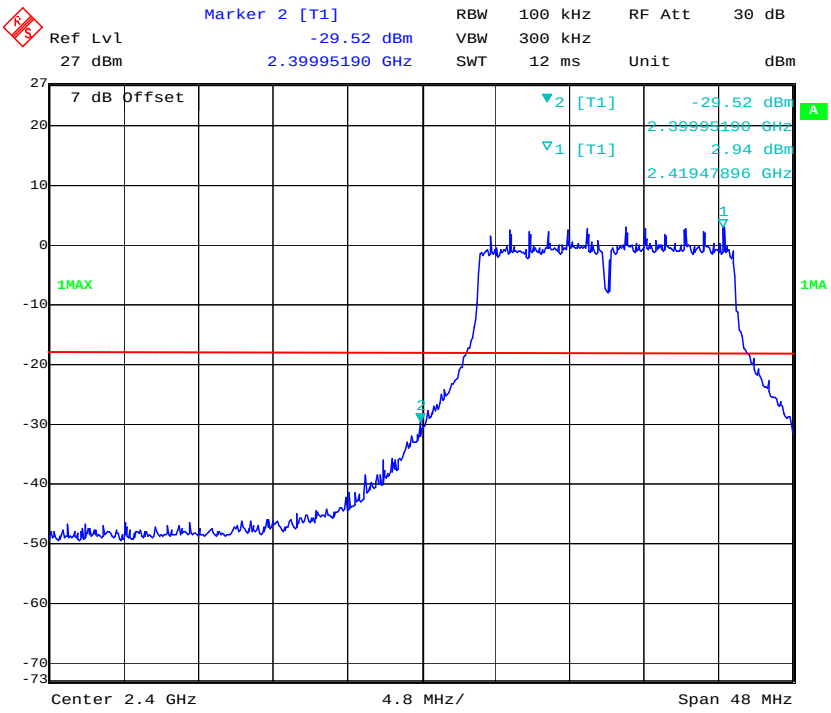
802.11b: Band Edge, Left Side



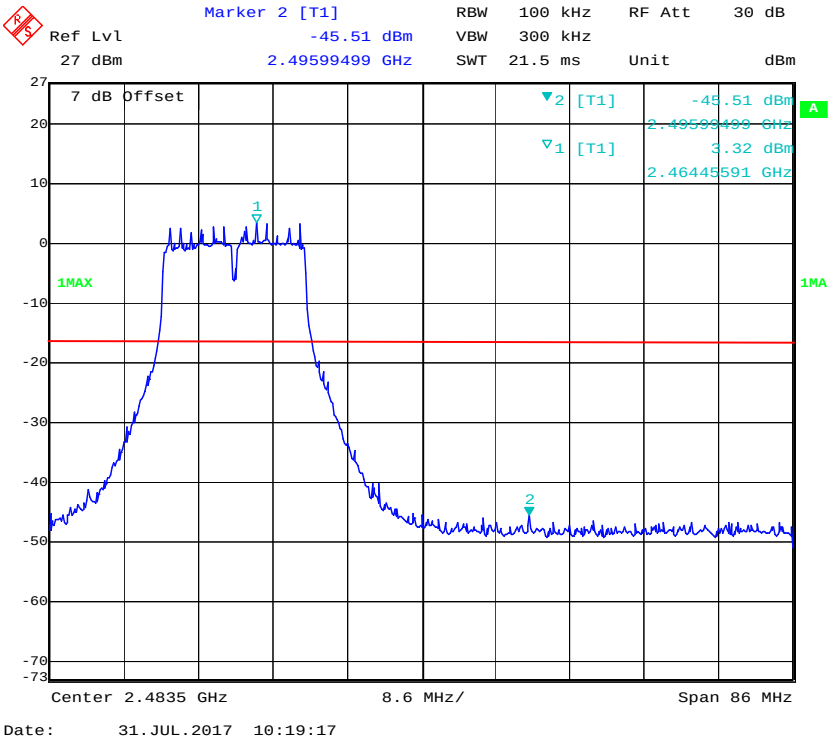
802.11b: Band Edge, Right Side



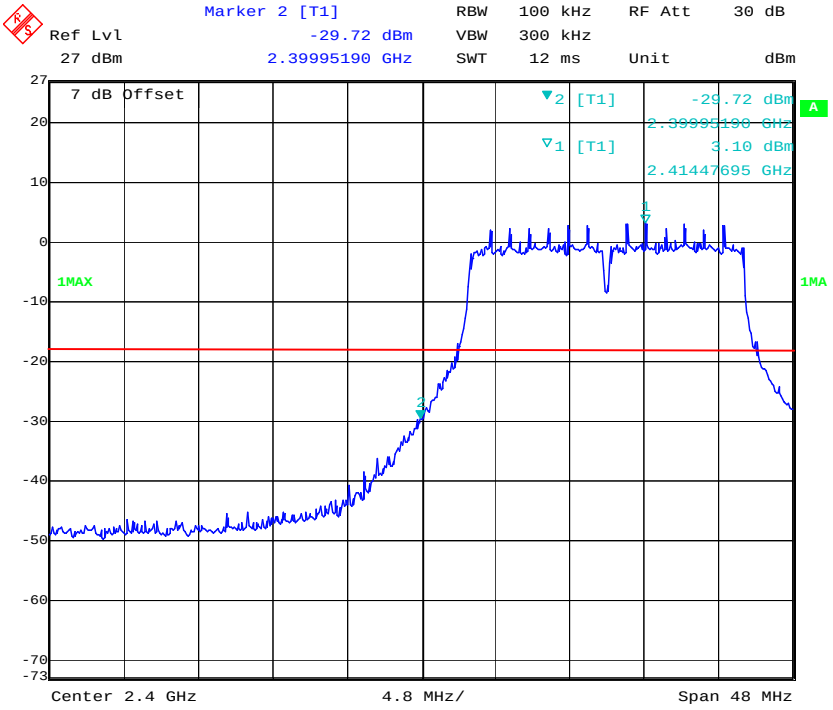
802.11g: Band Edge, Left Side



802.11g: Band Edge, Right Side

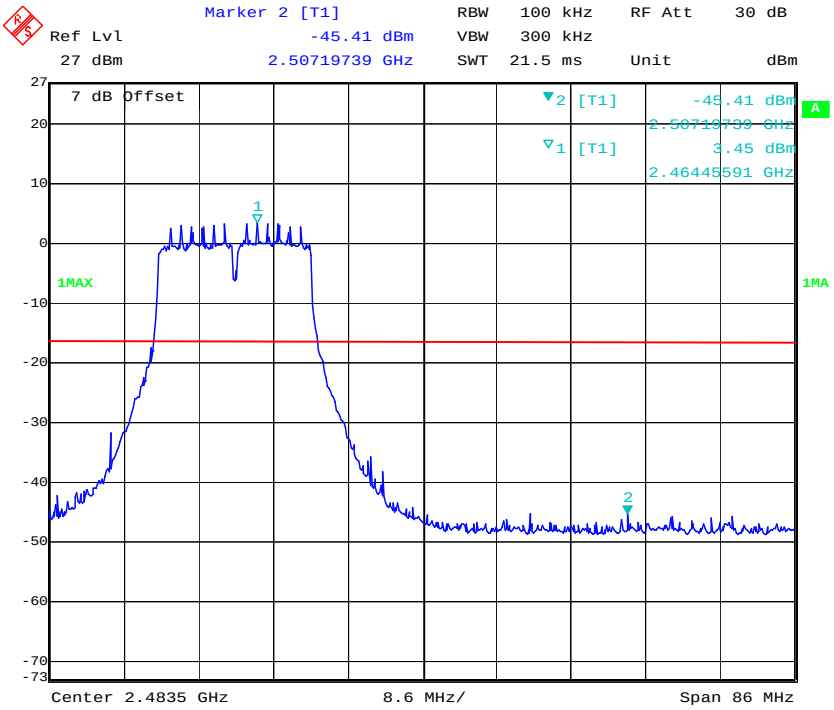


802.11n-HT20: Band Edge, Left Side



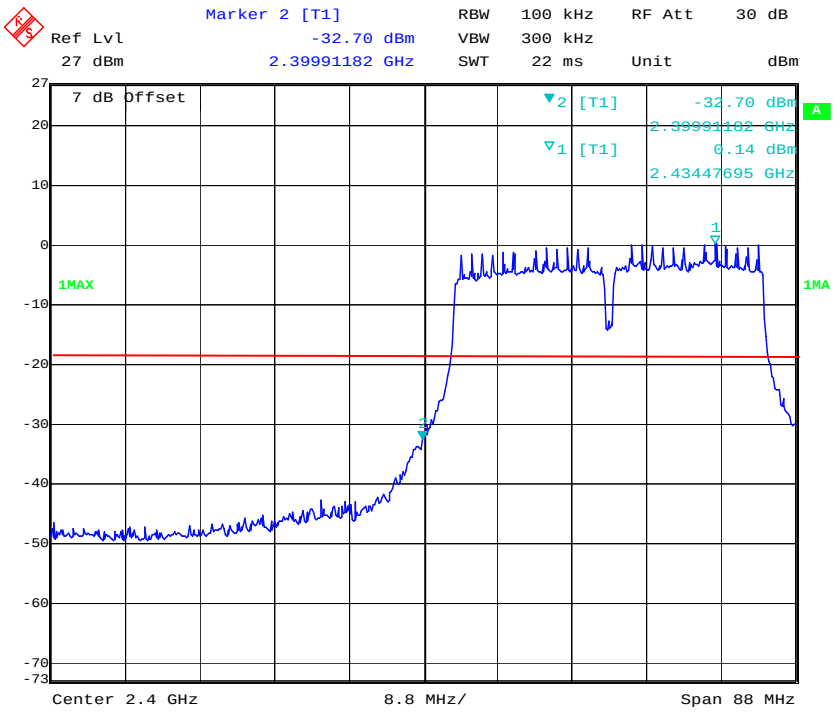
Date: 31.JUL.2017 10:27:36

802.11n-HT20: Band Edge, Right Side

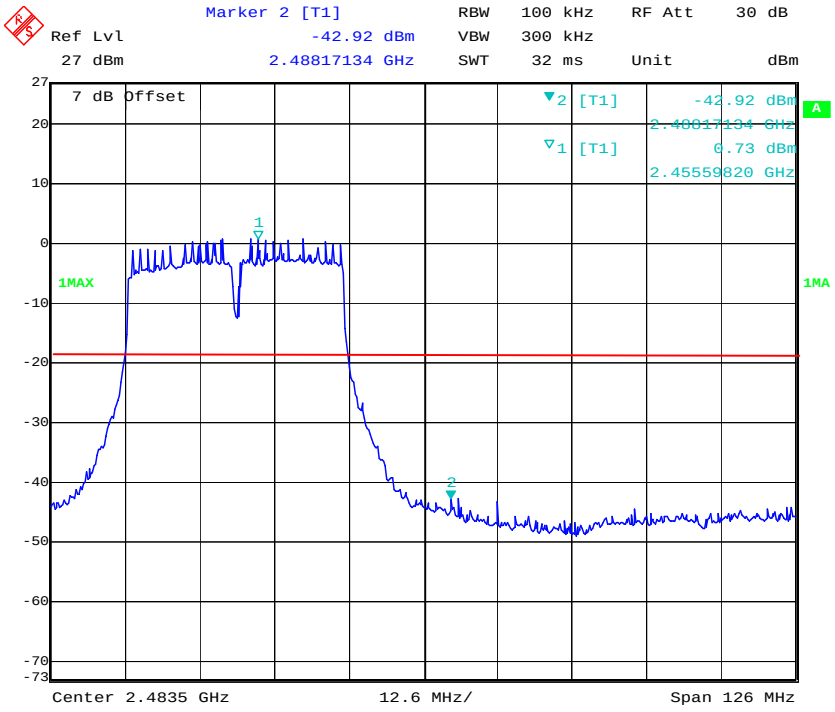


Date: 31.JUL.2017 10:45:58

802.11n-HT40: Band Edge, Left Side

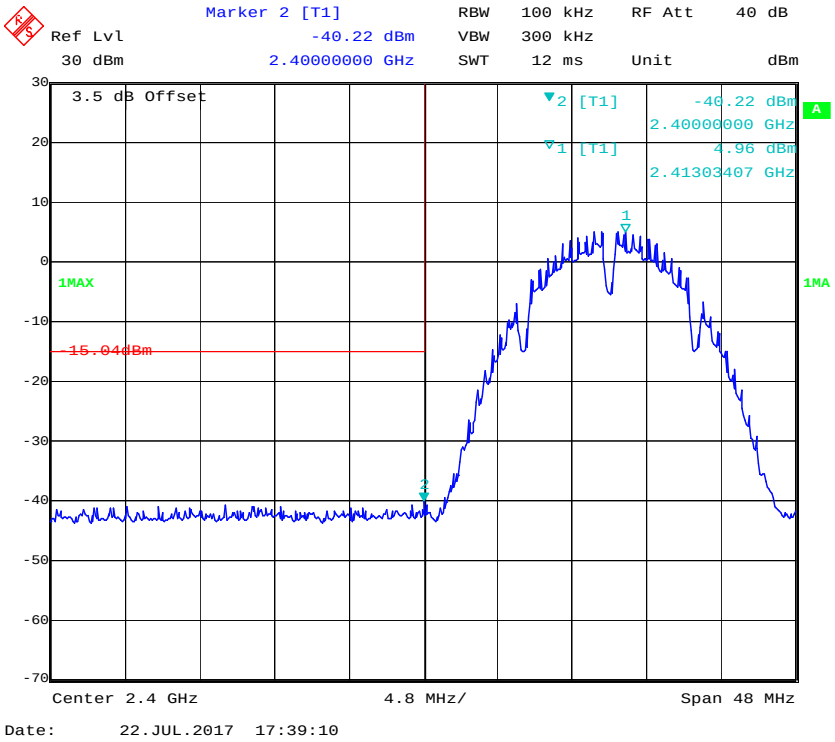


802.11n-HT40: Band Edge, Right Side

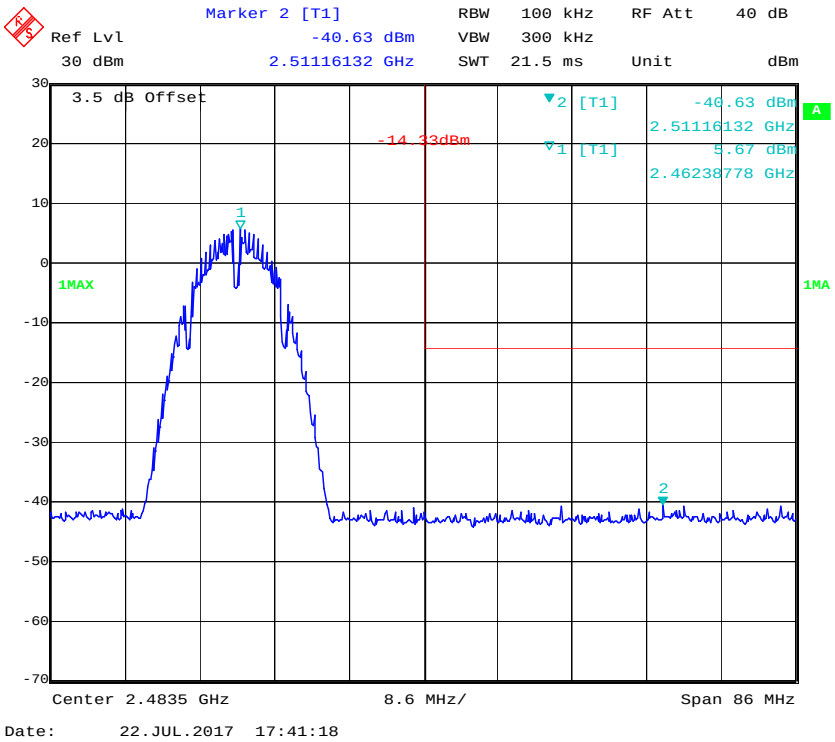


Antenna 1

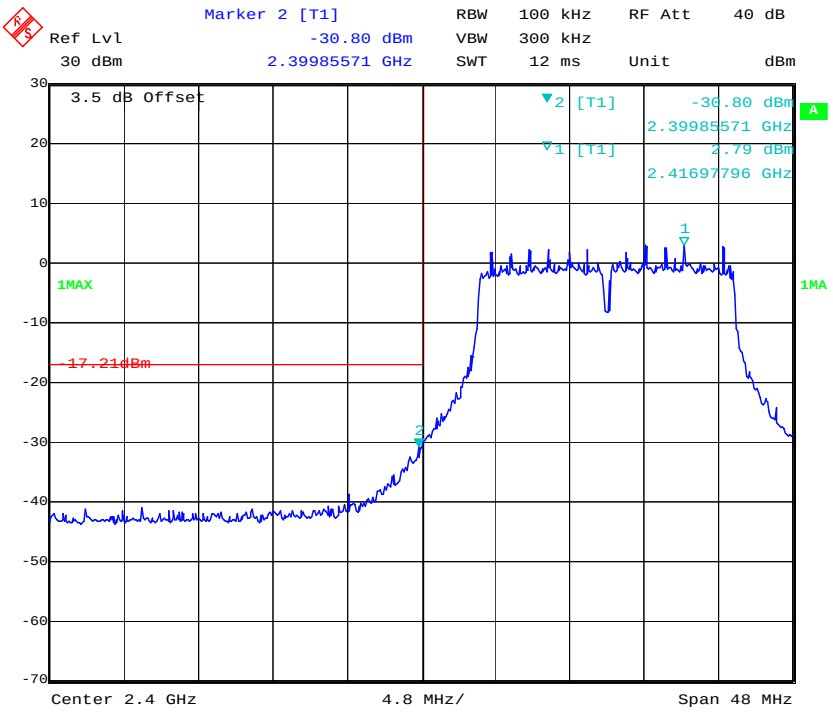
802.11b: Band Edge, Left Side



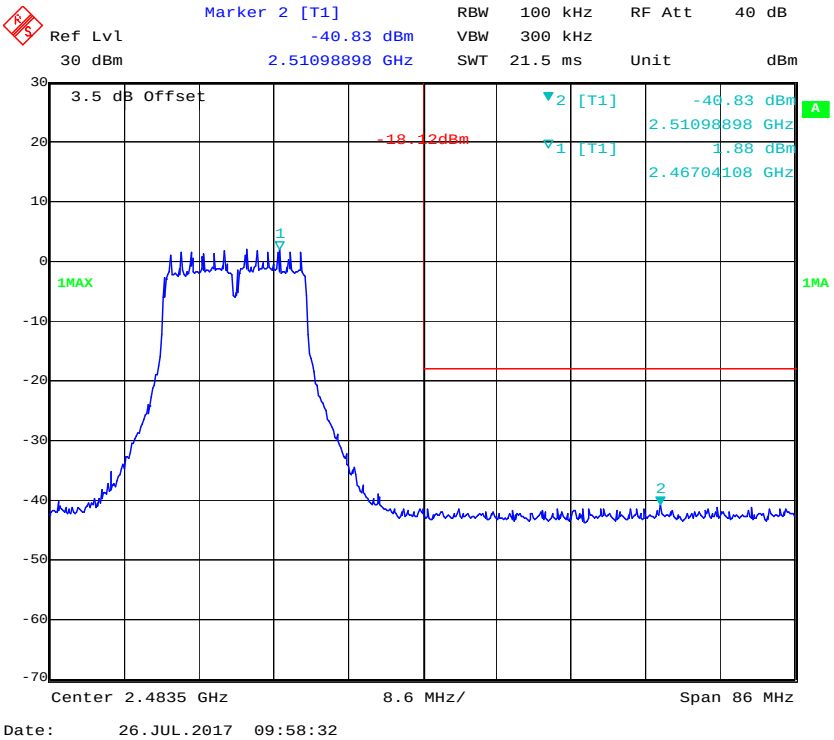
802.11b: Band Edge, Right Side



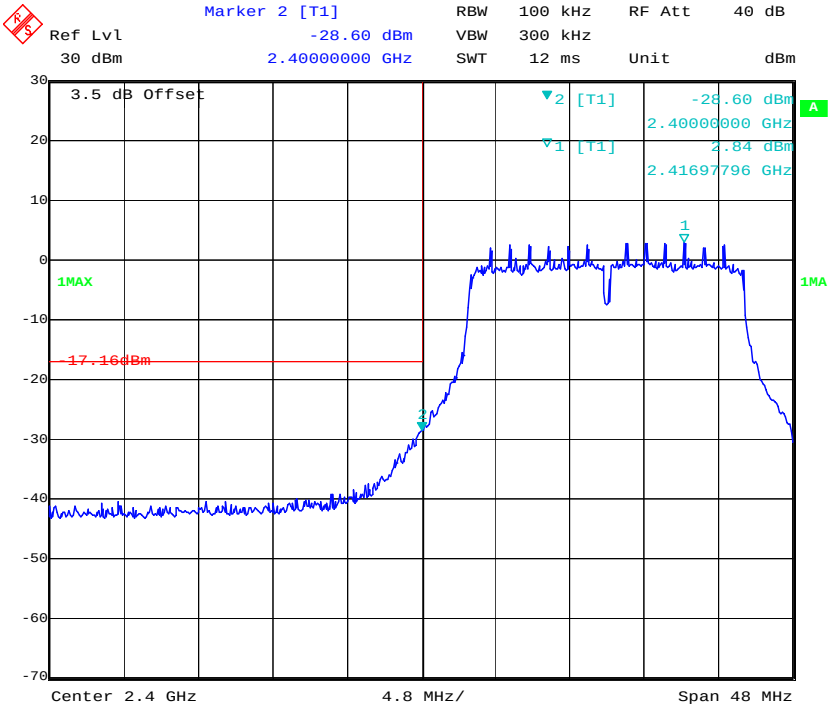
802.11g: Band Edge, Left Side



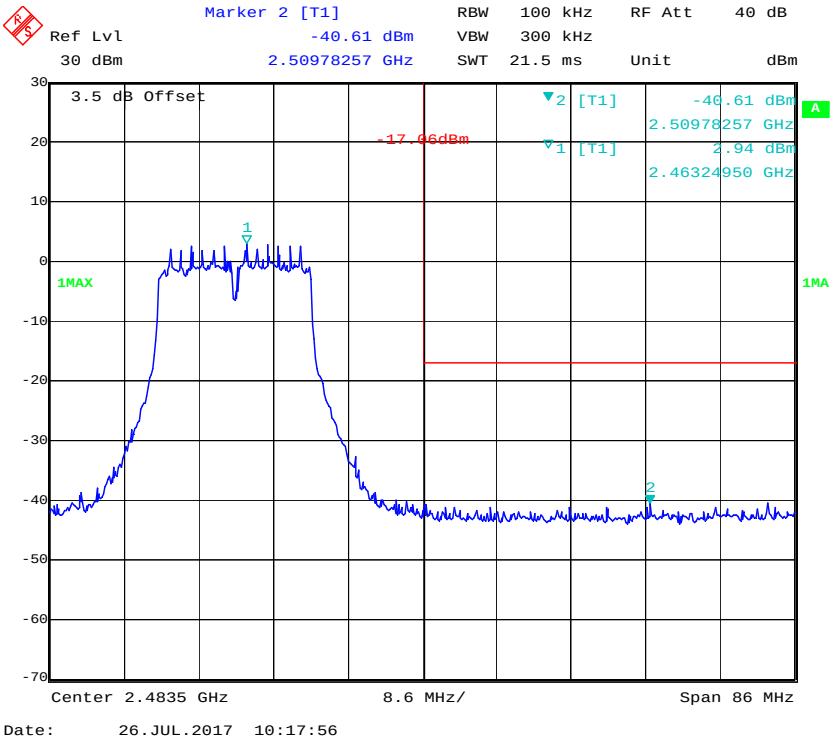
802.11g: Band Edge, Right Side



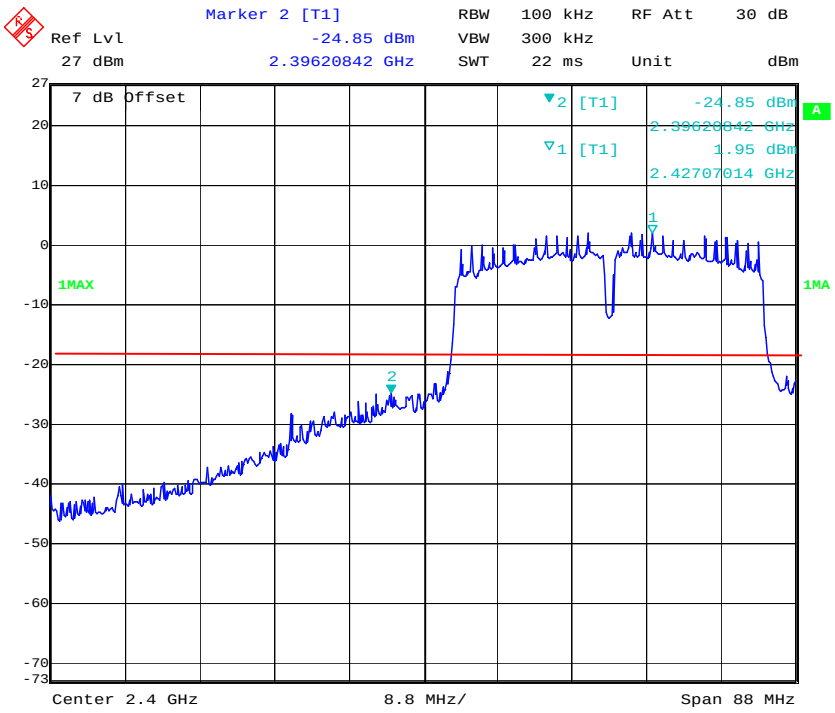
802.11n-HT20: Band Edge, Left Side



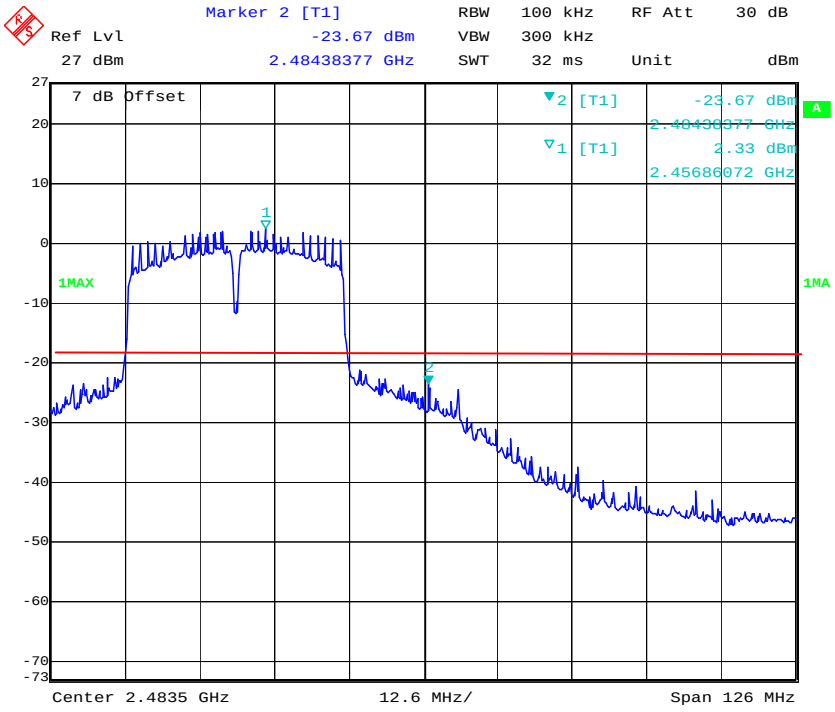
802.11n-HT20: Band Edge, Right Side



802.11n-HT40: Band Edge, Left Side



802.11n-HT40: Band Edge, Right Side



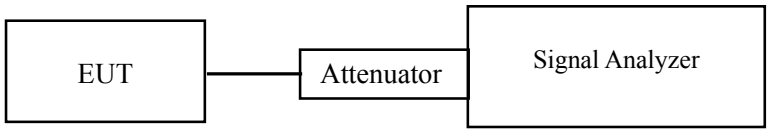
FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

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

Test Procedure

1. 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:	25 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Vincent Zeng from 2017-07-22 to 2017-09-16.

EUT operation mode: Transmitting

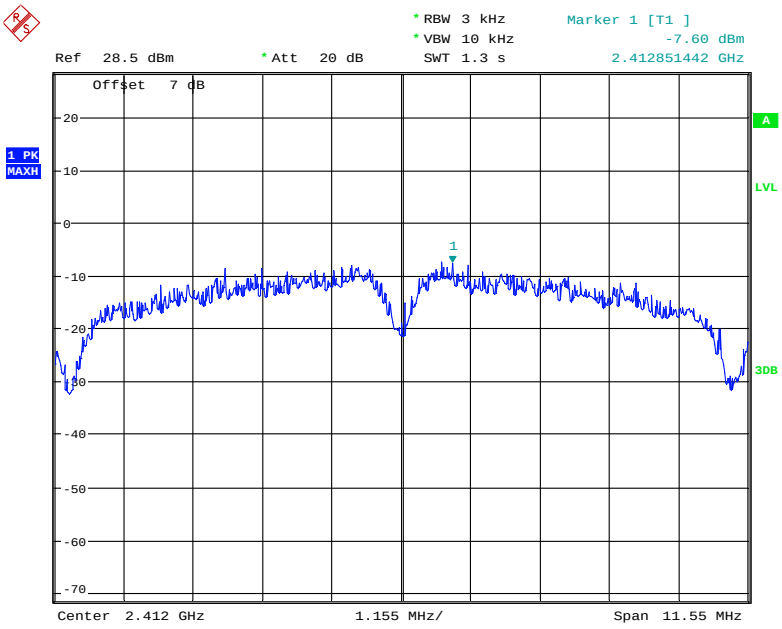
Test Result: Pass

This Device Employs Cyclic Delay Diversity.
When determining reductions in power spectral density limits, array gain is calculated as follows:
Array gain = 10 log (N_{ANT}), where N_{ANT} is the number of transmit antennas.
Total directional gain (dBi) = gain of individual transmit antennas (dBi) +3.0 (dB) =7.0dBi.
So the limit shall be subtracted 1dB.

Channel	Frequency (MHz)	Antenna 0 (dBm/3kHz)	Antenna 1 (dBm/3kHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)
802.11b mode					
Low	2412	-7.60	-6.39	-3.98	≤7
Middle	2437	-5.85	-6.49	-3.15	≤7
High	2462	-7.31	-7.55	-4.32	≤7
802.11g mode					
Low	2412	-11.61	-11.74	-8.54	≤7
Middle	2437	-8.61	-8.34	-5.46	≤7
High	2462	-9.8	-11.56	-7.70	≤7
802.11n-HT20 mode					
Low	2412	-11.15	-11.74	-8.24	≤7
Middle	2437	-8.74	-8.28	-5.49	≤7
High	2462	-11.81	-11.25	-8.54	≤7
802.11n HT40					
Low	2422	-14.79	-13.19	-10.97	≤7
Middle	2437	-12.24	-12.01	-9.11	≤7
High	2452	-14.22	-13.12	-10.46	≤7

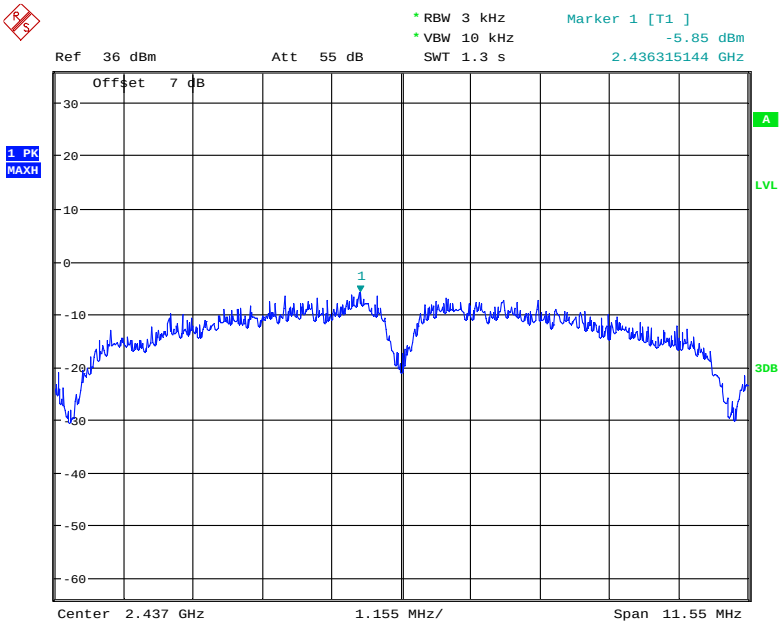
Antenna 0

Power Spectral Density, 802.11b Low Channel



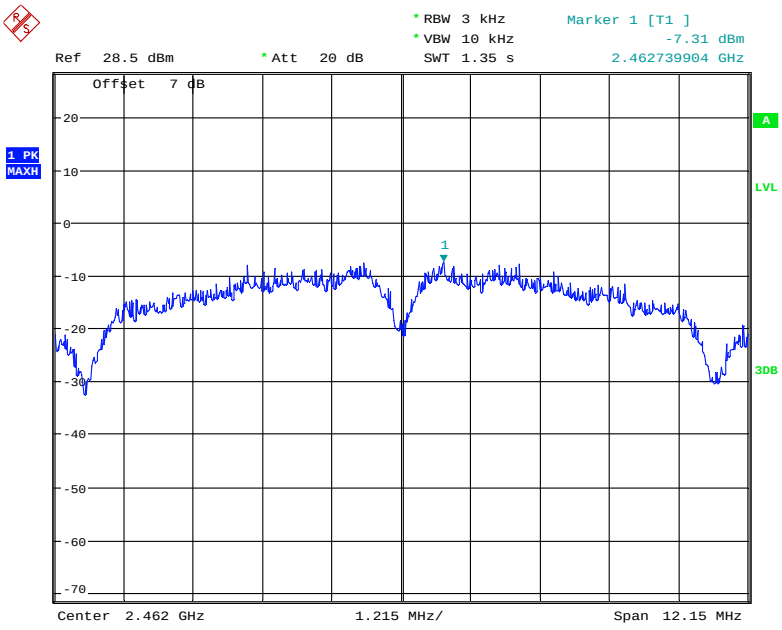
Date: 25.SEP.2017 11:08:41

Power Spectral Density, 802.11b Middle Channel

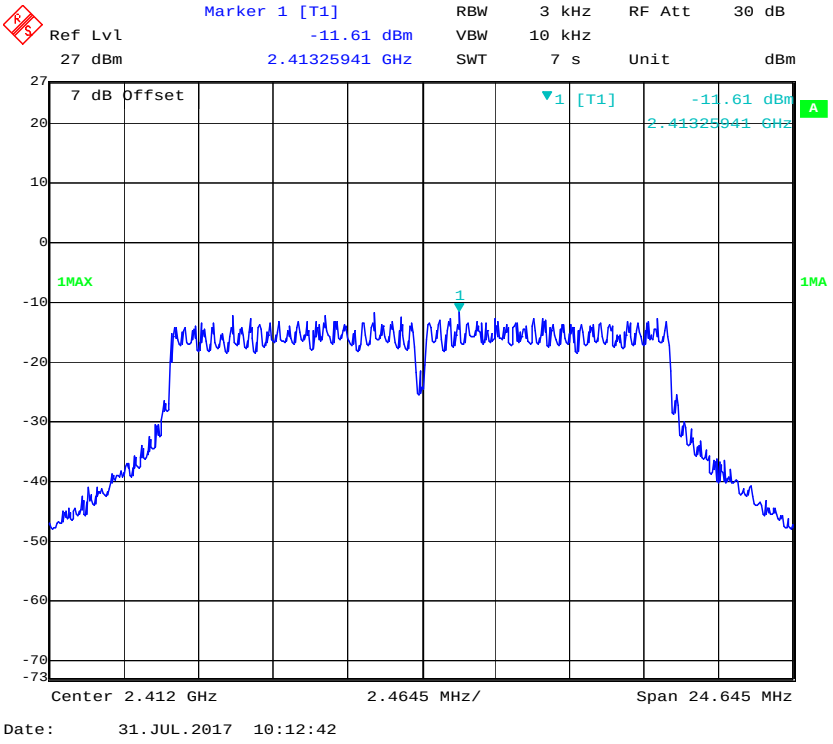


Date: 16.SEP.2017 20:34:49

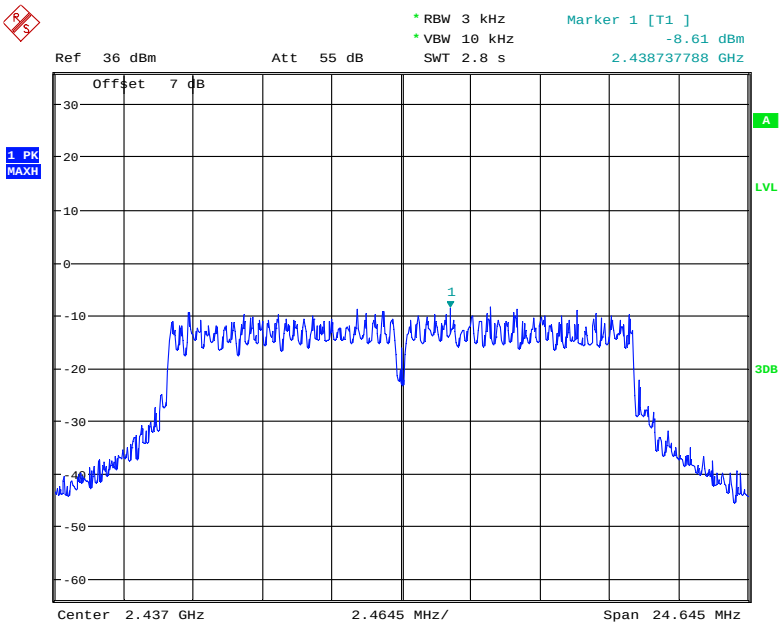
Power Spectral Density, 802.11b High Channel



Power Spectral Density, 802.11g Low Channel

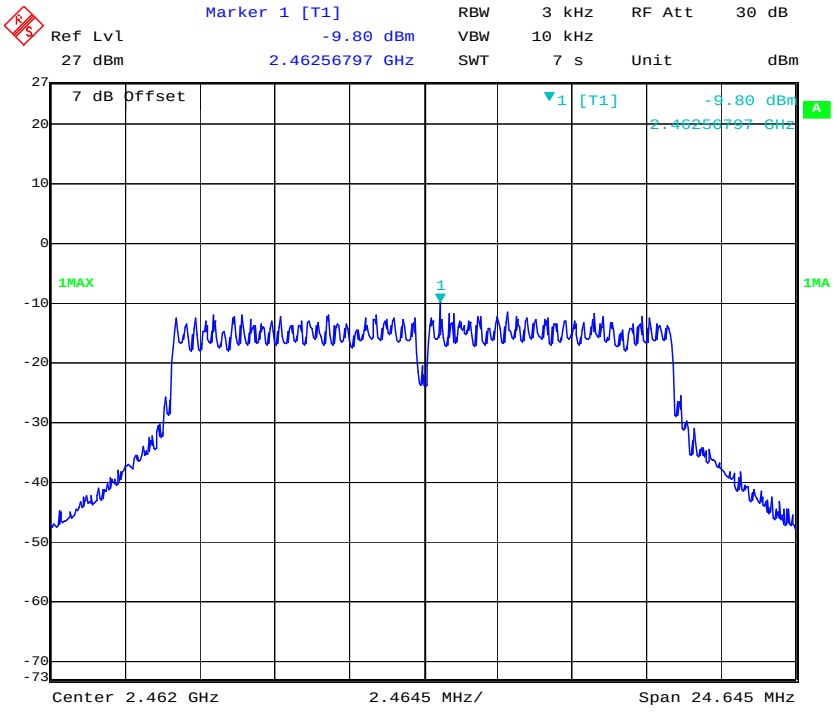


Power Spectral Density, 802.11g Middle Channel



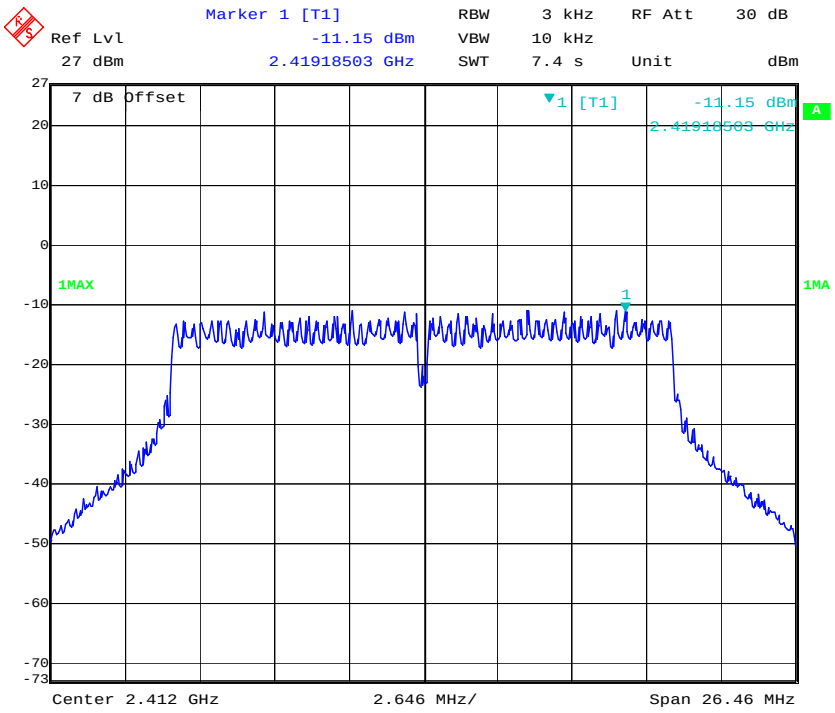
Date: 16.SEP.2017 20:33:07

Power Spectral Density, 802.11g High Channel

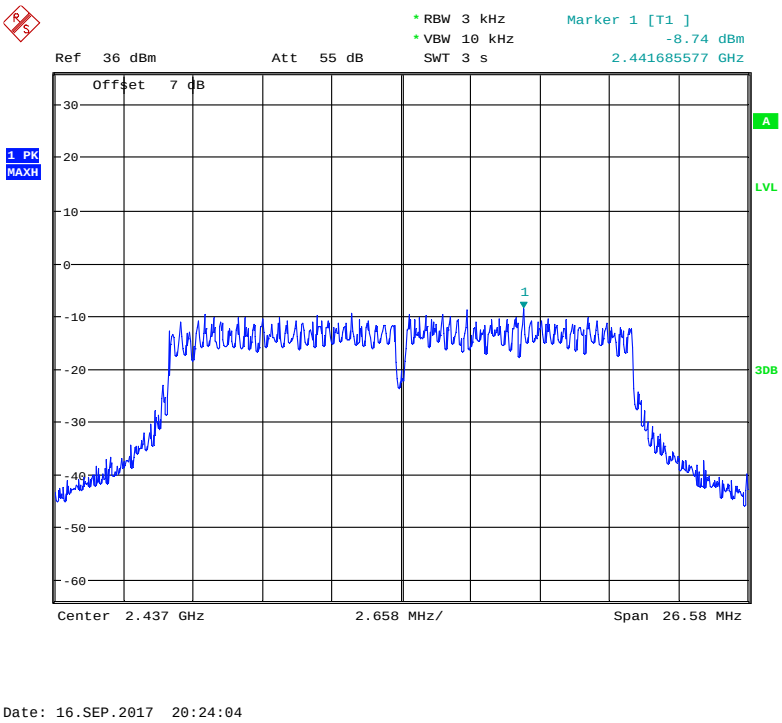


Date: 31.JUL.2017 10:19:02

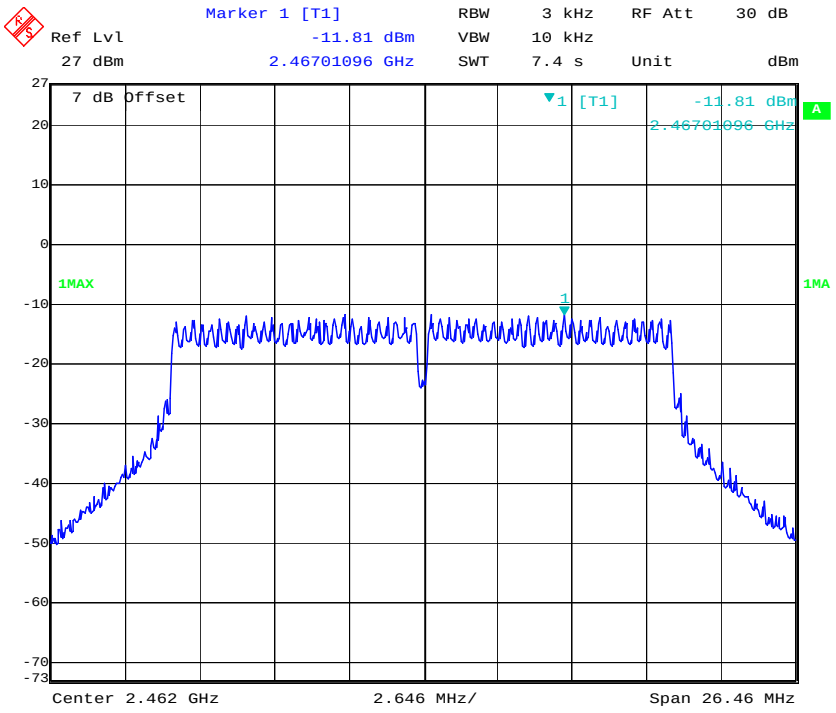
Power Spectral Density, 802.11n-HT20 Low Channel



Power Spectral Density, 802.11n-HT20 Middle Channel

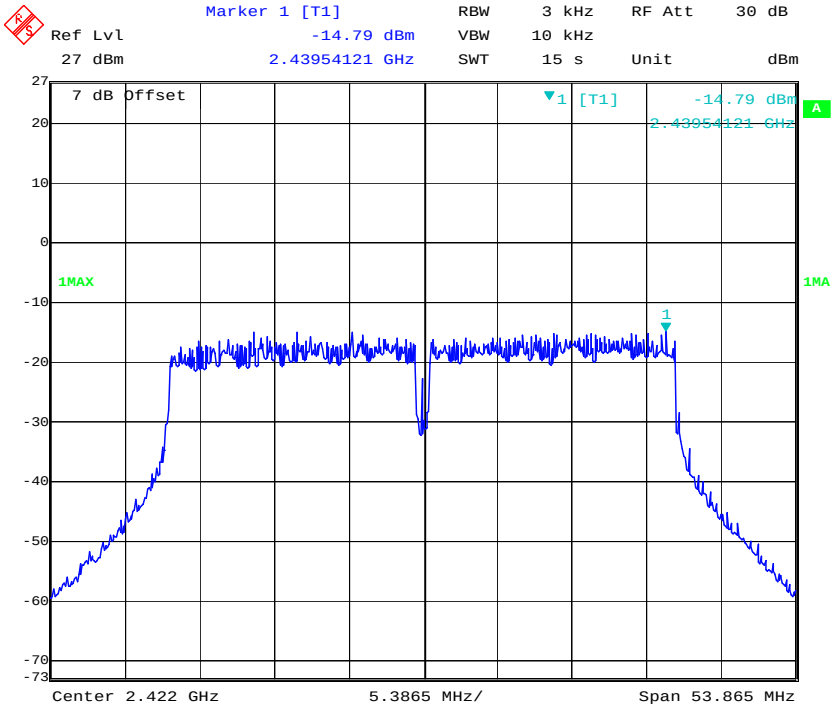


Power Spectral Density, 802.11n-HT20 High Channel



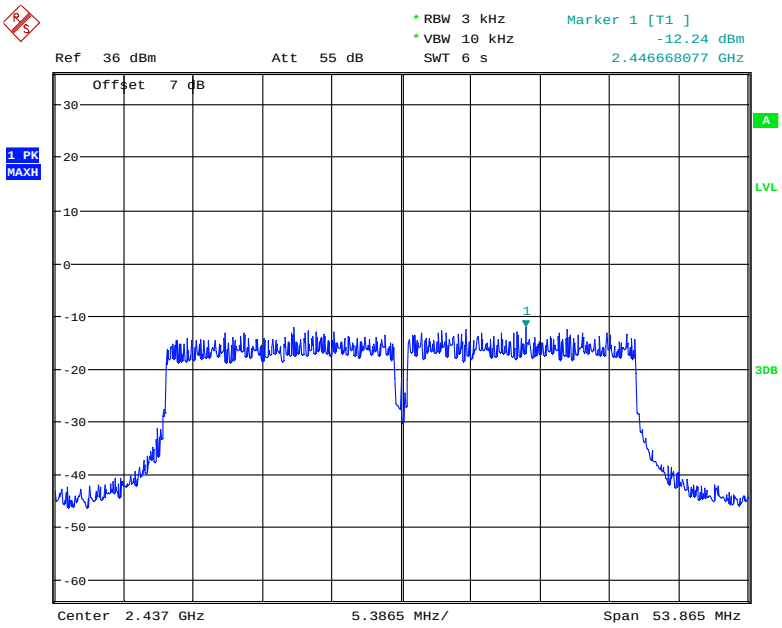
Date: 31.JUL.2017 10:45:35

Power Spectral Density, 802.11n-HT40 Low Channel



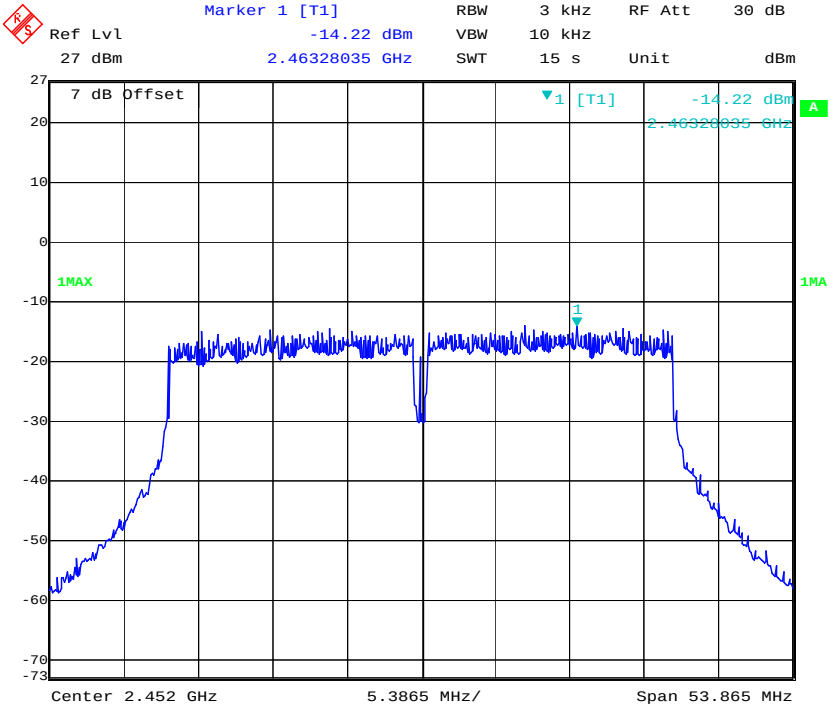
Date: 31.JUL.2017 11:00:03

Power Spectral Density, 802.11n-HT40 Middle Channel



Date: 16.SEP.2017 20:14:55

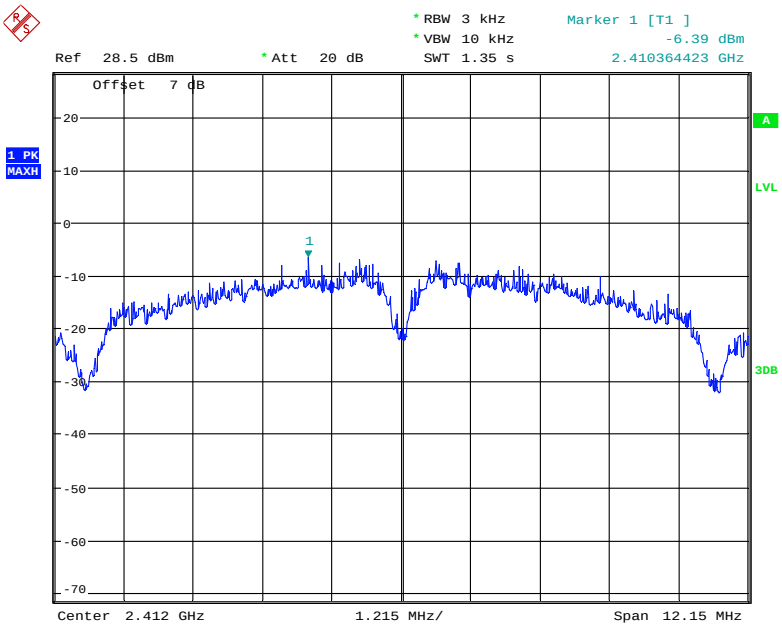
Power Spectral Density, 802.11n-HT40 High Channel



Date: 31.JUL.2017 11:03:33

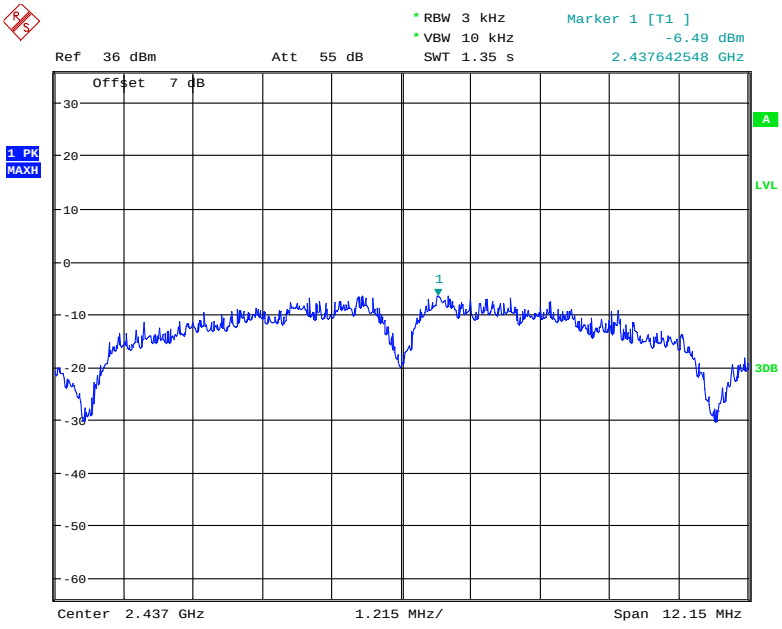
Antenna 1

Power Spectral Density, 802.11b Low Channel



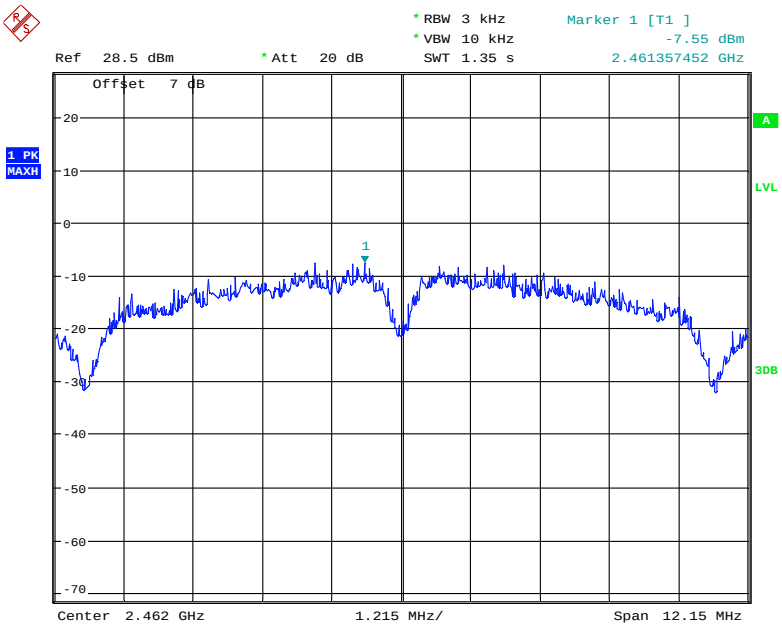
Date: 25.SEP.2017 10:38:39

Power Spectral Density, 802.11b Middle Channel

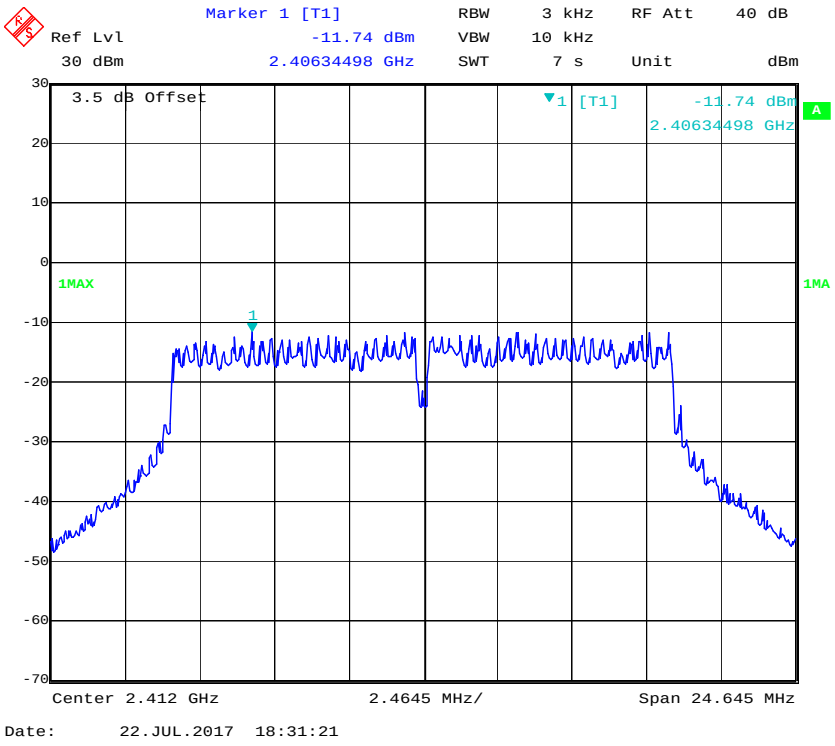


Date: 16.SEP.2017 20:34:01

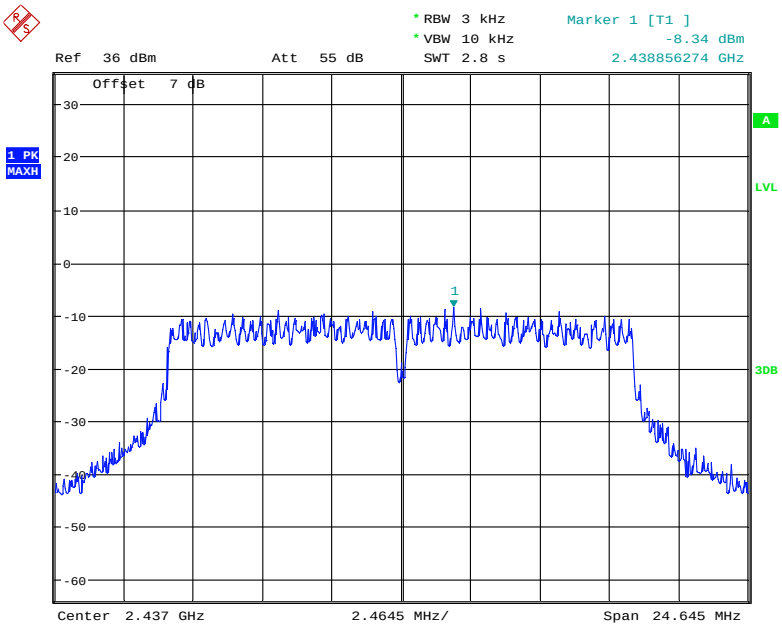
Power Spectral Density, 802.11b High Channel



Power Spectral Density, 802.11g Low Channel

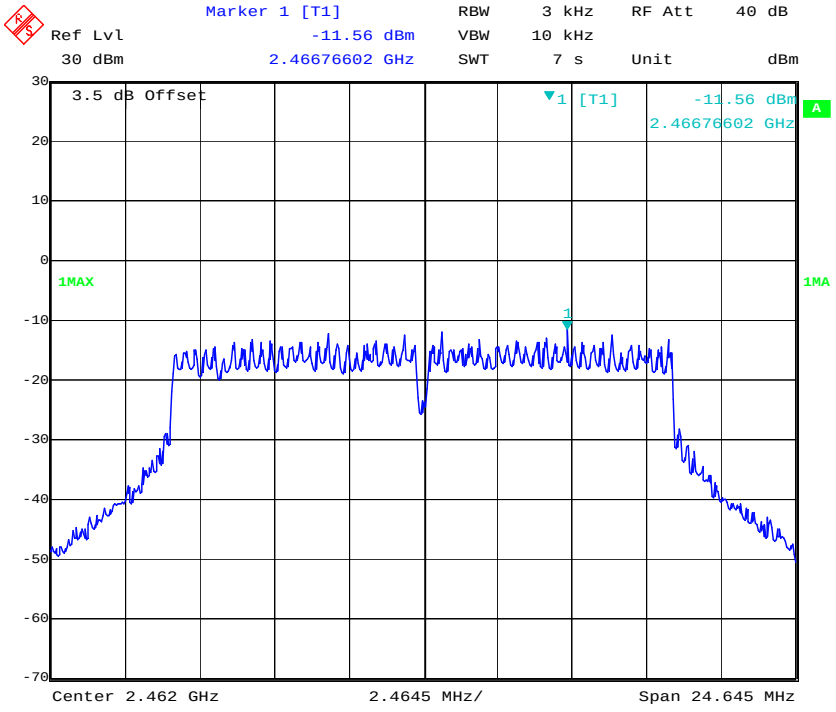


Power Spectral Density, 802.11g Middle Channel



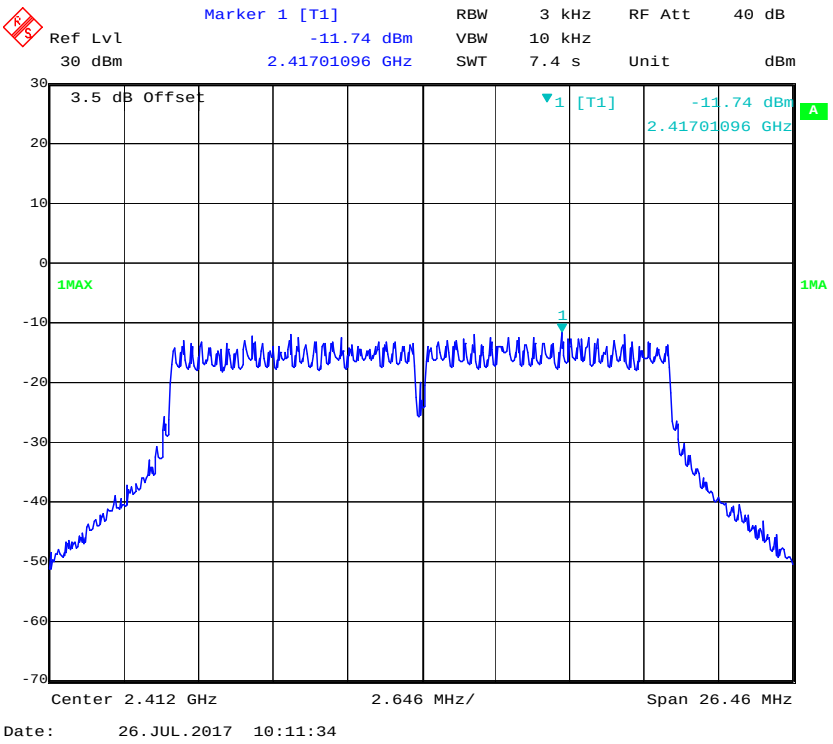
Date: 16.SEP.2017 20:32:30

Power Spectral Density, 802.11g High Channel

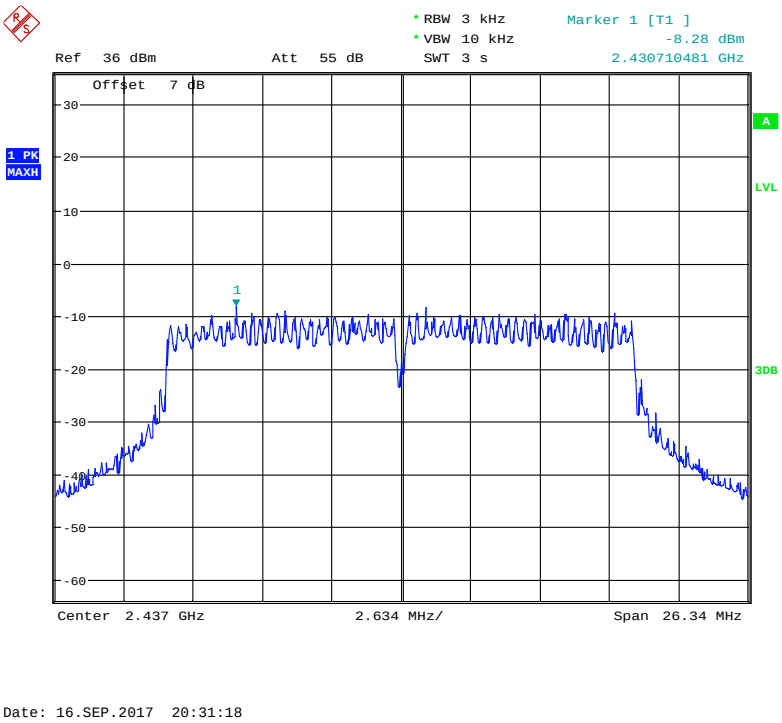


Date: 26.JUL.2017 09:58:09

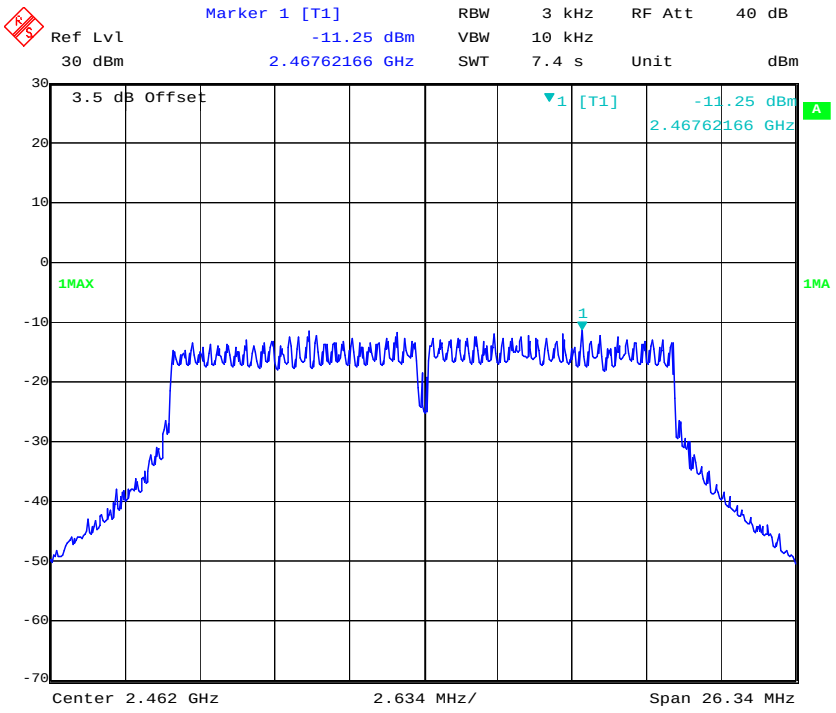
Power Spectral Density, 802.11n-HT20 Low Channel



Power Spectral Density, 802.11n-HT20 Middle Channel

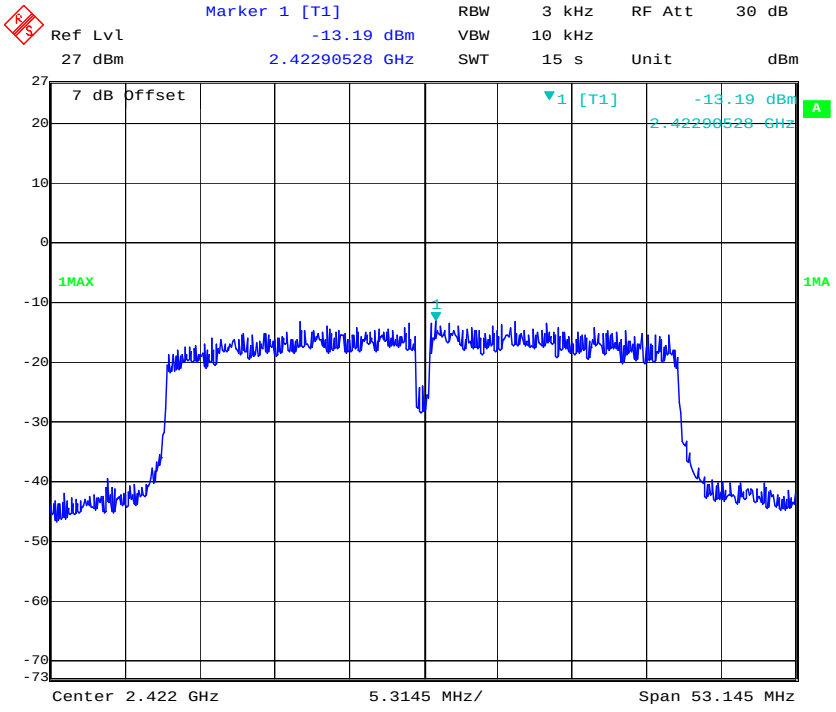


Power Spectral Density, 802.11n-HT20 High Channel



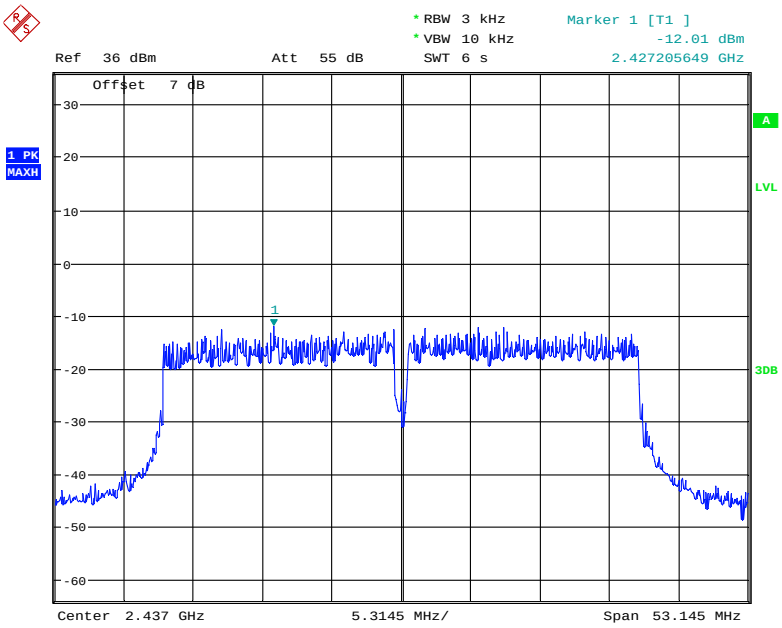
Date: 26.JUL.2017 10:17:40

Power Spectral Density, 802.11n-HT40 Low Channel



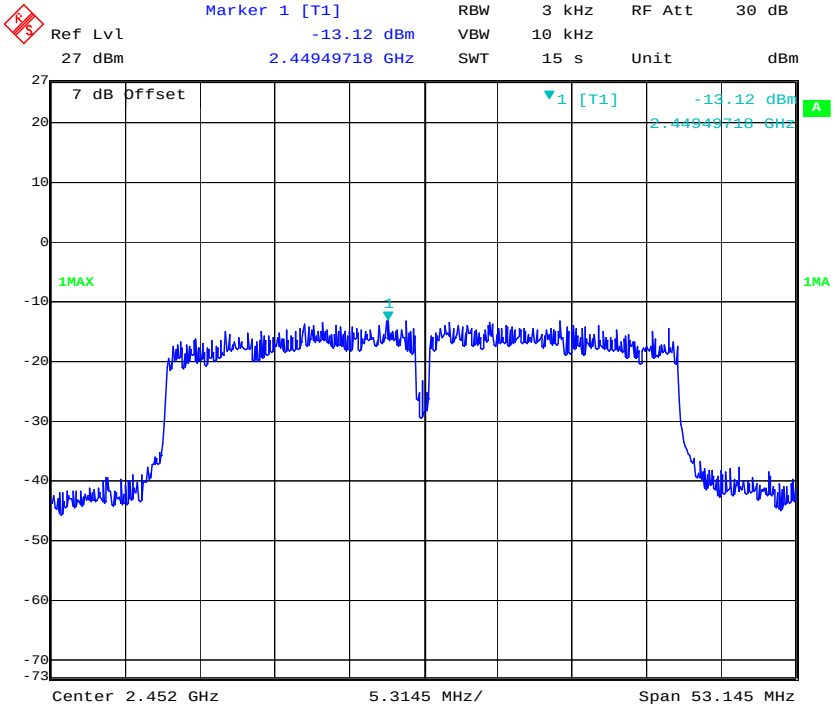
Date: 23.AUG.2017 20:40:48

Power Spectral Density, 802.11n-HT40 Middle Channel



Date: 16.SEP.2017 20:14:01

Power Spectral Density, 802.11n-HT40 High Channel



Date: 23.AUG.2017 20:29:47

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