TEST REPORT

Reference No.	:	WTD19S11079961W001 V1
FCC ID	:	2ADDH-139263
Applicant	:	Monoprice, Inc.
Address	:	1 Pointe Dr Suite# 400 Brea, California, United States
Manufacturer	:	Mansion Industry Co., Ltd.
Address	:	No.402, Xiangshan Rd., The 3rd Industrial Park, Luotian Community, Songgang Street, Baoan District, Shenzhen, Guangdong, 518105 China
Product	:	RS232-IP
Model(s)	:	139263
Brand Name	:	Monoprice
Standards	:	FCC CFR47 Part 15.247:2018
Date of Receipt sample	:	2019-11-19
Date of Test	:	2019-11-20 to 2019-12-09
Date of Issue	:	2020-03-31
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD19S11079961W001	2019-11-19	2019-11-20 to 2019-12-09	2019-12-10	original	-	Replaced
WTD19S11079961W001 V1	2019-11-19	2019-11-20 to 2019-12-09	2020-03-31	Version 1	Updated	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	RS232-IP
Model(s):	139263
Model Description:	N/A
Wi-Fi Specification:	2.4G-802.11b/g/n HT20/n HT40
Hardware Version:	V7.2
Software Version:	V1.78
Highest frequency (Exclude Radio):	1.25GHz
Storage Location:	Internal Storage
Note:	N/A

4.2 Details of E.U.T.

Operation Frequency:	WiFi: 802.11b/g/n HT20: 2412~2462MHz 802.11n HT40: 2422~2452MHz
Max. RF output power:	WiFi(2.4G): 16.42dBm
Type of Modulation:	WiFi: CCK, OFDM
Antenna installation:	WiFi: External antenna with special-SMA connector
Antenna Gain:	WiFi(2.4G): 6.0dBi
Ratings:	DC 5V, 1.0A, charging from adapter (Adapter Input: 100-240V~50/60Hz)
Adapter:	Manufacturer: Shenzhen Qiaojun Trade Co. , Ltd. Model No.: WEEQU-0510

4.3 Channel List

WIFI

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	-

4.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Power Spectral Density	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
6dB Bandwidth	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Band Edge	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX
Transmitter Spurious Emissions	802.11b	1 Mbps	1/6/11	TX
	802.11g	6 Mbps	1/6/11	TX
	802.11n HT20	MCS0	1/6/11	TX
	802.11n HT40	MCS0	3/6/9	TX

Note :Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product .

5 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.247(d) 15.205(a) 15.209(a)	PASS
Conducted Spurious Emissions	15.247(d)	PASS
Conducted Emissions	15.207(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3),(4)	PASS
Power Spectral Density	15.247(e)	PASS
Band Edge	15.247(d)	PASS
Antenna Requirement	15.203	PASS

Note：All test were performed that the device transmit continue of the 100% duty cycle.

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	2019-09-12	2020-09-11
2.	LISN	R&S	ENV216	101215	2019-09-12	2020-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2019-09-12	2020-09-11
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	2019-09-12	2020-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2019-09-12	2020-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2019-09-12	2020-09-11
4.	Cable	LARGE	RF300	-	2019-09-12	2020-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP	100091	2019-04-29	2020-04-28
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2019-04-09	2020-04-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2019-04-09	2020-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2019-09-12	2020-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2019-04-09	2020-04-08
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2019-04-09	2020-04-08
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2019-04-13	2020-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2019-04-13	2020-04-12
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2019-04-13	2020-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2019-04-09	2020-04-08
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2019-04-13	2020-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2019-04-13	2020-04-12

RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2019-09-12	2020-09-11
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2019-09-12	2020-09-11
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2019-09-12	2020-09-11

6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/

6.3 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10^{-7}Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval：95%. Confidence factor:k=2	

6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

7 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity: Class B

Limit:

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.	66 to 56*	56 to 46*
0.5 to 5	56	46
5 o 30	60	50

7.1 E.U.T. Operation

Operating Environment **:**

Temperature: 21.5 °C

Humidity: 51.9 % RH

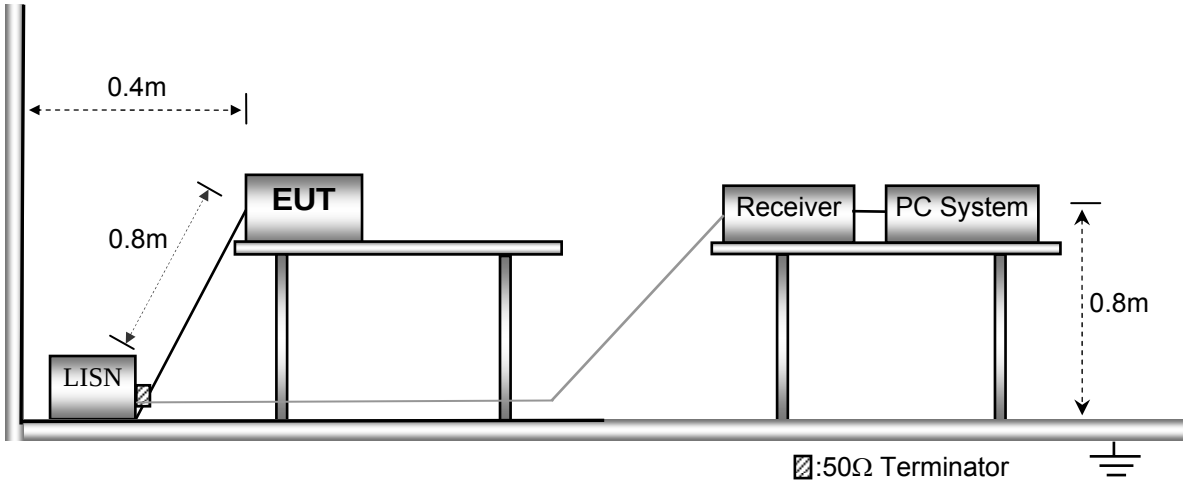
Atmospheric Pressure: 101.2kPa

EUT Operation **:**

The test was performed in TX transmitting mode, the worst data were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10.



7.3 Measurement Description

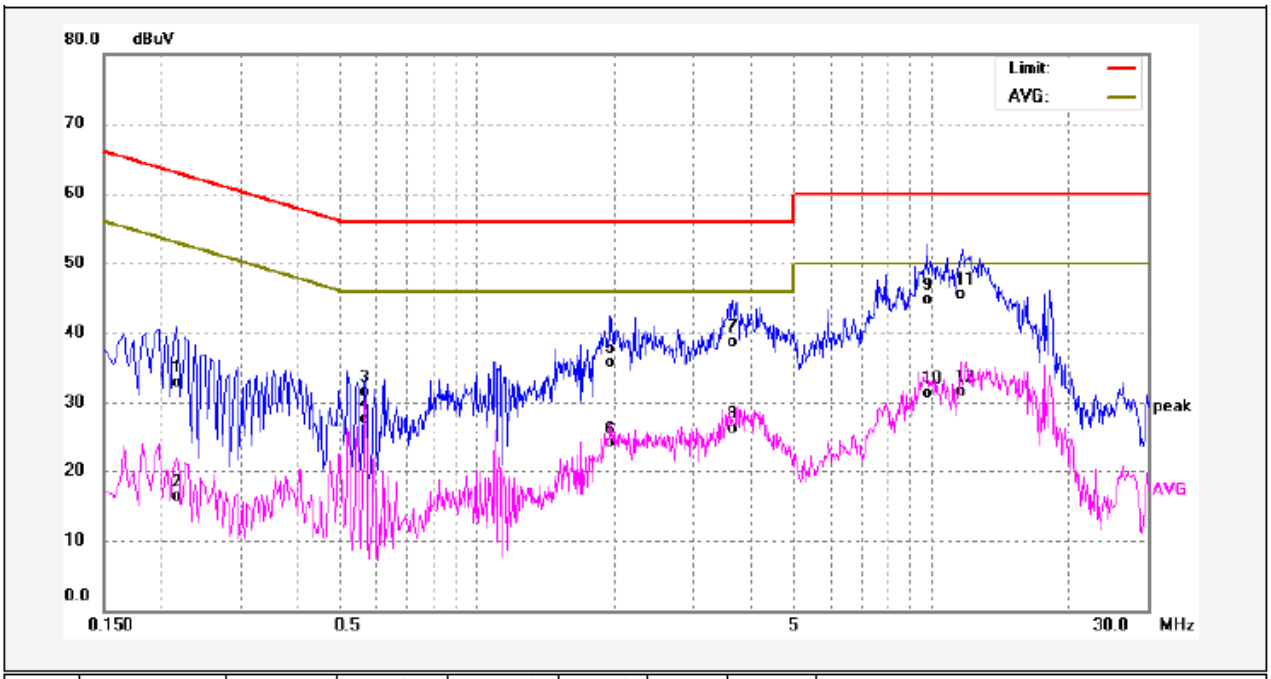
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

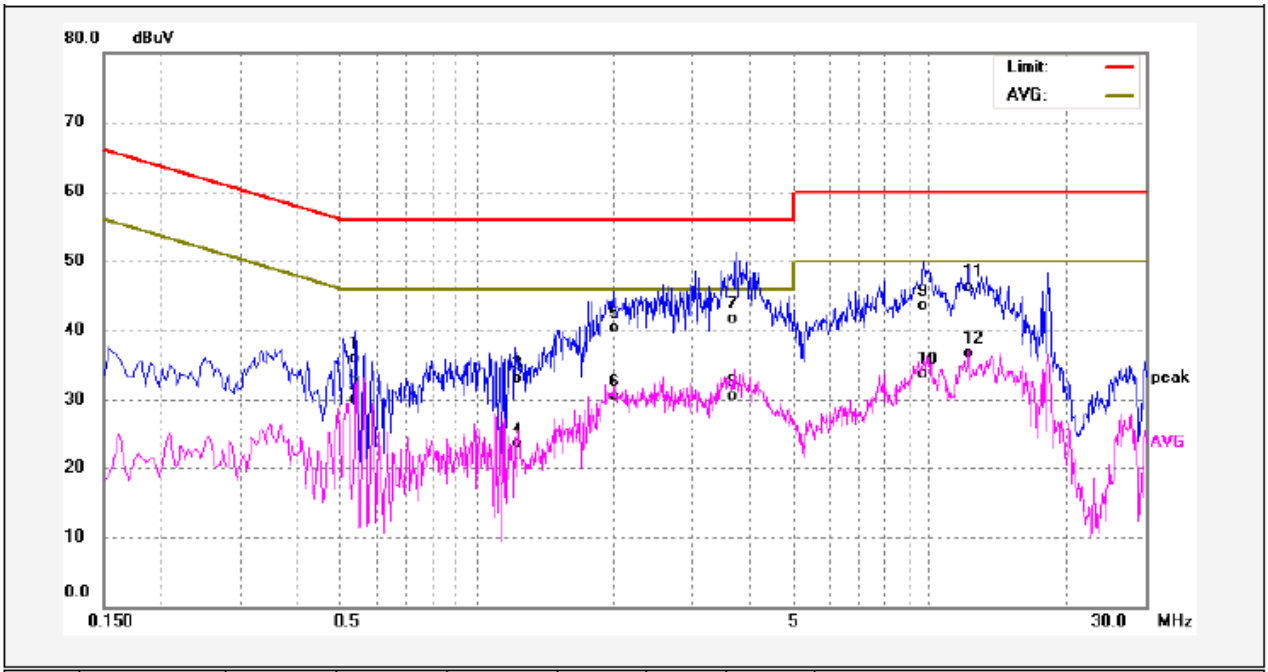
Worst Mode: WIFI mode (802.11b mode low channel)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2180	23.15	9.77	32.92	62.89	-29.97	QP	
2	0.2180	6.60	9.77	16.37	52.89	-36.52	AVG	
3	0.5660	21.77	9.83	31.60	56.00	-24.40	QP	
4	0.5660	17.82	9.83	27.65	46.00	-18.35	AVG	
5	1.9620	25.67	9.96	35.63	56.00	-20.37	QP	
6	1.9620	14.15	9.96	24.11	46.00	-21.89	AVG	
7	3.6460	28.73	9.94	38.67	56.00	-17.33	QP	
8	3.6460	16.45	9.94	26.39	46.00	-19.61	AVG	
9	9.8020	34.64	10.06	44.70	60.00	-15.30	QP	
10	9.8020	21.15	10.06	31.21	50.00	-18.79	AVG	
11	11.7060	35.33	10.09	45.42	60.00	-14.58	QP	
12	11.7060	21.50	10.09	31.59	50.00	-18.41	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5380	26.07	9.82	35.89	56.00	-20.11	QP	
2	0.5380	20.30	9.82	30.12	46.00	-15.88	AVG	
3	1.2140	23.17	9.90	33.07	56.00	-22.93	QP	
4	1.2140	13.61	9.90	23.51	46.00	-22.49	AVG	
5	1.9940	30.28	9.96	40.24	56.00	-15.76	QP	
6	1.9940	20.62	9.96	30.58	46.00	-15.42	AVG	
7	3.7340	31.83	9.94	41.77	56.00	-14.23	QP	
8	3.7340	20.50	9.94	30.44	46.00	-15.56	AVG	
9	9.6820	33.52	10.06	43.58	60.00	-16.42	QP	
10	9.6820	23.74	10.06	33.80	50.00	-16.20	AVG	
11	12.1980	36.23	10.10	46.33	60.00	-13.67	QP	
12	12.1980	26.52	10.10	36.62	50.00	-13.38	AVG	

8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019; ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

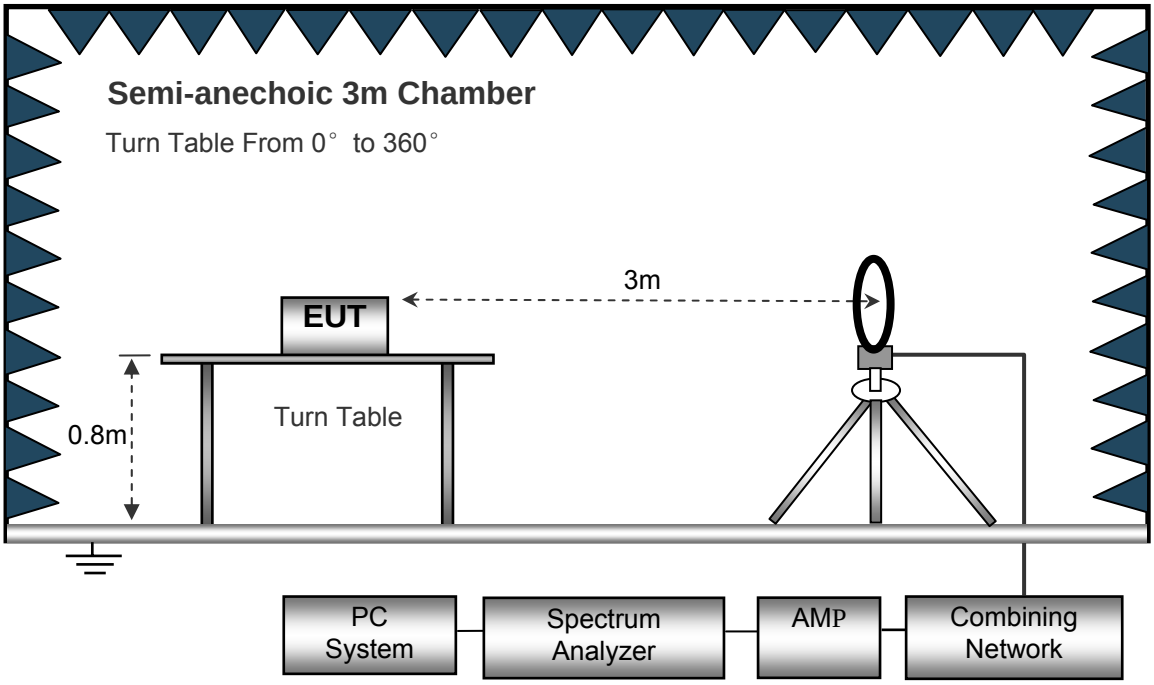
EUT Operation **:**

The test was performed in TX transmitting mode, the test data were shown in the report.

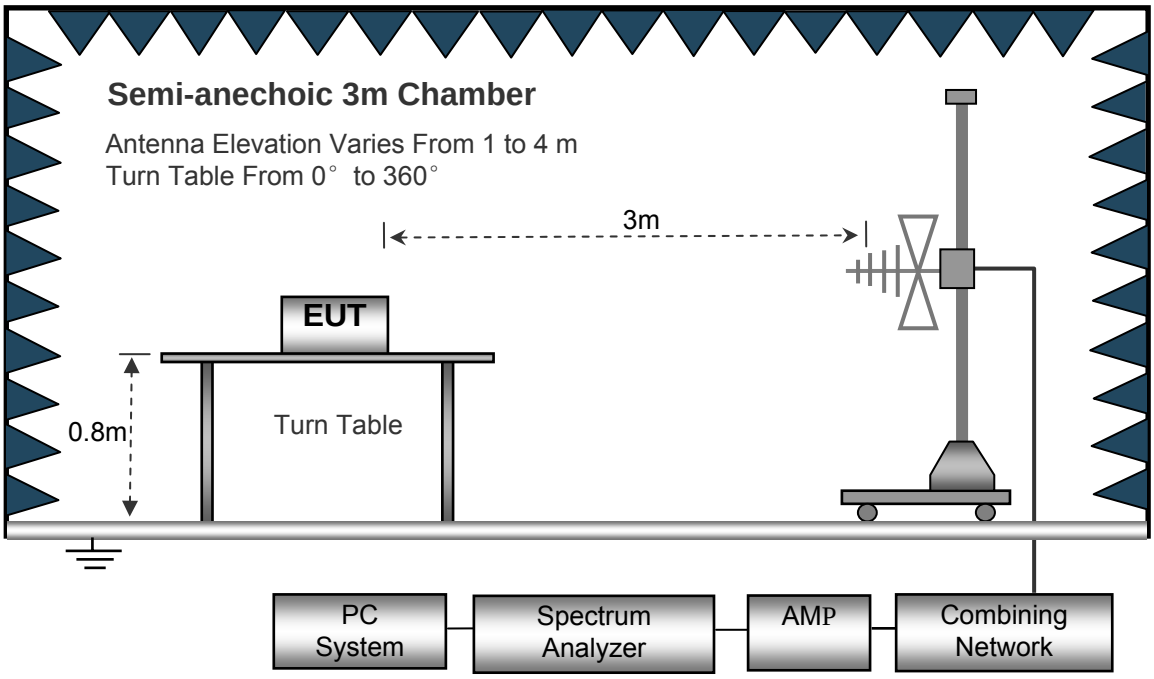
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

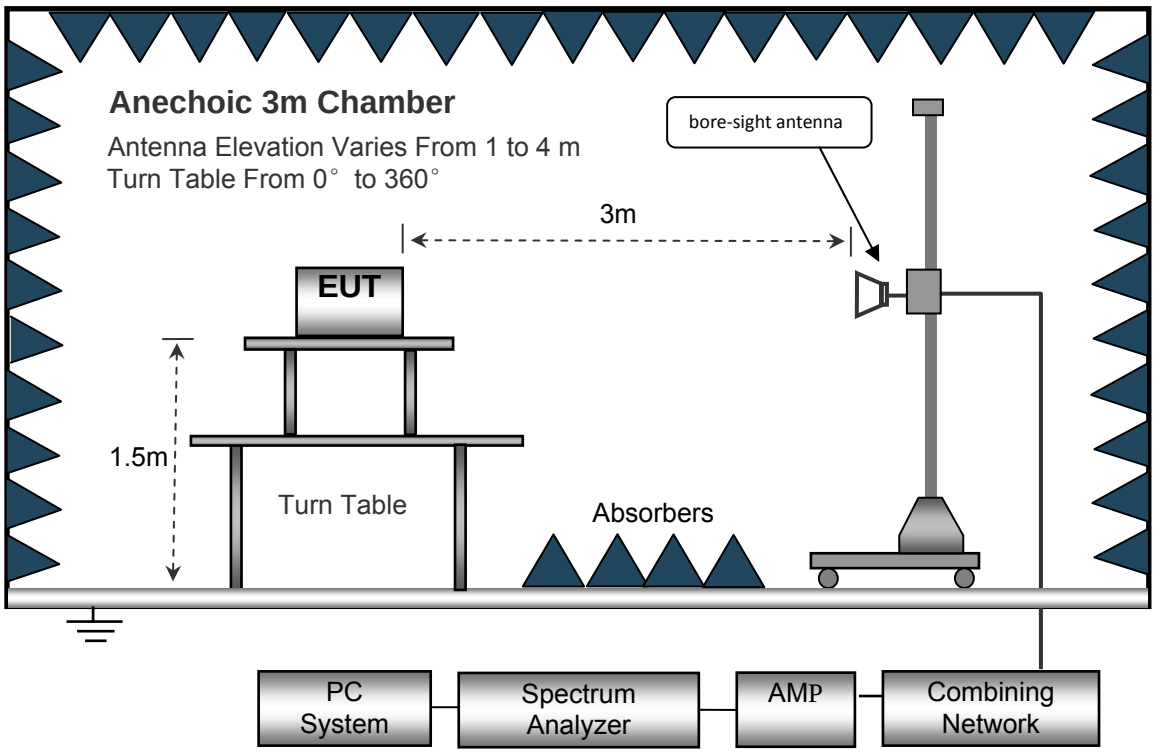
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used druing radiated emissions above 1GHz measurement.

8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

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

Margin = Corr. Ampl. – Limit

8.6 Summary of Test Results

Wifi:
Test Frequency: 9KHz~30MHz

Remark: only the worst data (802.11b/g/n Low channel mode) were recorded.

Frequency	Measurement results dBμV @3m	Detector PK/QP	Correct factor dB/m	Extrapolation factor dB	Measurement results (calculated) dBμV/m @30m	Limits dBμV/m @30m	Margin dB
(MHz)	Measurement results	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
802.11b							
6.032	25.31	QP	21.84	40.00	7.15	29.54	-22.39
15.730	24.71	QP	21.35	40.00	6.06	29.54	-23.48
25.680	25.54	QP	20.67	40.00	6.21	29.54	-23.33
802.11g							
6.032	24.53	QP	21.84	40.00	6.37	29.54	-23.17
8.051	24.71	QP	21.02	40.00	5.73	29.54	-23.81
26.215	25.06	QP	20.55	40.00	5.61	29.54	-23.93
802.11n(HT20)							
6.032	25.03	QP	21.84	40.00	6.87	29.54	-22.67
15.730	24.18	QP	21.35	40.00	5.53	29.54	-24.01
25.680	25.10	QP	20.67	40.00	5.77	29.54	-23.77
802.11n(HT40)							
6.032	25.11	QP	21.84	40.00	6.95	29.54	-22.59
8.051	25.23	QP	21.02	40.00	6.25	29.54	-23.29
26.215	24.57	QP	20.55	40.00	5.12	29.54	-24.42

Test Frequency : 30MHz ~ 8GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
223.45	39.14	QP	357	1.9	H	-11.62	27.52	46.00	-18.48
223.45	35.77	QP	167	1.3	V	-11.62	24.15	46.00	-21.85
4824.00	49.31	PK	355	1.7	V	-1.06	48.25	74.00	-25.75
4824.00	45.06	Ave	355	1.7	V	-1.06	44.00	54.00	-10.00
7236.00	40.17	PK	315	1.7	H	1.33	41.50	74.00	-32.50
7236.00	41.73	Ave	315	1.7	H	1.33	43.06	54.00	-10.94
2326.10	46.96	PK	171	2.0	V	-13.19	33.77	74.00	-40.23
2326.10	39.11	Ave	171	2.0	V	-13.19	25.92	54.00	-28.08
2365.46	42.53	PK	201	1.5	H	-13.14	29.39	74.00	-44.61
2365.46	37.95	Ave	201	1.5	H	-13.14	24.81	54.00	-29.19
2496.45	42.61	PK	188	1.0	V	-13.08	29.53	74.00	-44.47
2496.45	38.75	Ave	188	1.0	V	-13.08	25.67	54.00	-28.33

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
223.45	39.76	QP	57	1.2	H	-11.62	28.14	46.00	-17.86
223.45	35.32	QP	322	2.0	V	-11.62	23.70	46.00	-22.30
4874.00	50.29	PK	8	1.6	V	-0.62	49.67	74.00	-24.33
4874.00	44.13	Ave	8	1.6	V	-0.62	43.51	54.00	-10.49
7311.00	38.99	PK	74	1.1	H	2.21	41.20	74.00	-32.80
7311.00	42.56	Ave	74	1.1	H	2.21	44.77	54.00	-9.23
2318.92	45.58	PK	176	1.9	V	-13.19	32.39	74.00	-41.61
2318.92	38.45	Ave	176	1.9	V	-13.19	25.26	54.00	-28.74
2354.37	42.59	PK	233	1.2	H	-13.14	29.45	74.00	-44.55
2354.37	38.13	Ave	233	1.2	H	-13.14	24.99	54.00	-29.01
2499.45	44.16	PK	47	1.8	V	-13.08	31.08	74.00	-42.92
2499.45	37.17	Ave	47	1.8	V	-13.08	24.09	54.00	-29.91

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
223.45	38.89	QP	253	1.5	H	-11.62	27.27	46.00	-18.73
223.45	34.76	QP	44	1.6	V	-11.62	23.14	46.00	-22.86
4924.00	49.20	PK	59	1.6	V	-0.24	48.96	74.00	-25.04
4924.00	44.76	Ave	59	1.6	V	-0.24	44.52	54.00	-9.48
7386.00	39.24	PK	95	1.8	H	2.84	42.08	74.00	-31.92
7386.00	42.54	Ave	95	1.8	H	2.84	45.38	54.00	-8.62
2311.64	45.62	PK	146	1.8	V	-13.19	32.43	74.00	-41.57
2311.64	39.81	Ave	146	1.8	V	-13.19	26.62	54.00	-27.38
2382.03	44.56	PK	226	1.4	H	-13.14	31.42	74.00	-42.58
2382.03	38.03	Ave	226	1.4	H	-13.14	24.89	54.00	-29.11
2485.37	42.97	PK	17	1.9	V	-13.08	29.89	74.00	-44.11
2485.37	37.40	Ave	17	1.9	V	-13.08	24.32	54.00	-29.68

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: Low Channel 2412MHz									
223.45	37.75	QP	350	1.1	H	-11.62	26.13	46.00	-19.87
223.45	34.61	QP	57	1.6	V	-11.62	22.99	46.00	-23.01
4824.00	49.29	PK	91	1.6	V	-1.06	48.23	74.00	-25.77
4824.00	44.04	Ave	91	1.6	V	-1.06	42.98	54.00	-11.02
7236.00	38.96	PK	117	1.7	H	1.33	40.29	74.00	-33.71
7236.00	43.42	Ave	117	1.7	H	1.33	44.75	54.00	-9.25
2341.53	45.74	PK	233	1.1	V	-13.19	32.55	74.00	-41.45
2341.53	39.44	Ave	233	1.1	V	-13.19	26.25	54.00	-27.75
2358.15	44.07	PK	153	1.9	H	-13.14	30.93	74.00	-43.07
2358.15	37.36	Ave	153	1.9	H	-13.14	24.22	54.00	-29.78
2487.48	44.21	PK	231	1.3	V	-13.08	31.13	74.00	-42.87
2487.48	37.73	Ave	231	1.3	V	-13.08	24.65	54.00	-29.35

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: Middle Channel 2437MHz									
223.45	39.09	QP	72	1.3	H	-11.62	27.47	46.00	-18.53
223.45	35.03	QP	296	1.9	V	-11.62	23.41	46.00	-22.59
4874.00	48.78	PK	107	1.2	V	-0.62	48.16	74.00	-25.84
4874.00	42.99	Ave	107	1.2	V	-0.62	42.37	54.00	-11.63
7311.00	39.37	PK	125	1.9	H	2.21	41.58	74.00	-32.42
7311.00	42.81	Ave	125	1.9	H	2.21	45.02	54.00	-8.98
2313.03	46.88	PK	124	1.8	V	-13.19	33.69	74.00	-40.31
2313.03	38.37	Ave	124	1.8	V	-13.19	25.18	54.00	-28.82
2375.79	42.05	PK	236	1.1	H	-13.14	28.91	74.00	-45.09
2375.79	36.40	Ave	236	1.1	H	-13.14	23.26	54.00	-30.74
2498.51	44.03	PK	330	1.7	V	-13.08	30.95	74.00	-43.05
2498.51	38.67	Ave	330	1.7	V	-13.08	25.59	54.00	-28.41

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11g: High Channel 2462MHz									
223.45	39.38	QP	265	2.0	H	-11.62	27.76	46.00	-18.24
223.45	34.72	QP	53	1.1	V	-11.62	23.10	46.00	-22.90
4924.00	49.82	PK	307	1.9	V	-0.24	49.58	74.00	-24.42
4924.00	43.58	Ave	307	1.9	V	-0.24	43.34	54.00	-10.66
7386.00	37.98	PK	105	1.4	H	2.84	40.82	74.00	-33.18
7386.00	43.84	Ave	105	1.4	H	2.84	46.68	54.00	-7.32
2320.03	46.50	PK	4	1.6	V	-13.19	33.31	74.00	-40.69
2320.03	37.64	Ave	4	1.6	V	-13.19	24.45	54.00	-29.55
2387.38	44.05	PK	266	1.3	H	-13.14	30.91	74.00	-43.09
2387.38	37.46	Ave	266	1.3	H	-13.14	24.32	54.00	-29.68
2498.95	43.93	PK	290	1.6	V	-13.08	30.85	74.00	-43.15
2498.95	38.63	Ave	290	1.6	V	-13.08	25.55	54.00	-28.45

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n20: Low Channel 2412MHz									
223.45	40.07	QP	86	1.9	H	-11.62	28.45	46.00	-17.55
223.45	35.62	QP	246	1.7	V	-11.62	24.00	46.00	-22.00
4824.00	49.77	PK	140	1.4	V	-1.06	48.71	74.00	-25.29
4824.00	43.66	Ave	140	1.4	V	-1.06	42.60	54.00	-11.40
7236.00	37.50	PK	134	1.2	H	1.33	38.83	74.00	-35.17
7236.00	43.28	Ave	134	1.2	H	1.33	44.61	54.00	-9.39
2324.57	46.36	PK	238	1.6	V	-13.19	33.17	74.00	-40.83
2324.57	39.87	Ave	238	1.6	V	-13.19	26.68	54.00	-27.32
2370.93	43.46	PK	87	1.6	H	-13.14	30.32	74.00	-43.68
2370.93	37.57	Ave	87	1.6	H	-13.14	24.43	54.00	-29.57
2487.87	42.40	PK	67	1.4	V	-13.08	29.32	74.00	-44.68
2487.87	38.03	Ave	67	1.4	V	-13.08	24.95	54.00	-29.05

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n20: Middle Channel 2437MHz									
223.45	39.66	QP	129	1.7	H	-11.62	28.04	46.00	-17.96
223.45	34.79	QP	319	1.6	V	-11.62	23.17	46.00	-22.83
4874.00	48.41	PK	132	1.7	V	-0.62	47.79	74.00	-26.21
4874.00	43.13	Ave	132	1.7	V	-0.62	42.51	54.00	-11.49
7311.00	36.52	PK	340	1.1	H	2.21	38.73	74.00	-35.27
7311.00	41.99	Ave	340	1.1	H	2.21	44.20	54.00	-9.80
2349.25	45.62	PK	180	1.4	V	-13.19	32.43	74.00	-41.57
2349.25	39.01	Ave	180	1.4	V	-13.19	25.82	54.00	-28.18
2351.52	44.53	PK	12	1.2	H	-13.14	31.39	74.00	-42.61
2351.52	38.37	Ave	12	1.2	H	-13.14	25.23	54.00	-28.77
2484.32	44.07	PK	78	1.2	V	-13.08	30.99	74.00	-43.01
2484.32	37.09	Ave	78	1.2	V	-13.08	24.01	54.00	-29.99

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n20: High Channel 2462MHz									
223.45	40.65	QP	45	1.1	H	-11.62	29.03	46.00	-16.97
223.45	34.34	QP	298	1.3	V	-11.62	22.72	46.00	-23.28
4924.00	49.62	PK	192	1.0	V	-0.24	49.38	74.00	-24.62
4924.00	43.47	Ave	192	1.0	V	-0.24	43.23	54.00	-10.77
7386.00	36.32	PK	289	1.6	H	2.84	39.16	74.00	-34.84
7386.00	42.88	Ave	289	1.6	H	2.84	45.72	54.00	-8.28
2343.88	45.17	PK	307	1.2	V	-13.19	31.98	74.00	-42.02
2343.88	39.14	Ave	307	1.2	V	-13.19	25.95	54.00	-28.05
2388.26	43.20	PK	236	1.4	H	-13.14	30.06	74.00	-43.94
2388.26	38.63	Ave	236	1.4	H	-13.14	25.49	54.00	-28.51
2494.32	42.83	PK	326	1.1	V	-13.08	29.75	74.00	-44.25
2494.32	37.60	Ave	326	1.1	V	-13.08	24.52	54.00	-29.48

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n40: Low Channel 2422MHz									
223.45	40.58	QP	329	2.0	H	-11.62	28.96	46.00	-17.04
223.45	34.06	QP	127	1.0	V	-11.62	22.44	46.00	-23.56
4844.00	48.23	PK	308	1.0	V	-1.06	47.17	74.00	-26.83
4844.00	40.84	Ave	308	1.0	V	-1.06	39.78	54.00	-14.22
7266.00	33.53	PK	357	1.8	H	1.33	34.86	74.00	-39.14
7266.00	41.79	Ave	357	1.8	H	1.33	43.12	54.00	-10.88
2328.06	45.24	PK	175	1.1	V	-13.19	32.05	74.00	-41.95
2328.06	39.69	Ave	175	1.1	V	-13.19	26.50	54.00	-27.50
2364.26	44.67	PK	125	1.5	H	-13.14	31.53	74.00	-42.47
2364.26	38.25	Ave	125	1.5	H	-13.14	25.11	54.00	-28.89
2494.17	43.80	PK	20	1.6	V	-13.08	30.72	74.00	-43.28
2494.17	36.55	Ave	20	1.6	V	-13.08	23.47	54.00	-30.53

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n40: Middle Channel 2437MHz									
223.45	40.68	QP	114	1.0	H	-11.62	29.06	46.00	-16.94
223.45	34.28	QP	297	1.9	V	-11.62	22.66	46.00	-23.34
4874.00	48.12	PK	224	1.4	V	-0.62	47.50	74.00	-26.50
4874.00	39.89	Ave	224	1.4	V	-0.62	39.27	54.00	-14.73
7311.00	33.95	PK	208	1.6	H	2.21	36.16	74.00	-37.84
7311.00	42.43	Ave	208	1.6	H	2.21	44.64	54.00	-9.36
2327.90	45.37	PK	327	1.5	V	-13.19	32.18	74.00	-41.82
2327.90	38.24	Ave	327	1.5	V	-13.19	25.05	54.00	-28.95
2358.98	44.41	PK	159	1.9	H	-13.14	31.27	74.00	-42.73
2358.98	36.17	Ave	159	1.9	H	-13.14	23.03	54.00	-30.97
2495.40	43.16	PK	80	1.5	V	-13.08	30.08	74.00	-43.92
2495.40	36.52	Ave	80	1.5	V	-13.08	23.44	54.00	-30.56

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11n40: High Channel 2452MHz									
223.45	40.26	QP	359	1.3	H	-11.62	28.64	46.00	-17.36
223.45	33.88	QP	139	1.5	V	-11.62	22.26	46.00	-23.74
4904.00	48.67	PK	19	1.2	V	-0.24	48.43	74.00	-25.57
4904.00	39.64	Ave	19	1.2	V	-0.24	39.40	54.00	-14.60
7356.00	33.25	PK	127	1.3	H	2.84	36.09	74.00	-37.91
7356.00	42.50	Ave	127	1.3	H	2.84	45.34	54.00	-8.66
2346.56	46.15	PK	44	1.2	V	-13.19	32.96	74.00	-41.04
2346.56	38.64	Ave	44	1.2	V	-13.19	25.45	54.00	-28.55
2366.82	42.69	PK	306	1.4	H	-13.14	29.55	74.00	-44.45
2366.82	36.42	Ave	306	1.4	H	-13.14	23.28	54.00	-30.72
2488.40	44.20	PK	347	1.7	V	-13.08	31.12	74.00	-42.88
2488.40	38.43	Ave	347	1.7	V	-13.08	25.35	54.00	-28.65

Test Frequency: 8GHz~25GHz

The measurements were more than 20 dB below the limit and not reported.

9 Conducted Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

Test Result: PASS

Limit:

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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

9.1 Test Procedure

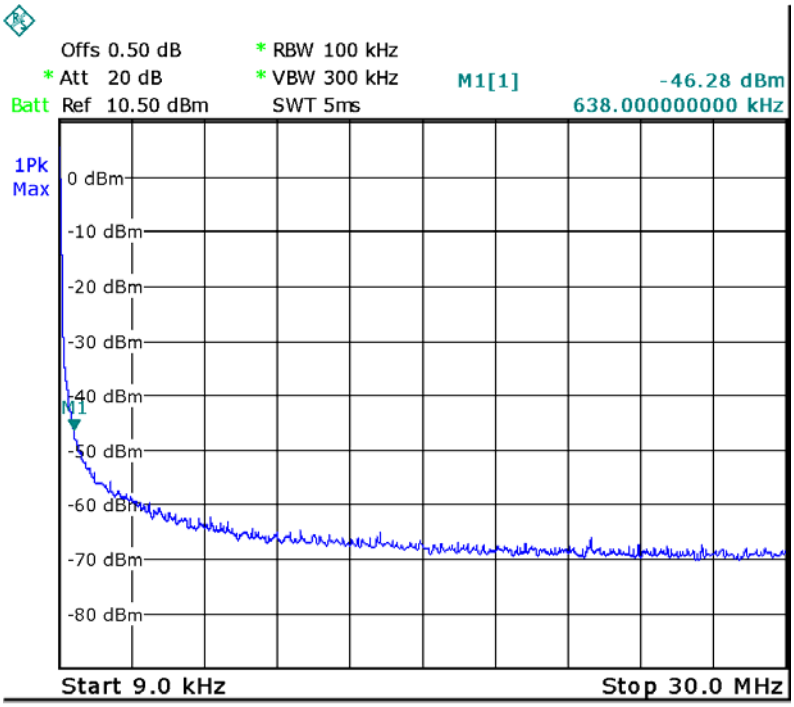
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:
   a) Set instrument center frequency to DTS channel center frequency.
   b) Set the span to _ 1.5 times the DTS bandwidth.
   c) Set the RBW = 100 kHz.
   d) Set the VBW _ [3 × RBW].
   e) Detector = peak.
   f) Sweep time = auto couple.
   g) Trace mode = max hold.
   h) Allow trace to fully stabilize.
   i) Use the peak marker function to determine the maximum PSD level.
   Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

9.2 Test Result

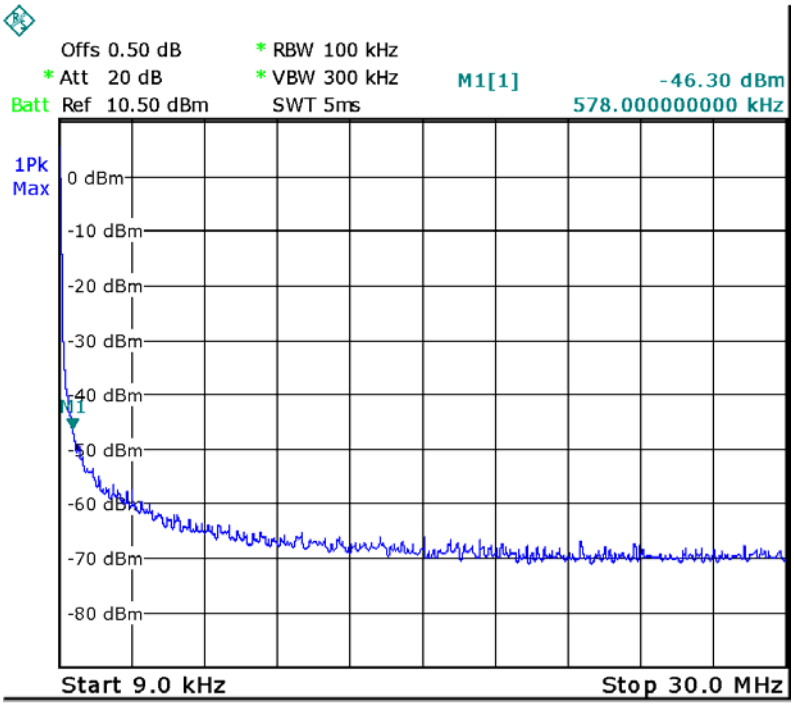
9KHz – 30MHz

802.11b

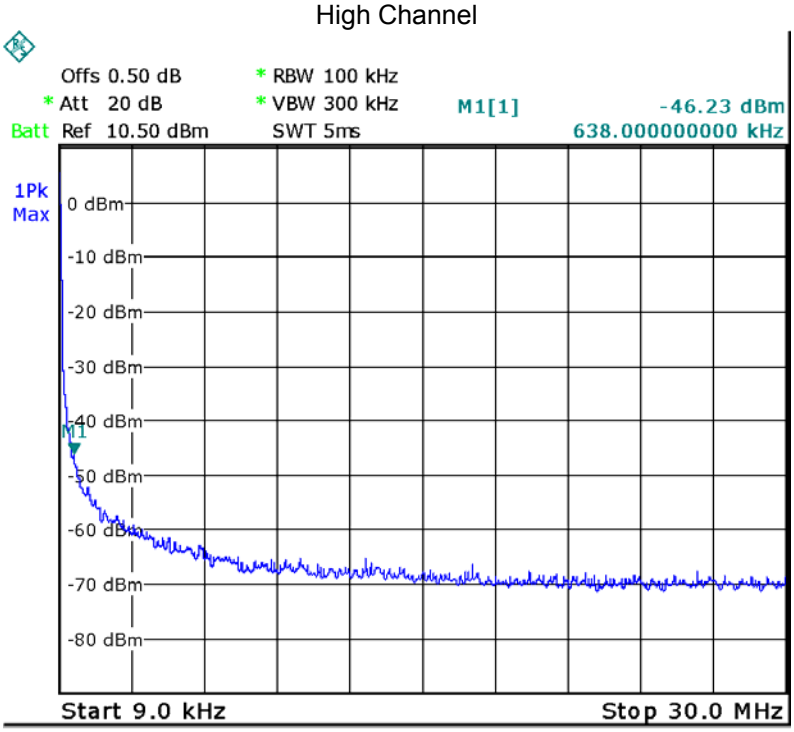
Low Channel



Middle Channel

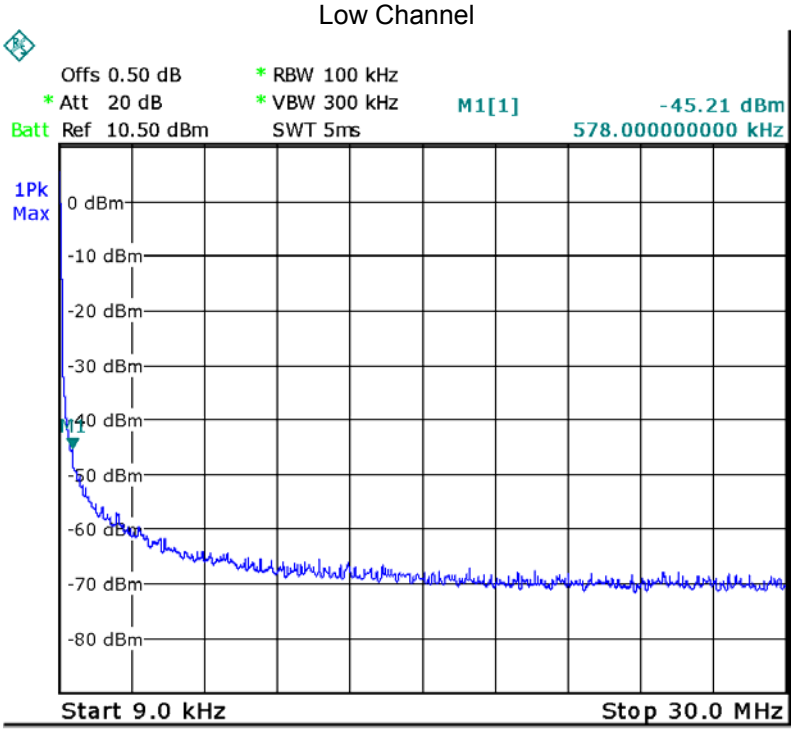


High Channel

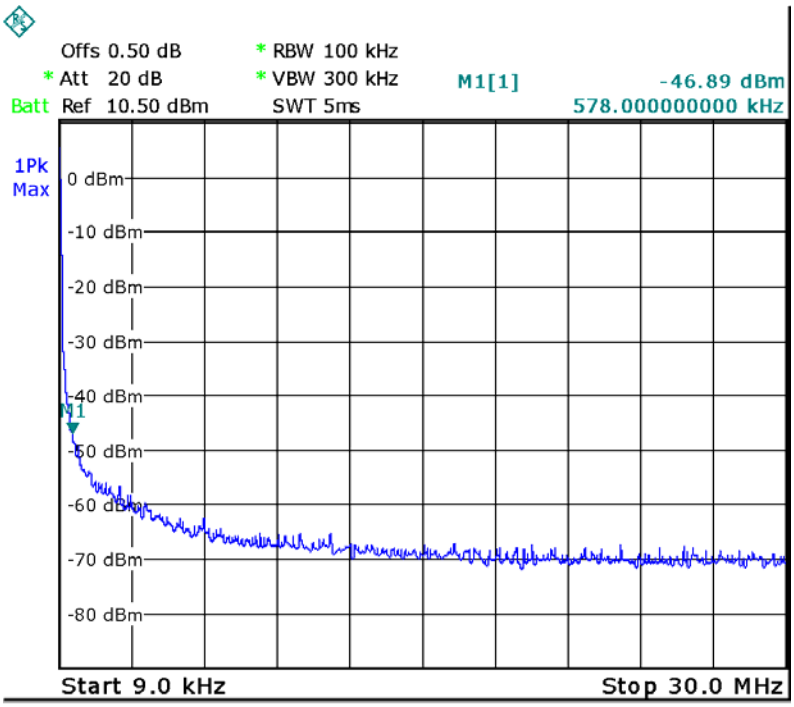


802.11g

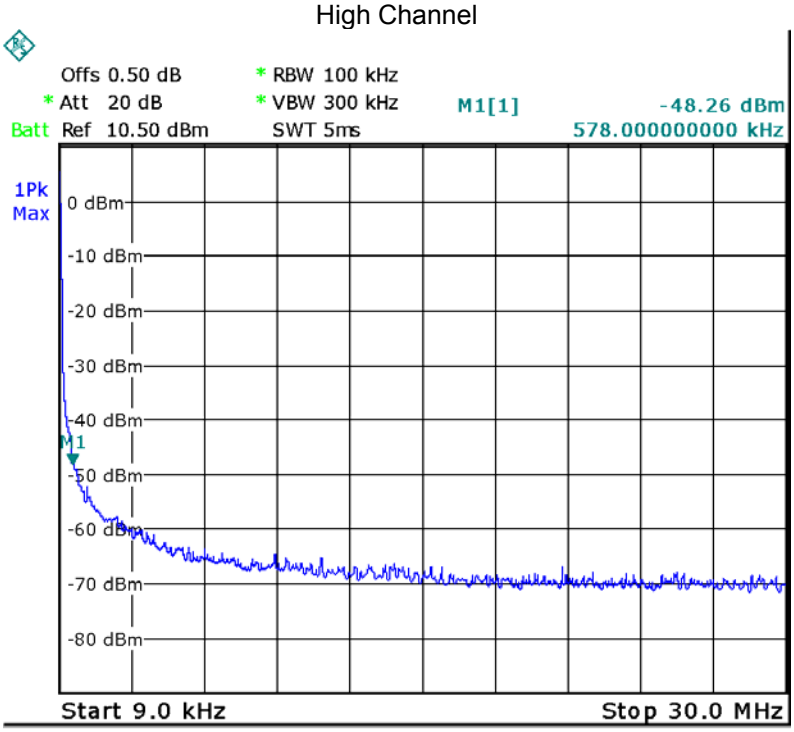
Low Channel



Middle Channel

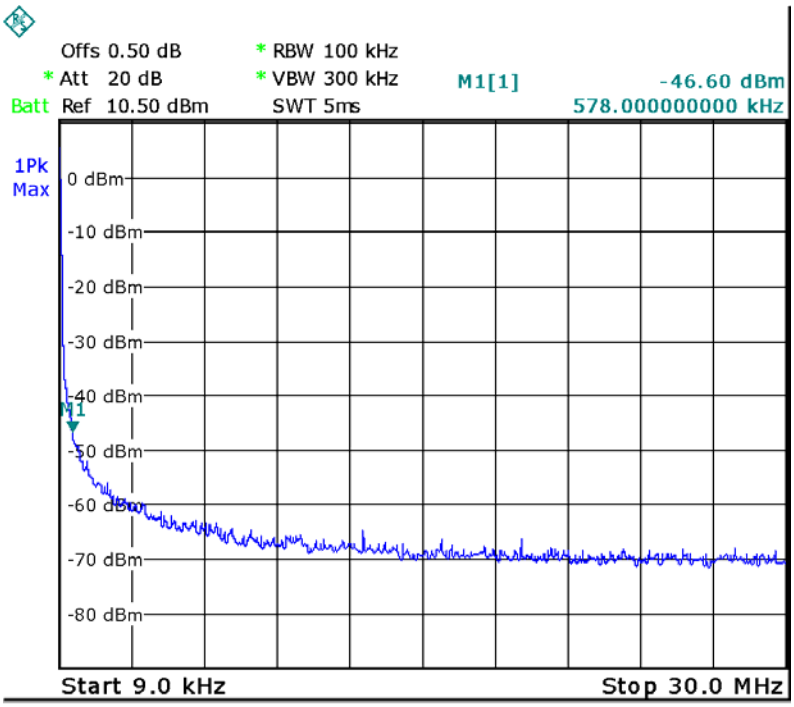


High Channel

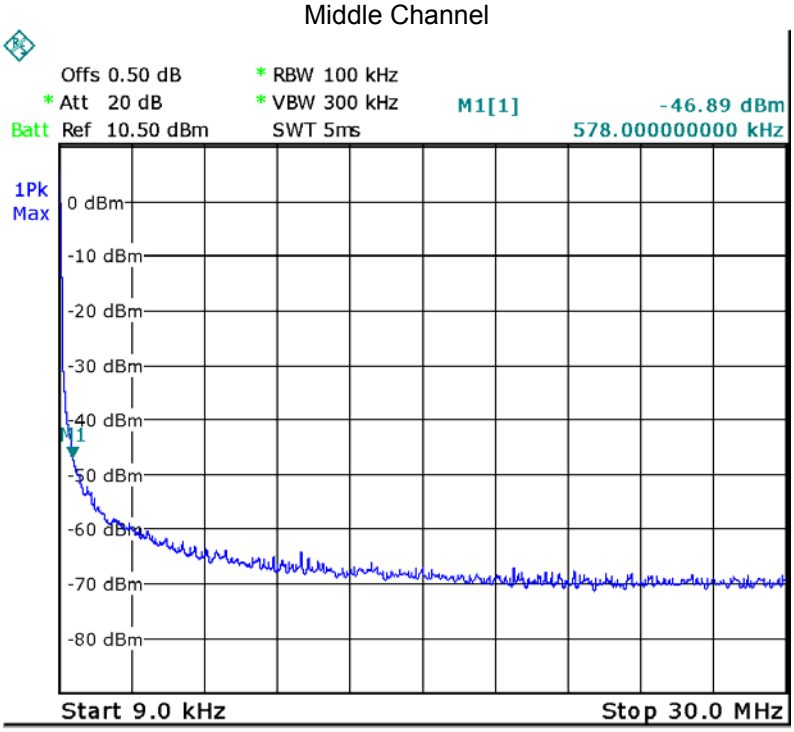


802.11n HT20

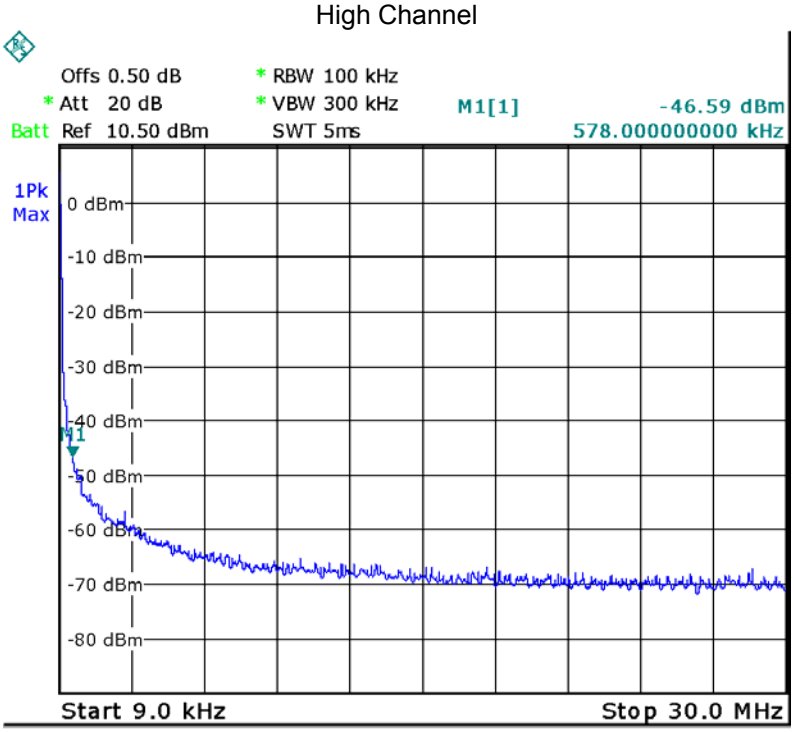
Low Channel



Middle Channel

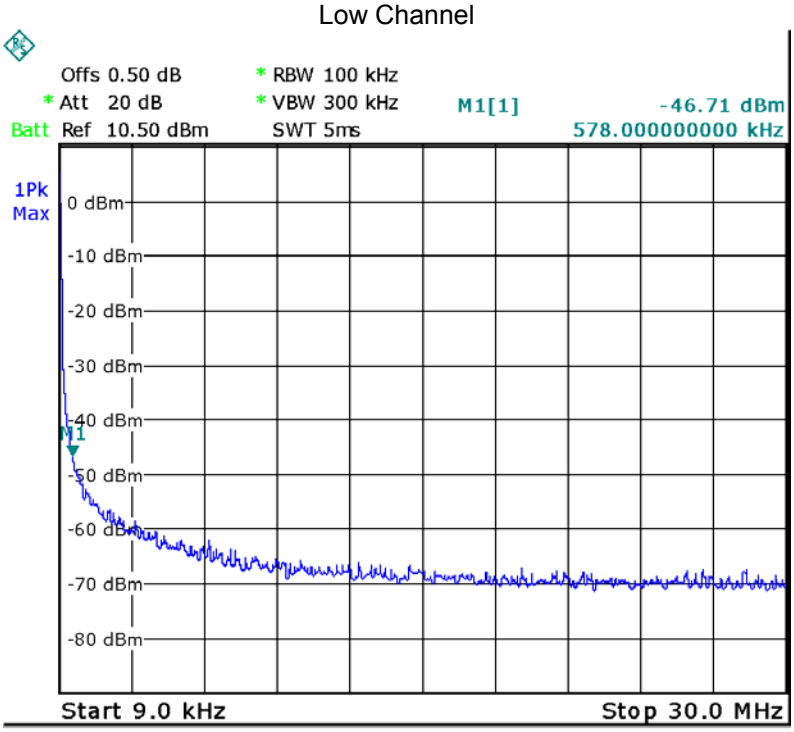


High Channel

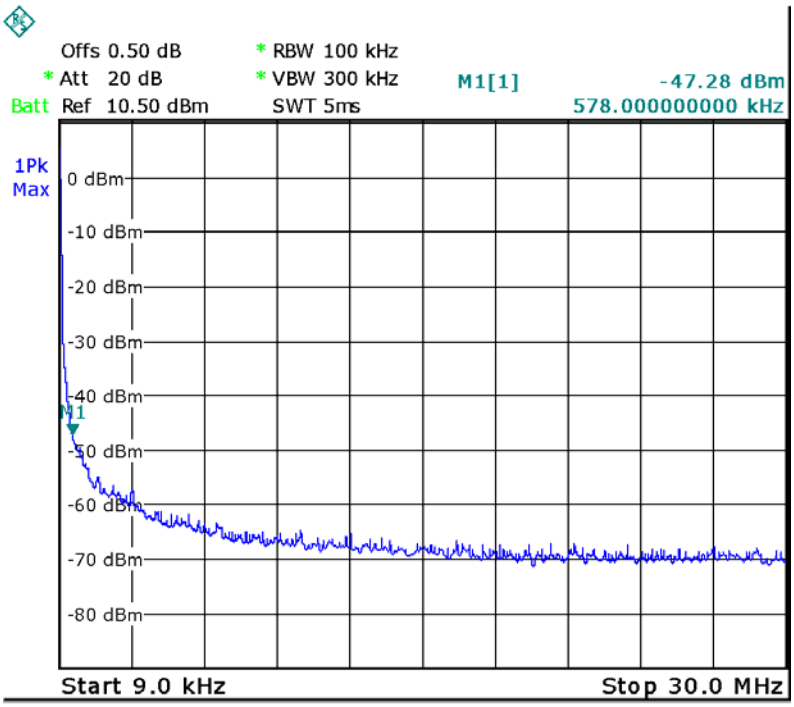


802.11n HT40

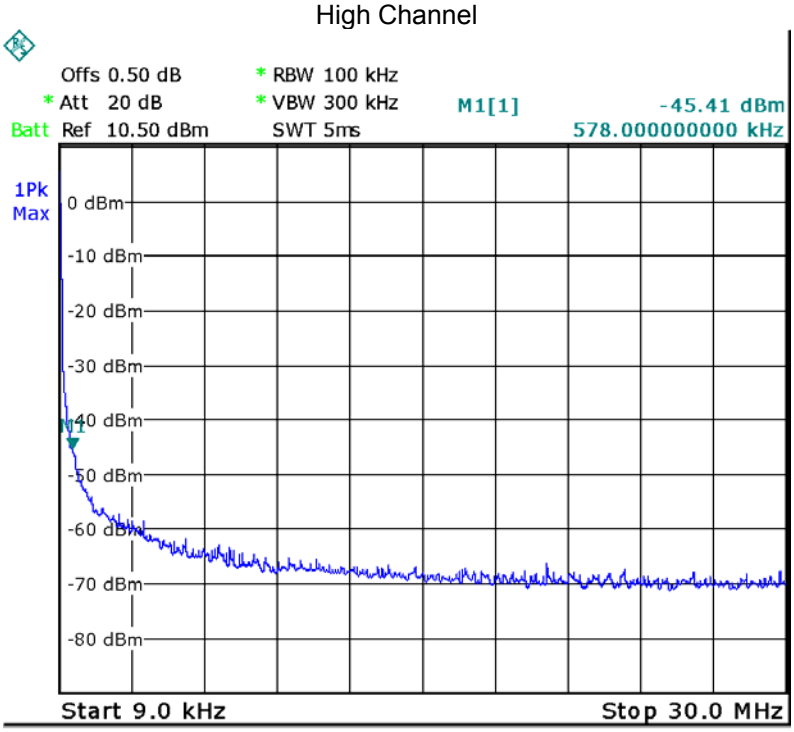
Low Channel



Middle Channel



High Channel

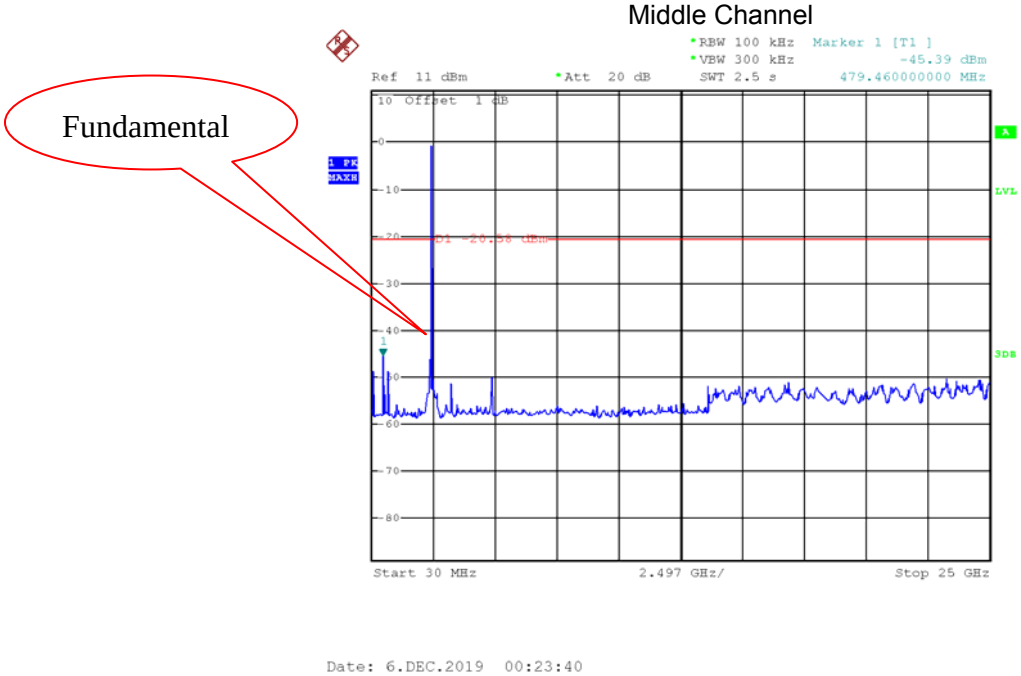


Above 30MHz

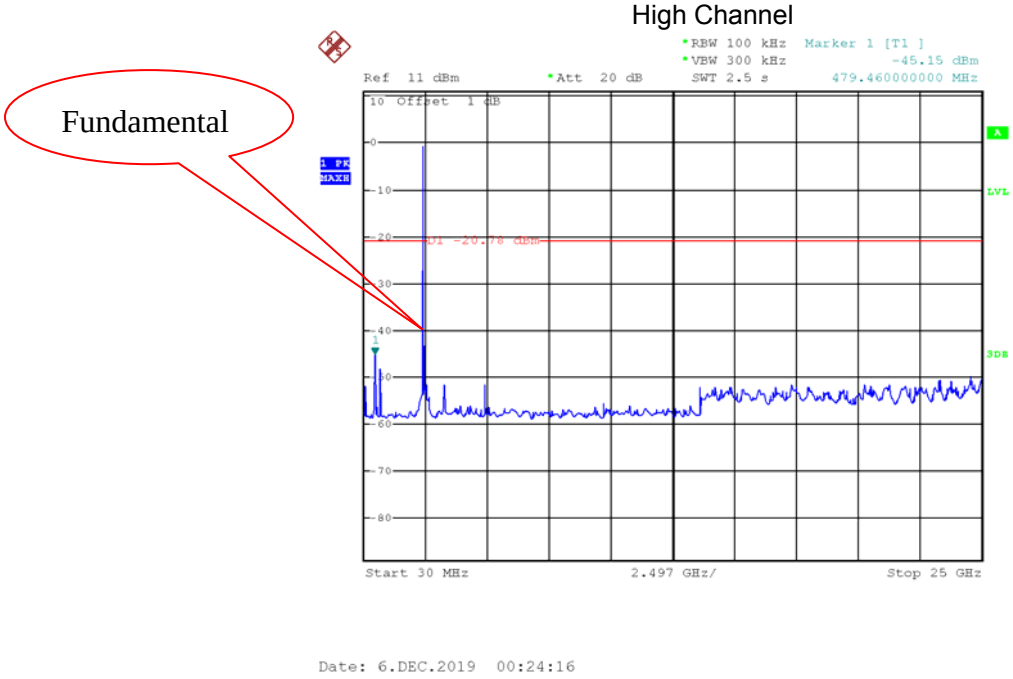
802.11b

Low Channel

Middle Channel

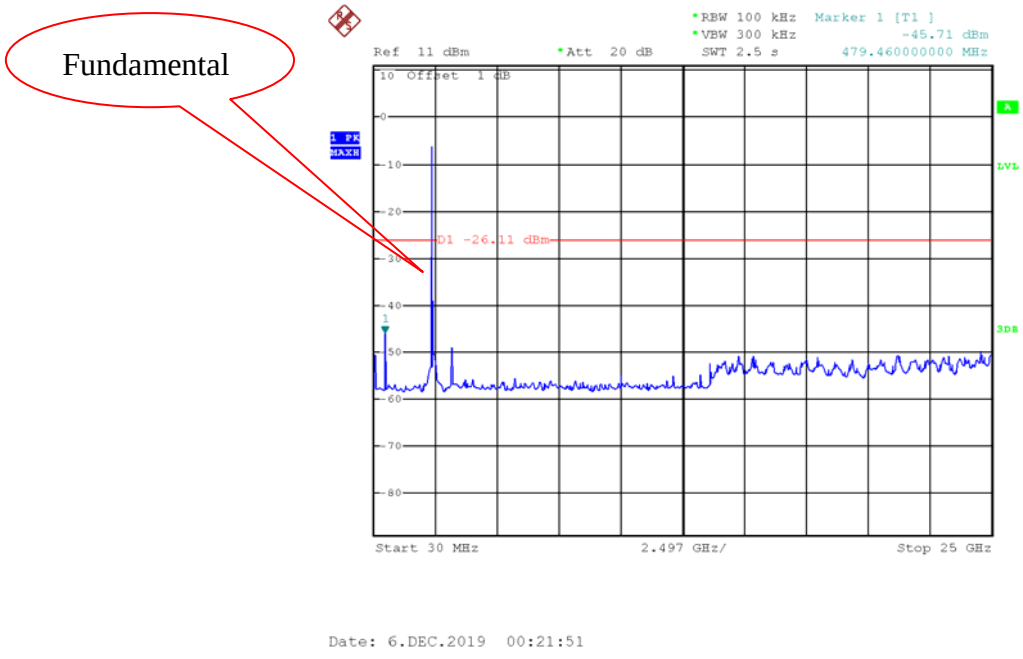


High Channel

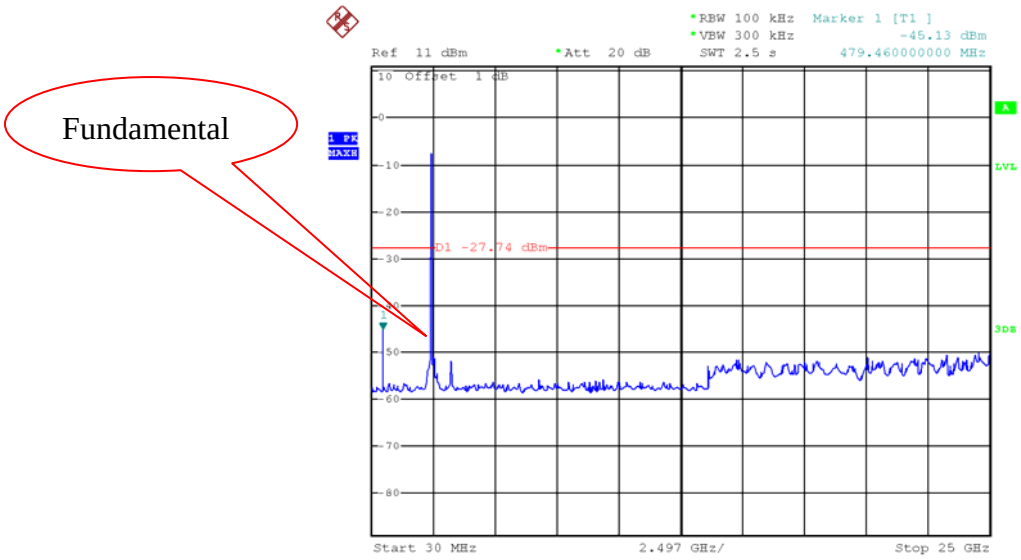


802.11g

Low Channel

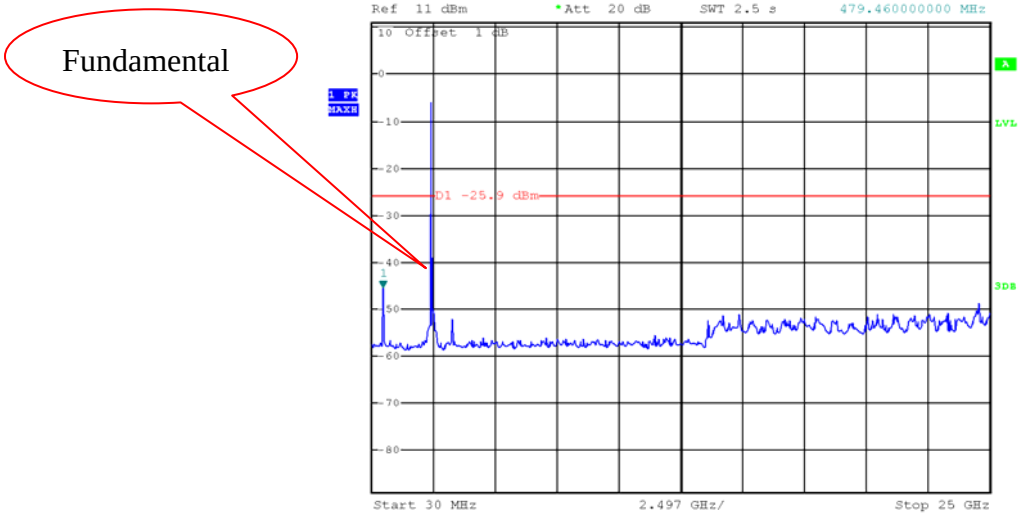


Middle Channel



Date: 6.DEC.2019 00:20:49

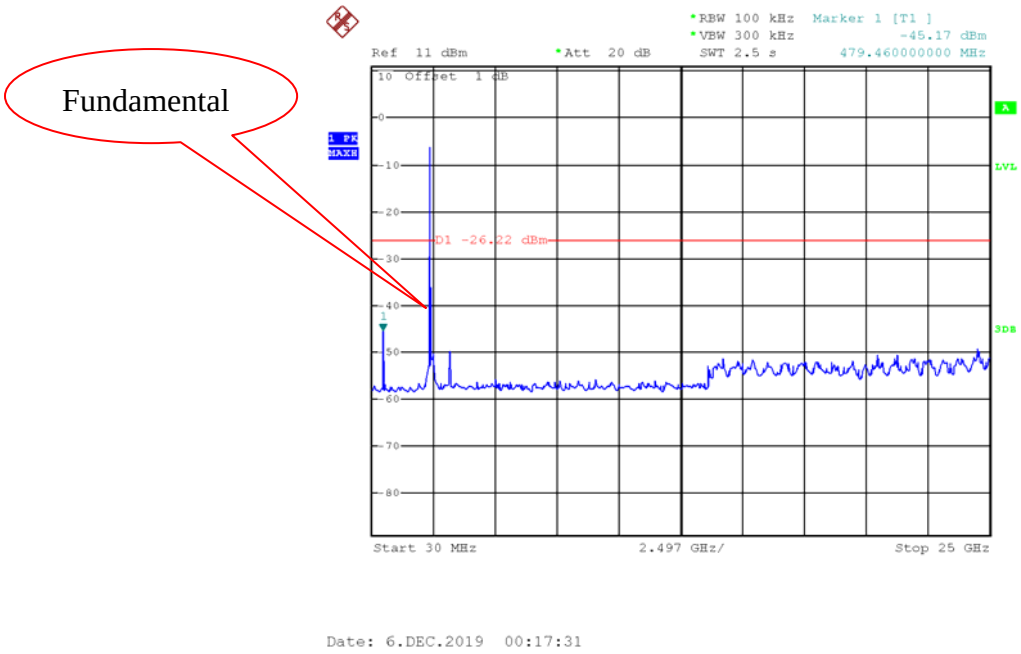
High Channel



Date: 6.DEC.2019 00:20:09

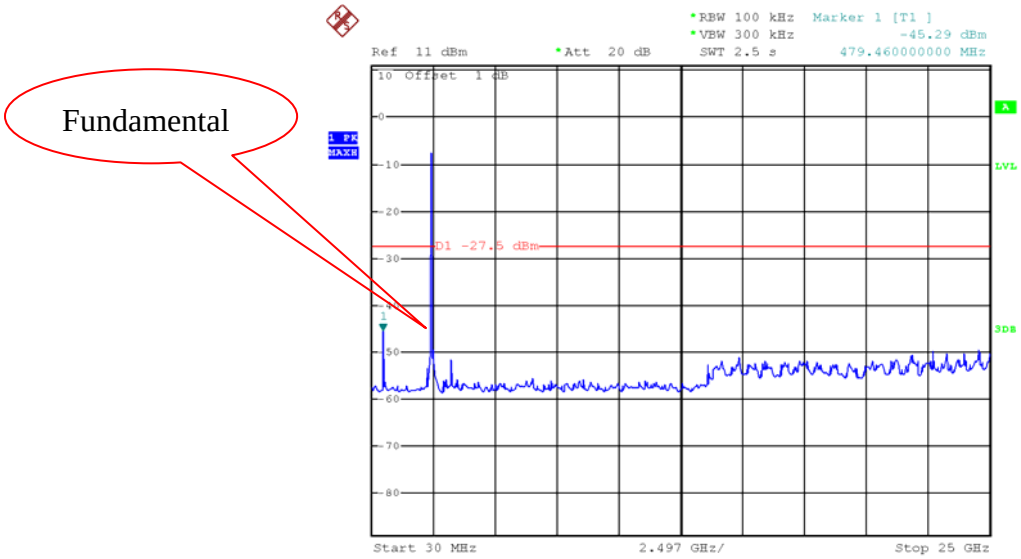
802.11n HT20

Low Channel



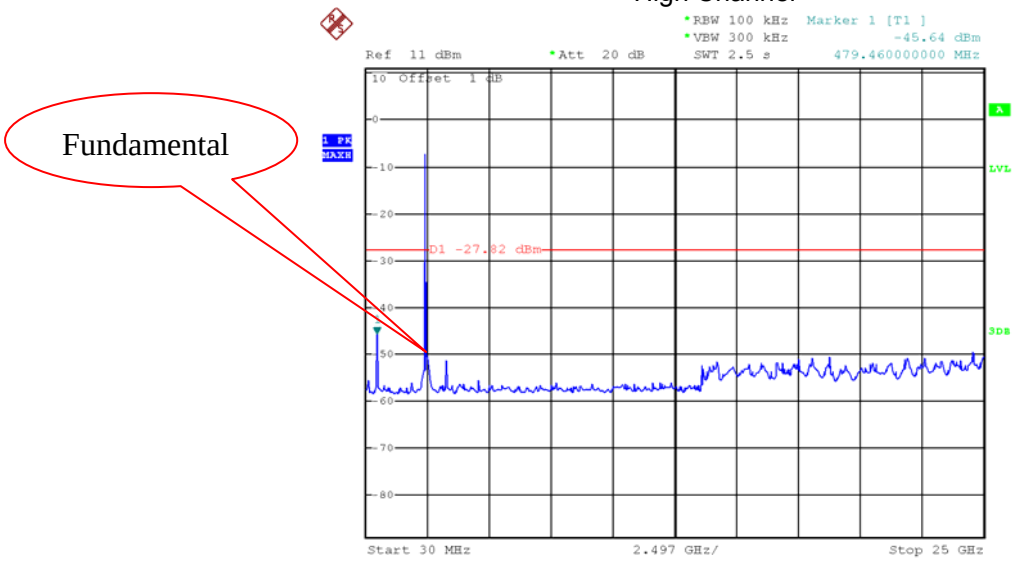
Date: 6.DEC.2019 00:17:31

Middle Channel



Date: 6.DEC.2019 00:18:22

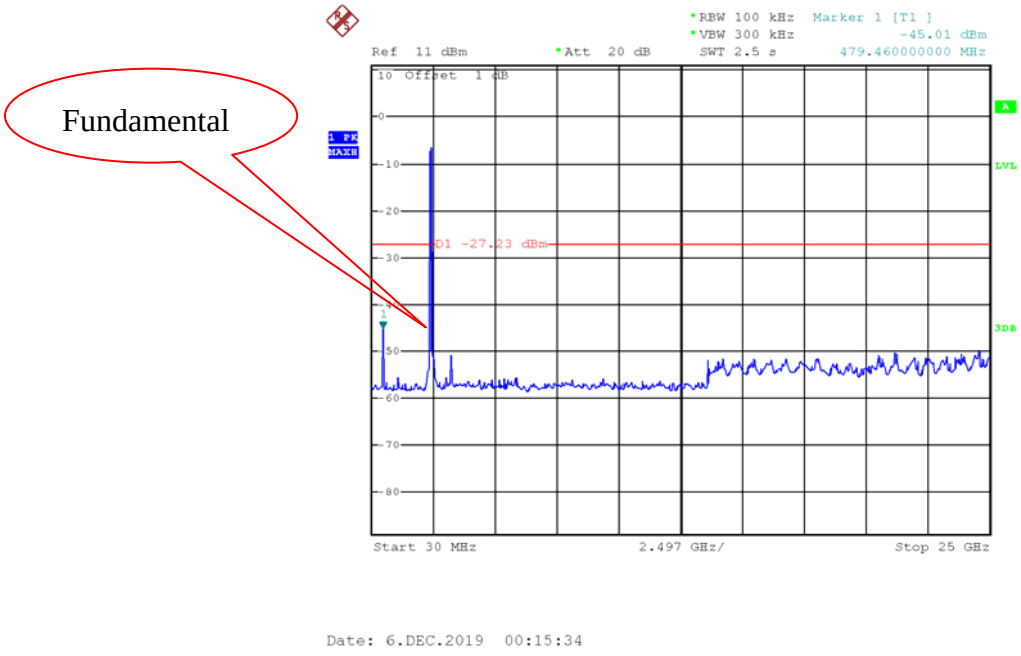
High Channel



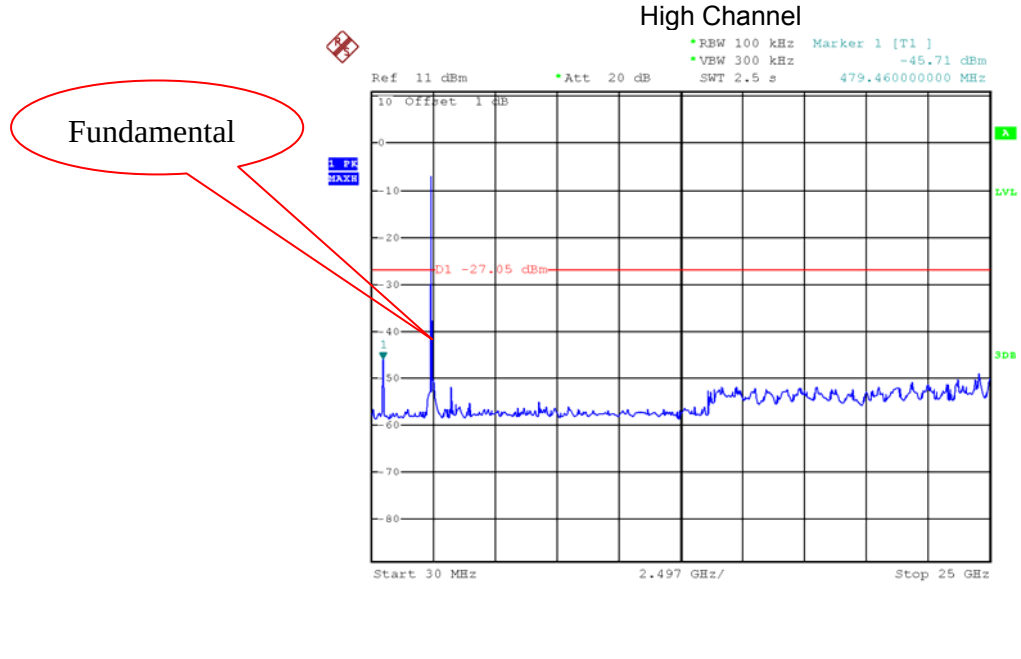
802.11n HT40

Low Channel

Middle Channel



High Channel



10 Band Edge Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

Test Limit: Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band 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 Mode: Transmitting

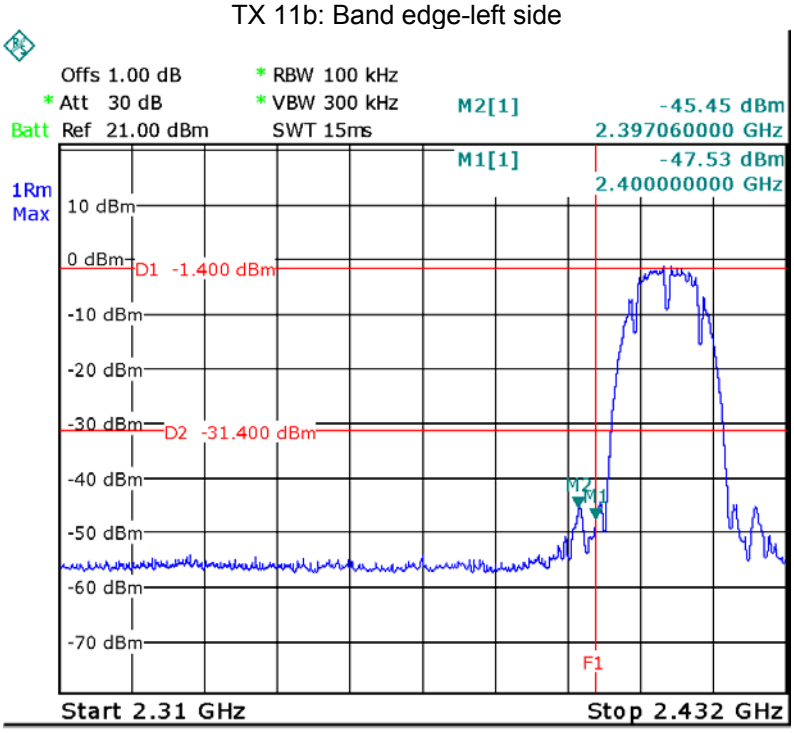
10.1 Test Produce

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.

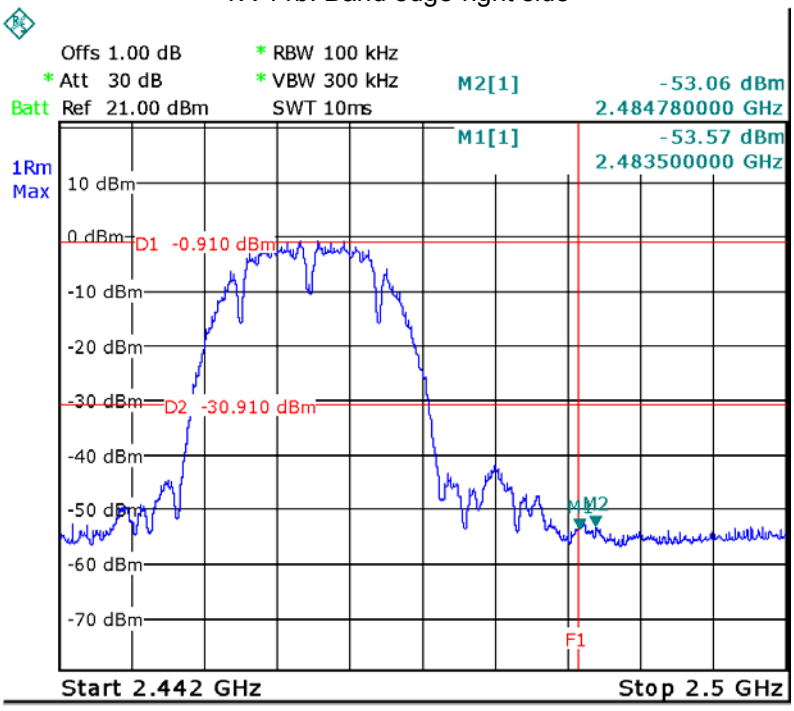
10.2 Test Result

Test result plots shown as follows:

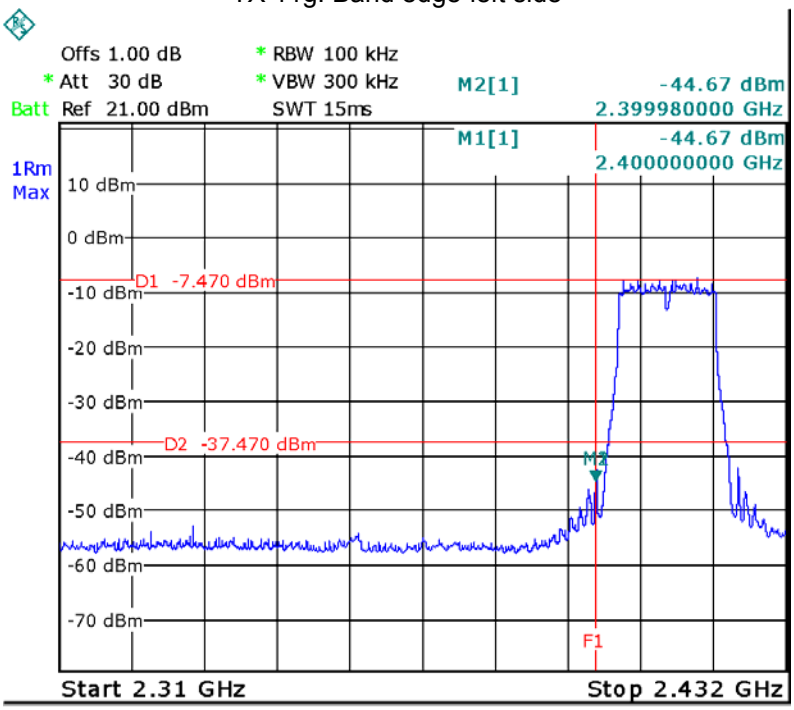
TX 11b: Band edge-left side



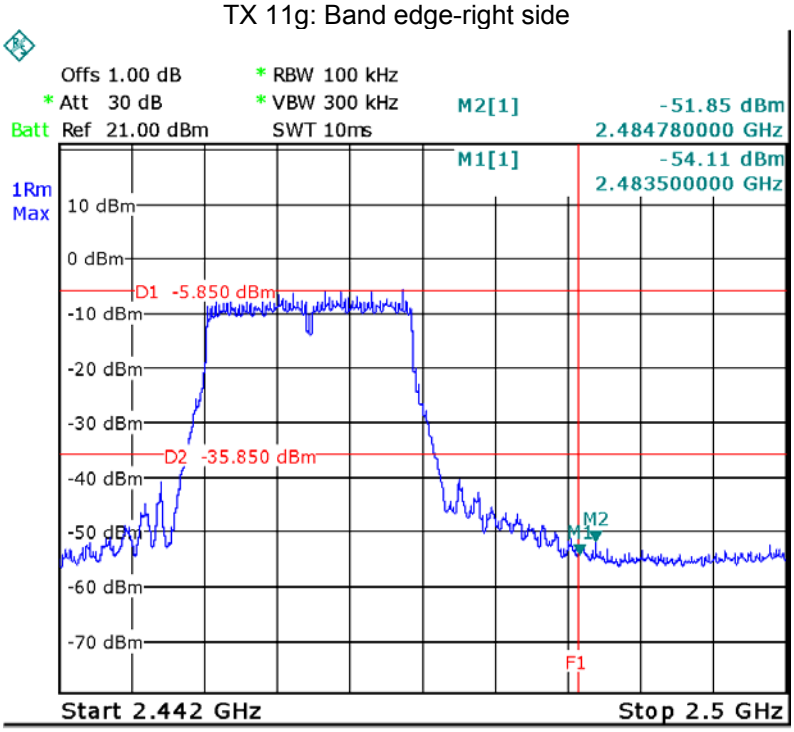
TX 11b: Band edge-right side



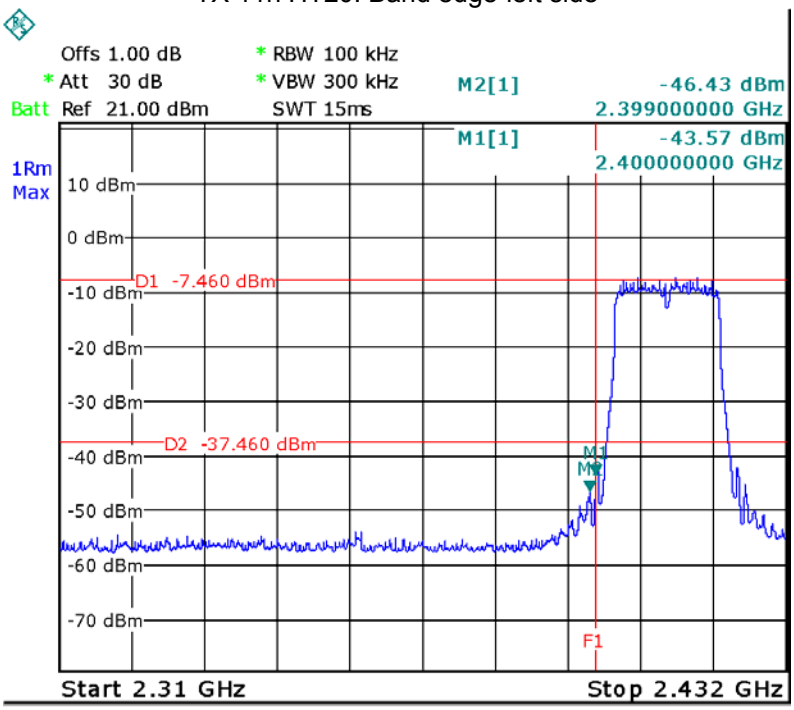
TX 11g: Band edge-left side



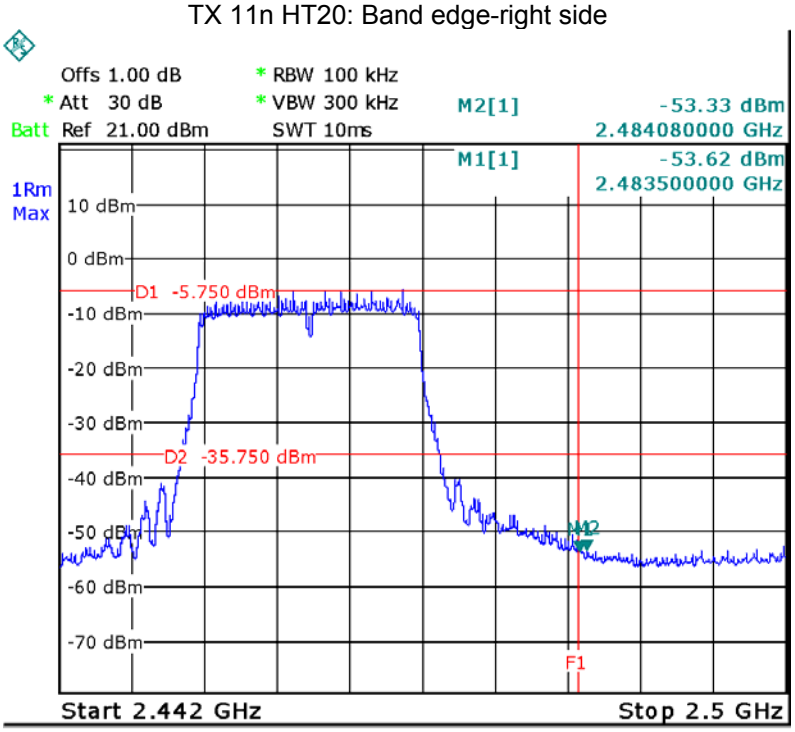
TX 11g: Band edge-right side



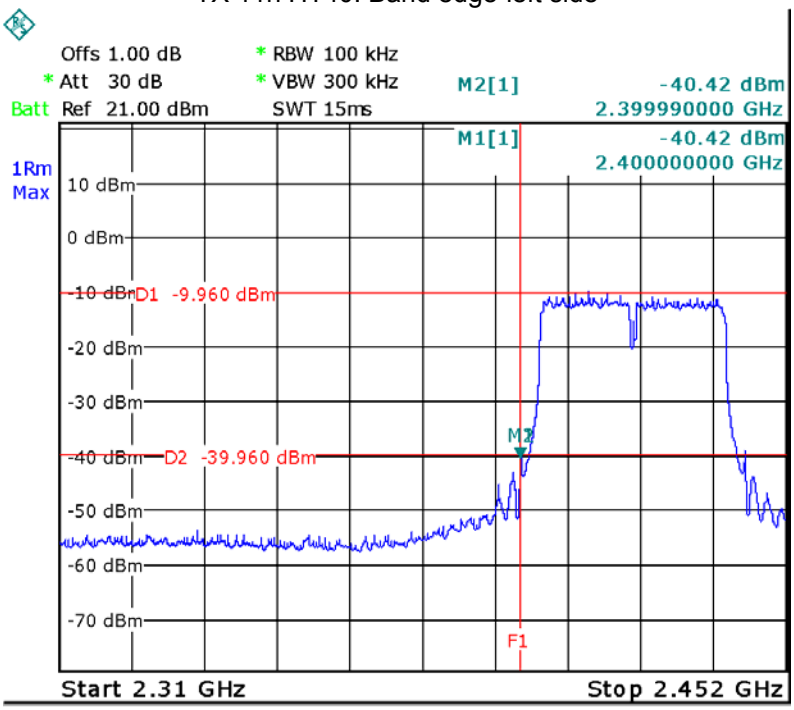
TX 11n HT20: Band edge-left side



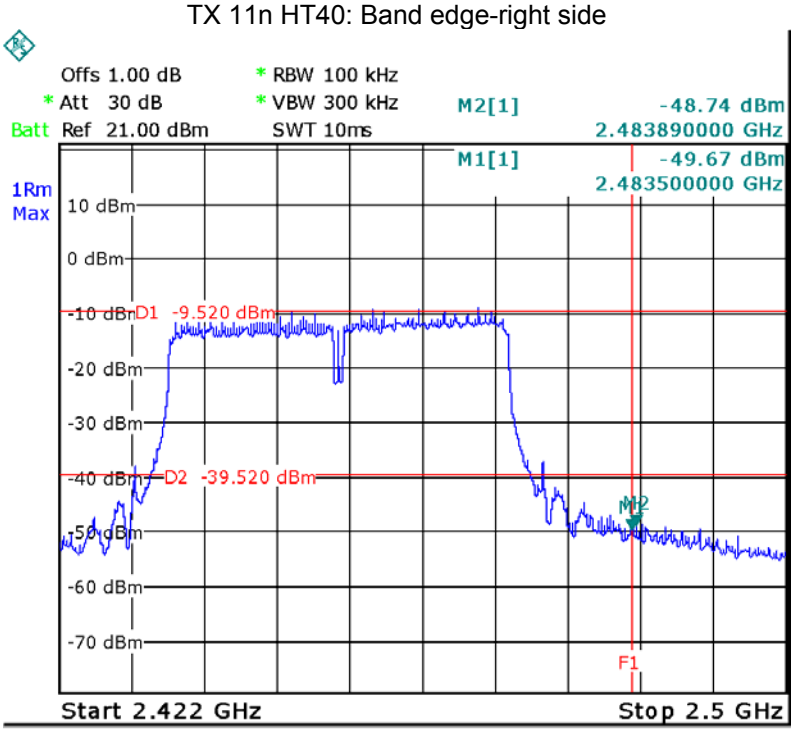
TX 11n HT20: Band edge-right side



TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



11 6 dB Bandwidth and 99% Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

11.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

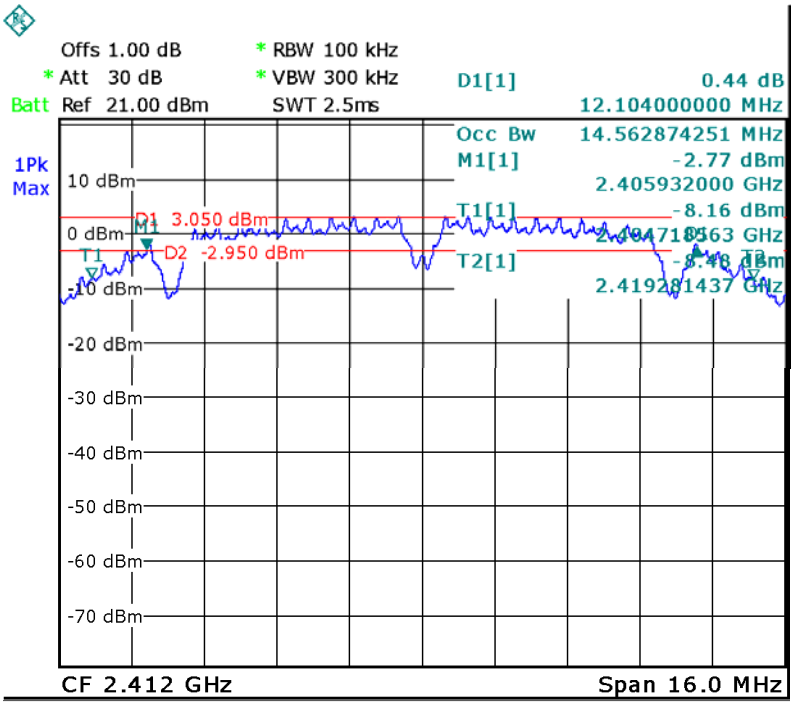
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

11.2 Test Result:

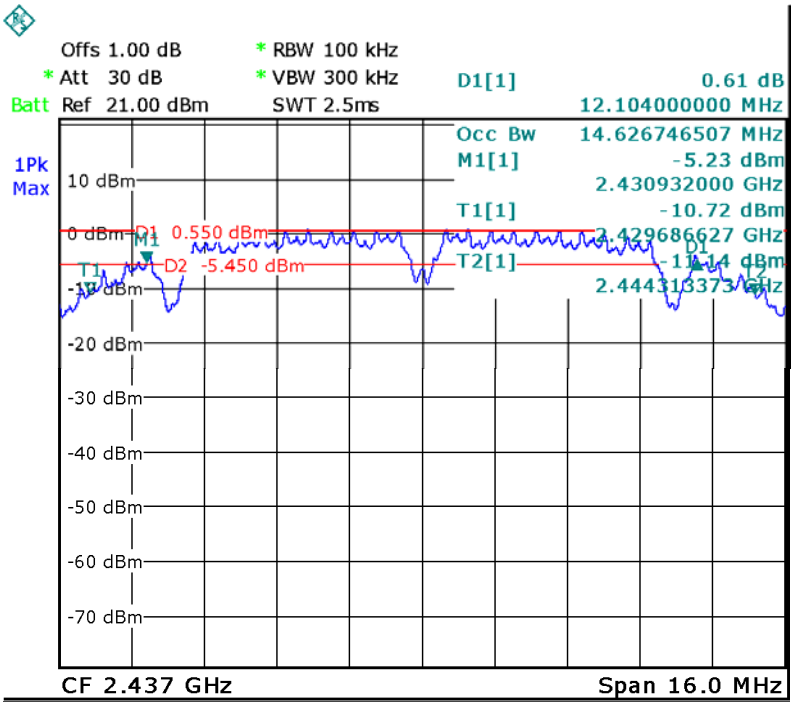
Operation mode	Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
TX 11b	Channel 1	12.104	14.563
	Channel 6	12.104	14.627
	Channel 11	12.072	14.595
TX 11g	Channel 1	16.367	16.467
	Channel 6	16.417	16.467
	Channel 11	16.367	16.417
TX 11n HT20	Channel 1	17.353	17.569
	Channel 6	17.515	17.569
	Channel 11	17.569	17.569
TX 11n HT40	Channel 3	35.570	36.008
	Channel 6	35.790	36.008
	Channel 9	35.790	35.898

Test result plot:

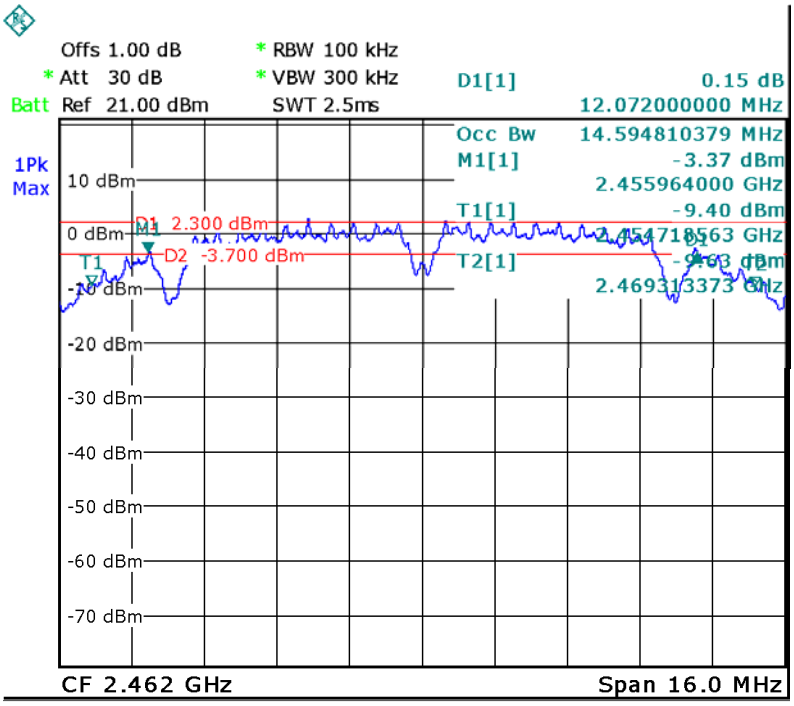
Mode: TX 11b channel 1



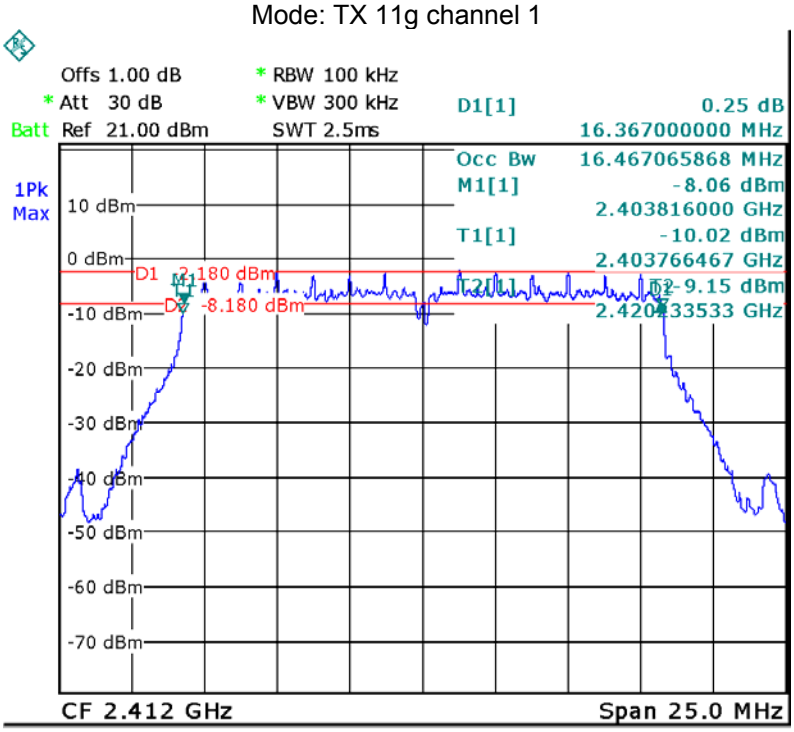
Mode: TX 11b channel 6



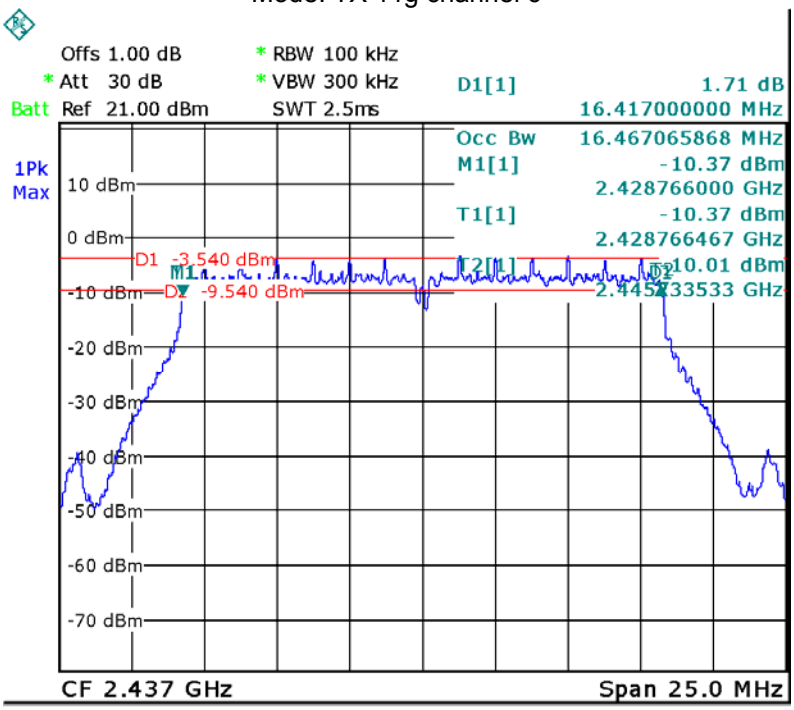
Mode: TX 11b channel 11



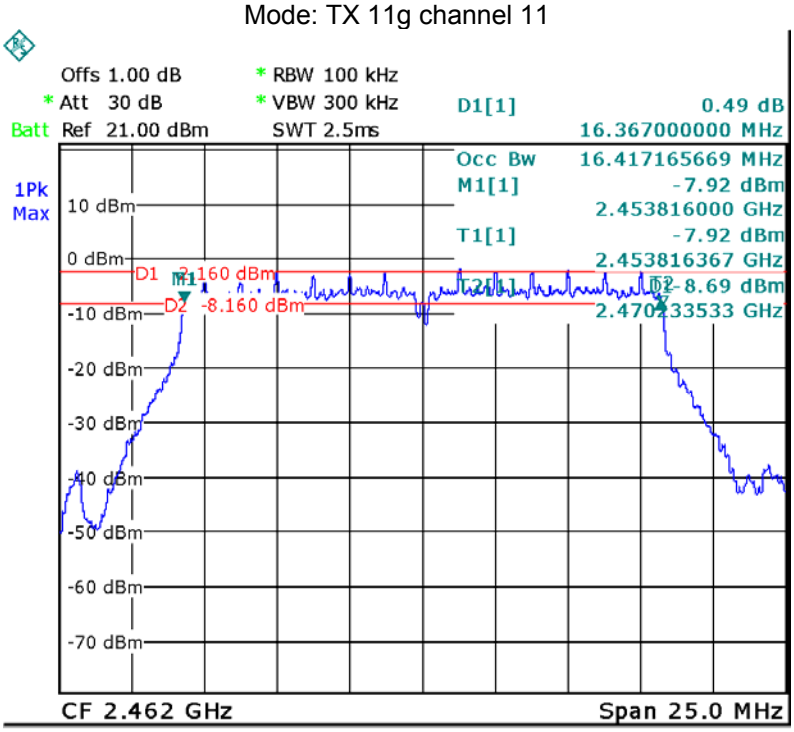
Mode: TX 11g channel 1



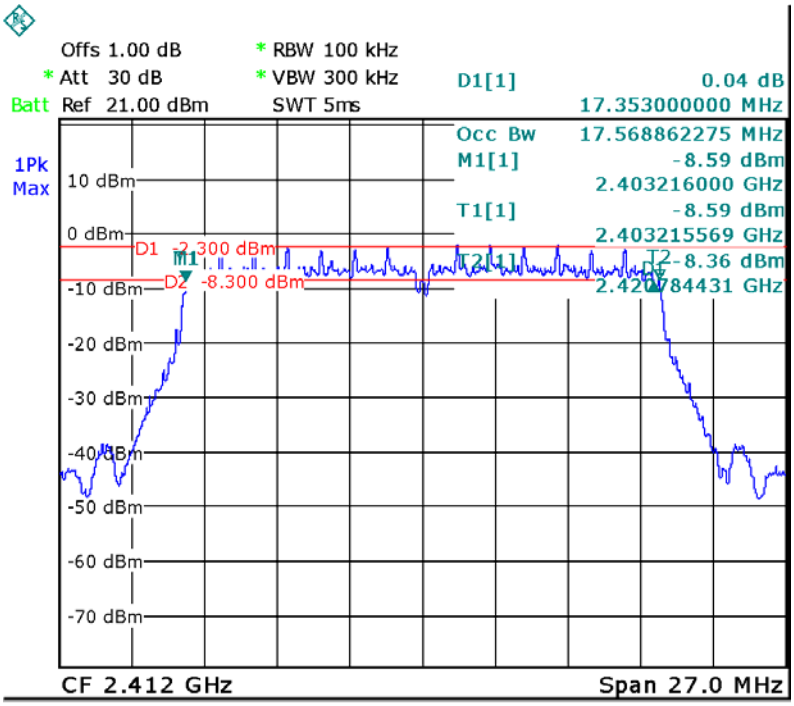
Mode: TX 11g channel 6



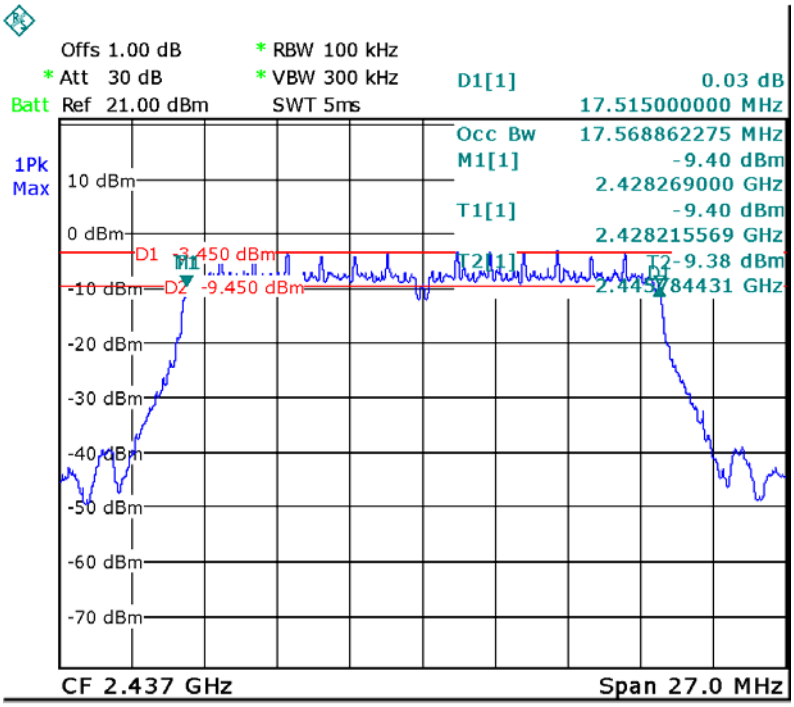
Mode: TX 11g channel 11



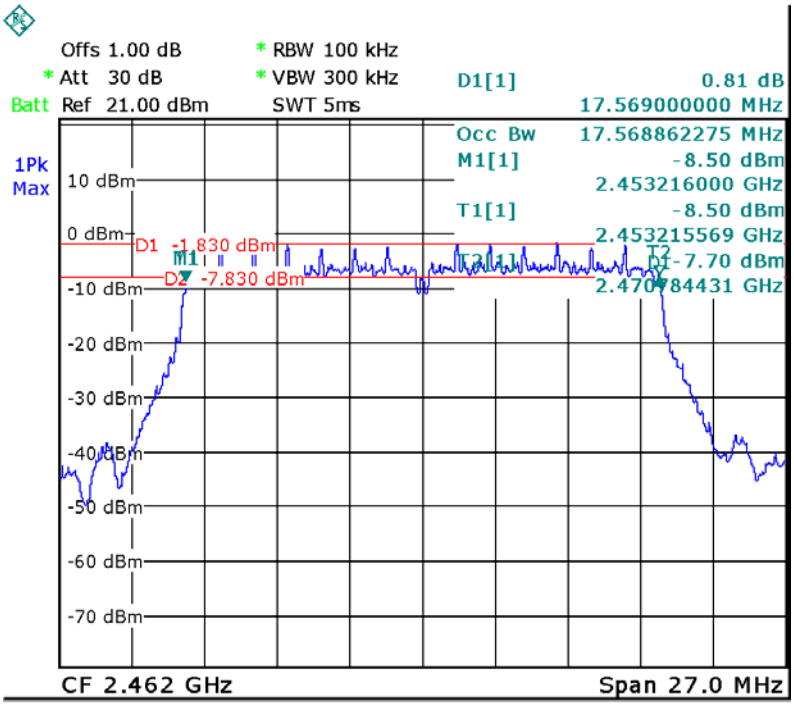
Mode: TX 11n HT20 channel 1



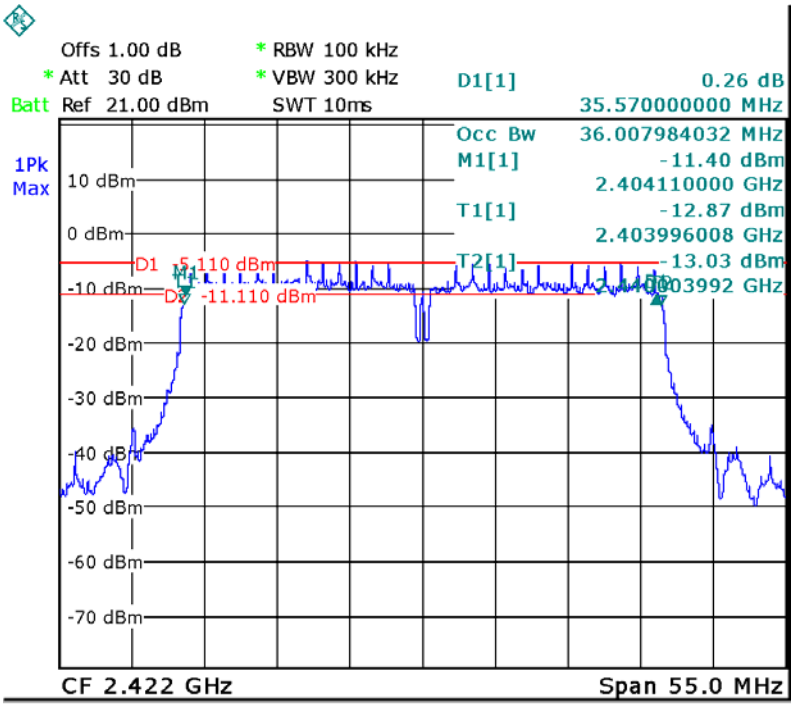
Mode: TX 11n HT20 channel 6



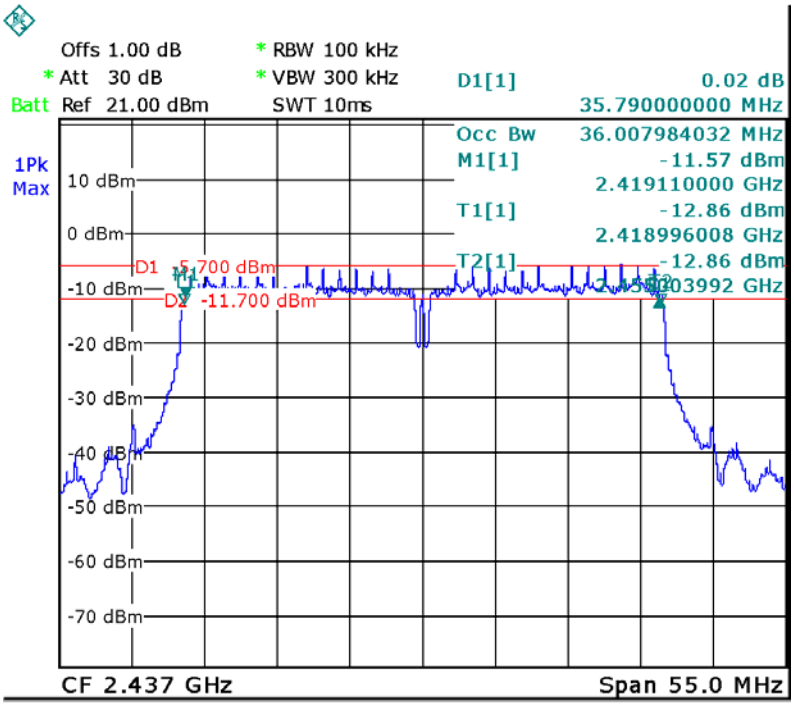
Mode: TX 11n HT20 channel 11



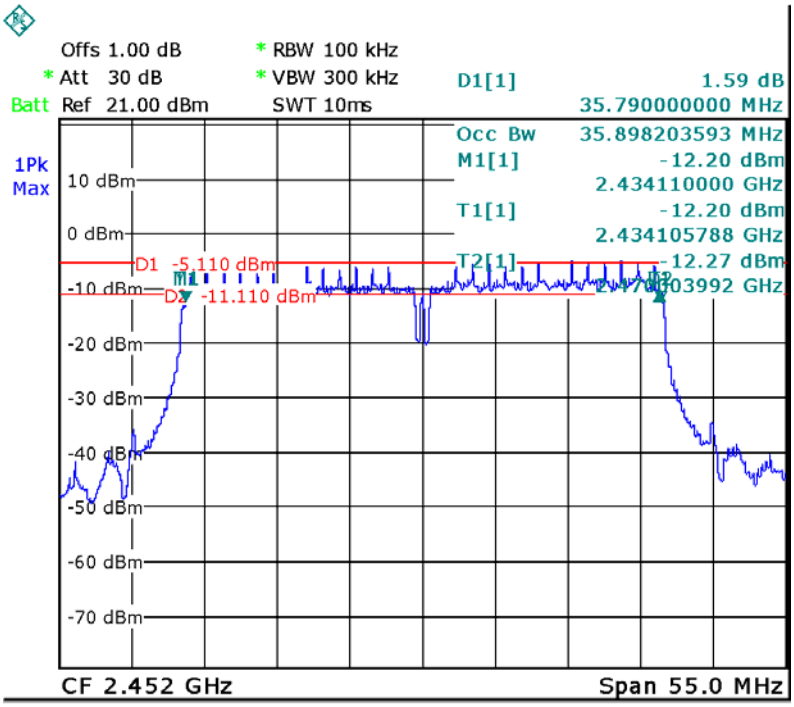
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



12 Maximum Peak conducted Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

12.1 Test Procedure:

KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019

section 8.3.1.1 (For BLE)

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

a)Set the RBW ≥ DTS bandwidth.

b)Set VBW ≥ 3 RBW.

c)Set span ≥ 3 x RBW

d)Sweep time = auto couple.

e)Detector = peak.

f)Trace mode = max hold.

g)Allow trace to fully stabilize.

h)Use peak marker function to determine the peak amplitude level.

section 8.3.1.2 (For WIFI)

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

a)Set the RBW = 1% to 5% of the OBW, not to exceed 1 MHz..

b)Set the VBW ≥ 3 x RBW

c)Set the span ≥ 1.5 x OBW.

d)Detector = RMS.

e)Sweep time = auto couple.

f) trigger = free run..

g) Number of points in sweep _ [2 × span / RBW]. (This gives bin-to-bin spacing _ RBW / 2, so that narrowband signals are not lost between frequency bins.)

h) Trace average at least 100 traces in power averaging (rms) mode.

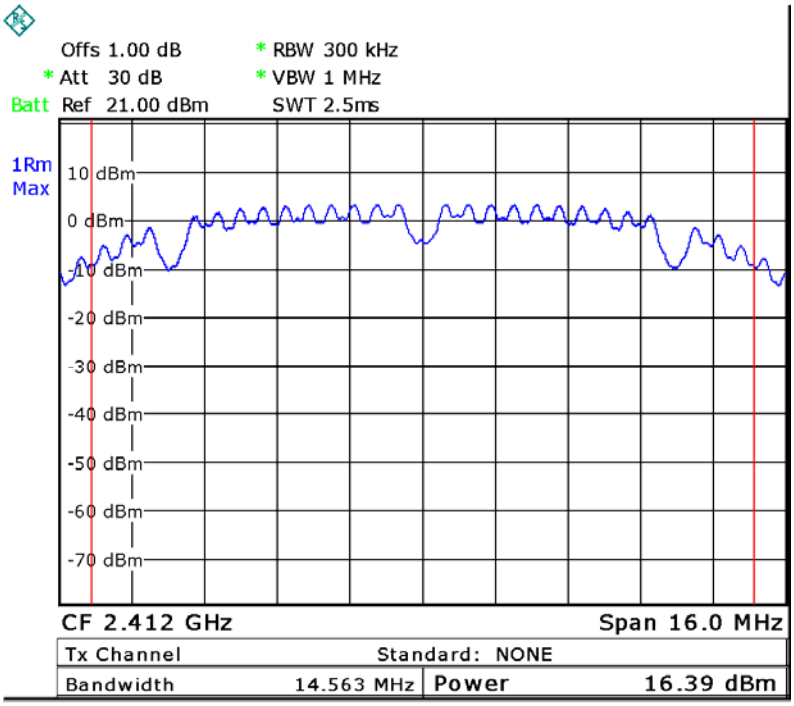
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum..

12.2 Test Result:

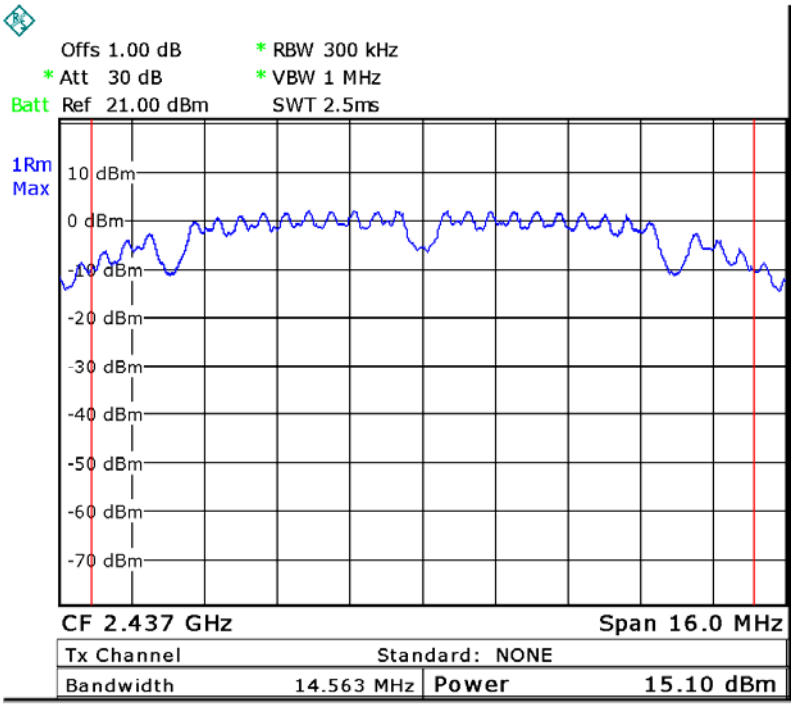
Operation mode	Channel Frequency (MHz)	Maximum Peak Output Power (dBm)	Limit
TX 11b	Low-2412	16.39	1W/30dBm
	Middle-2437	15.10	1W/30dBm
	High-2462	**16.42**	1W/30dBm
TX 11g	Low-2412	12.37	1W/30dBm
	Middle-2437	11.75	1W/30dBm
	High-2462	13.30	1W/30dBm
TX 11n HT20	Low-2412	12.85	1W/30dBm
	Middle-2437	11.91	1W/30dBm
	High-2462	13.21	1W/30dBm
TX 11n HT40	Low-2422	11.03	1W/30dBm
	Middle-2437	10.43	1W/30dBm
	High-2452	10.78	1W/30dBm

Test Plot

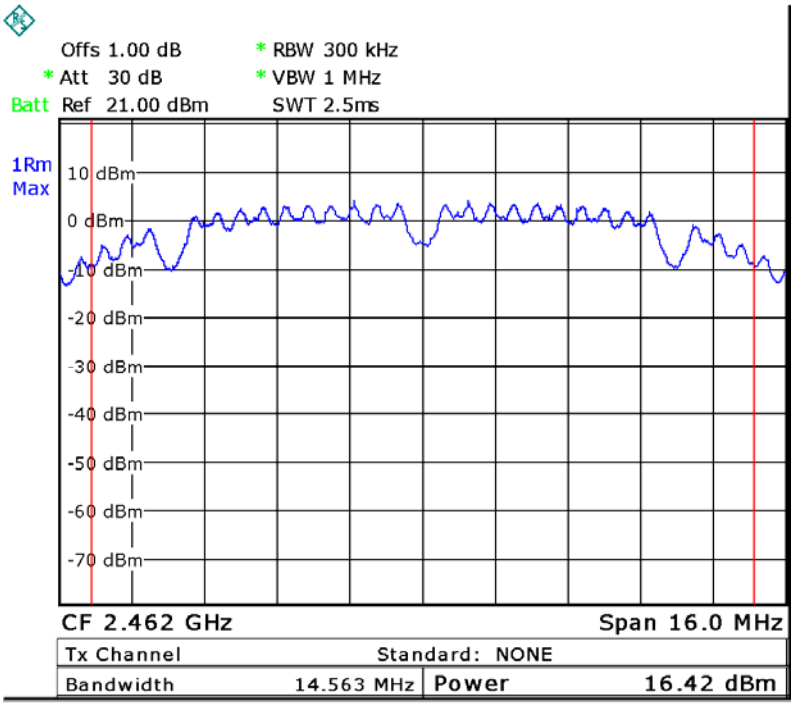
Mode: TX 11b channel 1



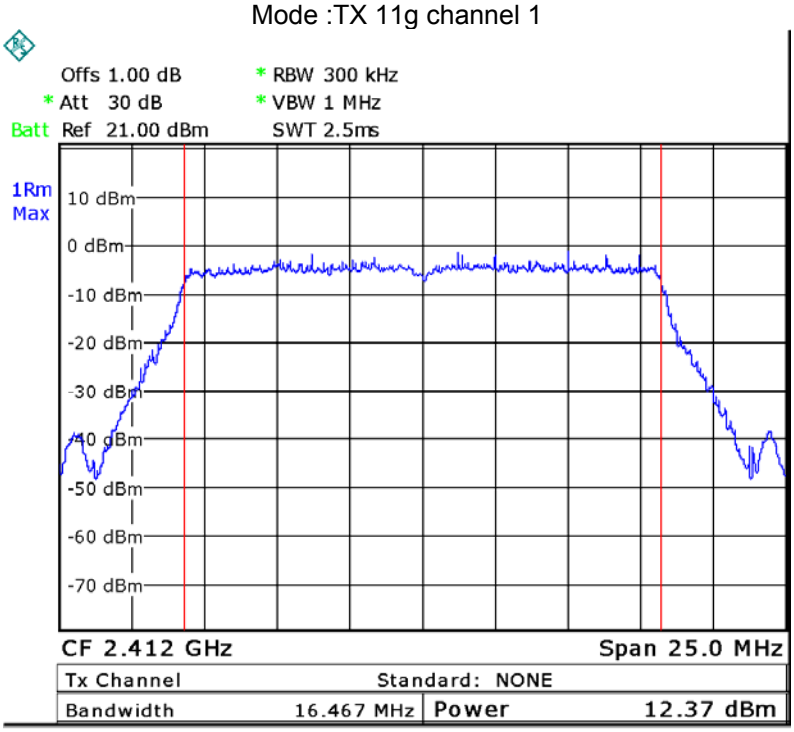
Mode: TX 11b channel 6



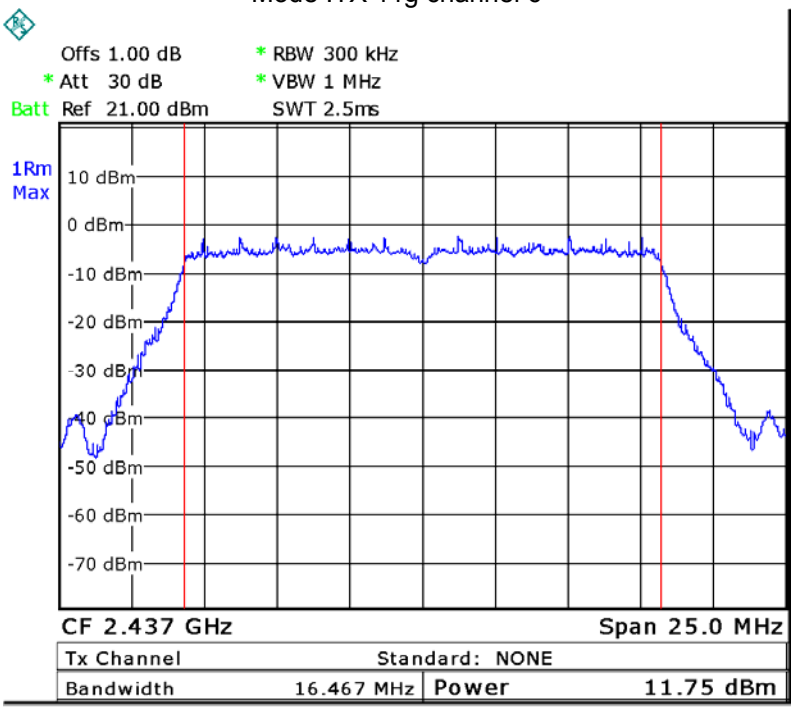
Mode: TX 11b channel 11



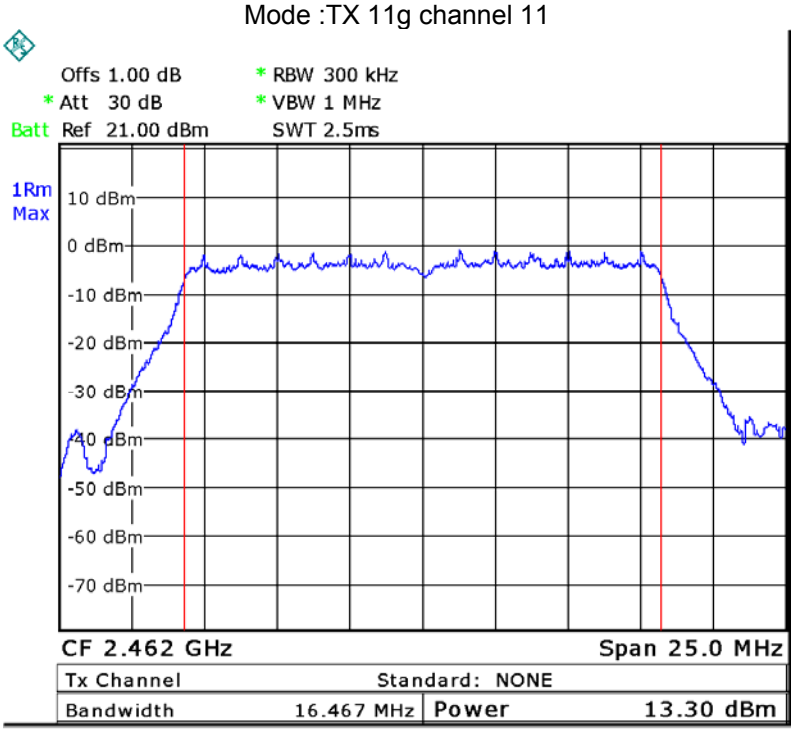
Mode :TX 11g channel 1



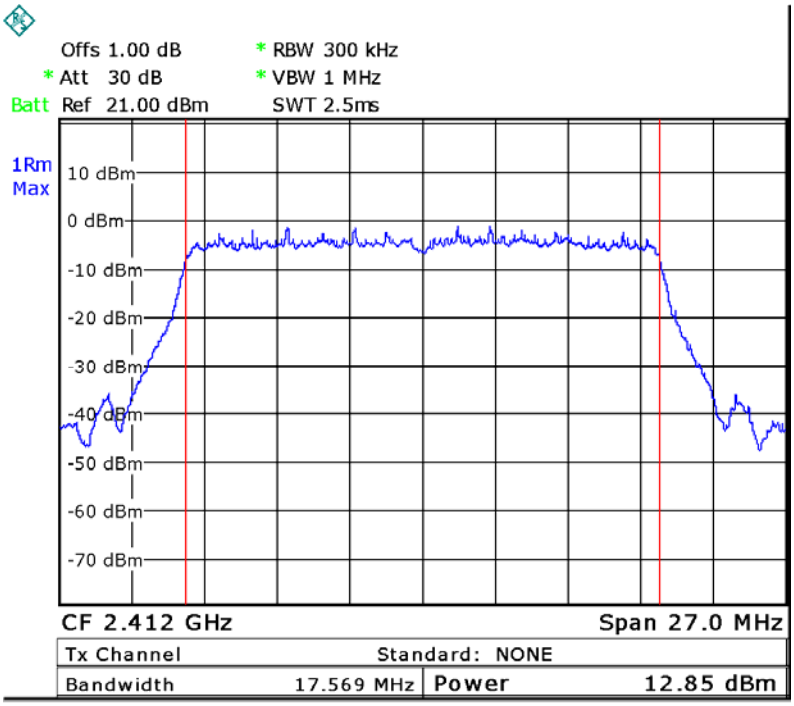
Mode :TX 11g channel 6



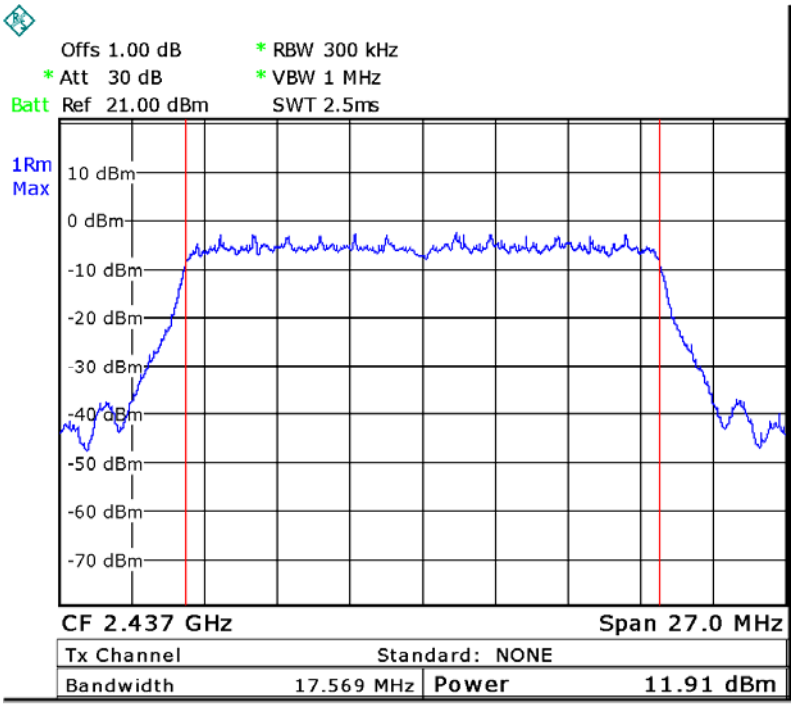
Mode :TX 11g channel 11



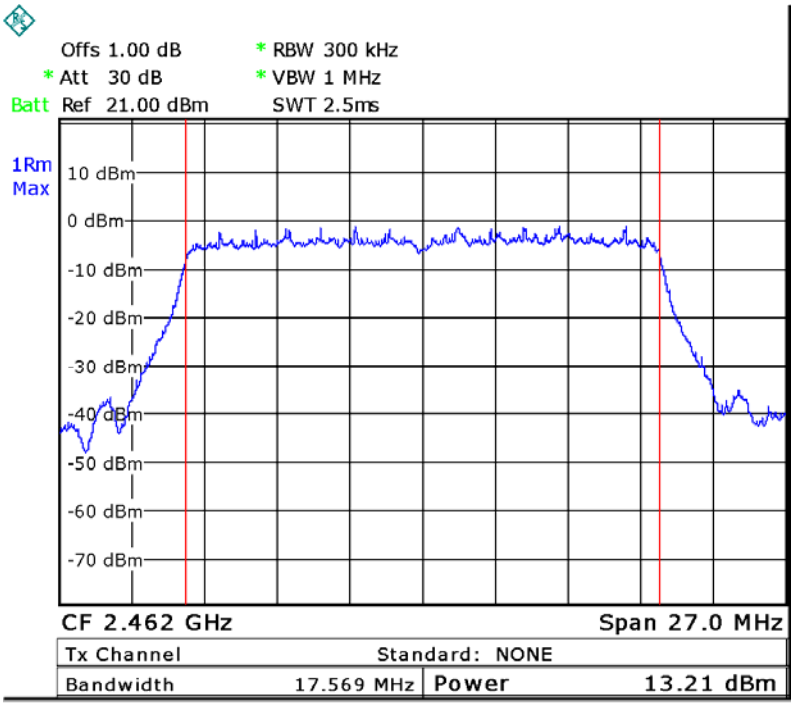
Mode: TX 11n HT20 channel 1



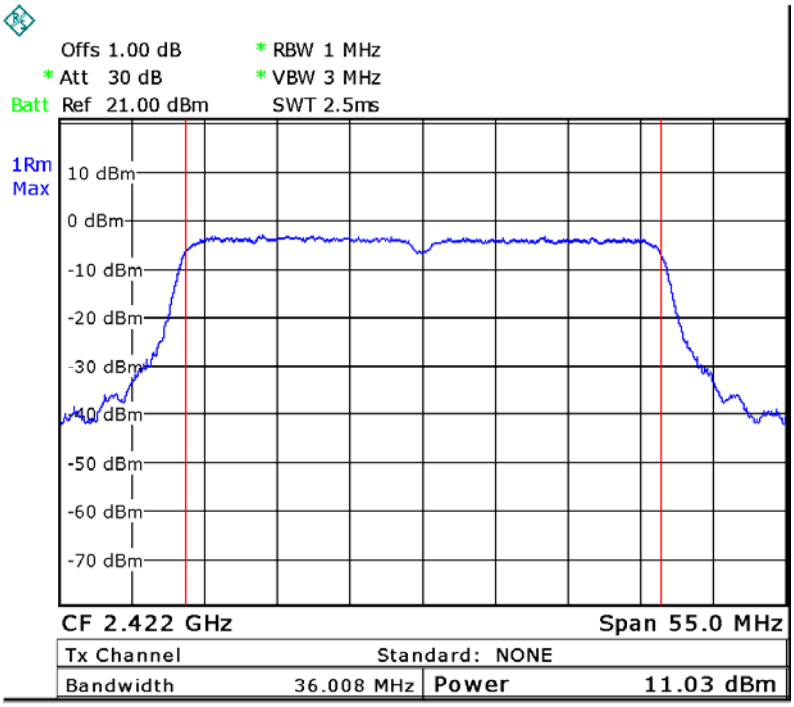
Mode: TX 11n HT20 channel 6



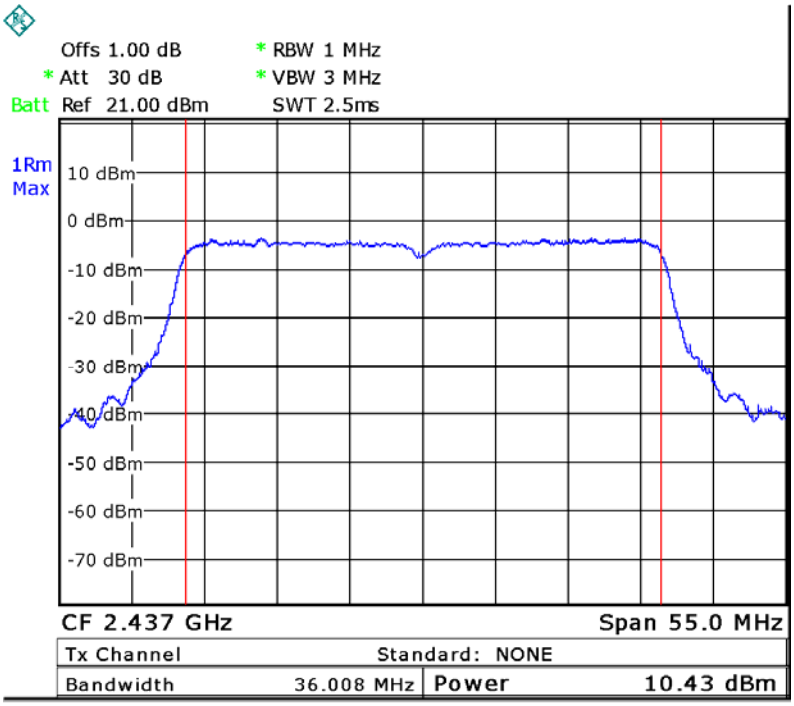
Mode: TX 11n HT20 channel 11



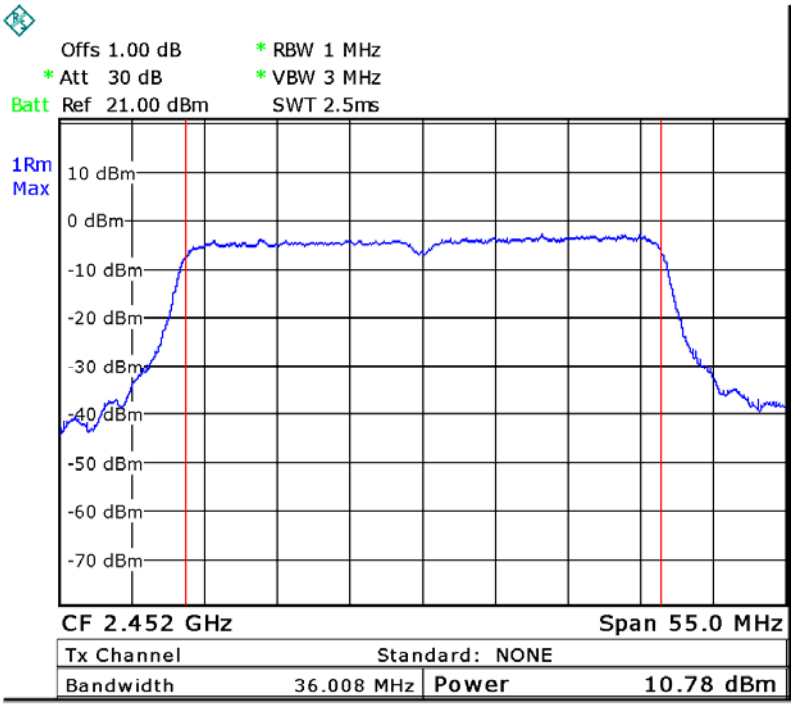
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



13 Duty cycle

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	EUT transmitting continuously

14 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

14.1 Test Procedure:

KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 section 10.2

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

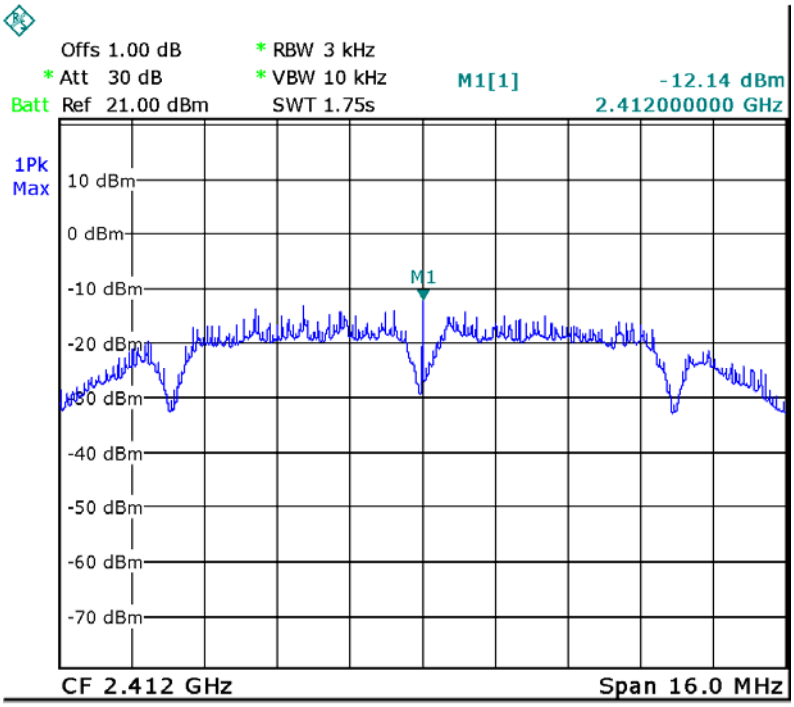
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

14.2 Test Result:

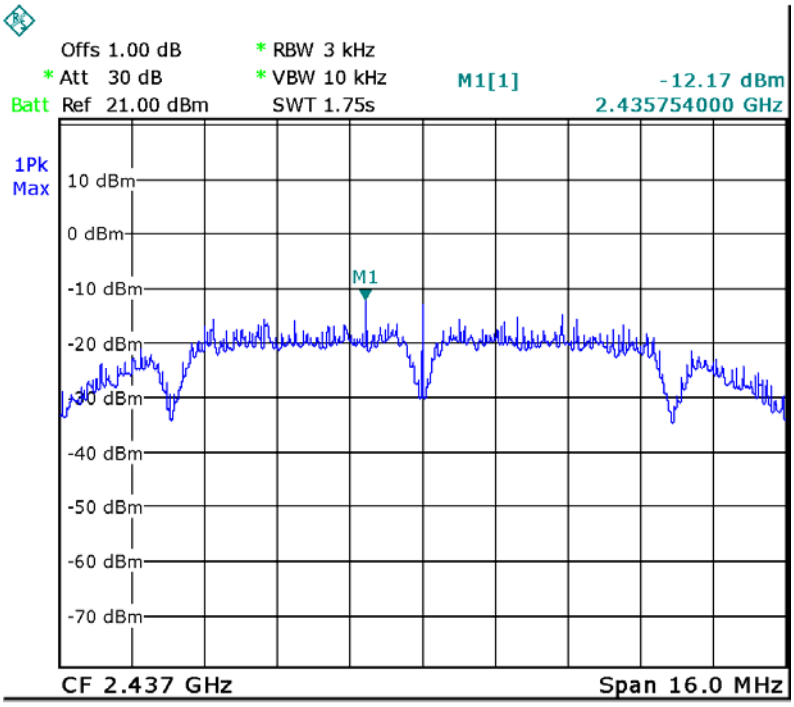
Operation mode	Channel Frequency (MHz)	Power Spectral (dBm per 3kHz)	Limit
TX 11b	Low-2412	-12.14	8dBm per 3kHz
	Middle-2437	-12.17	8dBm per 3kHz
	High-2462	-12.36	8dBm per 3kHz
TX 11g	Low-2412	-13.50	8dBm per 3kHz
	Middle-2437	-13.67	8dBm per 3kHz
	High-2462	-13.26	8dBm per 3kHz
TX 11n HT20	Low-2412	-12.91	8dBm per 3kHz
	Middle-2437	-13.50	8dBm per 3kHz
	High-2462	-13.23	8dBm per 3kHz
TX 11n HT40	Low-2422	-13.93	8dBm per 3kHz
	Middle-2437	-13.75	8dBm per 3kHz
	High-2452	-13.32	8dBm per 3kHz

Test Plot

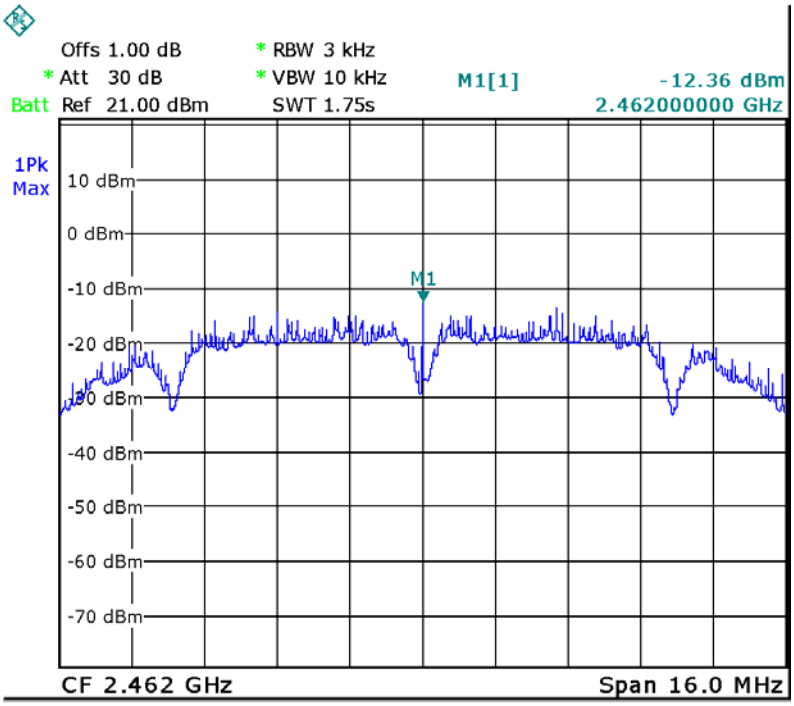
Mode: TX 11b channel 1



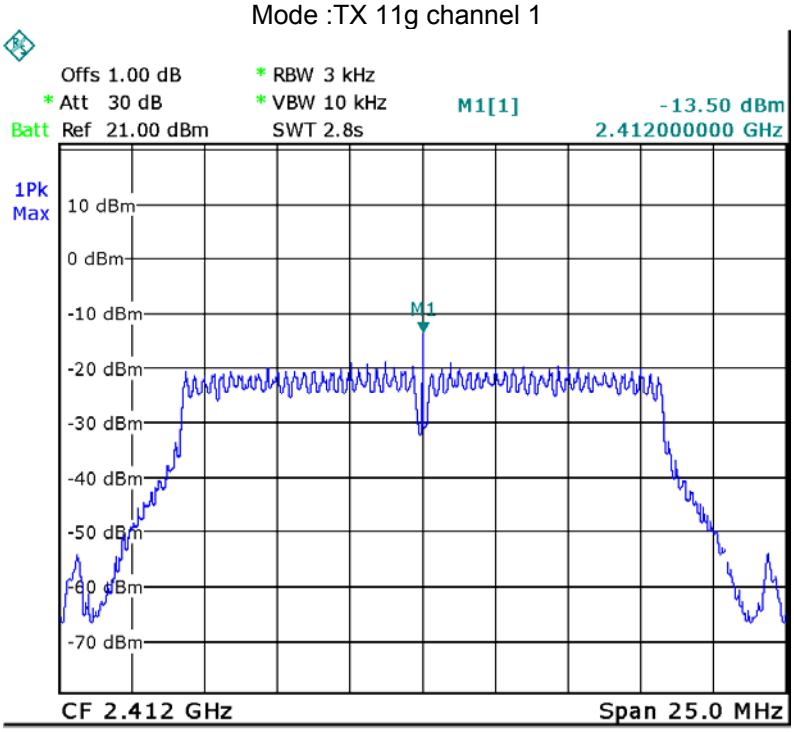
Mode: TX 11b channel 6



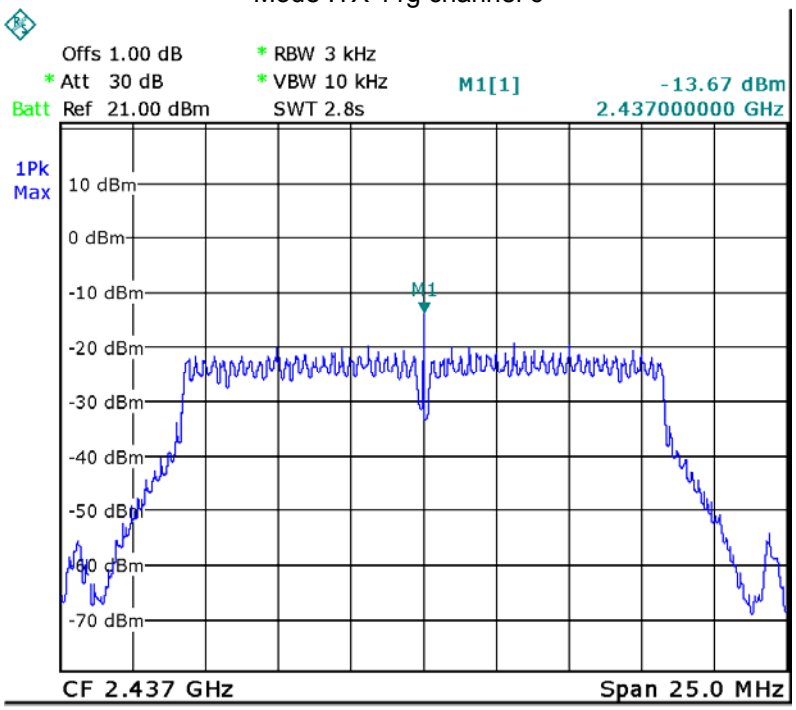
Mode: TX 11b channel 11



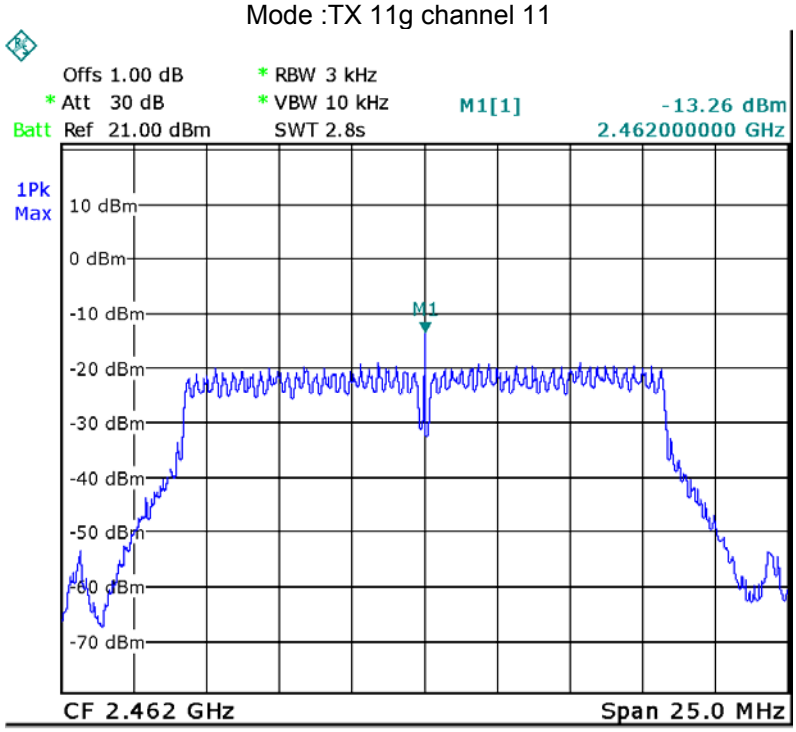
Mode :TX 11g channel 1



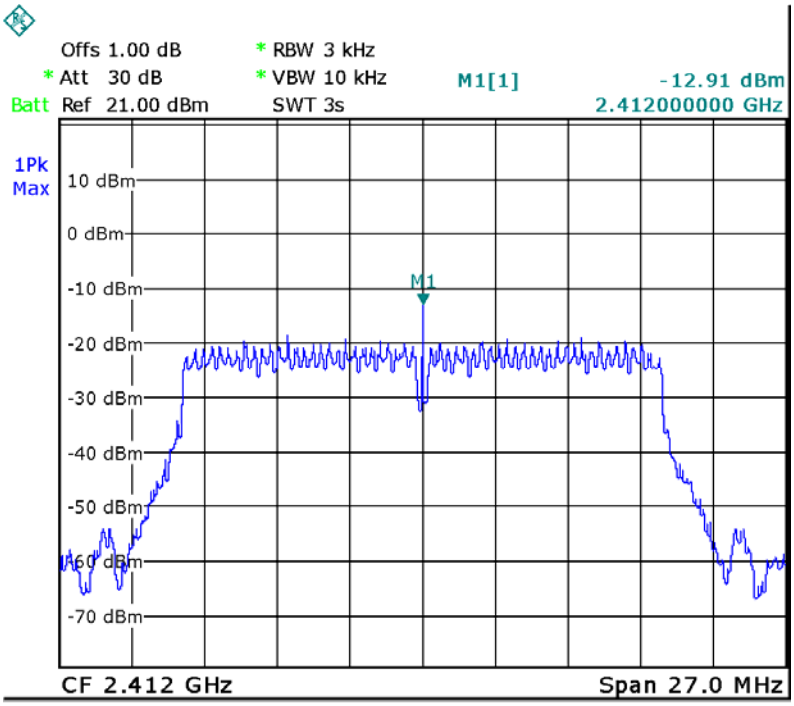
Mode :TX 11g channel 6



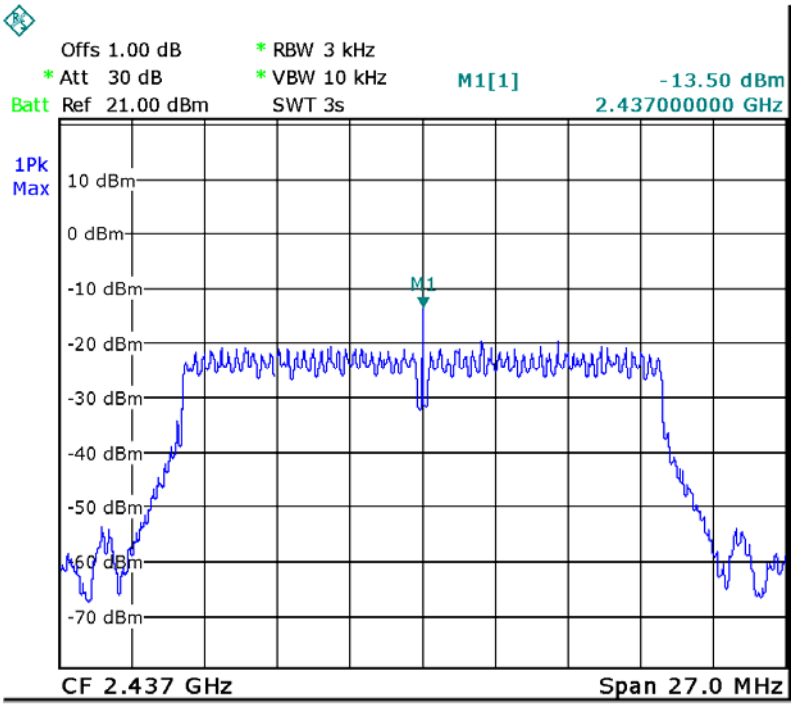
Mode :TX 11g channel 11



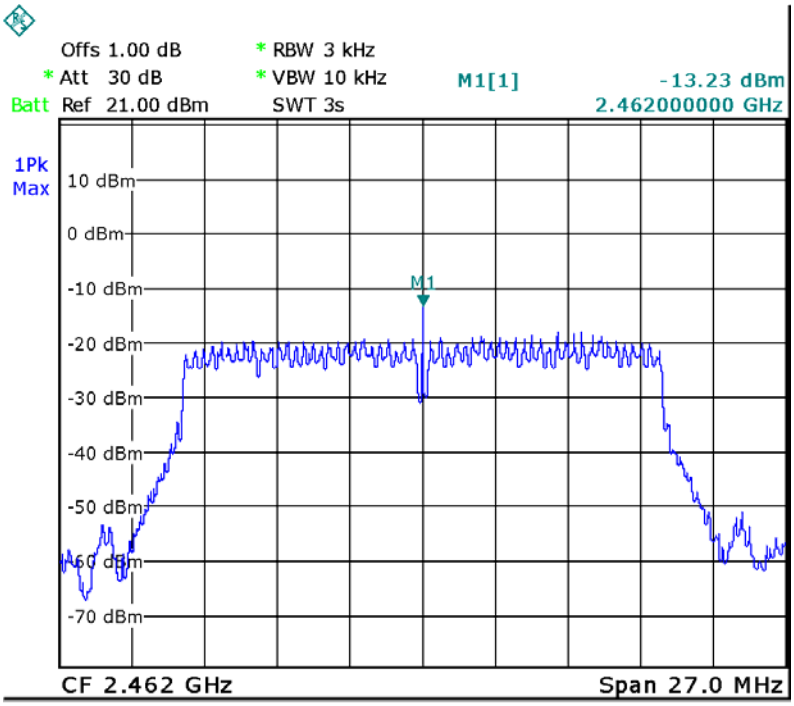
Mode: TX 11n HT20 channel 1



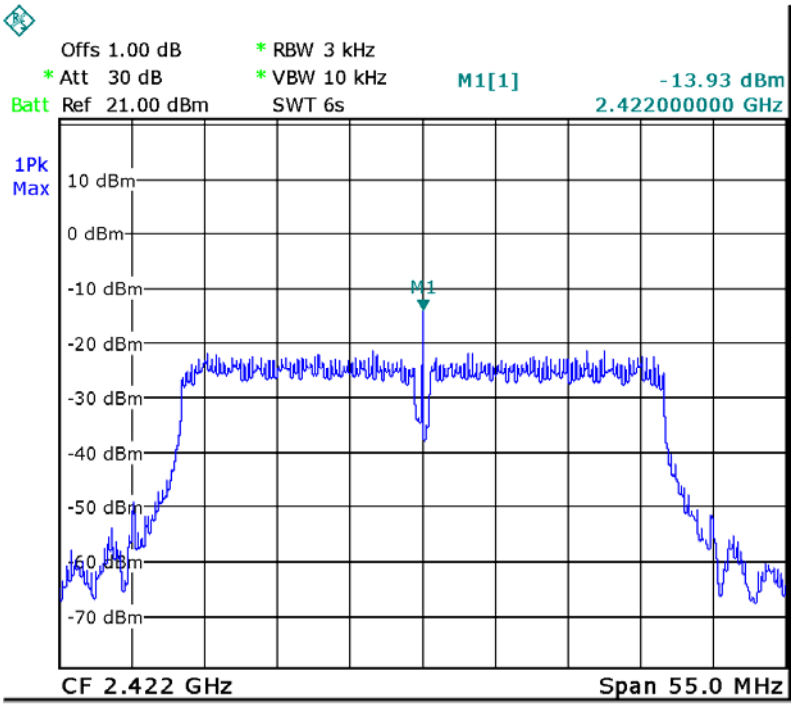
Mode: TX 11n HT20 channel 6



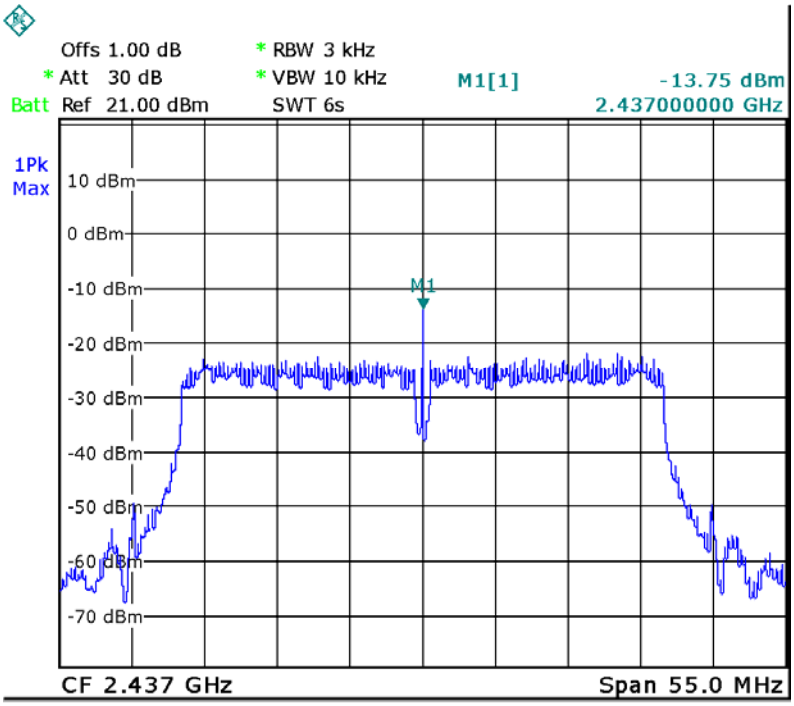
Mode: TX 11n HT20 channel 11



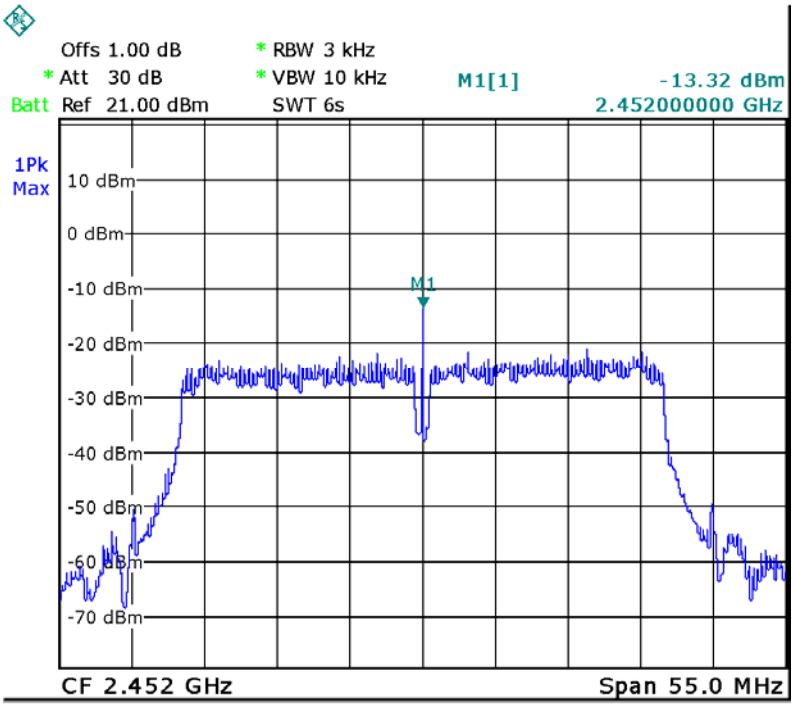
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



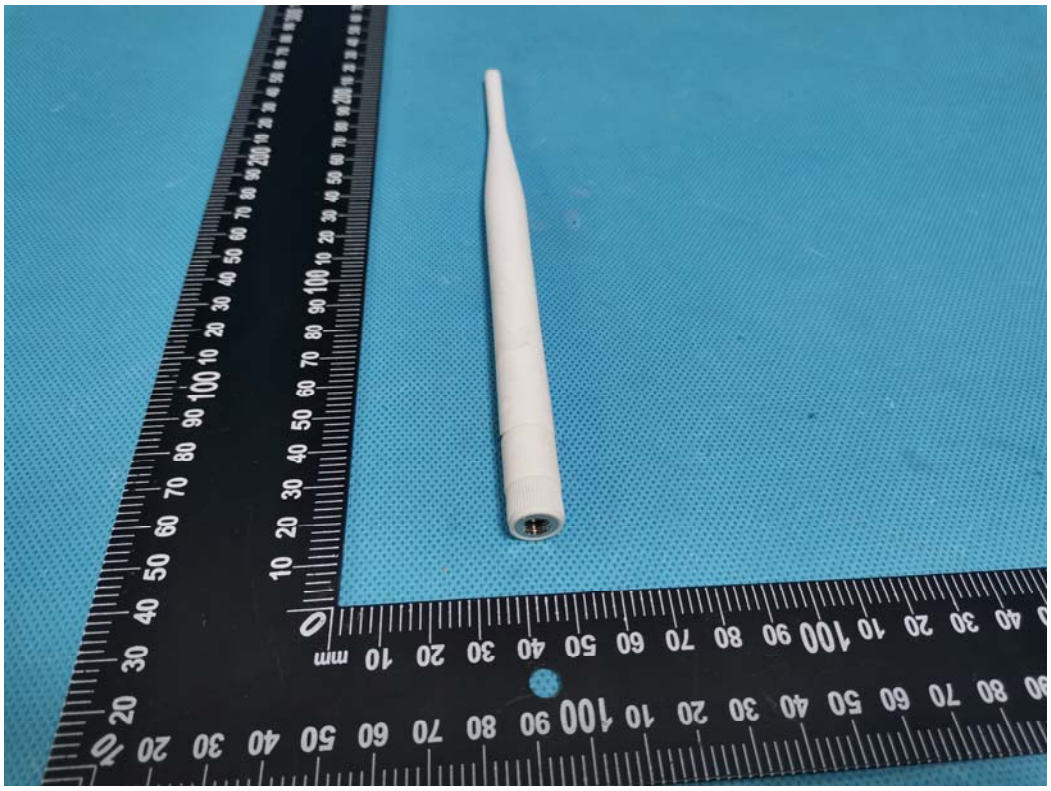
15 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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.

Result:

The EUT has one External antenna with special-SMA connector and the external antenna is a custom-designed component. If the user uses other external antennas, the product cannot work. The gain is 6.0 dBi. meets the requirements of FCC 15.203.



16 RF Exposure

Remark: refer to MPE report: WTD19S11079961W002.

17 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-139263-Photos.

======End of Report======