

TEST REPORT

Reference No...... : WTD19S11079960W001 V1
FCC ID : 2ADDH-139262
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..... : Wifi stream Music Receiver
Model(s) : 139262
Brand Name..... : Monoprice
Standards..... : FCC CFR47 Part 15.247:2018
Date of Receipt sample : 2019-11-19
Date of Test : 2019-11-20 to 2019-12-05
Date of Issue..... : 2020-03-27
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.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen,
Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Compiled by:

Ford Wang

Ford Wang / Project Engineer

Approved by:



Philo Zhong

Philo Zhong / Manager

2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS	2
3 REVISION HISTORY	3
4 GENERAL INFORMATION.....	4
4.1 GENERAL DESCRIPTION OF E.U.T.	4
4.2 DETAILS OF E.U.T.	4
4.3 CHANNEL LIST.....	5
4.4 TEST MODE	6
5 TEST SUMMARY	7
6 EQUIPMENT USED DURING TEST	8
6.1 EQUIPMENTS LIST	8
6.2 DESCRIPTION OF SUPPORT UNITS	9
6.3 MEASUREMENT UNCERTAINTY	9
6.4 TEST EQUIPMENT CALIBRATION	9
7 CONDUCTED EMISSION	10
7.1 E.U.T. OPERATION	10
7.2 EUT SETUP.....	10
7.3 MEASUREMENT DESCRIPTION	10
7.4 CONDUCTED EMISSION TEST RESULT	11
8 RADIATED EMISSIONS.....	13
8.1 EUT OPERATION.....	13
8.2 TEST SETUP	14
8.3 SPECTRUM ANALYZER SETUP	15
8.4 TEST PROCEDURE	16
8.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
8.6 SUMMARY OF TEST RESULTS	17
9 CONDUCTED SPURIOUS EMISSIONS.....	30
9.1 TEST PROCEDURE	30
9.2 TEST RESULT	31
10 BAND EDGE MEASUREMENT	43
10.1 TEST PRODUCE	43
10.2 TEST RESULT	44
11 6 DB BANDWIDTH AND 99% BANDWIDTH MEASUREMENT	48
11.1 TEST PROCEDURE:.....	48
11.2 TEST RESULT:	48
12 MAXIMUM PEAK CONDUCTED OUTPUT POWER.....	55
12.1 TEST PROCEDURE:.....	55
12.2 TEST RESULT:	56
13 DUTY CYCLE.....	63
14 POWER SPECTRAL DENSITY	64
14.1 TEST PROCEDURE:.....	64
14.2 TEST RESULT:	64
15 ANTENNA REQUIREMENT	71
16 RF EXPOSURE.....	71
17 PHOTOGRAPHS OF TEST SETUP AND EUT.....	73

3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD19S11079 960W001	2019-11-19	2019-11-20 to 2019-12-05	2019-12-06	original	-	Repalced
WTD19S11079 960W001 V1	2019-11-19	2019-11-20 to 2019-12-05	2020-03-27	Version 1	Updated	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	Wifi stream Music Receiver
Model(s):	139262
Model Description:	N/A
Wi-Fi Specification:	2.4G-802.11b/g/n HT20/n HT40
Hardware Version:	MAP-KWS120180718 V1.1
Software Version:	release 3.5.3612.17
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): 22.53dBm
Type of Modulation:	WiFi: CCK, OFDM
Antenna installation:	WiFi: Fixed antenna
Antenna Gain:	WiFi(2.4G): 3.7dBi
Ratings:	Powered by the POE
Adapter:	Sale without adapter

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 direction 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 (dB μ V)	
	Quasi-peak	Average
0.15 to 0.	66 to 56*	56 to 46*
0. to 5	56	46
5 to 30	60	50

7.1 E.U.T. Operation

Operating Environment :

Temperature: 21.5 °C

Humidity: 51.9 % RH

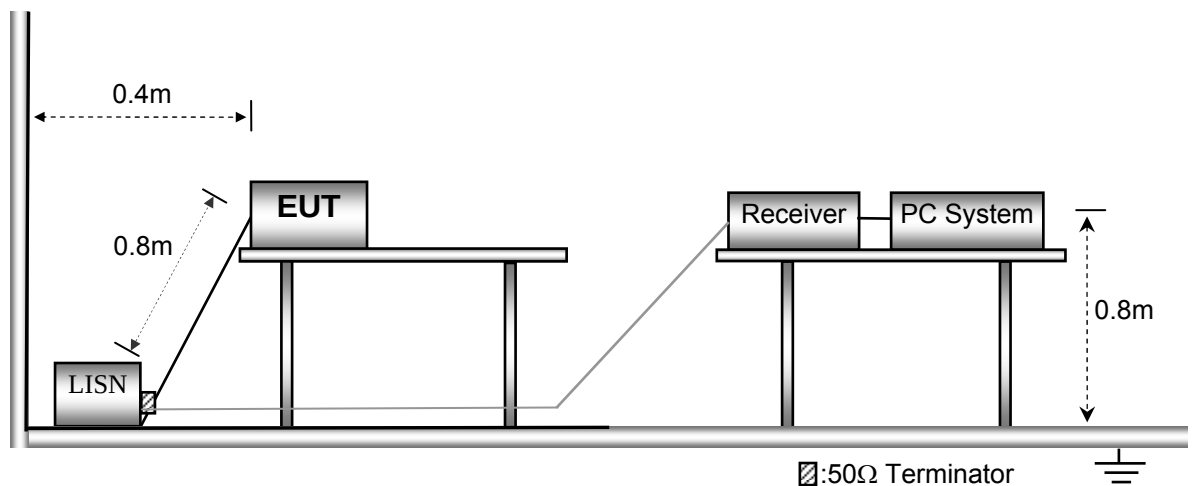
Atmospheric Pressure: 101.2kPa

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

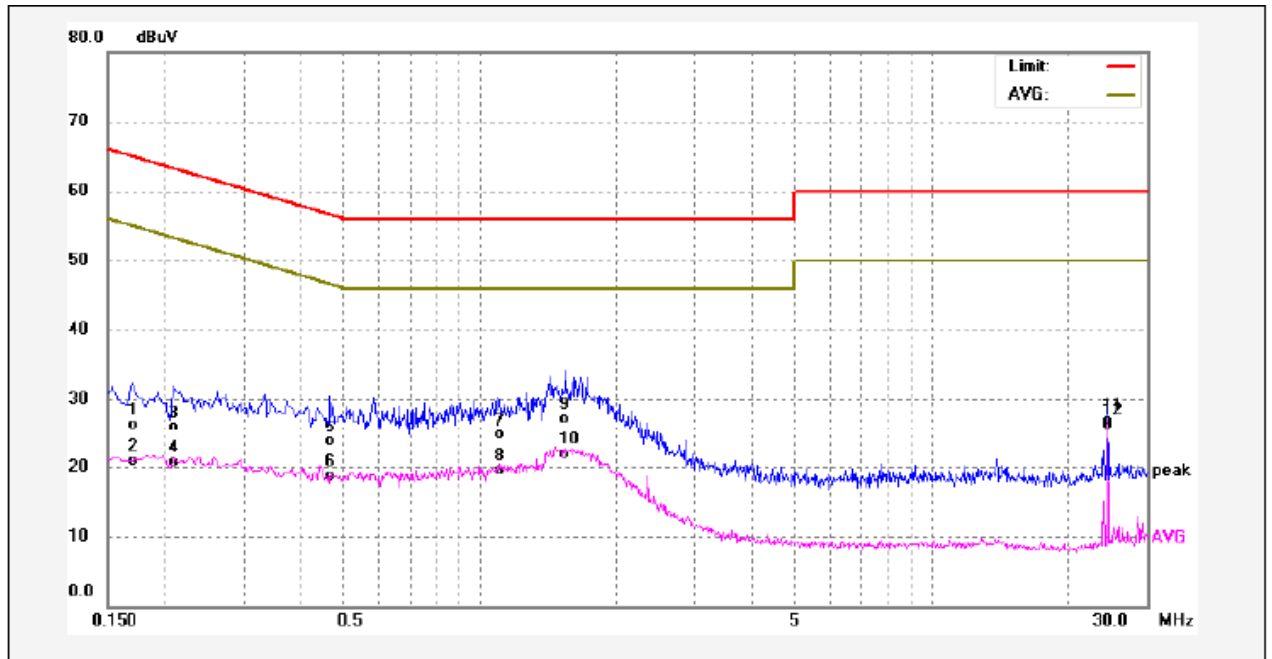
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

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

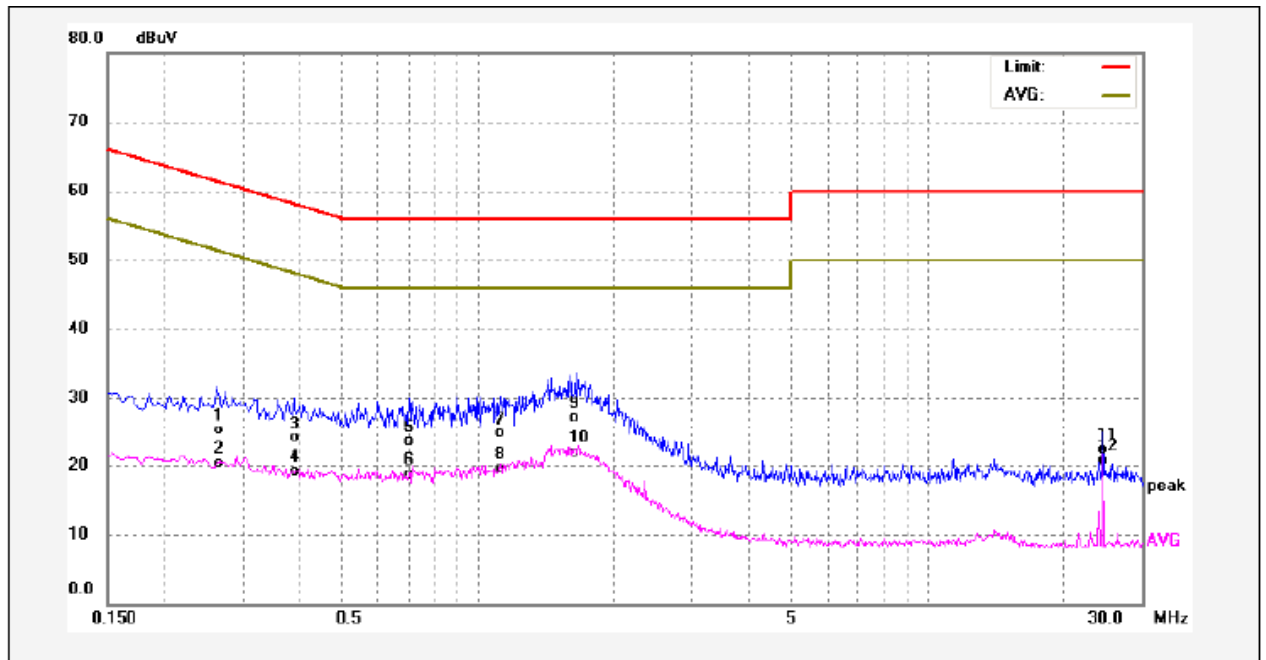
Worst Mode: WIFI mode (802.11b mode low channel)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	15.96	10.29	26.25	64.96	-38.71	QP	
2	0.1700	10.67	10.29	20.96	54.96	-34.00	AVG	
3	0.2100	15.50	10.34	25.84	63.20	-37.36	QP	
4	0.2100	10.39	10.34	20.73	53.20	-32.47	AVG	
5	0.4660	13.26	10.42	23.68	56.58	-32.90	QP	
6	0.4660	8.27	10.42	18.69	46.58	-27.89	AVG	
7	1.0900	14.33	10.44	24.77	56.00	-31.23	QP	
8	1.0900	9.12	10.44	19.56	46.00	-26.44	AVG	
9	1.5500	16.67	10.49	27.16	56.00	-28.84	QP	
10	1.5500	11.48	10.49	21.97	46.00	-24.03	AVG	
11	24.5780	16.44	10.53	26.97	60.00	-33.03	QP	
12	24.5780	15.73	10.53	26.26	50.00	-23.74	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2620	14.99	10.39	25.38	61.36	-35.98	QP	
2	0.2620	9.95	10.39	20.34	51.36	-31.02	AVG	
3	0.3899	13.64	10.42	24.06	58.06	-34.00	QP	
4	0.3899	8.60	10.42	19.02	48.06	-29.04	AVG	
5	0.7019	13.08	10.44	23.52	56.00	-32.48	QP	
6	0.7019	8.25	10.44	18.69	46.00	-27.31	AVG	
7	1.1180	14.21	10.44	24.65	56.00	-31.35	QP	
8	1.1180	9.15	10.44	19.59	46.00	-26.41	AVG	
9	1.6460	16.57	10.50	27.07	56.00	-28.93	QP	
10	1.6460	11.38	10.50	21.88	46.00	-24.12	AVG	
11	24.5780	11.76	10.53	22.29	60.00	-37.71	QP	
12	24.5780	10.09	10.53	20.62	50.00	-29.38	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

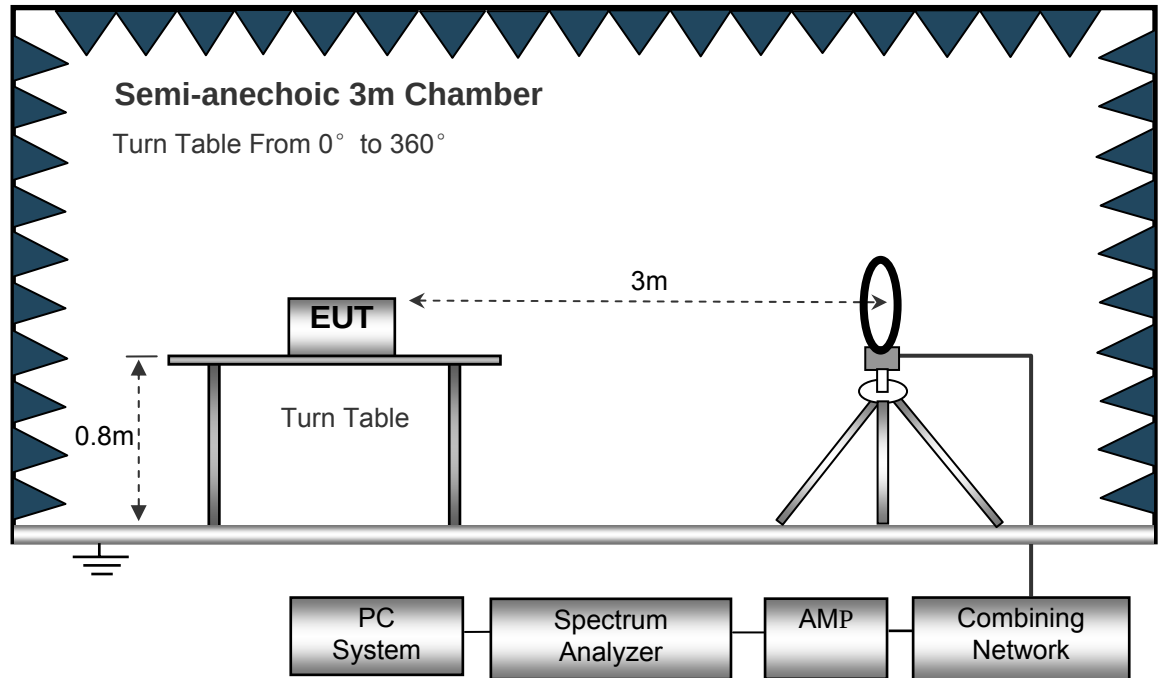
EUT Operation :

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

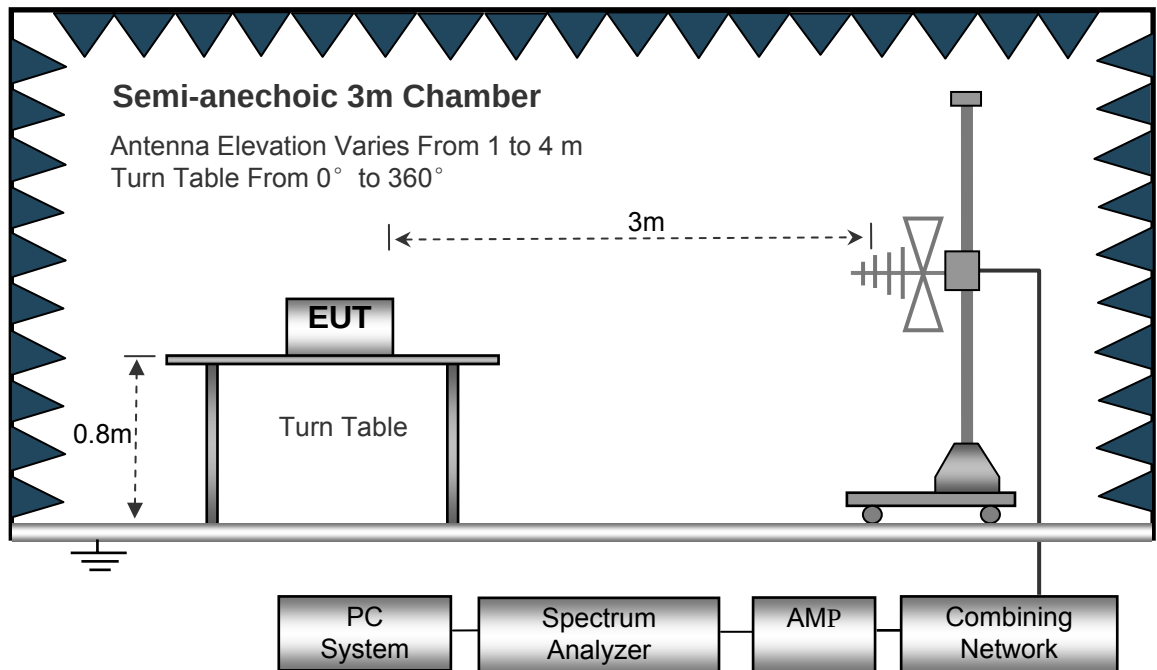
8.2 Test Setup

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

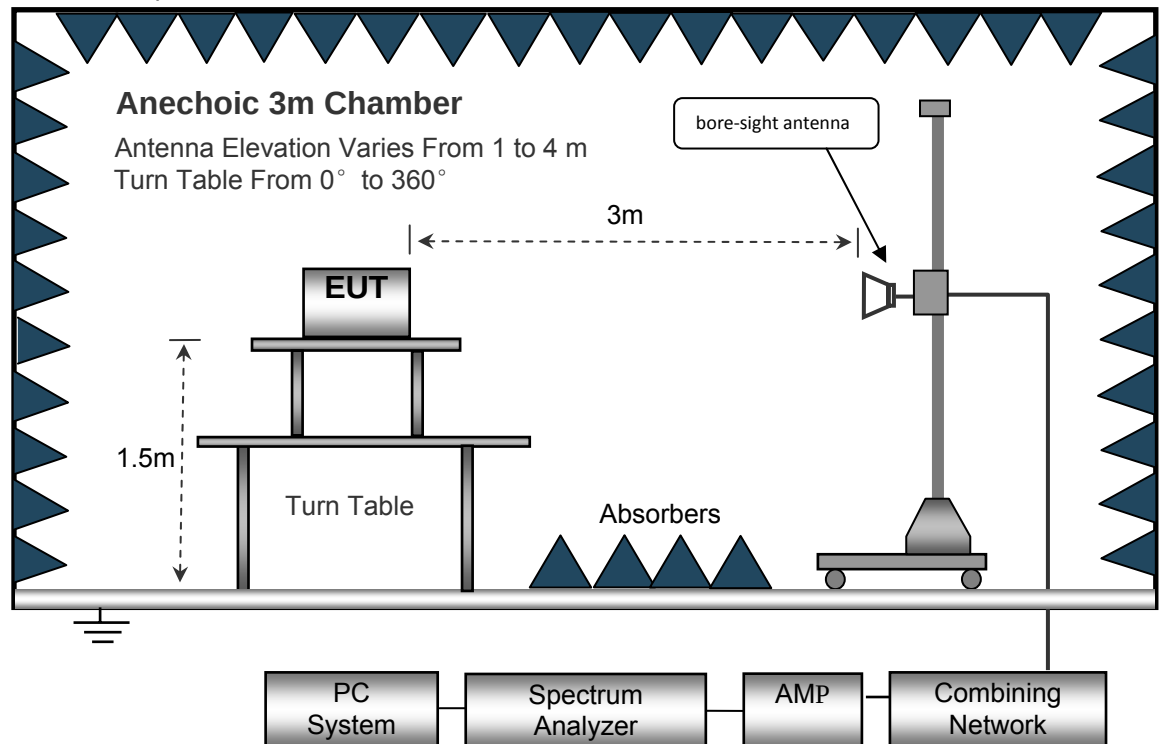
The test setup for emission measurement below 30MHz.



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
 DetectorPK
 Resolution Bandwidth.....100kHz
 Video Bandwidth.....300kHz

Above 1GHz

Sweep Speed Auto
 DetectorPK
 Resolution Bandwidth.....1MHz
 Video Bandwidth.....3MHz
 DetectorAve.
 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 during 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

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							
6.021	25.28	QP	21.84	40.00	7.12	29.54	-22.42
15.730	25.87	QP	21.35	40.00	7.22	29.54	-22.32
25.680	24.61	QP	20.67	40.00	5.28	29.54	-24.26
802.11g							
6.021	25.42	QP	21.84	40.00	7.26	29.54	-22.28
15.730	24.85	QP	21.35	40.00	6.20	29.54	-23.34
25.680	25.30	QP	20.67	40.00	5.97	29.54	-23.57
802.11n(HT20)							
6.021	25.06	QP	21.84	40.00	6.90	29.54	-22.64
15.730	24.89	QP	21.35	40.00	6.24	29.54	-23.30
25.680	25.11	QP	20.67	40.00	5.78	29.54	-23.76
802.11n(HT40)							
6.021	25.33	QP	21.84	40.00	7.17	29.54	-22.37
15.730	24.76	QP	21.35	40.00	6.11	29.54	-23.43
25.680	25.09	QP	20.67	40.00	5.76	29.54	-23.78

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	35.19	QP	155	1.1	H	-11.62	23.57	46.00	-22.43
223.45	50.66	QP	198	1.6	V	-11.62	39.04	46.00	-6.96
4824.00	46.30	PK	137	1.6	V	-1.06	45.24	74.00	-28.76
4824.00	40.63	Ave	137	1.6	V	-1.06	39.57	54.00	-14.43
7236.00	41.81	PK	167	1.3	H	1.33	43.14	74.00	-30.86
7236.00	41.96	Ave	167	1.3	H	1.33	43.29	54.00	-10.71
2310.68	45.02	PK	7	1.9	V	-13.19	31.83	74.00	-42.17
2310.68	37.15	Ave	7	1.9	V	-13.19	23.96	54.00	-30.04
2379.36	42.15	PK	256	1.7	H	-13.14	29.01	74.00	-44.99
2379.36	37.70	Ave	256	1.7	H	-13.14	24.56	54.00	-29.44
2488.14	44.82	PK	247	1.1	V	-13.08	31.74	74.00	-42.26
2488.14	38.40	Ave	247	1.1	V	-13.08	25.32	54.00	-28.68

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)
11b: Middle Channel 2437MHz									
223.45	33.72	QP	240	2.0	H	-11.62	22.10	46.00	-23.90
223.45	51.44	QP	99	1.5	V	-11.62	39.82	46.00	-6.18
4874.00	45.86	PK	230	1.8	V	-0.62	45.24	74.00	-28.76
4874.00	41.45	Ave	230	1.8	V	-0.62	40.83	54.00	-13.17
7311.00	41.06	PK	359	1.8	H	2.21	43.27	74.00	-30.73
7311.00	41.12	Ave	359	1.8	H	2.21	43.33	54.00	-10.67
2310.12	46.65	PK	167	1.6	V	-13.19	33.46	74.00	-40.54
2310.12	37.28	Ave	167	1.6	V	-13.19	24.09	54.00	-29.91
2360.38	43.00	PK	76	1.3	H	-13.14	29.86	74.00	-44.14
2360.38	38.14	Ave	76	1.3	H	-13.14	25.00	54.00	-29.00
2498.07	42.23	PK	235	1.7	V	-13.08	29.15	74.00	-44.85
2498.07	36.49	Ave	235	1.7	V	-13.08	23.41	54.00	-30.59

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	32.51	QP	317	1.8	H	-11.62	20.89	46.00	-25.11
223.45	52.59	QP	76	1.6	V	-11.62	40.97	46.00	-5.03
4924.00	45.26	PK	256	1.7	V	-0.24	45.02	74.00	-28.98
4924.00	40.31	Ave	256	1.7	V	-0.24	40.07	54.00	-13.93
7386.00	40.08	PK	319	2.0	H	2.84	42.92	74.00	-31.08
7386.00	39.91	Ave	319	2.0	H	2.84	42.75	54.00	-11.25
2344.25	45.46	PK	89	1.9	V	-13.19	32.27	74.00	-41.73
2344.25	38.55	Ave	89	1.9	V	-13.19	25.36	54.00	-28.64
2387.82	43.02	PK	309	1.7	H	-13.14	29.88	74.00	-44.12
2387.82	36.61	Ave	309	1.7	H	-13.14	23.47	54.00	-30.53
2490.70	43.92	PK	78	1.8	V	-13.08	30.84	74.00	-43.16
2490.70	38.87	Ave	78	1.8	V	-13.08	25.79	54.00	-28.21

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	32.78	QP	100	1.2	H	-11.62	21.16	46.00	-24.84
223.45	53.84	QP	326	1.4	V	-11.62	42.22	46.00	-3.78
4824.00	45.72	PK	178	1.5	V	-1.06	44.66	74.00	-29.34
4824.00	40.12	Ave	178	1.5	V	-1.06	39.06	54.00	-14.94
7236.00	40.53	PK	273	1.5	H	1.33	41.86	74.00	-32.14
7236.00	39.27	Ave	273	1.5	H	1.33	40.60	54.00	-13.40
2317.85	45.90	PK	63	1.2	V	-13.19	32.71	74.00	-41.29
2317.85	38.98	Ave	63	1.2	V	-13.19	25.79	54.00	-28.21
2370.37	44.37	PK	273	1.5	H	-13.14	31.23	74.00	-42.77
2370.37	37.13	Ave	273	1.5	H	-13.14	23.99	54.00	-30.01
2487.11	42.83	PK	190	1.4	V	-13.08	29.75	74.00	-44.25
2487.11	37.69	Ave	190	1.4	V	-13.08	24.61	54.00	-29.39

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	32.21	QP	72	1.6	H	-11.62	20.59	46.00	-25.41
223.45	55.20	QP	5	1.9	V	-11.62	43.58	46.00	-2.42
4874.00	45.54	PK	104	1.5	V	-0.62	44.92	74.00	-29.08
4874.00	41.17	Ave	104	1.5	V	-0.62	40.55	54.00	-13.45
7311.00	40.11	PK	160	1.5	H	2.21	42.32	74.00	-31.68
7311.00	38.42	Ave	160	1.5	H	2.21	40.63	54.00	-13.37
2348.72	46.04	PK	243	1.8	V	-13.19	32.85	74.00	-41.15
2348.72	37.60	Ave	243	1.8	V	-13.19	24.41	54.00	-29.59
2356.92	42.59	PK	2	1.8	H	-13.14	29.45	74.00	-44.55
2356.92	38.12	Ave	2	1.8	H	-13.14	24.98	54.00	-29.02
2489.57	44.22	PK	35	1.8	V	-13.08	31.14	74.00	-42.86
2489.57	37.32	Ave	35	1.8	V	-13.08	24.24	54.00	-29.76

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	32.90	QP	129	1.3	H	-11.62	21.28	46.00	-24.72
223.45	56.69	QP	72	1.7	V	-11.62	45.07	46.00	-0.93
4924.00	47.04	PK	237	1.5	V	-0.24	46.80	74.00	-27.20
4924.00	41.12	Ave	237	1.5	V	-0.24	40.88	54.00	-13.12
7386.00	41.43	PK	63	1.3	H	2.84	44.27	74.00	-29.73
7386.00	37.45	Ave	63	1.3	H	2.84	40.29	54.00	-13.71
2317.10	45.50	PK	240	1.6	V	-13.19	32.31	74.00	-41.69
2317.10	39.28	Ave	240	1.6	V	-13.19	26.09	54.00	-27.91
2350.19	42.35	PK	97	1.1	H	-13.14	29.21	74.00	-44.79
2350.19	38.06	Ave	97	1.1	H	-13.14	24.92	54.00	-29.08
2489.44	44.66	PK	179	1.0	V	-13.08	31.58	74.00	-42.42
2489.44	37.17	Ave	179	1.0	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)
11n20: Low Channel 2412MHz									
223.45	33.07	QP	321	1.8	H	-11.62	21.45	46.00	-24.55
223.45	56.64	QP	356	1.5	V	-11.62	45.02	46.00	-0.98
4824.00	45.66	PK	66	1.9	V	-1.06	44.60	74.00	-29.40
4824.00	39.83	Ave	66	1.9	V	-1.06	38.77	54.00	-15.23
7236.00	42.74	PK	50	1.8	H	1.33	44.07	74.00	-29.93
7236.00	38.95	Ave	50	1.8	H	1.33	40.28	54.00	-13.72
2330.51	45.97	PK	165	1.2	V	-13.19	32.78	74.00	-41.22
2330.51	37.20	Ave	165	1.2	V	-13.19	24.01	54.00	-29.99
2387.77	42.06	PK	139	1.1	H	-13.14	28.92	74.00	-45.08
2387.77	36.99	Ave	139	1.1	H	-13.14	23.85	54.00	-30.15
2488.77	43.69	PK	313	1.6	V	-13.08	30.61	74.00	-43.39
2488.77	37.35	Ave	313	1.6	V	-13.08	24.27	54.00	-29.73

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	33.76	QP	284	1.8	H	-11.62	22.14	46.00	-23.86
223.45	57.41	QP	260	1.6	V	-11.62	45.79	46.00	-0.21
4874.00	44.76	PK	49	1.7	V	-0.62	44.14	74.00	-29.86
4874.00	38.65	Ave	49	1.7	V	-0.62	38.03	54.00	-15.97
7311.00	44.01	PK	41	1.8	H	2.21	46.22	74.00	-27.78
7311.00	38.95	Ave	41	1.8	H	2.21	41.16	54.00	-12.84
2315.31	46.79	PK	284	1.7	V	-13.19	33.60	74.00	-40.40
2315.31	37.89	Ave	284	1.7	V	-13.19	24.70	54.00	-29.30
2364.51	42.74	PK	56	1.9	H	-13.14	29.60	74.00	-44.40
2364.51	36.96	Ave	56	1.9	H	-13.14	23.82	54.00	-30.18
2490.47	44.36	PK	263	1.3	V	-13.08	31.28	74.00	-42.72
2490.47	36.24	Ave	263	1.3	V	-13.08	23.16	54.00	-30.84

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	34.63	QP	65	1.3	H	-11.62	23.01	46.00	-22.99
223.45	56.01	QP	307	1.7	V	-11.62	44.39	46.00	-1.61
4924.00	43.83	PK	85	1.4	V	-0.24	43.59	74.00	-30.41
4924.00	38.97	Ave	85	1.4	V	-0.24	38.73	54.00	-15.27
7386.00	44.91	PK	114	1.1	H	2.84	47.75	74.00	-26.25
7386.00	39.35	Ave	114	1.1	H	2.84	42.19	54.00	-11.81
2347.62	46.02	PK	329	1.8	V	-13.19	32.83	74.00	-41.17
2347.62	37.82	Ave	329	1.8	V	-13.19	24.63	54.00	-29.37
2366.40	43.38	PK	96	1.9	H	-13.14	30.24	74.00	-43.76
2366.40	37.30	Ave	96	1.9	H	-13.14	24.16	54.00	-29.84
2487.16	43.22	PK	166	1.2	V	-13.08	30.14	74.00	-43.86
2487.16	38.18	Ave	166	1.2	V	-13.08	25.10	54.00	-28.90

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	35.12	QP	281	1.3	H	-11.62	23.50	46.00	-22.50
223.45	56.62	QP	289	1.1	V	-11.62	45.00	46.00	-1.00
4844.00	41.05	PK	65	1.7	V	-1.06	39.99	74.00	-34.01
4844.00	36.40	Ave	65	1.7	V	-1.06	35.34	54.00	-18.66
7266.00	43.65	PK	335	1.9	H	1.33	44.98	74.00	-29.02
7266.00	37.47	Ave	335	1.9	H	1.33	38.80	54.00	-15.20
2335.07	45.48	PK	149	1.8	V	-13.19	32.29	74.00	-41.71
2335.07	38.96	Ave	149	1.8	V	-13.19	25.77	54.00	-28.23
2362.40	43.68	PK	92	1.8	H	-13.14	30.54	74.00	-43.46
2362.40	38.65	Ave	92	1.8	H	-13.14	25.51	54.00	-28.49
2485.41	42.58	PK	302	1.2	V	-13.08	29.50	74.00	-44.50
2485.41	38.80	Ave	302	1.2	V	-13.08	25.72	54.00	-28.28

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	34.37	QP	316	1.5	H	-11.62	22.75	46.00	-23.25
223.45	56.09	QP	15	1.7	V	-11.62	44.47	46.00	-1.53
4874.00	41.11	PK	299	1.9	V	-0.62	40.49	74.00	-33.51
4874.00	35.94	Ave	299	1.9	V	-0.62	35.32	54.00	-18.68
7311.00	43.65	PK	181	1.7	H	2.21	45.86	74.00	-28.14
7311.00	38.32	Ave	181	1.7	H	2.21	40.53	54.00	-13.47
2334.04	46.15	PK	152	1.9	V	-13.19	32.96	74.00	-41.04
2334.04	38.04	Ave	152	1.9	V	-13.19	24.85	54.00	-29.15
2356.48	44.97	PK	26	1.1	H	-13.14	31.83	74.00	-42.17
2356.48	38.12	Ave	26	1.1	H	-13.14	24.98	54.00	-29.02
2485.36	42.27	PK	9	1.9	V	-13.08	29.19	74.00	-44.81
2485.36	37.05	Ave	9	1.9	V	-13.08	23.97	54.00	-30.03

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	34.19	QP	29	1.1	H	-11.62	22.57	46.00	-23.43
223.45	56.48	QP	270	1.2	V	-11.62	44.86	46.00	-1.14
4904.00	40.32	PK	58	1.3	V	-0.24	40.08	74.00	-33.92
4904.00	36.87	Ave	58	1.3	V	-0.24	36.63	54.00	-17.37
7356.00	42.80	PK	321	1.6	H	2.84	45.64	74.00	-28.36
7356.00	38.55	Ave	321	1.6	H	2.84	41.39	54.00	-12.61
2346.83	46.36	PK	280	1.6	V	-13.19	33.17	74.00	-40.83
2346.83	38.35	Ave	280	1.6	V	-13.19	25.16	54.00	-28.84
2360.26	42.67	PK	119	1.2	H	-13.14	29.53	74.00	-44.47
2360.26	37.77	Ave	119	1.2	H	-13.14	24.63	54.00	-29.37
2490.22	43.94	PK	226	1.2	V	-13.08	30.86	74.00	-43.14
2490.22	38.36	Ave	226	1.2	V	-13.08	25.28	54.00	-28.72

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 _ $[3 \times \text{RBW}]$.
 - 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.

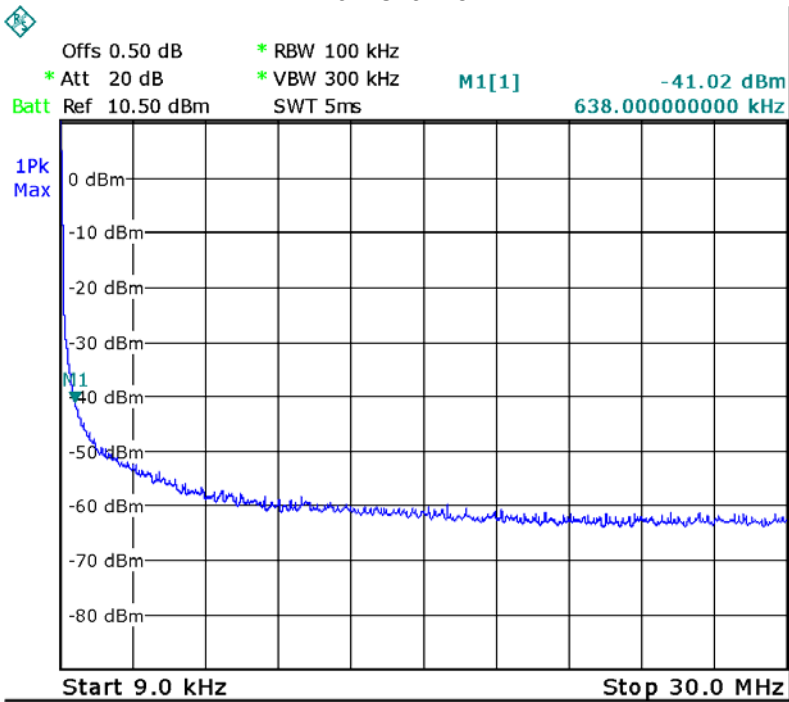
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

9.2 Test Result

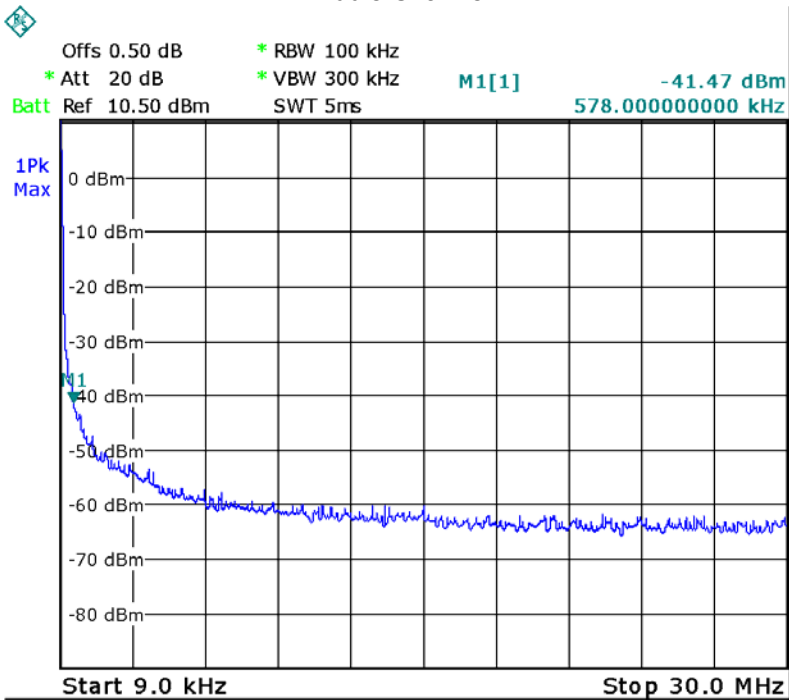
9KHz – 30MHz

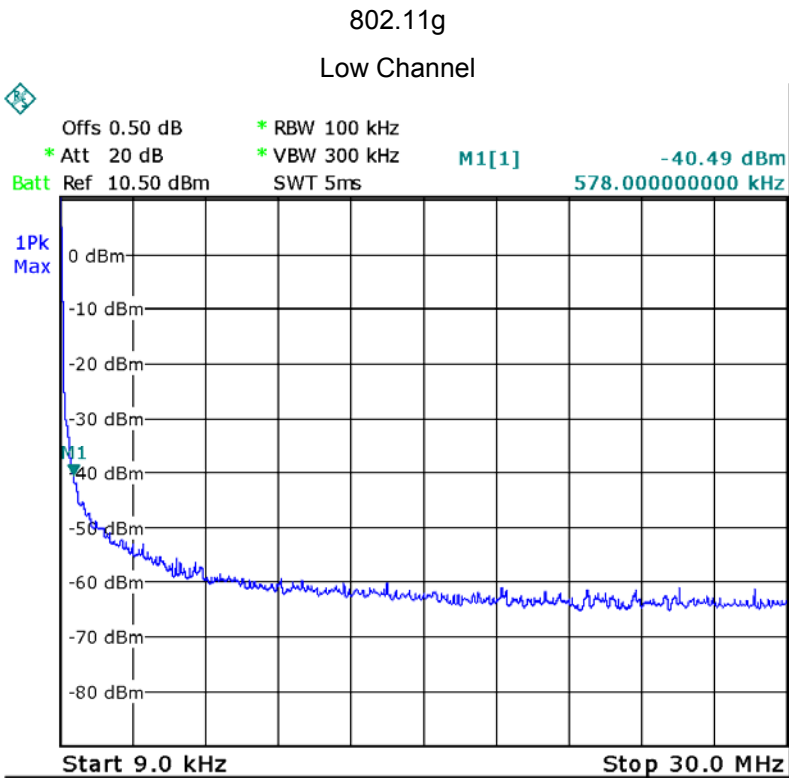
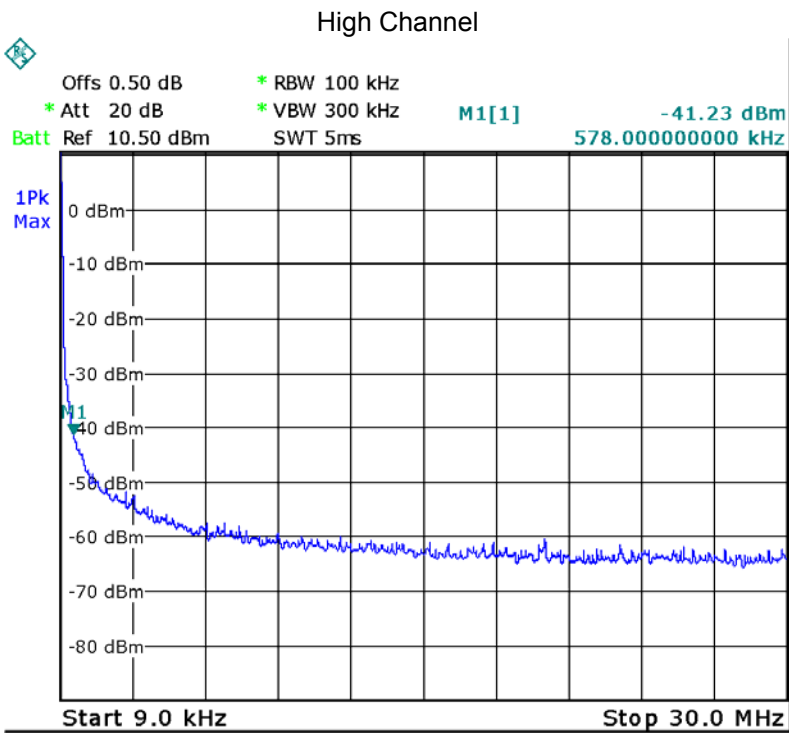
802.11b

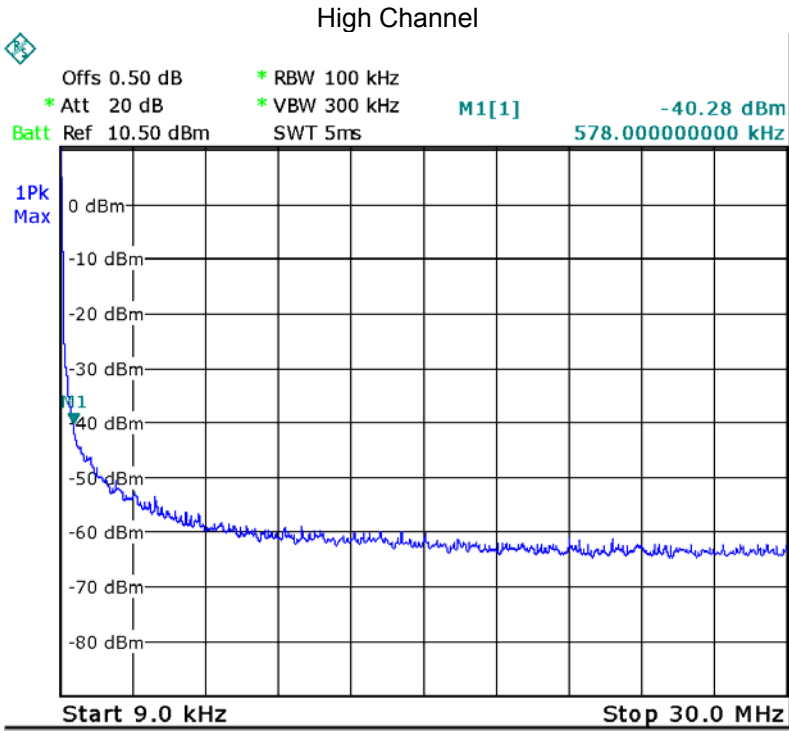
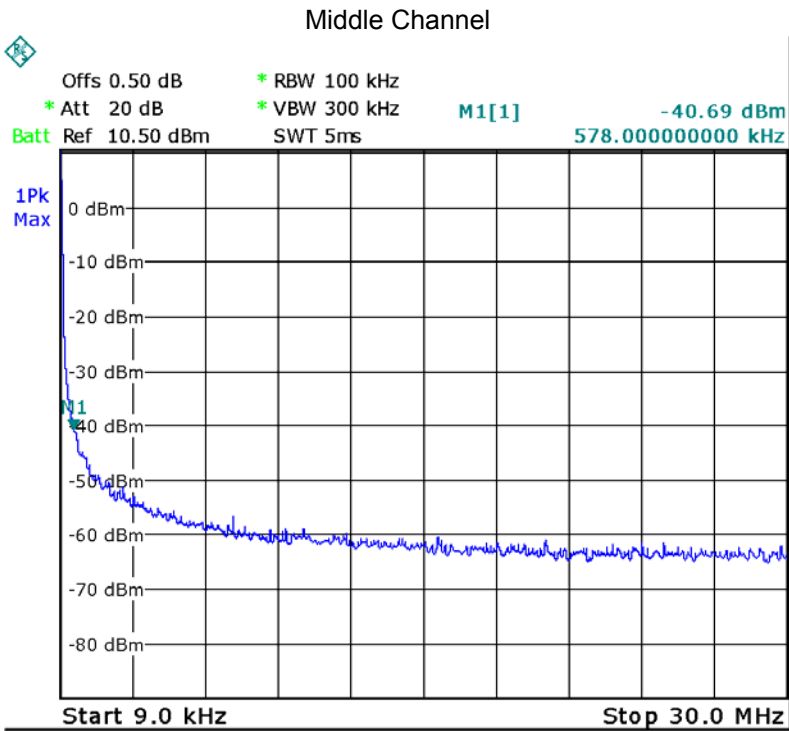
Low Channel



Middle Channel

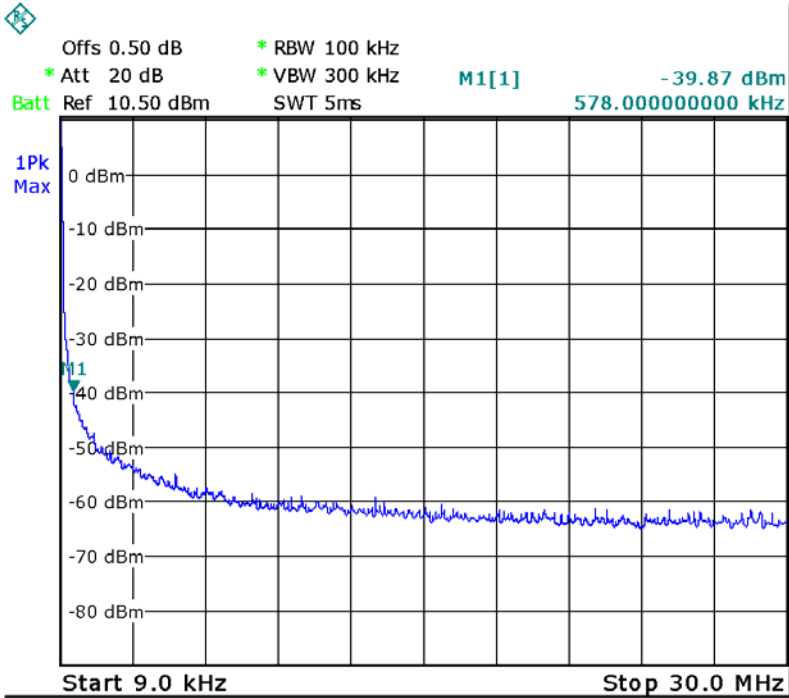




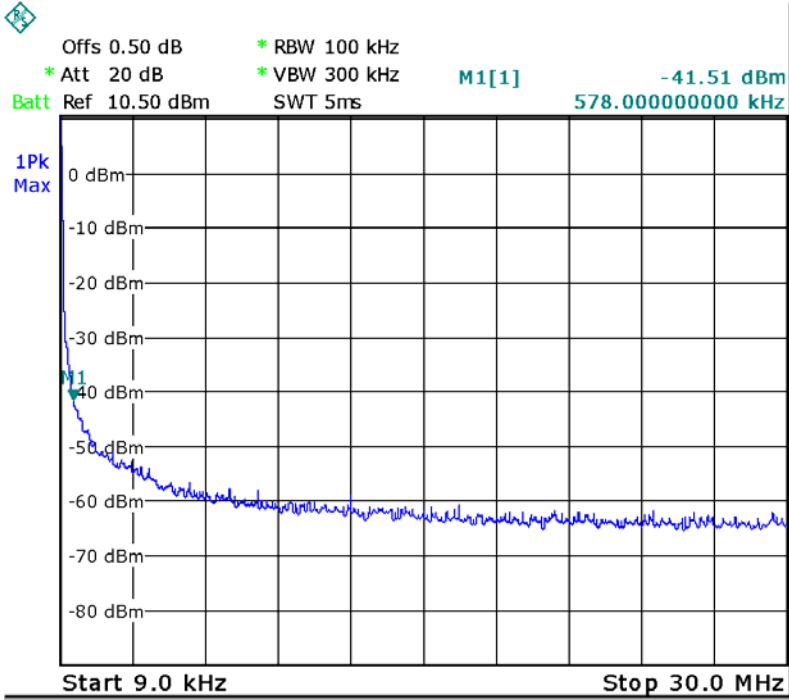


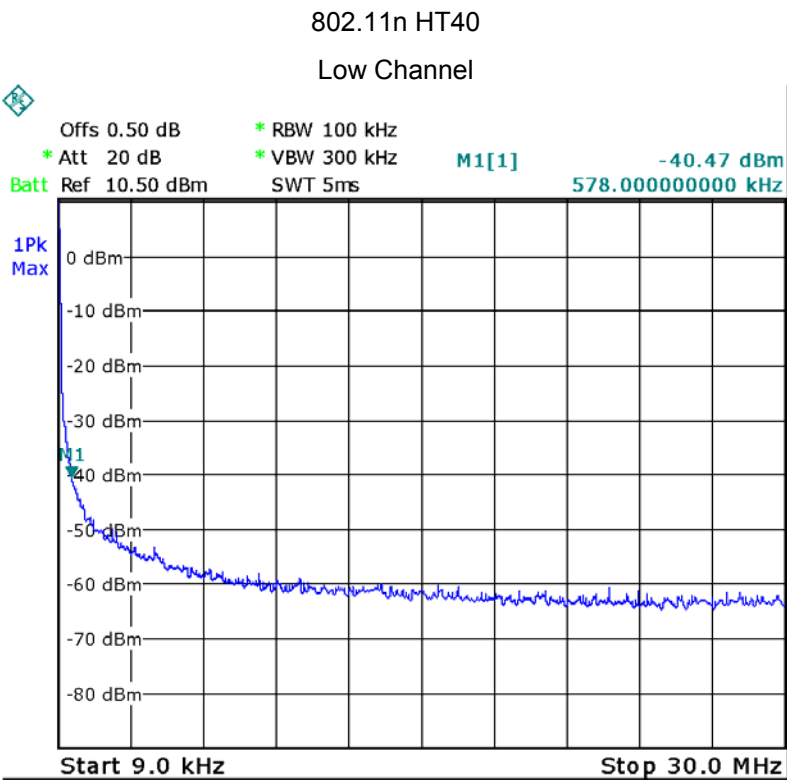
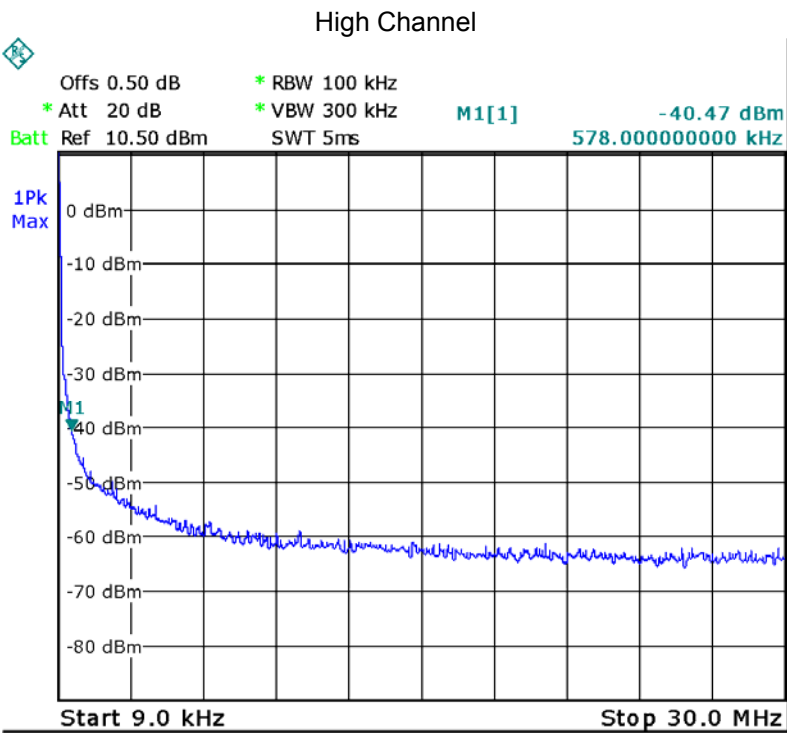
802.11n HT20

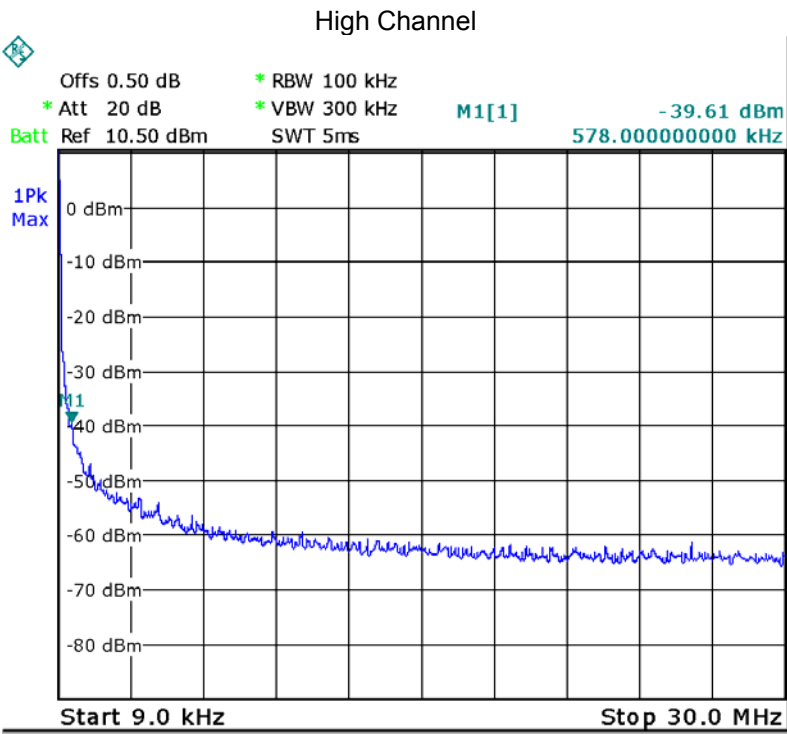
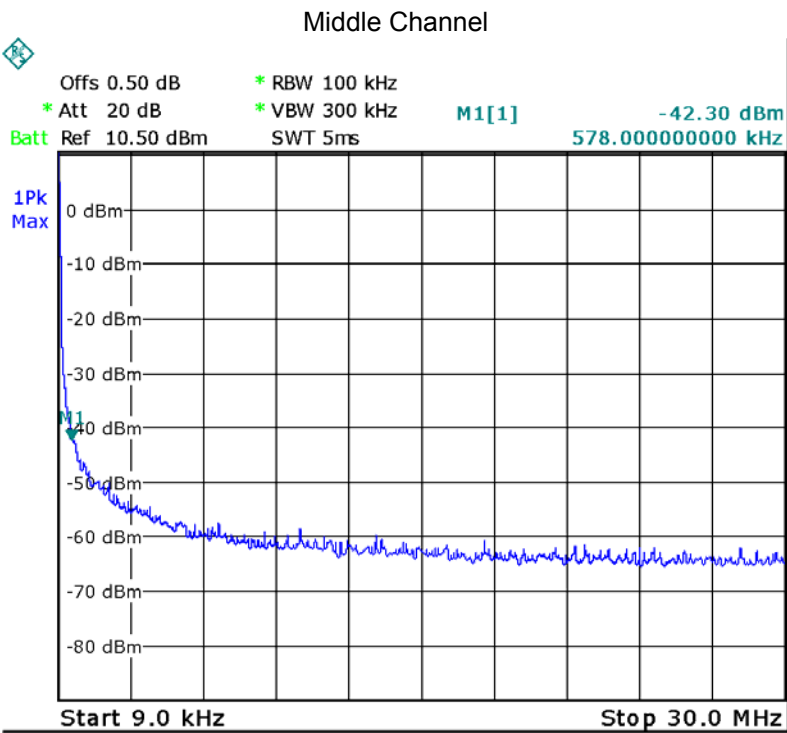
Low Channel



Middle Channel

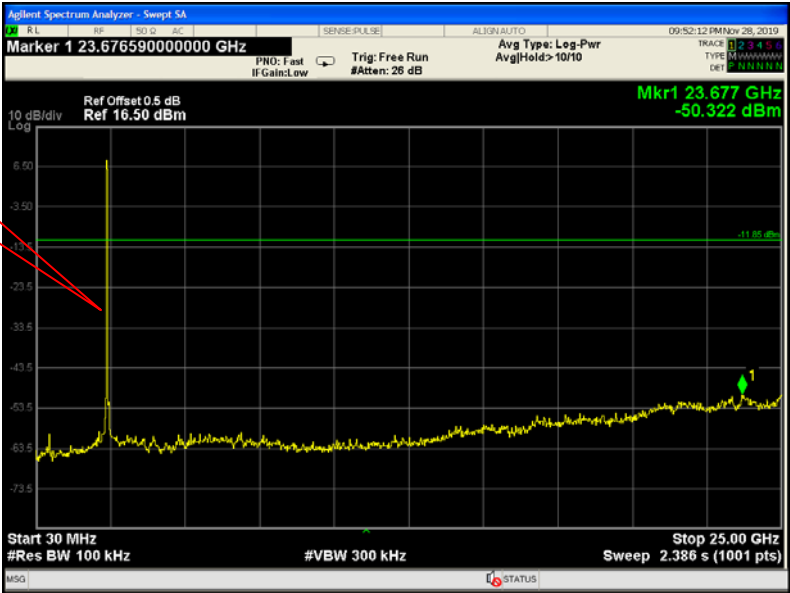






Above 30MHz
802.11b
Low Channel

Fundamental



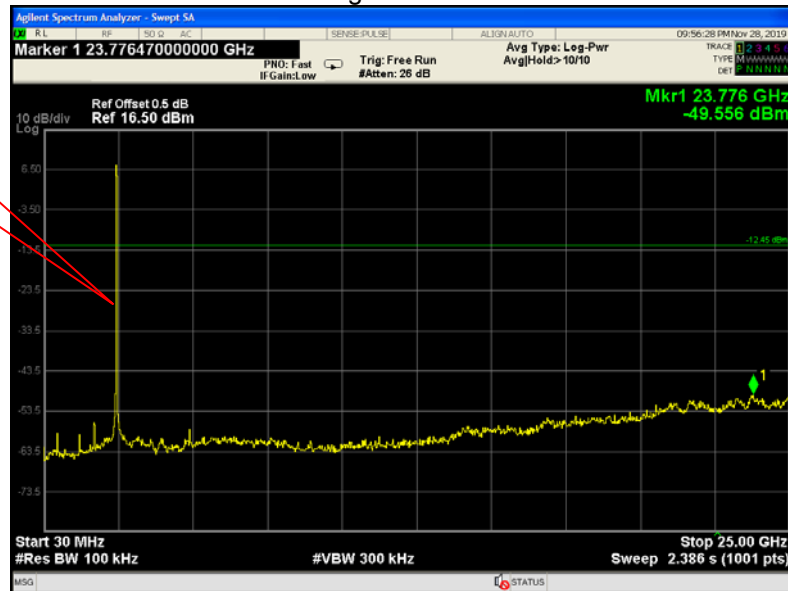
Middle Channel

Fundamental



High Channel

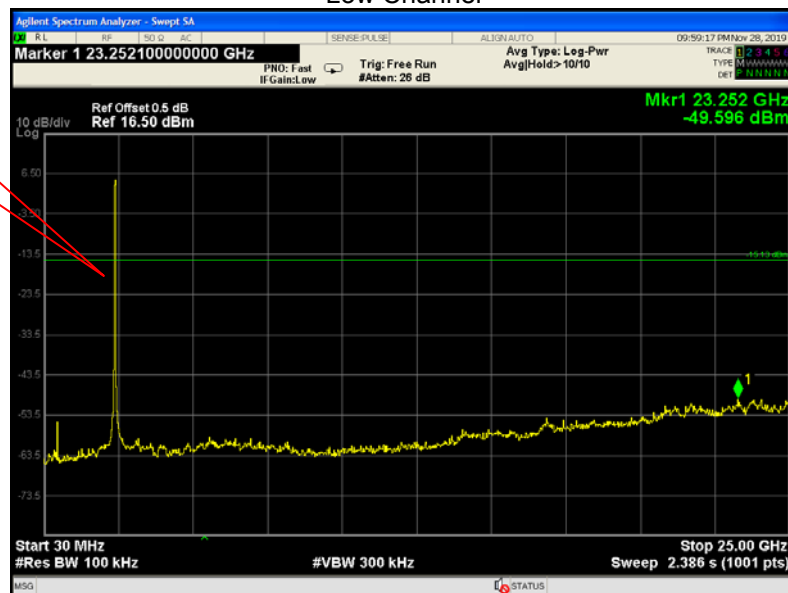
Fundamental



802.11g

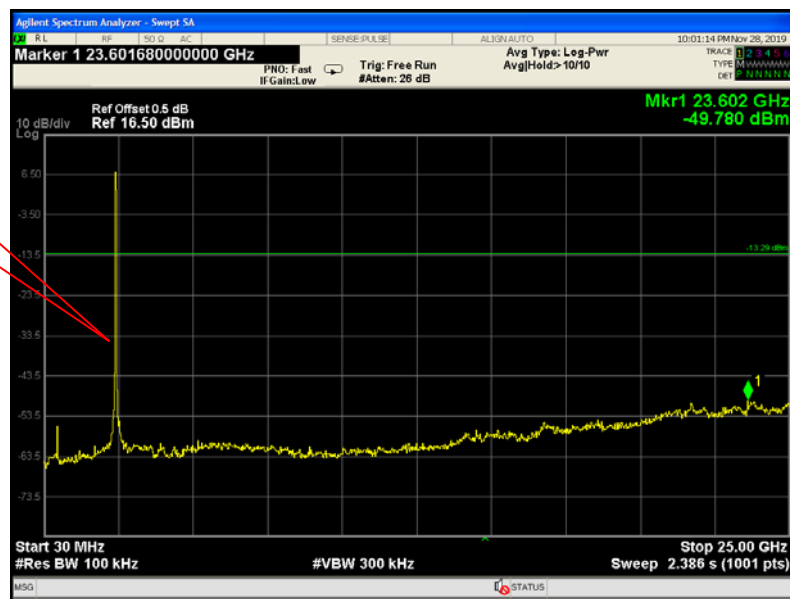
Low Channel

Fundamental



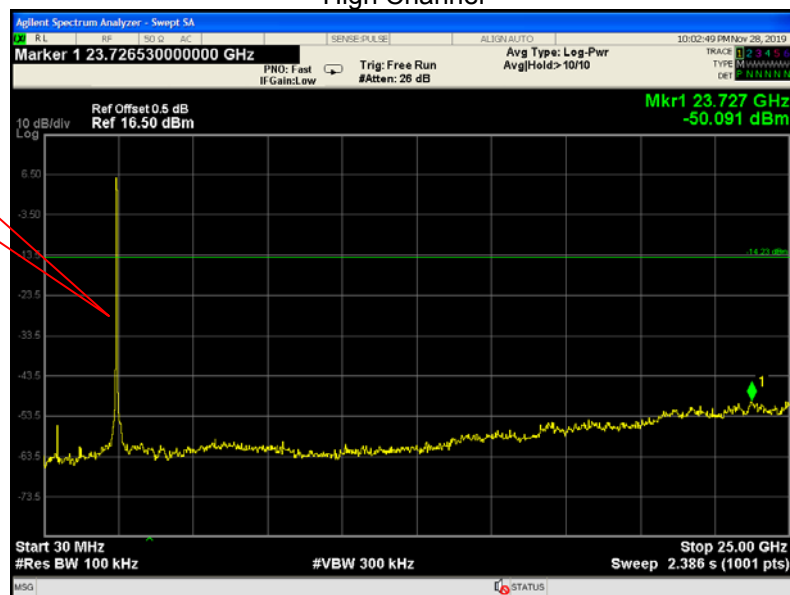
Middle Channel

Fundamental



High Channel

Fundamental



802.11n HT20

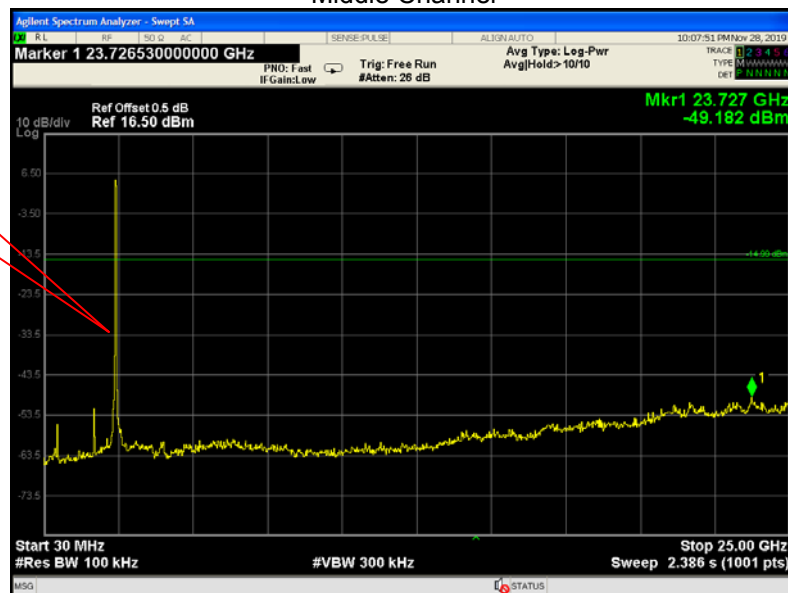
Low Channel

Fundamental



Middle Channel

Fundamental



High Channel

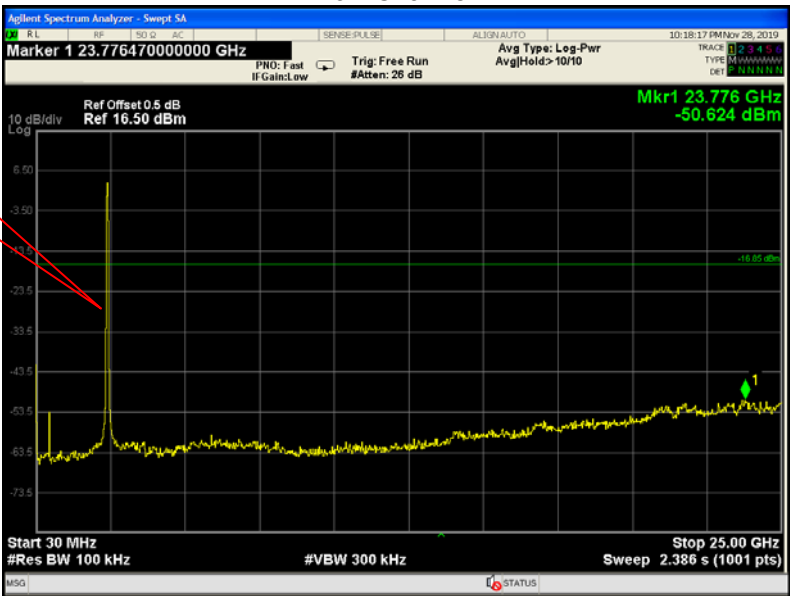
Fundamental



802.11n HT40

Low Channel

Fundamental



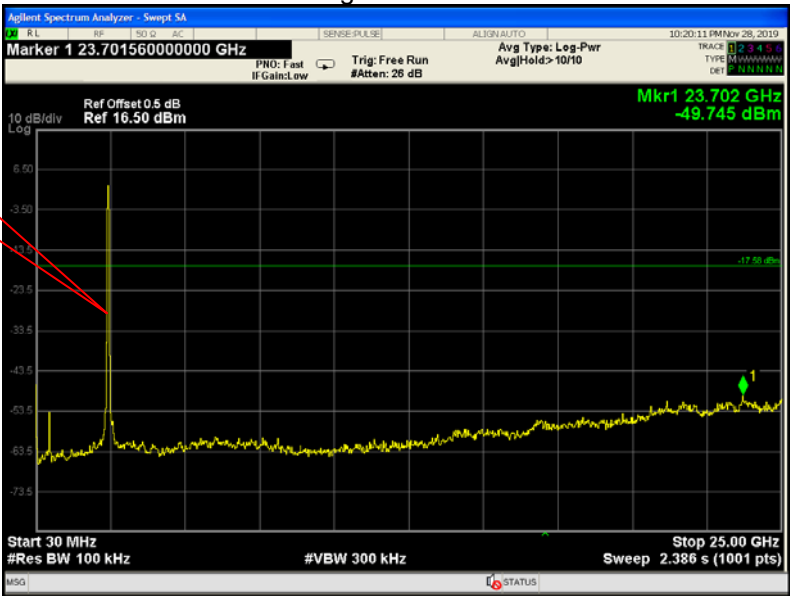
Middle Channel

Fundamental



High Channel

Fundamental



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)).

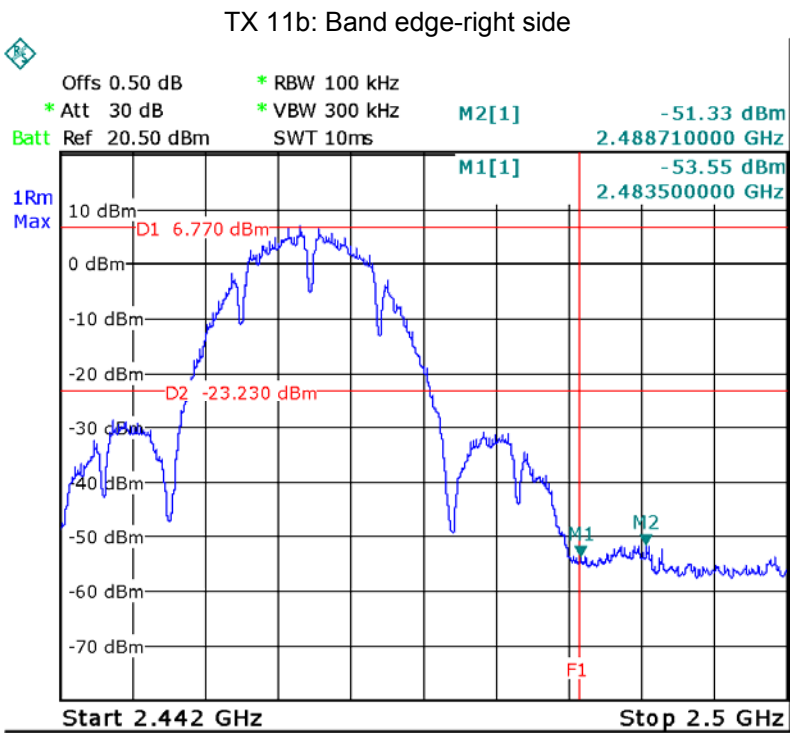
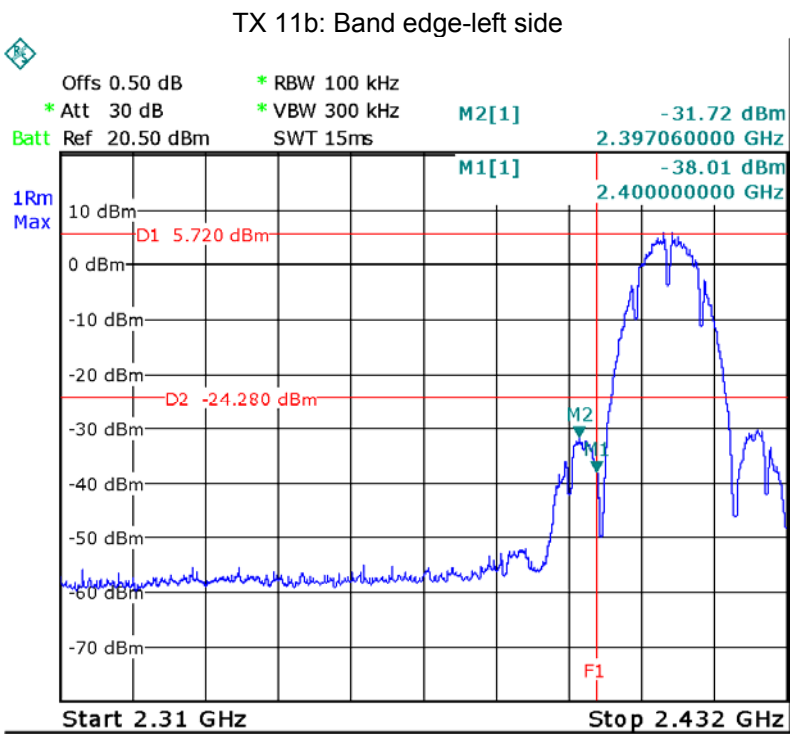
Test Mode: Transmitting

10.1 Test Produce

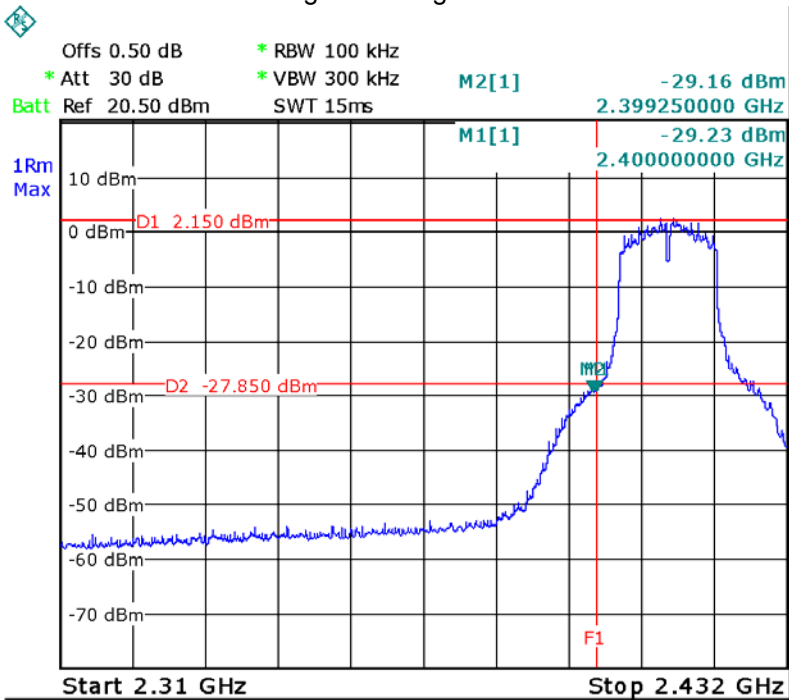
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then 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

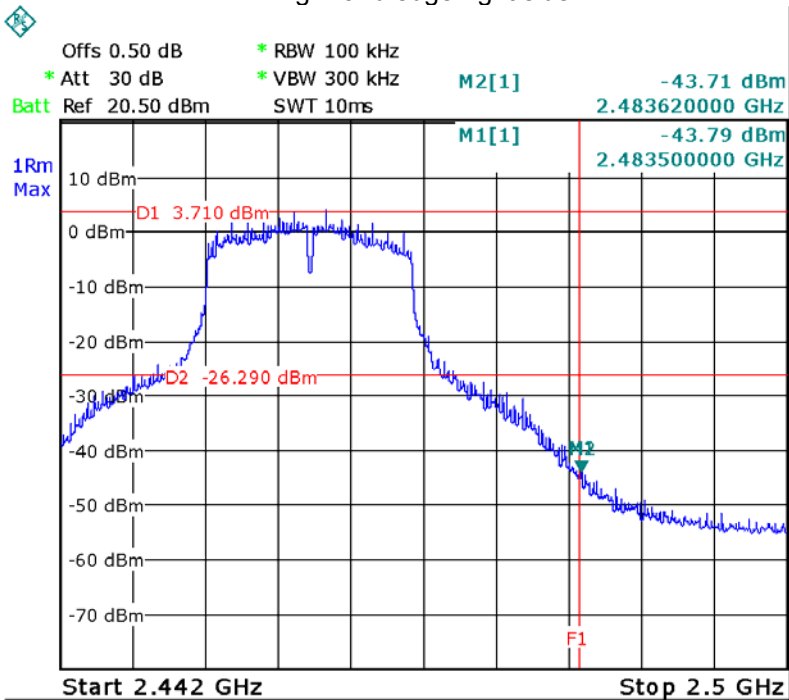
Test result plots shown as follows:

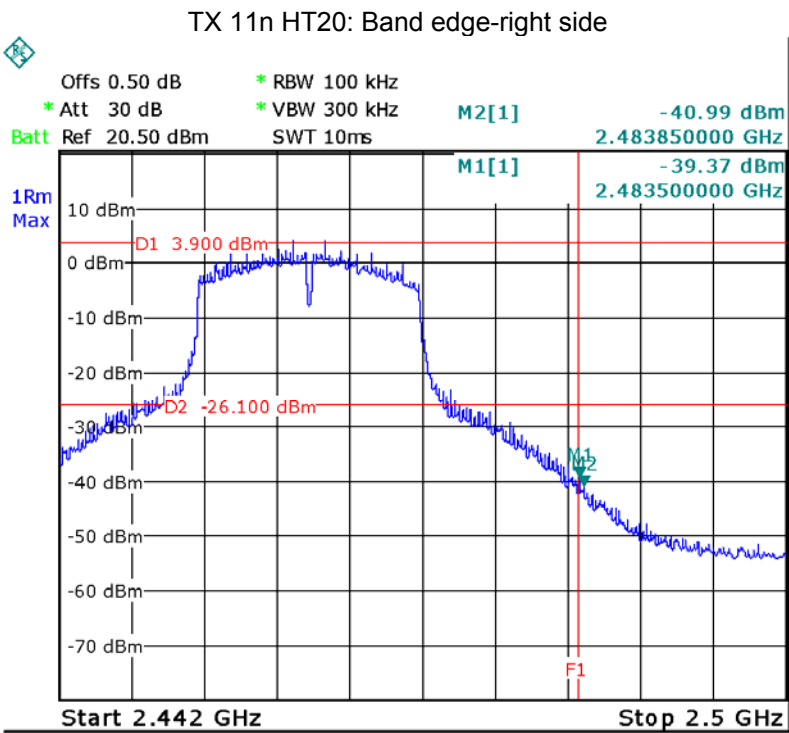
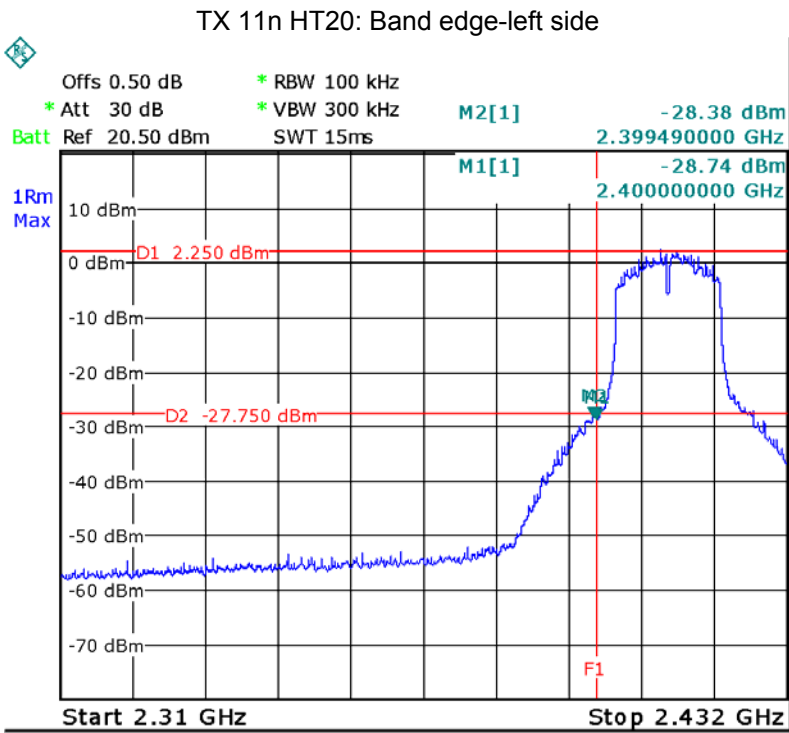


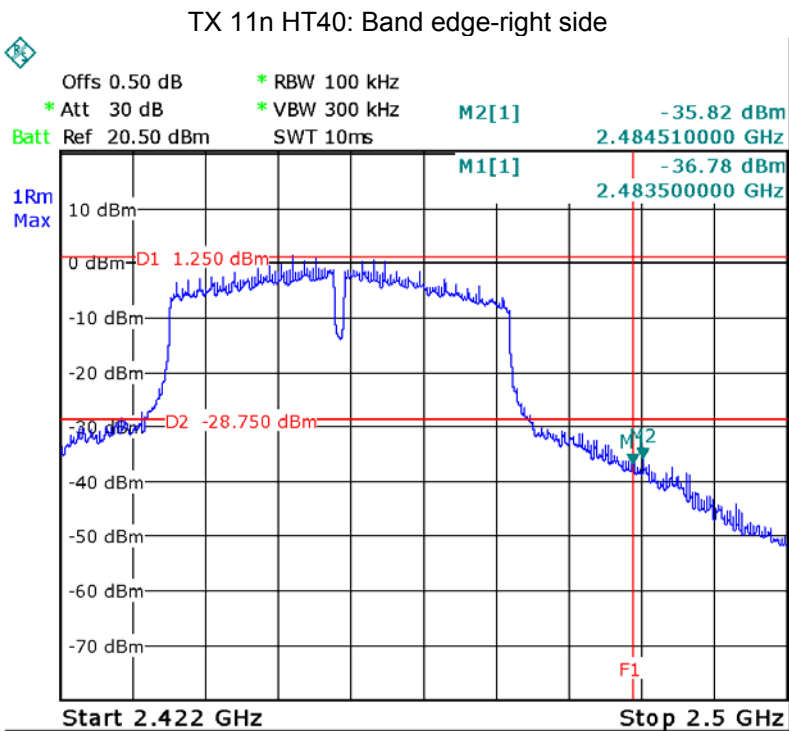
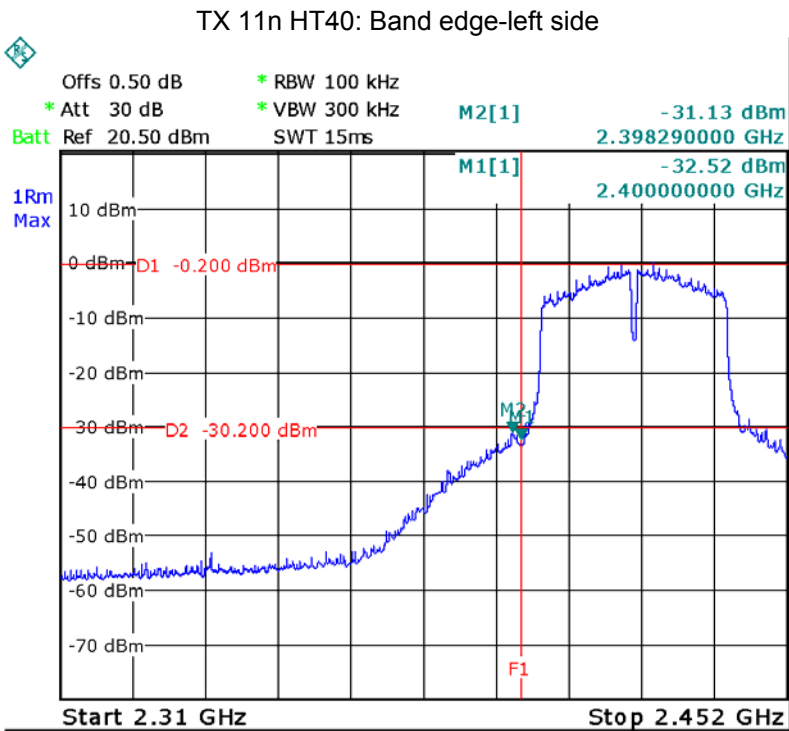
TX 11g: Band edge-left side



TX 11g: 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

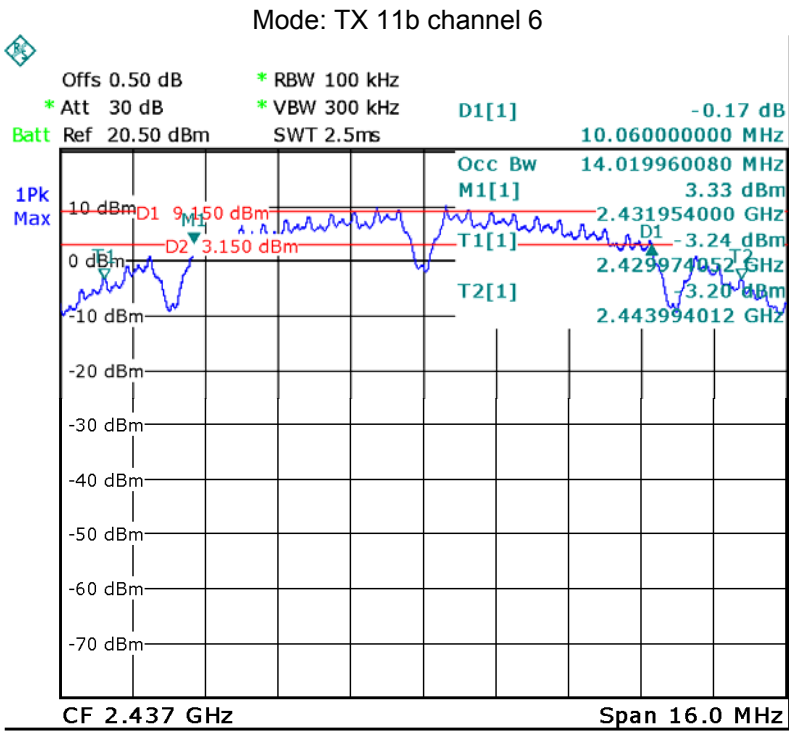
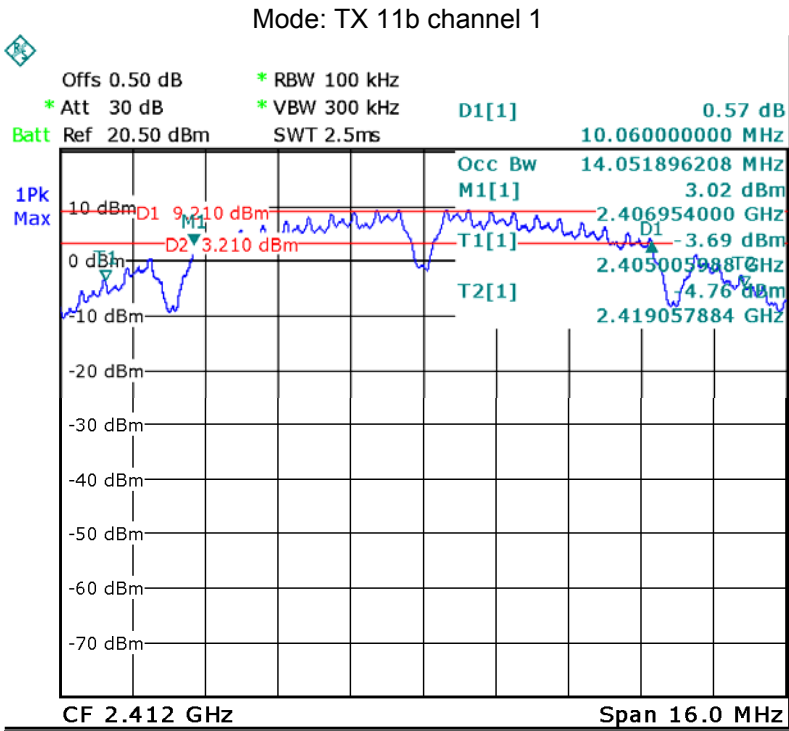
11.1 Test Procedure:

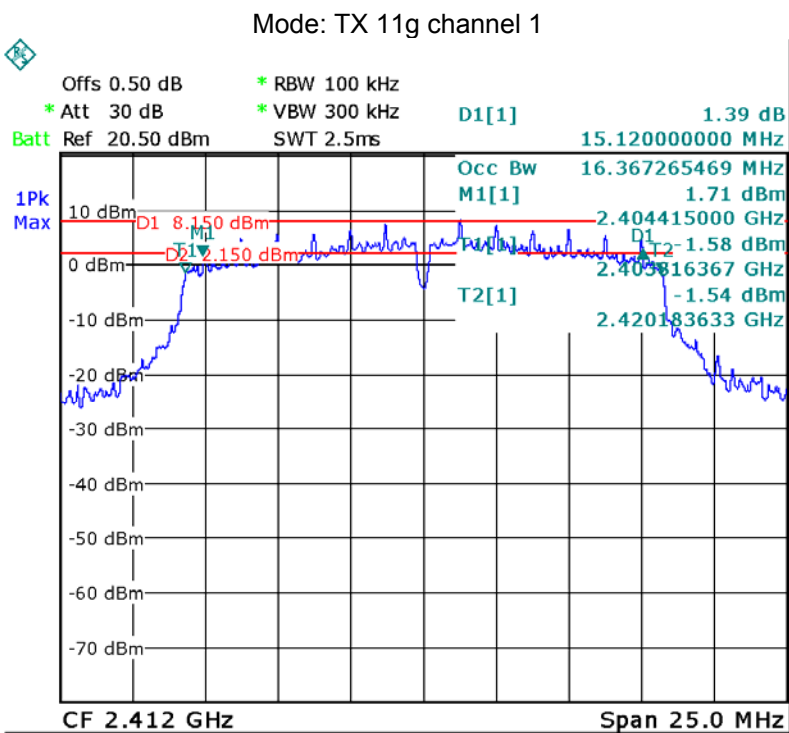
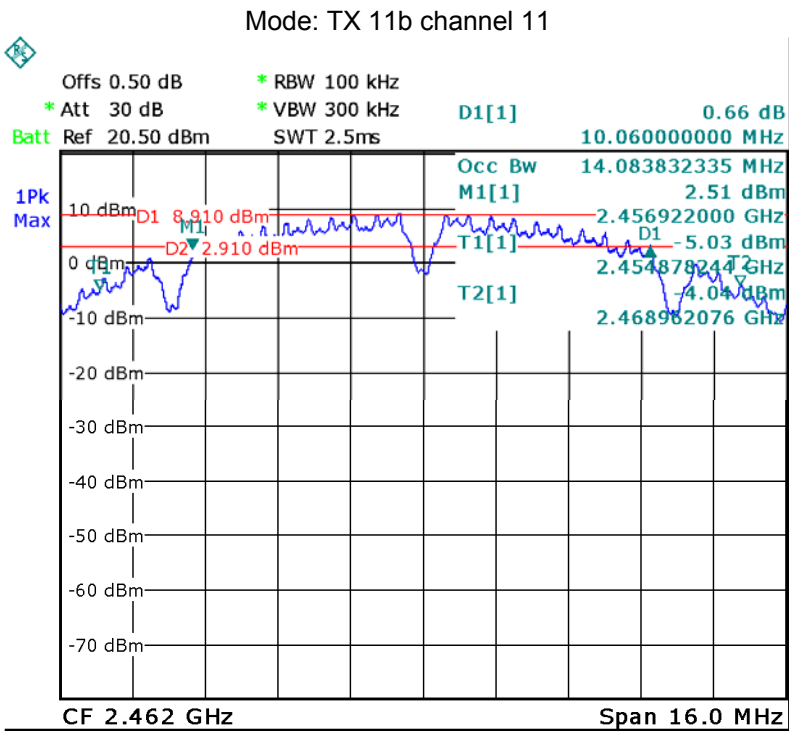
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

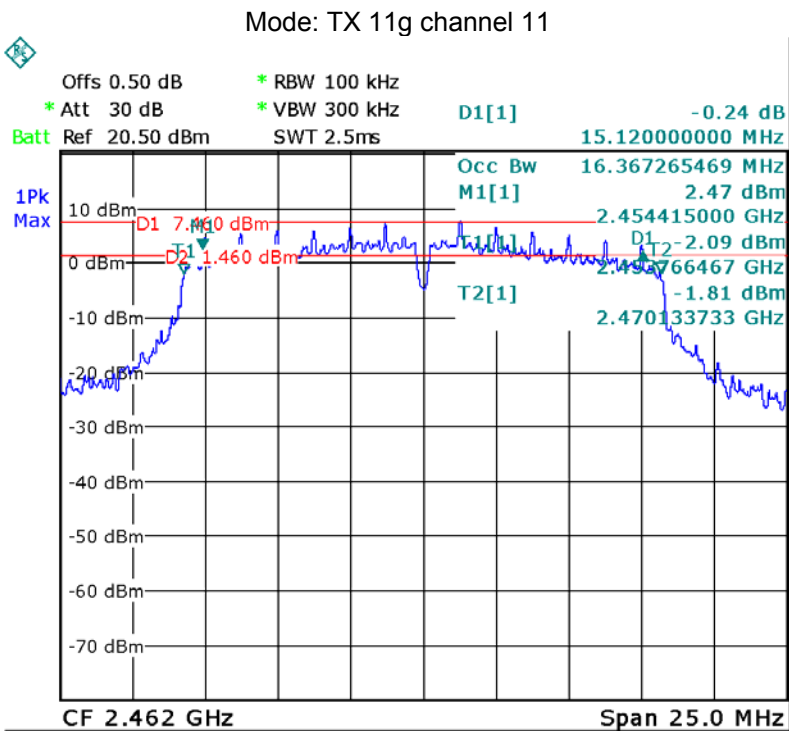
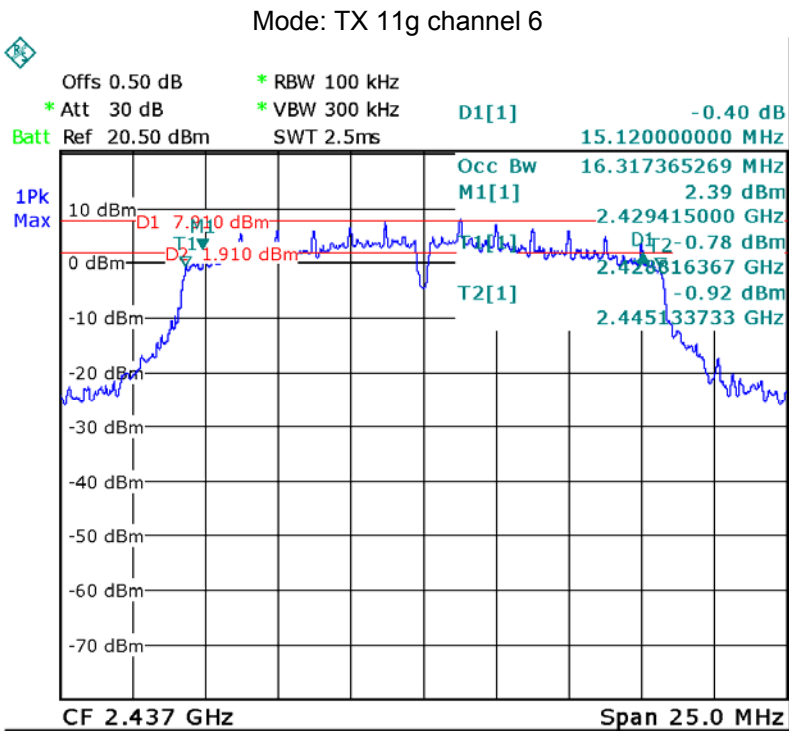
11.2 Test Result:

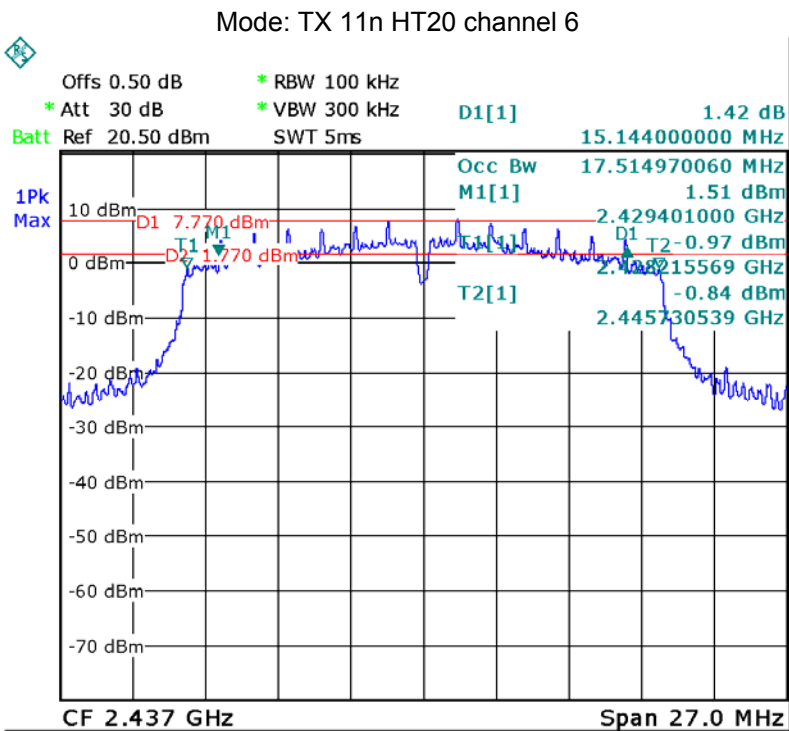
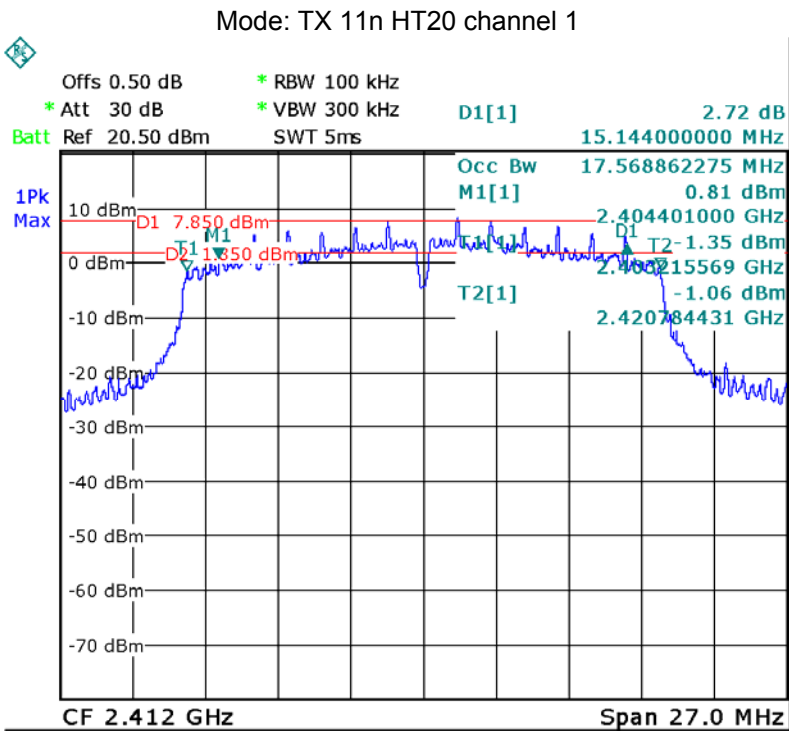
Operation mode	Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
TX 11b	Channel 1	10.060	14.052
	Channel 6	10.060	14.020
	Channel 11	10.060	14.084
TX 11g	Channel 1	15.120	16.367
	Channel 6	15.120	16.317
	Channel 11	15.120	16.367
TX 11n HT20	Channel 1	15.144	17.569
	Channel 6	15.144	17.515
	Channel 11	15.144	17.569
TX 11n HT40	Channel 3	35.020	35.679
	Channel 6	35.020	35.679
	Channel 9	32.600	35.679

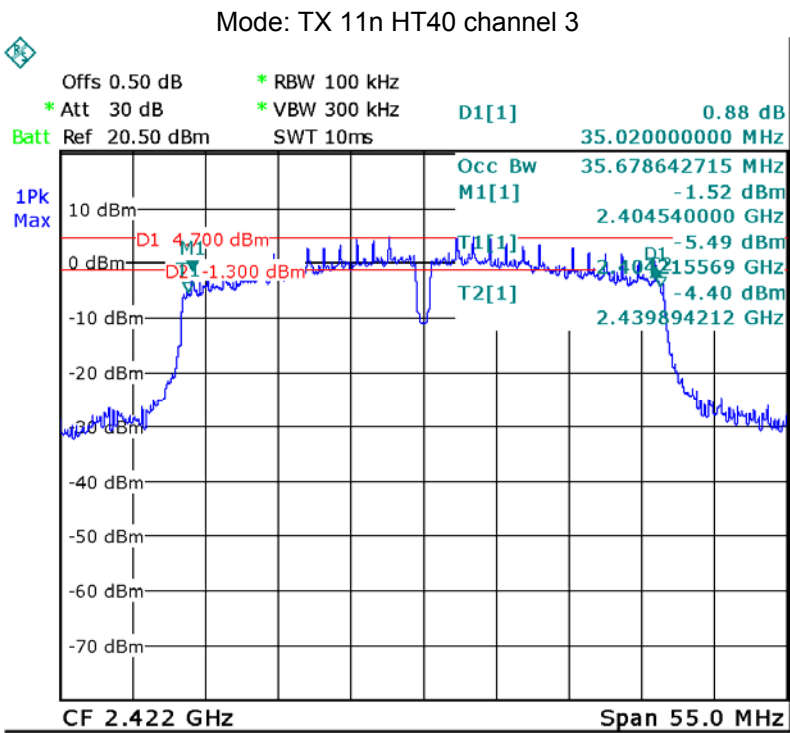
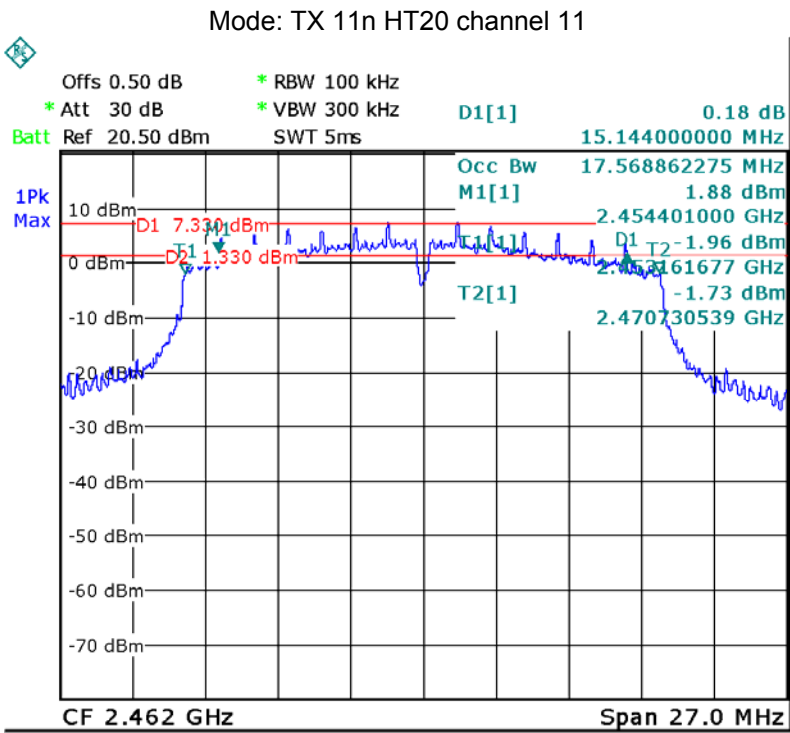
Test result plot:

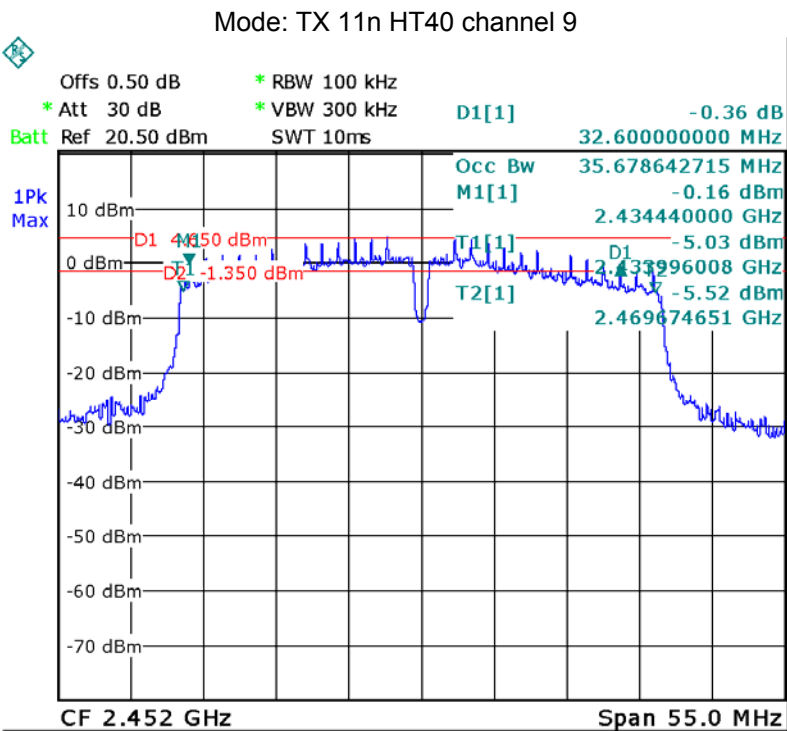
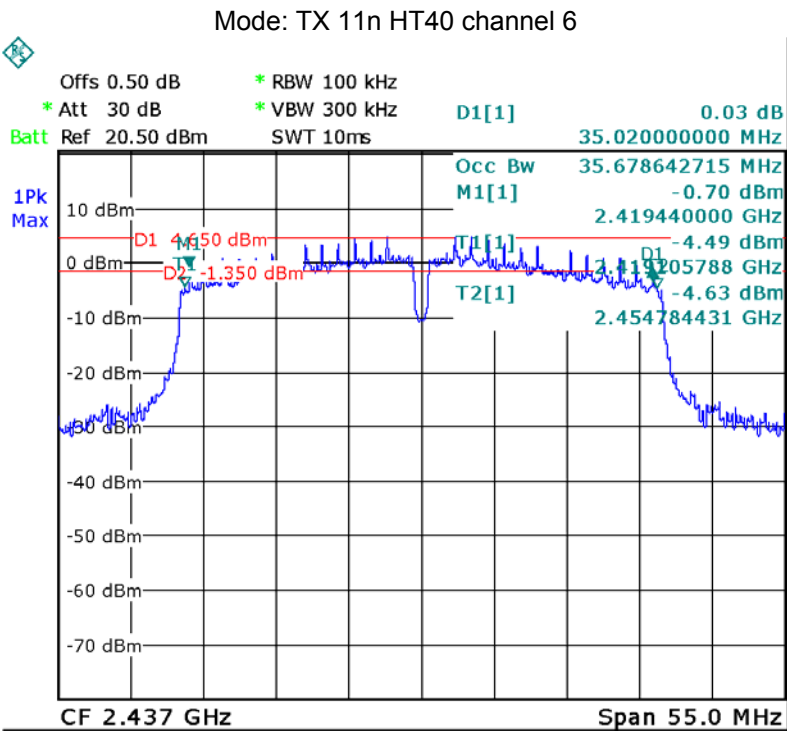












12 Maximum Peak conducted Output Power

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 $RBW \geq DTS$ bandwidth.
- b) Set $VBW \geq 3 \times RBW$.
- c) Set $span \geq 3 \times RBW$
- 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.

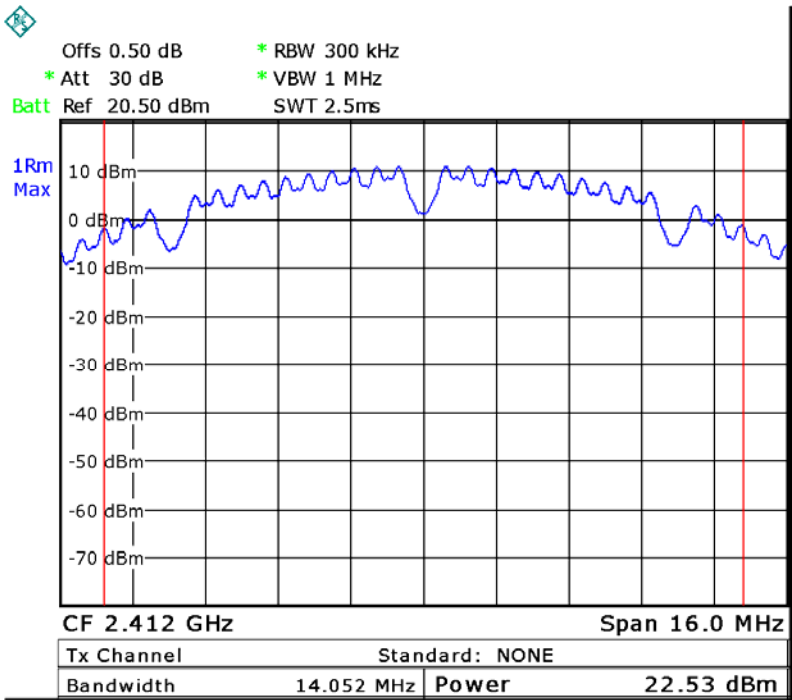
- a) Set the $RBW = 1\%$ to 5% of the OBW, not to exceed 1 MHz..
- b) Set the $VBW \geq 3 \times RBW$
- c) Set the $span \geq 1.5 \times OBW$.
- d) Detector = RMS.
- e) Sweep time = auto couple.
- f) trigger = free run..
- g) Number of points in sweep $\geq [2 \times span / RBW]$. (This gives bin-to-bin spacing $\geq RBW / 2$, 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:

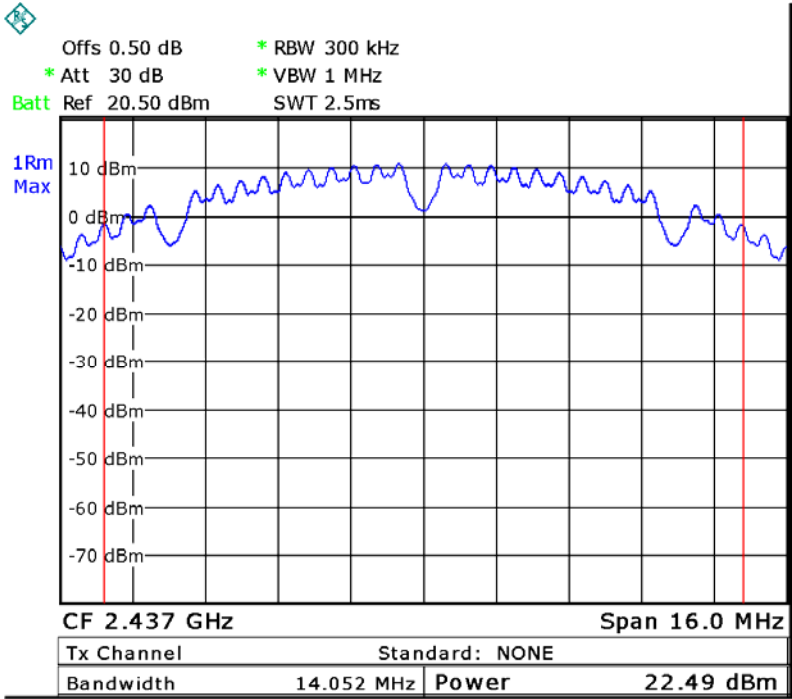
Operation mode	Channel Frequency (MHz)	Maximum Peak Output Power (dBm)	Limit
TX 11b	Low-2412	22.53	1W/30dBm
	Middle-2437	22.49	1W/30dBm
	High-2462	22.14	1W/30dBm
TX 11g	Low-2412	21.64	1W/30dBm
	Middle-2437	21.40	1W/30dBm
	High-2462	21.11	1W/30dBm
TX 11n HT20	Low-2412	21.56	1W/30dBm
	Middle-2437	21.61	1W/30dBm
	High-2462	21.54	1W/30dBm
TX 11n HT40	Low-2422	19.60	1W/30dBm
	Middle-2437	19.37	1W/30dBm
	High-2452	19.18	1W/30dBm

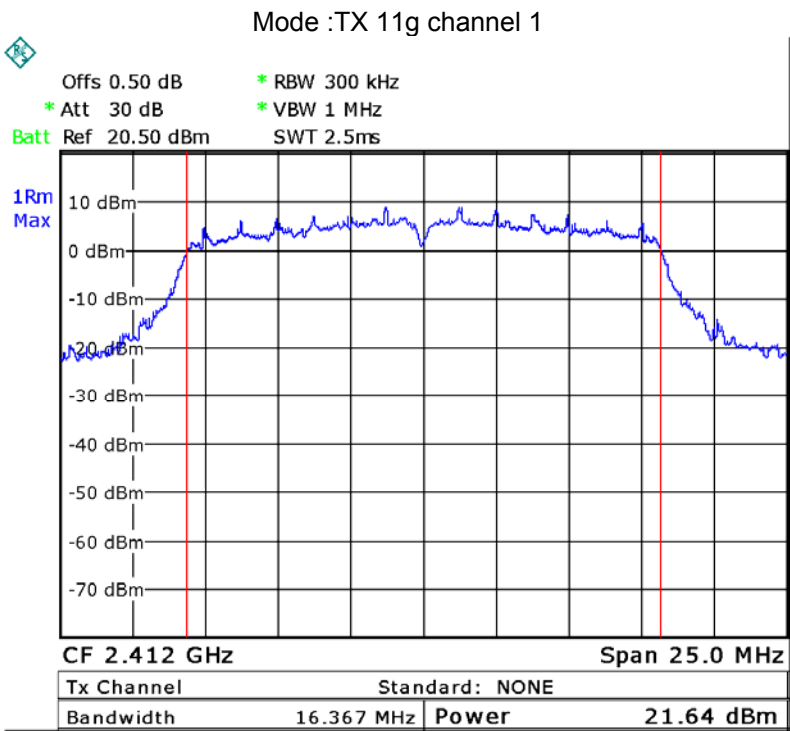
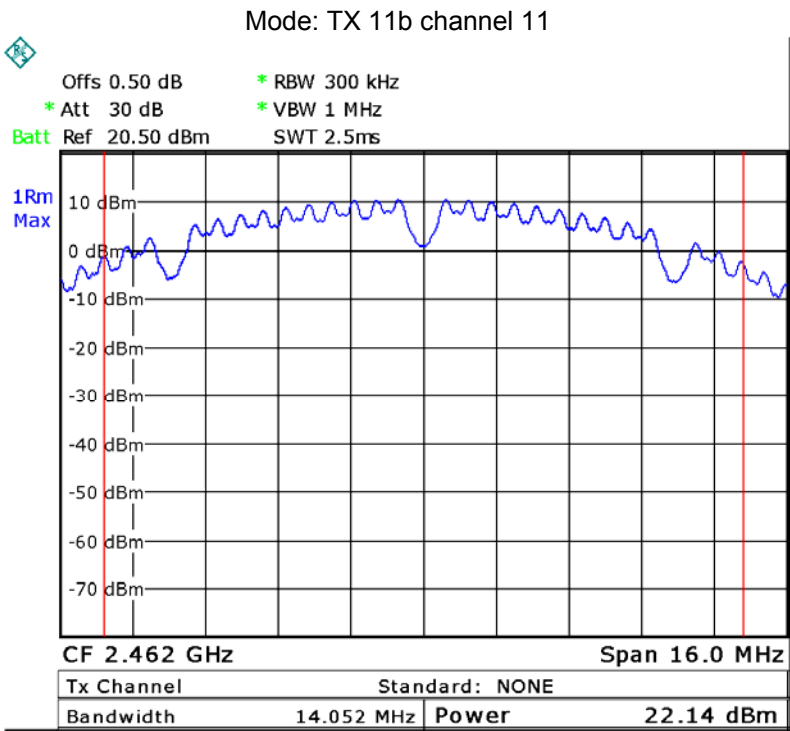
Test Plot

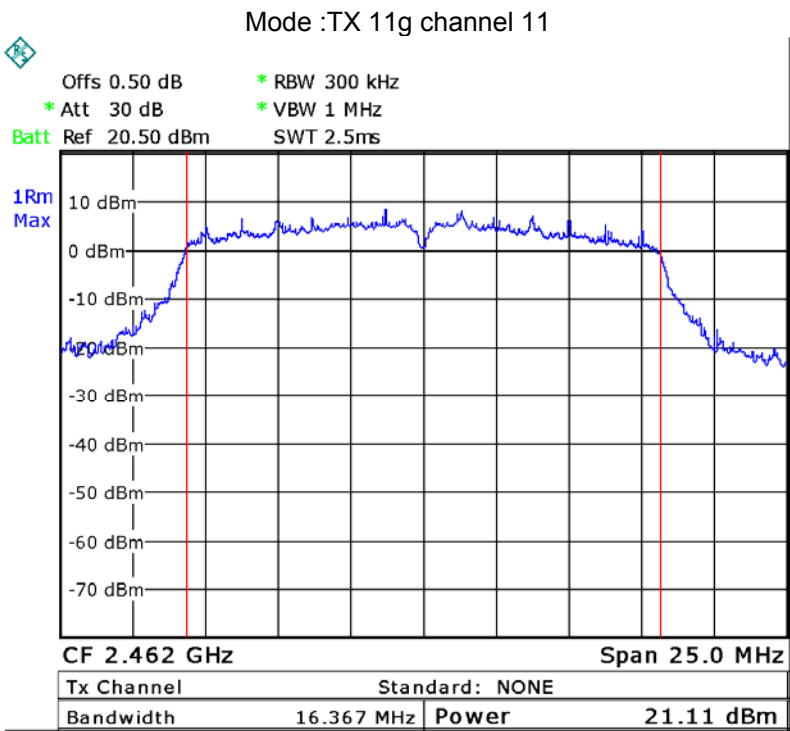
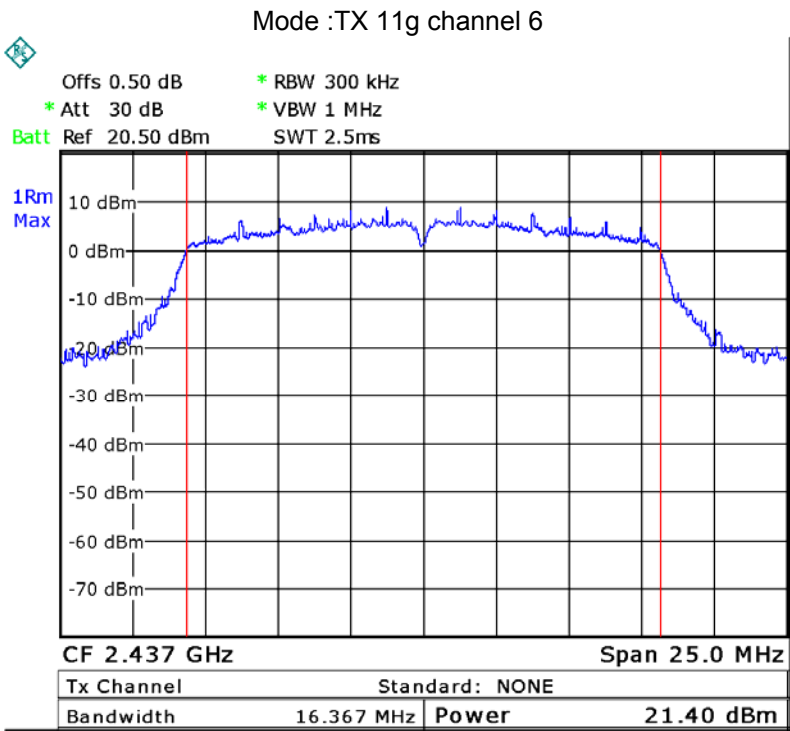
Mode: TX 11b channel 1

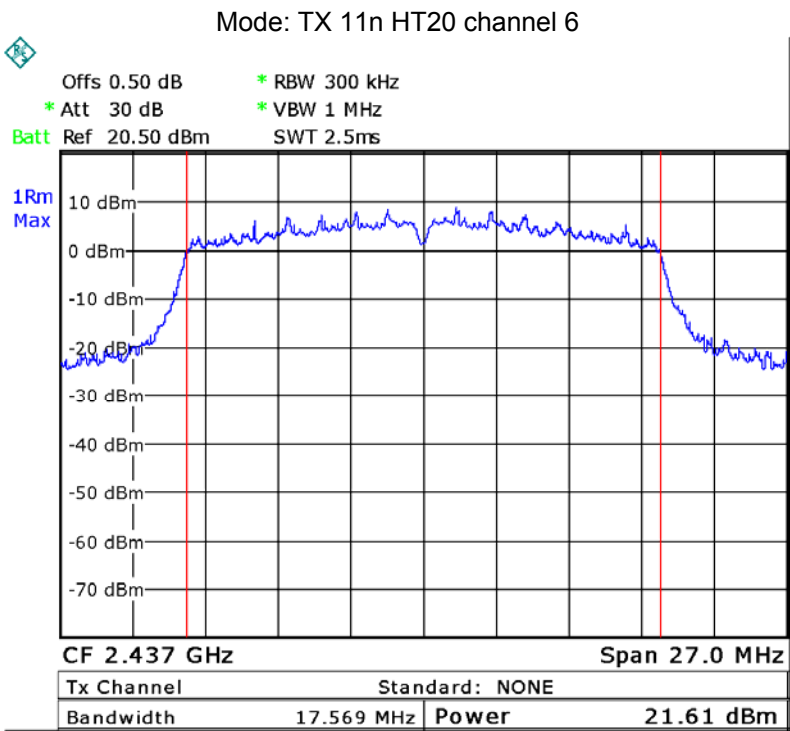
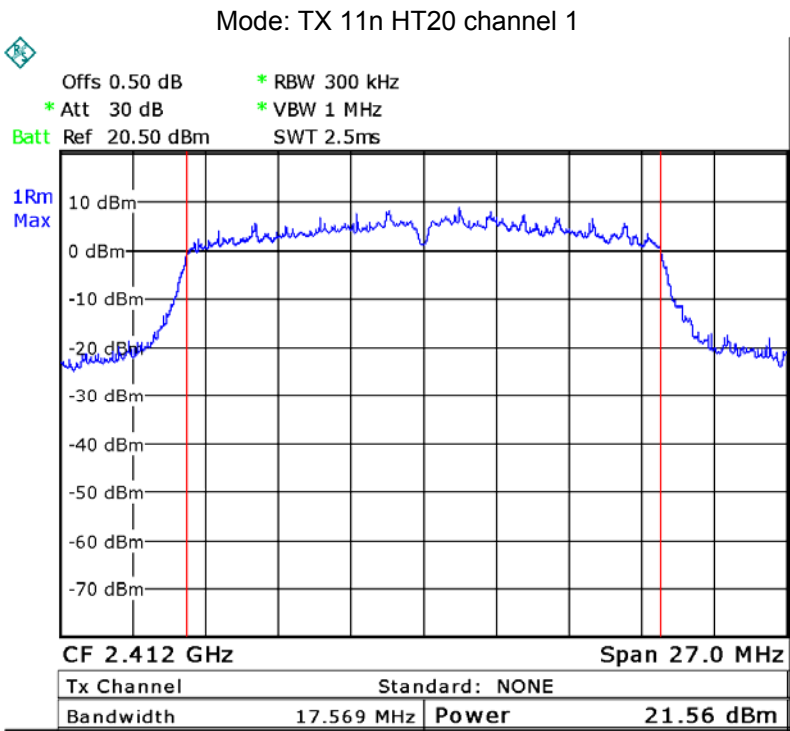


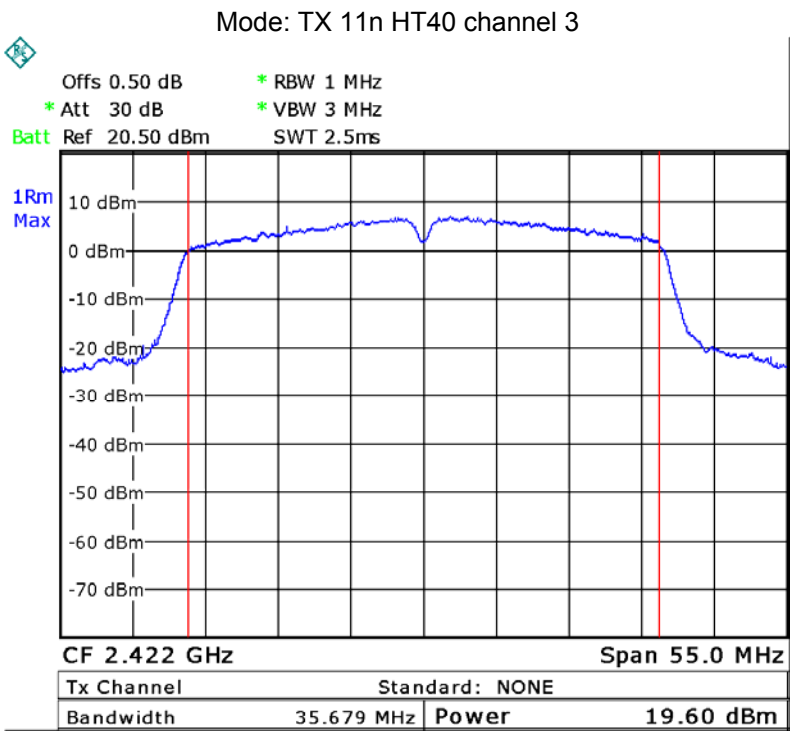
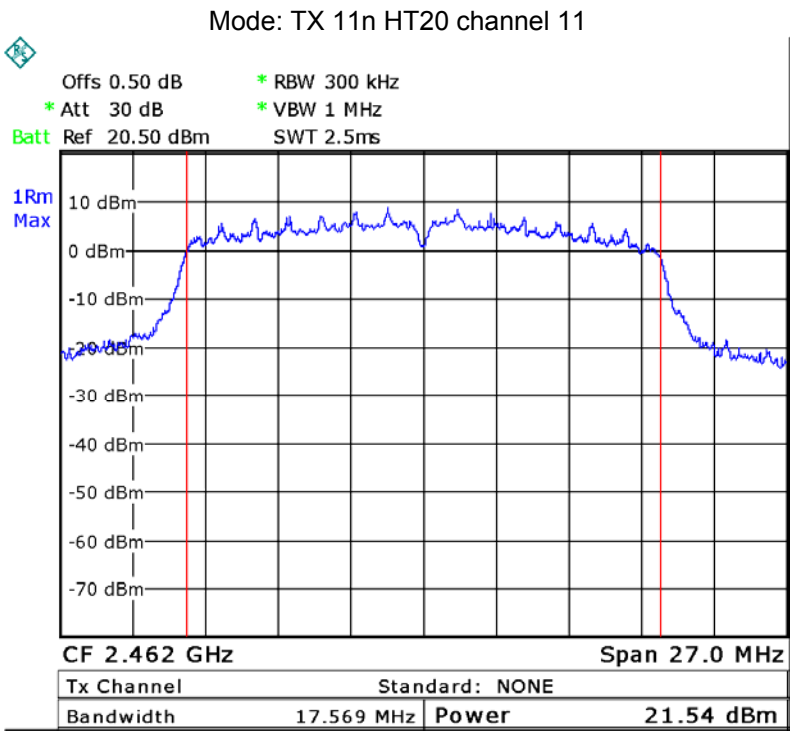
Mode: TX 11b channel 6

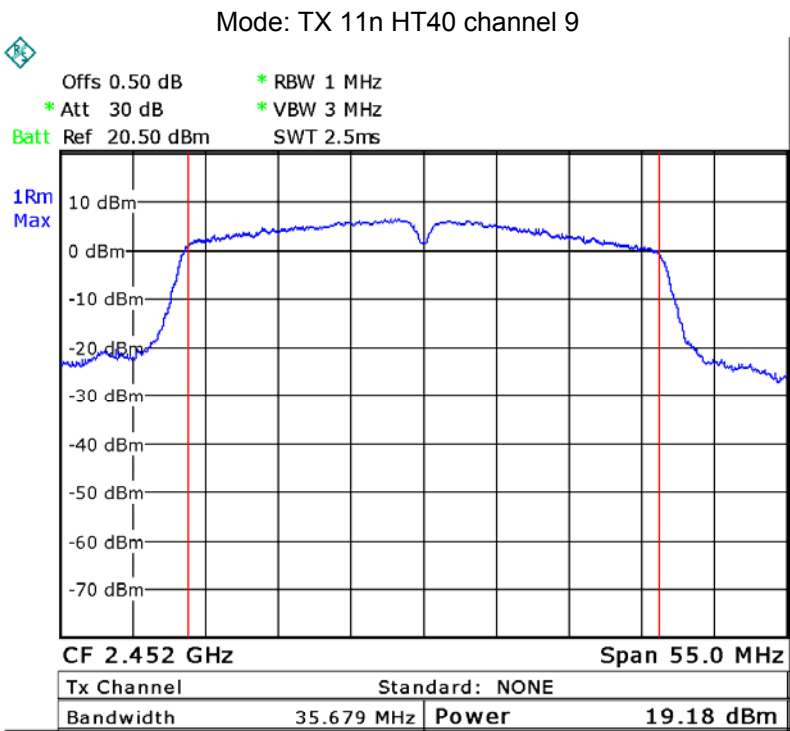
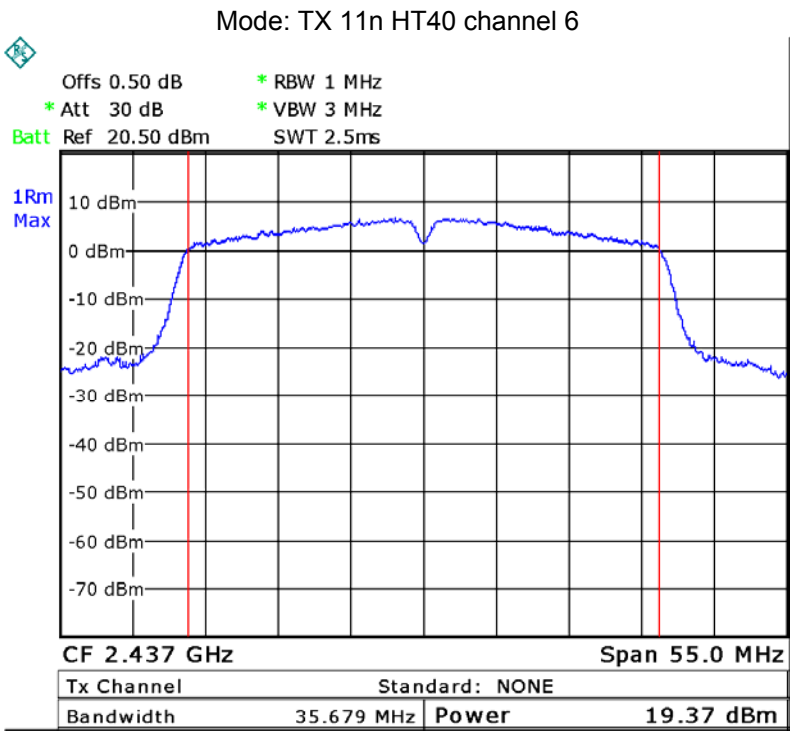












13 Duty cycle

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

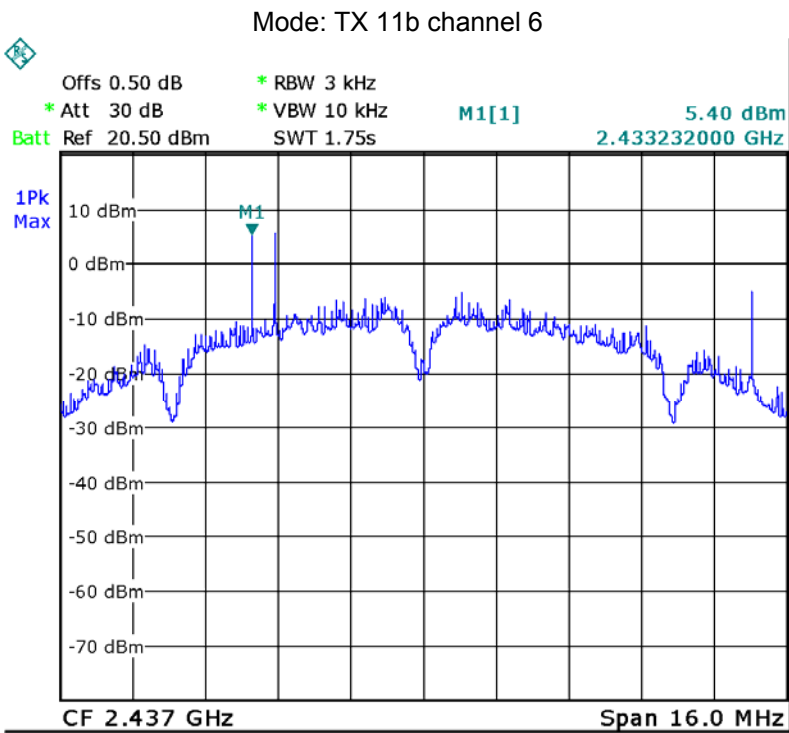
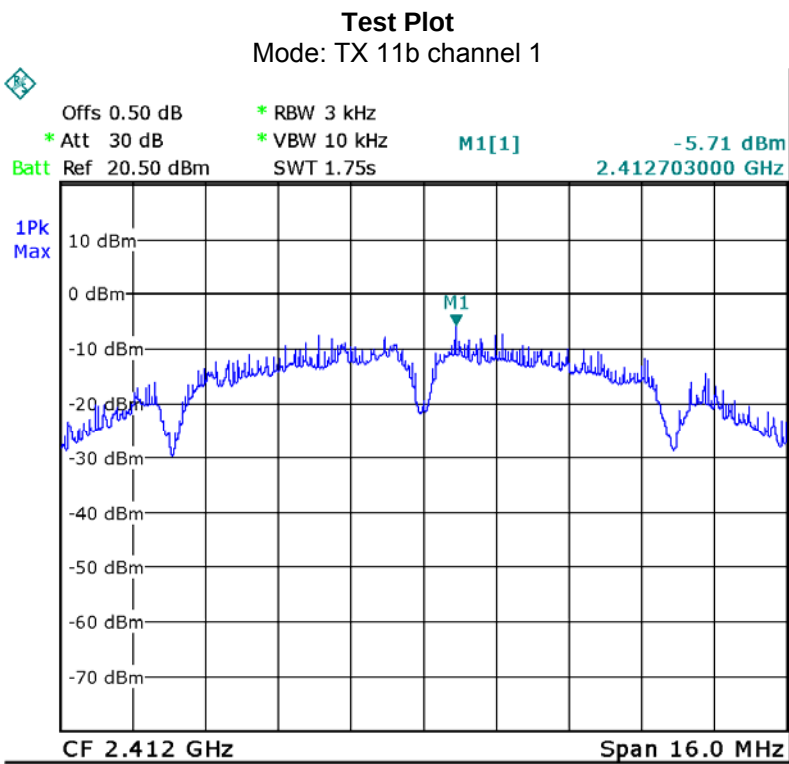
14.1 Test Procedure:

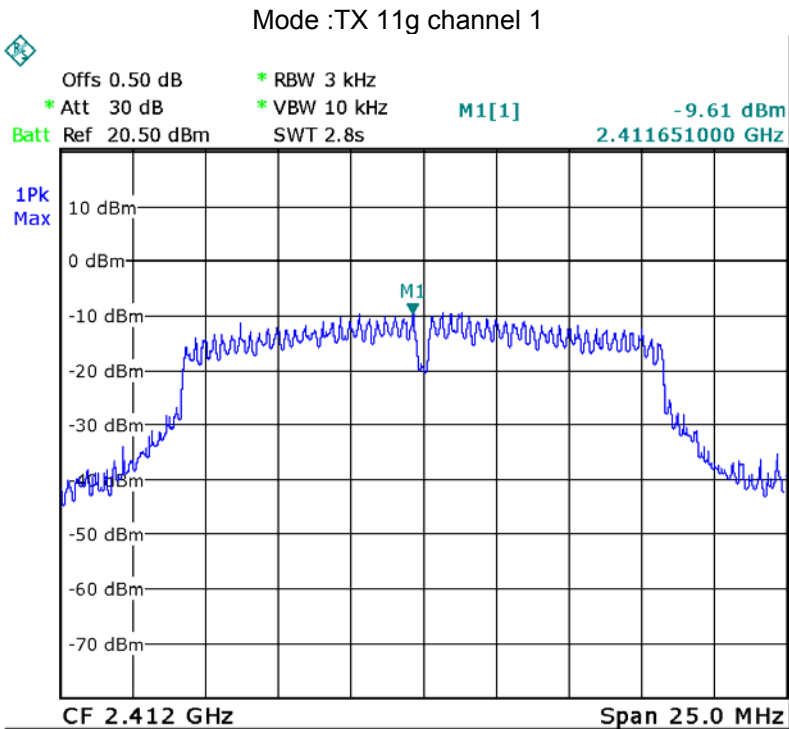
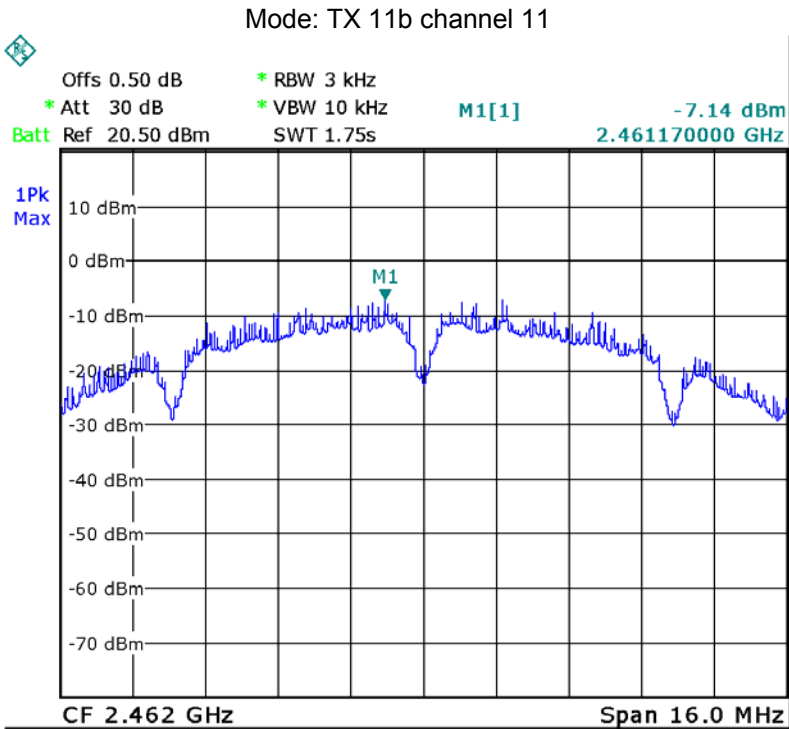
KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 section 10.2

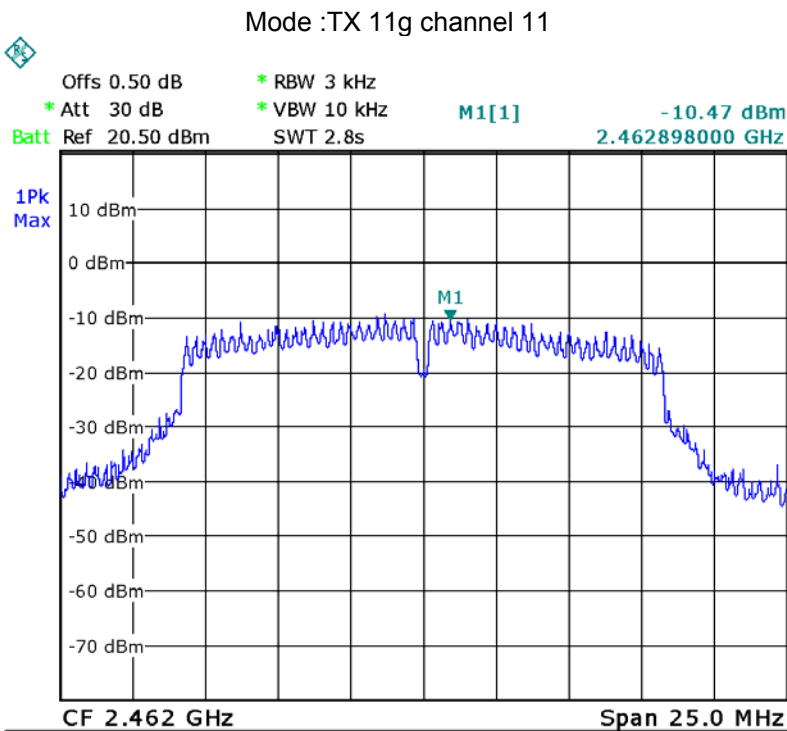
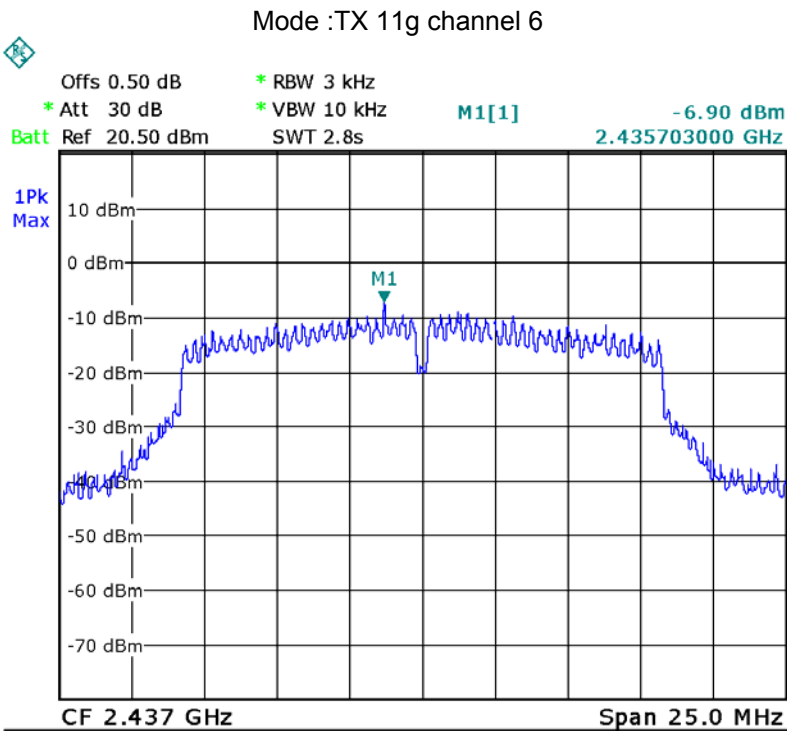
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to 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.

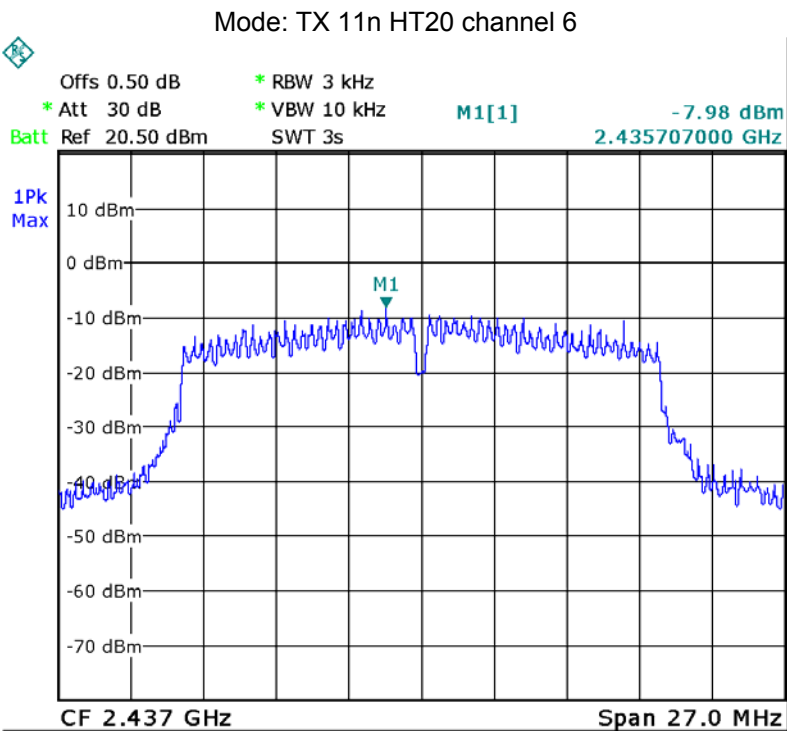
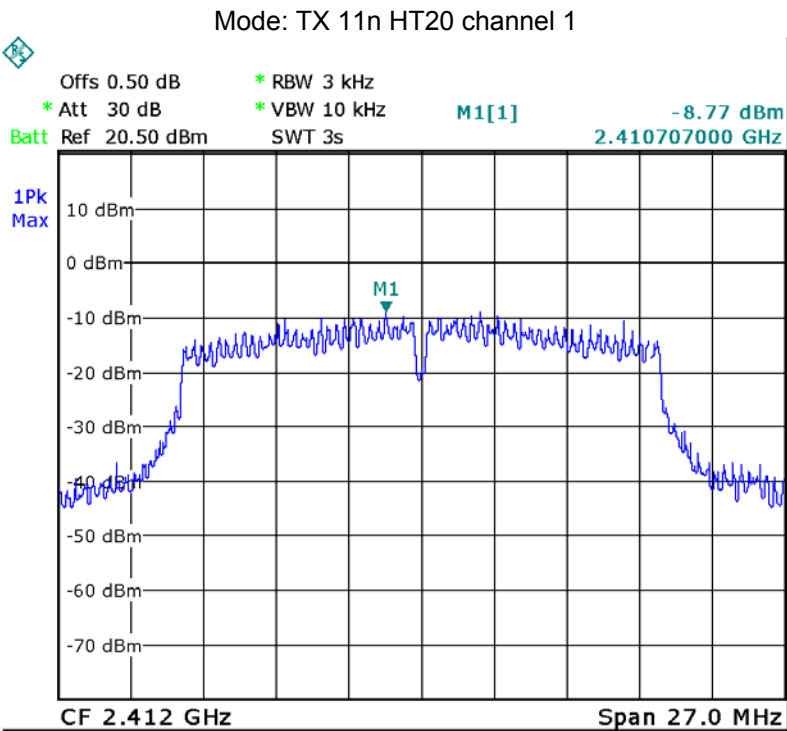
14.2 Test Result:

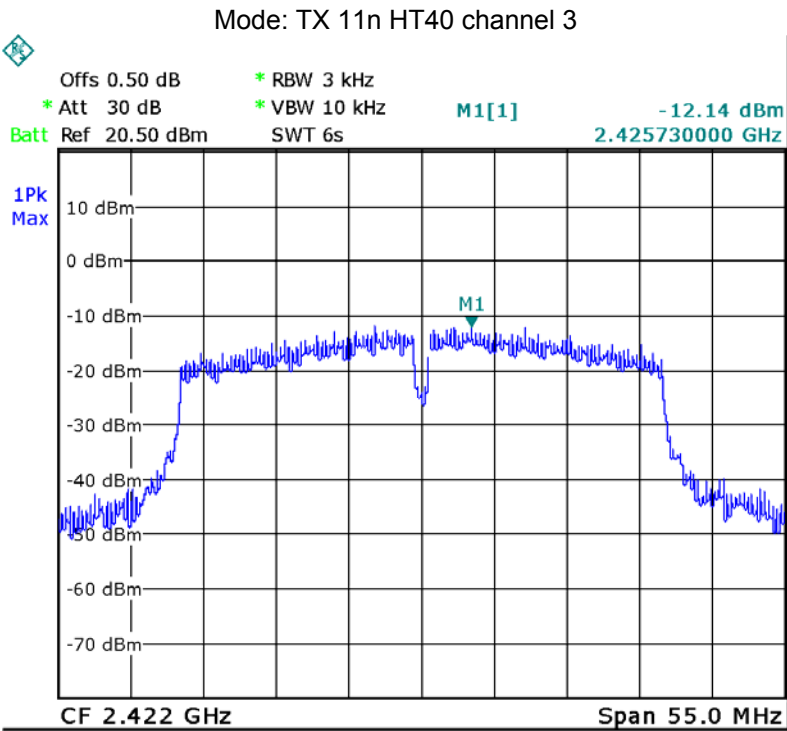
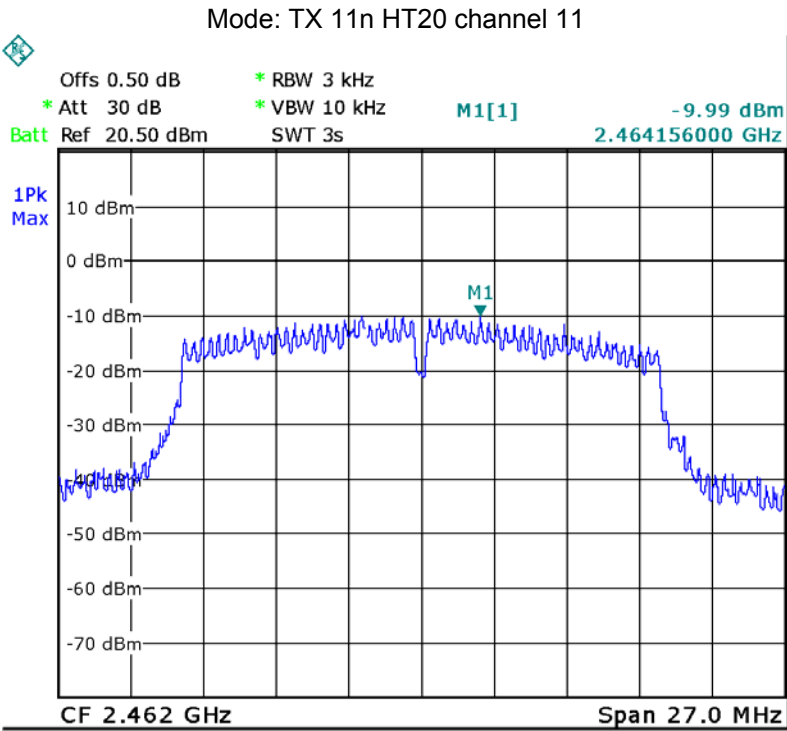
Operation mode	Channel Frequency (MHz)	Power Spectral (dBm per 3kHz)	Limit
TX 11b	Low-2412	-5.71	8dBm per 3kHz
	Middle-2437	-5.40	8dBm per 3kHz
	High-2462	-7.14	8dBm per 3kHz
TX 11g	Low-2412	-9.61	8dBm per 3kHz
	Middle-2437	-6.90	8dBm per 3kHz
	High-2462	-10.47	8dBm per 3kHz
TX 11n HT20	Low-2412	-8.77	8dBm per 3kHz
	Middle-2437	-7.98	8dBm per 3kHz
	High-2462	-9.99	8dBm per 3kHz
TX 11n HT40	Low-2422	-12.14	8dBm per 3kHz
	Middle-2437	-10.82	8dBm per 3kHz
	High-2452	-11.82	8dBm per 3kHz

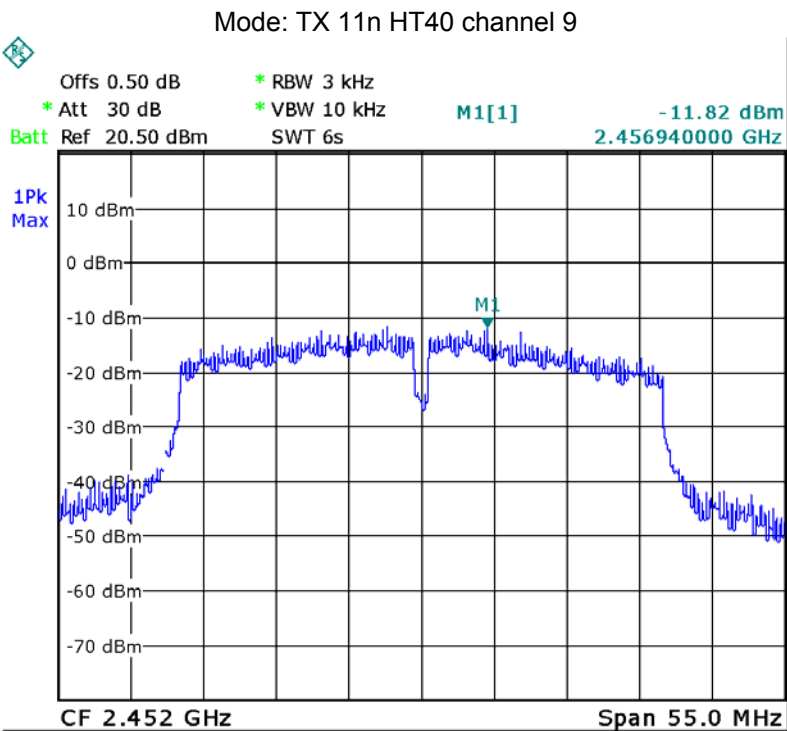
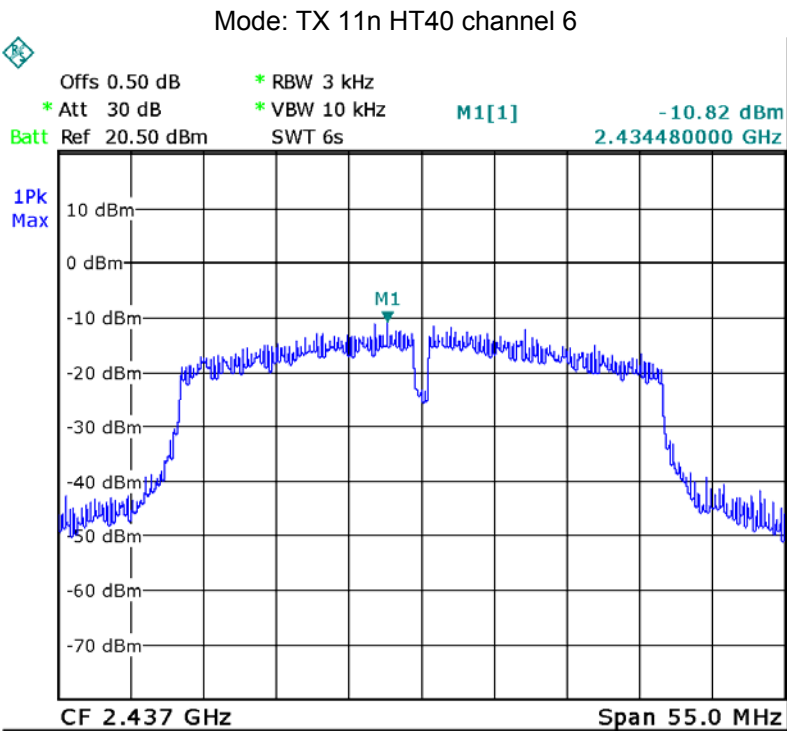












15 Antenna Requirement

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 Fixed antenna and the antenna is a custom-designed component. If the user uses other antennas, the product cannot work, the gain is 3.7 dBi. meets the requirements of FCC 15.203.



16 RF Exposure

Remark: refer to MPE report: WTD19S11079960W002.

17 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-139262-Photos.

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