TEST REPORT

Reference No.	:	WTF25D01007819W002
FCC ID	:	2BNJH-F1
Applicant	:	MagicScoop Technologies Inc.
Address	:	3154 Glendale Blvd Suite 1097, Los Angeles, CA 90039, United States.
Manufacturer	:	Shenzhen Gingerway Technologies Co., Ltd.
Address	:	Room 712, Fenghuangcheng Building, No.15, Keji North 1st Road, Nanshan, Shenzhen, Guangdong, China
Product	:	Smart Pet Water Fountain
Model(s)	:	F1
Standards	:	FCC 47CFR Part 15.247
Date of Receipt sample	:	2025-01-14
Date of Test	:	2025-01-21 to 2025-03-04
Date of Issue	:	2025-03-13
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
WTF25D01007819W002	2025-01-14	2025-01-21 to 2025-03-04	2025-03-13	Original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product: Smart Pet Water Fountain

Model(s): F1

Model Description: N/A

Test Sample No.: 1-1/1

Wi-Fi Specification: 2.4G-802.11b/g/n HT20/n HT40

Hardware Version: 1.3

Software Version: 1.1

4.2 Details of E.U.T.

Operation Frequency: 802.11b/g/n HT20: 2412~2462MHz
802.11n HT40: 2422~2452MHz

Max. RF output power: 19.96dBm

Type of Modulation: DSSS, OFDM

Antenna installation: PCB Antenna

Antenna Gain: 1.5dBi

Note:
#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

Ratings: Input: DC 5V

4.3 Channel List

Wi-Fi

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	-	-

4.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

4.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.6 Abnormalities from Standard Conditions

None.

4.7 Test Mode

Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Conducted 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 and 99% 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 applicant was used to set the operating channels as well as the maximum 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 and 99% Bandwidth	15.247(a)(2)	PASS
Maximum Conducted 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
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

6 Equipment Used during Test

6.1 Equipments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date	Calibration Due Date
Conducted Emissions 1#						
1	EMI Test Receiver	R&S	ESCI	100947	2024-07-18	2025-07-17
2	LISN	R&S	ENV216	100115	2024-07-18	2025-07-17
3	Cable	Top	TYPE16(3.5M)	-	2024-07-18	2025-07-17
3m Semi-anechoic Chamber for Radiation Emissions 1#						
1	Spectrum Analyzer	R&S	FSP30	100091	2024-04-22	2025-04-21
2	Amplifier	Agilent	8447D	2944A10178	2024-07-18	2025-07-17
3	Tri-log Broadband Antenna	SCHWARZBECK	VULB9163	336	2024-07-21	2025-07-20
4	Coaxial Cable	Top	TYPE16(13M)	-	2024-04-22	2025-04-21
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120D	667	2025-01-17	2026-01-16
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2024-07-18	2025-07-17
7	Broadband Preamplifier	COMPLIANCE	PAP-1G18	2004	2024-07-18	2025-07-17
8	Coaxial Cable	Top	ZT26-NJ-NJ-8M/FA	-	2024-04-22	2025-04-21
9	Microwave Amplifier	SCHWARZBECK	BBV 9721	100472	2024-07-18	2025-07-17
10	Coaxial Cable	Top	ZT40-2.92J-2.92J-2.0M	17100919	2024-04-22	2025-04-21
3m Semi-anechoic Chamber for Radiation Emissions 2#						
1	Test Receiver	R&S	ESCI	101296	2024-04-22	2025-04-21
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2024-11-04	2025-11-03
3	Active Loop Antenna	Com-Power	AL-130R	10160007	2024-04-27	2025-04-26
4	Amplifier	ANRITSU	MH648A	M43381	2024-04-22	2025-04-21
5	Cable	HUBER+SUHNER	CBL2	525178	2024-04-22	2025-04-21
RF Conducted Testing						
1	Spectrum Analyzer	R&S	FSP40	100501	2024-07-18	2025-07-17
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-07-18	2025-07-17

Test Software:

Test Item	Software name	Software version
Conduction disturbance Radiated Emission(3m)	EZ-EMC	EZ-EMC(RA-03A1-1)

6.2 Description of Support Units

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

6.3 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64dB (AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08dB (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 Duty Cycle

Type of Modulation	On time ms	Period ms	Duty Cycle linear	Duty Cycle %	Duty Cycle Factor(dB)	Average Factor(dB)
802.11b	100.000	100.000	1.00	100.00	0.00	0.00
802.11g	5.442	5.484	0.99	99.23	0.03	-0.07
802.11n-HT20	5.064	5.106	0.99	99.18	0.04	-0.07
802.11n-HT40	2.418	2.496	0.97	96.88	0.14	-0.28

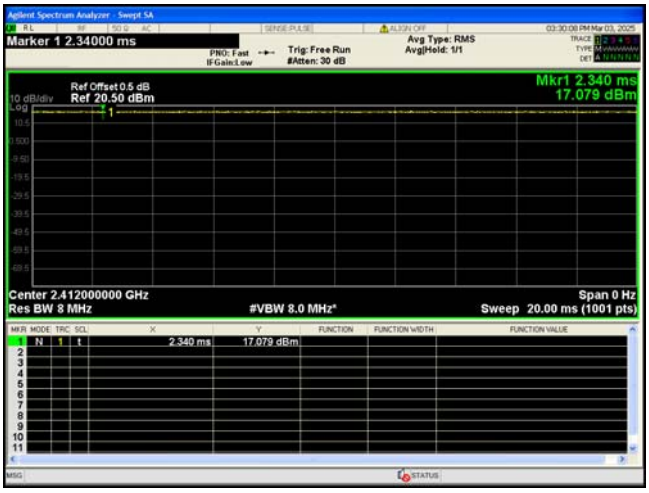
Remark:

Duty cycle=On Time/period;

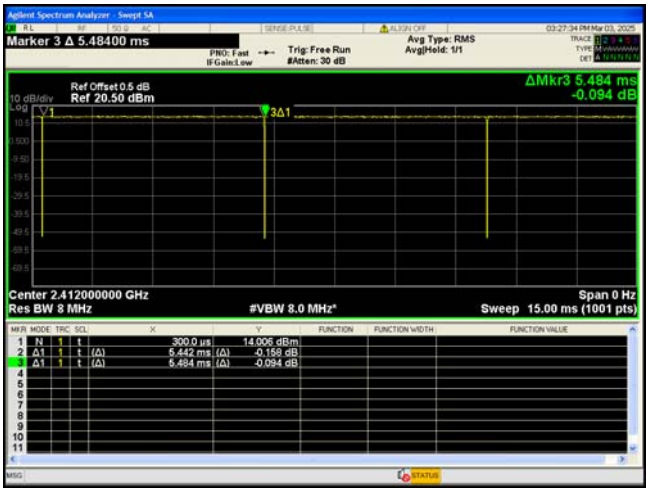
Duty cycle factor=10*log (1/Duty cycle);

Average factor=$20\log_{10}$Duty cycle

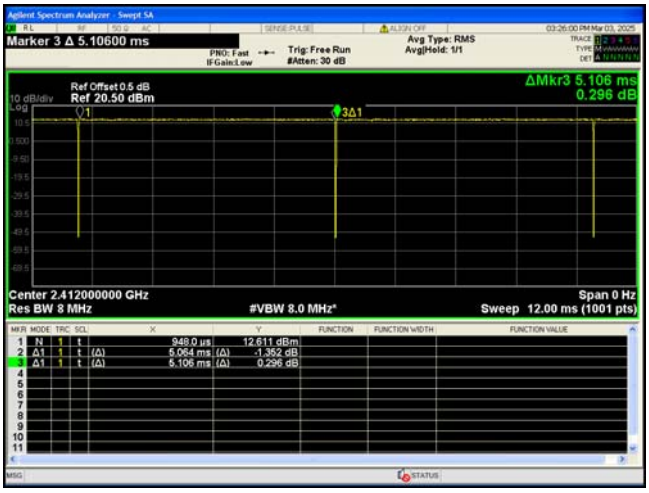
Wi-Fi 802.11b



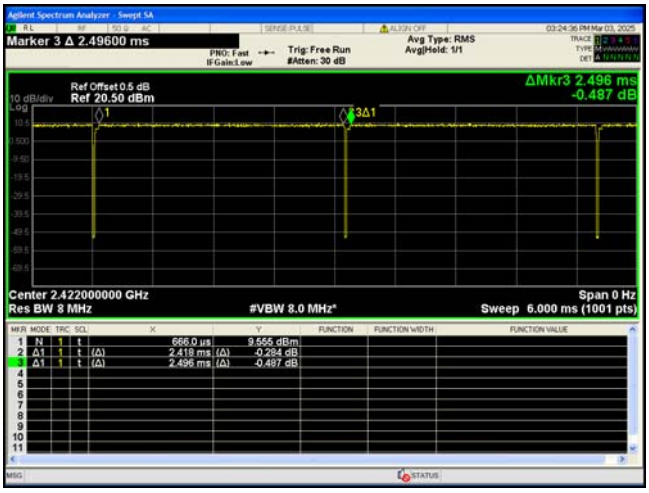
Wi-Fi 802.11g



Wi-Fi 802.11n-HT20



Wi-Fi 802.11n-HT40



8 Conducted Emission

Test Requirement: 47CFR FCC Part15 Subpart C §15.207

Test Method: ANSI C63.10-2020+A1-2024

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Limit:

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0. to 0.5	66 to 56*	56 to 46*
0.5 to 5.0	56	46
5.0 to 30	60	50
*Decreases with the logarithm of the frequency.		

8.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

Humidity: 51.1 % RH

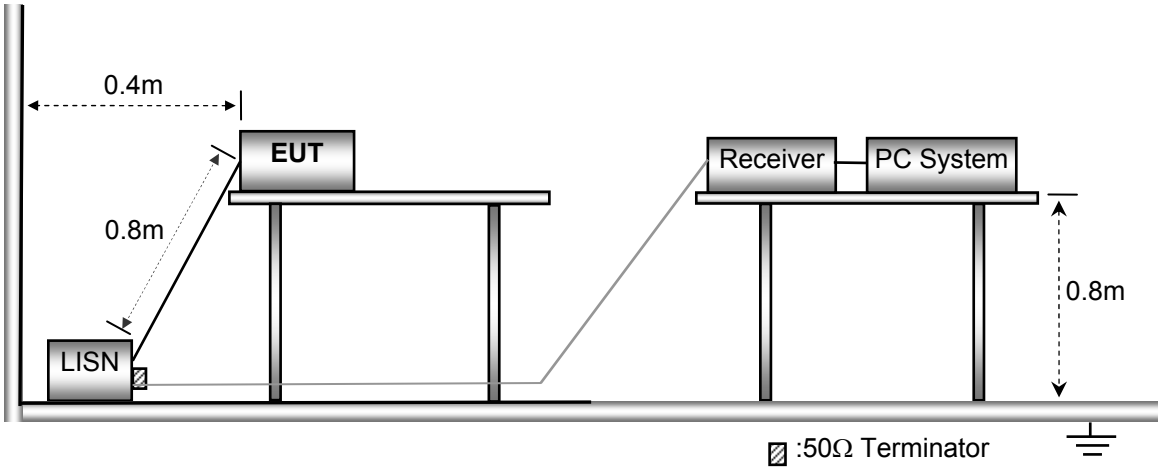
Atmospheric Pressure: 101.6kPa

EUT Operation:

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

8.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020+A1-2024.



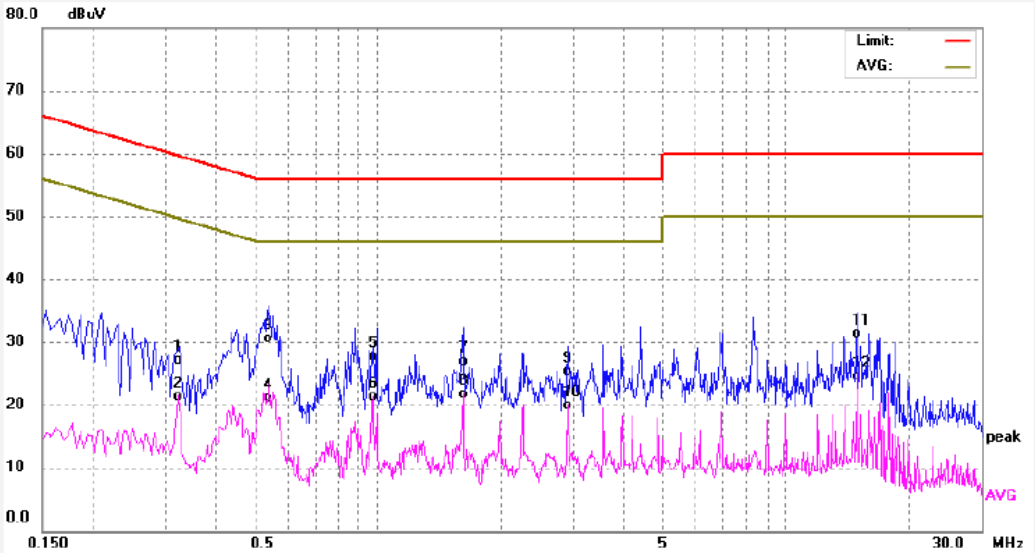
8.3 Measurement Description

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.

8.4 Conducted Emission Test Result

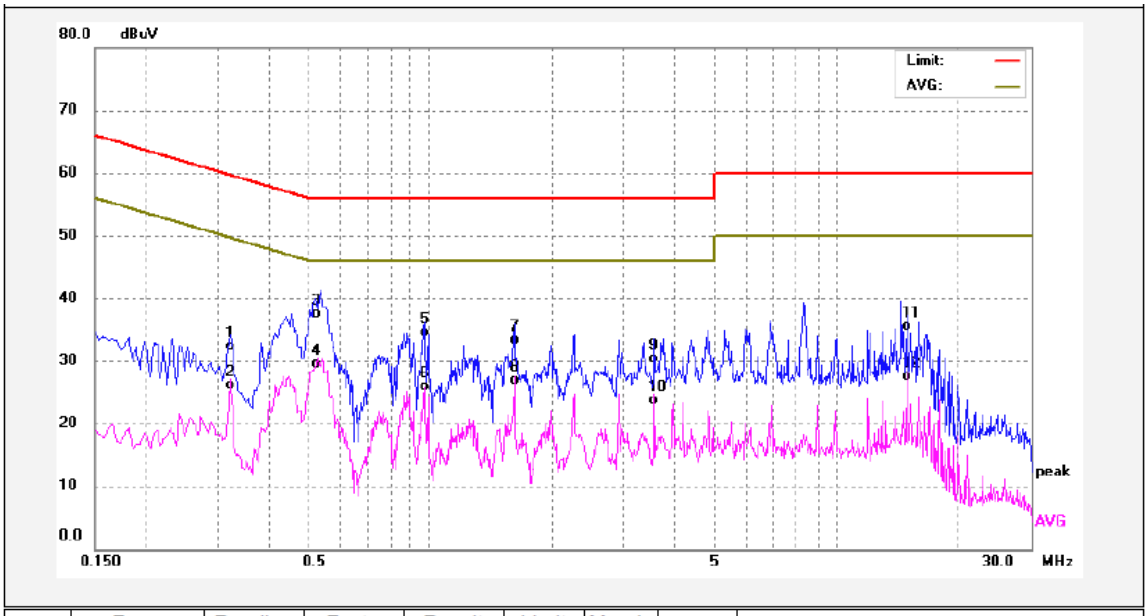
Remark: only the worst data (TX 11b mode High channel mode) were reported

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3220	17.52	9.58	27.10	59.65	-32.55	QP	
2	0.3220	11.82	9.58	21.40	49.65	-28.25	AVG	
3	0.5380	20.82	9.59	30.41	56.00	-25.59	QP	
4	0.5380	11.51	9.59	21.10	46.00	-24.90	AVG	
5	0.9700	18.04	9.66	27.70	56.00	-28.30	QP	
6	0.9700	11.62	9.66	21.28	46.00	-24.72	AVG	
7	1.6140	17.27	9.63	26.90	56.00	-29.10	QP	
8	1.6140	12.07	9.63	21.70	46.00	-24.30	AVG	
9	2.9060	15.67	9.69	25.36	56.00	-30.64	QP	
10	2.9060	10.21	9.69	19.90	46.00	-26.10	AVG	
11	14.8780	21.10	10.12	31.22	60.00	-28.78	QP	
12	14.8780	14.40	10.12	24.52	50.00	-25.48	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3220	22.73	9.59	32.32	59.65	-27.33	QP	
2	0.3220	16.54	9.59	26.13	49.65	-23.52	AVG	
3	0.5299	27.99	9.60	37.59	56.00	-18.41	QP	
4	0.5299	19.97	9.60	29.57	46.00	-16.43	AVG	
5	0.9700	24.76	9.67	34.43	56.00	-21.57	QP	
6	0.9700	16.18	9.67	25.85	46.00	-20.15	AVG	
7	1.6140	23.71	9.64	33.35	56.00	-22.65	QP	
8	1.6140	17.21	9.64	26.85	46.00	-19.15	AVG	
9	3.5540	20.49	9.73	30.22	56.00	-25.78	QP	
10	3.5540	13.91	9.73	23.64	46.00	-22.36	AVG	
11	14.8700	25.26	10.15	35.41	60.00	-24.59	QP	
12	14.8700	17.27	10.15	27.42	50.00	-22.58	AVG	

9 Radiated Emissions

Test Requirement: 47CFR FCC Part15 Subpart C §15.209&15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019; ANSI C63.10-2020+A1-2024

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	$20\log^{(500)}$

9.1 EUT Operation

Operating Environment:

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

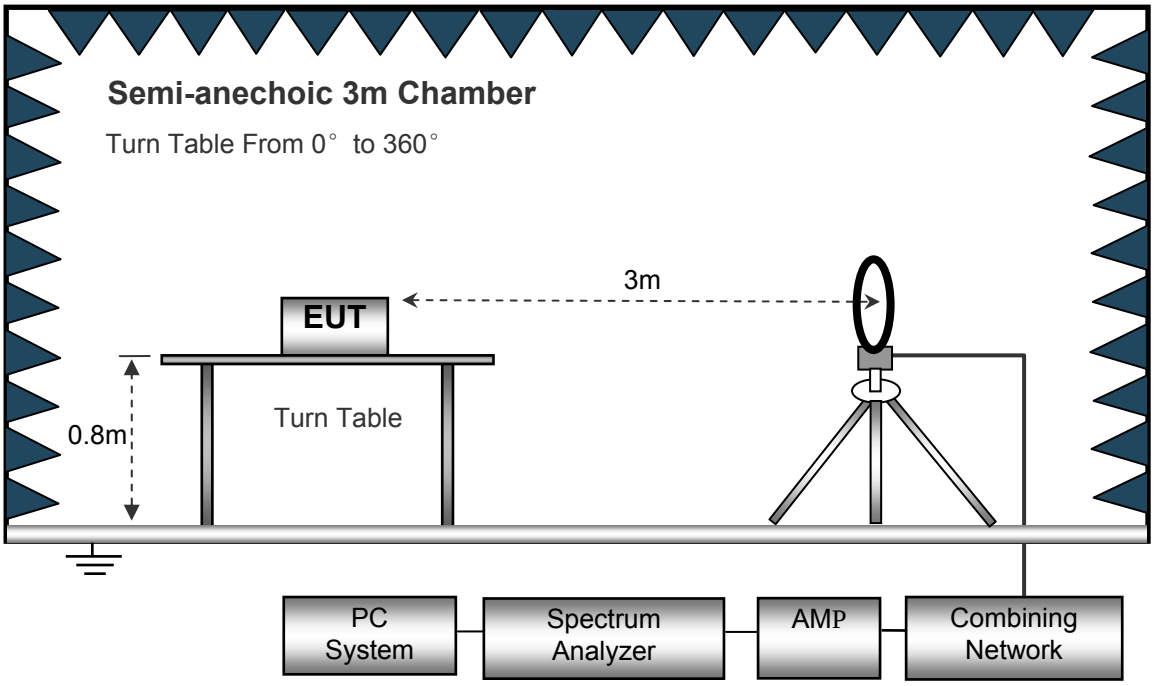
EUT Operation:

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

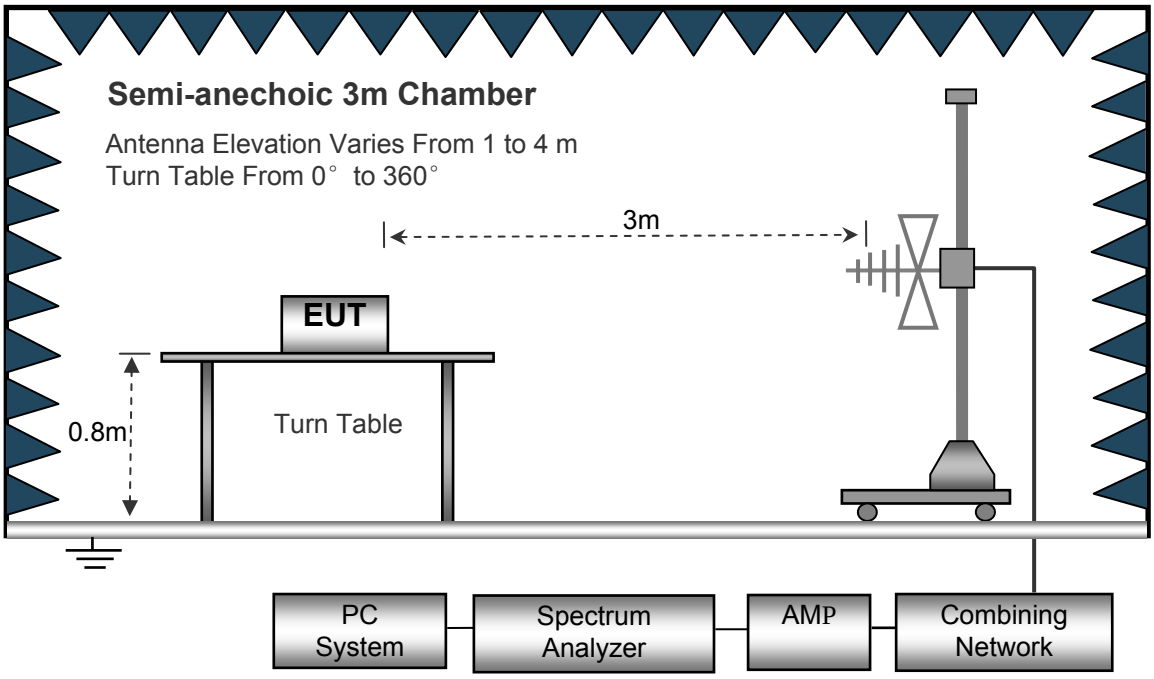
9.2 Test Setup

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

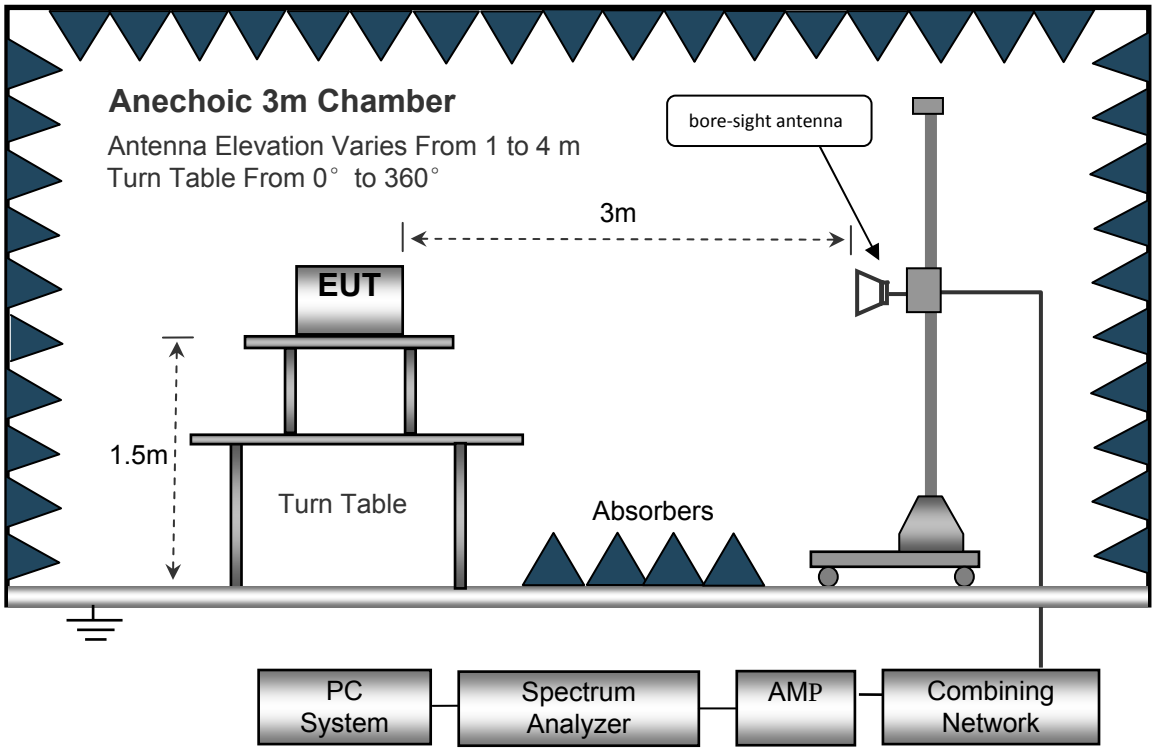
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



9.3 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

9.4 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.

9.5 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

9.6 Summary of Test Results

Test Frequency: 9kHz ~ 30MHz

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

Test Frequency: 30MHz ~ 8GHz

Note: Only the worst-case 11b mode were record in the report.

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
248.45	44.19	QP	57	1.8	H	-13.21	30.98	46.00	-15.02
248.45	48.38	QP	282	1.6	V	-13.21	35.17	46.00	-10.83
4824.00	58.80	PK	277	1.1	V	-1.06	57.74	74.00	-16.26
4824.00	44.22	Ave	277	1.1	V	-1.06	43.16	54.00	-10.84
7236.00	51.55	PK	233	1.6	H	1.33	52.88	74.00	-21.12
7236.00	38.65	Ave	233	1.6	H	1.33	39.98	54.00	-14.02

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Middle Channel 2437MHz									
248.45	45.30	QP	145	1.7	H	-13.21	32.09	46.00	-13.91
248.45	49.17	QP	230	1.2	V	-13.21	35.96	46.00	-10.04
4874.00	59.36	PK	181	1.1	V	-0.62	58.74	74.00	-15.26
4874.00	44.62	Ave	181	1.1	V	-0.62	44.00	54.00	-10.00
7311.00	50.38	PK	186	1.3	H	2.21	52.59	74.00	-21.41
7311.00	37.42	Ave	186	1.3	H	2.21	39.63	54.00	-14.37

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
248.45	44.66	QP	344	1.9	H	-13.21	31.45	46.00	-14.55
248.45	47.99	QP	303	1.7	V	-13.21	34.78	46.00	-11.22
4924.00	60.26	PK	137	1.1	V	-0.24	60.02	74.00	-13.98
4924.00	43.98	Ave	137	1.1	V	-0.24	43.74	54.00	-10.26
7386.00	50.65	PK	113	1.2	H	2.84	53.49	74.00	-20.51
7386.00	37.80	Ave	113	1.2	H	2.84	40.64	54.00	-13.36

Radiated Restricted Band Emission

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
2348.86	48.02	PK	60	1.2	V	-13.19	34.83	74.00	-39.17
2348.86	37.04	Ave	60	1.2	V	-13.19	23.85	54.00	-30.15
2360.99	44.19	PK	130	1.2	H	-13.14	31.05	74.00	-42.95
2360.99	37.54	Ave	130	1.2	H	-13.14	24.40	54.00	-29.60
2492.82	44.89	PK	13	1.7	V	-13.08	31.81	74.00	-42.19
2492.82	38.20	Ave	13	1.7	V	-13.08	25.12	54.00	-28.88

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: High Channel 2462MHz									
2342.08	46.69	PK	64	1.0	V	-13.19	33.50	74.00	-40.50
2342.08	39.71	Ave	64	1.0	V	-13.19	26.52	54.00	-27.48
2381.19	44.76	PK	162	1.1	H	-13.14	31.62	74.00	-42.38
2381.19	38.25	Ave	162	1.1	H	-13.14	25.11	54.00	-28.89
2484.54	44.26	PK	83	1.2	V	-13.08	31.18	74.00	-42.82
2484.54	37.86	Ave	83	1.2	V	-13.08	24.78	54.00	-29.22

Test Frequency: 8GHz~25GHz

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

10 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 C63.10-2020+A1-2024

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)).

10.1 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:

Blow 30MHz:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

Detector function = peak, Trace = max hold

Above 30MHz:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

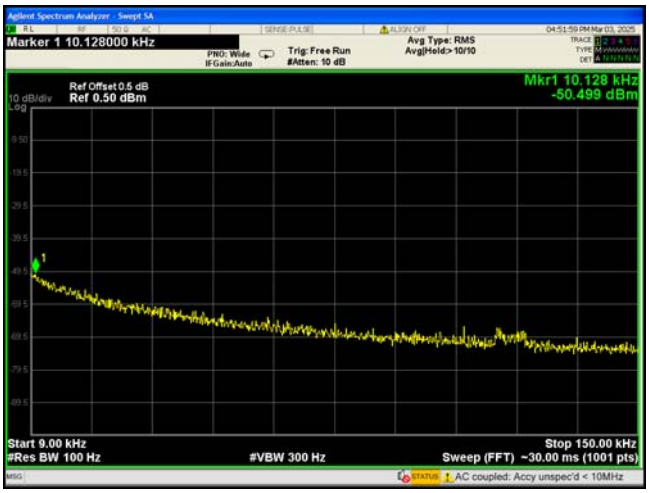
Detector function = peak, Trace = max hold

10.2 Test Result

9kHz – 150kHz

Mode: TX 11b channel 1

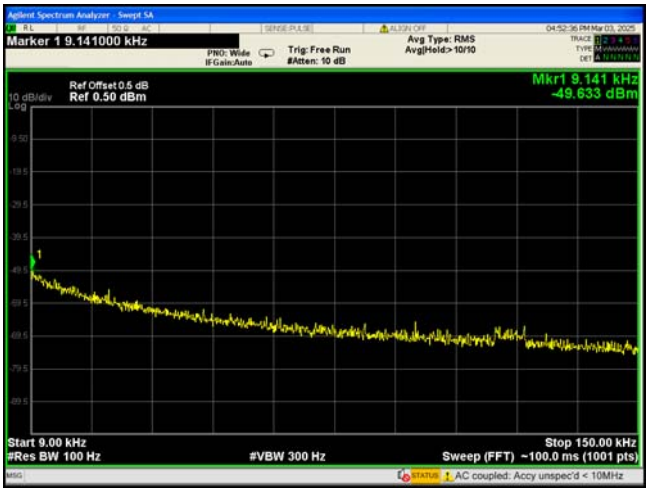
Mode: TX 11b channel 6



Mode: TX 11b channel 11

Mode: TX 11g channel 1

Mode: TX 11g channel 6



Mode: TX 11g channel 11

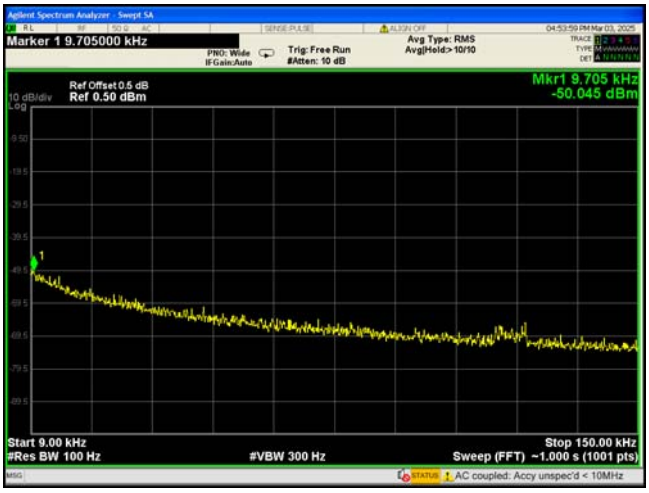
Mode: TX 11n HT20 channel 1

Mode: TX 11 n HT20 channel 6

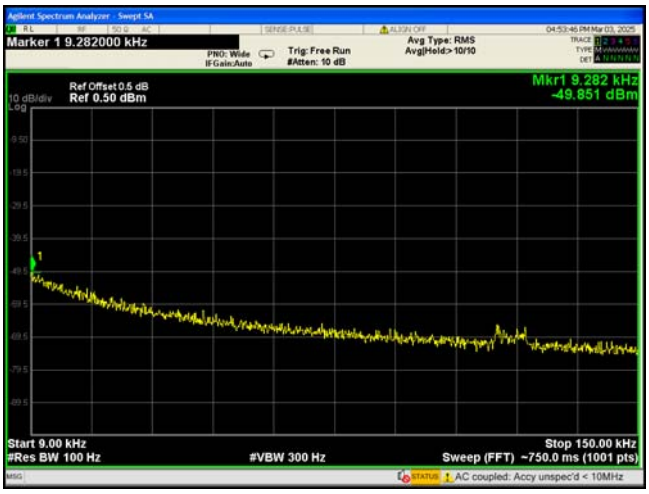
Mode: TX 11 n HT20 channel 11

Mode: TX 11n HT40 channel 3

Mode: TX 11 n HT40 channel 6

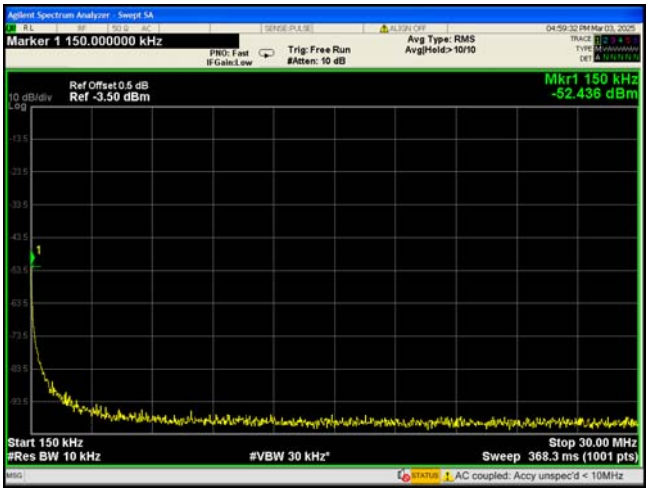


Mode: TX 11 n HT40 channel 9

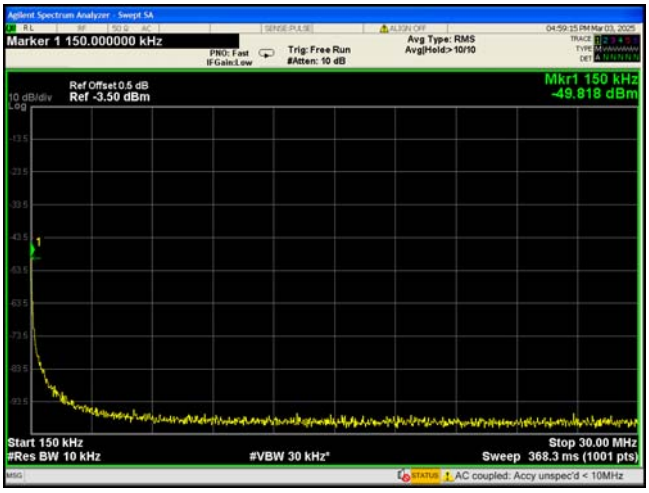


150kHz – 30MHz

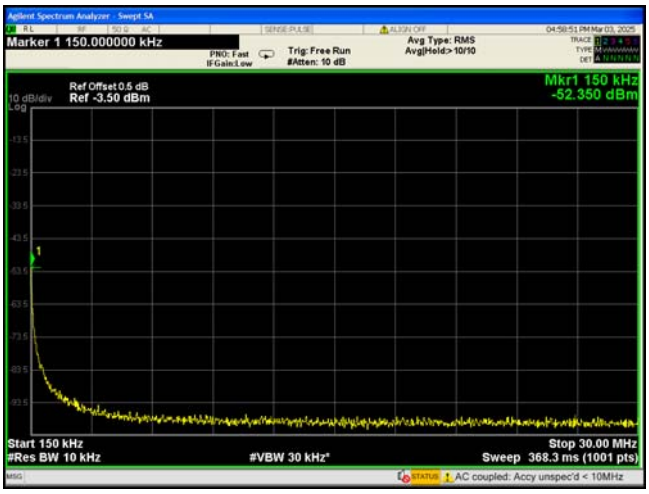
Mode: TX 11b channel 1



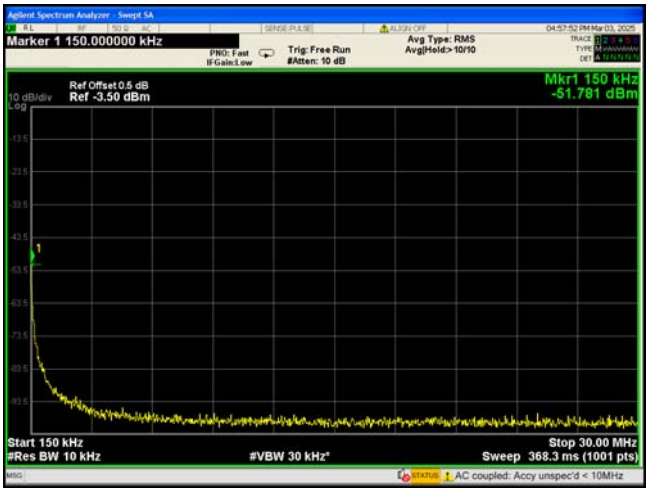
Mode: TX 11b channel 6



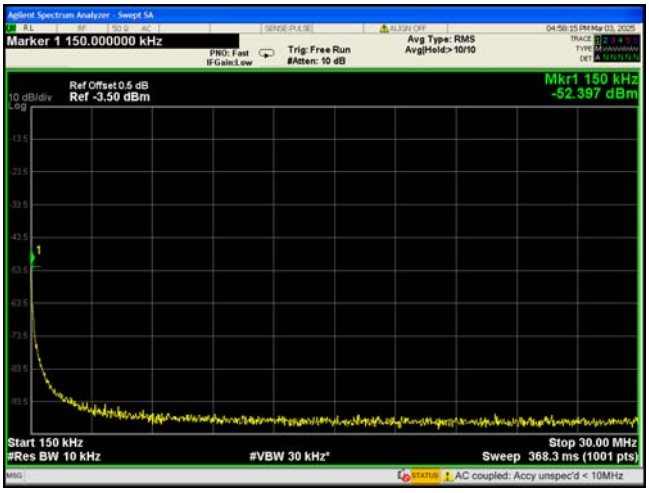
Mode: TX 11b channel 11



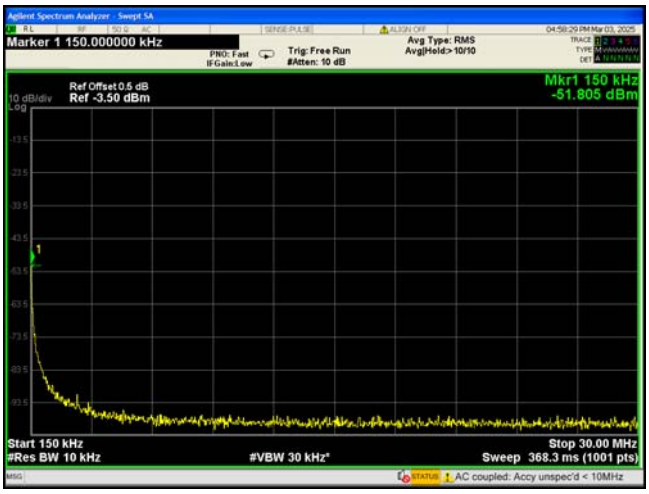
Mode: TX 11g channel 1



Mode: TX 11g channel 6

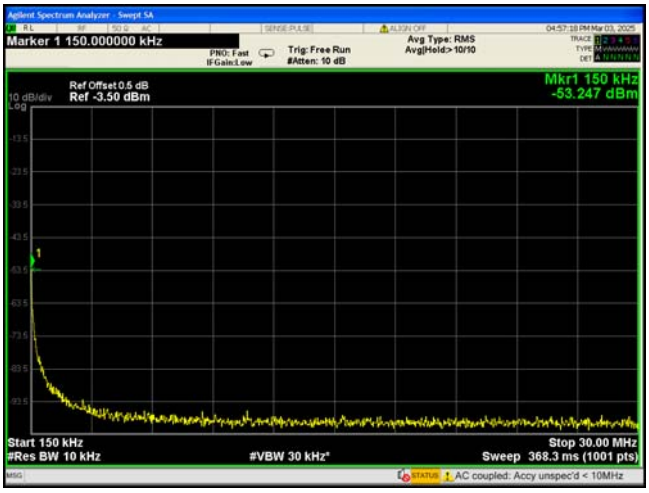


Mode: TX 11g channel 11

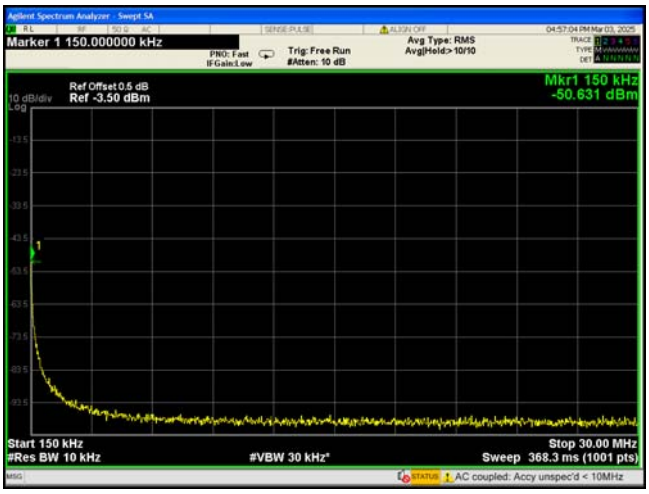


Mode: TX 11n HT20 channel 1

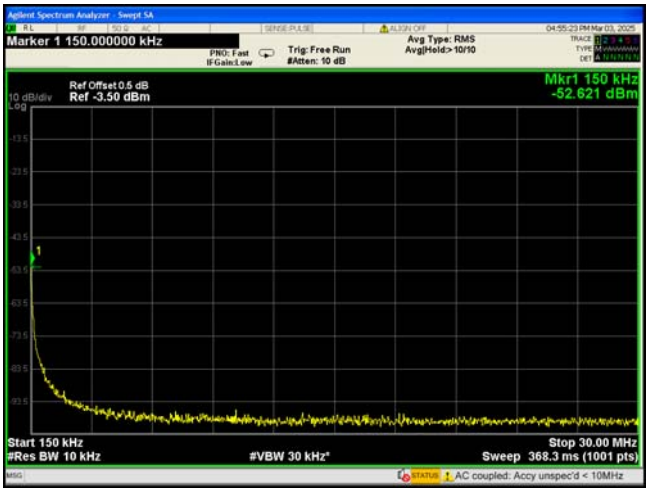
Mode: TX 11 n HT20 channel 6



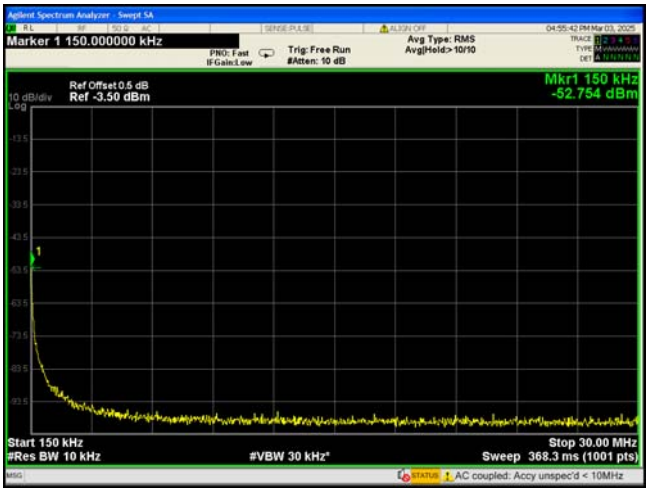
Mode: TX 11 n HT20 channel 11



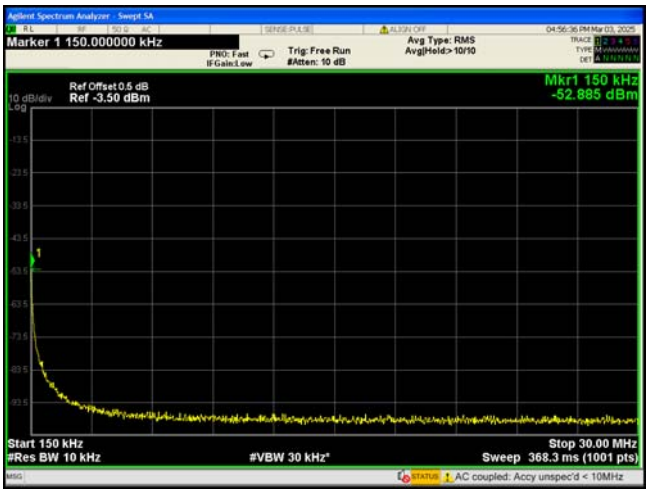
Mode: TX 11n HT40 channel 3



Mode: TX 11 n HT40 channel 6

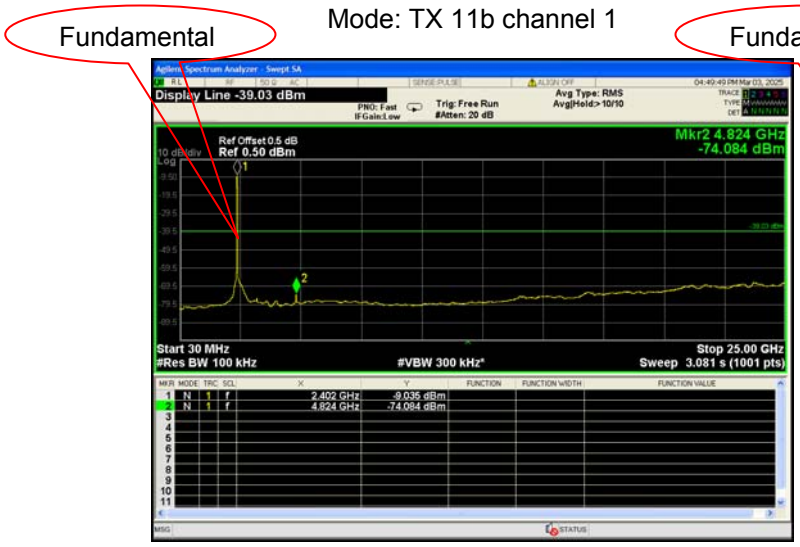


Mode: TX 11 n HT40 channel 9

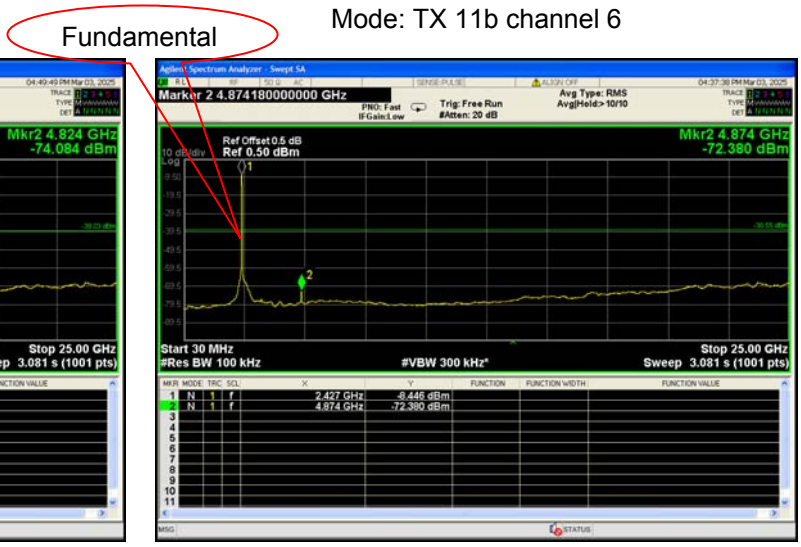


Above 30MHz

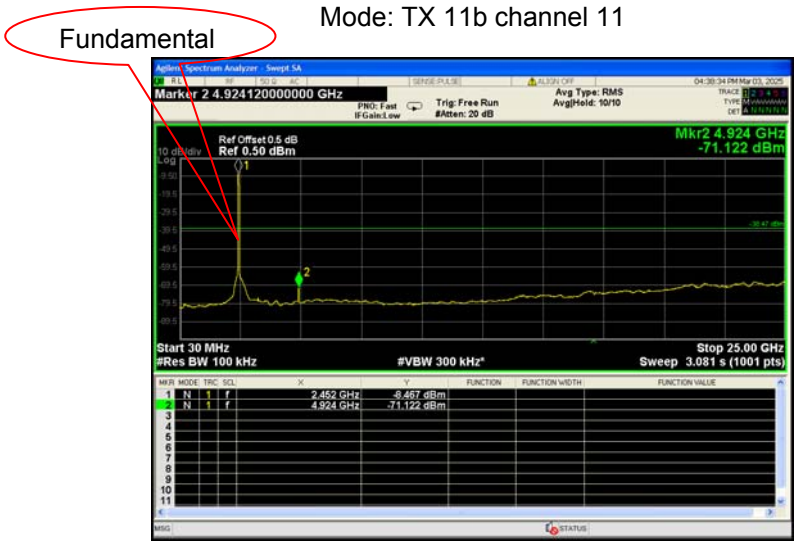
Mode: TX 11b channel 1



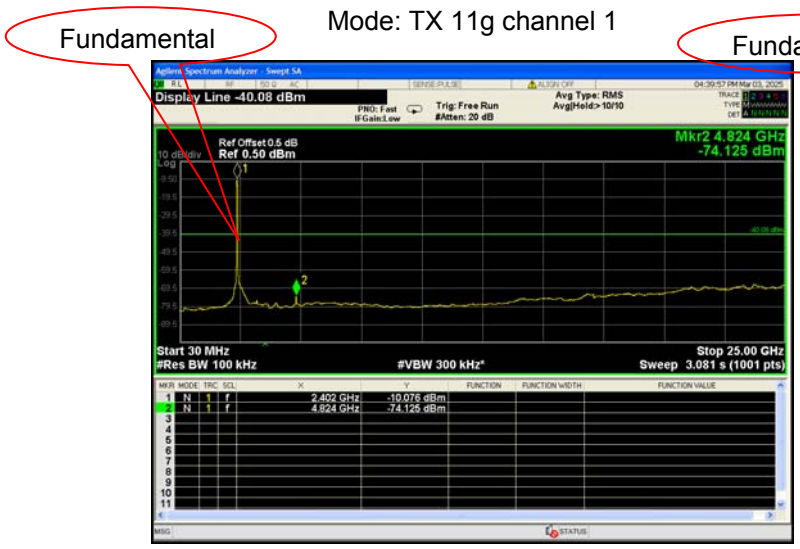
Mode: TX 11b channel 6



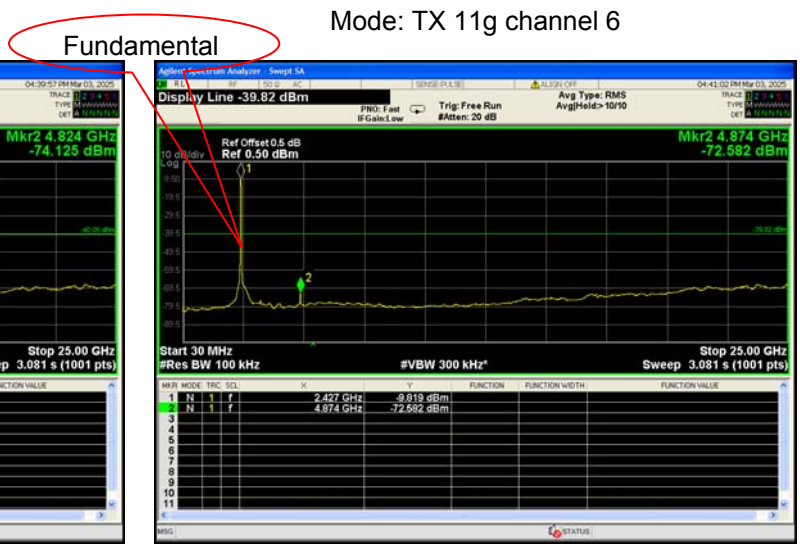
Mode: TX 11b channel 11



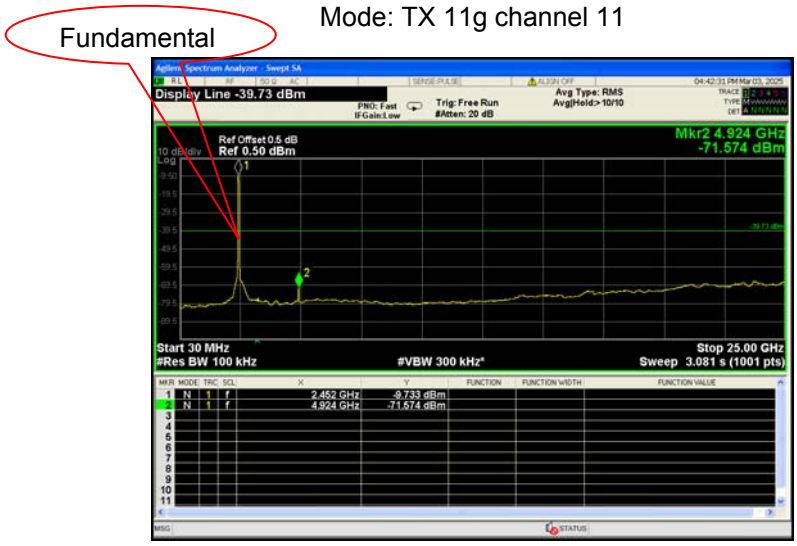
Mode: TX 11g channel 1



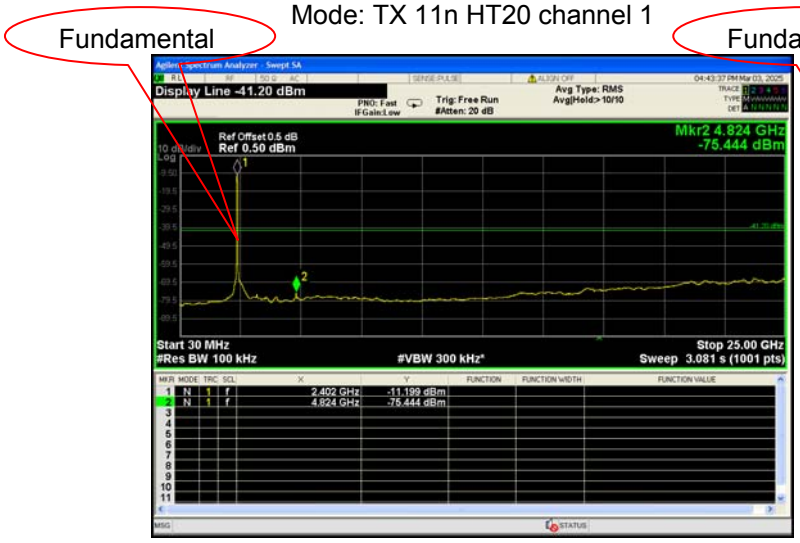
Mode: TX 11g channel 6



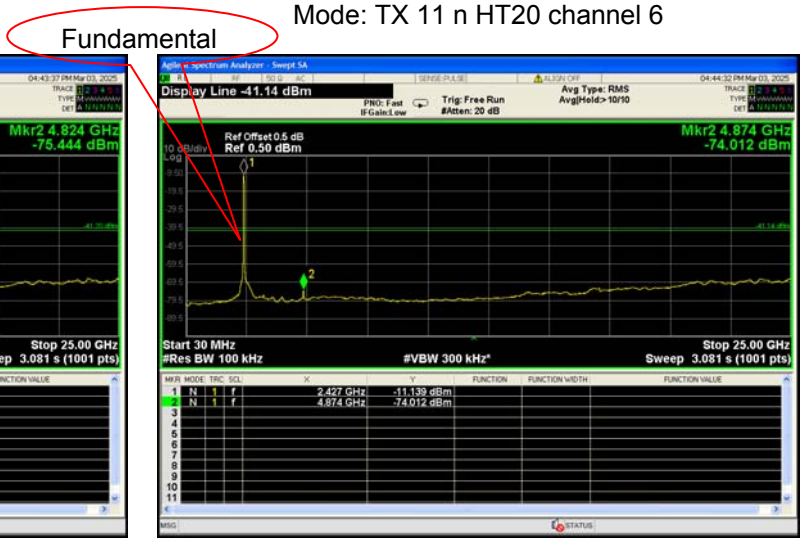
Mode: TX 11g channel 11



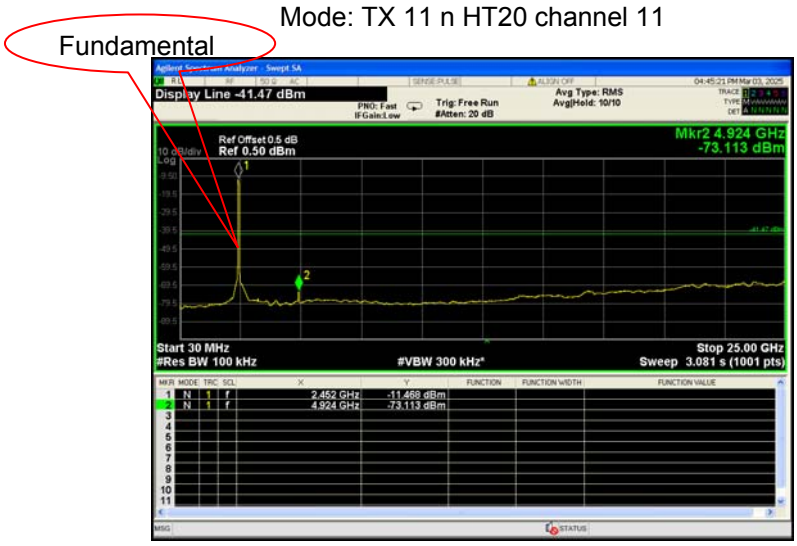
Mode: TX 11n HT20 channel 1



Mode: TX 11 n HT20 channel 6

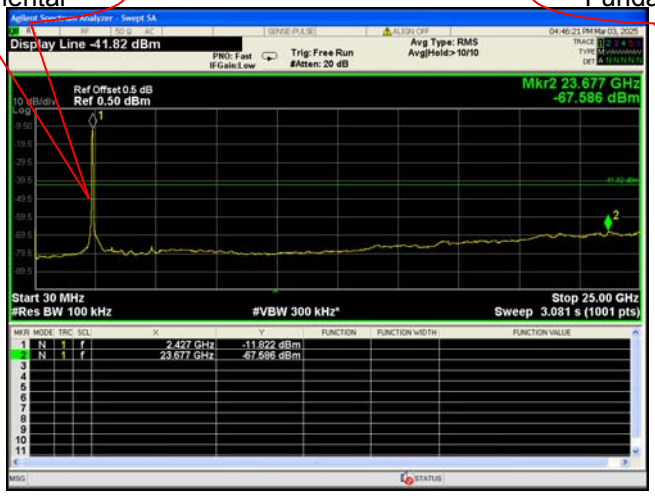


Mode: TX 11 n HT20 channel 11



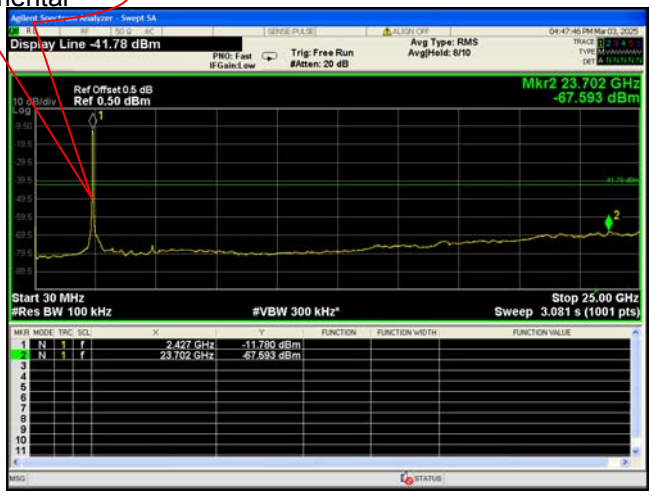
Mode: TX 11n HT40 channel 3

Fundamental



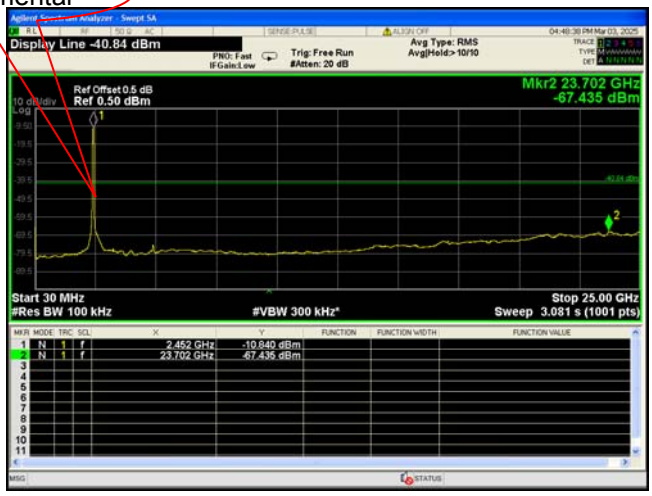
Mode: TX 11 n HT40 channel 6

Fundamental



Mode: TX 11 n HT40 channel 9

Fundamental



11 Band Edge Measurement

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	Regulation 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting

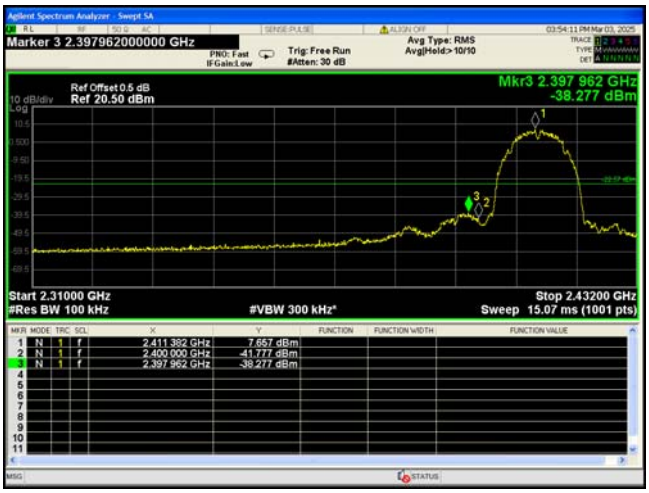
11.1 Test Produce

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.

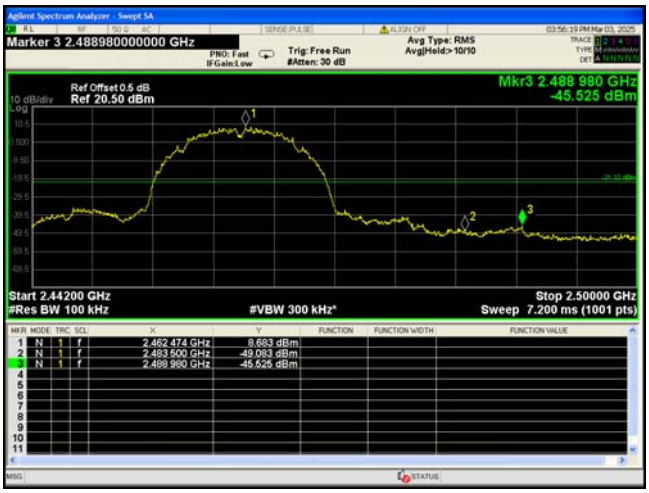
11.2 Test Result

Test result plots shown as follows:

TX 11b: Band edge-left side

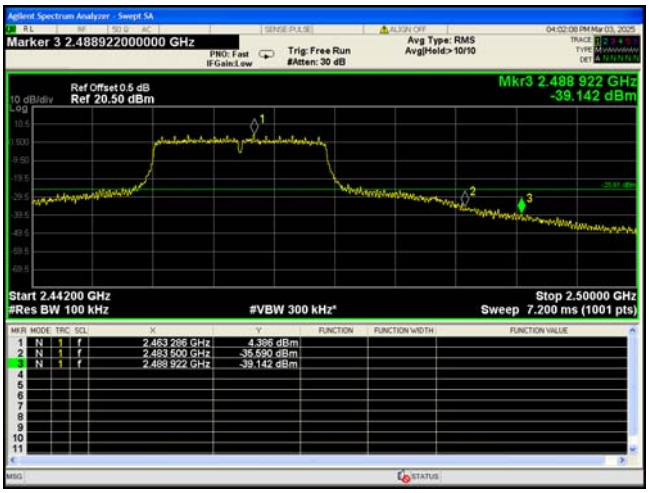


TX 11b: Band edge-right side

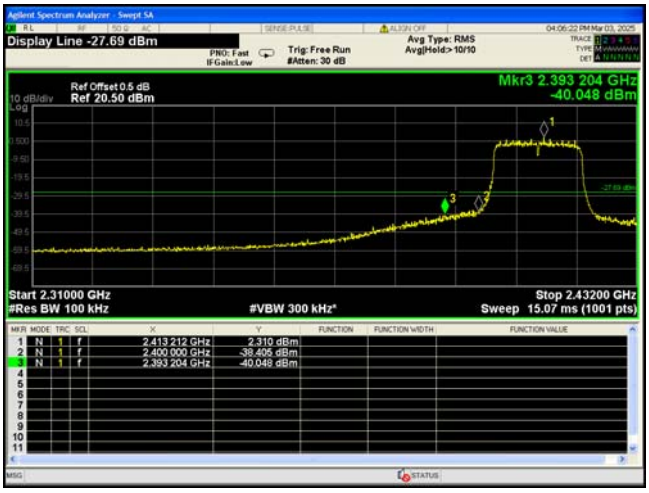


TX 11g: Band edge-left side

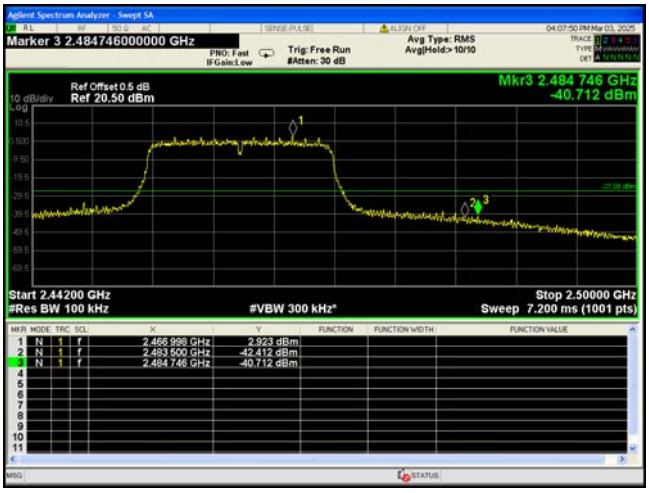
TX 11g: Band edge-right side



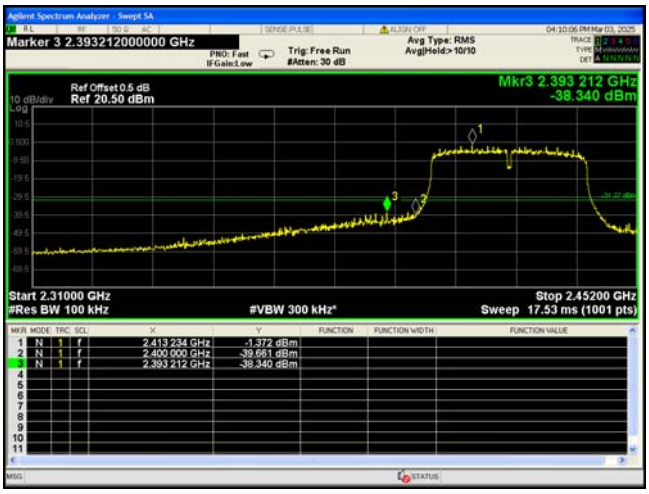
TX 11n HT20: Band edge-left side



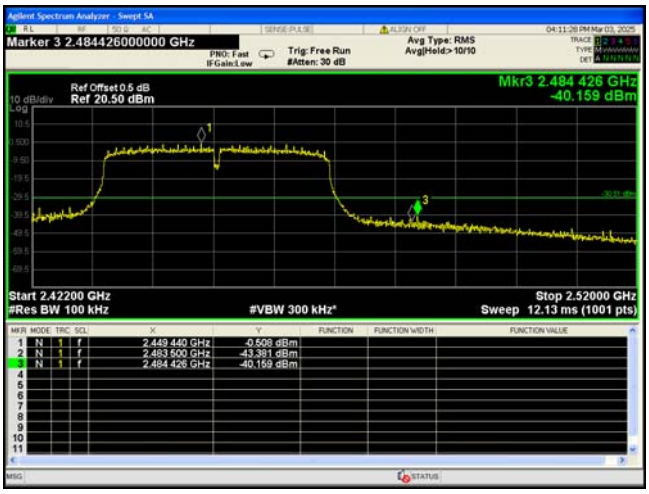
TX 11n HT20: Band edge-right side



TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



12 6 dB Bandwidth and 99% Bandwidth Measurement

Test Requirement: 47CFR FCC Part15 Subpart C §15.247

Test Method: ANSI C63.10-2020+A1-2024
KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Test Limit: §15.247(a)(2)
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Mode: Transmitting

12.1 Test Procedure

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

2. 6dB Bandwidth Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

99% Bandwidth Set the spectrum analyzer: 1~5% of the OBW, VBW = 3 times the RBW

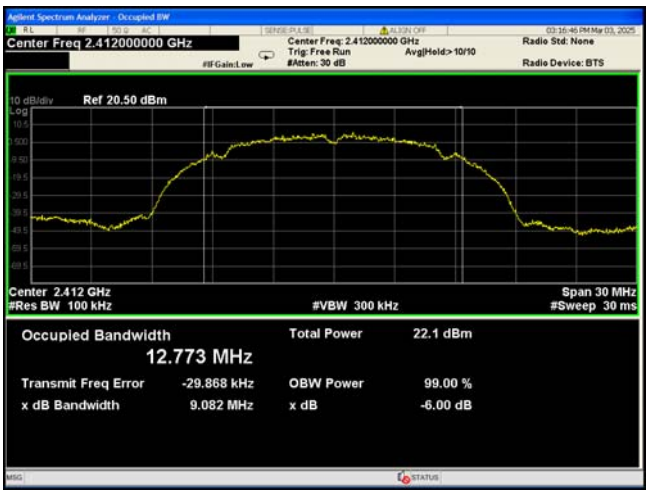
12.2 Test Result

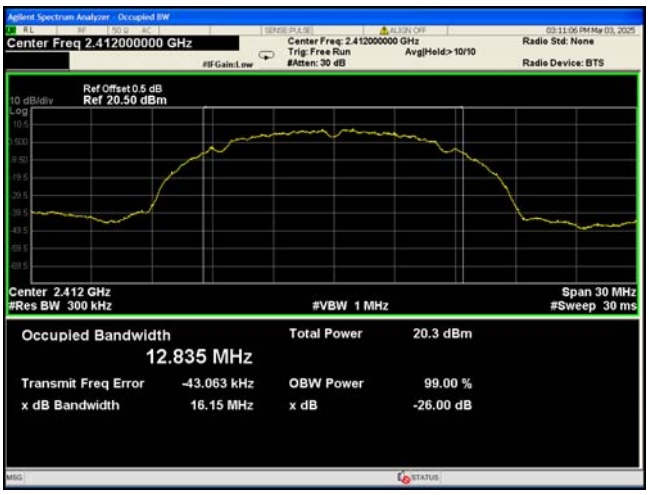
Operation mode	Test Channel	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
TX 11b	Channel 1	9.082	12.835
	Channel 6	8.888	12.818
	Channel 11	9.333	12.822
TX 11g	Channel 1	16.48	16.463
	Channel 6	16.49	16.459
	Channel 11	16.47	16.470
TX 11n HT20	Channel 1	17.30	17.420
	Channel 6	17.31	17.428
	Channel 11	17.52	17.433
TX 11n HT40	Channel 3	35.44	35.843
	Channel 6	35.38	35.853
	Channel 9	35.11	35.865

Test result plot:

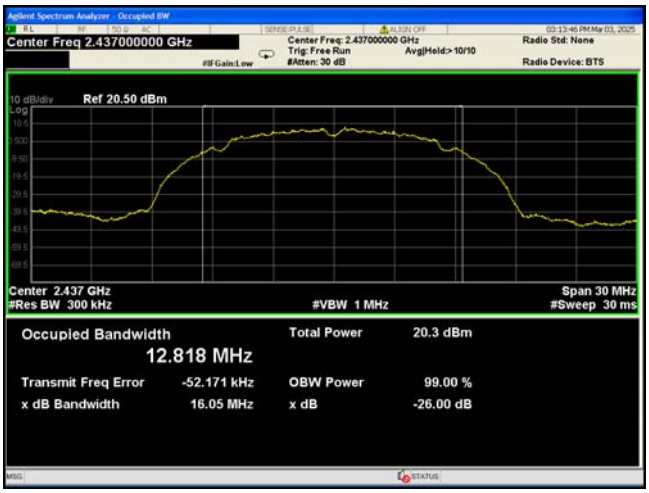
6 dB Bandwidth 99% Bandwidth

Mode: TX 11b channel 1



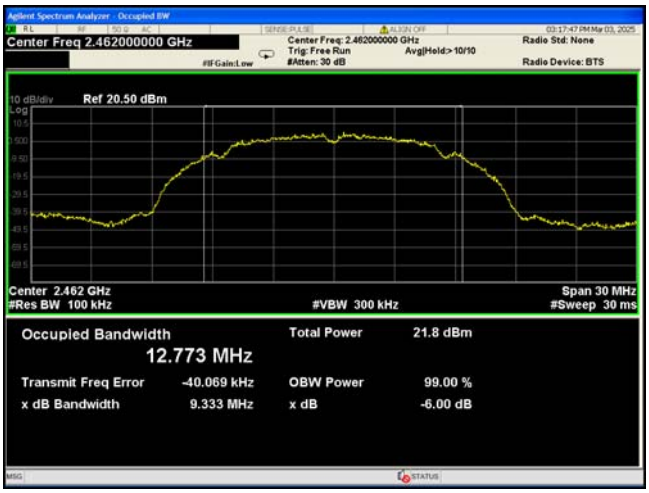


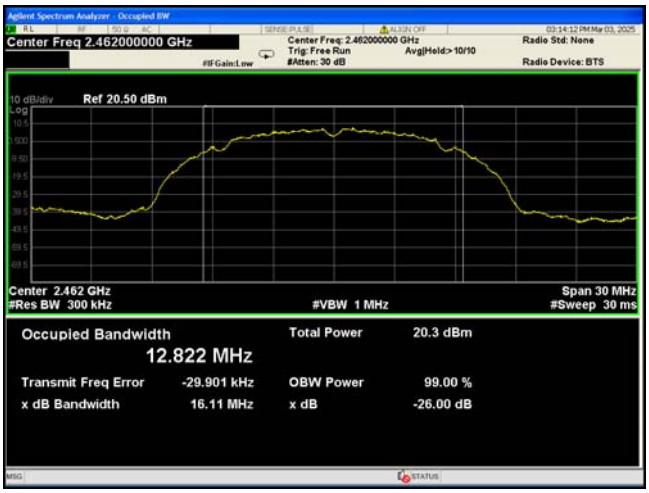
Mode: TX 11b channel 6



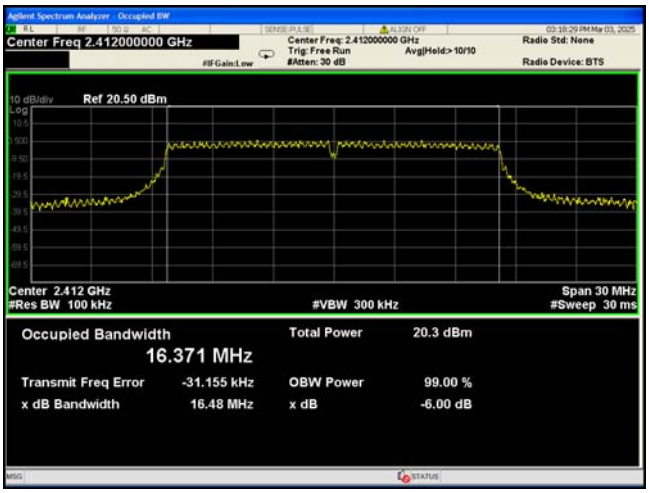
6 dB Bandwidth 99% Bandwidth

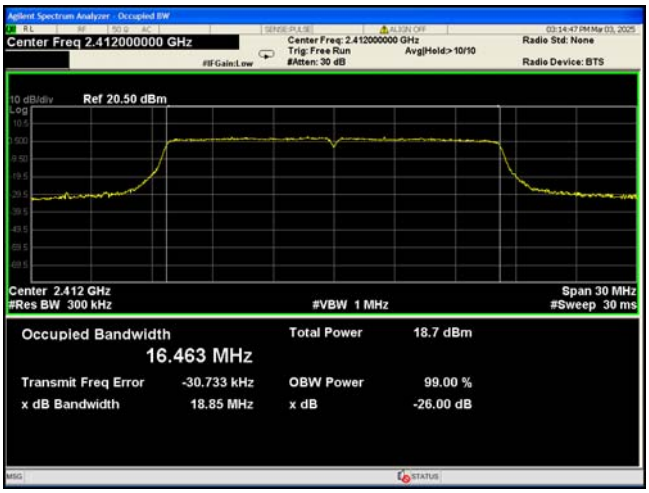
Mode: TX 11b channel 11





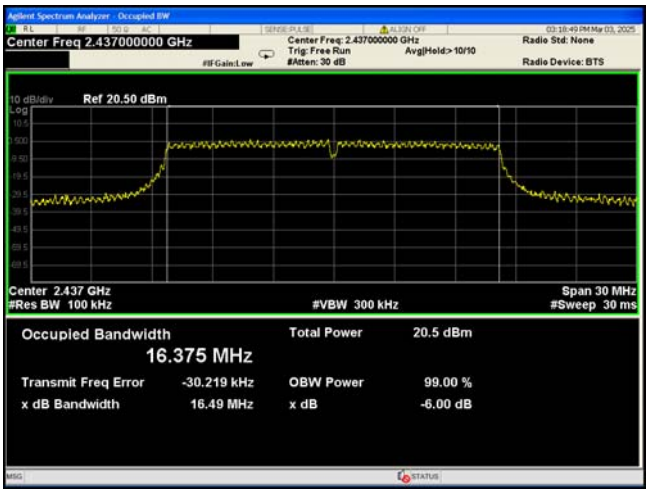
Mode: TX 11g channel 1

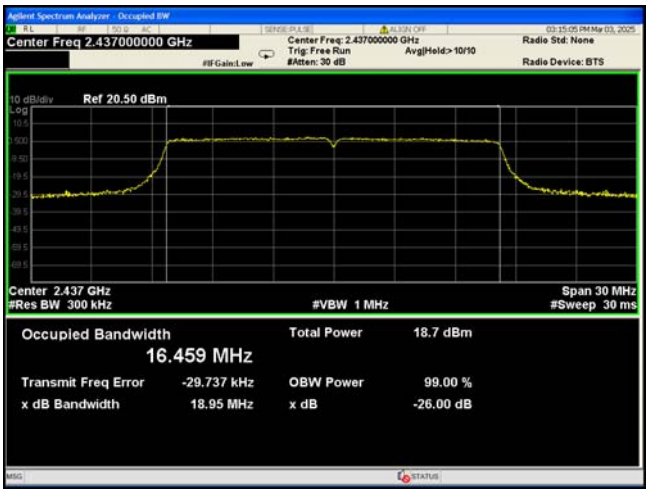




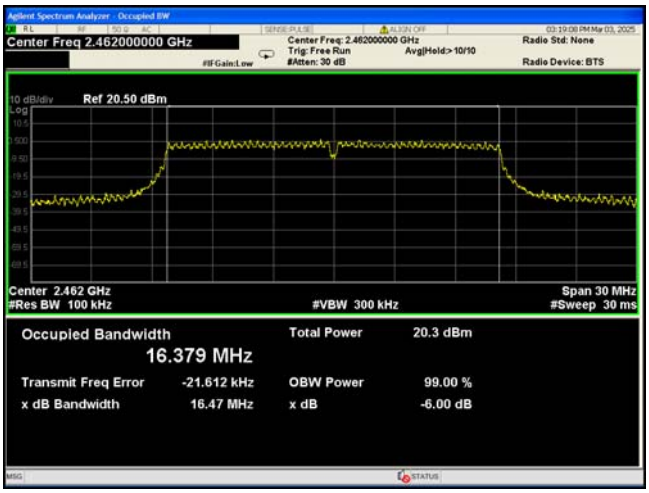
6 dB Bandwidth 99% Bandwidth

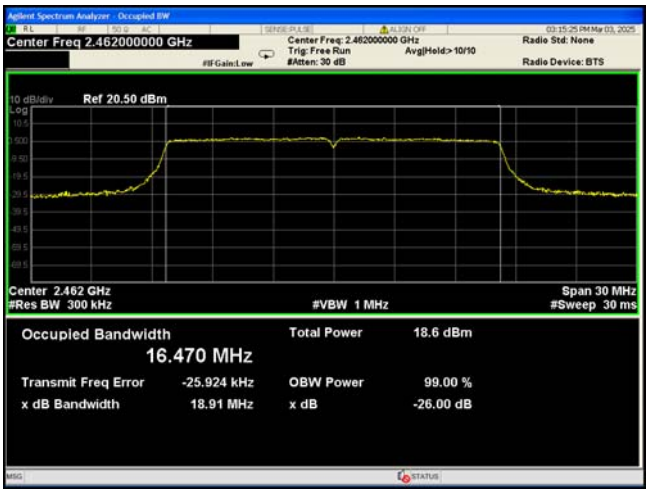
Mode: TX 11g channel 6





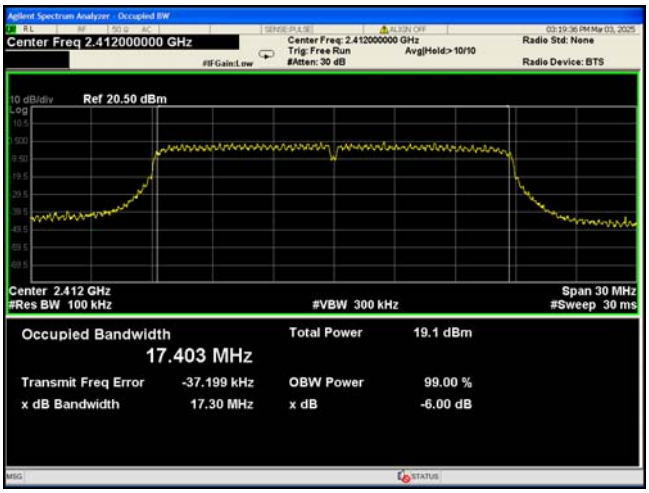
Mode: TX 11g channel 11

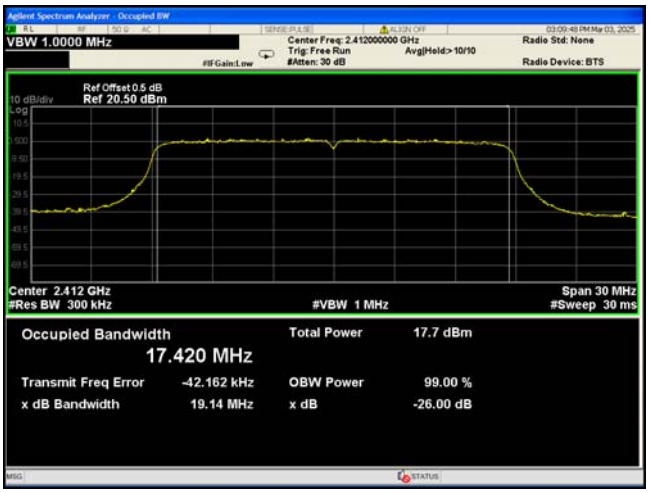




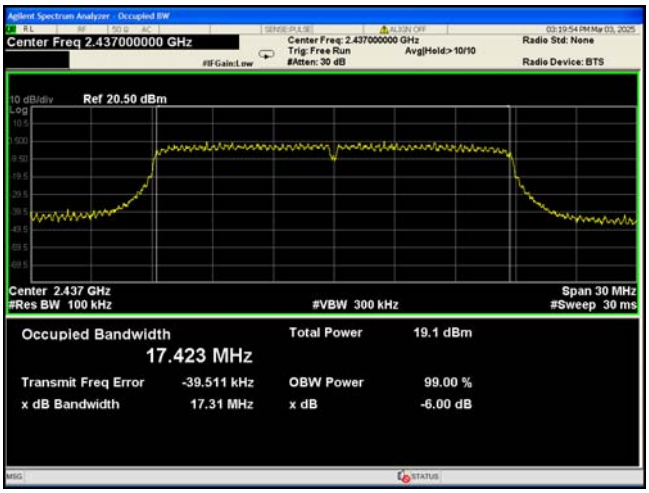
6 dB Bandwidth 99% Bandwidth

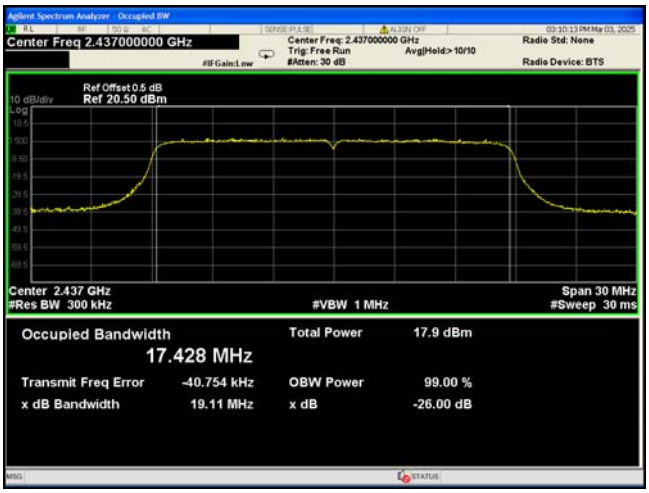
Mode: TX 11n HT20 channel 1





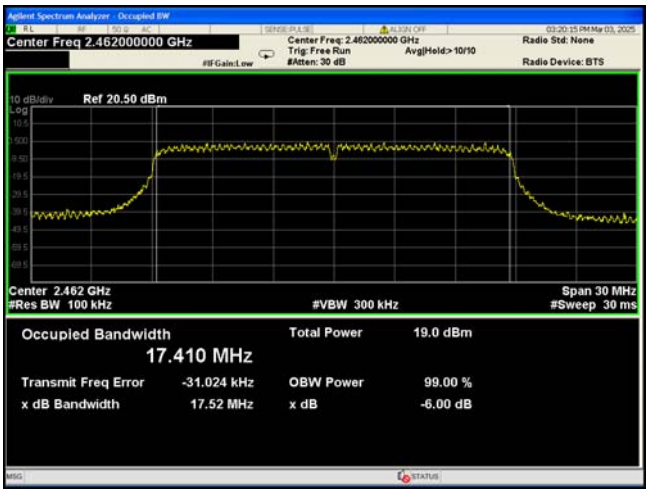
Mode: TX 11n HT20 channel 6

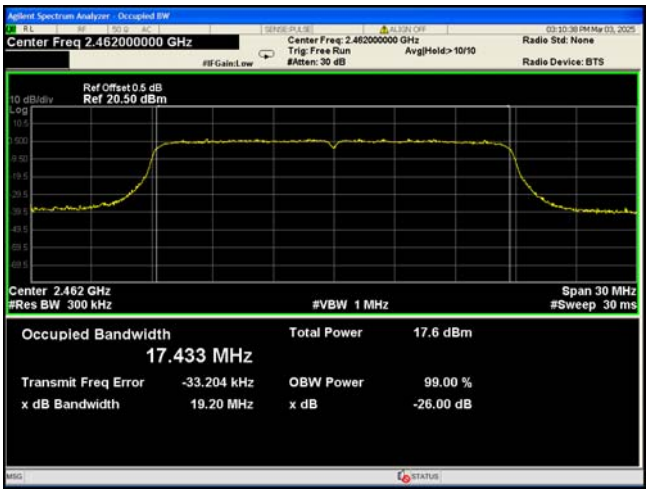




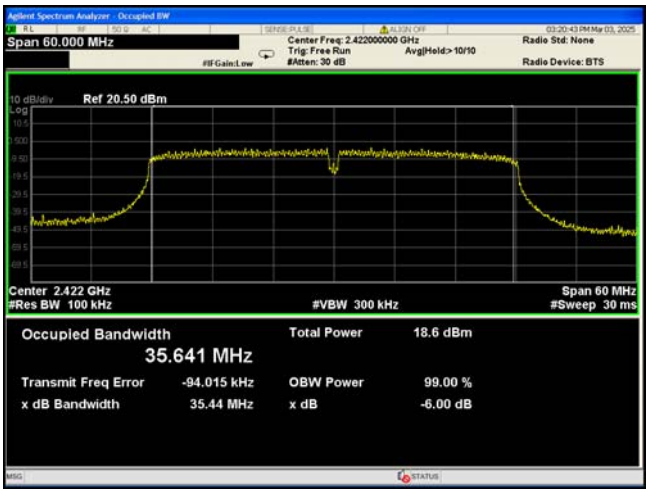
6 dB Bandwidth 99% Bandwidth

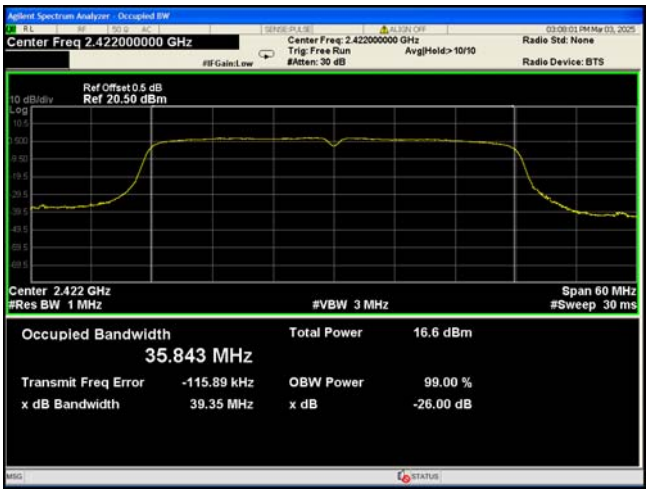
Mode: TX 11n HT20 channel 11





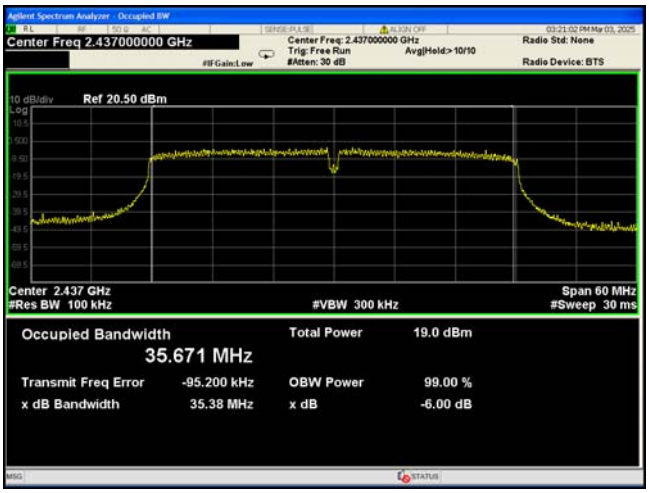
Mode: TX 11n HT40 channel 3

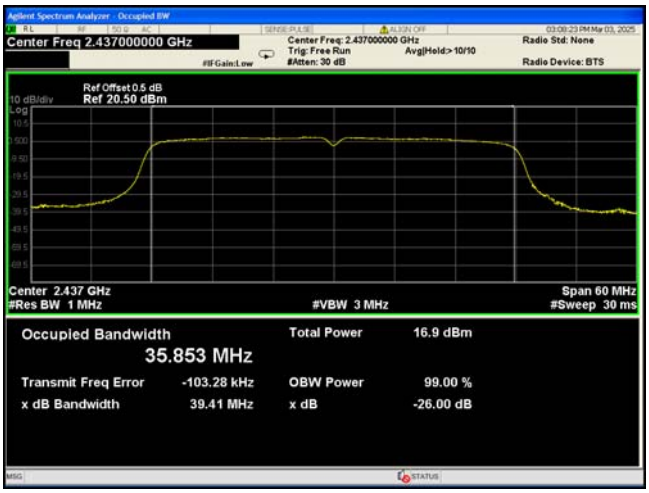




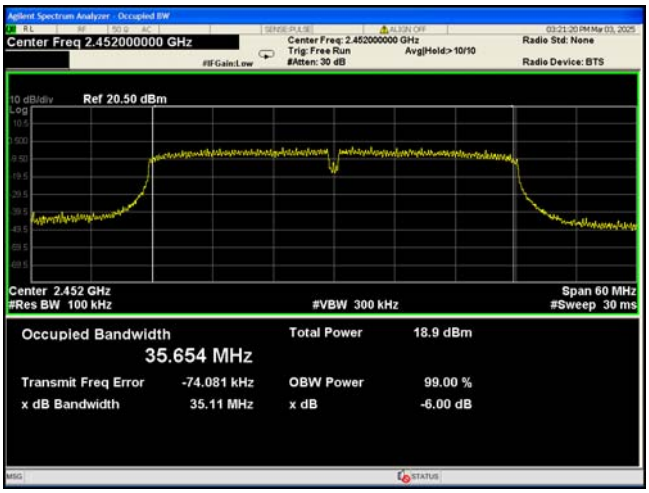
6 dB Bandwidth 99% Bandwidth

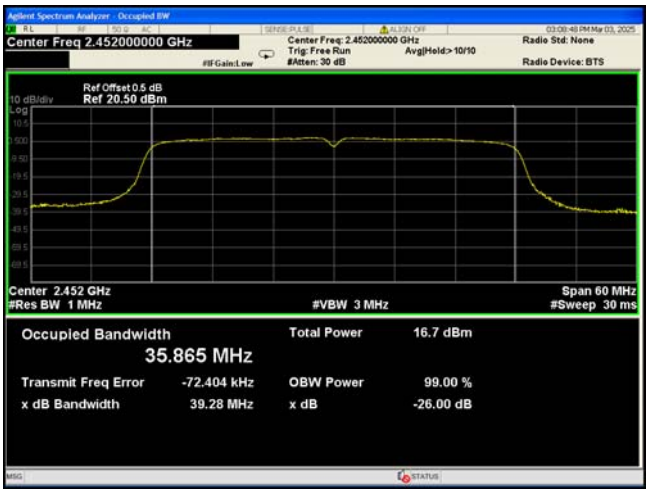
Mode: TX 11n HT40 channel 6





Mode: TX 11n HT40 channel 9





13 Maximum Conducted Output Power

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	ANSI C63.10-2020+A1-2024 KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	§15.247(b) The maximum peak conducted output power of the intentional radiator shall not exceed 1W.
Test Mode:	Transmitting

13.1 Test Procedure

According to KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Section 8.3.1.1 RBW ≥ DTS bandwidth

Subclause 11.9.1.1 of ANSI C63.10 is applicable.

Section 8.3.1.2 Integrated band power method

For measuring the output power of a device transmitting a wide-band noise-like signal where the peak power amplitude is a statistical parameter, the preferred methodology is to use an integrated average power measurement, as described in 8.3.2. The peak integrated band power method of 11.9.1 in ANSI C63.10 is not applicable.

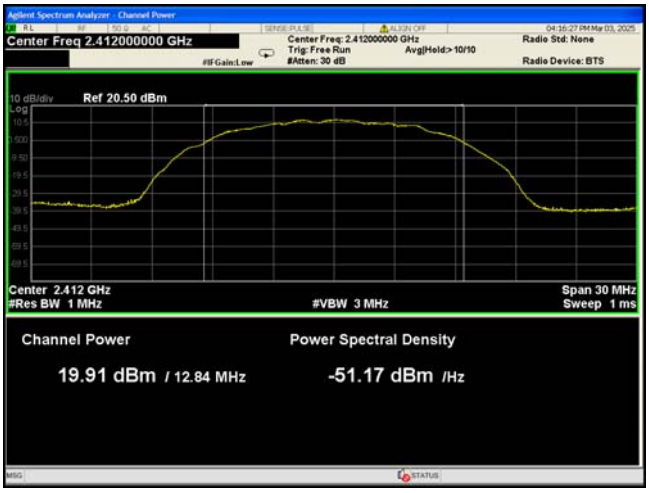
Subclause 11.9.2 of ANSI C63.10 is applicable.

13.2 Test Result

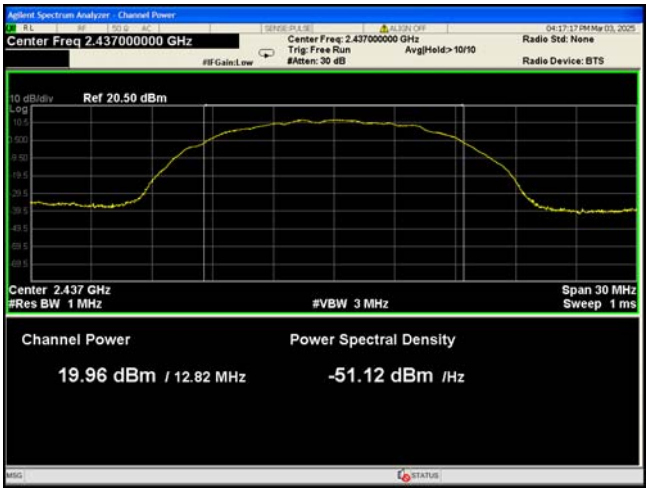
Operation mode	Channel Frequency (MHz)	Measurements (dBm)	Duty Cycle Factor (dB)	Conducted Output Power (dBm)	Limit
TX 11b	Low-2412	19.91	0.00	19.91	1W/30dBm
	Middle-2437	19.96		**19.96**	1W/30dBm
	High-2462	19.75		19.75	1W/30dBm
TX 11g	Low-2412	19.37	0.03	19.40	1W/30dBm
	Middle-2437	19.59		19.62	1W/30dBm
	High-2462	19.29		19.32	1W/30dBm
TX 11n HT20	Low-2412	18.15	0.04	18.19	1W/30dBm
	Middle-2437	18.33		18.37	1W/30dBm
	High-2462	17.97		18.01	1W/30dBm
TX 11n HT40	Low-2422	17.98	0.14	18.12	1W/30dBm
	Middle-2437	18.24		18.38	1W/30dBm
	High-2452	18.04		18.18	1W/30dBm

Test Plot:

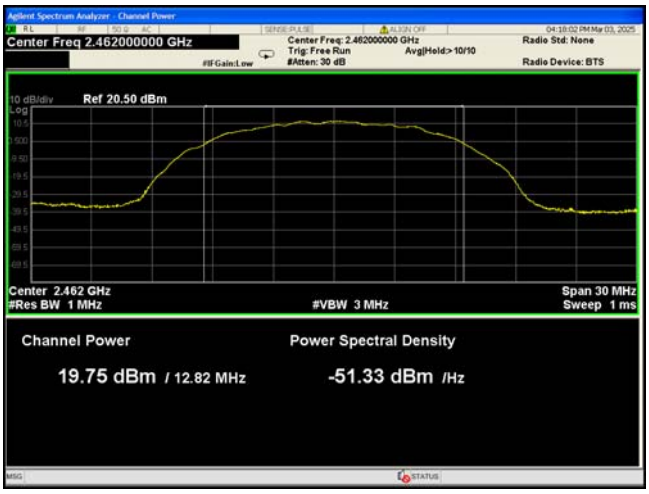
Mode: TX 11b channel 1



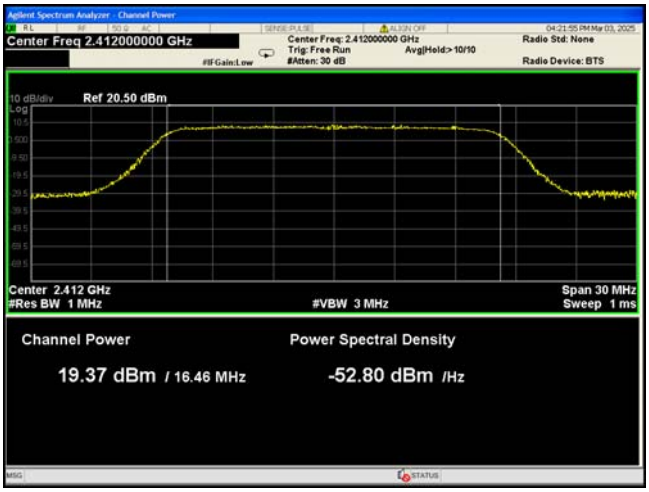
Mode: TX 11b channel 6



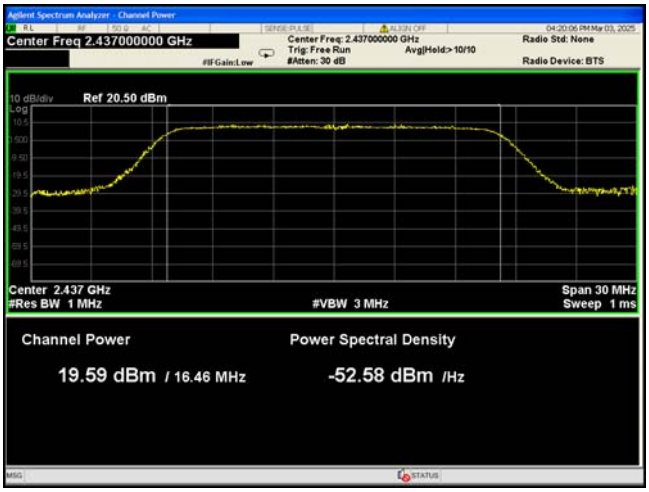
Mode: TX 11b channel 11



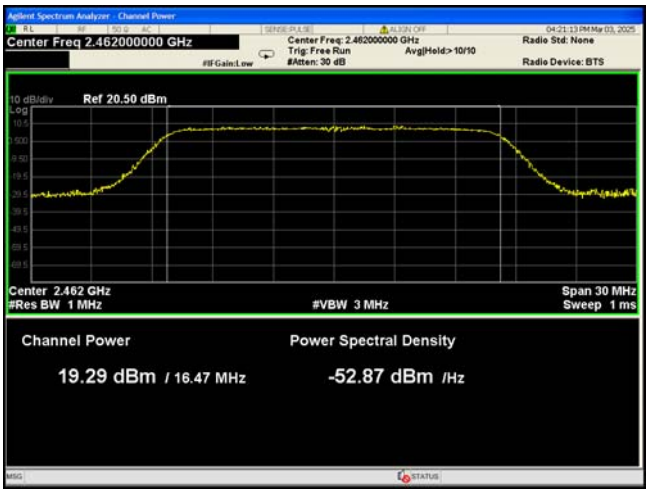
Mode: TX 11g channel 1



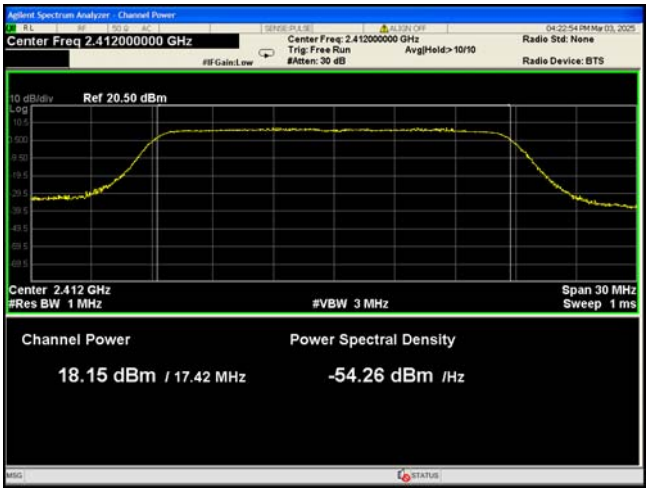
Mode: TX 11g channel 6



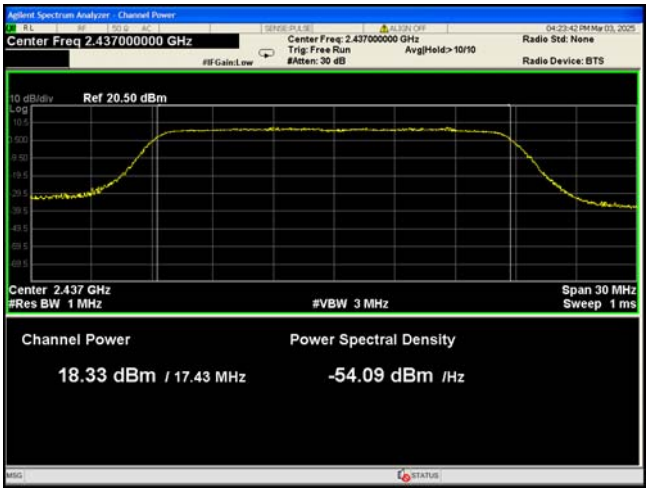
Mode: TX 11g channel 11



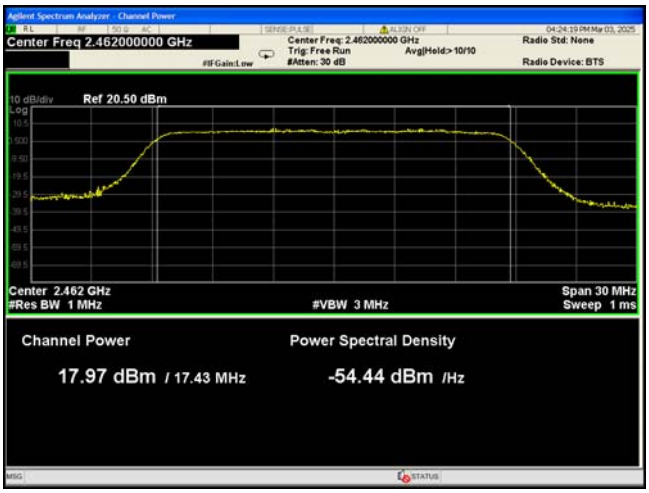
Mode: TX 11n HT20 channel 1



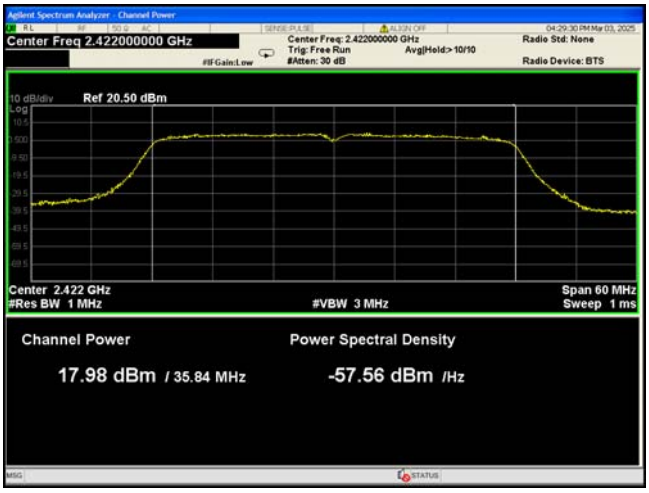
Mode: TX 11n HT20 channel 6



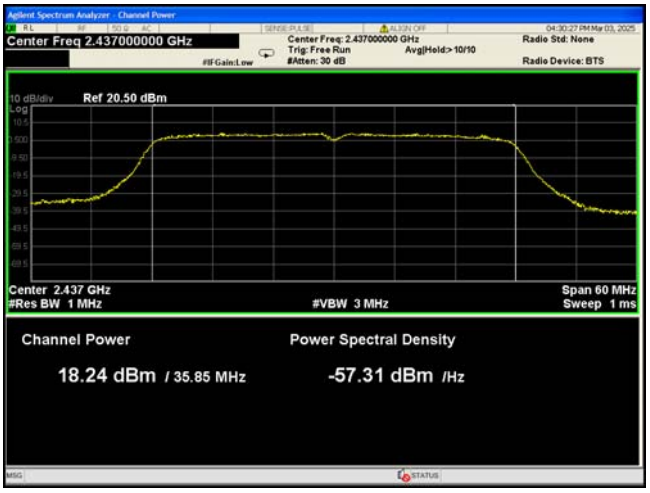
Mode: TX 11n HT20 channel 11



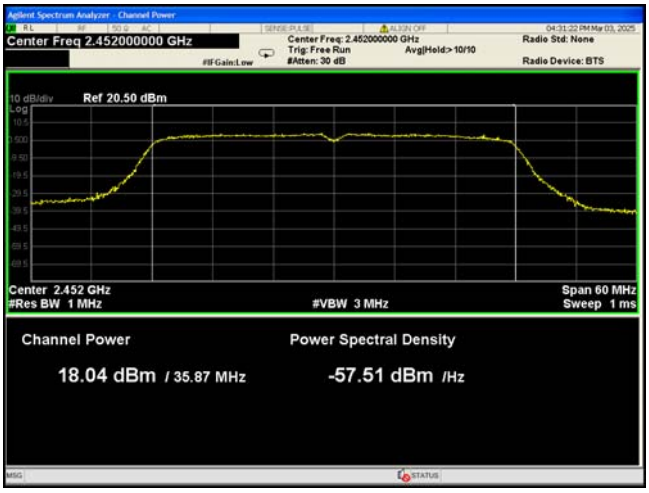
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



14 Power Spectral density

Test Requirement:	47CFR FCC Part15 Subpart C §15.247
Test Method:	ANSI C63.10-2020+A1-2024 KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019
Test Limit:	§15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
Test Mode:	Transmitting

14.1 Test Procedure

According to KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 section 8.4

Subclause 11.10 of ANSI C63.10 is applicable.

Choose the test procedure according to the product type

Peak PSD

Subclause 11.10.2 of ANSI C63.10 is applicable.

AVG PSD

Subclause 11.10.3/4/5/6/7/8 of ANSI C63.10 is applicable.

14.2 Test Result

Operation mode	Channel Frequency (MHz)	Measurements (dBm per 3kHz)	Duty Cycle Factor (dB)	Power Spectral density (dBm per 3kHz)	Limit
TX 11b	Low-2412	-12.475	0.00	-12.475	8dBm per 3kHz
	Middle-2437	-12.072		-12.072	8dBm per 3kHz
	High-2462	-11.709		-11.709	8dBm per 3kHz
TX 11g	Low-2412	-15.524	0.03	-15.494	8dBm per 3kHz
	Middle-2437	-15.356		-15.326	8dBm per 3kHz
	High-2462	-15.598		-15.568	8dBm per 3kHz
TX 11n HT20	Low-2412	-16.304	0.04	-16.264	8dBm per 3kHz
	Middle-2437	-16.607		-16.567	8dBm per 3kHz
	High-2462	-16.620		-16.580	8dBm per 3kHz
TX 11n HT40	Low-2422	-22.326	0.14	-22.186	8dBm per 3kHz
	Middle-2437	-20.510		-20.370	8dBm per 3kHz
	High-2452	-20.785		-20.645	8dBm per 3kHz

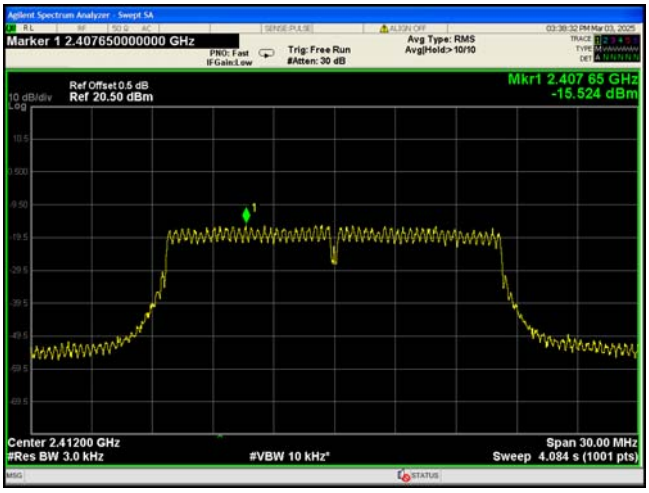
Test Plot:

Mode: TX 11b channel 1

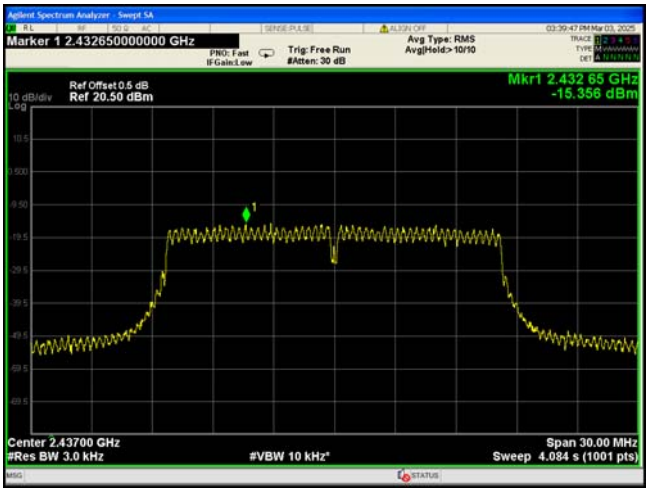
Mode: TX 11b channel 6

Mode: TX 11b channel 11

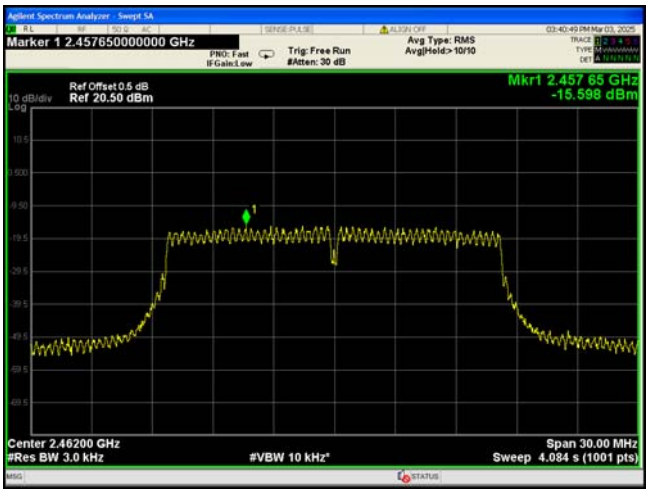
Mode: TX 11g channel 1



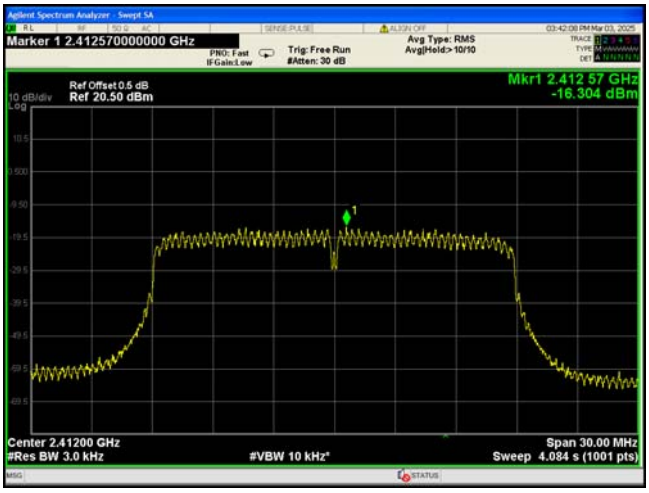
Mode: TX 11g channel 6



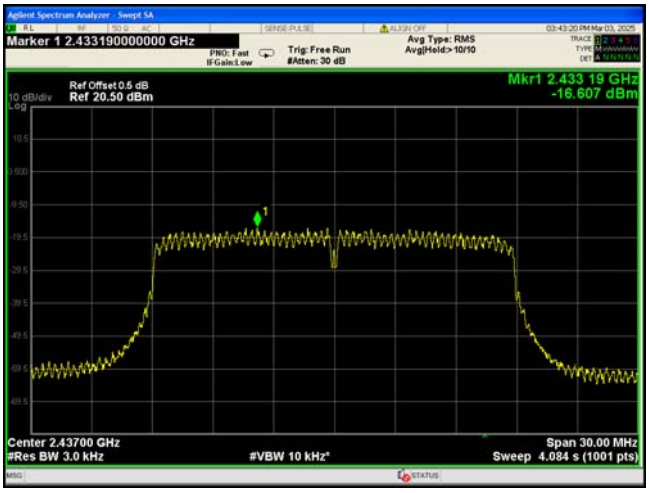
Mode: TX 11g channel 11



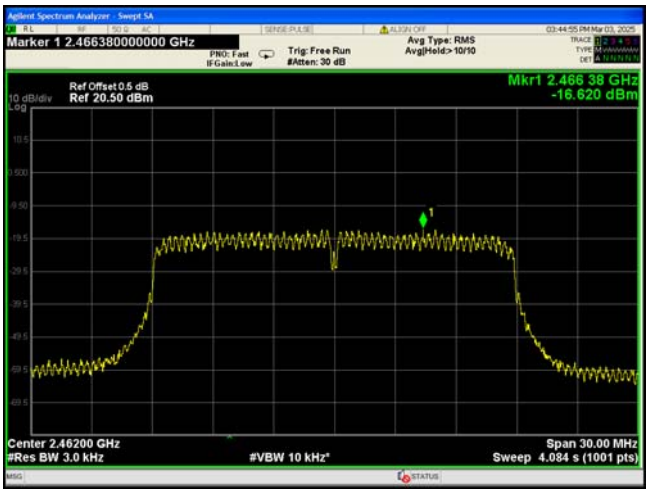
Mode: TX 11n HT20 channel 1



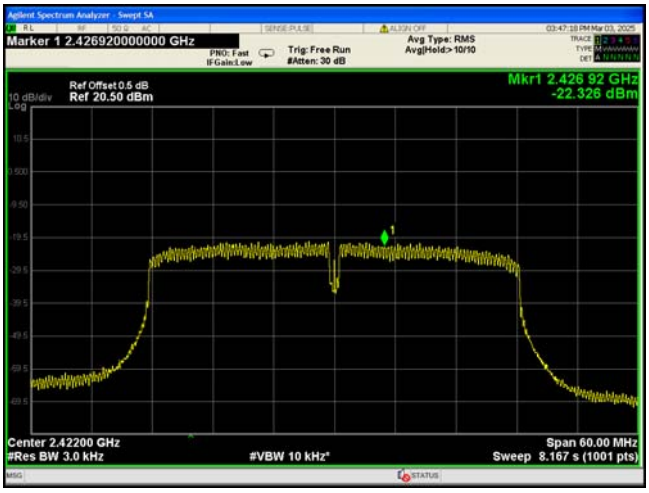
Mode: TX 11n HT20 channel 6



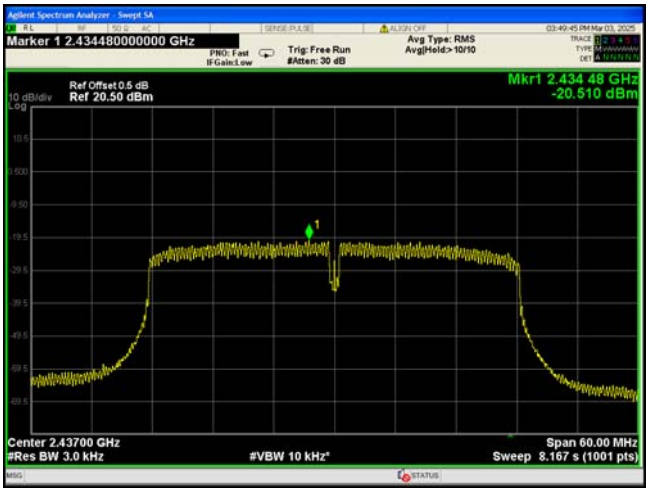
Mode: TX 11n HT20 channel 11



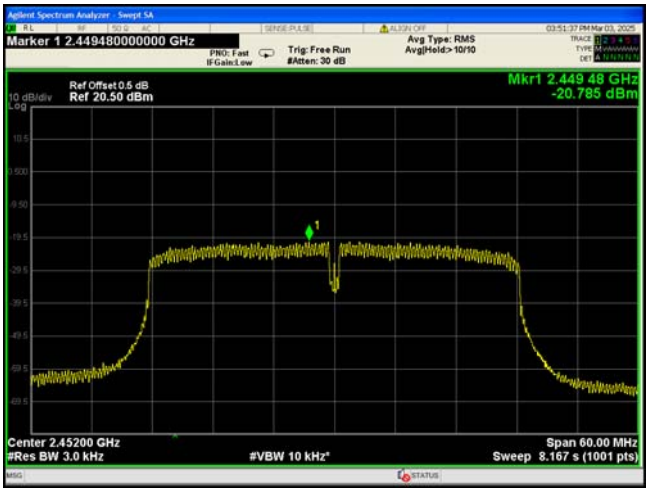
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



15 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a PCB Antenna fulfil the requirement of this section.

Note: Please refer to EUT photos for more details.

16 RF Exposure

Note: Please refer to RF Exposure Report: WTF25D01007819W003.

17 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-F1-Photos.

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