



RF TEST REPORT

Applicant Dspread Technology (Beijing) Inc
FCC ID 2AGQ6-D20PRO
Product Smart POS
Model D20
Report No. EFTA25020102-IE-08-R2V1
Issue Date April 30, 2025

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2024)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Xu Ying

Approved by: Xu Kai

Eurofins TA Technology (Shanghai) Co., Ltd.

Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

TABLE OF CONTENT

1. Test Laboratory	5
1.1. Notes of the Test Report.....	5
1.2. Test Facility.....	5
1.3. Testing Location.....	5
2. General Description of Equipment Under Test.....	6
2.1. Applicant and Manufacturer Information	6
2.2. General Information	6
3. Applied Standards.....	7
4. Test Configuration.....	8
5. Test Case Results.....	9
5.1. Maximum output power	9
5.2. 99% Bandwidth and 6dB Bandwidth	12
5.3. Band Edge	32
5.4. Power Spectral Density	45
5.5. Spurious RF Conducted Emissions.....	57
5.6. Unwanted Emission	77
5.7. Conducted Emission.....	115
6. Main Test Instruments.....	120
ANNEX A: The EUT Appearance.....	121
ANNEX B: Test Setup Photos.....	122

Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	April 21, 2025
Rev.1	Updated information.	April 30, 2025
Note: This revised report (Report No.: EFTA25020102-IE-08-R2V1) supersedes and replaces the previously issued report (Report No.: EFTA25020102-IE-08-R2). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	Maximum output power	15.247(b)(3)	PASS
2	99% Bandwidth and 6dB Bandwidth	15.247(a)(2) C63.10 6.9	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Unwanted Emissions	15.247(d), 15.205, 15.209	PASS
7	Conducted Emissions	15.207	PASS
Date of Testing: March 8, 2025 ~ March 20, 2025			
Date of Sample Received: February 19, 2025			
Note: All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <https://www.eurofins.com/electrical-and-electronics>
E-mail: Kain.Xu@cpt.eurofinscn.com

2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

Applicant	Dspread Technology (Beijing) Inc
Applicant address	Rm.407, B12C, #10 (Universal Business Park), Jiuxianqiao Road, Chaoyang District, Beijing, China,100015
Manufacturer	Dspread Technology (Beijing) Inc
Manufacturer address	Rm.407, B12C, #10 (Universal Business Park), Jiuxianqiao Road, Chaoyang District, Beijing, China,100015

2.2. General Information

EUT Description		
Model	D20	
IMEI	Conducted	01243020202410240003
	Radiated	01243020202410240001
Hardware Version	2.0.0	
Software Version	2.1.1	
Power Supply	Battery / AC adapter	
Antenna Type	Internal Antenna	
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)	
Antenna Gain	0.35 dBi	
Additional Beamforming Gain	NA	
Operating Frequency Range(s)	802.11b/g/n(HT20): 2412 ~ 2462 MHz 802.11n(HT40): 2422 ~ 2452 MHz Bluetooth LE V5.0: 2402 ~2480 MHz	
Modulation Type	802.11b: DSSS 802.11g/n: OFDM Bluetooth LE: GFSK	
Max. Output Power	Wi-Fi 2.4GHz: 19.14 dBm Bluetooth LE: -0.45 dBm	
Operating voltage range	3.45 V to 4.35 V	
State voltage	3.80 V	
EUT Accessory		
Battery	Manufacturer: Guangdong Fenghua New Energy Co.,Ltd. Model: D20	
USB Cable	Manufacturer: Shenzhen FKY-QY Hardware&Electronics.,Ltd. Model: XC04W1000100	
Adapter	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO., LTD. Model: TPA-46B050100UU	
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.		

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15C (2024) Radio Frequency Devices

ANSI C63.10-2013

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (Z axis) and the loop antenna is vertical, the others are vertical and horizontal. and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Test Mode	Data Rate
Bluetooth(Low Energy)	1Mbps; 2Mbps
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

5. Test Case Results

5.1. Maximum output power

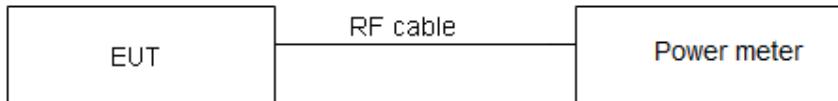
Ambient Condition

Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Methods of Measurement

During the process of the testing, The EUT was connected to Power meter with a known loss. The EUT is max power transmission with proper modulation.

Test Setup



Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz: 1 Watt."

Average Output Power	$\leq 1\text{W (}30\text{dBm)}$
----------------------	---------------------------------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44$ dB.

Test Results

Power Index					
Channel	802.11b	802.11g	802.11n HT20	Channel	802.11n HT40
CH1	19.5	17	17.5	CH3	15
CH6	19.5	17	17.5	CH6	15
CH11	19.5	17	17.5	CH9	15

Power Index	
Channel	Bluetooth (Low Energy)
CH0	default
CH19	default
CH39	default

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11b	1.000	0.000
802.11g	0.971	0.130
802.11n HT20	0.968	0.140
802.11n HT40	0.939	0.270
Bluetooth LE (1M)	0.320	4.950
Bluetooth LE (2M)	0.333	4.780

Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.

Test Mode	Carrier frequency (MHz)/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH 1	19.14	19.14	30	PASS
	2437/CH 6	19.11	19.11	30	PASS
	2462/CH11	19.04	19.04	30	PASS
802.11g	2412/CH 1	16.21	16.34	30	PASS
	2437/CH 6	16.48	16.61	30	PASS
	2462/CH11	16.36	16.49	30	PASS
802.11n HT20	2412/CH 1	16.70	16.84	30	PASS
	2437/CH 6	16.77	16.91	30	PASS
	2462/CH11	16.89	17.03	30	PASS
802.11n HT40	2422/CH3	14.50	14.77	30	PASS
	2437/CH6	14.57	14.84	30	PASS
	2452/CH9	14.62	14.89	30	PASS
Bluetooth (Low Energy) (1M)	2402/CH0	-5.48	-0.53	30	PASS
	2440/CH19	-5.45	-0.50	30	PASS
	2480/CH39	-5.82	-0.87	30	PASS
Bluetooth (Low Energy) (2M)	2402/CH0	-5.39	-0.61	30	PASS
	2440/CH19	-5.23	-0.45	30	PASS
	2480/CH39	-5.77	-0.99	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

5.2. 99% Bandwidth and 6dB Bandwidth

Ambient Condition

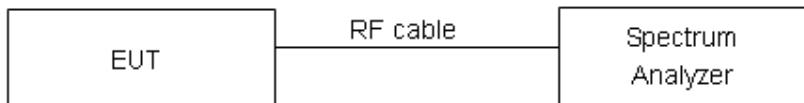
Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer. Dector=Peak, Trace mode=max hold.

The EUT was connected to the spectrum analyzer through a known loss cable. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

Test Setup



Limits

Rule Part 15.247 (a) (2) specifies that "Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz."

minimum 6 dB bandwidth	≥ 500 kHz
------------------------	----------------

Measurement Uncertainty

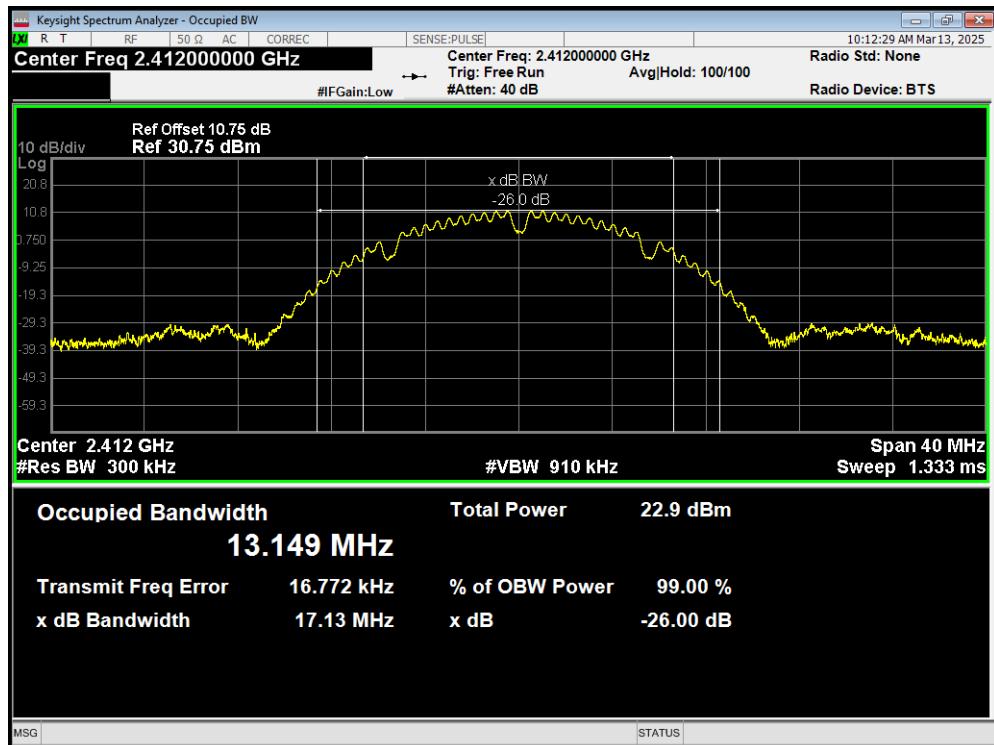
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

Test Results:

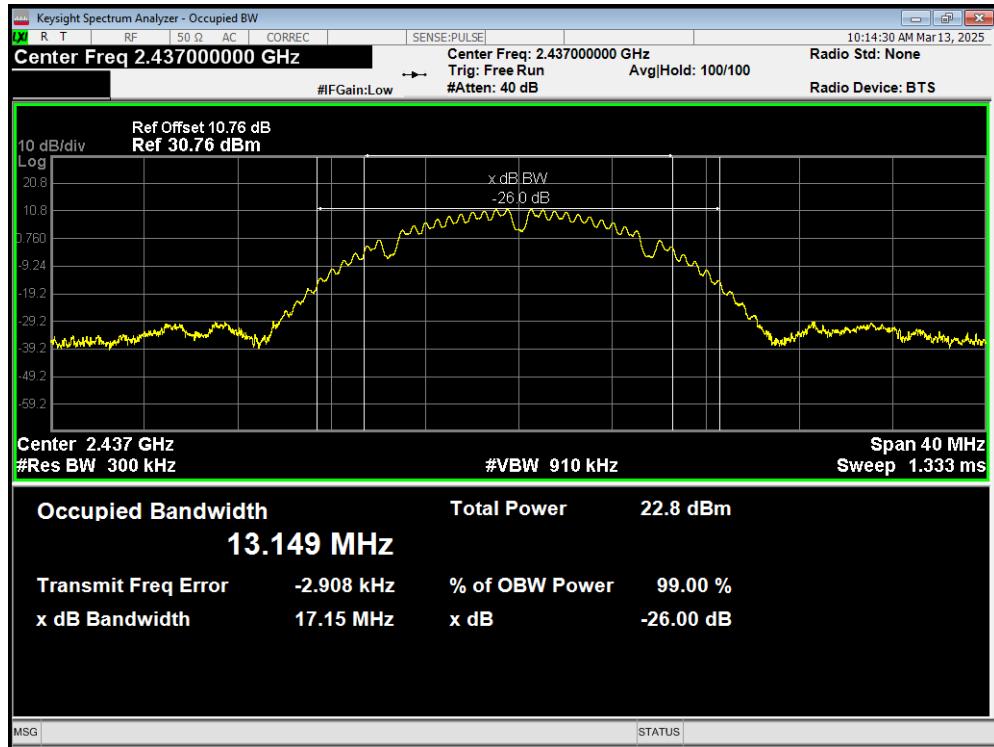
Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	13.149	8.019	500	PASS
	2437	13.149	8.039	500	PASS
	2462	13.158	7.595	500	PASS
802.11g	2412	16.617	15.708	500	PASS
	2437	16.566	14.784	500	PASS
	2462	16.554	14.874	500	PASS
802.11n HT20	2412	17.702	13.829	500	PASS
	2437	17.677	15.129	500	PASS
	2462	17.715	13.732	500	PASS
802.11n HT40	2422	36.073	33.853	500	PASS
	2437	36.047	33.853	500	PASS
	2452	36.133	35.076	500	PASS
Bluetooth (Low Energy) (1M)	2402	1.034	0.673	500	PASS
	2440	1.043	0.673	500	PASS
	2480	1.039	0.674	500	PASS
Bluetooth (Low Energy) (2M)	2402	2.067	1.154	500	PASS
	2440	2.070	1.137	500	PASS
	2480	2.074	1.160	500	PASS

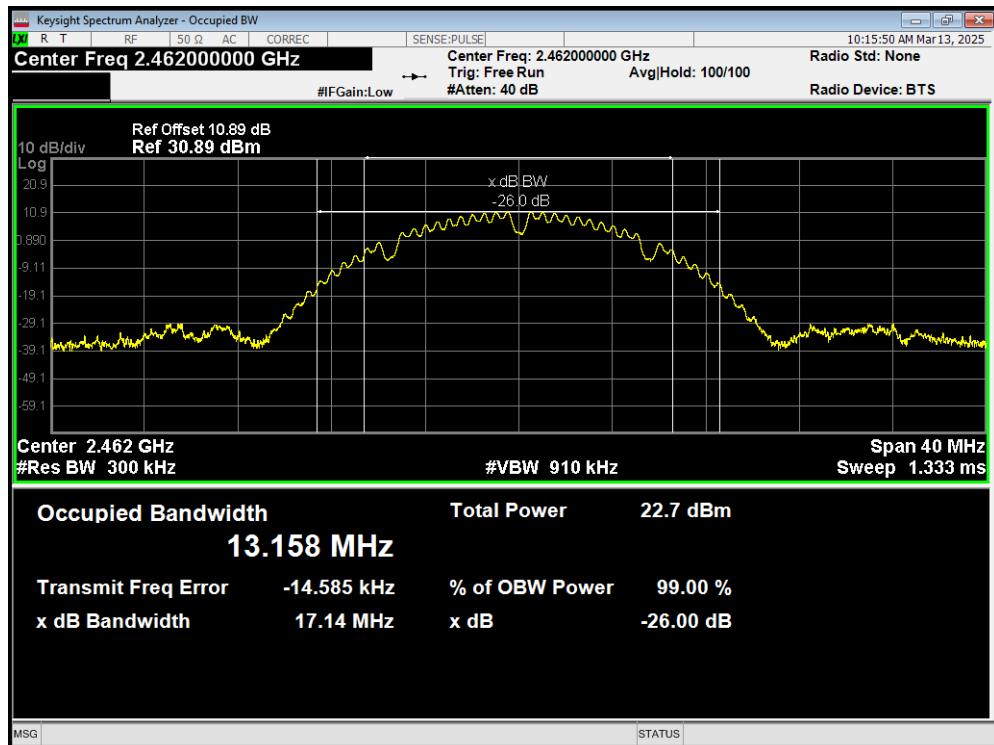
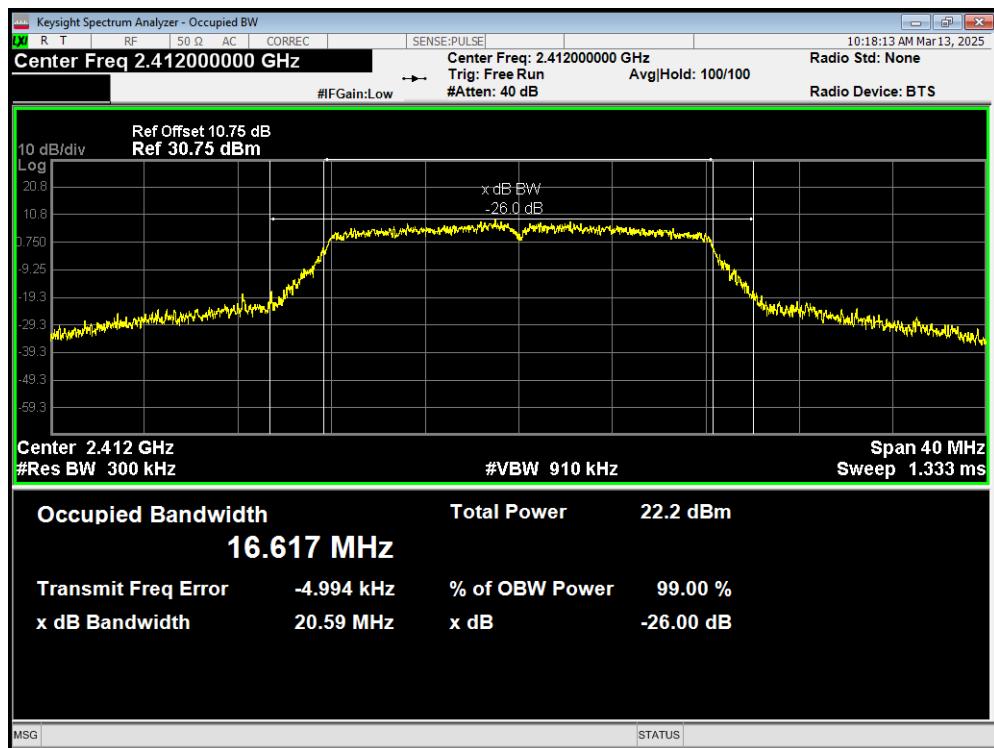
99%bandwidth

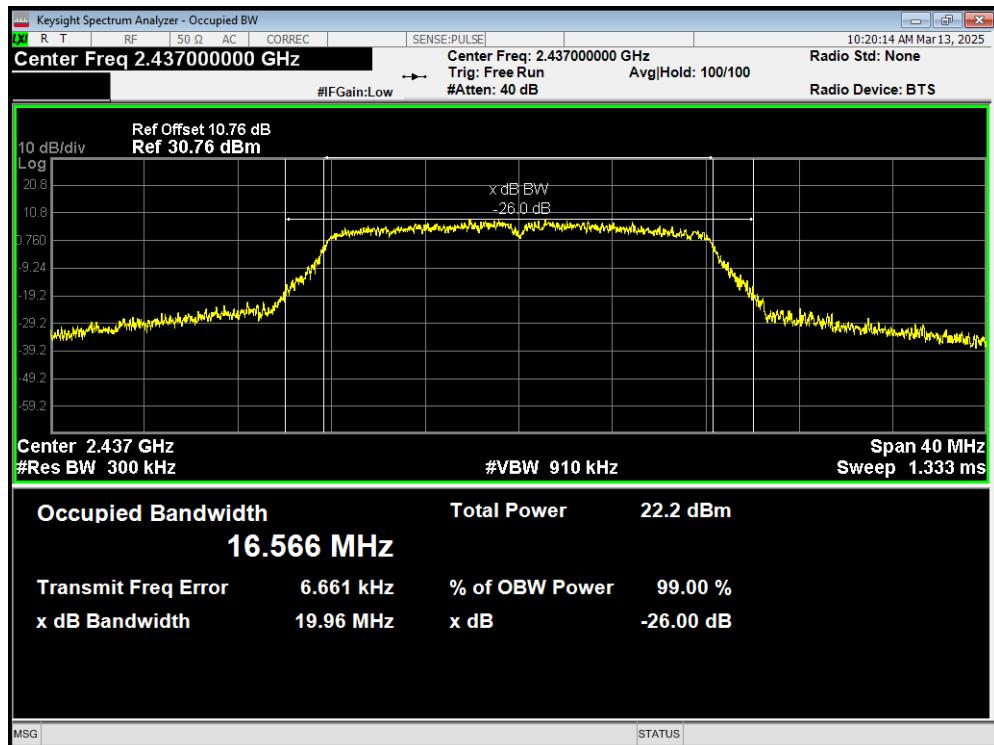
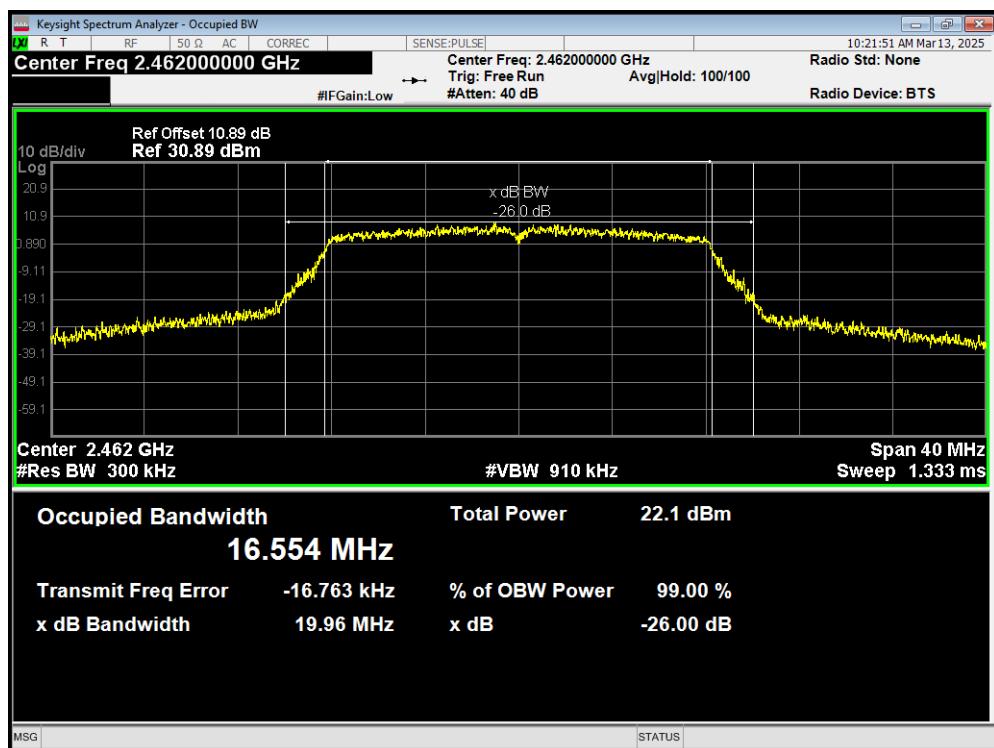
OBW 802.11b 2412MHz

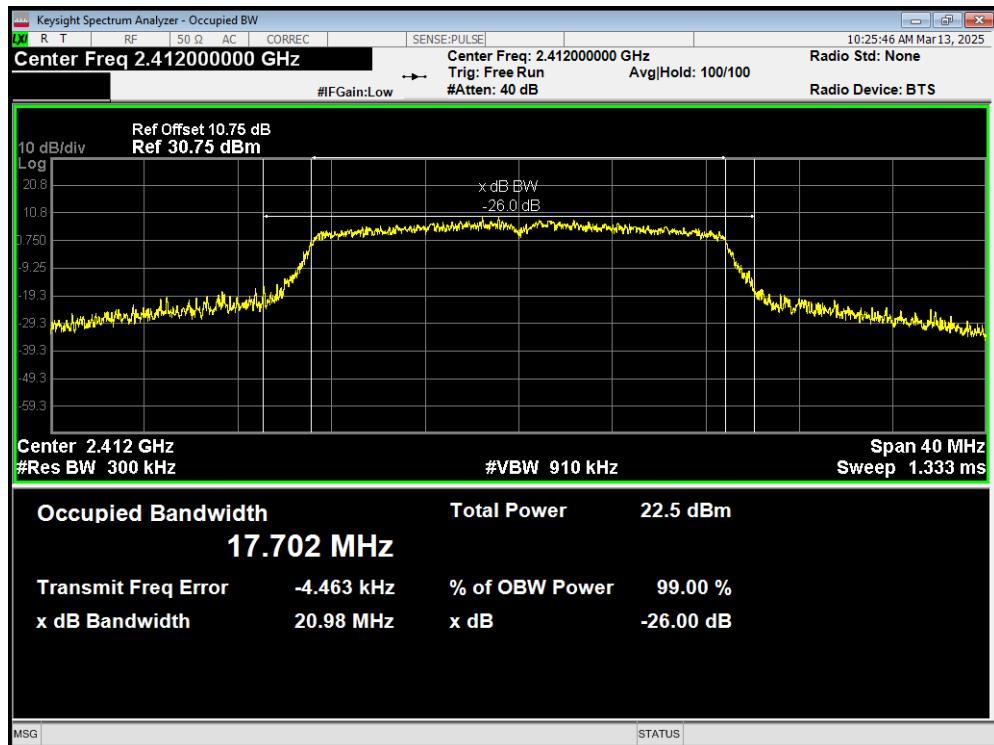
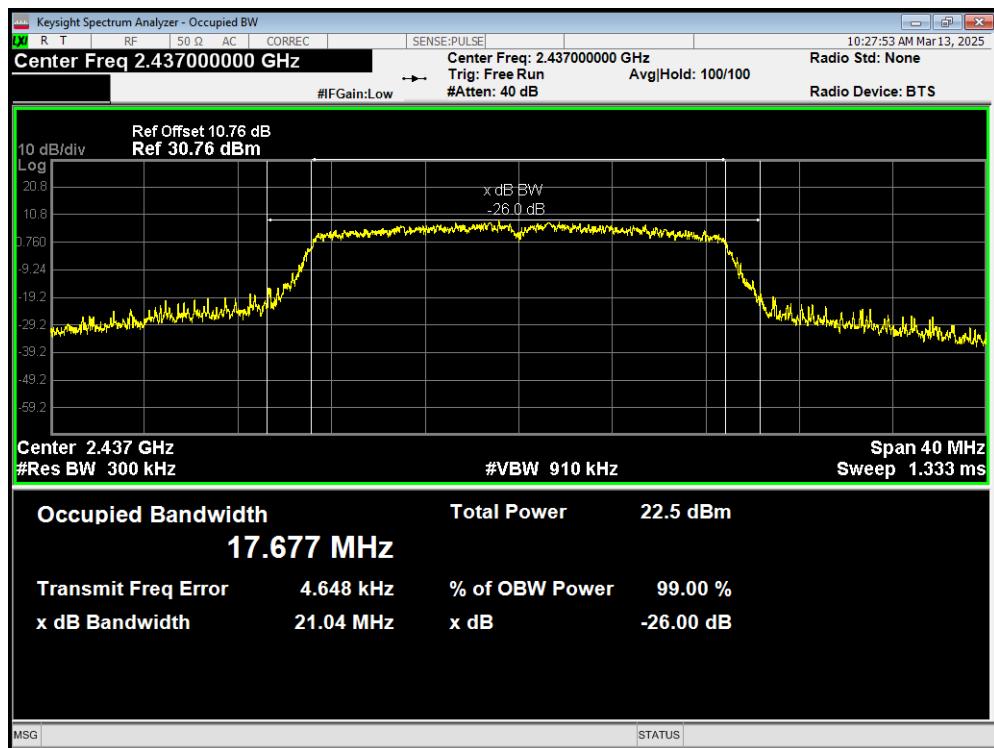


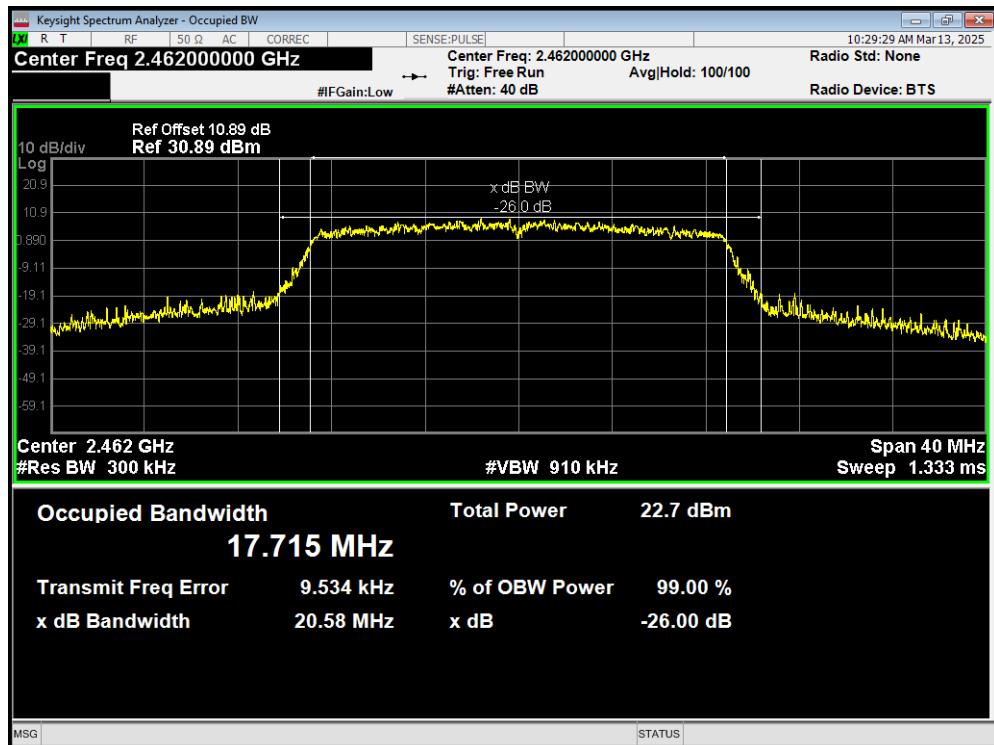
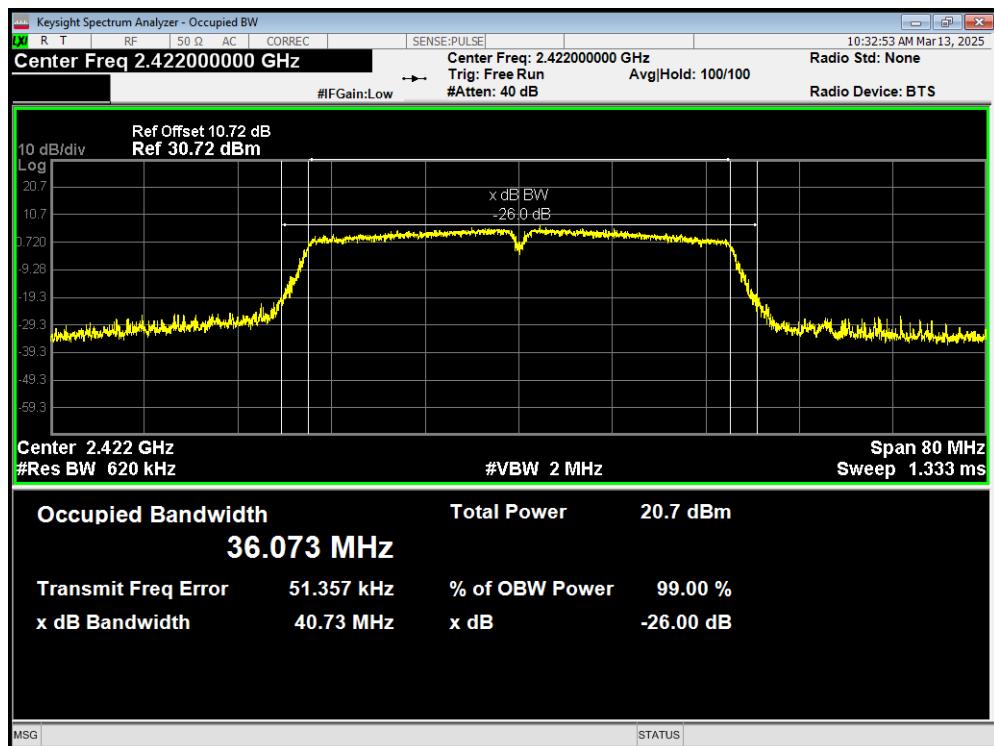
OBW 802.11b 2437MHz

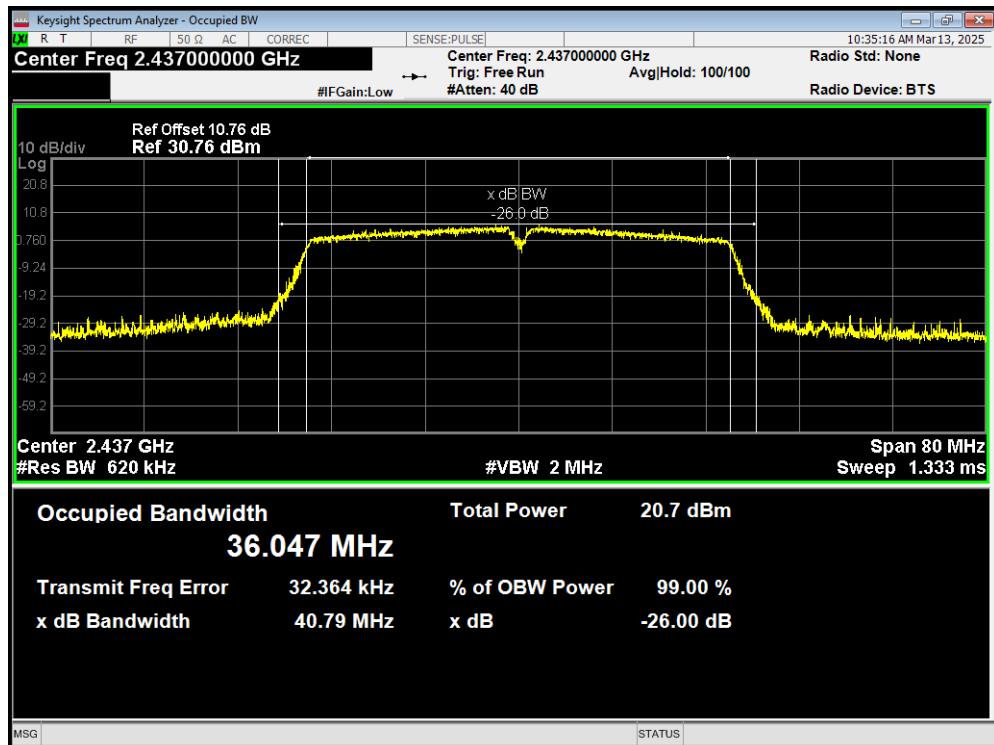
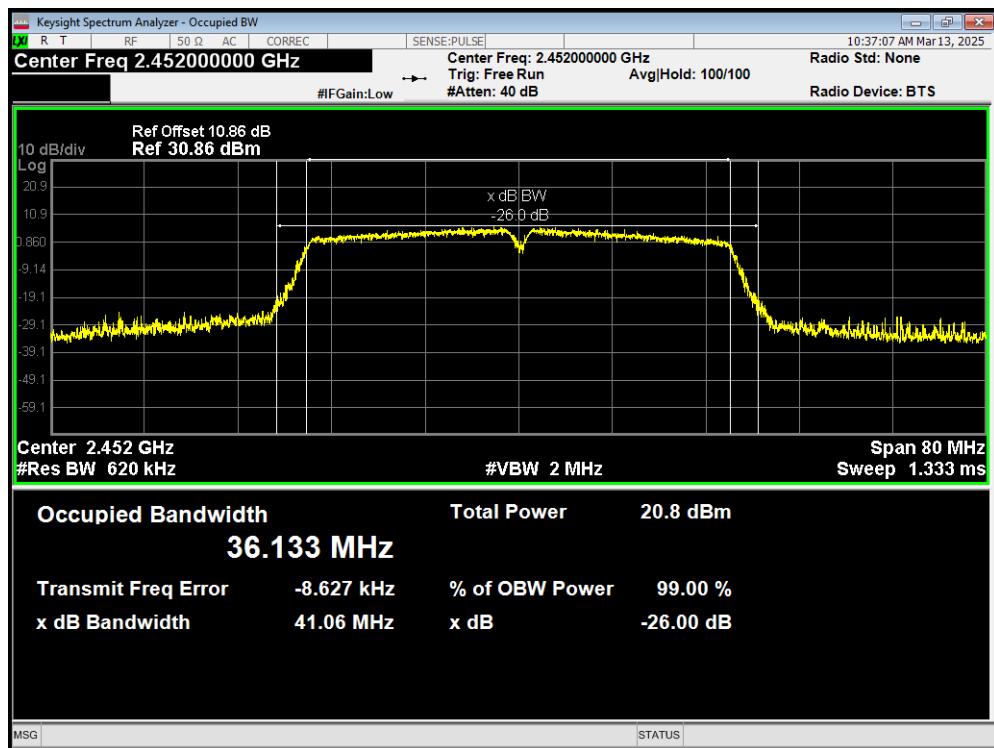


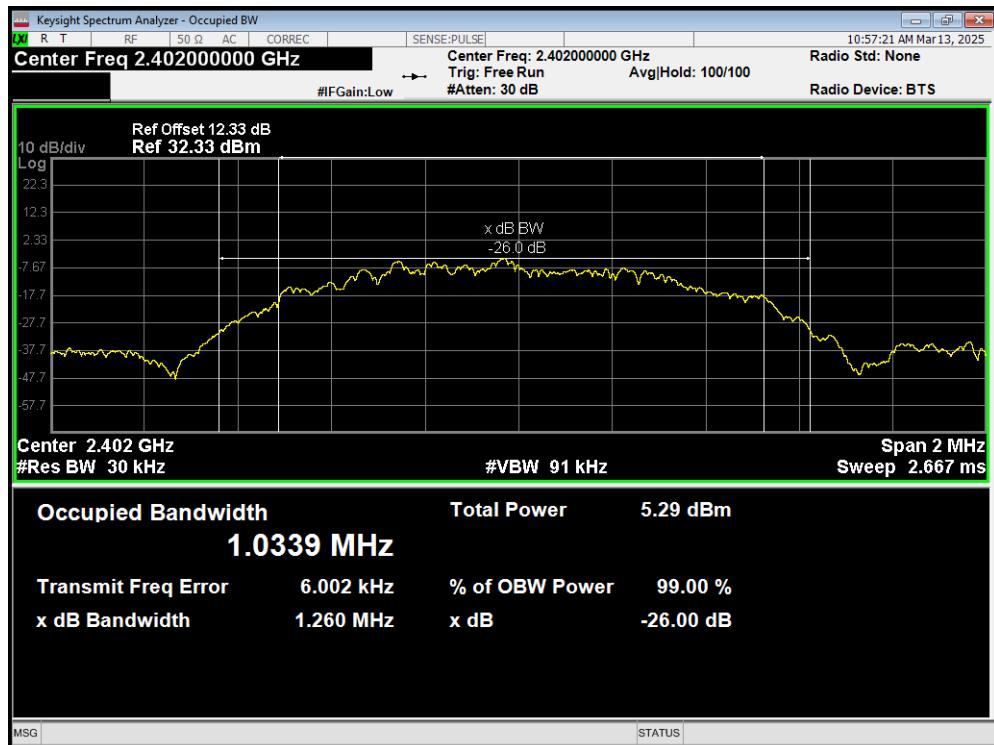
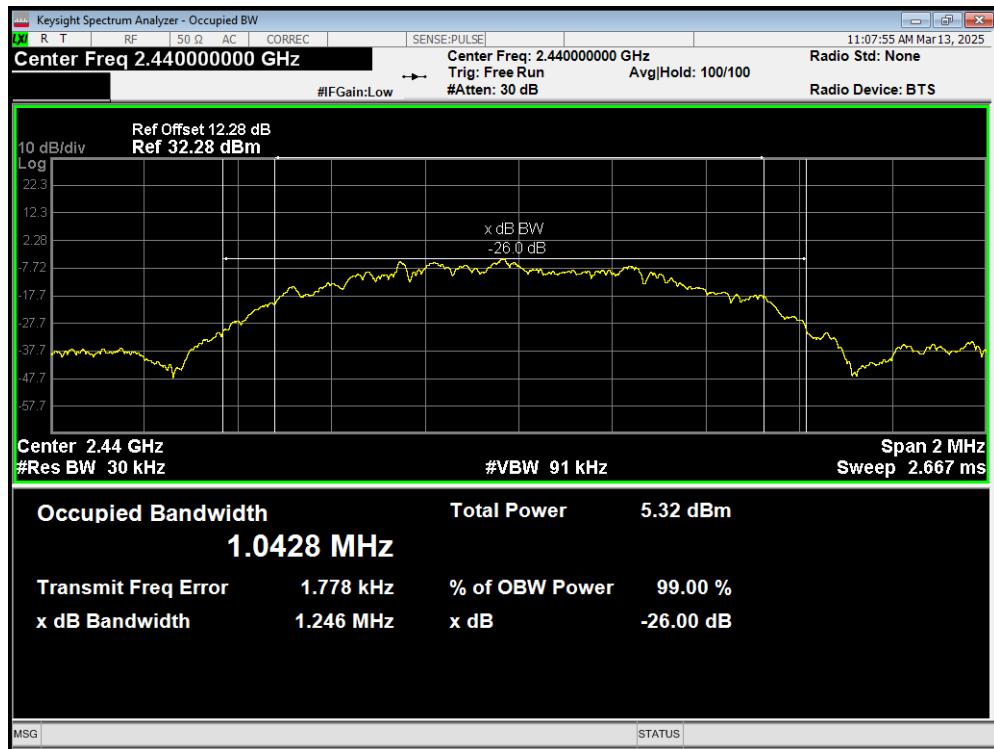
OBW 802.11b 2462MHz

OBW 802.11g 2412MHz


OBW 802.11g 2437MHz

OBW 802.11g 2462MHz


OBW 802.11n(HT20) 2412MHz

OBW 802.11n(HT20) 2437MHz


OBW 802.11n(HT20) 2462MHz

OBW 802.11n(HT40) 2422MHz


OBW 802.11n(HT40) 2437MHz

OBW 802.11n(HT40) 2452MHz


OBW Bluetooth LE (1M) 2402MHz

OBW Bluetooth LE (1M) 2440MHz


OBW Bluetooth LE (1M) 2480MHz

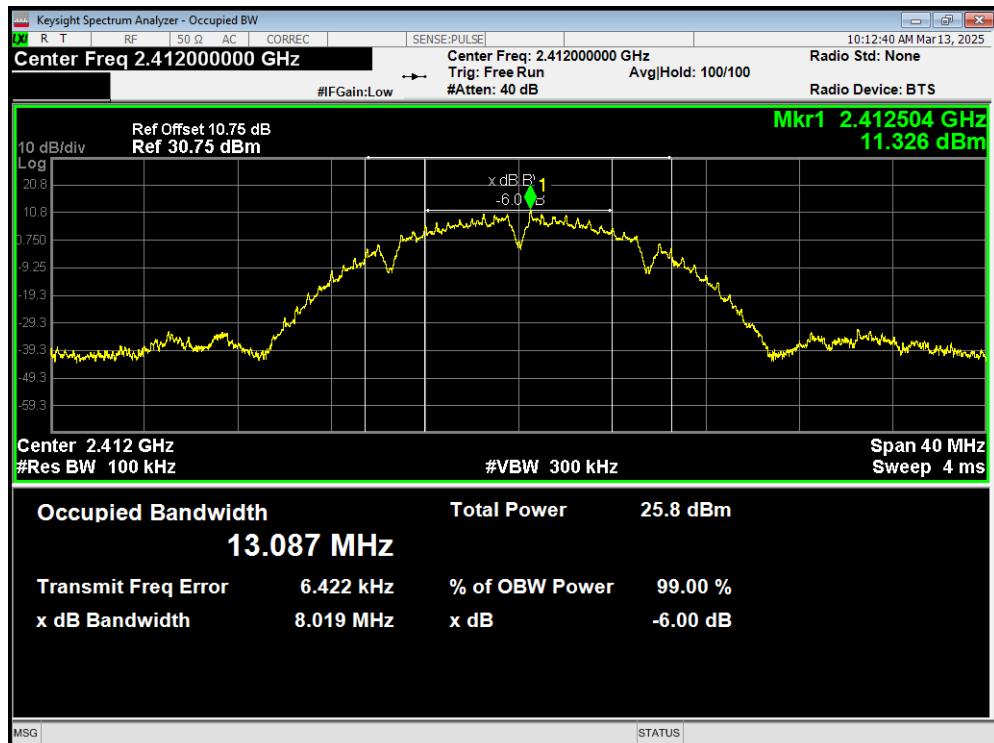
OBW Bluetooth LE (2M) 2402MHz


OBW Bluetooth LE (2M) 2440MHz

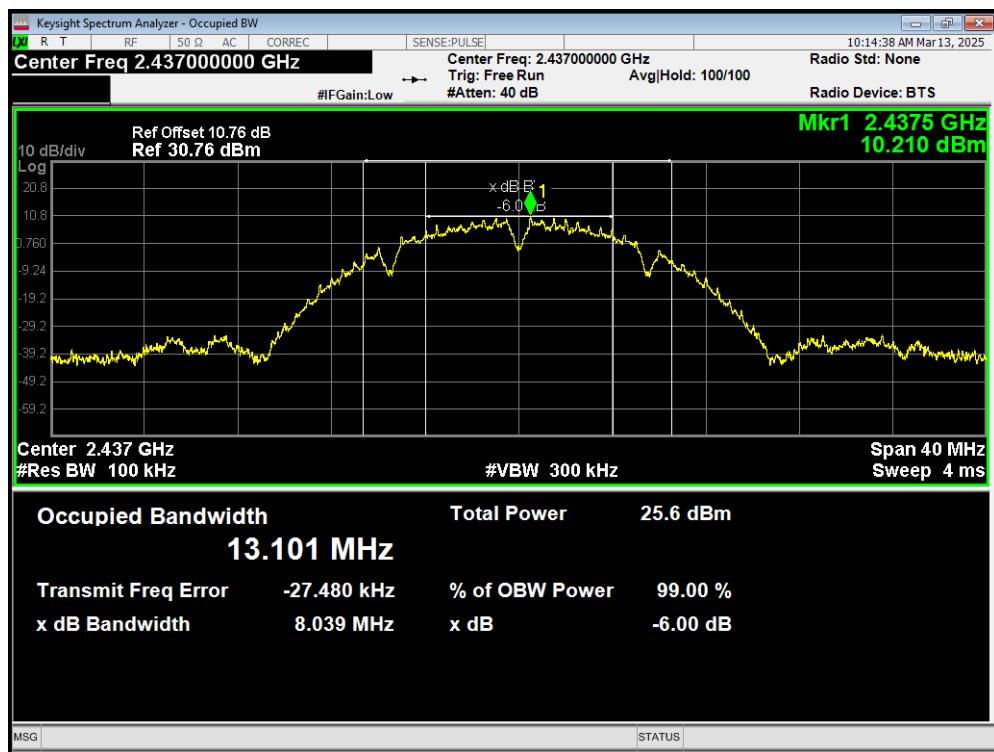
OBW Bluetooth LE (2M) 2480MHz

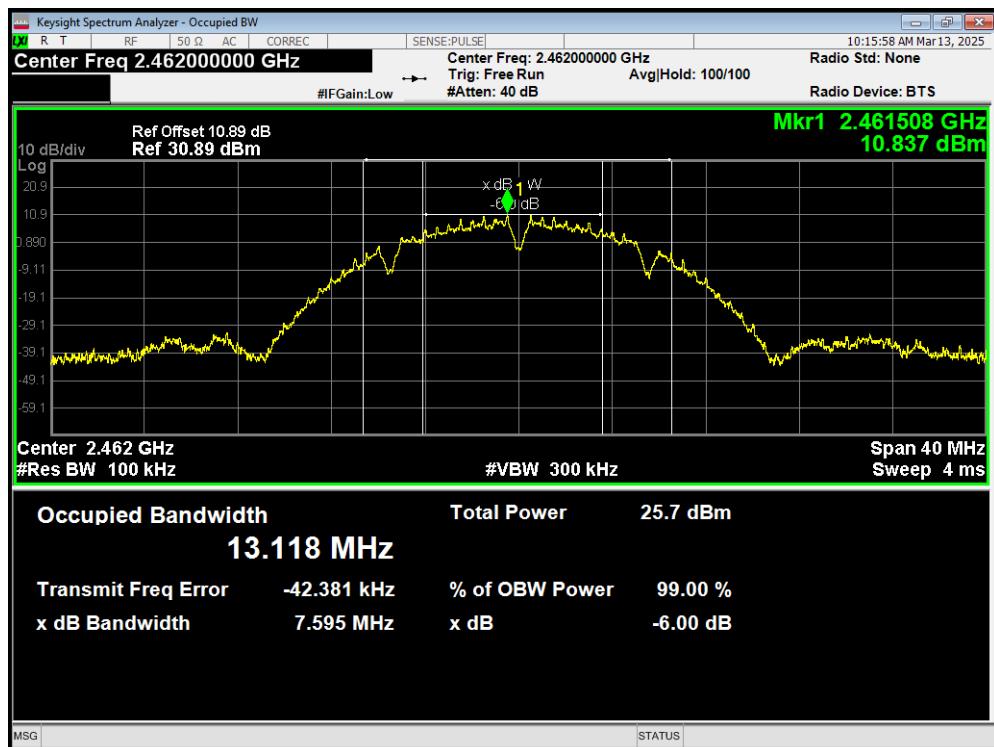
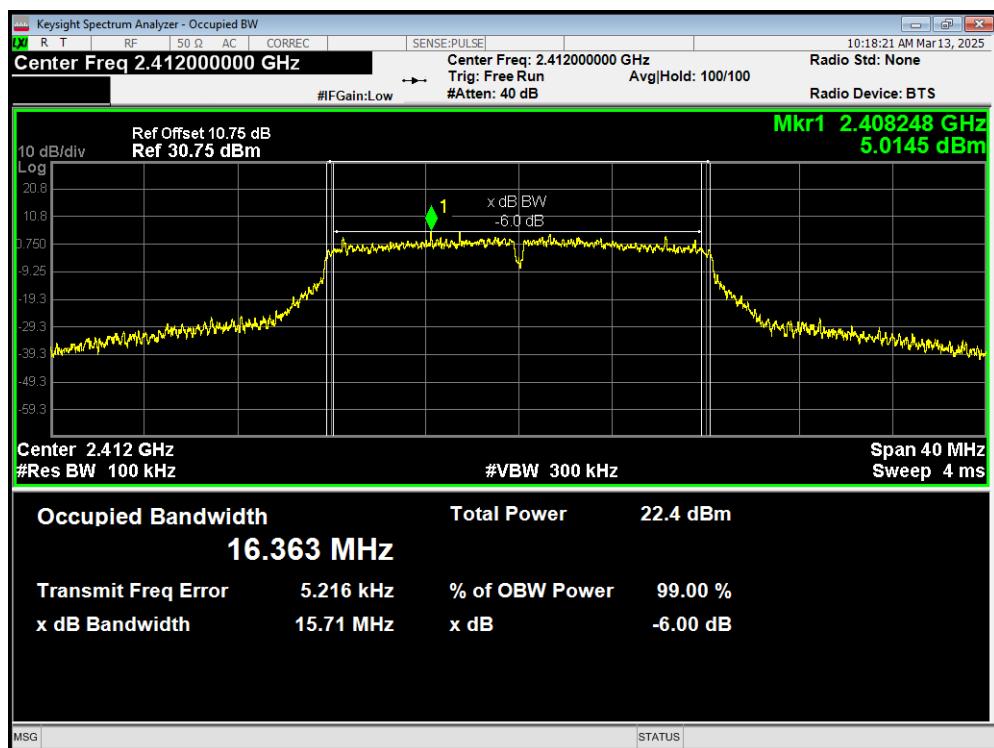

6 dB bandwidth

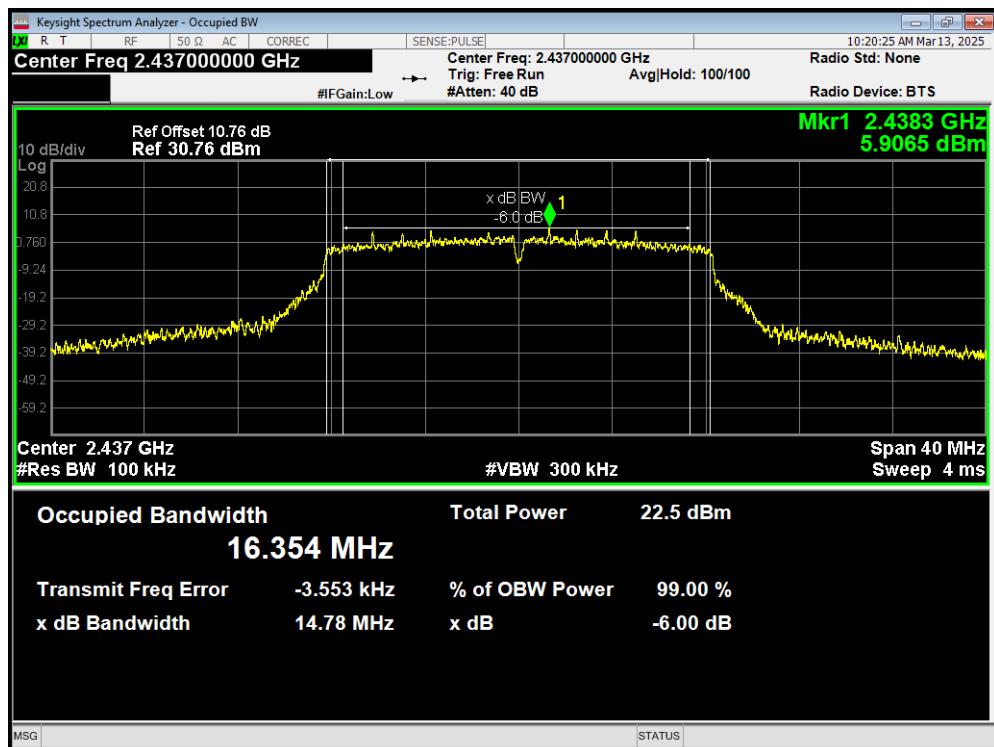
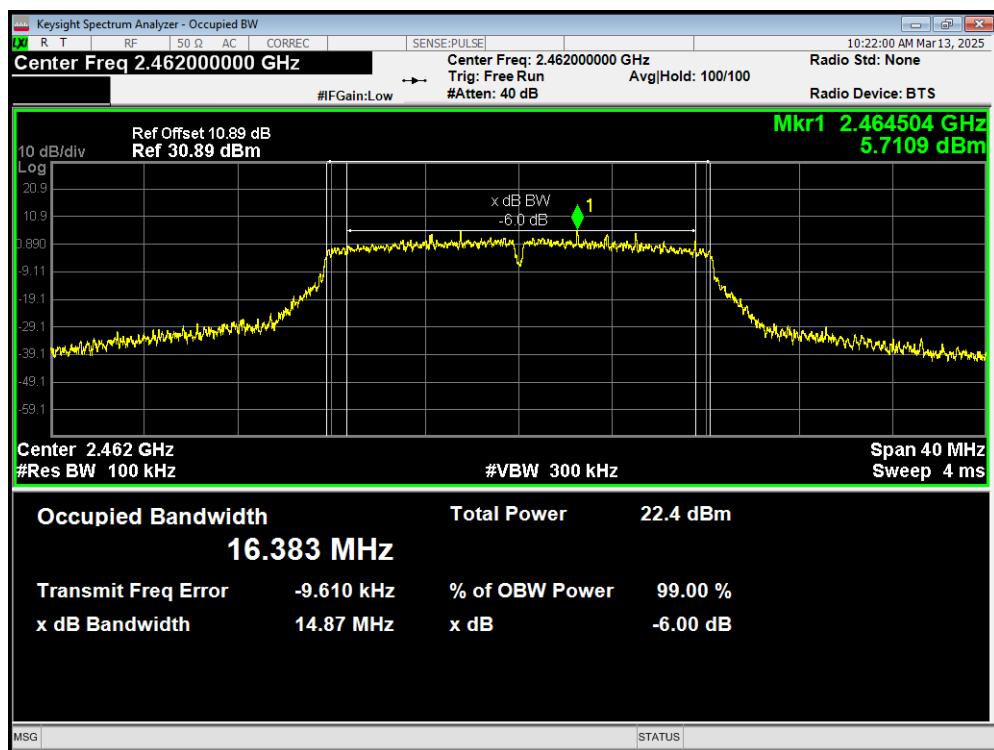
-6dB Bandwidth 802.11b 2412MHz

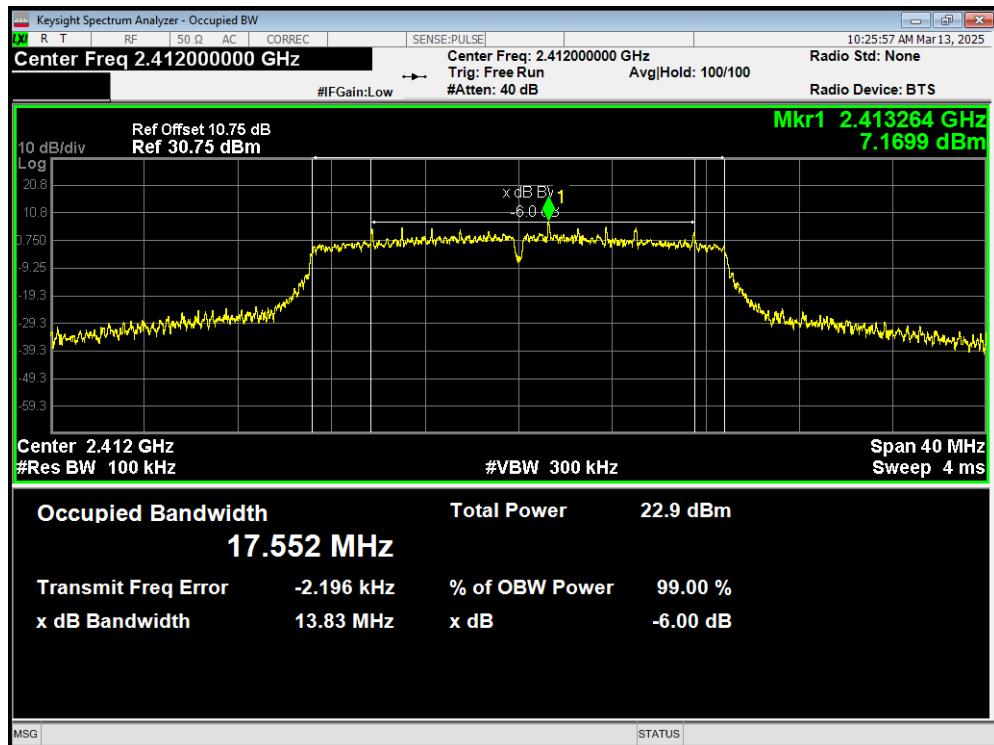
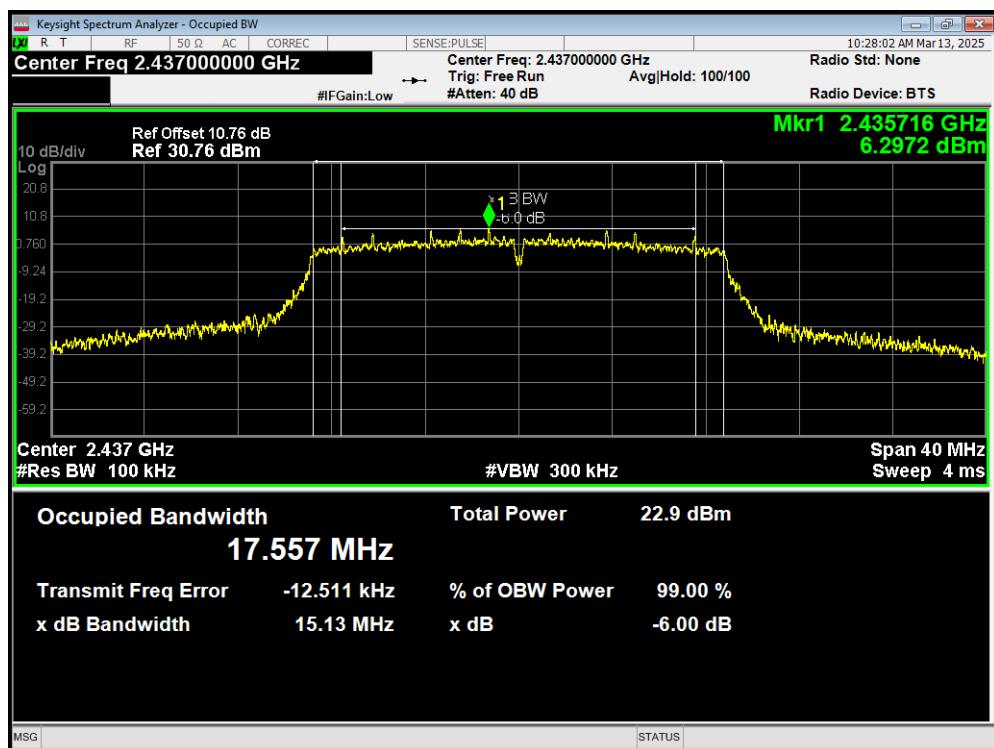


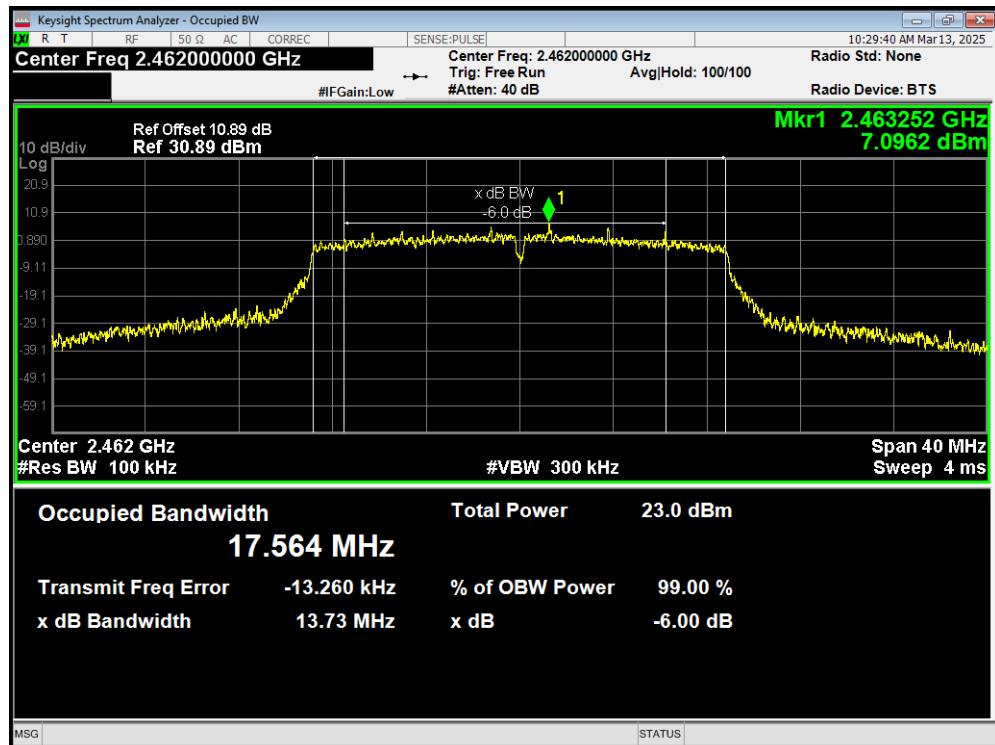
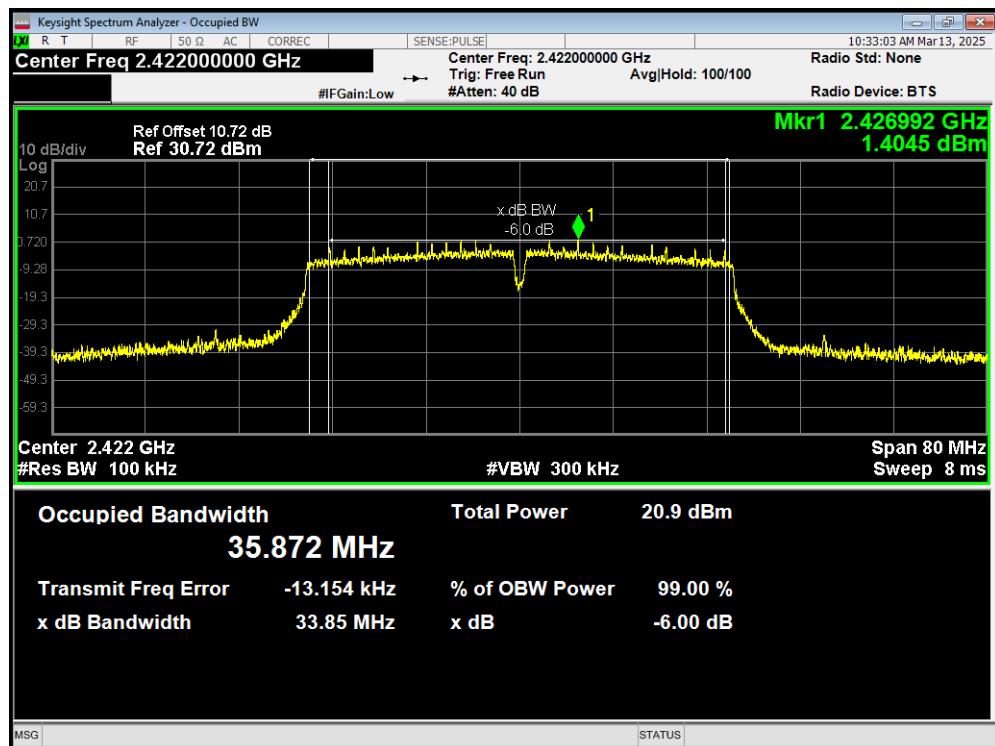
-6dB Bandwidth 802.11b 2437MHz



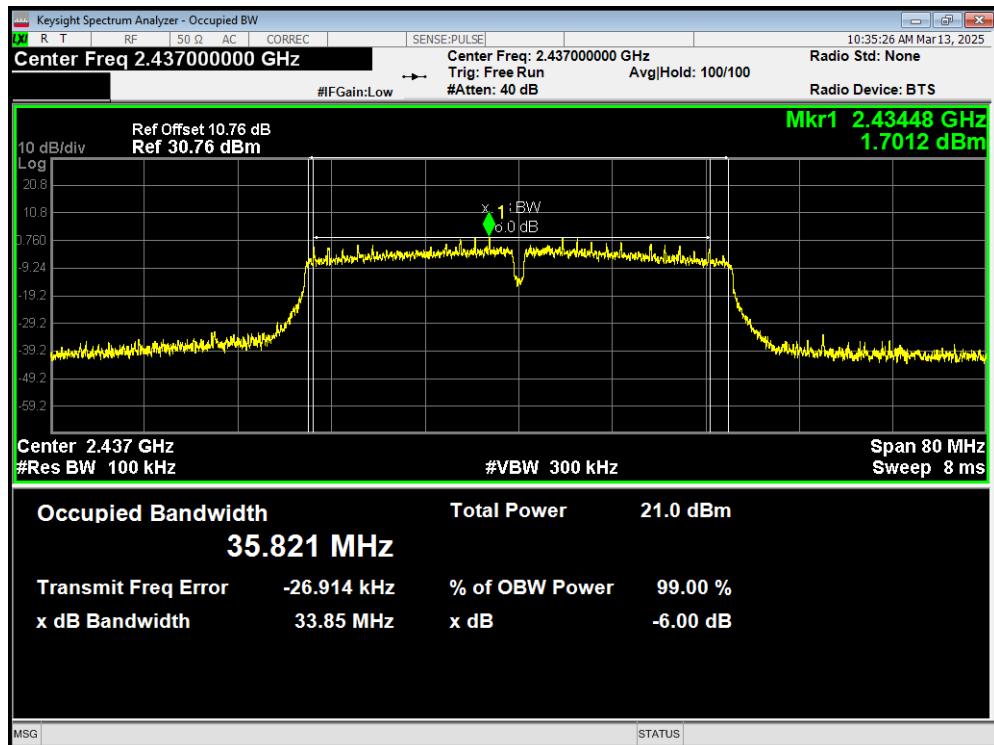
-6dB Bandwidth 802.11b 2462MHz

-6dB Bandwidth 802.11g 2412MHz


-6dB Bandwidth 802.11g 2437MHz

-6dB Bandwidth 802.11g 2462MHz


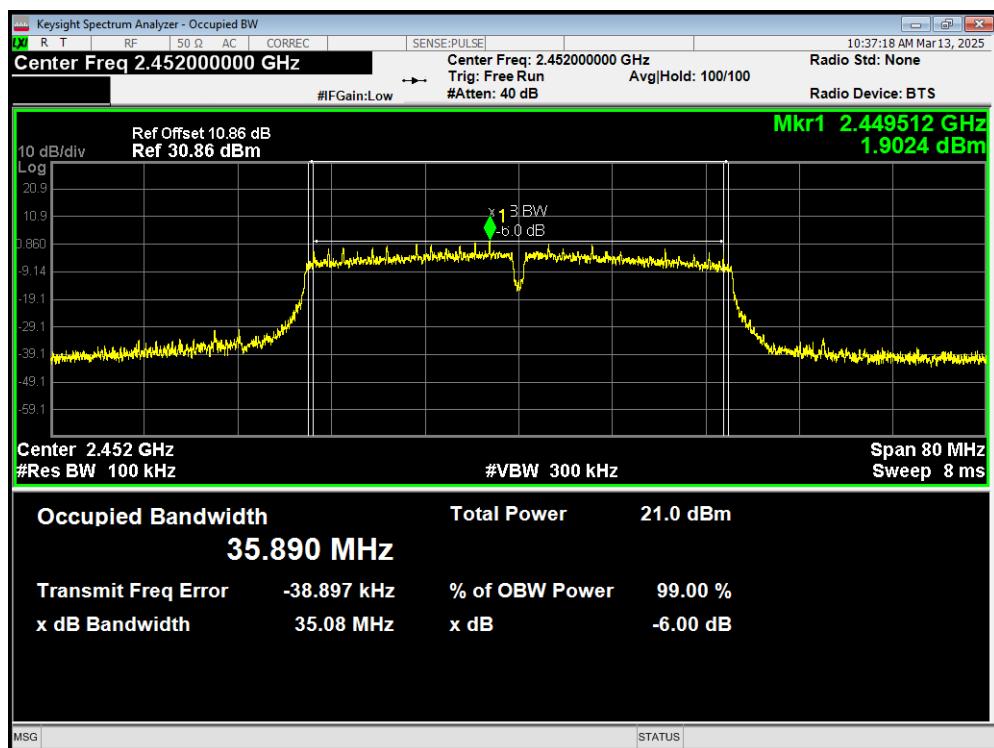
-6dB Bandwidth 802.11n(HT20) 2412MHz

-6dB Bandwidth 802.11n(HT20) 2437MHz


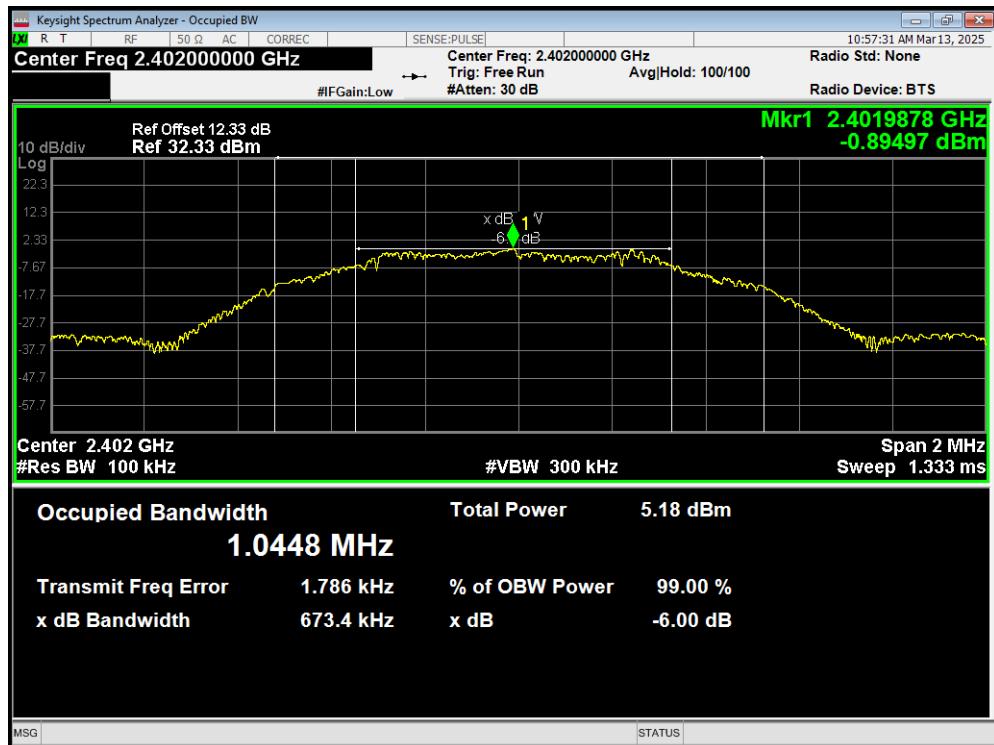
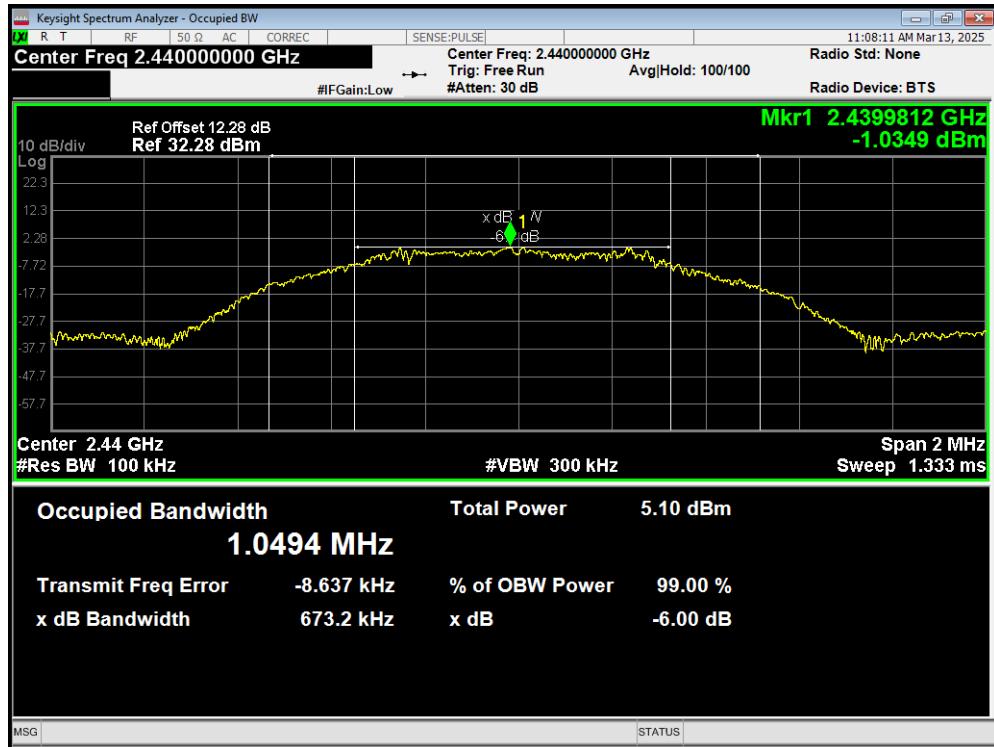
-6dB Bandwidth 802.11n(HT20) 2462MHz

-6dB Bandwidth 802.11n(HT40) 2422MHz


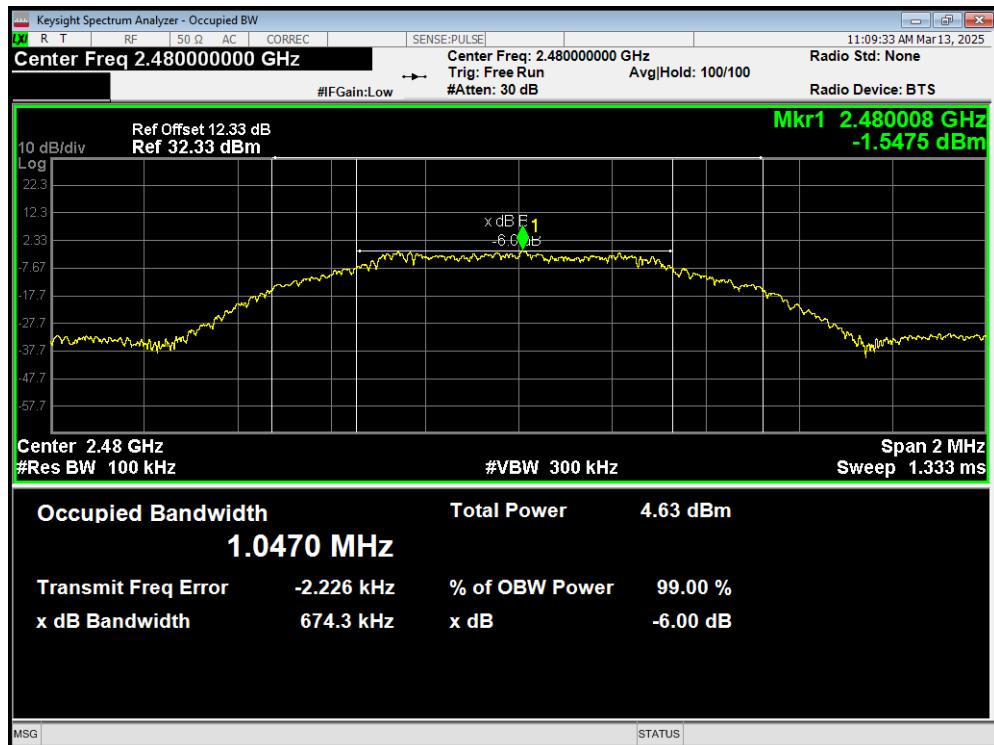
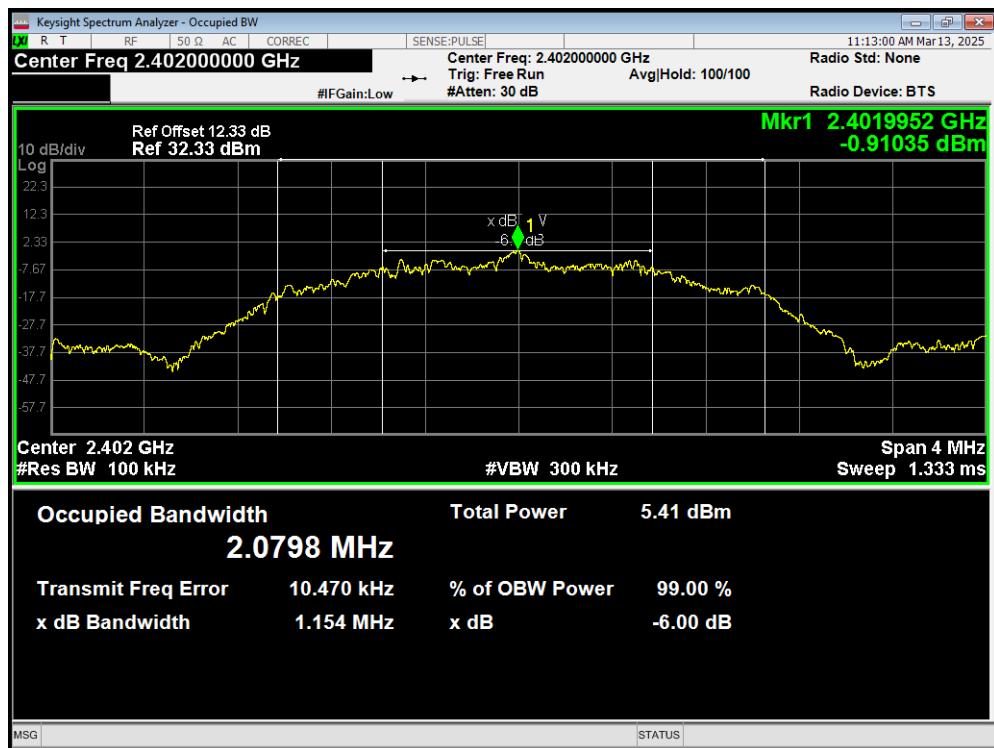
-6dB Bandwidth 802.11n(HT40) 2437MHz

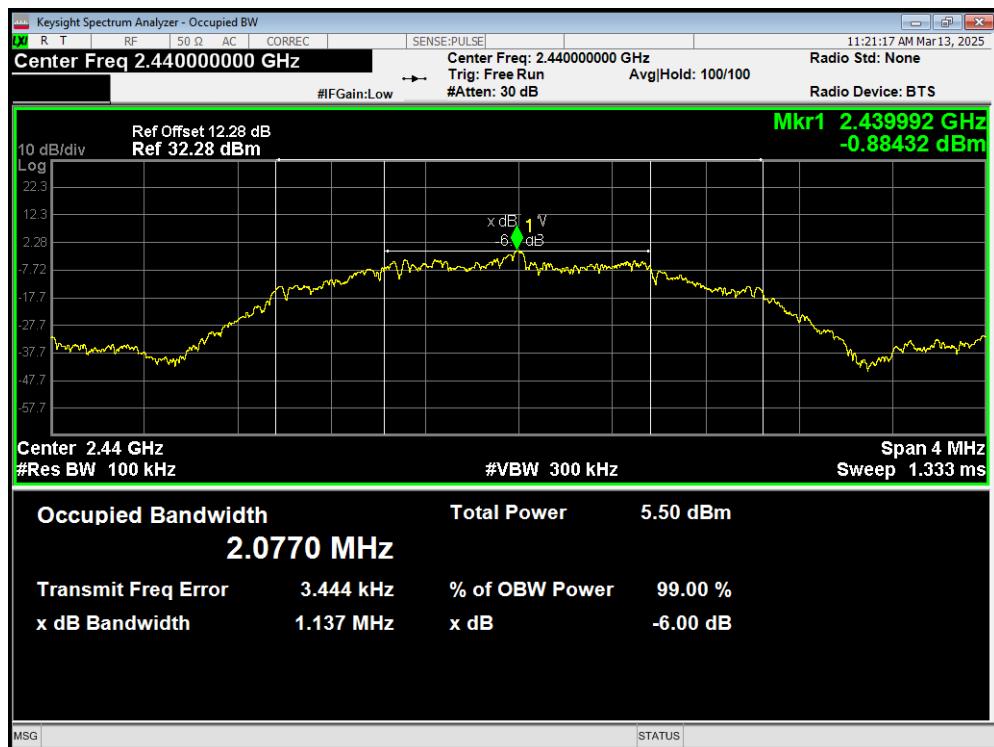


-6dB Bandwidth 802.11n(HT40) 2452MHz



-6dB Bandwidth Bluetooth LE (1M) 2402MHz

-6dB Bandwidth Bluetooth LE (1M) 2440MHz


-6dB Bandwidth Bluetooth LE (1M) 2480MHz

-6dB Bandwidth Bluetooth LE (2M) 2402MHz


-6dB Bandwidth Bluetooth LE (2M) 2440MHz

-6dB Bandwidth Bluetooth LE (2M) 2480MHz


5.3. Band Edge

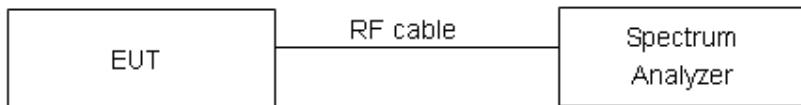
Ambient Condition

Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

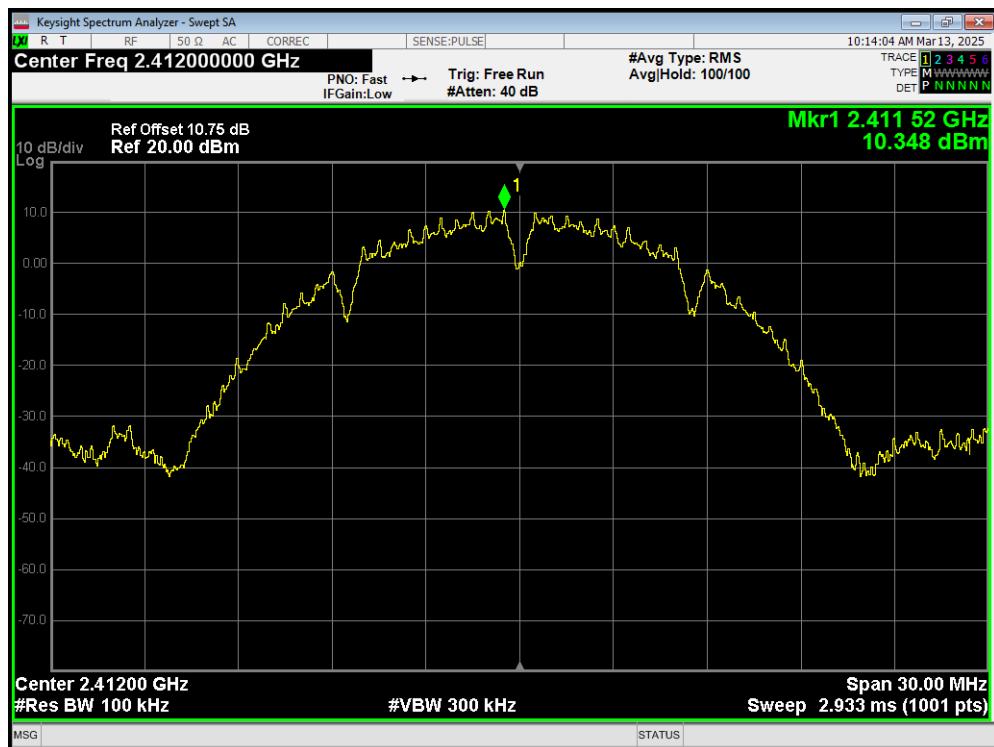
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

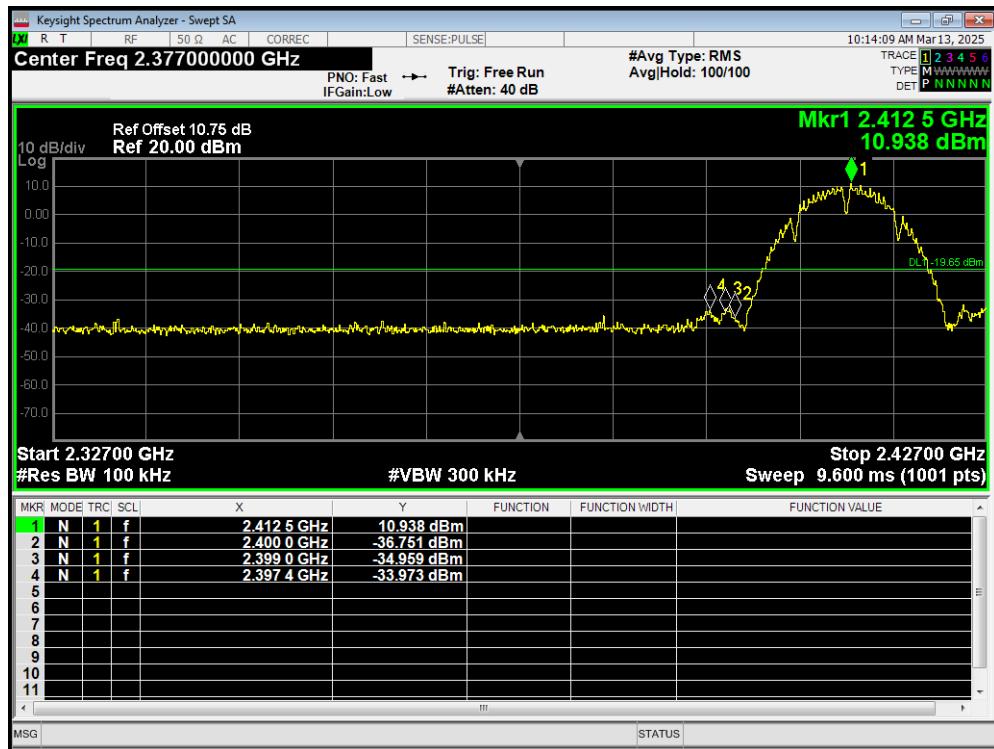
Frequency	Uncertainty
2GHz-3GHz	1.407 dB

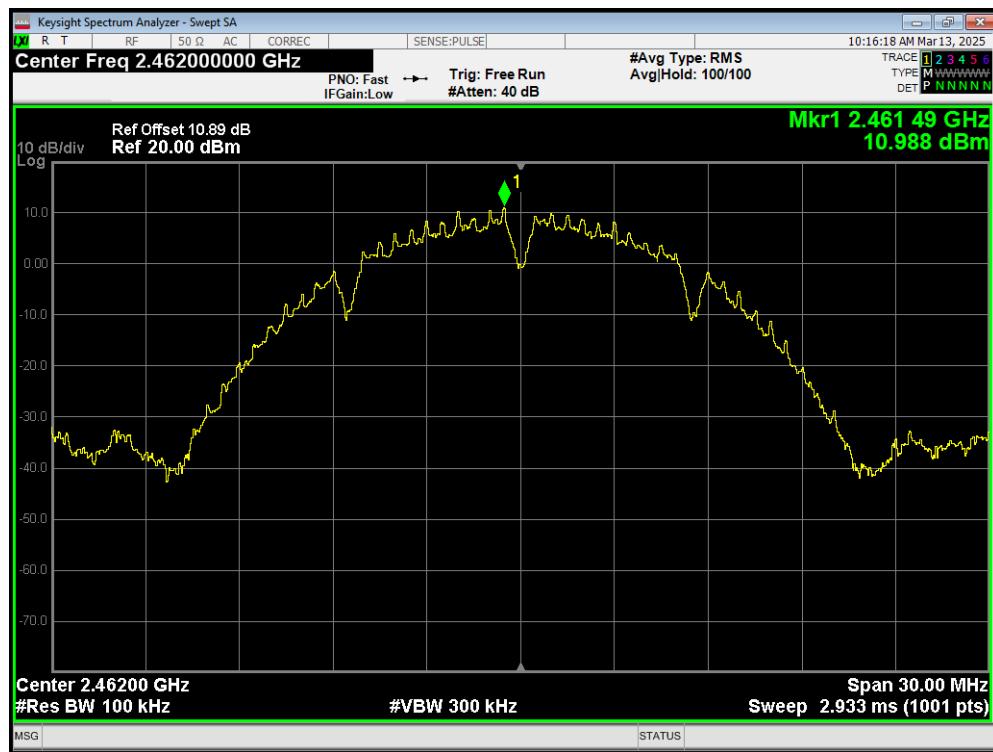
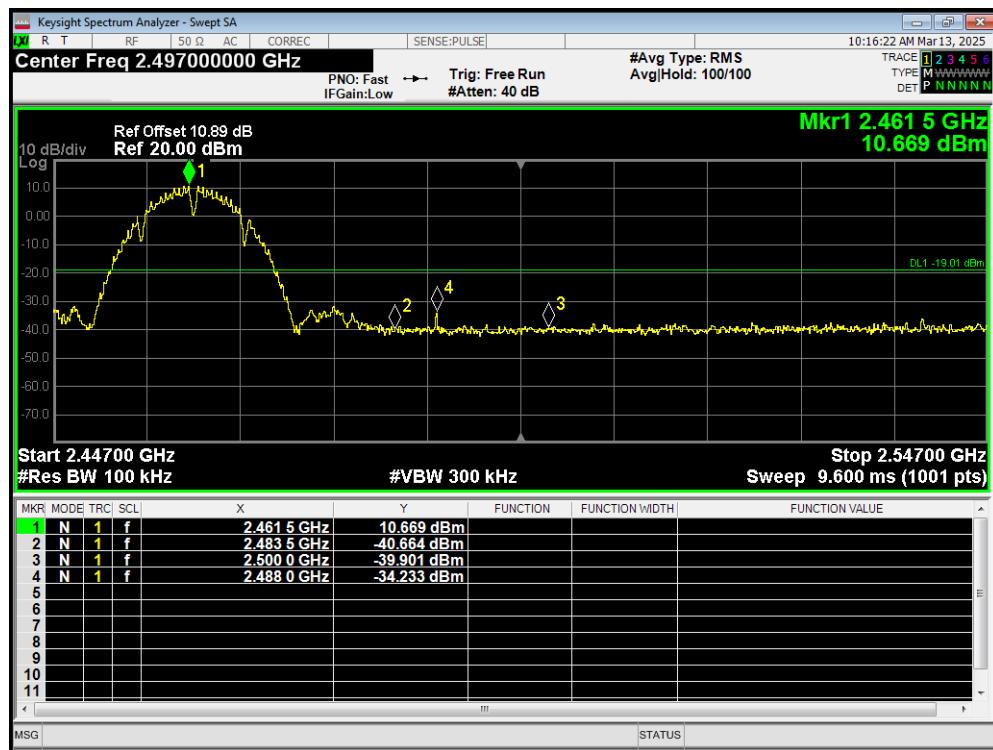
Test Results: PASS

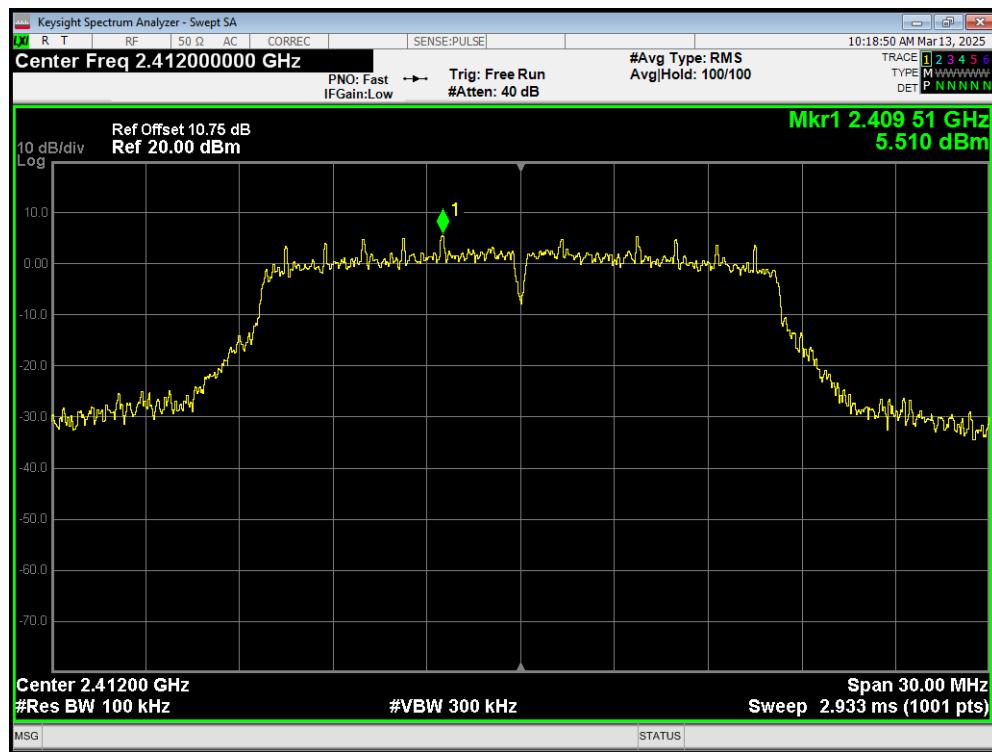
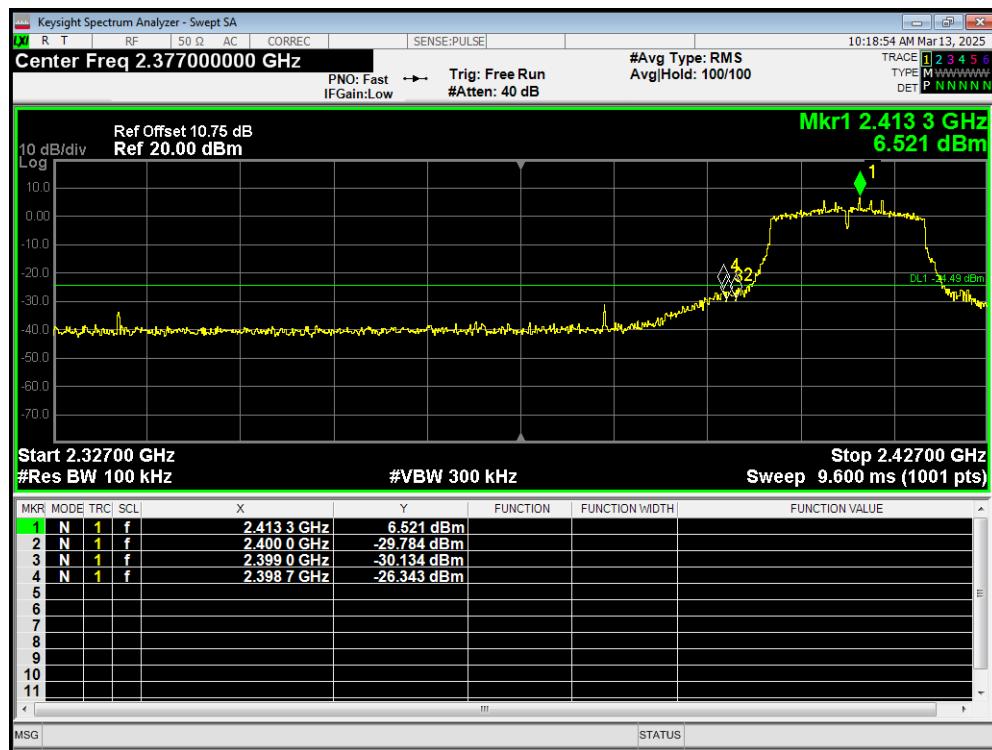
Band Edge 802.11b 2412MHz Ref

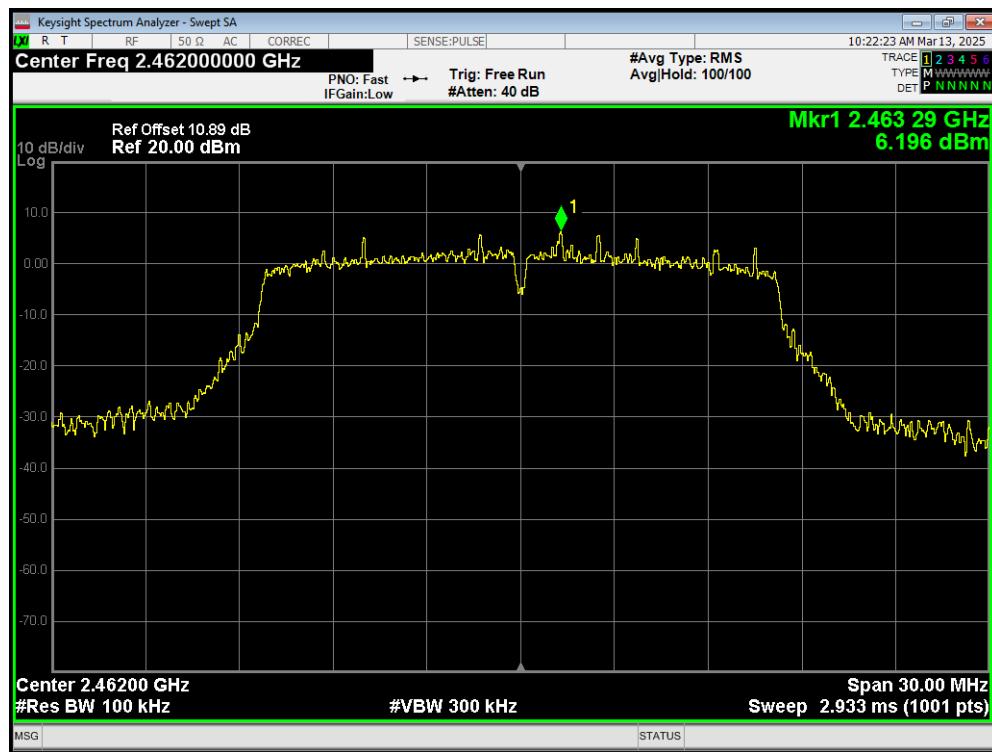
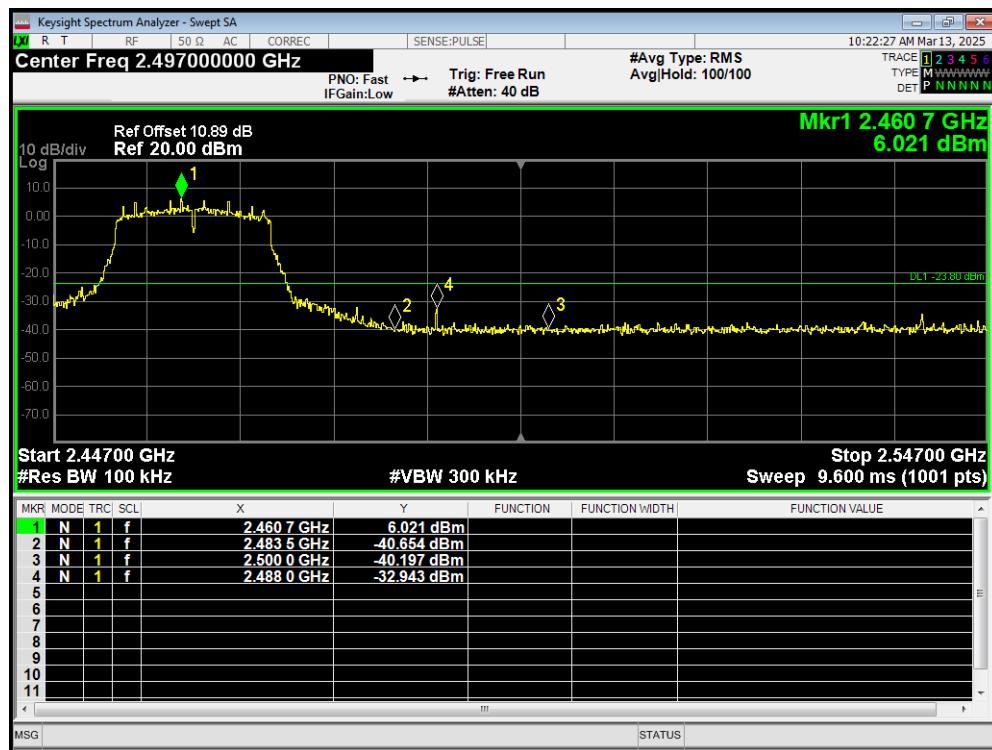


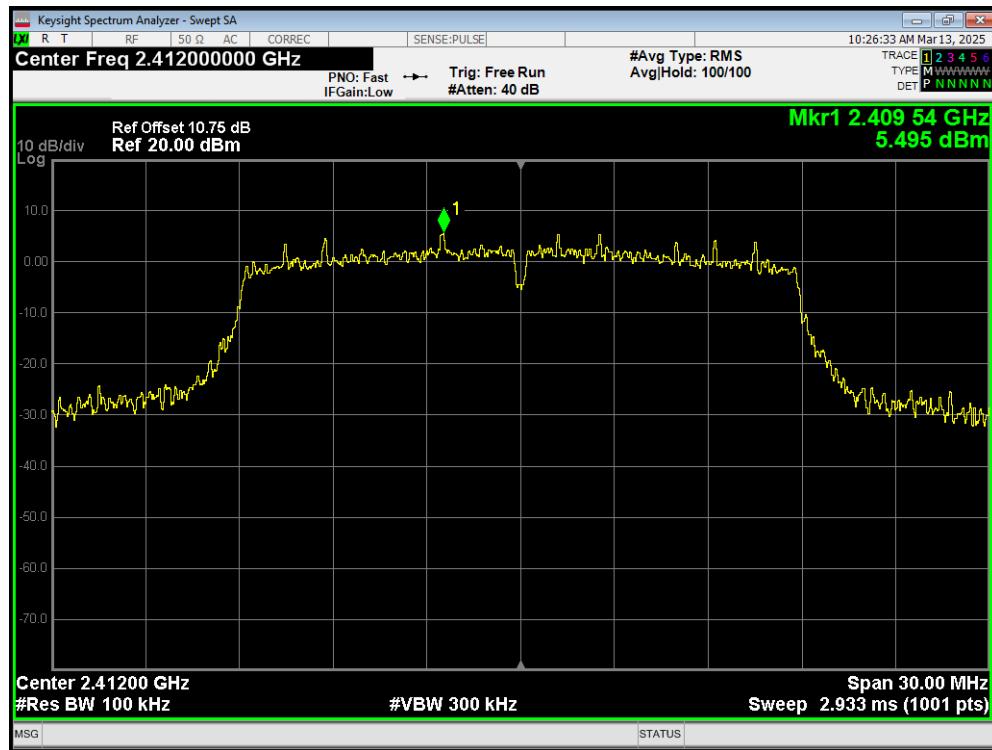
Band Edge 802.11b 2412MHz Emission

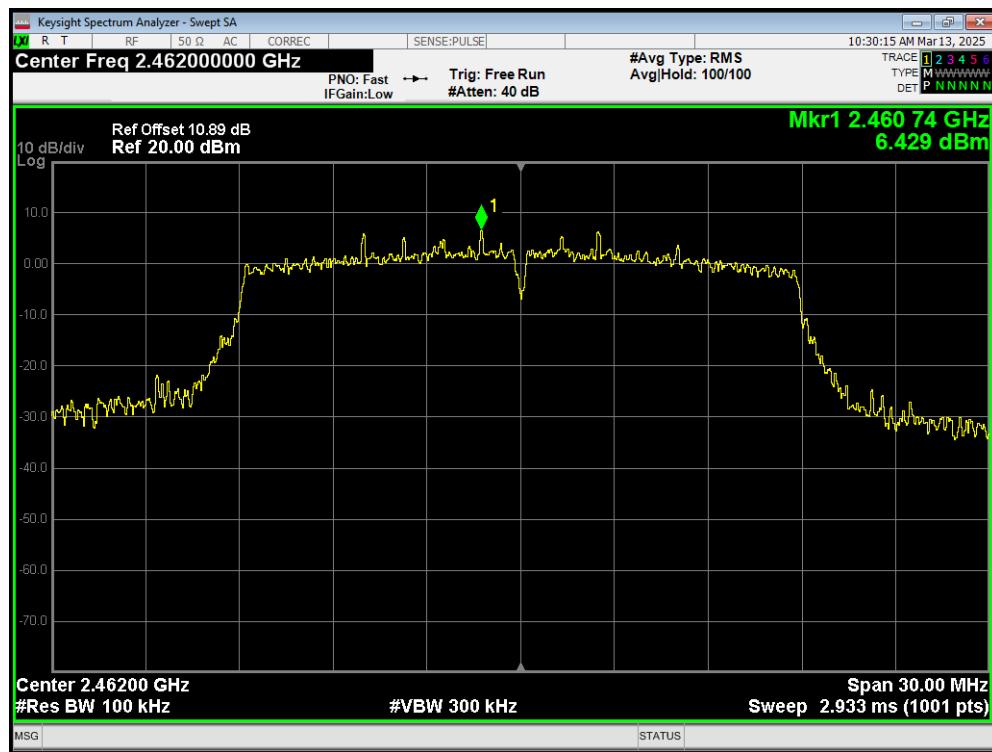
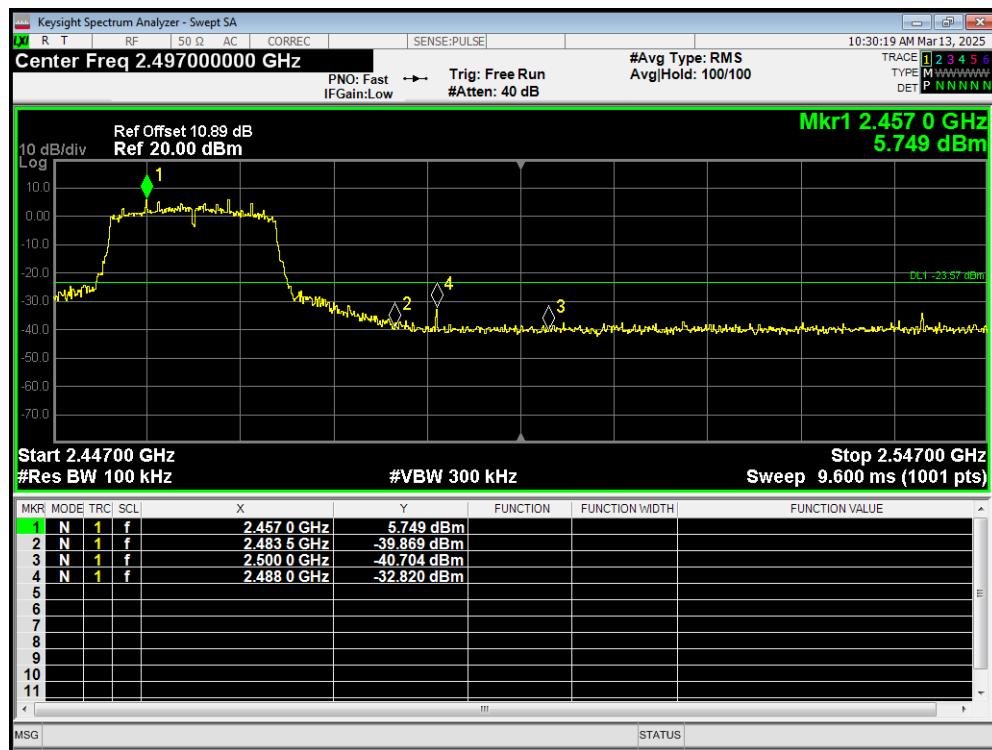


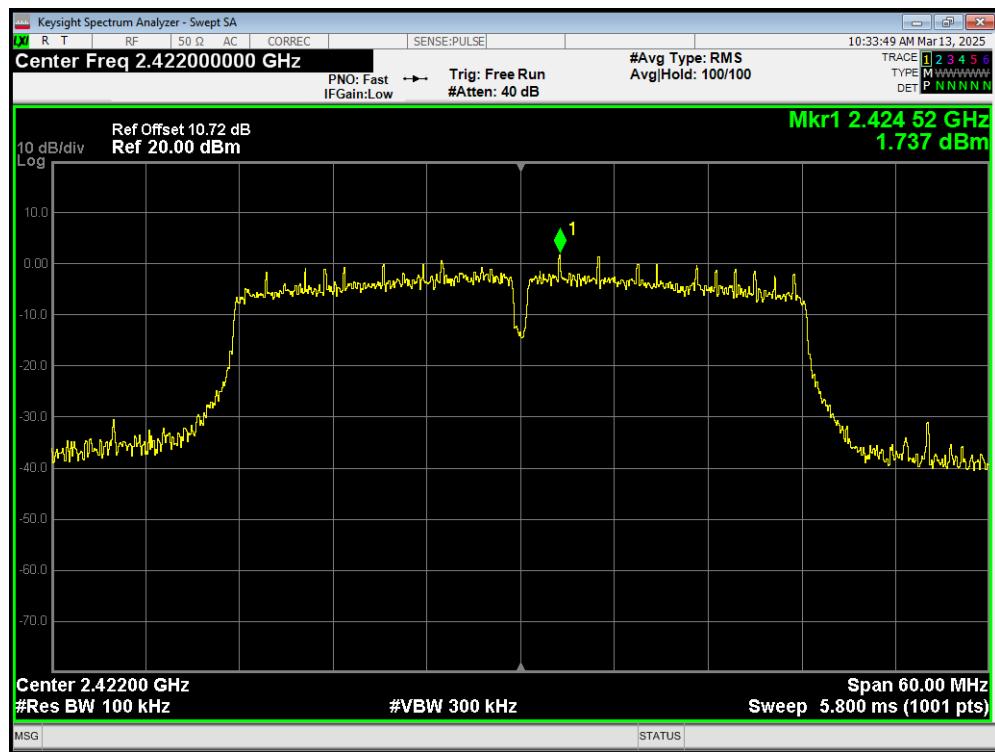
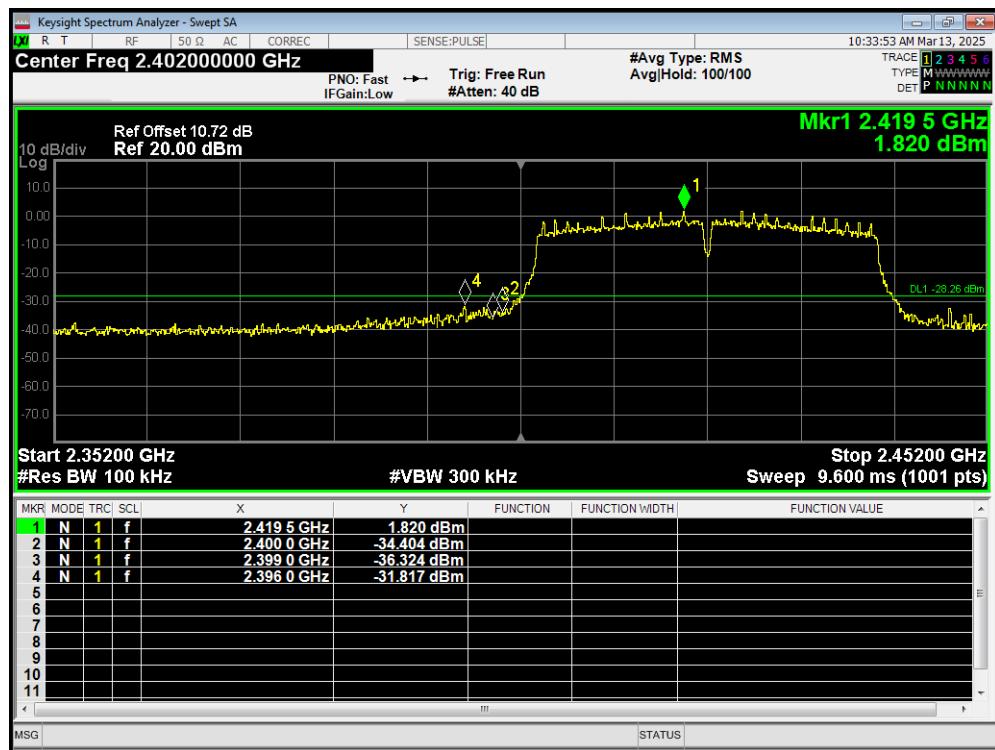
Band Edge 802.11b 2462MHz Ref

Band Edge 802.11b 2462MHz Emission


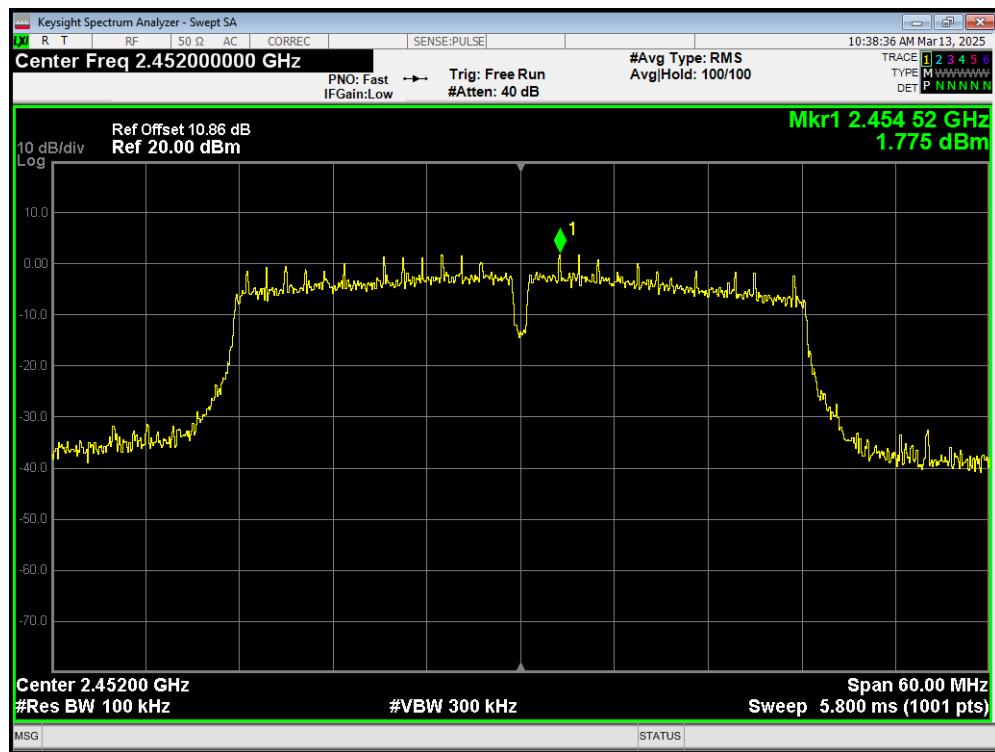
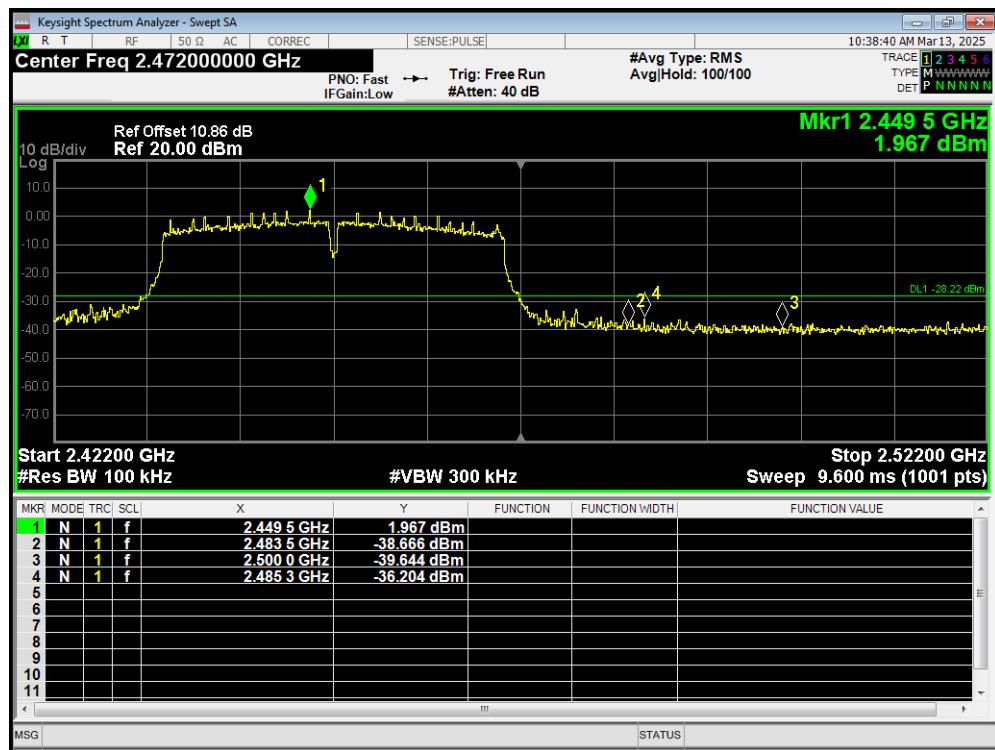
Band Edge 802.11g 2412MHz Ref

Band Edge 802.11g 2412MHz Emission


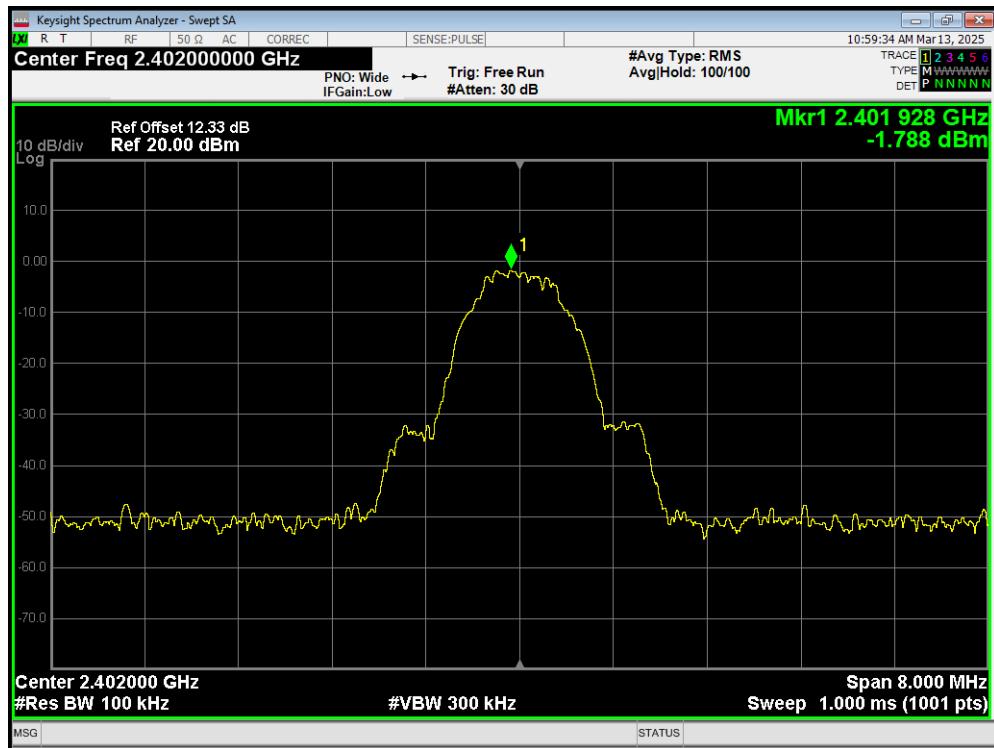
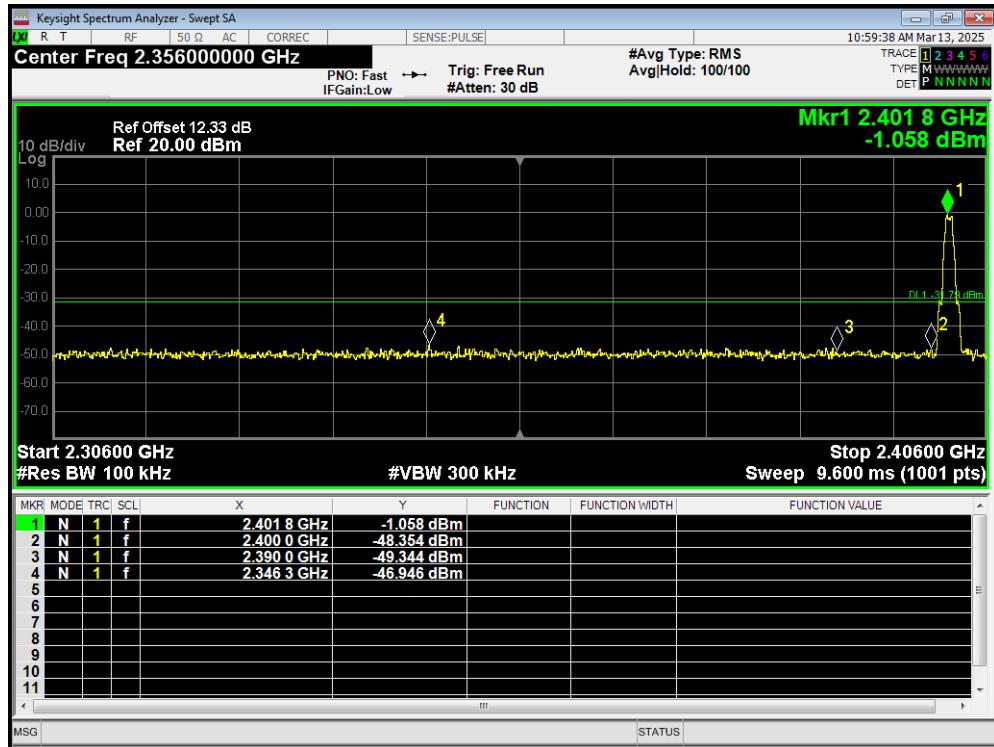
Band Edge 802.11g 2462MHz Ref

Band Edge 802.11g 2462MHz Emission


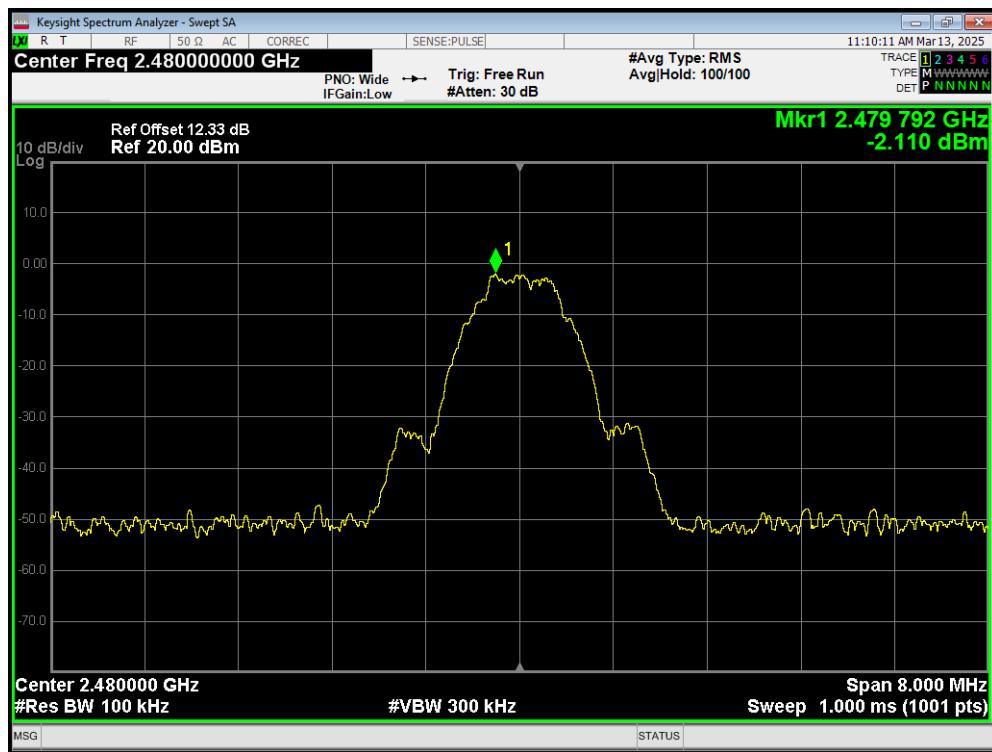
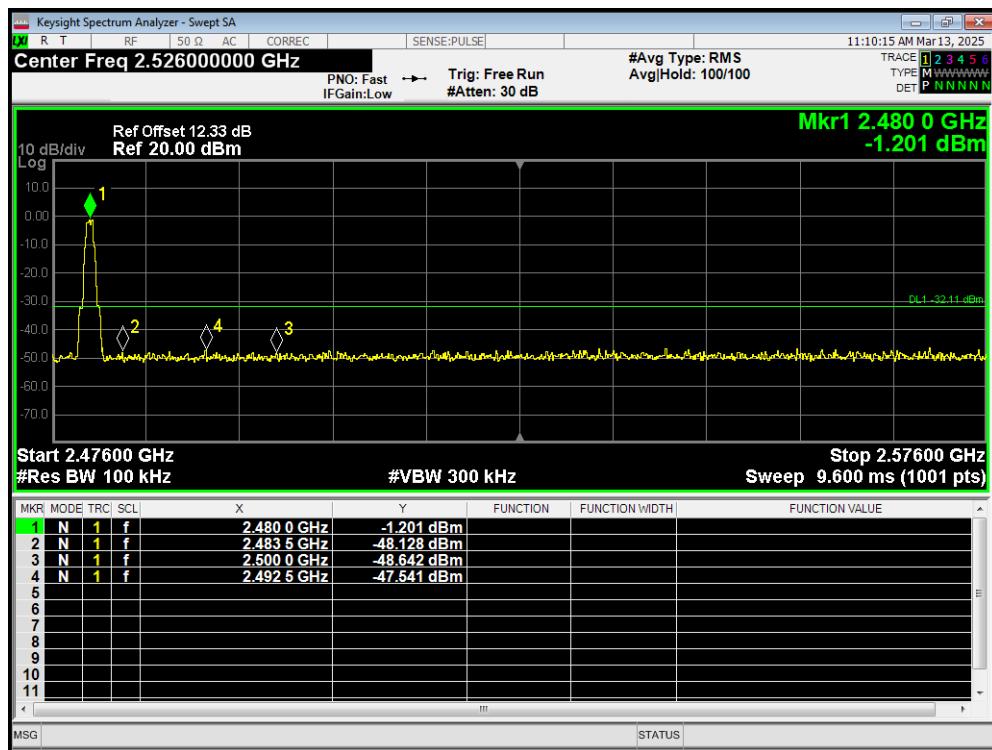
Band Edge 802.11n(HT20) 2412MHz Ref

Band Edge 802.11n(HT20) 2412MHz Emission


Band Edge 802.11n(HT20) 2462MHz Ref

Band Edge 802.11n(HT20) 2462MHz Emission


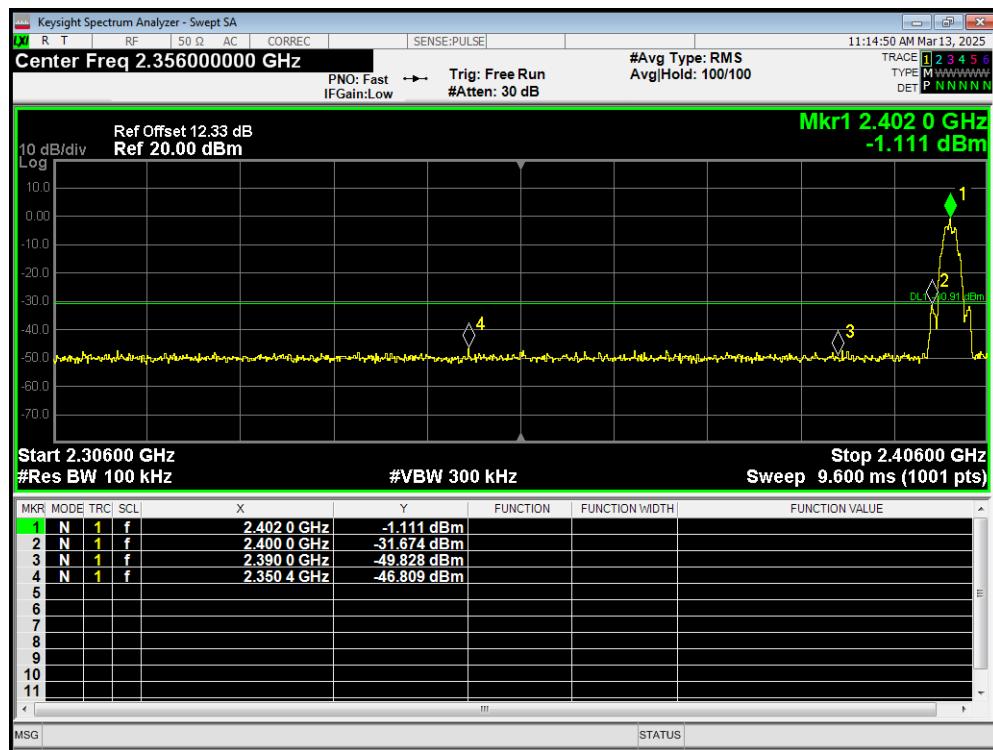
Band Edge 802.11n(HT40) 2422MHz Ref

Band Edge 802.11n(HT40) 2422MHz Emission


Band Edge 802.11n(HT40) 2452MHz Ref

Band Edge 802.11n(HT40) 2452MHz Emission


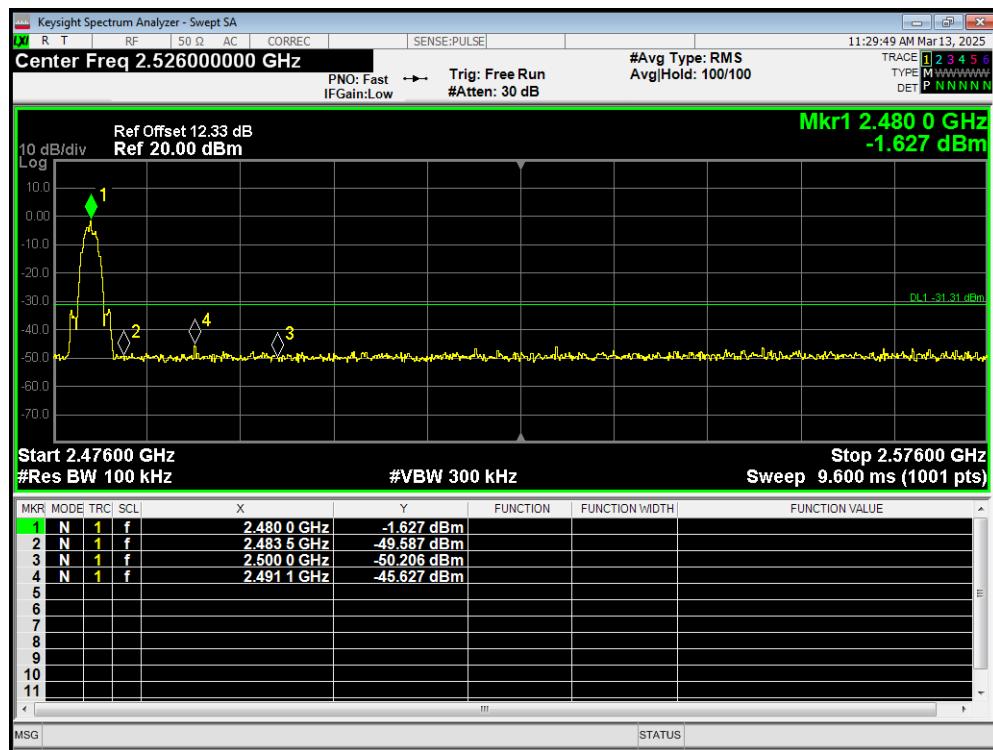
Band Edge Bluetooth LE (1M) 2402MHz Ref

Band Edge Bluetooth LE (1M) 2402MHz Emission


Band Edge Bluetooth LE (1M) 2480MHz Ref

Band Edge Bluetooth LE (1M) 2480MHz Emission


Band Edge Bluetooth LE (2M) 2402MHz Ref

Band Edge Bluetooth LE (2M) 2402MHz Emission


Band Edge Bluetooth LE (2M) 2480MHz Ref

Band Edge Bluetooth LE (2M) 2480MHz Emission


5.4. Power Spectral Density

Ambient Condition

Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Method of Measurement

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss.

The EUT is max power transmission with proper modulation.

Method AVGPSD-1 was used for this test.

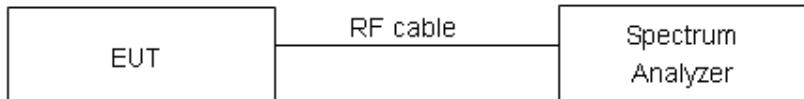
- a) Set instrument center frequency to DTS channel center frequency
- b) Set span to at least 1.5 times the OBW
- c) Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
- d) Set VBW $\geq [3 \times \text{RBW}]$
- e) Detector=power averaging (rms) or sample detector (when rms not available)
- f) Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span}/\text{RBW}]$
- g) Sweep time auto couple
- h) Employ trace averaging (rms) mode over a minimum of 100 traces
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced)

Method AVGPSD-2 was used for this test.

- a) Measure the duty cycle (D) of the transmitter output signal as described in 11.6
- b) Set instrument center frequency to DTS channel center frequency
- c) Set span to at least 1.5 times the OBW
- d) Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
- e) Set VBW $\geq [3 \times \text{RBW}]$
- f) Detector= power averaging (rms) or sample detector (when rms not available)
- g) Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span}/\text{RBW}]$
- h) Sweep time =auto couple
- i) Do not use sweep triggering; allow sweep to "free run"
- j) Employ trace averaging (rms) mode over a minimum of 100 traces
- k) Use the peak marker function to determine the maximum amplitude level

- I) Add $[10 \log(1/D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time
- m) If measured value exceeds requirement specified by regulatory agency then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced)

Test setup



Limits

Rule Part 15.247(e) specifies that "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."

Limits	$\leq 8 \text{ dBm} / 3\text{kHz}$
--------	------------------------------------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

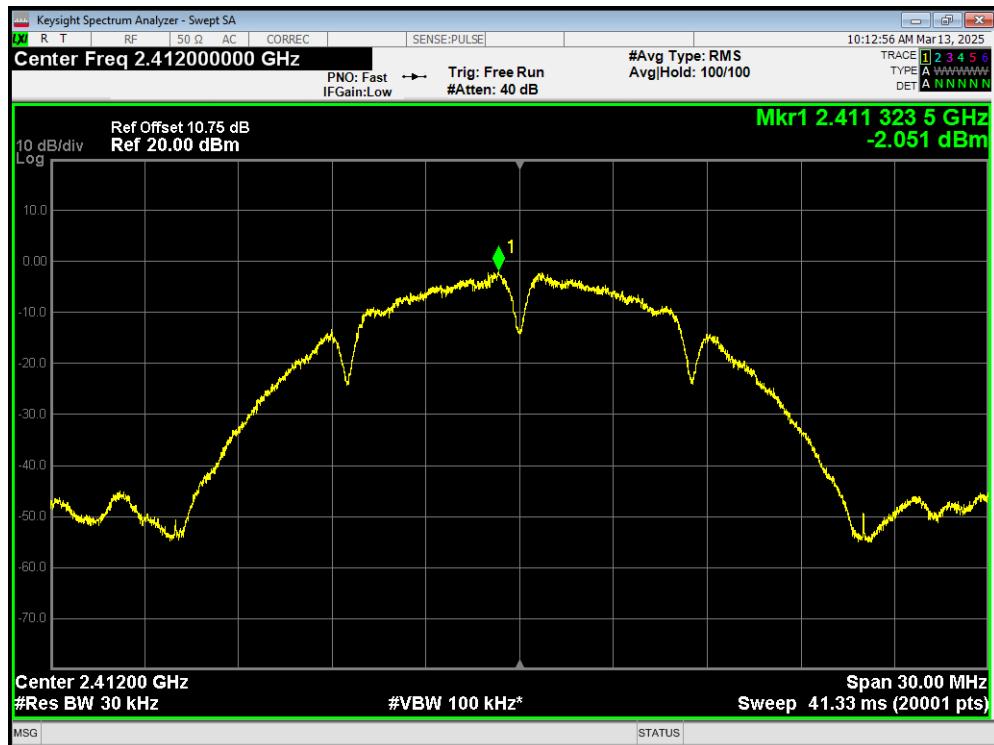
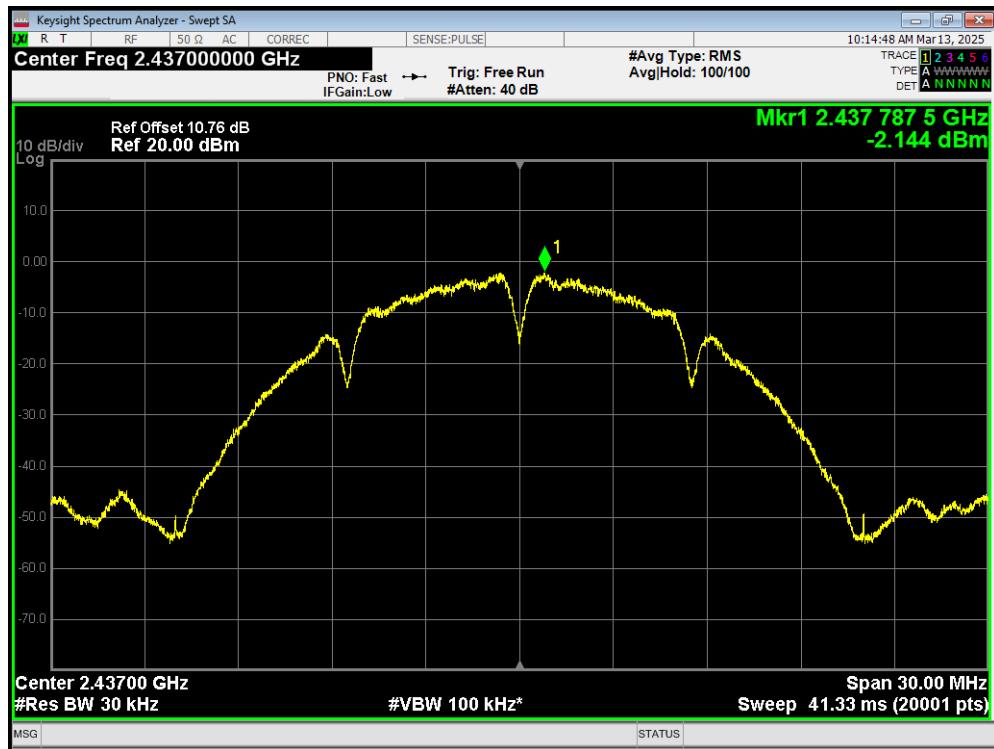
Test Results:

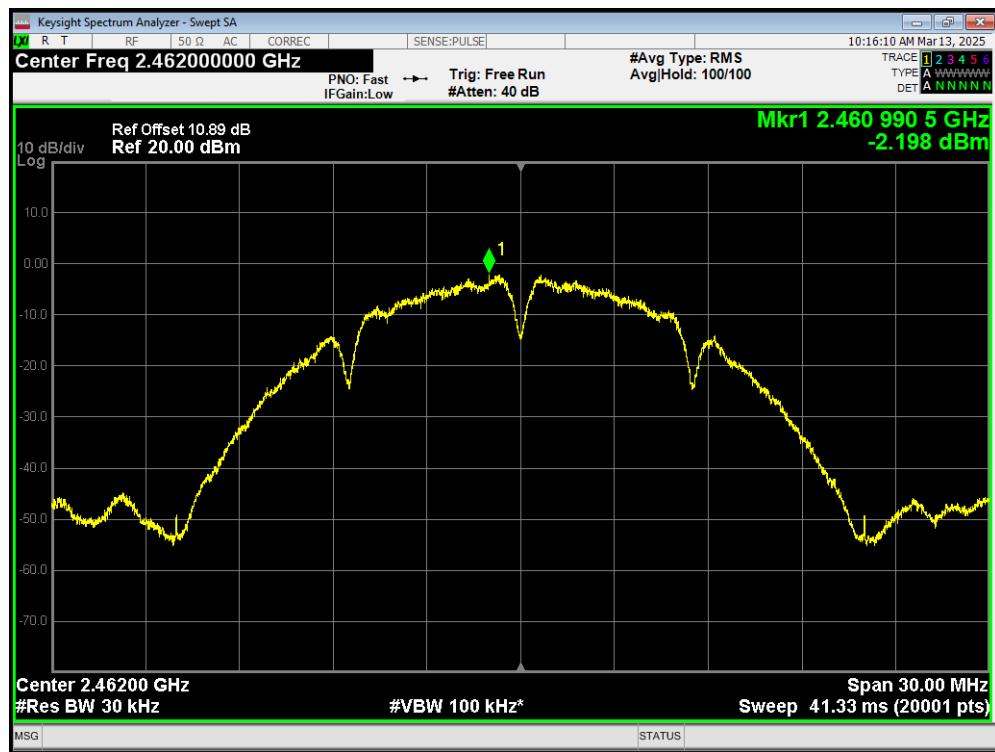
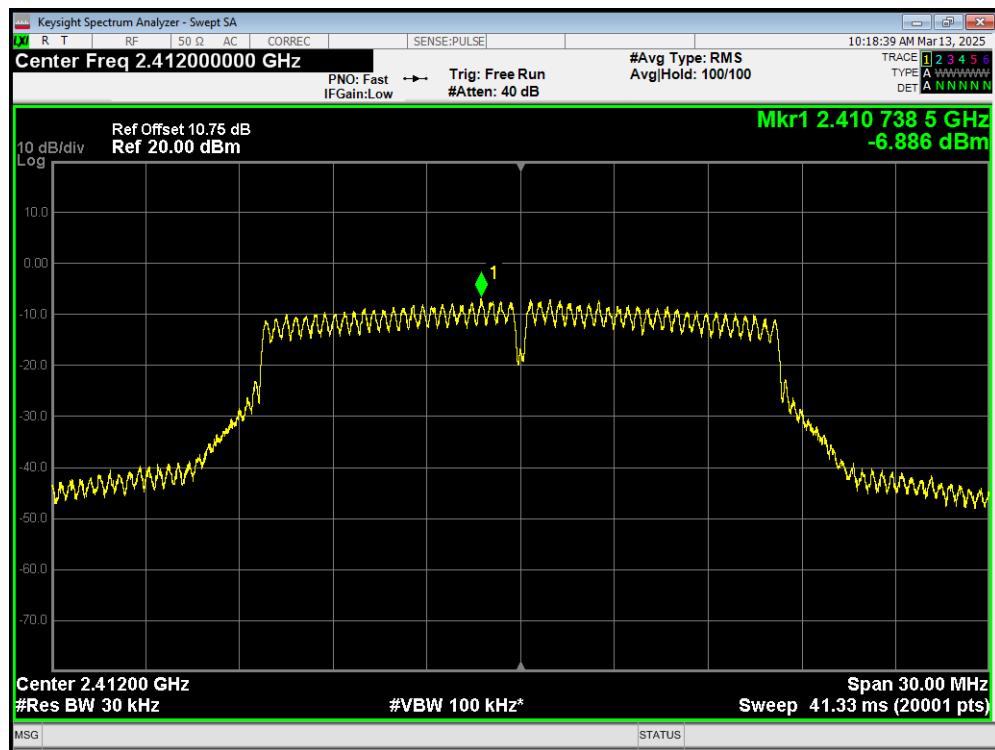
Test Mode	Carrier frequency (MHz) / Channel	Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	2412/CH 1	-2.05	-12.05	8	PASS
	2437/CH 6	-2.14	-12.14	8	PASS
	2462/CH11	-2.20	-12.20	8	PASS
802.11g	2412/CH 1	-6.89	-16.76	8	PASS
	2437/CH 6	-6.94	-16.81	8	PASS
	2462/CH11	-7.20	-17.07	8	PASS
802.11n HT20	2412/CH 1	-6.86	-16.72	8	PASS
	2437/CH 6	-6.27	-16.13	8	PASS
	2462/CH11	-6.70	-16.56	8	PASS
802.11n HT40	2422/CH3	-12.00	-21.73	8	PASS
	2437/CH6	-11.53	-21.26	8	PASS
	2452/CH9	-11.68	-21.41	8	PASS

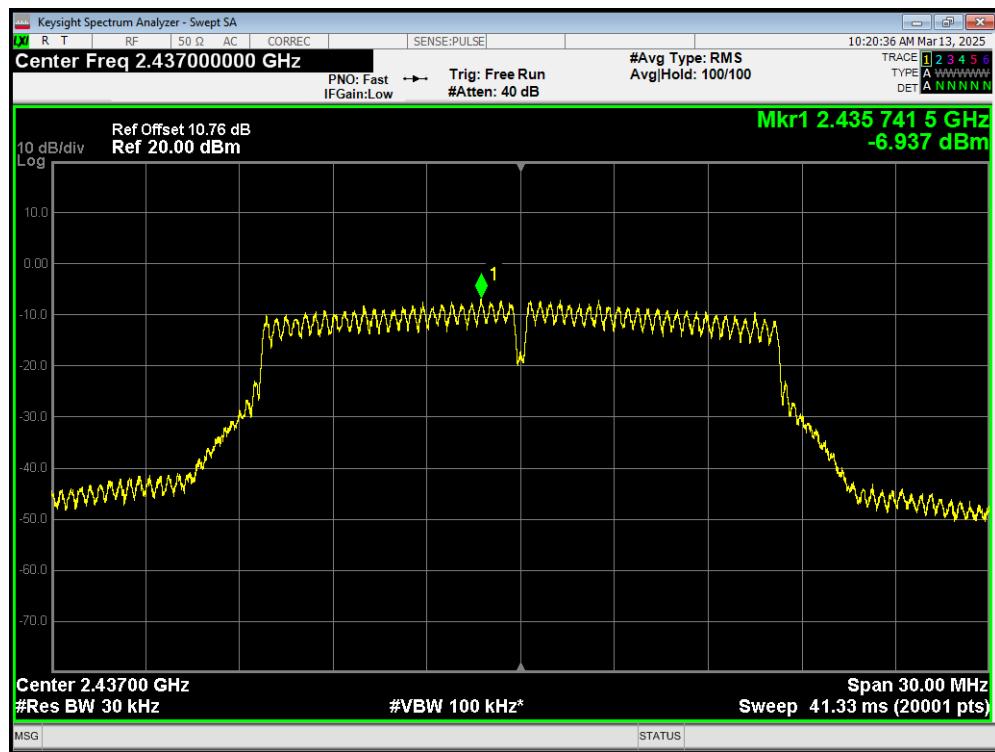
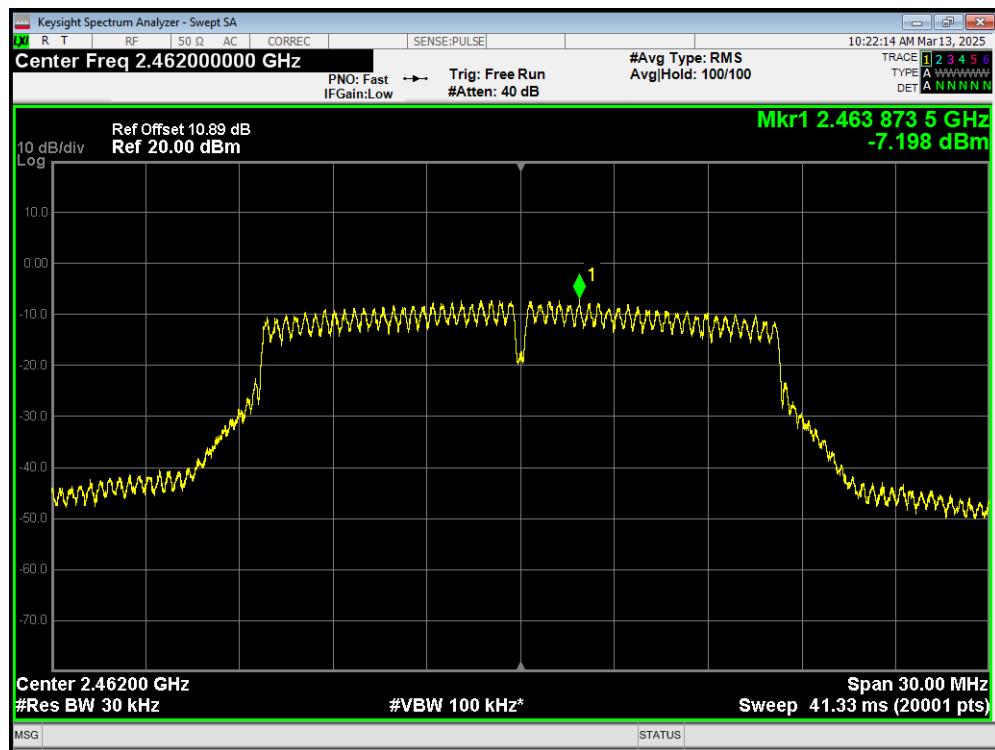
Note: Power Spectral Density (dBm/3kHz) =Read Value+Duty cycle correction factor + $10 \cdot \log_{10}(3/30)$

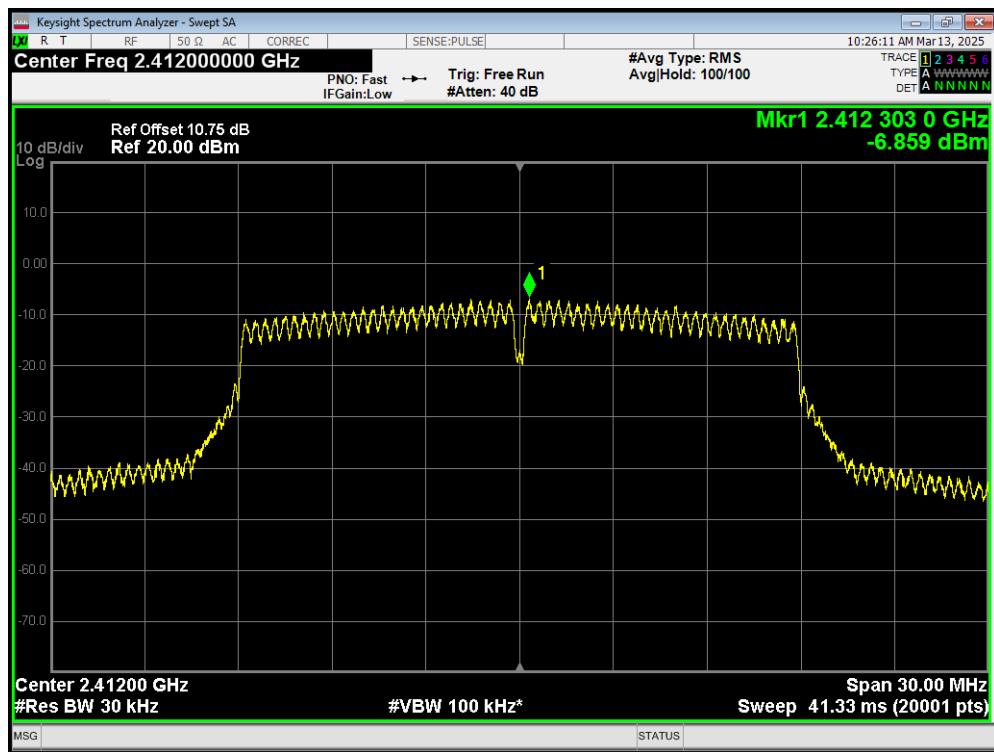
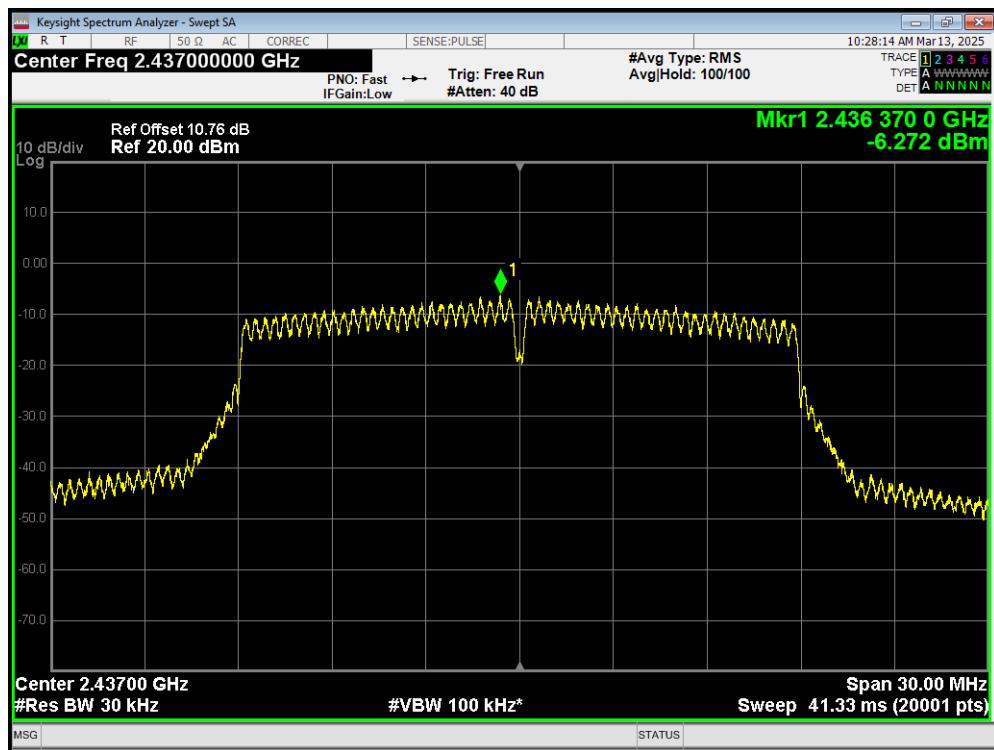
Test Mode	Carrier frequency (MHz) / Channel	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
Bluetooth (Low Energy) (1M)	2402/CH0	-23.21	-18.26	8	PASS
	2440/CH19	-22.89	-17.94	8	PASS
	2480/CH39	-23.15	-18.20	8	PASS
Bluetooth (Low Energy) (2M)	2402/CH0	-24.40	-19.62	8	PASS
	2440/CH19	-24.19	-19.41	8	PASS
	2480/CH39	-24.92	-20.14	8	PASS

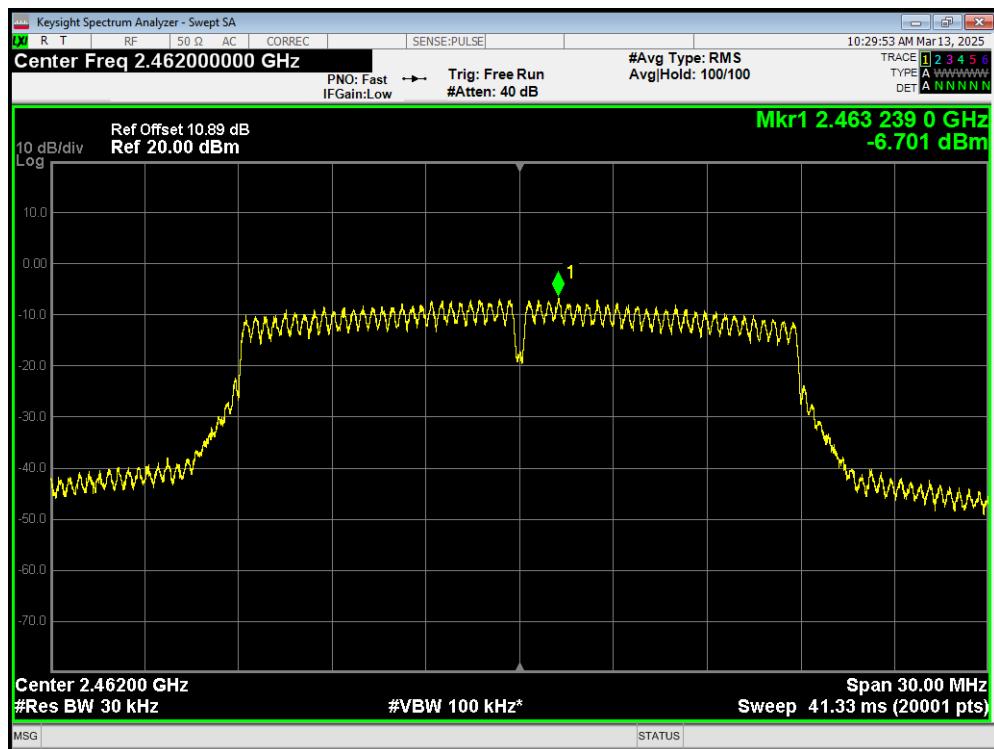
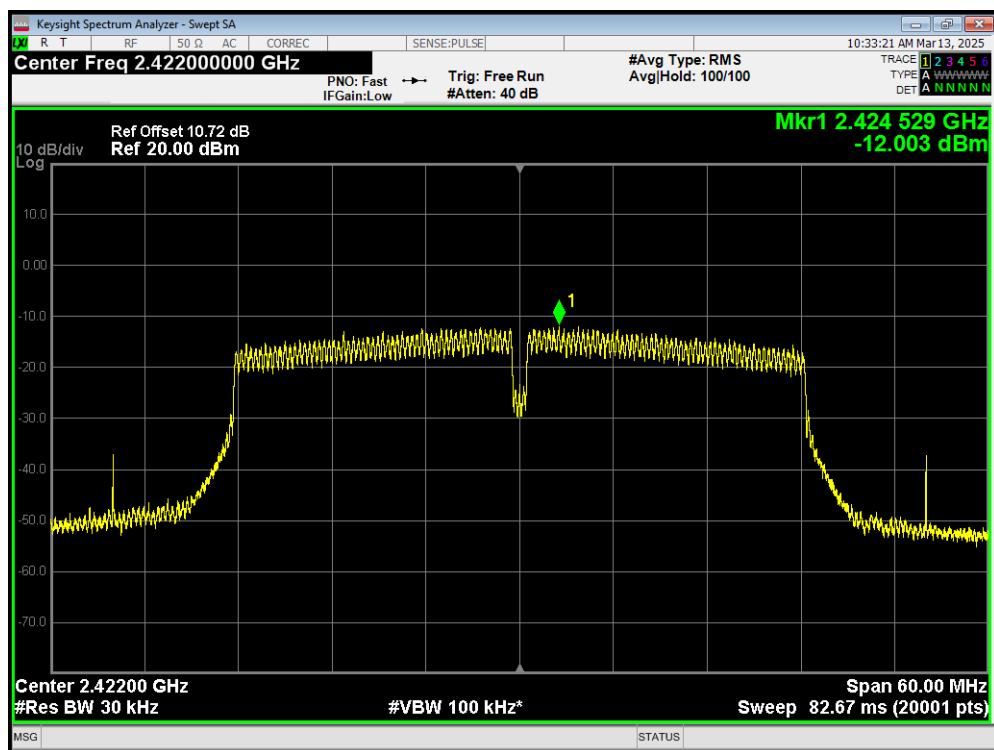
Note: Power Spectral Density =Read Value+Duty cycle correction factor

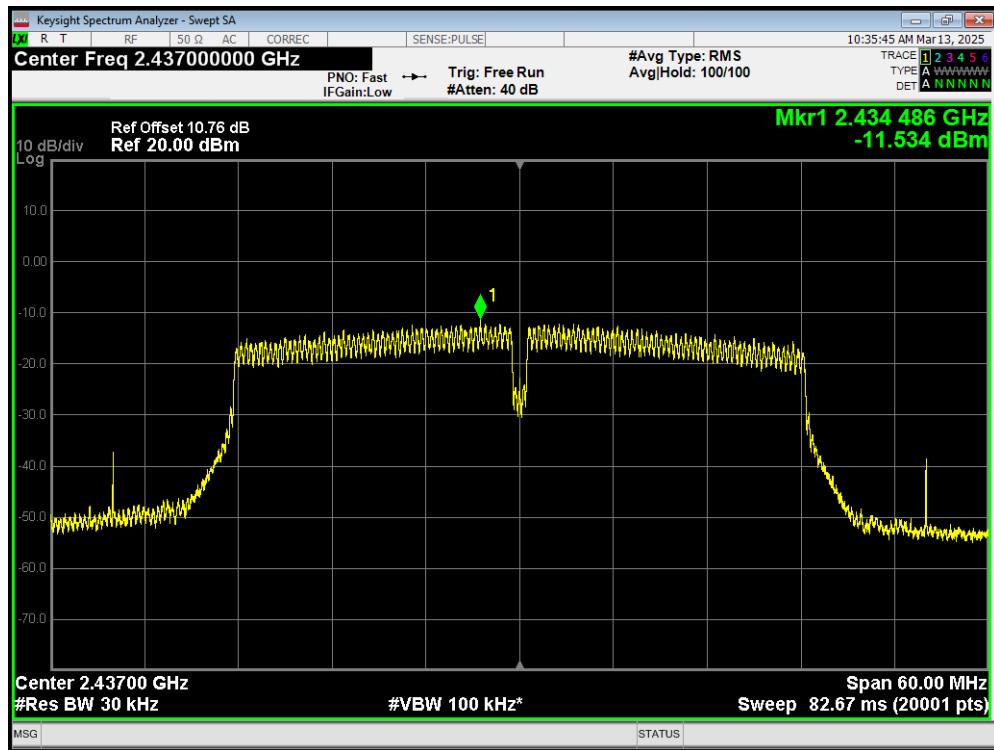
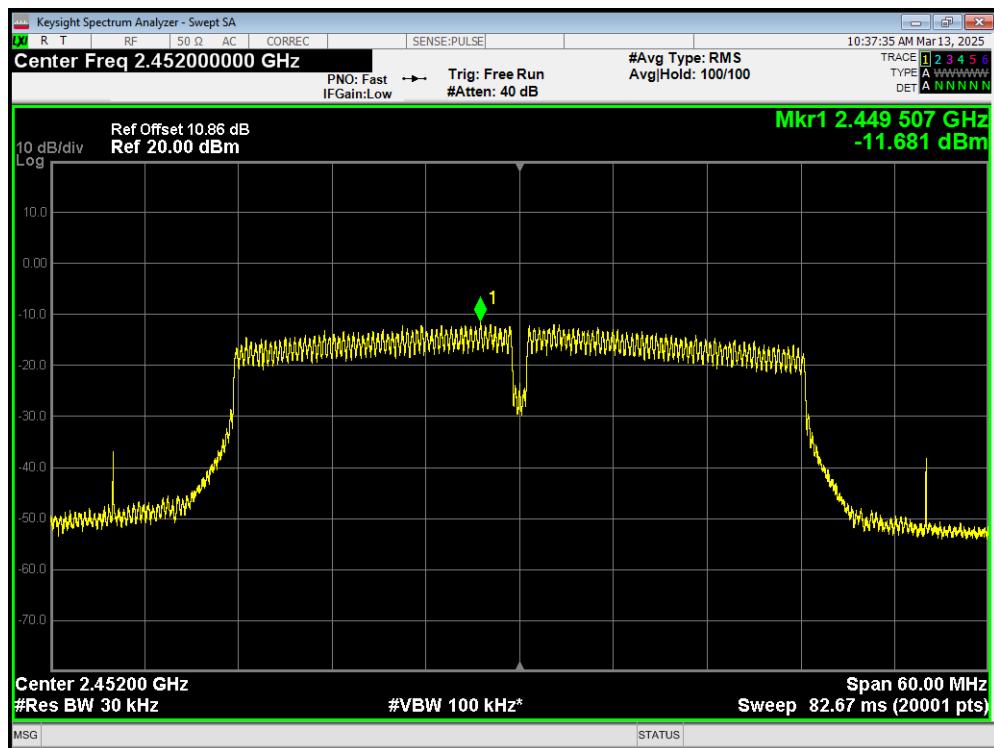
PSD 802.11b 2412MHz

PSD 802.11b 2437MHz


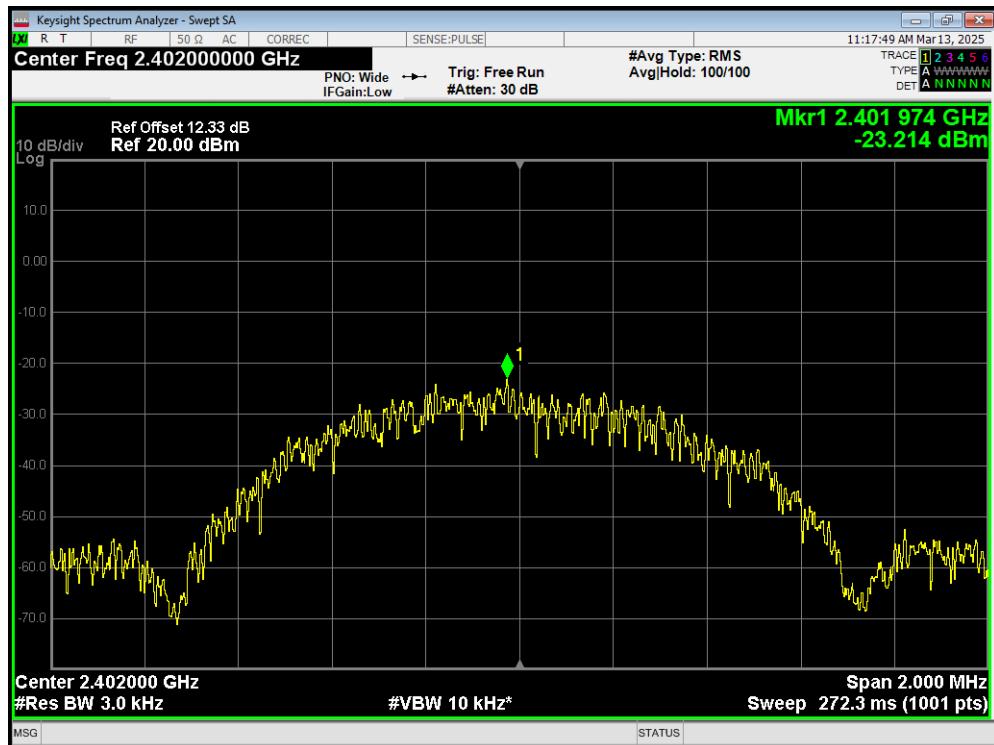
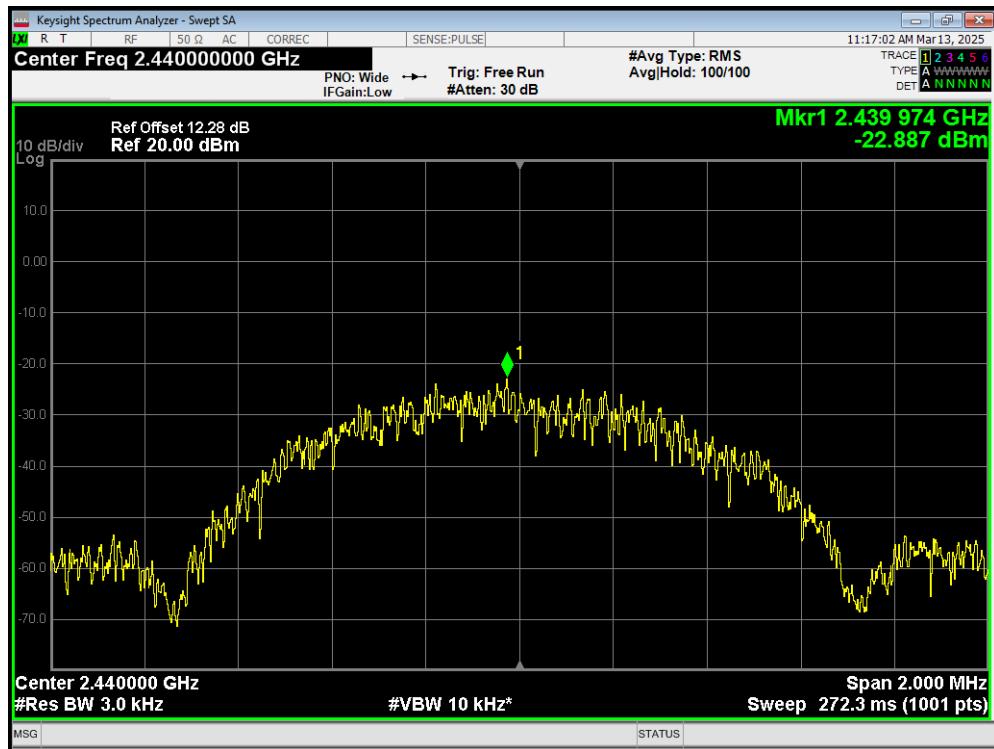
PSD 802.11b 2462MHz

PSD 802.11g 2412MHz


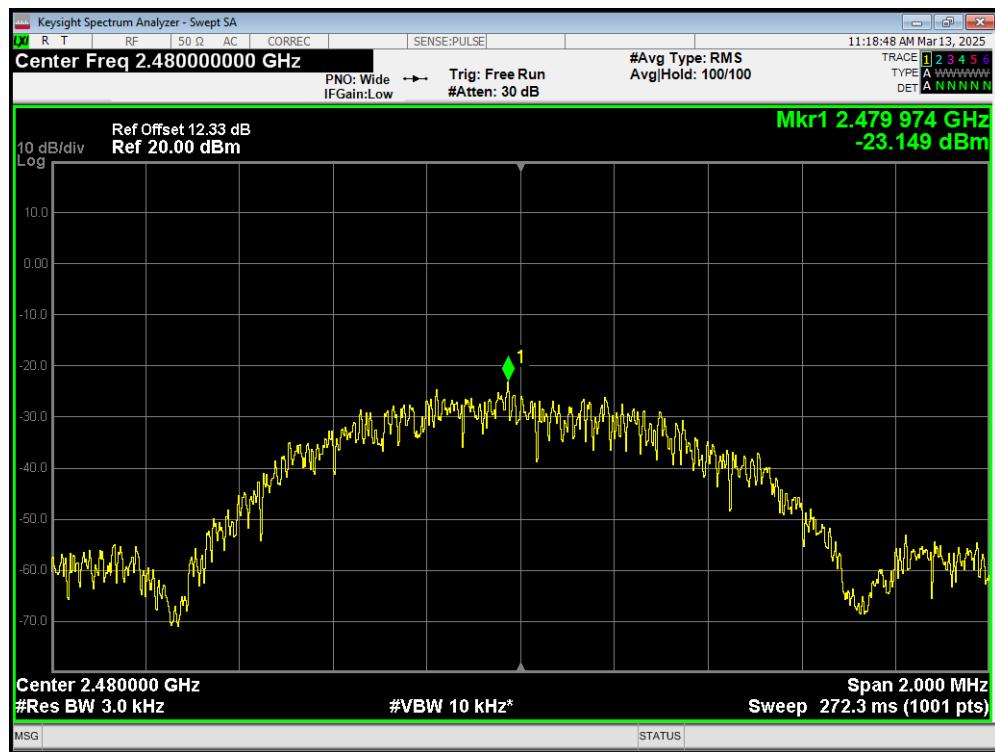
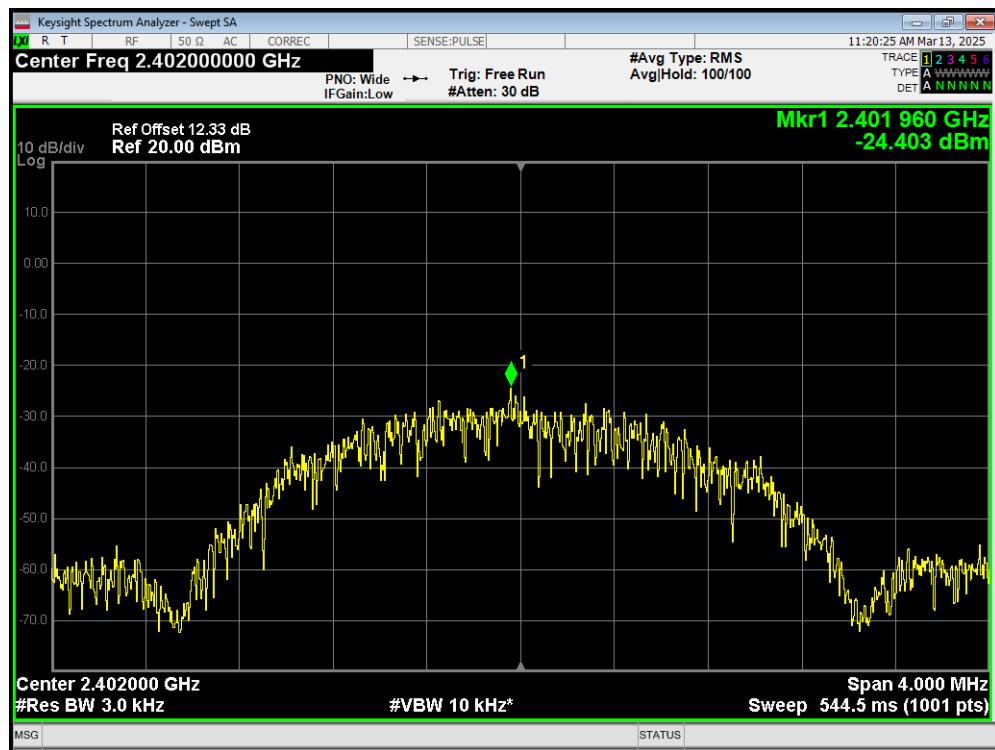
PSD 802.11g 2437MHz

PSD 802.11g 2462MHz


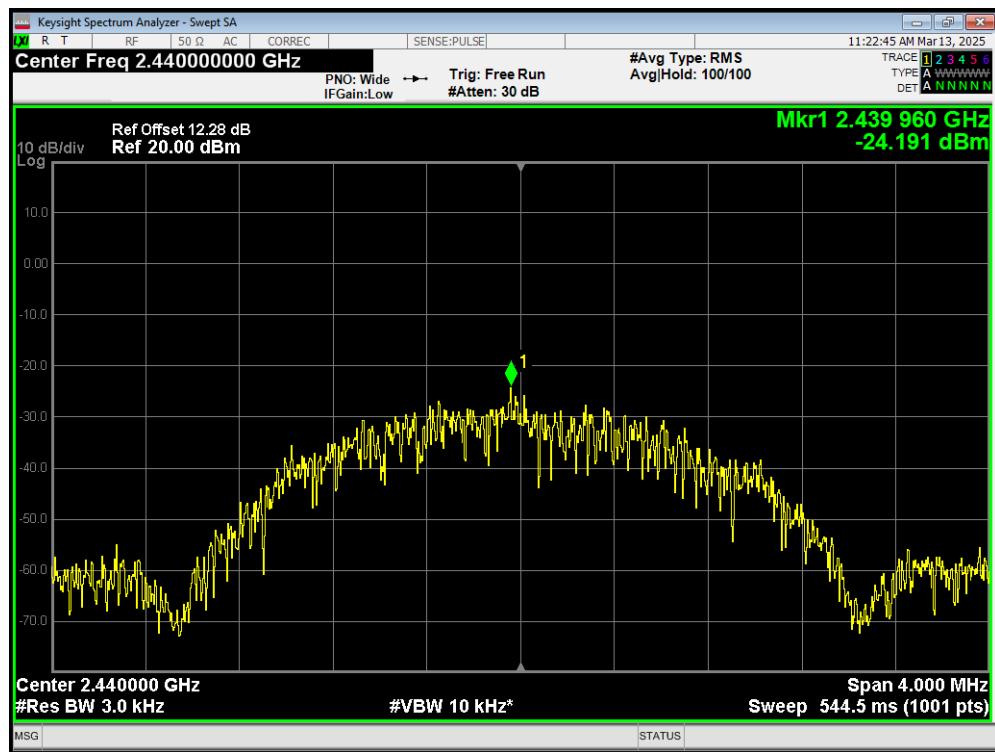
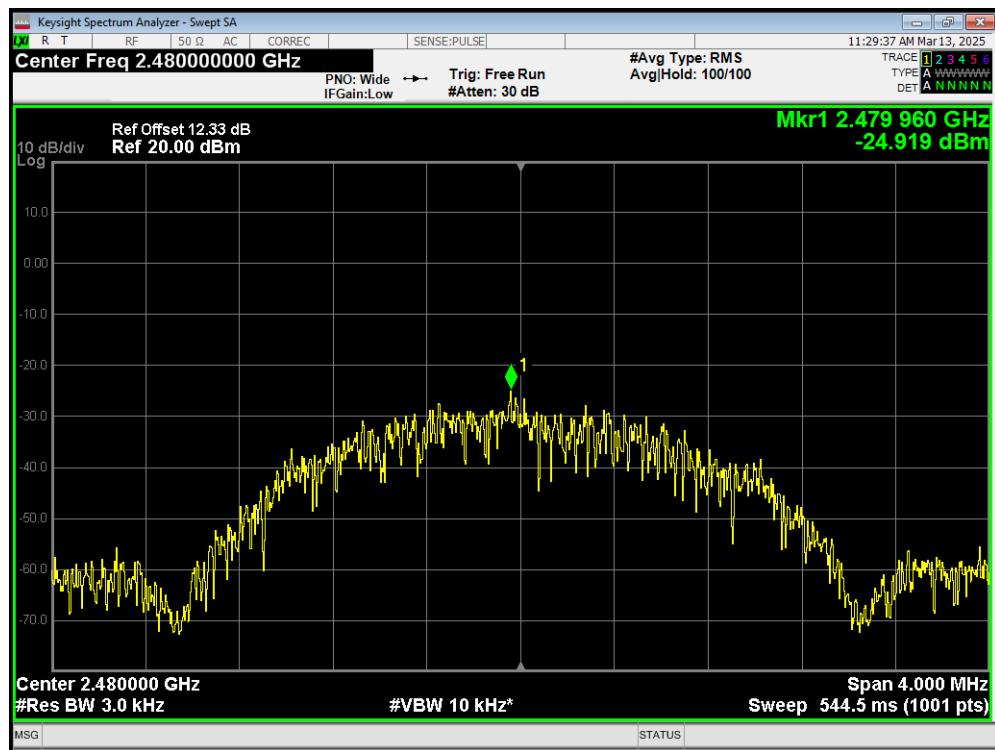
PSD 802.11n(HT20) 2412MHz

PSD 802.11n(HT20) 2437MHz


PSD 802.11n(HT20) 2462MHz

PSD 802.11n(HT40) 2422MHz


PSD 802.11n(HT40) 2437MHz

PSD 802.11n(HT40) 2452MHz


PSD Bluetooth LE (1M) 2402MHz

PSD Bluetooth LE (1M) 2440MHz


PSD Bluetooth LE (1M) 2480MHz

PSD Bluetooth LE (2M) 2402MHz


PSD Bluetooth LE (2M) 2440MHz

PSD Bluetooth LE (2M) 2480MHz


5.5. Spurious RF Conducted Emissions

Ambient Condition

Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Method of Measurement

The EUT was connected to the spectrum analyzer with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. Set RBW to 100 kHz and VBW to 300 kHz, Sweep is set to AUTO.

The test is in transmitting mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that "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. "

Test Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	11.20	-18.80
	2437	10.72	-19.28
	2462	10.22	-19.78
802.11g	2412	5.82	-24.18
	2437	6.53	-23.47
	2462	6.18	-23.82
802.11n HT20	2412	6.03	-23.97
	2437	6.99	-23.01
	2462	6.58	-23.42
802.11n HT40	2422	1.29	-28.71
	2437	1.68	-28.32

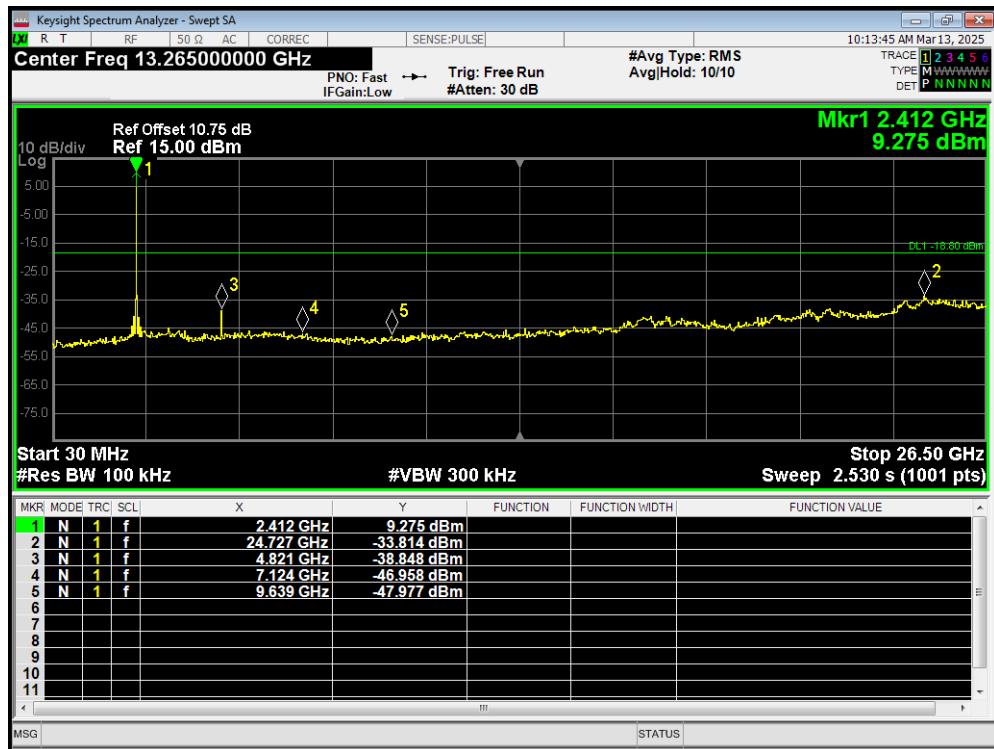
	2452	1.78	-28.22
Bluetooth (Low Energy) (1M)	2402	-0.90	-30.90
	2440	-0.96	-30.96
	2480	-1.31	-31.31
Bluetooth (Low Energy) (2M)	2402	-1.42	-31.42
	2440	-0.89	-30.89
	2480	-1.39	-31.39

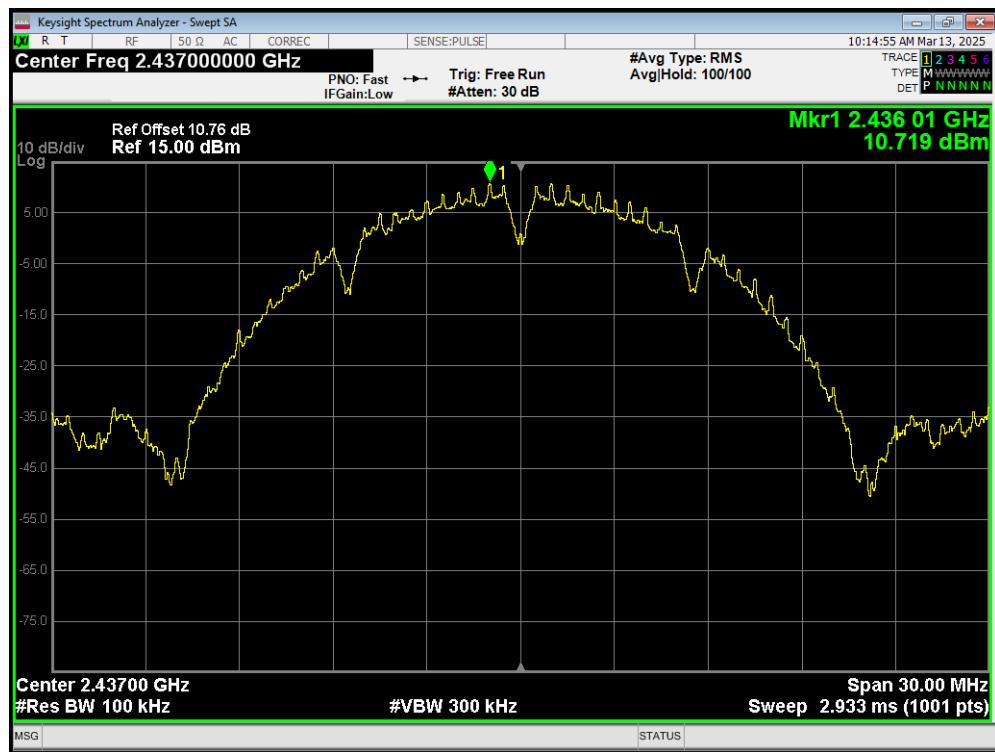
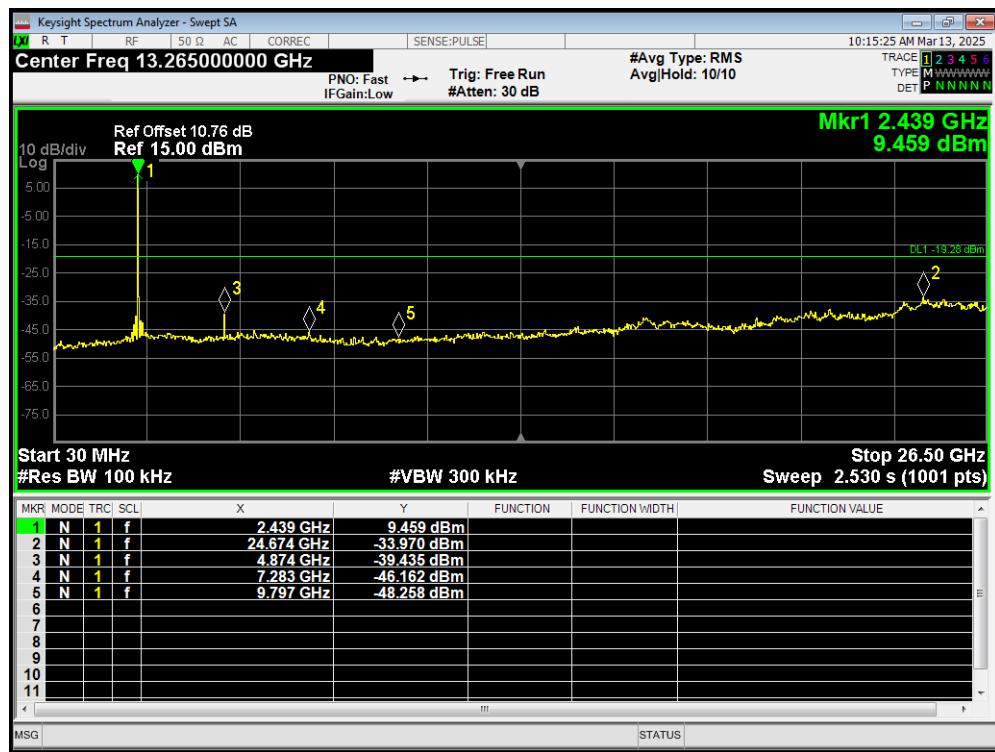
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

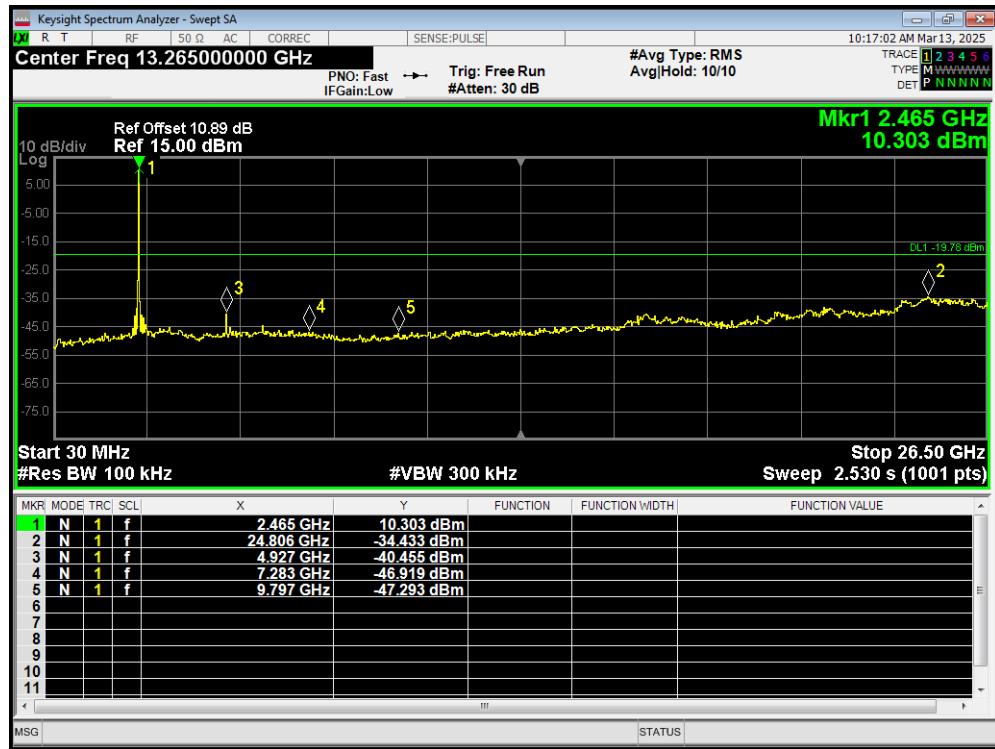
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

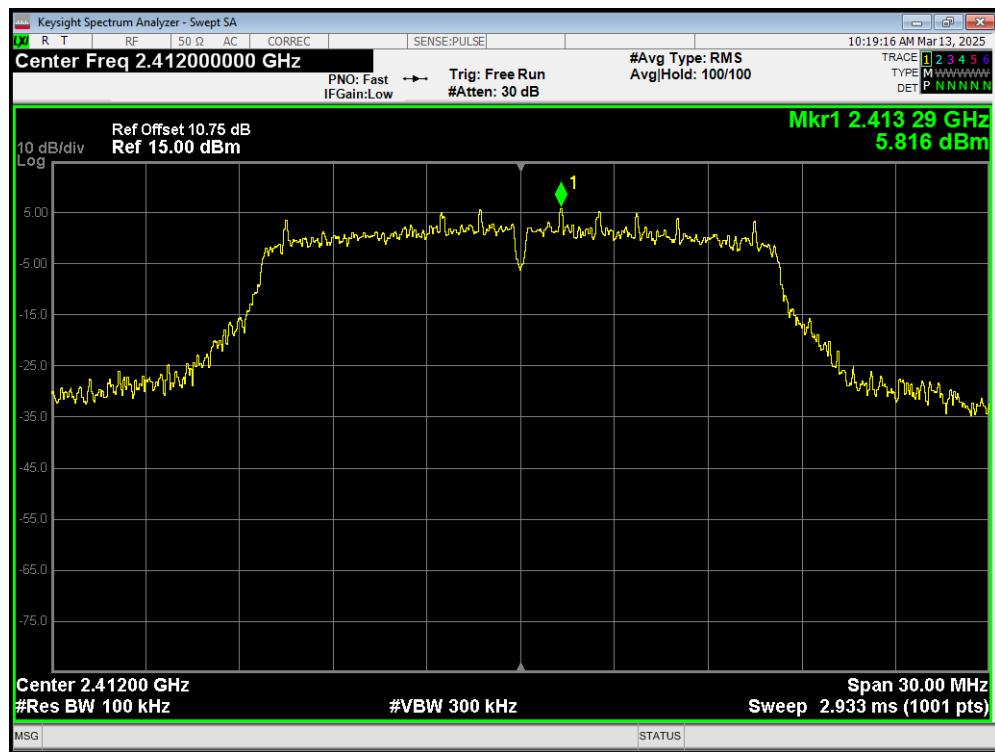
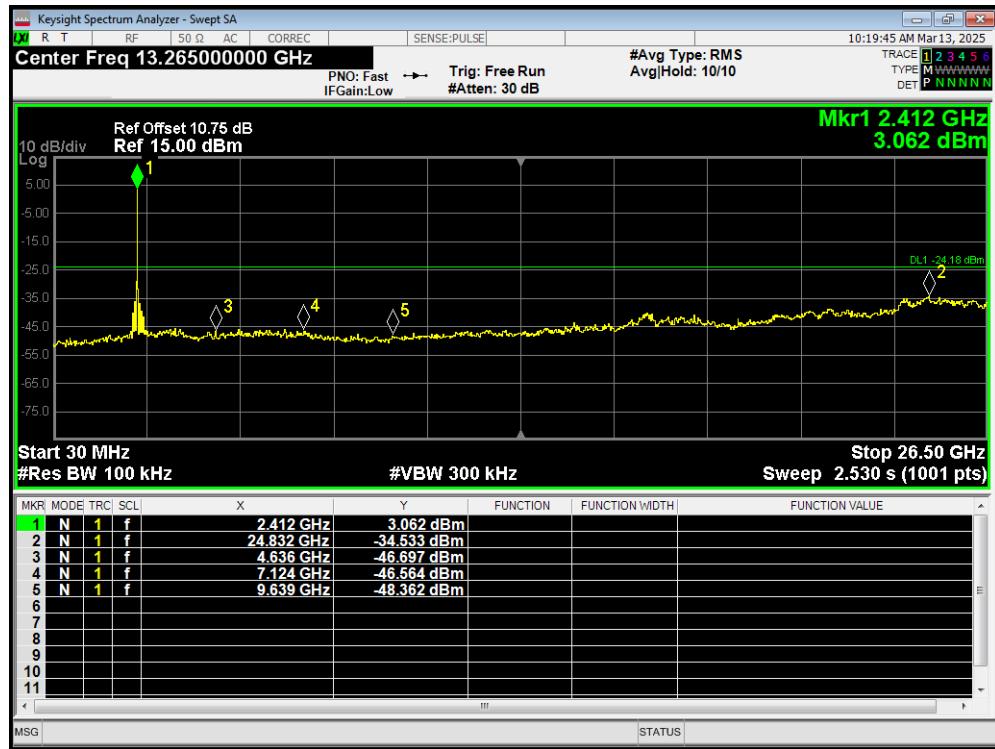
Test Results:
Tx. Spurious 802.11b 2412MHz Ref

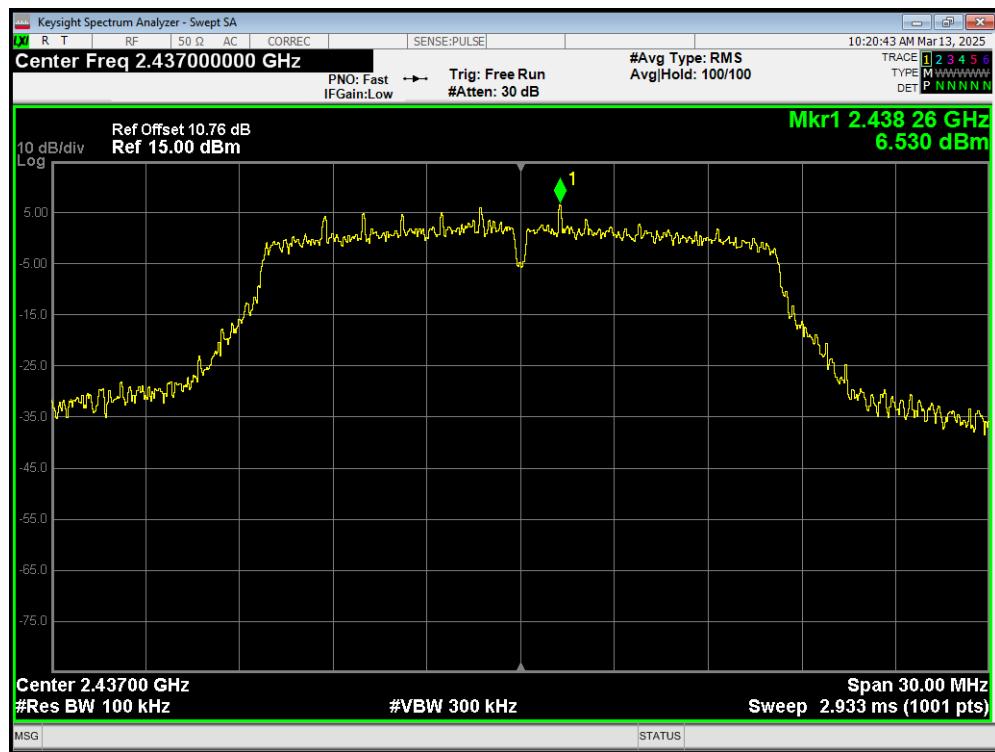
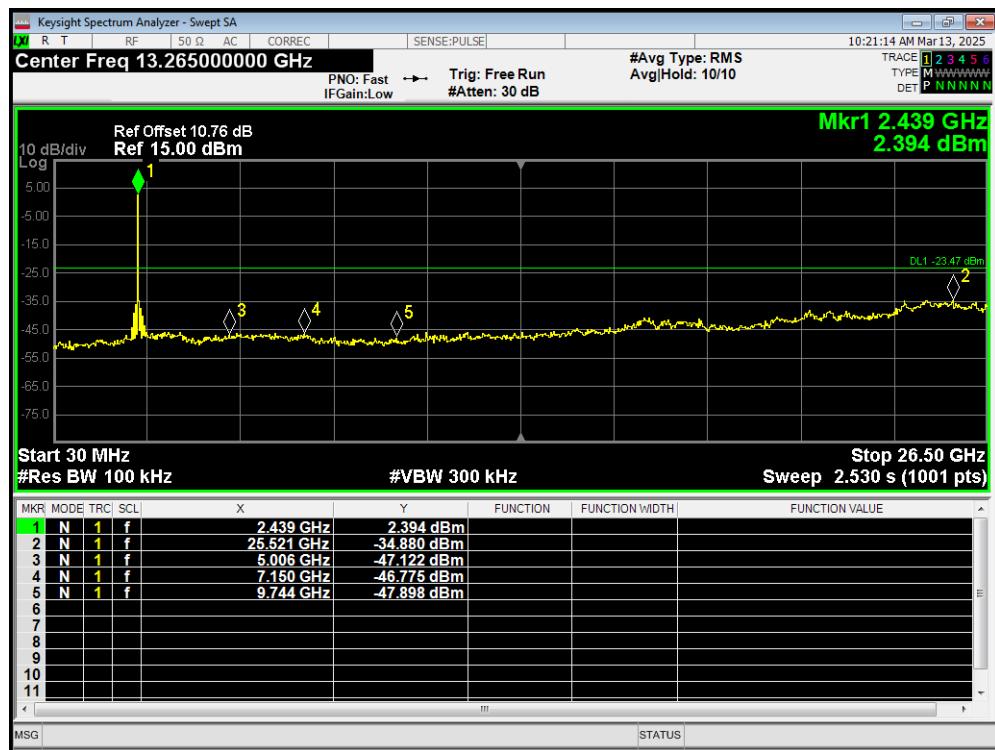
Tx. Spurious 802.11b 2412MHz Emission


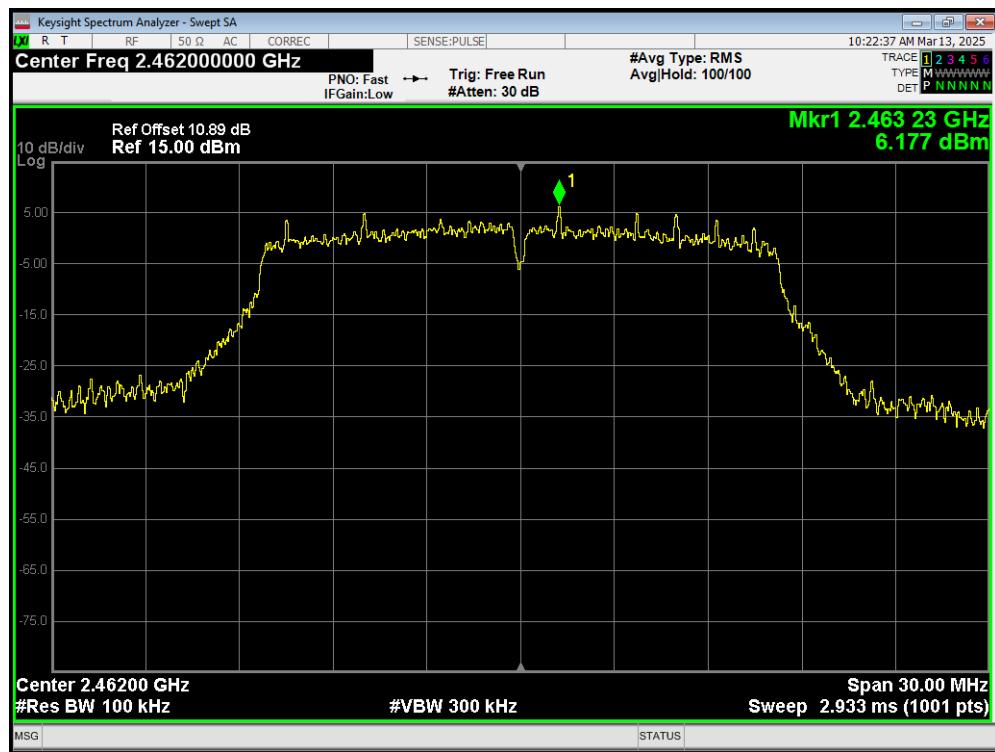
Tx. Spurious 802.11b 2437MHz Ref

Tx. Spurious 802.11b 2437MHz Emission


Tx. Spurious 802.11b 2462MHz Ref

Tx. Spurious 802.11b 2462MHz Emission


Tx. Spurious 802.11g 2412MHz Ref

Tx. Spurious 802.11g 2412MHz Emission


Tx. Spurious 802.11g 2437MHz Ref

Tx. Spurious 802.11g 2437MHz Emission


Tx. Spurious 802.11g 2462MHz Ref

Tx. Spurious 802.11g 2462MHz Emission
