



RF TEST REPORT

Applicant Arcelik.A.S /Arçelik Anonim Şirketi
FCC ID 2A3WF-QUARTZ04
Product WLAN Module (Wi-Fi)
Brand Arçelik
Model Quartz
Report No. R2207A0635-R1
Issue Date November 23, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2021)**. 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

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



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Summary of Measurement Results

umber	Test Case	Clause in FCC rules	Verdict
1	Maximum output power	15.247(b)(3)	PASS
2	6 dB bandwidth	15.247(a)(2)	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: July 27, 2022~ October 10, 2022			
Date of Sample Received: July 25, 2022			
Note: All indications of Pass/Fail in this report are opinions expressed by 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 **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)

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)

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

1.3. Testing Location

Company: 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: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Arcelik.A.S /Arçelik Anonim Şirketi
Applicant address	Karaağaç Caddesi 2-6 Sütlüce İstanbul
Manufacturer	Arcelik.A.S
Manufacturer address	Karaağaç Caddesi 2-6 Sütlüce İstanbul

2.2. General information

EUT Description	
Model	Quartz
Lab internal SN	R2207A0635/S01
Hardware Version	QUARTZ_ESP_G04_B01
Software Version	V186
Power Supply	External power supply
Antenna Type	PCB Antenna
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)
Antenna Gain	4.59 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 V4.2: 2402 ~2480 MHz
Modulation Type	802.11b: DSSS 802.11g/n(HT20/HT40): OFDM Bluetooth LE: GFSK
Max. Output Power	Wi-Fi 2.4G: 19.73 dBm Bluetooth LE: 9.55 dBm
Note: 1. The EUT is sent from the applicant to 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 (2021) 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 (X 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.

The test software is used IPOP

Worst-case data rates are shown as following table.

Test Mode	Data Rate
Bluetooth(Low Energy)	1Mbps
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

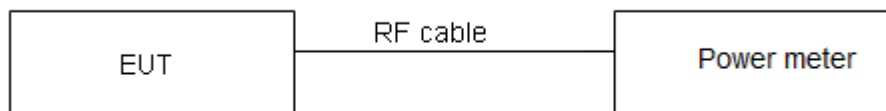
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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	$\leq 1W$ (30dBm)
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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 setting: default

Power Index					
Channel	802.11b	802.11g	802.11n HT20	Channel	802.11n HT40
CH1	0	12	16	CH1	--
CH2	--	0	0	CH2	--
CH3	--	--	--	CH3	16
CH4	--	--	--	CH4	8
CH5	--	--	--	CH5	4
CH6	0	0	0	CH6	0
CH7	--	--	--	CH7	4
CH8	--	--	--	CH8	12
CH9	--	--	--	CH9	16
CH10	--	0	0	CH10	--
CH11	0	12	16	CH11	--

Power Index	
Channel	Bluetooth LE
CH0	8
CH19	8
CH39	8

Test Mode	Duty cycle	Duty cycle correction Factor(dB)
802.11b	1.00	0.00
802.11g	1.00	0.00
802.11n HT20	1.00	0.00
802.11n HT40	1.00	0.00
Bluetooth LE	0.84	0.77

Note: when Duty cycle $\geq$ 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	19.73	19.73	30	PASS
	2437/CH 6	19.00	19.00	30	PASS
	2462/CH11	18.84	18.84	30	PASS
802.11g	2412/CH 1	15.25	15.25	30	PASS
	2417/CH 2	17.87	17.87	30	PASS
	2437/CH 6	17.33	17.33	30	PASS
	2457/CH 10	17.24	17.24	30	PASS
	2462/CH11	14.65	14.65	30	PASS
802.11n HT20	2412/CH 1	14.57	14.57	30	PASS
	2417/CH 2	18.08	18.08	30	PASS
	2437/CH 6	17.53	17.53	30	PASS
	2457/CH 10	17.43	17.43	30	PASS
	2462/CH11	13.66	13.66	30	PASS
802.11n HT40	2422/CH 3	14.20	14.20	30	PASS
	2427/CH 4	15.48	15.48	30	PASS
	2432/CH 5	16.53	16.53	30	PASS
	2437/CH 6	17.04	17.04	30	PASS
	2442/CH 7	15.73	15.73	30	PASS
	2447/CH 8	13.83	13.83	30	PASS
	2452/CH 9	13.58	13.58	30	PASS
Bluetooth (Low Energy) (1M)	2402/CH0	8.78	9.55	30	PASS
	2440/CH19	8.35	9.12	30	PASS
	2480/CH39	7.58	8.35	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

5.2. 99% Bandwidth and 6dB Bandwidth

Ambient condition

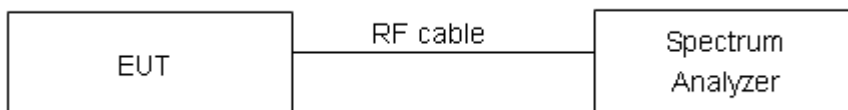
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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
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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.

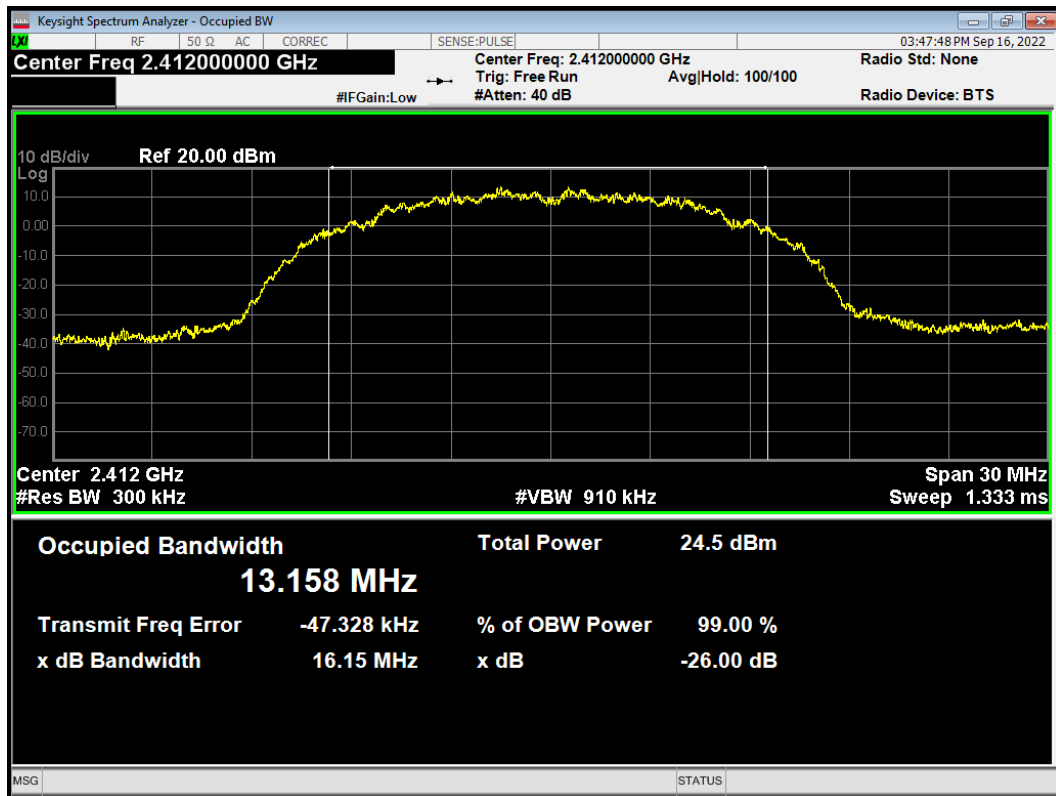
Test Results:

Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	13.158	9.551	500	PASS
	2437	13.125	9.946	500	PASS
	2462	13.121	9.537	500	PASS
802.11g	2412	16.424	16.386	500	PASS
	2417	16.481	16.411	500	PASS
	2437	16.423	16.371	500	PASS
	2457	16.441	16.387	500	PASS
	2462	16.415	16.381	500	PASS
802.11n HT20	2412	17.292	17.291	500	PASS
	2417	17.252	17.066	500	PASS
	2437	17.290	17.008	500	PASS
	2457	17.288	16.946	500	PASS
	2462	17.261	17.023	500	PASS
802.11n HT40	2422	34.176	32.217	500	PASS
	2427	34.173	32.251	500	PASS
	2432	34.182	32.543	500	PASS
	2437	34.222	32.552	500	PASS
	2442	34.182	32.184	500	PASS
	2447	34.187	32.792	500	PASS
	2452	34.171	32.533	500	PASS
Bluetooth (Low Energy)	2402	1.089	0.635	500	PASS
	2440	1.092	0.663	500	PASS
	2480	1.091	0.630	500	PASS

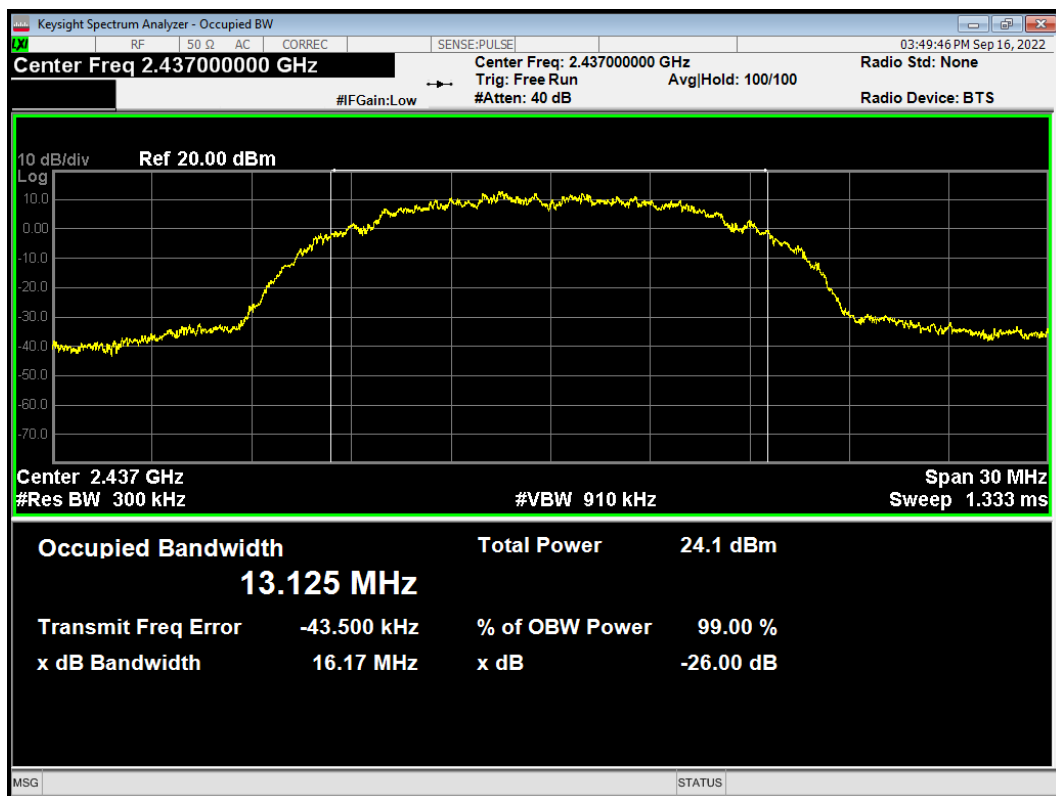


99%bandwidth

OBW 802.11b 2412MHz

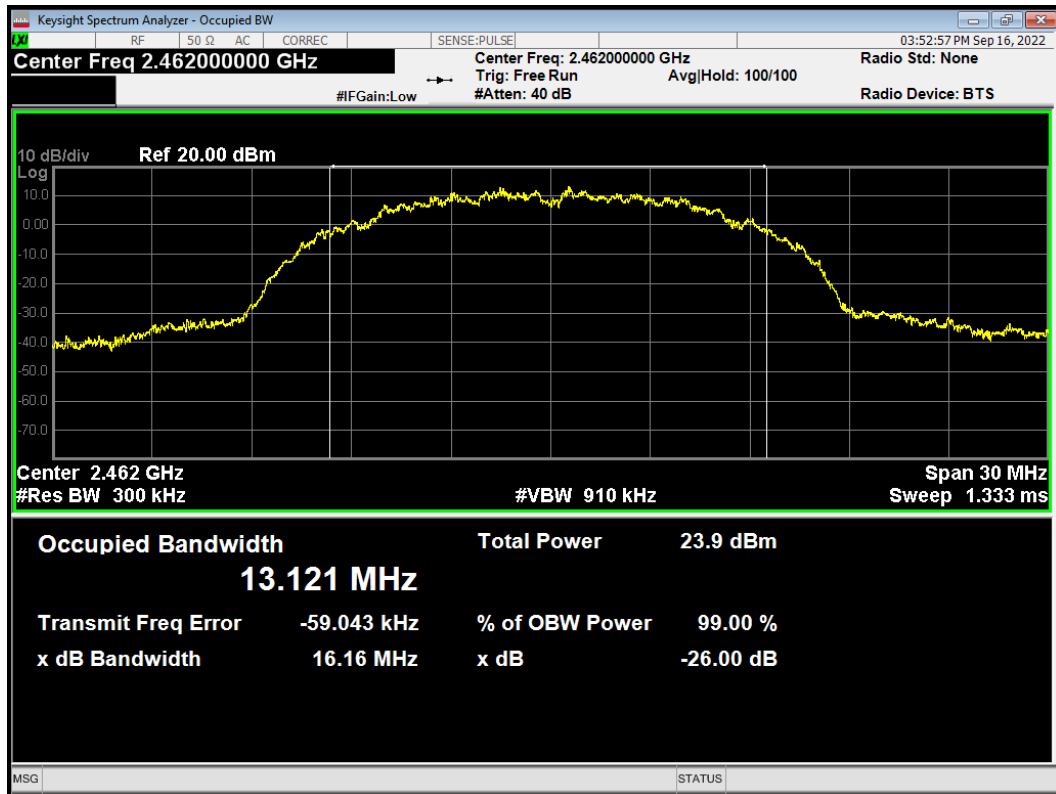


OBW 802.11b 2437MHz

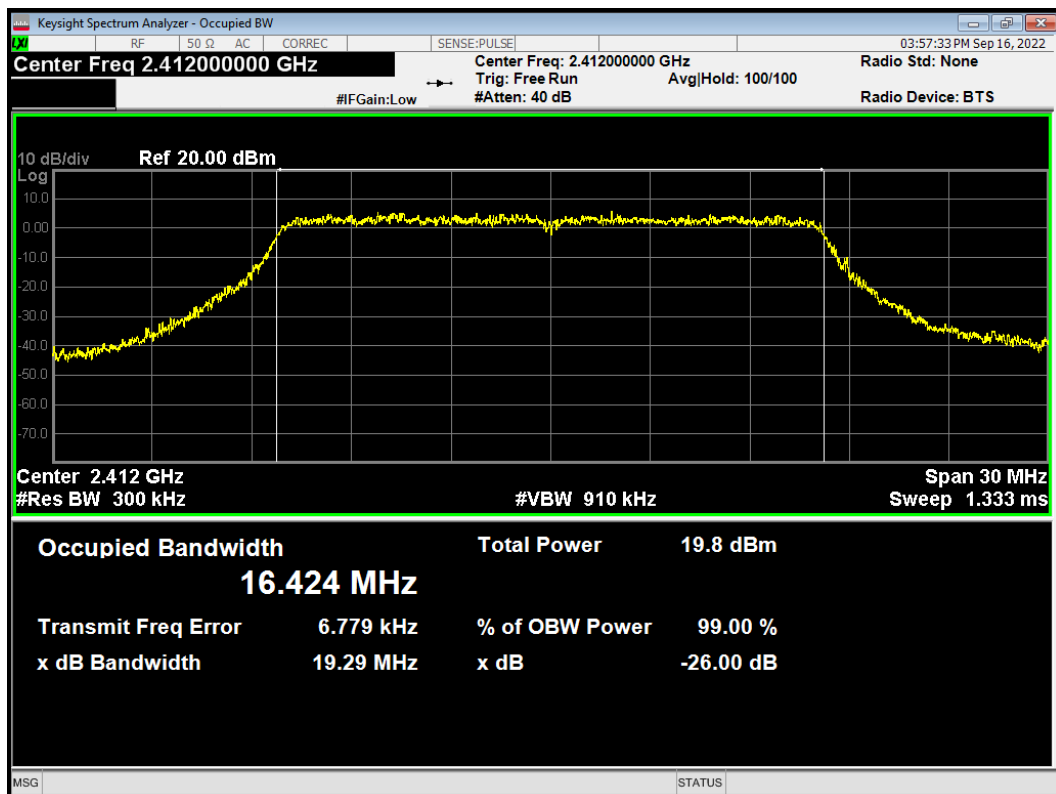




OBW 802.11b 2462MHz

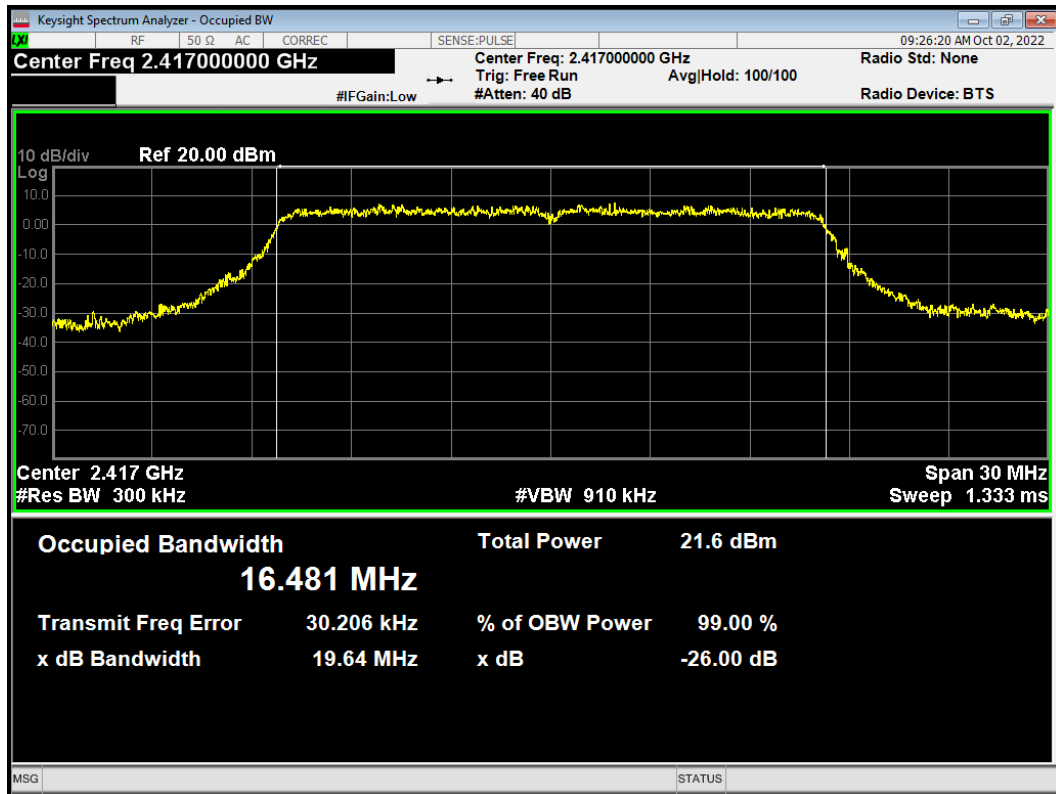


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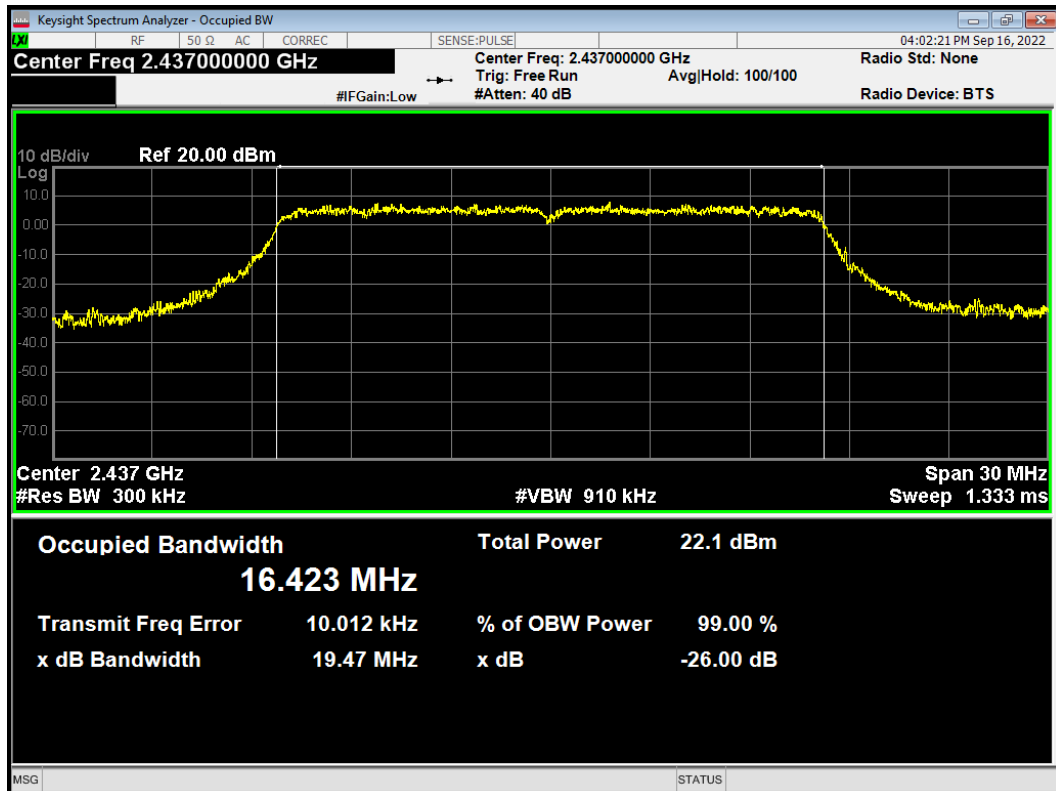




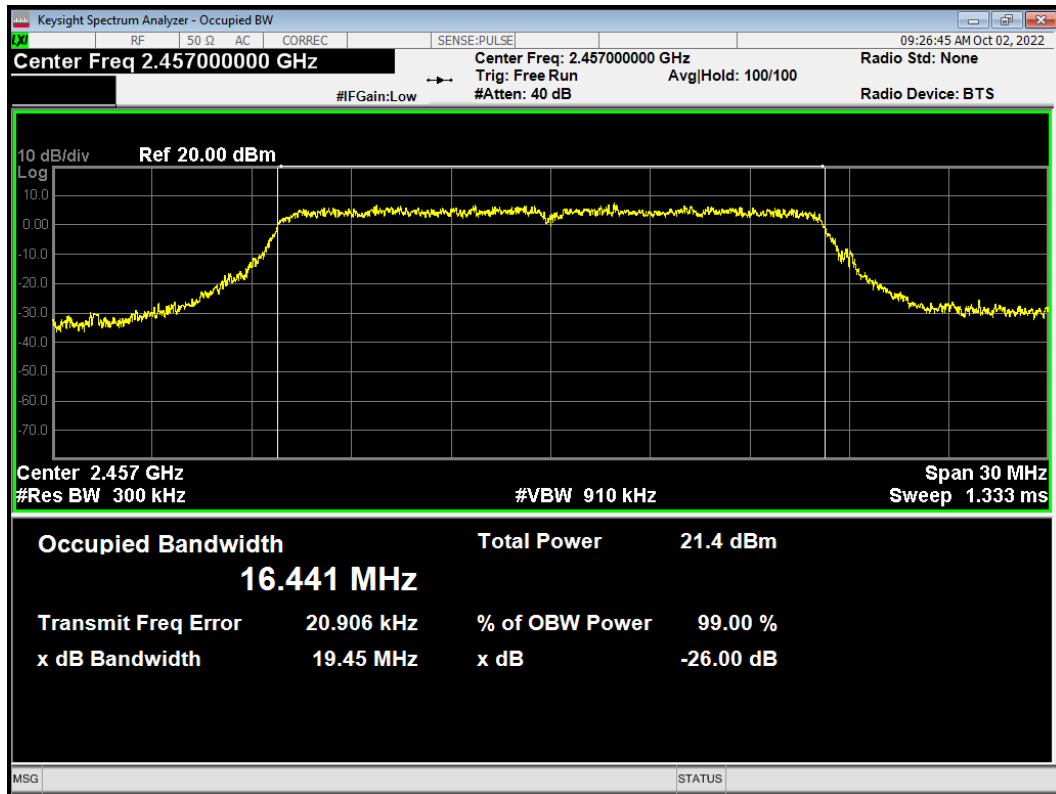
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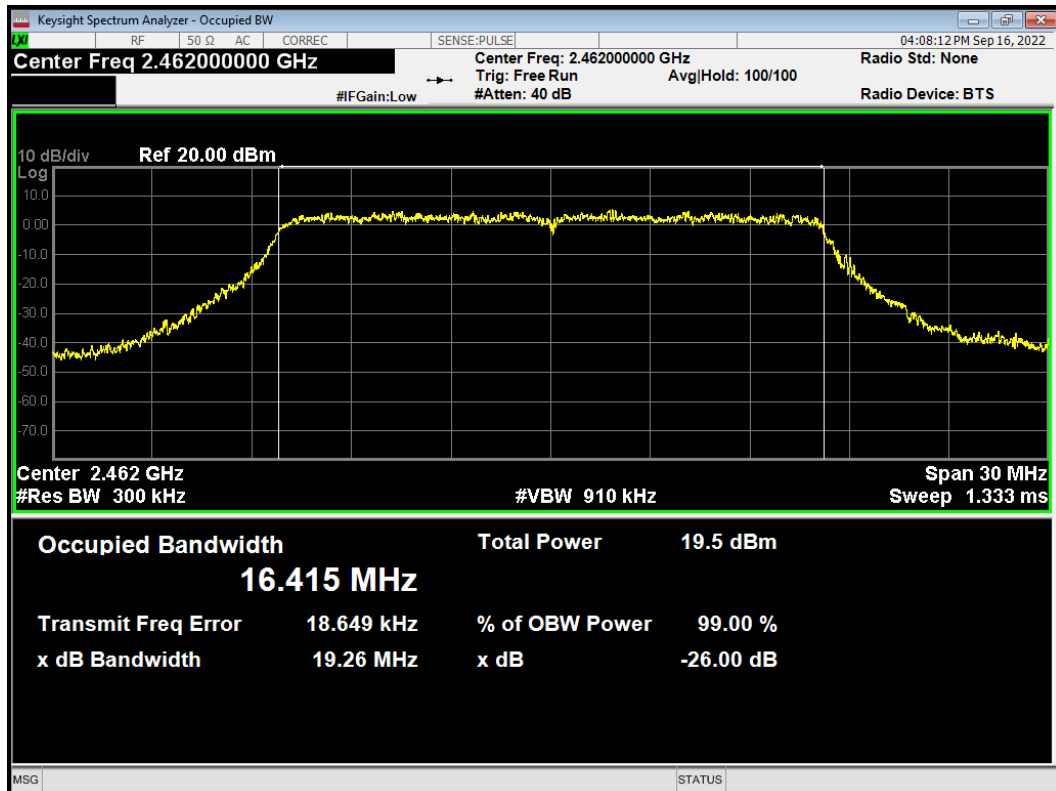
OBW 802.11g 2437MHz



OBW 802.11g 2457MHz

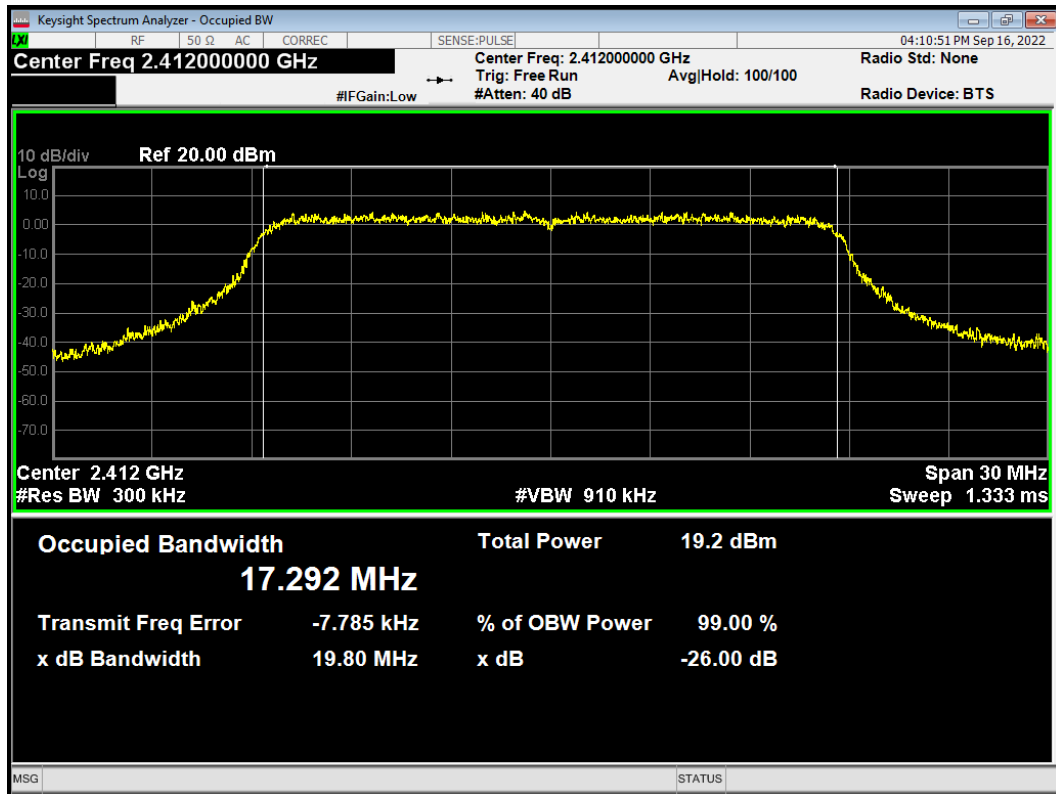


OBW 802.11g 2462MHz

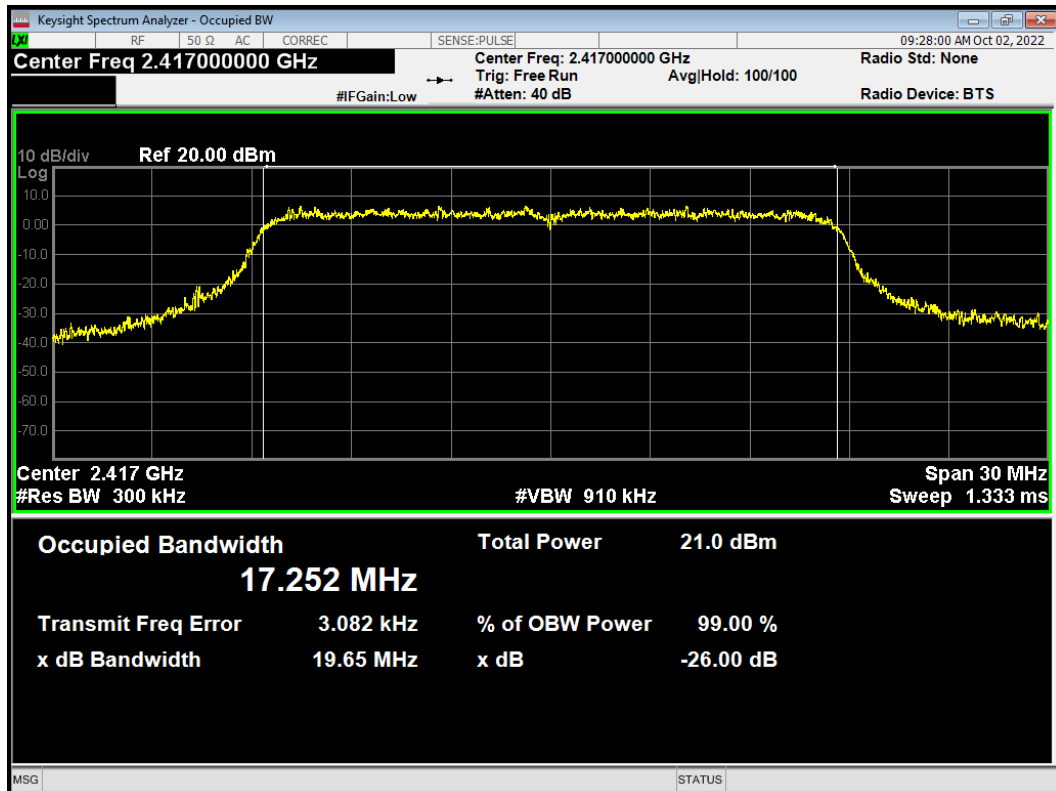




OBW 802.11n(HT20) 2412MHz

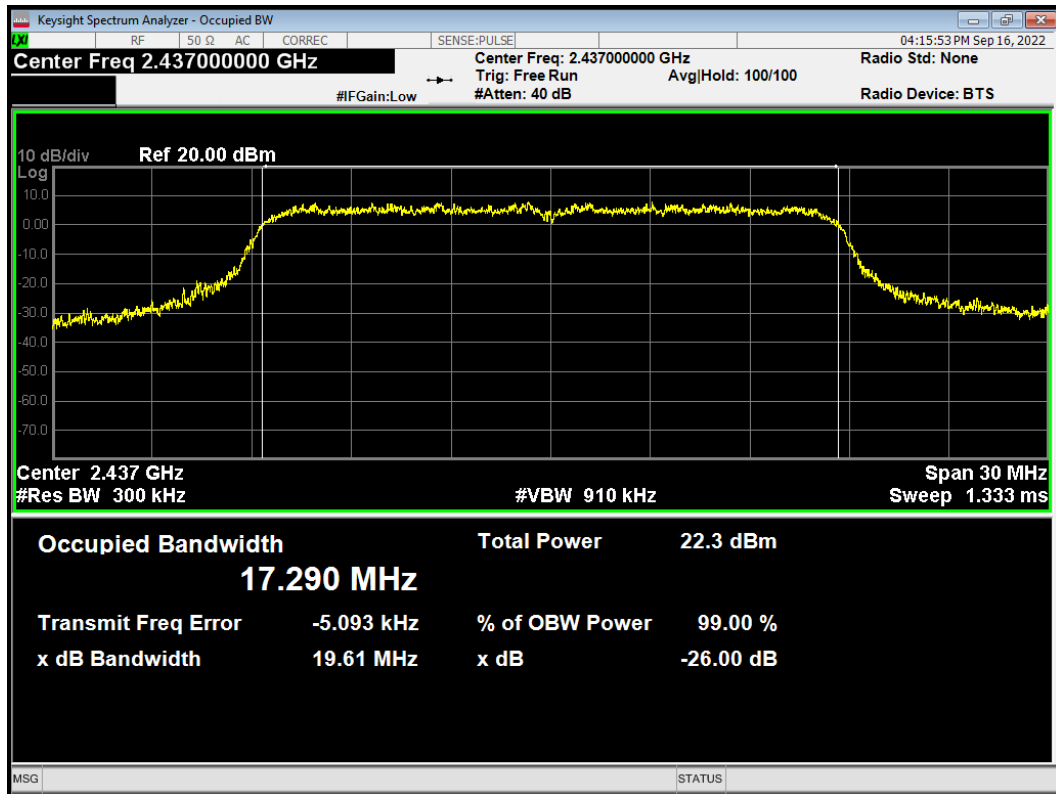


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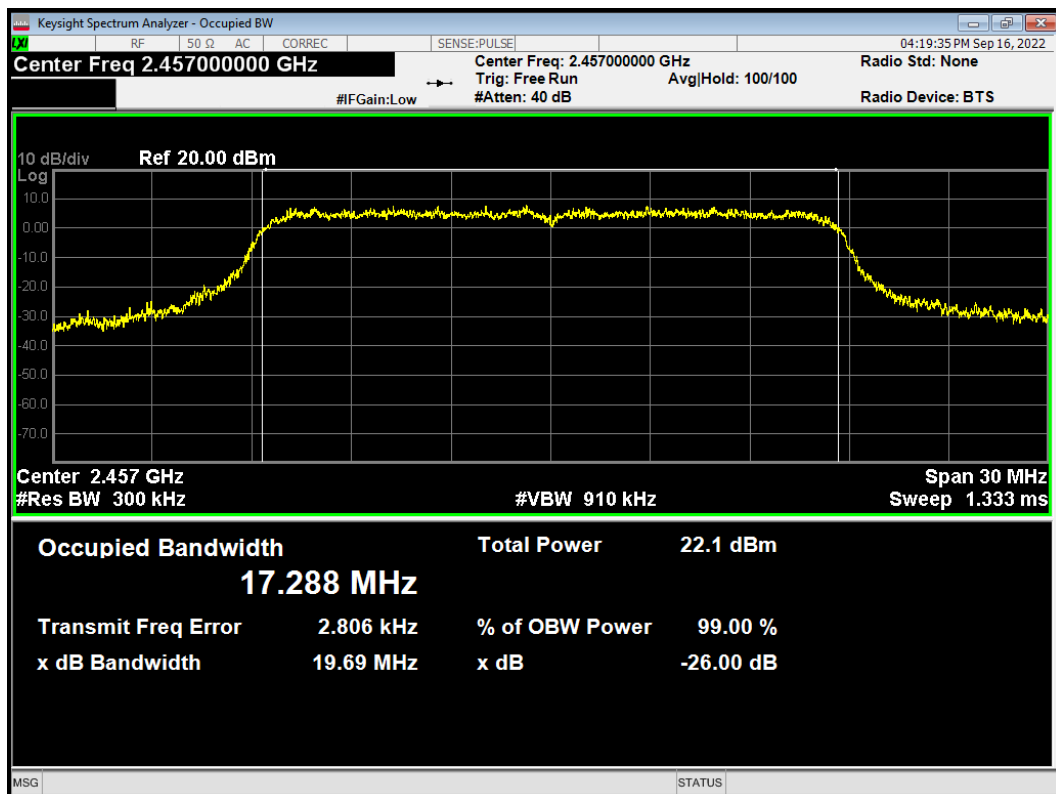




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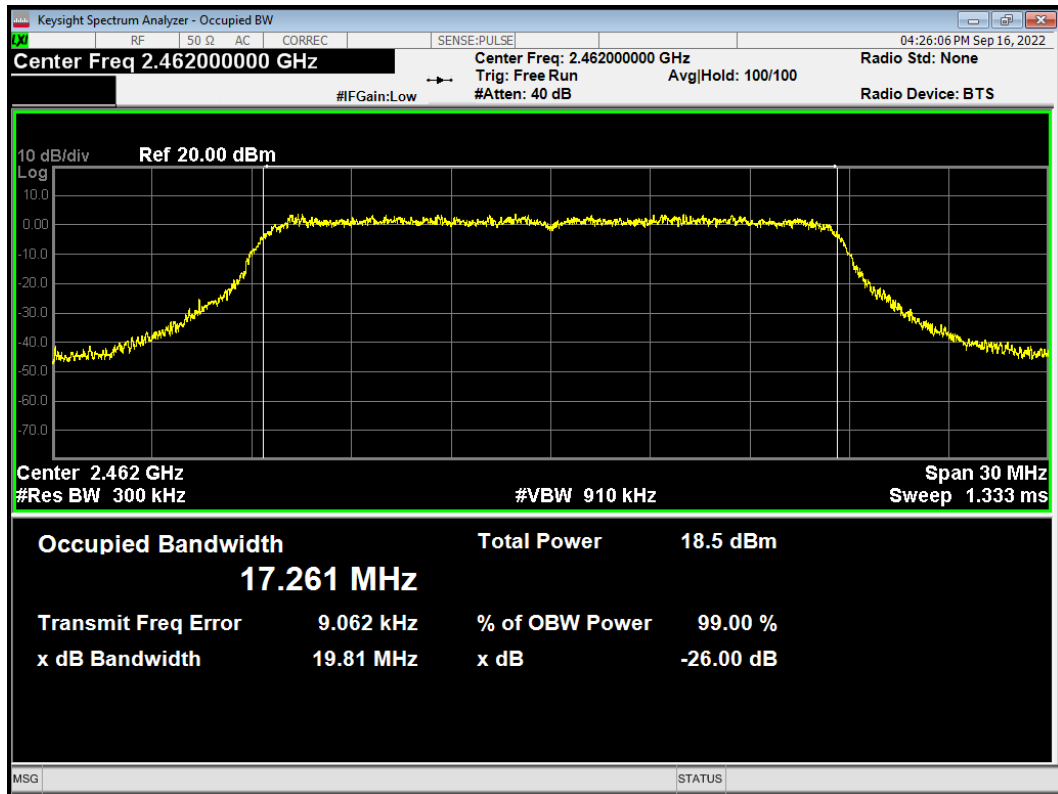


OBW 802.11n(HT20) 2457MHz

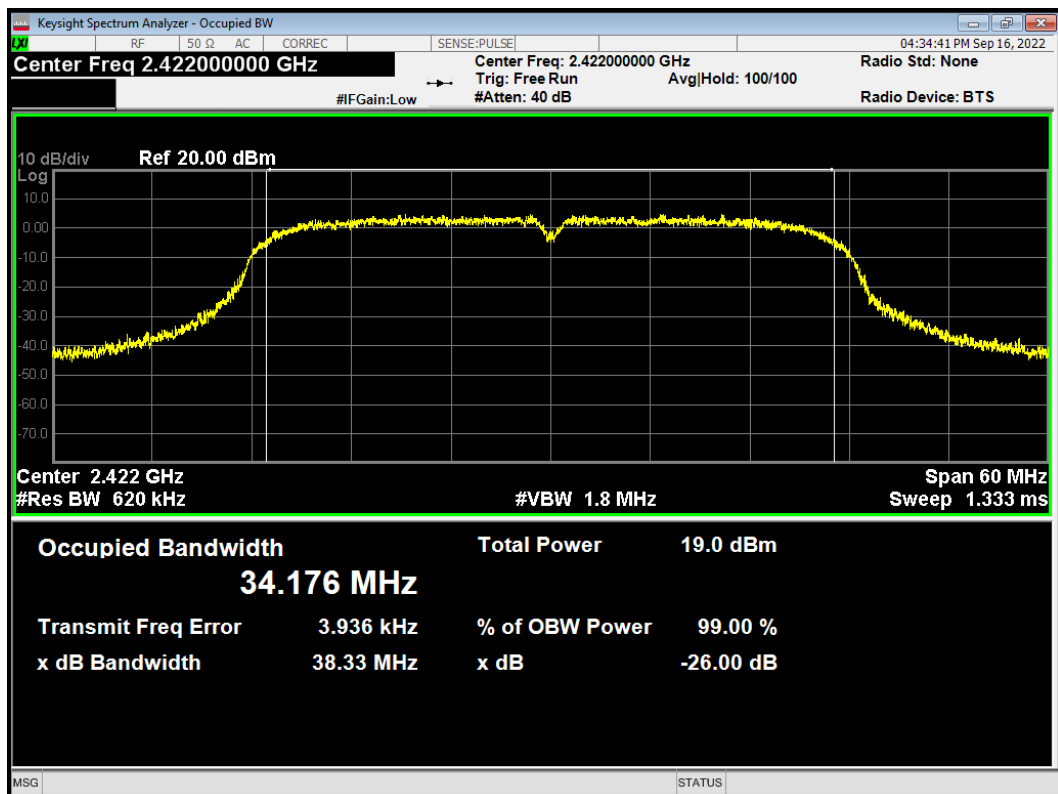




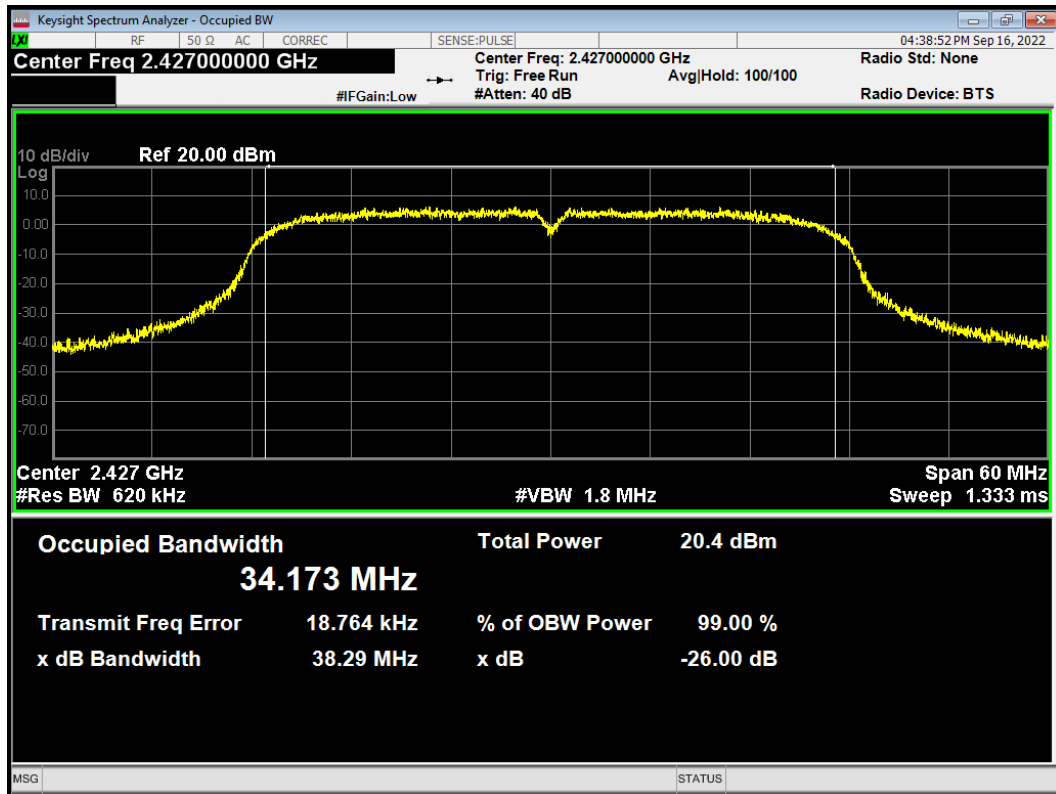
OBW 802.11n(HT20) 2462MHz



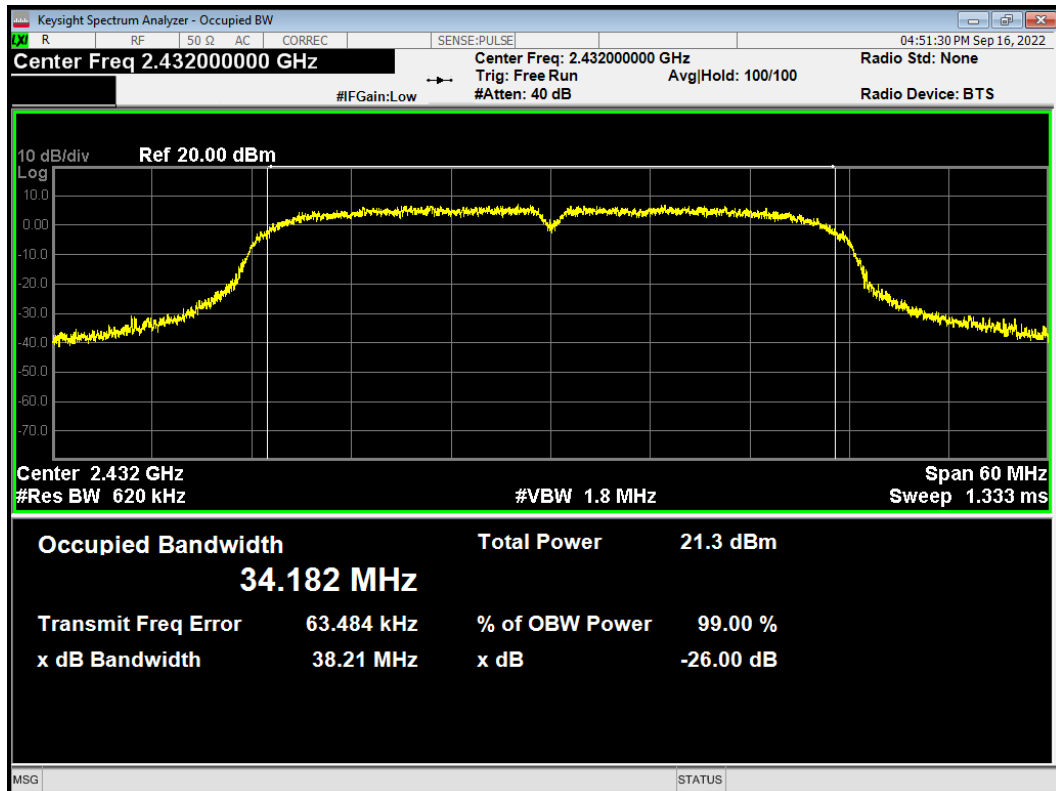
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OBW 802.11n(HT40) 2427MHz

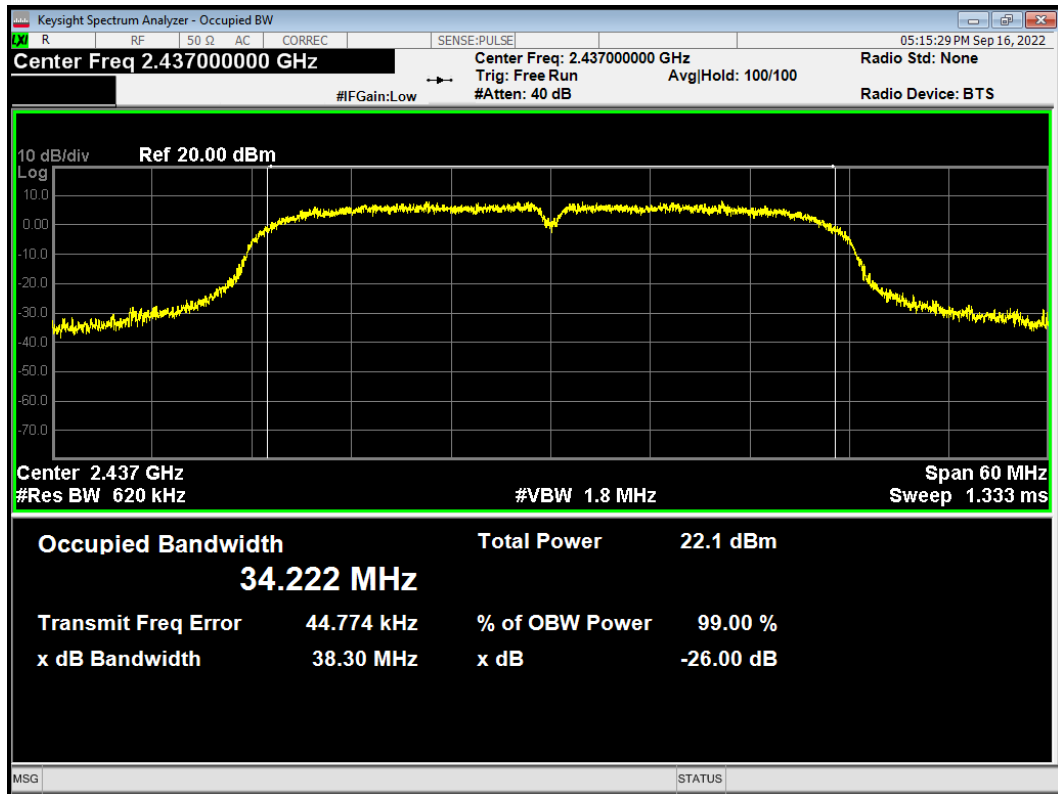


OBW 802.11n(HT40) 2432MHz

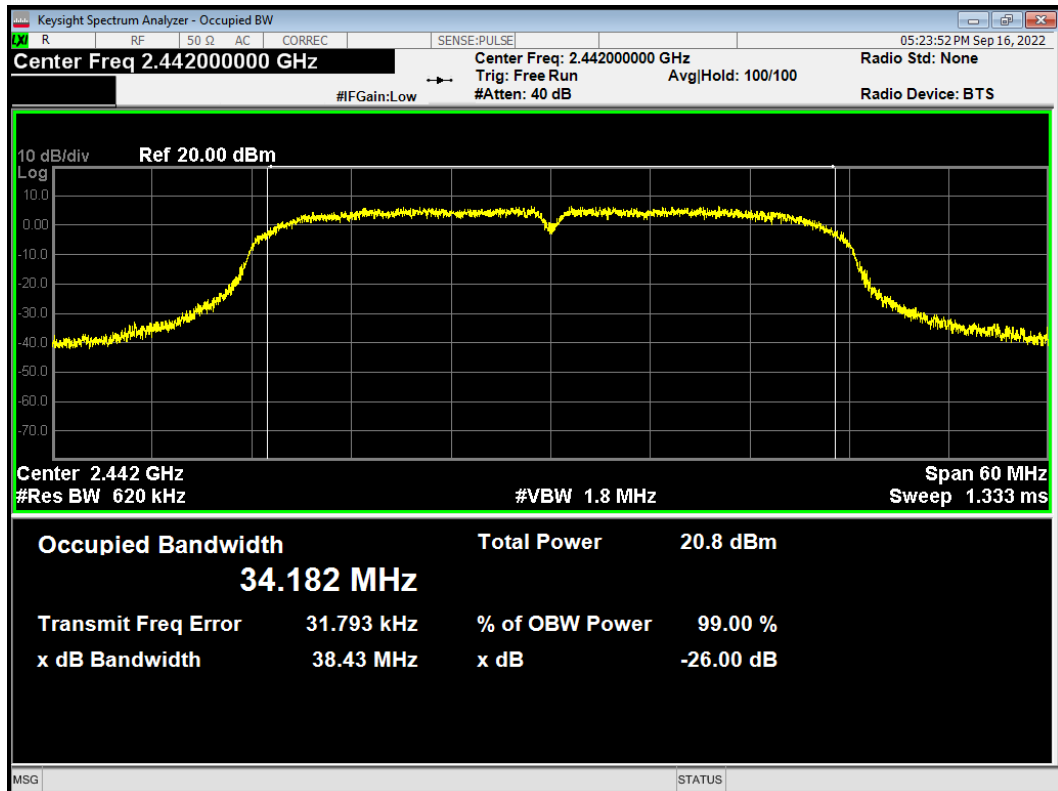




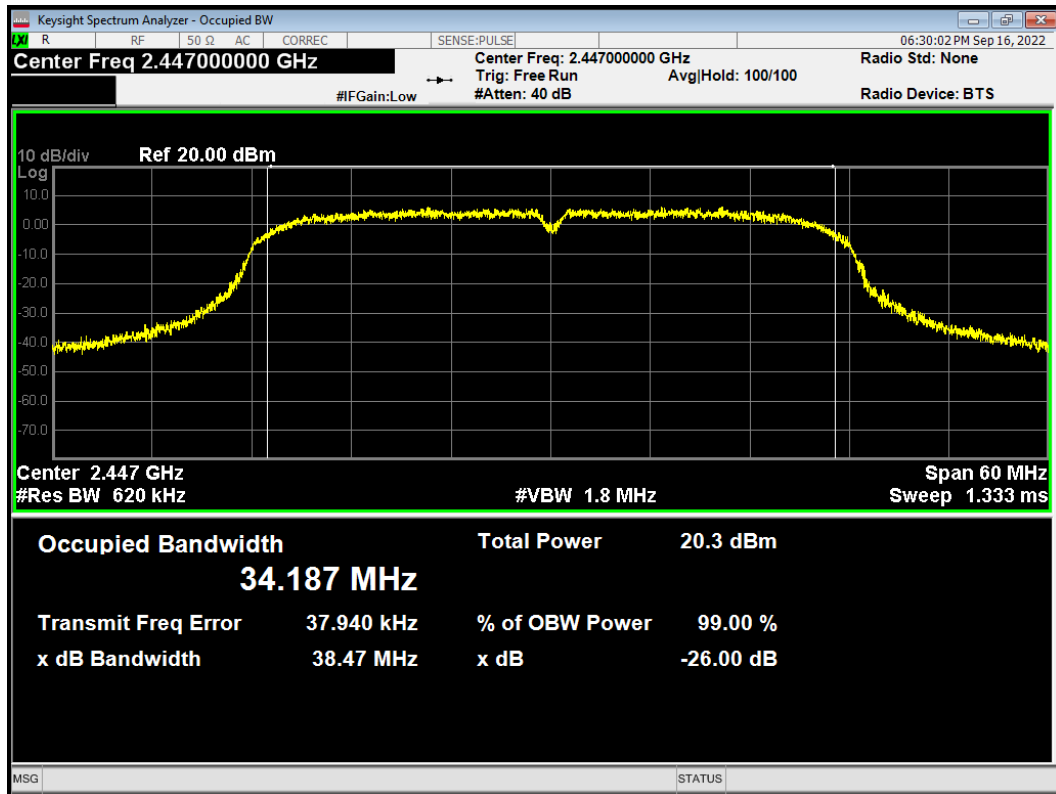
OBW 802.11n(HT40) 2437MHz



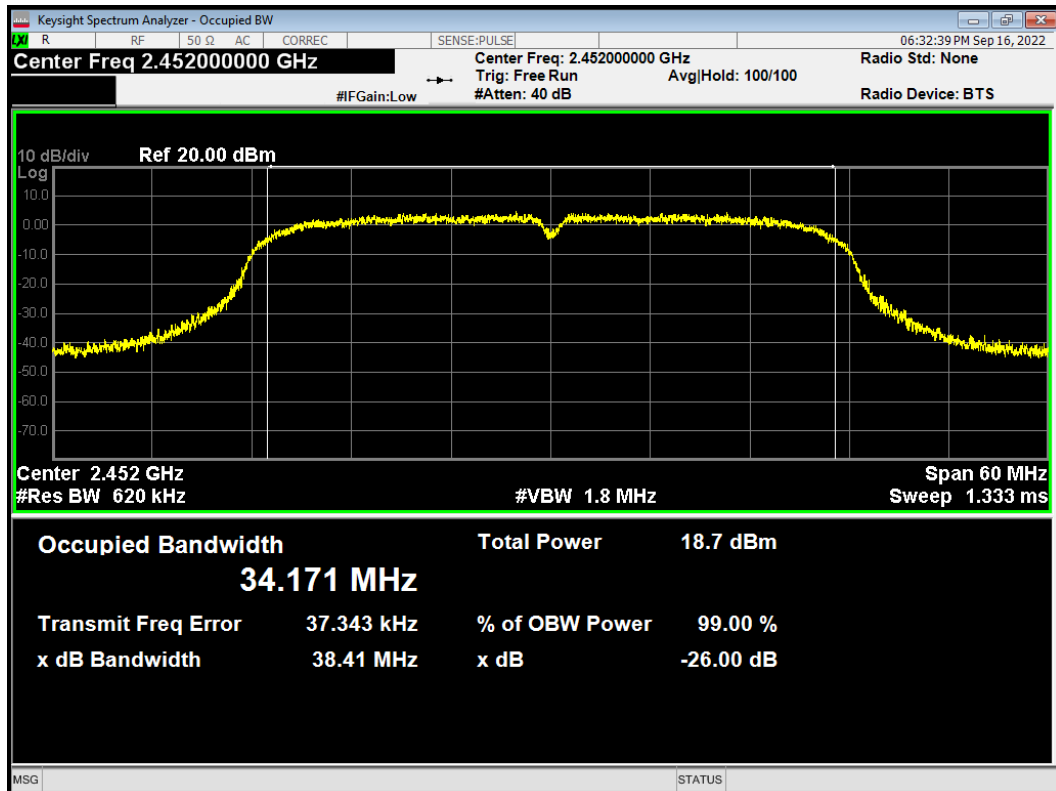
OBW 802.11n(HT40) 2442MHz



OBW 802.11n(HT40) 2447MHz

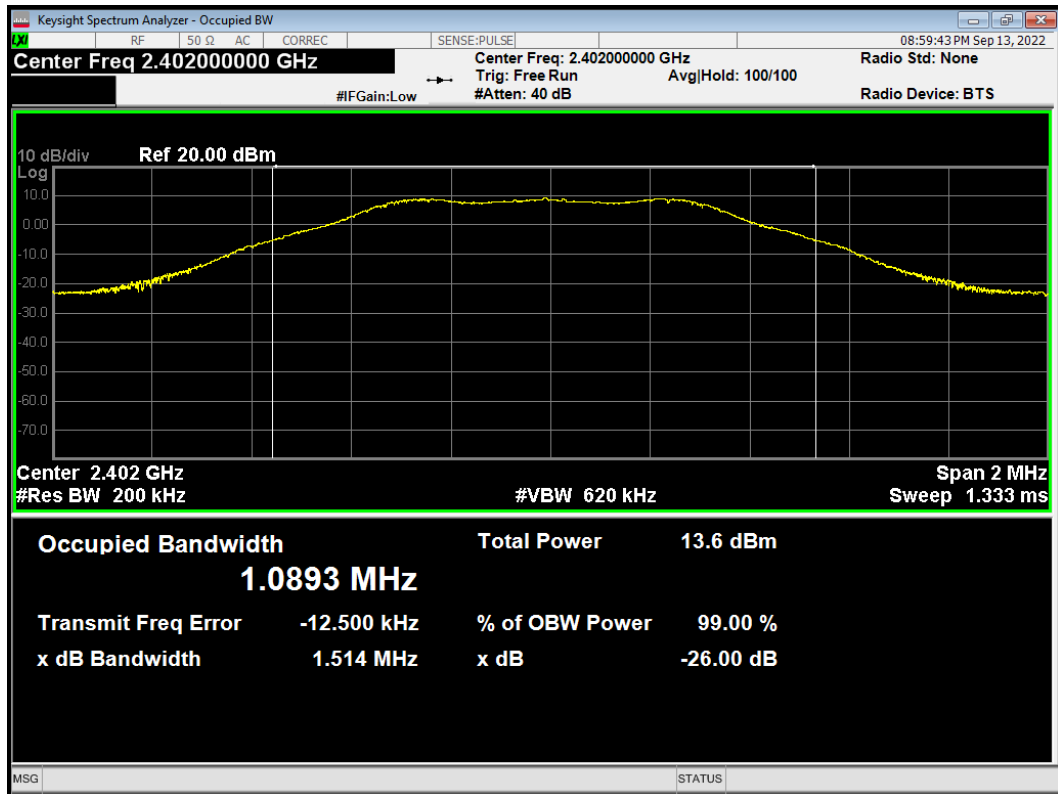


OBW 802.11n(HT40) 2452MHz

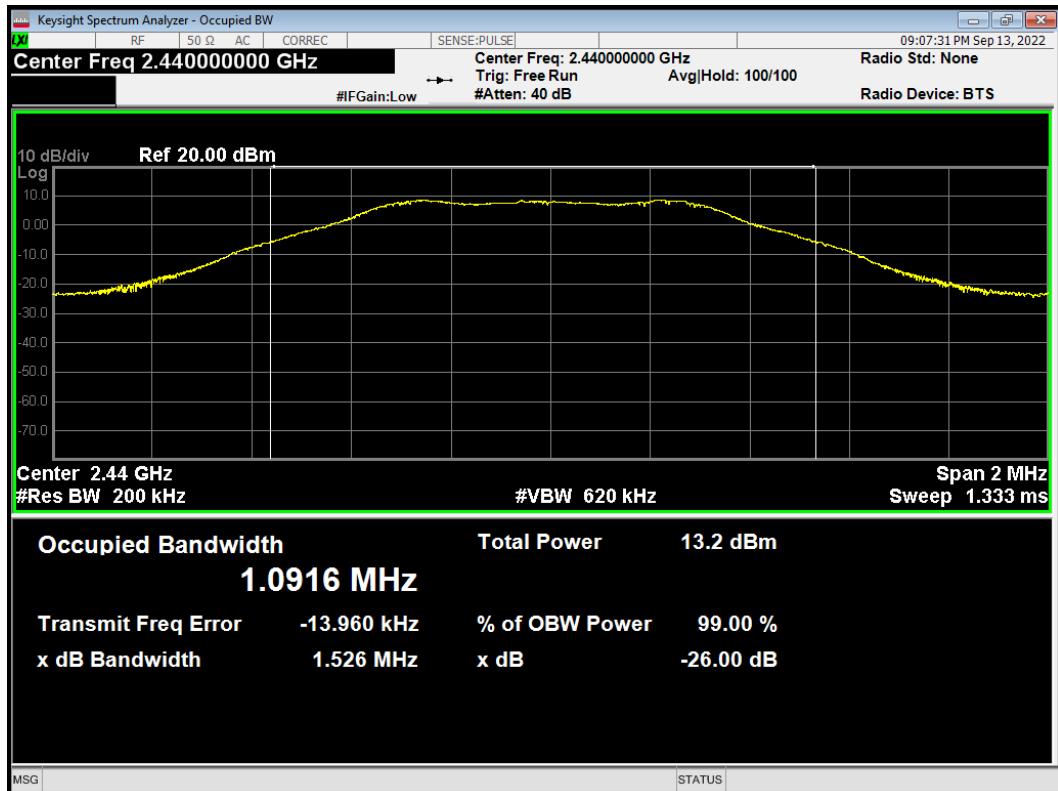




OBW BLE 2402MHz

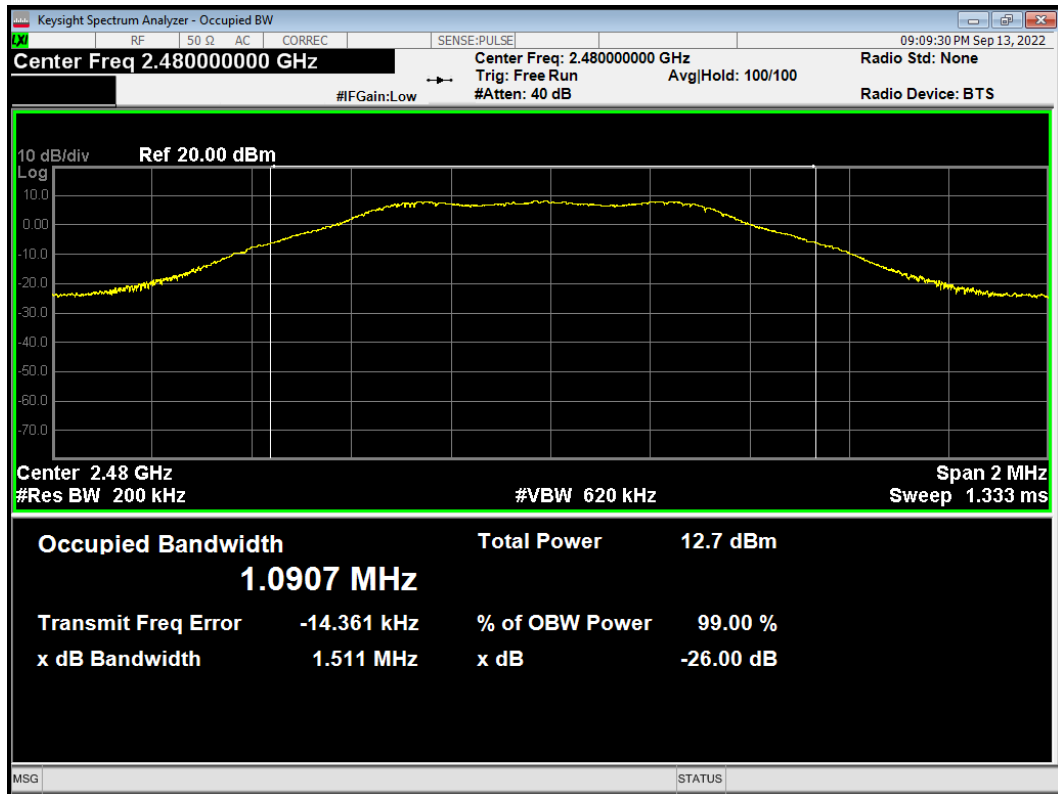


OBW BLE 2440MHz





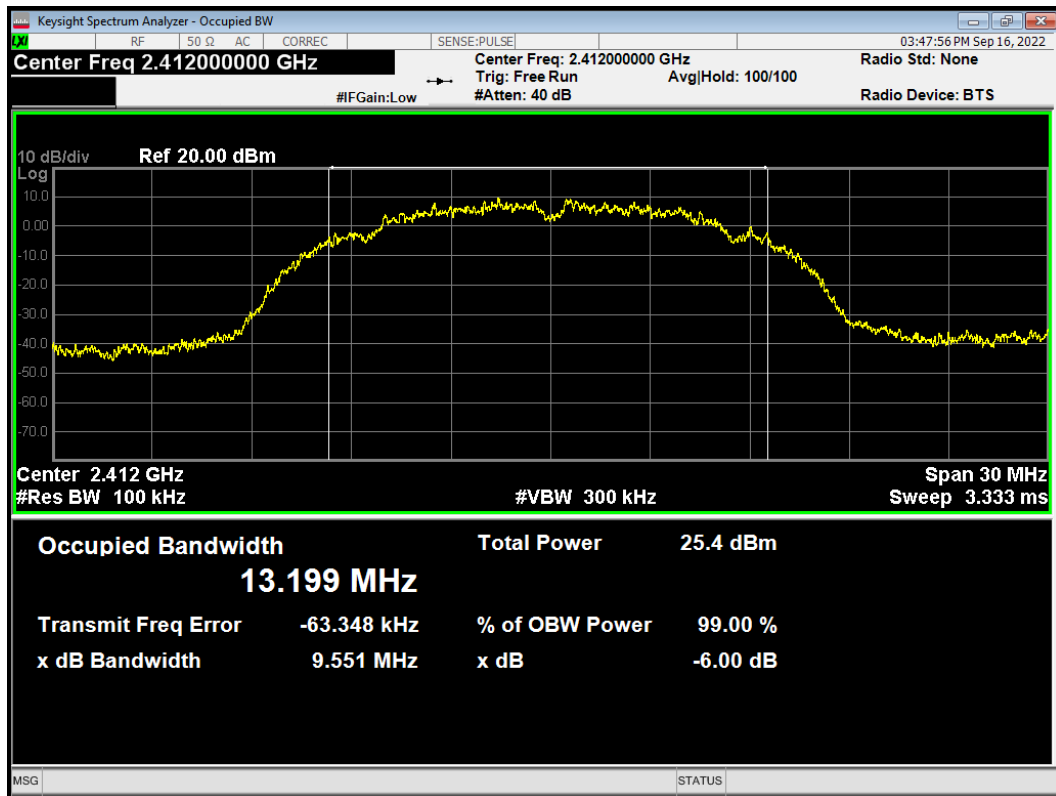
OBW BLE 2480MHz



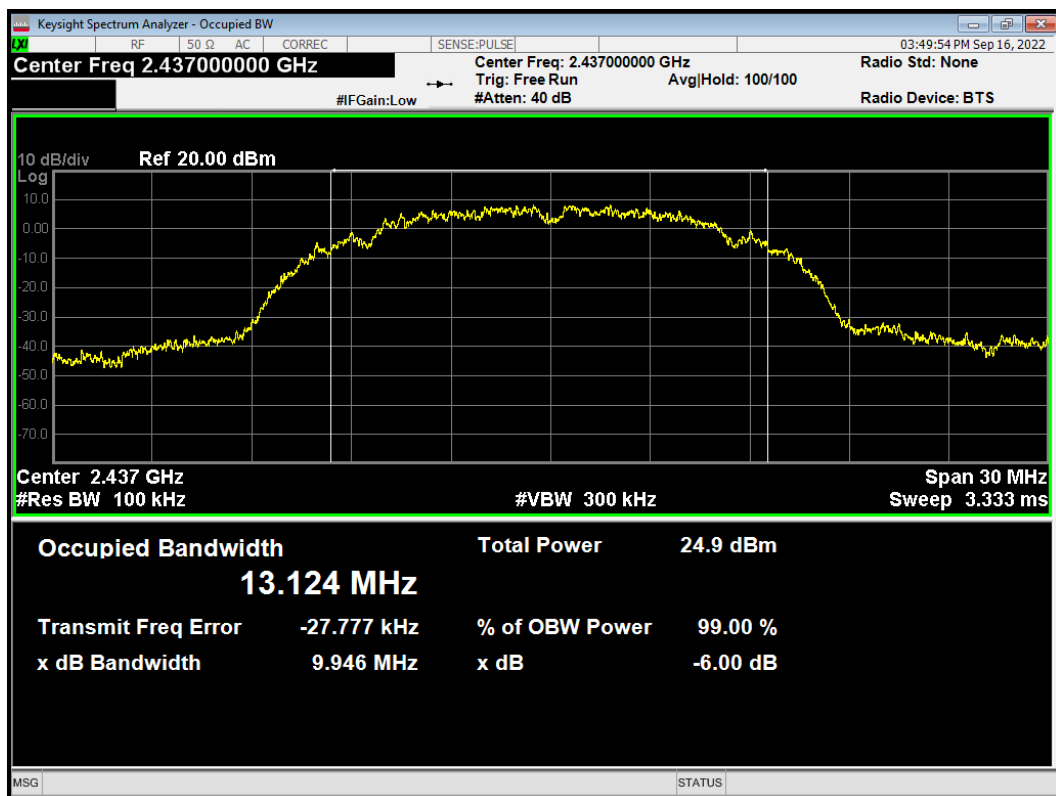


6 dB bandwidth

-6dB Bandwidth 802.11b 2412MHz

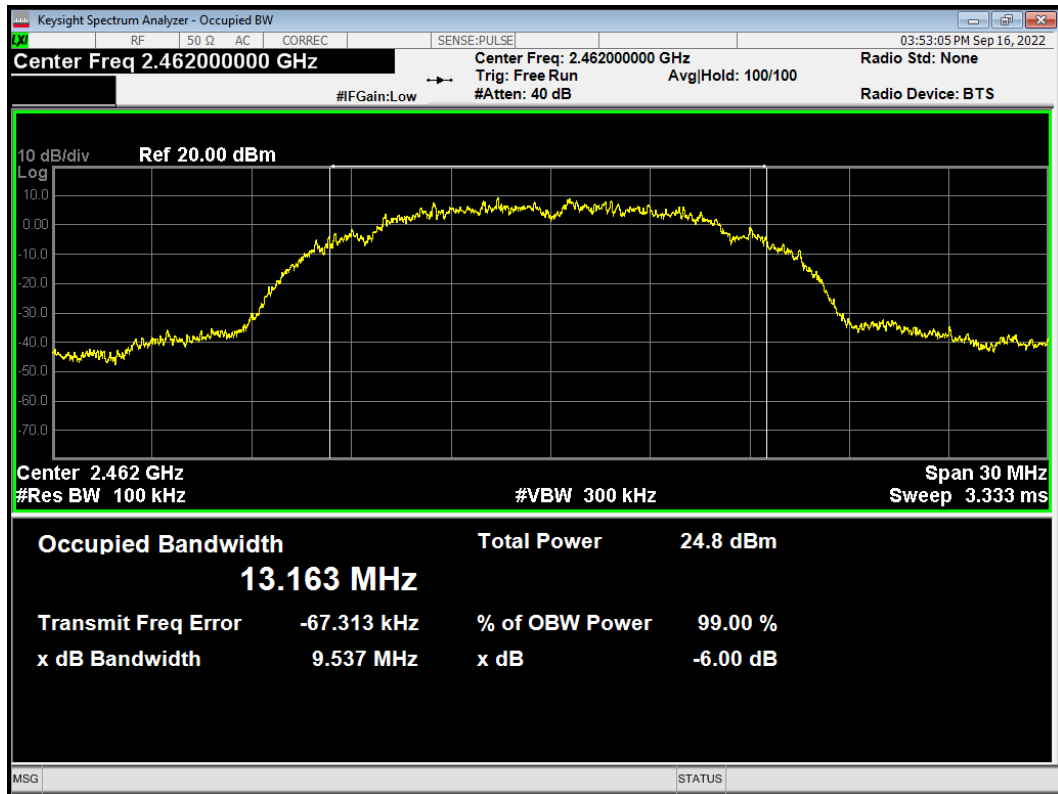


-6dB Bandwidth 802.11b 2437MHz

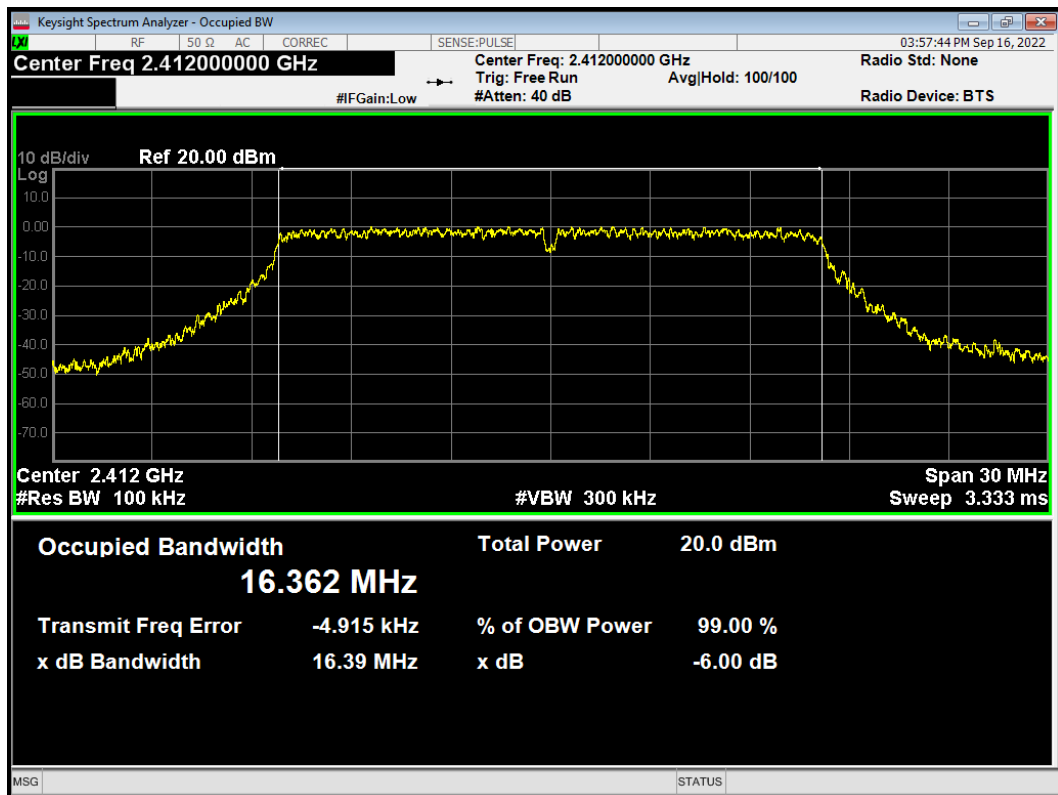


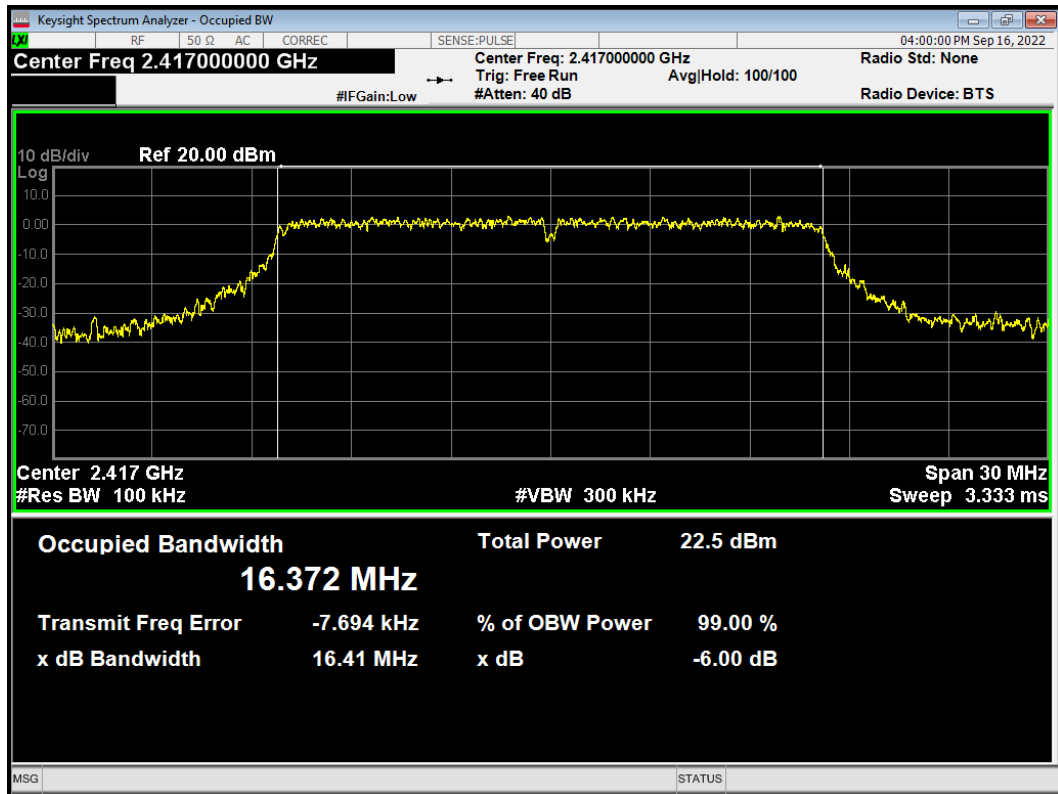
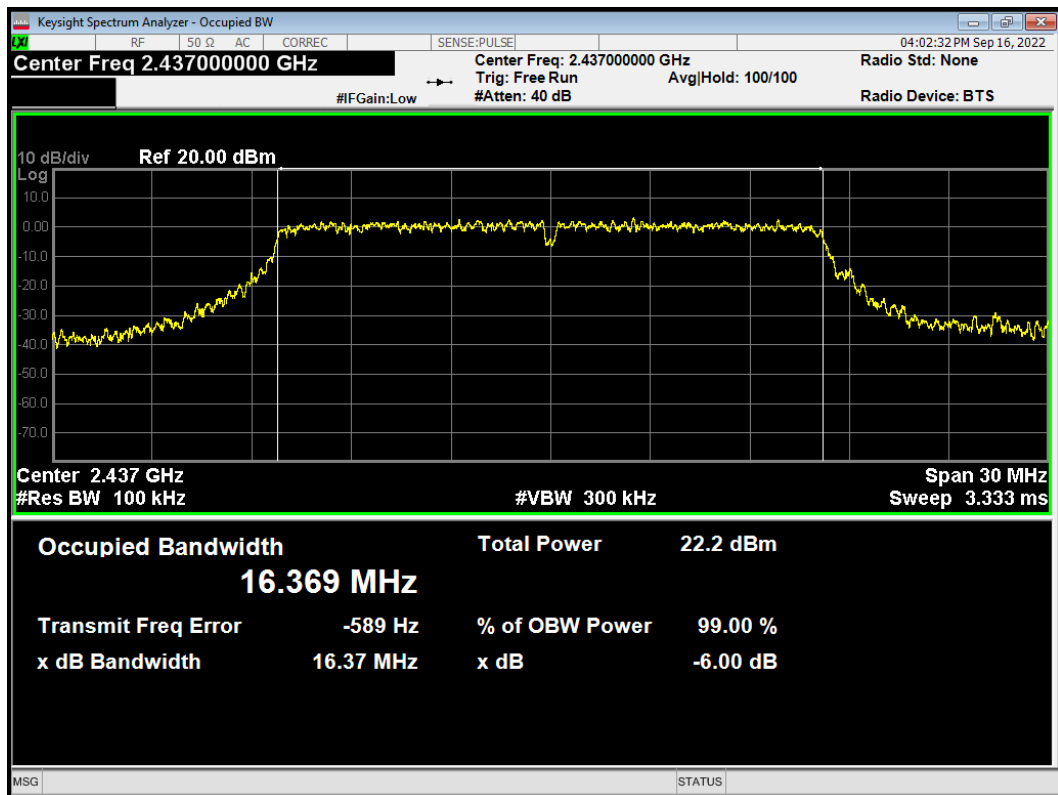


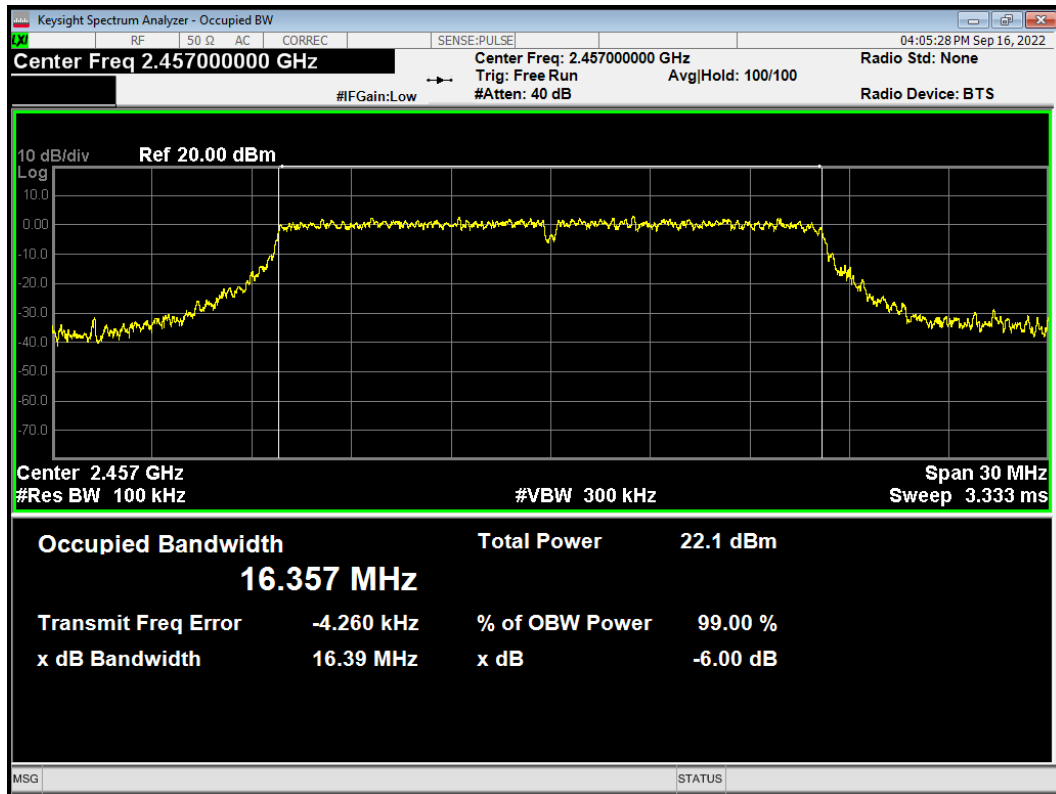
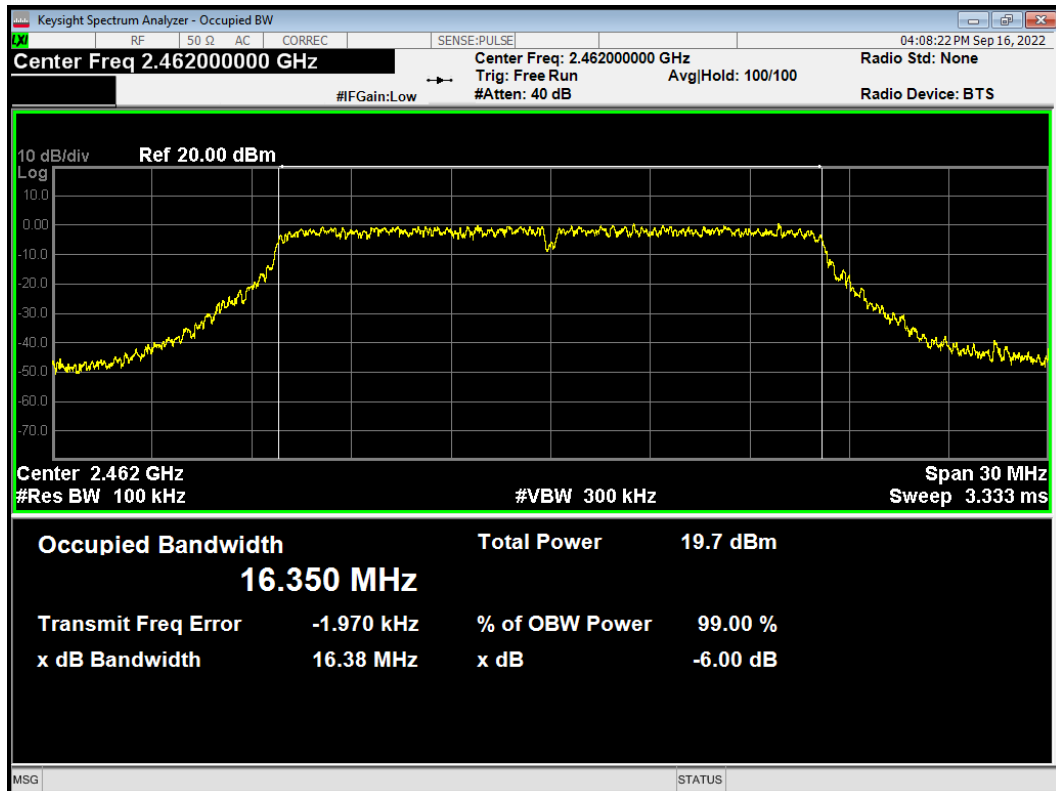
-6dB Bandwidth 802.11b 2462MHz

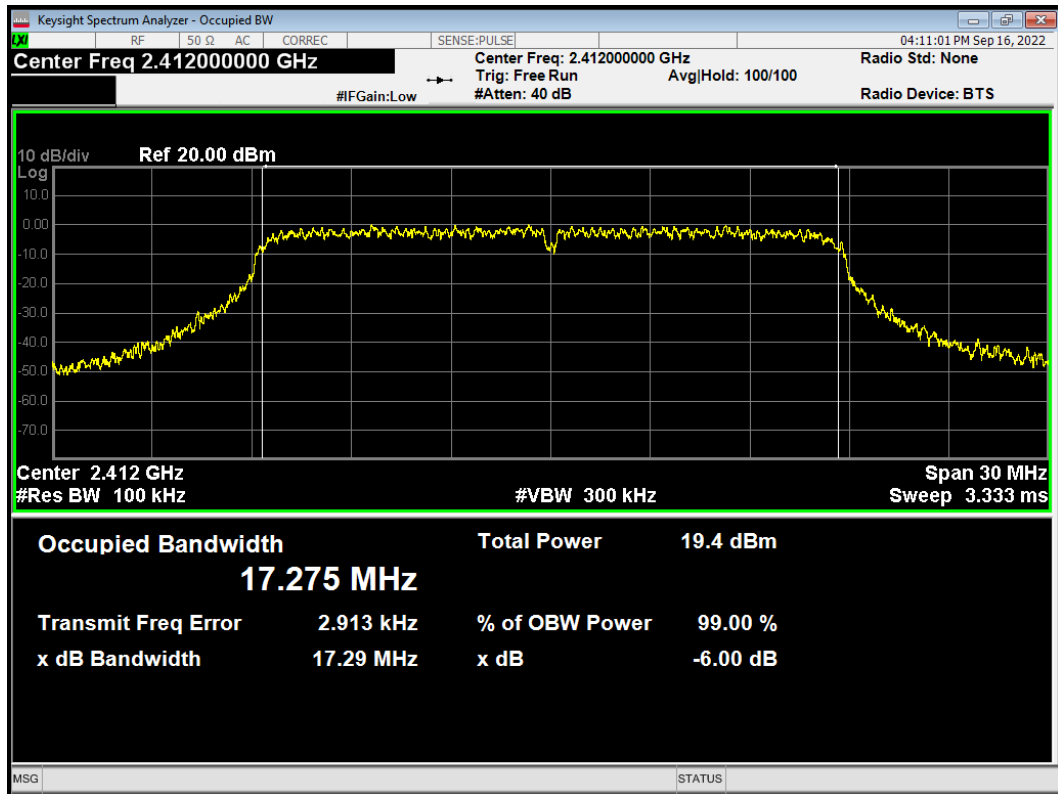
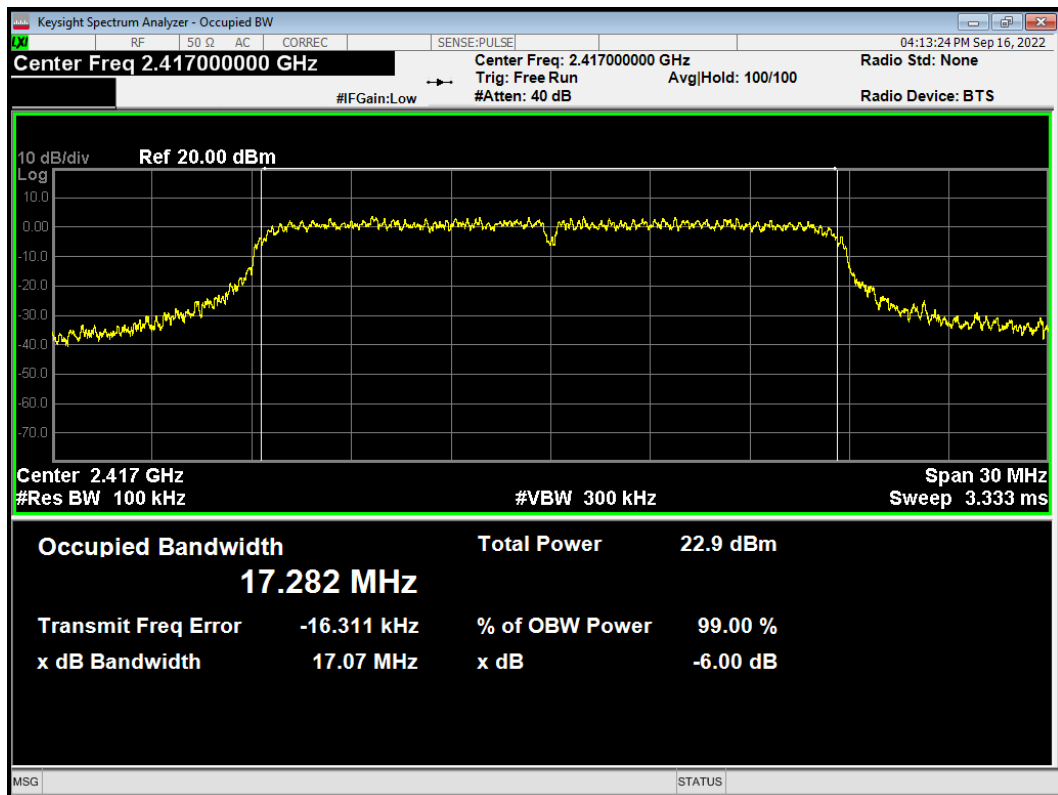


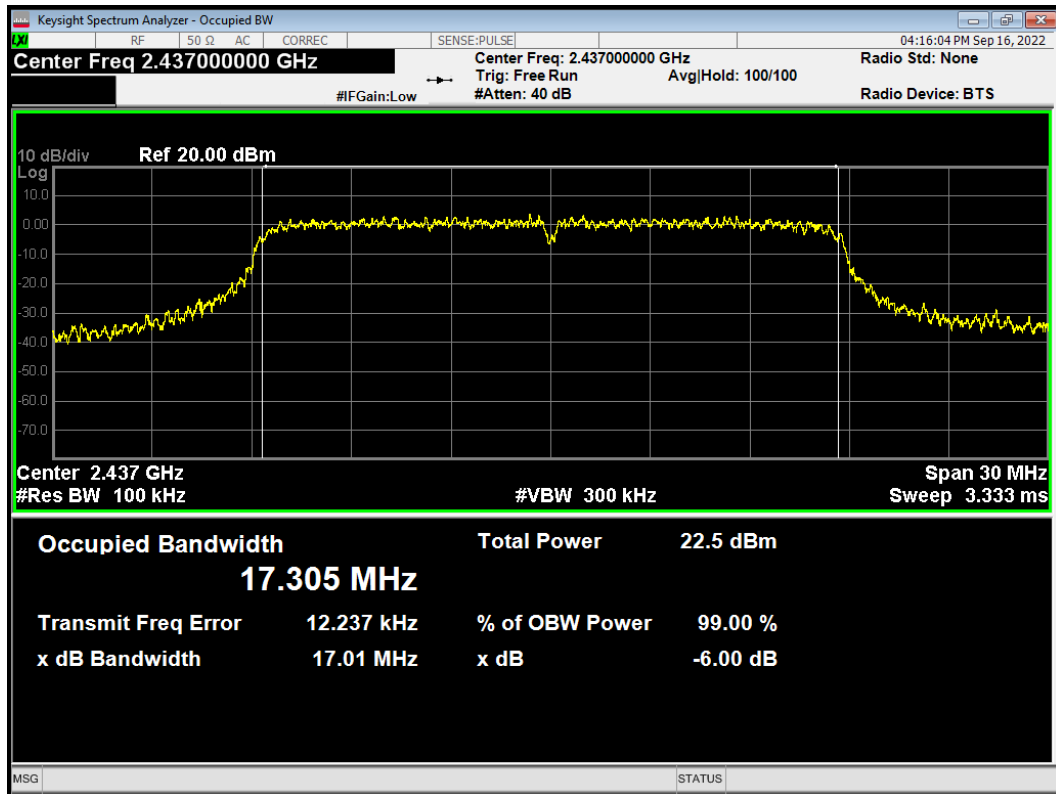
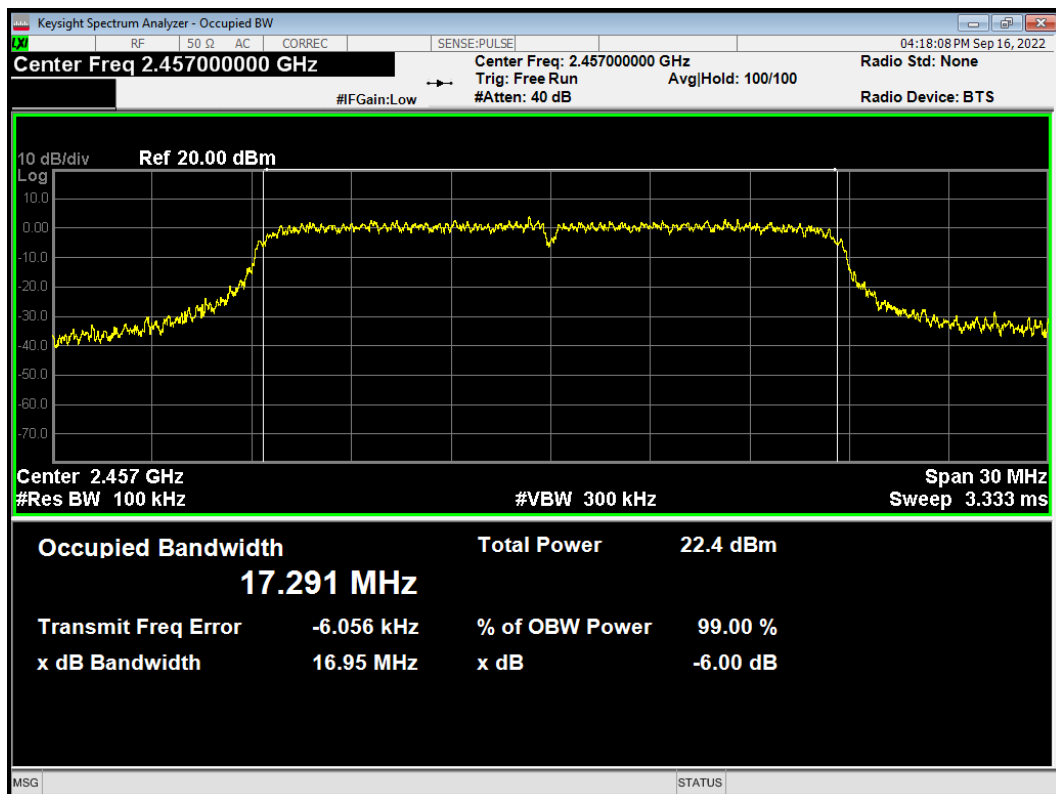
-6dB Bandwidth 802.11g 2412MHz

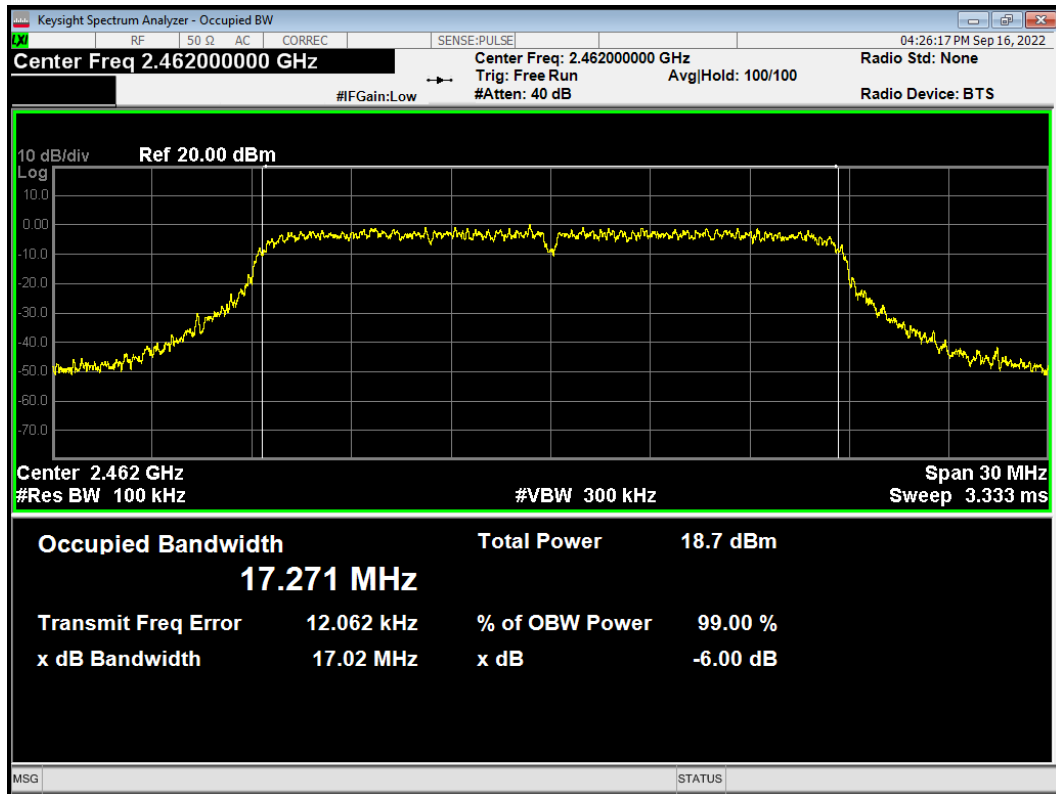
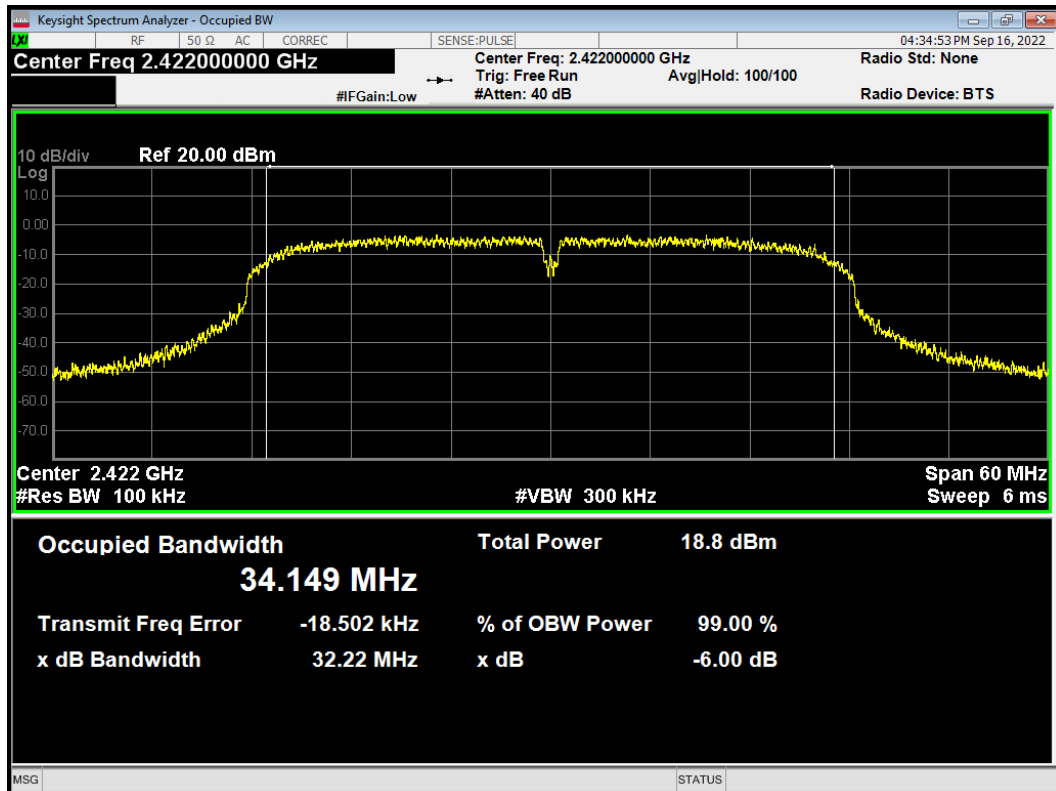


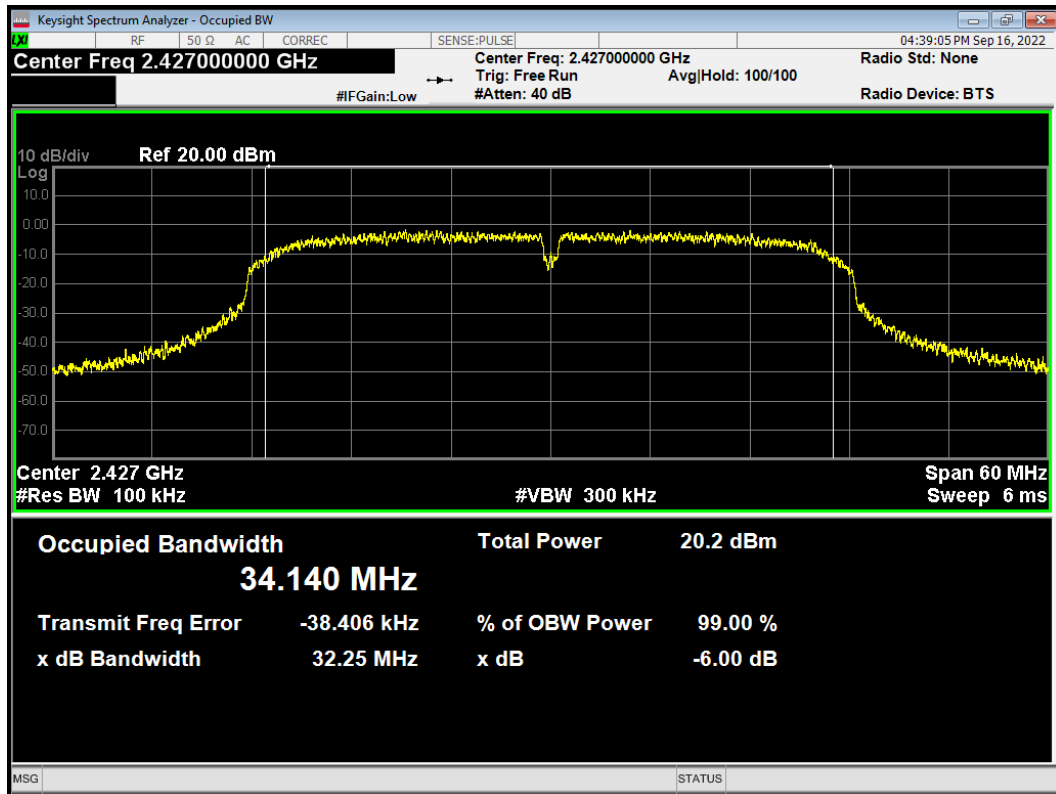
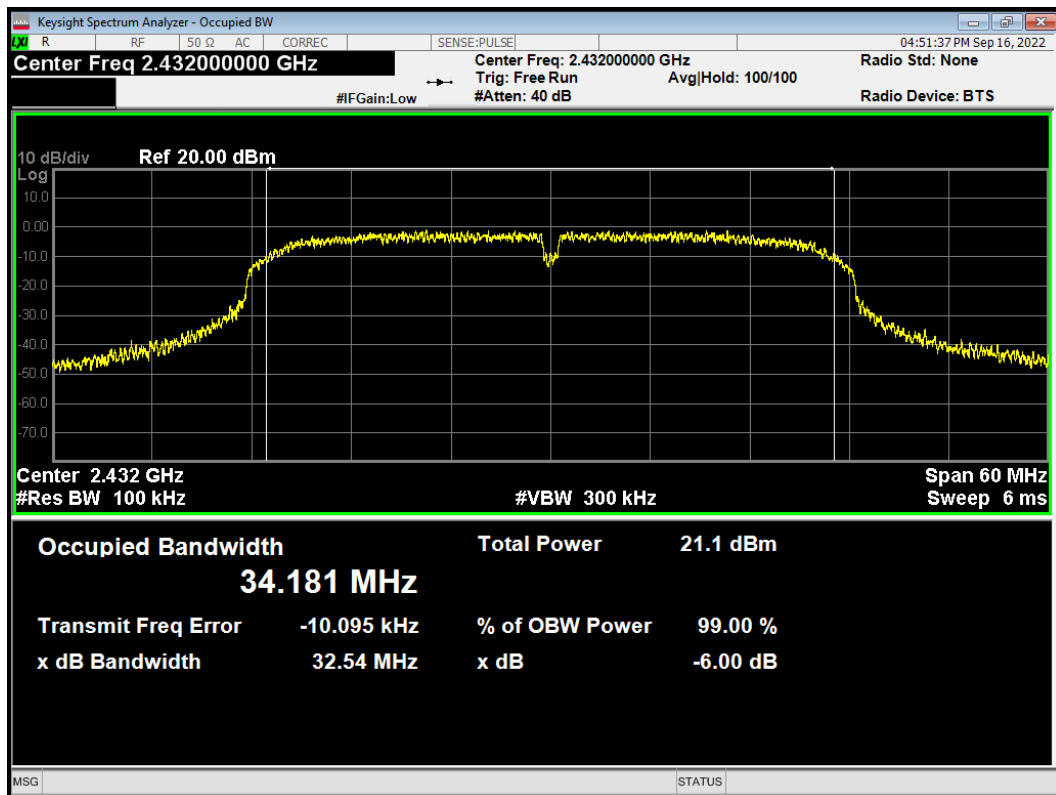
**-6dB Bandwidth 802.11g 2417MHz****-6dB Bandwidth 802.11g 2437MHz**

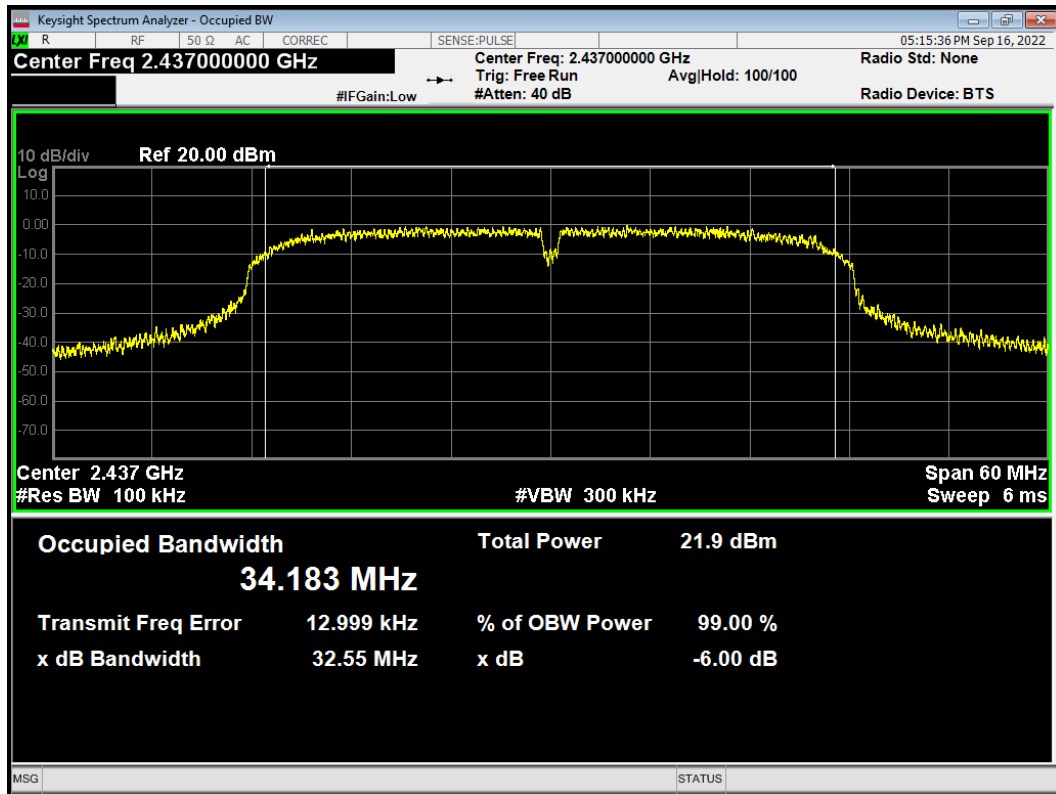
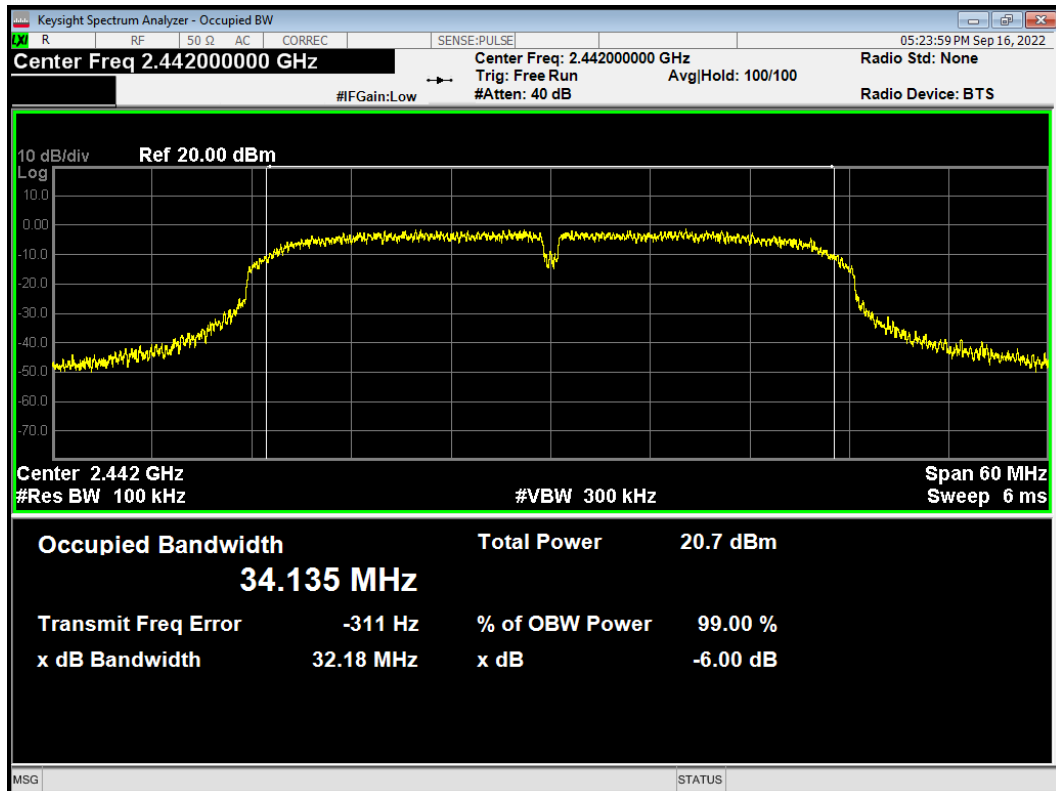
**-6dB Bandwidth 802.11g 2457MHz****-6dB Bandwidth 802.11g 2462MHz**

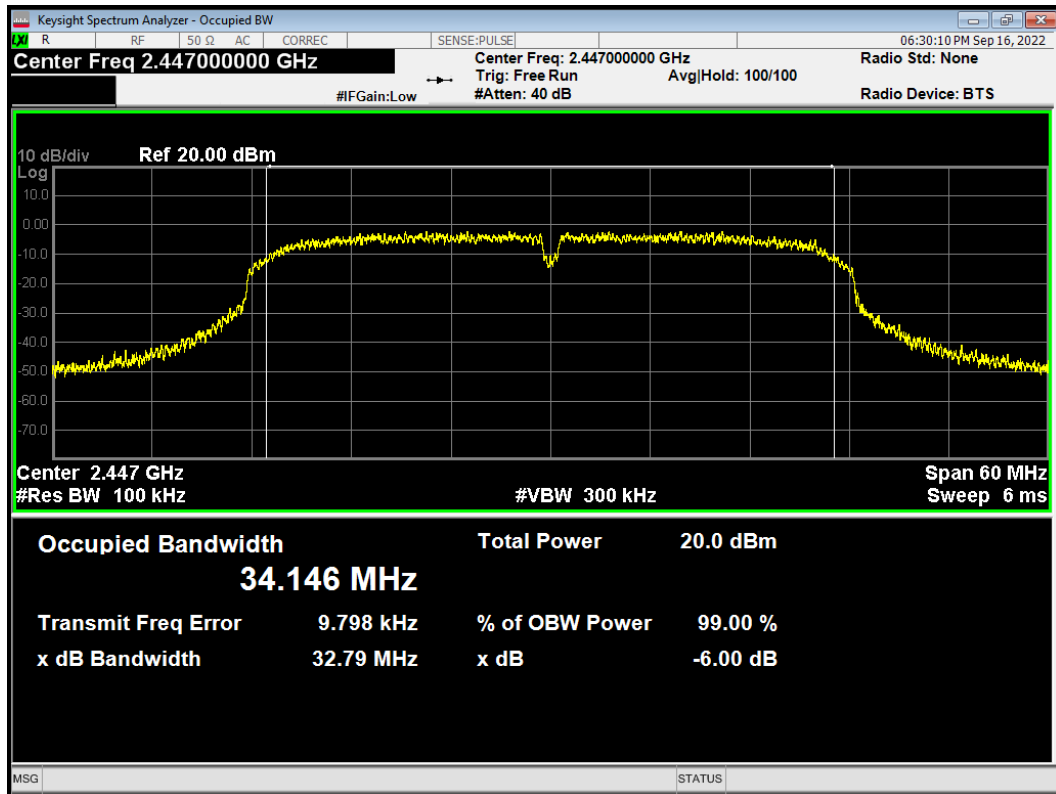
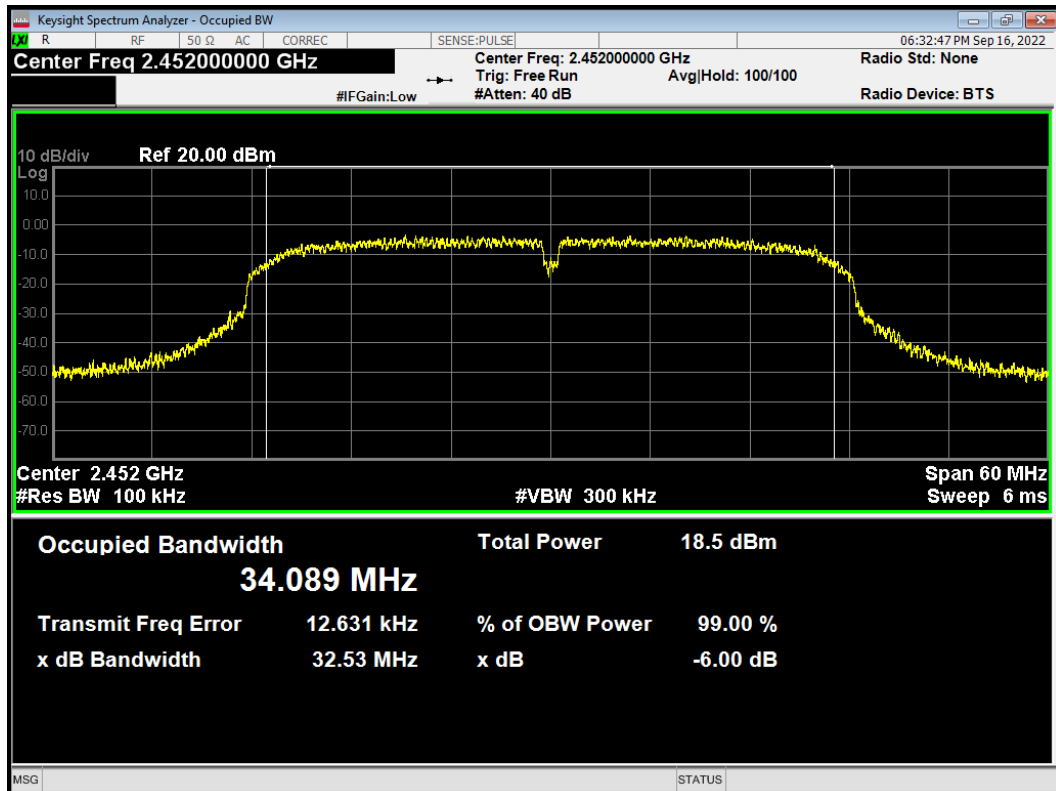
**-6dB Bandwidth 802.11n(HT20) 2412MHz****-6dB Bandwidth 802.11n(HT20) 2417MHz**

**-6dB Bandwidth 802.11n(HT20) 2437MHz****-6dB Bandwidth 802.11n(HT20) 2457MHz**

**-6dB Bandwidth 802.11n(HT20) 2462MHz****-6dB Bandwidth 802.11n(HT40) 2422MHz**

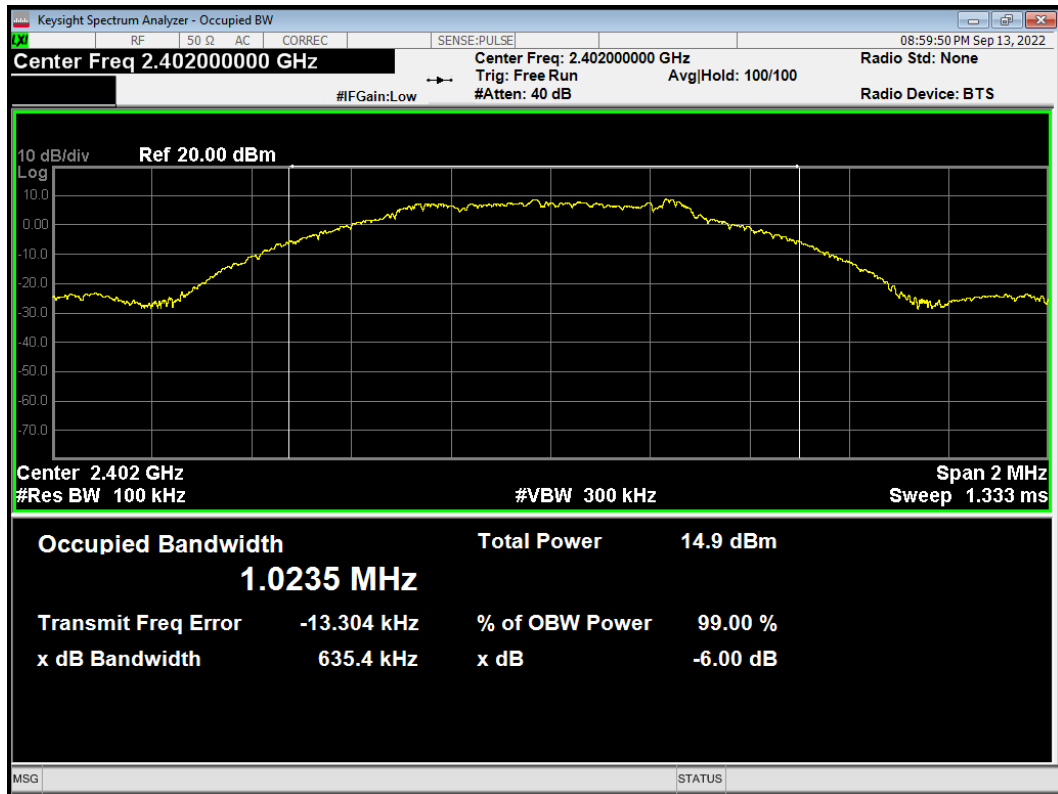
**-6dB Bandwidth 802.11n(HT40) 2427MHz****-6dB Bandwidth 802.11n(HT40) 2432MHz**

**-6dB Bandwidth 802.11n(HT40) 2437MHz****-6dB Bandwidth 802.11n(HT40) 2442MHz**

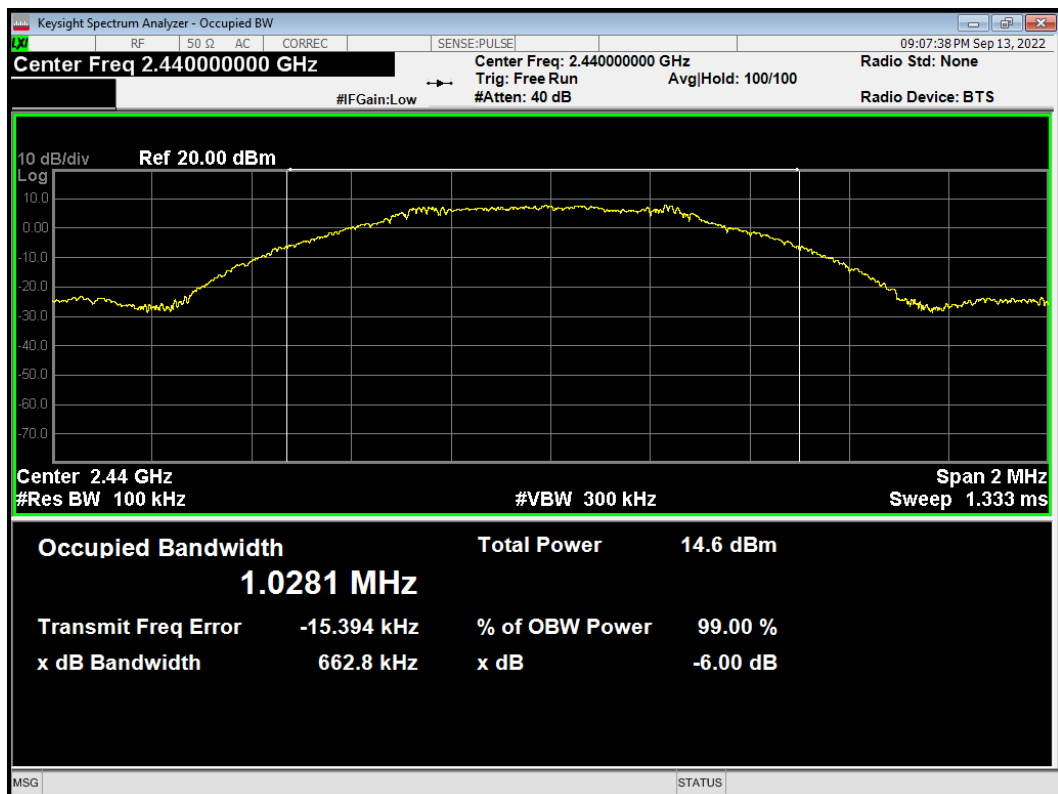
**-6dB Bandwidth 802.11n(HT40) 2447MHz****-6dB Bandwidth 802.11n(HT40) 2452MHz**



-6dB Bandwidth BLE 2402MHz

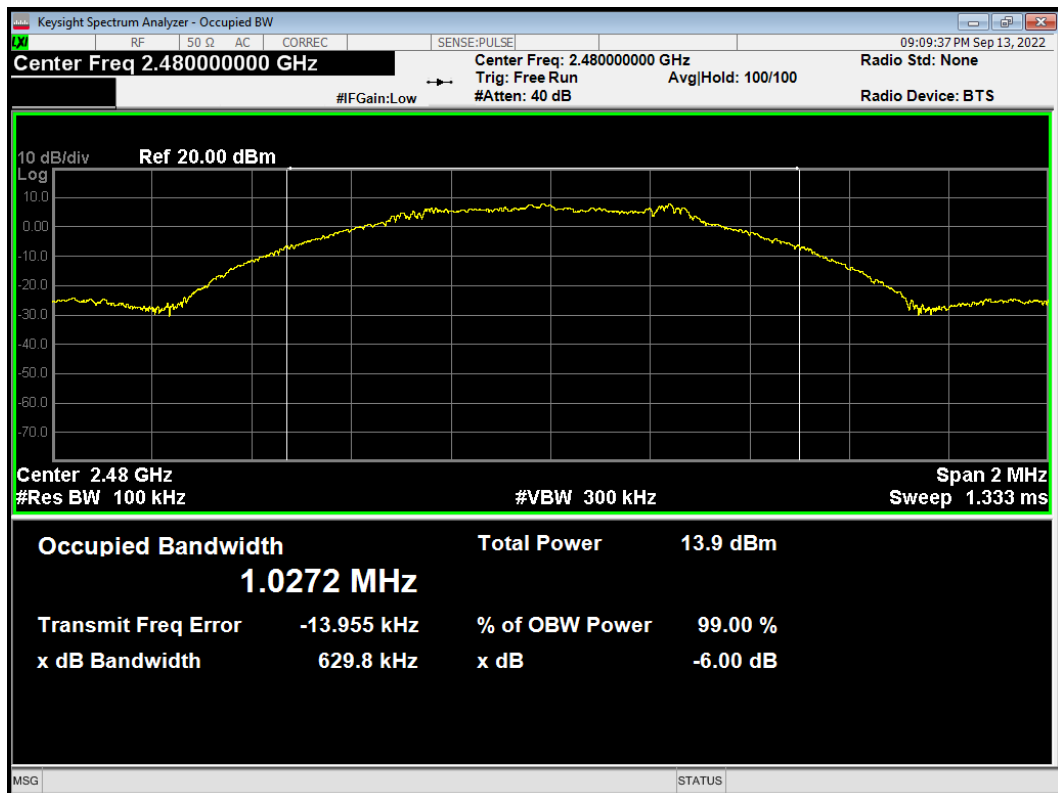


-6dB Bandwidth BLE 2440MHz





-6dB Bandwidth BLE 2480MHz



5.3. Band Edge

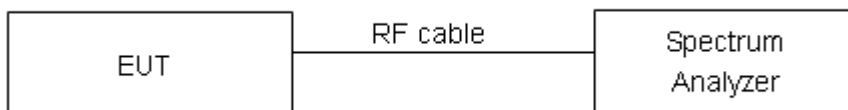
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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

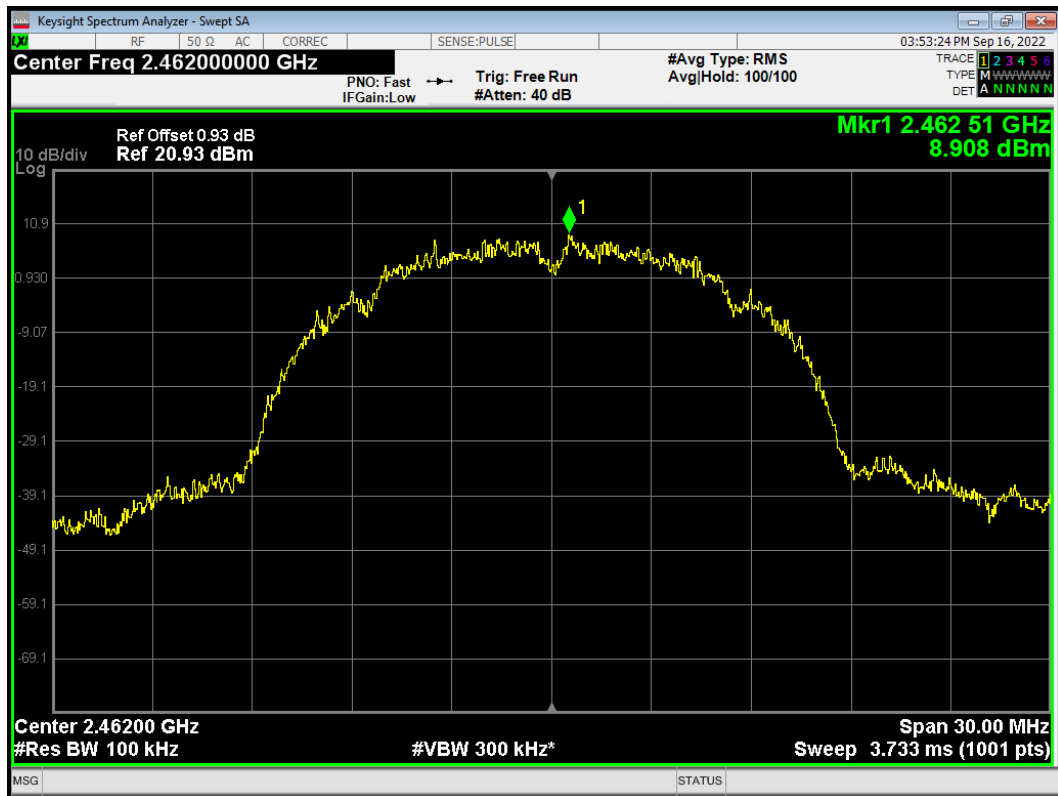
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

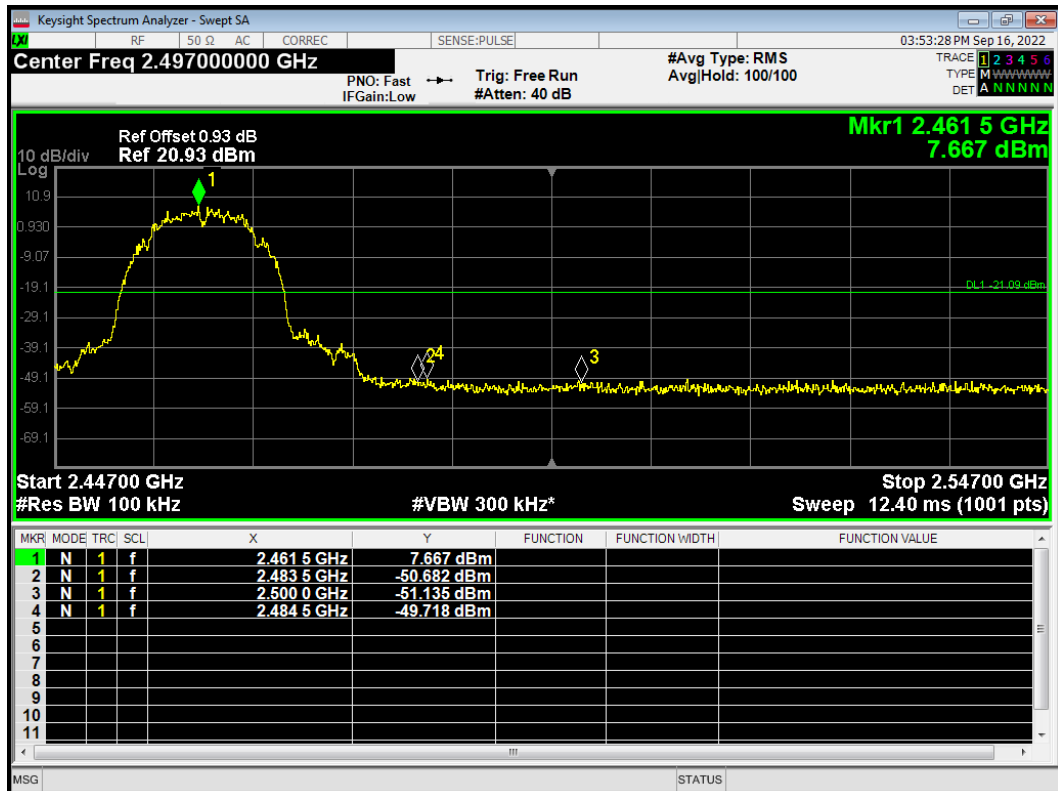


Test Results: PASS

Band Edge 802.11b 2462MHz Ref

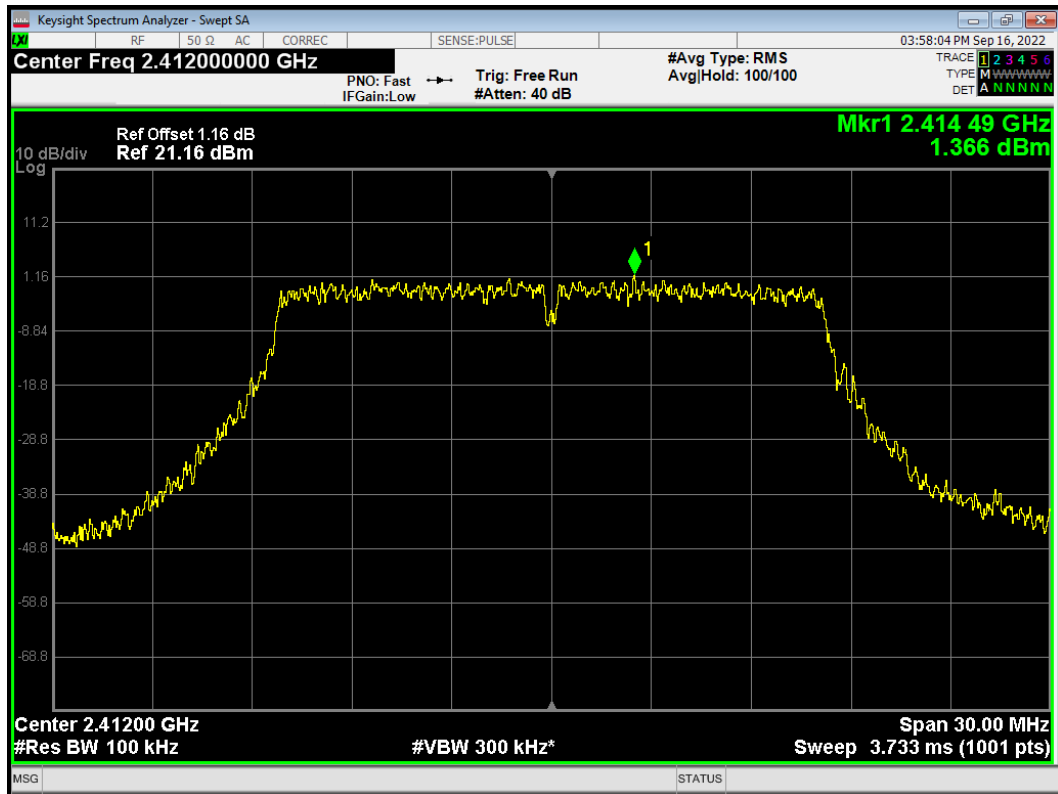


Band Edge 802.11b 2462MHz Emission

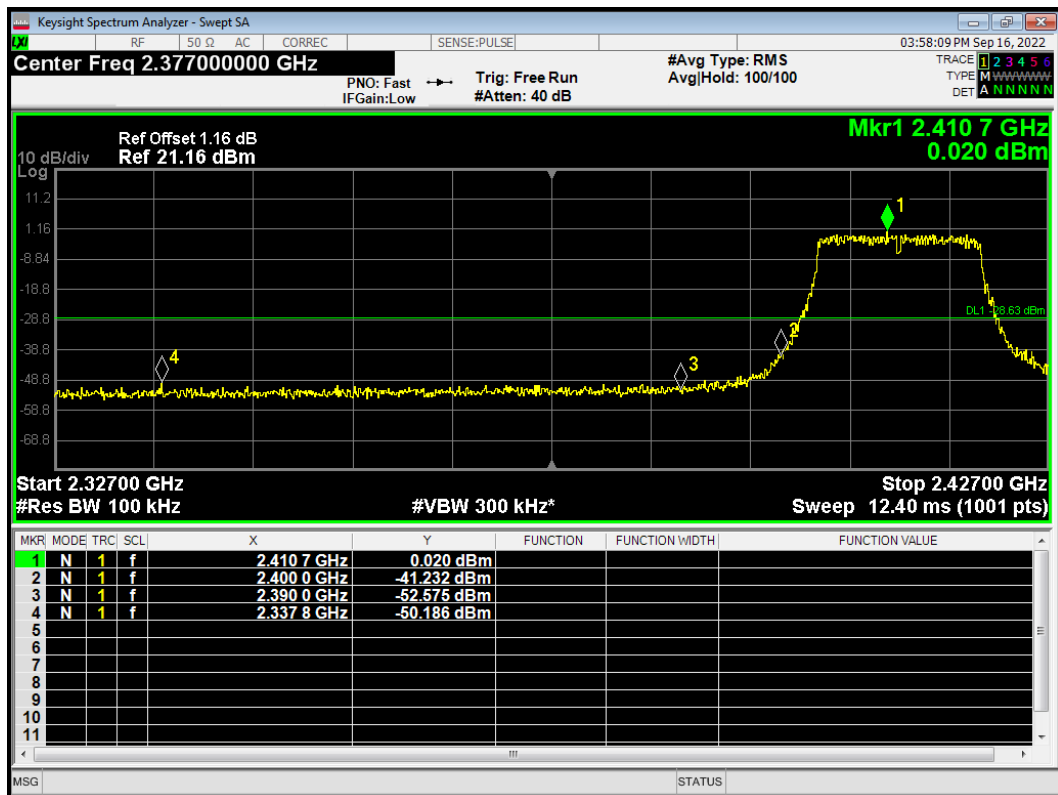




Band Edge 802.11g 2412MHz Ref

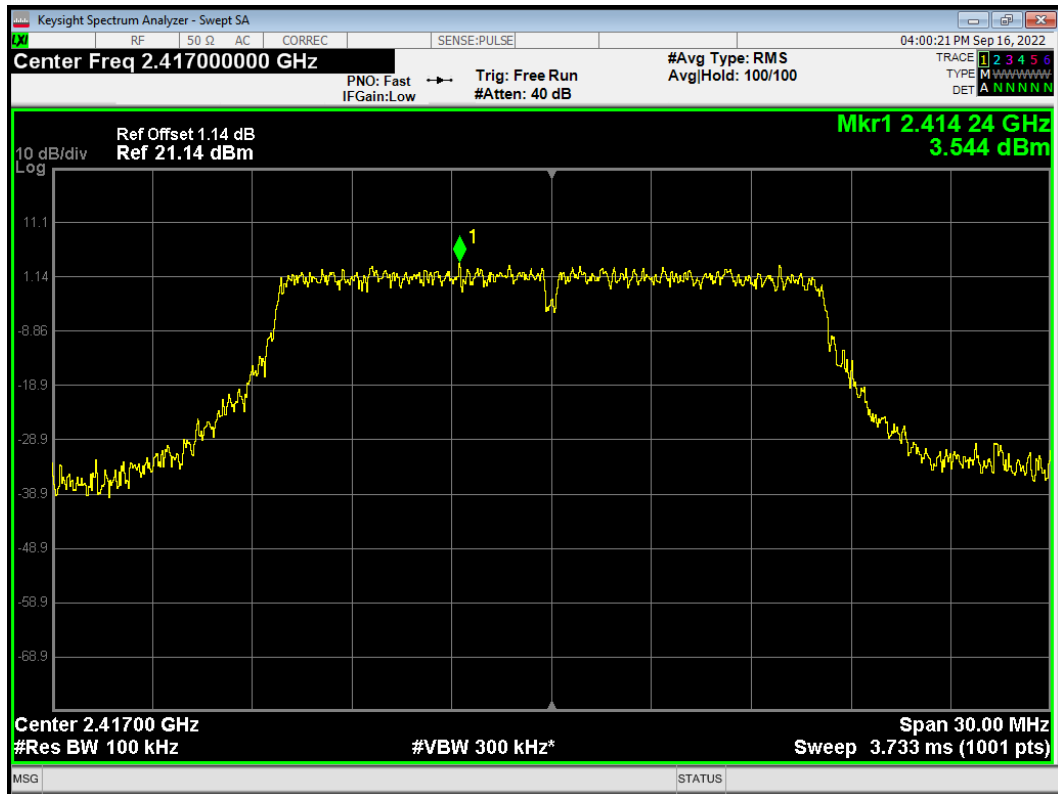


Band Edge 802.11g 2412MHz Emission

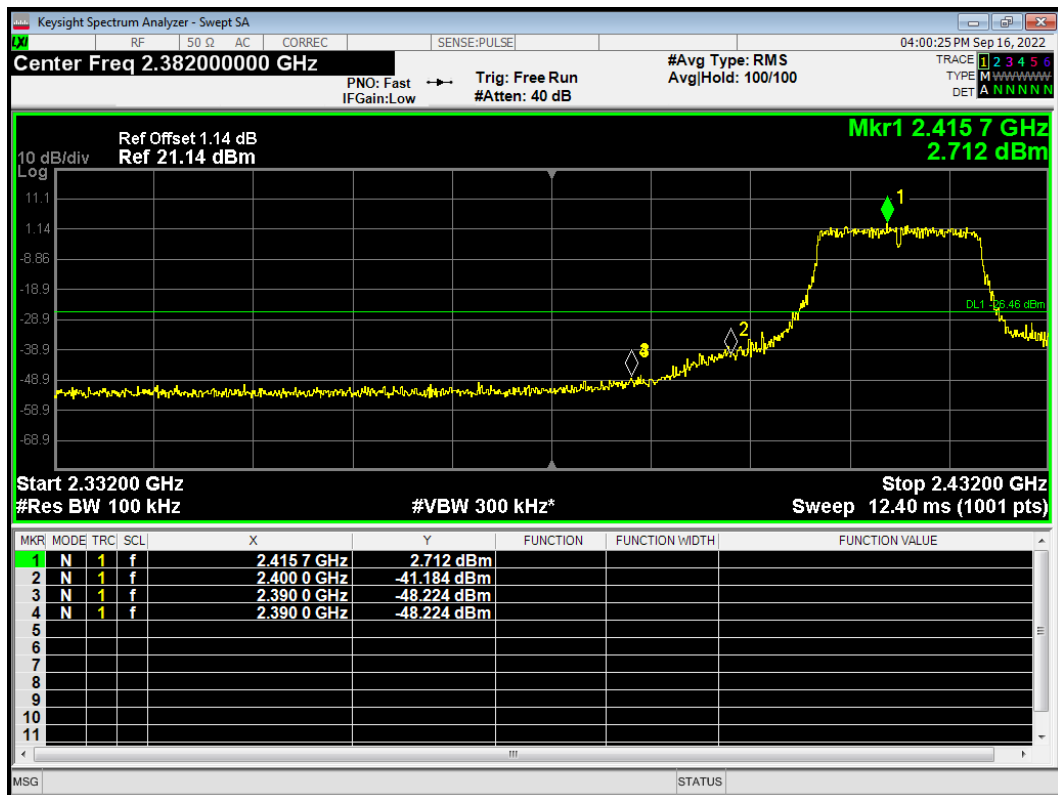




Band Edge 802.11g 2417MHz Ref

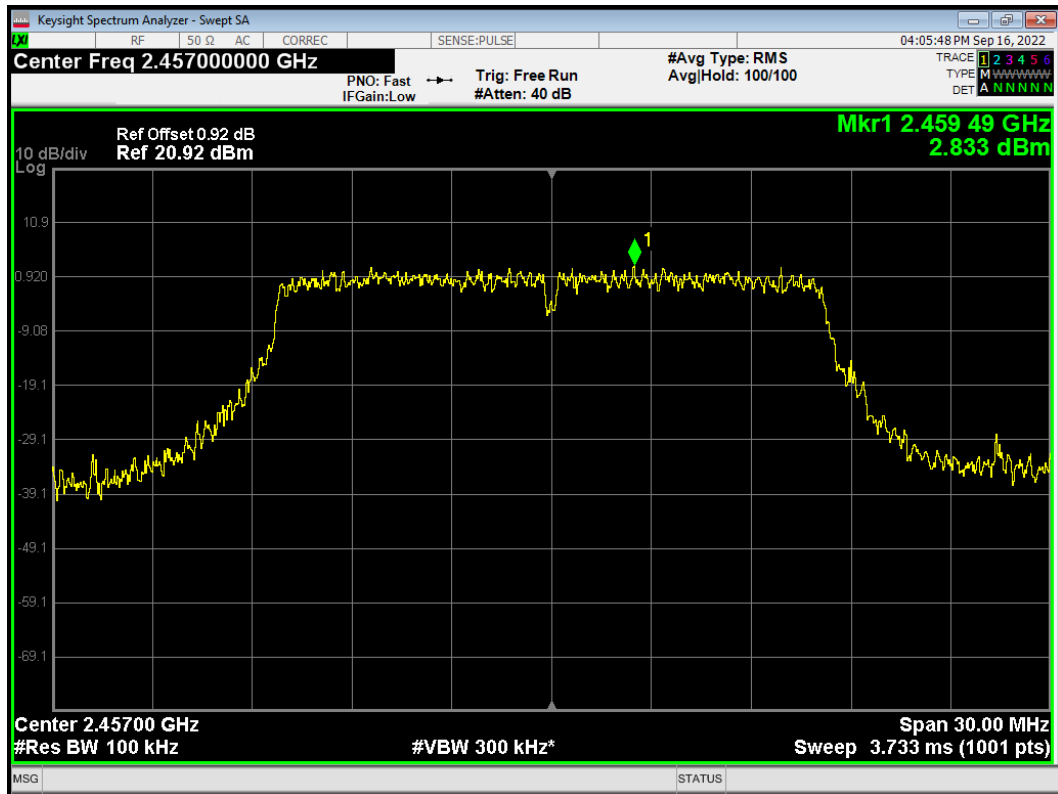


Band Edge 802.11g 2417MHz Emission

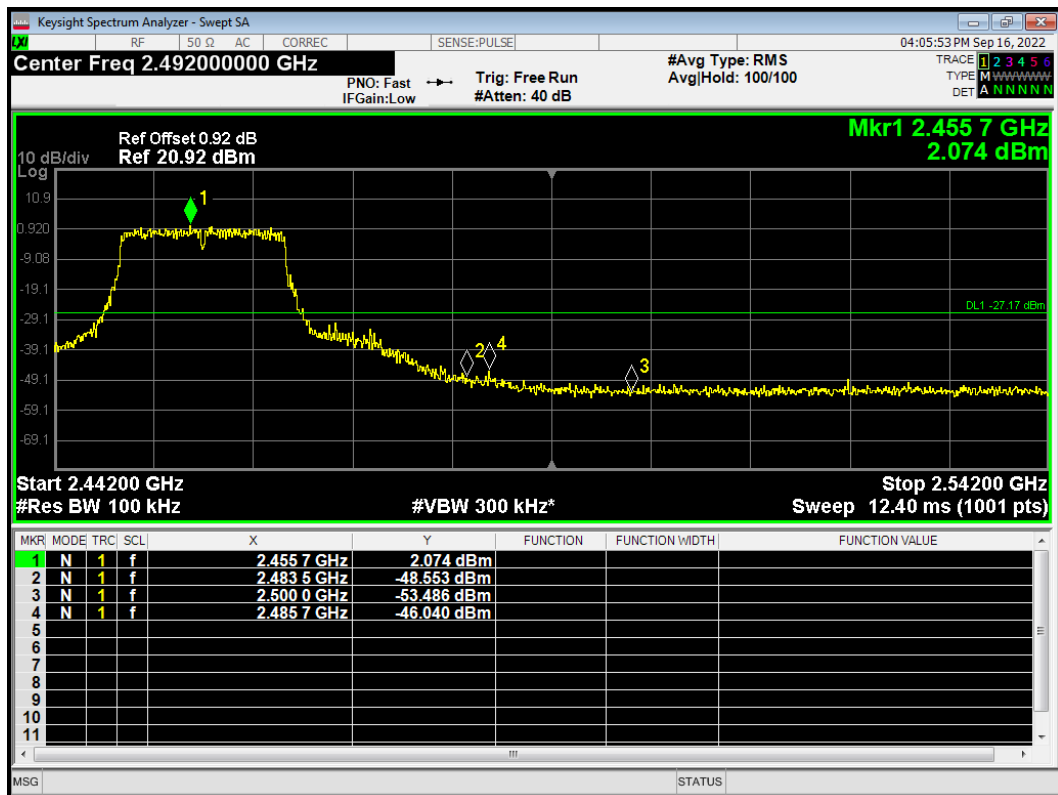




Band Edge 802.11g 2457MHz Ref

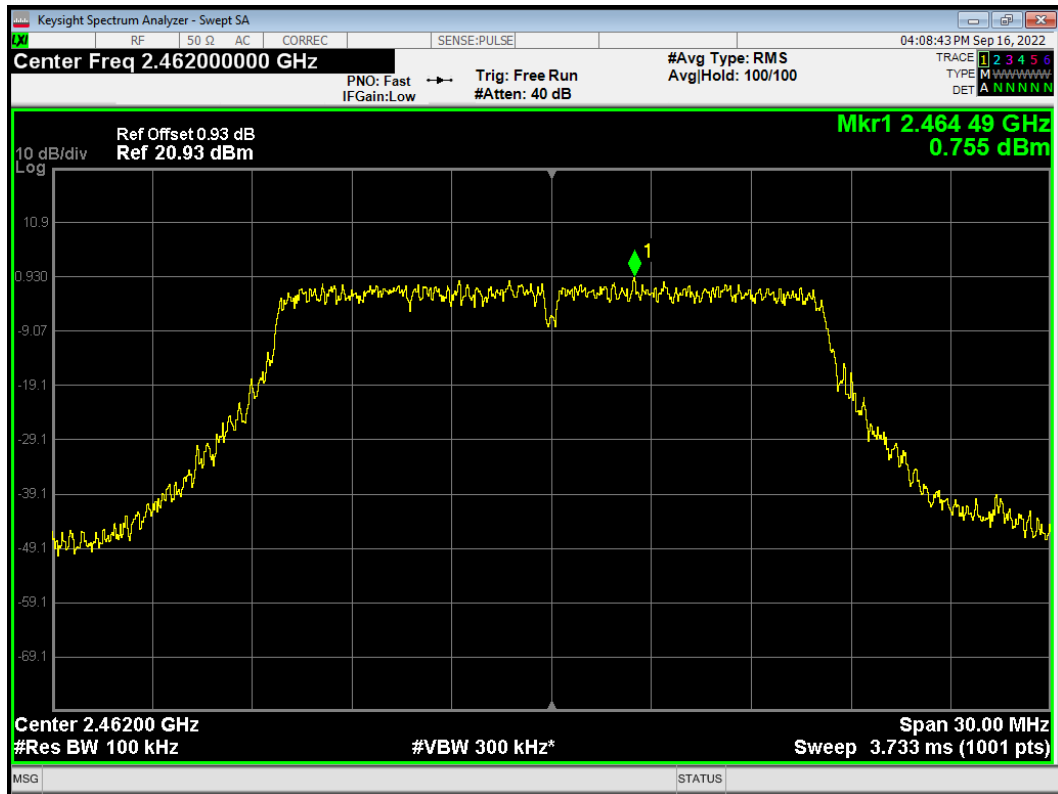


Band Edge 802.11g 2457MHz Emission

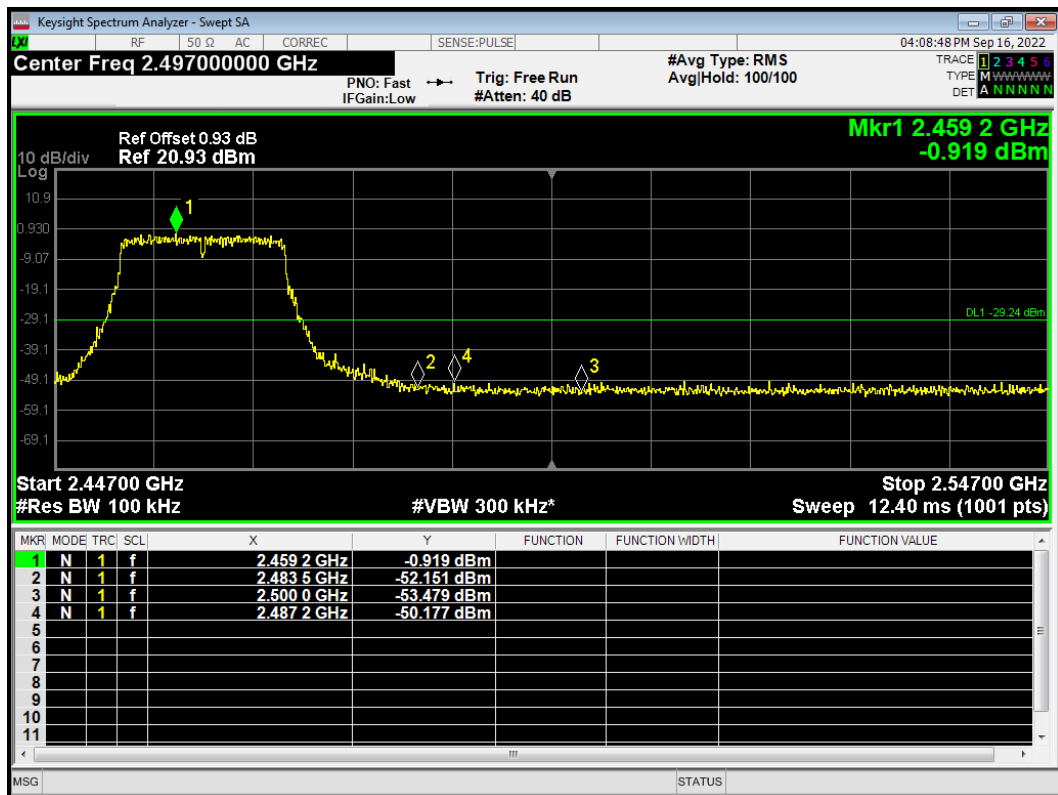




Band Edge 802.11g 2462MHz Ref

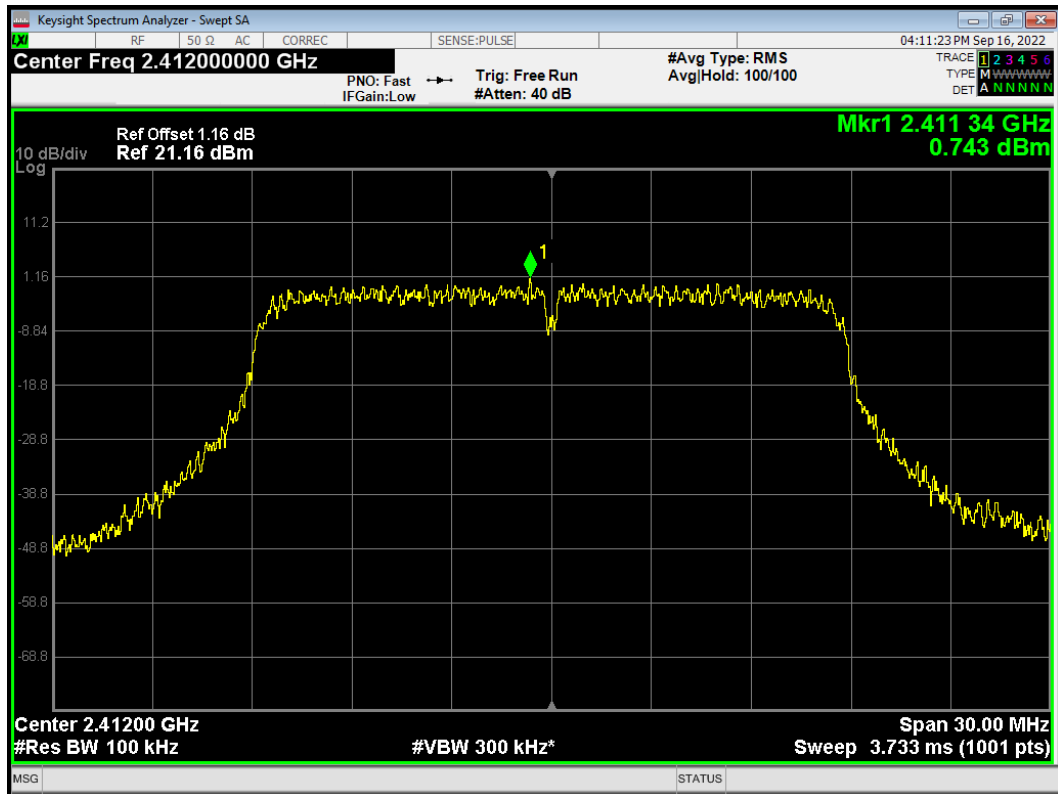


Band Edge 802.11g 2462MHz Emission

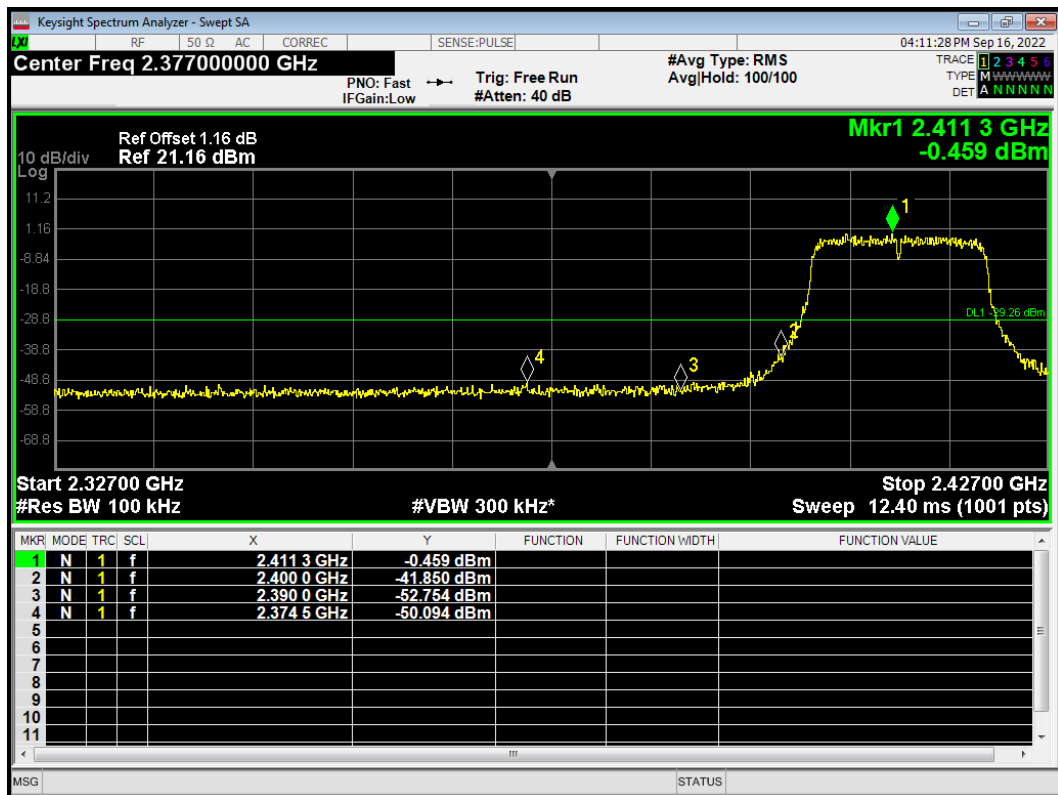




Band Edge 802.11n(HT20) 2412MHz Ref

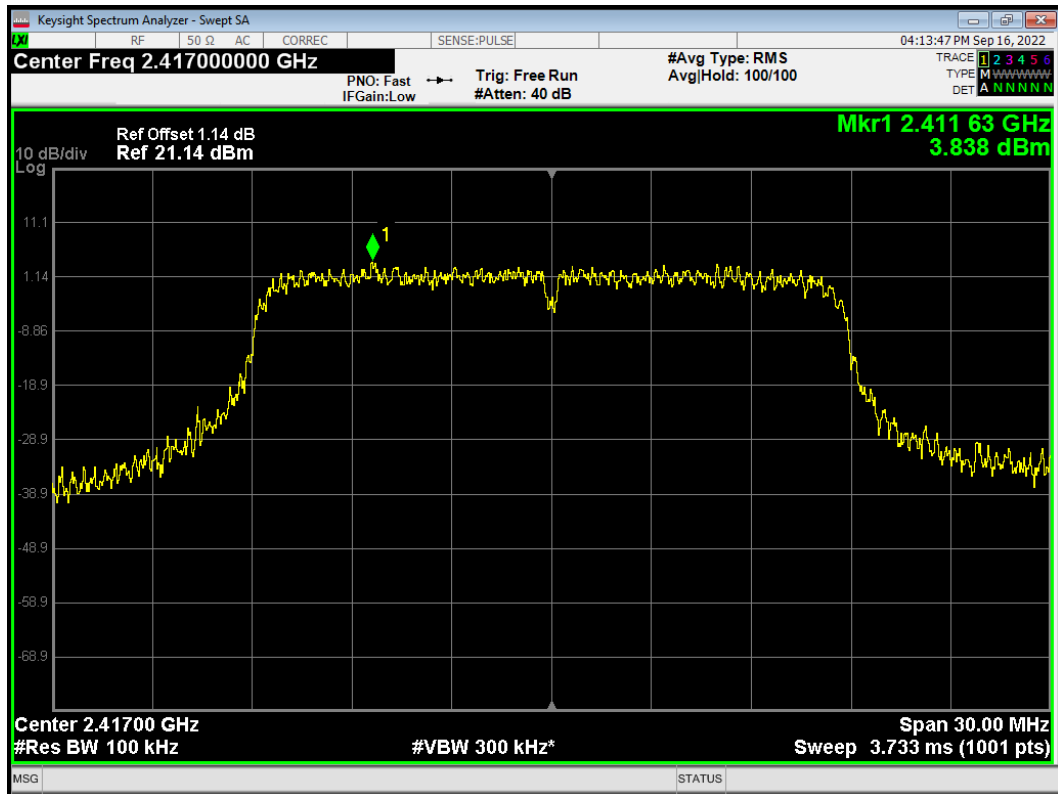


Band Edge 802.11n(HT20) 2412MHz Emission

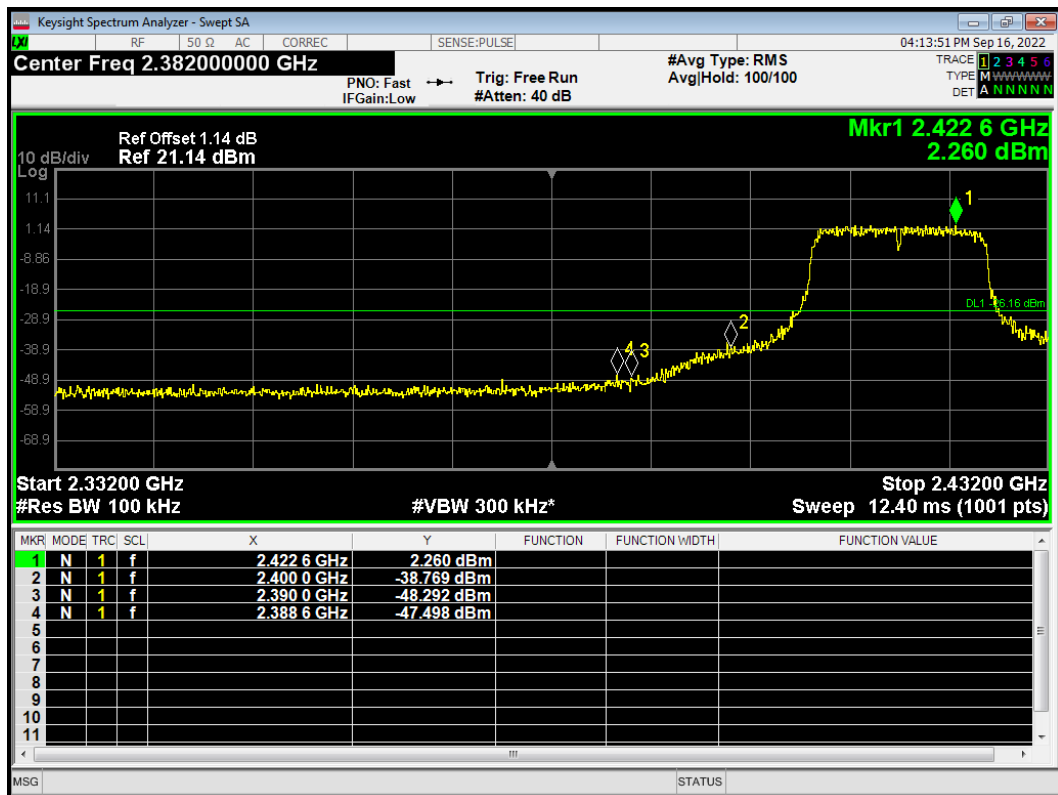




Band Edge 802.11n(HT20) 2417MHz Ref

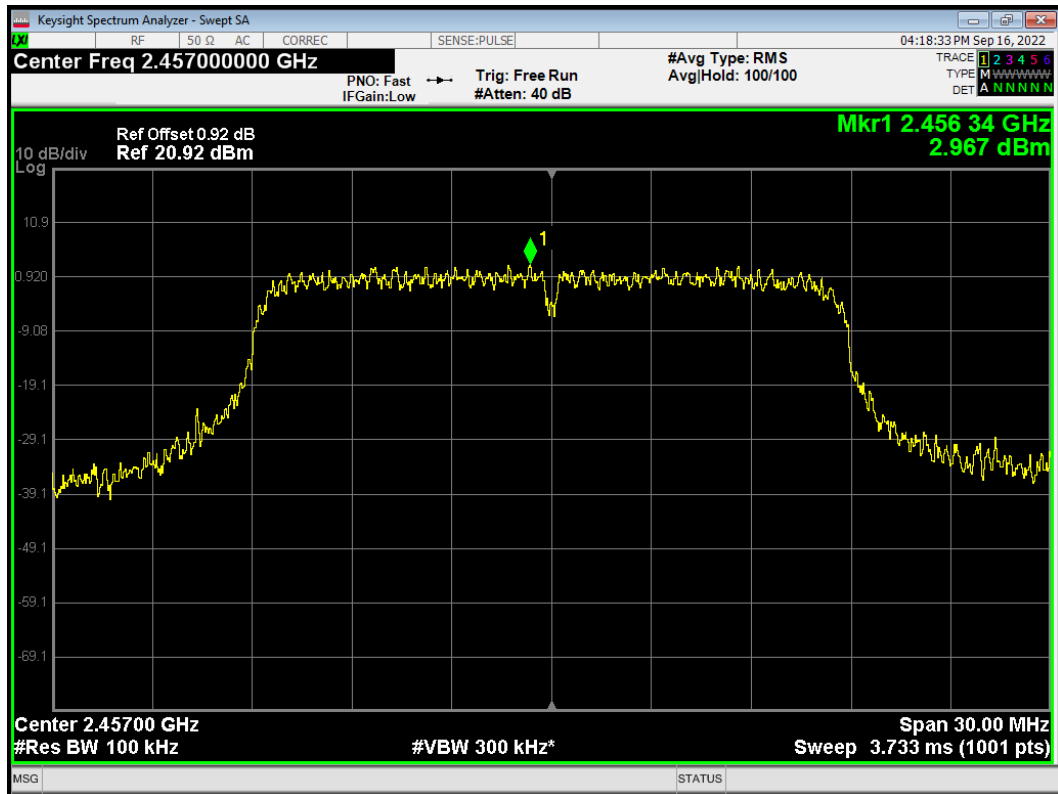


Band Edge 802.11n(HT20) 2417MHz Emission

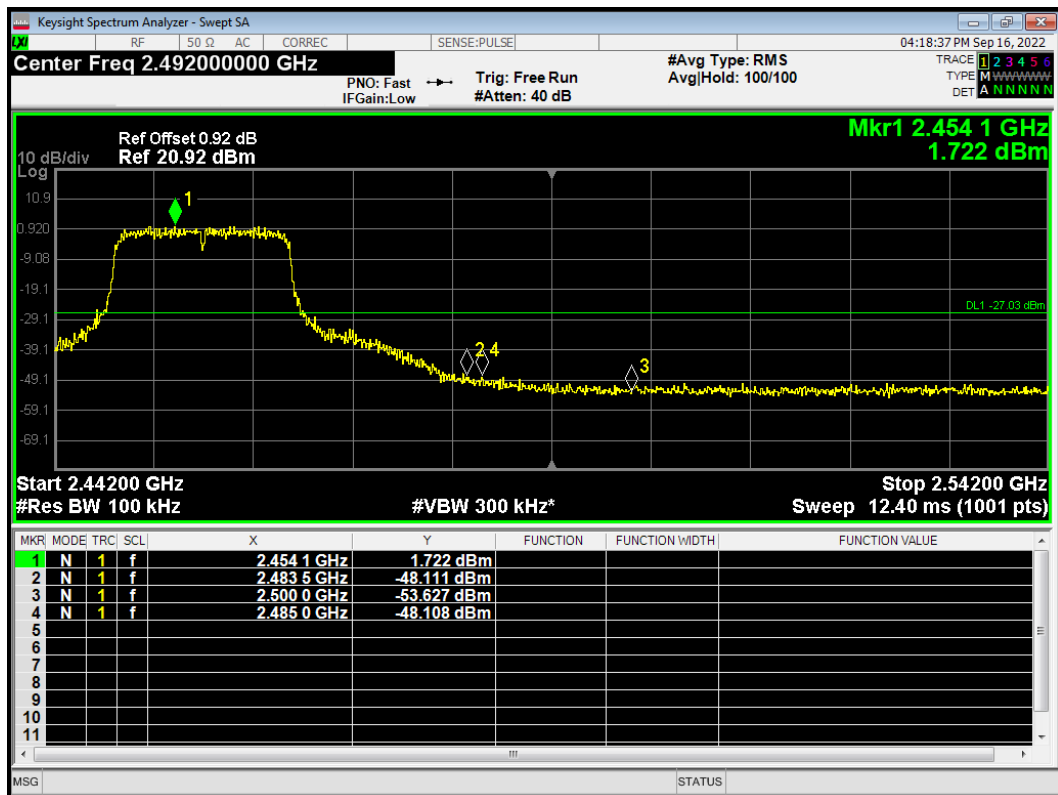




Band Edge 802.11n(HT20) 2457MHz Ref

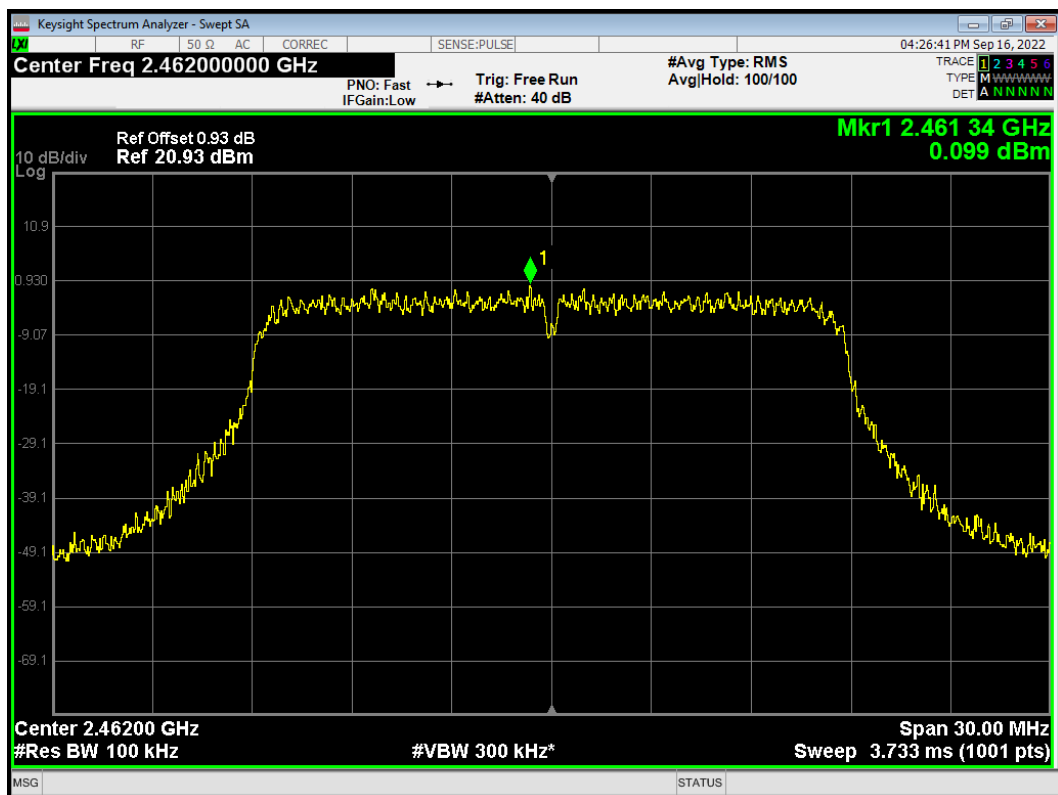


Band Edge 802.11n(HT20) 2457MHz Emission

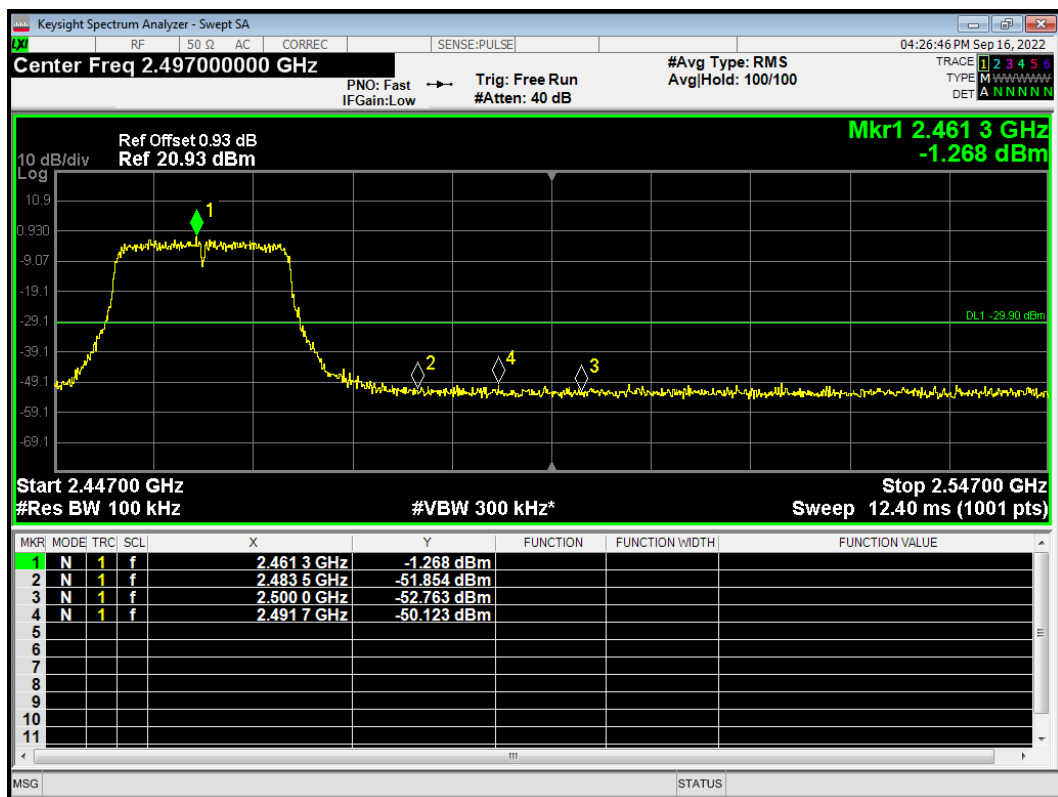




Band Edge 802.11n(HT20) 2462MHz Ref

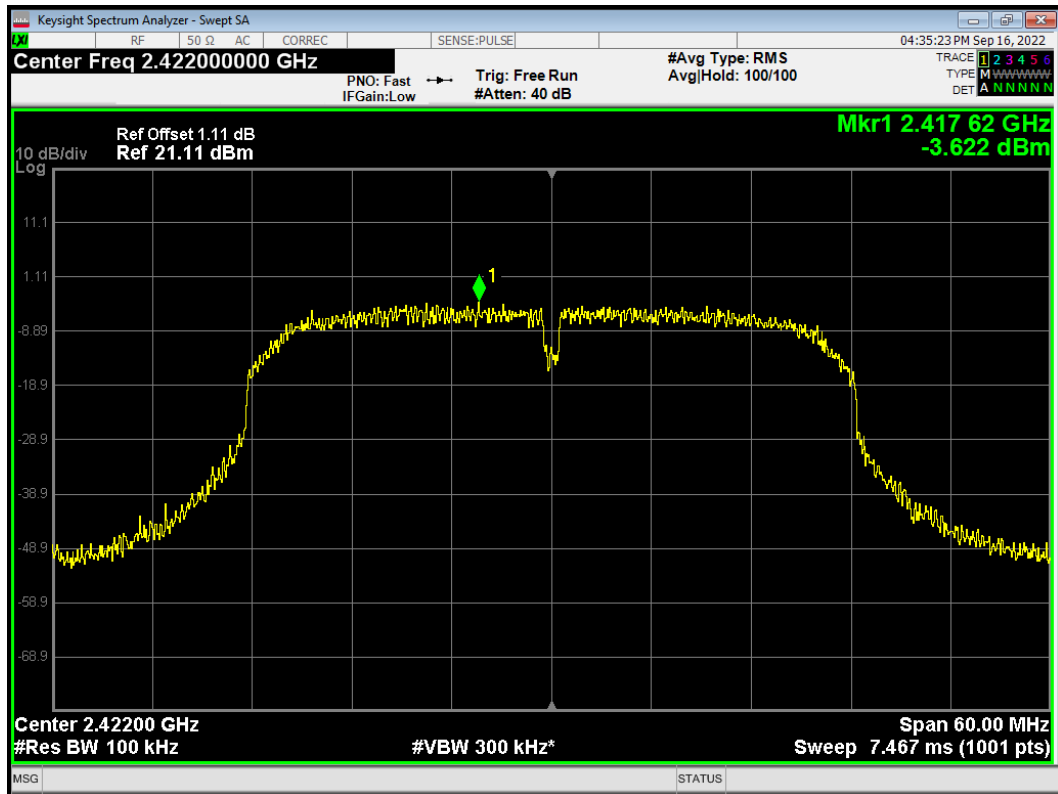


Band Edge 802.11n(HT20) 2462MHz Emission

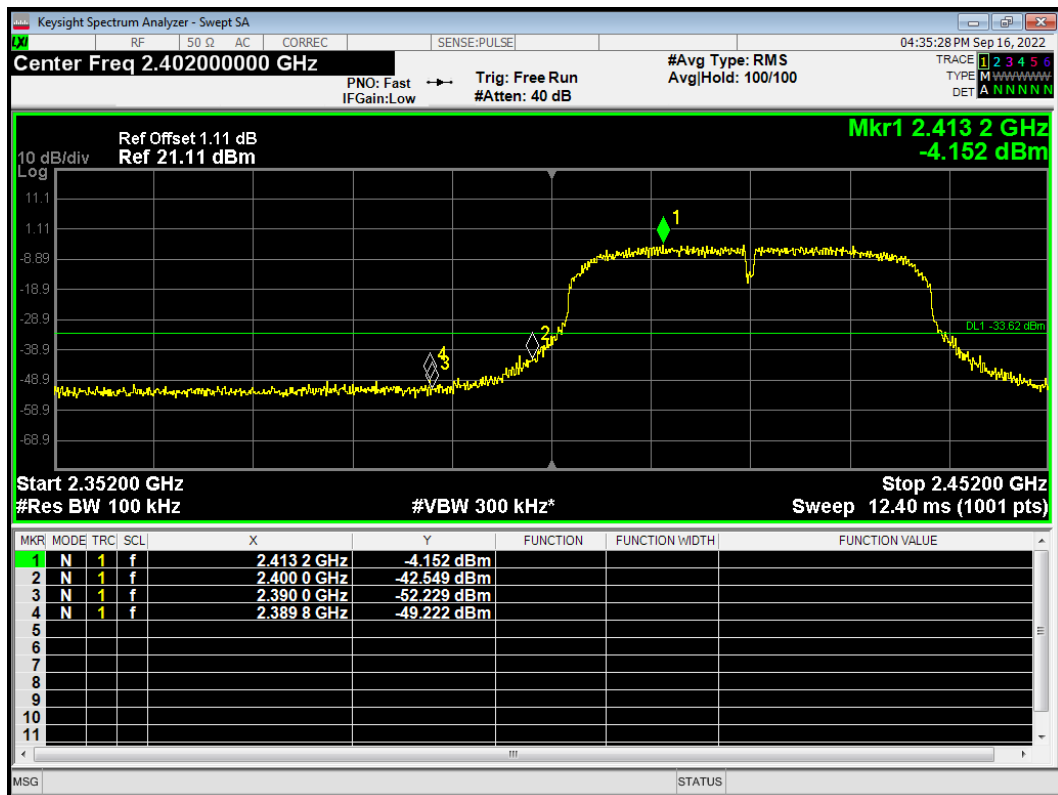




Band Edge 802.11n(HT40) 2422MHz Ref

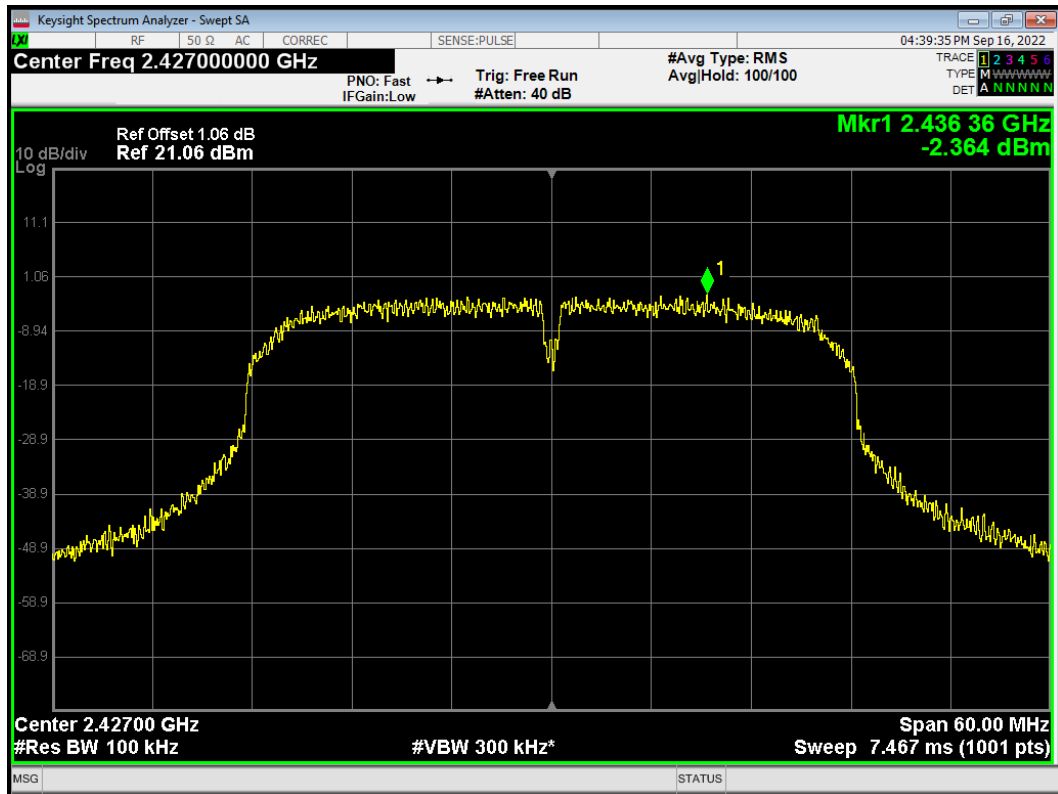


Band Edge 802.11n(HT40) 2422MHz Emission

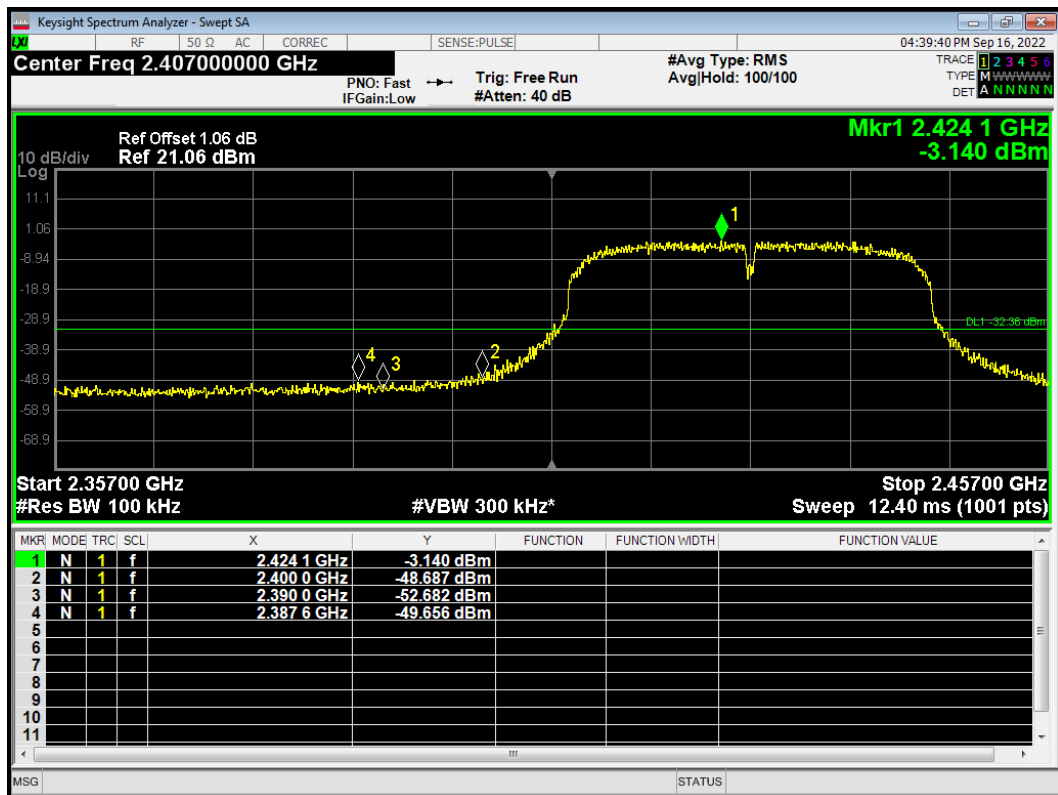




Band Edge 802.11n(HT40) 2427MHz Ref

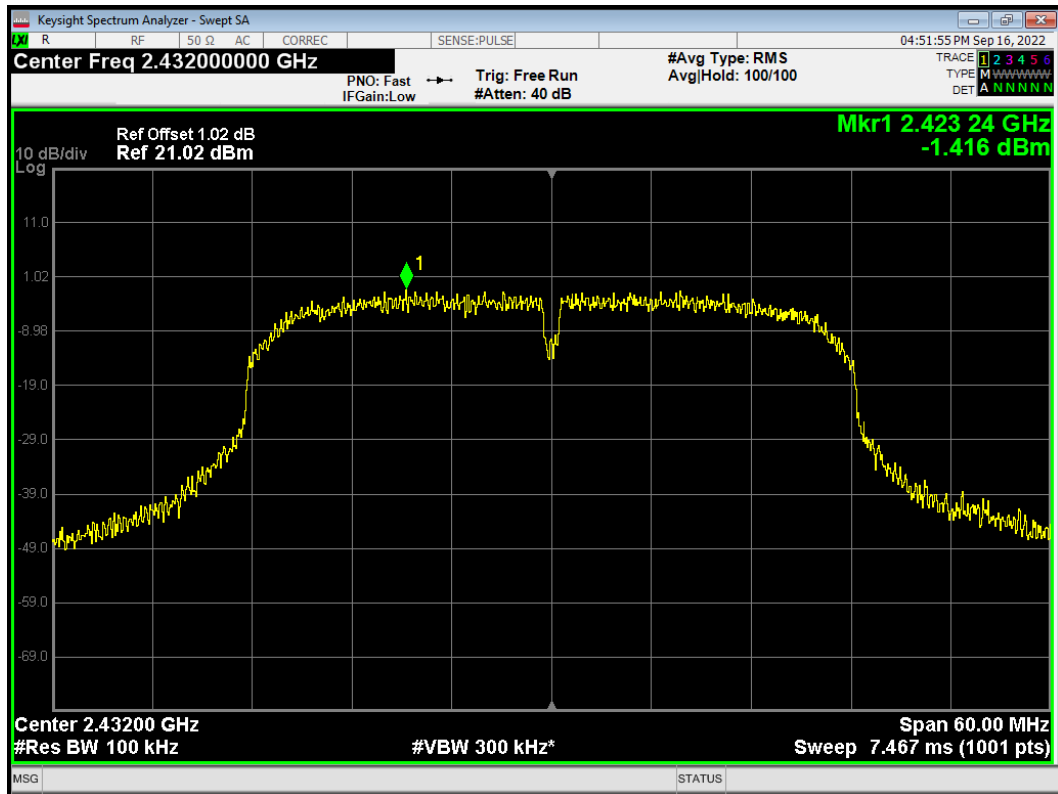


Band Edge 802.11n(HT40) 2427MHz Emission

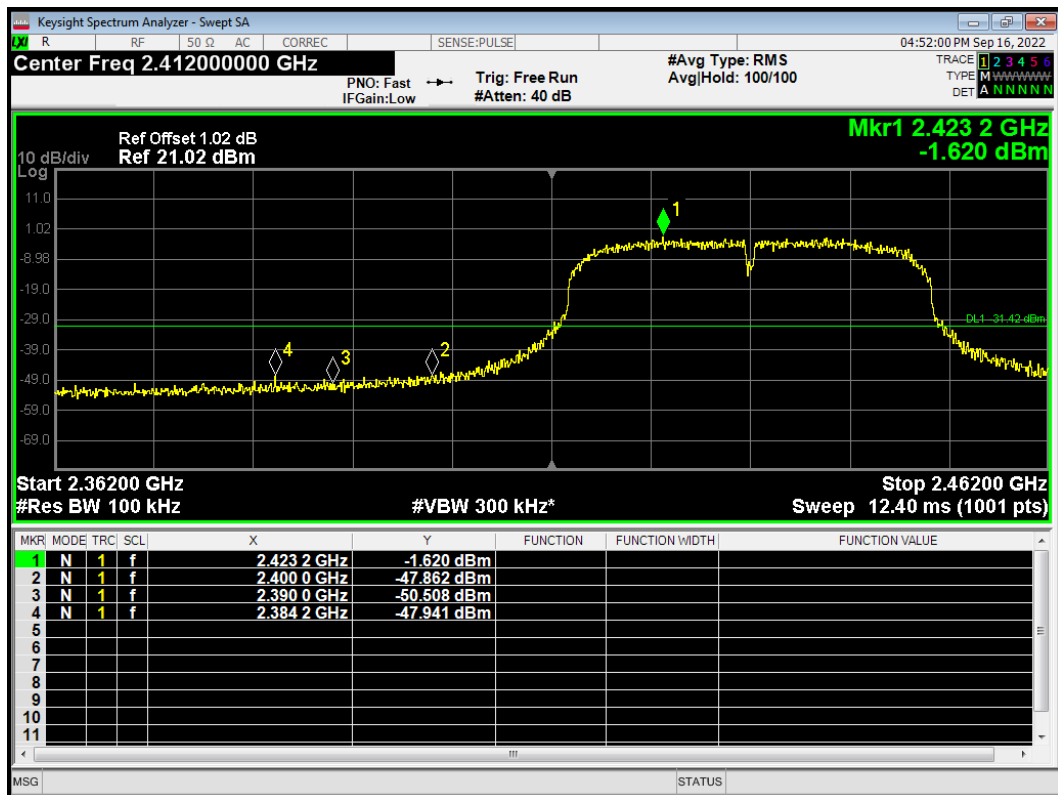




Band Edge 802.11n(HT40) 2432MHz Ref

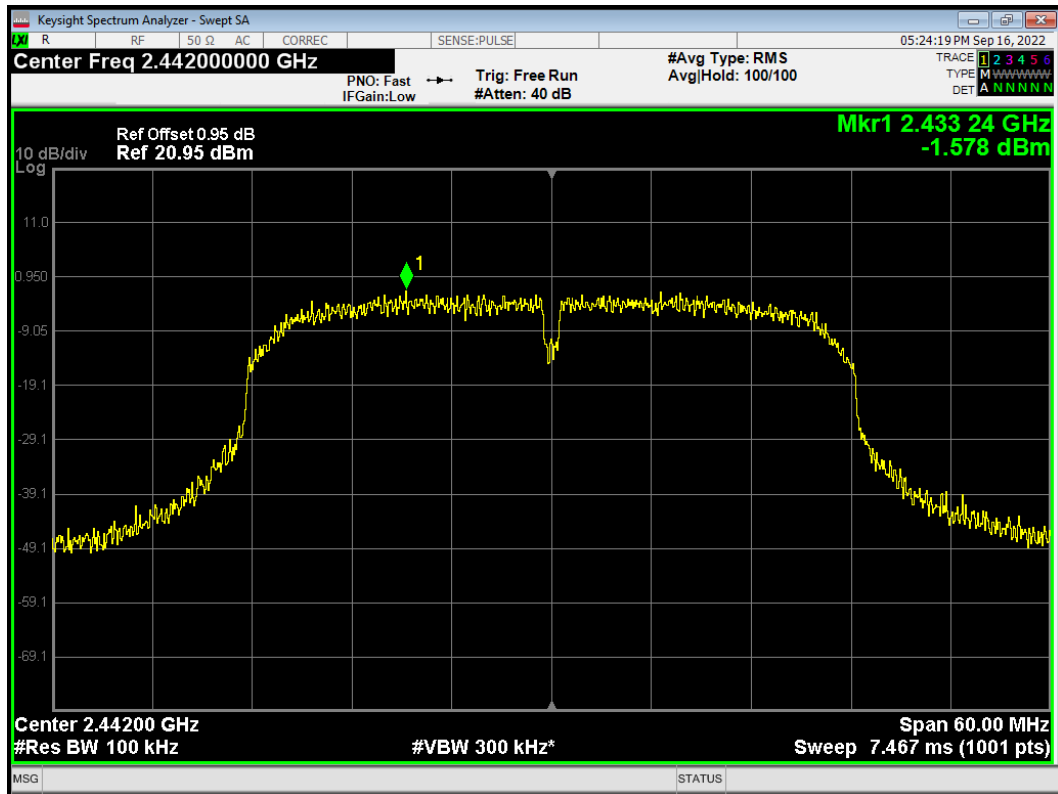


Band Edge 802.11n(HT40) 2432MHz Emission

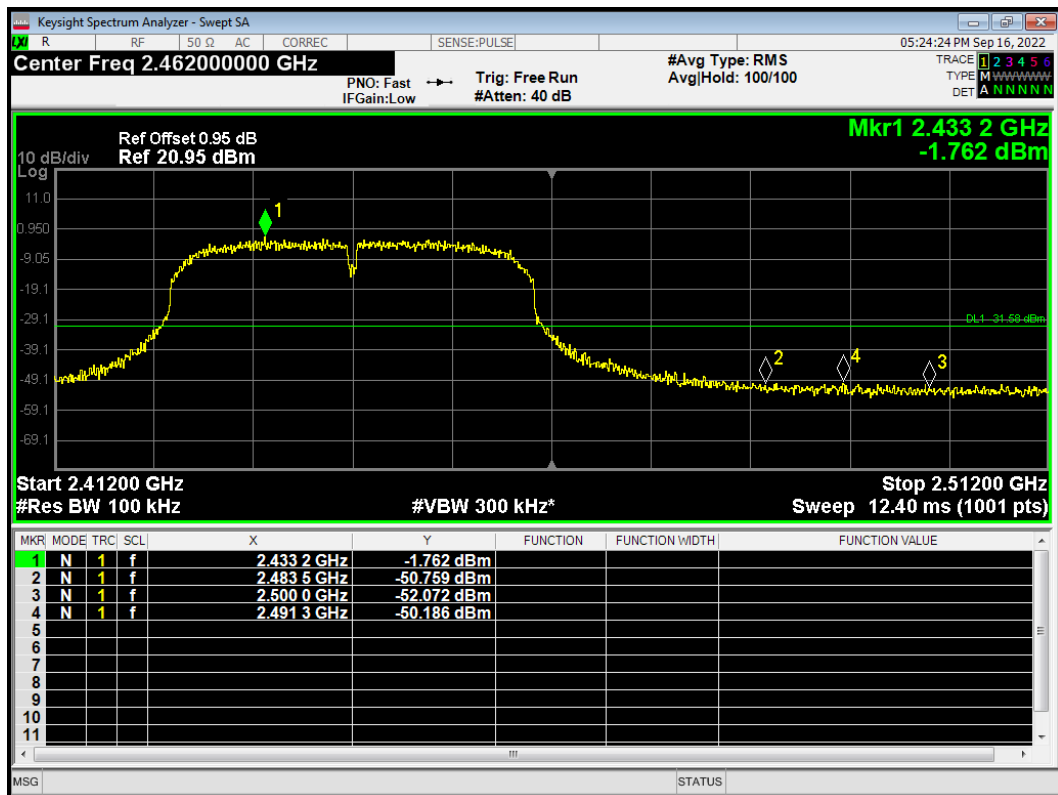




Band Edge 802.11n(HT40) 2442MHz Ref

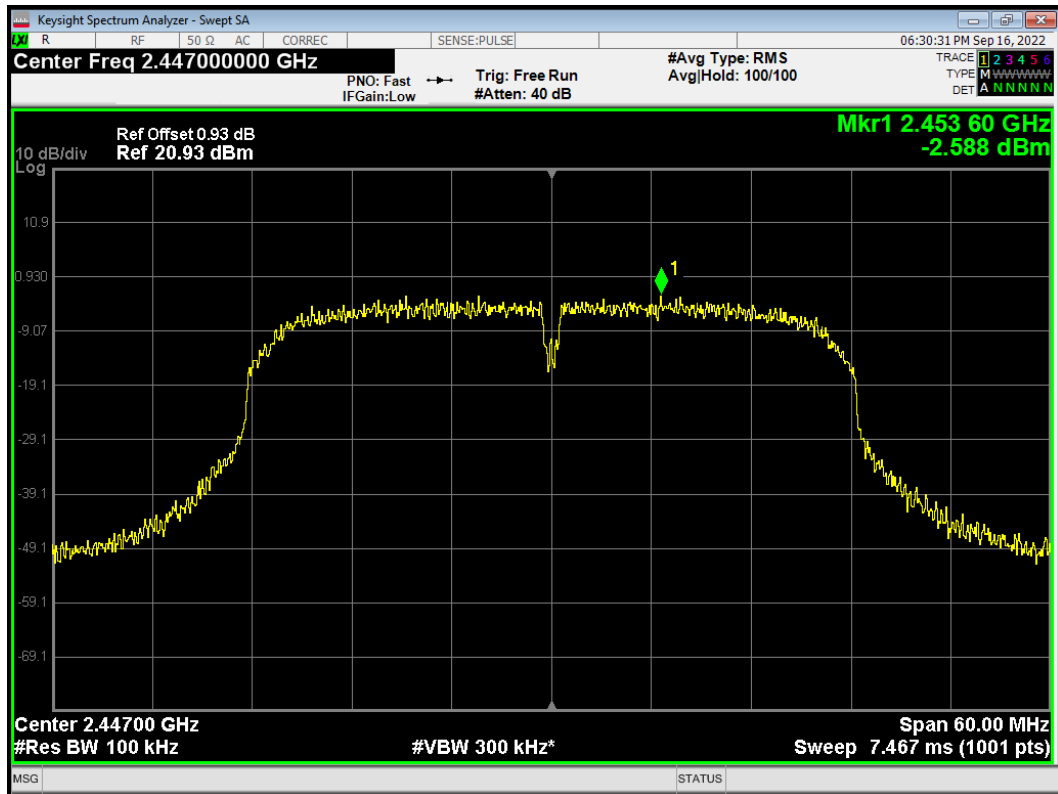


Band Edge 802.11n(HT40) 2442MHz Emission

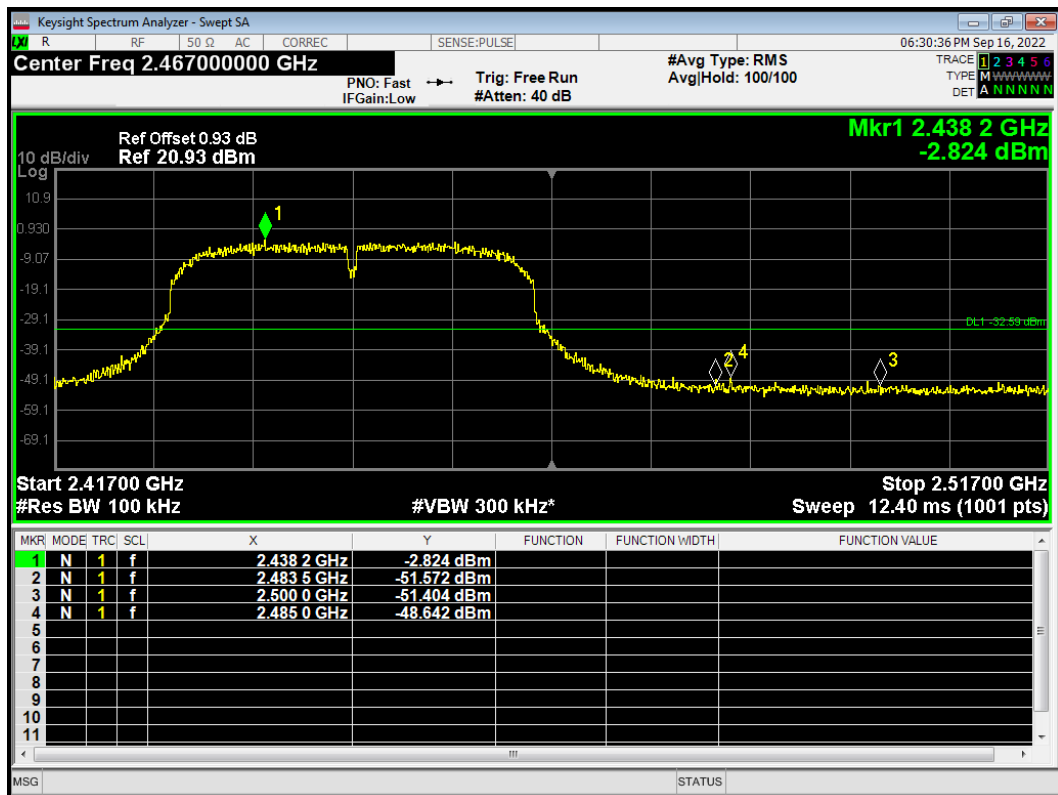




Band Edge 802.11n(HT40) 2447MHz Ref

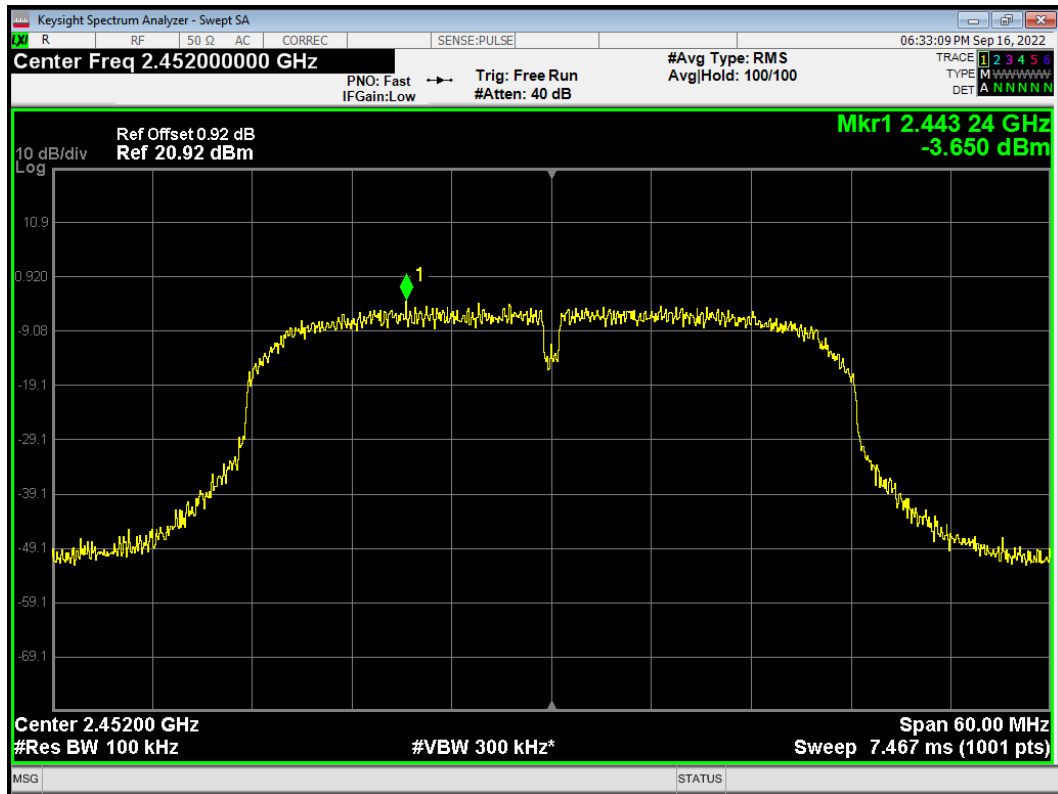


Band Edge 802.11n(HT40) 2447MHz Emission

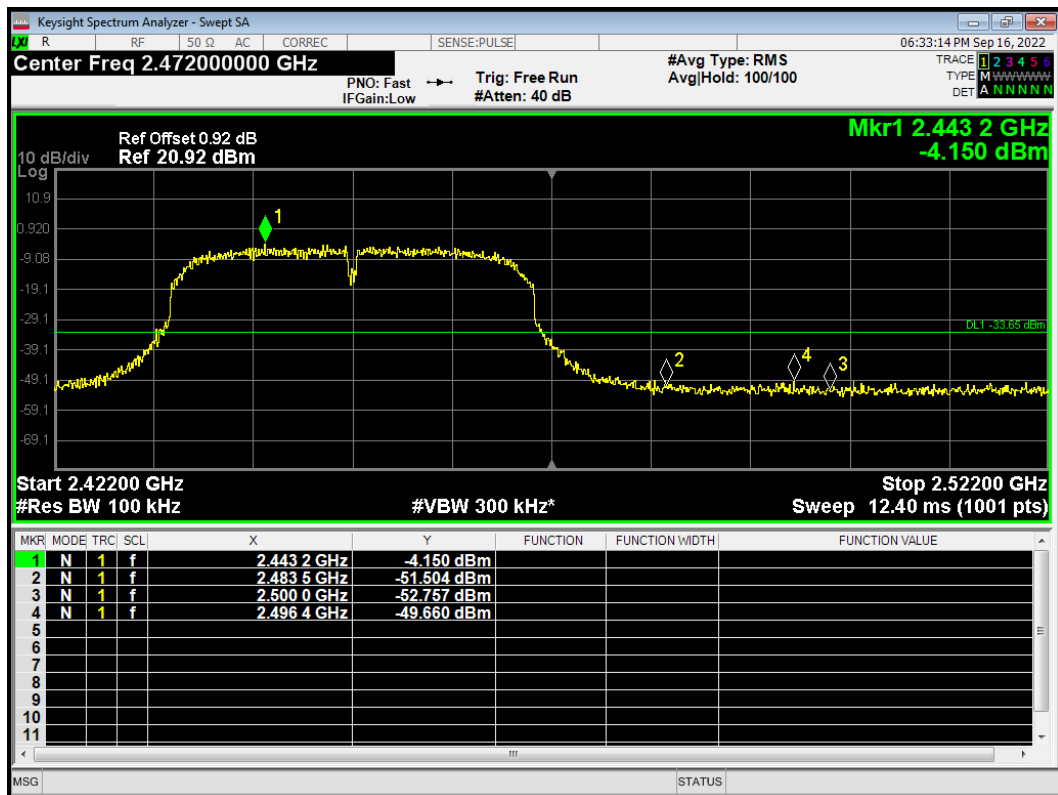




Band Edge 802.11n(HT40) 2452MHz Ref

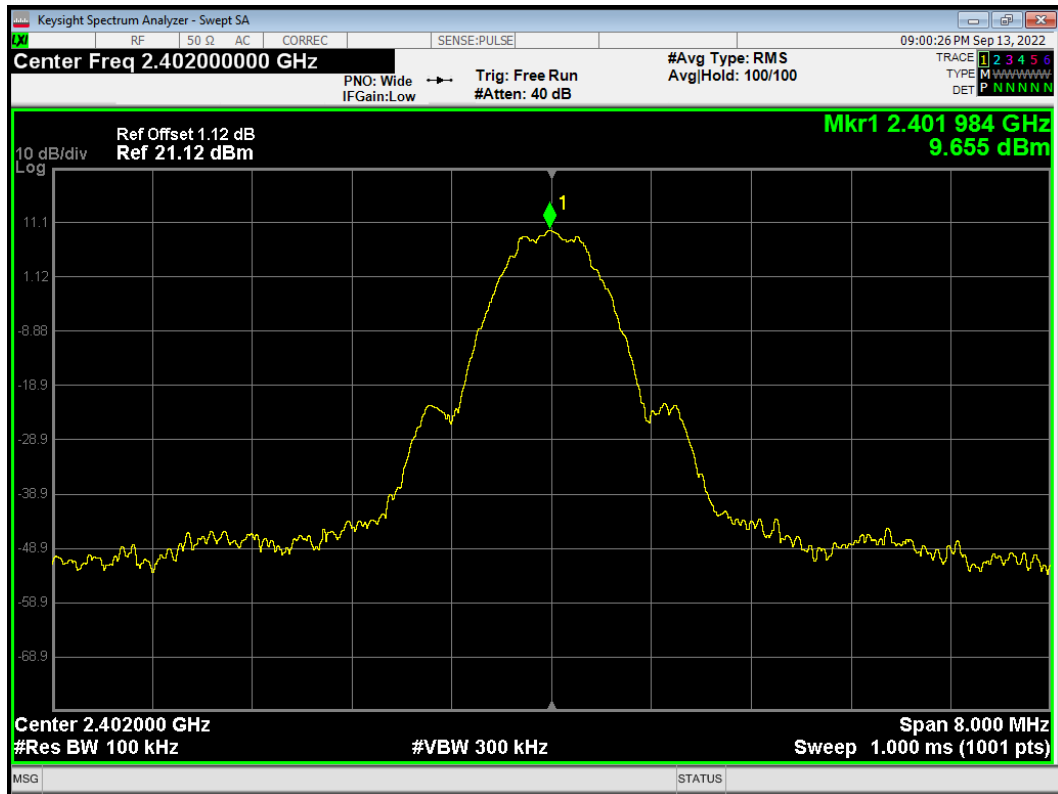


Band Edge 802.11n(HT40) 2452MHz Emission

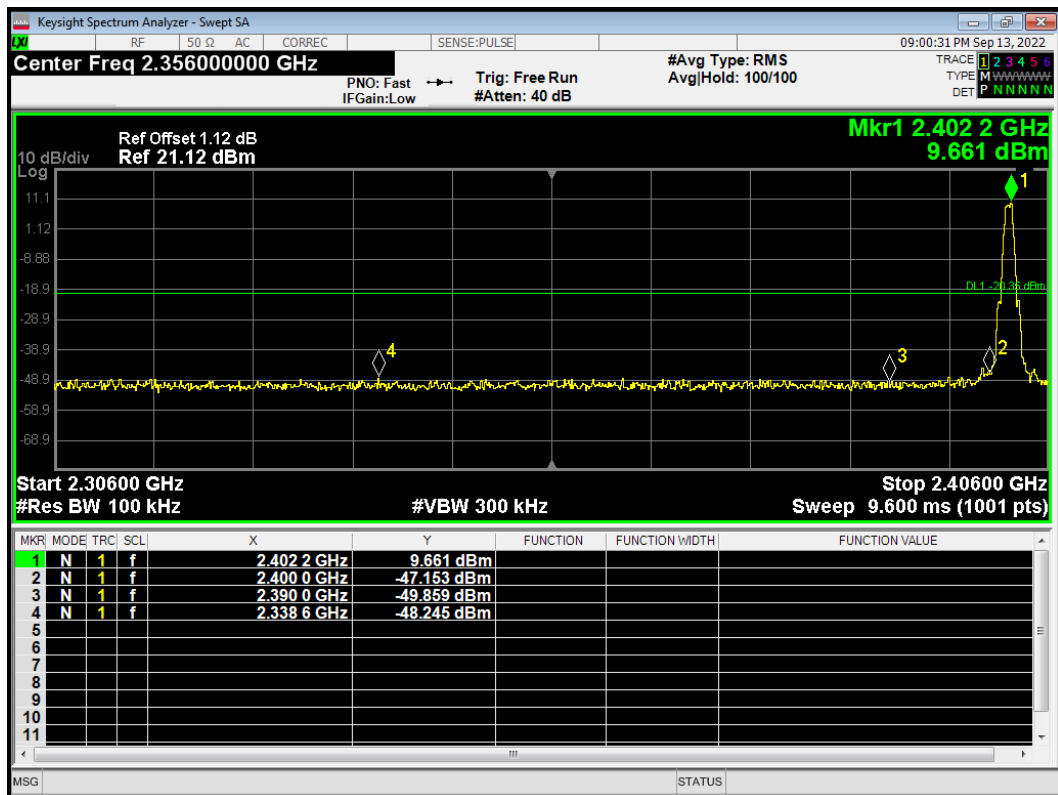




Band Edge BLE 2402MHz Ref

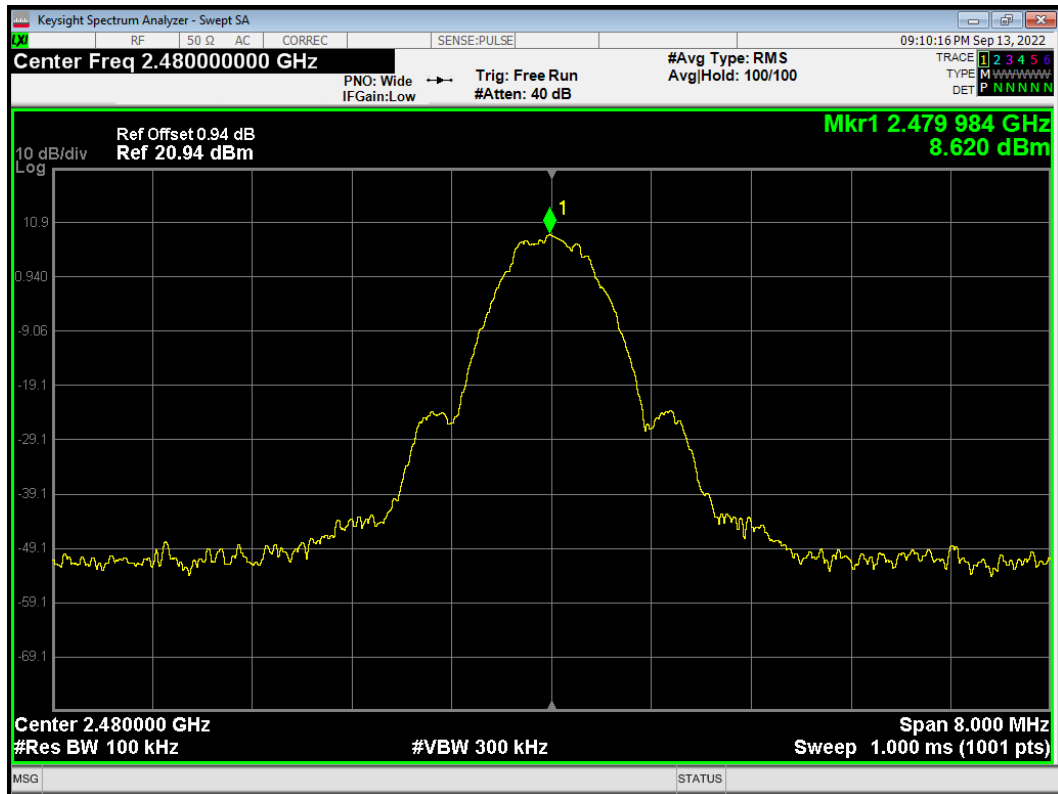


Band Edge BLE 2402MHz Emission

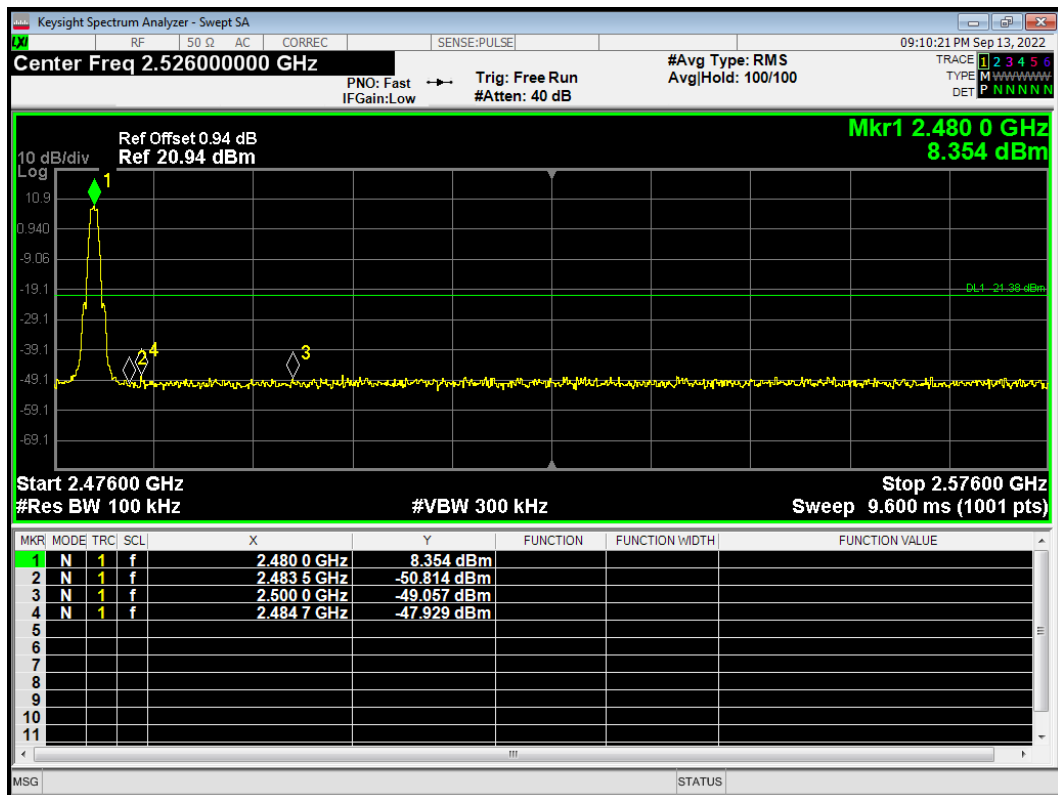




Band Edge BLE 2480MHz Ref



Band Edge BLE 2480MHz Emission



5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

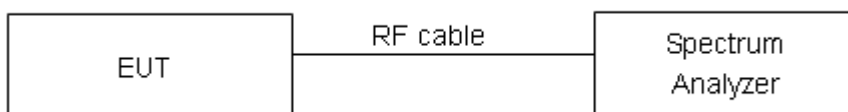
Method of Measurement

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 AVGPS-1 was used for this test.

- Set instrument center frequency to DTS channel center frequency
- Set span to at least 1.5 times the OBW
- Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
- Set VBW $\geq [3 \times \text{RBW}]$
- Detector=power averaging (rms) or sample detector (when rms not available)
- Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span}/\text{RBW}]$
- Sweep time auto couple
- Employ trace averaging (rms) mode over a minimum of 100 traces
- Use the peak marker function to determine the maximum amplitude level.
- 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)

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

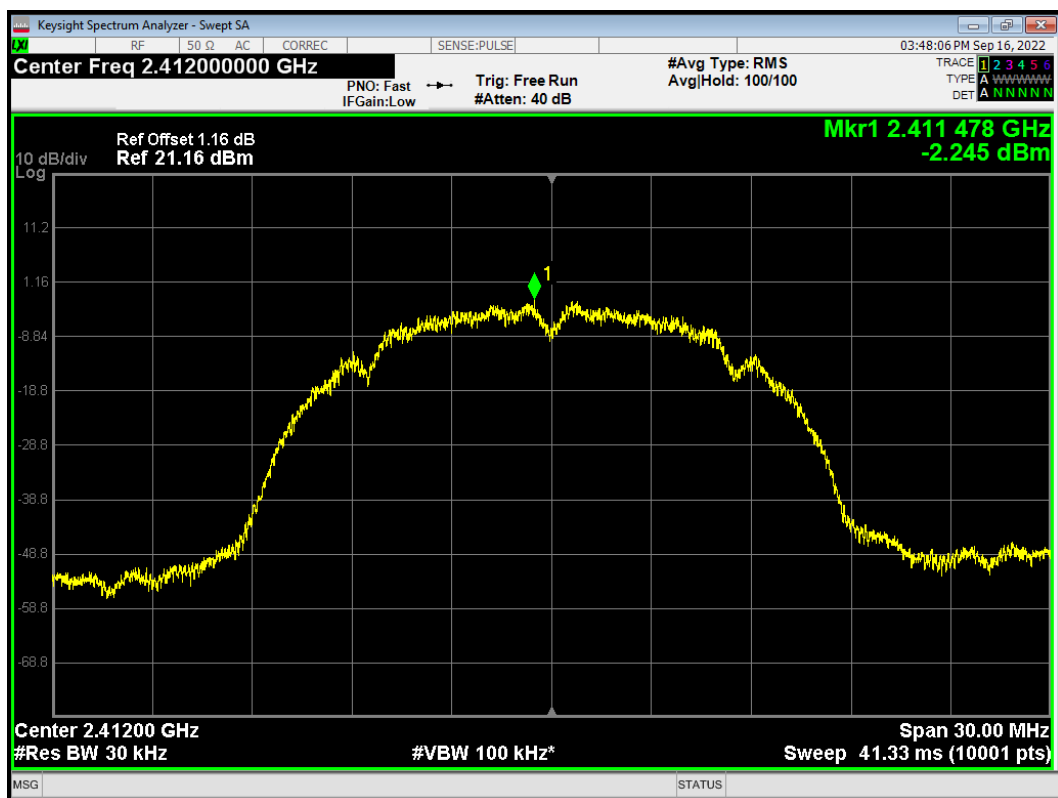
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

**Test Results:**

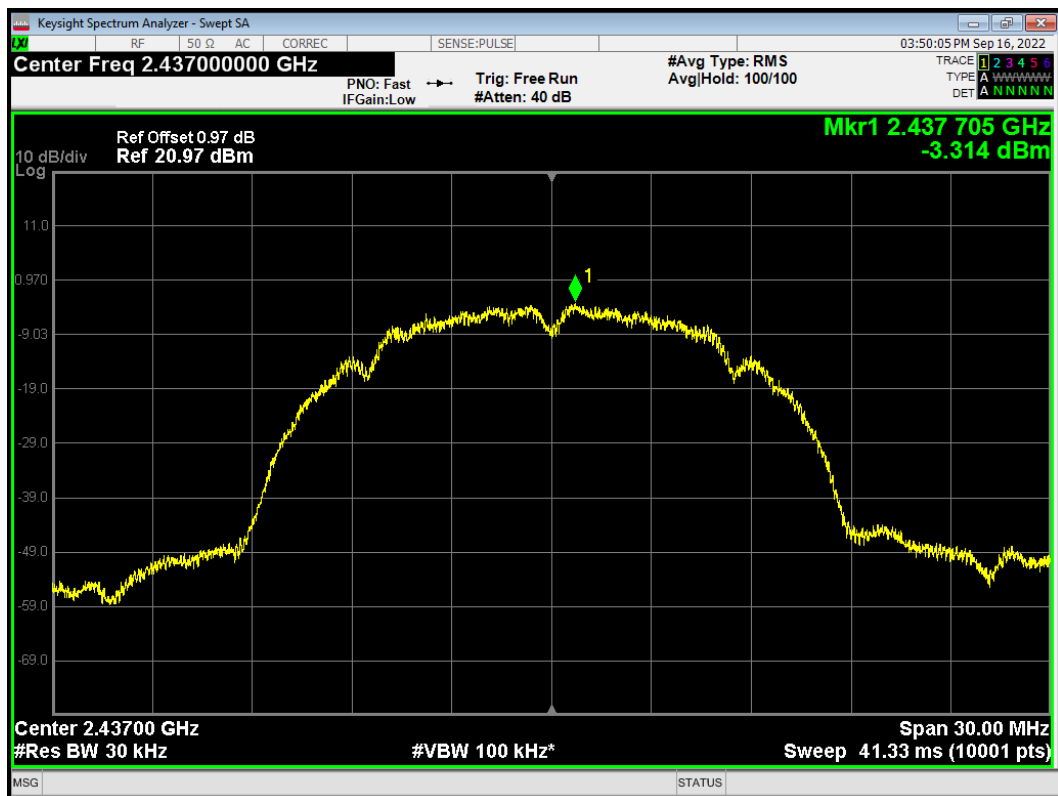
Test Mode	Channel Number	Read Value (dBm / 30kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-2.25	-12.25	8	PASS
	6	-3.31	-13.31	8	PASS
	11	-3.04	-13.04	8	PASS
802.11g	1	-8.89	-18.89	8	PASS
	2	-6.02	-16.02	8	PASS
	6	-6.83	-16.83	8	PASS
	10	-7.22	-17.22	8	PASS
	11	-9.71	-19.71	8	PASS
802.11n HT20	1	-10.15	-20.15	8	PASS
	2	-6.09	-16.09	8	PASS
	6	-6.85	-16.85	8	PASS
	10	-7.24	-17.24	8	PASS
	11	-10.86	-20.86	8	PASS
802.11n HT40	3	-12.98	-22.98	8	PASS
	4	-11.79	-21.79	8	PASS
	5	-10.93	-20.93	8	PASS
	6	-9.67	-19.67	8	PASS
	7	-10.82	-20.82	8	PASS
	8	-12.26	-22.26	8	PASS
	9	-13.29	-23.29	8	PASS
Note: Power Spectral Density (dBm/3kHz) =Read Value+Duty cycle correction factor + 10*log10(3 / 30)					

Test Mode	Channel Number	Read Value (dBm / 3kHz)	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
Bluetooth (Low Energy)	0	-10.71	-9.94	8	PASS
	19	-11.06	-10.29	8	PASS
	39	-11.59	-10.82	8	PASS
Note: Power Spectral Density =Read Value+Duty cycle correction factor					

PSD 802.11b 2412MHz

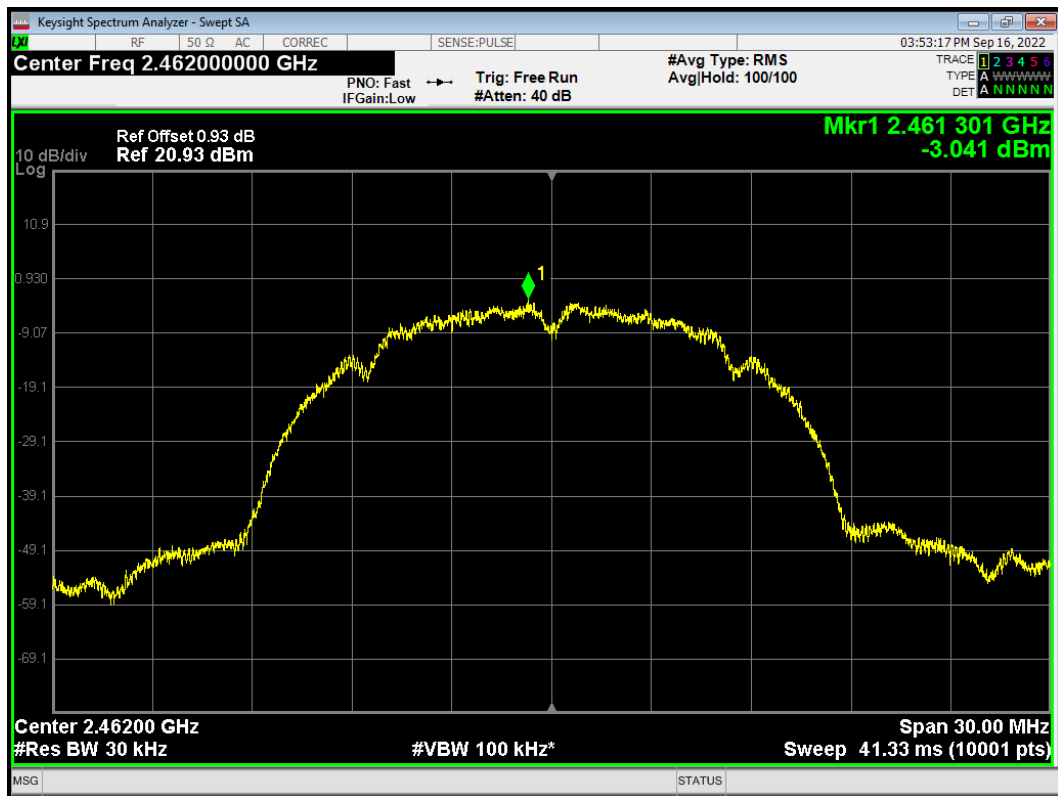


PSD 802.11b 2437MHz

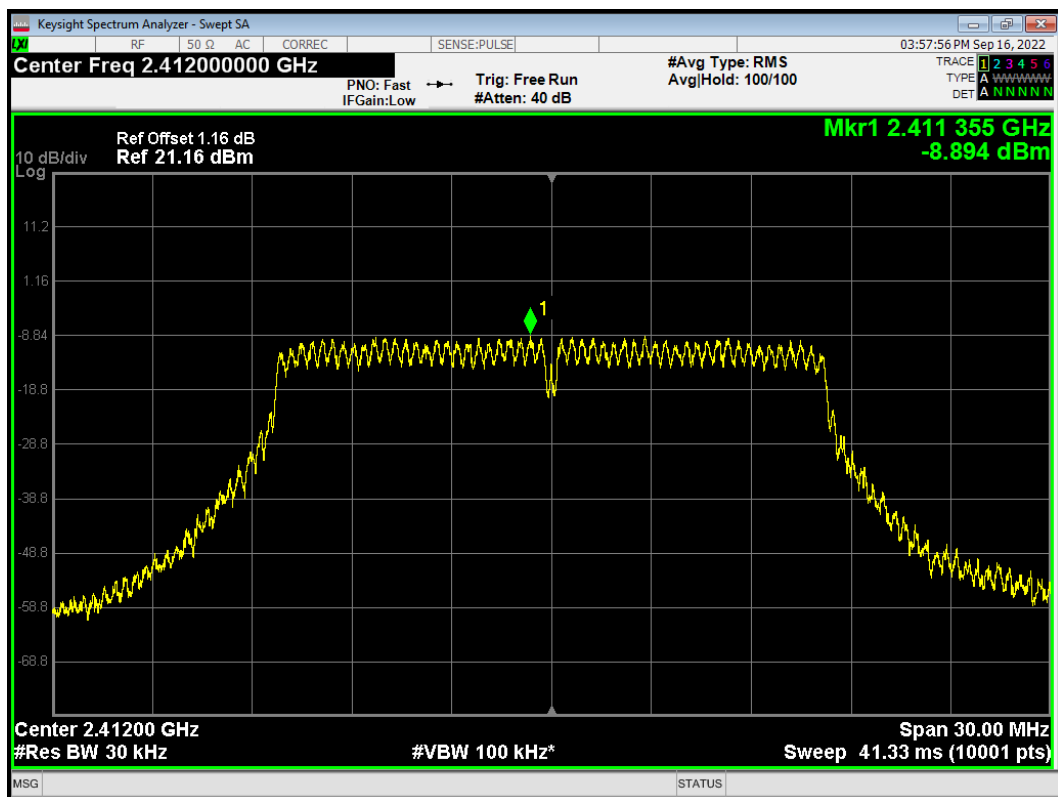




PSD 802.11b 2462MHz

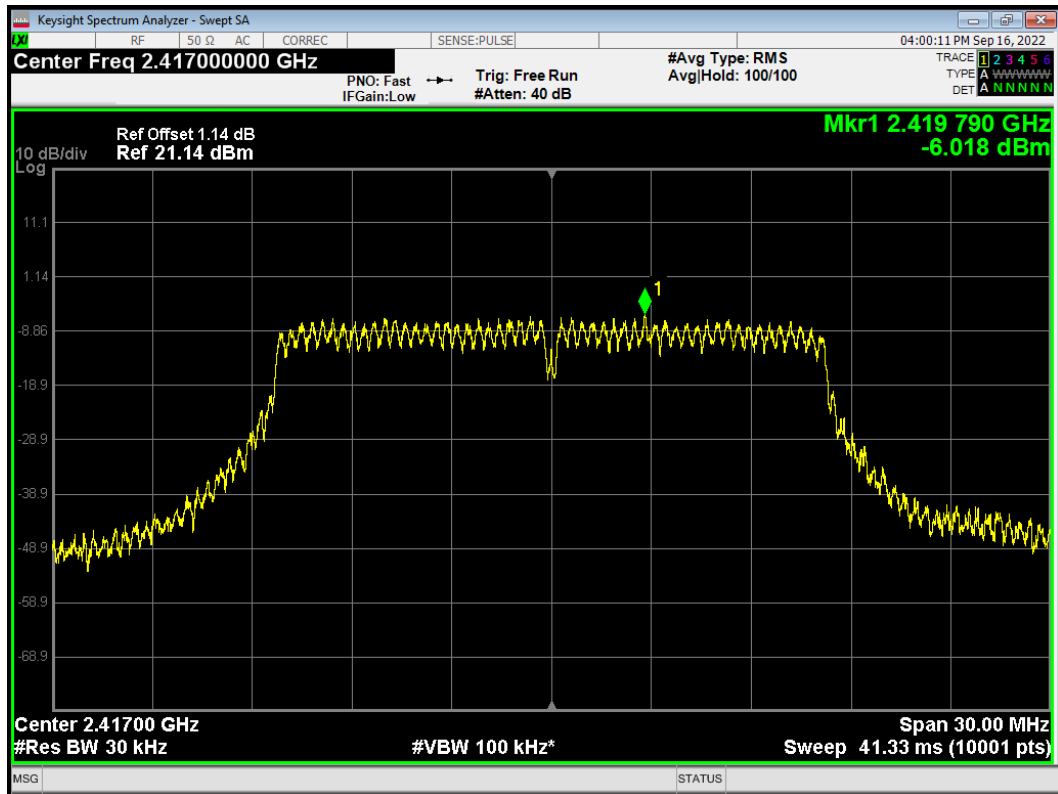


PSD 802.11g 2412MHz

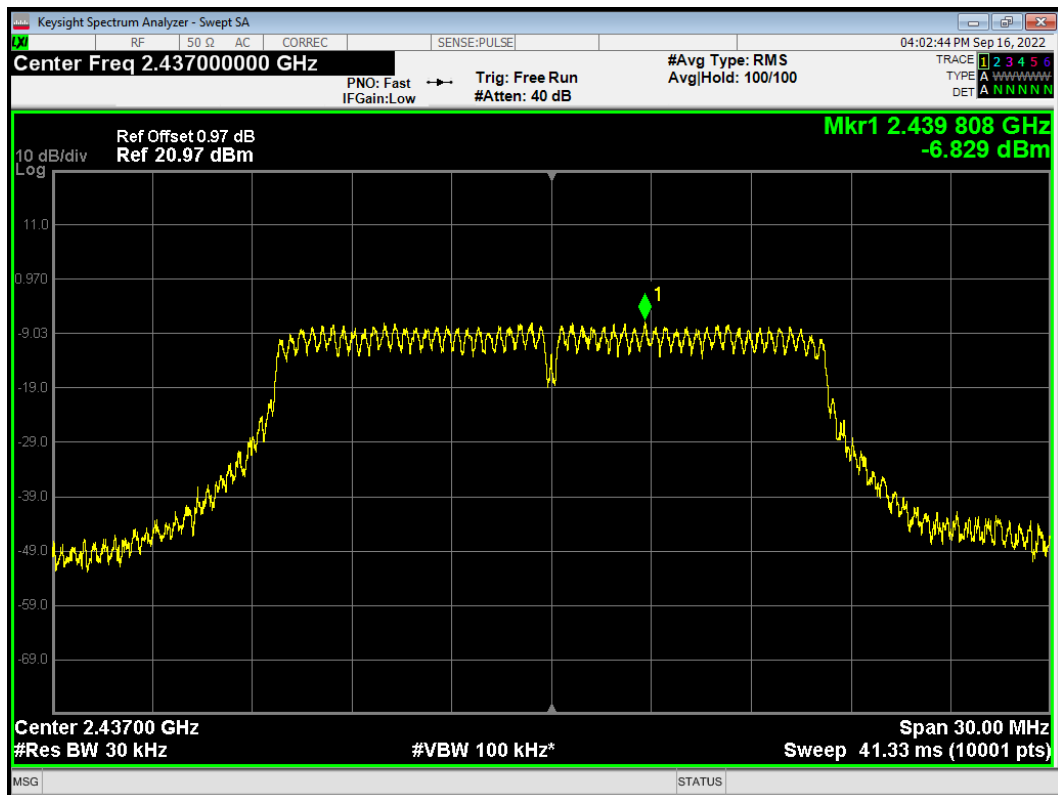




PSD 802.11g 2417MHz

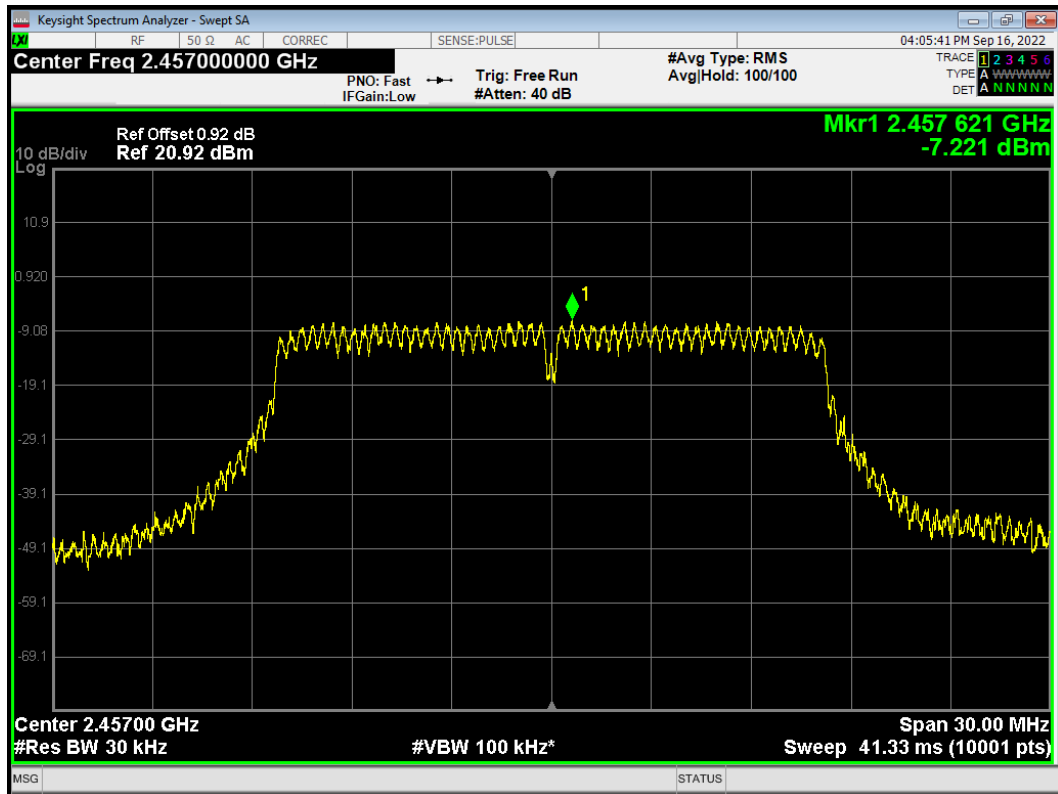


PSD 802.11g 2437MHz

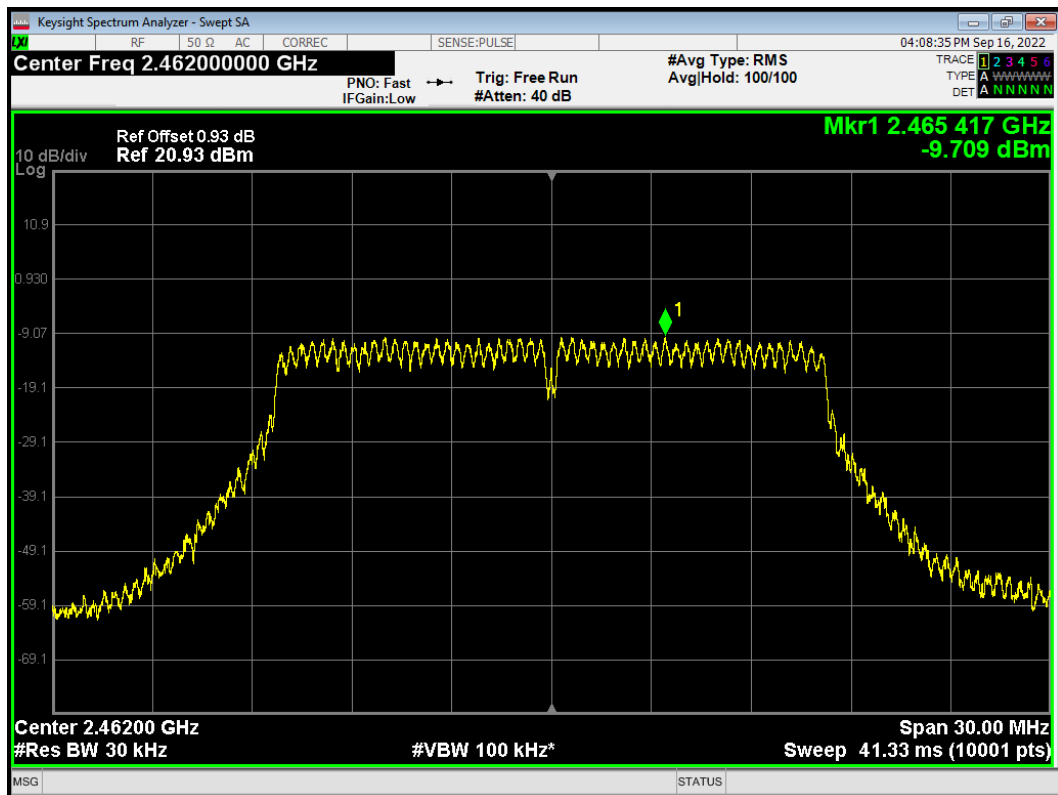




PSD 802.11g 2457MHz

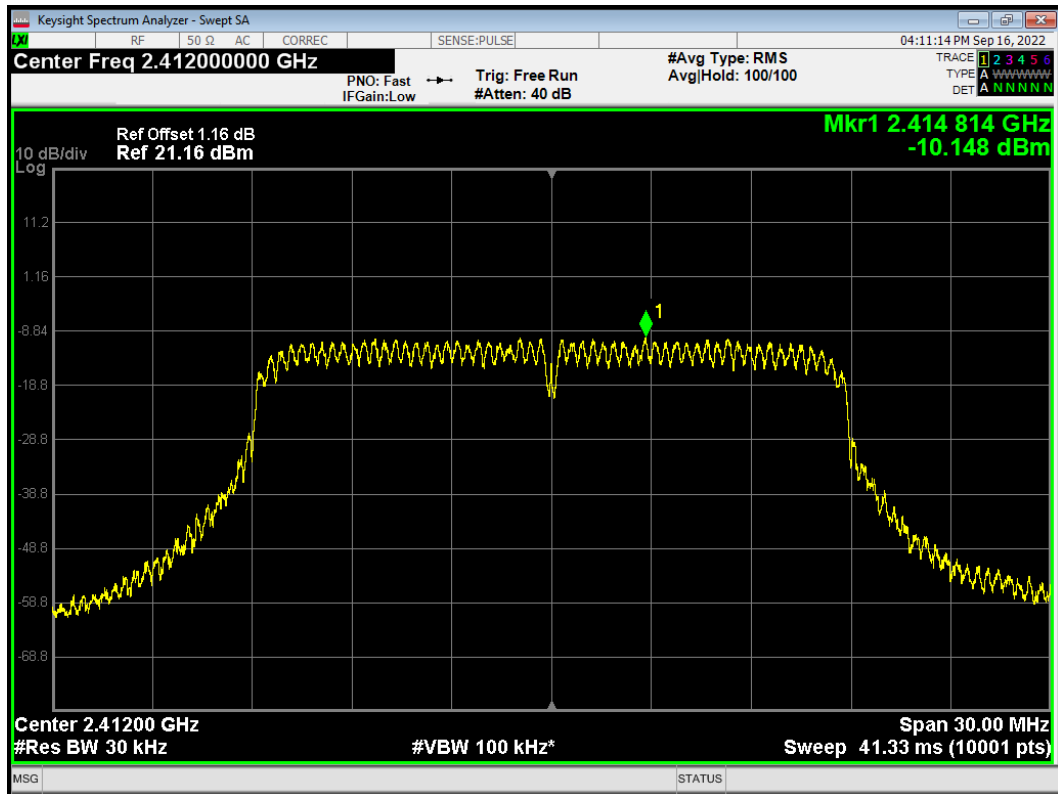


PSD 802.11g 2462MHz

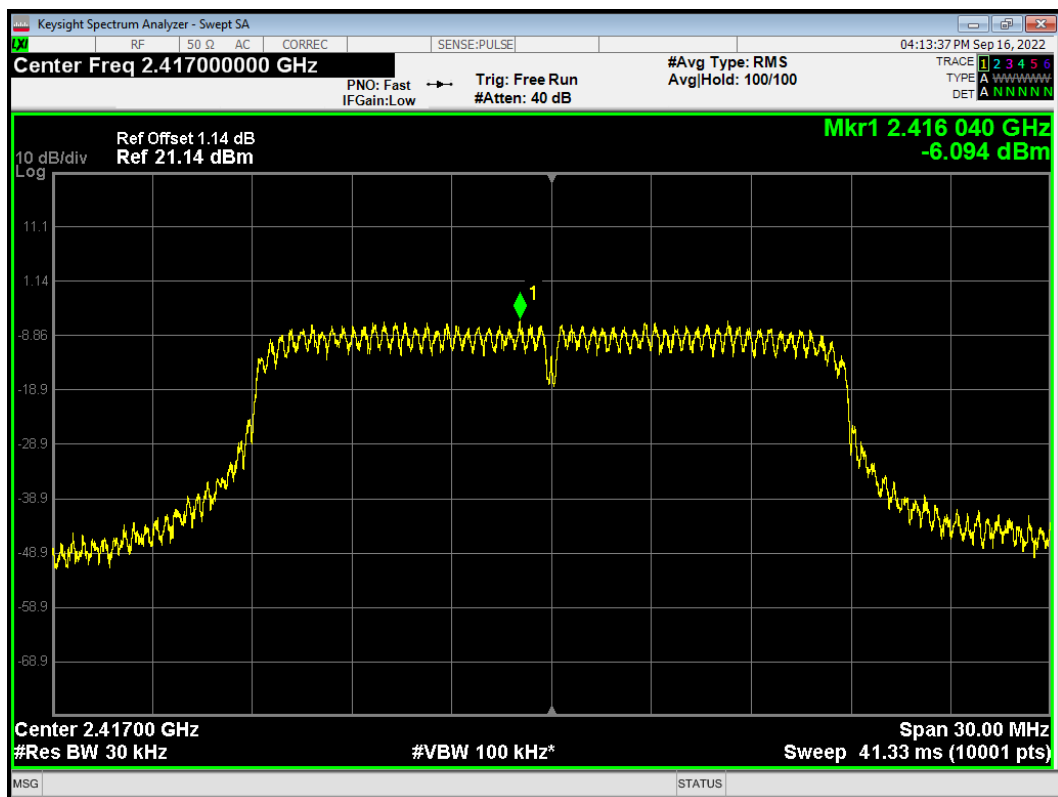




PSD 802.11n(HT20) 2412MHz

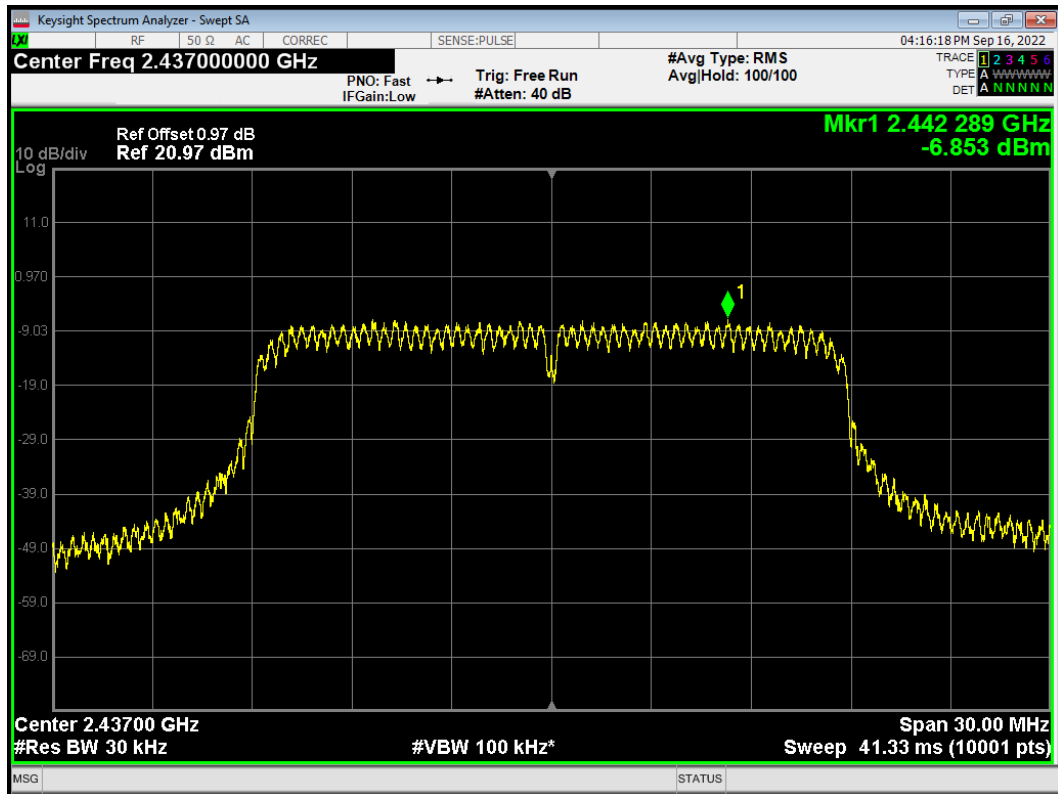


PSD 802.11n(HT20) 2417MHz

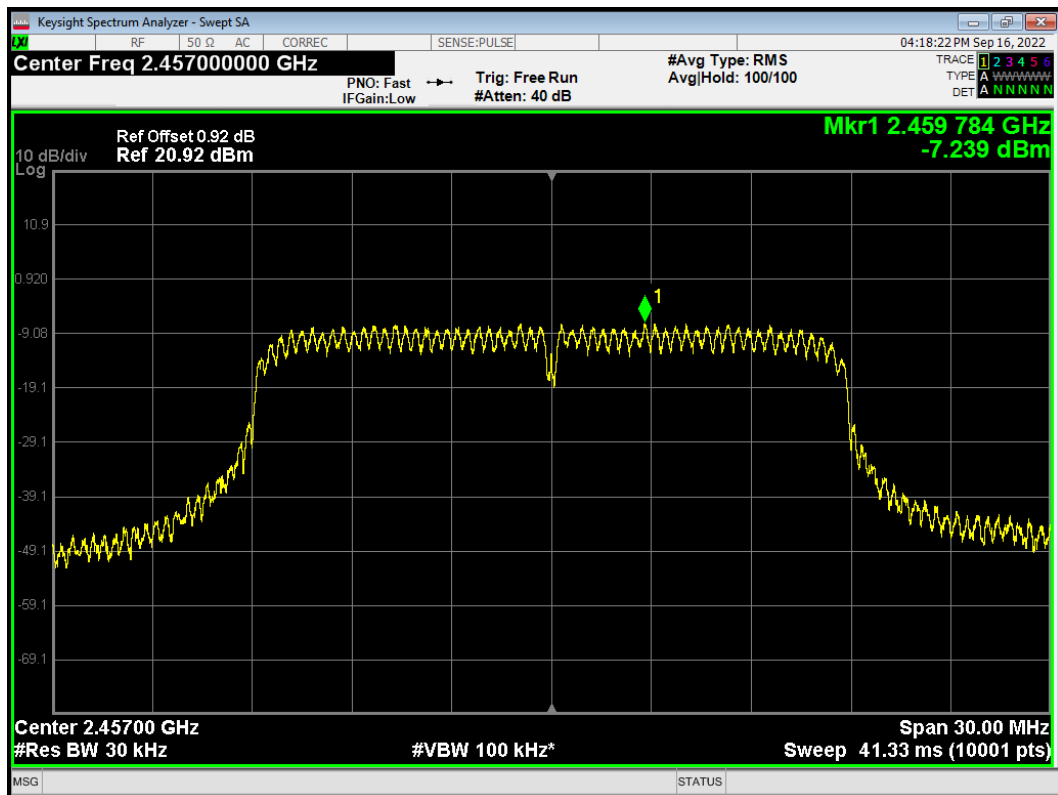




PSD 802.11n(HT20) 2437MHz

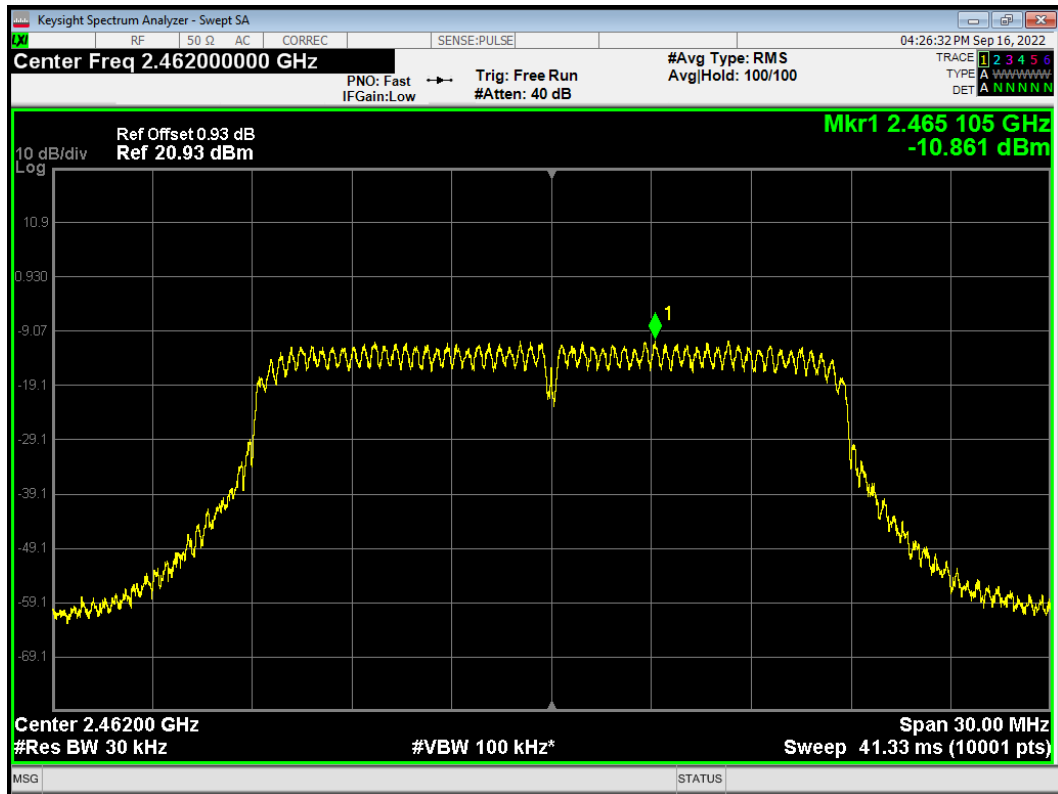


PSD 802.11n(HT20) 2457MHz

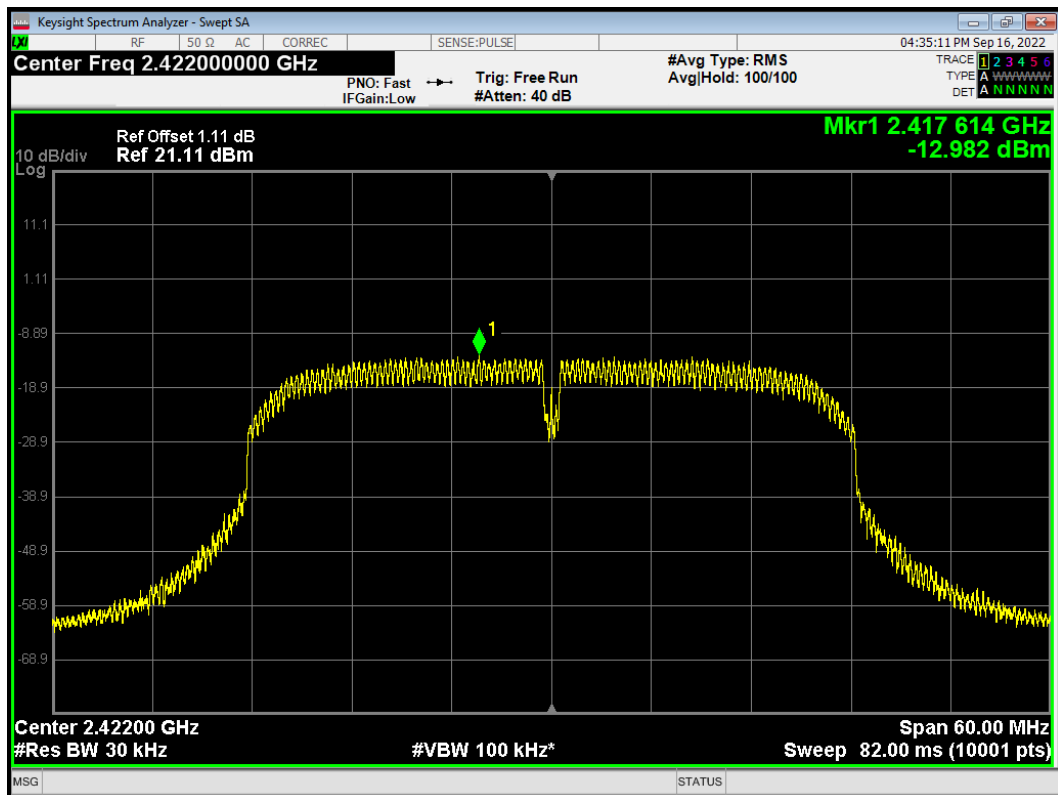




PSD 802.11n(HT20) 2462MHz

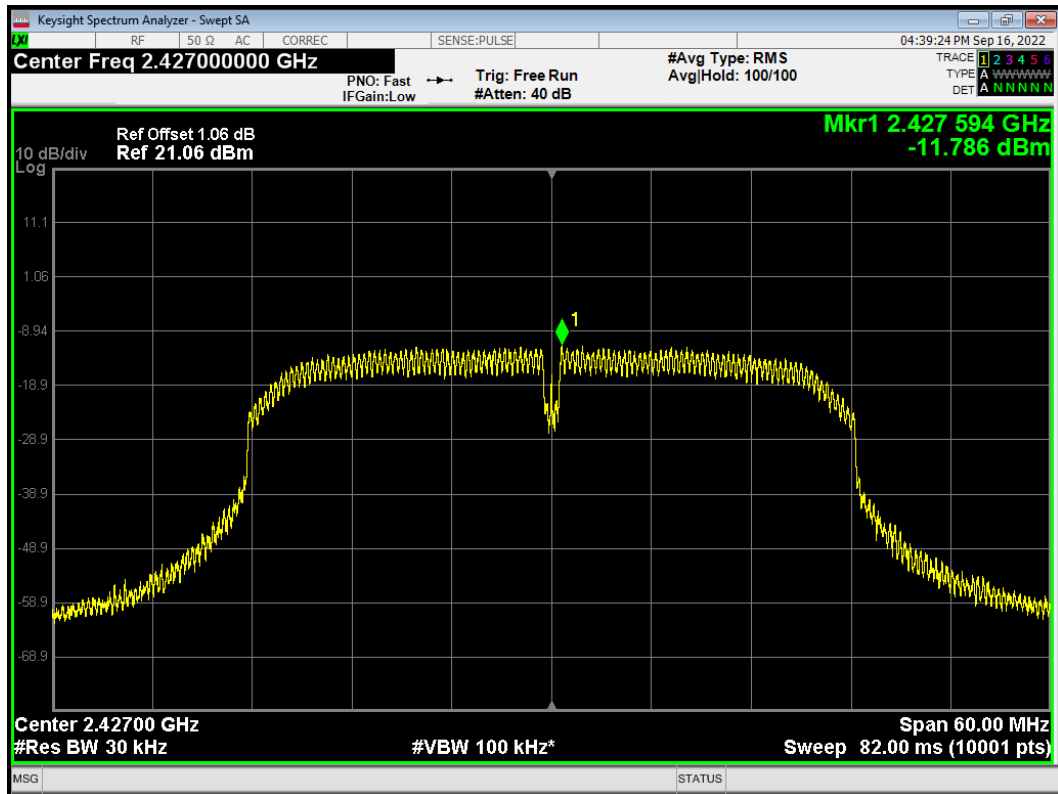


PSD 802.11n(HT40) 2422MHz

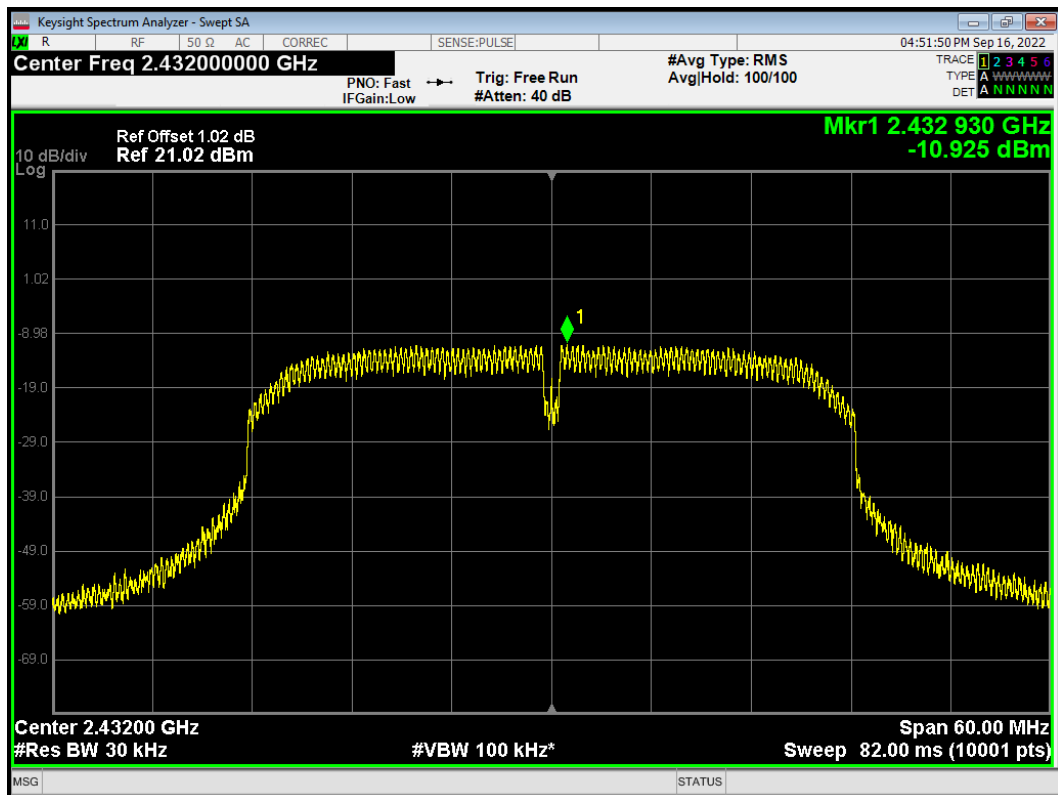




PSD 802.11n(HT40) 2427MHz

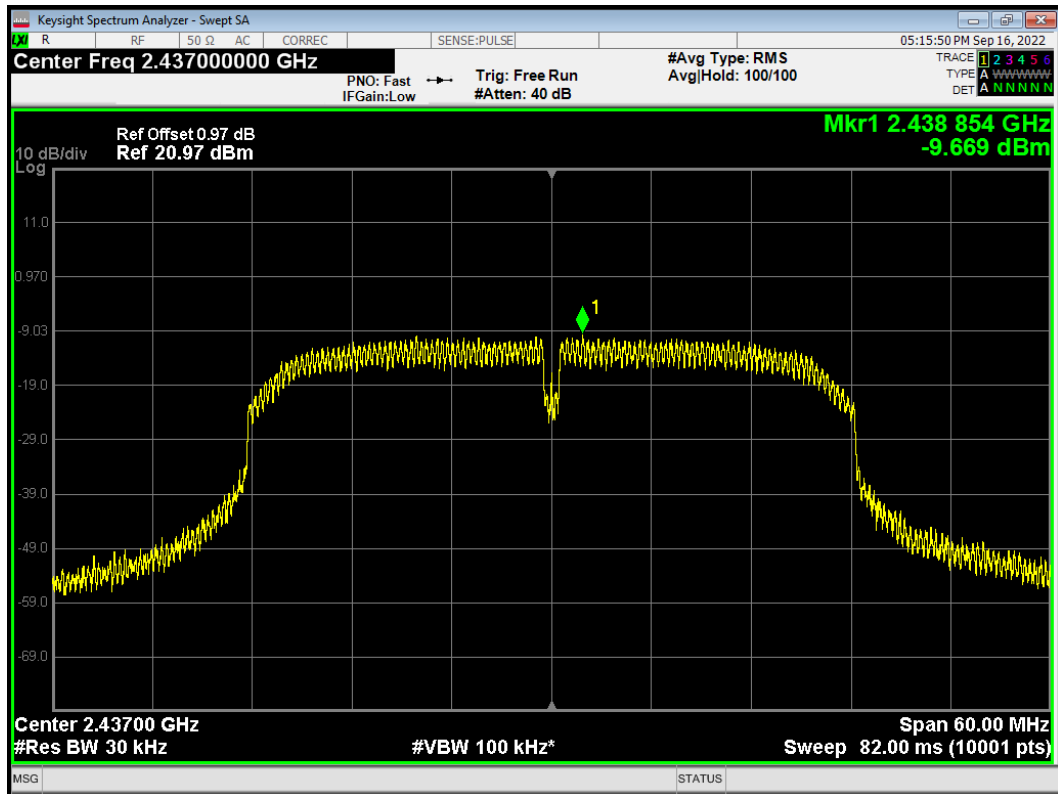


PSD 802.11n(HT40) 2432MHz

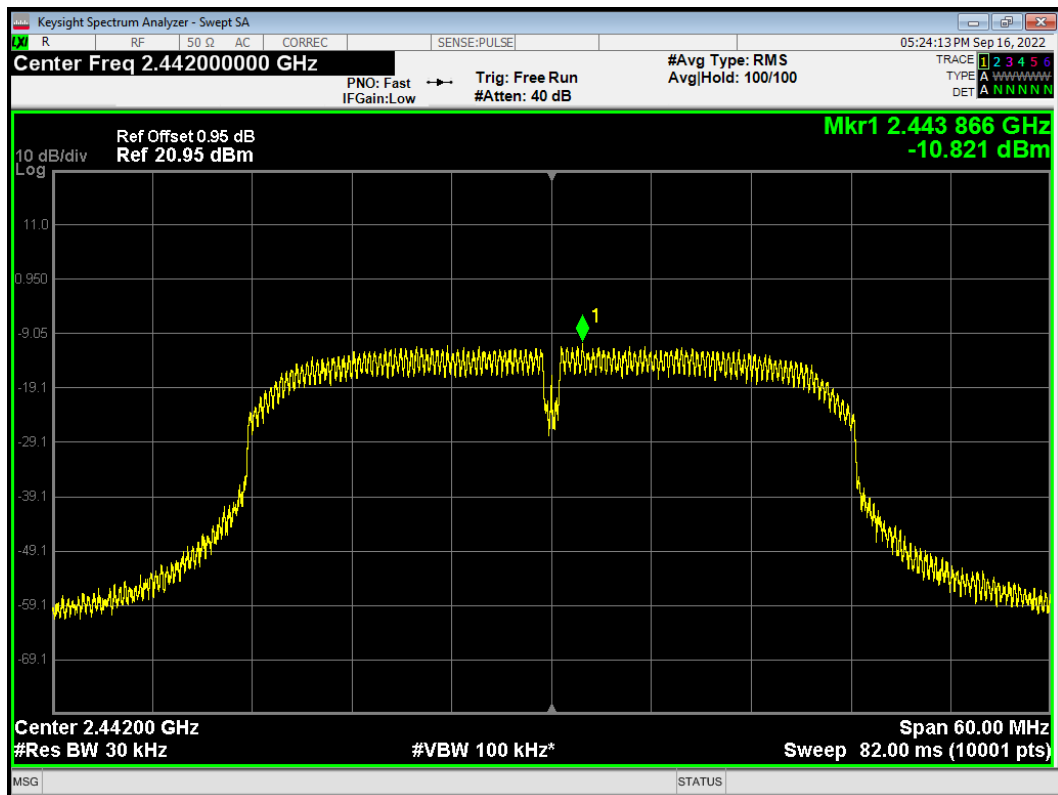




PSD 802.11n(HT40) 2437MHz

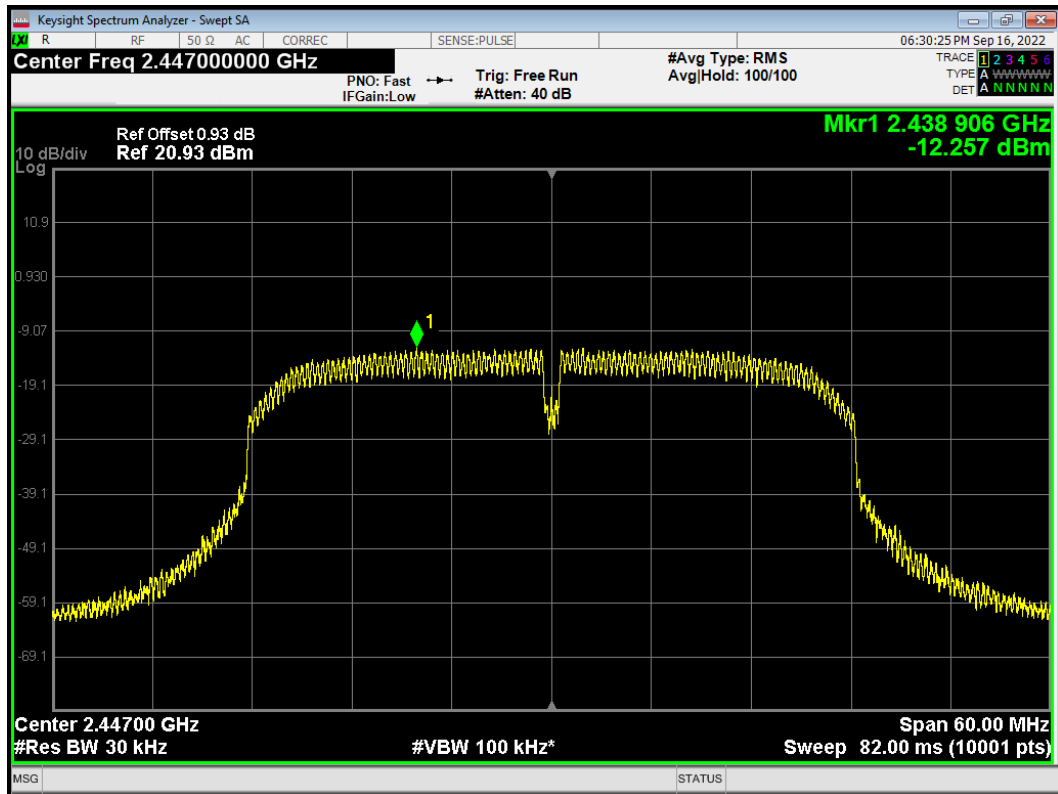


PSD 802.11n(HT40) 2442MHz

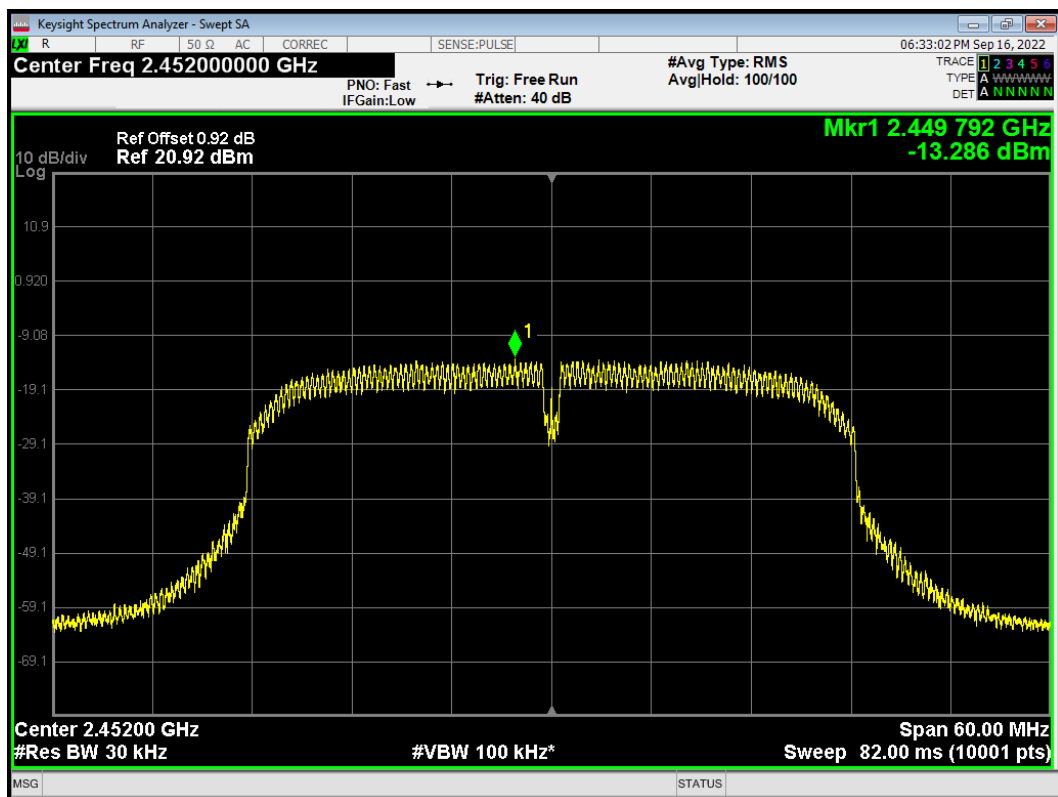




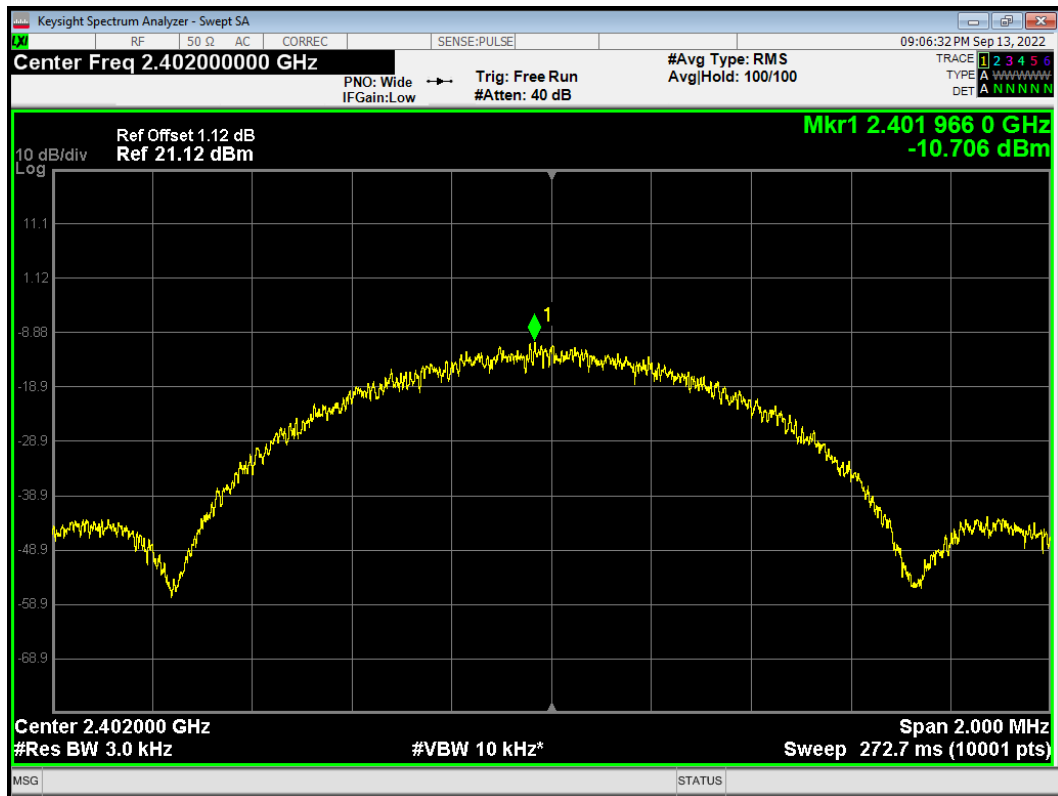
PSD 802.11n(HT40) 2447MHz



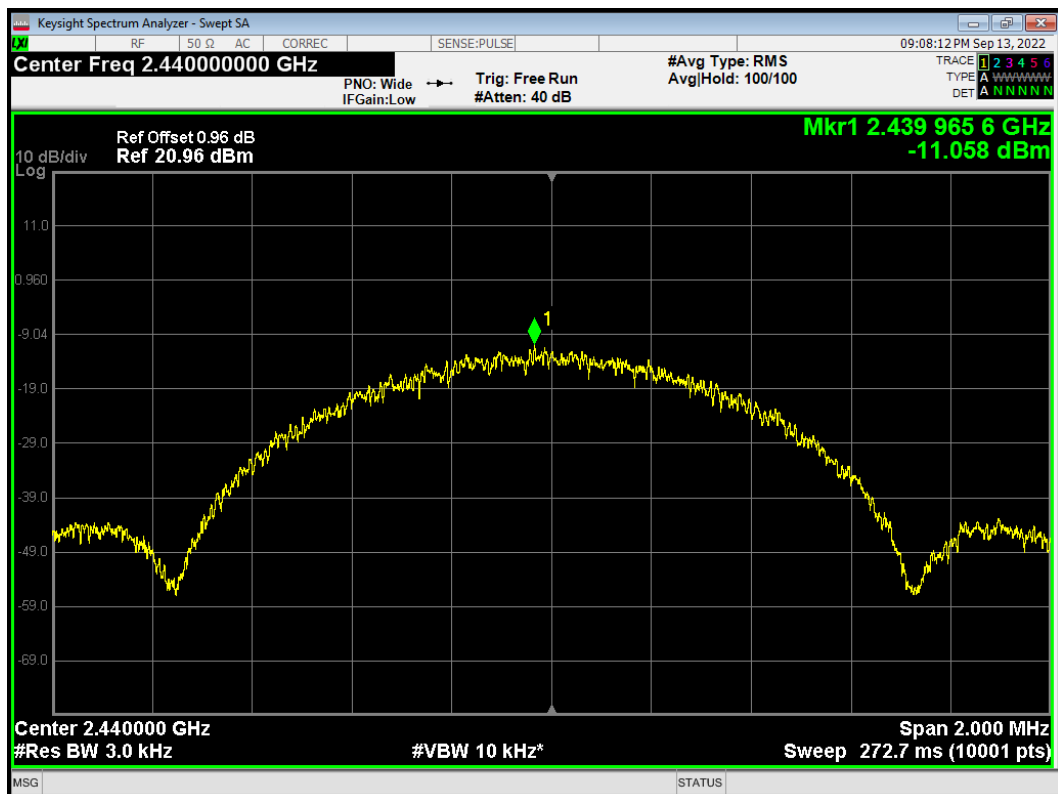
PSD 802.11n(HT40) 2452MHz



PSD BLE 2402MHz

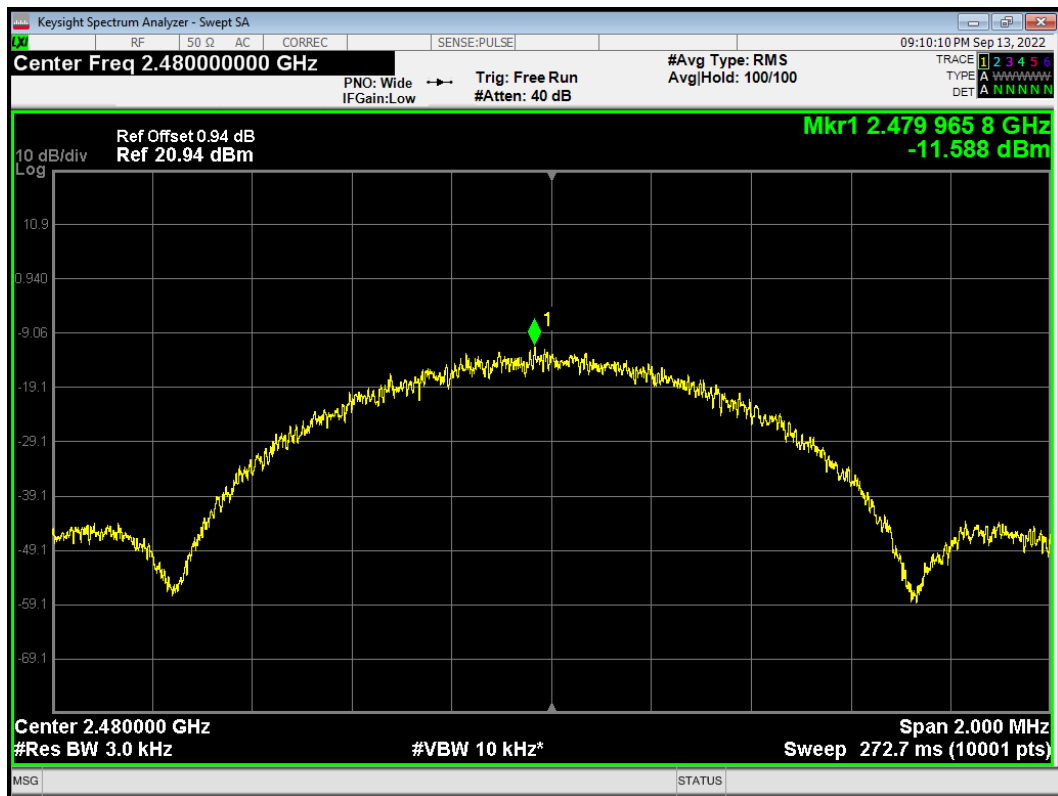


PSD BLE 2440MHz





PSD BLE 2480MHz



5.5. Spurious RF Conducted Emissions

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies 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. ”

Antenna 1

Test Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	9.420	-20.58
	2437	8.800	-21.20
	2462	9.750	-20.25
802.11g	2412	1.450	-28.55
	2417	3.670	-26.33
	2437	3.410	-26.59
	2457	3.100	-26.90
	2462	0.670	-29.33
802.11n HT20	2412	0.260	-29.74
	2417	3.840	-26.16



	2437	3.570	-26.43
	2457	3.630	-26.37
	2462	-0.290	-30.29
802.11n HT40	2422	-3.240	-33.24
	2427	-1.820	-31.82
	2432	-1.230	-31.23
	2437	-0.640	-30.64
	2442	-1.990	-31.99
	2447	-2.310	-32.31
	2452	-4.280	-34.28
Bluetooth (Low Energy)	2402	9.510	-20.49
	2440	9.400	-20.60
	2480	8.750	-21.25

Measurement Uncertainty

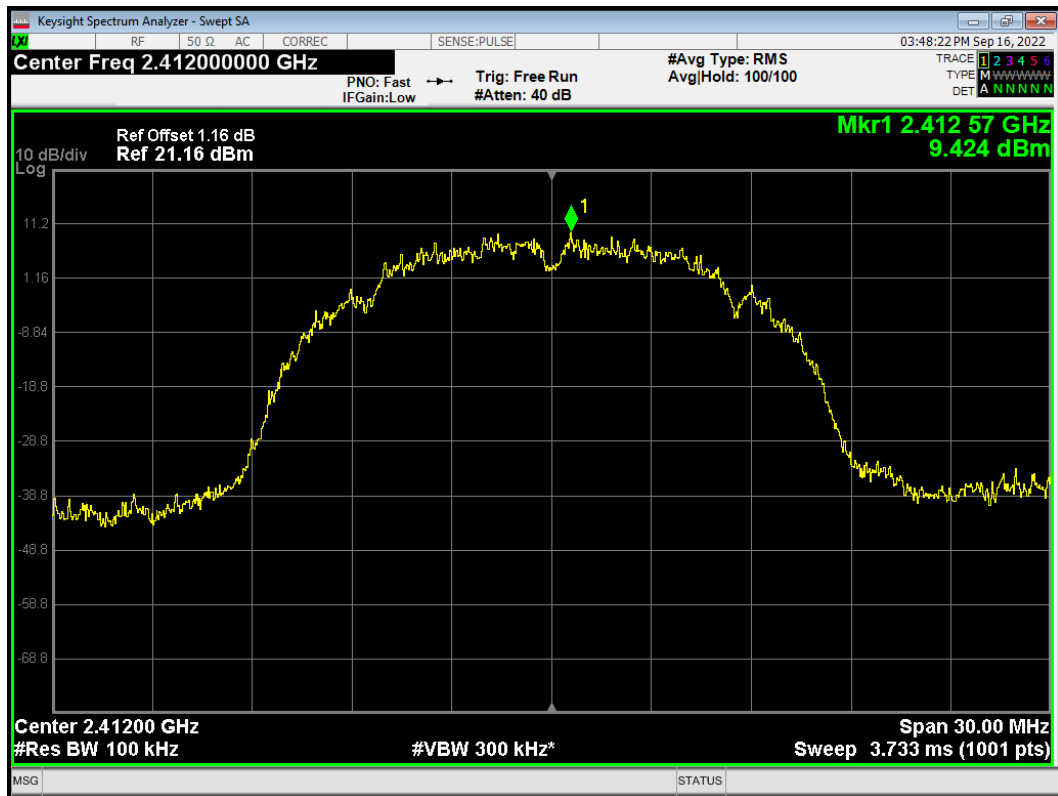
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

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

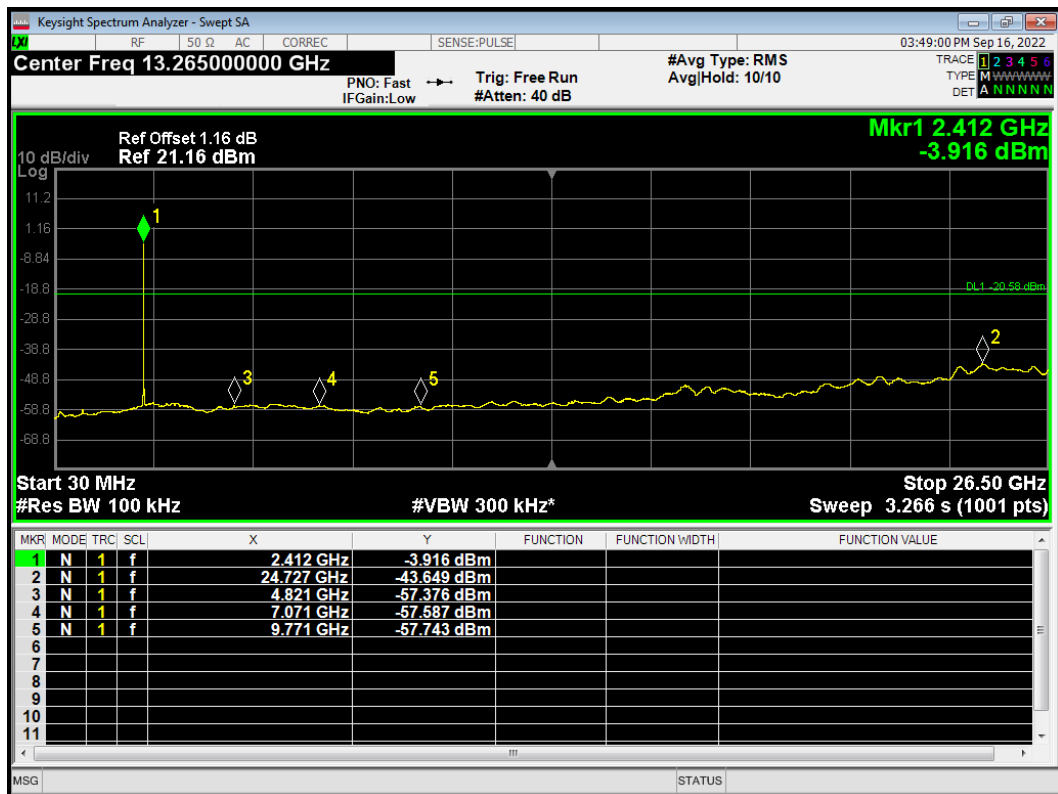


Test Results:

Tx. Spurious 802.11b 2412MHz Ref

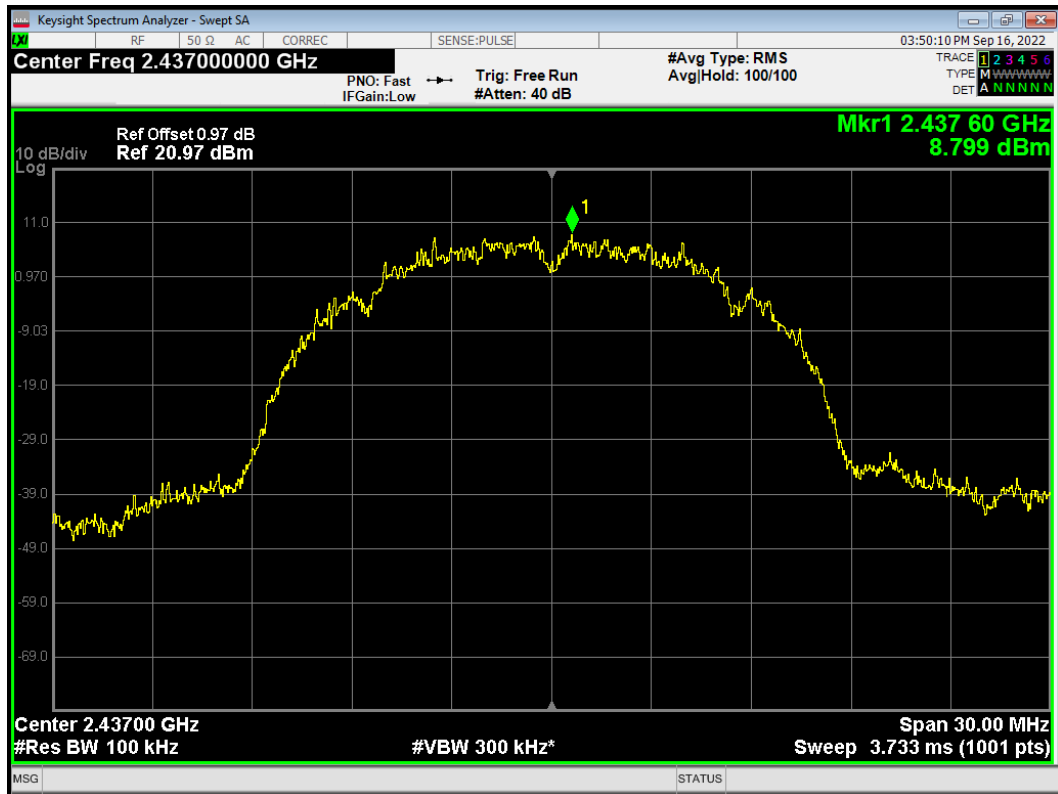


Tx. Spurious 802.11b 2412MHz Emission

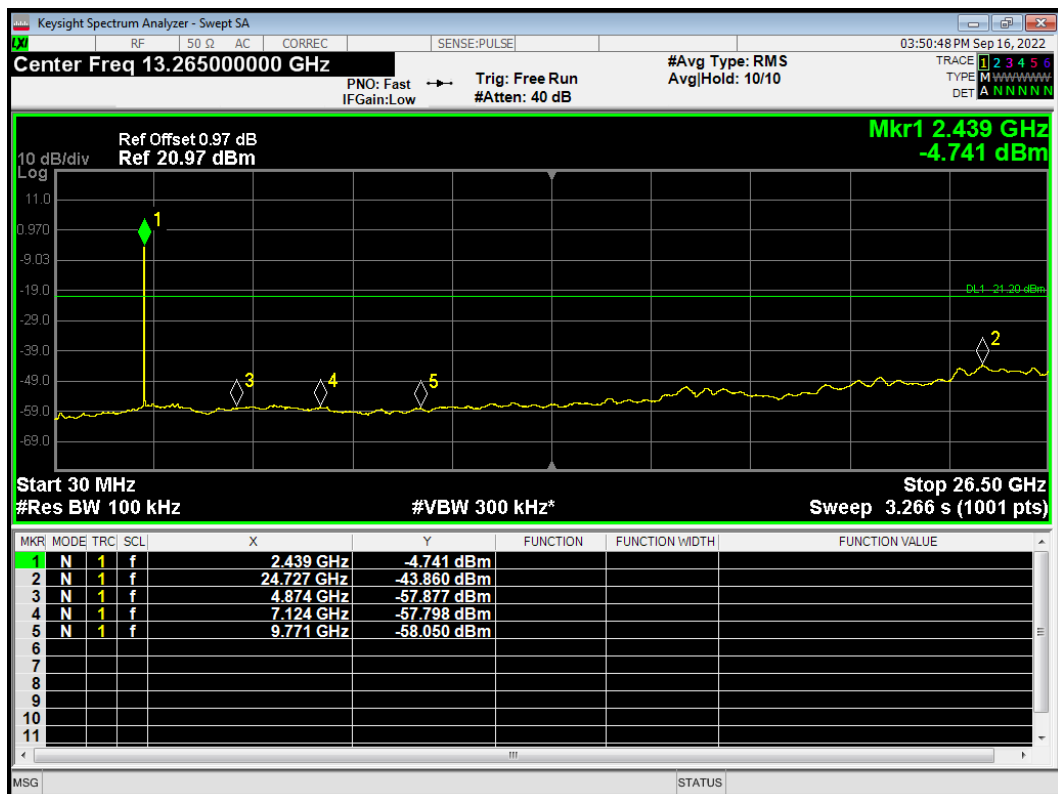




Tx. Spurious 802.11b 2437MHz Ref

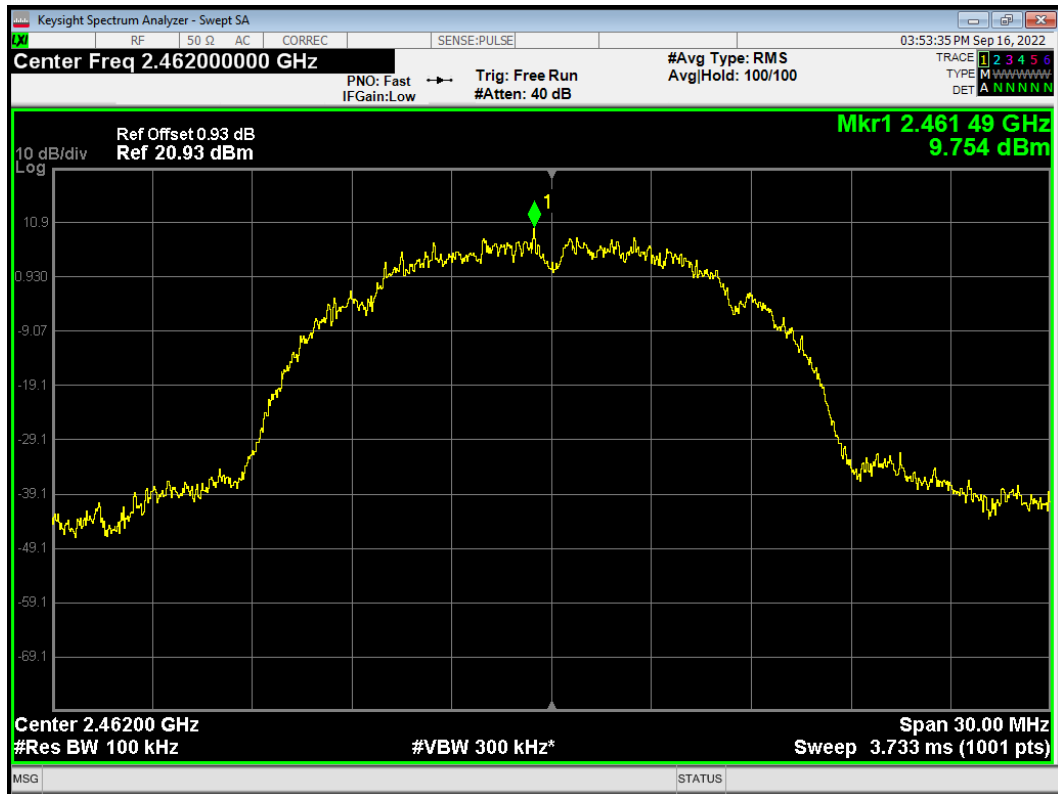


Tx. Spurious 802.11b 2437MHz Emission

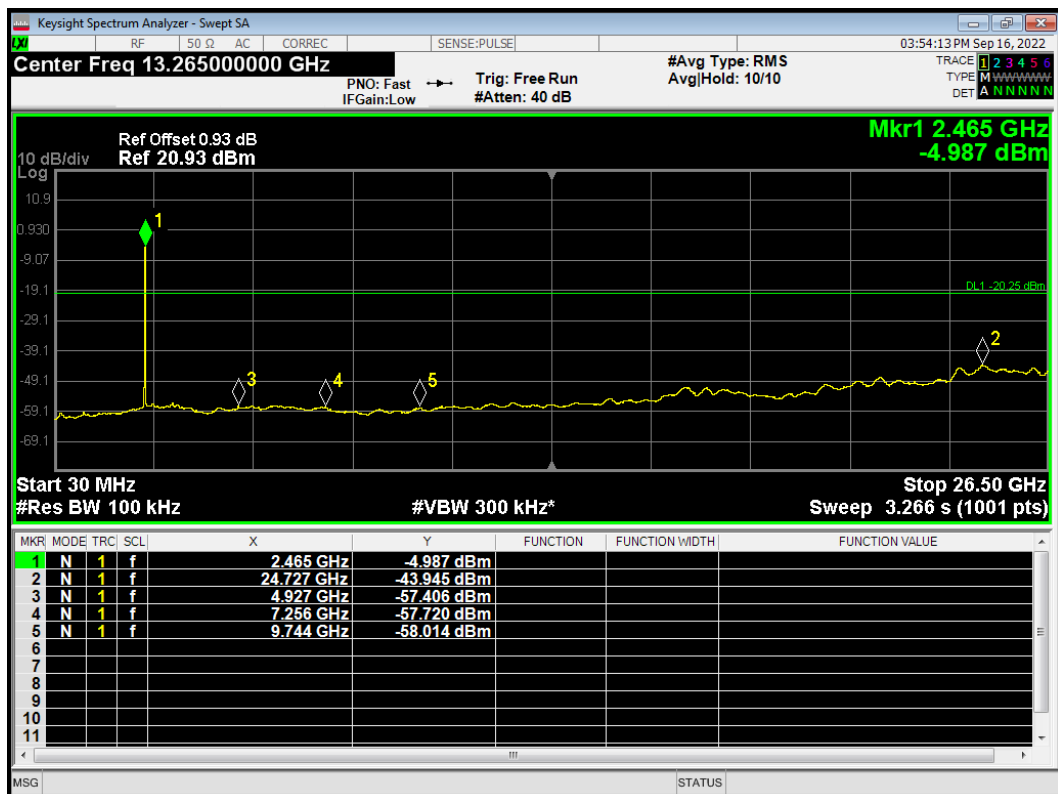




Tx. Spurious 802.11b 2462MHz Ref

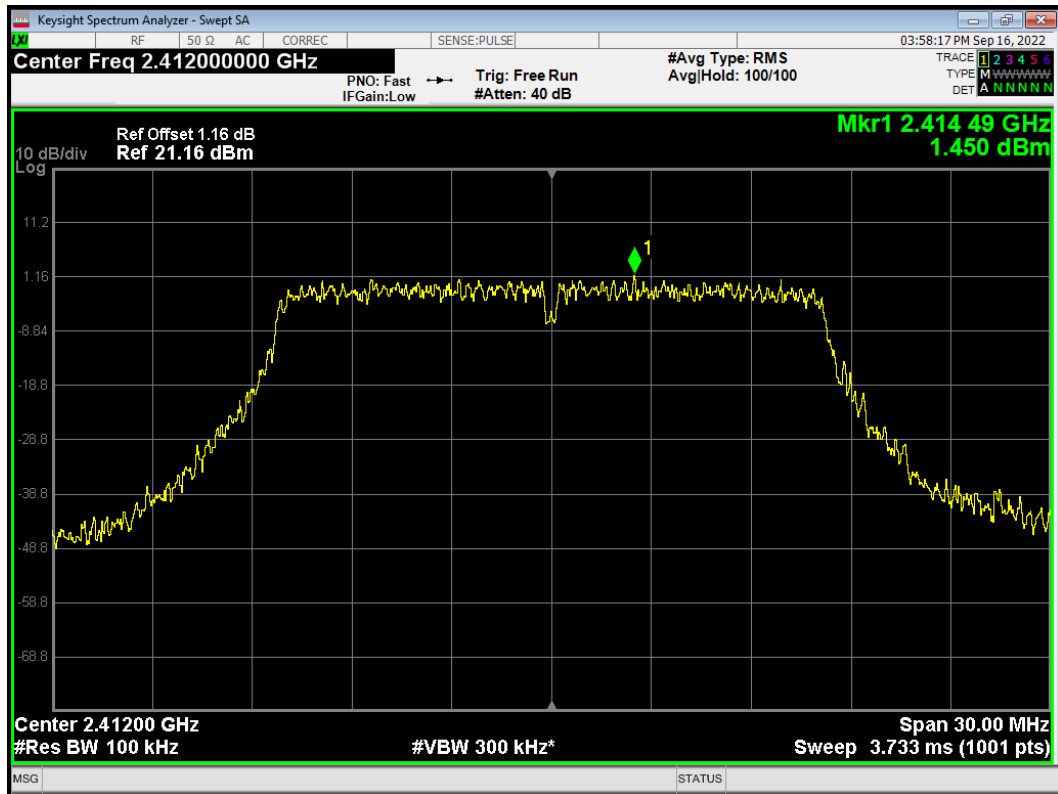


Tx. Spurious 802.11b 2462MHz Emission

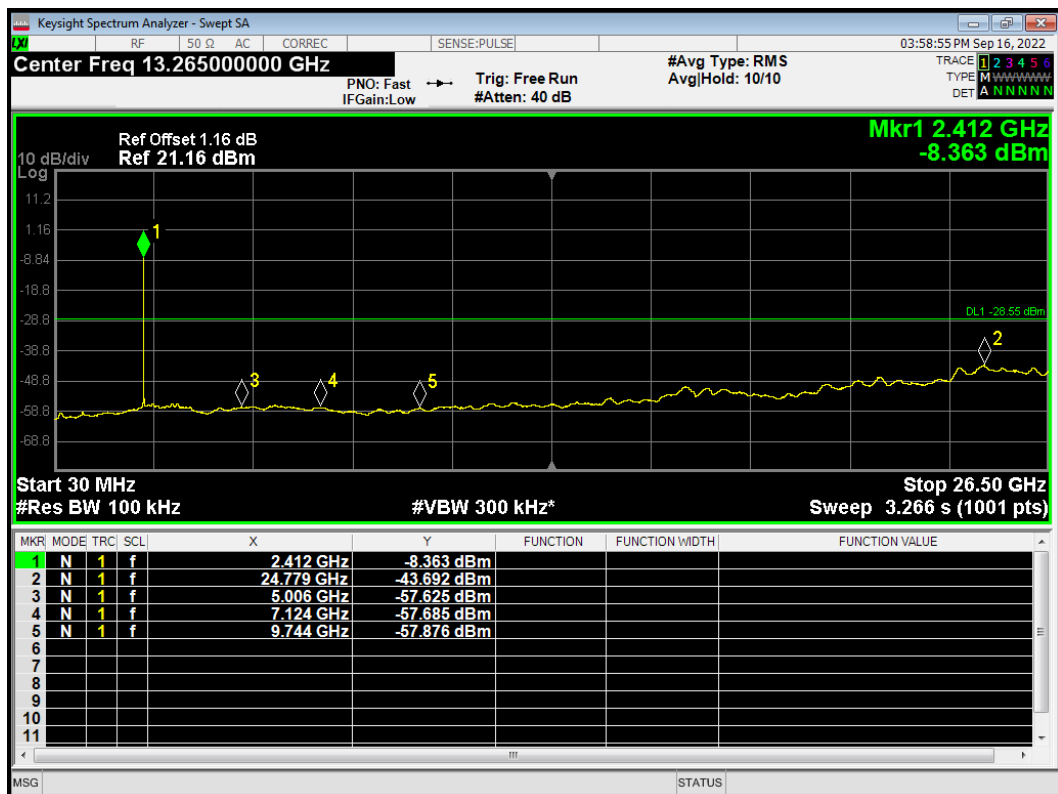




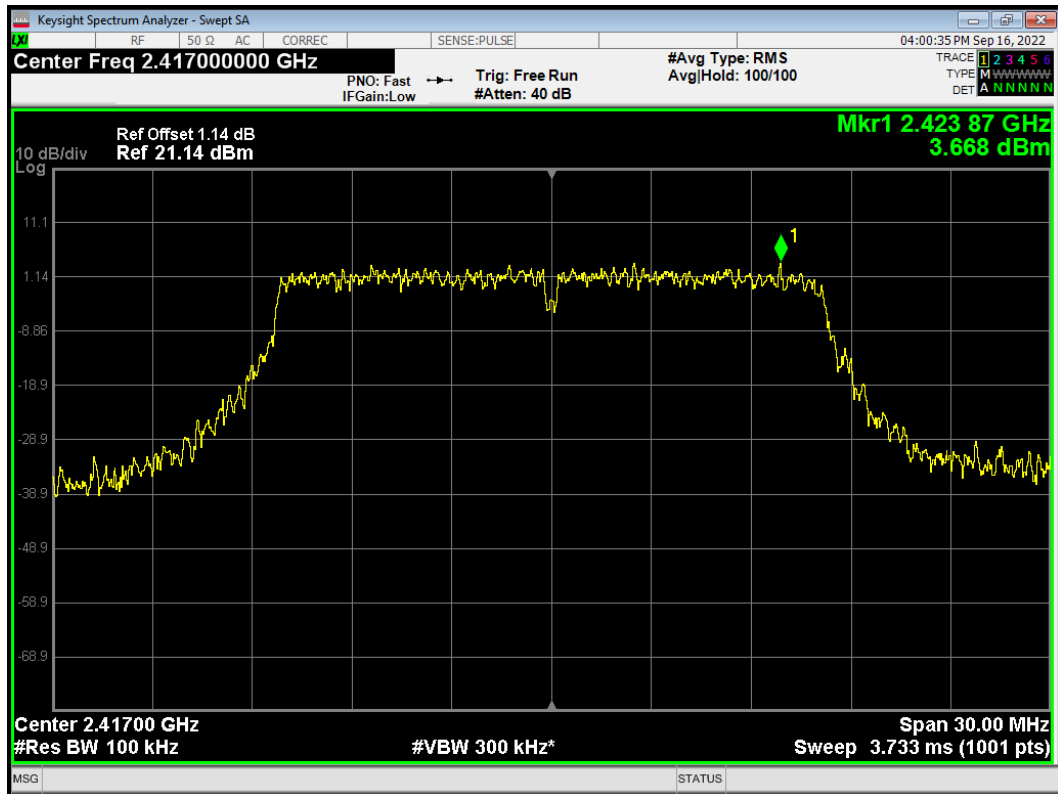
Tx. Spurious 802.11g 2412MHz Ref



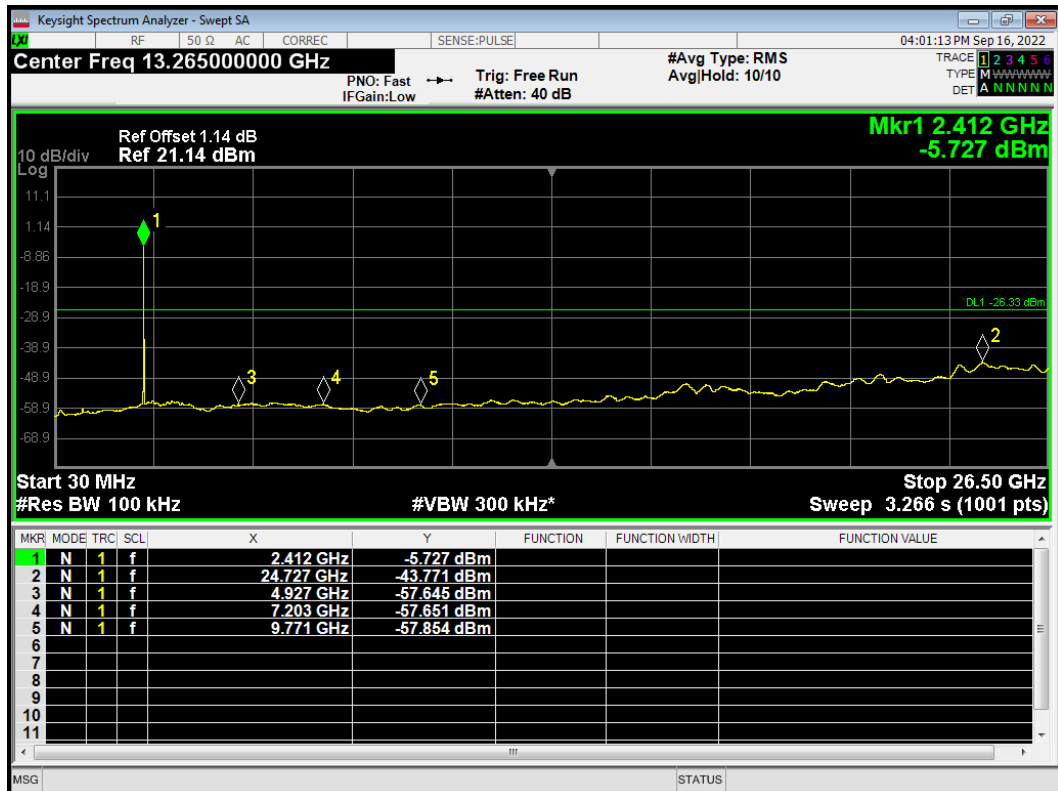
Tx. Spurious 802.11g 2412MHz Emission



Tx. Spurious 802.11g 2417MHz Ref

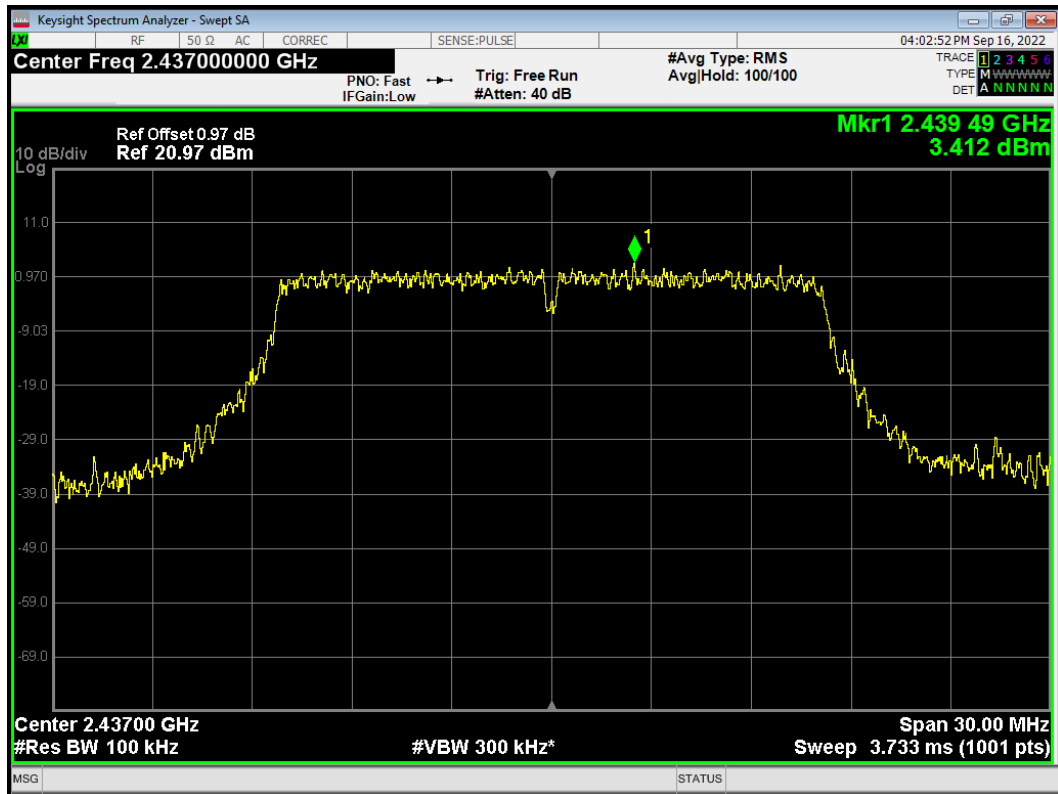


Tx. Spurious 802.11g 2417MHz Emission

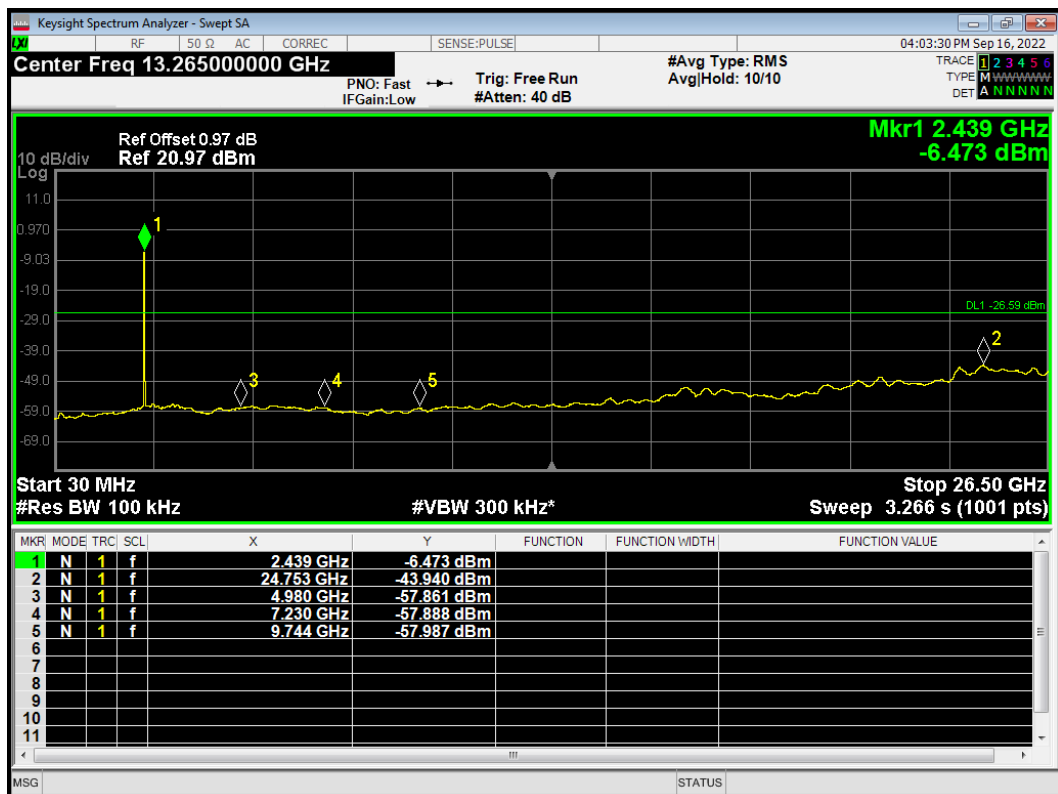




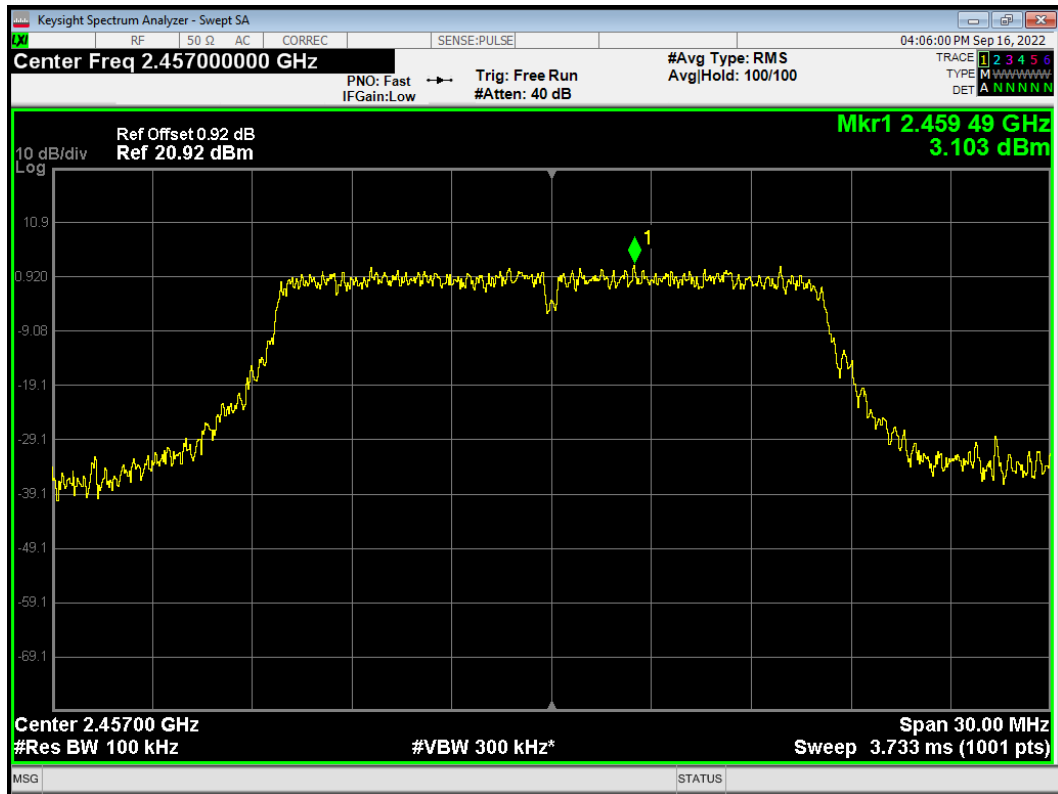
Tx. Spurious 802.11g 2437MHz Ref



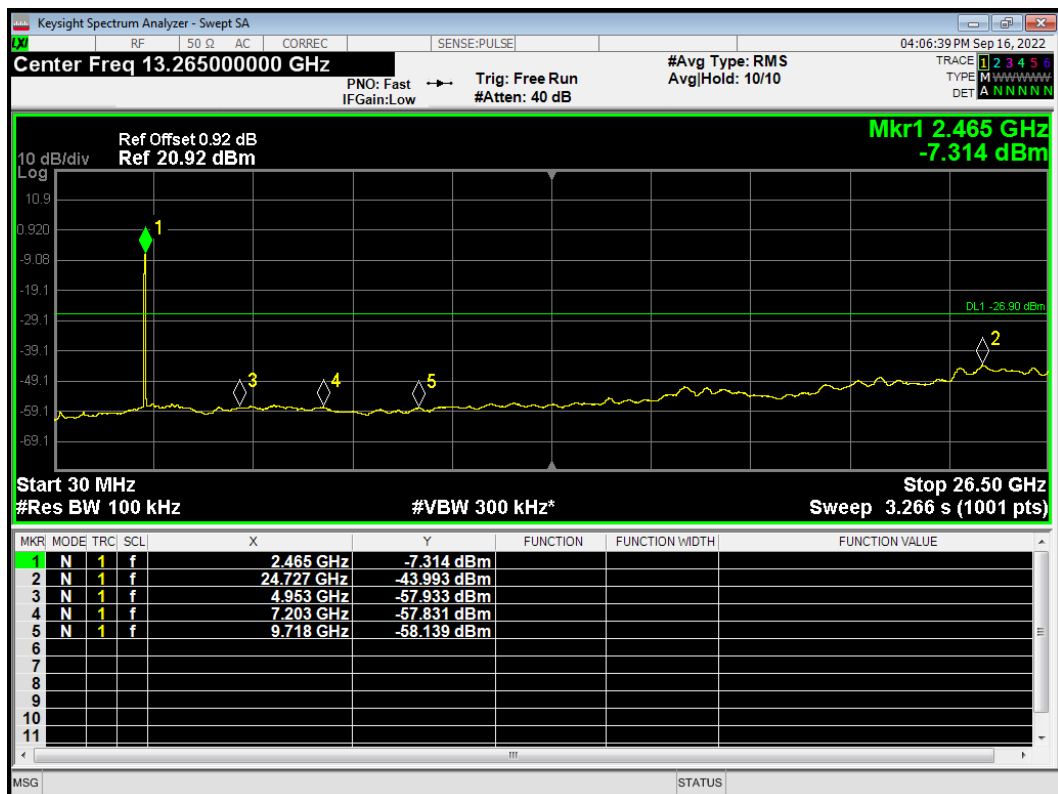
Tx. Spurious 802.11g 2437MHz Emission



Tx. Spurious 802.11g 2457MHz Ref

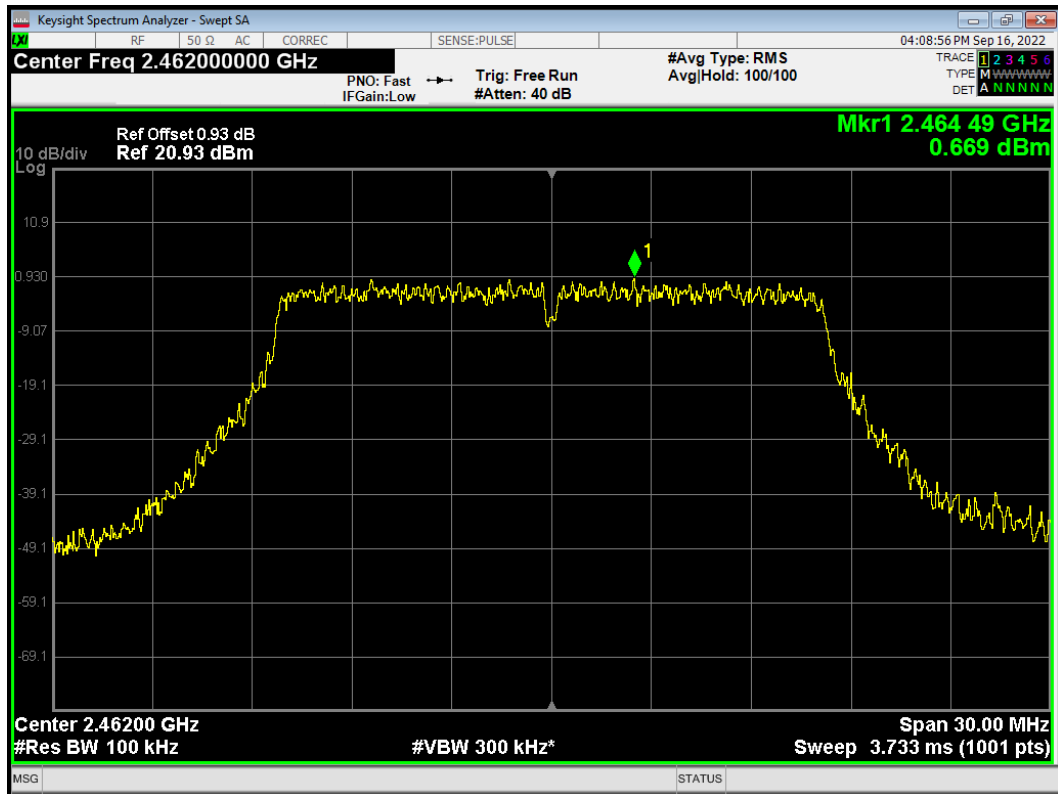


Tx. Spurious 802.11g 2457MHz Emission

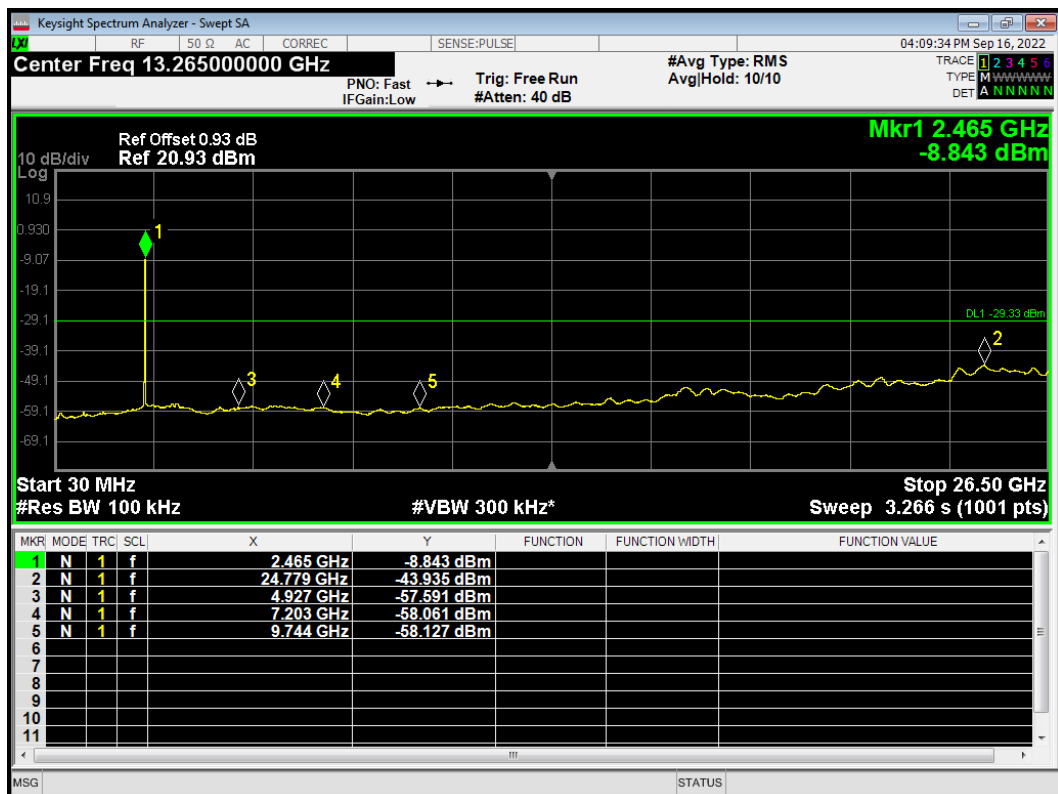




Tx. Spurious 802.11g 2462MHz Ref

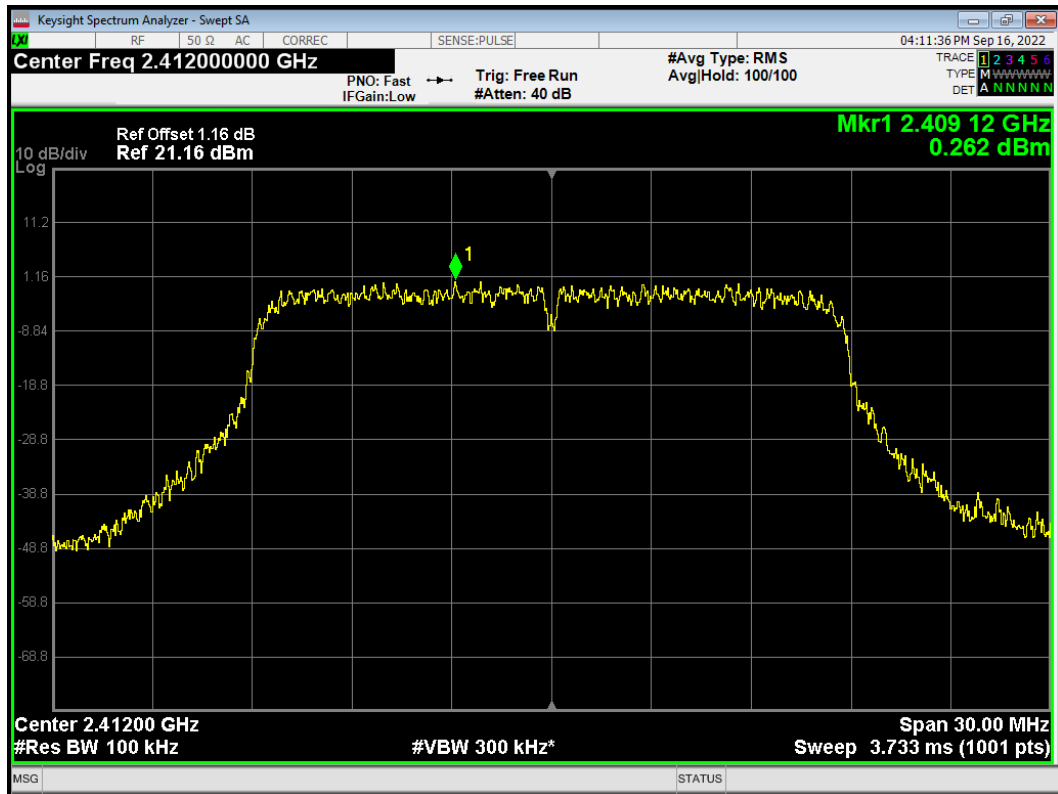


Tx. Spurious 802.11g 2462MHz Emission

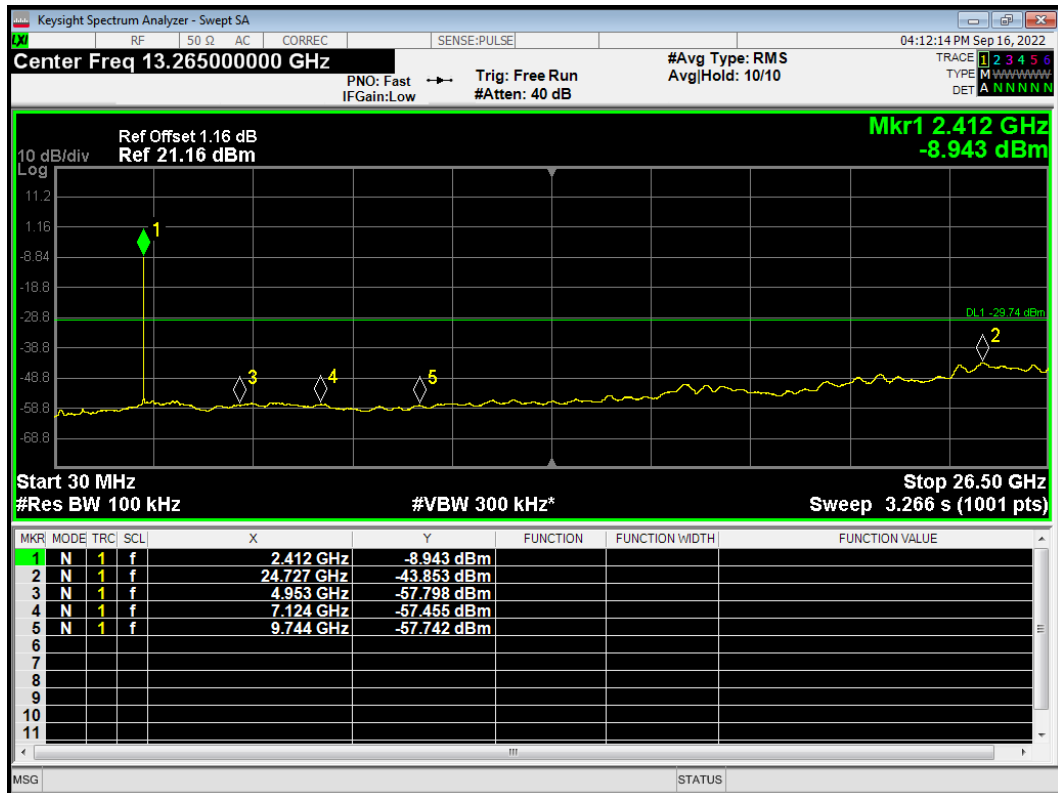




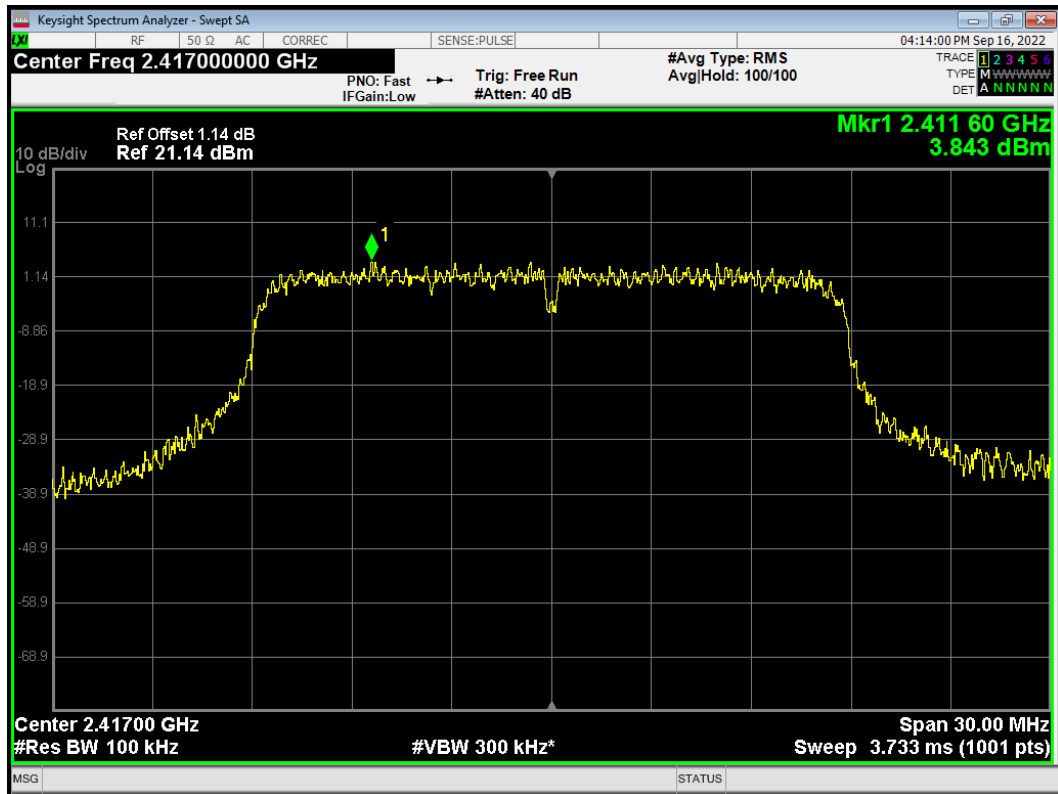
Tx. Spurious 802.11n(HT20) 2412MHz Ref



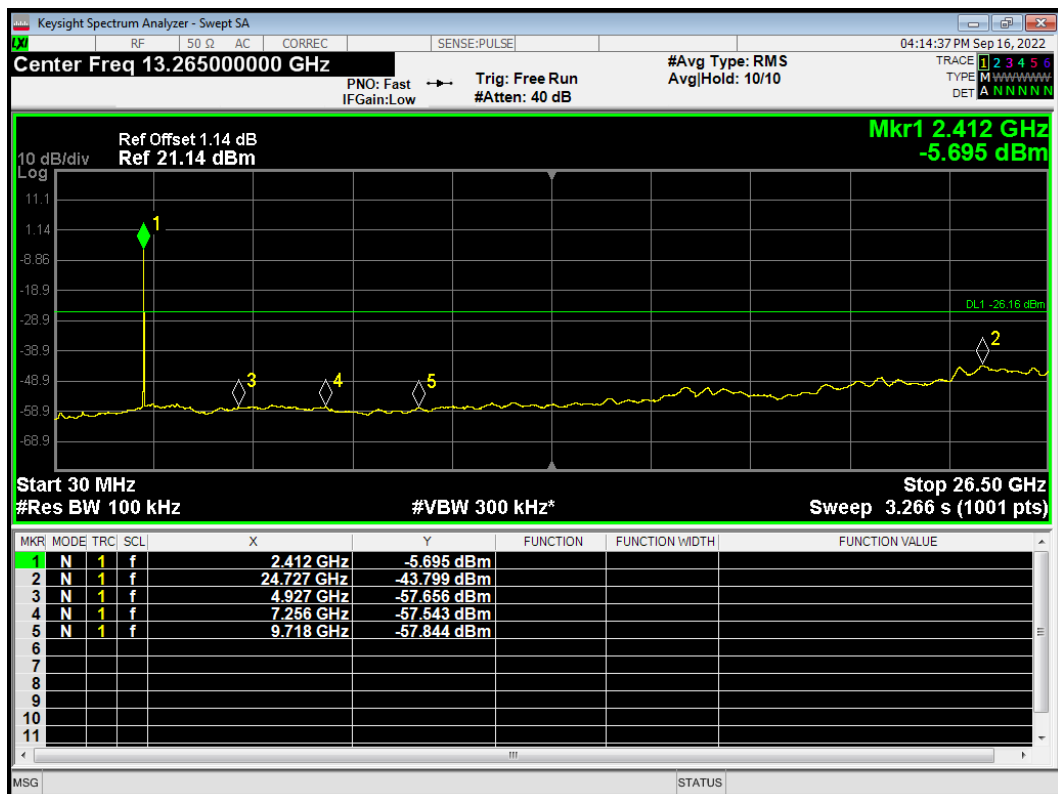
Tx. Spurious 802.11n(HT20) 2412MHz Emission



Tx. Spurious 802.11n(HT20) 2417MHz Ref

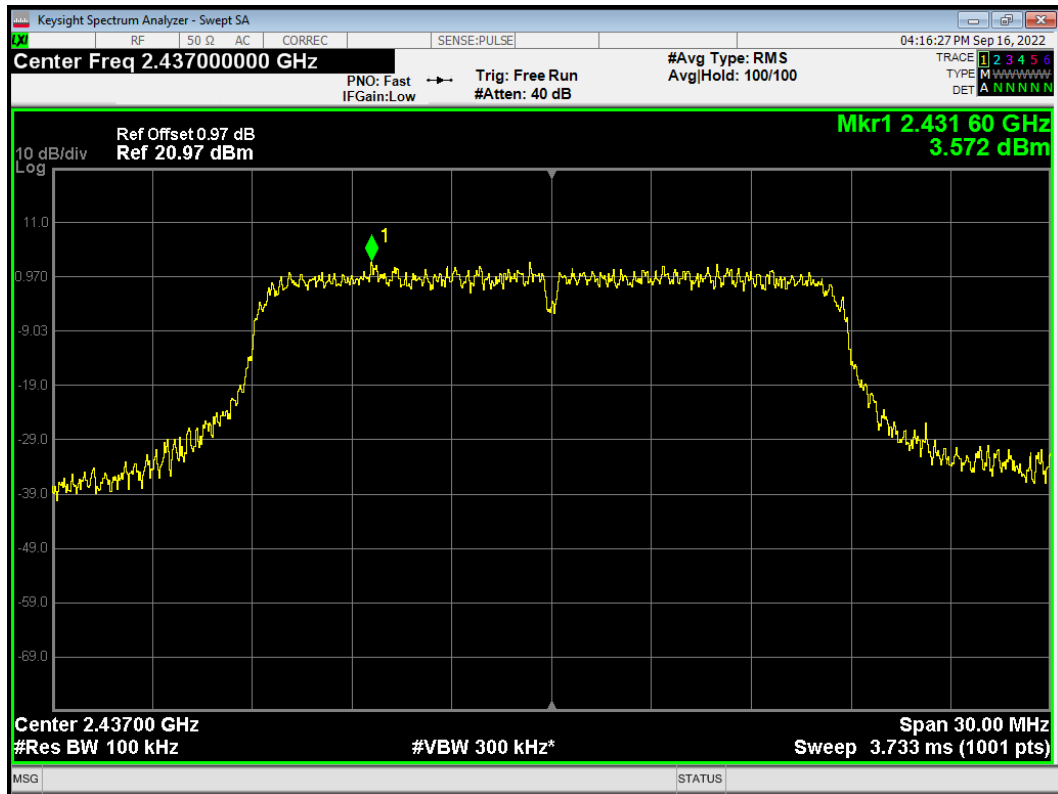


Tx. Spurious 802.11n(HT20) 2417MHz Emission

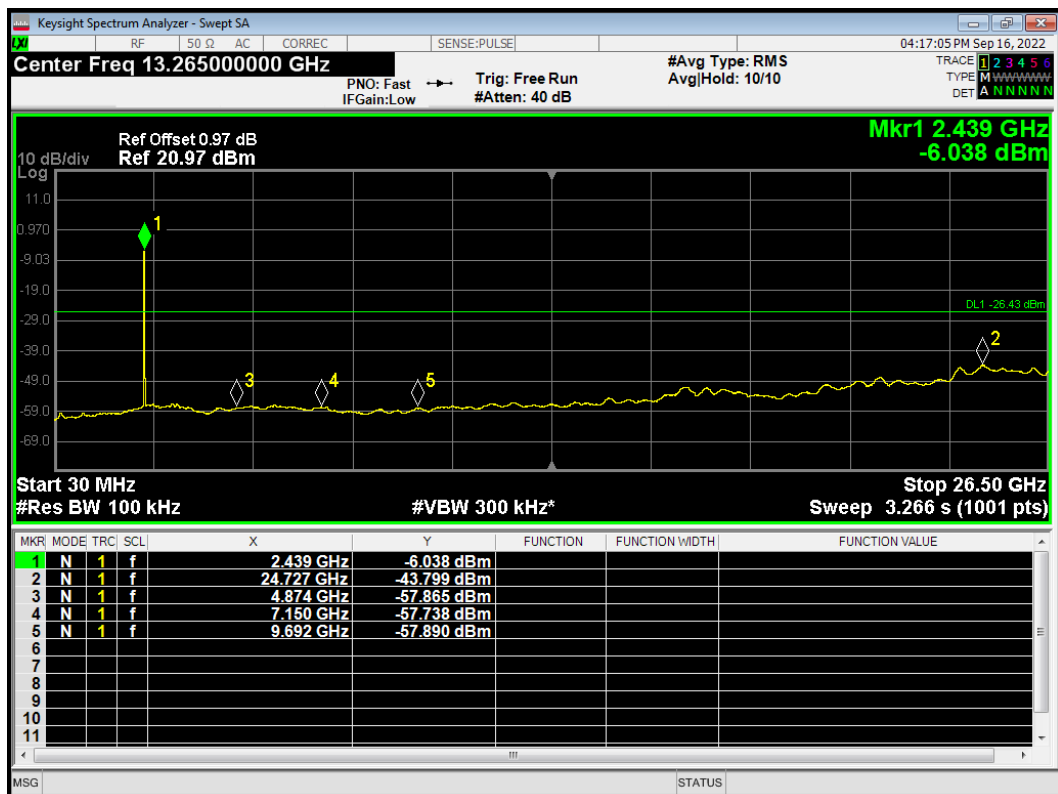




Tx. Spurious 802.11n(HT20) 2437MHz Ref

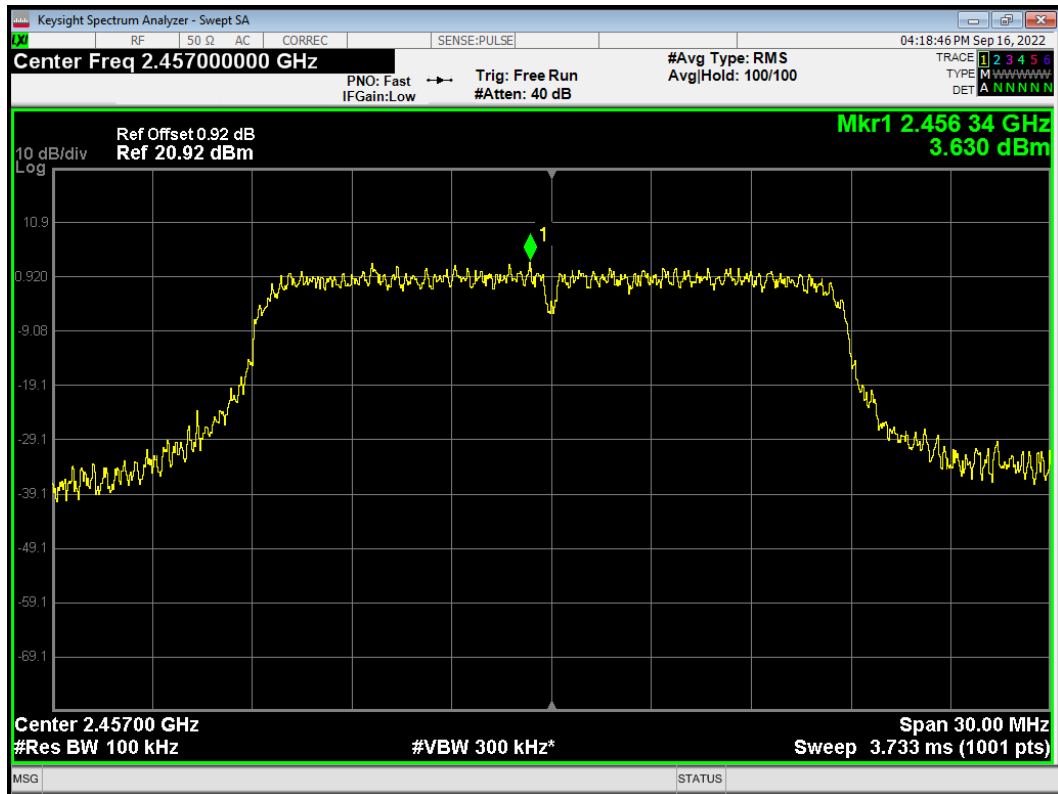


Tx. Spurious 802.11n(HT20) 2437MHz Emission

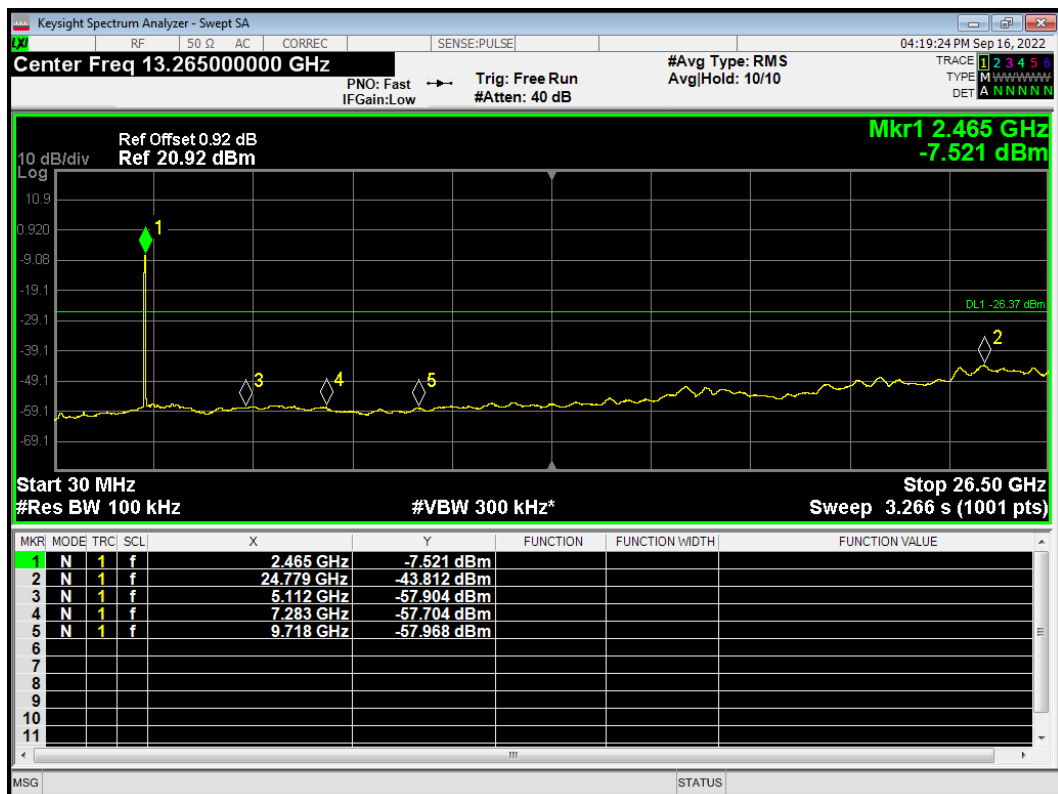




Tx. Spurious 802.11n(HT20) 2457MHz Ref

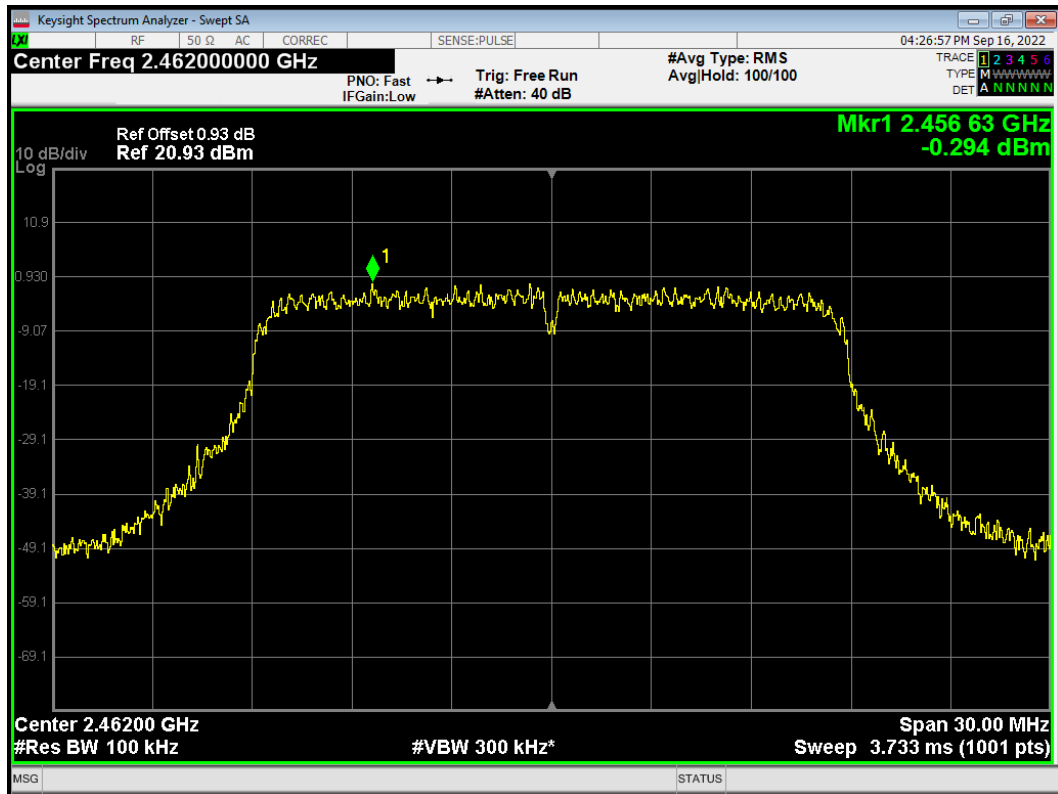


Tx. Spurious 802.11n(HT20) 2457MHz Emission

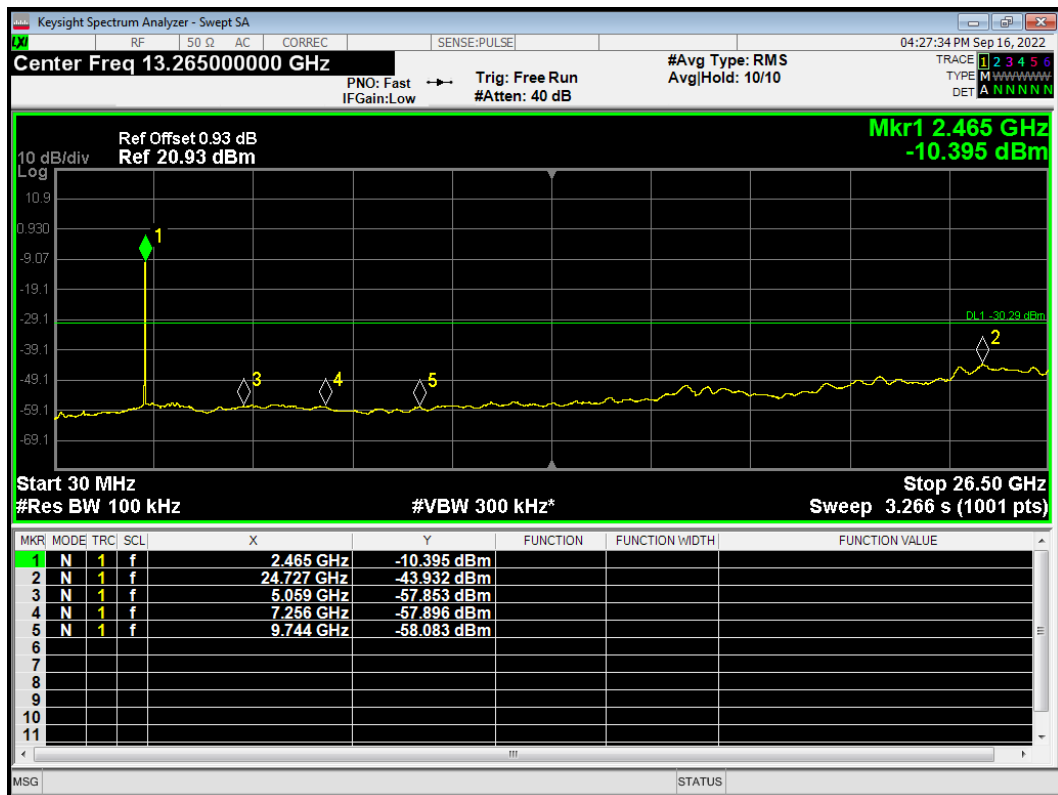




Tx. Spurious 802.11n(HT20) 2462MHz Ref

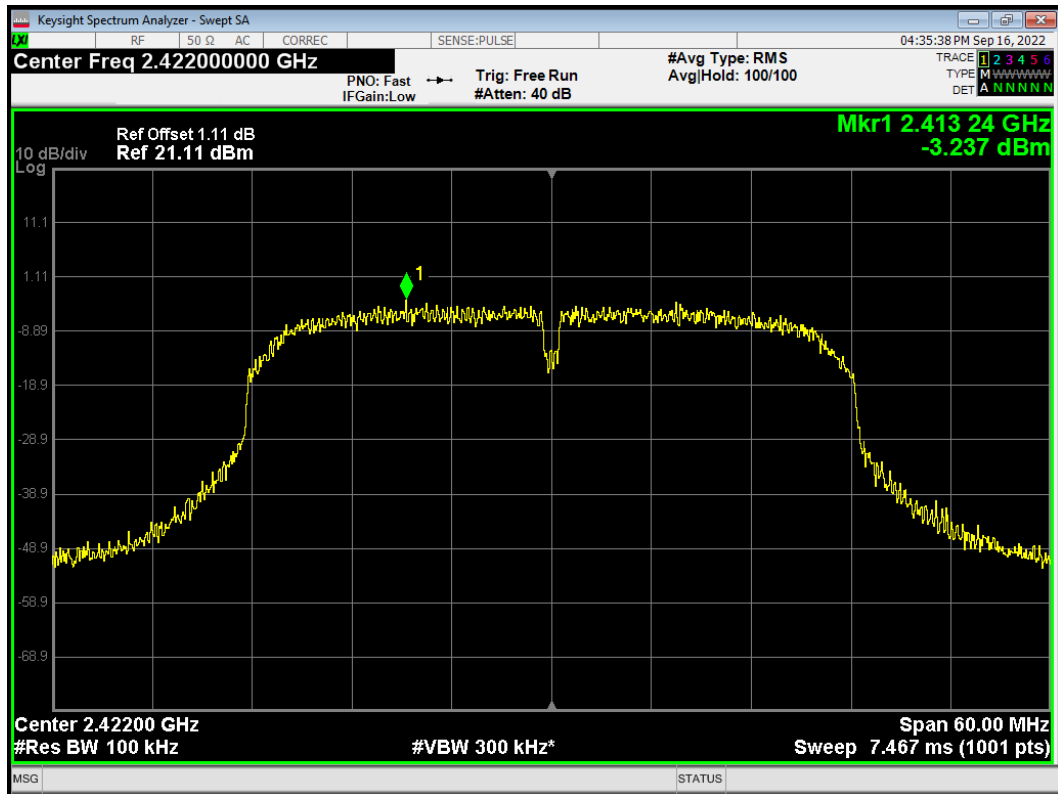


Tx. Spurious 802.11n(HT20) 2462MHz Emission

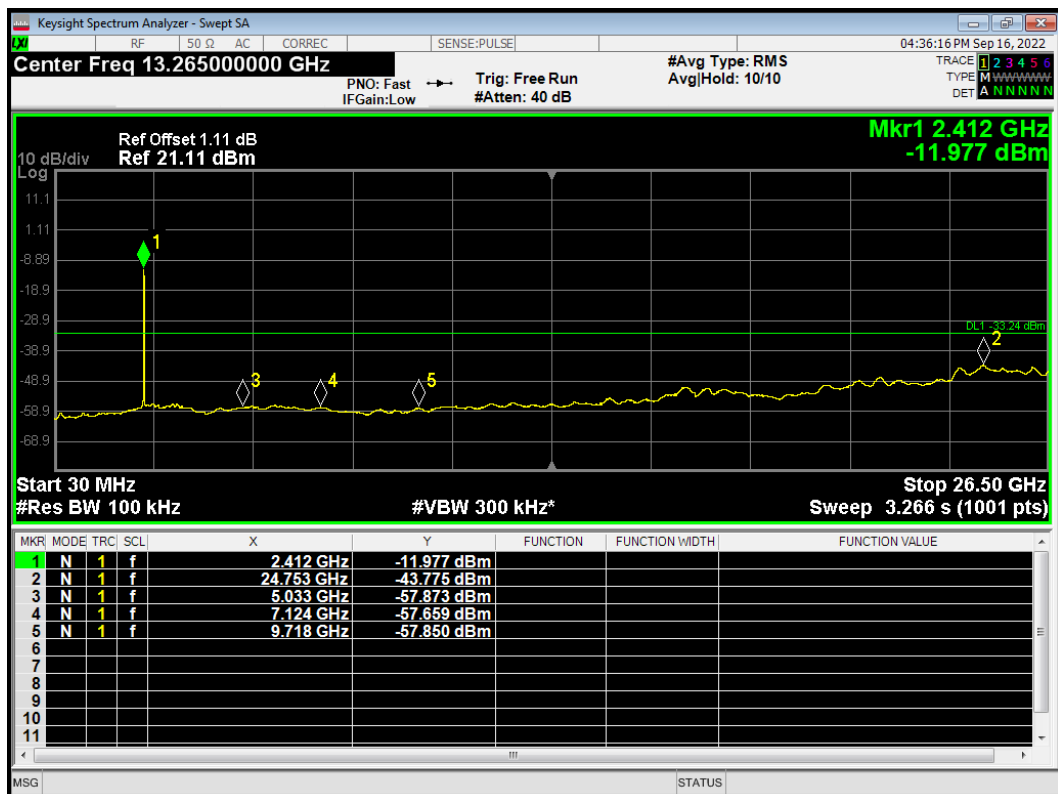




Tx. Spurious 802.11n(HT40) 2422MHz Ref

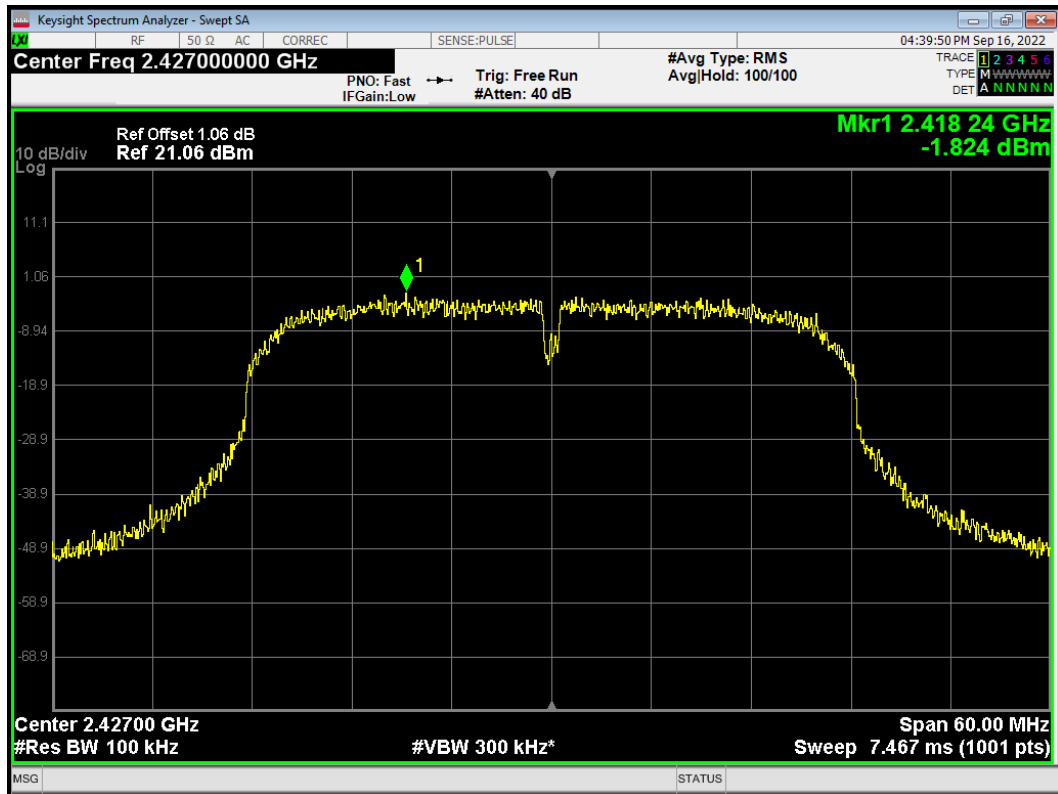


Tx. Spurious 802.11n(HT40) 2422MHz Emission

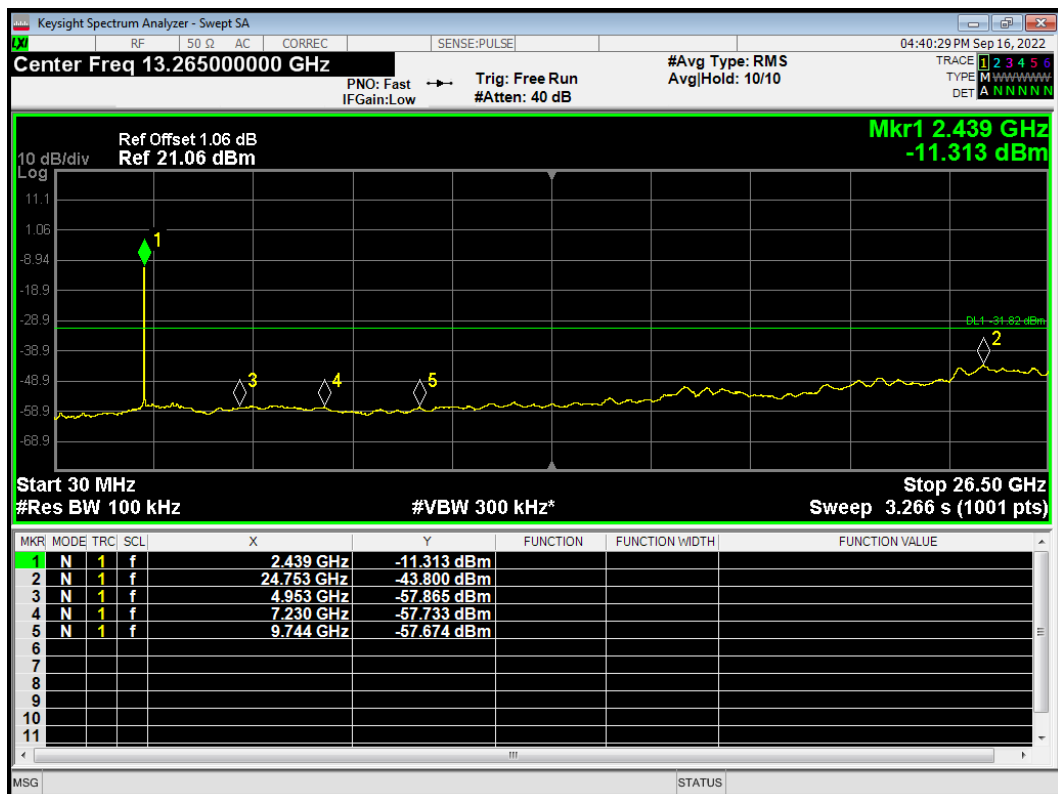




Tx. Spurious 802.11n(HT40) 2427MHz Ref

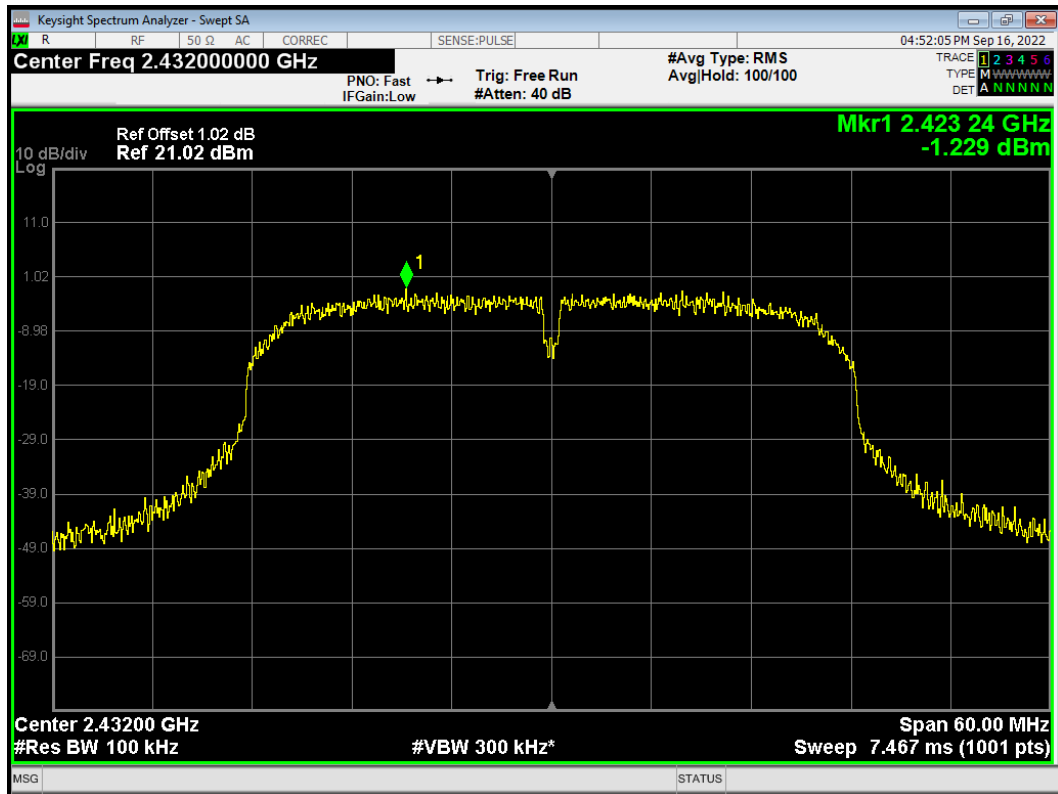


Tx. Spurious 802.11n(HT40) 2427MHz Emission

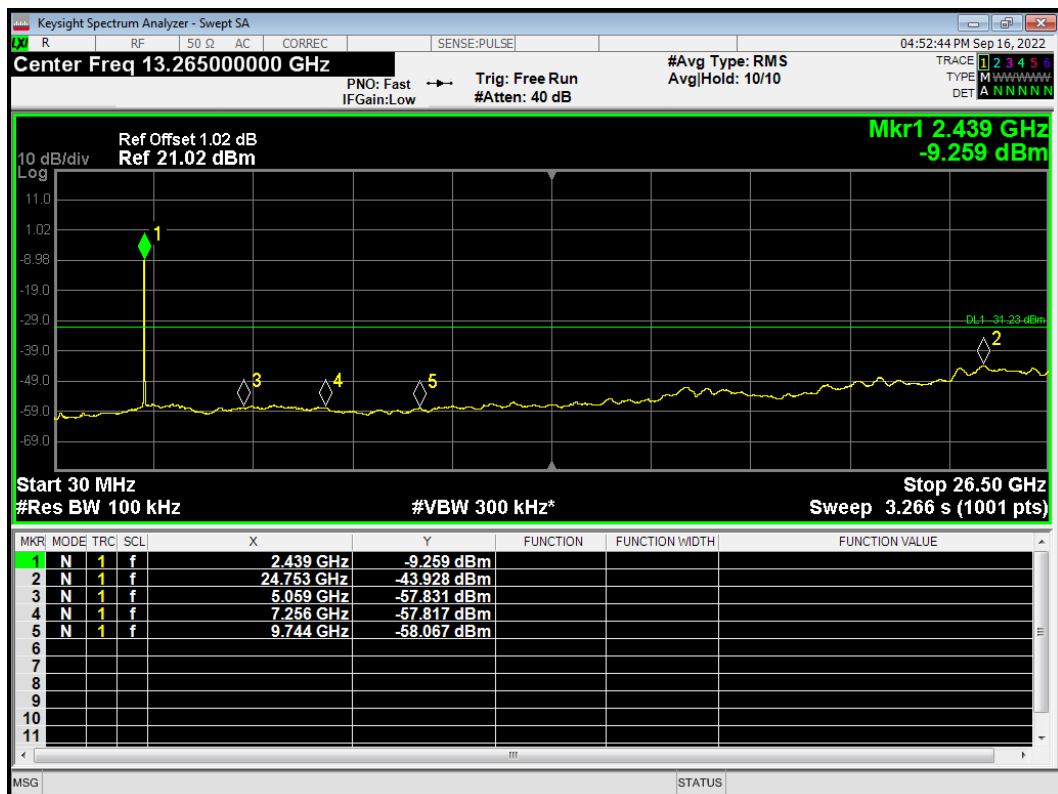




Tx. Spurious 802.11n(HT40) 2432MHz Ref

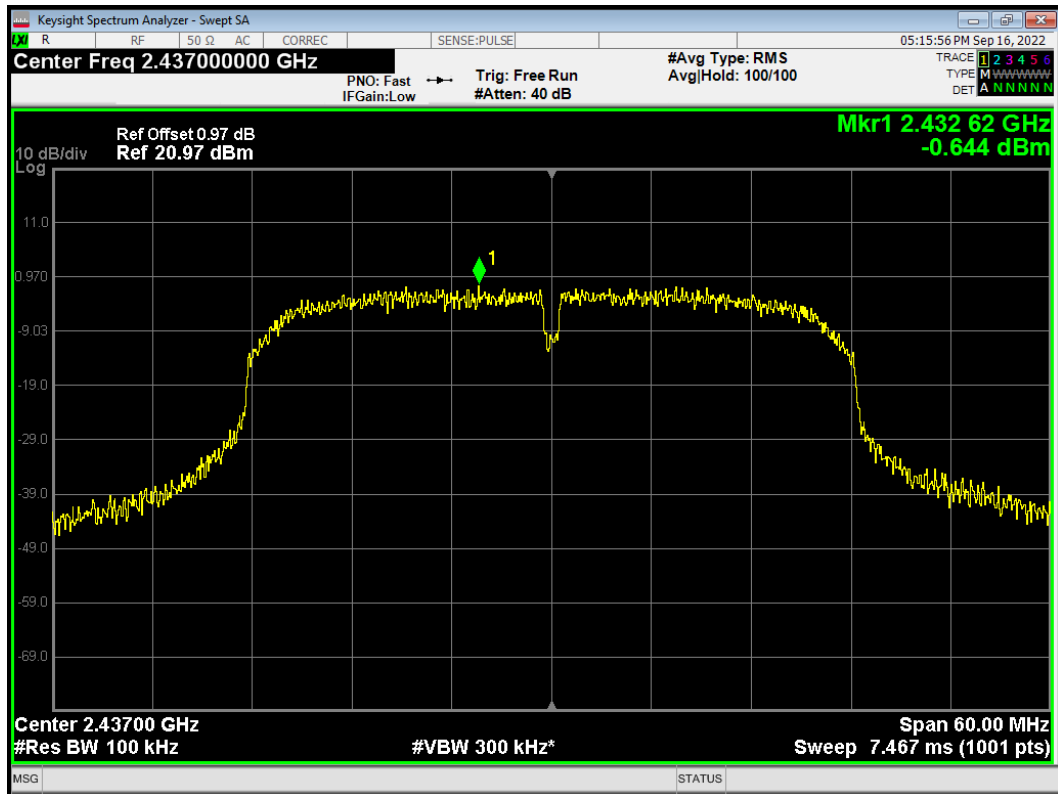


Tx. Spurious 802.11n(HT40) 2432MHz Emission

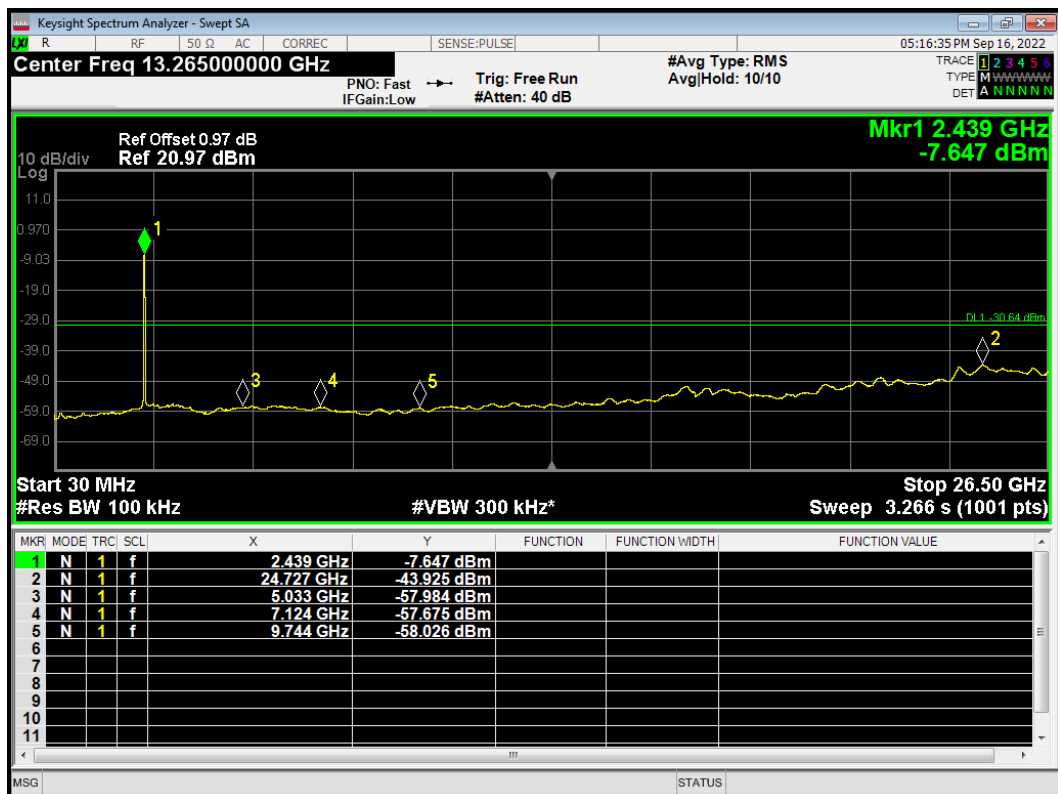




Tx. Spurious 802.11n(HT40) 2437MHz Ref

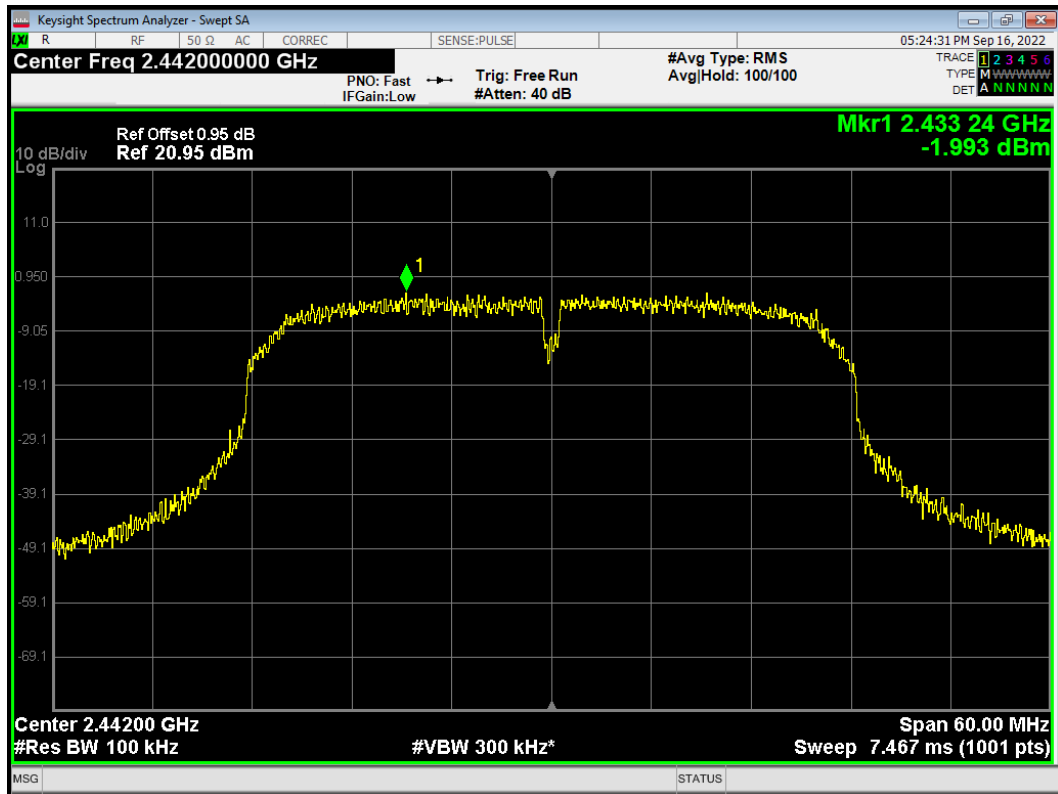


Tx. Spurious 802.11n(HT40) 2437MHz Emission

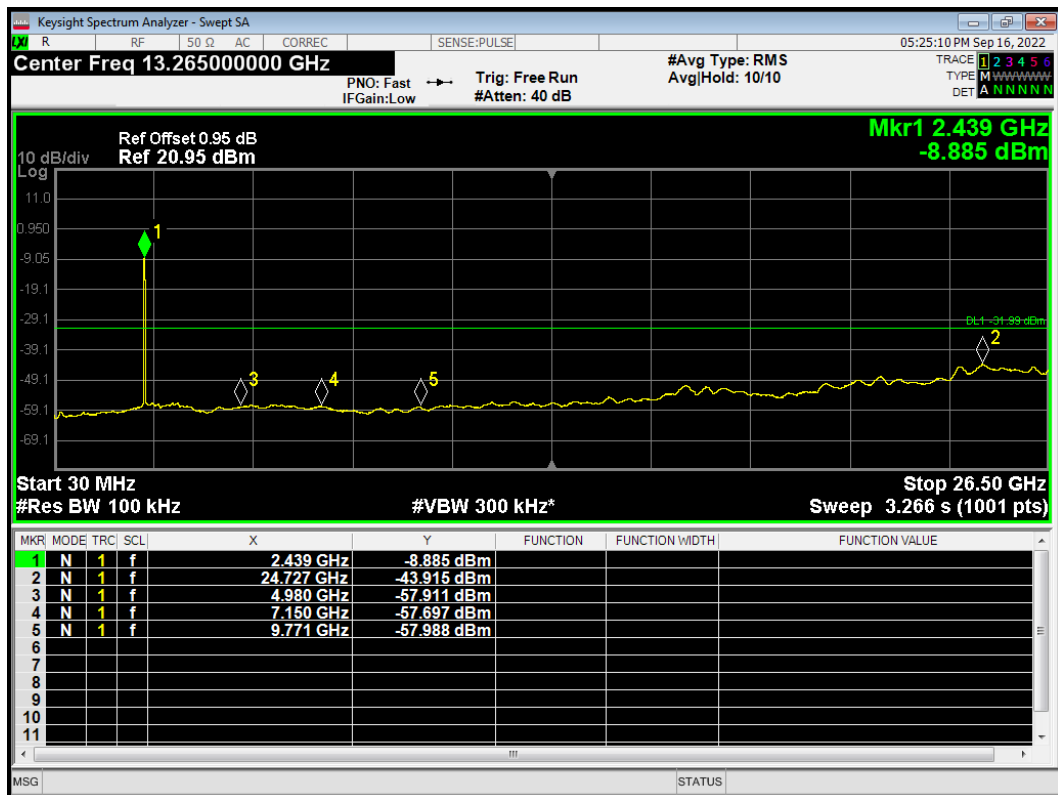




Tx. Spurious 802.11n(HT40) 2442MHz Ref

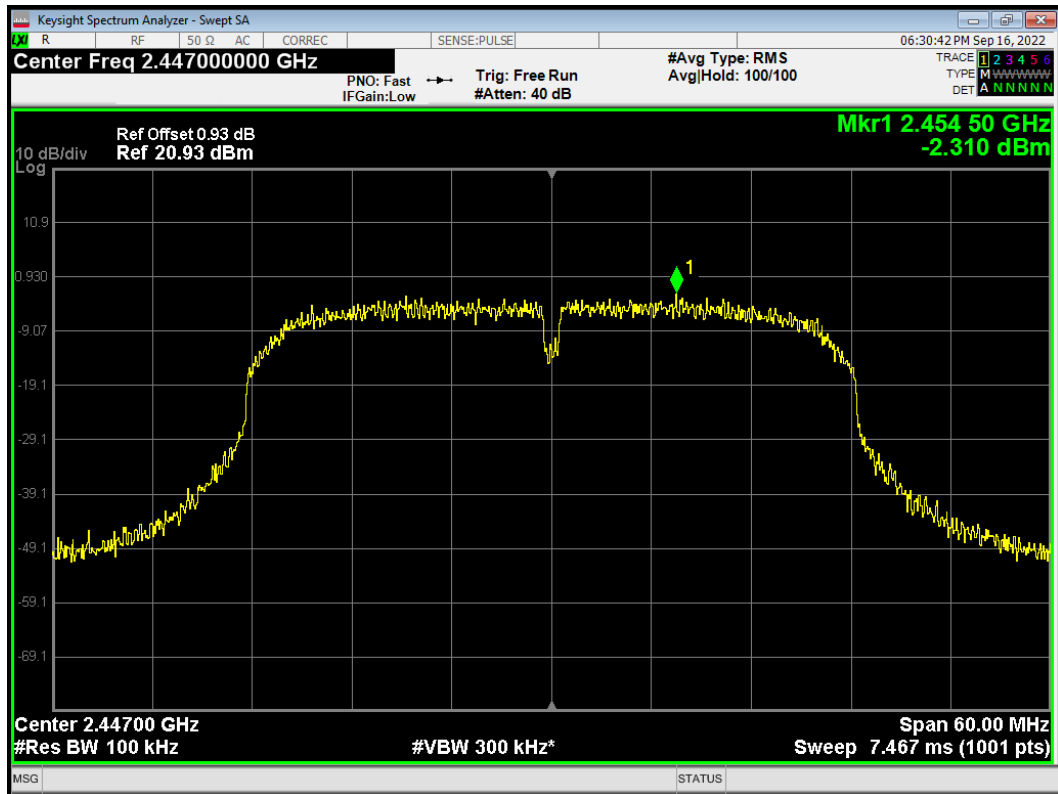


Tx. Spurious 802.11n(HT40) 2442MHz Emission





Tx. Spurious 802.11n(HT40) 2447MHz Ref



Tx. Spurious 802.11n(HT40) 2447MHz Emission

