RF TEST REPORT

Applicant	Espressif Systems (Shanghai)Co.,Ltd.
FCC ID	2AC7Z-ESPC3MINII
Product	Wi-Fi & Bluetooth Internet of Things Module
Brand	ESPRESSIF
Model	ESP32-C3-MINI-1U
Report No.	EFTA26030197-IE-02-R1V5
Issue Date	June 11, 2026

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2025)**. 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*

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Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	April 22, 2026
Rev.1	Updated data.	May 8, 2026
Rev.2	Updated information.	May 18, 2026
Rev.3	Updated information.	June 8, 2026
Rev.4	Updated information.	June 9, 2026
Rev.5	Updated information.	June 11, 2026
Note: This revised report (Report No.: EFTA26030197-IE-02-R1V5) supersedes and replaces the previously issued report (Report No.: EFTA26030197-IE-02-R1V4). Please discard or destroy the previously issued report and dispose of it accordingly.		

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	99% Bandwidth and 6dB Bandwidth	RSS-247-6.3.1/ RSS-Gen 6.7	PASS
2	Unwanted Emissions	RSS-Gen 6.13/8.9/8.10	PASS
Date of Testing: March 19, 2026 ~ April 3, 2026 and June 5, 2026 ~ June 11, 2026 Date of Sample Received: March 16, 2026			
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.			

ESP32-C3-MINI-1U (Report No.: EFTA26030197-IE-02-R1V5) is a variant model of ESP32-C3-MINI-1U (Report No.: R2107A0598-R1).
This report only adds two antennas(Antenna model NO.: 160180-02031 and 3A-CDZXX-019). Considering to the difference, after technical assessment, this report only tested Unwanted Emissions (Wi-Fi 2.4G 802.11n HT40 and Bluetooth LE) and Conducted Emission based on the worst case of the original report and the data passed, and they do not deteriorate, so they are not recorded in this report. Other test items refer to the original report

This report is also used for standard upgrade.
According to customer requirements the detailed standard upgrade please refers to following table:

Old Standard(s)	New Standard(s)
ANSI C63.10 (2013)	ANSI C63.10-2020+Cor.1-2023

After technical evaluation, test 6dB Bandwidth for Wi-Fi 2.4G(Conducted) and recorded in the report.
Other test data please refer to the original report (Report No.: R2107A0598-R1).

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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
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2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

Applicant	Espressif Systems (Shanghai) Co.,Ltd.
Applicant address	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China
Manufacturer	Espressif Systems (Shanghai) Co.,Ltd.
Manufacturer address	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

2.2. General Information

EUT Description		
Model	ESP32-C3-MINI-1U	
Lab internal SN	260206-19-002	
Hardware Version	V1.2	
Software Version	V1.1.3.0	
Power Supply	External power supply	
Antenna Type	External Antenna	
Antenna Connector	IPEX (meet with the standard FCC Part 15.203 requirement)	
Antenna Gain	Antenna model NO.	Max Gain
	160180-02031	4.12 dBi
	3A-CDZXX-019	4.90 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	
Operating voltage range	3.0 Vdc to 3.6 Vdc	
State voltage	3.3 Vdc	
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.		

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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 (2025) Radio Frequency Devices

ANSI C63.10-2020+Cor.1-2023

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02

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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.

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 EspRFTestTool.

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

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5. Test Case

5.1. 99% Bandwidth and 6dB Bandwidth

Ambient Condition

Temperature	Relative humidity
25°C	57%

Method of Measurement

99% Occupied Bandwidth

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 bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

6dB Bandwidth

The EUT was connected to the spectrum analyzer through a known loss cable.

1.The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.

2.VBW ≥ 3 × RBW.

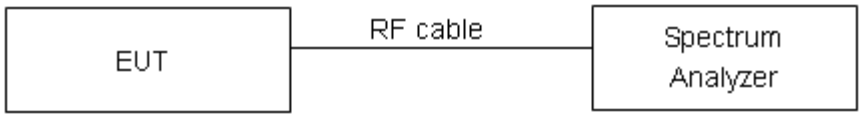
3.Detector= is Peak.

4.Trace mode= Max hold.

5. Sweep = Auto couple.

6. Allow the trace to stabilize.

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

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

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5.2. Unwanted Emission

Ambient Condition

Temperature	Relative humidity
25°C	57%

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10.
The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m/10m below 1GHz, 3m above 1GHz between the EUT and the receiving antenna.

The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna.The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. Sweep the Restricted Band and the emissions less than 20 dB below the permissible value are reported.
The radiated emissions measurements were made in a typical installation configuration.
Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

This method refer to ANSI C63.10.
The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:
Set the spectrum analyzer in the following:
9kHz~150 kHz
RBW=200Hz, VBW=1kHz/ Sweep=AUTO
150 kHz~30MHz
RBW=9kHz, VBW=30kHz,/ Sweep=AUTO
Below 1GHz
RBW=100kHz / VBW=300kHz / Sweep=AUTO
a) Peak emission levels are measured by setting the instrument as follows:
Above 1GHz
PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO
b) Average emission levels are measured by setting the instrument as follows:
Above 1GHz
AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO
c) Detector: The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage

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averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.
2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

The test is in transmitting mode.

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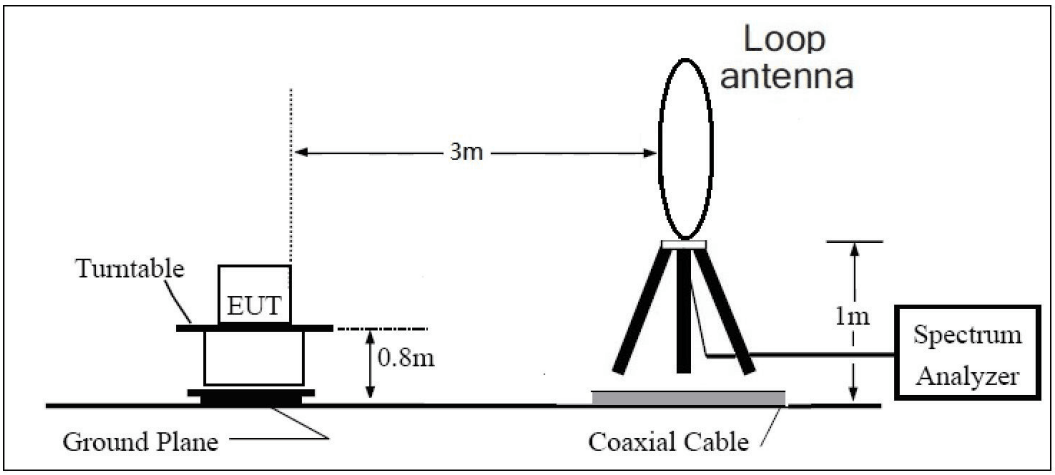
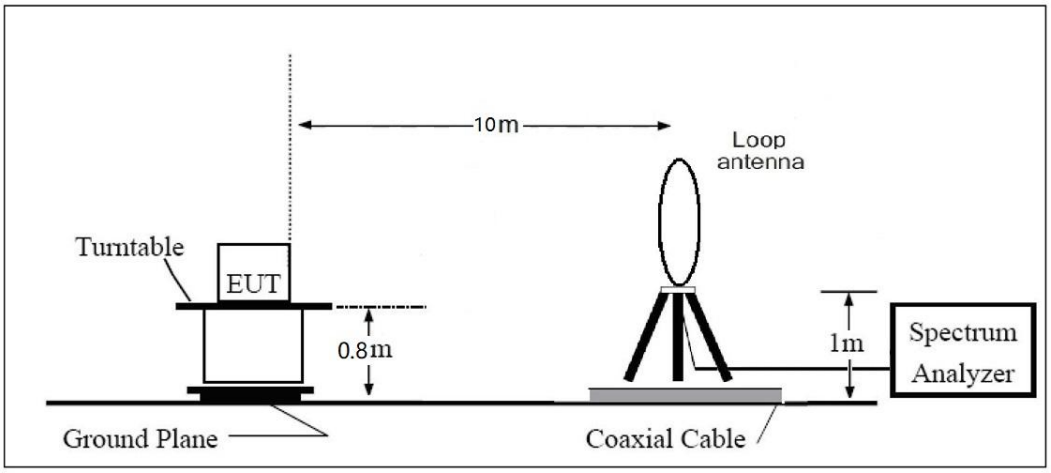
Test Setup

9kHz~ 30MHz



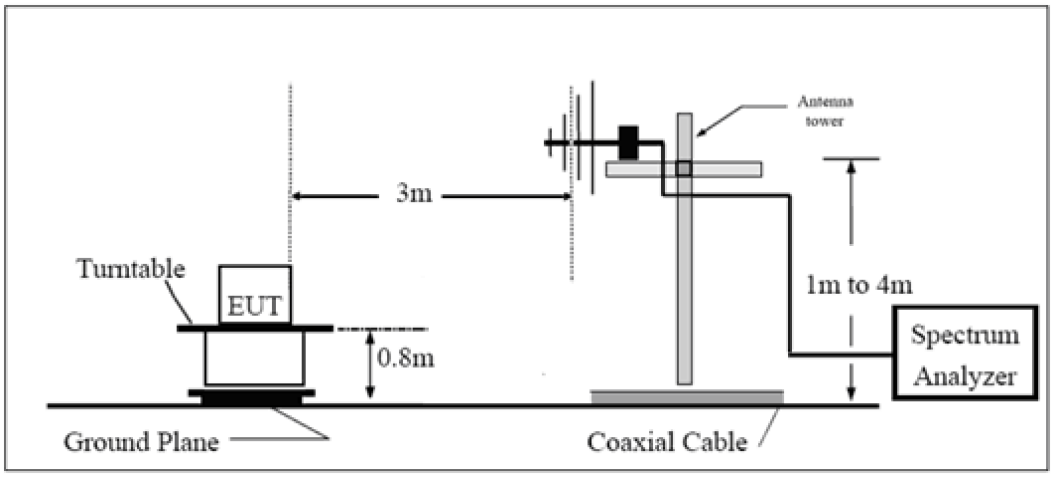
Note: Area side:2.4mX3.6m

Distance 10m



Note: Area side: 21m x 12m

30MHz~ 1GHz



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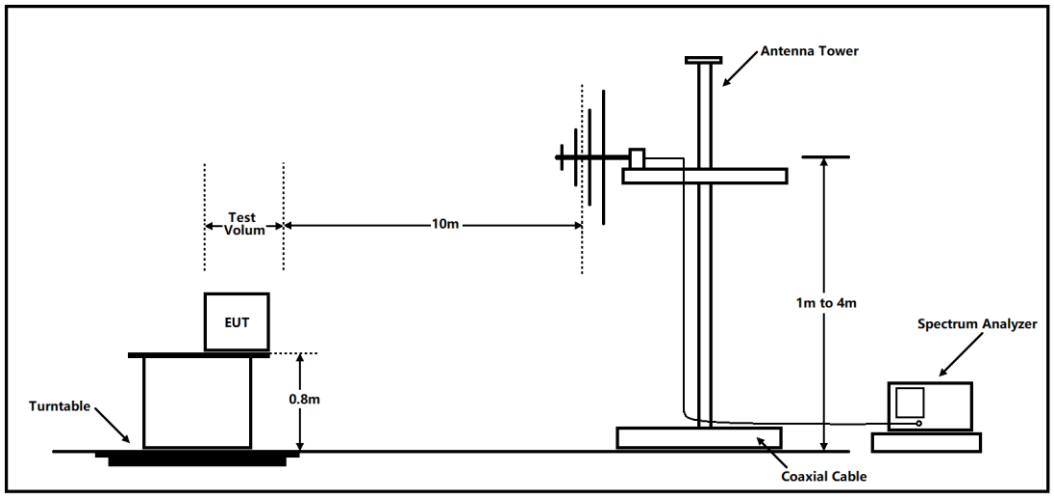
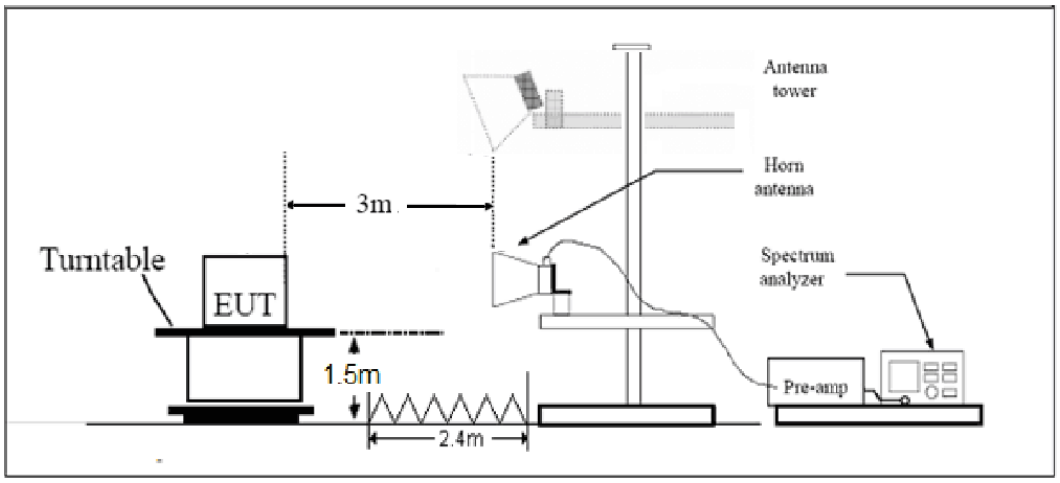
Note: Area side:2.4mX3.6m

Distance 10m



Note: Area side: 21m x 12m

Above 1GHz



Note: Area side:2.4mX3.6m

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Limits

Rule Part 15.247(d) specifies that “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)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength (μV/m)	Field strength (dBμV/m) @ 3 m	Field strength (dBμV/m) @ 10 m
0.009–0.490	2400/F(kHz)	/	/
0.490–1.705	24000/F(kHz)	/	/
1.705–30.0	30	/	/
30-88	100	40	30
88-216	150	43.5	33.5
216-960	200	46	36
960 -1000	500	54	44
Above 1000	500	54	--

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dBμV/m

Average Limit=54 dBμV/m

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Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

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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* = 1.96.

Frequency	Uncertainty for 3m
9kHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB
18-26.5GHz	5.90 dB
26.5GHz~40GHz	5.92 dB
Frequency	Uncertainty for 10m
30MHz – 200MHz	3.39 dB
200MHz – 1GHz	3.82 dB
1GHz – 18GHz	6.51 dB
18GHz – 40GHz	6.31 dB

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6. Test Results

6.1. 99% Bandwidth and 6dB Bandwidth

Test Mode	Carrier frequency (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	9.011	500	PASS
	2437	8.763	500	PASS
	2462	8.309	500	PASS
802.11g	2412	16.359	500	PASS
	2417	16.369	500	PASS
	2422	16.340	500	PASS
	2427	16.354	500	PASS
	2437	16.411	500	PASS
	2447	16.327	500	PASS
	2452	16.309	500	PASS
	2457	16.391	500	PASS
	2462	16.376	500	PASS
802.11n HT20	2412	17.299	500	PASS
	2417	17.210	500	PASS
	2422	17.418	500	PASS
	2437	17.253	500	PASS
	2447	17.269	500	PASS
	2452	17.268	500	PASS
	2457	17.058	500	PASS
	2462	17.205	500	PASS
802.11n HT40	2422	35.483	500	PASS
	2427	35.484	500	PASS
	2432	35.739	500	PASS
	2437	35.394	500	PASS

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	2442	35.432	500	PASS
	2447	35.570	500	PASS
	2452	35.404	500	PASS

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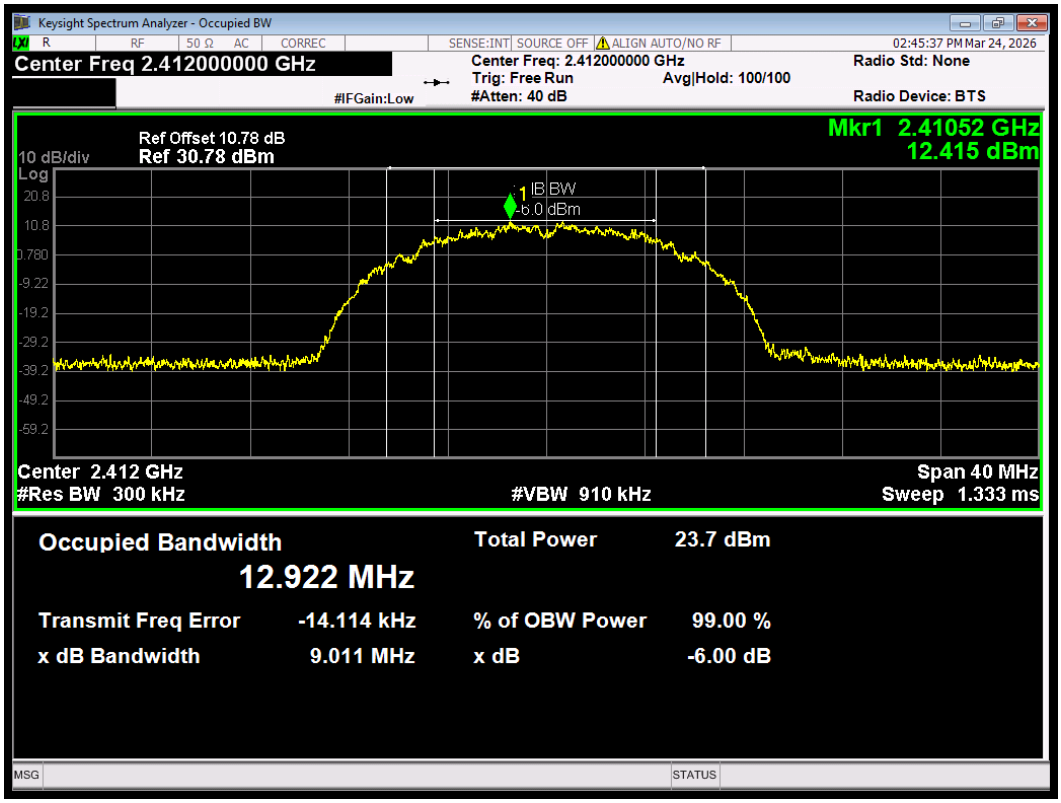
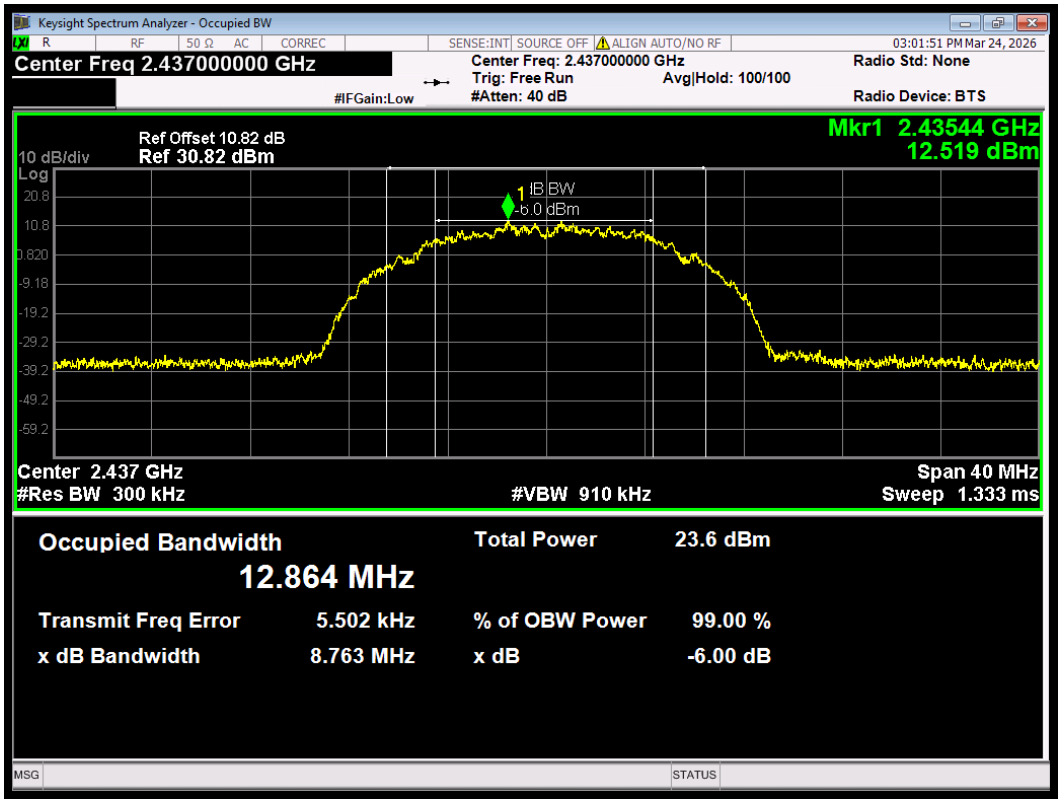
6 dB bandwidth

-6dB Bandwidth 802.11b 2412MHz



-6dB Bandwidth 802.11b 2437MHz



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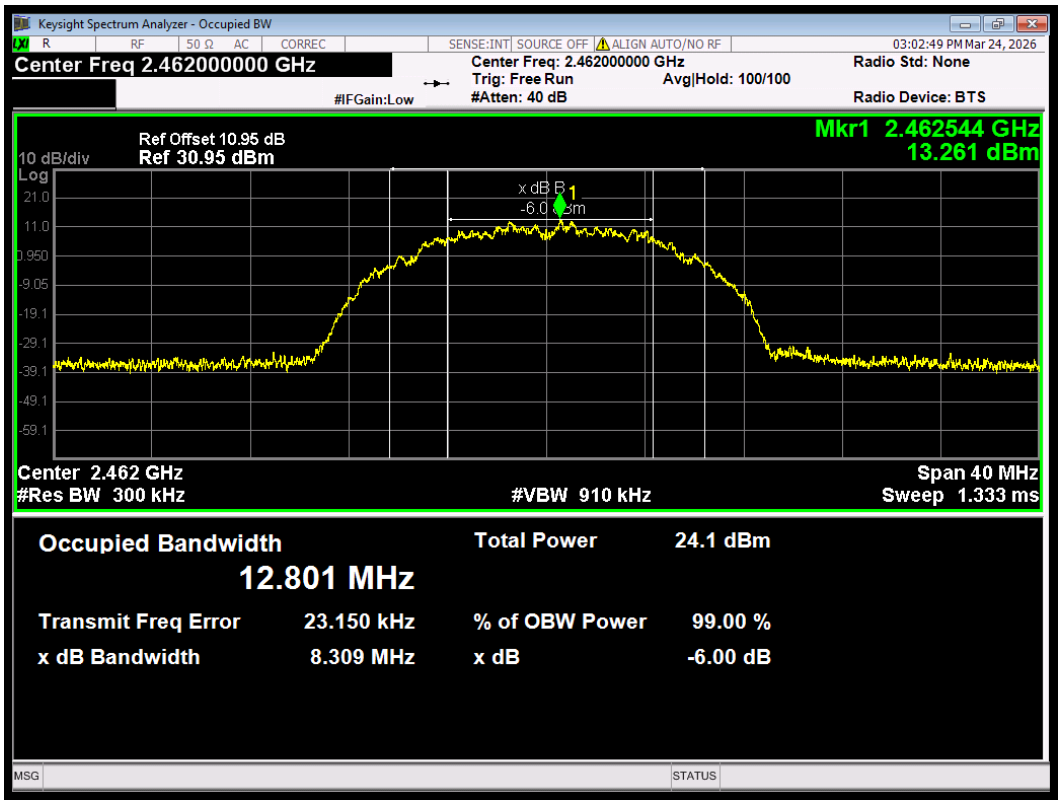
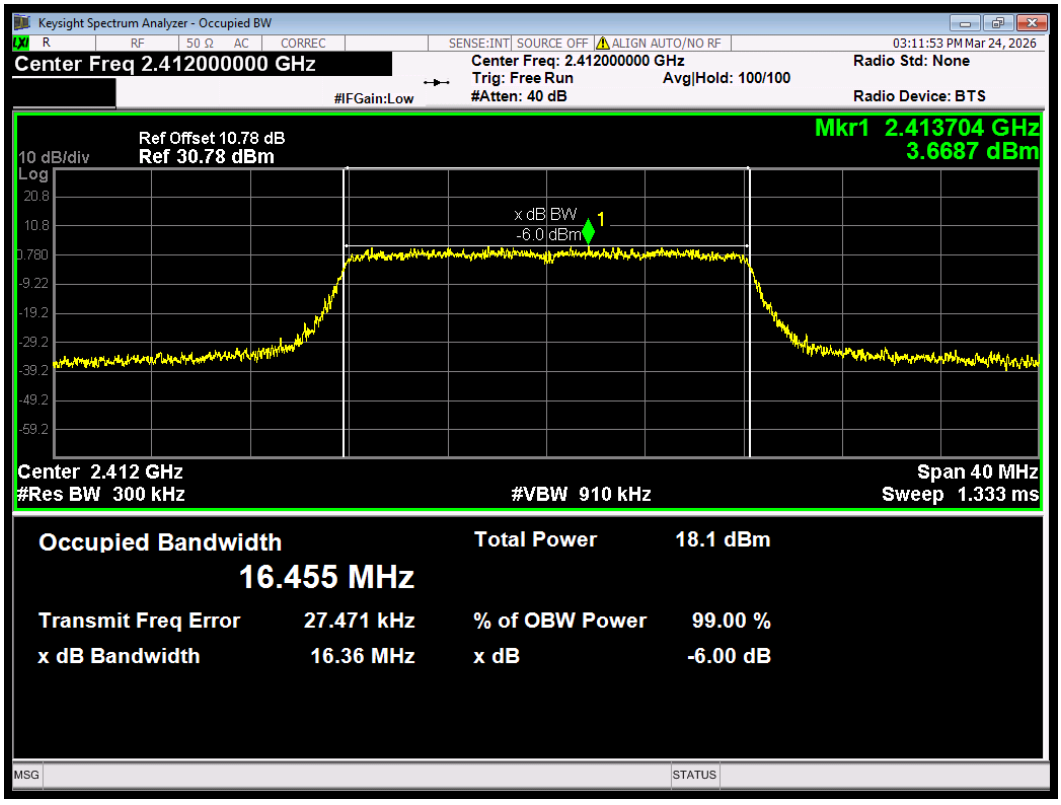
-6dB Bandwidth 802.11b 2462MHz



-6dB Bandwidth 802.11g 2412MHz



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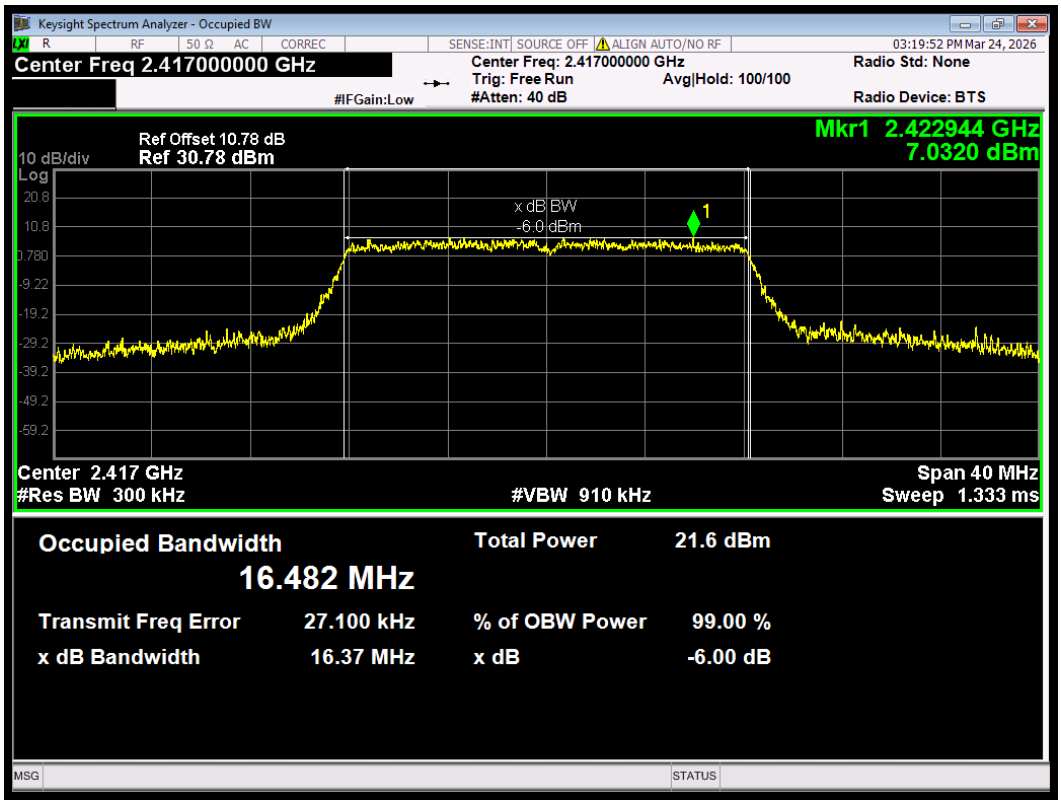
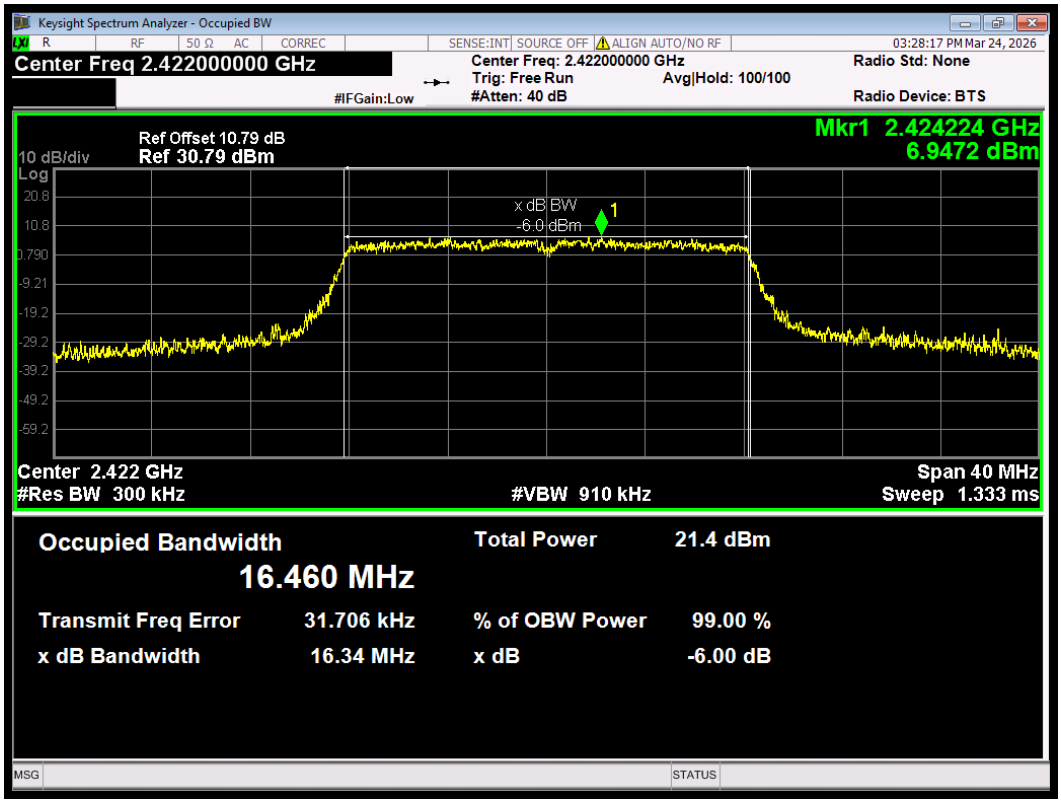
-6dB Bandwidth 802.11g 2417MHz



-6dB Bandwidth 802.11g 2422MHz



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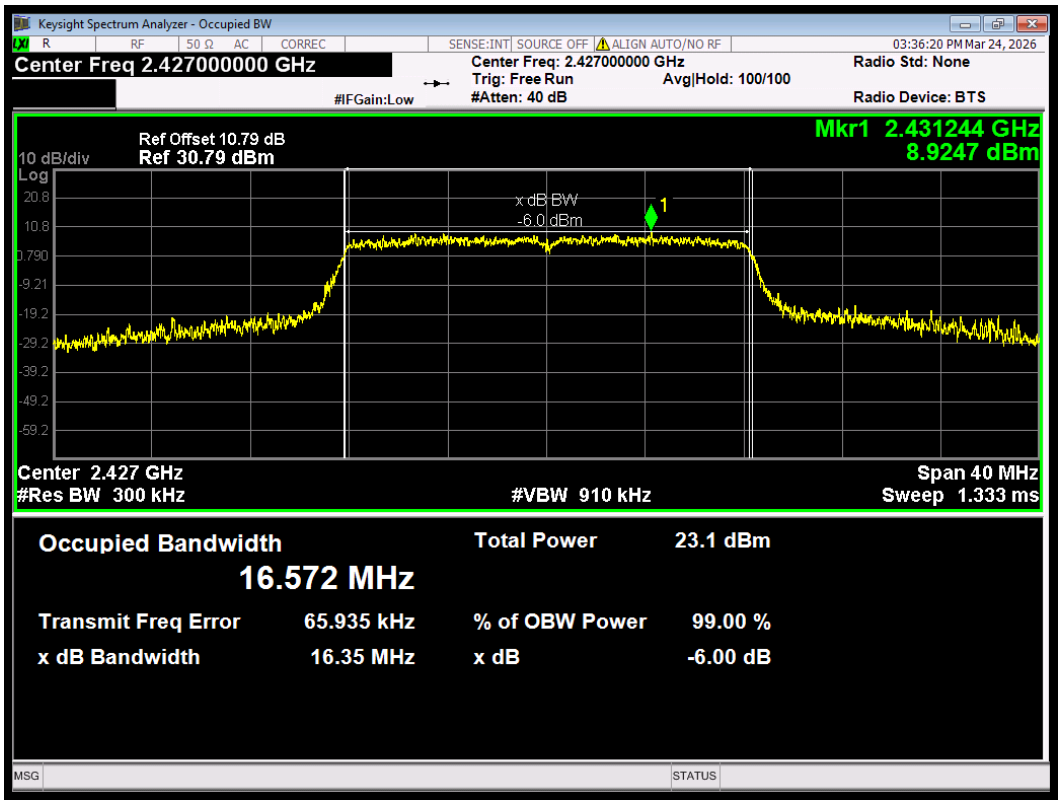
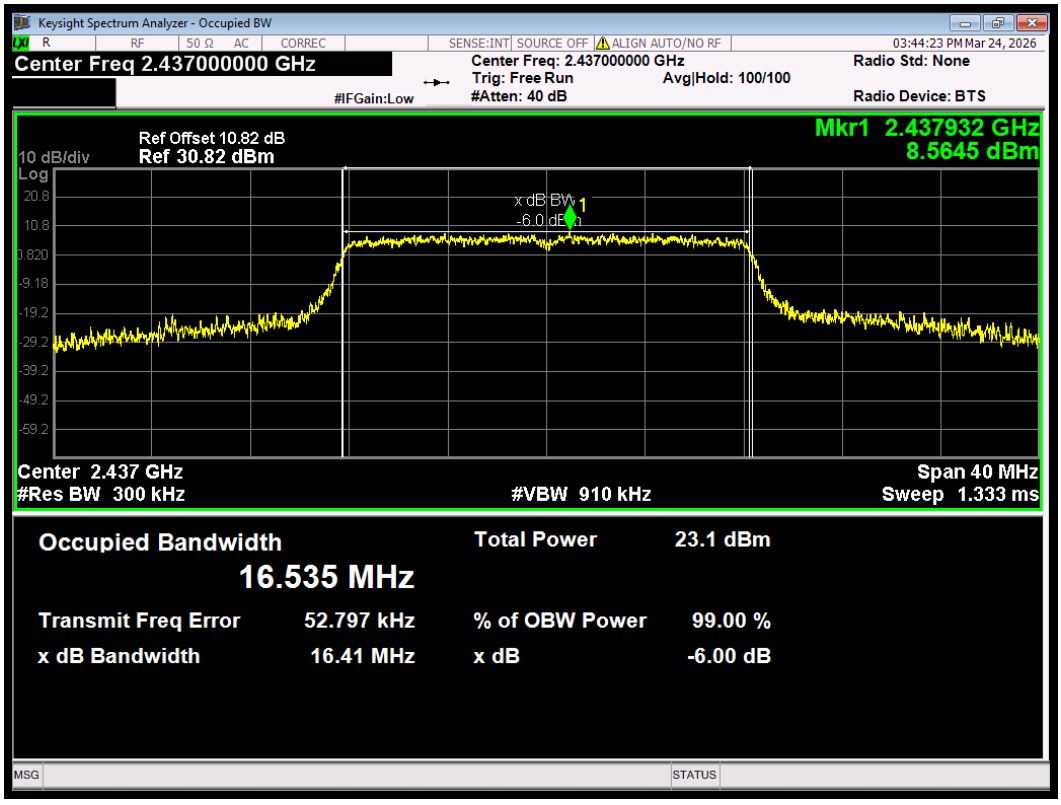
-6dB Bandwidth 802.11g 2427MHz



-6dB Bandwidth 802.11g 2437MHz



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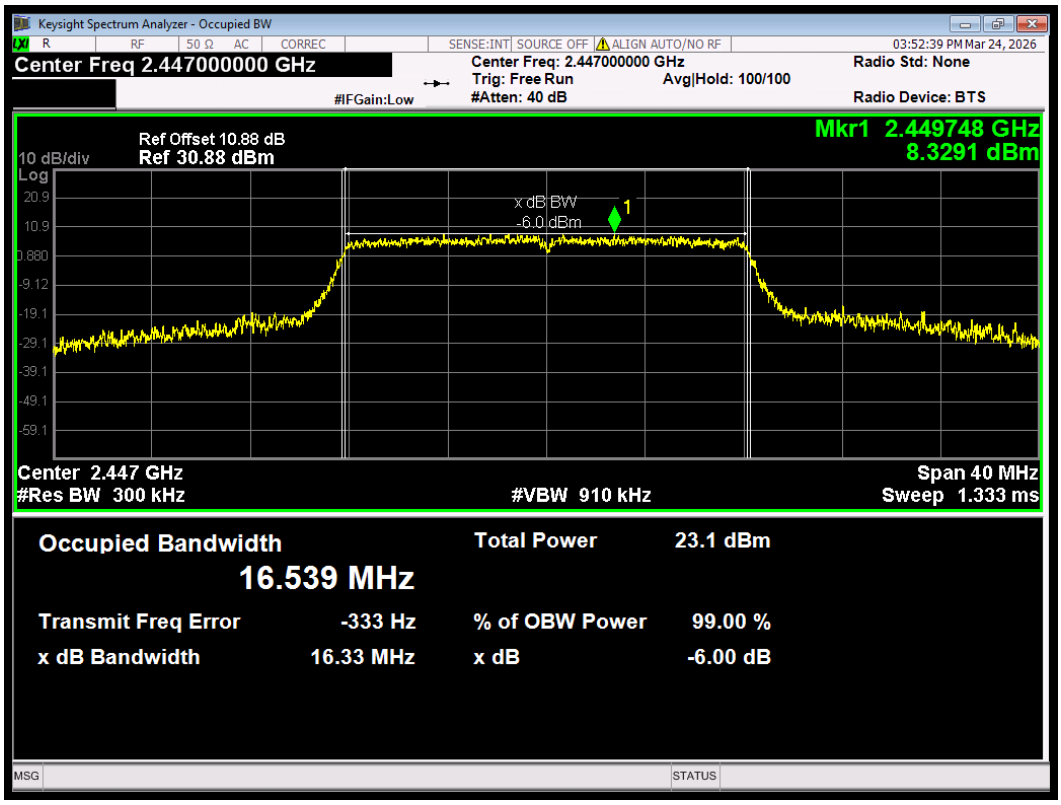
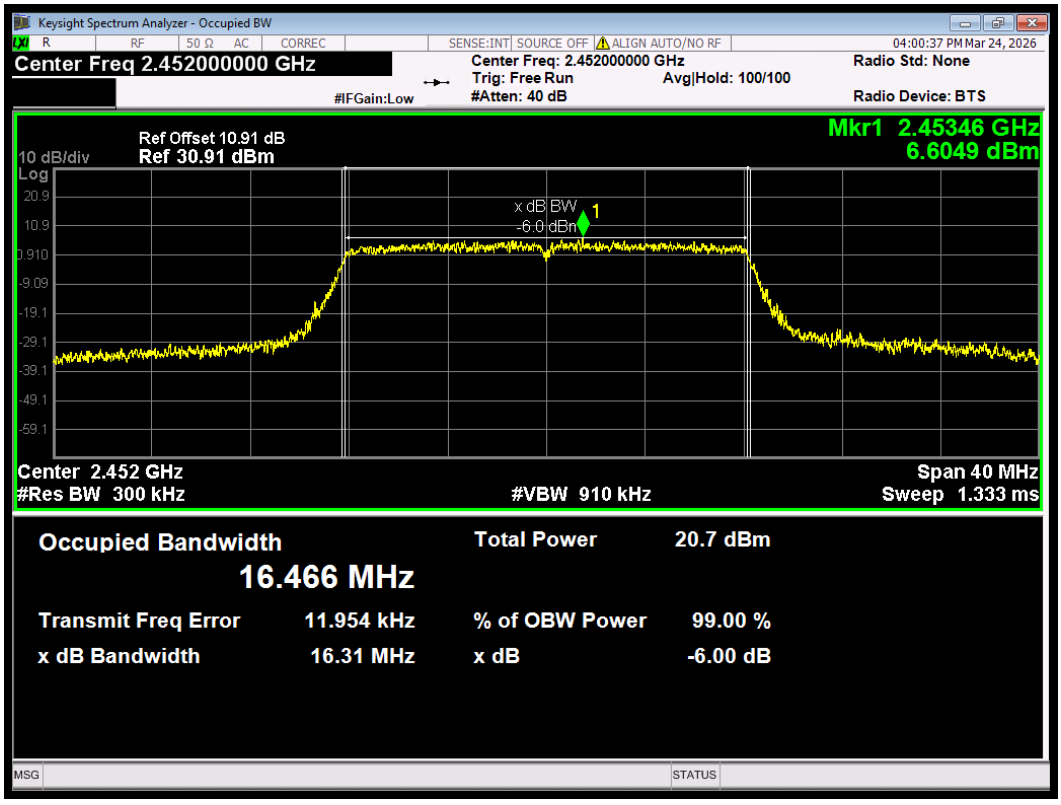
-6dB Bandwidth 802.11g 2447MHz



-6dB Bandwidth 802.11g 2452MHz



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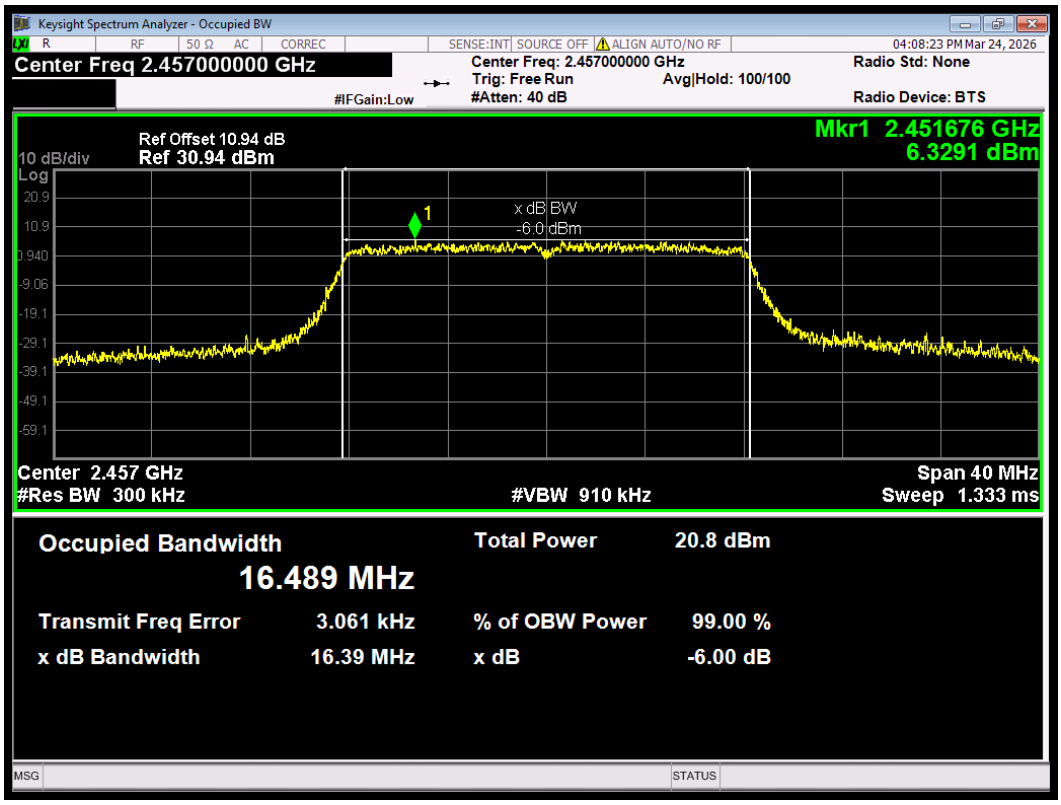
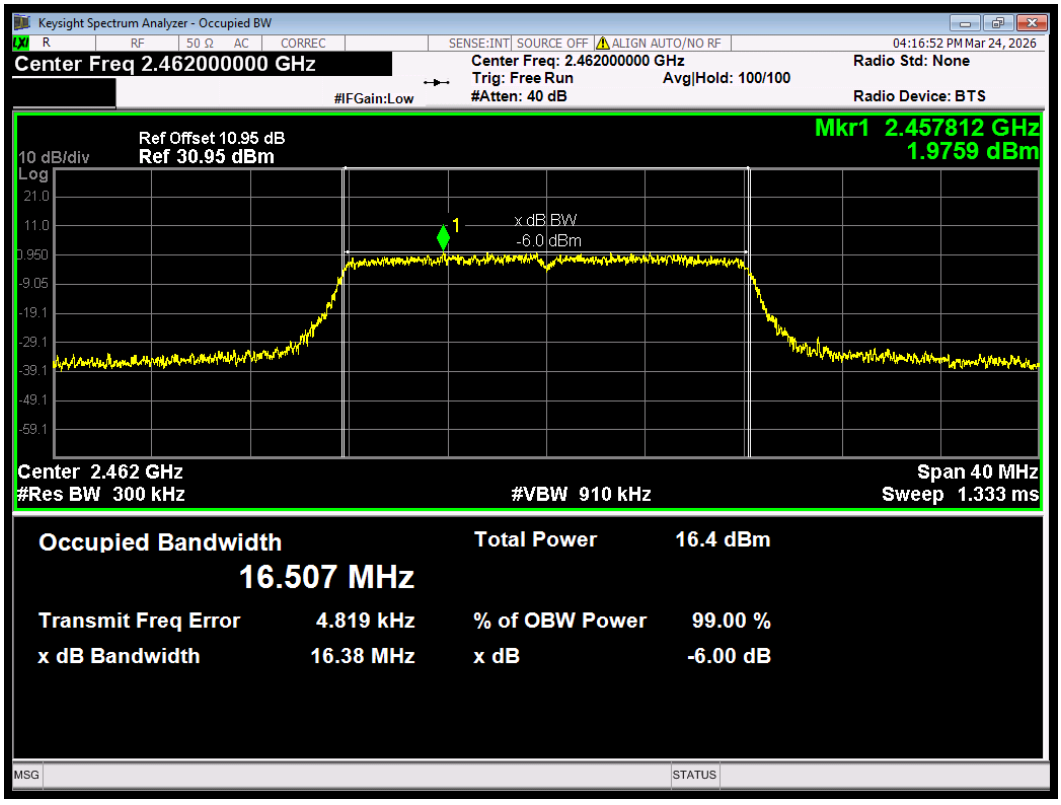
-6dB Bandwidth 802.11g 2457MHz



-6dB Bandwidth 802.11g 2462MHz



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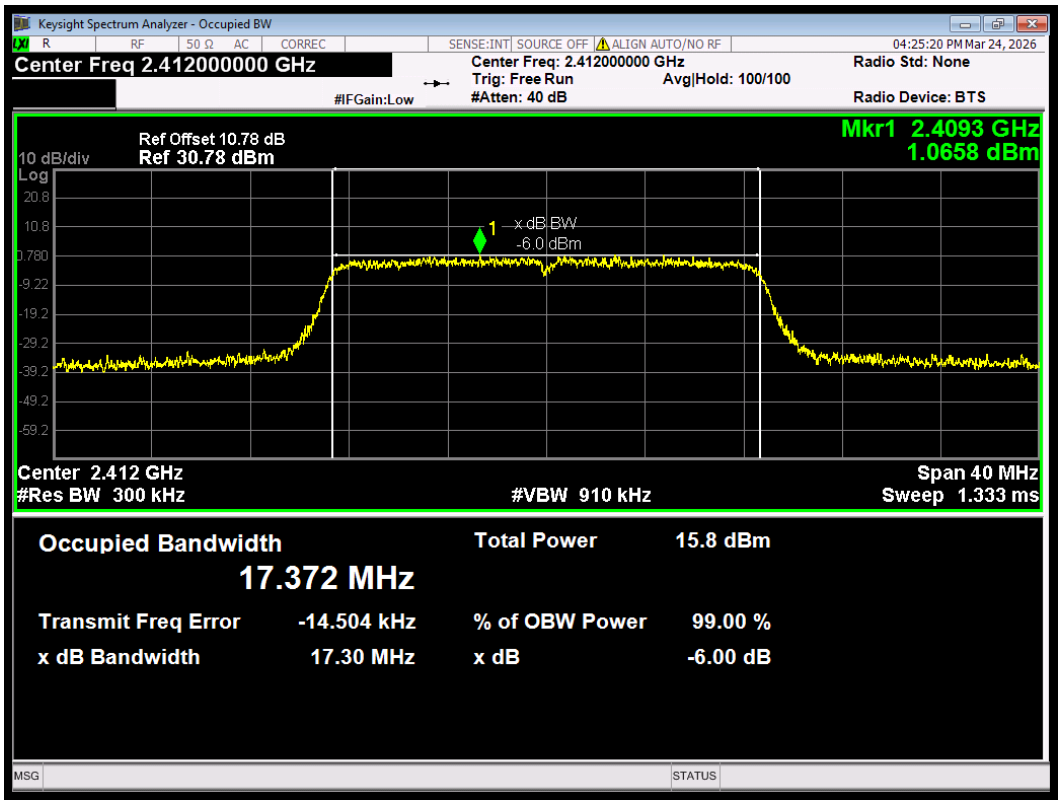
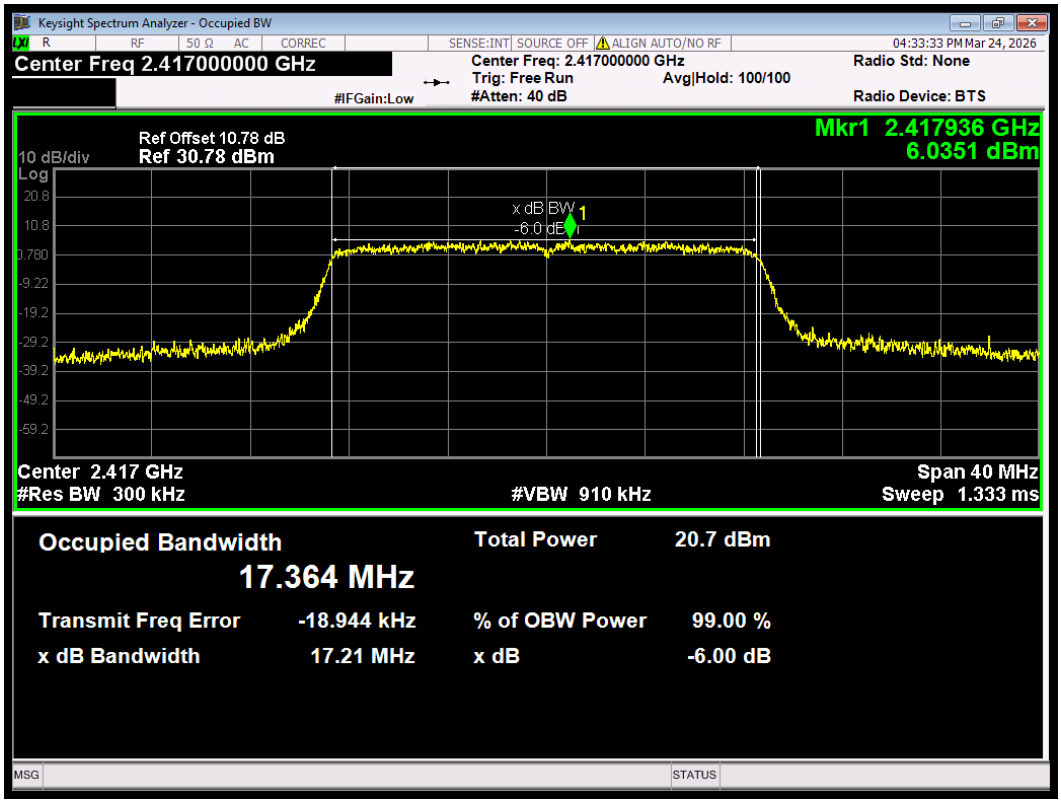
-6dB Bandwidth 802.11n(HT20) 2412MHz



-6dB Bandwidth 802.11n(HT20) 2417MHz



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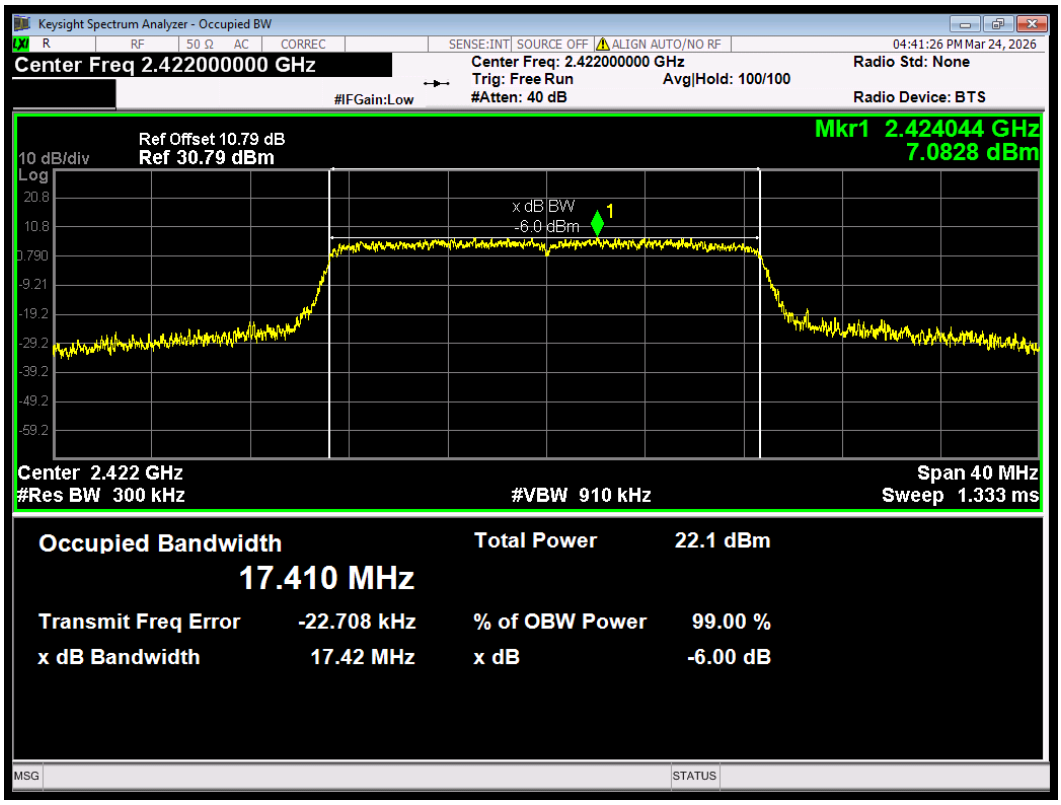
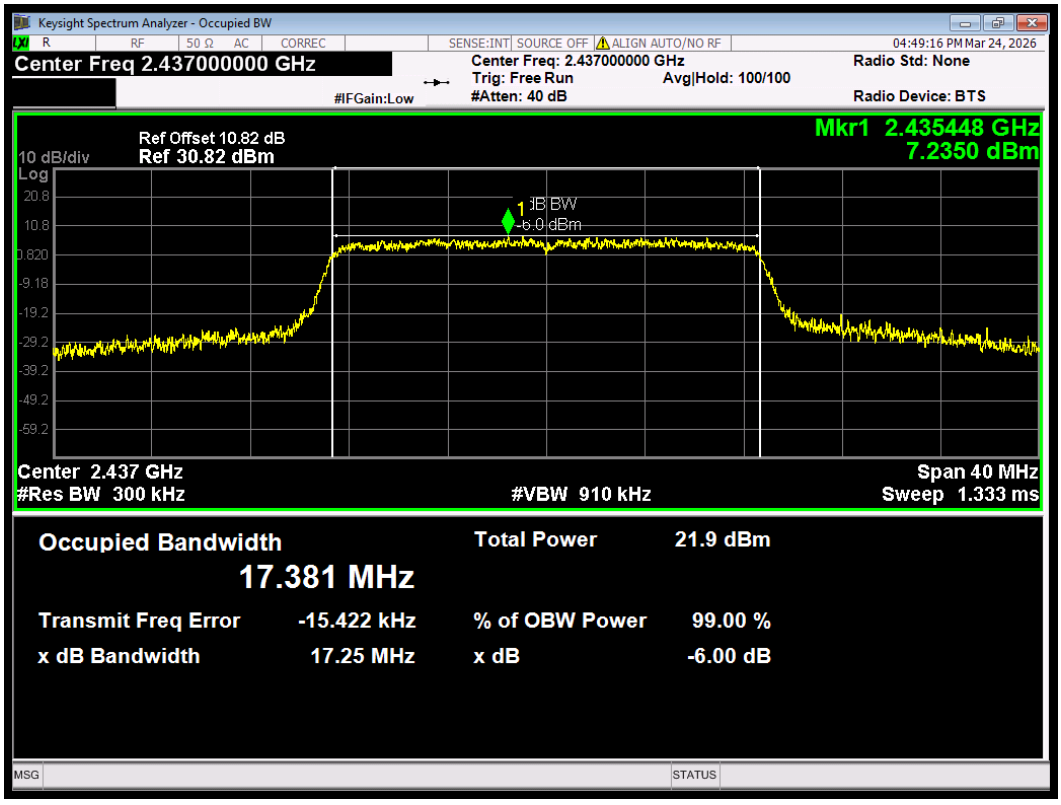
-6dB Bandwidth 802.11n(HT20) 2422MHz



-6dB Bandwidth 802.11n(HT20) 2437MHz



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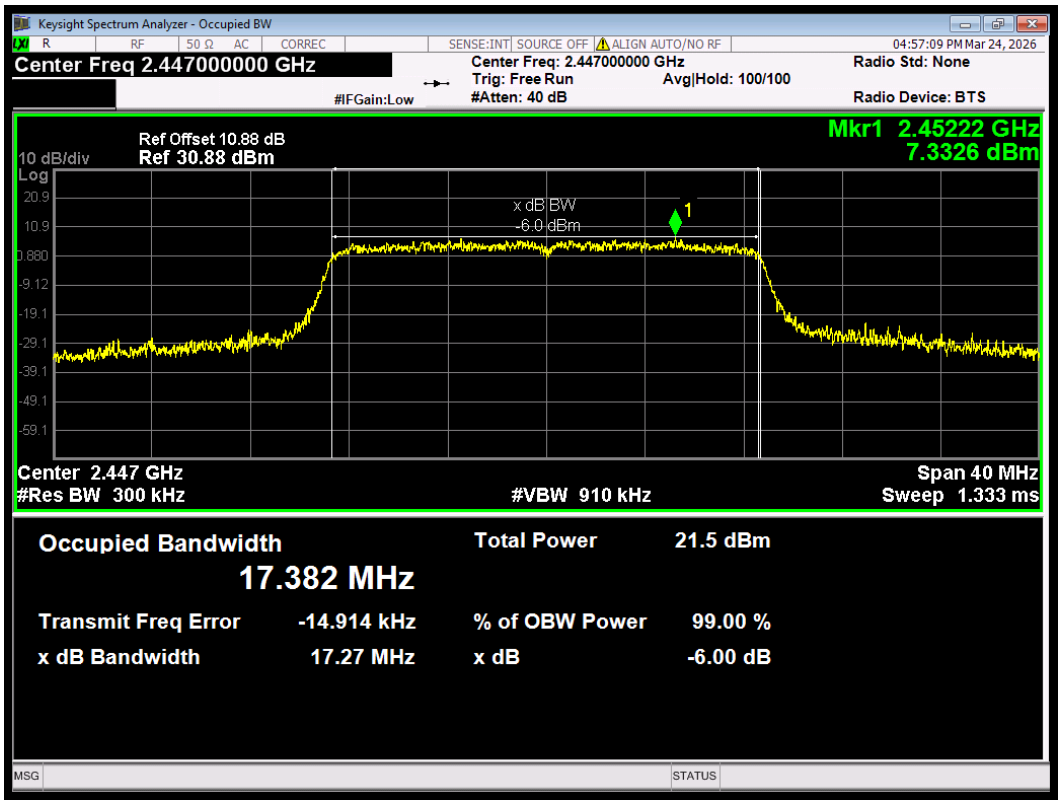
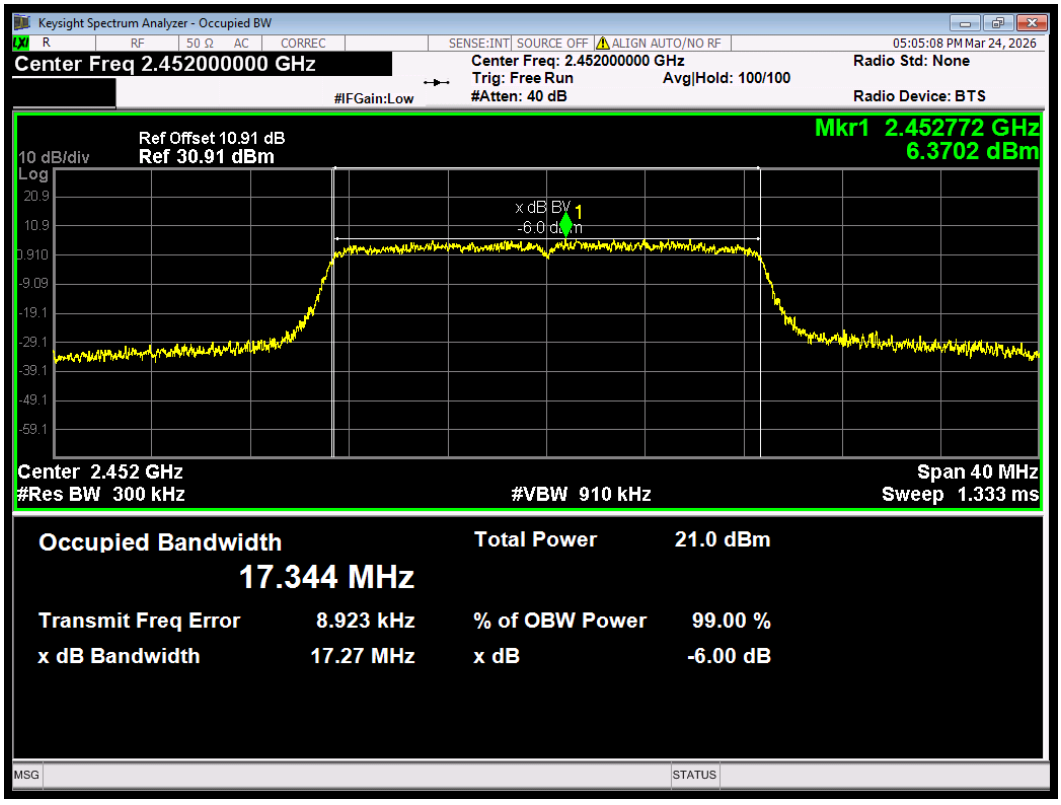
-6dB Bandwidth 802.11n(HT20) 2447MHz



-6dB Bandwidth 802.11n(HT20) 2452MHz



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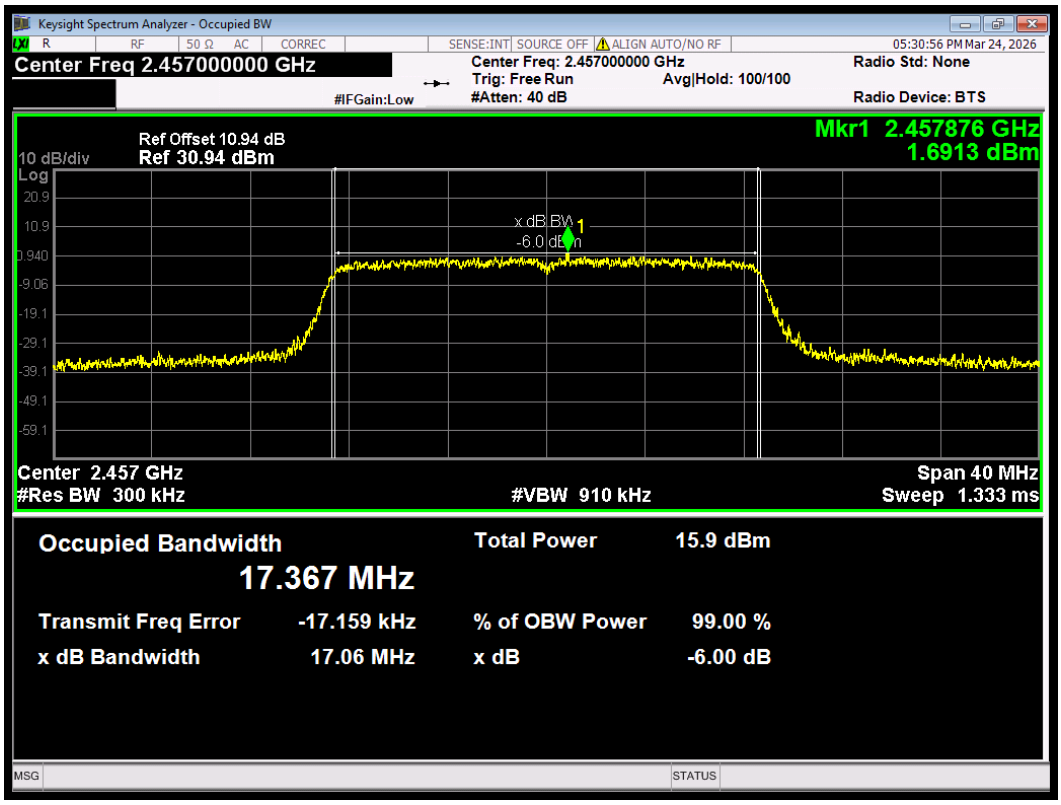
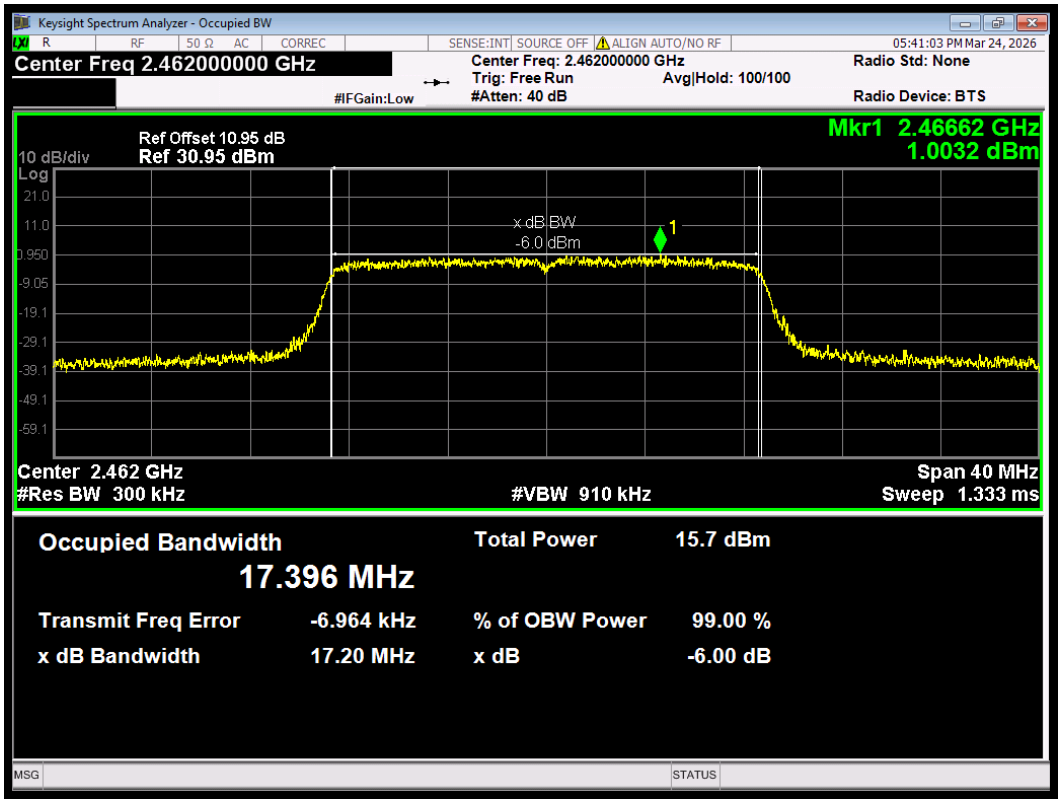
-6dB Bandwidth 802.11n(HT20) 2457MHz



-6dB Bandwidth 802.11n(HT20) 2462MHz



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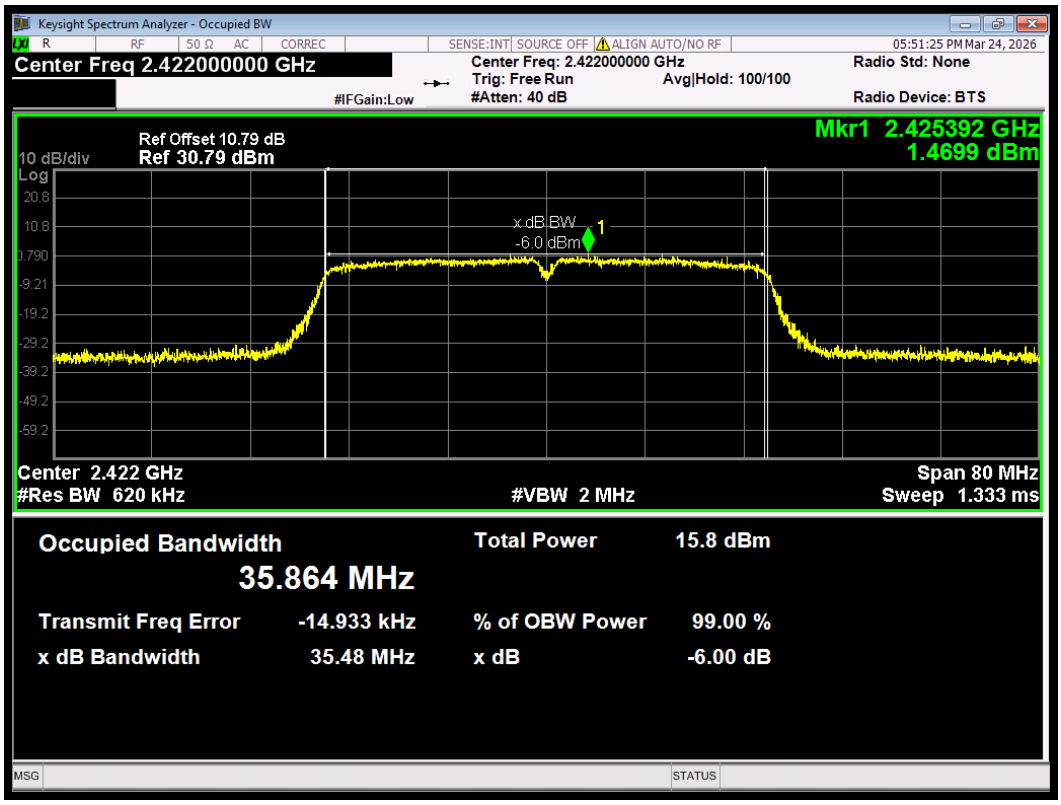
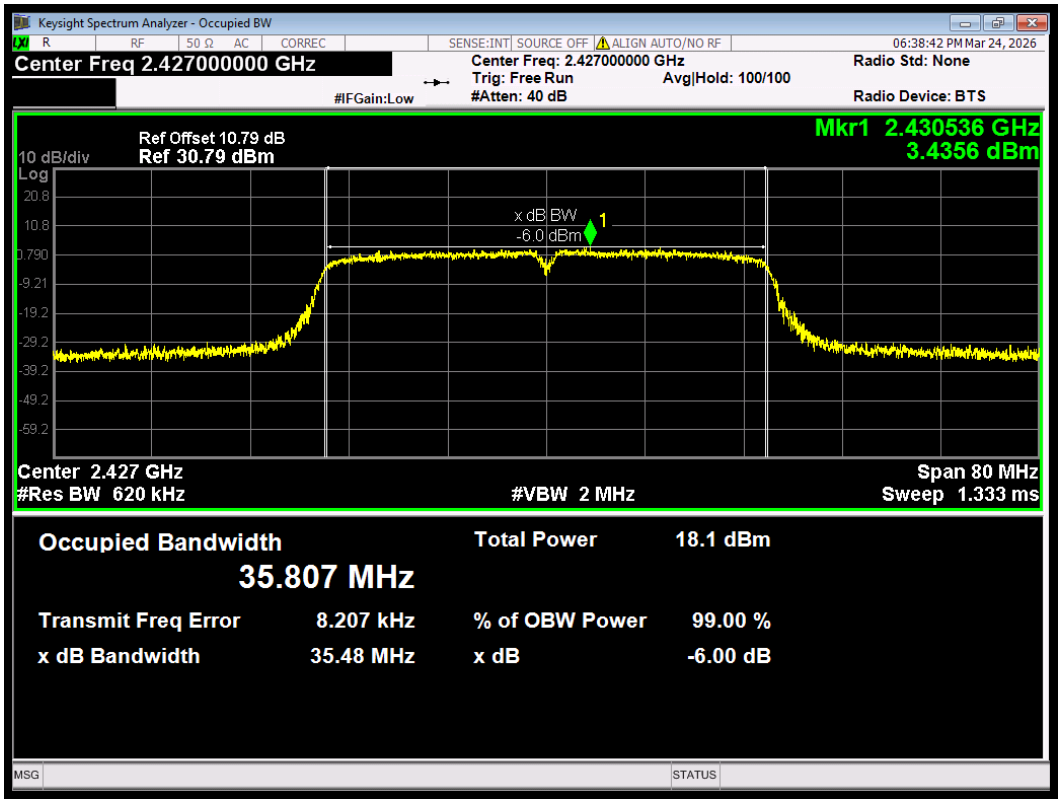
-6dB Bandwidth 802.11n(HT40) 2422MHz



-6dB Bandwidth 802.11n(HT40) 2427MHz



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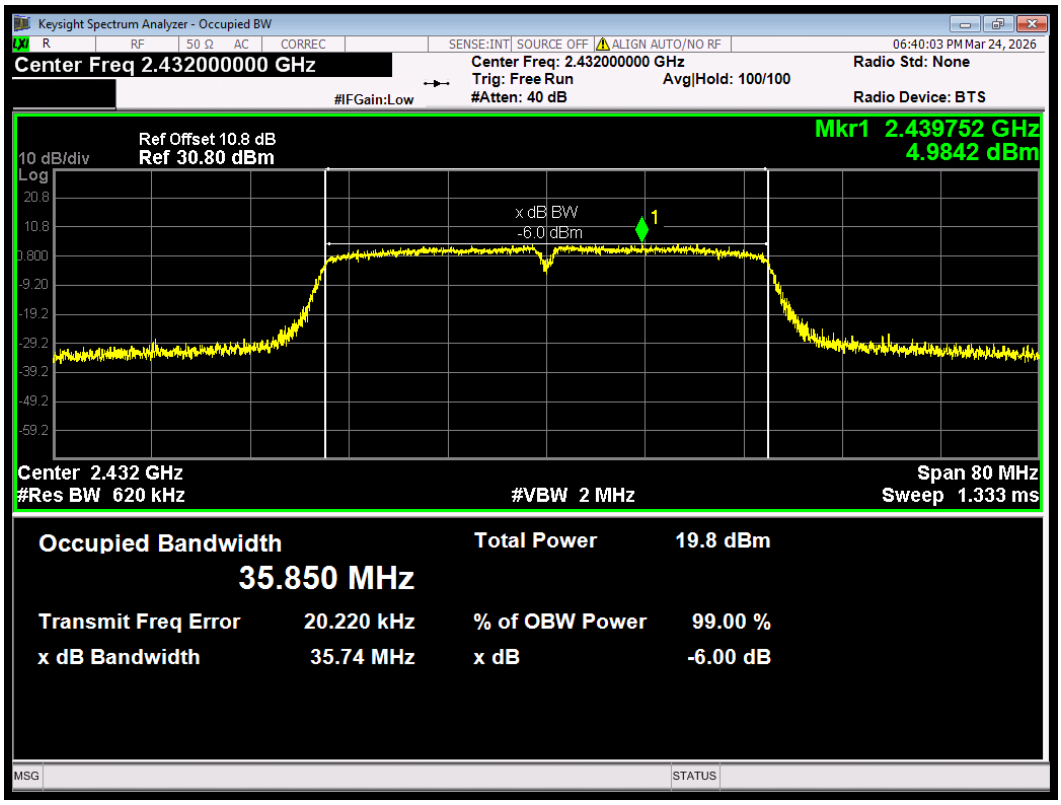
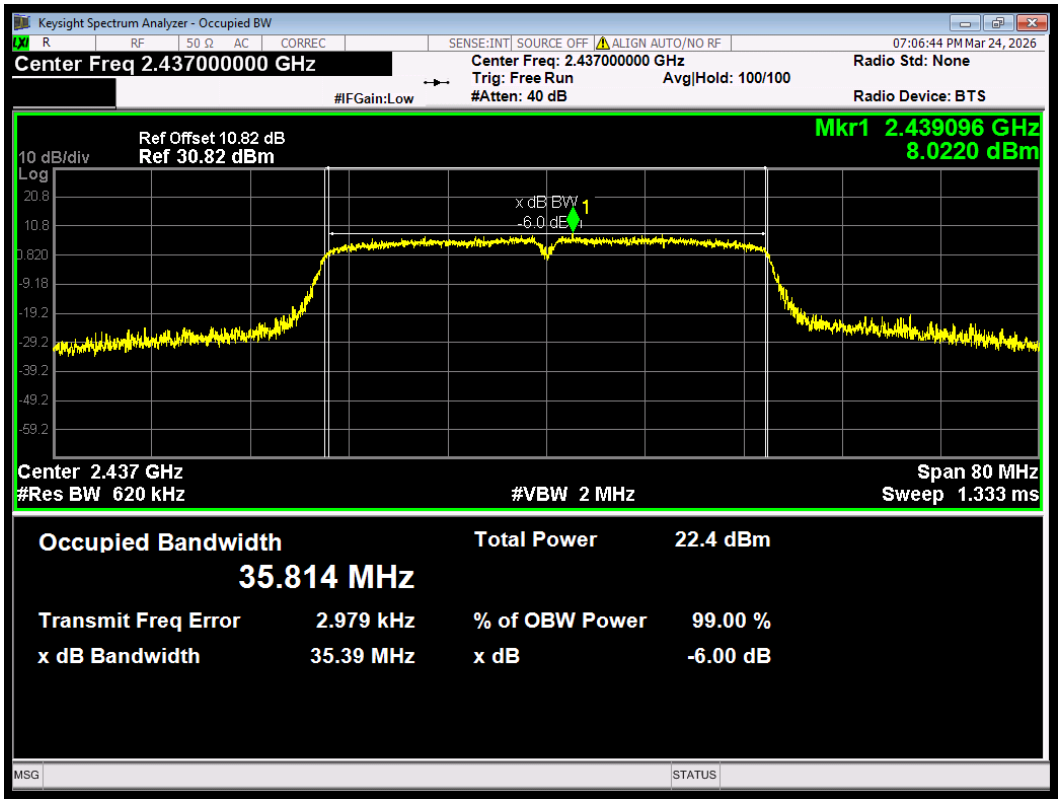
-6dB Bandwidth 802.11n(HT40) 2432MHz



-6dB Bandwidth 802.11n(HT40) 2437MHz



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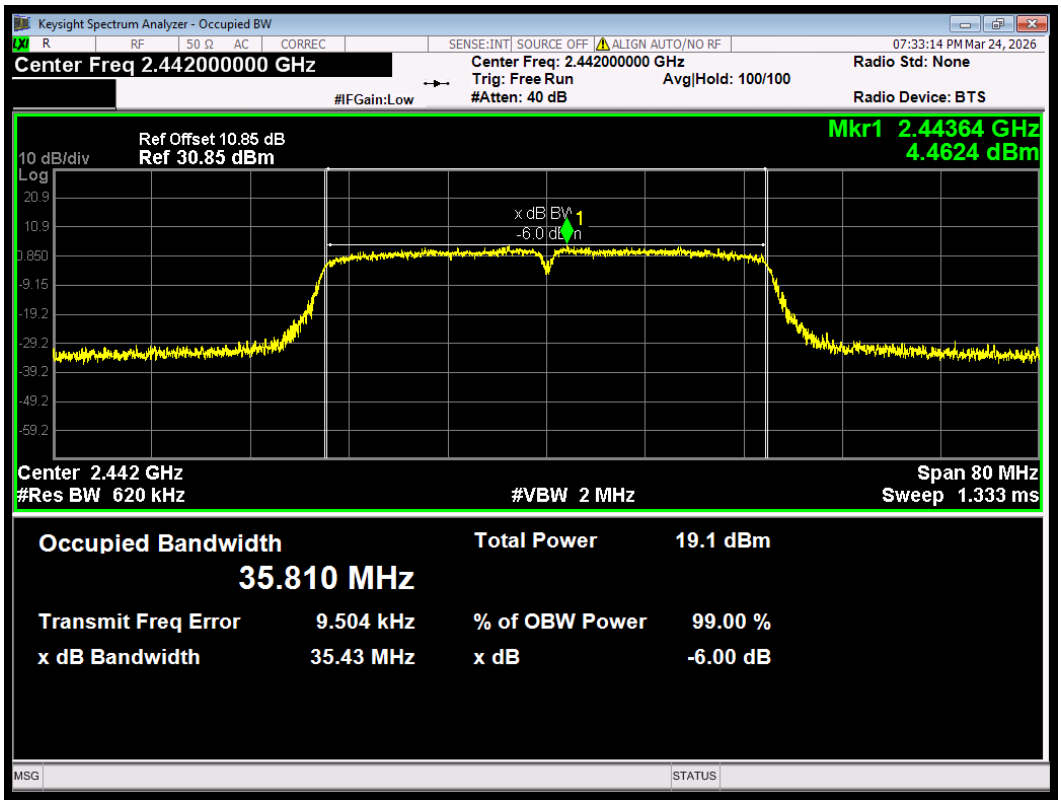
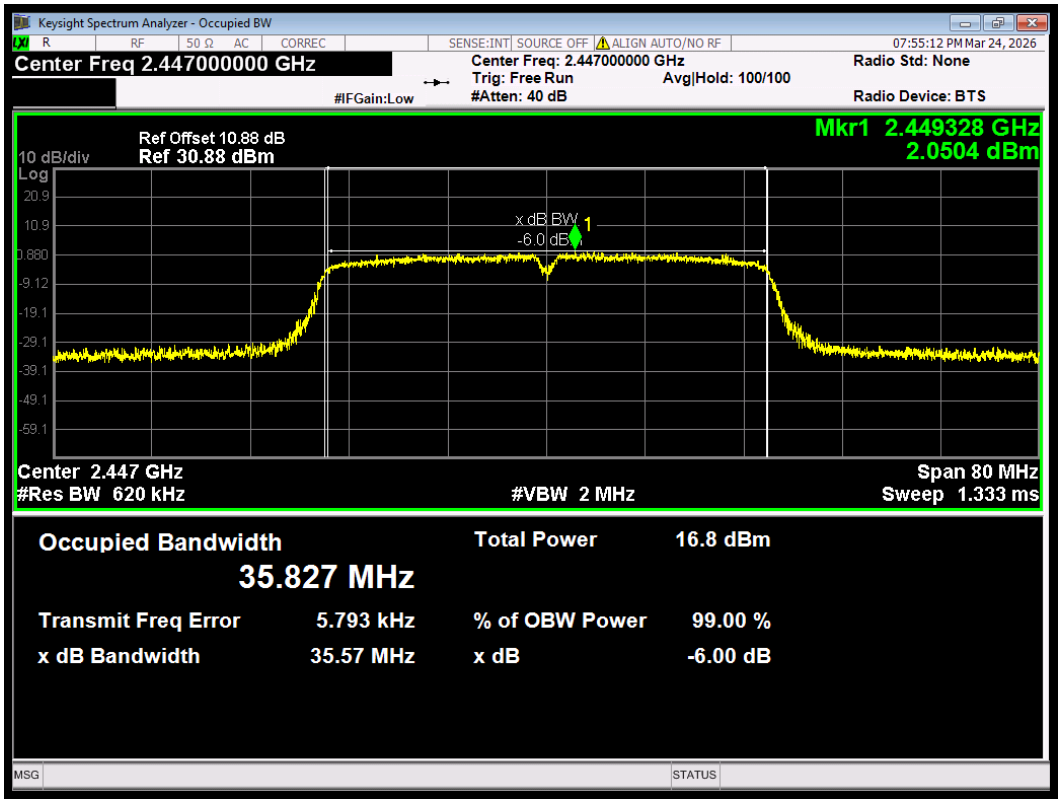
-6dB Bandwidth 802.11n(HT40) 2442MHz



-6dB Bandwidth 802.11n(HT40) 2447MHz



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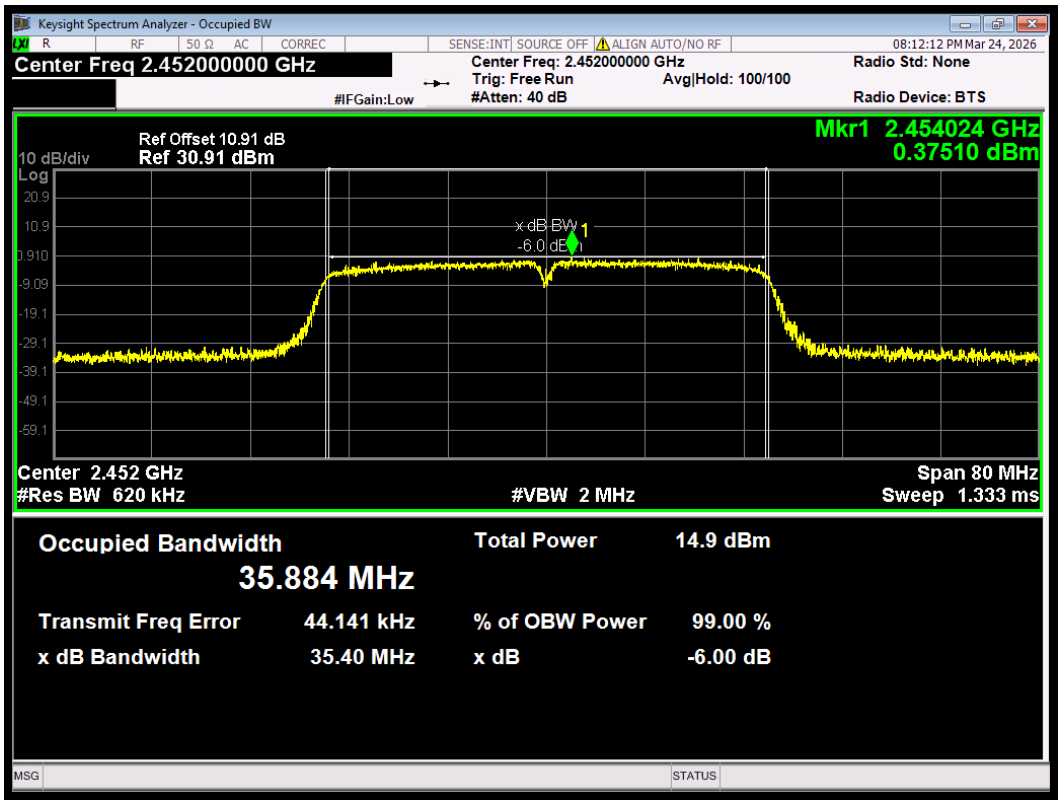
-6dB Bandwidth 802.11n(HT40) 2452MHz



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6.2. Unwanted Emission

The detailed test data see *EFTA26030197-IE-02-R1-ANNEX A* Test Result.

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7. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	KEYSIGHT	N9020A	MY51330870	2025-05-06	2026-05-05
				2026-04-21	2027-04-21
Test software	MW	MTS8310	2.0.0.0-	/	/
Attenuator	HASCO	HA18A-10	0003	/	/
EMI Test Receiver	R&S	ESCI3	100948	2025-05-07	2026-05-06
				2026-04-20	2027-04-19
Signal Analyzer	R&S	FSV40	101186	2025-05-06	2026-05-05
				2026-04-21	2027-04-20
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	1023	2023-07-14	2026-07-13
Horn Antenna	SCHWARZBECK	BBHA 9120D	430	2024-07-18	2027-07-17
Amplifier	R&S	SCU18F	101022	2025-05-06	2026-05-05
				2026-04-20	2027-04-19
Software	R&S	EMC32	9.26.01	/	/
Artificial main network	R&S	ENV216	102191	2025-11-24	2026-11-23
EMI Test Receiver	R&S	ESR	101667	2025-05-06	2026-05-05
				2026-04-20	2027-04-19
Software	R&S	ELEKTRA	5.02.1	/	/

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8. The EUT Appearance

Refer to *EUT Appearance*.

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9. Test Setup Photos

Refer to *Part15C Test Setup.*

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10. Product Change Description

The Product Change Description are submitted separately.

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