

TEST REPORT

Report Number: 15982167-E4V2

Applicant : APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

Model : A3473

Brand : APPLE

FCC ID : BCG-E9187A

IC : 579C-E9187A

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 4
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2026-08-03

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2026-07-21	Initial Issue	--
V2	2026-07-31	Addressed TCB Feedback	David Collins

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	5
2. TEST RESULTS SUMMARY	6
3. TEST METHODOLOGY	6
4. FACILITIES AND ACCREDITATION.....	6
5. DECISION RULES AND MEASUREMENT UNCERTAINTY.....	7
5.1. METROLOGICAL TRACEABILITY	7
5.2. DECISION RULES	7
5.3. MEASUREMENT UNCERTAINTY	7
5.4. SAMPLE CALCULATION	7
6. EQUIPMENT UNDER TEST	8
6.1. EUT DESCRIPTION.....	8
6.2. MAXIMUM OUTPUT POWER.....	8
6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS	8
6.4. SOFTWARE AND FIRMWARE	8
6.5. WORST-CASE CONFIGURATION AND MODE.....	9
6.6. DESCRIPTION OF TEST SETUP	11
7. TEST AND MEASUREMENT EQUIPMENT	14
8. ANTENNA PORT TEST RESULTS	16
8.1. ON TIME AND DUTY CYCLE	16
8.2. 99% BANDWIDTH.....	17
8.3. 6dB BANDWIDTH	19
8.3.1. 802.11b/n/be SISO MODE	20
8.3.2. 802.11b/n/be MIMO CDD MODE	21
8.4. OUTPUT POWER AND POWER SPECTRAL DENSITY.....	23
8.4.1. 802.11b SISO MODE	25
8.4.2. 802.11b MIMO MODE	26
8.4.3. 802.11n HT20 SISO MODE	27
8.4.4. 802.11n HT20 MIMO MODE	28
8.4.5. 802.11be EHT20 SISO MODE	29
8.4.6. 802.11be EHT20 MIMO MODE.....	31
8.5. CONDUCTED SPURIOUS EMISSIONS.....	33
8.5.1. 802.11b MODE 1TX.....	34
8.5.2. 802.11b CDD MODE 2TX	38
8.5.3. 802.11n HT20 SISO MODE	42
8.5.4. 802.11n HT20 CDD MODE 2TX	48
8.5.5. 802.11be EHT20 1TX MODE	55

8.5.6.	802.11be EHT20 2TX CDD MODE	70
9.	RADIATED TEST RESULTS	84
9.1.	TRANSMITTER ABOVE 1 GHz	86
9.1.1.	802.11b/n/be SISO MODE – LOW BANDEDGE – CHANNEL 1.....	86
9.1.2.	802.11b/n/be MIMO CDD MODE – LOW BANDEDGE – CHANNEL 1.....	89
9.1.3.	802.11b/n/be SISO MODE – LOW BANDEDGE – CHANNEL 2.....	92
9.1.4.	802.11b/n/be MIMO CDD MODE – LOW BANDEDGE – CHANNEL 2.....	95
9.1.5.	802.11b/n/be SISO MODE – LOW BANDEDGE – CHANNEL 3.....	98
9.1.6.	802.11b/n/be MIMO CDD MODE – LOW BANDEDGE – CHANNEL 3.....	101
9.1.7.	802.11b/n/be SISO MODE – HIGH BANDEDGE – CHANNEL 9.....	104
9.1.8.	802.11b/n/be MIMO CDD MODE – HIGH BANDEDGE – CHANNEL 9.....	107
9.1.9.	802.11b/n/be SISO MODE – HIGH BANDEDGE – CHANNEL 10.....	110
9.1.10.	802.11b/n/be MIMO CDD MODE – HIGH BANDEDGE – CHANNEL 10.....	113
9.1.11.	802.11b/n/be SISO MODE – HIGH BANDEDGE – CHANNEL 11.....	116
9.1.12.	802.11b/n/be MIMO CDD MODE – HIGH BANDEDGE – CHANNEL 11.....	119
9.1.13.	802.11b/n/be SISO MODE – HIGH BANDEDGE – CHANNEL 12.....	122
9.1.14.	802.11b/n/be MIMO CDD MODE – HIGH BANDEDGE – CHANNEL 12.....	125
9.1.15.	802.11b/n/be SISO MODE – HIGH BANDEDGE – CHANNEL 13.....	128
9.1.16.	802.11b/n/be MIMO CDD MODE – HIGH BANDEDGE – CHANNEL 13.....	131
9.1.17.	802.11b MIMO MODE – HARMONIC AND SPURIOUS EMISSIONS	134
9.1.18.	802.11n HT20 MIMO CDD MODE – HARMONIC AND SPURIOUS EMISSIONS 137	
9.1.19.	802.11be EHT20 MIMO CDD SU MODE – HARMONIC AND SPURIOUS EMISSIONS	140
9.1.20.	802.11be EHT20 MIMO CDD PARTIAL RU MODE – HARMONIC AND SPURIOUS EMISSIONS	143
9.2.	WORST CASE BELOW 1 GHz	146
9.3.	WORST CASE 18-26 GHz	148
10.	AC POWER LINE CONDUCTED EMISSIONS	150
10.1.	AC POWER LINE WITH AC/DC ADAPTER	151
10.2.	AC POWER LINE WITH LAPTOP	153
11.	SETUP PHOTOS.....	155

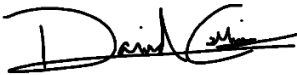
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3473
Brand	APPLE
FCC ID	BCG-E9187A
IC	579C-E9187A
EUT Description	SMARTPHONE
Serial Number	HVHHPZ000110001CCF, HVHHTW000HE0001CCY (Conducted) LHGQJ44Y7R, C697G3Q5V6 (Radiated)
Sample Receipt Date	2026-02-05
Date Tested	2026-02-10 to 2026-07-19
Applicable Standards	FCC 47 CFR Part 15 Subpart C ISED RSS-247 Issue 4 ISED RSS-GEN Issue 5 + A1 + A2
Test Results	COMPLIES

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to ensure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc., and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released By:	Prepared & Reviewed By:
	
Frank Ibrahim Staff Engineer UL Verification Services Inc.	David Collins Lab Supervisor UL Verification Services Inc.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer, which can impact the validity of the results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)
2. Cable loss (see section 6.3)

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (ISED)	Result
Duty Cycle	See Comment		Reporting purposes only
99% OBW	-	RSS-GEN 6.7	Complies
6dB BW	15.247 (a) (2)	RSS-247 6.3.1 (a)	Complies
Output Power	15.247 (b) (3)	RSS-247 6.3.2	Complies
PSD	15.247 (e)	RSS-247 6.3.1 (b)	Complies
Conducted Spurious Emissions	15.247 (d)	RSS-247 6.6	Complies
Radiated Emissions	15.209, 15.205	RSS-GEN 8.9, 8.10	Complies
AC Mains Conducted Emissions	15.207	RSS-Gen 8.8	Complies

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with;

- ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
- FCC 47 CFR Part 2
- FCC 47 CFR Part 15C
- KDB 558074 D01 15.247 Meas Guidance
- KDB 414788 D01 Radiated Test Site
- KDB 662911 D01 Multiple Transmitter Output
- RSS-GEN Issue 5 + A1 + A2
- RSS-247 Issue 4

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated regularly, with a maximum time between calibrations of one year or the manufacturer's recommendation, whichever is less, and, where applicable, is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U _{LAB}
Conducted Antenna Port Emission Measurement	1.94 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using a Power Meter	0.45 dB (Ave), 1.30 dB Peak)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22 %
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB)
– Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN
Insertion Loss.
36.5 dBuV + 0 dB + 10.1 dB + 0 dB = 46.6 dBuV

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5G NR1, 5G NR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB), Wireless Power Transfer (WPT Rx Only) and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2412 - 2472	802.11b	21.49	140.93
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20	21.46	139.96
	802.11ax HE20	Covered by 802.11be EHT20 1TX	
	802.11be EHT20	21.49	140.93

2Tx			
2412 - 2472	802.11b CDD	24.48	280.54
	802.11n HT20 CDD	24.47	279.90
	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
	802.11ax HE20	Covered by 802.11be EHT20 CDD	
	802.11be EHT20 CDD	24.44	277.97

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS

The antenna(s) gain and cable loss, as provided by the manufacturer, are as follows:

Frequency Range (GHz)	Antenna Type	Antenna Peak Gain				Cable Loss	
		ANT 4 (dBi)	ANT 3 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)	ANT 4 (dB)	ANT 3 (dB)
2.4	IFA	-0.50	-3.00	-2.80	0.00	1.63	1.75

The cables were used for RF antenna port tests that had been offset to the test equipment during testing.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware and software installed during testing were 24A343.

6.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations: X (Flatbed), Y (Landscape), and Z (Portrait). The following table exhibits the worst-case orientation. The full tests of the EUT have been made upon the orientations shown in the table below.

Band	ANT4	ANT3	ANT4+3
2.4GHz	X-Flatbed	X-Flatbed	X-Flatbed

With the same power on Full RU and SU higher data rate, an investigation was performed on both bandedge to determine the worst case, and the SU mode was determined to be the worst case.

Radiated band edge (Low/High channels), harmonic, and spurious emissions from 1GHz to 18GHz were measured with the EUT set to transmit at the highest power on Low/Mid/High channels.

Radiated emissions below 1GHz, 18-26GHz, and power line conducted emissions were performed with the EUT transmitting at the channel with the highest output power as a worst-case scenario. There were no emissions found below 30MHz within 20dB of the limit.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-26GHz, and power line conducted emissions were performed with the EUT set at the 2TX CDD mode among the CDD modes and SDM modes with power setting equal to or higher than SISO modes as a worst-case scenario. G mode is covered by HT20 mode since it has equal or lower tune up power than HT20.

Below 30MHz, 30-1000MHz emissions spurious tests were performed with EUT connected to an AC power adapter and set at X orientation as the worst case; and for above 1GHz tests, the worst-case configuration reported was with EUT only. For AC line conducted emission, the test was conducted with an AC power adapter and a laptop.

The modulation and bandwidth of 802.11ax and 802.11be modes are similar, and the target power of the 802.11ax mode is equal to or lower than that of the 802.11be mode. The data rate of 802.11be mode is higher than 802.11ax mode; therefore, 802.11be mode is performed in the test to represent worst-case reporting.

For 99% Bandwidth, both SISO and MIMO modes have been investigated. And the results are similar between these modes. The SISO mode data represents the MIMO mode and is reported.

The output power and PSD for the 802.11be mode were investigated across all different tones, and we found that the SU mode had the highest output power and RU26 had the highest PSD readings. After investigation, antenna port conducted tests were performed on both SU and the lowest tones. Radiated spurious emission and radiated band edge tests were also performed on SU and the lowest tones. Please see the worst-case summary table below.

WIFI DTS 2.4GHz - 802.11be					
BW (MHz)	Tone (T)	RU Index	RU Index from Chipset support	Worst Case Tone (UNII-1)	
				Power	PSD
20	26	0 ~ 8	0 ~ 8		X
	52	37 ~ 40	37 ~ 40		
	52 + 26	70 ~ 81	70, 71, 72		
	106	53 ~ 54	53 ~ 54		
	106 + 26	82 ~ 89	82, 83		
	242	61	61		
	SU	--	--	X	

A low data rate was used to test the antenna port, conduct tests, and radiate spurious emissions, as it has the highest maximum power. For radiated bandedge, the following are the worst-case data rates set for the test:

802.11b mode: 1 Mbps

802.11n HT20 mode : MCS7

802.11be EHT RU26 and SU, MCS9

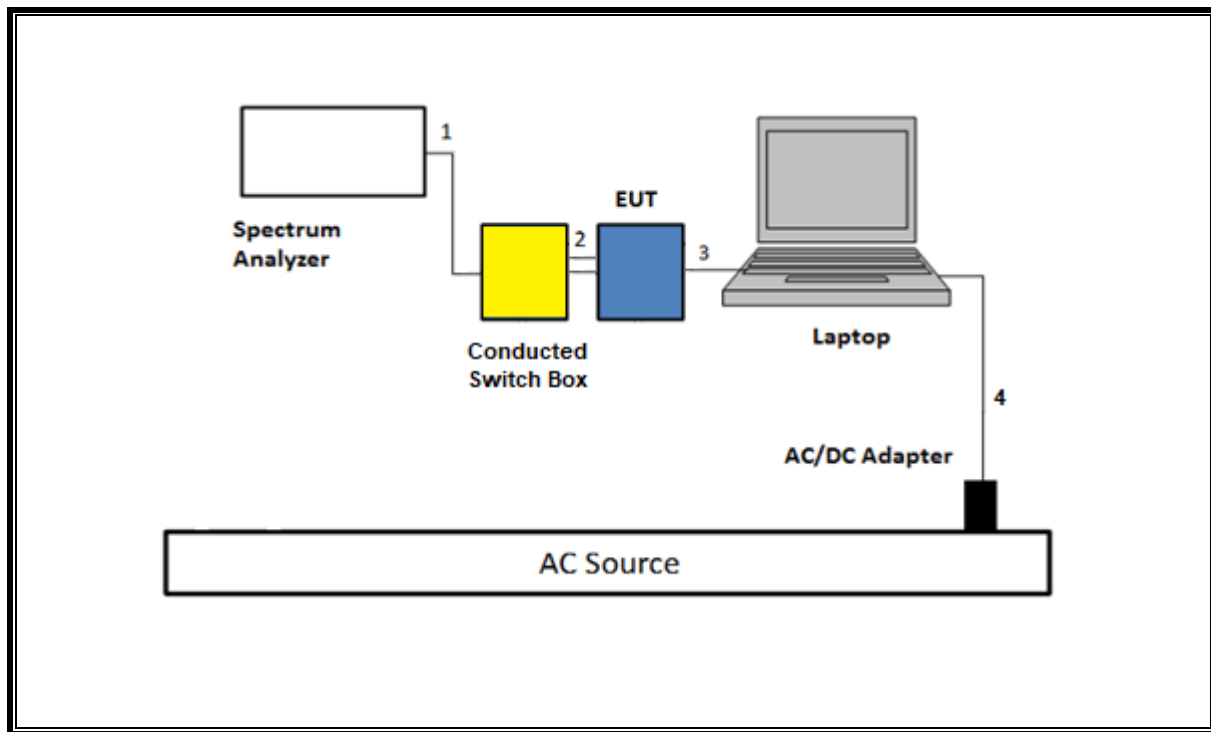
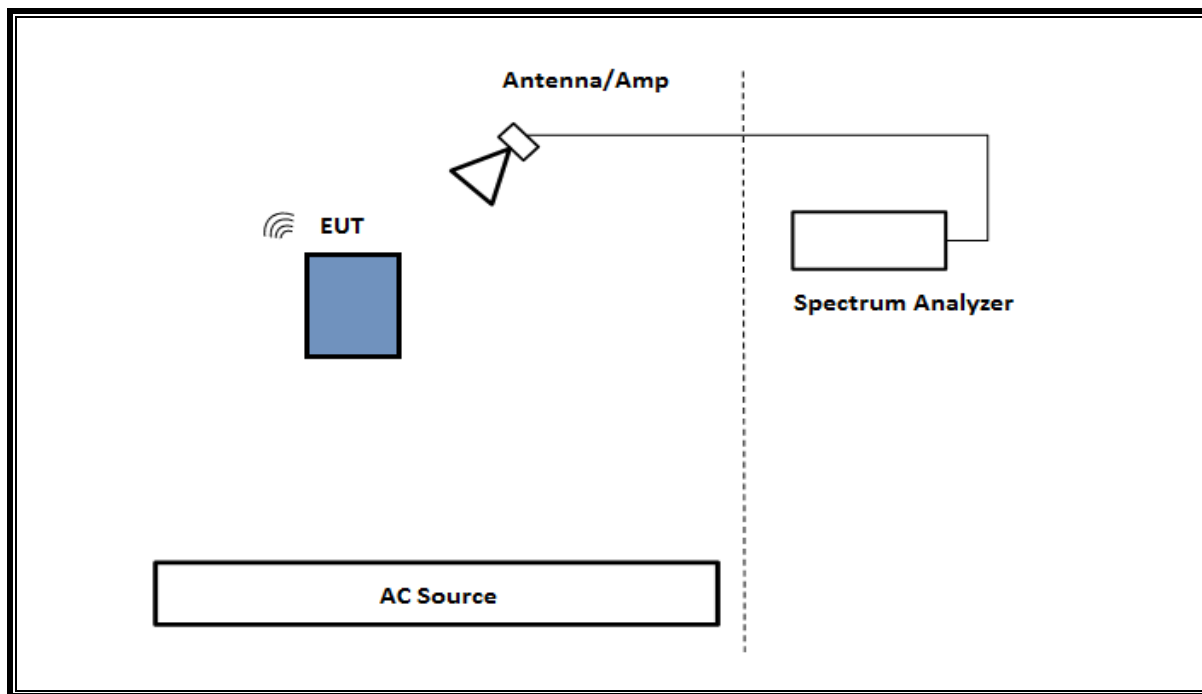
Plots included in the report are representative of the method and settings parameters used for the test.

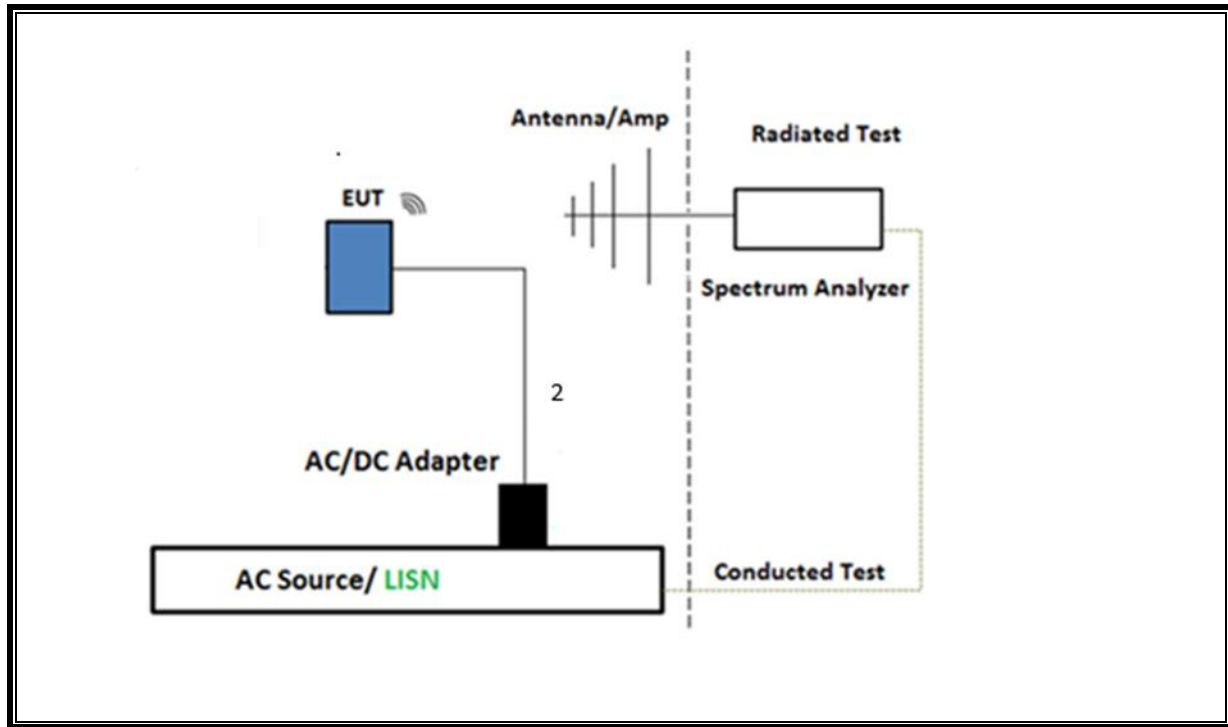
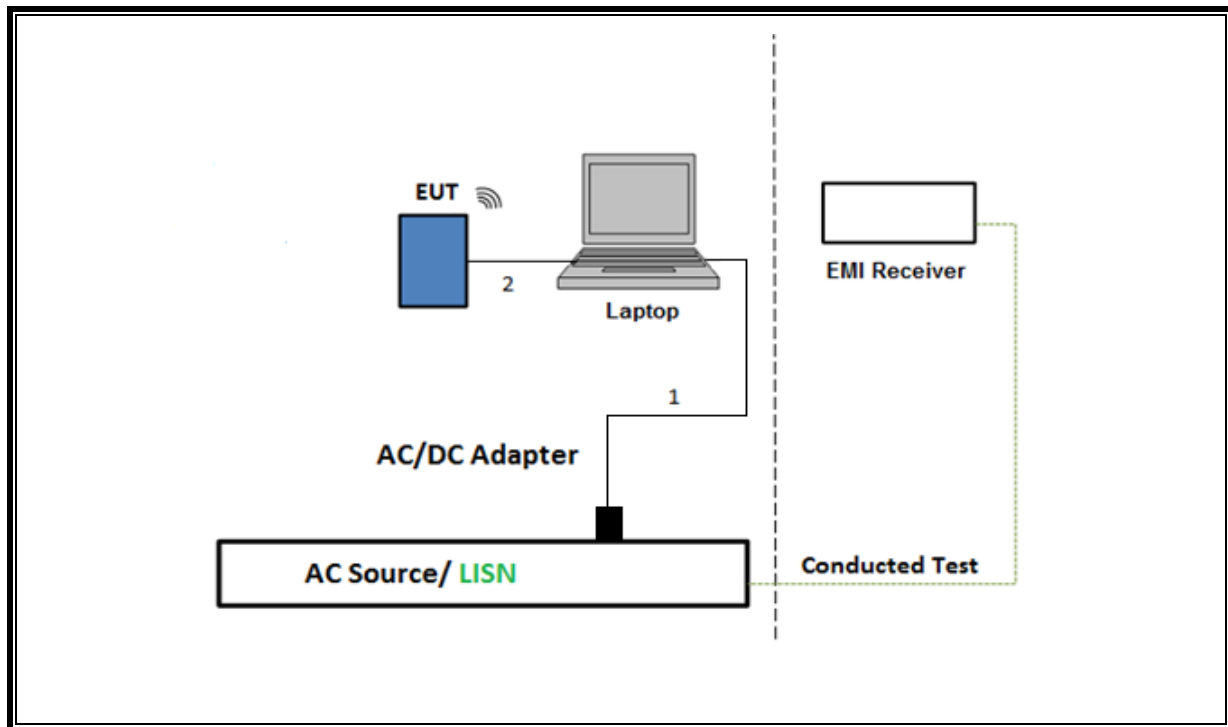
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description		Manufacturer	Model	Serial Number		FCC ID/ DoC
Laptop		Apple	Macbook Pro	C02VD7SAHV22		BCGA1708
Laptop AC/DC adapter		Liteon Technology	A1424	NSW25679		DoC
EUT AC/DC adapter		Apple	A1720	C3D8417A7R93KVPA8		DoC
Conducted Switch Box		UL	n/a	208281		N/A
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	SMA	1	SMA	Shielded	0.2	To the spectrum Analyzer
2	Antenna	1	SMA	Shielded	0.2	EUT to Switchbox
3	USB	1	USB-C	Shield	1.0	N/A
4	DC	1	DC	Shield	2.0	N/A
I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	DC	Shielded	2	N/A
2	USB	1	USB-C	Shielded	1	N/A

TEST SETUP

The EUT setup is shown below. Test software exercised the radio card.

SETUP DIAGRAM FOR CONDUCTED TESTS**SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz (1 to 26GHz)**

SETUP DIAGRAM FOR 30-1000MHz and AC LINE CONDUCTED TEST**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	ID Num	Cal Due
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200896	2027-03-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 2.0	216812	2027-07-31
EMI Test Receiver	Rohde & Schwarz	ESW44	230548	2027-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	222740	2026-09-30
Antenna, Hybrid 30-1000MHz	SUNAR	JB3	82258	2026-10-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 1.0	171389	2027-03-30
EMI Test Receiver	Rohde & Schwarz	ESW44	226078	2027-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	81887	2027-03-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 2.0	225575	2027-01-30
EMI Test Receiver	Rohde & Schwarz	ESW44	201498	2027-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	206805	2027-08-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 2.0	226781	2027-05-31
EMI Test Receiver	Rohde & Schwarz	ESW44	223459	2027-02-28
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 1.0	250156	2026-10-31
EMI Test Receiver	Rohde & Schwarz	ESW44	191428	2027-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200897	2027-05-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 2.0	230878	2027-05-31
EMI Test Receiver	Rohde & Schwarz	ESW44	169935	2027-03-18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	223084	2026-12-31
RF Filter Box, 1-18GHz	UL-FR1	UL RATS 2.0	231875	2026-12-31
EMI Test Receiver	Rohde & Schwarz	ESW44	170063	2027-02-28
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	202329	2027-04-30
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	170647	2027-03-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223460	2027-02-28
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	172363	2027-05-31
Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171580	2027-06-30
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO-METRICS	EM-6871	170014	2027-09-30
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO-METRICS	EM-6872	170016	2027-09-30
Spectrum Analyzer, PXA, 3Hz to 44GHz	N9030A	Keysight Technologies Inc	80397	2027-01-31
Spectrum Analyzer, PXA, 3Hz to 44GHz	N9030A	Keysight Technologies Inc	85313	2027-01-31
Conducted Switch Box	UL-FR1	CSB	245775	2027-01-31
Conducted Switch Box	UL-FR1	CSB	245781	2026-12-31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2027-01-31
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	257702	2027-01-31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90733	2027-01-31
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	257705	2027-01-31

AC Line Conducted				
Description	Manufacturer	Model	ID Num	Cal Due
EMI TEST RECEIVER	Rohde & Schwarz	ESCI7	82297	2027-02-28
LISN	Fischer Custom Communications	FCC-LISN-50/250-25-2-01-480V	175765	2027-01-31
Transient Limiter	TE	TBFL1	207996	2026-12-30
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Aug 15, 2025 Ver 9.5, Dec 15, 2025	
Conducted Software	UL	Station Tool	V2026.6.0	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, Aug 25, 2025	

*Testing is completed before equipment calibration due date.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

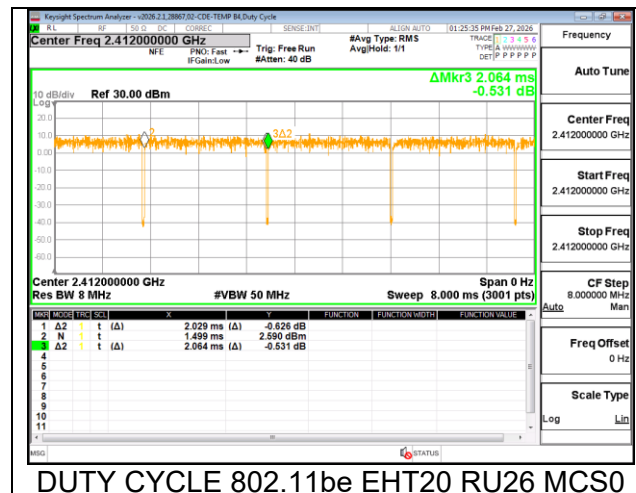
ANSI C63.10 Subclause 11.6.

ON TIME AND DUTY CYCLE RESULTS

Mode	Tone	Data Rate (Mbps)	ON Time T (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
b	--	1Mbps	12.43	12.450	0.9984	99.84%	0.00	0.010
HT20	--	MCS0	3.830	3.855	0.9935	99.35%	0.00	0.010
	--	MCS7	4.005	4.030	0.9938	99.38%	0.00	0.010
EHT20	SU	MCS0	4.620	4.645	0.9946	99.46%	0.00	0.010
		MCS9	5.413	5.433	0.9963	99.63%	0.00	0.010
	26	MCS0	2.029	2.064	0.9830	98.30%	0.00	0.010
		MCS9	2.029	2.067	0.9816	98.16%	0.00	0.010

Note: The duty cycle of 2TX is the same as that of 1TX.

DUTY CYCLE PLOT



8.2. 99% BANDWIDTH LIMITS

None; for reporting purposes only.

TEST PROCEDURE

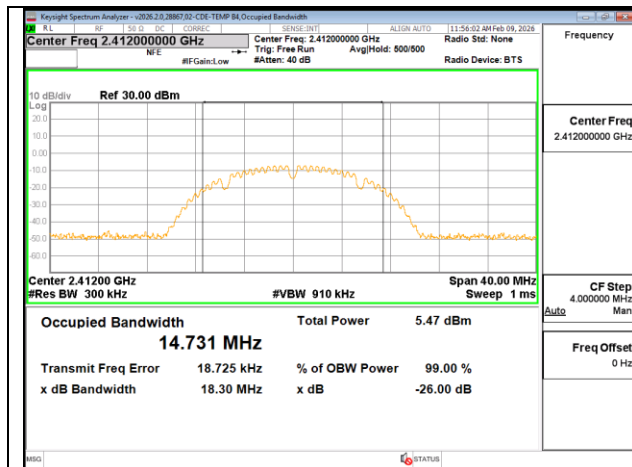
ANSI C63.10 Subclause 6.9.3.

RESULTS

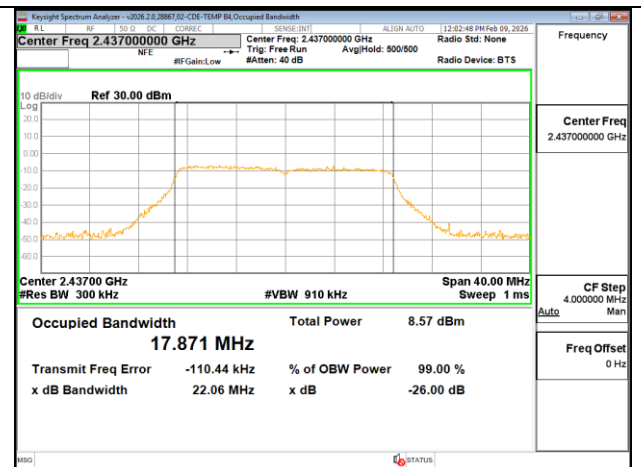
Both SISO and MIMO modes have been investigated. And the results are similar between these modes. The SISO mode data represents the MIMO mode and is reported as below.

SISO MODE

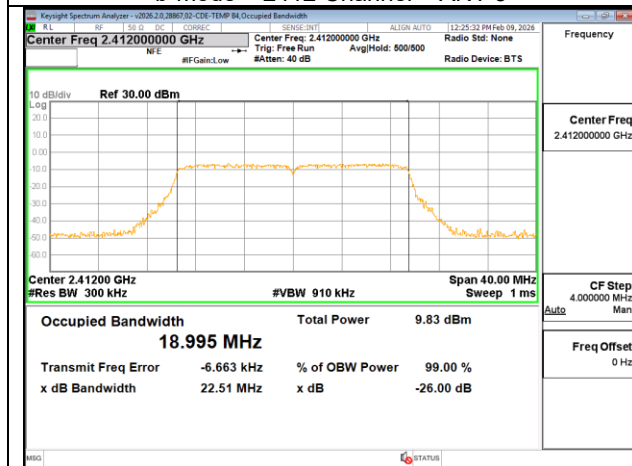
Mode	Frequency (MHz)	Channel Number	Tone	RU Index	99% Bandwidth (MHz)	
					ANT 4	ANT 3
b	2412	1	--	--	14.599	14.731
	2437	6	--	--	14.696	14.475
	2472	13	--	--	14.730	14.382
HT20	2412	1	--	--	17.834	17.868
	2437	6	--	--	17.871	17.775
	2472	13	--	--	17.719	17.594
EHT20	2412	1	SU	--	18.983	18.995
			26	0	18.738	18.698
				4	17.129	17.179
				8	18.377	18.669
	2437	6	SU	--	18.978	18.947
			26	0	18.603	18.619
				4	17.184	17.034
				8	18.595	18.666
	2472	13	SU	--	18.963	18.829
			26	0	18.353	18.031
				4	17.246	17.040
				8	18.564	18.448

WORST MAXIMUM PLOTS

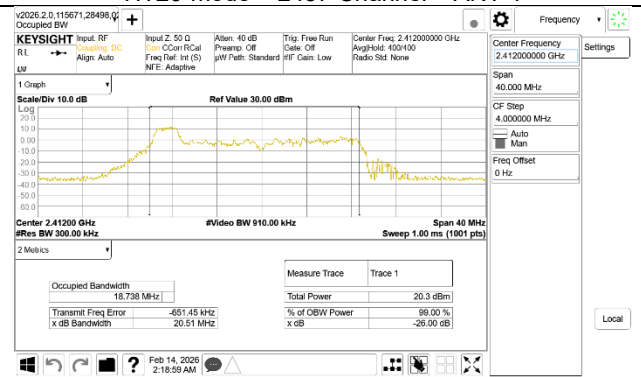
b-mode - 2412 Channel - ANT 3



HT20-mode - 2437 Channel - ANT 4



EHT20-mode - 2412 Channel - SU - ANT 3



EHT20-mode - 2412 Channel - Partial RU0 - ANT 4

8.3. 6dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 6.3.1 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

ANSI C63.10 Subclause -11.8.1 Option 1

RESULTS

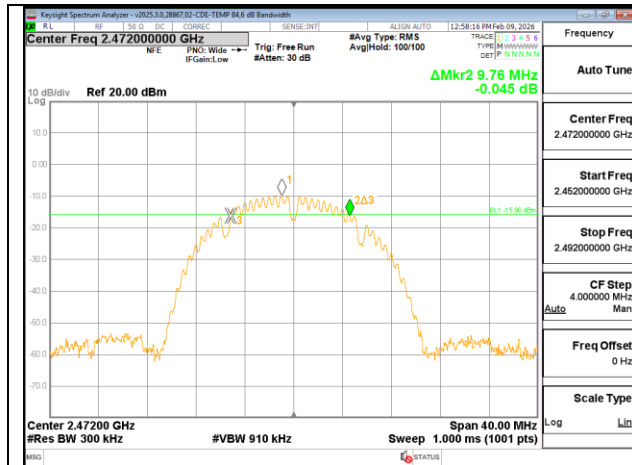
The 6dB bandwidth was measured for the narrowest bandwidth mode, b-Mode and 11be-Mode 26-Tones, as the worst case to demonstrate compliance with the minimum required bandwidth of 500 kHz to cover all OFDMA modes.

8.3.1. 802.11b/n/be SISO MODE

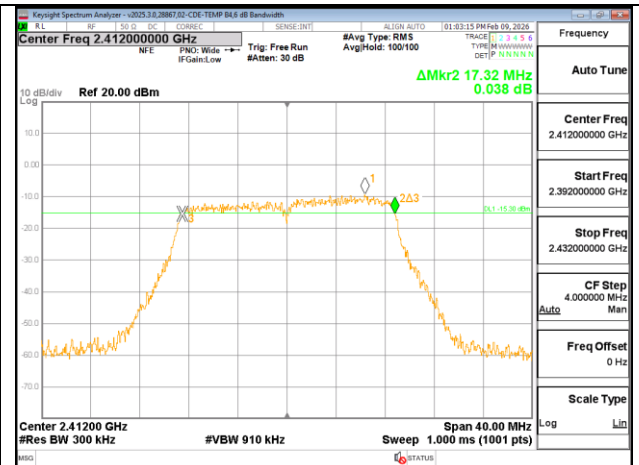
Mode (SISO)	Frequency (MHz)	Channel Number	Tone	RU Index	6dB Bandwidth (MHz)	
					ANT 4	ANT 3
b	2412	1	--	--	9.80	10.28
	2437	6	--	--	10.24	10.24
	2472	13	--	--	9.76	10.16
HT20	2412	1	--	--	17.32	17.56
	2437	6	--	--	17.68	17.64
	2472	13	--	--	17.56	17.60
EHT20	2412	1	SU	--	18.80	19.04
			26	0	2.00	1.96
				4	2.56	2.48
				8	2.08	2.12
	2437	6	SU	--	19.00	19.04
			26	0	2.12	2.08
				4	2.60	2.76
				8	2.24	2.12
	2472	13	SU	--	19.00	18.64
			26	0	2.04	1.92
				4	2.72	2.48
				8	2.16	2.04

8.3.2. 802.11b/n/be MIMO CDD MODE

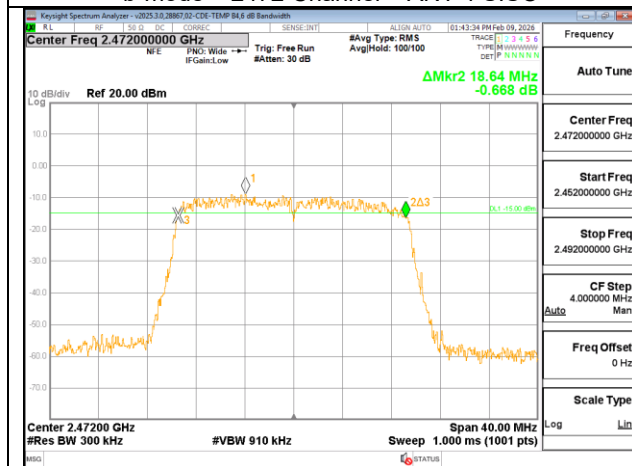
Mode (MIMO)	Frequency (MHz)	Channel Number	Tone	RU Index	6dB Bandwidth (MHz)	
					ANT 4	ANT 3
11b	2412	1	--	--	10.24	10.24
	2437	6	--	--	10.20	10.20
	2472	13	--	--	9.76	10.24
HT20	2412	1	--	--	17.56	17.64
	2437	6	--	--	17.64	17.68
	2472	13	--	--	17.4	17.64
EHT20	2412	1	SU	--	19	19.04
			26	0	2.00	2.16
				4	2.68	2.72
				8	2.08	2.08
	2437	6	SU	--	19.08	19
			26	0	1.92	1.96
				4	2.56	2.6
				8	2.04	2
	2472	13	SU	--	18.88	18.72
			26	0	2.12	2.12
				4	2.68	2.56
				8	2.04	2.08

WORST MINIMUM PLOTS

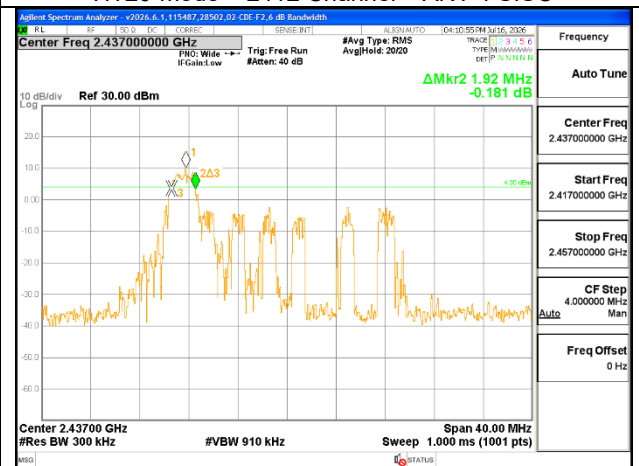
b-mode – 2472 Channel – ANT 4 SISO



HT20-mode – 2412 Channel – ANT 4 SISO



EHT20-mode – 2472 Channel – SU – ANT 3 SISO



EHT20-mode – 2437 Channel – Partial RU0 – ANT 4 MIMO

8.4. OUTPUT POWER AND POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (b) (3) & (e)

RSS-247 6.3.2 & 6.3.1 (b)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Conducted Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM G (Measurement using an RF average-reading power meter).

Power Spectral Density: ANSI C63.10 Subclause -11.10.3 Method AVGPS-1

DIRECTIONAL ANTENNA GAIN

For 1 TX:

There is only one transmitter output; therefore, the directional gain is equal to the antenna gain.

For 2 TX:

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting CDD in all MIMO modes. The directional gains are as follows:

Band (GHz)	ANT 4 Gain (dBi)	ANT 3 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.40	-0.50	-3.00	-2.80	0.00

RESULTS

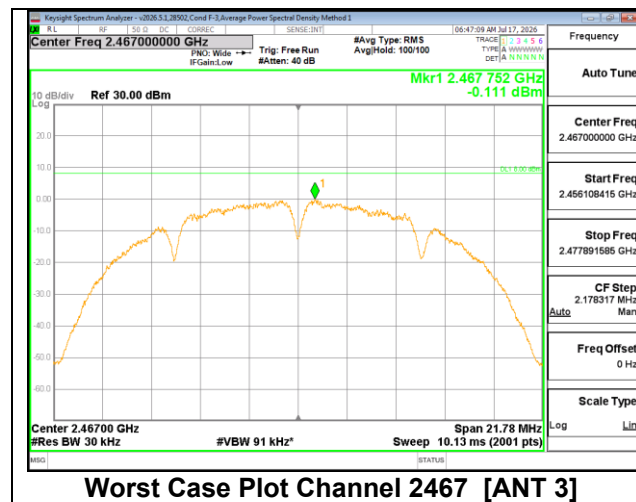
Only the worst-case plot is reported to show that the analyzer's settings.

Note: RBW setting is used greater than or equal to 3kHz on PSD measurement

8.4.1. 802.11b SISO MODE

DCCF (dB)	0.00
ANT 4 (dBi)	-0.50
ANT 3 (dBi)	-3.00

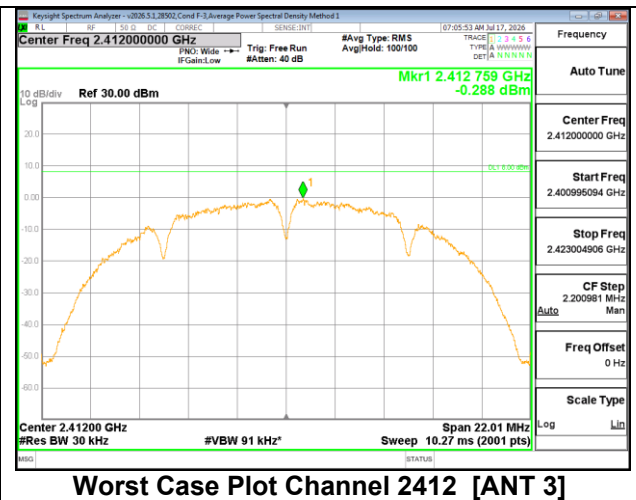
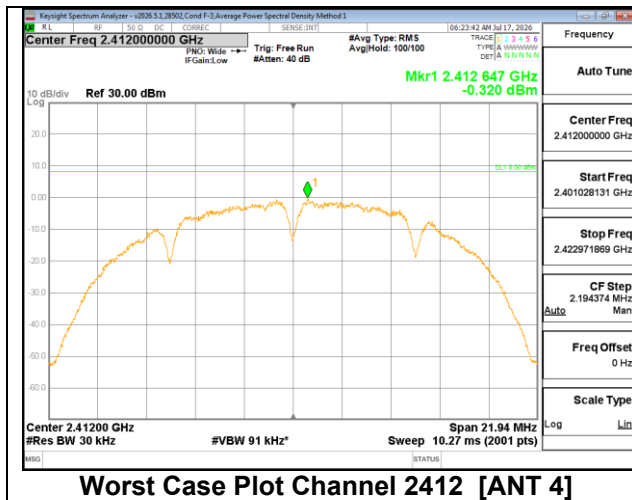
Mode (SISO)	Freq (MHz)	Ch. #	Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/3kHz)		PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)	
			ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3
b	2412	1	30.00	30.00	21.48	21.33	21.48	21.33	8.000	8.000	-0.399	-0.210	-0.399	-0.210
	2437	6			21.49	21.49	21.49	21.49			-0.748	-0.349	-0.748	-0.349
	2462	11			21.42	21.28	21.42	21.28			-0.311	-0.397	-0.311	-0.397
	2467	12			21.41	21.43	21.41	21.43			-0.401	-0.111	-0.401	-0.111
	2472	13			20.26	20.81	20.26	20.81			-1.705	-0.952	-1.705	-0.952



8.4.2. 802.11b MIMO MODE

DCCF (dB)	0.00
Uncorrelated Gain	-2.80
Correlated Gain	0.00

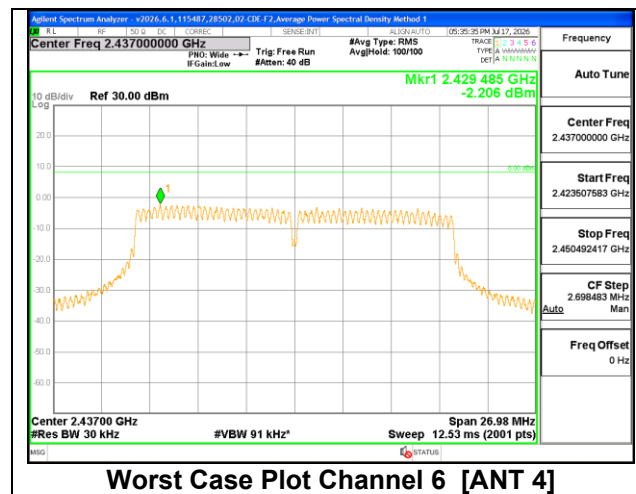
Mode (SISO)	Freq (MHz)	Ch. #	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/3kHz)	PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)
				ANT 4	ANT 3			ANT 4	ANT 3	
11b	2412	1	30.00	21.47	21.43	24.46	8.000	-0.320	-0.288	2.706
	2437	6		21.46	21.47	24.48		-0.797	-0.273	2.483
	2462	11		21.44	21.34	24.40		-0.498	-0.216	2.656
	2467	12		20.37	20.30	23.35		-0.810	-1.047	2.083
	2472	13		19.42	19.30	22.37		-2.154	-1.799	1.037



8.4.3. 802.11n HT20 SISO MODE

DCCF (MCS0) (dB)	0.00
ANT 4 (dBi)	-0.50
ANT 3 (dBi)	-3.00

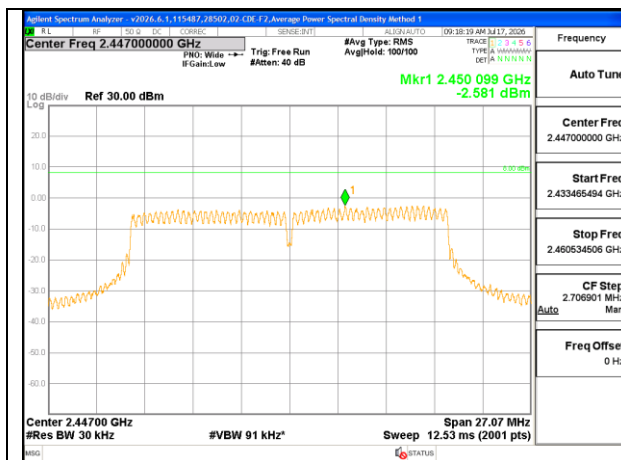
Mode (SISO)	Freq (MHz)	Ch. #	Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/3kHz)		PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)	
			ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3
HT20	2412	1	30.00	30.00	17.52	17.92	17.52	17.92	8.000	8.000	-6.175	-6.323	-6.175	-6.323
	2417	2			20.32	20.90	20.32	20.90			-3.402	-3.080	-3.402	-3.080
	2422	3			21.36	21.41	21.36	21.41			-2.737	-2.688	-2.737	-2.688
	2437	6			21.45	21.46	21.45	21.46			-2.206	-2.772	-2.206	-2.772
	2452	9			21.45	21.40	21.45	21.40			-2.242	-2.905	-2.242	-2.905
	2457	10			20.32	20.91	20.32	20.91			-2.956	-3.295	-2.956	-3.295
	2462	11			18.48	18.95	18.48	18.95			-5.577	-5.194	-5.577	-5.194
	2467	12			17.35	16.86	17.35	16.86			-6.212	-7.692	-6.212	-7.692
	2472	13			12.86	13.93	12.86	13.93			-9.992	-10.366	-9.992	-10.366



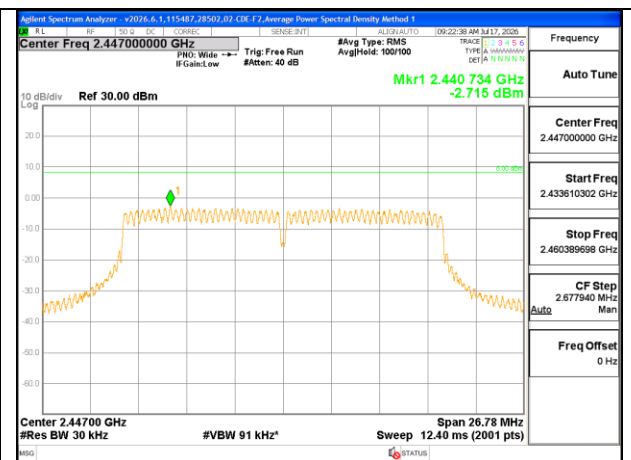
8.4.4. 802.11n HT20 MIMO MODE

DCCF (MCS0) (dB)	0.00
Uncorrelated Gain	-2.80
Correlated Gain	0.00

Mode (SISO)	Freq (MHz)	Ch. #	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/3kHz)	PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)
				ANT 4	ANT 3			ANT 4	ANT 3	
HT20	2412	1	30.00	17.99	17.91	20.96	8.000	-5.437	-6.635	-2.985
	2417	2		19.84	19.96	22.91		-3.817	-4.101	-0.946
	2422	3		21.35	21.40	24.39		-2.432	-2.880	0.360
	2437	6		21.47	21.45	24.47		-2.538	-2.903	0.294
	2447	8		21.42	21.42	24.43		-2.581	-2.715	0.363
	2452	9		20.49	20.49	23.50		-3.014	-3.800	-0.379
	2457	10		19.87	19.99	22.94		-3.826	-4.673	-1.219
	2462	11		17.99	17.98	21.00		-5.853	-6.450	-3.131
	2467	12		16.44	16.43	19.44		-6.782	-8.061	-4.364
	2472	13		13.87	13.98	16.93		-9.192	-10.472	-6.775



Worst Case Plot Channel 8 [ANT 4]

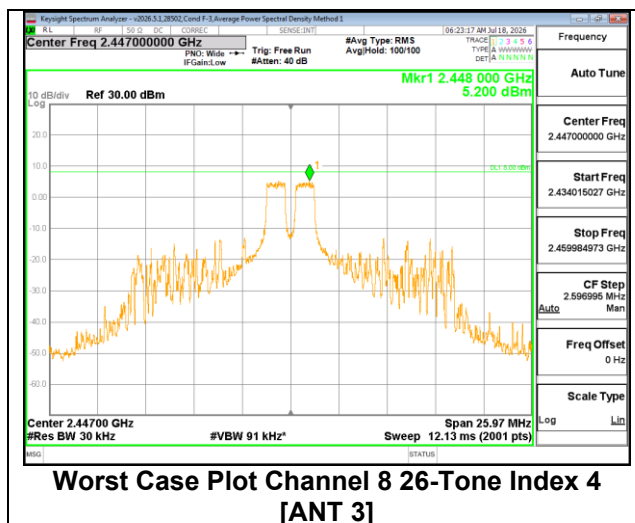


Worst Case Plot Channel 8 [ANT 3]

8.4.5. 802.11be EHT20 SISO MODE

	SU	26 Tone
DCCF (MCS0) (dB)	0.00	0.00
ANT 4 (dBi)	-0.50	
ANT 3 (dBi)	-3.00	

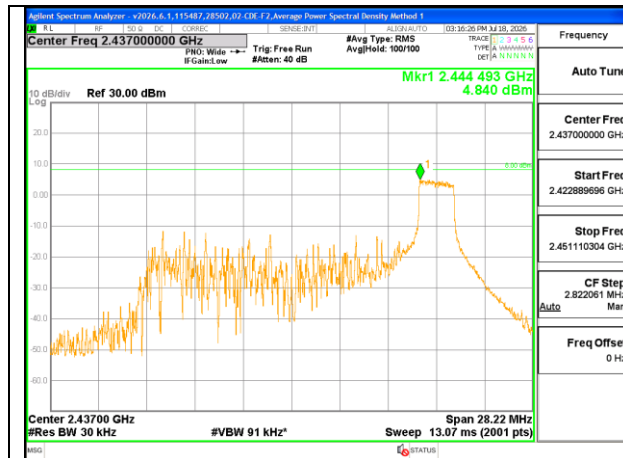
Mode (SISO)	Freq (MHz)	Ch. #	Tone	RU Index	Power Limit (dBm)		Output Power (Gated) (dBm)		Total Corrected Power (dBm)		PSD Limit (dBm/3kHz)		PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)	
					ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3	ANT 4	ANT 3
EHT20	2412	1	SU	--	30.00	30.00	17.48	17.38	17.48	17.38	8.000	8.000	-7.790	-7.910	-7.790	-7.910
			0				16.49	16.47	16.49	16.47			0.247	-0.324	0.247	-0.324
			26	4			16.45	16.49	16.45	16.49			-0.355	-0.125	-0.355	-0.125
			8				16.45	16.35	16.45	16.35			-0.524	-0.361	-0.524	-0.361
	2417	2	SU	--			19.99	19.43	19.99	19.43			-5.251	-5.745	-5.251	-5.745
			0				18.98	19.48	18.98	19.48			2.114	2.816	2.114	2.816
			26	4			18.94	19.46	18.94	19.46			1.928	2.802	1.928	2.802
			8				18.87	19.49	18.87	19.49			2.037	2.981	2.037	2.981
	2422	3	SU	--			21.25	21.34	21.25	21.34			-3.961	-4.005	-3.961	-4.005
			0				21.49	21.40	21.49	21.40			4.661	4.812	4.661	4.812
			26	4			21.35	21.41	21.35	21.41			4.349	5.139	4.349	5.139
			8				21.43	21.34	21.43	21.34			4.814	4.919	4.814	4.919
	2437	6	SU	--			21.43	21.40	21.43	21.40			-3.850	-4.049	-3.850	-4.049
			0				21.46	21.43	21.46	21.43			4.486	4.755	4.486	4.755
			26	4			21.47	21.37	21.47	21.37			4.431	4.713	4.431	4.713
			8				21.46	21.49	21.46	21.49			4.324	4.657	4.324	4.657
	2447	8	SU	--			21.38	21.40	21.38	21.40			-3.620	-4.434	-3.620	-4.434
			0				21.43	21.40	21.43	21.40			4.579	5.130	4.579	5.130
			26	4			21.38	21.42	21.38	21.42			4.508	5.200	4.508	5.200
			8				21.32	21.42	21.32	21.42			4.430	4.954	4.430	4.954
	2452	9	SU	--			20.83	21.40	20.83	21.40			-4.252	-3.910	-4.252	-3.910
			0				19.99	20.44	19.99	20.44			3.266	4.013	3.266	4.013
			26	4			19.92	20.45	19.92	20.45			3.004	4.033	3.004	4.033
			8				19.89	20.40	19.89	20.40			3.199	4.417	3.199	4.417
	2457	10	SU	--			20.15	20.18	20.15	20.18			-4.766	-5.422	-4.766	-5.422
			0				19.16	19.06	19.16	19.06			2.626	2.788	2.626	2.788
			26	4			18.95	19.06	18.95	19.06			2.578	2.752	2.578	2.752
			8				19.00	19.00	19.00	19.00			2.417	2.858	2.417	2.858
	2462	11	SU	--			17.83	17.43	17.83	17.43			-7.428	-8.243	-7.428	-8.243
			0				16.90	16.41	16.90	16.41			0.566	0.097	0.566	0.097
			26	4			16.94	16.47	16.94	16.47			0.221	0.153	0.221	0.153
			8				16.86	16.47	16.86	16.47			0.118	-0.204	0.118	-0.204
	2467	12	SU	--			16.80	16.33	16.80	16.33			-7.799	-9.229	-7.799	-9.229
			0				14.88	15.47	14.88	15.47			-1.178	-0.535	-1.178	-0.535
			26	4			14.84	15.36	14.84	15.36			-1.876	-1.303	-1.876	-1.303
			8				14.88	15.43	14.88	15.43			-1.582	-1.341	-1.582	-1.341
	2472	13	SU	--			9.88	10.43	9.88	10.43			-15.173	-14.960	-15.173	-14.960
			0				0.89	1.47	0.89	1.47			-15.635	-14.740	-15.635	-14.740
			26	4			0.90	1.49	0.90	1.49			-15.911	-15.251	-15.911	-15.251
			8				0.92	1.38	0.92	1.38			-15.731	-14.598	-15.731	-14.598



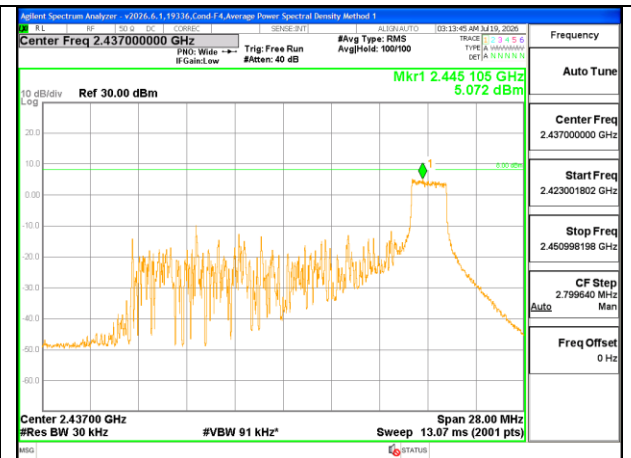
8.4.6. 802.11be EHT20 MIMO MODE

	SU	26 Tone
DCCF (MCS0) (dB)	0.00	0.00
Uncorrelated Gain	-2.80	-2.80
Correlated Gain	0.00	0.00

Mode (MIMO)	Freq (MHz)	Ch. #	Tone	RU Index	Power Limit (dBm)	Output Power (Gated) (dBm)		Total MIMO Corrected Power (dBm)	PSD Limit (dBm/3kHz)	PSD (dBm/kHz)		Total Corrected PSD (dBm/kHz)
						ANT 4	ANT 3			ANT 4	ANT 3	
EHT20	2412	1	SU	—	30.00	16.38	16.37	19.39	8.0	-8.426	-8.918	-5.655
			26	0		15.42	15.37	18.41		-1.350	-0.721	1.986
				4		15.42	15.36	18.40		-1.391	-1.016	1.811
				8		15.42	15.38	18.41		-1.514	-0.737	1.902
	2417	2	SU	—		18.39	18.40	21.40		-6.904	-7.030	-3.956
			26	0		17.41	17.37	20.40		0.881	0.779	3.841
				4		17.37	17.35	20.37		0.911	0.773	3.853
				8		17.43	17.40	20.43		0.945	0.916	3.941
	2422	3	SU	—		21.45	21.37	24.42		-4.121	-3.767	-0.930
			26	0		21.42	21.40	24.42		4.777	4.852	7.825
				4		21.43	21.39	24.42		4.533	4.776	7.666
				8		21.42	21.43	24.44		4.864	4.747	7.816
	2437	6	SU	—		21.39	21.40	24.41		-3.772	-3.995	-0.872
			26	0		21.41	21.37	24.40		4.691	5.066	7.893
				4		21.44	21.35	24.41		4.921	4.868	7.905
				8		21.37	21.39	24.39		4.840	5.072	7.968
	2447	8	SU	—		21.45	21.37	24.42		-3.928	-3.926	-0.917
			26	0		21.36	21.41	24.39		4.691	4.820	7.766
				4		21.37	21.38	24.39		4.921	4.965	7.953
				8		21.43	21.35	24.40		4.833	4.967	7.911
	2452	9	SU	—		19.41	19.38	22.40		-5.350	-6.220	-2.753
			26	0		18.44	18.37	21.41		1.951	2.306	5.142
				4		18.38	18.39	21.40		2.083	1.767	4.938
				8		18.45	18.42	21.45		2.157	1.400	4.805
	2457	10	SU	—		18.90	18.92	21.92		-6.462	-6.585	-3.513
			26	0		17.92	17.86	20.90		1.649	1.495	4.583
				4		17.92	17.89	20.91		1.688	1.752	4.730
				8		17.88	17.90	20.90		1.759	1.351	4.570
	2462	11	SU	—		16.92	16.89	19.91		-8.352	-8.485	-5.408
			26	0		15.88	15.91	18.90		-0.122	-0.316	2.792
				4		15.86	15.89	18.89		-0.619	-0.741	2.331
				8		15.85	15.87	18.87		-0.165	-0.592	2.637
	2467	12	SU	—		15.49	15.47	18.49		-9.051	-10.085	-6.527
			26	0		14.35	14.45	17.41		-2.522	-2.015	0.749
				4		14.45	14.43	17.45		-2.285	-2.242	0.747
				8		14.41	14.38	17.40		-2.268	-1.877	0.942
	2472	13	SU	—		8.85	8.88	11.87		-15.807	-16.413	-13.089
			26	0		-0.12	-0.12	2.89		-16.580	-16.510	-13.535
				4		-0.10	-0.08	2.92		-16.637	-16.503	-13.559
				8		-0.14	-0.05	2.92		-16.405	-16.250	-13.317



Worst Case Plot Channel 6 26-Tone Index 8
[ANT 4]



Worst Case Plot Channel 6 26-Tone Index 8
[ANT 3]

8.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 6.6

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

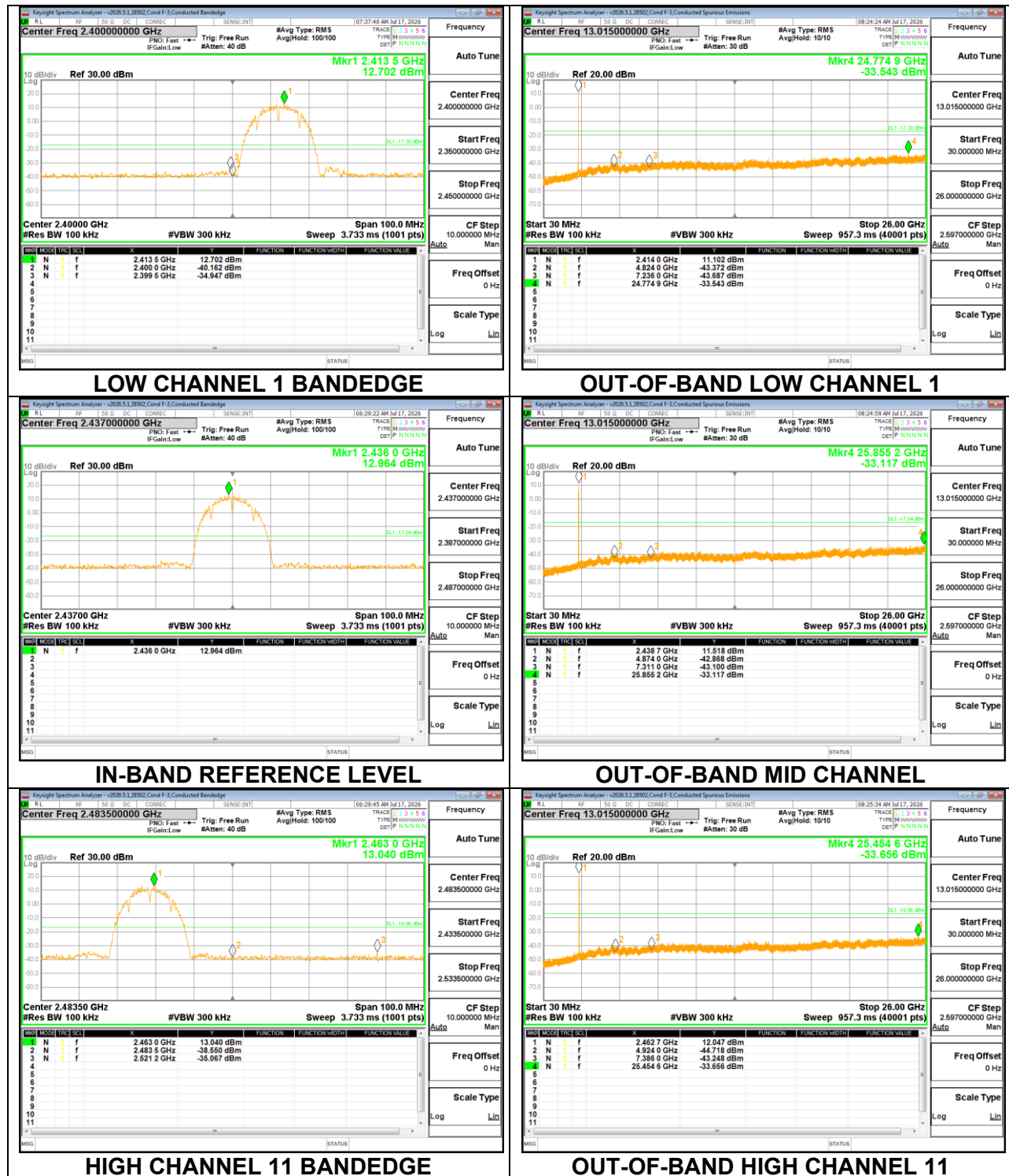
TEST PROCEDURE

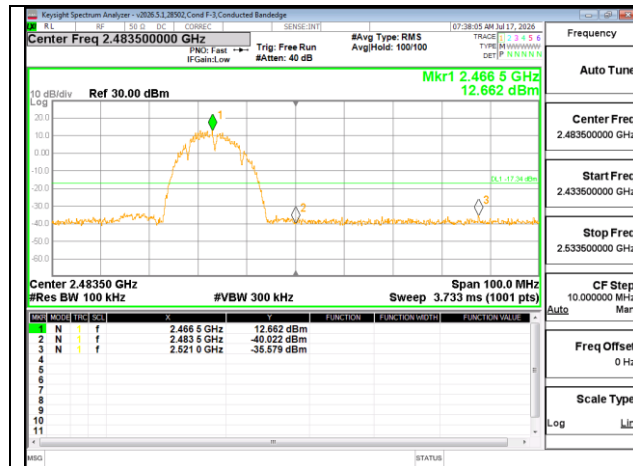
ANSI C63.10 Subclause -11.12.2

RESULTS

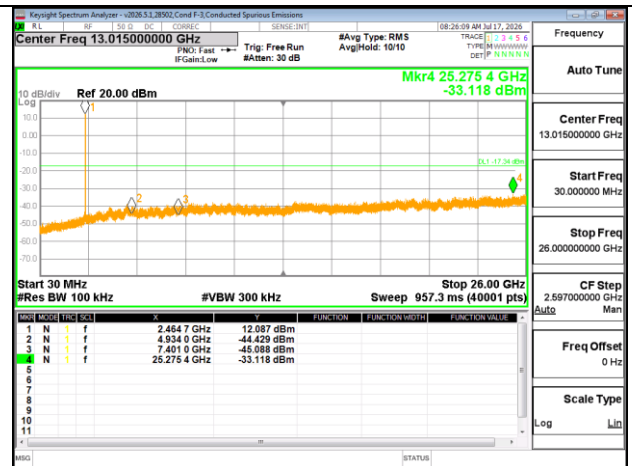
8.5.1. 802.11b MODE 1TX

1TX ANT 4 MODE

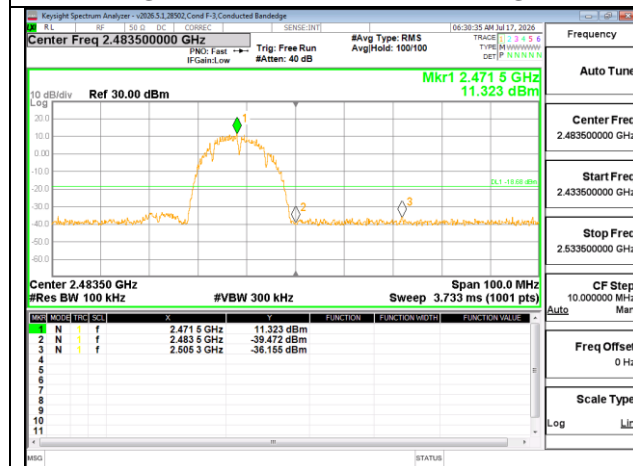




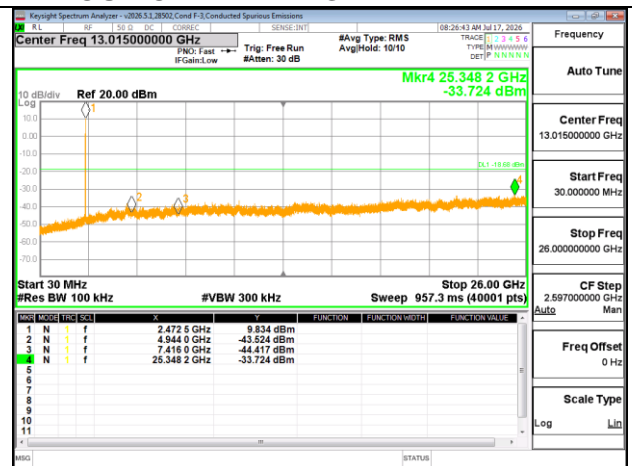
HIGH CHANNEL 12 BANDEDGE



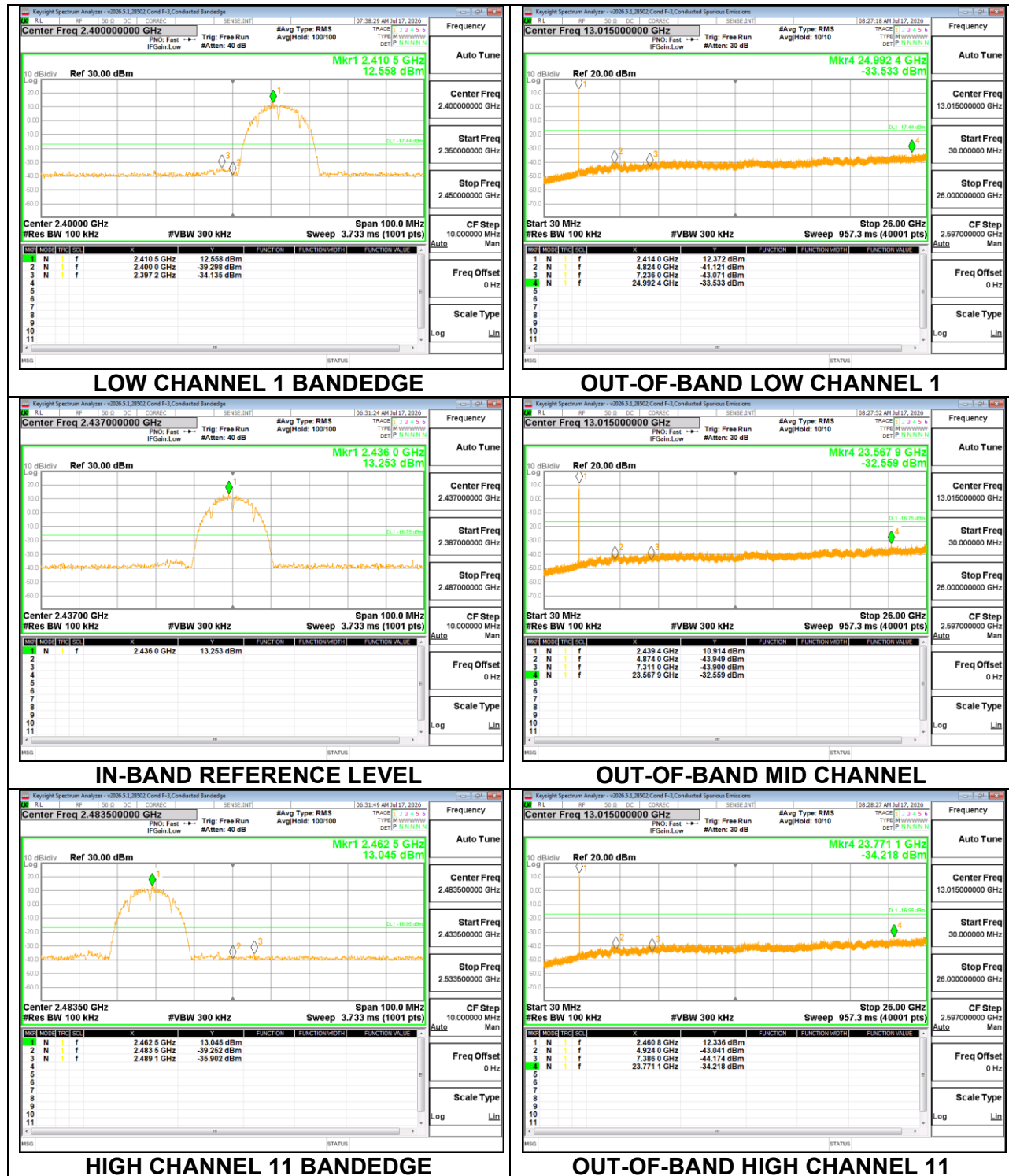
OUT-OF-BAND HIGH CHANNEL 12

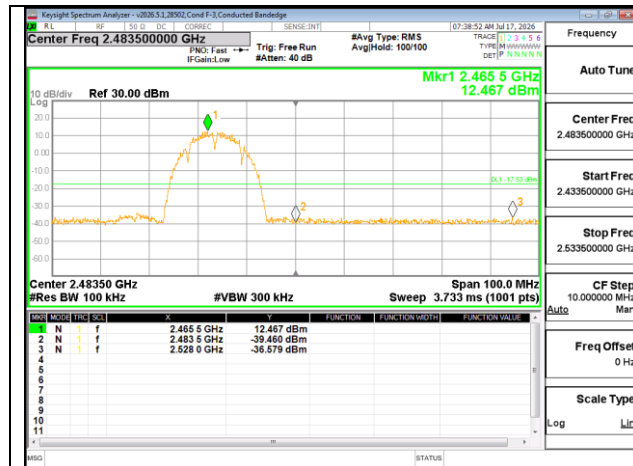


HIGH CHANNEL 13 BANDEDGE

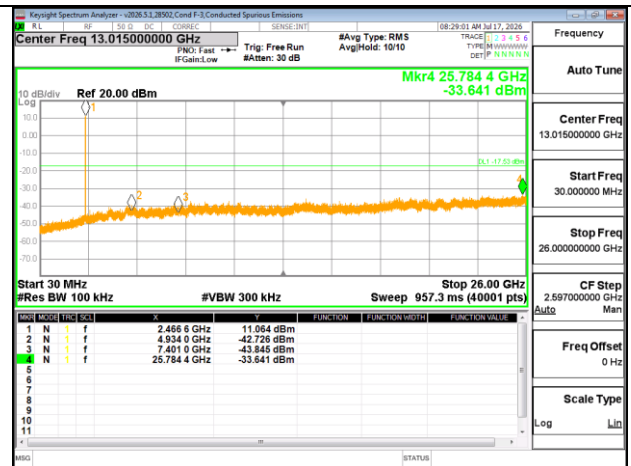


OUT-OF-BAND HIGH CHANNEL 13

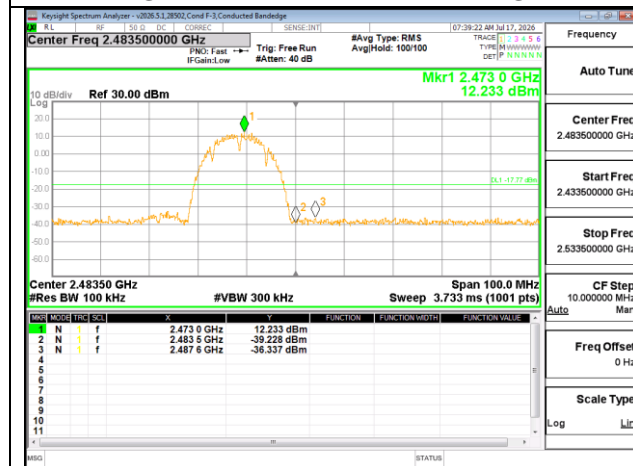
1TX ANT 3 MODE



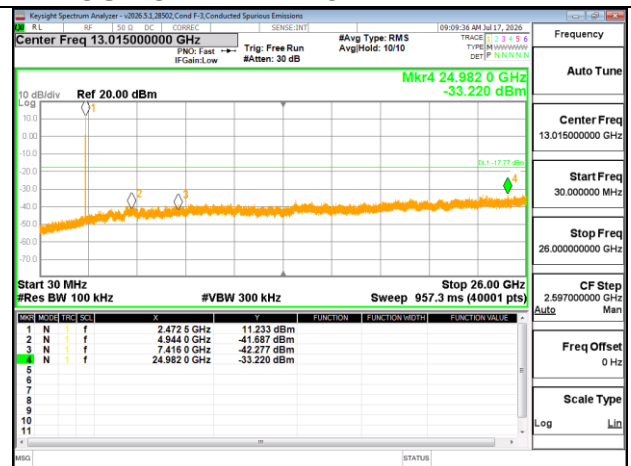
HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12



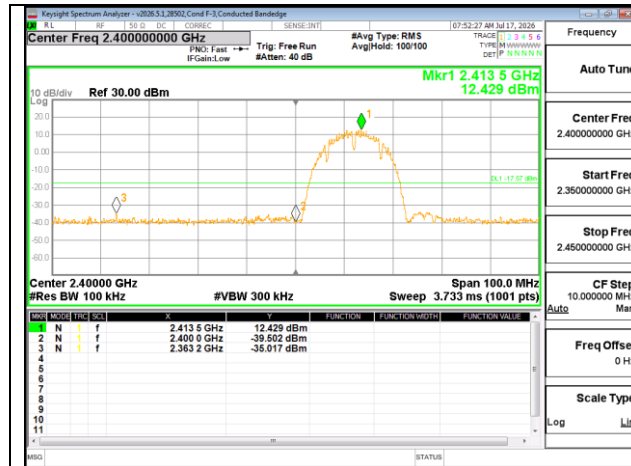
HIGH CHANNEL 13 BANDEDGE



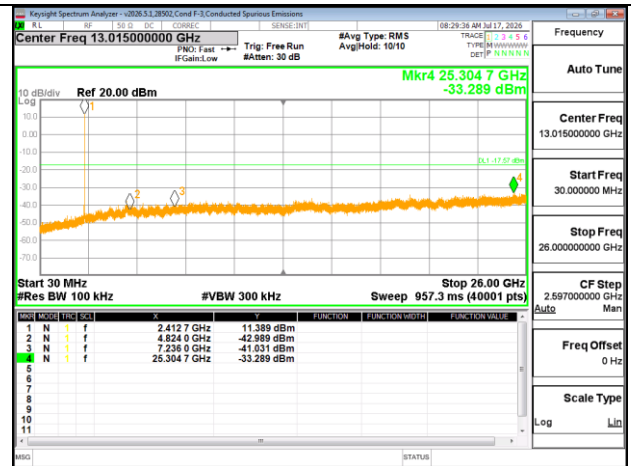
OUT-OF-BAND HIGH CHANNEL 13

8.5.2. 802.11b CDD MODE 2TX

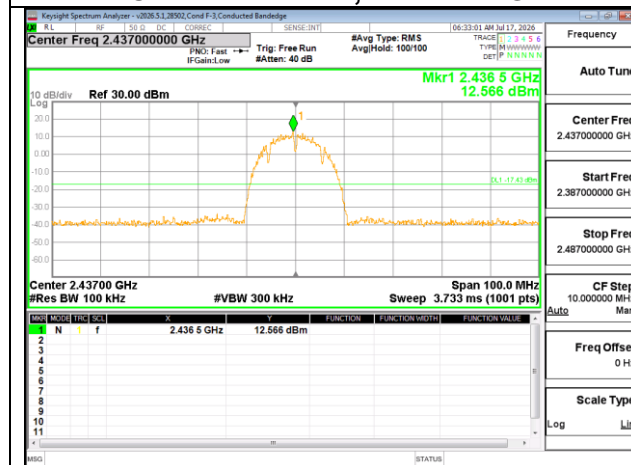
2TX ANT 4 MODE



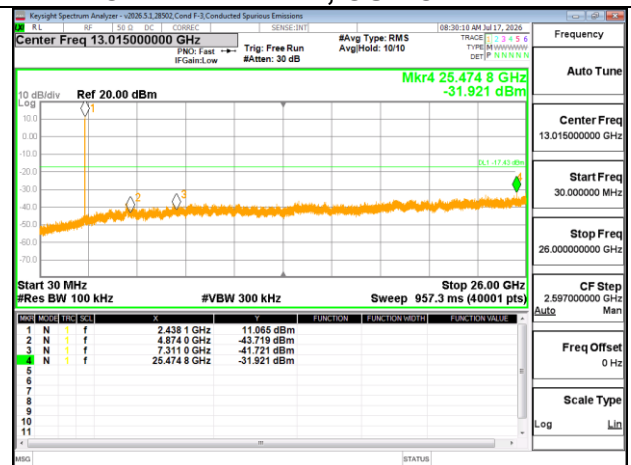
LOW CHANNEL 1, BAND-EDGE



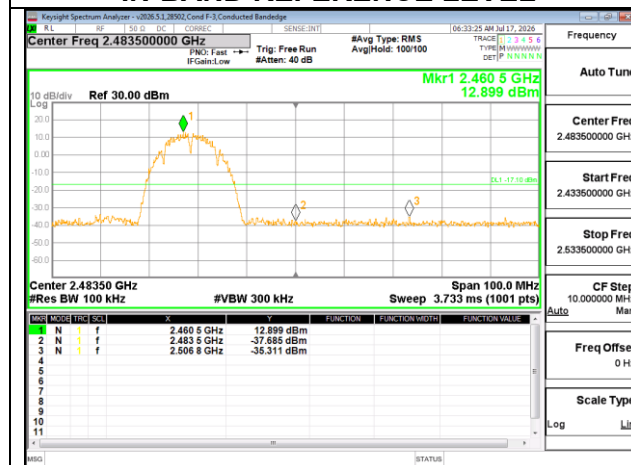
LOW CHANNEL 1, OUT-OF-BAND



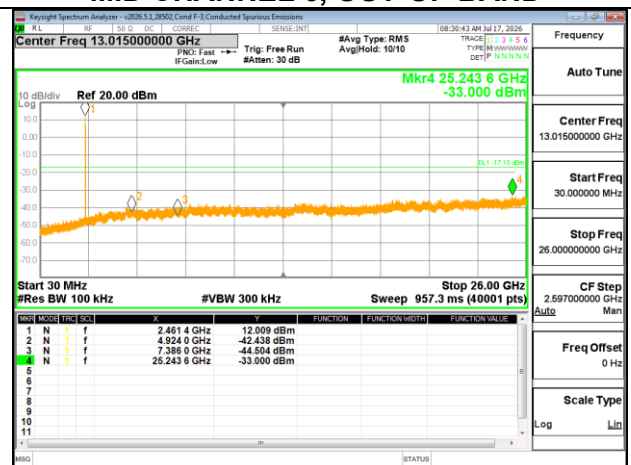
IN-BAND REFERENCE LEVEL



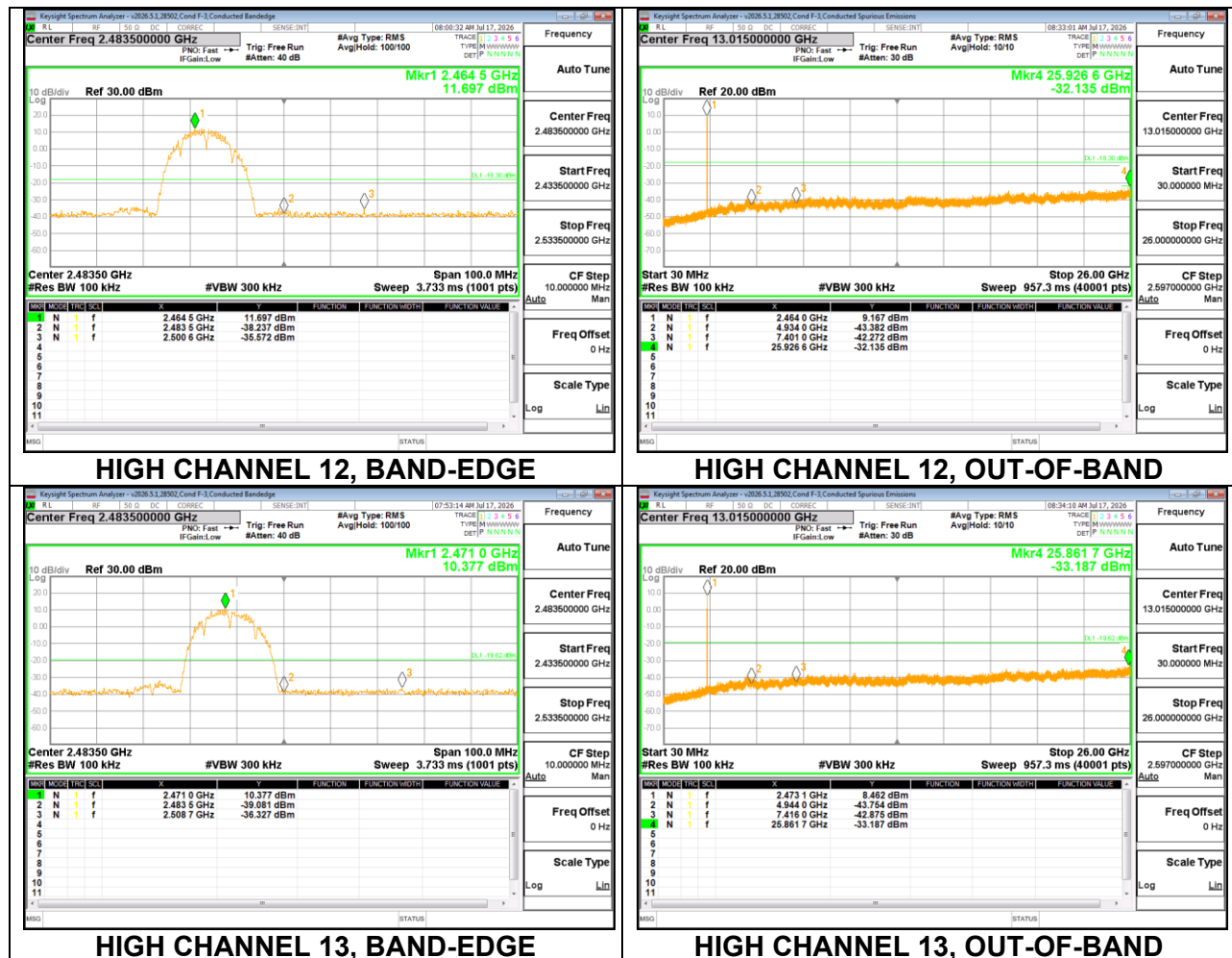
MID CHANNEL 6, OUT-OF-BAND

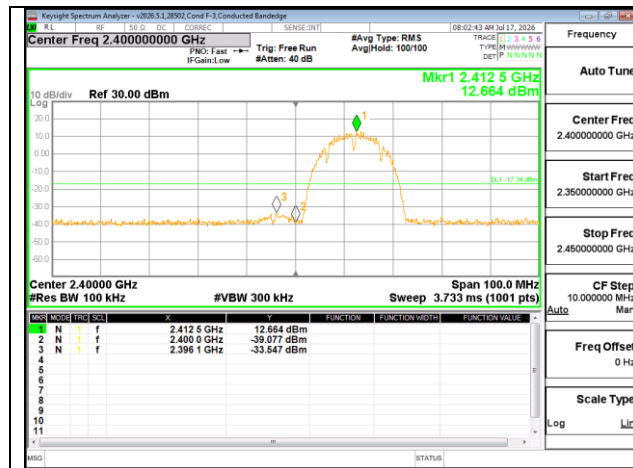
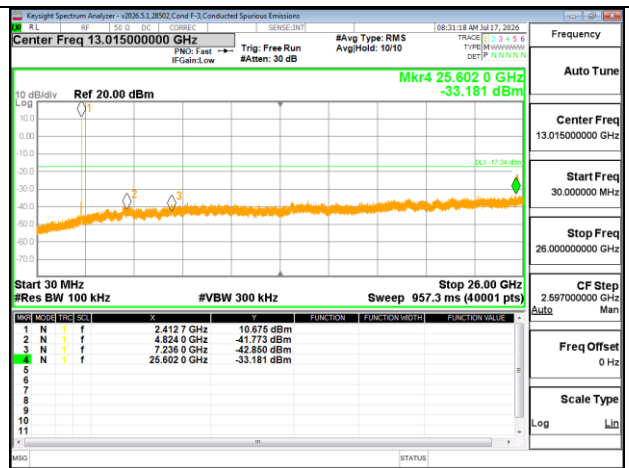
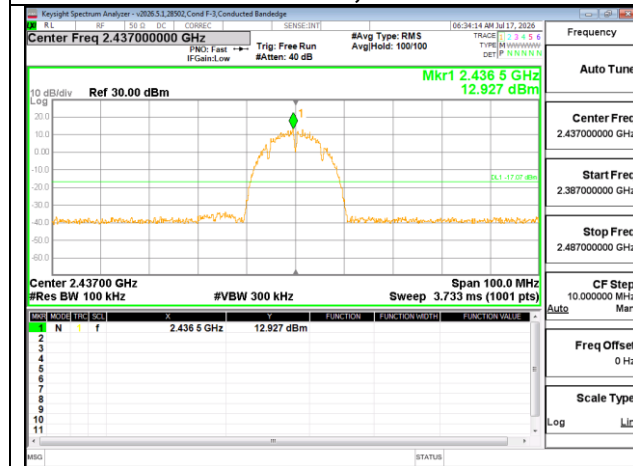
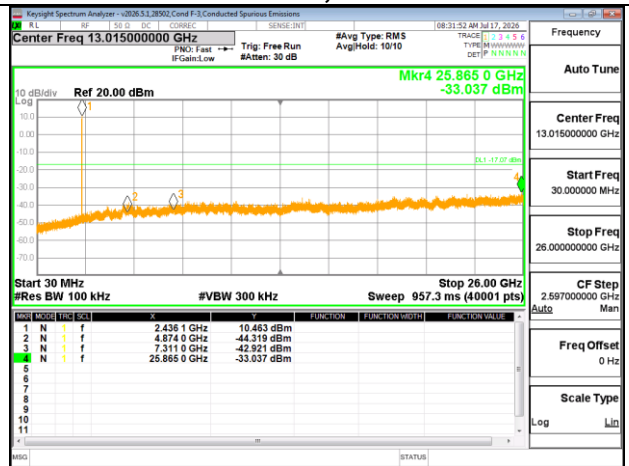
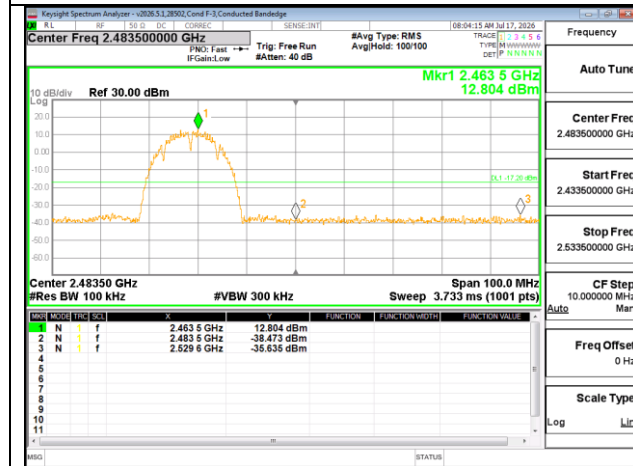
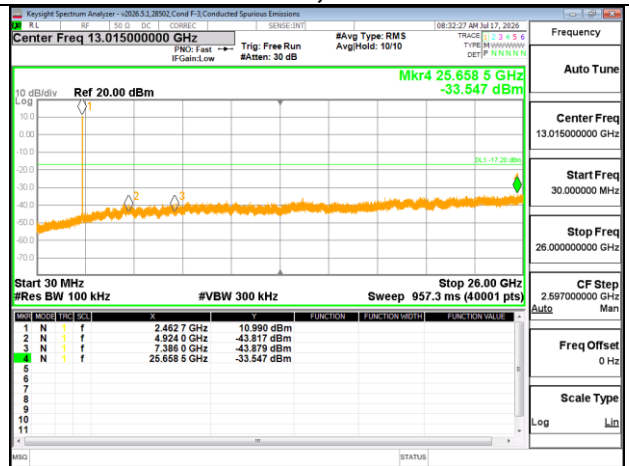


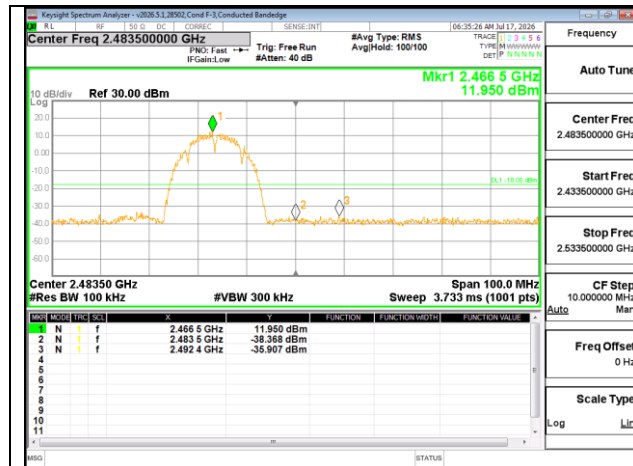
HIGH CHANNEL 11, BAND-EDGE



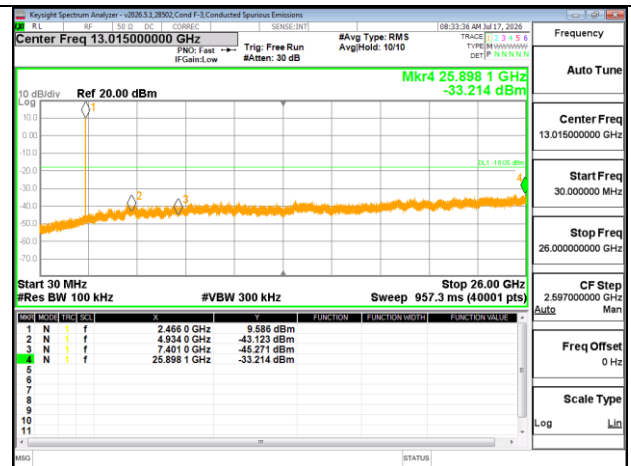
HIGH CHANNEL 11, OUT-OF-BAND



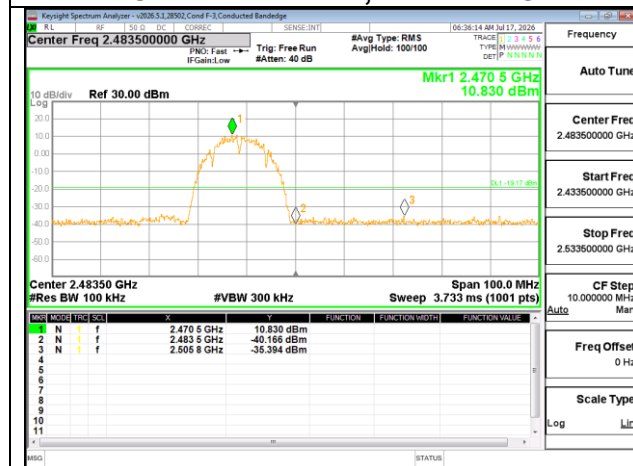
2TX ANT 3 MODE**LOW CHANNEL 1, BAND-EDGE****LOW CHANNEL 1, OUT-OF-BAND****IN-BAND REFERENCE LEVEL****MID CHANNEL 6, OUT-OF-BAND****HIGH CHANNEL 11, BAND-EDGE****HIGH CHANNEL 11, OUT-OF-BAND**



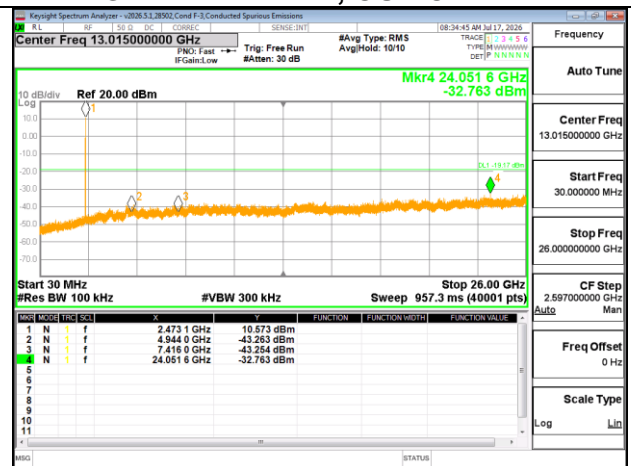
HIGH CHANNEL 12, BAND-EDGE



HIGH CHANNEL 12, OUT-OF-BAND



HIGH CHANNEL 13, BAND-EDGE



HIGH CHANNEL 13, OUT-OF-BAND

8.5.3. 802.11n HT20 SISO MODE

1TX ANT 4 MODE

