

TEST REPORT

Report Number: 14982479-E4V2

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

Model : A3084 (Parent Model)
A3295, A3296, A3297 (Variant Models)

Brand : APPLE

FCC ID : BCG-E8684A (Parent Model)
BCG-E8685A, BCG-E8686A, BCG-E8687A
(Variant Models)

IC : 579C-E8684A (Parent Model)
579C-E8685A, 579C-E8686A, 579C-E8687A
(Variant Models)

EUT : Smartphone
Description

Test : FCC 47 CFR PART 15 SUBPART C
Standard(s) ISED RSS-247 ISSUE 3
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2024/08/02

Prepared by:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024/07/31	Initial Issue	Tony Li
V2	2024/08/02	Addressed TCB Feedback on section 9 and update section 9.4	Tony Li

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: Smartphone

MODEL: A3084 (Parent Model)
 A3295, A3296, A3297 (Variant Models)

BRAND: APPLE

SERIAL NUMBER: MN2G2MKX4W, MFP0Q2YGW9, 0KPWHK6FX, MPXQTCW0F6

SAMPLE RECEIPT DATE: 2024/02/27

DATE TESTED: 2024/02/29 – 2024/07/24

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 3	Complies
ISED RSS-GEN Issue 5 + A1 + A2	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 can demonstrate 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 assure 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 considered 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 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. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



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2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Complies	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Complies	None.

3. TEST METHODOLOGY

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

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 558074 D01 v05r02 15.247 Meas Guidance
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1 + A2
- KDB 414788 D01 Radiated Test Site v01r01.
- RSS-247 Issue 3

4. FACILITIES AND ACCREDITATION

UL Verifications 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
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input checked="" type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
<input checked="" type="checkbox"/>	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 on a regular basis, with a maximum time between calibrations of one year or the manufacturers' 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
Power Spectral Density	2.466
Time Domain Measurements Using SA	3.39
RF Power Measurement Direct Method Using Power Meter	0.450 (Peak), 1.3 (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.2%
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%.

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) 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	21.99	158.12
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20	21.98	157.76
	802.11be EHT20	21.98	157.76

2Tx			
2412 -2472	802.11n HT20 CDD	24.98	314.77
	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
	802.11be EHT20	24.97	314.05

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	-2.00	-1.70

The Cable Loss as provided by the manufacturer' are as follows:

Frequency Range (GHz)	ANT 4 (dB)	ANT 3 (dB)
2.4	2.00	2.20

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 installed during testing was WiFi FW Version: 27_20_193_15.

6.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape) and Z (Portrait) on ANT 4, ANT 3, and 2TX. It was determined that Y (Landscape) orientation was worst-case orientation for ANT 3 and X (Flatbed) orientation was the worst-case orientation for ANT4 and 2TX.

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

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

Radiated emissions below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as 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/SDM modes and 2TX EHT mode with power setting equal or higher than SISO modes as worst-case scenario. G mode covered by HT20 mode since it has the same power as HT20.

Below 30MHz, 30-1000MHz emissions spurious tests were performed with EUT connected to 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. All ranges from below 30MHz, 30-1000MHz and 1 to 26.5GHz are measured at 3-meter distance. For AC line conducted emission, test was investigated with AC power adapter and with laptop.

The modulation and bandwidth of 802.11ax and 802.11be modes are similar, and the target power of 802.11ax mode is equal to or lower than that of 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.

The output power and psd for the 802.11be mode were investigated between all different tones, and we found that SU mode had the highest output power and RU26 had the highest PSD readings. And after investigation, antenna port conducted tests were performed on both SU and lowest tones; radiated spurious emission and radiated band edge tests were performed on SU and lowest tones. Please see 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	

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. For radiated bandedge, following are the worst-case data rates set for test:

- 802.11b mode : 1 Mbps
- 802.11n HT20 mode : MCS7
- 802.11be EHT20mode: MCS9
- 802.11be EHT RU26 and SU, MCS9

Note: In the Radiated Plots and emissions data, ANT1=ANT4 and ANT2=ANT 3.

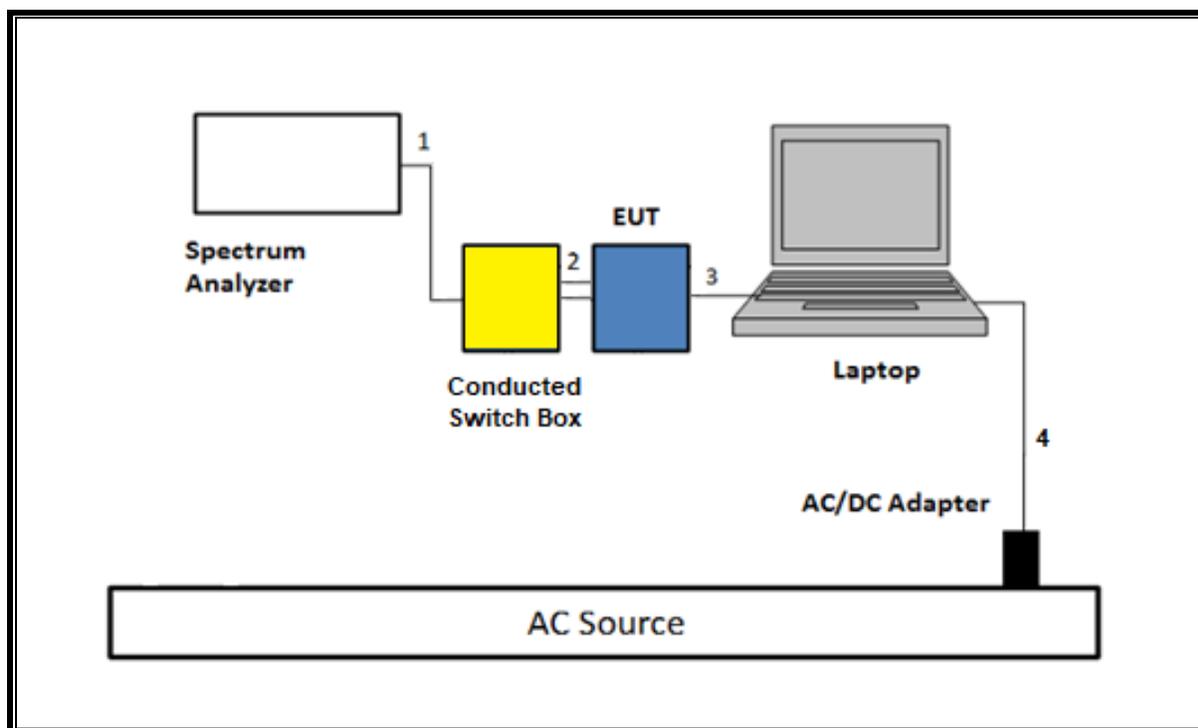
6.6. DESCRIPTION OF TEST SETUP

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	Antenna	1	SMA	Un-shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1.0	N/A
3	AC	1	AC	Un-shielded	2	N/A
I/O CABLES (RF RADIATED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Un-shielded	1	N/A

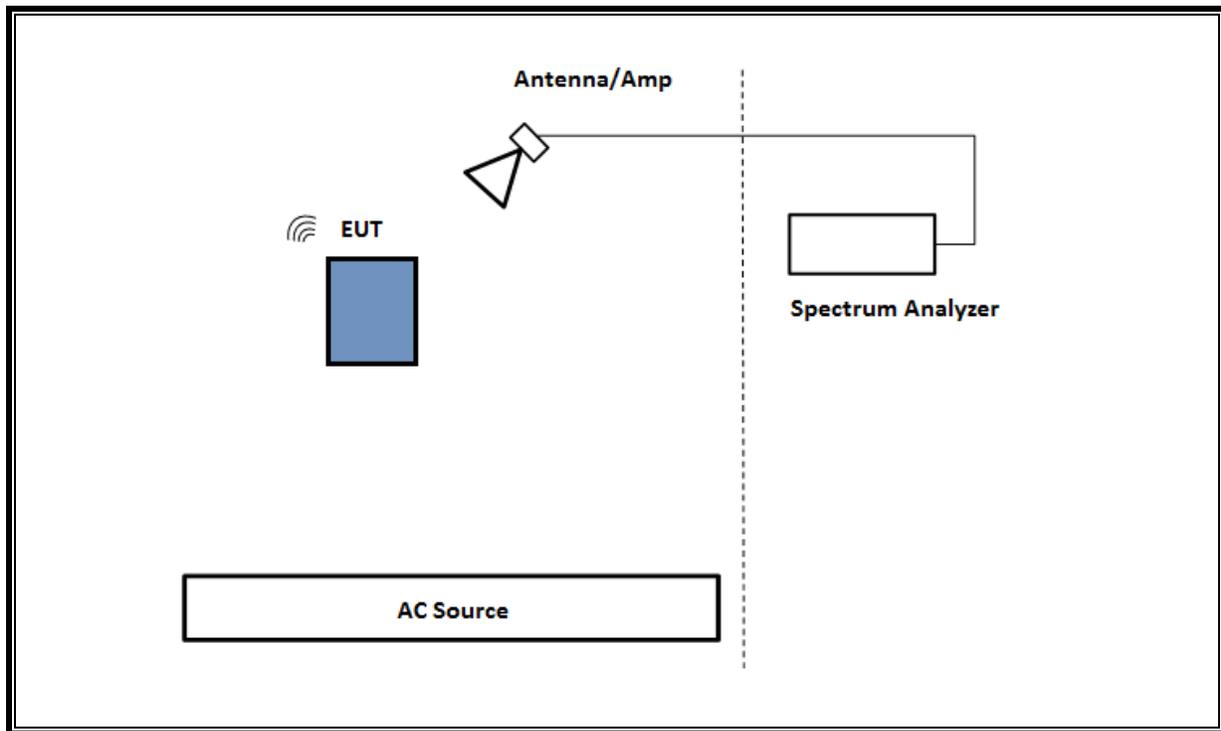
TEST SETUP

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

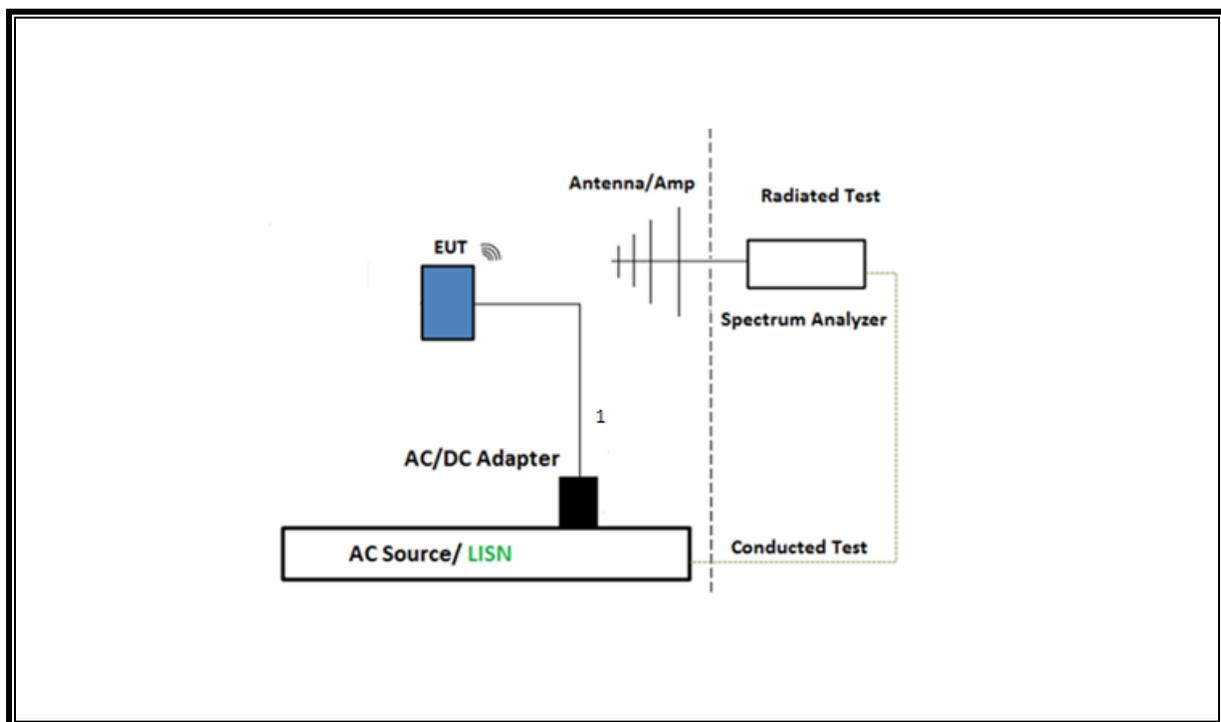
SETUP DIAGRAM FOR CONDUCTED TESTS



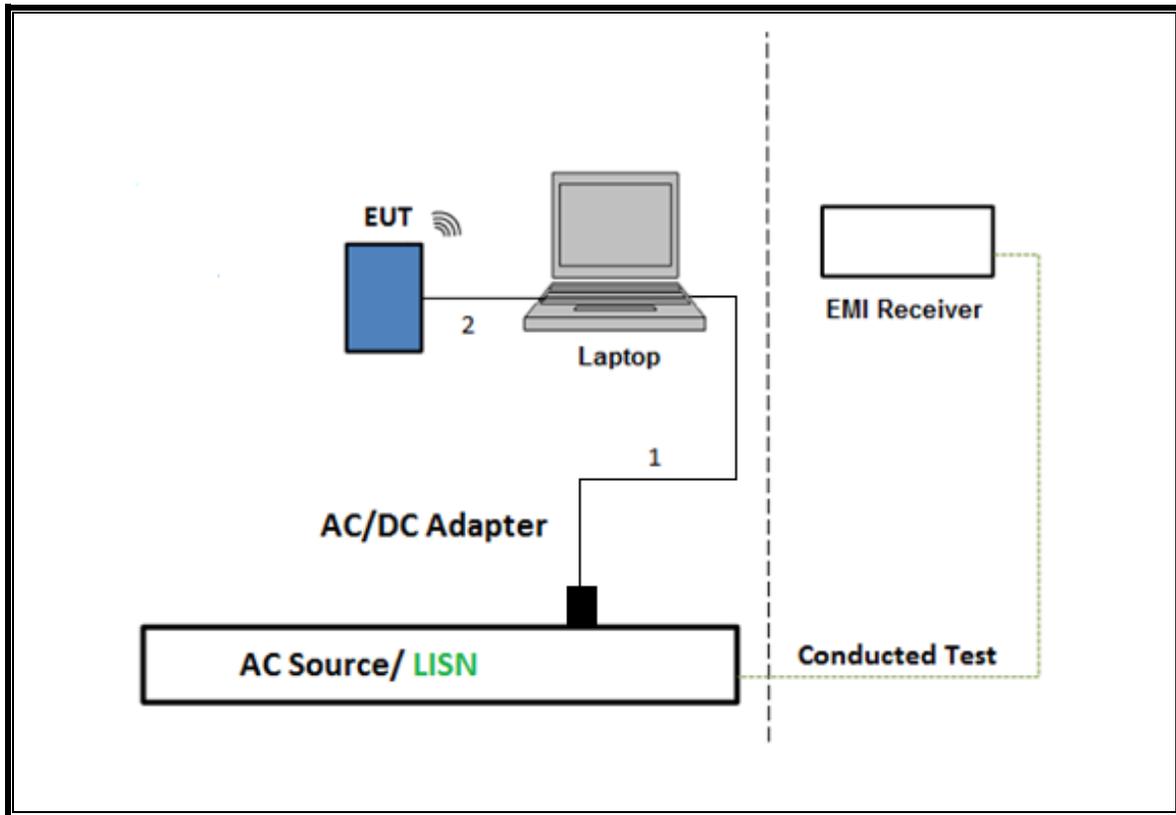
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz (1 to 26.5GHz)



SETUP DIAGRAM FOR below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



7. MEASUREMENT METHOD

Test Item	Test Method
6 dB BW	ANSI C63.10 Subclause -11.8.1 RBW \geq DTS BW
99% BW	ANSI C63.10-2013, Subclause 6.9.3.
Output Power	ANSI C63.10 Subclause -11.9.2.3.1 Method AVGPM (Measurement using an RF average-reading power meter)
PSD	ANSI C63.10 Subclause -11.10.3 Method AVGPSD-1
Radiated emissions non-restricted frequency bands	ANSI C63.10 Subclause -11.11 & Clause 13
Radiated emissions restricted frequency bands	ANSI C63.10 Subclause -11.12.1 & Clause 13
Conducted emissions in restricted frequency bands	ANSI C63.10 Subclause -11.12.2
Band-edge	ANSI C63.10 Subclause -11.13.3.2 & Clause 13: Integration method -Peak detection
Band-edge	ANSI C63.10 Subclause -11.13.3.3 & Clause 13: Integration method -Trace averaging with continuous transmission at full power
Radiated Spurious Emissions Below 30MHz	ANSI C63.10-2013 Subclause 6.4 & Clause 13
AC Power Line Conducted Emissions	ANSI C63.10-2013, Subclause 6.2

8. 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	80707	2024/05/31
*RF Filter Box, 1-18GHz	Miteq	UL-FR1	197920	2024/05/31
*EMI TEST RECEIVER	Rohde & Schwarz	ESW44	226079	2024/05/01
*Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	85151	2024/04/30
Link File, @3m, 9kHz-1000MHz Hybrid Path Loss	UL-FR1	Port 0 Factors	232001	2025/02/28
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201499	2025/02/11
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	226673	2025/01/31
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	231874	2024/08/30
EMI Test Receiver	Rohde & Schwarz	ESW44	191429	2025/02/28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	230300	2025/01/31
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	216812	2025/01/30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223461	2024/08/29
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200896	2025/04/24
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	2025/02/28
RF Filter Box, 1-18GHz	Miteq	UL-FR1	217255	2024/10/31
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	226674	2025/01/31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230547	2025/02/28
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	225474	2025/04/30
Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170014	2024/08/31
*Antenna, Horn 18 to 26.5GHz	A.R.A	MWH-1826/B	172353	2024/06/30
RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	2025/03/31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201501	2024/11/30
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO-METRICS	EM-6872	170016	2024/08/31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90731	2025/01/31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	80120	2025/01/31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2025/01/31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	2025/01/31
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178557	Verified Before Use
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	178558	Verified Before Use
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	2025/01/31
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight Technologies Inc	N9030A	80400	2025/02/02
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	125178	2025/01/31
*Conducted Switch Box	N/A	CSB	208281	2024/04/30
Conducted Switch Box	N/A	CSB	208281	2025/05/08

AC Line Conducted				
Description	Manufacturer	Model	ID Num	Cal Due
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	93091	2025/02/28
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250- 25-2-01-480V	175765	2025/01/31
Transient Limiter	TE	TBFL1	207996	2024/08/31
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, 2023, May 1	
Conducted Software	UL	UL EMC	2020.8.16	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, 2023, Mar 3	

*Testing is completed before equipment expiration date.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

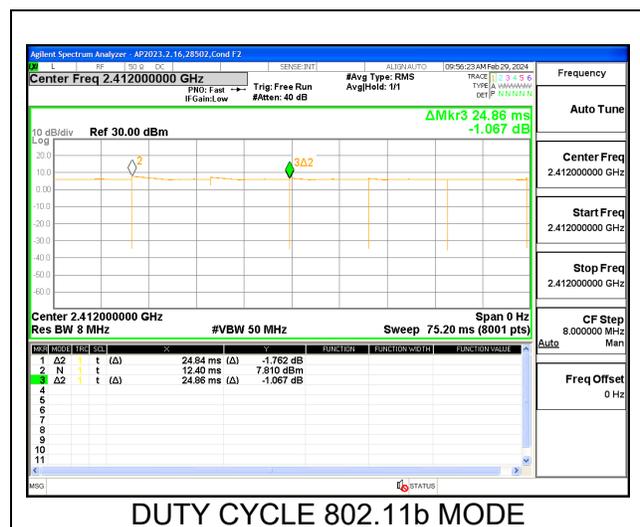
KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b	24.840	24.860	0.999	99.92%	0.00	0.010
802.11n HT20 MCS0	1.920	1.941	0.989	98.92%	0.00	0.010
802.11n HT20 MCS7	0.228	0.249	0.9145	91.45%	0.39	4.392
802.11be EHT20 RU26 MCS0	3.994	4.043	0.988	98.79%	0.00	0.010
802.11be EHT20 RU26 MCS9	0.348	0.400	0.871	87.08%	0.60	2.870
802.11be EHT20 SU MCS0	1.501	1.523	0.986	98.56%	0.00	0.010
802.11be EHT20 SU MCS9	0.182	0.204	0.896	89.58%	0.48	5.485

Note: Duty cycle 2TX is the same as 1TX.

DUTY CYCLE PLOTS



9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

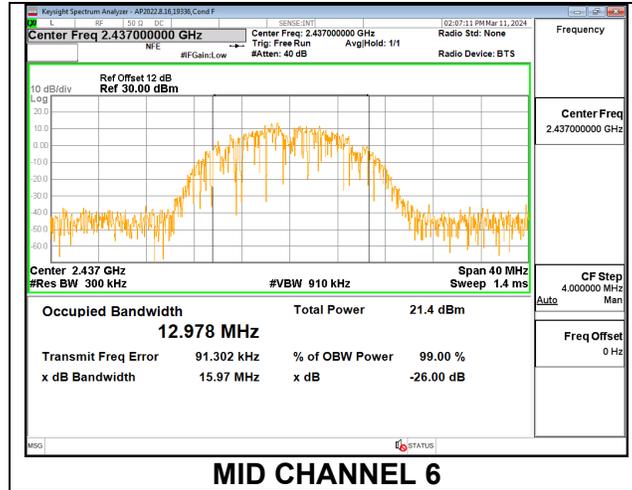
RESULTS

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

9.2.1. 802.11b MODE 1TX

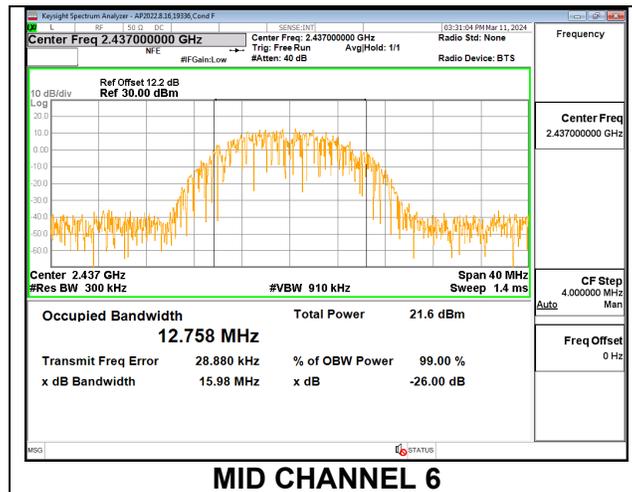
1TX ANT 4 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.835
Mid 6	2437	12.978
High 11	2462	13.128
High 12	2467	12.764
High 13	2472	12.913



1TX ANT 3 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	13.072
Mid 6	2437	12.758
High 11	2462	13.172
High 12	2467	12.590
High 13	2472	12.999

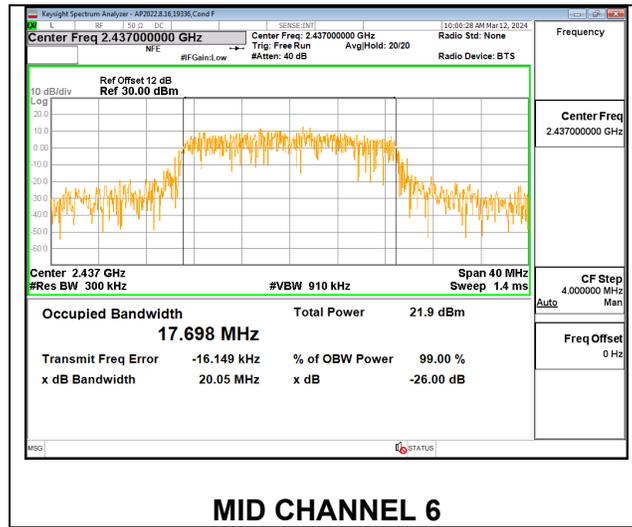


MID CHANNEL 6

9.2.2. 802.11n HT20 MODE

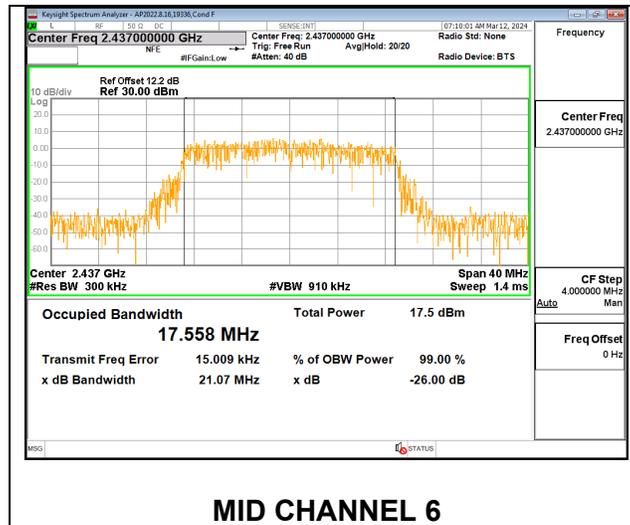
1TX ANT 4 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.645
Low 2	2417	17.644
Low 3	2422	17.741
Mid 6	2437	17.698
High 10	2457	17.776
High 11	2462	17.642
High 12	2467	17.600
High 13	2472	17.751



1TX ANT 3 MODE

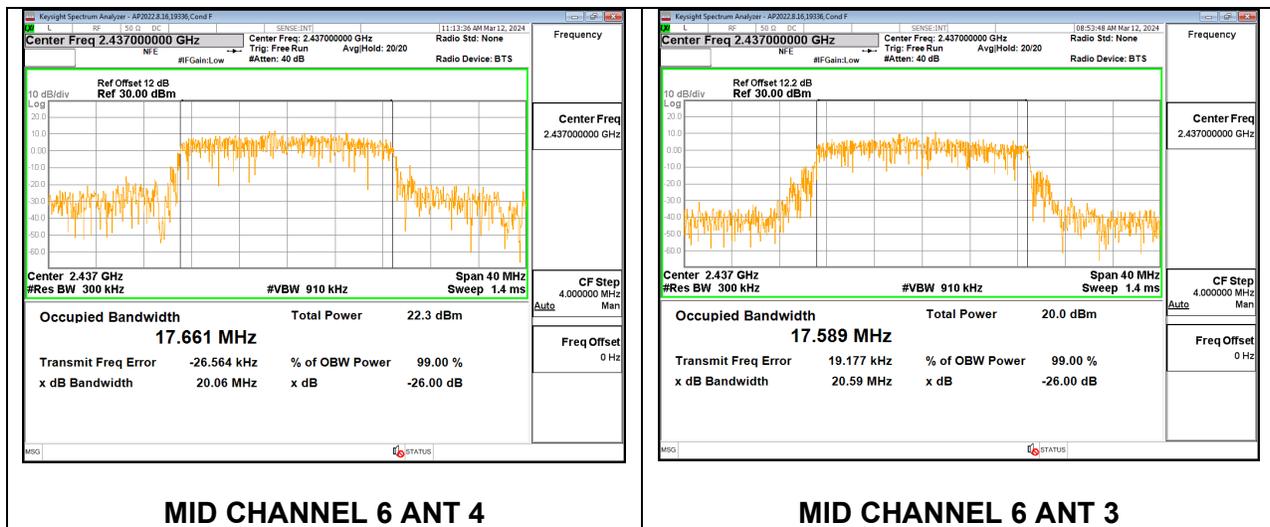
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.612
Low 2	2417	17.593
Low 3	2422	17.649
Mid 6	2437	17.558
High 10	2457	17.548
High 11	2462	17.543
High 12	2467	17.673
High 13	2472	17.497



9.2.3. 802.11n HT20 CDD MODE

ANT 4 + ANT 3 2TX MODE

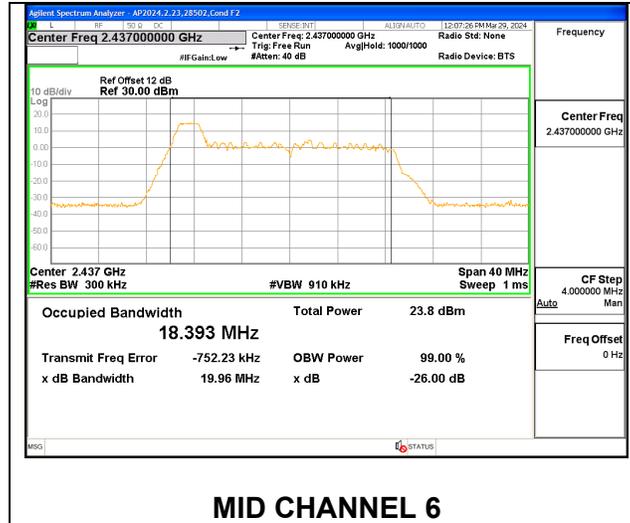
Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	17.770	17.702
Low 2	2417	17.643	17.597
Low 3	2422	17.715	17.603
Mid 6	2437	17.661	17.589
High 9	2452	17.631	17.730
High 10	2457	17.722	17.662
High 11	2462	17.648	17.633
High 12	2467	17.732	17.522
High 13	2472	17.760	17.658



9.2.4. 802.11be EHT20 MODE

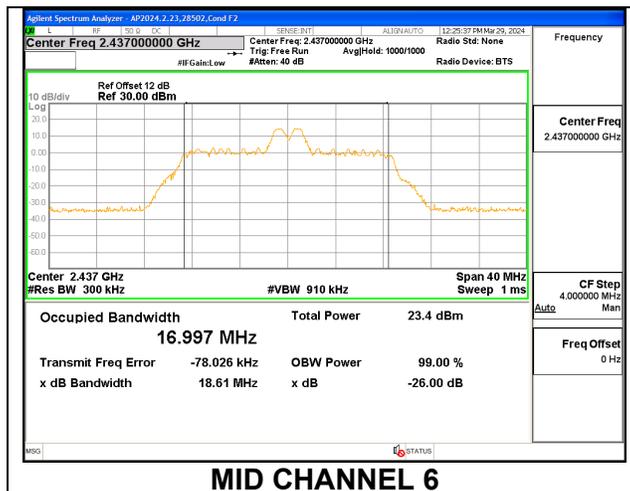
ANT 4 LEGACY SISO MODE: 26-Tones, RU index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.430
Mid 6	2437	18.393
High 11	2462	18.469
High 12	2467	18.383
High 13	2472	18.534



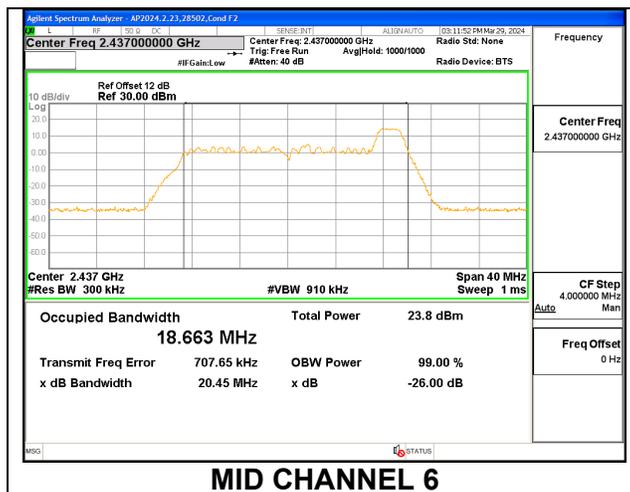
ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.108
Mid 6	2437	16.997
High 11	2462	16.954
High 12	2467	16.963
High 13	2472	17.138



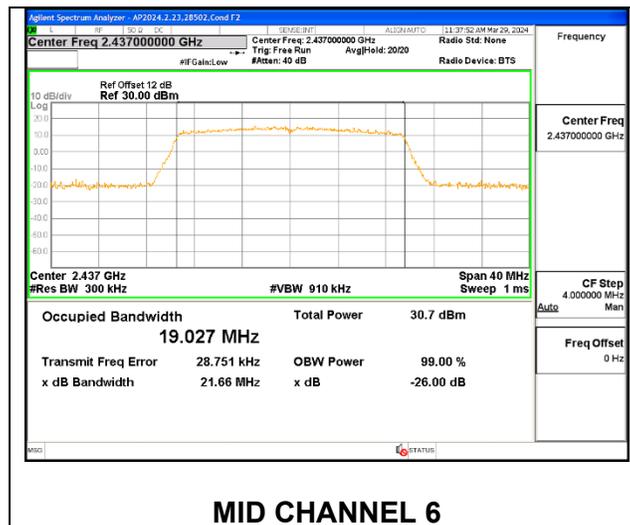
ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.680
Mid 6	2437	18.663
High 11	2462	18.651
High 12	2467	18.677
High 13	2472	18.772



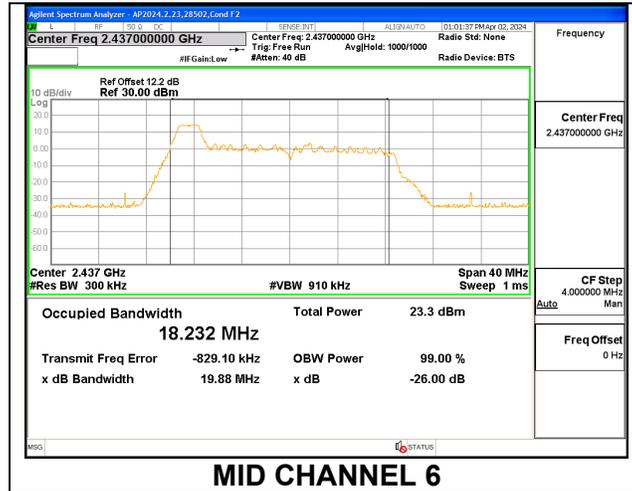
ANT 4 LEGACY SISO MODE: SU Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.910
Low 2	2417	19.017
Low 3	2422	18.991
Mid 6	2437	19.027
High 9	2452	19.012
High 10	2457	19.004
High 11	2462	19.008
High 12	2467	18.991
High 13	2472	18.985



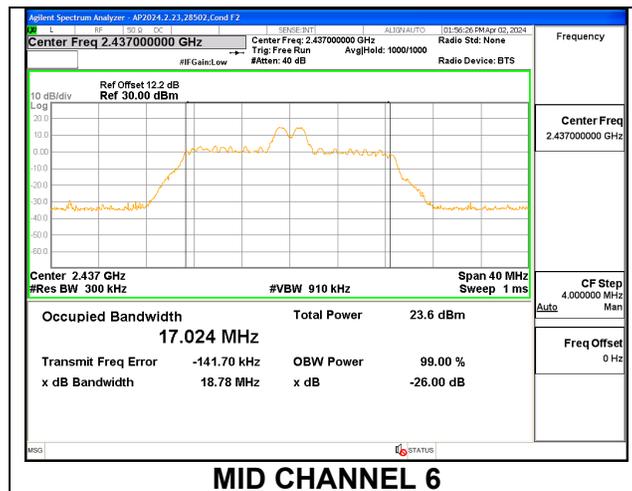
ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.570
Mid 6	2437	18.232
High 11	2462	18.434
High 12	2467	18.286
High 13	2472	18.498



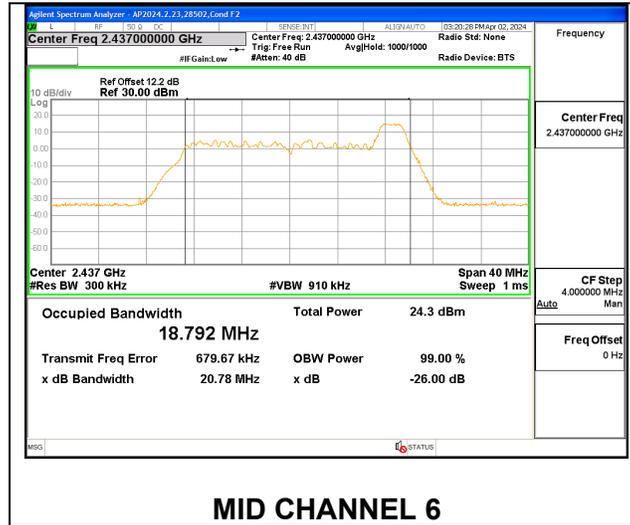
ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.134
Mid 6	2437	17.024
High 11	2462	16.738
High 12	2467	16.773
High 13	2472	17.118



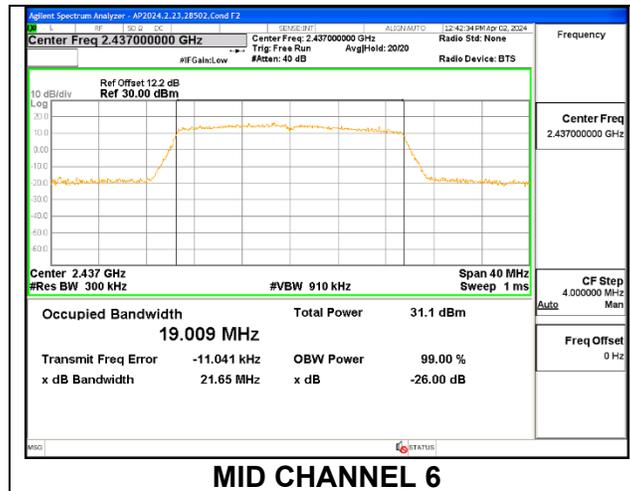
ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.600
Mid 6	2437	18.792
High 11	2462	18.575
High 12	2467	18.689
High 13	2472	18.750



ANT 3 LEGACY SISO MODE: SU

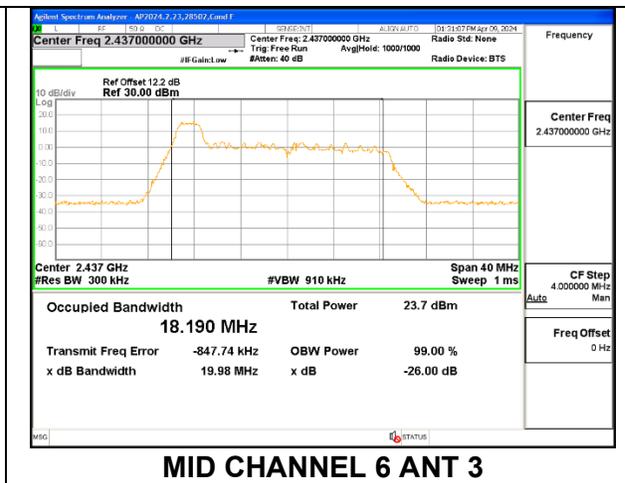
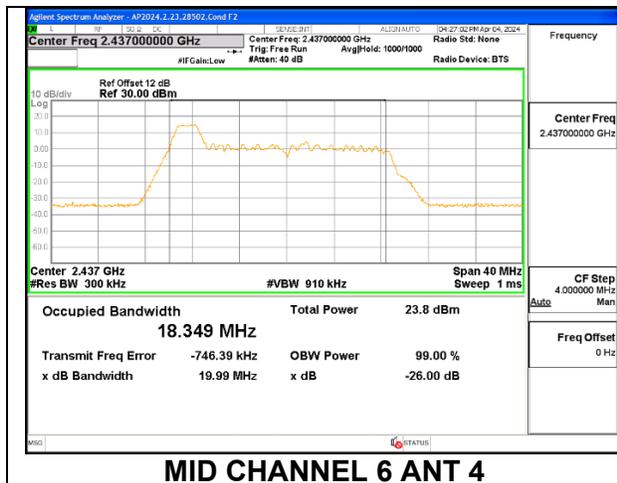
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	19.064
Low 2	2417	19.008
Mid 6	2437	19.009
High 9	2452	19.080
High 10	2457	18.975
High 11	2462	18.898
High 12	2467	18.916
High 13	2472	18.939



9.2.5. 802.11be EHT20 OFDMA MODE 2TX

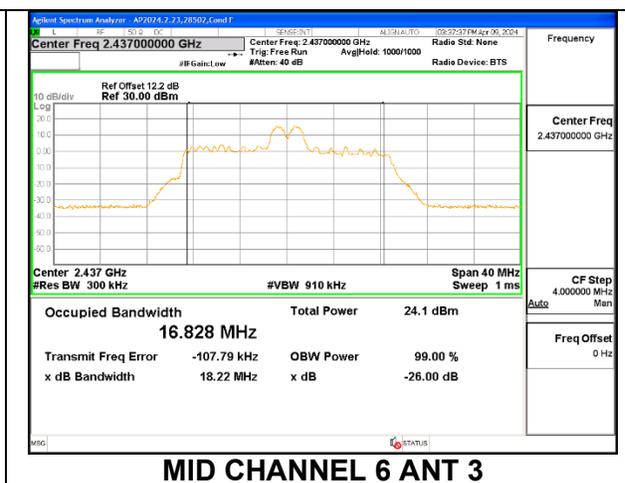
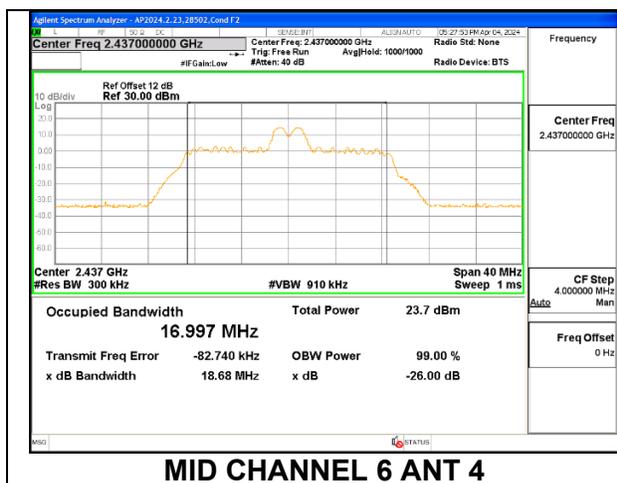
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)	99% Bandwidth (MHz)
		ANT 4	ANT 3
Low 1	2412	18.535	18.551
Mid 6	2437	18.349	18.190
High 11	2462	18.427	18.374
High 12	2467	18.394	18.193
High 13	2472	18.564	18.442



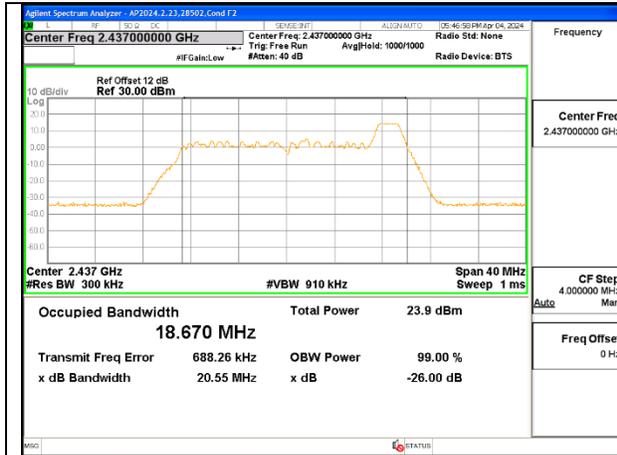
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)	99% Bandwidth (MHz)
		ANT 4	ANT 3
Low 1	2412	17.066	16.931
Mid 6	2437	16.997	16.828
High 11	2462	16.967	16.586
High 12	2467	16.975	16.682
High 13	2472	17.255	16.981

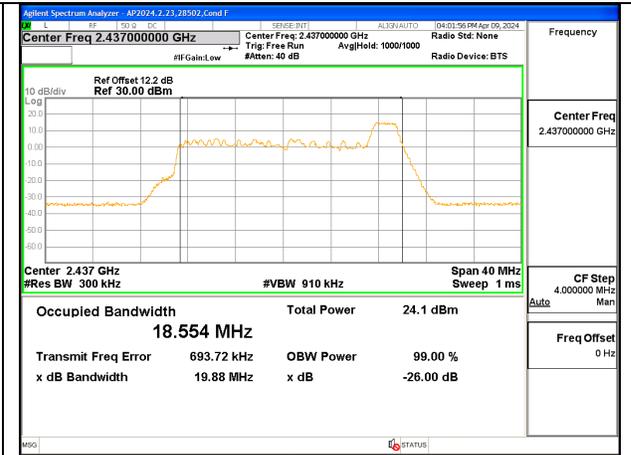


ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	18.670	18.278
Mid 6	2437	18.670	18.554
High 11	2462	18.670	18.341
High 12	2467	18.664	18.527
High 13	2472	18.796	18.612



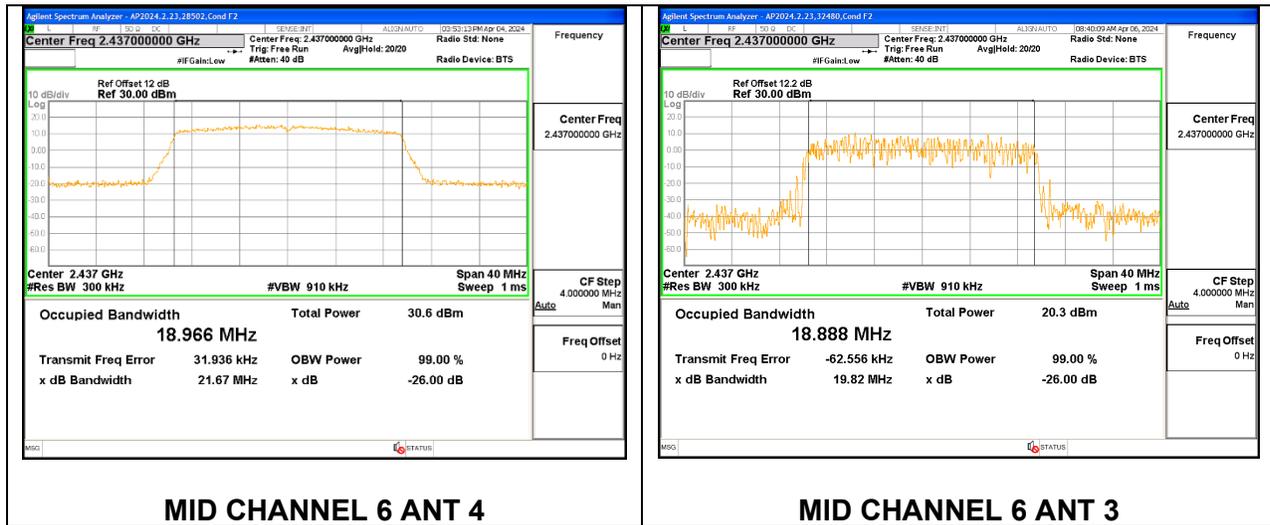
MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

ANT 4 + ANT 3 2TX MODE: SU

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	19.052	18.862
Low 2	2417	19.053	18.808
Low 3	2422	19.006	18.751
Mid 6	2437	18.966	18.888
High 9	2452	19.002	18.963
High 10	2457	18.950	18.754
High 11	2462	18.973	18.850
High 12	2467	18.971	18.856
High 13	2472	18.969	18.996



9.3. 6dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

RESULTS

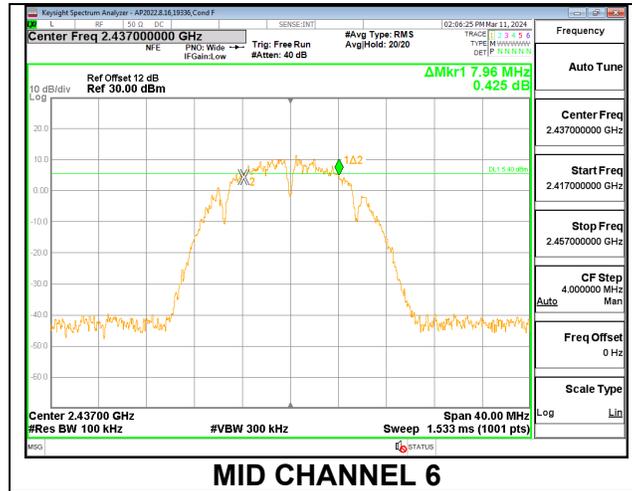
The 6dB bandwidth was measured for the narrowest bandwidth mode, b Mode and ax HE20 Mode 26-Tones as worst case to demonstrate compliance with the minimum required bandwidth of 500 kHz to cover all OFDMA modes.

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

9.3.1. 802.11b MODE 1TX

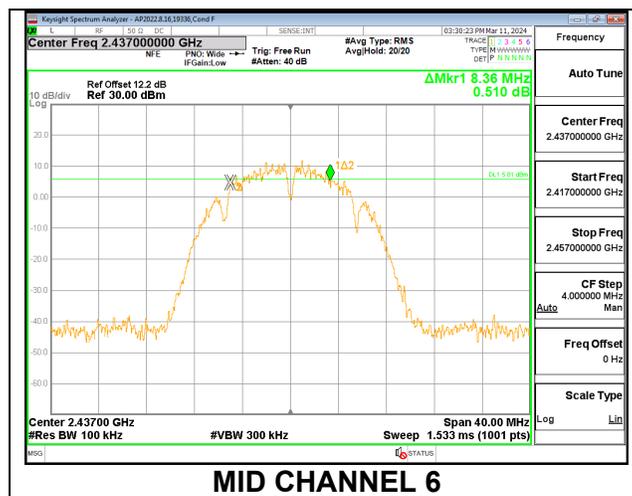
1TX ANT 4 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.40	0.5
Mid 6	2437	7.96	0.5
High 11	2462	8.64	0.5
High 12	2467	8.64	0.5
High 13	2472	8.04	0.5



1TX ANT 3 MODE

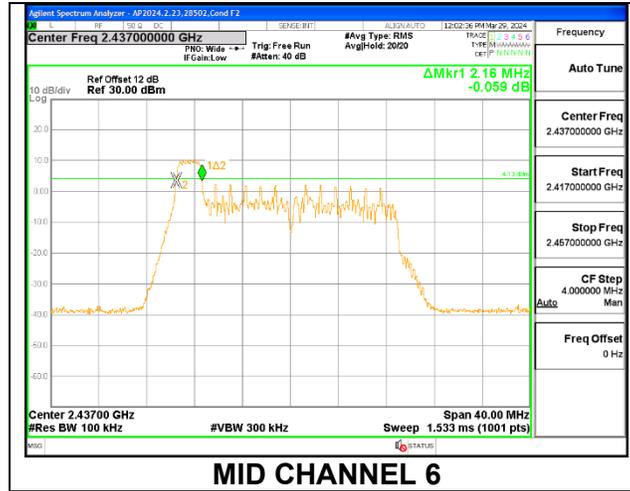
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	9.20	0.5
Mid 6	2437	8.36	0.5
High 11	2462	8.68	0.5
High 12	2467	8.12	0.5
High 13	2472	9.16	0.5



9.3.2. 802.11be EHT20 MODE

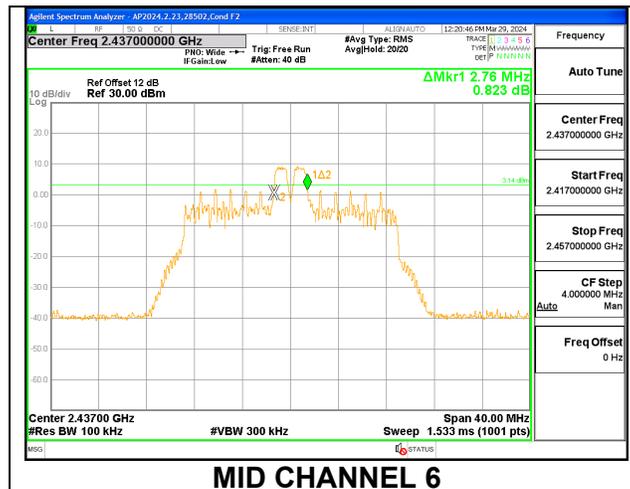
ANT 4 LEGACY SISO MODE: 26-Tones, RU index 0

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Mid 6	2437	2.16	0.5
High 11	2462	2.16	0.5
High 12	2467	2.20	0.5
High 13	2472	2.24	0.5



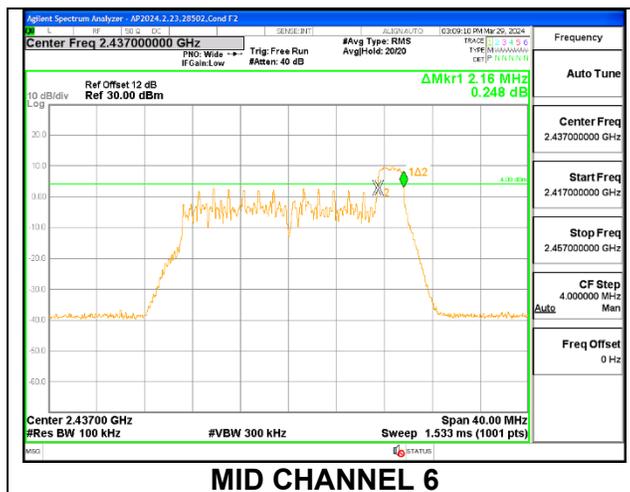
ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.72	0.5
Mid 6	2437	2.76	0.5
High 11	2462	2.72	0.5
High 12	2467	2.76	0.5
High 13	2472	2.72	0.5



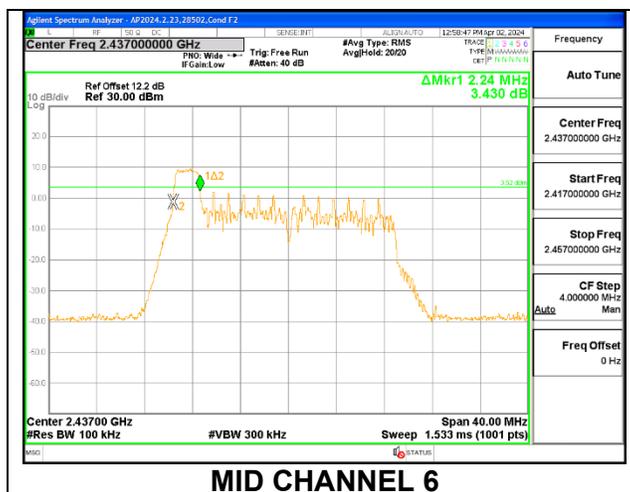
ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.16	0.5
Mid 6	2437	2.16	0.5
High 11	2462	2.16	0.5
High 12	2467	2.12	0.5
High 13	2472	2.16	0.5



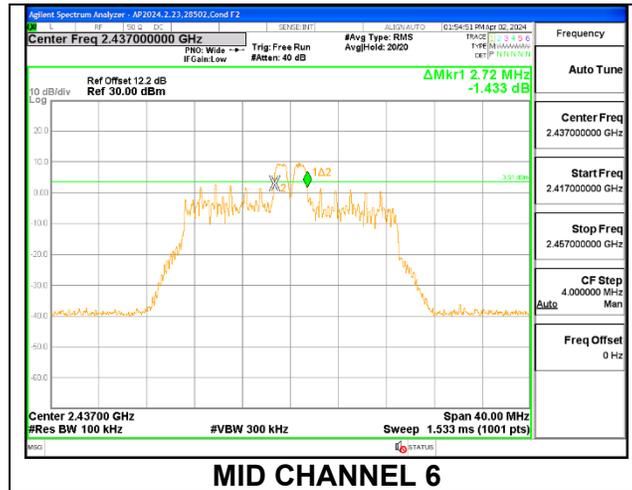
ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.16	0.5
Mid 6	2437	2.24	0.5
High 11	2462	2.16	0.5
High 12	2467	2.16	0.5
High 13	2472	2.20	0.5



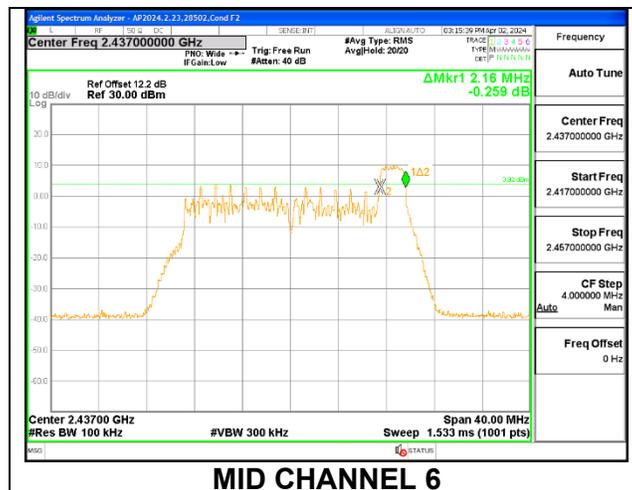
ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.72	0.5
Mid 6	2437	2.72	0.5
High 11	2462	2.72	0.5
High 12	2467	2.72	0.5
High 13	2472	2.76	0.5



ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 8

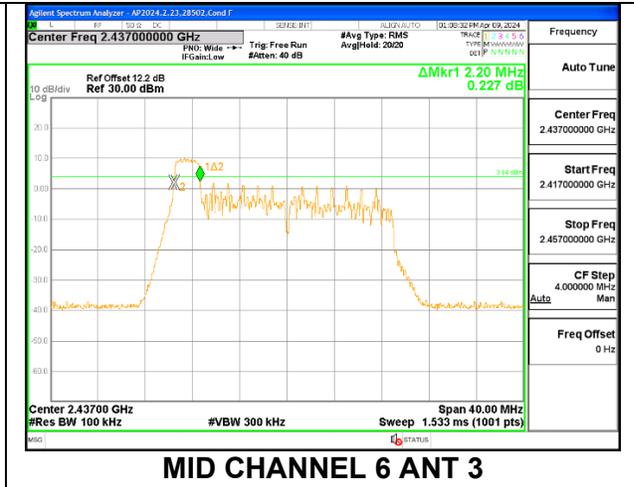
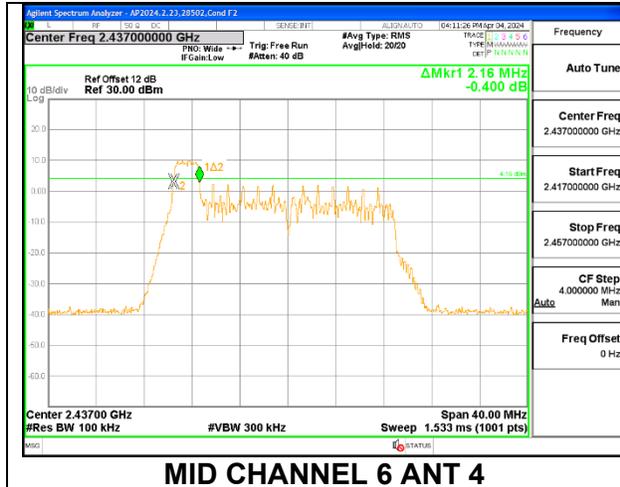
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.16	0.5
Mid 6	2437	2.16	0.5
High 11	2462	2.16	0.5
High 12	2467	2.16	0.5
High 13	2472	2.20	0.5



9.3.3. 802.11be EHT20 OFDMA MODE 2TX

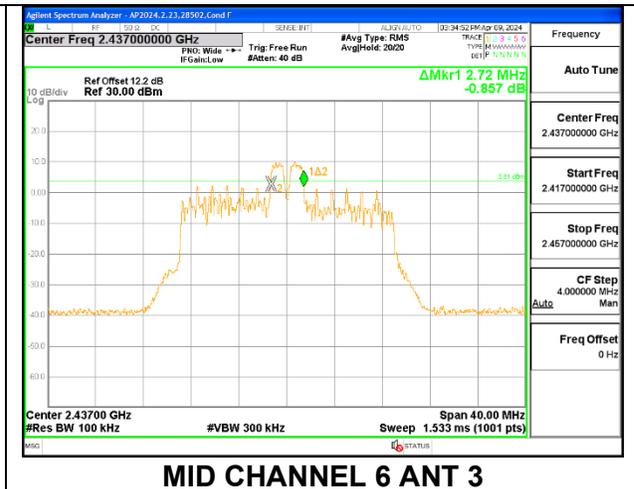
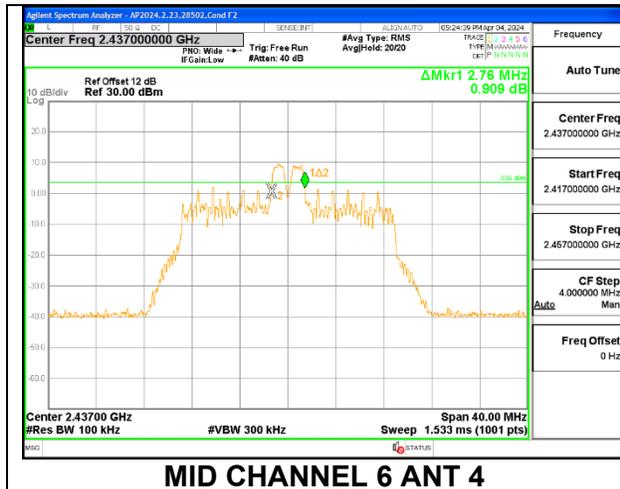
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	6dB BW(MHz) ANT 4	6dB BW (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	2.20	2.20	0.5
Mid 6	2437	2.16	2.20	0.5
High 11	2462	2.20	2.20	0.5
High 12	2467	2.16	2.16	0.5
High 13	2472	2.20	2.20	0.5



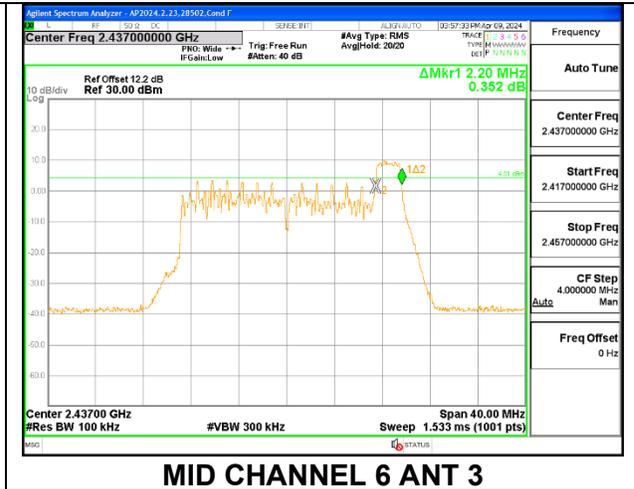
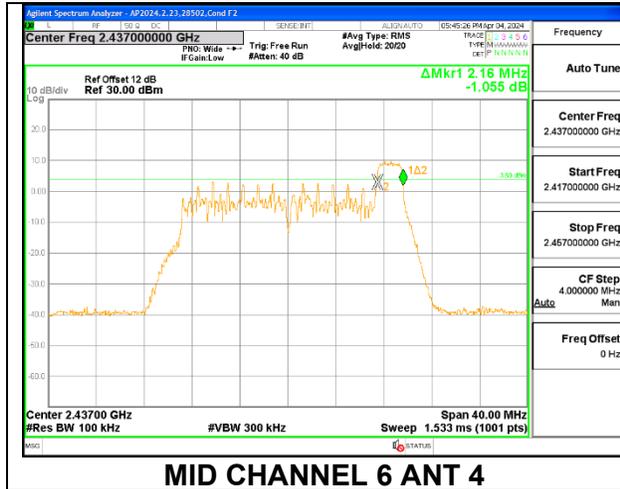
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	6dB BW(MHz) ANT 4	6dB BW (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	2.72	2.72	0.5
Mid 6	2437	2.76	2.72	0.5
High 11	2462	2.72	2.72	0.5
High 12	2467	2.76	2.72	0.5
High 13	2472	2.72	2.72	0.5



ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	6dB BW(MHz) ANT 4	6dB BW (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	2.16	2.16	0.5
Mid 6	2437	2.16	2.20	0.5
High 11	2462	2.16	2.16	0.5
High 12	2467	2.16	2.16	0.5
High 13	2472	2.16	2.16	0.5



9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

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.

TEST PROCEDURE

Measurements perform using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Average output power was read directly from the power meter.

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 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	-2.00	-1.70	-1.85	1.16

RESULTS

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain= $10 \cdot \text{LOG}((10^{(\text{Ant1}/10)} + 10^{(\text{Ant2}/10)})/2)$ Correlated directional Gain= $10 \cdot \text{LOG}(((10^{(\text{Ant1}/20)} + 10^{(\text{Ant2}/20)})^2)/2)$

Sample Calculation:

Ant1=-2.0, Ant2=-1.7

Uncorrelated Antenna gain= $10 \log[(10^{(-2.0/10)} + 10^{(-1.7/10)})/2] = -1.85 \text{dBi}$ Correlated Antenna gain= $10 \log[(10^{(-2.0/20)} + 10^{(-1.7/20)})^2/2] = 1.16 \text{dBi}$

9.4.1. 802.11b MODE 1TX

Test Engineer:	19336
Test Date:	05-21-2024

1TX ANT 4 MODE**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.46	21.46	30.00	-8.54
Mid 6	2437	21.86	21.86	30.00	-8.14
High 11	2462	21.48	21.48	30.00	-8.52
High 12	2467	21.42	21.42	30.00	-8.58
High 13	2472	20.47	20.47	30.00	-9.53

1TX ANT 3 MODE**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.40	21.40	30.00	-8.60
Mid 6	2437	21.99	21.99	30.00	-8.01
High 11	2462	21.47	21.47	30.00	-8.53
High 12	2467	21.47	21.47	30.00	-8.53
High 13	2472	20.40	20.40	30.00	-9.60

9.4.2. 802.11n HT20 MODE

Test Engineer:	19336
Test Date:	05-21-2024

1TX ANT 4 MODE

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Low 2	2417	-2.00	30.00	30	36	30.00
Low 3	2422	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 10	2457	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.40	17.40	30.00	-12.60
Low 2	2417	20.40	20.40	30.00	-9.60
Low 3	2422	21.44	21.44	30.00	-8.56
Mid 6	2437	21.98	21.98	30.00	-8.02
High 10	2457	20.46	20.46	30.00	-9.54
High 11	2462	18.46	18.46	30.00	-11.54
High 12	2467	16.50	16.50	30.00	-13.50
High 13	2472	14.98	14.98	30.00	-15.02

1TX ANT 3 MODE

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Low 2	2417	-1.70	30.00	30	36	30.00
Low 3	2422	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 10	2457	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.30	17.30	30.00	-12.70
Low 2	2417	20.40	20.40	30.00	-9.60
Low 3	2422	21.44	21.44	30.00	-8.56
Mid 6	2437	21.87	21.87	30.00	-8.13
High 10	2457	20.50	20.50	30.00	-9.50
High 11	2462	18.42	18.42	30.00	-11.58
High 12	2467	16.48	16.48	30.00	-13.52
High 13	2472	14.96	14.96	30.00	-15.04

9.4.3. 802.11n HT20 CDD MODE 2TX

Test Engineer:	19336
Test Date:	05-21-2024

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.85	30.00	36	30.00
Low 2	2417	-1.85	30.00	36	30.00
Low 3	2422	-1.85	30.00	36	30.00
Mid 6	2437	-1.85	30.00	36	30.00
High 9	2452	-1.85	30.00	36	30.00
High 10	2457	-1.85	30.00	36	30.00
High 11	2462	-1.85	30.00	36	30.00
High 12	2467	-1.85	30.00	36	30.00
High 13	2472	-1.85	30.00	36	30.00

Results

Channel	Frequency (MHz)	ANT 4 Meas Power (dBm)	ANT 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.97	16.95	19.97	30.00	-10.03
Low 2	2417	19.50	19.47	22.50	30.00	-7.50
Low 3	2422	20.95	20.96	23.97	30.00	-6.03
Mid 6	2437	21.95	21.99	24.98	30.00	-5.02
High 9	2452	20.46	20.47	23.48	30.00	-6.52
High 10	2457	19.39	19.49	22.45	30.00	-7.55
High 11	2462	17.49	17.43	20.47	30.00	-9.53
High 12	2467	14.99	15.00	18.01	30.00	-11.99
High 13	2472	14.49	14.48	17.50	30.00	-12.50

9.4.4. 802.11be EHT20 MODE

Test Engineer:	19336
Test Date:	05-21-2024

1TX ANT 4 MODE: 26-Tones, RU Index 0

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.19	12.19	30.00	-17.81
Mid 6	2437	12.17	12.17	30.00	-17.83
High 11	2462	12.25	12.25	30.00	-17.75
High 12	2467	12.20	12.20	30.00	-17.80
High 13	2472	0.98	0.98	30.00	-29.02

1TX ANT 4 MODE: 26-Tones, RU Index 4

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.15	12.15	30.00	-17.85
Mid 6	2437	12.12	12.12	30.00	-17.88
High 11	2462	12.18	12.18	30.00	-17.82
High 12	2467	12.16	12.16	30.00	-17.84
High 13	2472	0.94	0.94	30.00	-29.06

1TX ANT 4 MODE: 26-Tones, RU Index 8**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.09	12.09	30.00	-17.91
Mid 6	2437	12.19	12.19	30.00	-17.81
High 11	2462	12.25	12.25	30.00	-17.75
High 12	2467	12.13	12.13	30.00	-17.87
High 13	2472	0.98	0.98	30.00	-29.02

1TX ANT 4 MODE: SU MODE**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.00	30.00	30	36	30.00
Low 2	2417	-2.00	30.00	30	36	30.00
Low 3	2422	-2.00	30.00	30	36	30.00
Mid 6	2437	-2.00	30.00	30	36	30.00
High 9	2452	-2.00	30.00	30	36	30.00
High 10	2457	-2.00	30.00	30	36	30.00
High 11	2462	-2.00	30.00	30	36	30.00
High 12	2467	-2.00	30.00	30	36	30.00
High 13	2472	-2.00	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.97	16.97	30.00	-13.03
Low 2	2417	18.94	18.94	30.00	-11.06
Low 3	2422	20.90	20.90	30.00	-9.10
Mid 6	2437	21.89	21.89	30.00	-8.11
High 9	2452	20.99	20.99	30.00	-9.01
High 10	2457	18.97	18.97	30.00	-11.03
High 11	2462	16.98	16.98	30.00	-13.02
High 12	2467	14.91	14.91	30.00	-15.09
High 13	2472	9.93	9.93	30.00	-20.07

1TX ANT 3 MODE: 26-Tones, RU Index 0

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.08	12.08	30.00	-17.92
Mid 6	2437	12.16	12.16	30.00	-17.84
High 11	2462	12.24	12.24	30.00	-17.76
High 12	2467	12.11	12.11	30.00	-17.89
High 13	2472	0.94	0.94	30.00	-29.06

1TX ANT 3 MODE: 26-Tones, RU Index 4

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.18	12.18	30.00	-17.82
Mid 6	2437	12.14	12.14	30.00	-17.86
High 11	2462	12.10	12.10	30.00	-17.90
High 12	2467	12.12	12.12	30.00	-17.88
High 13	2472	0.96	0.96	30.00	-29.04

1TX ANT 3 MODE: 26-Tones, RU Index 8

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.15	12.15	30.00	-17.85
Mid 6	2437	12.14	12.14	30.00	-17.86
High 11	2462	12.16	12.16	30.00	-17.84
High 12	2467	12.11	12.11	30.00	-17.89
High 13	2472	0.93	0.93	30.00	-29.07

1TX ANT 3 MODE: SU MODE**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.70	30.00	30	36	30.00
Low 2	2417	-1.70	30.00	30	36	30.00
Low 3	2422	-1.70	30.00	30	36	30.00
Mid 6	2437	-1.70	30.00	30	36	30.00
High 9	2452	-1.70	30.00	30	36	30.00
High 10	2457	-1.70	30.00	30	36	30.00
High 11	2462	-1.70	30.00	30	36	30.00
High 12	2467	-1.70	30.00	30	36	30.00
High 13	2472	-1.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.94	16.94	30.00	-13.06
Low 2	2417	18.95	18.95	30.00	-11.05
Low 3	2422	20.99	20.99	30.00	-9.01
Mid 6	2437	21.98	21.98	30.00	-8.02
High 9	2452	20.92	20.92	30.00	-9.08
High 10	2457	18.98	18.98	30.00	-11.02
High 11	2462	16.95	16.95	30.00	-13.05
High 12	2467	14.89	14.89	30.00	-15.11
High 13	2472	9.96	9.96	30.00	-20.04

9.4.5. 802.11be EHT20 OFDMA MODE 2TX

Test Engineer:	19336
Test Date:	05-21-2024

ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.85	30.00	36	30.00
Mid 6	2437	-1.85	30.00	36	30.00
High 11	2462	-1.85	30.00	36	30.00
High 12	2467	-1.85	30.00	36	30.00
High 13	2472	-1.85	30.00	36	30.00

Results

Channel	Frequency (MHz)	ANT 4 Meas Power (dBm)	ANT 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.13	12.11	15.13	30.00	-14.87
Mid 6	2437	12.17	12.14	15.17	30.00	-14.83
High 11	2462	12.23	12.20	15.23	30.00	-14.77
High 12	2467	12.21	12.12	15.18	30.00	-14.82
High 13	2472	-0.09	-0.16	2.89	30.00	-27.11

ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.85	30.00	36	30.00
Mid 6	2437	-1.85	30.00	36	30.00
High 11	2462	-1.85	30.00	36	30.00
High 12	2467	-1.85	30.00	36	30.00
High 13	2472	-1.85	30.00	36	30.00

Results

Channel	Frequency (MHz)	ANT 4 Meas Power (dBm)	ANT 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.15	12.13	15.15	30.00	-14.85
Mid 6	2437	12.19	12.21	15.21	30.00	-14.79
High 11	2462	12.14	12.20	15.18	30.00	-14.82
High 12	2467	12.10	12.14	15.13	30.00	-14.87
High 13	2472	-0.08	-0.15	2.90	30.00	-27.10

ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.85	30.00	36	30.00
Mid 6	2437	-1.85	30.00	36	30.00
High 11	2462	-1.85	30.00	36	30.00
High 12	2467	-1.85	30.00	36	30.00
High 13	2472	-1.85	30.00	36	30.00

Results

Channel	Frequency (MHz)	ANT 4 Meas Power (dBm)	ANT 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	12.16	12.20	15.19	30.00	-14.81
Mid 6	2437	12.09	12.18	15.15	30.00	-14.85
High 11	2462	12.24	12.25	15.26	30.00	-14.74
High 12	2467	12.10	12.11	15.12	30.00	-14.88
High 13	2472	0.00	-0.14	2.94	30.00	-27.06

ANT 4 + ANT 3 2TX MODE: SU MODE

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.85	30.00	36	30.00
Low 2	2417	-1.85	30.00	36	30.00
Low 3	2422	-1.85	30.00	36	30.00
Mid 6	2437	-1.85	30.00	36	30.00
High 9	2452	-1.85	30.00	36	30.00
High 10	2457	-1.85	30.00	36	30.00
High 11	2462	-1.85	30.00	36	30.00
High 12	2467	-1.85	30.00	36	30.00
High 13	2472	-1.85	30.00	36	30.00

Results

Channel	Frequency (MHz)	ANT 4 Meas Power (dBm)	ANT 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	15.95	15.92	18.95	30.00	-11.05
Low 2	2417	17.96	17.86	20.92	30.00	-9.08
Low 3	2422	19.98	19.99	23.00	30.00	-7.00
Mid 6	2437	22.00	21.91	24.97	30.00	-5.03
High 9	2452	19.42	19.49	22.47	30.00	-7.53
High 10	2457	17.94	17.94	20.95	30.00	-9.05
High 11	2462	15.99	15.96	18.99	30.00	-11.01
High 12	2467	13.47	13.49	16.49	30.00	-13.51
High 13	2472	8.95	8.92	11.95	30.00	-18.05

9.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

RSS-247 (5.2) (b)

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.

RESULTS

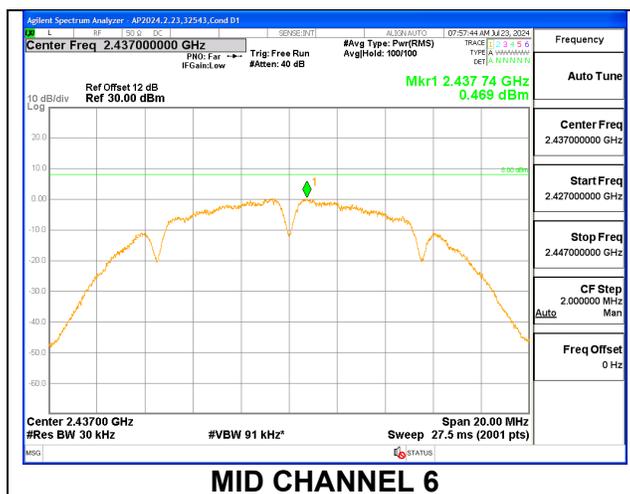
Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

Note: RBW setting is used greater than 3KHz on PSD measurement

9.5.1. 802.11b MODE 1TX

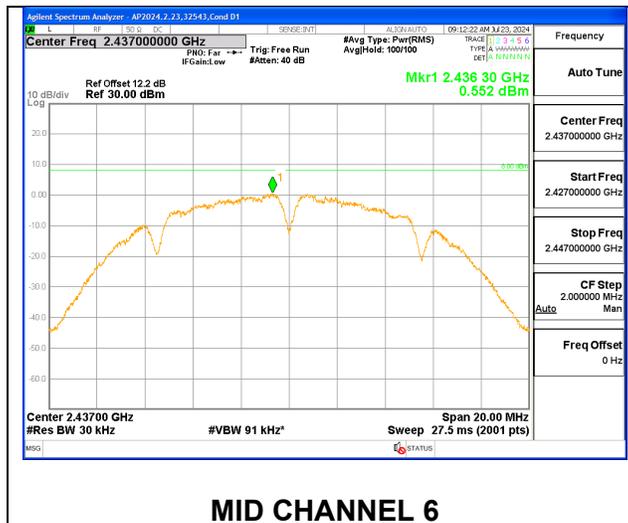
1TX ANT 4 MODE

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	0.147	0.147	8.0	-7.9
Mid 6	2437	0.469	0.469	8.0	-7.5
High 11	2462	-0.202	-0.202	8.0	-8.2
High 12	2467	-0.559	-0.559	8.0	-8.6
High 13	2472	-1.036	-1.036	8.0	-9.0



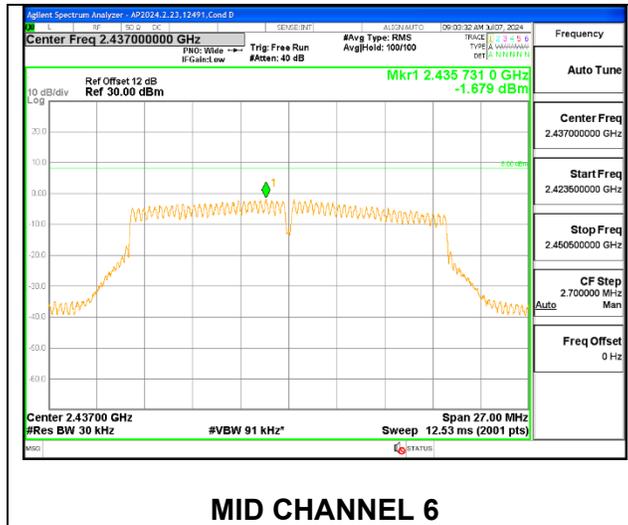
1TX ANT 3 MODE

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-0.012	-0.012	8.0	-8.0
Mid 6	2437	0.552	0.552	8.0	-7.4
High 11	2462	-0.335	-0.335	8.0	-8.3
High 12	2467	-0.237	-0.237	8.0	-8.2
High 13	2472	-1.320	-1.320	8.0	-9.3



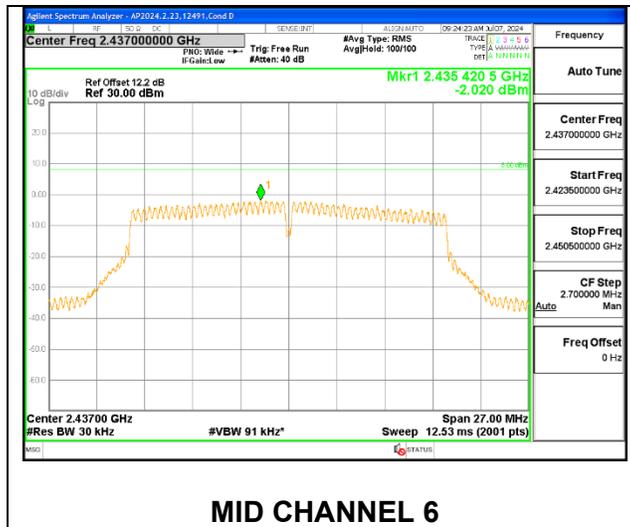
9.5.2. 802.11n HT20 MODE
1TX ANT 4 MODE

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-6.738	-6.738	8.0	-14.7
Low 2	2417	-3.543	-3.543	8.0	-11.5
Low 3	2422	-2.092	-2.092	8.0	-10.1
Mid 6	2437	-1.679	-1.679	8.0	-9.7
High 10	2457	-3.475	-3.475	8.0	-11.5
High 11	2462	-5.100	-5.100	8.0	-13.1
High 12	2467	-7.425	-7.425	8.0	-15.4
High 13	2472	-8.820	-8.820	8.0	-16.8



1TX ANT 3 MODE

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-6.649	-6.649	8.0	-14.6
Low 2	2417	-3.401	-3.401	8.0	-11.4
Low 3	2422	-2.256	-2.256	8.0	-10.3
Mid 6	2437	-2.020	-2.020	8.0	-10.0
High 10	2457	-3.432	-3.432	8.0	-11.4
High 11	2462	-4.975	-4.975	8.0	-13.0
High 12	2467	-7.257	-7.257	8.0	-15.3
High 13	2472	-8.979	-8.979	8.0	-17.0

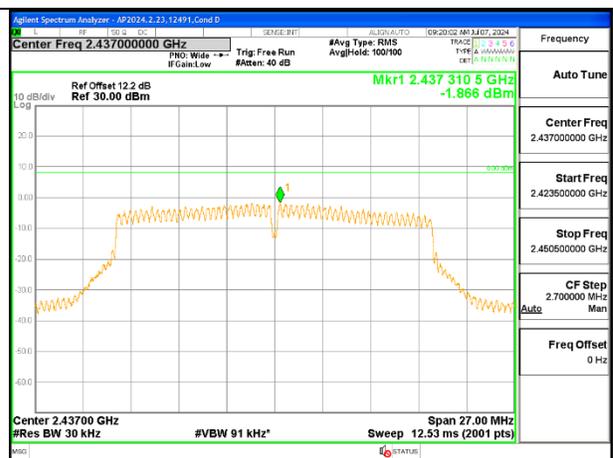


9.5.3. 802.11n HT20 CDD MODE 2TX

Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-7.103	-7.109	-4.096	8.0	-12.1
Low 2	2417	-4.287	-4.461	-1.363	8.0	-9.4
Low 3	2422	-2.729	-2.635	0.329	8.0	-7.7
Mid 6	2437	-1.906	-1.866	1.124	8.0	-6.9
High 9	2452	-3.396	-3.163	-0.268	8.0	-8.3
High 10	2457	-4.212	-4.031	-1.110	8.0	-9.1
High 11	2462	-6.118	-6.059	-3.078	8.0	-11.1
High 12	2467	-8.397	-8.354	-5.365	8.0	-13.4
High 13	2472	-9.011	-9.131	-6.060	8.0	-14.1



MID CHANNEL 6 ANT 4

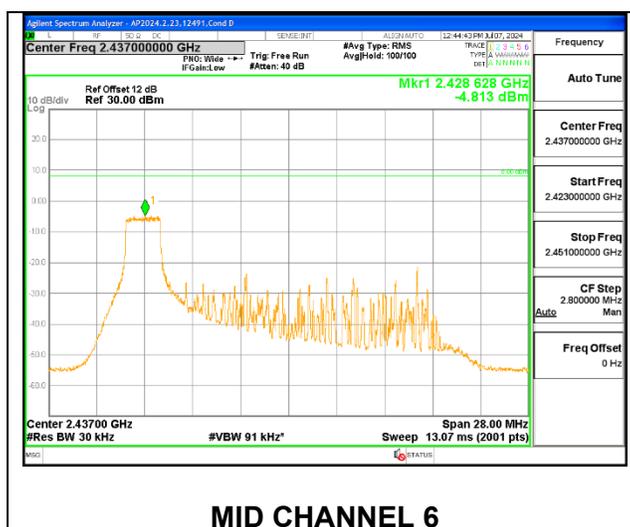


MID CHANNEL 6 ANT 3

9.5.4. 802.11be EHT20 MODE

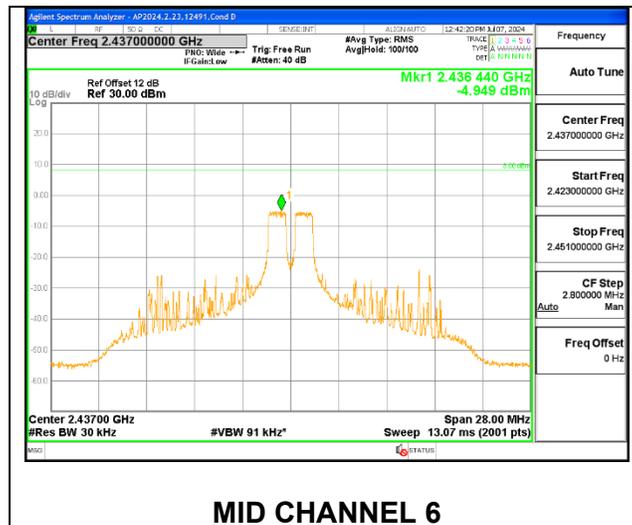
1TX ANT 4 MODE , 26-Tone RU Index 0

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.786	-4.786	8.0	-12.8
Mid 6	2437	-4.813	-4.813	8.0	-12.8
High 11	2462	-4.581	-4.581	8.0	-12.6
High 12	2467	-4.700	-4.700	8.0	-12.7
High 13	2472	-16.011	-16.011	8.0	-24.0



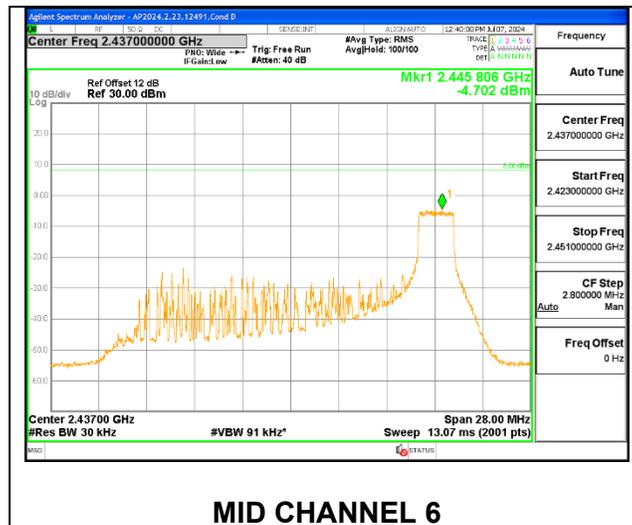
1TX ANT 4 MODE , 26-Tone RU Index 4

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.962	-4.962	8.0	-13.0
Mid 6	2437	-4.949	-4.949	8.0	-12.9
High 11	2462	-4.839	-4.839	8.0	-12.8
High 12	2467	-4.904	-4.904	8.0	-12.9
High 13	2472	-16.070	-16.070	8.0	-24.1



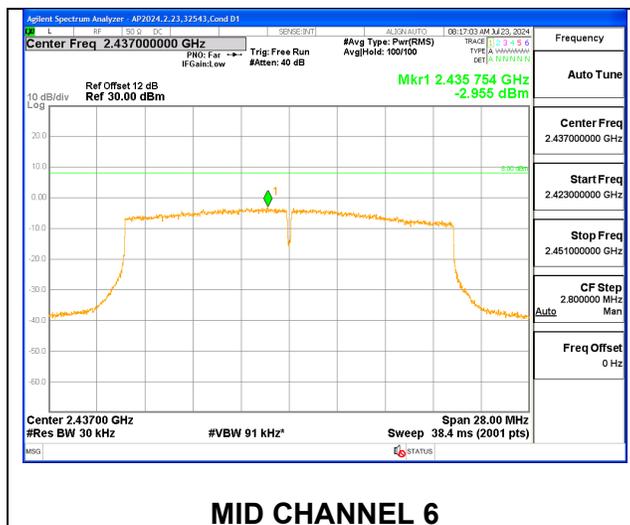
1TX ANT 4 MODE , 26-Tone RU Index 8

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.958	-4.958	8.0	-13.0
Mid 6	2437	-4.702	-4.702	8.0	-12.7
High 11	2462	-4.648	-4.648	8.0	-12.6
High 12	2467	-4.851	-4.851	8.0	-12.9
High 13	2472	-15.988	-15.988	8.0	-24.0



1TX ANT 4 MODE , SU Mode

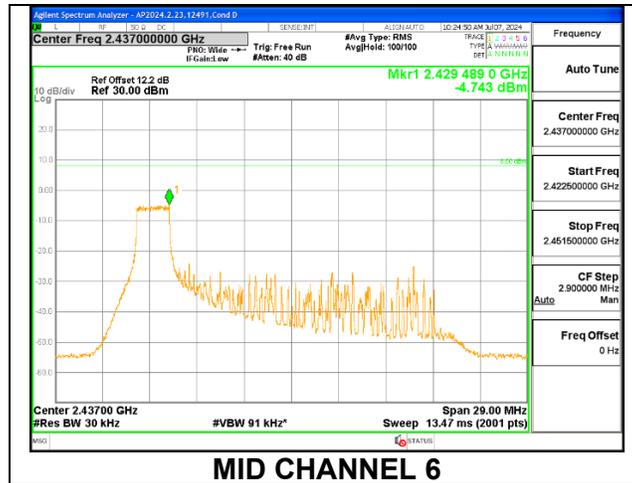
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-7.932	-7.932	8.0	-15.9
Low 2	2417	-6.460	-6.460	8.0	-14.5
Low 3	2422	-4.349	-4.349	8.0	-12.3
Mid 6	2437	-2.955	-2.955	8.0	-11.0
High 9	2452	-4.267	-4.267	8.0	-12.3
High 10	2457	-6.383	-6.383	8.0	-14.4
High 11	2462	-7.795	-7.795	8.0	-15.8
High 12	2467	-9.865	-9.865	8.0	-17.9
High 13	2472	-15.420	-15.420	8.0	-23.4



MID CHANNEL 6

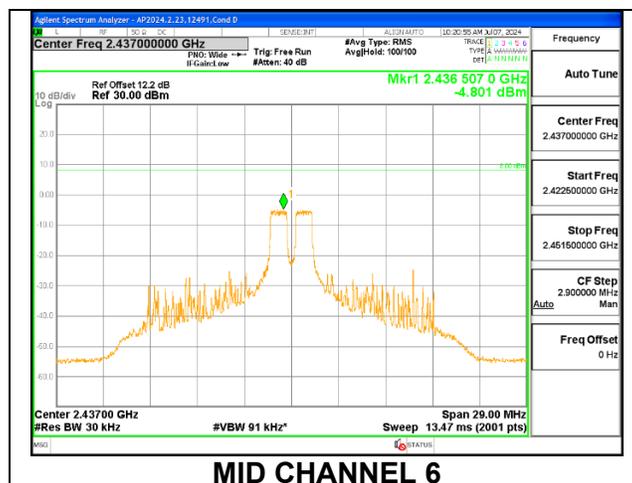
1TX ANT 3 MODE , 26-Tone RU Index 0

Duty Cycle CF (dB)		Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-5.068	-5.068	8.0	-13.1
Mid 6	2437	-4.743	-4.743	8.0	-12.7
High 11	2462	-4.480	-4.480	8.0	-12.5
High 12	2467	-4.960	-4.960	8.0	-13.0
High 13	2472	-16.097	-16.097	8.0	-24.1



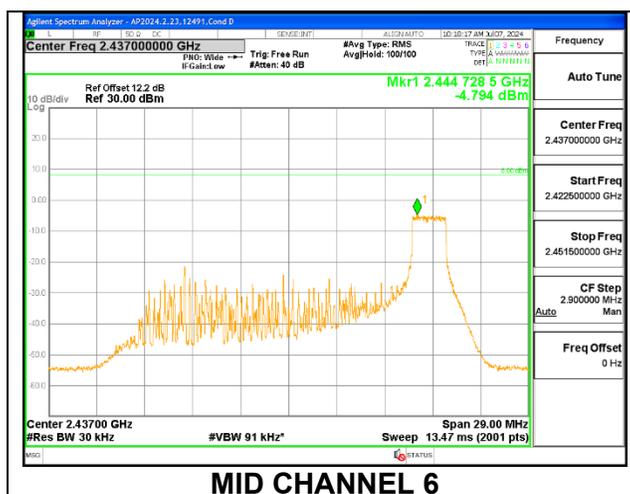
1TX ANT 3 MODE , 26-Tone RU Index 4

Duty Cycle CF (dB)		Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.700	-4.700	8.0	-12.7
Mid 6	2437	-4.801	-4.801	8.0	-12.8
High 11	2462	-5.007	-5.007	8.0	-13.0
High 12	2467	-4.922	-4.922	8.0	-12.9
High 13	2472	-16.198	-16.198	8.0	-24.2



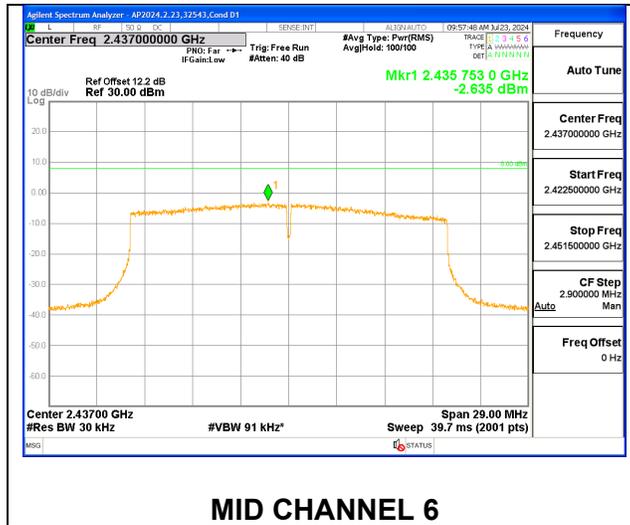
1TX ANT 3 MODE , 26-Tone RU Index 8

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.481	-4.481	8.0	-12.5
Mid 6	2437	-4.794	-4.794	8.0	-12.8
High 11	2462	-4.711	-4.711	8.0	-12.7
High 12	2467	-4.868	-4.868	8.0	-12.9
High 13	2472	-16.010	-16.010	8.0	-24.0



1TX ANT 3 MODE , SU Mode

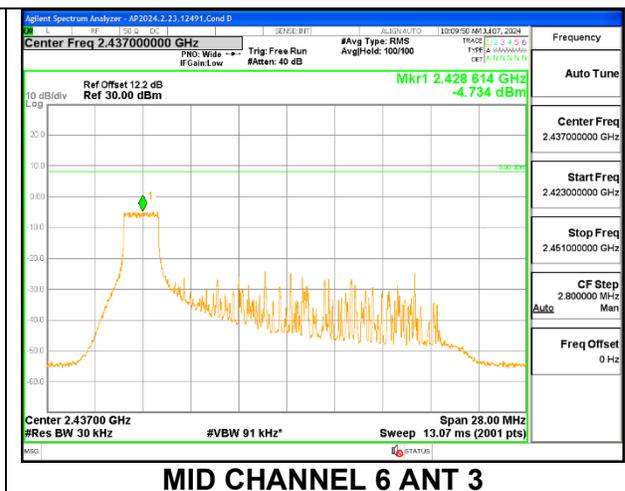
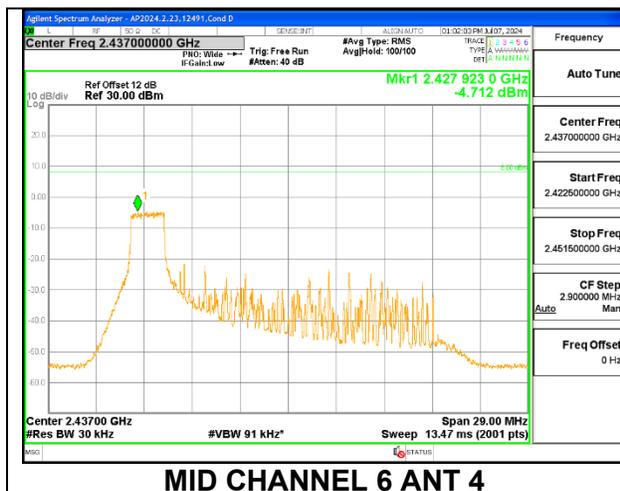
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-7.924	-7.92	8.0	-15.9
Low 2	2417	-6.312	-6.31	8.0	-14.3
Low 3	2422	-4.013	-4.01	8.0	-12.0
Mid 6	2437	-2.635	-2.64	8.0	-10.6
High 9	2452	-4.305	-4.31	8.0	-12.3
High 10	2457	-6.367	-6.37	8.0	-14.4
High 11	2462	-7.517	-7.52	8.0	-15.5
High 12	2467	-9.829	-9.83	8.0	-17.8
High 13	2472	-15.280	-15.28	8.0	-23.3



9.5.5. 802.11be EHT20 OFDMA MODE 2TX

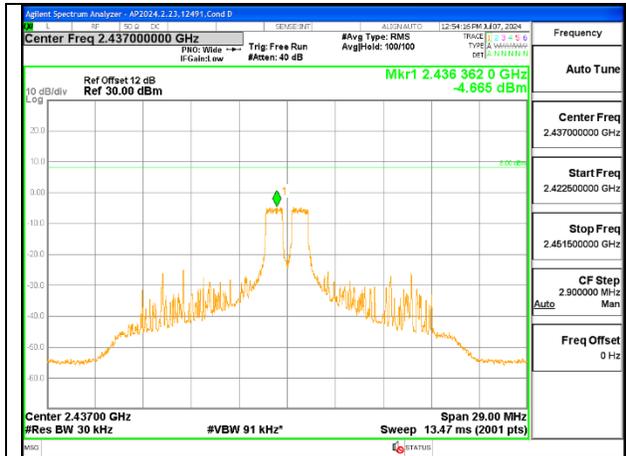
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0

Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.870	-4.890	-1.870	8.0	-9.9
Mid 6	2437	-4.712	-4.734	-1.713	8.0	-9.7
High 11	2462	-4.434	-4.566	-1.489	8.0	-9.5
High 12	2467	-4.474	-4.880	-1.662	8.0	-9.7
High 13	2472	-17.083	-16.964	-14.013	8.0	-22.0

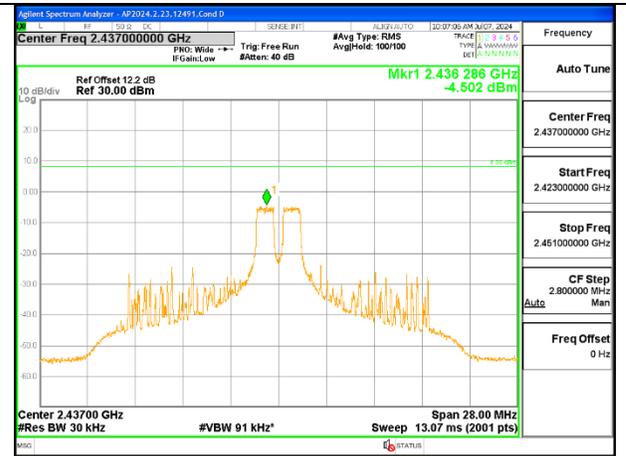


ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4

Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.747	-4.880	-1.803	8.0	-9.8
Mid 6	2437	-4.665	-4.502	-1.572	8.0	-9.6
High 11	2462	-4.789	-4.582	-1.674	8.0	-9.7
High 12	2467	-4.861	-4.885	-1.863	8.0	-9.9
High 13	2472	-17.034	-17.055	-14.034	8.0	-22.0



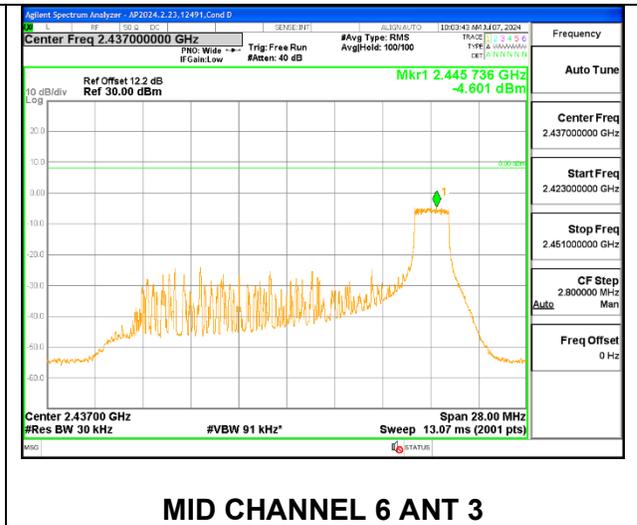
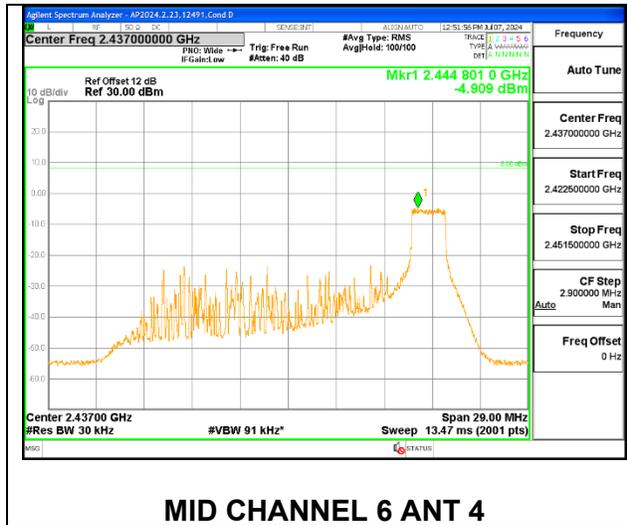
MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.793	-4.456	-1.611	8.0	-9.6
Mid 6	2437	-4.909	-4.601	-1.742	8.0	-9.7
High 11	2462	-4.323	-4.291	-1.297	8.0	-9.3
High 12	2467	-4.909	-4.945	-1.917	8.0	-9.9
High 13	2472	-16.946	-16.874	-13.900	8.0	-21.9

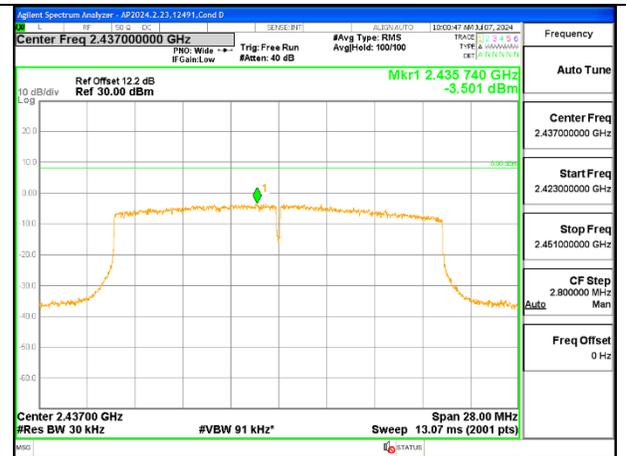


ANT 4 + ANT 3 2TX MODE: SU Mode

Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-9.519	-9.560	-6.529	8.0	-14.5
Low 2	2417	-7.067	-7.350	-4.196	8.0	-12.2
Low 3	2422	-5.143	-5.107	-2.115	8.0	-10.1
Mid 6	2437	-3.143	-3.501	-0.308	8.0	-8.3
High 9	2452	-5.644	-5.178	-2.394	8.0	-10.4
High 10	2457	-7.371	-7.189	-4.269	8.0	-12.3
High 11	2462	-9.364	-9.233	-6.288	8.0	-14.3
High 12	2467	-11.747	-11.890	-8.808	8.0	-16.8
High 13	2472	-16.461	-16.202	-13.319	8.0	-21.3



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

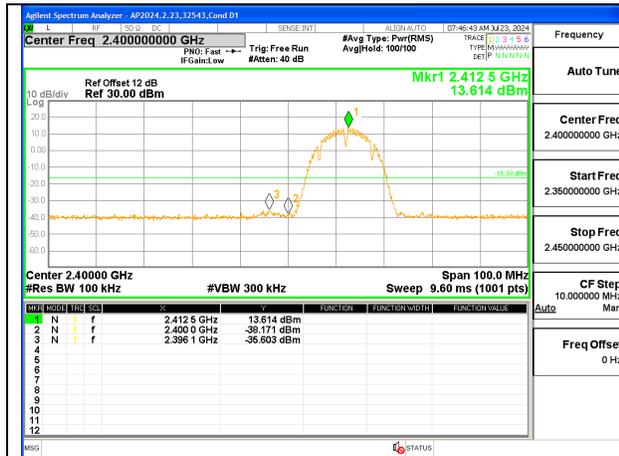
RSS-247 5.5

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)).

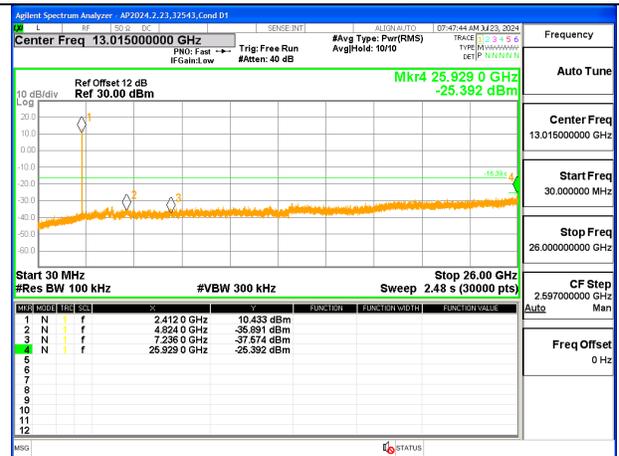
RESULTS

9.6.1. 802.11b MODE 1TX

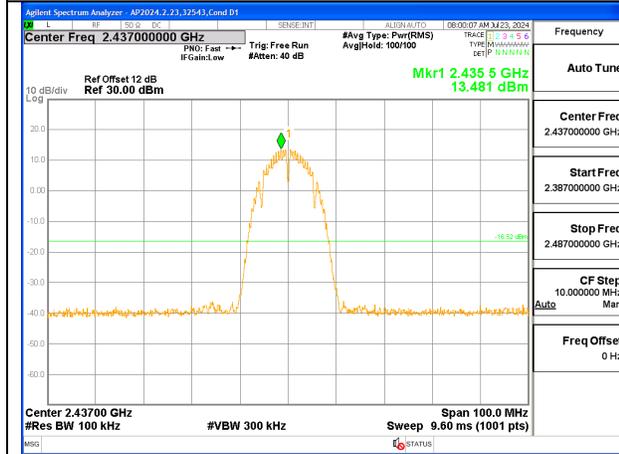
1TX ANT 4 MODE



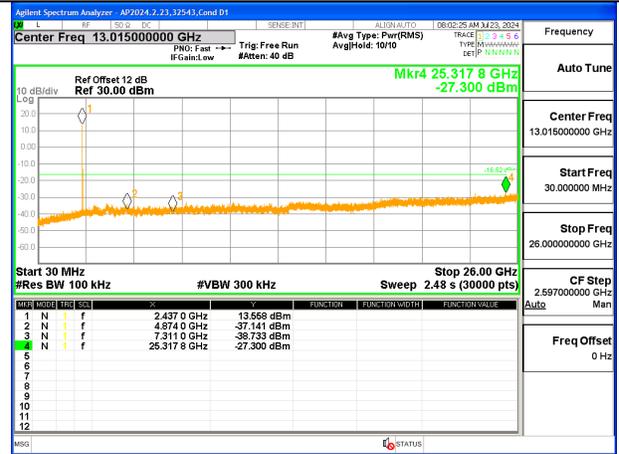
LOW CHANNEL 1 BANDEDGE



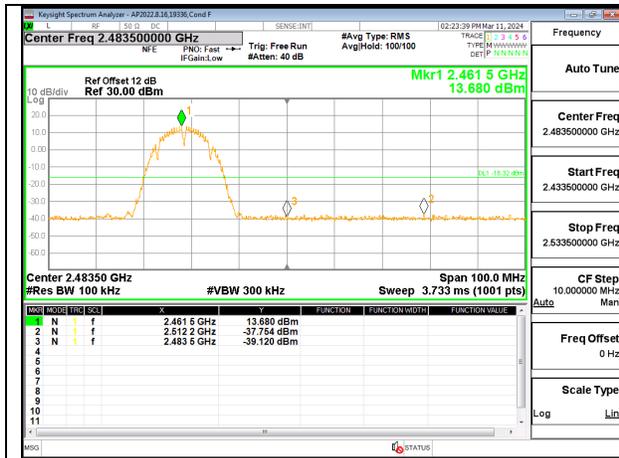
OUT-OF-BAND LOW CHANNEL 1



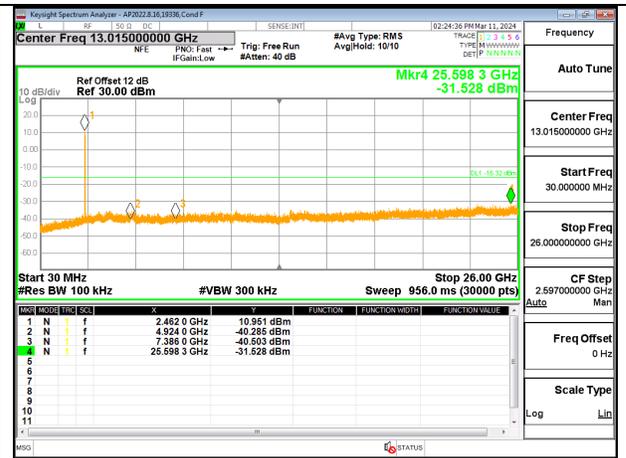
IN-BAND REFERENCE LEVEL



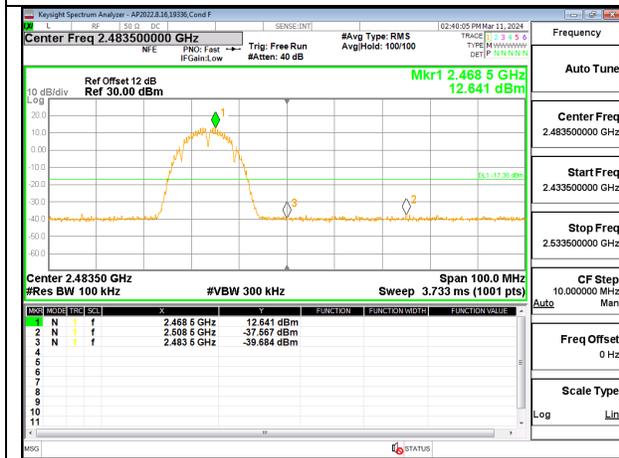
OUT-OF-BAND MID CHANNEL



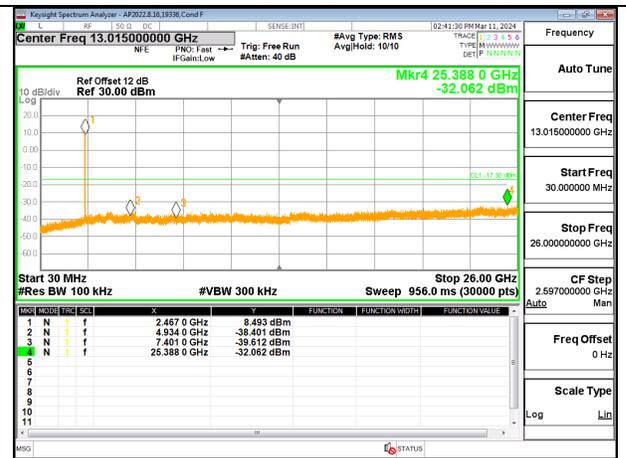
HIGH CHANNEL 11 BANDEDGE



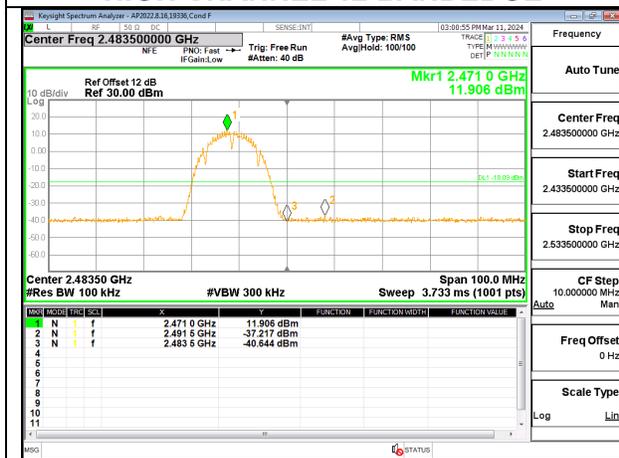
OUT-OF-BAND HIGH CHANNEL 11



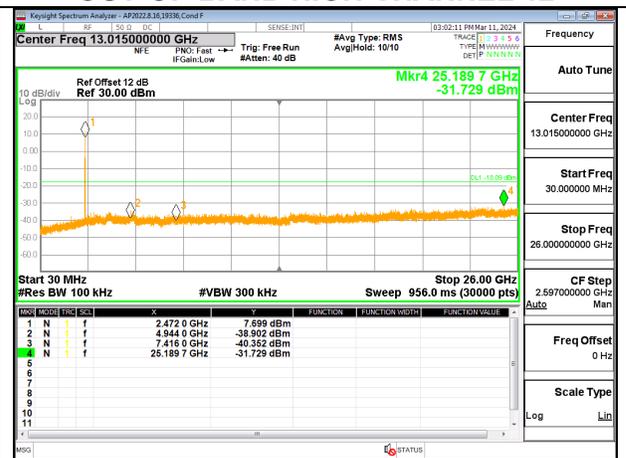
HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12

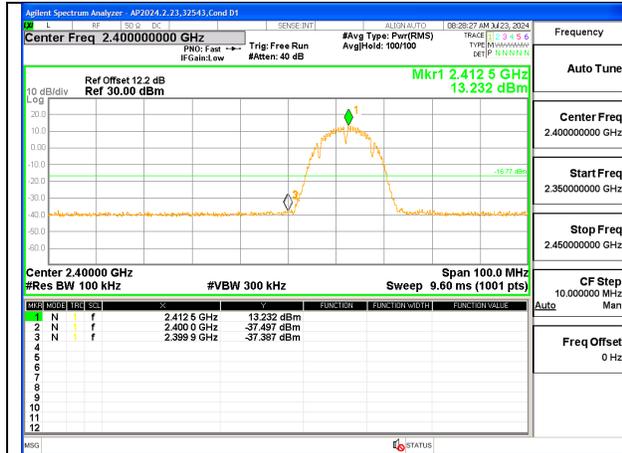


HIGH CHANNEL 13 BANDEDGE

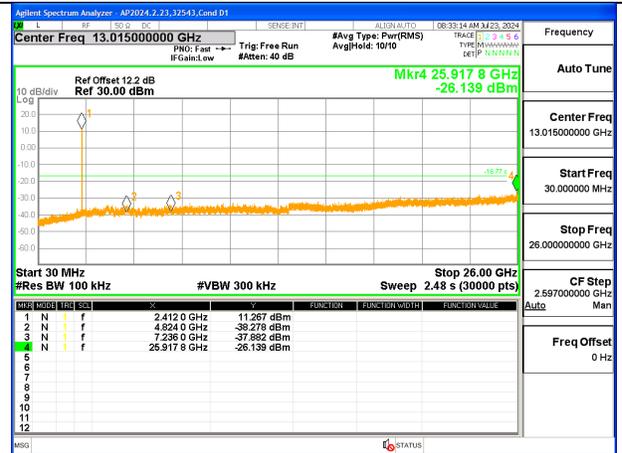


OUT-OF-BAND HIGH CHANNEL 13

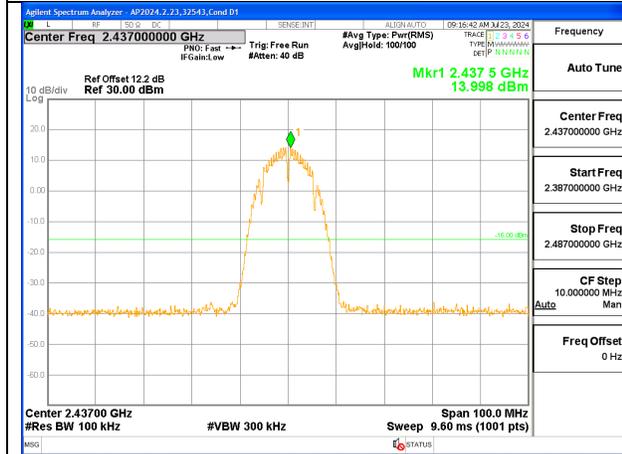
1TX ANT 3 MODE



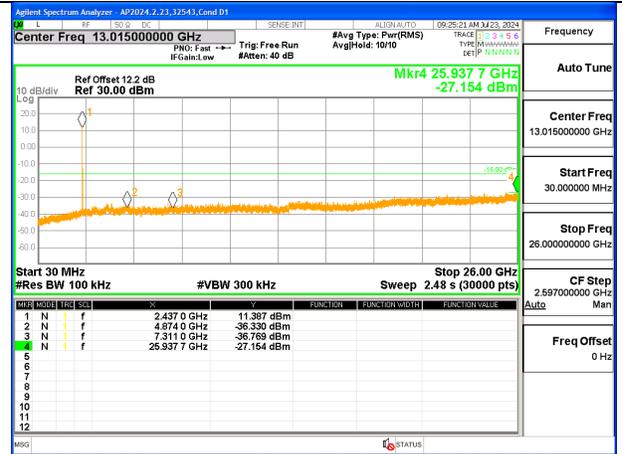
LOW CHANNEL 1 BANDEDGE



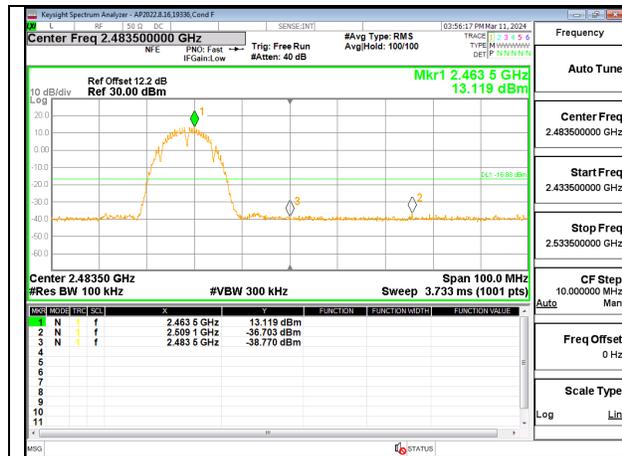
OUT-OF-BAND LOW CHANNEL 1



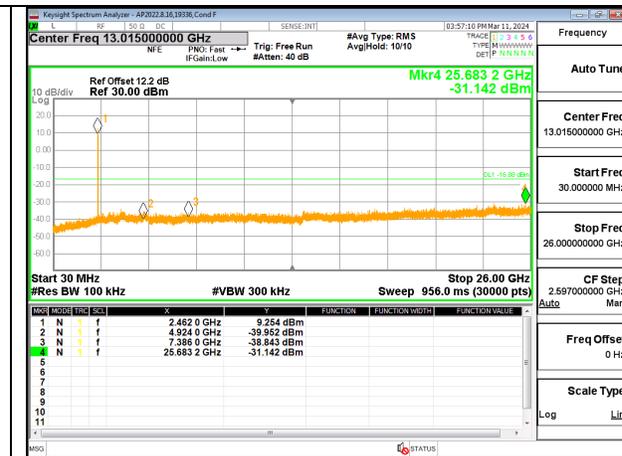
IN-BAND REFERENCE LEVEL



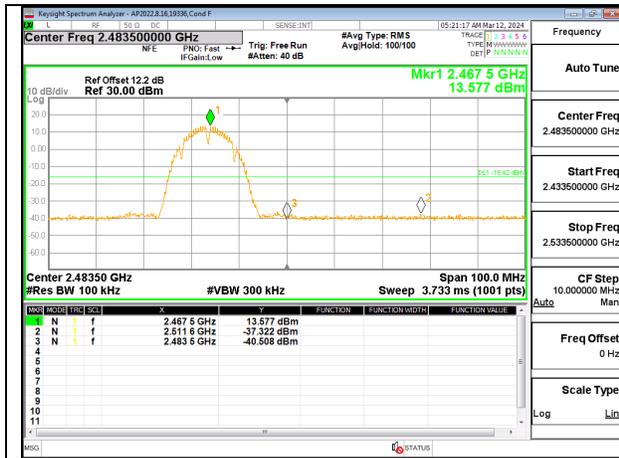
OUT-OF-BAND MID CHANNEL



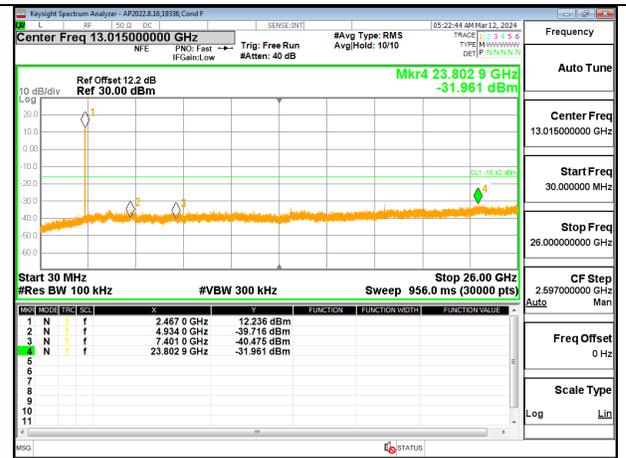
HIGH CHANNEL 11 BANDEDGE



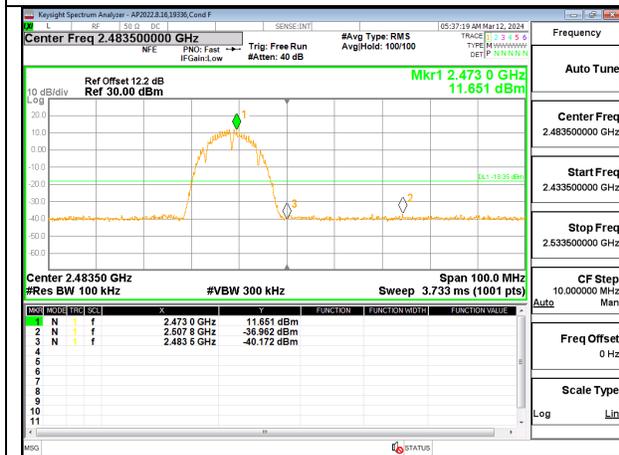
OUT-OF-BAND HIGH CHANNEL 11



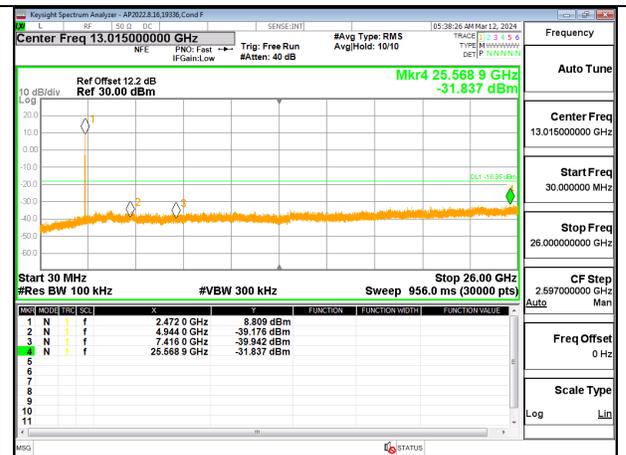
HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12



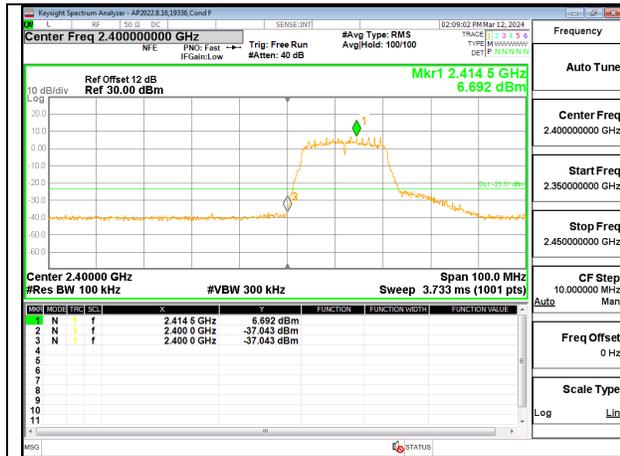
HIGH CHANNEL 13 BANDEDGE



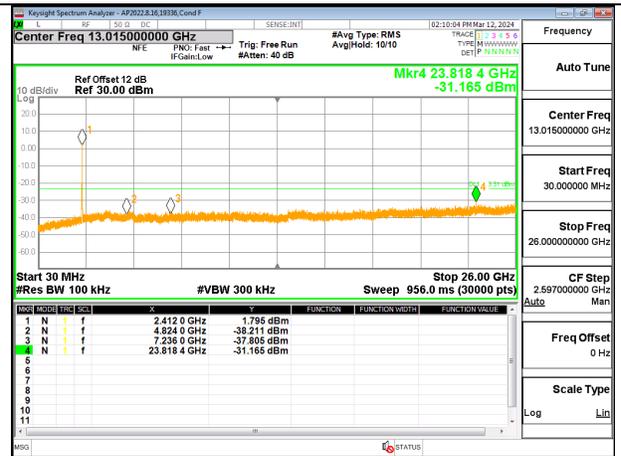
OUT-OF-BAND HIGH CHANNEL 13

9.6.2. 802.11n HT20 MODE

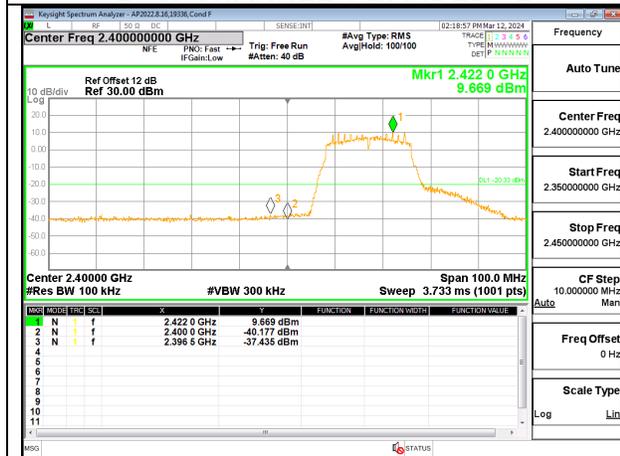
1TX ANT 4 MODE



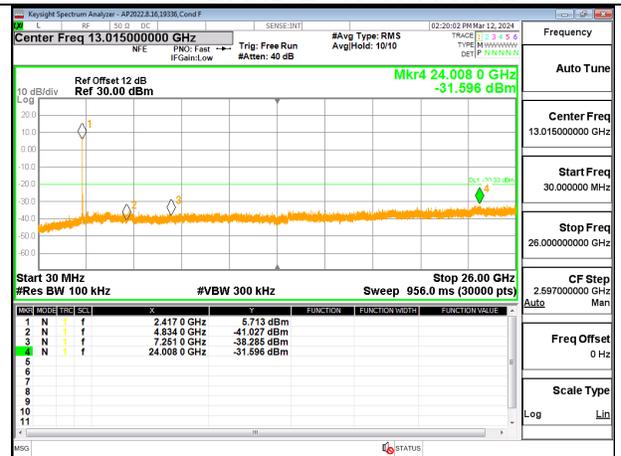
LOW CHANNEL 1 BANDEDGE



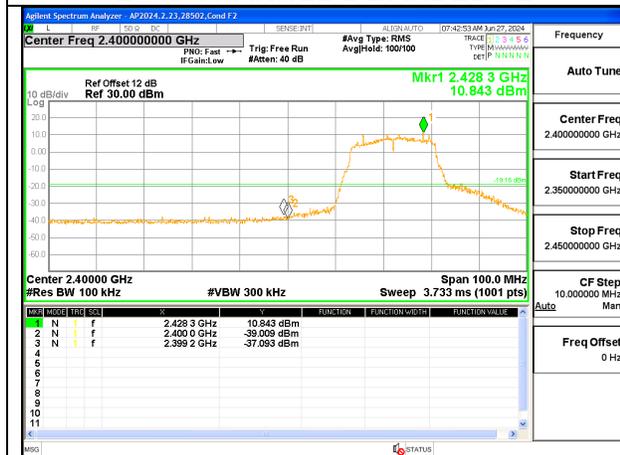
OUT-OF-BAND LOW CHANNEL 1



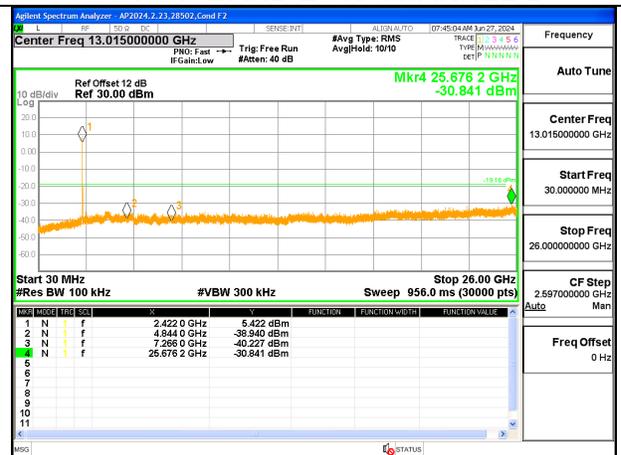
LOW CHANNEL 2 BANDEDGE



OUT-OF-BAND LOW CHANNEL 2



LOW CHANNEL 3 BANDEDGE



OUT-OF-BAND LOW CHANNEL 3

