

# TEST REPORT

**Report Number:** 14523744-E4V2

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

**Model :** A3101 (Full Test Model)  
A3102, A3104 (Variant Models)

**Brand :** APPLE

**FCC ID :** BCG-E8436A (Full Test Model)  
BCG-E8437A, BCG-E8438A (Variant Models)

**IC :** 579C-E8436A (Full Test Model)  
579C-E8437A, 579C-E8438A (Variant Models)

**EUT Description :** SMARTPHONE

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5 + A1 + A2

**Date Of Issue:**  
August 08, 2023

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**REPORT REVISION HISTORY**

Rev.	Issue Date	Revisions	Revised By
V1	8/3/2023	Initial Issue	Chin Pang
V2	8/8/2023	Address TCB's questions on Page 10, 18, 85-97, 104-106, 113-116, 142-143, 166-167, 224-226	Chin Pang

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# 1. ATTESTATION OF TEST RESULTS

**EUT DESCRIPTION:** SMARTPHONE

**MODEL:** A3101 (Full Test Model)  
A3102, A3104 (Variant Models)

**BRAND:** APPLE

**SERIAL NUMBER:** C07GQW000CA00003PN (Conducted)  
CY2KJ6YF12 (Radiated)

**SAMPLE RECEIPT DATE:** February 14, 2023 (Conducted)  
JUNE 06, 2023 (Radiated)

**DATE TESTED:** FEBRUARY 23 – JULY 28, 2023

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	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 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 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 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. 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:

Prepared 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 (Average)	Complies	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
- -247 Issue 2

## 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 checked="" 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 <sub>LAB</sub>
Conducted Antenna Port Emission Measurement	1.94 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 dB
RF Power Measurement Direct Method Using Power Meter	0.450 dB(Peak), 1.3 dB (Ave)
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)

$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

### 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.

$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC, NB UNII, 802.15.4, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

The Model and FCC/IC ID covered by this report includes:

Full Test Model: A3101, FCC ID: BCG-E8436A, IC ID: 579C-E8436A

Variant Models: A3102; FCC ID: BCG-E8437A, IC ID: 579C-E8437A  
A3104; FCC ID: BCG-E8438A, IC ID: 579C-E8438A

### 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)
<b>1Tx</b>			
2412 - 2472	802.11b	21.49	140.93
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20	21.49	140.93
	802.11ax HE20	21.43	139.00

<b>2Tx</b>			
2412 - 2472	802.11n HT20 CDD	24.49	281.19
	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
	802.11ax HE20	24.31	269.77

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:  
Cable loss is 1.95 dB

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	-4	-1.5

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## 6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WiFi FW Version: 23\_10\_663.

## 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 X (Flatbed) orientation was worst-case orientation for ANT 4, ANT 3, and 2TX.

With same power on Full RU and SU higher data rate, investigation were 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 HE 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 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz tests, the worst-case configuration reported was with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop.

The output power and psd for the 802.11 ax mode were investigated between all different tones, and we found that SU mode had the highest output power and the lowest tone 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.

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 HT20mode: MCS7  
802.11ax HE20mode: MCS9  
802.11ax HE20 RU26 and SU, MCS9

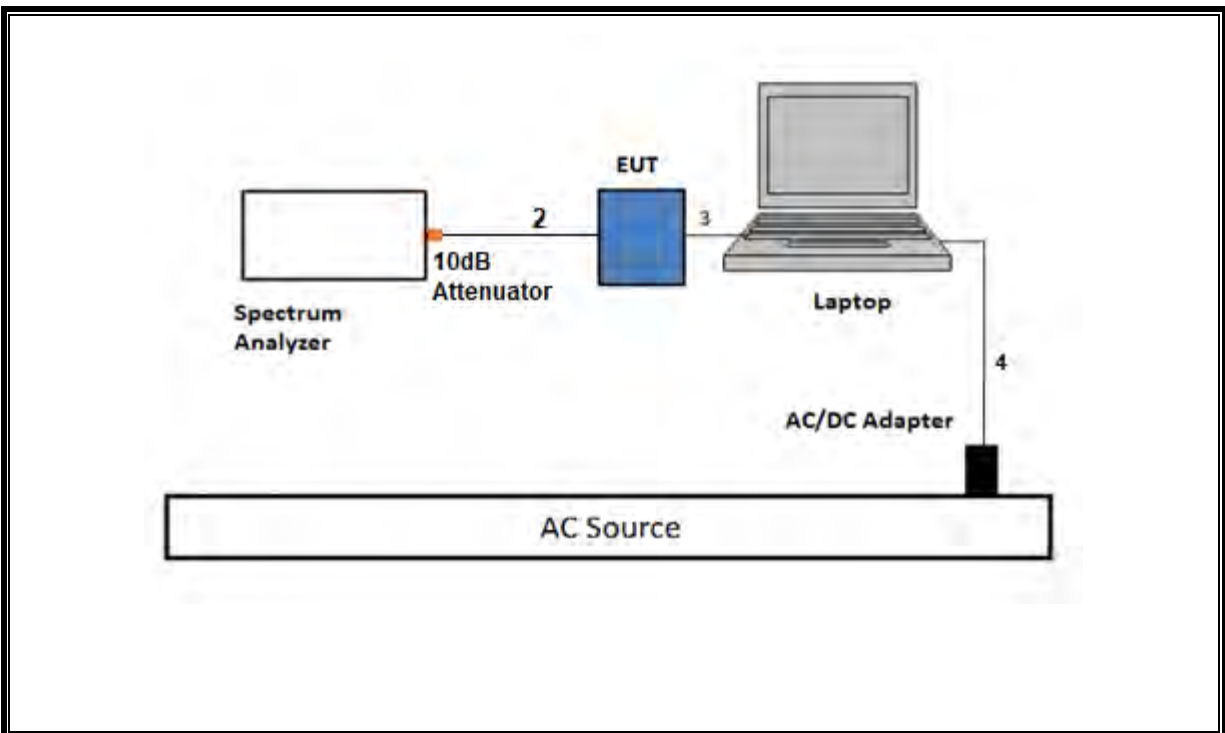
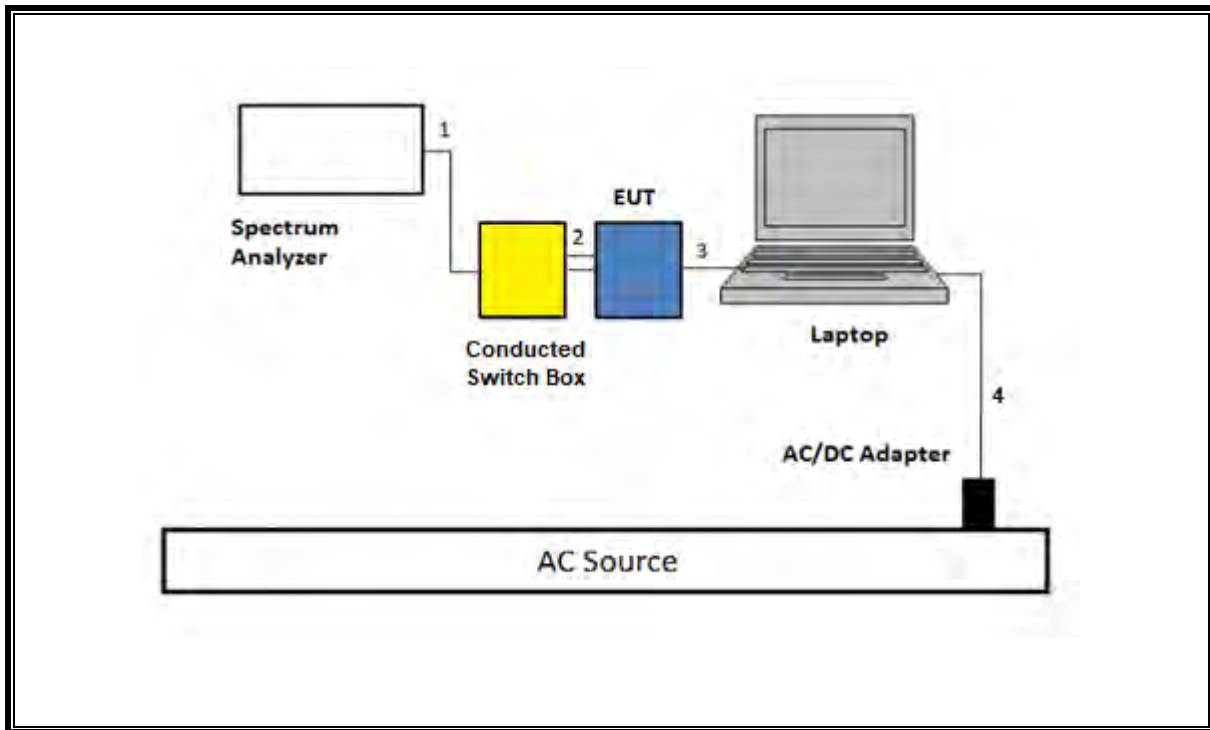
## 6.6. DESCRIPTION OF TEST SETUP

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		
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	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	0.75	To spectrum Analyzer
2	Antenna	2	SMA	Un-shielded	0.2	To Conducted Switch Box
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	AC	1	AC	Un-shielded	2	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	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Shielded	1	N/A

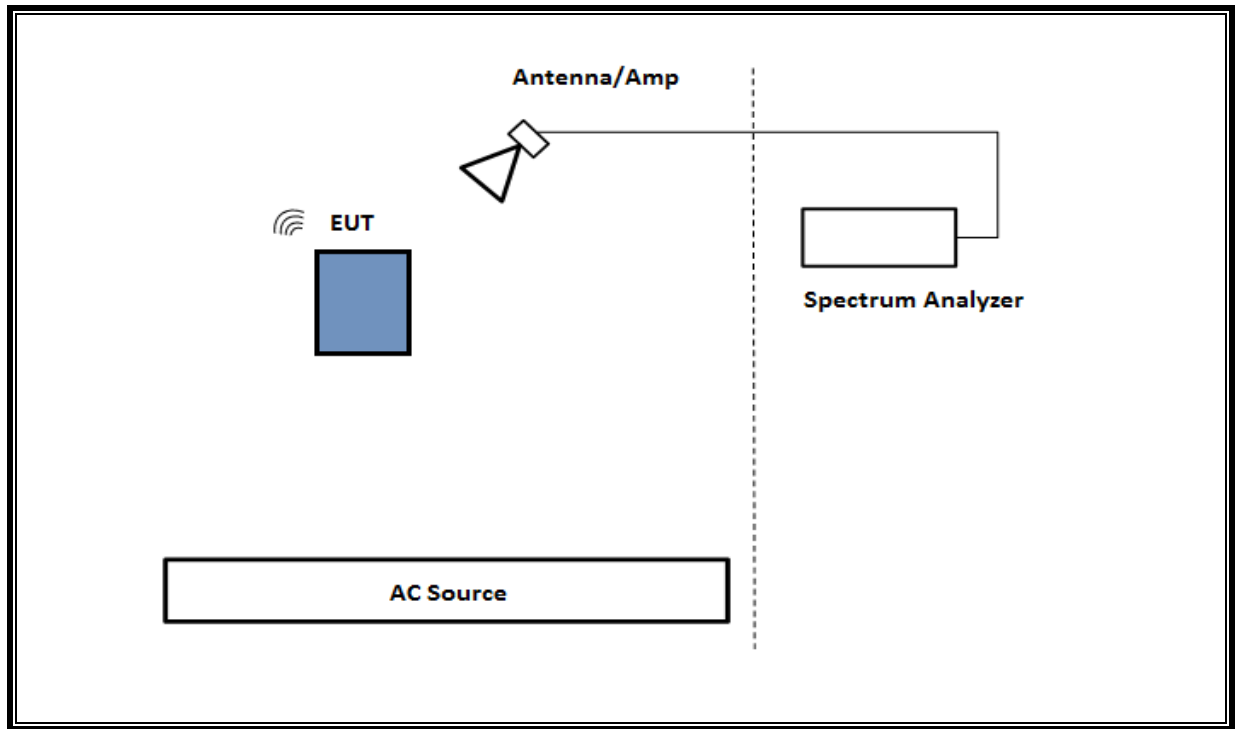
### TEST SETUP

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

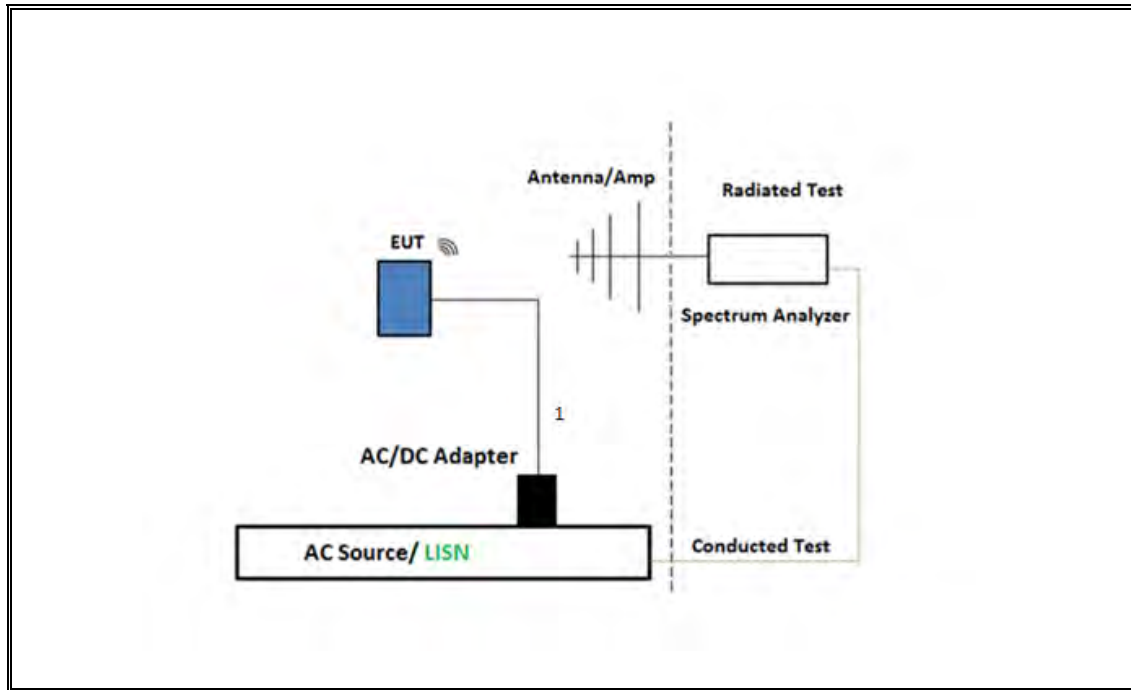
**SETUP DIAGRAM FOR CONDUCTED TESTS**



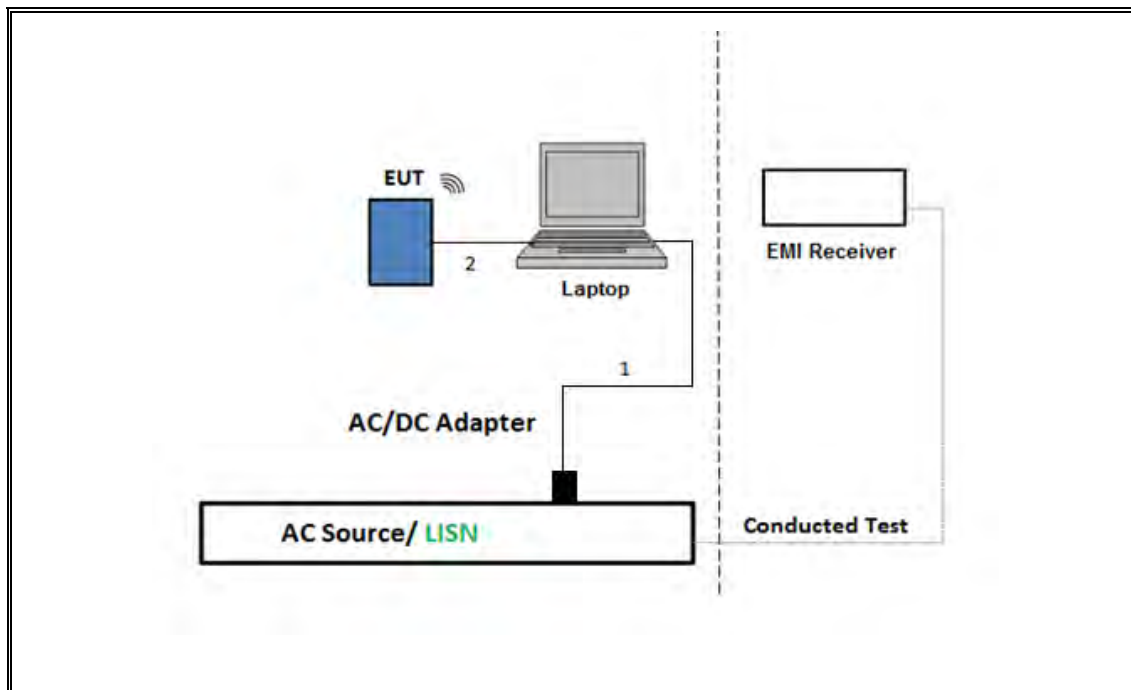
**SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz**



**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	Last Cal
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	84796	09/19/2023	09/19/2022
RF Filter Box 1-18GHz	UL-FR1	SAC 12 port rf box	217521	10/09/2023	10/09/2022
EMI Receiver	Rohde & Schwarz	ESW44	201498	02/29/2024	02/29/2023
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp	JB3	80714	10/06/2023	10/06/2022
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
EMI Receiver	Rohde & Schwarz	ESW44	201498	02/29/2024	02/29/2023
*Antenna Horn, 18 to 26.5GHz	ARA	MWH-1826/B	172353	06/01/2023	06/01/2022
RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023
*Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170013	07/28/2023	07/28/2022
*Antenna, Passive Loop 100KHz to 30MHz	ETS-Lindgren	EM-6872	170015	07/28/2023	07/28/2022
Power Meter, P-series single channel	Keysight	N1912A	90630	01/31/2024	01/31/2023
Power Sensor	Keysight	N1921A	90391	01/31/2024	01/31/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80404	08/08/2023	08/08/2022
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	216812	09/17/2023	09/17/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	81887	03/31/2024	03/31/2023
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	225474	03/31/2024	03/31/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	ESW44	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	200784	01/31/2024	01/31/2023
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	220095	01/31/2024	01/31/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201500	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	222740	08/31/2023	08/31/2022
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	231249	02/29/2024	02/29/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201499	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226673	01/09/2024	01/09/2023
*RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226781	04/30/2023	04/30/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	230299	01/12/2024	01/12/2023
*RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	231874	04/19/2023	04/19/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	02/20/2024	02/20/2023

TEST EQUIPMENT LIST (cont.)					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226671	01/09/2024	01/09/2023
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226779	03/05/2024	03/05/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	226078	02/29/2024	02/29/2023
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	Verified/Characterized before use	
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236355	Verified/Characterized before use	
*Conducted Switch Box	N/A	CSB	221008	06/21/2023	06/21/2022

AC Line Conducted					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	93091	02/29/2024	02/29/2023
Transient Limiter	UL-FR1	LIT-930	127455	01/31/2024	01/31/2023
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175764	01/31/2024	01/31/2023
*Transient Limiter	TE	TBFL1	207996	07/15/2023	07/15/2022
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, Mar 6, 2020		
Conducted Software	UL	UL EMC	2020.2.26		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, February 21, 2020		

\*Testing was completed before equipment cal due date.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE LIMITS

None; for reporting purposes only.

#### PROCEDURE

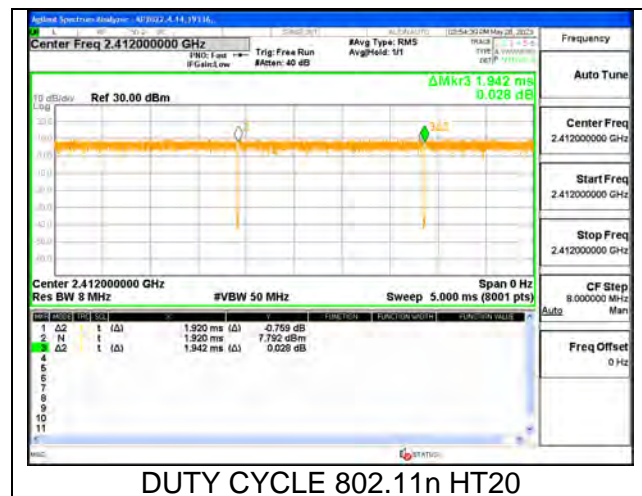
KDB 558074 Zero-Span Spectrum Analyzer Method.

#### 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)
<b>2.4GHz Band</b>						
802.11b	12.420	12.440	0.998	99.84%	0.00	0.010
802.11n HT20 MCS0	1.920	1.942	0.989	98.87%	0.00	0.010
802.11n HT20 MCS7	0.228	0.249	0.9137	91.37%	0.39	4.394
802.11ax HE20 RU26 MCS0	3.992	4.039	0.988	98.84%	0.00	0.010
802.11ax HE20 RU26 MCS9	0.350	0.395	0.888	88.82%	0.51	2.854
802.11ax HE20 SU MCS0	1.487	1.509	0.985	98.54%	0.00	0.010
802.11ax HE20 SU MCS9	0.168	0.189	0.885	88.54%	0.53	5.967

Duty cycle 2TX is the same as 1TX.

#### DUTY CYCLE PLOTS



## 9.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

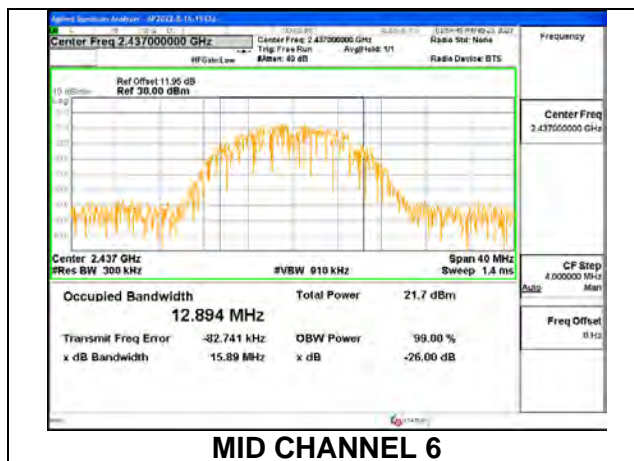
### RESULTS

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

**9.2.1. 802.11b MODE 1TX**

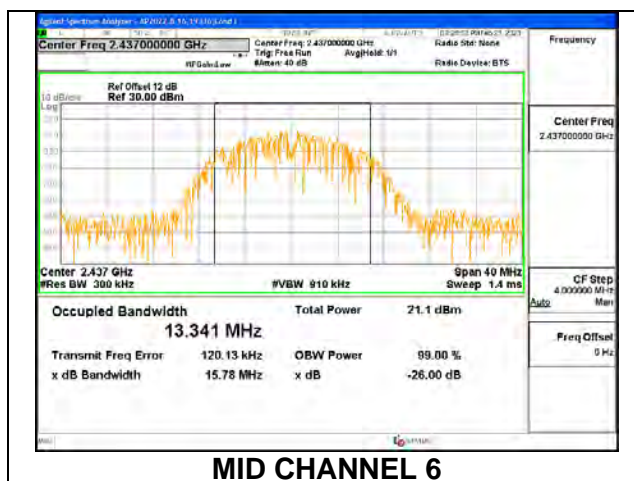
**1TX ANT 4 MODE**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.753
Mid 6	2437	12.894
High 11	2462	12.717
High 12	2467	12.908
High 13	2472	12.770



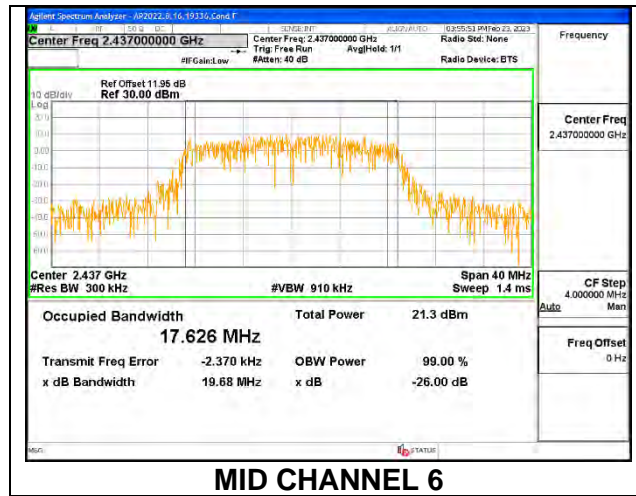
**1TX ANT 3 MODE**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.730
Mid 6	2437	13.341
High 11	2462	12.770
High 12	2467	12.852
High 13	2472	12.913



**9.2.2. 802.11n HT20 MODE**  
**1TX ANT 4 MODE**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.647
Low 2	2417	17.508
Low 3	2422	17.626
Mid 6	2437	17.626
High 9	2452	17.779
High 10	2457	17.786
High 11	2462	17.753
High 12	2467	17.683
High 13	2472	17.749

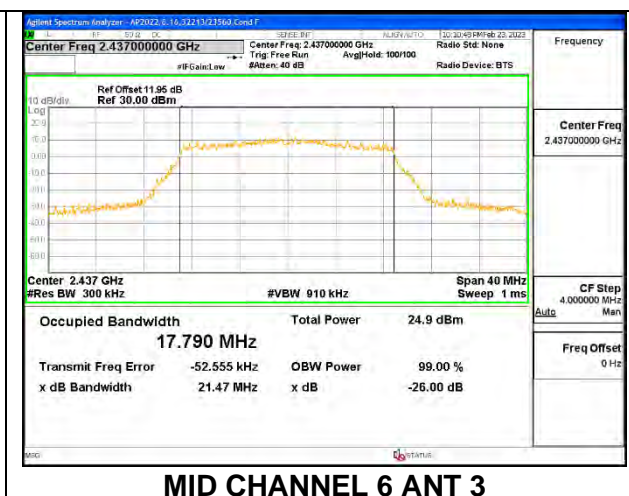
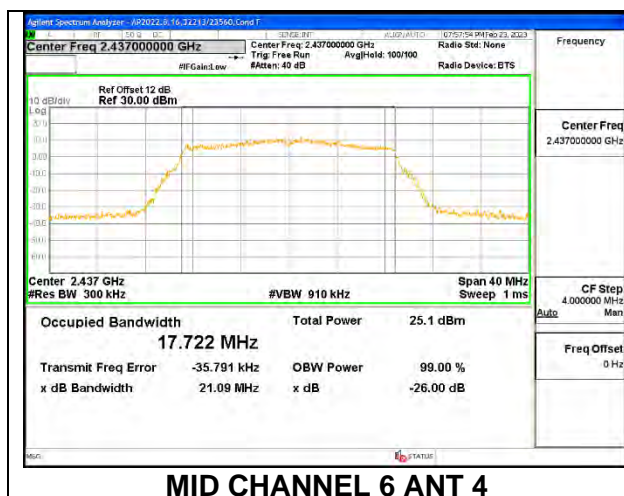




### 9.2.3. 802.11n HT20 CDD MODE

#### ANT 4 + ANT 3 2TX MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)	99% Bandwidth (MHz)
		ANT 4	ANT 3
Low 1	2412	17.714	17.760
Low 2	2417	17.736	17.652
Low 3	2422	17.707	17.661
Low 4	2427	17.710	17.662
Mid 6	2437	17.722	17.790
High 8	2447	17.734	17.733
High 9	2452	17.740	17.790
High 10	2457	17.757	17.706
High 11	2462	17.769	17.707
High 12	2467	17.688	17.673
High 13	2472	17.793	17.759

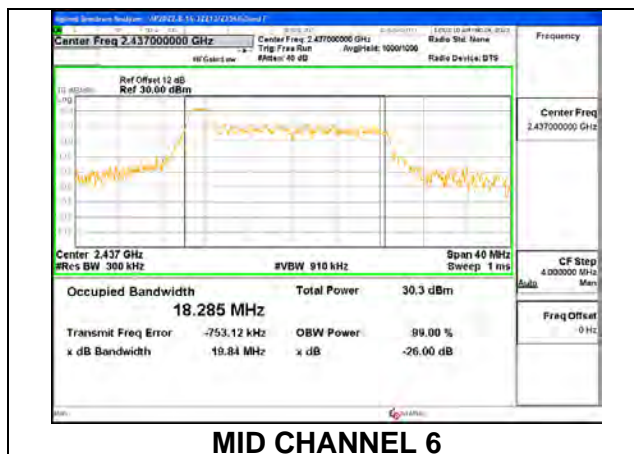




**9.2.4. 802.11ax HE20 MODE**

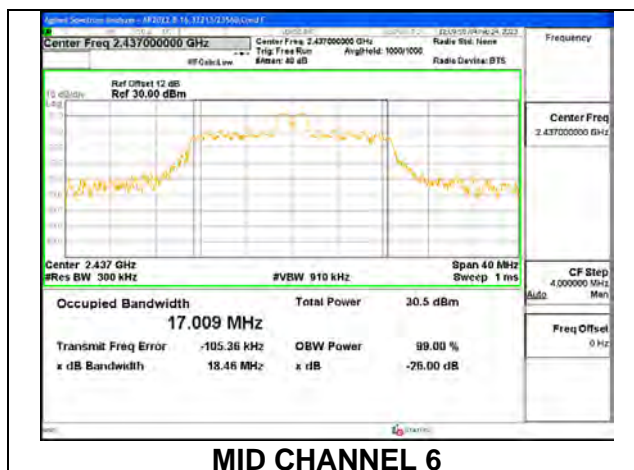
**ANT 4 LEGACY SISO MODE: 26-Tones, RU index 0**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.428
Mid 6	2437	18.285
High 11	2462	18.283
High 12	2467	18.148
High 13	2472	18.256



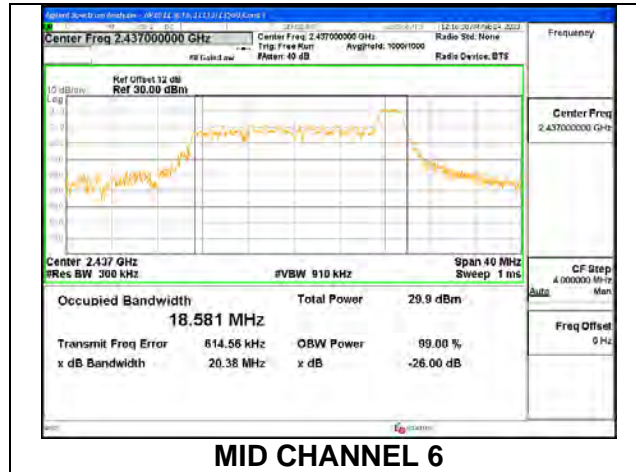
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	16.514
Mid 6	2437	17.009
High 11	2462	16.711
High 12	2467	17.756
High 13	2472	16.515



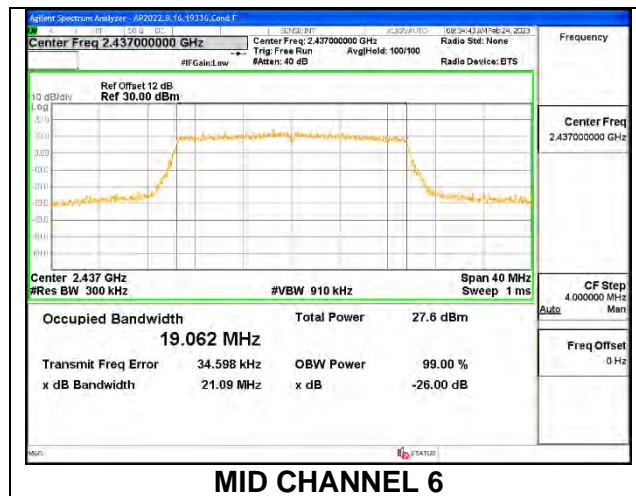
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.424
Mid 6	2437	18.581
High 11	2462	18.330
High 12	2467	18.573
High 13	2472	18.537



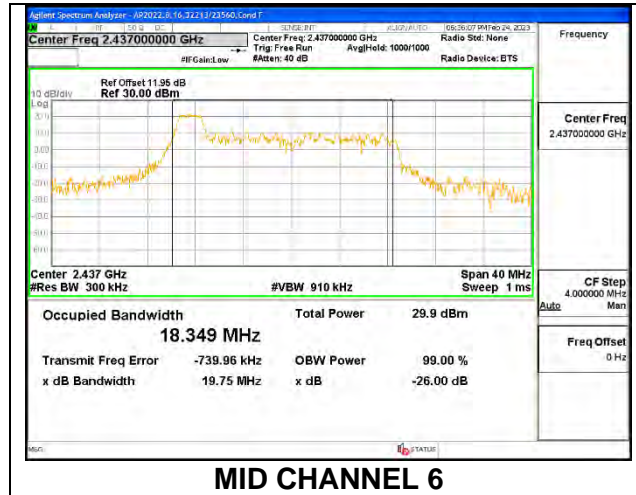
**ANT 4 SISO MODE: SU Mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	19.023
Low 2	2417	19.004
Low 3	2422	19.040
Mid 6	2437	19.062
High 9	2452	19.044
High 10	2457	18.980
High 11	2462	19.009
High 12	2467	19.036
High 13	2472	18.912



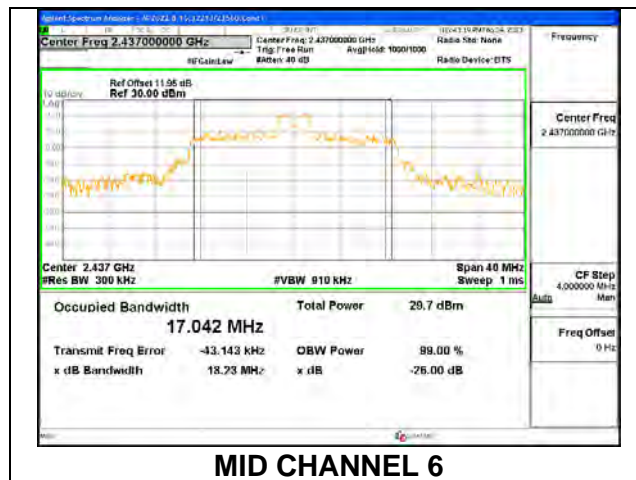
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.501
Mid 6	2437	18.349
High 11	2462	18.556
High 12	2467	18.105
High 13	2472	18.274



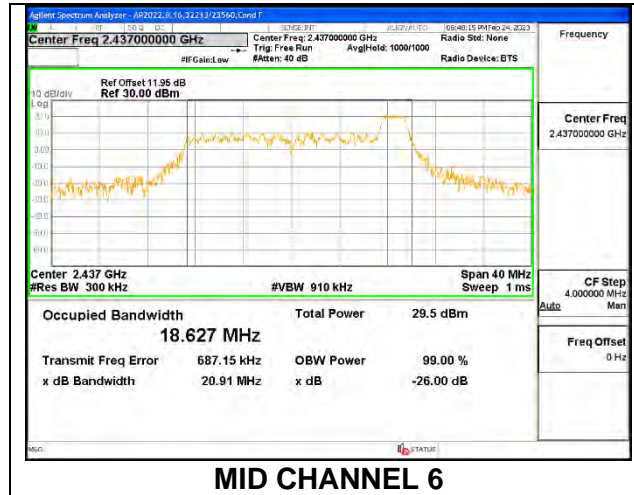
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	16.723
Mid 6	2437	17.042
High 11	2462	16.988
High 12	2467	17.017
High 13	2472	16.709



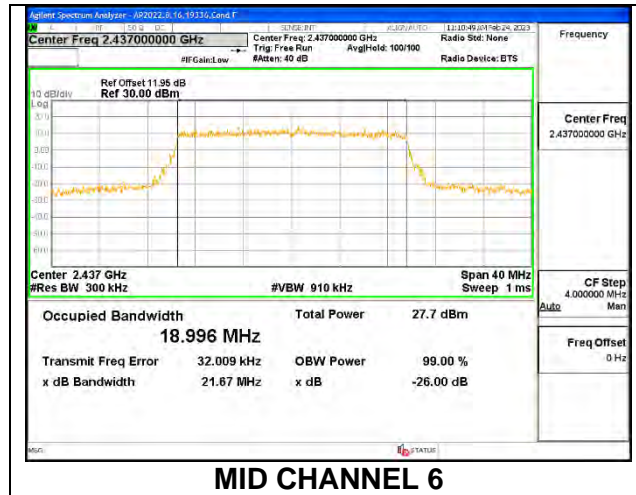
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 8**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.317
Mid 6	2437	18.627
High 11	2462	18.547
High 12	2467	18.520
High 13	2472	18.682



**ANT 3 LEGACY SISO MODE: SU-Tones**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.988
Low 2	2417	18.931
Low 3	2422	18.966
Mid 6	2437	18.996
High 9	2452	19.052
High 10	2457	18.977
High 11	2462	19.026
High 12	2467	19.007
High 13	2472	18.970

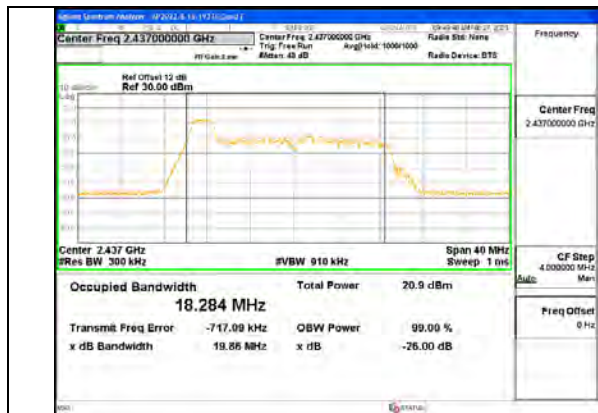




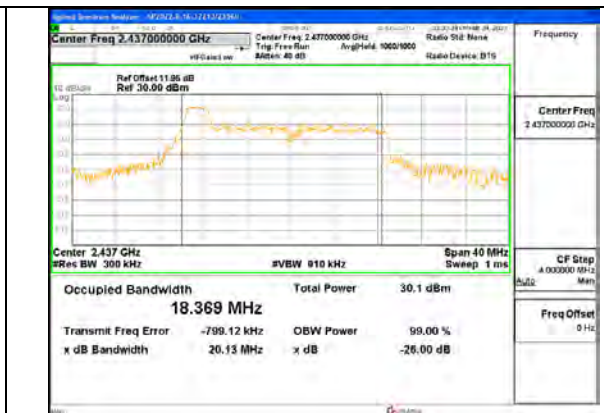
**9.2.5. 802.11ax HE20 OFDMA MODE 2TX**

**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	18.390	18.477
Mid 6	2437	18.284	18.369
High 11	2462	18.218	18.386
High 12	2467	18.066	18.229
High 13	2472	18.237	18.154



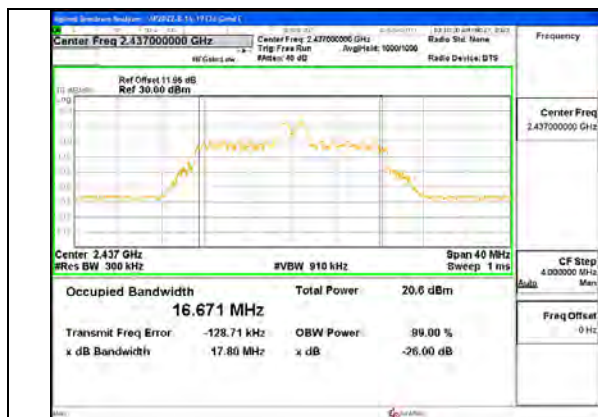
**MID CHANNEL 6 ANT 4**



**MID CHANNEL 6 ANT 3**

**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	16.856	16.458
Mid 6	2437	16.671	16.715
High 11	2462	16.736	16.544
High 12	2467	16.717	16.735
High 13	2472	16.716	16.701



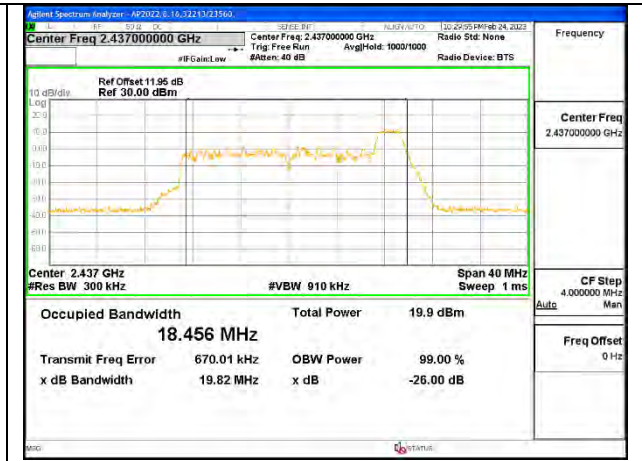
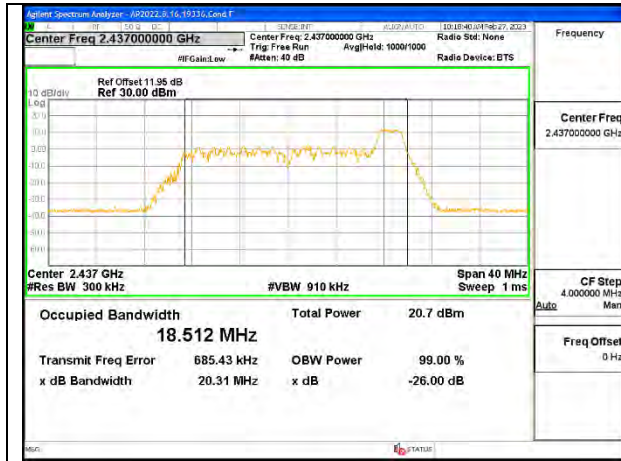
**MID CHANNEL 6 ANT 4**



**MID CHANNEL 6 ANT 3**

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

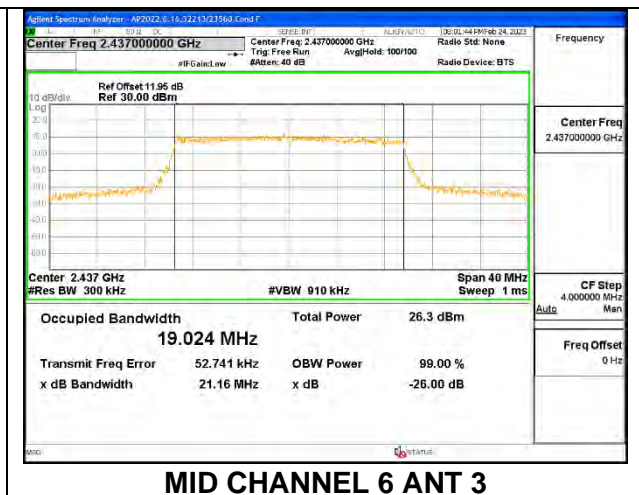
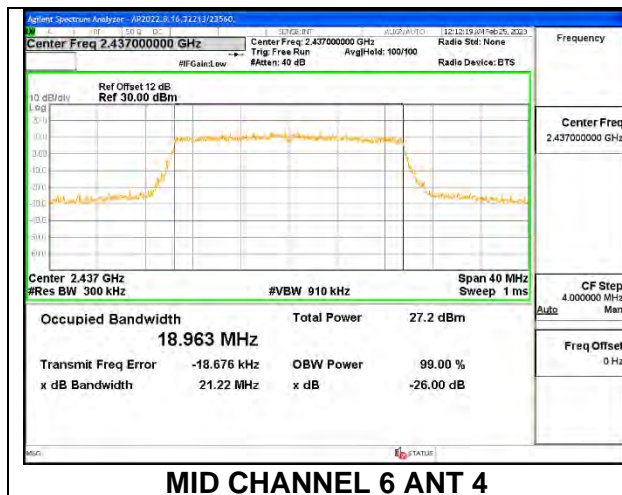
Channel	Frequency (MHz)	99% Bandwidth (MHz)	99% Bandwidth (MHz)
		ANT 4	ANT 3
Low 1	2412	18.281	18.195
Mid 6	2437	18.512	18.456
High 11	2462	18.476	18.279
High 12	2467	18.519	18.433
High 13	2472	18.537	18.582





**ANT 4 + ANT 3 2TX MODE: SU-MODE**

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	19.106	19.006
Low 2	2417	18.978	19.017
Low 3	2422	18.961	18.980
Low 4	2427	19.028	18.978
Mid 6	2437	18.963	19.024
High 8	2447	19.048	19.026
High 9	2452	19.066	18.985
High 10	2457	19.004	19.008
High 11	2462	18.993	19.049
High 12	2467	18.961	19.012
High 13	2472	18.935	19.008



### 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

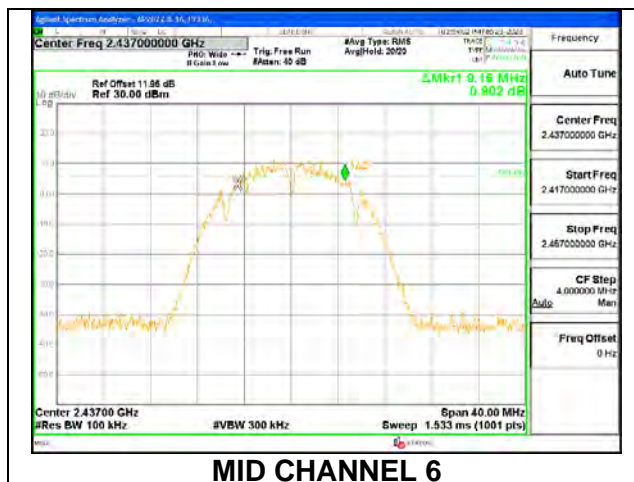
The 6dB bandwidth was measured for the narrowest bandwidth mode, b Mode and ax HE20 Mode 26-Tones as worst case to demonstrate compliance with the minimum required bandwidth of 500 kHz to cover all OFDMA modes.

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

### 9.3.1. 802.11b MODE 1TX

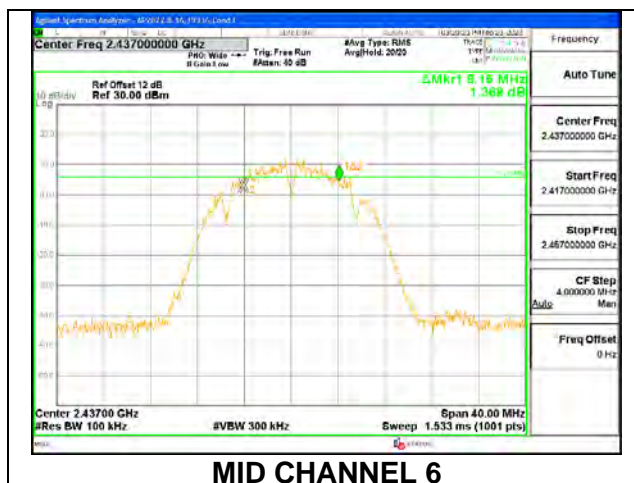
#### 1TX ANT 4 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.36	0.5
Mid 6	2437	9.16	0.5
High 11	2462	8.20	0.5
High 12	2467	7.52	0.5
High 13	2472	7.20	0.5



#### 1TX ANT 3 MODE

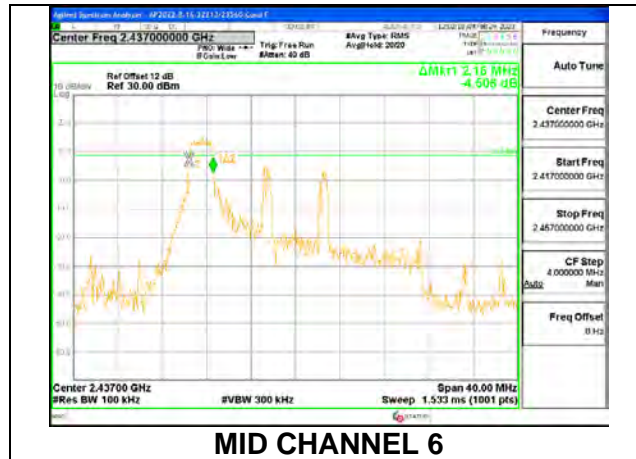
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	7.68	0.5
Mid 6	2437	8.16	0.5
High 11	2462	8.64	0.5
High 12	2467	8.36	0.5
High 13	2472	8.12	0.5



**9.3.2. 802.11ax HE20 MODE**

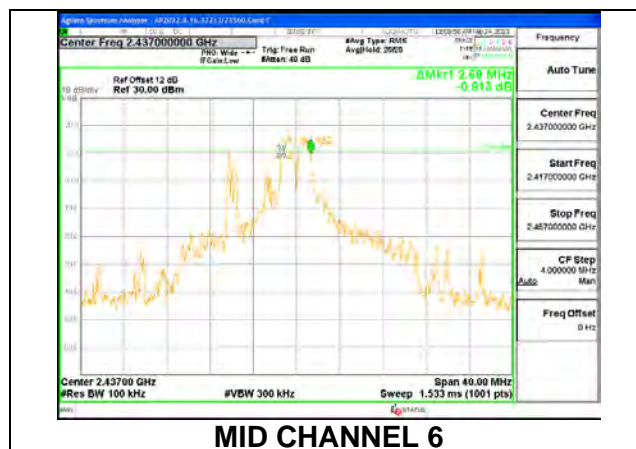
**ANT 4 LEGACY SISO MODE: 26-Tones, RU index 0**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.08	0.5
Mid 6	2437	2.16	0.5
High 11	2462	2.08	0.5
High 12	2467	2.16	0.5
High 13	2472	2.08	0.5



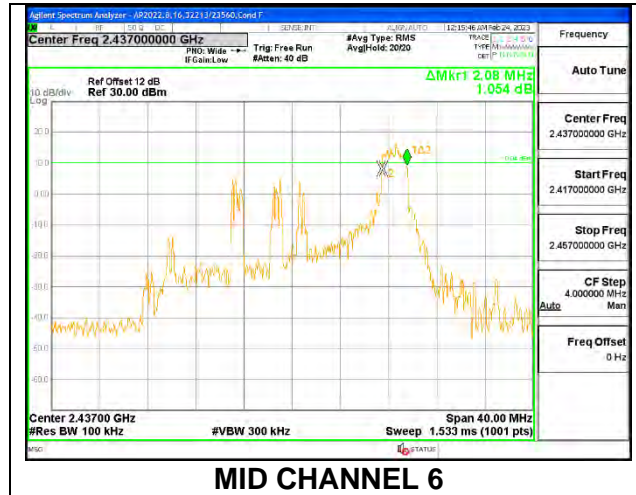
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 4**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.68	0.5
Mid 6	2437	2.68	0.5
High 11	2462	2.64	0.5
High 12	2467	2.60	0.5
High 13	2472	2.60	0.5



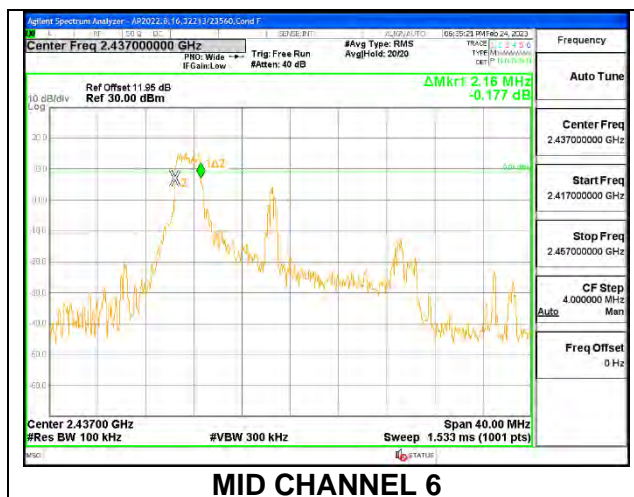
**ANT 4 LEGACY SISO MODE: 26-Tones, RU Index 8**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Mid 6	2437	2.08	0.5
High 11	2462	2.12	0.5
High 12	2467	2.12	0.5
High 13	2472	2.20	0.5



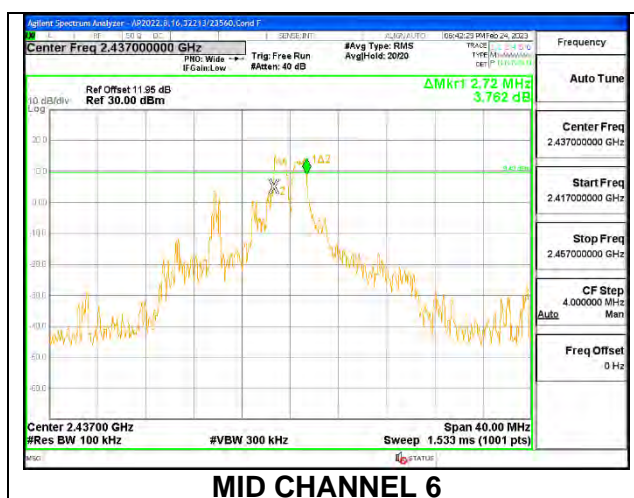
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 0**

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



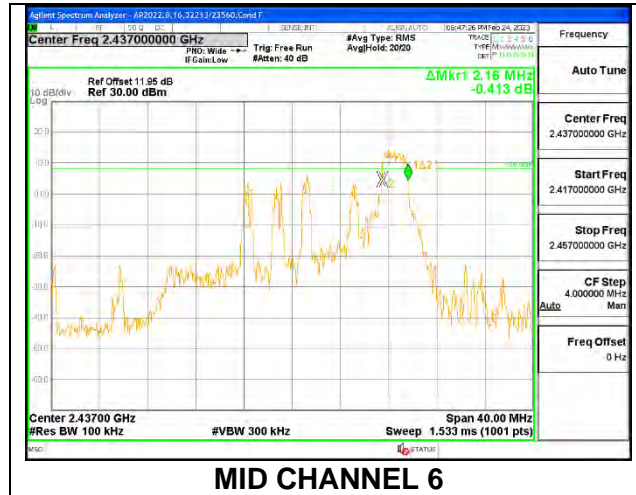
**ANT 3 LEGACY SISO MODE: 26-Tones, RU Index 4**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.68	0.5
Mid 6	2437	2.72	0.5
High 11	2462	2.72	0.5
High 12	2467	2.68	0.5
High 13	2472	2.64	0.5



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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.08	0.5
Mid 6	2437	2.16	0.5
High 11	2462	2.12	0.5
High 12	2467	2.08	0.5
High 13	2472	2.08	0.5





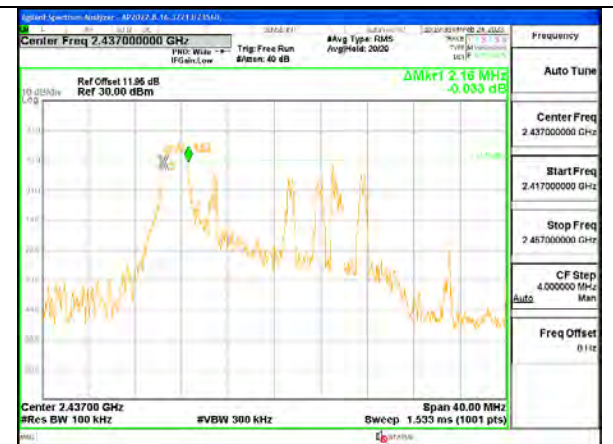
### 9.3.3. 802.11ax HE20 OFDMA MODE 2TX

#### 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	2.12	2.12	0.5
Mid 6	2437	2.08	2.16	0.5
High 11	2462	2.08	2.16	0.5
High 12	2467	2.12	2.12	0.5
High 13	2472	2.16	2.20	0.5



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

#### 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	2.60	2.64	0.5
Mid 6	2437	2.68	2.64	0.5
High 11	2462	2.68	2.68	0.5
High 12	2467	2.64	2.72	0.5
High 13	2472	2.68	2.64	0.5



MID CHANNEL 6 ANT 4

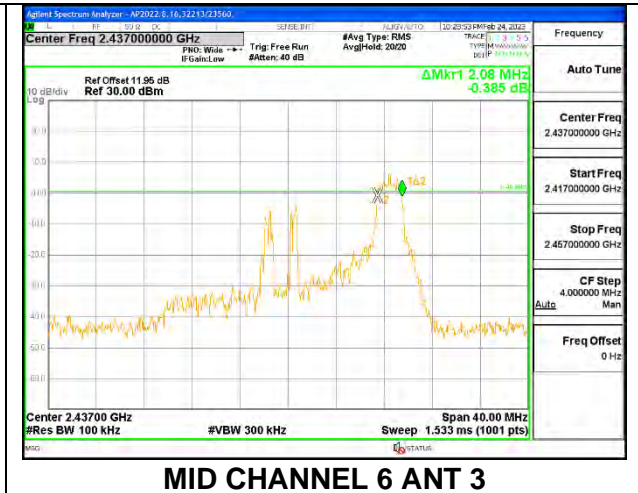
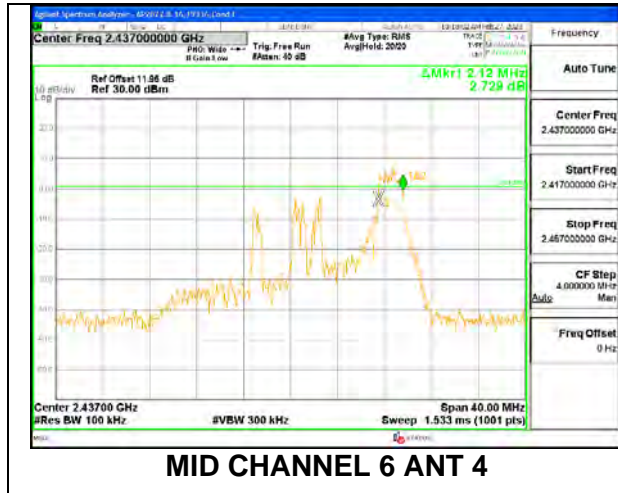


MID CHANNEL 6 ANT 3



**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	2.12	2.12	0.5
Mid 6	2437	2.12	2.08	0.5
High 11	2462	2.12	2.12	0.5
High 12	2467	2.12	2.12	0.5
High 13	2472	2.12	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	-4	-1.5	-2.57	0.35

### 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:

Ant4=-4.0, Ant3=-1.5

Uncorrelated Antenna gain= $10 \log[(10^{(-4.0/10)} + 10^{(-1.5/10)})/2] = -2.57 \text{dBi}$ Correlated Antenna gain= $10 \log[(10^{(-4.0/20)} + 10^{(-1.5/20)})^2/2] = 0.35 \text{dBi}$

**9.4.1. 802.11b MODE 1TX**

<b>Test Engineer:</b>	06/19/2023
<b>Test Date:</b>	32181

**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	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	20.48	20.48	30.00	-9.52
Mid 6	2437	21.47	21.47	30.00	-8.53
High 11	2462	21.49	21.49	30.00	-8.51
High 12	2467	20.47	20.47	30.00	-9.53
High 13	2472	17.99	17.99	30.00	-12.01

**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	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	20.49	20.49	30.00	-9.51
Mid 6	2437	21.46	21.46	30.00	-8.54
High 11	2462	21.47	21.47	30.00	-8.53
High 12	2467	20.48	20.48	30.00	-9.52
High 13	2472	17.97	17.97	30.00	-12.03

**9.4.3. 802.11n HT20 MODE**

<b>Test Engineer:</b>	32181
<b>Test Date:</b>	06/19/2023

**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	-4.00	30.00	30	36	30.00
Low 2	2417	-4.00	30.00	30	36	30.00
Low 3	2422	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 9	2452	-4.00	30.00	30	36	30.00
High 10	2457	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	17.97	17.97	30.00	-12.03
Low 2	2417	19.48	19.48	30.00	-10.52
Low 3	2422	21.49	21.49	30.00	-8.51
Mid 6	2437	21.49	21.49	30.00	-8.51
High 9	2452	20.98	20.98	30.00	-9.02
High 10	2457	19.47	19.47	30.00	-10.53
High 11	2462	18.48	18.48	30.00	-11.52
High 12	2467	15.99	15.99	30.00	-14.01
High 13	2472	14.48	14.48	30.00	-15.52

**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	-1.50	30.00	30	36	30.00
Low 2	2417	-1.50	30.00	30	36	30.00
Low 3	2422	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 9	2452	-1.50	30.00	30	36	30.00
High 10	2457	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	17.99	17.99	30.00	-12.01
Low 2	2417	19.48	19.48	30.00	-10.52
Low 3	2422	21.47	21.47	30.00	-8.53
Mid 6	2437	21.47	21.47	30.00	-8.53
High 9	2452	20.98	20.98	30.00	-9.02
High 10	2457	19.47	19.47	30.00	-10.53
High 11	2462	18.45	18.45	30.00	-11.55
High 12	2467	15.98	15.98	30.00	-14.02
High 13	2472	14.47	14.47	30.00	-15.53

**9.4.4. 802.11n HT20 CDD MODE 2TX**

<b>Test Engineer:</b>	32181
<b>Test Date:</b>	06/19/2023

**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.57	30.00	36	30.00
Low 2	2417	-2.57	30.00	36	30.00
Low 3	2422	-2.57	30.00	36	30.00
Low 4	2427	-2.57	30.00	36	30.00
Mid 6	2437	-2.57	30.00	36	30.00
High 8	2447	-2.57	30.00	36	30.00
High 9	2452	-2.57	30.00	36	30.00
High 10	2457	-2.57	30.00	36	30.00
High 11	2462	-2.57	30.00	36	30.00
High 12	2467	-2.57	30.00	36	30.00
High 13	2472	-2.57	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	17.49	17.48	20.50	30.00	-9.50
Low 2	2417	18.48	18.49	21.50	30.00	-8.50
Low 3	2422	19.98	19.97	22.99	30.00	-7.01
Low 4	2427	21.47	21.48	24.49	30.00	-5.51
Mid 6	2437	21.48	21.47	24.49	30.00	-5.51
High 8	2447	21.49	21.47	24.49	30.00	-5.51
High 9	2452	19.44	19.44	22.45	30.00	-7.55
High 10	2457	18.47	18.49	21.49	30.00	-8.51
High 11	2462	17.49	17.47	20.49	30.00	-9.51
High 12	2467	14.99	14.96	17.99	30.00	-12.01
High 13	2472	14.23	14.24	17.25	30.00	-12.75



**9.4.5. 802.11ax HE20 MODE**

<b>Test Engineer:</b>	32181
<b>Test Date:</b>	07/24/2023

**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	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	13.41	13.41	30.00	-16.59
Mid 6	2437	13.37	13.37	30.00	-16.63
High 11	2462	13.30	13.30	30.00	-16.70
High 12	2467	13.36	13.36	30.00	-16.64
High 13	2472	-0.15	-0.15	30.00	-30.15

**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	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	13.43	13.43	30.00	-16.57
Mid 6	2437	13.40	13.40	30.00	-16.60
High 11	2462	13.41	13.41	30.00	-16.59
High 12	2467	13.44	13.44	30.00	-16.56
High 13	2472	-0.10	-0.10	30.00	-30.10

**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	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	13.44	13.44	30.00	-16.56
Mid 6	2437	13.38	13.38	30.00	-16.62
High 11	2462	13.34	13.34	30.00	-16.66
High 12	2467	13.41	13.41	30.00	-16.59
High 13	2472	-0.02	-0.02	30.00	-30.02

**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	-4.00	30.00	30	36	30.00
Low 2	2417	-4.00	30.00	30	36	30.00
Low 3	2422	-4.00	30.00	30	36	30.00
Mid 6	2437	-4.00	30.00	30	36	30.00
High 9	2452	-4.00	30.00	30	36	30.00
High 10	2457	-4.00	30.00	30	36	30.00
High 11	2462	-4.00	30.00	30	36	30.00
High 12	2467	-4.00	30.00	30	36	30.00
High 13	2472	-4.00	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	16.90	16.90	30.00	-13.10
Low 2	2417	17.86	17.86	30.00	-12.14
Low 3	2422	21.33	21.33	30.00	-8.67
Mid 6	2437	21.38	21.38	30.00	-8.62
High 9	2452	21.43	21.43	30.00	-8.57
High 10	2457	17.88	17.88	30.00	-12.12
High 11	2462	16.90	16.90	30.00	-13.10
High 12	2467	14.75	14.75	30.00	-15.25
High 13	2472	9.90	9.90	30.00	-20.10

**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	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	13.36	13.36	30.00	-16.64
Mid 6	2437	13.35	13.35	30.00	-16.65
High 11	2462	13.41	13.41	30.00	-16.59
High 12	2467	13.43	13.43	30.00	-16.57
High 13	2472	-0.03	-0.03	30.00	-30.03

**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	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	13.37	13.37	30.00	-16.63
Mid 6	2437	13.33	13.33	30.00	-16.67
High 11	2462	13.38	13.38	30.00	-16.62
High 12	2467	13.35	13.35	30.00	-16.65
High 13	2472	-0.16	-0.16	30.00	-30.16

**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	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	13.41	13.41	30.00	-16.59
Mid 6	2437	13.43	13.43	30.00	-16.57
High 11	2462	13.45	13.45	30.00	-16.55
High 12	2467	13.37	13.37	30.00	-16.63
High 13	2472	-0.11	-0.11	30.00	-30.11

**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	-1.50	30.00	30	36	30.00
Low 2	2417	-1.50	30.00	30	36	30.00
Low 3	2422	-1.50	30.00	30	36	30.00
Mid 6	2437	-1.50	30.00	30	36	30.00
High 9	2452	-1.50	30.00	30	36	30.00
High 10	2457	-1.50	30.00	30	36	30.00
High 11	2462	-1.50	30.00	30	36	30.00
High 12	2467	-1.50	30.00	30	36	30.00
High 13	2472	-1.50	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	16.84	16.84	30.00	-13.16
Low 2	2417	17.79	17.79	30.00	-12.21
Low 3	2422	21.34	21.34	30.00	-8.66
Mid 6	2437	21.32	21.32	30.00	-8.68
High 9	2452	21.26	21.26	30.00	-8.74
High 10	2457	17.90	17.90	30.00	-12.10
High 11	2462	16.81	16.81	30.00	-13.19
High 12	2467	14.78	14.78	30.00	-15.22
High 13	2472	9.83	9.83	30.00	-20.17



**9.4.6. 802.11ax HE20 OFDMA MODE 2TX**

<b>Test Engineer:</b>	32181
<b>Test Date:</b>	07/24/2023

**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	-2.57	30.00	36	30.00
Mid 6	2437	-2.57	30.00	36	30.00
High 11	2462	-2.57	30.00	36	30.00
High 12	2467	-2.57	30.00	36	30.00
High 13	2472	-2.57	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	13.46	13.46	16.47	30.00	-13.53
Mid 6	2437	13.31	13.36	16.35	30.00	-13.65
High 11	2462	13.32	13.32	16.33	30.00	-13.67
High 12	2467	12.86	12.76	15.82	30.00	-14.18
High 13	2472	-0.08	-0.04	2.95	30.00	-27.05

**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	-2.57	30.00	36	30.00
Mid 6	2437	-2.57	30.00	36	30.00
High 11	2462	-2.57	30.00	36	30.00
High 12	2467	-2.57	30.00	36	30.00
High 13	2472	-2.57	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	13.44	13.35	16.41	30.00	-13.59
Mid 6	2437	13.29	13.39	16.35	30.00	-13.65
High 11	2462	13.33	13.36	16.36	30.00	-13.64
High 12	2467	12.88	12.86	15.88	30.00	-14.12
High 13	2472	-0.06	-0.09	2.94	30.00	-27.06

**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	-2.57	30.00	36	30.00
Mid 6	2437	-2.57	30.00	36	30.00
High 11	2462	-2.57	30.00	36	30.00
High 12	2467	-2.57	30.00	36	30.00
High 13	2472	-2.57	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	13.31	13.39	16.36	30.00	-13.64
Mid 6	2437	13.39	13.39	16.40	30.00	-13.60
High 11	2462	13.43	13.45	16.45	30.00	-13.55
High 12	2467	12.91	12.95	15.94	30.00	-14.06
High 13	2472	-0.15	-0.04	2.92	30.00	-27.08

**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	-2.57	30.00	36	30.00
Low 2	2417	-2.57	30.00	36	30.00
Low 3	2422	-2.57	30.00	36	30.00
Low 4	2427	-2.57	30.00	36	30.00
Mid 6	2437	-2.57	30.00	36	30.00
High 8	2447	-2.57	30.00	36	30.00
High 9	2452	-2.57	30.00	36	30.00
High 10	2457	-2.57	30.00	36	30.00
High 11	2462	-2.57	30.00	36	30.00
High 12	2467	-2.57	30.00	36	30.00
High 13	2472	-2.57	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	15.93	15.79	18.87	30.00	-11.13
Low 2	2417	16.85	16.94	19.91	30.00	-10.09
Low 3	2422	18.72	18.93	21.84	30.00	-8.16
Low 4	2427	21.19	21.40	24.31	30.00	-5.69
Mid 6	2437	21.20	21.28	24.25	30.00	-5.75
High 8	2447	21.22	21.31	24.28	30.00	-5.72
High 9	2452	18.39	18.21	21.31	30.00	-8.69
High 10	2457	16.63	16.80	19.73	30.00	-10.27
High 11	2462	15.72	15.79	18.77	30.00	-11.23
High 12	2467	13.93	13.78	16.87	30.00	-13.13
High 13	2472	8.89	8.82	11.87	30.00	-18.13

## 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

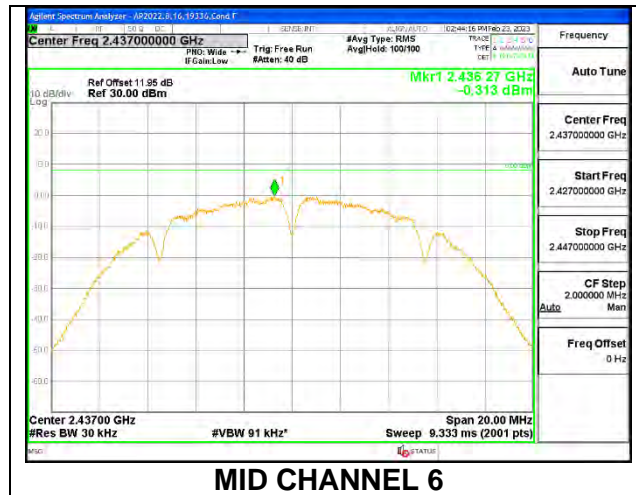
Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

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

**9.5.1. 802.11b MODE 1TX**

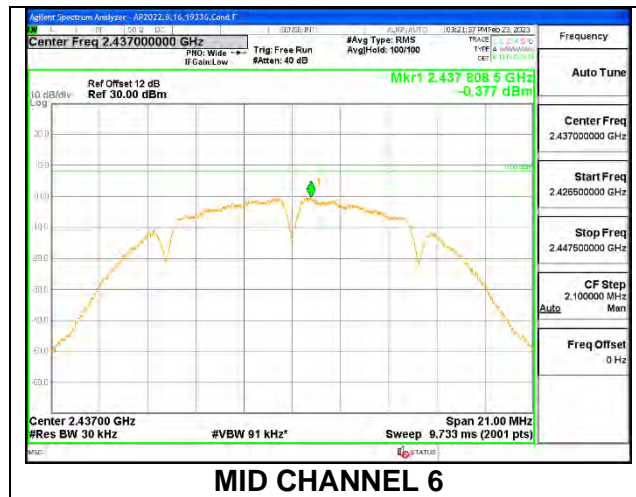
**1TX ANT 4 MODE**

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	-0.700	-0.700	8.0	-8.7
Mid 6	2437	-0.313	-0.313	8.0	-8.3
High 11	2462	-0.636	-0.636	8.0	-8.6
High 12	2467	-0.702	-0.702	8.0	-8.7
High 13	2472	-3.56	-3.555	8.0	-11.6



**1TX ANT 3 MODE**

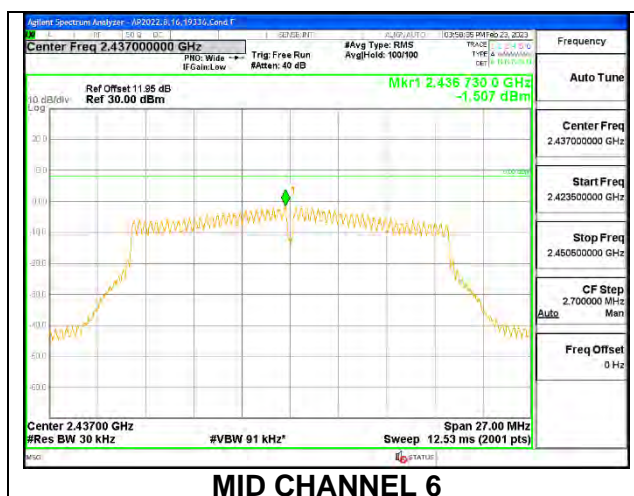
Duty Cycle CF (dB)		Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-0.762	-0.762	8.0	-8.8
Mid 6	2437	-0.377	-0.377	8.0	-8.4
High 11	2462	0.099	0.099	8.0	-7.9
High 12	2467	-0.708	-0.708	8.0	-8.7
High 13	2472	-3.595	-3.595	8.0	-11.6



**9.5.2. 802.11n HT20 MODE**

**1TX ANT 4 MODE**

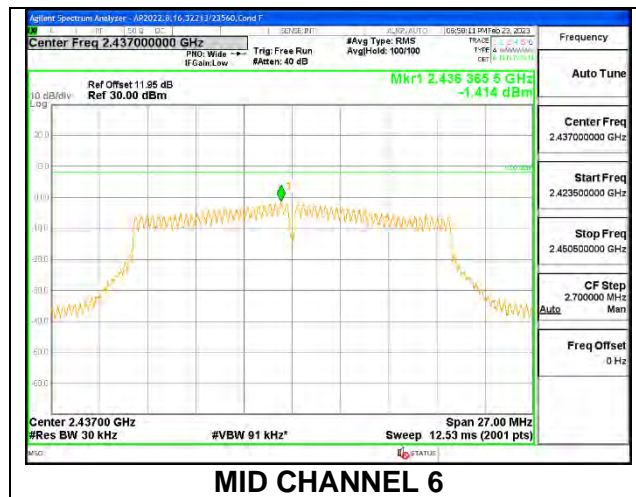
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-4.795	-4.795	8.0	-12.8
Low 2	2417	-3.663	-3.663	8.0	-11.7
Low 3	2422	-1.232	-1.232	8.0	-9.2
Mid 6	2437	-1.507	-1.507	8.0	-9.5
High 9	2452	-1.943	-1.943	8.0	-9.9
High 10	2457	-1.550	-1.550	8.0	-9.6
High 11	2462	-1.232	-1.232	8.0	-9.2
High 12	2467	-1.378	-1.378	8.0	-9.4
High 13	2472	-8.151	-8.151	8.0	-16.2





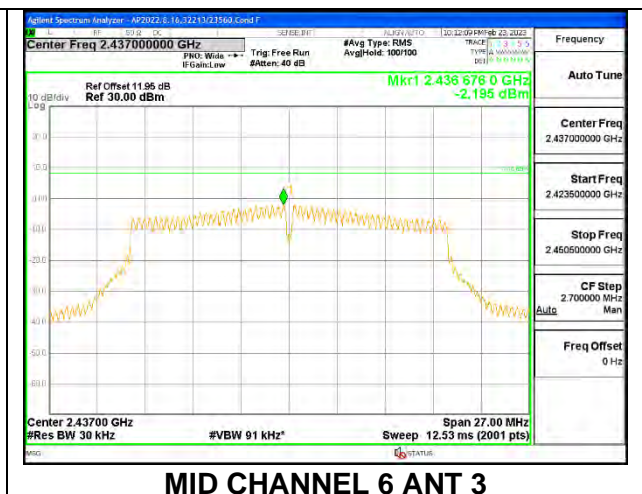
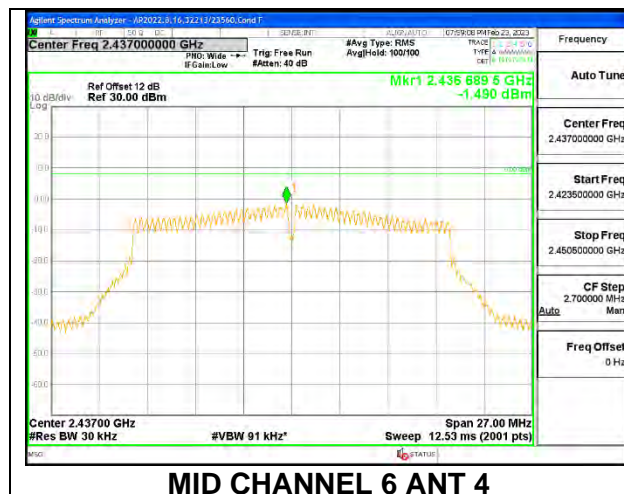
**1TX ANT 3 MODE**

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	-2.916	-2.916	8.0	-10.9
Low 2	2417	-3.234	-3.234	8.0	-11.2
Low 3	2422	-1.044	-1.044	8.0	-9.0
Mid 6	2437	-1.414	-1.414	8.0	-9.4
High 9	2452	-1.423	-1.423	8.0	-9.4
High 10	2457	-3.473	-3.473	8.0	-11.5
High 11	2462	-4.554	-4.554	8.0	-12.6
High 12	2467	-7.373	-7.373	8.0	-15.4
High 13	2472	-9.581	-9.581	8.0	-17.6



9.5.3. 802.11n HT20 CDD MODE 2TX

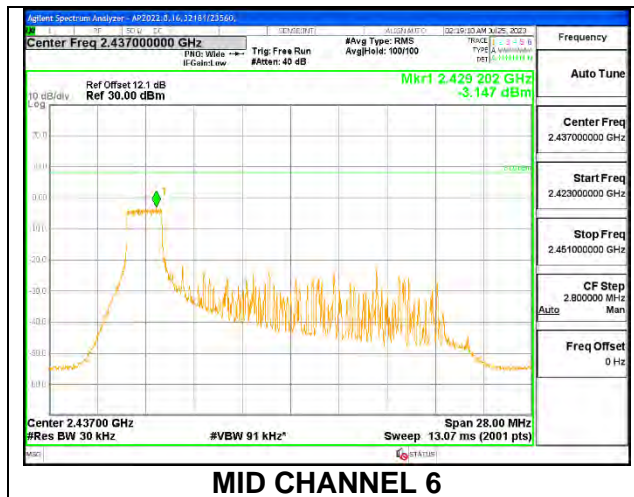
Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-5.391	-5.738	-2.551	8.0	-10.6
Low 2	2417	-4.401	-4.386	-1.383	8.0	-9.4
Low 3	2422	-2.576	-3.202	0.133	8.0	-7.9
Mid 6	2437	-1.490	-2.195	1.182	8.0	-6.8
High 9	2452	-3.426	-4.120	-0.749	8.0	-8.7
High 10	2457	-4.720	-4.271	-1.479	8.0	-9.5
High 11	2462	-5.737	-5.770	-2.743	8.0	-10.7
High 12	2467	-8.071	-8.114	-5.082	8.0	-13.1
High 13	2472	-9.051	-8.934	-5.982	8.0	-14.0



**9.5.4. 802.11ax HE20 MODE**

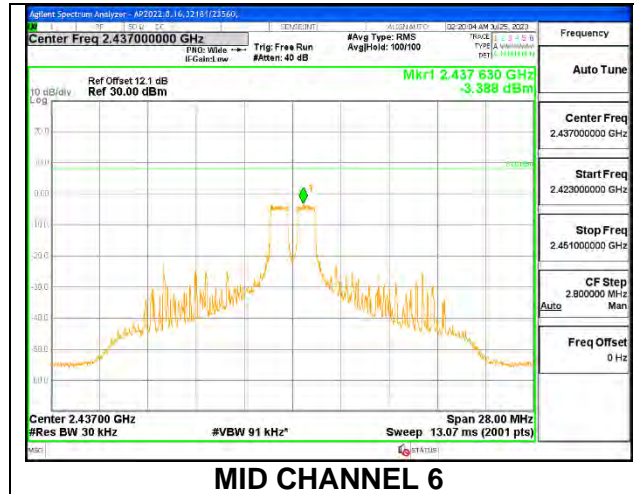
**1TX ANT 4 MODE , 26-Tone RU Index 0**

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	-3.555	-3.555	8.0	-11.6
Mid 6	2437	-3.147	-3.147	8.0	-11.1
High 11	2462	-3.503	-3.503	8.0	-11.5
High 12	2467	-3.622	-3.622	8.0	-11.6
High 13	2472	-17.318	-17.318	8.0	-25.3



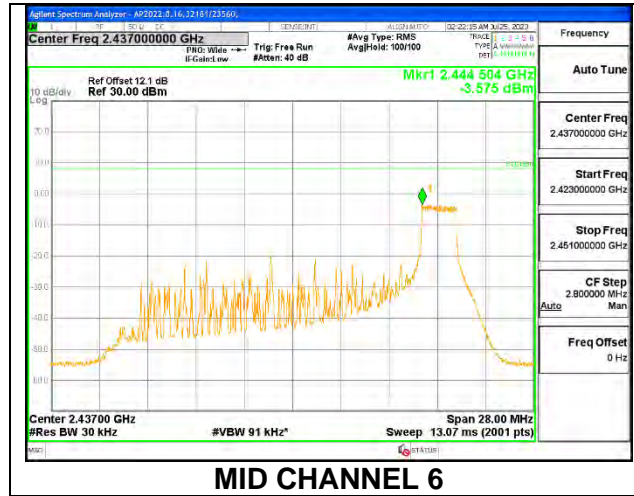
**1TX ANT 4 MODE , 26-Tone RU Index 4**

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	-3.388	-3.388	8.0	-11.4
Mid 6	2437	-3.388	-3.388	8.0	-11.4
High 11	2462	-3.272	-3.272	8.0	-11.3
High 12	2467	-3.554	-3.554	8.0	-11.6
High 13	2472	-17.034	-17.034	8.0	-25.0



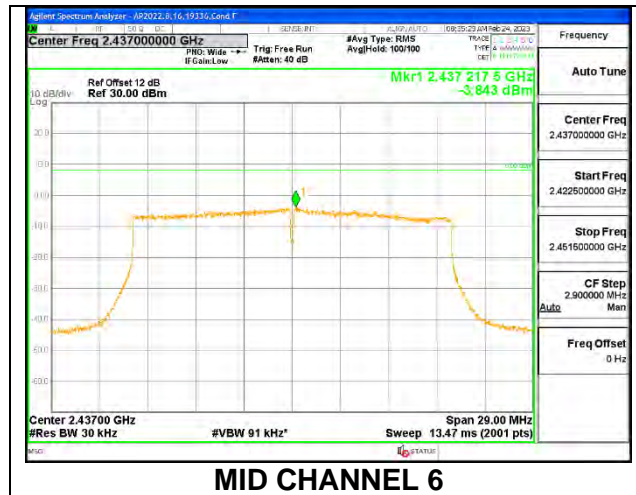
**1TX ANT 4 MODE , 26-Tone RU Index 8**

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	-3.444	-3.444	8.0	-11.4
Mid 6	2437	-3.575	-3.575	8.0	-11.6
High 11	2462	-3.887	-3.887	8.0	-11.9
High 12	2467	-3.642	-3.642	8.0	-11.6
High 13	2472	-16.884	-16.884	8.0	-24.9



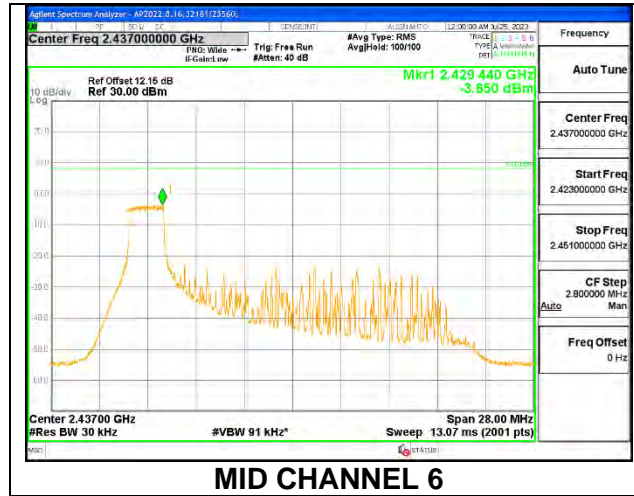
**1TX ANT 4 MODE , SU MODE**

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	-8.320	-8.320	8.0	-16.3
Low 2	2417	-7.102	-7.102	8.0	-15.1
Low 3	2422	-3.739	-3.739	8.0	-11.7
Mid 6	2437	-3.843	-3.843	8.0	-11.8
High 9	2452	-3.834	-3.834	8.0	-11.8
High 10	2457	-7.099	-7.099	8.0	-15.1
High 11	2462	-8.262	-8.262	8.0	-16.3
High 12	2467	-10.345	-10.345	8.0	-18.3
High 13	2472	-15.815	-15.815	8.0	-23.8



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

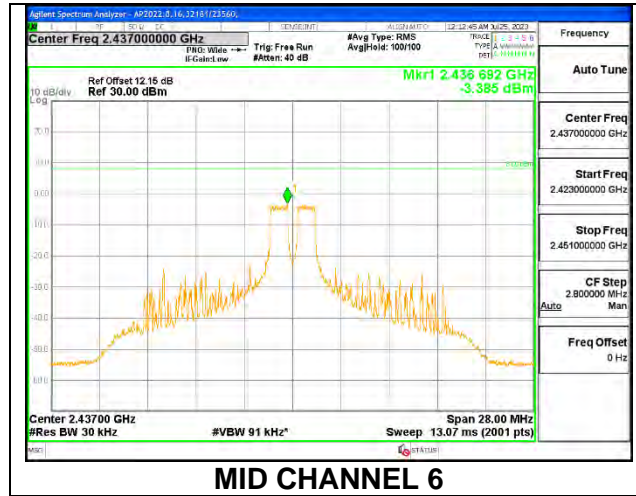
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-3.273	-3.273	8.0	-11.3
Mid 6	2437	-3.650	-3.650	8.0	-11.7
High 11	2462	-3.548	-3.548	8.0	-11.5
High 12	2467	-3.573	-3.573	8.0	-11.6
High 13	2472	-17.115	-17.115	8.0	-25.1





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

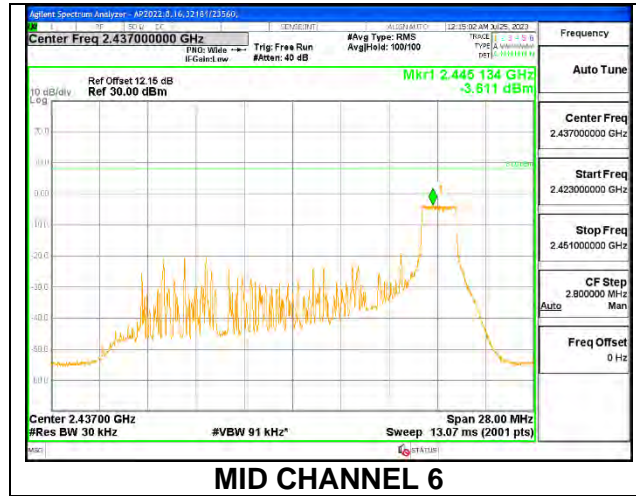
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-3.500	-3.500	8.0	-11.5
Mid 6	2437	-3.385	-3.385	8.0	-11.4
High 11	2462	-3.528	-3.528	8.0	-11.5
High 12	2467	-3.499	-3.499	8.0	-11.5
High 13	2472	-17.322	-17.322	8.0	-25.3





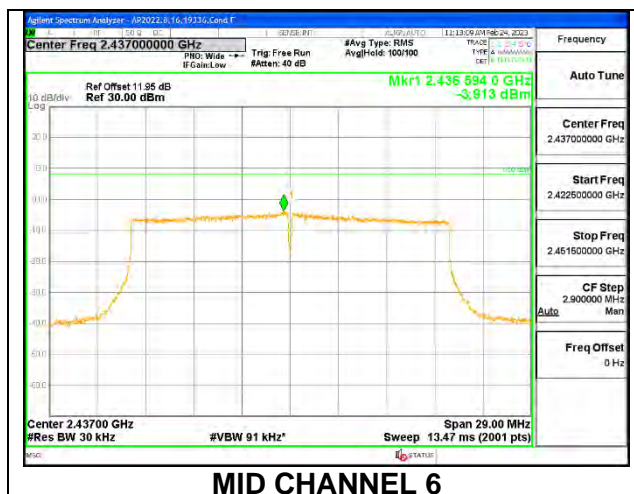
**1TX ANT 3 MODE , 26-Tone RU Index 8**

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	-3.419	-3.419	8.0	-11.4
Mid 6	2437	-3.611	-3.611	8.0	-11.6
High 11	2462	-3.485	-3.485	8.0	-11.5
High 12	2467	-3.617	-3.617	8.0	-11.6
High 13	2472	-16.589	-16.589	8.0	-24.6



**1TX ANT 3 MODE SU MODE**

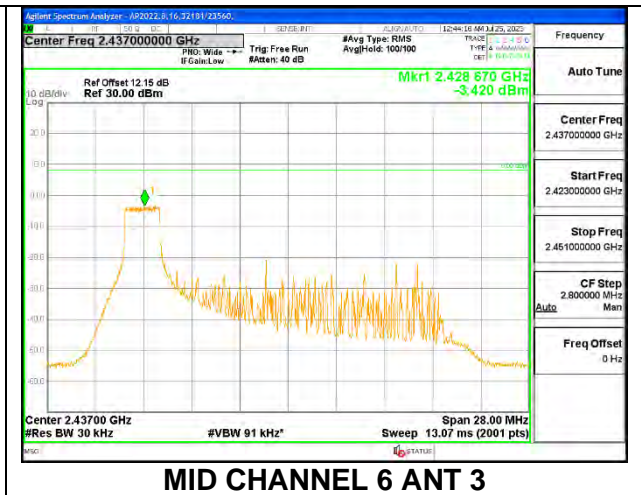
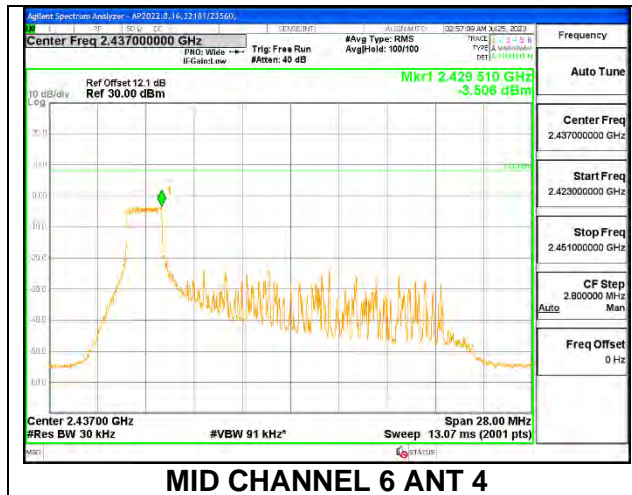
Duty Cycle CF (dB)		Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-8.476	-8.476	8.0	-16.5
Low 2	2417	-6.943	-6.943	8.0	-14.9
Low 3	2422	-3.843	-3.843	8.0	-11.8
Mid 6	2437	-3.913	-3.913	8.0	-11.9
High 9	2452	-3.913	-3.913	8.0	-11.9
High 10	2457	-7.022	-7.022	8.0	-15.0
High 11	2462	-8.277	-8.277	8.0	-16.3
High 12	2467	-10.316	-10.316	8.0	-18.3
High 13	2472	-14.893	-14.893	8.0	-22.9



**9.5.5. 802.11ax HE20 OFDMA MODE 2TX**

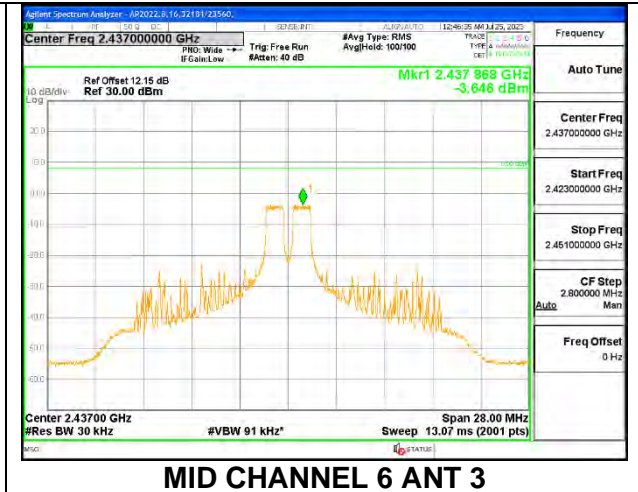
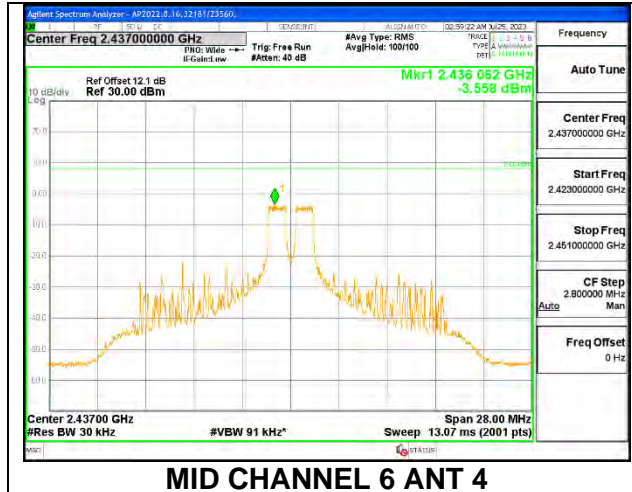
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 0**

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	-3.307	-2.972	-0.126	8.0	-8.1
Mid 6	2437	-3.506	-3.420	-0.452	8.0	-8.5
High 11	2462	-3.612	-3.049	-0.311	8.0	-8.3
High 12	2467	-3.827	-4.320	-1.056	8.0	-9.1
High 13	2472	-17.052	-17.280	-14.154	8.0	-22.2



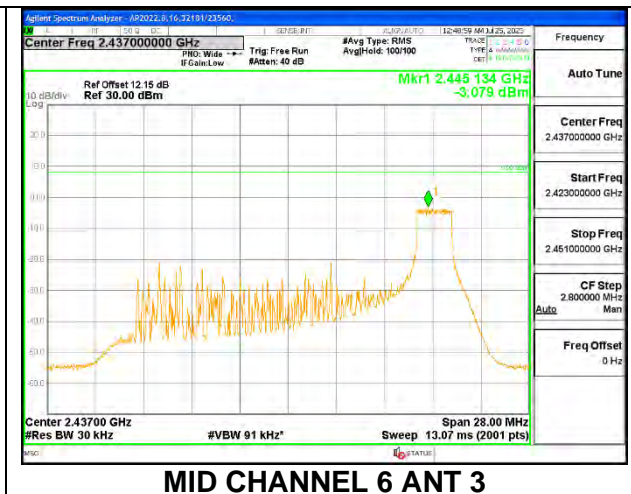
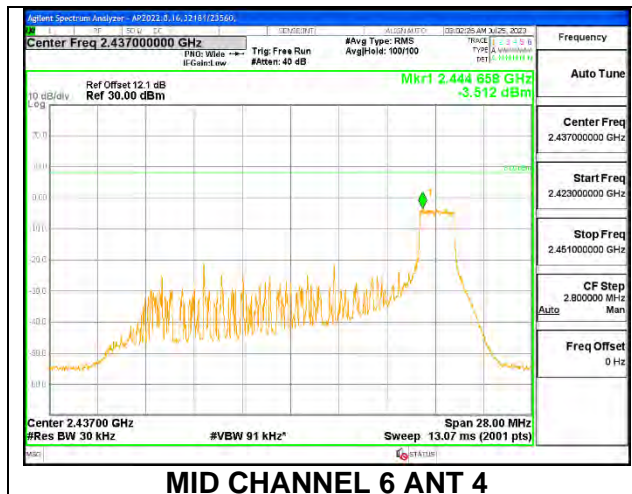
**ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4**

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	-3.297	-3.594	-0.433	8.0	-8.4
Mid 6	2437	-3.558	-3.646	-0.591	8.0	-8.6
High 11	2462	-3.500	-3.529	-0.504	8.0	-8.5
High 12	2467	-3.943	-3.799	-0.860	8.0	-8.9
High 13	2472	-16.766	-16.756	-13.751	8.0	-21.8



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

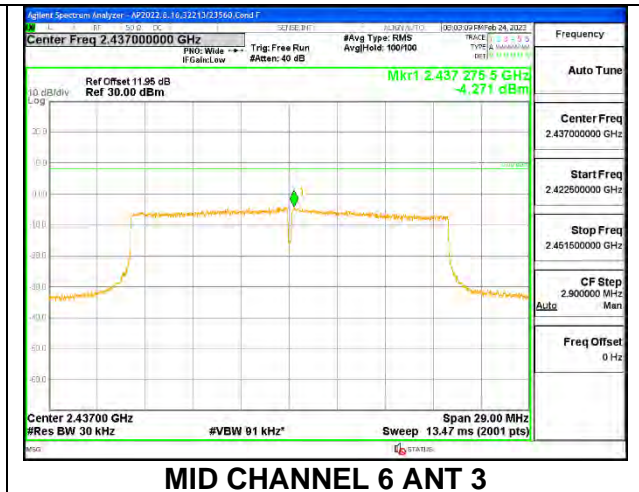
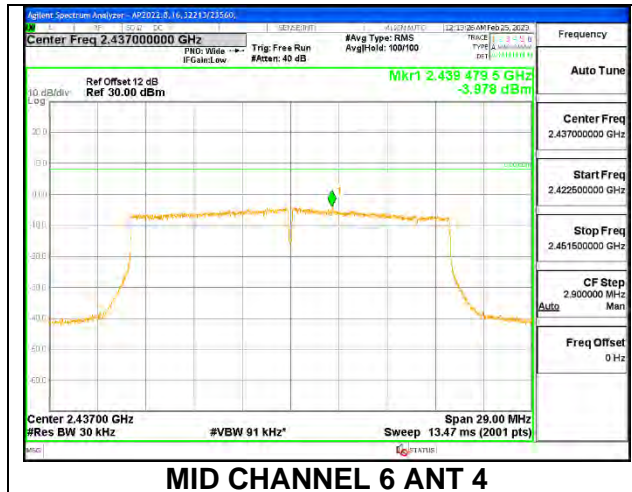
Duty Cycle CF (dB)		0.00		Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-3.692	-3.172	-0.414	8.0	-8.4
Mid 6	2437	-3.512	-3.079	-0.280	8.0	-8.3
High 11	2462	-3.617	-3.417	-0.506	8.0	-8.5
High 12	2467	-4.057	-4.255	-1.145	8.0	-9.1
High 13	2472	-16.931	-16.915	-13.913	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	-9.277	-9.030	-6.14	8.0	-14.1
Low 2	2417	-8.398	-8.379	-5.38	8.0	-13.4
Low 3	2422	-5.667	-6.103	-2.87	8.0	-10.9
Mid 6	2437	-3.978	-4.271	-1.11	8.0	-9.1
High 9	2452	-7.094	-7.267	-4.17	8.0	-12.2
High 10	2457	-8.366	-8.421	-5.38	8.0	-13.4
High 11	2462	-9.267	-9.774	-6.50	8.0	-14.5
High 12	2467	-11.630	-11.459	-8.53	8.0	-16.5
High 13	2472	-16.941	-17.234	-14.07	8.0	-22.1



## 9.6. CONDUCTED SPURIOUS EMISSIONS

### LIMITS

FCC §15.247 (d)

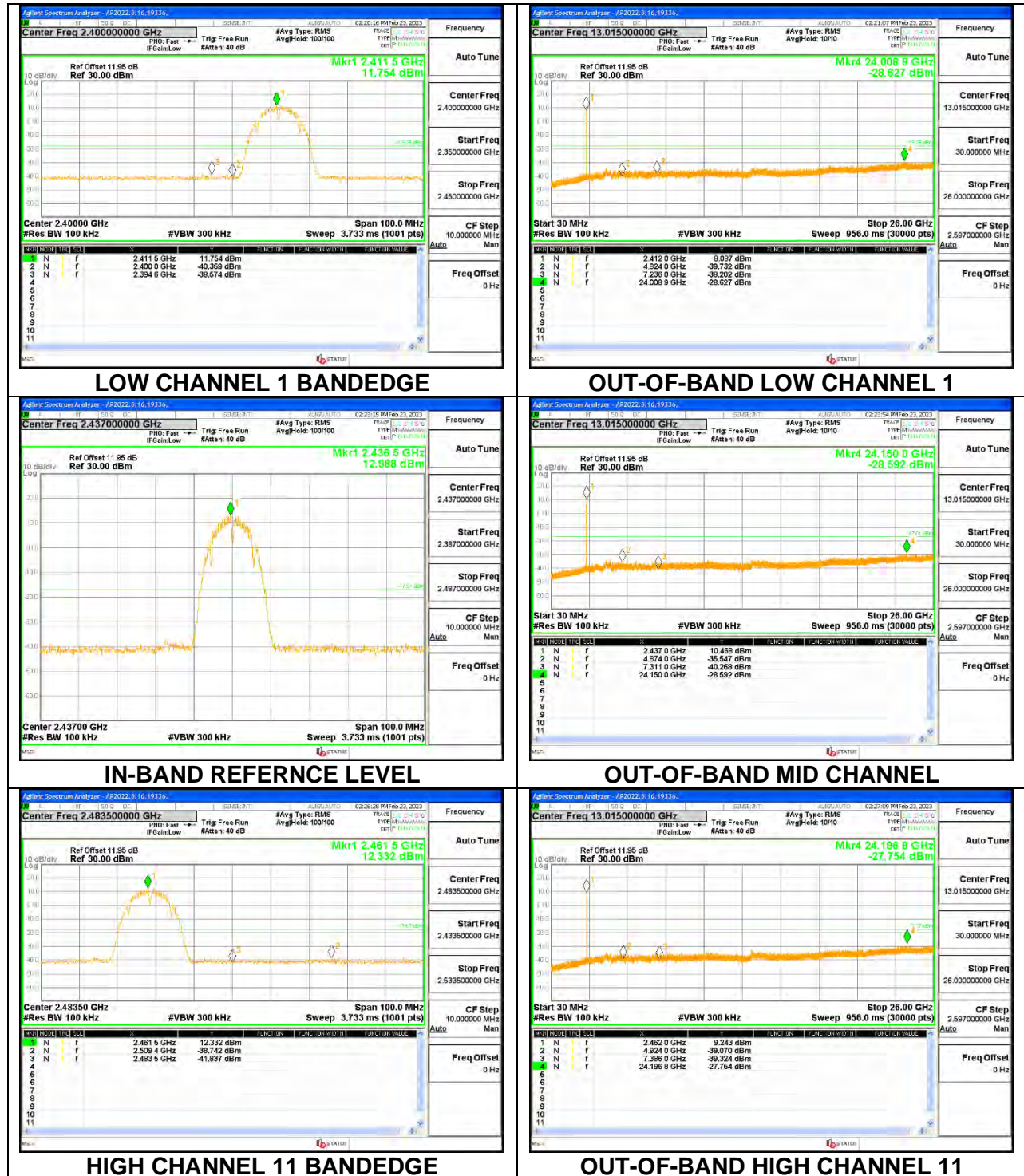
RSS-247 5.5

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)).

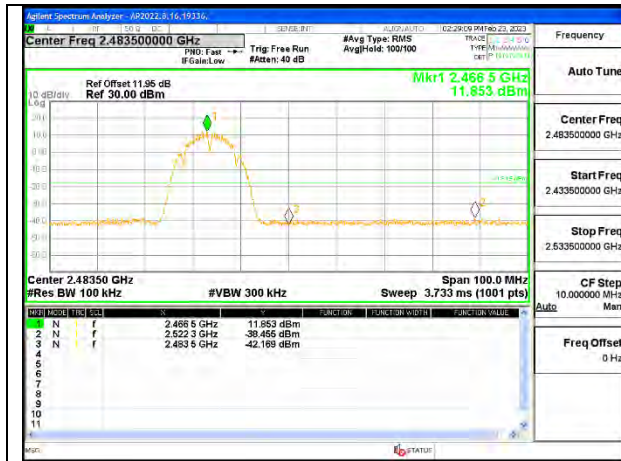
### RESULTS

### 9.6.1. 802.11b MODE 1TX

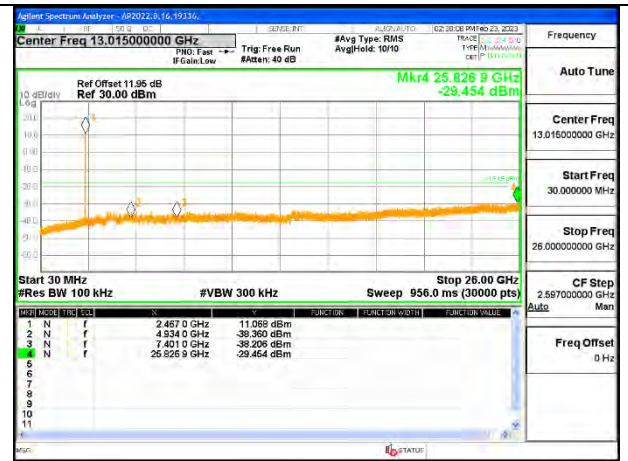
#### 1TX ANT 4 MODE



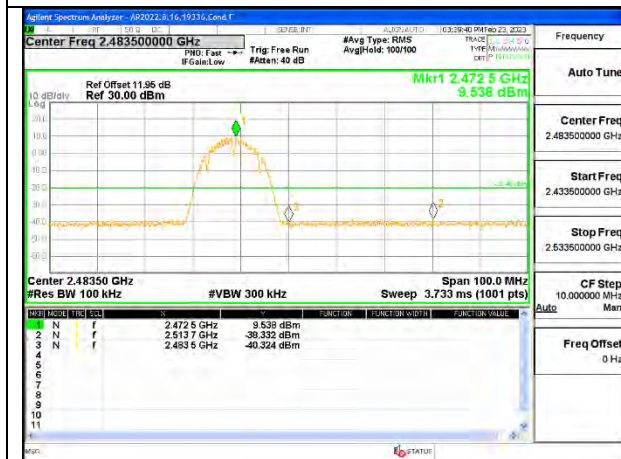




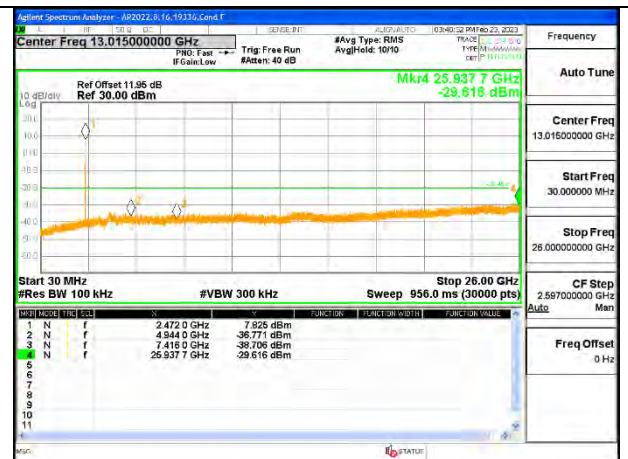
**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**

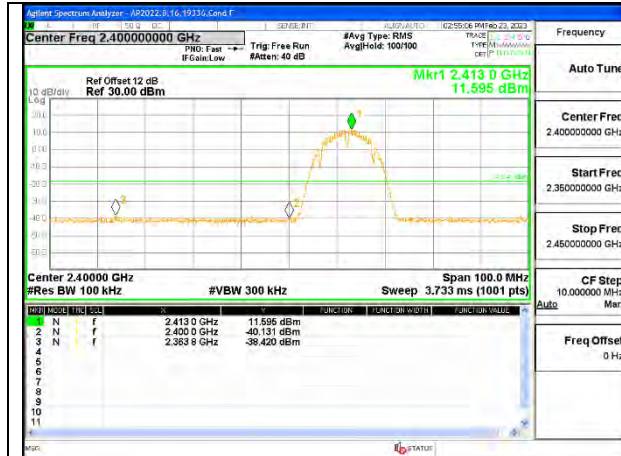


**HIGH CHANNEL 13 BANDEDGE**

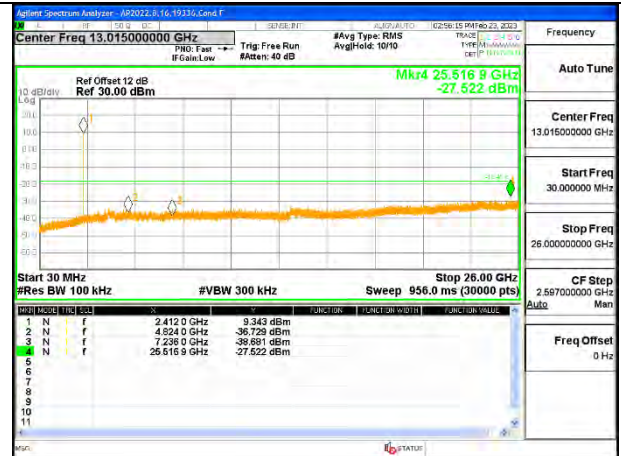


**OUT-OF-BAND HIGH CHANNEL 13**

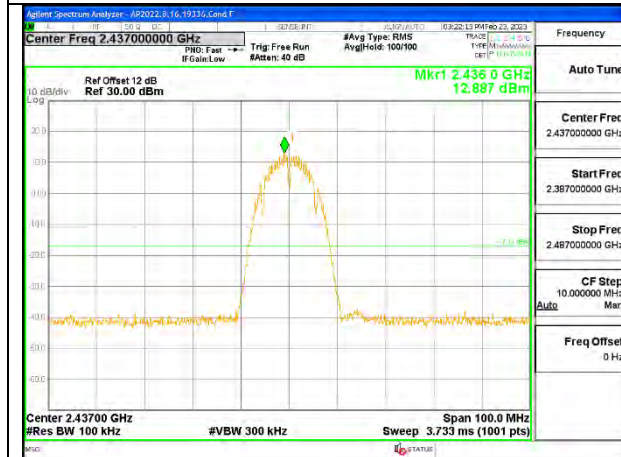
1TX ANT 3 MODE



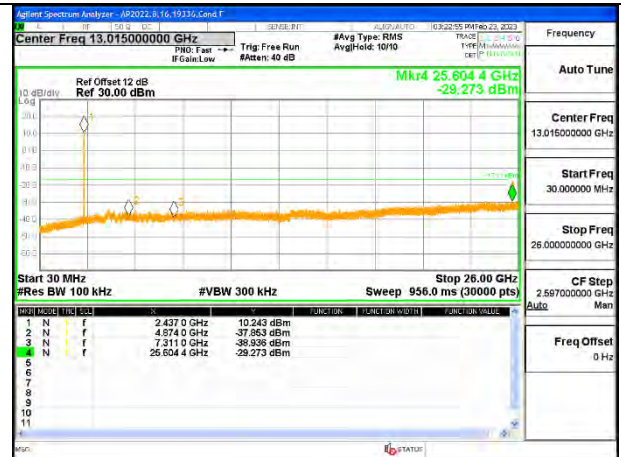
LOW CHANNEL 1 BANDEDGE



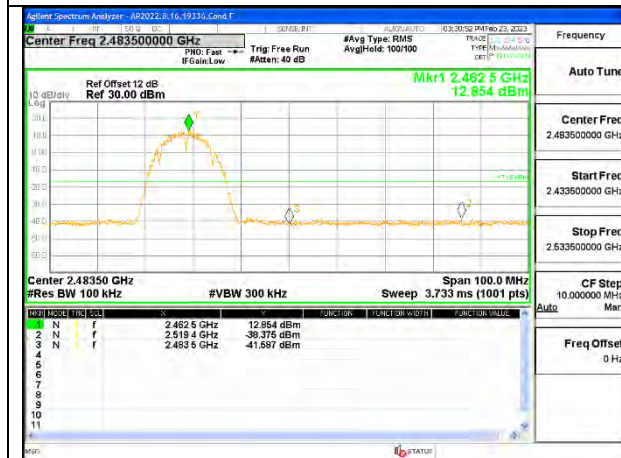
OUT-OF-BAND LOW CHANNEL 1



IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

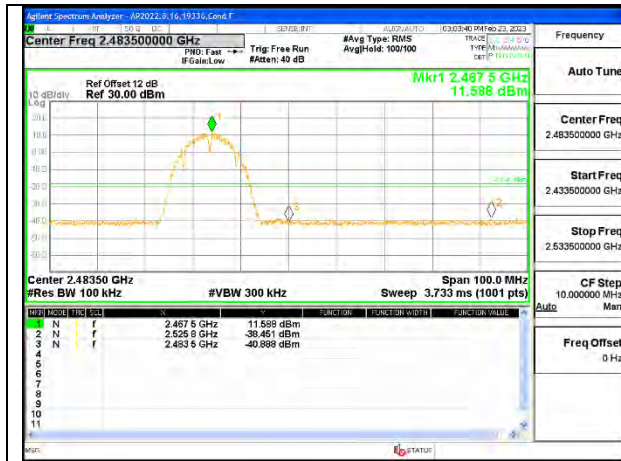


HIGH CHANNEL 11 BANDEDGE

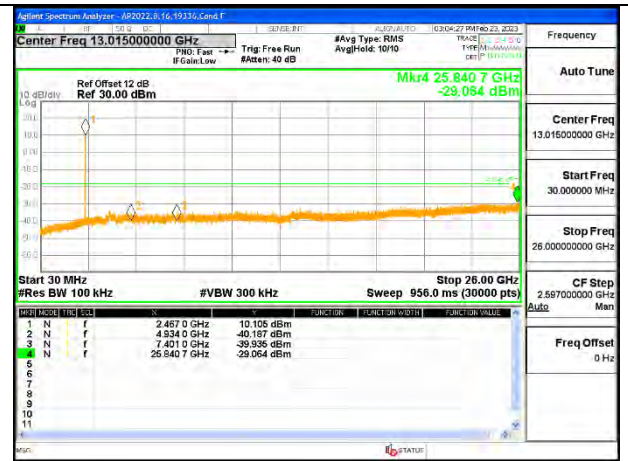


OUT-OF-BAND HIGH CHANNEL 11

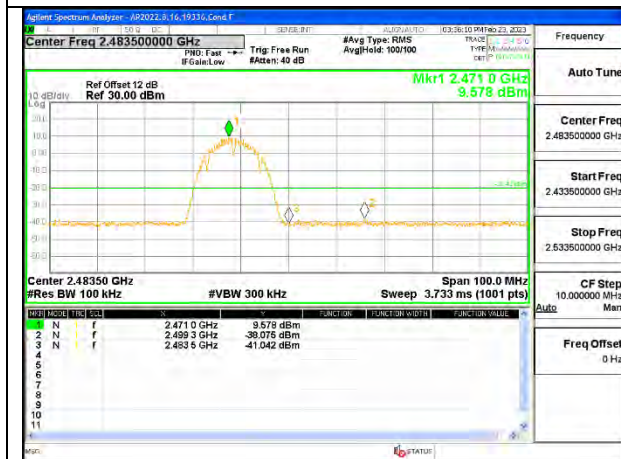




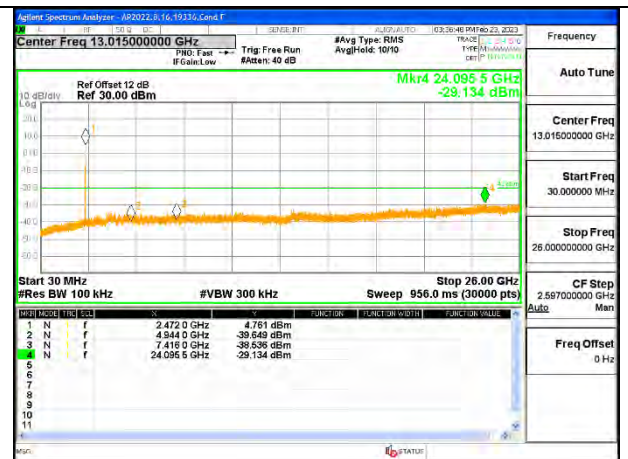
**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



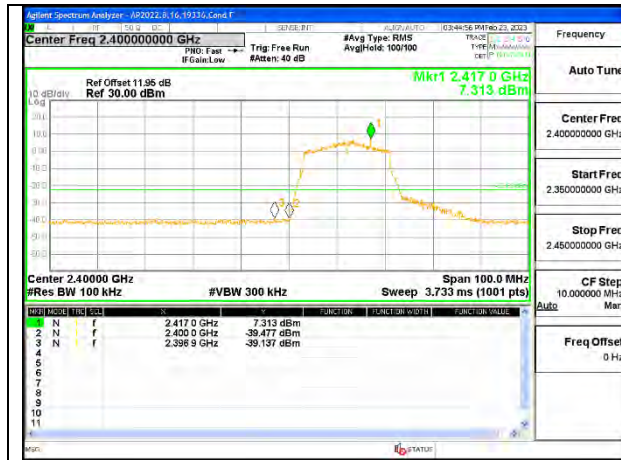
**HIGH CHANNEL 13 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 13**

9.6.2. 802.11n HT20 MODE

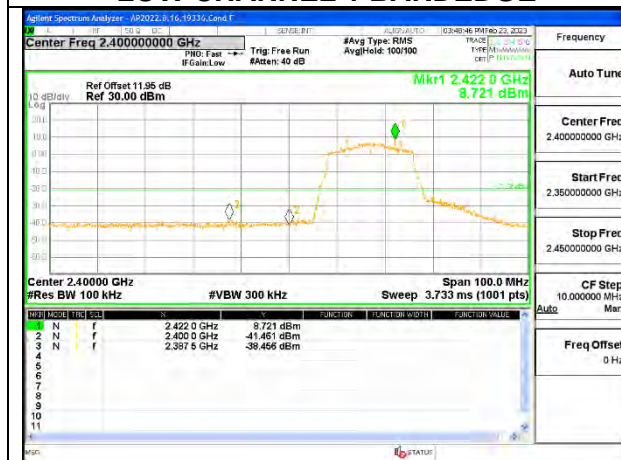
1TX ANT 4 MODE



LOW CHANNEL 1 BANDEDGE



OUT-OF-BAND LOW CHANNEL 1



LOW CHANNEL 2 BANDEDGE



OUT-OF-BAND LOW CHANNEL 2

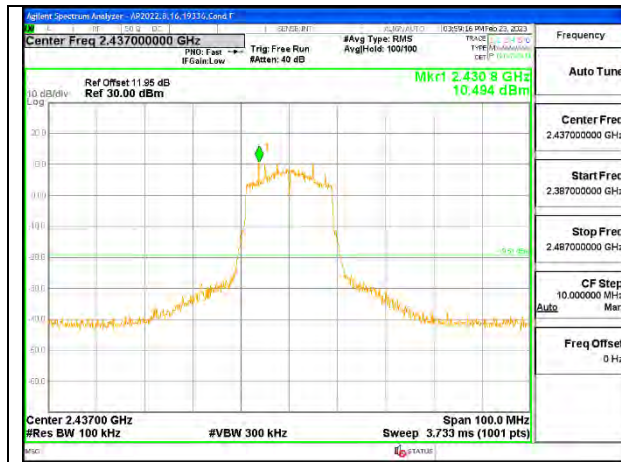


LOW CHANNEL 3 BANDEDGE



OUT-OF-BAND LOW CHANNEL 3



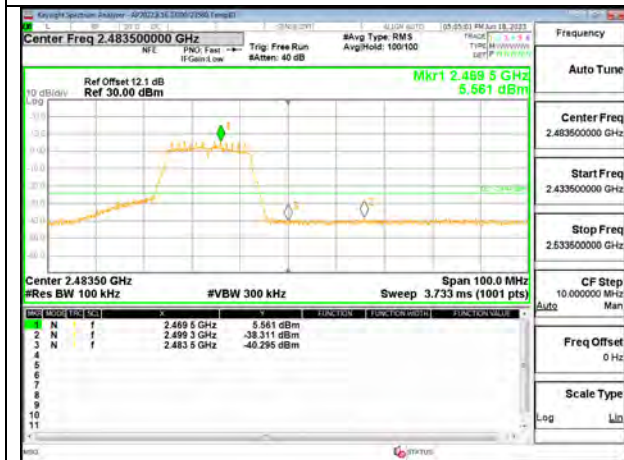




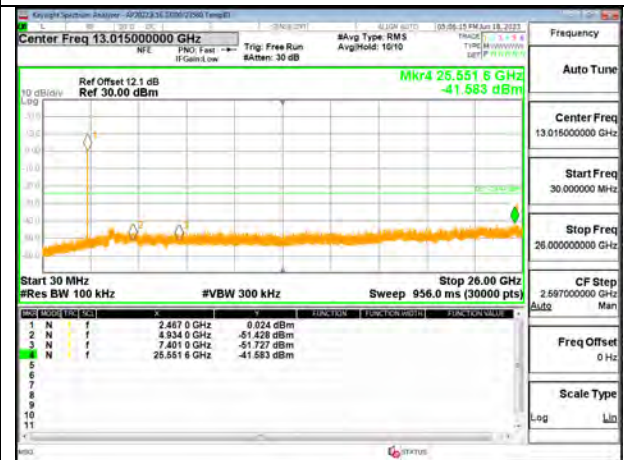
HIGH CHANNEL 11 BANDEDGE



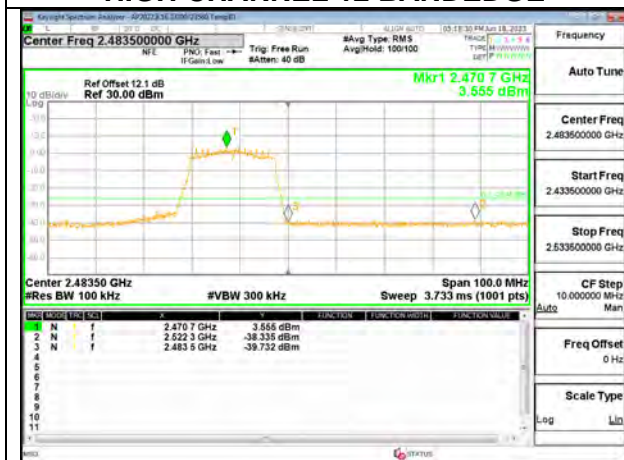
OUT-OF-BAND HIGH CHANNEL 11



HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12



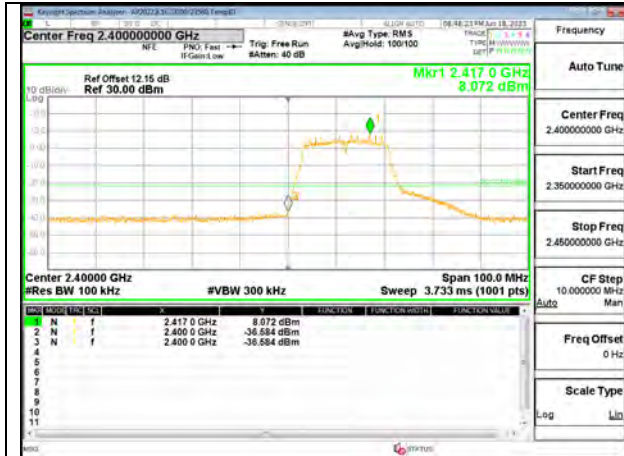
HIGH CHANNEL 13 BANDEDGE



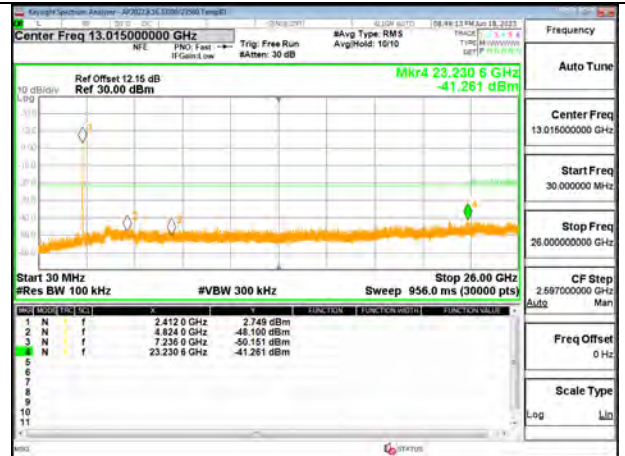
OUT-OF-BAND HIGH CHANNEL 13



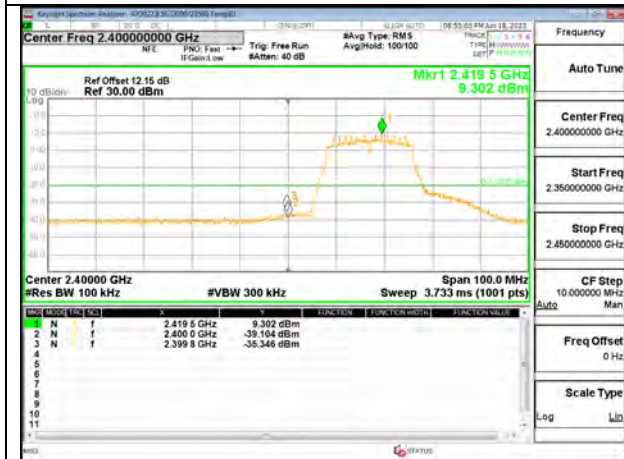
1TX ANT 3 MODE



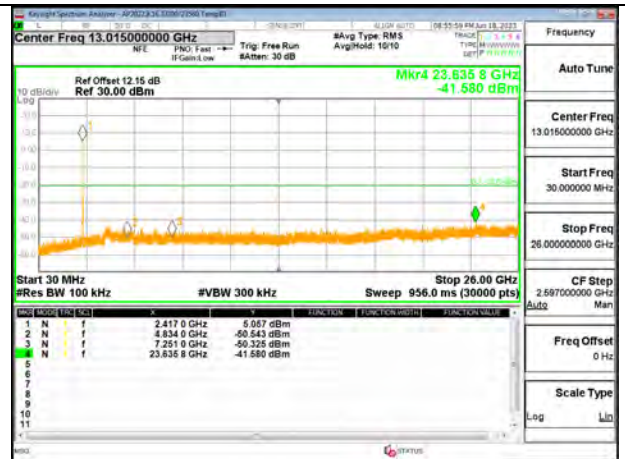
LOW CHANNEL 1 BANDEDGE



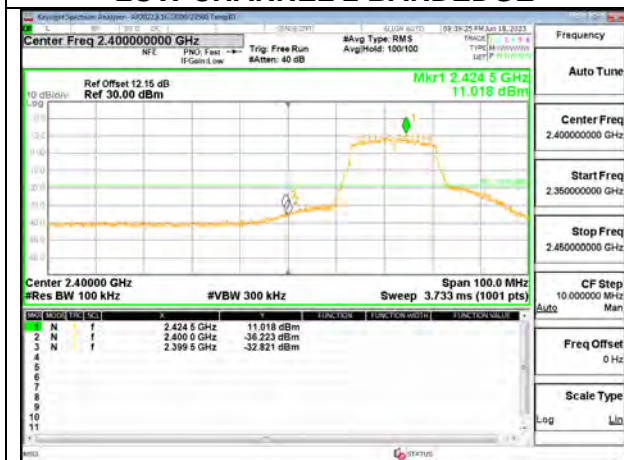
OUT-OF-BAND LOW CHANNEL 1



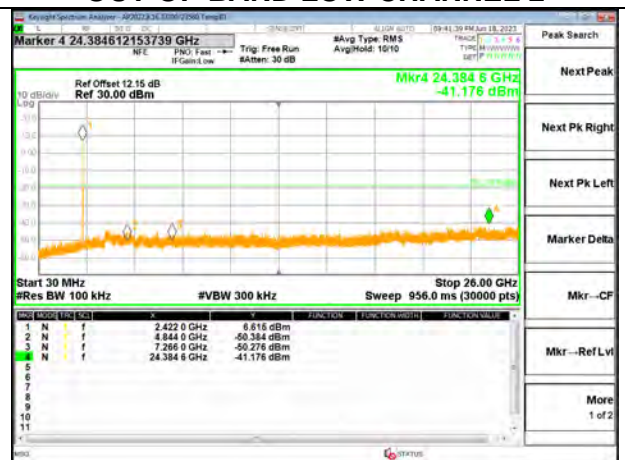
LOW CHANNEL 2 BANDEDGE



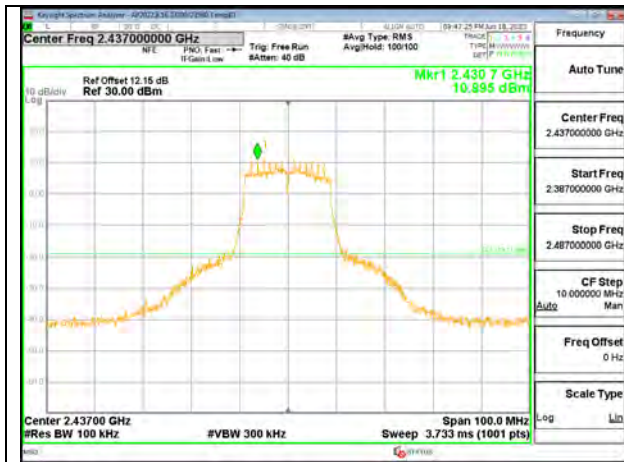
OUT-OF-BAND LOW CHANNEL 2



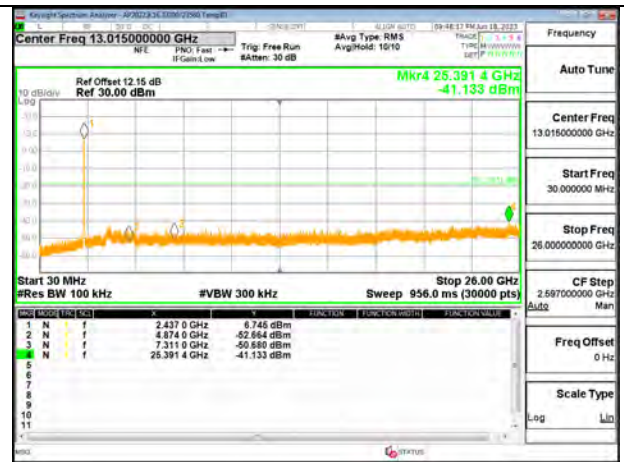
LOW CHANNEL 3 BANDEDGE



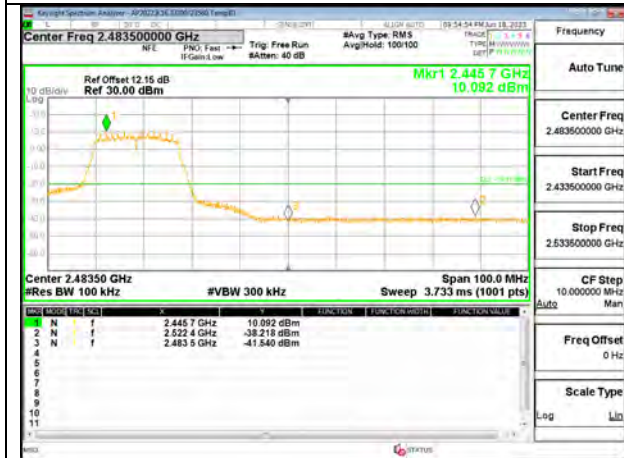
OUT-OF-BAND LOW CHANNEL 3



IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



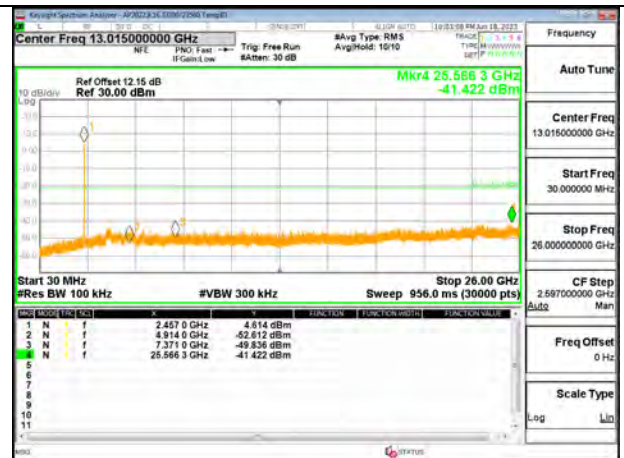
HIGH CHANNEL 9 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 9



HIGH CHANNEL 10 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 10

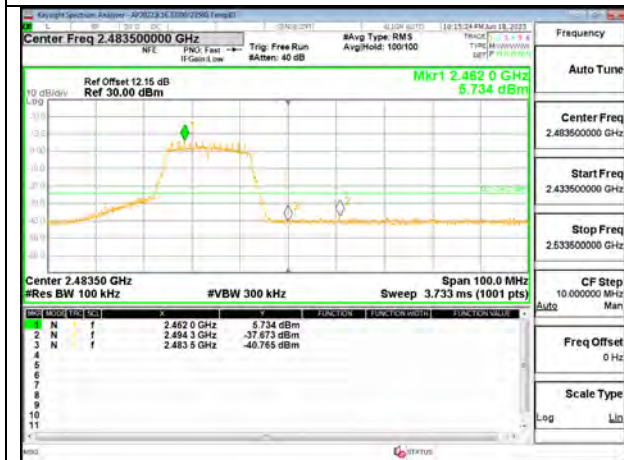




**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**



**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**

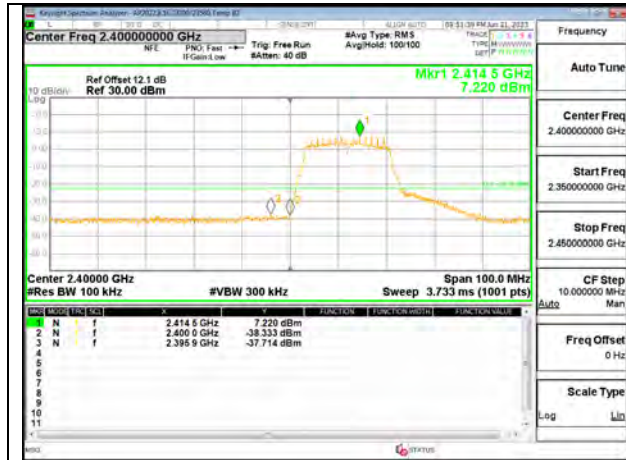


**HIGH CHANNEL 13 BANDEDGE**

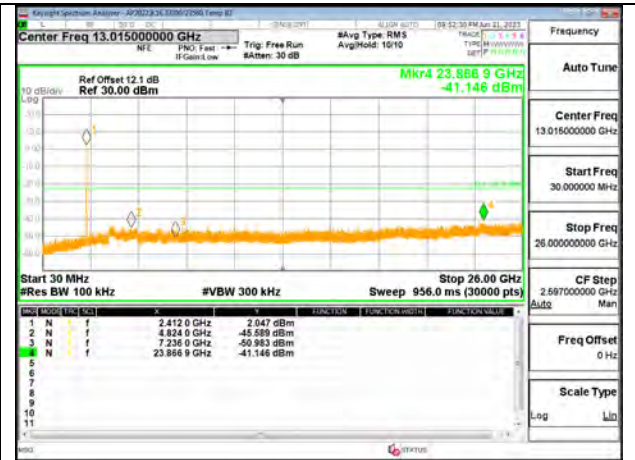


**OUT-OF-BAND HIGH CHANNEL 13**

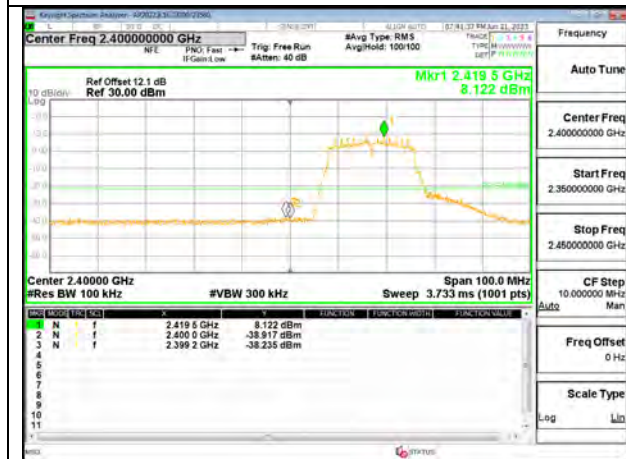
**9.6.3. 802.11n HT20 MODE 2TX**  
**2TX ANT 4 + ANT 3 CDD MODE**



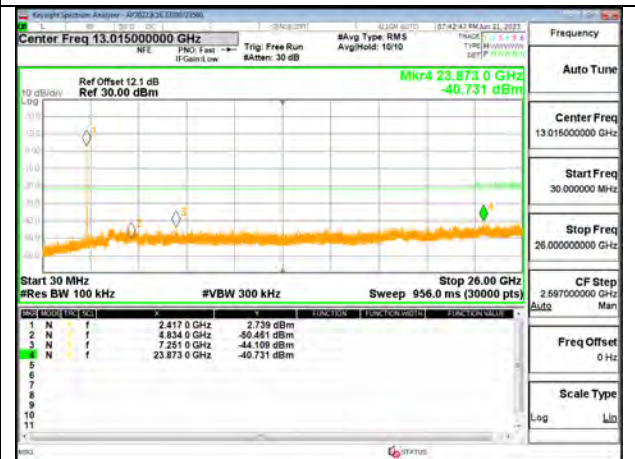
**LOW CHANNEL 1 BANDEDGE ANT 4**



**OUT-OF-BAND LOW CHANNEL 1 ANT 4**



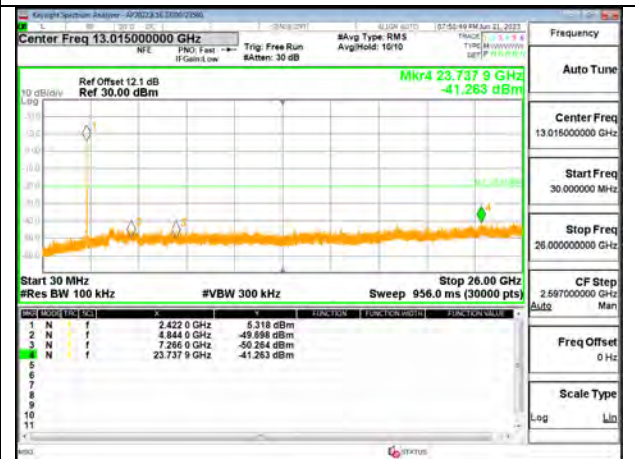
**LOW CHANNEL 2 BANDEDGE ANT 4**



**OUT-OF-BAND LOW CHANNEL 2 ANT 4**

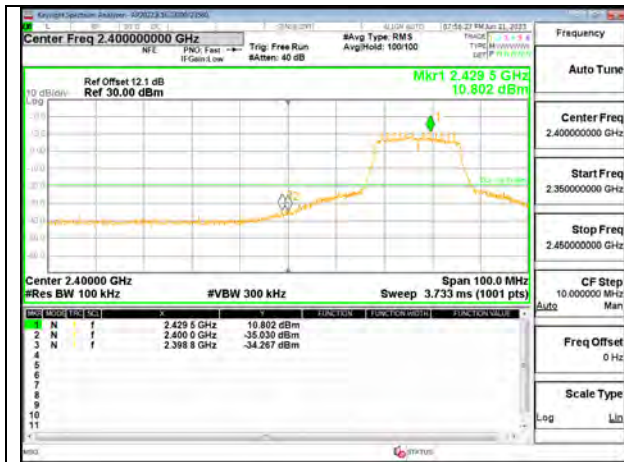


**LOW CHANNEL 3 BANDEDGE ANT 4**

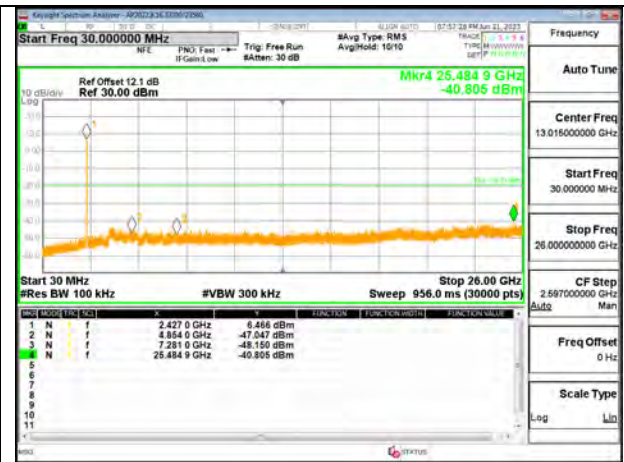


**OUT-OF-BAND LOW CHANNEL 3 ANT 4**

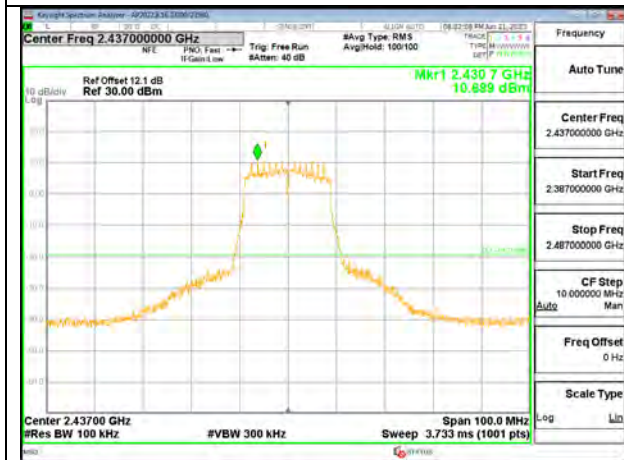




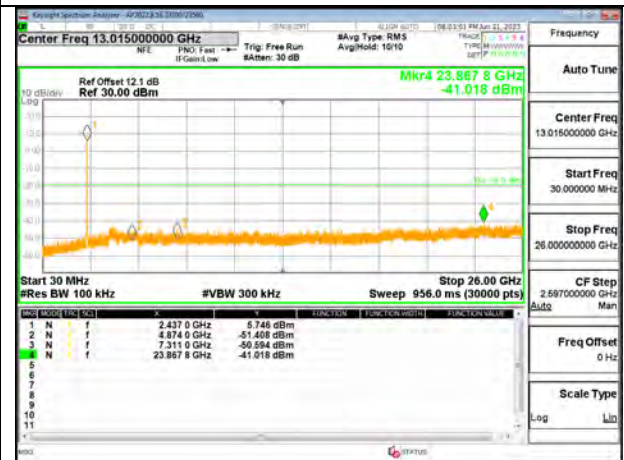
**LOW CHANNEL 4 BANDEDGE ANT 4**



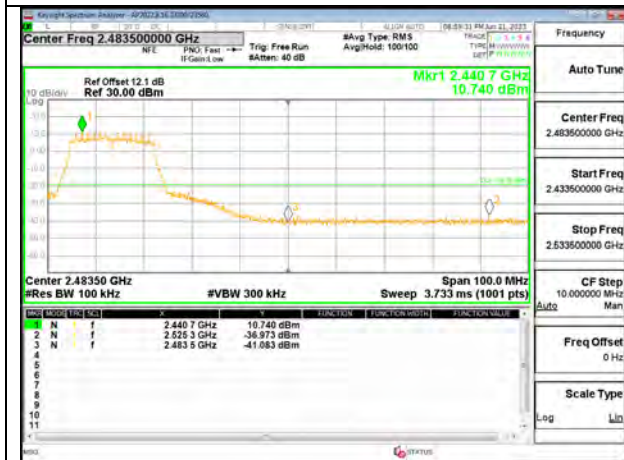
**OUT-OF-BAND LOW CHANNEL 4 ANT 4**



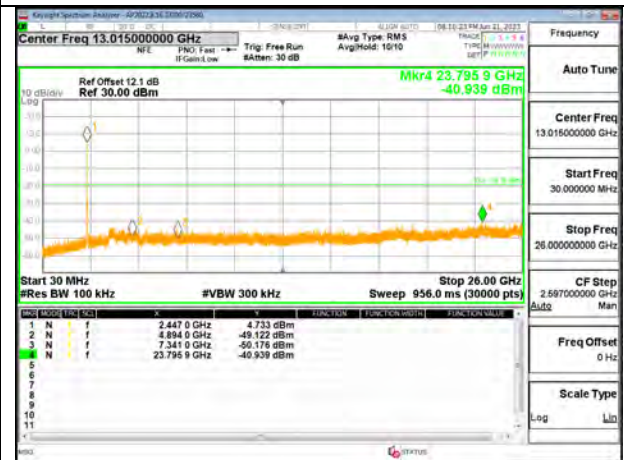
**IN-BAND REFERENCE LEVEL ANT 4**



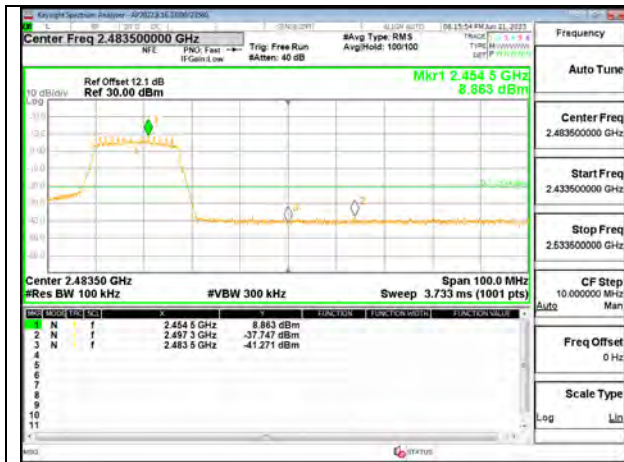
**OUT-OF-BAND MID CHANNEL 4 ANT 4**



**HIGH CHANNEL 8 BANDEDGE ANT 4**



**OUT-OF-BAND HIGH CHANNEL 8 ANT 4**



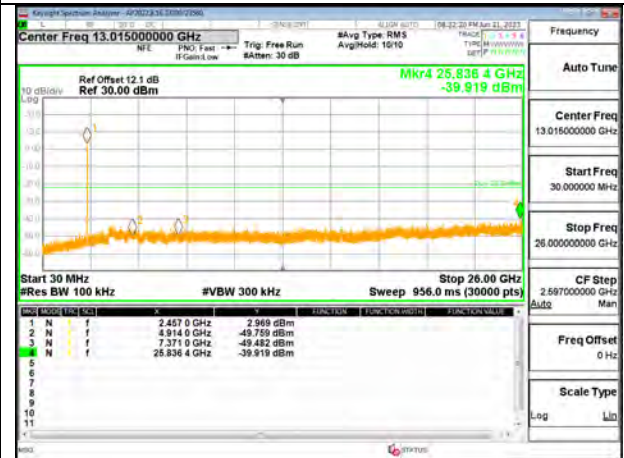
HIGH CHANNEL 9 BANDEDGE ANT 4



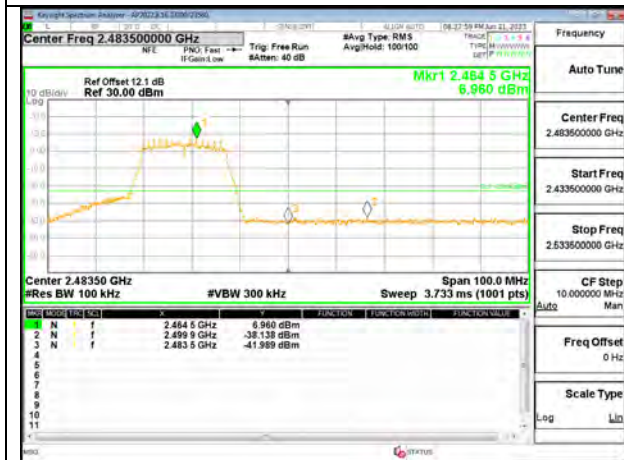
OUT-OF-BAND HIGH CHANNEL 9 ANT 4



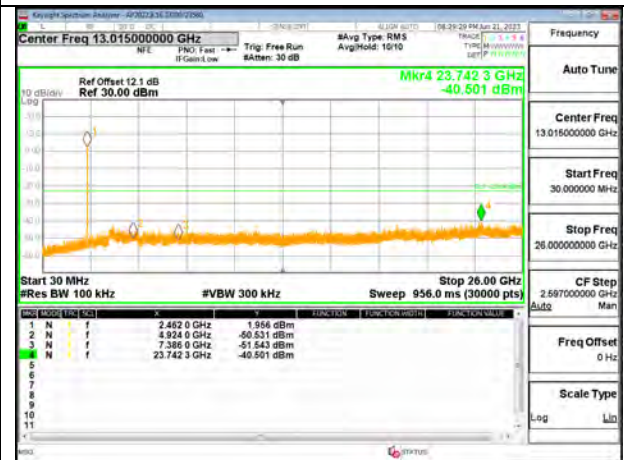
HIGH CHANNEL 10 BANDEDGE ANT 4



OUT-OF-BAND HIGH CHANNEL 10 ANT 4



HIGH CHANNEL 11 BANDEDGE ANT 4



OUT-OF-BAND HIGH CHANNEL 11 ANT 4

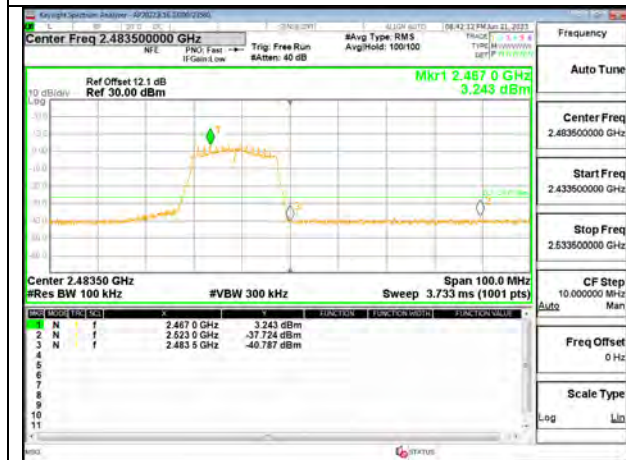




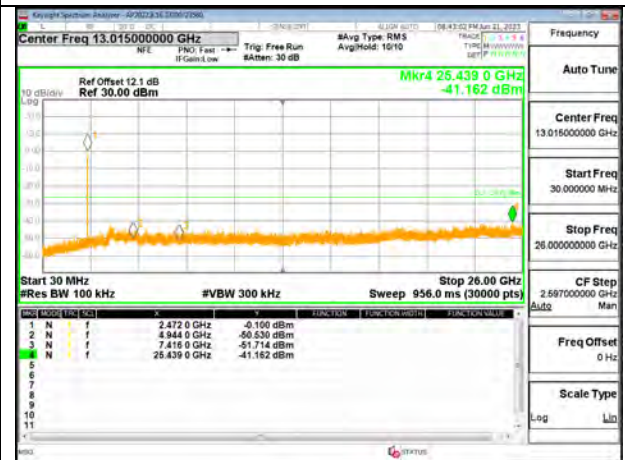
**HIGH CHANNEL 12 BANDEDGE ANT 4**



**OUT-OF-BAND HIGH CHANNEL 12 ANT 4**



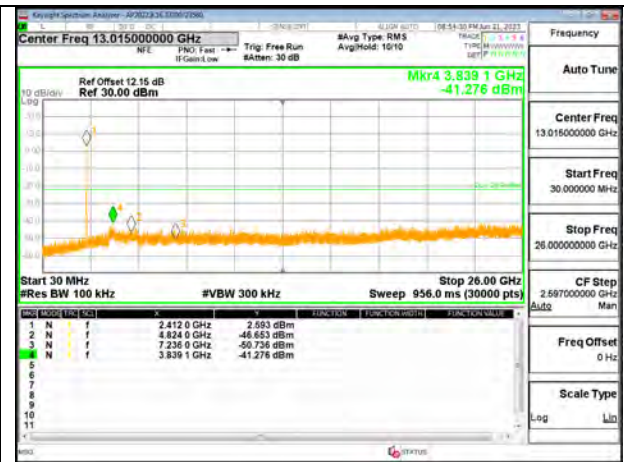
**HIGH CHANNEL 13 BANDEDGE ANT 4**



**OUT-OF-BAND HIGH CHANNEL 13 ANT 4**



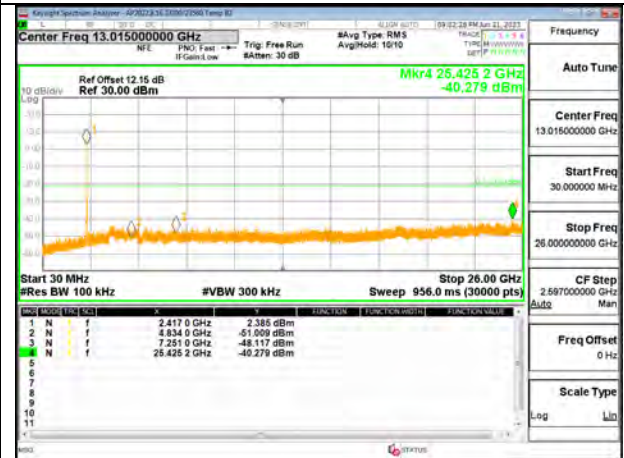
LOW CHANNEL 1 BANDEDGE ANT 3



OUT-OF-BAND LOW CHANNEL 1 ANT 3



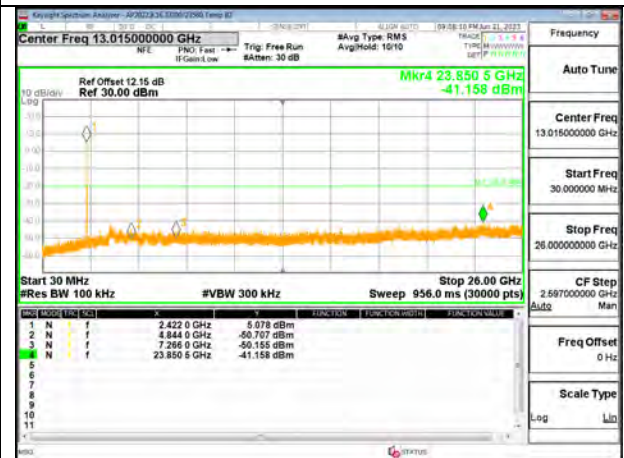
LOW CHANNEL 2 BANDEDGE ANT 3



OUT-OF-BAND LOW CHANNEL 2 ANT 3

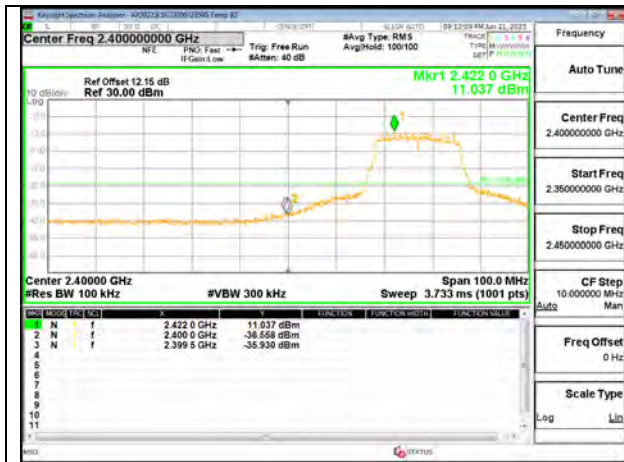


LOW CHANNEL 3 BANDEDGE ANT 3

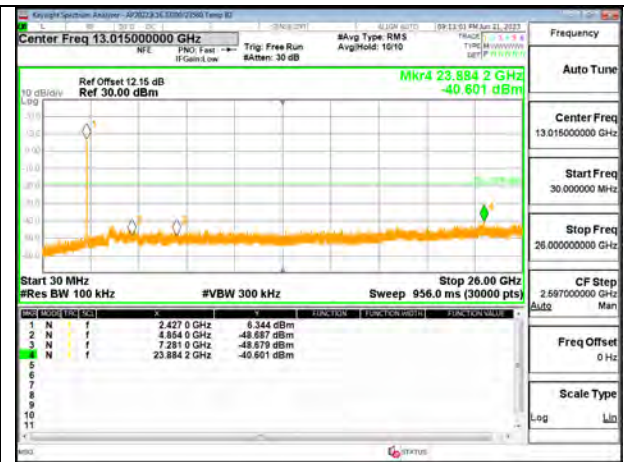


OUT-OF-BAND LOW CHANNEL 3 ANT 3

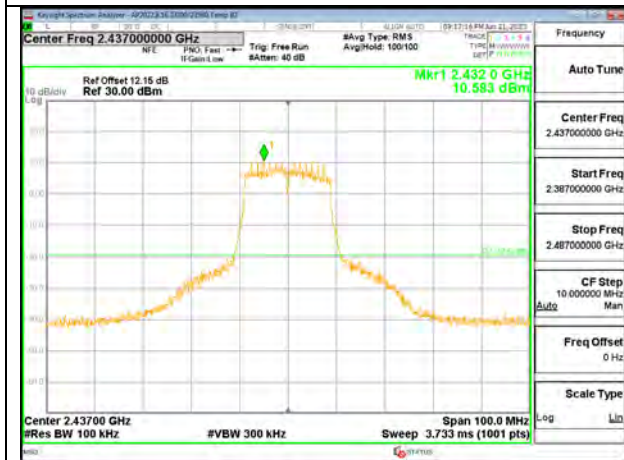




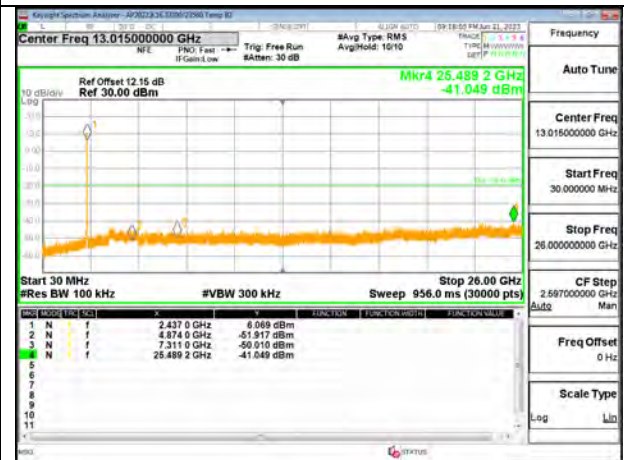
LOW CHANNEL 4 BANDEDGE ANT 3



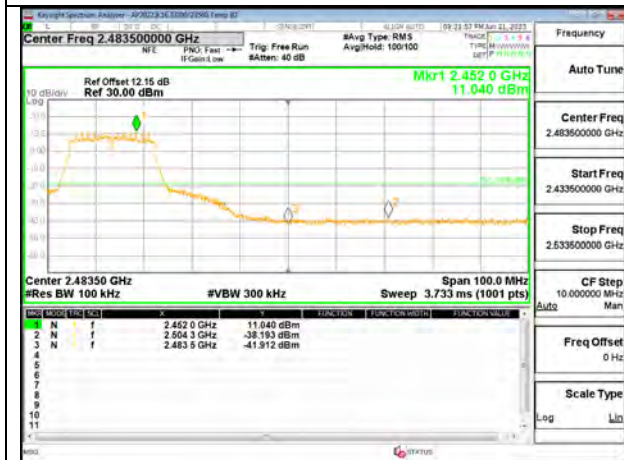
OUT-OF-BAND LOW CHANNEL 4 ANT 3



IN-BAND REFERENCE LEVEL ANT 3



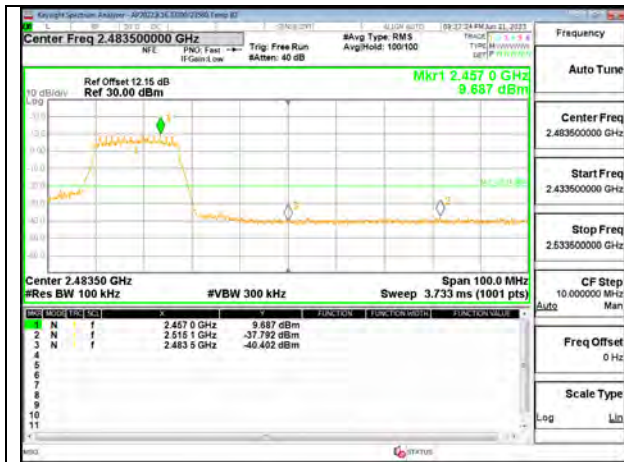
OUT-OF-BAND MID CHANNEL ANT 3



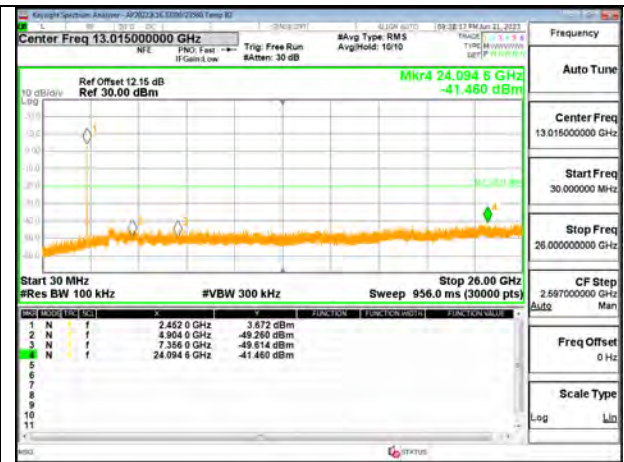
HIGH CHANNEL 8 BANDEDGE ANT 3



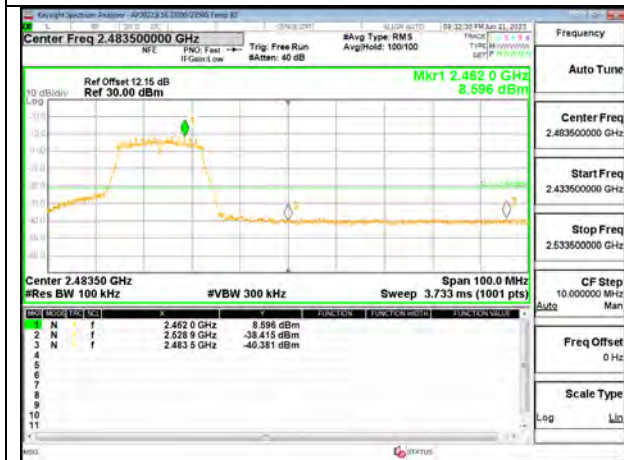
OUT-OF-BAND HIGH CHANNEL 8 ANT 3



**HIGH CHANNEL 9 BANDEDGE ANT 3**



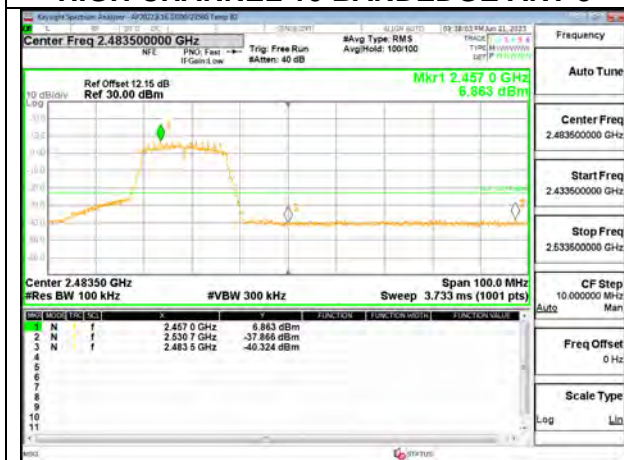
**OUT-OF-BAND HIGH CHANNEL 9 ANT 3**



**HIGH CHANNEL 10 BANDEDGE ANT 3**



**OUT-OF-BAND HIGH CHANNEL 10 ANT 3**



**HIGH CHANNEL 11 BANDEDGE ANT 3**



**OUT-OF-BAND HIGH CHANNEL 11 ANT 3**





**HIGH CHANNEL 12 BANDEDGE ANT 3**



**OUT-OF-BAND HIGH CHANNEL 12 ANT 3**

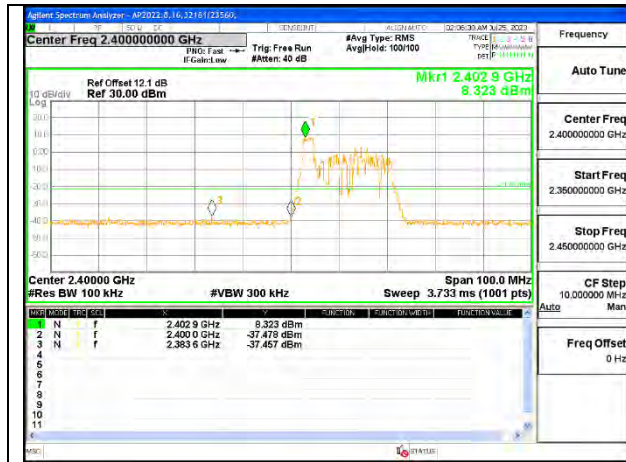


**HIGH CHANNEL 13 BANDEDGE ANT 3**

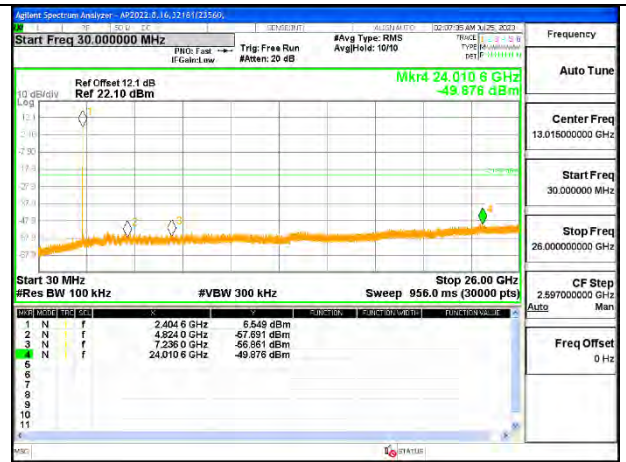


**OUT-OF-BAND HIGH CHANNEL 13 ANT 3**

**9.6.4. 802.11ax HE20 MODE**  
**1TX ANT 4 MODE, 26-Tone RU Index 0**



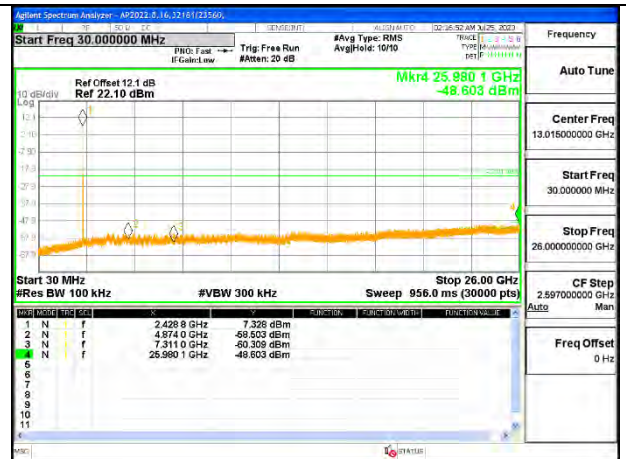
**LOW CHANNEL 1 BANDEDGE**



**OUT-OF-BAND LOW CHANNEL 1**



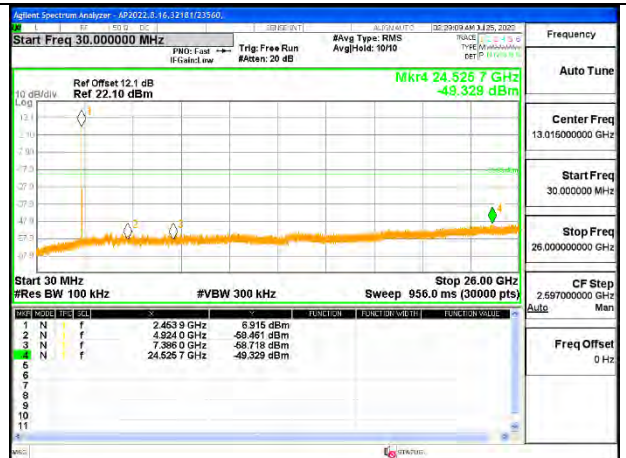
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**

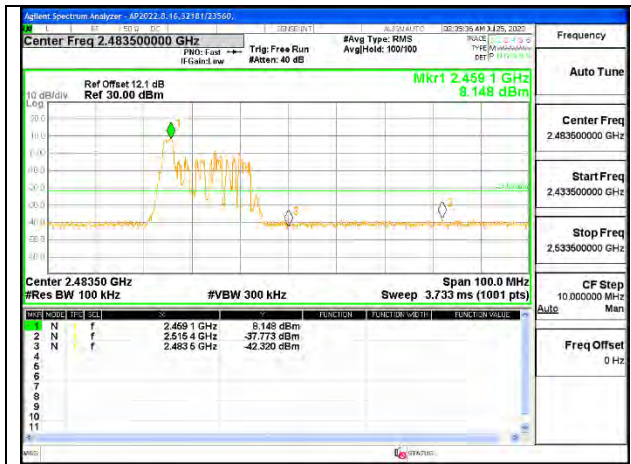


**HIGH CHANNEL 11 BANDEDGE**

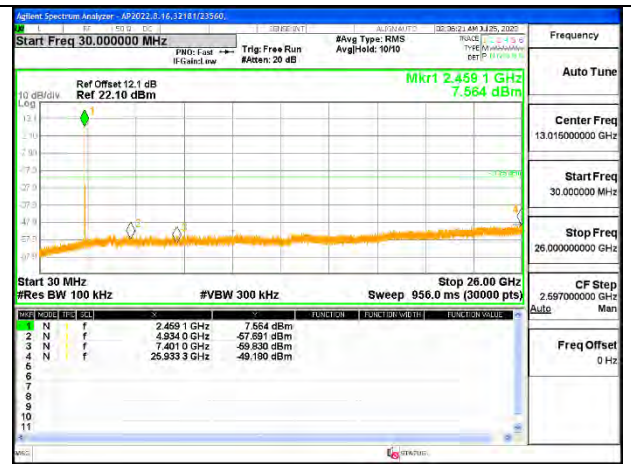


**OUT-OF-BAND HIGH CHANNEL 11**





**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



**HIGH CHANNEL 13 BANDEDGE**

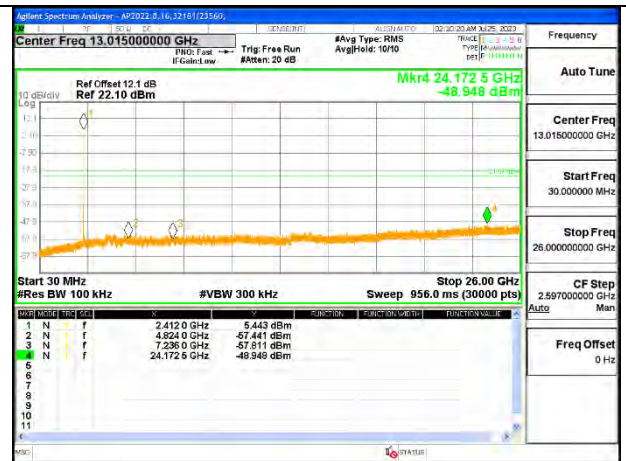


**OUT-OF-BAND HIGH CHANNEL 13**

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



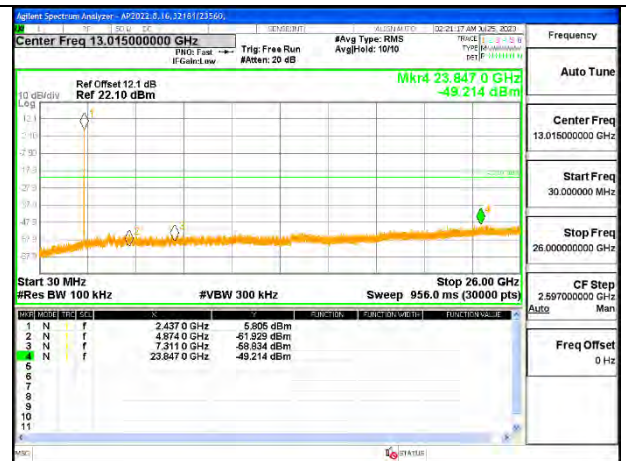
**LOW CHANNEL 1 BANDEDGE**



**OUT-OF-BAND LOW CHANNEL 1**



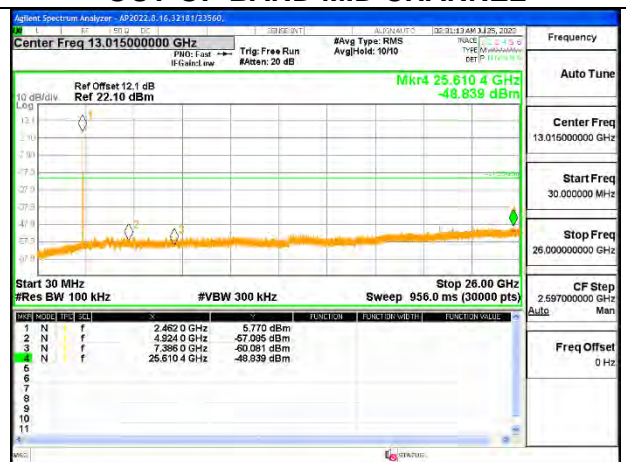
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**

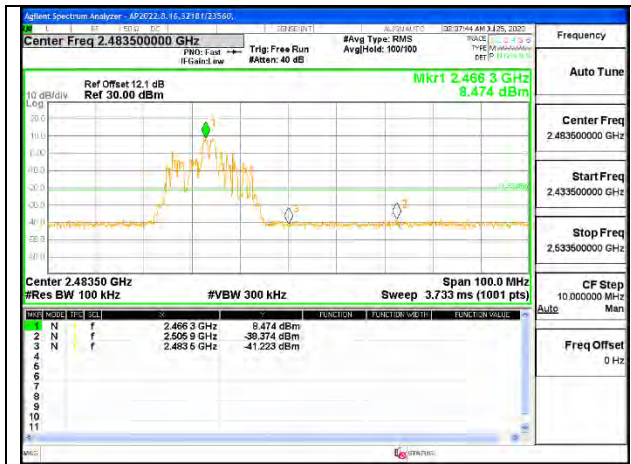


**HIGH CHANNEL 11 BANDEDGE**

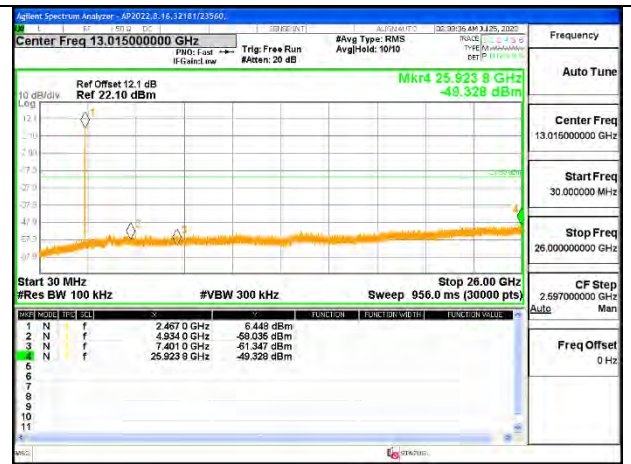


**OUT-OF-BAND HIGH CHANNEL 11**





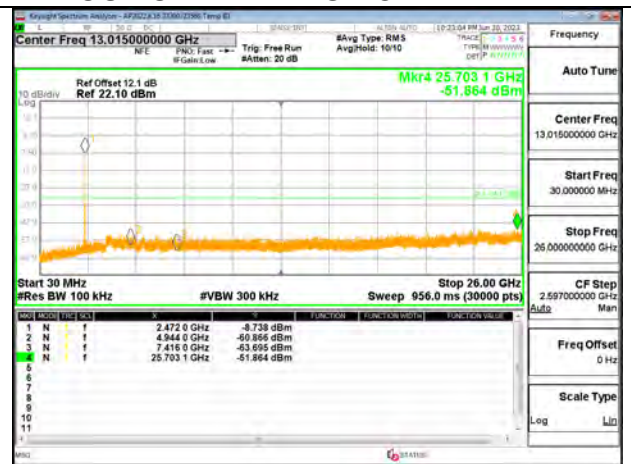
**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



**HIGH CHANNEL 13 BANDEDGE**

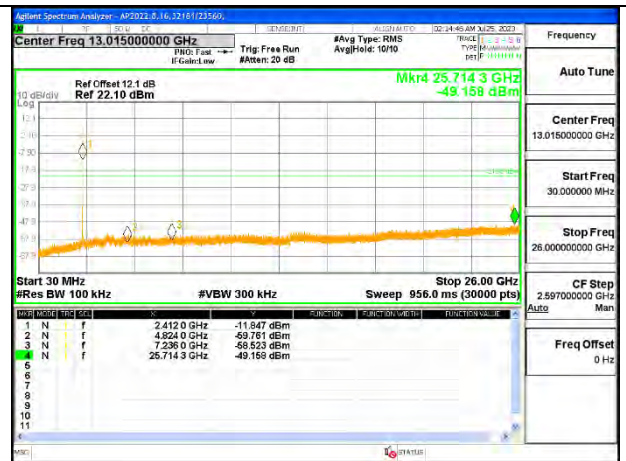


**OUT-OF-BAND HIGH CHANNEL 13**

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



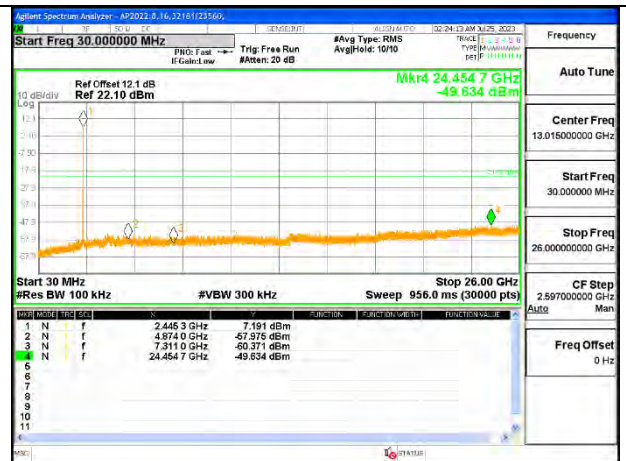
**LOW CHANNEL 1 BANDEDGE**



**OUT-OF-BAND LOW CHANNEL 1**



**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL 11 BANDEDGE**

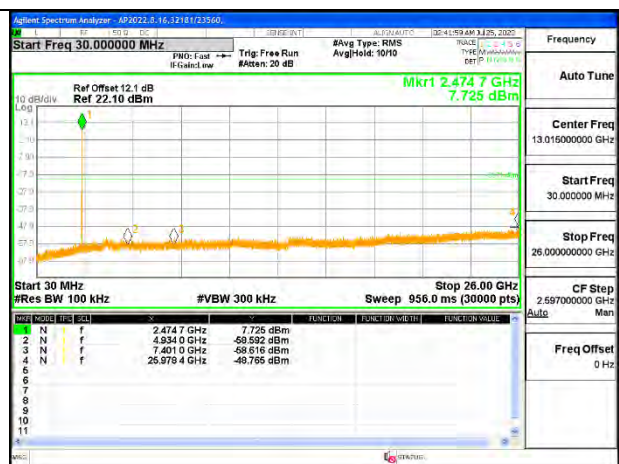


**OUT-OF-BAND HIGH CHANNEL 11**





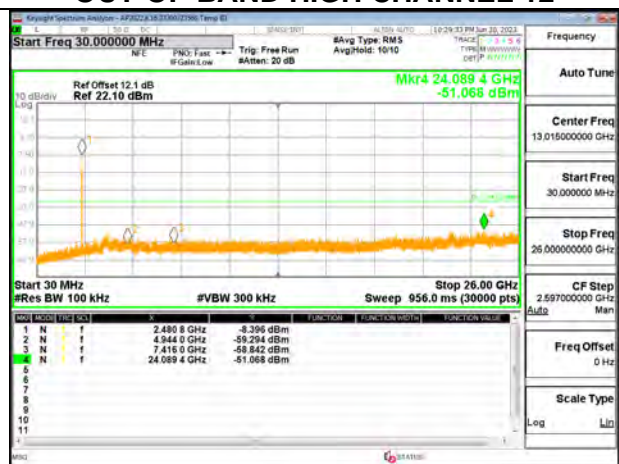
**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**

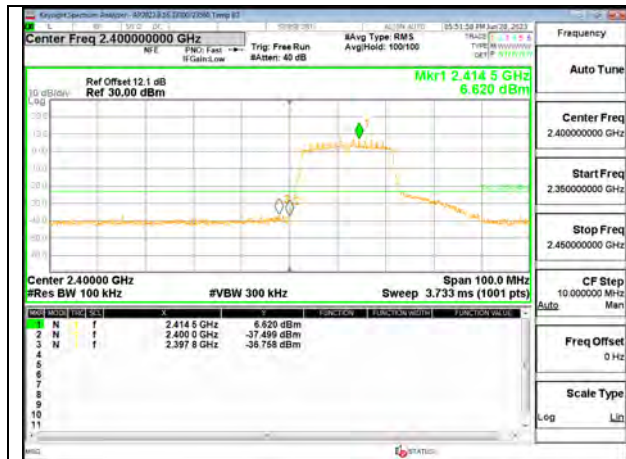


**HIGH CHANNEL 13 BANDEDGE**

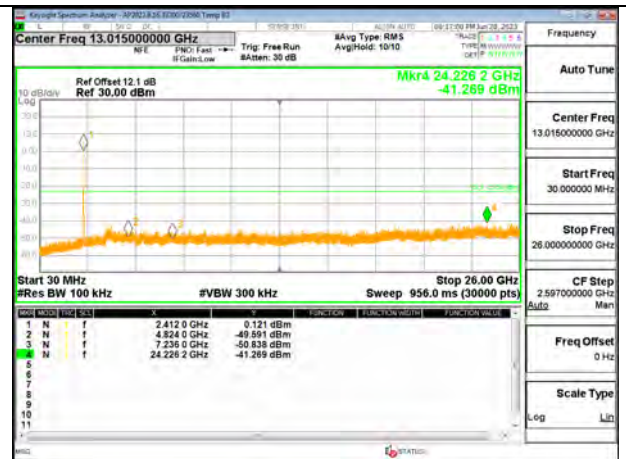


**OUT-OF-BAND HIGH CHANNEL 13**

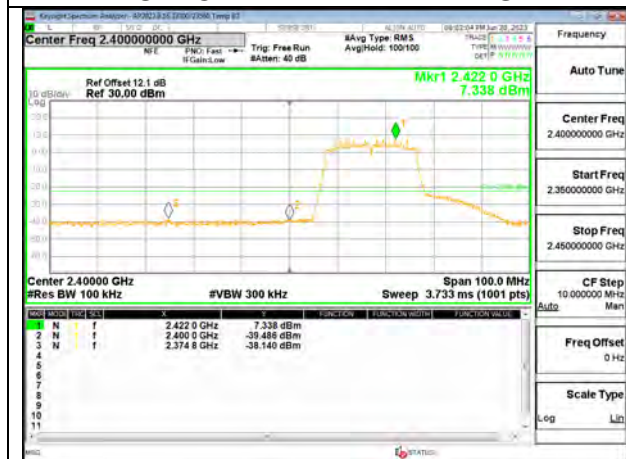
1TX ANT 4 MODE, SU MODE



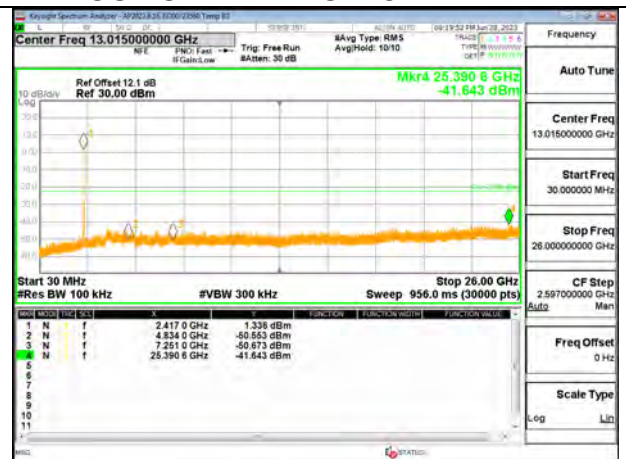
LOW CHANNEL 1 BANDEDGE



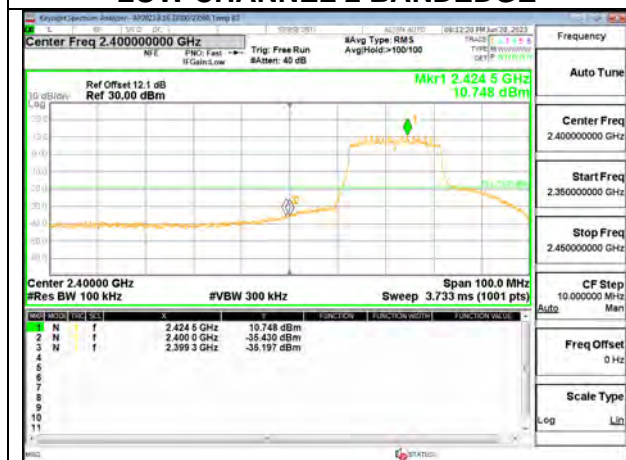
OUT-OF-BAND LOW CHANNEL 1



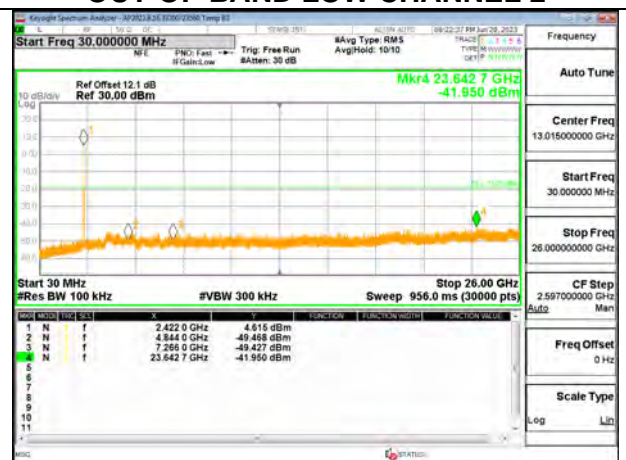
LOW CHANNEL 2 BANDEDGE



OUT-OF-BAND LOW CHANNEL 2

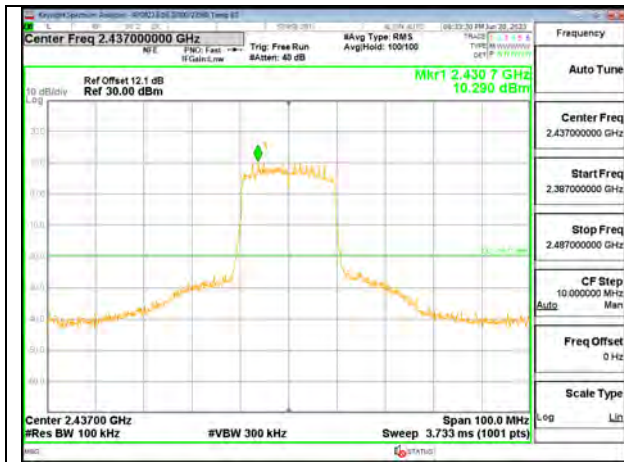


LOW CHANNEL 3 BANDEDGE

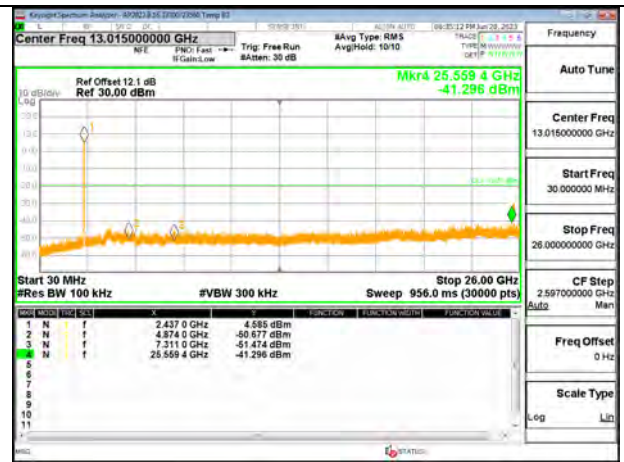


OUT-OF-BAND LOW CHANNEL 3

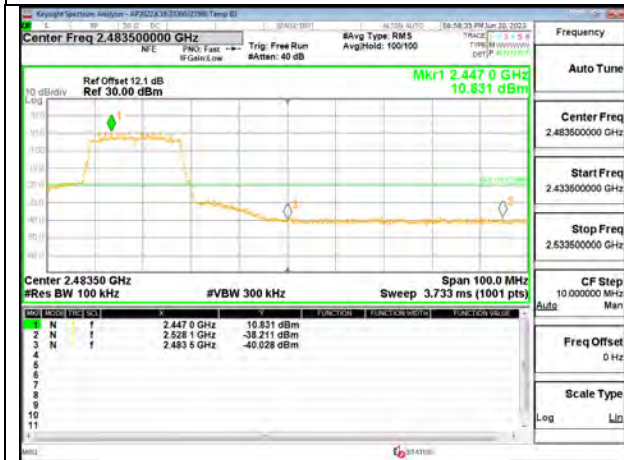




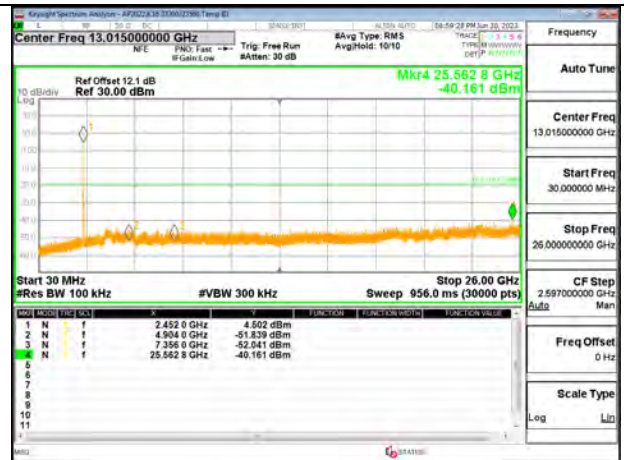
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL 9 BANDEDGE



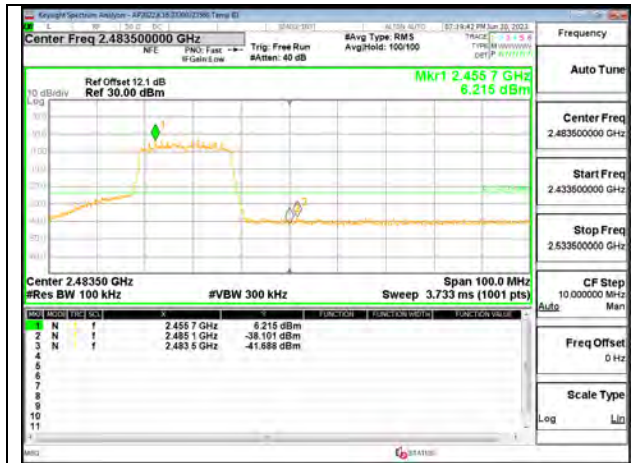
OUT-OF-BAND HIGH CHANNEL 9



HIGH CHANNEL 10 BANDEDGE



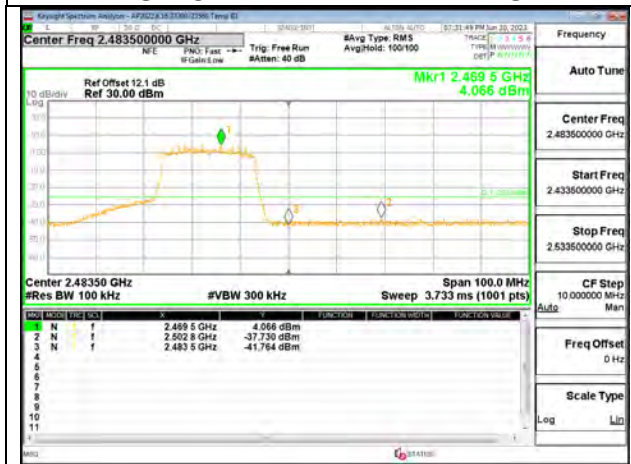
OUT-OF-BAND HIGH CHANNEL 10



**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**



**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



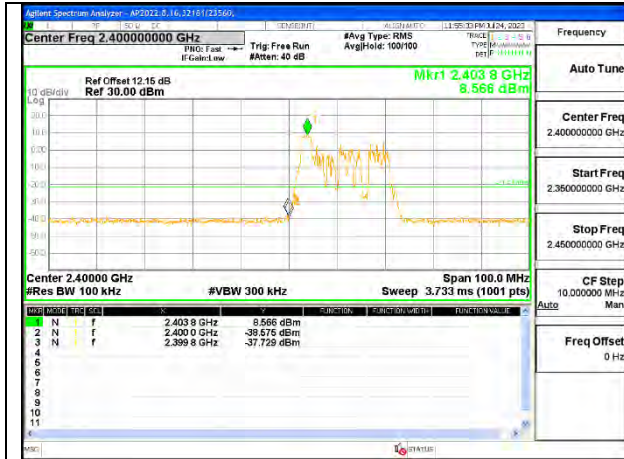
**HIGH CHANNEL 13 BANDEDGE**



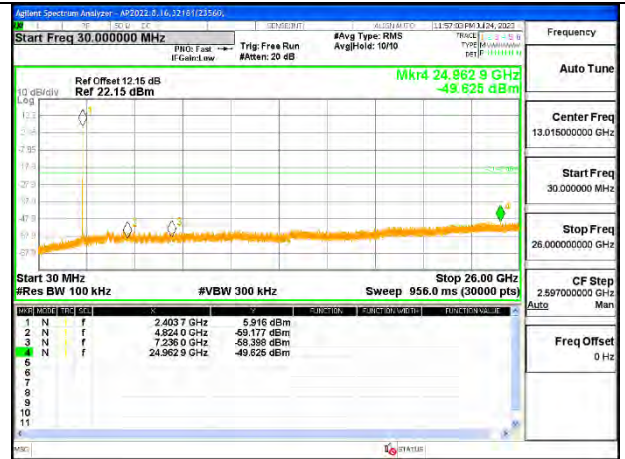
**OUT-OF-BAND HIGH CHANNEL 13**



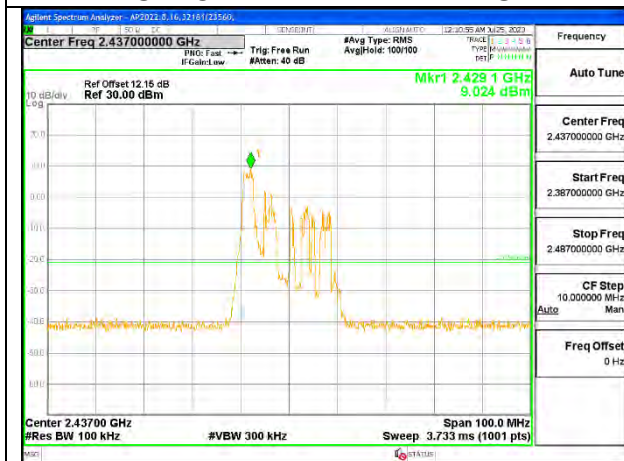
**1TX ANT 3 MODE, 26-Tone RU Index 0**



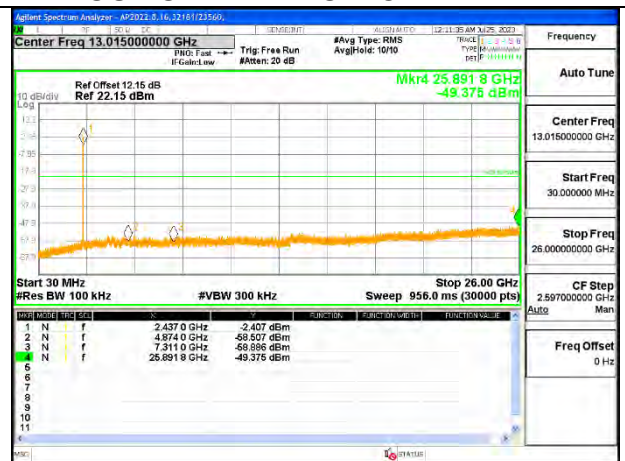
**LOW CHANNEL 1 BANDEDGE**



**OUT-OF-BAND LOW CHANNEL 1**



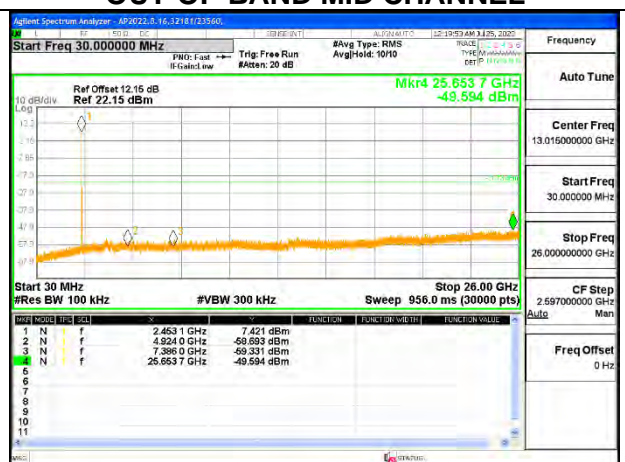
**IN-BAND REFERENCE LEVEL**



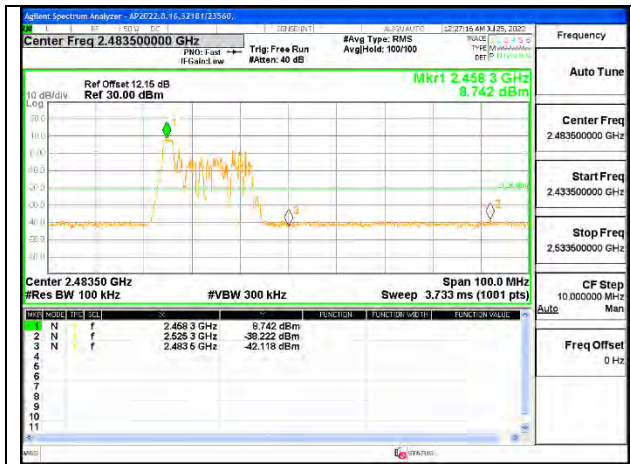
**OUT-OF-BAND MID CHANNEL**



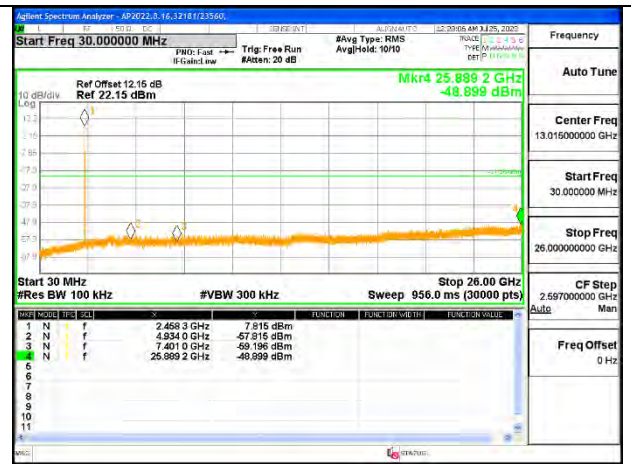
**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**



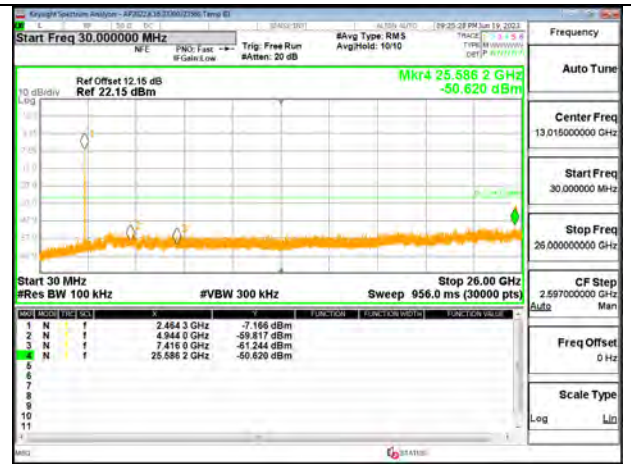
**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



**HIGH CHANNEL 13 BANDEDGE**



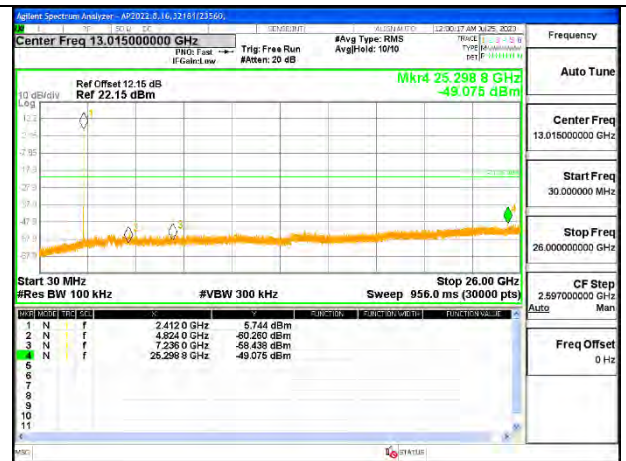
**OUT-OF-BAND HIGH CHANNEL 13**



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



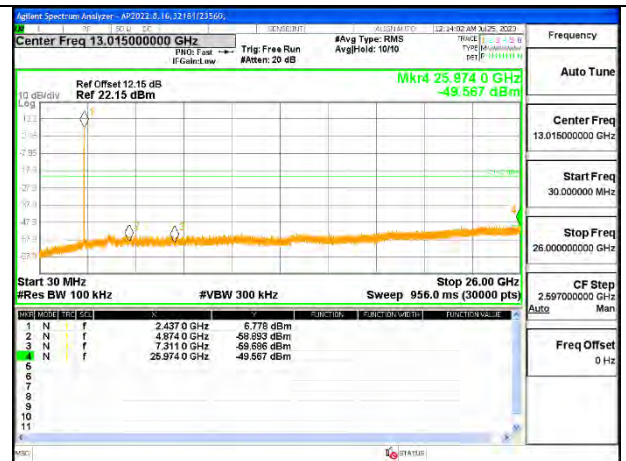
**LOW CHANNEL 1 BANDEDGE**



**OUT-OF-BAND LOW CHANNEL 1**



**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



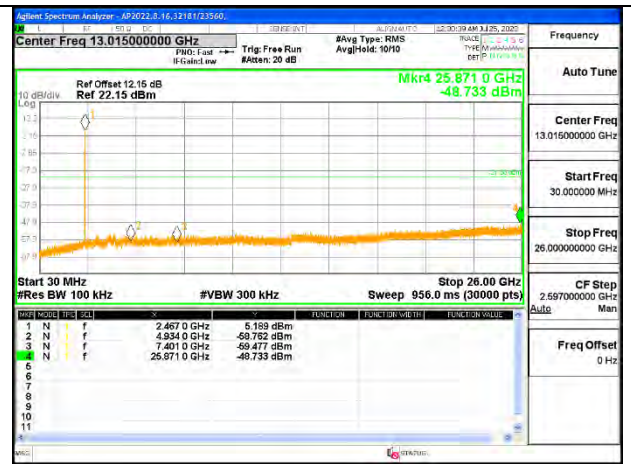
**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**



**HIGH CHANNEL 12 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 12**



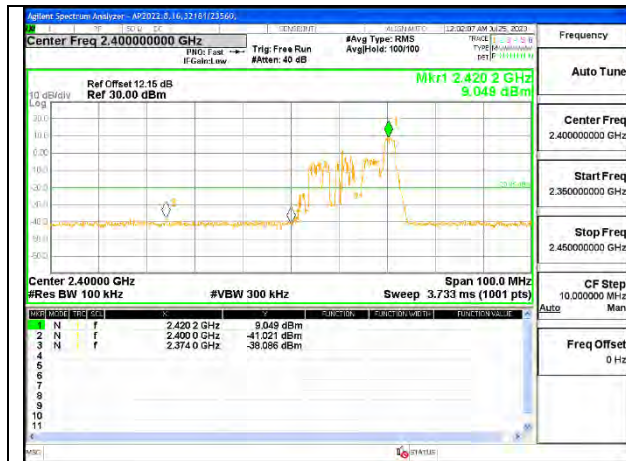
**HIGH CHANNEL 13 BANDEDGE**



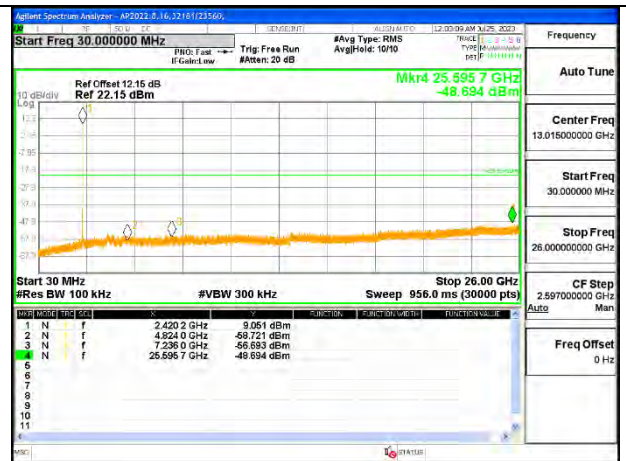
**OUT-OF-BAND HIGH CHANNEL 13**



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



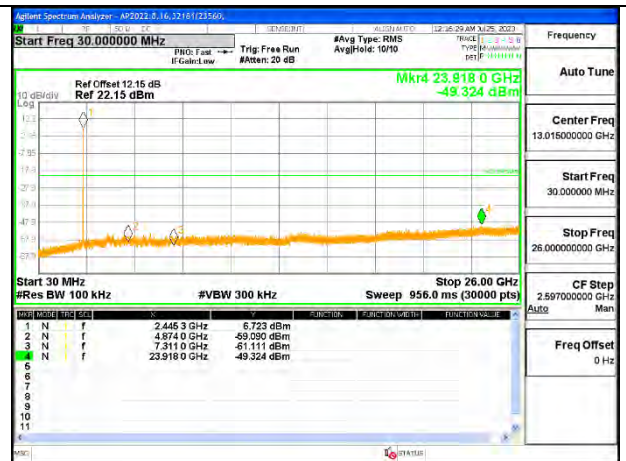
**LOW CHANNEL 1 BANDEDGE**



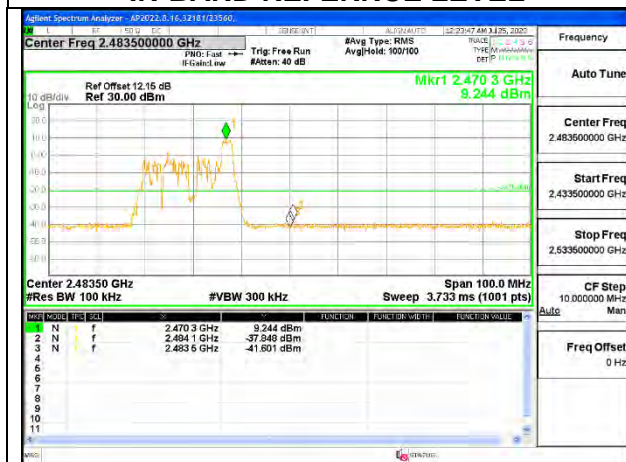
**OUT-OF-BAND LOW CHANNEL 1**



**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL 11 BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL 11**