



TEST REPORT

Report Number: 13571607-E4V2

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

Model : A2482 (Parent Model, Full Test)
A2635, A2631, A2633, A2634 (Variant Models)

FCC ID : BCG-E3997A (Parent Model)
BCG-E4032A, BCG-E3999A, BCG-E4031A (Variant Models)

IC : 579C-E3997A (Parent Model)
579C-E4032A, 579C-E3999A, 579C-E4031A (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:

July 22, 2021

Prepared by:

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



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	7/1/2021	Initial Issue	Frank Ibrahim
V2	7/22/2021	Address TCB's questions on section 9.4.2, 9.4.3 Page 273/275-286, 289-320	Chin Pang

REPORT REVISION HISTORY2

1. ATTESTATION OF TEST RESULTS5

2. TEST RESULTS SUMMARY7

3. TEST METHODOLOGY7

4. FACILITIES AND ACCREDITATION7

5. DECISION RULES AND MEASUREMENT UNCERTAINTY8

 5.1. METROLOGICAL TRACEABILITY8

 5.2. DECISION RULES.....8

 5.3. MEASUREMENT UNCERTAINTY.....8

6. EQUIPMENT UNDER TEST9

 6.1. EUT DESCRIPTION9

 6.2. MAXIMUM OUTPUT POWER.....9

 6.3. DESCRIPTION OF AVAILABLE ANTENNAS10

 6.4. SOFTWARE AND FIRMWARE.....10

 6.5. WORST-CASE CONFIGURATION AND MODE.....11

 6.6. DESCRIPTION OF TEST SETUP.....12

7. MEASUREMENT METHOD.....16

8. TEST AND MEASUREMENT EQUIPMENT17

9. ANTENNA PORT TEST RESULTS18

 9.1. ON TIME AND DUTY CYCLE.....18

 9.2. 99% BANDWIDTH.....22

 9.2.1. 802.11b MODE 1TX.....23

 9.2.2. 802.11n HT20 MODE 1TX.....25

 9.2.3. 802.11n HT20 CDD MODE 2TX27

 9.2.4. 802.11ax HE20 MODE 1TX.....28

 9.2.5. 802.11ax HE20 OFDMA MODE 2TX36

 9.3. 6 dB BANDWIDTH.....40

 9.3.1. 802.11b MODE 1TX.....41

 9.3.2. 802.11n HT20 MODE 1TX43

 9.3.3. 802.11n HT20 CDD MODE 2TX45

 9.3.4. 802.11ax HE20 MODE 1TX46

 9.3.5. 802.11ax HE20 OFDMA MODE 2TX54

 9.4. OUTPUT POWER.....58

 9.4.1. 802.11b MODE 1TX.....59

 9.4.2. 802.11n HT20 MODE 1TX.....61

 9.4.3. 802.11n HT20 CDD MODE 2TX63

 9.4.4. 802.11ax HE20 MODE 1TX.....64

9.4.5.	802.11ax HE20 OFDMA MODE 2TX	72
9.5.	<i>POWER SPECTRAL DENSITY</i>	76
9.5.1.	802.11b MODE 1TX.....	77
9.5.2.	802.11n HT20 MODE 1TX.....	79
9.5.3.	802.11n HT20 CDD MODE 2TX	81
9.5.4.	802.11ax HE20 MODE 1TX.....	82
9.5.5.	802.11ax HE20 OFDMA MODE 2TX	90
9.6.	<i>CONDUCTED SPURIOUS EMISSIONS</i>	94
9.6.1.	802.11b MODE	95
9.6.2.	802.11n HT20 MODE	99
9.6.3.	802.11n HT20 CDD MODE 2TX	105
9.6.4.	802.11ax HE20 MODE 1TX.....	113
9.6.5.	802.11ax HE20 OFDMA MODE 2TX	137
10.	RADIATED TEST RESULTS.....	169
10.1.	<i>TRANSMITTER ABOVE 1 GHz</i>	171
10.1.1.	TX ABOVE 1 GHz 802.11b 1TX MODE IN THE 2.4 GHz BAND.....	171
10.1.2.	TX ABOVE 1 GHz 802.11n HT20 1TX MODE IN THE 2.4 GHz BAND	199
10.1.3.	TX ABOVE 1 GHz 802.11n HT20 CDD MODE IN THE 2.4 GHz BAND	231
10.1.4.	TX ABOVE 1 GHz 802.11ax HE20 1TX MODE IN THE 2.4 GHz BAND	257
10.1.5.	TX ABOVE 1 GHz 802.11ax HE20 2TX MODE IN THE 2.4 GHz BAND	321
10.2.	<i>WORST CASE BELOW 1 GHz</i>	373
10.3.	<i>WORST CASE 18-26 GHz</i>	375
11.	AC POWER LINE CONDUCTED EMISSIONS.....	377
11.1.	<i>AC POWER LINE WITH LAPTOP</i>	378
11.2.	<i>AC POWER LINE WITH CHARGER</i>	380
12.	SETUP PHOTOS.....	382

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A2482 (Parent Model)
A2635, A2631, A2633, A2634 (Variant Models)

BRAND: APPLE

FCC ID: BCG-E3997A (Parent Model)
BCG-E4032A, BCG-E3999A, BCG-E4031A (Variant Models)

IC ID: 579C-E3997A (Parent Model)
579C-E4032A, 579C-E3999A, 579C-E4031A (Variant Models)

SERIAL NUMBER: G6TDQ0AG0XGQ; CQF9R4NQNJ

SAMPLE RECEIPT DATE: 01/28/2021; 01/22/2021

DATE TESTED: January 28, 2021 – JULY 21, 2021

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:



Frank Ibrahim
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:



Chris Xiong
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 11.6.
N/A	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	None.
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
- ANSI C63.10-2013
- KDB 558074 D01 15.247 Meas Guidance v05r02
- KDB 414788 D01 Radiated Test Site v01r01
- RSS-GEN Issue 5 + A1 + A2
- RSS-247 Issue 2

4. FACILITIES AND ACCREDITATION

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

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	208313
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	208313
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	208313

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

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

5.2. DECISION RULES

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

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U _{LAB}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB

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

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS and NFC. All models support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

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

Parent Model: A2482, FCC ID: BCG-E3997A, IC ID: 579C-E3997A

Variant Models: A2635; FCC ID: BCG-E4032A, IC ID: 579C-E4032A
 A2631; FCC ID: BCG-E3999A, IC ID: 579C-E3999A
 A2633; FCC ID: BCG-E4031A, IC ID: 579C-E4031A
 A2634; FCC ID: BCG-E4032A, IC ID: 579C-E4032A

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
2412 - 2472	802.11b	21.21	132.13
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20	21.24	133.05
	802.11ax HE20	21.25	133.35

2Tx			
2412 - 2472	802.11n HT20 CDD	24.26	266.69
	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
	802.11ax HE20	24.23	264.85

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna Type is IFA.

The antennas' gains, as provided by the manufacturer, are as follows:

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	-2.9	0.3

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WiFi FW Version: 20_10_745_15.

6.5. WORST-CASE CONFIGURATION AND MODE

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

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 full RU 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 HT20 mode: MCS7
802.11ax HE20 mode: MCS9
802.11ax HE20 FULL RU & RU26: MCS9

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

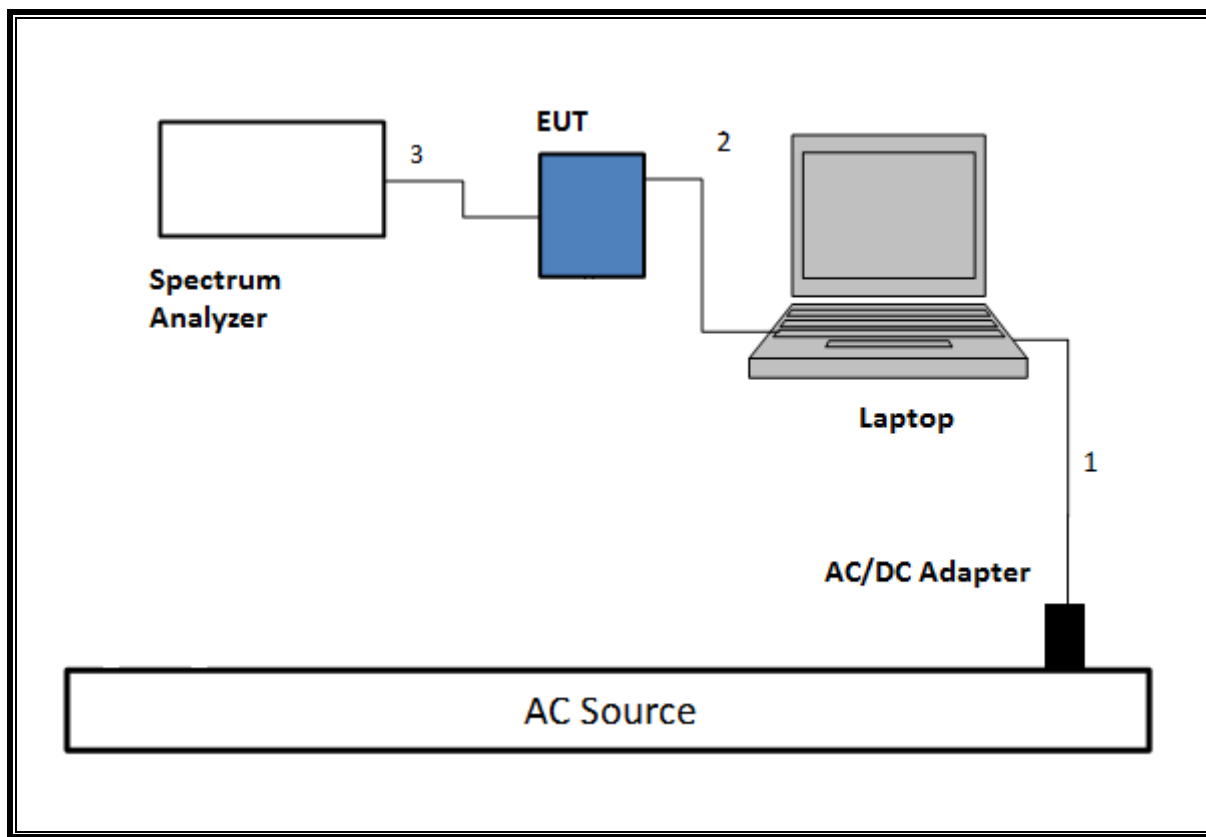
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Apple	Macbook Pro	C02YL3ZMJHC8	BCGA1989		
Laptop AC/DC adapter	Liteon Technology	A1424	NSW25679	DoC		
EUT AC/DC adapter	Apple	A1720	C3D8417A7R93KVPA8	DoC		
I/O CABLES (RF 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	1.0	N/A
3	Antenna	1	SMA	Un-shielded	0.2	To spectrum Analyzer
I/O CABLES (RF RADIATED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Un-shielded	1	N/A

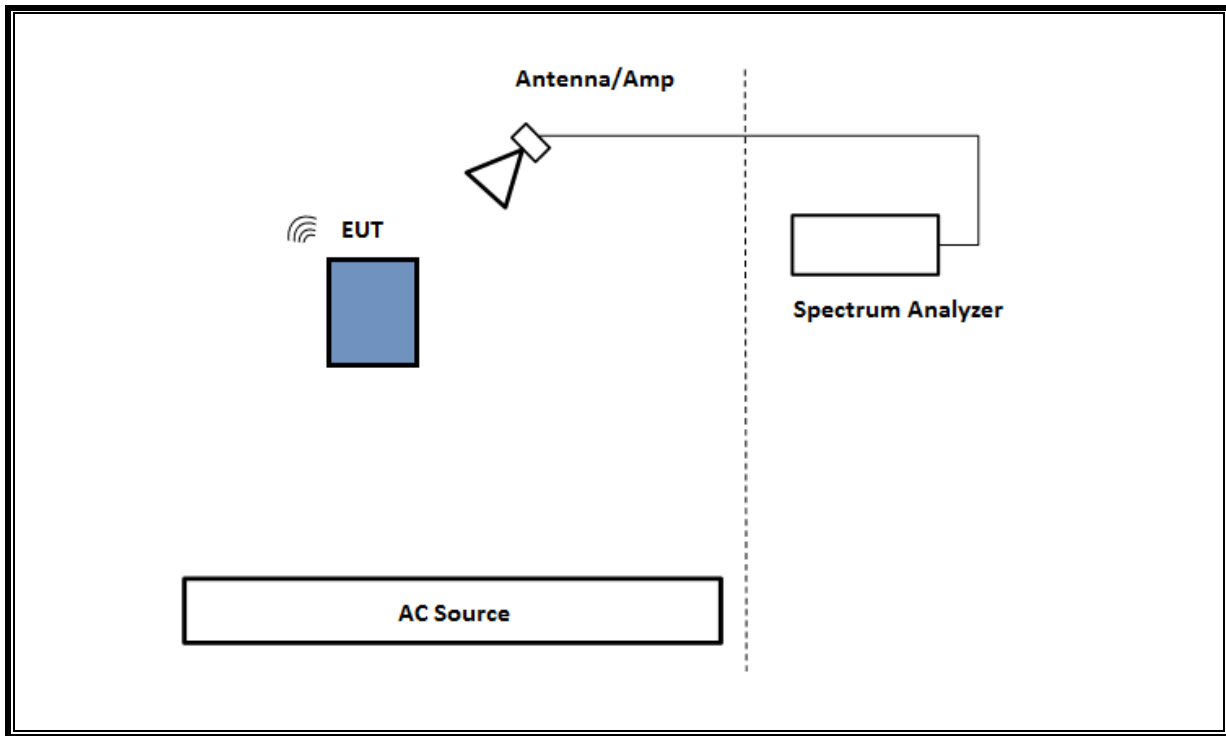
TEST SETUP

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

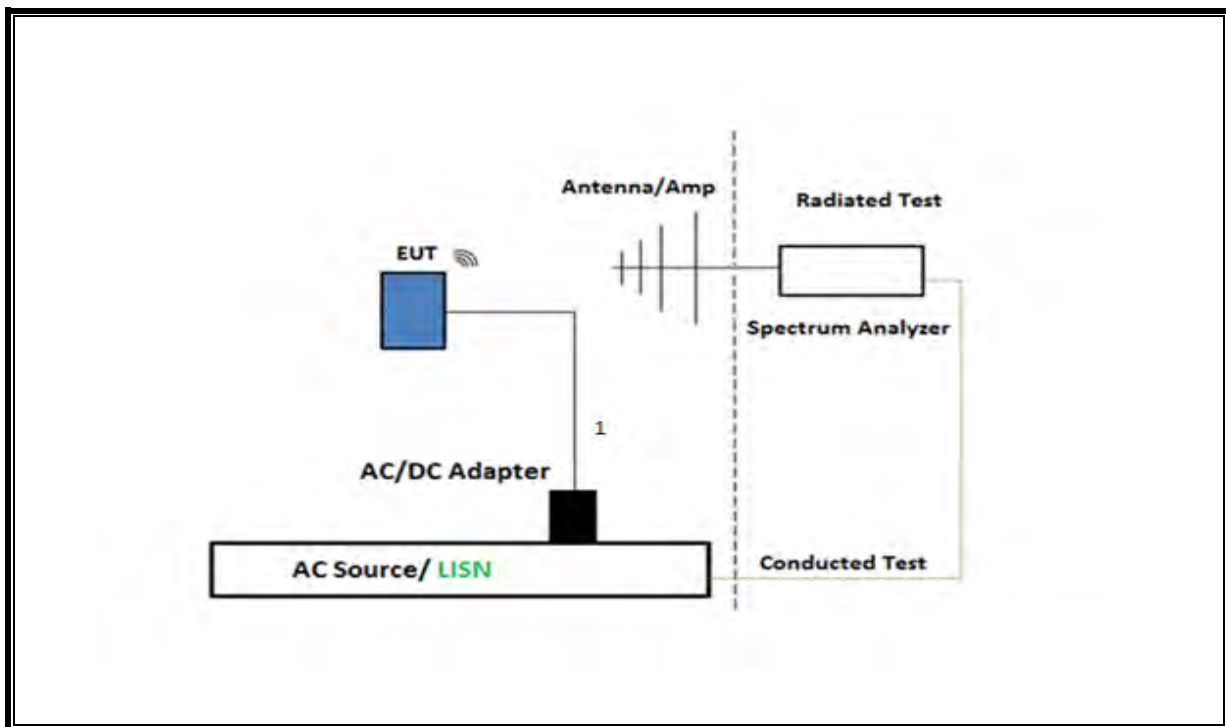
SETUP DIAGRAM FOR CONDUCTED TESTS



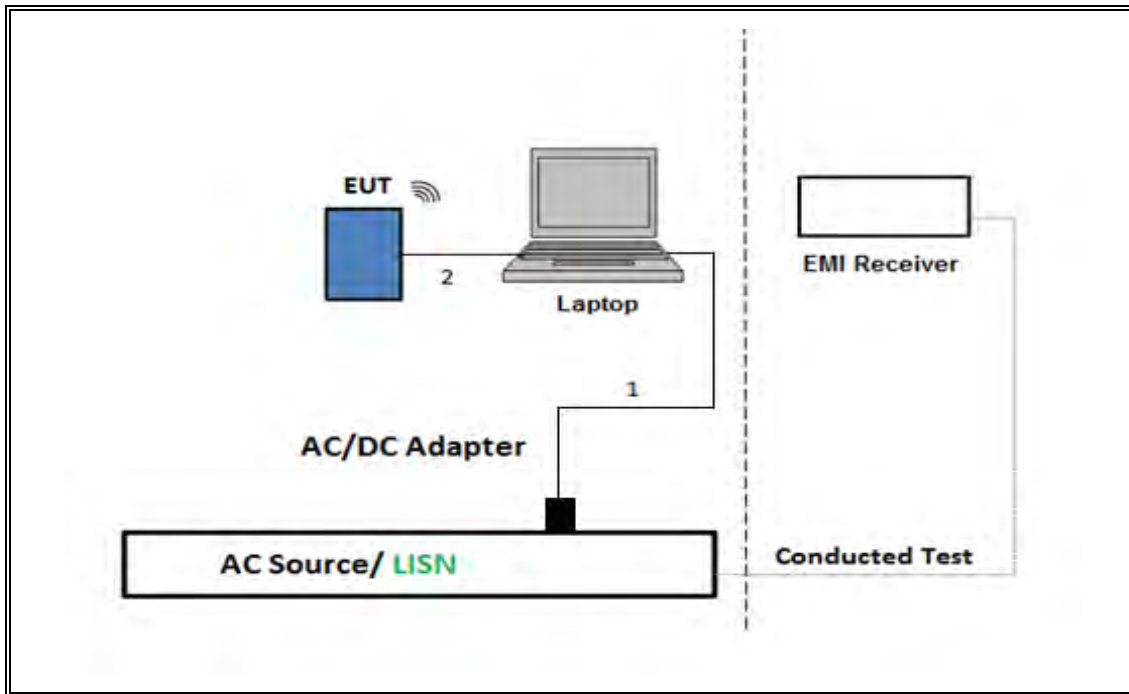
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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 C63.10-2013, Subclause 11.8.1 Option 1
99% BW	ANSI C63.10-2013, Subclause 6.9.3.
Output Power	ANSI C63.10-2013, Subclause 11.9.2.3.1 Method AVGPM
PSD	<ul style="list-style-type: none"> • ANSI C63.10-2013, Subclause, 11.10.3 Method AVGPSD-1 • ANSI C63.10-2013, Subclause, 11.10.5 Method AVGPSD-2
Radiated emissions non-restricted frequency bands	ANSI C63.10-2013, Subclause 11.11 & Clause 13
Radiated emissions restricted frequency bands	ANSI C63.10-2013, Subclause 11.12.1 & Clause 13
Conducted emissions in restricted frequency bands	ANSI C63.10-2013, Subclause 11.12.2
Band-edge	<ul style="list-style-type: none"> • ANSI C63.10-2013, Subclause 11.13.3.2 Peak Detection • ANSI C63.10-2013, Subclause 11.13.3.3 Trace averaging with continuous EUT transmission at full power • ANSI C63.10-2013, Subclause 11.13.3.4 Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
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 were utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179522	02/19/2022	02/19/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE010034	09/15/2021	09/15/2020
RF Amplifier, 1-18GHz	UL	-	PRE0181597	08/20/2021	08/20/2020
EMI Test Receiver	Rohde & Schwarz	ESW44	201502	02/24/2022	02/24/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE0213971	09/25/2021	09/25/2020
RF Amplifier, 1-18GHz	UL	-	202843	12/03/2021	12/03/2020
Antenna, Horn 1-18GHz	ETS Lindgren	3117	PRE0078107	03/01/2022	03/02/2021
Amplifier, 1 to 18GHz	Ampical	AMP1G18-35	138301	03/30/2022	03/30/2021
EMI Test Receiver	Rohde & Schwarz	ESW44	201501	02/23/2022	02/23/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200785	09/25/2021	09/25/2020
RF Amplifier, 1-18GHz	UL	-	203372	12/09/2021	12/09/2020
EMI Test Receiver	Rohde & Schwarz	ESW44	201498	02/25/2022	02/25/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE0213831	12/03/2021	12/03/2020
RF Amplifier, 1-18GHz	UL	-	203957	01/02/2022	01/02/2021
Antenna, Hybrid 30-1000MHz	Sunar-Keysight	JB3	202329	10/27/2021	10/27/2020
RF Amplifier, 30-1000MHz	Sonoma Instrument	310N	202992	11/22/2021	11/22/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	T341	01/28/2022	01/28/2021
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	T146	01/25/2022	01/25/2021
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	T1271	01/20/2022	01/20/2021
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90392	01/28/2022	01/28/2021
*Antenna Horn, 18 to 26GHz	ARA	SWH-28	T125	04/17/2021	04/17/2020
*Pre-Amp 18-26GHz	Agilent Technology	8449B	T404	04/08/2021	04/08/2020
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	11/23/2021	11/23/2020

AC Line Conducted					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	T1436	02/19/2022	02/19/2021
Power Cable, Line Conducted Emissions	UL	PR1	T861	10/27/2021	10/27/2020
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01	PRE0186446	01/20/2022	01/20/2021
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		

Note: *Testing is completed before equipment expiration date.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

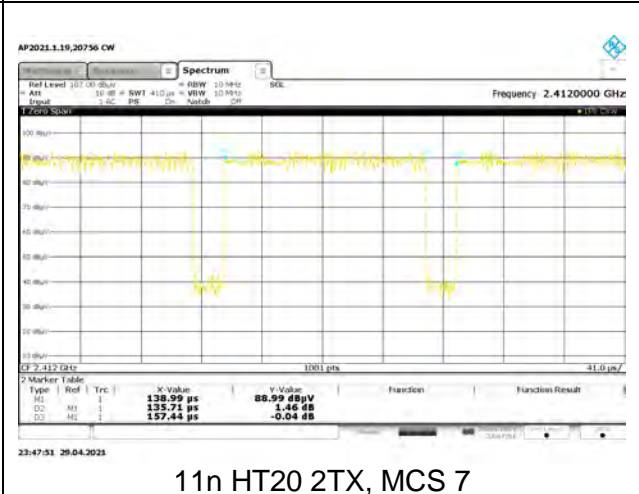
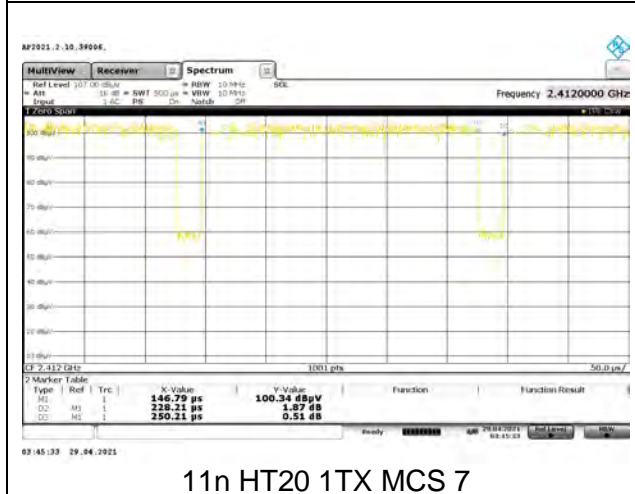
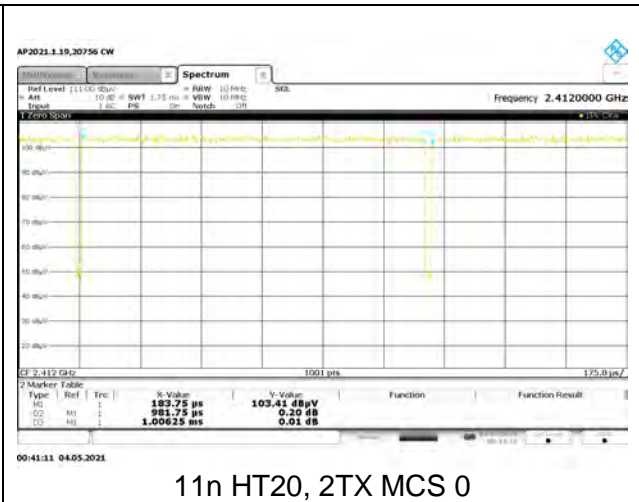
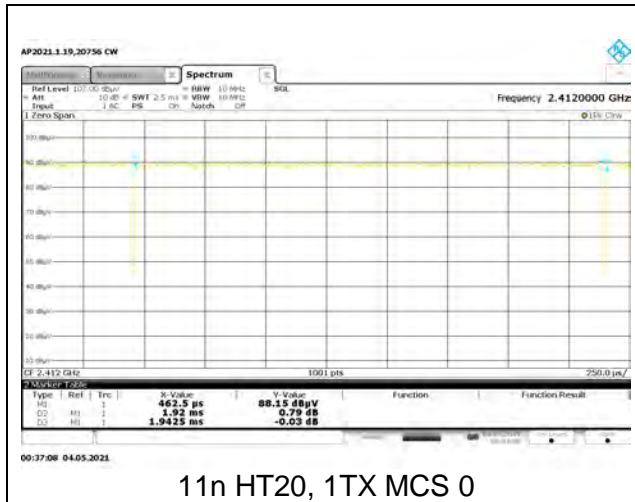
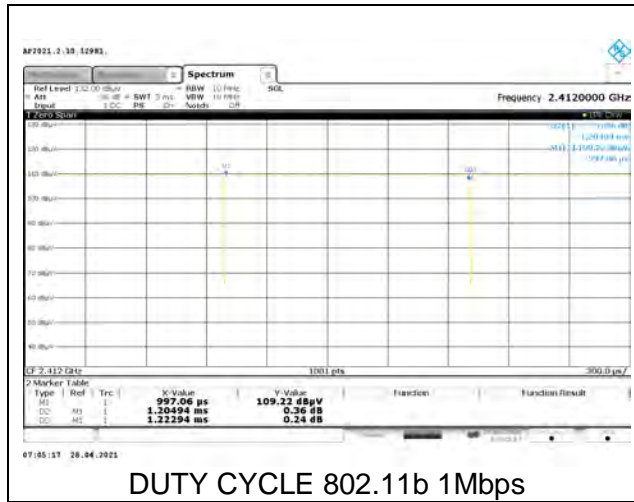
PROCEDURE

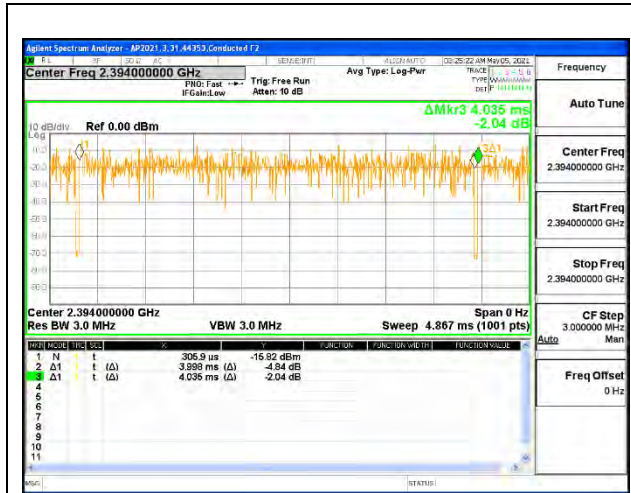
KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

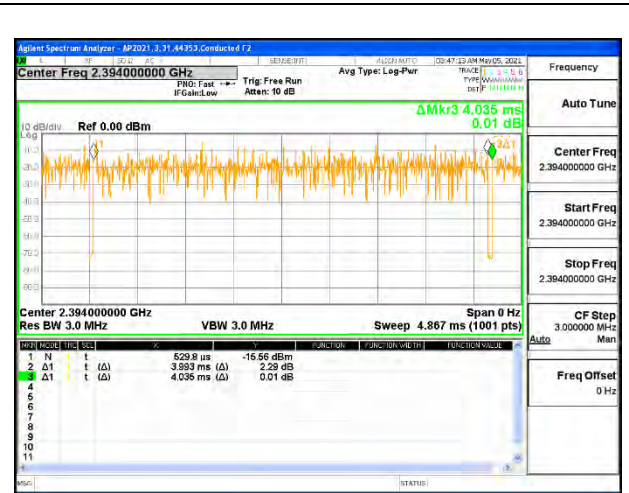
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz						
802.11b 1TX	1.2049	1.2229	0.985	98.53%	0.00	0.010
802.11n HT20 1TX, MCS 0	1.9200	1.9425	0.988	98.84%	0.00	0.010
802.11n HT20 2TX, MCS 0	0.9818	1.0063	0.976	97.57%	0.11	1.019
802.11n HT20 1TX, MCS 7	0.2282	0.2502	0.912	91.21%	0.40	4.382
802.11n HT20 2TX, MCS 7	0.1357	0.1574	0.862	86.21%	0.64	7.369
802.11ax HE20 26T 1TX, MCS0	3.9980	4.0350	0.991	99.08%	0.00	0.010
802.11ax HE20 26T 2TX, MCS0	3.9930	4.0350	0.990	98.96%	0.00	0.010
802.11ax HE20 26T 1TX, MCS9	3.9696	4.0368	0.983	98.34%	0.00	0.010
802.11ax HE20 26T 2TX, MCS9	3.9806	4.0586	0.981	98.08%	0.00	0.010
802.11ax HE20 SU Mode 1TX, MCS0	1.5580	1.5810	0.985	98.55%	0.00	0.010
802.11ax HE20 SU Mode 2TX, MCS0	1.5600	1.5810	0.987	98.67%	0.00	0.010
802.11ax HE20 SU Mode 1TX, MCS9	1.5575	1.5850	0.983	98.26%	0.00	0.010
802.11ax HE20 SU Mode 2TX, MCS9	1.5600	1.5850	0.984	98.42%	0.00	0.010

DUTY CYCLE PLOTS

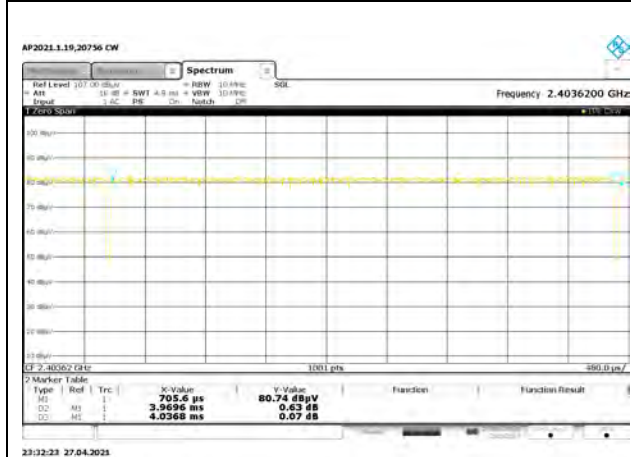




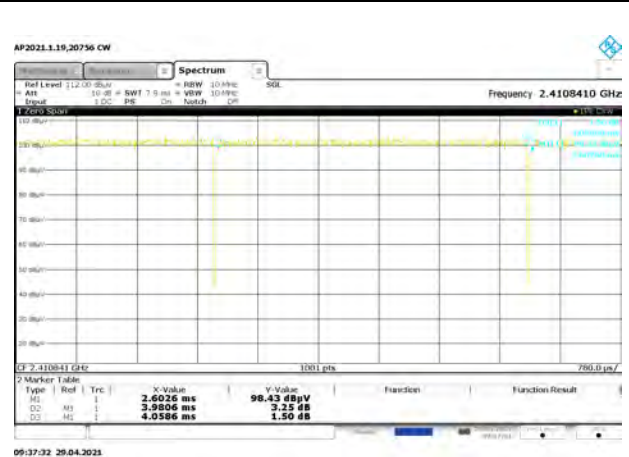
11ax HE20 26T 1TX, MCS0



11ax HE20 26T 2TX, MCS0



11ax HE20 26T 1TX, MCS9



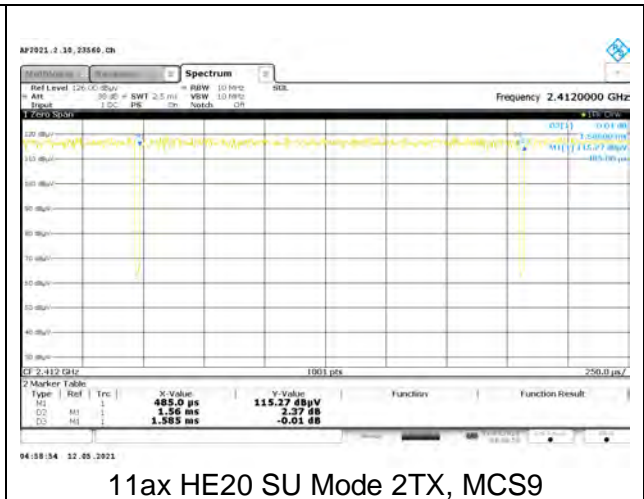
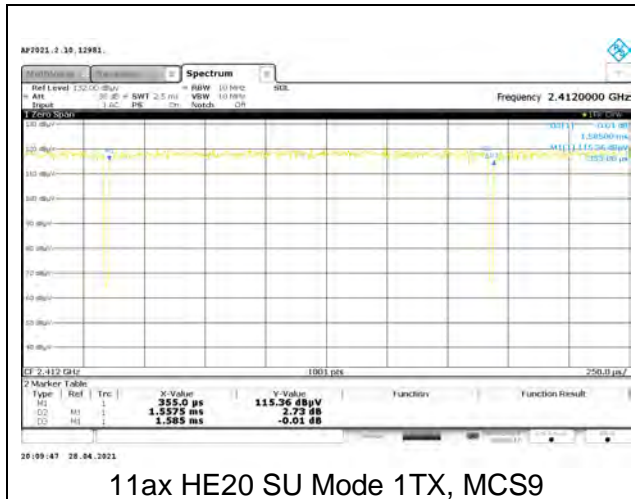
11ax HE20 26T 2TX, MCS9



11ax HE20 SU Mode 1TX, MCS0



11ax HE20 SU Mode 2TX, MCS0



9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

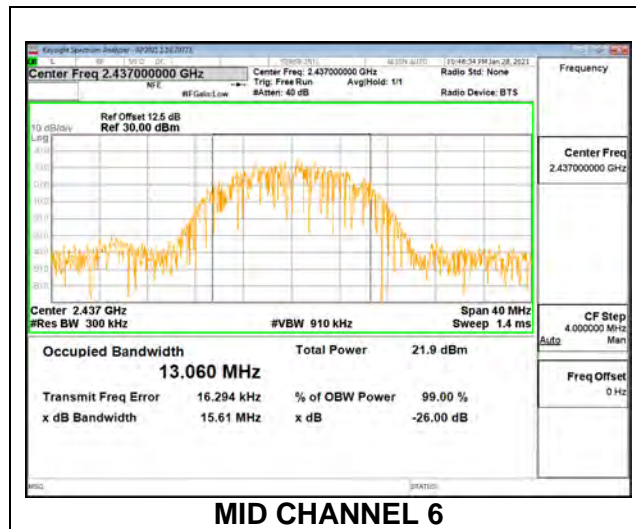
ID:	20773	Date:	1/28/21 to 2/5/21
------------	-------	--------------	-------------------

Only Mid channel plot is reported to show analyzer settings.

9.2.1. 802.11b MODE 1TX

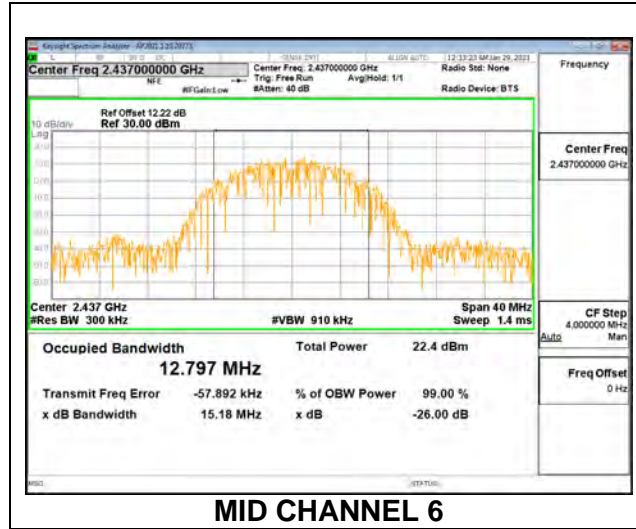
ANT 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.900
Mid 6	2437	13.060
High 11	2462	12.705
High 12	2467	12.804
High 13	2472	12.982



ANT 3

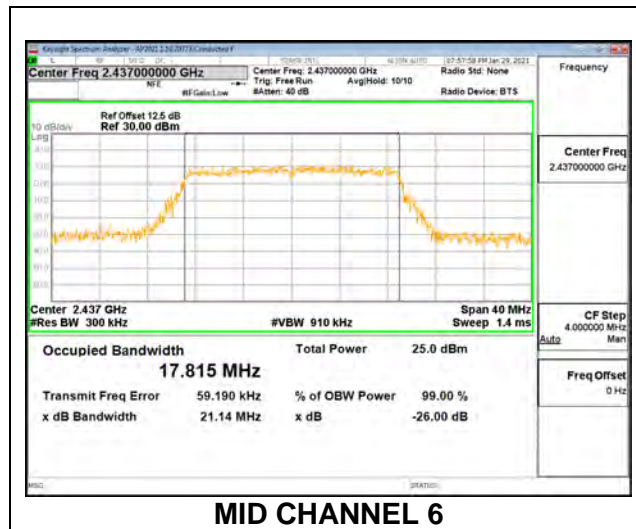
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.775
Mid 6	2437	12.797
High 11	2462	12.775
High 12	2467	13.040
High 13	2472	13.013



9.2.2. 802.11n HT20 MODE 1TX

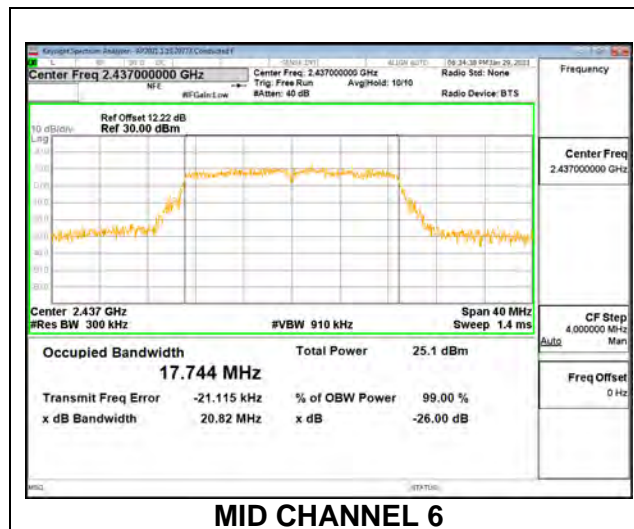
ANT 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.764
Low 2	2417	17.725
Low 3	2422	17.747
Mid 6	2437	17.815
High 9	2452	17.615
High 10	2457	17.707
High 11	2462	17.679
High 12	2467	17.751
High 13	2472	17.623



ANT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.813
Low 2	2417	17.744
Low 3	2422	17.686
Mid 6	2437	17.744
High 9	2452	17.715
High 10	2457	17.724
High 11	2462	17.668
High 12	2467	17.772
High 13	2472	17.601

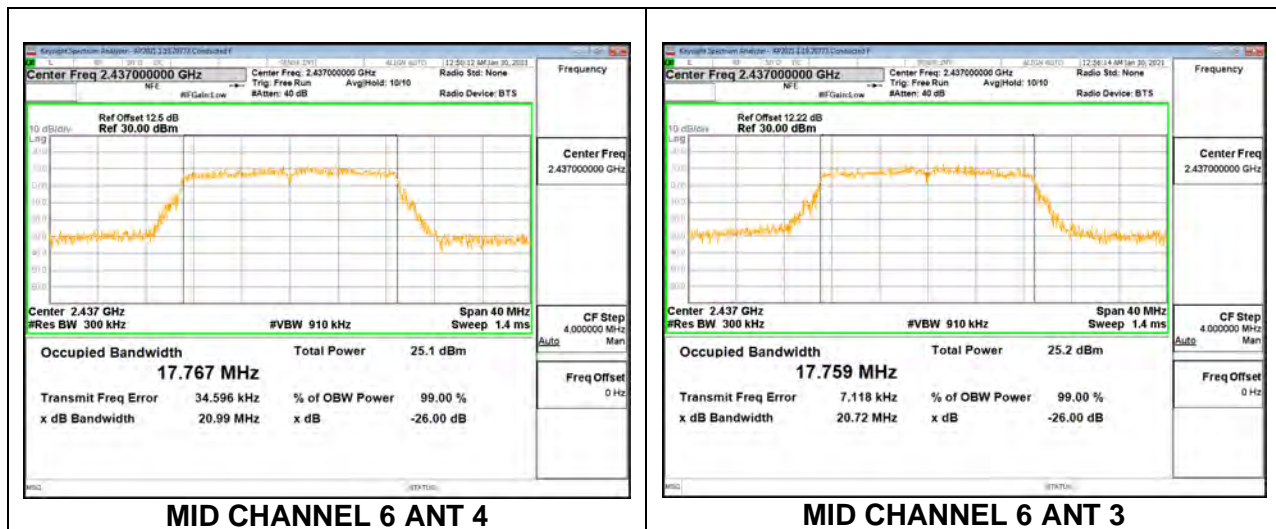


MID CHANNEL 6

9.2.3. 802.11n HT20 CDD MODE 2TX

ANT 4 + ANT 3

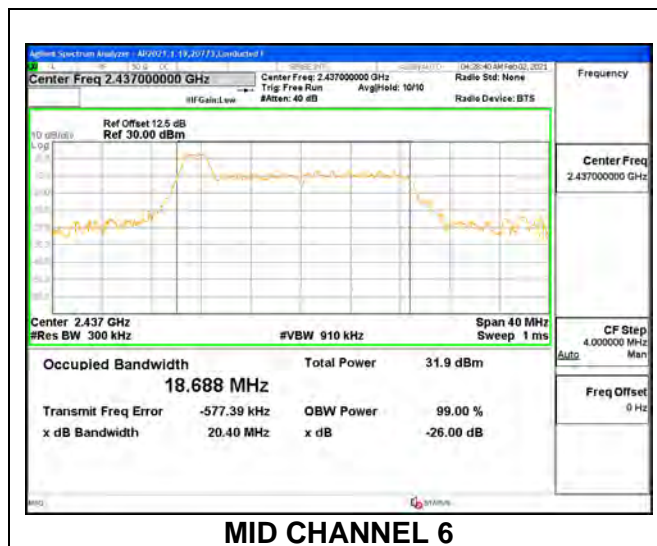
Channel	Frequency (MHz)	99% Bandwidth Antenna 4 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low 1	2412	17.660	17.819
Low 2	2417	17.706	17.742
Low 3	2422	17.813	17.687
Low 4	2427	17.777	17.747
Mid 6	2437	17.767	17.759
High 8	2447	17.603	17.731
High 9	2452	17.683	17.673
High 10	2457	17.662	17.751
High 11	2462	17.649	17.607
High 12	2467	17.790	17.803
High 13	2472	17.628	17.547



9.2.4. 802.11ax HE20 MODE 1TX

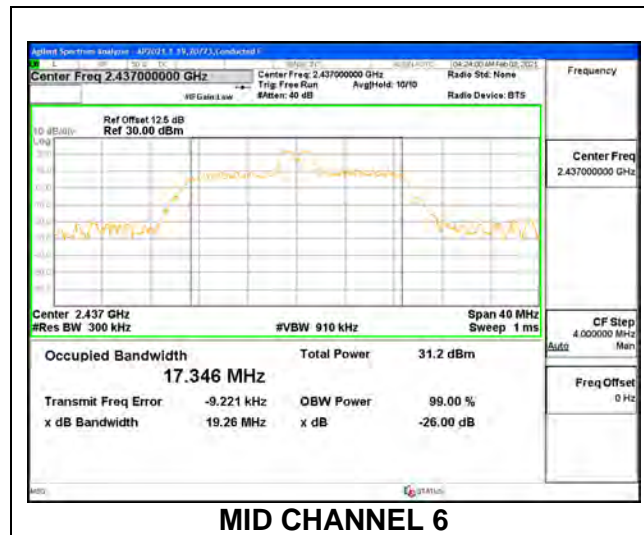
ANT 4: 26-Tone, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.414
Low 2	2417	18.345
Low 3	2422	18.487
Mid 6	2437	18.688
High 9	2452	18.372
High 10	2457	18.130
High 11	2462	18.179
High 12	2467	18.226
High 13	2472	18.382



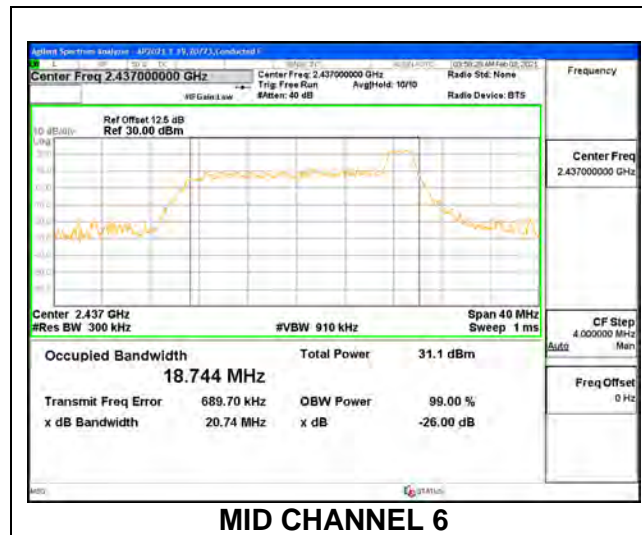
ANT 4: 26-Tone, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.199
Low 2	2417	17.178
Low 3	2422	17.181
Mid 6	2437	17.346
High 9	2452	17.01
High 10	2457	17.101
High 11	2462	17.088
High 12	2467	17.297
High 13	2472	17.125



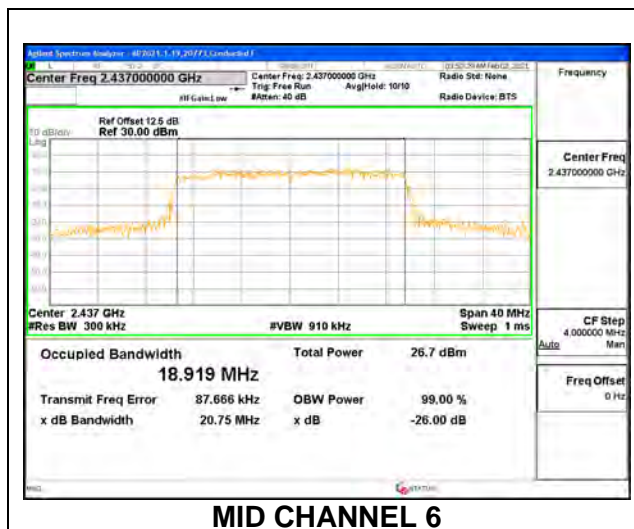
ANT 4: 26-Tone, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.814
Low 2	2417	18.781
Low 3	2422	18.899
Mid 6	2437	18.744
High 9	2452	18.716
High 10	2457	18.810
High 11	2462	18.916
High 12	2467	18.900
High 13	2472	18.862



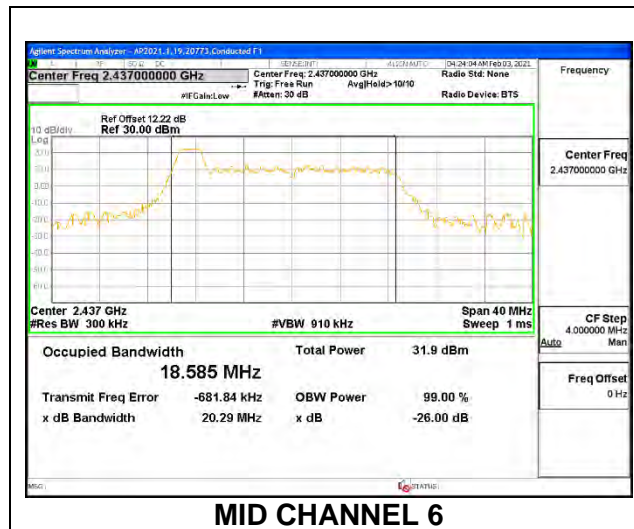
ANT 4: SU Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.956
Low 2	2417	18.875
Low 3	2422	18.917
Mid 6	2437	18.919
High 9	2452	18.793
High 10	2457	18.788
High 11	2462	18.900
High 12	2467	18.892
High 13	2472	18.944



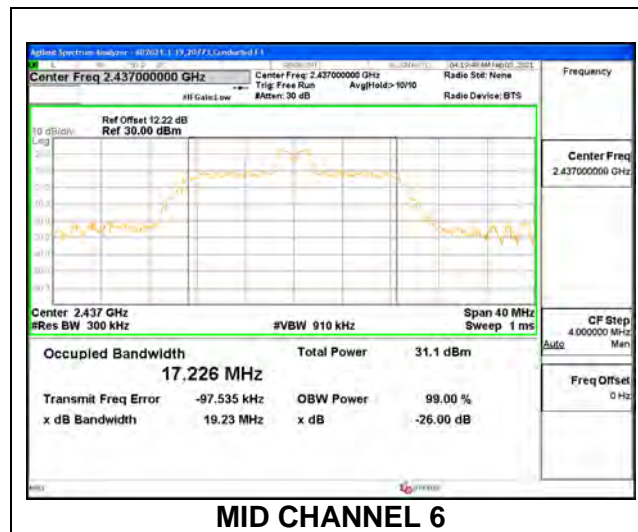
ANT 3: 26-Tone, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.519
Low 2	2417	18.105
Low 3	2422	18.559
Mid 6	2437	18.585
High 9	2452	18.476
High 10	2457	18.325
High 11	2462	18.338
High 12	2467	18.401
High 13	2472	18.345



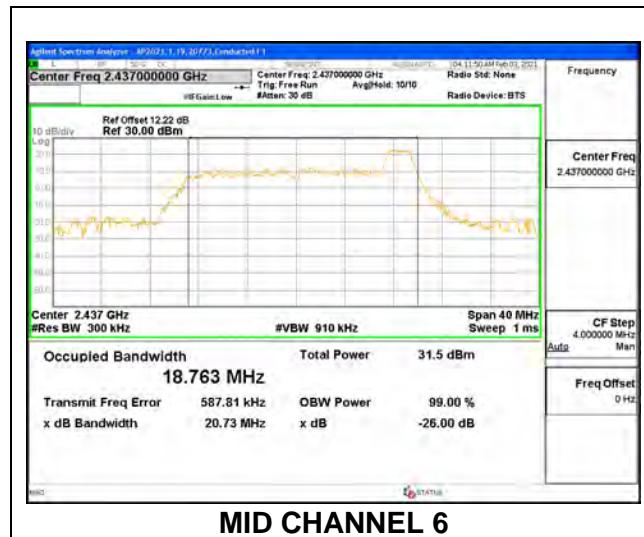
ANT 3: 26-Tone, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.304
Low 2	2417	17.266
Low 3	2422	17.039
Mid 6	2437	17.226
High 9	2452	17.202
High 10	2457	17.175
High 11	2462	17.214
High 12	2467	17.264
High 13	2472	17.104



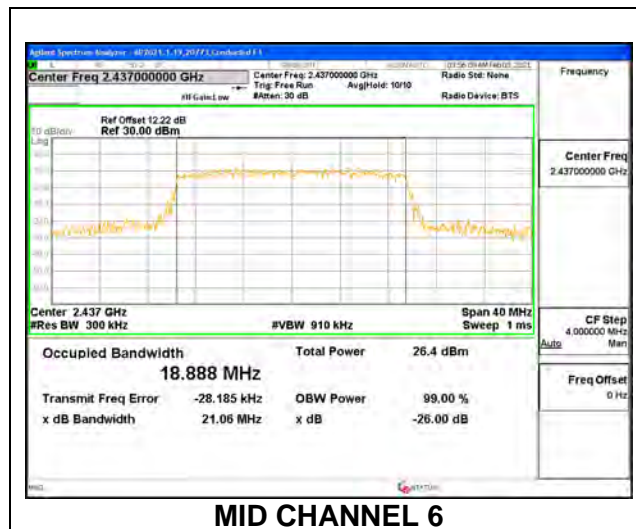
ANT 3: 26-Tone, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.848
Low 2	2417	18.764
Low 3	2422	18.708
Mid 6	2437	18.763
High 9	2452	18.743
High 10	2457	18.708
High 11	2462	18.89
High 12	2467	18.834
High 13	2472	18.774



ANT 3: SU Mode

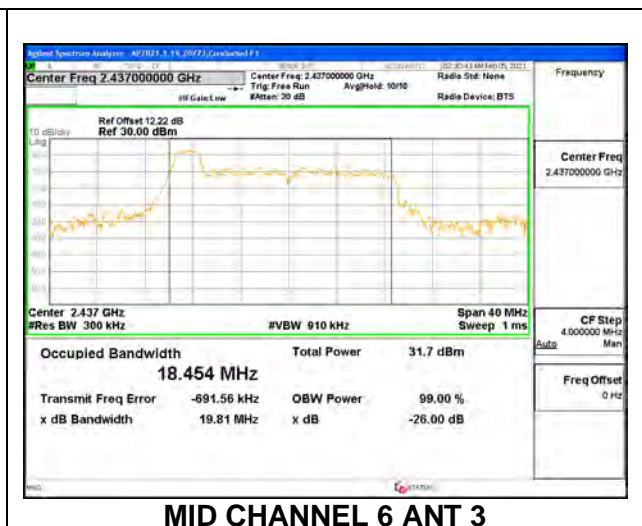
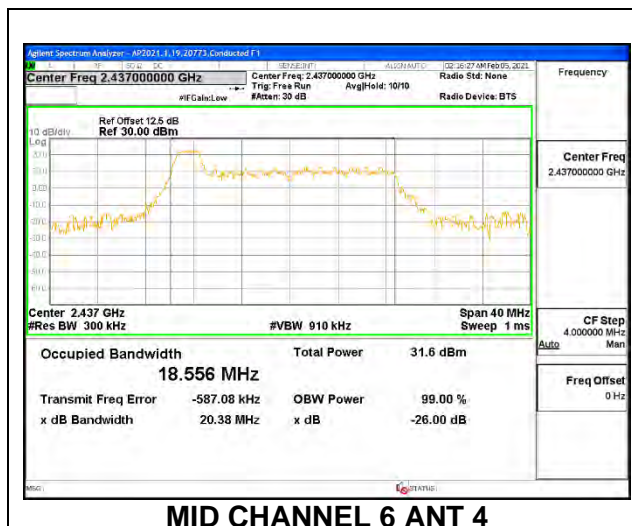
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	19.018
Low 2	2417	18.979
Low 3	2422	18.922
Mid 6	2437	18.888
High 9	2452	18.847
High 10	2457	18.922
High 11	2462	18.826
High 12	2467	18.829
High 13	2472	18.941



9.2.5. 802.11ax HE20 OFDMA MODE 2TX

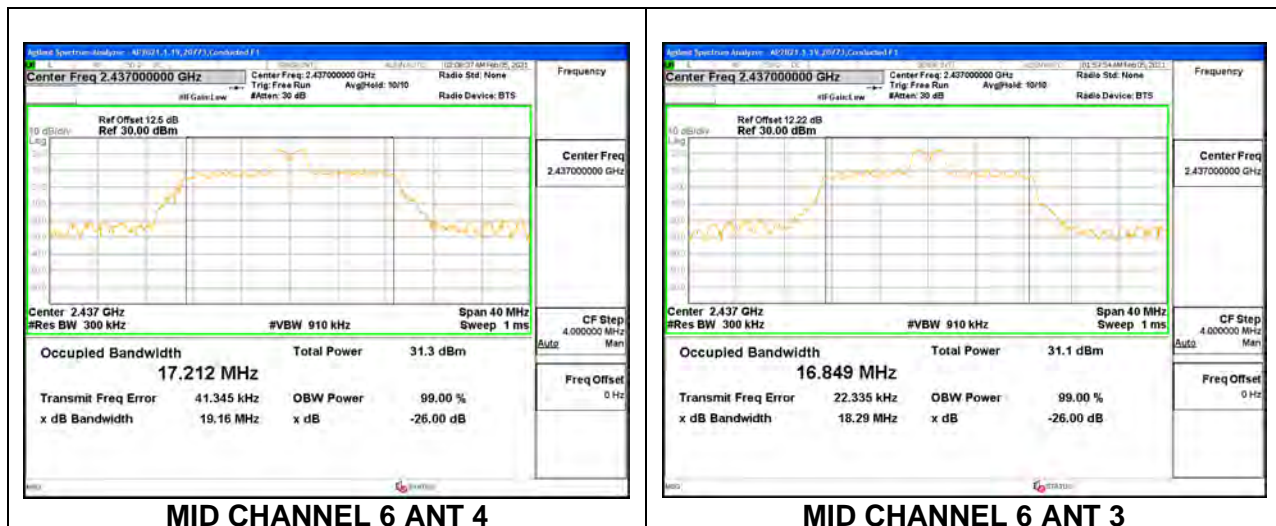
ANT 4 + ANT 3: 26-Tone, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth Antenna 4 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low 1	2412	18.402	18.441
Low 2	2417	18.401	18.427
Low 3	2422	18.342	18.396
Low 4	2427	18.510	18.379
Mid 6	2437	18.556	18.454
High 8	2447	18.442	18.264
High 9	2452	18.353	18.338
High 10	2457	18.166	18.297
High 11	2462	18.201	18.407
High 12	2467	18.247	18.463
High 13	2472	18.308	18.367



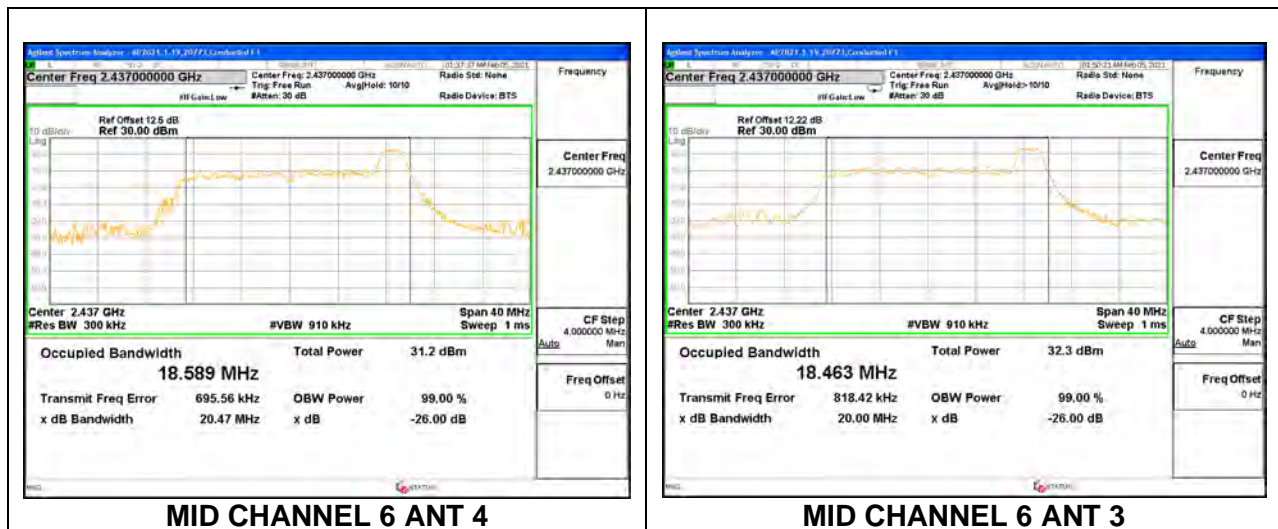
ANT 4 + ANT 3: 26-Tone, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth Antenna 4 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low 1	2412	17.198	16.936
Low 2	2417	17.096	16.763
Low 3	2422	17.193	16.621
Low 4	2427	17.319	16.641
Mid 6	2437	17.212	16.849
High 8	2447	16.898	16.655
High 9	2452	16.908	16.702
High 10	2457	17.214	17.176
High 11	2462	17.220	17.179
High 12	2467	17.316	17.294
High 13	2472	17.247	17.080



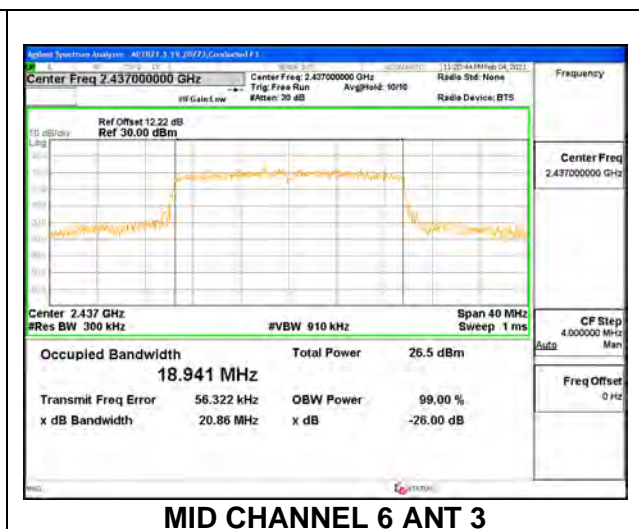
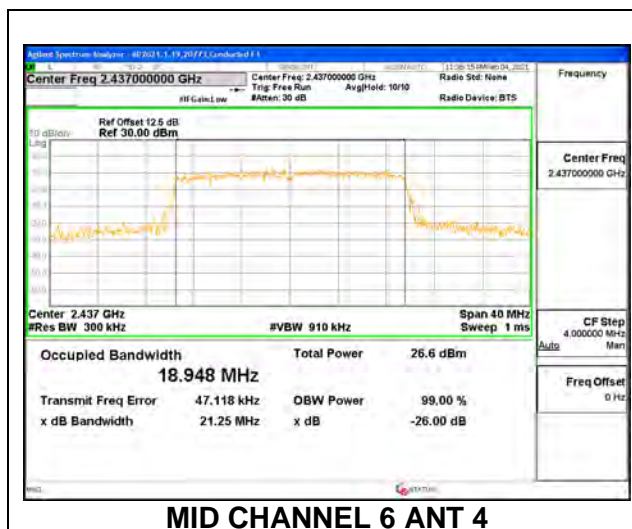
ANT 4 + ANT 3: 26-Tone, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth Antenna 4 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low 1	2412	18.749	18.419
Low 2	2417	18.796	18.295
Low 3	2422	18.922	18.339
Low 4	2427	18.829	18.423
Mid 6	2437	18.589	18.463
High 8	2447	18.696	18.405
High 9	2452	18.703	18.508
High 10	2457	18.797	18.913
High 11	2462	19.086	18.843
High 12	2467	17.878	18.951
High 13	2472	18.872	18.788



ANT 4 + ANT 3 2TX MODE: SU Mode

Channel	Frequency (MHz)	99% Bandwidth Antenna 4 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low 1	2412	18.936	18.959
Low 2	2417	18.881	18.902
Low 3	2422	18.869	18.841
Low 4	2427	18.974	18.799
Mid 6	2437	18.948	18.941
High 8	2447	18.852	18.906
High 9	2452	18.868	18.894
High 10	2457	18.835	18.885
High 11	2462	18.837	18.818
High 12	2467	18.892	18.989
High 13	2472	18.944	18.973



9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

RESULTS

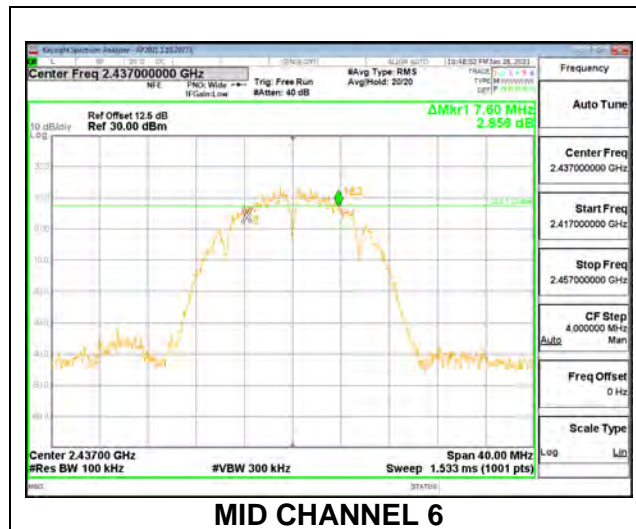
The 6dB bandwidth was measured for the narrowest bandwidth mode, b Mode and ax HE20 Mode 26-Tone as worst case to demonstrate compliance with the minimum required bandwidth of 500 kHz to cover all OFDMA modes.

Only Mid channel plot is reported to show analyzer settings.

9.3.1. 802.11b MODE 1TX

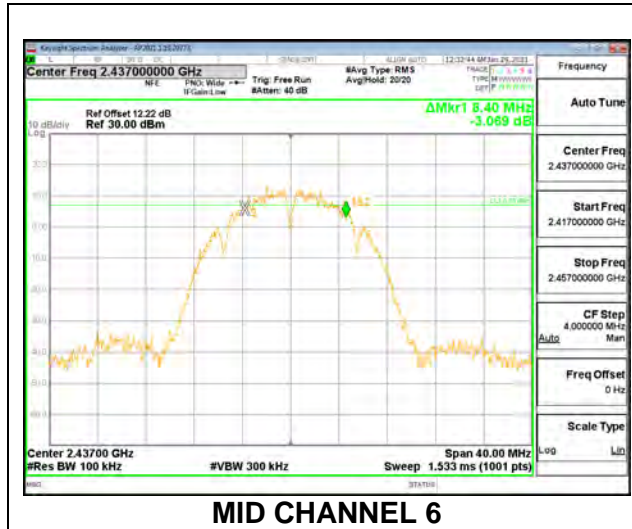
ANT 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.60	0.5
Mid 6	2437	7.60	0.5
High 11	2462	8.40	0.5
High 12	2467	6.36	0.5
High 13	2472	6.72	0.5



ANT 3

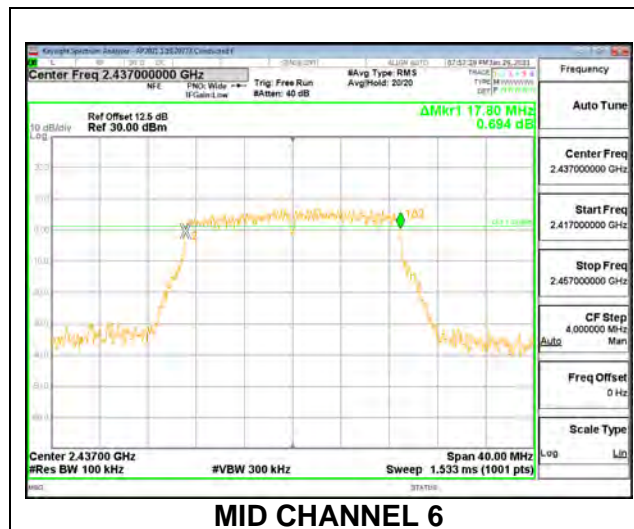
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	7.68	0.5
Mid 6	2437	8.40	0.5
High 11	2462	8.16	0.5
High 12	2467	7.64	0.5
High 13	2472	8.68	0.5



9.3.2. 802.11n HT20 MODE 1TX

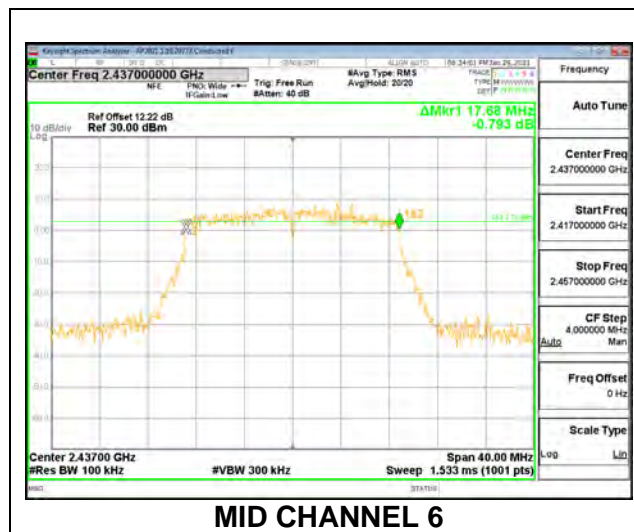
ANT 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.76	0.5
Low 2	2417	17.72	0.5
Low 3	2422	17.64	0.5
Mid 6	2437	17.80	0.5
High 9	2452	17.28	0.5
High 10	2457	17.76	0.5
High 11	2462	17.76	0.5
High 12	2467	17.56	0.5
High 13	2472	17.64	0.5



ANT 3

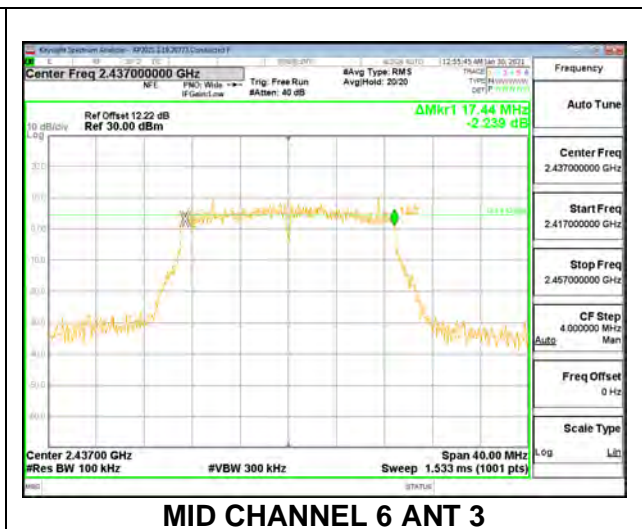
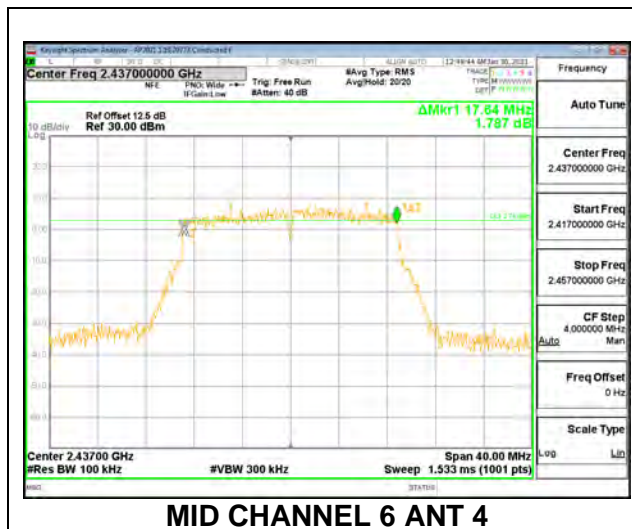
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.76	0.5
Low 2	2417	17.76	0.5
Low 3	2422	17.72	0.5
Mid 6	2437	17.68	0.5
High 9	2452	17.68	0.5
High 10	2457	17.76	0.5
High 11	2462	17.72	0.5
High 12	2467	17.68	0.5
High 13	2472	17.64	0.5



9.3.3. 802.11n HT20 CDD MODE 2TX

ANT 4 + ANT 3

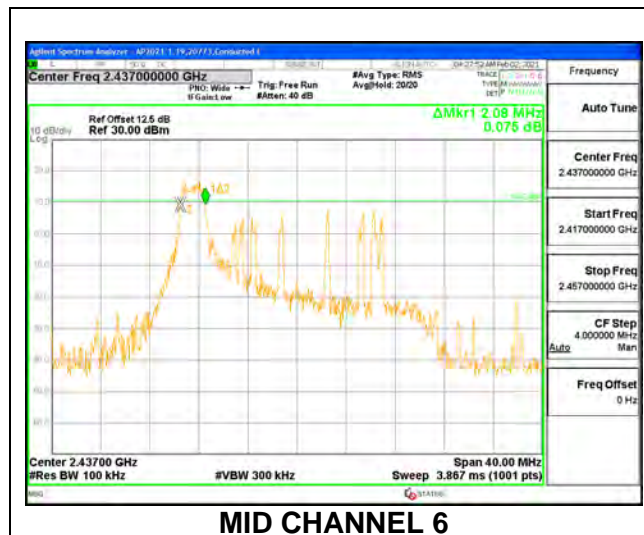
Channel	Frequency (MHz)	6 dB BW Antenna 4 (MHz)	6 dB BW Antenna 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	17.76	17.72	0.5
Low 2	2417	17.68	17.68	0.5
Low 3	2422	17.68	17.68	0.5
Low 4	2427	17.76	17.60	0.5
Mid 6	2437	17.64	17.44	0.5
High 8	2447	17.64	17.64	0.5
High 9	2452	17.72	17.68	0.5
High 10	2457	17.72	17.64	0.5
High 11	2462	17.48	17.60	0.5
High 12	2467	17.68	17.68	0.5
High 13	2472	17.60	17.24	0.5



9.3.4. 802.11ax HE20 MODE 1TX

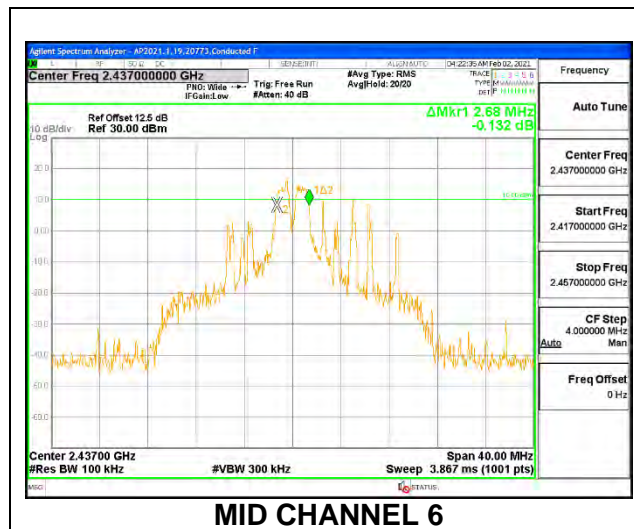
ANT 4: 26-Tone, RU Index 0

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Low 2	2417	2.12	0.5
Low 3	2422	2.12	0.5
Mid 6	2437	2.08	0.5
High 9	2452	2.04	0.5
High 10	2457	2.12	0.5
High 11	2462	2.08	0.5
High 12	2467	2.20	0.5
High 13	2472	2.12	0.5



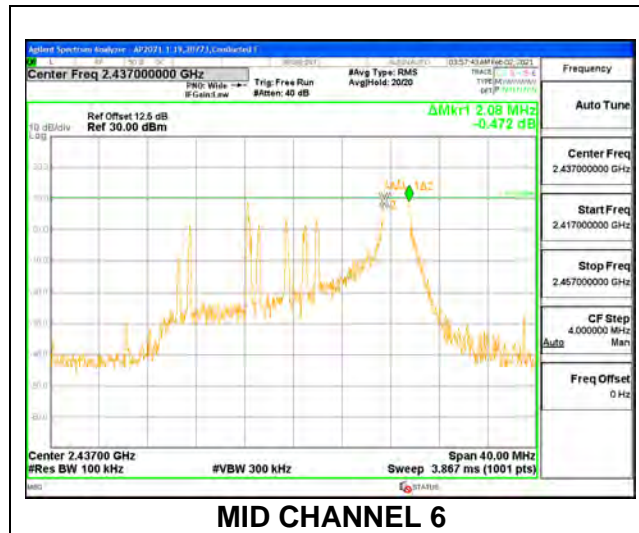
ANT 4: 26-Tone, RU Index 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.72	0.5
Low 2	2417	2.80	0.5
Low 3	2422	2.68	0.5
Mid 6	2437	2.68	0.5
High 9	2452	2.64	0.5
High 10	2457	2.64	0.5
High 11	2462	2.64	0.5
High 12	2467	2.56	0.5
High 13	2472	2.72	0.5



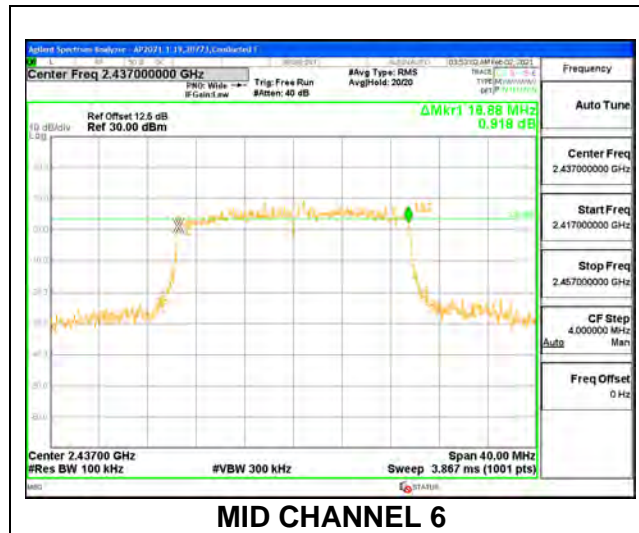
ANT 4: 26-Tone, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Low 2	2417	2.08	0.5
Low 3	2422	2.08	0.5
Mid 6	2437	2.08	0.5
High 9	2452	2.12	0.5
High 10	2457	2.12	0.5
High 11	2462	2.12	0.5
High 12	2467	2.04	0.5
High 13	2472	2.08	0.5



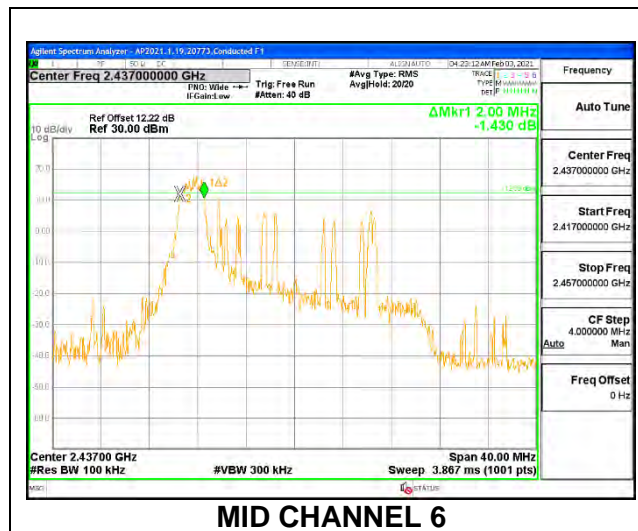
ANT 4: SU Mode

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	18.76	0.5
Low 2	2417	18.72	0.5
Low 3	2422	18.52	0.5
Mid 6	2437	18.88	0.5
High 9	2452	18.52	0.5
High 10	2457	18.76	0.5
High 11	2462	18.92	0.5
High 12	2467	18.80	0.5
High 13	2472	18.72	0.5



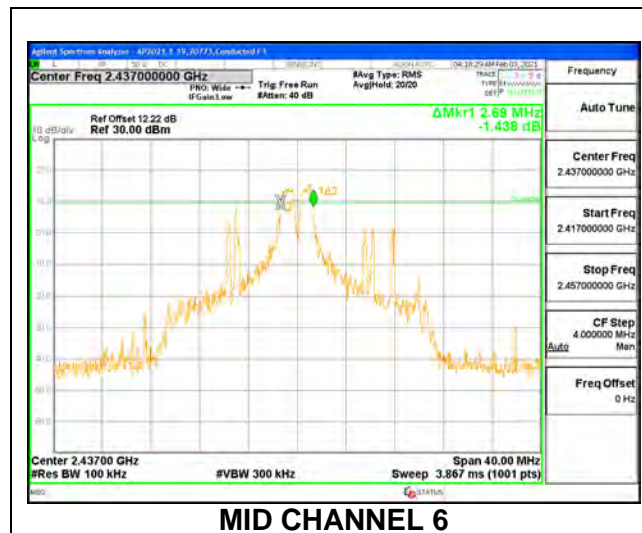
ANT 3: 26-Tone, RU Index 0

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Low 2	2417	2.08	0.5
Low 3	2422	2.08	0.5
Mid 6	2437	2.00	0.5
High 9	2452	2.16	0.5
High 10	2457	2.12	0.5
High 11	2462	2.08	0.5
High 12	2467	2.08	0.5
High 13	2472	2.08	0.5



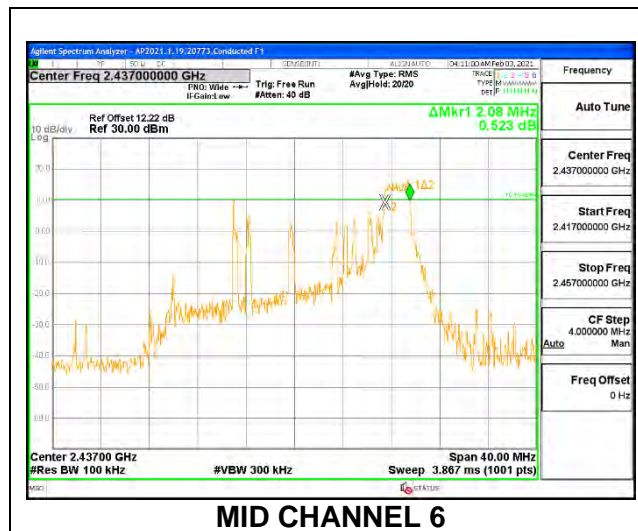
ANT 3: 26-Tone, RU Index 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.72	0.5
Low 2	2417	2.68	0.5
Low 3	2422	2.72	0.5
Mid 6	2437	2.68	0.5
High 9	2452	2.56	0.5
High 10	2457	2.64	0.5
High 11	2462	2.68	0.5
High 12	2467	2.68	0.5
High 13	2472	2.68	0.5



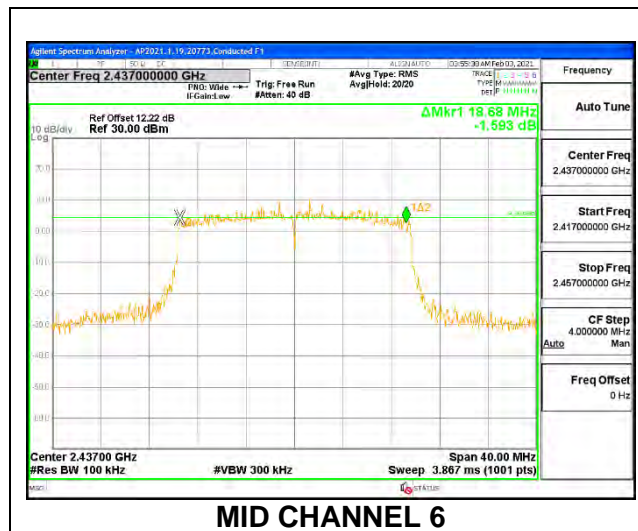
ANT 3: 26-Tone, RU Index 8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.12	0.5
Low 2	2417	2.12	0.5
Low 3	2422	2.12	0.5
Mid 6	2437	2.08	0.5
High 9	2452	2.16	0.5
High 10	2457	2.16	0.5
High 11	2462	2.12	0.5
High 12	2467	2.12	0.5
High 13	2472	2.04	0.5



ANT 3: SU Mode

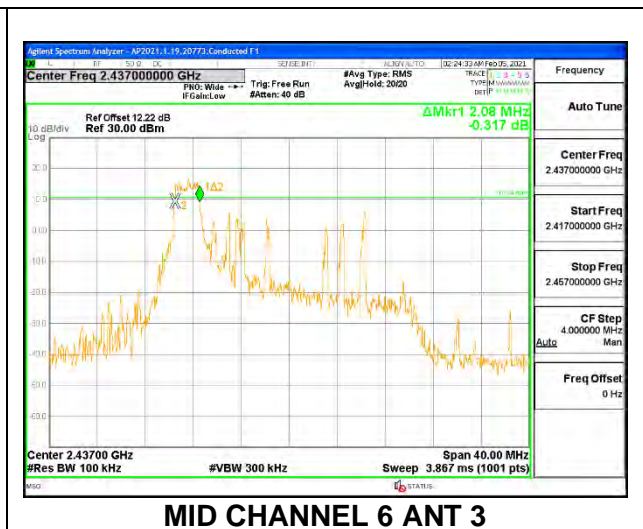
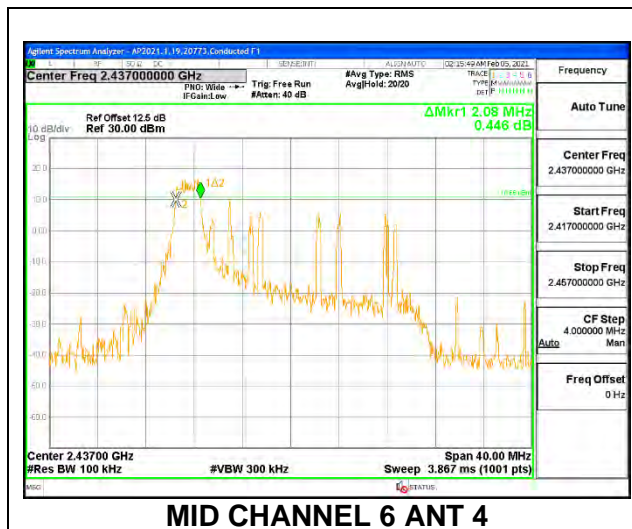
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	18.88	0.5
Low 2	2417	18.84	0.5
Low 3	2422	18.88	0.5
Mid 6	2437	18.68	0.5
High 9	2452	18.76	0.5
High 10	2457	18.56	0.5
High 11	2462	18.88	0.5
High 12	2467	18.76	0.5
High 13	2472	18.88	0.5



9.3.5. 802.11ax HE20 OFDMA MODE 2TX

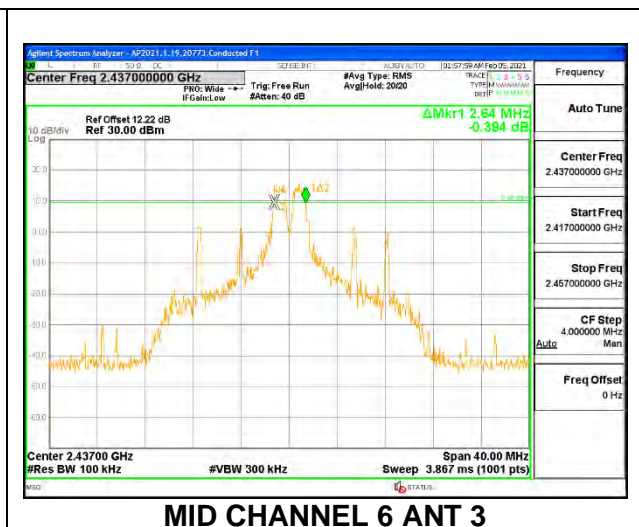
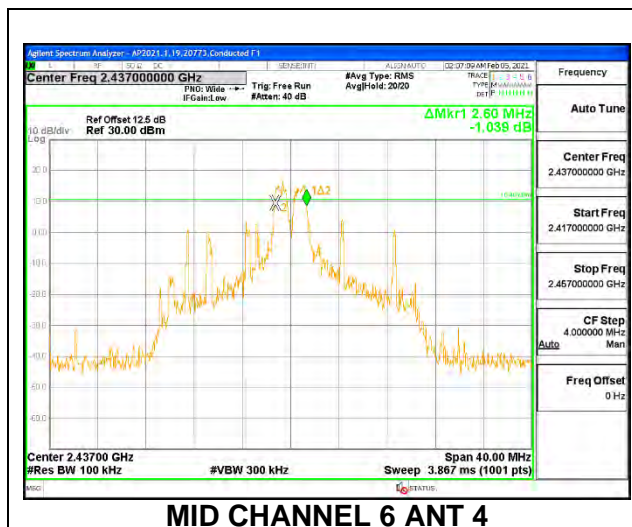
ANT 4 + ANT 3: 26-Tone, RU Index 0

Channel	Frequency (MHz)	6 dB BW Antenna 4 (MHz)	6 dB BW Antenna 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	2.08	2.08	0.5
Low 2	2417	2.00	2.12	0.5
Low 3	2422	2.04	2.12	0.5
Low 4	2427	2.12	2.16	0.5
Mid 6	2437	2.08	2.08	0.5
High 8	2447	2.16	2.12	0.5
High 9	2452	2.08	2.16	0.5
High 10	2457	2.08	2.16	0.5
High 11	2462	2.12	2.12	0.5
High 12	2467	2.12	2.12	0.5
High 13	2472	2.04	2.12	0.5



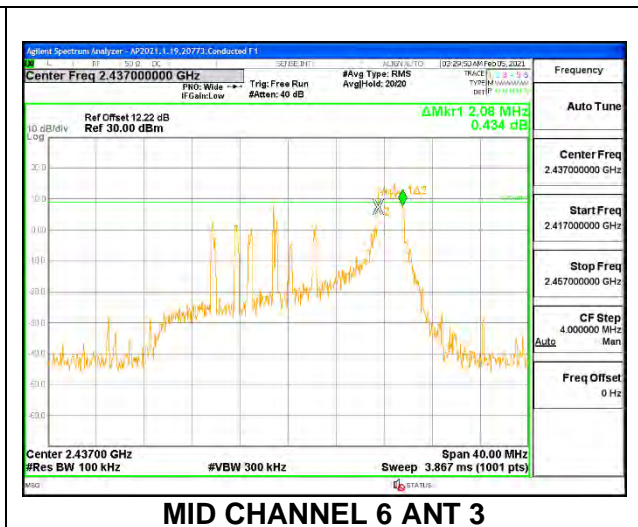
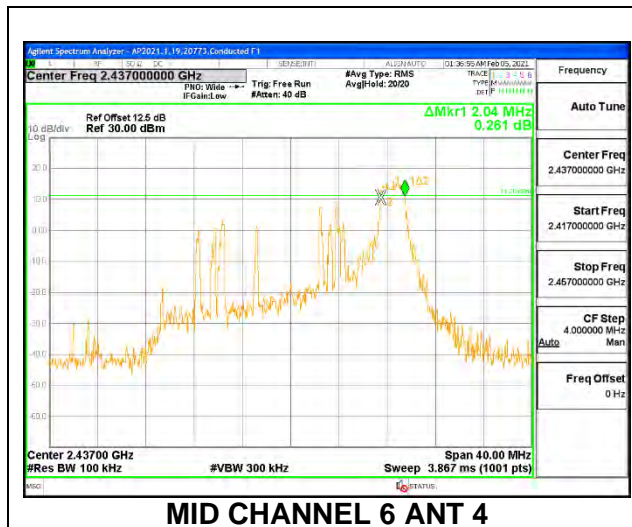
ANT 4 + ANT 3: 26-Tone, RU Index 4

Channel	Frequency (MHz)	6 dB BW Antenna 4 (MHz)	6 dB BW Antenna 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	2.8	2.64	0.5
Low 2	2417	2.64	2.64	0.5
Low 3	2422	2.68	2.72	0.5
Low 4	2427	2.68	2.64	0.5
Mid 6	2437	2.60	2.64	0.5
High 8	2447	2.64	2.64	0.5
High 9	2452	2.68	2.64	0.5
High 10	2457	2.64	2.64	0.5
High 11	2462	2.64	2.68	0.5
High 12	2467	2.68	2.60	0.5
High 13	2472	2.68	2.68	0.5



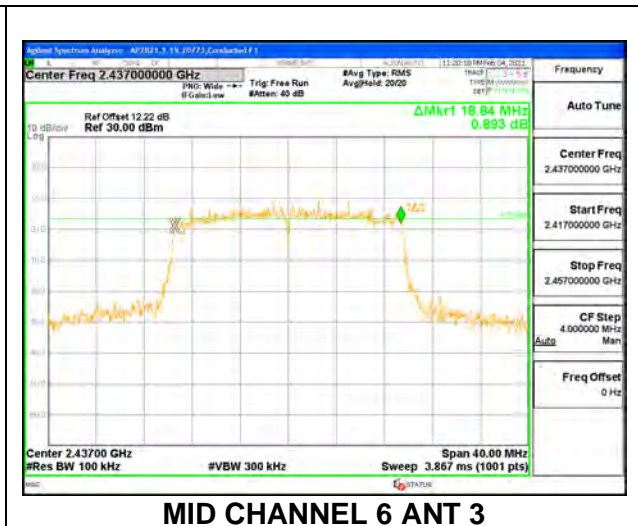
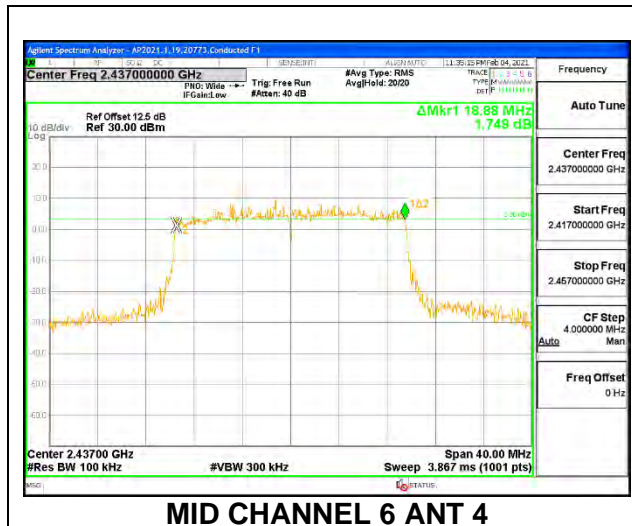
ANT 4 + ANT 3: 26-Tone, RU Index 8

Channel	Frequency (MHz)	6 dB BW Antenna 4 (MHz)	6 dB BW Antenna 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	2.16	2.12	0.5
Low 2	2417	2.12	2.12	0.5
Low 3	2422	2.08	2.04	0.5
Low 4	2427	2.12	2.28	0.5
Mid 6	2437	2.04	2.08	0.5
High 8	2447	2.16	2.08	0.5
High 9	2452	2.20	2.24	0.5
High 10	2457	2.12	2.12	0.5
High 11	2462	2.12	2.12	0.5
High 12	2467	2.08	2.08	0.5
High 13	2472	2.12	2.16	0.5



ANT 4 + ANT 3: SU Mode

Channel	Frequency (MHz)	6 dB BW Antenna 4 (MHz)	6 dB BW Antenna 3 (MHz)	Minimum Limit (MHz)
Low 1	2412	18.92	18.88	0.5
Low 2	2417	18.60	18.80	0.5
Low 3	2422	18.80	18.76	0.5
Low 4	2427	19.04	18.08	0.5
Mid 6	2437	18.88	18.84	0.5
High 8	2447	18.60	18.56	0.5
High 9	2452	18.84	18.92	0.5
High 10	2457	18.84	18.92	0.5
High 11	2462	18.80	18.84	0.5
High 12	2467	18.72	18.88	0.5
High 13	2472	18.88	18.84	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

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

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)	Antenna 4 Gain (dBi)	Antenna 3 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	-2.90	0.30	-1.01	1.86

RESULTS

9.4.1. 802.11b MODE 1TX

ANT 4

Test Engineer:	23560
Test Date:	6/7/21 – 7/21/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	20.21	20.21	30.00	-9.79
Mid 6	2437	21.19	21.19	30.00	-8.81
High 11	2462	21.18	21.18	30.00	-8.82
High 12	2467	20.22	20.22	30.00	-9.78
High 13	2472	17.64	17.64	30.00	-12.36

ANT 3

Test Engineer:	23560
Test Date:	6/7/21 & 7/21/21

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	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	20.24	20.24	30.00	-9.76
Mid 6	2437	21.20	21.20	30.00	-8.80
High 11	2462	21.21	21.21	30.00	-8.79
High 12	2467	20.22	20.22	30.00	-9.78
High 13	2472	17.67	17.67	30.00	-12.33

9.4.2. 802.11n HT20 MODE 1TX

ANT 4

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Low 2	2417	-2.90	30.00	30	36	30.00
Low 3	2422	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 9	2452	-2.90	30.00	30	36	30.00
High 10	2457	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.78	17.78	30.00	-12.22
Low 2	2417	19.24	19.24	30.00	-10.76
Low 3	2422	21.21	21.21	30.00	-8.79
Mid 6	2437	21.19	21.19	30.00	-8.81
High 9	2452	20.67	20.67	30.00	-9.33
High 10	2457	19.24	19.24	30.00	-10.76
High 11	2462	18.22	18.22	30.00	-11.78
High 12	2467	15.53	15.53	30.00	-14.47
High 13	2472	12.70	12.70	30.00	-17.30

ANT 3

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	0.30	30.00	30	36	30.00
Low 2	2417	0.30	30.00	30	36	30.00
Low 3	2422	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 9	2452	0.30	30.00	30	36	30.00
High 10	2457	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.70	17.70	30.00	-12.30
Low 2	2417	19.23	19.23	30.00	-10.77
Low 3	2422	21.24	21.24	30.00	-8.76
Mid 6	2437	21.18	21.18	30.00	-8.82
High 9	2452	20.69	20.69	30.00	-9.31
High 10	2457	19.25	19.25	30.00	-10.75
High 11	2462	18.20	18.20	30.00	-11.80
High 12	2467	15.71	15.71	30.00	-14.29
High 13	2472	12.69	12.69	30.00	-17.31

9.4.3. 802.11n HT20 CDD MODE 2TX

ANT 4+ ANT 3

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.01	30.00	36	30.00
Low 2	2417	-1.01	30.00	36	30.00
Low 3	2422	-1.01	30.00	36	30.00
Low 4	2427	-1.01	30.00	36	30.00
Mid 6	2437	-1.01	30.00	36	30.00
High 8	2447	-1.01	30.00	36	30.00
High 9	2452	-1.01	30.00	36	30.00
High 10	2457	-1.01	30.00	36	30.00
High 11	2462	-1.01	30.00	36	30.00
High 12	2467	-1.01	30.00	36	30.00
High 13	2472	-1.01	30.00	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.23	17.20	20.23	30.00	-9.77
Low 2	2417	18.19	18.20	21.21	30.00	-8.79
Low 3	2422	19.72	19.68	22.71	30.00	-7.29
Low 4	2427	21.21	21.20	24.22	30.00	-5.78
Mid 6	2437	21.19	21.23	24.22	30.00	-5.78
High 8	2447	21.24	21.25	24.26	30.00	-5.74
High 9	2452	19.19	19.18	22.20	30.00	-7.80
High 10	2457	18.20	18.23	21.23	30.00	-8.77
High 11	2462	17.18	17.21	20.21	30.00	-9.79
High 12	2467	14.72	14.74	17.74	30.00	-12.26
High 13	2472	11.79	11.80	14.81	30.00	-15.19

9.4.4. 802.11ax HE20 MODE 1TX

ANT 4: 26-Tone, RU Index 0

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Low 2	2417	-2.90	30.00	30	36	30.00
Low 3	2422	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 9	2452	-2.90	30.00	30	36	30.00
High 10	2457	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.71	11.71	30.00	-18.29
Low 2	2417	11.73	11.73	30.00	-18.27
Low 3	2422	11.70	11.70	30.00	-18.30
Mid 6	2437	11.74	11.74	30.00	-18.26
High 9	2452	11.68	11.68	30.00	-18.32
High 10	2457	11.65	11.65	30.00	-18.35
High 11	2462	11.70	11.70	30.00	-18.30
High 12	2467	11.69	11.69	30.00	-18.31
High 13	2472	-0.27	-0.27	30.00	-30.27

ANT 4: 26-Tone, RU Index 4

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Low 2	2417	-2.90	30.00	30	36	30.00
Low 3	2422	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 9	2452	-2.90	30.00	30	36	30.00
High 10	2457	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.68	11.68	30.00	-18.32
Low 2	2417	11.70	11.70	30.00	-18.30
Low 3	2422	11.75	11.75	30.00	-18.25
Mid 6	2437	11.73	11.73	30.00	-18.27
High 9	2452	11.72	11.72	30.00	-18.28
High 10	2457	11.66	11.66	30.00	-18.34
High 11	2462	11.68	11.68	30.00	-18.32
High 12	2467	11.69	11.69	30.00	-18.31
High 13	2472	-0.30	-0.30	30.00	-30.30

ANT 4: 26-Tone, RU Index 8

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Low 2	2417	-2.90	30.00	30	36	30.00
Low 3	2422	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 9	2452	-2.90	30.00	30	36	30.00
High 10	2457	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.70	11.70	30.00	-18.30
Low 2	2417	11.73	11.73	30.00	-18.27
Low 3	2422	11.68	11.68	30.00	-18.32
Mid 6	2437	11.74	11.74	30.00	-18.26
High 9	2452	11.66	11.66	30.00	-18.34
High 10	2457	11.64	11.64	30.00	-18.36
High 11	2462	11.73	11.73	30.00	-18.27
High 12	2467	11.71	11.71	30.00	-18.29
High 13	2472	-0.26	-0.26	30.00	-30.26

ANT 4: SU Mode

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-2.90	30.00	30	36	30.00
Low 2	2417	-2.90	30.00	30	36	30.00
Low 3	2422	-2.90	30.00	30	36	30.00
Mid 6	2437	-2.90	30.00	30	36	30.00
High 9	2452	-2.90	30.00	30	36	30.00
High 10	2457	-2.90	30.00	30	36	30.00
High 11	2462	-2.90	30.00	30	36	30.00
High 12	2467	-2.90	30.00	30	36	30.00
High 13	2472	-2.90	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.75	16.75	30.00	-13.25
Low 2	2417	17.70	17.70	30.00	-12.30
Low 3	2422	21.21	21.21	30.00	-8.79
Mid 6	2437	21.23	21.23	30.00	-8.77
High 9	2452	21.19	21.19	30.00	-8.81
High 10	2457	17.70	17.70	30.00	-12.30
High 11	2462	16.63	16.63	30.00	-13.37
High 12	2467	14.69	14.69	30.00	-15.31
High 13	2472	8.68	8.68	30.00	-21.32

ANT 3: 26-Tone, RU Index 0

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	0.30	30.00	30	36	30.00
Low 2	2417	0.30	30.00	30	36	30.00
Low 3	2422	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 9	2452	0.30	30.00	30	36	30.00
High 10	2457	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.66	30.00	-18.34
Low 2	2417	11.69	11.69	30.00	-18.31
Low 3	2422	11.73	11.73	30.00	-18.27
Mid 6	2437	11.72	11.72	30.00	-18.28
High 9	2452	11.70	11.70	30.00	-18.30
High 10	2457	11.68	11.68	30.00	-18.32
High 11	2462	11.68	11.68	30.00	-18.32
High 12	2467	11.75	11.75	30.00	-18.25
High 13	2472	-0.29	-0.29	30.00	-30.29

ANT 3: 26-Tone, RU Index 4

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	0.30	30.00	30	36	30.00
Low 2	2417	0.30	30.00	30	36	30.00
Low 3	2422	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 9	2452	0.30	30.00	30	36	30.00
High 10	2457	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.70	11.70	30.00	-18.30
Low 2	2417	11.69	11.69	30.00	-18.31
Low 3	2422	11.64	11.64	30.00	-18.36
Mid 6	2437	11.73	11.73	30.00	-18.27
High 9	2452	11.70	11.70	30.00	-18.30
High 10	2457	11.68	11.68	30.00	-18.32
High 11	2462	11.66	11.66	30.00	-18.34
High 12	2467	11.72	11.72	30.00	-18.28
High 13	2472	-0.26	-0.26	30.00	-30.26

ANT 3: 26-Tone, RU Index 8

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	0.30	30.00	30	36	30.00
Low 2	2417	0.30	30.00	30	36	30.00
Low 3	2422	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 9	2452	0.30	30.00	30	36	30.00
High 10	2457	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.73	11.73	30.00	-18.27
Low 2	2417	11.70	11.70	30.00	-18.30
Low 3	2422	11.68	11.68	30.00	-18.32
Mid 6	2437	11.74	11.74	30.00	-18.26
High 9	2452	11.66	11.66	30.00	-18.34
High 10	2457	11.65	11.65	30.00	-18.35
High 11	2462	11.69	11.69	30.00	-18.31
High 12	2467	11.71	11.71	30.00	-18.29
High 13	2472	-0.28	-0.28	30.00	-30.28

ANT 3: SU Mode

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	0.30	30.00	30	36	30.00
Low 2	2417	0.30	30.00	30	36	30.00
Low 3	2422	0.30	30.00	30	36	30.00
Mid 6	2437	0.30	30.00	30	36	30.00
High 9	2452	0.30	30.00	30	36	30.00
High 10	2457	0.30	30.00	30	36	30.00
High 11	2462	0.30	30.00	30	36	30.00
High 12	2467	0.30	30.00	30	36	30.00
High 13	2472	0.30	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.72	16.72	30.00	-13.28
Low 2	2417	17.71	17.71	30.00	-12.29
Low 3	2422	21.23	21.23	30.00	-8.77
Mid 6	2437	21.20	21.20	30.00	-8.80
High 9	2452	21.25	21.25	30.00	-8.75
High 10	2457	17.71	17.71	30.00	-12.29
High 11	2462	16.71	16.71	30.00	-13.29
High 12	2467	14.69	14.69	30.00	-15.31
High 13	2472	8.73	8.73	30.00	-21.27

9.4.5. 802.11ax HE20 OFDMA MODE 2TX

ANT 4 + ANT 3: 26-Tone, RU Index 0

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.01	30.00	36	30.00
Low 2	2417	-1.01	30.00	36	30.00
Low 3	2422	-1.01	30.00	36	30.00
Low 4	2427	-1.01	30.00	36	30.00
Mid 6	2437	-1.01	30.00	36	30.00
High 8	2447	-1.01	30.00	36	30.00
High 9	2452	-1.01	30.00	36	30.00
High 10	2457	-1.01	30.00	36	30.00
High 11	2462	-1.01	30.00	36	30.00
High 12	2467	-1.01	30.00	36	30.00
High 13	2472	-1.01	30.00	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.69	11.71	14.71	30.00	-15.29
Low 2	2417	11.73	11.74	14.75	30.00	-15.25
Low 3	2422	11.67	11.66	14.68	30.00	-15.32
Low 4	2427	11.73	11.69	14.72	30.00	-15.28
Mid 6	2437	11.74	11.75	14.76	30.00	-15.24
High 8	2447	11.68	11.70	14.70	30.00	-15.30
High 9	2452	11.70	11.68	14.70	30.00	-15.30
High 10	2457	11.66	11.67	14.68	30.00	-15.32
High 11	2462	11.73	11.71	14.73	30.00	-15.27
High 12	2467	11.73	11.68	14.72	30.00	-15.28
High 13	2472	-0.27	-0.29	2.73	30.00	-27.27

ANT 4 + ANT 3: 26-Tone, RU Index 4

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.01	30.00	36	30.00
Low 2	2417	-1.01	30.00	36	30.00
Low 3	2422	-1.01	30.00	36	30.00
Low 4	2427	-1.01	30.00	36	30.00
Mid 6	2437	-1.01	30.00	36	30.00
High 8	2447	-1.01	30.00	36	30.00
High 9	2452	-1.01	30.00	36	30.00
High 10	2457	-1.01	30.00	36	30.00
High 11	2462	-1.01	30.00	36	30.00
High 12	2467	-1.01	30.00	36	30.00
High 13	2472	-1.01	30.00	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.68	14.68	30.00	-15.32
Low 2	2417	11.67	11.70	14.70	30.00	-15.30
Low 3	2422	11.71	11.70	14.72	30.00	-15.28
Low 4	2427	11.70	11.73	14.73	30.00	-15.27
Mid 6	2437	11.73	11.69	14.72	30.00	-15.28
High 8	2447	11.69	11.72	14.72	30.00	-15.28
High 9	2452	11.73	11.71	14.73	30.00	-15.27
High 10	2457	11.65	11.68	14.68	30.00	-15.32
High 11	2462	11.69	11.69	14.70	30.00	-15.30
High 12	2467	11.72	11.71	14.73	30.00	-15.27
High 13	2472	-0.31	-0.28	2.72	30.00	-27.28

ANT 4 + ANT 3: 26-Tone, RU Index 8

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.01	30.00	36	30.00
Low 2	2417	-1.01	30.00	36	30.00
Low 3	2422	-1.01	30.00	36	30.00
Low 4	2427	-1.01	30.00	36	30.00
Mid 6	2437	-1.01	30.00	36	30.00
High 8	2447	-1.01	30.00	36	30.00
High 9	2452	-1.01	30.00	36	30.00
High 10	2457	-1.01	30.00	36	30.00
High 11	2462	-1.01	30.00	36	30.00
High 12	2467	-1.01	30.00	36	30.00
High 13	2472	-1.01	30.00	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.74	11.73	14.75	30.00	-15.25
Low 2	2417	11.73	11.69	14.72	30.00	-15.28
Low 3	2422	11.69	11.70	14.71	30.00	-15.29
Low 4	2427	11.68	11.71	14.71	30.00	-15.29
Mid 6	2437	11.73	11.72	14.74	30.00	-15.26
High 8	2447	11.66	11.69	14.69	30.00	-15.31
High 9	2452	11.73	11.70	14.73	30.00	-15.27
High 10	2457	11.71	11.72	14.73	30.00	-15.27
High 11	2462	11.72	11.73	14.74	30.00	-15.26
High 12	2467	11.67	11.69	14.69	30.00	-15.31
High 13	2472	-0.25	-0.27	2.75	30.00	-27.25

ANT 4 + ANT 3: SU Mode

Test Engineer:	23560
Test Date:	6/7/21

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	-1.01	30.00	36	30.00
Low 2	2417	-1.01	30.00	36	30.00
Low 3	2422	-1.01	30.00	36	30.00
Low 4	2427	-1.01	30.00	36	30.00
Mid 6	2437	-1.01	30.00	36	30.00
High 8	2447	-1.01	30.00	36	30.00
High 9	2452	-1.01	30.00	36	30.00
High 10	2457	-1.01	30.00	36	30.00
High 11	2462	-1.01	30.00	36	30.00
High 12	2467	-1.01	30.00	36	30.00
High 13	2472	-1.01	30.00	36	30.00

Results

Channel	Frequency (MHz)	Antenna 4 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	15.75	15.72	18.75	30.00	-11.25
Low 2	2417	16.68	16.71	19.71	30.00	-10.29
Low 3	2422	18.66	18.65	21.67	30.00	-8.33
Low 4	2427	21.21	21.19	24.21	30.00	-5.79
Mid 6	2437	21.23	21.20	24.23	30.00	-5.77
High 8	2447	21.16	21.18	24.18	30.00	-5.82
High 9	2452	18.19	18.21	21.21	30.00	-8.79
High 10	2457	16.72	16.73	19.74	30.00	-10.26
High 11	2462	15.70	15.65	18.69	30.00	-11.31
High 12	2467	13.70	13.73	16.73	30.00	-13.27
High 13	2472	8.19	8.22	11.22	30.00	-18.78

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 analyzer settings.

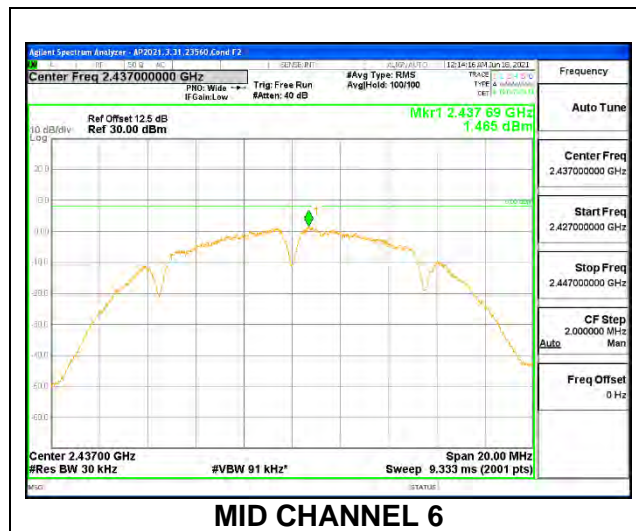
9.5.1. 802.11b MODE 1TX

ANT 4

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-0.050	-0.050	8.0	-8.050
Mid 6	2437	1.465	1.465	8.0	-6.535
High 11	2462	0.240	0.240	8.0	-7.760
High 12	2467	0.270	0.270	8.0	-7.730
High 13	2472	-0.320	-0.320	8.0	-8.320

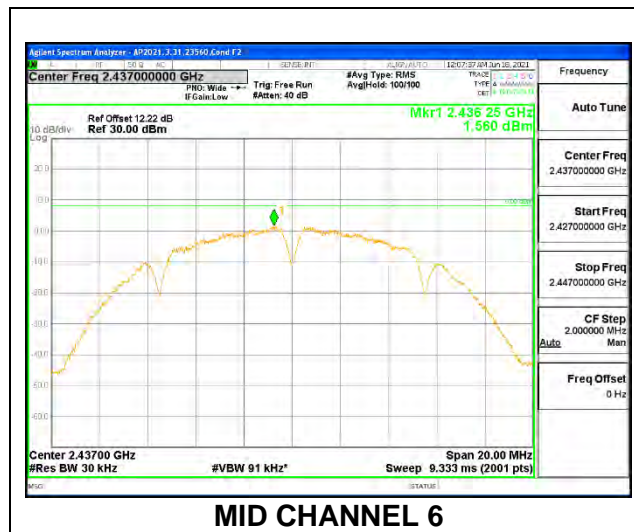


ANT 3

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	0.360	0.360	8.0	-7.640
Mid 6	2437	1.560	1.560	8.0	-6.440
High 11	2462	0.500	0.500	8.0	-7.500
High 12	2467	0.280	0.280	8.0	-7.720
High 13	2472	-0.210	-0.210	8.0	-8.210



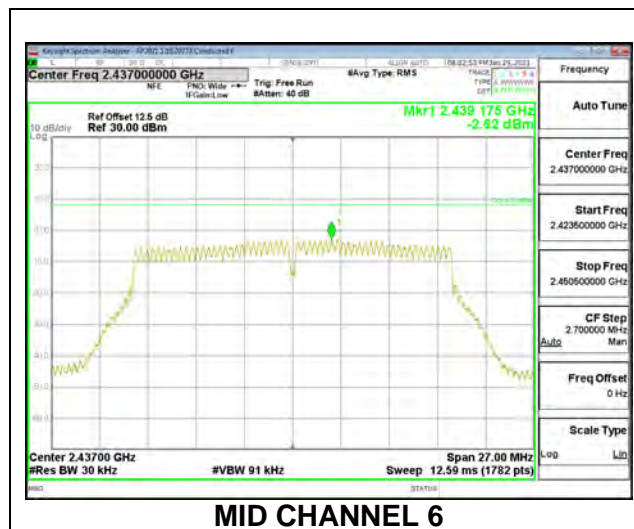
9.5.2. 802.11n HT20 MODE 1TX

ANT 4

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-6.52	-6.52	8.0	-14.52
Low 2	2417	-4.59	-4.59	8.0	-12.59
Low 3	2422	-2.55	-2.55	8.0	-10.55
Mid 6	2437	-2.62	-2.62	8.0	-10.62
High 9	2452	-2.73	-2.73	8.0	-10.73
High 10	2457	-4.54	-4.54	8.0	-12.54
High 11	2462	-6.25	-6.25	8.0	-14.25
High 12	2467	-8.66	-8.66	8.0	-16.66
High 13	2472	-7.25	-7.25	8.0	-15.25



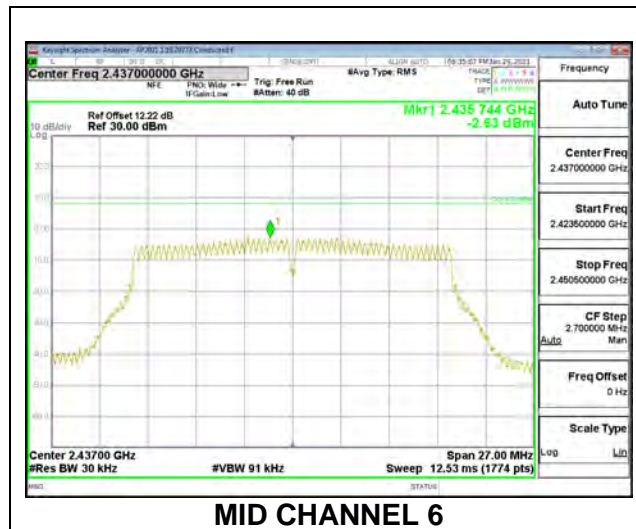
NOTE: Channel 1,11,12 and 13 PSD tested at higher power

ANT 3

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-6.53	-6.53	8.0	-14.53
Low 2	2417	-4.59	-4.59	8.0	-12.59
Low 3	2422	-2.26	-2.26	8.0	-10.26
Mid 6	2437	-2.63	-2.63	8.0	-10.63
High 9	2452	-2.76	-2.76	8.0	-10.76
High 10	2457	-4.65	-4.65	8.0	-12.65
High 11	2462	-6.24	-6.24	8.0	-14.24
High 12	2467	-7.46	-7.46	8.0	-15.46
High 13	2472	-7.35	-7.35	8.0	-15.35



NOTE: Channel 1,11,12 and 13 PSD tested at higher power

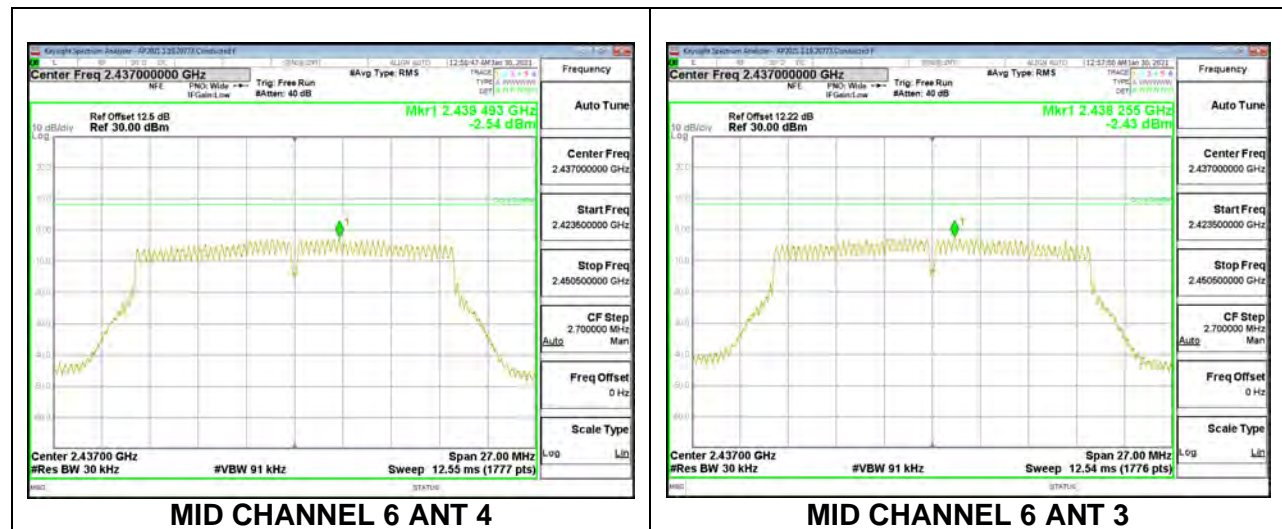
9.5.3. 802.11n HT20 CDD MODE 2TX

ANT 4 + ANT 3

Duty Cycle CF (dB)	0.11	Included in Calculations of Corr'd PSD
--------------------	------	--

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-7.47	-7.93	-4.57	8.0	-12.57
Low 2	2417	-5.27	-5.20	-2.11	8.0	-10.11
Low 3	2422	-3.80	-3.89	-0.73	8.0	-8.73
Low 4	2427	-2.52	-2.39	0.67	8.0	-7.33
Mid 6	2437	-2.54	-2.43	0.64	8.0	-7.36
High 8	2447	-2.53	-2.52	0.60	8.0	-7.40
High 9	2452	-4.42	-4.37	-1.27	8.0	-9.27
High 10	2457	-5.49	-5.47	-2.36	8.0	-10.36
High 11	2462	-7.55	-7.25	-4.28	8.0	-12.28
High 12	2467	-10.31	-10.12	-7.09	8.0	-15.09
High 13	2472	-8.39	-8.30	-5.22	8.0	-13.22



NOTE: Channel 1,11,12 and 13 PSD tested at higher power

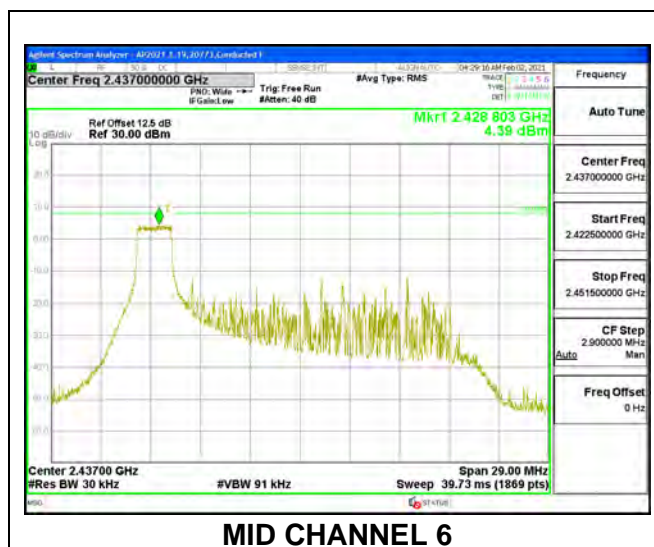
9.5.4. 802.11ax HE20 MODE 1TX

ANT 4: 26-Tone, RU Index 0

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
--------------------	------	--

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-1.16	-1.16	8.0	-9.16
Low 2	2417	0.65	0.65	8.0	-7.35
Low 3	2422	4.31	4.31	8.0	-3.69
Mid 6	2437	4.39	4.39	8.0	-3.61
High 9	2452	4.32	4.32	8.0	-3.68
High 10	2457	0.84	0.84	8.0	-7.16
High 11	2462	-1.19	-1.19	8.0	-9.19
High 12	2467	-2.97	-2.97	8.0	-10.97
High 13	2472	-17.35	-17.35	8.0	-25.35



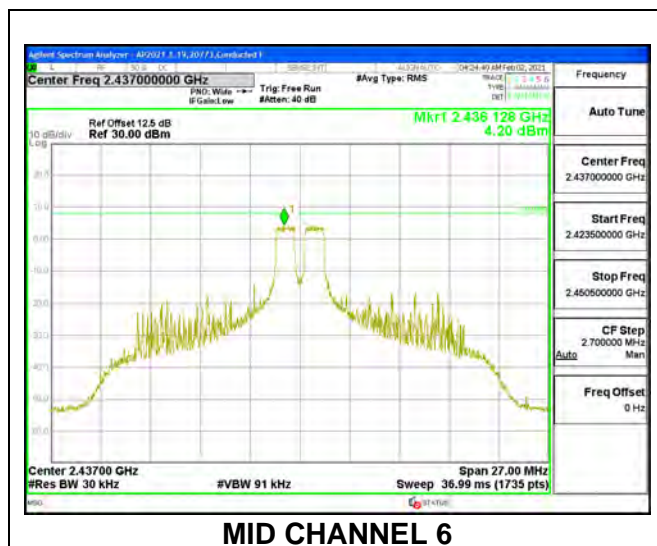
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 4: 26-Tone, RU Index 4

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-1.25	-1.25	8.0	-9.25
Low 2	2417	0.62	0.62	8.0	-7.38
Low 3	2422	4.45	4.45	8.0	-3.55
Mid 6	2437	4.20	4.20	8.0	-3.80
High 9	2452	4.33	4.33	8.0	-3.67
High 10	2457	0.71	0.71	8.0	-7.29
High 11	2462	-1.29	-1.29	8.0	-9.29
High 12	2467	-2.97	-2.97	8.0	-10.97
High 13	2472	-17.35	-17.35	8.0	-25.35



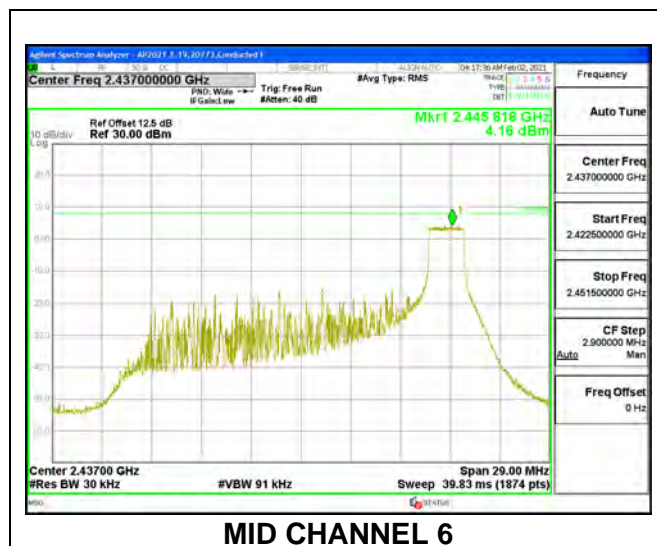
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 4: 26-Tone, RU Index 8

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-0.91	-0.91	8.0	-8.91
Low 2	2417	0.90	0.90	8.0	-7.10
Low 3	2422	4.40	4.40	8.0	-3.60
Mid 6	2437	4.16	4.16	8.0	-3.84
High 9	2452	4.24	4.24	8.0	-3.76
High 10	2457	1.02	1.02	8.0	-6.98
High 11	2462	-0.84	-0.84	8.0	-8.84
High 12	2467	-3.01	-3.01	8.0	-11.01
High 13	2472	-16.89	-16.89	8.0	-24.89



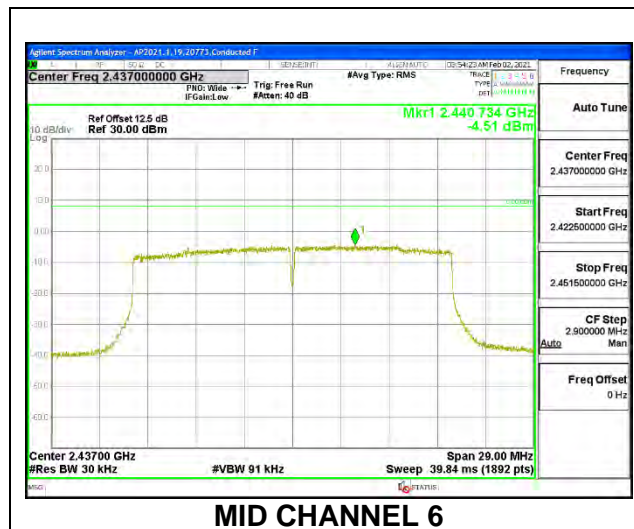
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 4 MODE , SU Mode

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-9.93	-9.93	8.0	-17.93
Low 2	2417	-7.70	-7.70	8.0	-15.70
Low 3	2422	-3.52	-3.52	8.0	-11.52
Mid 6	2437	-4.51	-4.51	8.0	-12.51
High 9	2452	-4.20	-4.20	8.0	-12.20
High 10	2457	-7.21	-7.21	8.0	-15.21
High 11	2462	-9.55	-9.55	8.0	-17.55
High 12	2467	-11.27	-11.27	8.0	-19.27
High 13	2472	-14.87	-14.87	8.0	-22.87



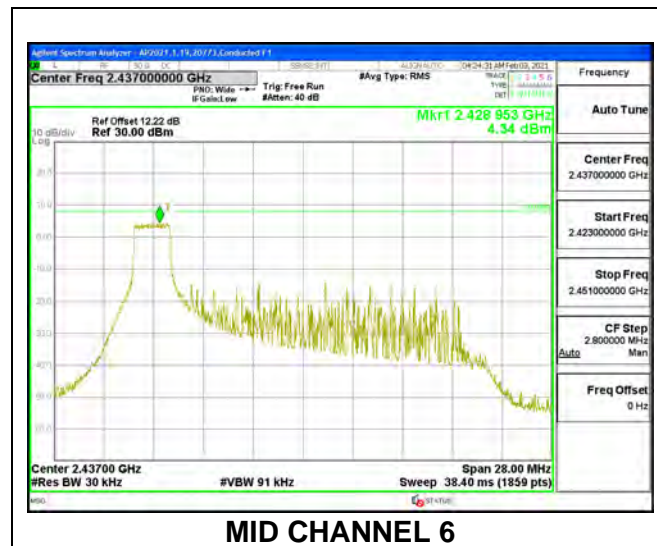
NOTE: Channel 1,11,12 and 13 PSD tested at higher power

ANT 3: 26-Tone, RU Index 0

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-1.20	-1.20	8.0	-9.20
Low 2	2417	0.89	0.89	8.0	-7.11
Low 3	2422	4.55	4.55	8.0	-3.45
Mid 6	2437	4.34	4.34	8.0	-3.66
High 9	2452	4.34	4.34	8.0	-3.66
High 10	2457	0.85	0.85	8.0	-7.15
High 11	2462	-1.21	-1.21	8.0	-9.21
High 12	2467	-2.98	-2.98	8.0	-10.98
High 13	2472	-16.80	-16.80	8.0	-24.80



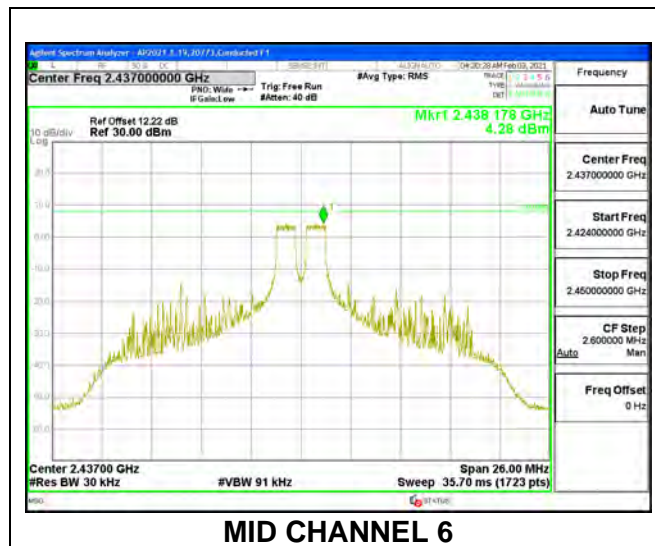
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 3: 26-Tone, RU Index 4

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-1.23	-1.23	8.0	-9.23
Low 2	2417	0.82	0.82	8.0	-7.18
Low 3	2422	4.36	4.36	8.0	-3.64
Mid 6	2437	4.28	4.28	8.0	-3.72
High 9	2452	4.29	4.29	8.0	-3.71
High 10	2457	0.93	0.93	8.0	-7.07
High 11	2462	-1.15	-1.15	8.0	-9.15
High 12	2467	-2.93	-2.93	8.0	-10.93
High 13	2472	-16.80	-16.80	8.0	-24.80



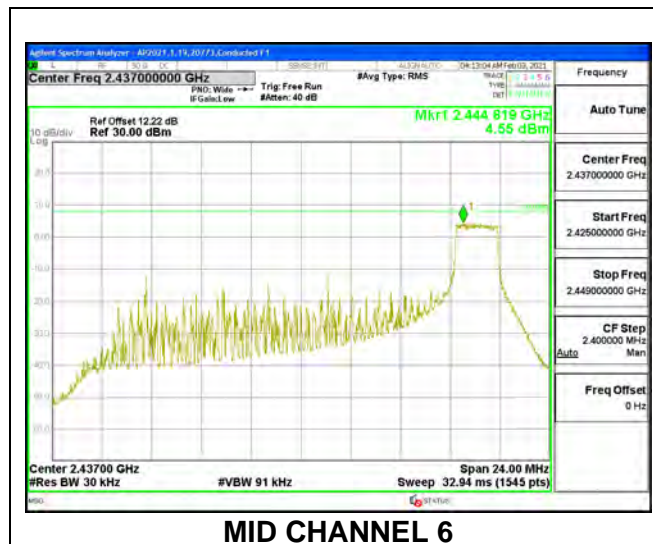
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 3: 26-Tone, RU Index 8

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-1.21	-1.21	8.0	-9.21
Low 2	2417	0.94	0.94	8.0	-7.06
Low 3	2422	4.34	4.34	8.0	-3.66
Mid 6	2437	4.55	4.55	8.0	-3.45
High 9	2452	4.51	4.51	8.0	-3.49
High 10	2457	0.93	0.93	8.0	-7.07
High 11	2462	-1.50	-1.50	8.0	-9.50
High 12	2467	-2.91	-2.91	8.0	-10.91
High 13	2472	-16.81	-16.81	8.0	-24.81



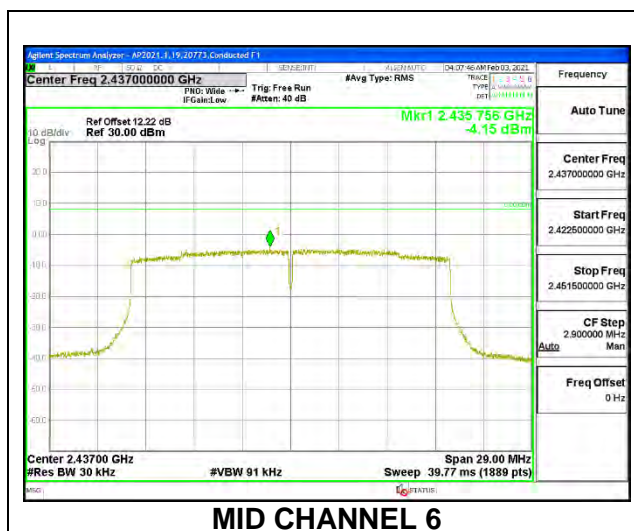
NOTE: Channels 1,2,3,6,9,10,11,12 PSD tested at higher power

ANT 3 MODE , SU Mode

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-10.05	-10.05	8.0	-18.05
Low 2	2417	-7.68	-7.68	8.0	-15.68
Low 3	2422	-3.32	-3.32	8.0	-11.32
Mid 6	2437	-4.15	-4.15	8.0	-12.15
High 9	2452	-4.48	-4.48	8.0	-12.48
High 10	2457	-7.42	-7.42	8.0	-15.42
High 11	2462	-9.75	-9.75	8.0	-17.75
High 12	2467	-11.55	-11.55	8.0	-19.55
High 13	2472	-14.89	-14.89	8.0	-22.89



NOTE: Channel 1,11,12 and 13 PSD tested at higher power

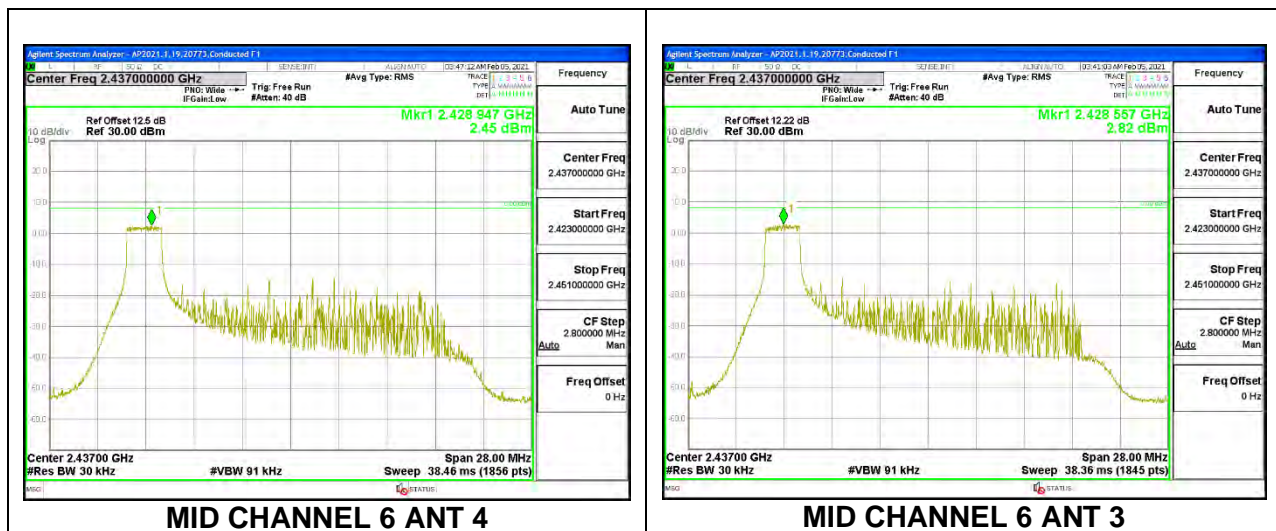
9.5.5. 802.11ax HE20 OFDMA MODE 2TX

ANT 4 + ANT 3: 26-Tone, RU Index 0

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
--------------------	------	--

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-2.20	-2.28	0.770	8.0	-7.230
Low 2	2417	-0.29	-0.54	2.597	8.0	-5.403
Low 3	2422	1.96	1.95	4.965	8.0	-3.035
Low 4	2427	2.90	2.69	5.804	8.0	-2.196
Mid 6	2437	2.45	2.82	5.649	8.0	-2.351
High 8	2447	2.84	2.88	5.870	8.0	-2.130
High 9	2452	1.39	1.33	4.370	8.0	-3.630
High 10	2457	-0.33	-0.55	2.572	8.0	-5.428
High 11	2462	-2.37	-2.32	0.665	8.0	-7.335
High 12	2467	-4.41	-4.59	-1.489	8.0	-9.489
High 13	2472	-17.32	-17.31	-14.305	8.0	-22.305



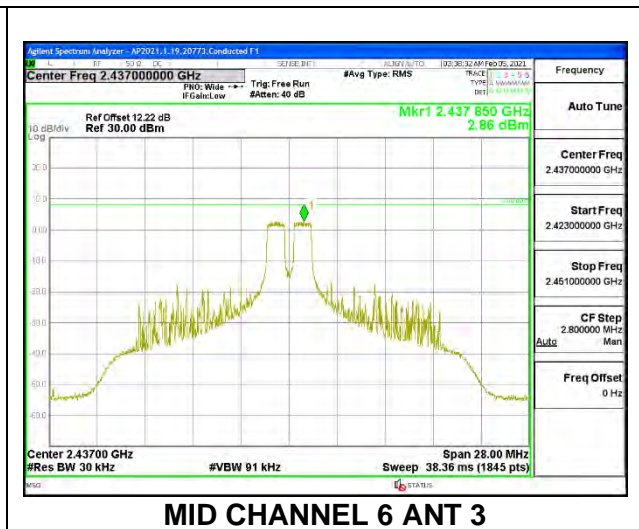
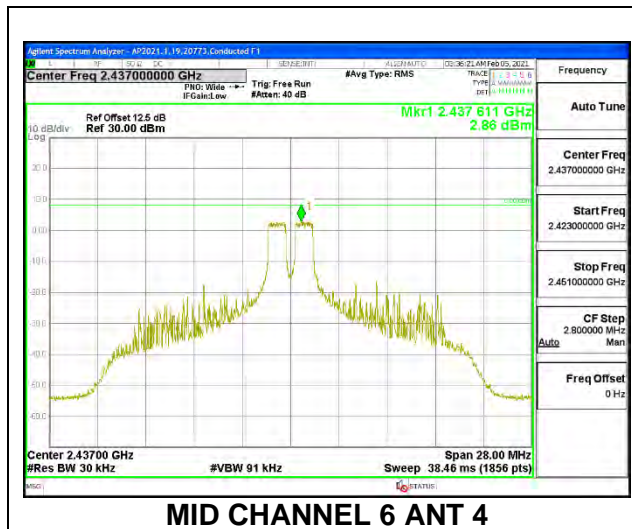
NOTE: Channels 1,2,3,4,6,8,9,10,11,12 PSD tested at higher power

ANT 4 + ANT 3: 26-Tone, RU Index 4

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-2.22	-2.26	0.77	8.0	-7.23
Low 2	2417	-0.36	-0.37	2.65	8.0	-5.35
Low 3	2422	1.94	2.04	5.00	8.0	-3.00
Low 4	2427	2.82	2.79	5.81	8.0	-2.19
Mid 6	2437	2.86	2.86	5.87	8.0	-2.13
High 8	2447	2.81	2.73	5.78	8.0	-2.22
High 9	2452	1.30	1.37	4.35	8.0	-3.65
High 10	2457	0.07	-0.04	3.03	8.0	-4.97
High 11	2462	-2.24	-2.31	0.74	8.0	-7.26
High 12	2467	-3.84	-3.92	-0.87	8.0	-8.87
High 13	2472	-17.28	-17.48	-14.37	8.0	-22.37



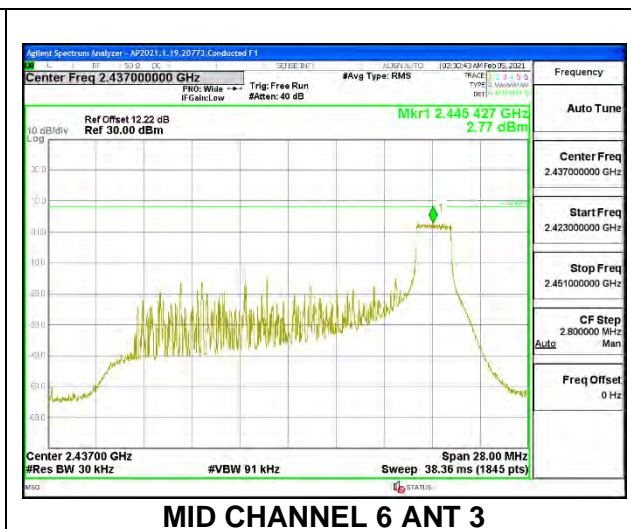
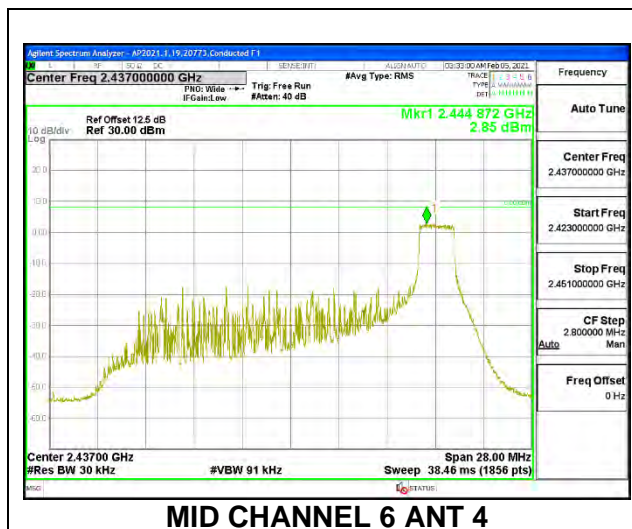
NOTE: Channels 1,2,3,4,6,8,9,10,11,12 PSD tested at higher power

ANT 4 + ANT 3: 26-Tone, RU Index 8

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
---------------------------	------	---

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-2.31	-2.22	0.75	8.0	-7.25
Low 2	2417	-0.41	-0.48	2.57	8.0	-5.43
Low 3	2422	1.92	1.97	4.96	8.0	-3.04
Low 4	2427	2.78	2.95	5.88	8.0	-2.12
Mid 6	2437	2.85	2.77	5.82	8.0	-2.18
High 8	2447	2.84	2.75	5.81	8.0	-2.19
High 9	2452	1.36	1.39	4.39	8.0	-3.61
High 10	2457	-0.10	0.03	2.98	8.0	-5.02
High 11	2462	-2.31	-2.29	0.71	8.0	-7.29
High 12	2467	-4.27	-4.12	-1.18	8.0	-9.18
High 13	2472	-16.83	-16.85	-13.83	8.0	-21.83



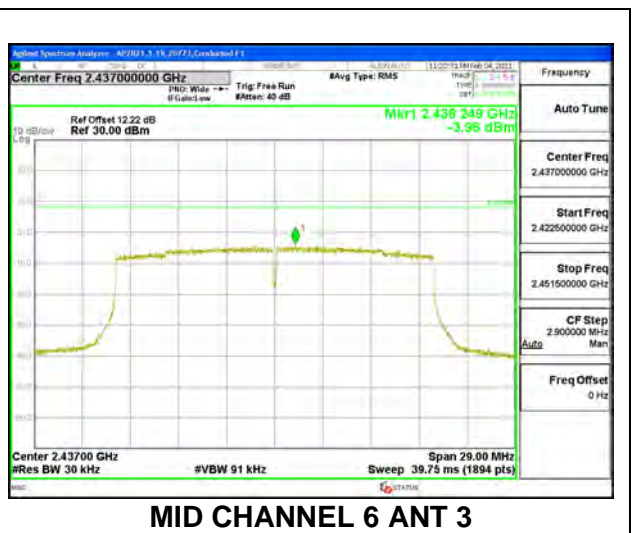
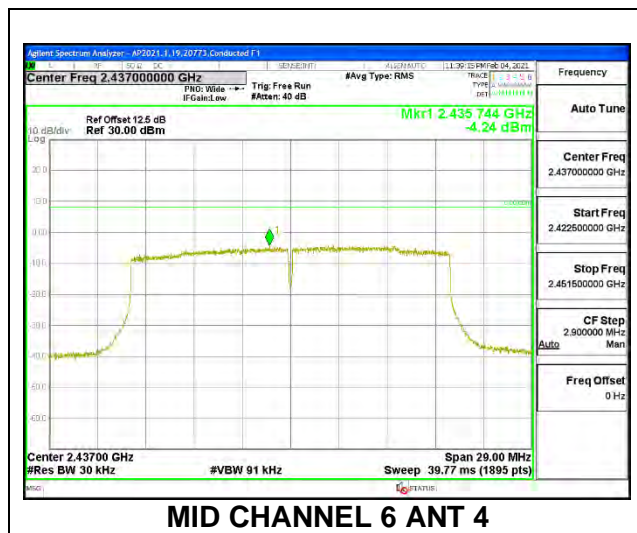
NOTE: Channels 1,2,3,4,6,8,9,10,11,12 PSD tested at higher power

ANT 4 + ANT 3: SU Mode

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
--------------------	------	--

PSD Results

Channel	Frequency (MHz)	Antenna 4 Meas (dBm/ 3kHz)	Antenna 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low 1	2412	-10.86	-10.84	-7.84	8.0	-15.84
Low 2	2417	-8.73	-8.42	-5.56	8.0	-13.56
Low 3	2422	-6.69	-6.45	-3.56	8.0	-11.56
Low 4	2427	-4.15	-3.98	-1.05	8.0	-9.05
Mid 6	2437	-4.24	-3.96	-1.09	8.0	-9.09
High 8	2447	-4.02	-4.10	-1.05	8.0	-9.05
High 9	2452	-7.06	-7.29	-4.16	8.0	-12.16
High 10	2457	-8.42	-8.30	-5.35	8.0	-13.35
High 11	2462	-10.55	-10.61	-7.57	8.0	-15.57
High 12	2467	-12.49	-12.39	-9.43	8.0	-17.43
High 13	2472	-17.49	-17.45	-14.46	8.0	-22.46



NOTE: Channel 1,11,12 and 13 PSD tested at higher power

9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

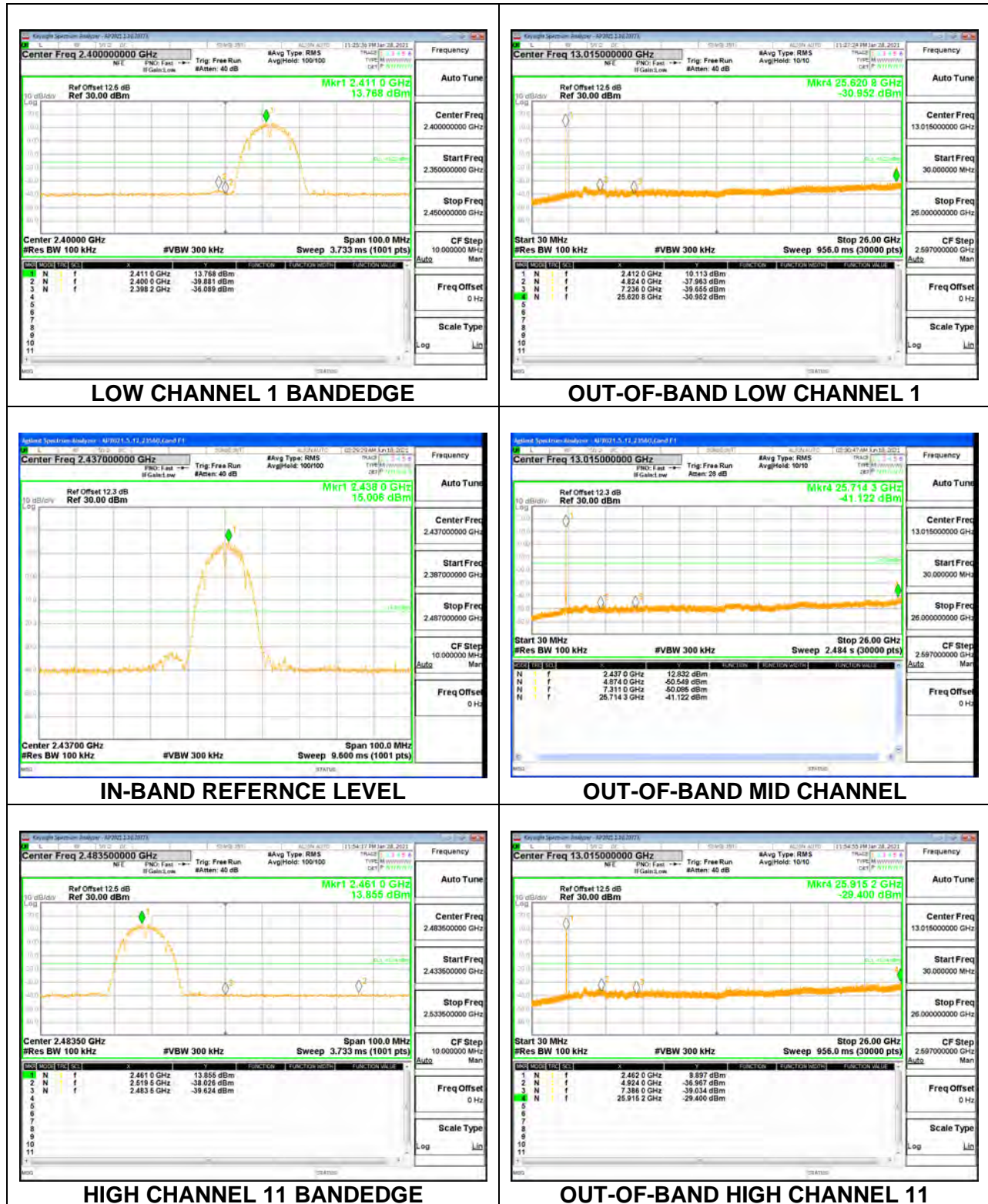
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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)).

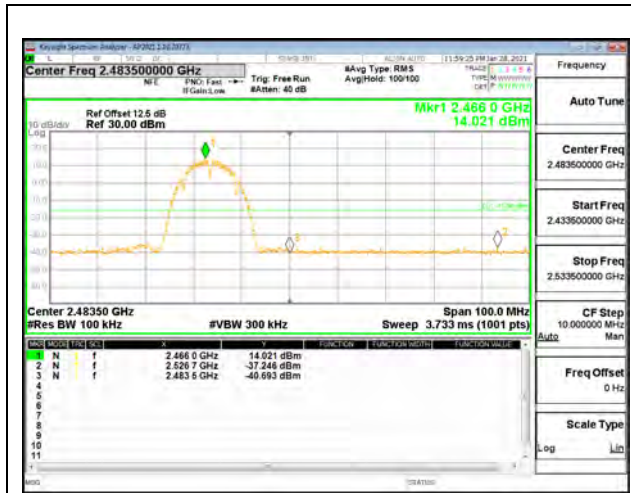
Attenuated by 30dB since average power was measured.

RESULTS

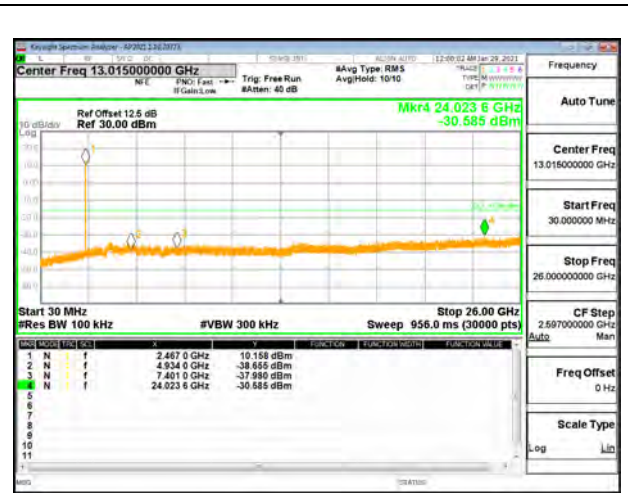
9.6.1. 802.11b MODE

1TX Antenna 4 MODE

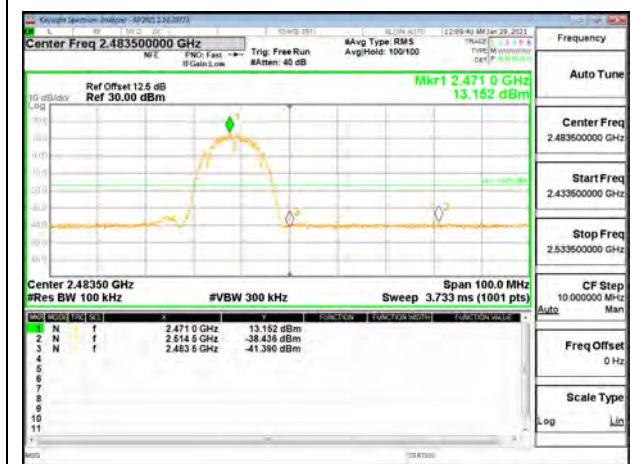




HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12

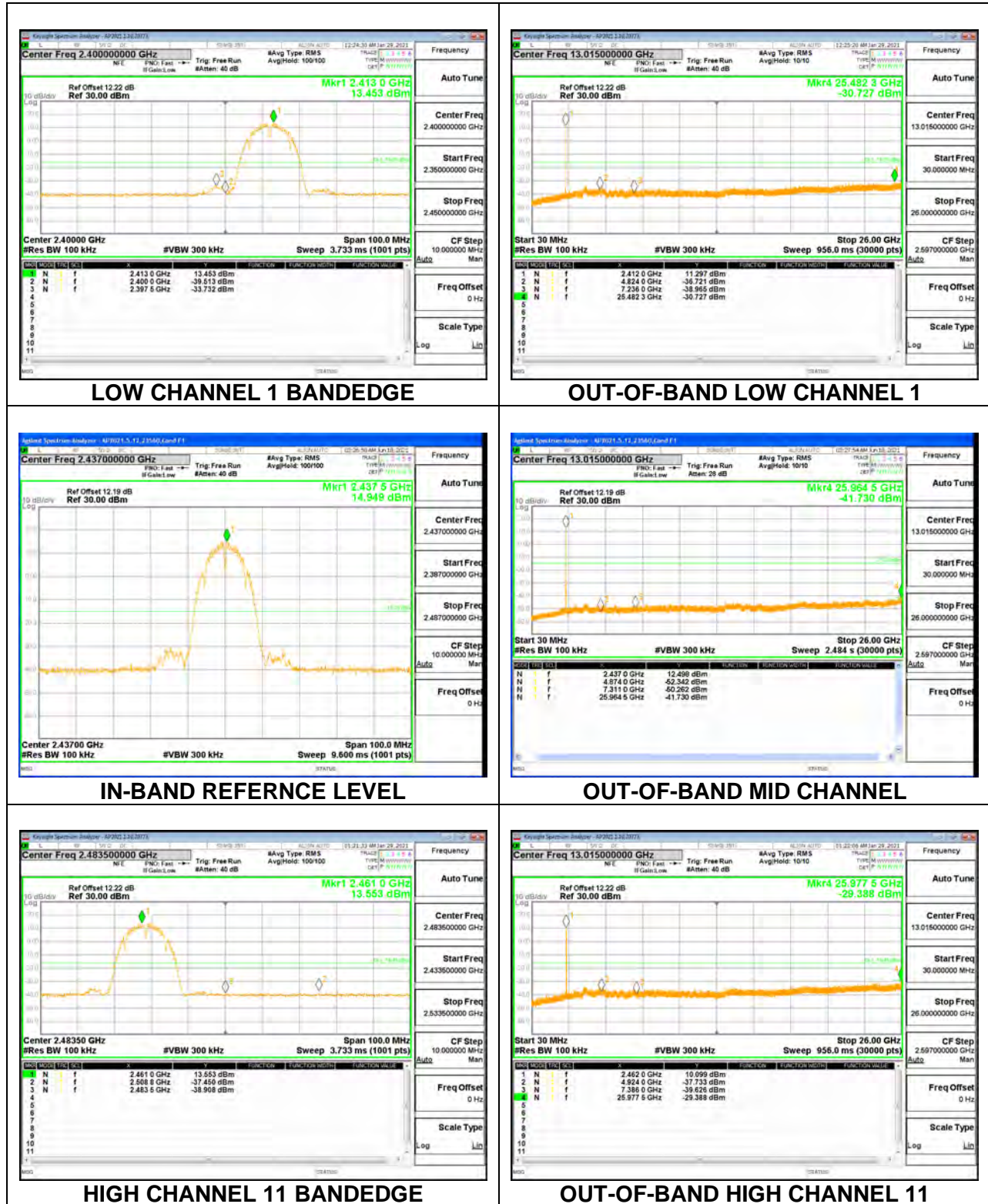


HIGH CHANNEL 13 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 13

1TX Antenna 3 MODE

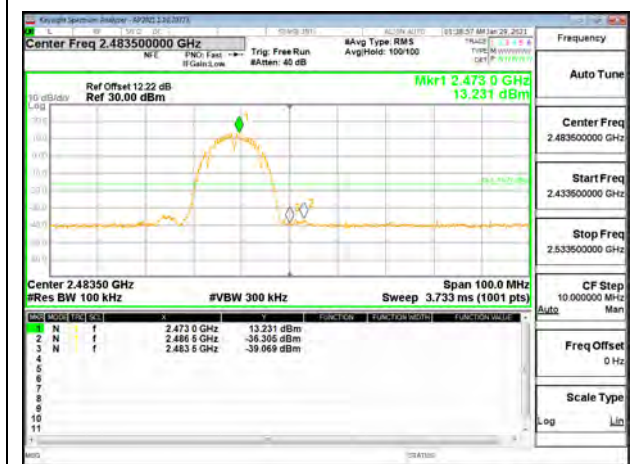




HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12



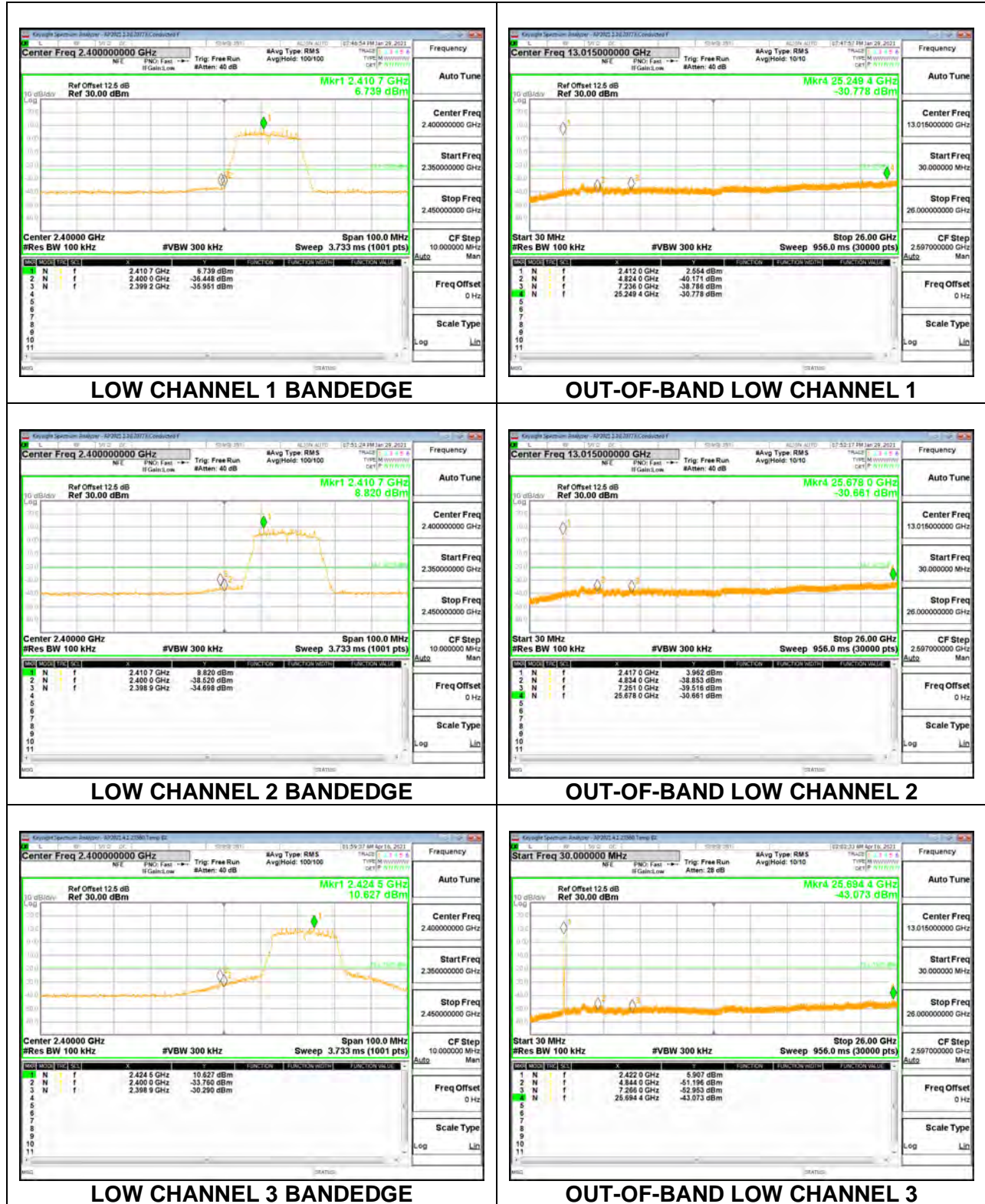
HIGH CHANNEL 13 BANDEDGE

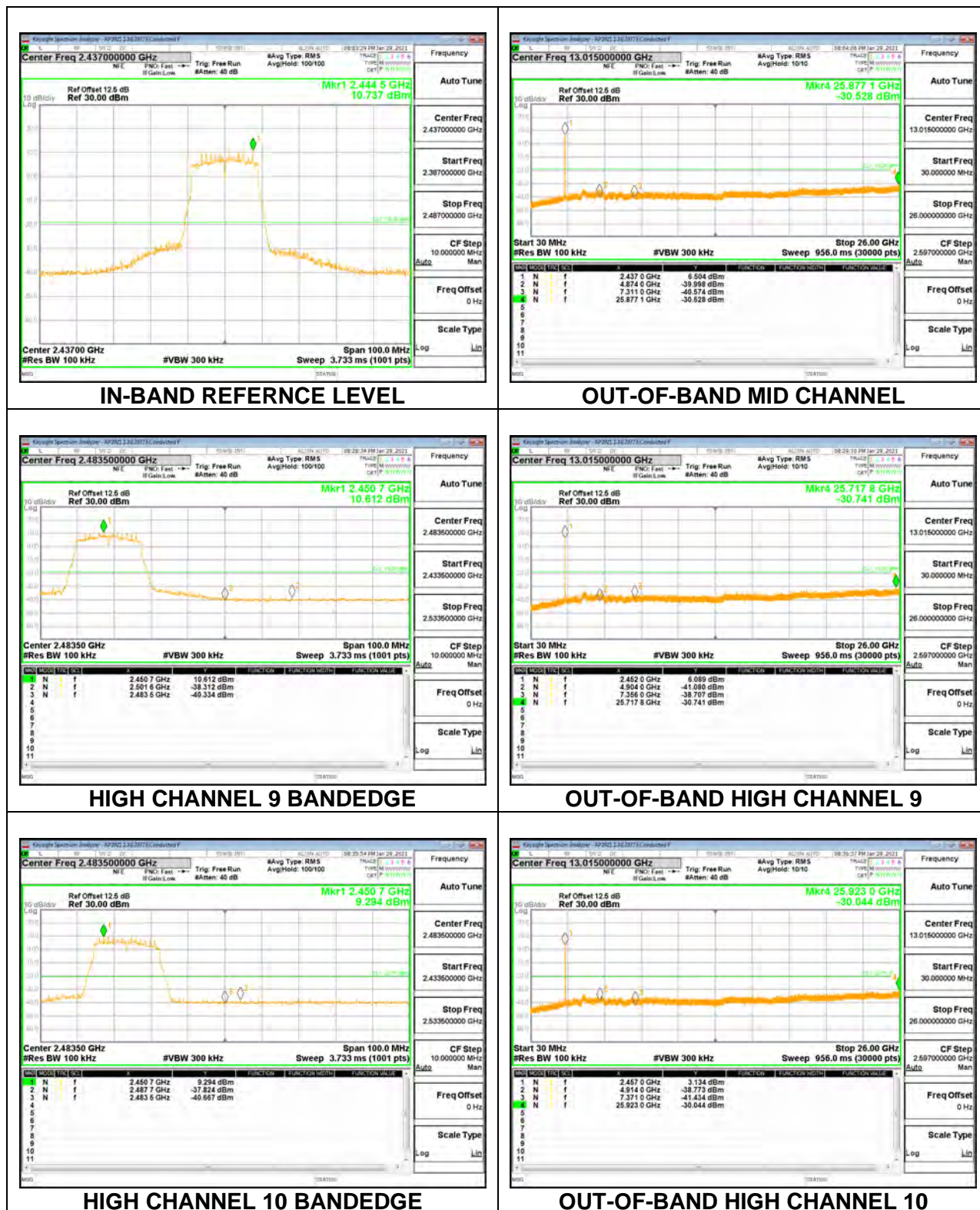


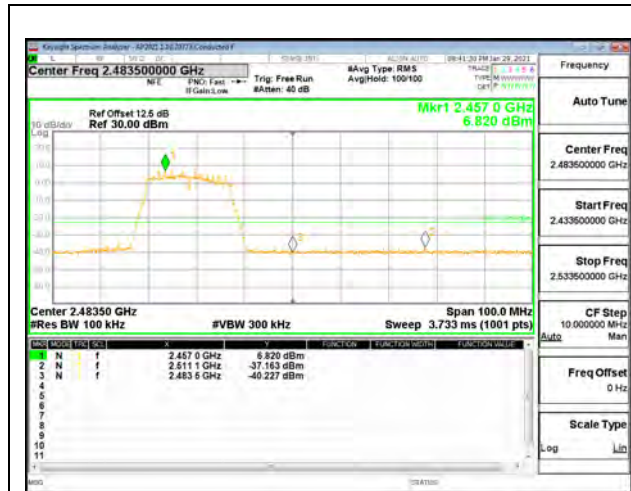
OUT-OF-BAND HIGH CHANNEL 13

9.6.2. 802.11n HT20 MODE

1TX Antenna 4 MODE







HIGH CHANNEL 11 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 11



HIGH CHANNEL 12 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 12

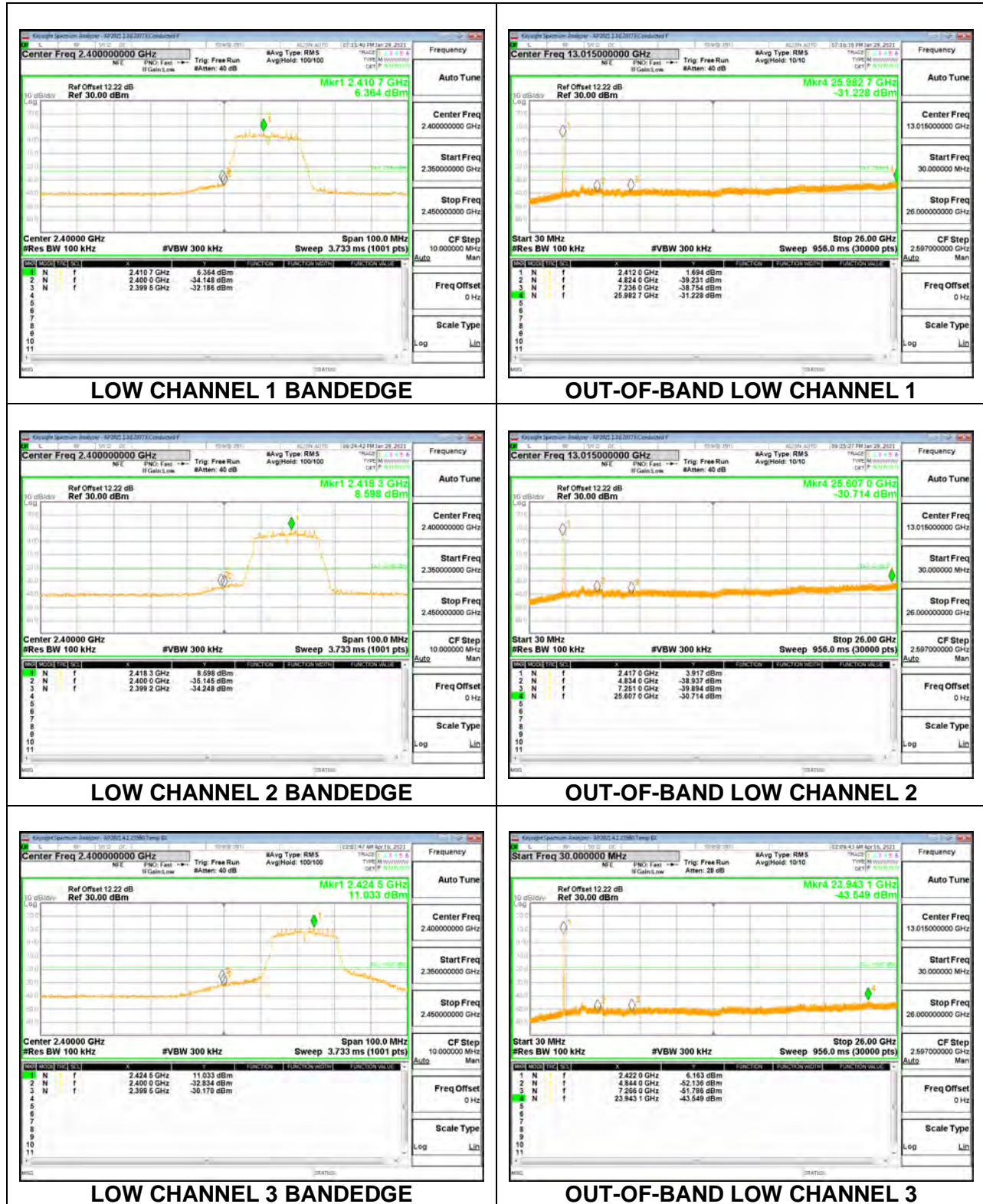


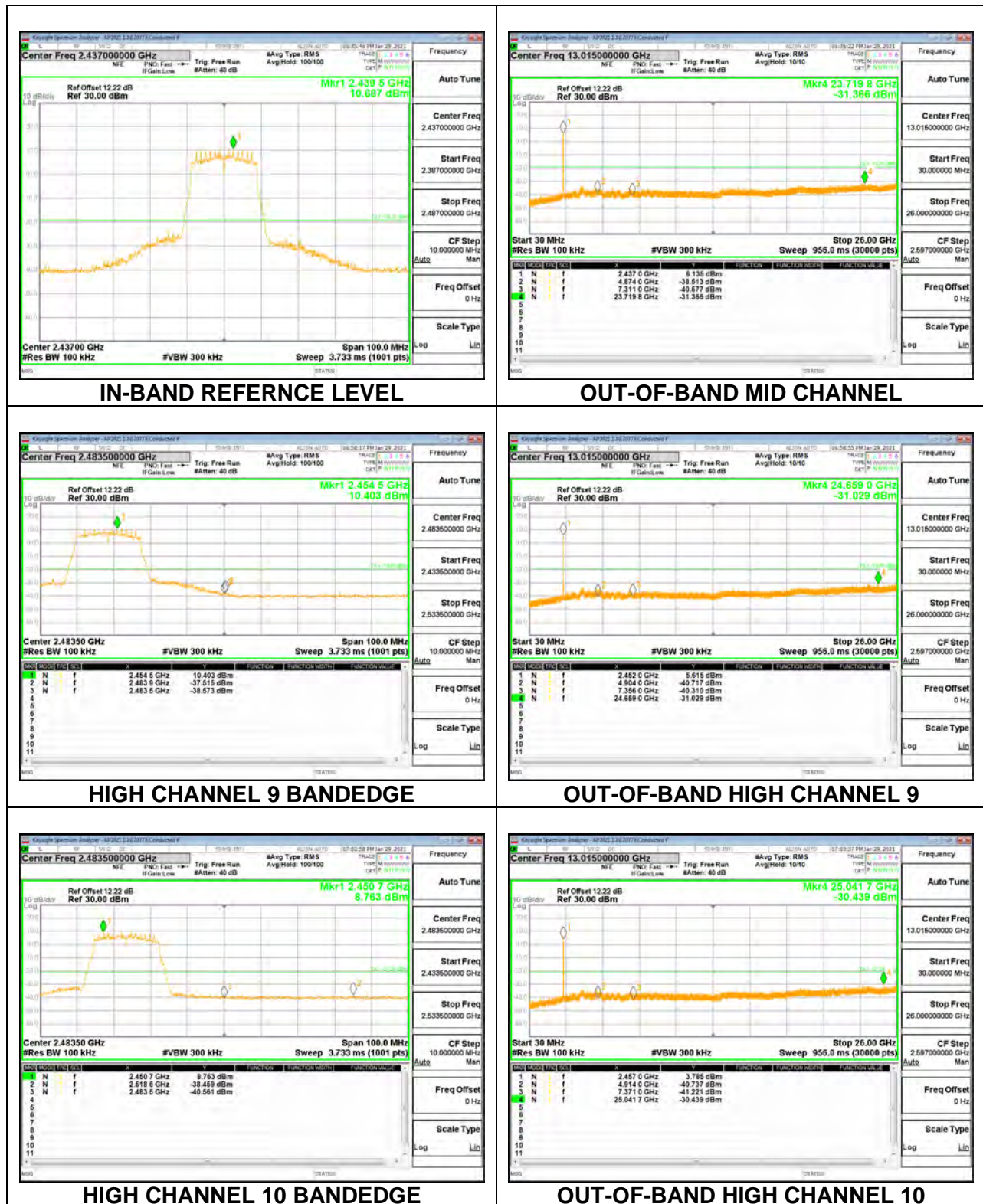
HIGH CHANNEL 13 BANDEDGE

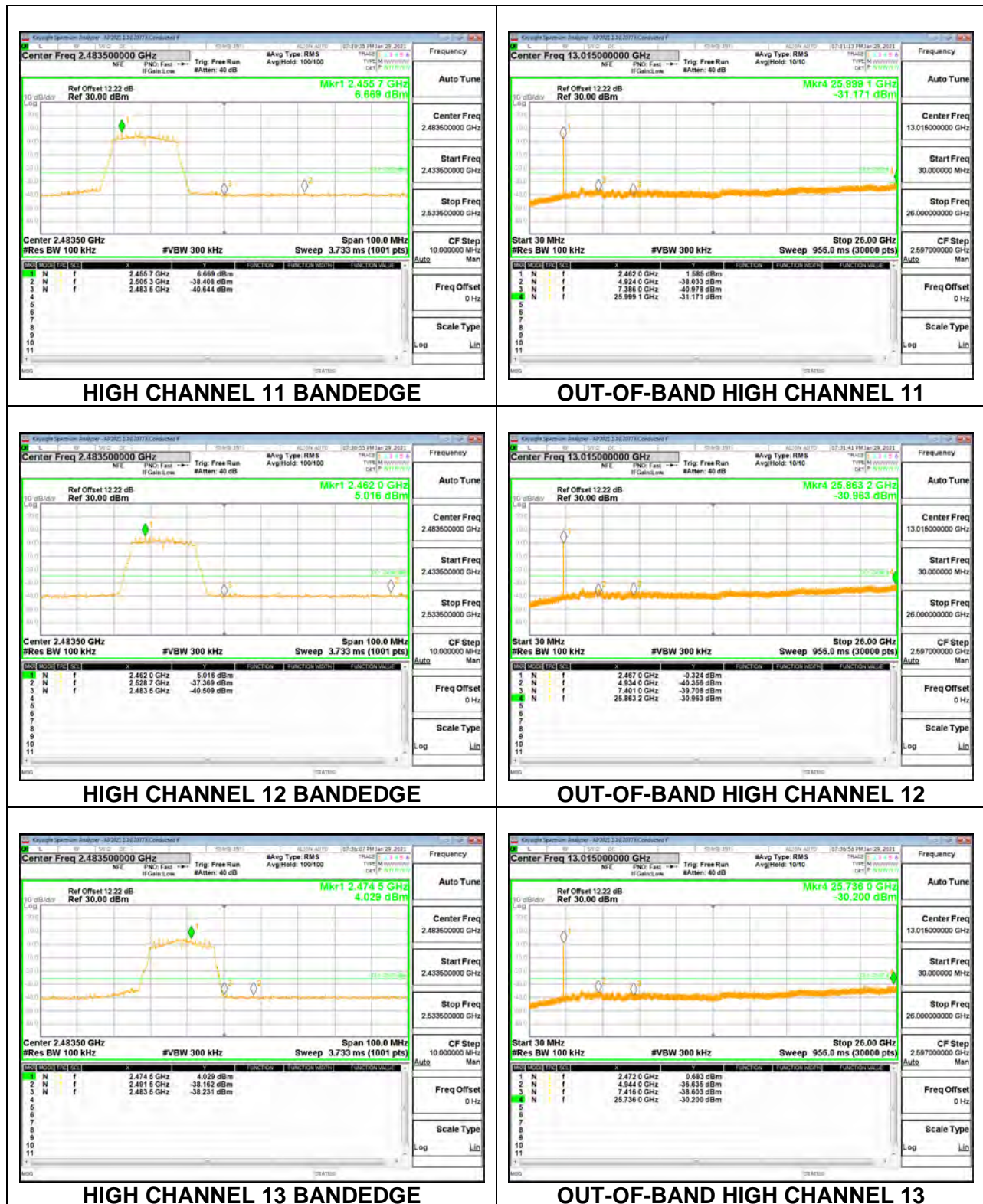


OUT-OF-BAND HIGH CHANNEL 13

1TX Antenna 3 MODE

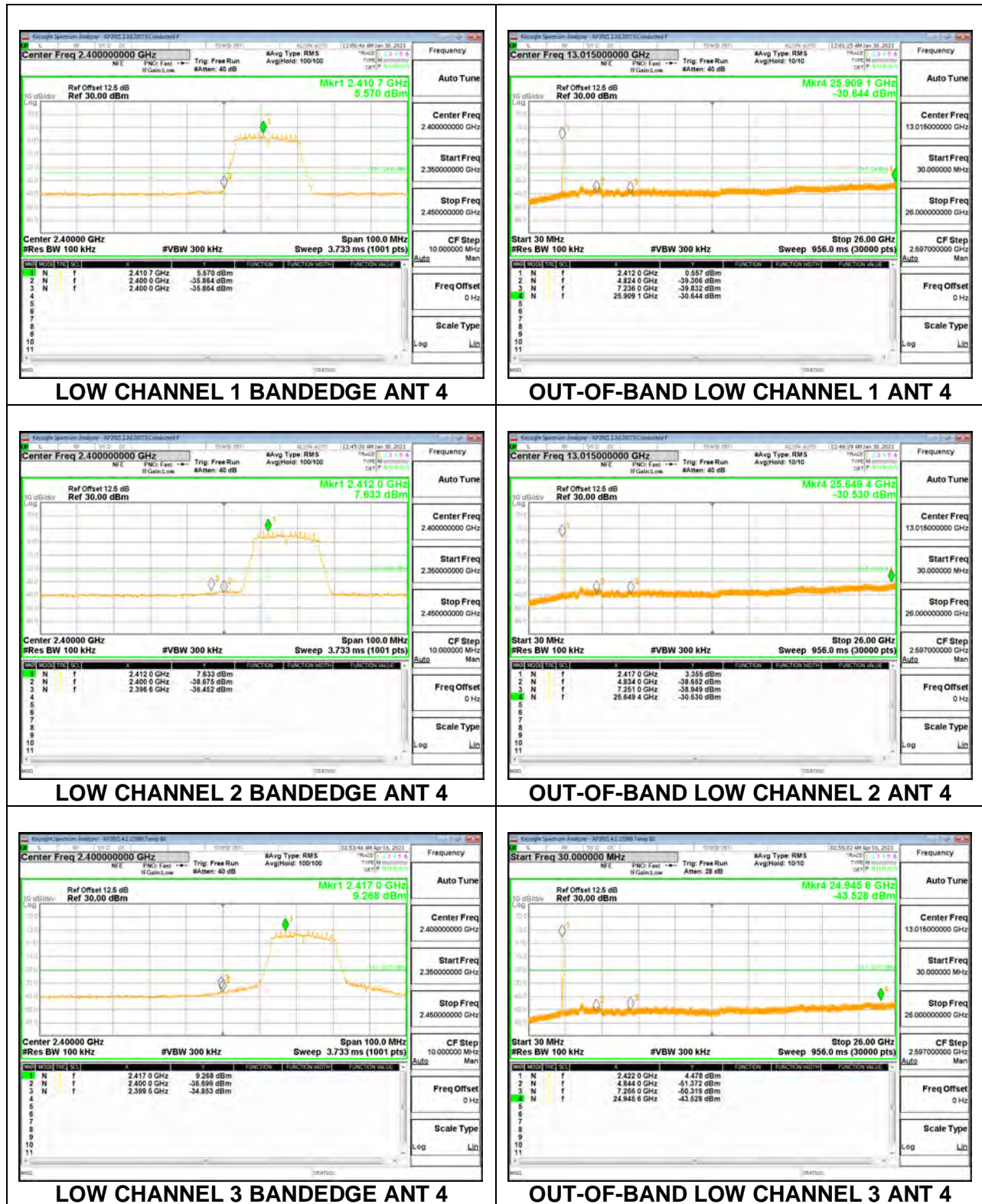


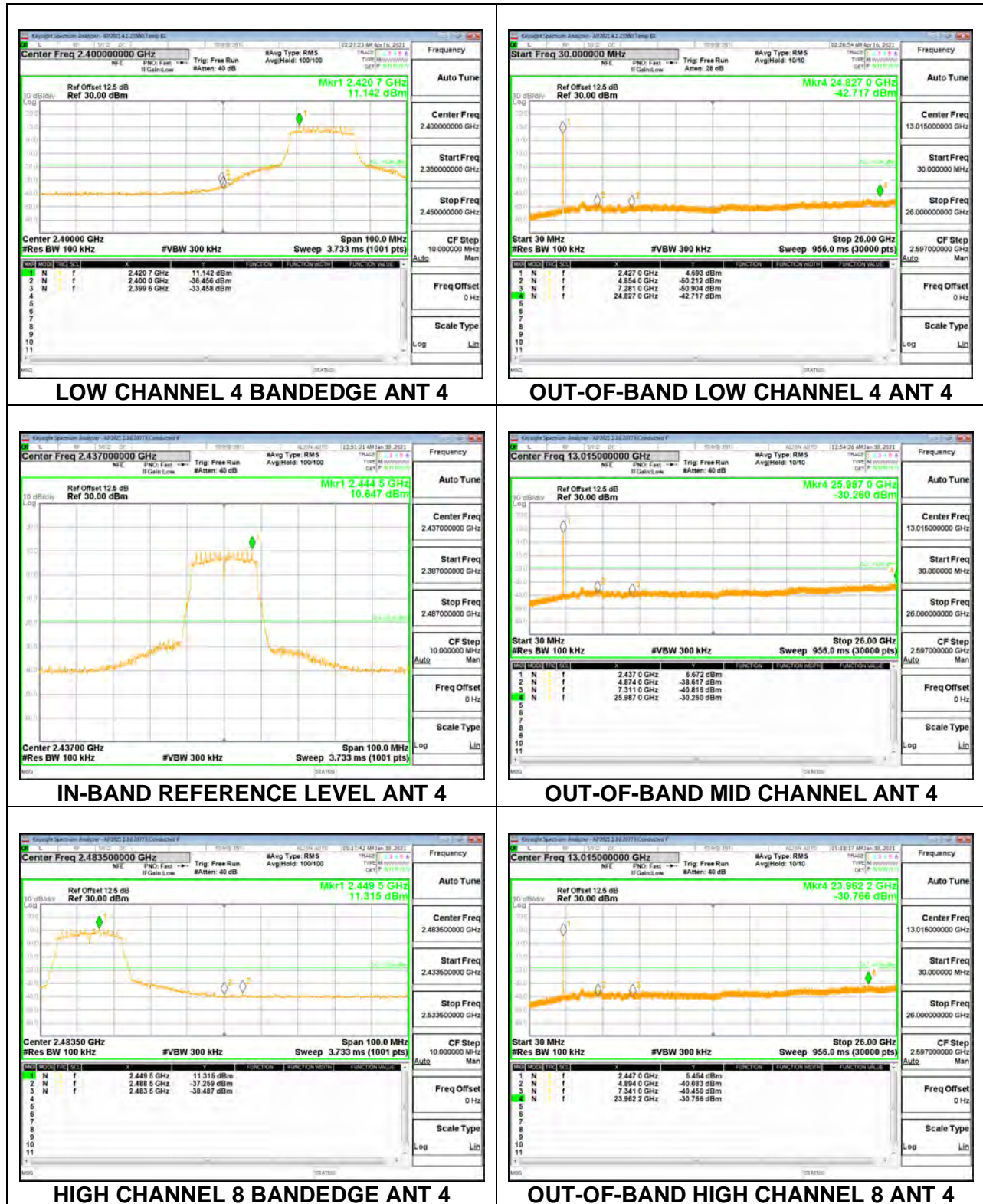


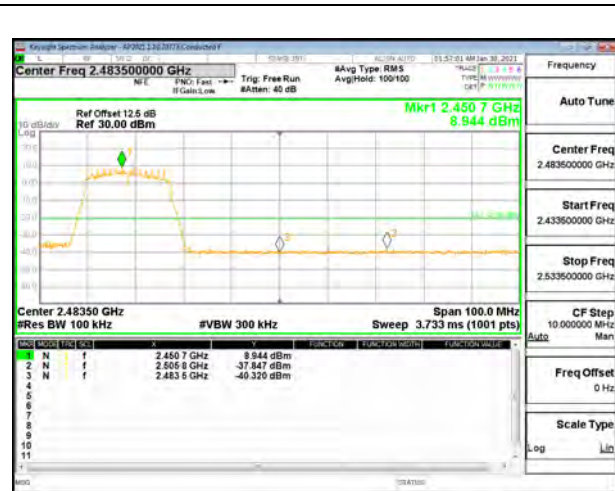


9.6.3. 802.11n HT20 CDD MODE 2TX

2TX Antenna 4 + Antenna 3 CDD MODE



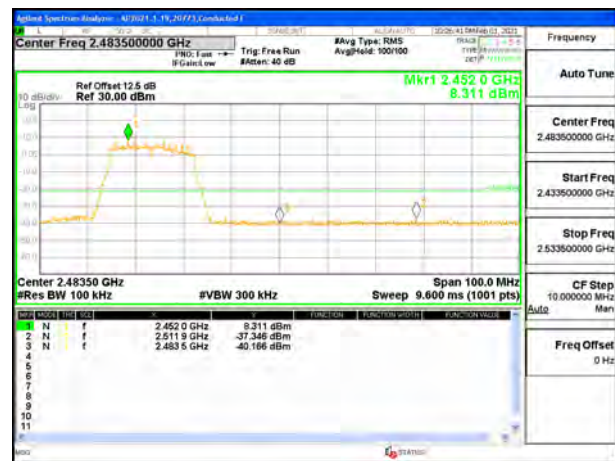




HIGH CHANNEL 9 BANDEDGE ANT 4



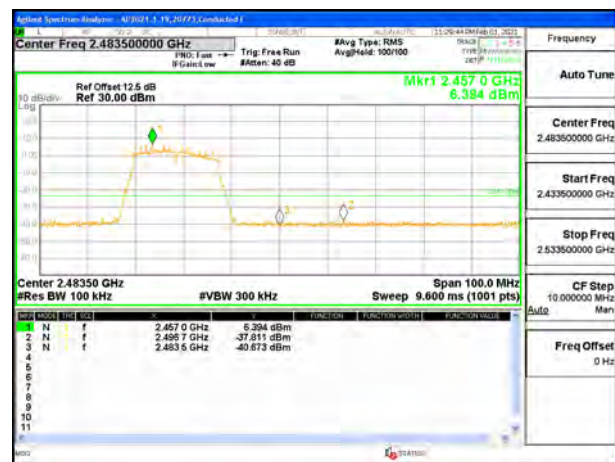
OUT-OF-BAND HIGH CHANNEL 9 ANT 4



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



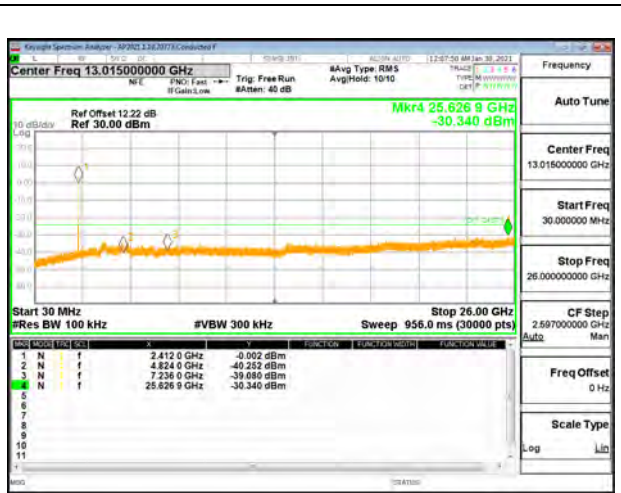
HIGH CHANNEL 13 BANDEDGE ANT 4



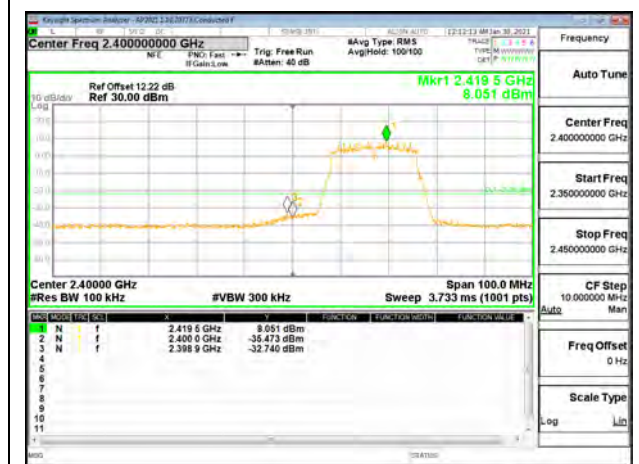
OUT-OF-BAND HIGH CHANNEL 13 ANT 4



LOW CHANNEL 1 BANDEDGE ANT 3



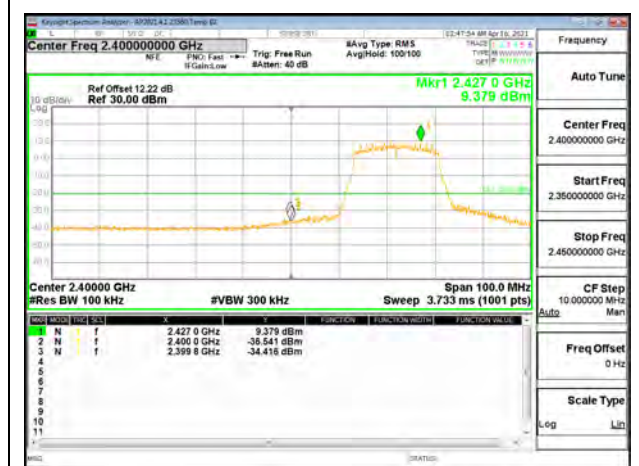
OUT-OF-BAND LOW CHANNEL 1 ANT 3



LOW CHANNEL 2 BANDEDGE ANT 3



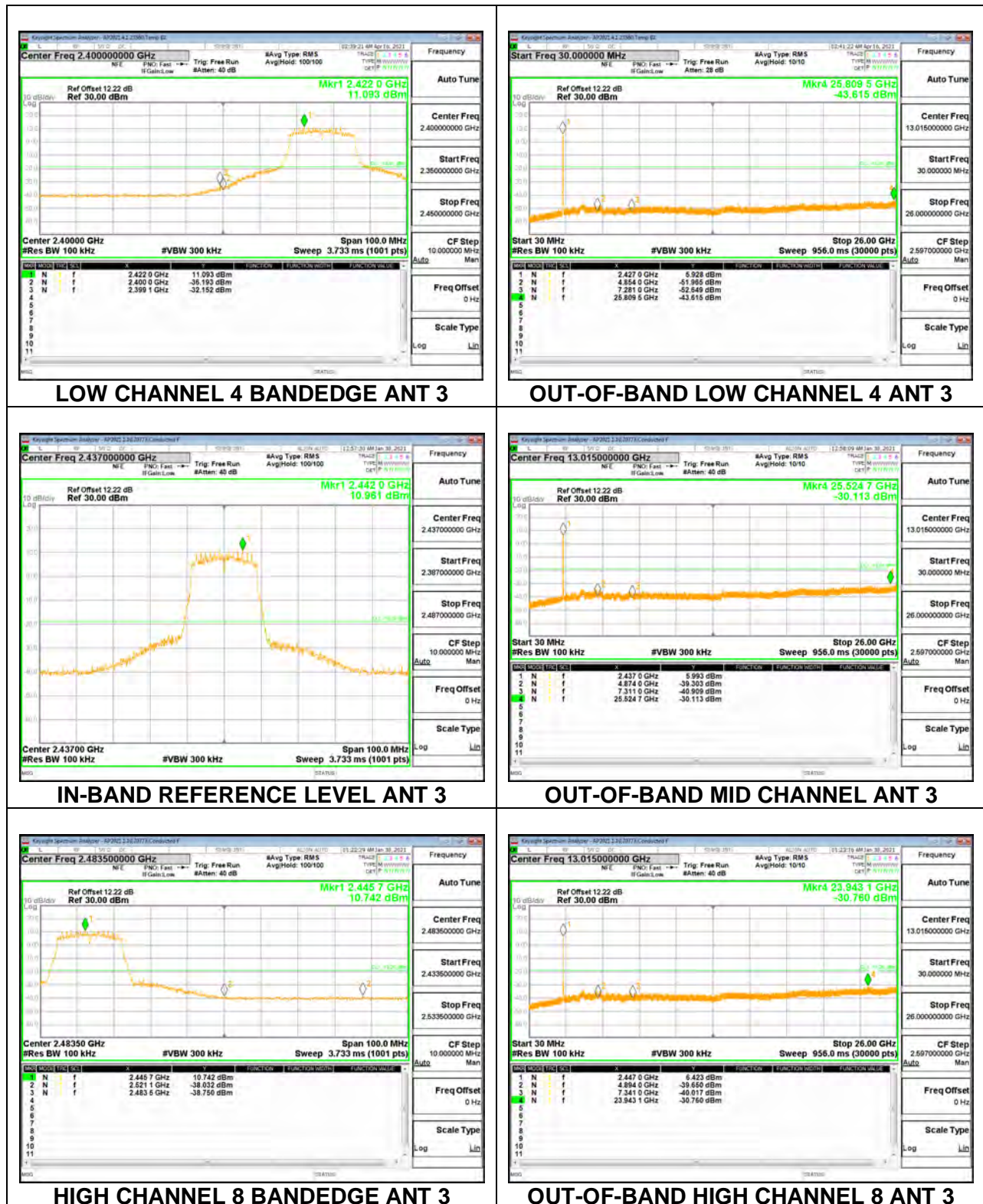
OUT-OF-BAND LOW CHANNEL 2 ANT 3

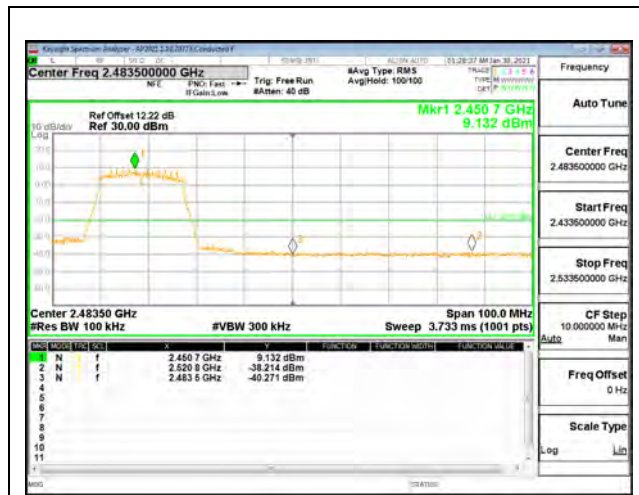


LOW CHANNEL 3 BANDEDGE ANT 3

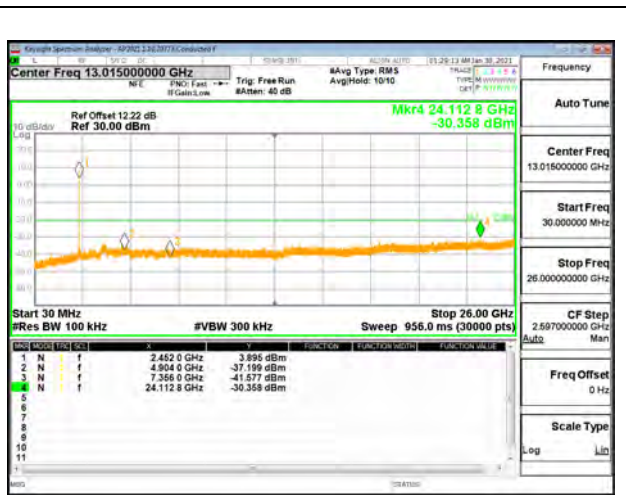


OUT-OF-BAND LOW CHANNEL 3 ANT 3





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



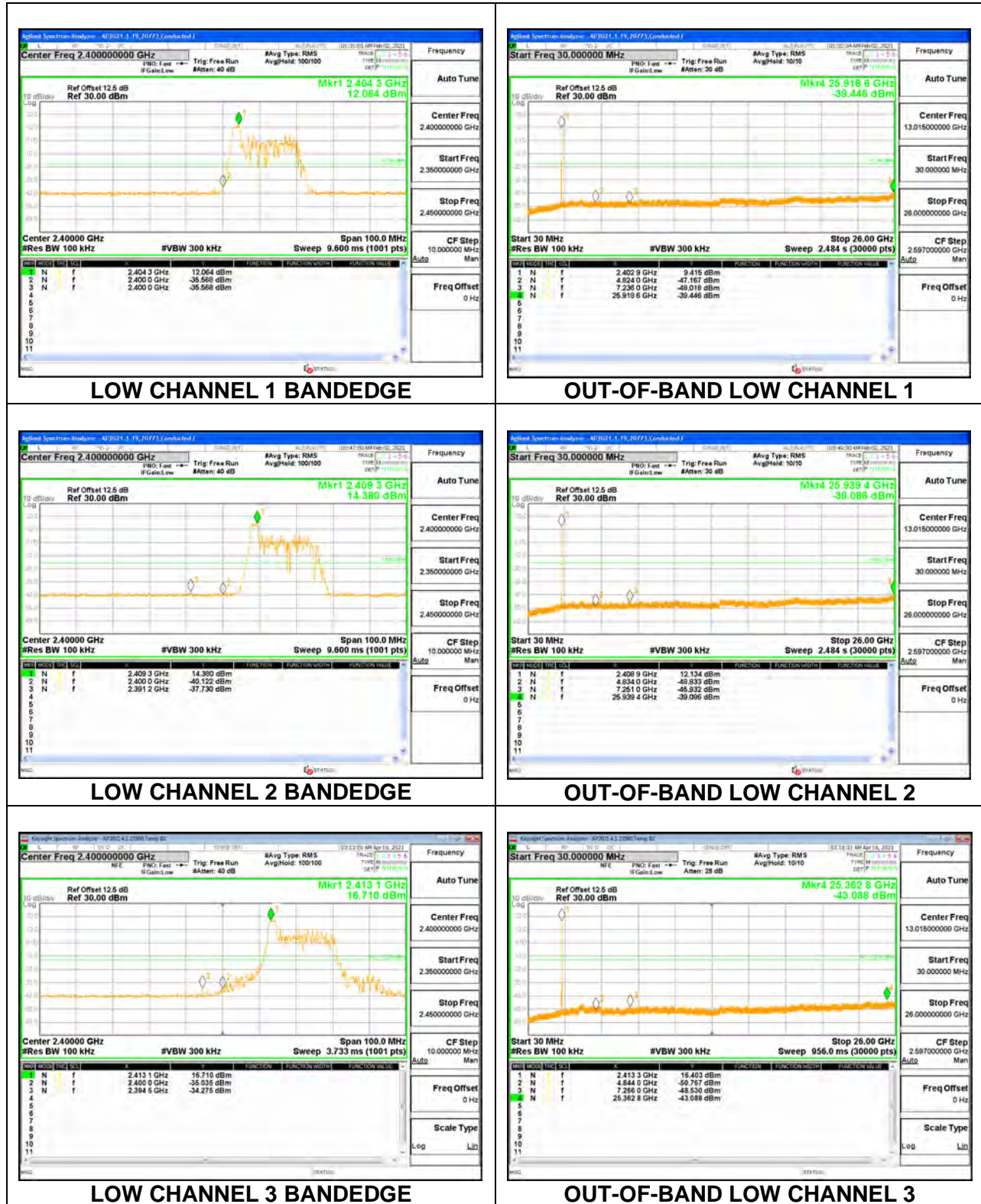
HIGH CHANNEL 13 BANDEDGE ANT 3

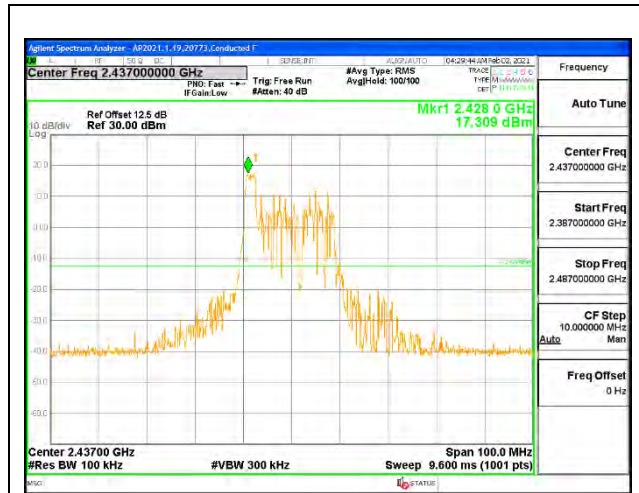


OUT-OF-BAND HIGH CHANNEL 13 ANT 3

9.6.4. 802.11ax HE20 MODE 1TX

ANT 4: 26-Tones, RU Index 0





MID CHANNEL REFERENCE LEVEL



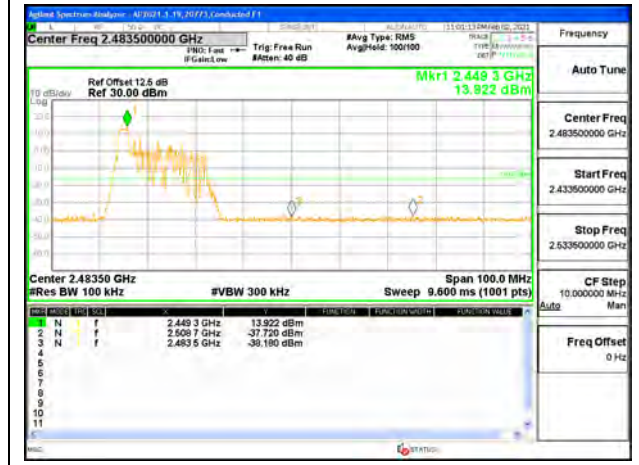
OUT-OF-BAND MID CHANNEL



HIGH CHANNEL 9 BANDEDGE



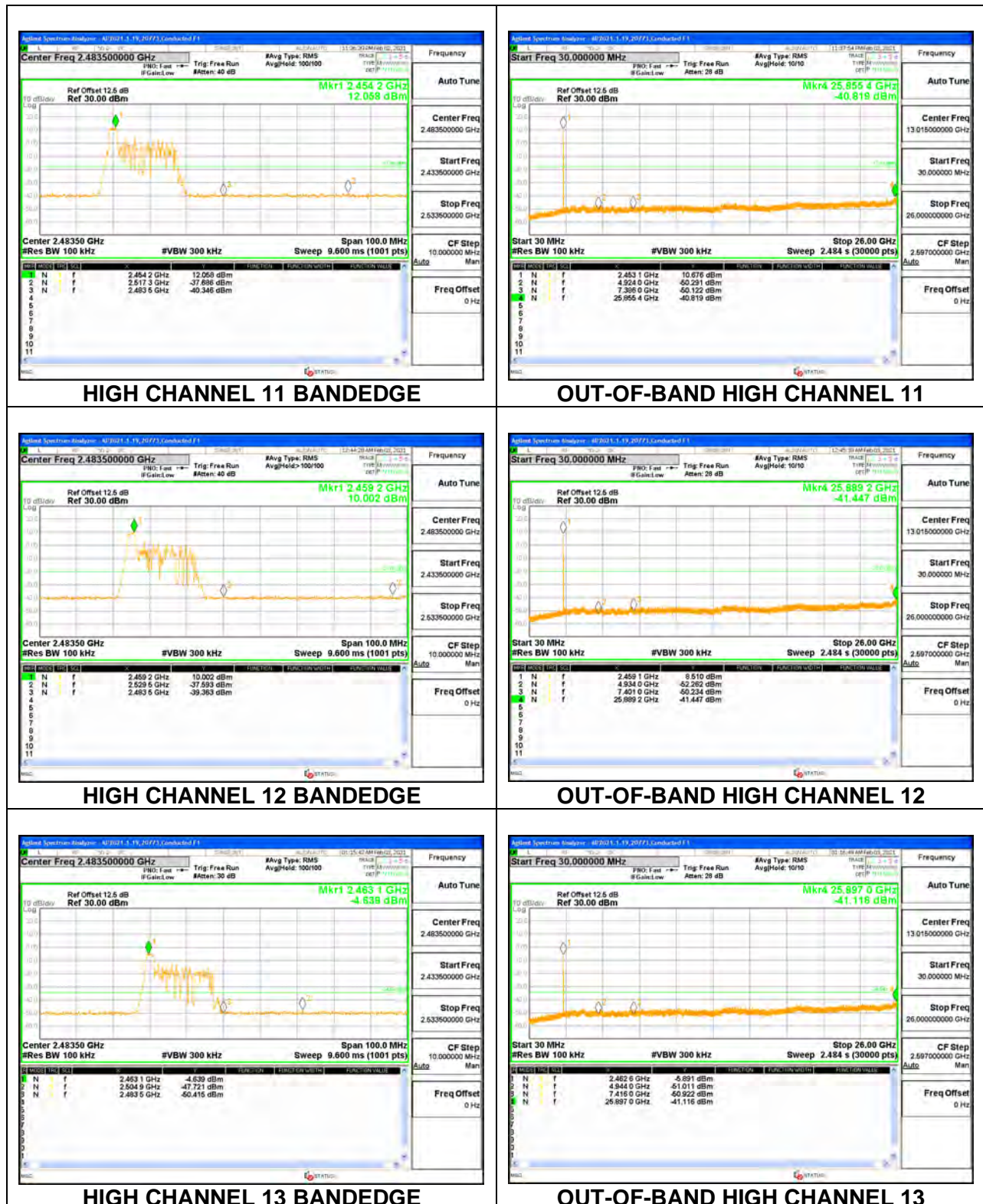
OUT-OF-BAND HIGH CHANNEL 9



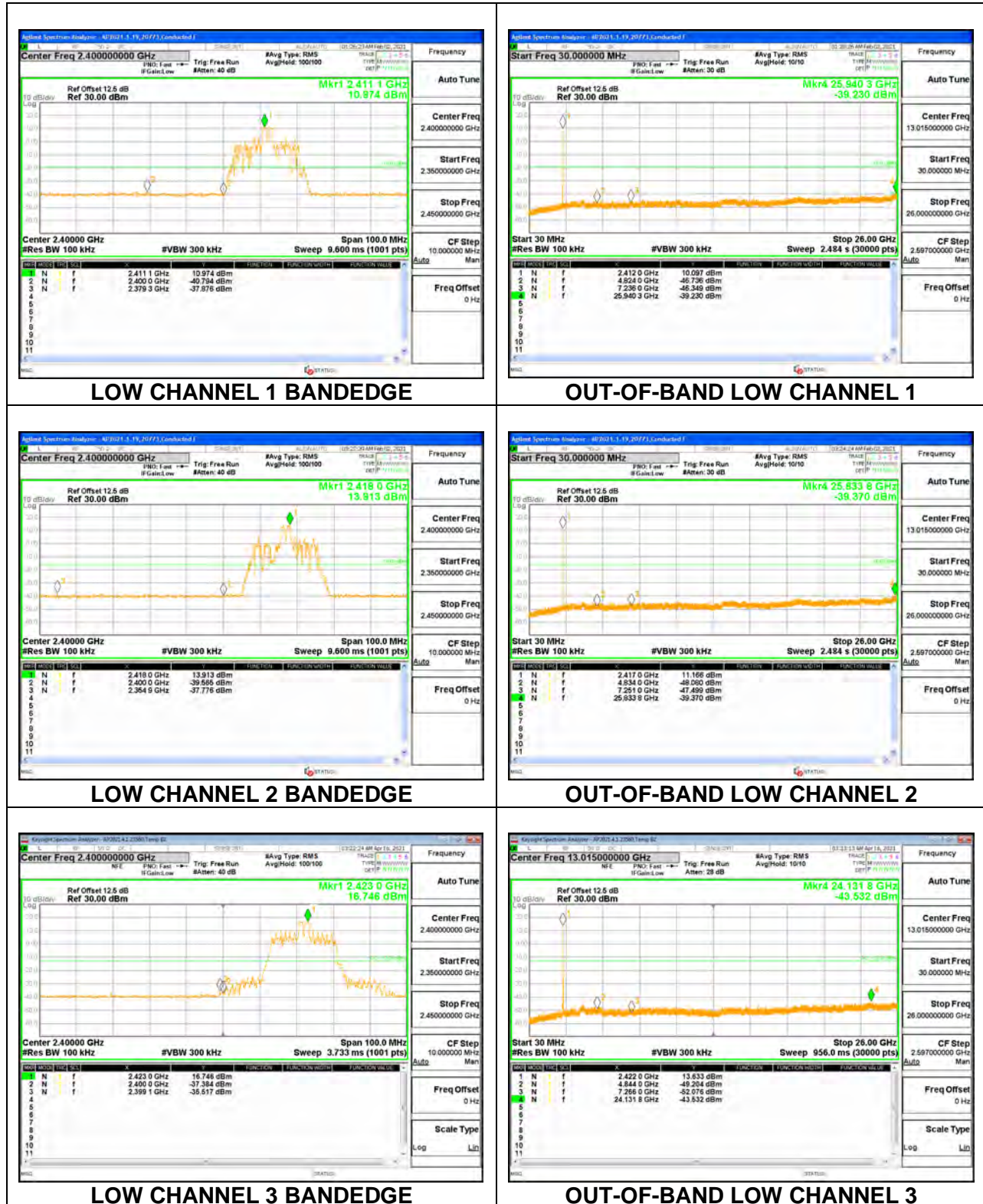
HIGH CHANNEL 10 BANDEDGE

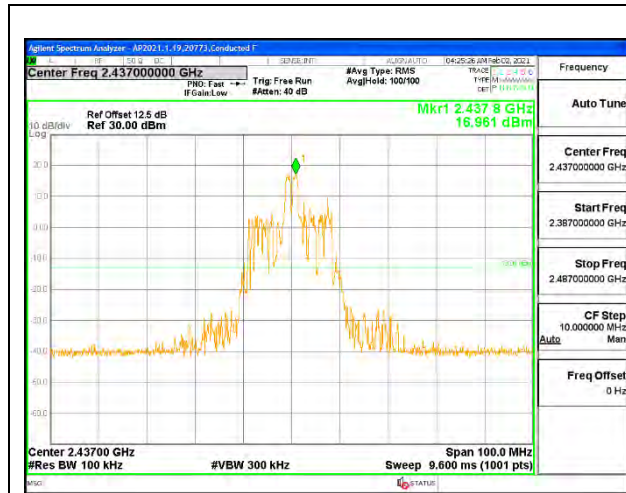


OUT-OF-BAND HIGH CHANNEL 10



ANT 4: 26-Tones, RU Index 4





MID CHANNEL REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



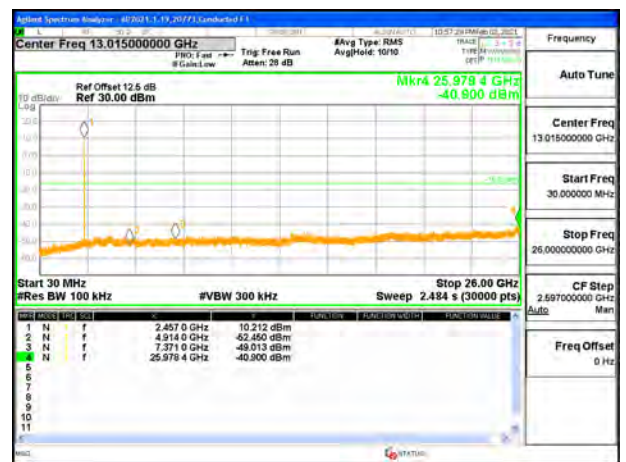
HIGH CHANNEL 9 BANDEDGE



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

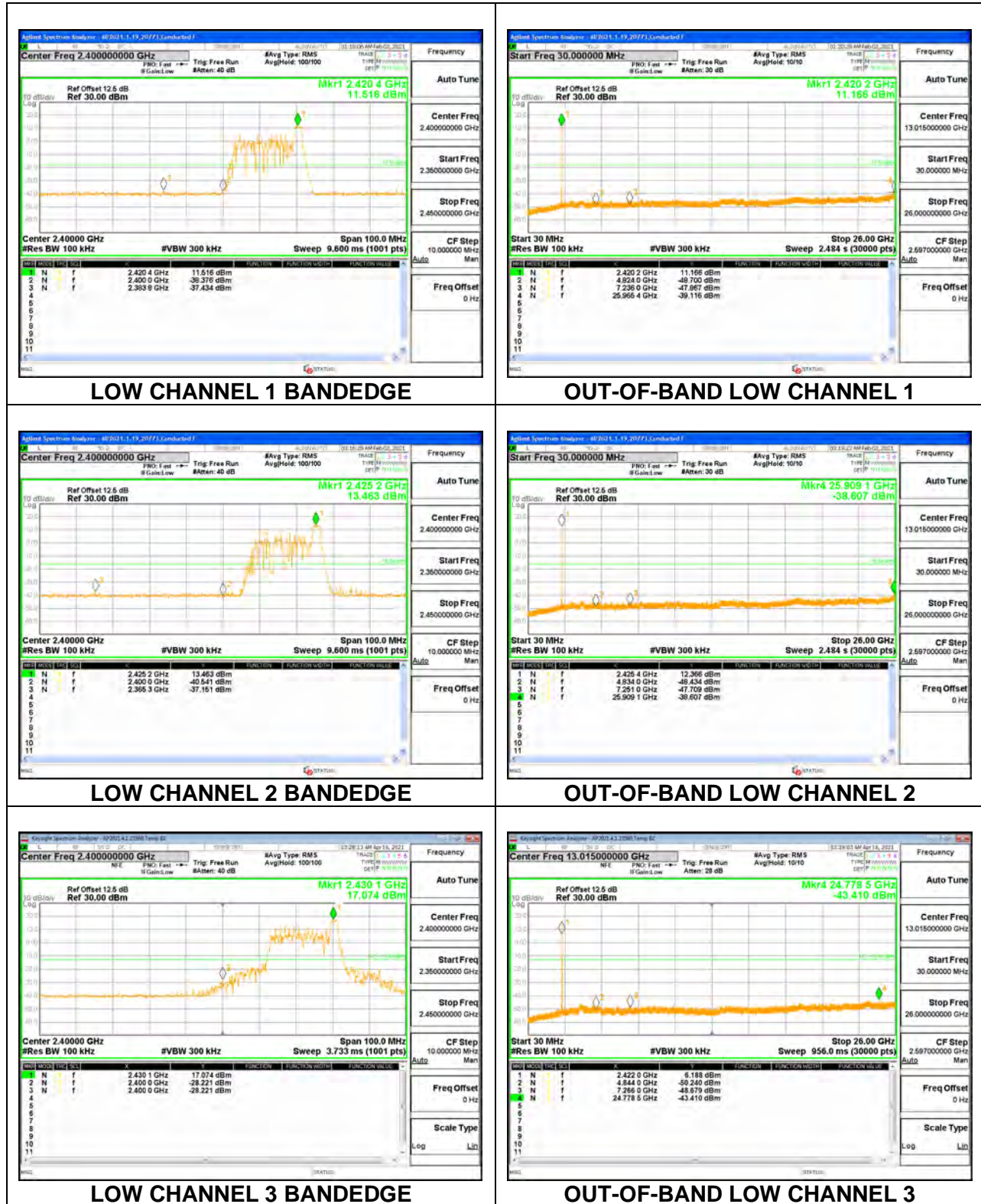


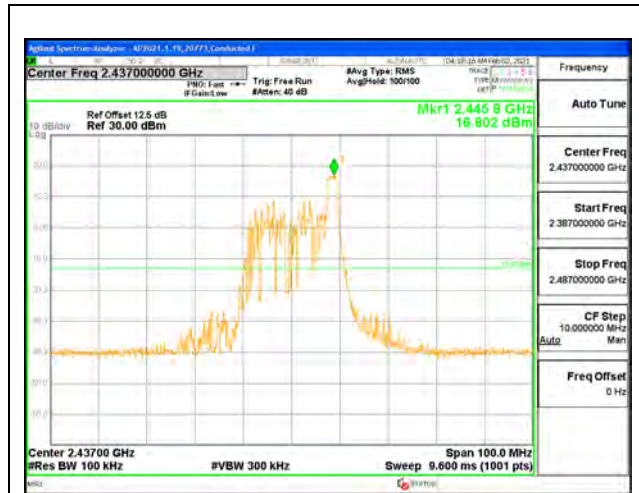
HIGH CHANNEL 13 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 13

ANT 4: 26-Tones, RU Index 8





MID CHANNEL REFERENCE LEVEL



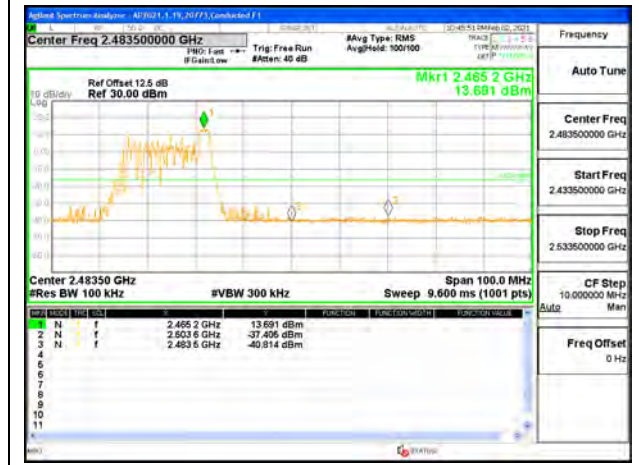
OUT-OF-BAND MID CHANNEL



HIGH CHANNEL 9 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 9



HIGH CHANNEL 10 BANDEDGE



OUT-OF-BAND HIGH CHANNEL 10