TEST REPORT

Report Number: 14040866-E4V3

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A2651 (Parent Model, Full Test) A2893, A2894, A2895, A2896 (Variant Models)
FCC ID	:	BCG-E8141A (Parent Model) BCG-E8154A, BCG-E8155A, BCG-E8156A (Variant Models)
IC	:	579C-E8141A (Parent Model) 579C-E8154A, 579C-E8155A, 579C-E8156A (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, 2022

Prepared by:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	7/14/2022	Initial Issue	Chris Xiong
V2	7/28/2022	Addressed TCB questions section 7, 8 and 10	Chris Xiong
V3	08/08/2022	Addressed TCB Feedback on updating radiated plot labels	Francisco Guarnero

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
EUT DESCRIPTION:	SMARTPHONE
MODEL:	A2651 (Parent Model) A2893, A2894, A2895, A2896 (Variant Models)
BRAND:	APPLE
FCC ID:	BCG-E8141A (Parent Model) BCG-E8154A, BCG-E8155A, BCG-E8156A (Variant Models)
IC ID:	579C-E8141A (Parent Model) 579C-E8154A, 579C-E8155A, 579C-E8156A (Variant Models)
SERIAL NUMBER:	JHXP7PXL52 (Radiated), RXPYHWRP4V (Conducted)
SAMPLE RECEIPT DATE:	MARCH 28, 2022
DATE TESTED:	APRIL 05, 2022 TO JULY 28, 2022

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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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.

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2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL LLC 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.
-	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
- FCC KDB 558074 D01 v05r02 15.247 Meas Guidance
- ANSI C63.10-2013
- KDB 662911
- RSS-GEN Issue 5 + A1 + A2
- KDB 414788 D01 Radiated Test Site v01r01
- RSS-247 Issue 2

4. FACILITIES AND ACCREDITATION

UL LLC 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.

Location	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	550739
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	550739

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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
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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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 and MSS. All models except reference model 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: A2651, FCC ID: BCG-E8141A, IC: 579C-E8141A

Variant Models: A2893, FCC ID: BCG-E8154A, IC: 579C-E8154A
A2894; FCC ID: BCG-E8155A, IC: 579C-E8155A
A2895 & A2896, FCC ID: BCG-E8156A, IC: 579C-E8156A

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	21.23	132.74
	802.11g	Covered by 802.11n HT20 1TX	
	802.11n HT20	21.24	133.05
	802.11ax HE20	21.23	132.74
2Tx 2412 - 2472	802.11n HT20 CDD	24.22	264.24
	802.11g SDM/STBC	Covered by 802.11n HT20 2TX CDD	
	802.11ax HE20 OFDMA	24.23	264.85

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain, as provided by the manufacturer' are as follow:

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	-1.0	-1.1

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was WiFi FW Version: 20_94_1_15.

6.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X, Y and Z on ANT 4 (Core 0), ANT 3 (Core 1) and 2TX. It was determined that X (Flatbed) orientation was the 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 HT20 mode: MCS7
802.11ax HE20 mode: MCS9
802.11ax HE20 RU26 and SU, MCS9

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There are three vendors of the Wi-Fi/Bluetooth radio modules: variant 1, 2 and 3. The WiFi/BT 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 three variants to determine the worst case on all conducted power and radiated emissions.

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

TEST SETUP

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

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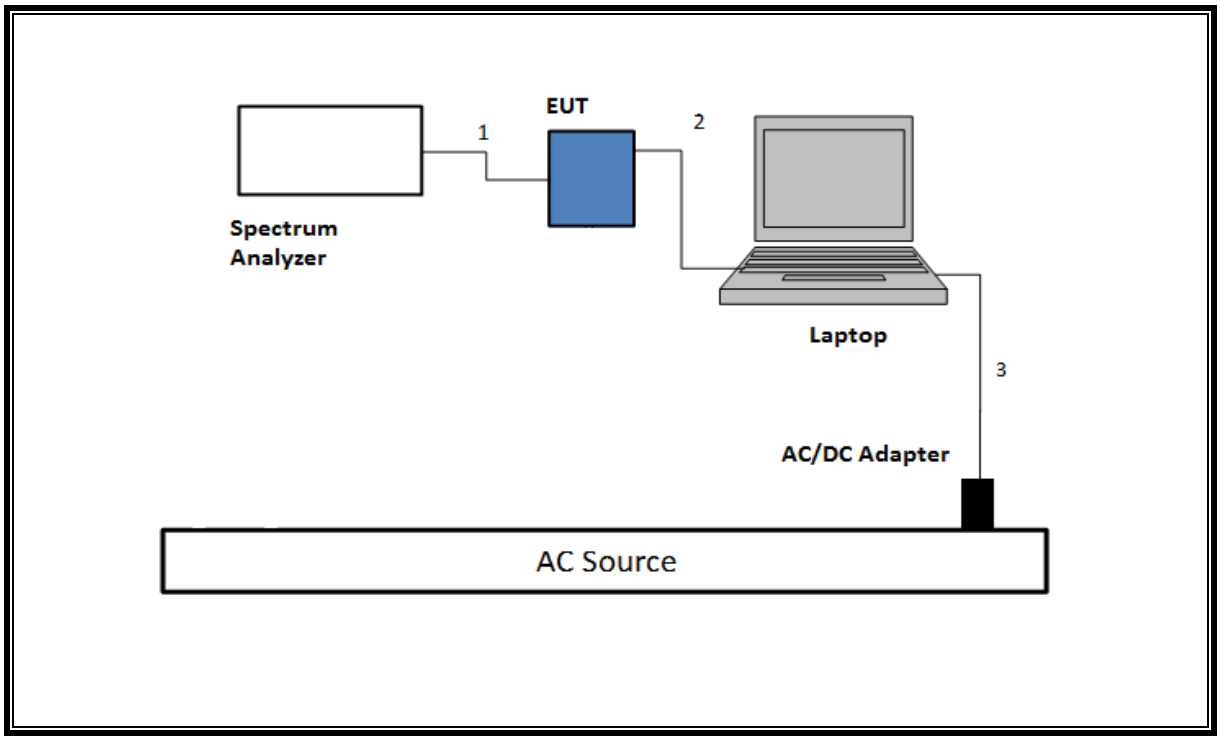
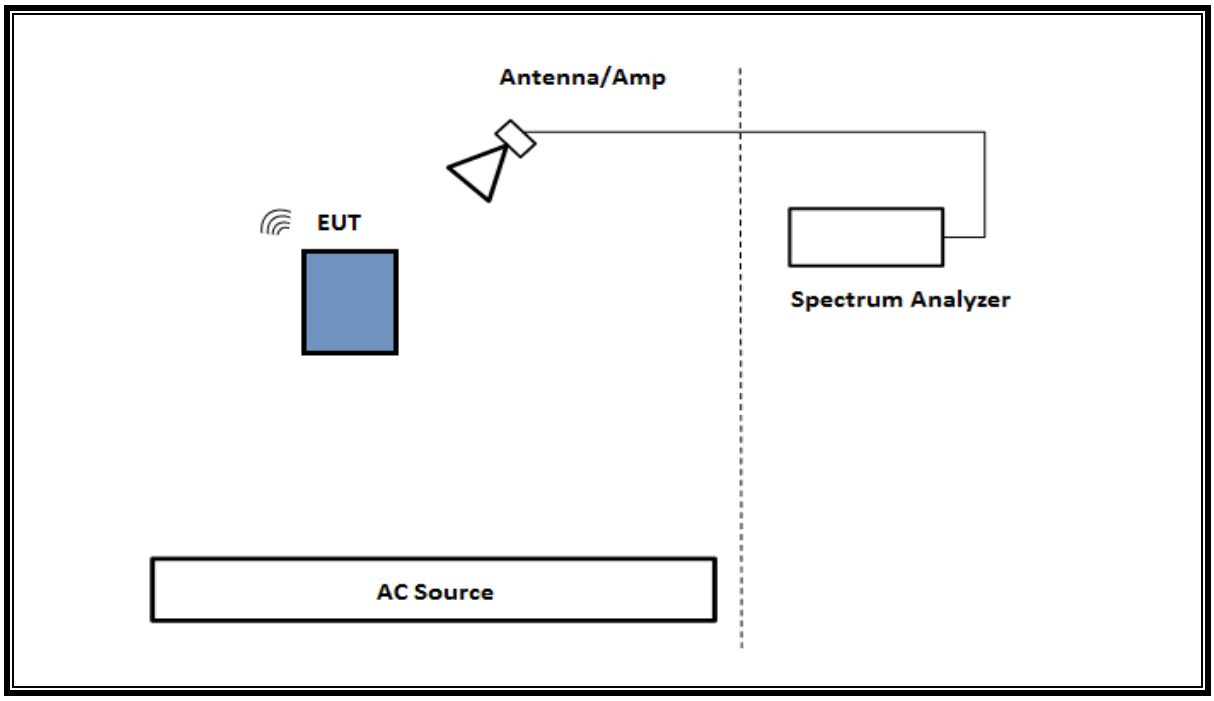
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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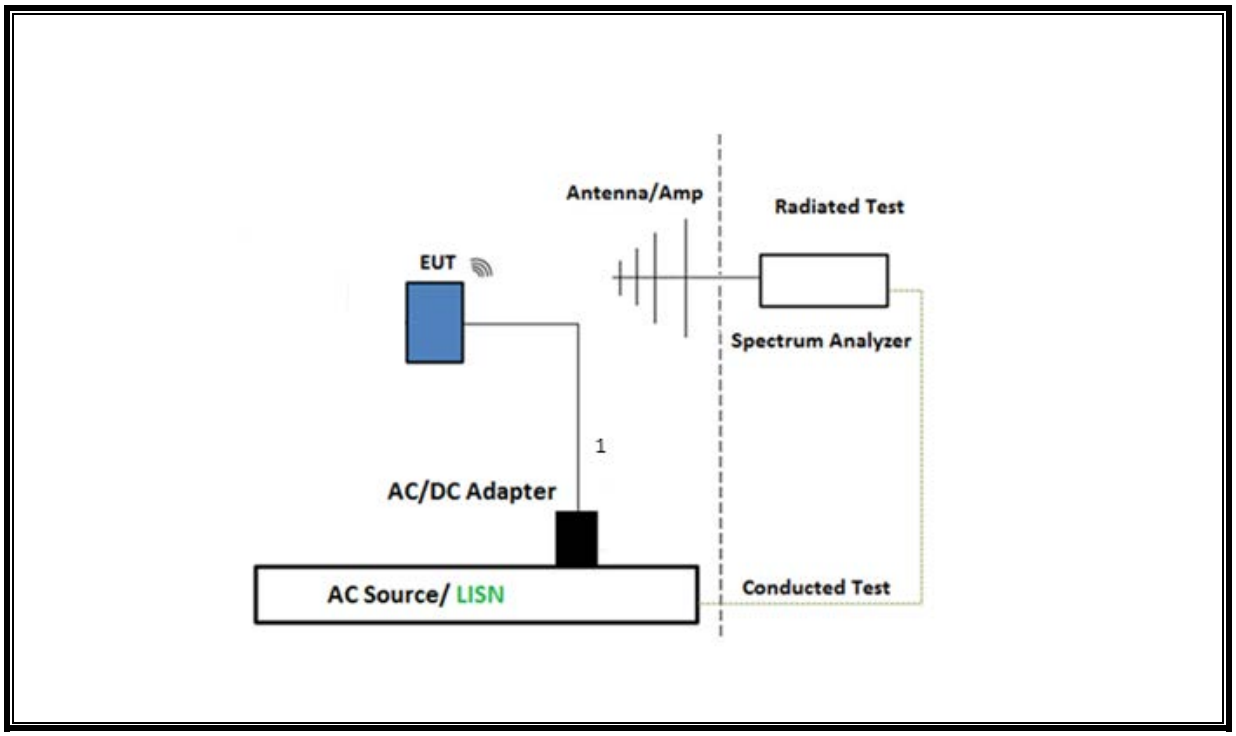
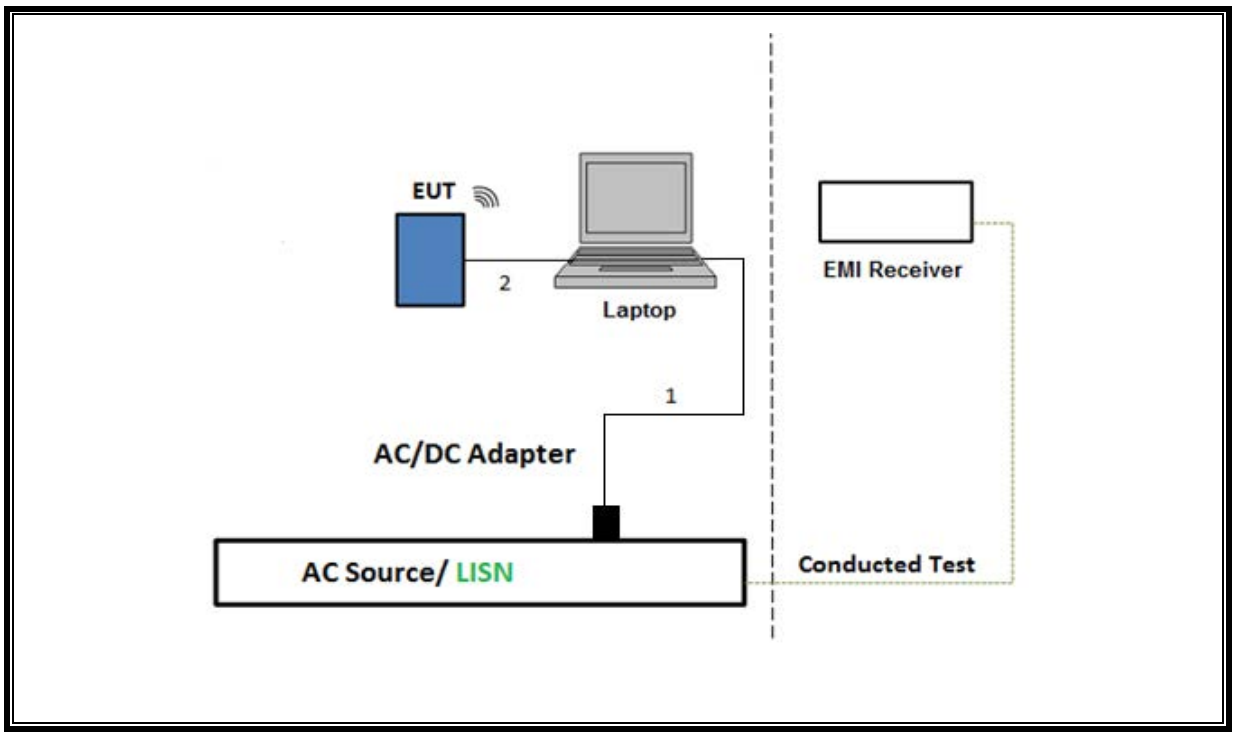
SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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7. MEASUREMENT METHOD

Test Item	Test Method
On Time and Duty Cycle	• KDB 558074 D01 v05r02, Section 6.
6dB Bandwith	• ANSI C63.10 Subclause -11.8.1 RBW ≥ DTS BW
Occupied Bandwidth (99%)	• ANSI C63.10-2013, Subclause 6.9.3.
Output Power	• ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (measurement using a gated RF average power meter)
Power Spectral Density	• 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 • 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

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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, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	80293	7/22/2022	7/22/2021
Amplifier, 10KHz to 1GHz, 32dB	Sonoma Instrument Co.	310N	89831	7/21/2022	7/21/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200786	2/24/2023	2/24/2022
RF Filter Box, 1-18GHz	UL-FR1 (CTECH)	N/A	PRE0183530	11/17/2022	11/17/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	191428	2/20/2023	2/20/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200897	2/24/2023	2/24/2022
*RF Filter Box	UL-FR1 (CTECH)	N/A	PRE0182865	4/13/2023	4/13/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	125188	1/30/2023	1/30/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	81887	3/16/2023	3/16/2022
Rf Filter Box	UL-FR1 (CTECH)	N/A	PRE0183207	10/23/2022	10/23/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	191429	2/20/2023	2/20/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80430	7/21/2022	7/21/2021
RF Filter Box, 1-18GHz	Fremont	N/A	169334	4/15/2023	4/15/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85201	2/1/2023	2/1/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80403	6/8/2023	6/8/2022
RF Filter Box, 1-18GHz	UL-FR1 (CTECH)	N/A	171389	5/31/2023	5/31/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201497	2/18/2023	2/18/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	84797	9/15/2022	9/15/2021
Filter Box, 1-18GHz 12 port	UL-FR1 (CTECH)	Frankenstein	217063	4/7/2023	4/7/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201502	2/22/2023	2/22/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	41112	9/21/2022	9/21/2021
RF Filter Box, 6 port, 1-18GHz	UL-FR1 (CTECH)	SAC 6 port rf box	203984	2/12/2023	2/12/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169936	2/22/2023	2/22/2022
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200895	10/13/2022	10/13/2021
RF Filter Box, 6 port, 1-18GHz	UL-FR1 (CTECH)	SAC 6 port rf box	203957	2/12/2023	2/12/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201498	2/20/2023	2/20/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	87738	02/02/2023	02/02/2022
Power sensor	Keysight	N1921A	90389	02/03/2023	02/03/2022
Power Meter, P-series single channel	Keysight	N1911A	PRE0177682	01/24/2023	01/24/2022
Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170013	07/29/2022	07/29/2021
Antenna, Passive Loop 100KHz to 30MHz	ETS-Lindgren	EM-6872	170015	07/29/2022	07/29/2021
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	82258	10/01/2022	10/01/2021
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	175953	2/08/2023	2/08/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169927	2/16/2023	2/16/2022
Antenna. Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	172363	12/07/2022	12/07/2021
Amplifier 18-26.5GHz,+5Vdc,-54dBmP1dB	AMPLICAL	AMP18G26.5-60	172583	1/27/2023	1/27/2022

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AC Line Conducted					
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	T1436	02/21/2023	02/21/2022
Power Cable, Line Conducted Emissions	UL	PR1	T861	10/27/2022	10/27/2021
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175765	01/26/2023	01/26/2022
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		

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b 1TX	1.206	1.221	0.988	98.77%	0.00	0.010
802.11n HT20, MCS 0	1.920	1.941	0.989	98.92%	0.00	0.010
802.11n HT20, MCS 7	0.136	0.156	0.870	87.00%	0.60	7.358
802.11ax HE20 26T, MCS0	3.995	4.035	0.990	99.01%	0.00	0.010
802.11ax HE20 26T, MCS9	0.350	0.393	0.891	89.06%	0.50	2.857
802.11ax HE20 SU, MCS0	1.488	1.509	0.986	98.61%	0.00	0.010
802.11ax HE20 SU, MCS9	0.168	0.188	0.891	89.07%	0.50	5.959

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

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DUTY CYCLE PLOTS

802.11b MODE

11n HT20, MCS 0

11n HT20, MCS 7

11ax HE20 26T, MCS0

11ax HE20 26T, MCS9

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11ax HE20 SU Mode, MCS0

11ax HE20 SU Mode, MCS9

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9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Only Mid channel plot is reported to show that setting parameters comply with testing methods/procedures.

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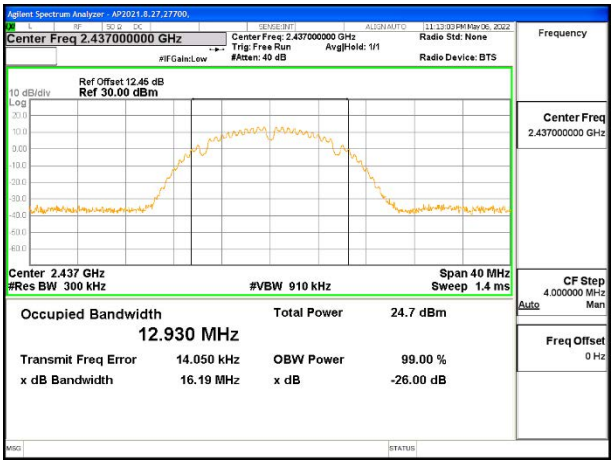
9.2.1. 802.11b MODE 1TX

1TX ANT 4 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.932
Mid 6	2437	12.930
High 11	2462	12.967
High 12	2467	13.074
High 13	2472	13.025



MID CHANNEL 6

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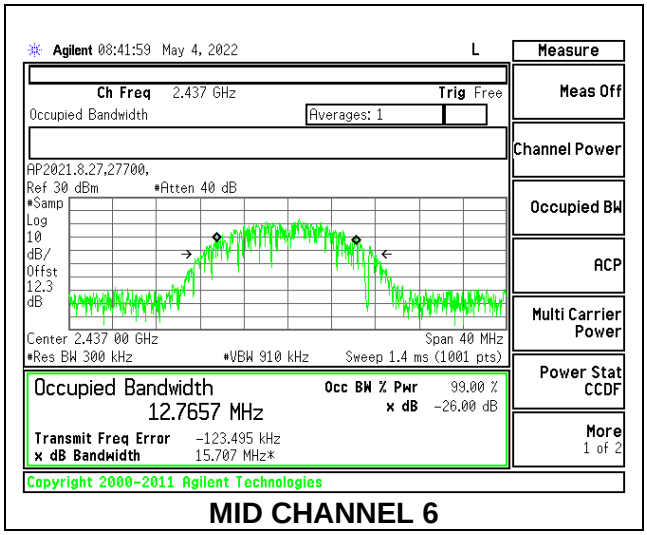
1TX ANT 3 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	12.745
Mid 6	2437	12.766
High 11	2462	12.947
High 12	2467	12.968
High 13	2472	13.041



MID CHANNEL 6

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9.2.2. 802.11n HT20 MODE 1TX

1TX ANT 4 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.896
Low 2	2417	17.837
Mid 6	2437	17.819
High 10	2457	17.985
High 11	2462	17.843
High 12	2467	17.910
High 13	2472	17.775

MID CHANNEL 6

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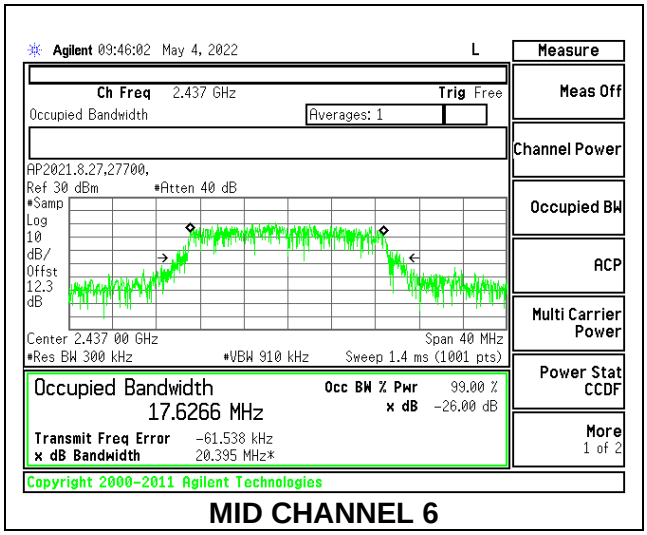
1TX ANT 3 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.686
Low 2	2417	17.719
Mid 6	2437	17.627
High 10	2457	17.683
High 11	2462	17.560
High 12	2467	17.698
High 13	2472	17.697



MID CHANNEL 6

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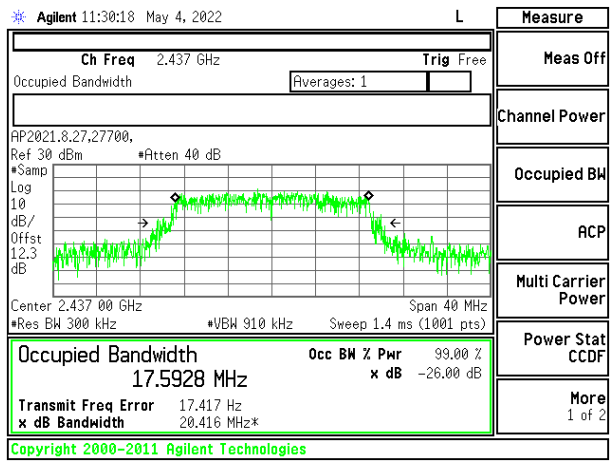
9.2.3. 802.11n HT20 CDD MODE 2TX

ANT 4 + ANT 3 2TX MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	17.872	17.661
Low 2	2417	17.811	17.569
Low 3	2422	17.870	17.827
Mid 6	2437	17.866	17.593
High 9	2452	17.828	17.921
High 10	2457	17.775	17.708
High 11	2462	17.813	17.640
High 12	2467	17.879	17.675
High 13	2472	17.843	17.654

MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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9.2.4. 802.11ax HE20 MODE 1TX

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.462
Mid 6	2437	18.417
High 11	2462	18.351
High 12	2467	18.388
High 13	2472	18.464

MID CHANNEL 6

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.120
Mid 6	2437	17.007
High 11	2462	17.028
High 12	2467	17.008
High 13	2472	17.239

MID CHANNEL 6

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.577
Mid 6	2437	18.561
High 11	2462	18.756
High 12	2467	18.695
High 13	2472	18.877

MID CHANNEL 6

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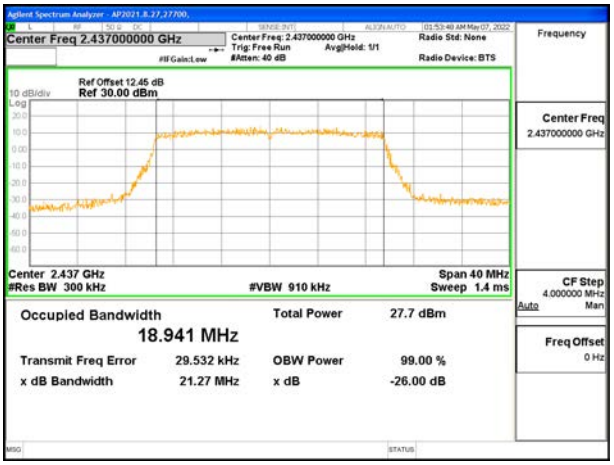
ANT 4 SISO MODE: SU Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.979
Low 2	2417	18.969
Low 3	2422	18.980
Mid 6	2437	18.941
High 9	2452	18.920
High 10	2457	18.949
High 11	2462	18.978
High 12	2467	19.025
High 13	2472	18.958



MID CHANNEL 6

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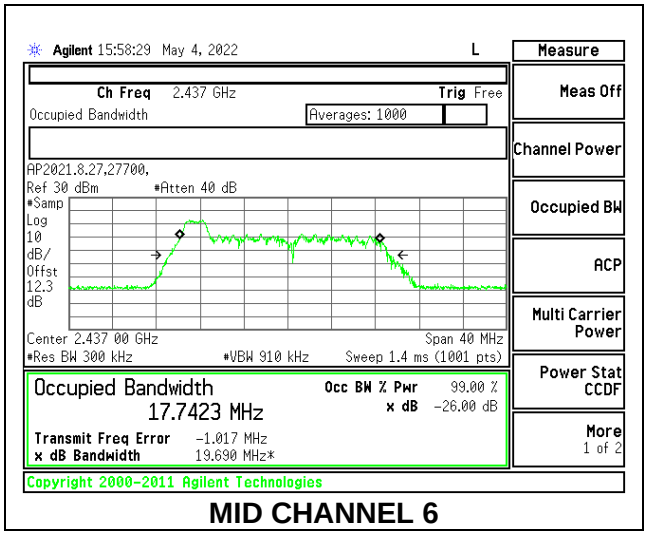
ANT 3 SISO MODE: 26-Tones, RU Index 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.1763
Mid 6	2437	17.7423
High 11	2462	17.8638
High 12	2467	17.8907
High 13	2472	17.6560



MID CHANNEL 6

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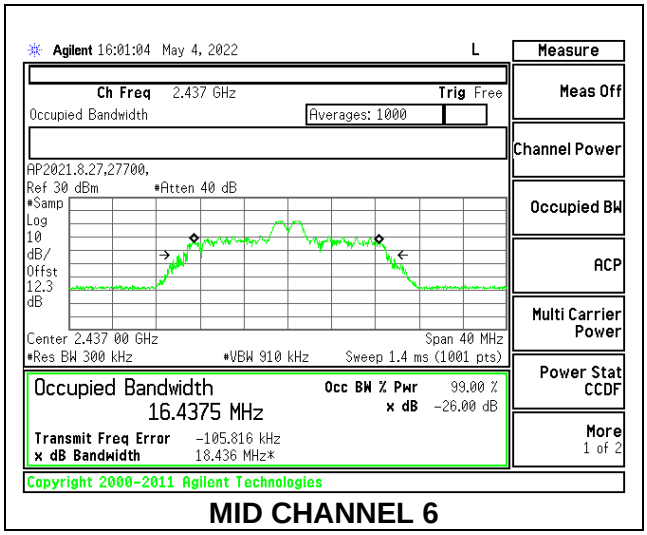
ANT 3 SISO MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	15.964
Mid 6	2437	16.438
High 11	2462	15.729
High 12	2467	15.504
High 13	2472	17.373



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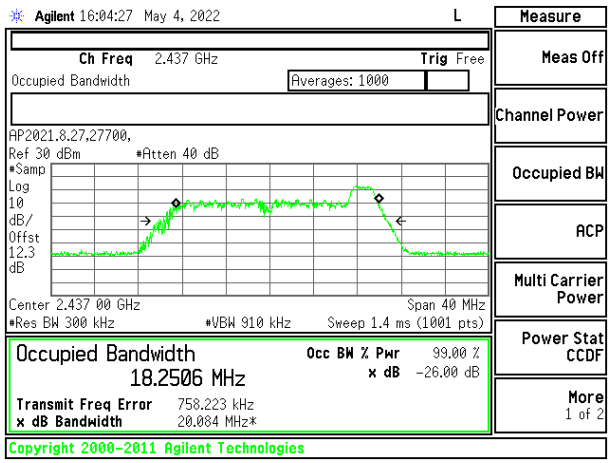
ANT 3 SISO MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	17.245
Mid 6	2437	18.251
High 11	2462	17.881
High 12	2467	18.452
High 13	2472	18.197



MID CHANNEL 6

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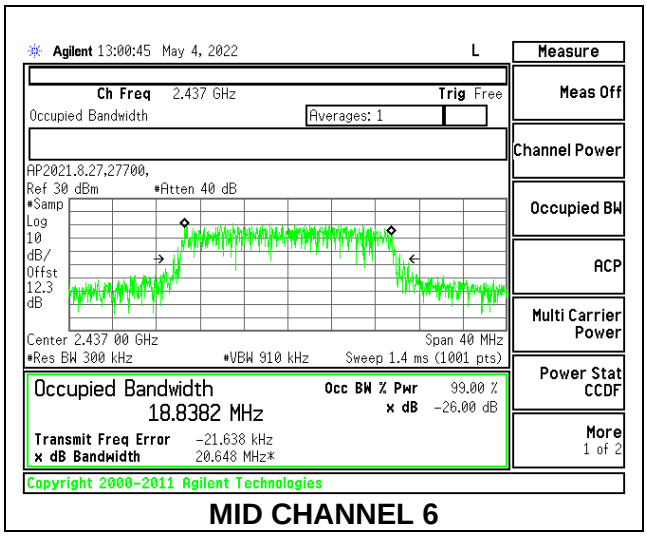
ANT 3 SISO MODE: SU Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low 1	2412	18.811
Low 2	2417	18.741
Low 3	2422	18.673
Mid 6	2437	18.838
High 9	2452	18.899
High 10	2457	19.062
High 11	2462	18.893
High 12	2467	18.789
High 13	2472	18.867



MID CHANNEL 6

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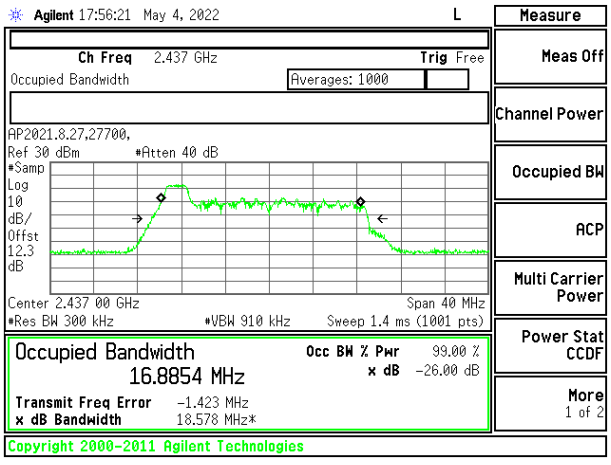
9.2.5. 802.11ax HE20 OFDMA MODE 2TX

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

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	18.428	18.399
Mid 6	2437	18.290	16.885
High 11	2462	18.271	18.182
High 12	2467	18.350	18.224
High 13	2472	18.451	18.268

MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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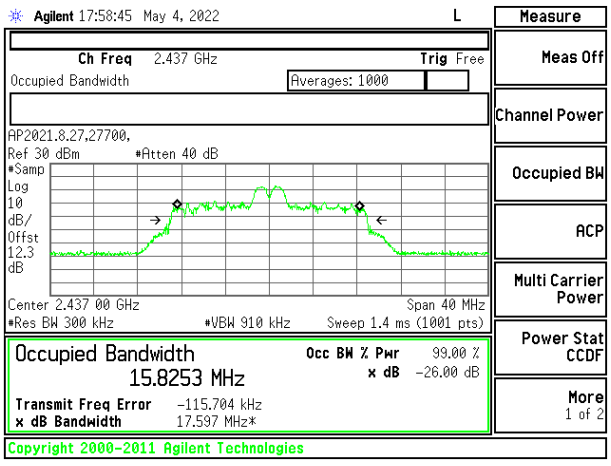
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 4

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	16.894	15.451
Mid 6	2437	16.919	15.825
High 11	2462	17.006	16.680
High 12	2467	16.911	16.553
High 13	2472	17.192	16.739

MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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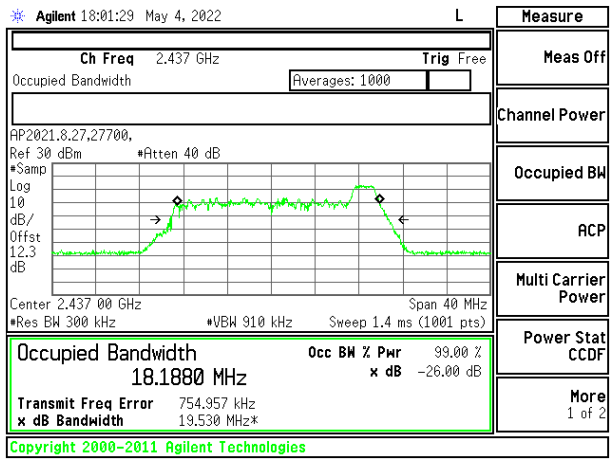
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	18.437	17.251
Mid 6	2437	18.497	18.188
High 11	2462	18.742	18.369
High 12	2467	18.774	18.382
High 13	2472	18.924	18.566

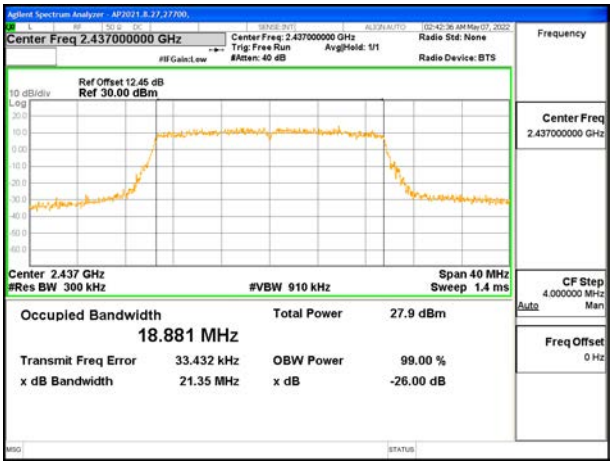
MID CHANNEL 6 ANT 4



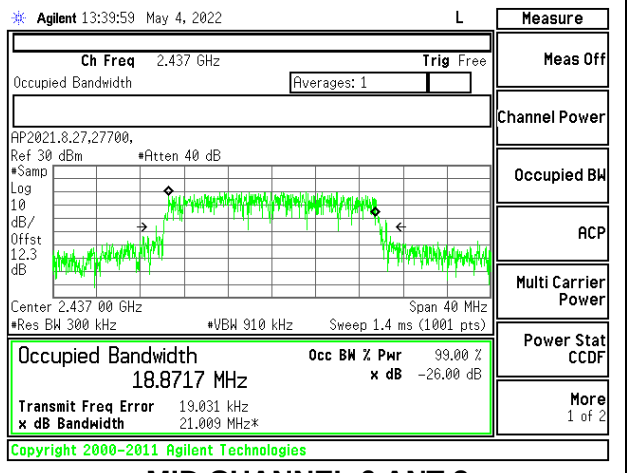
MID CHANNEL 6 ANT 3

ANT 4 + ANT 3 2TX MODE: SU Mode

Channel	Frequency (MHz)	99% Bandwidth (MHz) ANT 4	99% Bandwidth (MHz) ANT 3
Low 1	2412	18.947	18.883
Low 2	2417	18.942	18.871
Low 3	2422	18.967	18.831
Mid 6	2437	18.881	18.872
High 8	2447	18.949	18.902
High 9	2452	18.982	18.951
High 10	2457	18.972	18.841
High 11	2462	18.956	19.015
High 12	2467	18.974	18.911
High 13	2472	18.950	18.931



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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.

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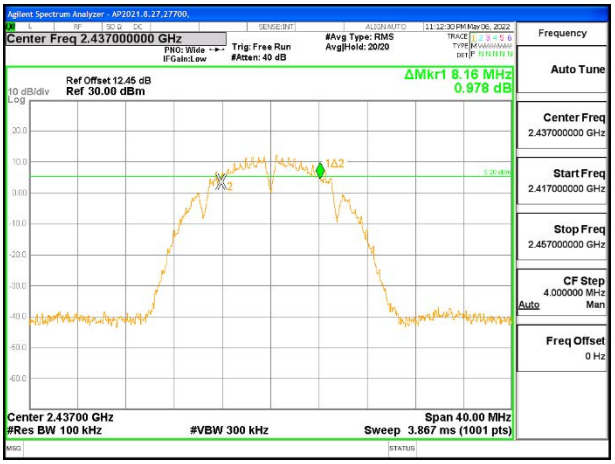
9.3.1. 802.11b MODE 1TX

1TX ANT 4 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.64	0.5
Mid 6	2437	8.16	0.5
High 11	2462	8.12	0.5
High 12	2467	7.64	0.5
High 13	2472	9.64	0.5



MID CHANNEL 6

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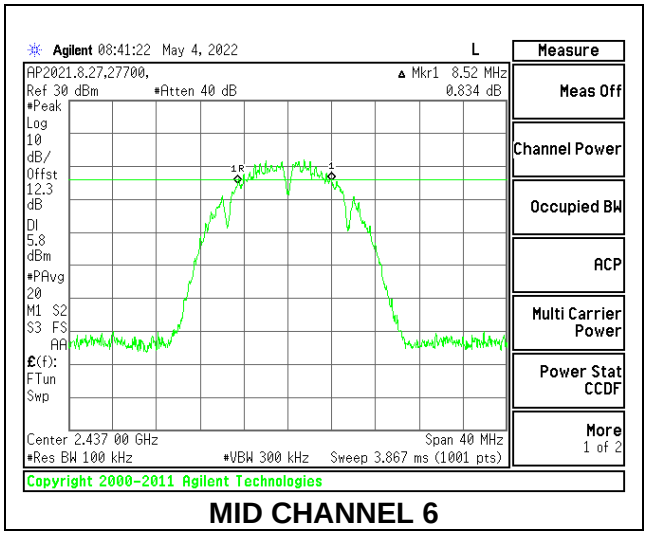
1TX ANT 3 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	8.20	0.5
Mid 6	2437	8.52	0.5
High 11	2462	8.08	0.5
High 12	2467	8.12	0.5
High 13	2472	8.16	0.5

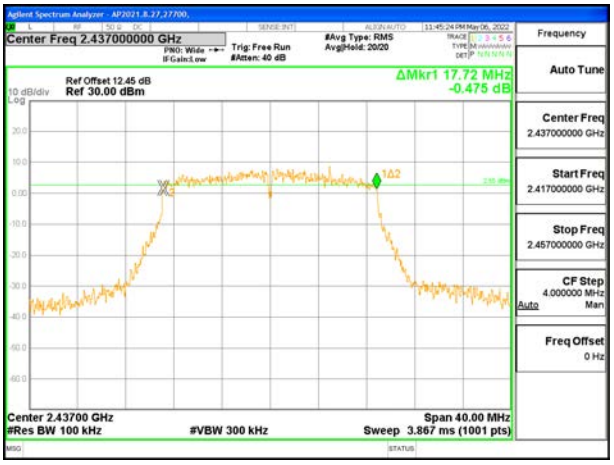


MID CHANNEL 6

9.3.2. 802.11n HT20 MODE 1TX

1TX ANT 4 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.28	0.5
Low 2	2417	17.64	0.5
Mid 6	2437	17.72	0.5
High 10	2457	17.68	0.5
High 11	2462	17.04	0.5
High 12	2467	17.68	0.5
High 13	2472	17.44	0.5



MID CHANNEL 6

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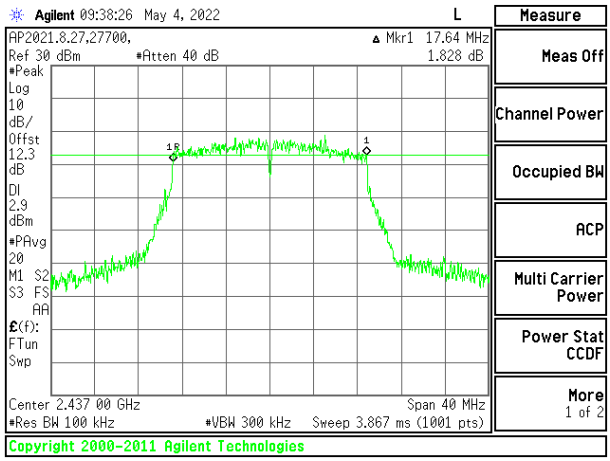
1TX ANT 3 MODE

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.36	0.5
Low 2	2417	15.36	0.5
Mid 6	2437	17.64	0.5
High 10	2457	15.68	0.5
High 11	2462	17.28	0.5
High 12	2467	16.76	0.5
High 13	2472	17.24	0.5

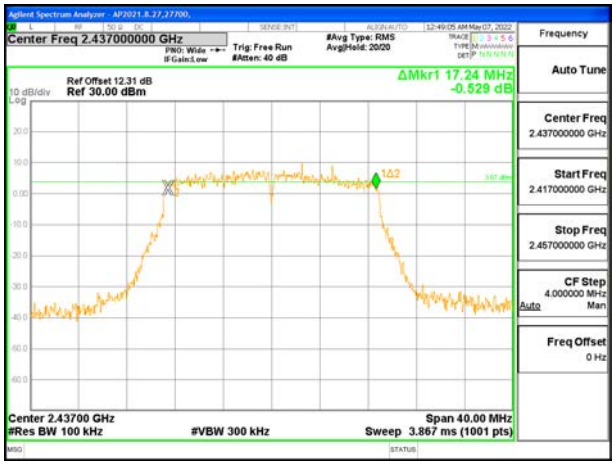


MID CHANNEL 6

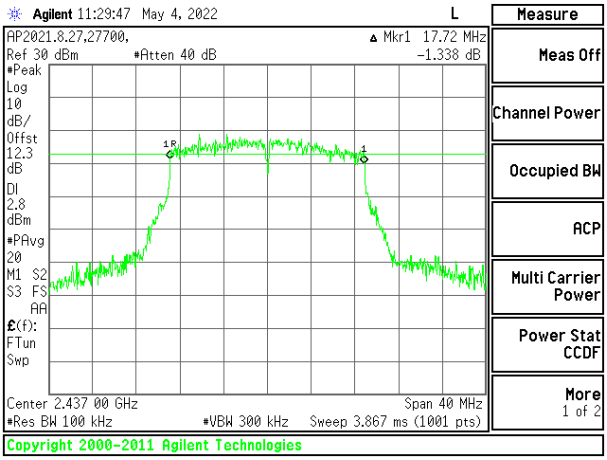
9.3.3. 802.11n HT20 CDD MODE 2TX

ANT 4 + ANT 3

Channel	Frequency (MHz)	6dB Bandwidth (MHz) ANT 4	6dB Bandwidth (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	16.76	17.72	0.5
Low 2	2417	16.36	15.76	0.5
Low 3	2422	15.36	15.60	0.5
Mid 6	2437	17.24	17.72	0.5
High 9	2452	15.20	17.36	0.5
High 10	2457	15.40	16.40	0.5
High 11	2462	15.80	17.68	0.5
High 12	2467	14.72	16.40	0.5
High 13	2472	17.44	16.72	0.5



MID CHANNEL 6 ANT 4

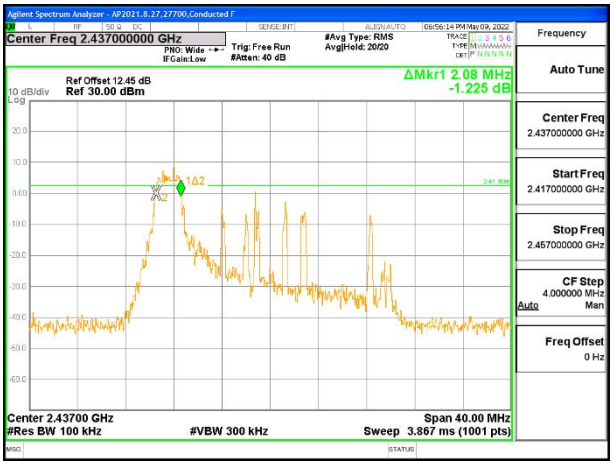


MID CHANNEL 6 ANT 3

9.3.4. 802.11ax HE20 MODE 1TX

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

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



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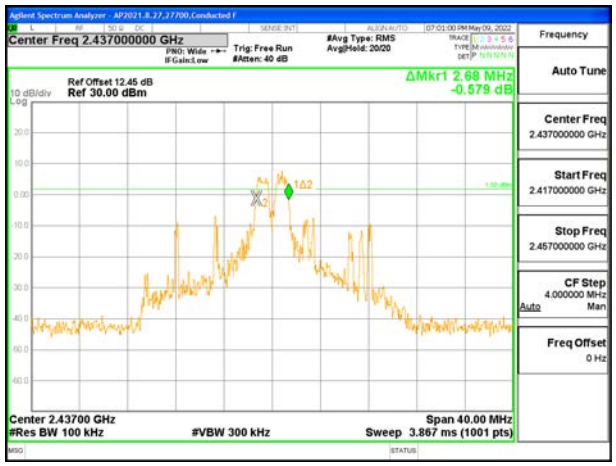
ANT 4 SISO MODE: 26-Tones, RU Index 4

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	2.68	0.5
High 13	2472	2.68	0.5



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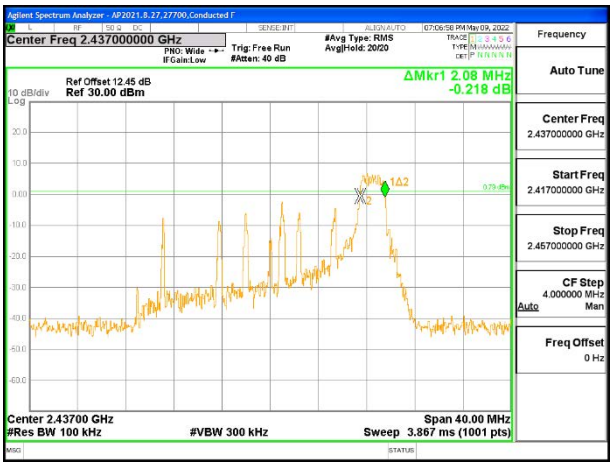
ANT 4 SISO MODE: 26-Tones, RU Index 8

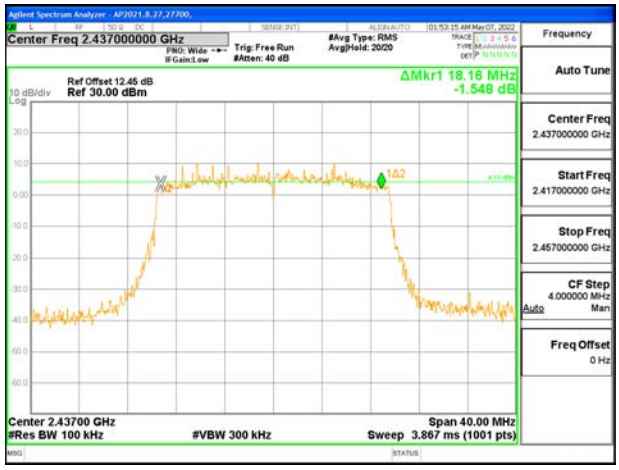
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.16	0.5
Mid 6	2437	2.08	0.5
High 11	2462	2.08	0.5
High 12	2467	2.08	0.5
High 13	2472	2.16	0.5



MID CHANNEL 6

ANT 4 SISO MODE: SU Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	17.36	0.5
Low 2	2417	16.60	0.5
Low 3	2422	16.72	0.5
Mid 6	2437	18.16	0.5
High 9	2452	18.56	0.5
High 10	2457	15.60	0.5
High 11	2462	17.00	0.5
High 12	2467	16.28	0.5
High 13	2472	18.28	0.5

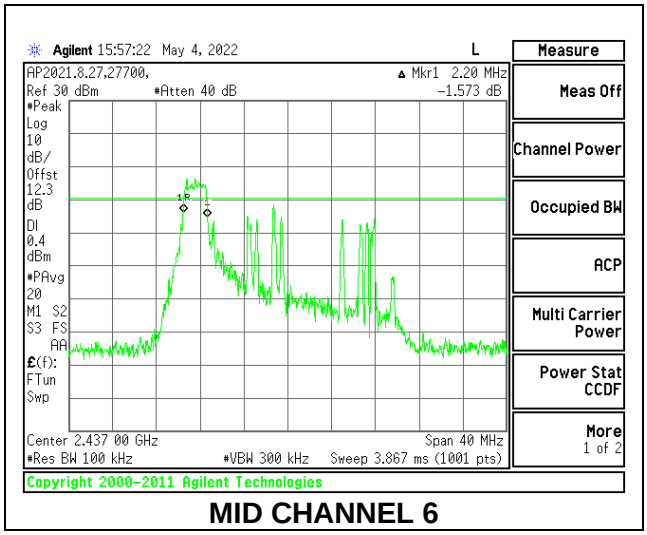


MID CHANNEL 6

UL LLC.
47173 Benicia Street, Fremont, CA 94538; USA. TEL:(510) 319-4000 FAX:(510) 661-0888

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

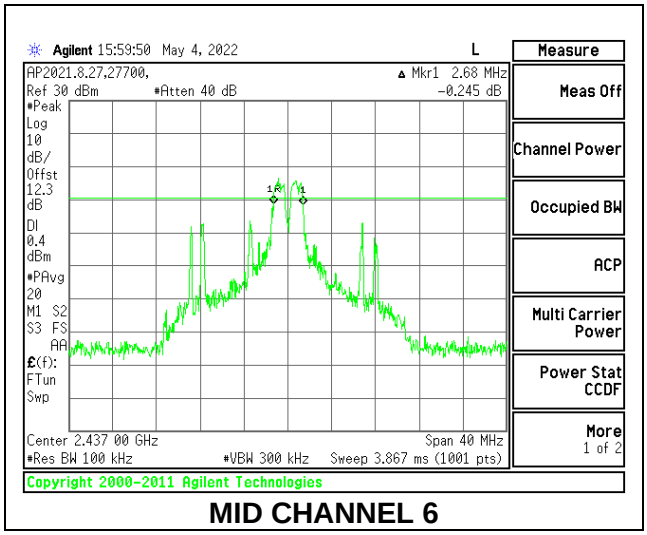
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.08	0.5
Mid 6	2437	2.20	0.5
High 11	2462	2.12	0.5
High 12	2467	2.12	0.5
High 13	2472	2.12	0.5



MID CHANNEL 6

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.64	0.5
Mid 6	2437	2.68	0.5
High 11	2462	2.68	0.5
High 12	2467	2.72	0.5
High 13	2472	2.12	0.5

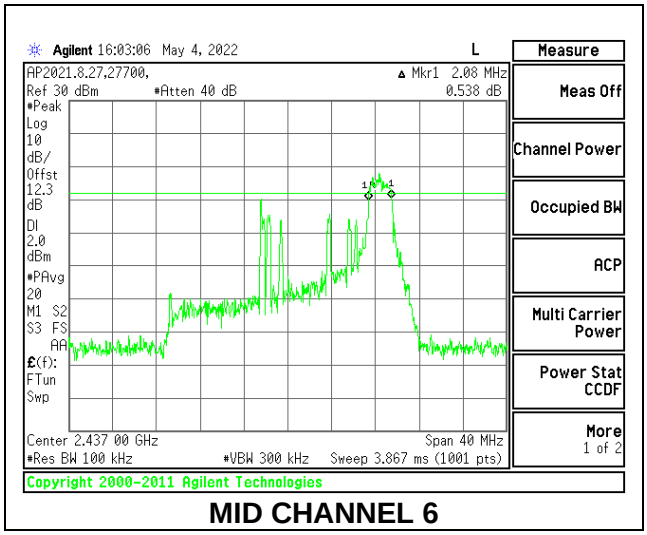


MID CHANNEL 6

UL LLC.
47173 Benicia Street, Fremont, CA 94538; USA. TEL:(510) 319-4000 FAX:(510) 661-0888

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

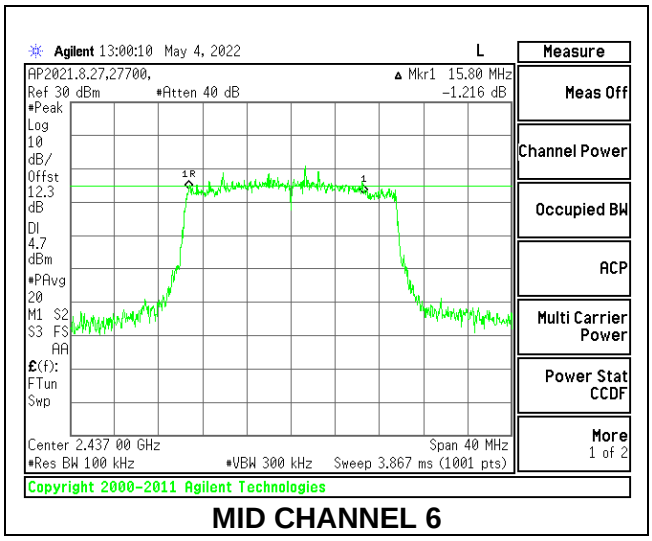
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	2.08	0.5
Mid 6	2437	2.08	0.5
High 11	2462	2.08	0.5
High 12	2467	2.08	0.5
High 13	2472	2.12	0.5



MID CHANNEL 6

ANT 3 SISO MODE: SU Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)
Low 1	2412	16.08	0.5
Low 2	2417	14.92	0.5
Low 3	2422	14.72	0.5
Mid 6	2437	15.80	0.5
High 9	2452	16.76	0.5
High 10	2457	18.80	0.5
High 11	2462	17.52	0.5
High 12	2467	18.00	0.5
High 13	2472	18.64	0.5

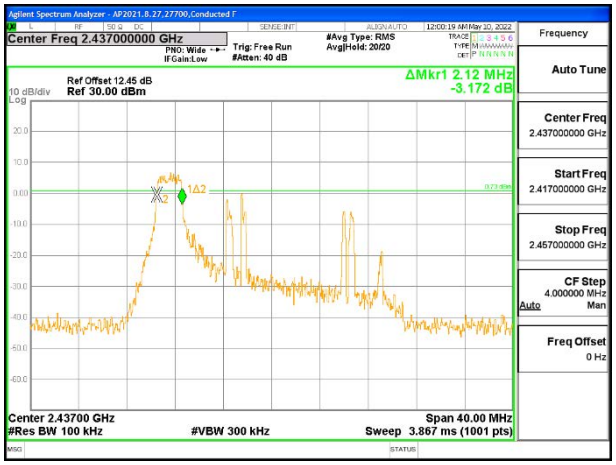


MID CHANNEL 6

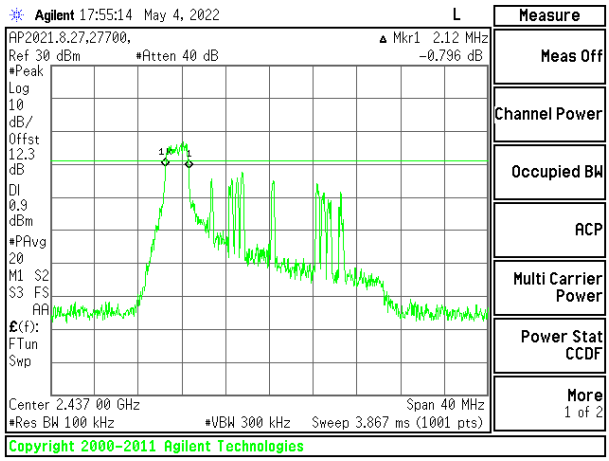
9.3.5. 802.11ax HE20 OFDMA MODE 2TX

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz) ANT 4	6dB Bandwidth (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	2.16	2.08	0.5
Mid 6	2437	2.12	2.12	0.5
High 11	2462	2.08	2.08	0.5
High 12	2467	2.12	2.08	0.5
High 13	2472	2.16	2.08	0.5



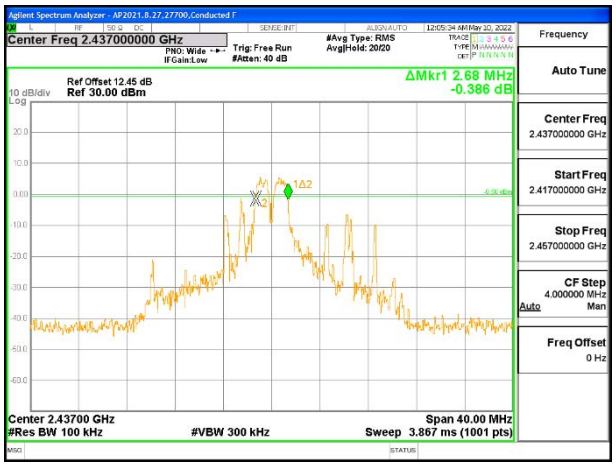
MID CHANNEL 6 ANT 4



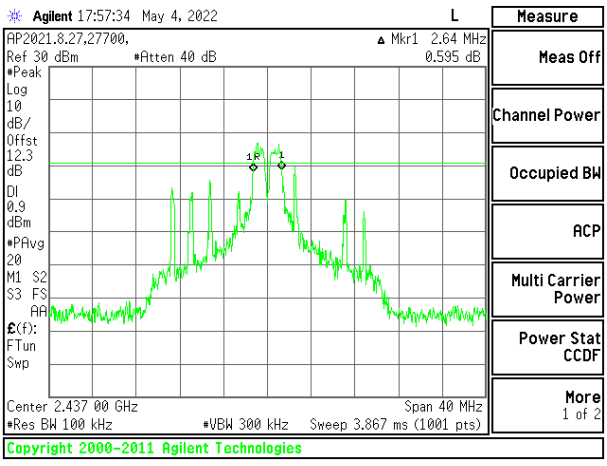
MID CHANNEL 6 ANT 3

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz) ANT 4	6dB Bandwidth (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	2.64	2.68	0.5
High 12	2467	2.64	2.72	0.5
High 13	2472	2.64	2.64	0.5



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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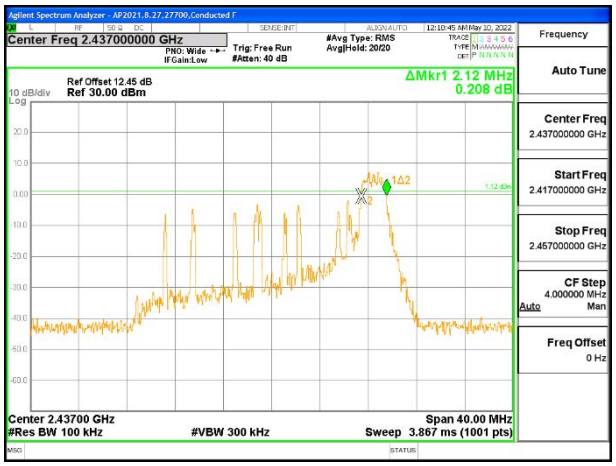
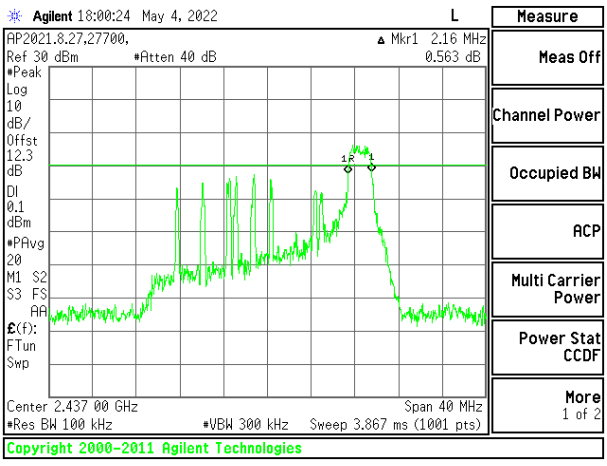
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Channel	Frequency (MHz)	6dB Bandwidth (MHz) ANT 4	6dB Bandwidth (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	2.12	2.12	0.5
Mid 6	2437	2.12	2.16	0.5
High 11	2462	2.12	2.08	0.5
High 12	2467	2.20	2.08	0.5
High 13	2472	2.08	2.12	0.5



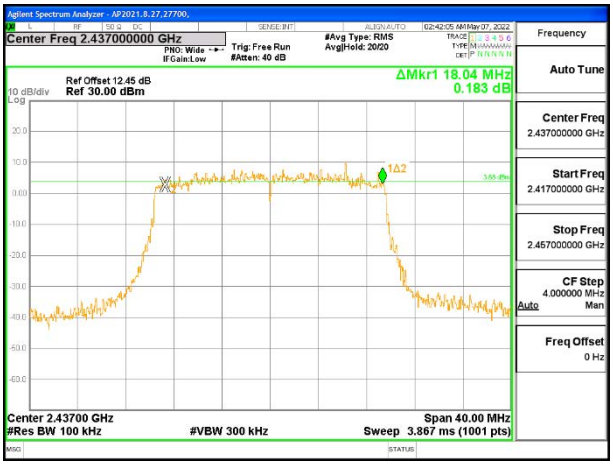
MID CHANNEL 6 ANT 4



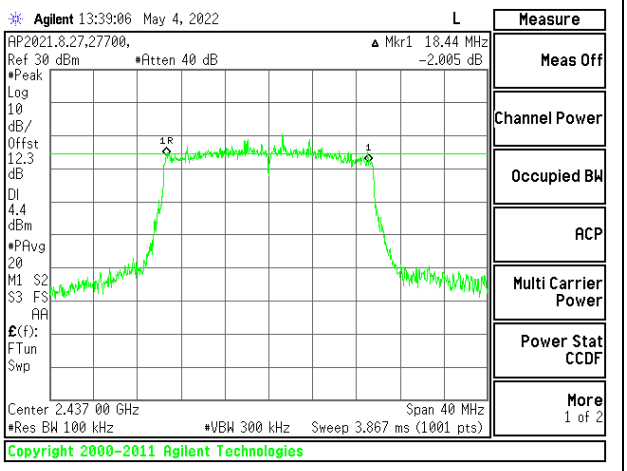
MID CHANNEL 6 ANT 3

ANT 4 + ANT 3 2TX MODE: SU Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz) ANT 4	6dB Bandwidth (MHz) ANT 3	Minimum Limit (MHz)
Low 1	2412	18.96	16.36	0.5
Low 2	2417	17.20	15.28	0.5
Low 3	2422	16.72	18.52	0.5
Mid 6	2437	18.04	18.44	0.5
High 8	2447	18.68	17.88	0.5
High 9	2452	17.00	18.00	0.5
High 10	2457	18.16	17.80	0.5
High 11	2462	15.56	18.84	0.5
High 12	2467	17.68	16.40	0.5
High 13	2472	18.48	18.40	0.5



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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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. Gated average 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)	ANT4 Gain (dBi)	ANT3 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	-1.00	-1.10	-1.05	1.96

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain=10*LOG((10^(Ant1/10)+10^(Ant2/10))/2)
Correlated directional Gain=10*LOG(((10^(Ant1/20)+10^(Ant2/20))^2)/2)

Sample Calculation:

Ant1 = -1.0, Ant2 = -1.1

Uncorrelated Antenna Gain = 10log[(10^(-1.0/10)+10^(-1.1/10))/2] = -1.05 dBi
Correlated Antenna Gain = 10log[(10^(-1.0/20)+10^(-1.1/20))^2)/2] = 1.96 dBi

RESULTS

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9.4.1. 802.11b MODE 1TX

Test Engineer:	26118
Test Date:	7/11/2022

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	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.21	21.21	30.00	-8.79
Mid 6	2437	21.20	21.20	30.00	-8.80
High 11	2462	21.23	21.23	30.00	-8.77
High 12	2467	21.19	21.19	30.00	-8.81
High 13	2472	21.21	21.21	30.00	-8.79

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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	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	21.19	21.19	30.00	-8.81
Mid 6	2437	21.20	21.20	30.00	-8.80
High 11	2462	21.22	21.22	30.00	-8.78
High 12	2467	21.18	21.18	30.00	-8.82
High 13	2472	21.20	21.20	30.00	-8.80

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9.4.2. 802.11n HT20 MODE 1TX

Test Engineer:	26118
Test Date:	7/11/2022

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	-1.00	30.00	30.00	36.00	30.00
Low 2	2417	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 10	2457	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.20	17.20	30.00	-12.80
Low 2	2417	20.22	20.22	30.00	-9.78
Mid 6	2437	21.23	21.23	30.00	-8.77
High 10	2457	20.18	20.18	30.00	-9.82
High 11	2462	18.17	18.17	30.00	-11.83
High 12	2467	16.20	16.20	30.00	-13.80
High 13	2472	14.73	14.73	30.00	-15.27

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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	-1.10	30.00	30.00	36.00	30.00
Low 2	2417	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 10	2457	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	17.21	17.21	30.00	-12.79
Low 2	2417	20.21	20.21	30.00	-9.79
Mid 6	2437	21.24	21.24	30.00	-8.76
High 10	2457	20.19	20.19	30.00	-9.81
High 11	2462	18.23	18.23	30.00	-11.77
High 12	2467	16.24	16.24	30.00	-13.76
High 13	2472	14.74	14.74	30.00	-15.26

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9.4.3. 802.11n HT20 CDD MODE 2TX

Test Engineer:	26118
Test Date:	7/11/2022

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	-1.05	30.00	36	36	30.00
Low 2	2417	-1.05	30.00	36	36	30.00
Low 3	2422	-1.05	30.00	36	36	30.00
Mid 6	2437	-1.05	30.00	36	36	30.00
High 9	2452	-1.05	30.00	36	36	30.00
High 10	2457	-1.05	30.00	36	36	30.00
High 11	2462	-1.05	30.00	36	36	30.00
High 12	2467	-1.05	30.00	36	36	30.00
High 13	2472	-1.05	30.00	36	36	30.00

Results

Channel	Frequency (MHz)	ANT4 Meas Power (dBm)	ANT3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.69	16.67	19.69	30.00	-10.31
Low 2	2417	19.23	19.20	22.23	30.00	-7.77
Low 3	2422	20.70	20.71	23.72	30.00	-6.28
Mid 6	2437	21.22	21.20	24.22	30.00	-5.78
High 9	2452	20.17	20.19	23.19	30.00	-6.81
High 10	2457	19.21	19.22	22.23	30.00	-7.77
High 11	2462	17.16	17.18	20.18	30.00	-9.82
High 12	2467	14.73	14.72	17.74	30.00	-12.26
High 13	2472	14.22	14.24	17.24	30.00	-12.76

9.4.4. 802.11ax HE20 MODE 1TX

Test Engineer:	26118
Test Date:	7/11/2022

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	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.70	11.70	30.00	-18.30
Mid 6	2437	11.75	11.75	30.00	-18.25
High 11	2462	11.69	11.69	30.00	-18.31
High 12	2467	11.70	11.70	30.00	-18.30
High 13	2472	0.73	0.73	30.00	-29.27

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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	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.66	30.00	-18.34
Mid 6	2437	11.69	11.69	30.00	-18.31
High 11	2462	11.67	11.67	30.00	-18.33
High 12	2467	11.70	11.70	30.00	-18.30
High 13	2472	0.71	0.71	30.00	-29.29

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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	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.72	11.72	30.00	-18.28
Mid 6	2437	11.75	11.75	30.00	-18.25
High 11	2462	11.74	11.74	30.00	-18.26
High 12	2467	11.67	11.67	30.00	-18.33
High 13	2472	0.70	0.70	30.00	-29.30

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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	-1.00	30.00	30.00	36.00	30.00
Low 2	2417	-1.00	30.00	30.00	36.00	30.00
Low 3	2422	-1.00	30.00	30.00	36.00	30.00
Mid 6	2437	-1.00	30.00	30.00	36.00	30.00
High 9	2452	-1.00	30.00	30.00	36.00	30.00
High 10	2457	-1.00	30.00	30.00	36.00	30.00
High 11	2462	-1.00	30.00	30.00	36.00	30.00
High 12	2467	-1.00	30.00	30.00	36.00	30.00
High 13	2472	-1.00	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	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	18.70	18.70	30.00	-11.30
Low 3	2422	20.73	20.73	30.00	-9.27
Mid 6	2437	21.22	21.22	30.00	-8.78
High 9	2452	20.70	20.70	30.00	-9.30
High 10	2457	18.66	18.66	30.00	-11.34
High 11	2462	16.69	16.69	30.00	-13.31
High 12	2467	14.72	14.72	30.00	-15.28
High 13	2472	9.74	9.74	30.00	-20.26

UL LLC.
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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	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.66	30.00	-18.34
Mid 6	2437	11.71	11.71	30.00	-18.29
High 11	2462	11.68	11.68	30.00	-18.32
High 12	2467	11.73	11.73	30.00	-18.27
High 13	2472	0.72	0.72	30.00	-29.28

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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	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.66	30.00	-18.34
Mid 6	2437	11.71	11.71	30.00	-18.29
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	0.69	0.69	30.00	-29.31

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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	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.71	11.71	30.00	-18.29
Mid 6	2437	11.74	11.74	30.00	-18.26
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	0.73	0.73	30.00	-29.27

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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	-1.10	30.00	30.00	36.00	30.00
Low 2	2417	-1.10	30.00	30.00	36.00	30.00
Low 3	2422	-1.10	30.00	30.00	36.00	30.00
Mid 6	2437	-1.10	30.00	30.00	36.00	30.00
High 9	2452	-1.10	30.00	30.00	36.00	30.00
High 10	2457	-1.10	30.00	30.00	36.00	30.00
High 11	2462	-1.10	30.00	30.00	36.00	30.00
High 12	2467	-1.10	30.00	30.00	36.00	30.00
High 13	2472	-1.10	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.65	16.65	30.00	-13.35
Low 2	2417	18.68	18.68	30.00	-11.32
Low 3	2422	20.70	20.70	30.00	-9.30
Mid 6	2437	21.23	21.23	30.00	-8.77
High 9	2452	20.69	20.69	30.00	-9.31
High 10	2457	18.70	18.70	30.00	-11.30
High 11	2462	16.72	16.72	30.00	-13.28
High 12	2467	14.69	14.69	30.00	-15.31
High 13	2472	9.73	9.73	30.00	-20.27

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9.4.5. 802.11ax HE20 OFDMA MODE 2TX

Test Engineer:	26118
Test Date:	7/11/2022

ANT 4 + ANT 3 2TX 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	-1.05	30.00	36.00	36.00	30.00
Mid 6	2437	-1.05	30.00	36.00	36.00	30.00
High 11	2462	-1.05	30.00	36.00	36.00	30.00
High 12	2467	-1.05	30.00	36.00	36.00	30.00
High 13	2472	-1.05	30.00	36.00	36.00	30.00

Results

Channel	Frequency (MHz)	ANT4 Meas Power (dBm)	ANT3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.72	11.70	14.72	30.00	-15.28
Mid 6	2437	11.71	11.73	14.73	30.00	-15.27
High 11	2462	11.68	11.66	14.68	30.00	-15.32
High 12	2467	11.70	11.73	14.73	30.00	-15.27
High 13	2472	-0.30	-0.33	2.70	30.00	-27.30

UL LLC.
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ANT 4 + ANT 3 2TX 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	-1.05	30.00	36.00	36.00	30.00
Mid 6	2437	-1.05	30.00	36.00	36.00	30.00
High 11	2462	-1.05	30.00	36.00	36.00	30.00
High 12	2467	-1.05	30.00	36.00	36.00	30.00
High 13	2472	-1.05	30.00	36.00	36.00	30.00

Results

Channel	Frequency (MHz)	ANT4 Meas Power (dBm)	ANT3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.66	11.71	14.70	30.00	-15.30
Mid 6	2437	11.68	11.70	14.70	30.00	-15.30
High 11	2462	11.71	11.72	14.73	30.00	-15.27
High 12	2467	11.66	11.65	14.67	30.00	-15.33
High 13	2472	-0.27	-0.29	2.73	30.00	-27.27

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ANT 4 + ANT 3 2TX 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	-1.05	30.00	36.00	36.00	30.00
Mid 6	2437	-1.05	30.00	36.00	36.00	30.00
High 11	2462	-1.05	30.00	36.00	36.00	30.00
High 12	2467	-1.05	30.00	36.00	36.00	30.00
High 13	2472	-1.05	30.00	36.00	36.00	30.00

Results

Channel	Frequency (MHz)	ANT4 Meas Power (dBm)	ANT3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	11.69	11.73	14.72	30.00	-15.28
Mid 6	2437	11.75	11.72	14.75	30.00	-15.25
High 11	2462	11.67	11.68	14.69	30.00	-15.31
High 12	2467	11.70	11.69	14.71	30.00	-15.29
High 13	2472	-0.25	-0.31	2.73	30.00	-27.27

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ANT 4 + ANT 3 2TX 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	-1.05	30.00	36.00	36.00	30.00
Low 2	2417	-1.05	30.00	36.00	36.00	30.00
Low 3	2422	-1.05	30.00	36.00	36.00	30.00
Mid 6	2437	-1.05	30.00	36.00	36.00	30.00
High 8	2447	-1.05	30.00	36.00	36.00	30.00
High 9	2452	-1.05	30.00	36.00	36.00	30.00
High 10	2457	-1.05	30.00	36.00	36.00	30.00
High 11	2462	-1.05	30.00	36.00	36.00	30.00
High 12	2467	-1.05	30.00	36.00	36.00	30.00
High 13	2472	-1.05	30.00	36.00	36.00	30.00

Results

Channel	Frequency (MHz)	ANT4 Meas Power (dBm)	ANT3 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	15.71	15.73	18.73	30.00	-11.27
Low 2	2417	17.72	17.69	20.72	30.00	-9.28
Low 3	2422	19.70	19.67	22.70	30.00	-7.30
Mid 6	2437	21.23	21.20	24.23	30.00	-5.77
High 8	2447	21.21	21.19	24.21	30.00	-5.79
High 9	2452	19.20	19.22	22.22	30.00	-7.78
High 10	2457	17.68	17.70	20.70	30.00	-9.30
High 11	2462	15.69	15.72	18.72	30.00	-11.28
High 12	2467	13.22	13.23	16.24	30.00	-13.76
High 13	2472	8.74	8.71	11.74	30.00	-18.26

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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

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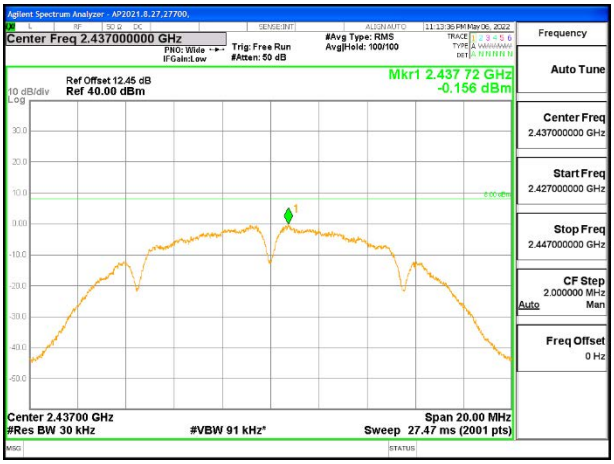
9.5.1. 802.11b MODE 1TX

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	-0.218	-0.218	8.000	-8.218
Mid 6	2437	-0.156	-0.156	8.000	-8.156
High 11	2462	-0.102	-0.102	8.000	-8.102
High 12	2467	-0.372	-0.372	8.000	-8.372
High 13	2472	-0.059	-0.059	8.000	-8.059



MID CHANNEL 6

UL LLC.
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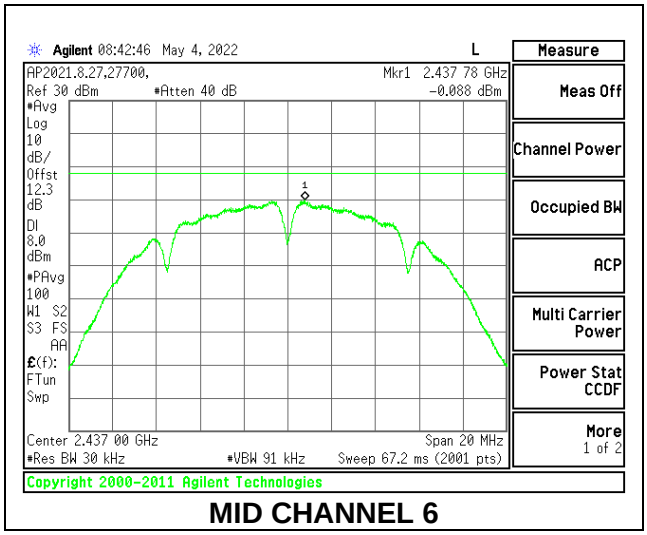
1TX ANT 3 MODE

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-0.121	-0.121	8.000	-8.121
Mid 6	2437	-0.088	-0.088	8.000	-8.088
High 11	2462	-0.201	-0.201	8.000	-8.201
High 12	2467	-0.201	-0.201	8.000	-8.201
High 13	2472	-0.380	-0.380	8.000	-8.380

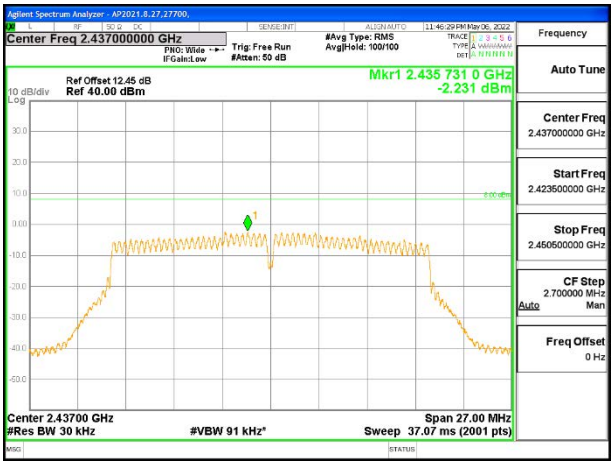


MID CHANNEL 6

9.5.2. 802.11n HT20 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	-6.894	-6.894	8.000	-14.894
Low 2	2417	-3.459	-3.459	8.000	-11.459
Mid 6	2437	-2.231	-2.231	8.000	-10.231
High 10	2457	-3.574	-3.574	8.000	-11.574
High 11	2462	-5.354	-5.354	8.000	-13.354
High 12	2467	-7.742	-7.742	8.000	-15.742
High 13	2472	-9.894	-9.894	8.000	-17.894



MID CHANNEL 6

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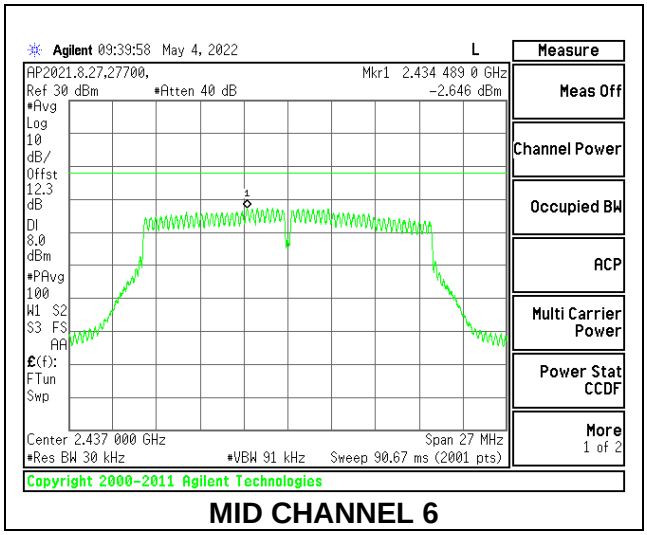
1TX ANT 3 MODE

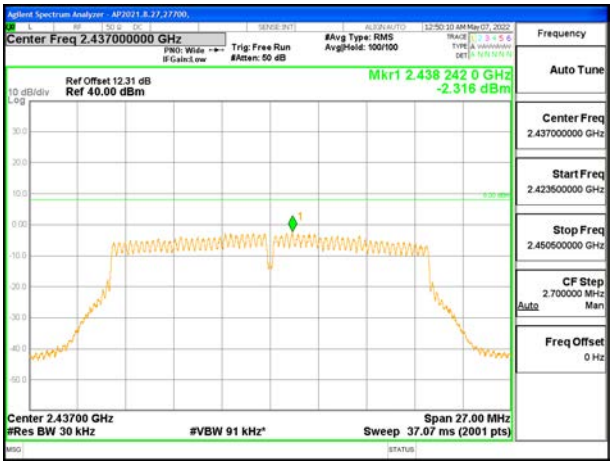
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-6.997	-6.997	8.000	-14.997
Low 2	2417	-3.549	-3.549	8.000	-11.549
Mid 6	2437	-2.646	-2.646	8.000	-10.646
High 10	2457	-3.721	-3.721	8.000	-11.721
High 11	2462	-5.613	-5.613	8.000	-13.613
High 12	2467	-7.548	-7.548	8.000	-15.548
High 13	2472	-9.577	-9.577	8.000	-17.577



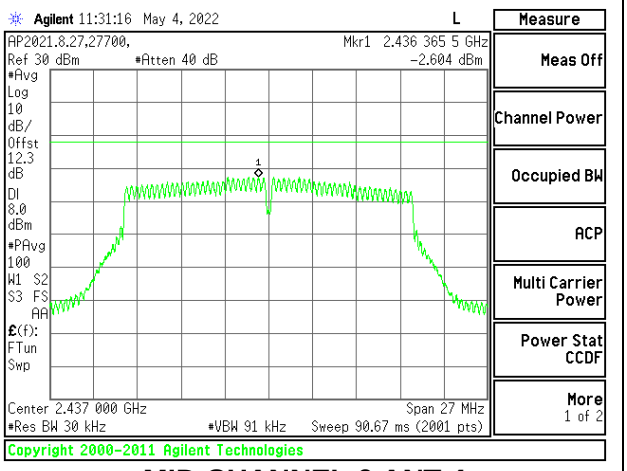
MID CHANNEL 6

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)	ANT4 Meas (dBm/3kHz)	ANT3 Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-7.125	-7.150	-4.127	8.000	-12.127
Low 2	2417	-3.629	-4.062	-0.830	8.000	-8.830
Low 3	2422	-2.825	-2.883	0.156	8.000	-7.844
Mid 6	2437	-2.316	-2.604	0.553	8.000	-7.447
High 9	2452	-3.373	-3.362	-0.357	8.000	-8.357
High 10	2457	-3.818	-4.107	-0.950	8.000	-8.950
High 11	2462	-6.476	-6.546	-3.501	8.000	-11.501
High 12	2467	-9.125	-8.909	-6.005	8.000	-14.005
High 13	2472	-10.245	-10.012	-7.117	8.000	-15.117



MID CHANNEL 6 ANT 3



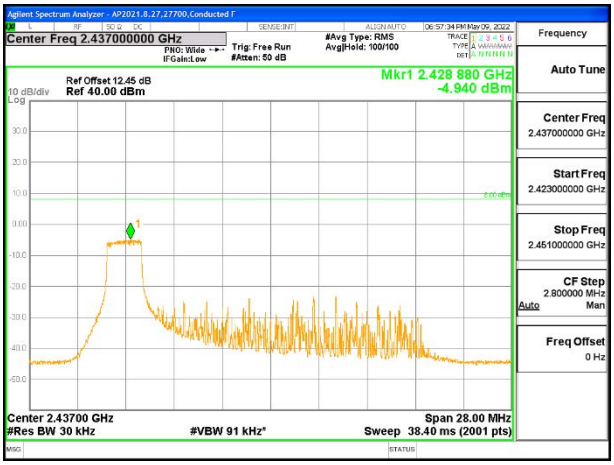
MID CHANNEL 6 ANT 4

UL LLC.
47173 Benicia Street, Fremont, CA 94538; USA. TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.4. 802.11ax HE20 MODE 1TX

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

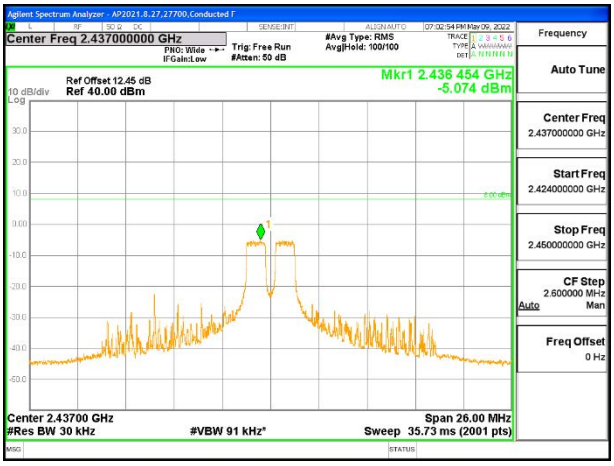
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-5.288	-5.288	8.000	-13.288
Mid 6	2437	-4.940	-4.940	8.000	-12.940
High 11	2462	-5.226	-5.226	8.000	-13.226
High 12	2467	-4.953	-4.953	8.000	-12.953
High 13	2472	-15.852	-15.852	8.000	-23.852



MID CHANNEL 6

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	-5.107	-5.107	8.000	-13.107
Mid 6	2437	-5.074	-5.074	8.000	-13.074
High 11	2462	-4.754	-4.754	8.000	-12.754
High 12	2467	-5.286	-5.286	8.000	-13.286
High 13	2472	-16.235	-16.235	8.000	-24.235



MID CHANNEL 6

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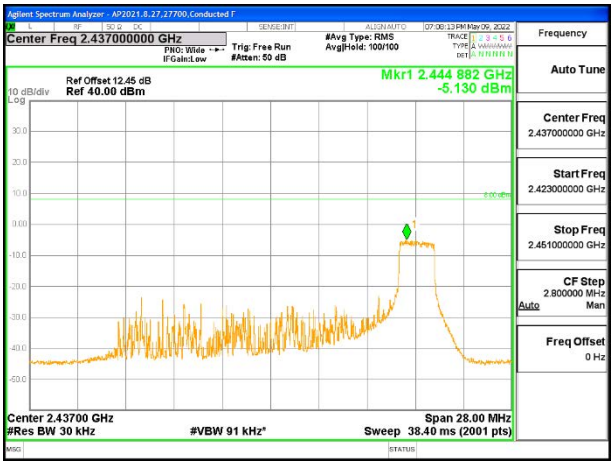
1TX ANT 4 MODE , 26-Tone RU Index 8

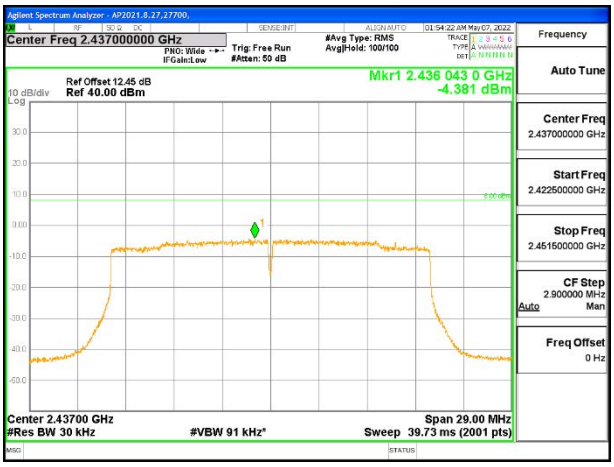
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-5.121	-5.121	8.000	-13.121
Mid 6	2437	-5.130	-5.130	8.000	-13.130
High 11	2462	-5.096	-5.096	8.000	-13.096
High 12	2467	-5.288	-5.288	8.000	-13.288
High 13	2472	-15.935	-15.935	8.000	-23.935



MID CHANNEL 6

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	-8.641	-8.641	8.000	-16.641
Low 2	2417	-6.779	-6.779	8.000	-14.779
Low 3	2422	-4.495	-4.495	8.000	-12.495
Mid 6	2437	-4.381	-4.381	8.000	-12.381
High 9	2452	-4.372	-4.372	8.000	-12.372
High 10	2457	-6.461	-6.461	8.000	-14.461
High 11	2462	-8.537	-8.537	8.000	-16.537
High 12	2467	-10.569	-10.569	8.000	-18.569
High 13	2472	-16.178	-16.178	8.000	-24.178

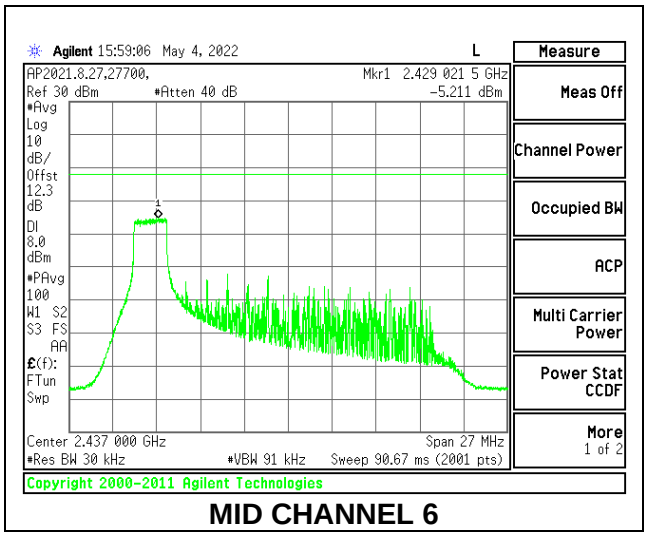


MID CHANNEL 6

UL LLC.
47173 Benicia Street, Fremont, CA 94538; USA. TEL:(510) 319-4000 FAX:(510) 661-0888

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

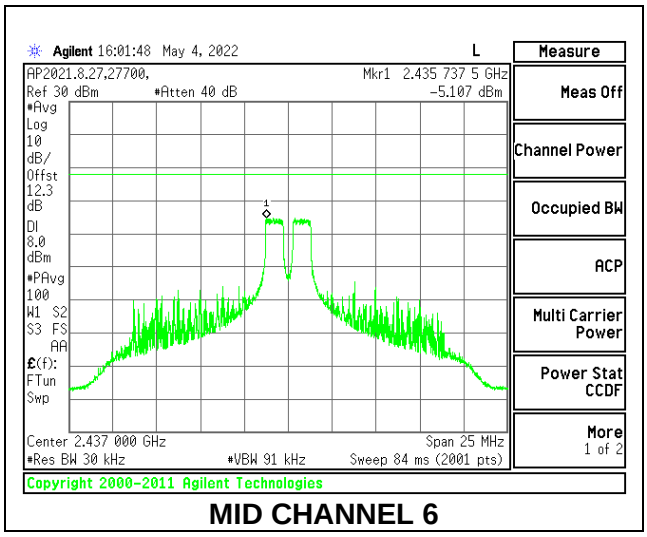
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-4.800	-4.800	8.000	-12.800
Mid 6	2437	-5.211	-5.211	8.000	-13.211
High 11	2462	-4.844	-4.844	8.000	-12.844
High 12	2467	-5.203	-5.203	8.000	-13.203
High 13	2472	-16.137	-16.137	8.000	-24.137



MID CHANNEL 6

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

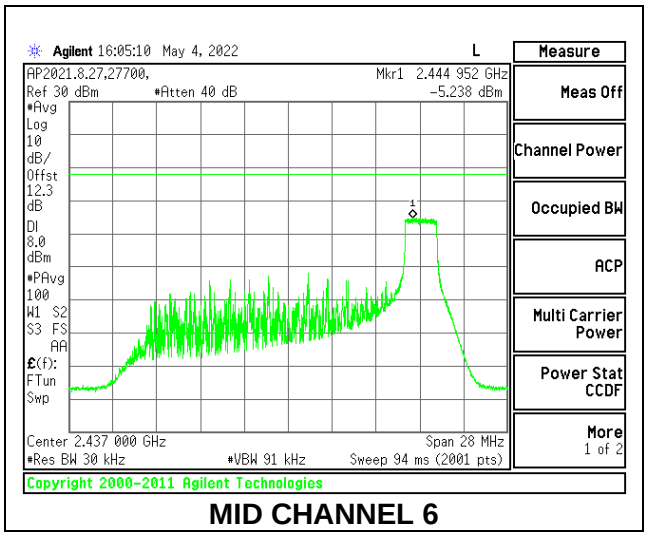
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-4.999	-4.999	8.000	-12.999
Mid 6	2437	-5.107	-5.107	8.000	-13.107
High 11	2462	-4.994	-4.994	8.000	-12.994
High 12	2467	-4.910	-4.910	8.000	-12.910
High 13	2472	-16.179	-16.179	8.000	-24.179



MID CHANNEL 6

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

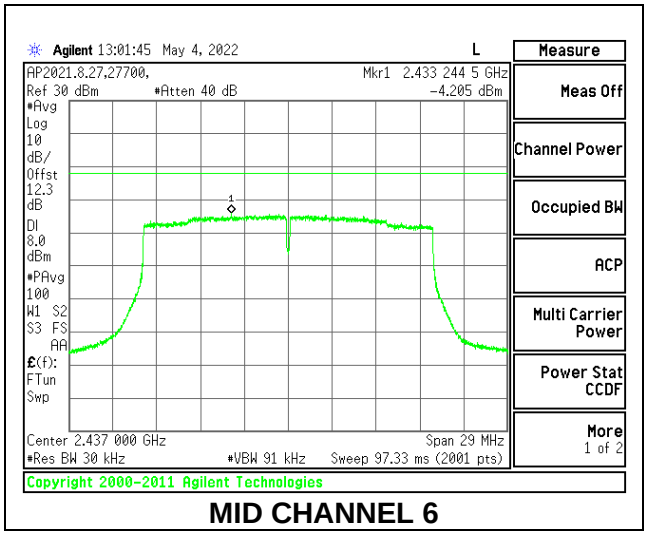
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-5.077	-5.077	8.000	-13.077
Mid 6	2437	-5.238	-5.238	8.000	-13.238
High 11	2462	-5.277	-5.277	8.000	-13.277
High 12	2467	-5.016	-5.016	8.000	-13.016
High 13	2472	-16.026	-16.026	8.000	-24.026



MID CHANNEL 6

1TX ANT 3 MODE , SU Mode

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD		
Channel	Frequency (MHz)	Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-8.969	-8.969	8.000	-16.969
Low 2	2417	-5.812	-5.812	8.000	-13.812
Low 3	2422	-4.416	-4.416	8.000	-12.416
Mid 6	2437	-4.205	-4.205	8.000	-12.205
High 9	2452	-4.479	-4.479	8.000	-12.479
High 10	2457	-6.423	-6.423	8.000	-14.423
High 11	2462	-8.123	-8.123	8.000	-16.123
High 12	2467	-10.700	-10.700	8.000	-18.700
High 13	2472	-15.818	-15.818	8.000	-23.818

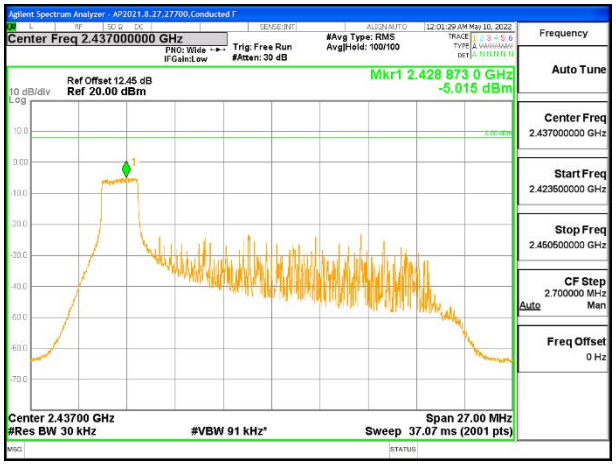


MID CHANNEL 6

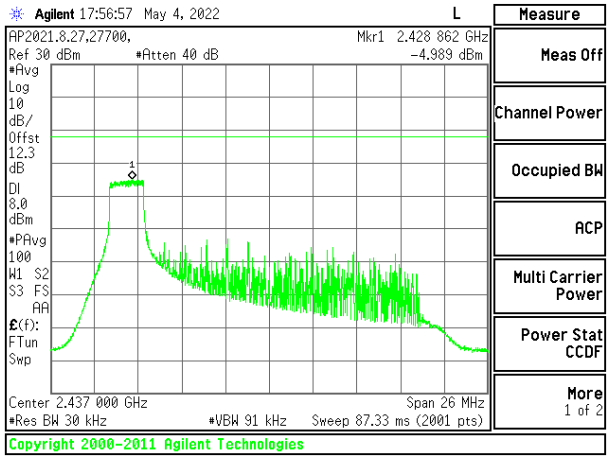
9.5.5. 802.11ax HE20 OFDMA MODE 2TX

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)	ANT4 Meas (dBm/3kHz)	ANT3 Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-4.627	-4.810	-1.707	8.000	-9.707
Mid 6	2437	-5.015	-4.989	-1.992	8.000	-9.992
High 11	2462	-5.160	-4.703	-1.915	8.000	-9.915
High 12	2467	-4.904	-4.935	-1.909	8.000	-9.909
High 13	2472	-17.068	-16.622	-13.829	8.000	-21.829



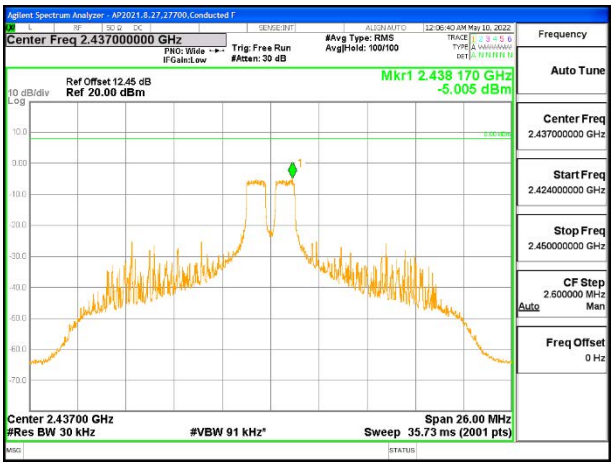
MID CHANNEL 6 ANT 4



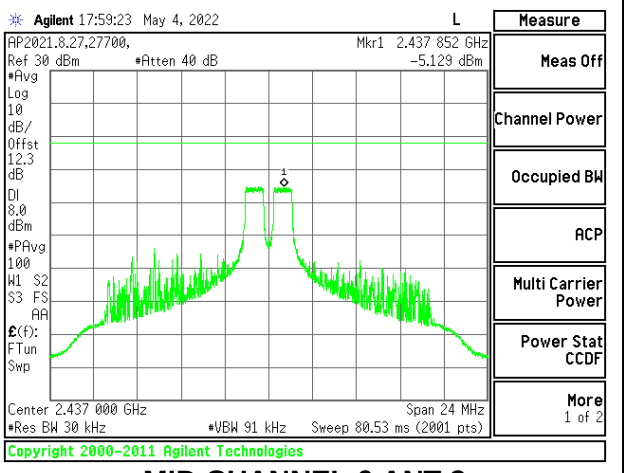
MID CHANNEL 6 ANT 3

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)	ANT4 Meas (dBm/3kHz)	ANT3 Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-5.304	-4.781	-2.024	8.000	-10.024
Mid 6	2437	-5.005	-5.129	-2.056	8.000	-10.056
High 11	2462	-4.997	-4.826	-1.900	8.000	-9.900
High 12	2467	-5.157	-5.429	-2.281	8.000	-10.281
High 13	2472	-16.503	-15.732	-13.090	8.000	-21.090



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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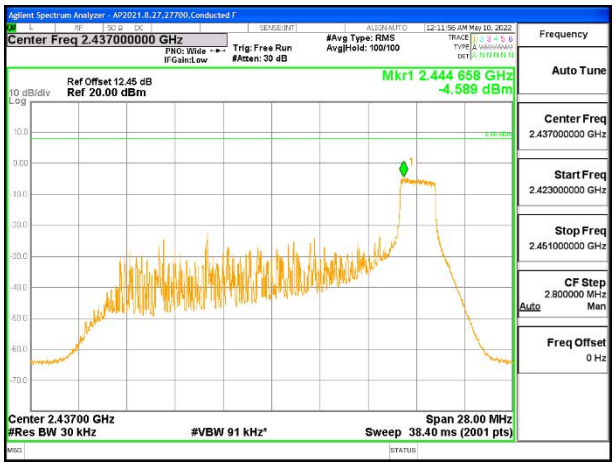
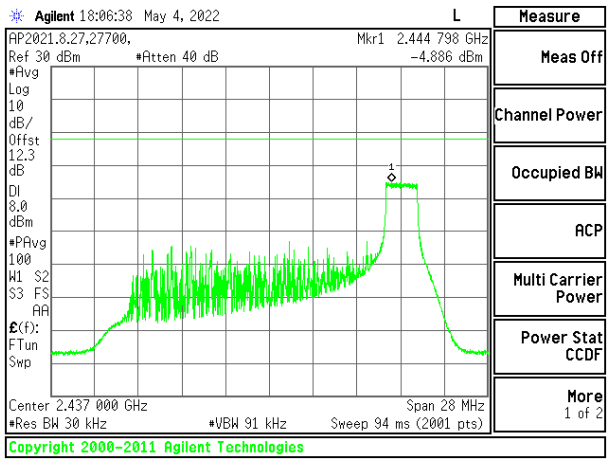
ANT 4 + ANT 3 2TX MODE: 26-Tones, RU Index 8

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	ANT4 Meas (dBm/3kHz)	ANT3 Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-5.273	-4.754	-1.995	8.000	-9.995
Mid 6	2437	-4.589	-4.886	-1.725	8.000	-9.725
High 11	2462	-5.177	-4.861	-2.006	8.000	-10.006
High 12	2467	-4.902	-4.781	-1.831	8.000	-9.831
High 13	2472	-15.770	-17.132	-13.388	8.000	-21.388



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

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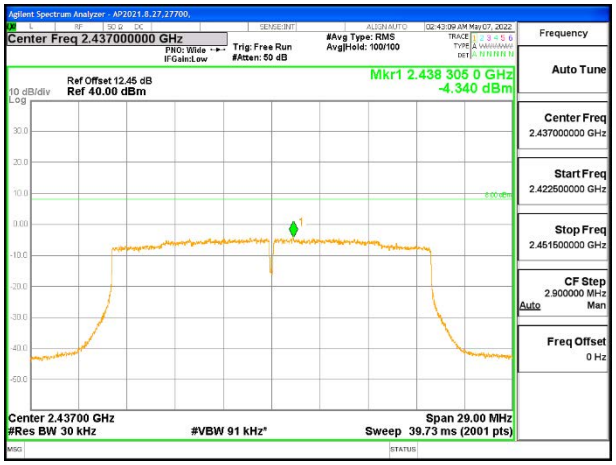
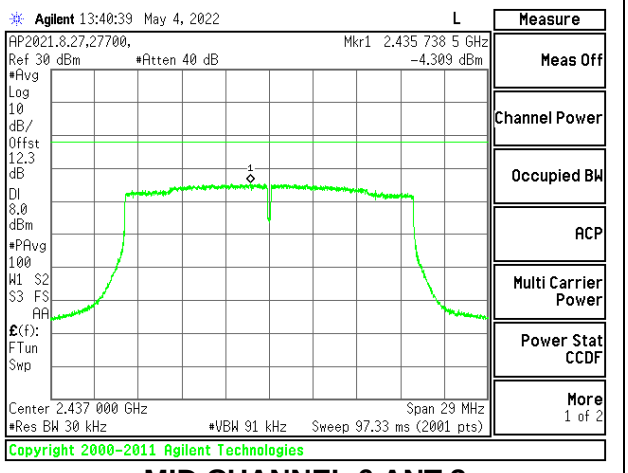
47173 Benicia Street, Fremont, CA 94538; USA. TEL:(510) 319-4000 FAX:(510) 661-0888

ANT 4 + ANT 3 2TX MODE: SU Mode

Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd PSD			
Channel	Frequency (MHz)	ANT4 Meas (dBm/3kHz)	ANT3 Meas (dBm/3kHz)	Total Corr'd PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low 1	2412	-9.174	-9.944	-6.532	8.000	-14.532
Low 2	2417	-7.378	-7.863	-4.603	8.000	-12.603
Low 3	2422	-5.684	-5.819	-2.741	8.000	-10.741
Mid 6	2437	-4.340	-4.309	-1.314	8.000	-9.314
High 8	2447	-4.065	-4.643	-1.334	8.000	-9.334
High 9	2452	-6.259	-6.269	-3.254	8.000	-11.254
High 10	2457	-7.529	-7.037	-4.266	8.000	-12.266
High 11	2462	-9.374	-9.687	-6.517	8.000	-14.517
High 12	2467	-12.247	-12.277	-9.252	8.000	-17.252
High 13	2472	-16.603	-16.610	-13.596	8.000	-21.596



MID CHANNEL 6 ANT 4



MID CHANNEL 6 ANT 3

9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

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

RESULTS

UL LLC.
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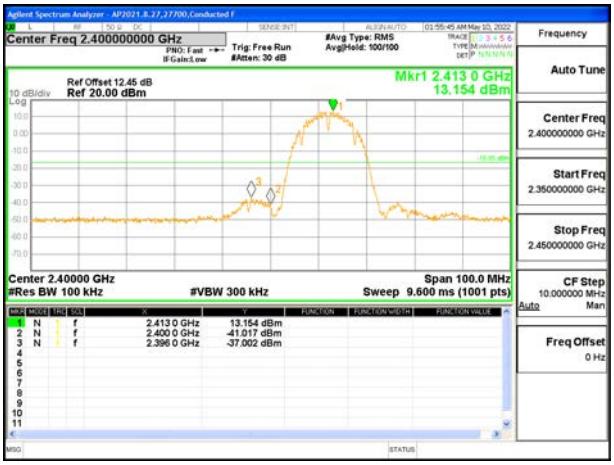
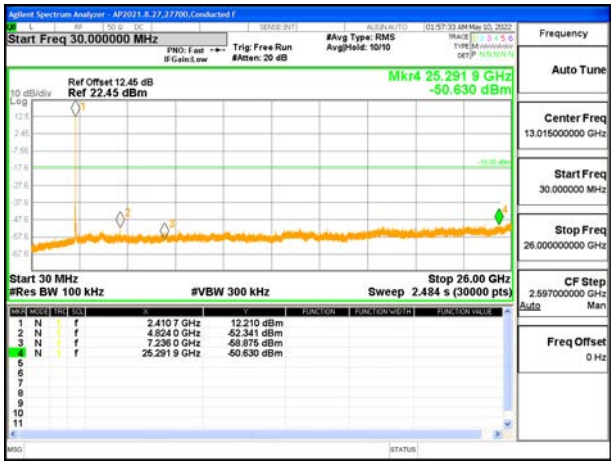
9.6.1. 802.11b MODE 1TX

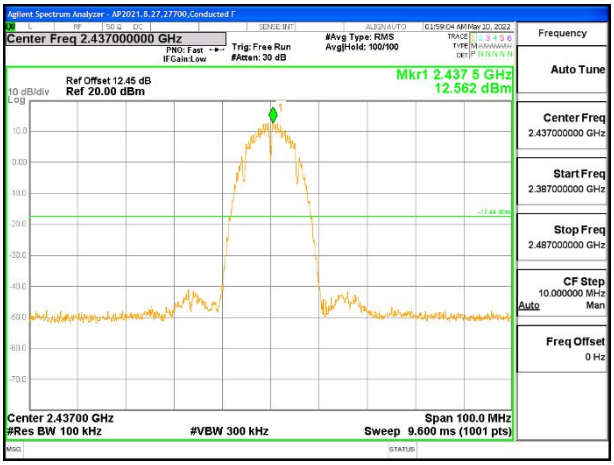
1TX ANT 4 MODE



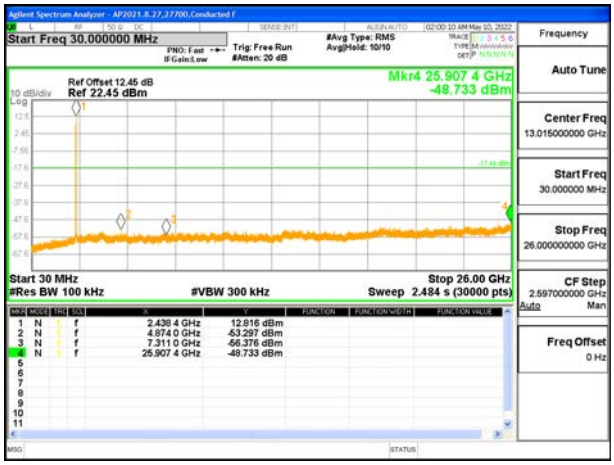
LOW CHANNEL 1 BANDEDGE



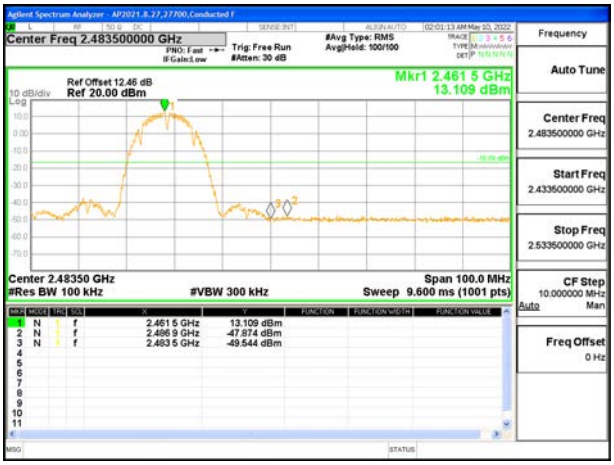
LOW CHANNEL 1 OUT-OF-BAND



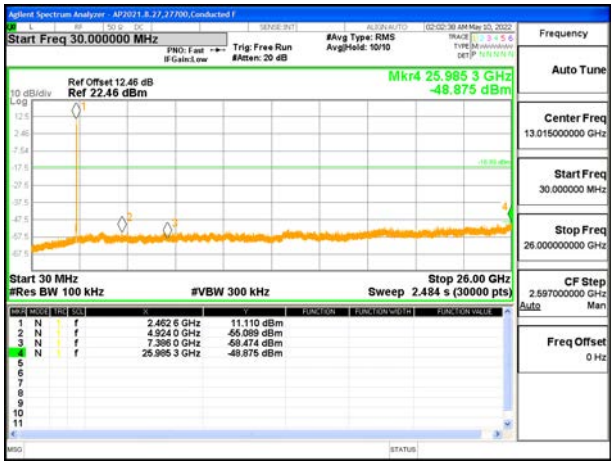
MID CHANNEL REFERENCE LEVEL



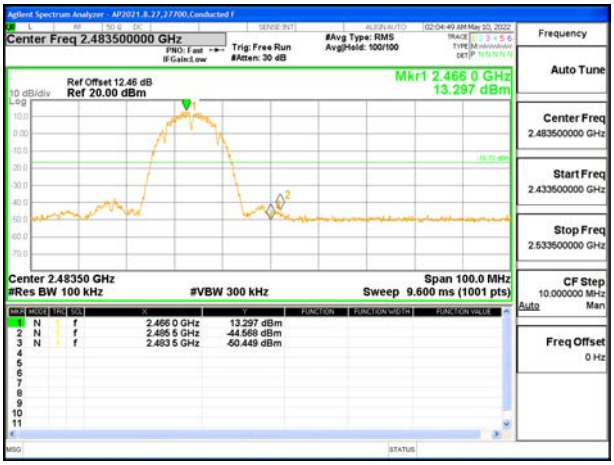
MID CHANNEL OUT-OF-BAND



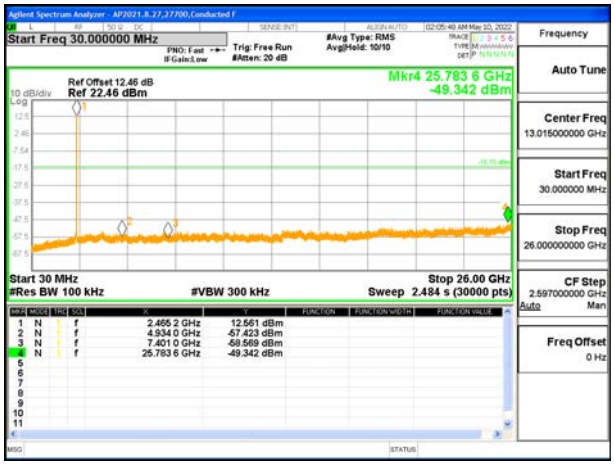
HIGH CHANNEL 11 BANDEDGE



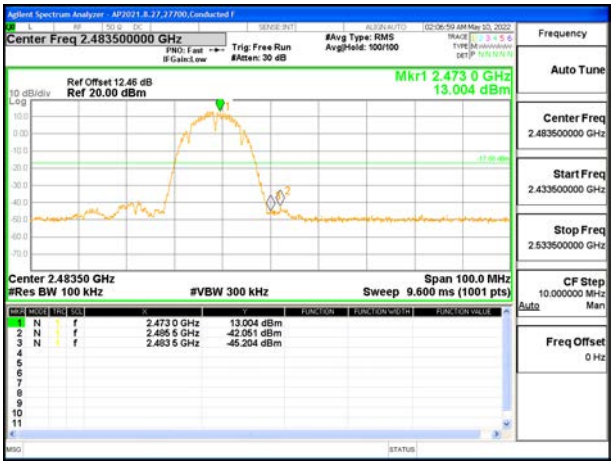
HIGH CHANNEL 11 OUT-OF-BAND



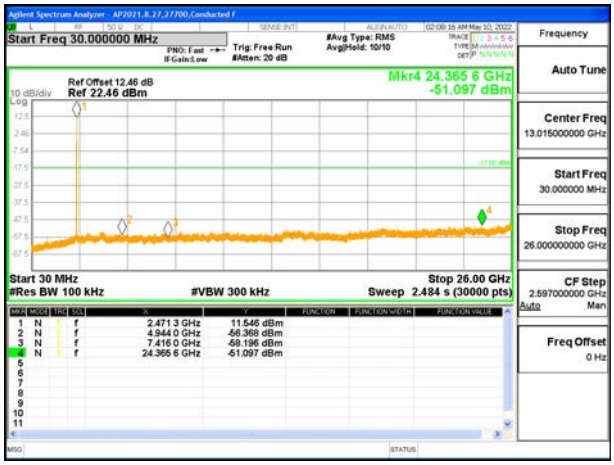
HIGH CHANNEL 12 BANDEDGE



HIGH CHANNEL 12 OUT-OF-BAND

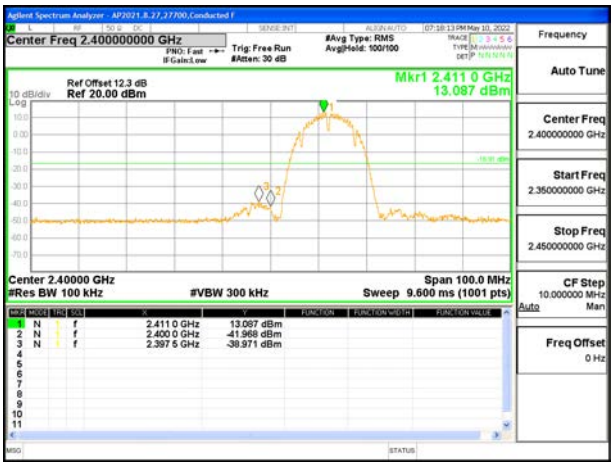


HIGH CHANNEL 13 BANDEDGE

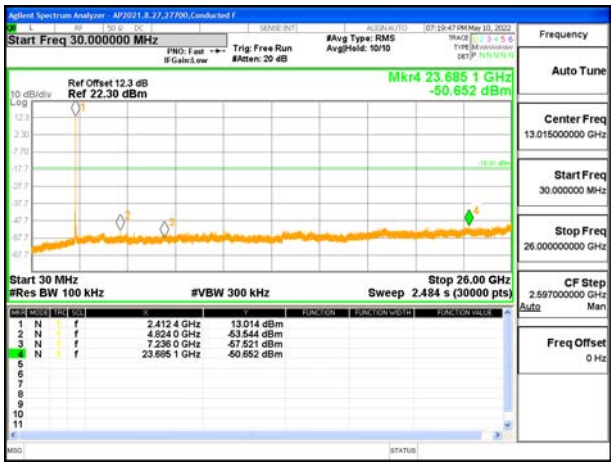


HIGH CHANNEL 13 OUT-OF-BAND

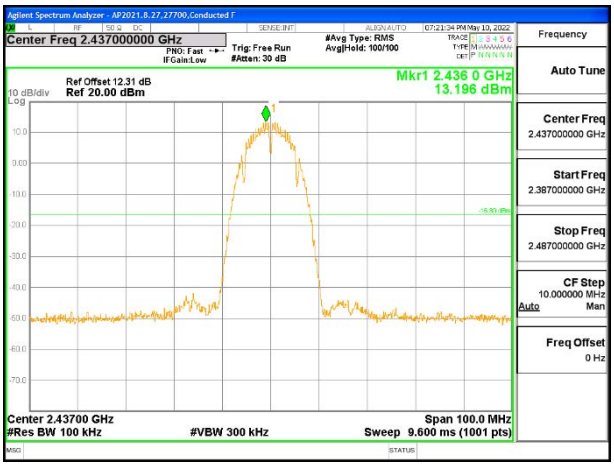
1TX ANT 3 MODE



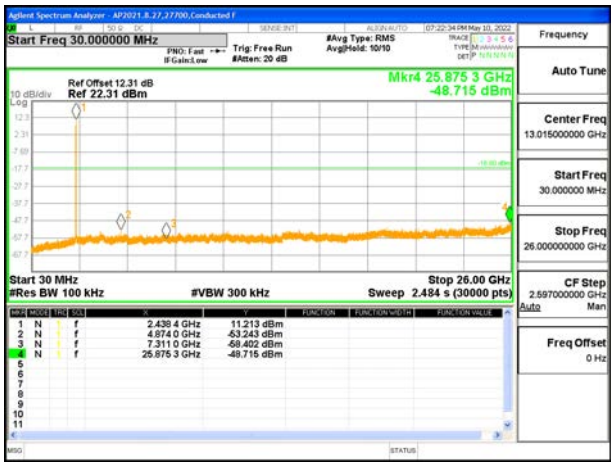
LOW CHANNEL 1 BANDEDGE



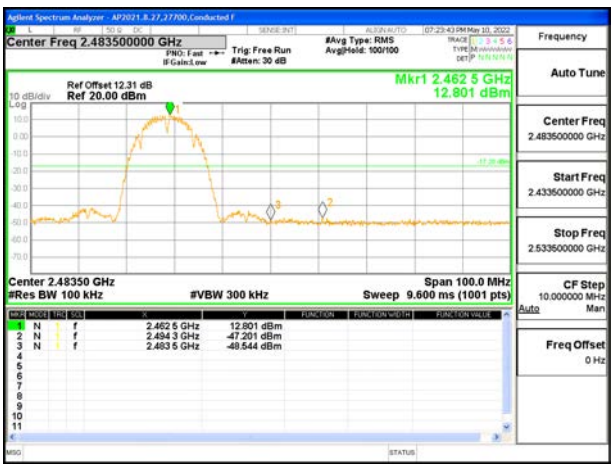
LOW CHANNEL 1 OUT-OF-BAND



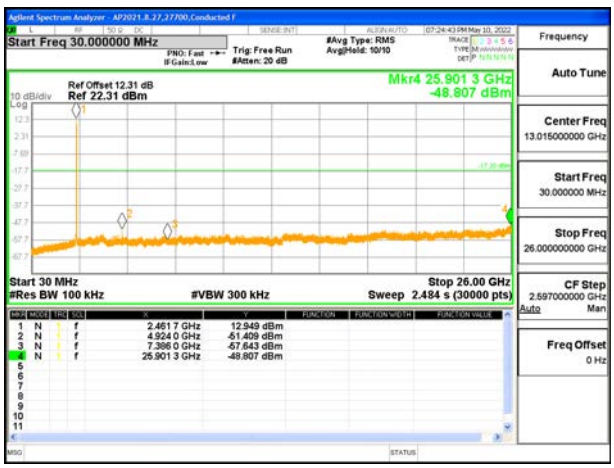
MID CHANNEL REFERENCE LEVEL



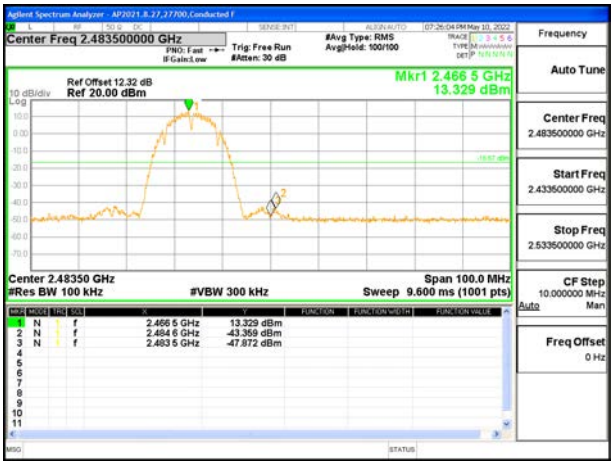
MID CHANNEL OUT-OF-BAND



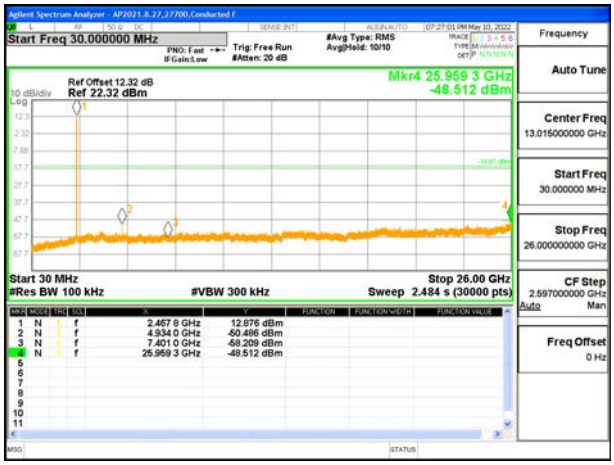
HIGH CHANNEL 11 BANDEDGE



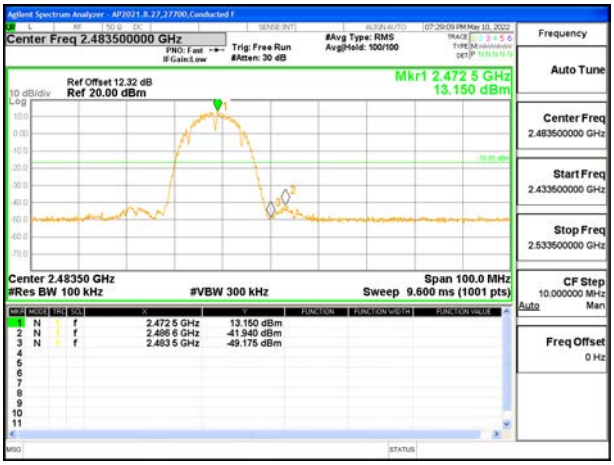
HIGH CHANNEL 11 OUT-OF-BAND



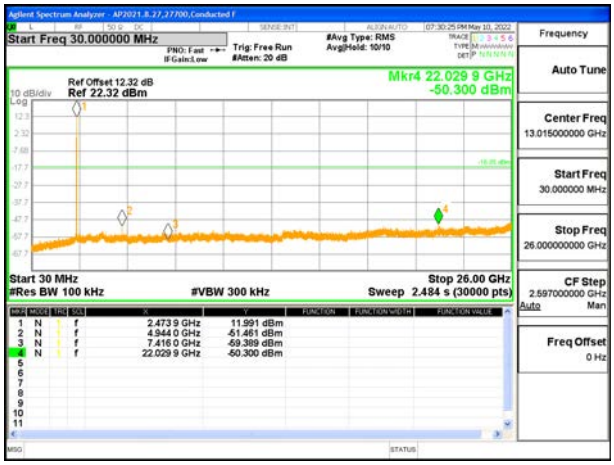
HIGH CHANNEL 12 BANDEDGE



HIGH CHANNEL 12 OUT-OF-BAND



HIGH CHANNEL 13 BANDEDGE



HIGH CHANNEL 13 OUT-OF-BAND

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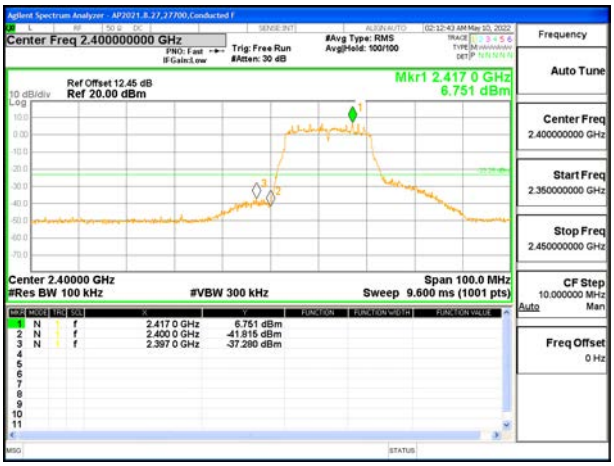
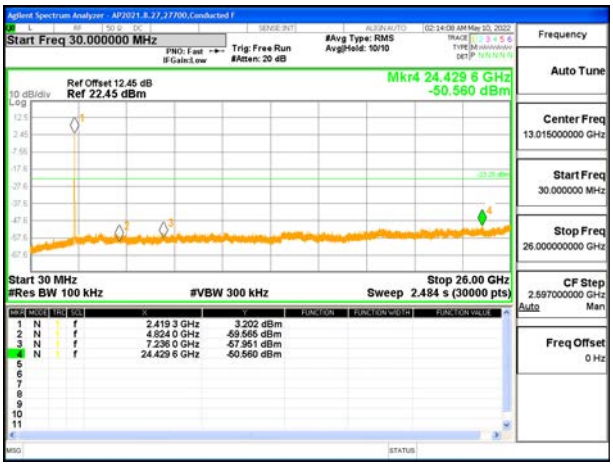
9.6.2. 802.11n HT20 MODE 1TX

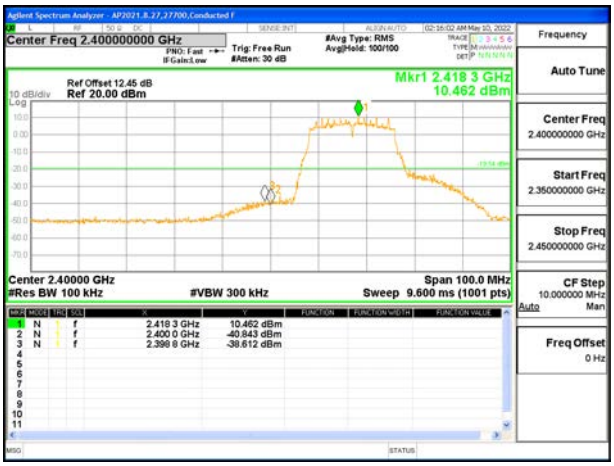
1TX ANT 4 MODE



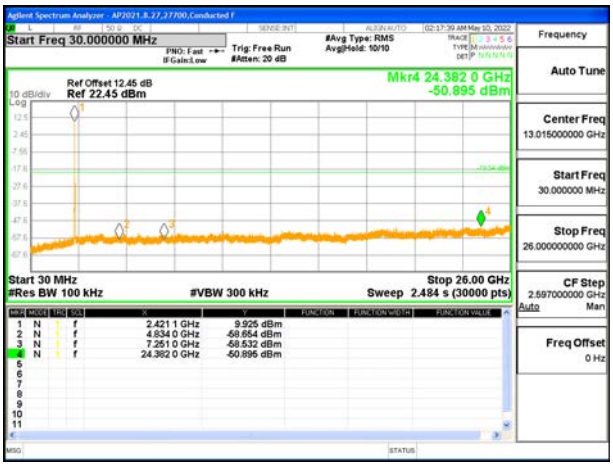
LOW CHANNEL 1 BANDEDGE



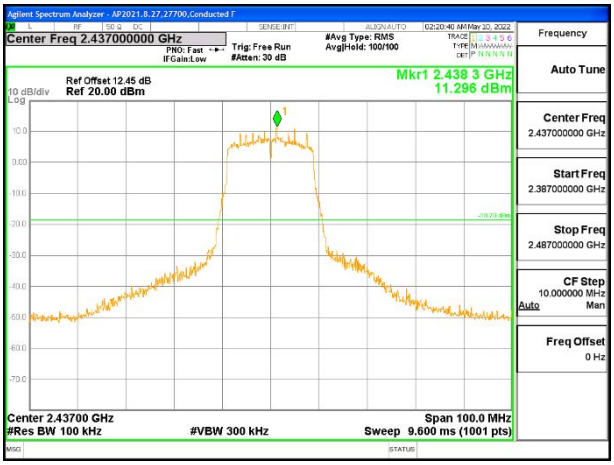
LOW CHANNEL 1 OUT-OF-BAND



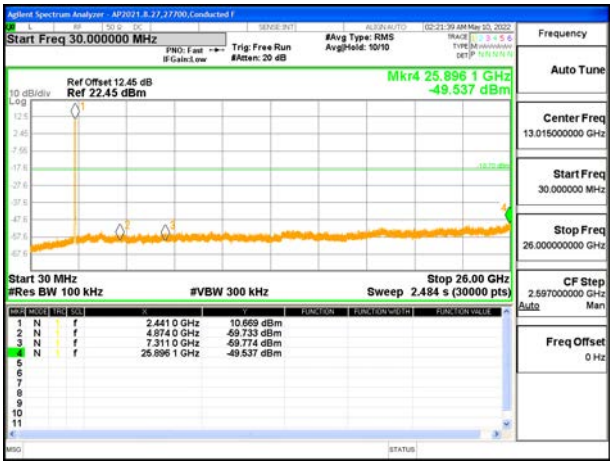
LOW CHANNEL 2 BANDEDGE



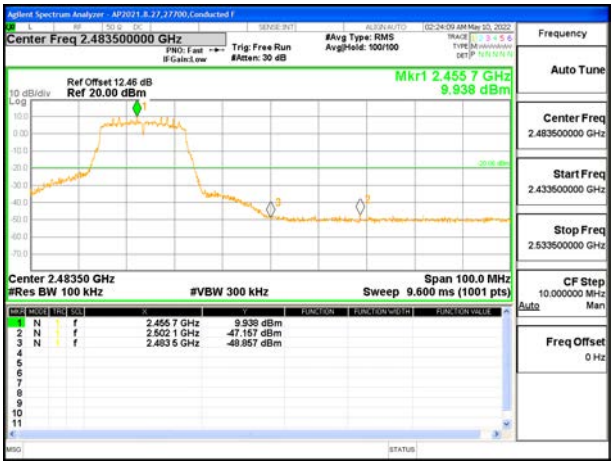
LOW CHANNEL 2 OUT-OF-BAND



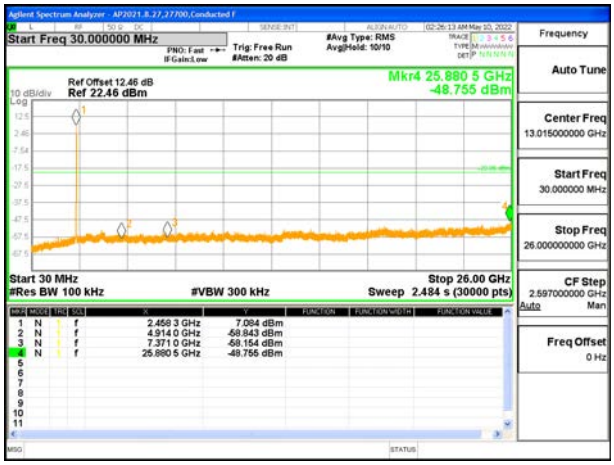
MID CHANNEL REFERENCE LEVEL



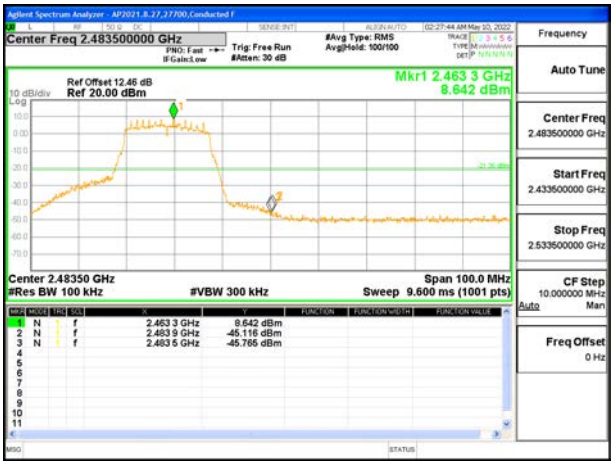
MID CHANNEL OUT-OF-BAND



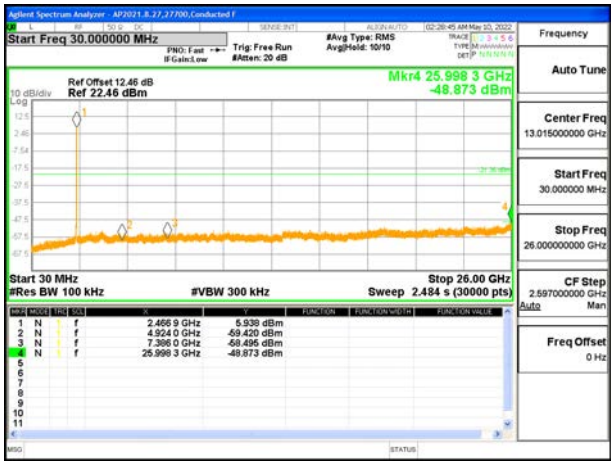
HIGH CHANNEL 10 BANDEDGE



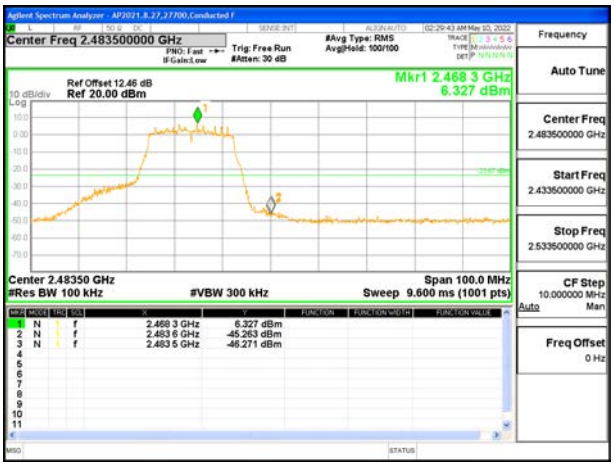
HIGH CHANNEL 10 OUT-OF-BAND



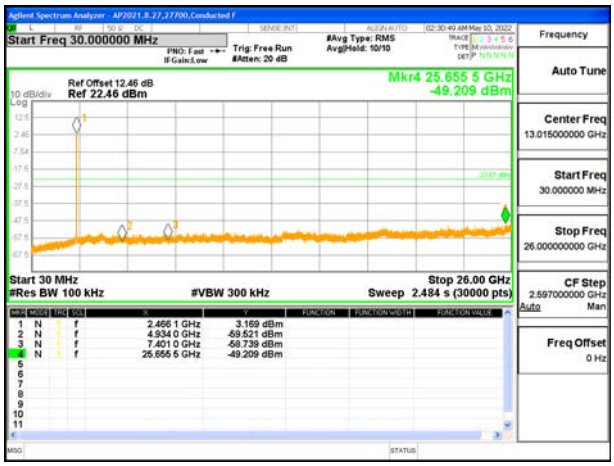
HIGH CHANNEL 11 BANDEDGE



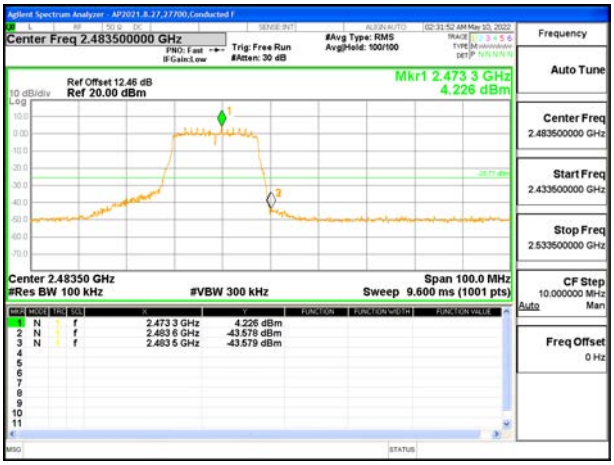
HIGH CHANNEL 11 OUT-OF-BAND



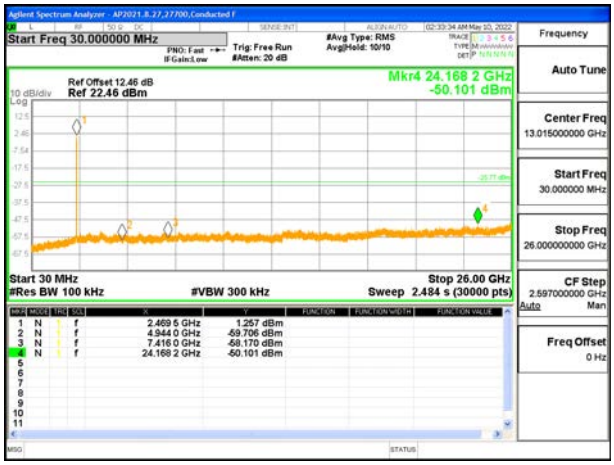
HIGH CHANNEL 12 BANDEDGE



HIGH CHANNEL 12 OUT-OF-BAND



HIGH CHANNEL 13 BANDEDGE



HIGH CHANNEL 13 OUT-OF-BAND

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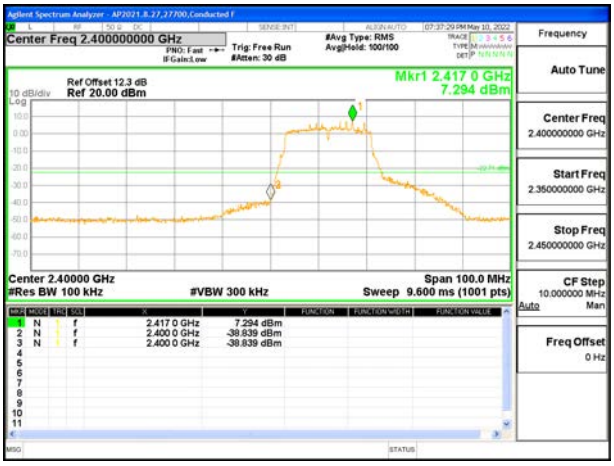
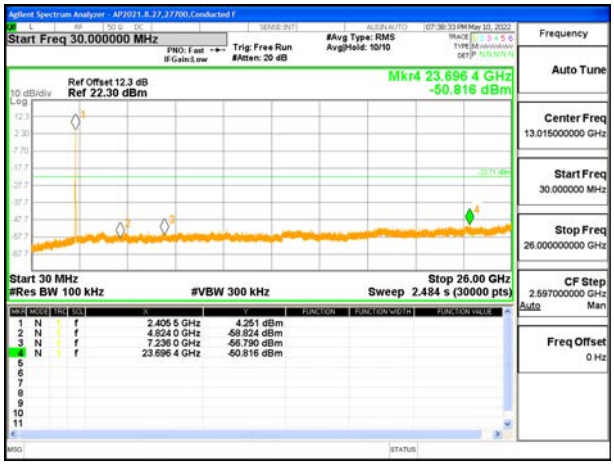
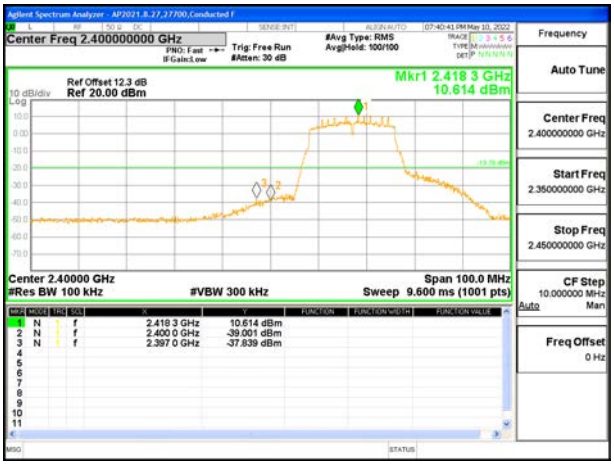
1TX ANT 3 MODE



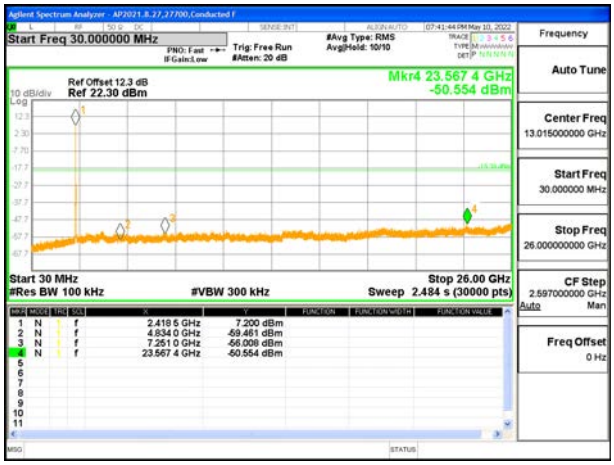
LOW CHANNEL 1 BANDEDGE



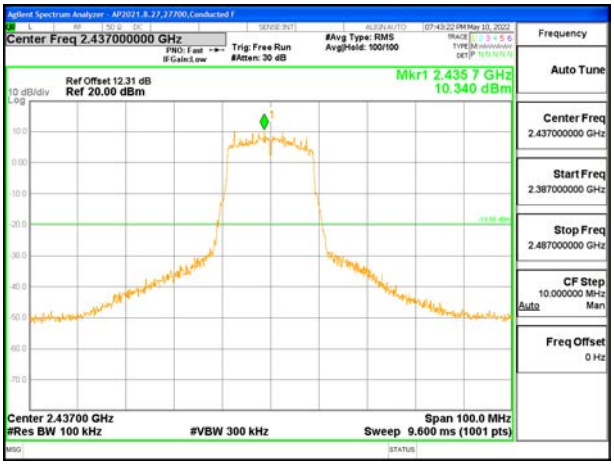
LOW CHANNEL 1 OUT-OF-BAND



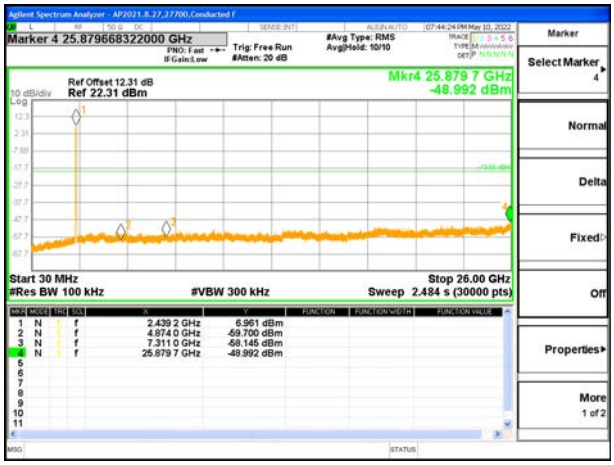
LOW CHANNEL 2 BANDEDGE



LOW CHANNEL 2 OUT-OF-BAND



MID CHANNEL REFERENCE LEVEL



MID CHANNEL OUT-OF-BAND

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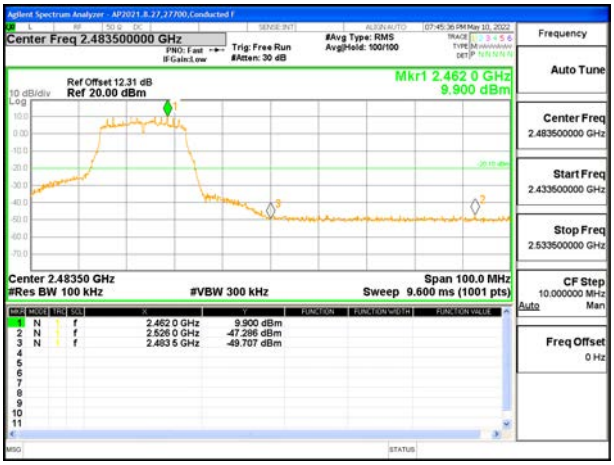
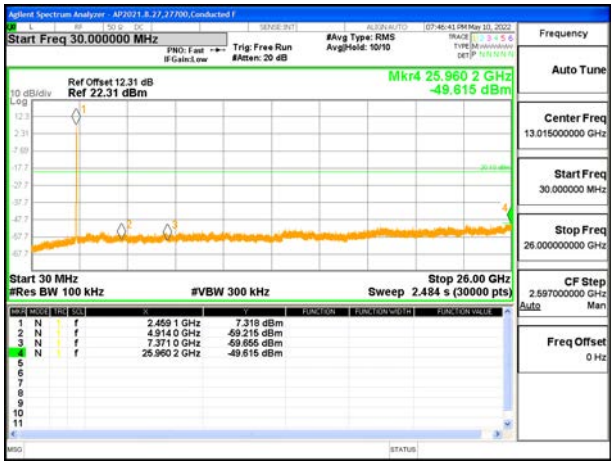
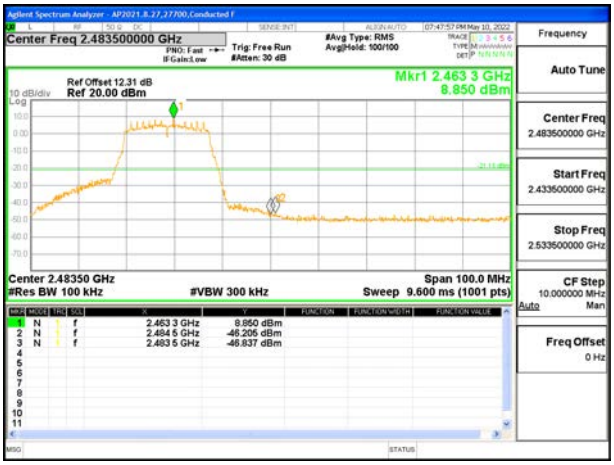


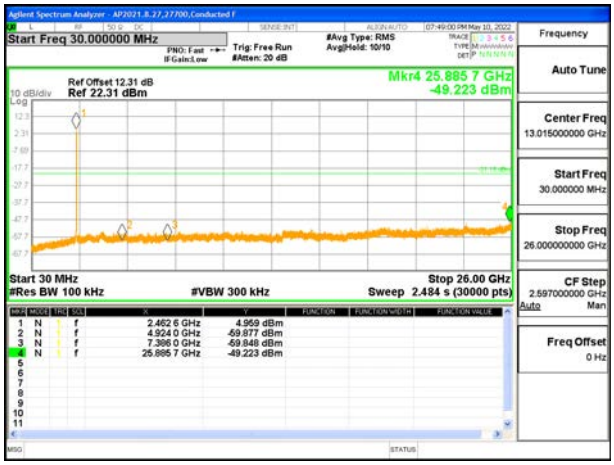
HIGH CHANNEL 10 BANDEDGE



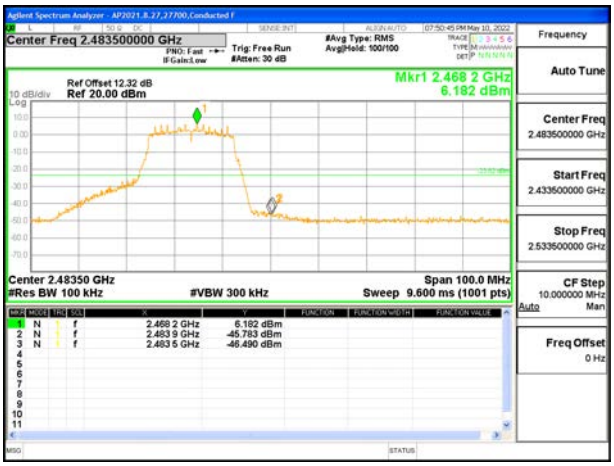
HIGH CHANNEL 10 OUT-OF-BAND



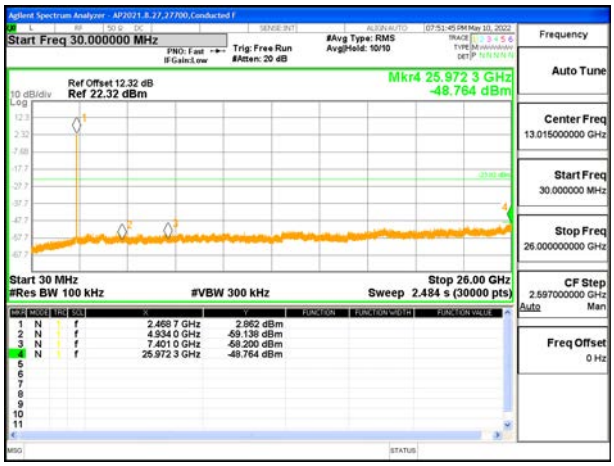
HIGH CHANNEL 11 BANDEDGE



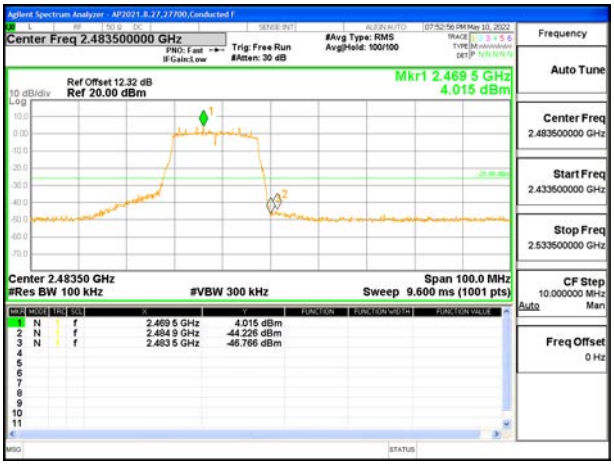
HIGH CHANNEL 11 OUT-OF-BAND



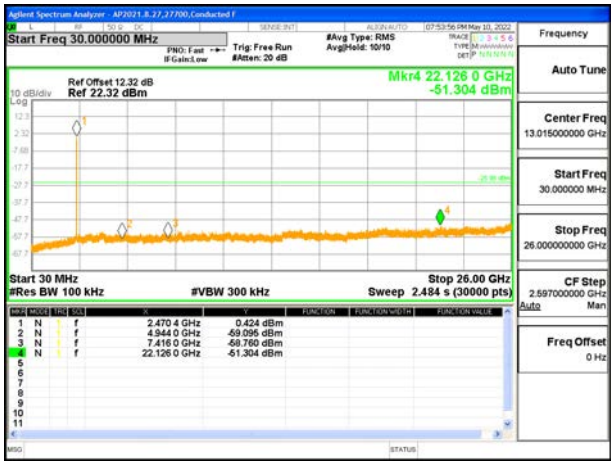
HIGH CHANNEL 12 BANDEDGE



HIGH CHANNEL 12 OUT-OF-BAND



HIGH CHANNEL 13 BANDEDGE



HIGH CHANNEL 13 OUT-OF-BAND

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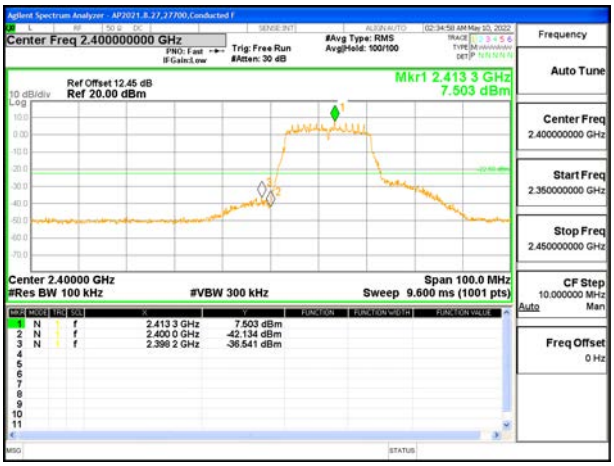
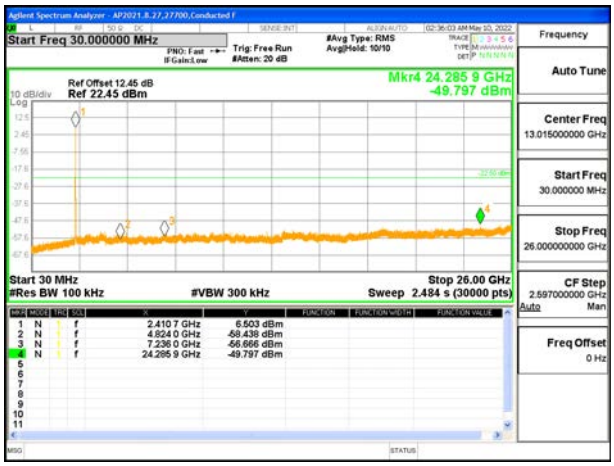
9.6.3. 802.11n HT20 CDD MODE 2TX

2TX ANT 4 + ANT 3 CDD MODE

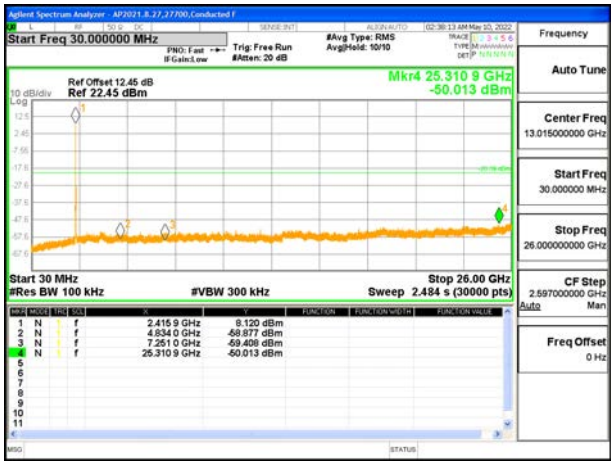


LOW CHANNEL 1 BANDEDGE [ANT 4]

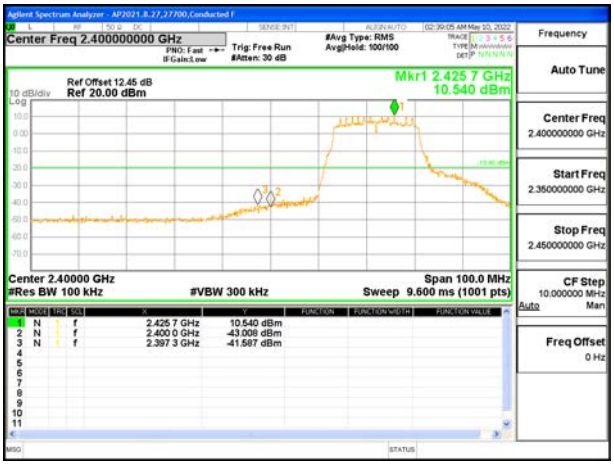


LOW CHANNEL 1 OUT-OF-BAND [ANT 4]

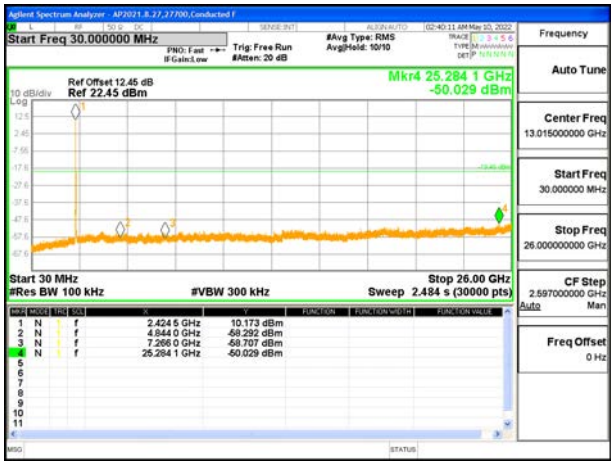
LOW CHANNEL 2 BANDEDGE [ANT 4]



LOW CHANNEL 2 OUT-OF-BAND [ANT 4]



LOW CHANNEL 3 BANDEDGE [ANT 4]



LOW CHANNEL 3 OUT-OF-BAND [ANT 4]

UL LLC.
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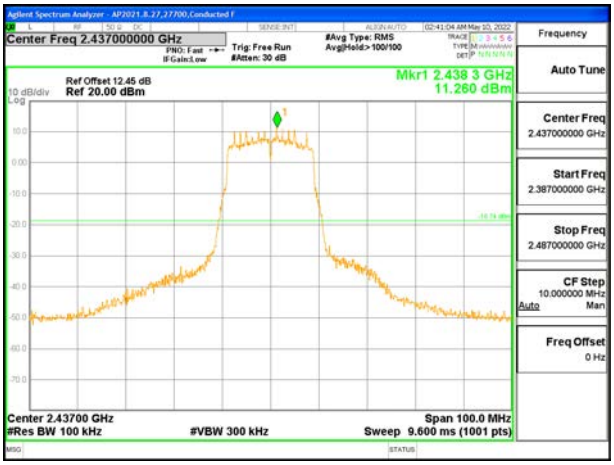
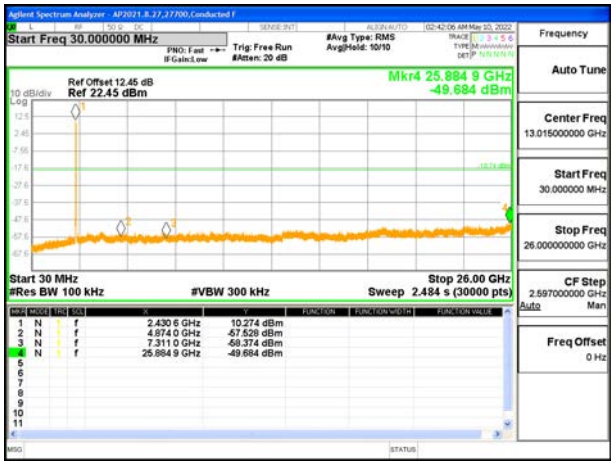
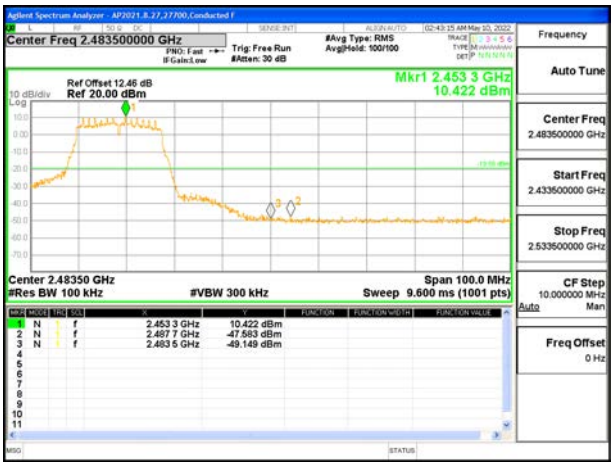


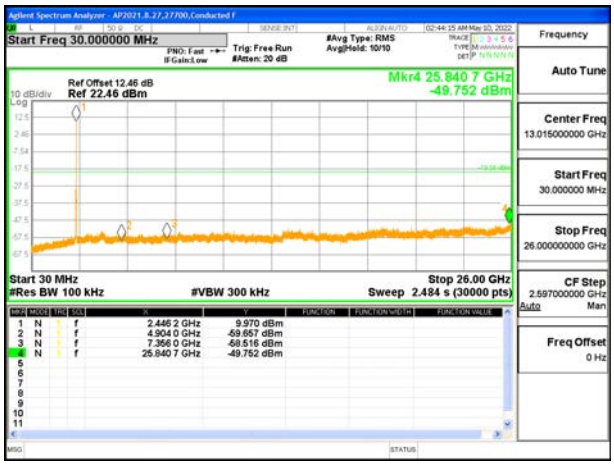
MID CHANNEL REFERENCE LEVEL [ANT 4]



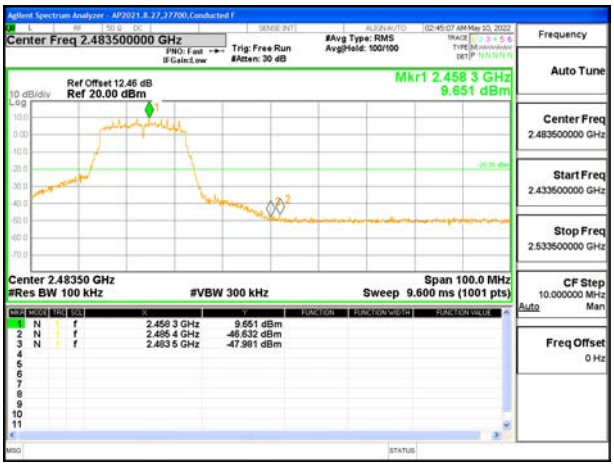
MID CHANNEL OUT-OF-BAND [ANT 4]



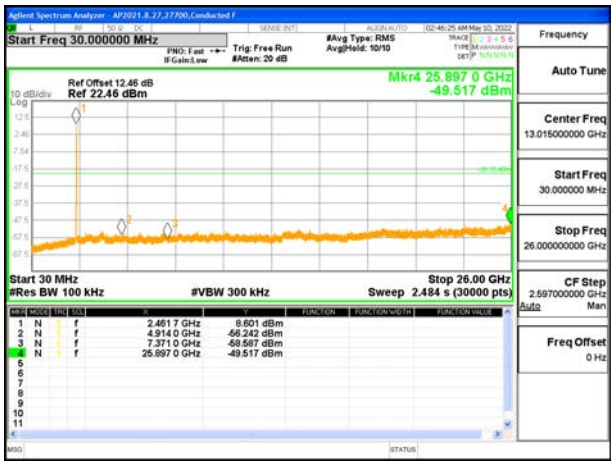
HIGH CHANNEL 9 BANDEDGE [ANT 4]



HIGH CHANNEL 9 OUT-OF-BAND [ANT 4]



HIGH CHANNEL 10 BANDEDGE [ANT 4]



HIGH CHANNEL 10 OUT-OF-BAND [ANT 4]

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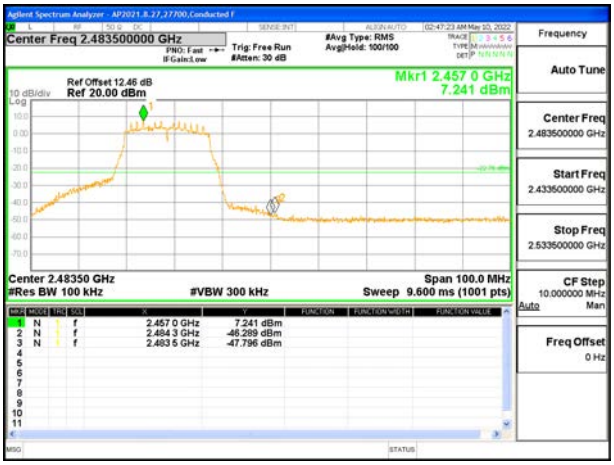
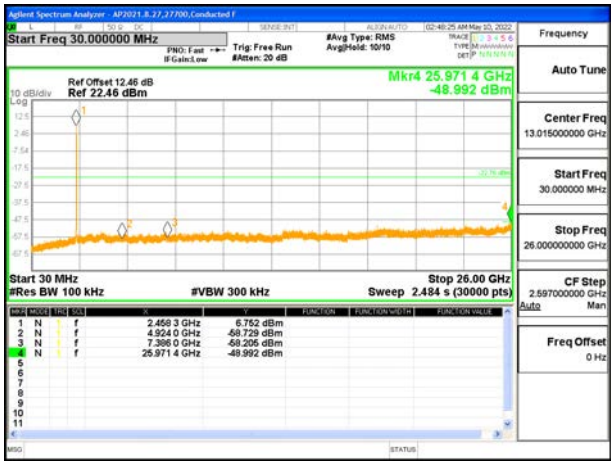
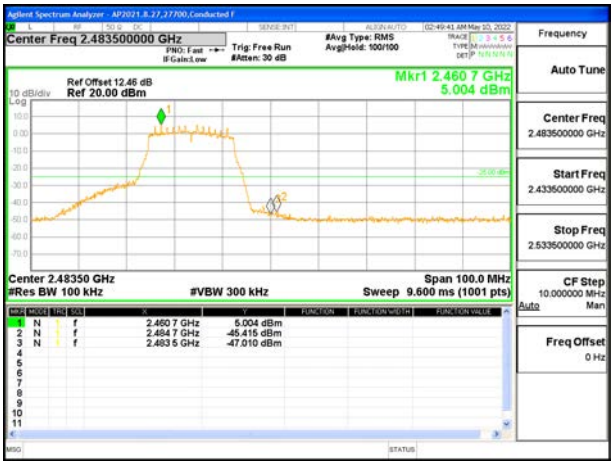


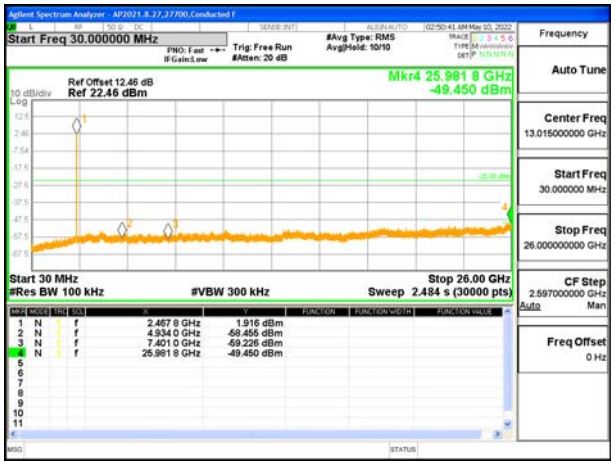
HIGH CHANNEL 11 BANDEDGE [ANT 4]



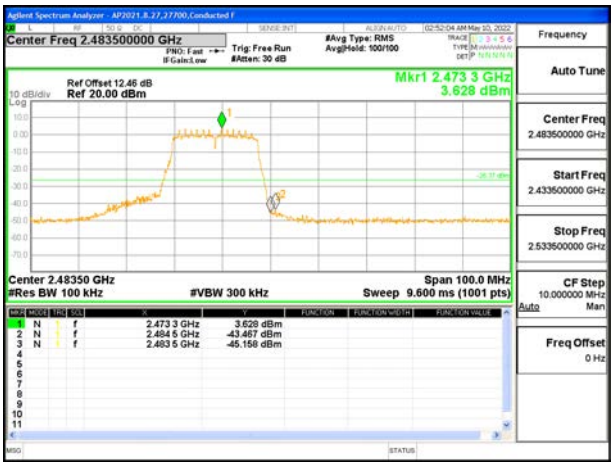
HIGH CHANNEL 11 OUT-OF-BAND [ANT 4]



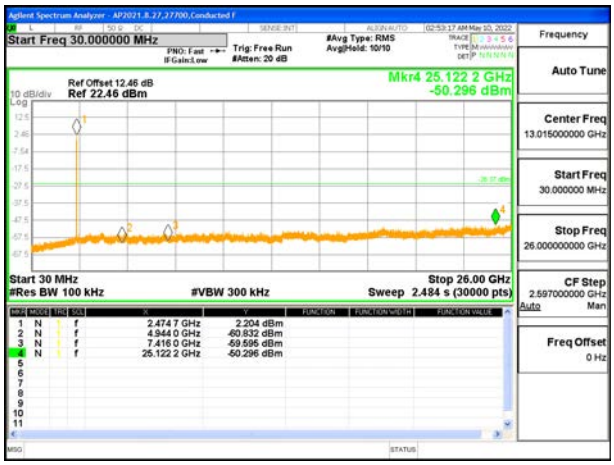
HIGH CHANNEL 12 BANDEDGE [ANT 4]



HIGH CHANNEL 12 OUT-OF-BAND [ANT 4]



HIGH CHANNEL 13 BANDEDGE [ANT 4]



HIGH CHANNEL 13 OUT-OF-BAND [ANT 4]

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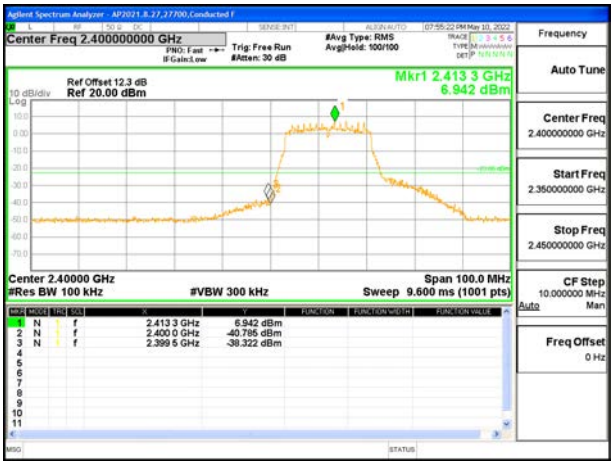
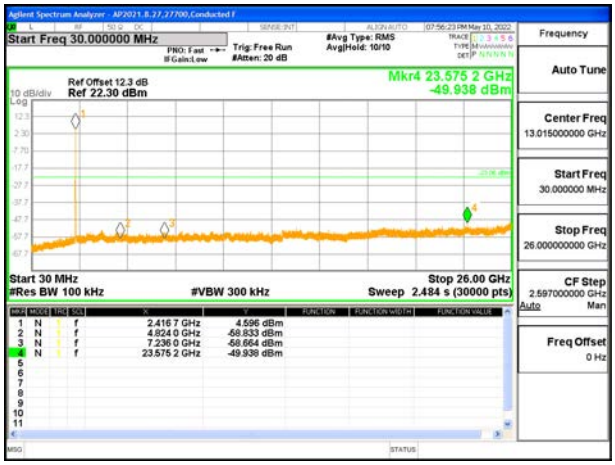
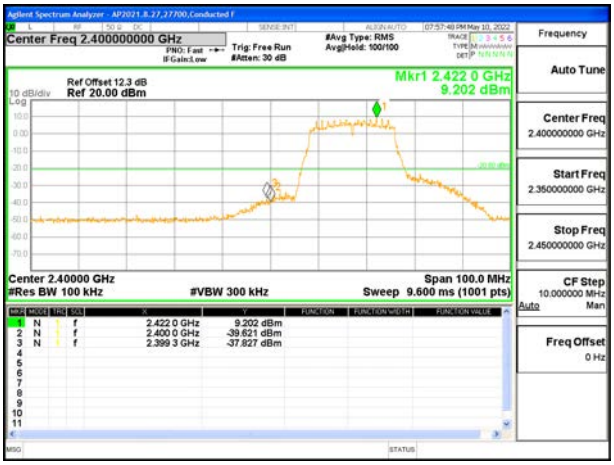


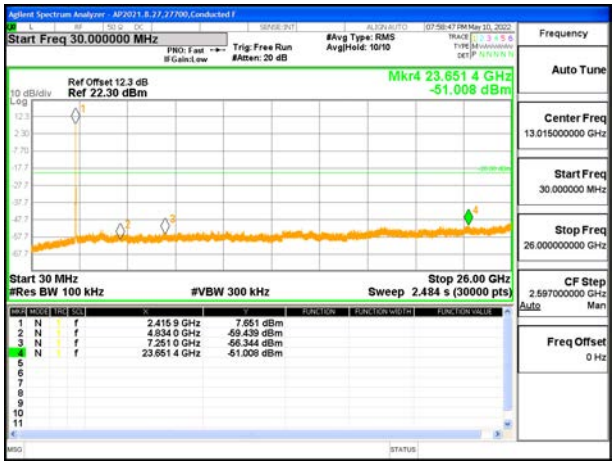
LOW CHANNEL 1 BANDEDGE [ANT 3]



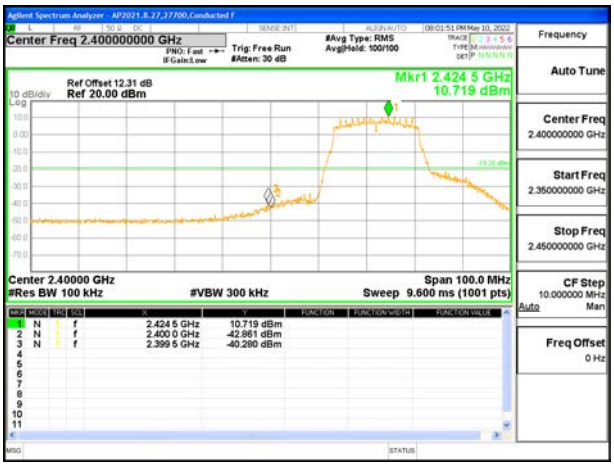
LOW CHANNEL 1 OUT-OF-BAND [ANT 3]



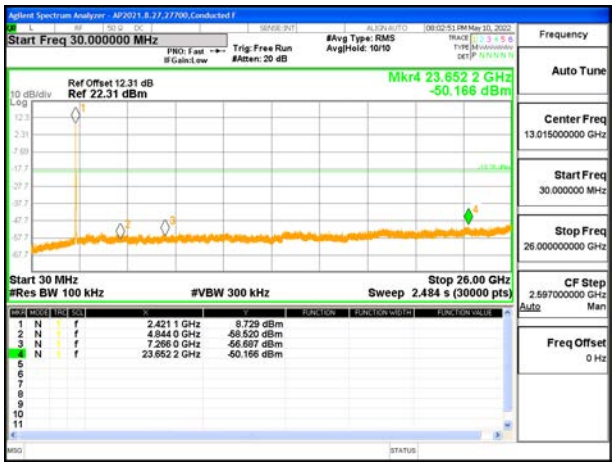
LOW CHANNEL 2 BANDEDGE [ANT 3]



LOW CHANNEL 2 OUT-OF-BAND [ANT 3]



LOW CHANNEL 3 BANDEDGE [ANT 3]



LOW CHANNEL 3 OUT-OF-BAND [ANT 3]

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