REPORT No.: SZ24040157W09

TEST REPORT

APPLICANT	:	Linkplay Technology Inc.
PRODUCT NAME	:	WiiM Ultra Hi-Res Audio Streamer
MODEL NAME	:	ASR004
BRAND NAME	:	WiiM
FCC ID	:	2BABF-ASR004
STANDARD(S)	:	47 CFR Part 15 Subpart E
RECEIPT DATE	:	2024-04-19
TEST DATE	:	2024-05-27 to 2024-06-27
ISSUE DATE	:	2024-07-11

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Summary of Test Results ····· 4
1.1. Testing Applied Standards and Methods ····· 5
1.2. Test Equipment and Software List ····· 6
1.3. Measurement Uncertainty ····· 8
1.4. Testing Laboratory ····· 8
2. General Description ····· 9
2.1. Information of Applicant and Manufacturer ····· 9
2.2. Information of EUT ····· 9
2.3. Channel Center Frequency of EUT ····· 10
2.4. Test Configuration of EUT ····· 11
2.5. Test Conditions ····· 12
2.6. Test Setup Layout Diagram ····· 13
3. Description of Test Items and Results ····· 16
3.1. Antenna Requirement ····· 16
3.2. Duty Cycle, Transmission Duration, and Maximum Power Control Level ····· 17
3.3. Conducted Output Power and E.I.R.P. ····· 18
3.4. Occupied Bandwidth and Emission Bandwidth ····· 19
3.5. Power Spectral Density ····· 20
3.6. Emission Mask ····· 21
3.7. Contention Based Protocol ····· 22
3.8. Frequency Stability ····· 24
3.9. Conducted Emission ····· 25
3.10. Restricted Frequency Bands ····· 26
3.11. Radiated Emission ····· 28
Annex A Test Data and Result ····· 30

Change History		
Version	**Date**	**Reason for change**
1.0	2024-07-11	First edition

1. Summary of Test Results

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	ANSI C63.10	Duty Cycle of the Test Signal	Jun. 03, 2024	Su Xiaoxian	PASS	No deviation
3	15.407(a)	Conducted Output Power and E.I.R.P.	Jun. 03, 2024	Su Xiaoxian	PASS	No deviation
4	15.407(a)	Occupied Bandwidth and Emission Bandwidth	Jun. 06&07, 2024	Su Xiaoxian	PASS	No deviation
5	15.407(a)	Power Spectral Density	Jun. 03, 2024	Su Xiaoxian	PASS	No deviation
6	15.407(b)	Emission Mask	Jun. 07, 2024	Su Xiaoxian	PASS	No deviation
7	15.407(d)	Contention Based Protocol	Jun. 26, 2024	Su Xiaoxian	PASS	No deviation
8	15.407(g)	Frequency Stability	Jun. 07, 2024	Su Xiaoxian	PASS	No deviation
9	15.207	Conducted Emission	May 27, 2024	Wang Deyong	PASS	No deviation
10	15.407(b)	Restricted Frequency Bands	Jun. 11&12, 2024	Gao Jianrou	PASS	No deviation
11	15.407(b)	Radiated Emission	Jun. 11&12, 2024	Gao Jianrou	PASS	No deviation

Note 1: Additions to, deviation, or exclusions from the method shall be judged in the “method determination” column of add, deviate or exclude from the specific method shall be explained in the “Remark” of the above table.

Note 2: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.1. Testing Applied Standards and Methods

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

No.	Standards or Methods	Description
1	47 CFR Part 15 Subpart E	FCC Technical Requirements
2	ANSI C63.10	Procedures for Compliance Testing of Unlicensed Wireless Devices
3	KDB 789033 D02	Guidelines for compliance testing of U-NII devices
4	KDB 987594 D01	General guideline for U-NII 5,6,7,8 bands under Part 15 Subpart E
5	KDB 987594 D02	Guidelines for compliance testing of U-NII 6GHz devices
6	KDB 987594 D03	Questions and Answers for U-NII 5,6,7,8 bands under Part 15 Subpart E
7	KDB 662911 D01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

1.2. Test Equipment and Software List

1.2.1. List of Software

Name	Manufacturer	Software Version
MTS 8310	MaiWei	2.0.0.0
Morlab EMCR	Morlab	V1.2
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

1.2.2. Conducted Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2024.02.19	2025.02.18
Power Sensor	MY54180008	U2021XA	Agilent	2023.10.17	2024.10.16
Temperature Chamber	12108015	DTL-003S101	YOMA	2023.09.19	2024.09.18
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Attenuator	MTJ6004-10	10dB	MTJ cooperation	N/A	N/A

1.2.3. Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024.01.25	2025.01.24
LISN	8127449	NSLK 8127	Schwarzbeck	2024.02.02	2025.02.01
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2024.05.30	2025.05.29
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	N/A	N/A

1.2.4. Radiated Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56060145	N9038A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2023.07.01	2024.06.30
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2023.06.26	2024.06.25
				2024.06.03	2025.06.02
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2023.07.01	2024.06.30
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2023.07.01	2024.06.30
Preamplifier (10MHz-6GHz)	46732	S10M100L3802	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (2GHz-18GHz)	61171/61172	S020180L3203	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KKF-2	Qualwave	2023.07.04	2024.07.03
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-NN-5	Qualwave	2023.07.04	2024.07.03
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Output Power	±2.22dB	Confidence levels of 95%
Power Spectral Density	±2.22dB	Confidence levels of 95%
Bandwidth	±5%	Confidence levels of 95%
Frequency Stability	±2%	Confidence levels of 95%
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone	+86 755 36698555
Facsimile	+86 755 36698525
FCC Designation Number	CN1192
FCC Test Firm Registration Number	226174

2. General Description

2.1. Information of Applicant and Manufacturer

Applicant	Linkplay Technology Inc.
Applicant Address	8000 Jarvis Avenue Suite #130, Newark, CA 94560
Manufacturer	Linkplay Technology Inc.
Manufacturer Address	8000 Jarvis Avenue Suite #130, Newark, CA 94560

2.2. Information of EUT

Product Name	WiiM Ultra Hi-Res Audio Streamer	
Sample No.	1#	
Hardware Version	A98D V02+Main Board V02	
Software Version	Linkplay.5.3.613253	
Modulation Technology	OFDMA	
Modulation Mode	802.11ax (HEW20), 802.11ax (HEW40), 802.11ax (HEW80)	
U-NII Band	☒U-NII 5 (5925-6425MHz), ☒U-NII 6 (6425-6525MHz), ☒U-NII 7 (6525-6875MHz), ☒U-NII 8 (6875-7125MHz).	
Operating Frequency Range	U-NII 5 (5955-6415MHz), U-NII 6 (6435-6515MHz), U-NII 7 (6535-6855MHz), U-NII 8 (6875-7115MHz).	
Equipment Class	☒Low Power Device	☐6ID ☐6PP ☒6XD ☐6CD
	☐Standard Power Device	☐6SD ☐6FX ☐6FC
Antenna Type	PIFA Antenna	
Antenna Gain (dBi)	ANT1: 3.51dBi; ANT2: 3.51dBi	

Note 1: The EUT has two antennas that cannot transmit simultaneously. Both of the two antennas were evaluated separately, only the worst test result (ANT2) were recorded in the test report.

Note 2: The dedicated software was used to control the EUT continuous transmission.

Note 3: For more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.3. Channel Center Frequency of EUT

2.3.1. Channel center frequency of different bandwidths

Channel Center Frequency = 5950MHz + 5 x n_{ch}; 1 ≤ n_{ch} ≤ 233	
Bandwidth	**Value of n_{ch}**
20MHz	1 + 4(n-1); 1 ≤ n ≤ 59
40MHz	3 + 8(n-1); 1 ≤ n ≤ 29
80MHz	7 + 16(n-1); 1 ≤ n ≤ 14
160MHz	15 + 32(n-1); 1 ≤ n ≤ 7

2.3.2. Center Frequency of Low Middle and High Channel in each U-NII band

Bandwidth	LCH/MCH/HCH	n/n_{ch}/Frequency@MHz			
		U-NII 5	U-NII 6	U-NII 7	U-NII 8
20MHz	LCH	1/1/5955	25/97/6435	30/117/6535	47/185/6875
	MCH	12/45/6175	27/105/6475	38/149/6695	53/209/6995
	HCH	24/93/6415	29/113/6515	46/181/6855	59/233/7115
40MHz	LCH	1/3/5965	13/99/6445	16/123/6565	24/187/6885
	MCH	7/51/6205	-/-/-	19/147/6685	26/203/6965
	HCH	12/91/6405	14/107/6485	23/179/6845	29/227/7085
80MHz	LCH	1/7/5985	-/-/-	9/135/6625	13/199/6945
	MCH	4/55/6225	7/103/6465	10/151/6705	-/-/-
	HCH	6/87/6385	-/-/-	11/167/6785	14/215/7025

2.4. Test Configuration of EUT

2.4.1. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate
802.11ax	20/40/80 (HEW20/40/80)	OFDMA	**BPSK**	**MSC0**~MCS11
			QPSK	
			16QAM	
			64QAM	
			256QAM	
			1024QAM	

2.4.2. Evaluation of The Worst Case

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode
Conducted Output Power and E.I.R.P.	ax80 5985MHz@Ant2
Power Spectral Density	ax20 6415MHz@Ant2
Occupied Bandwidth and Emission Bandwidth	ax80 6945MHz@Ant1
Emission Mask	Each Bandwidth
Contention Based Protocol	Each U-NII Band and Each Bandwidth
Frequency Stability	Unmodulated Signal
Conducted Emission	Normal Use
Restricted Frequency Bands	ax80 in U-NII 5&8
Radiated Emission	ax80

Note 1: The worst-case mode in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

2.4.3. Operation and Transmitter Power Level Setting

The EUT was tested while in a continues transmitter/receiver mode under the control of tool which is provided by manufacturer, all the items of transmitter were tested under the power setting as below:

Modulation Technology	Power Setting (U-NII 5/6/7/8)	
	ANT 1	ANT 2
OFDMA (802.11ax (HE20))	9/9/8/6	8/8/8/5
OFDMA (802.11ax (HE40))	10/10/10/6	9/9/9/7
OFDMA (802.11ax (HE80))	13/13/13/12	13/13/13/12

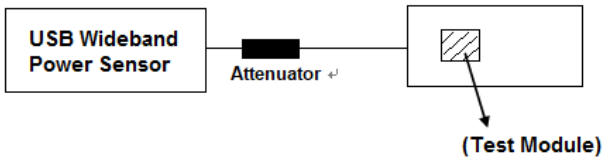
2.5. Test Conditions

Temperature (°C)	15-35
Relative Humidity (%)	30-60
Atmospheric Pressure (kPa)	86-106

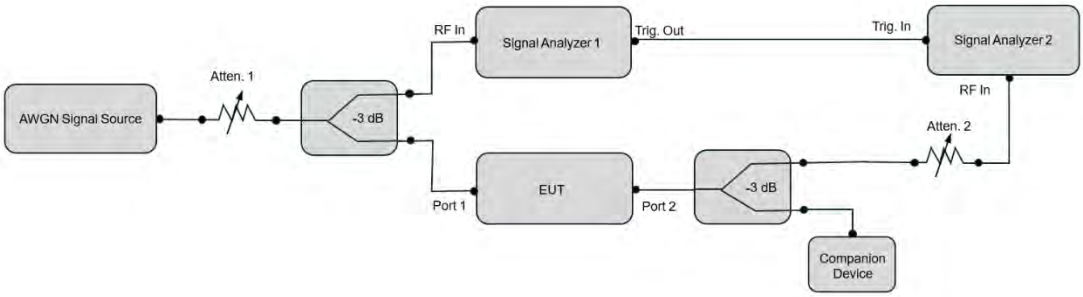
2.6. Test Setup Layout Diagram

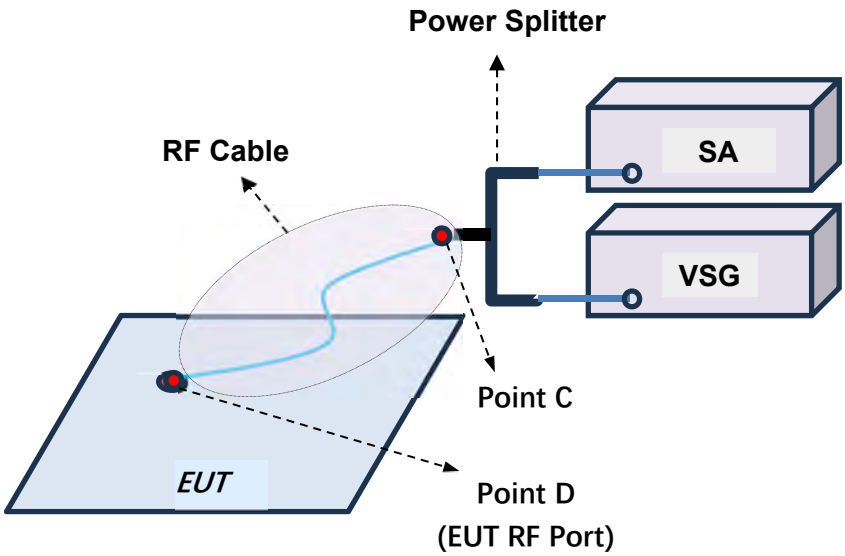
2.6.1. Conducted Measurement

1) For Output Power:

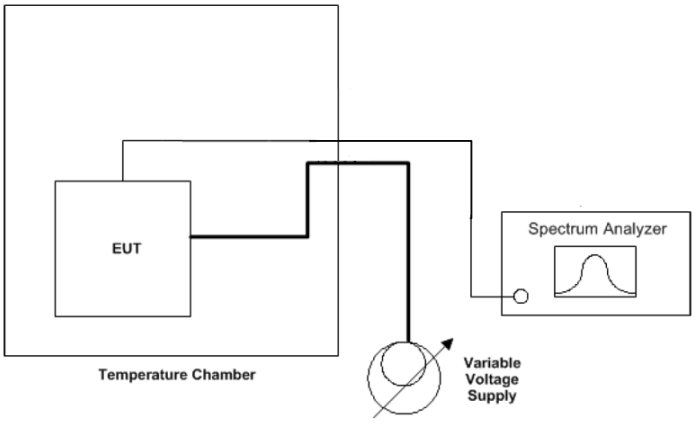


2) For Contention Based Protocol:

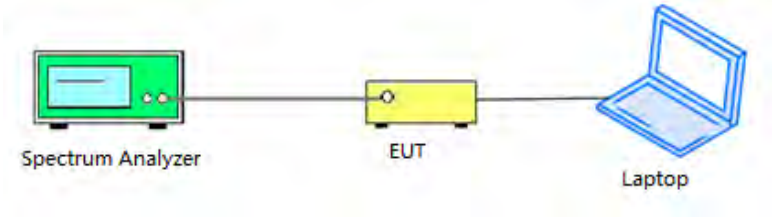




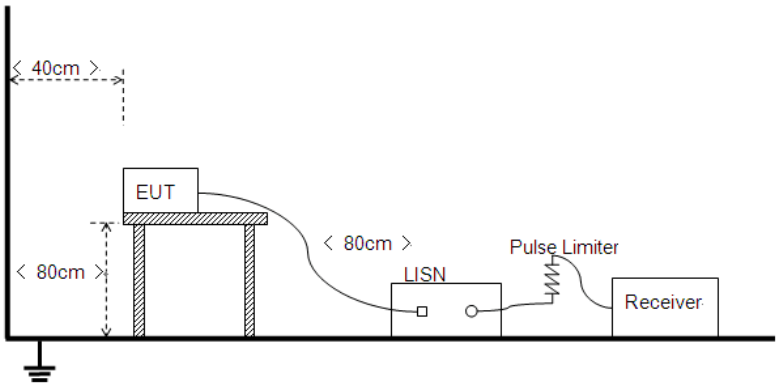
3) For Frequency Stability:



4) For other items:

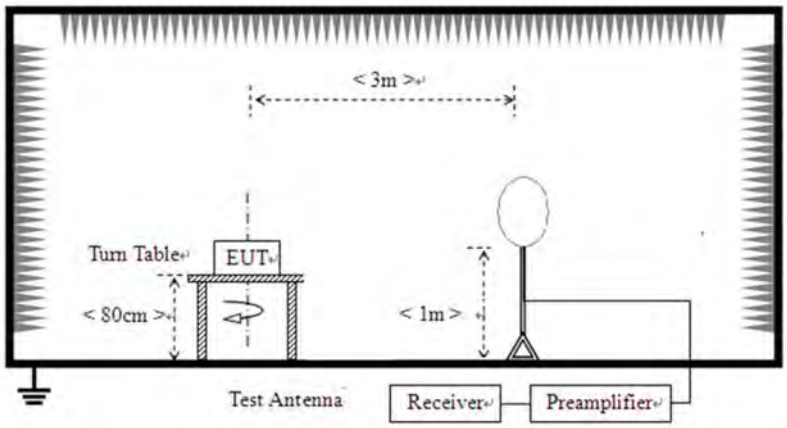


2.6.2. Conducted Emission Measurement

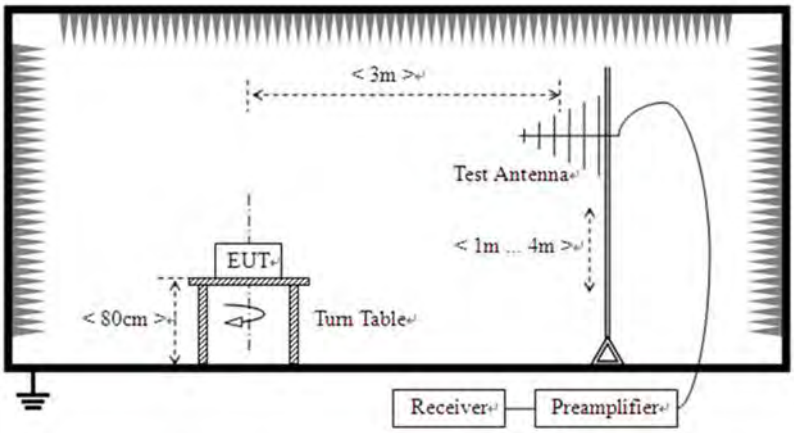


2.6.3. Radiation Measurement

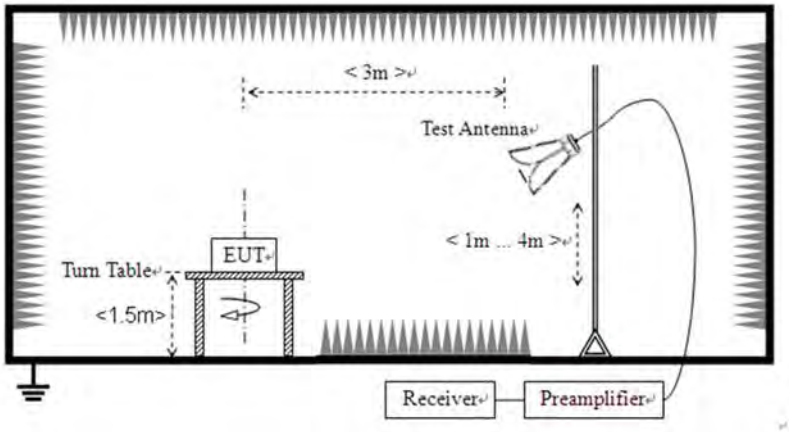
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



3. Description of Test Items and Results

3.1. Antenna Requirement

3.1.1. Requirement

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.1.2. Test Result

Inside of the EUT has a PIFA antenna coupled with the I-PEX connector. Please refer to the EUT internal photos.

3.2. Duty Cycle, Transmission Duration, and Maximum Power Control Level

3.2.1. Requirement

All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be non-constant.

1) T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2) Duty cycle (x), as used in this document, refers to the fraction of time over which the transmitter is on and is transmitting at its maximum power control level.
3) The term “maximum power control level” is intended to distinguish between operating power levels of the EUT and differences in power levels of individual symbols that occur with some modulation types such as quadrature amplitude modulation (QAM). During testing, the EUT is not required to transmit continuously its highest possible symbol power level. Rather, it shall transmit all of the symbols and shall do so at the highest power control level (i.e., highest operating power level) of the EUT.

3.2.2. Test Procedures

Refer to section II.B.2 of KDB 789033 D02.

3.2.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.2.4. Test Result

Refer to Annex A.1 in this report.

3.3. Conducted Output Power and E.I.R.P.

3.3.1. Requirement

Device Class	U-NII Band	EIRP	Clause
Standard-Power AP	U-NII 5 U-NII 7	36dBm (<=21dBm@>30° for outdoor device)	15.407(a)(4)
Client Connected to Standard-Power AP			
Client Device (Except fixed client)		30dBm (Power below its associated standard power access point's authorized transmit power <=6dB)	15.407(a)(7)
Low-Power AP	U-NII 5 U-NII 6 U-NII 7 U-NII 8	30dBm	15.407(a)(5)
Client Connected to Low-Power AP		24dBm	15.407(a)(8)
Subordinate Device		30dBm	15.407(a)(6)

3.3.2. Test Procedures

Refer to the Method PM-G which in section II.C.1. of KDB 789033 D02.

3.3.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.3.4. Test Result

Refer to Annex A.2 in this report.

3.4. Occupied Bandwidth and Emission Bandwidth

3.4.1. Requirement

The occupied bandwidth is the bandwidth containing 99 % of the power of the signal.

The emission bandwidth here is the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio of 26dB.

There is no requirement on the occupied bandwidth and emission bandwidth itself, but the value of emission bandwidth is required in other test items, such as emission mask, etc.

3.4.1. Test Procedures

Refer to section II.C.1. of KDB 789033 D02.

3.4.2. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.4.3. Test Result

Refer to Annex A.3 and Annex A.4 in this report.

3.5. Power Spectral Density

3.5.1. Requirement

Device Class	U-NII Band	EIRP.SD	Clause
Standard-Power AP	U-NII 5 U-NII 7	23dBm/MHz	15.407(a)(4)
Client Connected to Standard-Power AP			
Client Device (Except fixed client)		17dBm/MHz	15.407(a)(7)
Low-Power AP	U-NII 5 U-NII 6 U-NII 7 U-NII 8	5dBm/MHz	15.407(a)(5)
Client Connected to Low-Power AP		-1dBm/MHz	15.407(a)(8)
Subordinate Device		5dBm/MHz	15.407(a)(6)

3.5.2. Test Procedures

Refer to section II.F of KDB 789033 D02.

3.5.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

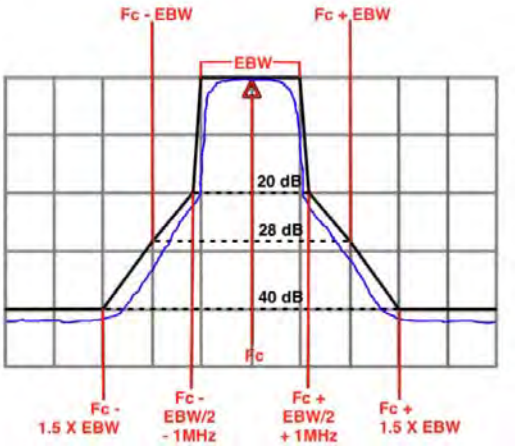
3.5.4. Test Result

Refer to Annex A.5 in this report.

3.6. Emission Mask

3.6.1. Requirement

For transmitters operating within the 5.925–7.125GHz bands: Power spectral density must be suppressed by 20dB at 1 MHz outside of channel edge, by 28dB at one channel bandwidth from the channel center, and by 40dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20dB and 28dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28dB and 40dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40dB.



Generic Emission Mask

3.6.2. Test Procedures

Refer to section II.J of KDB 987594 D02.

3.6.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.6.4. Test Result

Refer to Annex A.6 in this report.

3.7. Contention Based Protocol

3.7.1. Requirement

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125GHz band are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission.

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel (in which incumbent signal is transmitted) and stay off the incumbent channel as long as detected radio frequency power is equal to or greater than the threshold (-62dBm). The -62dBm (or lower) threshold is referenced to a 0dBi antenna gain.

To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

<table>
<tr><th>Parameters</th><th>Limit</th></tr>
<tr><td>Detection Threshold</td><td>≤ -62dBm</td></tr>
<tr><td>Detection Probability</td><td>≥ 90%</td></tr>
<tr><td>Simulating Incumbent Signal Type</td><td>AWGN</td></tr>
<tr><td>Simulating Incumbent Signal Bandwidth</td><td>10MHz</td></tr>
<tr><td>Number of tests</td><td>
<table>
<tr><th>If</th><th>Number of Tests</th><th>Placement of Incumbent Transmission</th></tr>
<tr><td>$BW_{EUT} \leq BW_{Inc}$</td><td>Once</td><td>Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)</td></tr>
<tr><td>$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$</td><td>Once</td><td>Incumbent transmission is contained within BW_{EUT}</td></tr>
<tr><td>$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$</td><td>Twice. Incumbent transmission is contained within BW_{EUT}</td><td>Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel</td></tr>
<tr><td>$BW_{EUT} > 4BW_{Inc}$</td><td>Three times</td><td>Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel</td></tr>
</table>
where:
BW_{EUT}: Transmission bandwidth of EUT signal
BW_{Inc}: Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)
f_{c1}: Center frequency of EUT transmission
f_{c2}: Center frequency of simulated incumbent signal
</td></tr>
</table>

3.7.2. Test Procedures

Refer to section II.J of KDB 987594 D02.
The signal of the EUT is simulated by using software and pinging with the accompanying device to simulate data transmission.

3.7.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.7.4. Test Result

Refer to Annex A.7 in this report.

3.8. Frequency Stability

3.8.1. Requirement

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.8.2. Test Procedures

Refer to section 6.8 of ANSI C63.10.

3.8.3. Test Setup Layout

Refer to chapter 2.6.1 in this report.

3.8.4. Test Result

Refer to Annex A.8 in this report.

3.9. Conducted Emission

3.9.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.9.2. Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10.

3.9.3. Test Setup Layout

Refer to chapter 2.6.2 in this report.

3.9.4. Test Result

Refer to Annex A.9 in this report.

3.10. Restricted Frequency Bands

3.10.1. Requirement

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), should comply with the radiated emission limits specified in Section 15.209(a) (below table).

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

The following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m):

$$E = 1000000 \times \sqrt{30P} / 3 \ \mu V/m$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the above table.

For Above 1000MHz, the emission limit in above is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

3.10.2. Test Procedures

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

3.10.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.10.4. Test Result

Refer to Annex A.10 in this report.

3.11. Radiated Emission

3.11.1. Requirement

For transmitters operating within the 5.925–7.125 GHz band: Any emissions outside of the 5.925–7.125 GHz band must not exceed an e.i.r.p. of −27 dBm/MHz.

The following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \ \mu V/m$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

3.11.2. Test Procedures

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT

distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

3.11.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

3.11.4. Test Result

Refer to Annex A.11 in this report.

Annex A Test Data and Result

A.1. Duty Cycle of Test Signal

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	ax20	5955	Ant1	98.02	0.09	0.21
NVNT	ax20	6175	Ant1	98.02	0.09	0.21
NVNT	ax20	6415	Ant1	97.98	0.09	0.21
NVNT	ax20	6435	Ant1	98.02	0.09	0.21
NVNT	ax20	6475	Ant1	97.98	0.09	0.21
NVNT	ax20	6515	Ant1	97.98	0.09	0.21
NVNT	ax20	6535	Ant1	97.98	0.09	0.21
NVNT	ax20	6695	Ant1	98.02	0.09	0.21
NVNT	ax20	6855	Ant1	98.02	0.09	0.21
NVNT	ax20	6875	Ant1	98.02	0.09	0.21
NVNT	ax20	6995	Ant1	97.98	0.09	0.21
NVNT	ax20	7115	Ant1	98.02	0.09	0.21
NVNT	ax20	5955	Ant2	99.15	0.04	4.27
NVNT	ax20	6175	Ant2	97.98	0.09	0.21
NVNT	ax20	6415	Ant2	98.02	0.09	0.21
NVNT	ax20	6435	Ant2	97.98	0.09	0.21
NVNT	ax20	6475	Ant2	97.98	0.09	0.21
NVNT	ax20	6515	Ant2	98.02	0.09	0.21
NVNT	ax20	6535	Ant2	97.98	0.09	0.21
NVNT	ax20	6695	Ant2	98.02	0.09	0.21
NVNT	ax20	6855	Ant2	97.98	0.09	0.21
NVNT	ax20	6875	Ant2	97.98	0.09	0.21
NVNT	ax20	6995	Ant2	98.02	0.09	0.21
NVNT	ax20	7115	Ant2	97.98	0.09	0.21
NVNT	ax40	5965	Ant1	96.09	0.17	0.41
NVNT	ax40	6205	Ant1	96.08	0.17	0.41
NVNT	ax40	6405	Ant1	96.16	0.17	0.41
NVNT	ax40	6445	Ant1	96.16	0.17	0.41
NVNT	ax40	6485	Ant1	96.08	0.17	0.41
NVNT	ax40	6565	Ant1	96.08	0.17	0.41
NVNT	ax40	6685	Ant1	96.09	0.17	0.41
NVNT	ax40	6845	Ant1	96.08	0.17	0.41

NVNT	ax40	6885	Ant1	96.08	0.17	0.41
NVNT	ax40	6965	Ant1	96.08	0.17	0.41
NVNT	ax40	7085	Ant1	96.08	0.17	0.41
NVNT	ax40	5965	Ant2	96.16	0.17	0.41
NVNT	ax40	6205	Ant2	96.16	0.17	0.41
NVNT	ax40	6405	Ant2	96.24	0.17	0.41
NVNT	ax40	6445	Ant2	96.16	0.17	0.41
NVNT	ax40	6485	Ant2	96.16	0.17	0.41
NVNT	ax40	6565	Ant2	96.16	0.17	0.41
NVNT	ax40	6685	Ant2	96.16	0.17	0.41
NVNT	ax40	6845	Ant2	96.16	0.17	0.41
NVNT	ax40	6885	Ant2	96.17	0.17	0.41
NVNT	ax40	6965	Ant2	96.24	0.17	0.41
NVNT	ax40	7085	Ant2	96.16	0.17	0.41
NVNT	ax80	5985	Ant1	92.48	0.34	0.83
NVNT	ax80	6225	Ant1	92.48	0.34	0.83
NVNT	ax80	6385	Ant1	92.48	0.34	0.83
NVNT	ax80	6465	Ant1	92.47	0.34	0.83
NVNT	ax80	6625	Ant1	92.48	0.34	0.83
NVNT	ax80	6705	Ant1	92.47	0.34	0.83
NVNT	ax80	6785	Ant1	92.48	0.34	0.83
NVNT	ax80	6945	Ant1	92.48	0.34	0.83
NVNT	ax80	7025	Ant1	92.47	0.34	0.83
NVNT	ax80	5985	Ant2	92.47	0.34	0.83
NVNT	ax80	6225	Ant2	92.48	0.34	0.83
NVNT	ax80	6385	Ant2	92.48	0.34	0.83
NVNT	ax80	6465	Ant2	92.48	0.34	0.83
NVNT	ax80	6625	Ant2	92.48	0.34	0.83
NVNT	ax80	6705	Ant2	92.47	0.34	0.83
NVNT	ax80	6785	Ant2	92.48	0.34	0.83
NVNT	ax80	6945	Ant2	92.47	0.34	0.83
NVNT	ax80	7025	Ant2	92.48	0.34	0.83

A.2. Conducted Output Power and E.I.R.P.

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Gain (dBi)	eirp Power	Limit (dBm)	Verdict
NVNT	ax20	5955	Ant1	5.51	0	5.51	3.51	9.02	24	Pass
NVNT	ax20	6175	Ant1	4.93	0	4.93	3.51	8.44	24	Pass
NVNT	ax20	6415	Ant1	6.74	0	6.74	3.51	10.25	24	Pass
NVNT	ax20	6435	Ant1	6.59	0	6.59	3.51	10.1	24	Pass
NVNT	ax20	6475	Ant1	6.69	0	6.69	3.51	10.2	24	Pass
NVNT	ax20	6515	Ant1	6.7	0	6.7	3.51	10.21	24	Pass
NVNT	ax20	6535	Ant1	4.83	0	4.83	3.51	8.34	24	Pass
NVNT	ax20	6695	Ant1	6.4	0	6.4	3.51	9.91	24	Pass
NVNT	ax20	6855	Ant1	5.48	0	5.48	3.51	8.99	24	Pass
NVNT	ax20	6875	Ant1	3.52	0	3.52	3.51	7.03	24	Pass
NVNT	ax20	6995	Ant1	3.34	0	3.34	3.51	6.85	24	Pass
NVNT	ax20	7115	Ant1	1.78	0	1.78	3.51	5.29	24	Pass
NVNT	ax20	5955	Ant2	8.07	0	8.07	3.51	11.58	24	Pass
NVNT	ax20	6175	Ant2	6.41	0	6.41	3.51	9.92	24	Pass
NVNT	ax20	6415	Ant2	7.39	0	7.39	3.51	10.9	24	Pass
NVNT	ax20	6435	Ant2	7.14	0	7.14	3.51	10.65	24	Pass
NVNT	ax20	6475	Ant2	7.2	0	7.2	3.51	10.71	24	Pass
NVNT	ax20	6515	Ant2	6.62	0	6.62	3.51	10.13	24	Pass
NVNT	ax20	6535	Ant2	5.78	0	5.78	3.51	9.29	24	Pass
NVNT	ax20	6695	Ant2	5.48	0	5.48	3.51	8.99	24	Pass
NVNT	ax20	6855	Ant2	5.89	0	5.89	3.51	9.4	24	Pass
NVNT	ax20	6875	Ant2	2.93	0	2.93	3.51	6.44	24	Pass
NVNT	ax20	6995	Ant2	3.97	0	3.97	3.51	7.48	24	Pass
NVNT	ax20	7115	Ant2	2.47	0	2.47	3.51	5.98	24	Pass
NVNT	ax40	5965	Ant1	10.1	0	10.1	3.51	13.61	24	Pass
NVNT	ax40	6205	Ant1	8.02	0	8.02	3.51	11.53	24	Pass
NVNT	ax40	6405	Ant1	9.17	0	9.17	3.51	12.68	24	Pass
NVNT	ax40	6445	Ant1	9.55	0	9.55	3.51	13.06	24	Pass
NVNT	ax40	6485	Ant1	9.32	0	9.32	3.51	12.83	24	Pass
NVNT	ax40	6565	Ant1	7.63	0	7.63	3.51	11.14	24	Pass
NVNT	ax40	6685	Ant1	7.96	0	7.96	3.51	11.47	24	Pass
NVNT	ax40	6845	Ant1	9.37	0	9.37	3.51	12.88	24	Pass
NVNT	ax40	6885	Ant1	4.95	0	4.95	3.51	8.46	24	Pass
NVNT	ax40	6965	Ant1	6.17	0	6.17	3.51	9.68	24	Pass

NVNT	ax40	7085	Ant1	4.91	0	4.91	3.51	8.42	24	Pass
NVNT	ax40	5965	Ant2	9.69	0	9.69	3.51	13.2	24	Pass
NVNT	ax40	6205	Ant2	7.58	0	7.58	3.51	11.09	24	Pass
NVNT	ax40	6405	Ant2	8.92	0	8.92	3.51	12.43	24	Pass
NVNT	ax40	6445	Ant2	9.18	0	9.18	3.51	12.69	24	Pass
NVNT	ax40	6485	Ant2	8.57	0	8.57	3.51	12.08	24	Pass
NVNT	ax40	6565	Ant2	7.1	0	7.1	3.51	10.61	24	Pass
NVNT	ax40	6685	Ant2	6.89	0	6.89	3.51	10.4	24	Pass
NVNT	ax40	6845	Ant2	7.33	0	7.33	3.51	10.84	24	Pass
NVNT	ax40	6885	Ant2	5.62	0	5.62	3.51	9.13	24	Pass
NVNT	ax40	6965	Ant2	7.02	0	7.02	3.51	10.53	24	Pass
NVNT	ax40	7085	Ant2	7.47	0	7.47	3.51	10.98	24	Pass
NVNT	ax80	5985	Ant1	11.82	0	11.82	3.51	15.33	24	Pass
NVNT	ax80	6225	Ant1	10.69	0	10.69	3.51	14.2	24	Pass
NVNT	ax80	6385	Ant1	11.47	0	11.47	3.51	14.98	24	Pass
NVNT	ax80	6465	Ant1	11.27	0	11.27	3.51	14.78	24	Pass
NVNT	ax80	6625	Ant1	9.52	0	9.52	3.51	13.03	24	Pass
NVNT	ax80	6705	Ant1	9.89	0	9.89	3.51	13.4	24	Pass
NVNT	ax80	6785	Ant1	10.06	0	10.06	3.51	13.57	24	Pass
NVNT	ax80	6945	Ant1	9.91	0	9.91	3.51	13.42	24	Pass
NVNT	ax80	7025	Ant1	9.4	0	9.4	3.51	12.91	24	Pass
NVNT	ax80	5985	Ant2	12.07	0	12.07	3.51	15.58	24	Pass
NVNT	ax80	6225	Ant2	11.74	0	11.74	3.51	15.25	24	Pass
NVNT	ax80	6385	Ant2	11.66	0	11.66	3.51	15.17	24	Pass
NVNT	ax80	6465	Ant2	10.67	0	10.67	3.51	14.18	24	Pass
NVNT	ax80	6625	Ant2	8.58	0	8.58	3.51	12.09	24	Pass
NVNT	ax80	6705	Ant2	9.14	0	9.14	3.51	12.65	24	Pass
NVNT	ax80	6785	Ant2	9.08	0	9.08	3.51	12.59	24	Pass
NVNT	ax80	6945	Ant2	9.42	0	9.42	3.51	12.93	24	Pass
NVNT	ax80	7025	Ant2	10.62	0	10.62	3.51	14.13	24	Pass

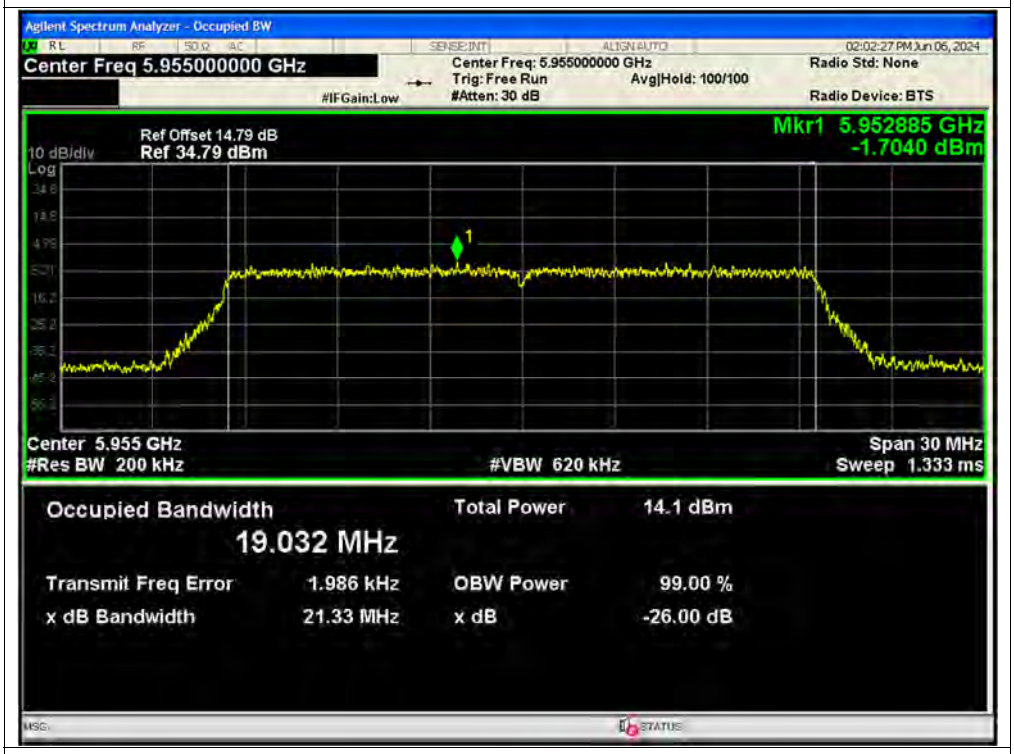
A.3. Occupied Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	ax20	5955	Ant1	19.0320
NVNT	ax20	6175	Ant1	19.0190
NVNT	ax20	6415	Ant1	19.0166
NVNT	ax20	6435	Ant1	19.0618
NVNT	ax20	6475	Ant1	19.0313
NVNT	ax20	6515	Ant1	18.9991
NVNT	ax20	6535	Ant1	19.0203
NVNT	ax20	6695	Ant1	19.0421
NVNT	ax20	6855	Ant1	19.0584
NVNT	ax20	6875	Ant1	19.0204
NVNT	ax20	6995	Ant1	18.9685
NVNT	ax20	7115	Ant1	18.9389
NVNT	ax20	5955	Ant2	19.0046
NVNT	ax20	6175	Ant2	19.0186
NVNT	ax20	6415	Ant2	19.0365
NVNT	ax20	6435	Ant2	19.0105
NVNT	ax20	6475	Ant2	19.0505
NVNT	ax20	6515	Ant2	19.0325
NVNT	ax20	6535	Ant2	19.0255
NVNT	ax20	6695	Ant2	19.028
NVNT	ax20	6855	Ant2	19.0133
NVNT	ax20	6875	Ant2	19.0421
NVNT	ax20	6995	Ant2	18.96
NVNT	ax20	7115	Ant2	18.9484
NVNT	ax40	5965	Ant1	37.6307
NVNT	ax40	6205	Ant1	37.6243
NVNT	ax40	6405	Ant1	37.5701
NVNT	ax40	6445	Ant1	37.5607
NVNT	ax40	6485	Ant1	37.5678
NVNT	ax40	6565	Ant1	37.609
NVNT	ax40	6685	Ant1	37.5744
NVNT	ax40	6845	Ant1	37.6349
NVNT	ax40	6885	Ant1	37.5617
NVNT	ax40	6965	Ant1	37.7284
NVNT	ax40	7085	Ant1	37.717
NVNT	ax40	5965	Ant2	37.6522

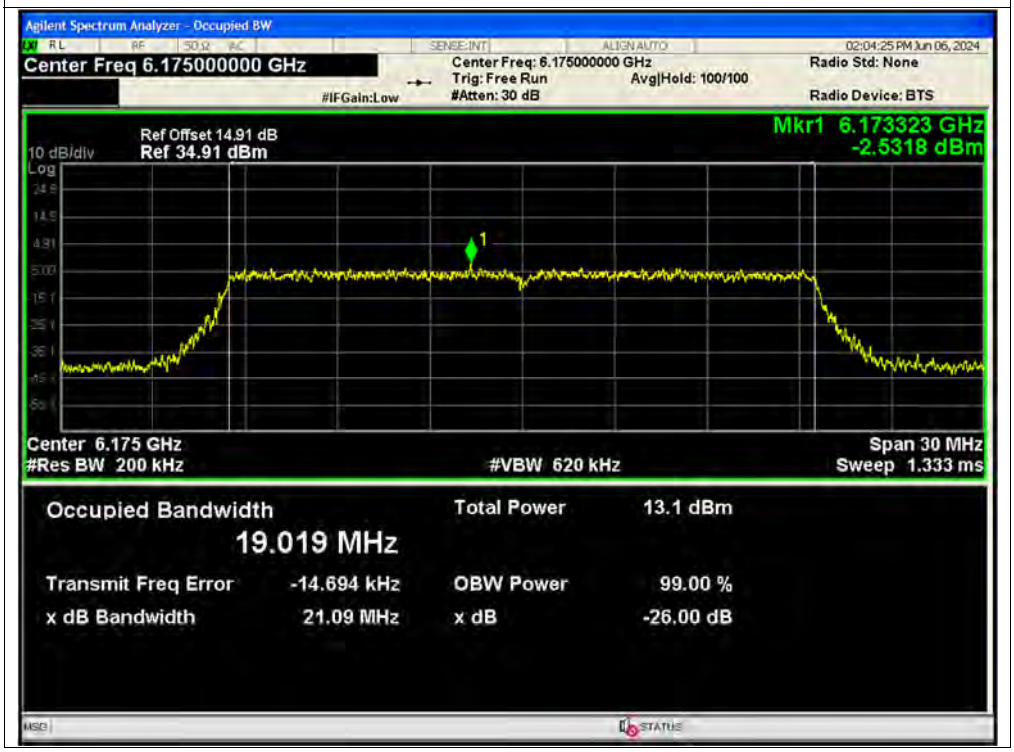
NVNT	ax40	6205	Ant2	37.5766
NVNT	ax40	6405	Ant2	37.5819
NVNT	ax40	6445	Ant2	37.6197
NVNT	ax40	6485	Ant2	37.5784
NVNT	ax40	6565	Ant2	37.5545
NVNT	ax40	6685	Ant2	37.5578
NVNT	ax40	6845	Ant2	37.5884
NVNT	ax40	6885	Ant2	37.597
NVNT	ax40	6965	Ant2	37.7292
NVNT	ax40	7085	Ant2	37.7562
NVNT	ax80	5985	Ant1	76.8312
NVNT	ax80	6225	Ant1	76.8429
NVNT	ax80	6385	Ant1	76.8424
NVNT	ax80	6465	Ant1	76.8965
NVNT	ax80	6625	Ant1	76.8399
NVNT	ax80	6705	Ant1	76.8435
NVNT	ax80	6785	Ant1	76.9694
NVNT	ax80	6945	Ant1	77.2484
NVNT	ax80	7025	Ant1	77.2234
NVNT	ax80	5985	Ant2	76.8996
NVNT	ax80	6225	Ant2	76.9199
NVNT	ax80	6385	Ant2	76.8333
NVNT	ax80	6465	Ant2	76.918
NVNT	ax80	6625	Ant2	76.8723
NVNT	ax80	6705	Ant2	76.8218
NVNT	ax80	6785	Ant2	76.9329
NVNT	ax80	6945	Ant2	77.1905
NVNT	ax80	7025	Ant2	77.2107

Test Graphs

OBW NVNT ax20 5955MHz Ant1

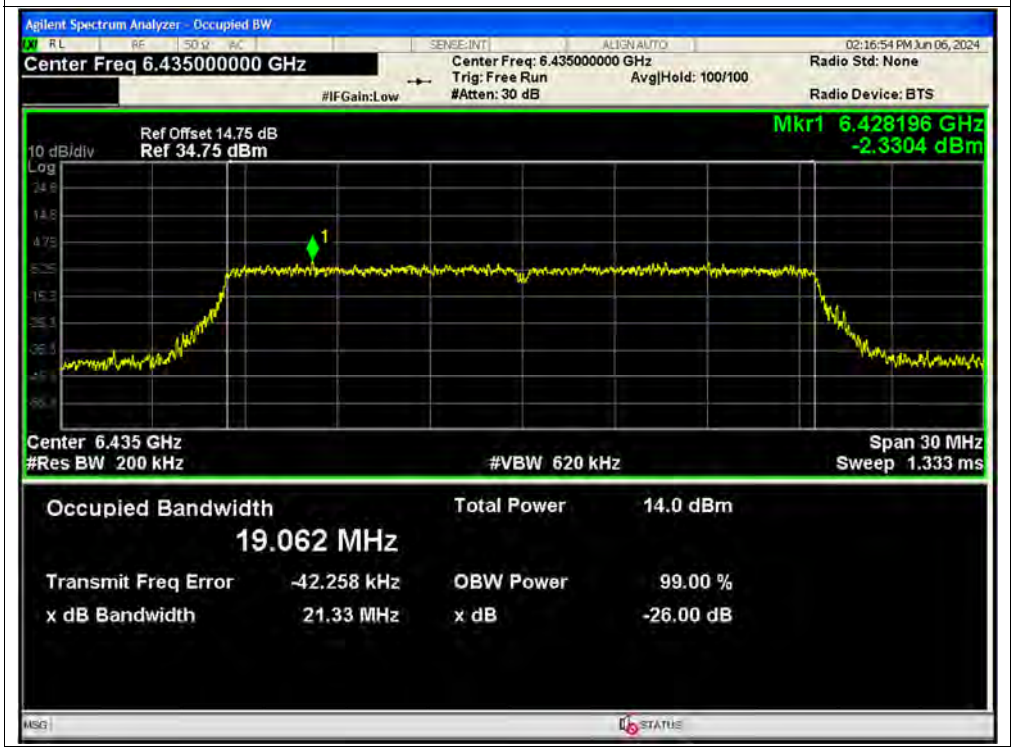


OBW NVNT ax20 6175MHz Ant1



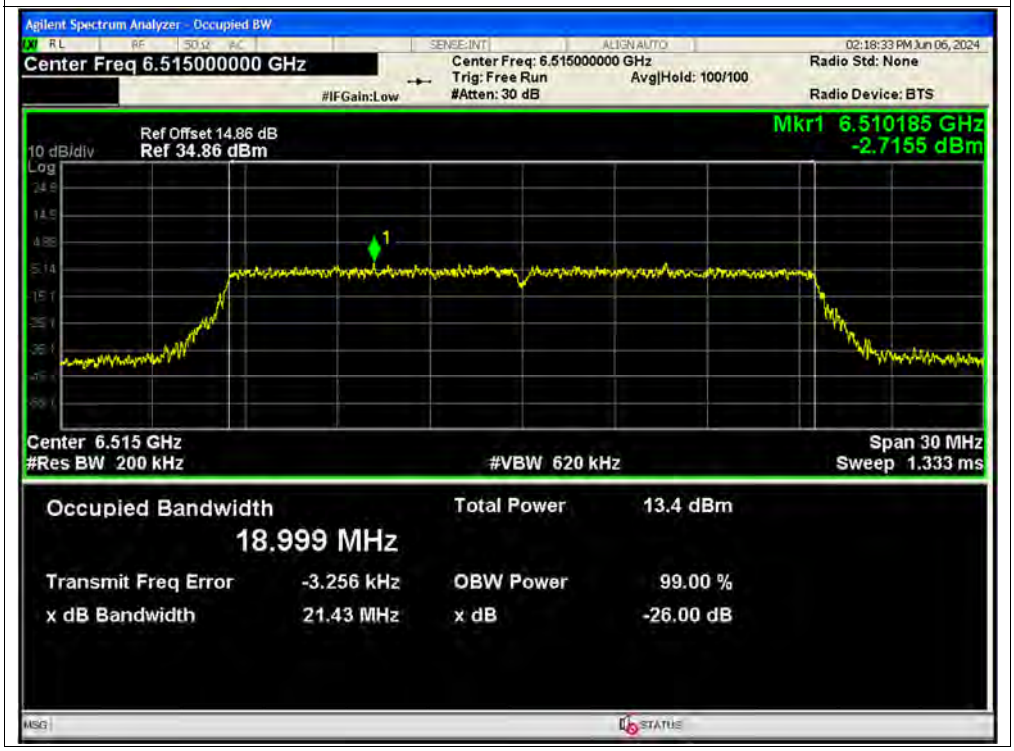
OBW NVNT ax20 6415MHz Ant1

OBW NVNT ax20 6435MHz Ant1



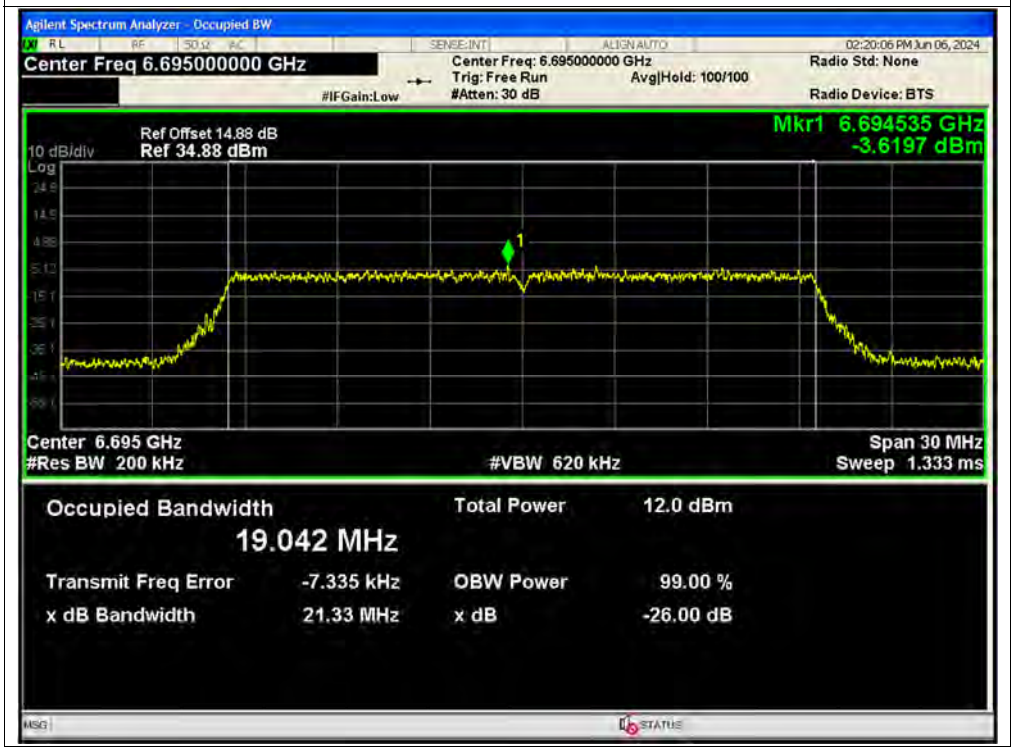
OBW NVNT ax20 6475MHz Ant1

OBW NVNT ax20 6515MHz Ant1

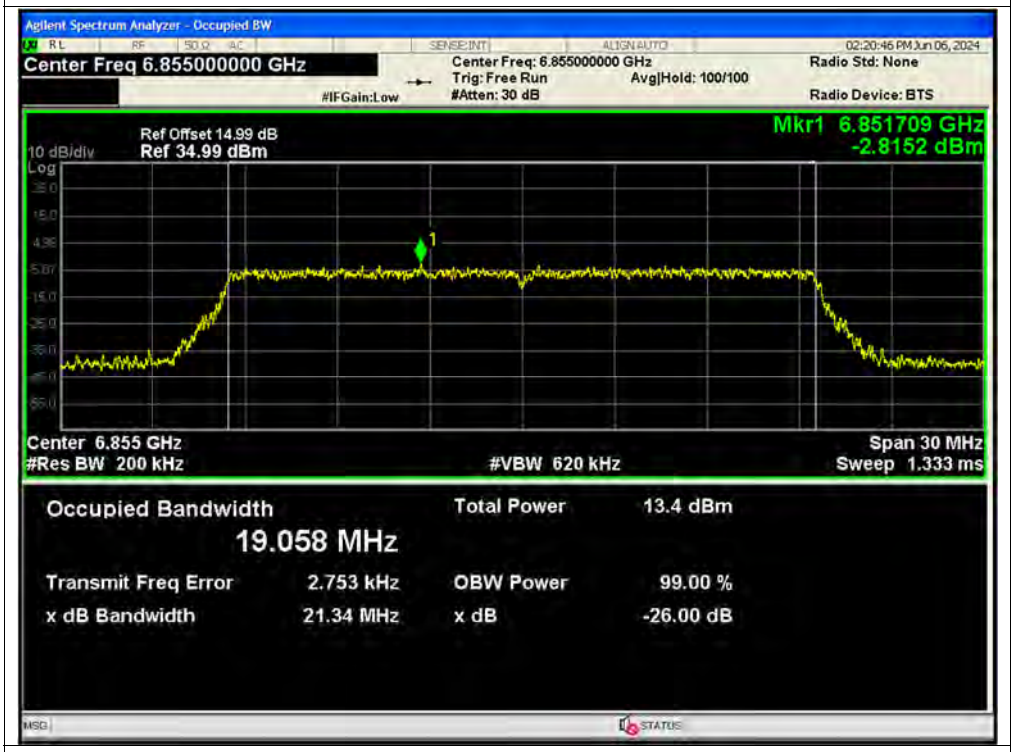


OBW NVNT ax20 6535MHz Ant1

OBW NVNT ax20 6695MHz Ant1



OBW NVNT ax20 6855MHz Ant1



OBW NVNT ax20 6875MHz Ant1

OBW NVNT ax20 6995MHz Ant1

OBW NVNT ax20 7115MHz Ant1

OBW NVNT ax20 5955MHz Ant2

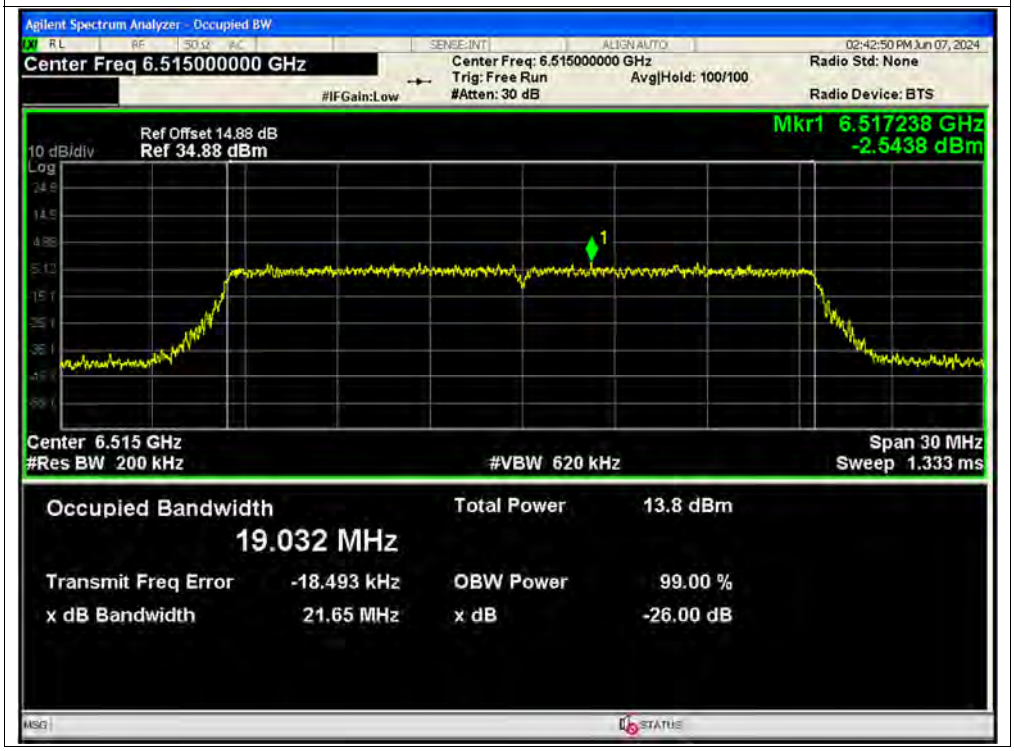
OBW NVNT ax20 6175MHz Ant2

OBW NVNT ax20 6415MHz Ant2

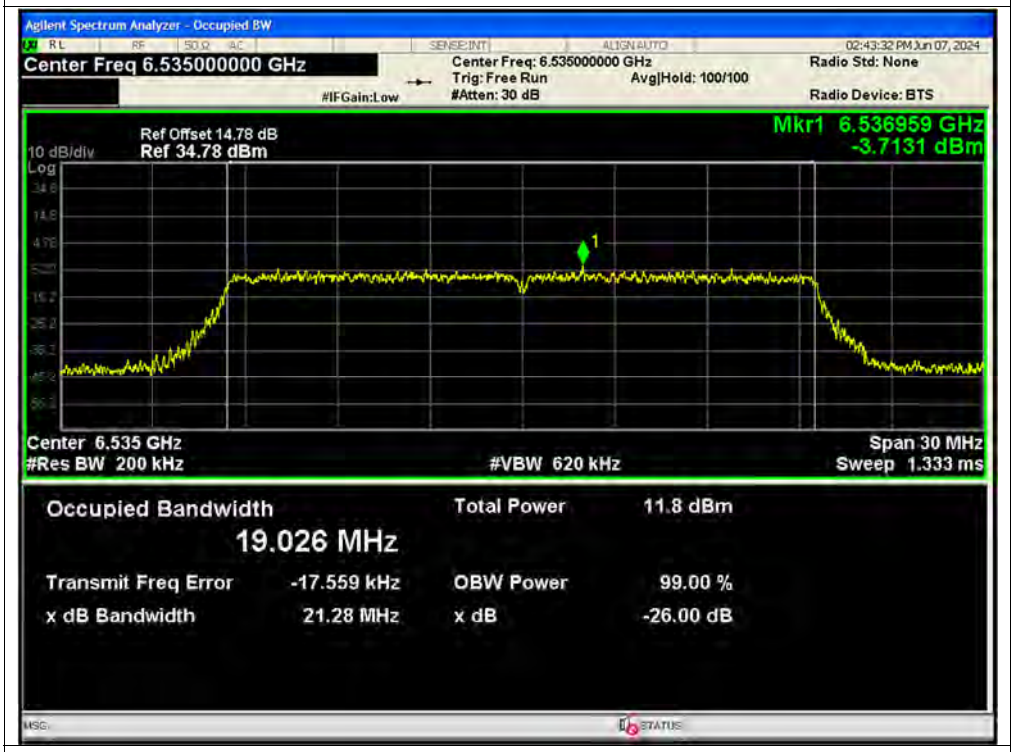
OBW NVNT ax20 6435MHz Ant2

OBW NVNT ax20 6475MHz Ant2

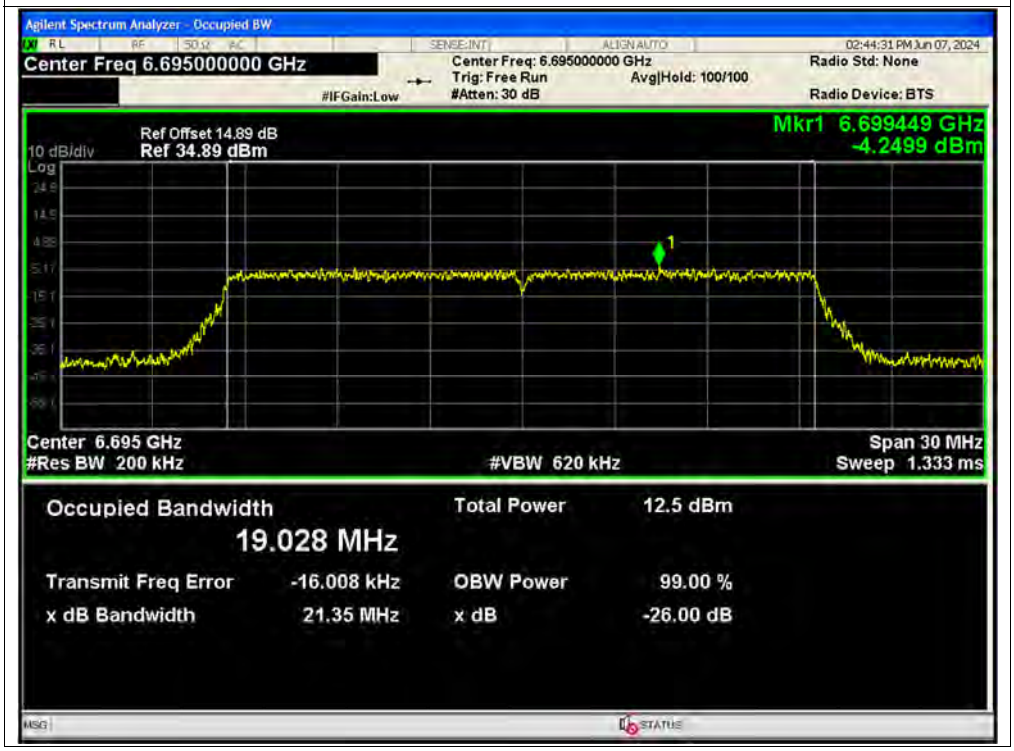
OBW NVNT ax20 6515MHz Ant2



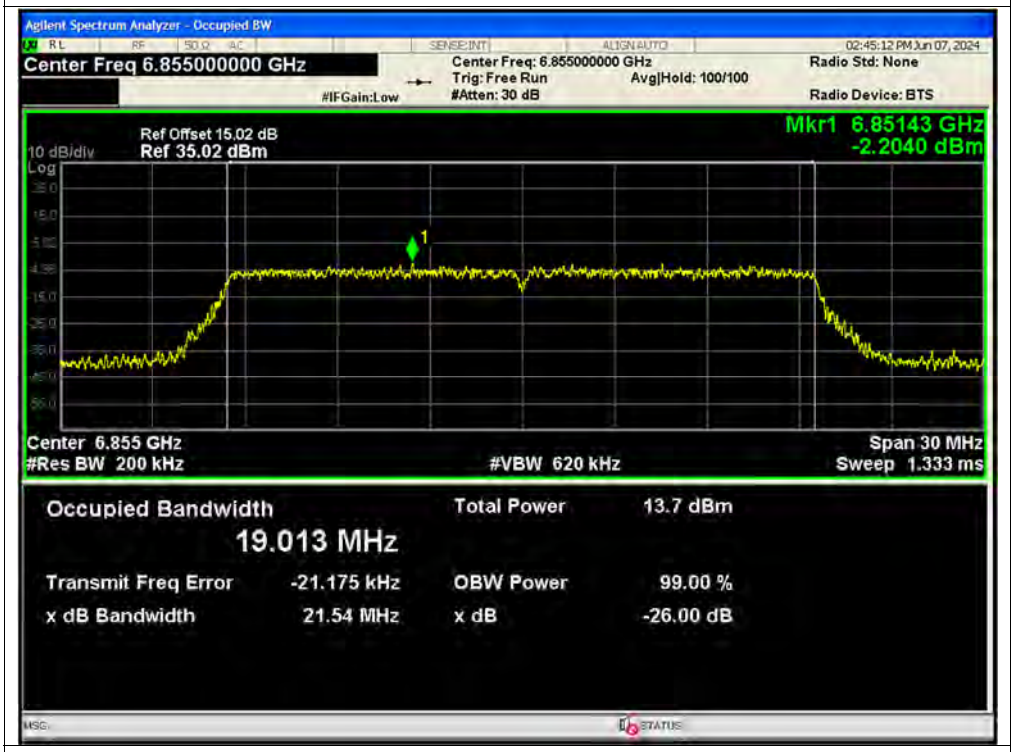
OBW NVNT ax20 6535MHz Ant2



OBW NVNT ax20 6695MHz Ant2



OBW NVNT ax20 6855MHz Ant2

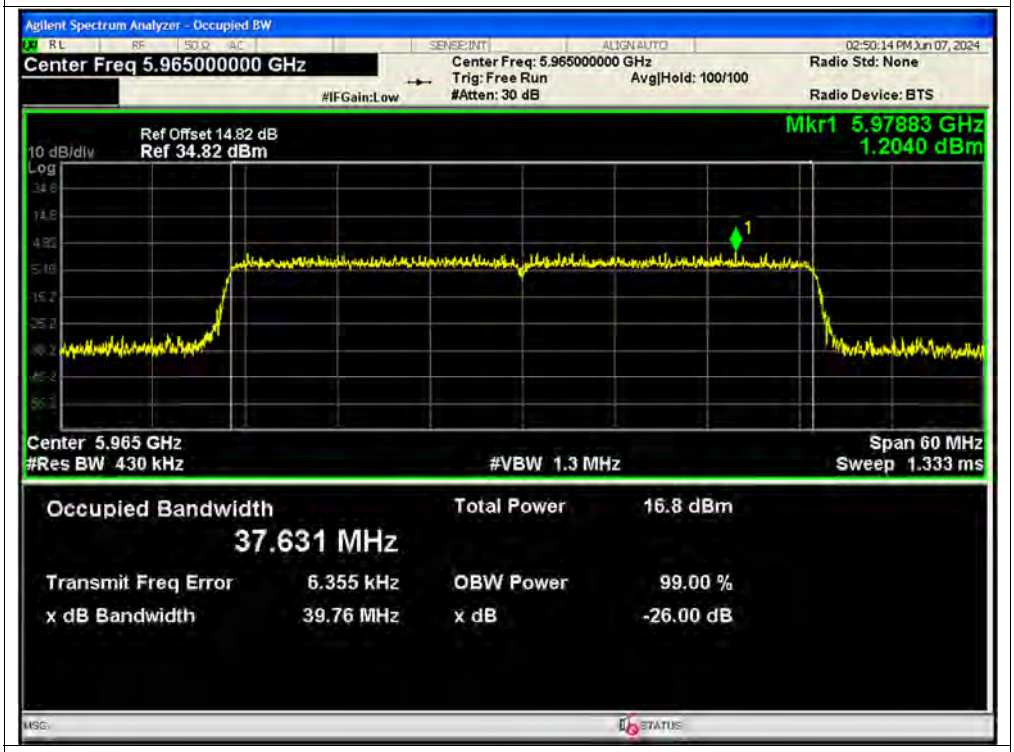


OBW NVNT ax20 6875MHz Ant2

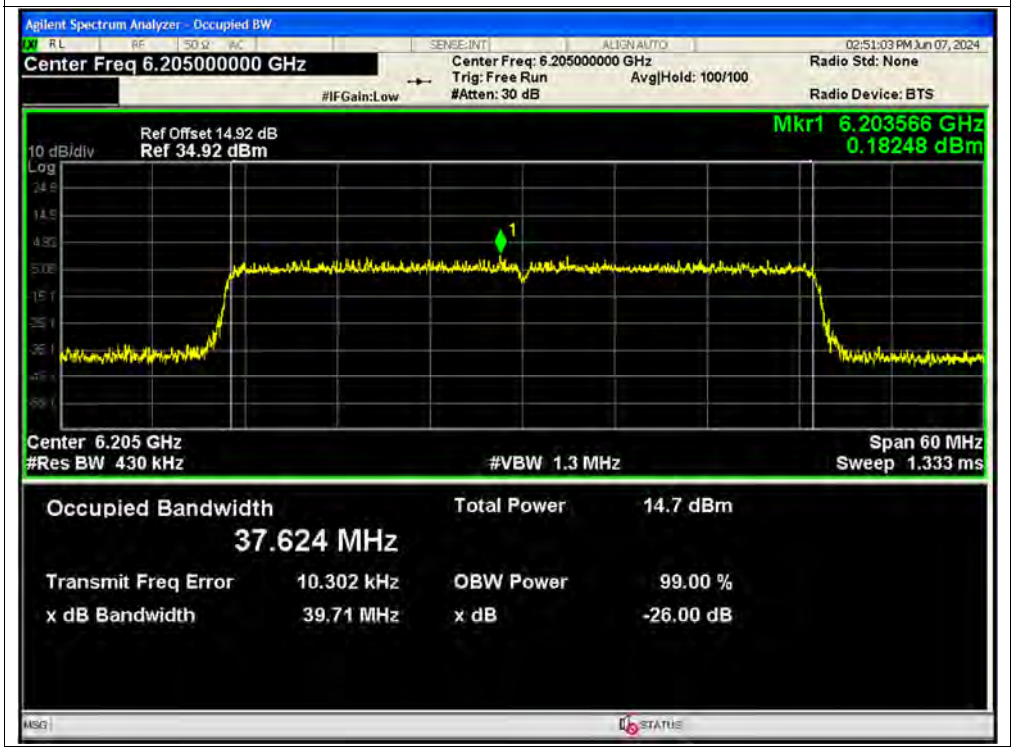
OBW NVNT ax20 6995MHz Ant2

OBW NVNT ax20 7115MHz Ant2

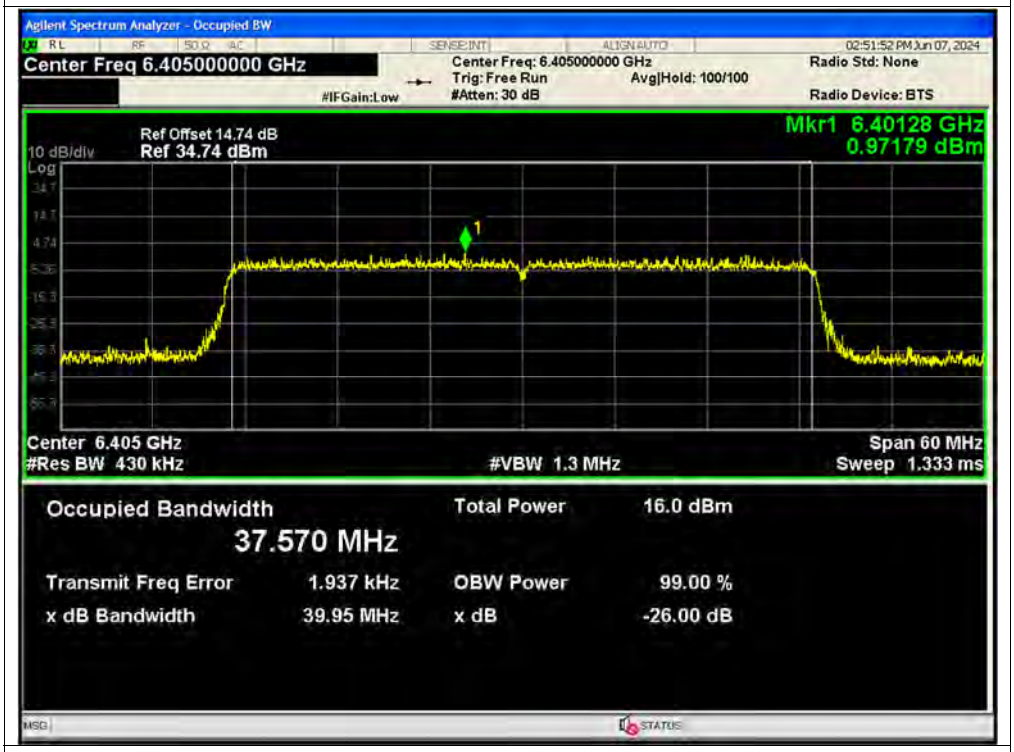
OBW NVNT ax40 5965MHz Ant1



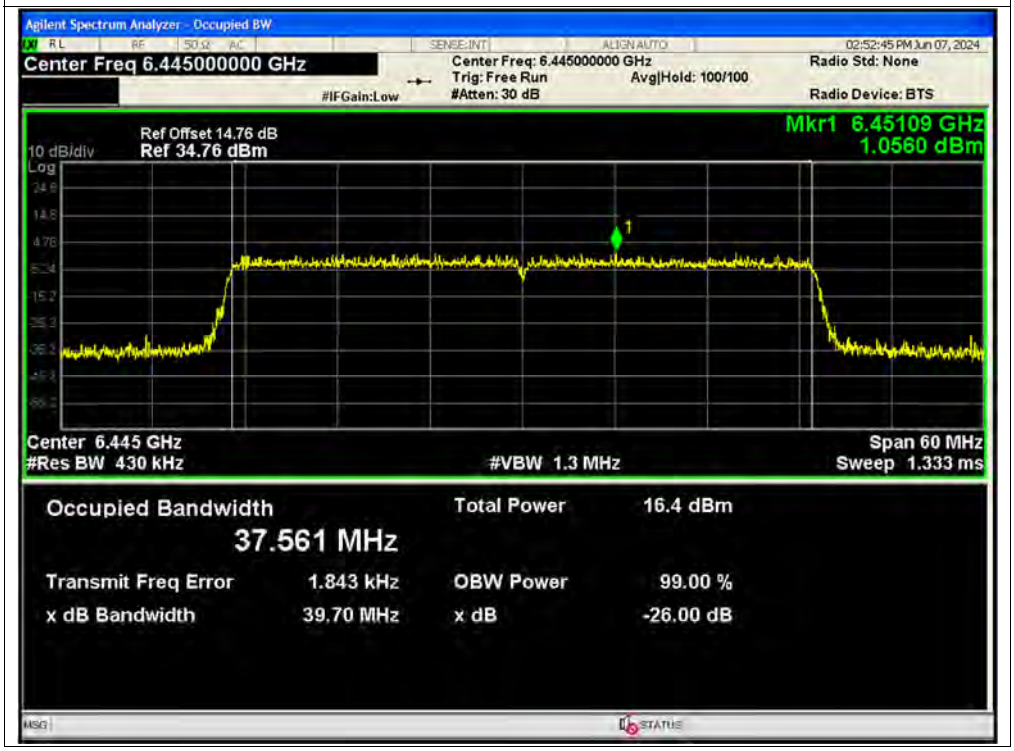
OBW NVNT ax40 6205MHz Ant1



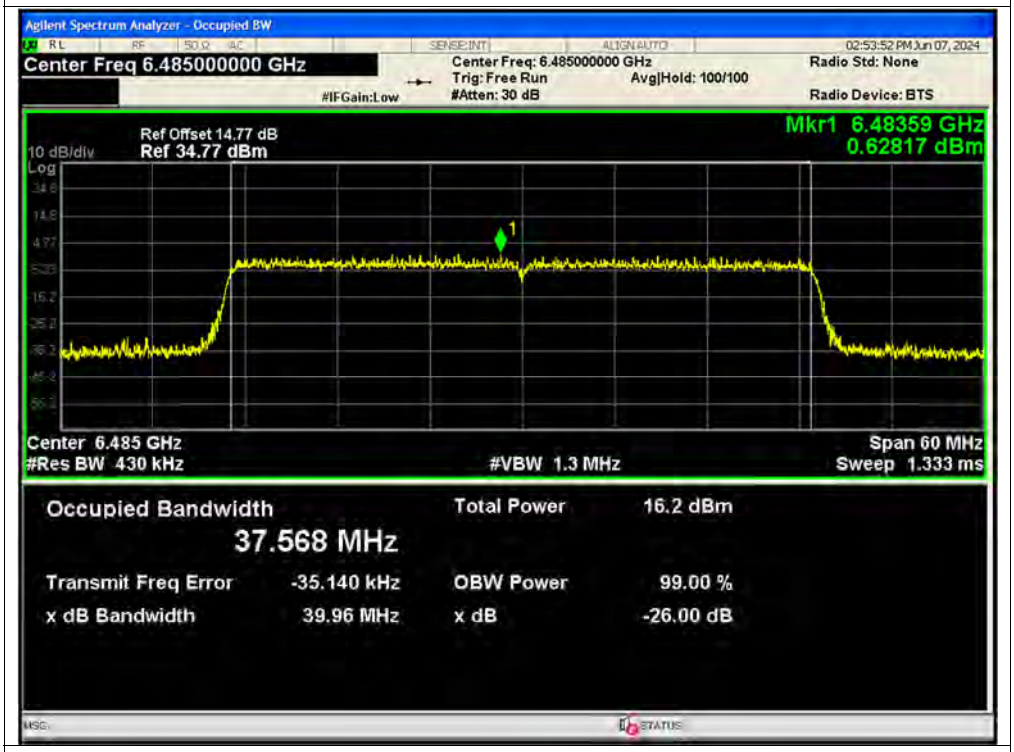
OBW NVNT ax40 6405MHz Ant1



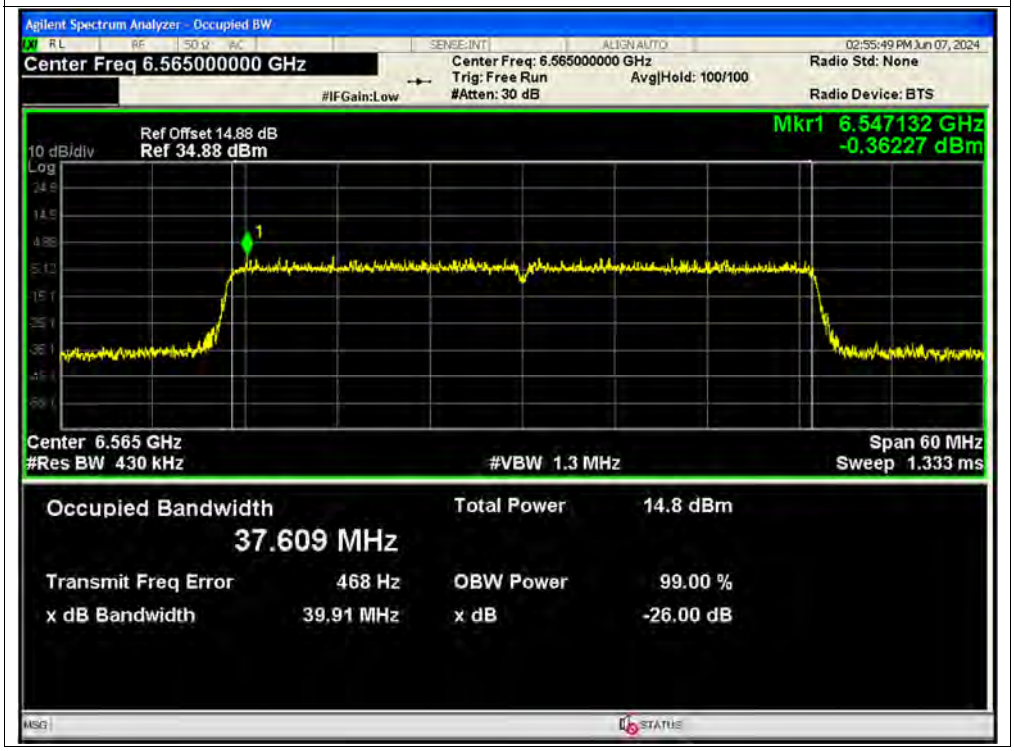
OBW NVNT ax40 6445MHz Ant1



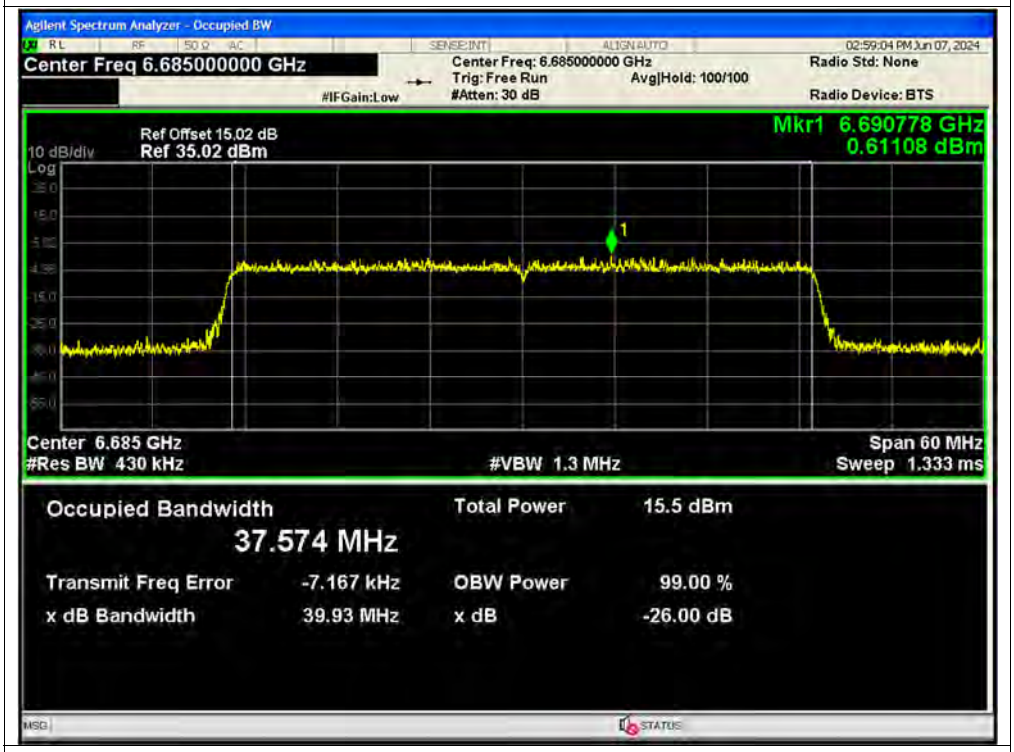
OBW NVNT ax40 6485MHz Ant1



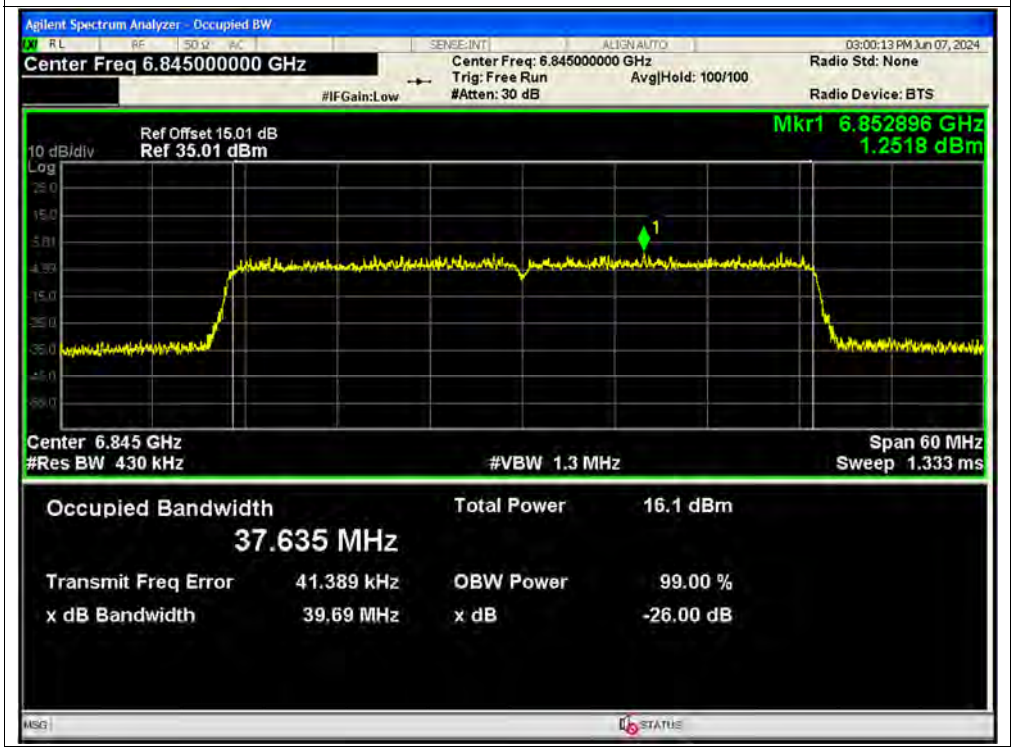
OBW NVNT ax40 6565MHz Ant1



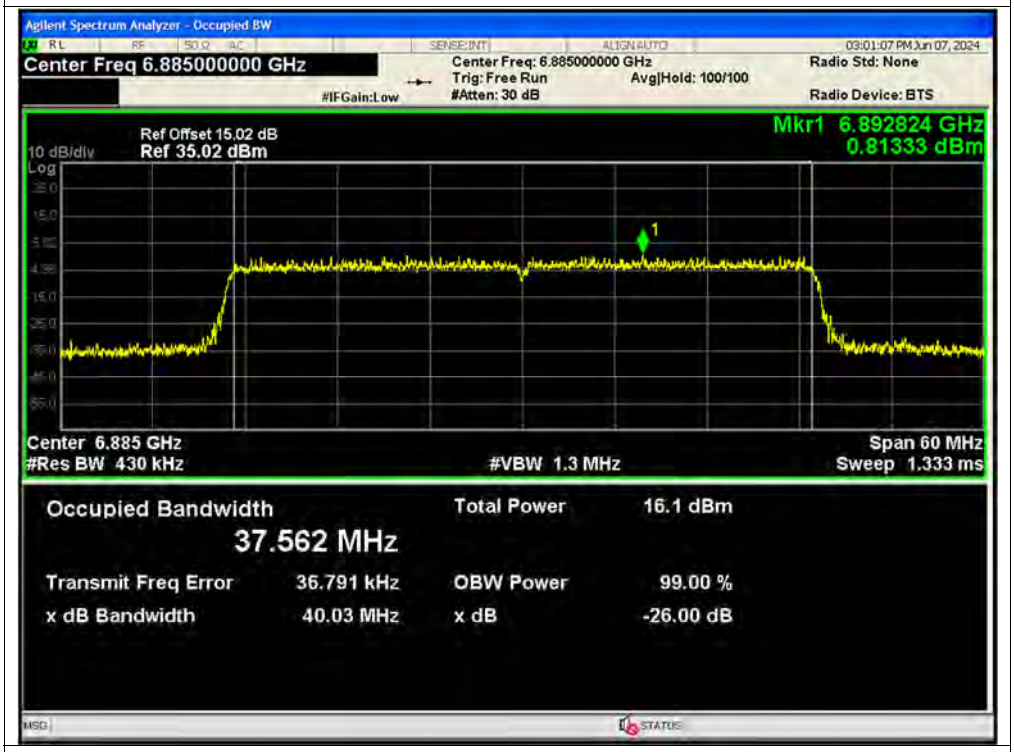
OBW NVNT ax40 6685MHz Ant1



OBW NVNT ax40 6845MHz Ant1



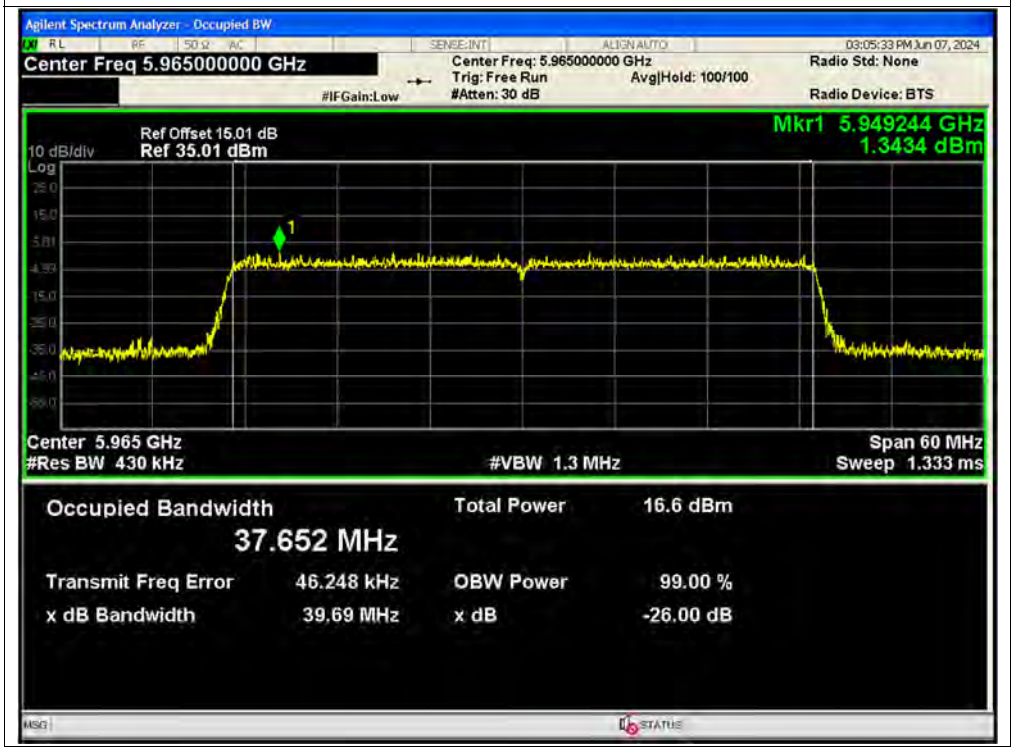
OBW NVNT ax40 6885MHz Ant1



OBW NVNT ax40 6965MHz Ant1

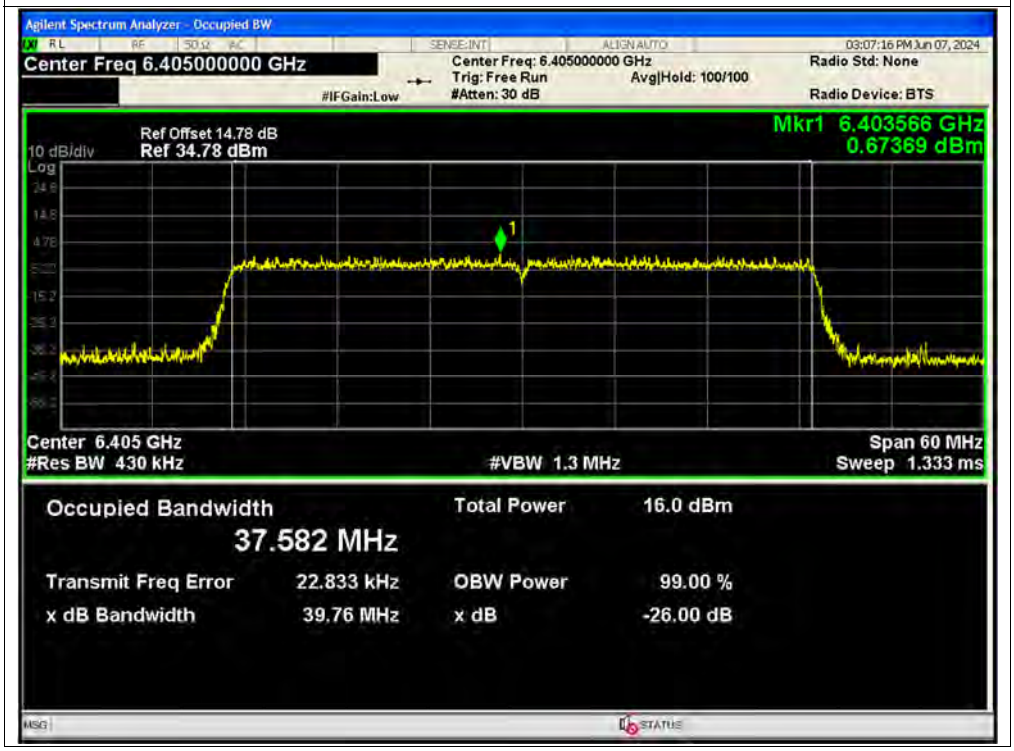
OBW NVNT ax40 7085MHz Ant1

OBW NVNT ax40 5965MHz Ant2

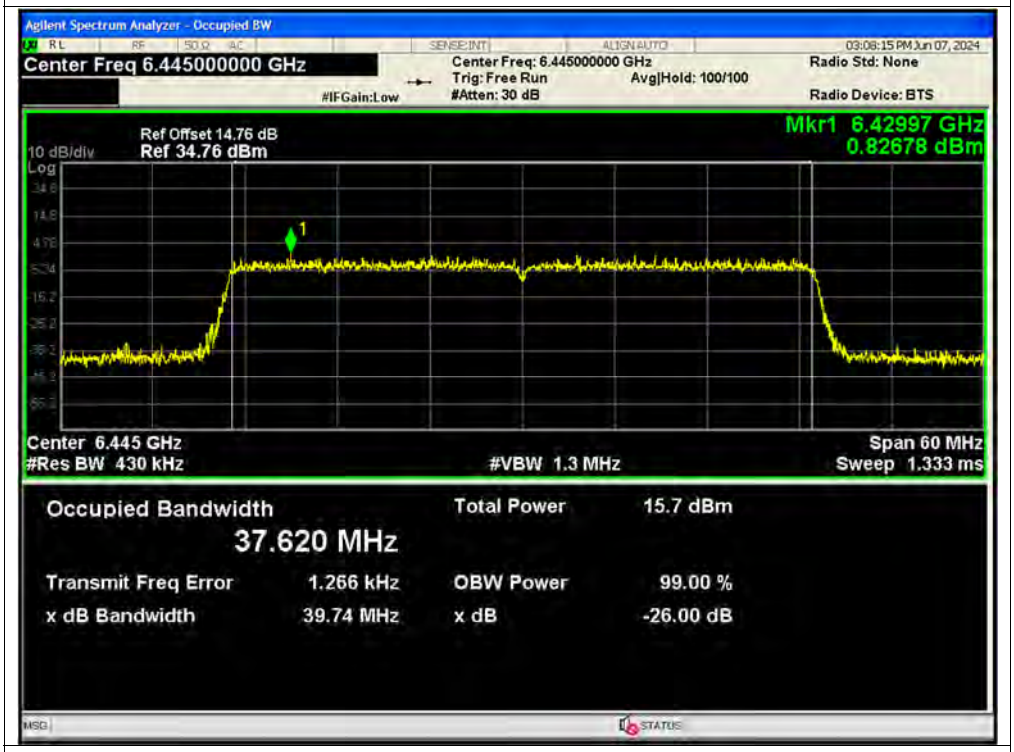


OBW NVNT ax40 6205MHz Ant2

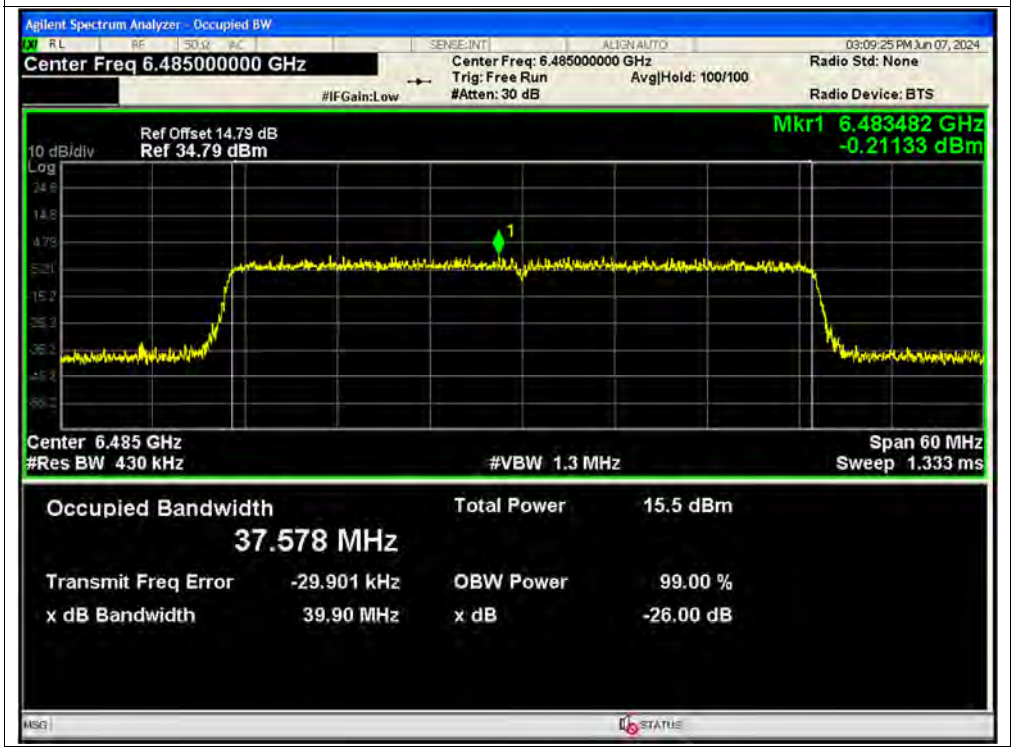
OBW NVNT ax40 6405MHz Ant2



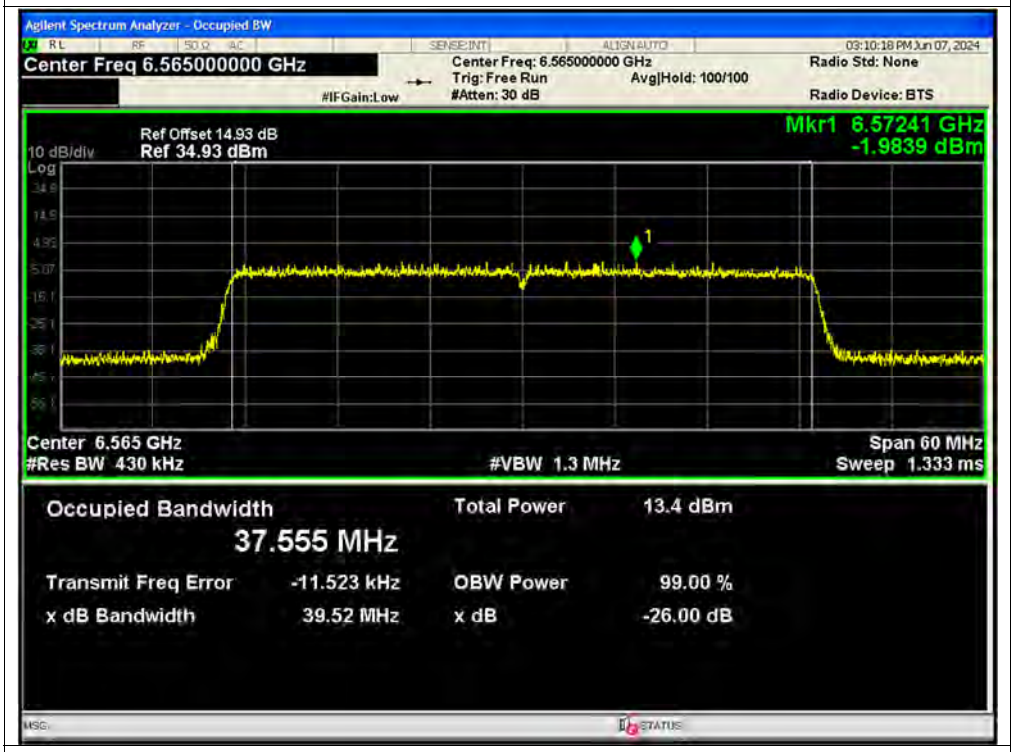
OBW NVNT ax40 6445MHz Ant2



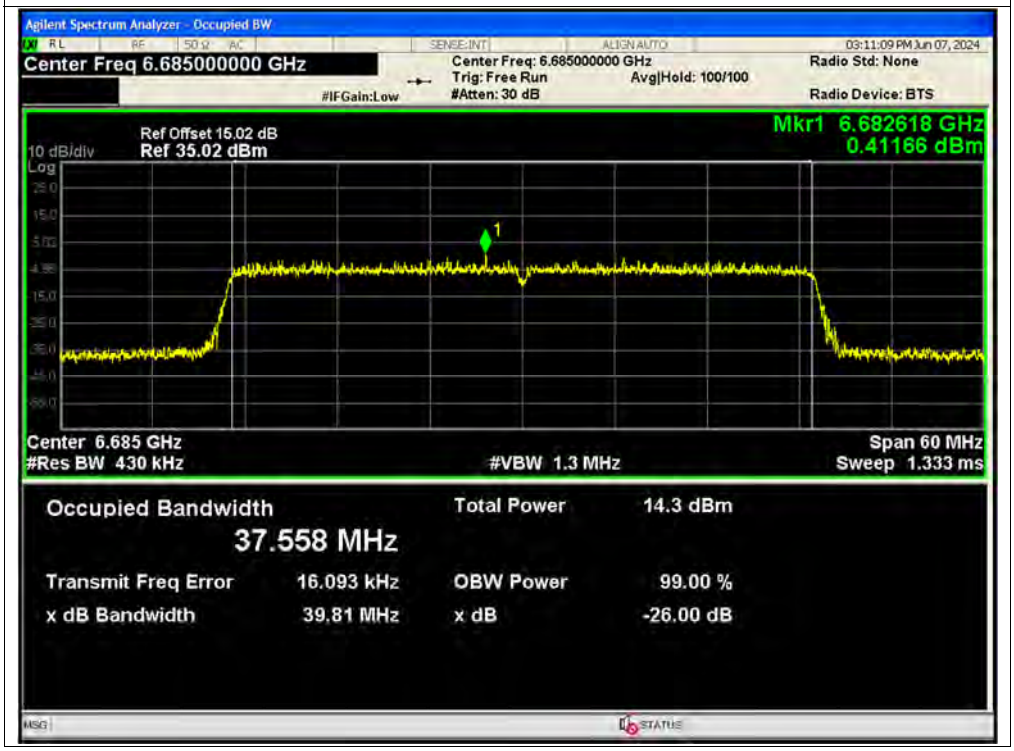
OBW NVNT ax40 6485MHz Ant2



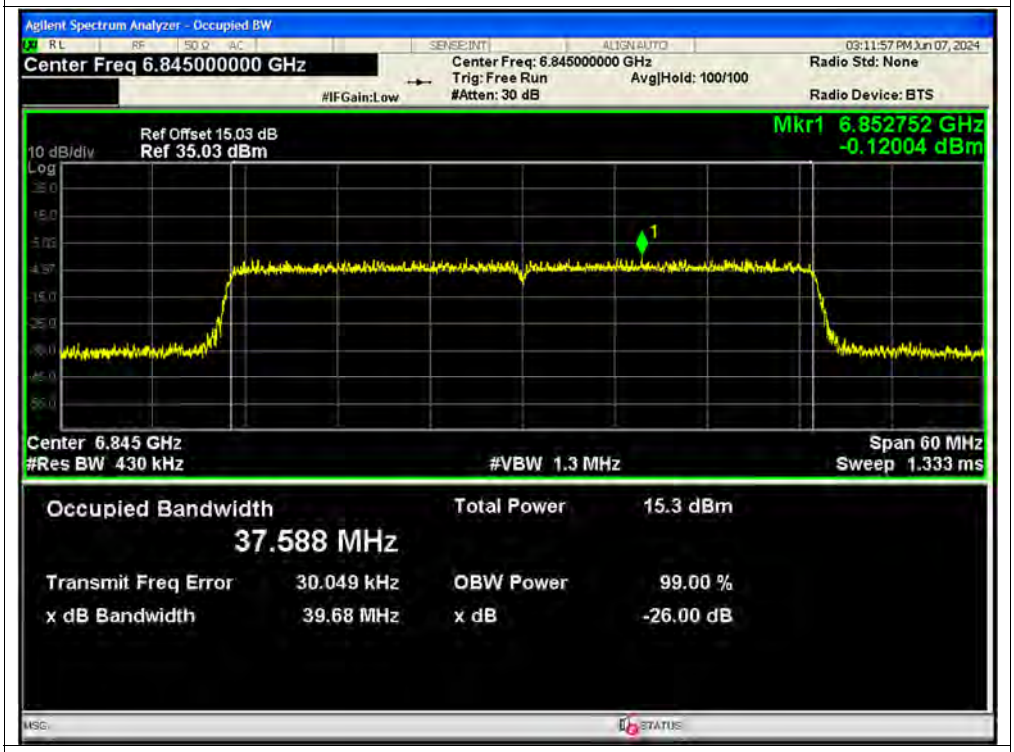
OBW NVNT ax40 6565MHz Ant2



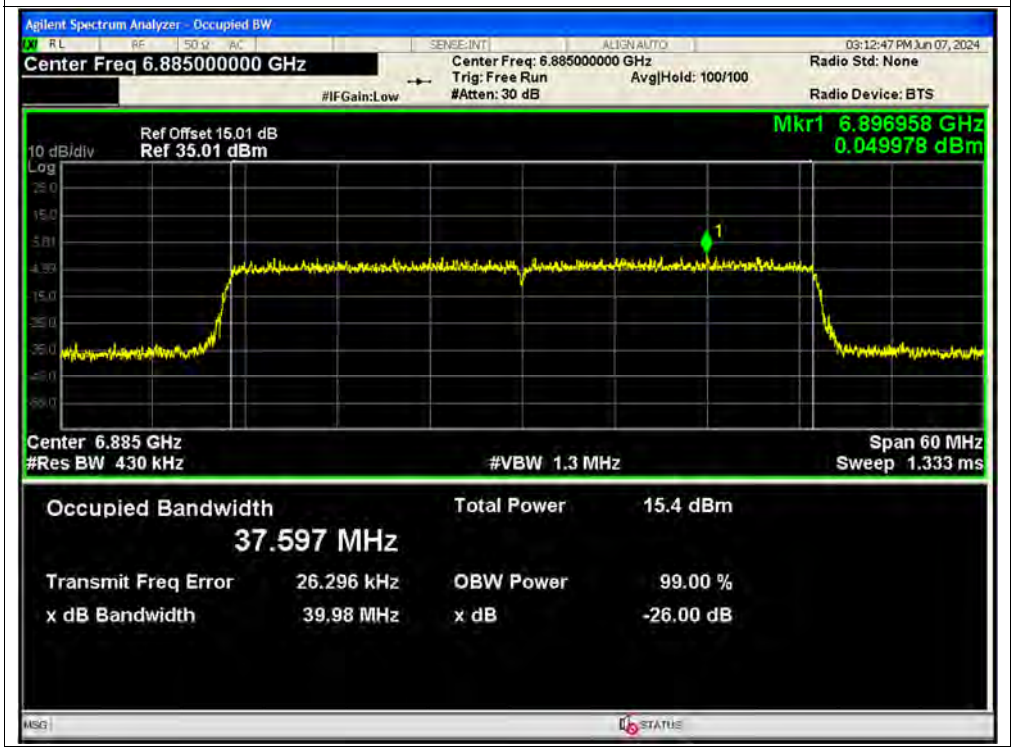
OBW NVNT ax40 6685MHz Ant2



OBW NVNT ax40 6845MHz Ant2



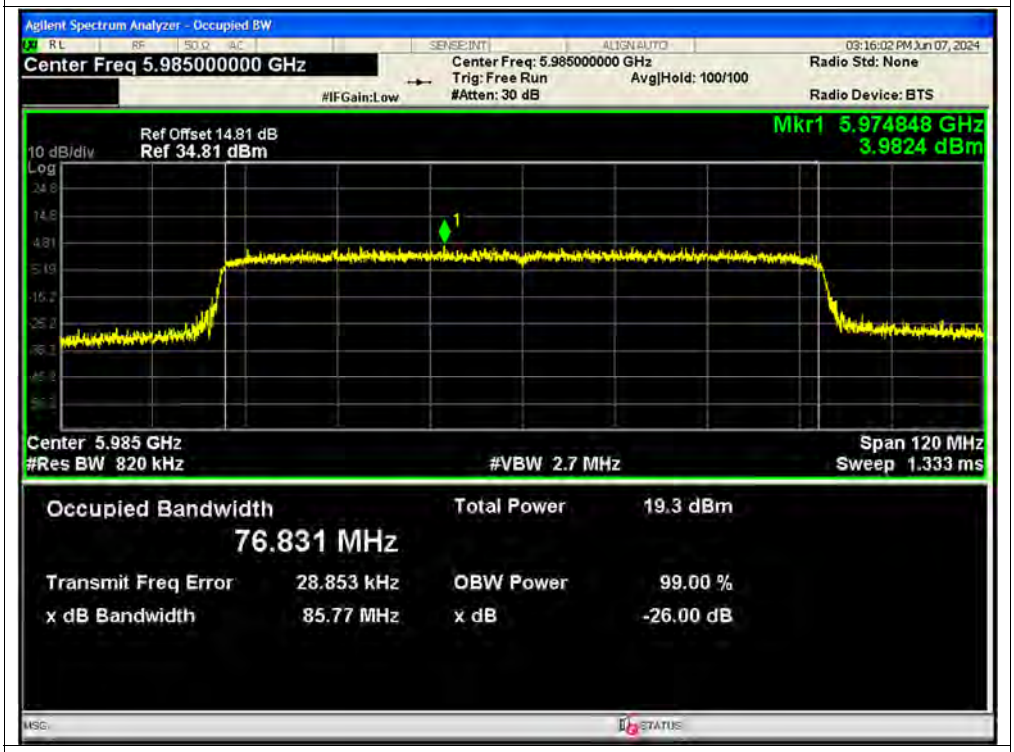
OBW NVNT ax40 6885MHz Ant2



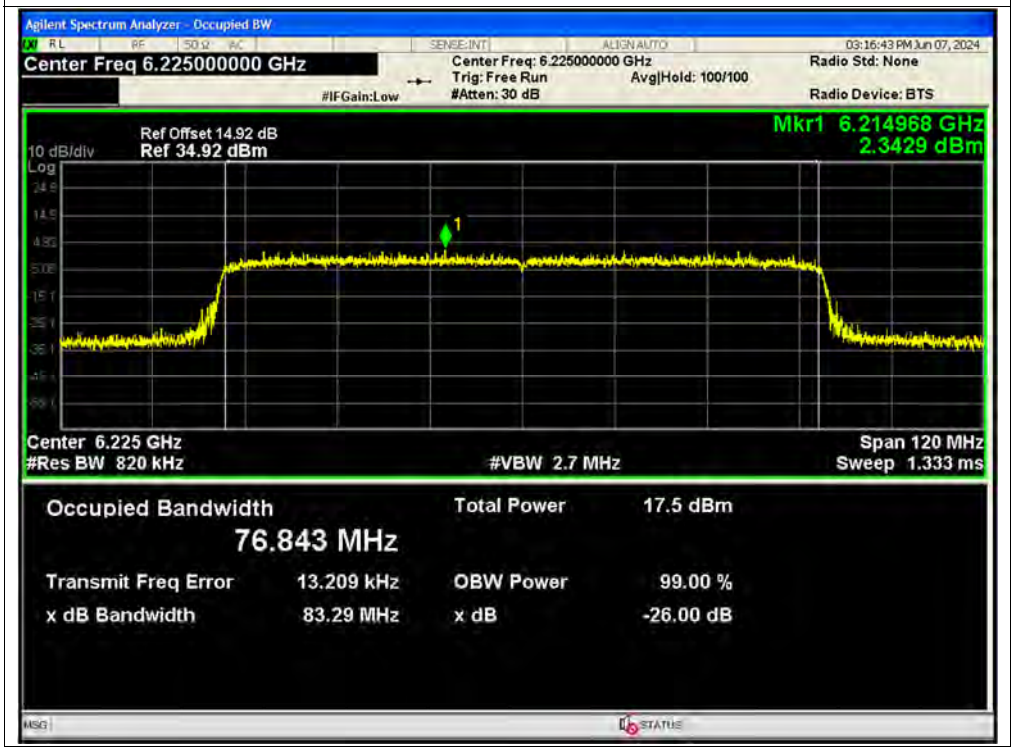
OBW NVNT ax40 6965MHz Ant2

OBW NVNT ax40 7085MHz Ant2

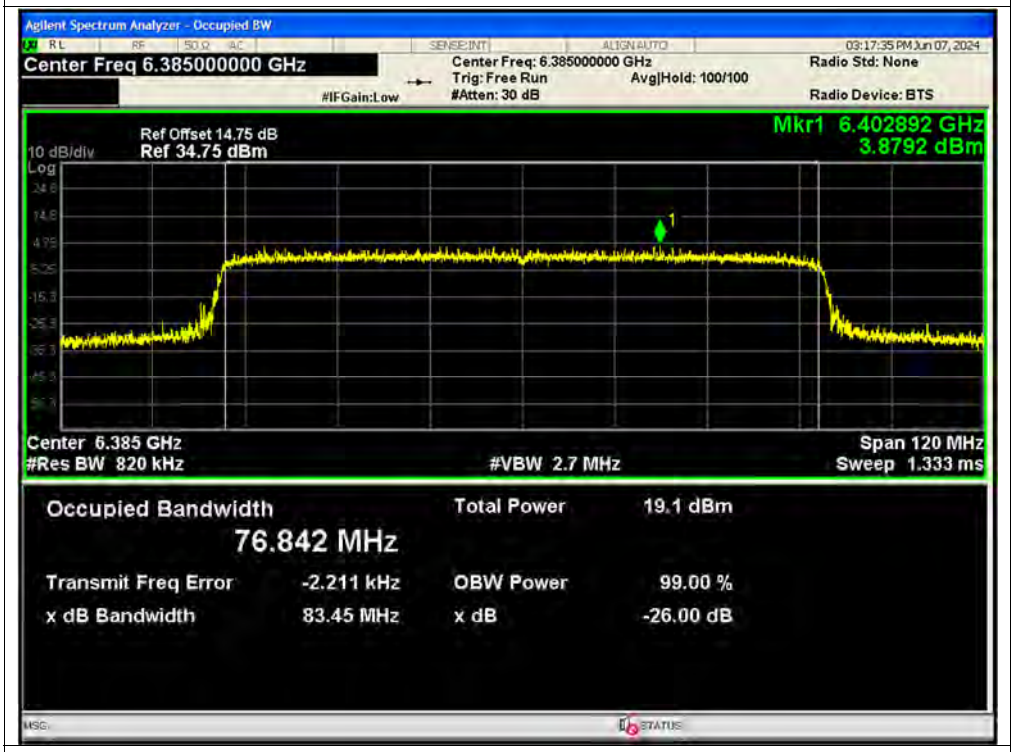
OBW NVNT ax80 5985MHz Ant1



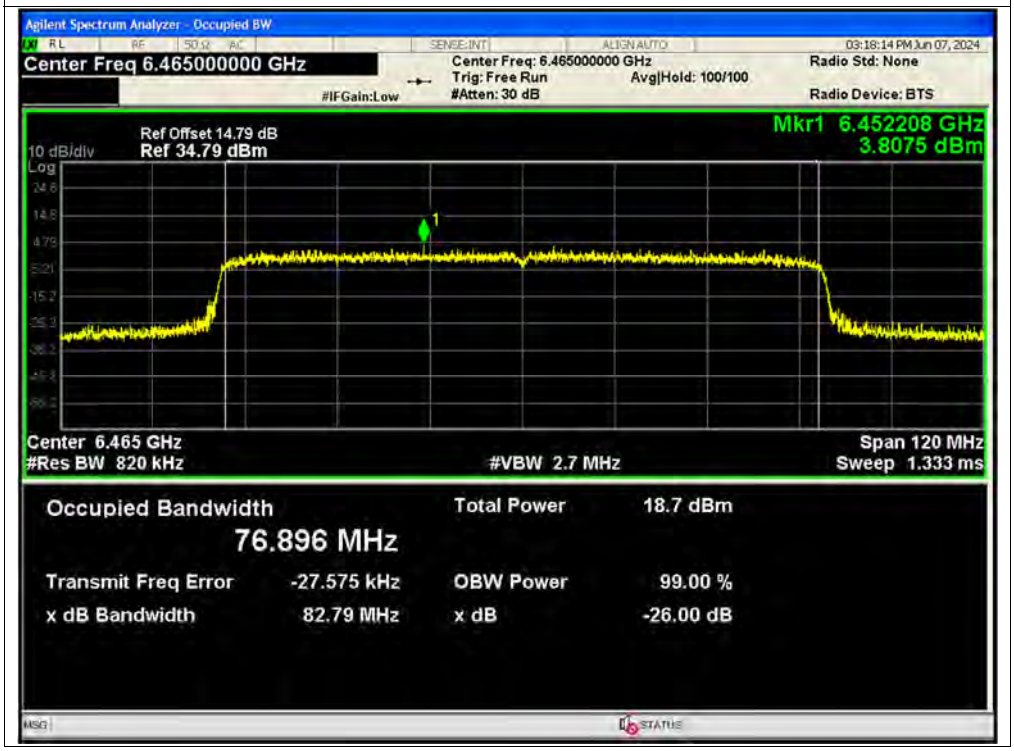
OBW NVNT ax80 6225MHz Ant1



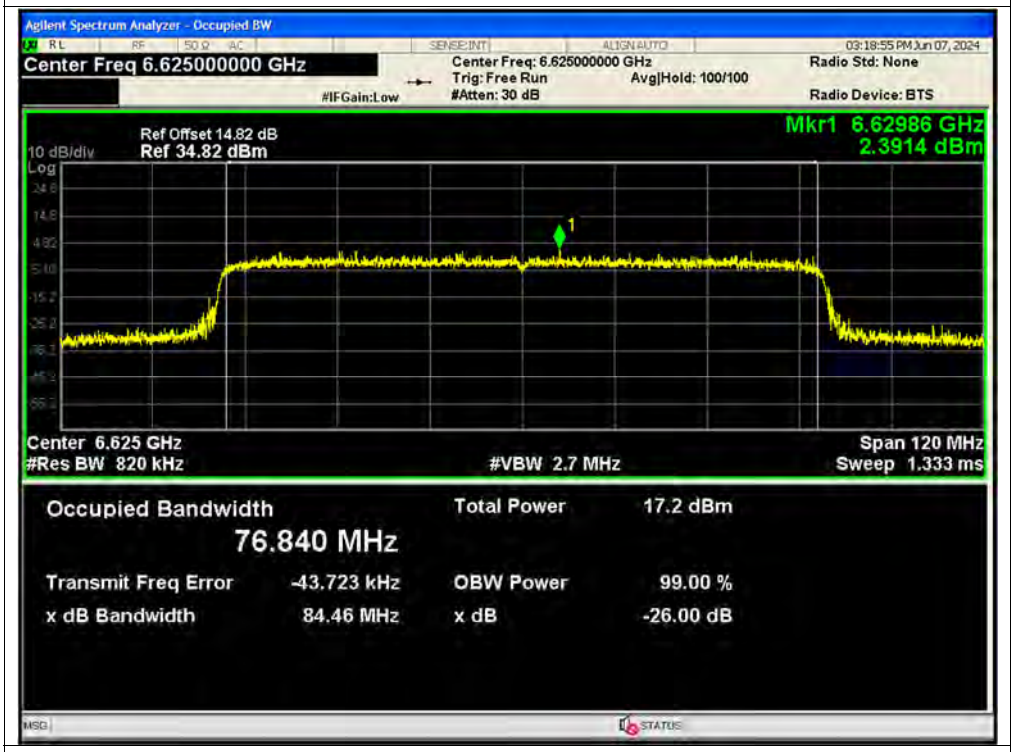
OBW NVNT ax80 6385MHz Ant1



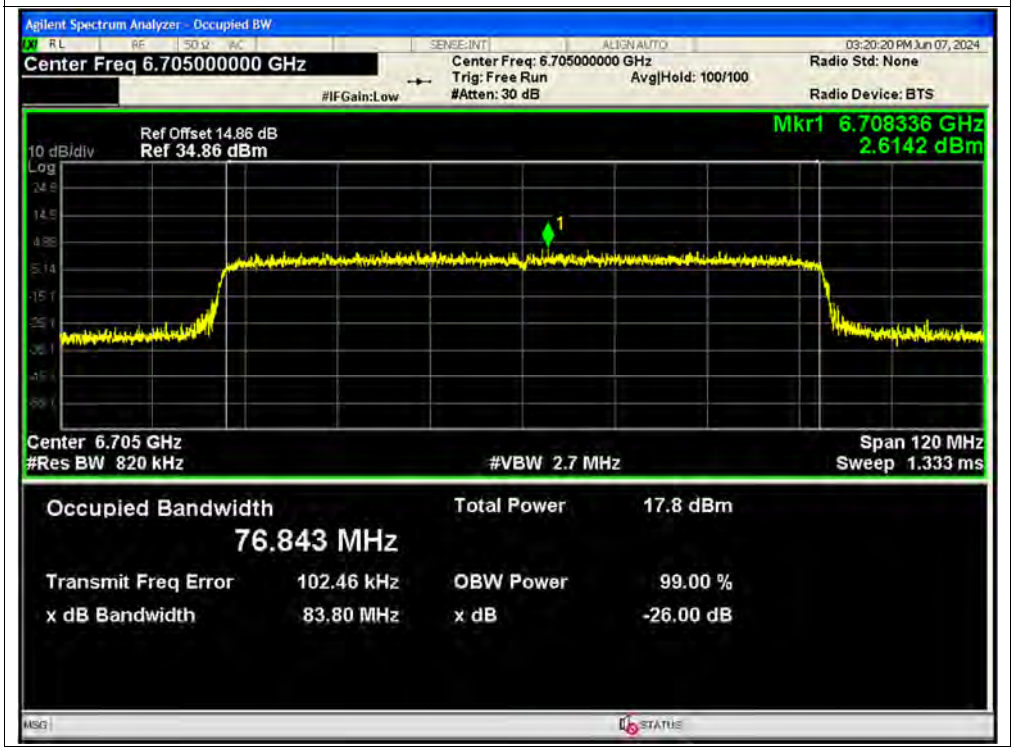
OBW NVNT ax80 6465MHz Ant1



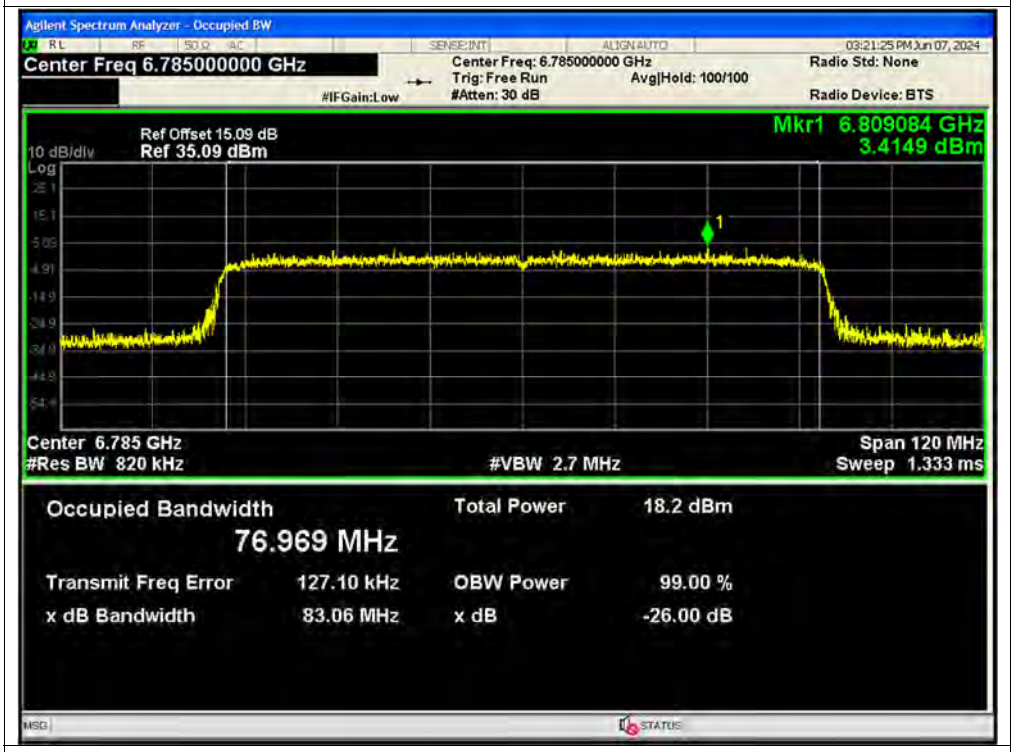
OBW NVNT ax80 6625MHz Ant1



OBW NVNT ax80 6705MHz Ant1



OBW NVNT ax80 6785MHz Ant1

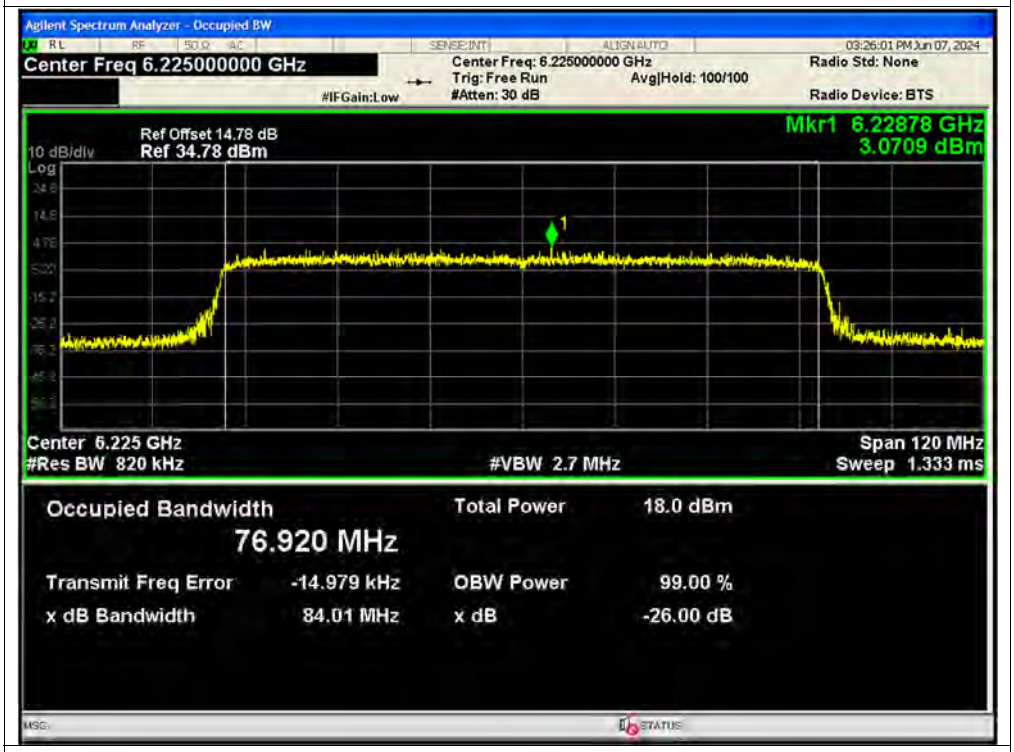


OBW NVNT ax80 6945MHz Ant1

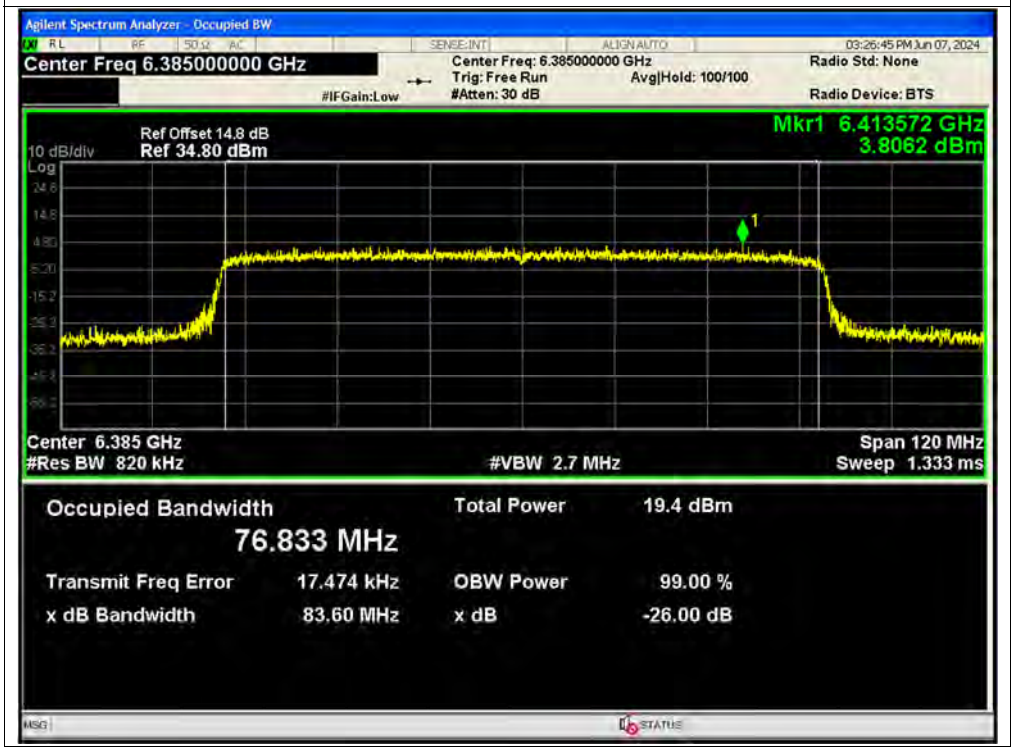
OBW NVNT ax80 7025MHz Ant1

OBW NVNT ax80 5985MHz Ant2

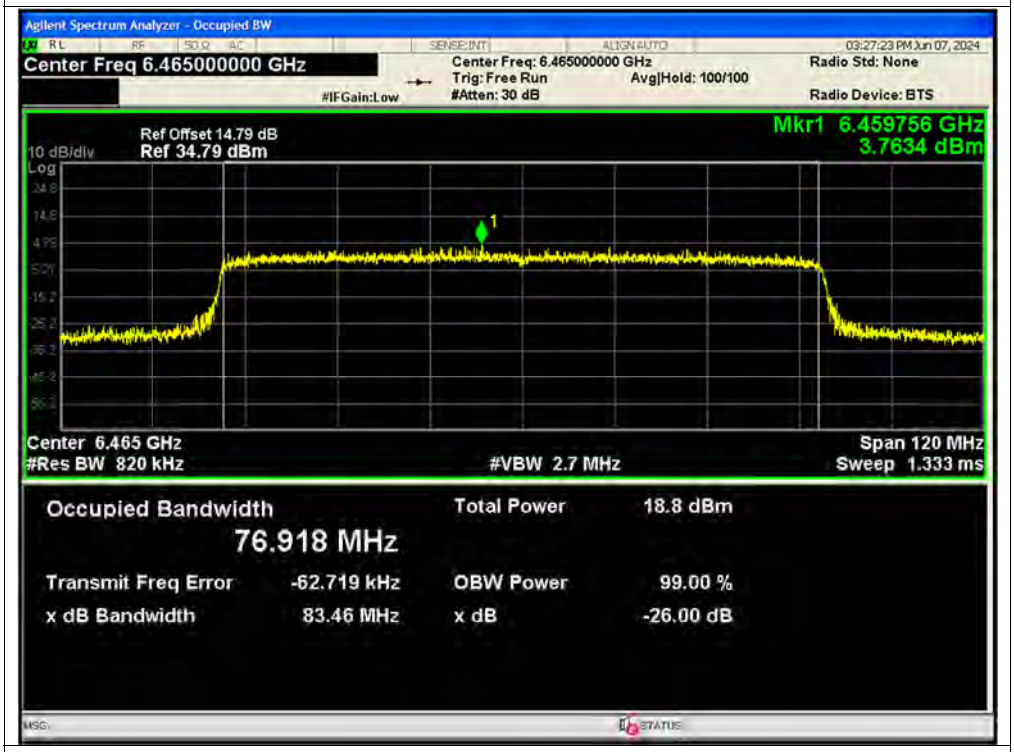
OBW NVNT ax80 6225MHz Ant2



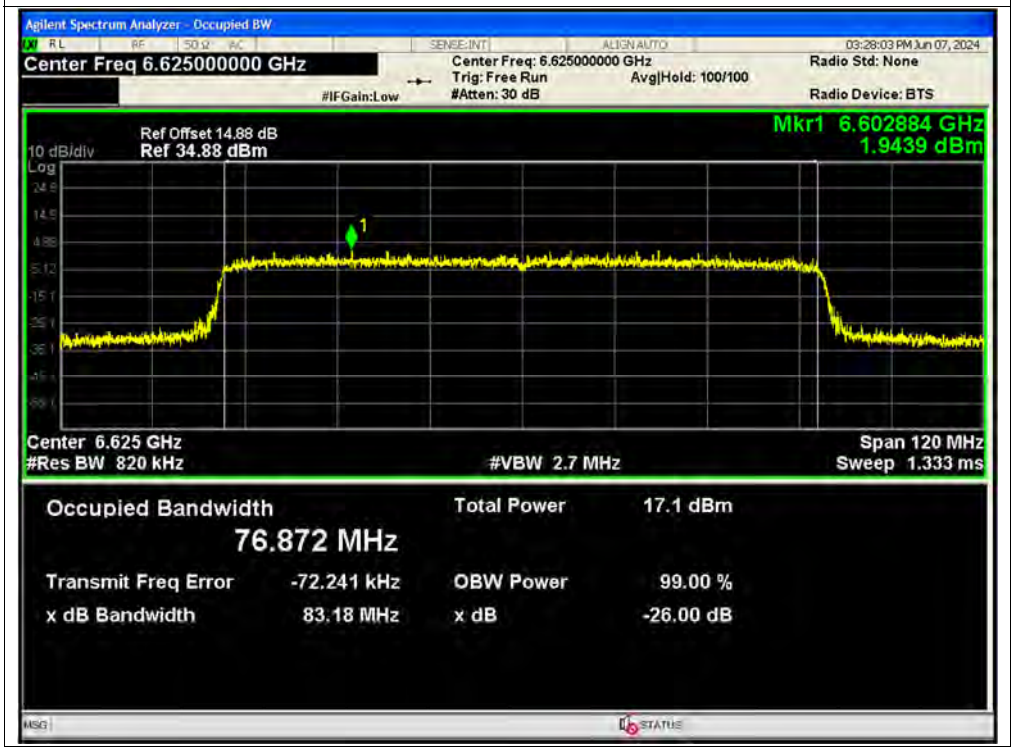
OBW NVNT ax80 6385MHz Ant2



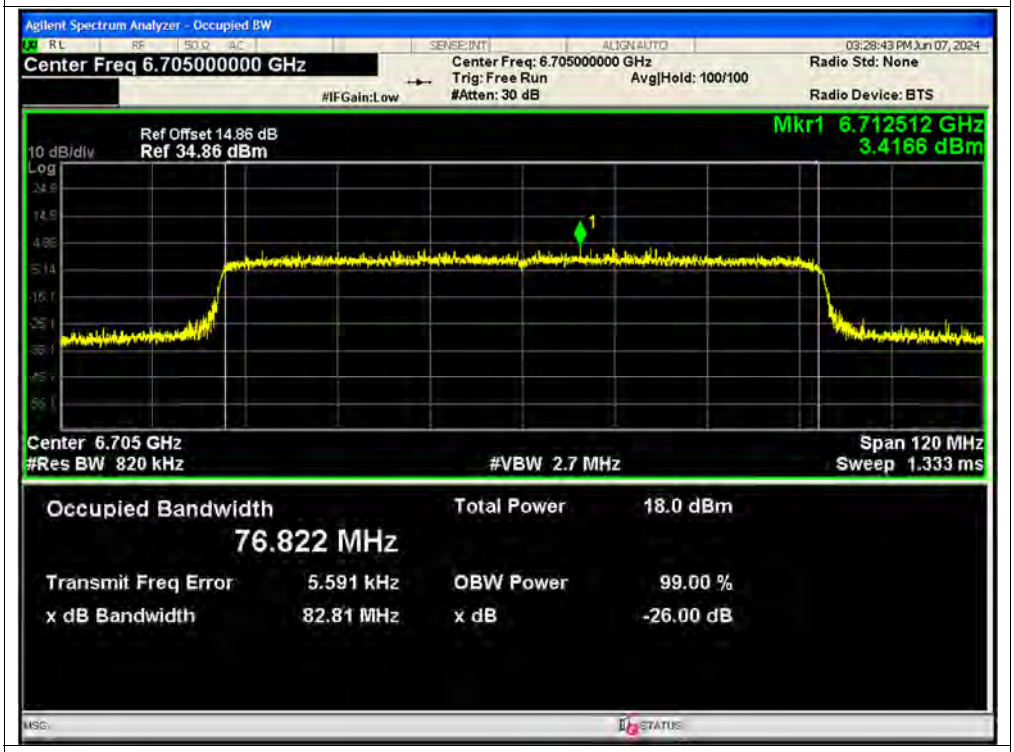
OBW NVNT ax80 6465MHz Ant2



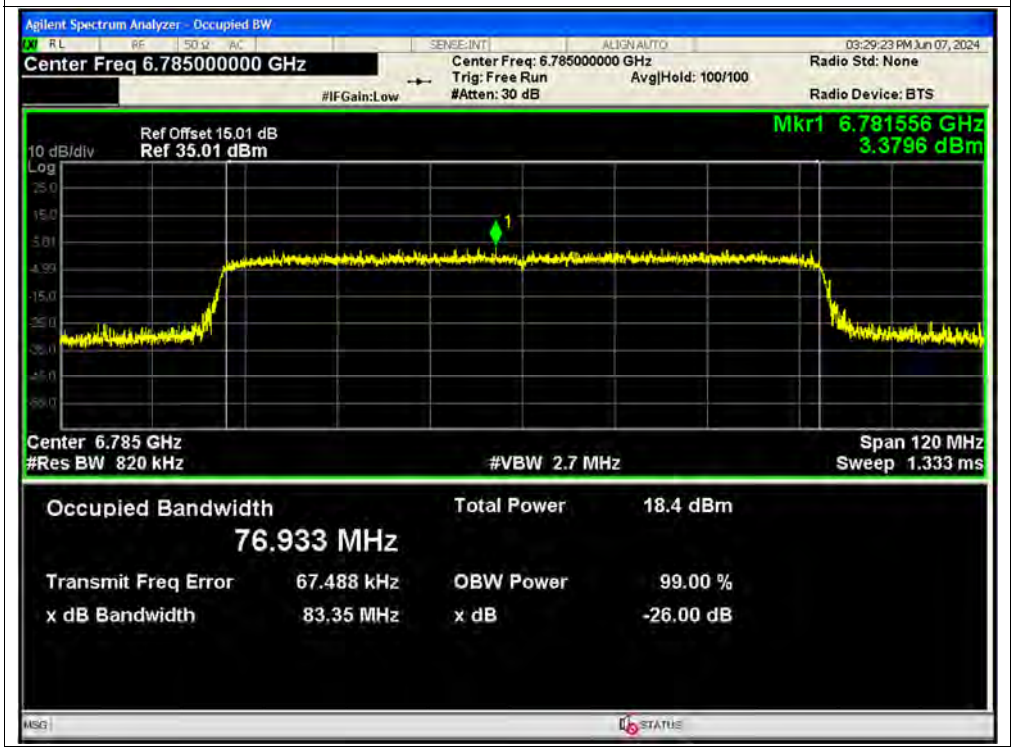
OBW NVNT ax80 6625MHz Ant2



OBW NVNT ax80 6705MHz Ant2



OBW NVNT ax80 6785MHz Ant2



OBW NVNT ax80 6945MHz Ant2

OBW NVNT ax80 7025MHz Ant2

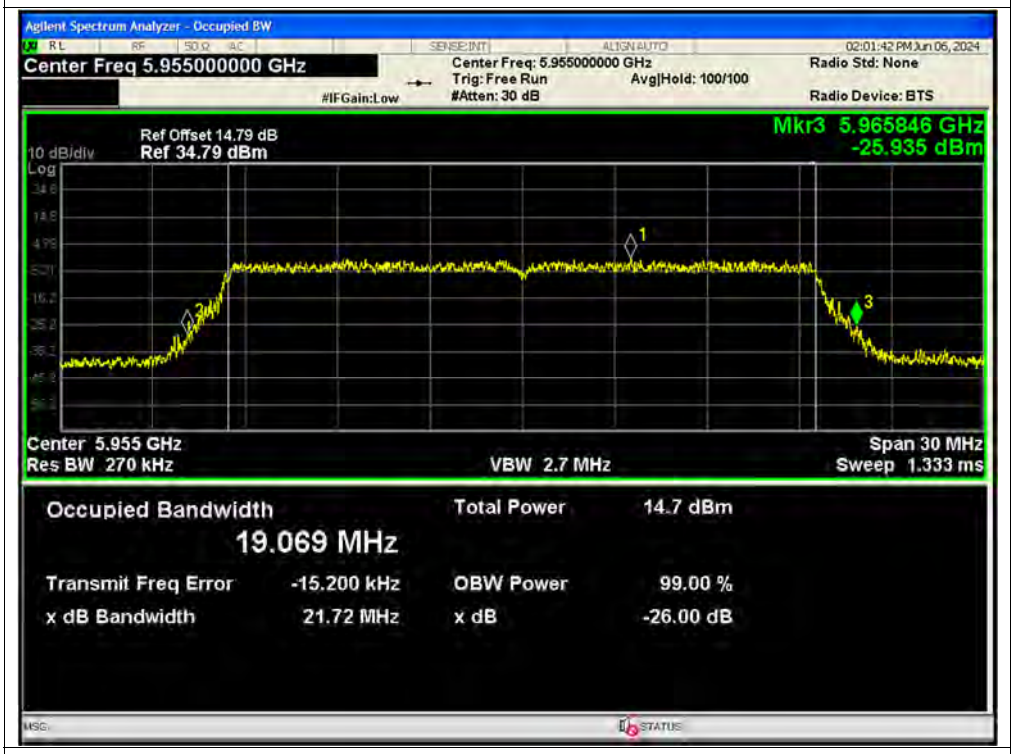
A.4. Emission Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)
NVNT	ax20	5955	Ant1	21.723
NVNT	ax20	6175	Ant1	21.616
NVNT	ax20	6415	Ant1	21.323
NVNT	ax20	6435	Ant1	21.575
NVNT	ax20	6475	Ant1	21.737
NVNT	ax20	6515	Ant1	21.555
NVNT	ax20	6535	Ant1	21.912
NVNT	ax20	6695	Ant1	21.789
NVNT	ax20	6855	Ant1	21.61
NVNT	ax20	6875	Ant1	21.714
NVNT	ax20	6995	Ant1	20.817
NVNT	ax20	7115	Ant1	20.695
NVNT	ax20	5955	Ant2	25.29
NVNT	ax20	6175	Ant2	21.633
NVNT	ax20	6415	Ant2	21.592
NVNT	ax20	6435	Ant2	21.697
NVNT	ax20	6475	Ant2	21.781
NVNT	ax20	6515	Ant2	21.5
NVNT	ax20	6535	Ant2	21.658
NVNT	ax20	6695	Ant2	21.497
NVNT	ax20	6855	Ant2	21.407
NVNT	ax20	6875	Ant2	21.39
NVNT	ax20	6995	Ant2	20.733
NVNT	ax20	7115	Ant2	20.841
NVNT	ax40	5965	Ant1	39.872
NVNT	ax40	6205	Ant1	39.795
NVNT	ax40	6405	Ant1	40.367
NVNT	ax40	6445	Ant1	39.825
NVNT	ax40	6485	Ant1	39.941
NVNT	ax40	6565	Ant1	40.156
NVNT	ax40	6685	Ant1	39.86
NVNT	ax40	6845	Ant1	40.044
NVNT	ax40	6885	Ant1	40.204
NVNT	ax40	6965	Ant1	39.265
NVNT	ax40	7085	Ant1	39.34
NVNT	ax40	5965	Ant2	40.226

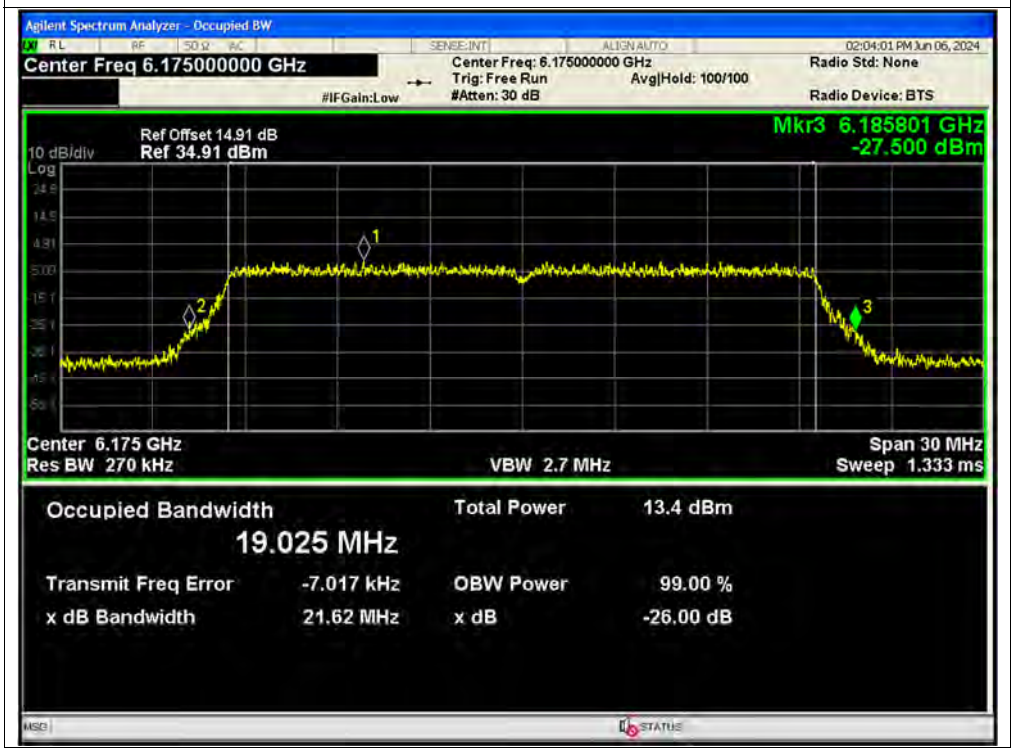
NVNT	ax40	6205	Ant2	40.271
NVNT	ax40	6405	Ant2	40.15
NVNT	ax40	6445	Ant2	40.02
NVNT	ax40	6485	Ant2	40.179
NVNT	ax40	6565	Ant2	40.17
NVNT	ax40	6685	Ant2	40.329
NVNT	ax40	6845	Ant2	40.062
NVNT	ax40	6885	Ant2	40.491
NVNT	ax40	6965	Ant2	39.439
NVNT	ax40	7085	Ant2	39.424
NVNT	ax80	5985	Ant1	94.53
NVNT	ax80	6225	Ant1	84.194
NVNT	ax80	6385	Ant1	84.588
NVNT	ax80	6465	Ant1	85.151
NVNT	ax80	6625	Ant1	83.133
NVNT	ax80	6705	Ant1	83.935
NVNT	ax80	6785	Ant1	88.983
NVNT	ax80	6945	Ant1	85.526
NVNT	ax80	7025	Ant1	84.436
NVNT	ax80	5985	Ant2	84.992
NVNT	ax80	6225	Ant2	85.331
NVNT	ax80	6385	Ant2	83.009
NVNT	ax80	6465	Ant2	83.743
NVNT	ax80	6625	Ant2	84.364
NVNT	ax80	6705	Ant2	85.331
NVNT	ax80	6785	Ant2	84.609
NVNT	ax80	6945	Ant2	85.261
NVNT	ax80	7025	Ant2	85.4

Test Graphs

-26dB Bandwidth NVNT ax20 5955MHz Ant1

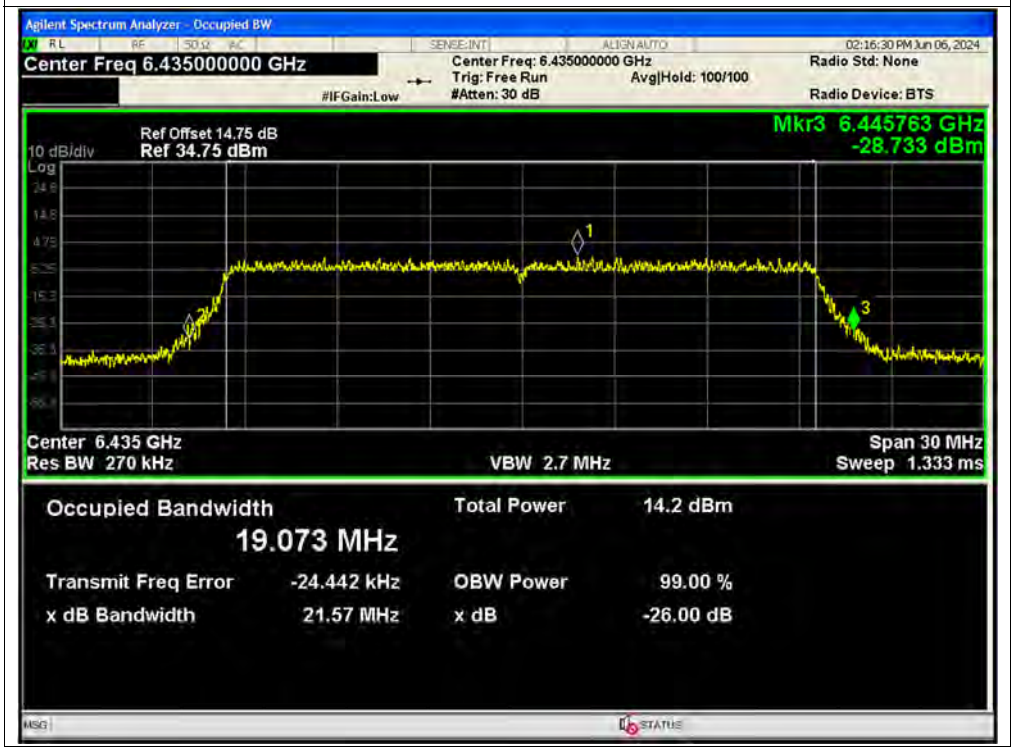


-26dB Bandwidth NVNT ax20 6175MHz Ant1



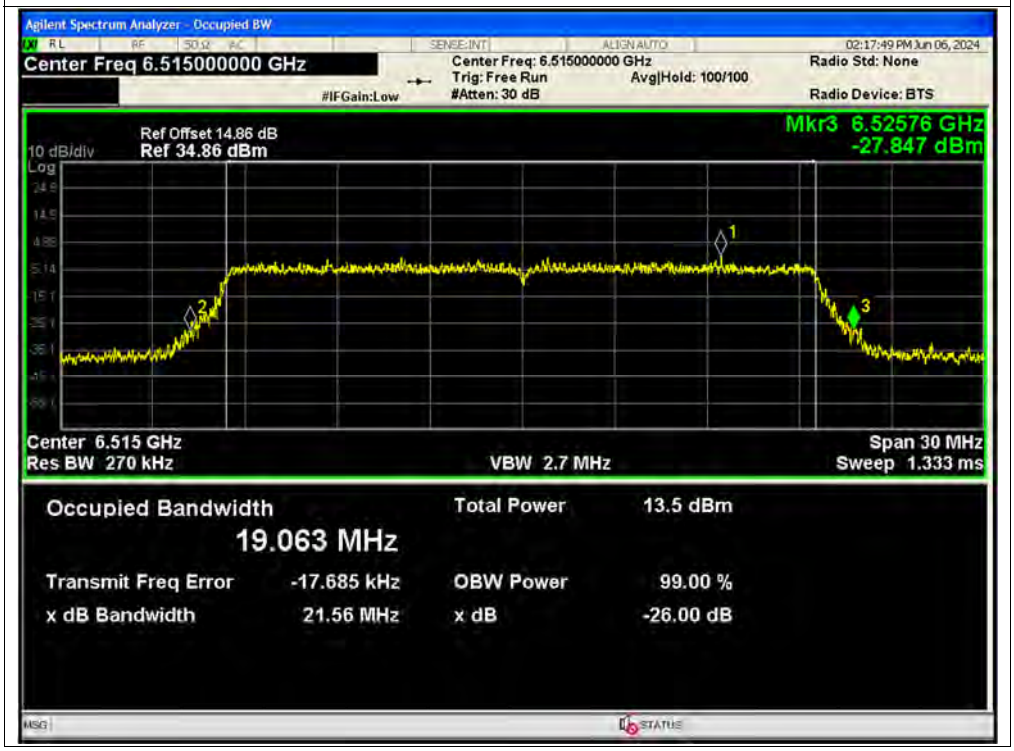
-26dB Bandwidth NVNT ax20 6415MHz Ant1

-26dB Bandwidth NVNT ax20 6435MHz Ant1



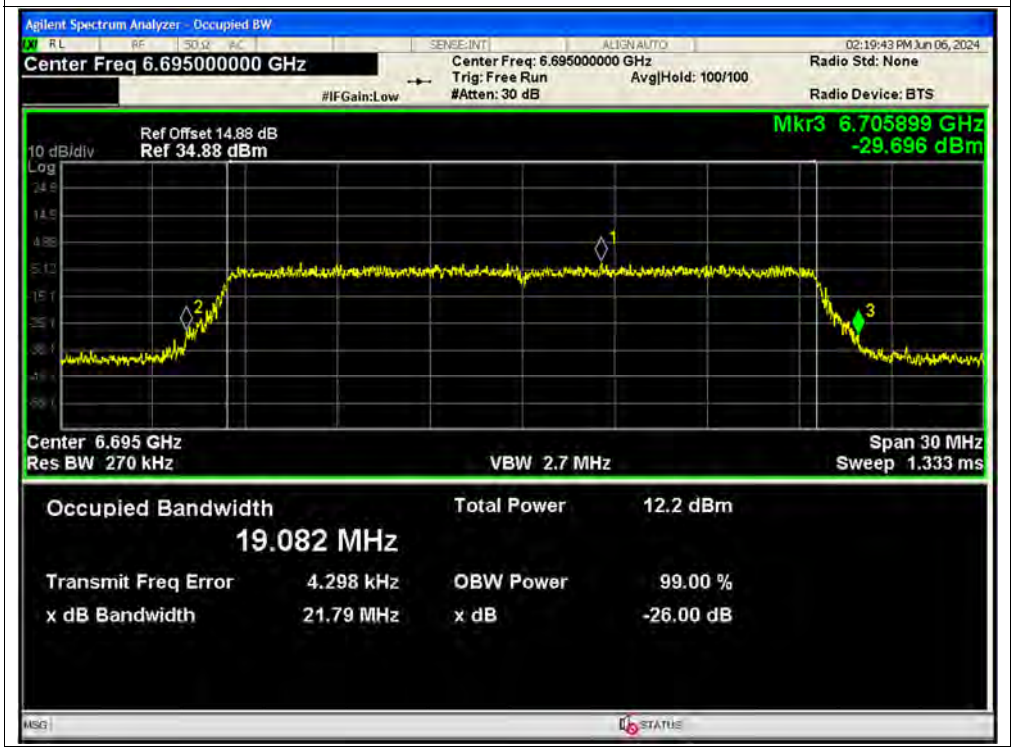
-26dB Bandwidth NVNT ax20 6475MHz Ant1

-26dB Bandwidth NVNT ax20 6515MHz Ant1



-26dB Bandwidth NVNT ax20 6535MHz Ant1

-26dB Bandwidth NVNT ax20 6695MHz Ant1



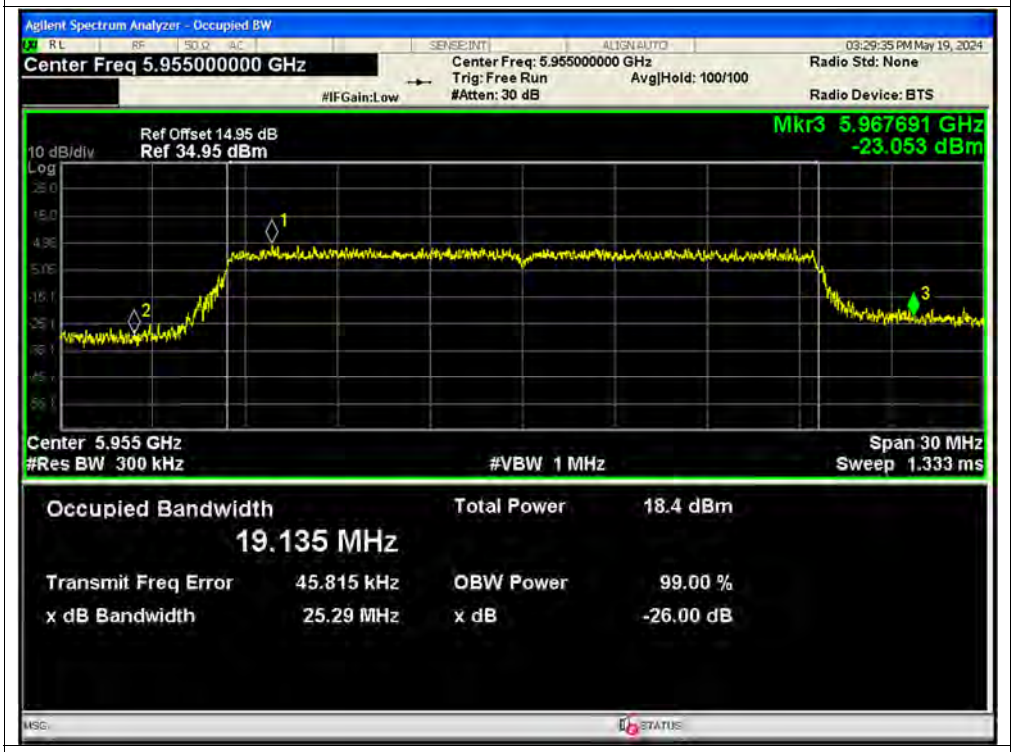
-26dB Bandwidth NVNT ax20 6855MHz Ant1

-26dB Bandwidth NVNT ax20 6875MHz Ant1

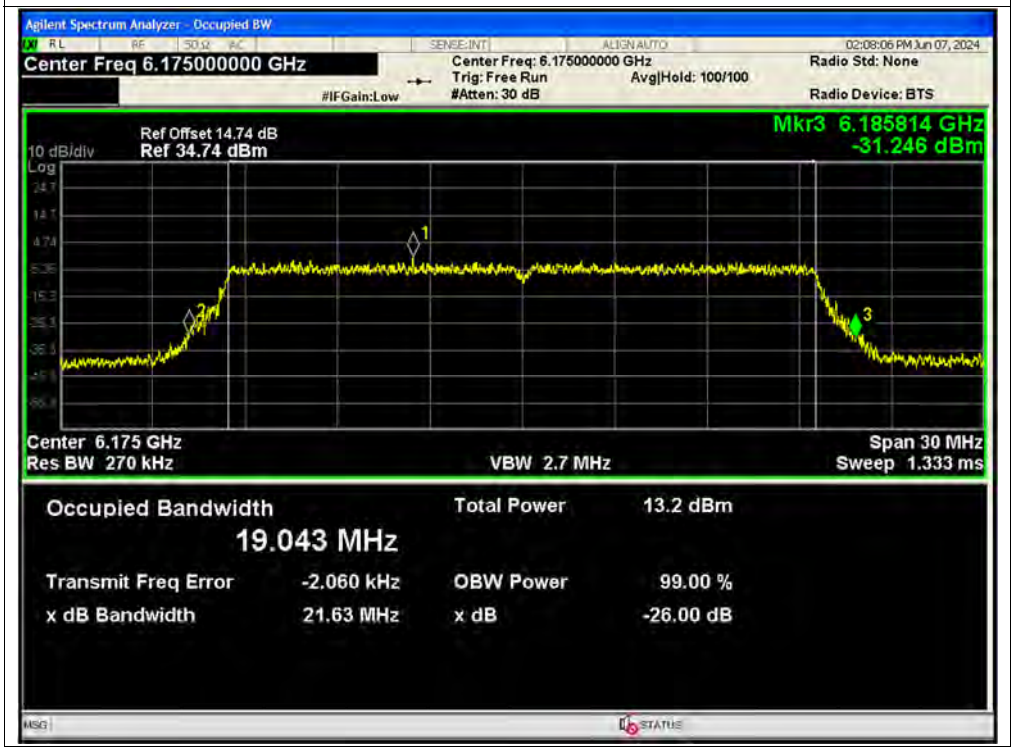
-26dB Bandwidth NVNT ax20 6995MHz Ant1

-26dB Bandwidth NVNT ax20 7115MHz Ant1

-26dB Bandwidth NVNT ax20 5955MHz Ant2



-26dB Bandwidth NVNT ax20 6175MHz Ant2



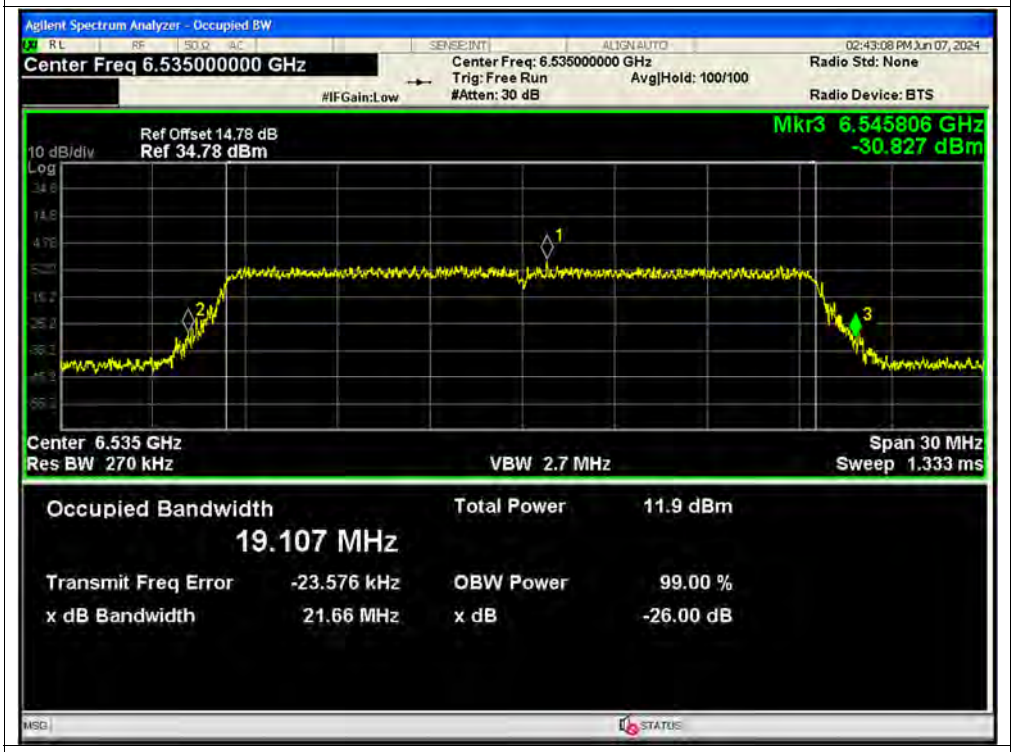
-26dB Bandwidth NVNT ax20 6415MHz Ant2

-26dB Bandwidth NVNT ax20 6435MHz Ant2

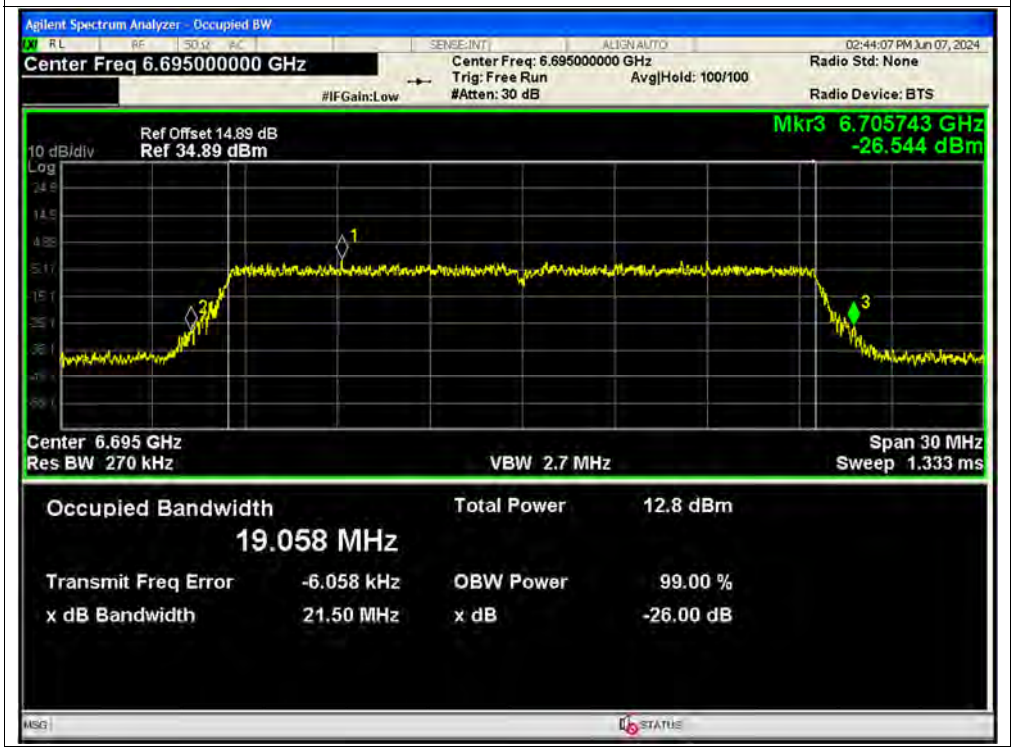
-26dB Bandwidth NVNT ax20 6475MHz Ant2

-26dB Bandwidth NVNT ax20 6515MHz Ant2

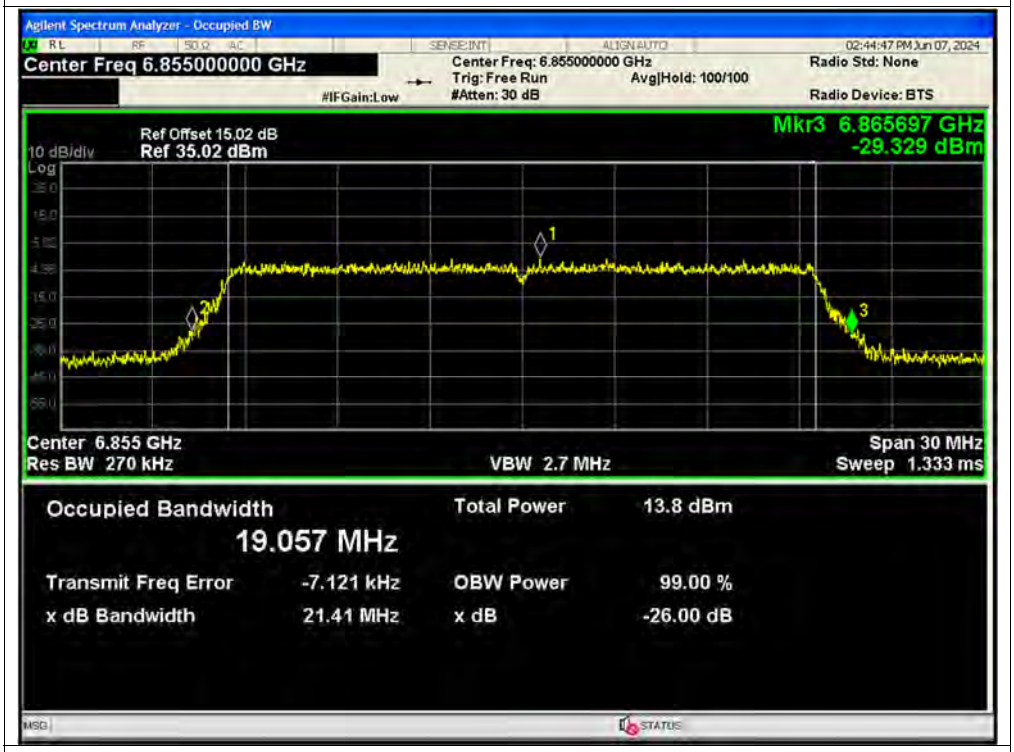
-26dB Bandwidth NVNT ax20 6535MHz Ant2



-26dB Bandwidth NVNT ax20 6695MHz Ant2



-26dB Bandwidth NVNT ax20 6855MHz Ant2



-26dB Bandwidth NVNT ax20 6875MHz Ant2

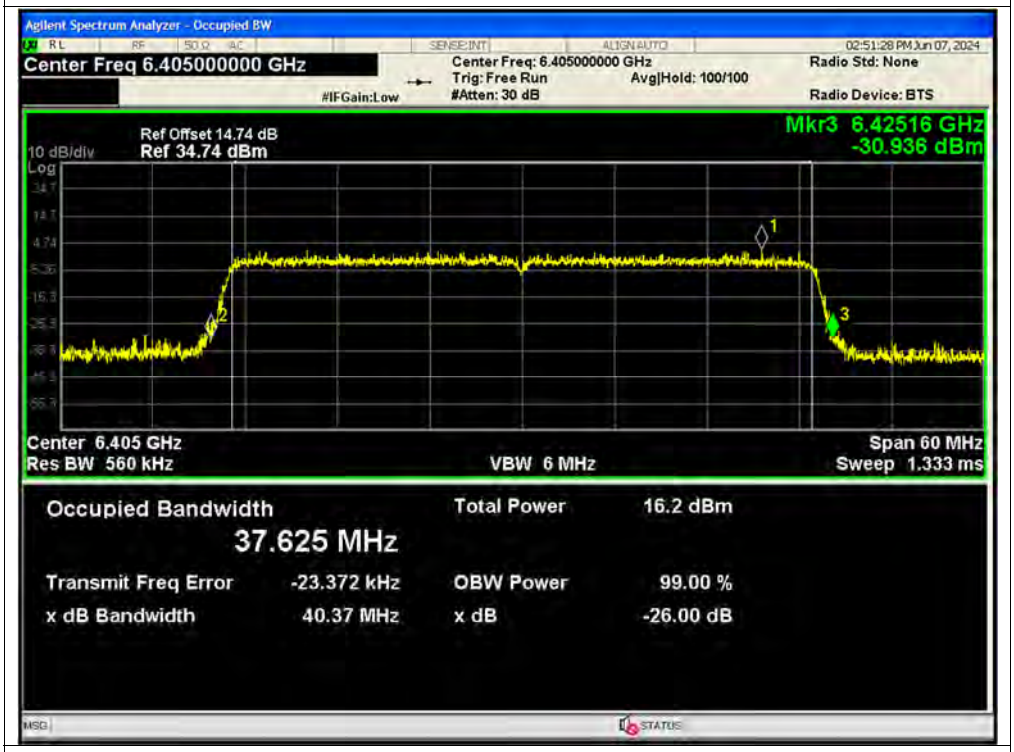
-26dB Bandwidth NVNT ax20 6995MHz Ant2

-26dB Bandwidth NVNT ax20 7115MHz Ant2

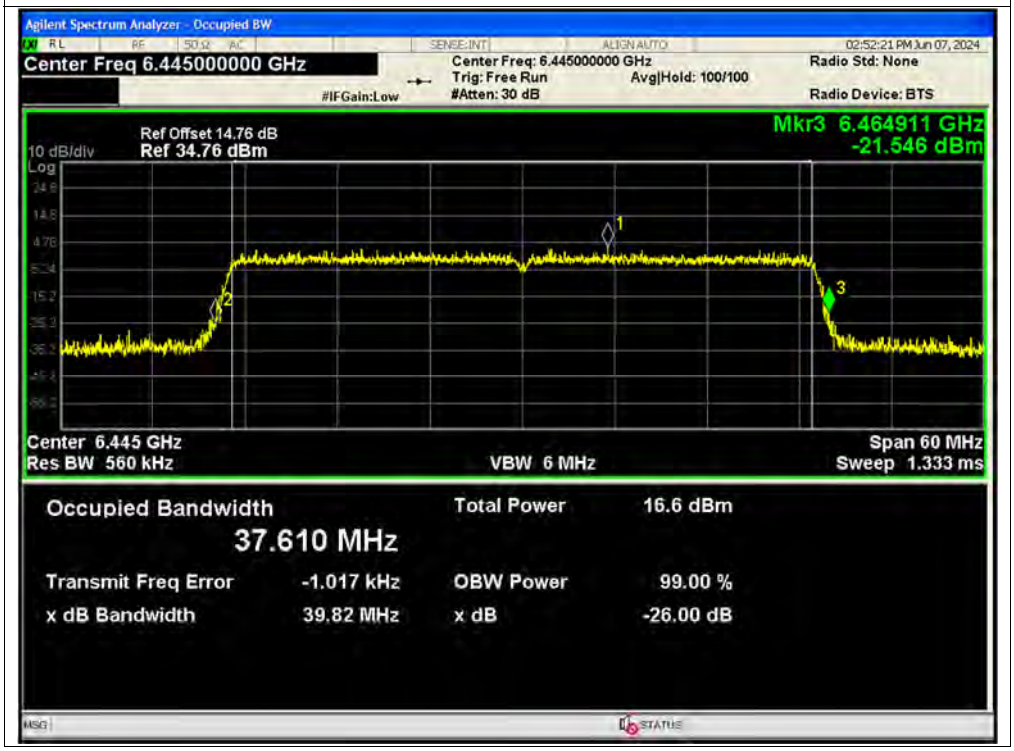
-26dB Bandwidth NVNT ax40 5965MHz Ant1

-26dB Bandwidth NVNT ax40 6205MHz Ant1

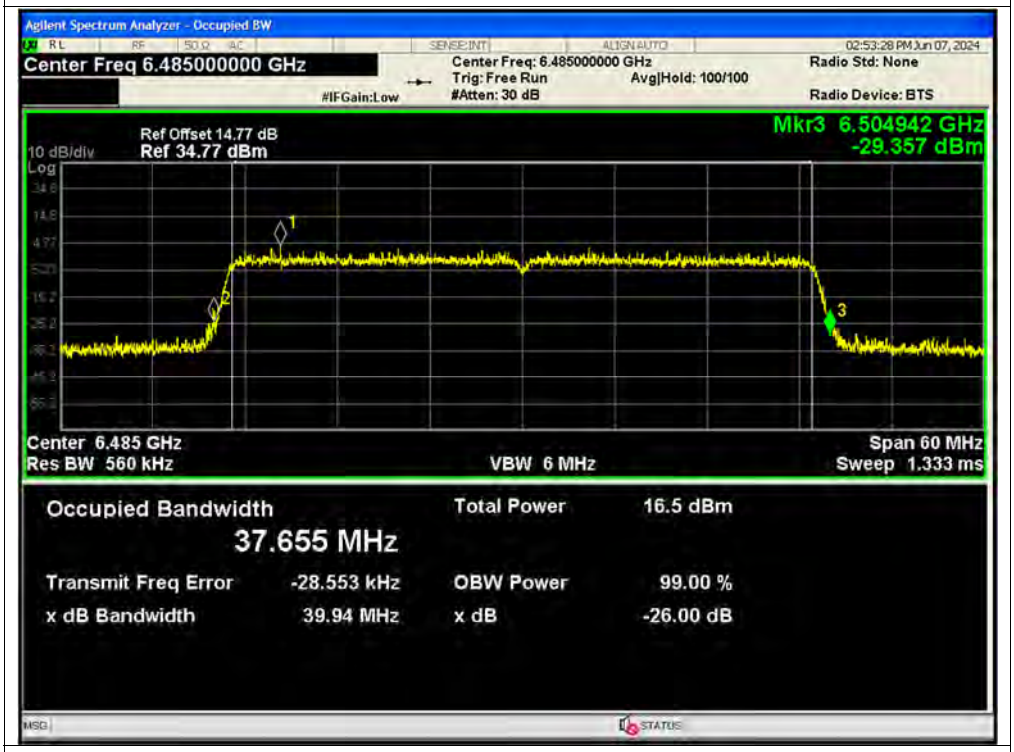
-26dB Bandwidth NVNT ax40 6405MHz Ant1



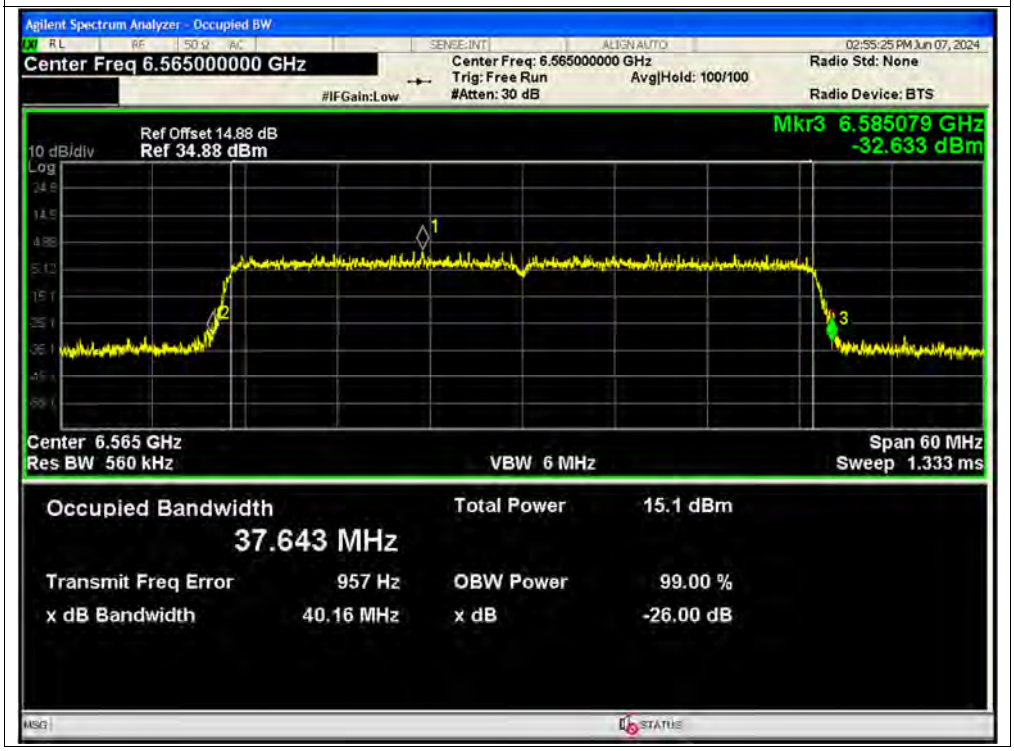
-26dB Bandwidth NVNT ax40 6445MHz Ant1



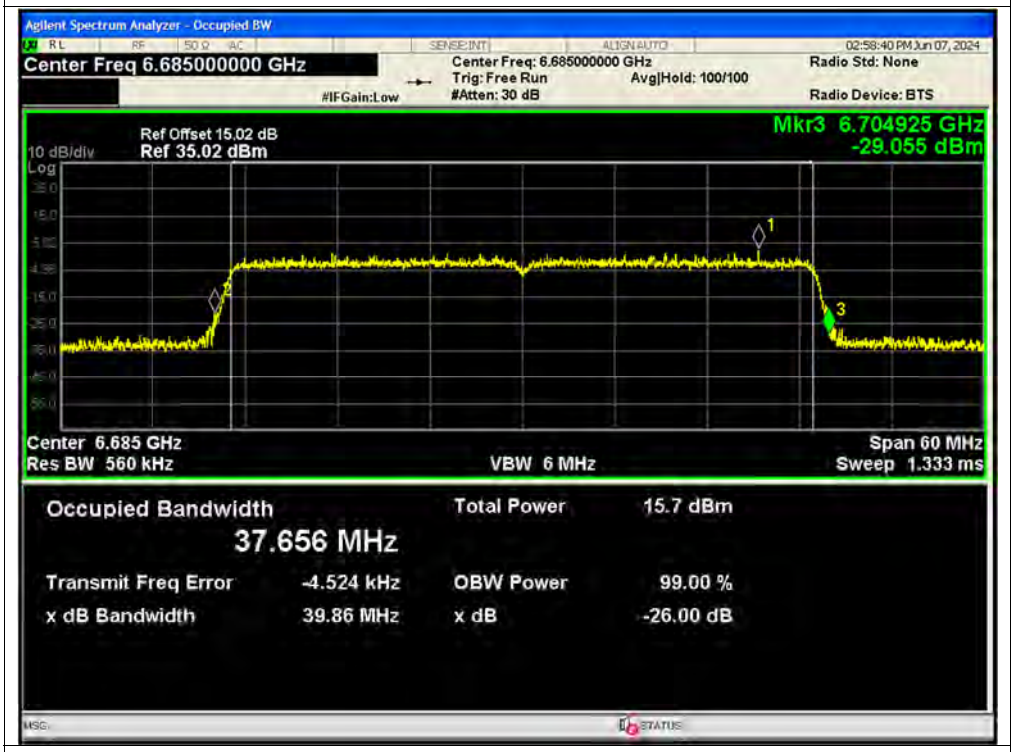
-26dB Bandwidth NVNT ax40 6485MHz Ant1



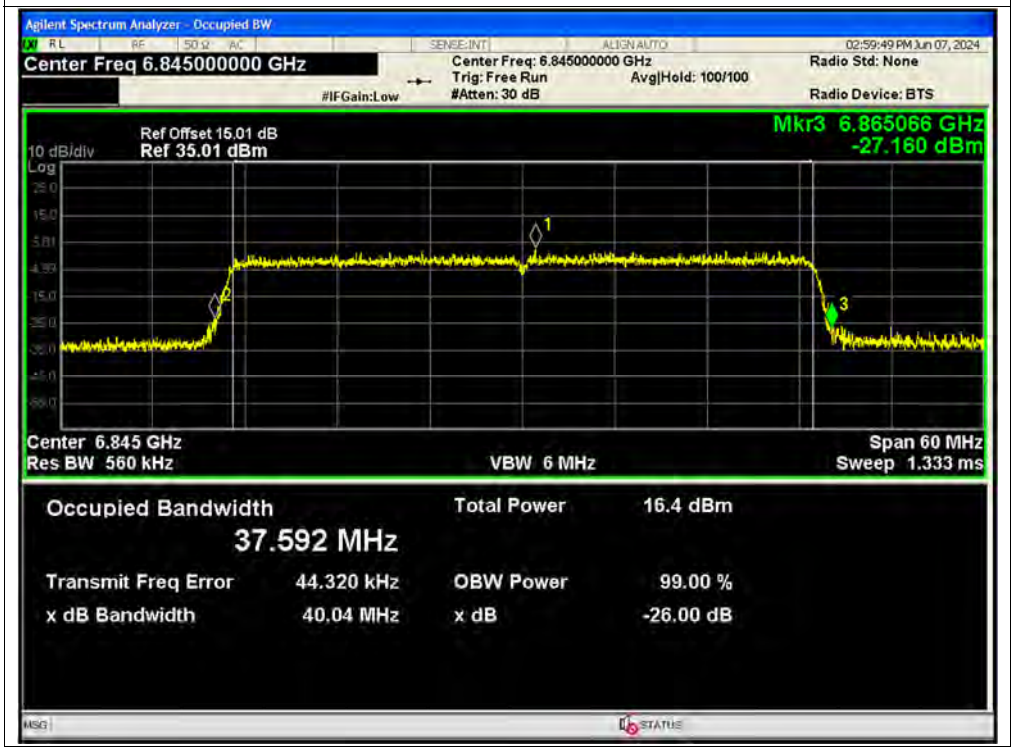
-26dB Bandwidth NVNT ax40 6565MHz Ant1



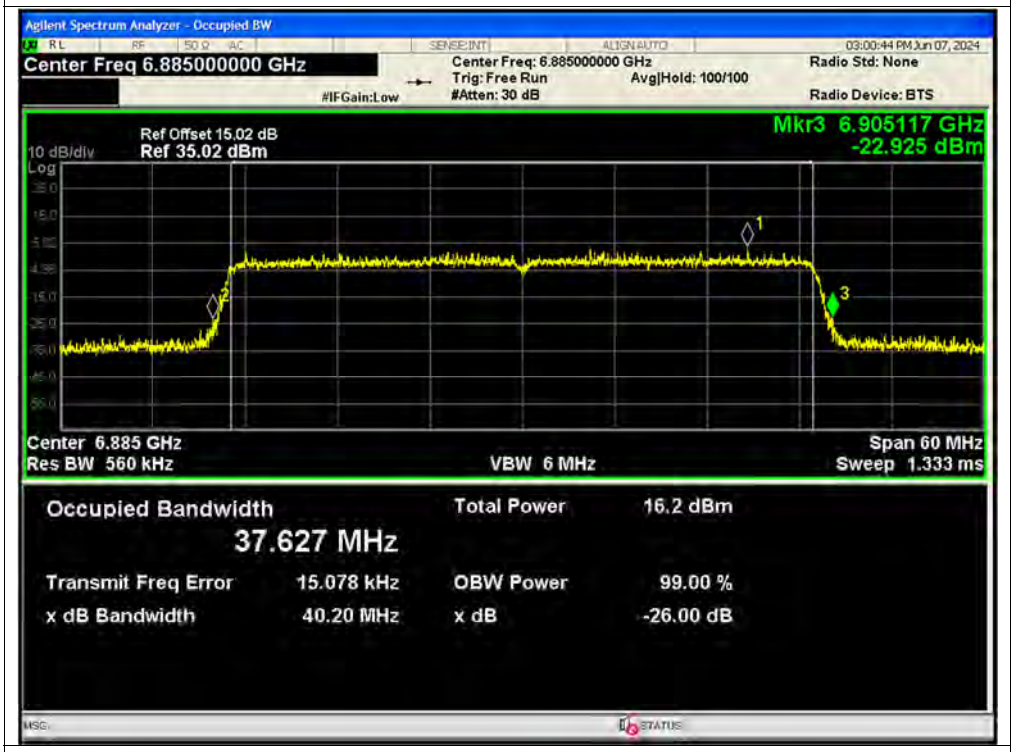
-26dB Bandwidth NVNT ax40 6685MHz Ant1



-26dB Bandwidth NVNT ax40 6845MHz Ant1



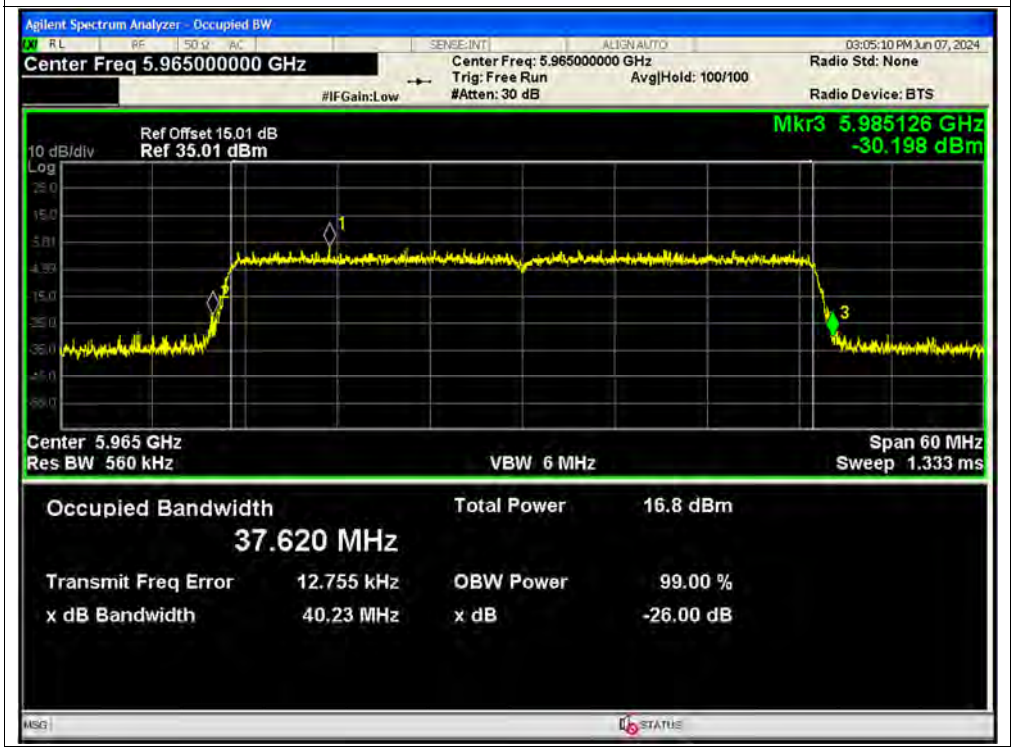
-26dB Bandwidth NVNT ax40 6885MHz Ant1



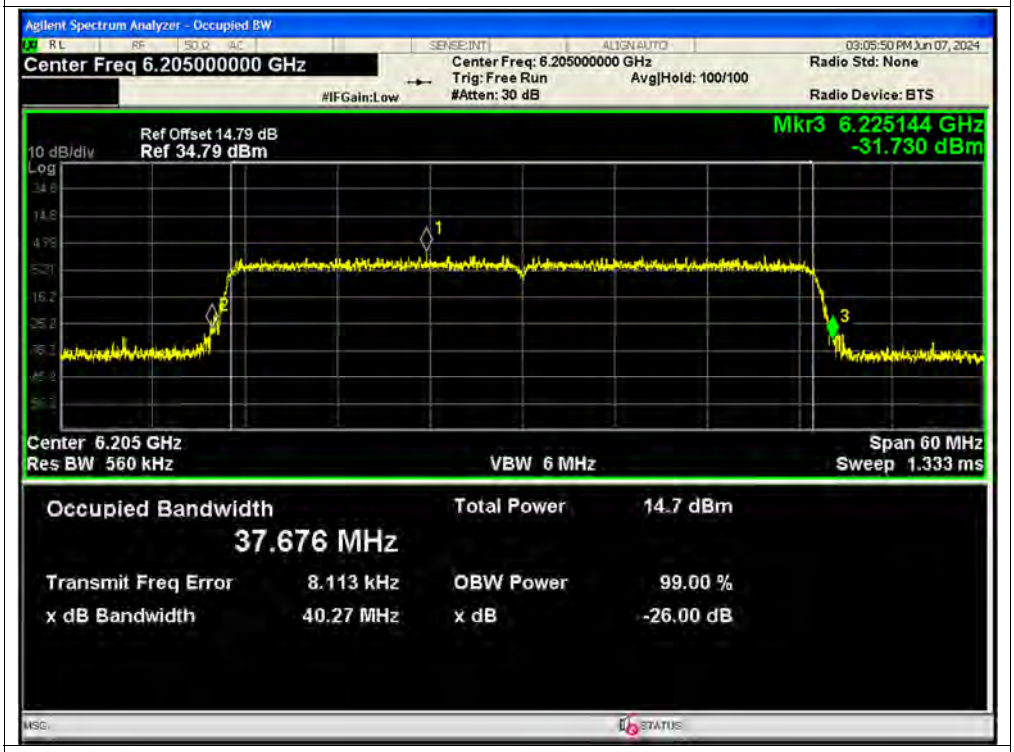
-26dB Bandwidth NVNT ax40 6965MHz Ant1

-26dB Bandwidth NVNT ax40 7085MHz Ant1

-26dB Bandwidth NVNT ax40 5965MHz Ant2

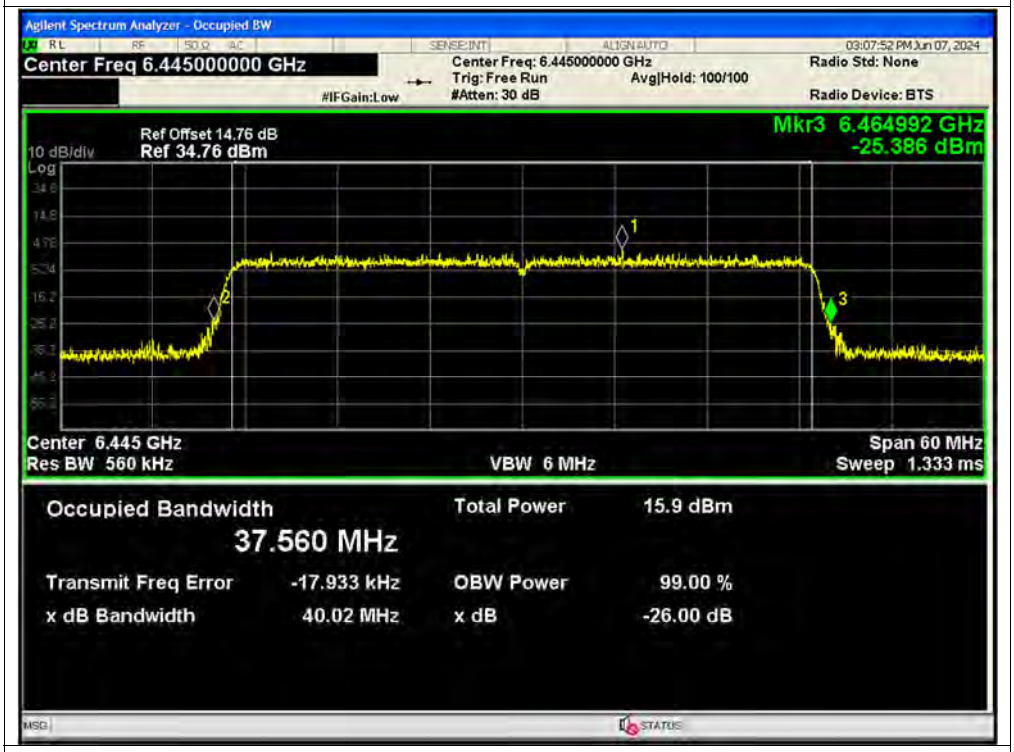


-26dB Bandwidth NVNT ax40 6205MHz Ant2

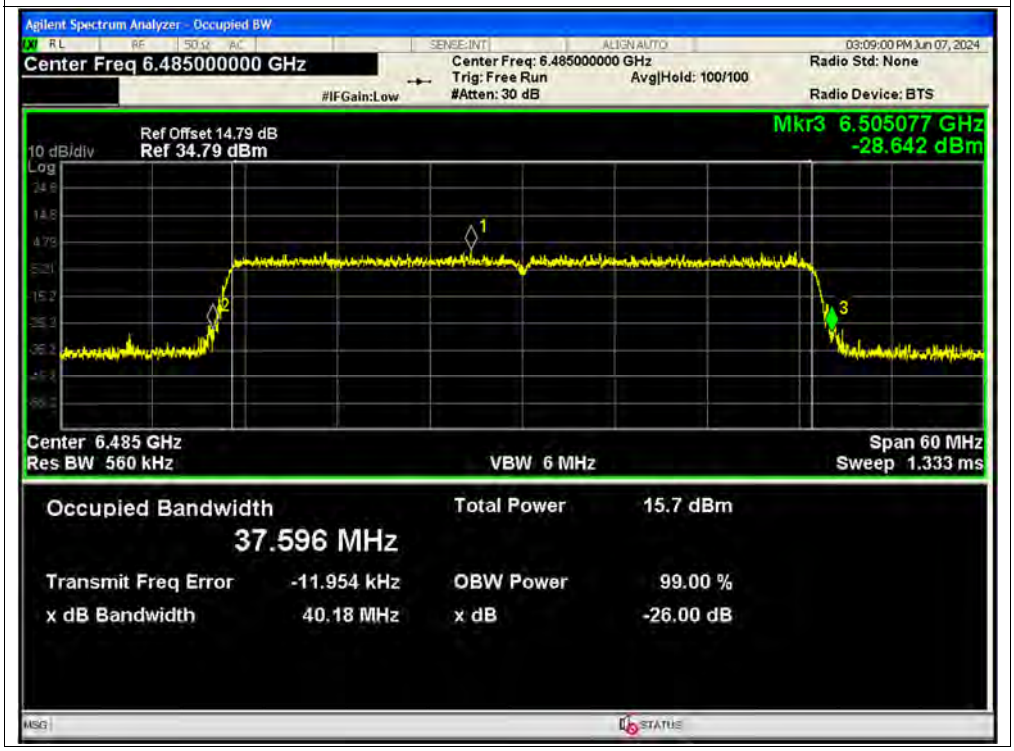


-26dB Bandwidth NVNT ax40 6405MHz Ant2

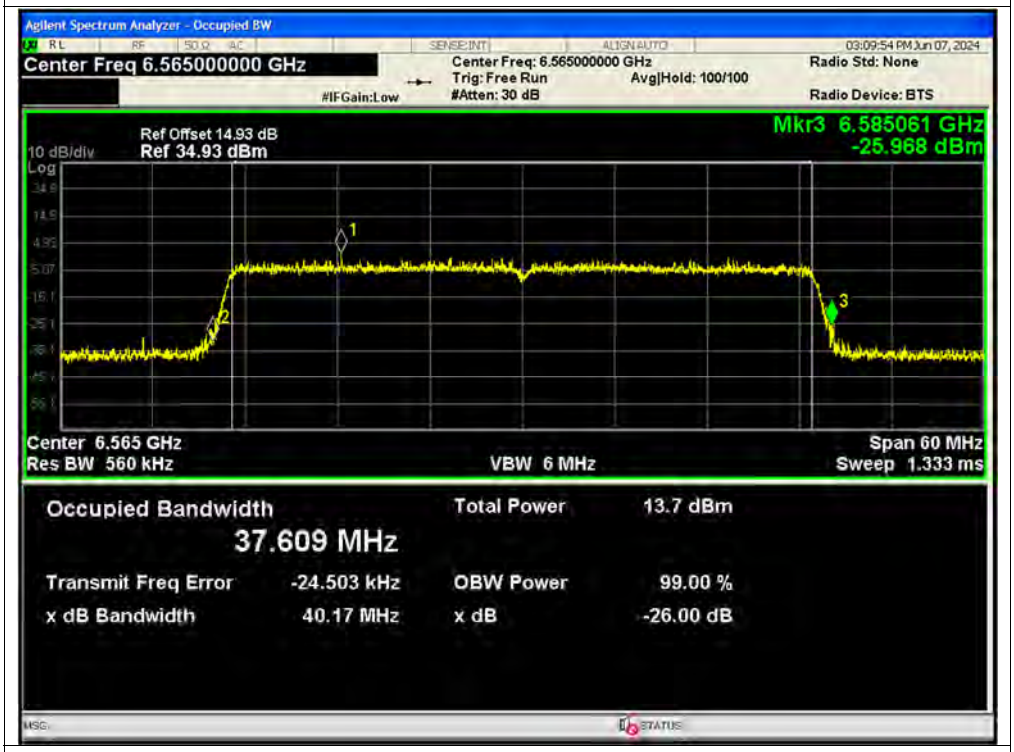
-26dB Bandwidth NVNT ax40 6445MHz Ant2



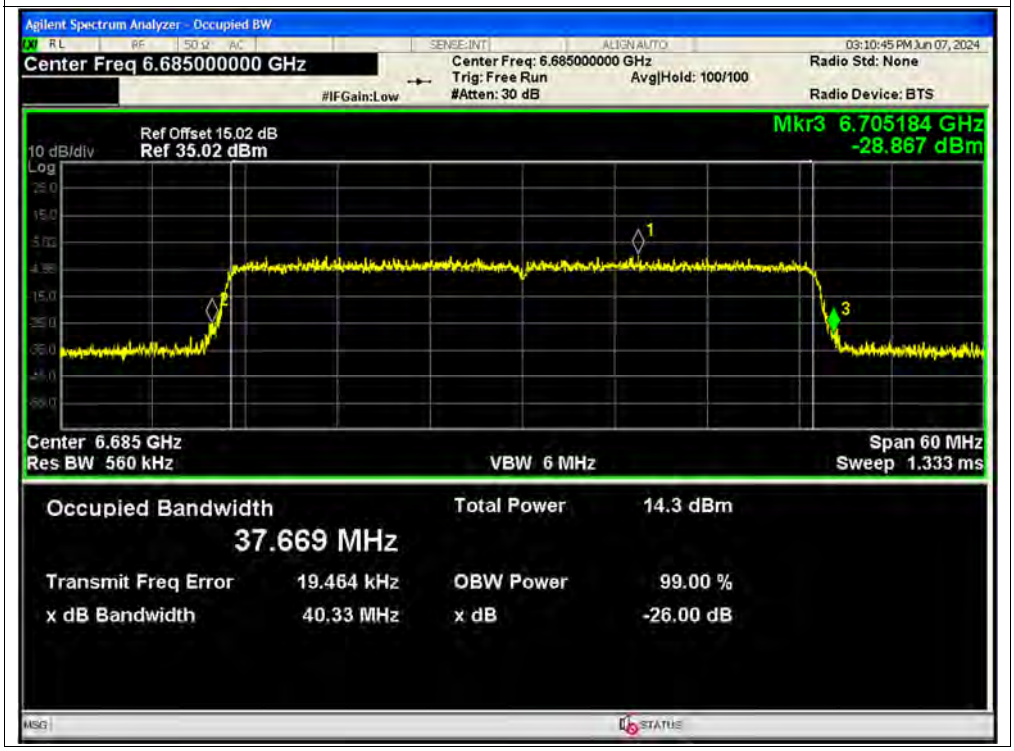
-26dB Bandwidth NVNT ax40 6485MHz Ant2



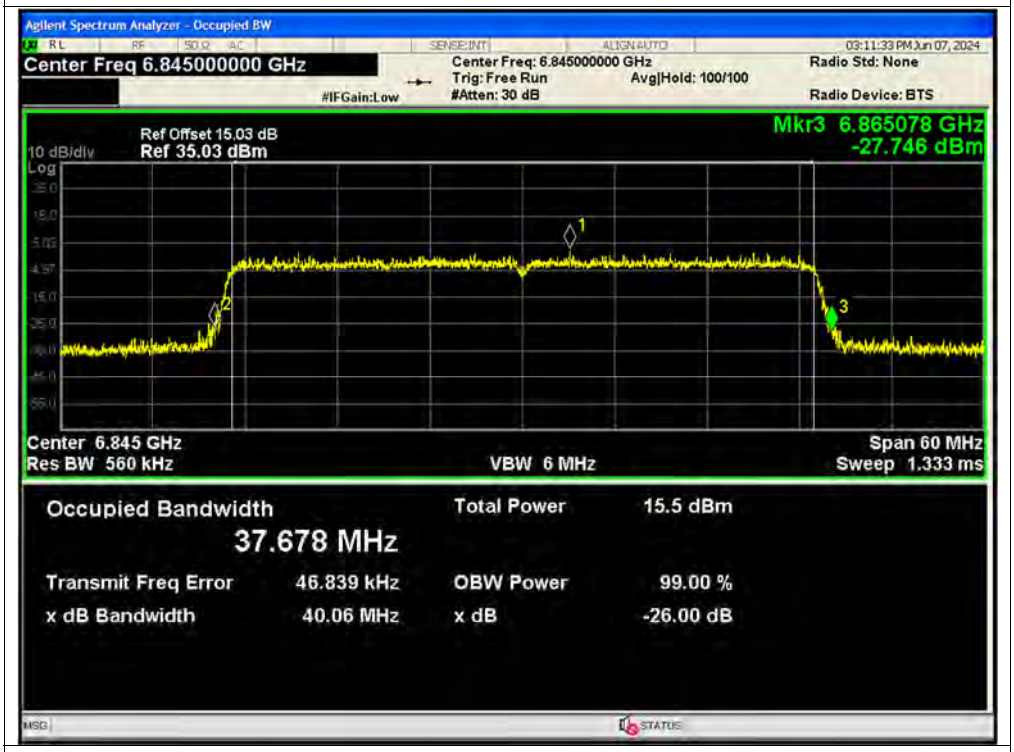
-26dB Bandwidth NVNT ax40 6565MHz Ant2



-26dB Bandwidth NVNT ax40 6685MHz Ant2



-26dB Bandwidth NVNT ax40 6845MHz Ant2

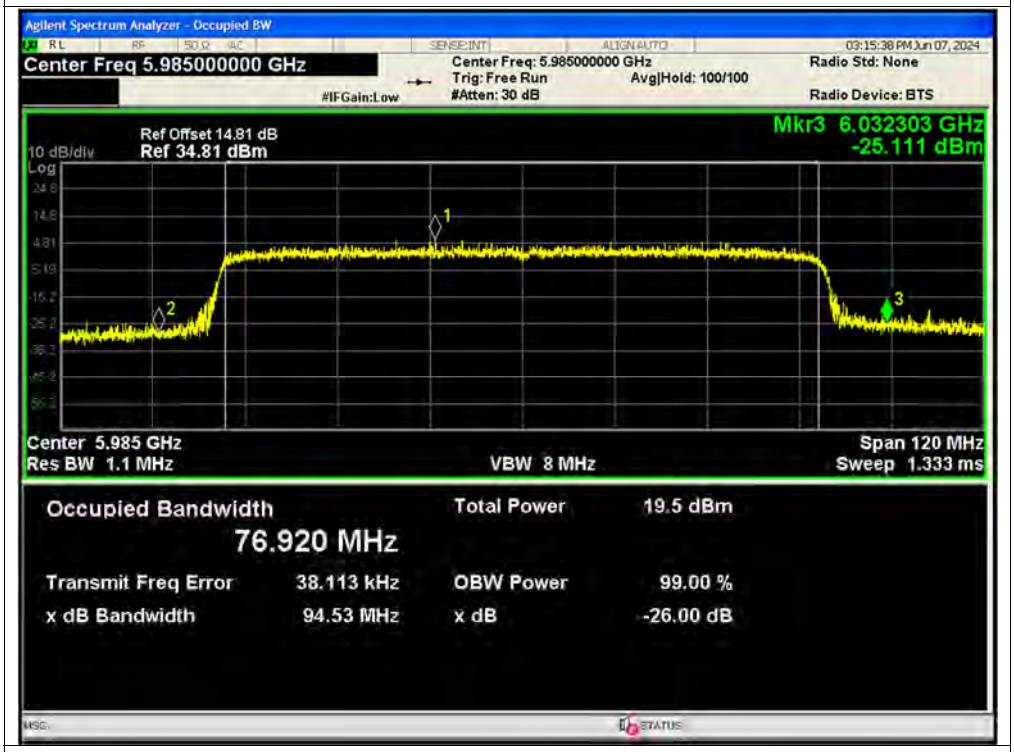


-26dB Bandwidth NVNT ax40 6885MHz Ant2

-26dB Bandwidth NVNT ax40 6965MHz Ant2

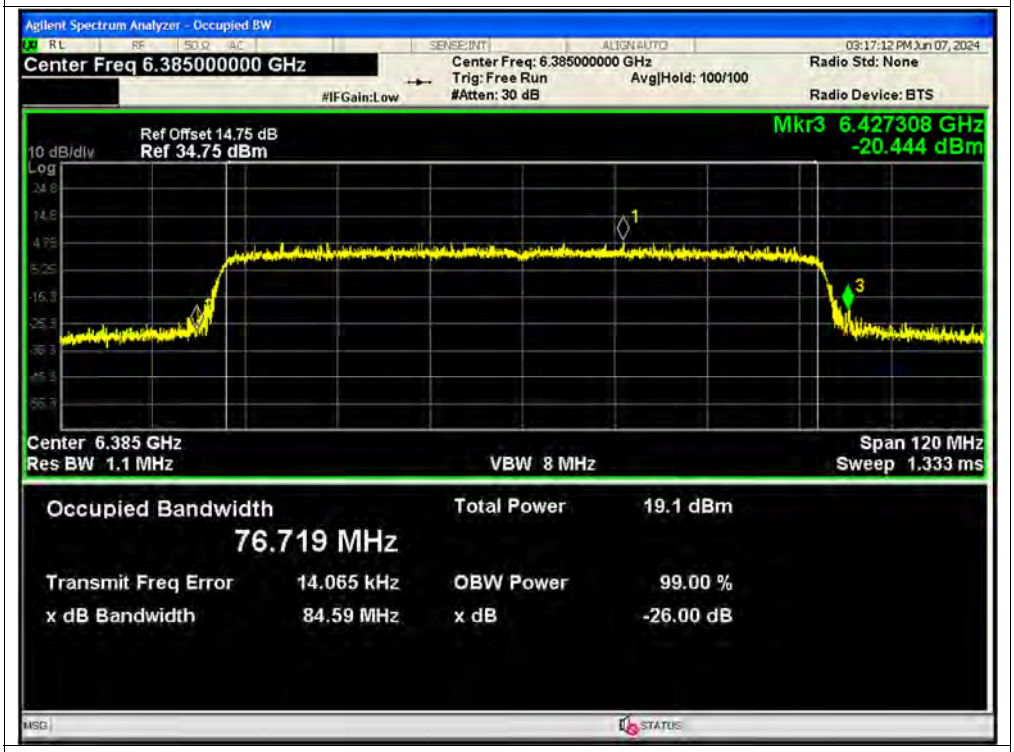
-26dB Bandwidth NVNT ax40 7085MHz Ant2

-26dB Bandwidth NVNT ax80 5985MHz Ant1



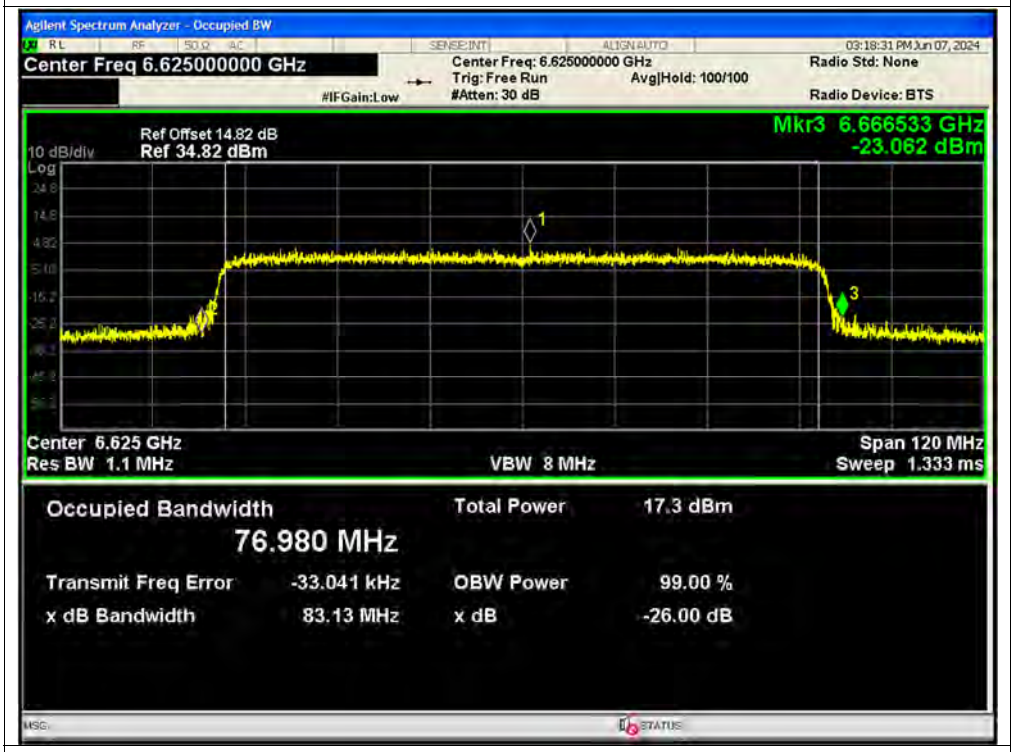
-26dB Bandwidth NVNT ax80 6225MHz Ant1

-26dB Bandwidth NVNT ax80 6385MHz Ant1

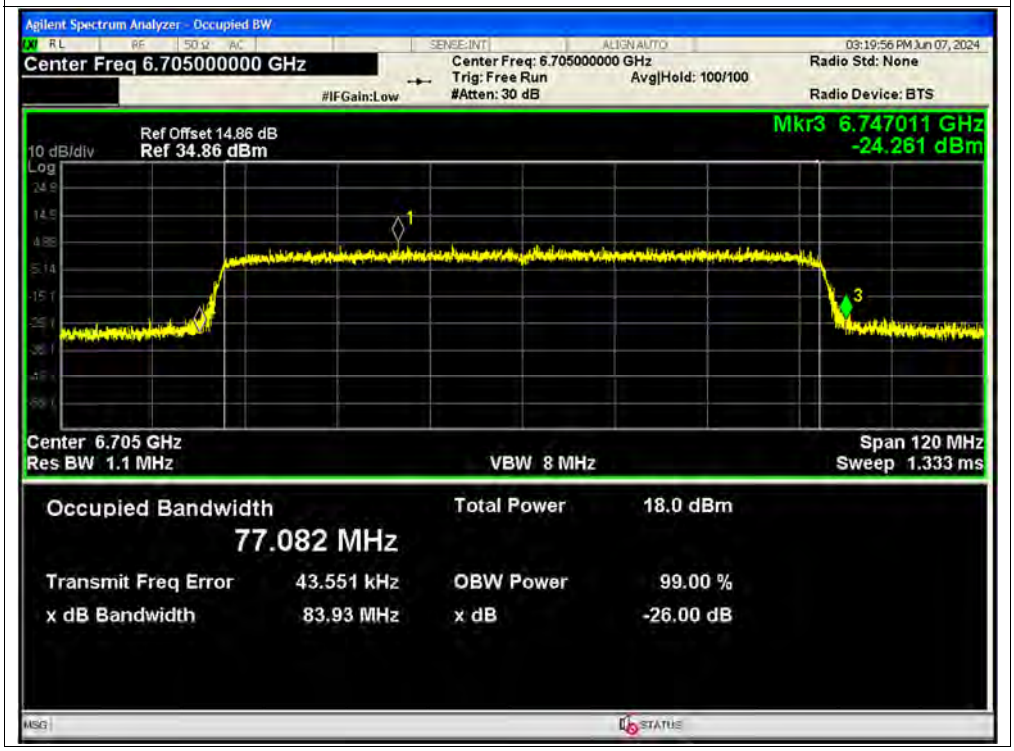


-26dB Bandwidth NVNT ax80 6465MHz Ant1

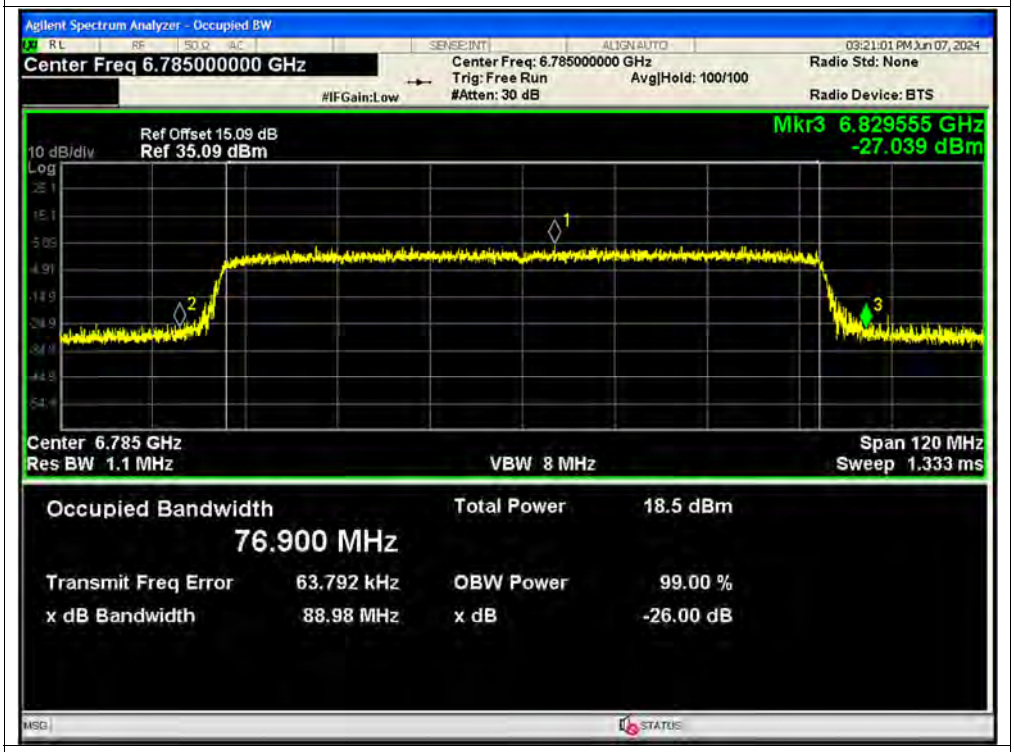
-26dB Bandwidth NVNT ax80 6625MHz Ant1



-26dB Bandwidth NVNT ax80 6705MHz Ant1



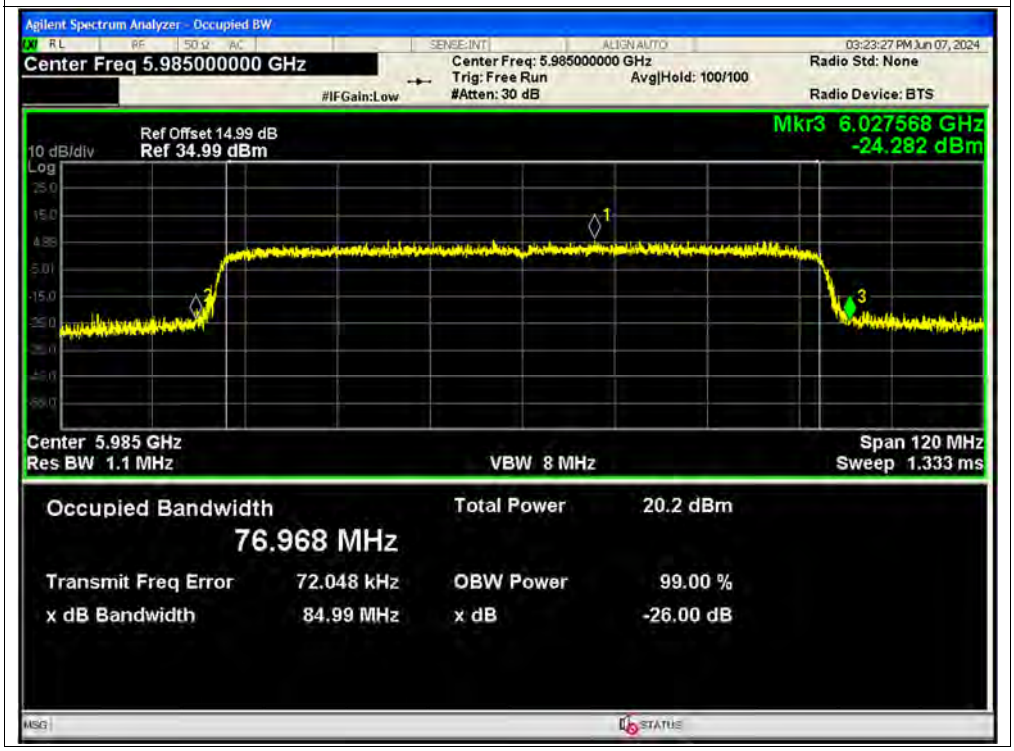
-26dB Bandwidth NVNT ax80 6785MHz Ant1



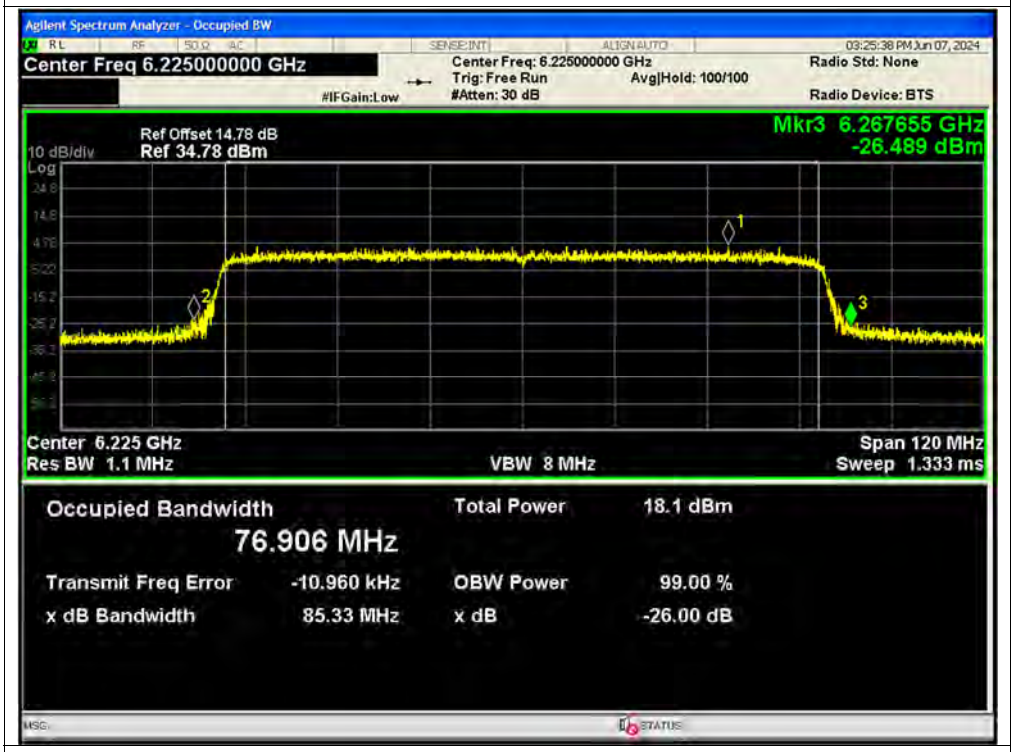
-26dB Bandwidth NVNT ax80 6945MHz Ant1

-26dB Bandwidth NVNT ax80 7025MHz Ant1

-26dB Bandwidth NVNT ax80 5985MHz Ant2

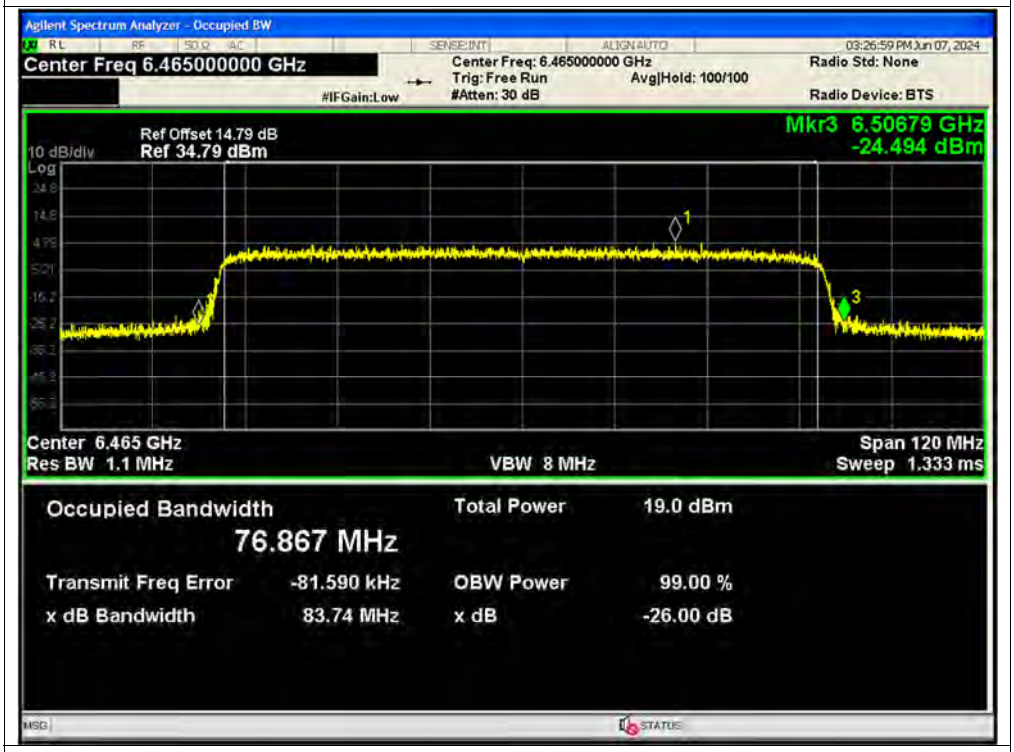


-26dB Bandwidth NVNT ax80 6225MHz Ant2

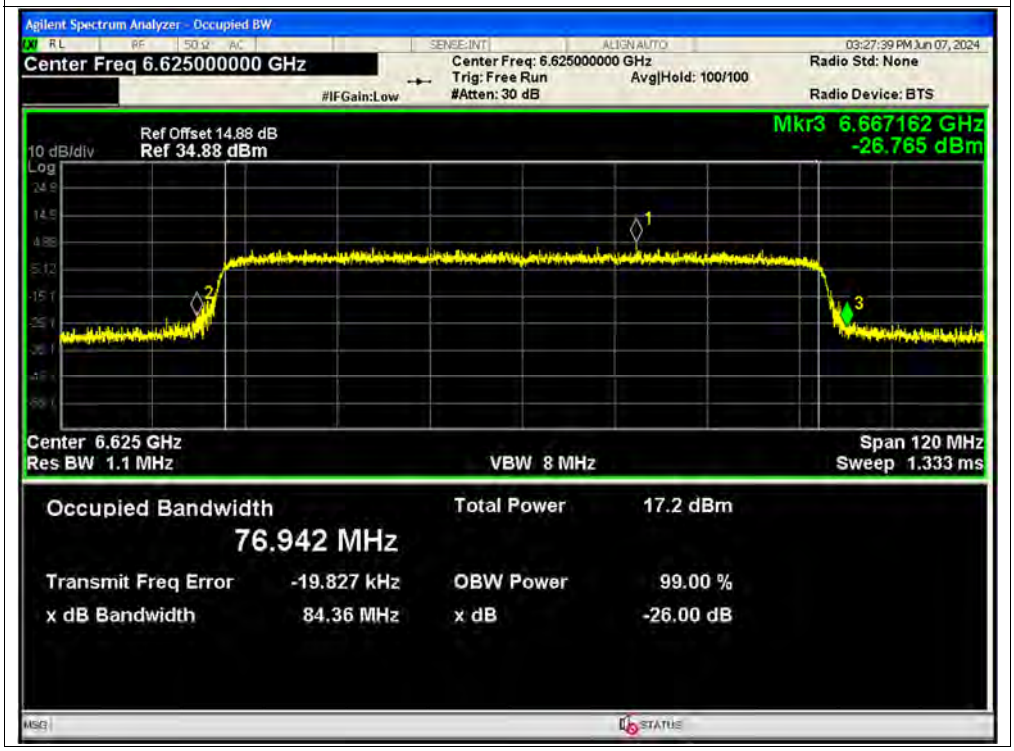


-26dB Bandwidth NVNT ax80 6385MHz Ant2

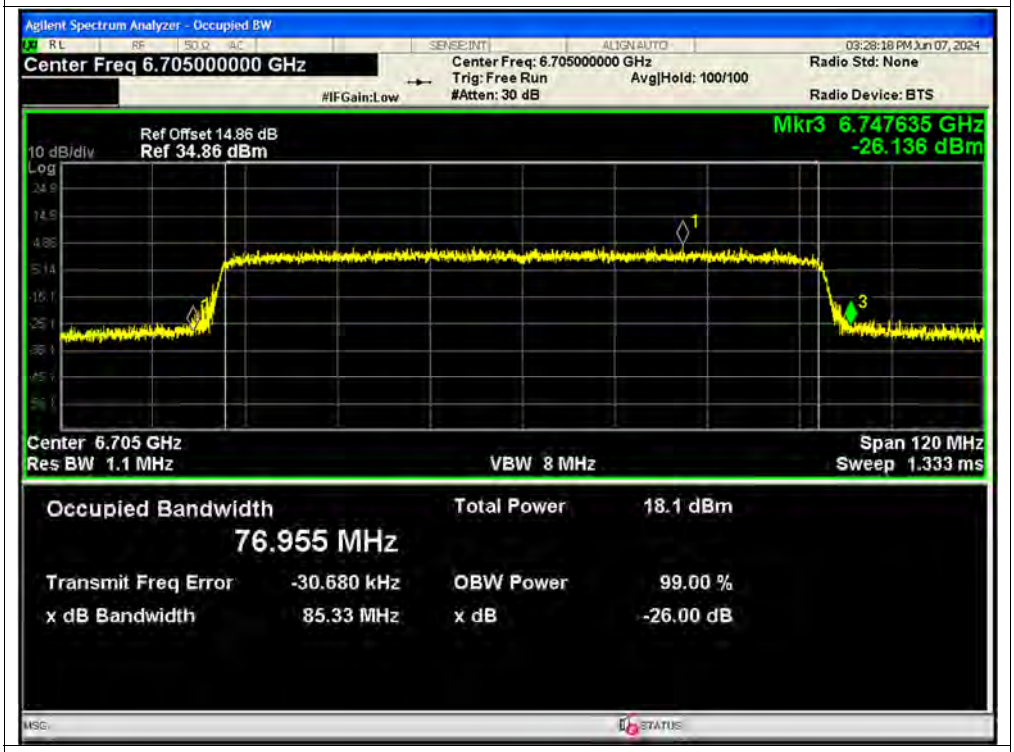
-26dB Bandwidth NVNT ax80 6465MHz Ant2



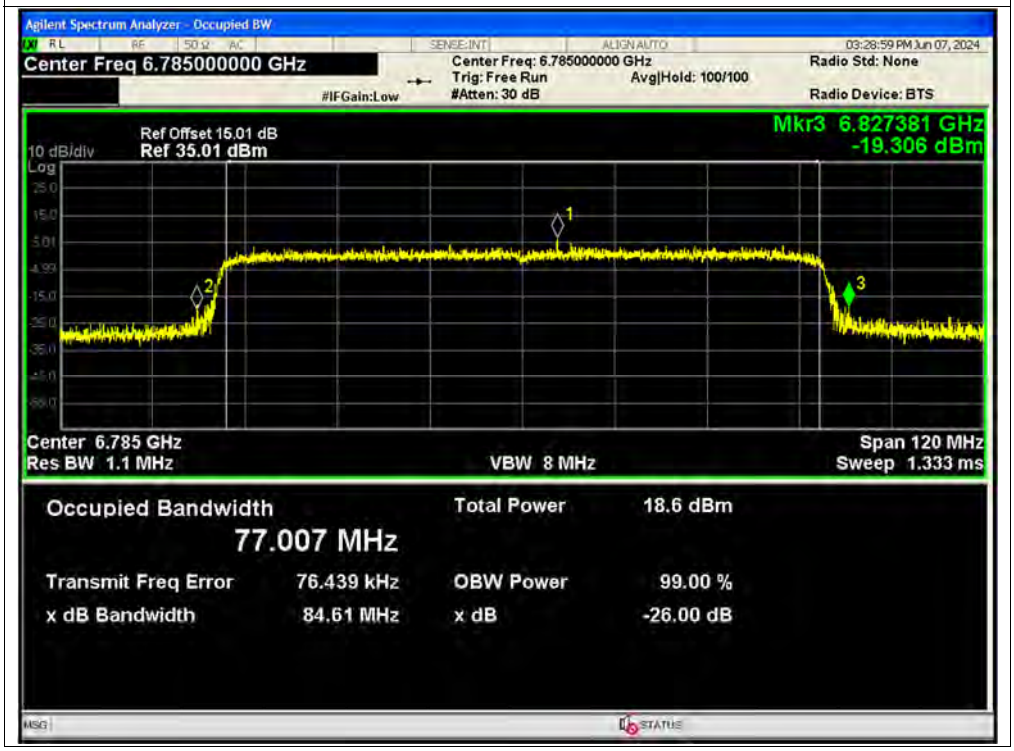
-26dB Bandwidth NVNT ax80 6625MHz Ant2



-26dB Bandwidth NVNT ax80 6705MHz Ant2



-26dB Bandwidth NVNT ax80 6785MHz Ant2



-26dB Bandwidth NVNT ax80 6945MHz Ant2

-26dB Bandwidth NVNT ax80 7025MHz Ant2

A.5. Power Spectral Density

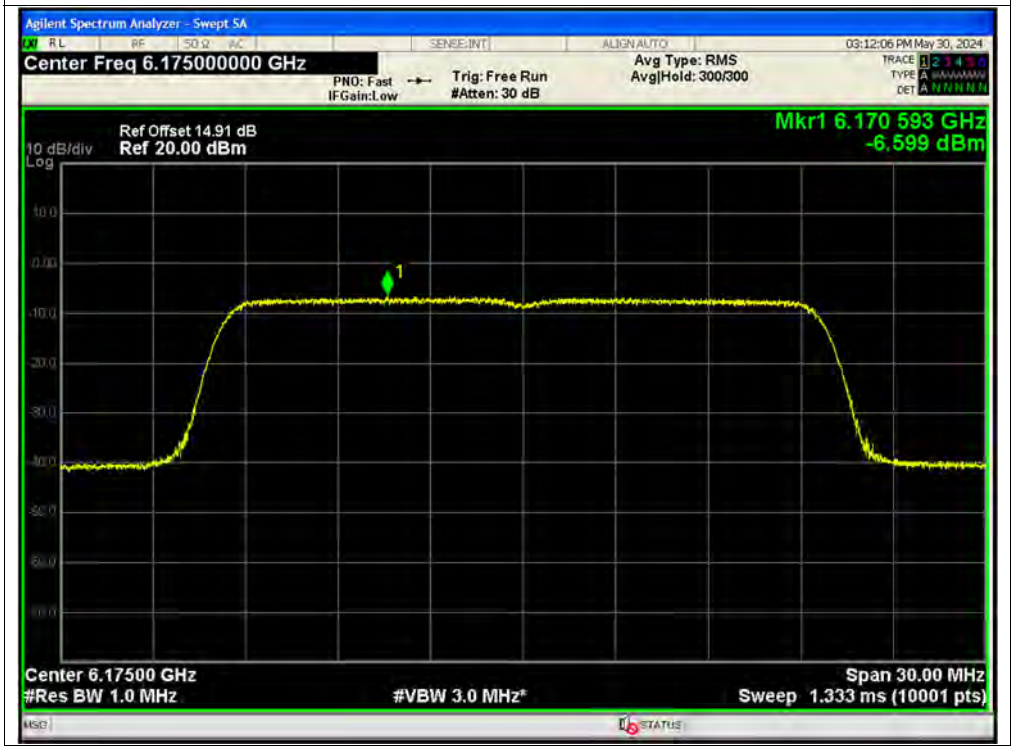
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Gain (dBi)	eirp PSD (dBm)	Limit (dBm)	Verdict
NVNT	ax20	5955	Ant1	-6.69	0.09	-6.6	3.51	-3.09	-1	Pass
NVNT	ax20	6175	Ant1	-6.6	0.09	-6.51	3.51	-3	-1	Pass
NVNT	ax20	6415	Ant1	-4.78	0.09	-4.69	3.51	-1.18	-1	Pass
NVNT	ax20	6435	Ant1	-5.1	0.09	-5.01	3.51	-1.5	-1	Pass
NVNT	ax20	6475	Ant1	-4.84	0.09	-4.75	3.51	-1.24	-1	Pass
NVNT	ax20	6515	Ant1	-4.89	0.09	-4.8	3.51	-1.29	-1	Pass
NVNT	ax20	6535	Ant1	-6.89	0.09	-6.8	3.51	-3.29	-1	Pass
NVNT	ax20	6695	Ant1	-5.2	0.09	-5.11	3.51	-1.6	-1	Pass
NVNT	ax20	6855	Ant1	-5.15	0.09	-5.06	3.51	-1.55	-1	Pass
NVNT	ax20	6875	Ant1	-7.16	0.09	-7.07	3.51	-3.56	-1	Pass
NVNT	ax20	6995	Ant1	-5.63	0.09	-5.54	3.51	-2.03	-1	Pass
NVNT	ax20	7115	Ant1	-6.79	0.09	-6.7	3.51	-3.19	-1	Pass
NVNT	ax20	5955	Ant2	-6.44	0.04	-6.4	3.51	-2.89	-1	Pass
NVNT	ax20	6175	Ant2	-5.97	0.09	-5.88	3.51	-2.37	-1	Pass
NVNT	ax20	6415	Ant2	-4.64	0.09	-4.55	3.51	-1.04	-1	Pass
NVNT	ax20	6435	Ant2	-5.36	0.09	-5.27	3.51	-1.76	-1	Pass
NVNT	ax20	6475	Ant2	-4.98	0.09	-4.89	3.51	-1.38	-1	Pass
NVNT	ax20	6515	Ant2	-5.33	0.09	-5.24	3.51	-1.73	-1	Pass
NVNT	ax20	6535	Ant2	-6.68	0.09	-6.59	3.51	-3.08	-1	Pass
NVNT	ax20	6695	Ant2	-5.97	0.09	-5.88	3.51	-2.37	-1	Pass
NVNT	ax20	6855	Ant2	-5.03	0.09	-4.94	3.51	-1.43	-1	Pass
NVNT	ax20	6875	Ant2	-8.22	0.09	-8.13	3.51	-4.62	-1	Pass
NVNT	ax20	6995	Ant2	-5.41	0.09	-5.32	3.51	-1.81	-1	Pass
NVNT	ax20	7115	Ant2	-6.4	0.09	-6.31	3.51	-2.8	-1	Pass
NVNT	ax40	5965	Ant1	-4.92	0.17	-4.75	3.51	-1.24	-1	Pass
NVNT	ax40	6205	Ant1	-6.75	0.17	-6.58	3.51	-3.07	-1	Pass
NVNT	ax40	6405	Ant1	-4.82	0.17	-4.65	3.51	-1.14	-1	Pass
NVNT	ax40	6445	Ant1	-5.41	0.17	-5.24	3.51	-1.73	-1	Pass
NVNT	ax40	6485	Ant1	-5.44	0.17	-5.27	3.51	-1.76	-1	Pass
NVNT	ax40	6565	Ant1	-6.72	0.17	-6.55	3.51	-3.04	-1	Pass
NVNT	ax40	6685	Ant1	-5.79	0.17	-5.62	3.51	-2.11	-1	Pass
NVNT	ax40	6845	Ant1	-5.24	0.17	-5.07	3.51	-1.56	-1	Pass
NVNT	ax40	6885	Ant1	-5.04	0.17	-4.87	3.51	-1.36	-1	Pass
NVNT	ax40	6965	Ant1	-5.74	0.17	-5.57	3.51	-2.06	-1	Pass

NVNT	ax40	7085	Ant1	-4.92	0.17	-4.75	3.51	-1.24	-1	Pass
NVNT	ax40	5965	Ant2	-5.47	0.17	-5.3	3.51	-1.79	-1	Pass
NVNT	ax40	6205	Ant2	-8.07	0.17	-7.9	3.51	-4.39	-1	Pass
NVNT	ax40	6405	Ant2	-6.66	0.17	-6.49	3.51	-2.98	-1	Pass
NVNT	ax40	6445	Ant2	-6.64	0.17	-6.47	3.51	-2.96	-1	Pass
NVNT	ax40	6485	Ant2	-7.15	0.17	-6.98	3.51	-3.47	-1	Pass
NVNT	ax40	6565	Ant2	-9.02	0.17	-8.85	3.51	-5.34	-1	Pass
NVNT	ax40	6685	Ant2	-8.6	0.17	-8.43	3.51	-4.92	-1	Pass
NVNT	ax40	6845	Ant2	-7.11	0.17	-6.94	3.51	-3.43	-1	Pass
NVNT	ax40	6885	Ant2	-8.64	0.17	-8.47	3.51	-4.96	-1	Pass
NVNT	ax40	6965	Ant2	-5.3	0.17	-5.13	3.51	-1.62	-1	Pass
NVNT	ax40	7085	Ant2	-4.91	0.17	-4.74	3.51	-1.23	-1	Pass
NVNT	ax80	5985	Ant1	-5.83	0.34	-5.49	3.51	-1.98	-1	Pass
NVNT	ax80	6225	Ant1	-7.28	0.34	-6.94	3.51	-3.43	-1	Pass
NVNT	ax80	6385	Ant1	-5.77	0.34	-5.43	3.51	-1.92	-1	Pass
NVNT	ax80	6465	Ant1	-6.56	0.34	-6.22	3.51	-2.71	-1	Pass
NVNT	ax80	6625	Ant1	-7.96	0.34	-7.62	3.51	-4.11	-1	Pass
NVNT	ax80	6705	Ant1	-7.11	0.34	-6.77	3.51	-3.26	-1	Pass
NVNT	ax80	6785	Ant1	-6.67	0.34	-6.33	3.51	-2.82	-1	Pass
NVNT	ax80	6945	Ant1	-5.28	0.34	-4.94	3.51	-1.43	-1	Pass
NVNT	ax80	7025	Ant1	-5.02	0.34	-4.68	3.51	-1.17	-1	Pass
NVNT	ax80	5985	Ant2	-5.44	0.34	-5.1	3.51	-1.59	-1	Pass
NVNT	ax80	6225	Ant2	-8.24	0.34	-7.9	3.51	-4.39	-1	Pass
NVNT	ax80	6385	Ant2	-6.72	0.34	-6.38	3.51	-2.87	-1	Pass
NVNT	ax80	6465	Ant2	-7.39	0.34	-7.05	3.51	-3.54	-1	Pass
NVNT	ax80	6625	Ant2	-9.25	0.34	-8.91	3.51	-5.4	-1	Pass
NVNT	ax80	6705	Ant2	-8.26	0.34	-7.92	3.51	-4.41	-1	Pass
NVNT	ax80	6785	Ant2	-7.8	0.34	-7.46	3.51	-3.95	-1	Pass
NVNT	ax80	6945	Ant2	-5.54	0.34	-5.2	3.51	-1.69	-1	Pass
NVNT	ax80	7025	Ant2	-5.42	0.34	-5.08	3.51	-1.57	-1	Pass

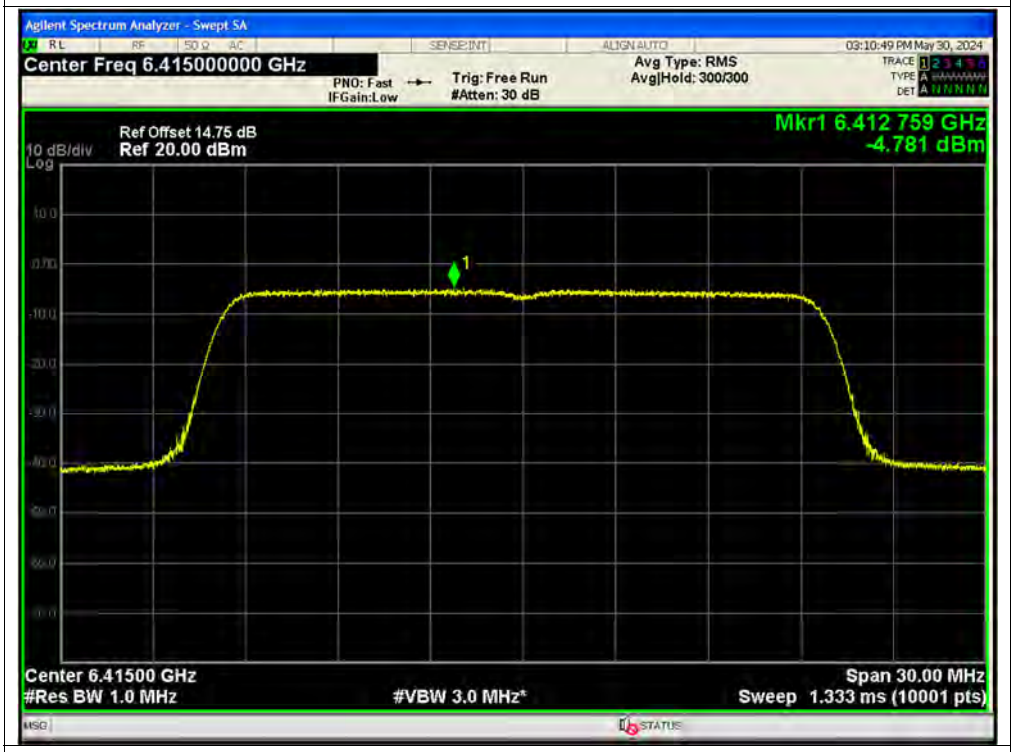
Test Graphs

PSD NVNT ax20 5955MHz Ant1

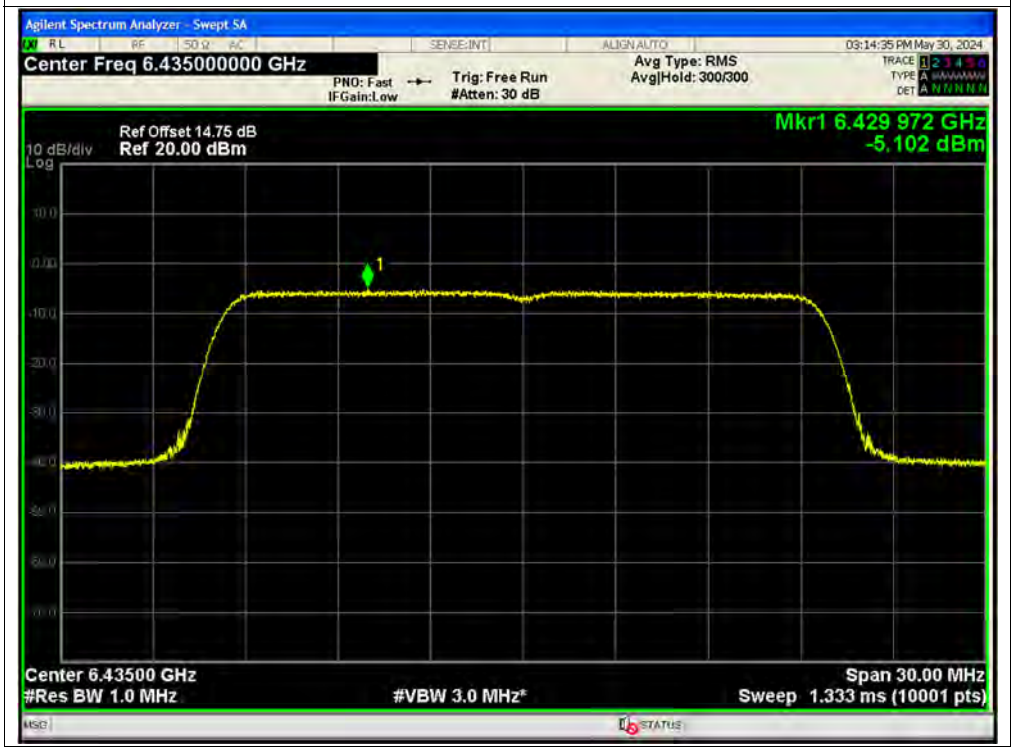
PSD NVNT ax20 6175MHz Ant1



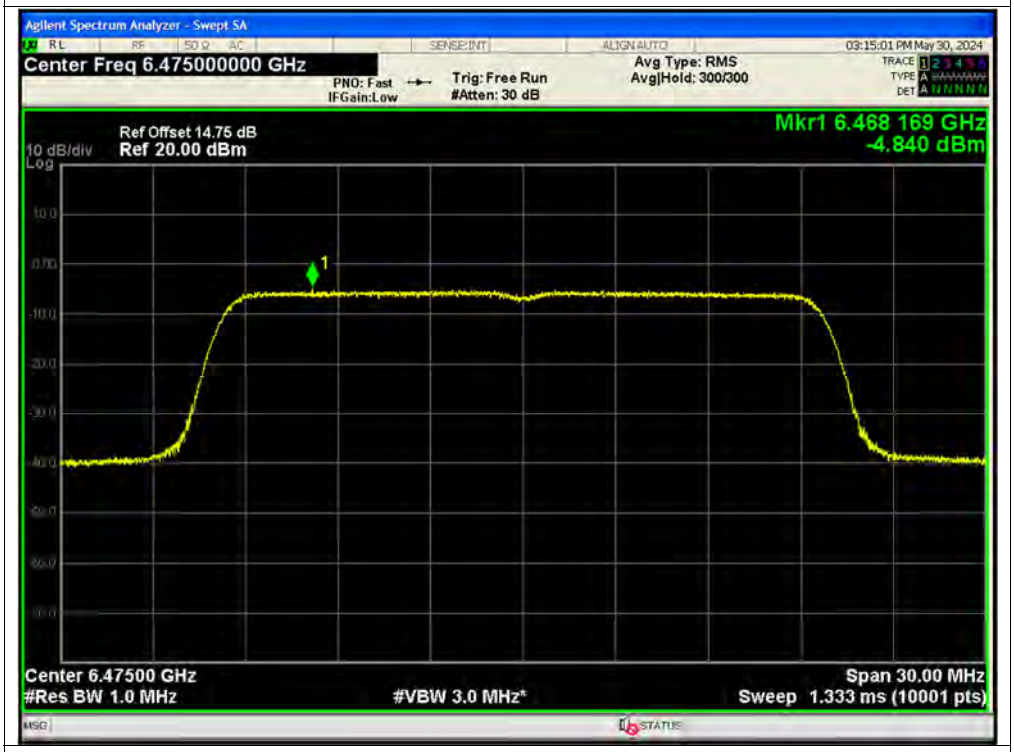
PSD NVNT ax20 6415MHz Ant1



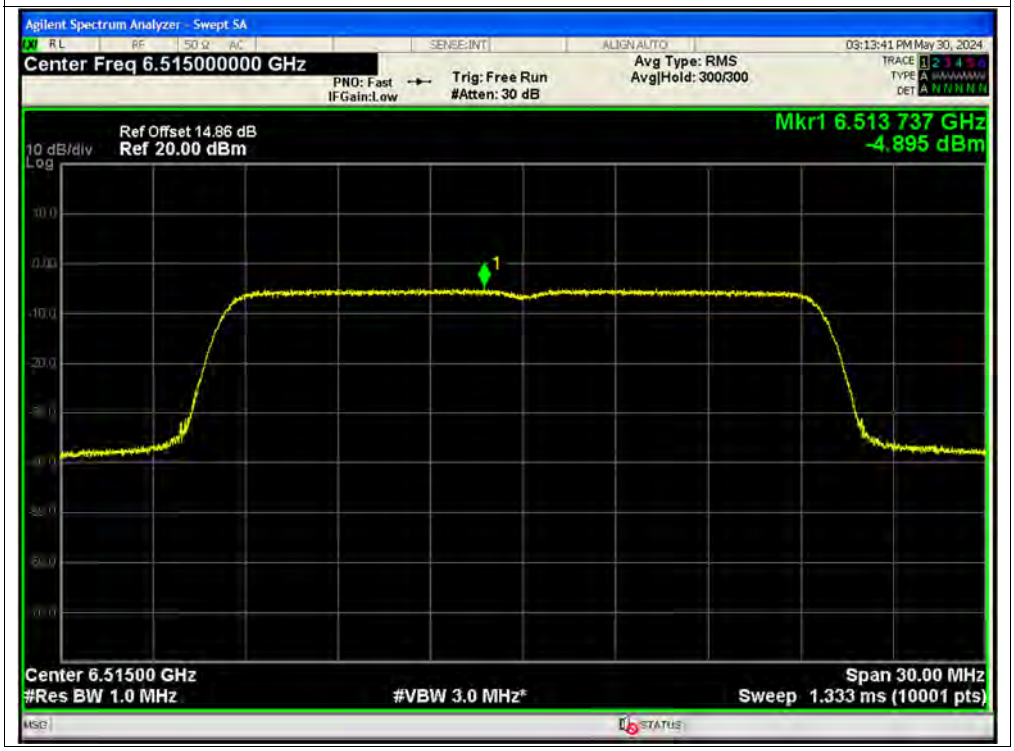
PSD NVNT ax20 6435MHz Ant1



PSD NVNT ax20 6475MHz Ant1

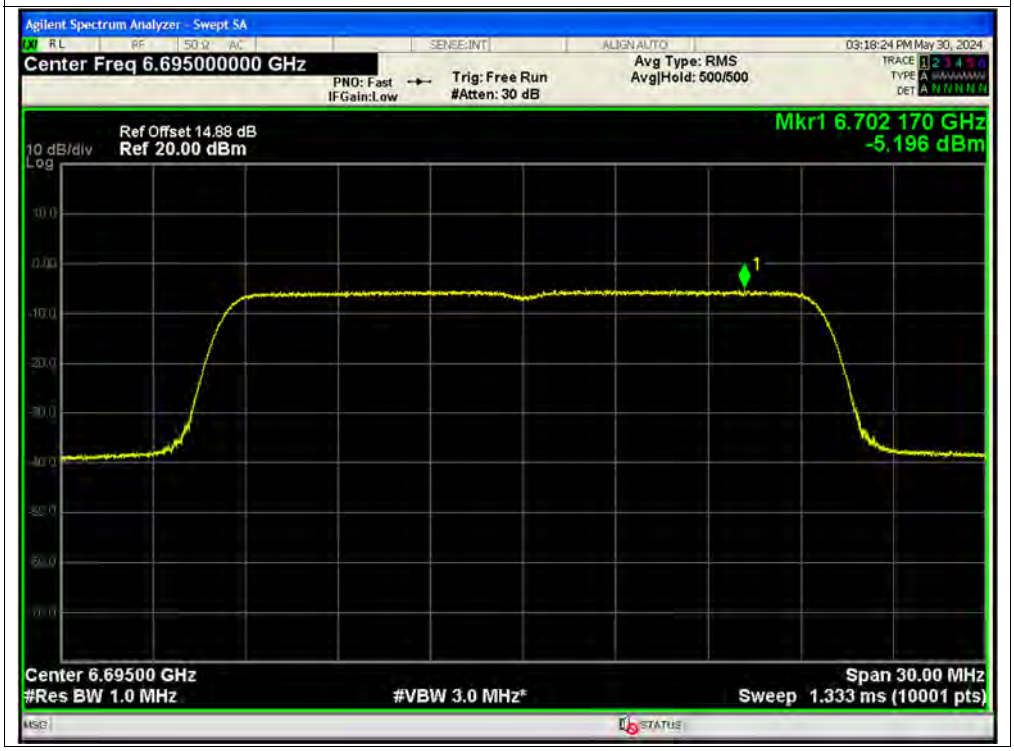


PSD NVNT ax20 6515MHz Ant1

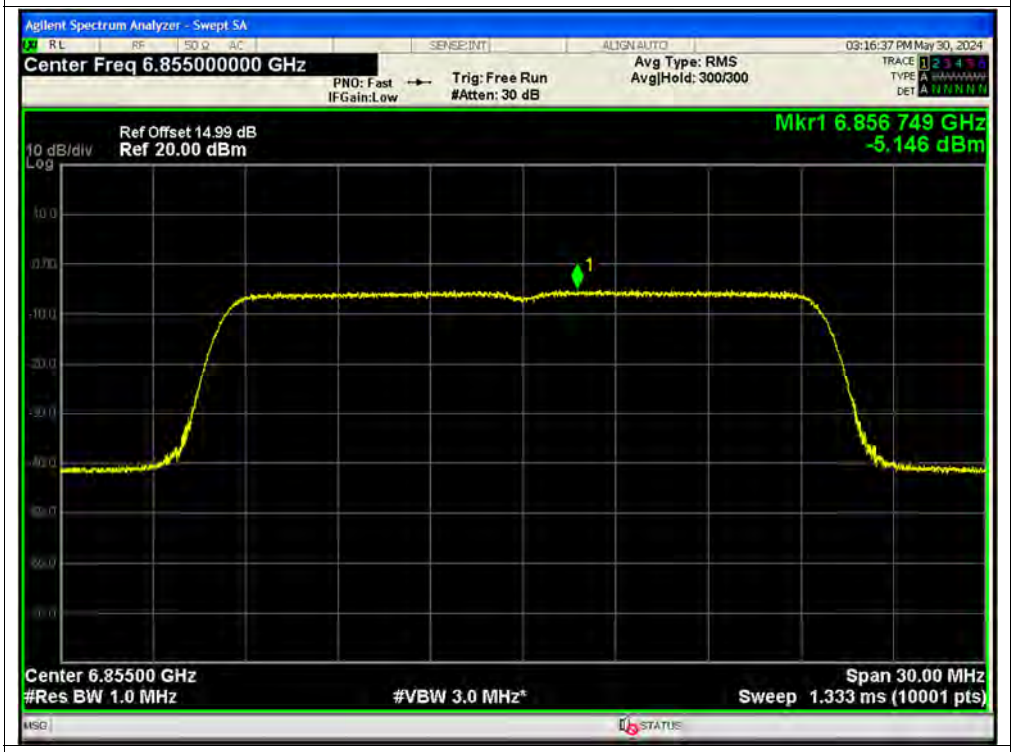


PSD NVNT ax20 6535MHz Ant1

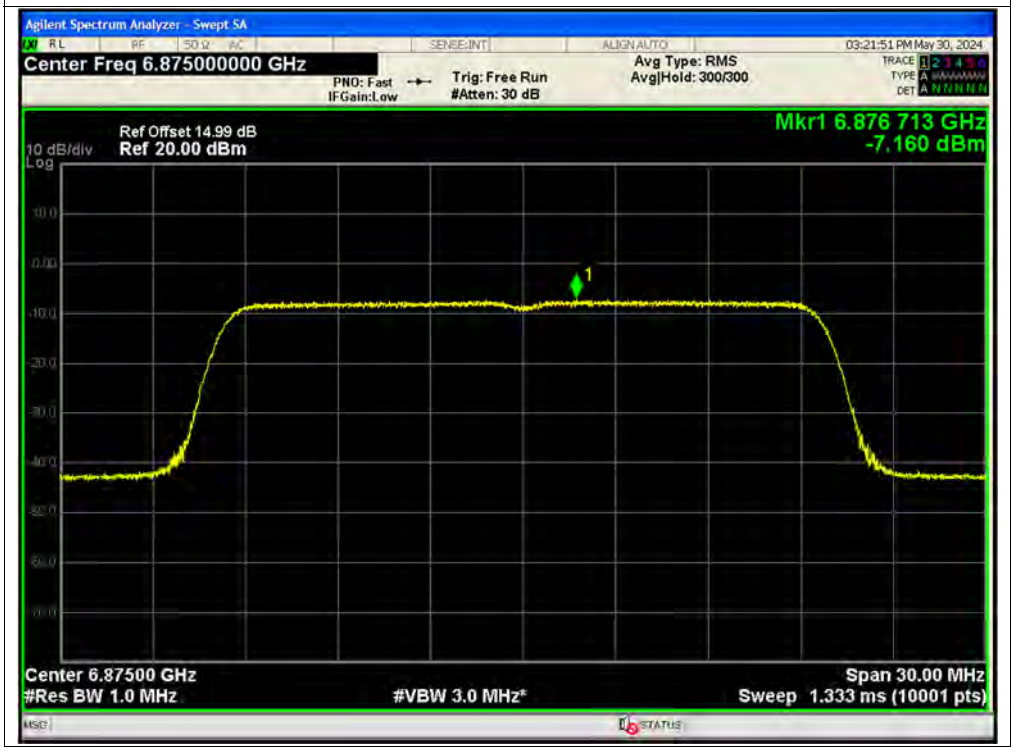
PSD NVNT ax20 6695MHz Ant1



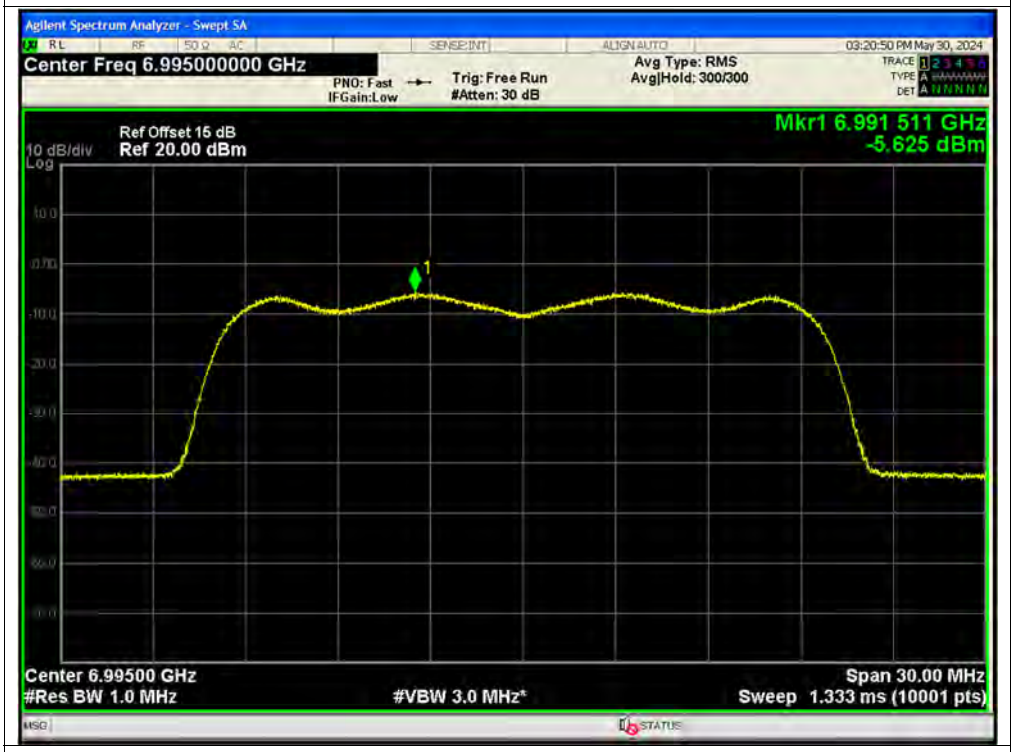
PSD NVNT ax20 6855MHz Ant1



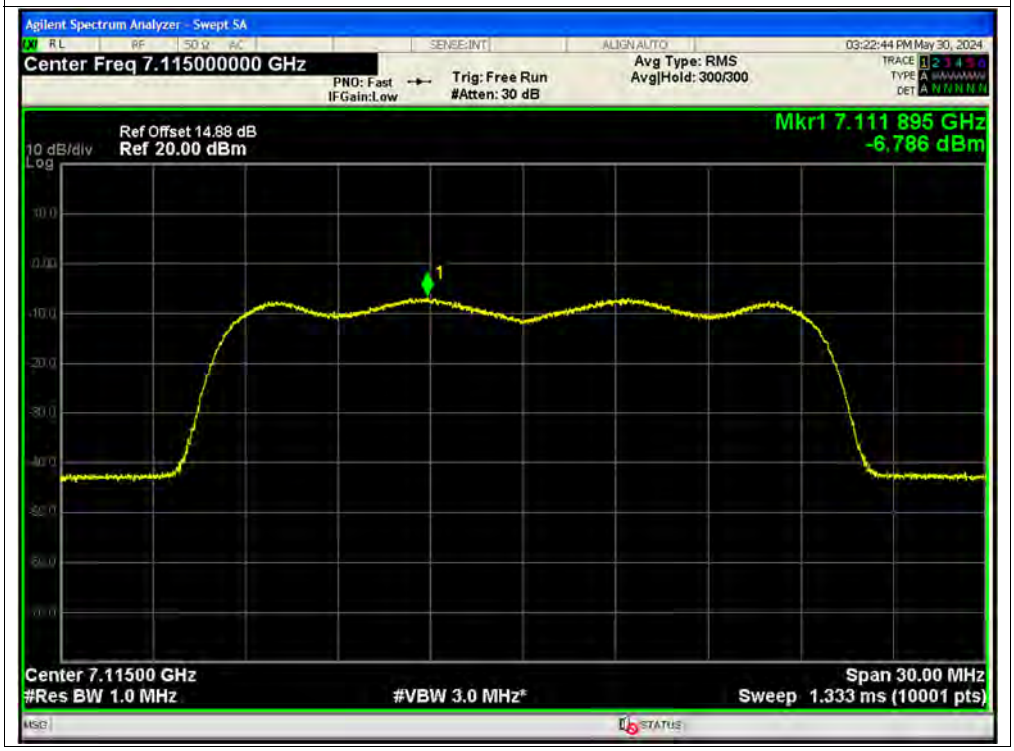
PSD NVNT ax20 6875MHz Ant1



PSD NVNT ax20 6995MHz Ant1

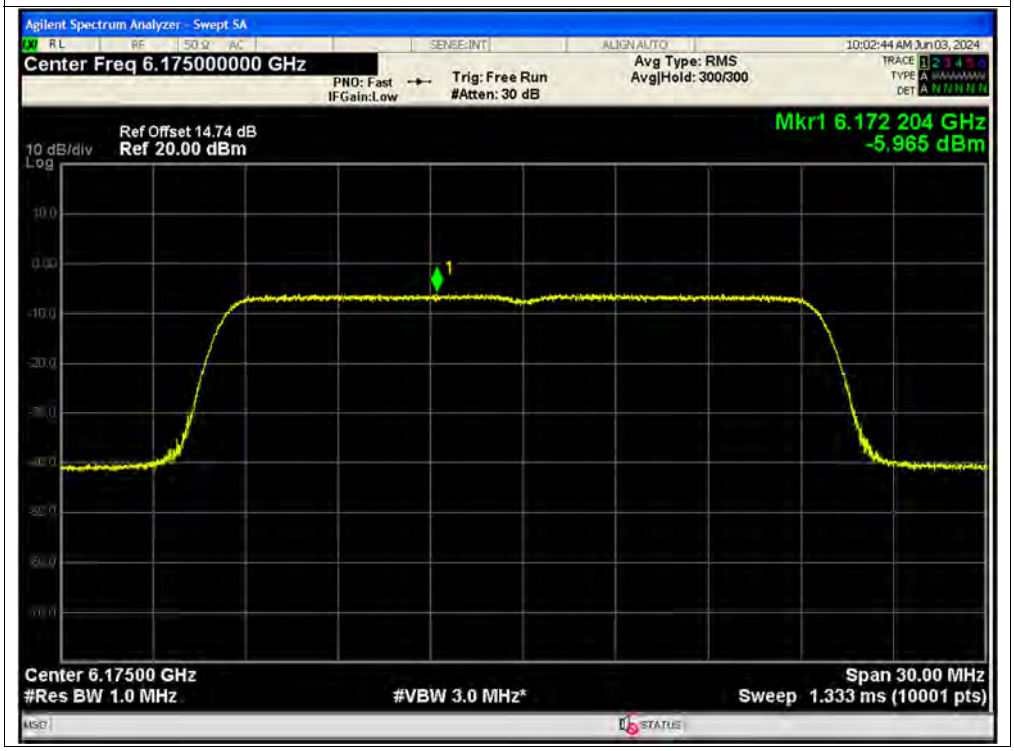


PSD NVNT ax20 7115MHz Ant1

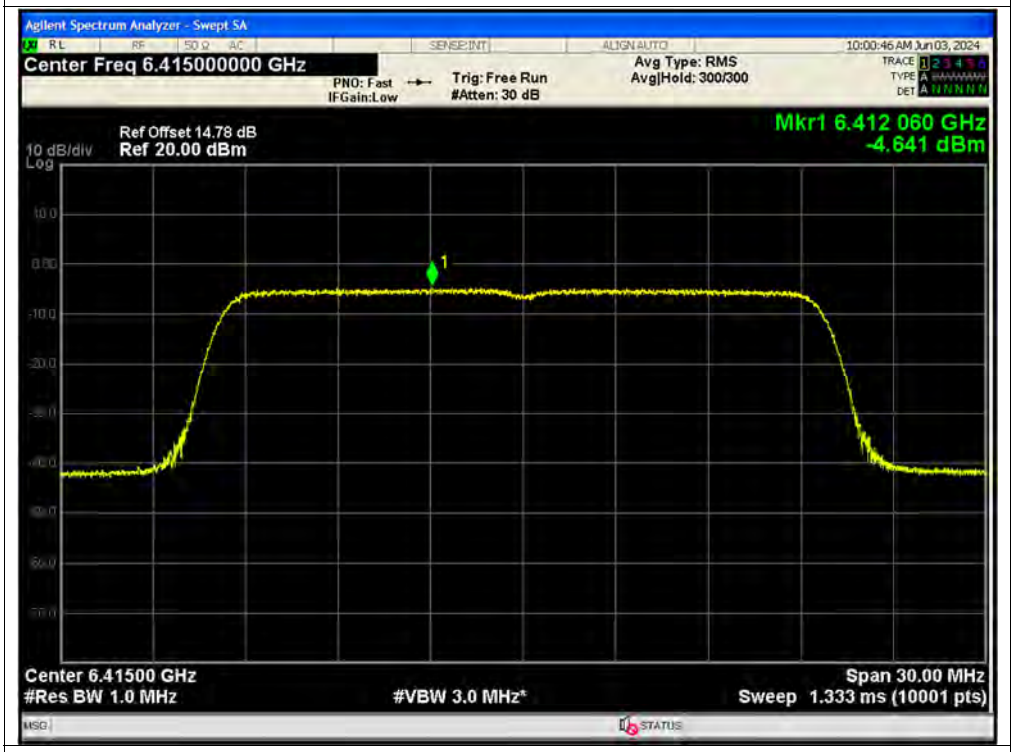


PSD NVNT ax20 5955MHz Ant2

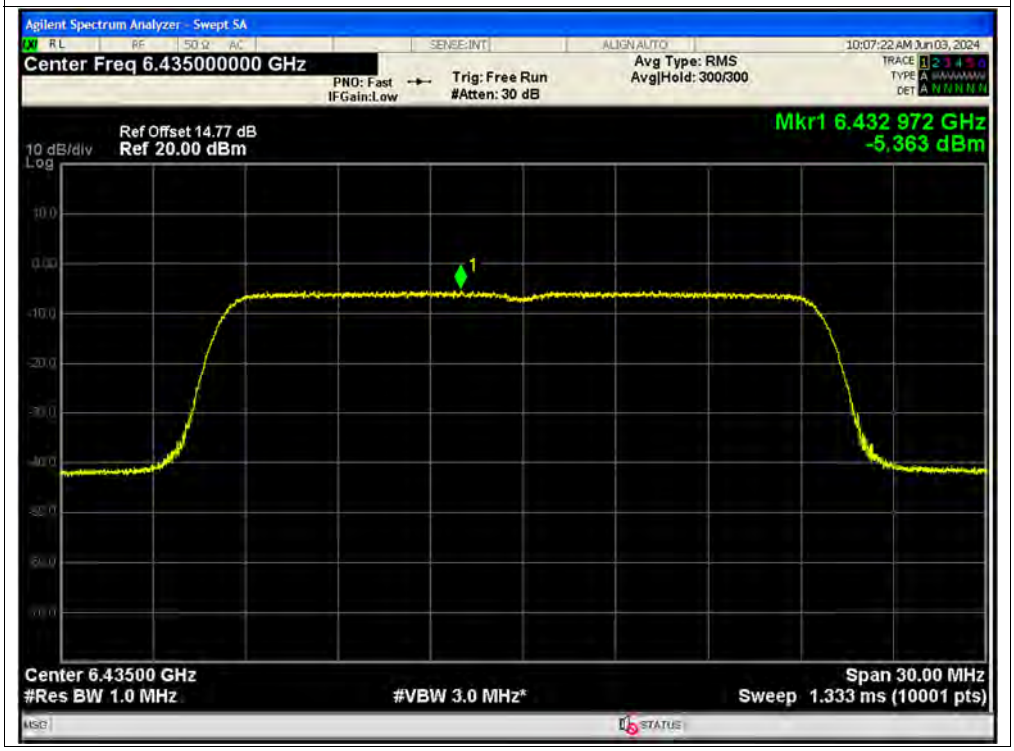
PSD NVNT ax20 6175MHz Ant2



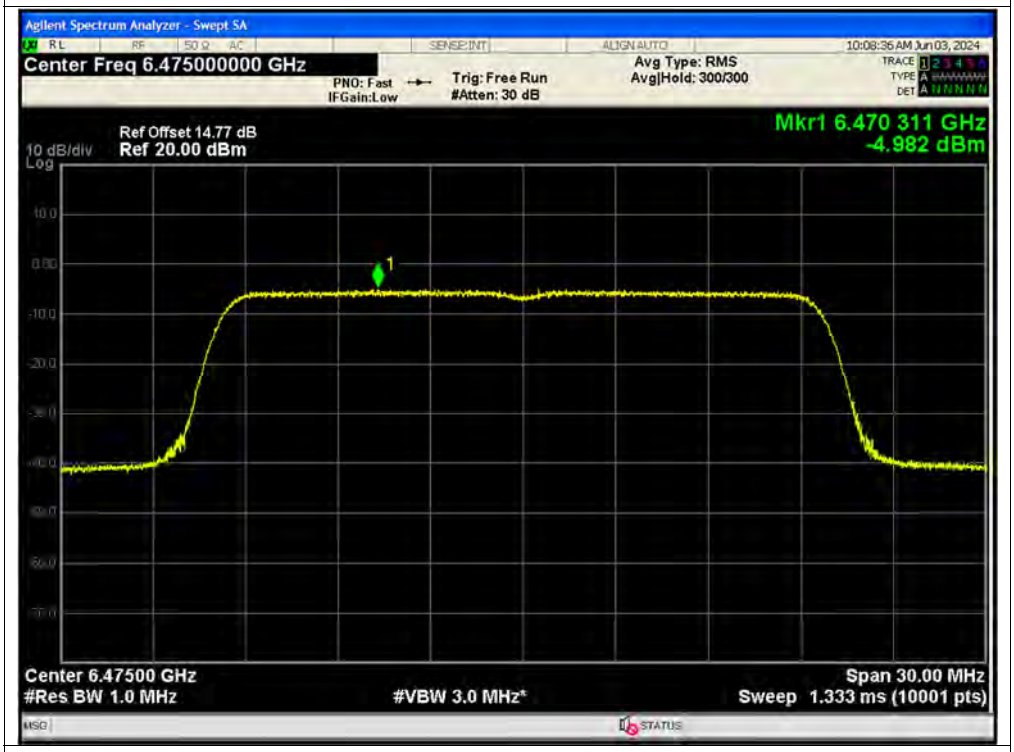
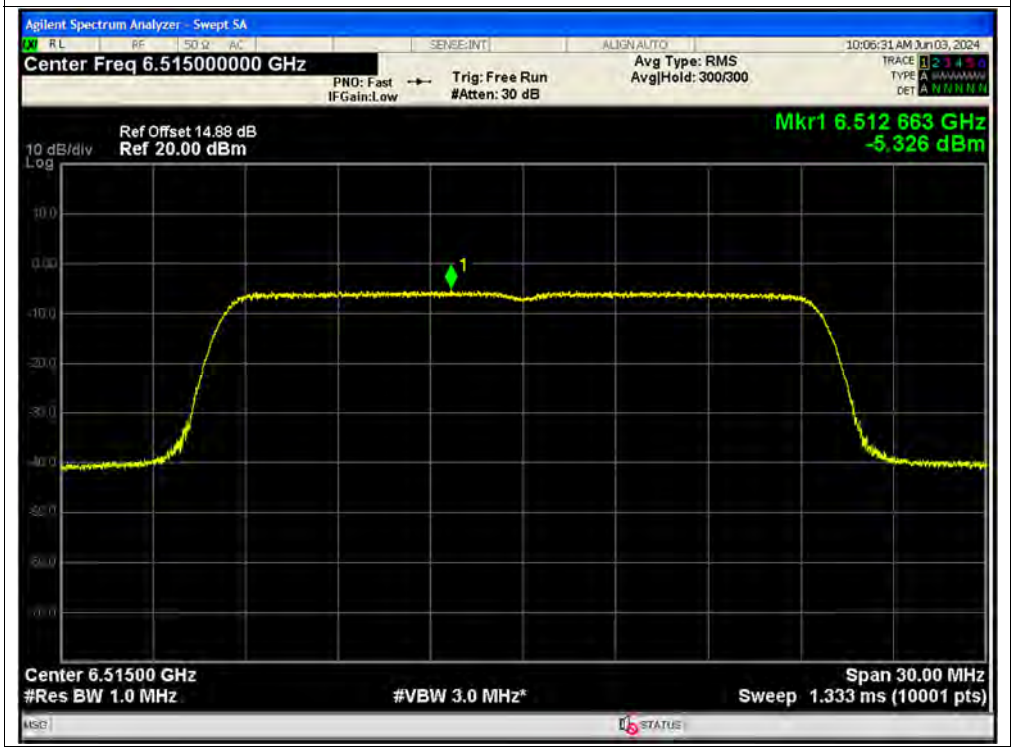
PSD NVNT ax20 6415MHz Ant2



PSD NVNT ax20 6435MHz Ant2



PSD NVNT ax20 6475MHz Ant2



PSD NVNT ax20 6515MHz Ant2