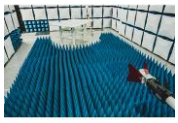
PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



PART 27 MEASUREMENT REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
9/10/2021 - 11/10/2021
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2109090103-29.A3L

FCC ID:	**A3LSMS906U**
Applicant Name:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SM-S906U
Additional Model(s):	SM-S906U1
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	27
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
CERT #2041.01

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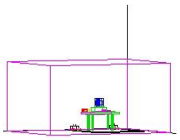
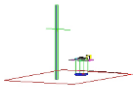


PART 27 MEASUREMENT REPORT



Antenna SRS-1 / ANT F						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n77 PC2 (3450 - 3550MHz)	100 MHz	π/2 BPSK	3500.0	0.088	19.45	96M9G7D
		QPSK	3500.0	0.083	19.19	96M7G7D
		16QAM	3500.0	0.051	17.11	96M4W7D
	90 MHz	π/2 BPSK	3495.0 - 3505.0	0.086	19.34	87M1G7D
		QPSK	3495.0 - 3505.0	0.077	18.89	87M8G7D
		16QAM	3495.0 - 3505.0	0.052	17.20	87M7W7D
	80 MHz	π/2 BPSK	3490.0 - 3510.0	0.091	19.57	77M5G7D
		QPSK	3490.0 - 3510.0	0.083	19.18	77M7G7D
		16QAM	3490.0 - 3510.0	0.047	16.68	77M8W7D
	70 MHz	π/2 BPSK	3485.0 - 3515.0	0.094	19.75	64M3G7D
		QPSK	3485.0 - 3515.0	0.084	19.25	67M7G7D
		16QAM	3485.0 - 3515.0	0.054	17.29	67M8W7D
	60 MHz	π/2 BPSK	3480.0 - 3520.0	0.094	19.74	57M8G7D
		QPSK	3480.0 - 3520.0	0.086	19.37	58M0G7D
		16QAM	3480.0 - 3520.0	0.062	17.95	58M1W7D
	50 MHz	π/2 BPSK	3475.0 - 3525.0	0.094	19.71	46M0G7D
		QPSK	3475.0 - 3525.0	0.084	19.24	47M7G7D
		16QAM	3475.0 - 3525.0	0.054	17.36	47M8W7D
	40 MHz	π/2 BPSK	3470.0 - 3530.0	0.095	19.77	35M9G7D
		QPSK	3470.0 - 3530.0	0.087	19.40	38M0G7D
		16QAM	3470.0 - 3530.0	0.054	17.31	37M9W7D
	30 MHz	π/2 BPSK	3465.0 - 3535.0	0.094	19.73	26M9G7D
		QPSK	3465.0 - 3535.0	0.086	19.32	28M0G7D
		16QAM	3465.0 - 3535.0	0.054	17.36	28M0W7D
	20 MHz	π/2 BPSK	3460.0 - 3540.0	0.093	19.71	17M9G7D
		QPSK	3460.0 - 3540.0	0.086	19.36	18M3G7D
		16QAM	3460.0 - 3540.0	0.055	17.43	18M3W7D
	15 MHz	π/2 BPSK	3457.5 - 3542.5	0.093	19.67	13M1G7D
		QPSK	3457.5 - 3542.5	0.084	19.24	13M7G7D
		16QAM	3457.5 - 3542.5	0.056	17.49	13M7W7D
	10 MHz	π/2 BPSK	3455.0 - 3545.0	0.090	19.56	8M69G7D
		QPSK	3455.0 - 3545.0	0.082	19.14	8M75G7D
		16QAM	3455.0 - 3545.0	0.053	17.26	8M65W7D

EUT Overview

Antenna SRS-1 / ANT F						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n77 PC2 (3700 - 3980MHz)	100 MHz	π/2 BPSK	3750.0 - 3930.0	0.164	22.15	96M9G7D
		QPSK	3750.0 - 3930.0	0.167	22.22	98M0G7D
		16QAM	3750.0 - 3930.0	0.120	20.80	97M9W7D
	90 MHz	π/2 BPSK	3745.0 - 3935.0	0.172	22.35	86M7G7D
		QPSK	3745.0 - 3935.0	0.162	22.09	87M7G7D
		16QAM	3745.0 - 3935.0	0.125	20.96	87M7W7D
	80 MHz	π/2 BPSK	3740.0 - 3940.0	0.177	22.47	77M1G7D
		QPSK	3740.0 - 3940.0	0.151	21.78	77M8G7D
		16QAM	3740.0 - 3940.0	0.120	20.79	77M7W7D
	70 MHz	π/2 BPSK	3735.0 - 3945.0	0.180	22.55	64M5G7D
		QPSK	3735.0 - 3945.0	0.140	21.45	67M7G7D
		16QAM	3735.0 - 3945.0	0.117	20.67	67M8W7D
	60 MHz	π/2 BPSK	3730.0 - 3950.0	0.167	22.23	58M1G7D
		QPSK	3730.0 - 3950.0	0.144	21.58	58M1G7D
		16QAM	3730.0 - 3950.0	0.119	20.75	58M1W7D
	50 MHz	π/2 BPSK	3725.0 - 3955.0	0.164	22.14	45M7G7D
		QPSK	3725.0 - 3955.0	0.136	21.34	47M7G7D
		16QAM	3725.0 - 3955.0	0.108	20.35	47M7W7D
	40 MHz	π/2 BPSK	3720.0 - 3960.0	0.158	21.98	35M9G7D
		QPSK	3720.0 - 3960.0	0.152	21.81	37M9G7D
		16QAM	3720.0 - 3960.0	0.130	21.13	38M0W7D
	30 MHz	π/2 BPSK	3715.0 - 3965.0	0.162	22.10	27M0G7D
		QPSK	3715.0 - 3965.0	0.149	21.74	28M0G7D
		16QAM	3715.0 - 3965.0	0.127	21.04	27M9W7D
	20 MHz	π/2 BPSK	3710.0 - 3970.0	0.178	22.50	18M0G7D
		QPSK	3710.0 - 3970.0	0.154	21.86	18M3G7D
		16QAM	3710.0 - 3970.0	0.114	20.58	18M4W7D
	15 MHz	π/2 BPSK	3707.5 - 3972.5	0.171	22.34	12M9G7D
		QPSK	3707.5 - 3972.5	0.165	22.17	13M7G7D
		16QAM	3707.5 - 3972.5	0.126	21.01	13M6W7D
	10 MHz	π/2 BPSK	3705.0 - 3975.0	0.185	22.68	8M64G7D
		QPSK	3705.0 - 3975.0	0.169	22.27	8M67G7D
		16QAM	3705.0 - 3975.0	0.133	21.23	8M68W7D

EUT Overview

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS906U**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 0100M, 0061M, 0097M, 0045M, 0044M, 0080M, 1218M, 0359M, 0364M, 0379M, 0361M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR , 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

The device has 1 Tx antenna for n77 data (Ant F) and 3 Rx antennas (Ant C, K, D). With SRS operations, all 4 antennas can transmit the SRS signal to check for the channel quality of n77. The antennas cannot simultaneously transmit. Only the single TX/RX antenna is used for Data transmission.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 3 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure……..None

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated power measurements, substitution method is used per the guidance of ANSI/TIA-603-E-2016. A half-wave dipole is substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\,[dBm]} = P_{g\,[dBm]} - \text{cable loss}_{\,[dB]} + \text{antenna gain}_{\,[dBd/dBi]};$$

where P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g\,[dBm]}$ – cable loss $_{[dB]}$.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{[dB\mu V/m]} = \text{Measured amplitude level}_{[dBm]} + 107 + \text{Cable Loss}_{[dB]} + \text{Antenna Factor}_{[dB/m]}$$

And

$$EIRP_{[dBm]} = E_{[dB\mu V/m]} + 20\log D - 104.8;$$ where D is the measurement distance in meters.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurement antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx4	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx4
-	LTx5	LIcensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
Keysight Technologies	N9030A	PXA Signal Analyzer	10/16/2020	Annual	12/16/2021	MY54490576
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	9/17/2020	Annual	12/17/2021	MY57141001
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	12/11/2021	MY51210133
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	4/30/2021	Annual	4/30/2022	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

2. Equipment with a calibration date of “N/A” shown in this list was not used to make direct calibrated measurements.

6.0 SAMPLE CALCULATIONS

QPSK Modulation

Emission Designator = 8M62G7D
LTE BW = 8.62 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D
LTE BW = 8.45 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So, 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm – (-24.80) = 50.3 dBc.

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

FCC ID: A3LSMS906U

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (NR Band n77)	2.1051, 27.53(l), 27.53(n)	≤ 13 dBm / MHz	PASS	Sections 7.4, 7.5
	Peak-to-Average Ratio (NR Band n77)	27.53(j)(4), 27.53(k)(4)	≤ 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block.	PASS	Section 7.9
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n77)	27.50(j)(3), 27.50(k)(3)	≤ 1 Watt EIRP	PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n77)	2.1053, 27.53(l), 27.53(n)	≤ 13 dBm / MHz	PASS	Section 7.8

* The only transmitter output conducted powers included in this report are those where the Pmax value, per the tune-up document, is higher than any of the DSI power levels. For the remaining conducted power measurements, see the **RF Exposure Report**.

Table 7-1. Summary of Test Results

Notes:

1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool v1.1.

7.2 Conducted Power Output Data

Test Overview

The EUT is set up to transmit at maximum power for NR channels. All power levels are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2

Test Settings

1. The signal analyzer's channel power measurement capability was used to perform power output measurement at the RF terminal.
2. Integration BW was set greater or equal to the expected channel bandwidth of the emission
3. RBW = 1-5% of the Integration BW
4. VBW ≥ 3 x RBW
5. Trigger Mode = Free Run for continuous emissions, RF Burst for pulsed emissions
6. Gating = Off for continuous emissions, On only during transmission for pulsed emissions
7. Detector = RMS
8. Trace mode = trace averaging
9. Sweep time = auto couple
10. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	633333	3500.00	1 / 204	26.66
	QPSK	633333	3500.00	1 / 204	26.75
	16-QAM	633333	3500.00	1 / 204	25.59
90 MHz	π/2 BPSK	633000	3495.00	1 / 122	26.56
		633333	3500.00	1 / 122	26.44
		633666	3504.99	1 / 122	26.44
	QPSK	633000	3495.00	1 / 122	26.45
		633333	3500.00	1 / 122	26.30
		633666	3504.99	1 / 122	26.33
	16-QAM	633333	3500.00	1 / 122	25.68
80 MHz	π/2 BPSK	632668	3490.02	1 / 162	26.78
		633333	3500.00	1 / 162	26.74
		634000	3510.00	1 / 54	26.19
	QPSK	632668	3490.02	1 / 162	26.60
		633333	3500.00	1 / 162	26.74
		634000	3510.00	1 / 54	26.27
	16-QAM	633333	3500.00	1 / 162	25.17
70 MHz	π/2 BPSK	632334	3485.01	1 / 47	26.63
		633333	3500.00	1 / 141	26.79
		634332	3514.98	1 / 47	26.96
	QPSK	632334	3485.01	1 / 47	26.19
		633333	3500.00	1 / 141	26.62
		634332	3514.98	1 / 47	26.81
	16-QAM	634332	3514.98	1 / 47	25.77
60 MHz	π/2 BPSK	632000	3480.00	1 / 81	26.91
		633333	3500.00	1 / 81	26.52
		634666	3519.99	1 / 121	26.96
	QPSK	632000	3480.00	1 / 81	26.93
		633333	3500.00	1 / 81	26.55
		634666	3519.99	1 / 121	26.87
	16-QAM	632000	3480.00	1 / 81	26.43
50 MHz	π/2 BPSK	631668	3475.02	1 / 66	26.75
		633333	3500.00	1 / 66	26.93
		635000	3525.00	1 / 66	26.80
	QPSK	631668	3475.02	1 / 66	26.80
		633333	3500.00	1 / 66	26.69
		635000	3525.00	1 / 66	26.75
	16-QAM	631668	3475.02	1 / 66	25.84
40 MHz	π/2 BPSK	631334	3470.01	1 / 79	26.89
		633333	3500.00	1 / 26	26.98
		635332	3529.98	1 / 26	26.42
	QPSK	631334	3470.01	1 / 79	26.96
		633333	3500.00	1 / 26	26.55
		635332	3529.98	1 / 26	26.59
	16-QAM	631334	3470.01	1 / 79	25.80
30 MHz	π/2 BPSK	631000	3465.00	1 / 19	26.65
		633333	3500.00	1 / 39	26.94
		635666	3534.99	1 / 19	26.86
	QPSK	631000	3465.00	1 / 19	26.89
		633333	3500.00	1 / 39	26.45
		635666	3534.99	1 / 19	26.64
	16-QAM	633333	3500.00	1 / 39	25.85
20 MHz	π/2 BPSK	630668	3460.02	1 / 13	26.45
		633333	3500.00	1 / 13	26.81
		636000	3540.00	1 / 13	26.92
	QPSK	630668	3460.02	1 / 13	26.66
		633333	3500.00	1 / 13	26.81
		636000	3540.00	1 / 13	26.93
	16-QAM	636000	3540.00	1 / 13	25.91
15 MHz	π/2 BPSK	630500	3457.50	1 / 19	26.80
		633333	3500.00	1 / 9	26.80
		636166	3542.49	1 / 28	26.88
	QPSK	630500	3457.50	1 / 19	26.70
		633333	3500.00	1 / 9	26.49
		636166	3542.49	1 / 28	26.80
	16-QAM	630500	3457.50	1 / 19	25.98
10 MHz	π/2 BPSK	630334	3455.01	1 / 17	26.77
		633333	3500.00	1 / 12	26.49
		636332	3544.98	1 / 12	26.72
	QPSK	630334	3455.01	1 / 17	26.64
		633333	3500.00	1 / 12	26.37
		636332	3544.98	1 / 12	26.70
	16-QAM	633333	3500.00	1 / 12	25.75

Table 7-2. Conducted Power Data (NR Band n77 PC2 – DoD-Band – SRS-1 – Ant F)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 68	26.76
		656000	3840.00	1 / 136	26.93
		662000	3930.00	1 / 68	26.32
	QPSK	650000	3750.00	1 / 68	26.87
		656000	3840.00	1 / 136	26.66
		662000	3930.00	1 / 68	26.68
	16-QAM	662000	3930.00	1 / 68	25.43
90 MHz	π/2 BPSK	649668	3745.02	1 / 122	26.75
		656000	3840.00	1 / 122	26.87
		662332	3934.98	1 / 122	26.52
	QPSK	649668	3745.02	1 / 122	26.46
		656000	3840.00	1 / 122	26.39
		662332	3934.98	1 / 122	26.55
	16-QAM	662332	3934.98	1 / 122	25.59
80 MHz	π/2 BPSK	649334	3740.01	1 / 108	26.79
		656000	3840.00	1 / 108	26.53
		662666	3939.99	1 / 108	26.65
	QPSK	649334	3740.01	1 / 108	26.40
		656000	3840.00	1 / 108	26.34
		662666	3939.99	1 / 108	26.24
	16-QAM	662666	3939.99	1 / 108	25.42
70 MHz	π/2 BPSK	649000	3735.00	1 / 141	26.36
		656000	3840.00	1 / 47	26.58
		663000	3945.00	1 / 94	26.73
	QPSK	649000	3735.00	1 / 141	26.28
		656000	3840.00	1 / 47	26.56
		663000	3945.00	1 / 94	25.91
	16-QAM	663000	3945.00	1 / 94	25.30
60 MHz	π/2 BPSK	648668	3730.02	1 / 81	26.69
		656000	3840.00	1 / 121	26.94
		663332	3949.98	1 / 81	26.40
	QPSK	648668	3730.02	1 / 81	26.25
		656000	3840.00	1 / 121	26.66
		663332	3949.98	1 / 81	26.05
	16-QAM	663332	3949.98	1 / 81	25.38
50 MHz	π/2 BPSK	648334	3725.01	1 / 33	26.56
		656000	3840.00	1 / 66	26.56
		663666	3954.99	1 / 33	26.32
	QPSK	648334	3725.01	1 / 33	26.28
		656000	3840.00	1 / 66	26.18
		663666	3954.99	1 / 33	25.80
	16-QAM	663666	3954.99	1 / 33	24.98
40 MHz	π/2 BPSK	648000	3720.00	1 / 53	26.50
		656000	3840.00	1 / 26	26.60
		664000	3960.00	1 / 26	26.16
	QPSK	648000	3720.00	1 / 53	26.13
		656000	3840.00	1 / 26	26.61
		664000	3960.00	1 / 26	26.27
	16-QAM	664000	3960.00	1 / 26	25.76
30 MHz	π/2 BPSK	647668	3715.02	1 / 39	26.36
		656000	3840.00	1 / 39	26.45
		664332	3964.98	1 / 19	26.28
	QPSK	647668	3715.02	1 / 39	26.05
		656000	3840.00	1 / 39	26.39
		664332	3964.98	1 / 58	26.20
	16-QAM	664332	3964.98	1 / 58	25.67
20 MHz	π/2 BPSK	647334	3710.01	1 / 13	26.75
		656000	3840.00	1 / 13	26.45
		664666	3969.99	1 / 25	26.68
	QPSK	647334	3710.01	1 / 13	26.12
		656000	3840.00	1 / 13	26.38
		664666	3969.99	1 / 25	26.33
	16-QAM	664666	3969.99	1 / 25	25.21
15 MHz	π/2 BPSK	647167	3707.51	1 / 19	26.65
		656000	3840.00	1 / 9	26.57
		664499	3972.50	1 / 19	26.52
	QPSK	647167	3707.51	1 / 19	26.49
		656000	3840.00	1 / 9	26.67
		664499	3972.50	1 / 19	26.64
	16-QAM	664499	3972.50	1 / 19	25.64
10 MHz	π/2 BPSK	647000	3705.00	1 / 6	26.67
		656000	3840.00	1 / 12	26.52
		664332	3975.00	1 / 6	26.86
	QPSK	647000	3705.00	1 / 6	26.74
		656000	3840.00	1 / 12	26.62
		664332	3975.00	1 / 6	26.74
	16-QAM	664332	3975.00	1 / 6	25.86

Table 7-3. Conducted Power Data (NR Band n77 PC2 – C-Band – SRS-1 – Ant F)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	633334	3500.01	1 / 136	20.91
	QPSK	633334	3500.01	1 / 136	20.65
	16-QAM	633334	3500.01	1 / 136	18.74

Table 7-4. Conducted Power Data (NR Band n77 PC2 – DoD-Band – SRS-2 – Ant C)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 68	20.42
		656000	3840.00	1 / 68	20.23
		662000	3930.00	1 / 136	20.76
	QPSK	650000	3750.00	1 / 68	20.11
		656000	3840.00	1 / 68	20.42
		662000	3930.00	1 / 136	20.88
	16-QAM	650000	3750.00	1 / 68	19.74

Table 7-5. Conducted Power Data (NR Band n77 PC2 – C-Band – SRS-2 – Ant C)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	633333	3500.00	1 / 68	25.45
	QPSK	633333	3500.00	1 / 68	25.37
	16-QAM	633333	3500.00	1 / 68	23.65

Table 7-6. Conducted Power Data (NR Band n77 PC2 – DoD-Band – SRS-3 – Ant K)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 204	25.21
		656000	3840.00	1 / 204	25.16
		662000	3930.00	1 / 68	25.29
	QPSK	650000	3750.00	1 / 204	25.10
		656000	3840.00	1 / 204	25.36
		662000	3930.00	1 / 68	25.48
	16-QAM	650000	3750.00	1 / 204	23.91

Table 7-7. Conducted Power Data (NR Band n77 PC2 – C-Band – SRS-3 – Ant K)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	633333	3500.00	1 / 204	21.29
	QPSK	633333	3500.00	1 / 204	21.28
	16-QAM	633333	3500.00	1 / 204	20.76

Table 7-8. Conducted Power Data (NR Band n77 PC2 – DoD-Band – SRS-4 – Ant D)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 68	20.24
		656000	3840.00	1 / 204	20.18
		662000	3930.00	1 / 136	20.38
	QPSK	650000	3750.00	1 / 68	20.23
		656000	3840.00	1 / 204	19.95
		662000	3930.00	1 / 136	20.22
	16-QAM	662000	3930.00	1 / 136	19.78

Table 7-9. Conducted Power Data (NR Band n77 PC2 – C-Band – SRS-4 – Ant D)

7.3 Occupied Bandwidth

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

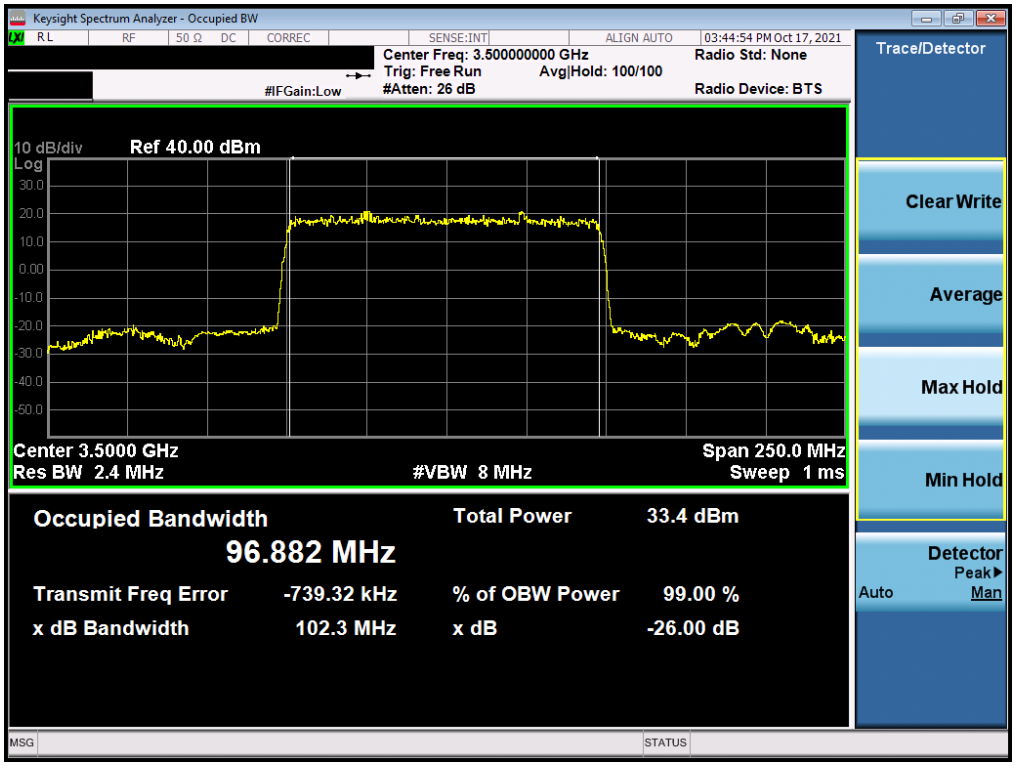
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-2. Test Instrument & Measurement Setup

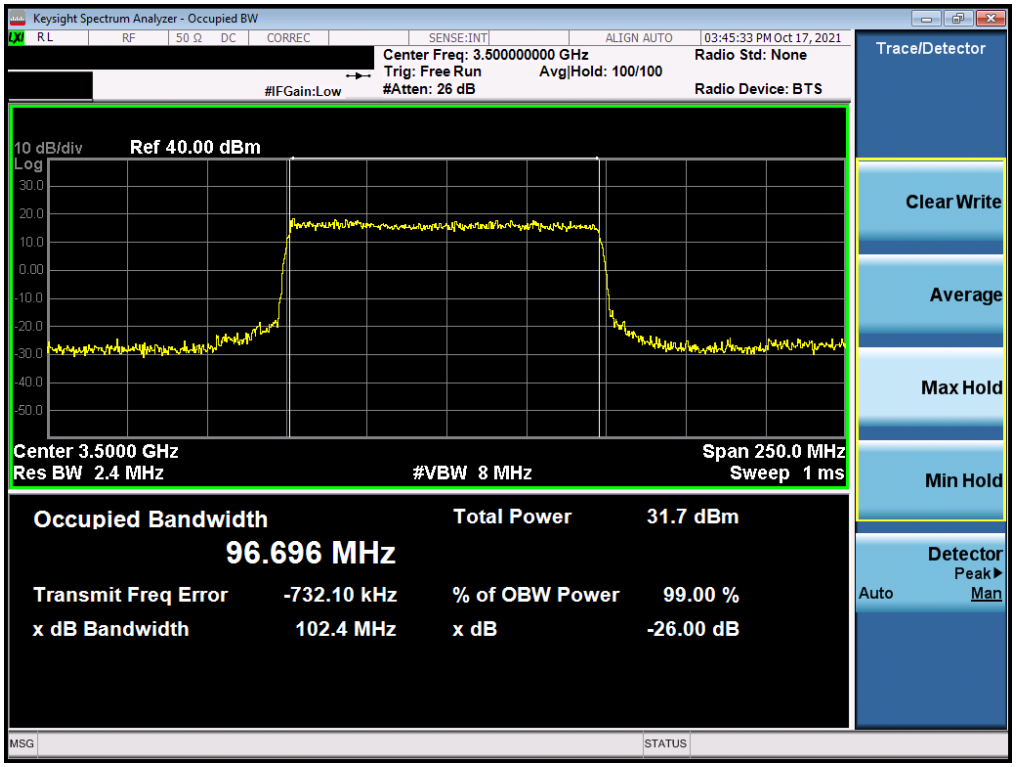
Test Note

The Occupied Bandwidth was only measured on the antenna with the highest power for each band (SRS-1 / ANT F).

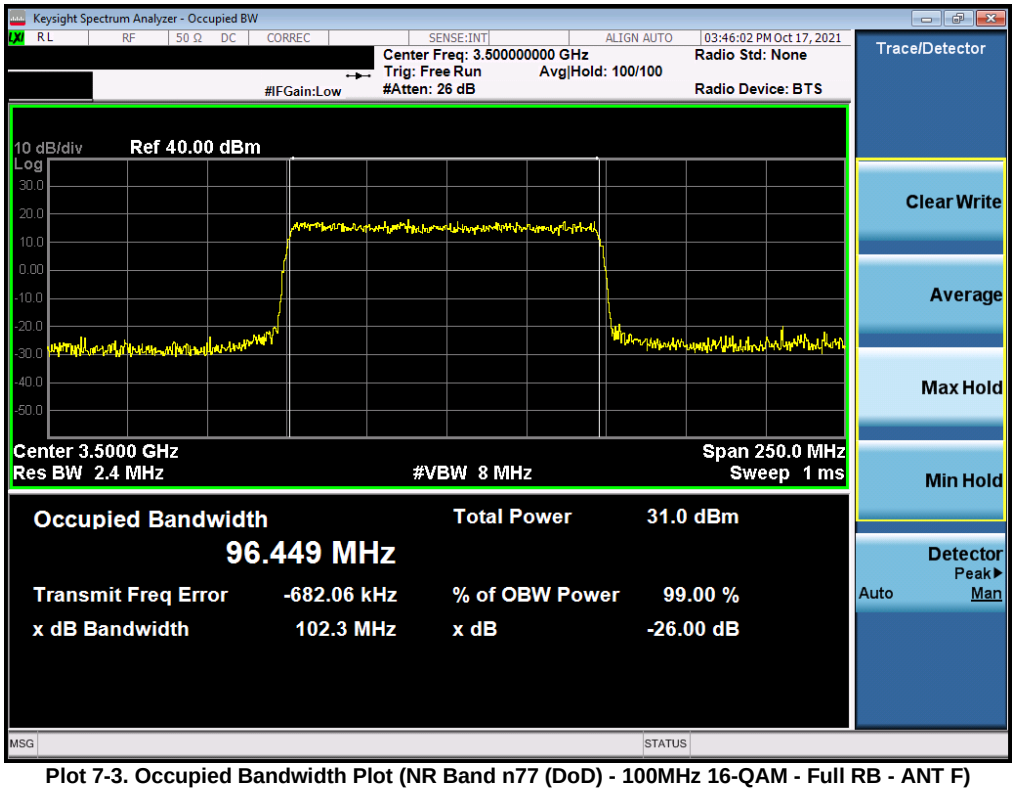
NR Band n77 (PC2) – DoD-Band – SRS-1 – ANT F



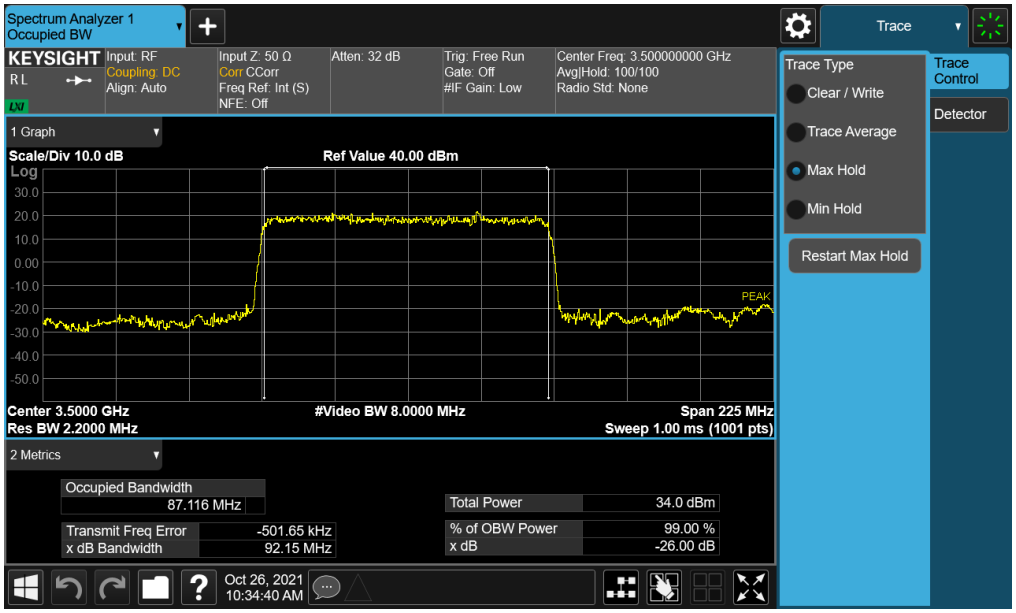
Plot 7-1. Occupied Bandwidth Plot (NR Band n77 (DoD) - 100MHz π/2 BPSK - Full RB - ANT F)



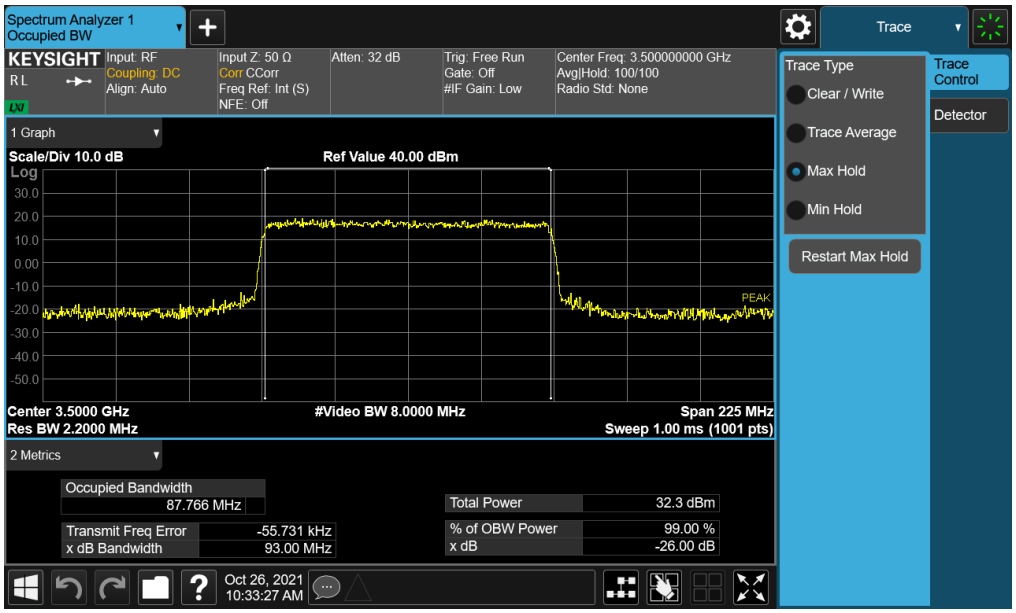
Plot 7-2. Occupied Bandwidth Plot (NR Band n77 (DoD) - 100MHz QPSK - Full RB - ANT F)



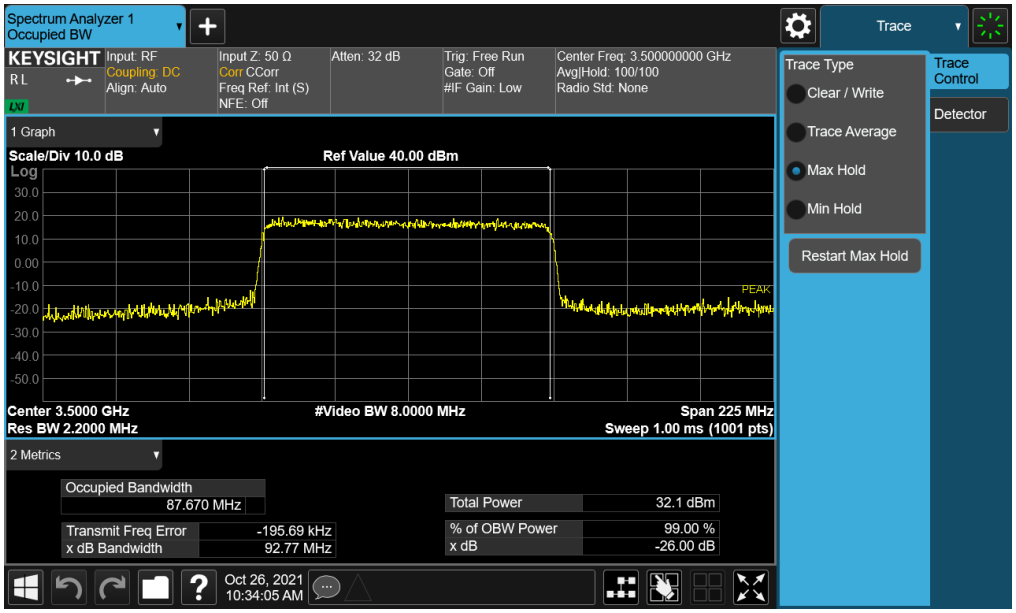
Plot 7-3. Occupied Bandwidth Plot (NR Band n77 (DoD) - 100MHz 16-QAM - Full RB - ANT F)



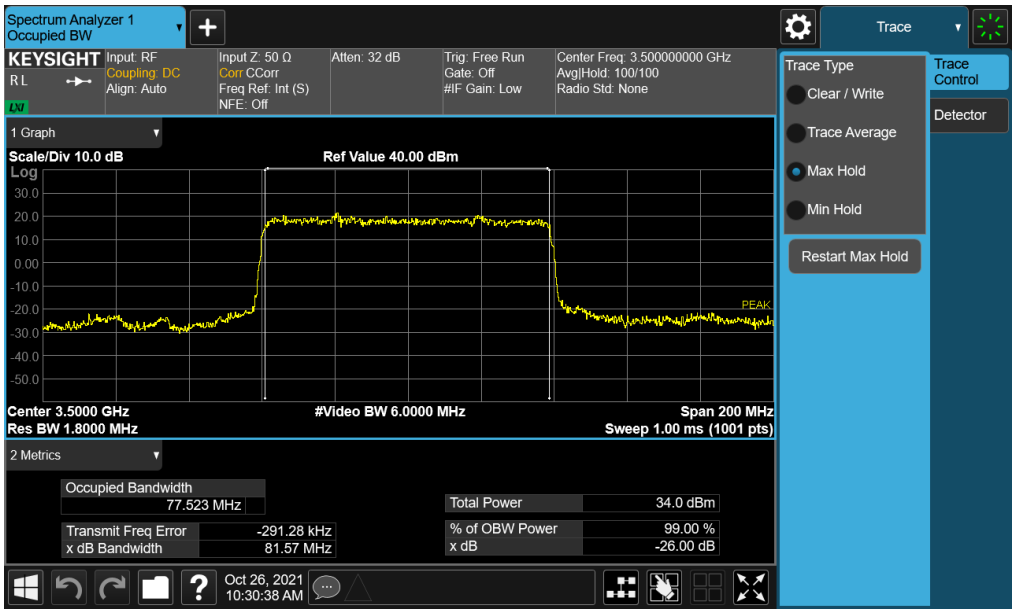
Plot 7-4. Occupied Bandwidth Plot (NR Band n77 (DoD) - 90MHz π/2 BPSK - Full RB - ANT F)



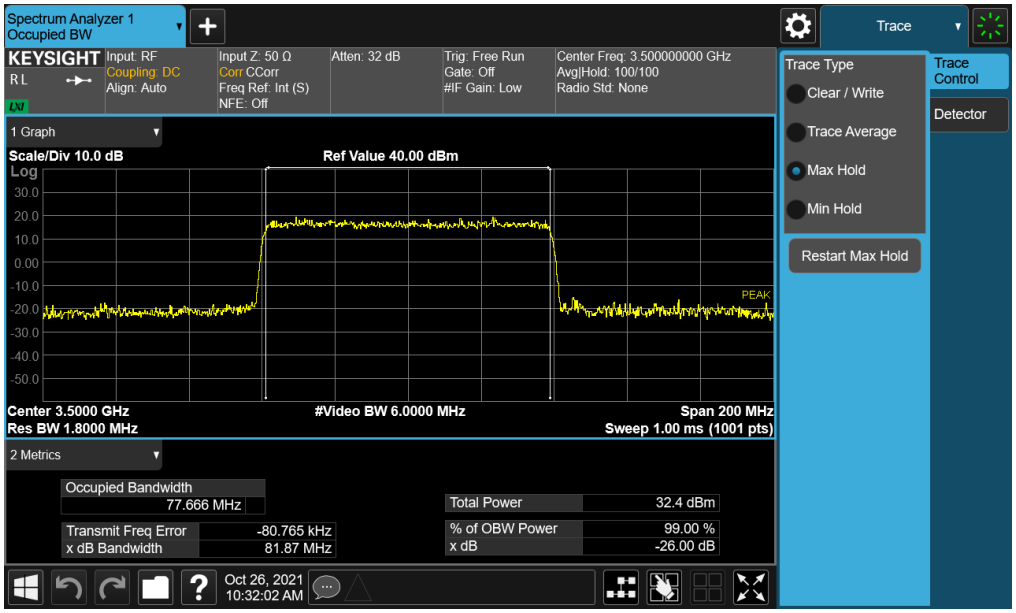
Plot 7-5. Occupied Bandwidth Plot (NR Band n77 (DoD) - 90MHz QPSK - Full RB - ANT F)



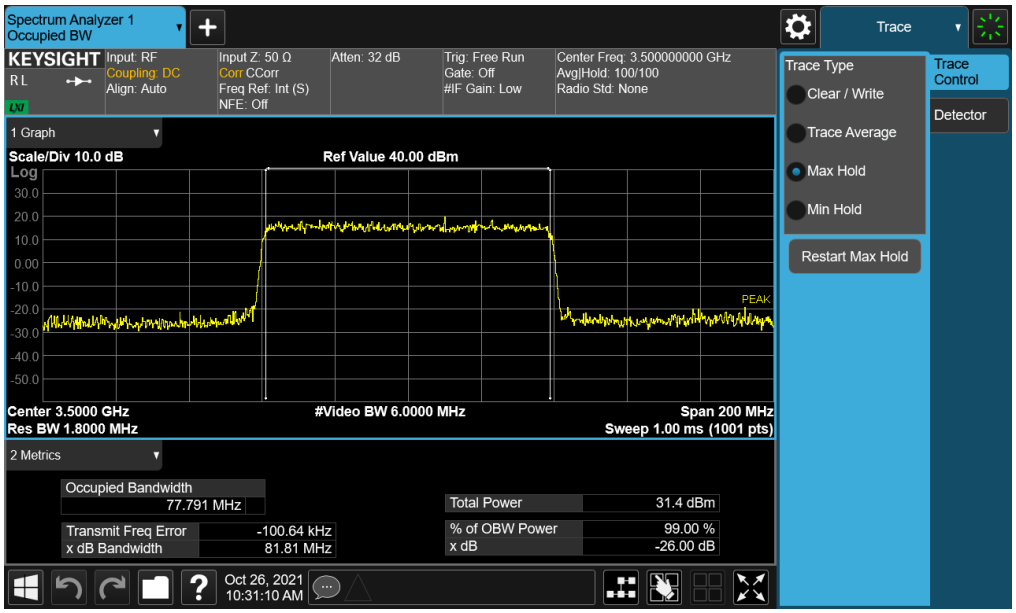
Plot 7-6. Occupied Bandwidth Plot (NR Band n77 (DoD) - 90MHz 16-QAM - Full RB - ANT F)



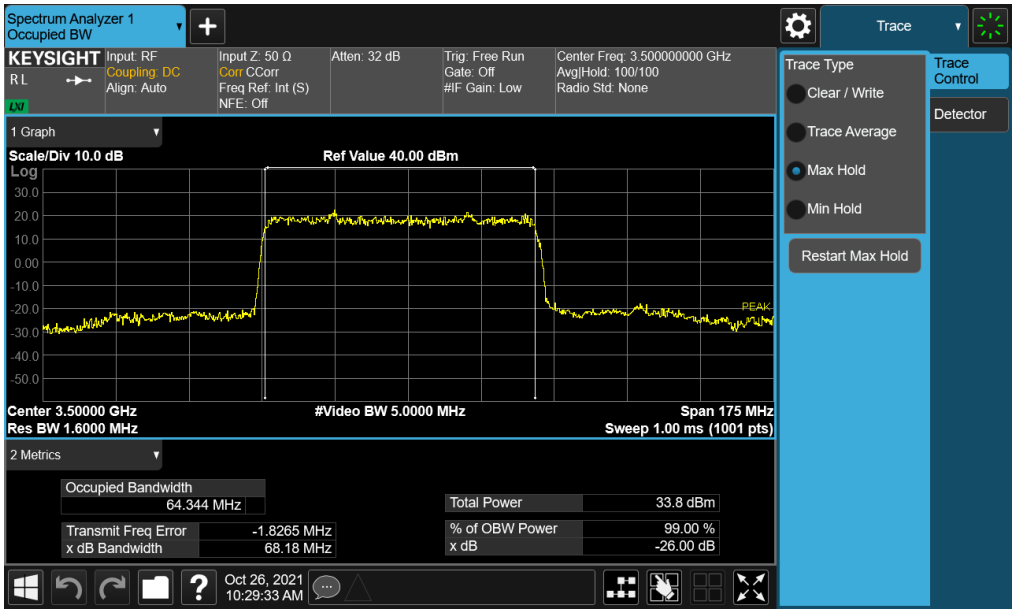
Plot 7-7. Occupied Bandwidth Plot (NR Band n77 (DoD) - 80MHz π/2 BPSK - Full RB - ANT F)



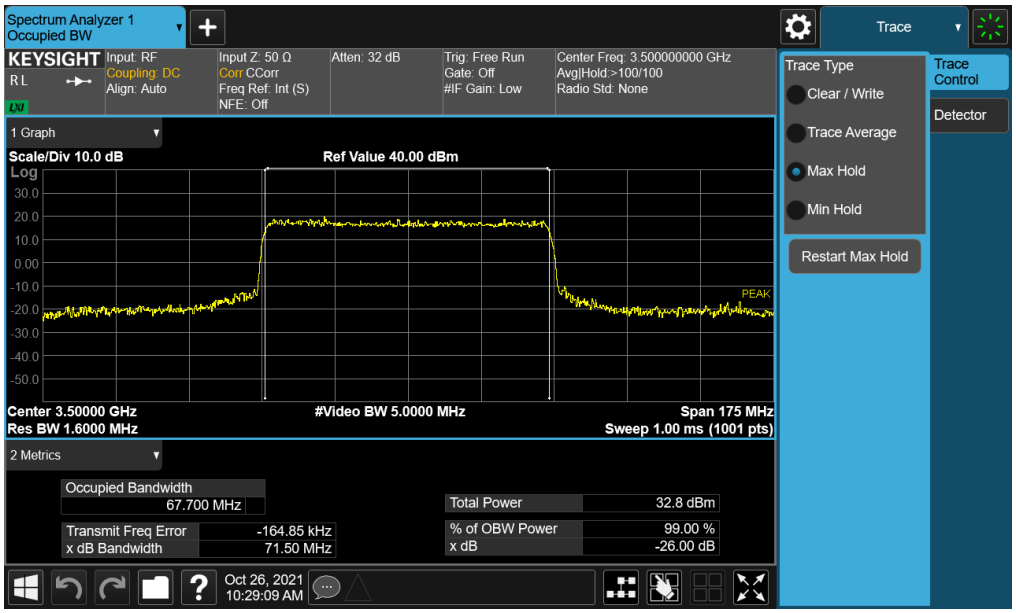
Plot 7-8. Occupied Bandwidth Plot (NR Band n77 (DoD) - 80MHz QPSK - Full RB - ANT F)



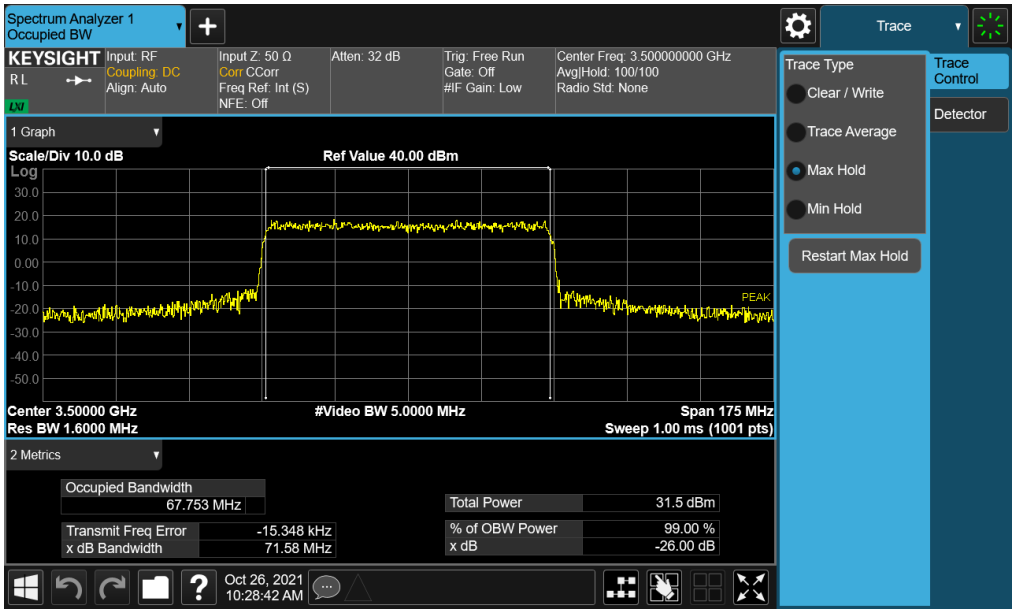
Plot 7-9. Occupied Bandwidth Plot (NR Band n77 (DoD) - 80MHz 16-QAM - Full RB - ANT F)



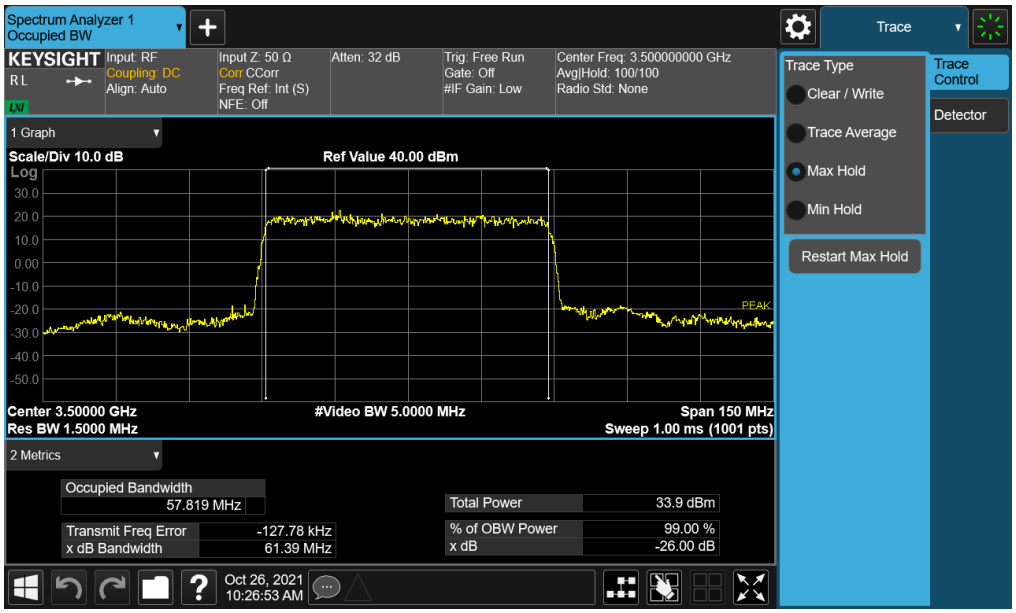
Plot 7-10. Occupied Bandwidth Plot (NR Band n77 (DoD) - 70MHz π/2 BPSK - Full RB - ANT F)



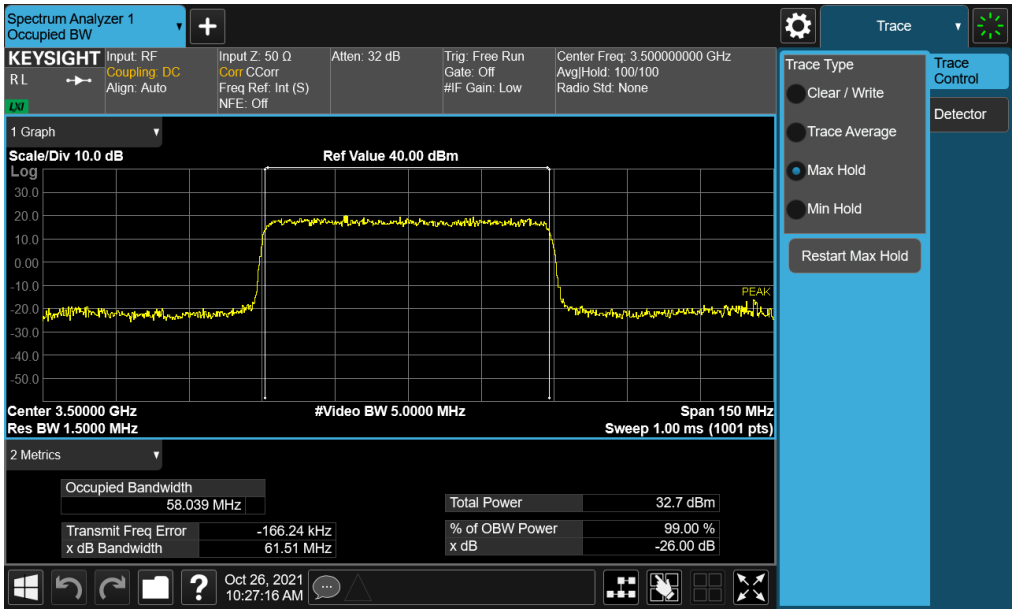
Plot 7-11. Occupied Bandwidth Plot (NR Band n77 (DoD) - 70MHz QPSK - Full RB - ANT F)



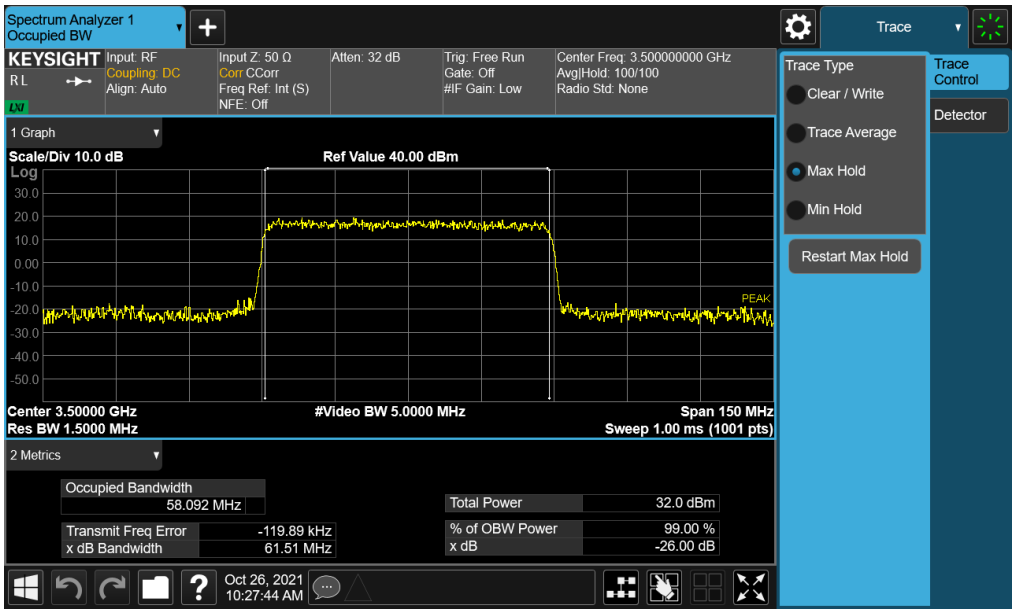
Plot 7-12. Occupied Bandwidth Plot (NR Band n77 (DoD) - 70MHz 16-QAM - Full RB - ANT F)



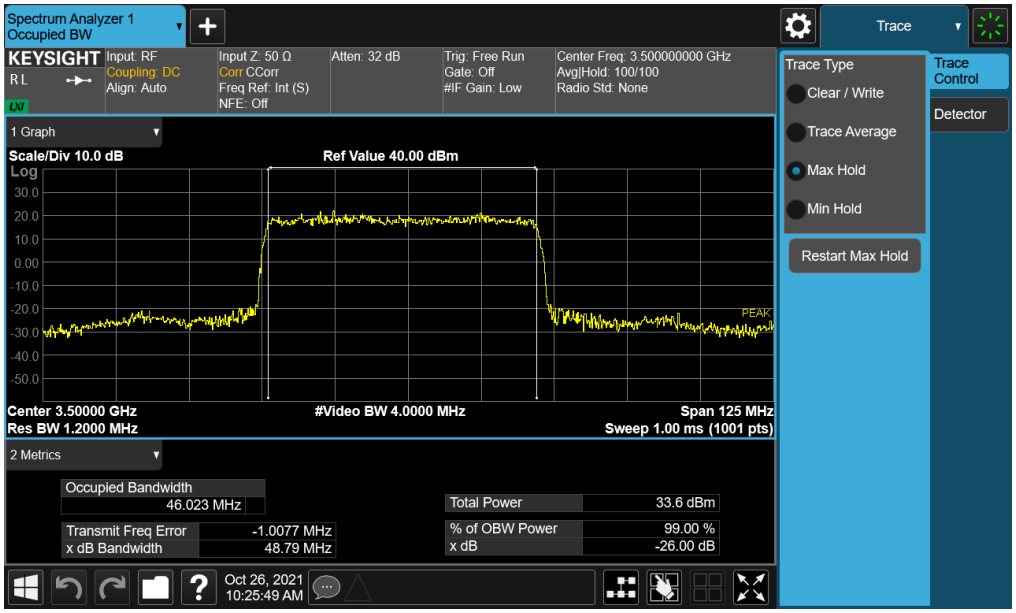
Plot 7-13. Occupied Bandwidth Plot (NR Band n77 (DoD) - 60MHz π/2 BPSK - Full RB - ANT F)



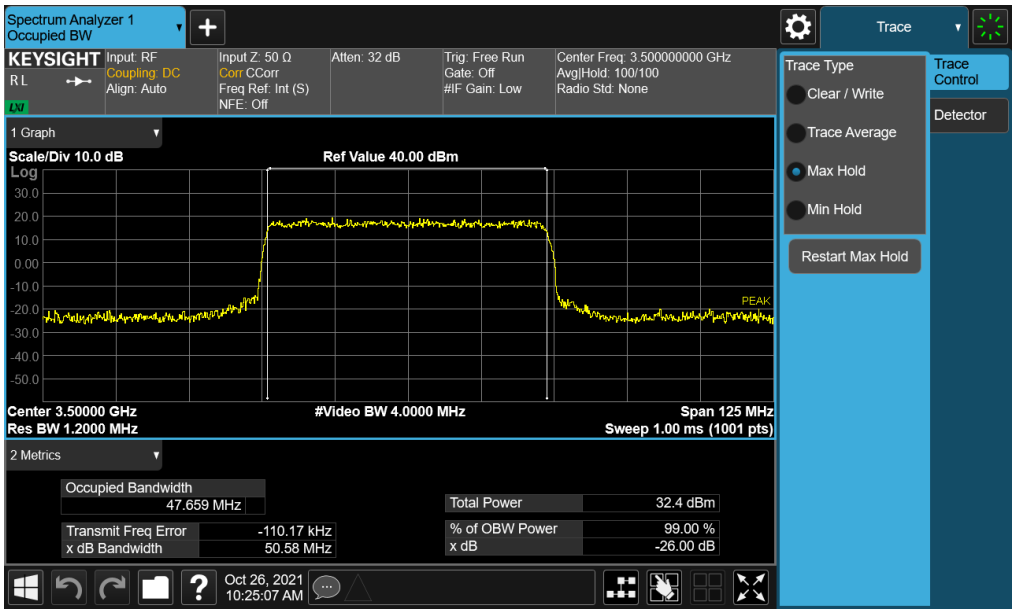
Plot 7-14. Occupied Bandwidth Plot (NR Band n77 (DoD) - 60MHz QPSK - Full RB - ANT F)



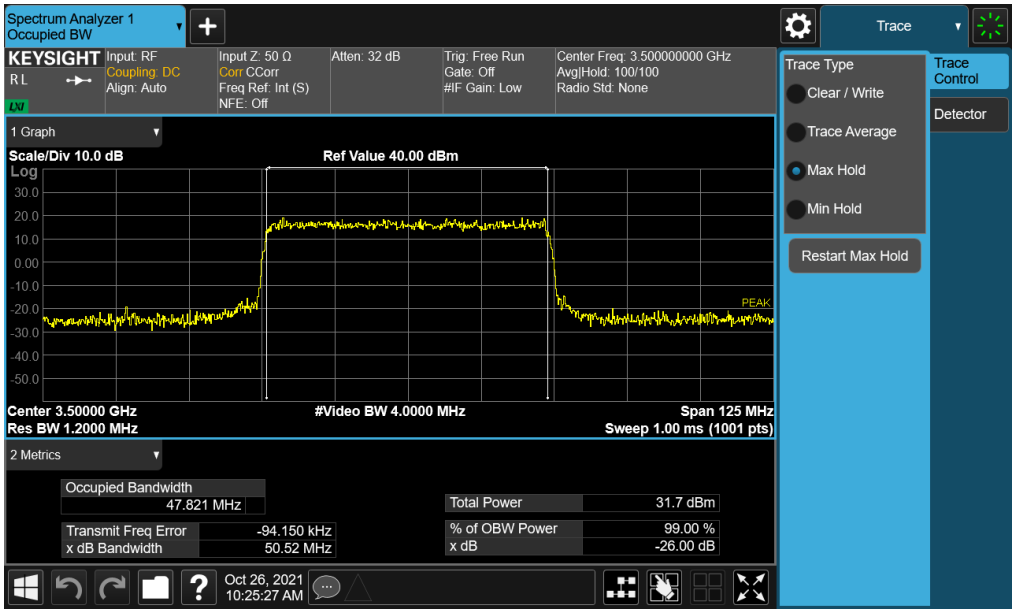
Plot 7-15. Occupied Bandwidth Plot (NR Band n77 (DoD) - 60MHz 16-QAM - Full RB - ANT F)



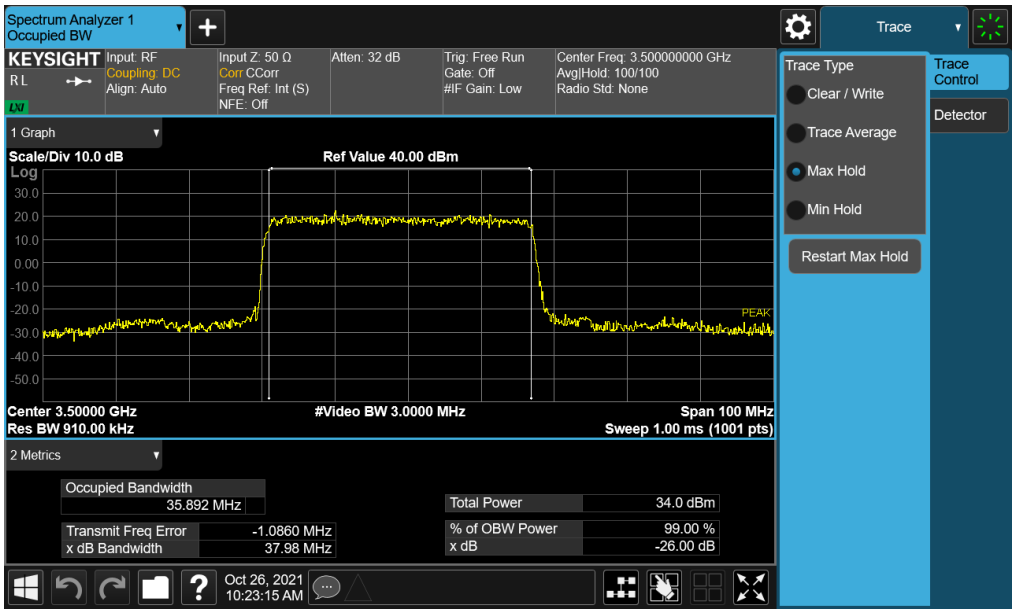
Plot 7-16. Occupied Bandwidth Plot (NR Band n77 (DoD) - 50MHz π/2 BPSK - Full RB - ANT F)



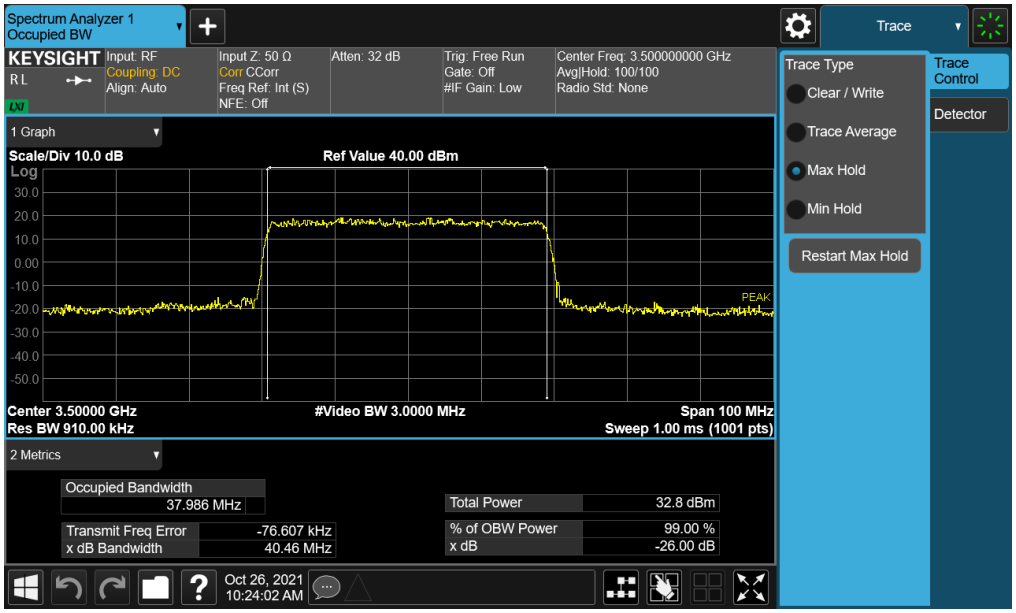
Plot 7-17. Occupied Bandwidth Plot (NR Band n77 (DoD) - 50MHz QPSK - Full RB - ANT F)



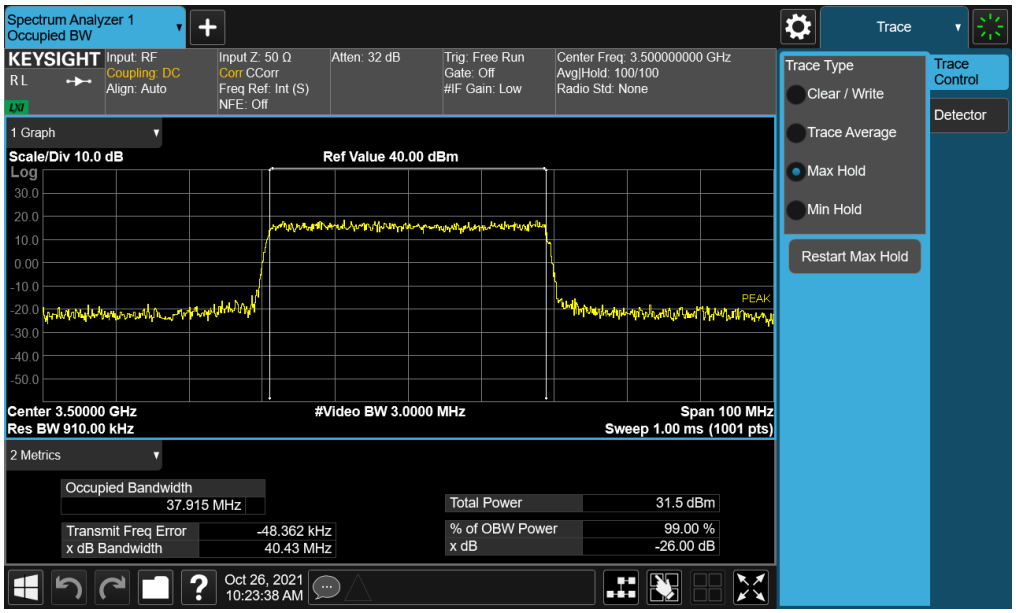
Plot 7-18. Occupied Bandwidth Plot (NR Band n77 (DoD) - 50MHz 16-QAM - Full RB - ANT F)



Plot 7-19. Occupied Bandwidth Plot (NR Band n77 (DoD) - 40MHz π/2 BPSK - Full RB - ANT F)

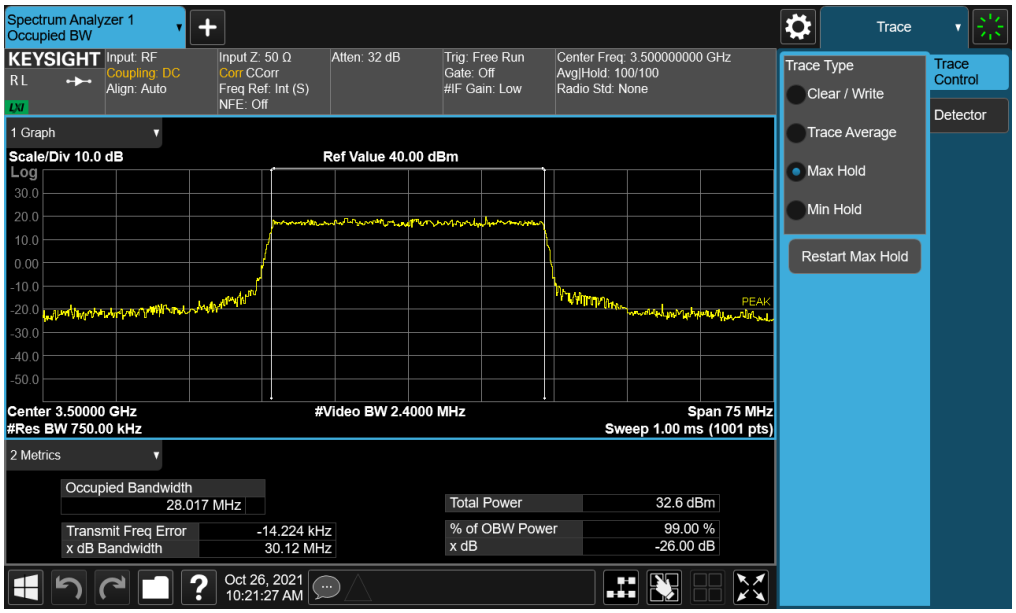


Plot 7-20. Occupied Bandwidth Plot (NR Band n77 (DoD) - 40MHz QPSK - Full RB - ANT F)

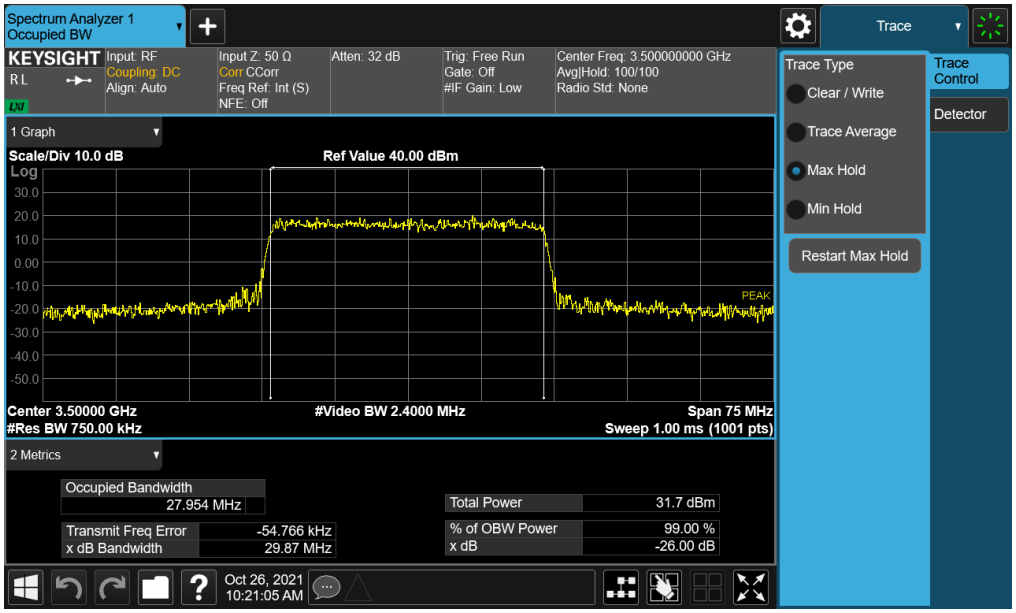


Plot 7-21. Occupied Bandwidth Plot (NR Band n77 (DoD) - 40MHz 16-QAM - Full RB - ANT F)

Plot 7-22. Occupied Bandwidth Plot (NR Band n77 (DoD) - 30MHz π/2 BPSK - Full RB - ANT F)

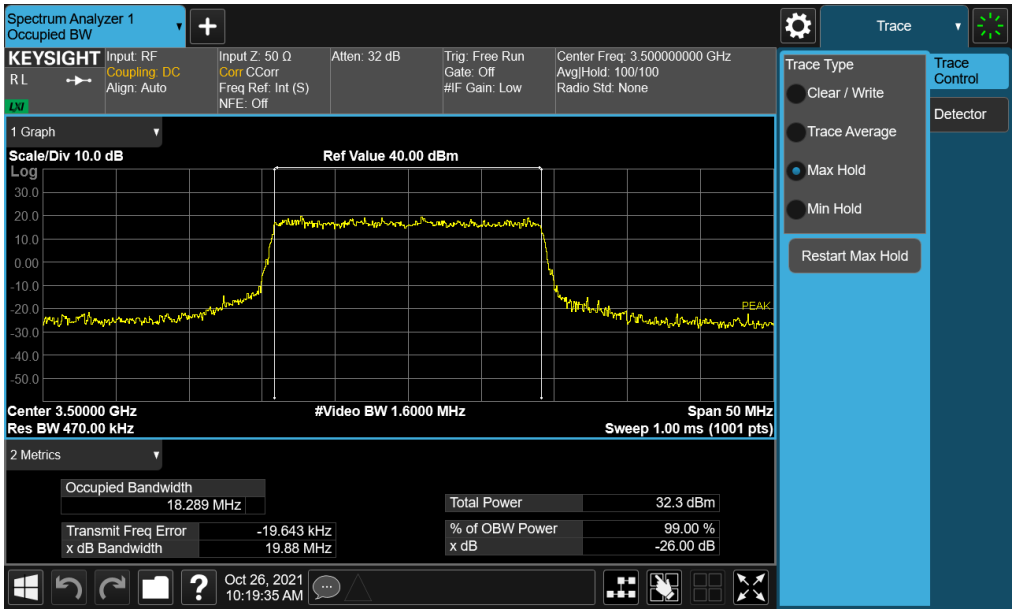


Plot 7-23. Occupied Bandwidth Plot (NR Band n77 (DoD) - 30MHz QPSK - Full RB - ANT F)

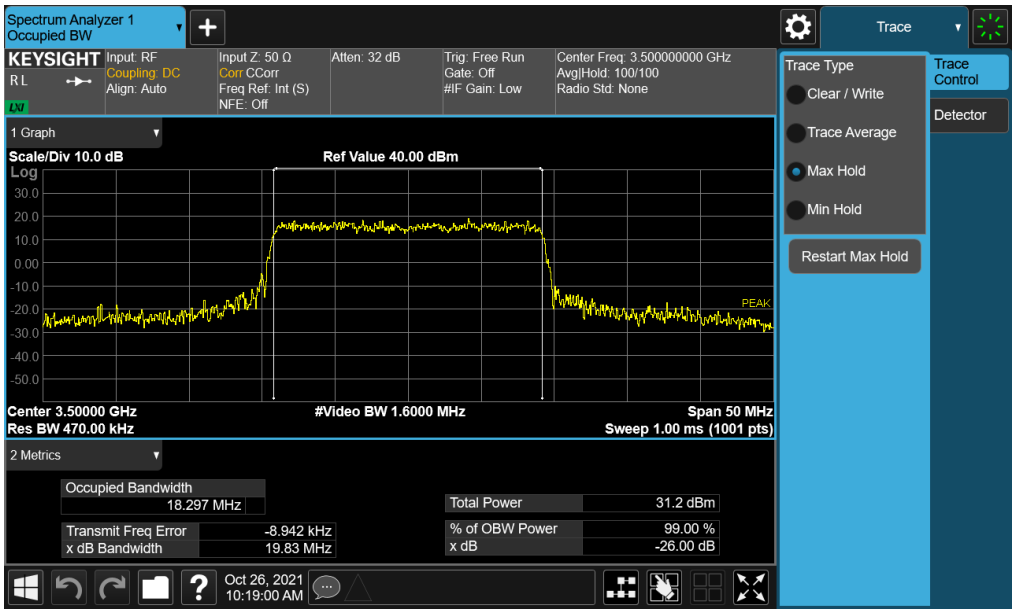


Plot 7-24. Occupied Bandwidth Plot (NR Band n77 (DoD) - 30MHz 16-QAM - Full RB - ANT F)

Plot 7-25. Occupied Bandwidth Plot (NR Band n77 (DoD) - 20MHz π/2 BPSK - Full RB - ANT F)

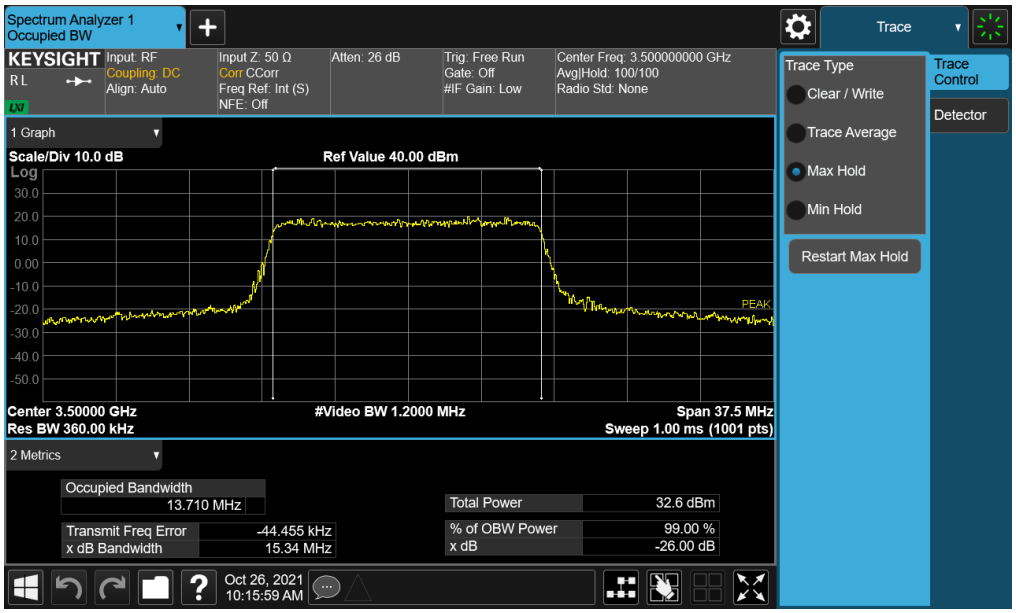


Plot 7-26. Occupied Bandwidth Plot (NR Band n77 (DoD) - 20MHz QPSK - Full RB - ANT F)

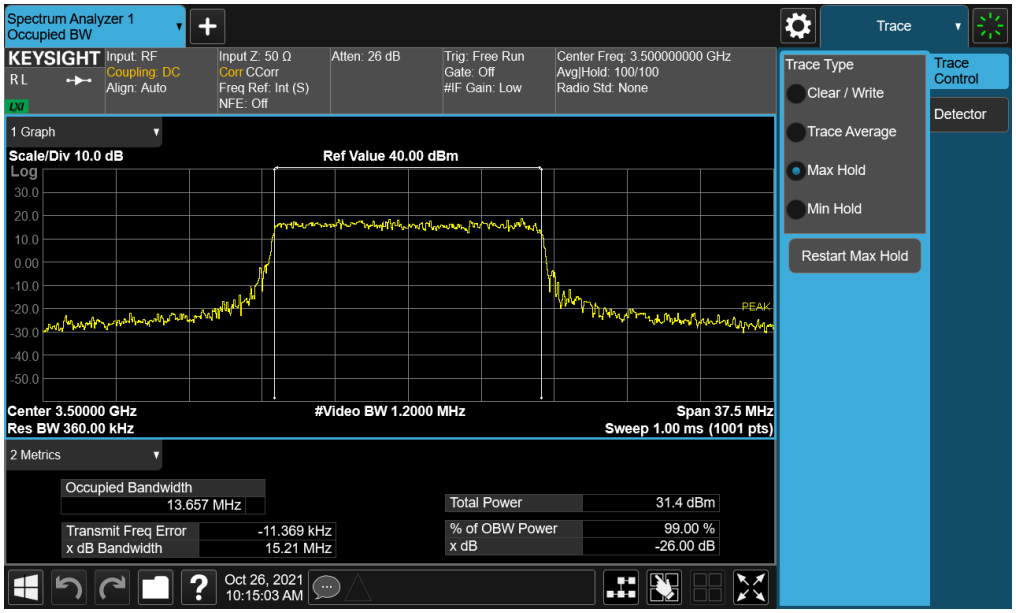


Plot 7-27. Occupied Bandwidth Plot (NR Band n77 (DoD) - 20MHz 16-QAM - Full RB - ANT F)

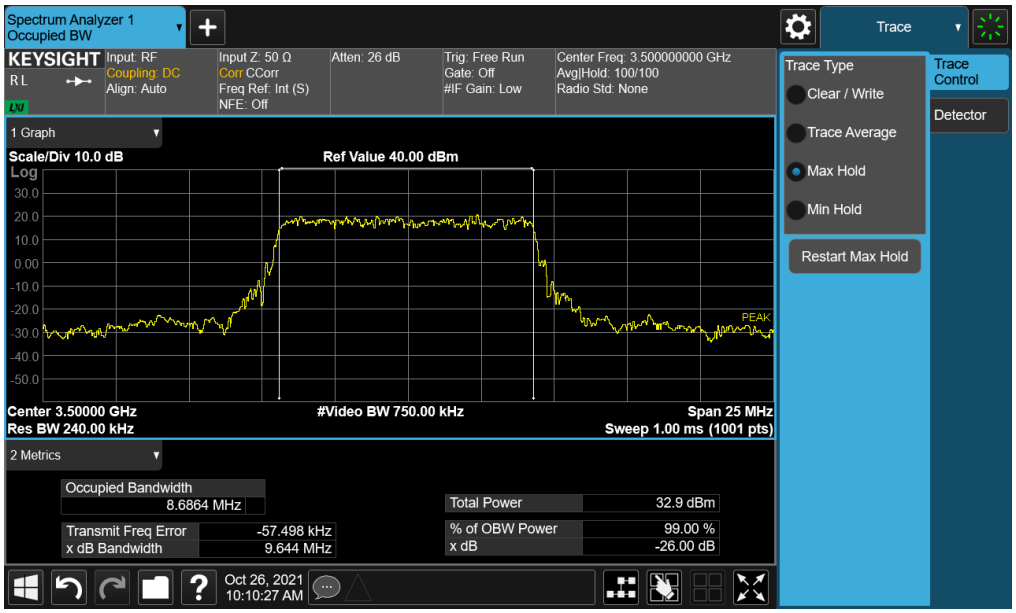
Plot 7-28. Occupied Bandwidth Plot (NR Band n77 (DoD) - 15MHz π/2 BPSK - Full RB - ANT F)



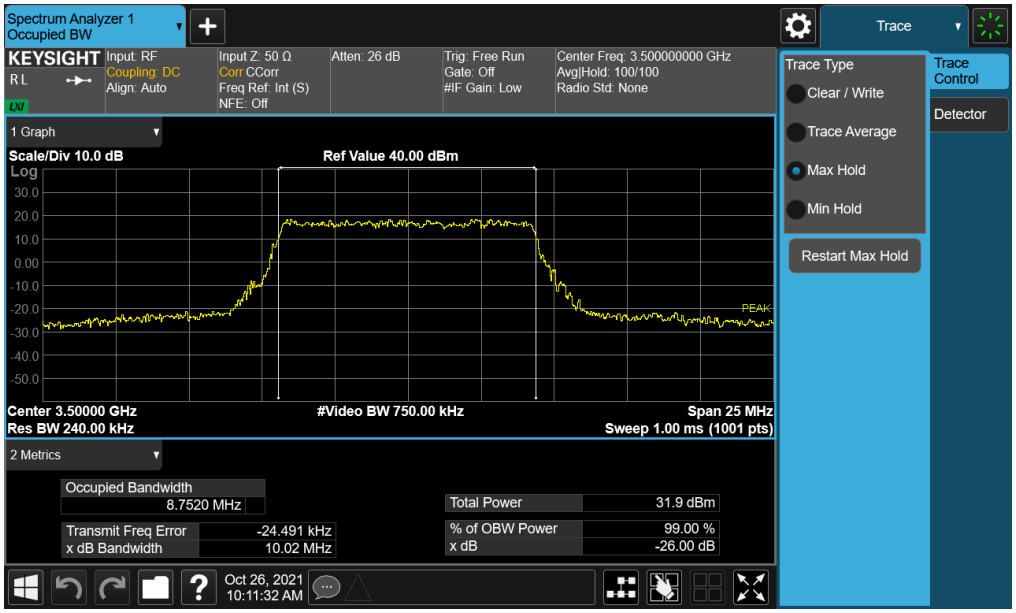
Plot 7-29. Occupied Bandwidth Plot (NR Band n77 (DoD) - 15MHz QPSK - Full RB - ANT F)



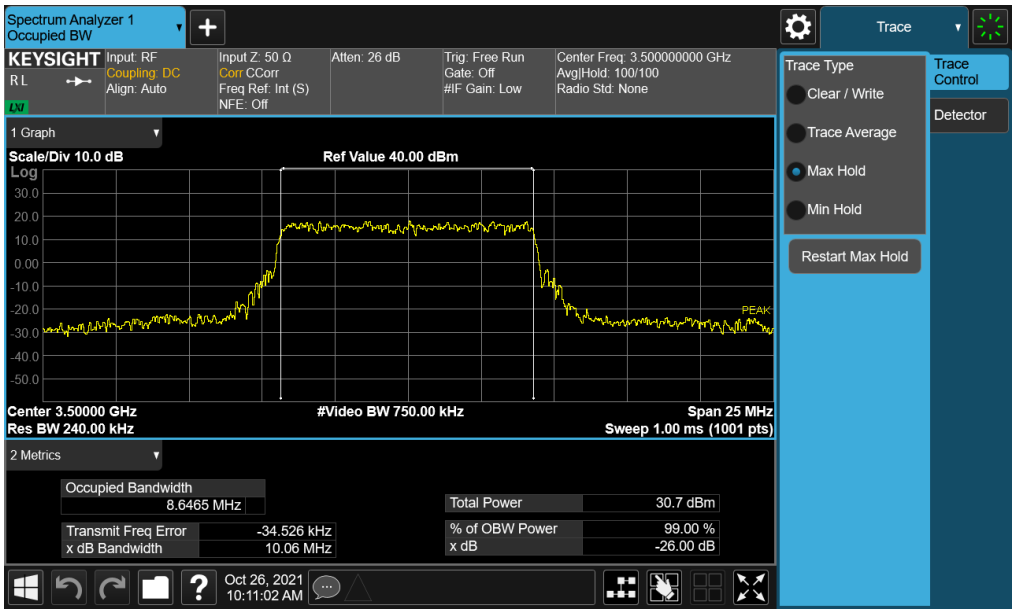
Plot 7-30. Occupied Bandwidth Plot (NR Band n77 (DoD) - 15MHz 16-QAM - Full RB - ANT F)



Plot 7-31. Occupied Bandwidth Plot (NR Band n77 (DoD) - 10MHz π/2 BPSK - Full RB - ANT F)

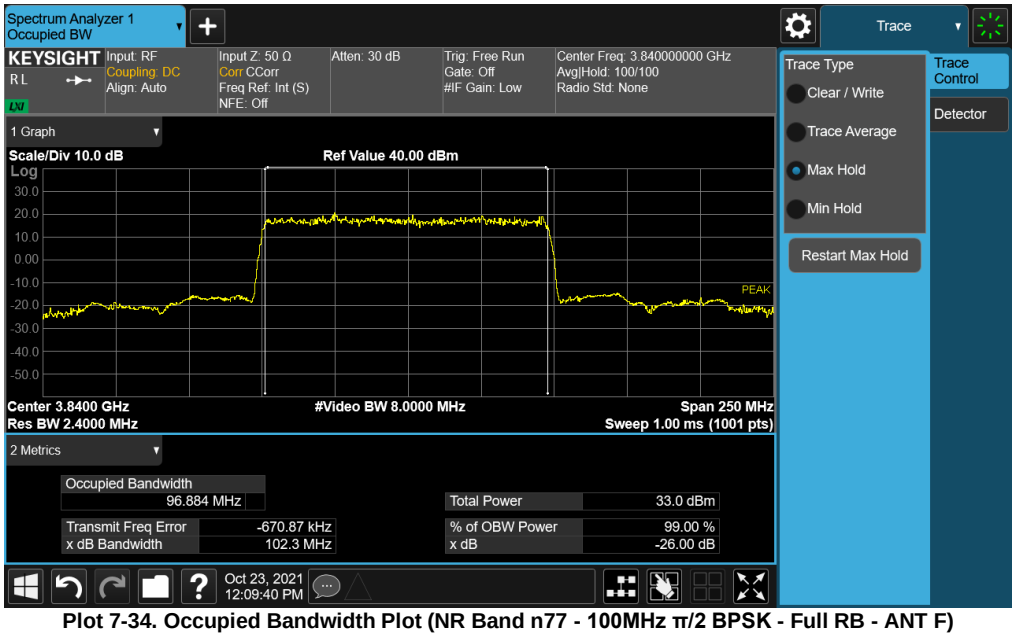


Plot 7-32. Occupied Bandwidth Plot (NR Band n77 (DoD) - 10MHz QPSK - Full RB - ANT F)



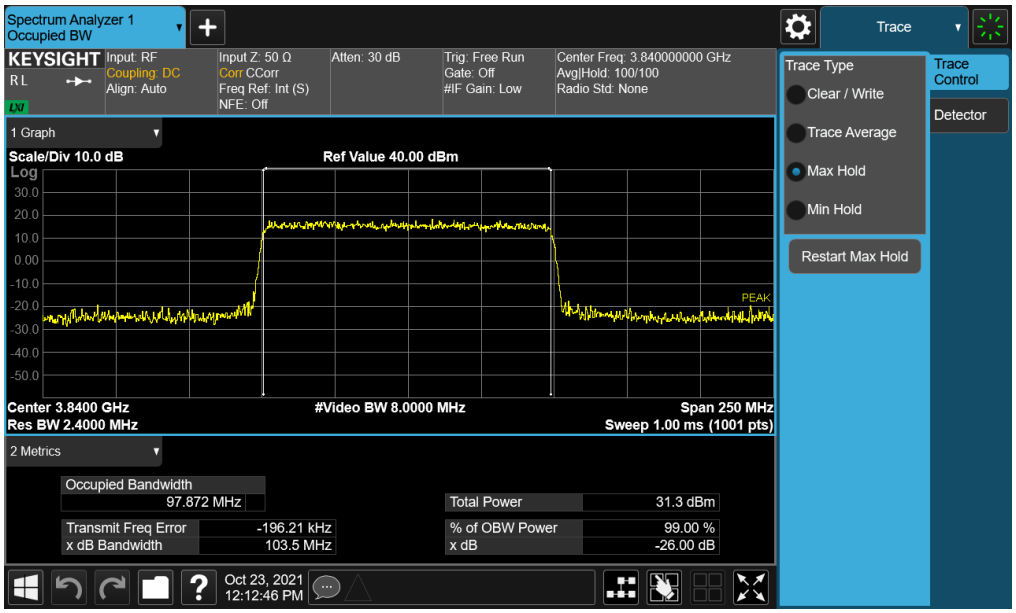
Plot 7-33. Occupied Bandwidth Plot (NR Band n77 (DoD) - 10MHz 16-QAM - Full RB - ANT F)

NR Band n77 (PC2) – C-Band – SRS-1 – ANT F

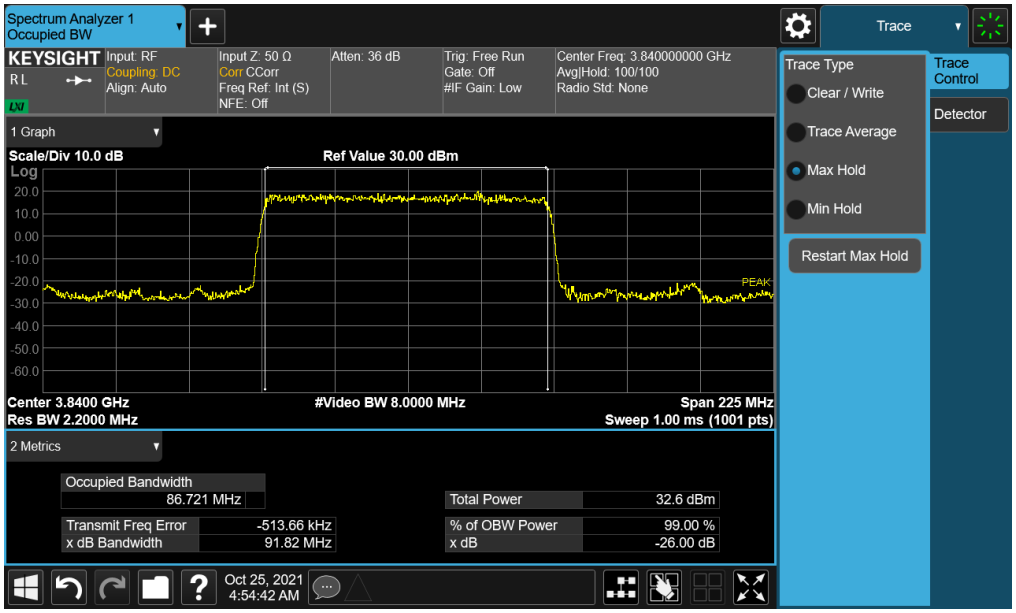


Plot 7-34. Occupied Bandwidth Plot (NR Band n77 - 100MHz π/2 BPSK - Full RB - ANT F)

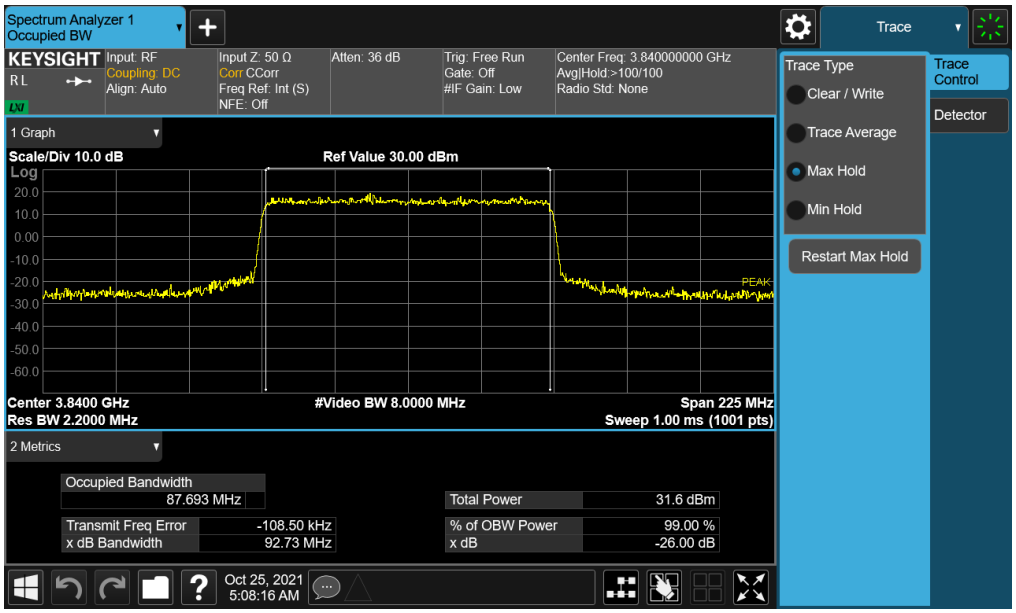
Plot 7-35. Occupied Bandwidth Plot (NR Band n77 - 100MHz QPSK - Full RB - ANT F)



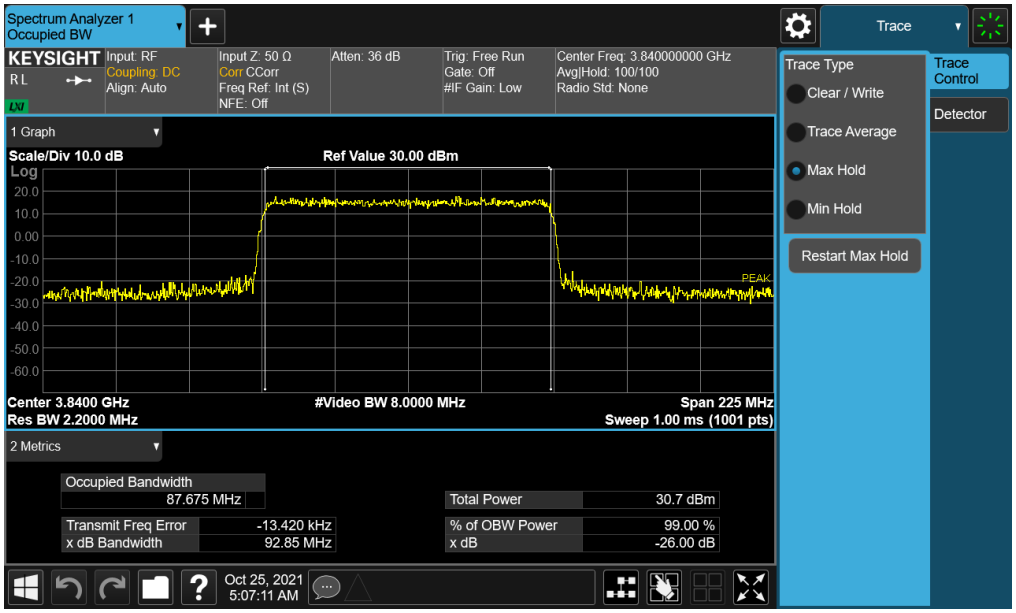
Plot 7-36. Occupied Bandwidth Plot (NR Band n77 - 100MHz 16-QAM - Full RB - ANT F)



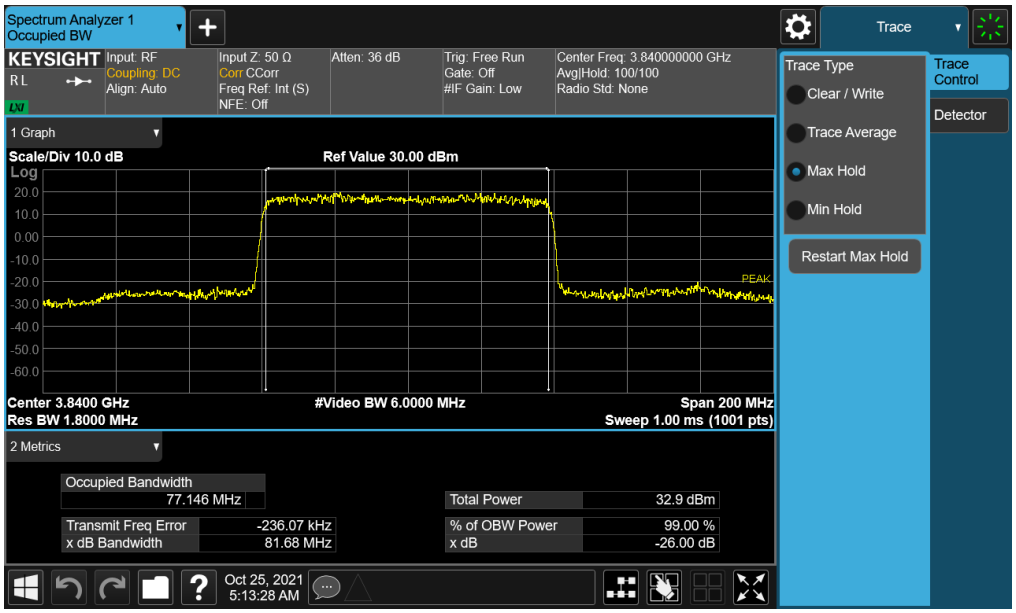
Plot 7-37. Occupied Bandwidth Plot (NR Band n77 - 90MHz π/2 BPSK - Full RB - ANT F)



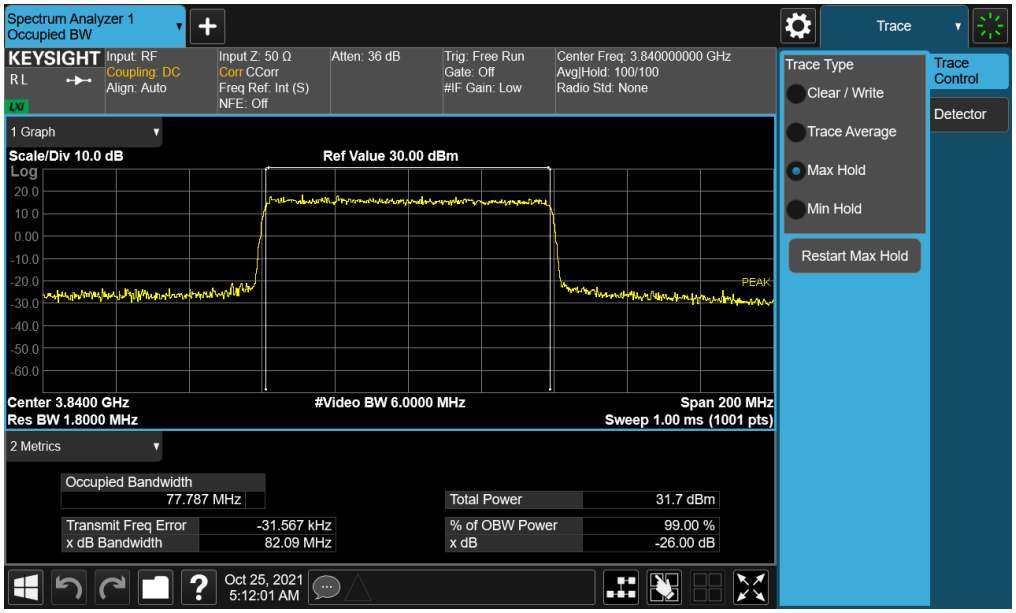
Plot 7-38. Occupied Bandwidth Plot (NR Band n77 - 90MHz QPSK - Full RB - ANT F)



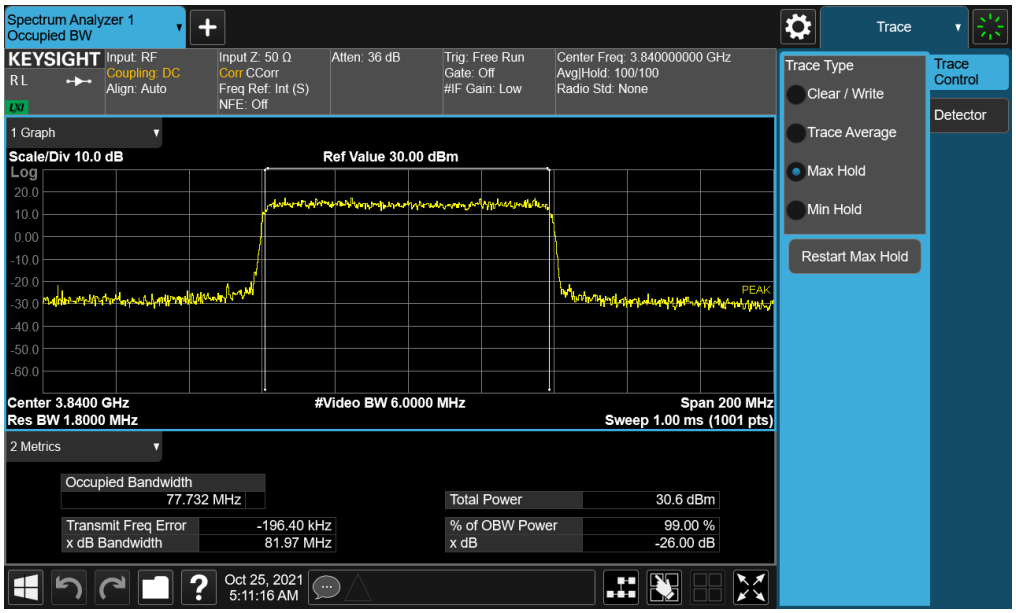
Plot 7-39. Occupied Bandwidth Plot (NR Band n77 - 90MHz 16-QAM - Full RB - ANT F)



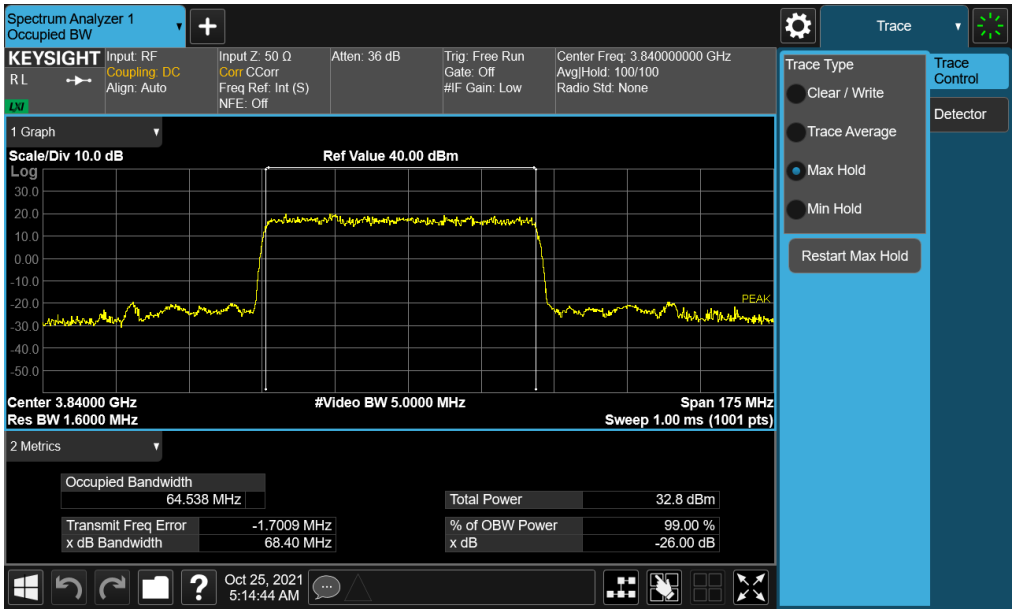
Plot 7-40. Occupied Bandwidth Plot (NR Band n77 - 80MHz π/2 BPSK - Full RB - ANT F)



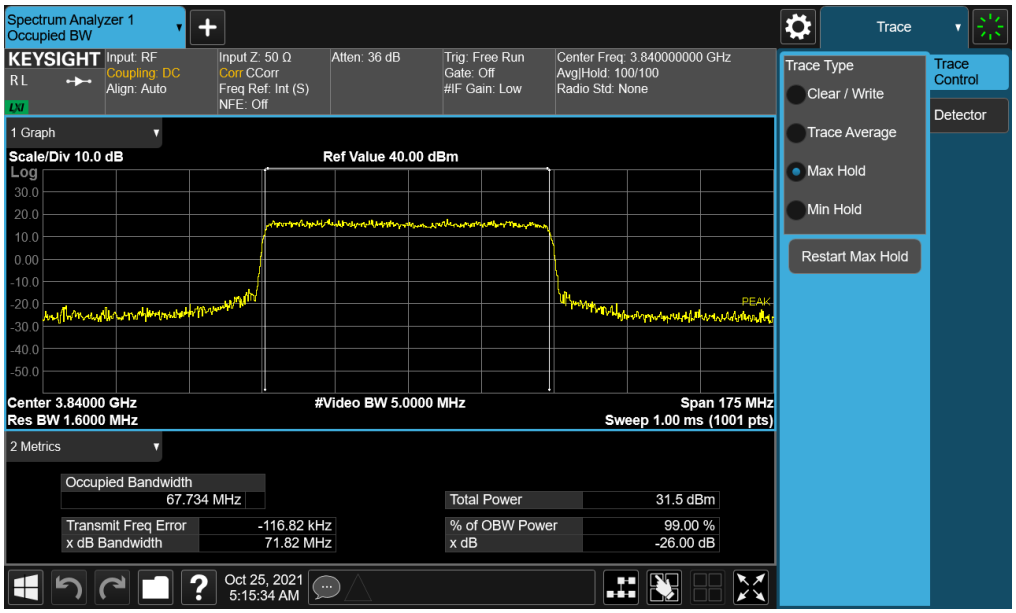
Plot 7-41. Occupied Bandwidth Plot (NR Band n77 - 80MHz QPSK - Full RB - ANT F)



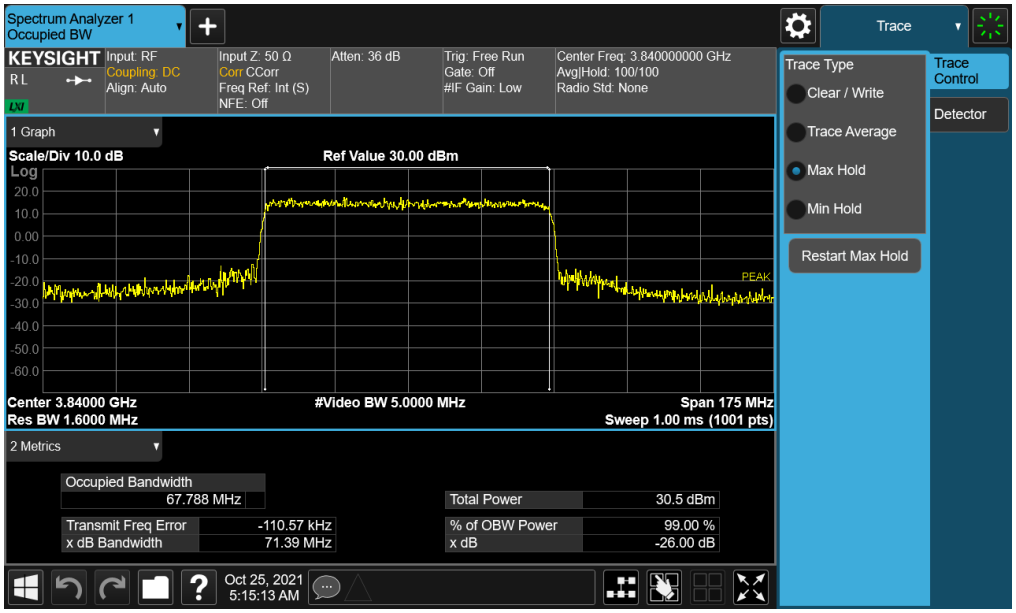
Plot 7-42. Occupied Bandwidth Plot (NR Band n77 - 80MHz 16-QAM - Full RB - ANT F)



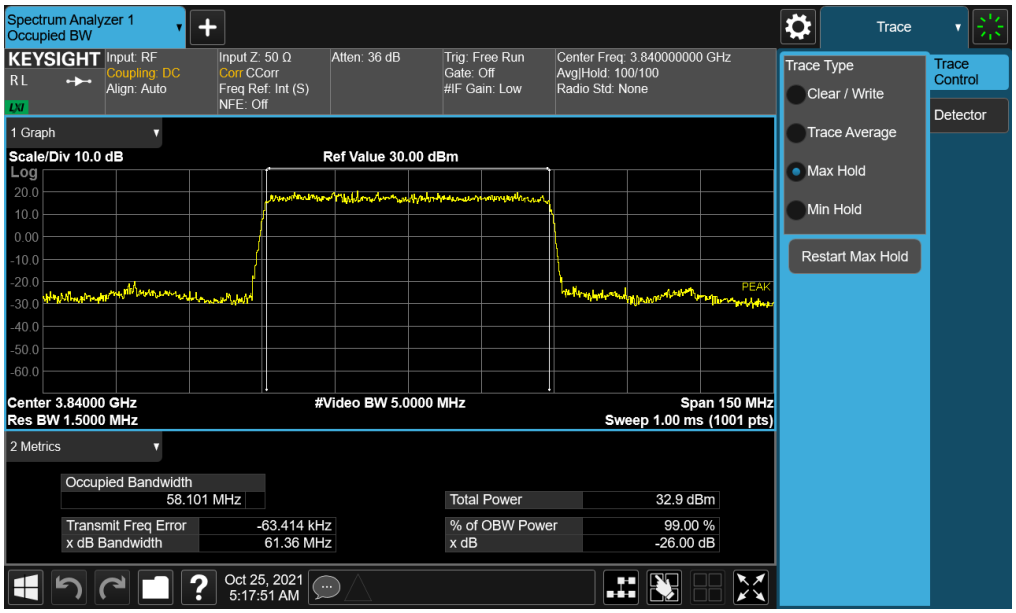
Plot 7-43. Occupied Bandwidth Plot (NR Band n77 - 70MHz π/2 BPSK - Full RB - ANT F)



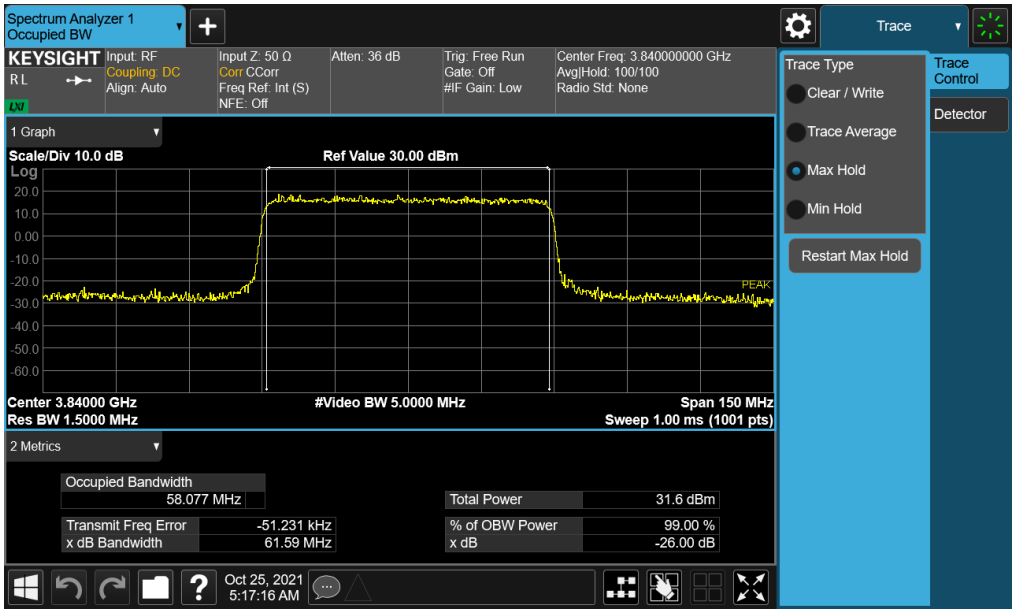
Plot 7-44. Occupied Bandwidth Plot (NR Band n77 - 70MHz QPSK - Full RB - ANT F)



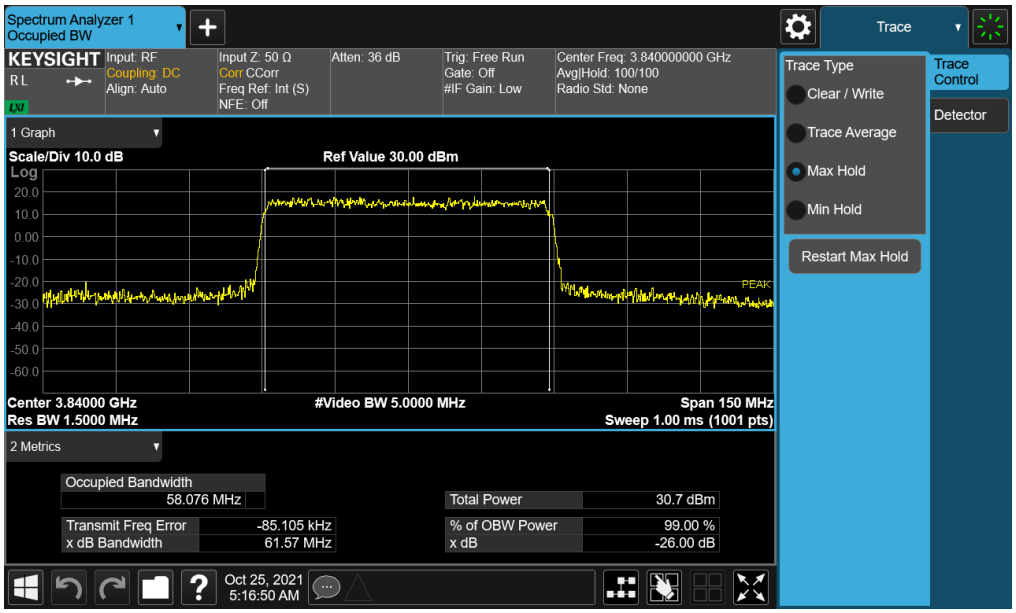
Plot 7-45. Occupied Bandwidth Plot (NR Band n77 - 70MHz 16-QAM - Full RB - ANT F)



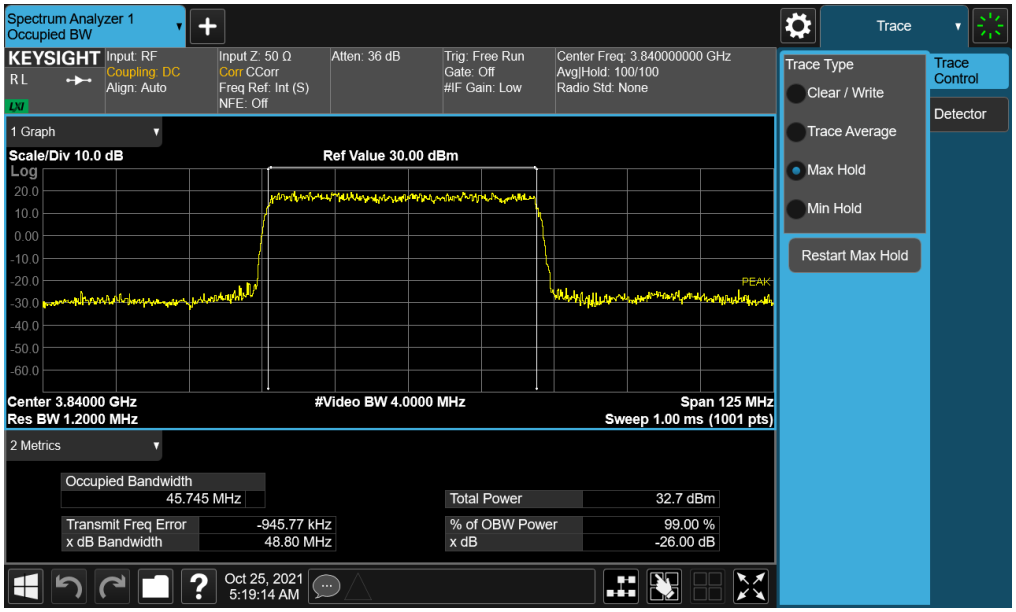
Plot 7-46. Occupied Bandwidth Plot (NR Band n77 - 60MHz π/2 BPSK - Full RB - ANT F)



Plot 7-47. Occupied Bandwidth Plot (NR Band n77 - 60MHz QPSK - Full RB - ANT F)

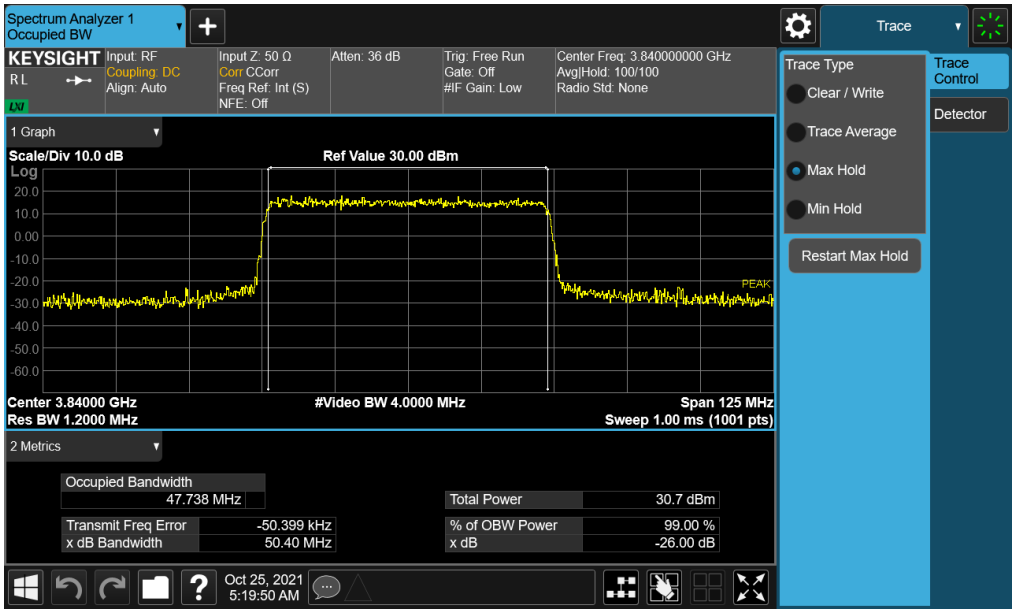


Plot 7-48. Occupied Bandwidth Plot (NR Band n77 - 60MHz 16-QAM - Full RB - ANT F)



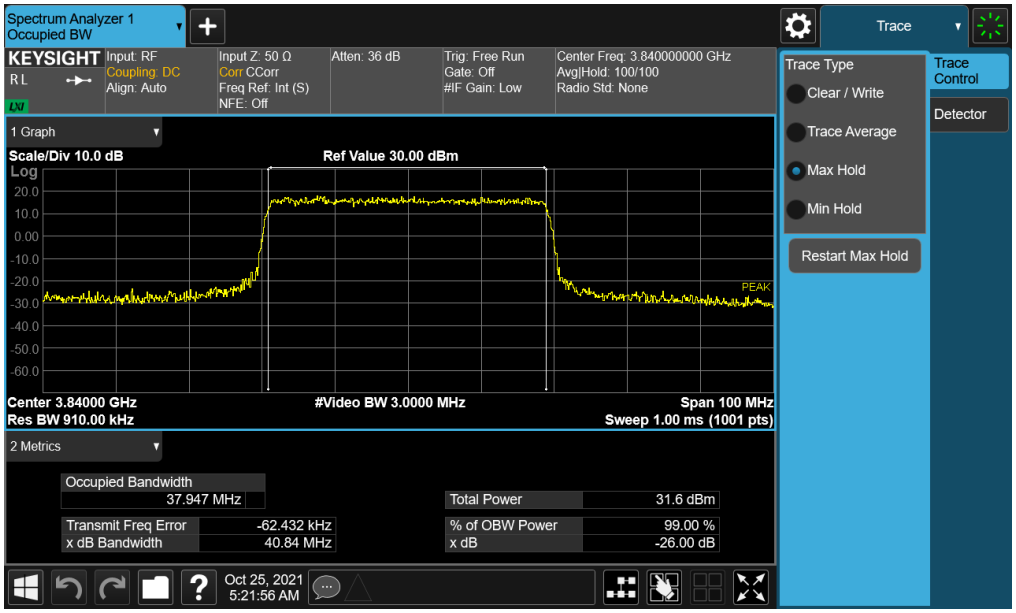
Plot 7-49. Occupied Bandwidth Plot (NR Band n77 - 50MHz π/2 BPSK - Full RB - ANT F)

Plot 7-50. Occupied Bandwidth Plot (NR Band n77 - 50MHz QPSK - Full RB - ANT F)

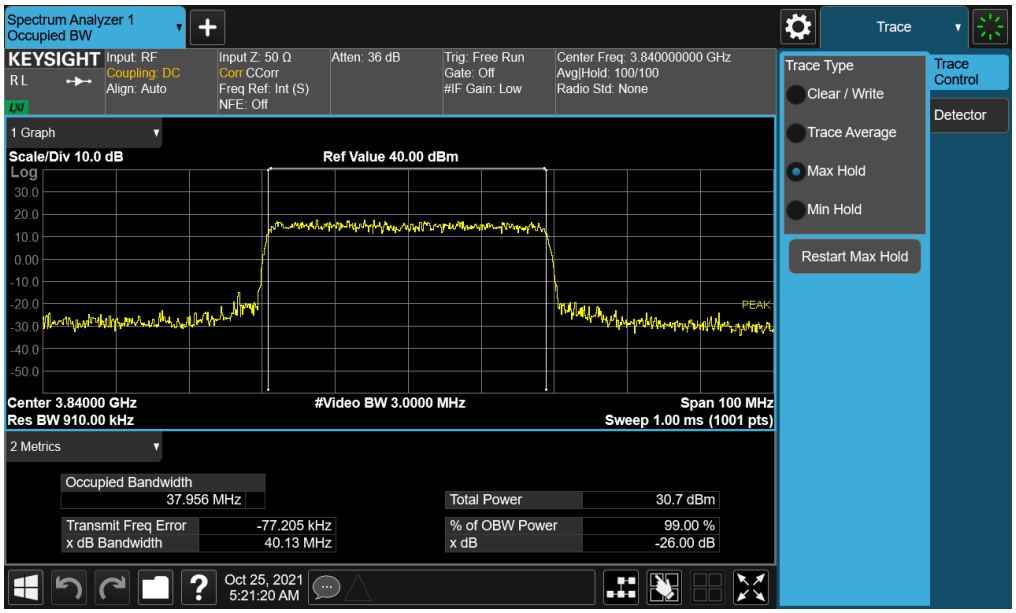


Plot 7-51. Occupied Bandwidth Plot (NR Band n77 - 50MHz 16-QAM - Full RB - ANT F)

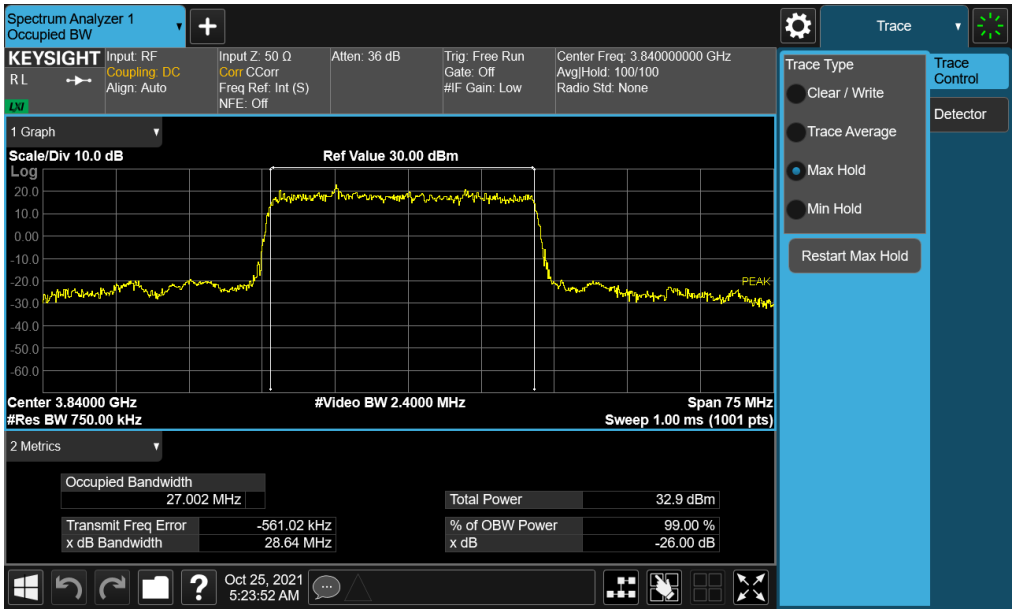
Plot 7-52. Occupied Bandwidth Plot (NR Band n77 - 40MHz π/2 BPSK - Full RB - ANT F)



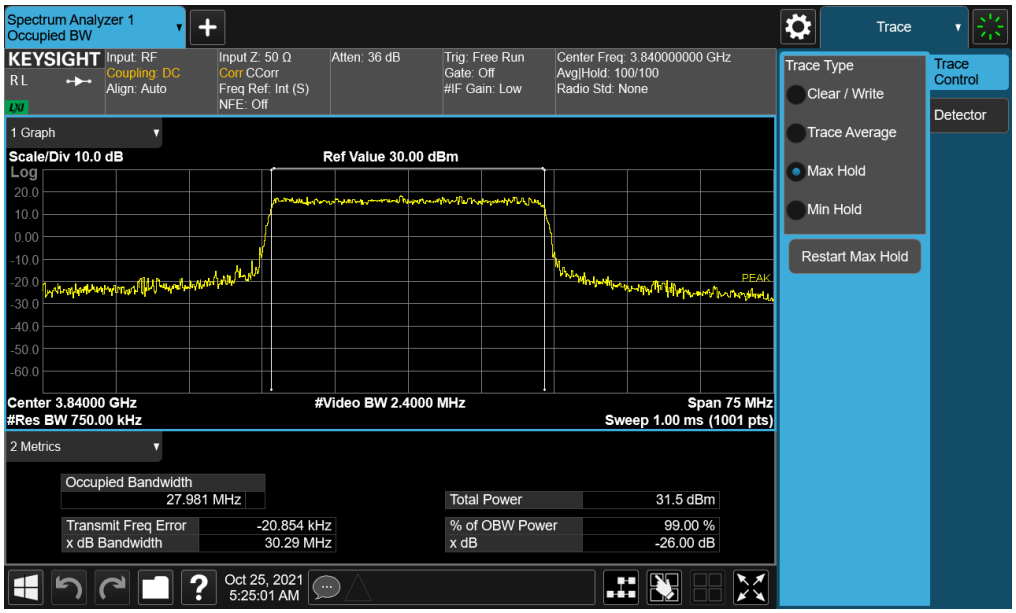
Plot 7-53. Occupied Bandwidth Plot (NR Band n77 - 40MHz QPSK - Full RB - ANT F)



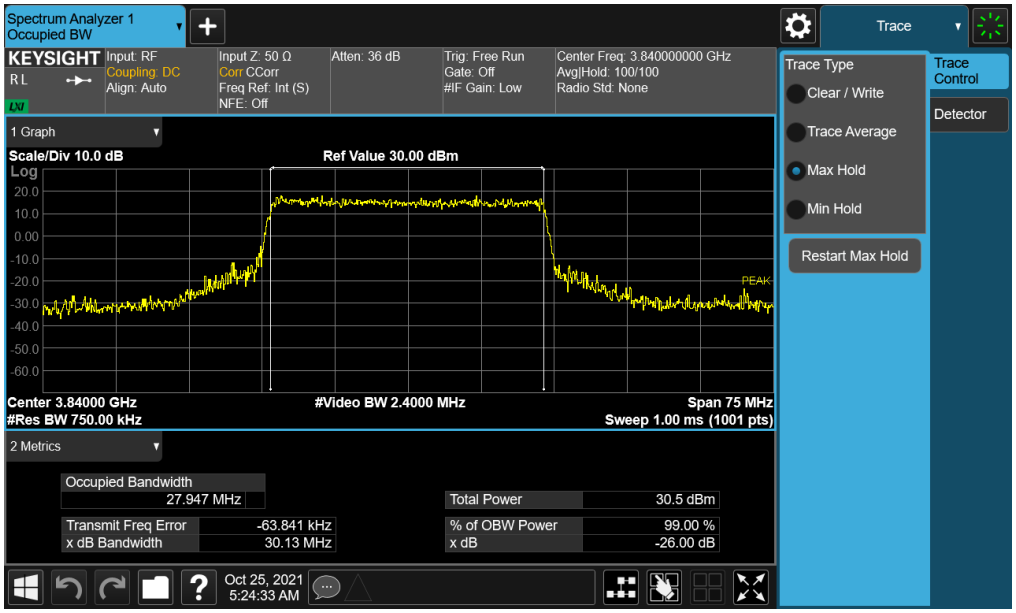
Plot 7-54. Occupied Bandwidth Plot (NR Band n77 - 40MHz 16-QAM - Full RB - ANT F)



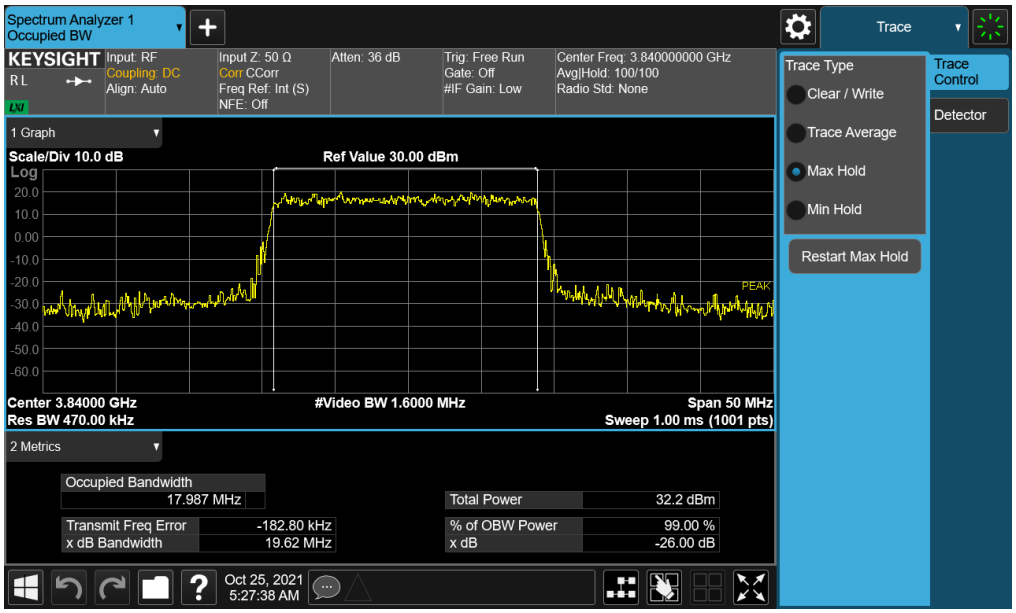
Plot 7-55. Occupied Bandwidth Plot (NR Band n77 - 30MHz π/2 BPSK - Full RB - ANT F)



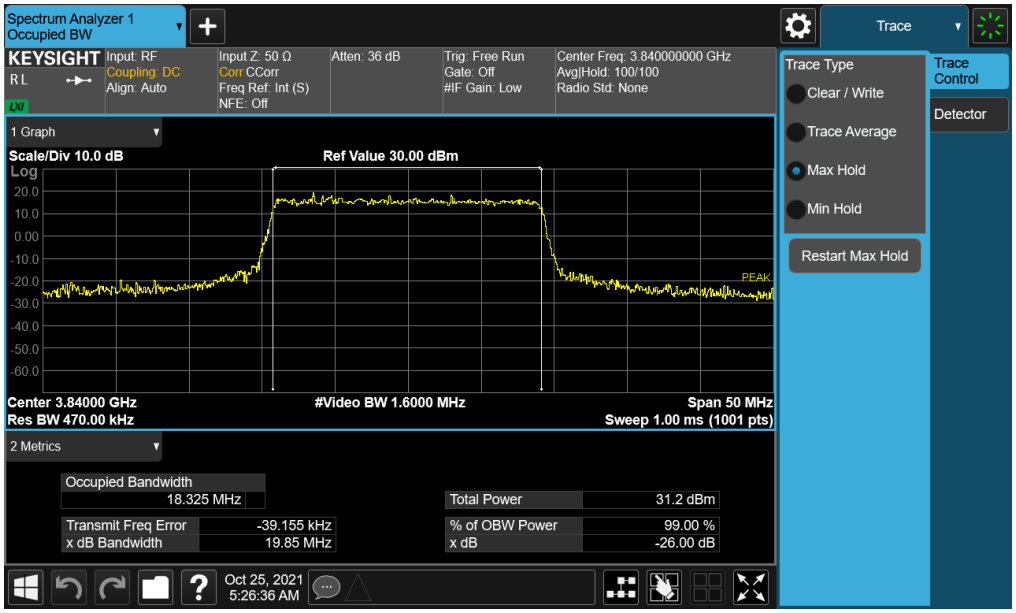
Plot 7-56. Occupied Bandwidth Plot (NR Band n77 - 30MHz QPSK - Full RB - ANT F)



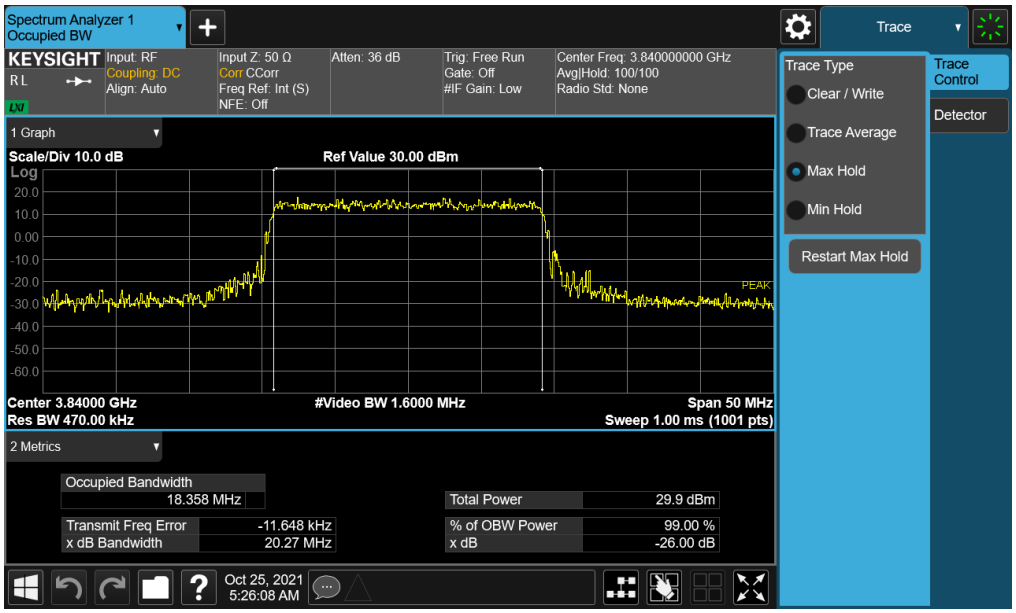
Plot 7-57. Occupied Bandwidth Plot (NR Band n77 - 30MHz 16-QAM - Full RB - ANT F)



Plot 7-58. Occupied Bandwidth Plot (NR Band n77 - 20MHz π/2 BPSK - Full RB - ANT F)

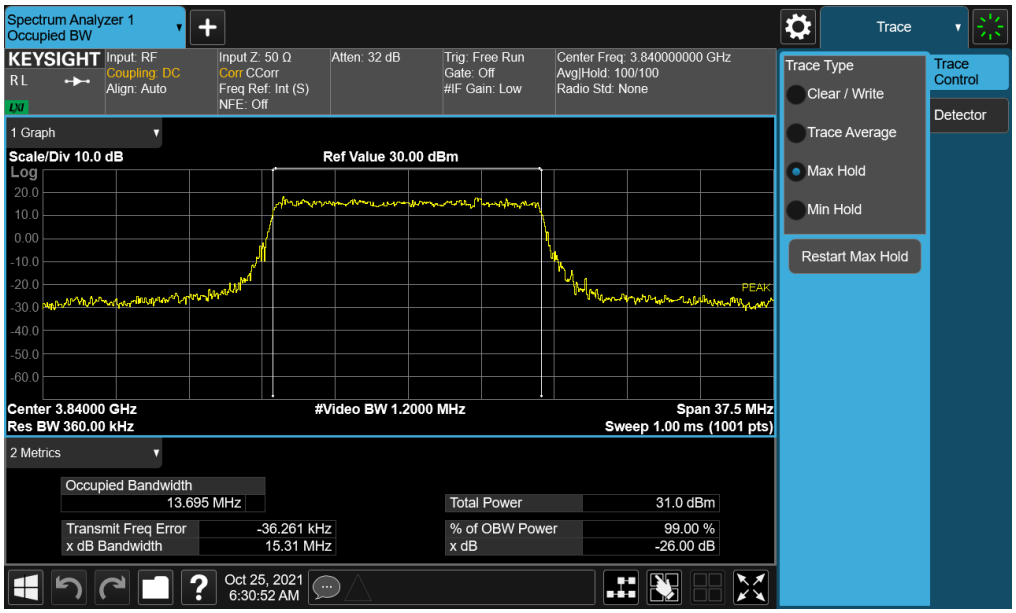


Plot 7-59. Occupied Bandwidth Plot (NR Band n77 - 20MHz QPSK - Full RB - ANT F)

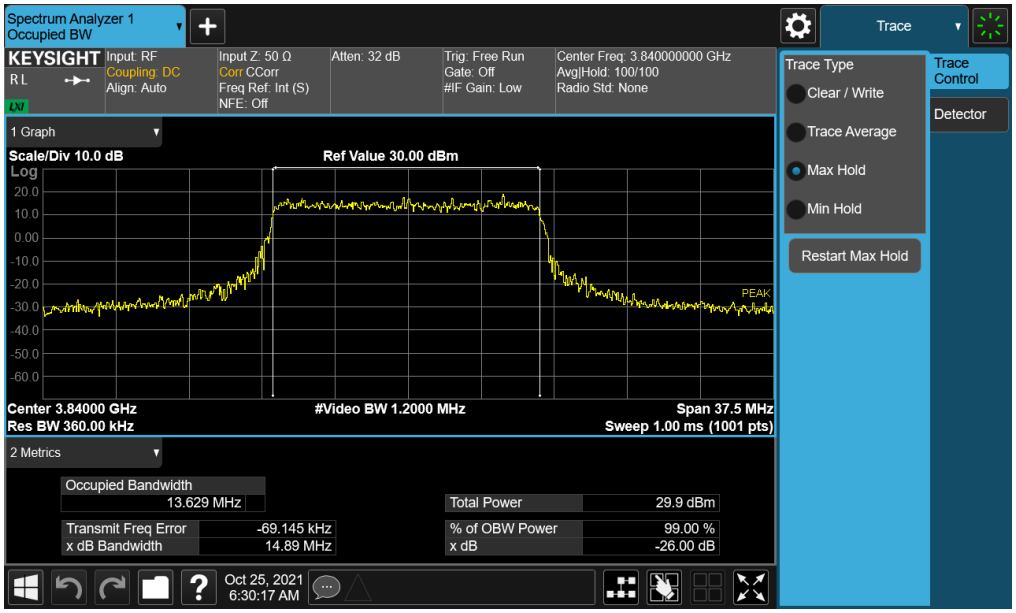


Plot 7-60. Occupied Bandwidth Plot (NR Band n77 - 20MHz 16-QAM - Full RB - ANT F)

Plot 7-61. Occupied Bandwidth Plot (NR Band n77 - 15MHz π/2 BPSK - Full RB - ANT F)



Plot 7-62. Occupied Bandwidth Plot (NR Band n77 - 15MHz QPSK - Full RB - ANT F)



Plot 7-63. Occupied Bandwidth Plot (NR Band n77 - 15MHz 16-QAM - Full RB - ANT F)