Test Report for FCC & IC

Report Number		ESTRGC2311-003		
Applicant	Company name	FCC : LG Electronics USA, Inc.		
		ISED : LG Electronics Inc.		
	Address	FCC : 111 Sylvan Avenue North Building Englewood New Jersey United States 07632		
		ISED : 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Republic of Korea		
	Telephone	201-470-2696		
Product	Product name	NAD Module		
	Model No.	TM15FNNAHD0	Manufacturer	LG Electronics Inc.
	Serial No.	NONE	Country of origin	KOREA
Test date	18-Sep-23 ~ 22-Nov-23		Date of issue	23-Nov-23
Testing location	140-16, Eongmalli-ro, Majang-myeon, Icheon-si, Gyeonggi-do, Rep. of Korea			
FCC ID	BEJTM15FNNAHD0			
ISED ID	2703H-TM15FNNAHD0			
FCC Rule Part(s)	Part 22, Part 24, Part 27			
ISED Requlation(s)	RSS-Gen Issue 5, RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4			
Test result				Complied
Measurement facility registration number	659627			
MRA Registration number	KR0019			
Tested by	Engineer J.G. Lee			(Signature)
Reviewed by	Engineering Manager I.K. Hong			(Signature)
Abbreviation	OK, Pass = Complied, Fail = Failed, N/A = not applicable			

* Note
- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test report is not related to KOLAS accreditation
- This product is tested in a single channel at the request of the company.
- This is the reissue report due to the change of the applicant

Contents

1. Laboratory Information

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu, Seoul 153-759, R. O. Korea

EMC/Telecom/Safety Test Lab : 140-16, Eongmalli-ro, Majang-myeon, Icheon-si, Gyeonggi-do, Rep. of Korea

Official Qualification(s)

MSIP : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC

FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE
ISED : Accredited Lab By Canada Laboratory Accreditation

2. EUT Description

2.1 General Information

Product : NAD Module
FCC ID : BEJTM15FNNAHD0
IC : 2703H-TM15FNNAHD0
Model Number : TM15FNNAHD0
Add Model Name : -
Serial Number : NONE
Hardware Version Id Number (HVIN): TM15FNNAHD0
Firmware Version Id Number (FVIN): N/A
Product Marketing Name (PMN): TM15FNNAHD0
Manufacturer : LG Electronics Inc.
Country of origin : KOREA
Modulation Type : π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM
Channel Bandwidth(MHz) : NR Band n2 : 5, 10, 15, 20
NR Band n5 : 5, 10, 15, 20
NR Band n66 : 5, 10, 15, 20, 40
Supply Voltage to product: 3.9 V

2.2 Description Of EUT

This device supports the following capabilities:
Multi-Band LTE and 5G NR(FR1)
5G NR supports SCS 15 kHz for FDD Band and SCS 30 kHz for TDD Band.

2.3 Antenna information

Antenna type	PIFA Antenna	
Antenna gain	Ant1 NR Band n2 : 1.78 dBi	Ant2 NR Band n2 : 0.92 dBi
	Ant1 NR Band n5 : 2.44 dBi	Ant2 NR Band n5 : 0.49 dBi
	Ant1 NR Band n66 : 1.88 dBi	Ant2 NR Band n66 : 1.10 dBi

2.4 Emission Designator and Max power

band	Frequecny	modulation	Emission Designator	Conducted Output Power		ERP/EIRP	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
Band 2	1 852.5 ~ 1 907.5	π/2 BPSK	4M47G7D	23.49	0.223	27.38	0.547
Band 2	1 852.5 ~ 1 907.5	QPSK	4M48G7D	23.58	0.228	26.44	0.441
Band 2	1 852.5 ~ 1 907.5	16QAM	4M48W7D	22.45	0.176	24.70	0.295
Band 2	1 852.5 ~ 1 907.5	64QAM	4M47W7D	21.54	0.143	23.32	0.215
Band 2	1 852.5 ~ 1 907.5	256QAM	4M47W7D	19.51	0.089	21.14	0.130
Band 2	1 885 ~ 1 905	π/2 BPSK	8M92G7D	23.45	0.221	27.26	0.532
Band 2	1 885 ~ 1 905	QPSK	8M92G7D	23.52	0.225	26.31	0.428
Band 2	1 885 ~ 1 905	16QAM	8M92W7D	22.41	0.174	24.46	0.279
Band 2	1 885 ~ 1 905	64QAM	8M93W7D	21.51	0.142	23.20	0.209
Band 2	1 885 ~ 1 905	256QAM	8M93W7D	19.47	0.089	21.25	0.133
Band 2	1 857.5 ~ 1 902.5	π/2 BPSK	13M39G7D	23.57	0.228	27.68	0.586
Band 2	1 857.5 ~ 1 902.5	QPSK	13M39G7D	23.60	0.229	26.13	0.410
Band 2	1 857.5 ~ 1 902.5	16QAM	13M38W7D	22.38	0.173	25.09	0.323
Band 2	1 857.5 ~ 1 902.5	64QAM	13M38W7D	20.88	0.122	23.44	0.221
Band 2	1 857.5 ~ 1 902.5	256QAM	13M38W7D	18.90	0.078	20.97	0.125
Band 2	1 860 ~ 1 900	π/2 BPSK	17M85G7D	23.50	0.224	27.65	0.582
Band 2	1 860 ~ 1 900	QPSK	17M85G7D	23.39	0.218	26.40	0.437
Band 2	1 860 ~ 1 900	16QAM	17M88W7D	22.38	0.173	25.10	0.324
Band 2	1 860 ~ 1 900	64QAM	17M85W7D	20.90	0.123	23.56	0.227

Band 2	1 860 ~ 1 900	256QAM	17M90W7D	19.01	0.080	21.43	0.139
Band 5	826.5 ~ 846.5	π/2 BPSK	4M49G7D	23.57	0.228	21.54	0.143
Band 5	826.5 ~ 846.5	QPSK	4M47G7D	23.55	0.226	20.25	0.106
Band 5	826.5 ~ 846.5	16QAM	4M48W7D	22.60	0.182	19.28	0.085
Band 5	826.5 ~ 846.5	64QAM	4M48W7D	21.13	0.130	17.13	0.052
Band 5	826.5 ~ 846.5	256QAM	4M48W7D	19.16	0.082	14.87	0.031
Band 5	829 ~ 844	π/2 BPSK	8M95G7D	23.57	0.228	20.70	0.117
Band 5	829 ~ 844	QPSK	8M94G7D	23.53	0.225	20.27	0.106
Band 5	829 ~ 844	16QAM	8M96W7D	22.57	0.181	19.87	0.097
Band 5	829 ~ 844	64QAM	8M95W7D	21.25	0.133	18.58	0.072
Band 5	829 ~ 844	256QAM	8M96W7D	19.12	0.082	15.94	0.039
Band 5	831.5 ~ 841.5	π/2 BPSK	13M42G7D	23.68	0.233	23.39	0.218
Band 5	831.5 ~ 841.5	QPSK	13M43G7D	23.60	0.229	22.13	0.163
Band 5	831.5 ~ 841.5	16QAM	13M43W7D	22.68	0.185	18.48	0.070
Band 5	831.5 ~ 841.5	64QAM	13M43W7D	21.33	0.136	17.36	0.054
Band 5	831.5 ~ 841.5	256QAM	13M42W7D	19.20	0.083	14.69	0.029
Band 5	834 ~ 839	π/2 BPSK	17M86G7D	23.58	0.228	22.52	0.179
Band 5	834 ~ 839	QPSK	17M84G7D	23.61	0.230	21.28	0.134
Band 5	834 ~ 839	16QAM	17M85W7D	22.61	0.182	19.35	0.086
Band 5	834 ~ 839	64QAM	17M85W7D	21.15	0.130	17.82	0.061
Band 5	834 ~ 839	256QAM	17M86W7D	19.20	0.083	14.56	0.029
Band 66	1 712.5 ~ 1 777.5	π/2 BPSK	4M48G7D	23.83	0.242	26.88	0.488
Band 66	1 712.5 ~ 1 777.5	QPSK	4M47G7D	23.81	0.240	26.65	0.462
Band 66	1 712.5 ~ 1 777.5	16QAM	4M47W7D	22.96	0.198	24.63	0.290
Band 66	1 712.5 ~ 1 777.5	64QAM	4M47W7D	21.40	0.138	23.21	0.209

Band 66	1 712.5 ~ 1 777.5	256QAM	4M47W7D	19.43	0.088	21.02	0.126
Band 66	1 715 ~ 1 775	π/2 BPSK	8M92G7D	23.68	0.233	27.31	0.538
Band 66	1 715 ~ 1 775	QPSK	8M92G7D	23.61	0.230	27.13	0.516
Band 66	1 715 ~ 1 775	16QAM	8M93W7D	22.75	0.188	24.85	0.305
Band 66	1 715 ~ 1 775	64QAM	8M93W7D	21.32	0.136	23.32	0.215
Band 66	1 715 ~ 1 775	256QAM	8M92W7D	19.14	0.082	21.11	0.129
Band 66	1 717.5 ~ 1 772.5	π/2 BPSK	13M38G7D	23.71	0.235	27.45	0.556
Band 66	1 717.5 ~ 1 772.5	QPSK	13M38G7D	23.70	0.234	27.30	0.537
Band 66	1 717.5 ~ 1 772.5	16QAM	13M38W7D	22.82	0.191	25.14	0.327
Band 66	1 717.5 ~ 1 772.5	64QAM	13M38W7D	21.39	0.138	23.54	0.226
Band 66	1 717.5 ~ 1 772.5	256QAM	13M38W7D	19.21	0.083	21.43	0.139
Band 66	1 720 ~ 1 770	π/2 BPSK	17M83G7D	23.60	0.229	27.90	0.617
Band 66	1 720 ~ 1 770	QPSK	17M81G7D	23.60	0.229	27.49	0.561
Band 66	1 720 ~ 1 770	16QAM	17M82W7D	22.78	0.190	25.22	0.333
Band 66	1 720 ~ 1 770	64QAM	17M86W7D	21.30	0.135	23.59	0.229
Band 66	1 720 ~ 1 770	256QAM	17M80W7D	19.16	0.082	21.55	0.143
Band 66	1 730 ~ 1 760	π/2 BPSK	38M50G7D	23.72	0.236	27.67	0.585
Band 66	1 730 ~ 1 760	QPSK	38M50G7D	23.55	0.226	27.46	0.557
Band 66	1 730 ~ 1 760	16QAM	38M48W7D	22.68	0.185	26.07	0.405
Band 66	1 730 ~ 1 760	64QAM	38M43W7D	21.52	0.142	24.52	0.283
Band 66	1 730 ~ 1 760	256QAM	38M48W7D	19.26	0.084	22.72	0.187

3. INTRODUCTION

3.1. EUT DESCRIPTION

Temperature : +21 ℃ ~ +24 ℃

Humidity : 42 % ~ 46 %

Extreme Test Temperature : -10 ℃ ~ +55 ℃

3.2 Measurement Uncertainty

Item	Measurement Uncertainty
Conducted Output Power	±3.2 %
Occupied Channel Bandwidth	±0.87dB
Unwanted Emission, Conducted	±0.86dB
Emissions, Radiated (Below 1GHz)	±3.54dB
Emissions, Radiated (1GHz-18GHz)	±4.22dB
Emissions, Radiated (18GHz-25GHz)	±4.81dB

3.3 Summary of Test Results

Test Description	FCC Part Section(s)	ISED Part Section(s)	Test Limit	Test Condition	Test Result
Conducted Output Power	2.1046	-	N/A	Conducted	C
Occupied Bandwidth	2.1049	RSS-Gen[6.7]	N/A		C
Peak to Average Ratio	24.232(d) 27.50(d.5)	RSS-130 [4.6] RSS-132 [5.4] RSS-133 [6.4] RSS-139 [5.5]	< 13 dB		C
Band Edge / Conducted Spurious Emissions	2.1051 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [5.6]	> 43 + 10log10 (P) dB at Band edge and for all out-of-band emissions		C
Frequency Stability	2.1055 22.355 24.235 27.54	RSS-130 [4.5] RSS-132 [5.3] RSS-133 [6.3] RSS-139 [5.4]	Refer to section 3.7 of this report.		C

Radiated Output Power (n5)	22.913(a.5)	RSS-132 [5.4]	For mobile equipment: < 7 Watts max. ERP	Radiated	C
Radiated Output Power (B66)	27.50(d.4)	RSS-139 [5.5]	For mobile equipment: < 1 Watts max. EIRP		C
Radiated Output Power (n2)	24.232(c)	RSS-133 [6.4]	For mobile equipment: < 2 Watts max. EIRP		C
Undesirable Emissions	2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [5.6]	> 43 + 10log10 (P) dB for all out-of-band emissions		C

Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable

3.4 Worst Case (Radiated Test)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
(Worst case: DFT-S-OFDM)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.

- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
Please refer to the table below.

- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported.
(Worst case : Band 2 : 15 MHz , Band 5 : 15 MHz, Band 66 : 40 MHz)

[Worst case]

Test Description	Modulation	RB size	RB offset
Effective Radiated	PI/2 BPSK,	See Section 13.2	

Power	QPSK, 16QAM, 64QAM, 256QAM	
Radiated Spurious Emissions	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 13.3

Worst Case(Conducted Test)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
(Worst case: DFT-S-OFDM)

- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.
(Worst case: PI/2 BPSK)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth Peak- to- Average Ratio	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	5, 10, 15, 20	Mid	Full RB	0
Band Edge	PI/2 BPSK	5	Low	1	0
	PI/2 BPSK	5	High	1	24
	PI/2 BPSK	10	Low	1	0
	PI/2 BPSK	10	High	1	51
	PI/2 BPSK	15	Low	1	0
	PI/2 BPSK	15	High	1	78
	PI/2 BPSK	20	Low	1	0
	PI/2 BPSK	20	High	1	105
	PI/2 BPSK	5, 10, 15, 20	Low	Full RB	0
	PI/2 BPSK	5, 10, 15, 20	High	Full RB	0

Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	5, 10, 15, 20	Low	1	0
	PI/2 BPSK	5, 10, 15, 20	Mid	1	0
	PI/2 BPSK	5, 10, 15, 20	High	1	0

3.5 Sample Calculation

NR Band n2(π/2 BPSK)
Emission Designator = 8M92G7D
OBW = 8.9161 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

NR Band n2(QPSK)
Emission Designator = 8M92G7D
OBW = 8.9184 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

NR Band n2(16QAM)
Emission Designator = 8M92W7D
OBW = 8.9222 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

NR Band n2(64QAM)
Emission Designator = 8M93W7D
OBW = 8.929 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

NR Band n2(256QAM)

Emission Designator = 8M93W7D
OBW = 8.9291 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

For substitution method

1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1 GHz respectively above ground.
2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3) During the test, the turn table is rotated until the maximum signal is found.
4) Record the field strength meter's level.
5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
6) Increase the signal generator output till the field strength meter's level is equal to the item (4).
7) Record the level at substituted antenna terminal.
8) The result is calculated as below;

EIRP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBi)
ERP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBd)
Where, TX Antenna Gain (dBd) = TX Antenna Gain (dBi) - 2.15 dB

4. Test Equipment

4.1 Measurement equipment

Equipment Name	Type	Manufacturer	Serial No.	Cal. Date	Cal. Due Date
Radio Communication Test Station	MT8000A	Anritsu	6261867318	2022-11-30	2023-11-30
Radio Communication Analyzer	MT8821C	Anritsu	6262116716	2022-11-29	2023-11-29
UXA Signal Analyzer	N9040B	Keysight	US57212216	2022-11-29	2023-11-29
Power divider	K240C	Anritsu	2143005	2023-03-13	2024-03-13
UXA Signal Analyzer	N9040B	Keysight	US57212216	2022-11-29	2023-11-29
SPECTRUM ANALYZER	MS2840A	Anritsu	MS2840A	2023-04-19	2024-04-19
Attenuator	A-4010.2902.2	ACE RF COMM	A-1	2023-04-17	2024-04-17
Power Meter	N1912A	Agilent	MY45100570	2022-11-28	2023-11-28
Power Sensor	A1921A	Agilent	MY45240427	2022-11-28	2023-11-28
TEST Receiver	ESCI7	ROHDE & SCHWARZ	100916	2023-06-12	2024-06-12
LOOP Antenna	HFH2-Z2	ROHDE & SCHWARZ	100188	2023-08-24	2024-08-24
Logbicon Antenna	VULB 9168	SCHWARZBECK	193	2022-12-09	2023-12-09
Turn Table	DT3000-2t	Innco System GmbH	N/A	-	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-	-
PREAMPLIFIER	8449B	HP	3008A00581	2023-06-12	2024-06-12
Horn Antenna	LB-42-15-C-SF	A-INFOMF	J2020079000055	2022-11-11	2023-11-11
Horn Antenna	BBHA9120D	SCHWARZBECK	469	2022-11-08	2023-11-08
TEST Receiver	ESU	ROHDE & SCHWARZ	100529	2023-06-12	2024-06-12
Turn Table	DT1500-S	Innco System GmbH	N/A	-	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-	-
Antenna Mast	SW-AM-EMF	SIWON	-	-	-
Antenna Master & Turn table controller	CO2000-P	Innco System GmbH	CO2000/642 /28051111/L	-	-

TEST Receiver	ESHS 30	Rohde & Schwarz	828765/002	2023-06-28	2024-06-28
Log-Periodic Antenna	UHALP9107	SCHWARZBECK	1562	2023-05-19	2024-05-19
Signal Generator	SMB 100A	ROHDE & SCHWARZ	177653	2022-11-29	2023-11-29
Horn Antenna	BBHA 9170	SCHWARZBECK	732	2023-06-15	2024-06-15
AMPLIFER	TK-PA1840H	TESTEK	N/A	2023-06-15	2024-06-15
DC Power supply	AK3010	VUPOWER	01020516	2022-11-28	2023-11-28
DC Power supply	HMP2020	ROHDE & SCHWARZ	120957	2023-08-18	2024-08-18
Temp./Humidity Chamber	SH-642	ESPEC	93016326	2022-11-28	2023-11-28
Radio Communication Test Station	MT8000A	Anritsu	6272354124	2023-10-17	2024-10-17
Radio Communication Analyzer	MT8821C	Anritsu	6272348668	2022-11-29	2023-11-29

5. OUTPUT POWER

5.1 Test Procedure

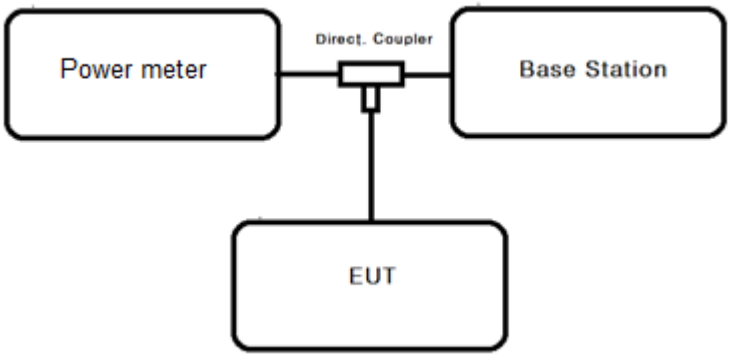
- KDB971168 D01v03 - Section 5.2.4

- ANSI C63.26-2015 – Section 5.2.4.2

5.2Test settings

The average conducted output powers were measured using an average power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

5.3 Test Setup

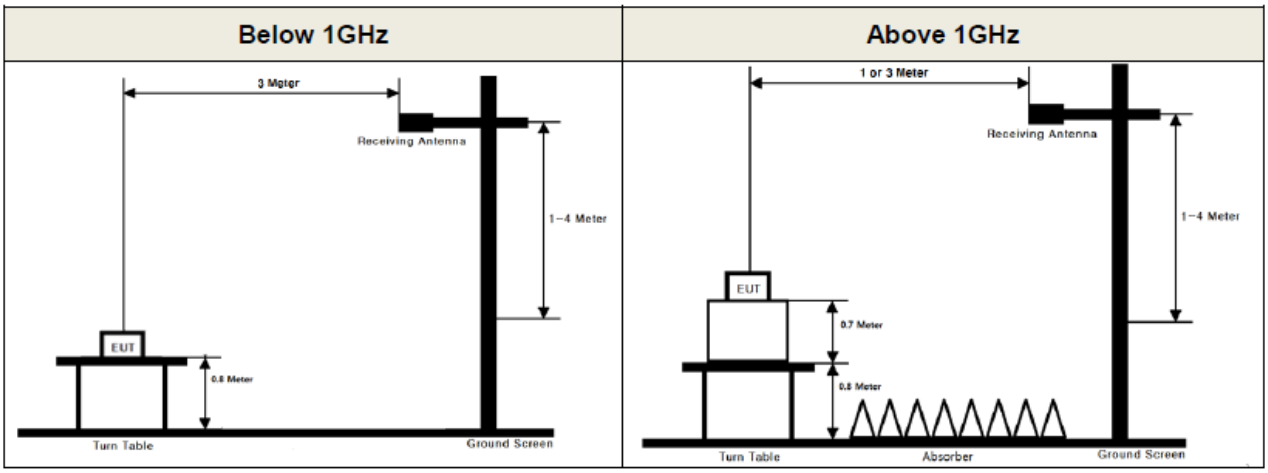


Test Limit

N/A.

6. ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

6.1Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 or 1.5-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed 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 below 1 GHz, the absorbers are removed.

6.2 Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.17
- KDB971168 D01v03 - Section 5.2.2
- ANSI C63.26-2015 – Section 5.2.4.4.1

6.3 Test setting

1. Set span to 2 x to 3 x the OBW.

2. Set RBW = 1 % to 5 % of the OBW.

3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.

5. Sweep time:
1) Set = auto-couple, or
2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible)
measurement. Transmission period is the on and off time of the transmitter.

6. Detector = power averaging (rms).

7. If the EUT can be configured to transmit continuously, then set the trigger to free run.

8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full power transmissions).

9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.

10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum

analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

7. PEAK TO AVERAGE RATIO

7.1 Test Procedure

- KDB971168 D01v03 – section 5.7.2

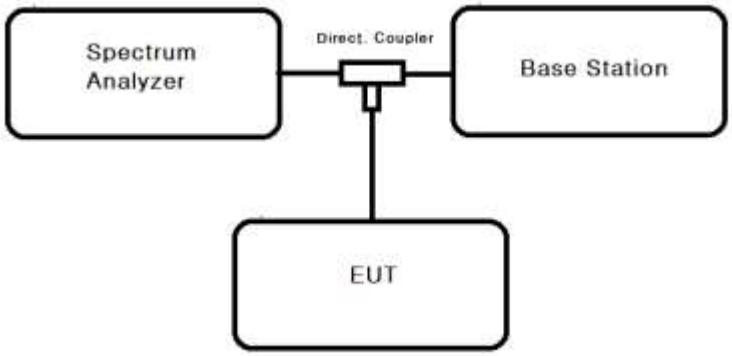
- ANSI C63.26-2015 – Section 5.2.3.4

7.2 Test settings

The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

a) The spectrum Analyzer`s CCDF measurement function is enabled.
b) Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
c) Set the number of counts to a value that stabilizes the measured CCDF curve.
d) Set the measurement interval as follows:
1) For continuous transmissions, set to the greater of [10 × (number of points in sweep) ×(transmission symbol period)] or 1 ms.
2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual
carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated
from the sum of the individual carrier peak powers.
e) Record the maximum PAPR level associated with a probability of 0.1 %.
f) The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.

7.3 Test Setup



8. Occupied Bandwidth

8.1 Test Procedure

- KDB971168 D01v03 – section 4.3

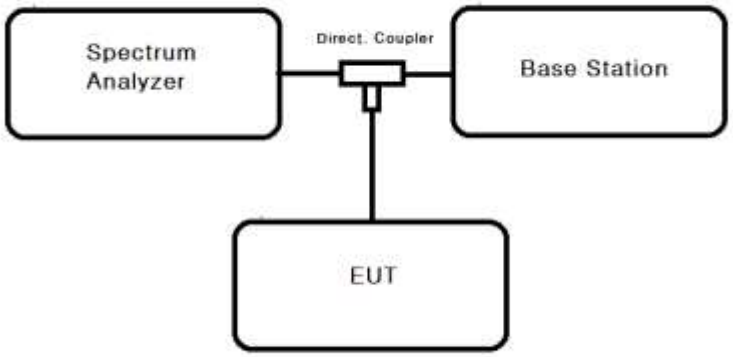
- ANSI C63.26-2015 – Section 5.4.4

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.

8.2 Test settings

• 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.
a) RBW = 1 ~ 5% of the expected OBW.
b) VBW shall be set ≥ 3 × RBW
c) Detector = peak,
d) Trace mode = max-hold.
e) Sweep point to Auto couple
f) The trace was allowed to stabilize.
g) If necessary, steps were repeated after changing the RBW such that it would be within 1 ~ 5% of the 99% occupied bandwidth observed in Step

8.3 Test Setup



9. BAND EDGE EMISSIONS AT ANTENNA TERMINAL

9.1 Test Procedure

- KDB971168 D01v03 – section 6

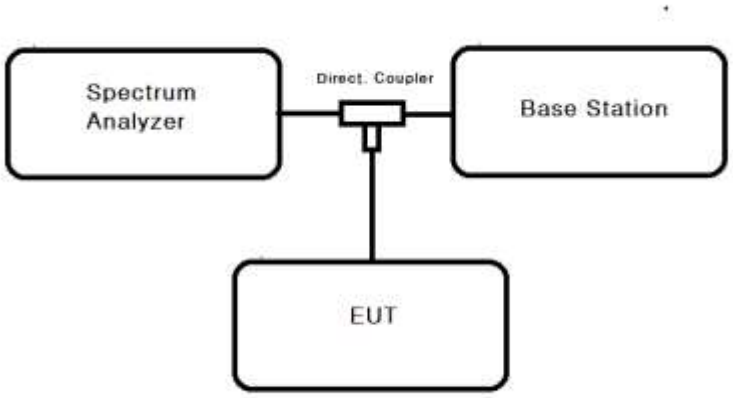
- ANSI C63.26-2015 – Section 5.7

9.2 Test settings

The EUT was setup to maximum output power at its lowest and highest channel with all bandwidths, modulations and RB configurations.

a) Start and stop frequency were set such that the band edge would be placed in the center of the plot
b) Span was set large enough so as to capture all out of band emissions near the band edge
c) RBW ≥ 1 % of the emission bandwidth or Specified bandwidth
d) VBW ≥ 3 X RBW
e) Detector = RMS & Trace mode = Max hold
f) Sweep time = Auto couple or 1 s for band edge
g) Number of sweep point ≥ 2 X span / RBW
h) The trace was allowed to stabilize

9.3 Test Setup



Test Note

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
All measurements were done at 2 channels(low and high operational frequency range.)
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.

10. FREQUENCY STABILITY

10.1 Test Procedure

- KDB971168 D01v03 – section 9

- ANSI/TIA-603-E-2016

10.2 Test settings

he frequency stability of the transmitter is measured by:

a.) Temperature:
The temperature is varied from -30 °C to +50 °C using an environmental chamber.

b.) Primary Supply Voltage:
The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification:
Part 24.235, Part 27.54, RSS-130[4.5], RSS-132[5.4], RSS-139[5.4]: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
Part 22.355: The frequency stability of the transmitter shall be maintained within ±0.000 25 % (±2.5 ppm) of the center frequency.
RSS-133[4.5]: The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.0 ppm for base stations.

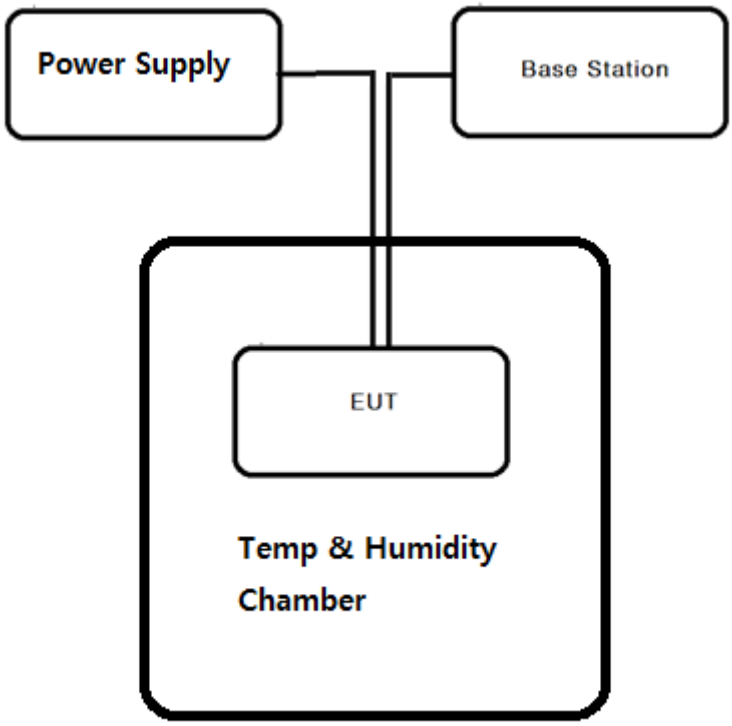
1. The carrier frequency of the transmitter is measured at room temperature.
(20 °C to provide a reference)

2. The equipment is turned on in a “standby” condition for one minute before applying power to

the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C.
A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

10.3 Test Setup



11. SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

11.1 Test Procedure

- KDB971168 D01v03 – section 6

- ANSI C63.26-2015 – Section 5.7

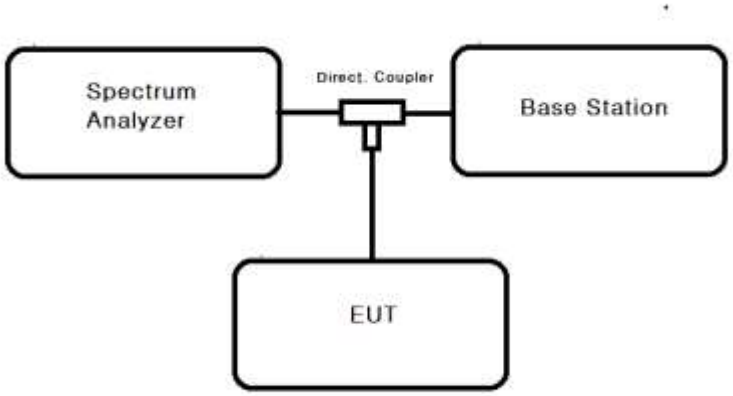
11.2 Test settings

The spectrum is scanned from 9 kHz up to a frequency including its 10th harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

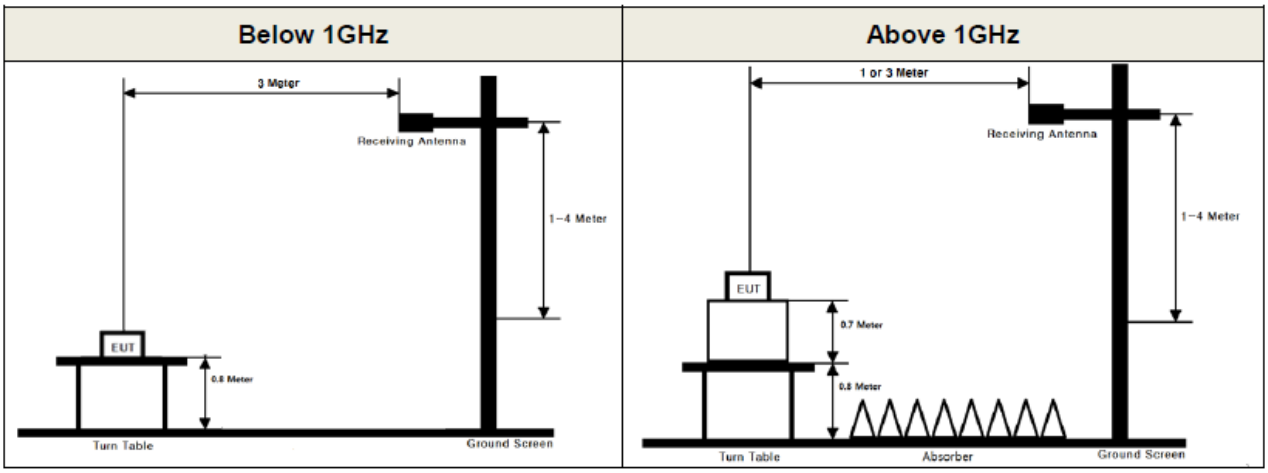
a) RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW ≥ 3 X RBW
b) Detector = RMS
c) Trace mode = Max hold
d) Sweep time = Auto couple
e) Number of sweep point ≥ 2 X span / RBW
f) The trace was allowed to stabilize

11.3 Test Setup



12. RADIATED SPURIOUS EMISSIONS

12.1Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 or 1.5-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed 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 below 1 GHz, the absorbers are removed.

12.2 Test Procedure

- ANSI/TIA-603-E-2016 - Section 2.2.12
- KDB971168 D01v03 - Section 6
- ANSI C63.26-2015 – Section 5.5

12.3 Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.
For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain

the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.
This measurement was performed with the EUT oriented in 3 orthogonal axis.

13. TEST DATA

13.1 CONDUCTED OUTPUT POWER

- All modes of operation were investigated, and the worst-case configuration results are reported in this section

Band 2

channel obw	Frequency	Modulation	1RB					MID RB			
			edge left	inner left	Mid	inner right	edge right	Low	MID	HI	Full RB
5	1852.50	BPSK	22.85	23.38	23.48	23.44	22.92	22.95	23.39	22.92	22.85
		QPSK	22.36	23.34	23.35	23.34	22.37	22.47	23.39	22.4	22.28
		16QAM	21.31	22.35	22.45	22.35	21.36	21.48	22.32	21.33	22.02
		64QAM	20.87	20.85	20.96	20.94	20.90	20.96	20.91	20.90	21.54
		256QAM	18.93	18.93	18.94	18.90	18.92	18.97	18.87	18.89	19.51
	1880.00	BPSK	22.79	23.33	23.49	23.33	22.89	22.84	23.27	22.90	22.86
		QPSK	22.16	23.30	23.58	23.30	22.20	22.36	23.38	22.31	22.31
		16QAM	21.26	22.22	22.30	22.30	21.24	21.28	22.23	21.32	21.91
		64QAM	20.79	20.78	20.86	20.85	20.82	20.82	20.87	20.86	21.45
		256QAM	18.86	18.80	18.83	18.85	18.92	18.84	18.88	18.90	19.43
	1907.50	BPSK	22.48	23.22	23.20	23.23	22.74	22.73	23.23	22.72	22.70
		QPSK	22.00	23.03	23.10	23.18	22.18	22.08	23.15	22.09	22.12
		16QAM	21.14	22.07	22.16	22.18	21.18	21.18	20.09	21.22	21.20
		64QAM	20.71	20.71	20.75	20.76	20.76	20.72	20.74	20.76	20.75
		256QAM	18.66	18.69	18.71	18.75	18.74	18.71	18.74	18.78	18.72
10	1855.00	BPSK	22.85	23.37	23.45	23.42	22.90	22.95	23.37	22.85	22.82
		QPSK	22.32	23.30	23.37	23.28	22.32	22.41	23.29	22.23	22.23
		16QAM	21.30	22.32	22.41	22.33	21.31	21.45	22.31	21.31	22.01
		64QAM	20.82	20.78	20.92	20.91	20.87	20.88	20.97	20.85	21.51
		256QAM	18.88	18.91	18.9	18.85	18.88	18.89	18.82	18.84	19.47
	1880.00	BPSK	22.85	23.35	23.35	23.31	22.81	22.92	23.41	22.95	22.82
		QPSK	22.11	23.10	23.52	23.33	22.22	22.32	23.35	22.30	22.35
		16QAM	21.24	22.27	22.28	22.27	21.21	21.25	22.21	21.29	21.30
		64QAM	20.75	20.71	20.84	20.82	20.86	20.81	20.85	20.83	20.82
		256QAM	18.82	18.30	18.80	18.81	18.90	18.82	18.84	18.95	19.41
	1905.00	BPSK	22.82	23.35	23.44	23.43	22.95	22.92	23.32	22.96	22.87
		QPSK	22.05	23.01	23.15	23.15	22.15	22.09	23.12	22.01	22.1

		16QAM	21.11	22.04	22.11	22.17	21.17	21.15	20.11	21.20	21.15
		64QAM	20.70	20.68	20.69	20.72	20.72	20.71	20.71	20.72	20.71
		256QAM	18.63	18.65	18.68	18.71	18.71	18.67	18.79	18.75	18.69
15	1857.50	BPSK	22.86	23.41	23.47	23.51	23.33	22.91	23.49	22.93	22.95
		QPSK	22.29	23.29	23.60	23.52	23.50	22.46	23.48	22.39	22.33
		16QAM	21.25	22.33	22.31	22.27	22.21	21.32	22.29	21.25	21.27
		64QAM	20.79	20.80	20.85	20.83	20.82	20.81	20.80	20.84	20.82
		256QAM	18.81	18.85	18.84	18.82	18.78	18.84	18.82	18.87	18.81
	1880.00	BPSK	22.81	23.32	23.45	23.33	23.33	22.84	23.57	22.83	22.78
		QPSK	22.18	23.35	23.49	23.31	23.20	22.30	23.27	22.26	22.29
		16QAM	21.35	22.31	22.38	22.32	22.27	21.38	22.32	21.37	21.34
		64QAM	20.83	20.82	20.88	20.87	20.88	20.84	20.85	20.87	20.85
		256QAM	18.85	18.89	18.88	18.86	18.90	18.86	18.85	18.88	18.85
	1902.50	BPSK	22.75	23.28	23.42	23.30	23.31	22.80	23.52	22.81	22.89
		QPSK	22.15	23.31	23.45	23.30	23.15	22.27	23.24	22.23	22.25
		16QAM	21.37	22.38	22.35	22.33	22.23	21.34	22.30	21.32	21.33
		64QAM	20.88	20.80	20.84	20.88	20.85	20.81	20.84	20.81	20.82
		256QAM	18.81	18.85	18.82	18.82	18.84	18.82	18.82	18.85	18.84
20	1860.00	BPSK	22.86	23.39	23.45	23.29	23.32	22.68	23.50	22.85	22.95
		QPSK	22.46	23.22	23.29	23.16	23.15	23.38	23.39	23.34	22.39
		16QAM	21.34	22.36	22.38	22.31	22.29	21.35	22.31	21.34	21.31
		64QAM	20.84	20.52	20.89	20.78	20.77	20.75	20.81	20.82	20.81
		256QAM	18.89	18.95	19.01	18.88	18.86	18.90	18.91	18.95	18.94
	1880.00	BPSK	22.80	23.31	23.36	23.25	23.22	22.80	23.35	22.81	22.80
		QPSK	22.43	23.16	23.18	23.12	23.13	22.34	23.32	22.36	22.37
		16QAM	21.36	22.30	22.36	22.28	22.27	21.38	22.32	21.36	21.35
		64QAM	20.88	20.86	20.90	20.80	20.80	20.81	20.84	20.85	20.86
		256QAM	18.82	18.86	18.91	18.80	18.81	18.85	18.88	18.85	18.87
	1900.00	BPSK	22.73	23.20	23.34	23.16	23.19	22.55	23.35	22.73	22.82
		QPSK	22.57	23.05	23.16	23.03	23.02	23.25	23.17	23.22	22.25
		16QAM	21.22	22.14	22.24	22.19	22.16	21.22	22.18	21.22	21.19
		64QAM	20.71	20.40	20.77	20.65	20.62	20.61	20.68	20.70	20.68
		256QAM	18.77	18.82	18.88	18.75	18.74	18.68	18.71	18.81	18.80

Band 5

channel obw	Frequency	Modulation	1RB					MID RB			
			edge left	inner left	Mid	inner right	edge right	Low	MID	HI	Full RB
5	826.50	BPSK	22.95	23.50	23.54	23.46	22.89	23.12	23.57	22.98	23.02
		QPSK	22.51	23.40	23.41	23.30	22.34	22.64	23.55	22.49	22.55
		16QAM	21.63	22.60	22.47	21.47	21.45	21.55	22.55	21.52	21.57
		64QAM	21.02	21.12	21.02	20.92	20.88	21.13	21.08	21.01	21.08
		256QAM	19.12	19.16	19.05	19.01	18.98	19.07	19.04	19.01	19.07
	836.50	BPSK	22.94	23.45	23.32	23.24	22.67	22.93	23.36	22.79	22.80
		QPSK	22.30	23.18	23.20	23.12	22.19	22.48	23.37	22.29	22.34
		16QAM	21.48	22.38	22.25	21.28	21.26	21.37	22.37	21.31	21.35
		64QAM	20.88	20.96	20.82	20.71	20.82	20.98	20.85	20.83	20.89
		256QAM	18.95	18.92	18.86	18.84	18.83	18.91	18.93	18.99	18.97
	846.50	BPSK	22.89	23.39	23.28	23.14	22.60	22.89	23.17	22.76	22.81
		QPSK	22.25	23.12	23.17	23.08	22.15	22.42	23.34	22.25	22.29
		16QAM	21.41	22.35	22.21	21.23	21.21	21.32	22.31	21.27	21.30
		64QAM	20.81	20.91	20.77	20.67	20.74	20.93	20.81	20.77	20.85
		256QAM	19.02	19.07	19.08	19.06	19.04	19.02	19.04	19.05	19.02
10	829.00	BPSK	22.98	23.56	23.54	23.40	22.92	23.08	23.53	22.93	23.01
		QPSK	22.47	23.48	23.42	23.34	22.35	22.69	23.53	22.47	22.53
		16QAM	21.61	22.57	22.42	21.41	21.40	21.52	22.54	21.50	21.54
		64QAM	21.01	21.10	21.00	20.89	20.85	21.08	21.04	20.95	21.03
		256QAM	19.09	19.12	19.02	18.99	18.96	19.05	19.01	18.97	19.03
	836.50	BPSK	22.97	23.45	23.57	23.56	23.03	22.98	23.52	23.09	23.00
		QPSK	22.32	23.21	23.18	23.10	22.15	22.45	23.34	22.24	22.31
		16QAM	21.51	22.41	22.29	21.31	21.24	21.35	22.34	21.28	21.29
		64QAM	20.91	21.01	20.88	20.77	20.87	21.02	20.91	20.88	20.87
		256QAM	18.92	18.87	18.84	18.81	18.80	18.87	18.86	18.84	18.92
	844.00	BPSK	23.14	23.35	23.44	23.43	22.95	22.92	23.32	22.96	23.20
		QPSK	22.64	23.15	23.21	23.15	22.31	22.49	23.28	22.49	22.70
		16QAM	21.79	22.38	22.27	21.29	21.29	21.39	22.36	21.42	21.82
		64QAM	20.98	20.90	20.79	20.71	20.82	20.97	20.89	20.69	21.25
		256QAM	19.09	19.11	19.07	19.08	19.10	19.10	19.09	19.08	19.10

15	831.50	BPSK	22.95	23.61	23.48	23.39	23.21	22.95	23.41	23.08	23.03
		QPSK	22.65	23.38	23.41	23.31	22.71	22.59	23.27	22.65	22.71
		16QAM	21.77	22.61	22.59	21.42	21.49	21.64	22.31	21.61	21.68
		64QAM	21.16	21.22	21.09	20.89	20.79	21.05	21.15	21.02	21.01
		256QAM	19.05	19.07	19.08	19.07	19.08	19.09	19.08	19.08	19.07
	836.50	BPSK	23.12	23.68	23.43	23.32	22.86	23.16	23.54	22.91	23.00
		QPSK	22.62	23.60	23.41	23.29	22.31	22.65	23.52	22.48	22.54
		16QAM	21.71	22.64	22.50	22.33	22.68	21.60	22.54	21.47	21.52
		64QAM	21.18	21.33	21.05	20.90	20.85	21.16	21.02	20.95	21.06
		256QAM	19.19	19.20	19.02	18.90	18.85	19.09	19.01	18.97	19.03
	841.50	BPSK	23.04	23.49	23.29	23.21	22.69	22.93	23.36	22.88	22.82
		QPSK	22.51	23.44	23.28	23.40	23.45	22.43	23.34	22.40	22.35
		16QAM	21.46	22.47	22.31	22.24	21.23	21.47	22.37	21.38	21.35
		64QAM	21.01	21.04	20.88	20.76	20.77	20.94	20.89	20.89	20.84
		256QAM	18.99	19.03	18.86	18.84	18.72	18.97	18.84	18.89	18.84
20	1720.00	BPSK	23.00	23.57	23.42	23.35	22.83	23.09	23.54	22.93	23.01
		QPSK	22.44	23.53	23.61	23.21	22.21	22.60	23.51	22.46	22.53
		16QAM	21.53	22.51	22.50	22.26	21.33	21.62	22.53	21.43	21.53
		64QAM	21.09	21.04	21.02	20.82	20.80	21.12	21.03	20.96	21.05
		256QAM	19.07	19.02	19.03	18.82	18.84	19.11	19.07	18.97	19.03
	1745.00	BPSK	22.95	23.48	23.38	23.32	22.82	23.07	23.45	22.81	22.96
		QPSK	22.44	23.46	23.41	23.21	22.43	22.60	23.41	22.41	22.52
		16QAM	21.50	22.49	22.48	22.24	21.30	21.59	22.49	21.41	21.50
		64QAM	21.05	21.01	20.98	20.78	20.75	21.07	20.98	20.91	20.96
		256QAM	19.03	19.05	19.08	18.81	18.82	19.07	18.98	18.81	19.01
	1770.00	BPSK	23.11	23.58	23.33	23.23	22.71	23.06	23.43	22.85	22.95
		QPSK	22.48	23.50	23.34	23.17	22.14	22.54	23.44	22.33	22.46
		16QAM	21.60	22.61	22.42	22.21	21.26	21.56	22.45	21.36	21.44
		64QAM	21.15	21.15	20.98	20.79	20.82	21.07	20.96	20.87	20.96
		256QAM	19.20	19.14	18.91	18.83	18.76	19.04	18.95	18.84	18.97

Band 66

channel obw	Frequency	Modulation	1RB					MID RB			
			edge left	inner left	Mid	inner right	edge right	Low	MID	HI	Full RB
5	1712.50	BPSK	22.96	23.49	23.52	23.51	22.98	22.95	23.50	22.97	22.95
		QPSK	22.33	23.35	23.36	23.50	22.44	22.44	23.48	22.48	22.44
		16QAM	21.41	22.41	22.40	22.45	21.43	21.45	22.45	21.51	21.49
		64QAM	20.99	20.92	21.00	20.95	20.96	20.97	20.96	21.03	20.97
		256QAM	18.96	18.91	18.93	18.99	18.97	18.95	18.95	18.98	18.92
	1745.00	BPSK	23.00	23.52	23.60	23.59	23.08	23.05	23.56	23.12	23.05
		QPSK	22.43	23.46	23.55	23.51	22.51	22.54	23.51	22.61	22.56
		16QAM	21.39	22.35	22.52	22.48	21.51	21.52	22.52	21.53	21.52
		64QAM	20.96	21.00	20.99	21.11	21.09	21.52	21.05	21.06	21.00
		256QAM	19.00	18.99	19.02	19.04	19.00	18.97	19.02	19.03	19.01
	1777.50	BPSK	23.08	23.62	23.72	23.68	23.22	23.19	23.68	23.20	23.14
		QPSK	22.52	23.45	23.54	23.52	22.53	22.69	23.51	22.77	22.73
		16QAM	21.64	22.62	22.67	22.68	21.65	21.66	22.58	21.75	21.70
		64QAM	21.10	21.16	21.24	21.18	21.23	21.17	21.19	21.20	21.17
		256QAM	19.18	19.15	19.26	19.23	19.17	19.13	19.19	19.20	19.16
10	1715.00	BPSK	23.05	23.49	23.60	23.44	22.91	23.03	23.49	23.03	22.99
		QPSK	22.35	23.39	23.40	23.31	22.35	22.46	23.48	22.46	22.50
		16QAM	21.48	22.47	22.44	22.44	21.41	21.52	22.50	21.49	21.54
		64QAM	21.07	21.10	20.98	20.97	20.90	21.05	21.01	21.02	21.03
		256QAM	19.04	19.04	19.05	18.96	18.97	19.00	18.99	18.99	19.00
	1745.00	BPSK	22.97	23.45	23.57	23.56	23.03	22.98	23.52	23.09	23.00
		QPSK	22.43	23.42	23.55	23.60	22.66	22.49	23.54	22.58	22.53
		16QAM	21.52	22.56	22.61	22.72	21.74	21.52	22.61	21.63	21.66
		64QAM	21.02	21.06	21.02	21.05	21.01	21.06	20.98	20.94	20.91
		256QAM	19.03	19.02	19.03	18.95	18.97	18.99	18.95	19.06	19.02
	1775.00	BPSK	23.14	23.35	23.44	23.43	22.95	22.92	23.32	22.96	23.20
		QPSK	22.58	23.31	23.41	23.39	22.65	22.66	23.33	22.75	22.70
		16QAM	21.65	22.64	22.66	22.78	21.81	21.59	22.69	21.72	21.72
		64QAM	21.26	21.29	21.25	21.29	21.30	21.24	21.29	21.28	21.23
		256QAM	19.14	19.12	19.16	19.15	19.13	19.15	19.12	19.13	19.14
15	1717.50	BPSK	22.75	23.34	23.40	23.37	23.25	22.82	23.39	23.02	23.09

		QPSK	22.29	23.27	23.37	23.28	22.31	22.28	23.32	22.41	22.45
		16QAM	21.37	22.35	22.40	22.35	21.37	21.48	22.41	21.41	21.48
		64QAM	20.95	21.02	20.87	20.85	20.75	20.95	20.93	20.92	20.95
		256QAM	19.04	19.04	19.05	18.96	18.97	19.00	18.99	18.99	19.00
	1745.00	BPSK	22.91	23.38	23.53	23.48	23.50	22.91	23.45	23.01	23.05
		QPSK	22.39	23.37	23.52	23.51	22.63	22.43	23.48	22.52	22.47
		16QAM	21.47	22.50	22.57	22.67	21.63	21.46	22.57	21.52	21.60
		64QAM	20.95	21.02	20.95	21.02	20.95	21.03	20.92	20.88	20.86
		256QAM	19.01	19.02	19.03	19.01	19.01	19.03	19.02	19.02	19.03
	1772.50	BPSK	23.25	23.69	23.71	23.61	23.65	23.27	23.71	22.98	23.29
		QPSK	22.67	23.70	23.56	23.59	22.60	22.78	23.70	22.68	22.78
		16QAM	21.72	22.68	22.71	22.82	21.88	21.64	22.73	21.78	21.79
		64QAM	21.28	21.37	21.30	21.39	21.36	21.29	21.36	21.33	21.26
		256QAM	19.19	19.19	19.18	19.20	19.19	19.21	19.18	19.19	19.18
20	1720.00	BPSK	22.96	23.49	23.40	23.31	22.75	22.96	23.44	22.88	22.85
		QPSK	22.44	23.46	23.35	23.22	22.28	22.36	23.38	22.76	22.45
		16QAM	21.51	22.25	22.26	22.28	21.25	21.38	22.34	21.34	21.32
		64QAM	20.79	20.98	20.76	20.77	20.67	20.84	20.88	20.84	20.92
		256QAM	19.01	19.02	19.01	18.94	18.95	18.94	18.96	18.95	18.97
	1745.00	BPSK	22.99	23.50	23.54	23.57	23.10	23.02	23.55	23.05	23.02
		QPSK	22.43	23.32	23.49	23.48	22.59	22.39	23.39	22.50	22.45
		16QAM	21.44	22.38	22.41	22.61	21.58	21.43	22.51	21.49	21.51
		64QAM	20.91	20.98	20.91	20.95	20.89	20.94	20.84	20.81	20.79
		256QAM	19.05	19.08	19.05	19.07	19.05	19.02	19.05	19.04	19.07
	1770.00	BPSK	23.18	23.59	23.64	23.54	23.59	23.25	23.68	22.93	23.22
		QPSK	22.60	23.59	23.48	23.48	22.53	22.71	23.61	22.57	22.71
		16QAM	21.68	22.61	22.68	22.75	21.79	21.58	22.68	21.72	21.71
		64QAM	21.21	21.31	21.24	21.32	21.28	21.22	21.29	21.28	21.19
		256QAM	19.10	19.12	19.11	19.12	19.12	19.13	19.12	19.14	19.12
40	1730.00	BPSK	23.11	23.65	23.46	23.65	23.14	23.18	23.58	23.16	23.07
		QPSK	22.56	23.58	23.40	23.56	22.59	22.69	23.58	22.63	22.62
		16QAM	21.66	22.67	22.51	22.55	21.52	21.64	22.55	21.62	21.67
		64QAM	21.19	21.12	21.17	21.01	21.05	20.95	20.90	21.08	21.10
		256QAM	19.34	19.36	19.04	19.23	19.23	19.18	19.11	19.10	19.16
	1760.00	BPSK	23.21	23.66	23.62	23.83	23.43	23.21	23.66	23.33	23.17
		QPSK	22.54	23.47	23.57	23.81	22.86	22.58	23.69	22.81	22.66

		16QAM	21.57	22.65	22.60	22.96	21.84	21.67	22.65	21.78	21.69
		64QAM	21.19	21.16	21.12	21.38	21.40	21.19	21.12	21.25	21.19
		256QAM	19.12	19.20	19.16	19.33	19.43	19.19	19.17	19.26	19.19

13.2 EIRP & ERP

All modes of operation were investigated, and the worst-case configuration results are reported in this section.

NR Band n2

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Pol (H/V)	Measured Level (dBm)	Ant Gain(dBI)	EIRP (dBm)	EIRP (W)
5	1 852.50	π/2 BPSK	1/12	H	17.13	10.25	27.38	0.547
		QPSK	1/12	H	15.91	10.25	26.16	0.413
		16QAM	1/12	H	14.33	10.25	24.58	0.287
		64QAM	1/12	H	12.93	10.25	23.18	0.208
		256QAM	1/12	H	10.70	10.25	20.95	0.124
	1 880.00	π/2 BPSK	1/12	H	17.03	10.28	27.31	0.538
		QPSK	1/12	H	16.16	10.28	26.44	0.441
		16QAM	1/12	H	13.93	10.28	24.21	0.264
		64QAM	1/12	H	12.85	10.28	23.13	0.206
		256QAM	1/12	H	10.65	10.28	20.93	0.124
	1 907.50	π/2 BPSK	1/12	H	15.16	10.30	25.46	0.352
		QPSK	1/12	H	15.12	10.30	25.42	0.348
		16QAM	1/12	H	14.40	10.30	24.70	0.295
		64QAM	1/12	H	13.02	10.30	23.32	0.215
		256QAM	1/12	H	10.84	10.30	21.14	0.130
10	1 855.00	π/2 BPSK	1/0	H	17.01	10.25	27.26	0.532
		QPSK	1/0	H	15.84	10.25	26.09	0.406
		16QAM	1/0	H	14.21	10.25	24.46	0.279
		64QAM	1/0	H	12.60	10.25	22.85	0.193
		256QAM	1/0	H	10.76	10.25	21.01	0.126
	1 880.00	π/2 BPSK	1/0	H	16.94	10.28	27.22	0.527
		QPSK	1/0	H	16.03	10.28	26.31	0.428
		16QAM	1/0	H	14.02	10.28	24.30	0.269
		64QAM	1/0	H	12.70	10.28	22.98	0.199
		256QAM	1/0	H	10.78	10.28	21.06	0.128
	1 905.00	π/2 BPSK	1/0	H	15.69	10.30	25.99	0.397
		QPSK	1/0	H	14.91	10.30	25.21	0.332

		16QAM	1/0	H	14.04	10.30	24.34	0.272
		64QAM	1/0	H	12.90	10.30	23.20	0.209
		π/2 BPSK	1/0	H	17.01	10.25	27.26	0.532
15	1 857.50	π/2 BPSK	1/37	H	17.41	10.27	27.68	0.586
		QPSK	1/37	H	15.72	10.27	25.99	0.397
		16QAM	1/37	H	14.35	10.27	24.62	0.290
		64QAM	1/37	H	12.95	10.27	23.22	0.210
		256QAM	1/37	H	10.70	10.27	20.97	0.125
	1 880.00	π/2 BPSK	1/37	H	17.11	10.28	27.39	0.548
		QPSK	1/37	H	15.85	10.28	26.13	0.410
		16QAM	1/37	H	14.52	10.28	24.80	0.302
		64QAM	1/37	H	12.81	10.28	23.09	0.204
		256QAM	1/37	H	10.48	10.28	20.76	0.119
	1 902.50	π/2 BPSK	1/37	H	16.66	10.30	26.96	0.497
		QPSK	1/37	H	15.10	10.30	25.40	0.347
		16QAM	1/37	H	14.79	10.30	25.09	0.323
		64QAM	1/37	H	13.14	10.30	23.44	0.221
		256QAM	1/37	H	10.61	10.30	20.91	0.123
20	1 860.00	π/2 BPSK	1/1	H	16.66	10.26	26.92	0.492
		QPSK	1/1	H	16.14	10.26	26.40	0.437
		16QAM	1/1	H	14.50	10.26	24.76	0.299
		64QAM	1/1	H	13.19	10.26	23.45	0.221
		256QAM	1/1	H	11.16	10.26	21.42	0.139
	1 880.00	π/2 BPSK	1/1	H	16.92	10.28	27.20	0.525
		QPSK	1/1	H	16.12	10.28	26.40	0.437
		16QAM	1/1	H	14.28	10.28	24.56	0.286
		64QAM	1/1	H	12.73	10.28	23.01	0.200
		256QAM	1/1	H	10.57	10.28	20.85	0.122
	1 900.00	π/2 BPSK	1/1	H	17.35	10.30	27.65	0.582
		QPSK	1/1	H	15.57	10.30	25.87	0.386
		16QAM	1/1	H	14.80	10.30	25.10	0.324
		64QAM	1/1	H	13.26	10.30	23.56	0.227
		256QAM	1/1	H	11.13	10.30	21.43	0.139

NR Band n5

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Pol (H/V)	Measured Level (dBm)	Ant Gain(dBI)	ERP (dBm)	ERP (W)
5	826.5	π/2 BPSK	1/1	H	17.88	2.84	20.72	0.118
		QPSK	1/1	H	15.91	2.84	18.75	0.075
		16QAM	1/1	H	14.92	2.84	17.76	0.060
		64QAM	1/1	H	12.92	2.84	15.76	0.038
		256QAM	1/1	H	10.47	2.84	13.31	0.021
	836.5	π/2 BPSK	1/1	H	17.44	2.88	20.32	0.108
		QPSK	1/1	H	16.47	2.88	19.35	0.086
		16QAM	1/1	H	15.60	2.88	18.48	0.070
		64QAM	1/1	H	13.42	2.88	16.30	0.043
		256QAM	1/1	H	10.97	2.88	13.85	0.024
	846.5	π/2 BPSK	1/1	H	19.02	2.52	21.54	0.143
		QPSK	1/1	H	17.73	2.52	20.25	0.106
		16QAM	1/1	H	16.76	2.52	19.28	0.085
		64QAM	1/1	H	14.61	2.52	17.13	0.052
		256QAM	1/1	H	12.35	2.52	14.87	0.031
10	829	π/2 BPSK	1/50	H	17.78	2.92	20.70	0.117
		QPSK	1/50	H	16.66	2.92	19.58	0.091
		16QAM	1/50	H	16.37	2.92	19.29	0.085
		64QAM	1/50	H	15.27	2.92	18.19	0.066
		256QAM	1/50	H	12.49	2.92	15.41	0.035
	836.5	π/2 BPSK	1/50	H	17.47	2.88	20.35	0.108
		QPSK	1/50	H	17.39	2.88	20.27	0.106
		16QAM	1/50	H	16.92	2.88	19.80	0.095
		64QAM	1/50	H	15.36	2.88	18.24	0.067
		256QAM	1/50	H	13.06	2.88	15.94	0.039
	844	π/2 BPSK	1/50	H	17.97	2.65	20.62	0.115
		QPSK	1/50	H	17.62	2.65	20.27	0.106
		16QAM	1/50	H	17.22	2.65	19.87	0.097
		64QAM	1/50	H	15.93	2.65	18.58	0.072
		256QAM	1/50	H	13.04	2.65	15.69	0.037
15	831.5	π/2 BPSK	1/0	H	20.46	2.93	23.39	0.218
		QPSK	1/0	H	18.20	2.93	21.13	0.130

		16QAM	1/0	H	15.25	2.93	18.18	0.066
		64QAM	1/0	H	14.29	2.93	17.22	0.053
		256QAM	1/0	H	11.71	2.93	14.64	0.029
	836.5	π/2 BPSK	1/0	H	19.99	2.88	22.87	0.194
		QPSK	1/0	H	19.25	2.88	22.13	0.163
		16QAM	1/0	H	15.60	2.88	18.48	0.070
		64QAM	1/0	H	14.48	2.88	17.36	0.054
		256QAM	1/0	H	11.81	2.88	14.69	0.029
	841.5	π/2 BPSK	1/0	H	17.85	2.77	20.62	0.115
		QPSK	1/0	H	16.94	2.77	19.71	0.094
		16QAM	1/0	H	15.44	2.77	18.21	0.066
		64QAM	1/0	H	14.31	2.77	17.08	0.051
		256QAM	1/0	H	11.83	2.77	14.60	0.029
20	834	π/2 BPSK	1/0	H	15.27	2.91	18.18	0.066
		QPSK	1/0	H	15.16	2.91	18.07	0.064
		16QAM	1/0	H	14.25	2.91	17.16	0.052
		64QAM	1/0	H	12.80	2.91	15.71	0.037
		256QAM	1/0	H	10.31	2.91	13.22	0.021
	836.5	π/2 BPSK	1/0	H	17.08	2.88	19.96	0.099
		QPSK	1/0	H	16.07	2.88	18.95	0.079
		16QAM	1/0	H	15.26	2.88	18.14	0.065
		64QAM	1/0	H	13.82	2.88	16.70	0.047
		256QAM	1/0	H	11.44	2.88	14.32	0.027
	839	π/2 BPSK	1/0	H	19.66	2.86	22.52	0.179
		QPSK	1/0	H	18.42	2.86	21.28	0.134
		16QAM	1/0	H	16.49	2.86	19.35	0.086
		64QAM	1/0	H	14.96	2.86	17.82	0.061
		256QAM	1/0	H	11.70	2.86	14.56	0.029

NR Band n66

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Pol (H/V)	Measured Level (dBm)	Ant Gain(dBI)	EIRP (dBm)	EIRP (W)
40	1 712.50	π/2 BPSK	1/11	H	15.71	9.93	25.64	0.366
		QPSK	1/11	H	15.66	9.93	25.59	0.362
		16QAM	1/11	H	14.28	9.93	24.21	0.264
		64QAM	1/11	H	12.83	9.93	22.76	0.189
		256QAM	1/11	H	10.84	9.93	20.77	0.119
	1 745.00	π/2 BPSK	1/11	H	16.48	10.03	26.51	0.448
		QPSK	1/11	H	16.21	10.03	26.24	0.421
		16QAM	1/11	H	14.27	10.03	24.30	0.269
		64QAM	1/11	H	12.74	10.03	22.77	0.189
		256QAM	1/11	H	10.60	10.03	20.63	0.116
	1 777.00	π/2 BPSK	1/11	H	16.75	10.13	26.88	0.488
		QPSK	1/11	H	16.52	10.13	26.65	0.462
		16QAM	1/11	H	14.50	10.13	24.63	0.290
		64QAM	1/11	H	13.08	10.13	23.21	0.209
		256QAM	1/11	H	10.89	10.13	21.02	0.126
10	1 715.00	π/2 BPSK	1/25	H	16.33	9.94	26.27	0.424
		QPSK	1/25	H	16.17	9.94	26.11	0.408
		16QAM	1/25	H	14.42	9.94	24.36	0.273
		64QAM	1/25	H	12.87	9.94	22.81	0.191
		256QAM	1/25	H	10.73	9.94	20.67	0.117
	1 745.00	π/2 BPSK	1/25	H	16.86	10.03	26.89	0.489
		QPSK	1/25	H	16.70	10.03	26.73	0.471
		16QAM	1/25	H	14.25	10.03	24.28	0.268
		64QAM	1/25	H	12.80	10.03	22.83	0.192
		256QAM	1/25	H	10.49	10.03	20.52	0.113
	1 775.00	π/2 BPSK	1/25	H	17.19	10.12	27.31	0.538
		QPSK	1/25	H	17.01	10.12	27.13	0.516
		16QAM	1/25	H	14.73	10.12	24.85	0.305
		64QAM	1/25	H	13.20	10.12	23.32	0.215
		256QAM	1/25	H	10.99	10.12	21.11	0.129
15	1 717.50	π/2 BPSK	1/38	H	17.11	9.95	27.06	0.508
		QPSK	1/38	H	17.01	9.95	26.96	0.497

		16QAM	1/38	H	14.58	9.95	24.53	0.284
		64QAM	1/38	H	12.95	9.95	22.90	0.195
		256QAM	1/38	H	10.91	9.95	20.86	0.122
	1 745.00	π/2 BPSK	1/38	H	16.87	10.03	26.90	0.490
		QPSK	1/38	H	16.63	10.03	26.66	0.463
		16QAM	1/38	H	14.24	10.03	24.27	0.267
		64QAM	1/38	H	12.67	10.03	22.70	0.186
		256QAM	1/38	H	10.58	10.03	20.61	0.115
	1 772.50	π/2 BPSK	1/38	H	17.34	10.11	27.45	0.556
		QPSK	1/38	H	17.19	10.11	27.30	0.537
		16QAM	1/38	H	15.03	10.11	25.14	0.327
		64QAM	1/38	H	13.43	10.11	23.54	0.226
		256QAM	1/38	H	11.32	10.11	21.43	0.139
20	1 720.00	π/2 BPSK	1/52	H	17.94	9.96	27.90	0.617
		QPSK	1/52	H	17.53	9.96	27.49	0.561
		16QAM	1/52	H	14.96	9.96	24.92	0.310
		64QAM	1/52	H	13.38	9.96	23.34	0.216
		256QAM	1/52	H	11.44	9.96	21.40	0.138
	1 745.00	π/2 BPSK	1/52	H	16.88	10.03	26.91	0.491
		QPSK	1/52	H	16.79	10.03	26.82	0.481
		16QAM	1/52	H	14.27	10.03	24.30	0.269
		64QAM	1/52	H	12.64	10.03	22.67	0.185
		256QAM	1/52	H	10.54	10.03	20.57	0.114
	1 770.00	π/2 BPSK	1/52	H	17.04	10.11	27.15	0.519
		QPSK	1/52	H	16.83	10.11	26.94	0.494
		16QAM	1/52	H	15.11	10.11	25.22	0.333
		64QAM	1/52	H	13.48	10.11	23.59	0.229
		256QAM	1/52	H	11.44	10.11	21.55	0.143

13.3 RADIATED SPURIOUS EMISSIONS

All modes of operation were investigated, and the worst-case configuration results are reported in this section.

Band 2

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Measured Frequency (MHz)	Pol (H/V)	Measured Level (dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
15	1 875.5	π/2 BPSK	1/1	3 713.80	H	-51.68	12.78	-38.90	-13.00	25.90
				5 592.90	H	-63.99	13.59	-50.40	-13.00	37.40
		QPSK	1/1	3 714.04	H	-52.87	12.78	-40.09	-13.00	27.09
				5 592.90	H	-64.53	13.59	-50.94	-13.00	37.94
		16QAM	1/1	3 713.96	H	-54.11	12.76	-41.35	-13.00	28.35
				5 593.14	H	-65.39	13.59	-51.80	-13.00	38.80
		64QAM	1/1	3 713.88	H	-56.15	12.78	-43.37	-13.00	30.37
				5 592.82	H	-65.78	13.59	-52.19	-13.00	39.19
		256QAM	1/1	3 700.76	H	-56.12	12.79	-43.33	-13.00	30.33
				5 592.9	H	-66.06	13.59	-52.47	-13.00	39.47
	1 880	π/2 BPSK	1/1	3 758.96	H	-51.96	12.74	-39.22	-13.00	26.22
				5 638.40	H	-61.02	13.58	-47.44	-13.00	34.44
		QPSK	1/1	3 758.96	H	-53.07	12.74	-40.33	-13.00	27.33
				5 638.32	H	-61.86	13.58	-48.28	-13.00	35.28
		16QAM	1/1	3 746.24	H	-54.13	12.75	-41.38	-13.00	28.38
				5 618.80	H	-63.05	13.59	-49.46	-13.00	36.46
		64QAM	1/1	3 746.00	H	-55.32	12.75	-42.57	-13.00	29.57
				5 619.04	H	-64.20	13.59	-50.61	-13.00	37.61
		256QAM	1/1	3 760.15	H	-55.33	12.79	-42.54	-13.00	29.54
				5 640.18	H	-64.29	13.59	-50.70	-13.00	37.70
	1902.5	π/2 BPSK	1/1	3 803.80	H	-56.13	12.70	-43.43	-13.00	30.43
				5 706.06	H	-63.93	13.54	-50.39	-13.00	37.39
		QPSK	1/1	3 803.88	H	-56.55	12.70	-43.85	-13.00	30.85
				5 705.82	H	-63.95	13.54	-50.41	-13.00	37.41
		16QAM	1/1	3 803.80	H	-57.85	12.70	-45.15	-13.00	32.15
				5 705.90	H	-65.15	13.54	-51.61	-13.00	38.61
		64QAM	1/1	3 804.20	H	-59.31	12.70	-46.61	-13.00	33.61
				5 706.06	H	-66.19	13.54	-52.65	-13.00	39.65
		256QAM	1/1	3791.16	H	-59.15	12.70	-46.45	-13.00	33.45

				5686.54	H	-66.07	13.55	-52.52	-13.00	39.52

Band 5

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Measured Frequency (MHz)	Pol (H/V)	Measured Level (dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
15	831.5	π/2 BPSK	1/37	1 649.39	H	-49.46	7.49	-41.97	-13.00	28.97
				2 473.81	H	-63.50	8.49	-55.01	-13.00	42.01
				4 147.12	H	-56.37	10.65	-45.72	-13.00	32.72
		QPSK	1/37	1 649.46	H	-53.36	7.49	-45.87	-13.00	32.87
				2 473.59	H	-63.96	8.49	-55.47	-13.00	42.47
				4 147.24	H	-57.18	10.65	-46.53	-13.00	33.53
		16QAM	1/37	1 649.16	H	-54.10	7.49	-46.61	-13.00	33.61
				2 473.12	H	-63.98	8.49	-55.49	-13.00	42.49
				4 147.84	H	-57.66	10.65	-47.01	-13.00	34.01
		64QAM	1/37	1 649.31	H	-56.00	7.49	-48.51	-13.00	35.51
				2 473.89	H	-64.69	8.49	-56.20	-13.00	43.20
				4 147.63	H	-56.83	10.65	-46.18	-13.00	33.18
		256QAM	1/37	1 649.46	H	-58.99	7.49	-51.50	-13.00	38.50
				2 473.46	H	-65.07	8.49	-56.58	-13.00	43.58
				4 147.45	H	-61.45	10.65	-50.80	-13.00	37.80
	836.5	π/2 BPSK	1/37	1 658.43	H	-54.00	7.54	-46.46	-13.00	33.46
				2 488.29	H	-60.76	8.52	-52.24	-13.00	39.24
				4 182.64	H	-50.68	10.65	-40.03	-13.00	27.03
		QPSK	1/37	1 673.29	H	-53.81	7.54	-46.27	-13.00	33.27
				2 509.11	H	-61.17	8.52	-52.65	-13.00	39.65
				4 183.46	H	-51.03	10.65	-40.38	-13.00	27.38
		16QAM	1/37	1 673.54	H	-55.42	7.54	-47.88	-13.00	34.88
				2 509.26	H	-61.87	8.52	-53.35	-13.00	40.35
				4 182.18	H	-51.98	10.65	-41.33	-13.00	28.33
		64QAM	1/37	1 673.63	H	-56.97	7.54	-49.43	-13.00	36.43
				2 510.85	H	-63.30	8.52	-54.78	-13.00	41.78
				4 182.10	H	-56.84	10.65	-46.19	-13.00	33.19
		256QAM	1/37	1 673.36	H	-59.69	7.54	-52.15	-13.00	39.15
				2 510.54	H	-64.13	8.52	-55.61	-13.00	42.61
				4 182.28	H	-58.69	10.65	-48.04	-13.00	35.04

	841.5	π/2 BPSK	1/37	1 677.44	H	-54.00	7.63	-46.37	-13.00	33.37
				2 517.16	H	-60.53	8.61	-51.92	-13.00	38.92
				4 195.88	H	-50.22	10.65	-39.57	-13.00	26.57
		QPSK	1/37	1 677.26	H	-54.54	7.63	-46.91	-13.00	33.91
				2 517.73	H	-60.67	8.61	-52.06	-13.00	39.06
				4 195.41	H	-52.00	10.65	-41.35	-13.00	28.35
		16QAM	1/37	1 678.54	H	-55.56	7.63	-47.93	-13.00	34.93
				2 517.63	H	-61.46	8.61	-52.85	-13.00	39.85
				4 195.48	H	-53.59	10.65	-42.94	-13.00	29.94
		64QAM	1/37	1 678.11	H	-57.67	7.63	-50.04	-13.00	37.04
				2 517.23	H	-62.27	8.61	-53.66	-13.00	40.66
				4 195.59	H	-57.39	10.65	-46.74	-13.00	33.74
		256QAM	1/37	1 678.84	H	-58.75	7.63	-51.12	-13.00	38.12
				2 517.19	H	-64.31	8.61	-55.70	-13.00	42.70
				4 195.22	H	-59.42	10.65	-48.77	-13.00	35.77

Band 66

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Measured Frequency (MHz)	Pol (H/V)	Measured Level (dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
40	1 730.00	π/2 BPSK	1/1	3 421.36	H	-61.49	12.83	-48.66	-13.00	35.66
				5 132.13	H	-64.18	12.83	-51.35	-13.00	38.35
		QPSK	1/1	3 421.40	H	-58.72	12.83	-45.89	-13.00	32.89
				5 132.49	H	-61.89	12.83	-49.06	-13.00	36.06
		16QAM	1/1	3 421.43	H	-61.46	12.83	-48.63	-13.00	35.63
				5 132.29	H	-63.80	12.83	-50.97	-13.00	37.97
		64QAM	1/1	3 421.29	H	-60.93	12.83	-48.10	-13.00	35.10
				5 132.44	H	-62.42	12.83	-49.59	-13.00	36.59
		256QAM	1/1	3 421.02	H	-63.33	12.83	-50.50	-13.00	37.50
				5 132.63	H	-64.88	12.83	-52.05	-13.00	39.05
	1 745.00	π/2 BPSK	1/1	3 471.23	H	-60.91	12.68	-48.23	-13.00	35.23
				5 207.50	H	-63.95	12.91	-51.04	-13.00	38.04
		QPSK	1/1	3 471.29	H	-59.92	12.68	-47.24	-13.00	34.24
				5 207.64	H	-61.40	12.91	-48.49	-13.00	35.49
		16QAM	1/1	3 471.11	H	-61.36	12.68	-48.68	-13.00	35.68
				5 207.63	H	-61.80	12.91	-48.89	-13.00	35.89
		64QAM	1/1	3 471.59	H	-61.84	12.68	-49.16	-13.00	36.16
				5 207.64	H	-62.81	12.91	-49.90	-13.00	36.90
		256QAM	1/1	3 471.48	H	-61.00	12.74	-48.26	-13.00	35.26
				5 205.00	H	-64.70	12.87	-51.83	-13.00	38.83
	1 760.00	π/2 BPSK	1/1	3 521.10	H	-61.60	12.57	-49.03	-13.00	36.03
				5 207.50	H	-65.62	12.91	-52.71	-13.00	39.71
		QPSK	1/1	3 521.49	H	-58.83	12.57	-46.26	-13.00	33.26
				5 207.63	H	-62.62	12.91	-49.71	-13.00	36.71
		16QAM	1/1	3 521.19	H	-58.62	12.57	-46.05	-13.00	33.05
				5 207.48	H	-65.88	12.91	-52.97	-13.00	39.97
		64QAM	1/1	3 521.14	H	-60.56	12.57	-47.99	-13.00	34.99
				5 207.50	H	-64.90	12.91	-51.99	-13.00	38.99
		256QAM	1/1	3 521.12	H	-63.18	12.57	-50.61	-13.00	37.61
				5 207.39	H	-62.64	12.91	-49.73	-13.00	36.73

13.4 FREQUENCY STABILITY

Operting Frequency :	1 880	MHz
Reference Voltage :	3.90	Vd.c.
Deviatin Limit :	± 0.000 25	%

Voltage (%)	Power (Vdc)	Temperature (℃)	Frequency (Hz)	Deviation (%)
100	3.90	+20(Ref)	1 880.000.007	0.000000372
100		-30	1 879.999.992	-0.000000426
100		-20	1 880.000.010	0.000000532
100		-10	1 879.999.995	-0.000000266
100		0	1 880.000.009	0.000000479
100		10	1 880.000.003	0.000000160
100		20	1 880.000.015	0.000000798
100		30	1 880.000.011	0.000000585
100		40	1 880.000.003	0.000000160
100		50	1 880.000.001	0.000000053
115	4.485	20	1 879.999.996	-0.000000213
85	3.315	20	1 880.0000.14	0.000000745

Operting Frequency :	836.5	MHz
Reference Voltage :	3.90	Vd.c.
Deviatin Limit :	± 0.000 25	%

Voltage (%)	Power (Vdc)	Temperature (℃)	Frequency (Hz)	Deviation (%)
100	3.90	+20(Ref)	836.499.998	-0.000000239
100		-30	836.499.997	-0.000000359
100		-20	836.499.993	-0.000000837
100		-10	836.499.997	-0.000000359
100		0	836.499.991	-0.000001076
100		10	836.499.998	-0.000000239
100		20	836.499.995	-0.000000598
100		30	836.499.996	-0.000000478
100		40	836.499.999	-0.000000120
100		50	836.499.994	-0.000000717
115	4.485	20	836.499.992	-0.000000956
85	3.315	20	836.499.997	-0.000000359

Operting Frequency :	1 745	MHz
Reference Voltage :	3.90	Vd.c.
Deviatin Limit :	± 0.000 25	%

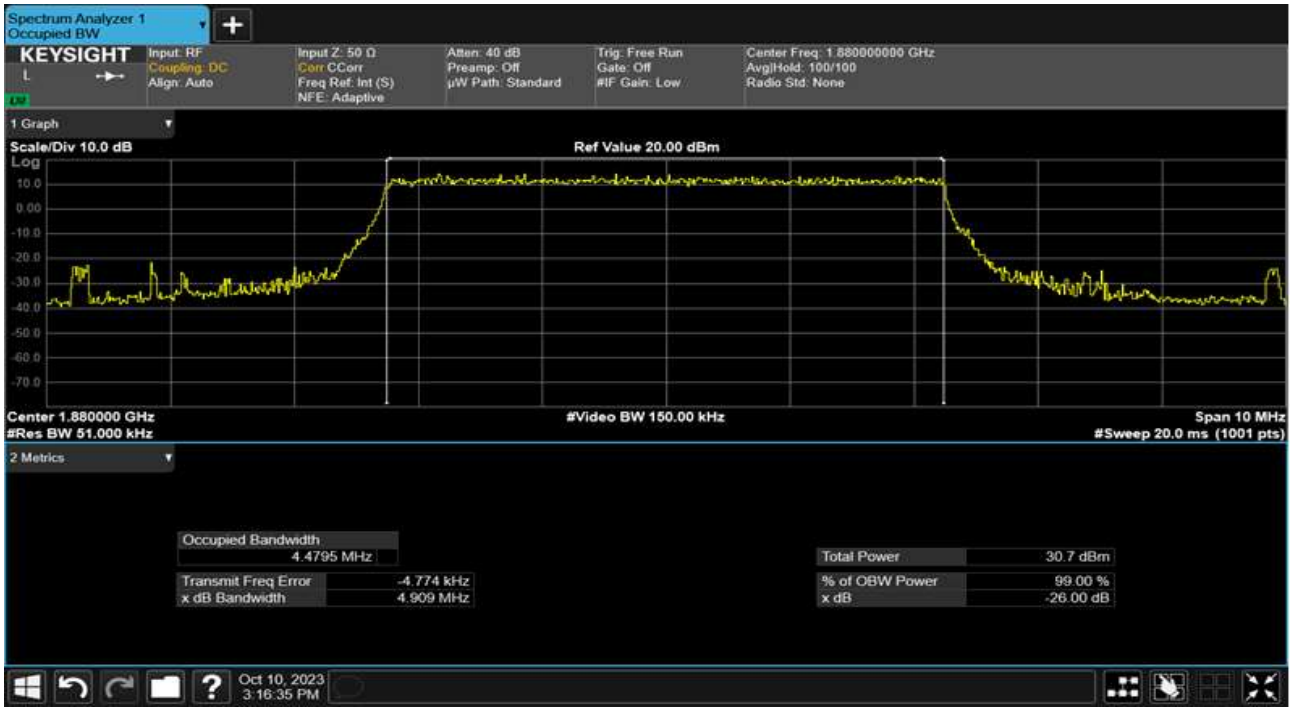
Voltage (%)	Power (Vdc)	Temperature (℃)	Frequency (Hz)	Deviation (%)
100	3.90	+20(Ref)	1 744.999.997	-0.000000172
100		-30	1 745.000.007	0.000000401
100		-20	1 744.999.995	-0.000000287
100		-10	1 744.999.998	-0.000000115
100		0	1 745.000.008	0.000000458
100		10	1 744.999.995	-0.000000287
100		20	1 745.000.014	0.000000802
100		30	1 745.000.006	0.000000344
100		40	1 745.000.011	0.000000630
100		50	1 744.999.997	-0.000000172
115	4.485	20	1 744.999.993	-0.000000401
85	3.315	20	1 745.000.003	0.000000172

13.5 OCCUPIED BANDWIDTH

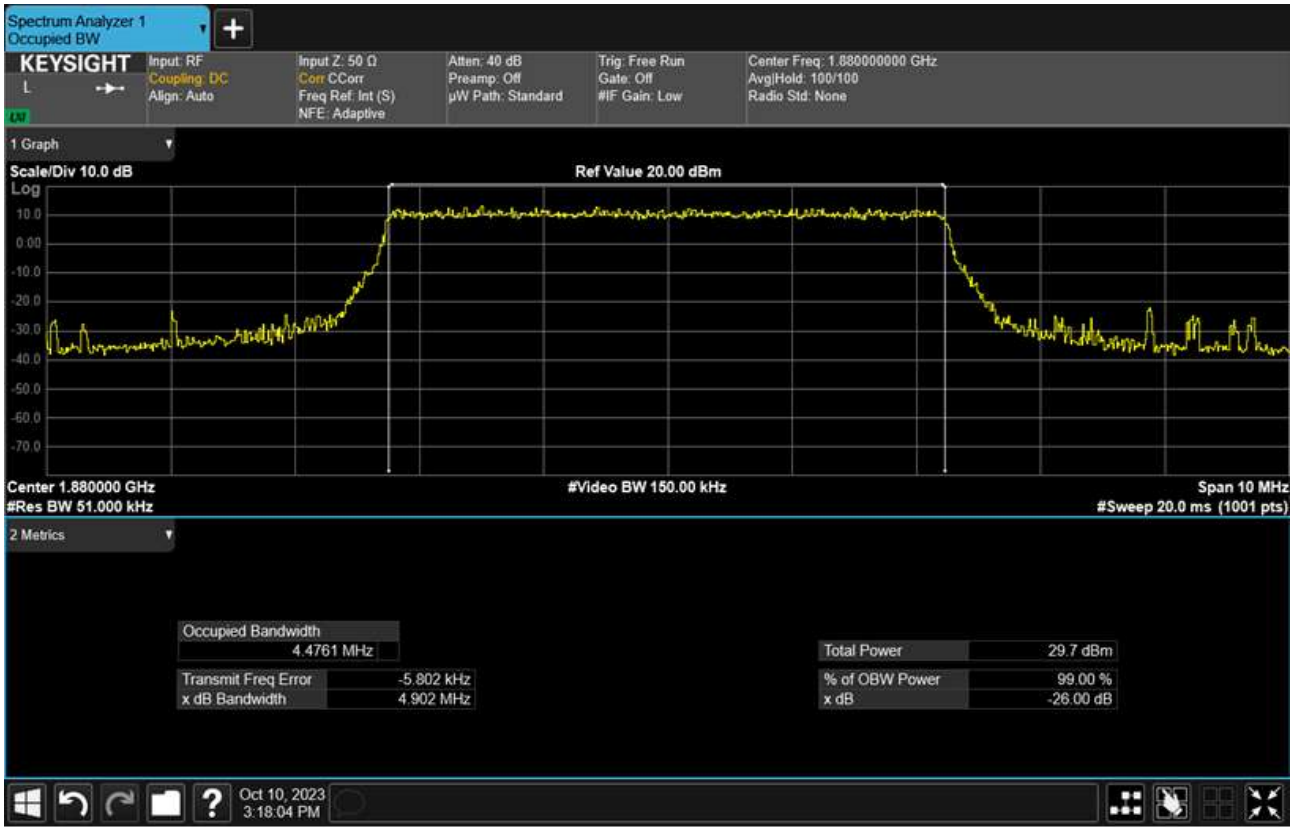
All modes of operation were investigated, and the worst-case configuration results are reported in this section.

BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, BPSK, Full RB)

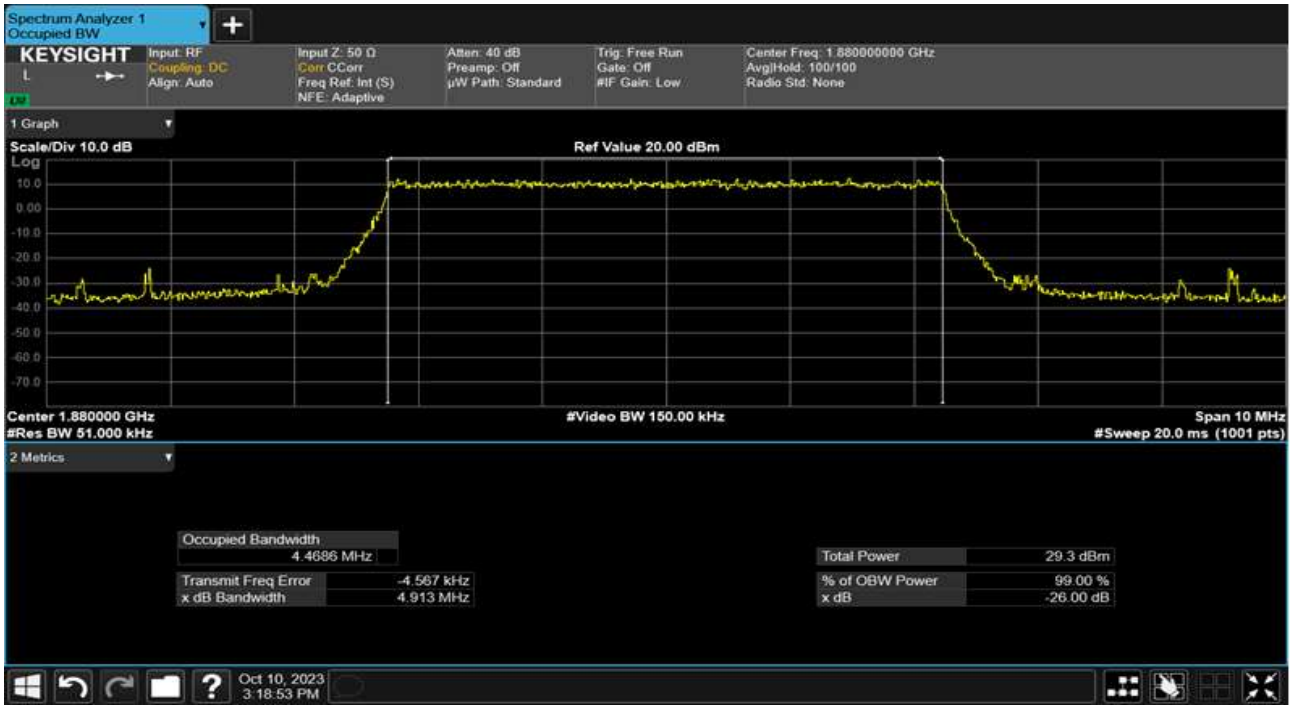
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, QPSK, Full RB)



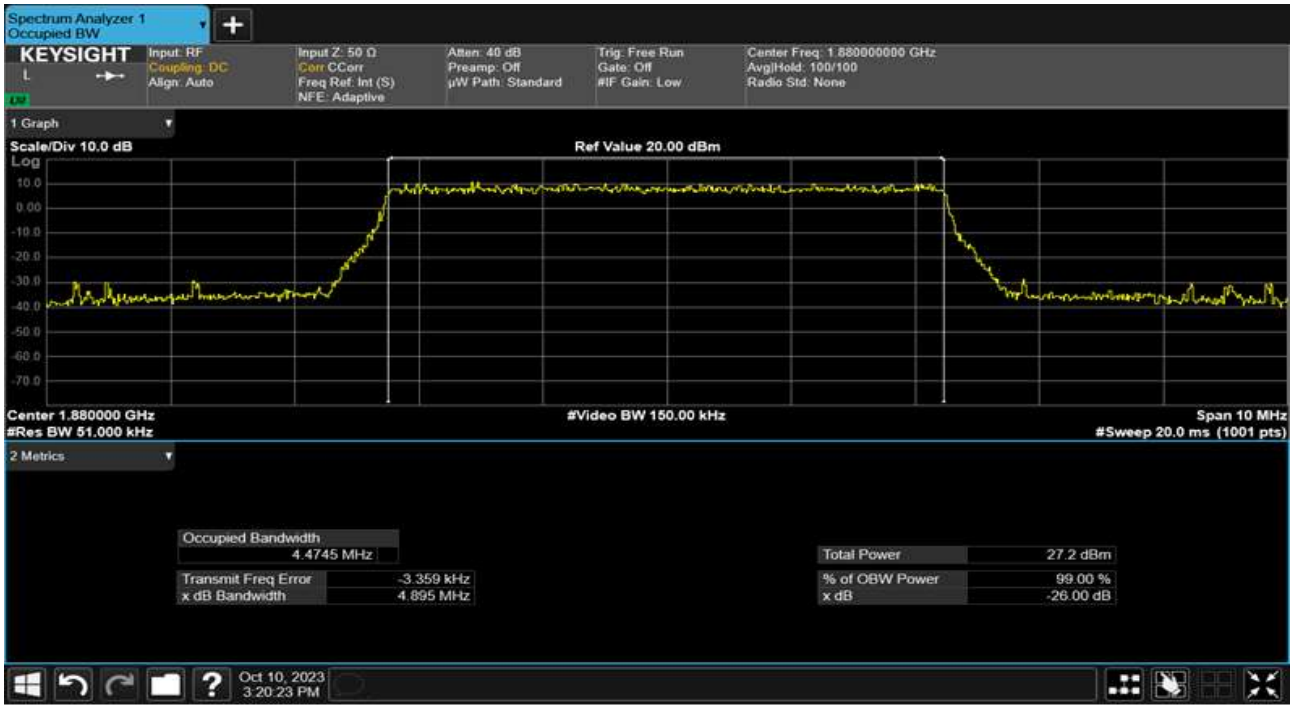
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 16QAM, Full RB)



BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 64QAM, Full RB)

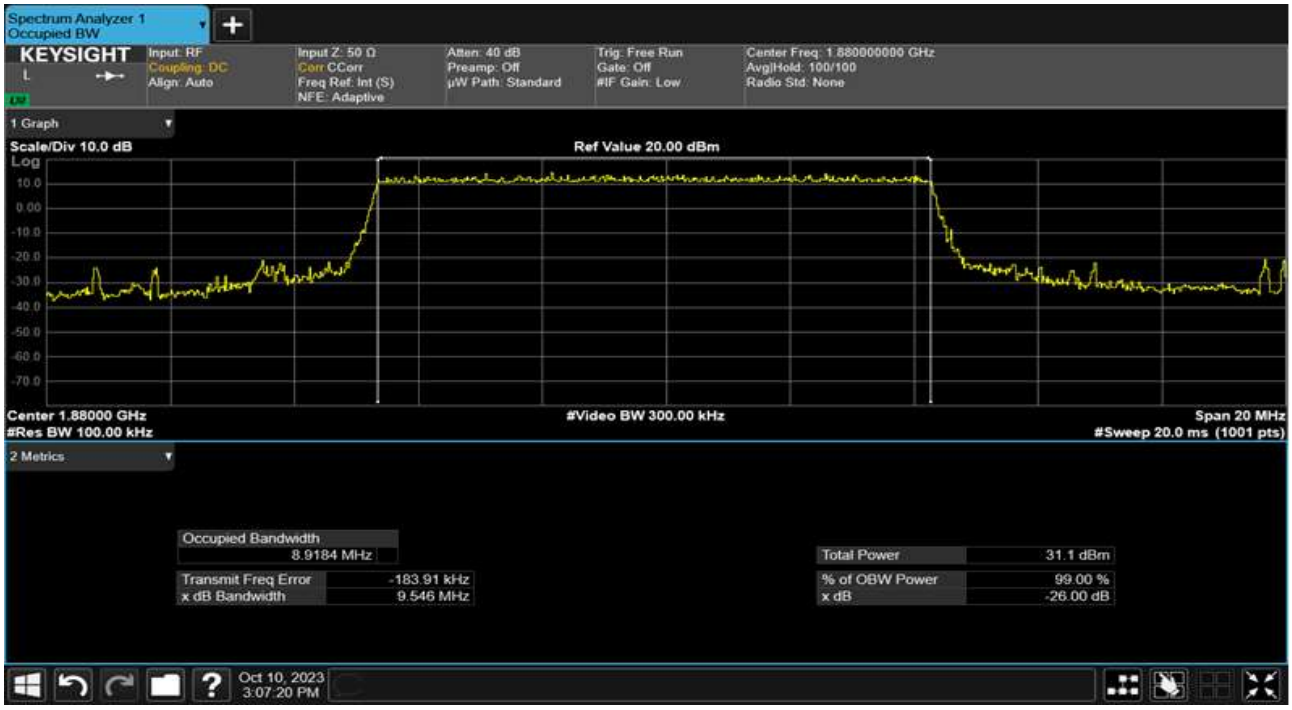


BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 256QAM, Full RB)

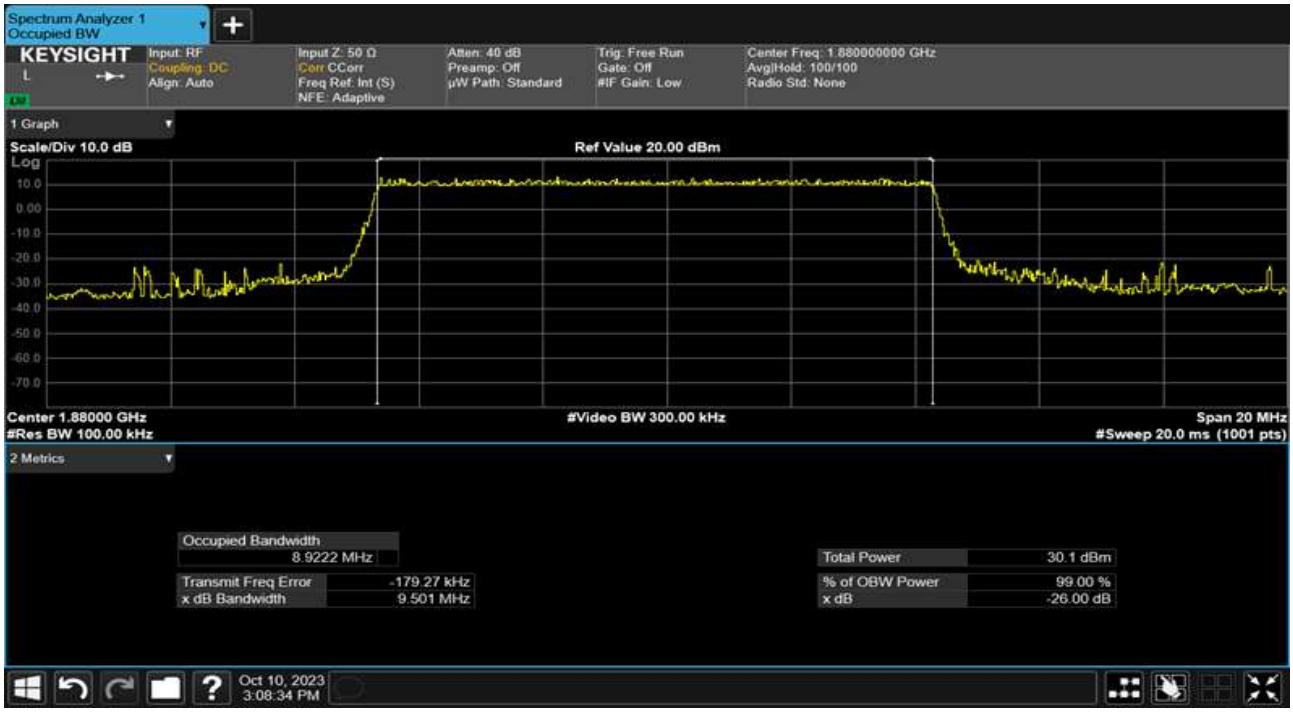


BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, BPSK, Full RB)

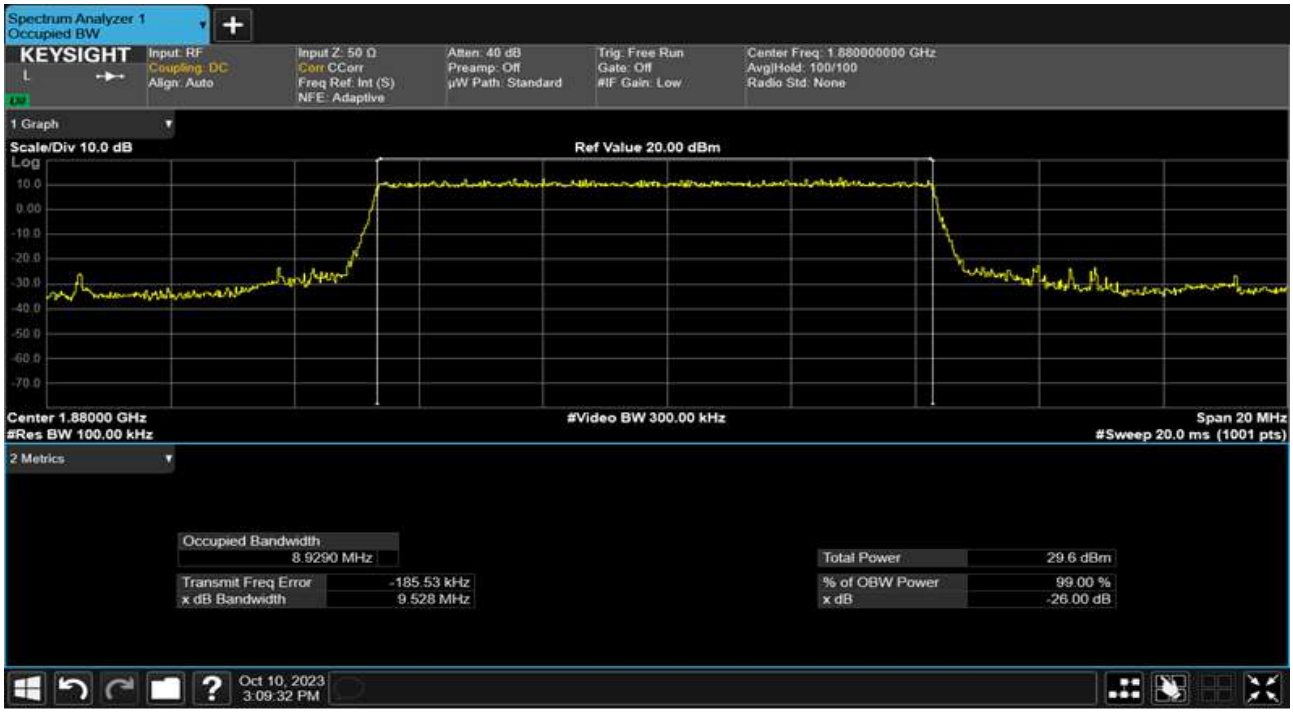
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, QPSK, Full RB)



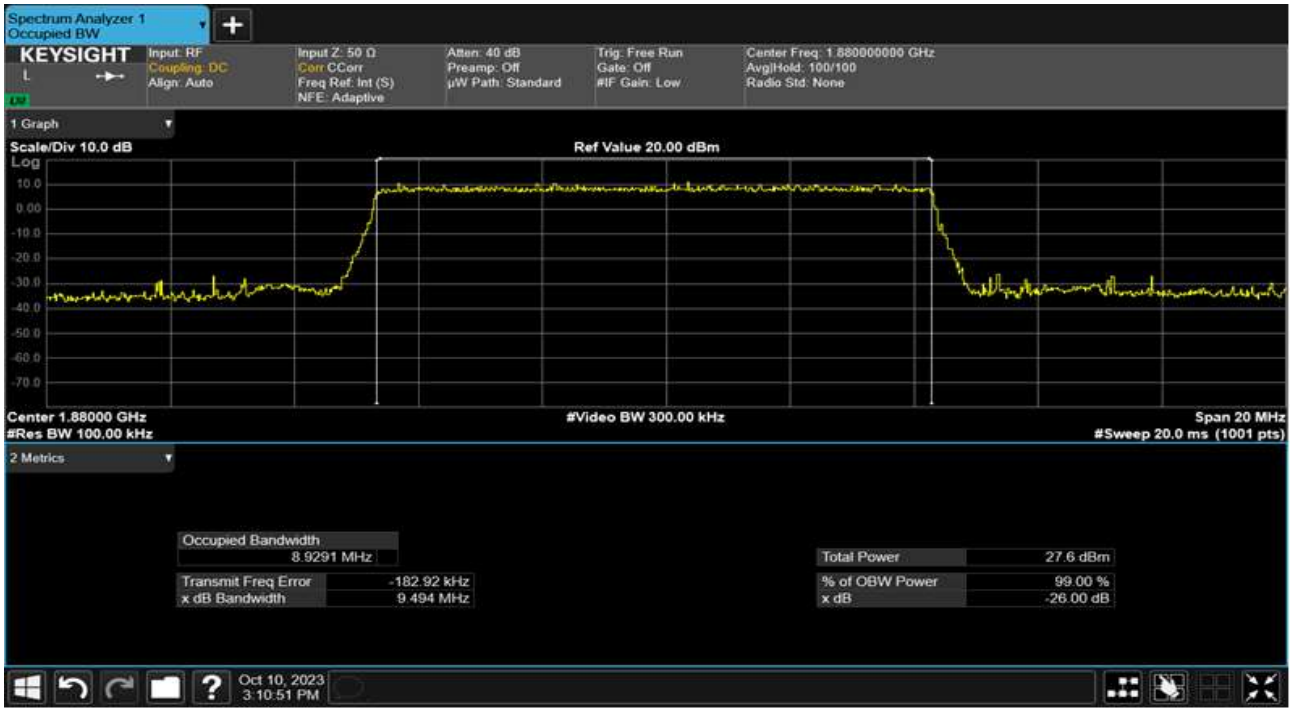
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 16QAM, Full RB)



BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 64QAM, Full RB)

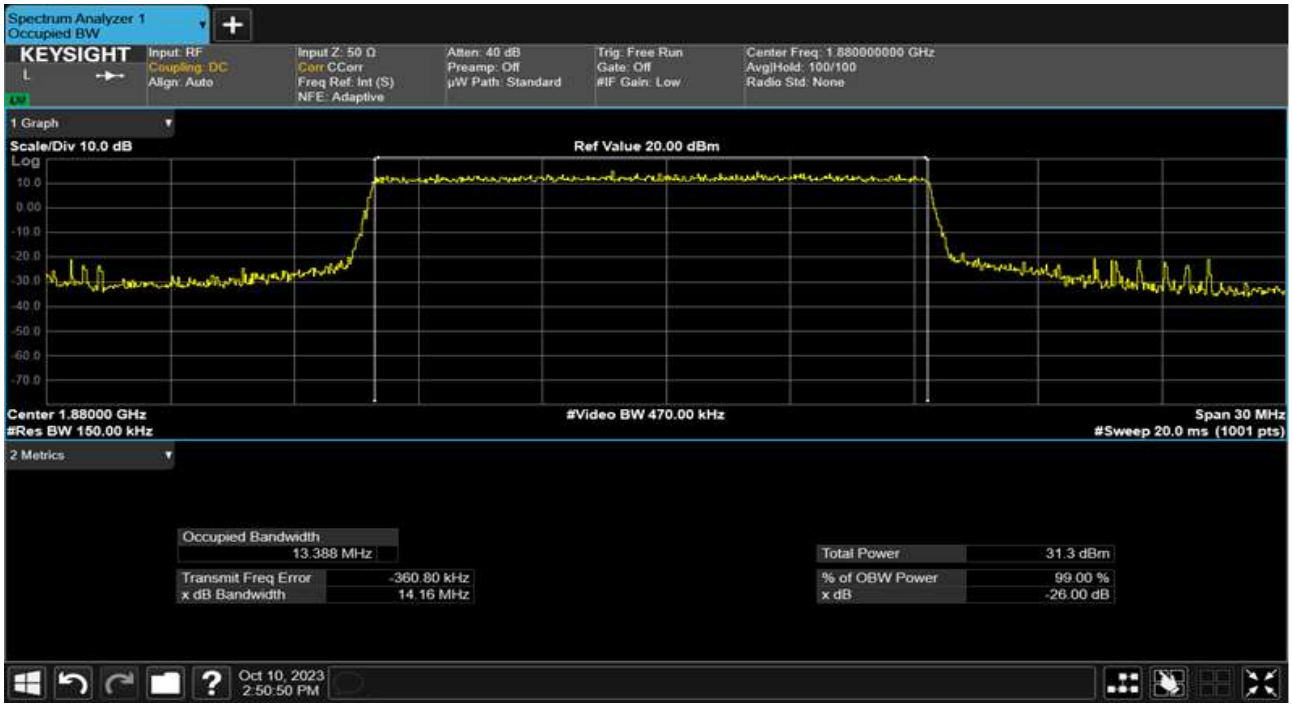


BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 256QAM, Full RB)

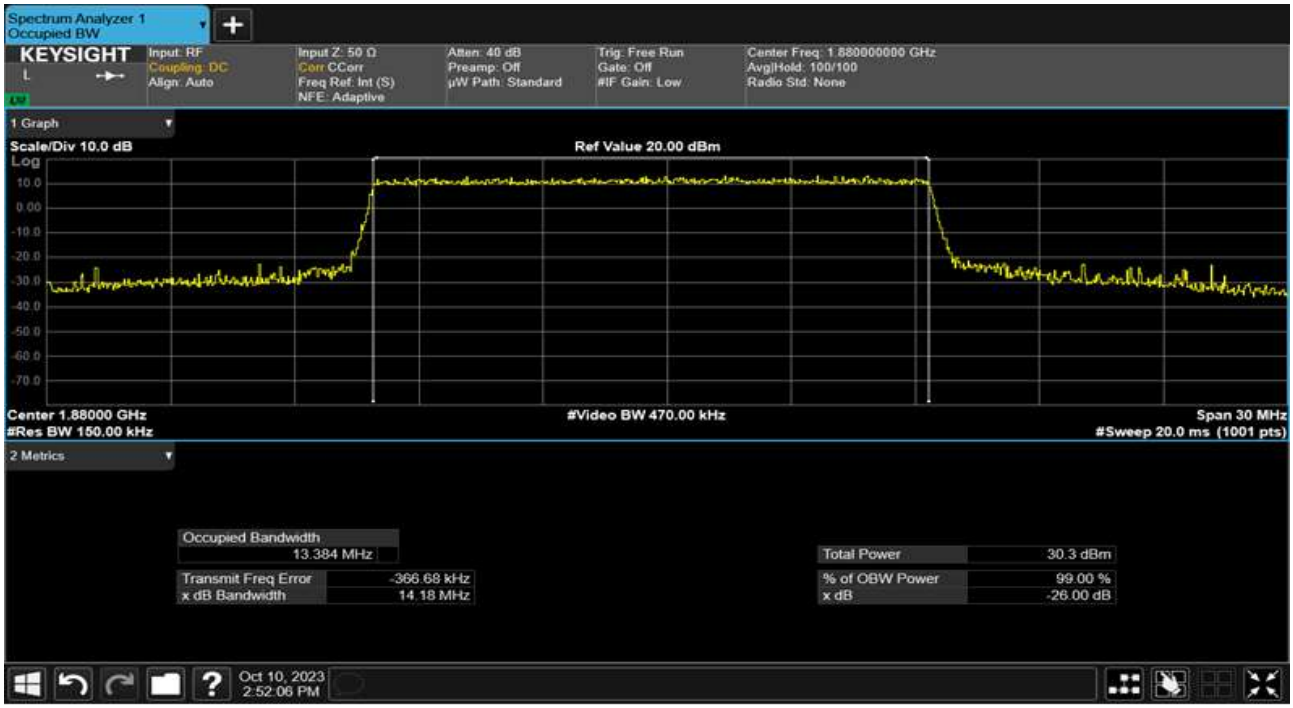


BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, BPSK, Full RB)

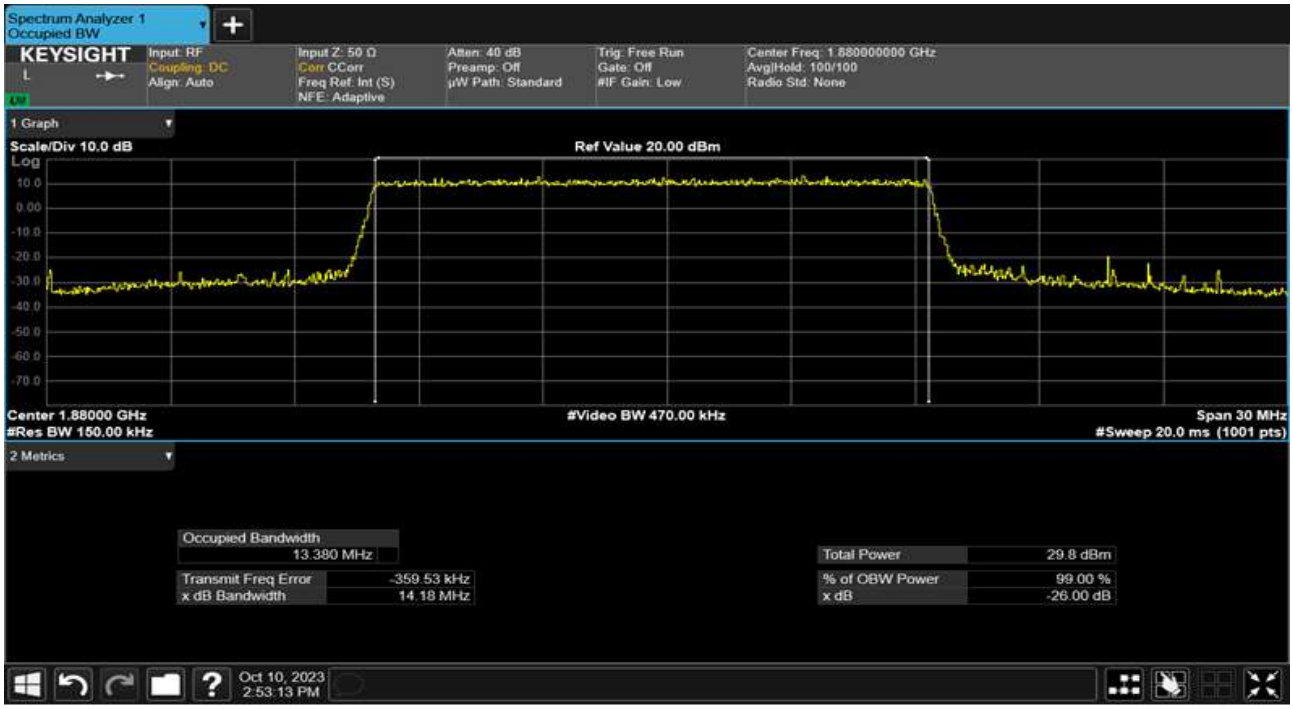
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, QPSK, Full RB)



BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 16QAM, Full RB)



BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 64QAM, Full RB)



BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 256QAM, Full RB)

BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, BPSK, Full RB)

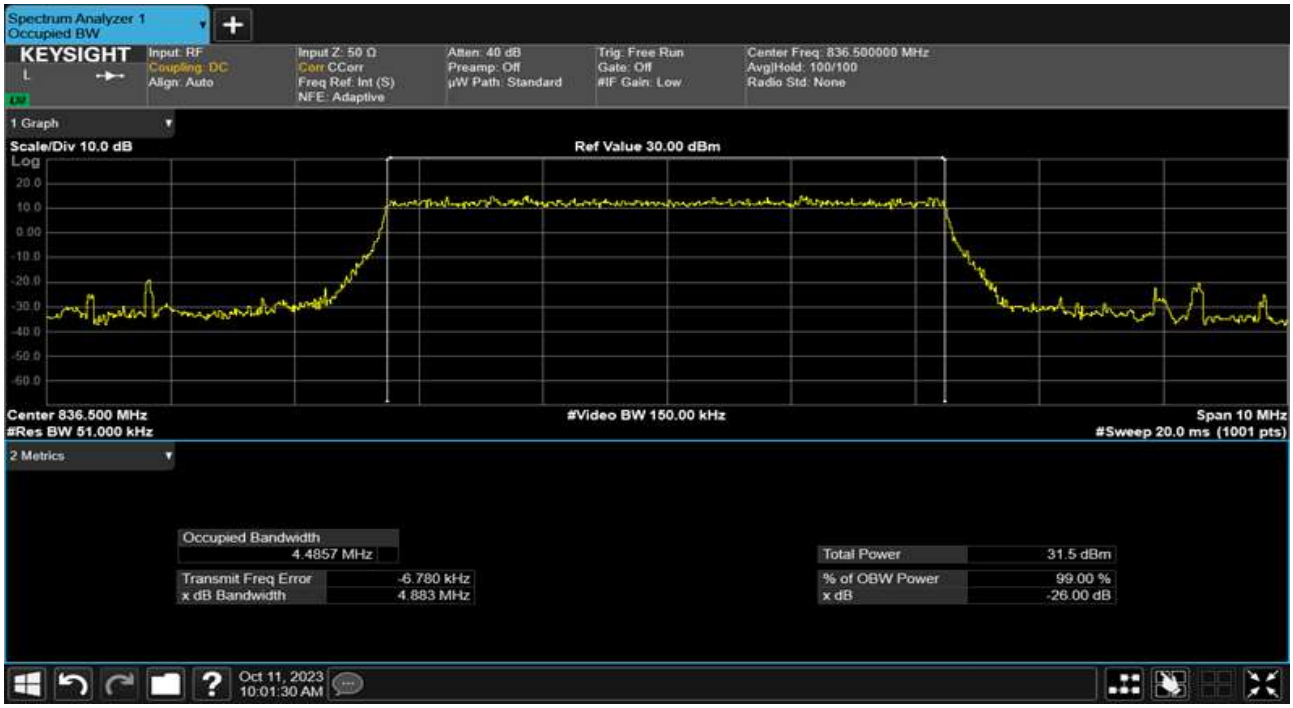
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, QPSK, Full RB)

BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 16QAM, Full RB)

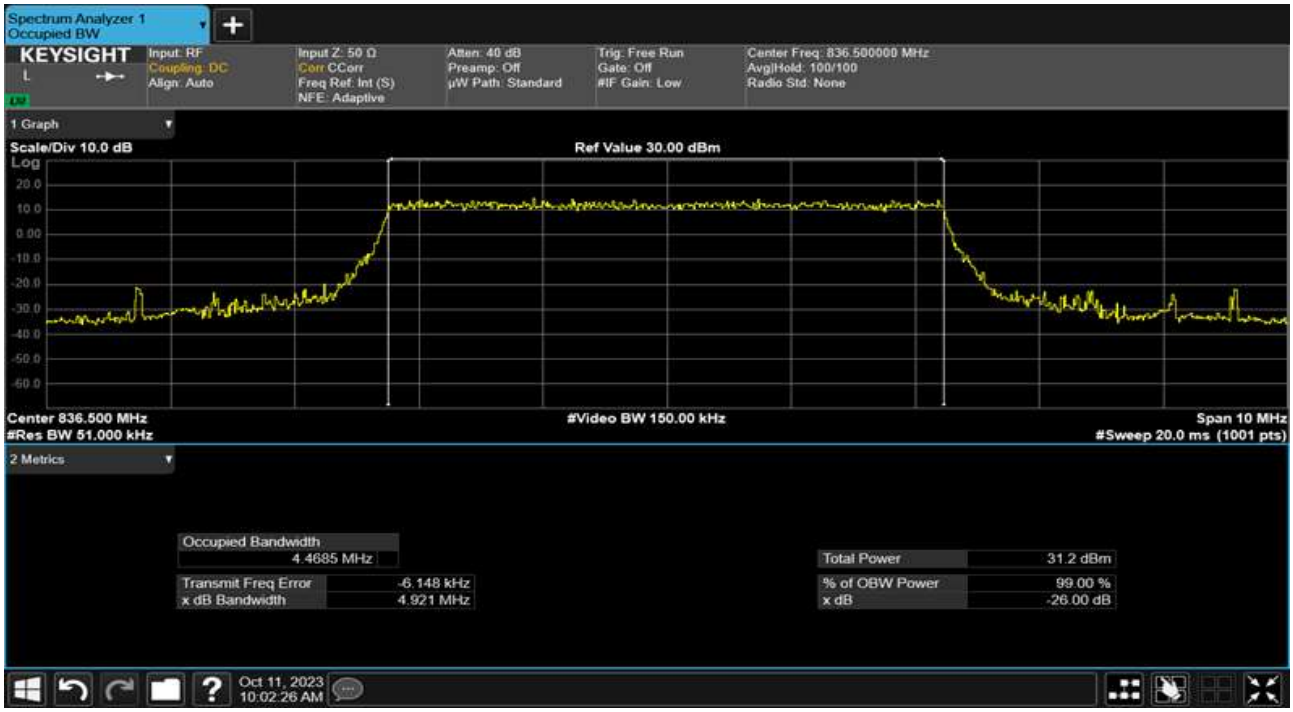
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 64QAM, Full RB)

BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 256QAM, Full RB)

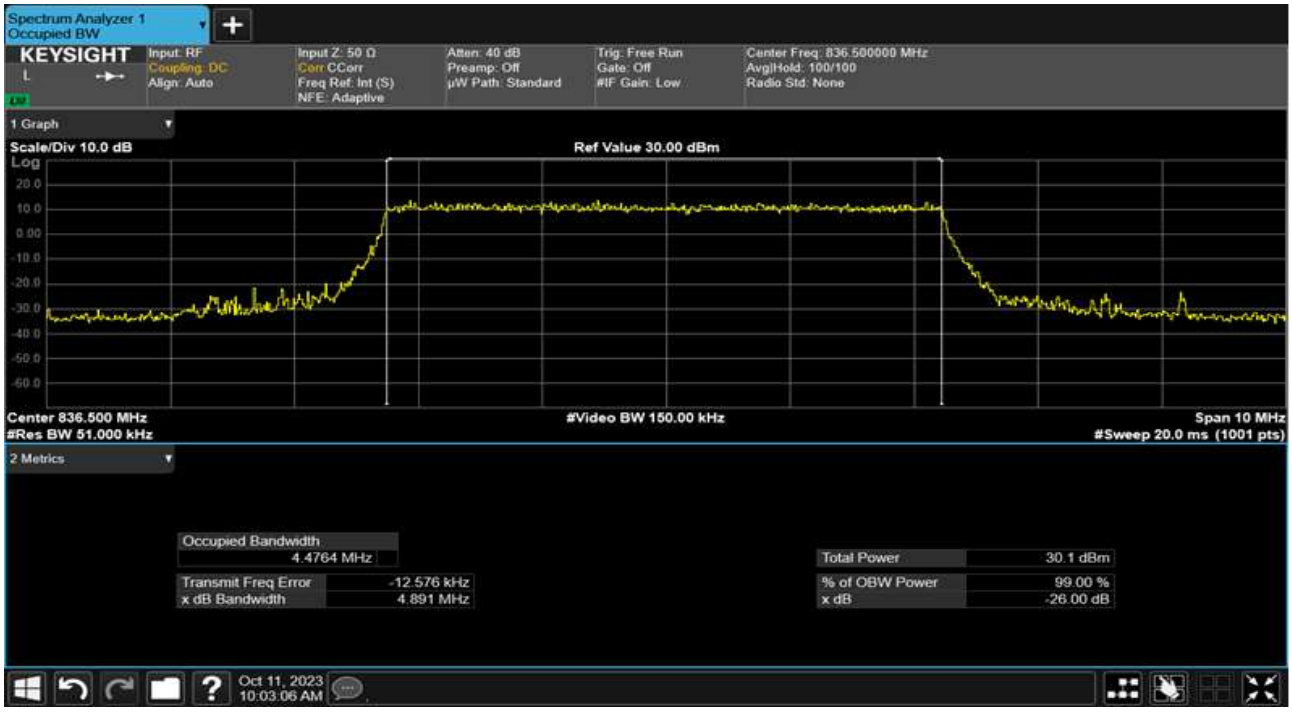
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, BPSK, Full RB)



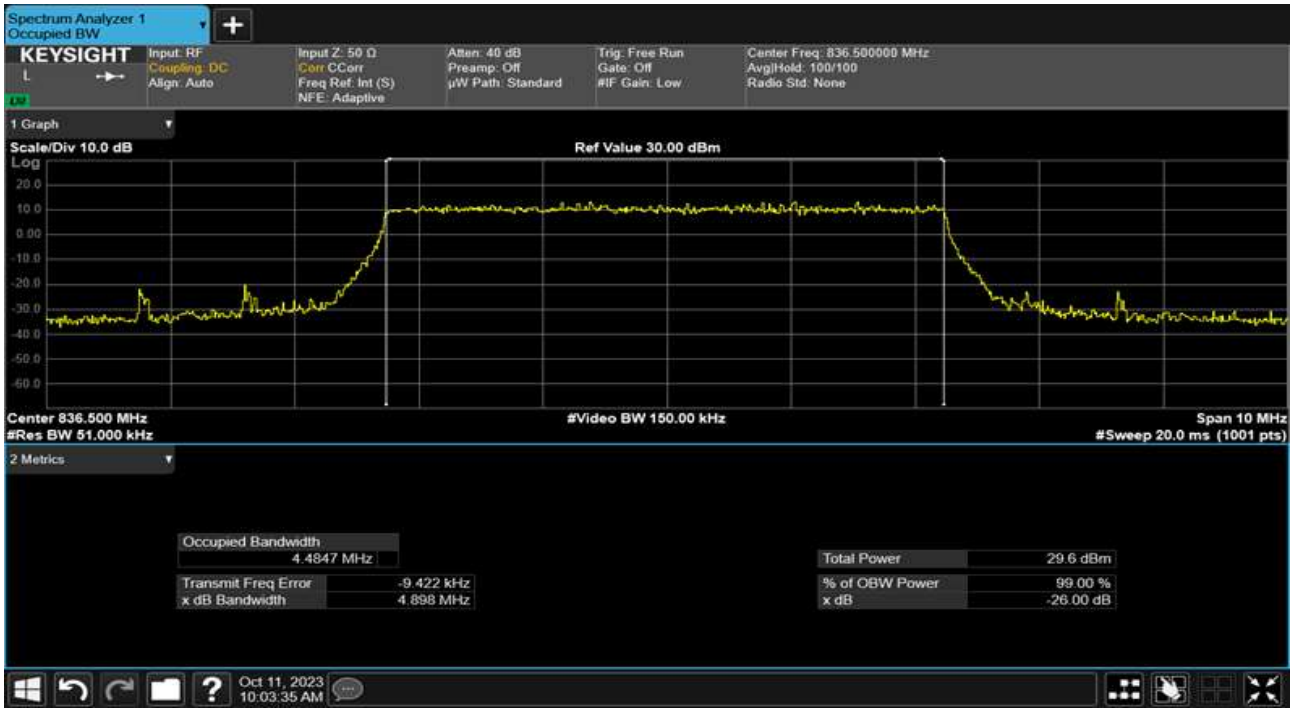
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, QPSK, Full RB)



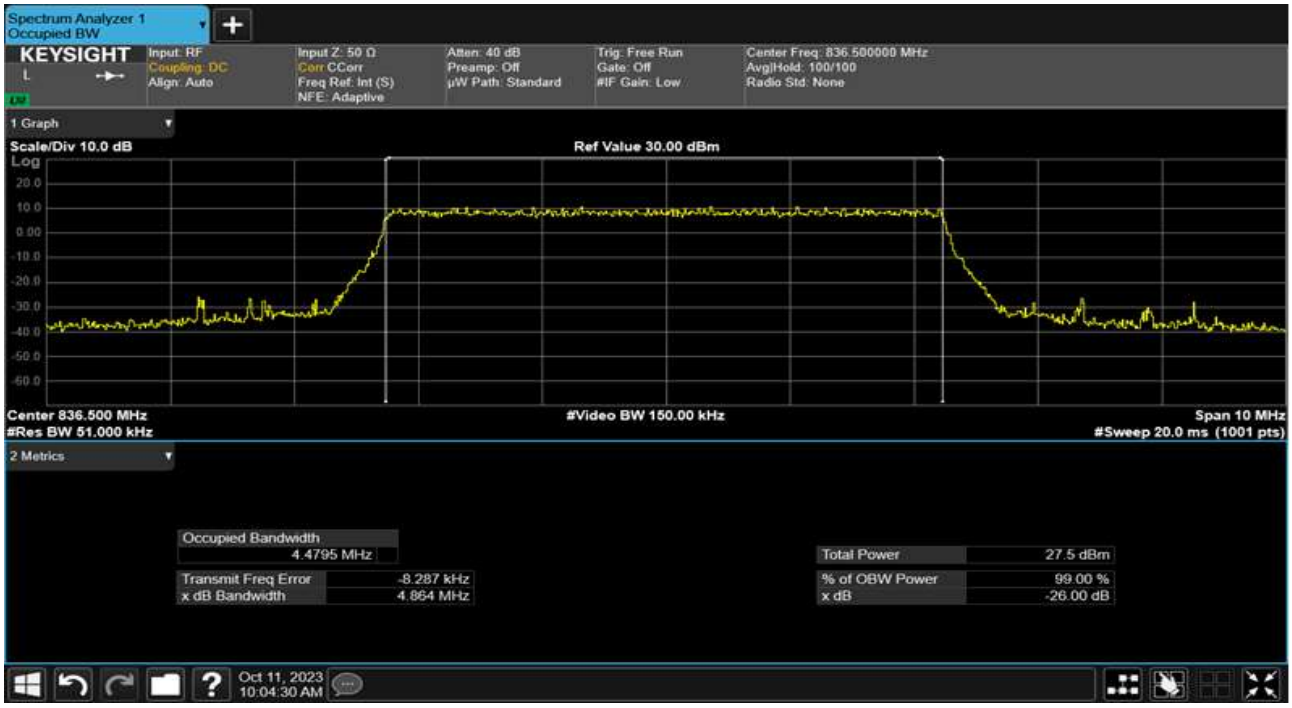
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 16QAM, Full RB)



BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 64QAM, Full RB)



BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 256QAM, Full RB)



BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, BPSK, Full RB)

BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, QPSK, Full RB)

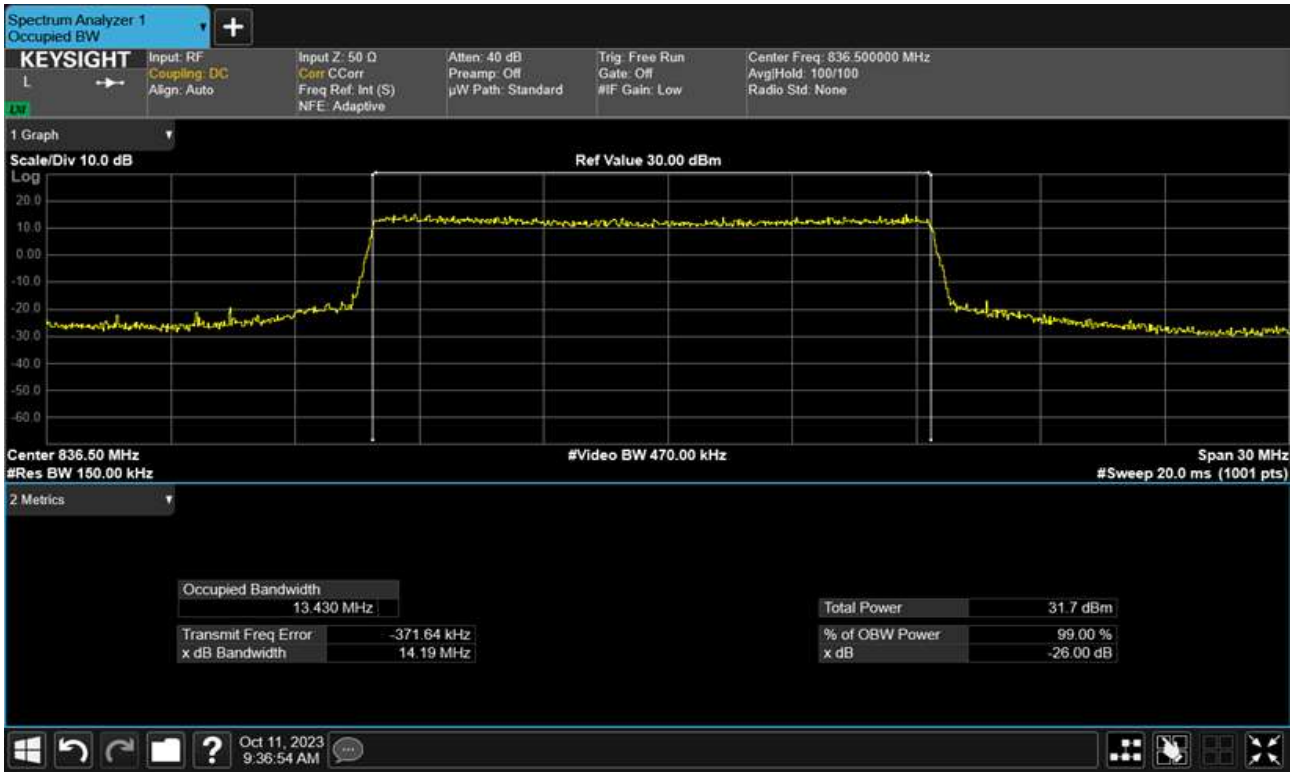
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 16QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 64QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 256QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, BPSK, Full RB)

BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, QPSK, Full RB)



BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 16QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 64QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 256QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, BPSK, Full RB)

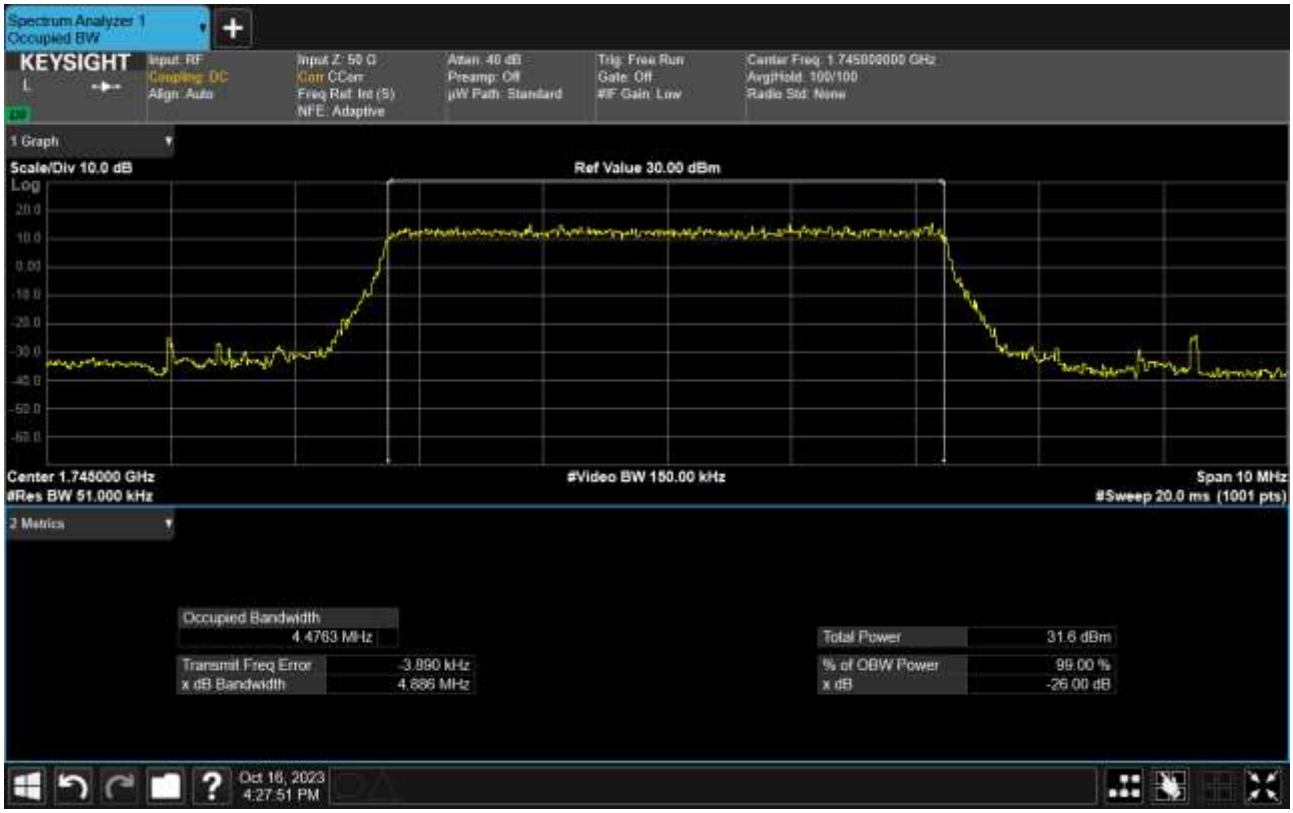
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, QPSK, Full RB)

BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 16QAM, Full RB)

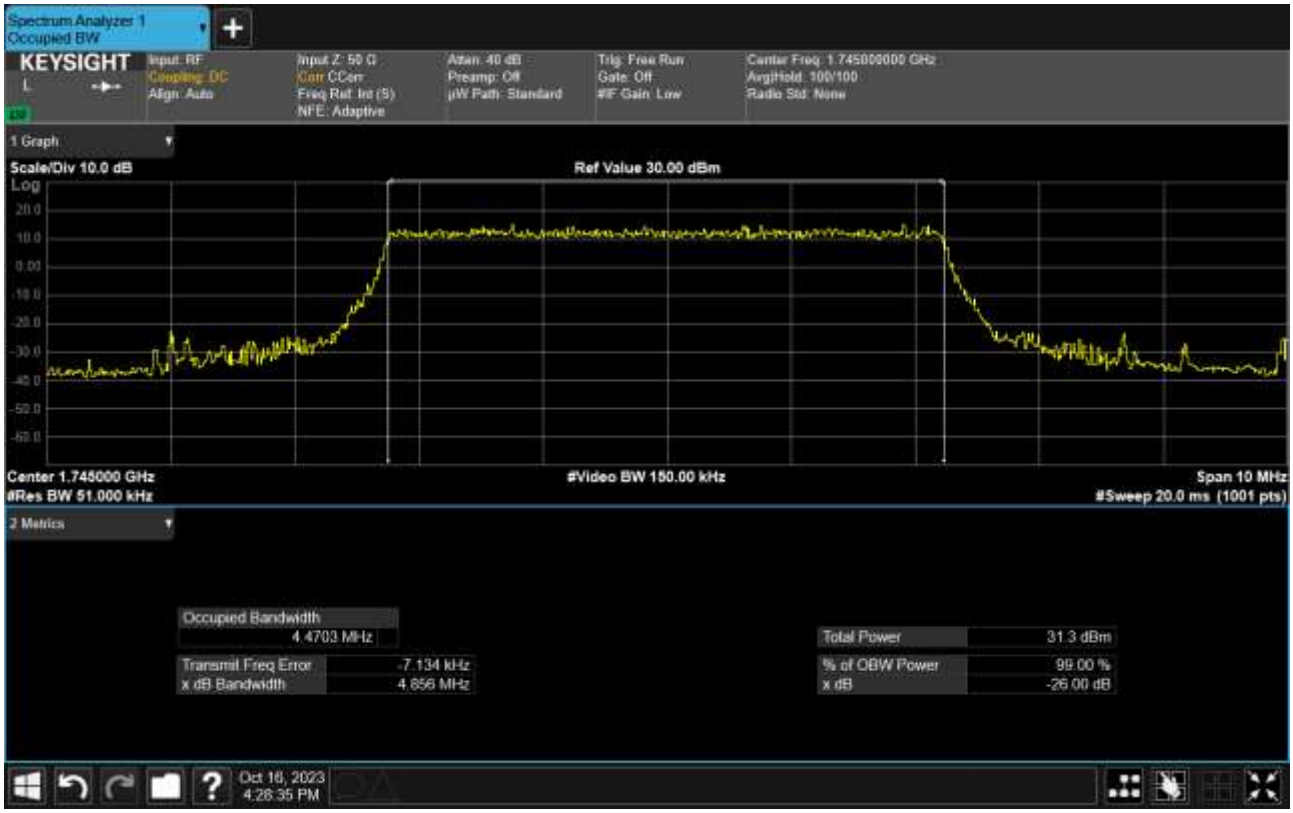
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 64QAM, Full RB)

BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 256QAM, Full RB)

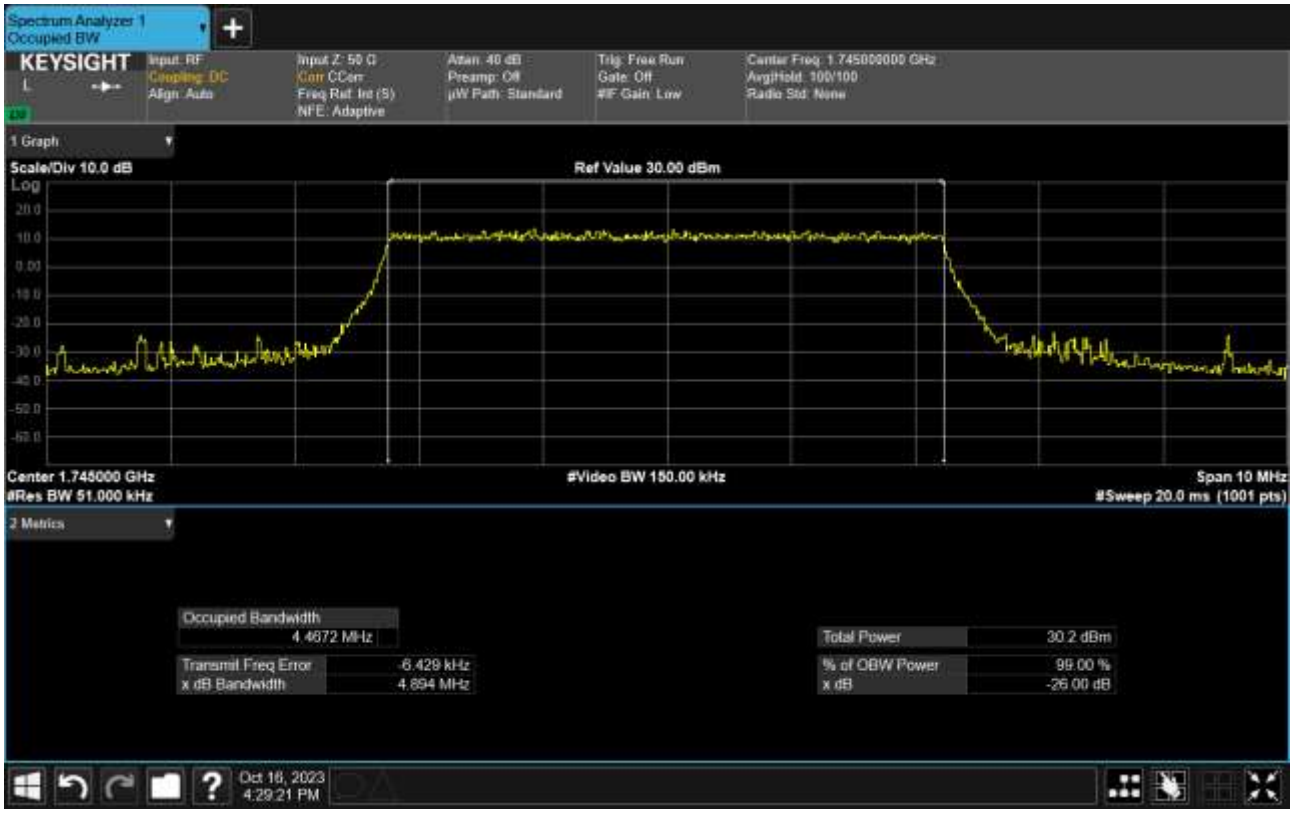
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, BPSK, Full RB)



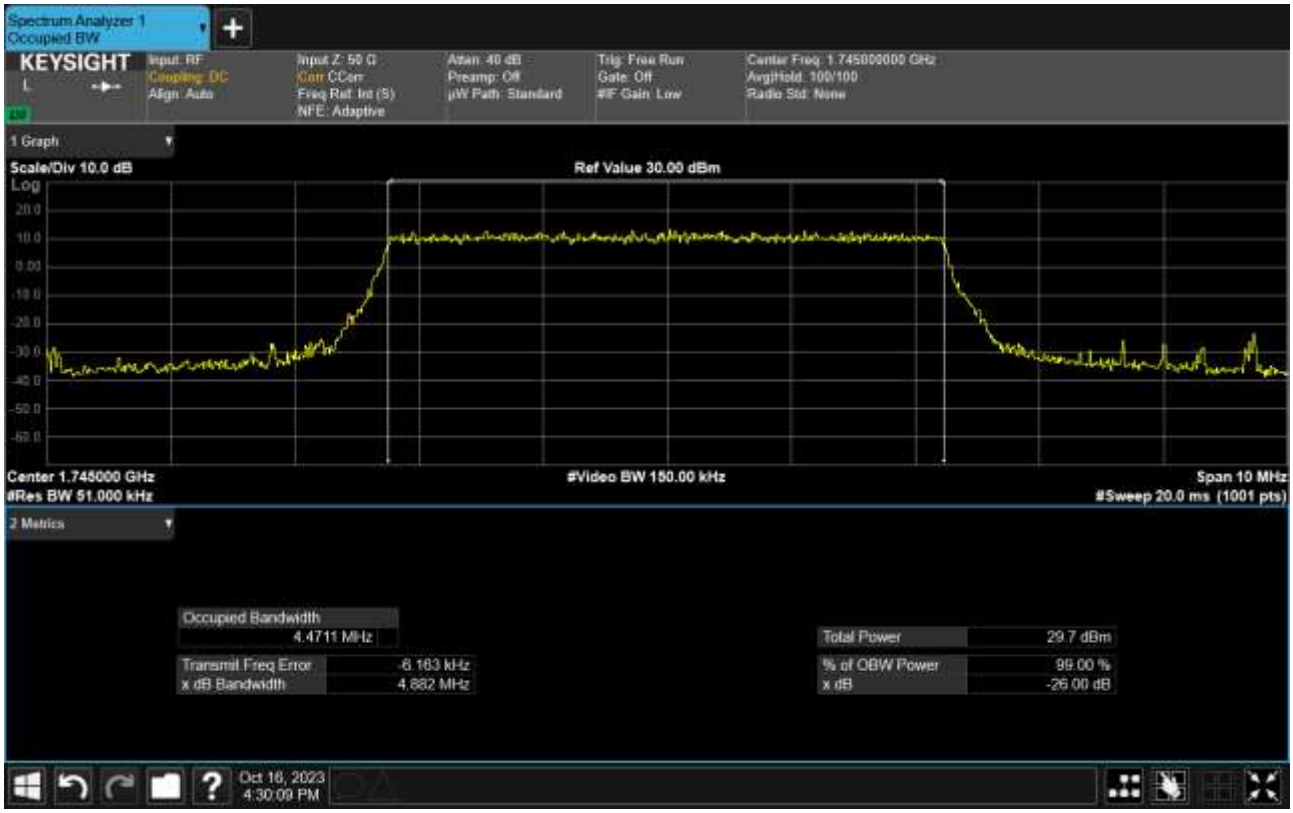
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, QPSK, Full RB)



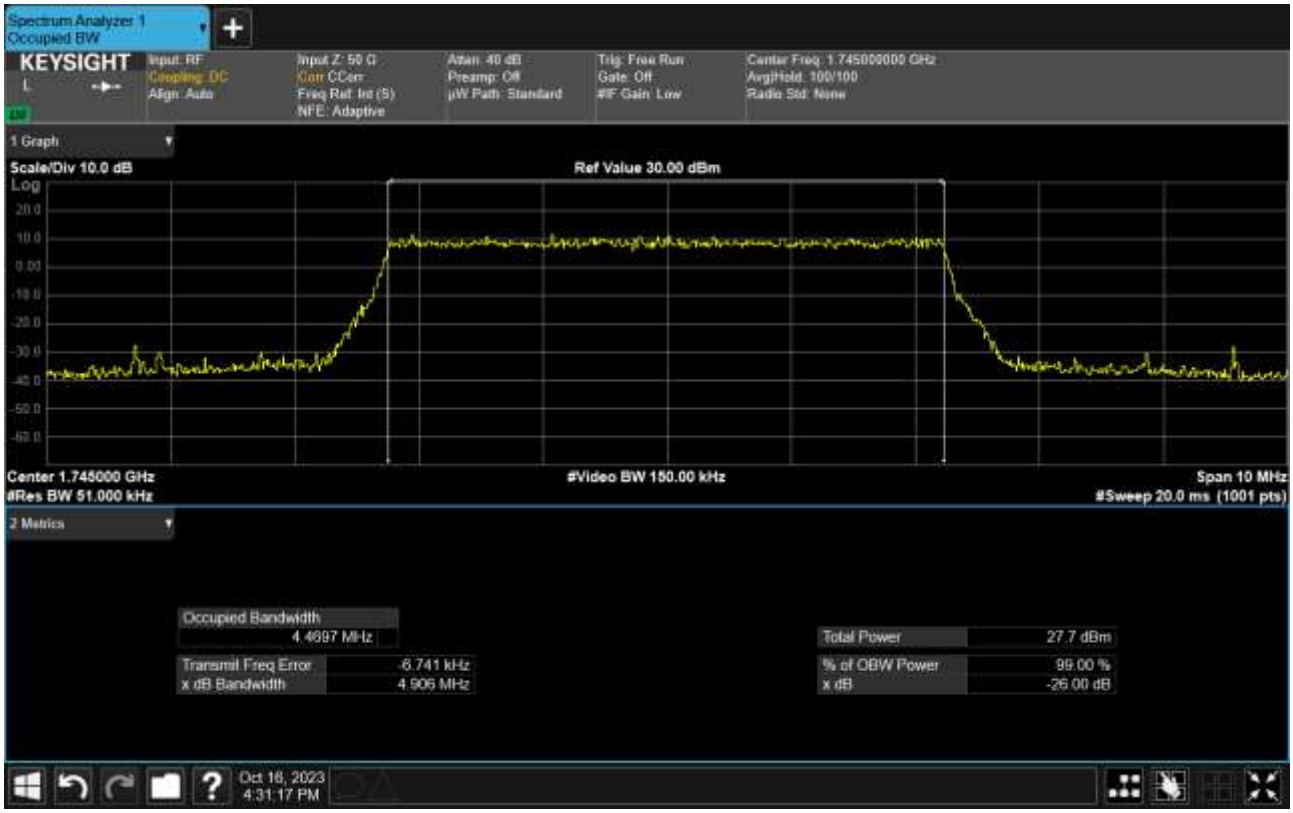
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 16QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 64QAM, Full RB)

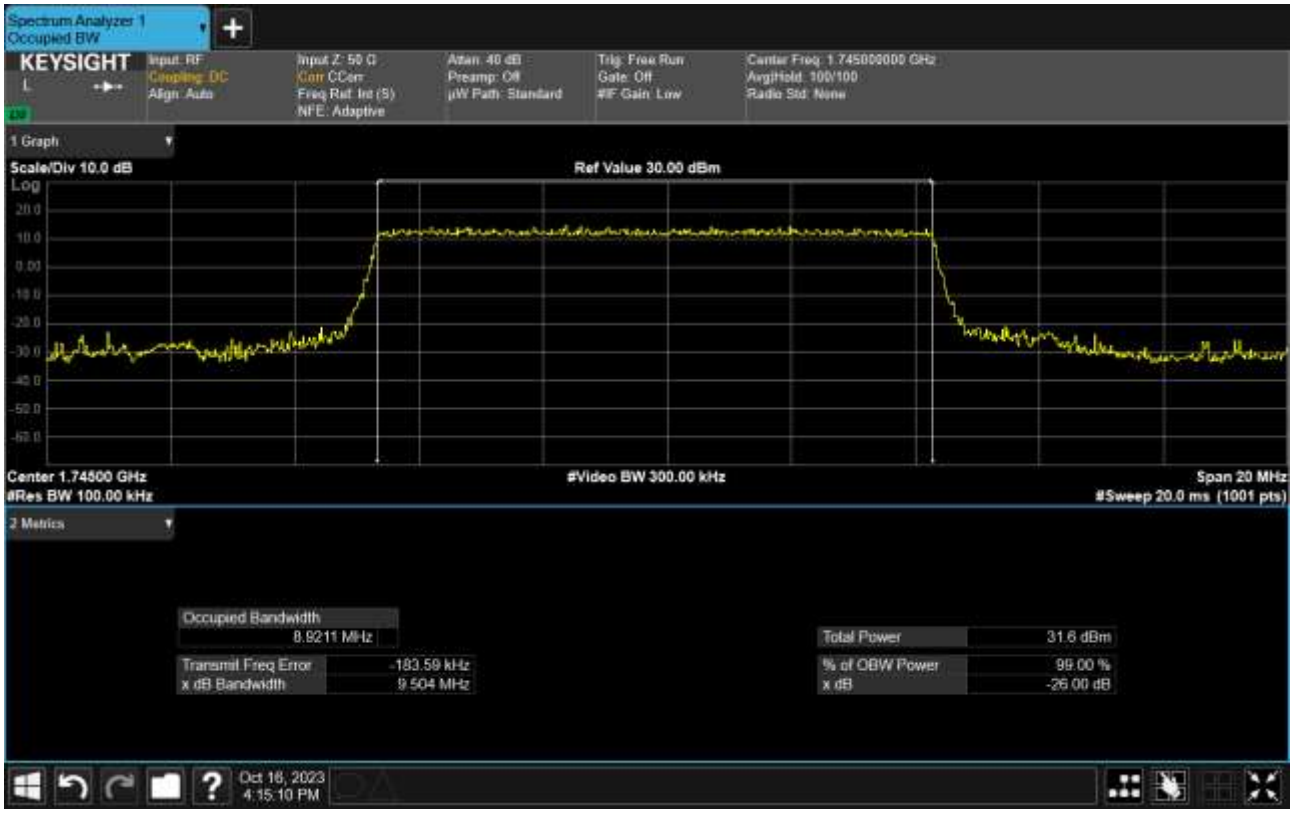


BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 256QAM, Full RB)

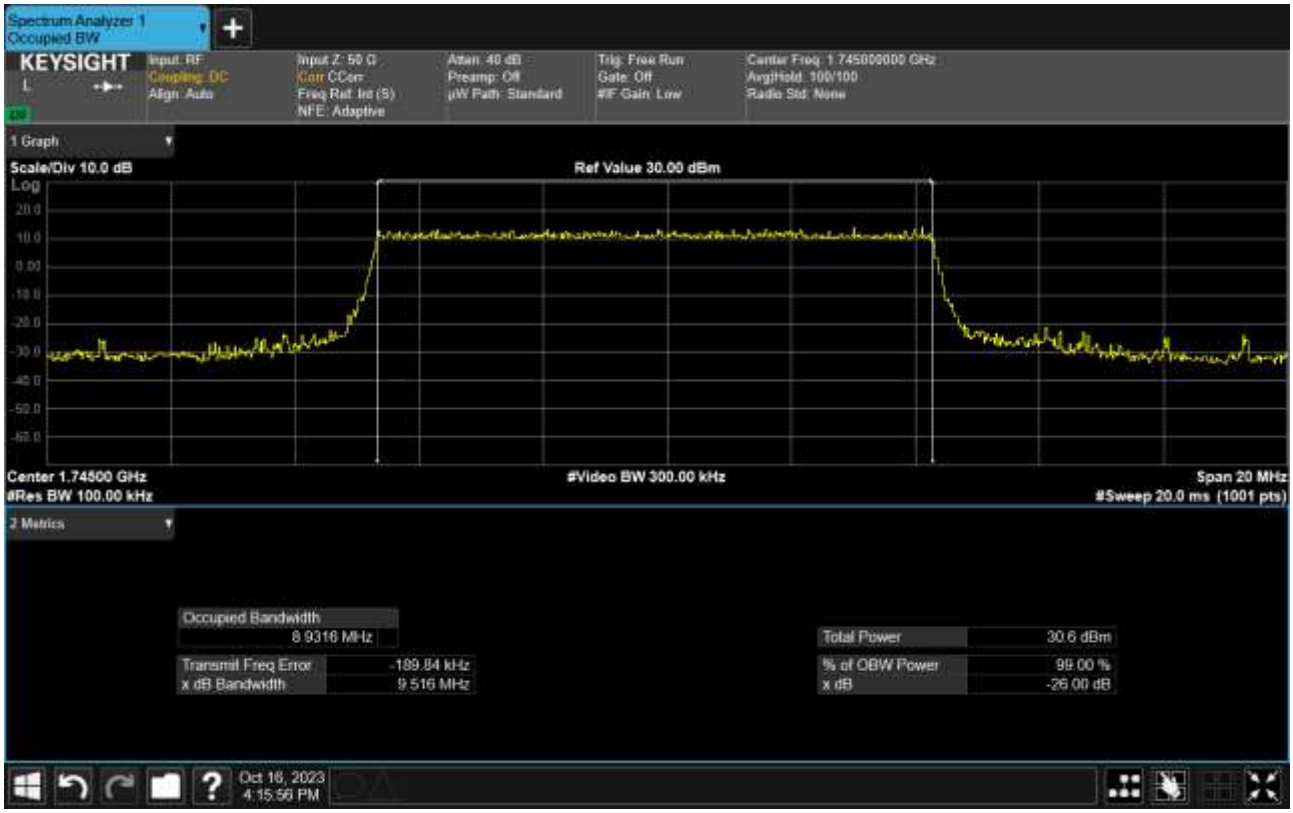


BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, BPSK, Full RB)

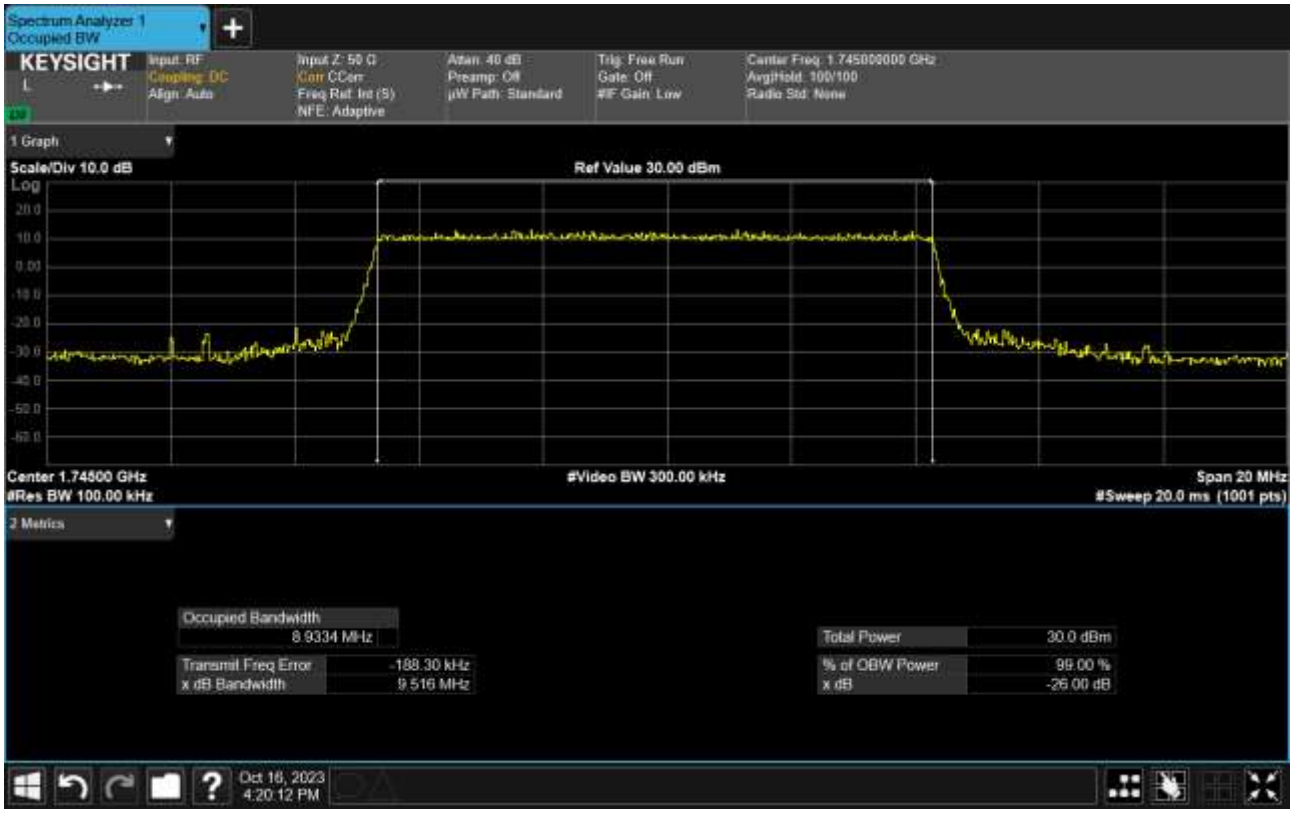
BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, QPSK, Full RB)



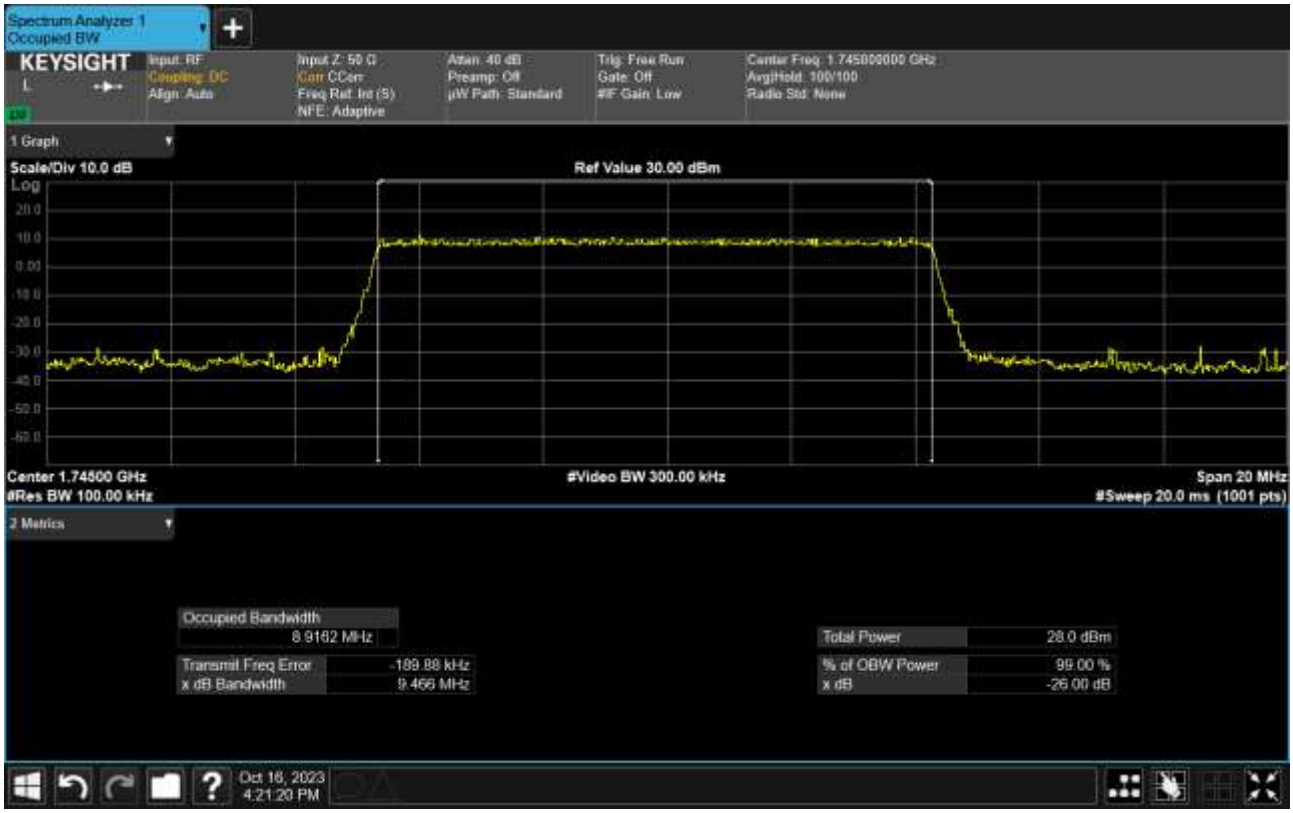
BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 16QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 64QAM, Full RB)

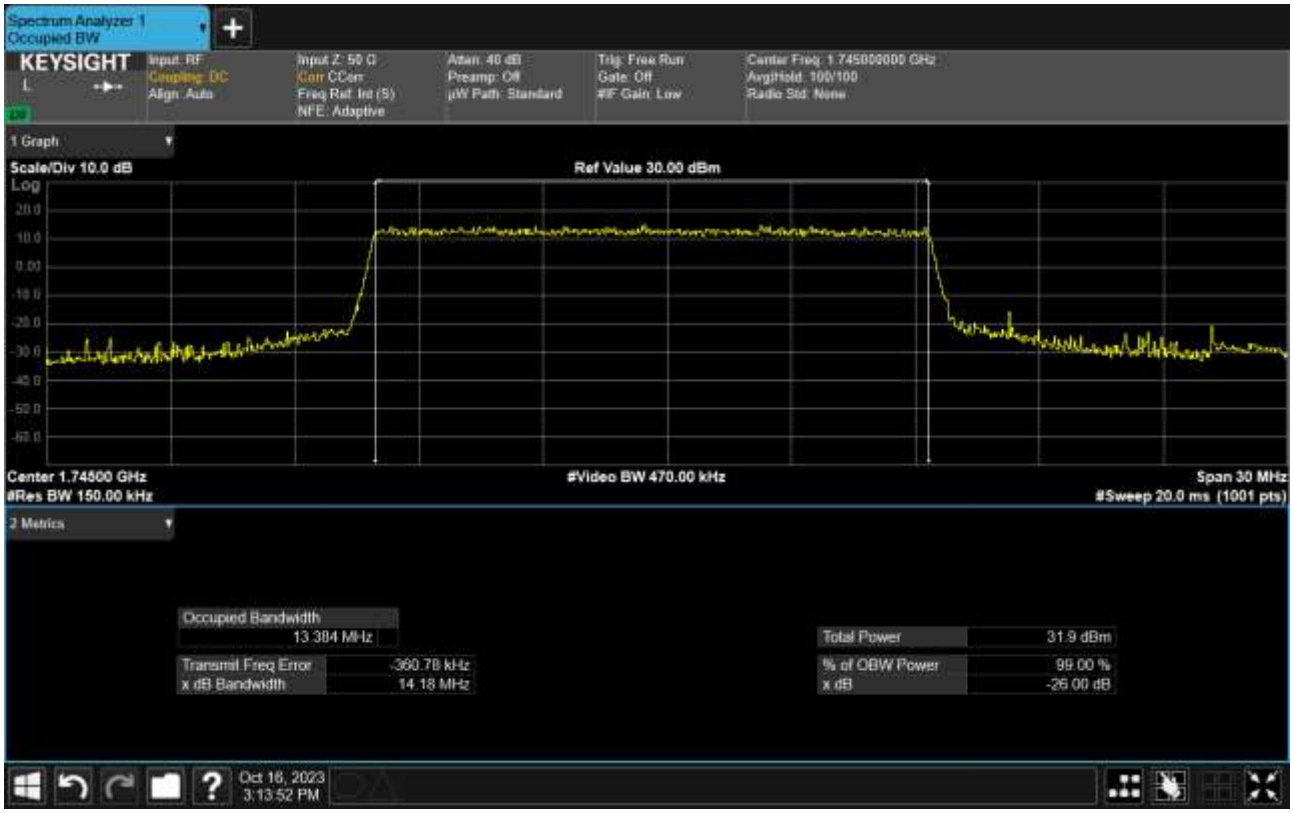


BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 256QAM, Full RB)

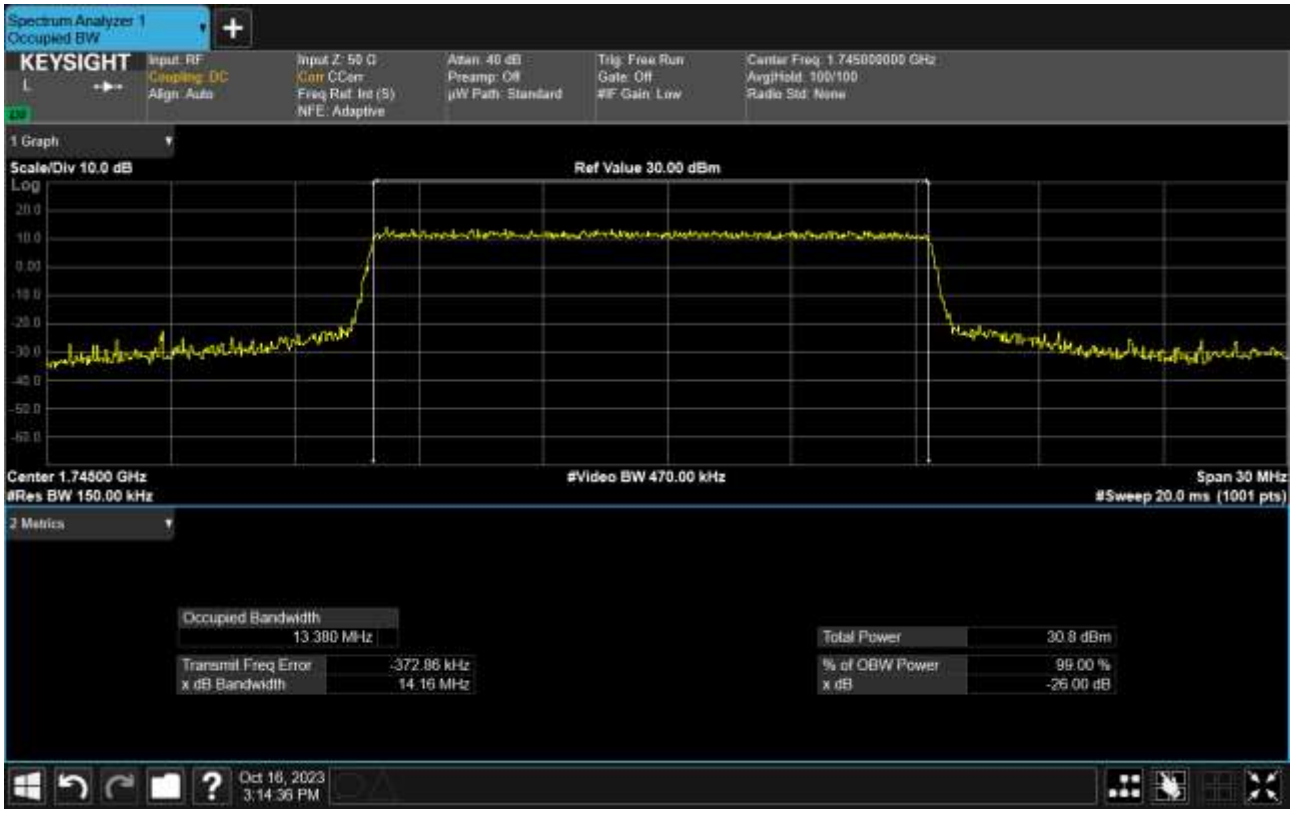


BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, BPSK, Full RB)

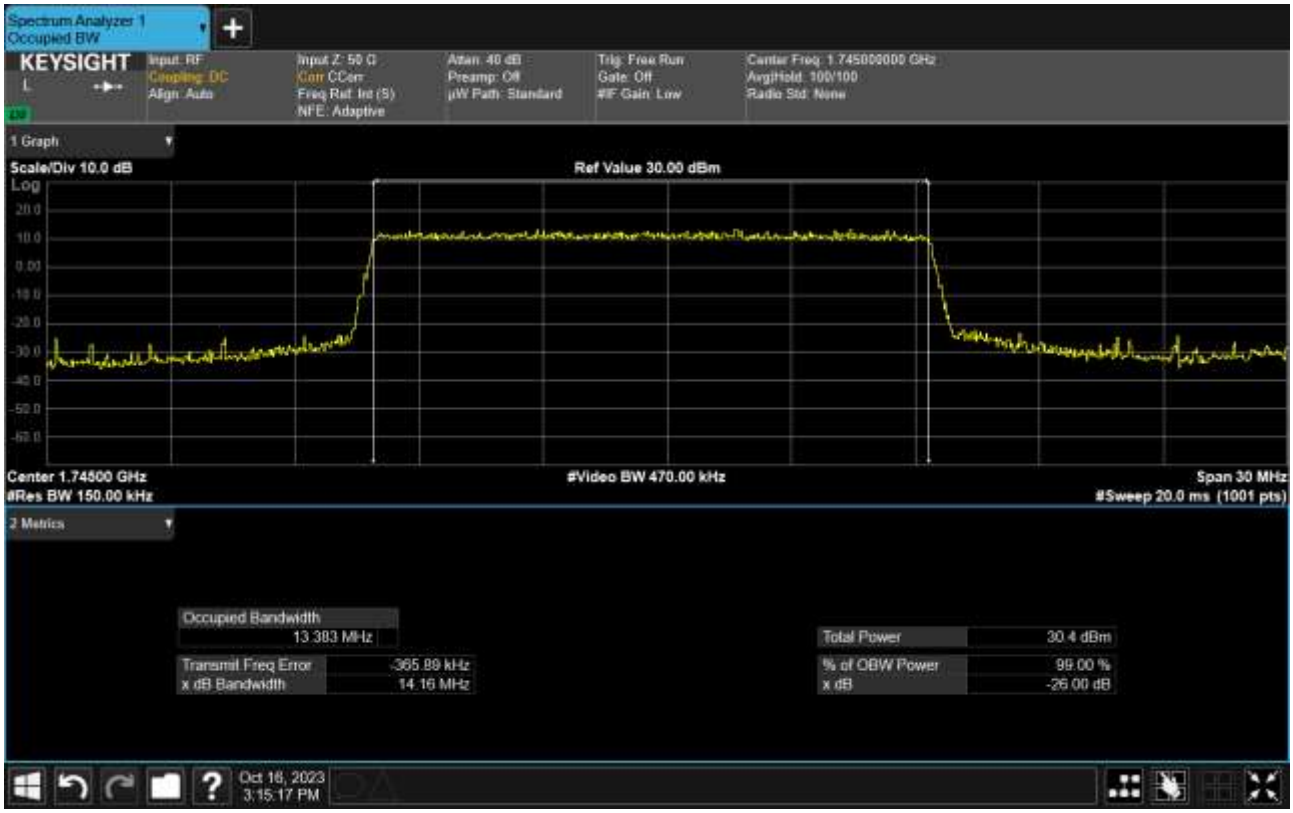
BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, QPSK, Full RB)



BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, 16QAM, Full RB)



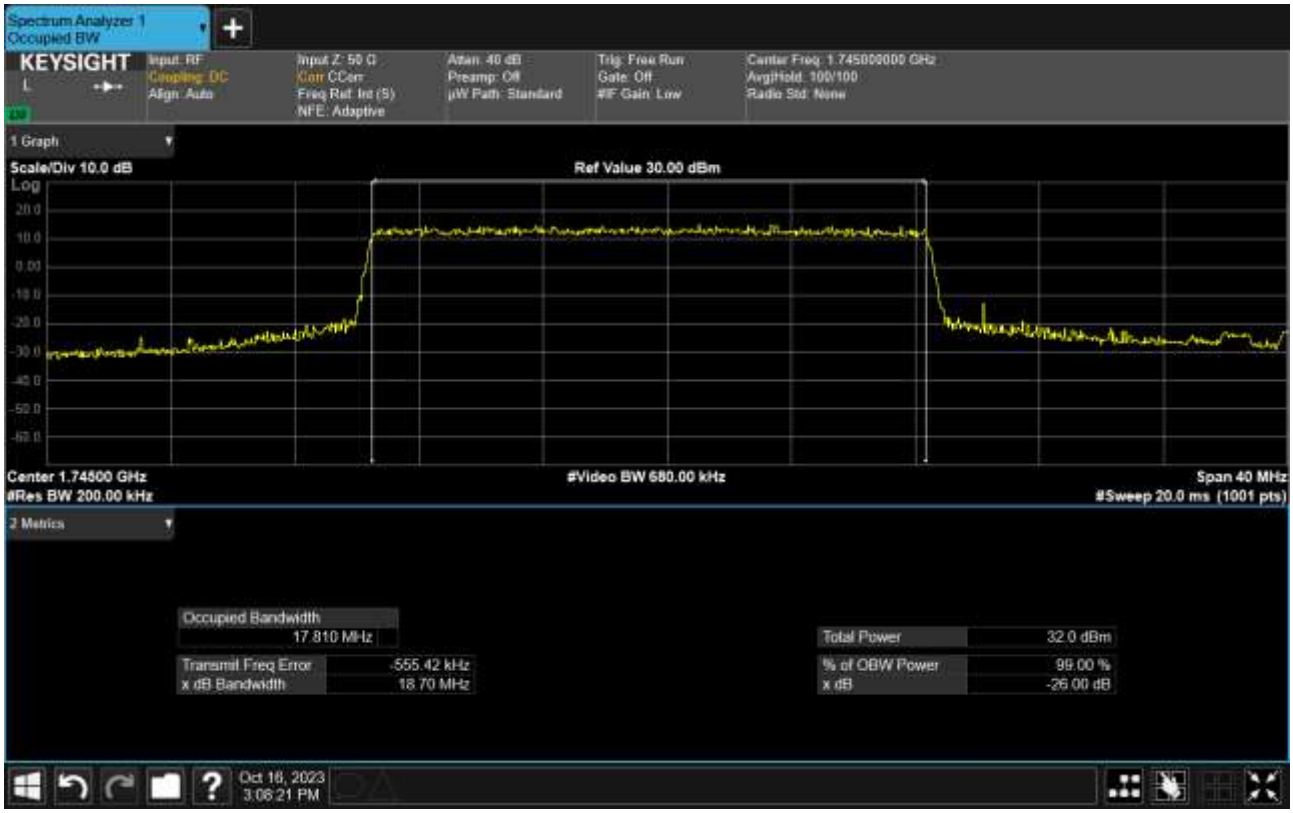
BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, 64QAM, Full RB)



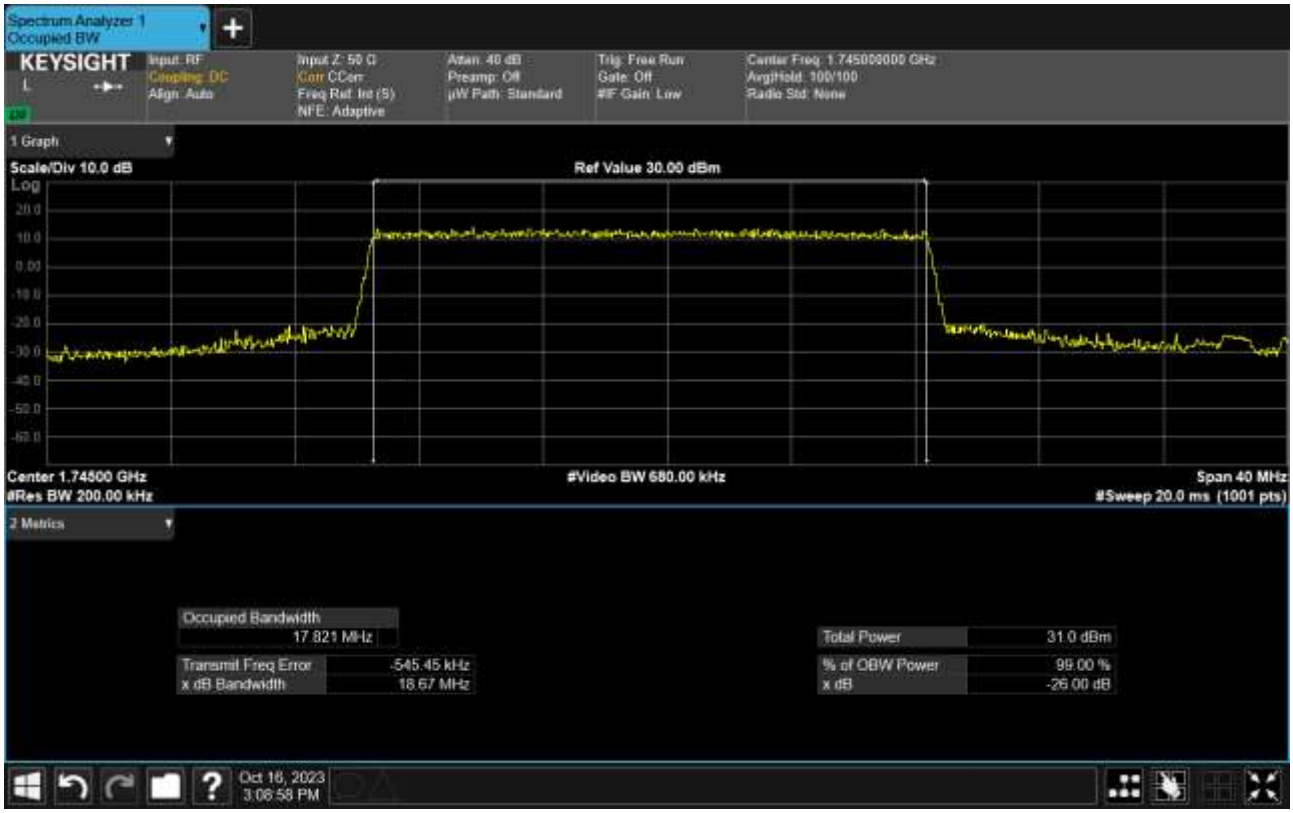
BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, 256QAM, Full RB)

BAND 66 Occupied Bandwidth Plot (20 MHz, 1745 MHz, BPSK, Full RB)

BAND 66 Occupied Bandwidth Plot (20 MHz, 1745 MHz, QPSK, Full RB)



BAND 66 Occupied Bandwidth Plot (20 MHz, 1745 MHz, 16QAM, Full RB)



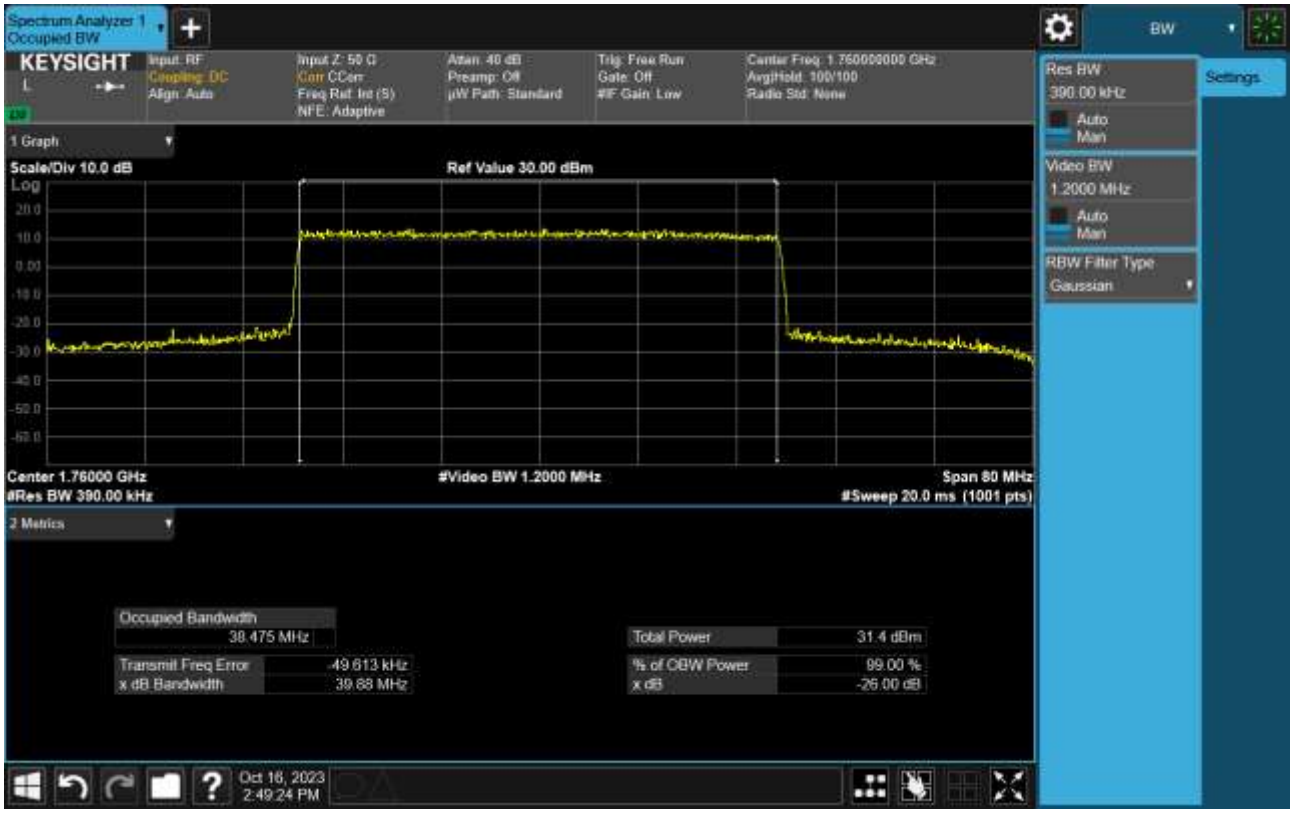
BAND 66 Occupied Bandwidth Plot (20 MHz, 1745 MHz, 64QAM, Full RB)

BAND 66 Occupied Bandwidth Plot (20 MHz, 1745 MHz, 256QAM, Full RB)

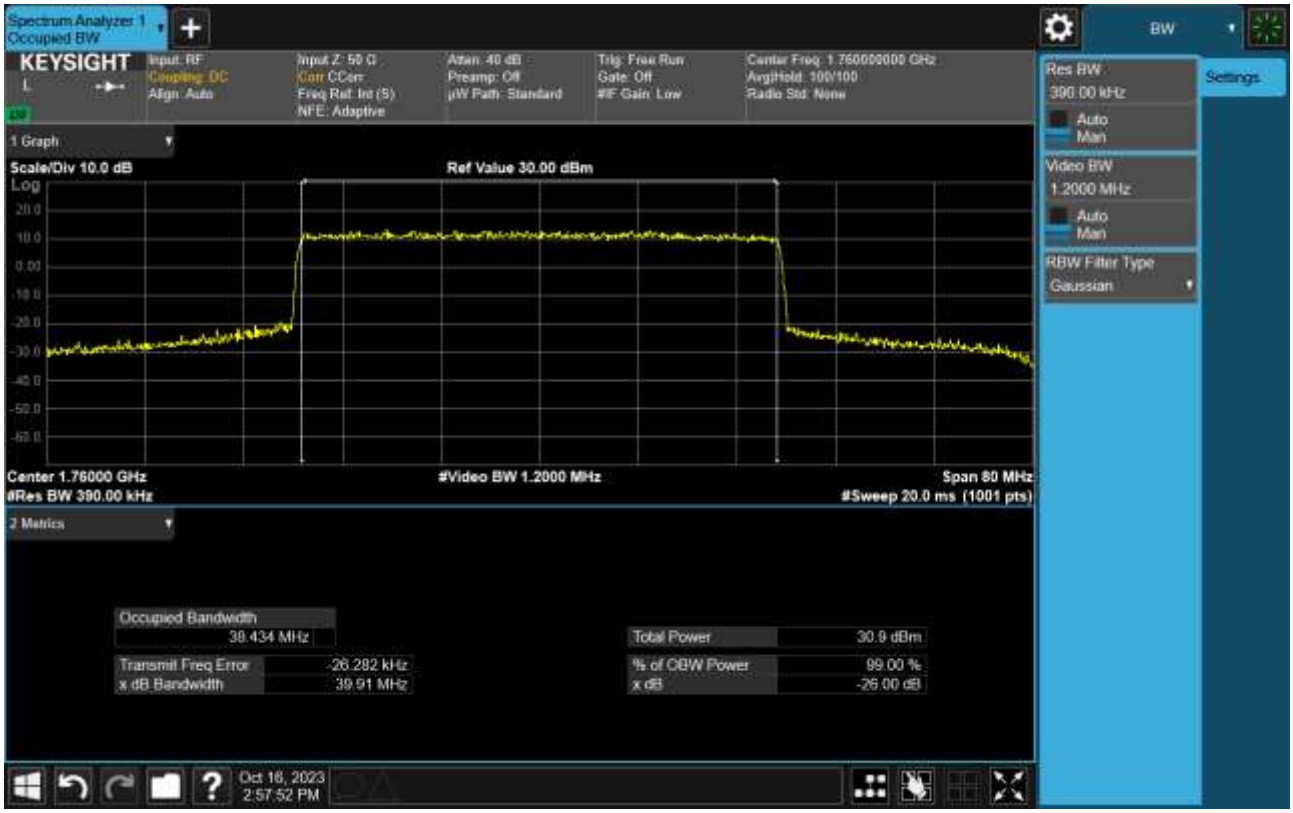
BAND 66 Occupied Bandwidth Plot (40 MHz, 1745 MHz, BPSK, Full RB)

BAND 66 Occupied Bandwidth Plot (40 MHz, 1745 MHz, QPSK, Full RB)

BAND 66 Occupied Bandwidth Plot (40 MHz, 1745 MHz, 16QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (40 MHz, 1745 MHz, 64QAM, Full RB)

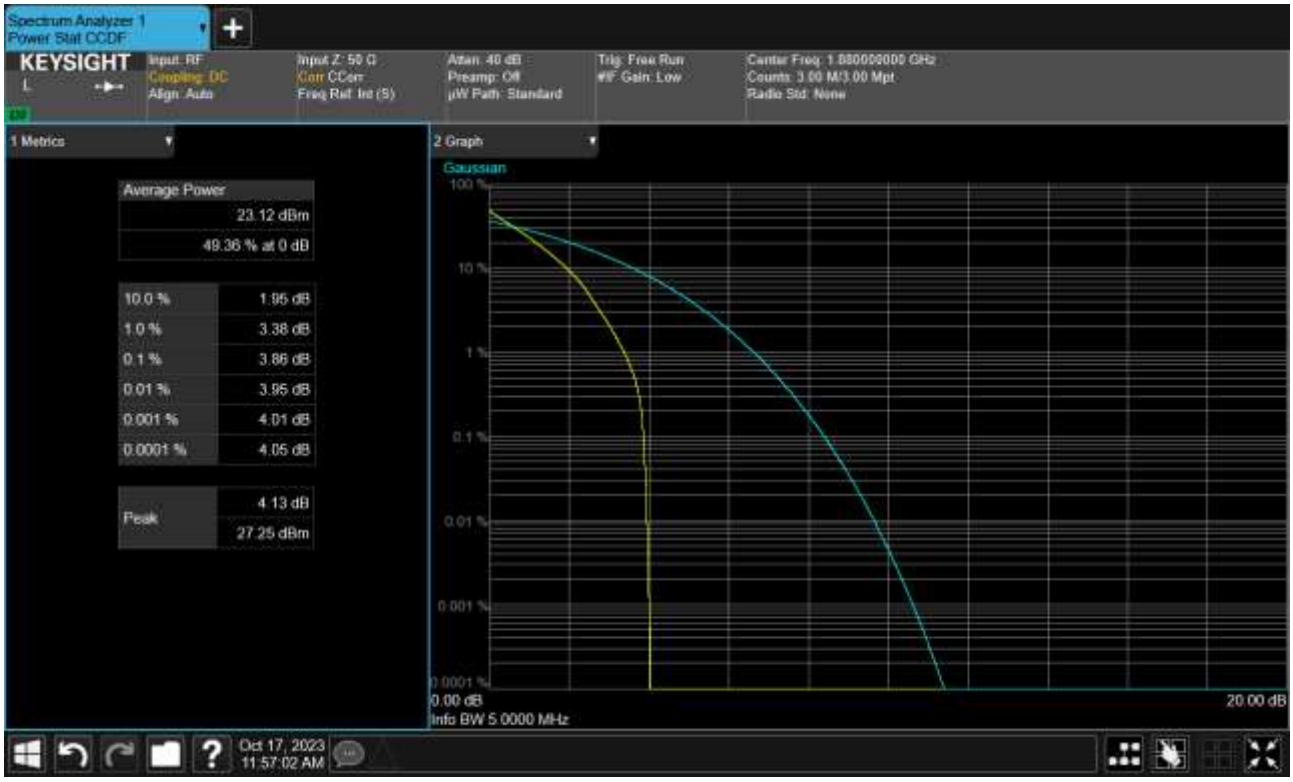


BAND 66 Occupied Bandwidth Plot (40 MHz, 1745 MHz, 256QAM, Full RB)

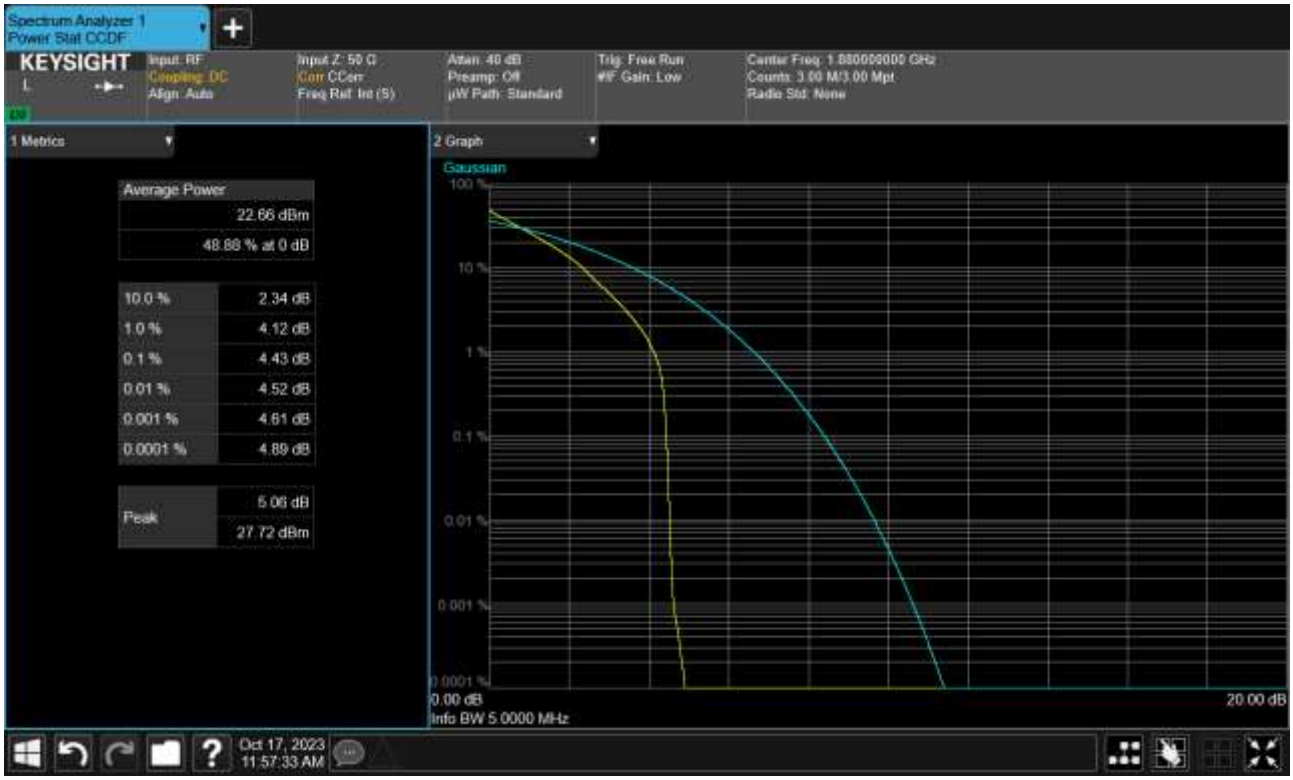
13.6 PEAK TO AVERAGE RATIO

All modes of operation were investigated, and the worst-case configuration results are reported in this section.

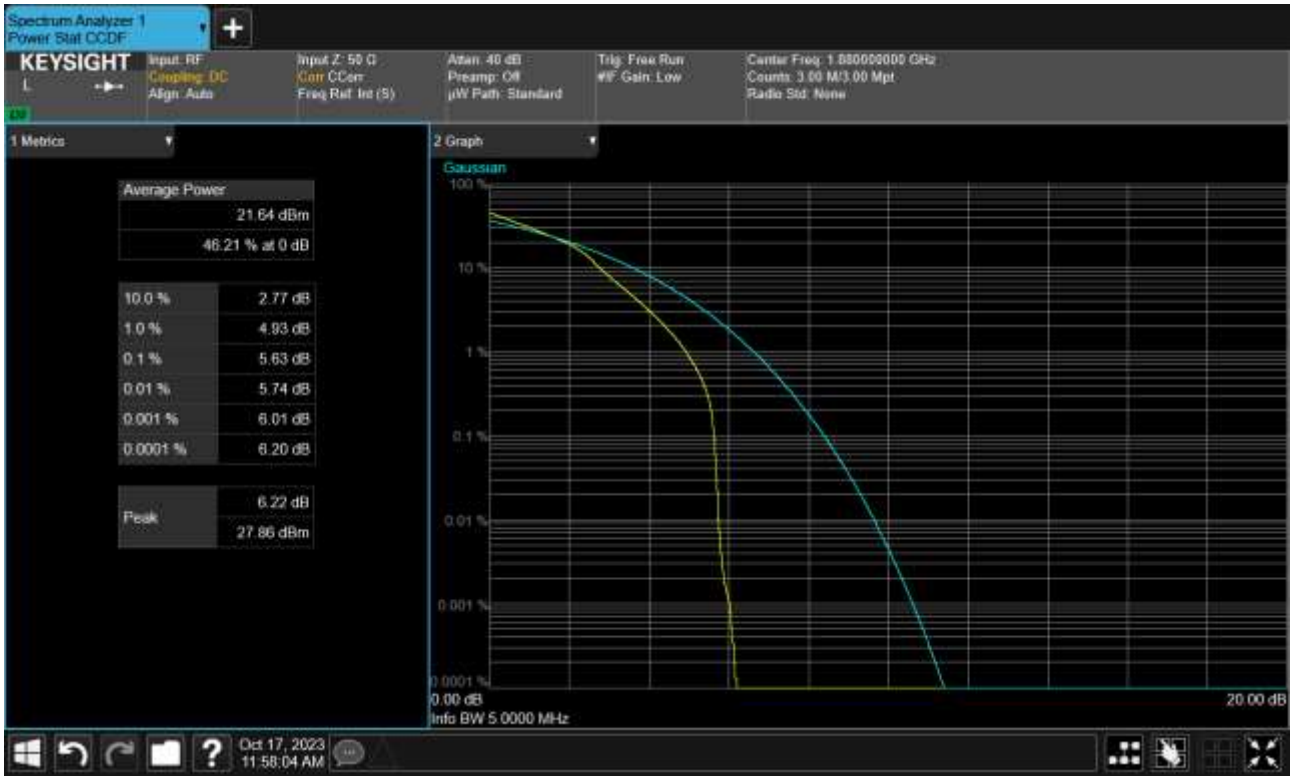
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, BPSK, Full RB)



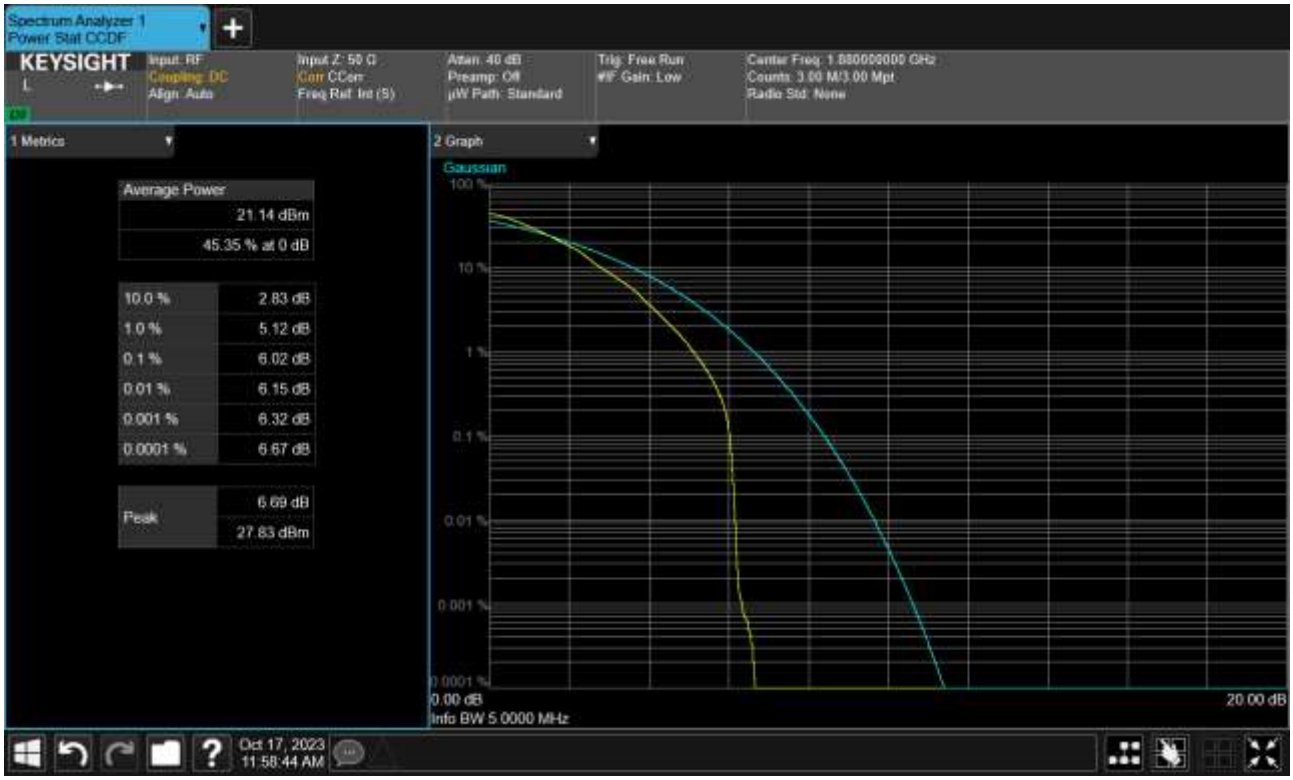
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, QPSK, Full RB)



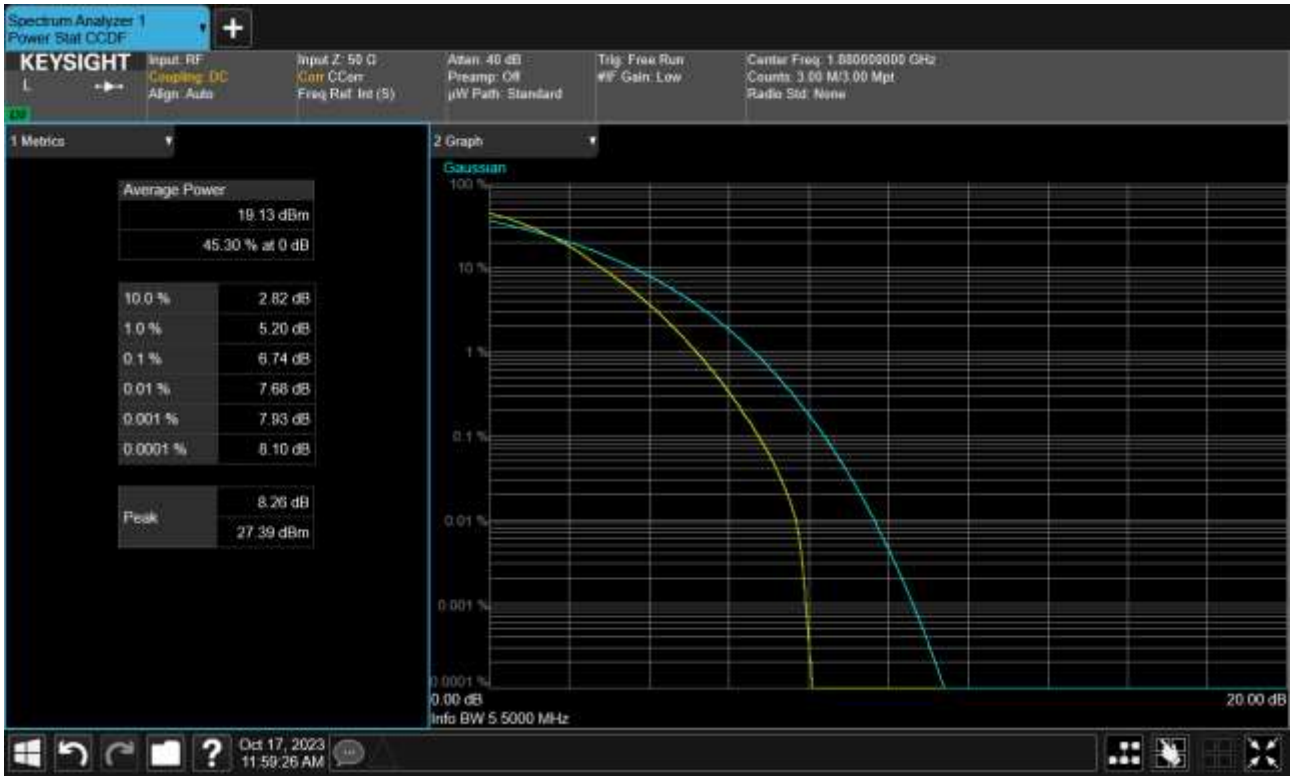
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 16QAM, Full RB)



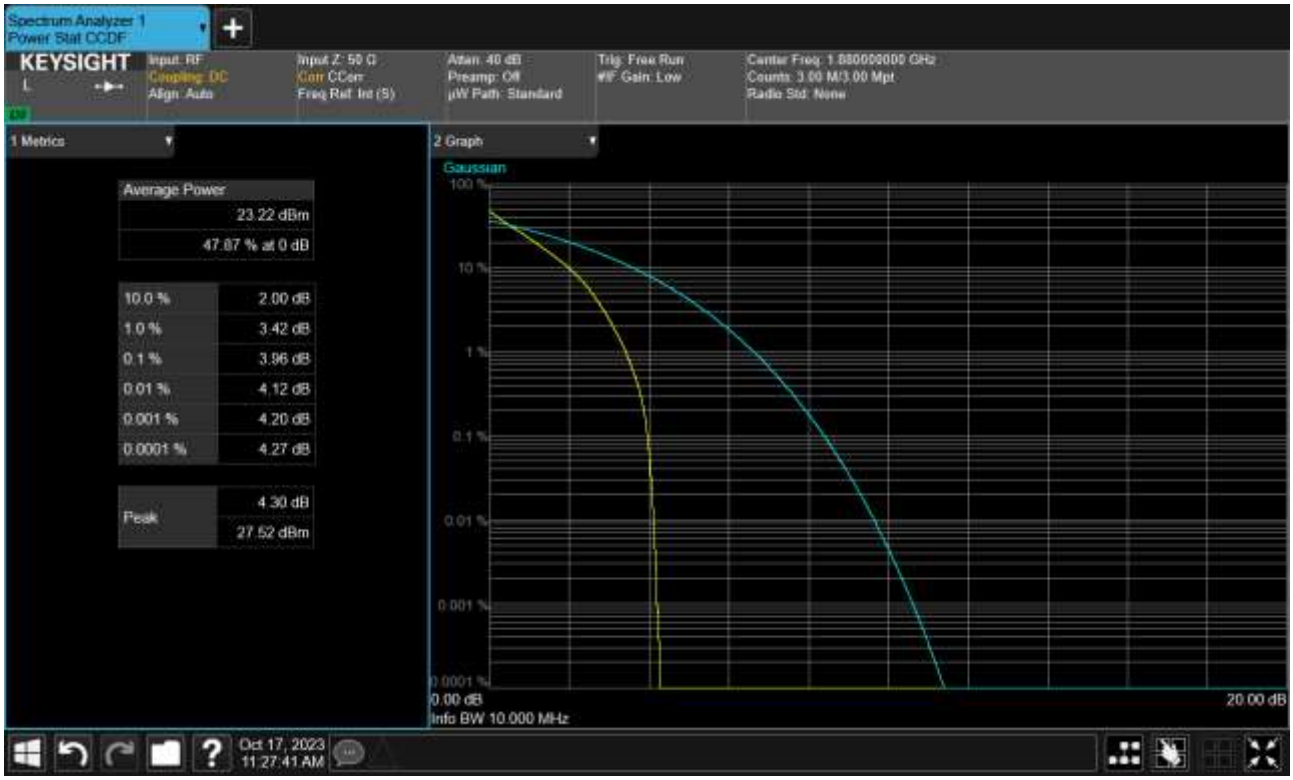
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 64QAM, Full RB)



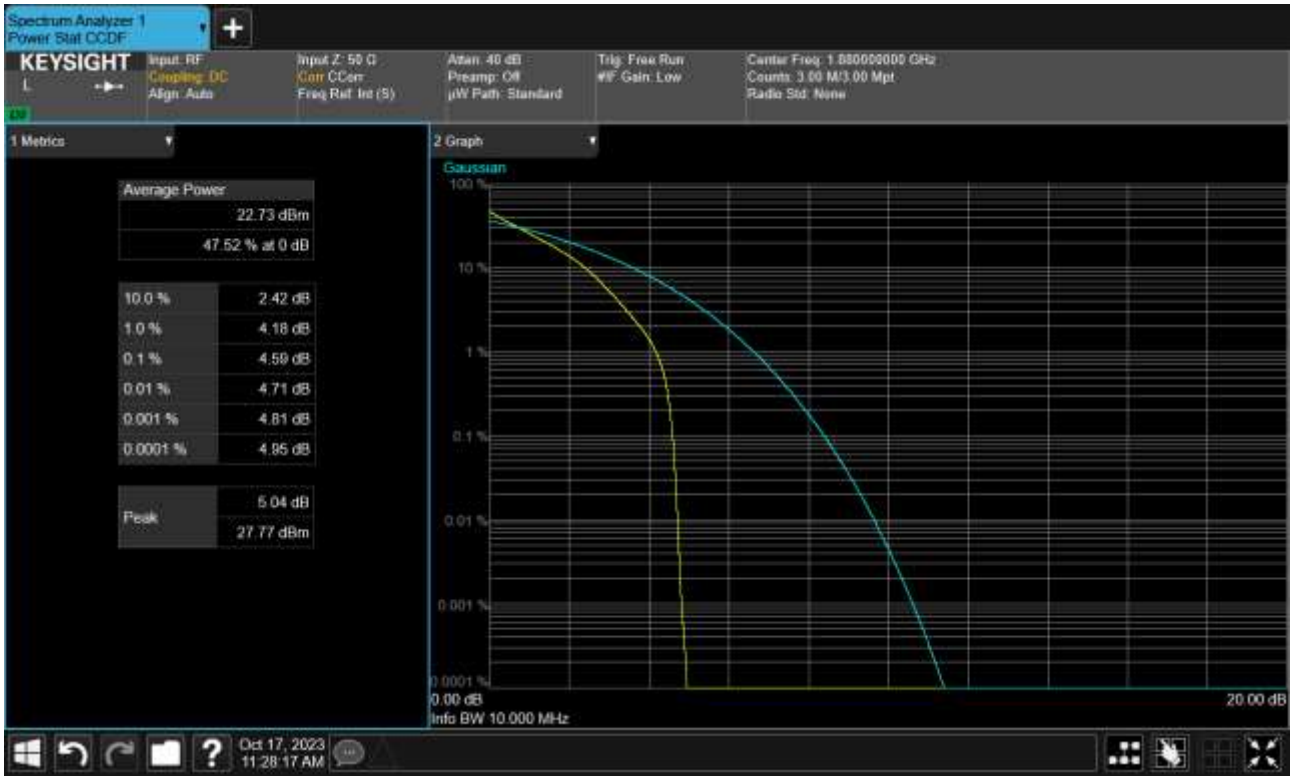
BAND 2 Occupied Bandwidth Plot (5 MHz, 1880 MHz, 256QAM, Full RB)



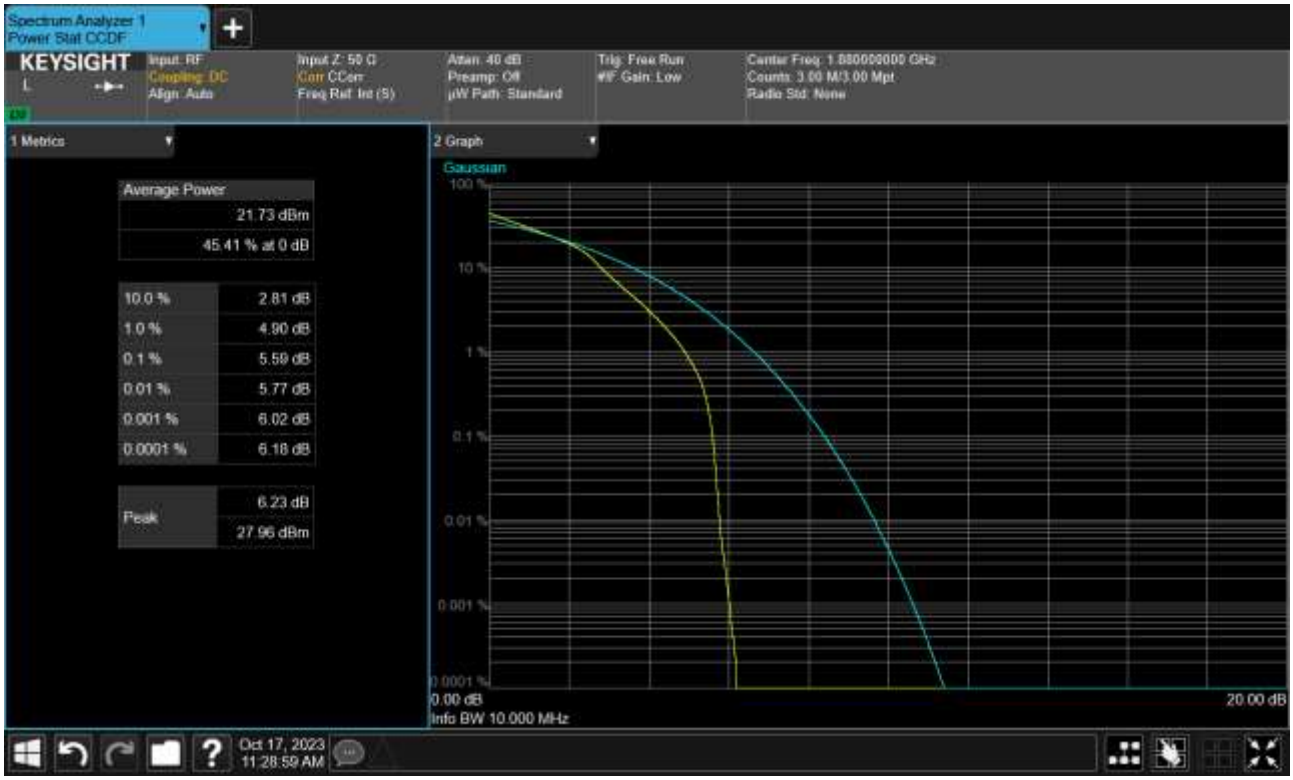
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, BPSK, Full RB)



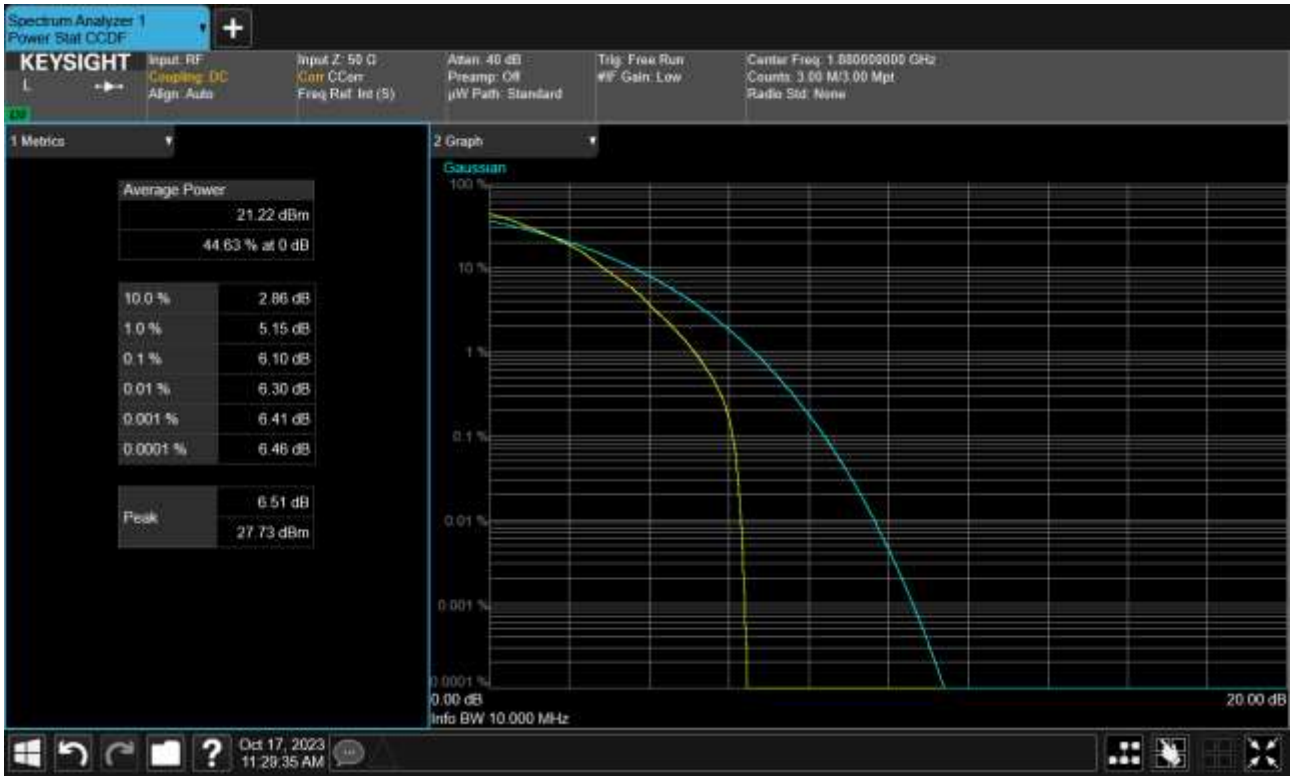
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, QPSK, Full RB)



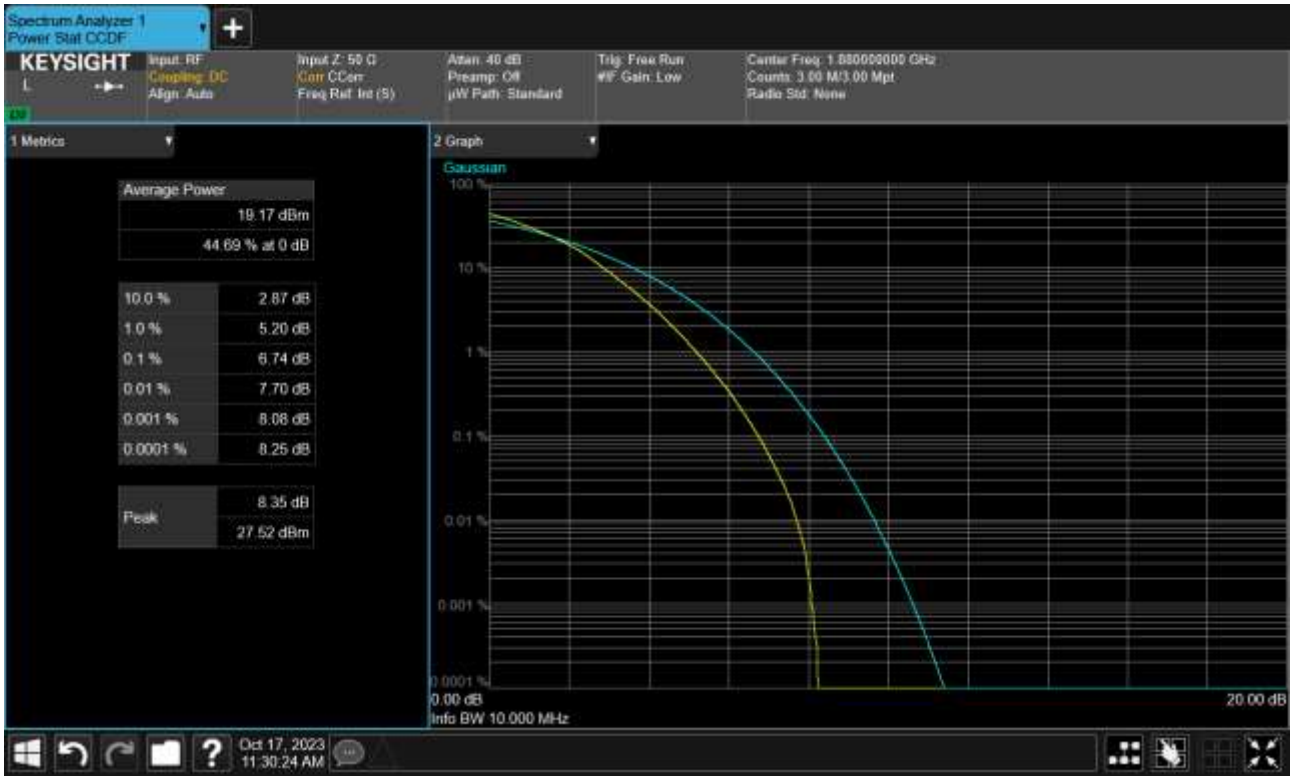
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 16QAM, Full RB)



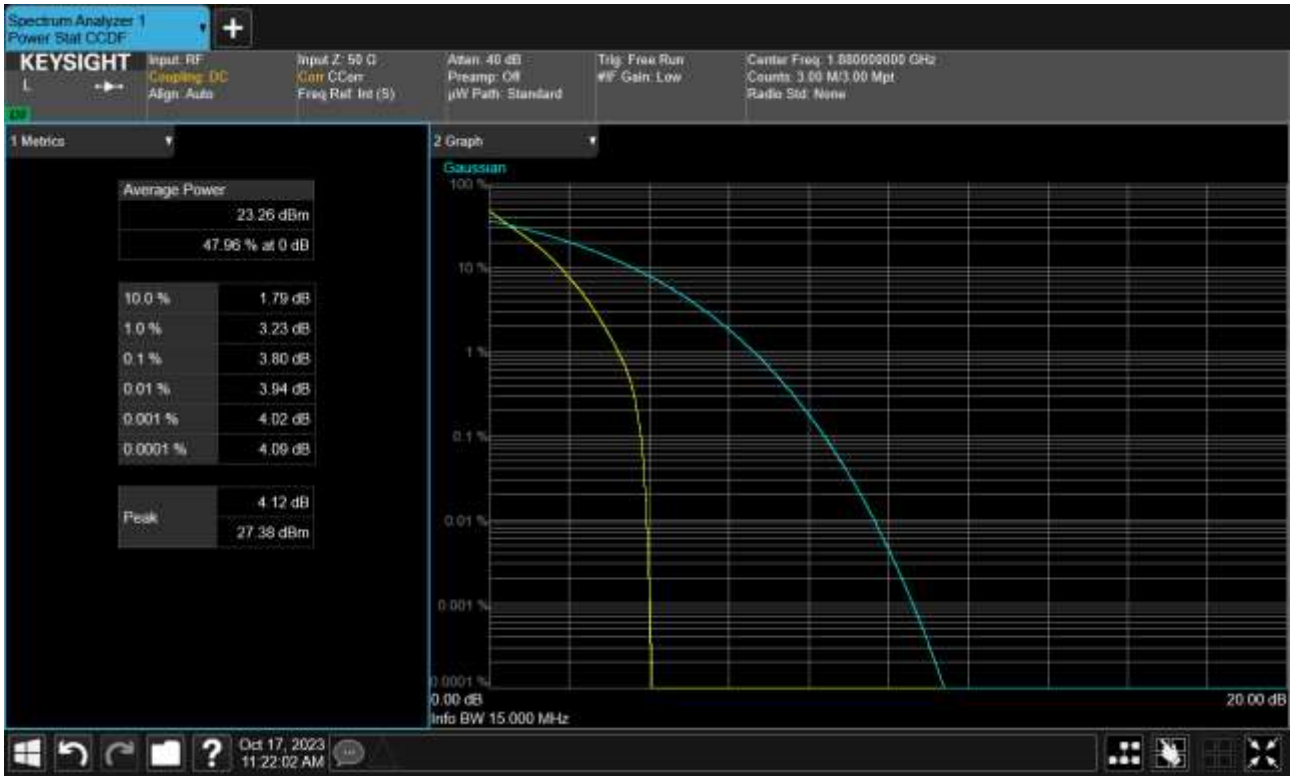
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 64QAM, Full RB)



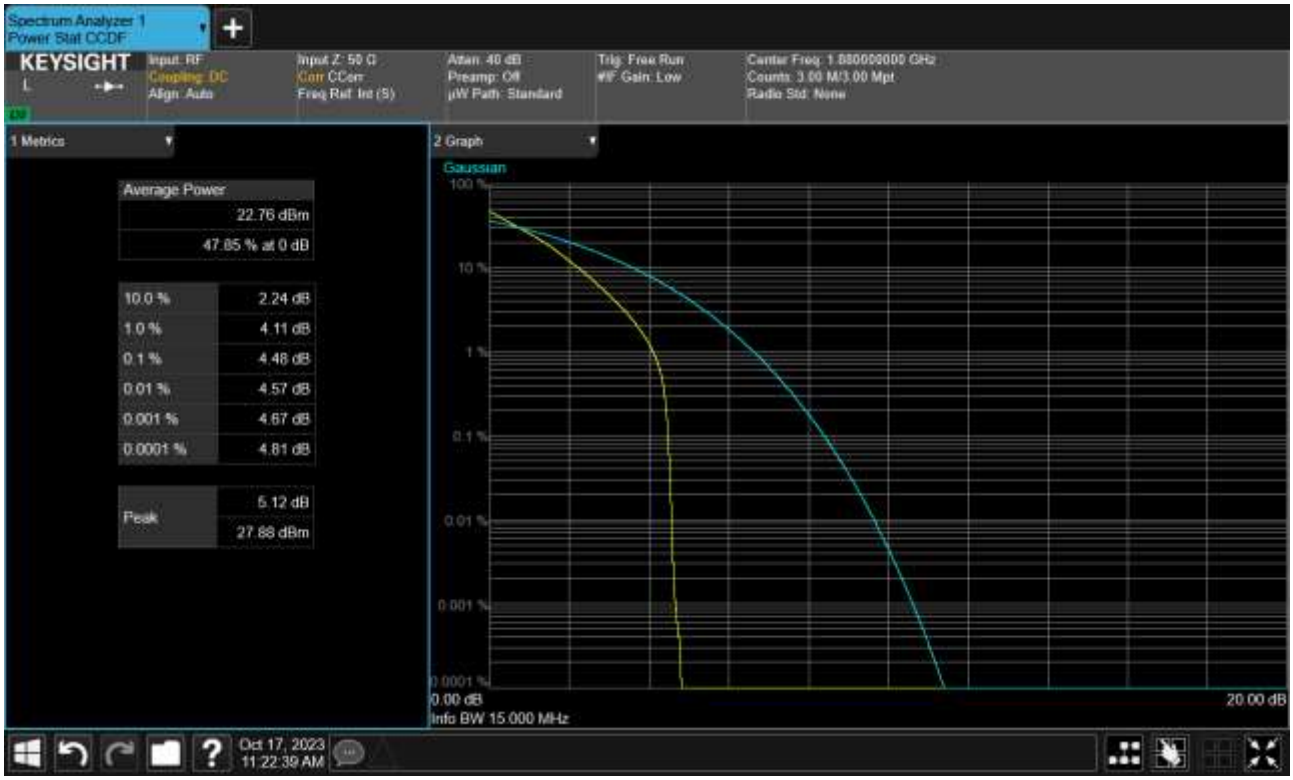
BAND 2 Occupied Bandwidth Plot (10 MHz, 1880 MHz, 256QAM, Full RB)



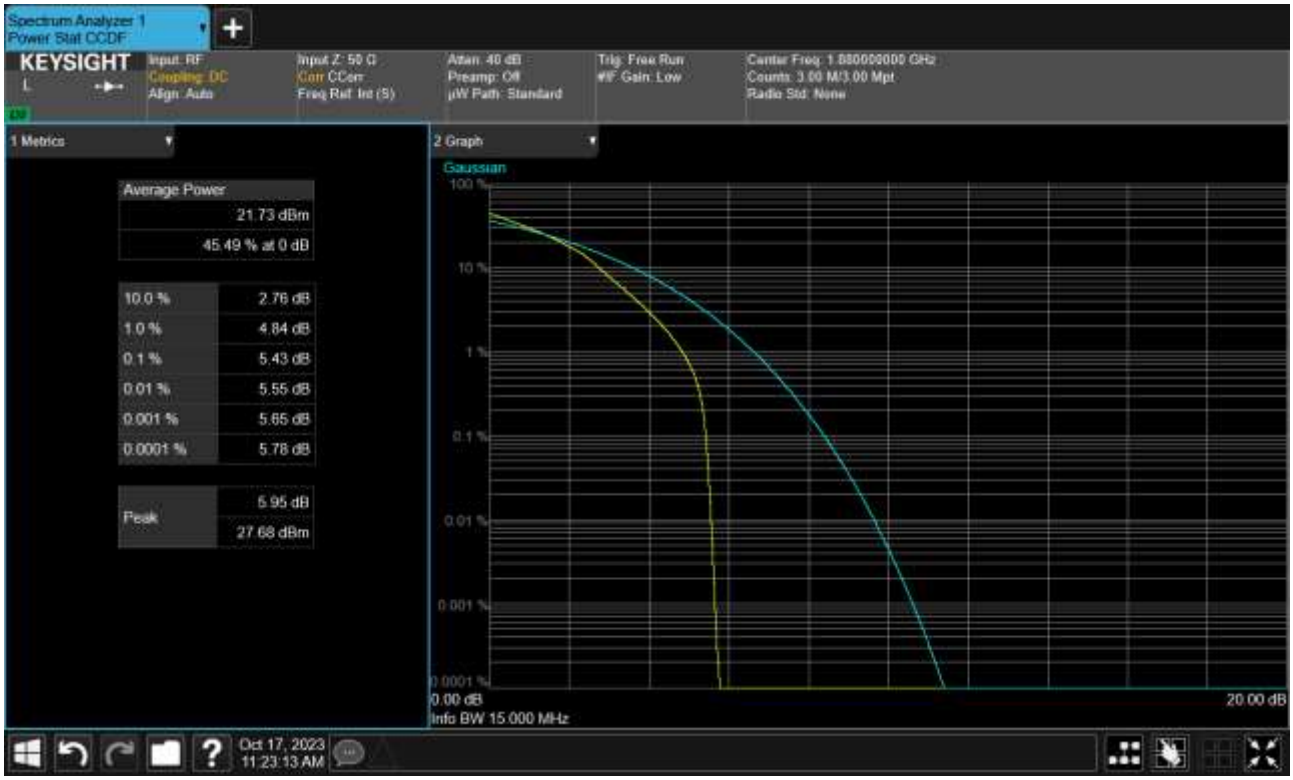
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, BPSK, Full RB)



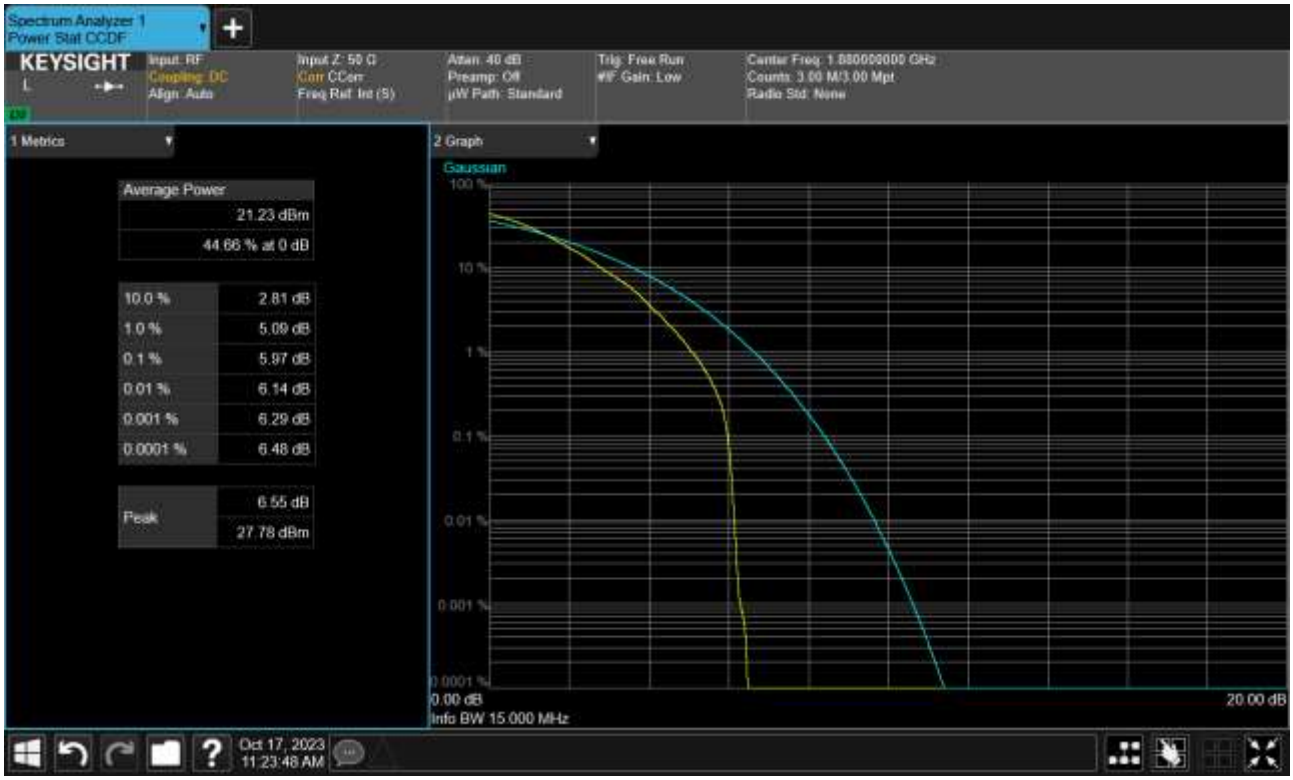
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, QPSK, Full RB)



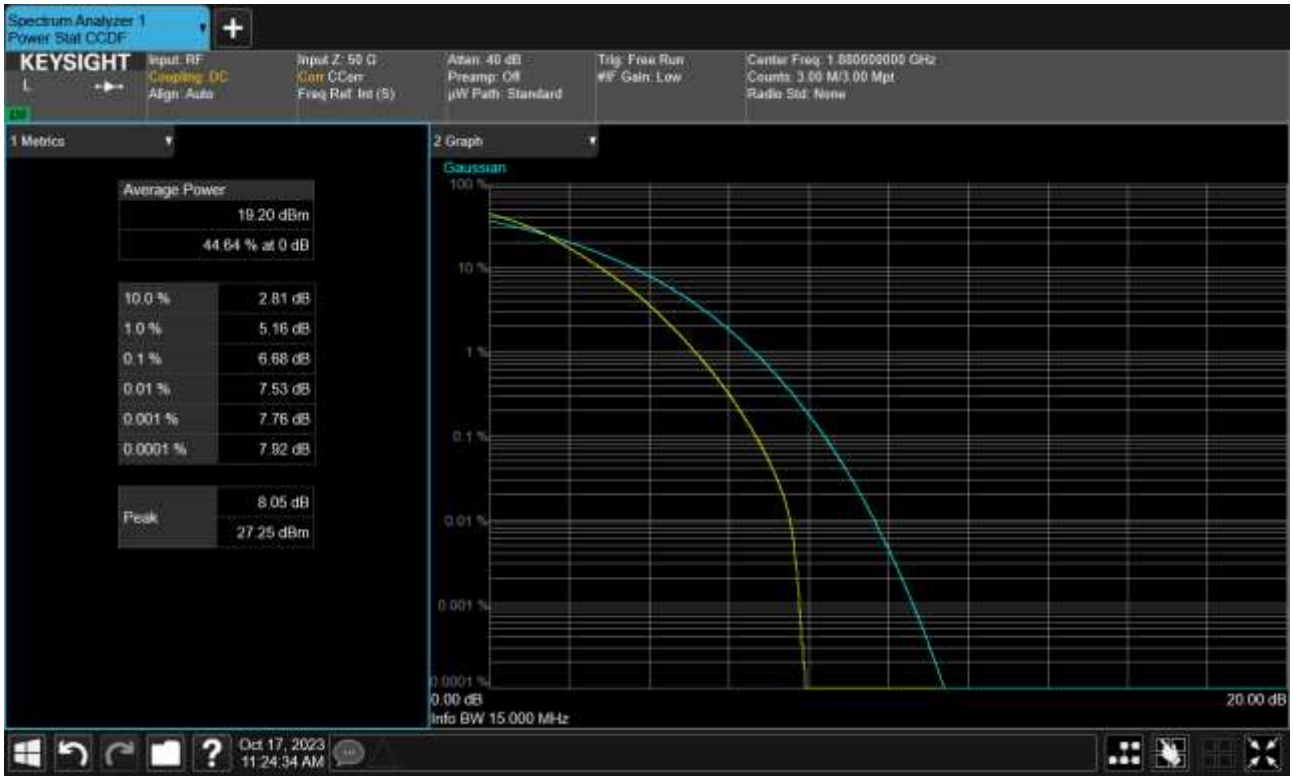
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 16QAM, Full RB)



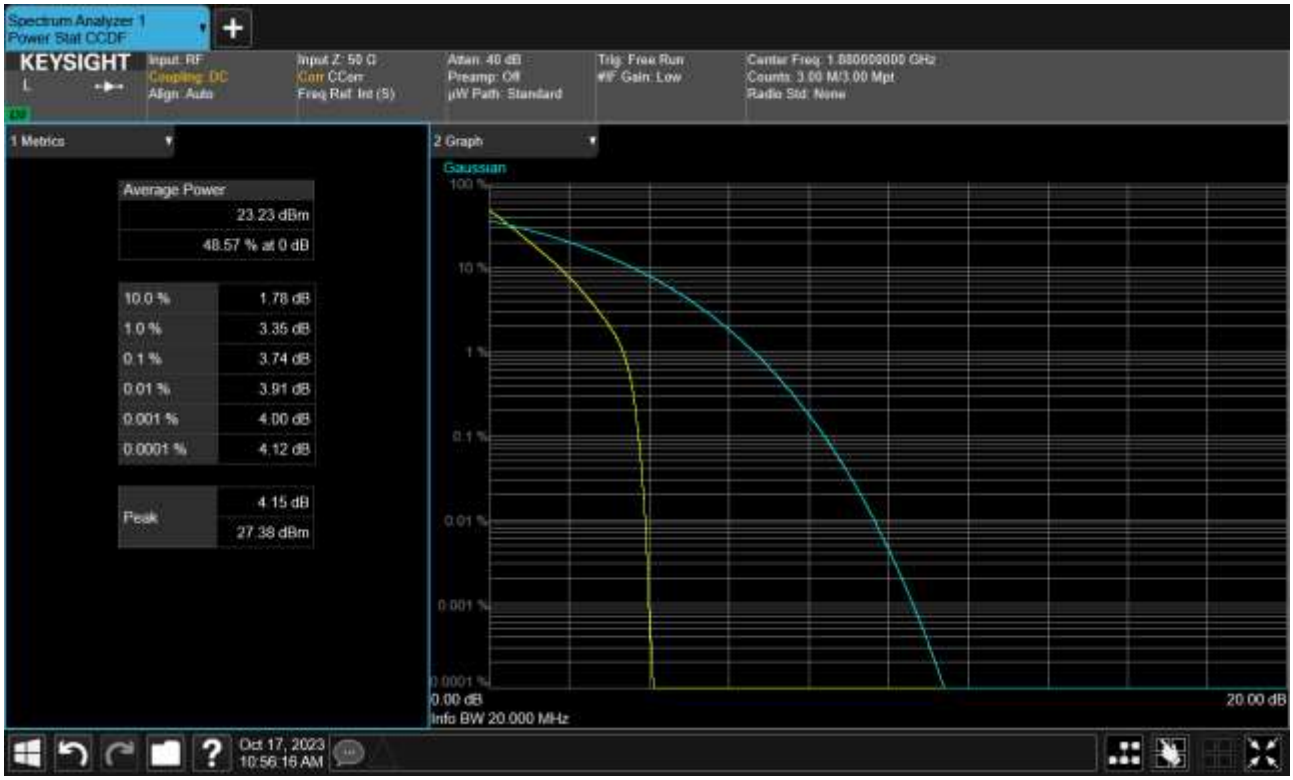
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 64QAM, Full RB)



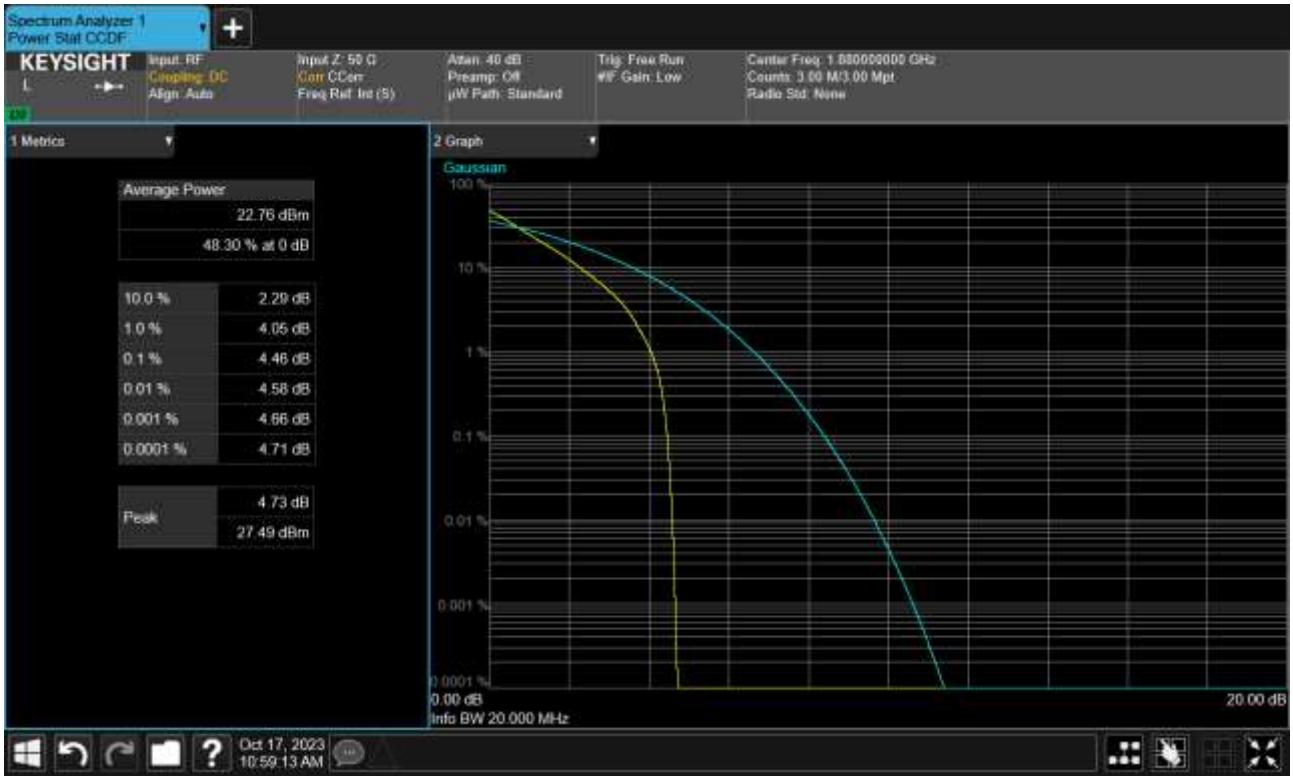
BAND 2 Occupied Bandwidth Plot (15 MHz, 1880 MHz, 256QAM, Full RB)



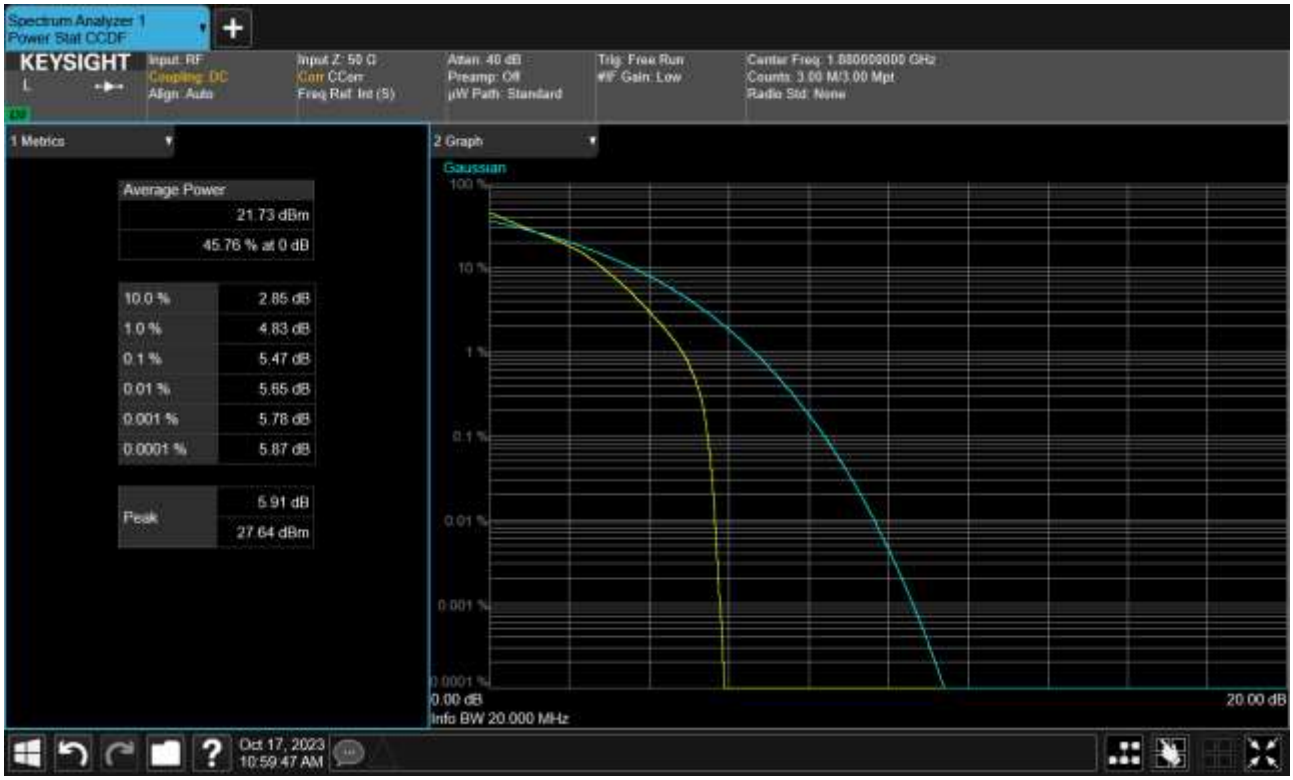
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, BPSK, Full RB)



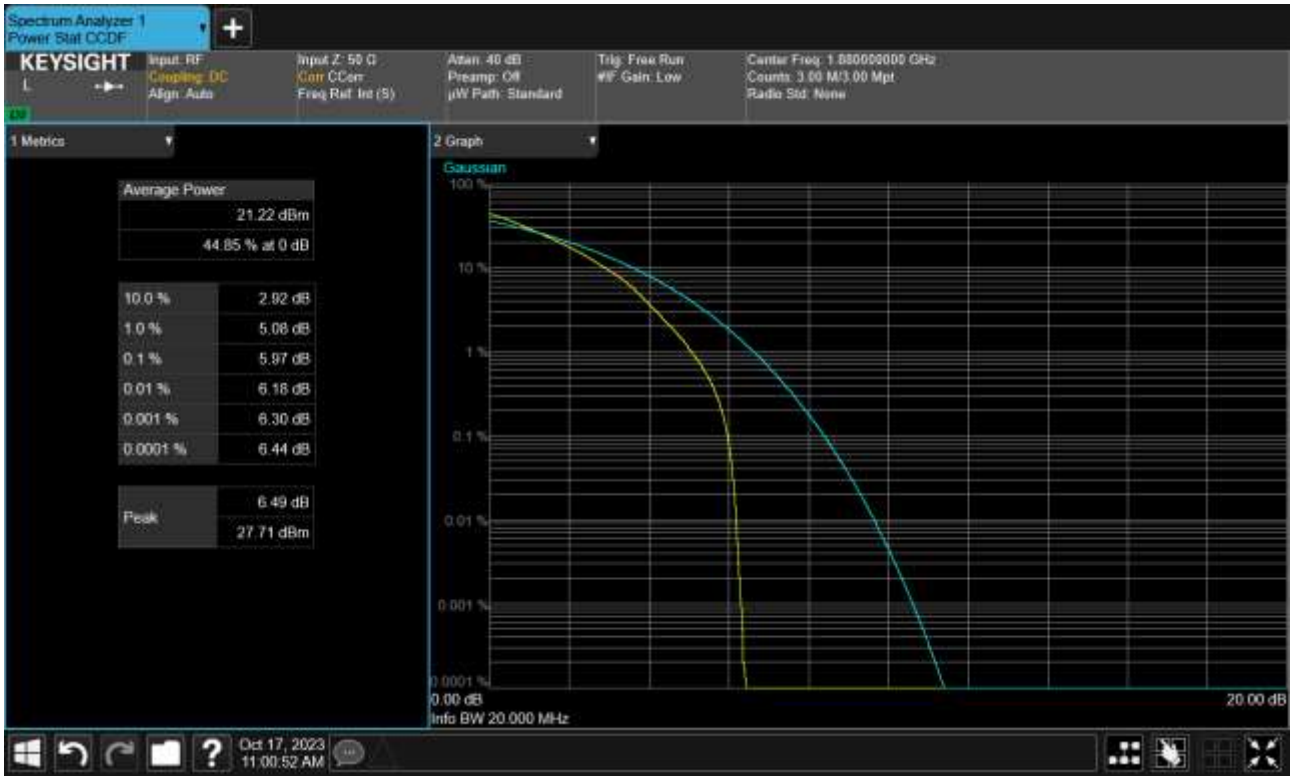
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, QPSK, Full RB)



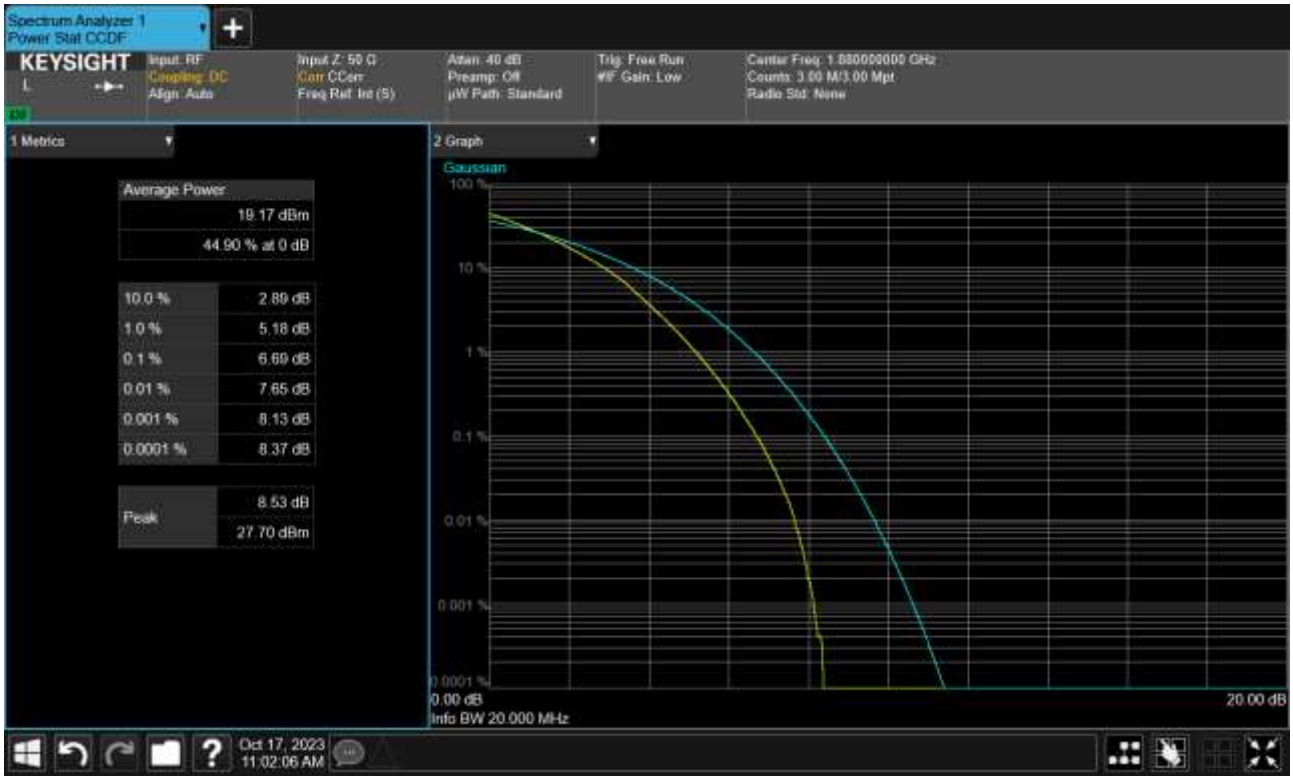
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 16QAM, Full RB)



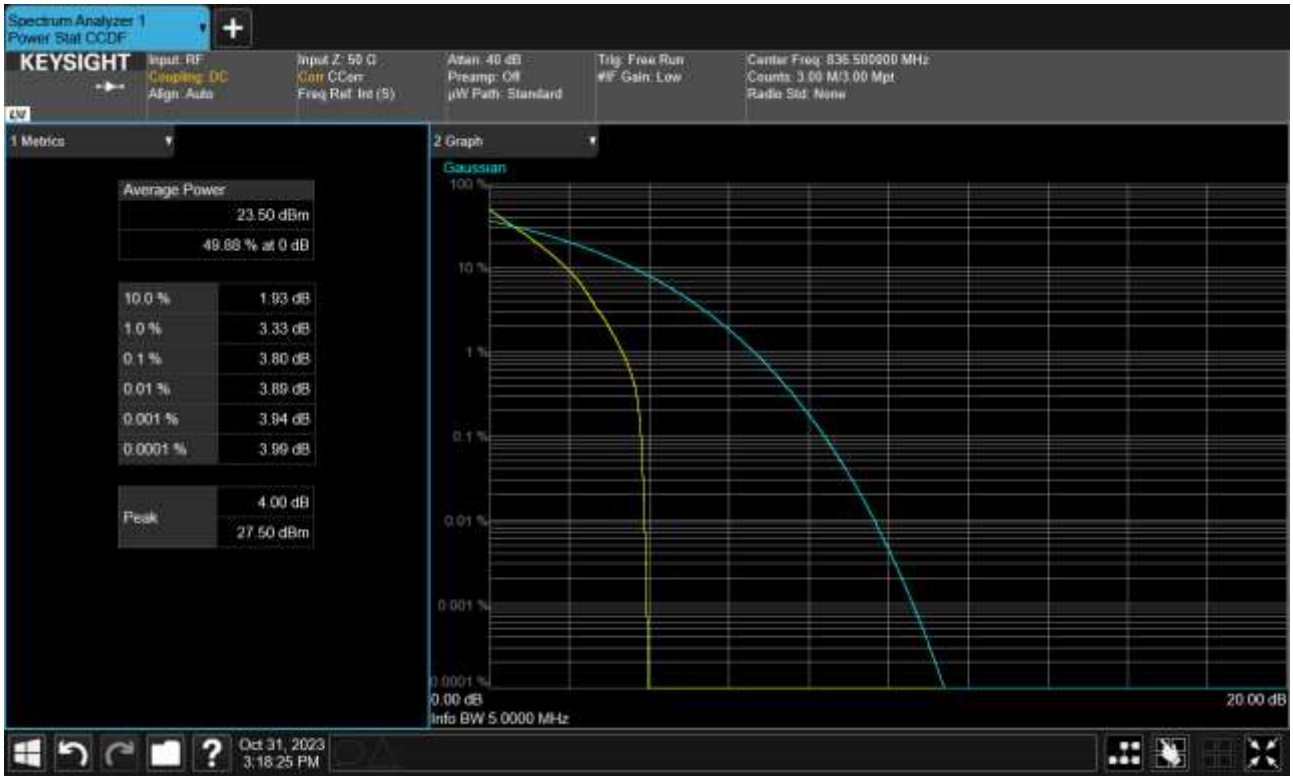
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 64QAM, Full RB)



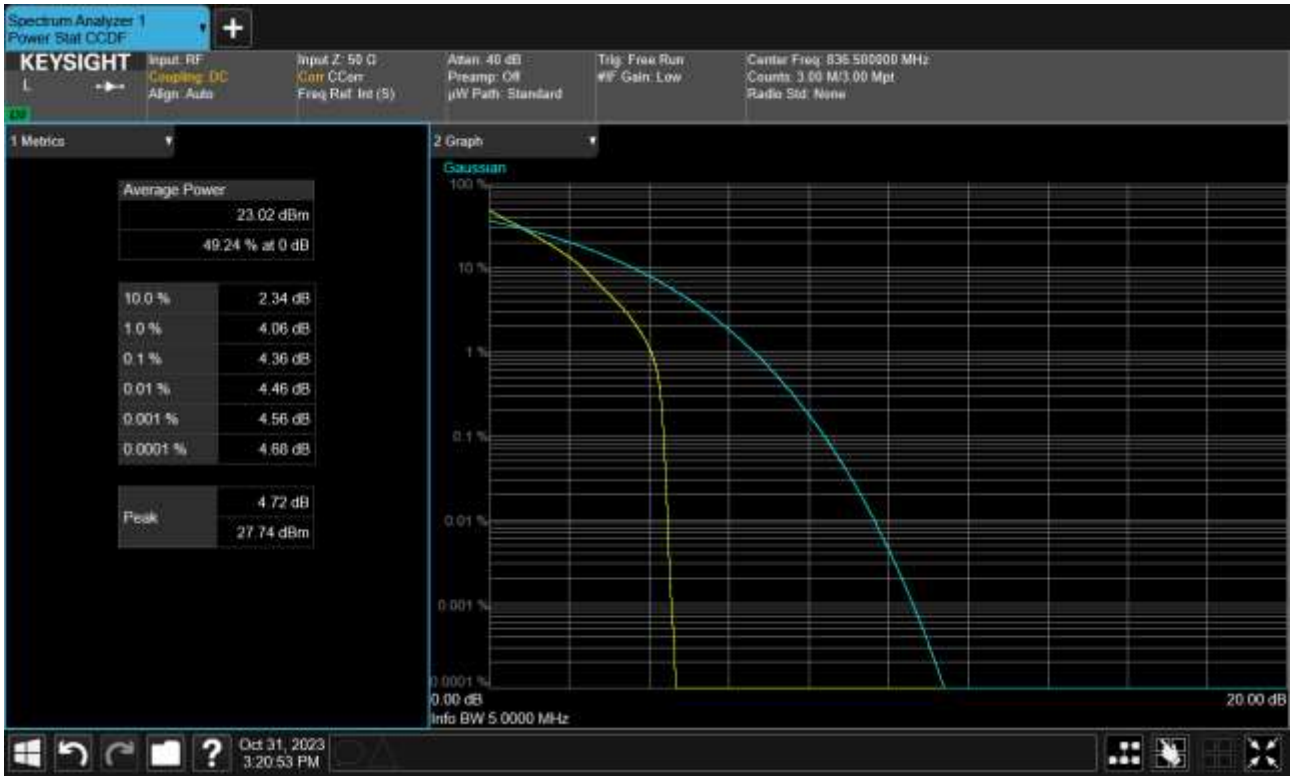
BAND 2 Occupied Bandwidth Plot (20 MHz, 1880 MHz, 256QAM, Full RB)



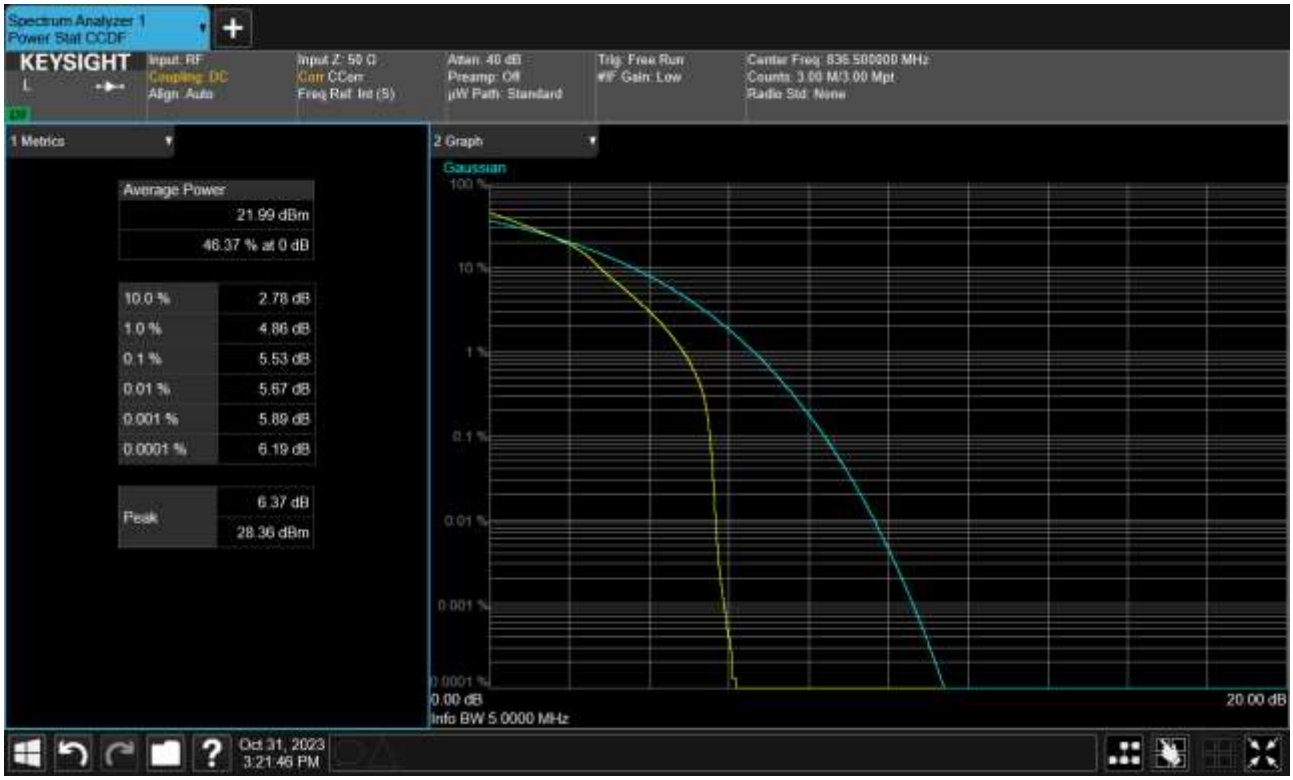
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, BPSK, Full RB)



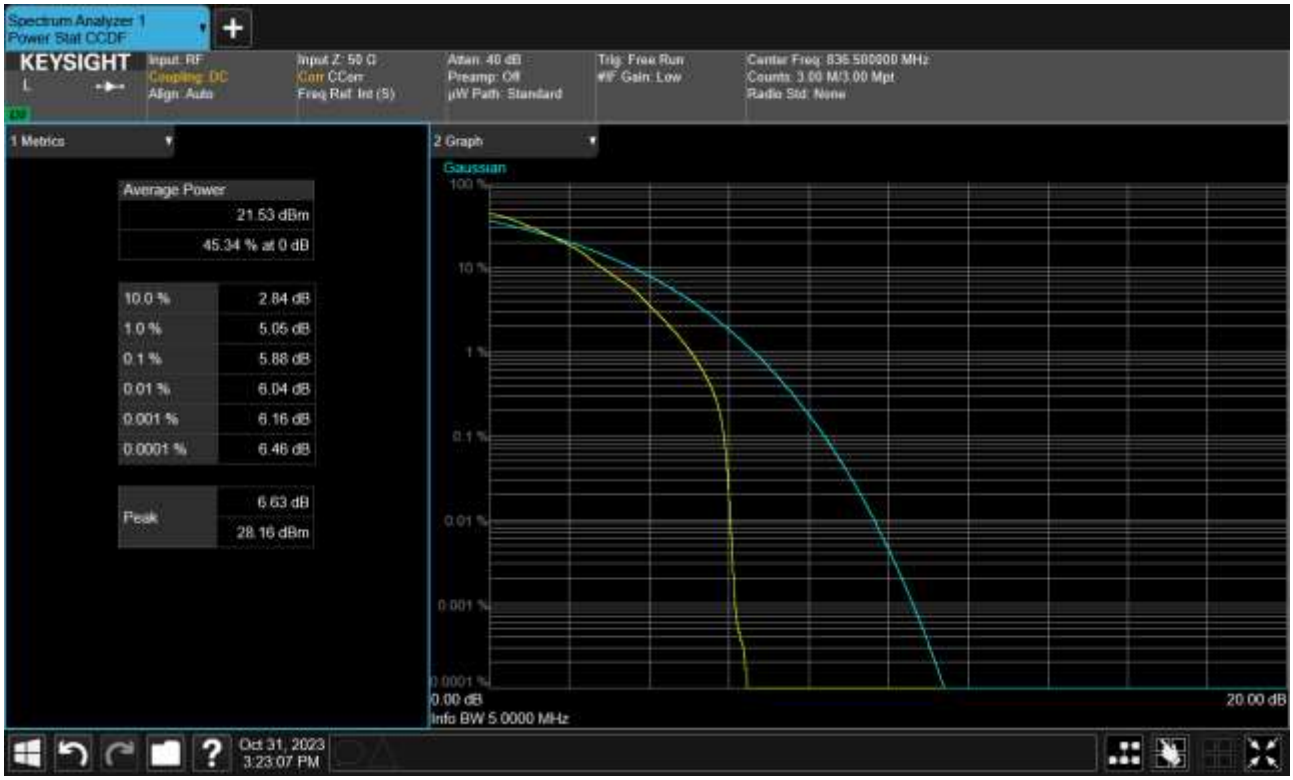
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, QPSK, Full RB)



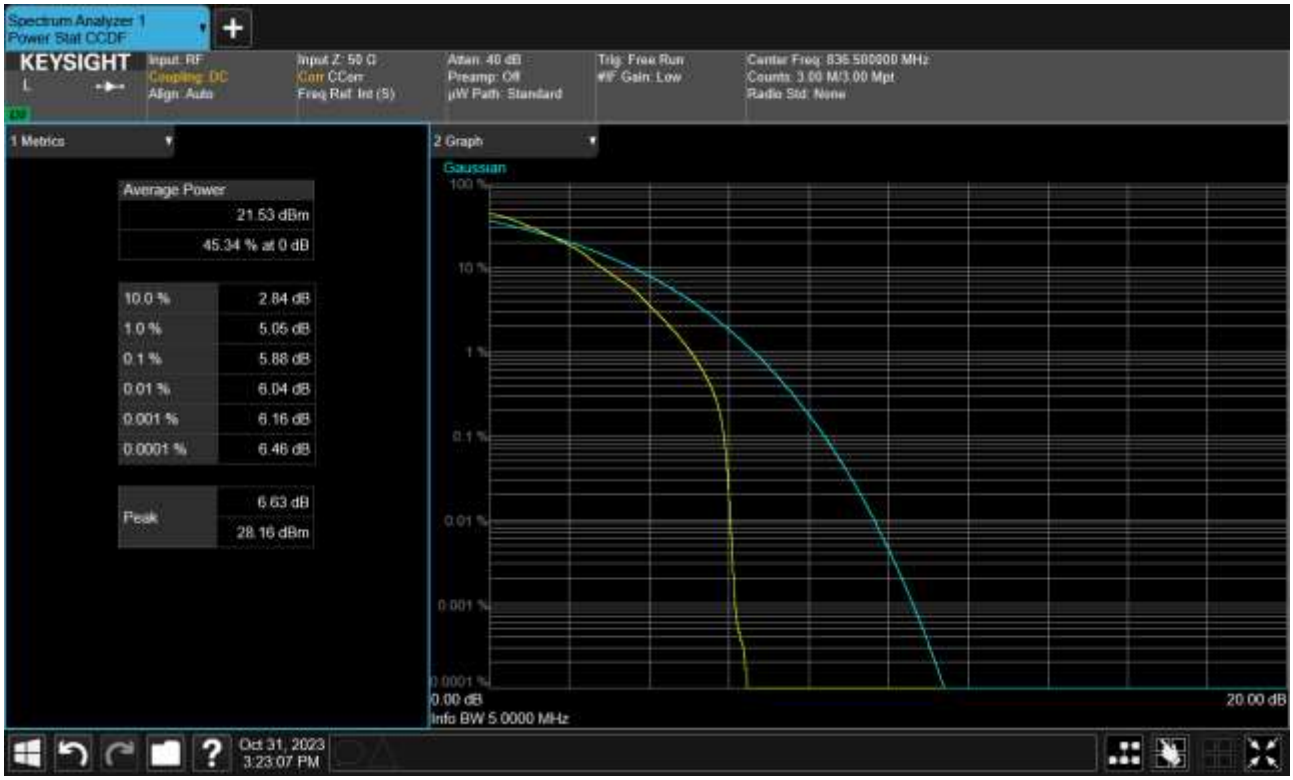
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 16QAM, Full RB)



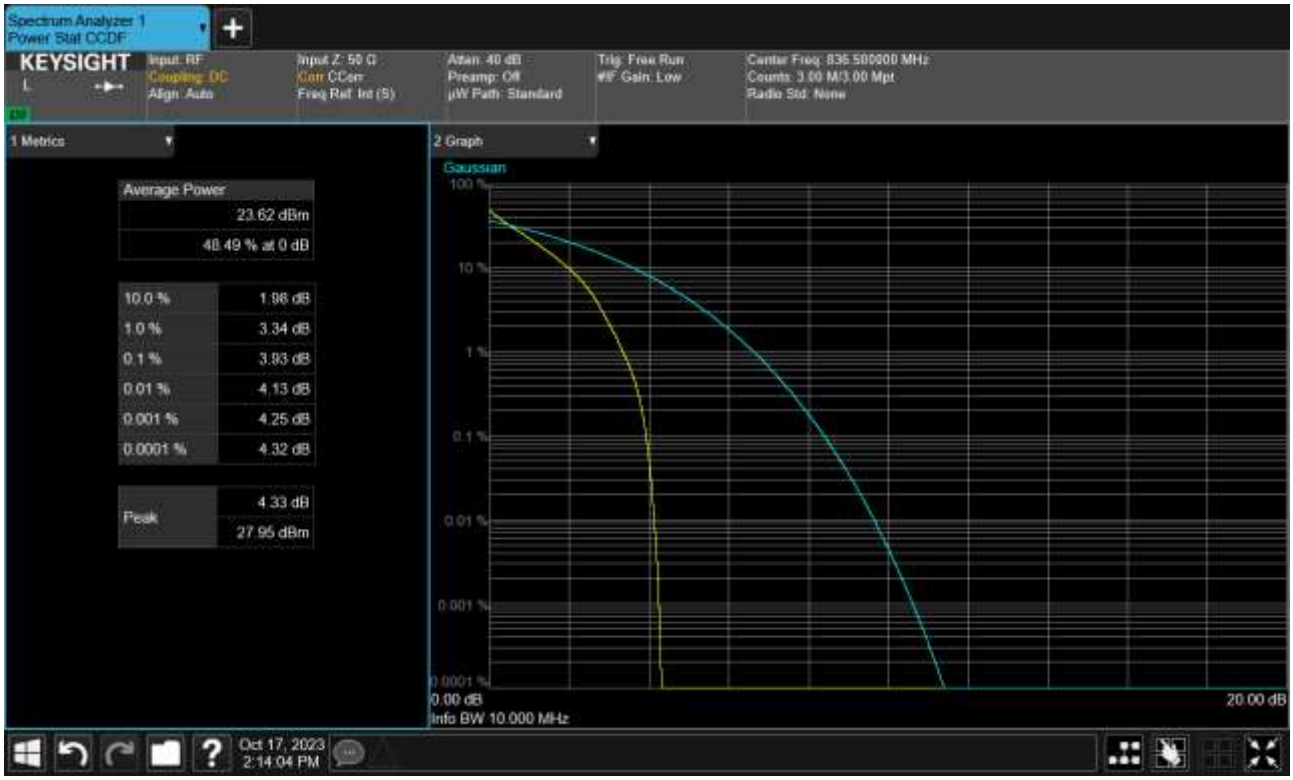
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 64QAM, Full RB)



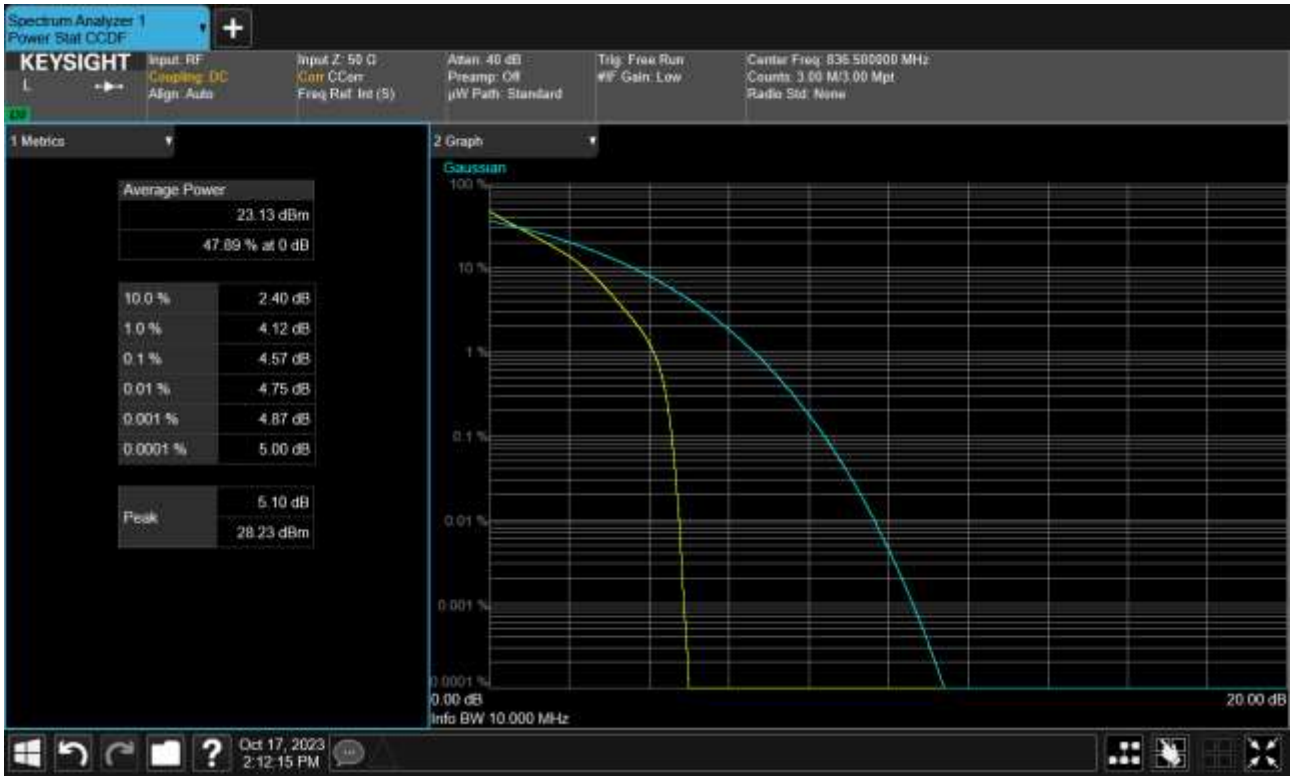
BAND 5 Occupied Bandwidth Plot (5 MHz, 836.5 MHz, 256QAM, Full RB)



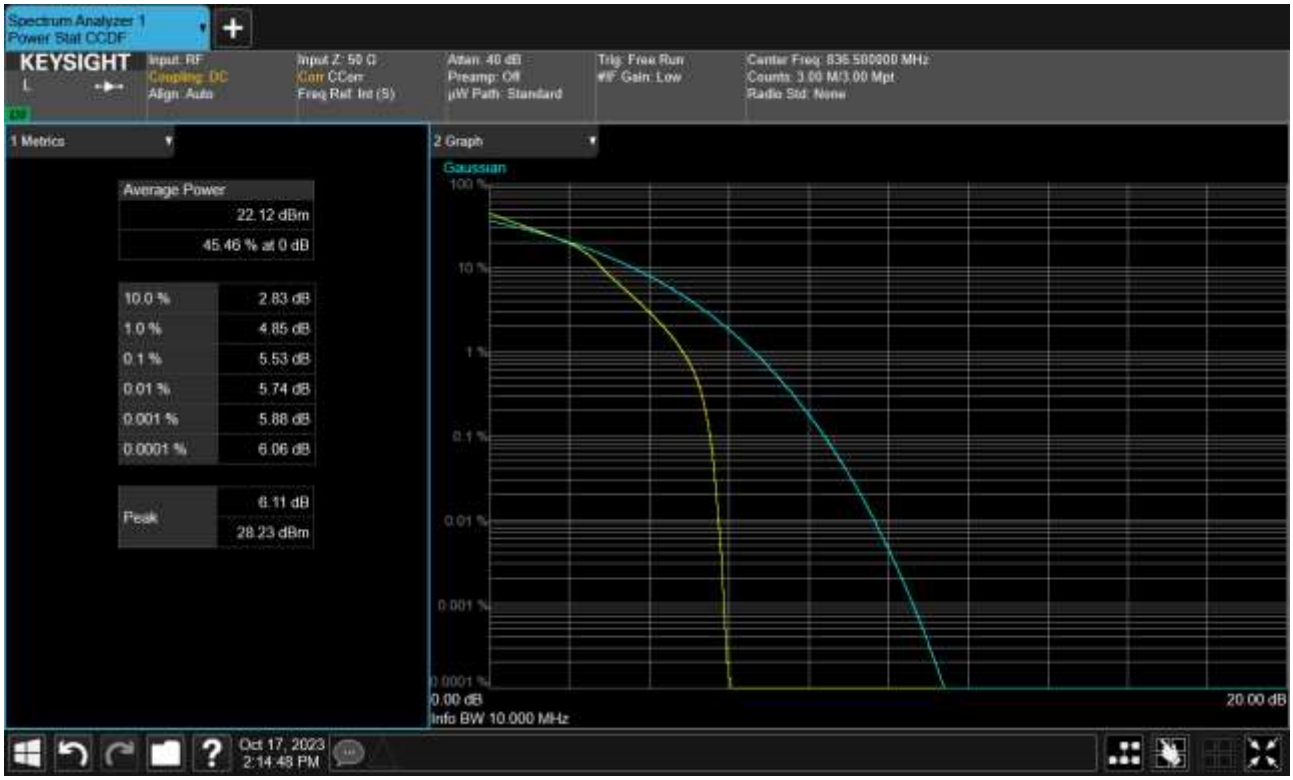
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, BPSK, Full RB)



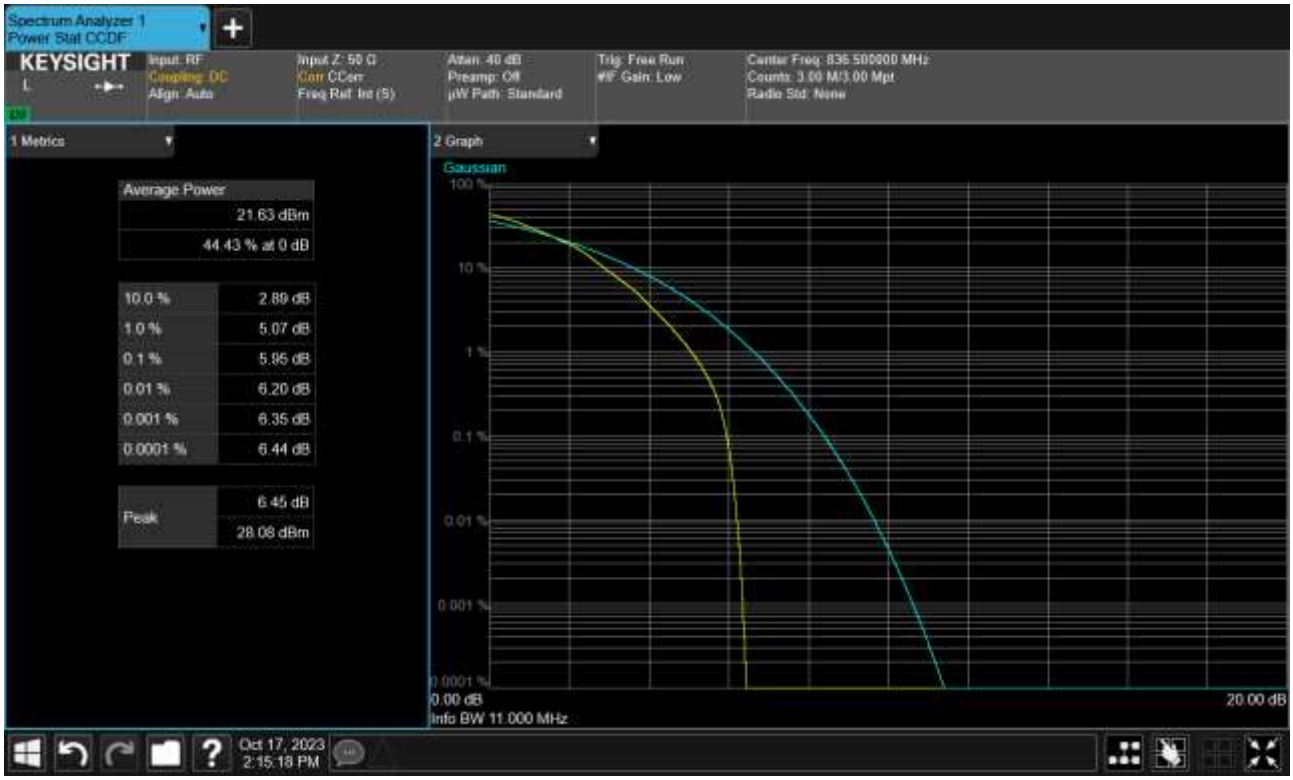
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, QPSK, Full RB)



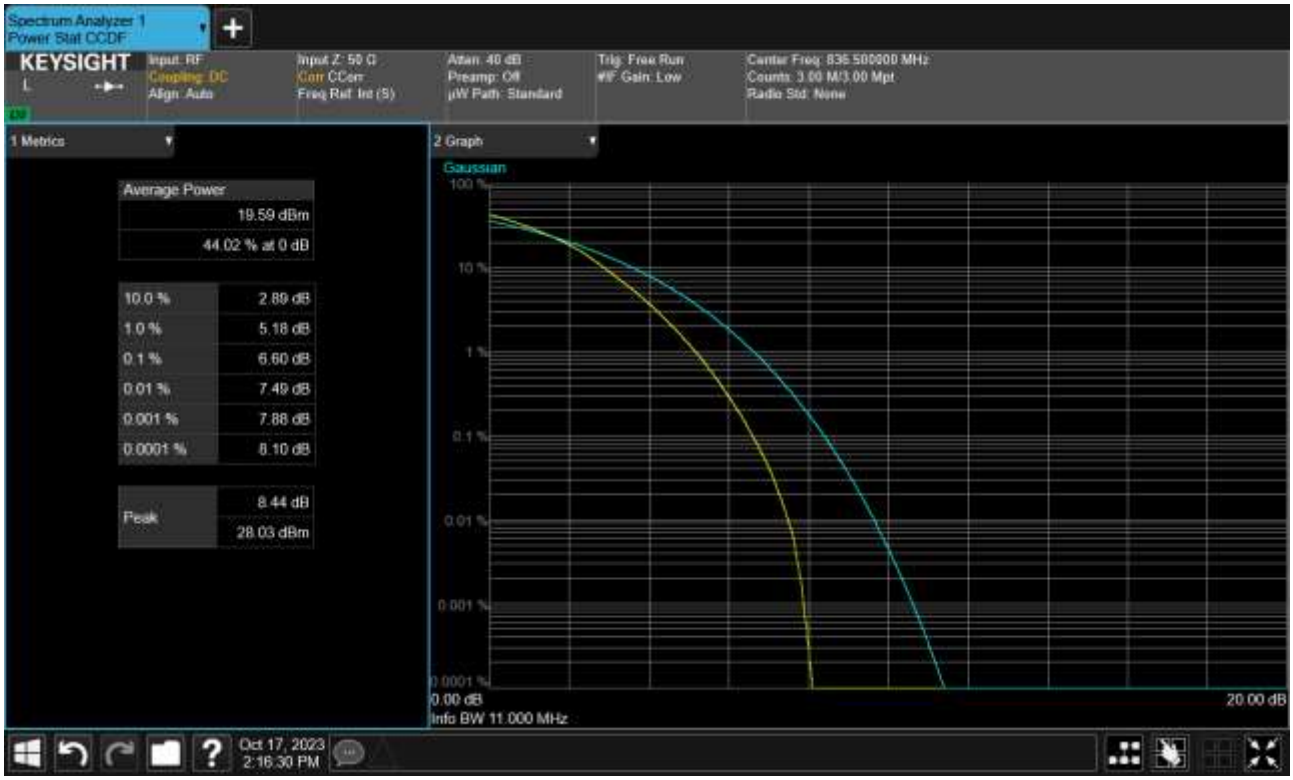
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 16QAM, Full RB)



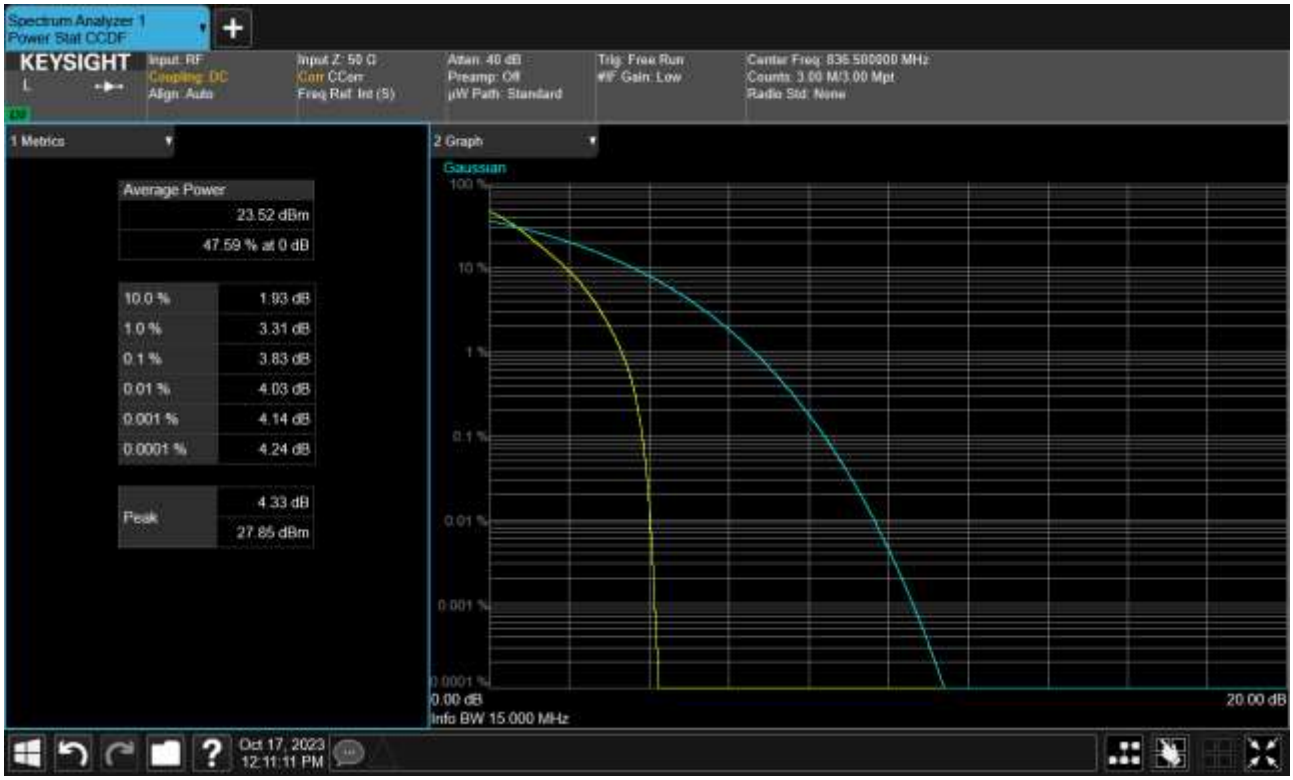
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 64QAM, Full RB)



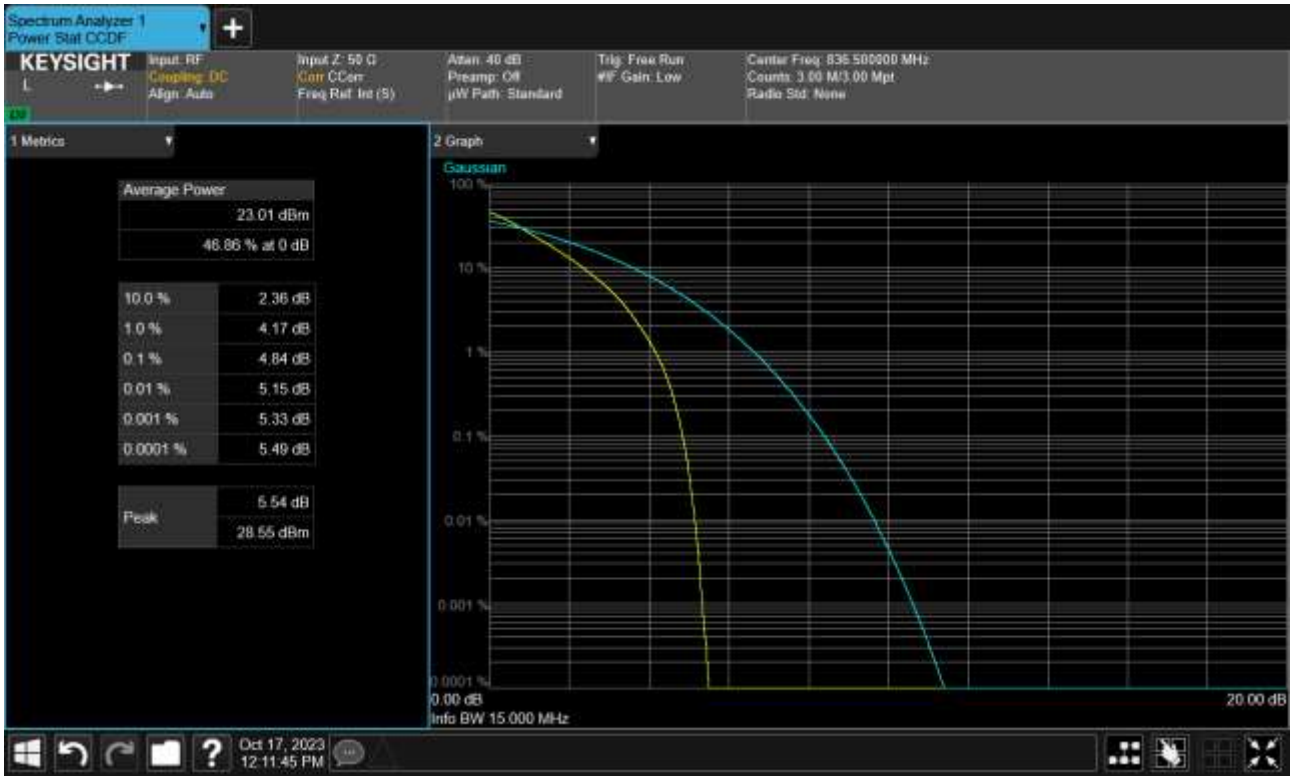
BAND 5 Occupied Bandwidth Plot (10 MHz, 836.5 MHz, 256QAM, Full RB)



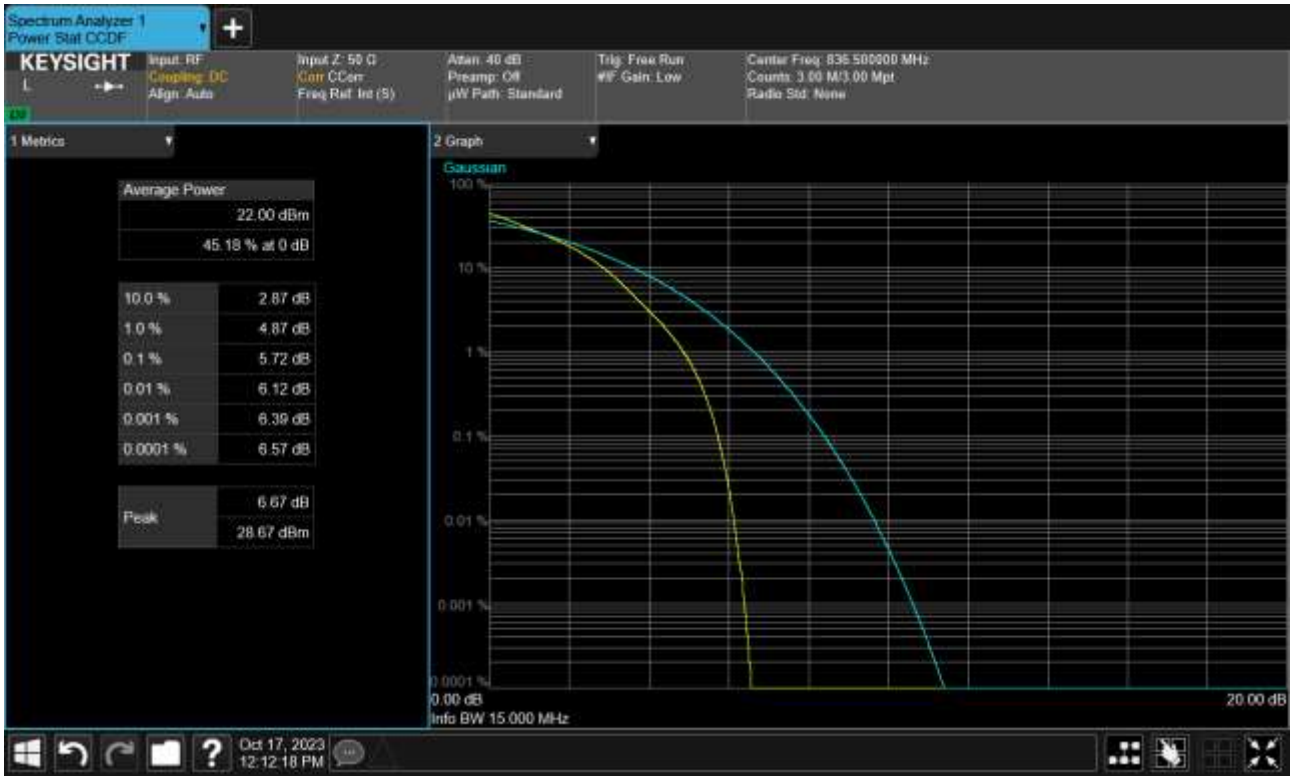
BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, BPSK, Full RB)



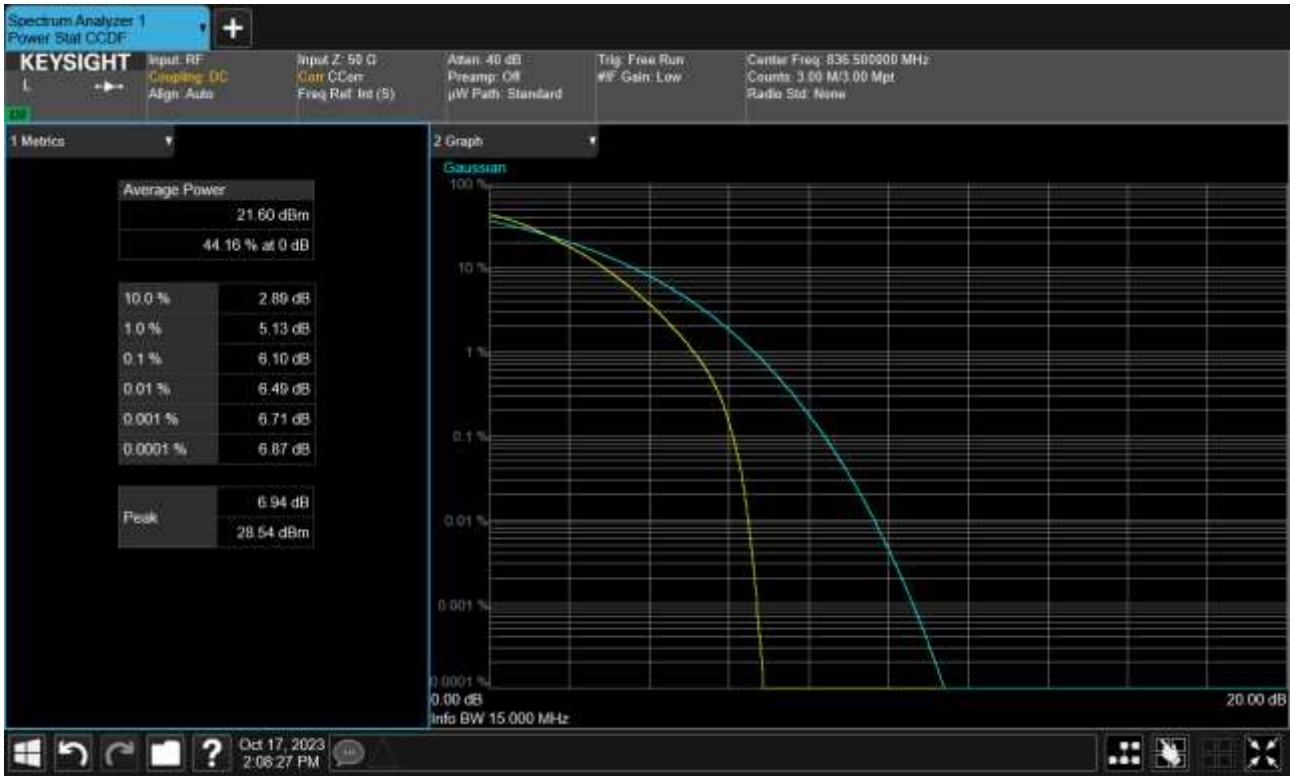
BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, QPSK, Full RB)



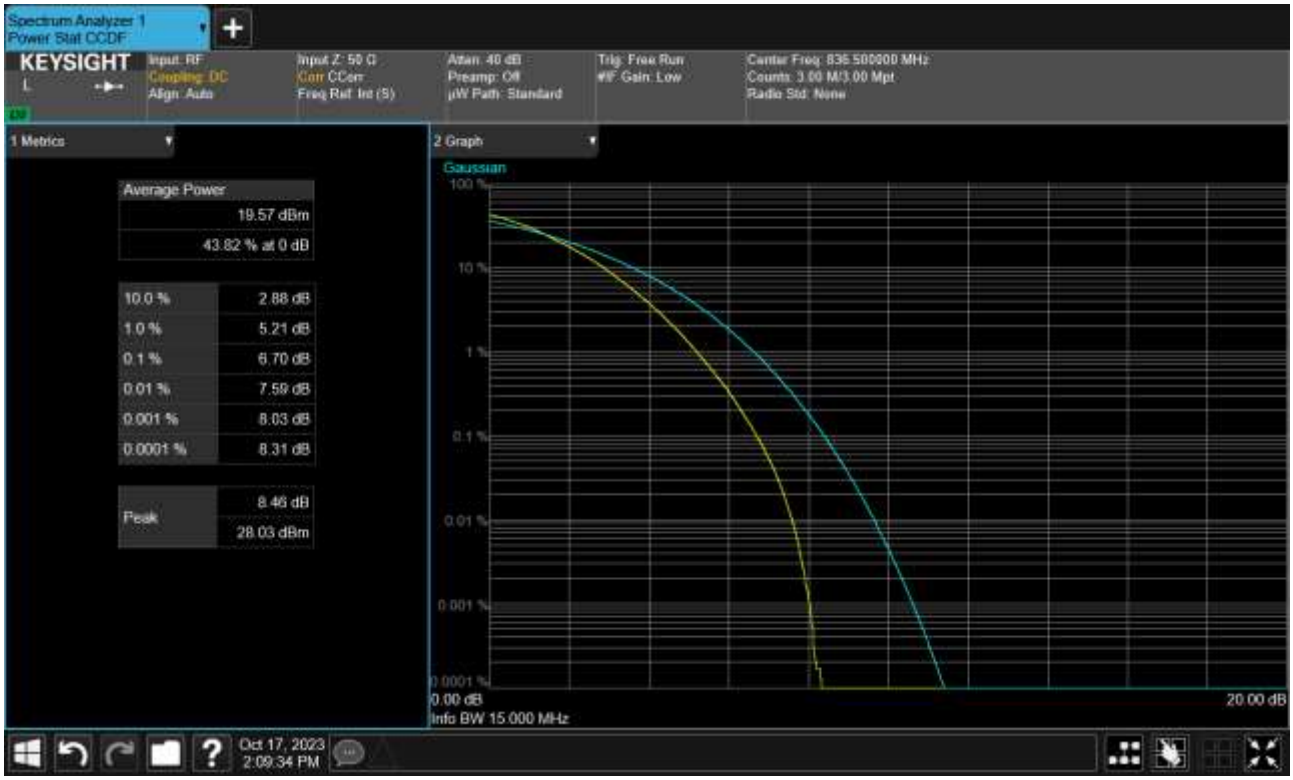
BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 16QAM, Full RB)



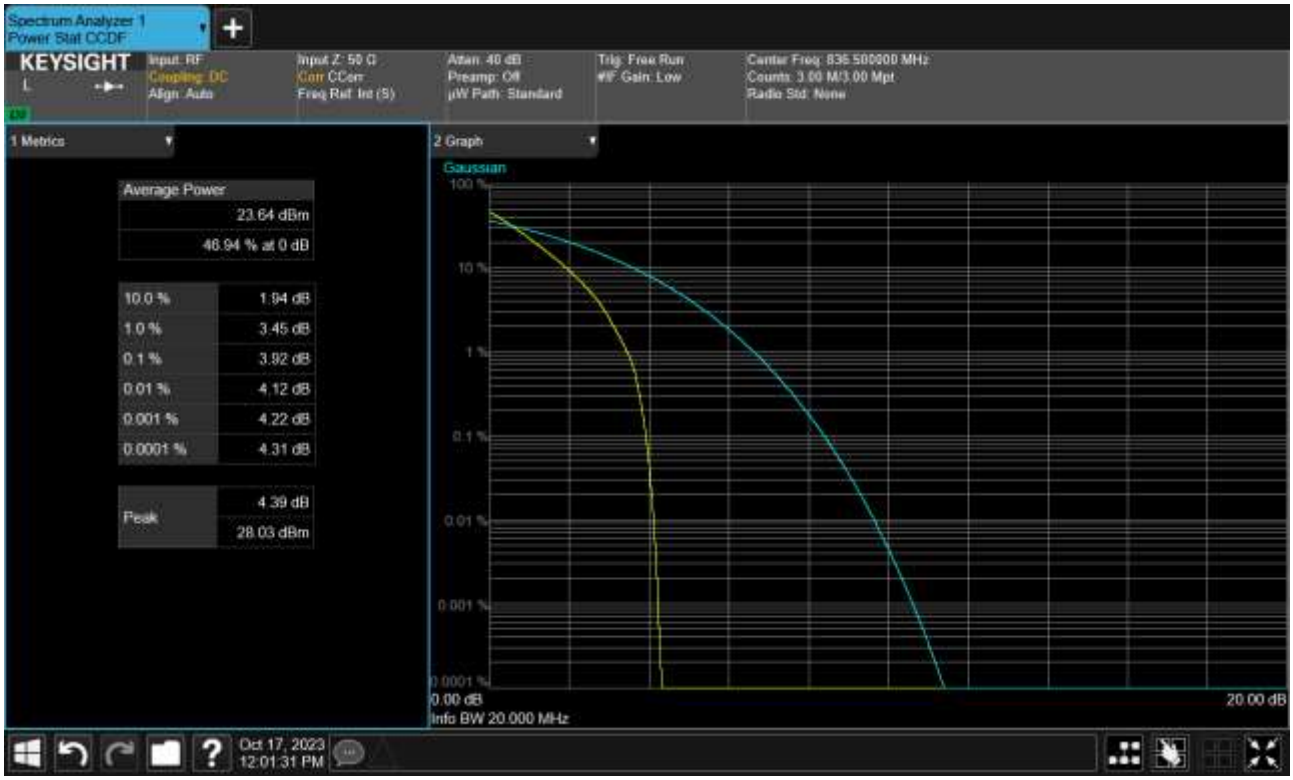
BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 64QAM, Full RB)



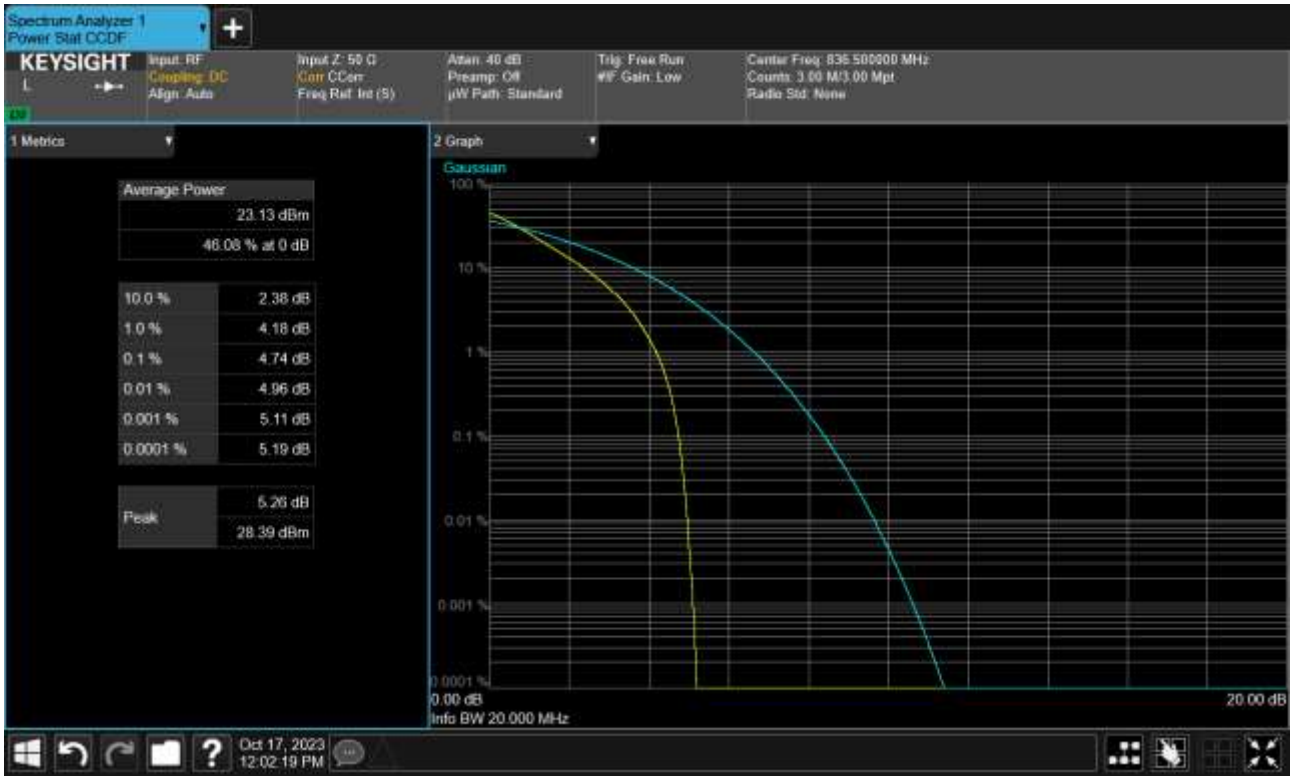
BAND 5 Occupied Bandwidth Plot (15 MHz, 836.5 MHz, 256QAM, Full RB)



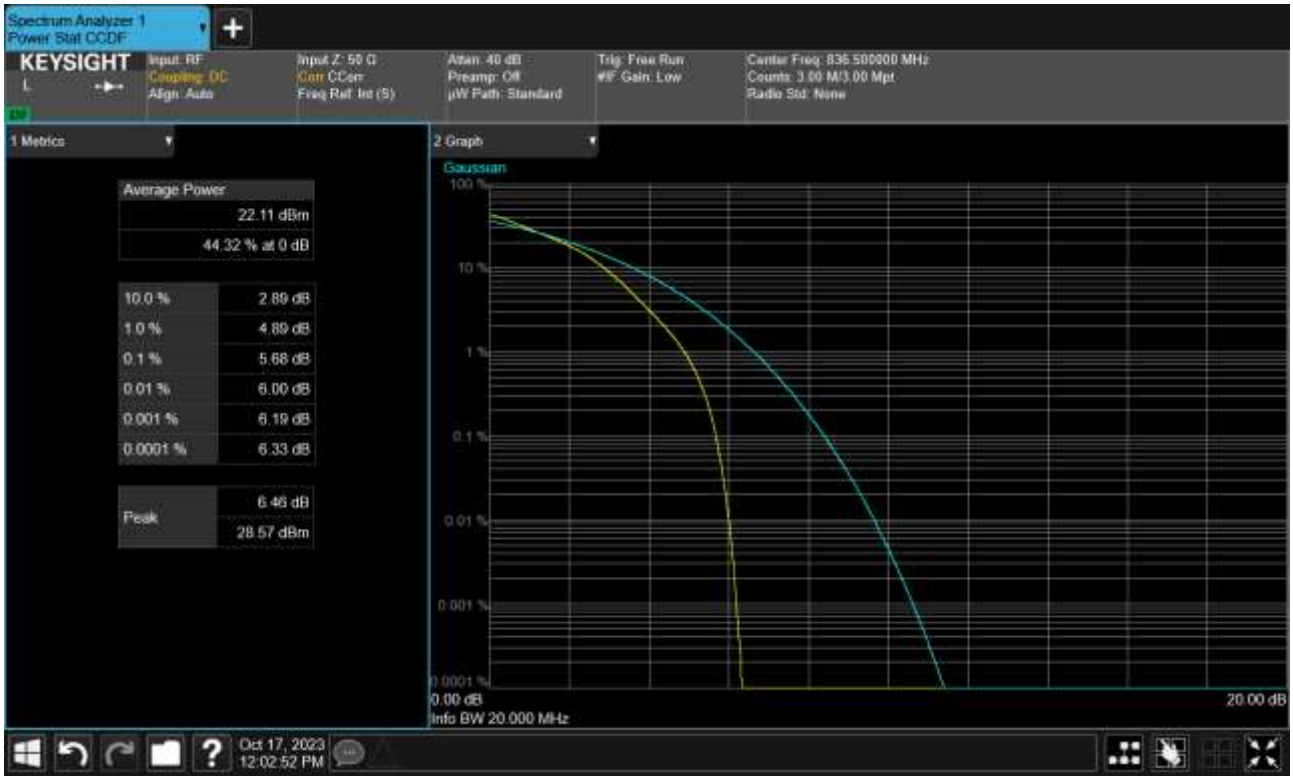
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, BPSK, Full RB)



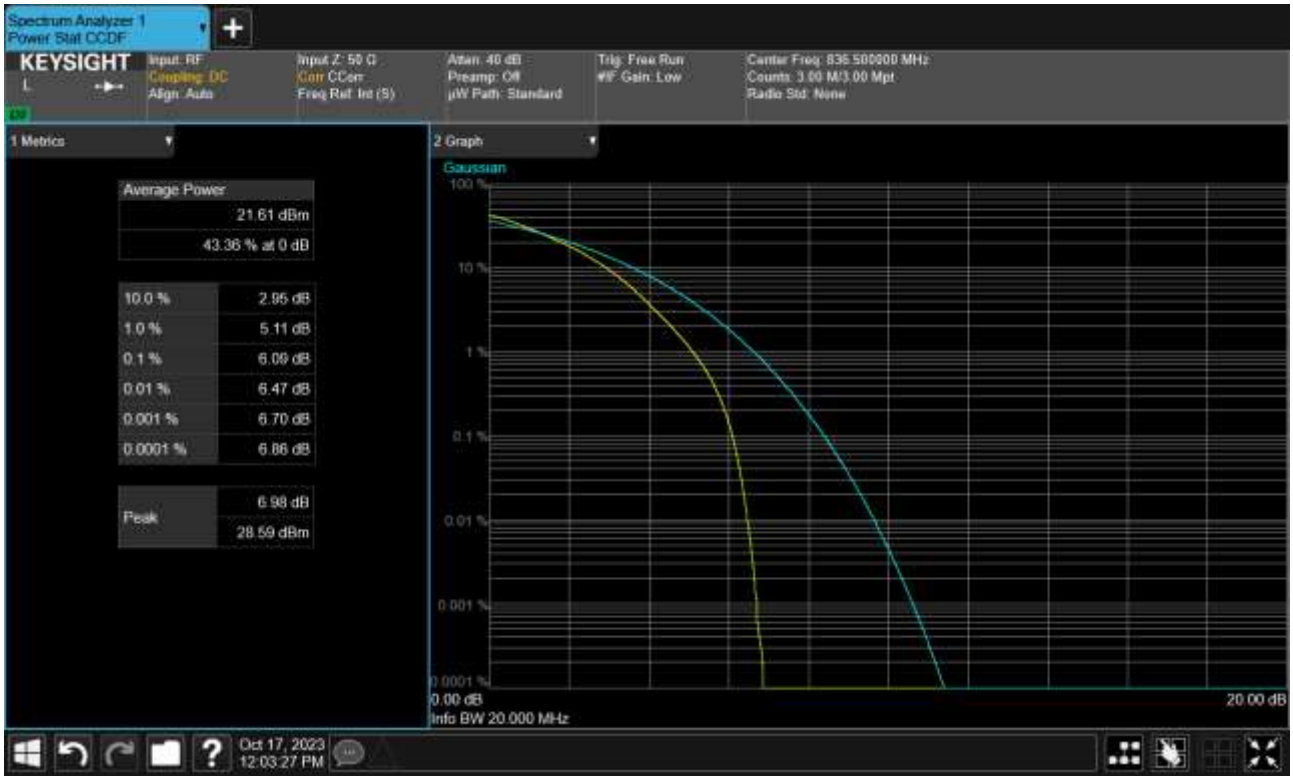
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, QPSK, Full RB)



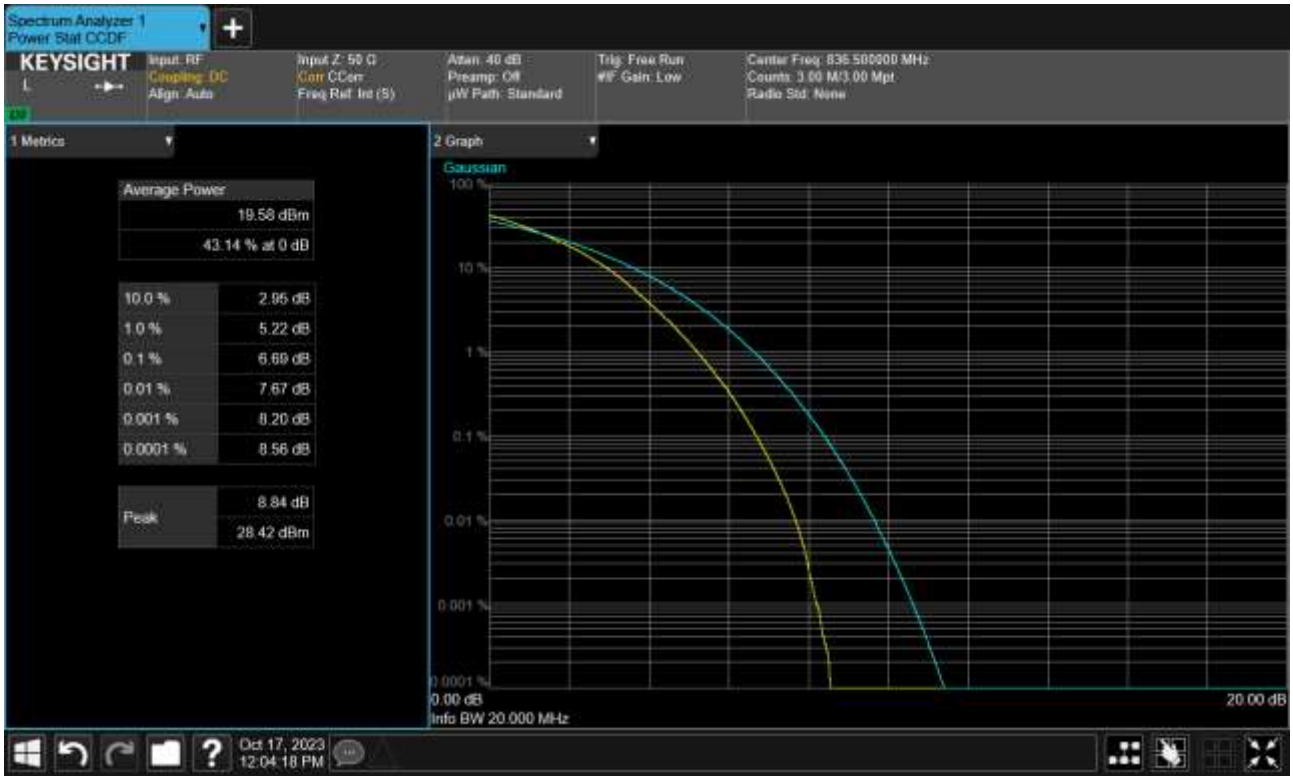
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 16QAM, Full RB)



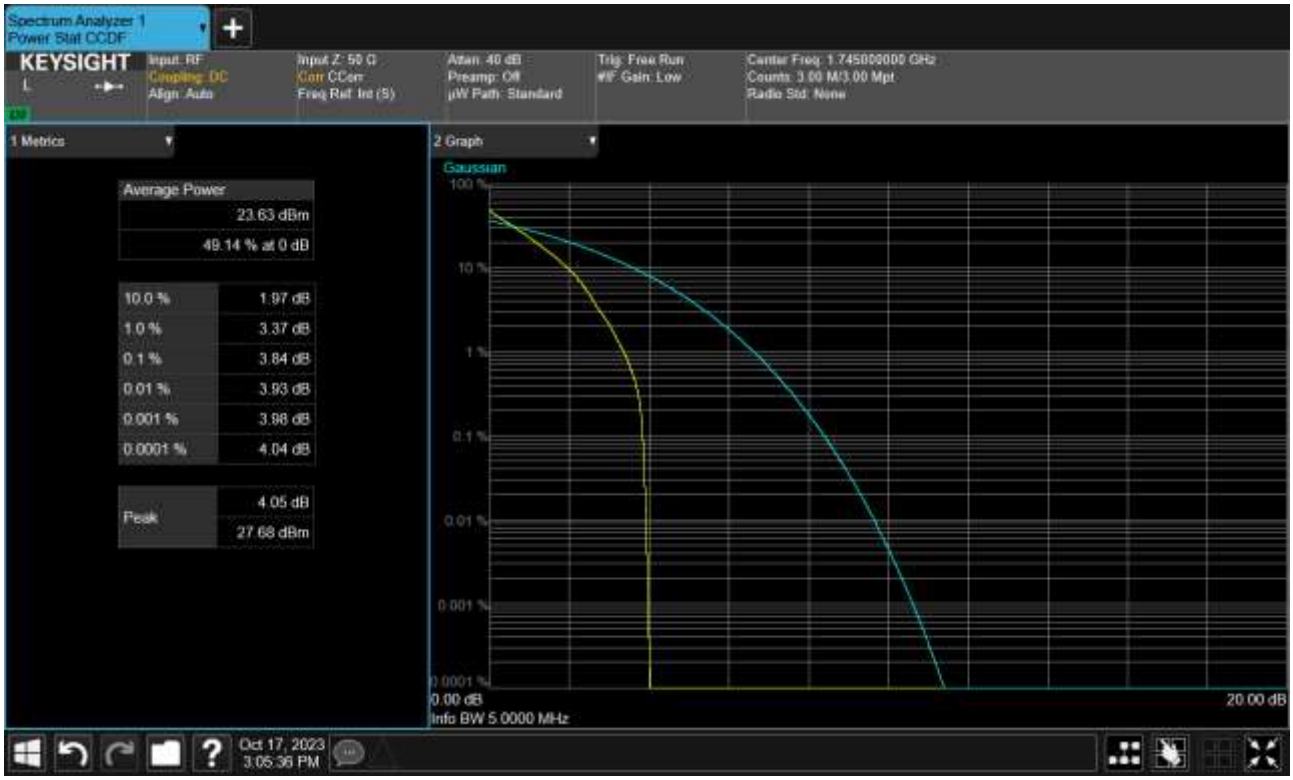
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 64QAM, Full RB)



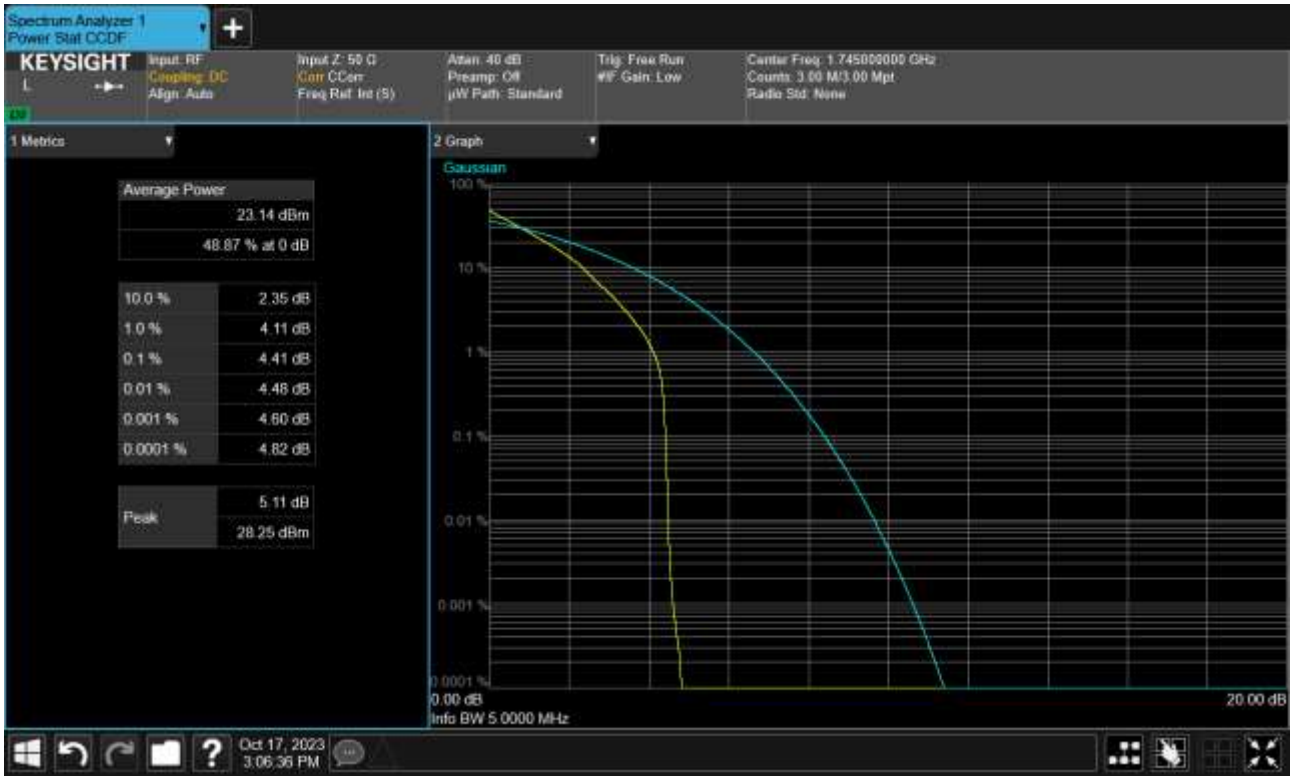
BAND 5 Occupied Bandwidth Plot (20 MHz, 836.5 MHz, 256QAM, Full RB)



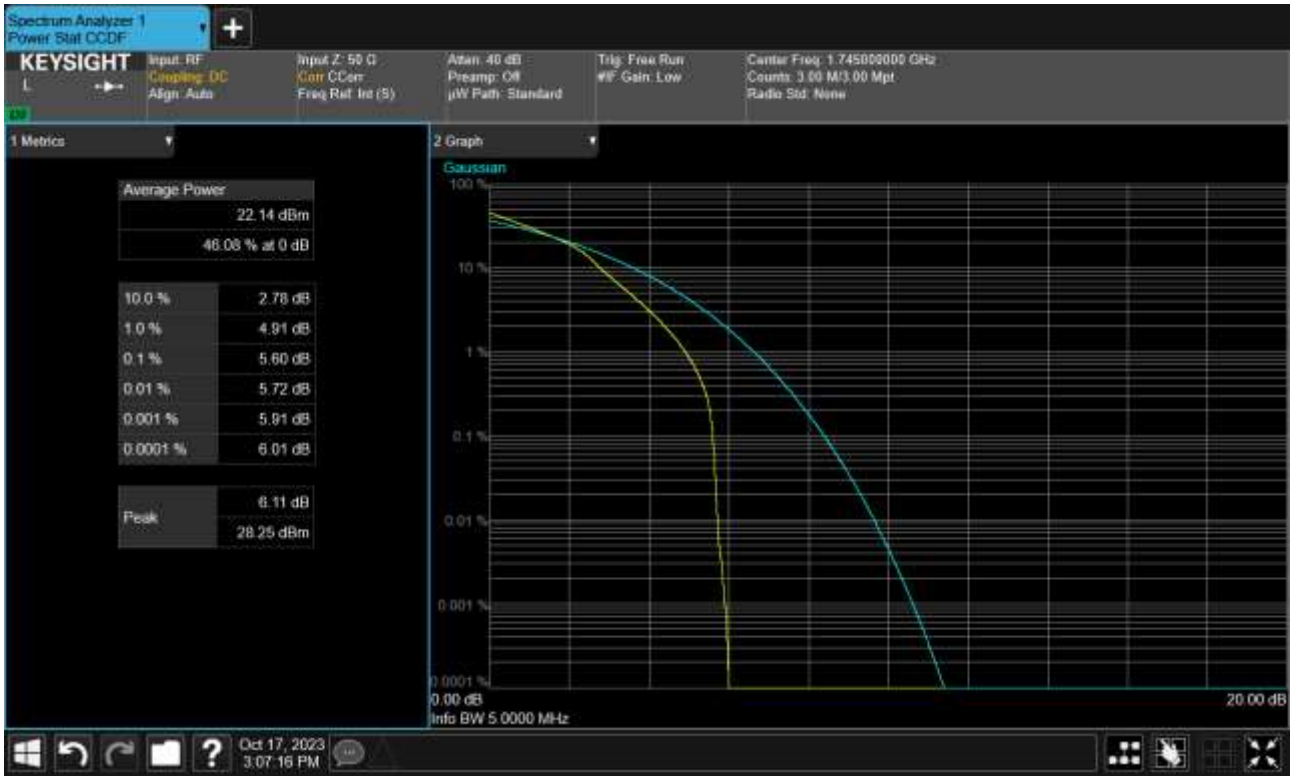
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, BPSK, Full RB)



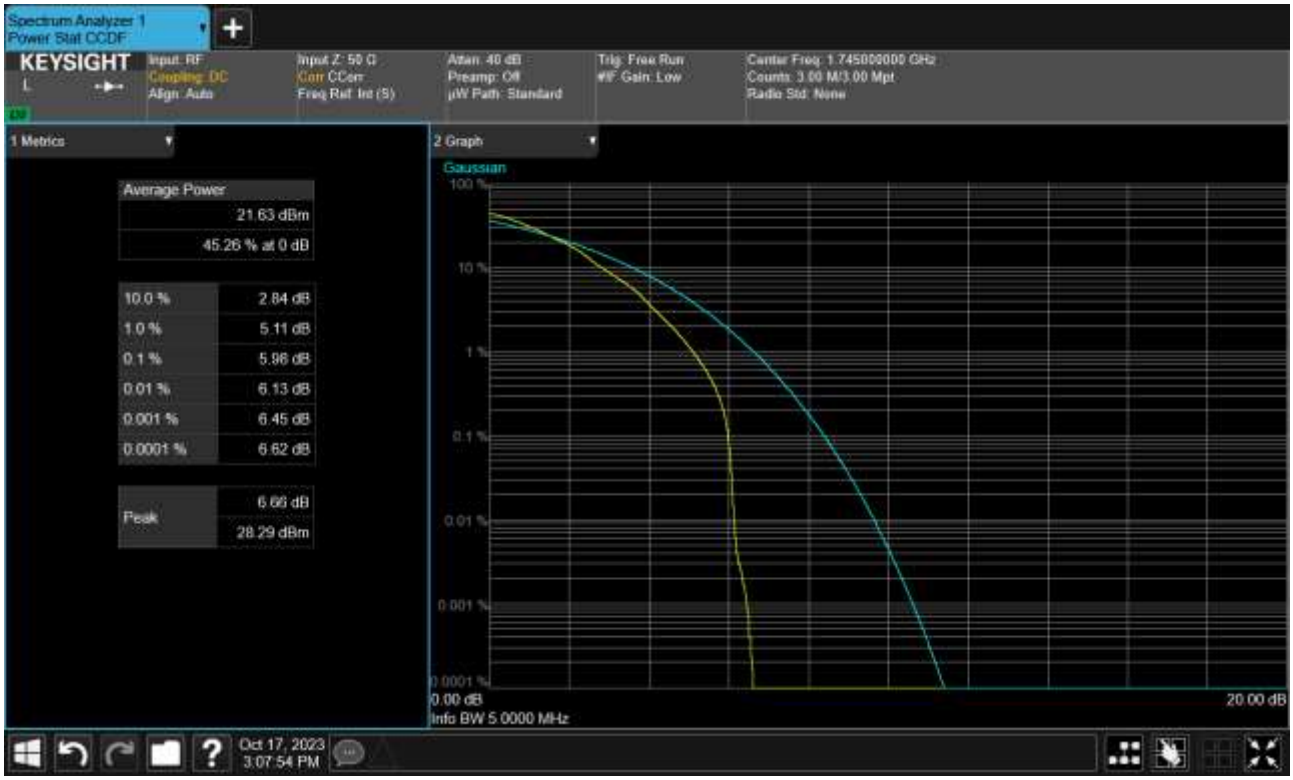
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, QPSK, Full RB)



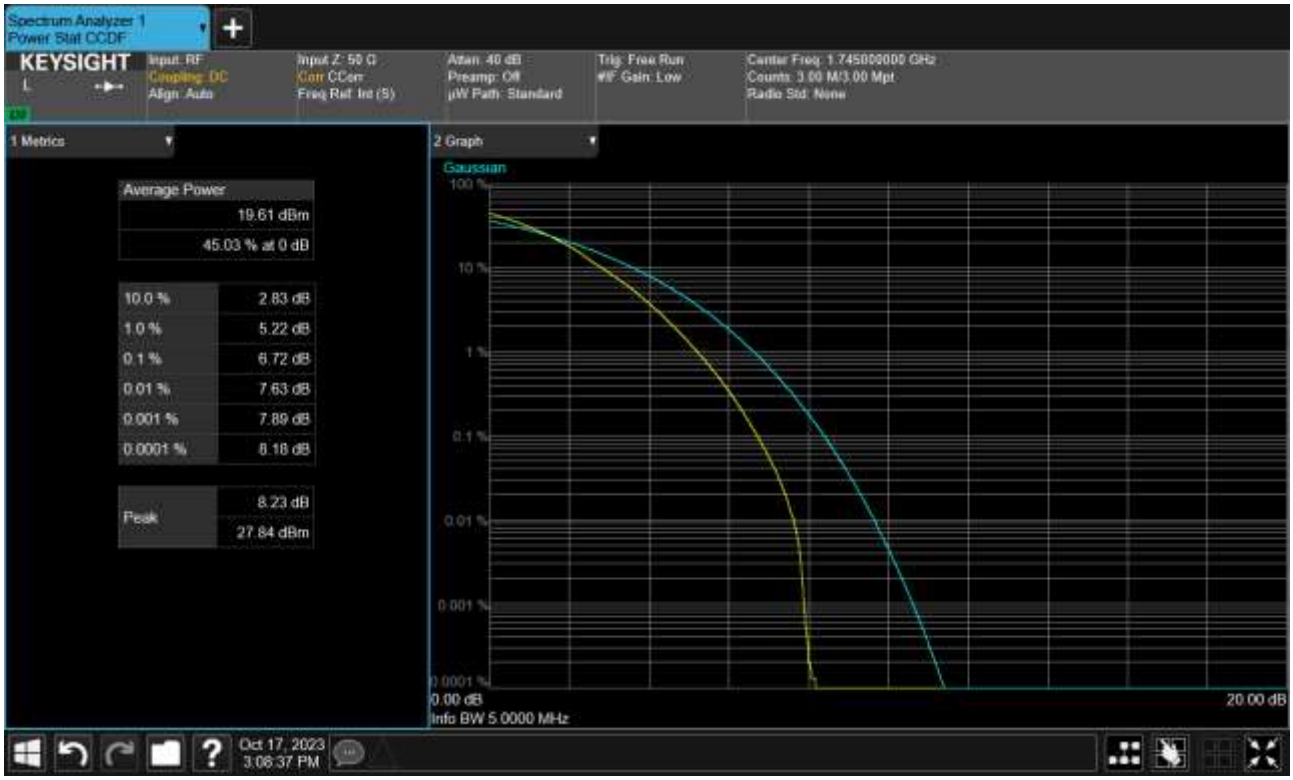
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 16QAM, Full RB)



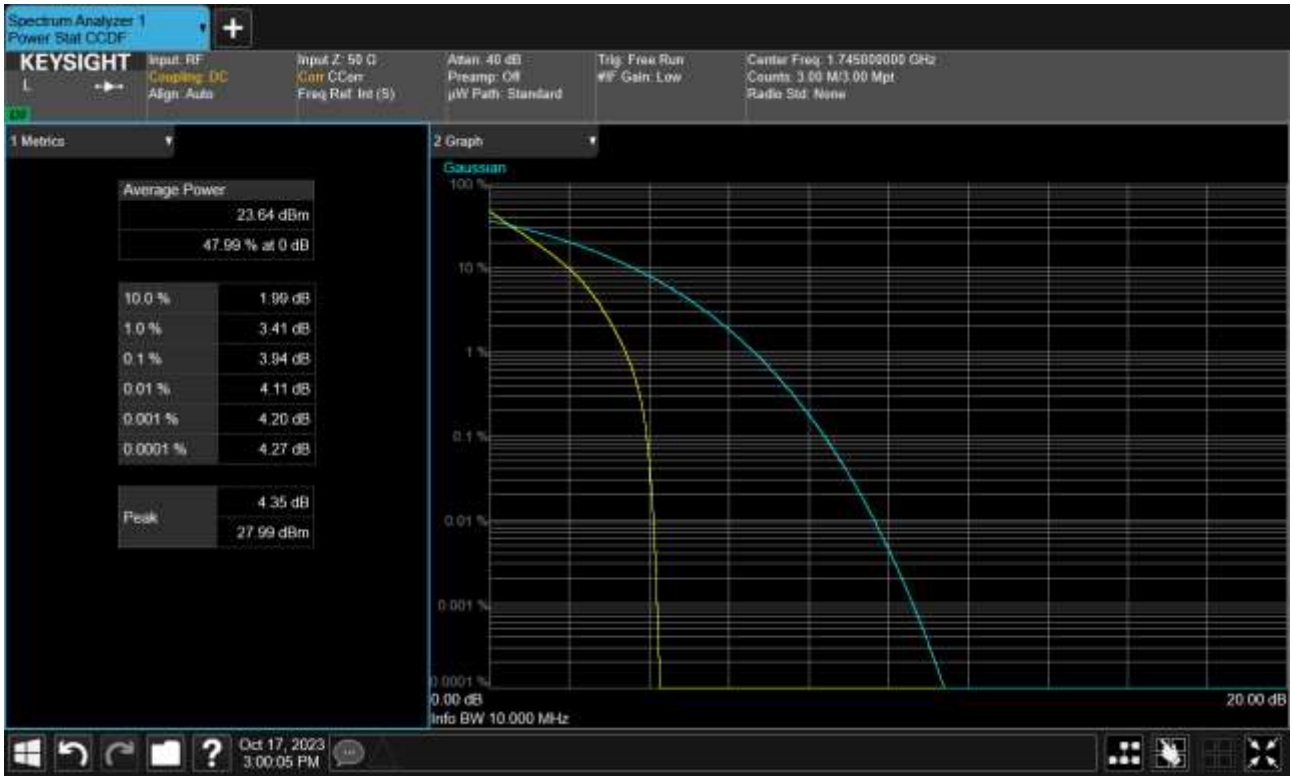
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 64QAM, Full RB)



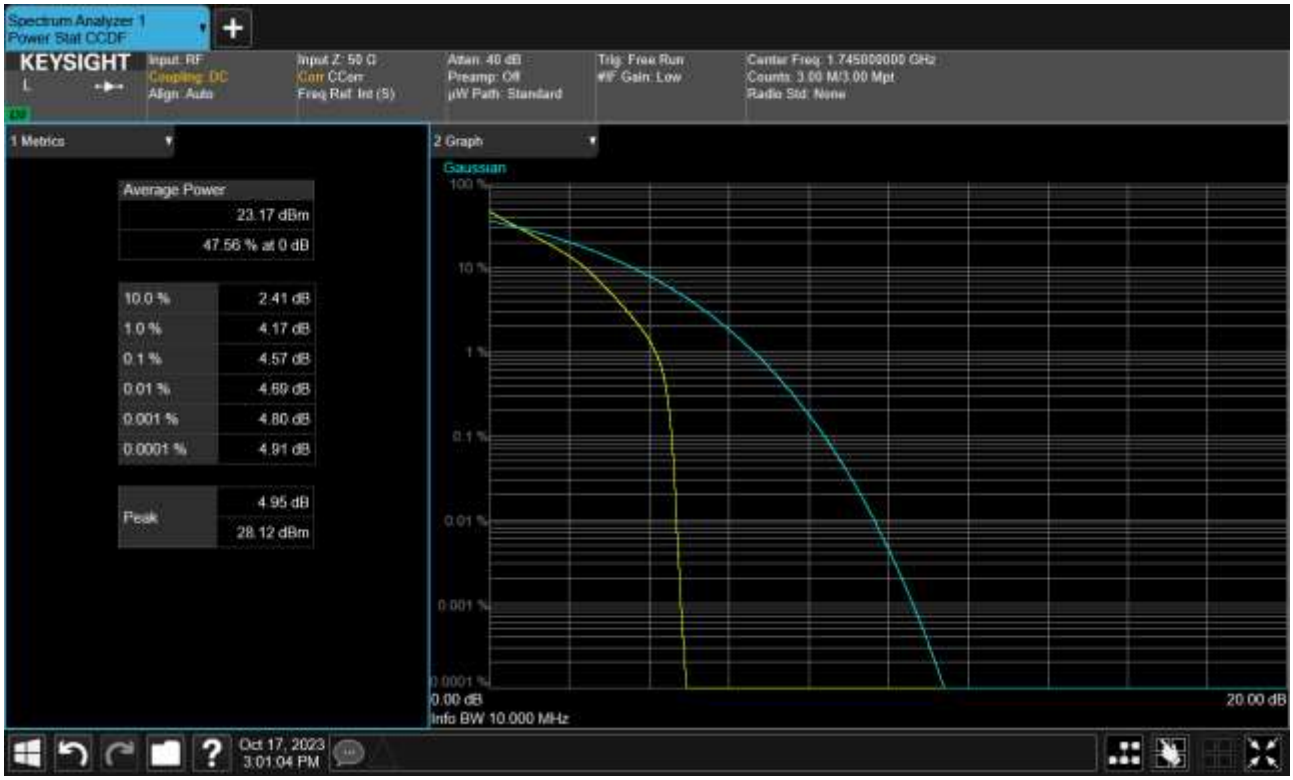
BAND 66 Occupied Bandwidth Plot (5 MHz, 1745 MHz, 256QAM, Full RB)



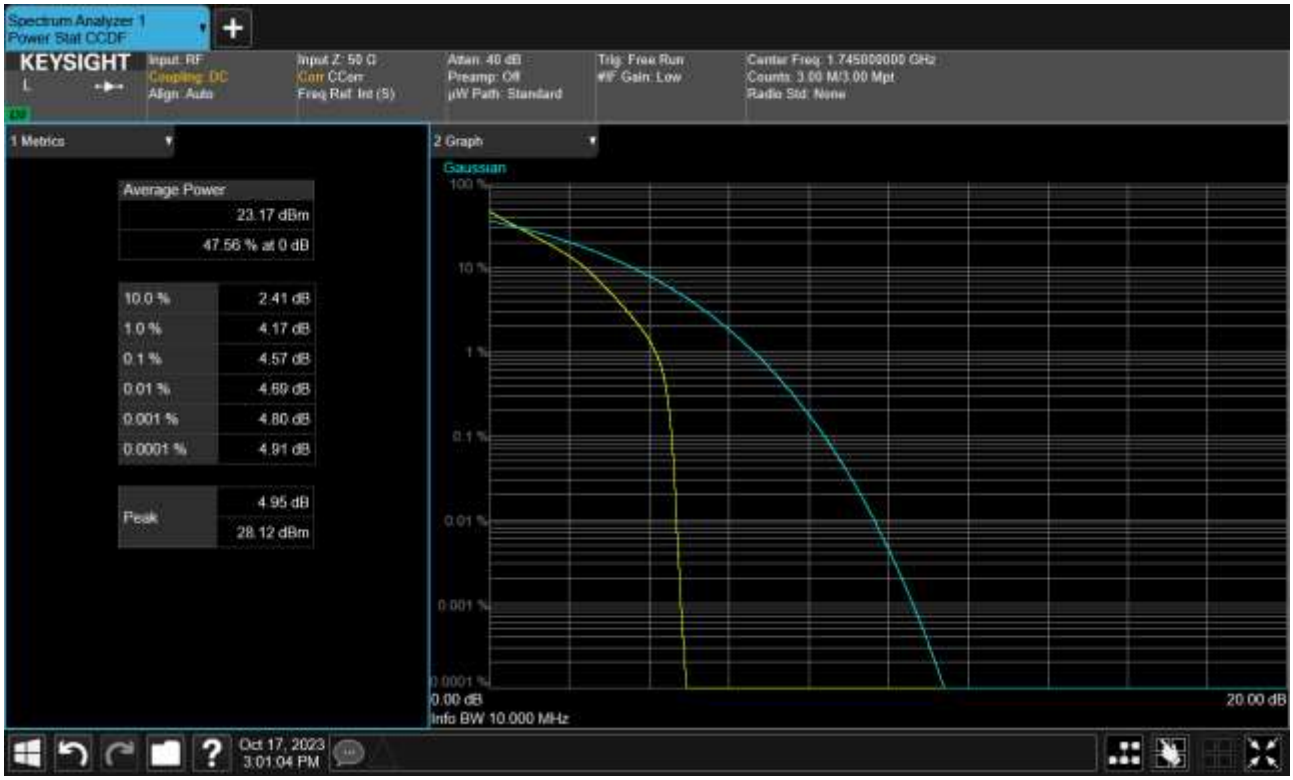
BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, BPSK, Full RB)



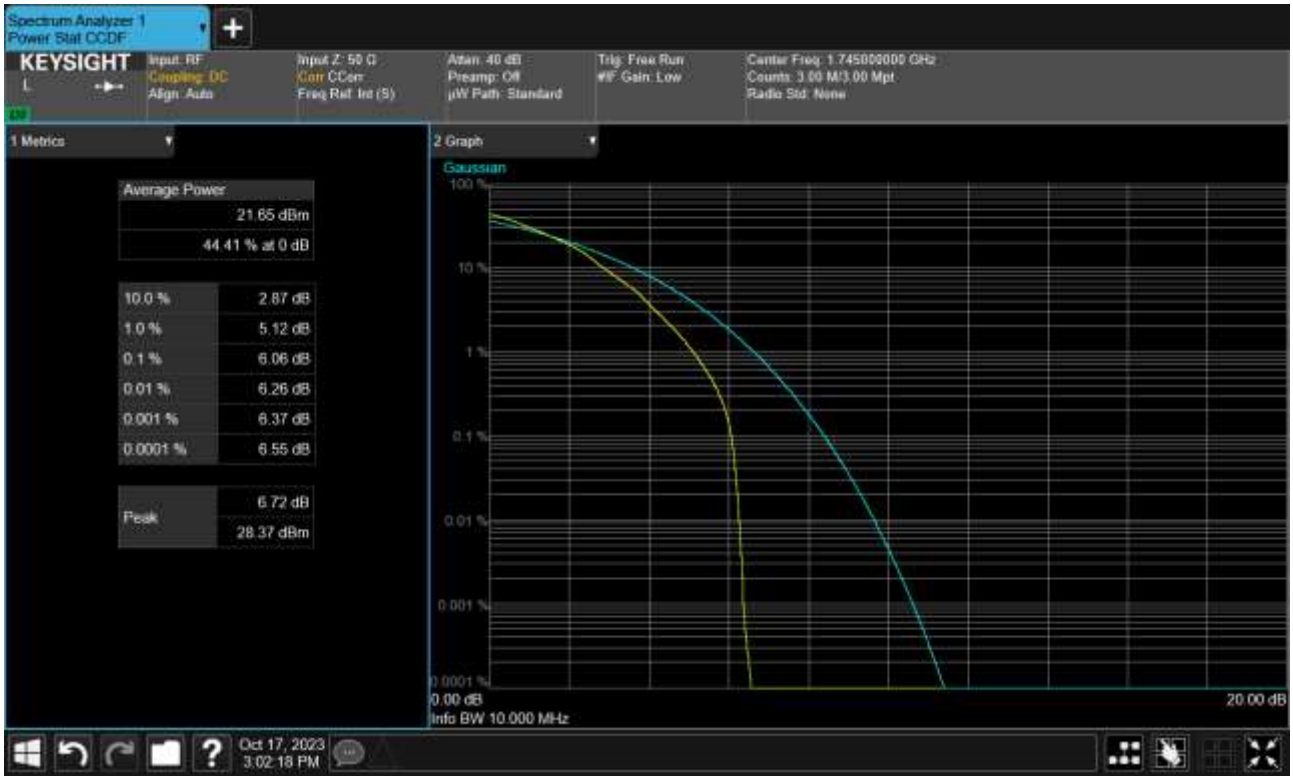
BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, QPSK, Full RB)



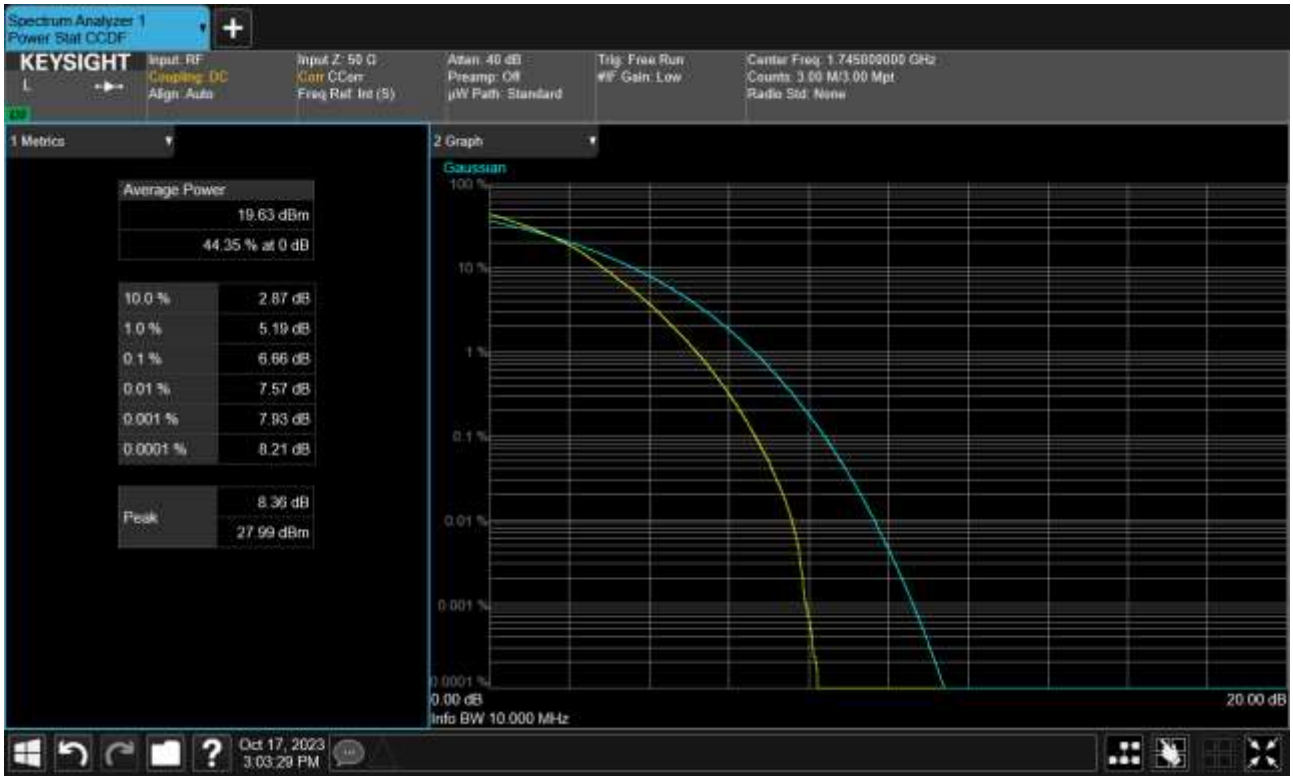
BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 16QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 64QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (10 MHz, 1745 MHz, 256QAM, Full RB)



BAND 66 Occupied Bandwidth Plot (15 MHz, 1745 MHz, BPSK, Full RB)