Element Materials Technology
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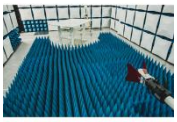

PART 27 MEASUREMENT REPORT

Applicant Name:
Apple Inc.
One Apple Park Way
Cupertino, CA 95014
United States

Date of Testing:
10/1/2023 - 3/16/2024
Test Report Issue Date:
3/23/2024
Test Site/Location:
Element Materials Technology, Morgan Hill, CA, USA
Test Report Serial No.:
1C2311270066-09.BCG

FCC ID:	**BCGA2899**
APPLICANT:	**Apple Inc.**

Application Type:	Certification
Model:	A2899, A2900
EUT Type:	Tablet Device
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part:	27
Test Procedure(s):	ANSI C63.26-2015, TIA-603-E-2016, KDB 971168 D01 v03r01

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.

RJ Ortanez
Executive Vice President

Prepared by: WKR0000006193

Reviewed by: WKR0000005805

ACCREDITED
CERT #2041.02

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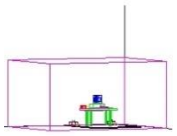
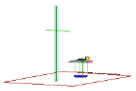


PART 27 MEASUREMENT REPORT



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	ERP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
LTE Band 71	5 MHz	QPSK	665.5 - 695.5	4.5435	0.153	21.85	4M54G7W
		16QAM	665.5 - 695.5	4.5311	0.131	21.18	4M53D7W
		64QAM	665.5 - 695.5	4.5303	0.100	20.00	4M53D7W
		256QAM	665.5 - 695.5	4.5307	0.050	17.00	4M53D7W
	10 MHz	QPSK	668.0 - 693.0	9.0222	0.149	21.73	9M02G7W
		16QAM	668.0 - 693.0	9.0308	0.129	21.12	9M03D7W
		64QAM	668.0 - 693.0	9.0554	0.099	19.94	9M06D7W
		256QAM	668.0 - 693.0	9.0303	0.049	16.88	9M03D7W
	15 MHz	QPSK	670.5 - 690.5	13.5235	0.143	21.54	13M5G7W
		16QAM	670.5 - 690.5	13.5567	0.123	20.90	13M6D7W
		64QAM	670.5 - 690.5	13.5032	0.096	19.83	13M5D7W
		256QAM	670.5 - 690.5	13.5219	0.049	16.90	13M5D7W
	20 MHz	QPSK	673.0 - 688.0	17.9978	0.144	21.59	18M0G7W
		16QAM	673.0 - 688.0	18.0010	0.131	21.18	18M0D7W
		64QAM	673.0 - 688.0	17.9669	0.098	19.91	18M0D7W
		256QAM	673.0 - 688.0	18.0006	0.048	16.79	18M0D7W
LTE Band 12	1.4 MHz	QPSK	699.7 - 715.3	1.1072	0.139	21.44	1M11G7W
		16QAM	699.7 - 715.3	1.1034	0.119	20.76	1M10D7W
		64QAM	699.7 - 715.3	1.1032	0.093	19.68	1M10D7W
		256QAM	699.7 - 715.3	1.1051	0.047	16.73	1M11D7W
	3 MHz	QPSK	700.5 - 714.5	2.7181	0.137	21.37	2M72G7W
		16QAM	700.5 - 714.5	2.7184	0.119	20.76	2M72D7W
		64QAM	700.5 - 714.5	2.7190	0.095	19.80	2M72D7W
		256QAM	700.5 - 714.5	2.7163	0.045	16.58	2M72D7W
	5 MHz	QPSK	701.5 - 713.5	4.5238	0.150	21.75	4M52G7W
		16QAM	701.5 - 713.5	4.5214	0.124	20.92	4M52D7W
		64QAM	701.5 - 713.5	4.5434	0.096	19.83	4M54D7W
		256QAM	701.5 - 713.5	4.5211	0.046	16.60	4M52D7W
	10 MHz	QPSK	704.0 - 711.0	9.0191	0.140	21.47	9M02G7W
		16QAM	704.0 - 711.0	9.0167	0.120	20.79	9M02D7W
		64QAM	704.0 - 711.0	9.0088	0.093	19.70	9M01D7W
		256QAM	704.0 - 711.0	9.0115	0.046	16.59	9M01D7W
LTE Band 17	5 MHz	QPSK	706.5 - 713.5	4.5238	0.150	21.75	4M52G7W
		16QAM	706.5 - 713.5	4.5214	0.133	21.24	4M52D7W
		64QAM	706.5 - 713.5	4.5434	0.101	20.04	4M54D7W
		256QAM	706.5 - 713.5	4.5211	0.048	16.79	4M52D7W
	10 MHz	QPSK	709.0 - 711.0	9.0191	0.150	21.75	9M02G7W
		16QAM	709.0 - 711.0	9.0167	0.129	21.09	9M02D7W
		64QAM	709.0 - 711.0	9.0088	0.098	19.93	9M01D7W
		256QAM	709.0 - 711.0	9.0115	0.049	16.86	9M01D7W
LTE Band 13	5 MHz	QPSK	779.5 - 784.5	4.5346	0.123	20.89	4M53G7W
		16QAM	779.5 - 784.5	4.5514	0.103	20.12	4M55D7W
		64QAM	779.5 - 784.5	4.5343	0.082	19.13	4M53D7W
		256QAM	779.5 - 784.5	4.5455	0.040	16.07	4M55D7W
	10 MHz	QPSK	782.0	8.9938	0.114	20.58	8M99G7W
		16QAM	782.0	8.9973	0.101	20.03	9M00D7W
		64QAM	782.0	8.9928	0.076	18.83	8M99D7W
		256QAM	782.0	8.9841	0.038	15.81	8M98D7W

Overview Table (<1GHz Band)

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	ERP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
NR Band n71	5 MHz	π/2 BPSK	665.5 - 695.5	4.4652	0.153	21.85	4M47G7W
		QPSK	665.5 - 695.5	4.4733	0.152	21.82	4M47G7W
		16QAM	665.5 - 695.5	4.4943	0.130	21.15	4M49D7W
		64QAM	665.5 - 695.5	4.4889	0.103	20.14	4M49D7W
		256QAM	665.5 - 695.5	4.4855	0.065	18.10	4M49D7W
	10 MHz	π/2 BPSK	668.0 - 693.0	8.9256	0.153	21.84	8M93G7W
		QPSK	668.0 - 693.0	9.2205	0.153	21.85	9M22G7W
		16QAM	668.0 - 693.0	9.3003	0.126	21.02	9M30D7W
		64QAM	668.0 - 693.0	9.3099	0.103	20.12	9M31D7W
		256QAM	668.0 - 693.0	9.2888	0.063	17.99	9M29D7W
	15 MHz	π/2 BPSK	670.5 - 690.5	13.4052	0.153	21.85	13M4G7W
		QPSK	670.5 - 690.5	14.0785	0.153	21.84	14M1G7W
		16QAM	670.5 - 690.5	14.0908	0.126	21.01	14M1D7W
		64QAM	670.5 - 690.5	14.1555	0.104	20.17	14M2D7W
		256QAM	670.5 - 690.5	14.1039	0.067	18.23	14M1D7W
	20 MHz	π/2 BPSK	673.0 - 688.0	17.8752	0.153	21.84	17M9G7W
		QPSK	673.0 - 688.0	18.8316	0.153	21.85	18M8G7W
		16QAM	673.0 - 688.0	19.0264	0.135	21.30	19M0D7W
		64QAM	673.0 - 688.0	18.8988	0.103	20.15	18M9D7W
		256QAM	673.0 - 688.0	18.8728	0.064	18.08	18M9D7W
NR Band n12	5 MHz	π/2 BPSK	701.5 - 713.5	4.4692	0.150	21.75	4M47G7W
		QPSK	701.5 - 713.5	4.4798	0.146	21.64	4M48G7W
		16QAM	701.5 - 713.5	4.4784	0.119	20.76	4M48D7W
		64QAM	701.5 - 713.5	4.4932	0.094	19.73	4M49D7W
		256QAM	701.5 - 713.5	4.4657	0.062	17.94	4M47D7W
	10 MHz	π/2 BPSK	704.0 - 711.0	8.9285	0.149	21.75	8M93G7W
		QPSK	704.0 - 711.0	9.3054	0.150	21.75	9M31G7W
		16QAM	704.0 - 711.0	9.2896	0.121	20.83	9M29D7W
		64QAM	704.0 - 711.0	9.2965	0.098	19.93	9M30D7W
		256QAM	704.0 - 711.0	9.2784	0.063	18.01	9M28D7W
	15 MHz	π/2 BPSK	706.5 - 708.5	13.4219	0.150	21.75	13M4G7W
		QPSK	706.5 - 708.5	14.0609	0.150	21.75	14M1G7W
		16QAM	706.5 - 708.5	14.1457	0.123	20.91	14M1D7W
		64QAM	706.5 - 708.5	14.1421	0.102	20.10	14M1D7W
		256QAM	706.5 - 708.5	14.1424	0.065	18.13	14M1D7W

Overview Table (<1GHz Band)

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	PAR at 0.1% [dB]	EIRP		Emission Designator
						Max. Power [W]	Max. Power [dBm]	
WCDMA1700	5 MHz	Spread Spectrum	1712.4 - 1752.6	4.1614	2.89	0.419	26.22	4M16F9W
LTE Band 4	1.4 MHz	QPSK	1710.7 - 1754.3	1.1081	5.03	0.468	26.70	1M11G7W
		16QAM	1710.7 - 1754.3	1.1098	5.81	0.385	25.85	1M11D7W
		64QAM	1710.7 - 1754.3	1.1054	6.52	0.307	24.87	1M11D7W
		256QAM	1710.7 - 1754.3	1.1025	6.85	0.149	21.74	1M10D7W
	3 MHz	QPSK	1711.5 - 1753.5	2.7182	4.68	0.461	26.64	2M72G7W
		16QAM	1711.5 - 1753.5	2.7174	5.70	0.395	25.97	2M72D7W
		64QAM	1711.5 - 1753.5	2.7219	6.47	0.306	24.86	2M72D7W
		256QAM	1711.5 - 1753.5	2.7172	6.92	0.153	21.85	2M72D7W
	5 MHz	QPSK	1712.5 - 1752.5	4.5398	4.93	0.472	26.74	4M54G7W
		16QAM	1712.5 - 1752.5	4.5258	5.83	0.402	26.04	4M53D7W
		64QAM	1712.5 - 1752.5	4.5416	6.47	0.310	24.92	4M54D7W
		256QAM	1712.5 - 1752.5	4.5201	7.05	0.152	21.82	4M52D7W
	10MHz	QPSK	1715.0 - 1750.0	9.0645	5.03	0.457	26.60	9M06G7W
		16QAM	1715.0 - 1750.0	9.0327	5.87	0.400	26.02	9M03D7W
		64QAM	1715.0 - 1750.0	9.0461	6.50	0.304	24.83	9M05D7W
		256QAM	1715.0 - 1750.0	9.0548	7.15	0.151	21.78	9M05D7W
	15 MHz	QPSK	1717.5 - 1747.5	13.5595	5.04	0.450	26.53	13M6G7W
		16QAM	1717.5 - 1747.5	13.5415	5.78	0.378	25.77	13M5D7W
		64QAM	1717.5 - 1747.5	13.5394	6.49	0.300	24.77	13M5D7W
		256QAM	1717.5 - 1747.5	13.5464	6.98	0.146	21.65	13M5D7W
	20 MHz	QPSK	1720.0 - 1745.0	18.0280	4.92	0.440	26.43	18M0G7W
		16QAM	1720.0 - 1745.0	18.0292	5.90	0.385	25.85	18M0D7W
		64QAM	1720.0 - 1745.0	18.0265	6.44	0.303	24.81	18M0D7W
		256QAM	1720.0 - 1745.0	17.9974	7.20	0.144	21.59	18M0D7W
LTE Band 66	1.4 MHz	QPSK	1710.7 - 1779.3	1.1081	5.01	0.513	27.10	1M11G7W
		16QAM	1710.7 - 1779.3	1.1098	5.80	0.436	26.39	1M11D7W
		64QAM	1710.7 - 1779.3	1.1054	6.44	0.336	25.26	1M11D7W
		256QAM	1710.7 - 1779.3	1.1025	6.80	0.167	22.23	1M10D7W
	3 MHz	QPSK	1711.5 - 1778.5	2.7182	4.67	0.509	27.07	2M72G7W
		16QAM	1711.5 - 1778.5	2.7174	5.66	0.453	26.56	2M72D7W
		64QAM	1711.5 - 1778.5	2.7219	6.47	0.341	25.33	2M72D7W
		256QAM	1711.5 - 1778.5	2.7172	6.73	0.168	22.25	2M72D7W
	5 MHz	QPSK	1712.5 - 1777.5	4.5398	4.90	0.513	27.10	4M54G7W
		16QAM	1712.5 - 1777.5	4.5258	5.81	0.443	26.46	4M53D7W
		64QAM	1712.5 - 1777.5	4.5416	6.46	0.343	25.35	4M54D7W
		256QAM	1712.5 - 1777.5	4.5201	7.03	0.167	22.22	4M52D7W
	10 MHz	QPSK	1715.0 - 1775.0	9.0645	5.01	0.508	27.06	9M06G7W
		16QAM	1715.0 - 1775.0	9.0327	5.88	0.444	26.47	9M03D7W
		64QAM	1715.0 - 1775.0	9.0461	6.49	0.339	25.30	9M05D7W
		256QAM	1715.0 - 1775.0	9.0548	7.11	0.168	22.26	9M05D7W
	15 MHz	QPSK	1717.5 - 1772.5	13.5595	5.00	0.495	26.95	13M6G7W
		16QAM	1717.5 - 1772.5	13.5415	5.92	0.422	26.25	13M5D7W
		64QAM	1717.5 - 1772.5	13.5394	6.47	0.330	25.19	13M5D7W
		256QAM	1717.5 - 1772.5	13.5464	6.64	0.167	22.24	13M5D7W
	20 MHz	QPSK	1720.0 - 1770.0	18.0280	4.90	0.501	27.00	18M0G7W
		16QAM	1720.0 - 1770.0	18.0292	5.85	0.426	26.29	18M0D7W
		64QAM	1720.0 - 1770.0	18.0265	6.46	0.330	25.18	18M0D7W
		256QAM	1720.0 - 1770.0	17.9974	6.64	0.163	22.11	18M0D7W

Overview Table (>1GHz Bands)

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	PAR at 0.1% [dB]	EIRP		Emission Designator
						Max. Power [W]	Max. Power [dBm]	
NR Band n66	5 MHz	π/2 BPSK	1712.5 - 1777.5	4.4697	3.99	0.492	26.92	4M47G7W
		QPSK	1712.5 - 1777.5	4.4588	5.34	0.513	27.10	4M46G7W
		16QAM	1712.5 - 1777.5	4.4715	6.30	0.414	26.16	4M47D7W
		64QAM	1712.5 - 1777.5	4.4776	6.77	0.321	25.06	4M48D7W
		256QAM	1712.5 - 1777.5	4.4770	6.76	0.206	23.14	4M48D7W
	10 MHz	π/2 BPSK	1715.0 - 1775.0	8.9500	4.23	0.509	27.07	8M95G7W
		QPSK	1715.0 - 1775.0	9.2915	5.60	0.513	27.10	9M29G7W
		16QAM	1715.0 - 1775.0	9.2783	6.31	0.430	26.33	9M28D7W
		64QAM	1715.0 - 1775.0	9.3207	6.47	0.337	25.28	9M32D7W
		256QAM	1715.0 - 1775.0	9.2754	6.68	0.219	23.40	9M28D7W
	15 MHz	π/2 BPSK	1717.5 - 1772.5	13.4051	4.12	0.504	27.02	13M4G7W
		QPSK	1717.5 - 1772.5	14.1828	5.49	0.513	27.10	14M2G7W
		16QAM	1717.5 - 1772.5	14.1334	6.23	0.461	26.64	14M1D7W
		64QAM	1717.5 - 1772.5	14.1279	6.63	0.341	25.33	14M1D7W
		256QAM	1717.5 - 1772.5	14.1136	6.65	0.209	23.20	14M1D7W
	20 MHz	π/2 BPSK	1720.0 - 1770.0	17.9294	4.23	0.510	27.07	17M9G7W
		QPSK	1720.0 - 1770.0	19.0300	5.52	0.513	27.10	19M0G7W
		16QAM	1720.0 - 1770.0	18.9488	6.35	0.418	26.21	18M9D7W
		64QAM	1720.0 - 1770.0	18.9436	6.50	0.357	25.52	18M9D7W
		256QAM	1720.0 - 1770.0	19.0089	6.65	0.212	23.26	19M0D7W
	25 MHz	π/2 BPSK	1722.5 - 1767.5	22.8354	4.02	0.513	27.10	22M8G7W
		QPSK	1722.5 - 1767.5	23.8586	5.30	0.505	27.03	23M9G7W
		16QAM	1722.5 - 1767.5	23.8530	6.24	0.443	26.46	23M9D7W
		64QAM	1722.5 - 1767.5	23.7671	6.52	0.352	25.47	23M8D7W
		256QAM	1722.5 - 1767.5	23.8286	6.63	0.213	23.28	23M8D7W
	30 MHz	π/2 BPSK	1725.0 - 1765.0	28.4975	4.34	0.510	27.08	28M5G7W
		QPSK	1725.0 - 1765.0	28.6313	5.51	0.513	27.10	28M6G7W
		16QAM	1725.0 - 1765.0	28.6779	6.39	0.424	26.28	28M7D7W
		64QAM	1725.0 - 1765.0	28.6232	6.54	0.346	25.39	28M6D7W
		256QAM	1725.0 - 1765.0	28.6824	6.79	0.216	23.34	28M7D7W
	35 MHz	π/2 BPSK	1727.5 - 1762.5	32.1884	4.25	0.512	27.09	32M2G7W
		QPSK	1727.5 - 1762.5	33.6030	5.46	0.513	27.10	33M6G7W
		16QAM	1727.5 - 1762.5	33.6088	6.42	0.419	26.22	33M6D7W
		64QAM	1727.5 - 1762.5	33.6089	6.49	0.354	25.49	33M6D7W
		256QAM	1727.5 - 1762.5	33.6659	6.69	0.215	23.32	33M7D7W
	40 MHz	π/2 BPSK	1730.0 - 1760.0	38.7004	4.09	0.509	27.07	38M7G7W
		QPSK	1730.0 - 1760.0	38.6562	5.40	0.513	27.10	38M7G7W
		16QAM	1730.0 - 1760.0	38.6200	6.21	0.418	26.21	38M6D7W
		64QAM	1730.0 - 1760.0	38.6976	6.50	0.339	25.31	38M7D7W
		256QAM	1730.0 - 1760.0	38.6600	6.63	0.222	23.46	38M7D7W
NR Band n70	5 MHz	π/2 BPSK	1712.5 - 1777.5	4.4769	4.02	0.287	24.57	4M48G7W
		QPSK	1712.5 - 1777.5	4.4886	5.32	0.287	24.58	4M49G7W
		16QAM	1712.5 - 1777.5	4.4789	6.31	0.241	23.82	4M48D7W
		64QAM	1712.5 - 1777.5	4.4793	6.71	0.192	22.84	4M48D7W
		256QAM	1712.5 - 1777.5	4.4797	6.72	0.120	20.80	4M48D7W
	10 MHz	π/2 BPSK	1715.0 - 1775.0	8.9453	4.24	0.285	24.55	8M95G7W
		QPSK	1715.0 - 1775.0	9.2364	5.54	0.287	24.57	9M24G7W
		16QAM	1715.0 - 1775.0	9.2955	6.34	0.239	23.78	9M30D7W
		64QAM	1715.0 - 1775.0	9.3364	6.55	0.193	22.87	9M34D7W
		256QAM	1715.0 - 1775.0	9.3067	6.81	0.119	20.74	9M31D7W
	15 MHz	π/2 BPSK	1702.5	13.4056	4.12	0.290	24.62	13M4G7W
		QPSK	1702.5	14.1704	5.43	0.293	24.67	14M2G7W
		16QAM	1702.5	14.2151	6.25	0.242	23.85	14M2D7W
		64QAM	1702.5	14.0637	6.62	0.197	22.94	14M1D7W
		256QAM	1702.5	14.1513	6.61	0.122	20.86	14M2D7W

Overview Table (>1GHz Bands)

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 Element Materials Technology Test Location

These measurement tests were conducted at the Element Materials Technology facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations

Measurements were performed at Element Materials Technology.

- Element Materials Technology is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 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.

- Element Materials Technology 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).

- Element Materials Technology facility is a registered (22831) test laboratory with the site description on file with ISED.

- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Agreements (MRAs).

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2899**. 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.: MV3WTWWGT4, VGTVQGM9J9, RX5LQRFQ9Q, DLXGYV0005D0000FH3, DLXGYV0002L0000FH3

2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, 802.11a/ax WIFI 6E, 802.15.4, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, HDR4, HDR8), WPT

This device supports BT Beamforming

This device supports simultaneous transmission operations, which allows for multiple transmitters to transmit simultaneously on the same antenna. The table below shows all configurations possible.

Antenna	Simultaneous Tx Config	Wifi 2GHz	Bluetooth	Thread	Wifi 5GHz	Wifi 6GHz	NB UNII	LTE/FR1 NR	LTE/FR1 NR
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE1/2M	802.15.4	802.11 a/n/ac/ax	802.11 a/ax	BDR, HDR4/8	MB/HB	UHB
Antenna 3b	Config 1	✗	✗	✗	✓	✗	✗	✓	✗
Antenna 3b	Config 2	✗	✗	✗	✗	✓	✗	✓	✗
Antenna 3b	Config 3	✗	✗	✗	✗	✗	✓	✓	✗
Antenna 3a	Config 4	✓	✗	✗	✗	✗	✗	✗	✓
Antenna 3a	Config 5	✗	✓	✗	✗	✗	✗	✗	✓
Antenna 3a	Config 6	✗	✗	✓	✗	✗	✗	✗	✓
Antenna 1a	Config 7	✓	✗	✗	✗	✗	✗	✗	✓
Antenna 1a	Config 8	✗	✓	✗	✗	✗	✗	✗	✓
Antenna 1a	Config 9	✗	✗	✓	✗	✗	✗	✗	✓
Antenna 1b	Config 10	✗	✗	✗	✓	✗	✗	✓	✗
Antenna 1b	Config 11	✗	✗	✗	✗	✓	✗	✓	✗
Antenna 1b	Config 12	✗	✗	✗	✗	✗	✓	✓	✗

Table 2-1. Simultaneous Transmission Configurations

✓ = Support; × = Not Support

Note:

All the above simultaneous transmission configurations have been tested and the worst case configuration was found to be Config 8 and reported in RF Bluetooth, RF FCC Part 96 test reports.

Specific 2.4GHz Wi-Fi antenna that can only transmit simultaneously with 2.4GHz Bluetooth antenna is listed in the SAR test report. For BT (2.4GHz) in connected mode and Wi-Fi (2.4GHz) - Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. For BT (2.4GHz) in disconnected mode and Wi-Fi (2.4GHz) - BT will be using iPA only and Wi-Fi max power will not exceed minimum of (SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

2.3 Antenna Description

Following antenna gains provided by manufacturer were used for testing.

Band	Antenna Gain [dBi]			
	Antenna 4	Antenna 2	Antenna 1b	Antenna 3b
LTE Band 12/17	-1.8	-1.6	×	×
NR Band 12				
LTE Band 13	-2.6	-2.3	×	×
LTE Band 4/66	0.6	1.6	-1.2	-2.6
NR Band n66				
WCDMA1700				
LTE Band 71	-1.7	-1.8	×	×
NR Band n71				
NR Band 70	-1.0	-0.8	-2.2	-4.0

Table 2-2. Highest Antenna Gain

× = Not Support

2.4 Test Support Equipment

1	Apple MacBook Pro	Model:	A2141	S/N:	C02H604EQ05D
	w/AC/DC Adapter	Model:	A2166	S/N:	C4H042705ZNPM0WA6
2	Apple USB-C Cable	Model:	Spartan	S/N:	GXK1336018XKTR024
3	USB-C Cable	Model:	A246C	S/N:	DWH80115BK826GV19
	w/ AC Adapter	Model:	A2305	S/N:	C4H95160004PF4F4V
4	DC Power Supply	Model:	KPS3010D	S/N:	N/A
5	Apple Pencil	Model:	A2538	S/N:	KJ26TCFXJW

Table 2-3. Test Support Equipment

2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.26-2015, TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power and the worst case channel.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

2.6 Software and Firmware

The test was conducted with firmware version 21E8197 installed on the EUT.

2.7 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 documents titled “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services” (ANSI C63.26-2015 and TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure……..……..None

3.2 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 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

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014.

Per KDB 414788 D01 v01r01, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

Radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015 and TIA-603-E-2016.

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. 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	2.07
Radiated Disturbance (<30MHz)	4.12
Radiated Disturbance (30MHz-1GHz)	4.85
Radiated Disturbance (1-18GHz)	5.08
Radiated Disturbance (>18GHz)	4.59

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements 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
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/21/2023	Annual	6/21/2024	MY49430244
ESPEC	SU-241	Tabletop Temperature Chamber	11/17/2023	Annual	11/17/2024	92009574
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/30/2023	Annual	3/30/2024	00218555
Keysight Technology	N9040B	UXA Signal Analyzer	11/5/2023	Annual	11/5/2024	MY57213068
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/31/2023	Annual	8/31/2024	100052
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/11/2023	Annual	5/11/2024	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	6/6/2023	Annual	6/6/2024	101668
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	6/22/2023	Annual	6/22/2024	102356
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/30/2023	Annual	11/30/2024	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/27/2023	Annual	12/27/2024	164715
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/2/2023	Annual	6/2/2024	100050
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/1/2023	Annual	5/1/2024	100519
Rohde & Schwarz	FSW43	Signal Analyzer (2Hz-43.5GHz)	7/13/2023	Annual	7/13/2024	101261
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/17/2023	Annual	4/17/2024	00304

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.

6.0 SAMPLE CALCULATIONS

Emission Designator

WCDMA Emission Designator

Emission Designator = 4M16F9W
WCDMA BW = 4.16 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

π/2 BPSK / QPSK Modulation

Emission Designator = 8M62G7W
BW = 8.62 MHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination of Any

QAM Modulation

Emission Designator = 8M45D7W
LTE BW = 8.45 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
W = Combination of Any

Spurious Radiated Emission

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average 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 analzyer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.

FCC ID: BCGA2899

FCC Classification: PCS Licensed Transmitter (PCB)

Mode(s): WCDMA/LTE/NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Occupied Bandwidth	2.1049	N/A	N/A	Section 7.2
	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	-13 dBm at Band Edge and for all out-of-band emissions	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (LTE Band 13)	2.1051, 27.53	-13 dBm at Band Edge and for all out-of-band emissions < -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Sections 7.3, 7.4
	Peak-Average Ratio	27.50(d)(5)	< 13 dB	PASS	Section 7.5
	Transmitter Conducted Output Power	2.1046	N/A	N/A	See RF Exposure Report
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 71)	27.50(b)(10)	< 3 Watts max. ERP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n71)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12/17)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band 12)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 13)	27.50(c)(10)	< 3 Watts max. ERP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (WCDMA)	27.50(d)(4)	< 1 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (NR Band n66)			PASS	Section 7.6
	Equivalent Isotropic Radiated Power (LTE Band 4/66)			PASS	Section 7.6
	Equivalent Isotropic Radiated Power (NR Band n70)			PASS	Section 7.6
RADIATED	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	-13 dBm for all out-of-band emissions < -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Section 7.7
	Radiated Spurious Emissions	2.1053, 27.53	-13 dBm for all out-of-band emissions	PASS	Section 7.7

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 ports 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 Element EMC Software Tool EMC Software Tool v1.1.

7.2 Occupied Bandwidth

§2.1049

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. All ports were tested and only the worst case data were reported.

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.

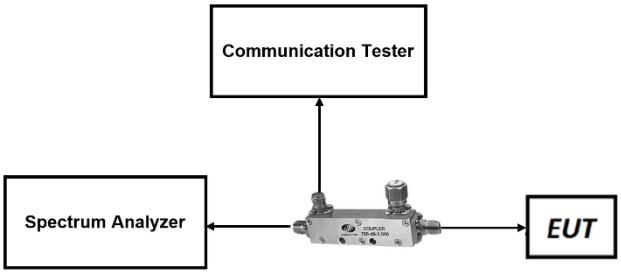
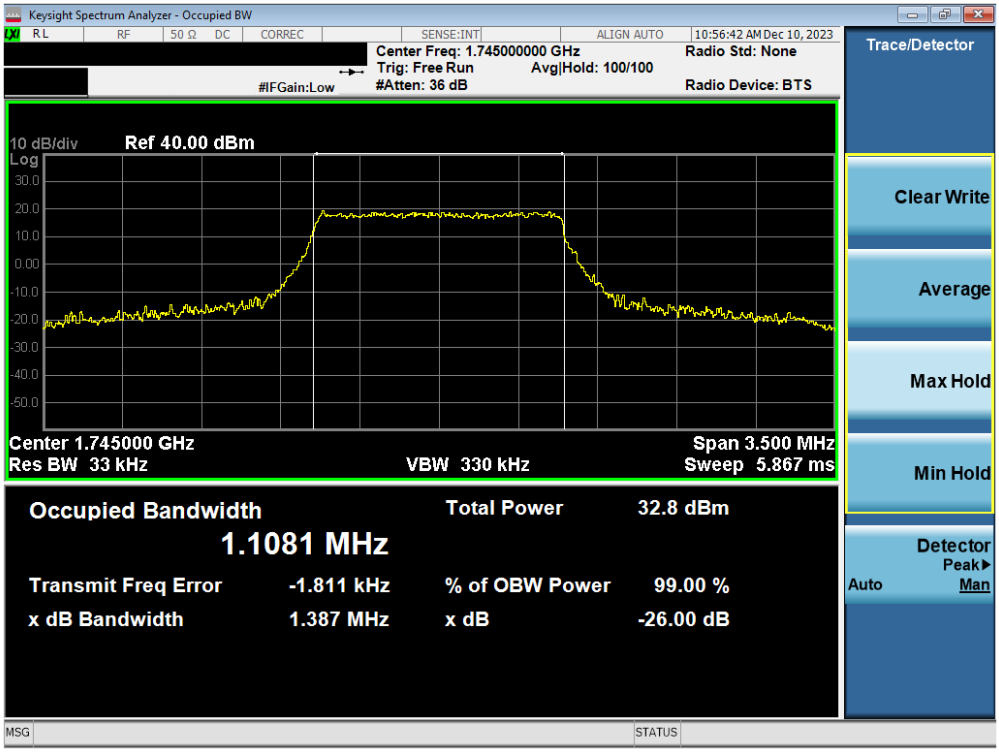


Figure 7-1. Test Instrument & Measurement Setup

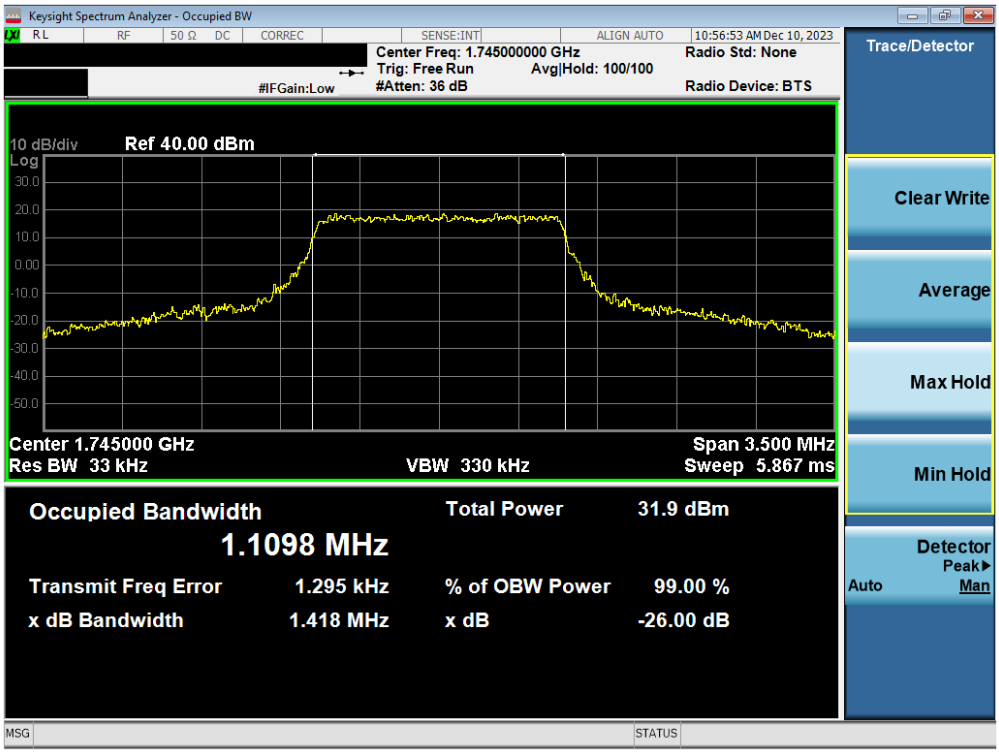
Test Notes

None.

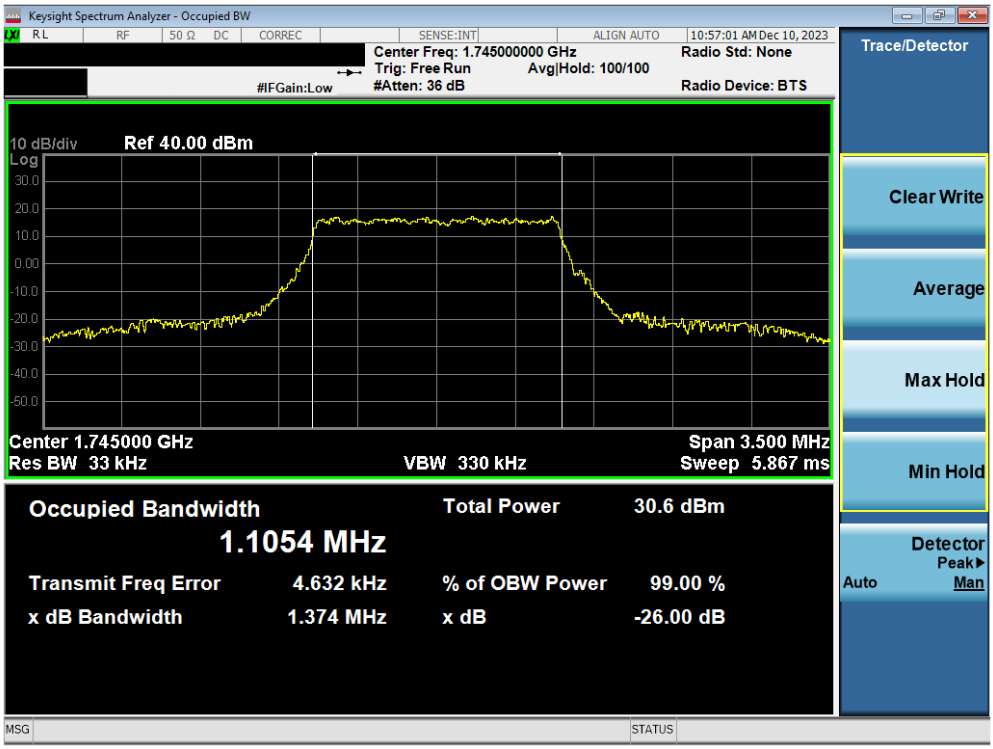
LTE Band 66/4



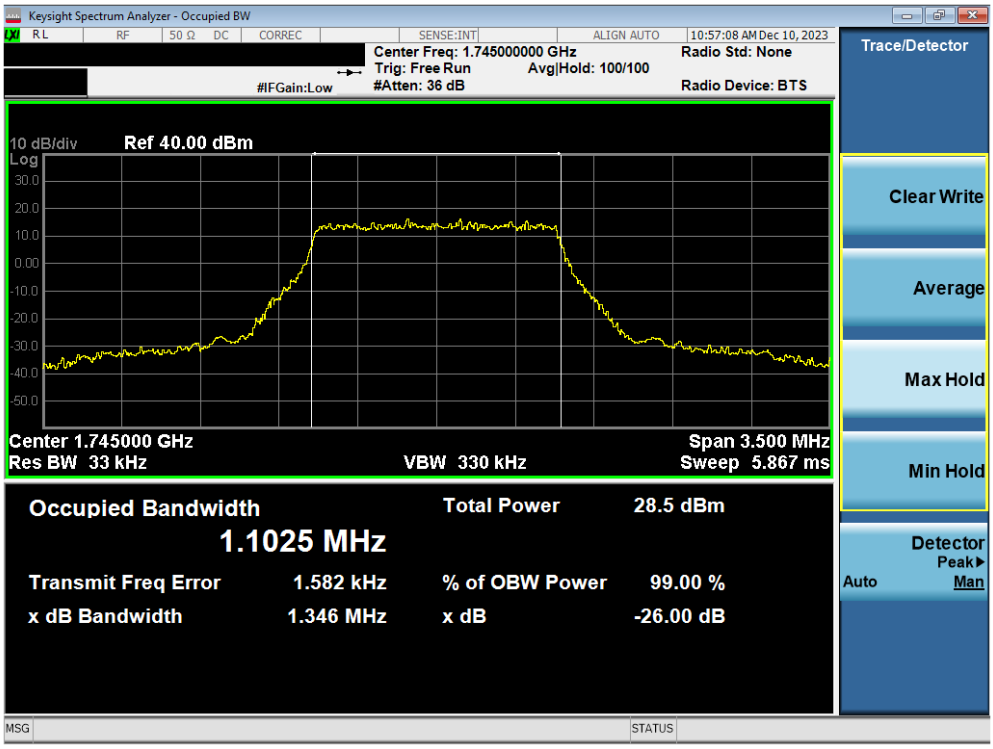
Plot 7-1. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



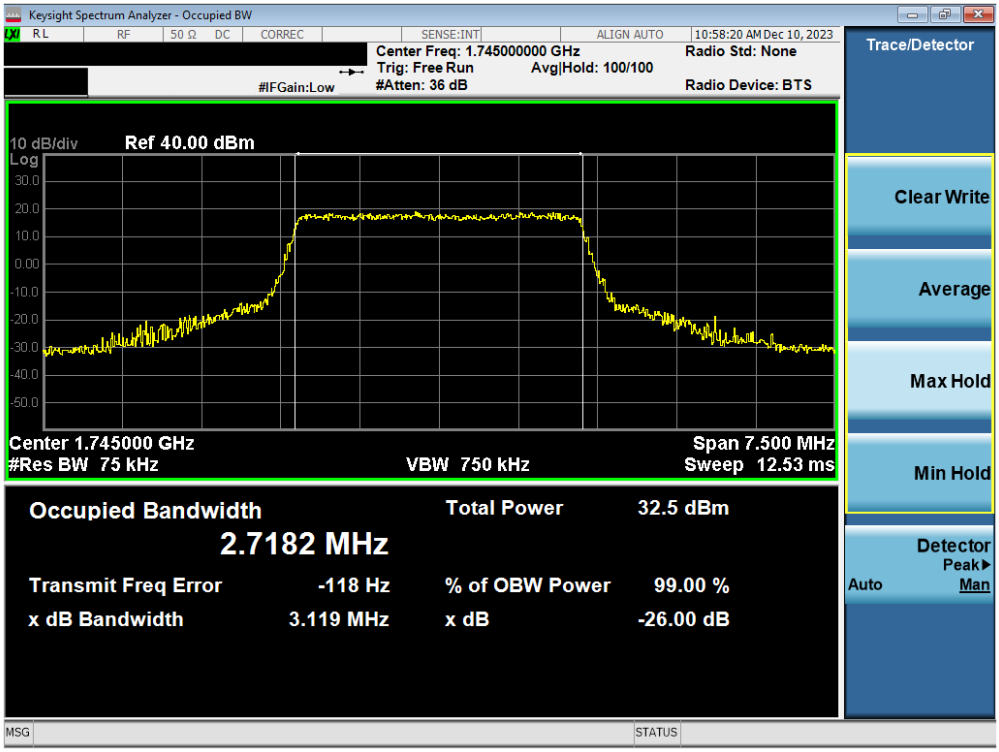
Plot 7-2. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB)



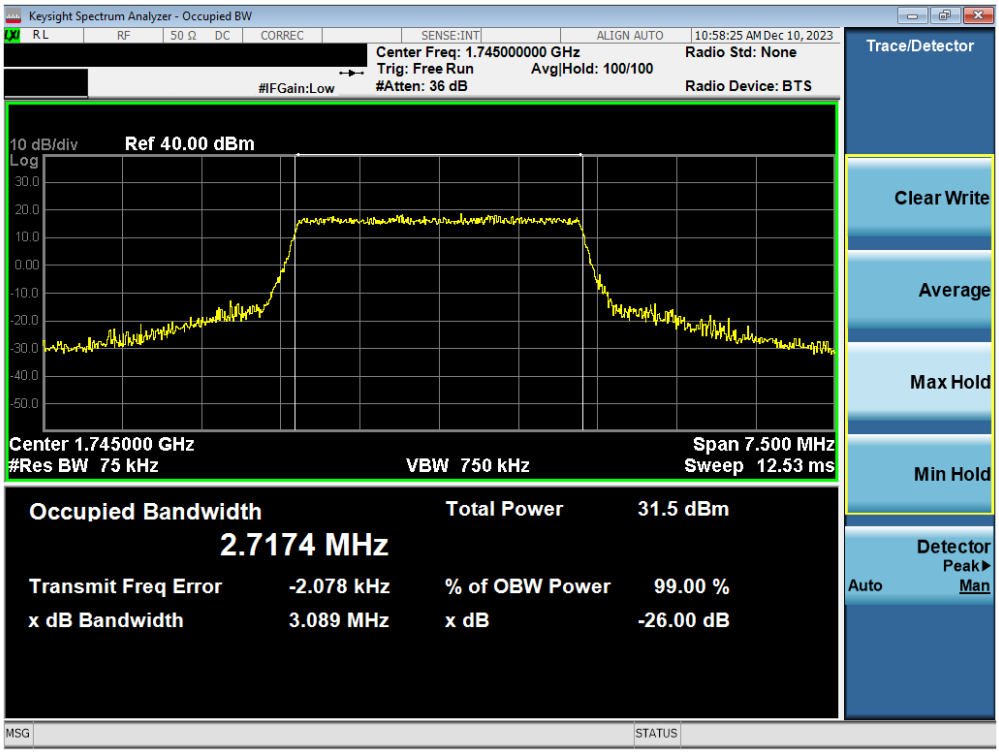
Plot 7-3. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB)



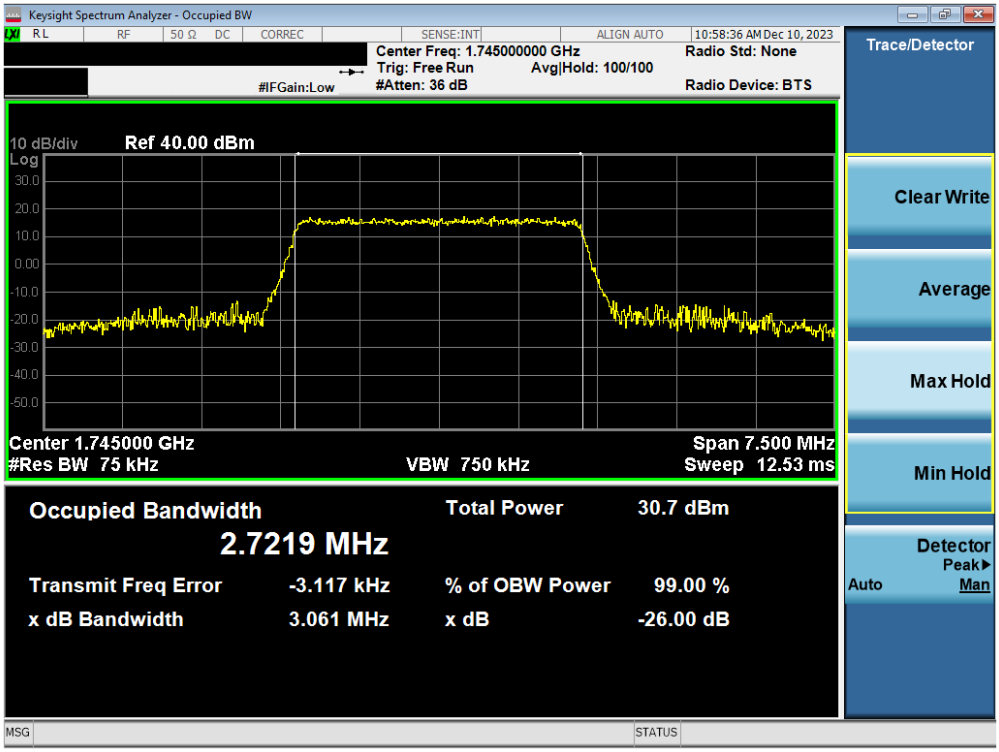
Plot 7-4. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 256-QAM - Full RB)



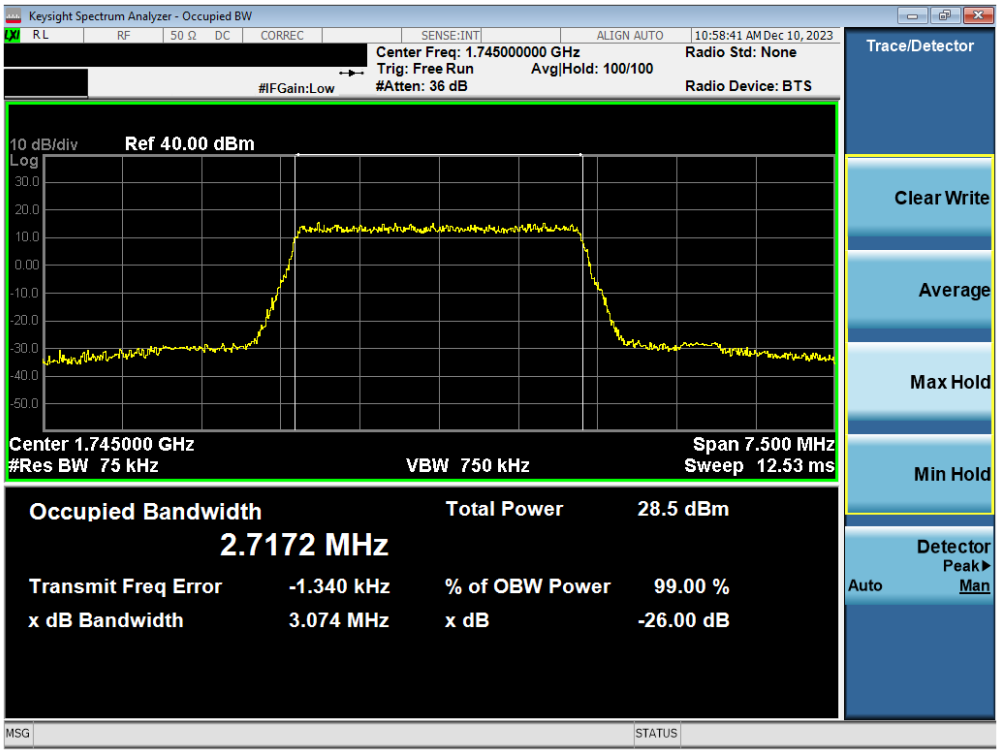
Plot 7-5. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz QPSK - Full RB)



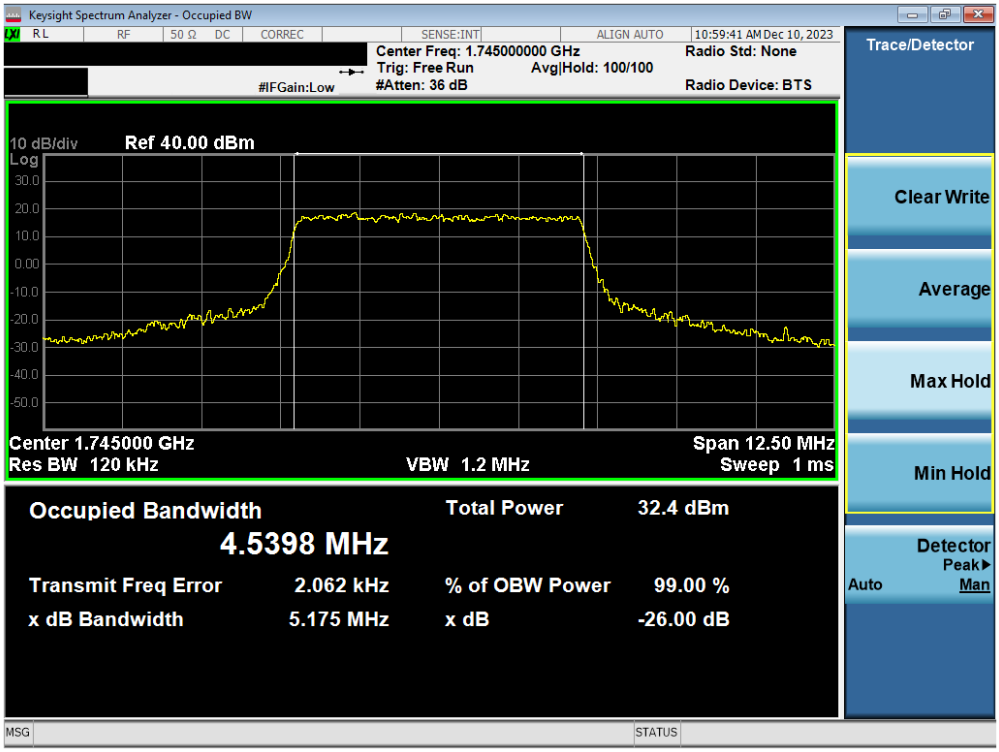
Plot 7-6. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB)



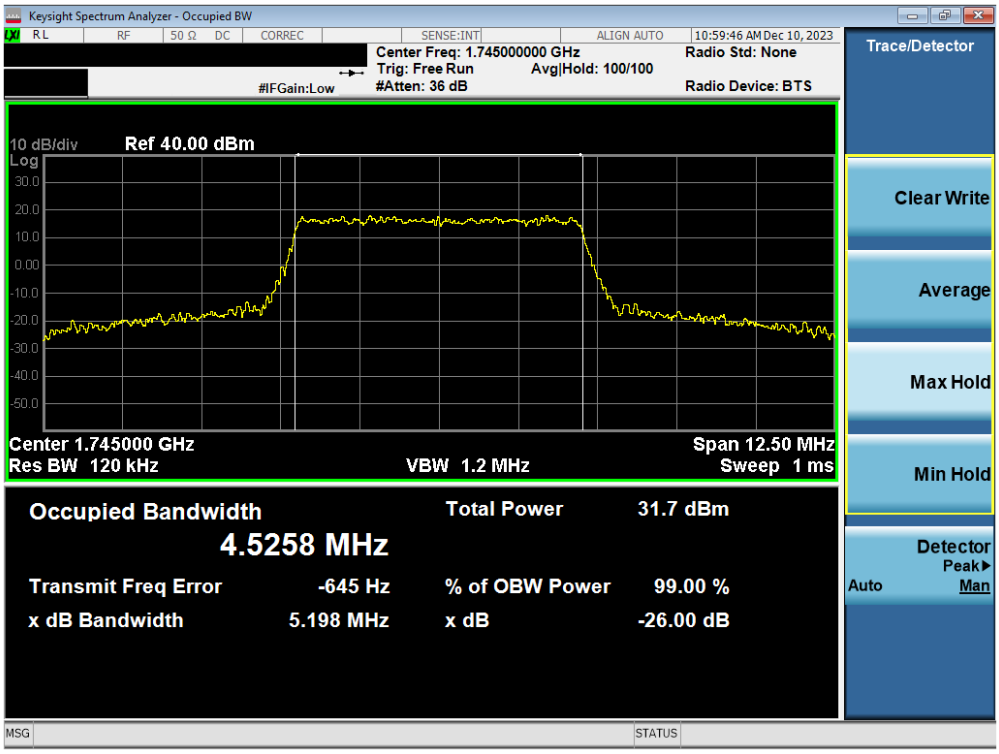
Plot 7-7. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB)



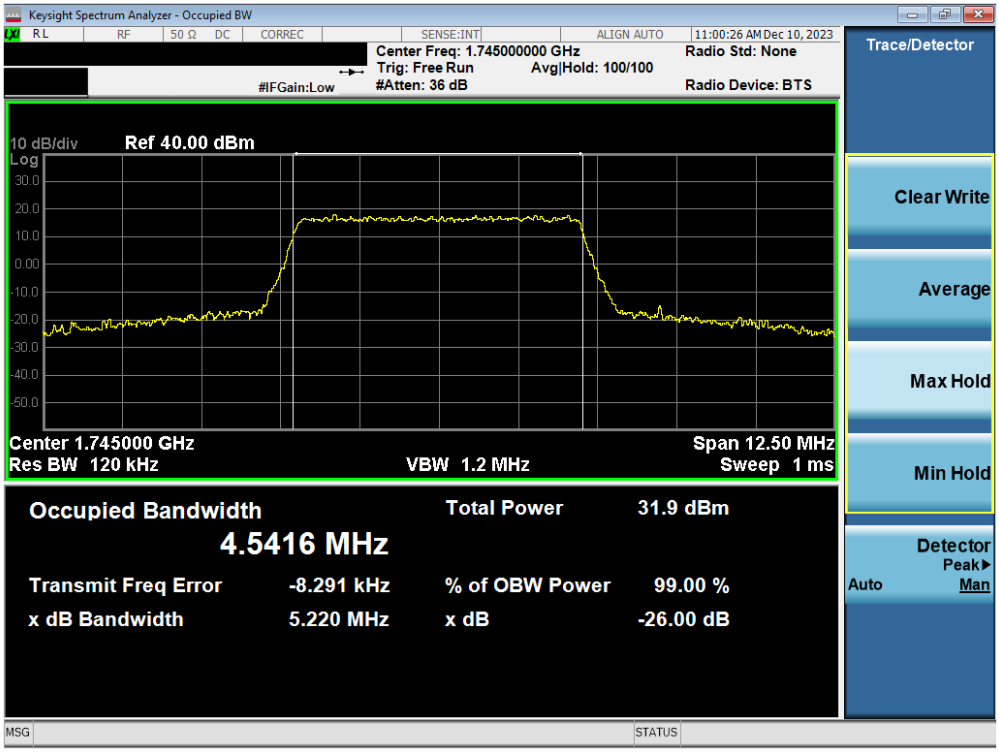
Plot 7-8. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 256-QAM - Full RB)



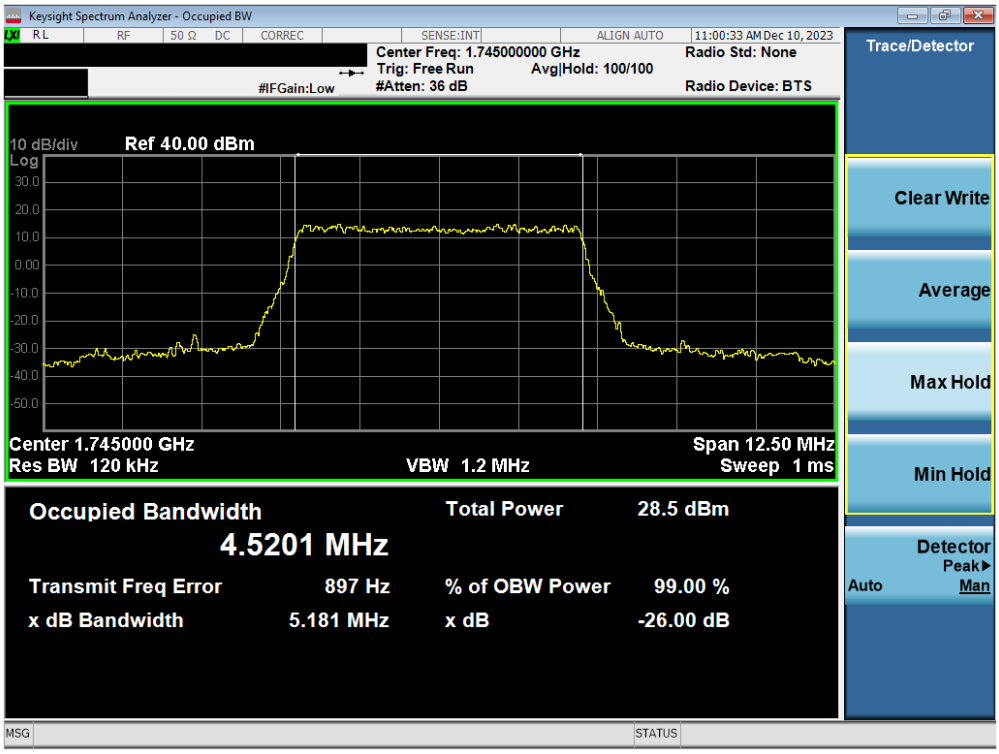
Plot 7-9. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz QPSK - Full RB)



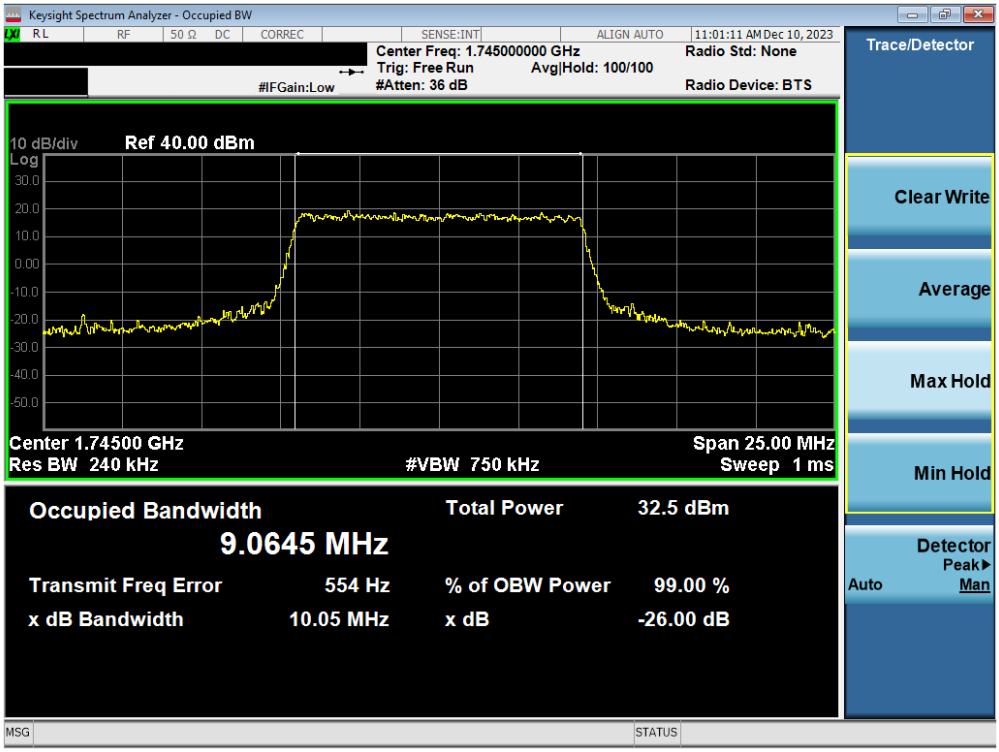
Plot 7-10. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB)



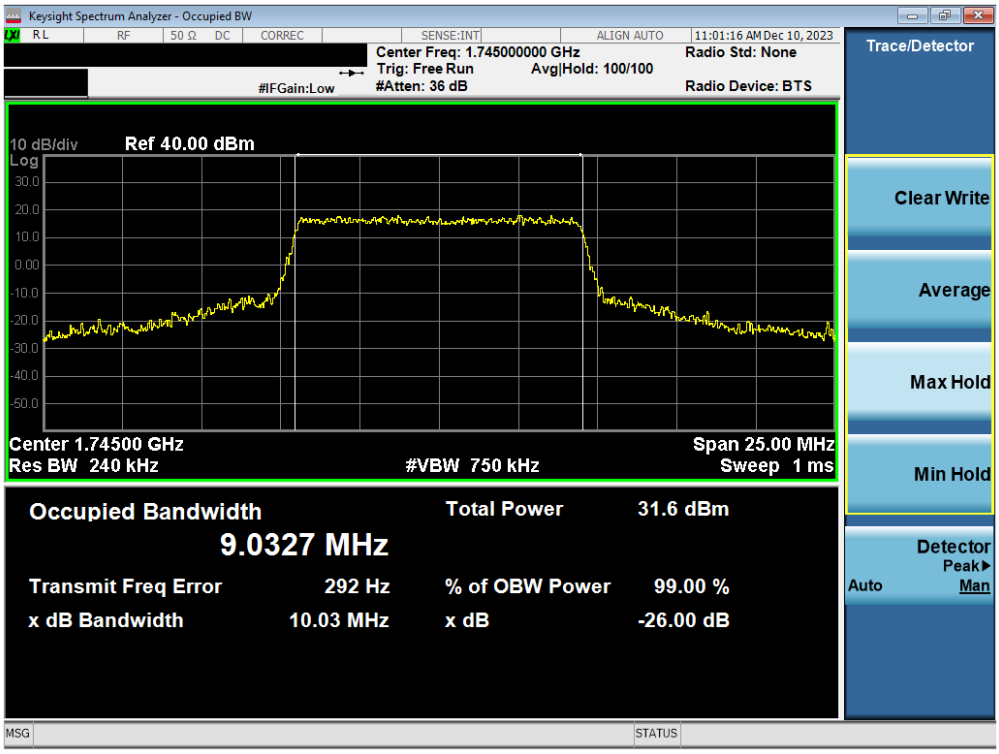
Plot 7-11. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB)



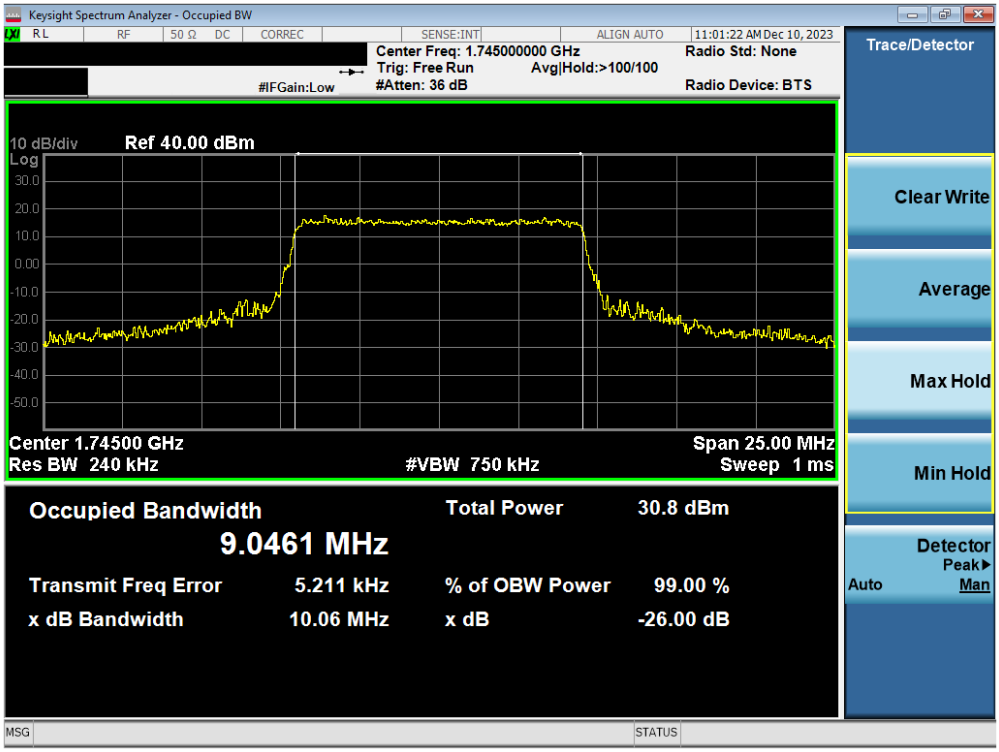
Plot 7-12. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 256-QAM - Full RB)



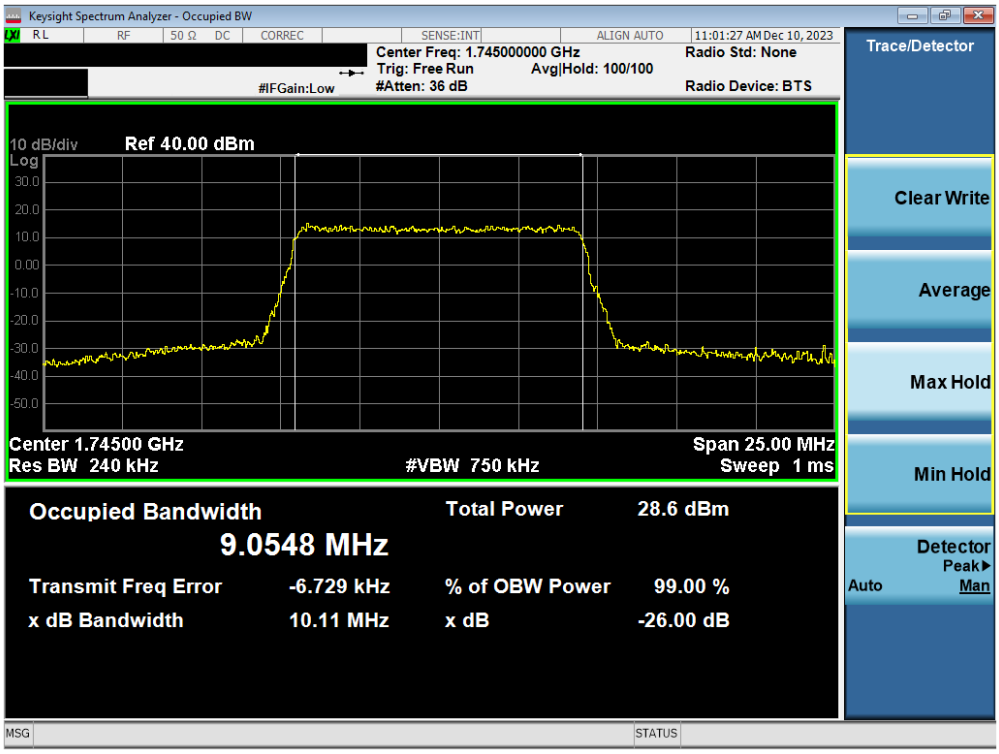
Plot 7-13. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz QPSK - Full RB)



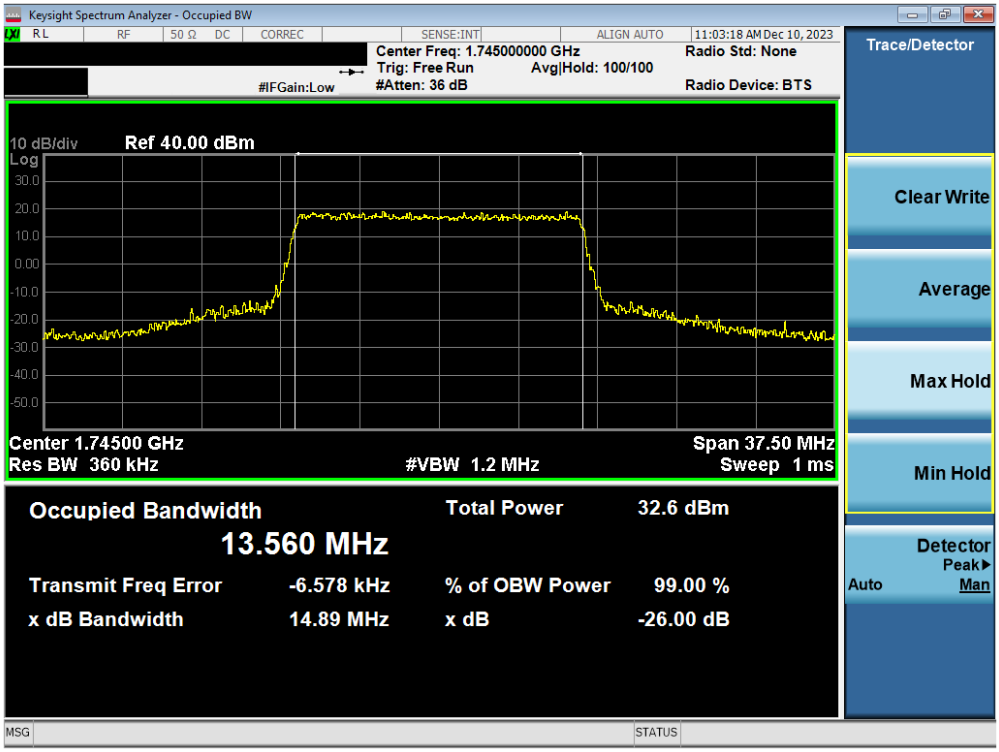
Plot 7-14. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB)



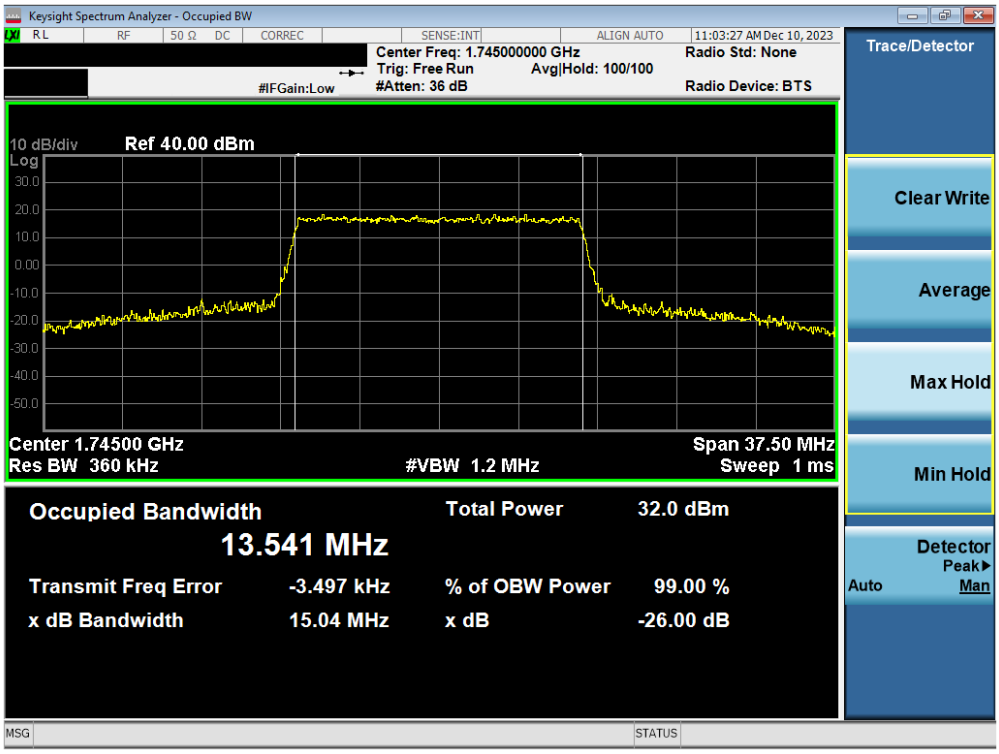
Plot 7-15. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB)



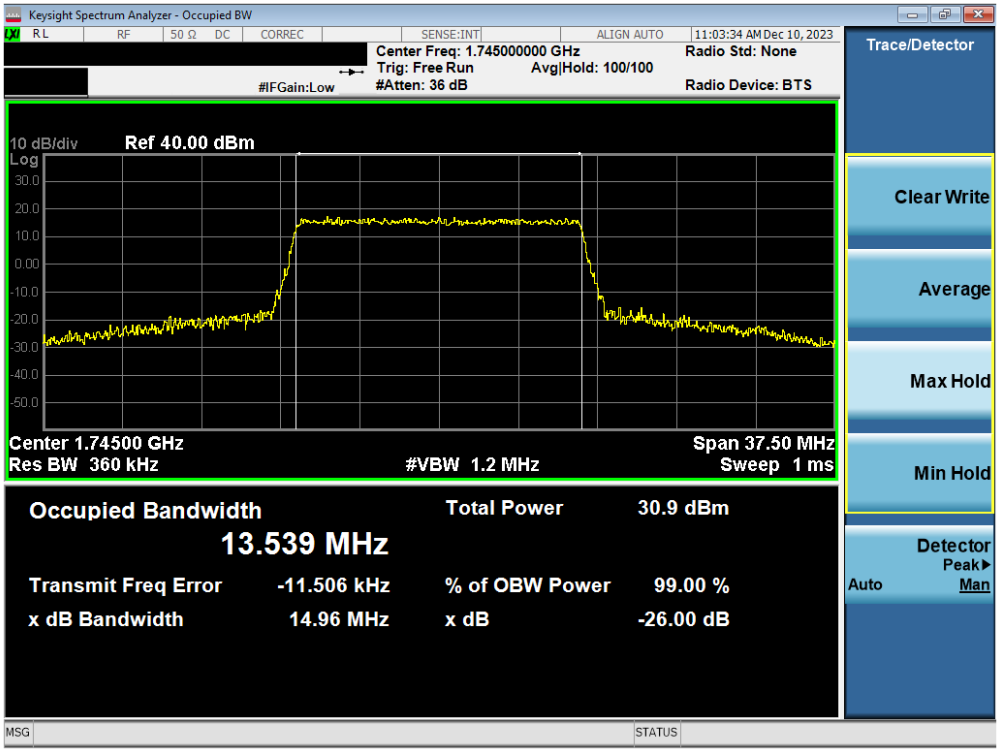
Plot 7-16. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 256-QAM - Full RB)



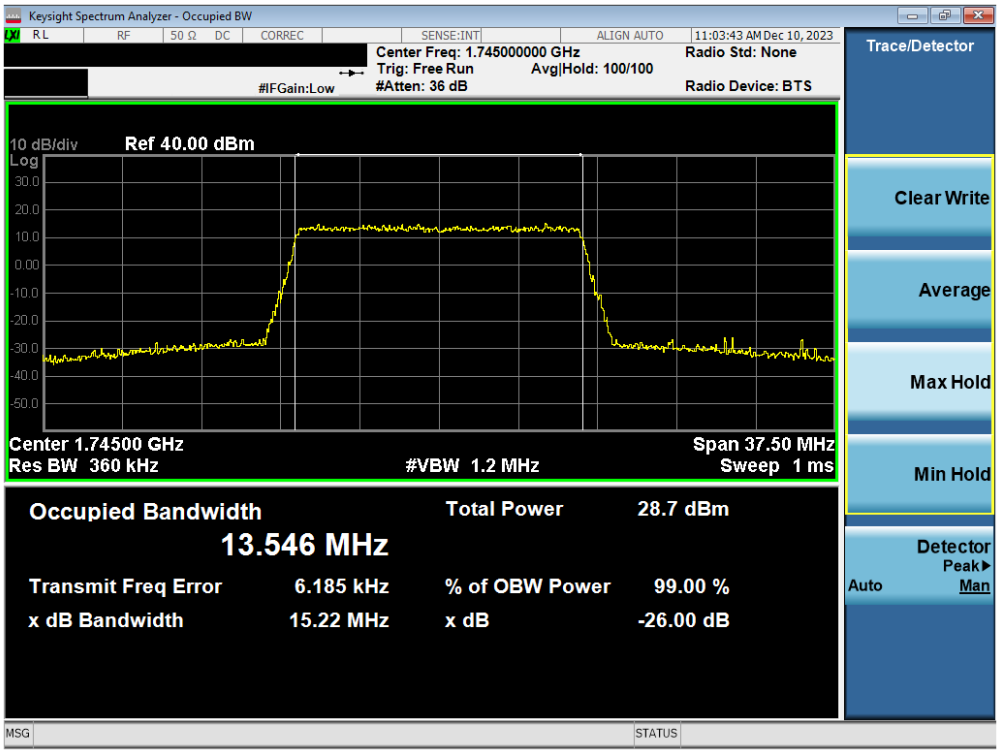
Plot 7-17. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz QPSK - Full RB)



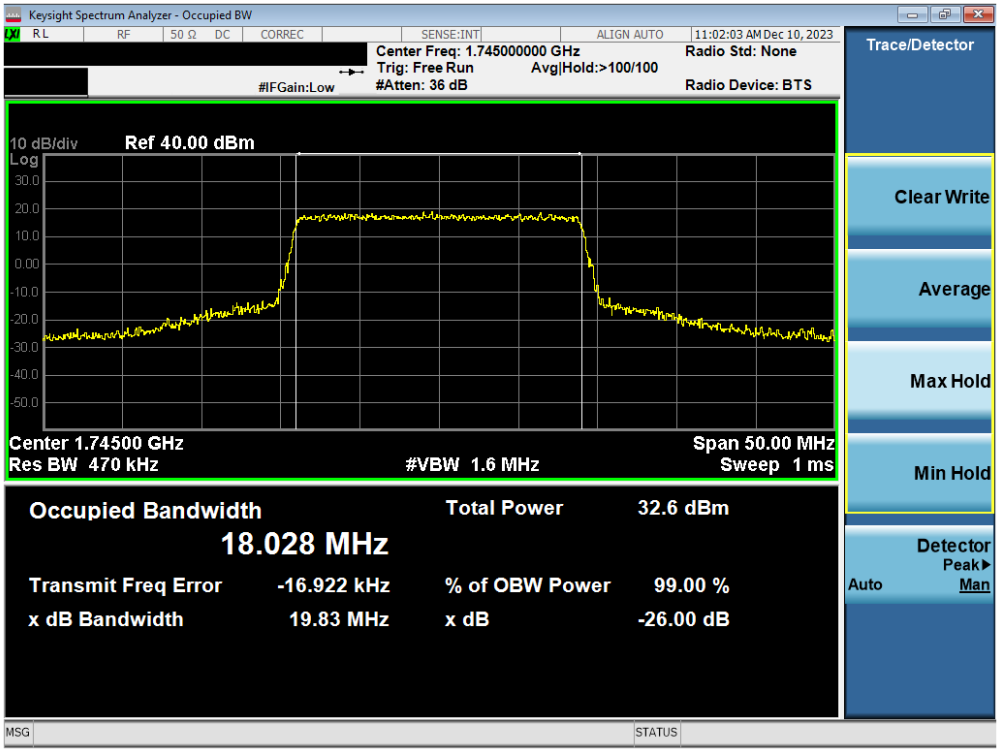
Plot 7-18. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB)



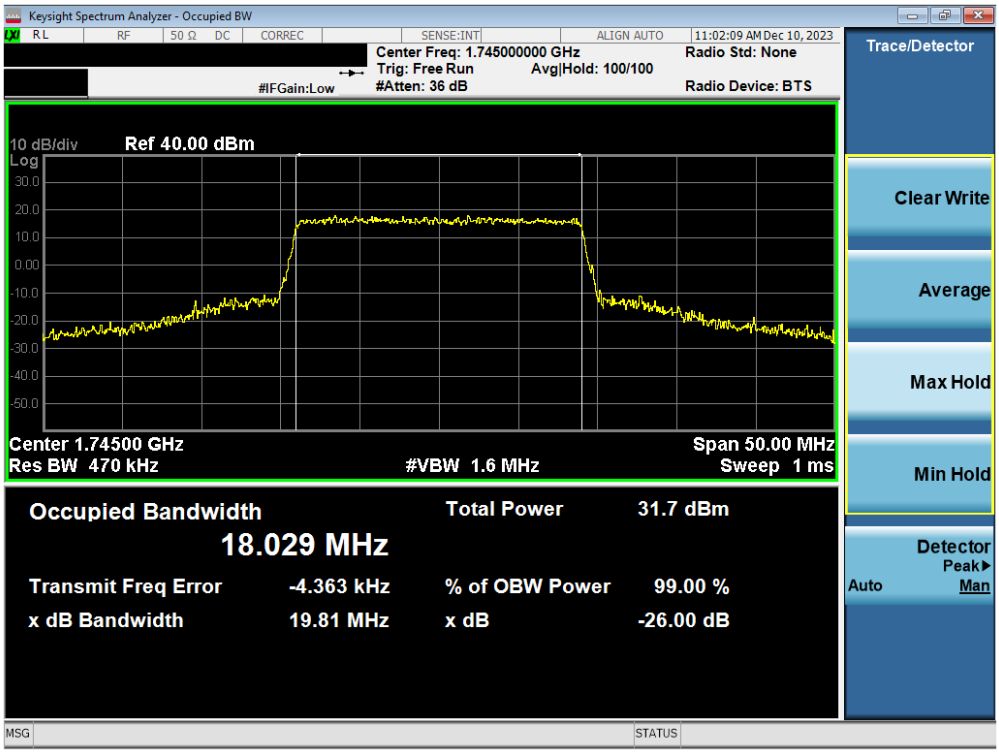
Plot 7-19. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB)



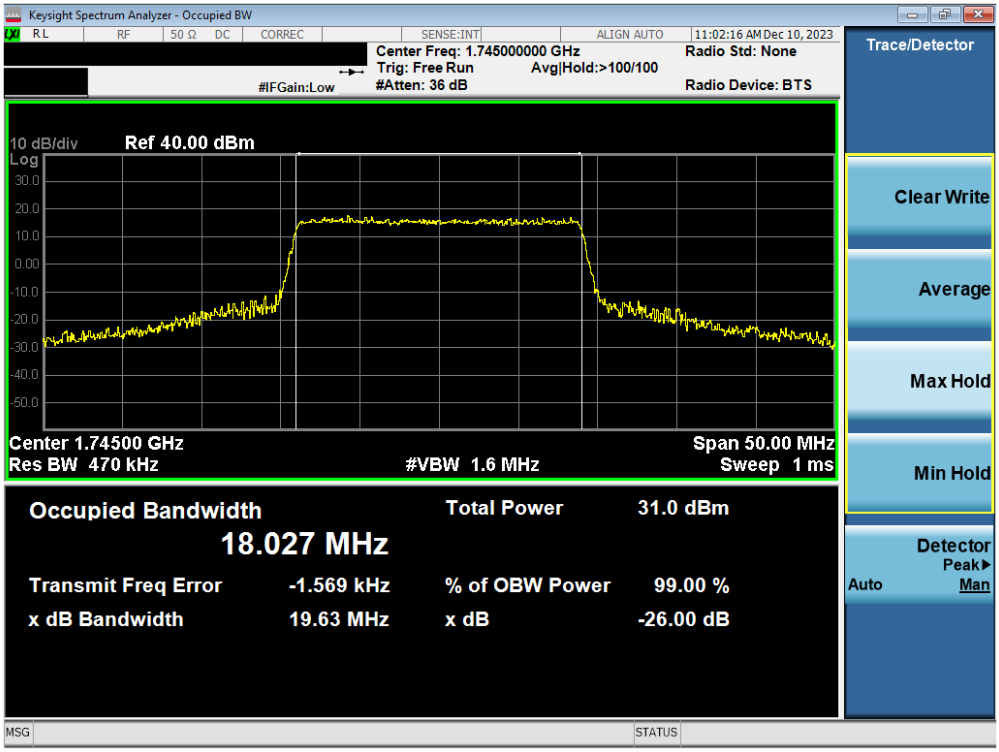
Plot 7-20. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 256-QAM - Full RB)



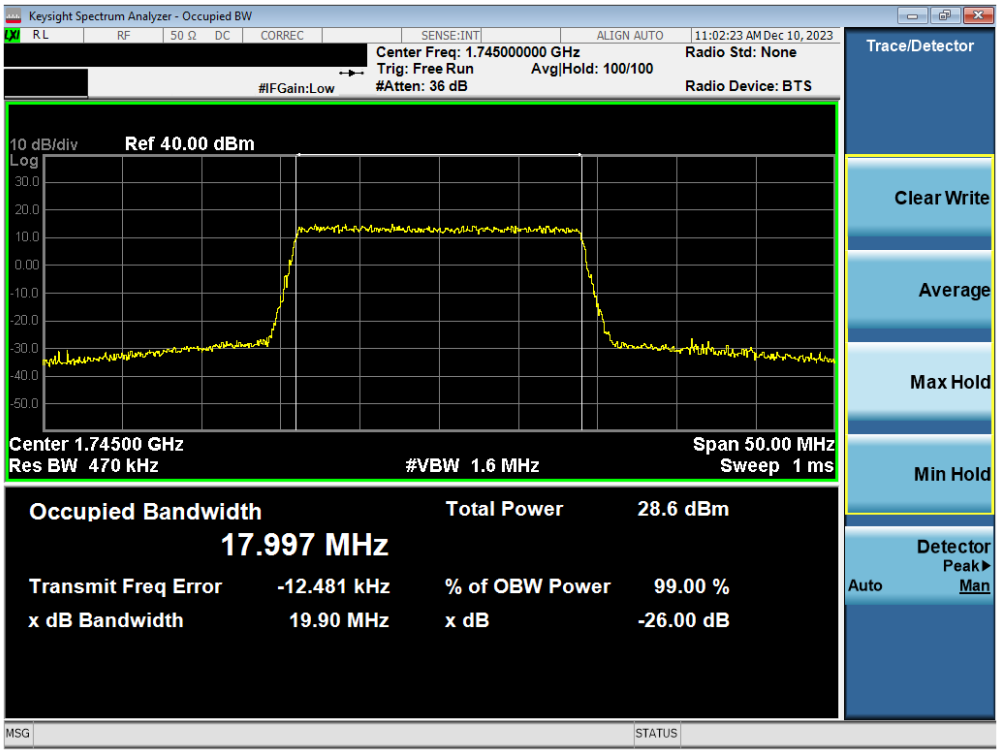
Plot 7-21. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB)

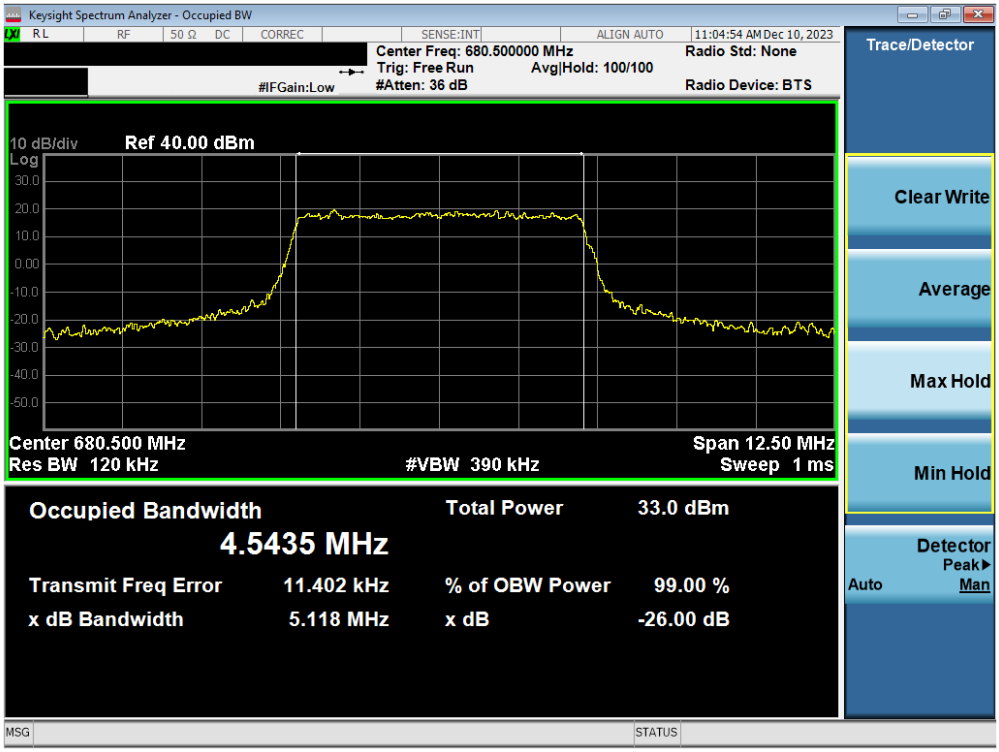


Plot 7-23. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB)

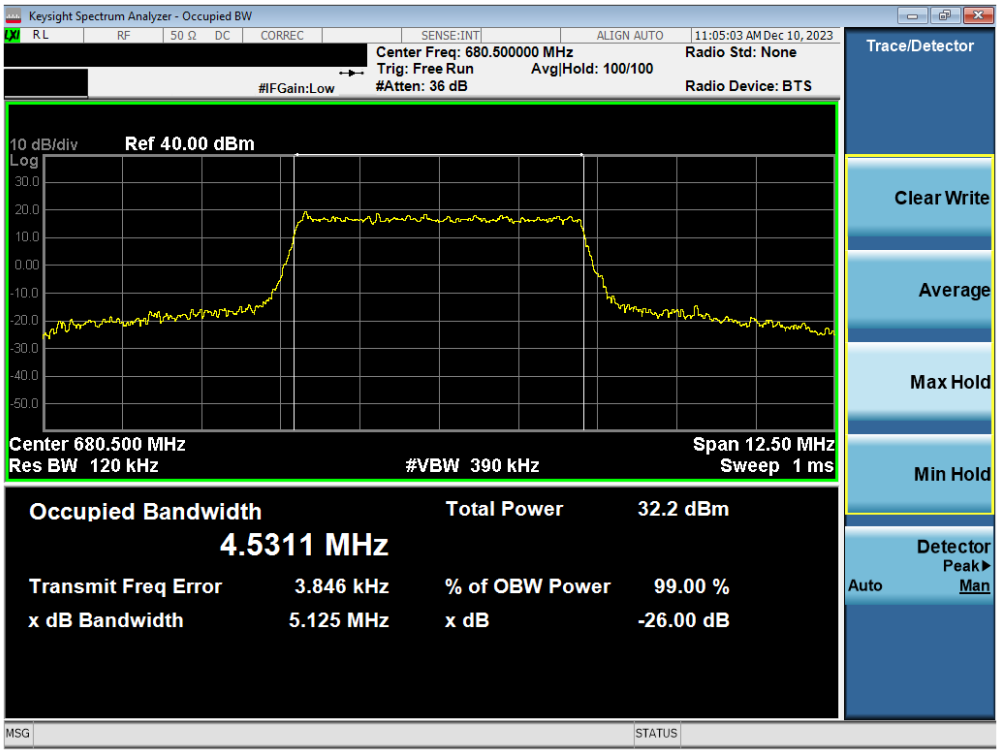


Plot 7-24. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 256-QAM - Full RB)

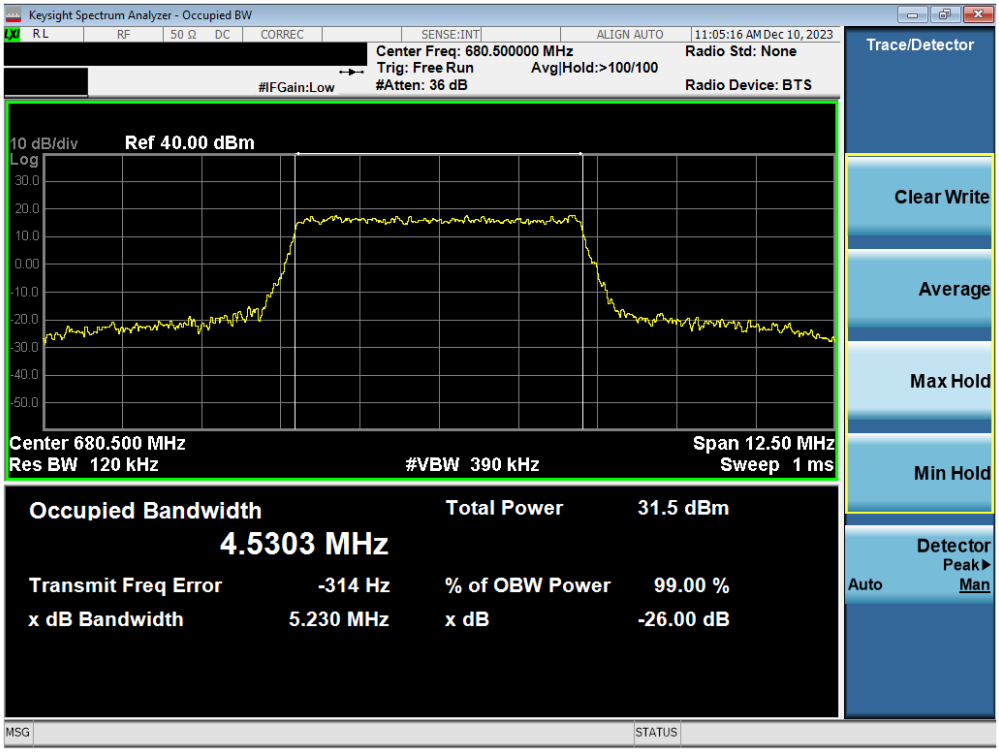
LTE Band 71



Plot 7-25. Occupied Bandwidth Plot (LTE Band 71 - 5MHz QPSK - Full RB)

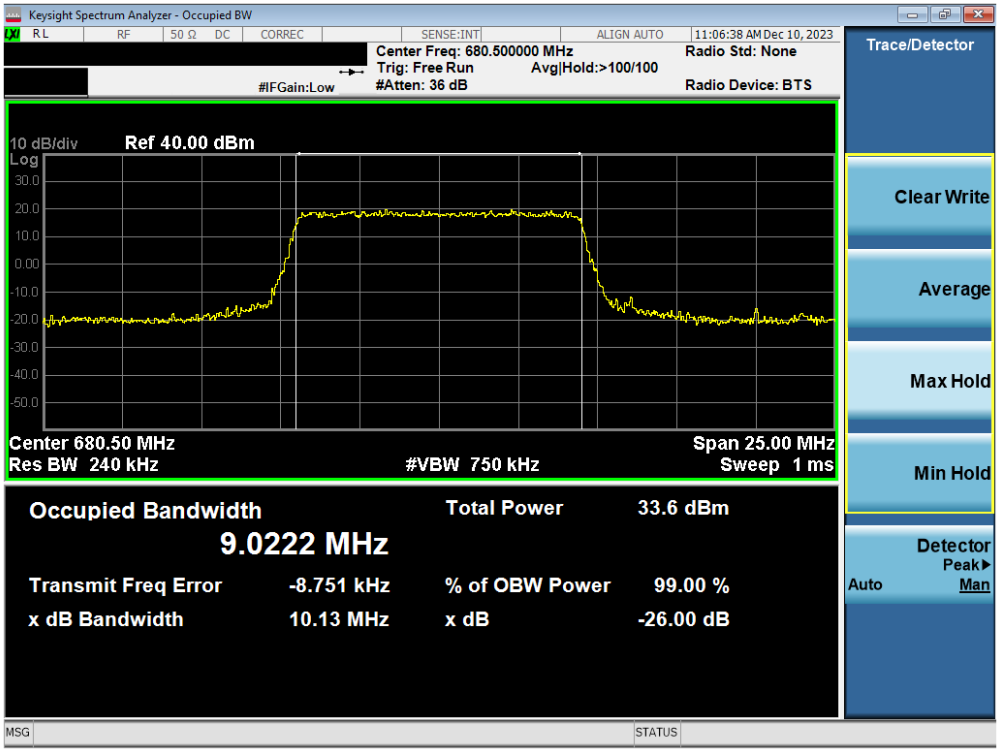


Plot 7-26. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 16-QAM - Full RB)

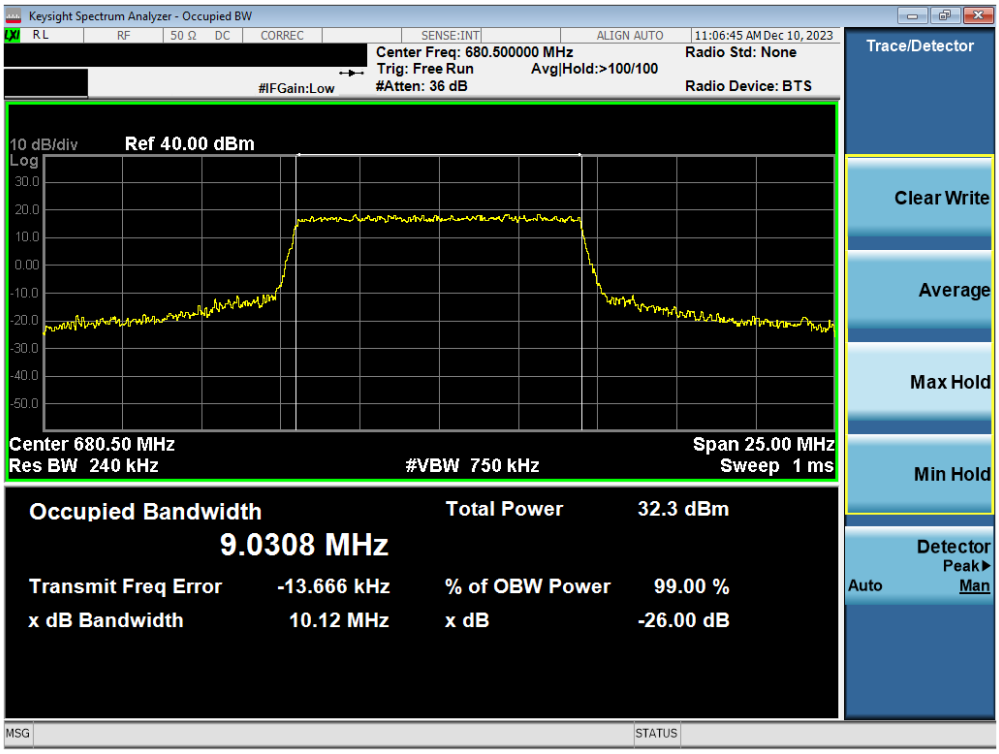


Plot 7-27. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 64-QAM - Full RB)

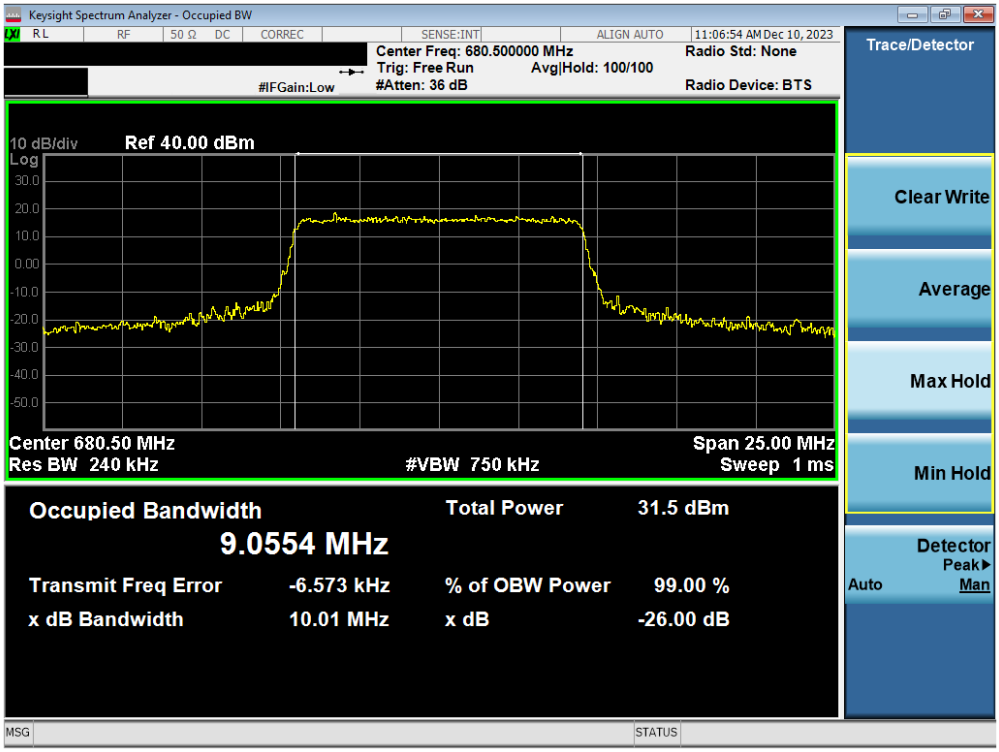
Plot 7-28. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 256-QAM - Full RB)



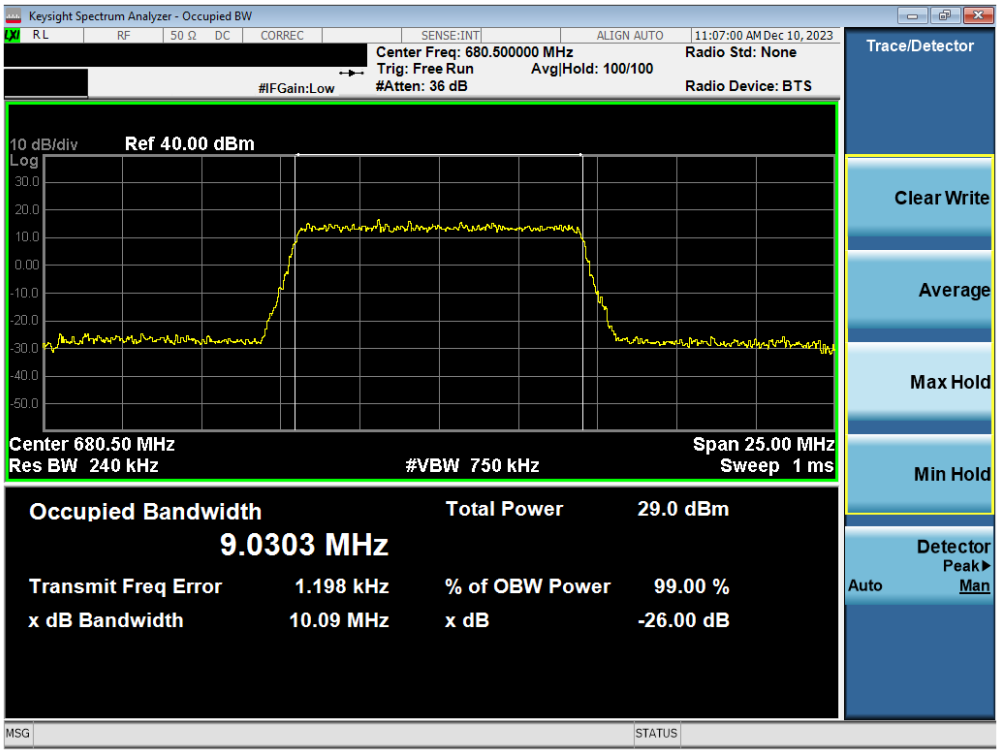
Plot 7-29. Occupied Bandwidth Plot (LTE Band 71 - 10MHz QPSK - Full RB)



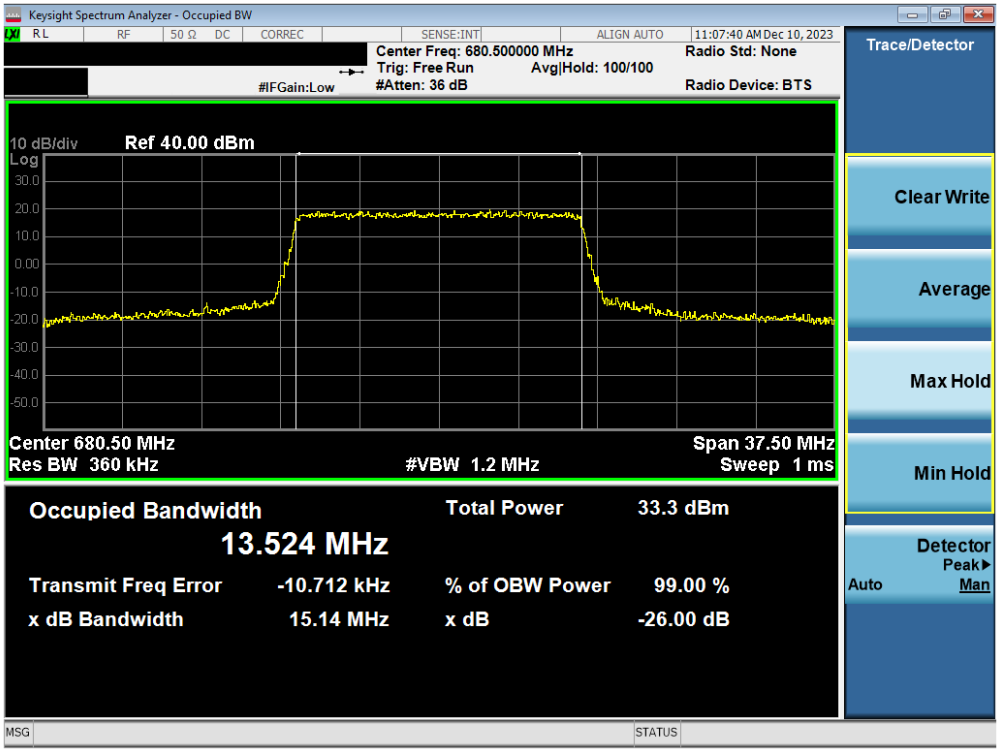
Plot 7-30. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 16-QAM - Full RB)



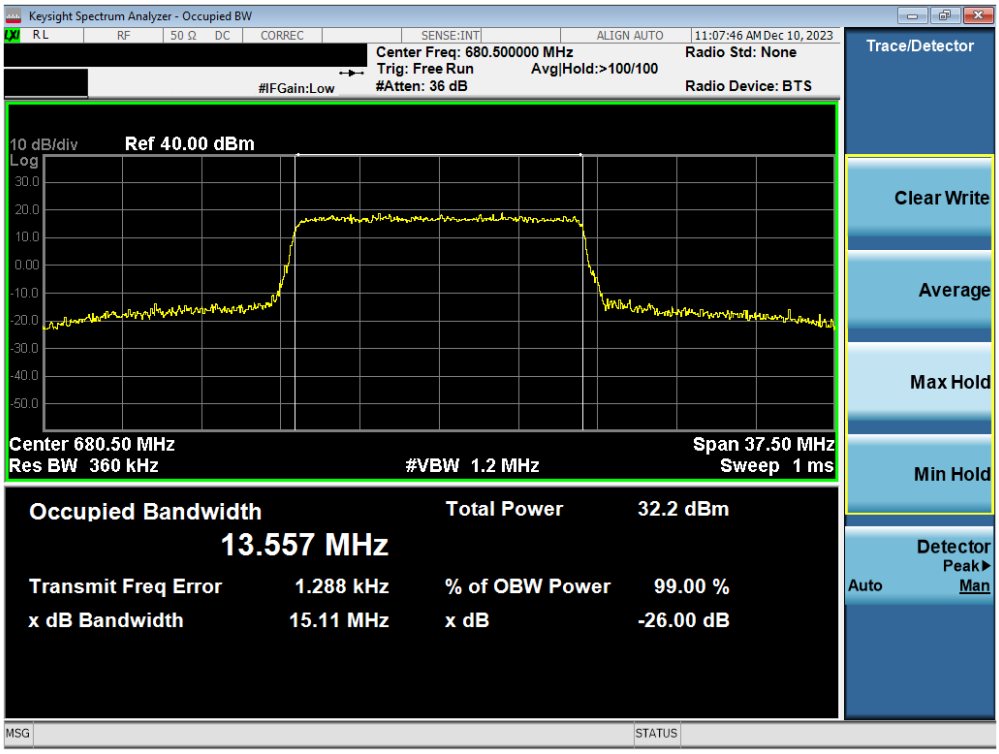
Plot 7-31. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 64-QAM - Full RB)



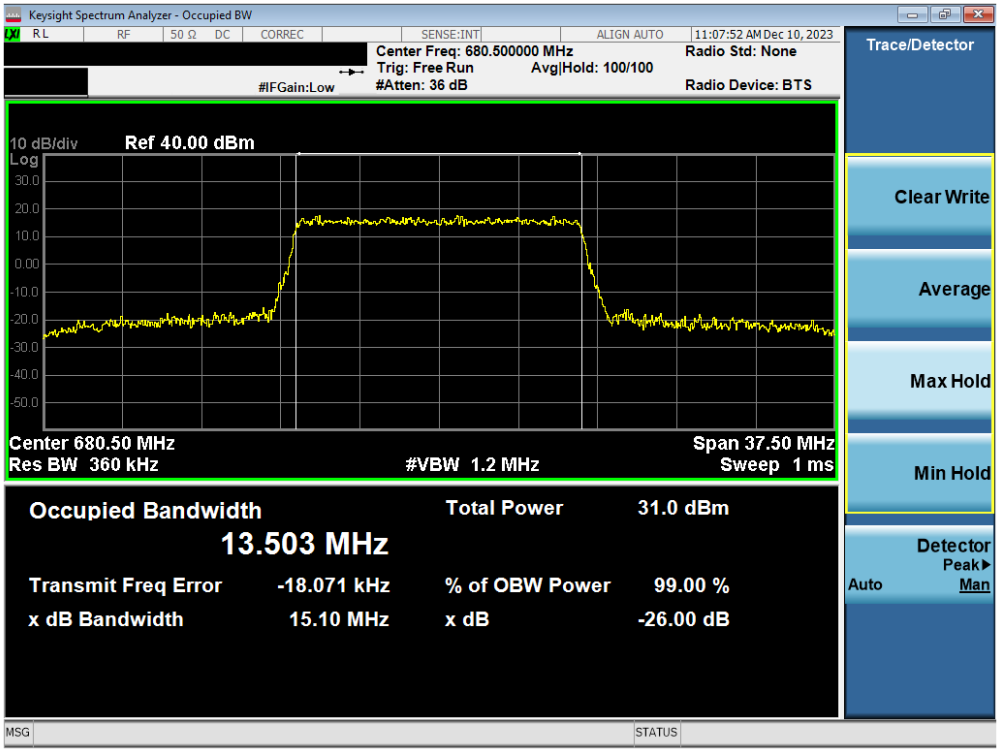
Plot 7-32. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 256-QAM - Full RB)



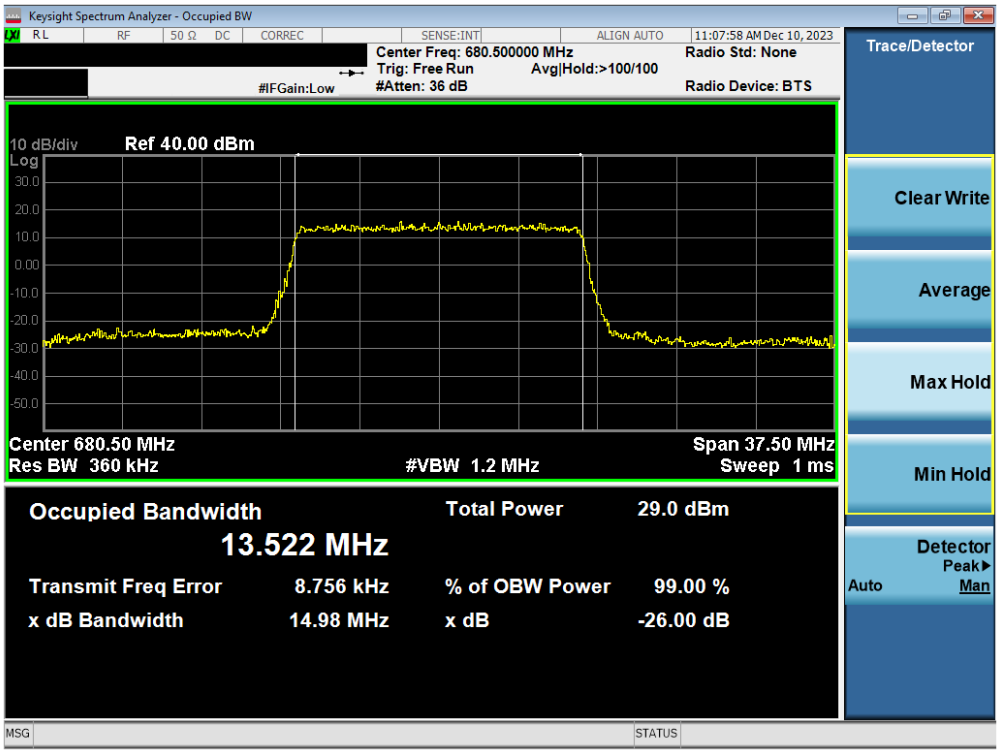
Plot 7-33. Occupied Bandwidth Plot (LTE Band 71 - 15MHz QPSK - Full RB)



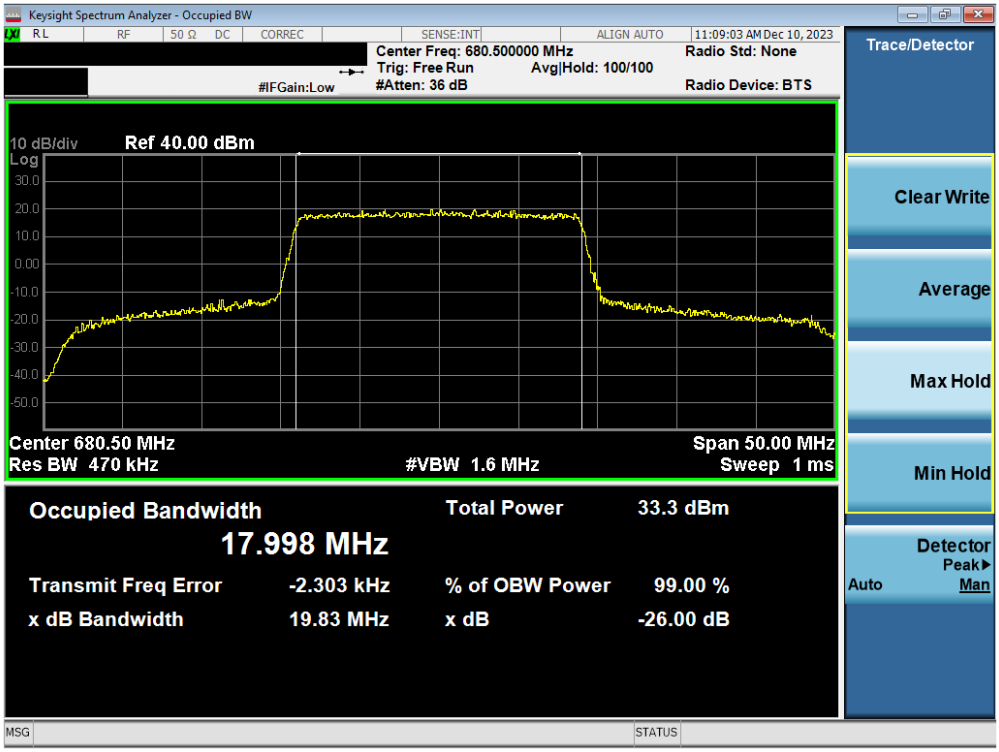
Plot 7-34. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 16-QAM - Full RB)



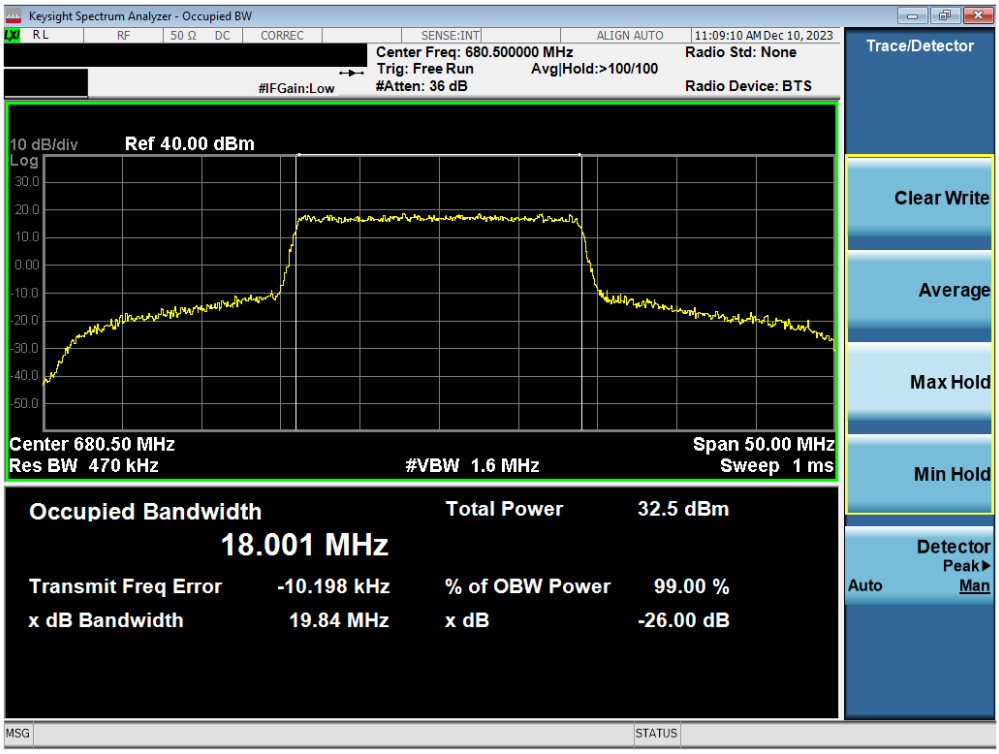
Plot 7-35. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 64-QAM - Full RB)



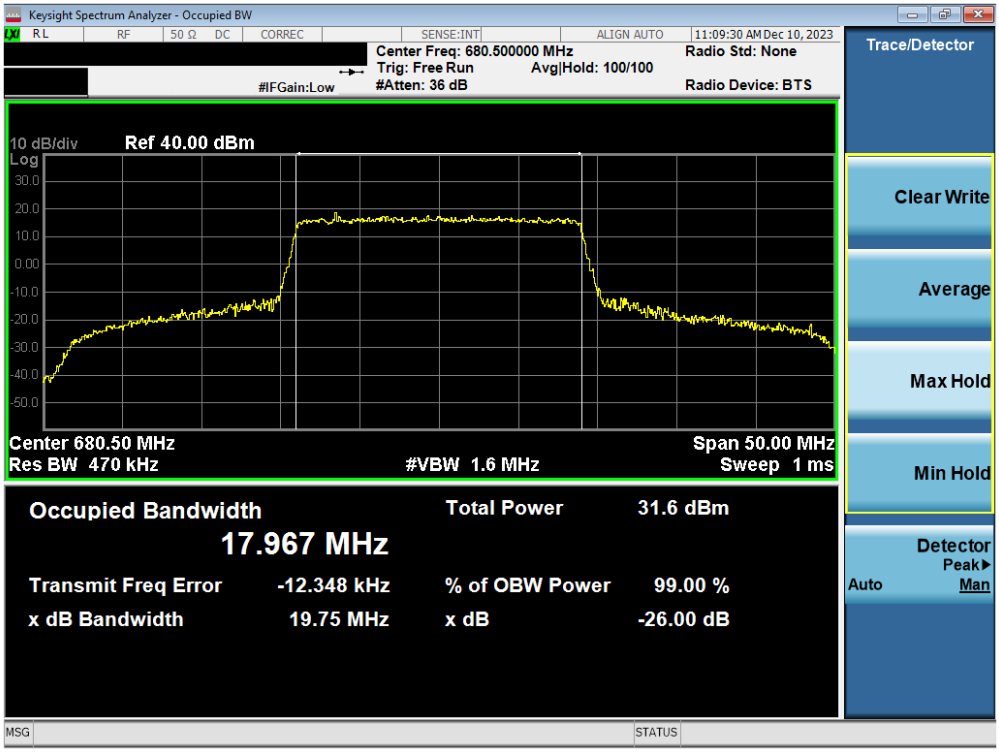
Plot 7-36. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 256-QAM - Full RB)



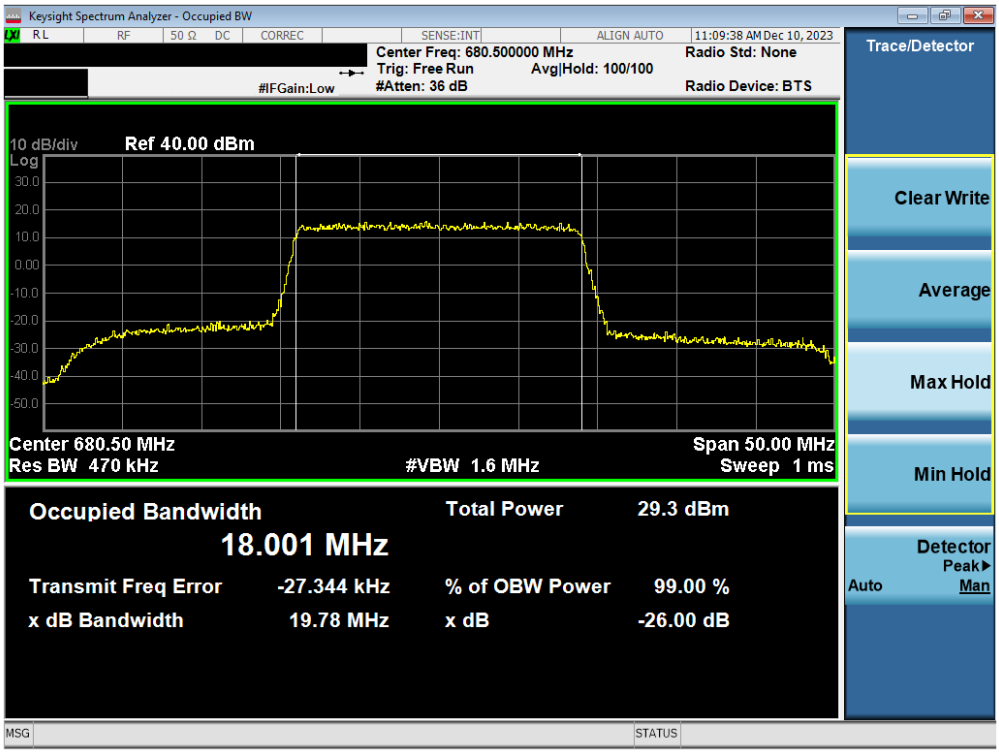
Plot 7-37. Occupied Bandwidth Plot (LTE Band 71 - 20MHz QPSK - Full RB)



Plot 7-38. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 16-QAM - Full RB)

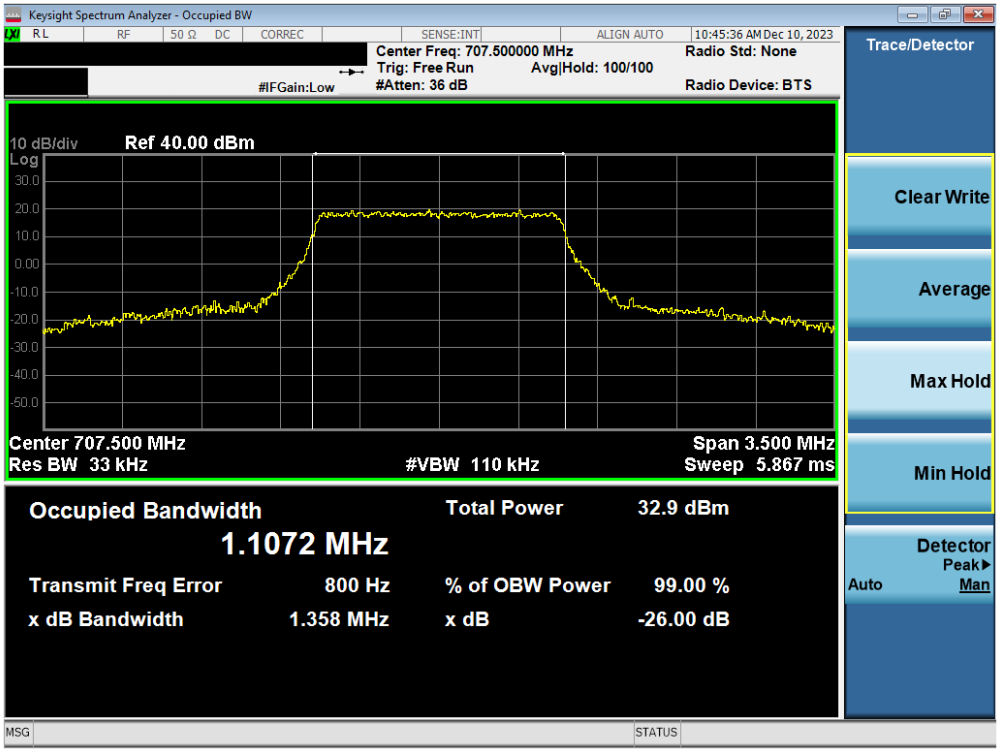


Plot 7-39. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 64-QAM - Full RB)

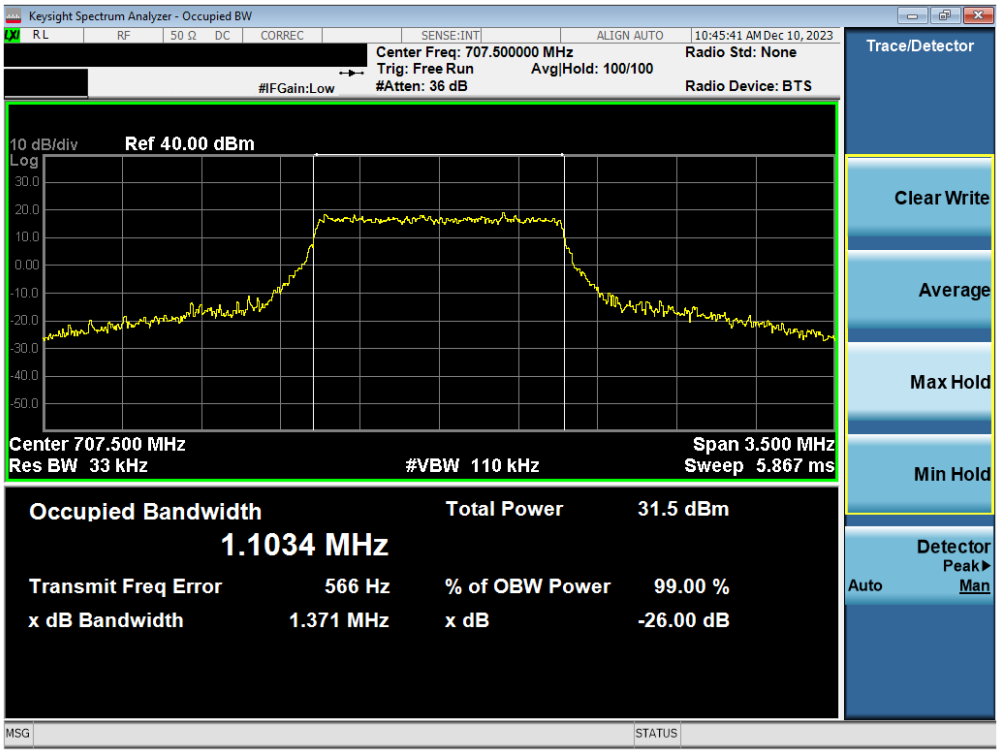


Plot 7-40. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 256-QAM - Full RB)

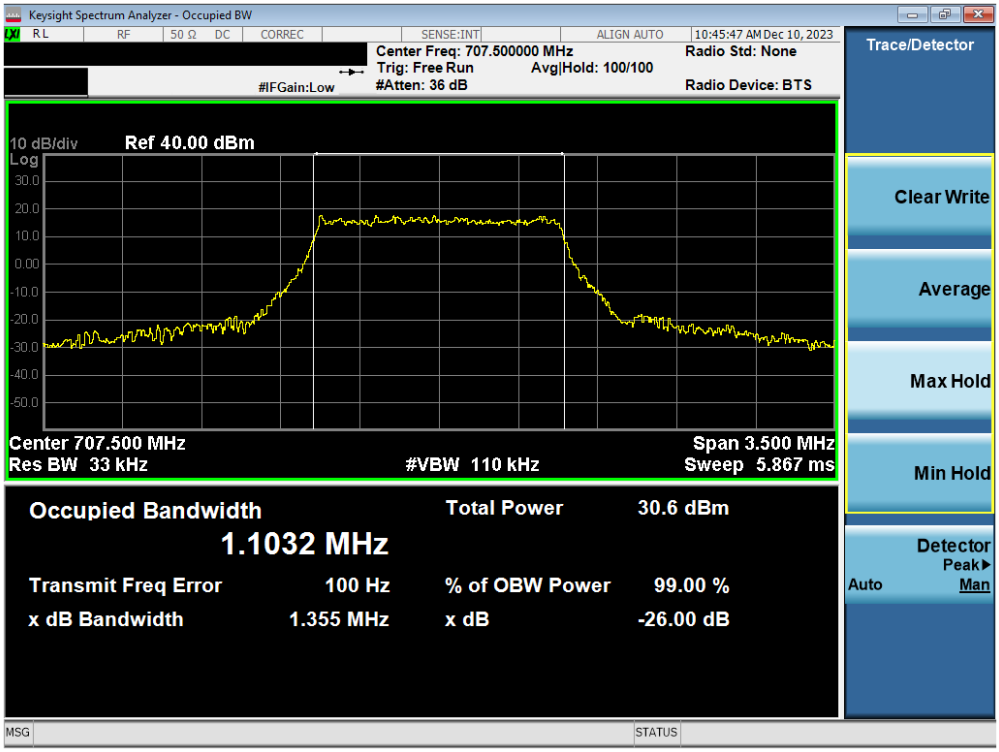
LTE Band 12/17



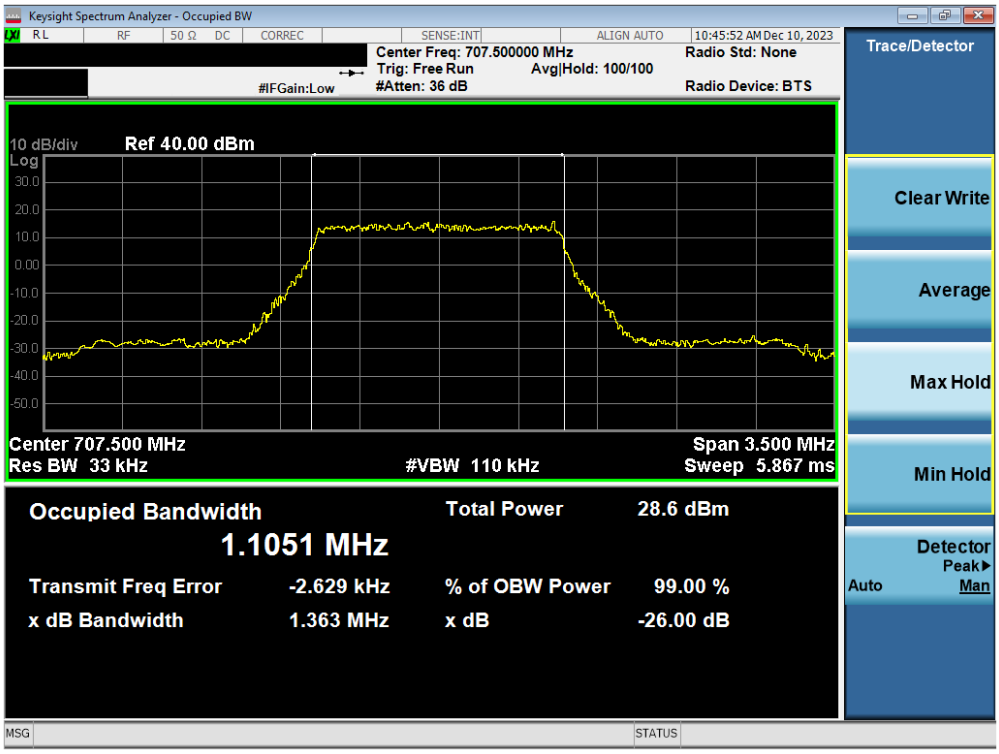
Plot 7-41. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB)



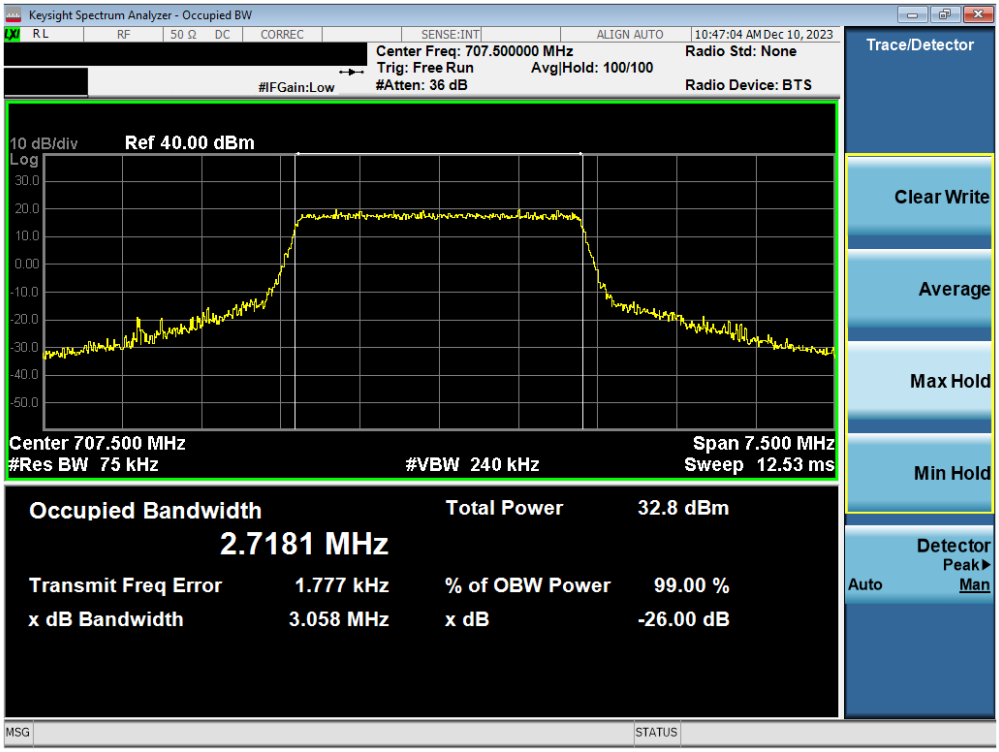
Plot 7-42. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB)



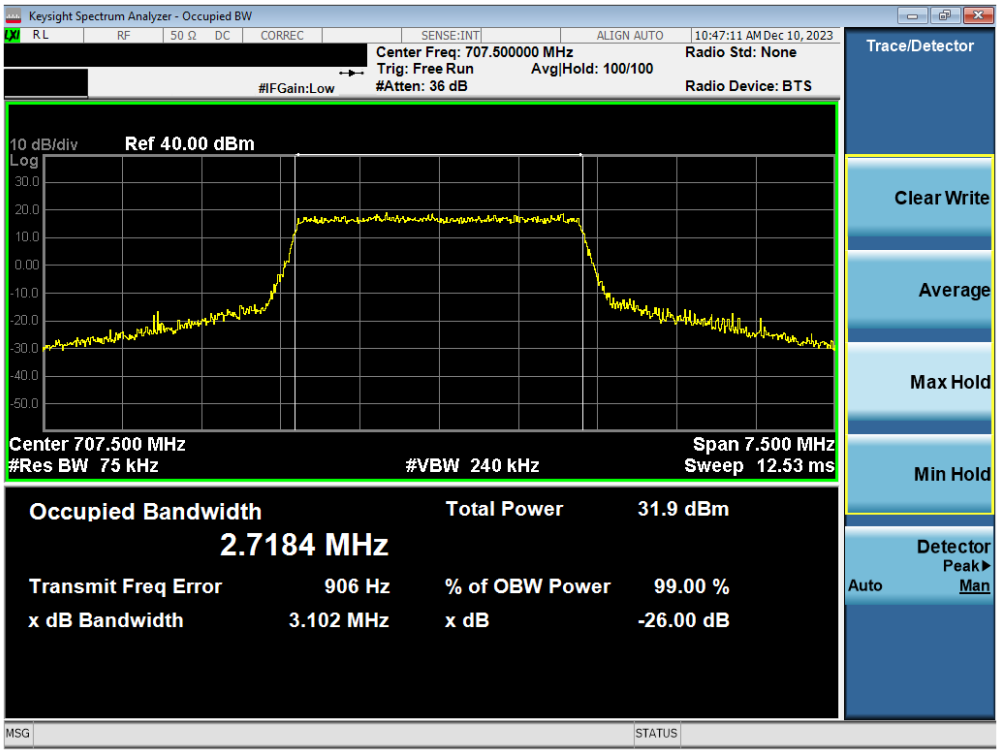
Plot 7-43. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 64-QAM - Full RB)



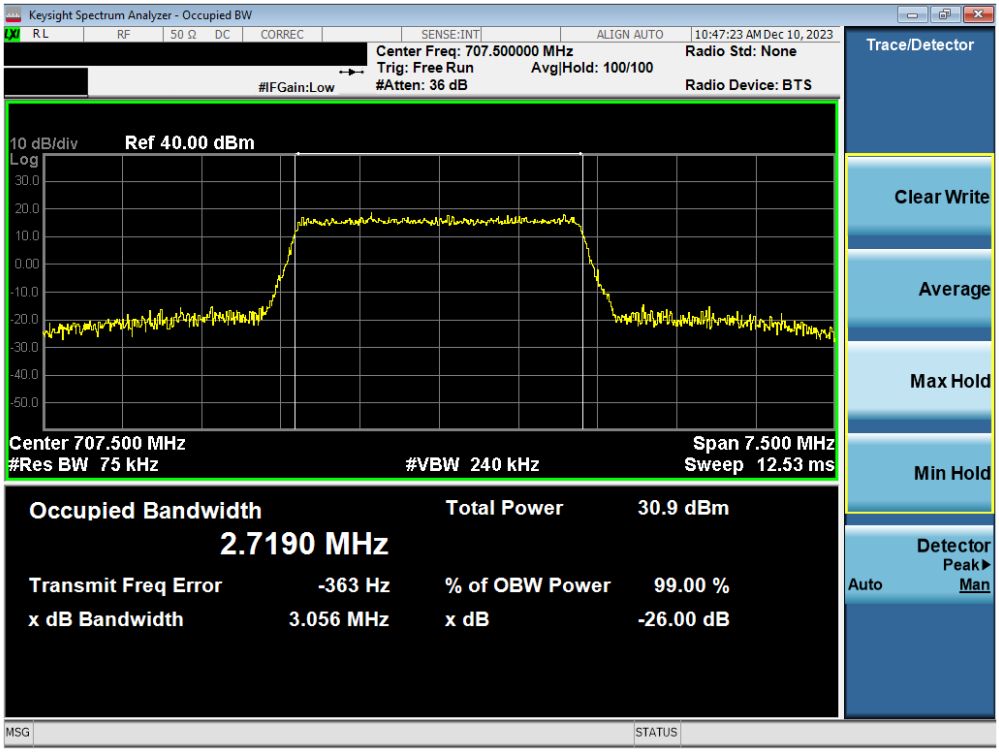
Plot 7-44. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 256-QAM - Full RB)



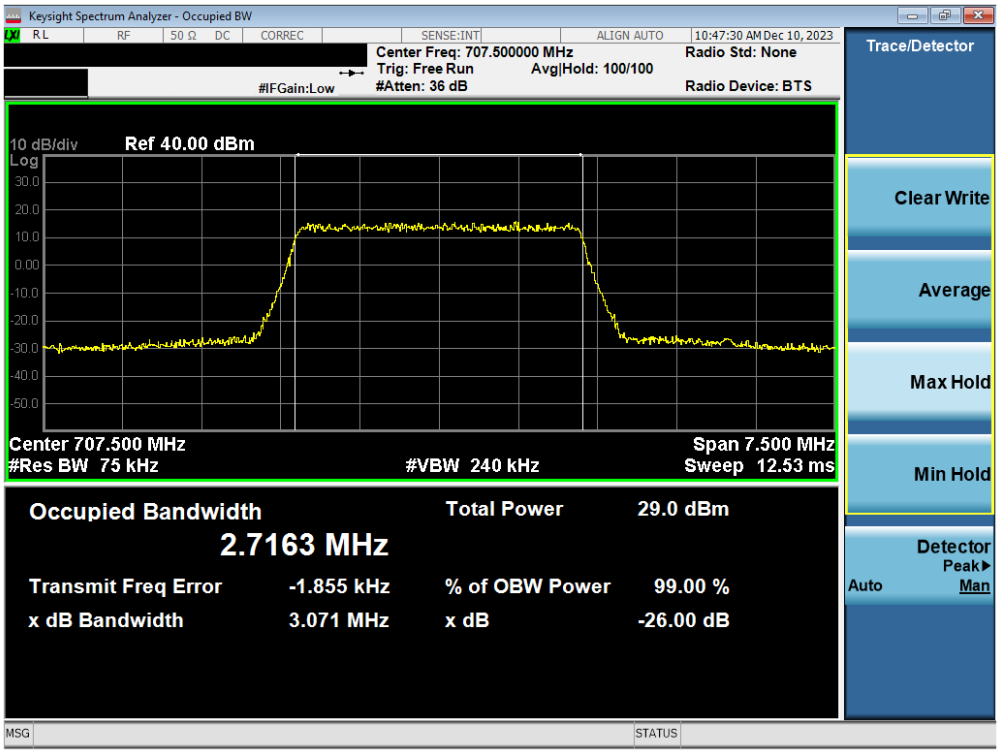
Plot 7-45. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB)



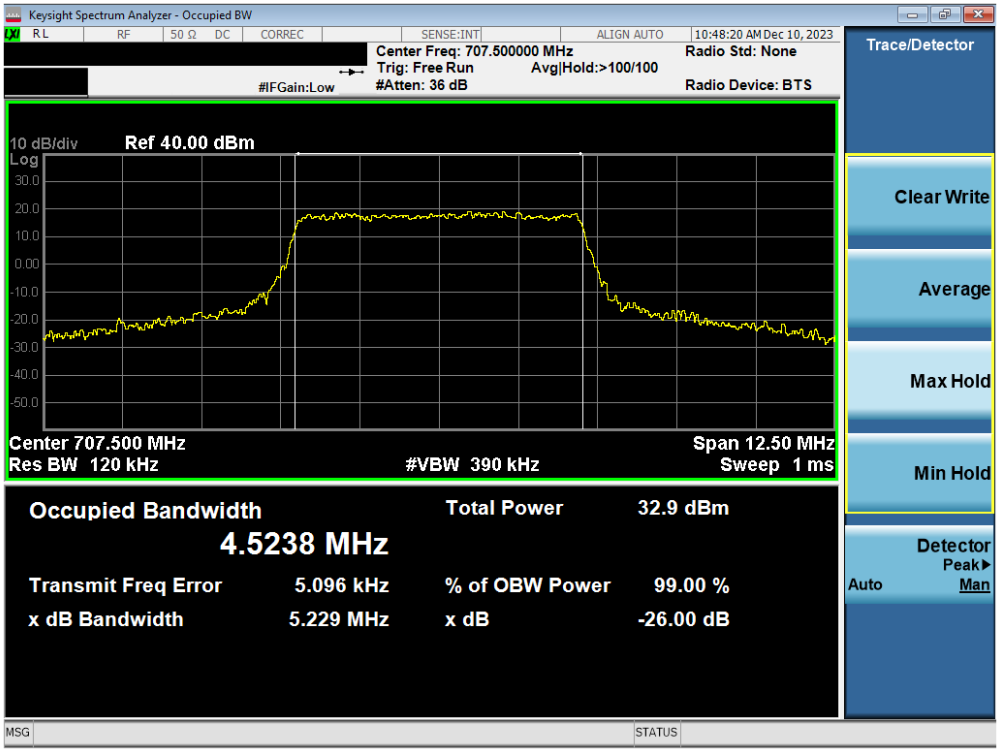
Plot 7-46. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB)



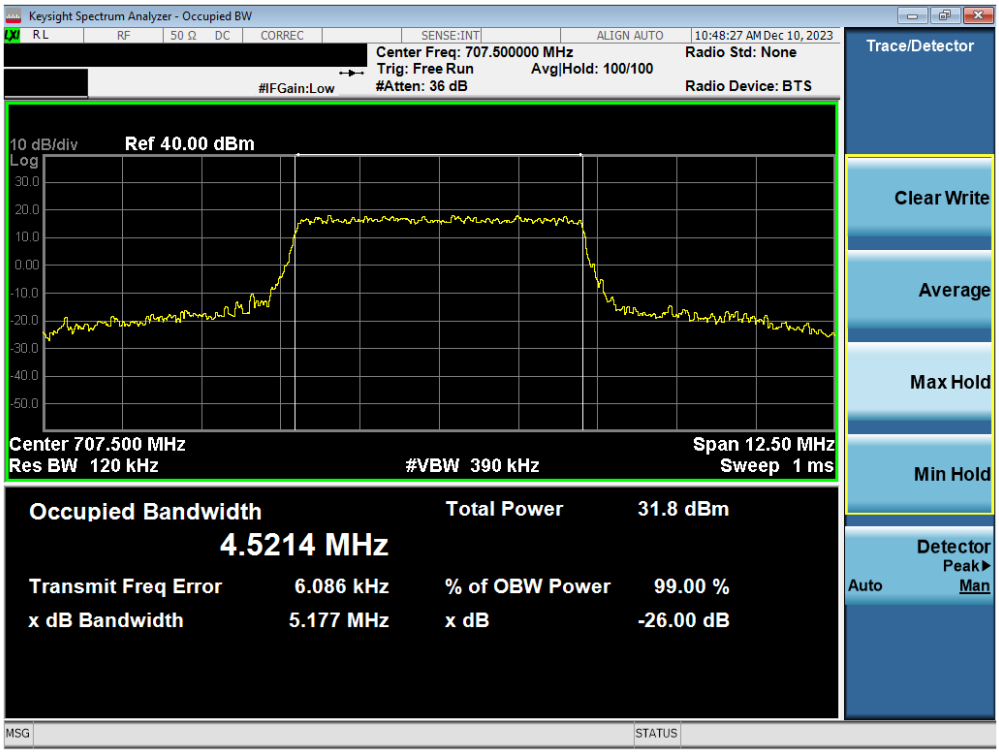
Plot 7-47. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 64-QAM - Full RB)



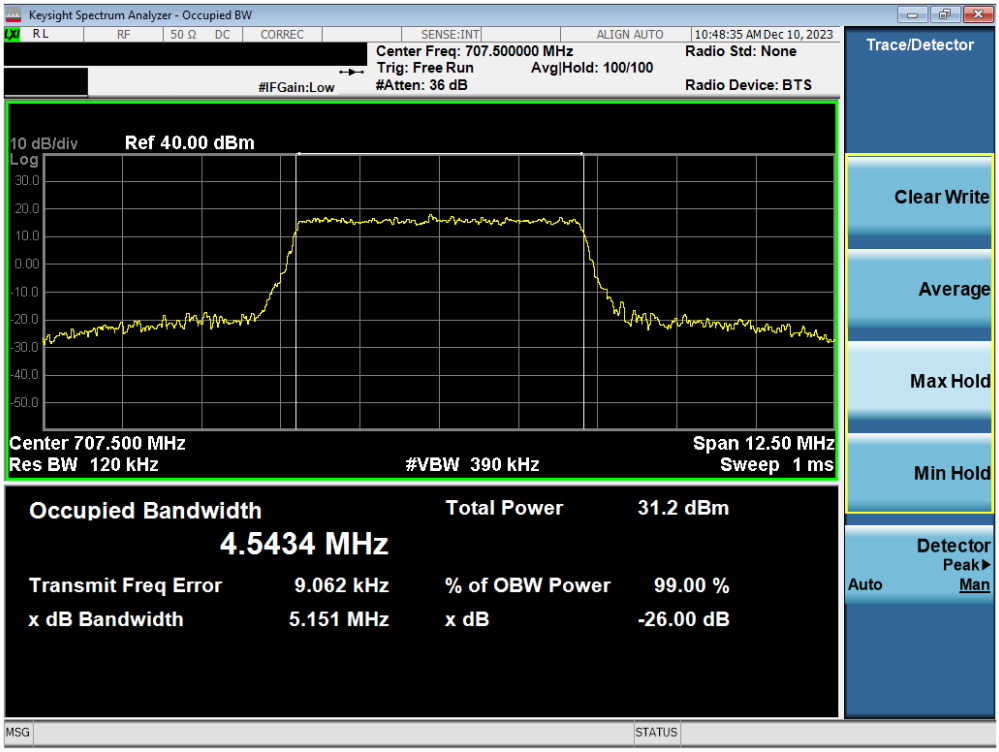
Plot 7-48. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 256-QAM - Full RB)



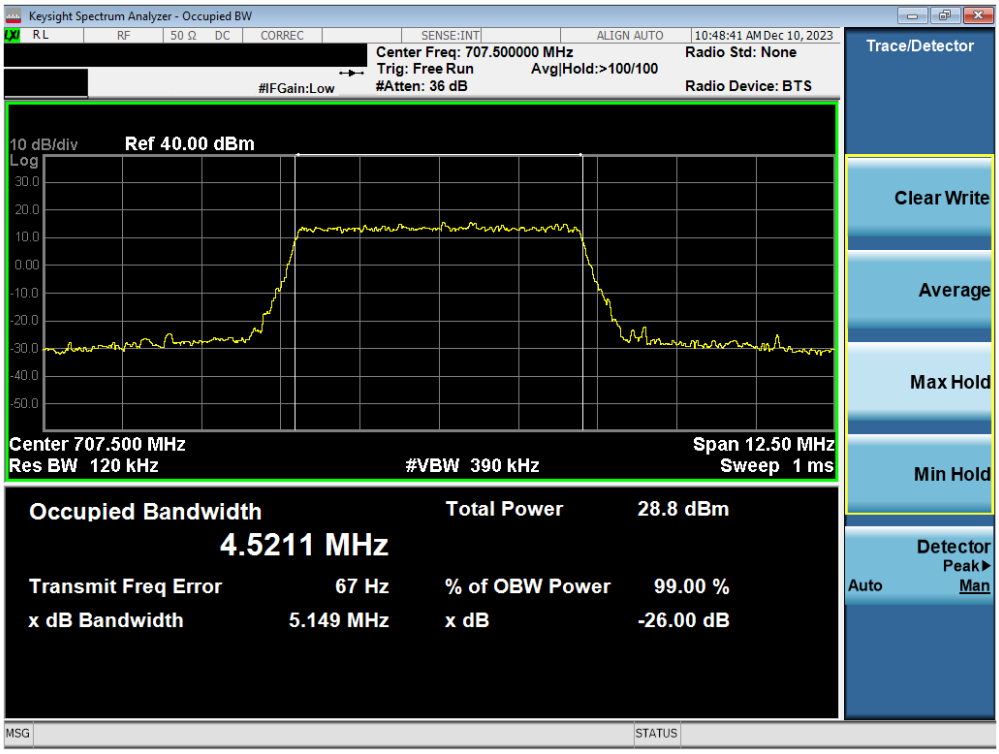
Plot 7-49. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz QPSK - Full RB)



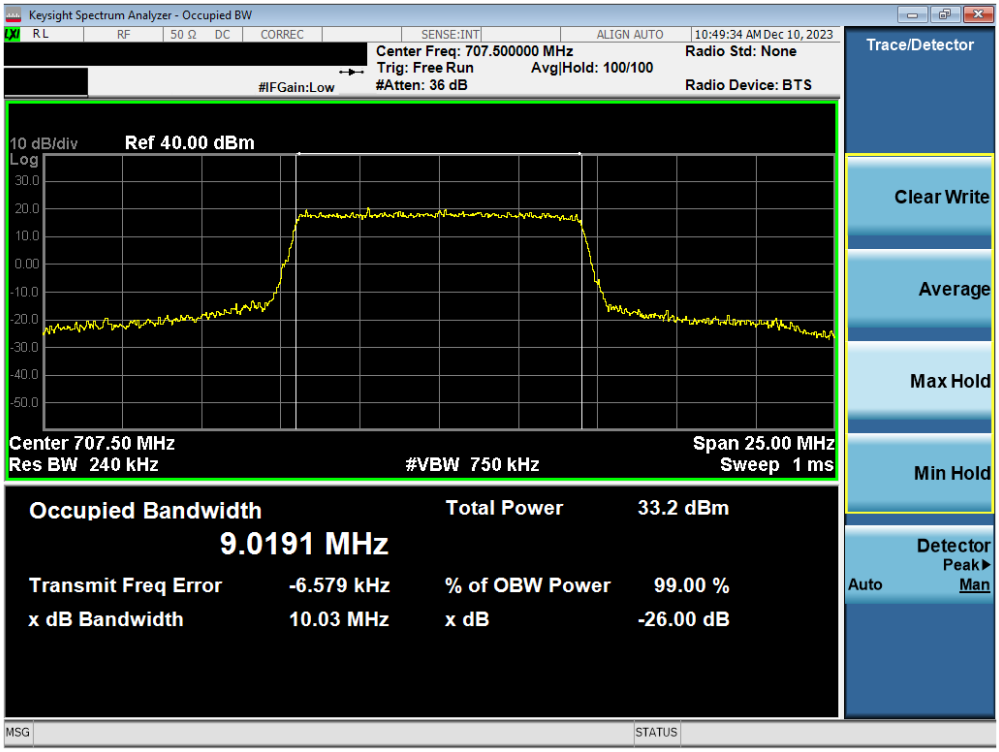
Plot 7-50. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 16-QAM - Full RB)



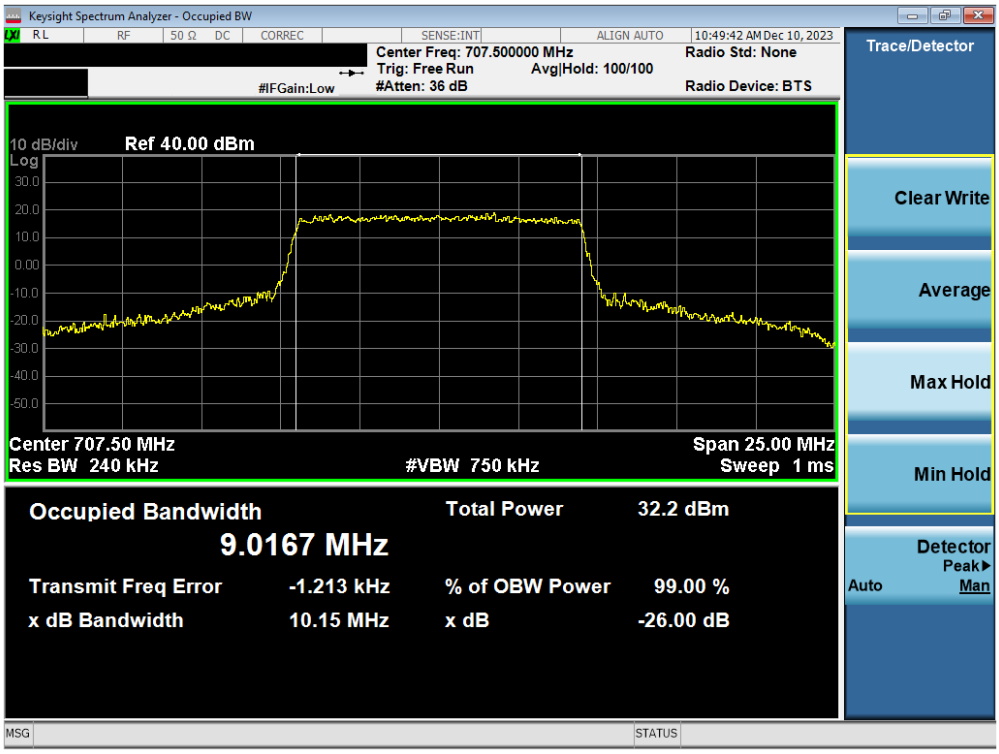
Plot 7-51. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 64-QAM - Full RB)



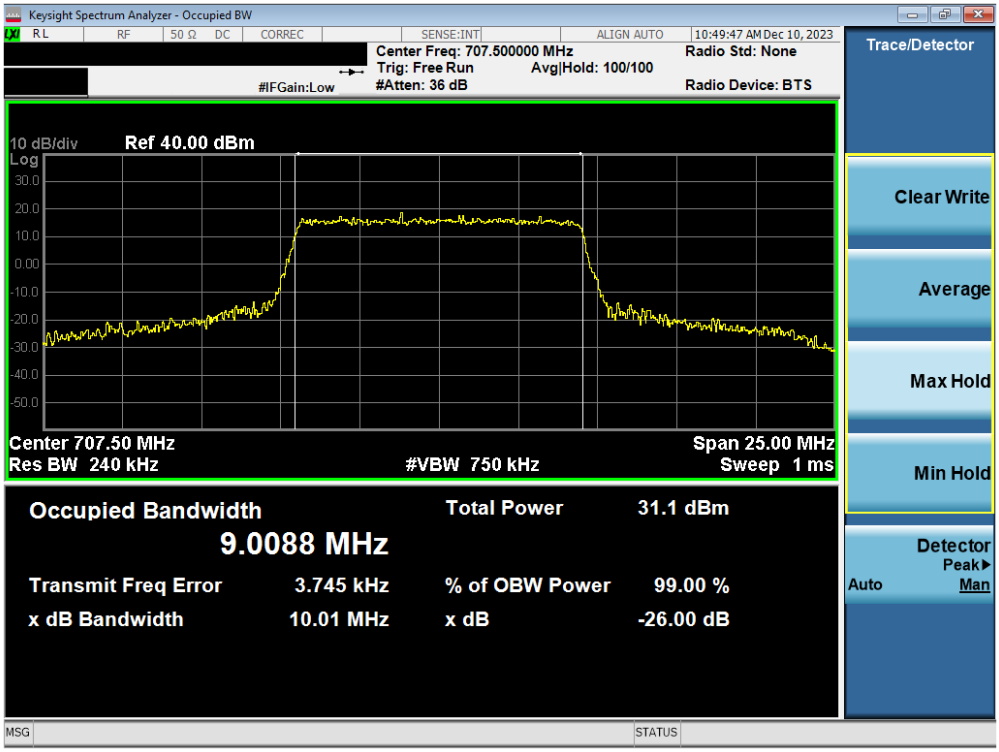
Plot 7-52. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 256-QAM - Full RB)



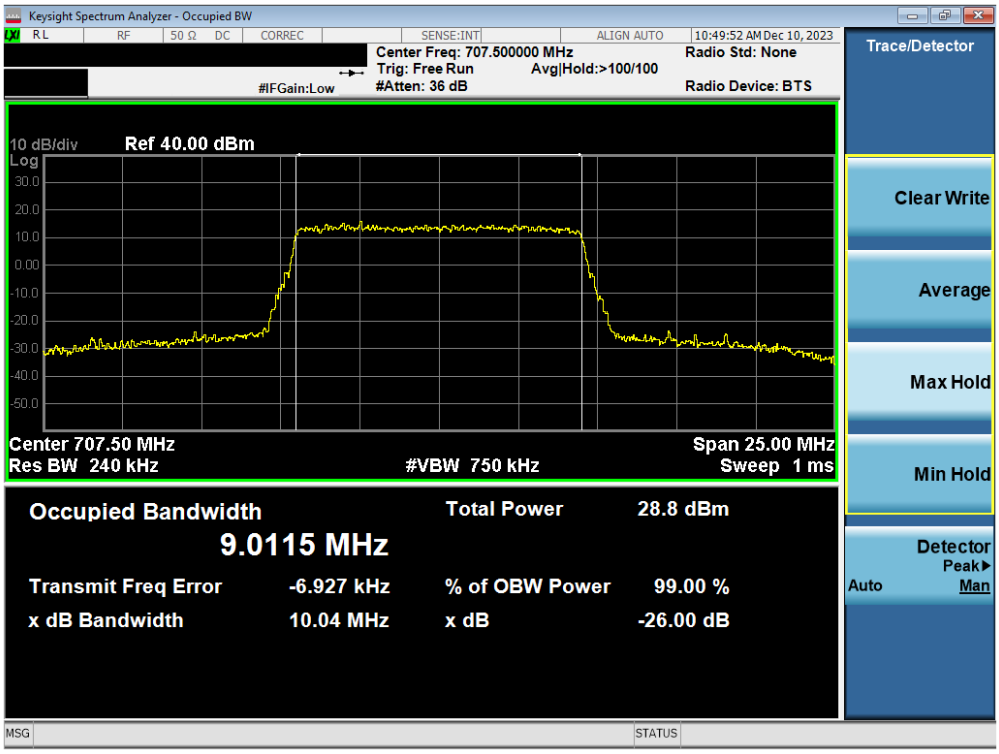
Plot 7-53. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz QPSK - Full RB)



Plot 7-54. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 16-QAM - Full RB)

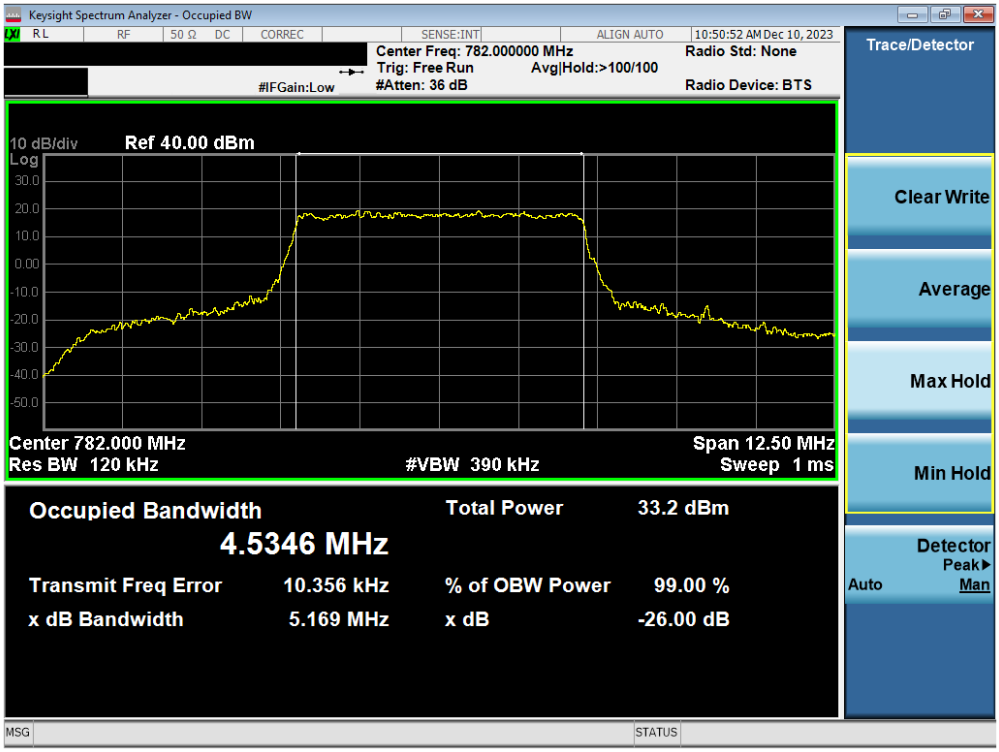


Plot 7-55. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 64-QAM - Full RB)

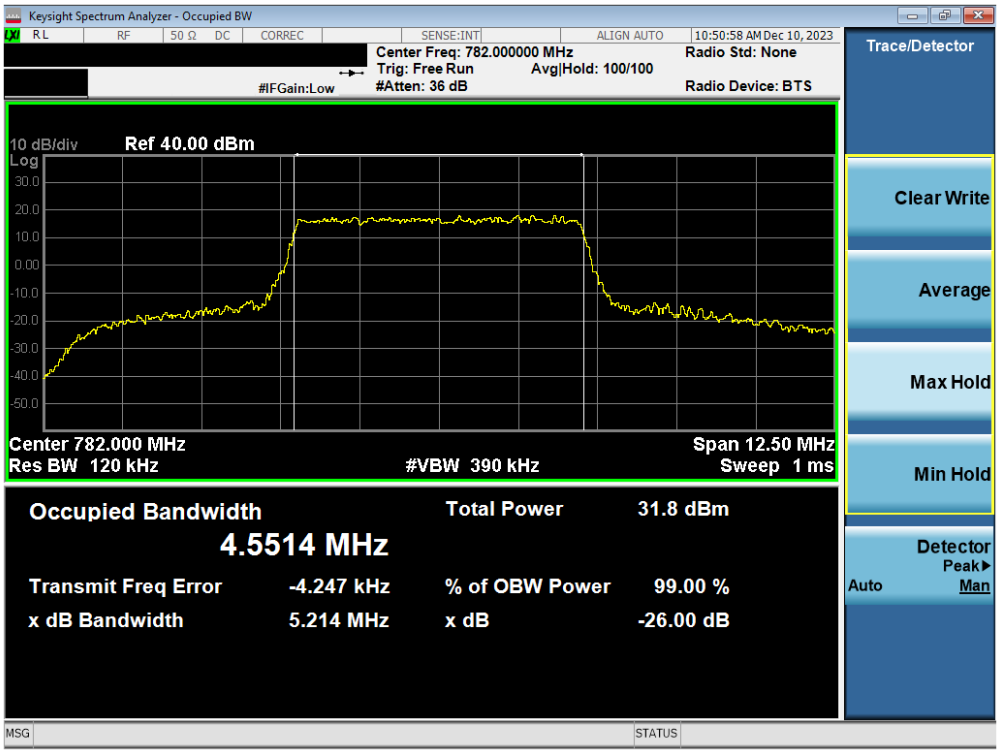


Plot 7-56. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 256-QAM - Full RB)

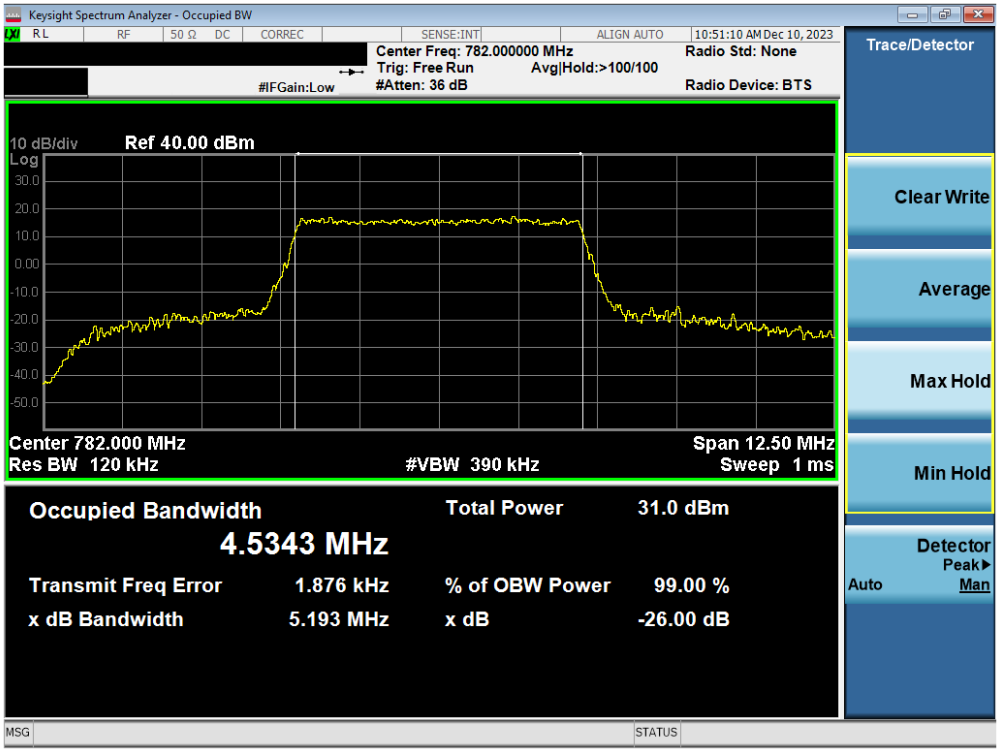
LTE Band 13



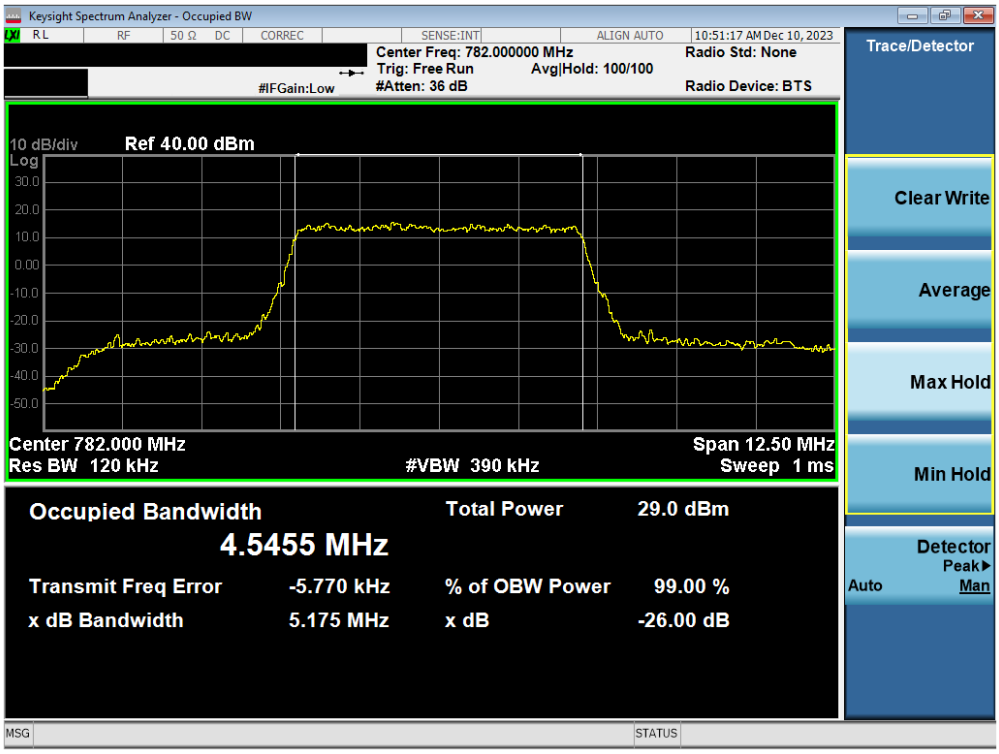
Plot 7-57. Occupied Bandwidth Plot (LTE Band 13 - 5MHz QPSK - Full RB)



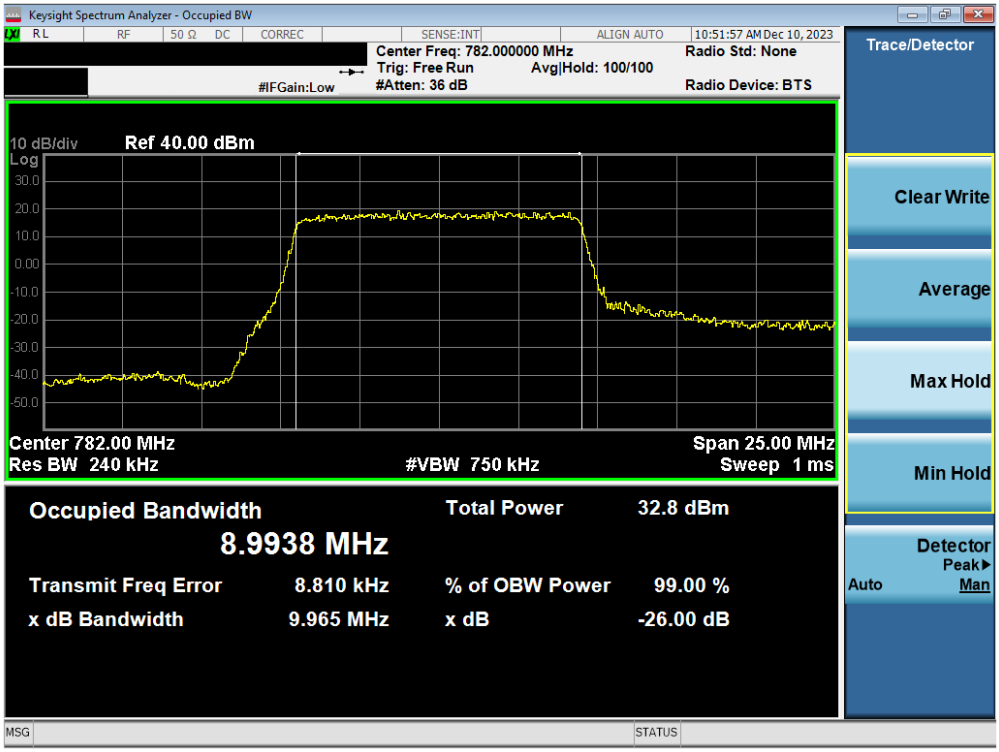
Plot 7-58. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)



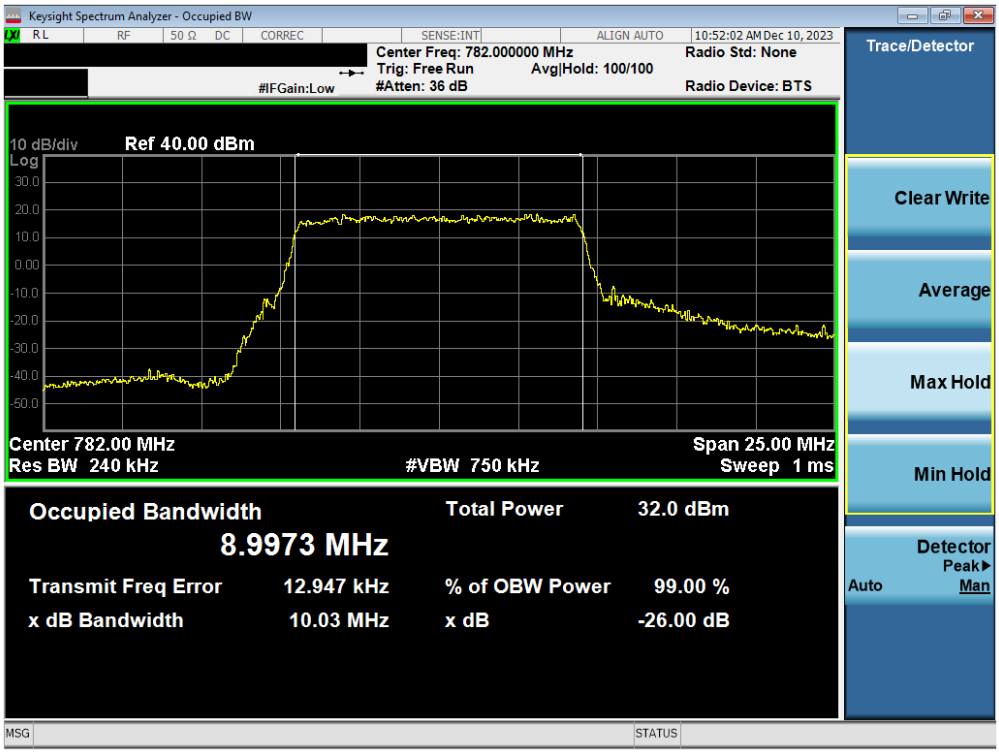
Plot 7-59. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 64-QAM - Full RB)



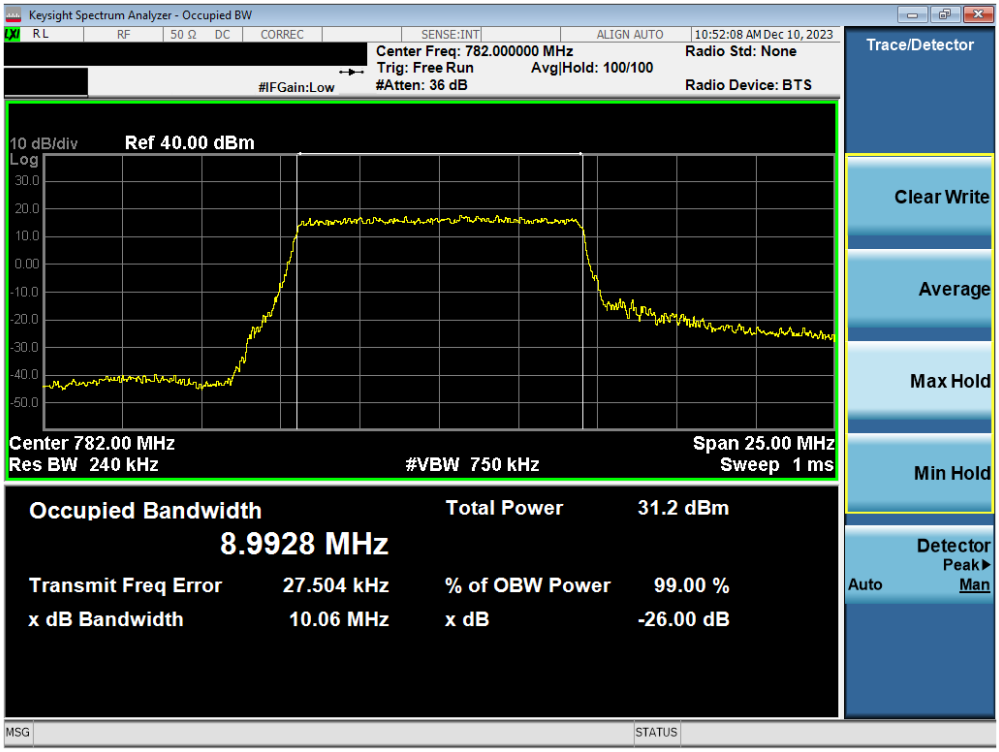
Plot 7-60. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 256-QAM - Full RB)



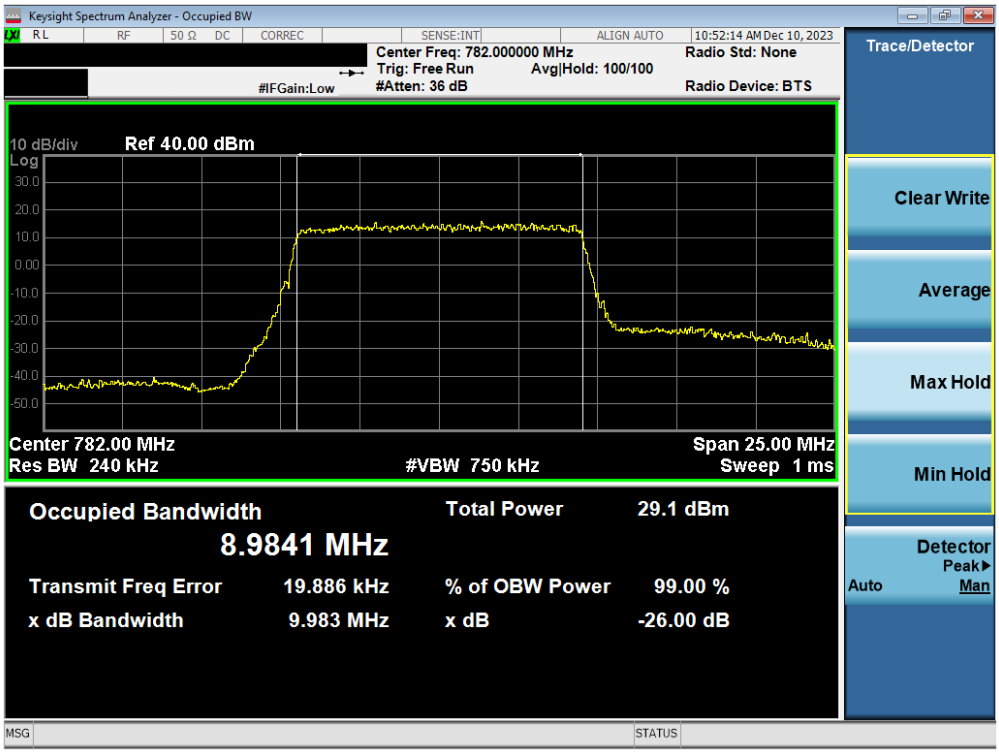
Plot 7-61. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB)



Plot 7-62. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

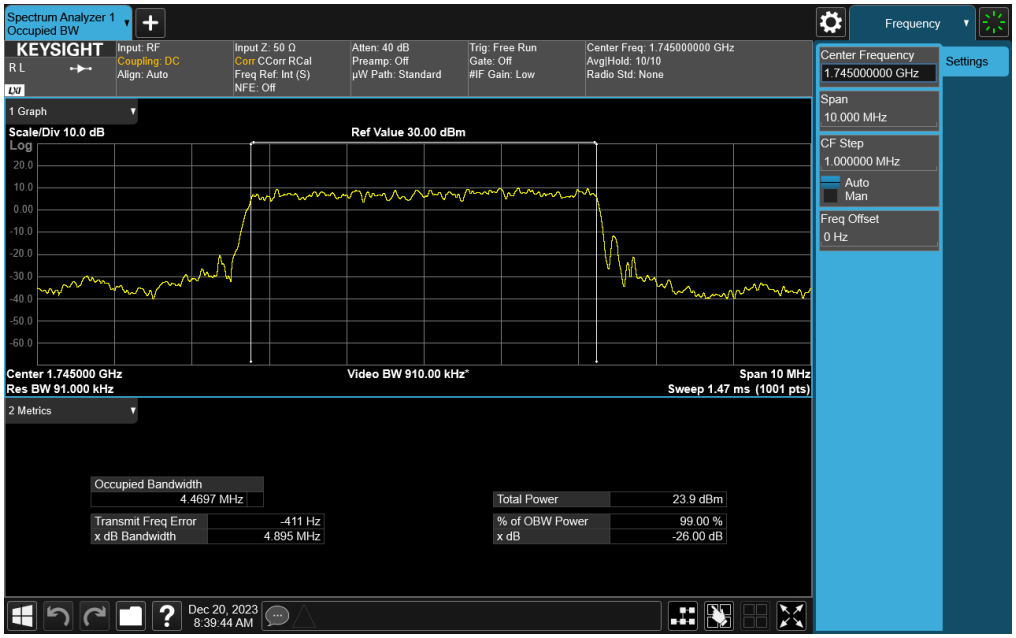


Plot 7-63. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 64-QAM - Full RB)

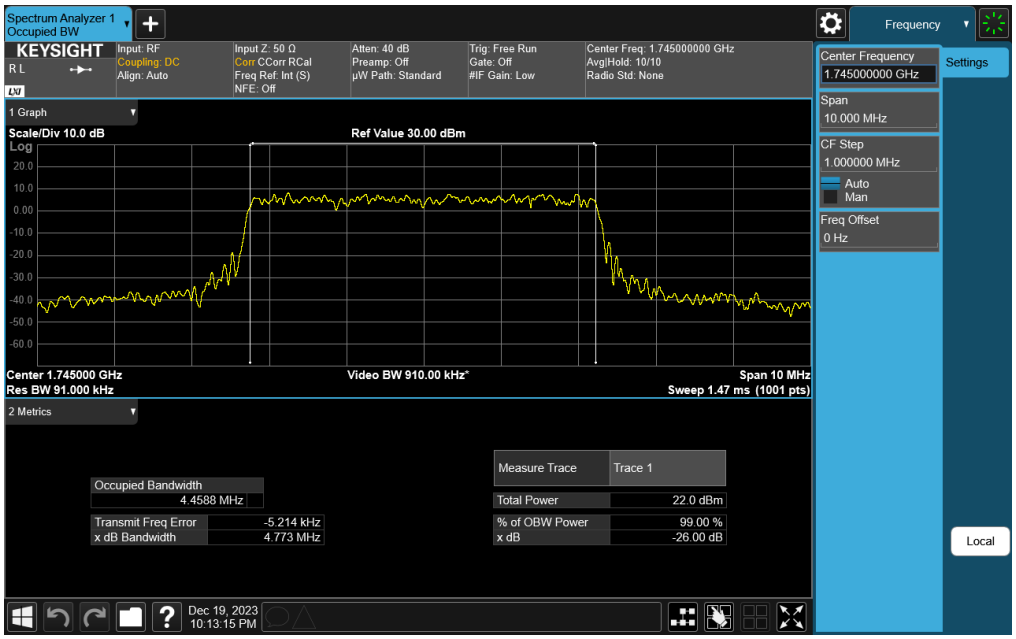


Plot 7-64. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 256-QAM - Full RB)

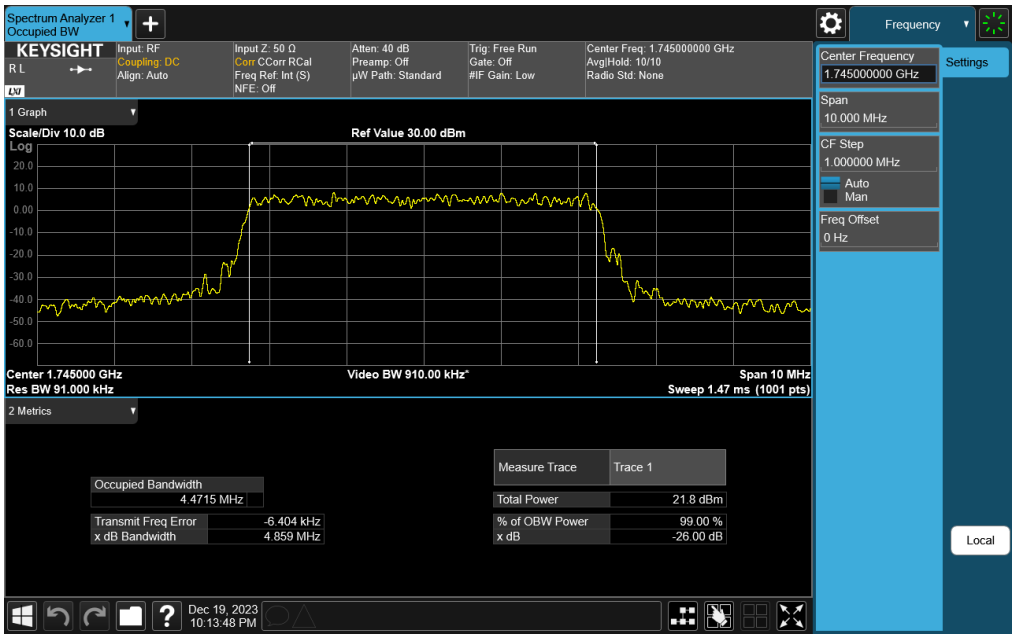
NR Band n66



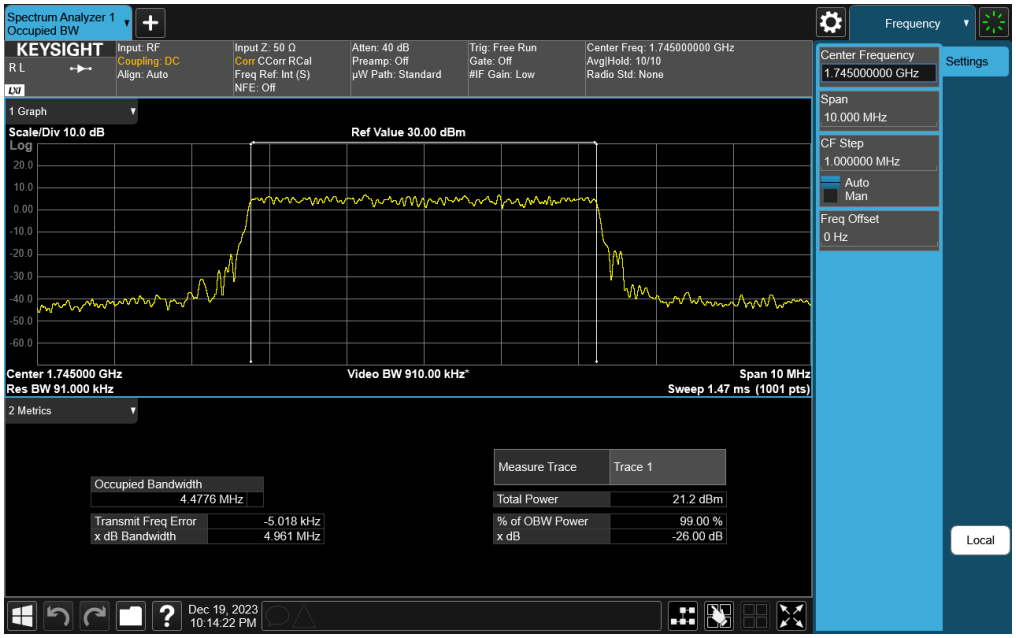
Plot 7-65. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



Plot 7-66. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB)

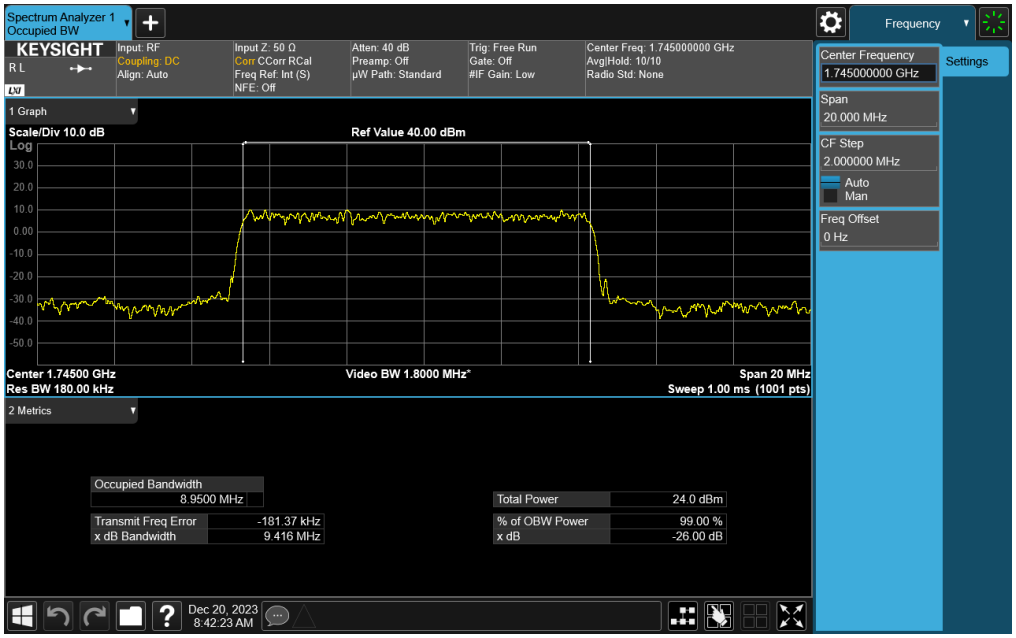


Plot 7-67. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 16QAM - Full RB)



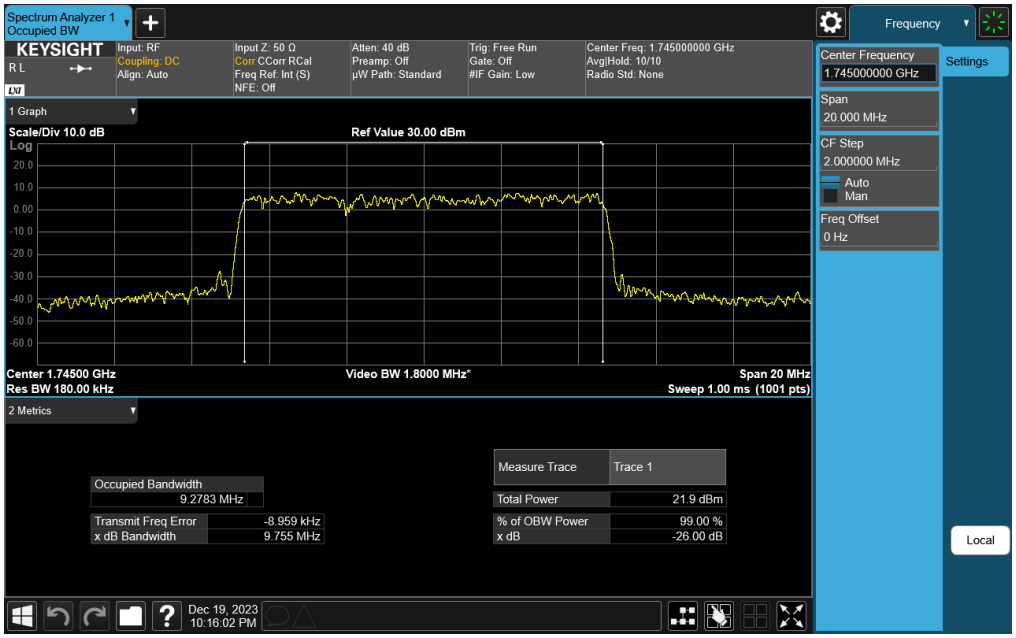
Plot 7-68. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 64QAM - Full RB)

Plot 7-69. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 256QAM - Full RB)

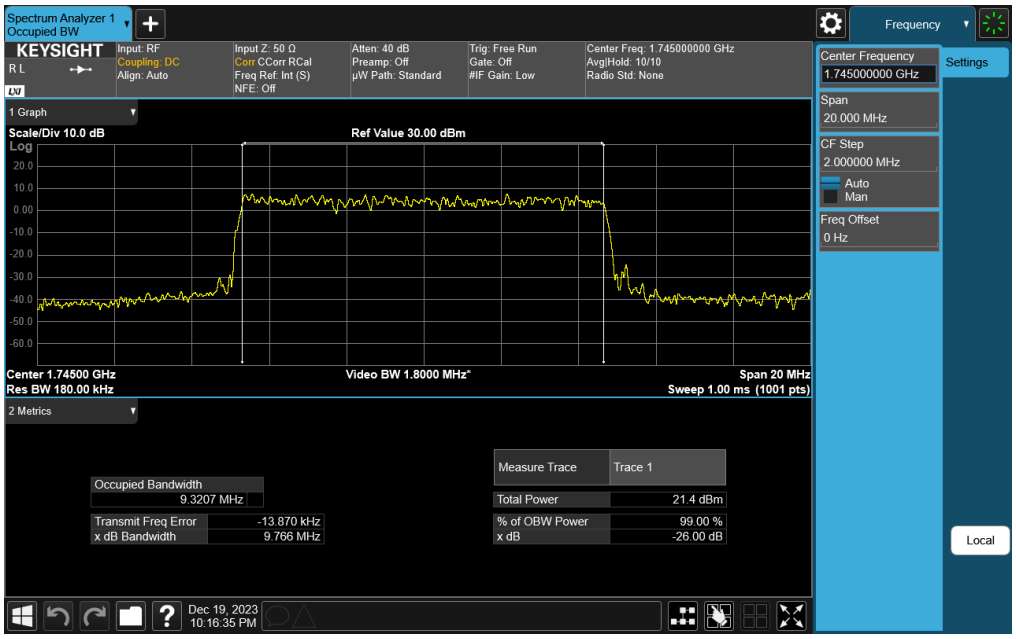


Plot 7-70. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz DFT-s-OFDM π/2 BPSK - Full RB)

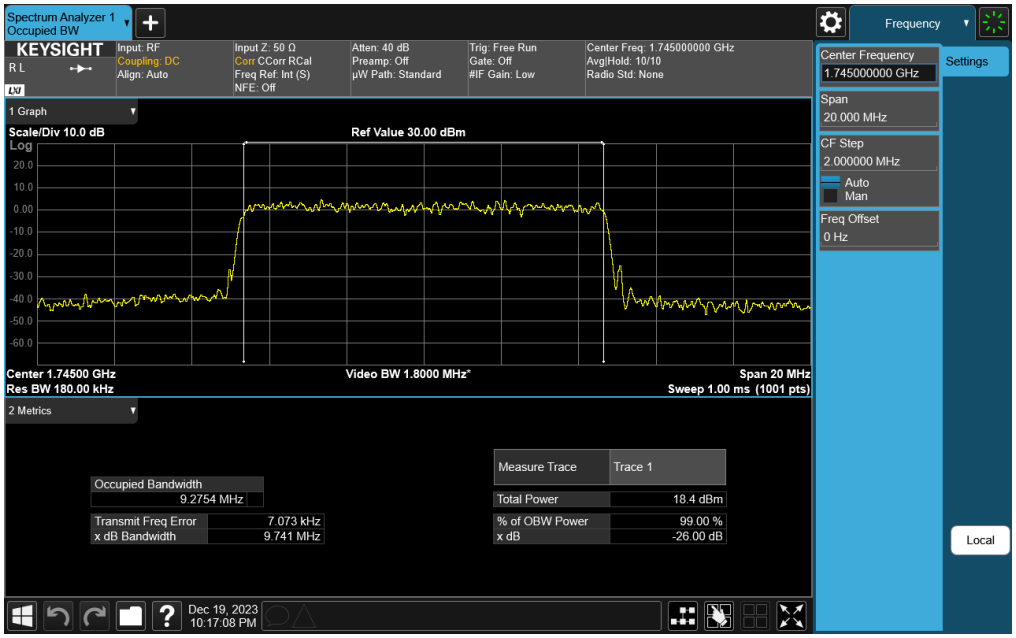
Plot 7-71. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB)



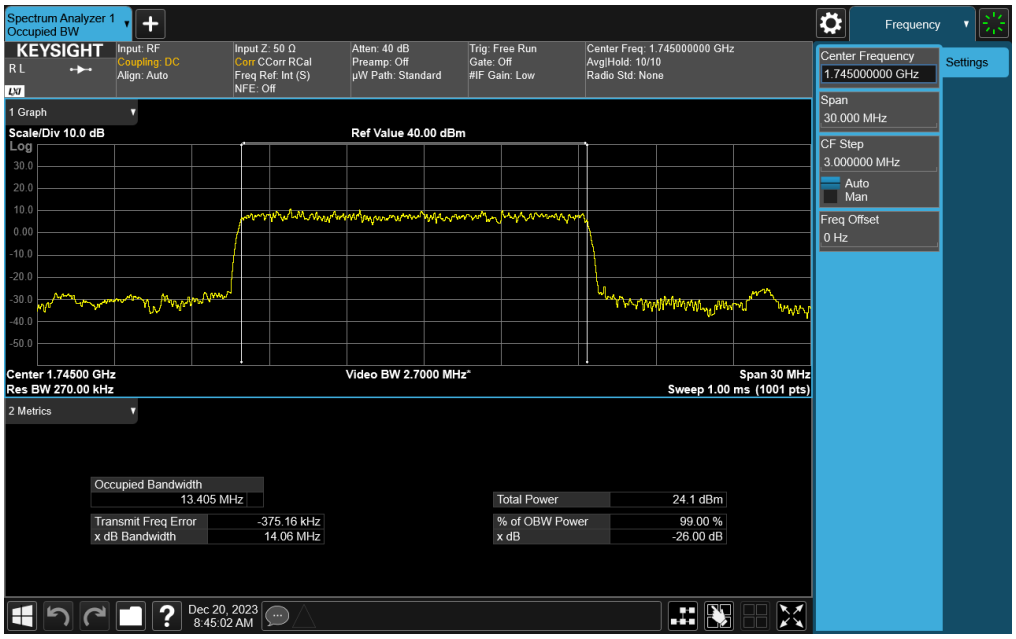
Plot 7-72. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 16QAM - Full RB)



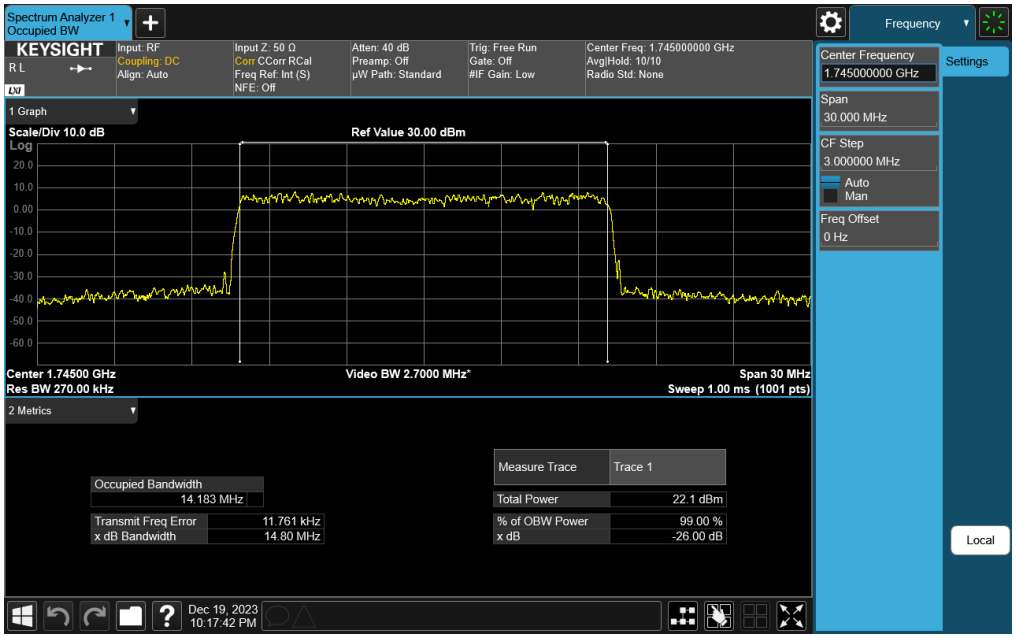
Plot 7-73. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 64QAM - Full RB)



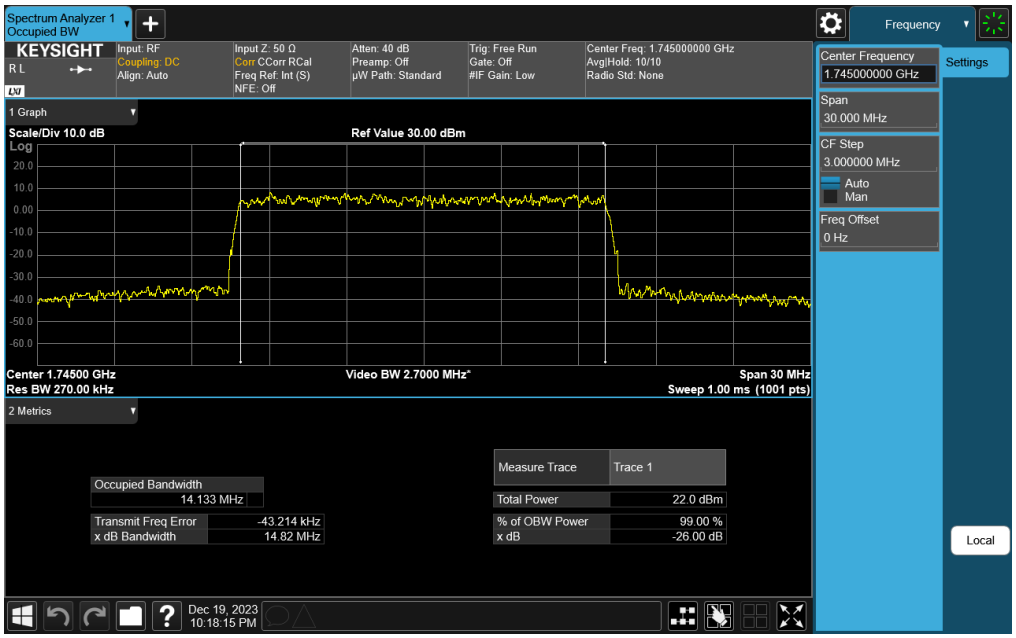
Plot 7-74. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 256QAM - Full RB)



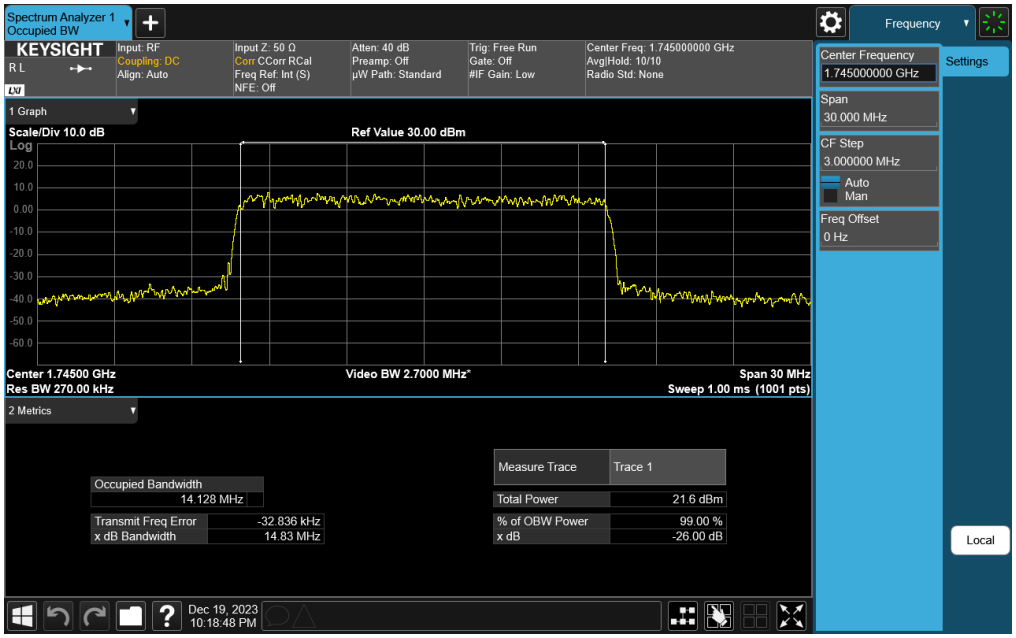
Plot 7-75. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



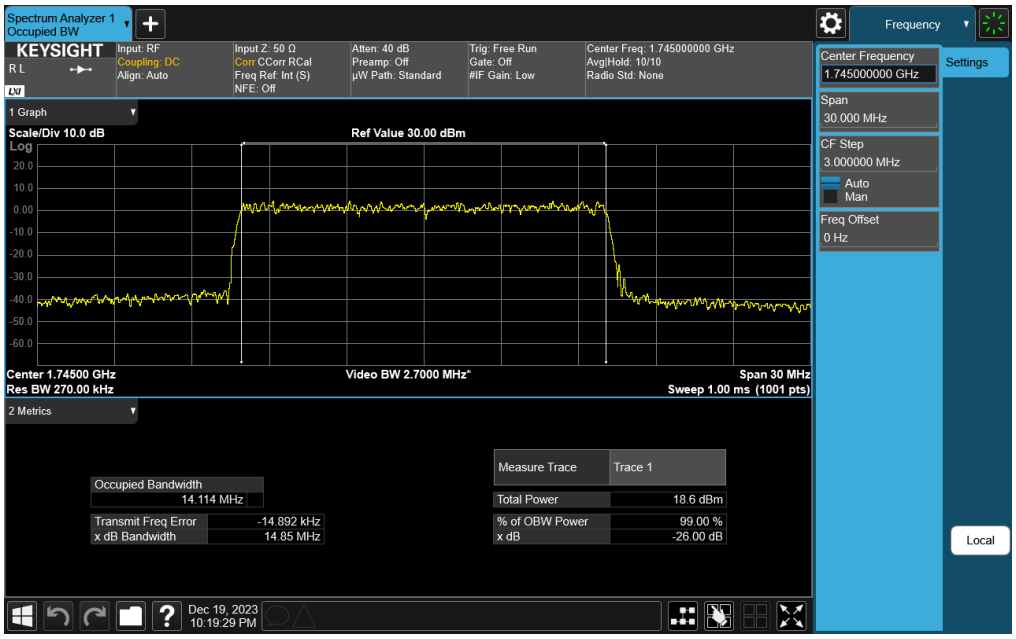
Plot 7-76. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB)



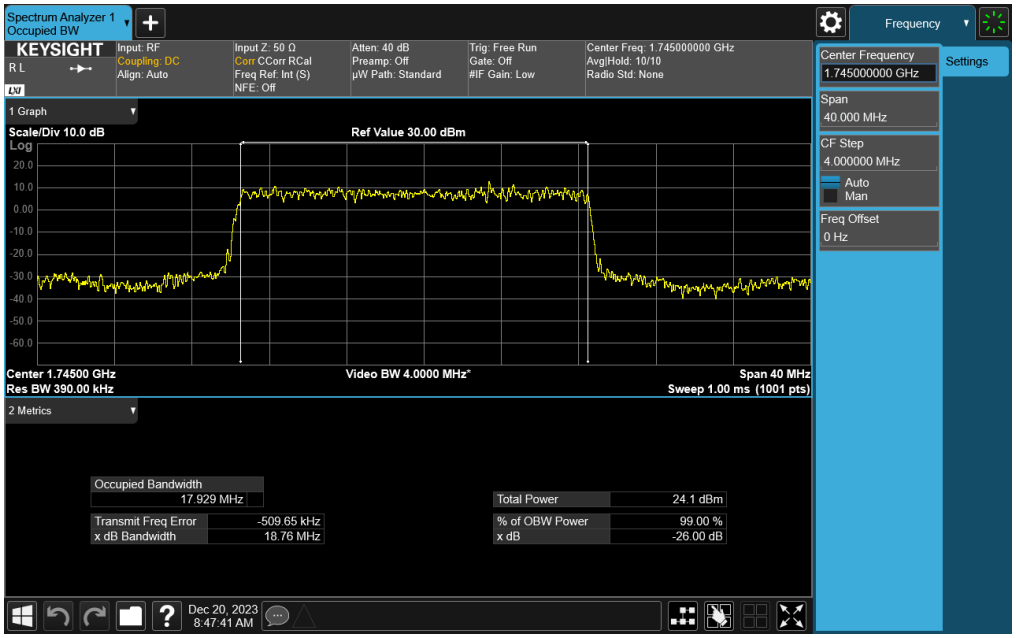
Plot 7-77. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 16QAM - Full RB)



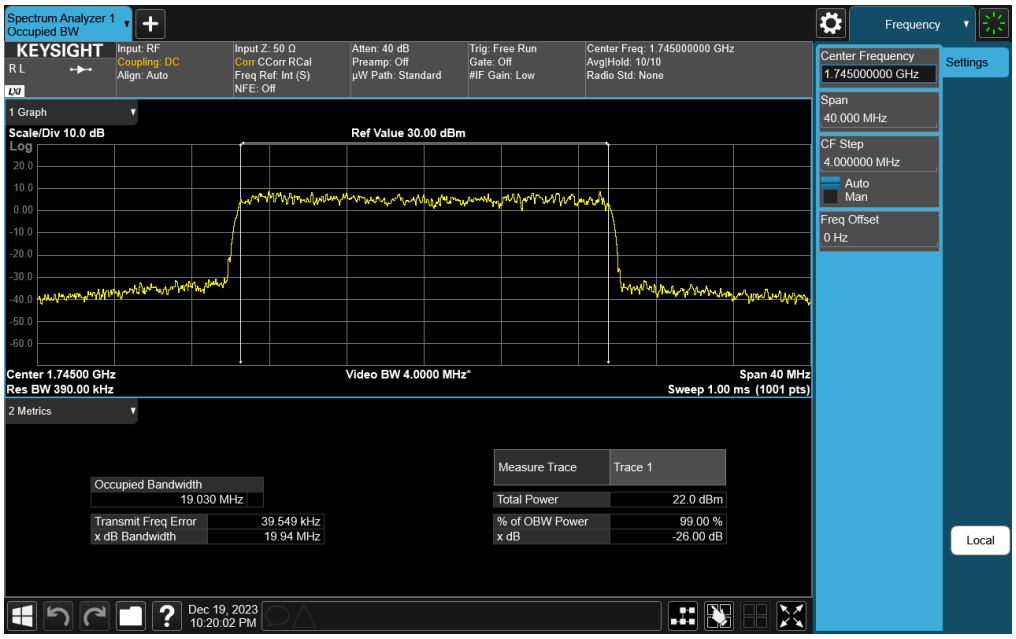
Plot 7-78. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 64QAM - Full RB)



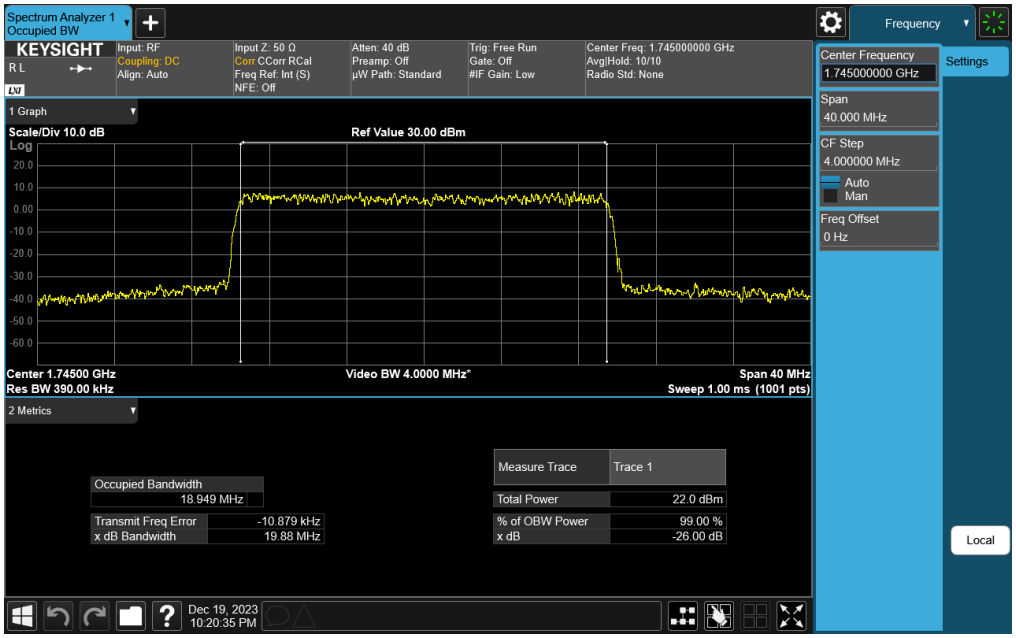
Plot 7-79. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 256QAM - Full RB)



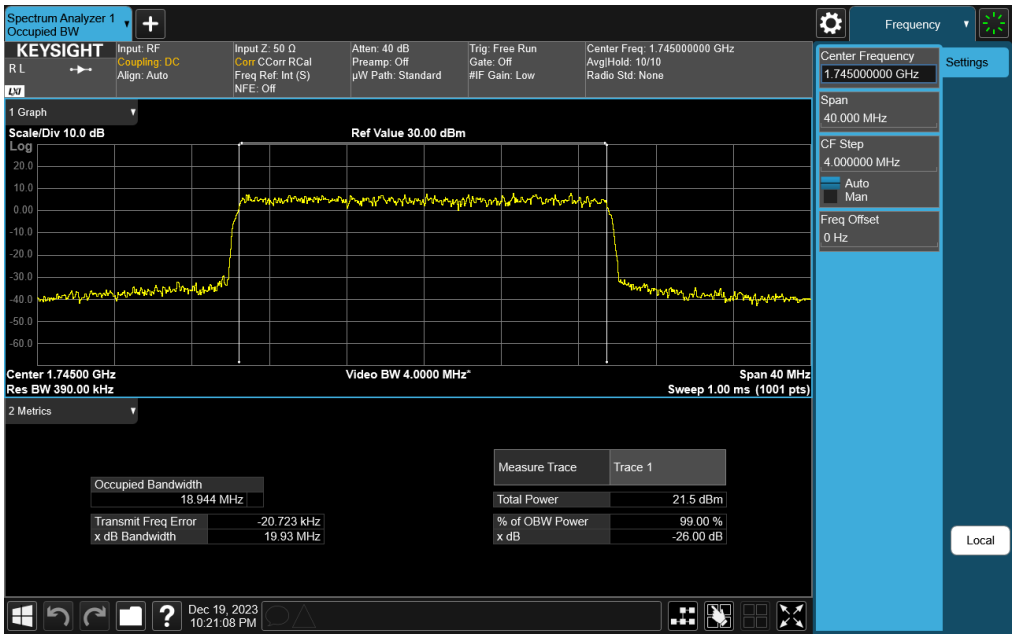
Plot 7-80. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



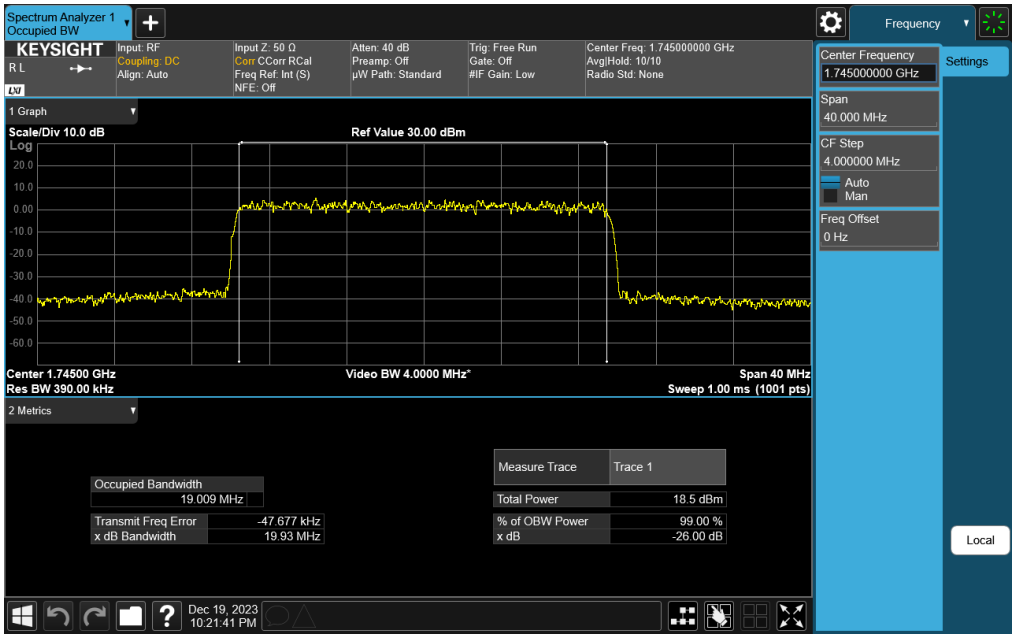
Plot 7-81. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB)



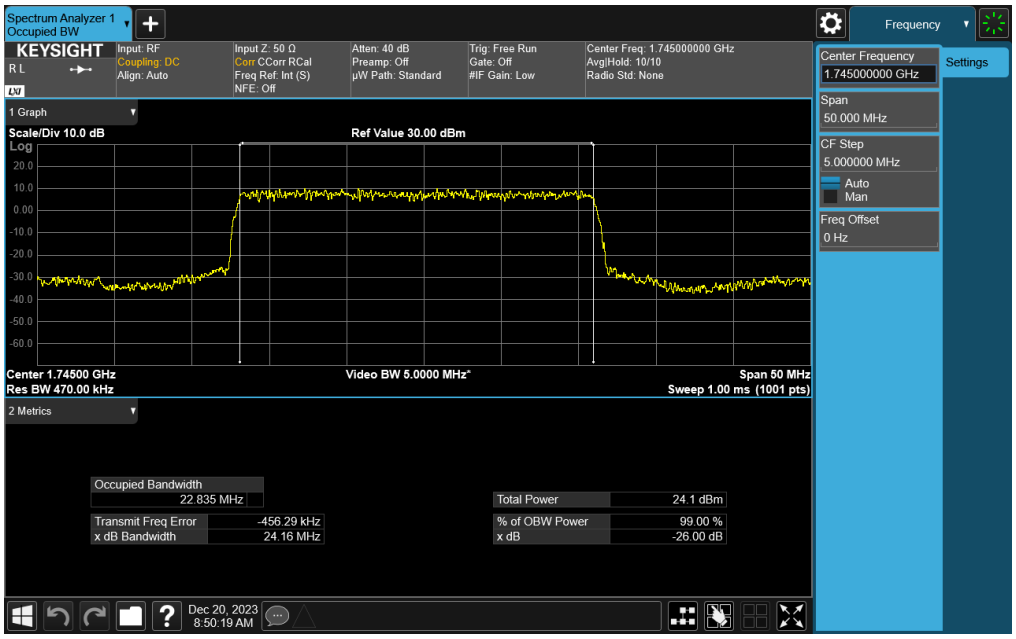
Plot 7-82. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 16QAM - Full RB)



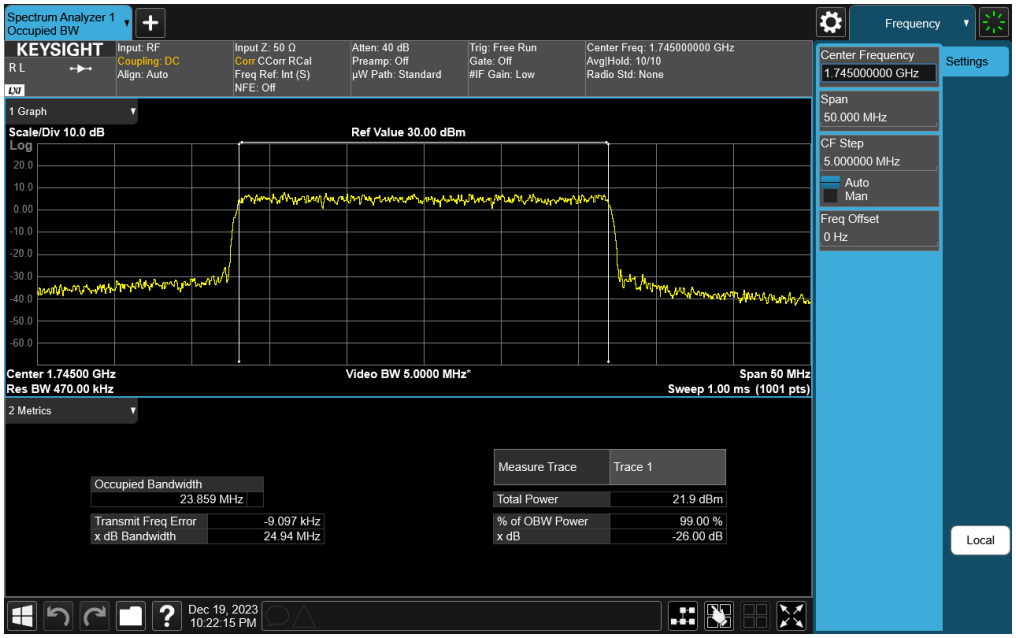
Plot 7-83. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 64QAM - Full RB)



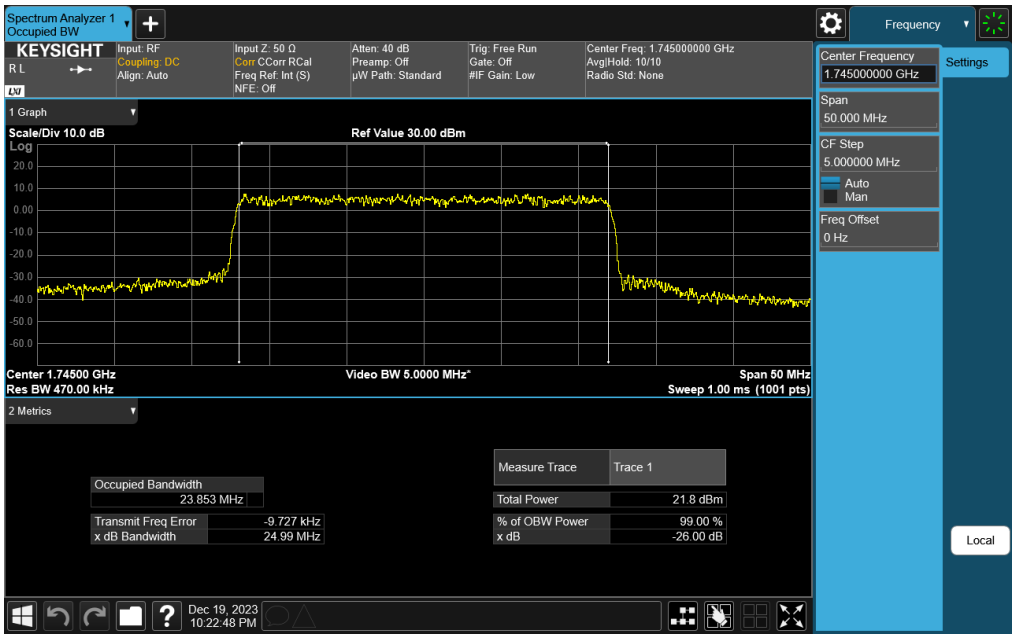
Plot 7-84. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 256QAM - Full RB)



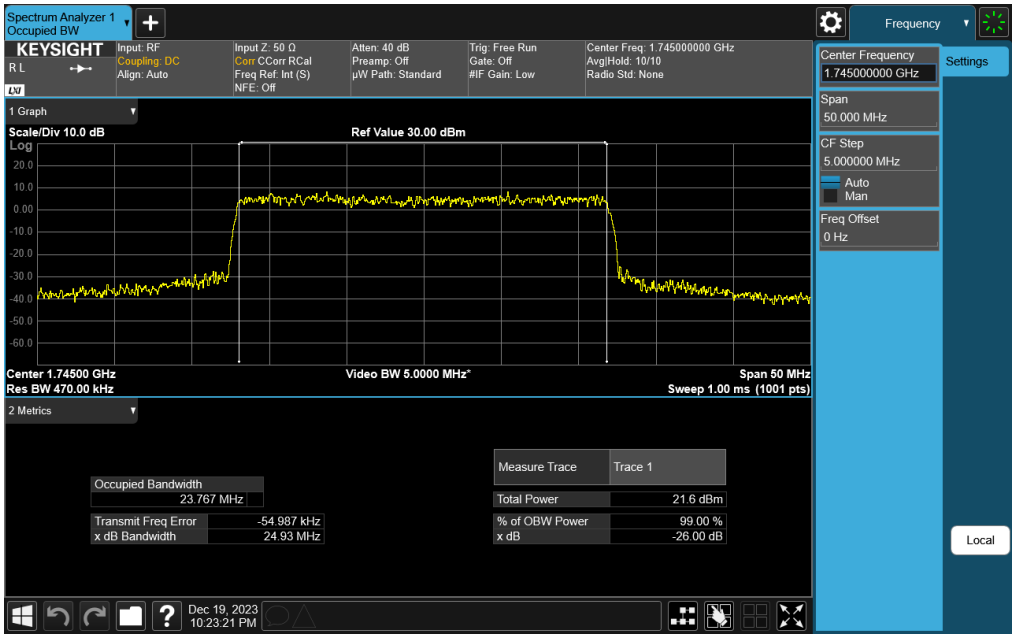
Plot 7-85. Occupied Bandwidth Plot (NR Band n66 - 25.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



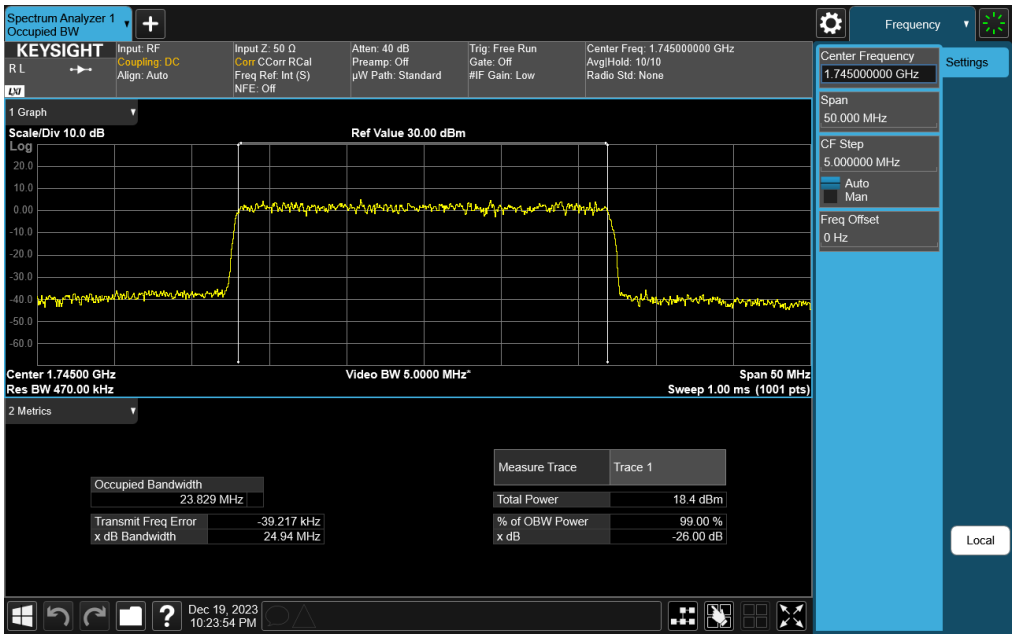
Plot 7-86. Occupied Bandwidth Plot (NR Band n66 - 25.0MHz CP-OFDM QPSK - Full RB)



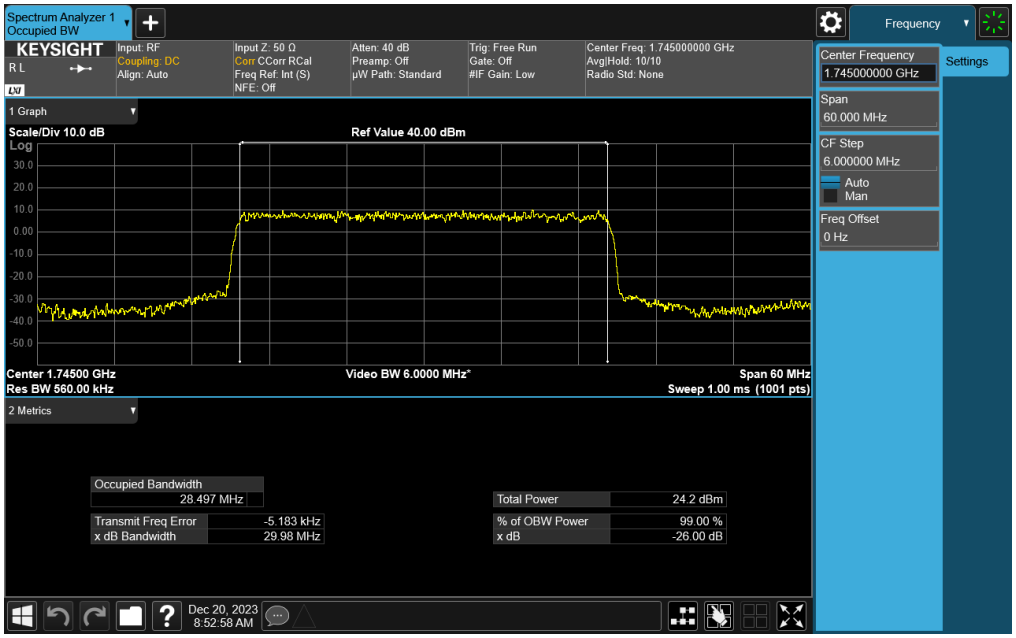
Plot 7-87. Occupied Bandwidth Plot (NR Band n66 - 25.0MHz CP-OFDM 16QAM - Full RB)



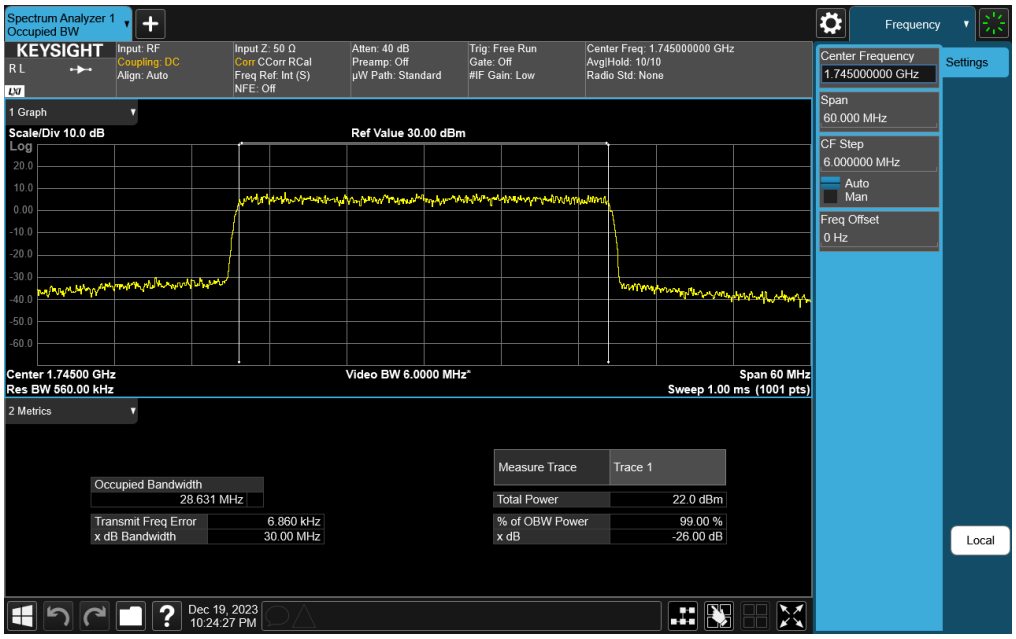
Plot 7-88. Occupied Bandwidth Plot (NR Band n66 - 25.0MHz CP-OFDM 64QAM - Full RB)



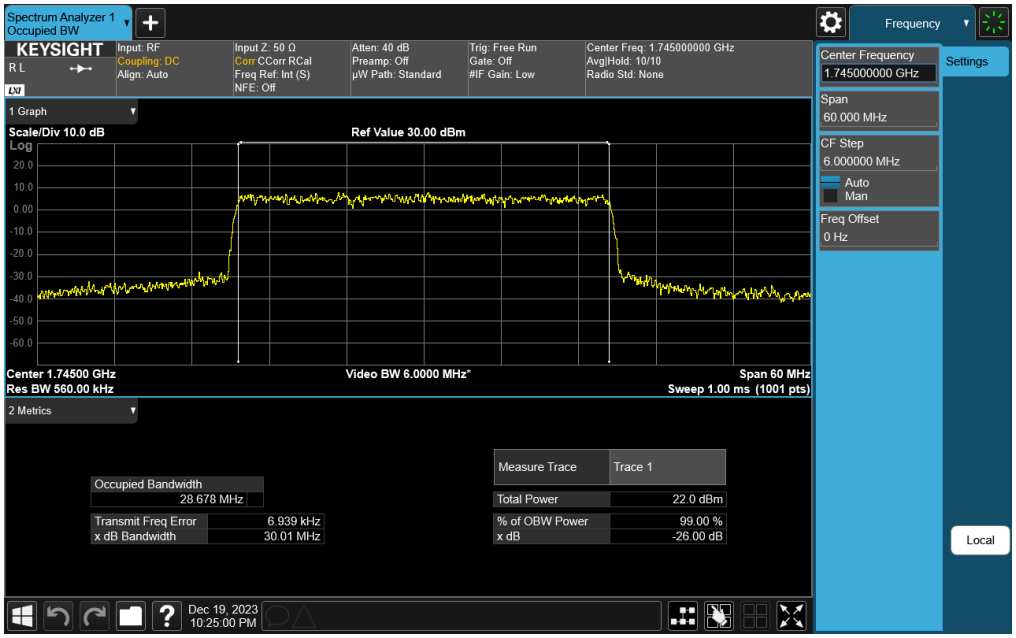
Plot 7-89. Occupied Bandwidth Plot (NR Band n66 - 25.0MHz CP-OFDM 256QAM - Full RB)



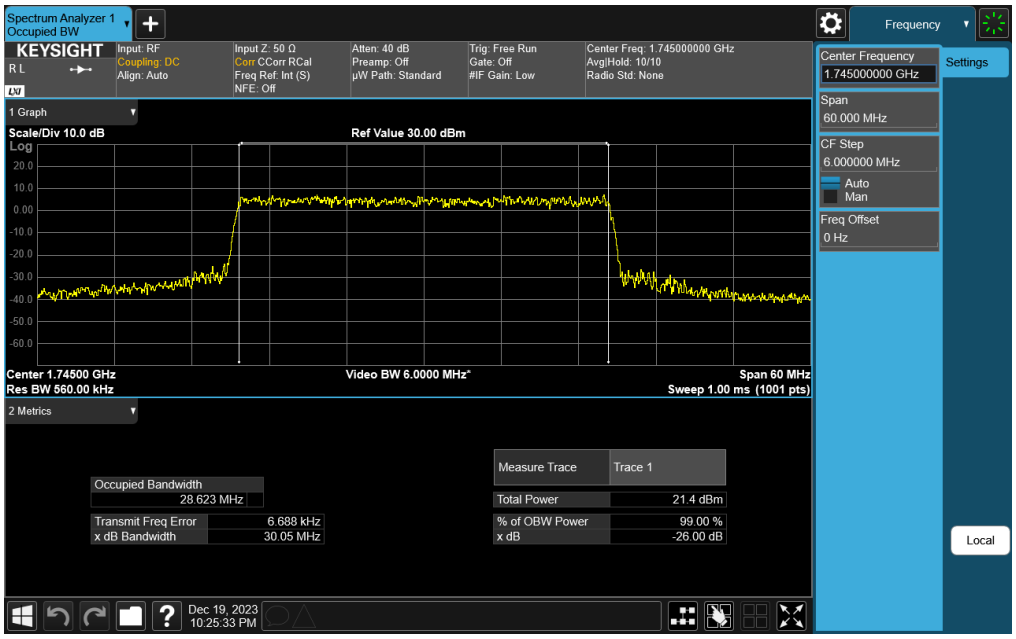
Plot 7-90. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



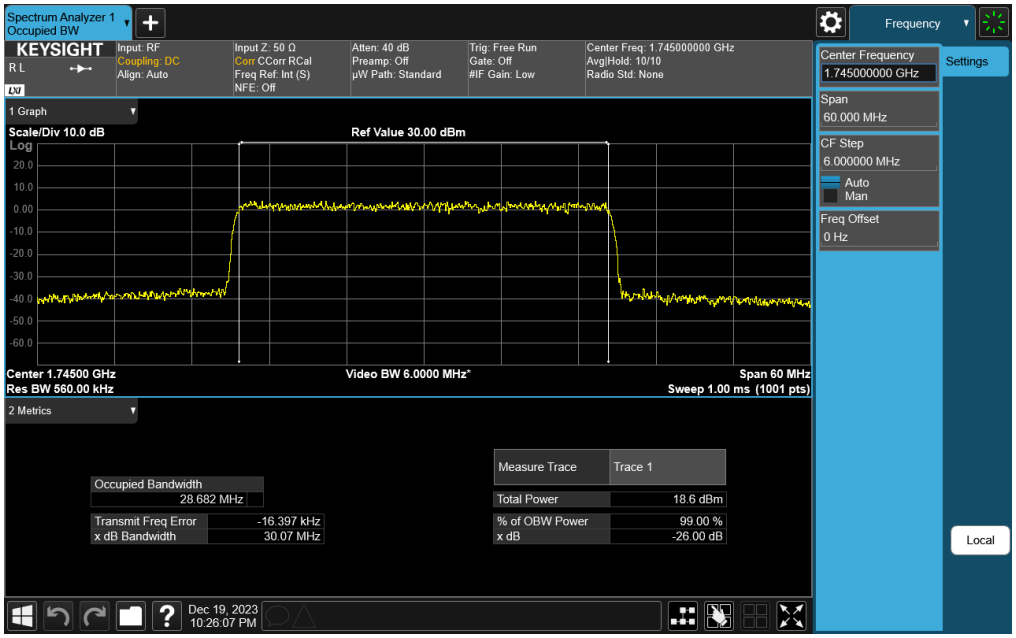
Plot 7-91. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM QPSK - Full RB)



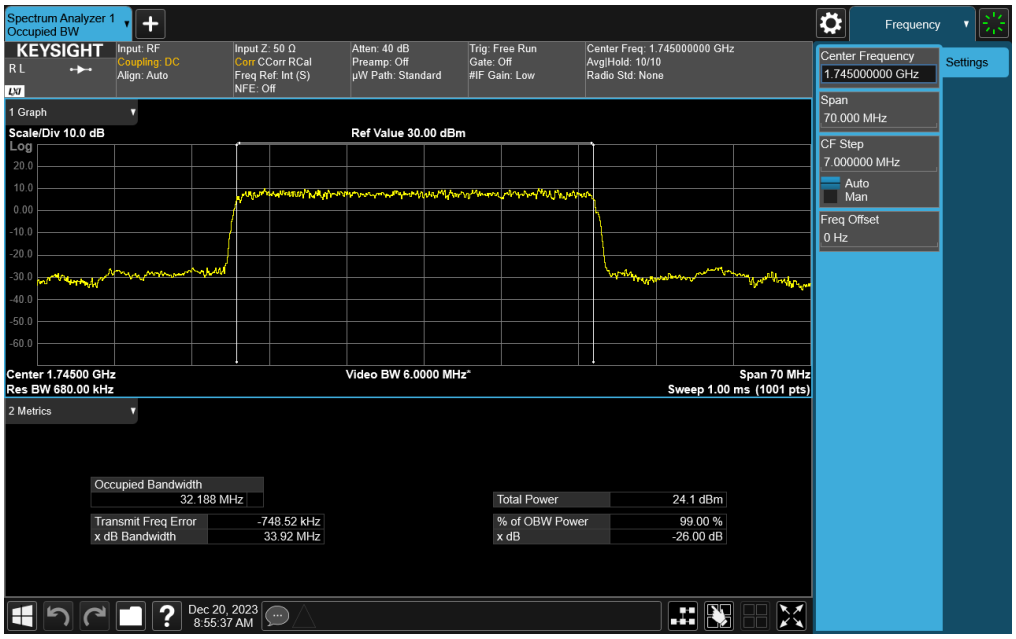
Plot 7-92. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM 16QAM - Full RB)



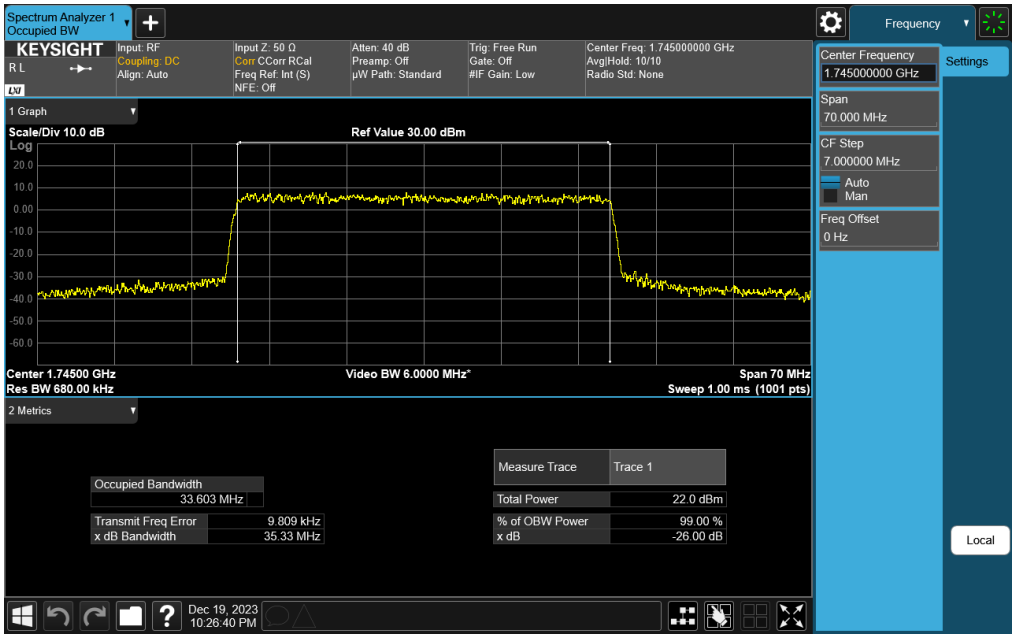
Plot 7-93. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM 64QAM - Full RB)



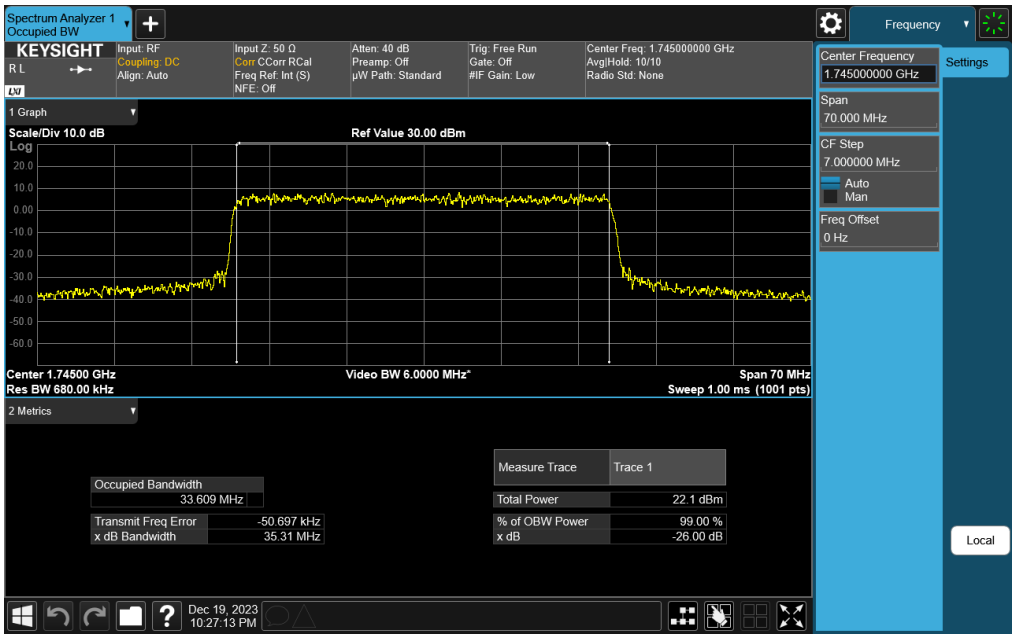
Plot 7-94. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM 256QAM - Full RB)



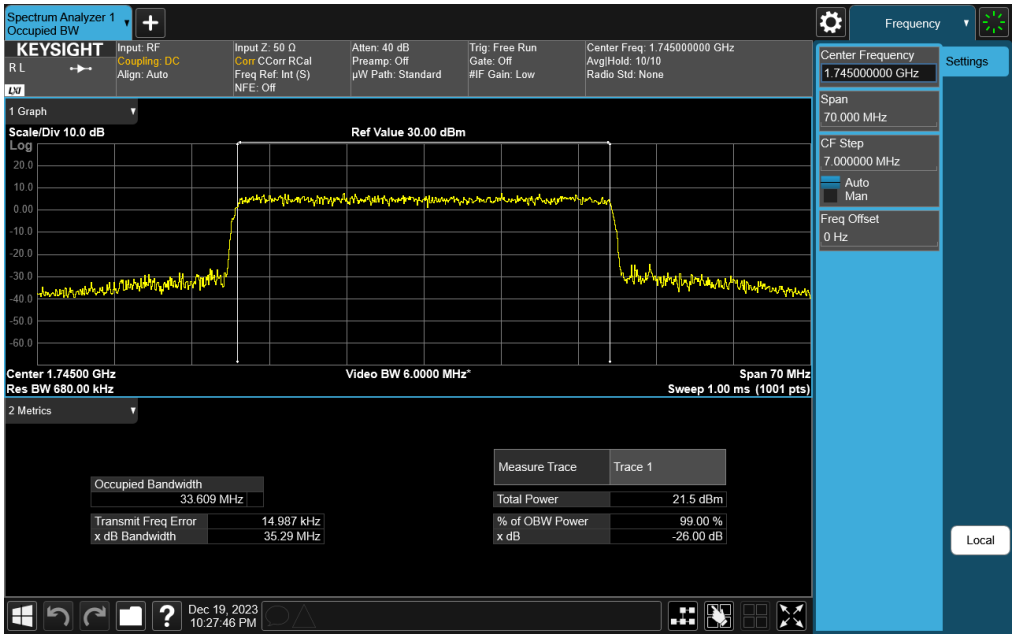
Plot 7-95. Occupied Bandwidth Plot (NR Band n66 - 35.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



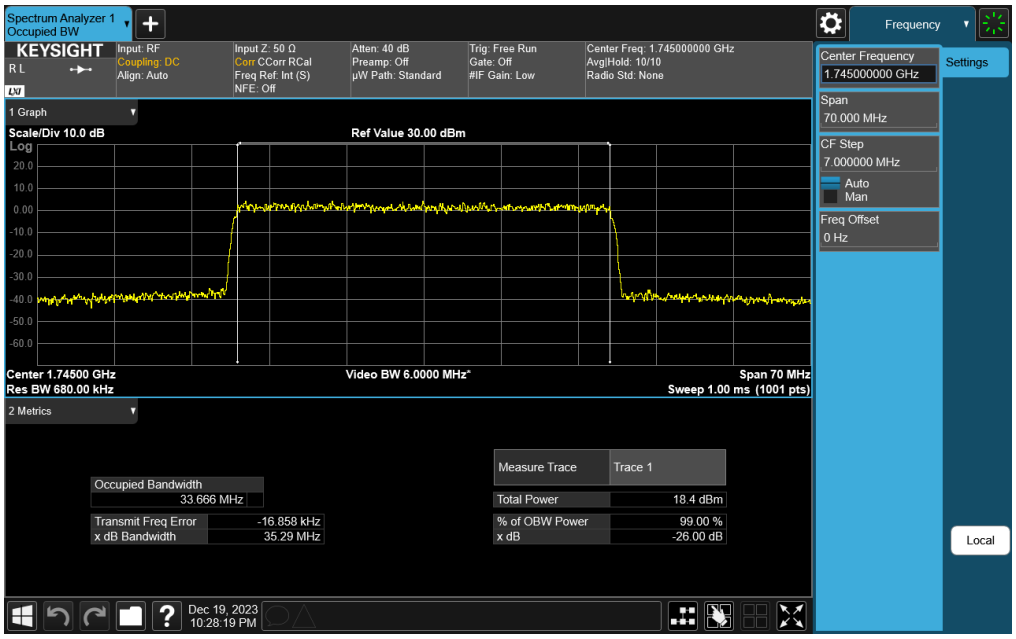
Plot 7-96. Occupied Bandwidth Plot (NR Band n66 - 35.0MHz CP-OFDM QPSK - Full RB)



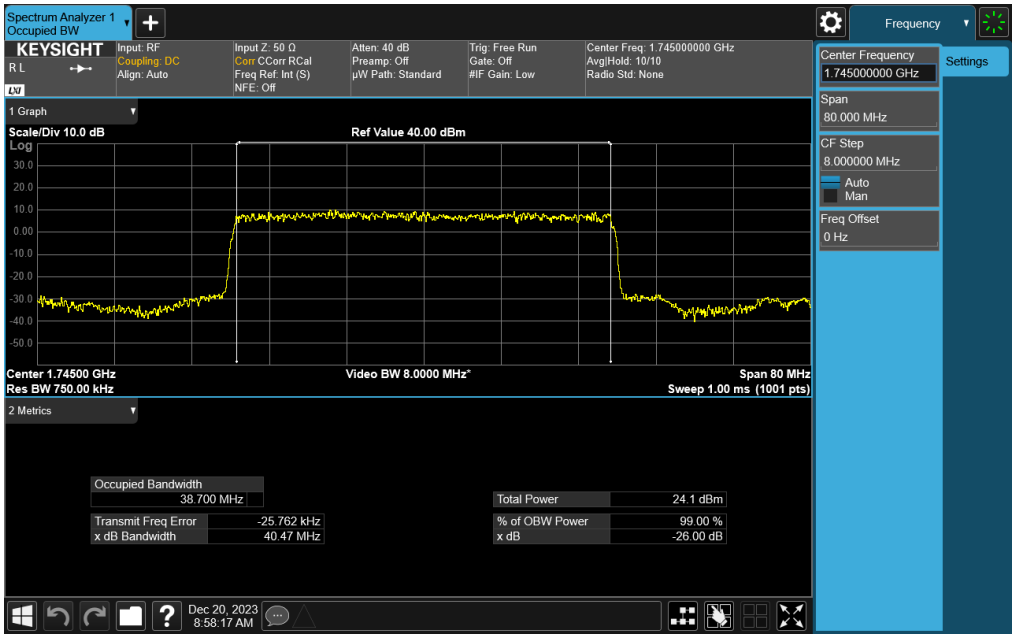
Plot 7-97. Occupied Bandwidth Plot (NR Band n66 - 35.0MHz CP-OFDM 16QAM - Full RB)



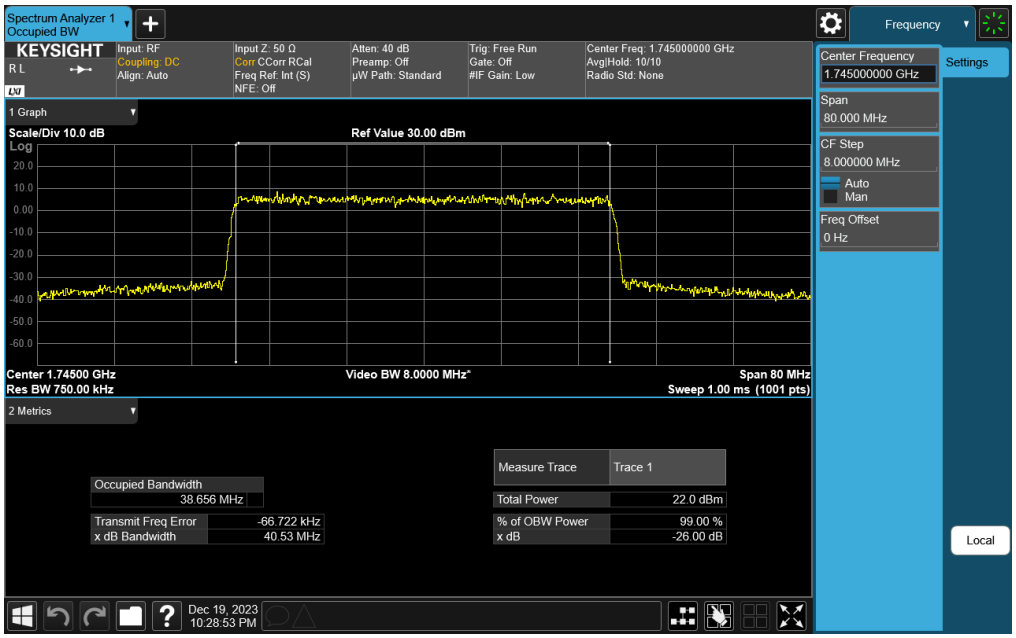
Plot 7-98. Occupied Bandwidth Plot (NR Band n66 - 35.0MHz CP-OFDM 64QAM - Full RB)



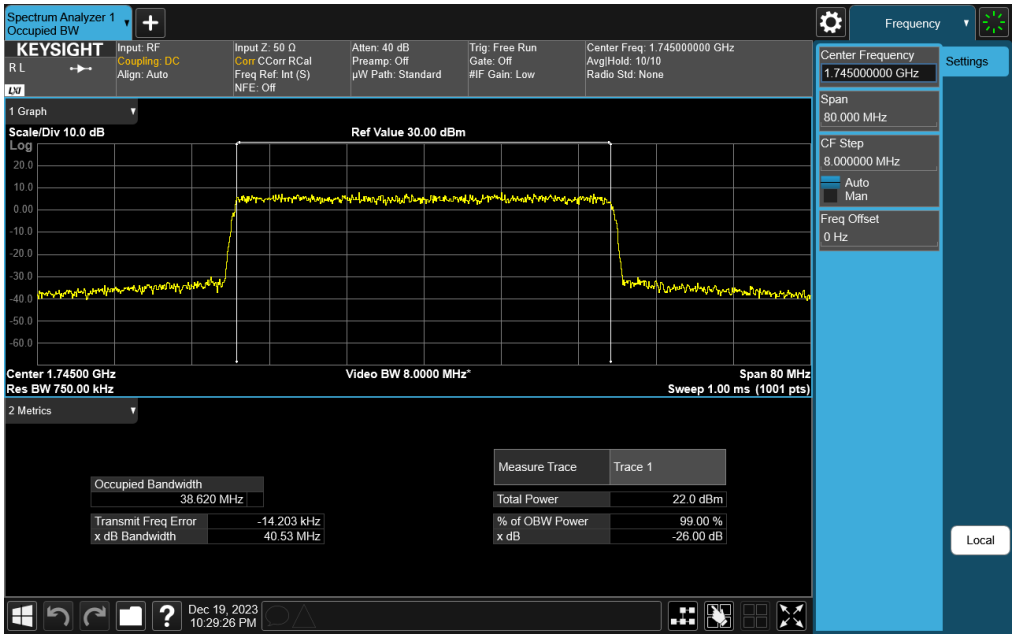
Plot 7-99. Occupied Bandwidth Plot (NR Band n66 - 35.0MHz CP-OFDM 256QAM - Full RB)



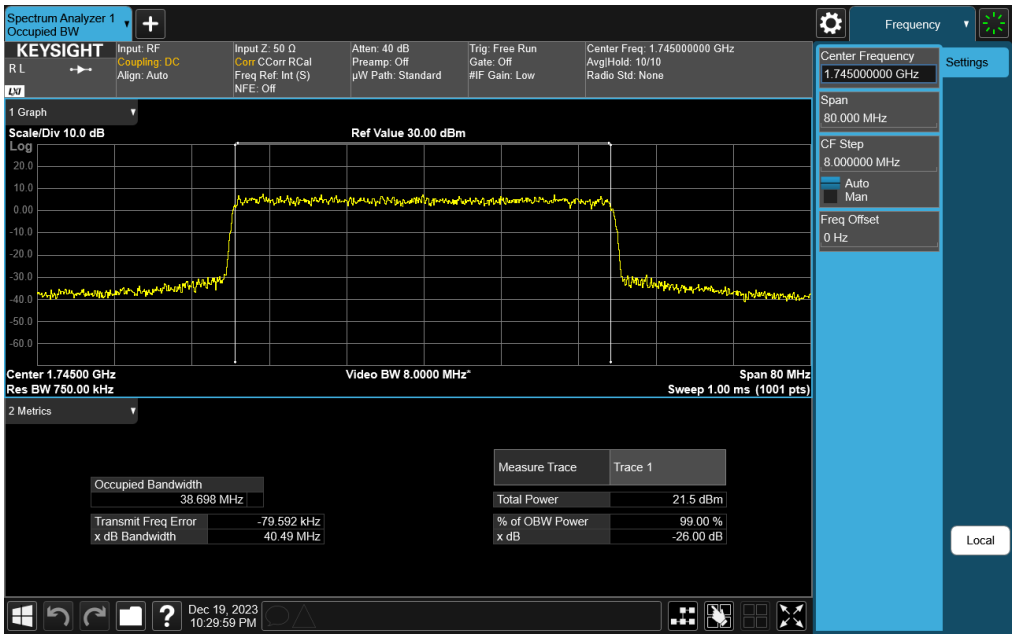
Plot 7-100. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz DFT-s-OFDM π/2 BPSK - Full RB)



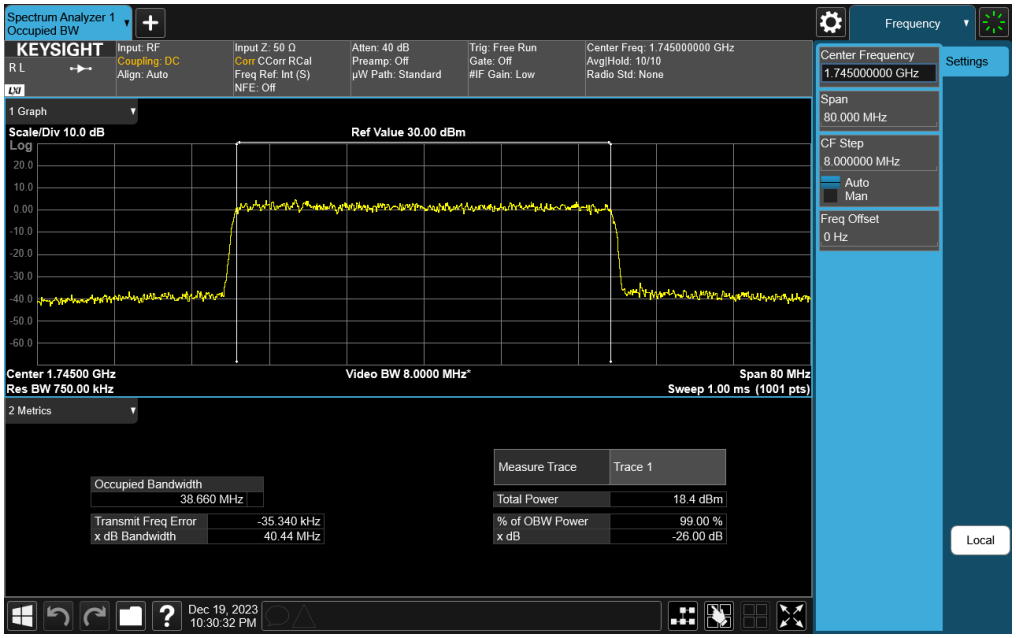
Plot 7-101. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM QPSK - Full RB)



Plot 7-102. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 16QAM - Full RB)

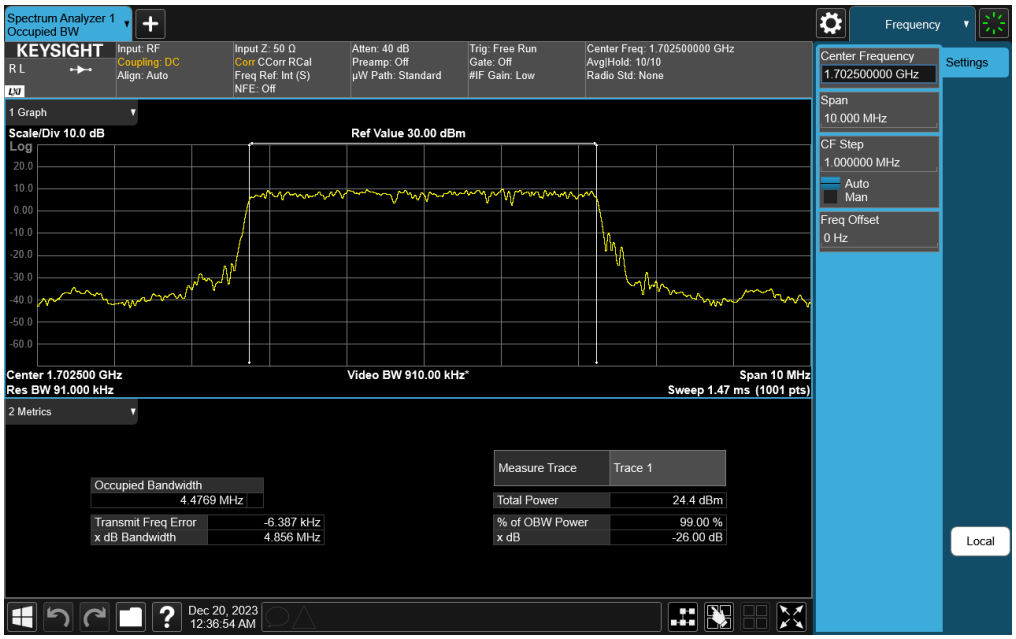


Plot 7-103. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 64QAM - Full RB)

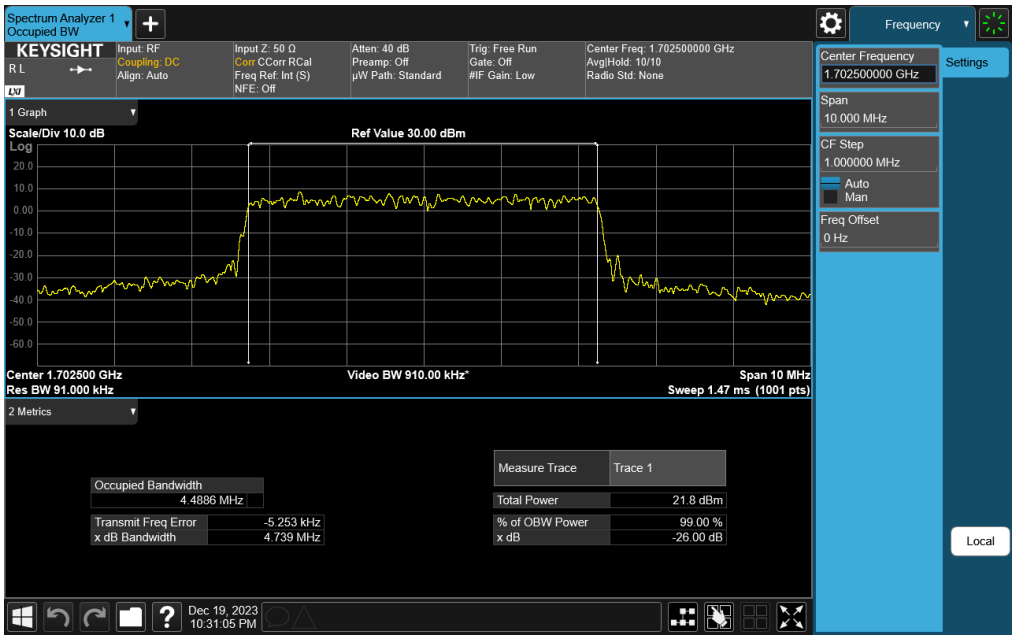


Plot 7-104. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 256QAM - Full RB)

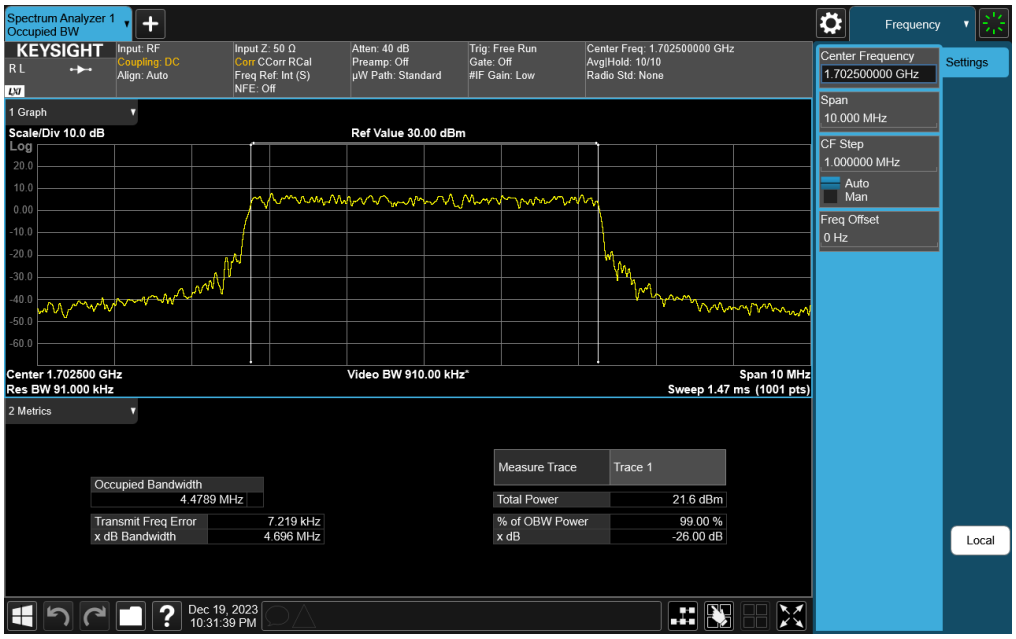
NR Band n70



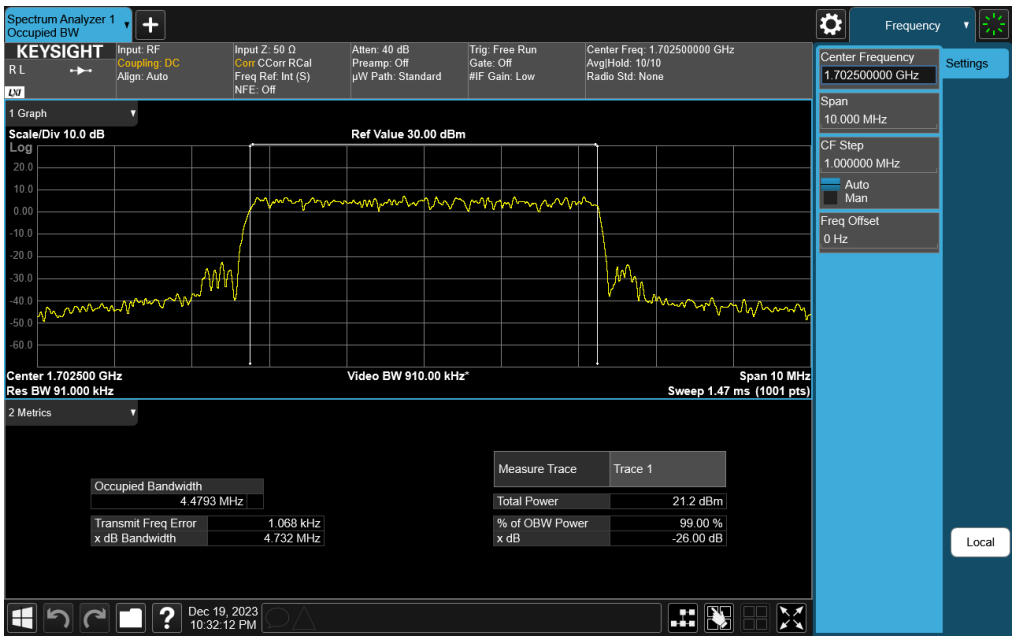
Plot 7-105. Occupied Bandwidth Plot (NR Band n70 - 5MHz DFT-s-OFDM π/2 BPSK - Full RB)



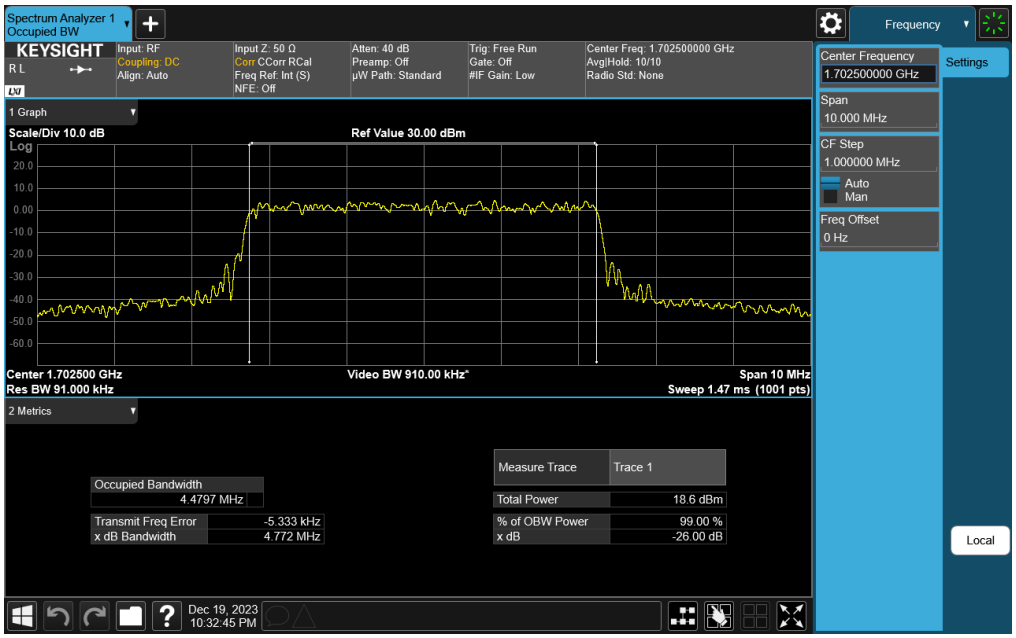
Plot 7-106. Occupied Bandwidth Plot (NR Band n70 - 5MHz CP-OFDM QPSK - Full RB)



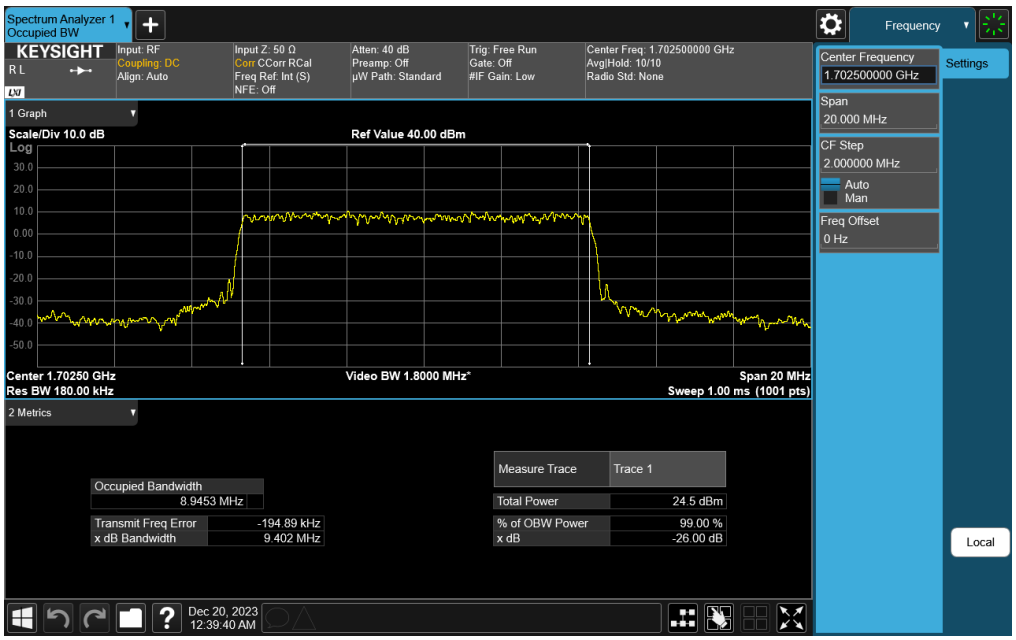
Plot 7-107. Occupied Bandwidth Plot (NR Band n70 - 5MHz CP-OFDM 16-QAM - Full RB)



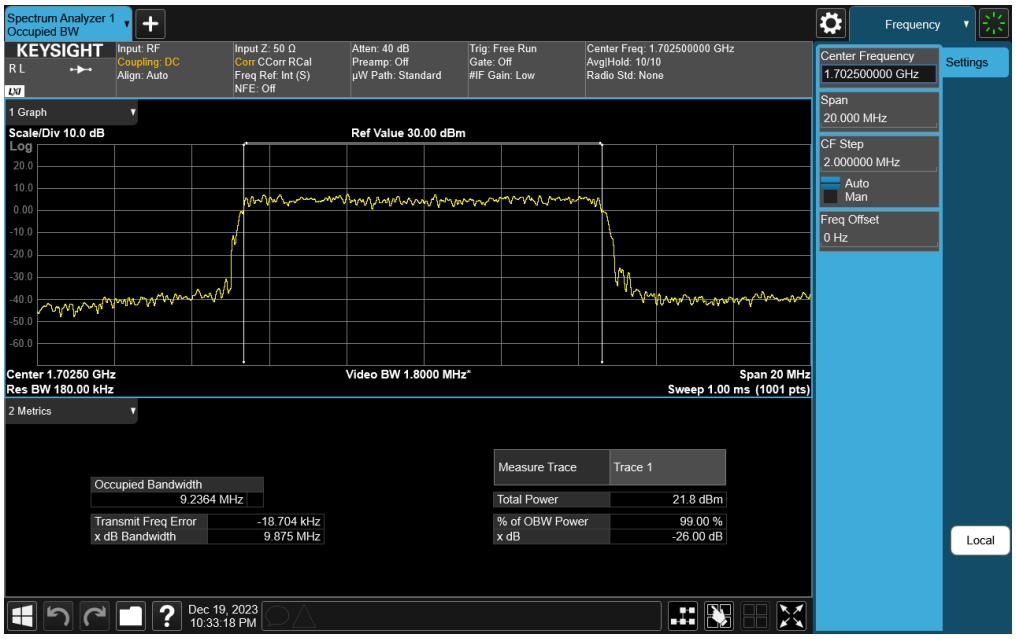
Plot 7-108. Occupied Bandwidth Plot (NR Band n70 - 5MHz CP-OFDM 64-QAM - Full RB)



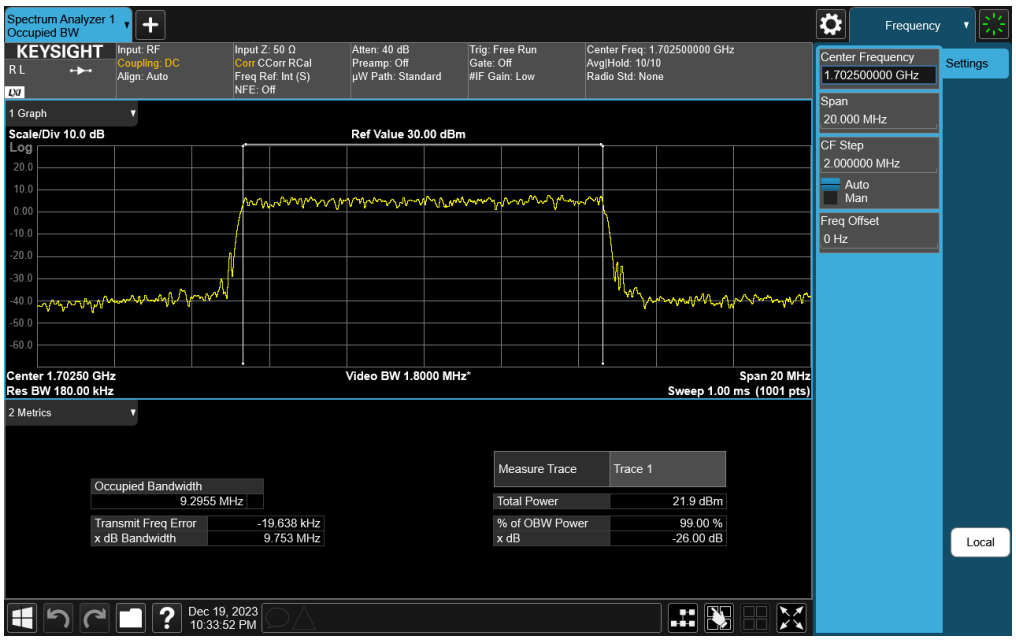
Plot 7-109. Occupied Bandwidth Plot (NR Band n70 - 5MHz CP-OFDM 256-QAM - Full RB)



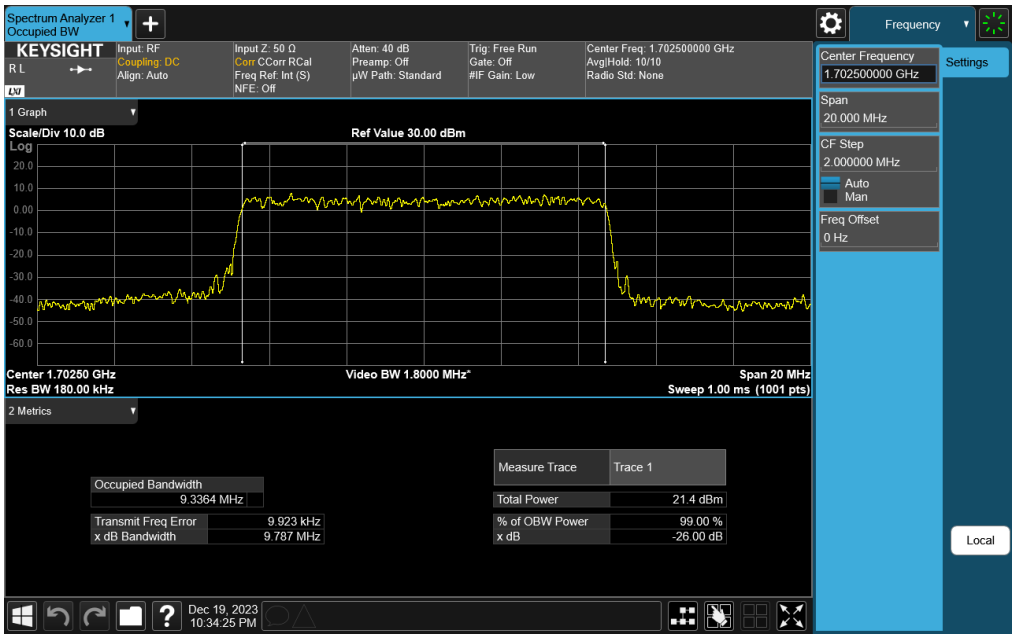
Plot 7-110. Occupied Bandwidth Plot (NR Band n70 - 10MHz DFT-s-OFDM π/2 BPSK - Full RB)



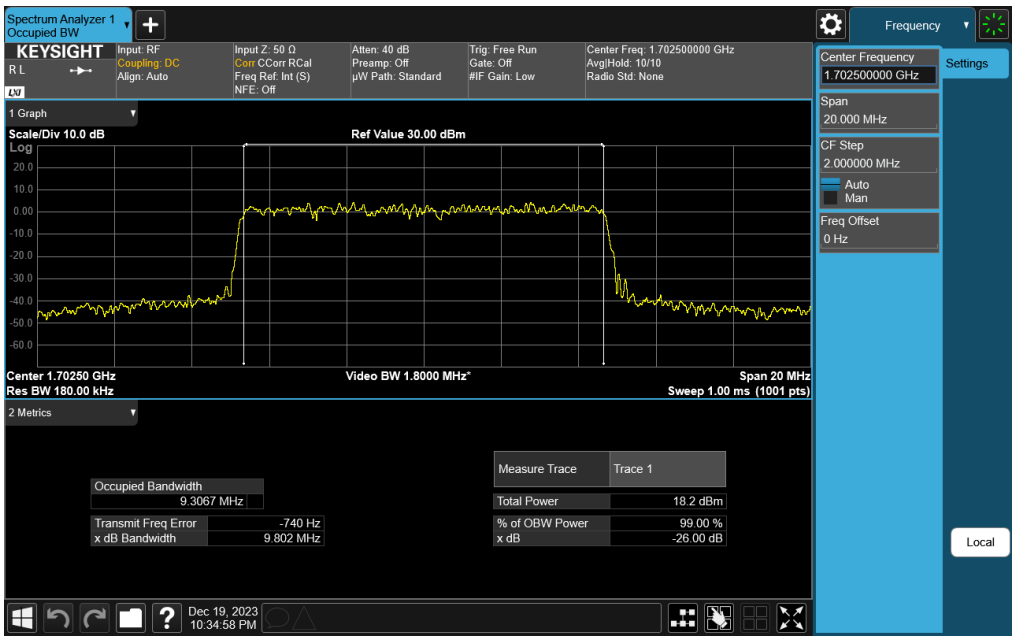
Plot 7-111. Occupied Bandwidth Plot (NR Band n70 - 10MHz CP-OFDM QPSK - Full RB)



Plot 7-112. Occupied Bandwidth Plot (NR Band n70 - 10MHz CP-OFDM 16-QAM - Full RB)



Plot 7-113. Occupied Bandwidth Plot (NR Band n70 - 10MHz CP-OFDM 64-QAM - Full RB)



Plot 7-114. Occupied Bandwidth Plot (NR Band n70 - 10MHz CP-OFDM 256-QAM - Full RB)