PCTEST
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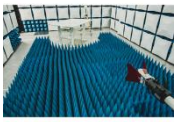

MEASUREMENT REPORT
LTE

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

Date of Testing:
07/16/2020 - 09/09/2020
Test Site/Location:
PCTEST Lab. Morgan Hill, CA, USA
Test Report Serial No.:
1C2004270029-03.BCG

FCC ID:	**BCGA2324**
APPLICANT:	**Apple Inc.**

Application Type:	Certification
Model:	A2324
EUT Type:	Tablet Device
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	22, 24, & 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.

Randy Ortanez
President

ACCREDITED
CERT #2041.02

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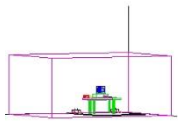
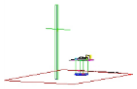


MEASUREMENT REPORT
FCC Part 22, 24, & 27



LTE	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)		
Band 71	27	665.5 - 695.5	0.133	21.25			4M53G7W	QPSK
Band 71	27	665.5 - 695.5	0.114	20.55			4M53D7W	16QAM
Band 71	27	665.5 - 695.5	0.088	19.46			4M54D7W	64QAM
Band 71	27	668 - 693	0.133	21.25			9M09G7W	QPSK
Band 71	27	668 - 693	0.121	20.81			9M02D7W	16QAM
Band 71	27	668 - 693	0.091	19.61			9M04D7W	64QAM
Band 71	27	670.5 - 690.5	0.133	21.25			13M6G7W	QPSK
Band 71	27	670.5 - 690.5	0.107	20.31			13M5D7W	16QAM
Band 71	27	670.5 - 690.5	0.090	19.56			13M6D7W	64QAM
Band 71	27	673 - 688	0.133	21.25			18M0G7W	QPSK
Band 71	27	673 - 688	0.119	20.74			18M0D7W	16QAM
Band 71	27	673 - 688	0.099	19.95			18M0D7W	64QAM
Band 12	27	699.7 - 715.3	0.133	21.25	0.219	23.40	1M11G7W	QPSK
Band 12	27	699.7 - 715.3	0.106	20.24	0.173	22.39	1M11D7W	16QAM
Band 12	27	699.7 - 715.3	0.088	19.46	0.145	21.61	1M11D7W	64QAM
Band 12	27	700.5 - 714.5	0.133	21.25	0.219	23.40	2M72G7W	QPSK
Band 12	27	700.5 - 714.5	0.113	20.54	0.186	22.69	2M73D7W	16QAM
Band 12	27	700.5 - 714.5	0.090	19.52	0.147	21.67	2M72D7W	64QAM
Band 12	27	701.5 - 713.5	0.133	21.25	0.219	23.40	4M55G7W	QPSK
Band 12	27	701.5 - 713.5	0.115	20.59	0.188	22.74	4M55D7W	16QAM
Band 12	27	701.5 - 713.5	0.087	19.38	0.142	21.53	4M55D7W	64QAM
Band 12	27	704 - 711	0.133	21.25	0.219	23.40	9M04G7W	QPSK
Band 12	27	704 - 711	0.115	20.61	0.189	22.76	9M04D7W	16QAM
Band 12	27	704 - 711	0.089	19.48	0.146	21.63	9M05D7W	64QAM
Band 17	27	706.5 - 713.5	0.133	21.25	0.219	23.40	4M55G7W	QPSK
Band 17	27	706.5 - 713.5	0.113	20.52	0.185	22.67	4M55D7W	16QAM
Band 17	27	706.5 - 713.5	0.089	19.50	0.146	21.65	4M55D7W	64QAM
Band 17	27	709 - 711	0.133	21.25	0.219	23.40	9M04G7W	QPSK
Band 17	27	709 - 711	0.119	20.77	0.196	22.92	9M04D7W	16QAM
Band 17	27	709 - 711	0.091	19.58	0.149	21.73	9M05D7W	64QAM
Band 13	27	779.5 - 784.5	0.133	21.25	0.219	23.40	4M56G7W	QPSK
Band 13	27	779.5 - 784.5	0.112	20.48	0.183	22.63	4M55D7W	16QAM
Band 13	27	779.5 - 784.5	0.089	19.50	0.146	21.65	4M55D7W	64QAM
Band 13	27	782	0.133	21.25	0.219	23.40	9M01G7W	QPSK
Band 13	27	782	0.121	20.81	0.198	22.96	9M03D7W	16QAM
Band 13	27	782	0.094	19.72	0.154	21.87	9M00D7W	64QAM
Band 5	22H	824.7 - 848.3	0.153	21.85	0.251	24.00	1M11G7W	QPSK
Band 5	22H	824.7 - 848.3	0.125	20.96	0.205	23.11	1M11D7W	16QAM
Band 5	22H	824.7 - 848.3	0.105	20.21	0.172	22.36	1M11D7W	64QAM
Band 5	22H	825.5 - 847.5	0.153	21.85	0.251	24.00	2M73G7W	QPSK
Band 5	22H	825.5 - 847.5	0.132	21.21	0.217	23.36	2M73D7W	16QAM
Band 5	22H	825.5 - 847.5	0.100	20.02	0.165	22.17	2M73D7W	64QAM
Band 5	22H	826.5 - 846.5	0.153	21.85	0.251	24.00	4M54G7W	QPSK
Band 5	22H	826.5 - 846.5	0.129	21.12	0.212	23.27	4M55D7W	16QAM
Band 5	22H	826.5 - 846.5	0.102	20.08	0.167	22.23	4M55D7W	64QAM
Band 5	22H	829 - 844	0.153	21.85	0.251	24.00	9M06G7W	QPSK
Band 5	22H	829 - 844	0.132	21.19	0.216	23.34	9M05D7W	16QAM
Band 5	22H	829 - 844	0.103	20.13	0.169	22.28	9M05D7W	64QAM
Band 26	22H	824.7 - 848.3	0.153	21.85	0.251	24.00	1M11G7W	QPSK
Band 26	22H	824.7 - 848.3	0.124	20.92	0.203	23.07	1M11D7W	16QAM
Band 26	22H	824.7 - 848.3	0.100	20.02	0.165	22.17	1M11D7W	64QAM
Band 26	22H	825.5 - 847.5	0.153	21.85	0.251	24.00	2M73G7W	QPSK
Band 26	22H	825.5 - 847.5	0.136	21.33	0.223	23.48	2M73D7W	16QAM
Band 26	22H	825.5 - 847.5	0.100	20.00	0.164	22.15	2M73D7W	64QAM
Band 26	22H	826.5 - 846.5	0.153	21.85	0.251	24.00	4M54G7W	QPSK
Band 26	22H	826.5 - 846.5	0.135	21.30	0.221	23.45	4M55D7W	16QAM
Band 26	22H	826.5 - 846.5	0.101	20.06	0.166	22.21	4M55D7W	64QAM
Band 26	22H	829 - 844	0.153	21.85	0.251	24.00	9M06G7W	QPSK
Band 26	22H	829 - 844	0.127	21.03	0.208	23.18	9M05D7W	16QAM
Band 26	22H	829 - 844	0.104	20.15	0.170	22.30	9M05D7W	64QAM

EUT Overview (Low Band)

LTE	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
Band 4	27	1710.7 - 1754.3	0.343	25.35	1M11G7W	QPSK
Band 4	27	1710.7 - 1754.3	0.276	24.41	1M11D7W	16QAM
Band 4	27	1710.7 - 1754.3	0.235	23.71	1M11D7W	64QAM
Band 4	27	1711.5 - 1753.5	0.330	25.19	2M73G7W	QPSK
Band 4	27	1711.5 - 1753.5	0.285	24.55	2M73D7W	16QAM
Band 4	27	1711.5 - 1753.5	0.218	23.39	2M75D7W	64QAM
Band 4	27	1712.5 - 1752.5	0.343	25.35	4M53G7W	QPSK
Band 4	27	1712.5 - 1752.5	0.292	24.66	4M54D7W	16QAM
Band 4	27	1712.5 - 1752.5	0.227	23.56	4M54D7W	64QAM
Band 4	27	1715 - 1750	0.340	25.31	9M07G7W	QPSK
Band 4	27	1715 - 1750	0.305	24.84	9M05D7W	16QAM
Band 4	27	1715 - 1750	0.224	23.51	9M08D7W	64QAM
Band 4	27	1717.5 - 1747.5	0.343	25.35	13M6G7W	QPSK
Band 4	27	1717.5 - 1747.5	0.283	24.52	13M6D7W	16QAM
Band 4	27	1717.5 - 1747.5	0.225	23.53	13M6D7W	64QAM
Band 4	27	1720 - 1745	0.343	25.35	18M1G7W	QPSK
Band 4	27	1720 - 1745	0.297	24.73	18M1D7W	16QAM
Band 4	27	1720 - 1745	0.224	23.51	18M1D7W	64QAM
Band 66	27	1710.7 - 1779.3	0.343	25.35	1M11G7W	QPSK
Band 66	27	1710.7 - 1779.3	0.279	24.45	1M11D7W	16QAM
Band 66	27	1710.7 - 1779.3	0.235	23.71	1M11D7W	64QAM
Band 66	27	1711.5 - 1778.5	0.337	25.28	2M73G7W	QPSK
Band 66	27	1711.5 - 1778.5	0.279	24.46	2M73D7W	16QAM
Band 66	27	1711.5 - 1778.5	0.217	23.37	2M75D7W	64QAM
Band 66	27	1712.5 - 1777.5	0.343	25.35	4M53G7W	QPSK
Band 66	27	1712.5 - 1777.5	0.298	24.74	4M54D7W	16QAM
Band 66	27	1712.5 - 1777.5	0.228	23.57	4M54D7W	64QAM
Band 66	27	1715 - 1775	0.343	25.35	9M07G7W	QPSK
Band 66	27	1715 - 1775	0.303	24.82	9M05D7W	16QAM
Band 66	27	1715 - 1775	0.236	23.72	9M08D7W	64QAM
Band 66	27	1717.5 - 1772.5	0.343	25.35	13M6G7W	QPSK
Band 66	27	1717.5 - 1772.5	0.275	24.40	13M6D7W	16QAM
Band 66	27	1717.5 - 1772.5	0.228	23.57	13M6D7W	64QAM
Band 66	27	1720 - 1770	0.343	25.35	18M1G7W	QPSK
Band 66	27	1720 - 1770	0.293	24.67	18M1D7W	16QAM
Band 66	27	1720 - 1770	0.232	23.66	18M1D7W	64QAM
Band 2	24E	1850.7 - 1909.3	0.339	25.30	1M10G7W	QPSK
Band 2	24E	1850.7 - 1909.3	0.295	24.70	1M10D7W	16QAM
Band 2	24E	1850.7 - 1909.3	0.230	23.61	1M10D7W	64QAM
Band 2	24E	1851.5 - 1908.5	0.339	25.30	2M72G7W	QPSK
Band 2	24E	1851.5 - 1908.5	0.293	24.67	2M72D7W	16QAM
Band 2	24E	1851.5 - 1908.5	0.227	23.56	2M72D7W	64QAM
Band 2	24E	1852.5 - 1907.5	0.339	25.30	4M56G7W	QPSK
Band 2	24E	1852.5 - 1907.5	0.288	24.60	4M54D7W	16QAM
Band 2	24E	1852.5 - 1907.5	0.225	23.53	4M53D7W	64QAM
Band 2	24E	1855 - 1905	0.339	25.30	9M06G7W	QPSK
Band 2	24E	1855 - 1905	0.285	24.55	9M05D7W	16QAM
Band 2	24E	1855 - 1905	0.228	23.58	9M02D7W	64QAM
Band 2	24E	1857.5 - 1902.5	0.339	25.30	13M6G7W	QPSK
Band 2	24E	1857.5 - 1902.5	0.277	24.43	13M6D7W	16QAM
Band 2	24E	1857.5 - 1902.5	0.224	23.50	13M6D7W	64QAM
Band 2	24E	1860 - 1900	0.339	25.30	18M1G7W	QPSK
Band 2	24E	1860 - 1900	0.281	24.49	18M0D7W	16QAM
Band 2	24E	1860 - 1900	0.219	23.41	18M1D7W	64QAM
Band 25	24E	1850.7 - 1914.3	0.339	25.30	1M10G7W	QPSK
Band 25	24E	1850.7 - 1914.3	0.292	24.66	1M10D7W	16QAM
Band 25	24E	1850.7 - 1914.3	0.241	23.82	1M10D7W	64QAM
Band 25	24E	1851.5 - 1913.5	0.339	25.30	2M72G7W	QPSK
Band 25	24E	1851.5 - 1913.5	0.294	24.68	2M72D7W	16QAM
Band 25	24E	1851.5 - 1913.5	0.222	23.46	2M72D7W	64QAM
Band 25	24E	1852.5 - 1912.5	0.339	25.30	4M56G7W	QPSK
Band 25	24E	1852.5 - 1912.5	0.288	24.60	4M54D7W	16QAM
Band 25	24E	1852.5 - 1912.5	0.229	23.60	4M53D7W	64QAM
Band 25	24E	1855 - 1910	0.339	25.30	9M06G7W	QPSK
Band 25	24E	1855 - 1910	0.292	24.66	9M05D7W	16QAM
Band 25	24E	1855 - 1910	0.229	23.59	9M02D7W	64QAM
Band 25	24E	1857.5 - 1907.5	0.339	25.30	13M6G7W	QPSK
Band 25	24E	1857.5 - 1907.5	0.284	24.54	13M6D7W	16QAM
Band 25	24E	1857.5 - 1907.5	0.229	23.59	13M6D7W	64QAM
Band 25	24E	1860 - 1905	0.339	25.30	18M1G7W	QPSK
Band 25	24E	1860 - 1905	0.299	24.76	18M0D7W	16QAM
Band 25	24E	1860 - 1905	0.250	23.98	18M1D7W	64QAM

EUT Overview (Mid Bands)

LTE	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
Band 30	27	2307.5 - 2312.5	0.200	23.00	4M55G7W	QPSK
Band 30	27	2307.5 - 2312.5	0.173	22.38	4M53D7W	16QAM
Band 30	27	2307.5 - 2312.5	0.142	21.51	4M53D7W	64QAM
Band 30	27	2310	0.200	23.00	9M06G7W	QPSK
Band 30	27	2310	0.178	22.51	9M06D7W	16QAM
Band 30	27	2310	0.140	21.46	9M04D7W	64QAM
Band 7	27	2502.5 - 2567.5	0.335	25.25	4M54G7W	QPSK
Band 7	27	2502.5 - 2567.5	0.284	24.54	4M52D7W	16QAM
Band 7	27	2502.5 - 2567.5	0.222	23.46	4M53D7W	64QAM
Band 7	27	2505 - 2565	0.335	25.25	9M08G7W	QPSK
Band 7	27	2505 - 2565	0.288	24.59	9M04D7W	16QAM
Band 7	27	2505 - 2565	0.220	23.42	9M04D7W	64QAM
Band 7	27	2507.5 - 2562.5	0.335	25.25	13M6G7W	QPSK
Band 7	27	2507.5 - 2562.5	0.270	24.31	13M6D7W	16QAM
Band 7	27	2507.5 - 2562.5	0.219	23.41	13M5D7W	64QAM
Band 7	27	2510 - 2560	0.335	25.25	18M1G7W	QPSK
Band 7	27	2510 - 2560	0.281	24.49	18M1D7W	16QAM
Band 7	27	2510 - 2560	0.221	23.45	18M1D7W	64QAM
Band 41 (PC2)	27	2498.5 - 2687.5	0.653	28.15	4M56G7W	QPSK
Band 41 (PC2)	27	2498.5 - 2687.5	0.564	27.51	4M56D7W	16QAM
Band 41 (PC2)	27	2498.5 - 2687.5	0.457	26.60	4M55D7W	64QAM
Band 41 (PC2)	27	2501 - 2685	0.653	28.15	9M07G7W	QPSK
Band 41 (PC2)	27	2501 - 2685	0.551	27.41	9M10D7W	16QAM
Band 41 (PC2)	27	2501 - 2685	0.455	26.58	9M08D7W	64QAM
Band 41 (PC2)	27	2503.5 - 2682.5	0.652	28.14	13M5G7W	QPSK
Band 41 (PC2)	27	2503.5 - 2682.5	0.569	27.55	13M6D7W	16QAM
Band 41 (PC2)	27	2503.5 - 2682.5	0.444	26.47	13M5D7W	64QAM
Band 41 (PC2)	27	2506 - 2680	0.635	28.03	18M1G7W	QPSK
Band 41 (PC2)	27	2506 - 2680	0.540	27.32	18M1D7W	16QAM
Band 41 (PC2)	27	2506 - 2680	0.439	26.42	18M1D7W	64QAM
Band 41 (PC3)	27	2498.5 - 2687.5	0.335	25.25	4M56G7W	QPSK
Band 41 (PC3)	27	2498.5 - 2687.5	0.271	24.33	4M56D7W	16QAM
Band 41 (PC3)	27	2498.5 - 2687.5	0.216	23.34	4M55D7W	64QAM
Band 41 (PC3)	27	2501 - 2685	0.335	25.25	9M07G7W	QPSK
Band 41 (PC3)	27	2501 - 2685	0.286	24.56	9M10D7W	16QAM
Band 41 (PC3)	27	2501 - 2685	0.229	23.60	9M08D7W	64QAM
Band 41 (PC3)	27	2503.5 - 2682.5	0.335	25.25	13M5G7W	QPSK
Band 41 (PC3)	27	2503.5 - 2682.5	0.269	24.29	13M6D7W	16QAM
Band 41 (PC3)	27	2503.5 - 2682.5	0.224	23.51	13M5D7W	64QAM
Band 41 (PC3)	27	2506 - 2680	0.335	25.25	18M1G7W	QPSK
Band 41 (PC3)	27	2506 - 2680	0.278	24.44	18M1D7W	16QAM
Band 41 (PC3)	27	2506 - 2680	0.221	23.44	18M1D7W	64QAM

EUT Overview (High 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 PCTEST Test Location

These measurement tests were conducted at the PCTEST. 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

- PCTEST is an ISO 17025-2005 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.

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

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

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2324**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: DLXD101FQ8MX, DLXD100MQ8MX, DLX018400MYPWT71Q, DLX019300F7PWTJ1L

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE, HDR4, HDR8), WPT

This device supports BT Beamforming

LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore, test data provided in this report covers Band 17 as well as Band 12.

LTE Band 26 (814.7 – 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.

LTE Band 66 (1710 - 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz). Therefore, test data provided in this report covers Band 4 as well as Band 66.

LTE Band 25 (1850 - 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

LTE Band 41 supports NS04 for Antenna 4, Antenna 2a, Antenna 1a and Antenna 3a.

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	WLAN	Bluetooth	LTE / GSM / WCDMA	UNII
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE	Mid band/ High band	802.11 a/n/ac/ax
1a	Config 1	✓	×	✓	×
	Config 2	×	✓	✓	×
2a	Config 3	×	×	✓	✓
3a	Config 4	✓	×	✓	×
	Config 5	×	✓	✓	×

Table 2-1. Simultaneous Transmission Configurations

✓ = Support; × = Not Support

2.3 Antenna Description

Following antennas were used for the testing.

Frequency [MHz]	Antenna Gain (dBi)				
	Antenna 4	Antenna 3b	Antenna 2a	Antenna 1a	Antenna 3a
650-800	-2.1	-3.1	N/A	N/A	N/A
820-960	-1.5	-1.6	N/A	N/A	N/A
1700-1800	0.6	N/A	-2.0	0.5	-3.1
1820-2100	-0.2	N/A	-1.2	0.8	-4.1
2300-2320	0.0	N/A	-0.7	0.5	-3.3
2400-2700	0.1	N/A	0.9	1.0	-1.7

Table 2-2. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple MacBook	Model:	A1398	S/N:	C2QKP008F6F3
	w/AC/DC Adapter	Model:	A1435	S/N:	N/A
2	Apple USB-C Cable	Model:	Chimp	S/N:	420A57
3	USB-C Cable	Model:	A146	S/N:	N/A
	w/ AC Adapter	Model:	A2305	S/N:	N/A
4	Apple Pencil	Model:	N/A	S/N:	GQX91220J13LL6U7AS
5	DC Power Supply	Model:	KPS3010D	S/N:	N/A

Table 2-3. Test Support Equipment List

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.

All possible simultaneous transmission configurations have been investigated and the worst case config has been reported.

Description	LTE (Band 41)	Bluetooth LE
Antenna	Antenna 1a	Antenna 1a
Channel	39750	19
Operating Frequency (MHz)	2506	2440
Mode/Modulation	QPSK/1RB/20MHz	1M/ePA

Table 2-4. Worst Case Simultaneous Transmission Configuration

2.6 Software and Firmware

The test was conducted with firmware version 18A325 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 Measurement Procedure

The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI C63.26-2015/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**.**

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. Per the guidelines of KDB 412172 D01 v01r01, radiated power levels are measured using the following formula:

$$\text{ERP or EIRP} = P_T + G_T - L_C$$

Where P_T is the transmitter output power, expressed in dBm, G_T is the gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP), and L_C signal attenuation in the connecting cable between the transmitter and antenna in dB.

Per the guidance of ANSI C63.26-2015 and TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

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

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

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + $10\log_{10}$(Power $_{[Watts]}$). For Band 7 and 41, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of 55 + $10\log_{10}$(Power $_{[Watts]}$). For Band 30 the calculated P_d levels are compared to the absolute spurious emission limit of -40dBm which is equivalent to the required minimum attenuation of 70 + $10\log_{10}$(Power $_{[Watts]}$).

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.

4.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.30
Radiated Disturbance (<1GHz)	4.15
Radiated Disturbance (>1GHz)	4.59
Radiated Disturbance (>18GHz)	4.96

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	3/4/2020	Annual	3/4/2021	MY49430244
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	10/29/2019	Annual	10/29/2020	T058701-02
ESPEC	SU-241	Tabletop Temperature Chamber	9/3/2019	Annual	9/3/2020	92009574
ETS-Lindgren	3142E–PA	Pre-Amplifier (30MHz - 6GHz)	9/19/2019	Annual	9/19/2020	213236
ETS-Lindgren	3142E	BiConiLog Antenna (30MHz - 6GHz)	1/6/2020	Annual	1/6/2021	224569
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/21/2020	Annual	4/21/2021	205956
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	3/2/2020	Annual	3/2/2021	101619
Rohde & Schwarz	ESW26	EMI Test Receiver	6/1/2020	Annual	6/1/2021	101299
Rohde & Schwarz	ESW44	EMI Test Receiver	9/13/2019	Annual	9/13/2020	101570
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/16/2019	Annual	11/16/2020	164715
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	4/16/2020	Annual	4/16/2021	166869
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	9/19/2019	Annual	9/19/2020	100051
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna (400MHz-18GHz)	11/14/2019	Annual	11/14/2020	101057
Rohde & Schwarz	HFH2-Z2	Loop Antenna	3/12/2020	Annual	3/12/2021	100546

Table 5-1. Test Equipment List

Notes:

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

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7W

LTE 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
D = Amplitude/Angle Modulated
7 = Quantized/Digital Info
W = Combination of Any

Spurious Radiated Emission – LTE Band

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: BCGA2324

FCC Classification: PCS Licensed Transmitter (PCB)

Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	N/A	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	> 43 + 10 $\log_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.3, 7.4
27.53(m)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3, 7.4
27.53(a)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(a)			Section 7.3, 7.4
24.232(d) 27.50(d)(5)	Peak-Average Ratio	< 13 dB			Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			See RF Exposure Report
2.1046	Additional Maximum Power Reduction (A-MPR)	N/A			Section 7.6
27.53(m)	Uplink Carrier Aggregation	Undesirable emissions much meet the limits pdetailed in 27.53(m)			Section 7.7, 7.10
2.1055 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)			Section 7.10.3

Table 7-1. Summary of Conducted Test Results

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 26/5)	< 7 Watts max. ERP	CONDUCTED	PASS	Section 7.8
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 71, 12/17, 13)	< 3 Watts max. ERP			Section 7.8
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 25/2, 7, 41)	< 2 Watts max. EIRP			Section 7.8
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 66/4)	< 1 Watts max. EIRP			Section 7.8
27.50(a)(3) 27.50(d)(5)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 Watts max. EIRP			Section 7.8
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10 $\log_{10}$ (P[Watts]) for all out-of-band emissions	RADIATED		Section 7.9
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz			Section 7.9
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10 $\log_{10}$ (P[Watts])			Section 7.9
27.53(m)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.9

Table 7-2. Summary of Conducted/Radiated 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 (Sections 7.2, 7.3, 7.4, 7.5) were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version 5.3.

7.2 Occupied Bandwidth

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

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

Test Setup

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

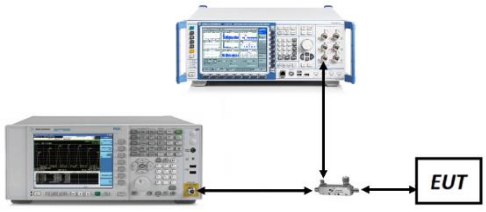


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

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

LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 71	5	QPSK	4532.6
Band 71	5	16QAM	4525.6
Band 71	5	64QAM	4538.6
Band 71	10	QPSK	9085.8
Band 71	10	16QAM	9024.6
Band 71	10	64QAM	9043.3
Band 71	15	QPSK	13643.0
Band 71	15	16QAM	13541.0
Band 71	15	64QAM	13562.0
Band 71	20	QPSK	18034.0
Band 71	20	16QAM	18004.0
Band 71	20	64QAM	18021.0
Band 12	1.4	QPSK	1111.1
Band 12	1.4	16QAM	1112.7
Band 12	1.4	64QAM	1110.9
Band 12	3	QPSK	2722.4
Band 12	3	16QAM	2731.9
Band 12	3	64QAM	2721.7
Band 12	5	QPSK	4550.7
Band 12	5	16QAM	4550.0
Band 12	5	64QAM	4547.6
Band 12	10	QPSK	9037.3
Band 12	10	16QAM	9037.4
Band 12	10	64QAM	9047.9
Band 17	5	QPSK	4550.7
Band 17	5	16QAM	4550.0
Band 17	5	64QAM	4547.6
Band 17	10	QPSK	9037.3
Band 17	10	16QAM	9037.4
Band 17	10	64QAM	9047.9
Band 13	5	QPSK	4561.8
Band 13	5	16QAM	4548.3
Band 13	5	64QAM	4548.6
Band 13	10	QPSK	9006.9
Band 13	10	16QAM	9031.0
Band 13	10	64QAM	8995.4
Band 5	1.4	QPSK	1105.5
Band 5	1.4	16QAM	1110.9
Band 5	1.4	64QAM	1109.1
Band 5	3	QPSK	2733.6
Band 5	3	16QAM	2727.6
Band 5	3	64QAM	2726.7
Band 5	5	QPSK	4543.6
Band 5	5	16QAM	4553.5
Band 5	5	64QAM	4550.7
Band 5	10	QPSK	9055.9
Band 5	10	16QAM	9047.3
Band 5	10	64QAM	9053.5
Band 26	1.4	QPSK	1105.5
Band 26	1.4	16QAM	1110.9
Band 26	1.4	64QAM	1109.1
Band 26	3	QPSK	2733.6
Band 26	3	16QAM	2727.6
Band 26	3	64QAM	2726.7
Band 26	5	QPSK	4543.6
Band 26	5	16QAM	4553.5
Band 26	5	64QAM	4550.7
Band 26	10	QPSK	9055.9
Band 26	10	16QAM	9047.3
Band 26	10	64QAM	9053.5

Table 7-3. Occupied Band Width Results (Low Bands)

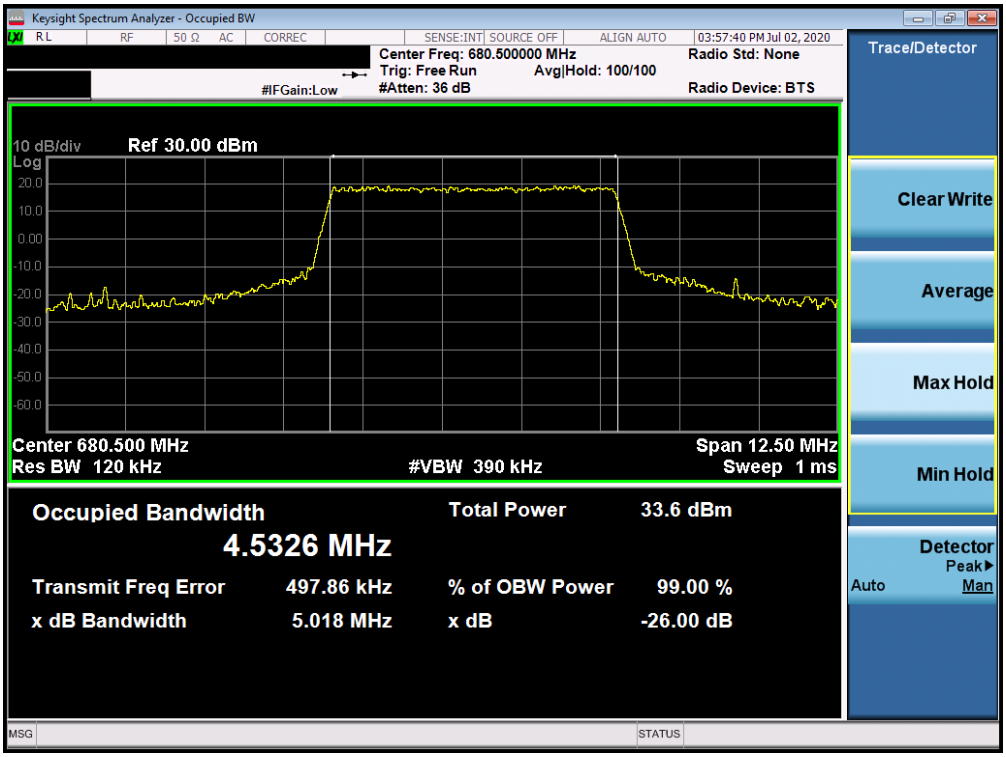
LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 4	1.4	QPSK	1106.3
Band 4	1.4	16QAM	1106.7
Band 4	1.4	64QAM	1114.0
Band 4	3	QPSK	2730.1
Band 4	3	16QAM	2726.8
Band 4	3	64QAM	2746.7
Band 4	5	QPSK	4534.7
Band 4	5	16QAM	4535.0
Band 4	5	64QAM	4543.5
Band 4	10	QPSK	9067.8
Band 4	10	16QAM	9050.7
Band 4	10	64QAM	9076.6
Band 4	15	QPSK	13590.0
Band 4	15	16QAM	13592.0
Band 4	15	64QAM	13605.0
Band 4	20	QPSK	18099.0
Band 4	20	16QAM	18085.0
Band 4	20	64QAM	18102.0
Band 66	1.4	QPSK	1106.3
Band 66	1.4	16QAM	1106.7
Band 66	1.4	64QAM	1114.0
Band 66	3	QPSK	2730.1
Band 66	3	16QAM	2726.8
Band 66	3	64QAM	2746.7
Band 66	5	QPSK	4534.7
Band 66	5	16QAM	4535.0
Band 66	5	64QAM	4543.5
Band 66	10	QPSK	9067.8
Band 66	10	16QAM	9050.7
Band 66	10	64QAM	9076.6
Band 66	15	QPSK	13590.0
Band 66	15	16QAM	13592.0
Band 66	15	64QAM	13605.0
Band 66	20	QPSK	18099.0
Band 66	20	16QAM	18085.0
Band 66	20	64QAM	18102.0
Band 2	1.4	QPSK	1104.8
Band 2	1.4	16QAM	1104.9
Band 2	1.4	64QAM	1101.9
Band 2	3	QPSK	2723.6
Band 2	3	16QAM	2719.6
Band 2	3	64QAM	2719.1
Band 2	5	QPSK	4563.8
Band 2	5	16QAM	4538.4
Band 2	5	64QAM	4534.9
Band 2	10	QPSK	9058.4
Band 2	10	16QAM	9048.6
Band 2	10	64QAM	9020.5
Band 2	15	QPSK	13624.0
Band 2	15	16QAM	13566.0
Band 2	15	64QAM	13568.0
Band 2	20	QPSK	18080.0
Band 2	20	16QAM	18045.0
Band 2	20	64QAM	18052.0
Band 25	1.4	QPSK	1104.8
Band 25	1.4	16QAM	1104.9
Band 25	1.4	64QAM	1101.9
Band 25	3	QPSK	2723.6
Band 25	3	16QAM	2719.6
Band 25	3	64QAM	2719.1
Band 25	5	QPSK	4563.8
Band 25	5	16QAM	4538.4
Band 25	5	64QAM	4534.9
Band 25	10	QPSK	9058.4
Band 25	10	16QAM	9048.6
Band 25	10	64QAM	9020.5
Band 25	15	QPSK	13624.0
Band 25	15	16QAM	13566.0
Band 25	15	64QAM	13568.0
Band 25	20	QPSK	18080.0
Band 25	20	16QAM	18045.0
Band 25	20	64QAM	18052.0

Table 7-4. Occupied Band Width Results (Mid Bands)

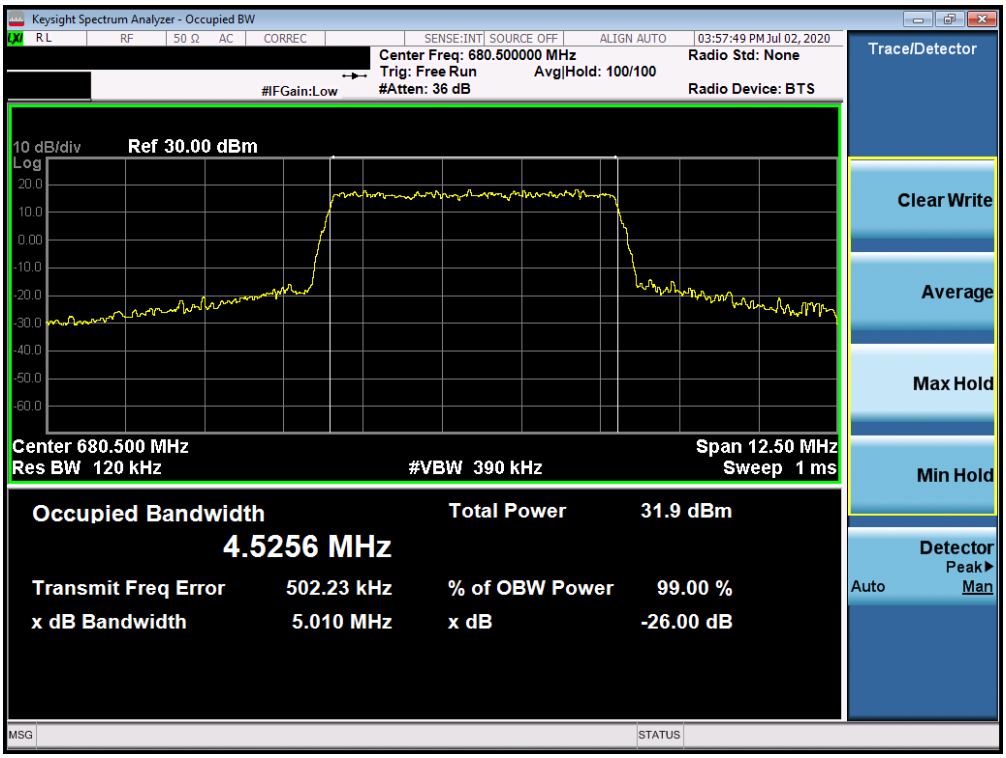
LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 30	5	QPSK	4548.3
Band 30	5	16QAM	4525.4
Band 30	5	64QAM	4534.7
Band 30	10	QPSK	9061.5
Band 30	10	16QAM	9063.5
Band 30	10	64QAM	9039.3
Band 7	5	QPSK	4543.0
Band 7	5	16QAM	4520.2
Band 7	5	64QAM	4526.4
Band 7	10	QPSK	9079.2
Band 7	10	16QAM	9038.6
Band 7	10	64QAM	9042.2
Band 7	15	QPSK	13618.0
Band 7	15	16QAM	13589.0
Band 7	15	64QAM	13529.0
Band 7	20	QPSK	18118.0
Band 7	20	16QAM	18062.0
Band 7	20	64QAM	18055.0
Band 41	5	QPSK	4560.0
Band 41	5	16QAM	4558.6
Band 41	5	64QAM	4554.7
Band 41	10	QPSK	9071.5
Band 41	10	16QAM	9095.2
Band 41	10	64QAM	9081.2
Band 41	15	QPSK	13518.0
Band 41	15	16QAM	13580.0
Band 41	15	64QAM	13502.0
Band 41	20	QPSK	18102.0
Band 41	20	16QAM	18101.0
Band 41	20	64QAM	18077.0

Table 7-5. Occupied Band Width Results (High Bands)

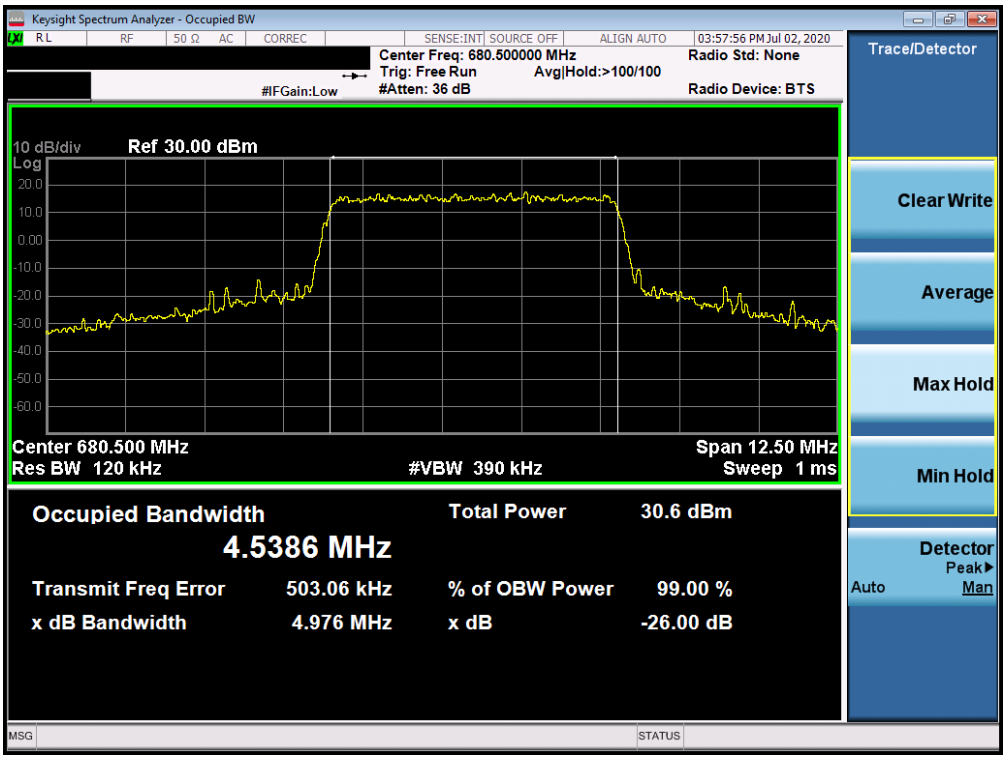
Band 71



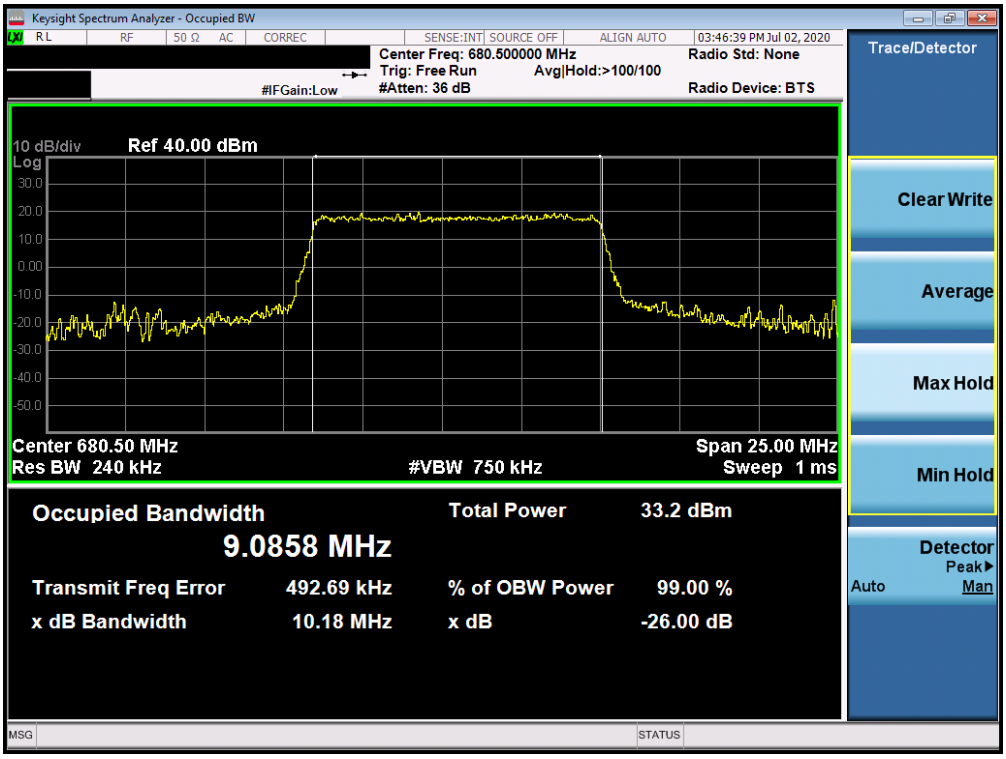
Plot 7-1. Occupied Bandwidth Plot (Band 71 - 5.0MHz QPSK - Full RB Configuration)



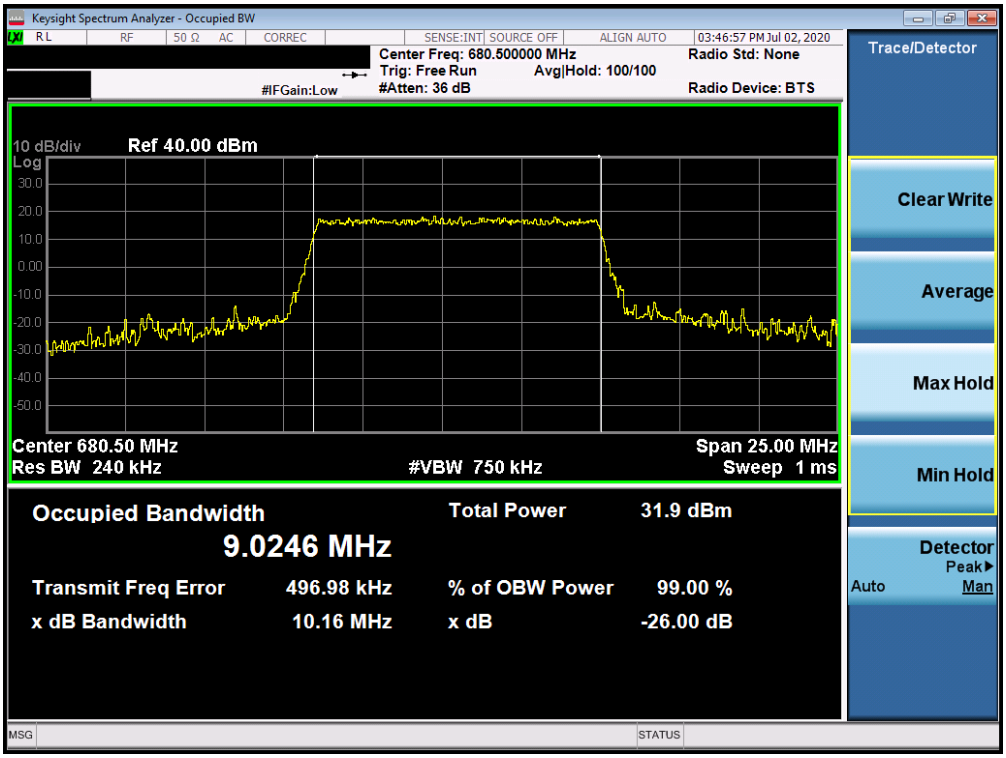
Plot 7-2. Occupied Bandwidth Plot (Band 71 - 5.0MHz 16-QAM - Full RB Configuration)



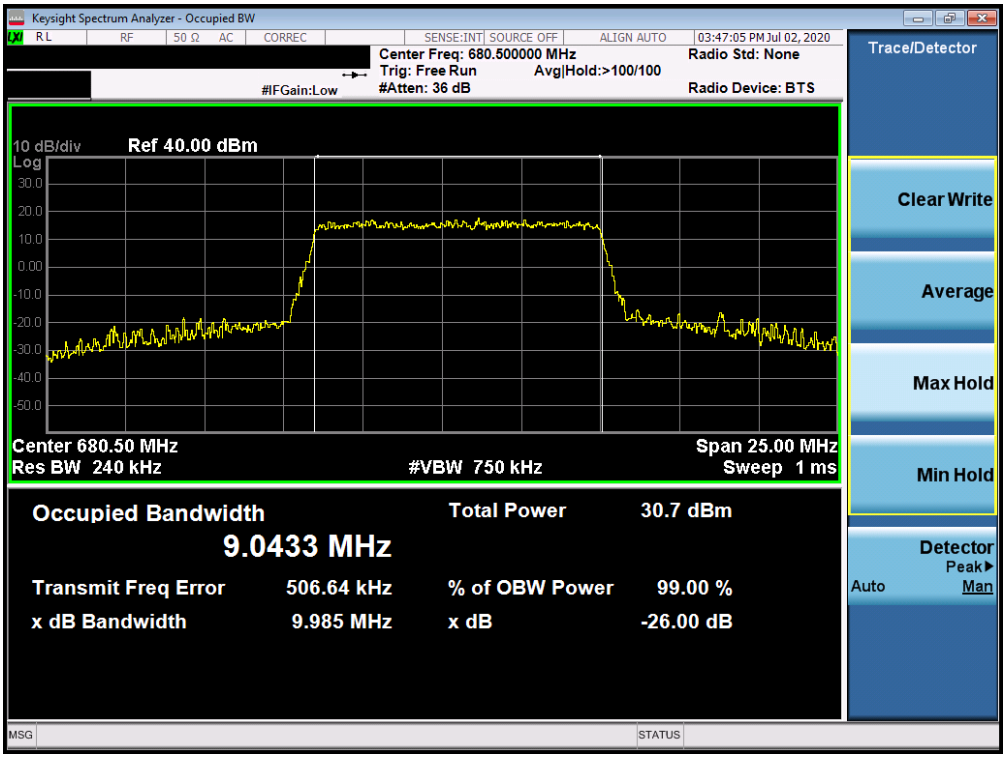
Plot 7-3. Occupied Bandwidth Plot (Band 71 - 5.0MHz 64-QAM - Full RB Configuration)



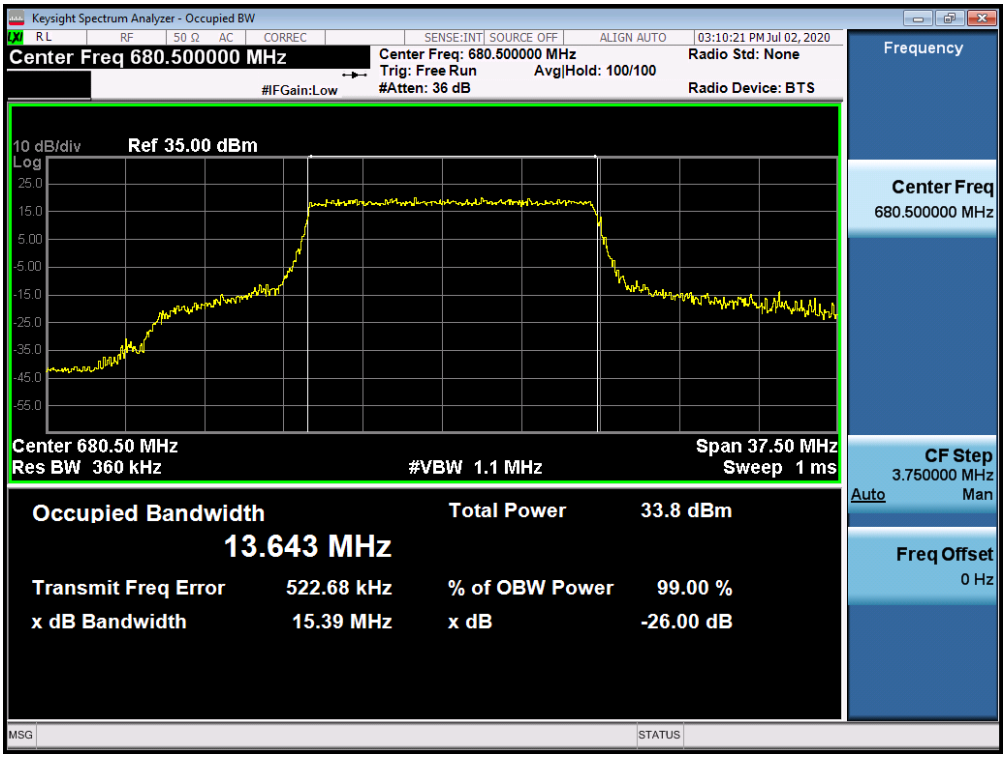
Plot 7-4. Occupied Bandwidth Plot (Band 71 - 10.0MHz QPSK - Full RB Configuration)



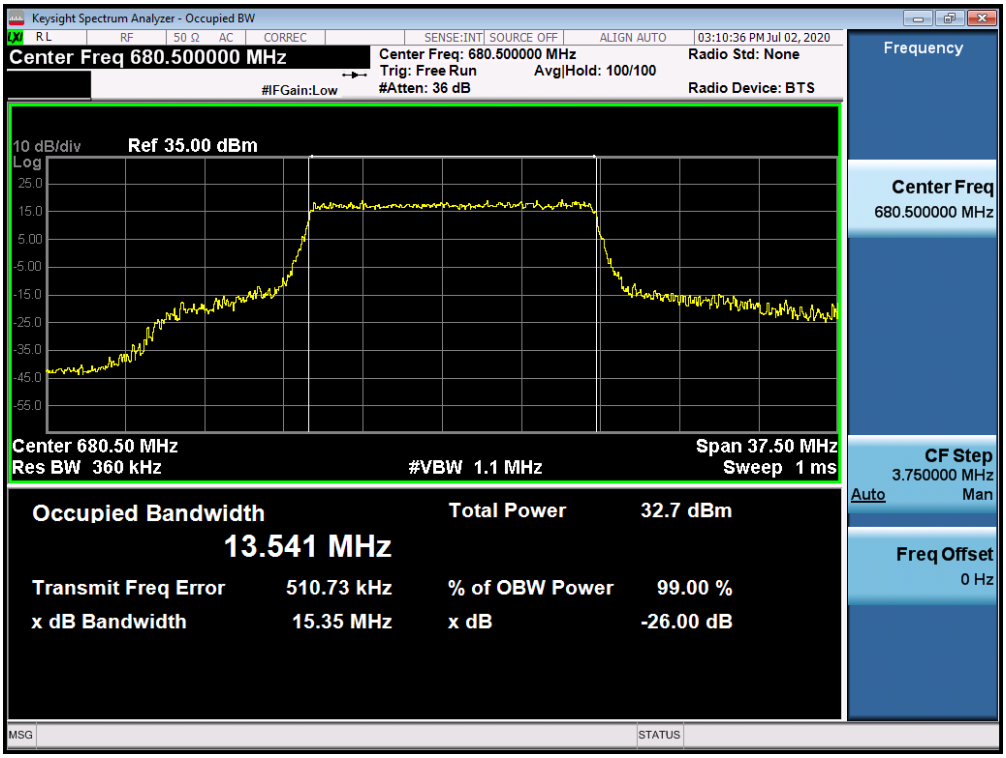
Plot 7-5. Occupied Bandwidth Plot (Band 71 - 10.0MHz 16-QAM - Full RB Configuration)



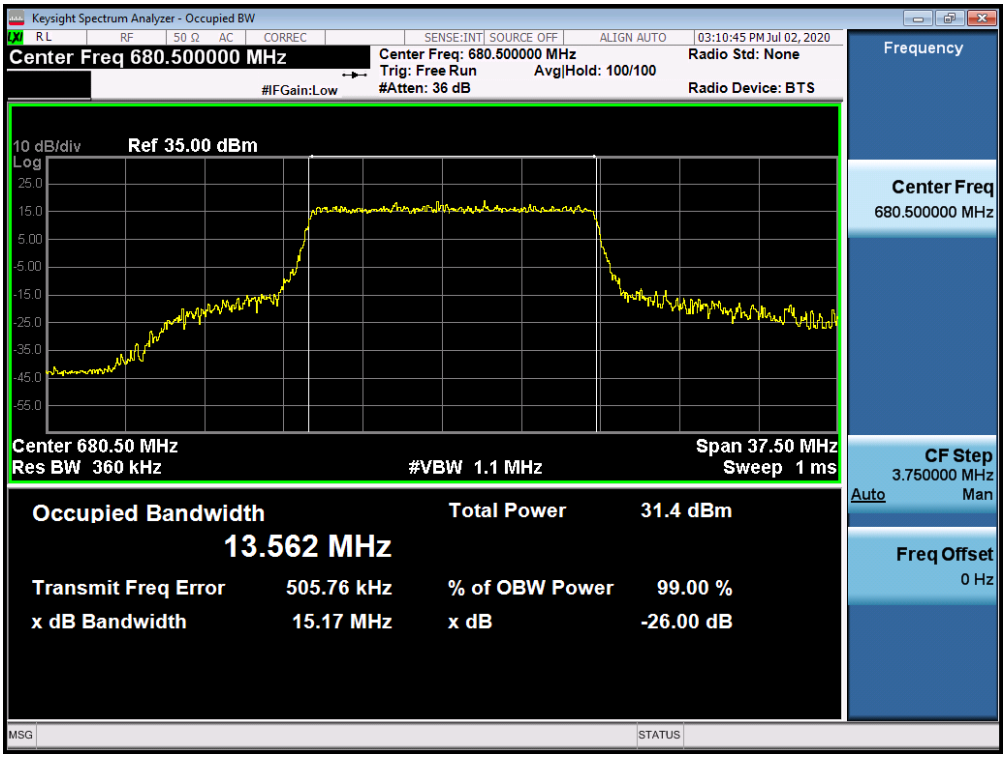
Plot 7-6. Occupied Bandwidth Plot (Band 71 - 10.0MHz 64-QAM - Full RB Configuration)



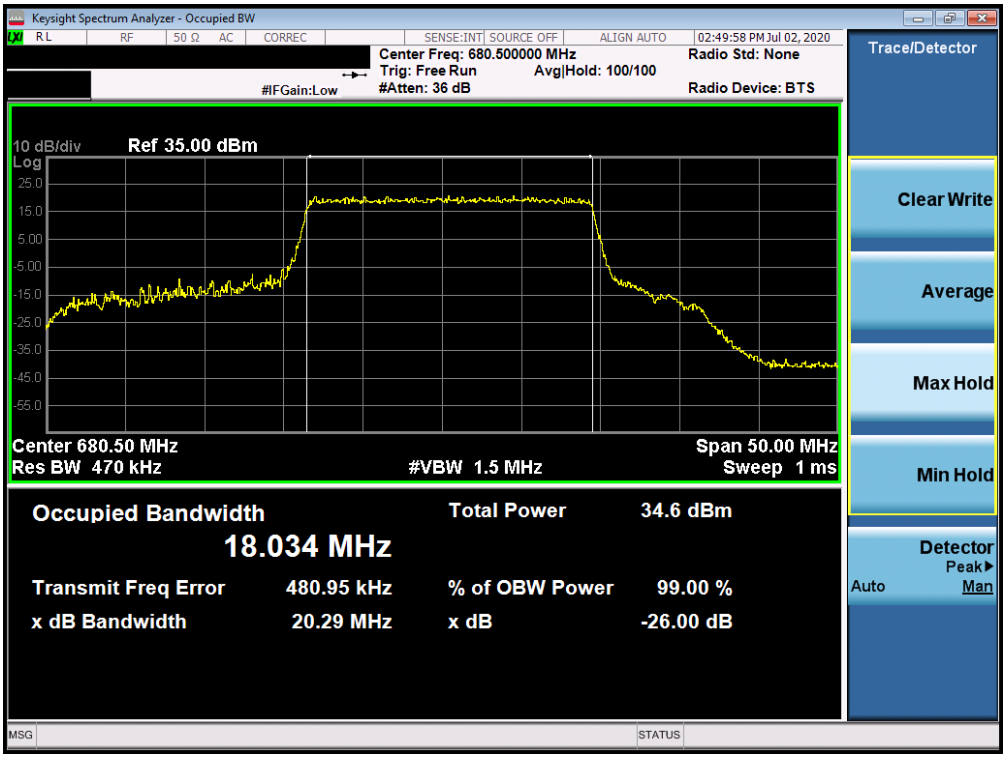
Plot 7-7. Occupied Bandwidth Plot (Band 71 - 15.0MHz QPSK - Full RB Configuration)



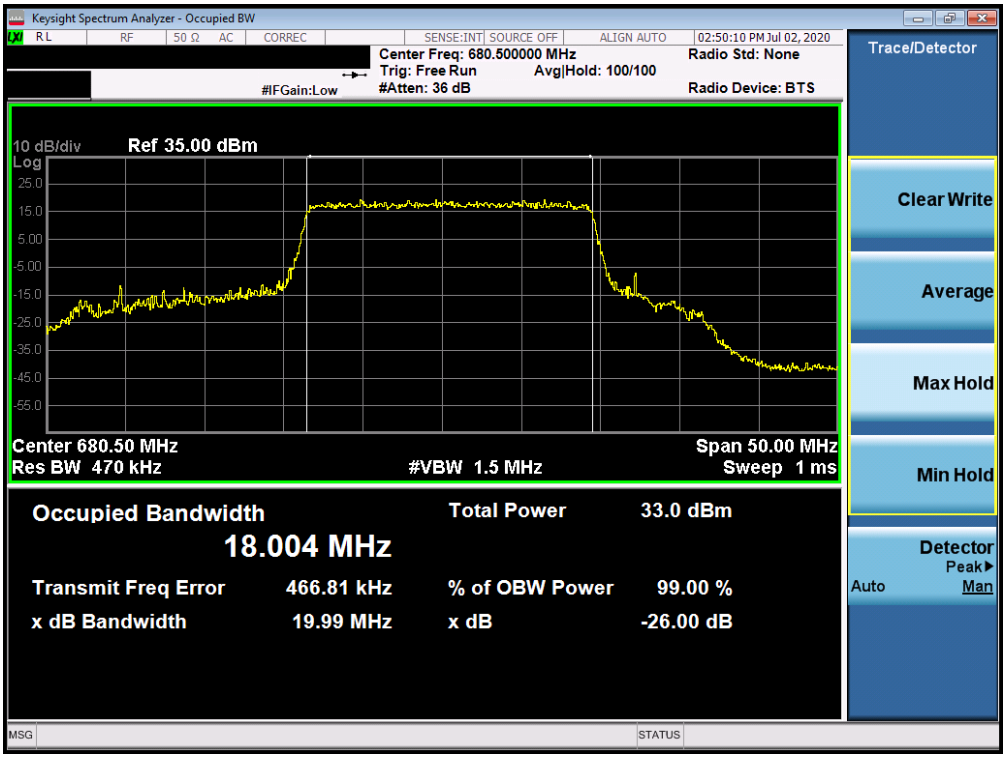
Plot 7-8. Occupied Bandwidth Plot (Band 71 - 15.0MHz 16-QAM - Full RB Configuration)



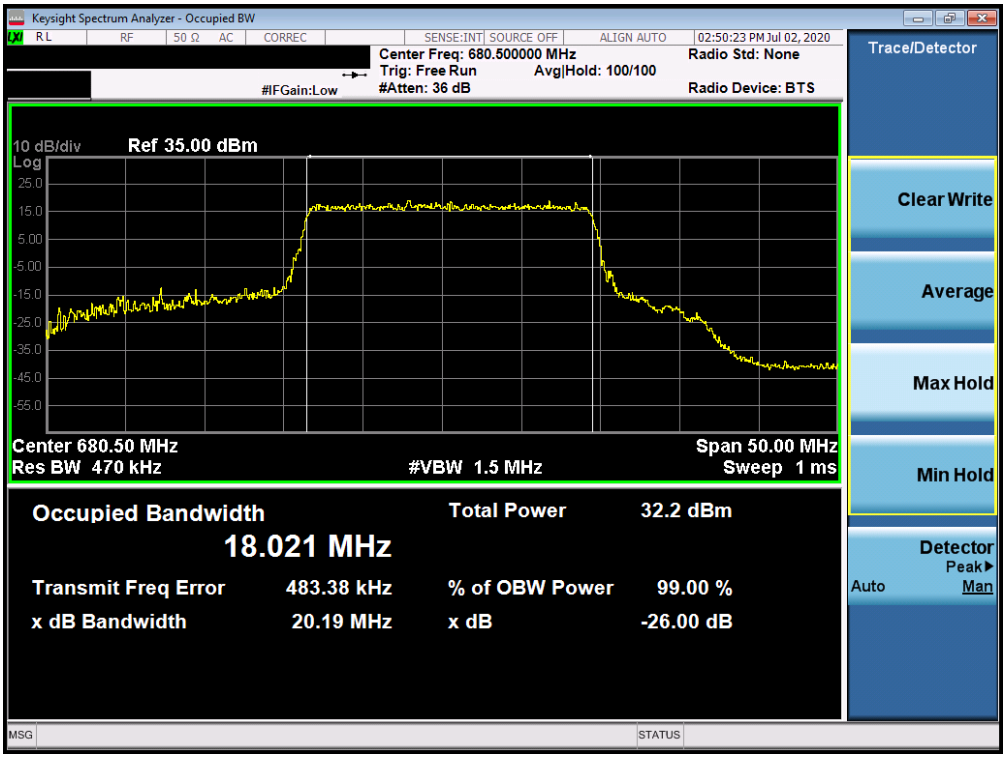
Plot 7-9. Occupied Bandwidth Plot (Band 71 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (Band 71 - 20.0MHz QPSK - Full RB Configuration)

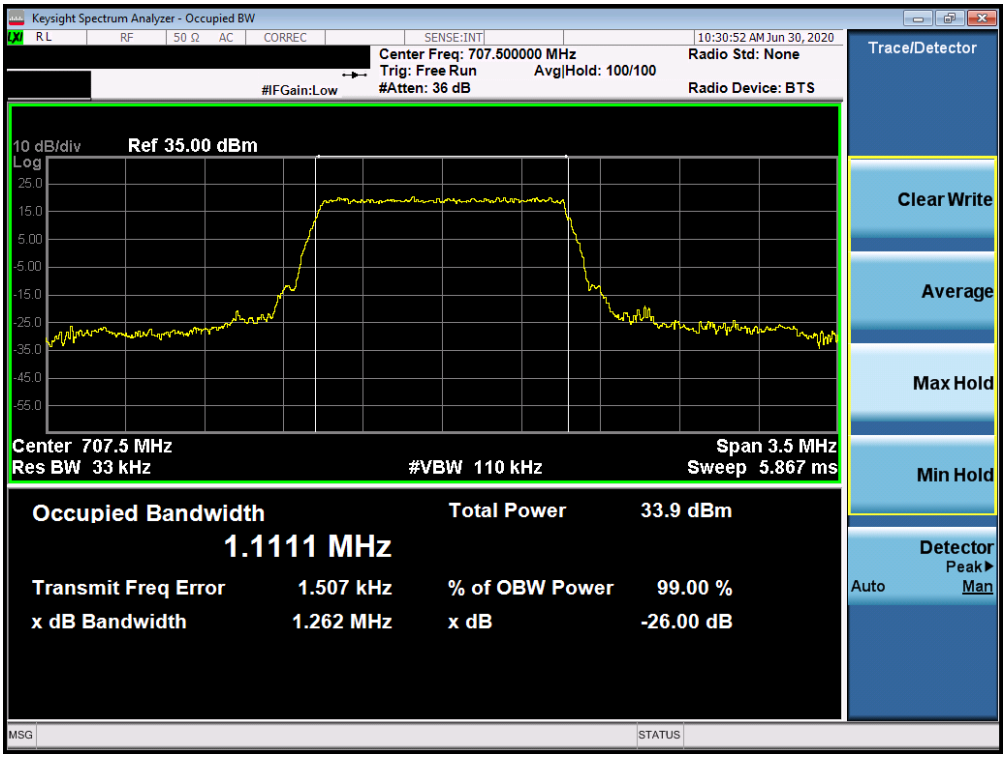


Plot 7-11. Occupied Bandwidth Plot (Band 71 - 20.0MHz 16-QAM - Full RB Configuration)

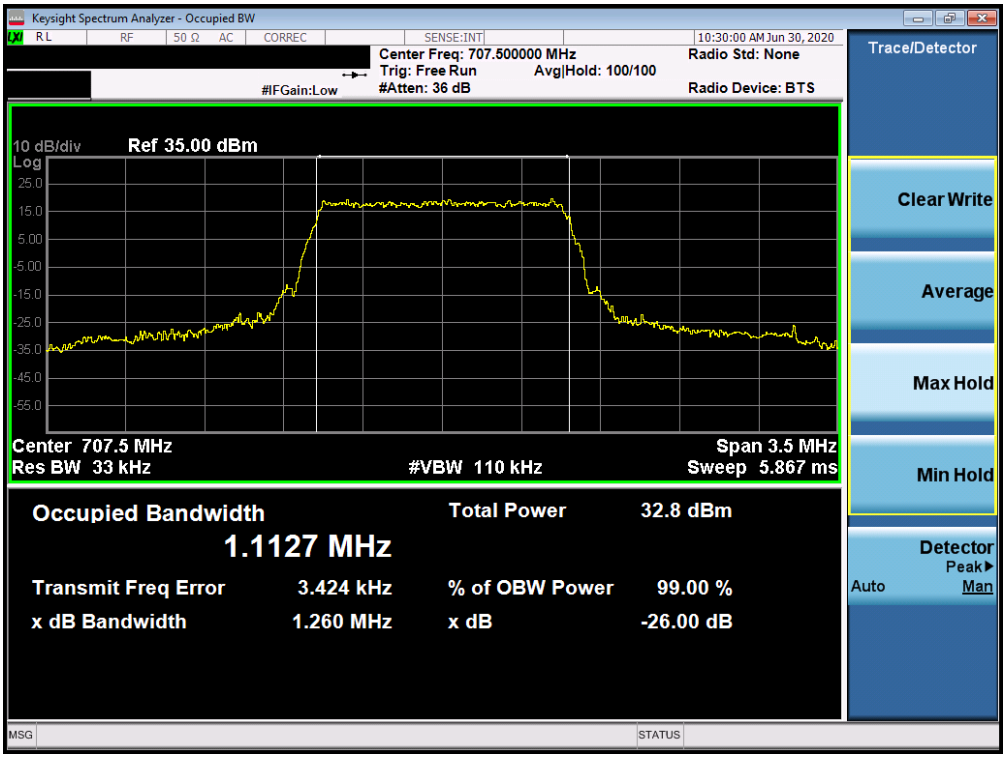


Plot 7-12. Occupied Bandwidth Plot (Band 71 - 20.0MHz 64-QAM - Full RB Configuration)

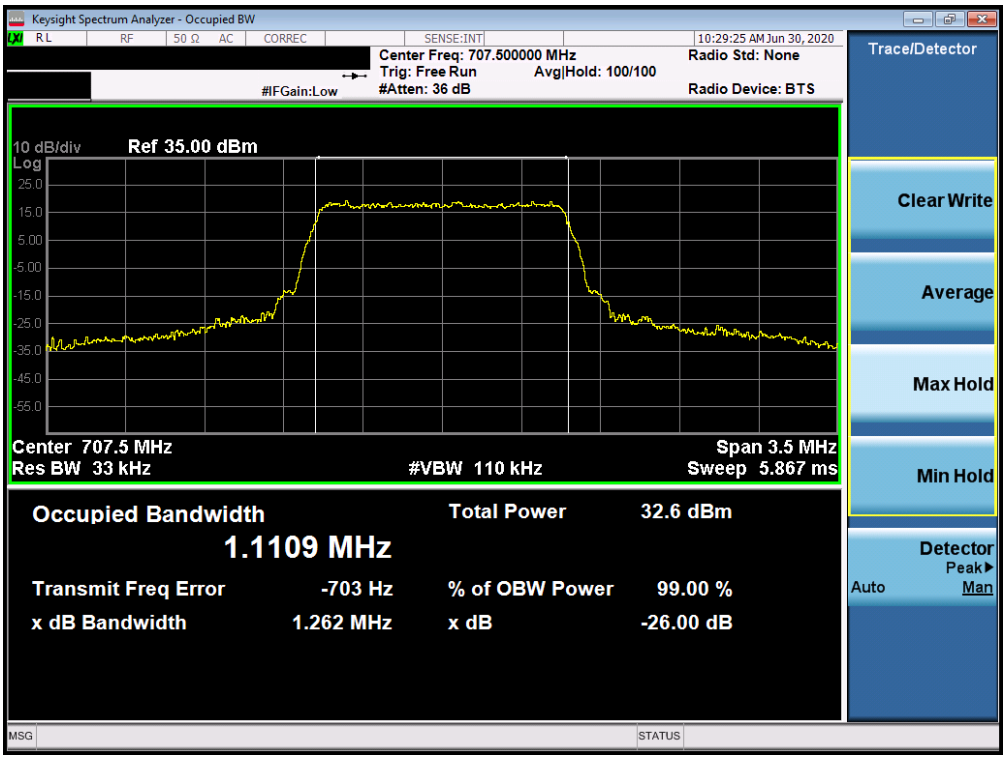
Band 12/17



Plot 7-13. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

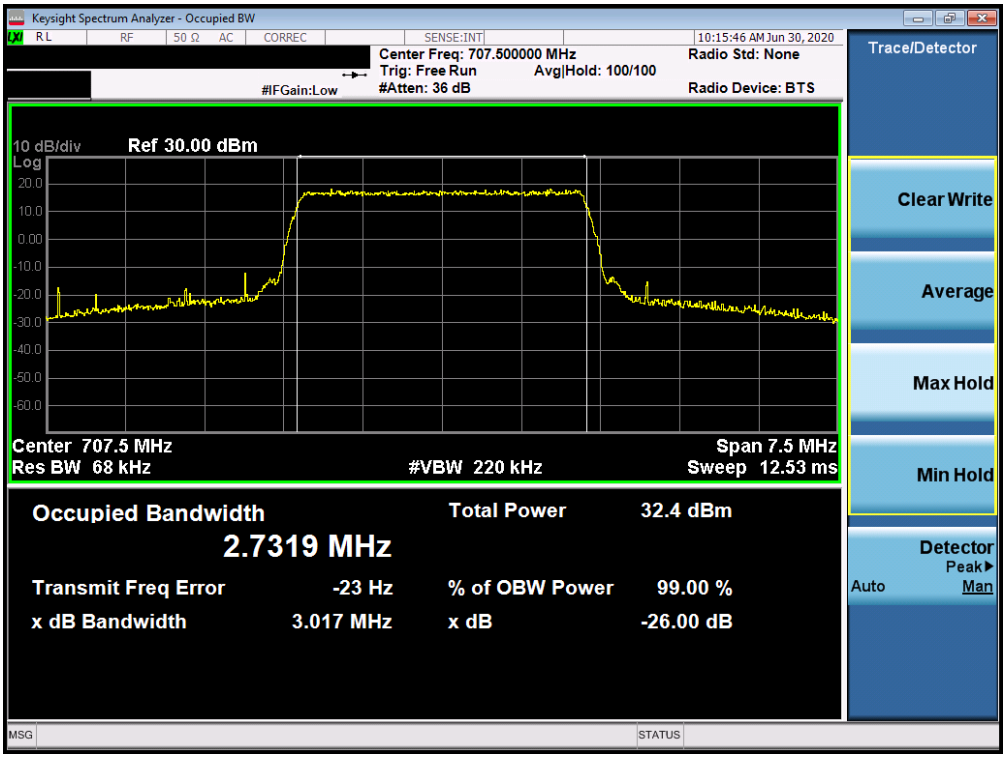


Plot 7-14. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

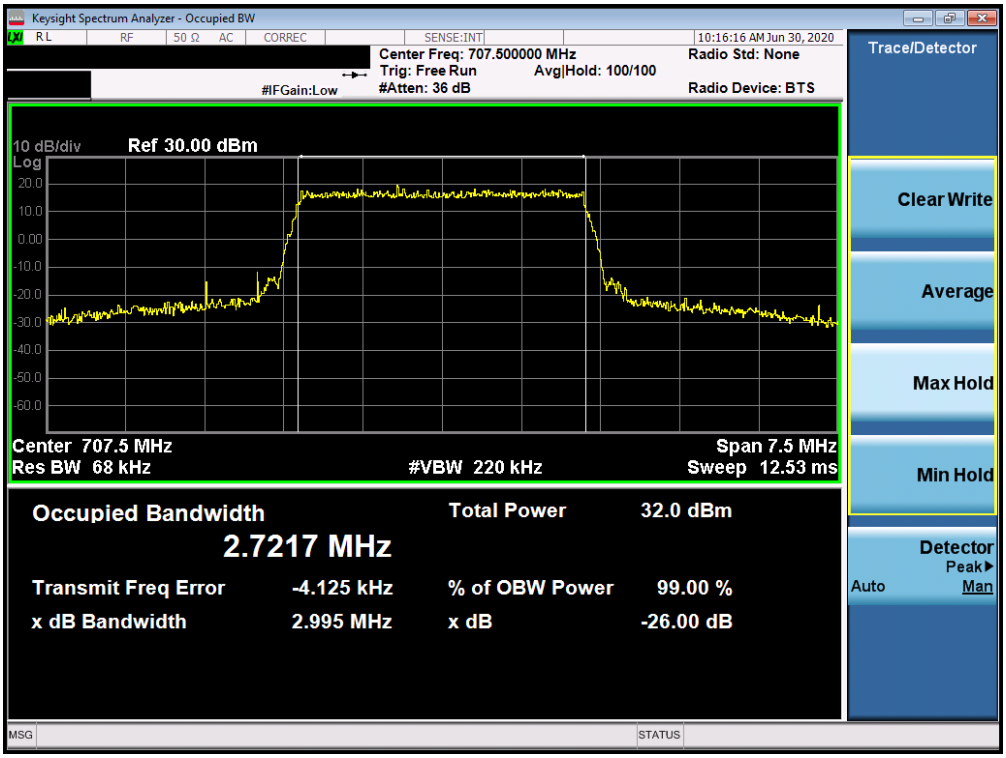


Plot 7-15. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)

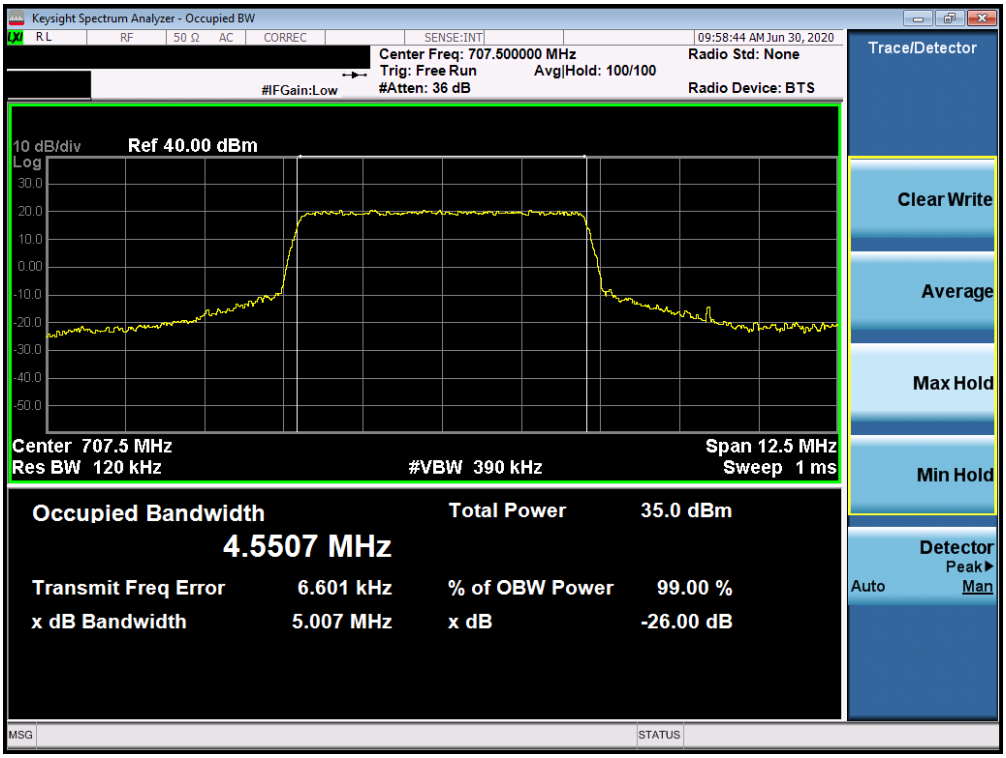
Plot 7-16. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-17. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)

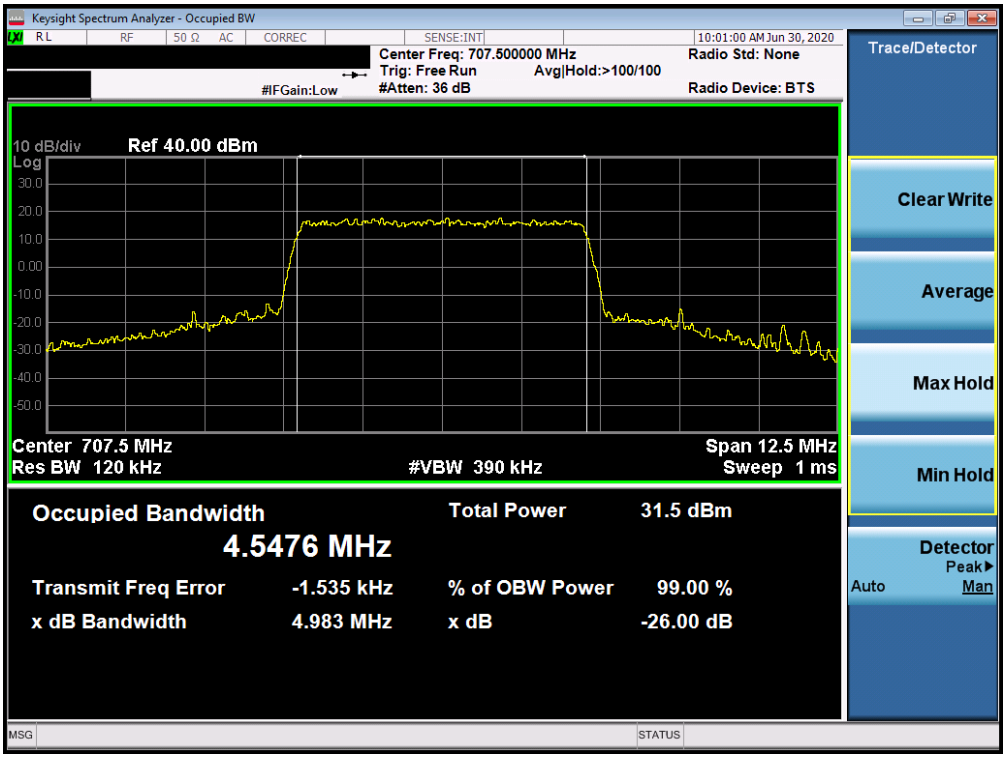


Plot 7-18. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

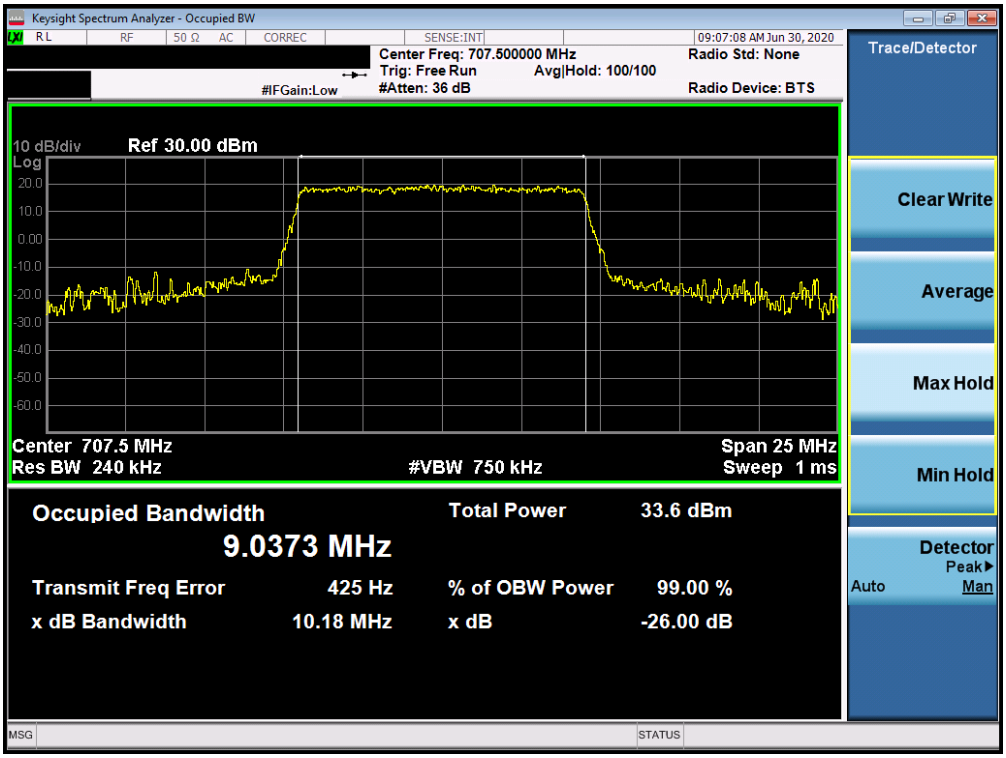


Plot 7-19. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz QPSK - Full RB Configuration)

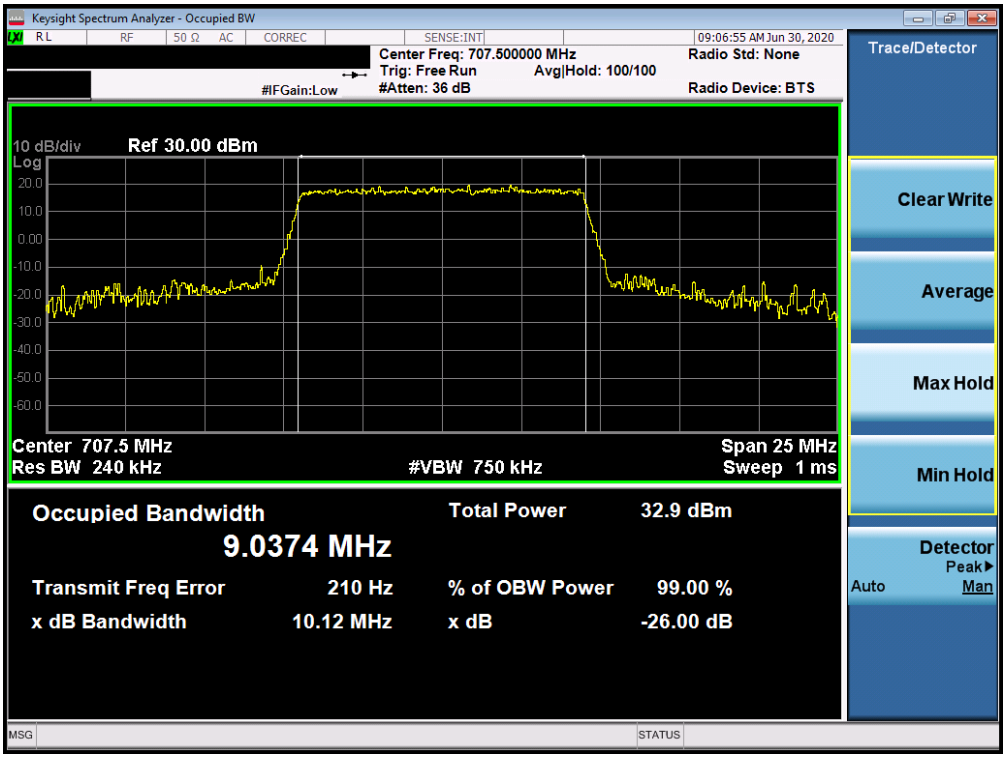
Plot 7-20. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz 16-QAM - Full RB Configuration)



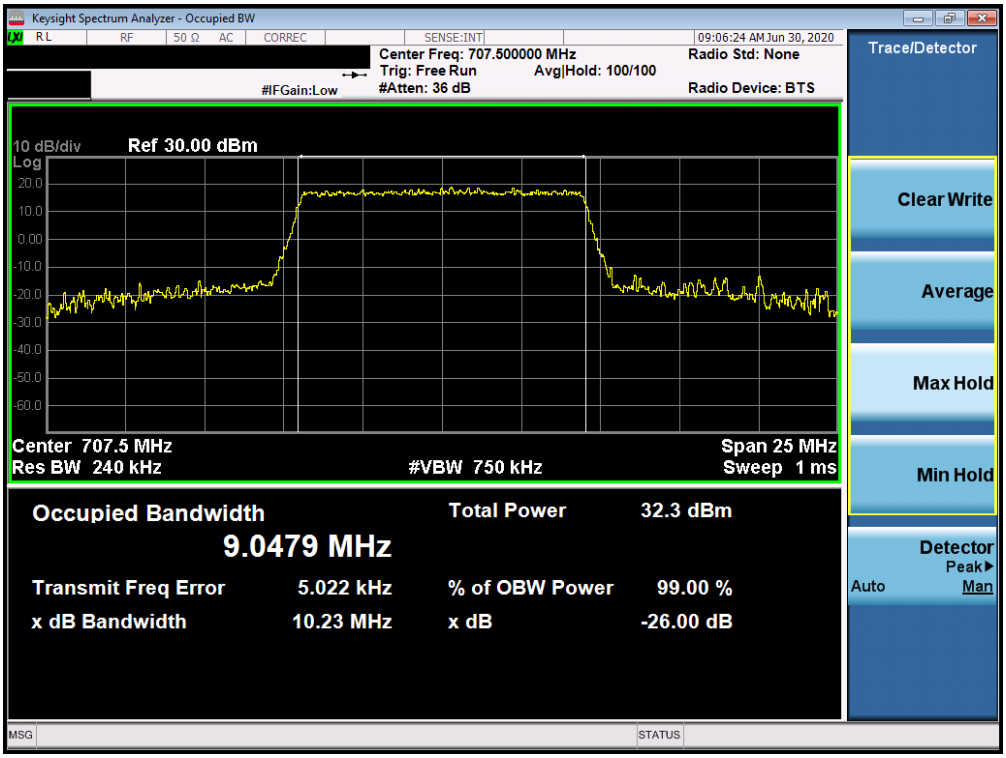
Plot 7-21. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz QPSK - Full RB Configuration)

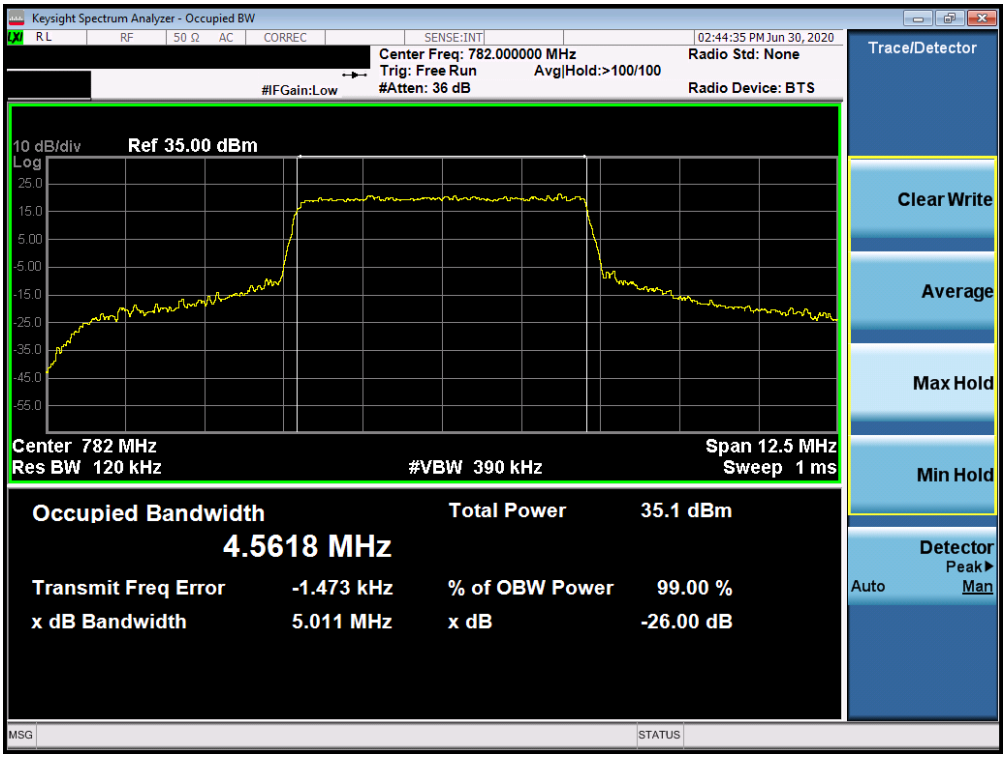


Plot 7-23. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz 16-QAM - Full RB Configuration)

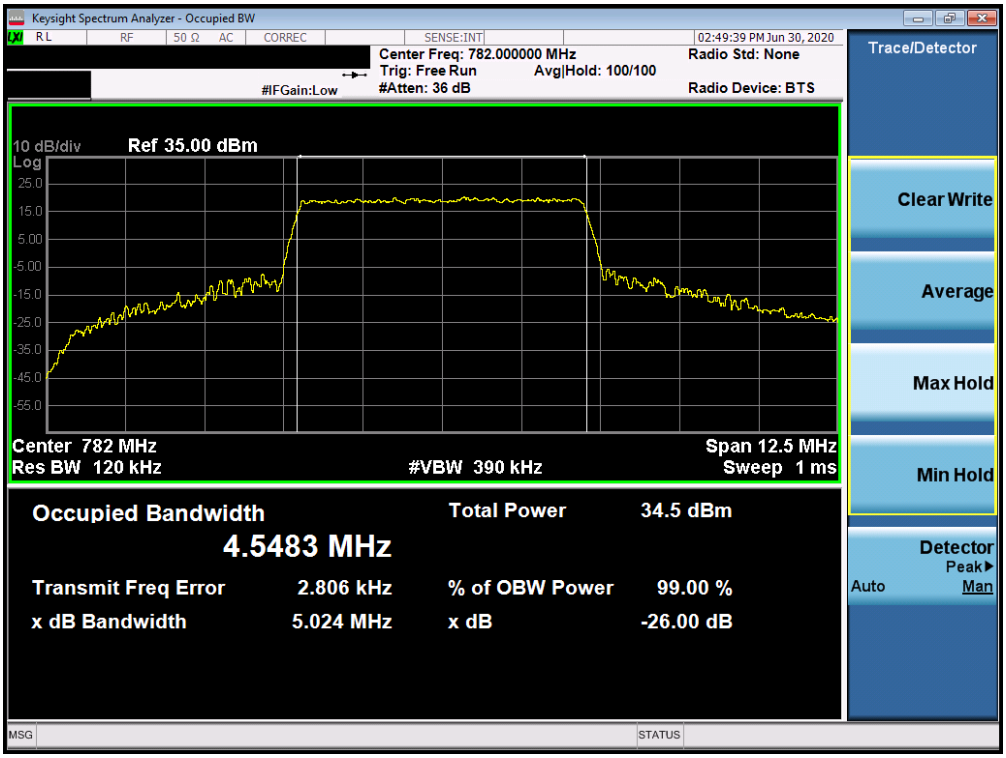


Plot 7-24. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz 64-QAM - Full RB Configuration)

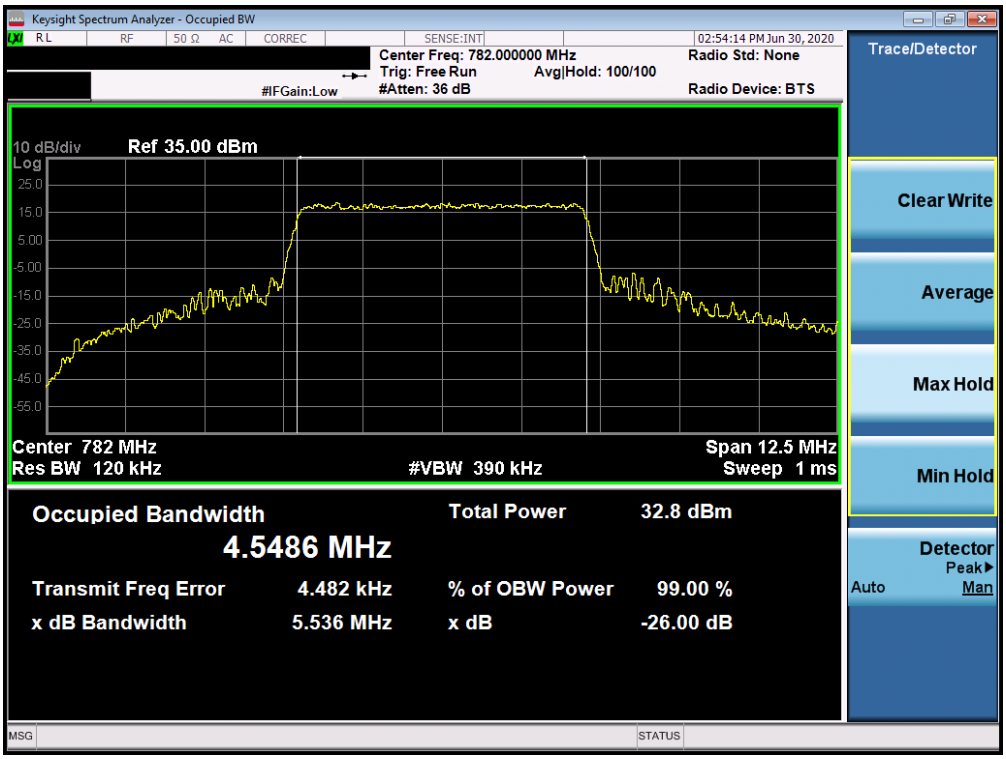
Band 13



Plot 7-25. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

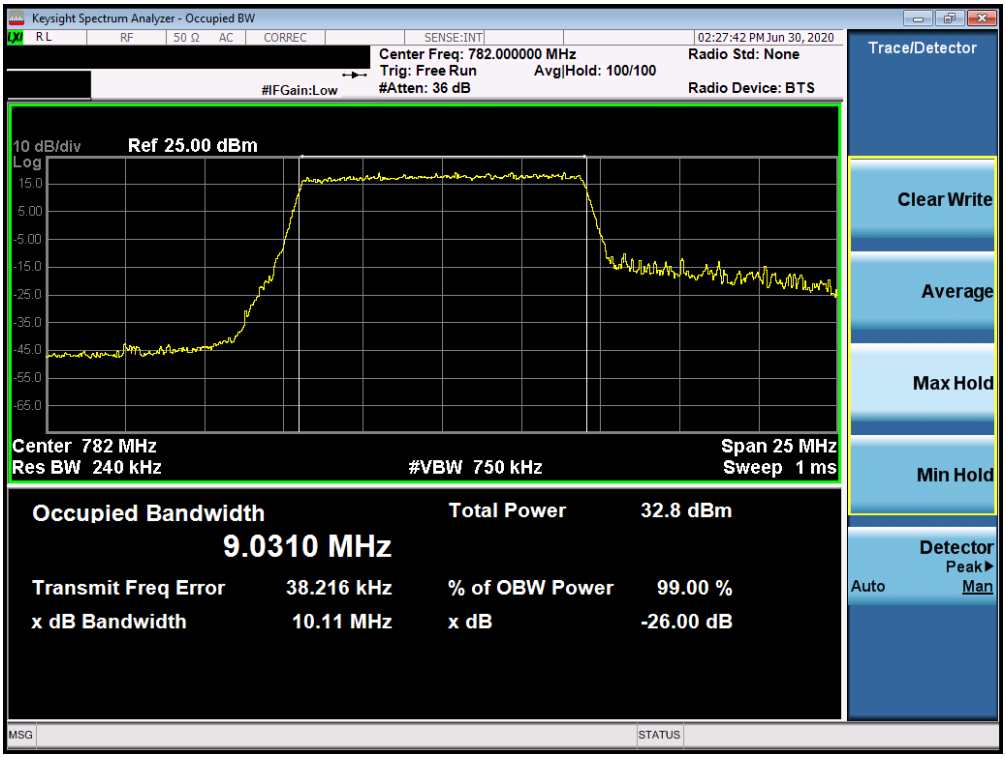


Plot 7-26. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

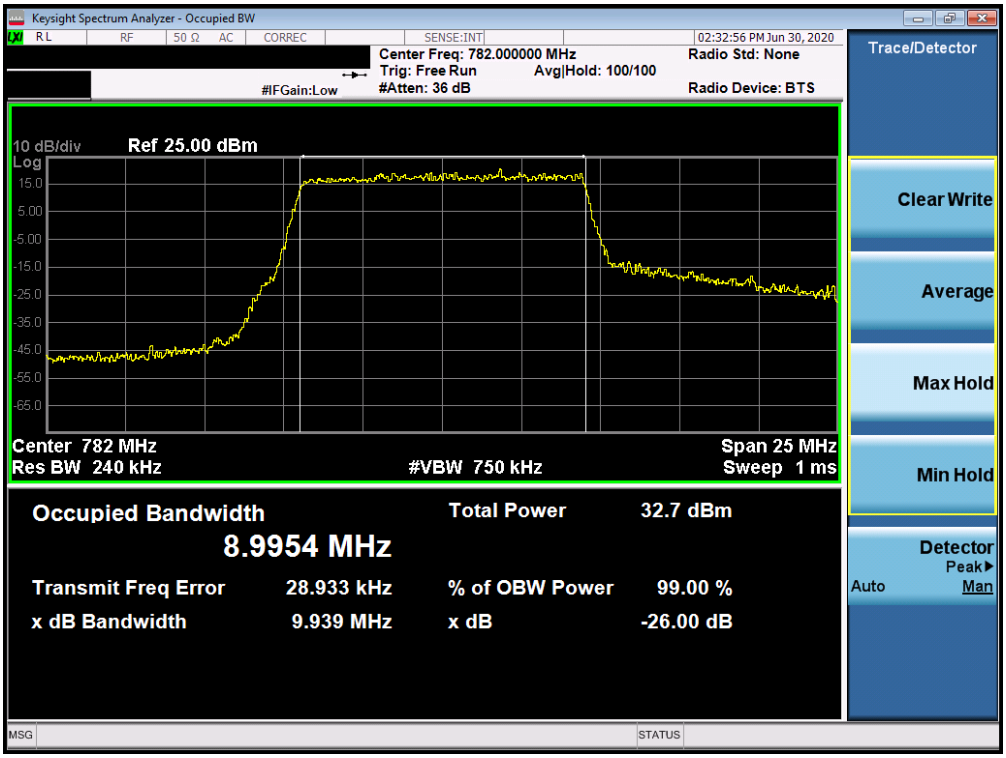


Plot 7-27. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)

Plot 7-28. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

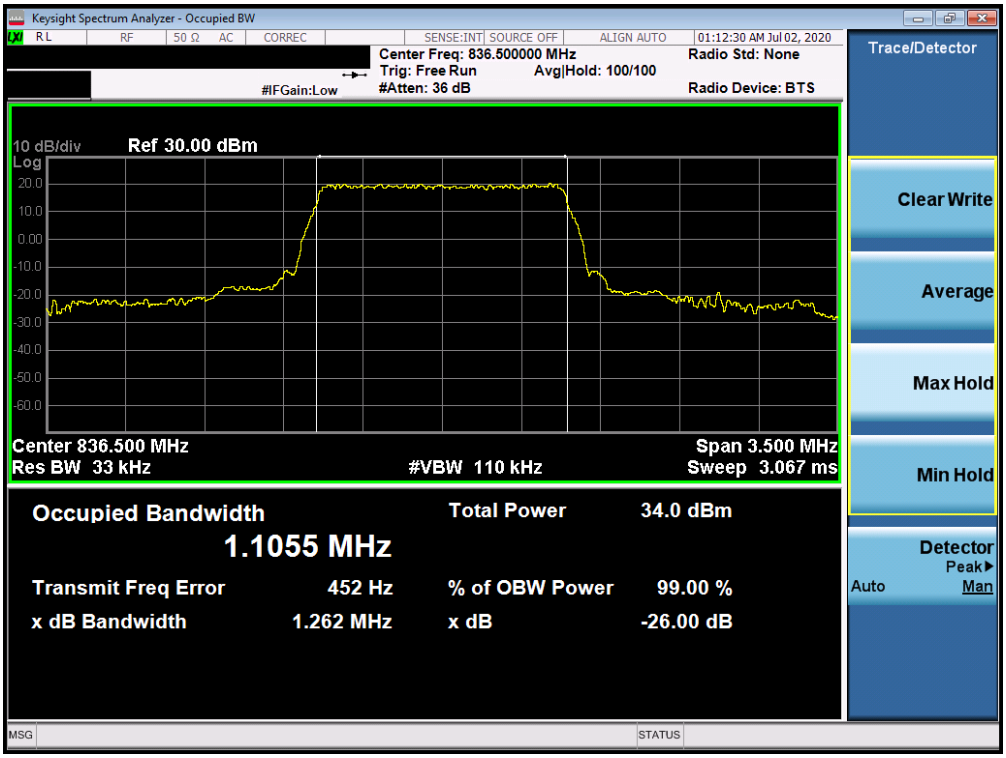


Plot 7-29. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)

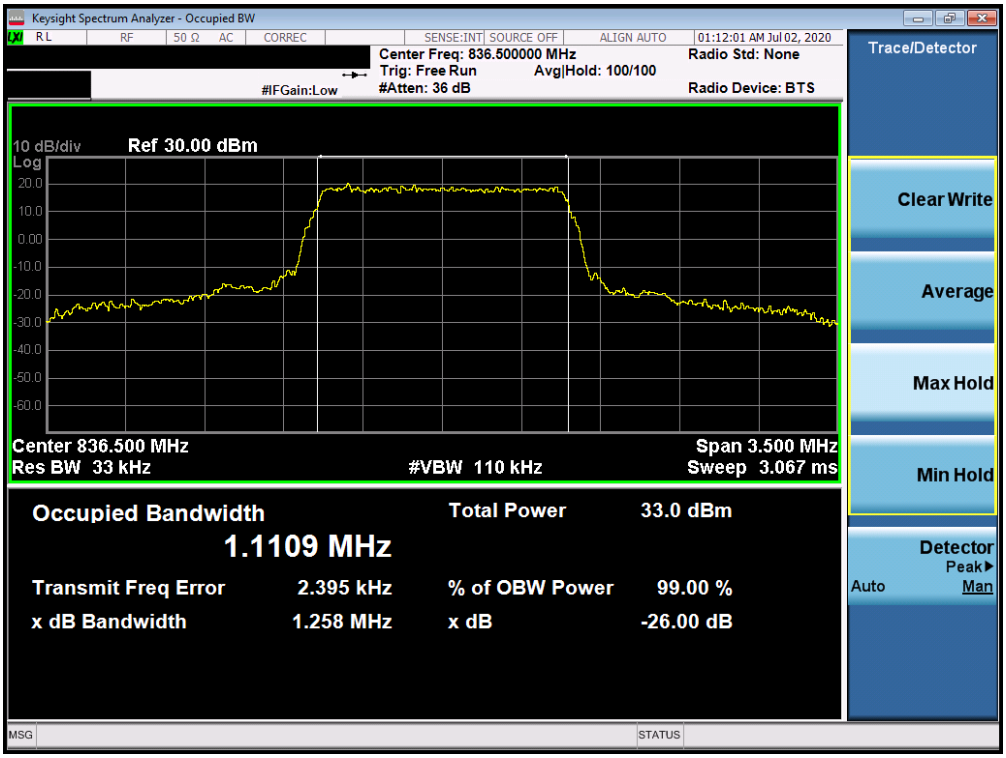


Plot 7-30. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

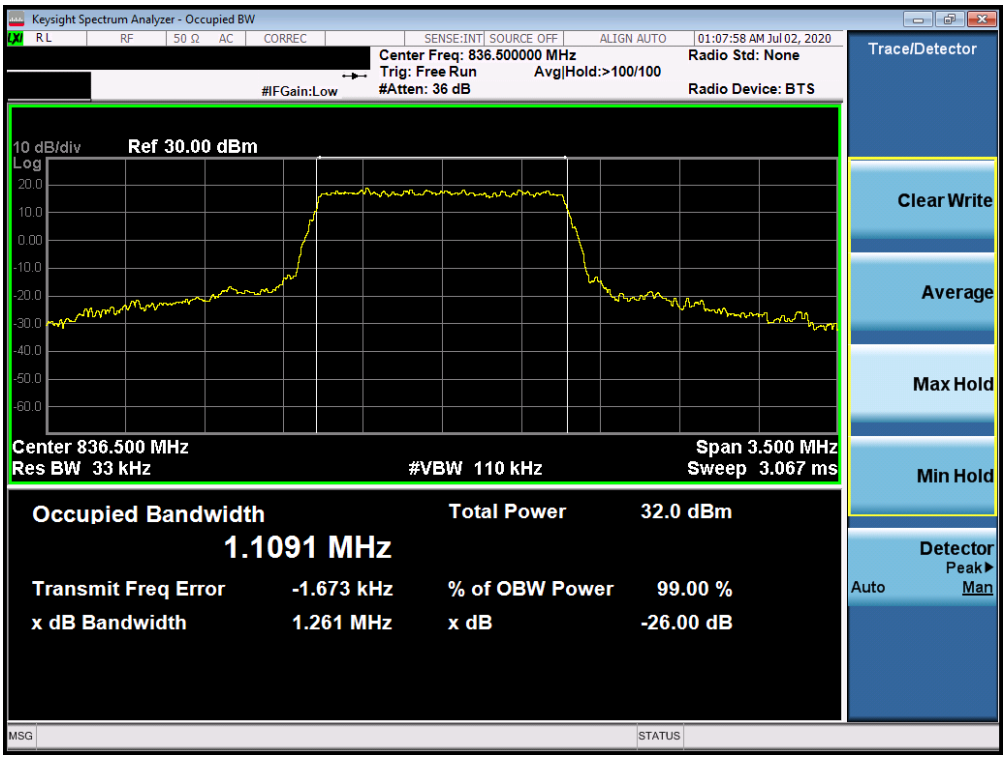
Band 26/5



Plot 7-31. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

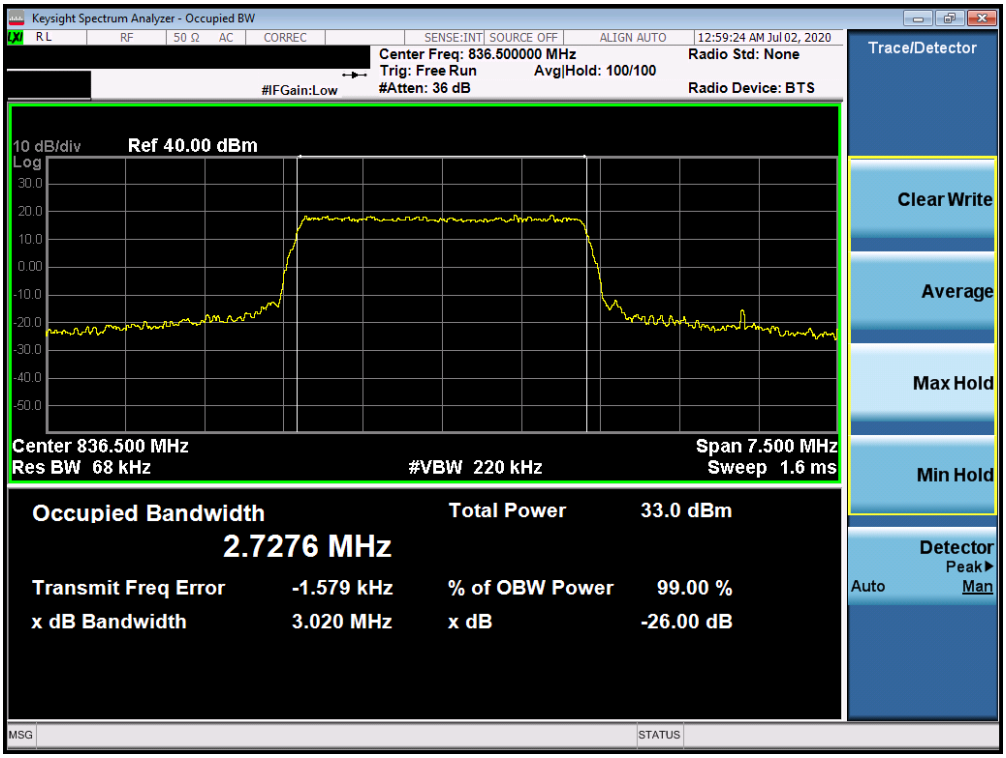


Plot 7-32. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

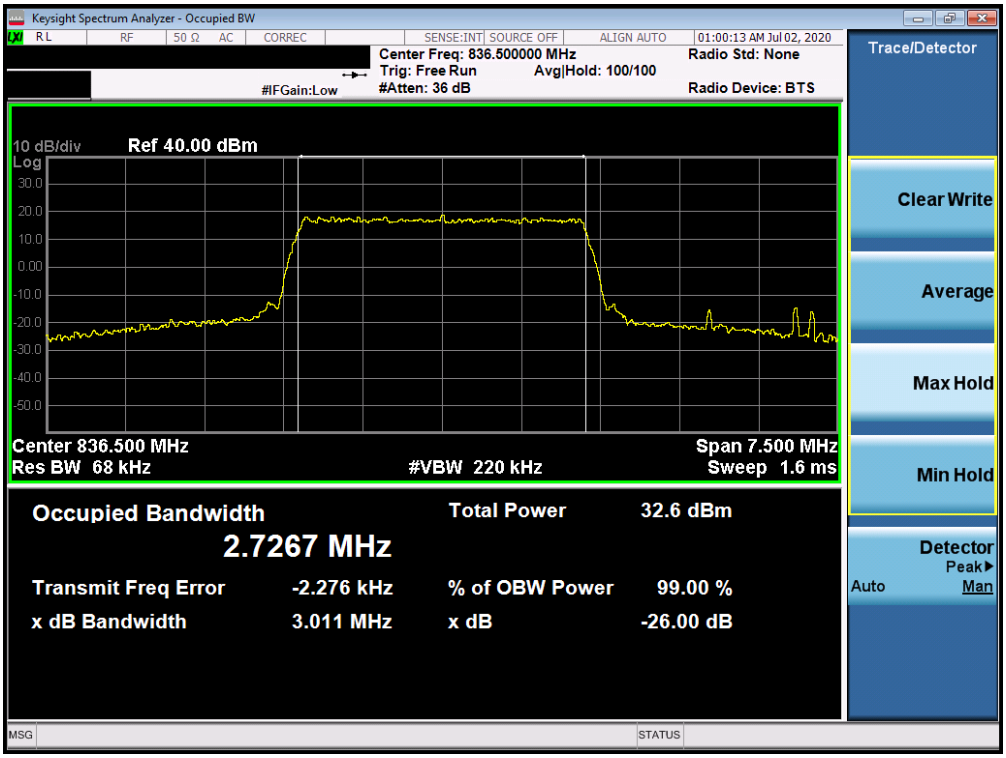


Plot 7-33. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 64-QAM - Full RB Configuration)

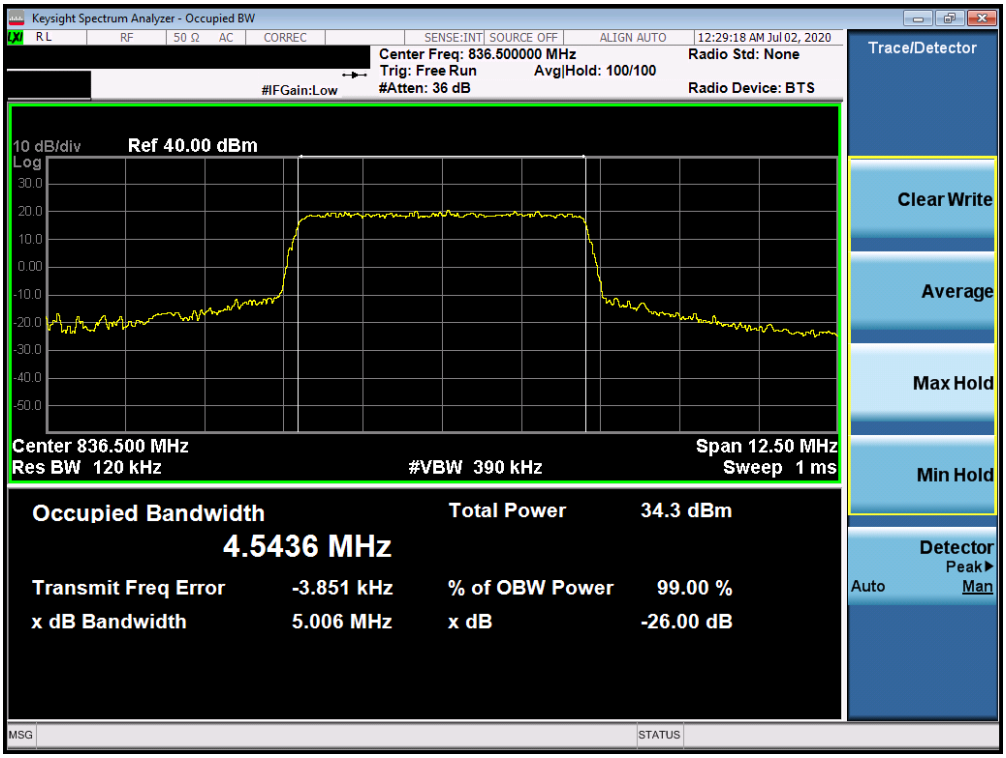
Plot 7-34. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)



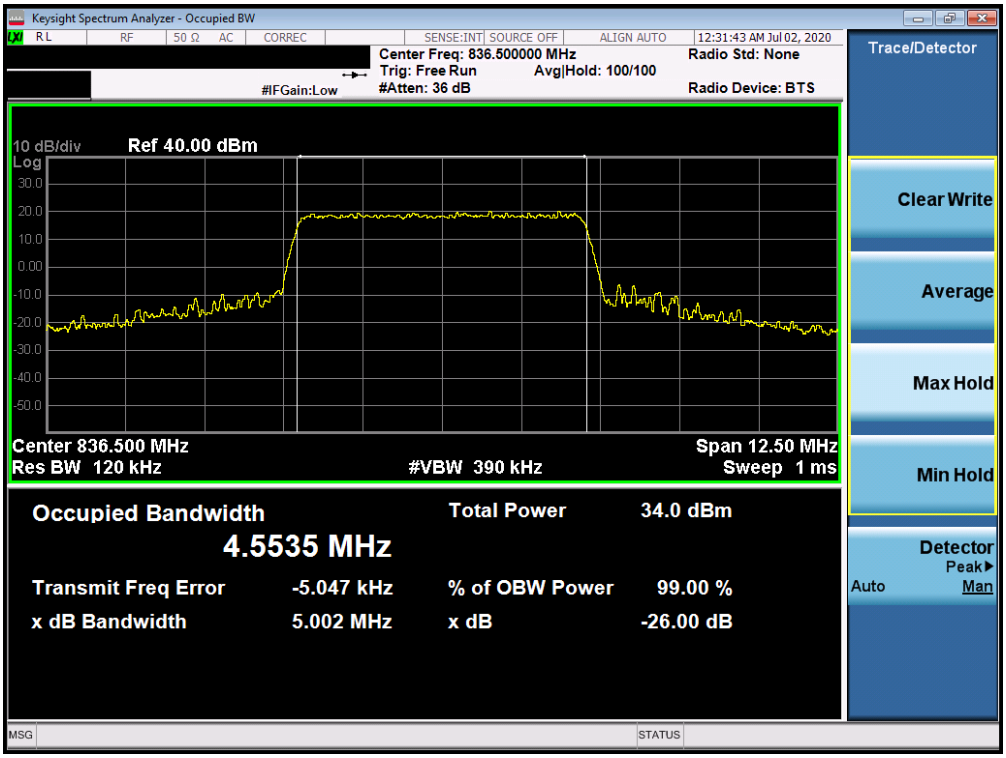
Plot 7-35. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)



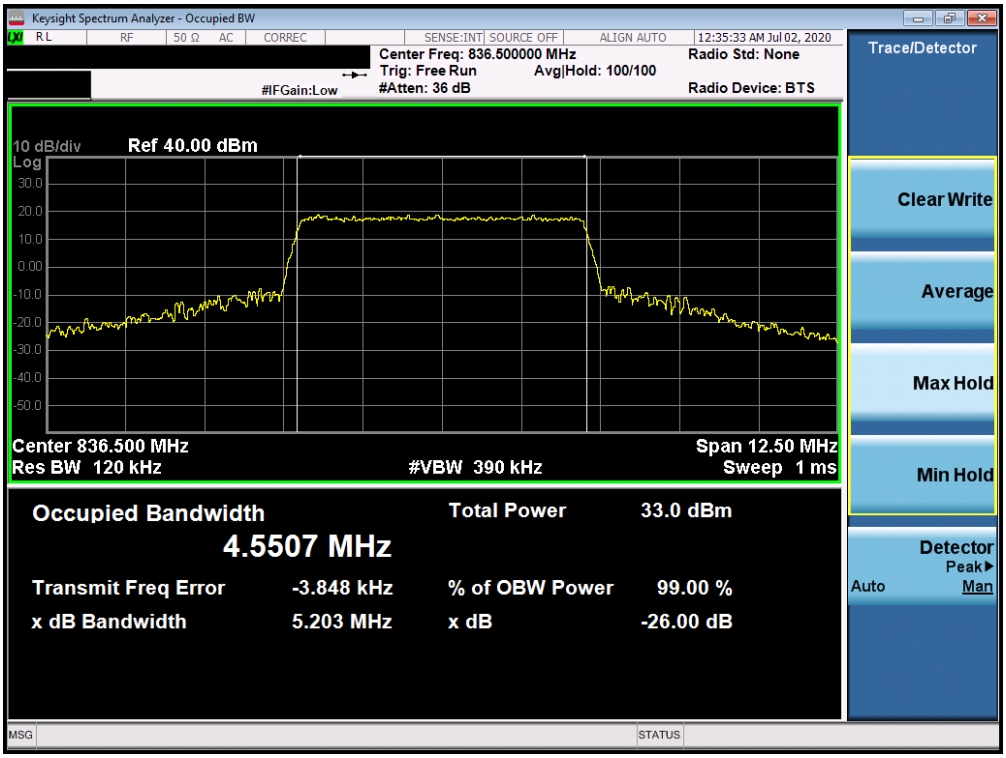
Plot 7-36. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 64-QAM - Full RB Configuration)



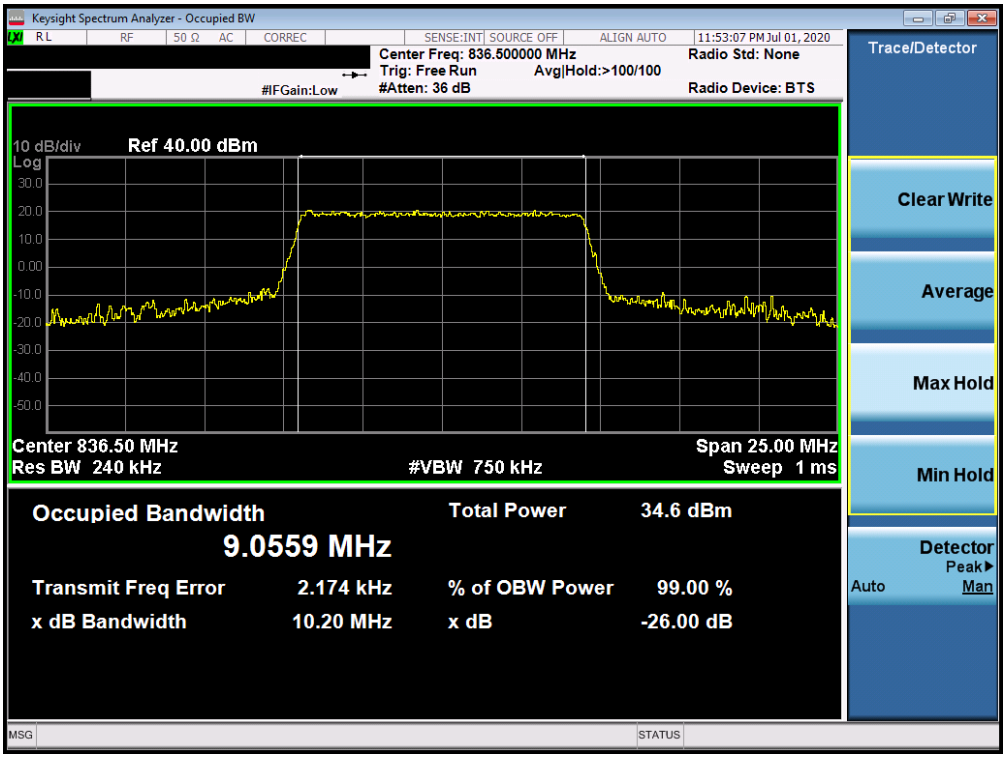
Plot 7-37. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)



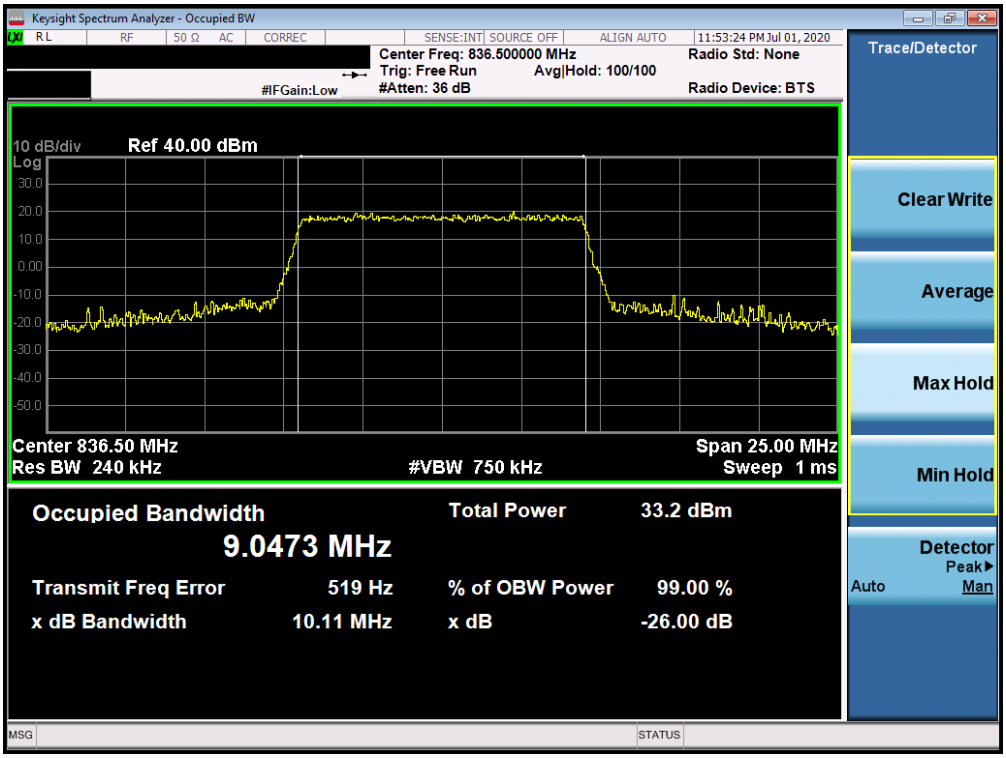
Plot 7-38. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)



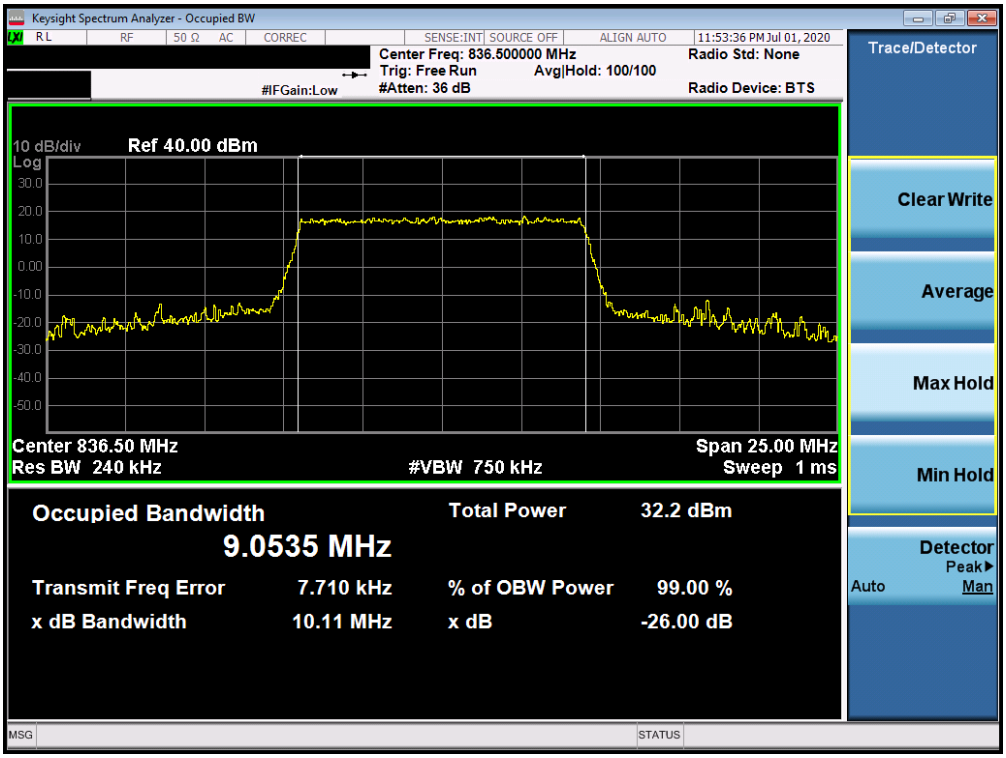
Plot 7-39. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-40. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

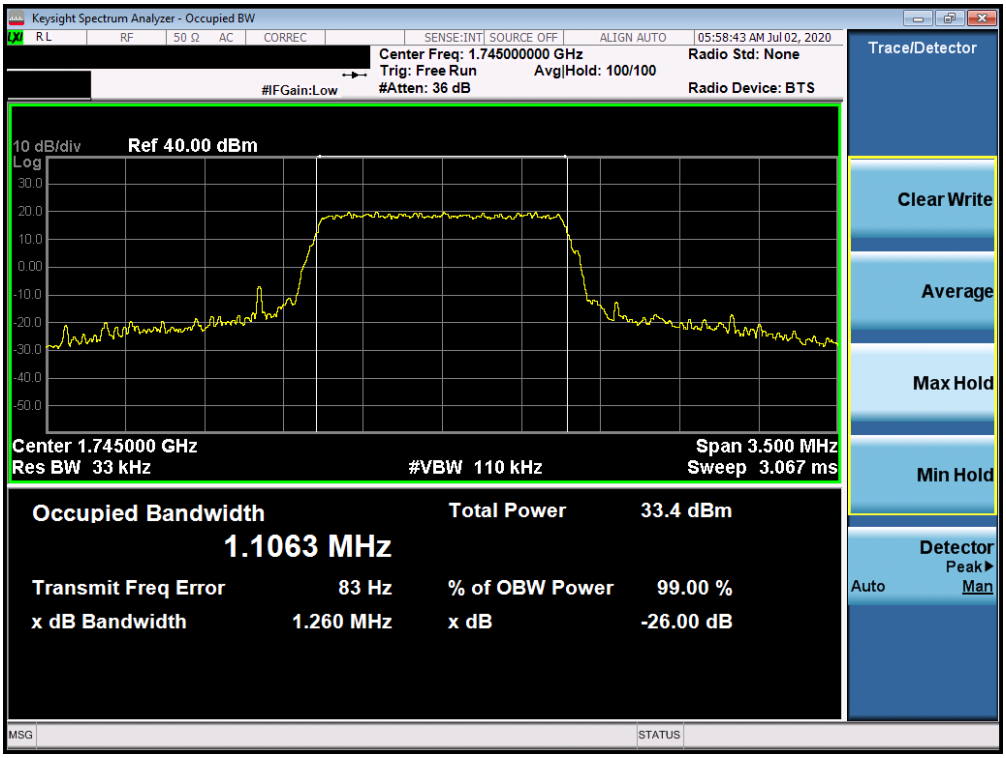


Plot 7-41. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)

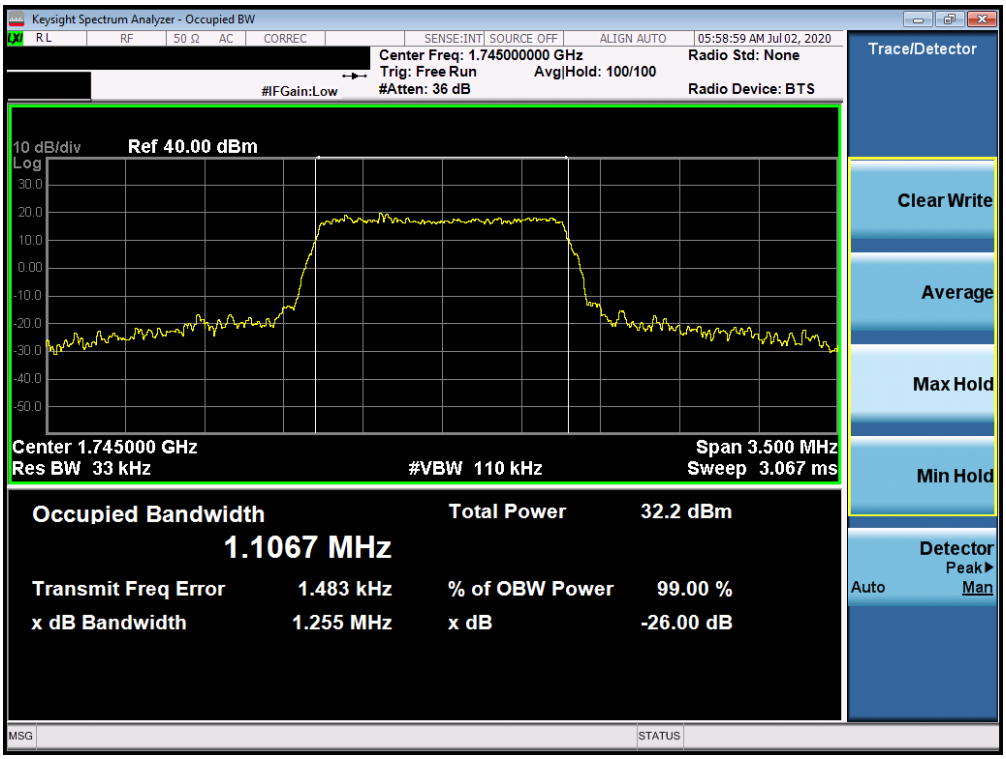


Plot 7-42. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 64-QAM - Full RB Configuration)

Band 66/4



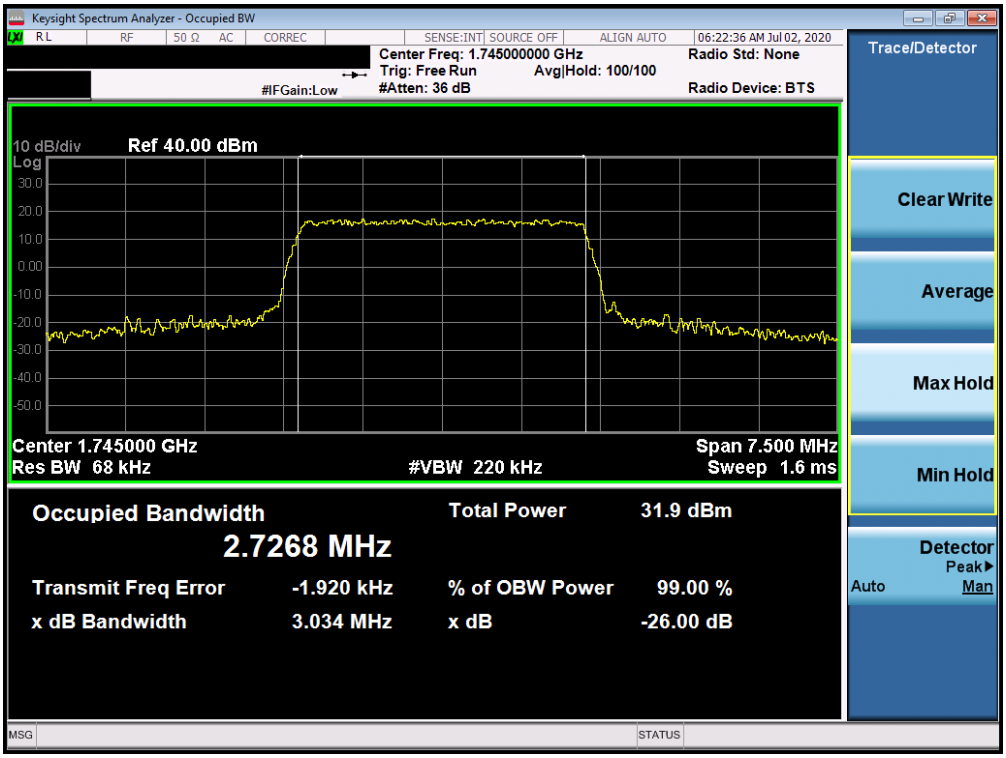
Plot 7-43. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



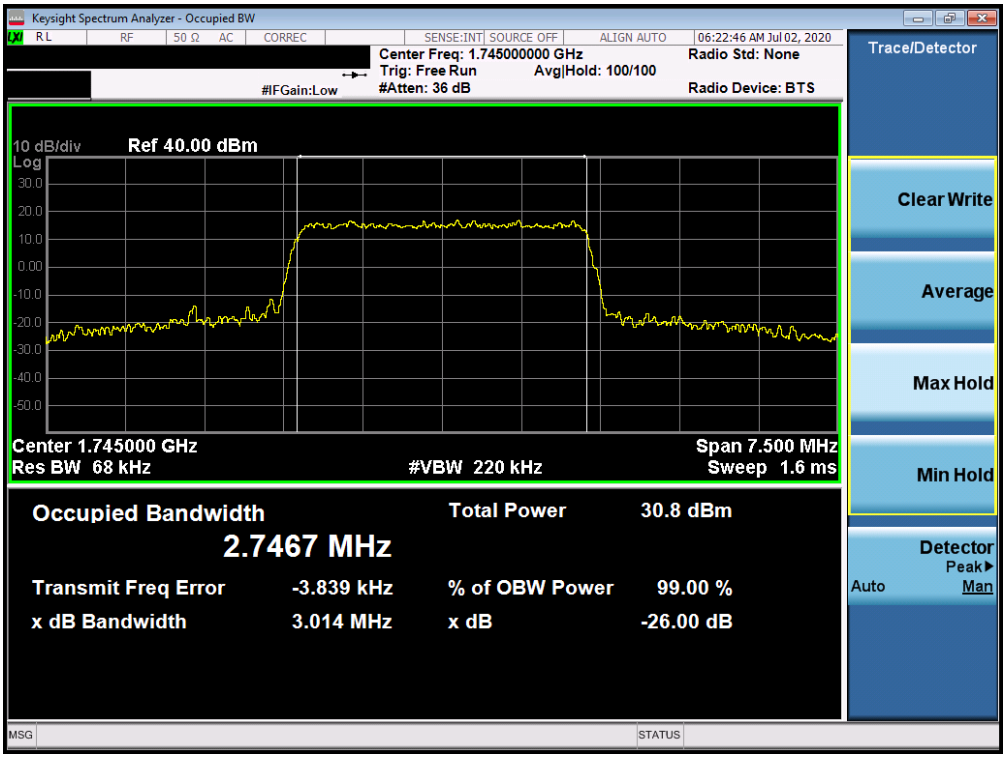
Plot 7-44. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

Plot 7-45. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

Plot 7-46. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

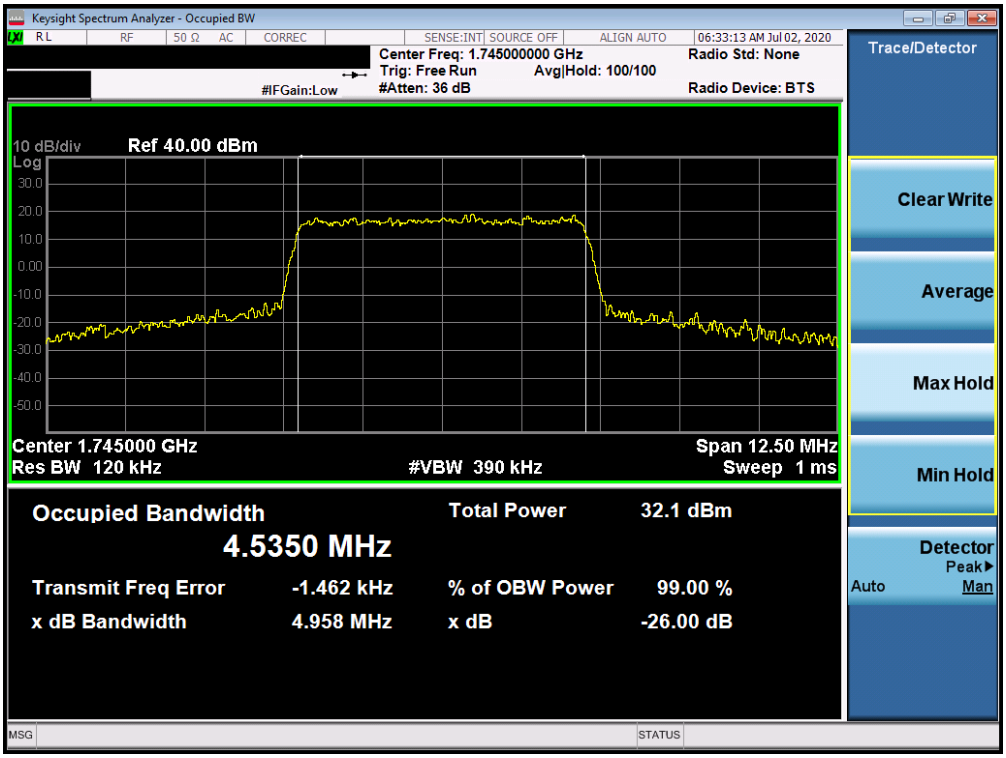


Plot 7-47. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

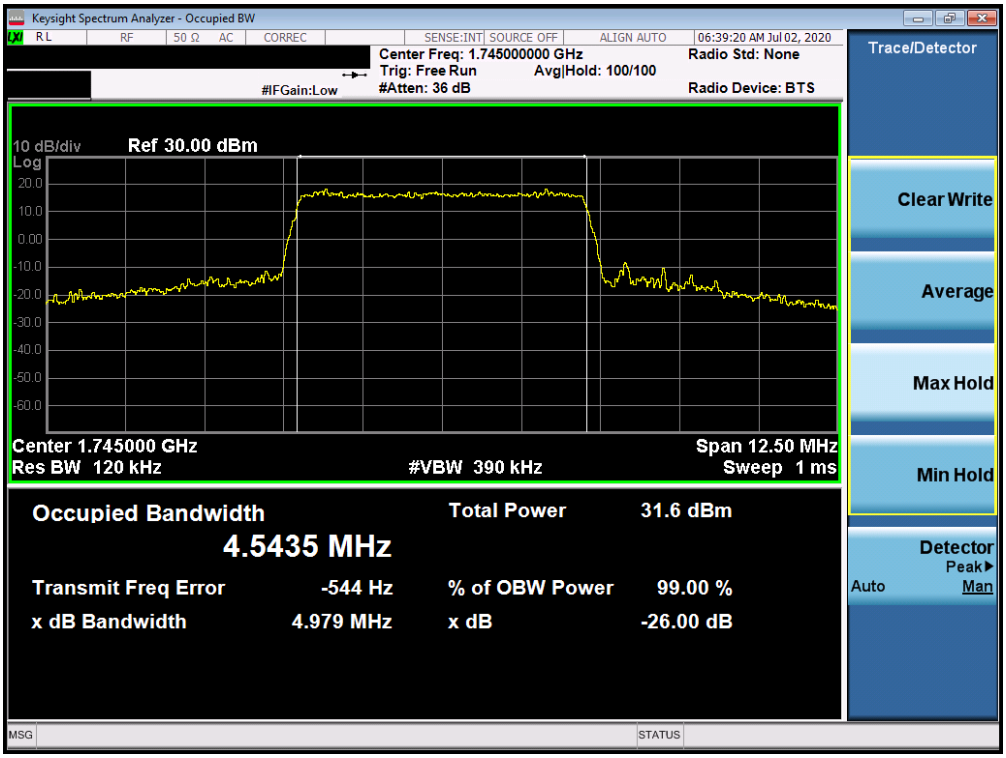


Plot 7-48. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

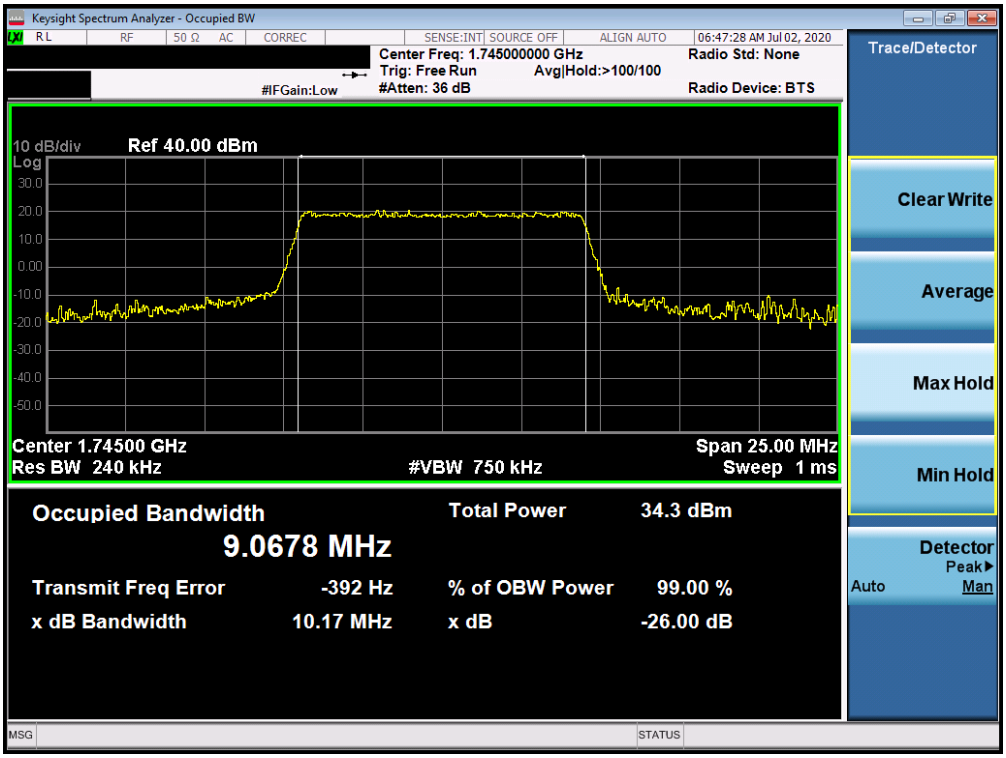
Plot 7-49. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



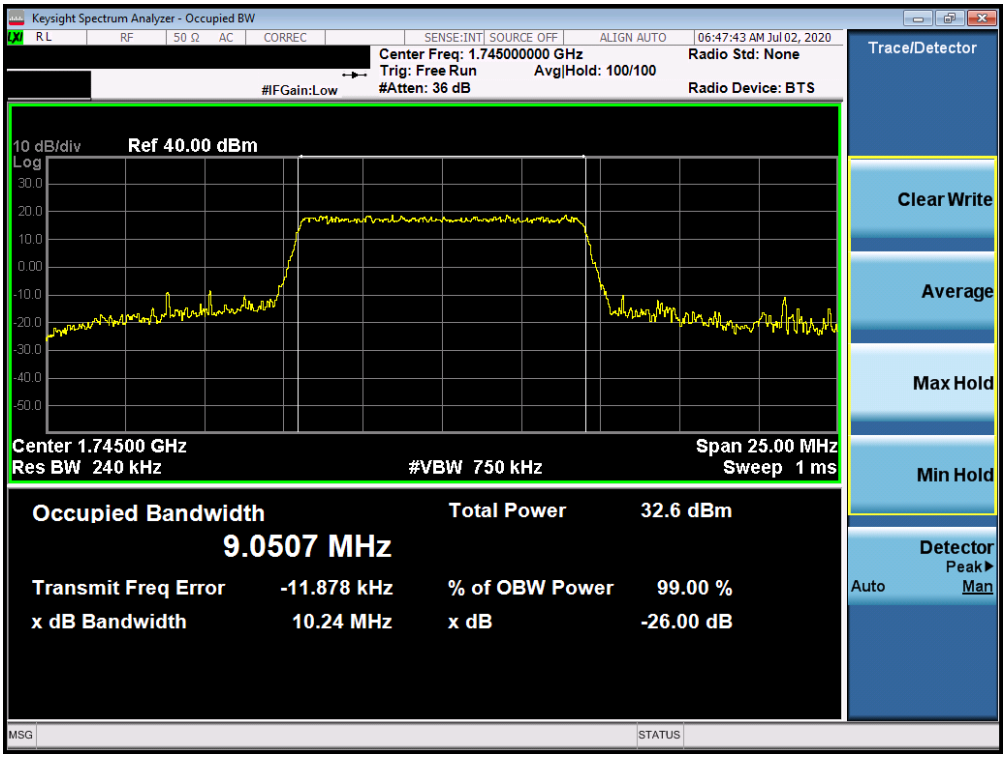
Plot 7-50. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)



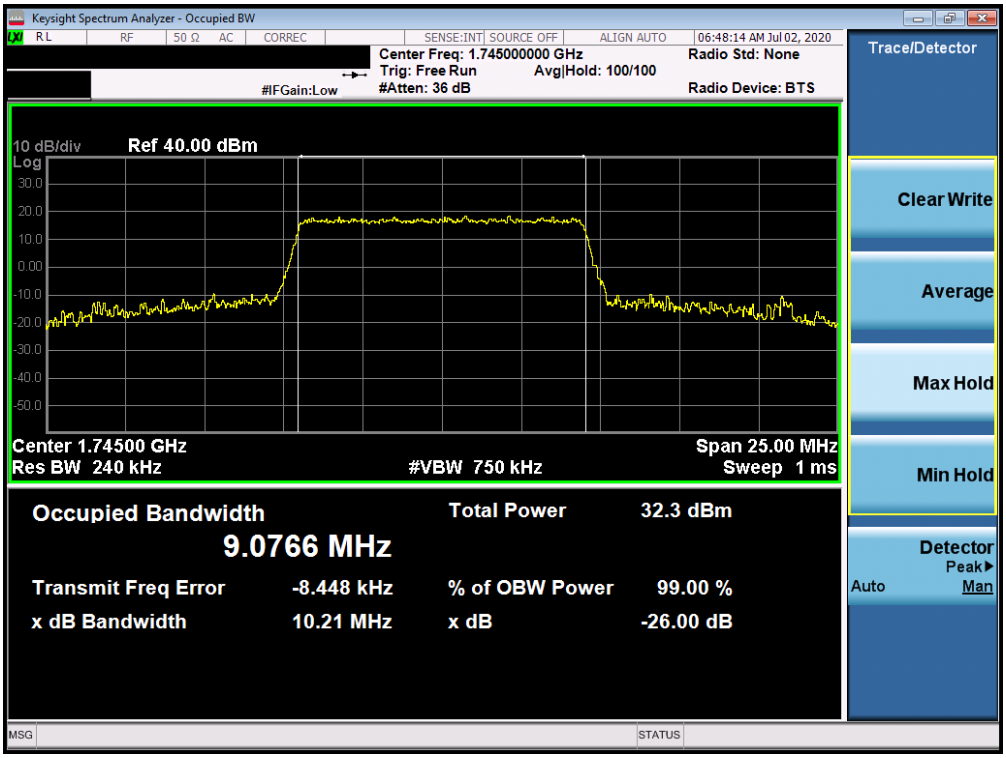
Plot 7-51. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)



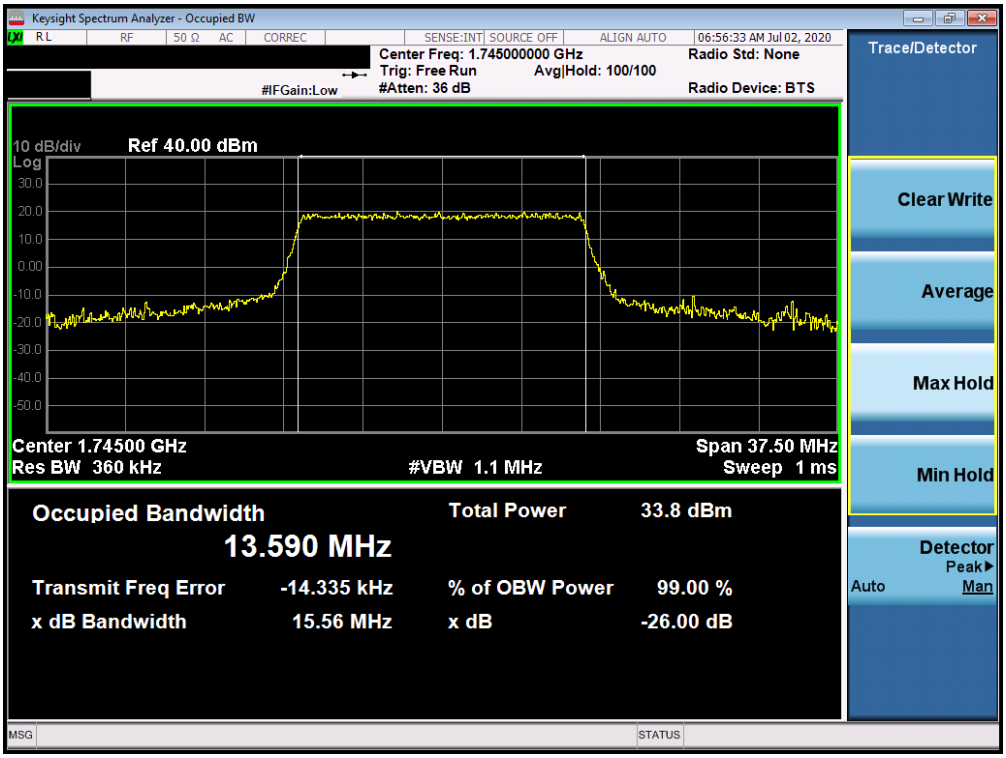
Plot 7-52. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



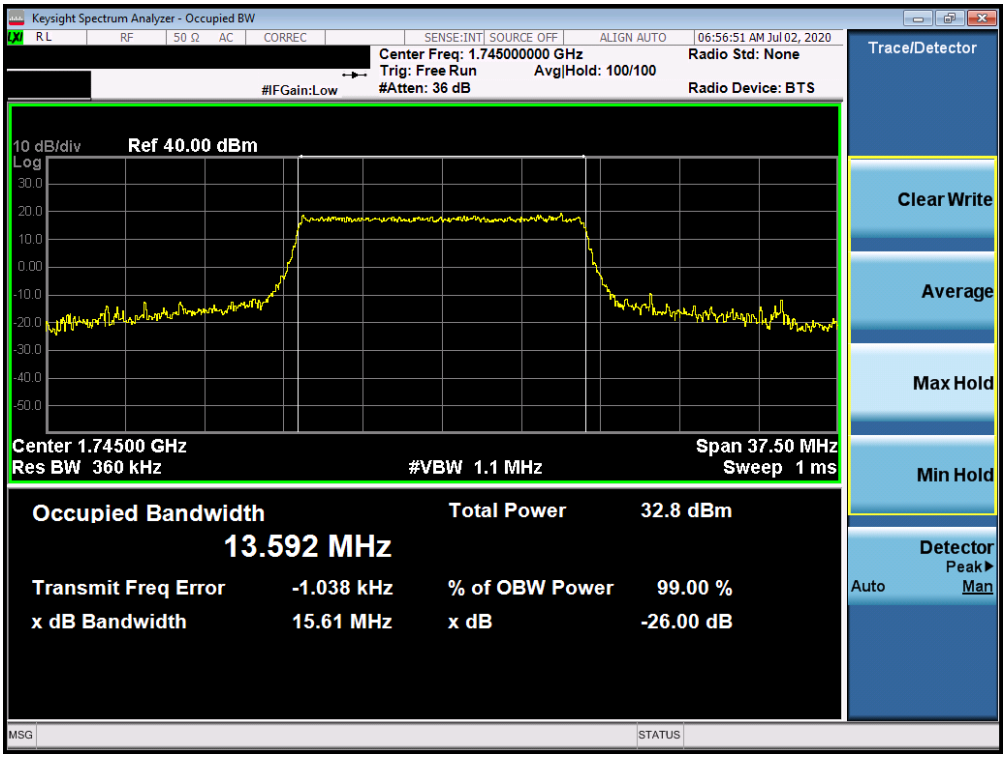
Plot 7-53. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)



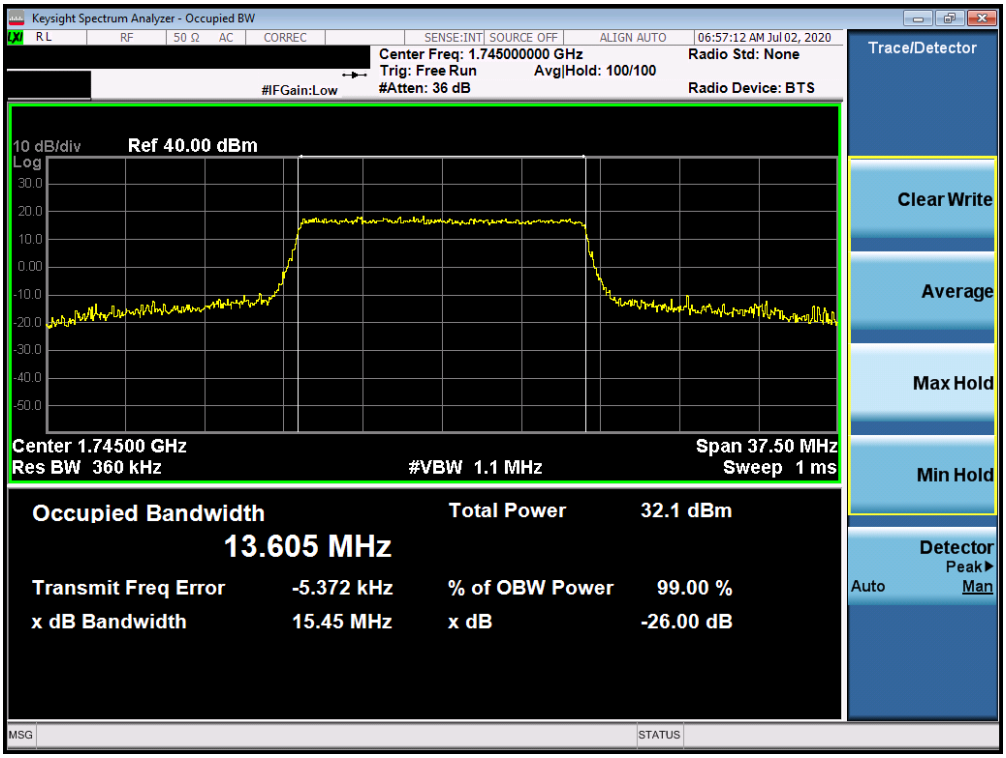
Plot 7-54. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)



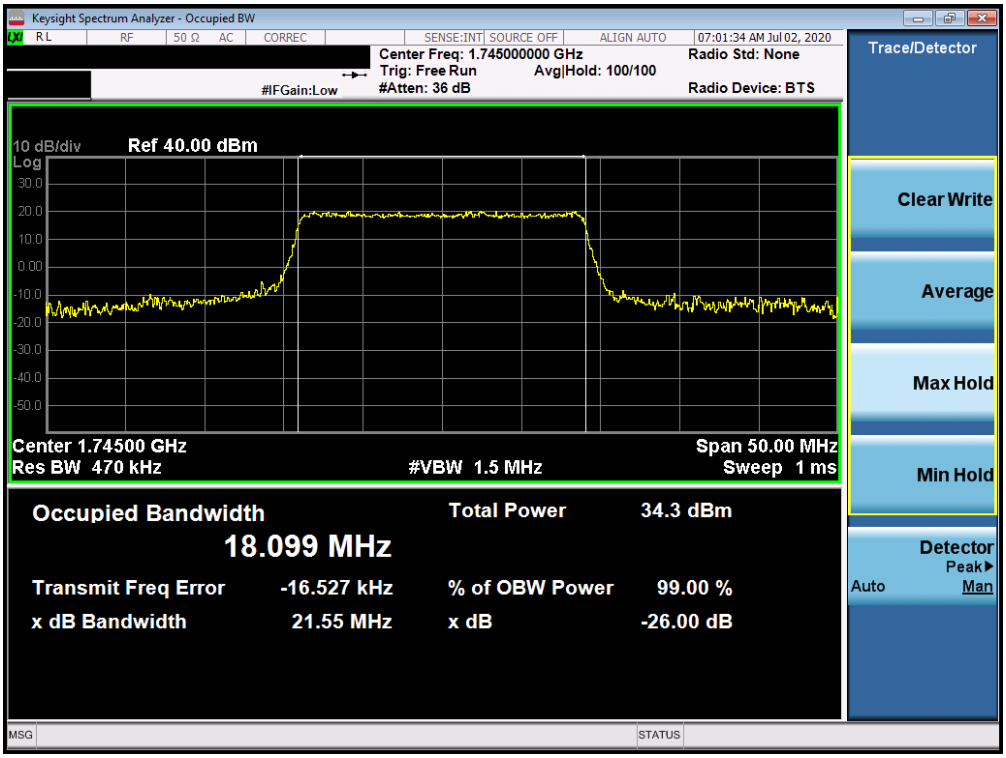
Plot 7-55. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



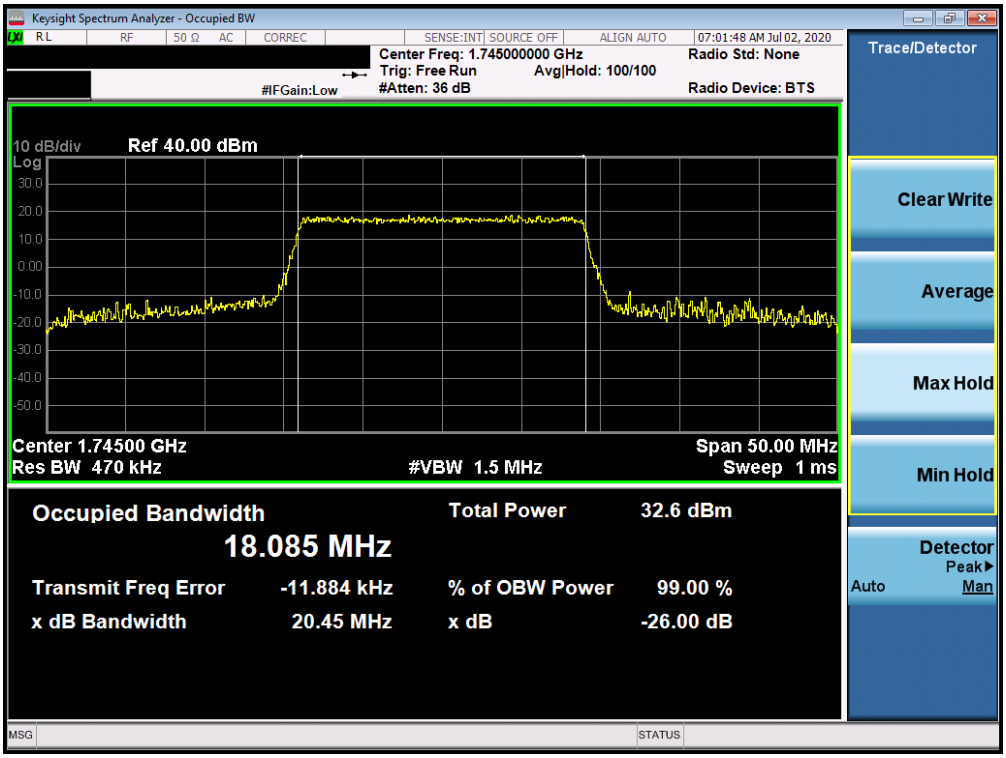
Plot 7-56. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)



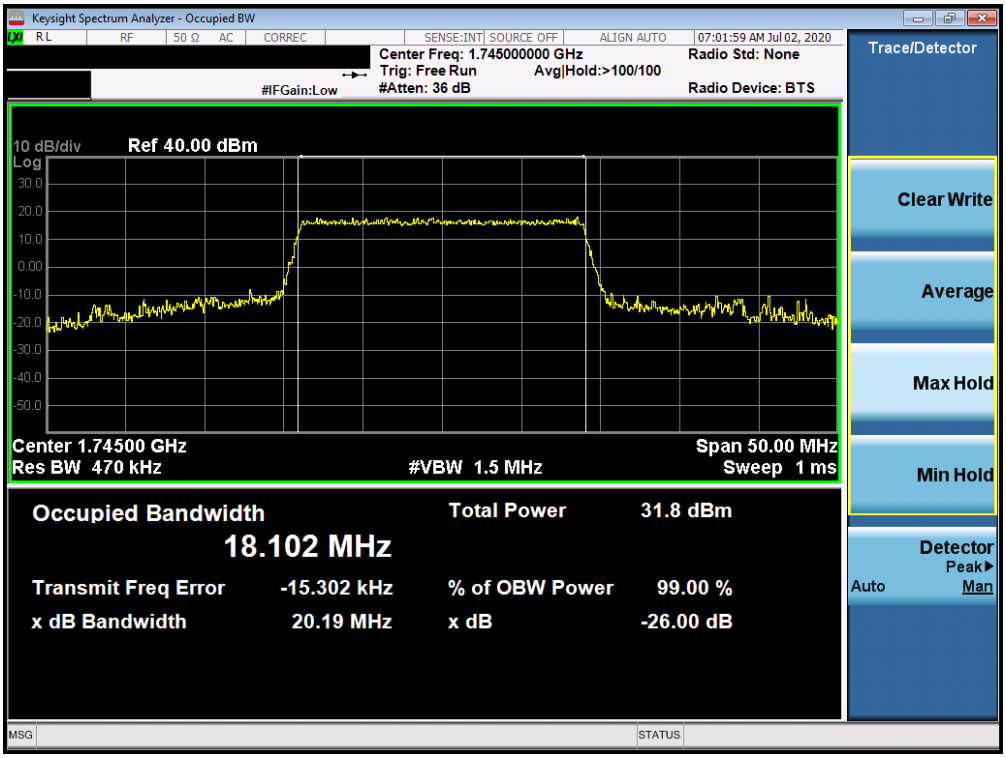
Plot 7-57. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-58. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

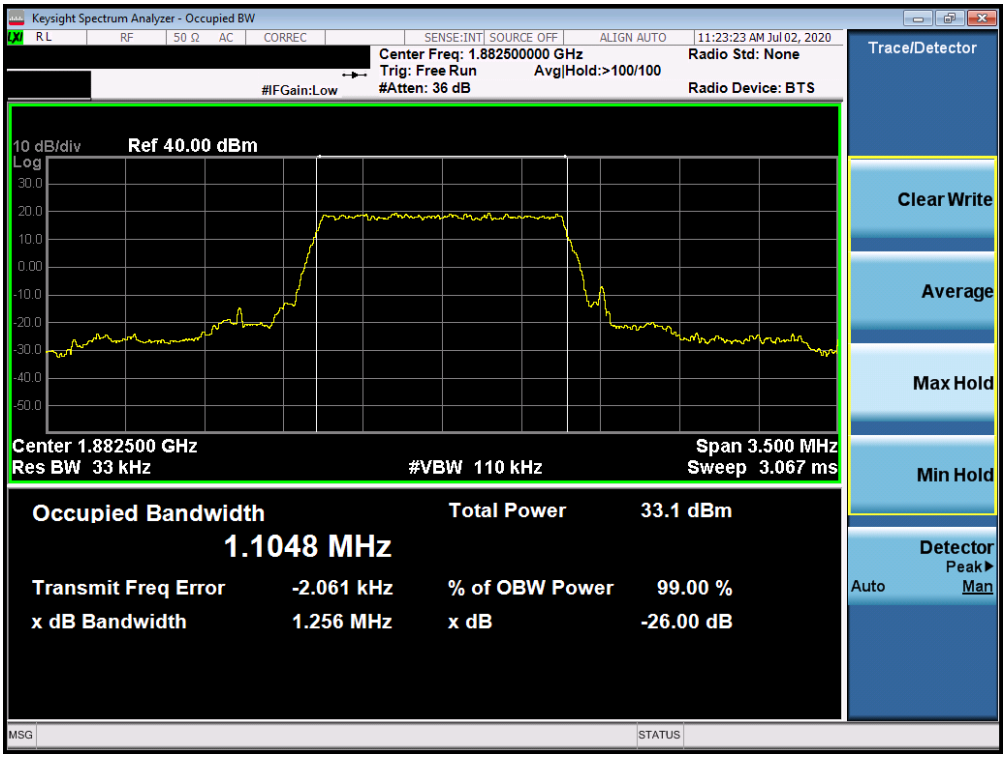


Plot 7-59. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)

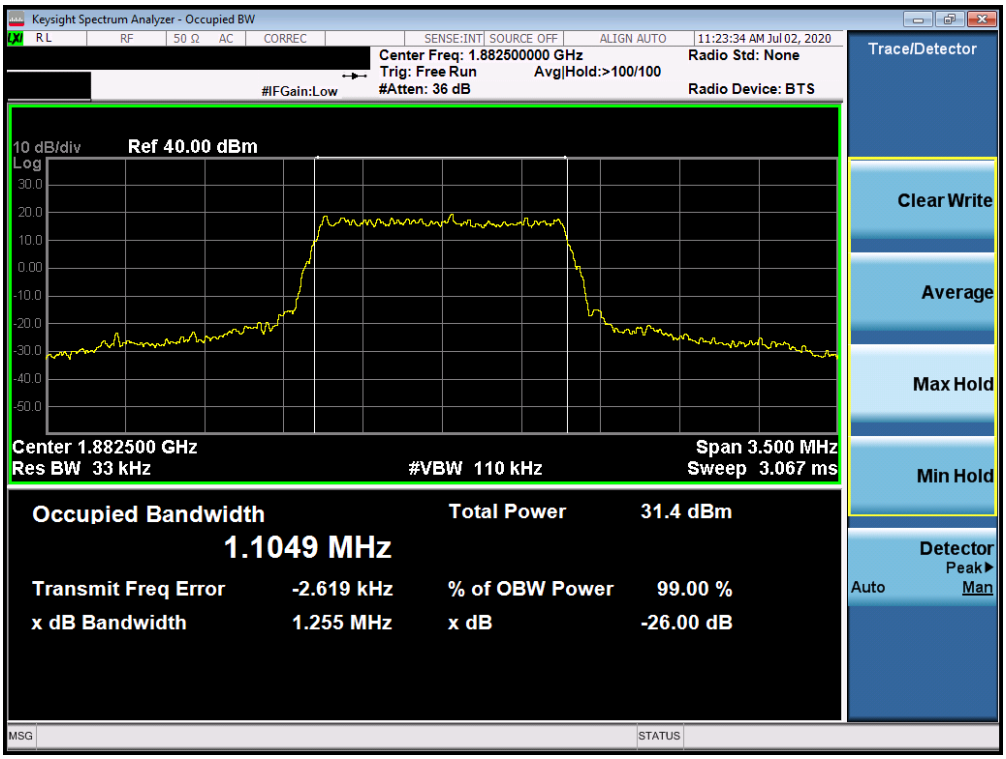


Plot 7-60. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

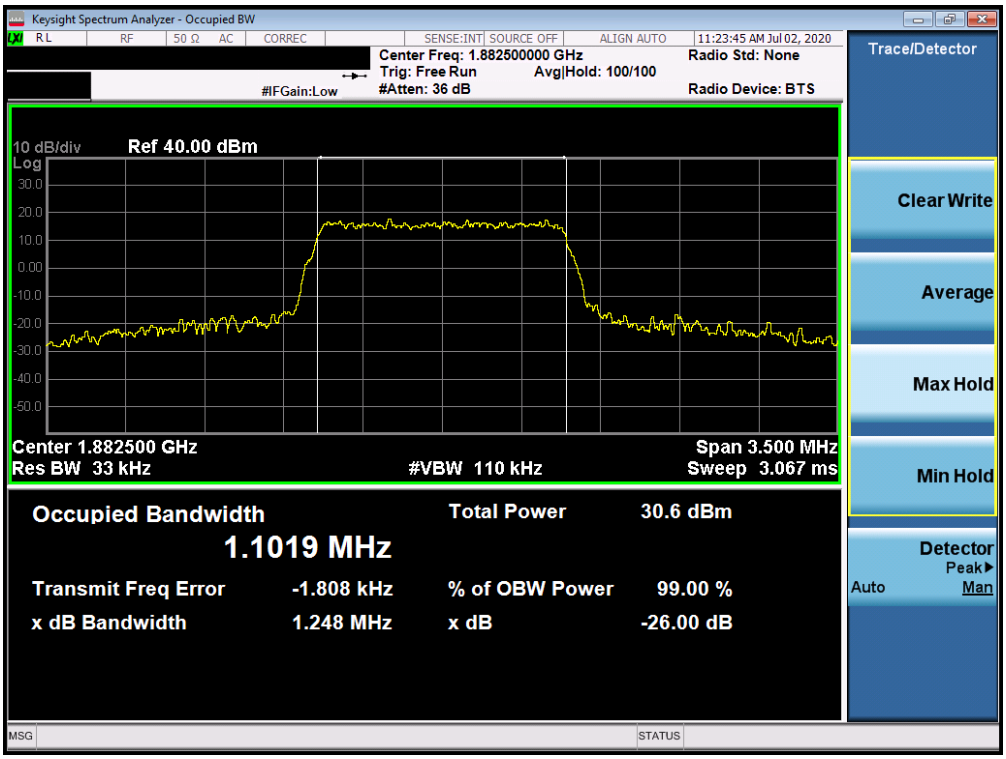
Band 25/2



Plot 7-61. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

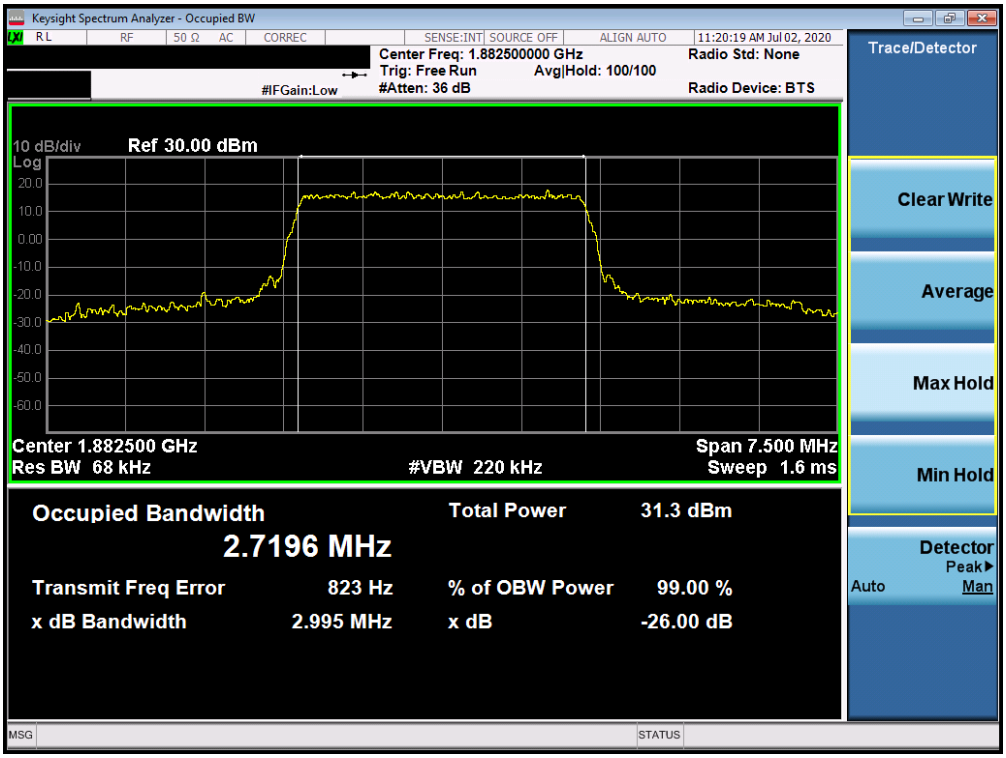


Plot 7-62. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

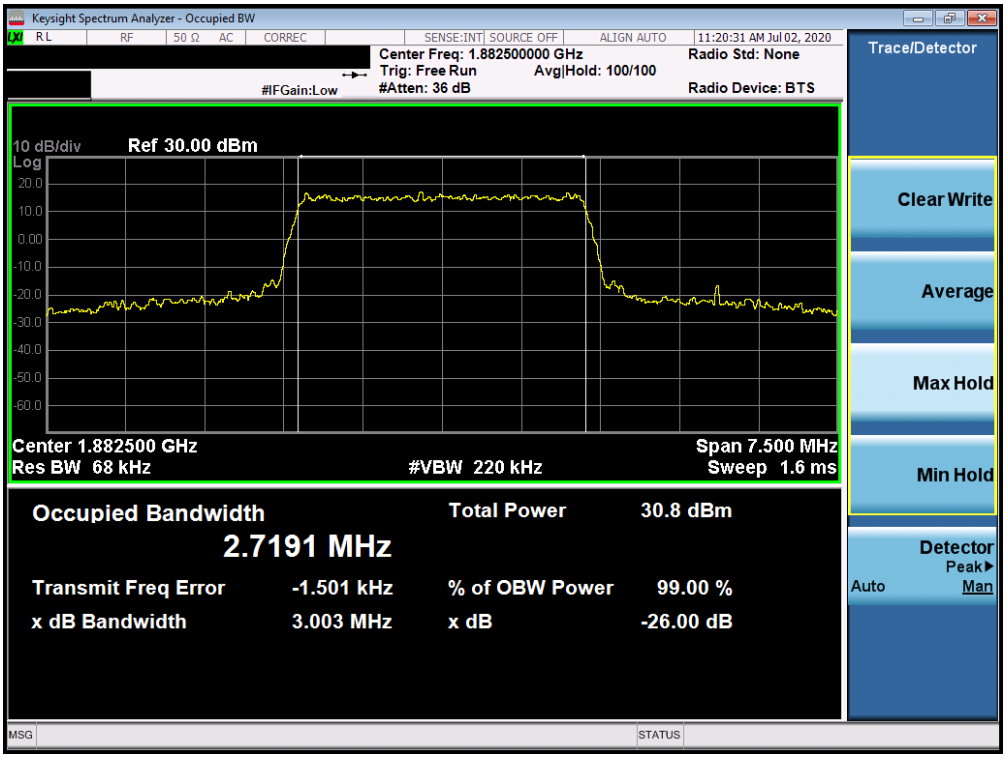


Plot 7-63. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

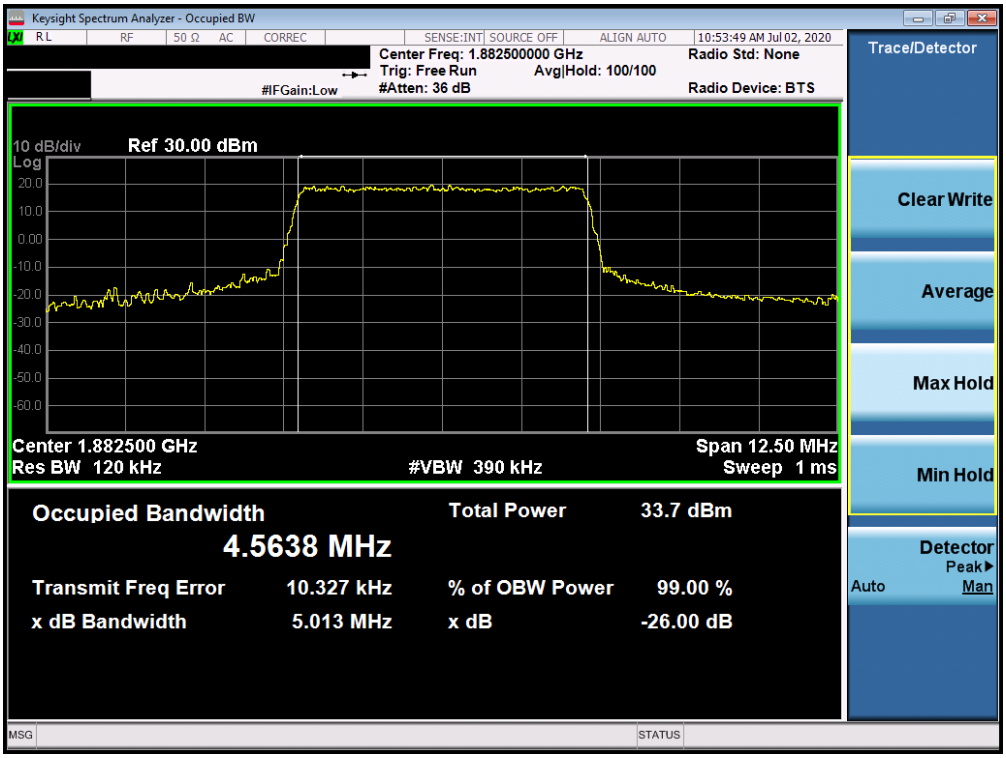
Plot 7-64. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



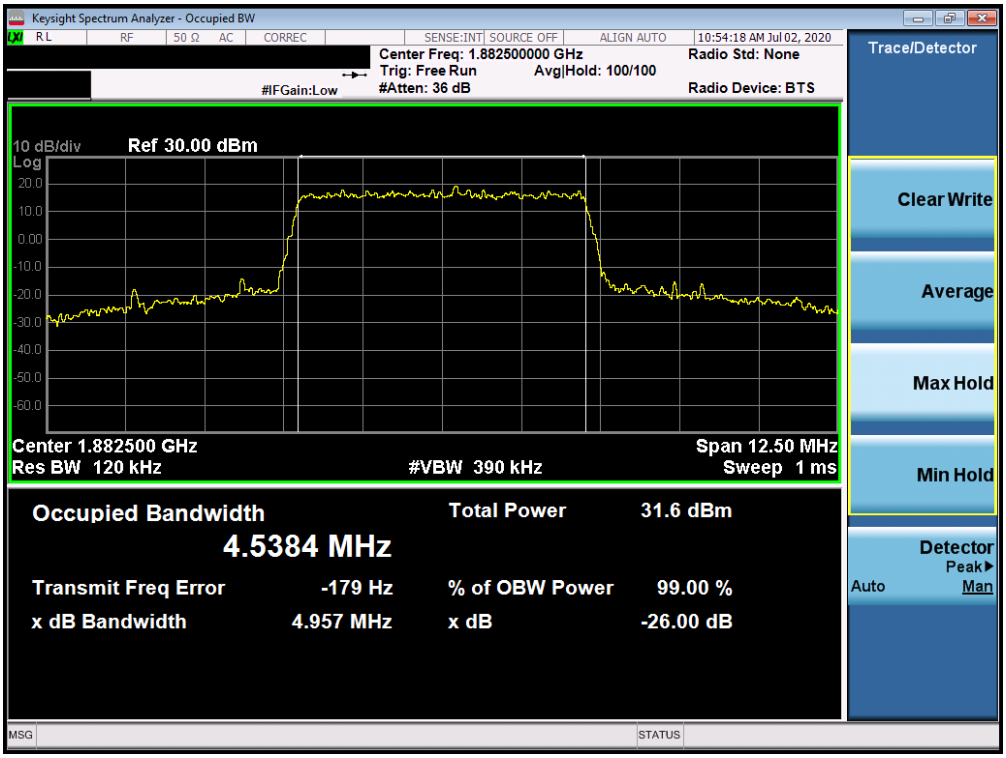
Plot 7-65. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



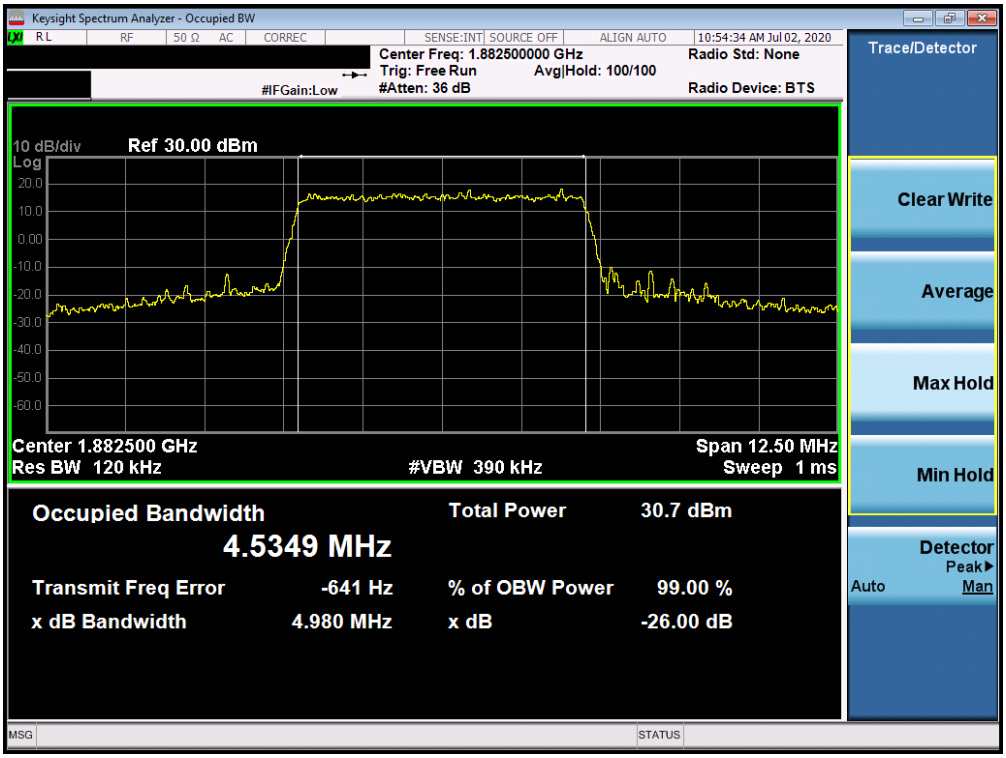
Plot 7-66. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)



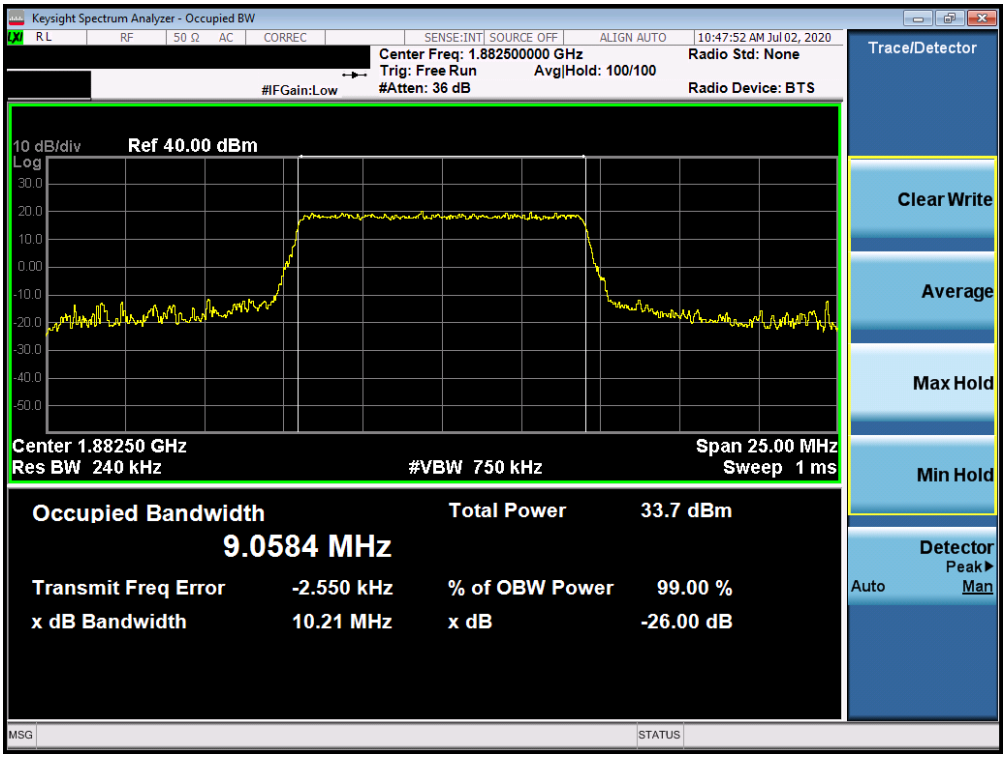
Plot 7-67. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



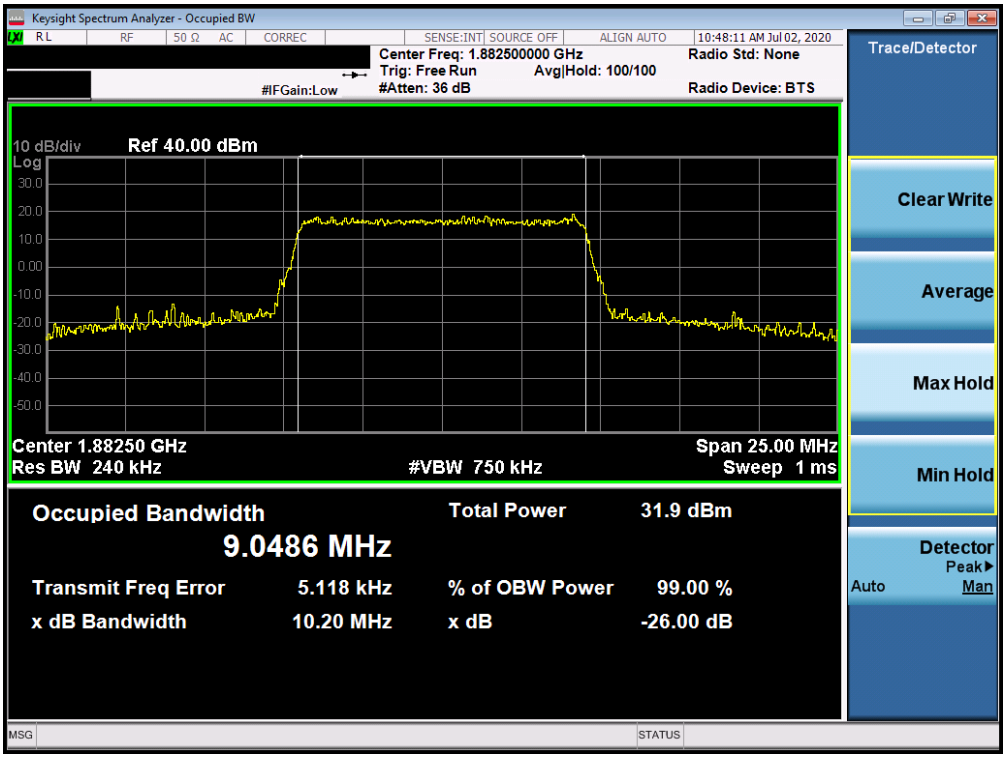
Plot 7-68. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



Plot 7-69. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

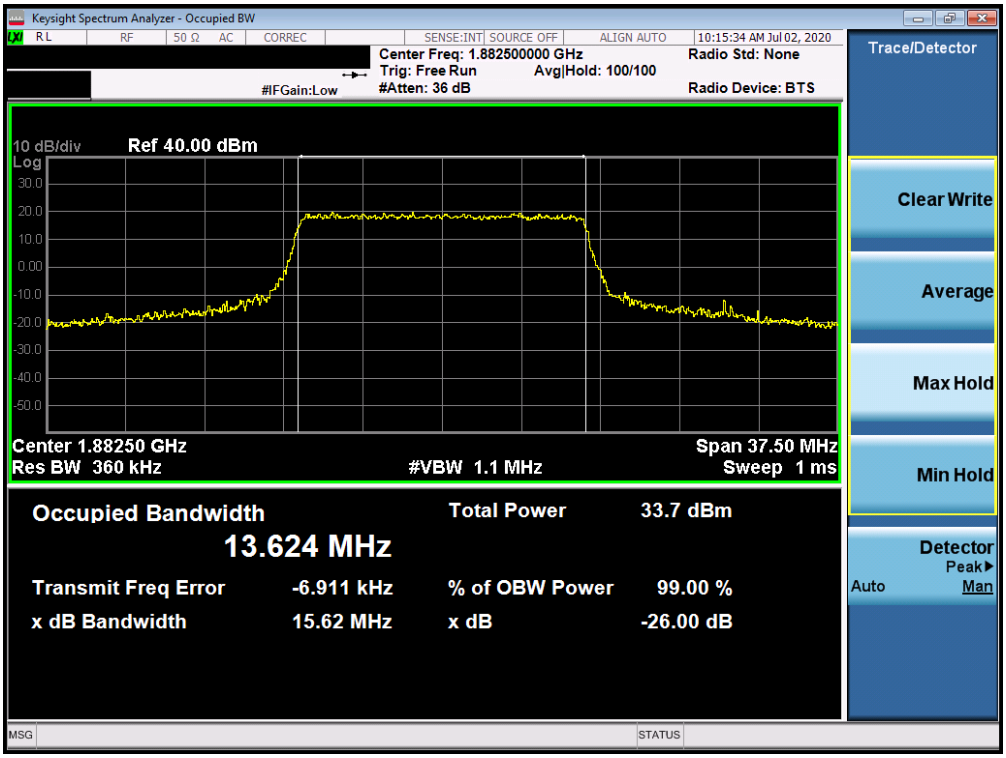


Plot 7-70. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

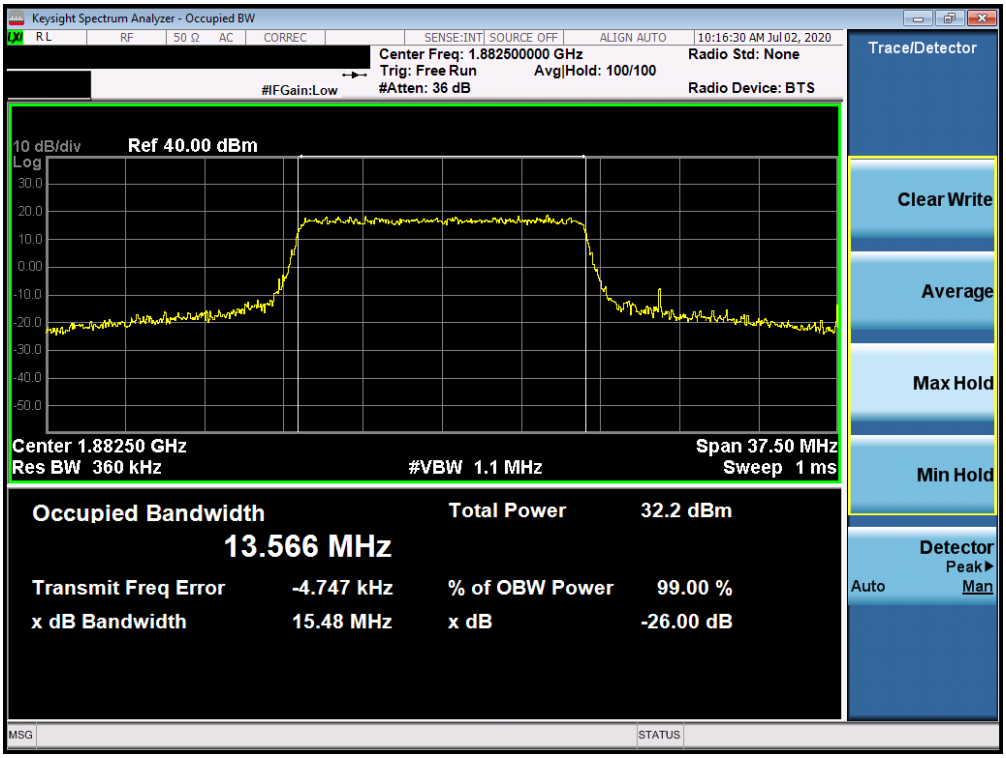


Plot 7-71. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

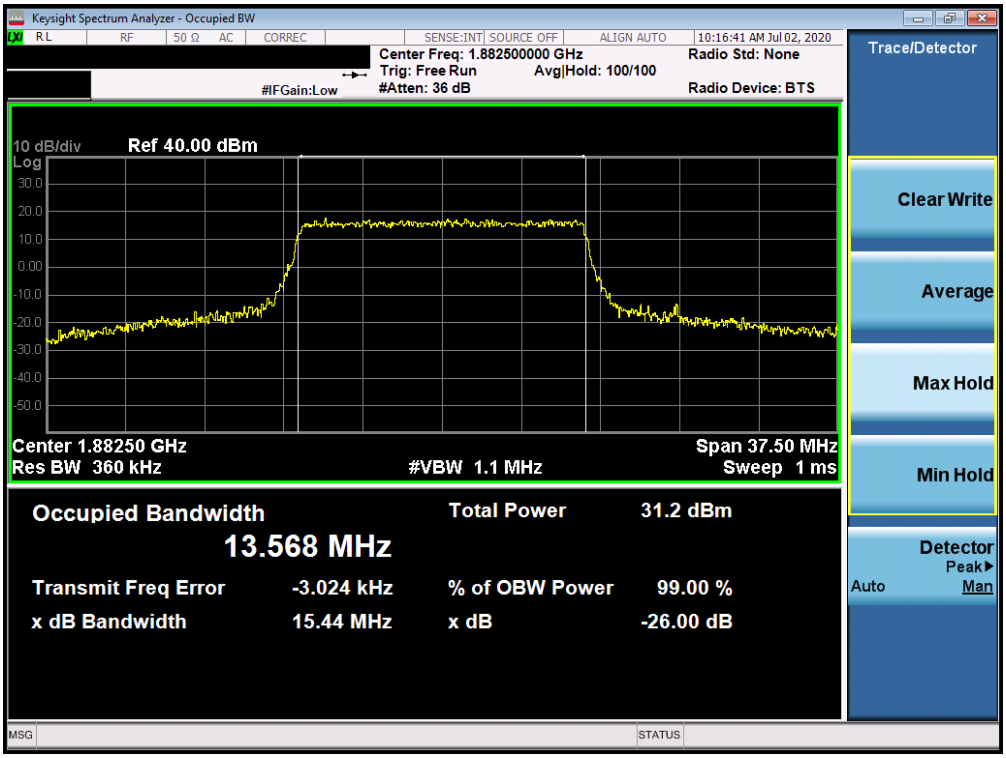
Plot 7-72. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)



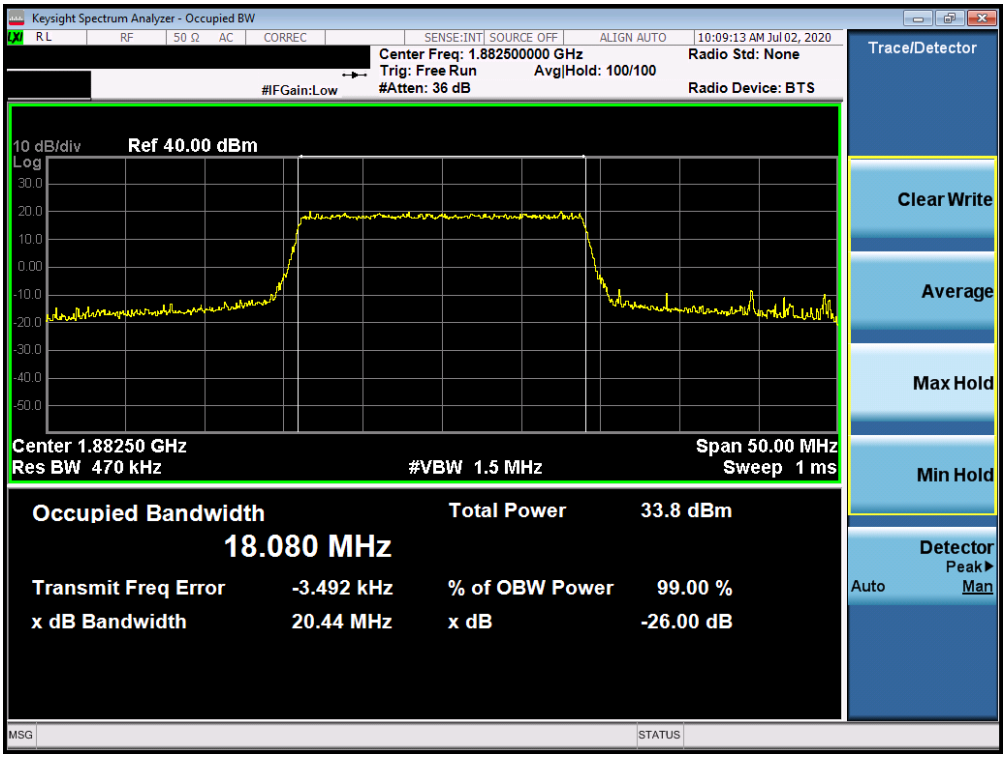
Plot 7-73. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



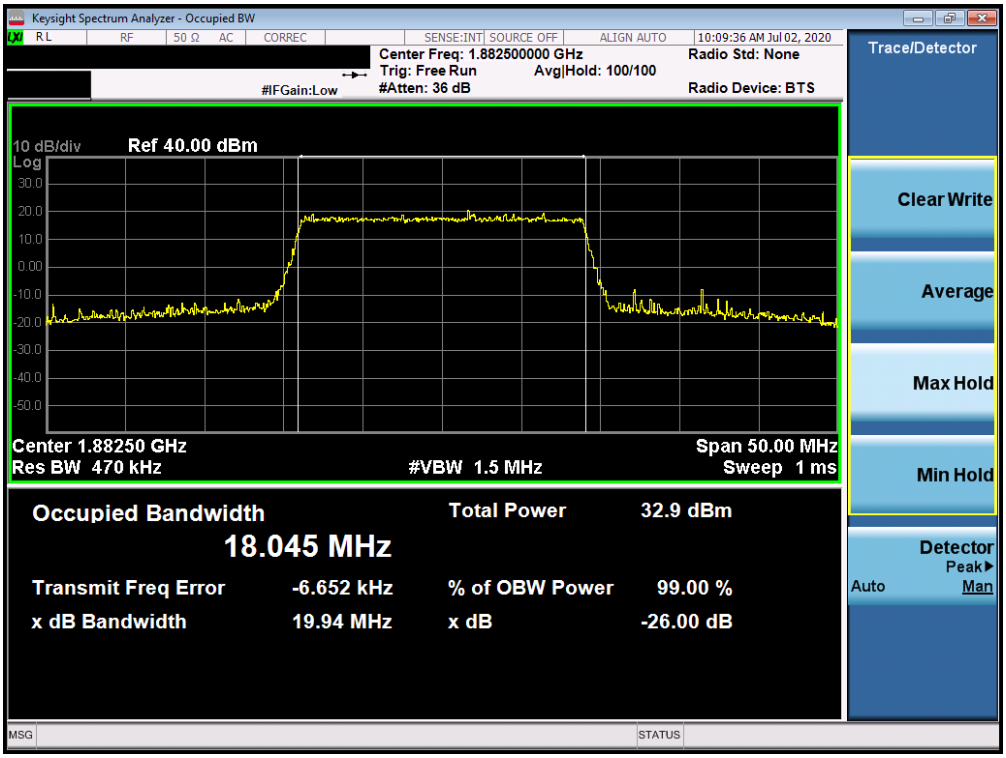
Plot 7-74. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



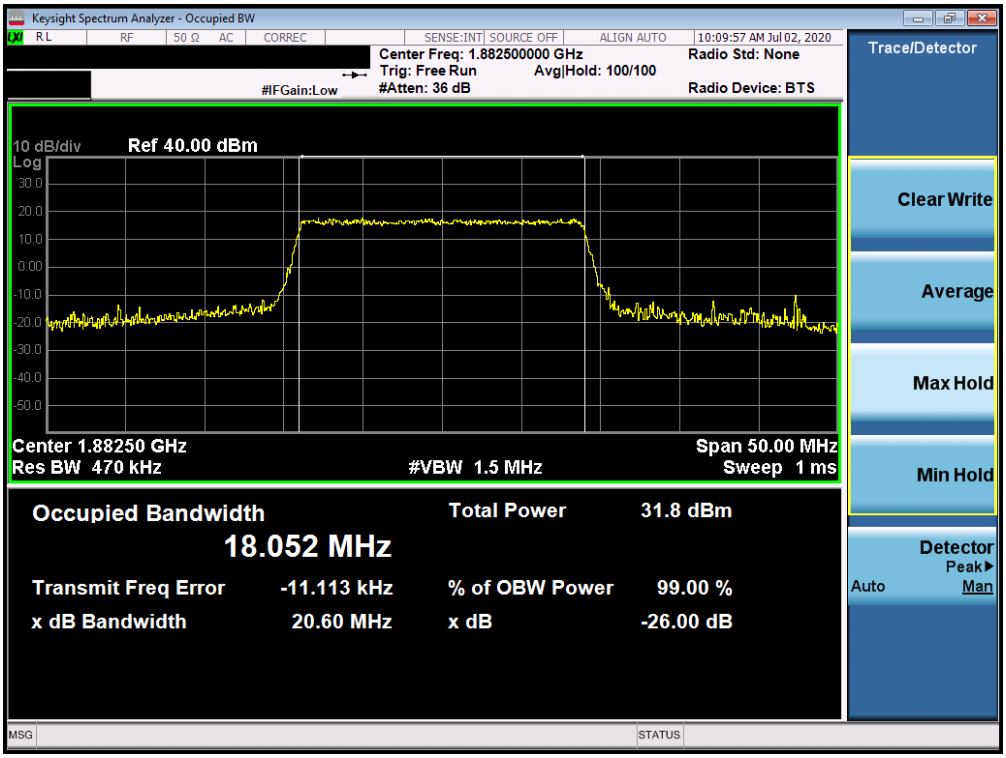
Plot 7-75. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-76. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

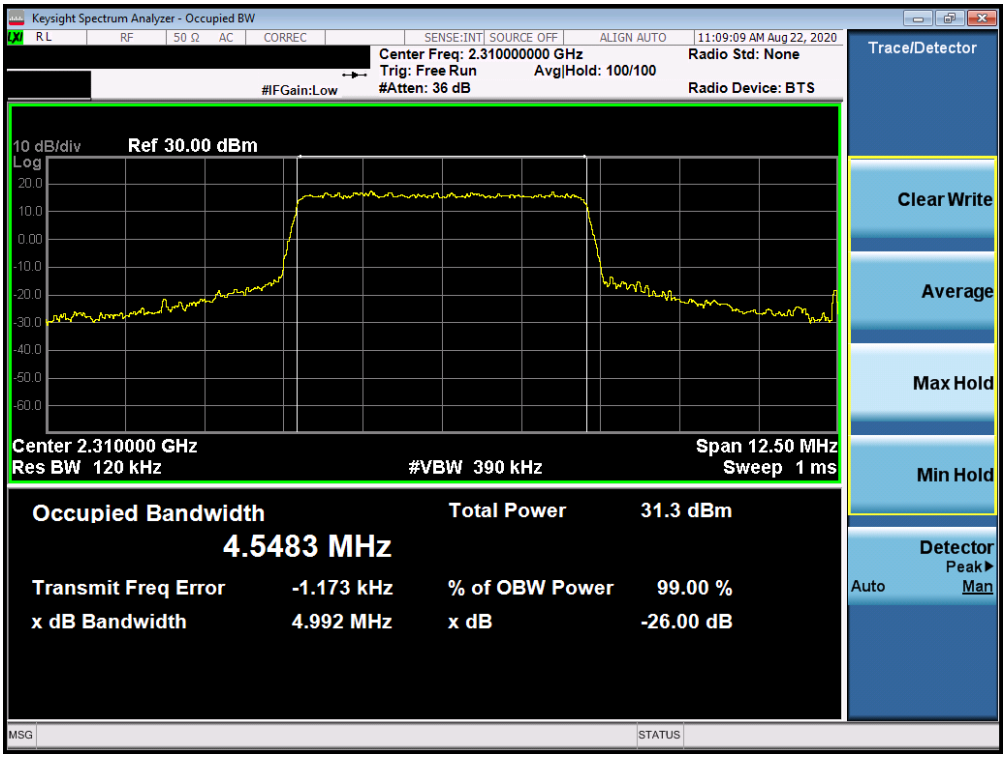


Plot 7-77. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

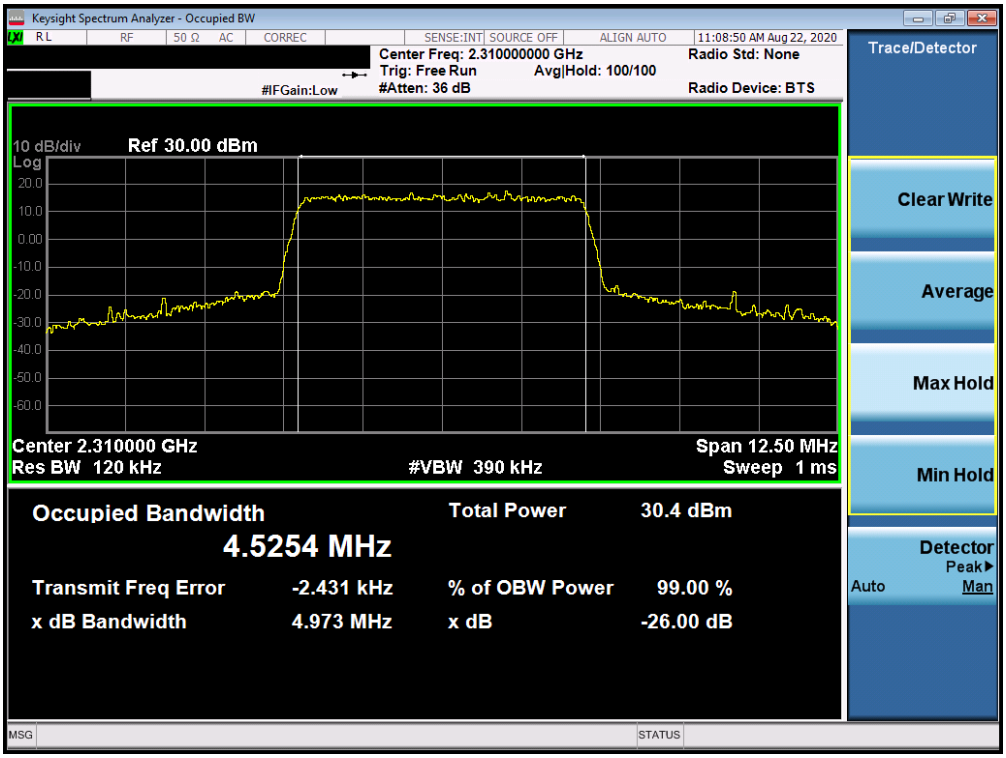


Plot 7-78. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

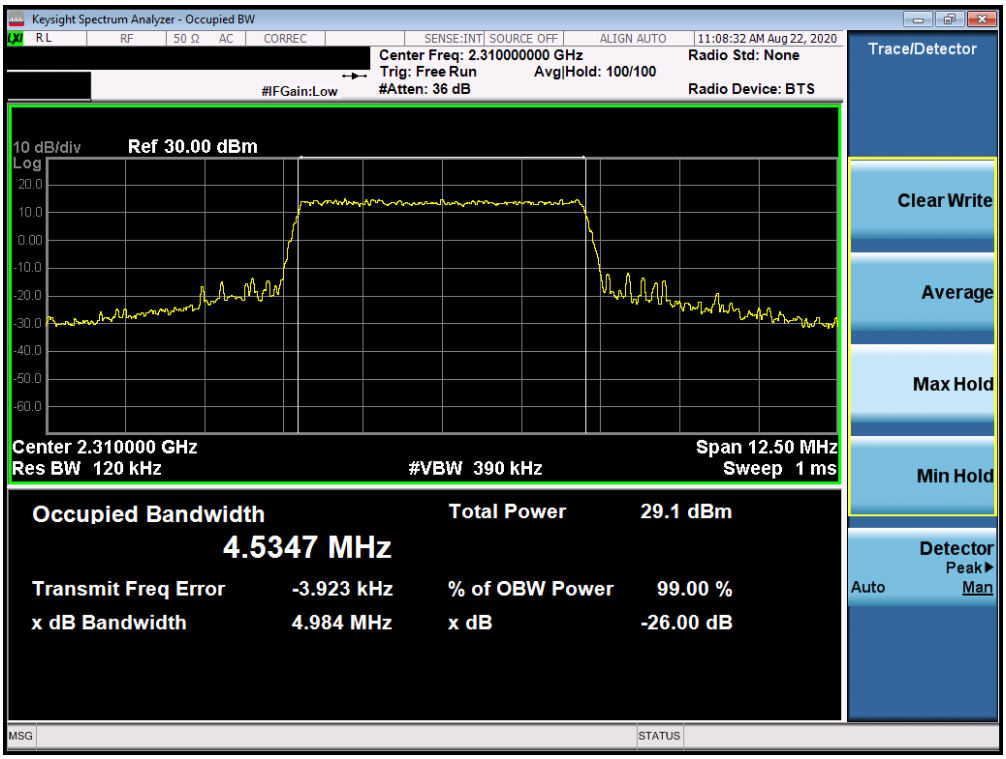
Band 30



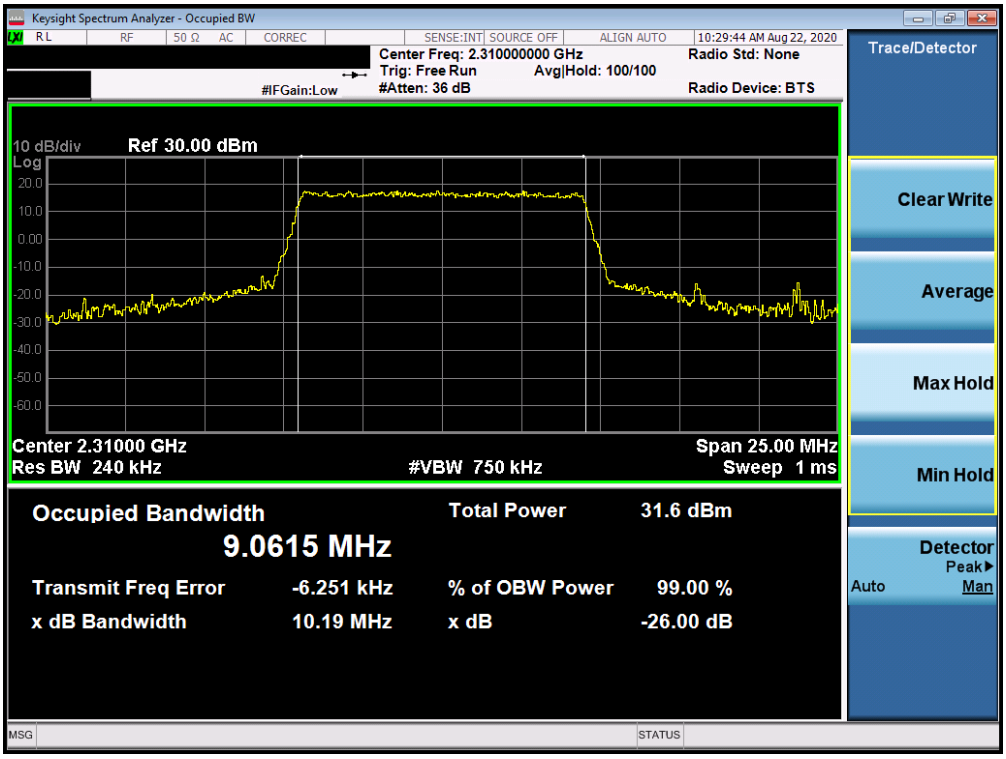
Plot 7-79. Occupied Bandwidth Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



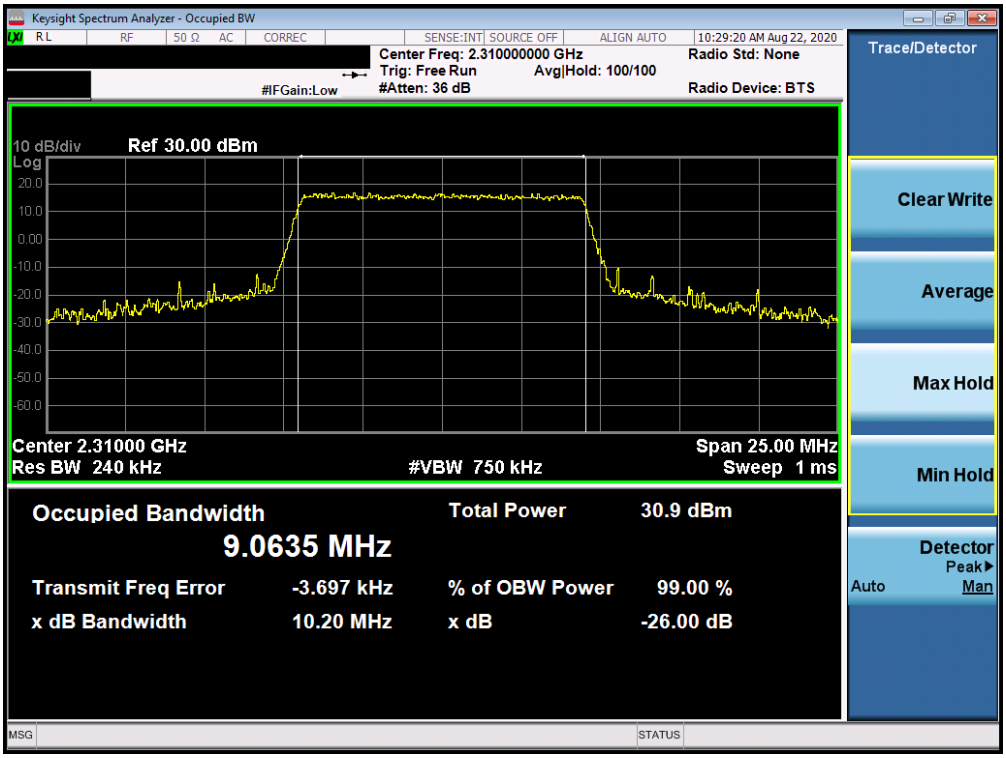
Plot 7-80. Occupied Bandwidth Plot (Band 30 - 5.0MHz 16-QAM - Full RB Configuration)



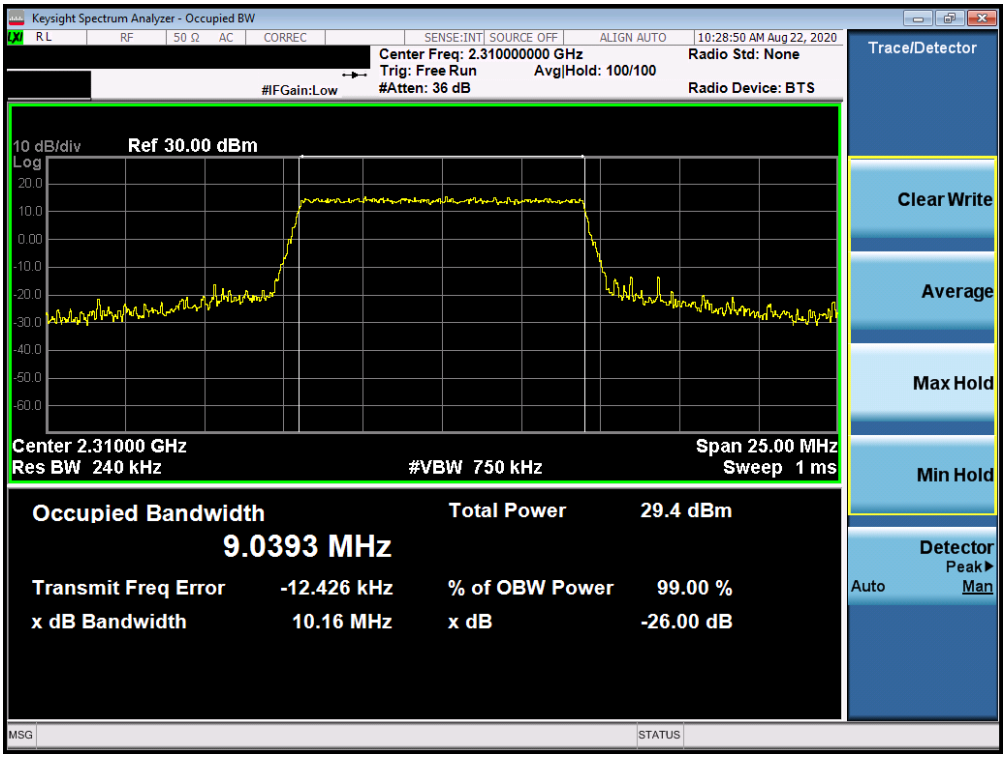
Plot 7-81. Occupied Bandwidth Plot (Band 30 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-82. Occupied Bandwidth Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

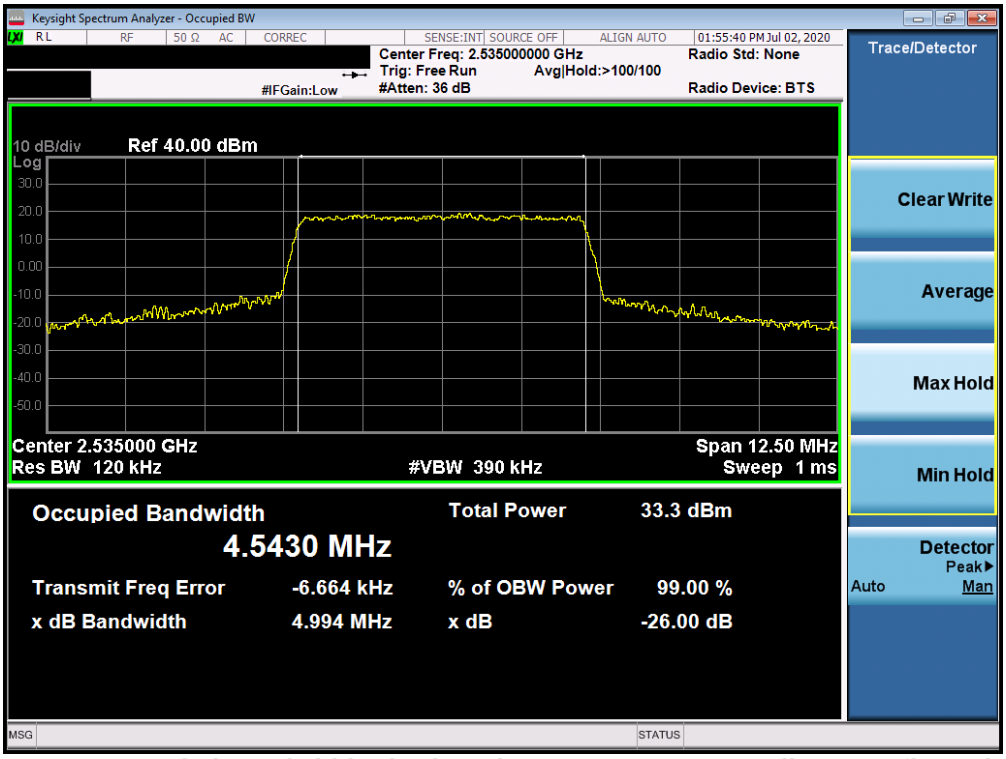


Plot 7-83. Occupied Bandwidth Plot (Band 30 - 10.0MHz 16-QAM - Full RB Configuration)

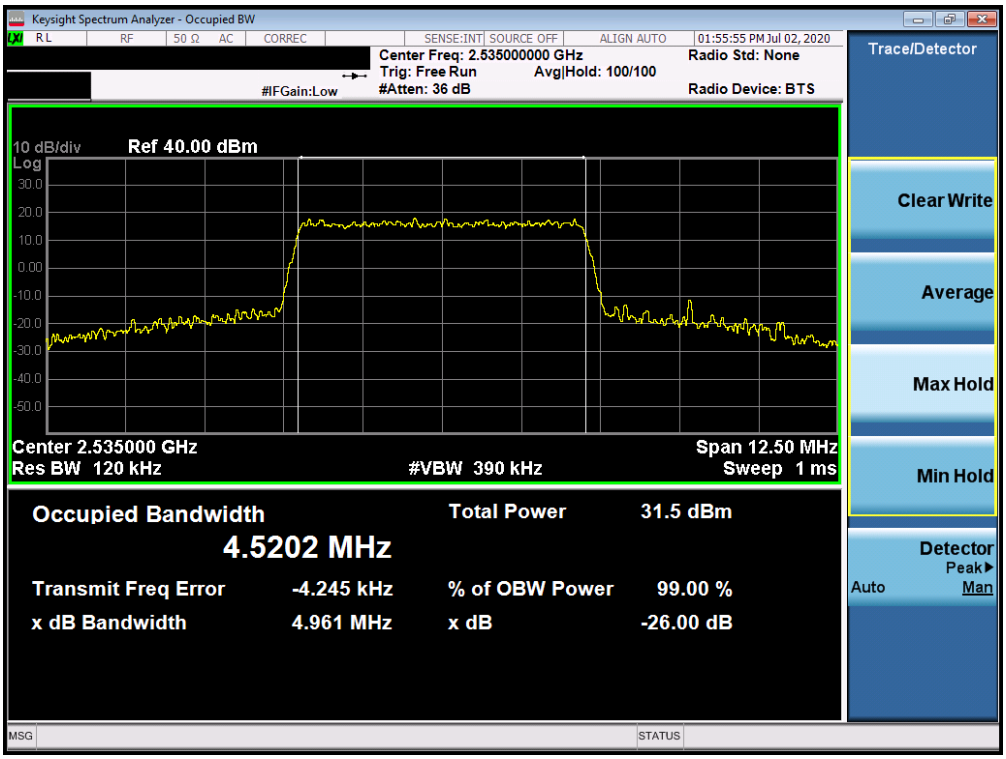


Plot 7-84. Occupied Bandwidth Plot (Band 30 - 10.0MHz 64-QAM - Full RB Configuration)

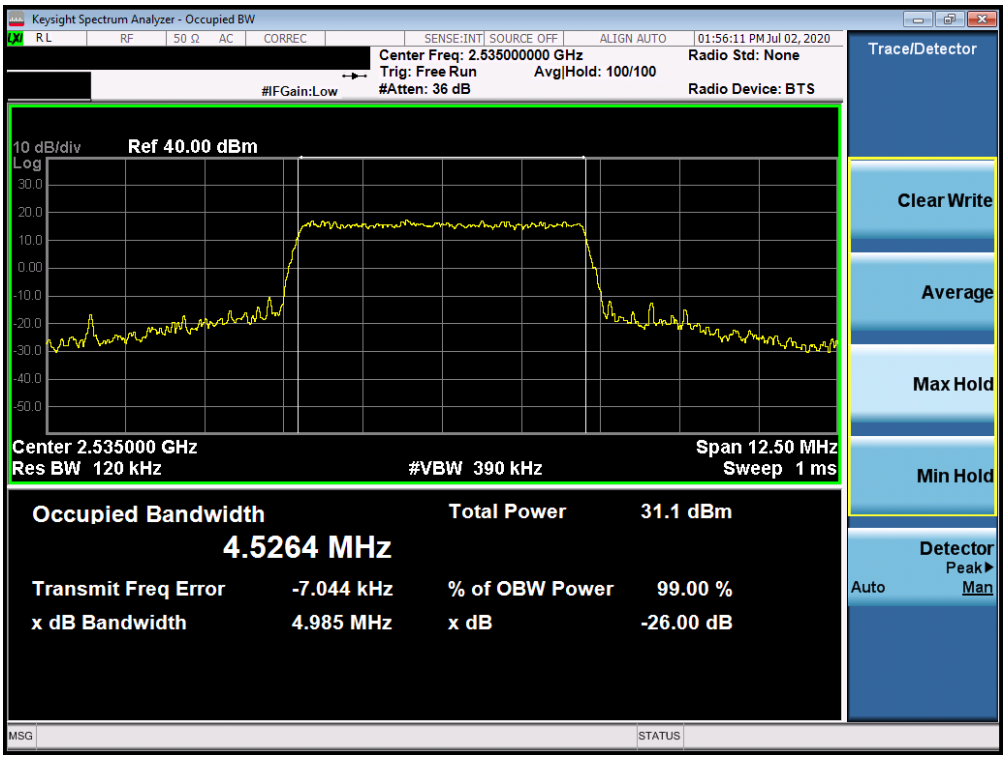
Band 7



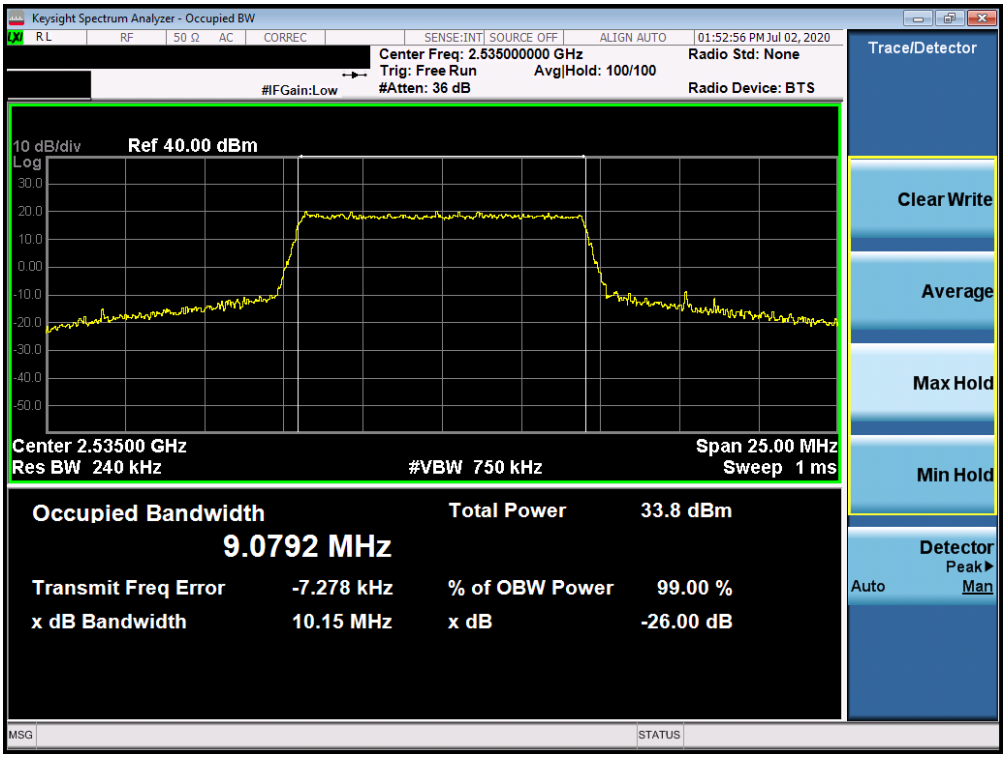
Plot 7-85. Occupied Bandwidth Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-86. Occupied Bandwidth Plot (Band 7 - 5.0MHz 16-QAM - Full RB Configuration)

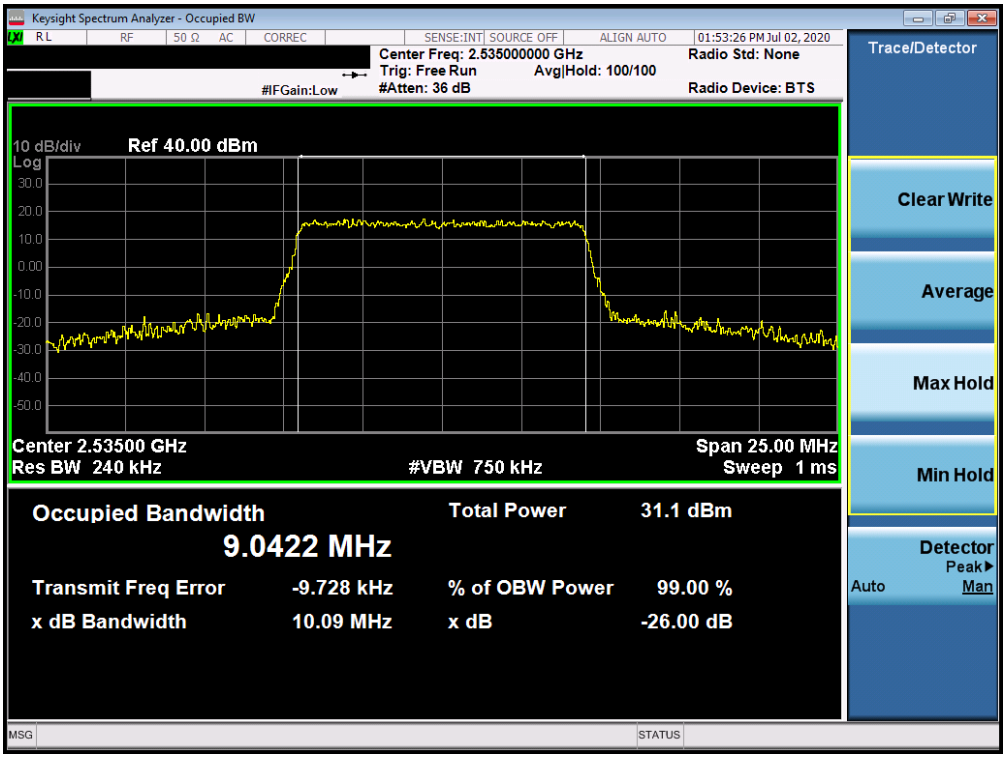


Plot 7-87. Occupied Bandwidth Plot (Band 7 - 5.0MHz 64-QAM - Full RB Configuration)

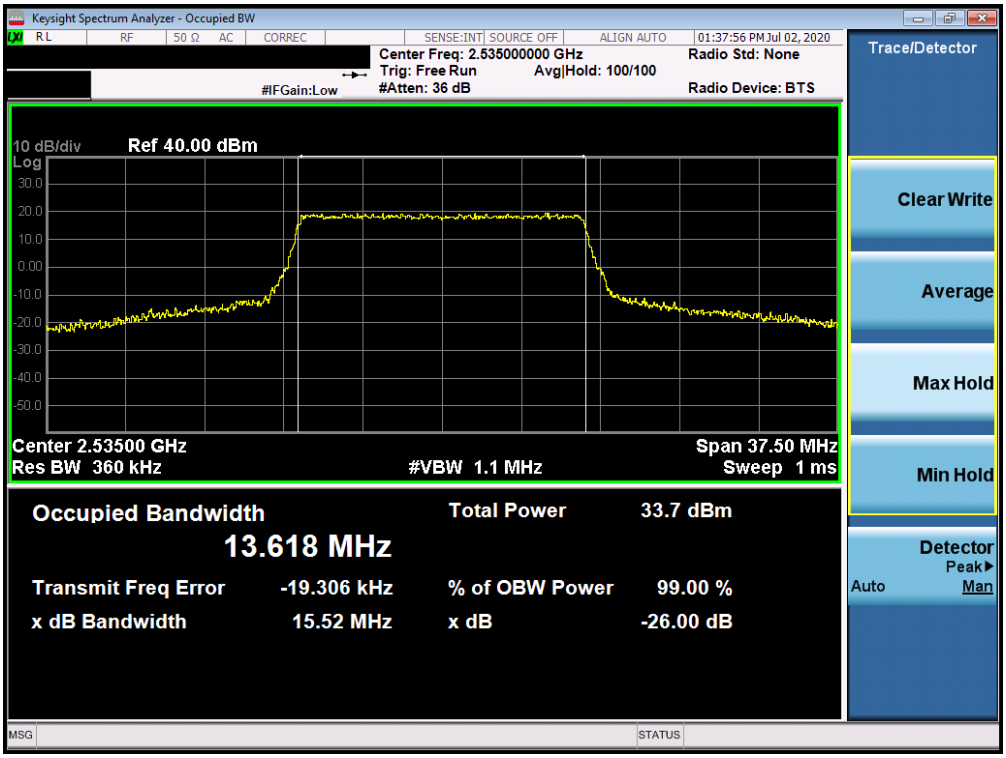


Plot 7-88. Occupied Bandwidth Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

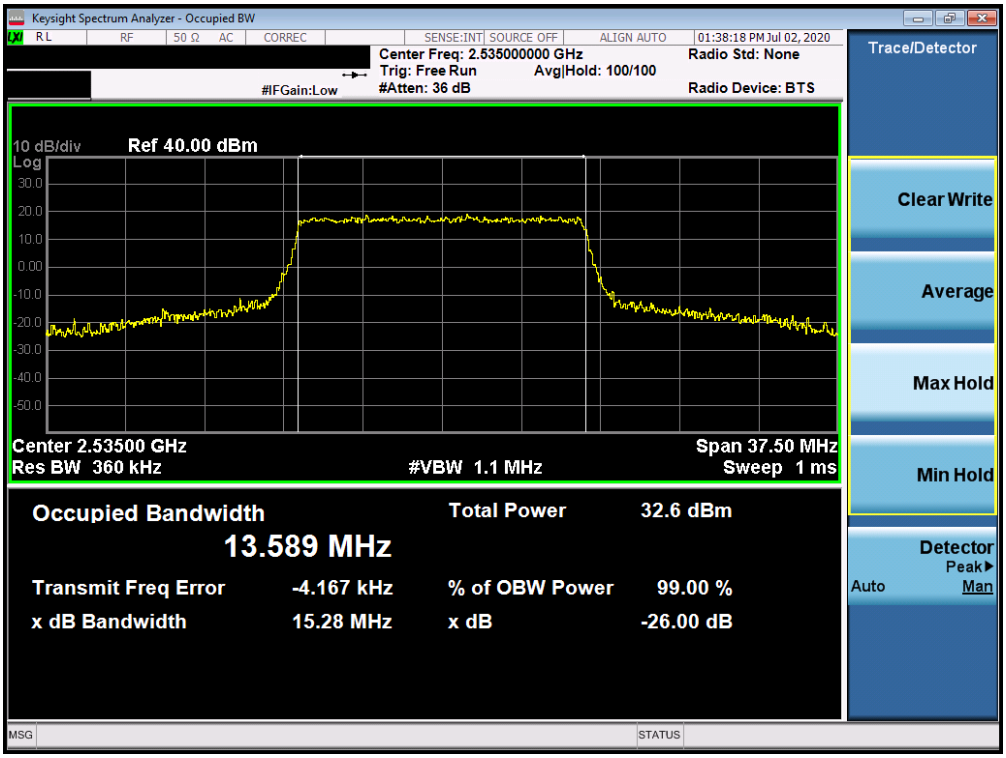
Plot 7-89. Occupied Bandwidth Plot (Band 7 - 10.0MHz 16-QAM - Full RB Configuration)



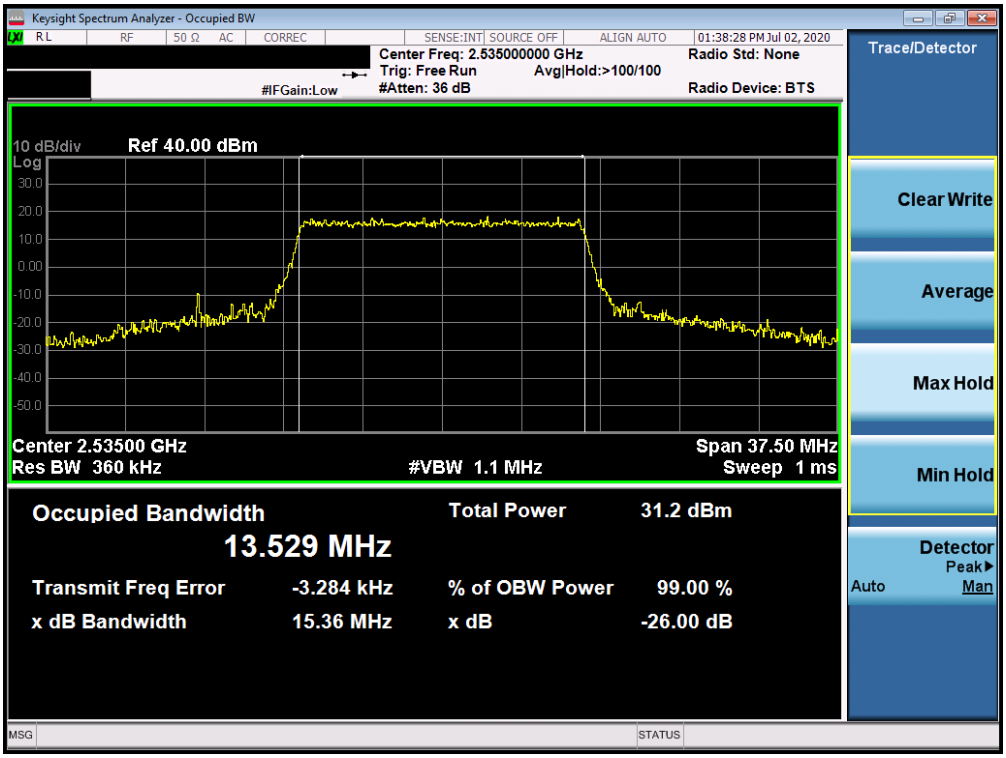
Plot 7-90. Occupied Bandwidth Plot (Band 7 - 10.0MHz 64-QAM - Full RB Configuration)



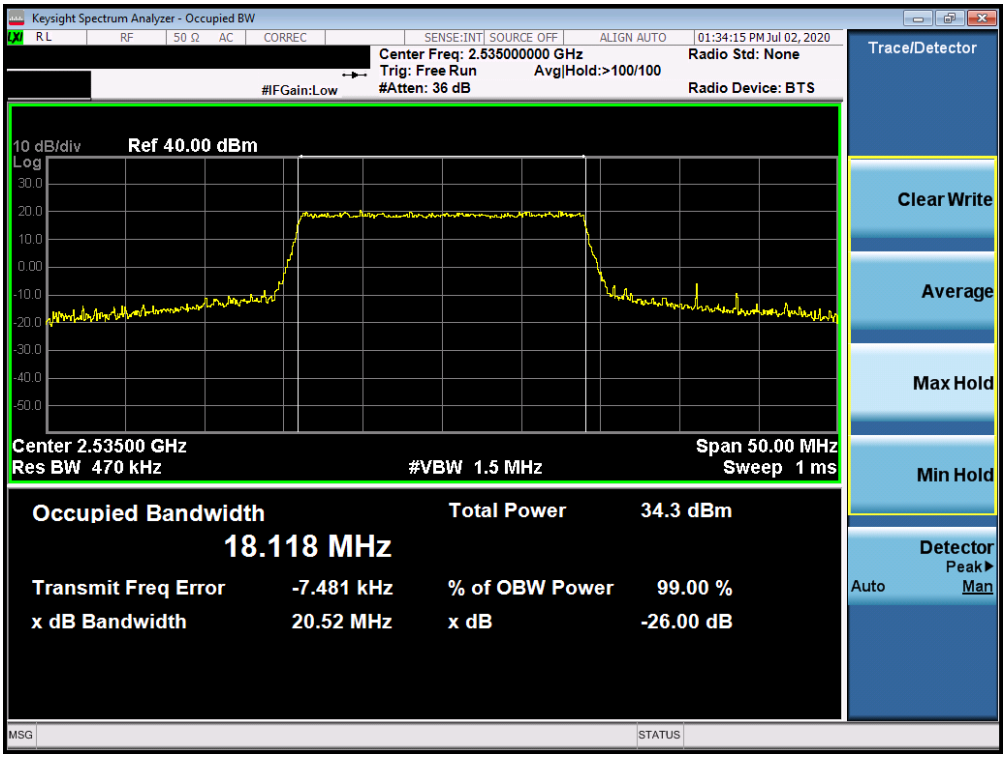
Plot 7-91. Occupied Bandwidth Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)



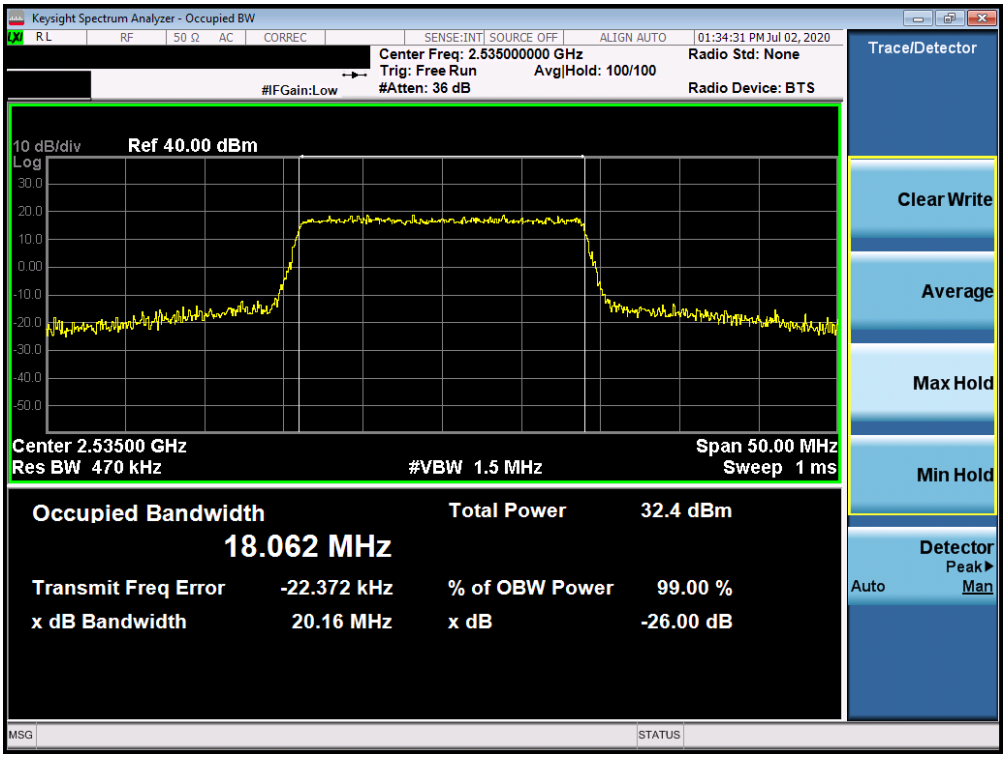
Plot 7-92. Occupied Bandwidth Plot (Band 7 - 15.0MHz 16-QAM - Full RB Configuration)



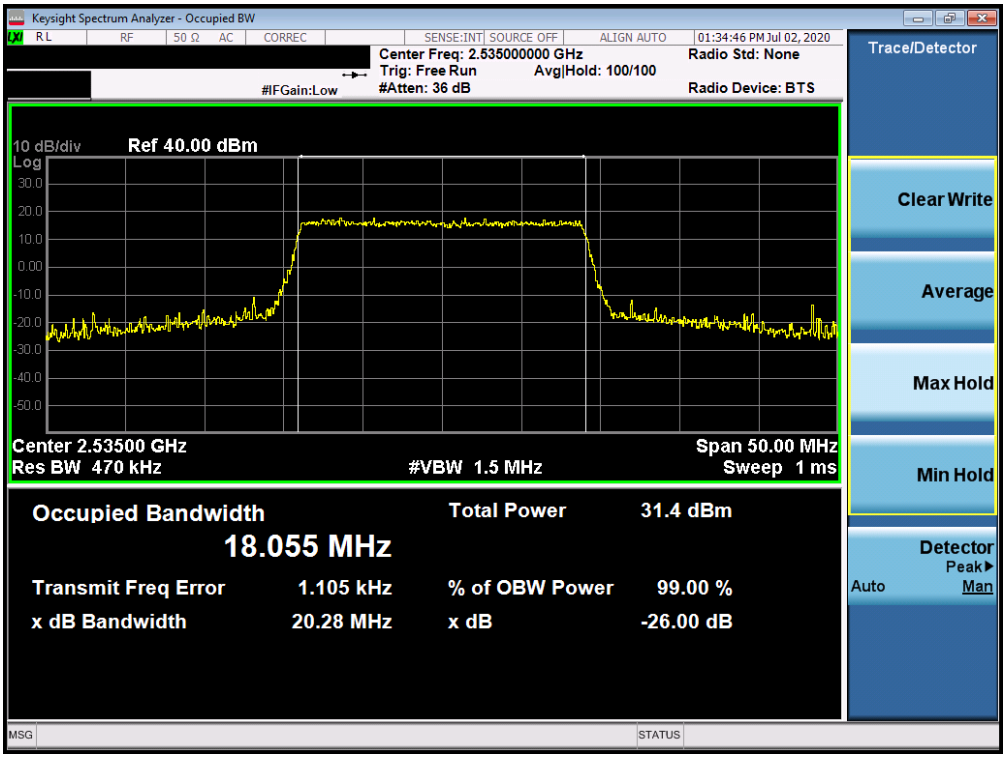
Plot 7-93. Occupied Bandwidth Plot (Band 7 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-94. Occupied Bandwidth Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

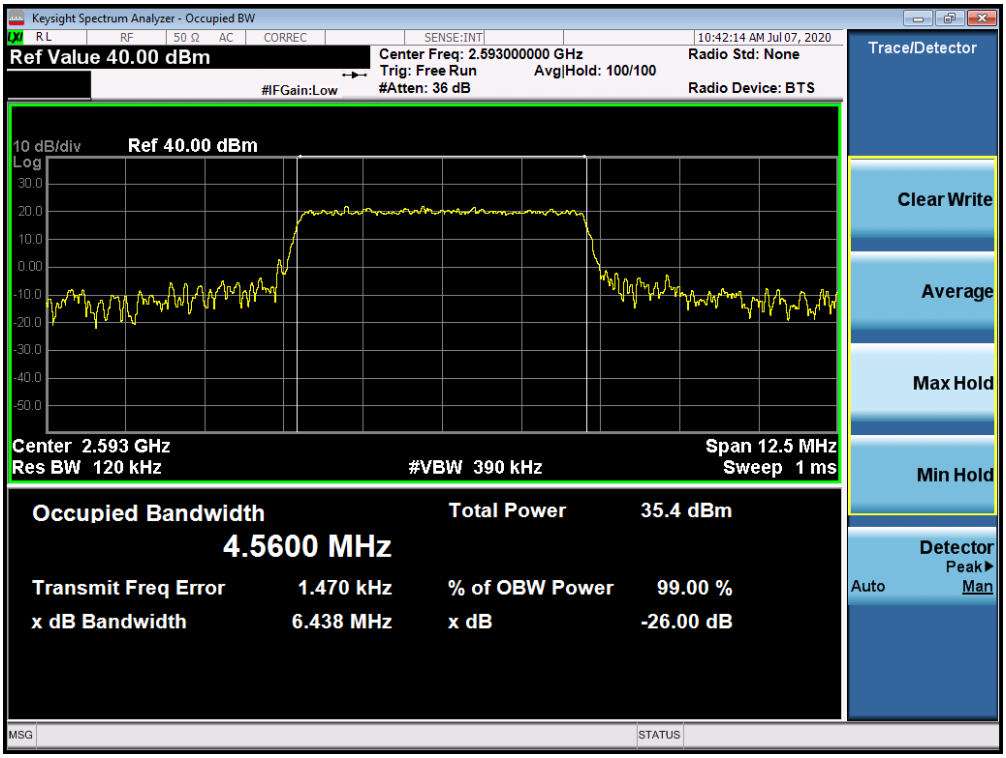


Plot 7-95. Occupied Bandwidth Plot (Band 7 - 20.0MHz 16-QAM - Full RB Configuration)

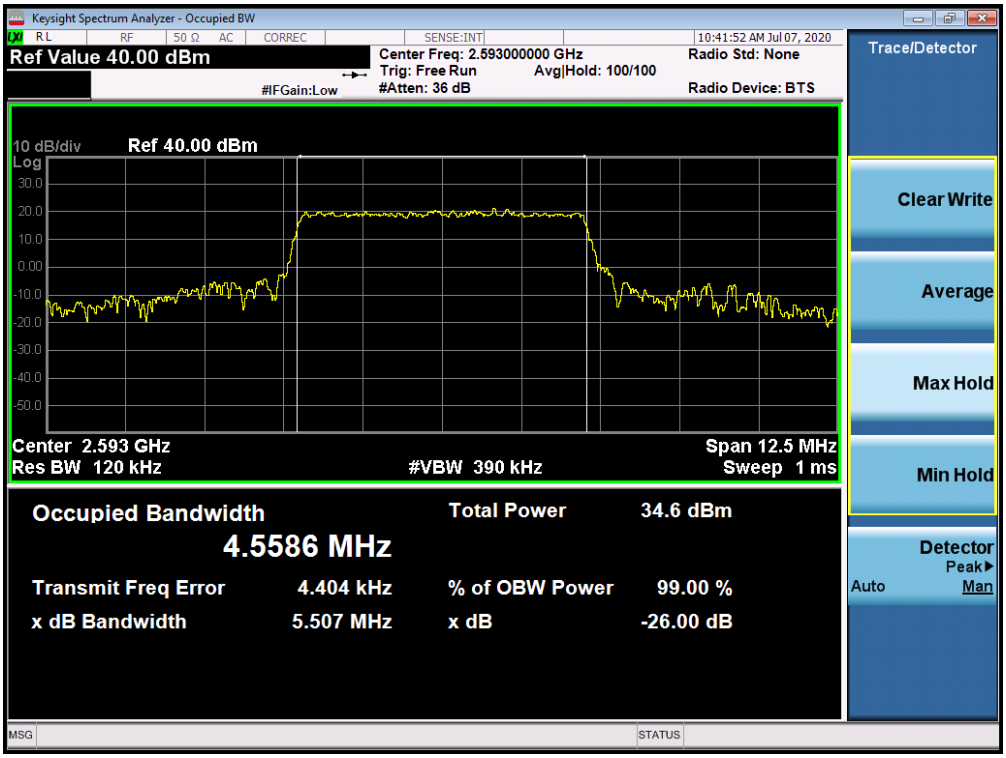


Plot 7-96. Occupied Bandwidth Plot (Band 7 - 20.0MHz 64-QAM - Full RB Configuration)

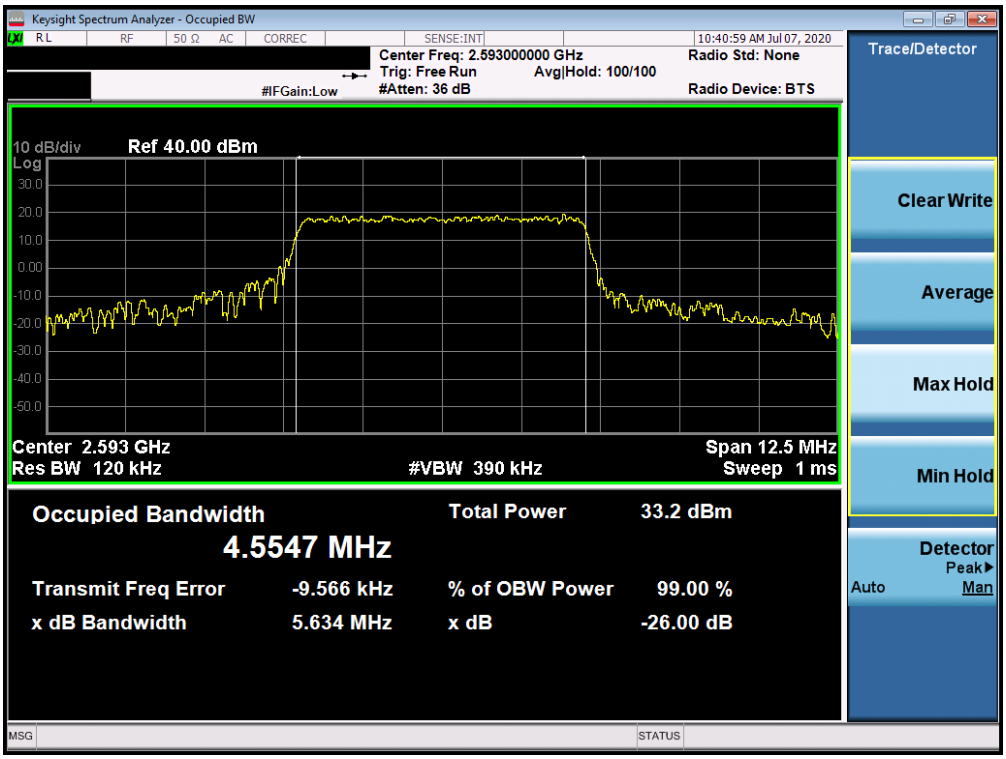
Band 41



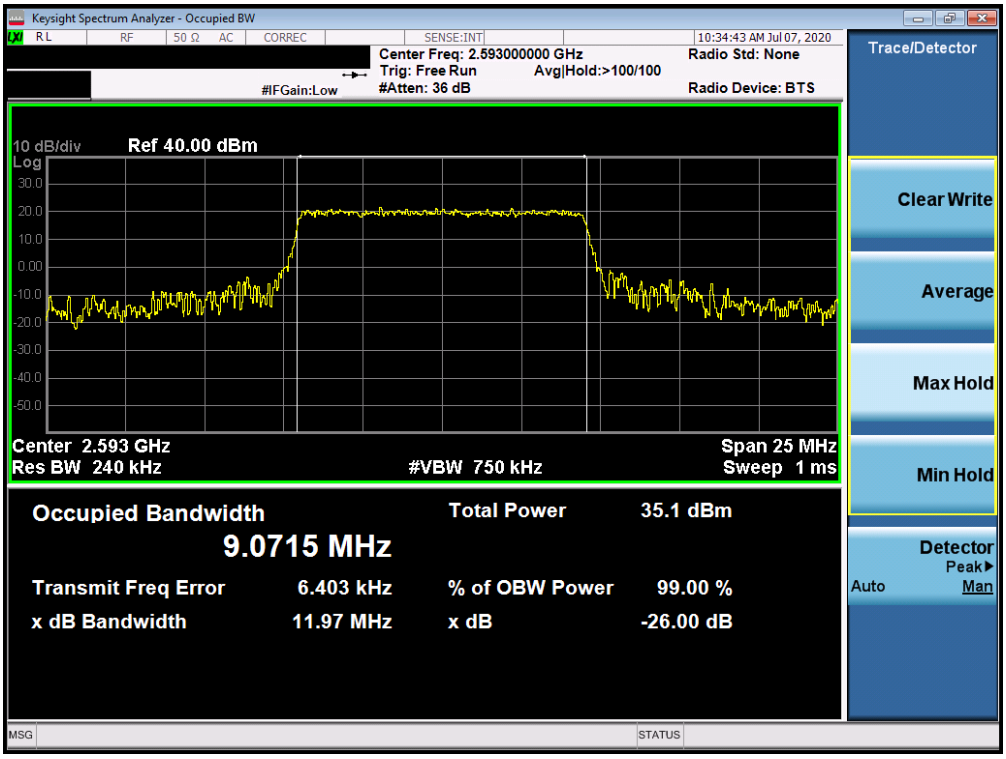
Plot 7-97. Occupied Bandwidth Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)



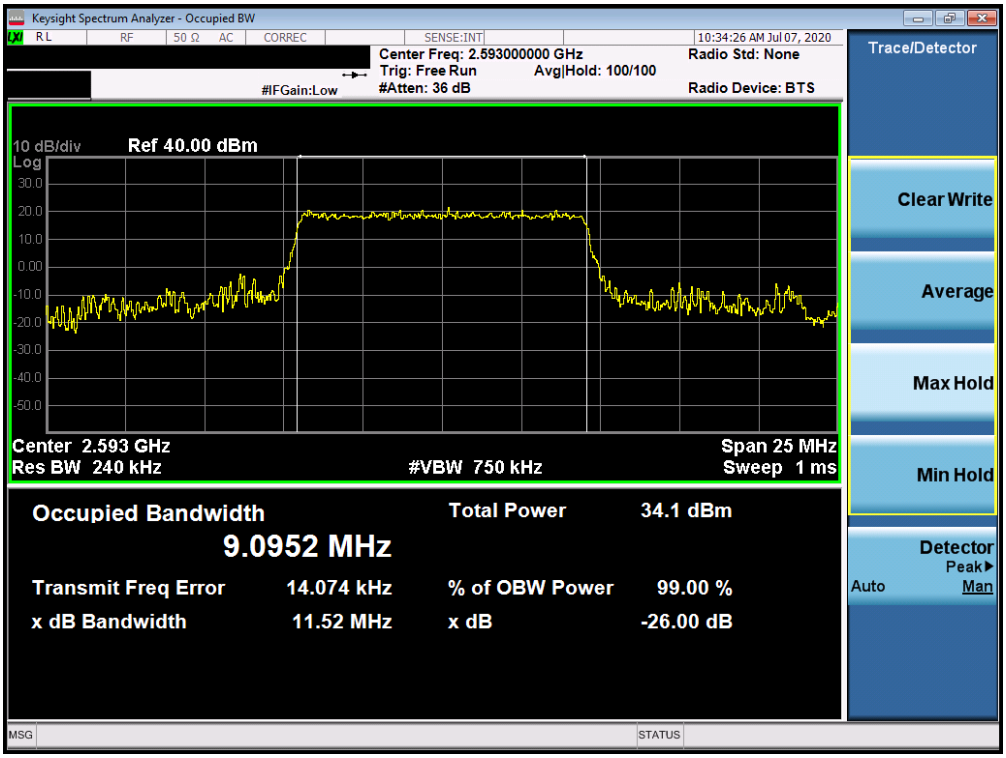
Plot 7-98. Occupied Bandwidth Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)



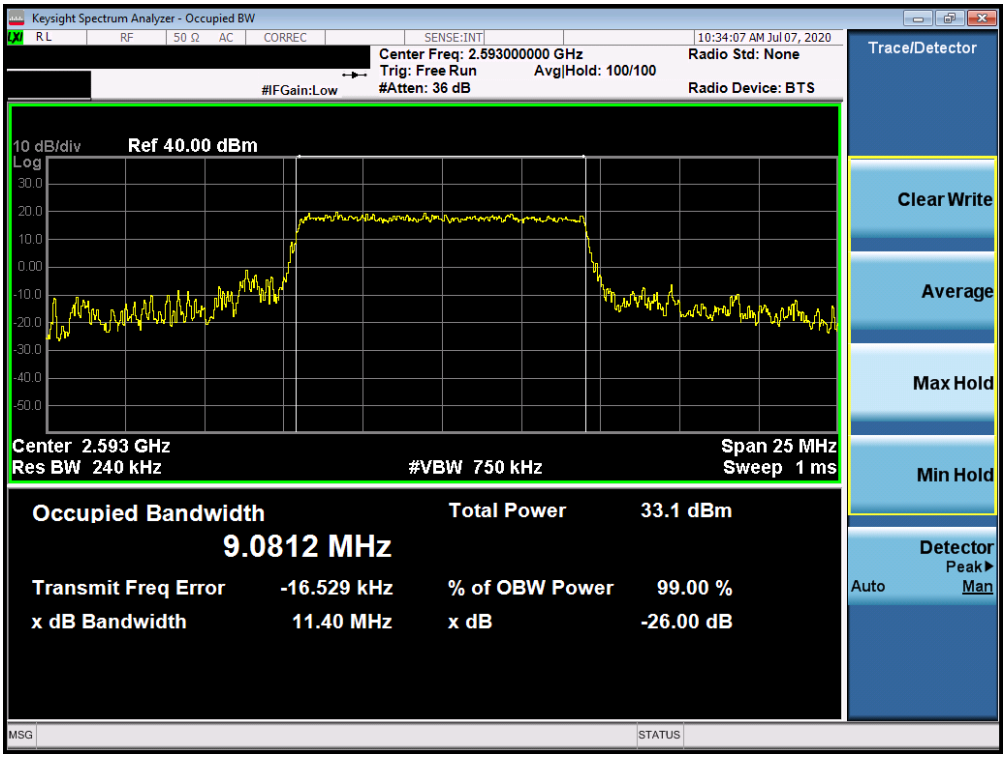
Plot 7-99. Occupied Bandwidth Plot (Band 41 - 5.0MHz 64-QAM - Full RB Configuration)



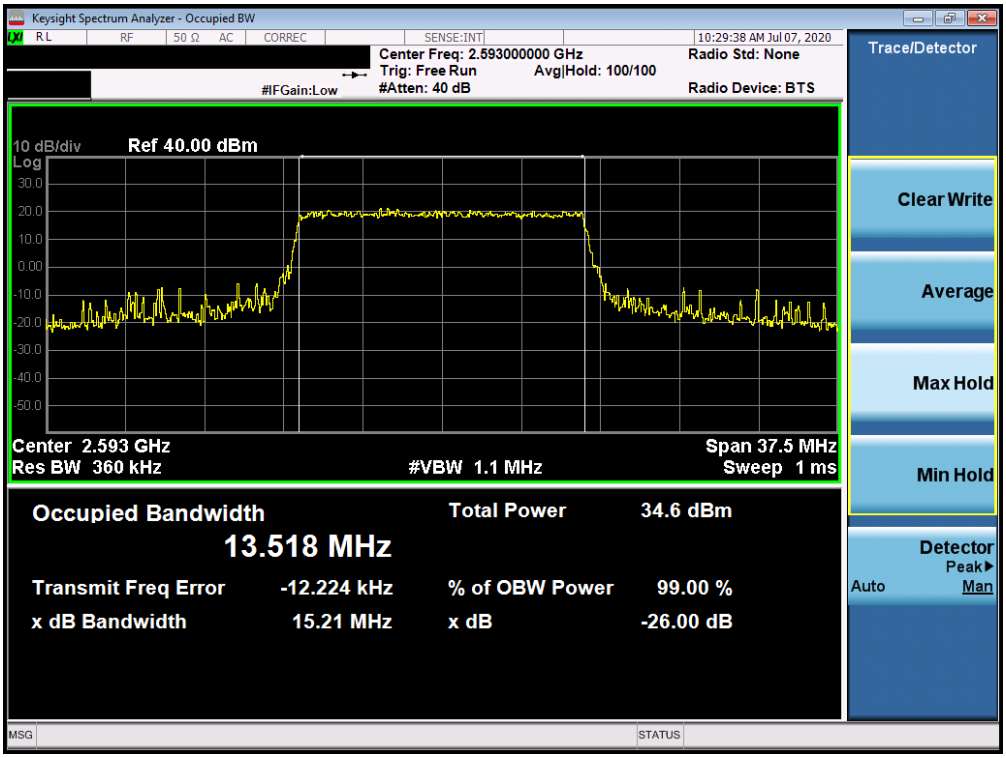
Plot 7-100. Occupied Bandwidth Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)



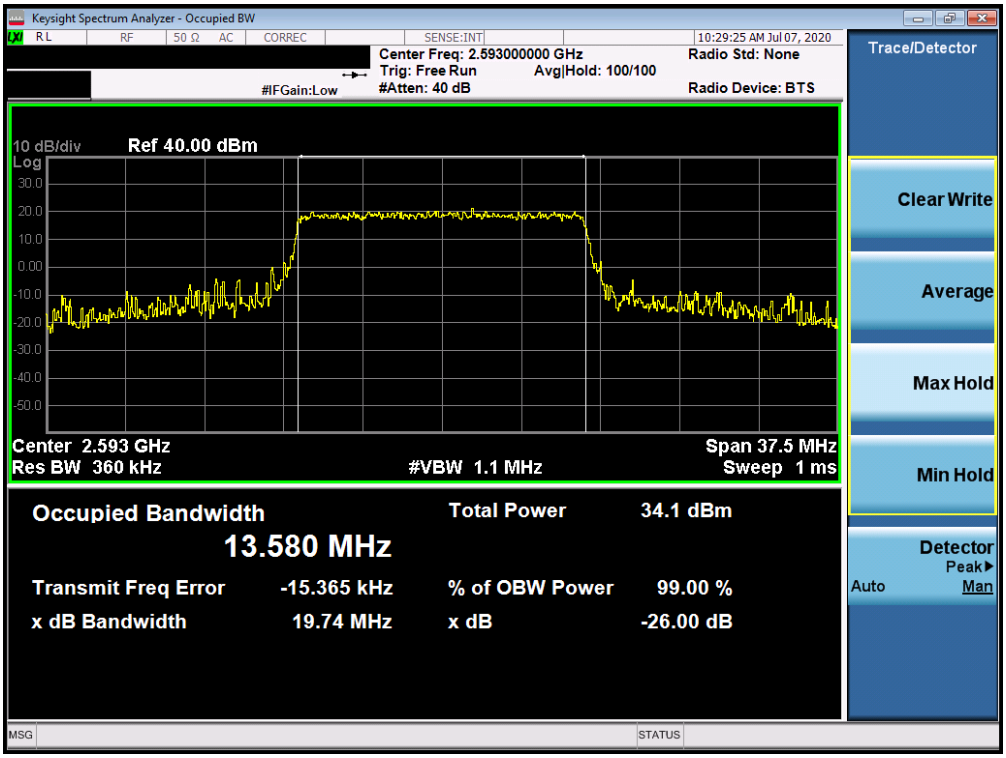
Plot 7-101. Occupied Bandwidth Plot (Band 41 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-102. Occupied Bandwidth Plot (Band 41 - 10.0MHz 64-QAM - Full RB Configuration)



Plot 7-103. Occupied Bandwidth Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-104. Occupied Bandwidth Plot (Band 41 - 15.0MHz 16-QAM - Full RB Configuration)