



MEASUREMENT REPORT LTE

Applicant Name:

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

Date of Testing:

05/01/2020-07/22/2020

Test Site/Location:

PCTEST Lab. Morgan Hill, CA, USA

Test Report Serial No.:

1C2004270033-03.BCG

FCC ID:	BCGA2428
APPLICANT:	Apple Inc.

Application Type:

Certification

Model:

A2428

EUT Type:

Tablet Device

FCC Classification:

PCS Licensed Transmitter (PCB)

FCC Rule Part(s):

22, 24, & 27

Test Procedure(s):

ANSI C63.26-2015, ANSI/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

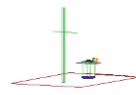
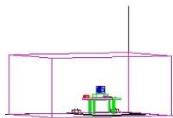


FCC ID: BCGA2428	PCTEST[®] Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 1 of 355

T A B L E O F C O N T E N T S

1.0	INTRODUCTION.....	6
1.1	Scope.....	6
1.2	PCTEST Test Location	6
1.3	Test Facility / Accreditations.....	6
2.0	PRODUCT INFORMATION.....	7
2.1	Equipment Description.....	7
2.2	Device Capabilities	7
2.3	Antenna Description.....	8
2.4	Test Support Equipment.....	8
2.5	Test Configuration	9
2.6	Software and Firmware.....	9
2.7	EMI Suppression Device(s)/Modifications	9
3.0	DESCRIPTION OF TESTS.....	10
3.1	Measurement Procedure.....	10
3.2	Radiated Spurious Emissions.....	10
4.0	MEASUREMENT UNCERTAINTY.....	11
5.0	TEST EQUIPMENT CALIBRATION DATA	12
6.0	SAMPLE CALCULATIONS.....	13
7.0	TEST RESULTS	14
7.1	Summary.....	14
7.2	Occupied Bandwidth.....	16
7.3	Spurious and Harmonic Emissions at Antenna Terminal.....	74
7.4	Band Edge Emissions at Antenna Terminal	120
7.5	Peak-Average Ratio.....	204
7.6	Additional Maximum Power Reduction (A-MPR)	242
7.7	Uplink Carrier Aggregation Conducted Measurements	244
7.8	Radiated Power (ERP/EIRP).....	254
7.9	Radiated Spurious Emissions.....	279
7.10	Uplink Carrier Aggregation Radiated Measurements	326
7.11	Frequency Stability / Temperature Variation.....	336
8.0	CONCLUSION	355

FCC ID: BCGA2428	 PCTEST Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 2 of 355	



MEASUREMENT REPORT

FCC Part 22, 24, & 27

Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)		
LTE Band 71	27	665.5 - 695.5	0.193	22.85			4M58G7W	QPSK
LTE Band 71	27	665.5 - 695.5	0.165	22.17			4M53D7W	16QAM
LTE Band 71	27	665.5 - 695.5	0.132	21.21			4M55D7W	64QAM
LTE Band 71	27	668 - 693	0.193	22.85			9M09G7W	QPSK
LTE Band 71	27	668 - 693	0.162	22.09			9M07D7W	16QAM
LTE Band 71	27	668 - 693	0.128	21.06			9M06D7W	64QAM
LTE Band 71	27	670.5 - 690.5	0.193	22.85			13M6G7W	QPSK
LTE Band 71	27	670.5 - 690.5	0.161	22.07			13M6D7W	16QAM
LTE Band 71	27	670.5 - 690.5	0.128	21.06			13M6D7W	64QAM
LTE Band 71	27	673 - 688	0.193	22.85			18M1G7W	QPSK
LTE Band 71	27	673 - 688	0.168	22.25			18M1D7W	16QAM
LTE Band 71	27	673 - 688	0.128	21.07			18M1D7W	64QAM
LTE Band 12	27	699.7 - 715.3	0.193	22.85	0.316	25.00	1M11G7W	QPSK
LTE Band 12	27	699.7 - 715.3	0.156	21.92	0.255	24.07	1M11D7W	16QAM
LTE Band 12	27	699.7 - 715.3	0.130	21.13	0.213	23.28	1M11D7W	64QAM
LTE Band 12	27	700.5 - 714.5	0.193	22.85	0.316	25.00	2M72G7W	QPSK
LTE Band 12	27	700.5 - 714.5	0.167	22.22	0.274	24.37	2M73D7W	16QAM
LTE Band 12	27	700.5 - 714.5	0.134	21.28	0.220	23.43	2M73D7W	64QAM
LTE Band 12	27	701.5 - 713.5	0.193	22.85	0.316	25.00	4M56G7W	QPSK
LTE Band 12	27	701.5 - 713.5	0.163	22.11	0.267	24.26	4M54D7W	16QAM
LTE Band 12	27	701.5 - 713.5	0.131	21.17	0.215	23.32	4M55D7W	64QAM
LTE Band 12	27	704 - 711	0.193	22.85	0.316	25.00	9M06G7W	QPSK
LTE Band 12	27	704 - 711	0.169	22.27	0.277	24.42	9M08D7W	16QAM
LTE Band 12	27	704 - 711	0.129	21.11	0.212	23.26	9M04D7W	64QAM
LTE Band 17	27	706.5 - 713.5	0.193	22.85	0.316	25.00	4M56G7W	QPSK
LTE Band 17	27	706.5 - 713.5	0.167	22.22	0.274	24.37	4M54D7W	16QAM
LTE Band 17	27	706.5 - 713.5	0.127	21.04	0.208	23.19	4M55D7W	64QAM
LTE Band 17	27	709 - 711	0.193	22.85	0.316	25.00	9M06G7W	QPSK
LTE Band 17	27	709 - 711	0.164	22.16	0.270	24.31	9M08D7W	16QAM
LTE Band 17	27	709 - 711	0.128	21.06	0.209	23.21	9M04D7W	64QAM
LTE Band 13	27	779.5 - 784.5	0.193	22.85	0.316	25.00	4M55G7W	QPSK
LTE Band 13	27	779.5 - 784.5	0.160	22.04	0.262	24.19	4M55D7W	16QAM
LTE Band 13	27	779.5 - 784.5	0.128	21.07	0.210	23.22	4M55D7W	64QAM
LTE Band 13	27	782	0.193	22.85	0.316	25.00	9M05G7W	QPSK
LTE Band 13	27	782	0.166	22.19	0.272	24.34	9M04D7W	16QAM
LTE Band 13	27	782	0.132	21.21	0.217	23.36	9M01D7W	64QAM
LTE Band 5	22H	824.7 - 848.3	0.180	22.55	0.295	24.70	1M11G7W	QPSK
LTE Band 5	22H	824.7 - 848.3	0.148	21.70	0.243	23.85	1M11D7W	16QAM
LTE Band 5	22H	824.7 - 848.3	0.123	20.91	0.202	23.06	1M11D7W	64QAM
LTE Band 5	22H	825.5 - 847.5	0.180	22.55	0.295	24.70	2M73G7W	QPSK
LTE Band 5	22H	825.5 - 847.5	0.160	22.05	0.263	24.20	2M73D7W	16QAM
LTE Band 5	22H	825.5 - 847.5	0.123	20.90	0.202	23.05	2M73D7W	64QAM
LTE Band 5	22H	826.5 - 846.5	0.180	22.55	0.295	24.70	4M55G7W	QPSK
LTE Band 5	22H	826.5 - 846.5	0.155	21.91	0.255	24.06	4M54D7W	16QAM
LTE Band 5	22H	826.5 - 846.5	0.122	20.85	0.200	23.00	4M55D7W	64QAM
LTE Band 5	22H	829 - 844	0.180	22.55	0.295	24.70	9M08G7W	QPSK
LTE Band 5	22H	829 - 844	0.155	21.91	0.255	24.06	9M06D7W	16QAM
LTE Band 5	22H	829 - 844	0.120	20.79	0.197	22.94	9M05D7W	64QAM
LTE Band 26	22H	824.7 - 848.3	0.180	22.55	0.295	24.70	1M11G7W	QPSK
LTE Band 26	22H	824.7 - 848.3	0.159	22.02	0.261	24.17	1M11D7W	16QAM
LTE Band 26	22H	824.7 - 848.3	0.133	21.25	0.219	23.40	1M11D7W	64QAM
LTE Band 26	22H	825.5 - 847.5	0.180	22.55	0.295	24.70	2M73G7W	QPSK
LTE Band 26	22H	825.5 - 847.5	0.161	22.07	0.264	24.22	2M73D7W	16QAM
LTE Band 26	22H	825.5 - 847.5	0.129	21.09	0.211	23.24	2M73D7W	64QAM
LTE Band 26	22H	826.5 - 846.5	0.180	22.55	0.295	24.70	4M55G7W	QPSK
LTE Band 26	22H	826.5 - 846.5	0.158	21.98	0.259	24.13	4M54D7W	16QAM
LTE Band 26	22H	826.5 - 846.5	0.131	21.17	0.215	23.32	4M55D7W	64QAM
LTE Band 26	22H	829 - 844	0.180	22.55	0.295	24.70	9M08G7W	QPSK
LTE Band 26	22H	829 - 844	0.160	22.03	0.262	24.18	9M06D7W	16QAM
LTE Band 26	22H	829 - 844	0.124	20.95	0.204	23.10	9M05D7W	64QAM

EUT Overview (Low Band)

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 3 of 355

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 4	27	1710.7 - 1754.3	0.490	26.90	1M11G7W	QPSK
LTE Band 4	27	1710.7 - 1754.3	0.387	25.88	1M11D7W	16QAM
LTE Band 4	27	1710.7 - 1754.3	0.314	24.97	1M11D7W	64QAM
LTE Band 4	27	1711.5 - 1753.5	0.490	26.90	2M74G7W	QPSK
LTE Band 4	27	1711.5 - 1753.5	0.418	26.21	2M73D7W	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.313	24.96	2M73D7W	64QAM
LTE Band 4	27	1712.5 - 1752.5	0.490	26.90	4M56G7W	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.419	26.22	4M55D7W	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.322	25.08	4M55D7W	64QAM
LTE Band 4	27	1715 - 1750	0.484	26.85	9M06G7W	QPSK
LTE Band 4	27	1715 - 1750	0.415	26.18	9M08D7W	16QAM
LTE Band 4	27	1715 - 1750	0.313	24.96	9M06D7W	64QAM
LTE Band 4	27	1717.5 - 1747.5	0.490	26.90	13M6G7W	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.390	25.91	13M6D7W	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.323	25.09	13M6D7W	64QAM
LTE Band 4	27	1720 - 1745	0.490	26.90	18M1G7W	QPSK
LTE Band 4	27	1720 - 1745	0.426	26.29	18M1D7W	16QAM
LTE Band 4	27	1720 - 1745	0.328	25.16	18M1D7W	64QAM
LTE Band 66	27	1710.7 - 1779.3	0.484	26.85	1M11G7W	QPSK
LTE Band 66	27	1710.7 - 1779.3	0.385	25.86	1M11D7W	16QAM
LTE Band 66	27	1710.7 - 1779.3	0.324	25.11	1M11D7W	64QAM
LTE Band 66	27	1711.5 - 1778.5	0.481	26.82	2M74G7W	QPSK
LTE Band 66	27	1711.5 - 1778.5	0.424	26.27	2M73D7W	16QAM
LTE Band 66	27	1711.5 - 1778.5	0.313	24.96	2M73D7W	64QAM
LTE Band 66	27	1712.5 - 1777.5	0.490	26.90	4M56G7W	QPSK
LTE Band 66	27	1712.5 - 1777.5	0.425	26.28	4M55D7W	16QAM
LTE Band 66	27	1712.5 - 1777.5	0.330	25.19	4M55D7W	64QAM
LTE Band 66	27	1715 - 1775	0.480	26.81	9M06G7W	QPSK
LTE Band 66	27	1715 - 1775	0.427	26.30	9M08D7W	16QAM
LTE Band 66	27	1715 - 1775	0.321	25.07	9M06D7W	64QAM
LTE Band 66	27	1717.5 - 1772.5	0.490	26.90	13M6G7W	QPSK
LTE Band 66	27	1717.5 - 1772.5	0.394	25.96	13M6D7W	16QAM
LTE Band 66	27	1717.5 - 1772.5	0.318	25.03	13M6D7W	64QAM
LTE Band 66	27	1720 - 1770	0.490	26.90	18M1G7W	QPSK
LTE Band 66	27	1720 - 1770	0.411	26.14	18M1D7W	16QAM
LTE Band 66	27	1720 - 1770	0.319	25.04	18M1D7W	64QAM
LTE Band 2	24E	1850.7 - 1909.3	0.586	27.68	1M11G7W	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.515	27.12	1M11D7W	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.400	26.02	1M11D7W	64QAM
LTE Band 2	24E	1851.5 - 1908.5	0.581	27.64	2M73G7W	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.505	27.03	2M73D7W	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.394	25.95	2M74D7W	64QAM
LTE Band 2	24E	1852.5 - 1907.5	0.598	27.77	4M54G7W	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.513	27.10	4M54D7W	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.400	26.02	4M55D7W	64QAM
LTE Band 2	24E	1855 - 1905	0.583	27.66	9M07G7W	QPSK
LTE Band 2	24E	1855 - 1905	0.490	26.90	9M07D7W	16QAM
LTE Band 2	24E	1855 - 1905	0.398	26.00	9M07D7W	64QAM
LTE Band 2	24E	1857.5 - 1902.5	0.603	27.80	13M7G7W	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.498	26.97	13M6D7W	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.403	26.05	13M7D7W	64QAM
LTE Band 2	24E	1860 - 1900	0.596	27.75	18M2G7W	QPSK
LTE Band 2	24E	1860 - 1900	0.507	27.05	18M2D7W	16QAM
LTE Band 2	24E	1860 - 1900	0.387	25.88	18M1D7W	64QAM
LTE Band 25	24E	1850.7 - 1914.3	0.587	27.69	1M11G7W	QPSK
LTE Band 25	24E	1850.7 - 1914.3	0.493	26.93	1M11D7W	16QAM
LTE Band 25	24E	1850.7 - 1914.3	0.391	25.92	1M11D7W	64QAM
LTE Band 25	24E	1851.5 - 1913.5	0.585	27.67	2M73G7W	QPSK
LTE Band 25	24E	1851.5 - 1913.5	0.505	27.03	2M73D7W	16QAM
LTE Band 25	24E	1851.5 - 1913.5	0.398	26.00	2M74D7W	64QAM
LTE Band 25	24E	1852.5 - 1912.5	0.603	27.80	4M54G7W	QPSK
LTE Band 25	24E	1852.5 - 1912.5	0.516	27.13	4M54D7W	16QAM
LTE Band 25	24E	1852.5 - 1912.5	0.403	26.05	4M55D7W	64QAM
LTE Band 25	24E	1855 - 1910	0.582	27.65	9M07G7W	QPSK
LTE Band 25	24E	1855 - 1910	0.493	26.93	9M07D7W	16QAM
LTE Band 25	24E	1855 - 1910	0.403	26.05	9M07D7W	64QAM
LTE Band 25	24E	1857.5 - 1907.5	0.598	27.77	13M7G7W	QPSK
LTE Band 25	24E	1857.5 - 1907.5	0.501	27.00	13M6D7W	16QAM
LTE Band 25	24E	1857.5 - 1907.5	0.400	26.02	13M7D7W	64QAM
LTE Band 25	24E	1860 - 1905	0.596	27.75	18M2G7W	QPSK
LTE Band 25	24E	1860 - 1905	0.500	26.99	18M2D7W	16QAM
LTE Band 25	24E	1860 - 1905	0.392	25.93	18M1D7W	64QAM

EUT Overview (Mid Bands)

FCC ID: BCGA2428	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 4 of 355	

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 30	27	2307.5 - 2312.5	0.209	23.20	4M55G7W	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.183	22.62	4M55D7W	16QAM
LTE Band 30	27	2307.5 - 2312.5	0.150	21.77	4M55D7W	64QAM
LTE Band 30	27	2310	0.209	23.20	9M06G7W	QPSK
LTE Band 30	27	2310	0.187	22.72	9M09D7W	16QAM
LTE Band 30	27	2310	0.145	21.61	9M07D7W	64QAM
LTE Band 7	27	2502.5 - 2567.5	0.525	27.20	4M54G7W	QPSK
LTE Band 7	27	2502.5 - 2567.5	0.457	26.60	4M54D7W	16QAM
LTE Band 7	27	2502.5 - 2567.5	0.333	25.23	4M55D7W	64QAM
LTE Band 7	27	2505 - 2565	0.525	27.20	9M10G7W	QPSK
LTE Band 7	27	2505 - 2565	0.444	26.47	9M07D7W	16QAM
LTE Band 7	27	2505 - 2565	0.336	25.26	9M06D7W	64QAM
LTE Band 7	27	2507.5 - 2562.5	0.525	27.20	13M6G7W	QPSK
LTE Band 7	27	2507.5 - 2562.5	0.421	26.24	13M6D7W	16QAM
LTE Band 7	27	2507.5 - 2562.5	0.339	25.30	13M6D7W	64QAM
LTE Band 7	27	2510 - 2560	0.525	27.20	18M2G7W	QPSK
LTE Band 7	27	2510 - 2560	0.448	26.51	18M2D7W	16QAM
LTE Band 7	27	2510 - 2560	0.347	25.40	18M1D7W	64QAM
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.736	28.67	4M63G7W	QPSK
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.668	28.25	4M65D7W	16QAM
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.527	27.22	4M61D7W	64QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.740	28.69	9M18G7W	QPSK
LTE Band 41 (PC2)	27	2501 - 2685	0.673	28.28	9M28D7W	16QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.520	27.16	9M21D7W	64QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.740	28.69	13M9G7W	QPSK
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.658	28.18	13M8D7W	16QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.537	27.30	13M8D7W	64QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.741	28.70	18M4G7W	QPSK
LTE Band 41 (PC2)	27	2506 - 2680	0.682	28.34	18M4D7W	16QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.540	27.32	18M3D7W	64QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.525	27.20	4M63G7W	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.418	26.21	4M65D7W	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.354	25.49	4M61D7W	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.515	27.12	9M18G7W	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.400	26.02	9M28D7W	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.339	25.30	9M21D7W	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.518	27.14	13M9G7W	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.413	26.16	13M8D7W	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.350	25.44	13M8D7W	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.519	27.15	18M4G7W	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.412	26.15	18M4D7W	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.349	25.43	18M3D7W	64QAM

EUT Overview (High Bands)

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 5 of 355

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 v01.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Morgan Hill, CA 95037, U.S.A.

- 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.

FCC ID: BCGA2428	 PCTEST Proud to be part of 		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 6 of 355	

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2428**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: F9FCN06WQ7KN, F9FCN05MQ7KN, F9F01960HB5PWW72S, F9F01930HA8PWW72V

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 WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE)

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 (2496 - 2690 MHz) overlaps the entire frequency range of LTE Band 38 (2570 - 2620 MHz). Therefore, test data provided in this report covers Band 38 as well as Band 41.

LTE Band 41 supports NS04 for Port A (Antenna C) and NS01 for Port B (Antenna D).

This device supports simultaneous multi radio transmission feature, which allows Bluetooth (1x, EDR, LE) and WiFi UNII 5GHz (802.11a/n/ac) to transmit simultaneously at the same antenna. All possible simultaneous configurations have been investigated and worst case mode has been found and reported in Bluetooth and UNII test reports.

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 7 of 355

2.3 Antenna Description

Following antenna was used for the testing.

Antenna and Port	
Port A	Port B
Antenna C	Antenna D

Table 2-1. Antenna vs Ports

Frequency [MHz]	Antennas	
	Antenna C	Antenna D
650-800	-0.5	-0.7
820-960	-0.8	-0.6
1700-1800	1.4	2.0
1820-2100	2.3	2.6
2300-2320	1.4	1.7
2400-2700	1.7	2.0

Table 2-2. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple MacBook w/AC/DC Adapter	Model: A1398 Model: A1435	S/N: C2QKP008F6F3 S/N: N/A
2	Apple USB Cable	Model: Kanzi	S/N: 32530F
3	USB-C to Lightning Cable w/ AC Adapter	Model: N/A Model: A2305	S/N: N/A S/N: N/A
4	Apple Pencil	Model: A1603	S/N: G64TG0FEGWTJ
5	DC Power Supply	Model: KPS3010D	S/N: N/A

Table 2-3. Test Support Equipment List

FCC ID: BCGA2428	 PCTEST [®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 8 of 355

2.5 Test Configuration

The EUT was tested per the guidance of ANSIC63.26, 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 channel and the worst case configuration.

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 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.

FCC ID: BCGA2428	 PCTEST Proud to be part of 		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 9 of 355

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/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 dB μ (EIRP), and L_C signal attenuation in the connecting cable between the transmitter and antenna in dB.

Per the guidance of ANSI/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:

$$P_d [\text{dBm}] = P_g [\text{dBm}] - \text{cable loss } [\text{dB}] + \text{antenna gain } [\text{dBd/dBi}]$$

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 (dB μ). The substitute level is equal to $P_g [\text{dBm}] - \text{cable loss } [\text{dB}]$.

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 $43 + 10\log_{10}(\text{Power } [\text{Watts}])$. 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 $55 + 10\log_{10}(\text{Power } [\text{Watts}])$. 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 $70 + 10\log_{10}(\text{Power } [\text{Watts}])$.

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.

FCC ID: BCGA2428	PCTEST [®] Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 10 of 355

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 (\pm dB)
Conducted Bench Top Measurements	1.30
Radiated Disturbance (<1GHz)	4.15
Radiated Disturbance (>1GHz)	4.59
Radiated Disturbance (>18GHz)	4.96

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 11 of 355	

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:

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.

FCC ID: BCGA2428	PCTEST [®] Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

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 analyzer. 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).

FCC ID: BCGA2428	 PCTEST Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 13 of 355

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCGA2428
 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	PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	> $43 + 10 \log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions			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 must meet the limits detailed 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 7.11

Table 7-1. Summary of Conducted Test Results

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 14 of 355	

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	RADIATED	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	> $43 + 10 \log_{10} (P[\text{Watts}])$ for all out-of-band emissions			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)	> $70 + 10 \log_{10} (P[\text{Watts}])$			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 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.
- 5) All ports were investigated and for some test cases only the worst case data was reported

FCC ID: BCGA2428	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 15 of 355

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

ANSI C63.26-2015

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 \geq 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.

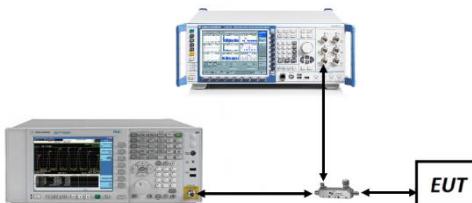


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

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

FCC ID: BCGA2428	 PCTEST[®] Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 16 of 355

© 2020 PCTEST

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

V 10.1 02/01/2020

LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 71	5	QPSK	4578.3
Band 71	5	16QAM	4534.6
Band 71	5	64QAM	4551.0
Band 71	10	QPSK	9093.9
Band 71	10	16QAM	9065.9
Band 71	10	64QAM	9060.0
Band 71	15	QPSK	13614.3
Band 71	15	16QAM	13615.2
Band 71	15	64QAM	13595.5
Band 71	20	QPSK	18057.6
Band 71	20	16QAM	18074.0
Band 71	20	64QAM	18074.0
Band 12	1.4	QPSK	1106.5
Band 12	1.4	16QAM	1107.7
Band 12	1.4	64QAM	1105.1
Band 12	3	QPSK	2723.7
Band 12	3	16QAM	2726.6
Band 12	3	64QAM	2729.7
Band 12	5	QPSK	4562.2
Band 12	5	16QAM	4538.2
Band 12	5	64QAM	4548.3
Band 12	10	QPSK	9062.6
Band 12	10	16QAM	9080.0
Band 12	10	64QAM	9039.3
Band 17	5	QPSK	4562.2
Band 17	5	16QAM	4538.2
Band 17	5	64QAM	4548.3
Band 17	10	QPSK	9062.6
Band 17	10	16QAM	9080.0
Band 17	10	64QAM	9039.3
Band 13	5	QPSK	4550.7
Band 13	5	16QAM	4550.6
Band 13	5	64QAM	4548.9
Band 13	10	QPSK	9051.0
Band 13	10	16QAM	9037.9
Band 13	10	64QAM	9009.3
Band 5	1.4	QPSK	1110.2
Band 5	1.4	16QAM	1106.0
Band 5	1.4	64QAM	1107.4
Band 5	3	QPSK	2731.1
Band 5	3	16QAM	2727.6
Band 5	3	64QAM	2729.0
Band 5	5	QPSK	4547.2
Band 5	5	16QAM	4543.0
Band 5	5	64QAM	4547.1
Band 5	10	QPSK	9077.5
Band 5	10	16QAM	9060.8
Band 5	10	64QAM	9047.2
Band 26	1.4	QPSK	1110.2
Band 26	1.4	16QAM	1106.0
Band 26	1.4	64QAM	1107.4
Band 26	3	QPSK	2731.1
Band 26	3	16QAM	2727.6
Band 26	3	64QAM	2729.0
Band 26	5	QPSK	4547.2
Band 26	5	16QAM	4543.0
Band 26	5	64QAM	4547.1
Band 26	10	QPSK	9077.5
Band 26	10	16QAM	9060.8
Band 26	10	64QAM	9047.2

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

FCC ID: BCGA2428	PCTEST [®] Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 4	1.4	QPSK	1109.2
Band 4	1.4	16QAM	1110.0
Band 4	1.4	64QAM	1107.7
Band 4	3	QPSK	2738.3
Band 4	3	16QAM	2731.7
Band 4	3	64QAM	2731.1
Band 4	5	QPSK	4556.5
Band 4	5	16QAM	4549.7
Band 4	5	64QAM	4545.7
Band 4	10	QPSK	9064.6
Band 4	10	16QAM	9079.3
Band 4	10	64QAM	9063.0
Band 4	15	QPSK	13632.0
Band 4	15	16QAM	13644.0
Band 4	15	64QAM	13628.0
Band 4	20	QPSK	18110.0
Band 4	20	16QAM	18117.0
Band 4	20	64QAM	18103.3
Band 66	1.4	QPSK	1109.2
Band 66	1.4	16QAM	1110.0
Band 66	1.4	64QAM	1107.7
Band 66	3	QPSK	2738.3
Band 66	3	16QAM	2731.7
Band 66	3	64QAM	2731.1
Band 66	5	QPSK	4556.5
Band 66	5	16QAM	4549.7
Band 66	5	64QAM	4545.7
Band 66	10	QPSK	9064.6
Band 66	10	16QAM	9079.3
Band 66	10	64QAM	9063.0
Band 66	15	QPSK	13632.0
Band 66	15	16QAM	13644.0
Band 66	15	64QAM	13628.0
Band 66	20	QPSK	18110.0
Band 66	20	16QAM	18117.0
Band 66	20	64QAM	18103.3
Band 2	1.4	QPSK	1110.8
Band 2	1.4	16QAM	1108.7
Band 2	1.4	64QAM	1110.6
Band 2	3	QPSK	2734.1
Band 2	3	16QAM	2731.4
Band 2	3	64QAM	2740.6
Band 2	5	QPSK	4542.1
Band 2	5	16QAM	4539.7
Band 2	5	64QAM	4553.2
Band 2	10	QPSK	9072.9
Band 2	10	16QAM	9069.6
Band 2	10	64QAM	9073.4
Band 2	15	QPSK	13666.0
Band 2	15	16QAM	13637.2
Band 2	15	64QAM	13656.0
Band 2	20	QPSK	18164.3
Band 2	20	16QAM	18154.0
Band 2	20	64QAM	18125.4
Band 25	1.4	QPSK	1110.8
Band 25	1.4	16QAM	1108.7
Band 25	1.4	64QAM	1110.6
Band 25	3	QPSK	2734.1
Band 25	3	16QAM	2731.4
Band 25	3	64QAM	2740.6
Band 25	5	QPSK	4542.1
Band 25	5	16QAM	4539.7
Band 25	5	64QAM	4553.2
Band 25	10	QPSK	9072.9
Band 25	10	16QAM	9069.6
Band 25	10	64QAM	9073.4
Band 25	15	QPSK	13666.0
Band 25	15	16QAM	13637.2
Band 25	15	64QAM	13656.0
Band 25	20	QPSK	18164.3
Band 25	20	16QAM	18154.0
Band 25	20	64QAM	18125.4

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

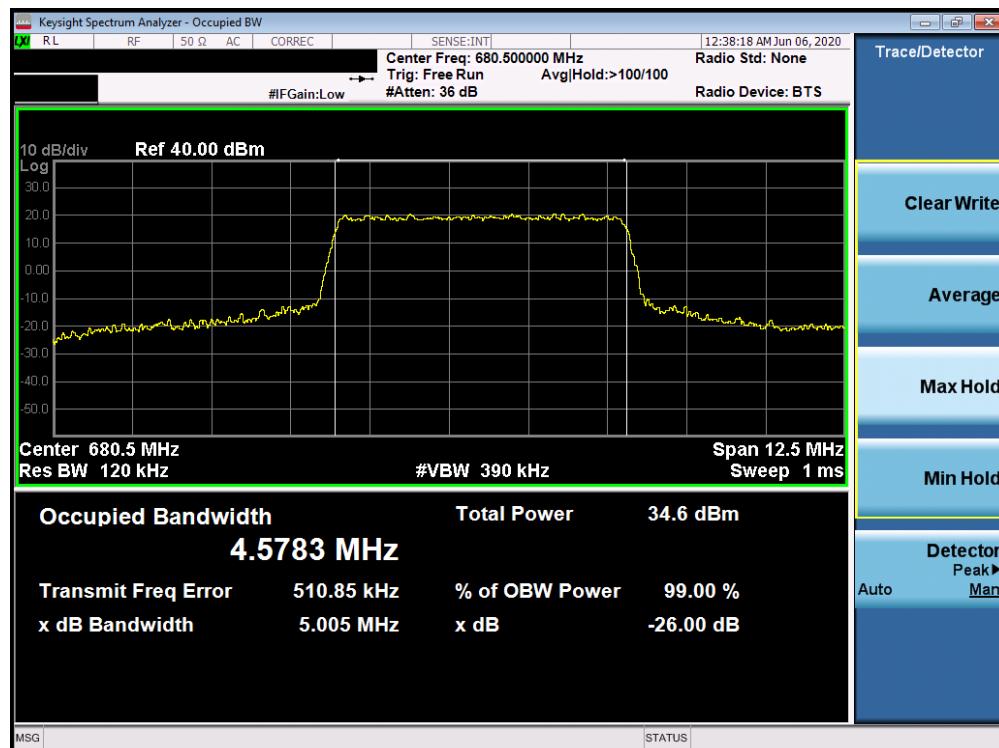
FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 18 of 355	

LTE	BW (MHz)	Modulation	Occupied BW [kHz]
Band 30	5	QPSK	4554.2
Band 30	5	16QAM	4546.8
Band 30	5	64QAM	4554.8
Band 30	10	QPSK	9057.5
Band 30	10	16QAM	9093.1
Band 30	10	64QAM	9069.6
Band 7	5	QPSK	4544.4
Band 7	5	16QAM	4540.3
Band 7	5	64QAM	4548.0
Band 7	10	QPSK	9095.0
Band 7	10	16QAM	9065.1
Band 7	10	64QAM	9056.6
Band 7	15	QPSK	13648.0
Band 7	15	16QAM	13639.4
Band 7	15	64QAM	13637.2
Band 7	20	QPSK	18153.0
Band 7	20	16QAM	18215.0
Band 7	20	64QAM	18090.0
Band 41	5	QPSK	4631.3
Band 41	5	16QAM	4648.7
Band 41	5	64QAM	4607.6
Band 41	10	QPSK	9179.7
Band 41	10	16QAM	9277.9
Band 41	10	64QAM	9208.4
Band 41	15	QPSK	13910.0
Band 41	15	16QAM	13791.0
Band 41	15	64QAM	13757.0
Band 41	20	QPSK	18373.0
Band 41	20	16QAM	18377.0
Band 41	20	64QAM	18276.4

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

FCC ID: BCGA2428	PCTEST [®] Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

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)

FCC ID: BCGA2428	 PCTEST® Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 20 of 355	

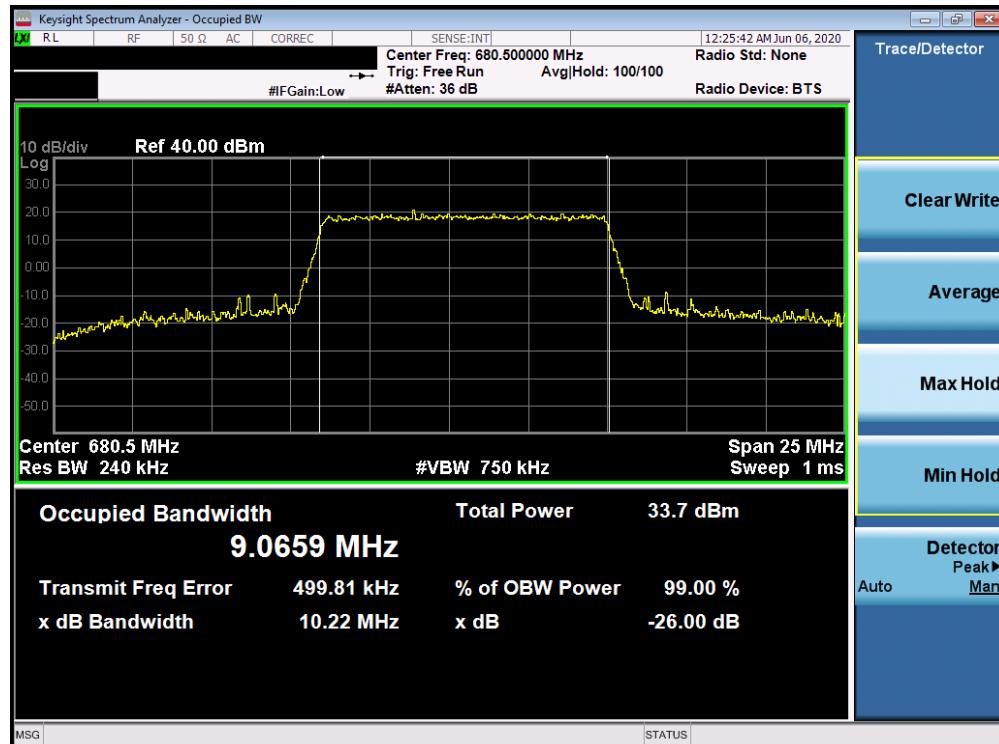


Plot 7-3. Occupied Bandwidth Plot (Band 71 - 5.0MHz 64-QAM - Full RB Configuration)

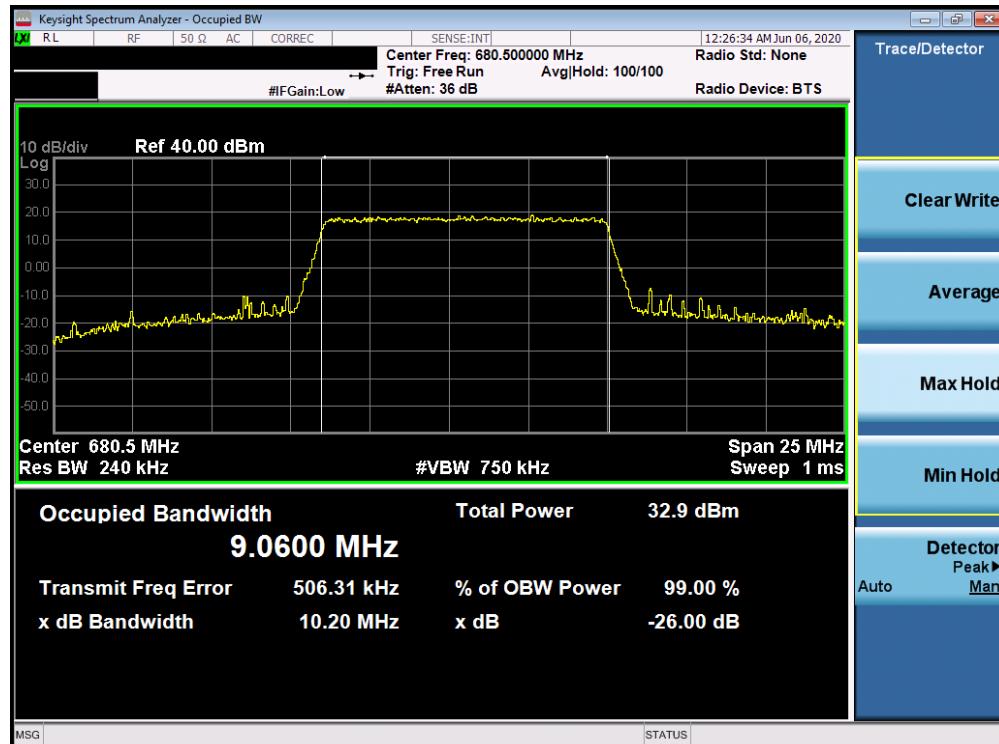


Plot 7-4. Occupied Bandwidth Plot (Band 71 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 21 of 355

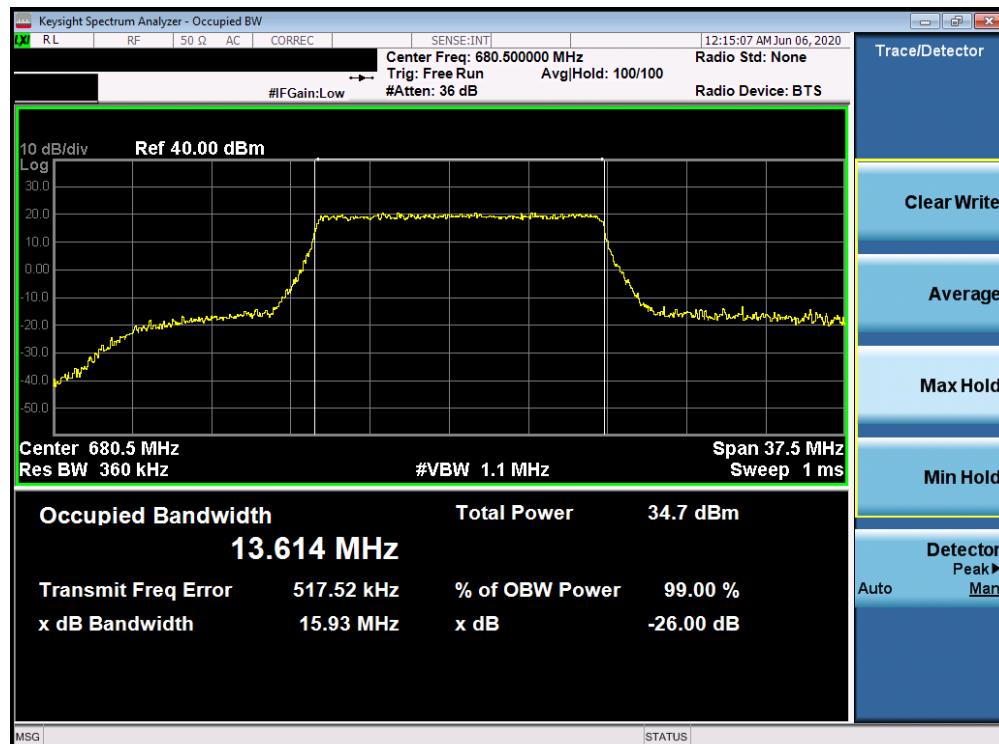


Plot 7-5. Occupied Bandwidth Plot (Band 71 - 10.0MHz 16-QAM - Full RB Configuration)

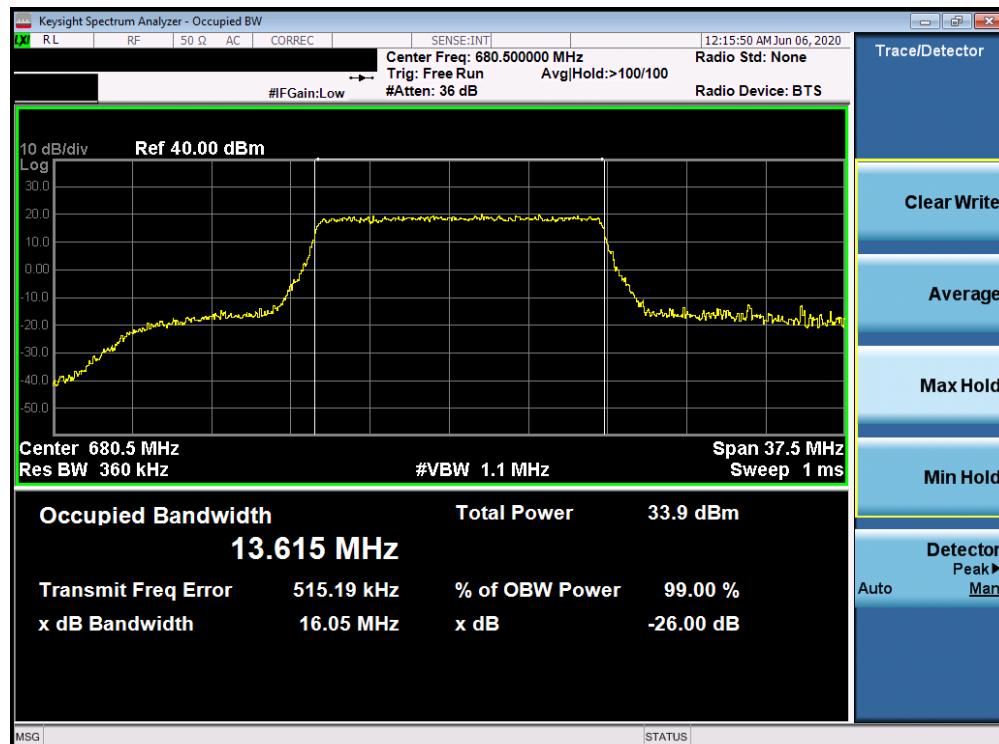


Plot 7-6. Occupied Bandwidth Plot (Band 71 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



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)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 23 of 355	



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)

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 24 of 355	



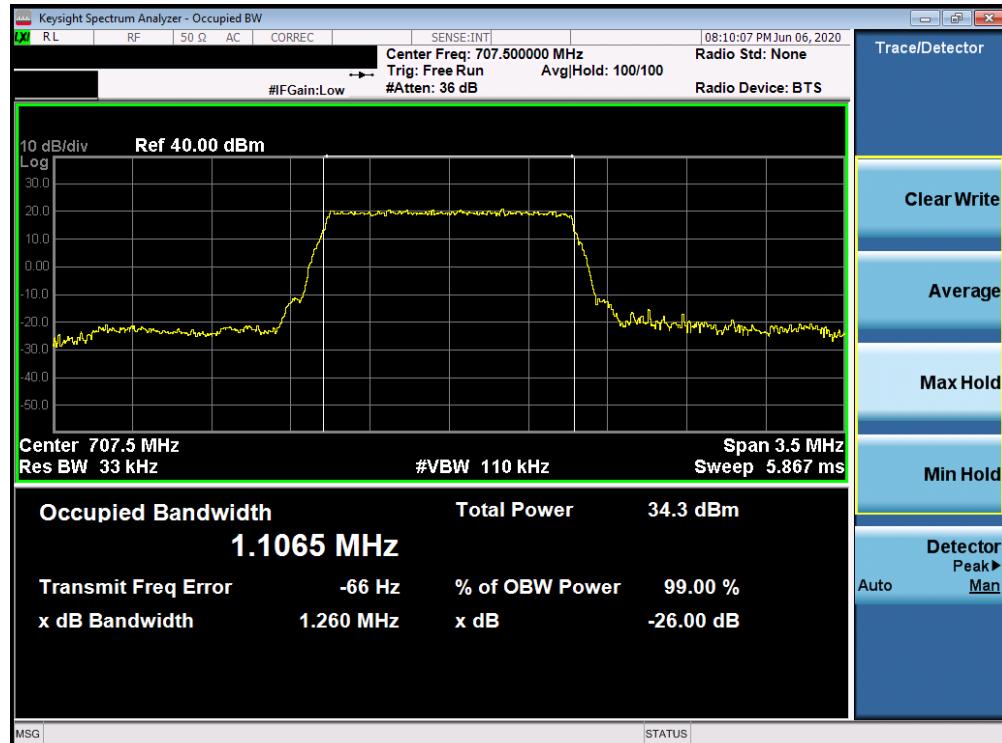
Plot 7-11. Occupied Bandwidth Plot (Band 71 - 20.0MHz 16-QAM - Full RB Configuration)



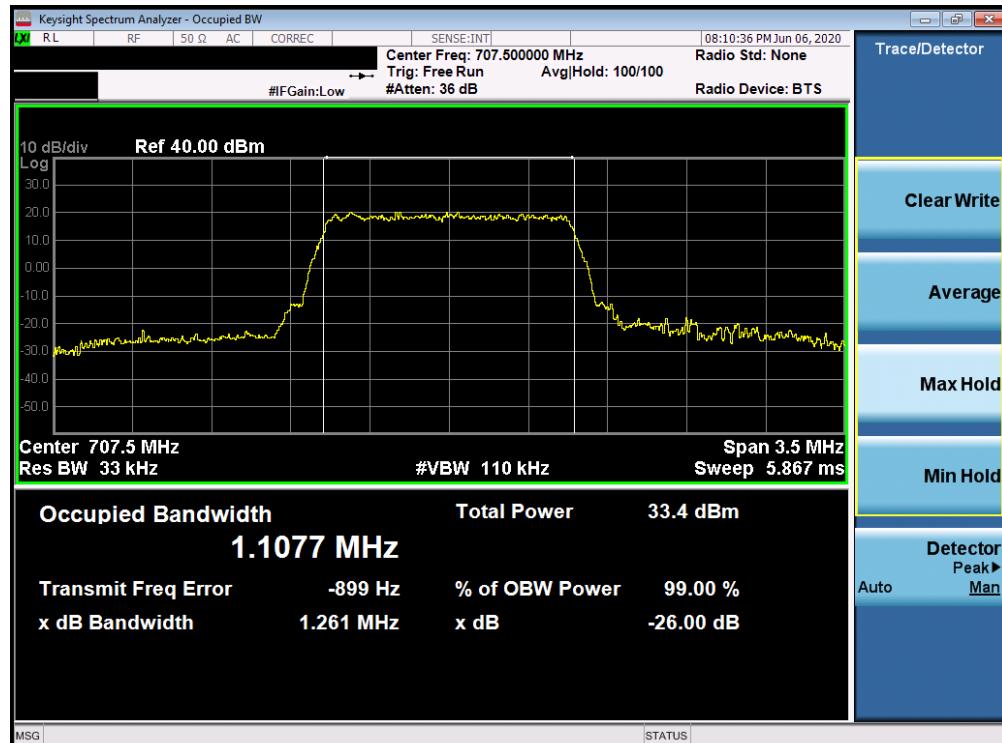
Plot 7-12. Occupied Bandwidth Plot (Band 71 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

Band 12/17

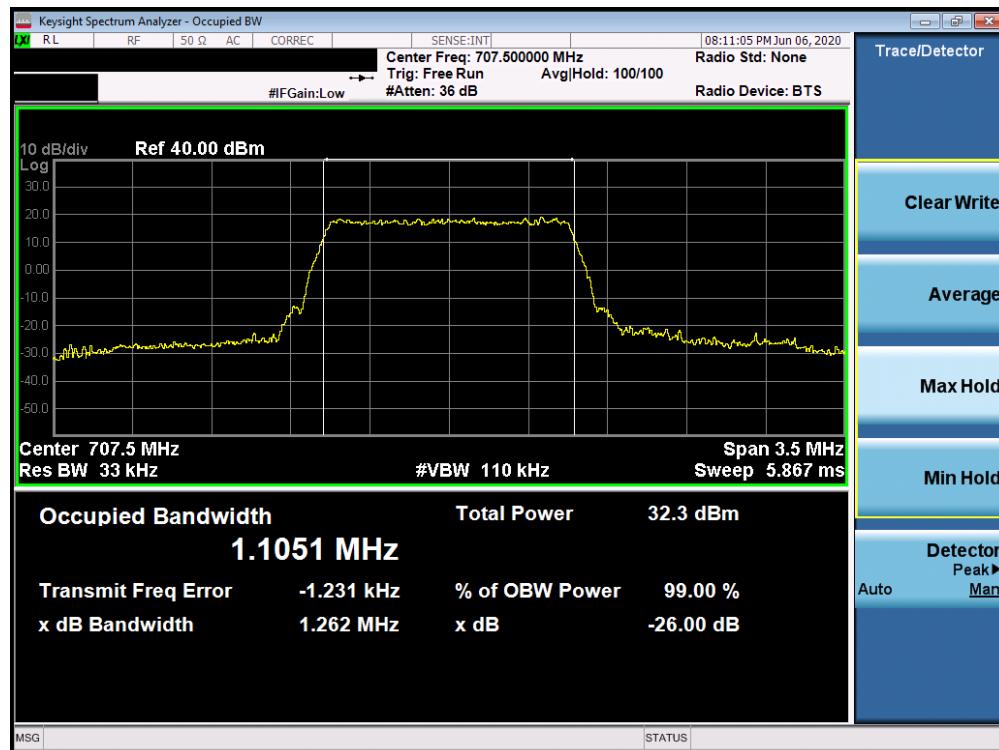


Plot 7-13. Occupied Bandwidth Plot (Band 12/17 - 1.4MHz QPSK - Full RB Configuration)

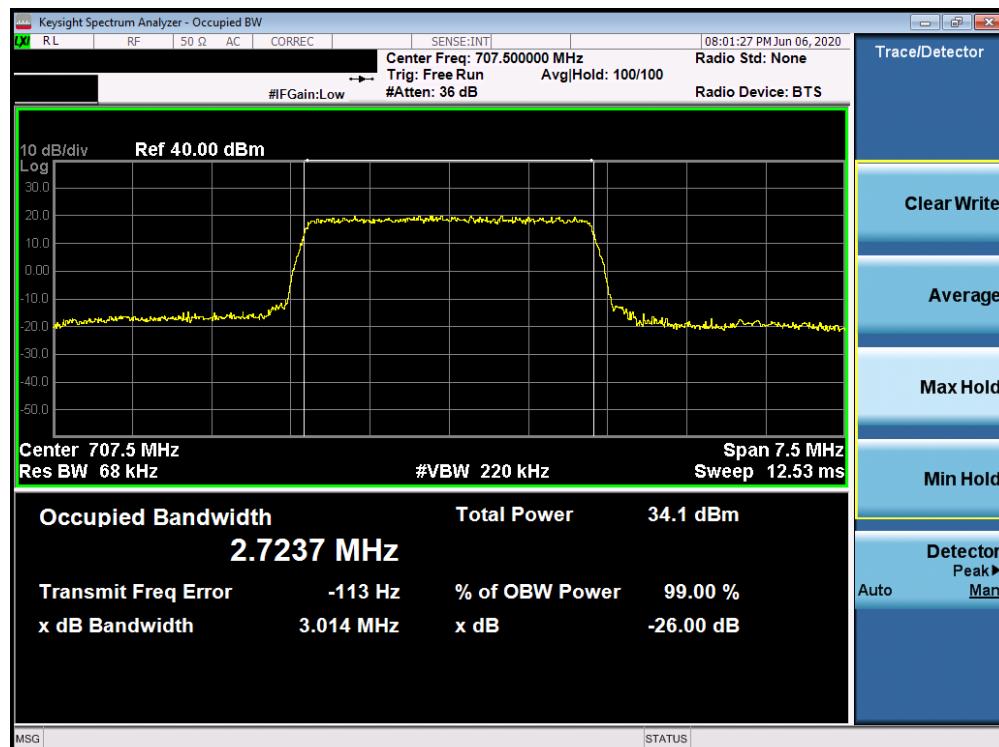


Plot 7-14. Occupied Bandwidth Plot (Band 12/17 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 26 of 355	

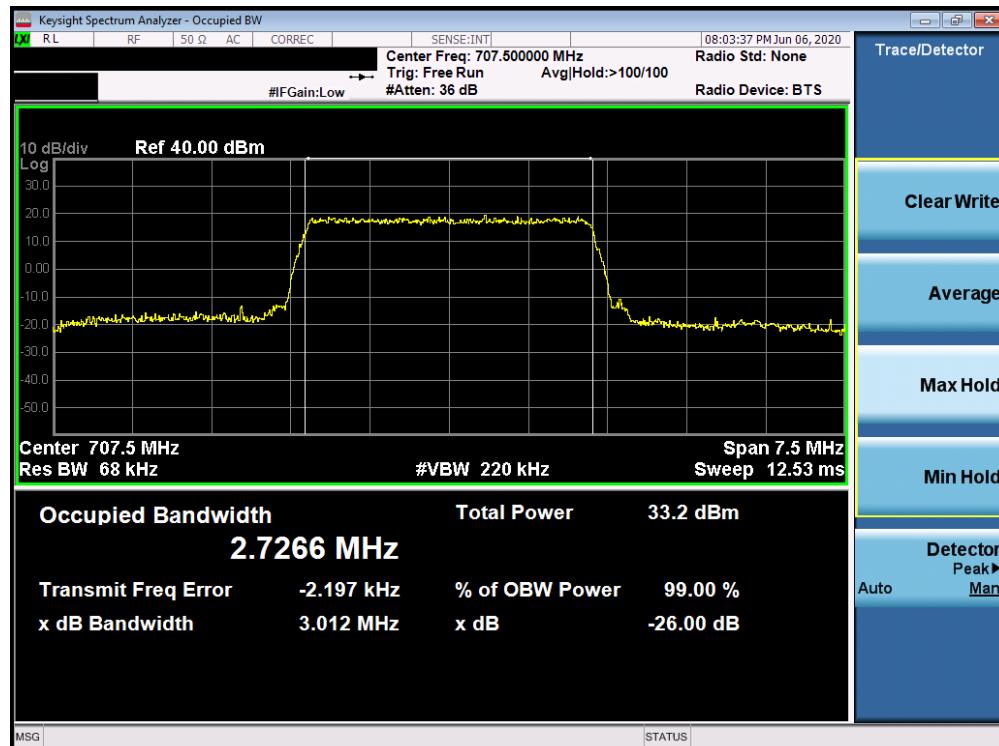


Plot 7-15. Occupied Bandwidth Plot (Band 12/17 - 1.4MHz 64-QAM - Full RB Configuration)

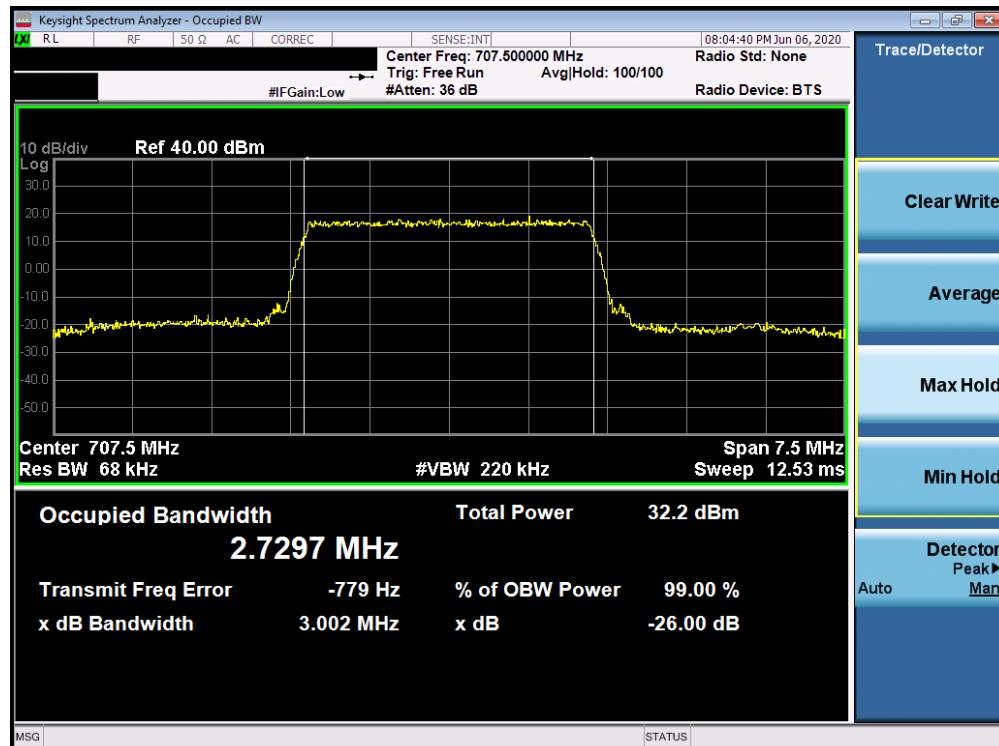


Plot 7-16. Occupied Bandwidth Plot (Band 12/17 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



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

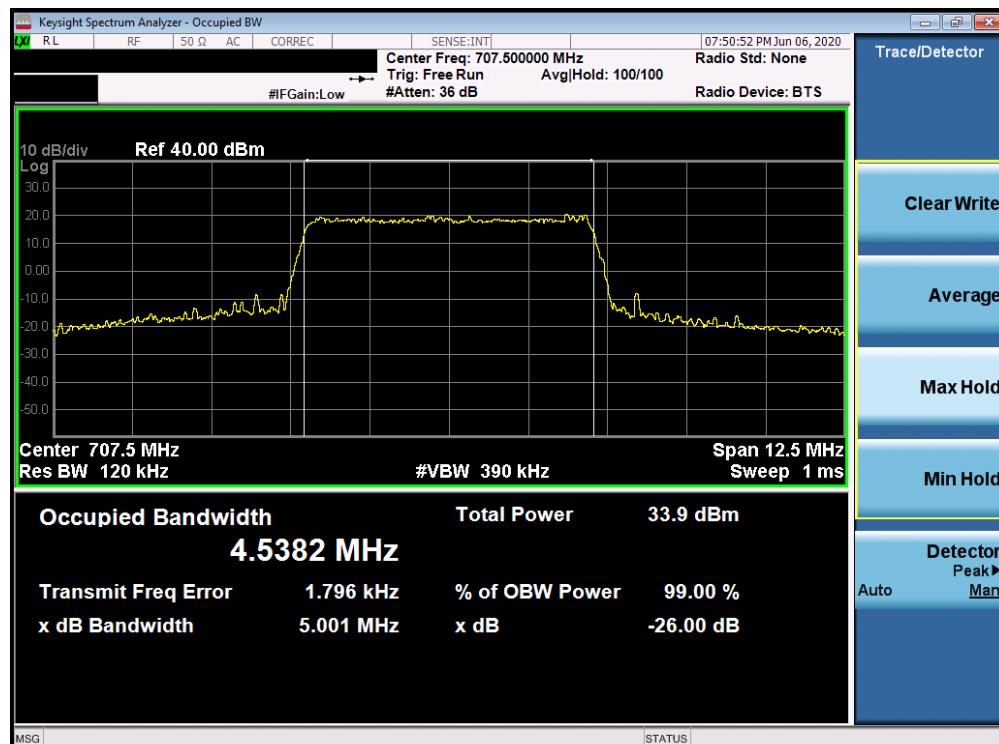


Plot 7-18. Occupied Bandwidth Plot (Band 12/17 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

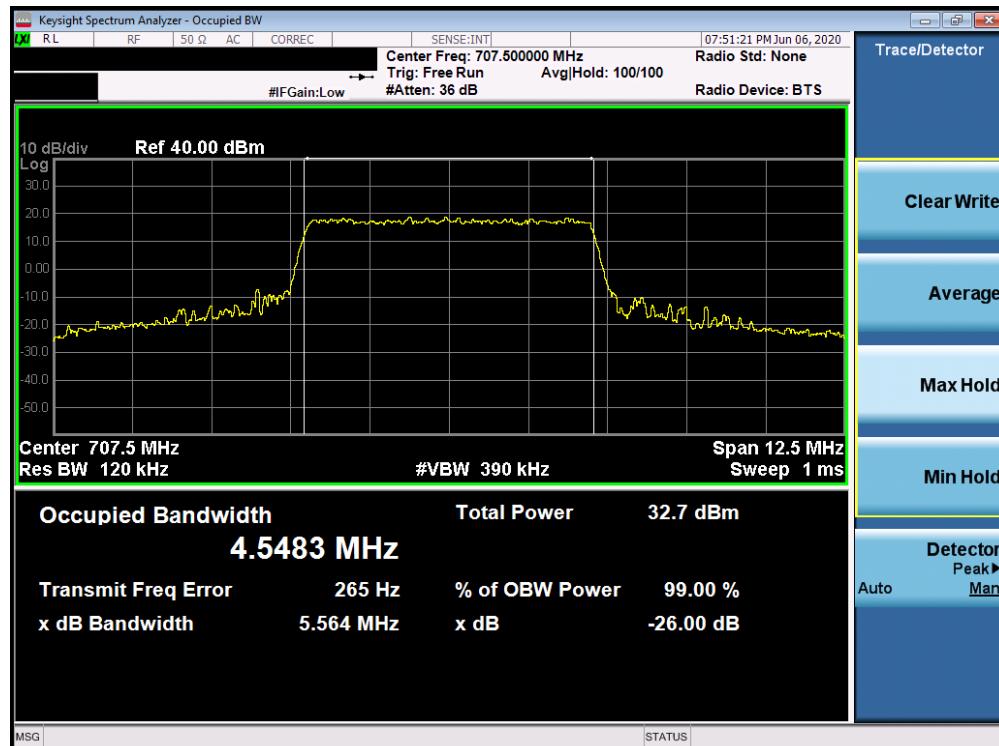


Plot 7-19. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz QPSK - Full RB Configuration)



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

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

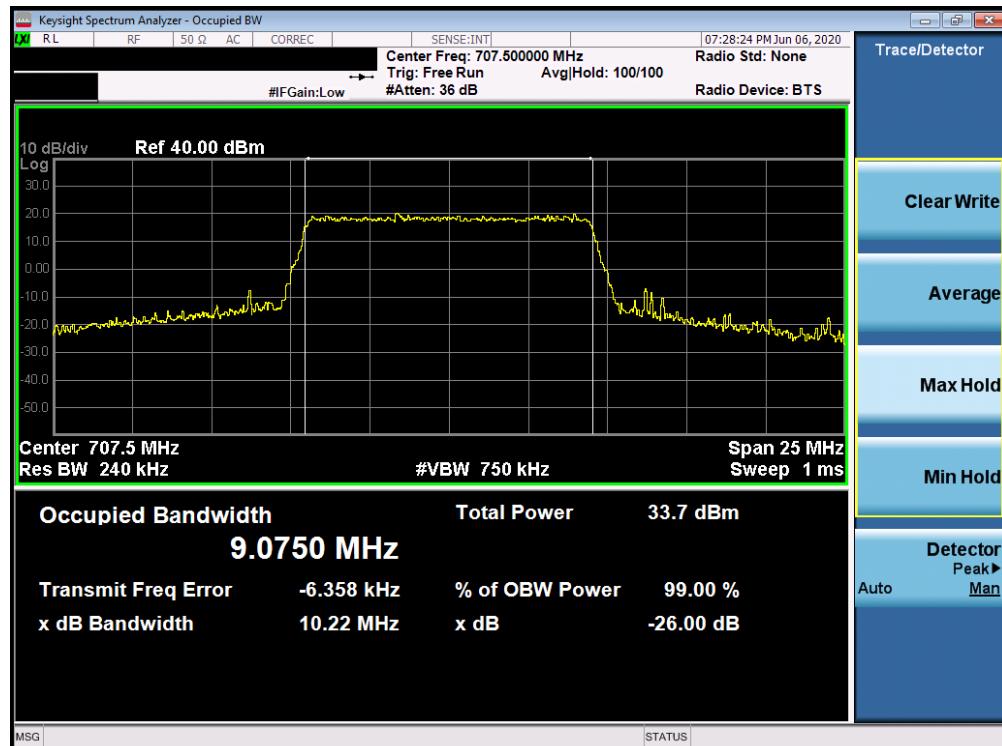


Plot 7-21. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz 64-QAM - Full RB Configuration)



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

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 30 of 355



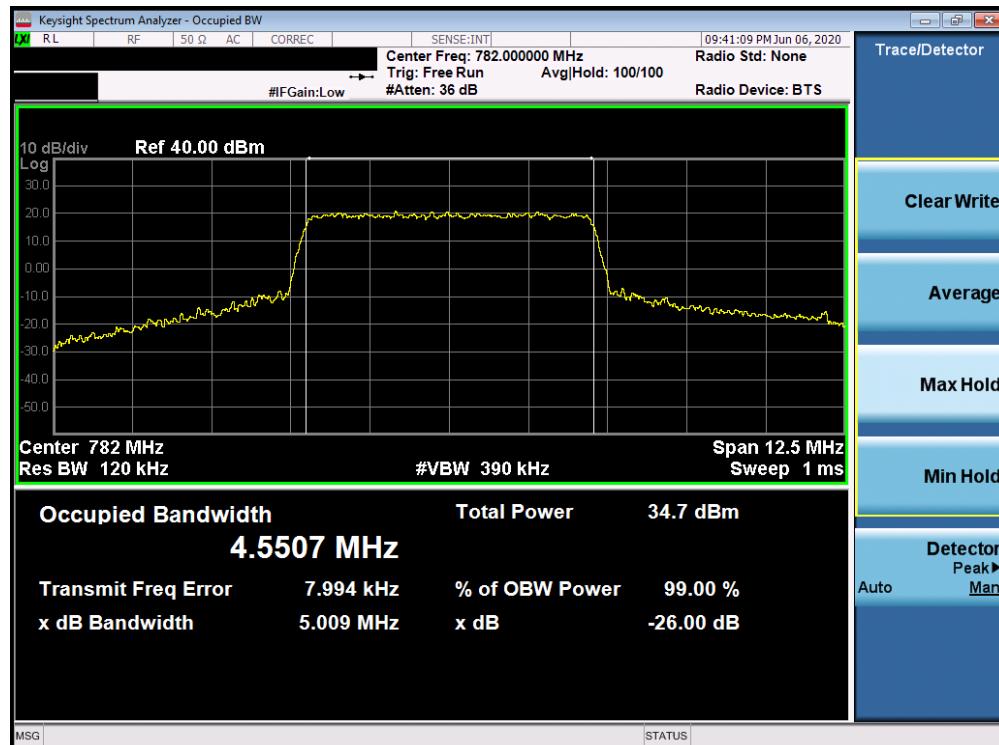
Plot 7-23. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 31 of 355

Band 13



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

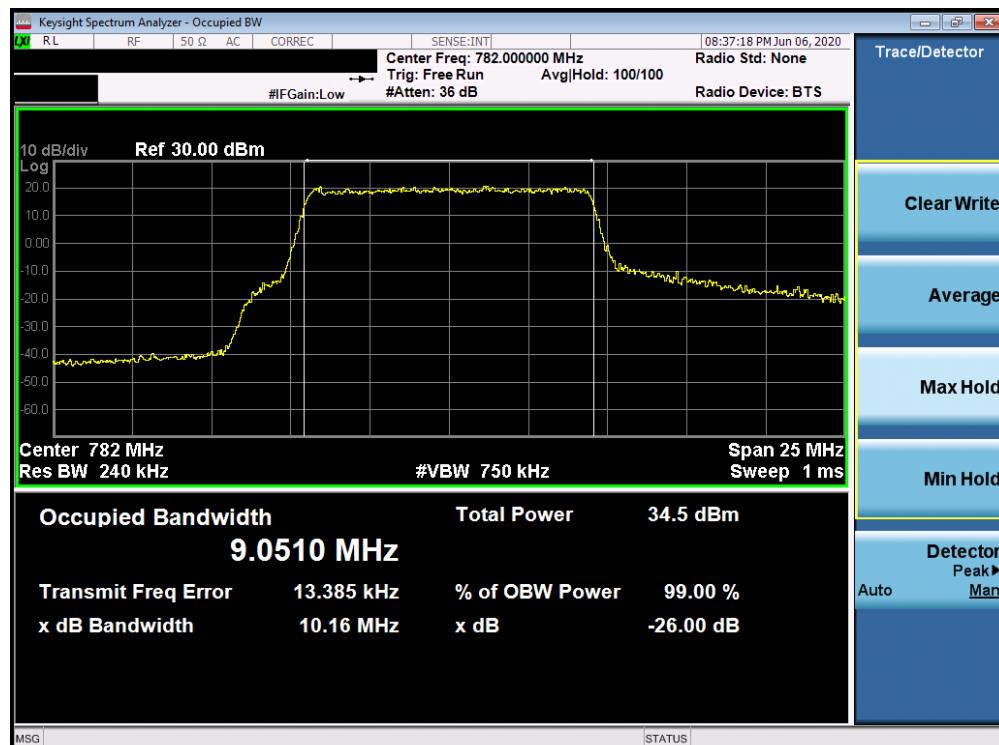


Plot 7-26. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 32 of 355	



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)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



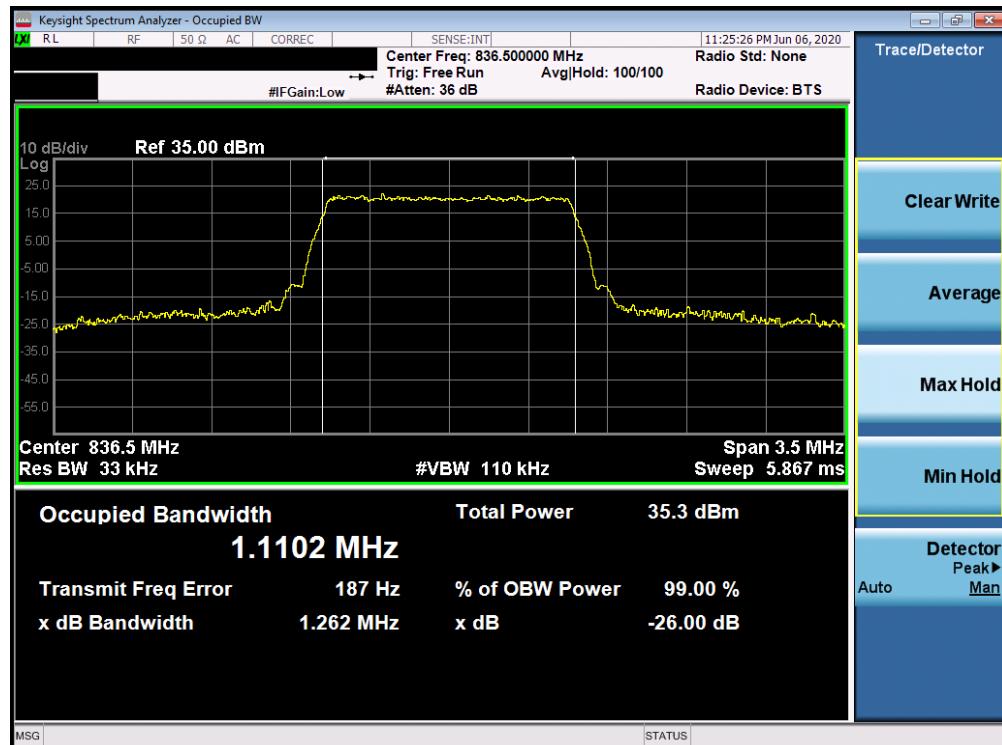
Plot 7-29. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



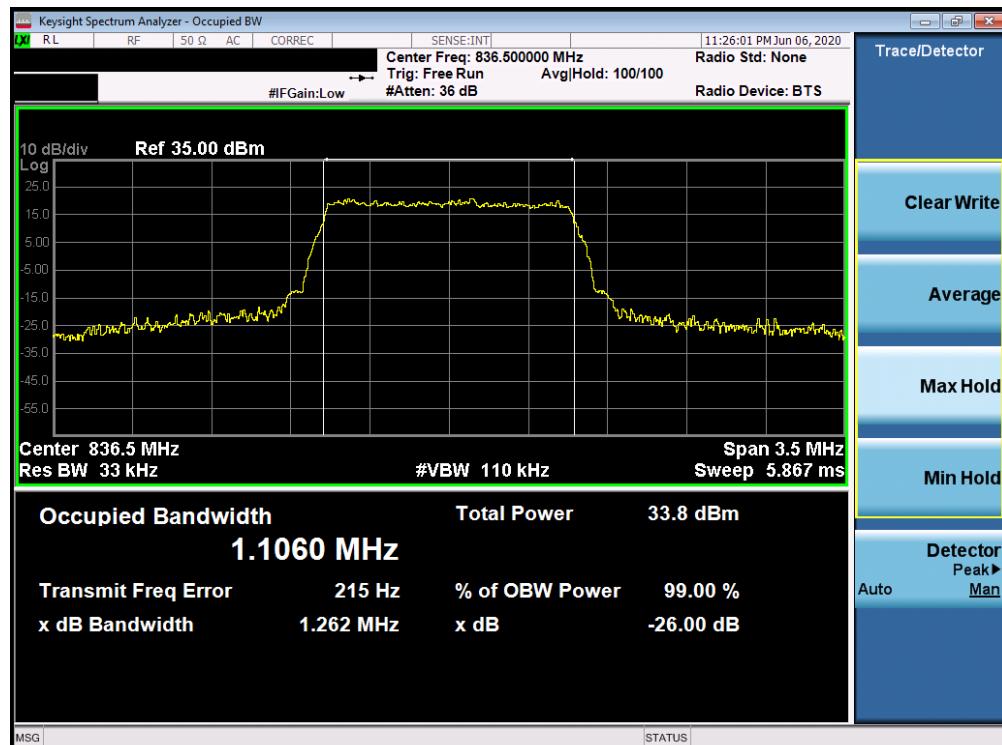
Plot 7-30. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 34 of 355

Band 26/5

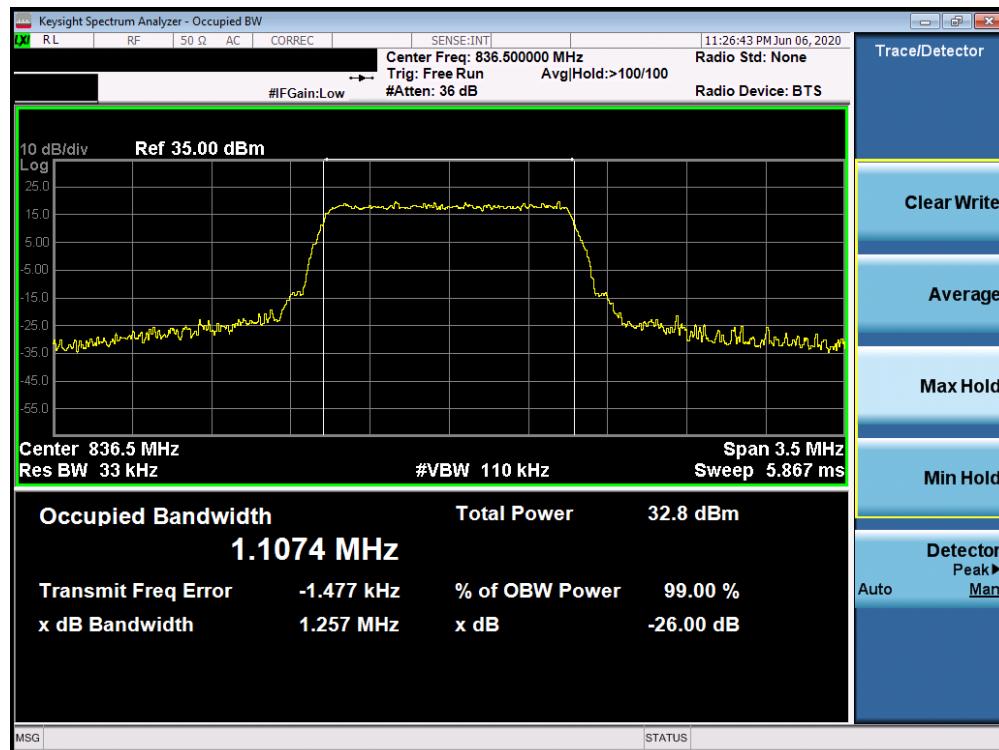


Plot 7-31. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

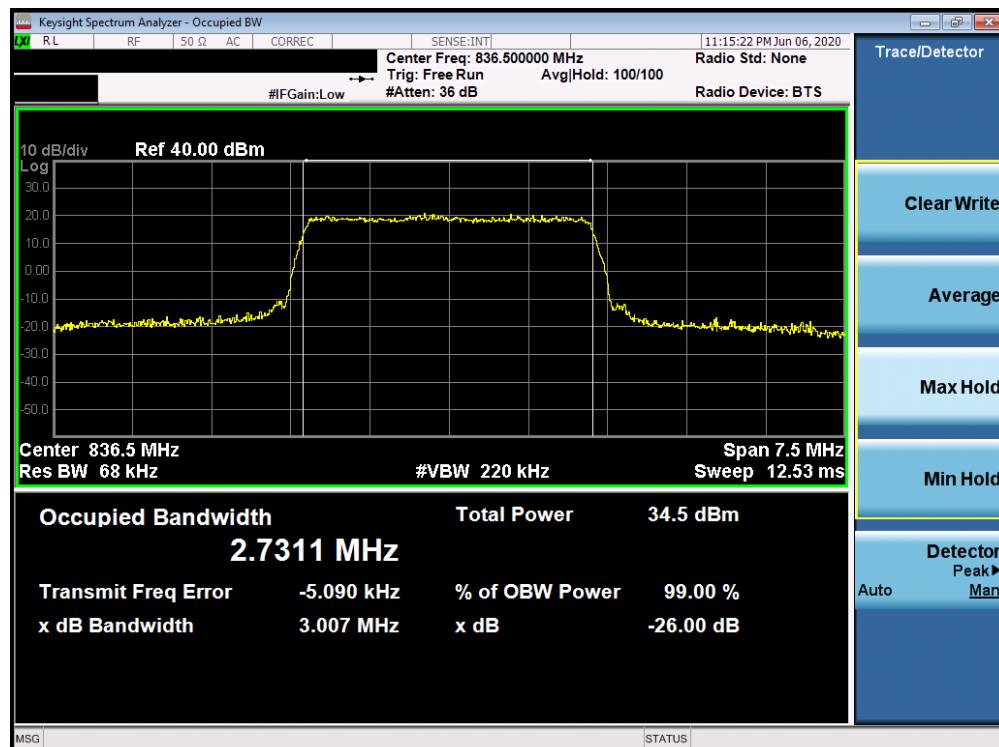


Plot 7-32. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 35 of 355

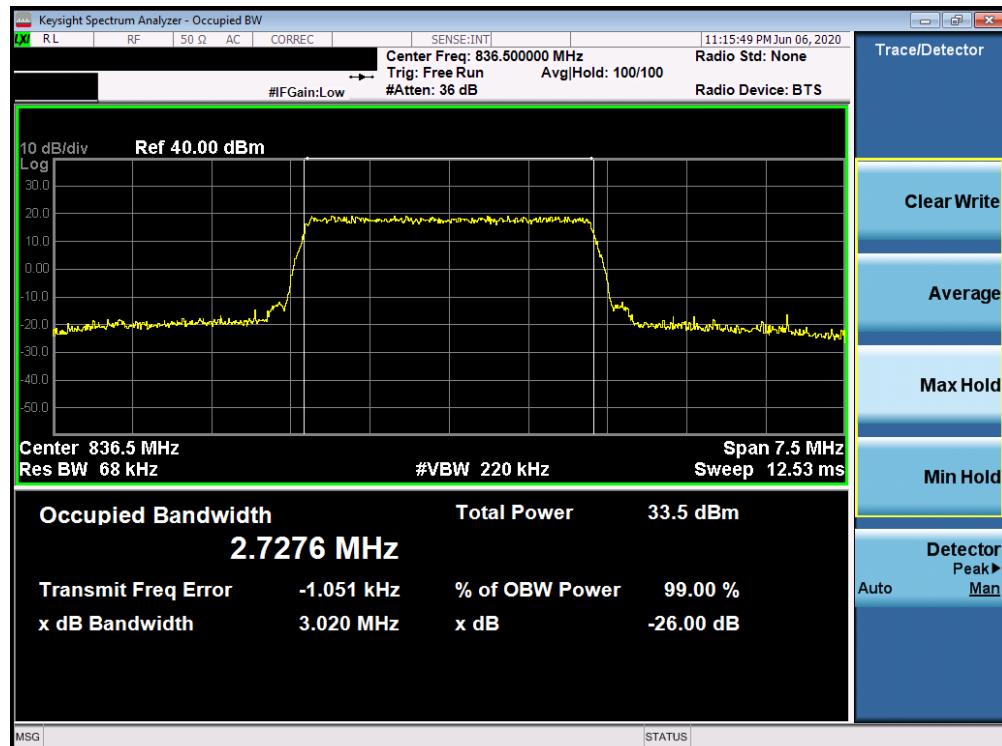


Plot 7-33. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 64-QAM - Full RB Configuration)

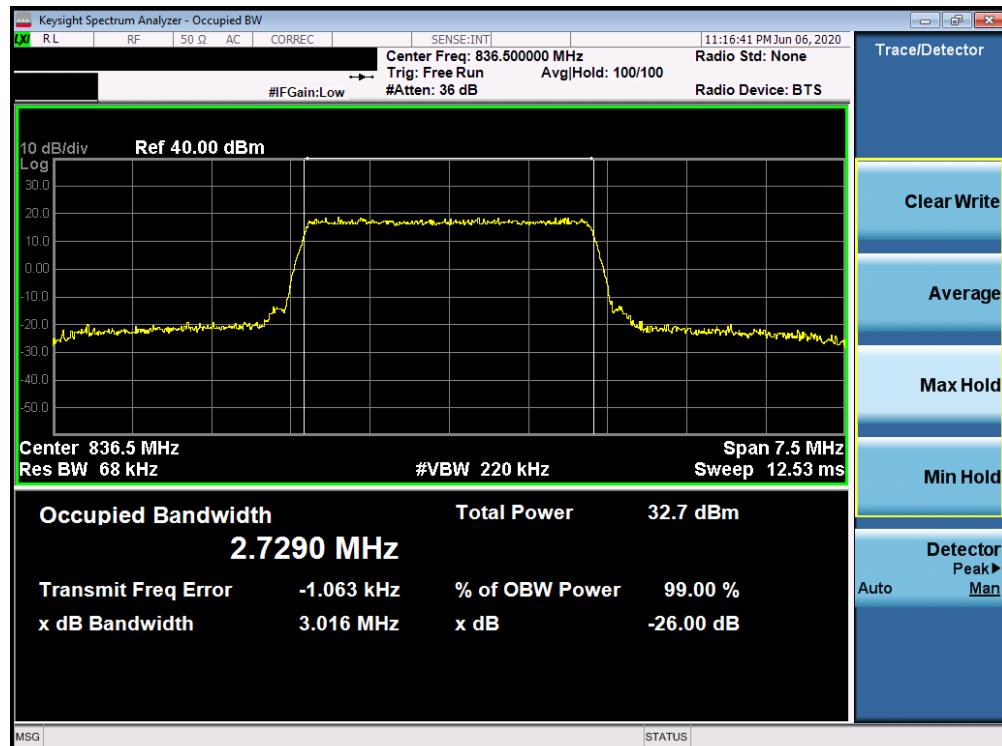


Plot 7-34. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	PCTEST® Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



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

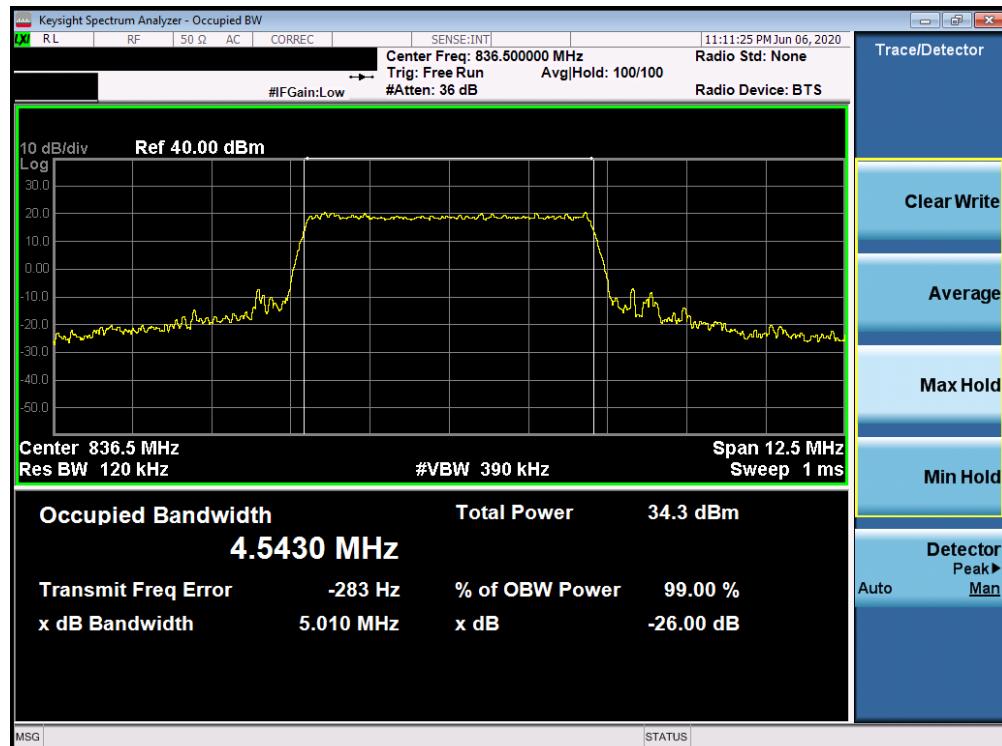


Plot 7-36. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



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)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

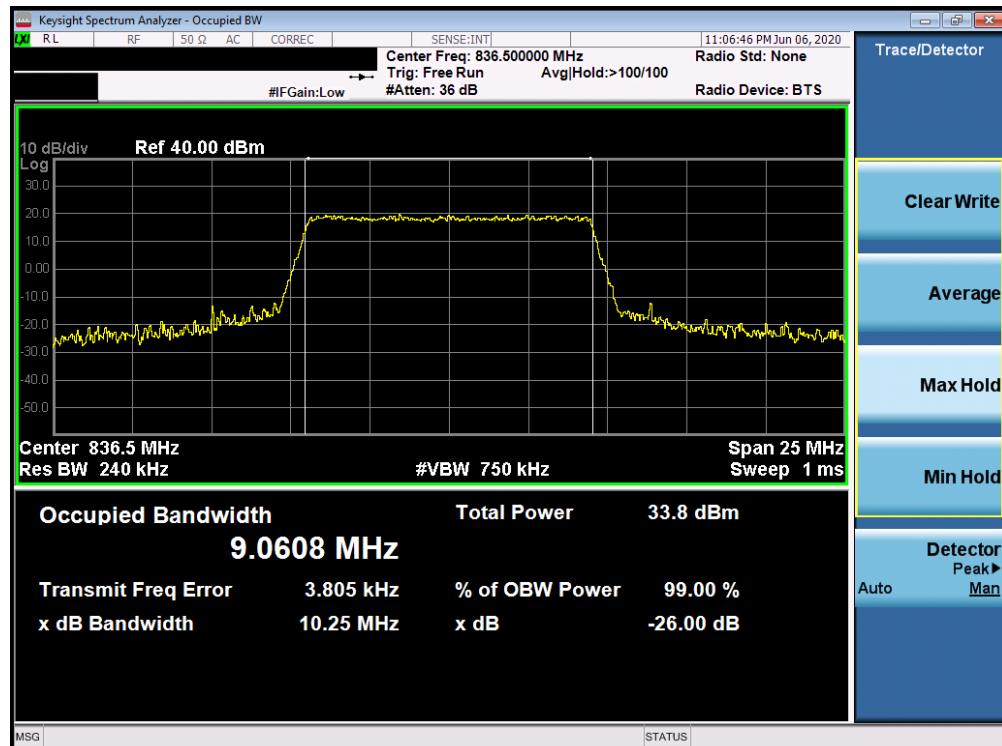


Plot 7-39. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 64-QAM - Full RB Configuration)

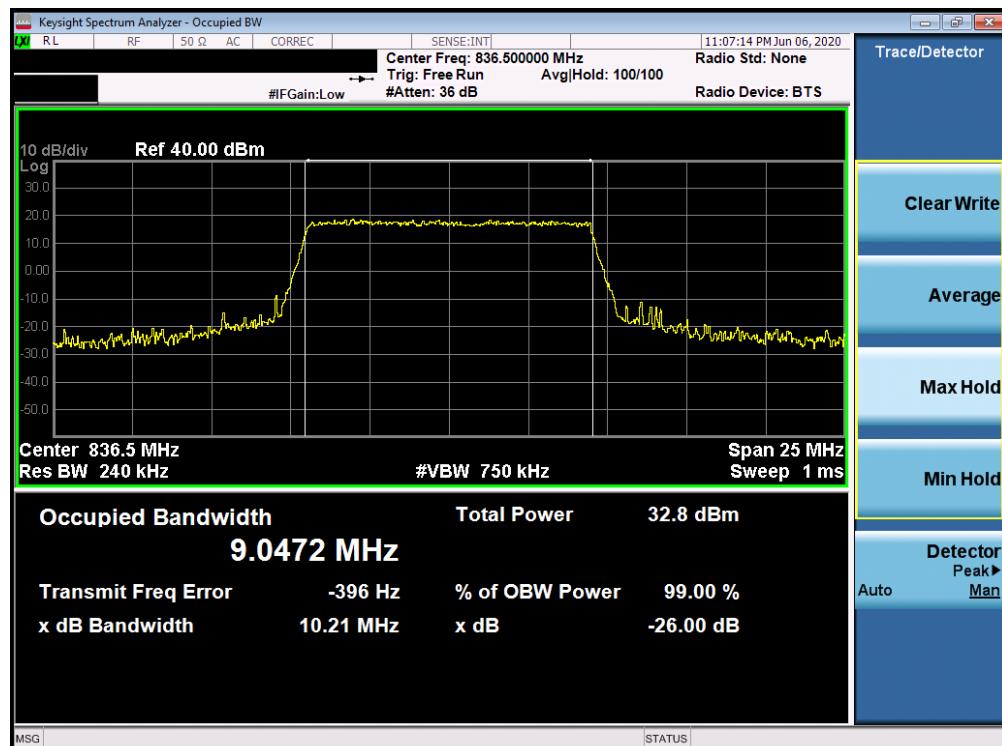


Plot 7-40. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



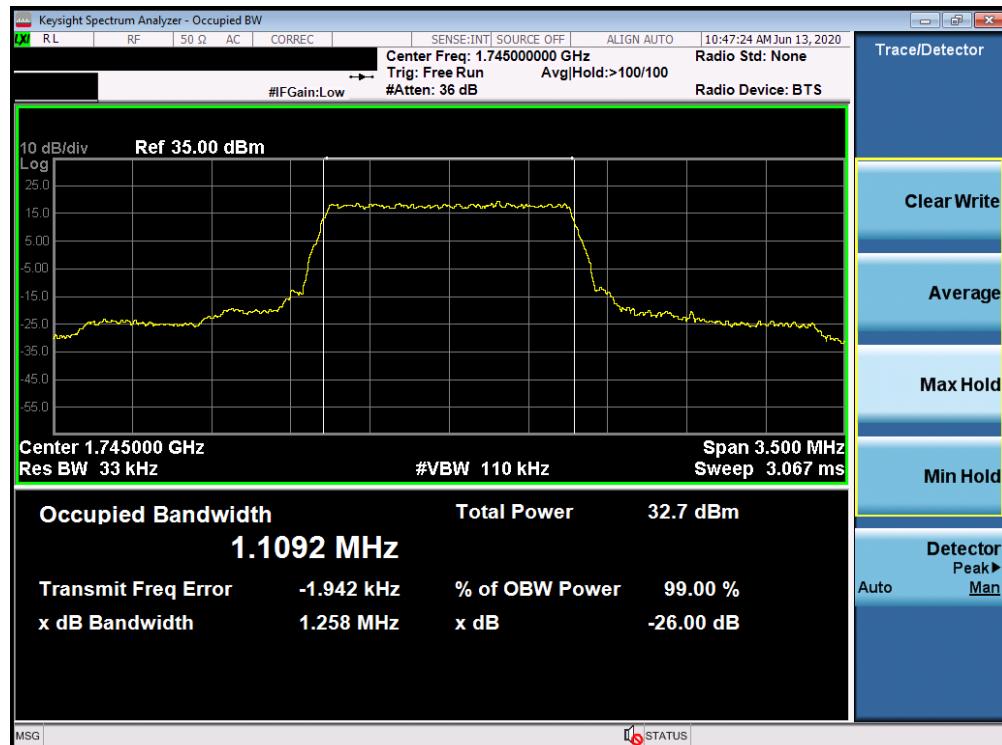
Plot 7-41. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)



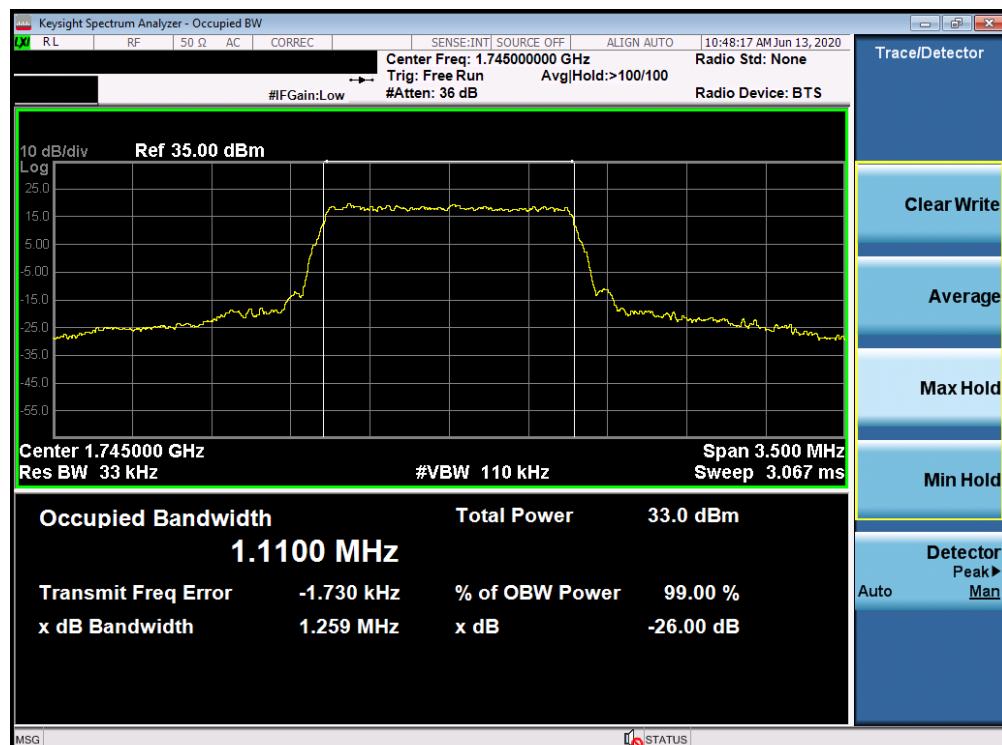
Plot 7-42. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

Band 66/4

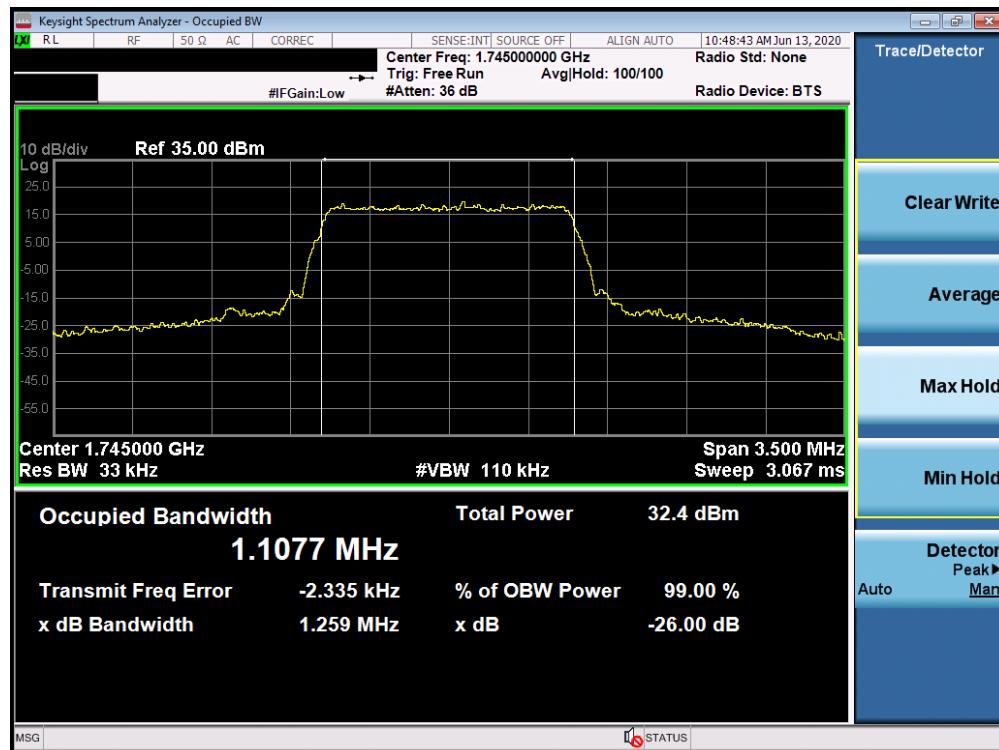


Plot 7-43. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

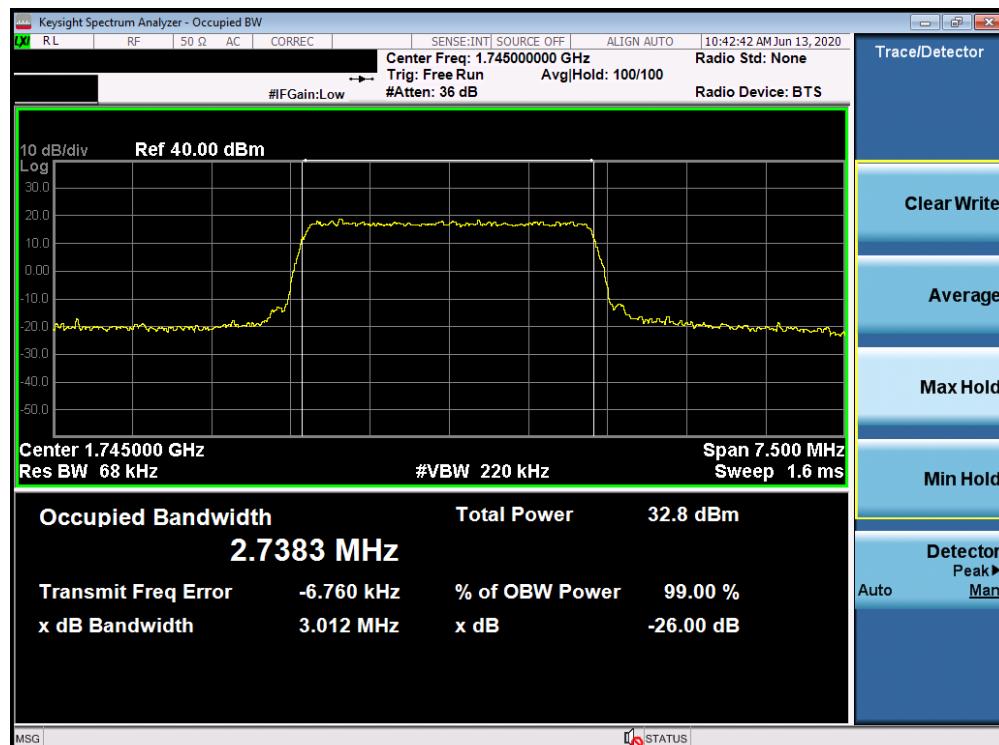


Plot 7-44. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 PCTEST Proud to be part of element		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 41 of 355	

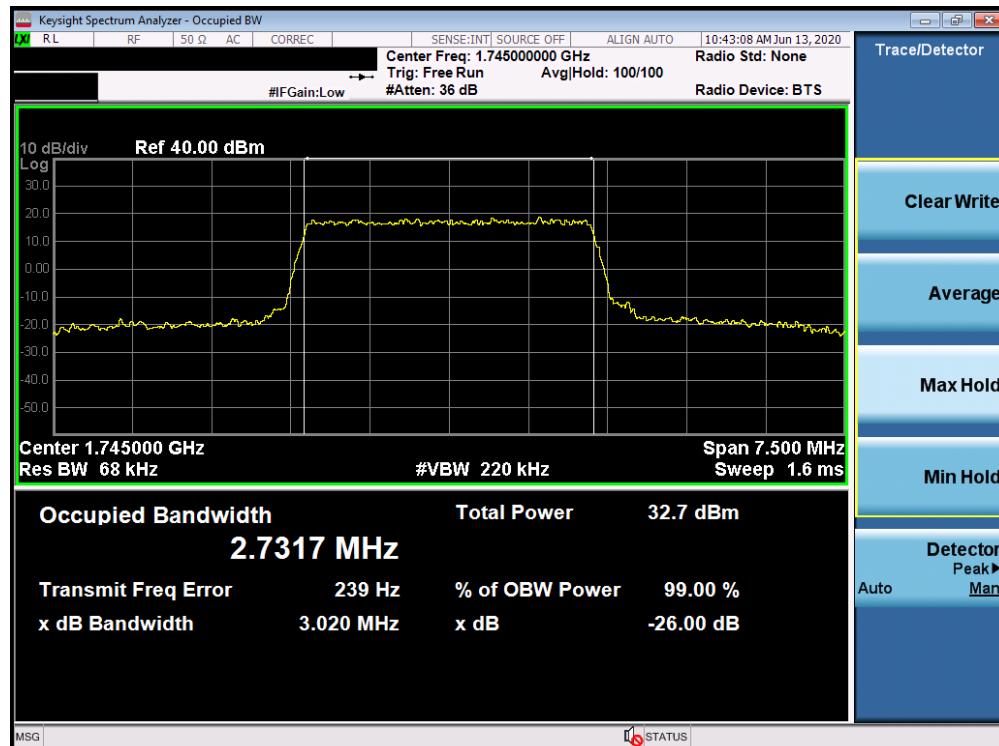


Plot 7-45. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

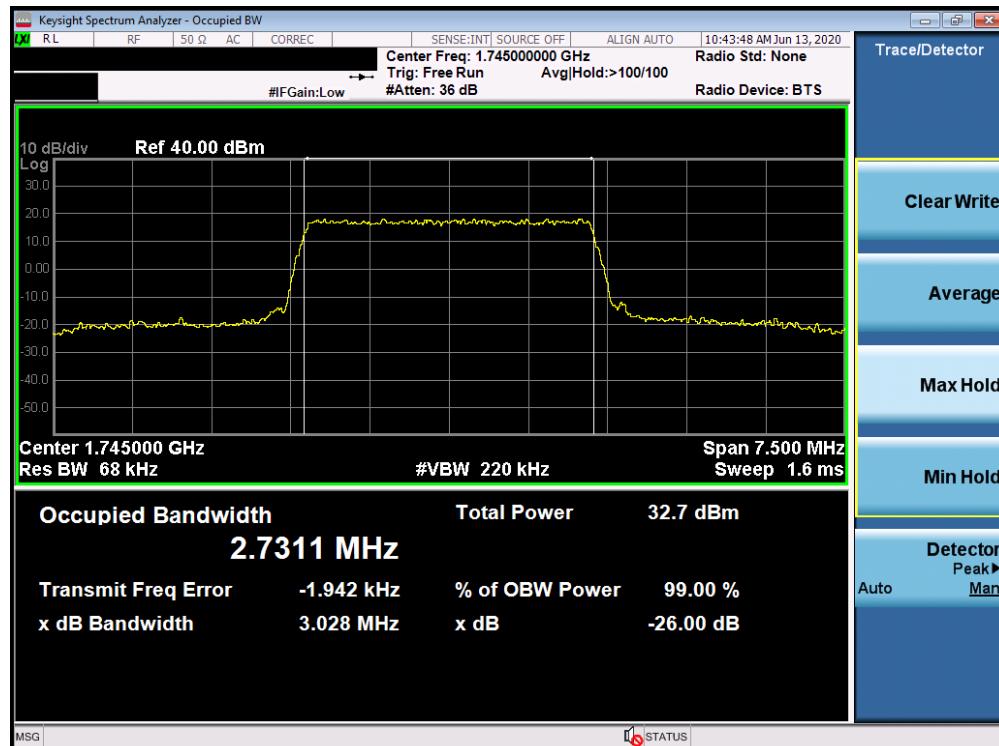


Plot 7-46. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

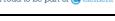
FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 42 of 355	

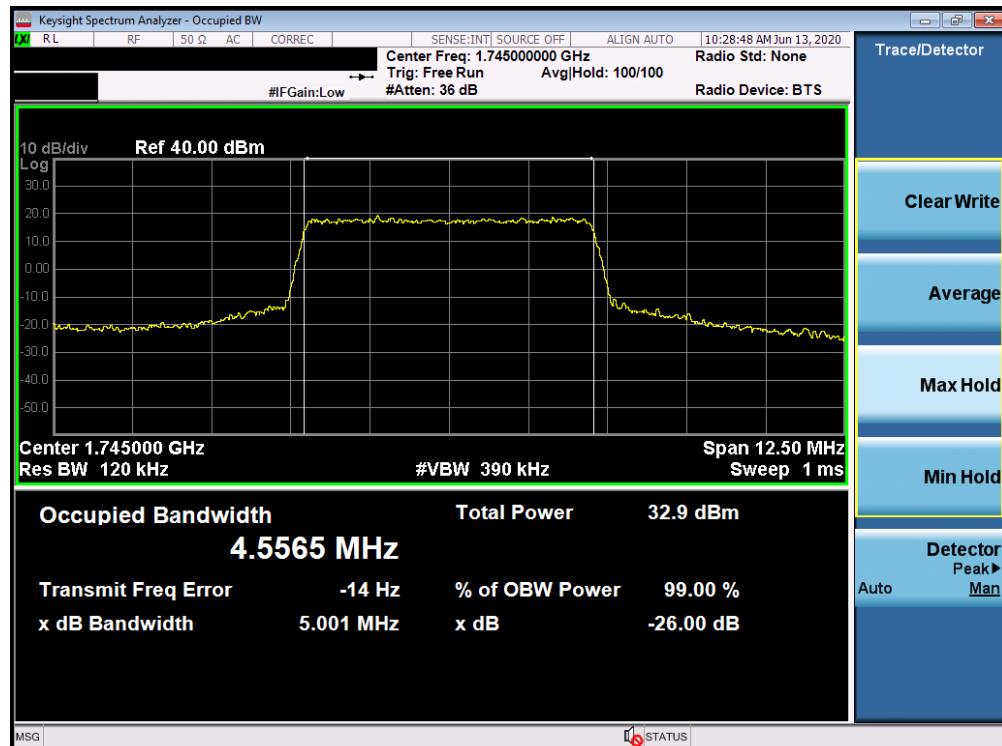


Plot 7-47. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

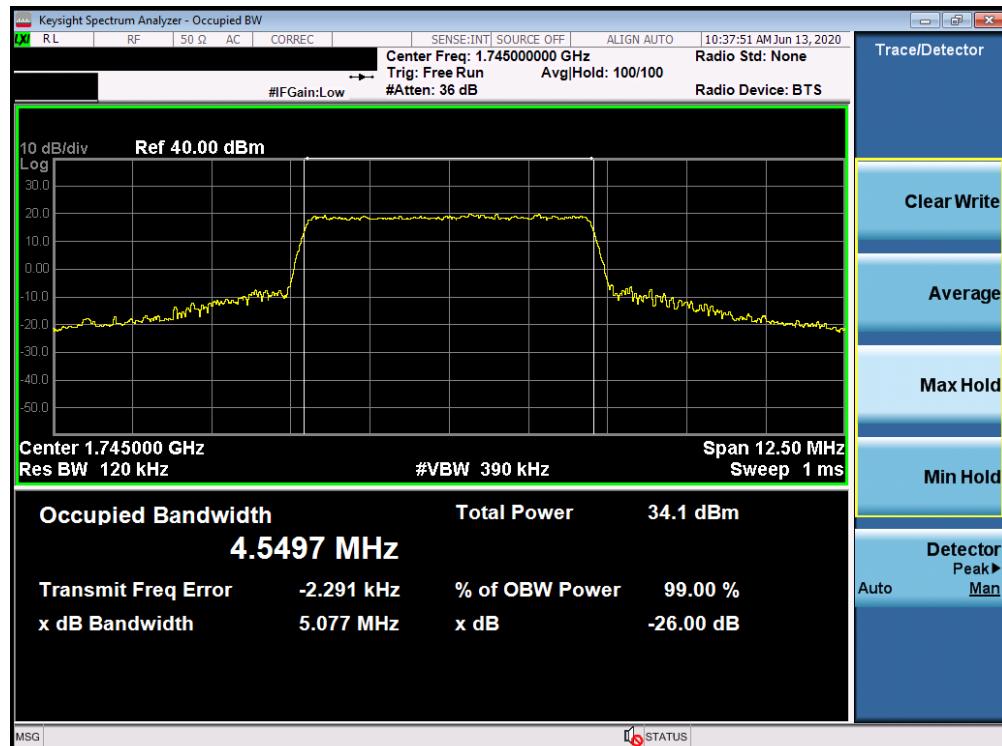


Plot 7-48. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 43 of 355	

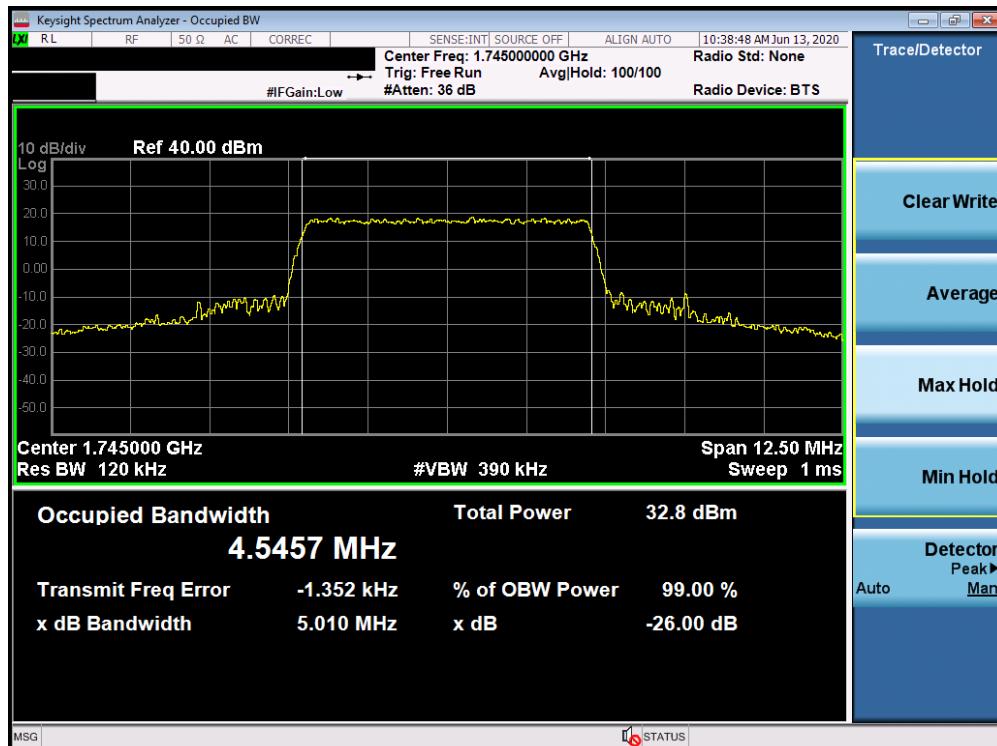


Plot 7-49. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



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

FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 44 of 355	



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)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 45 of 355	

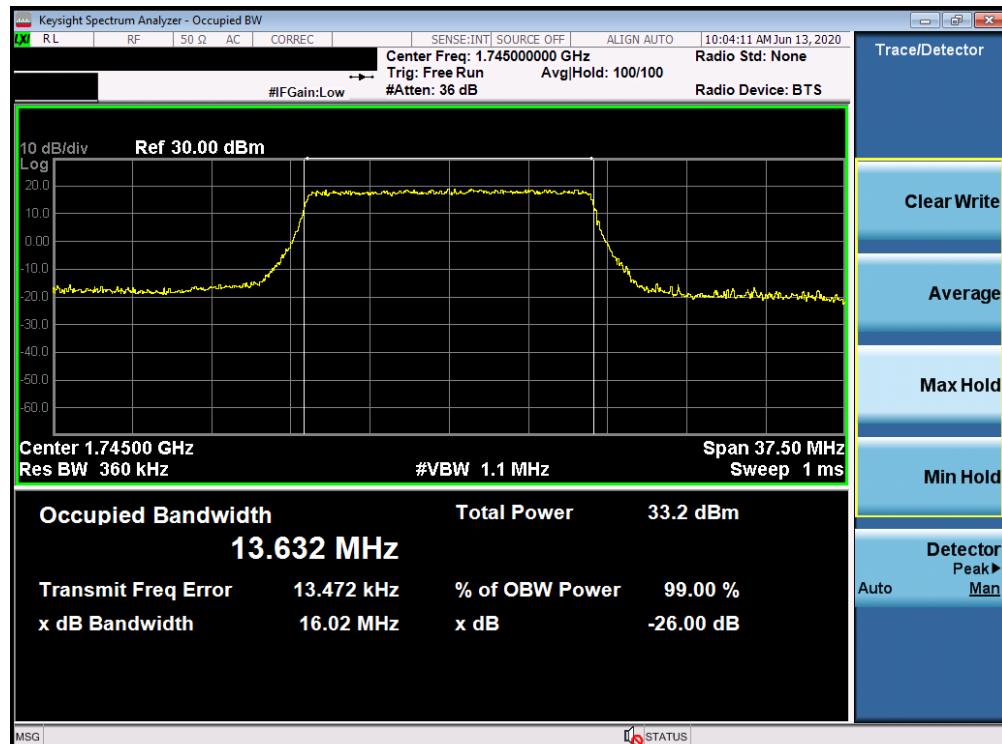


Plot 7-53. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

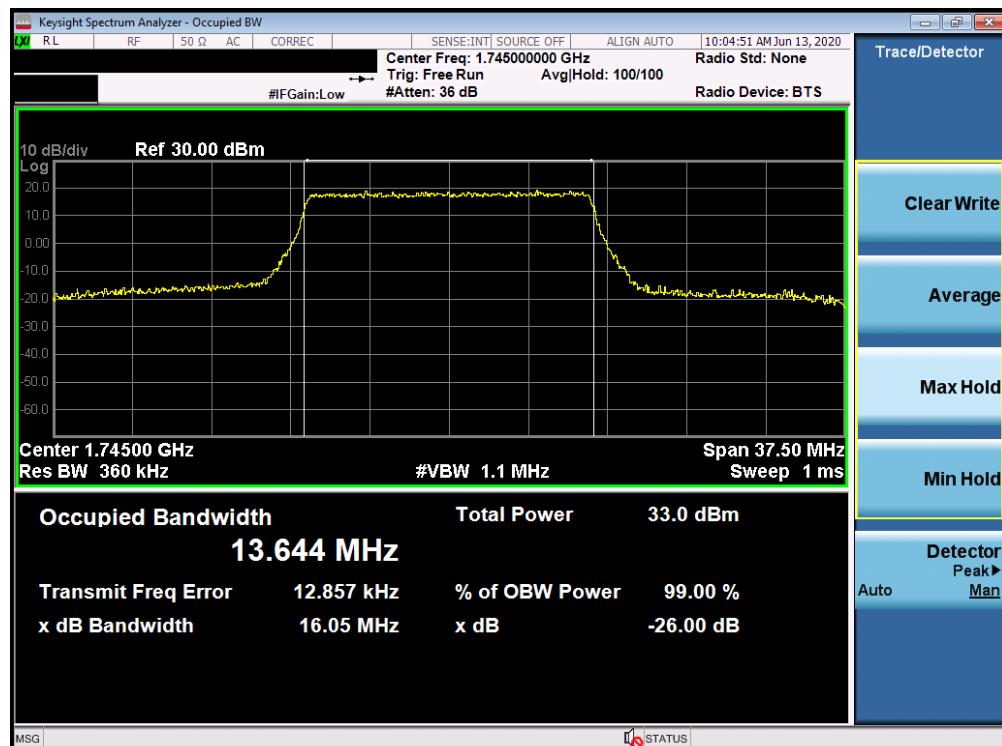


Plot 7-54. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

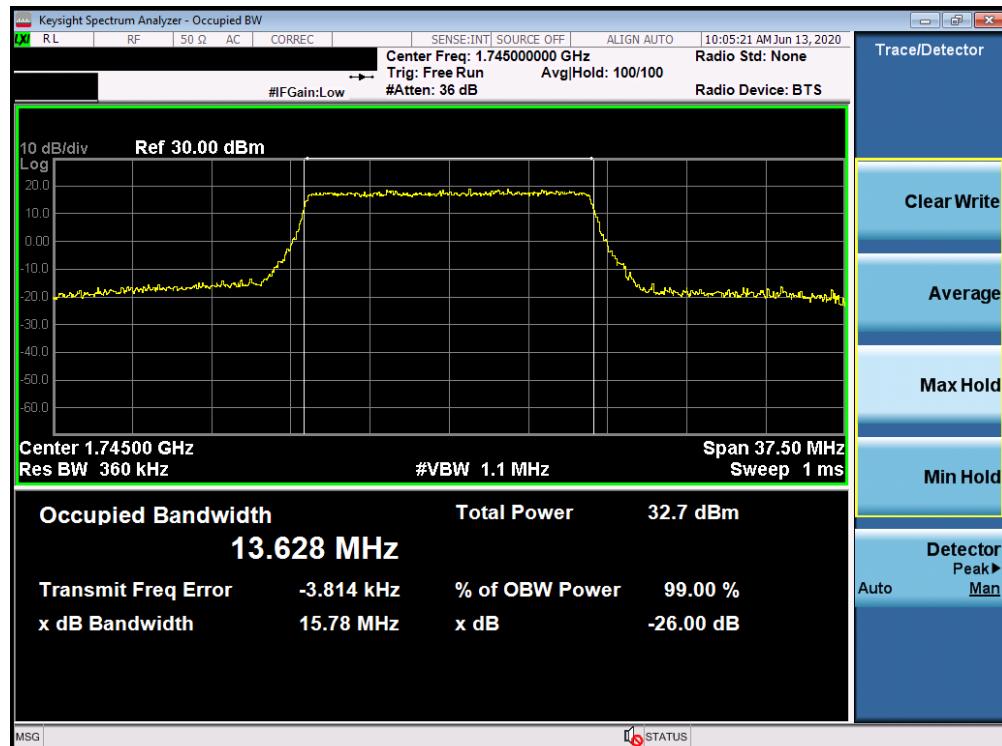


Plot 7-55. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

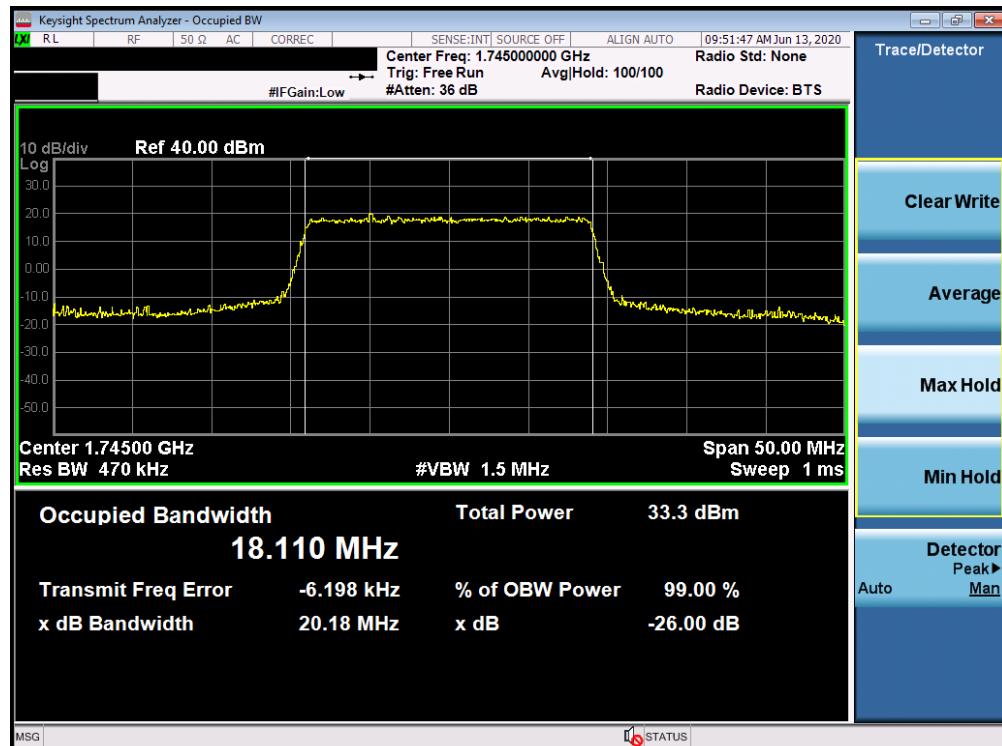


Plot 7-56. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

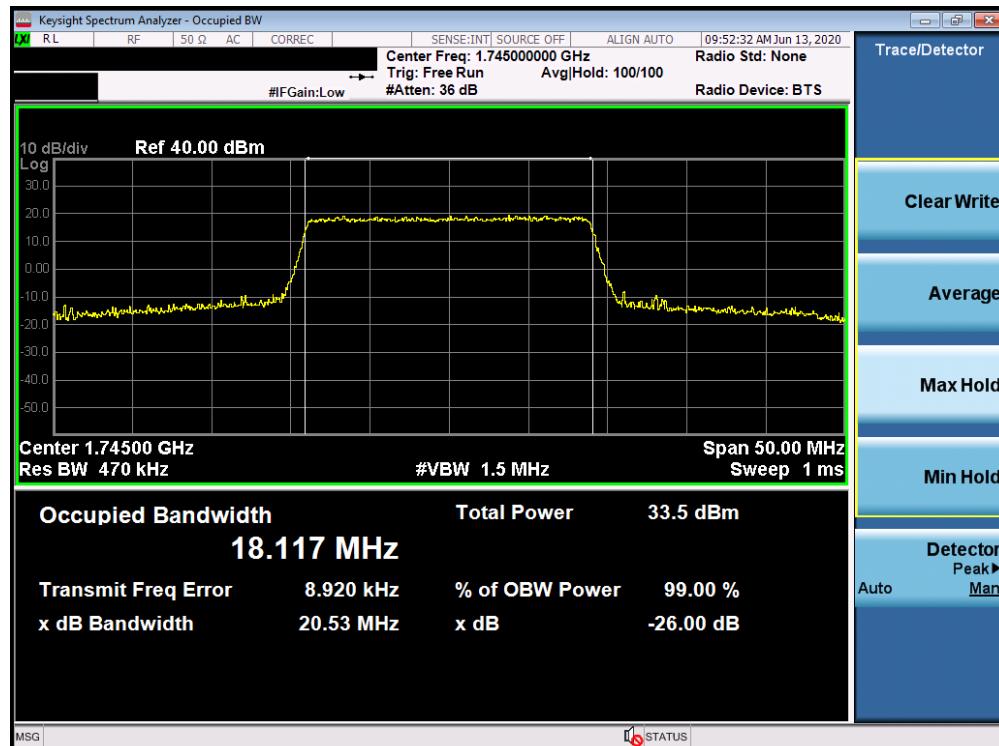


Plot 7-57. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)

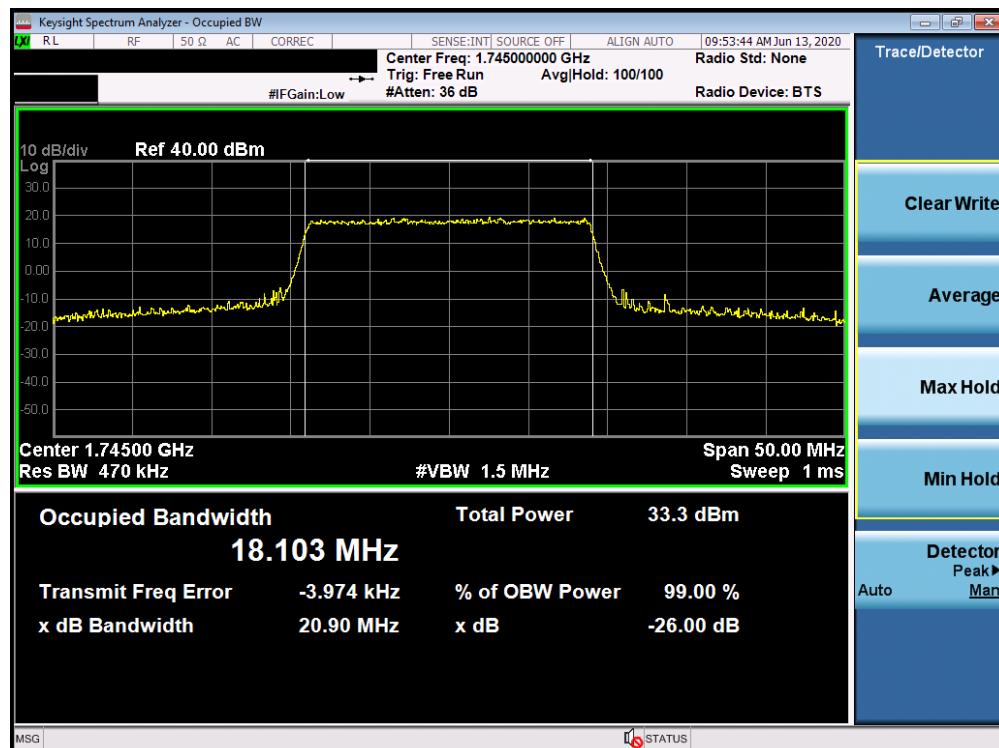


Plot 7-58. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Approved by: Quality Manager	



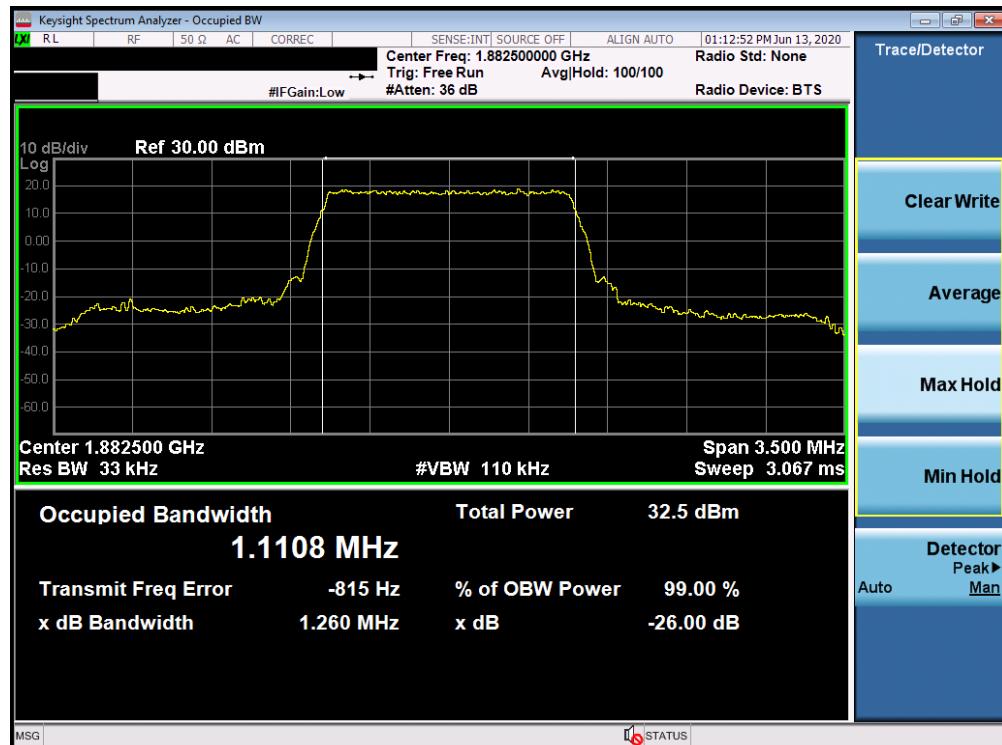
Plot 7-59. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



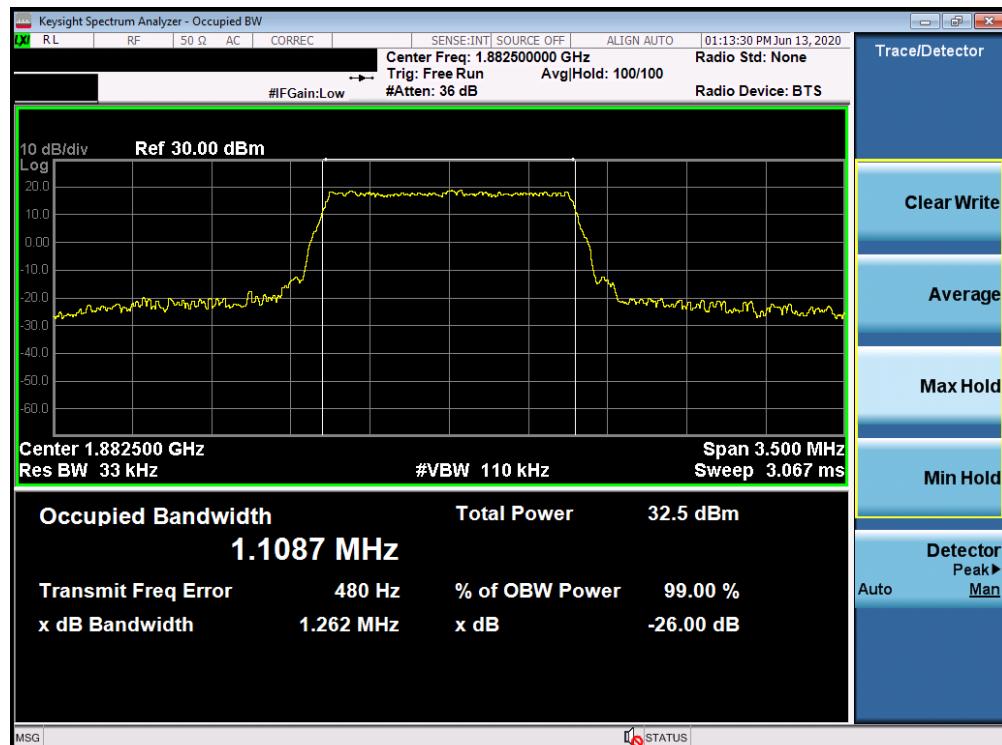
Plot 7-60. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

Band 25/2

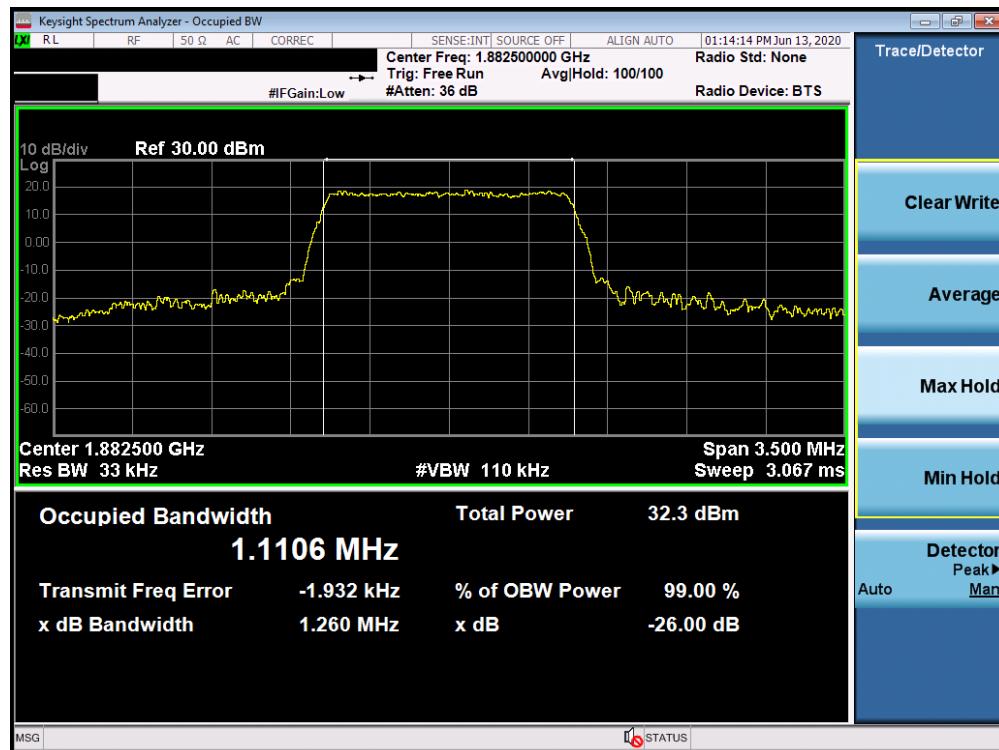


Plot 7-61. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

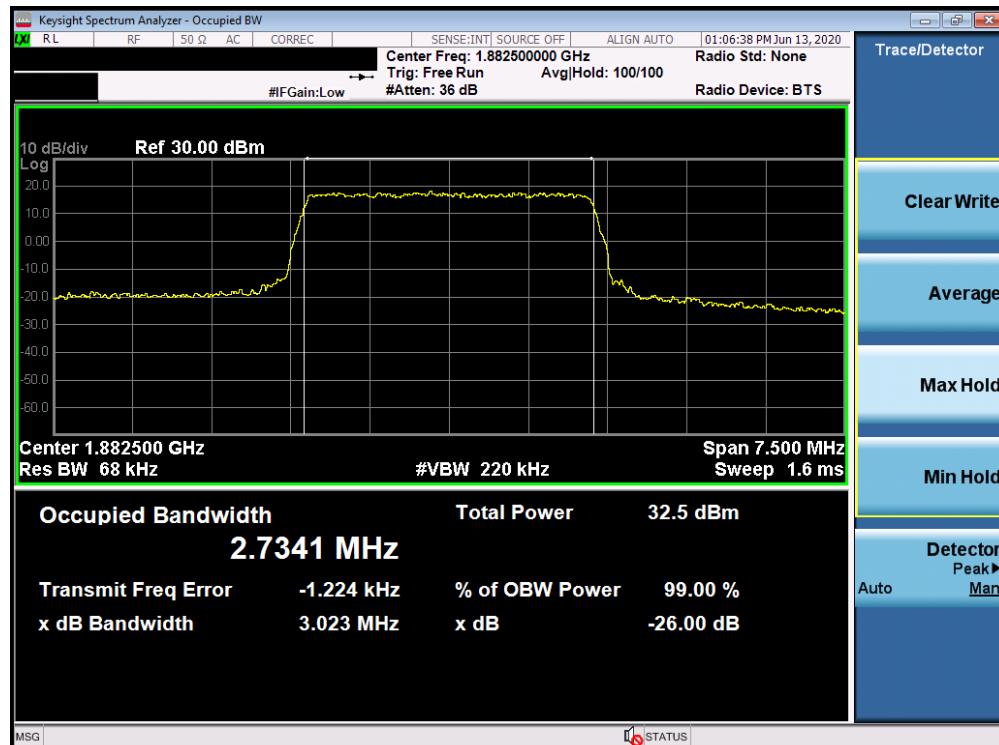


Plot 7-62. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST® Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

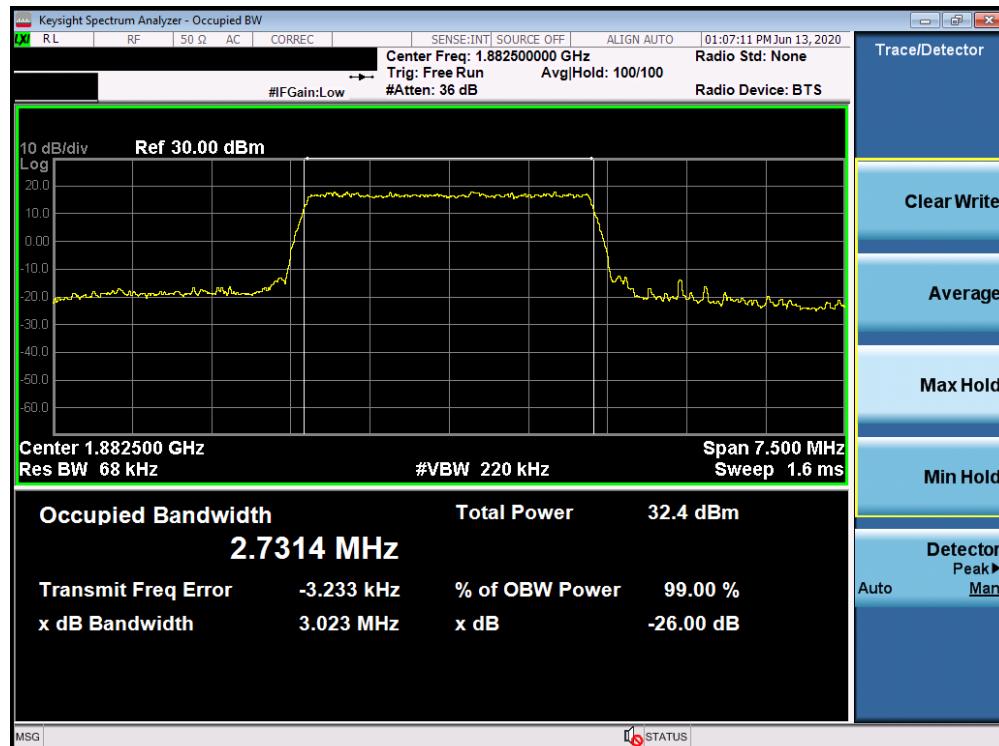


Plot 7-63. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

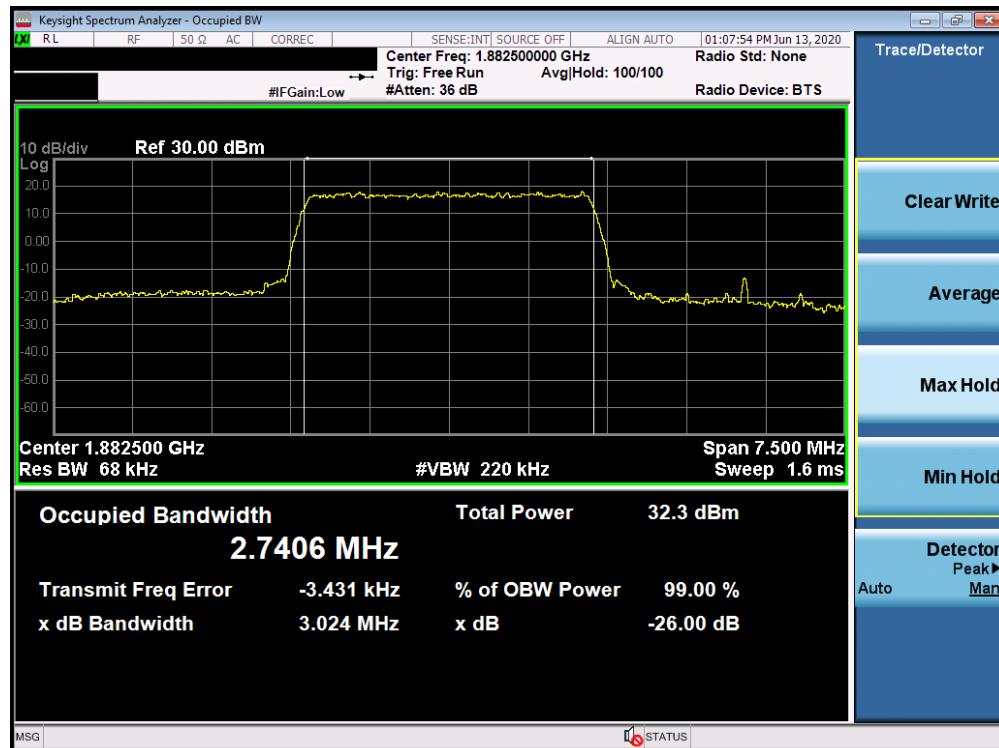


Plot 7-64. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

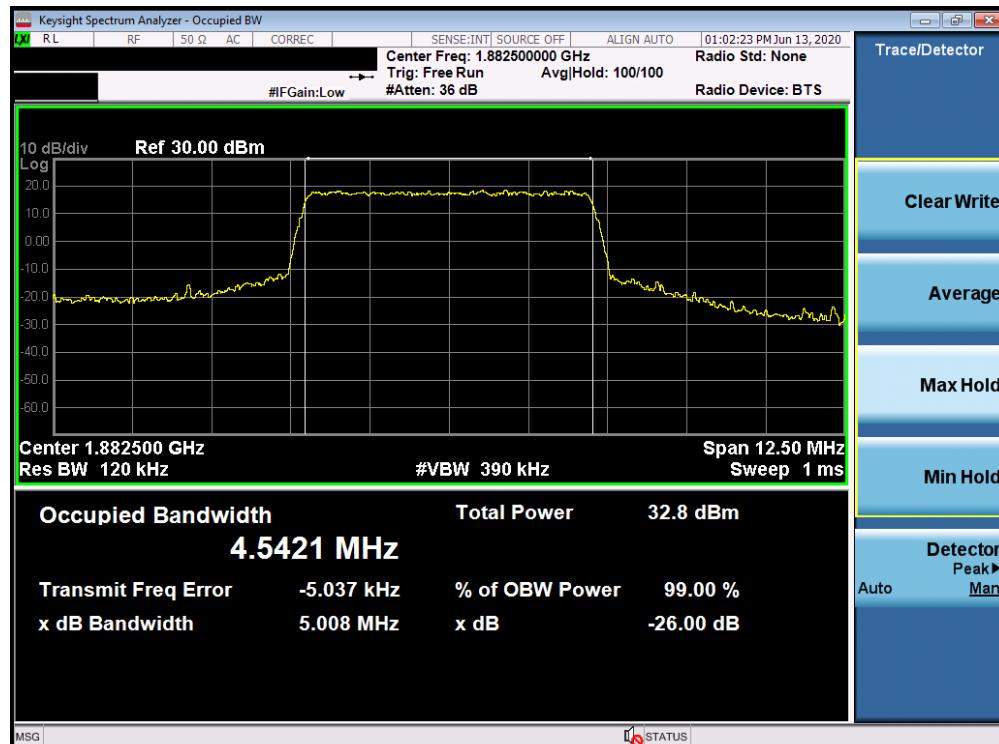


Plot 7-65. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

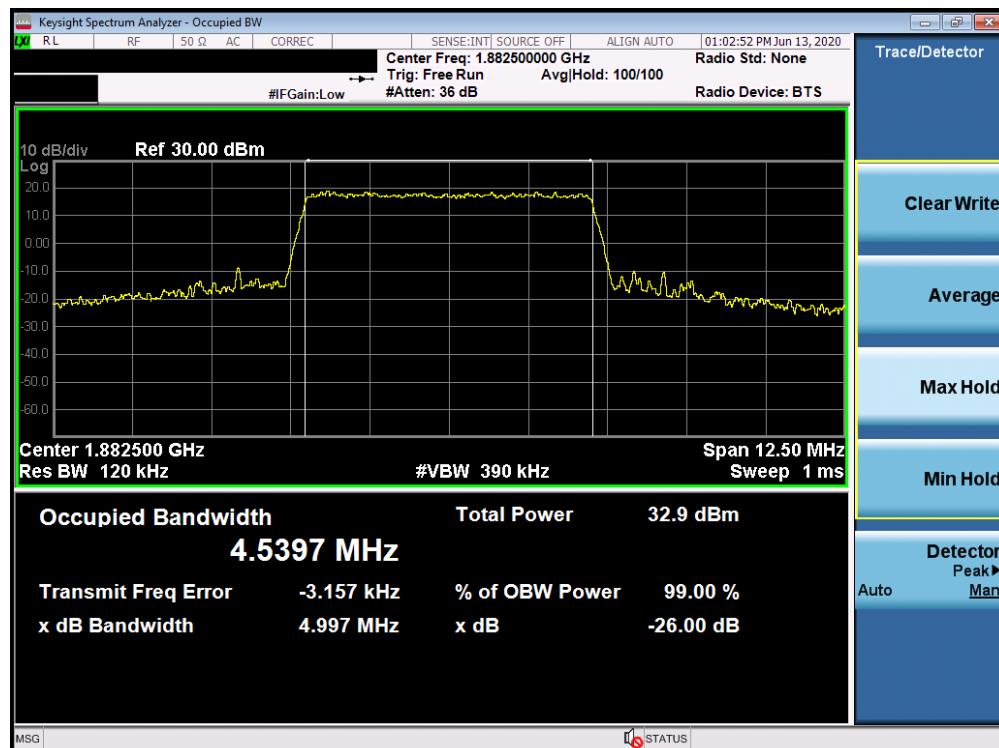


Plot 7-66. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

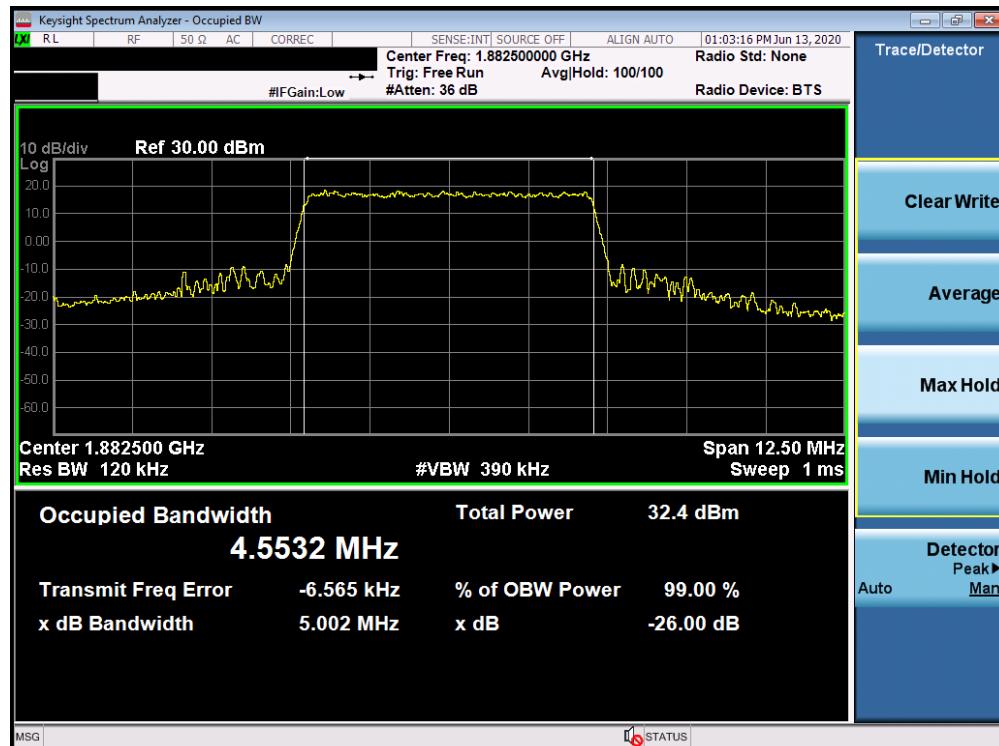


Plot 7-67. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



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

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 53 of 355

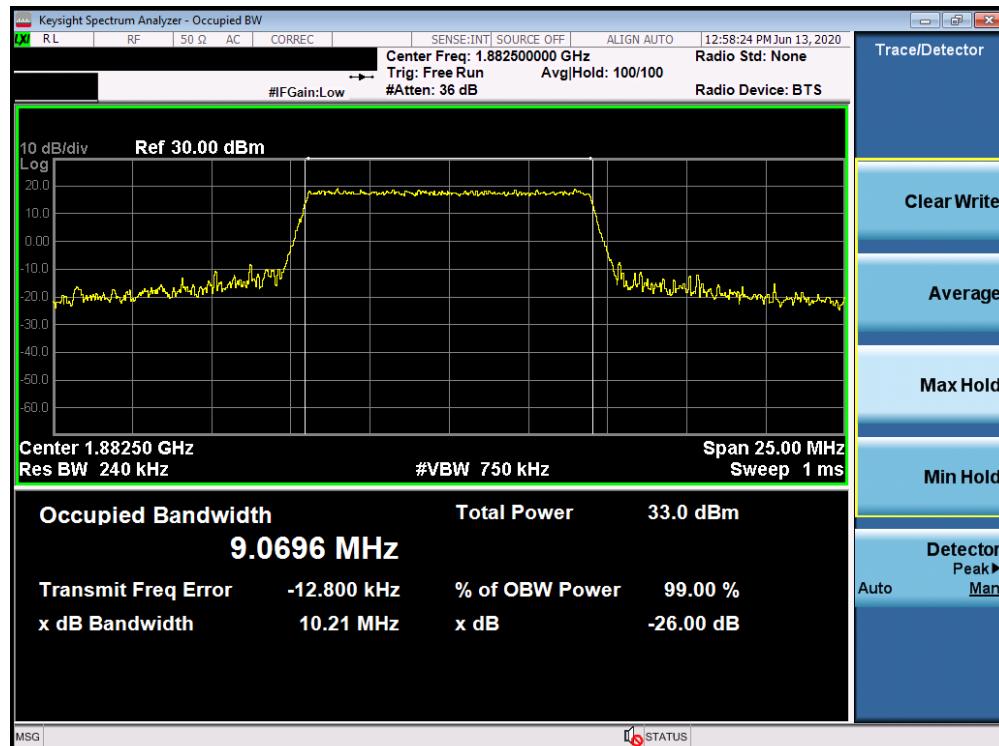


Plot 7-69. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

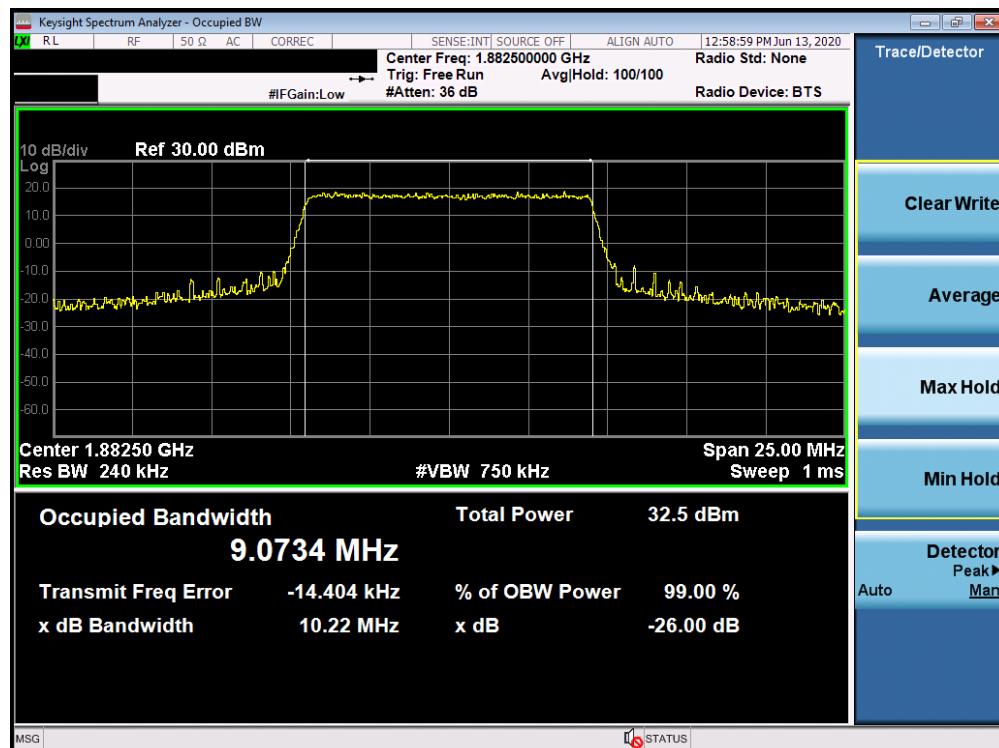


Plot 7-70. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

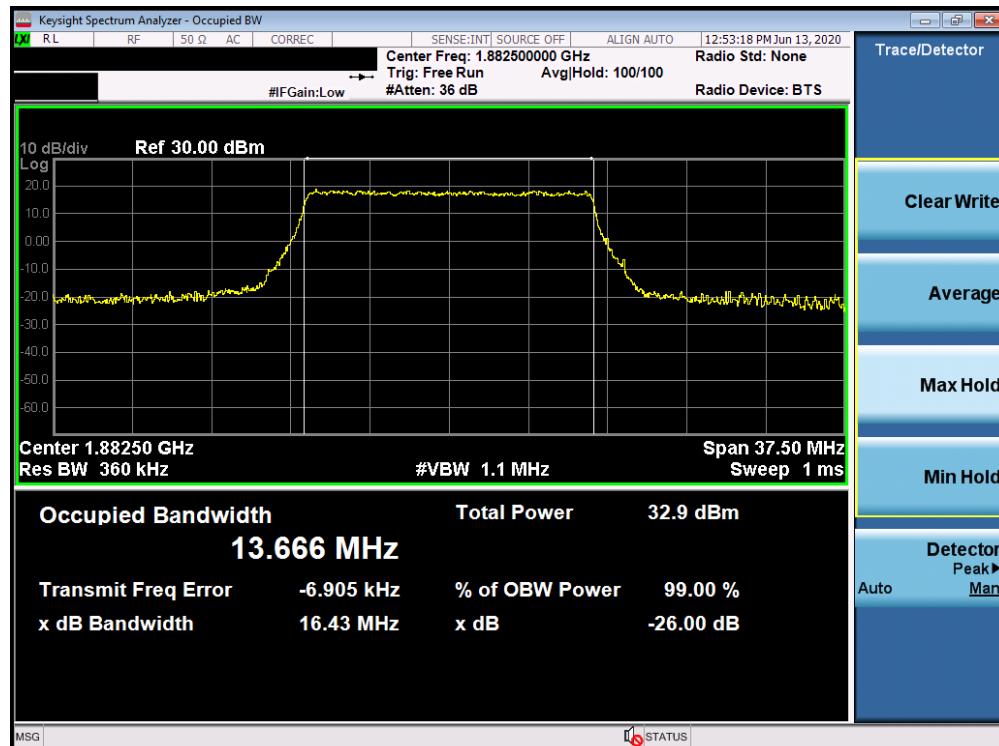


Plot 7-71. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

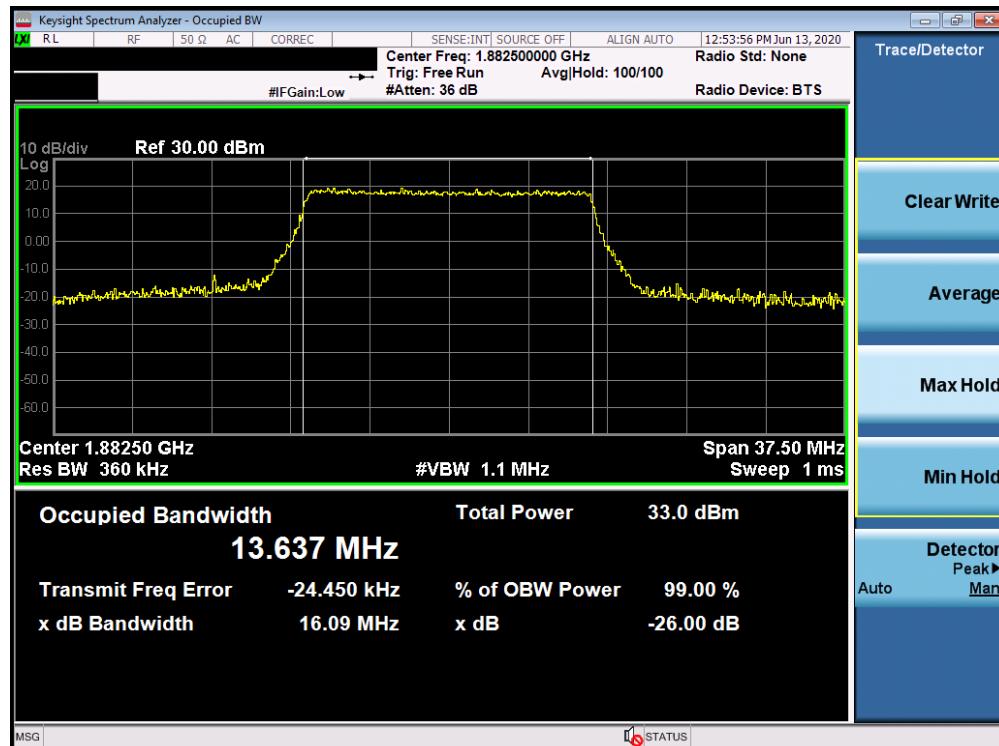


Plot 7-72. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 55 of 355	

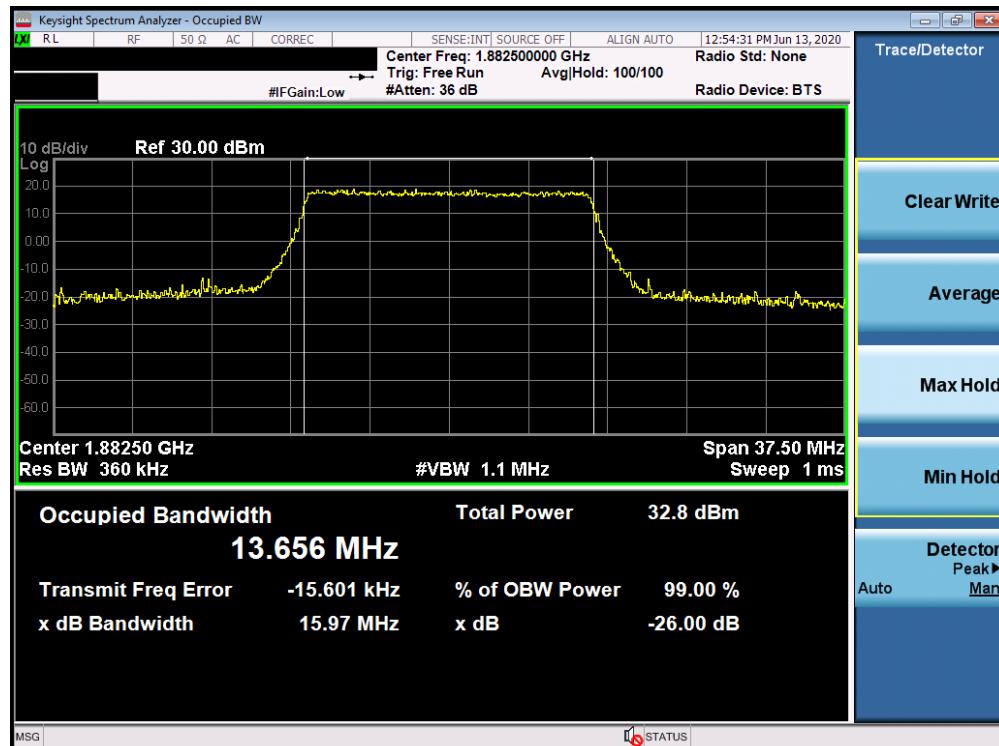


Plot 7-73. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



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

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



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)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			



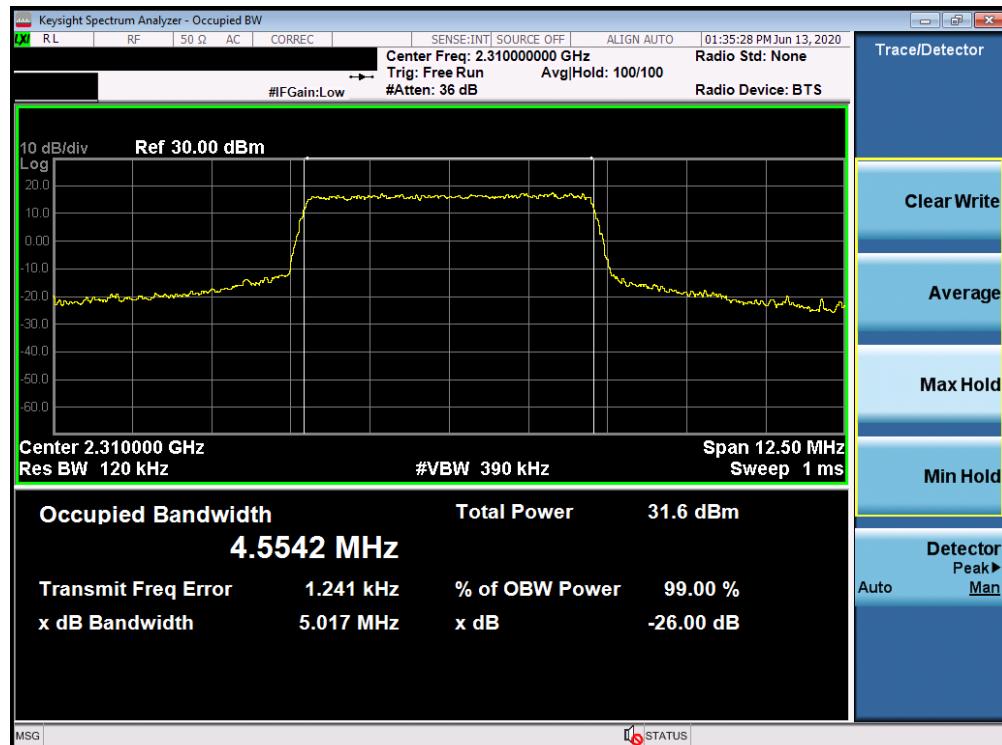
Plot 7-77. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



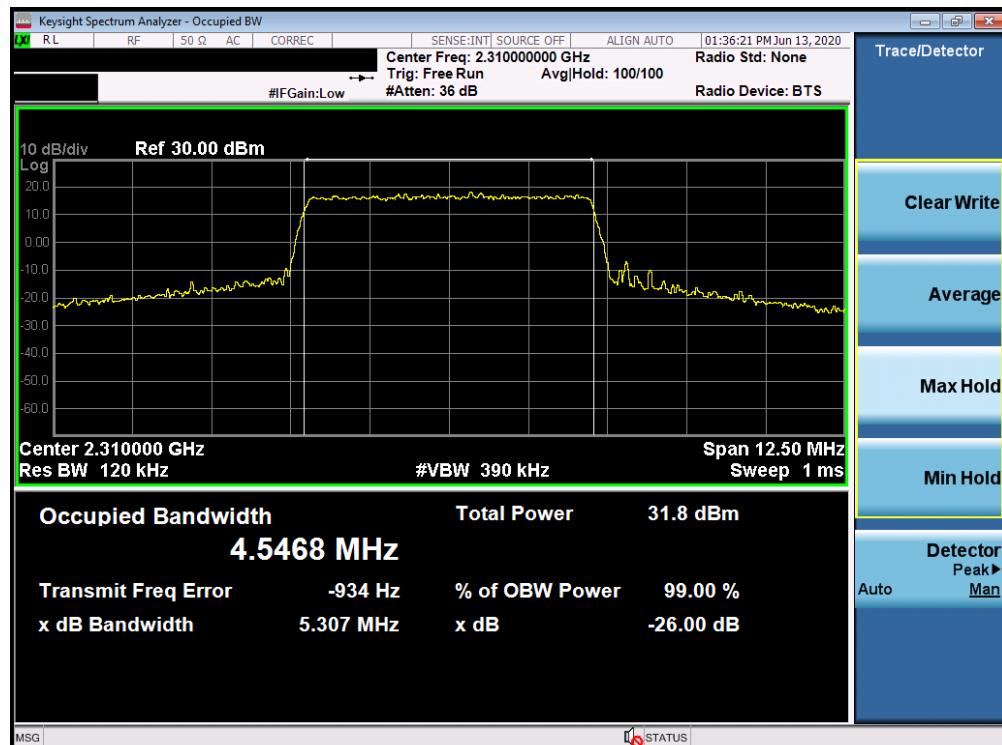
Plot 7-78. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

Band 30

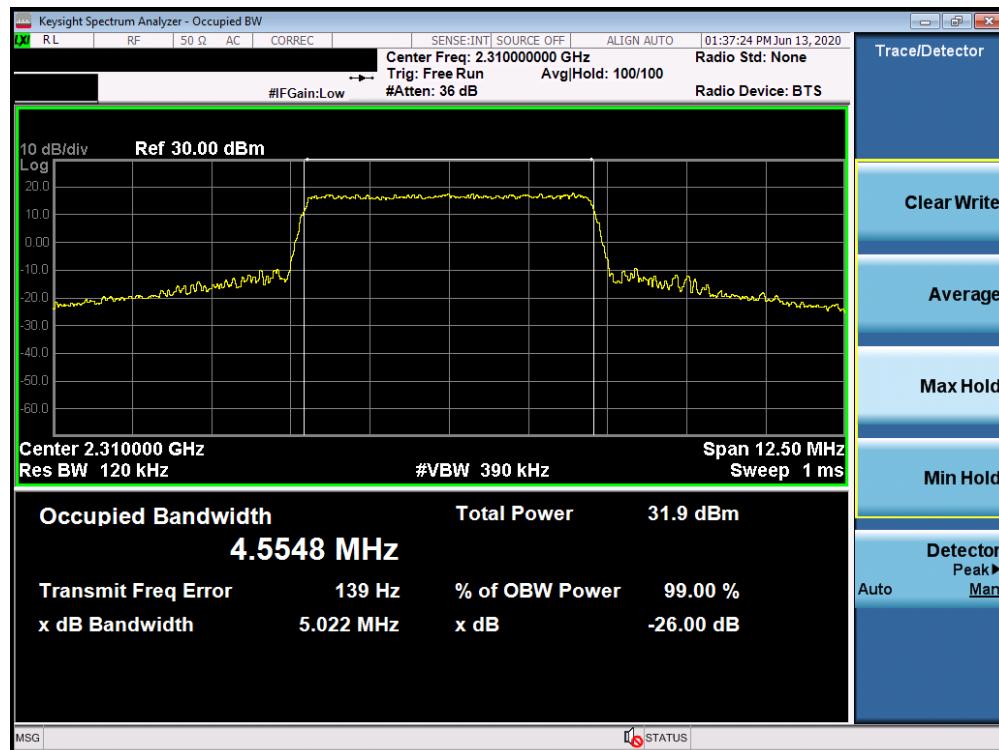


Plot 7-79. Occupied Bandwidth Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

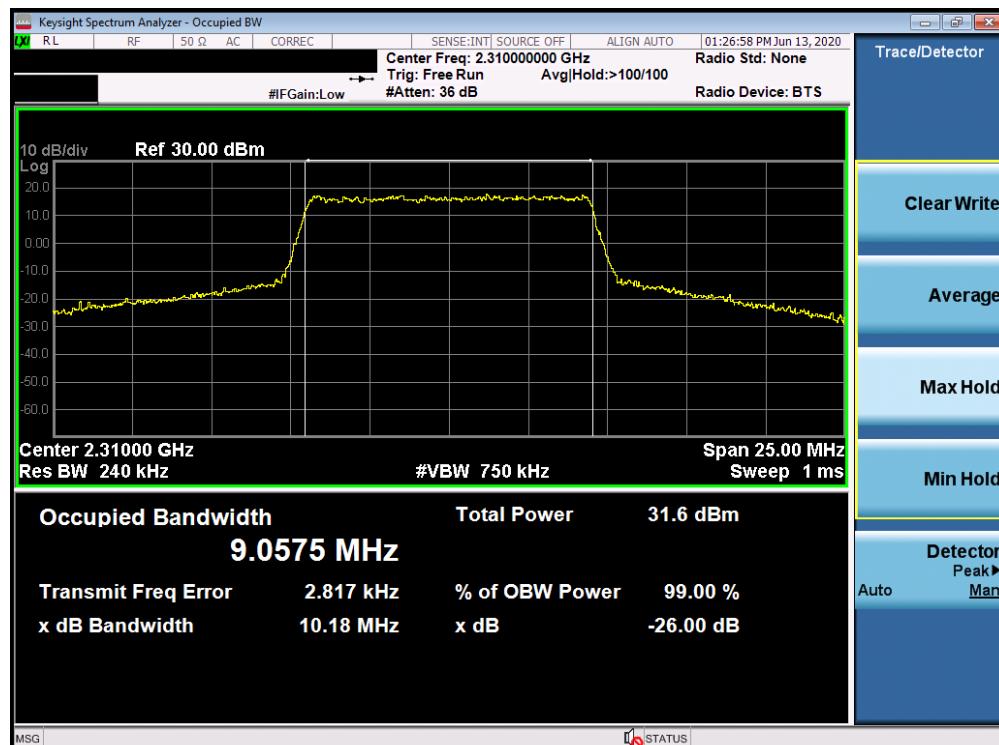


Plot 7-80. Occupied Bandwidth Plot (Band 30 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device		Page 59 of 355

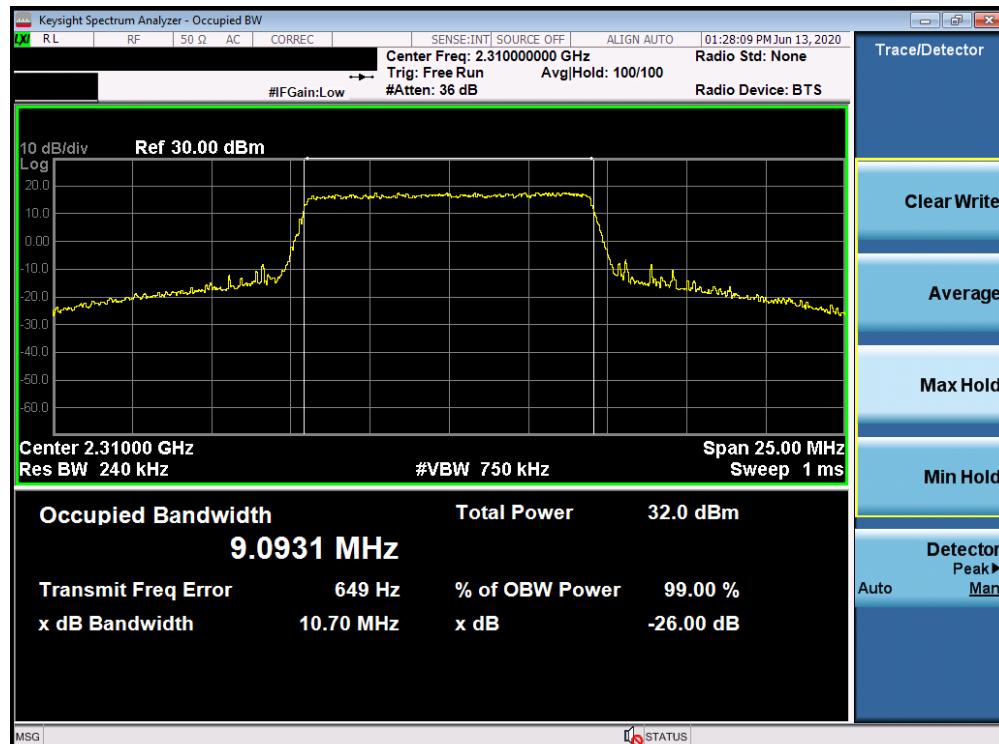


Plot 7-81. Occupied Bandwidth Plot (Band 30 - 5.0MHz 64-QAM - Full RB Configuration)



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

FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 60 of 355	



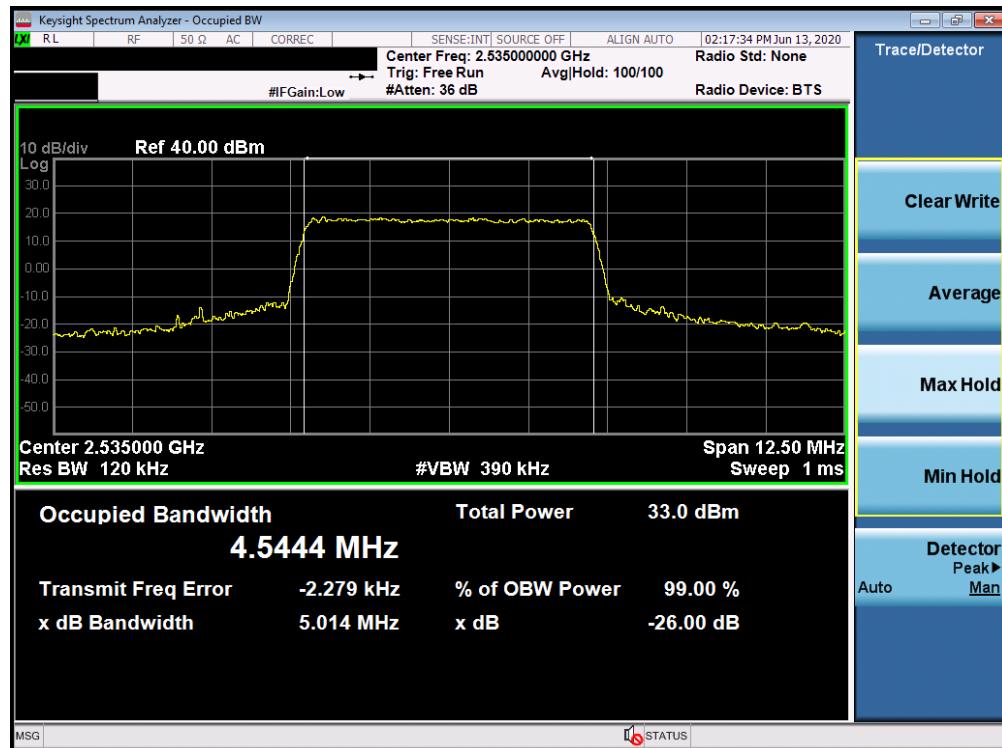
Plot 7-83. Occupied Bandwidth Plot (Band 30 - 10.0MHz 16-QAM - Full RB Configuration)



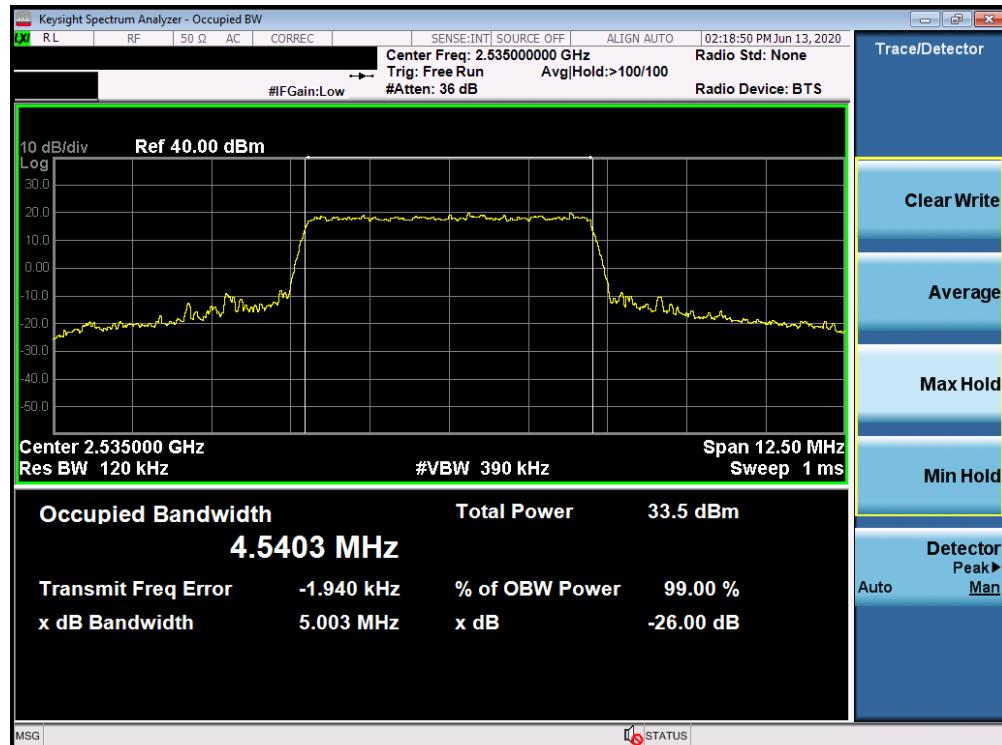
Plot 7-84. Occupied Bandwidth Plot (Band 30 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 61 of 355	

Band 7



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

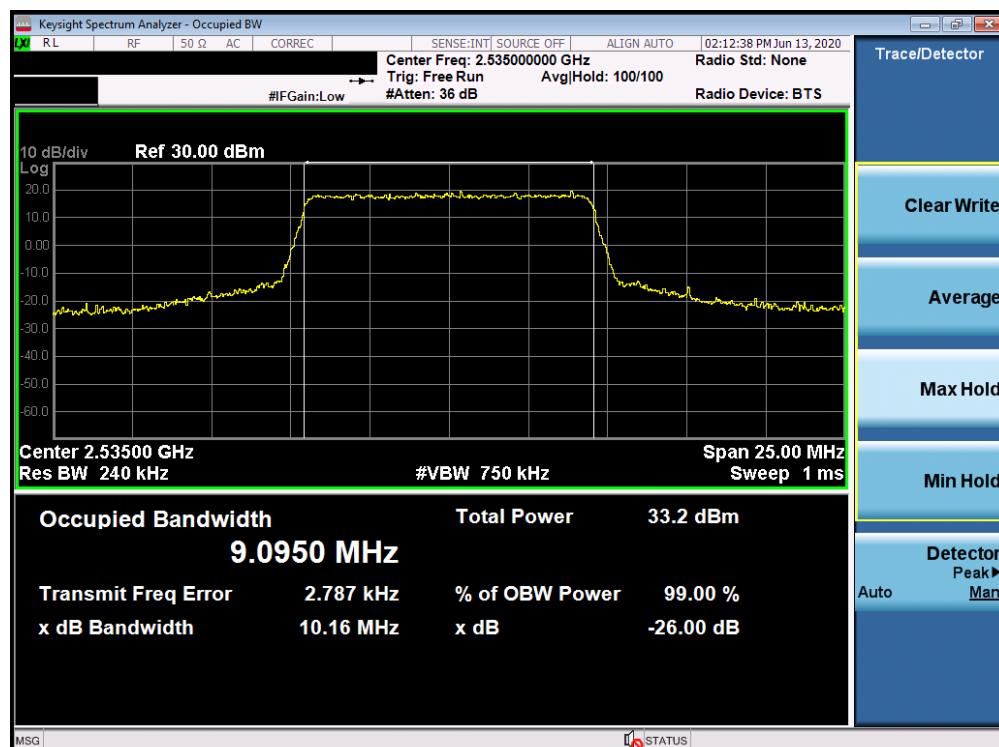


Plot 7-86. Occupied Bandwidth Plot (Band 7 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	 PCTEST® Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

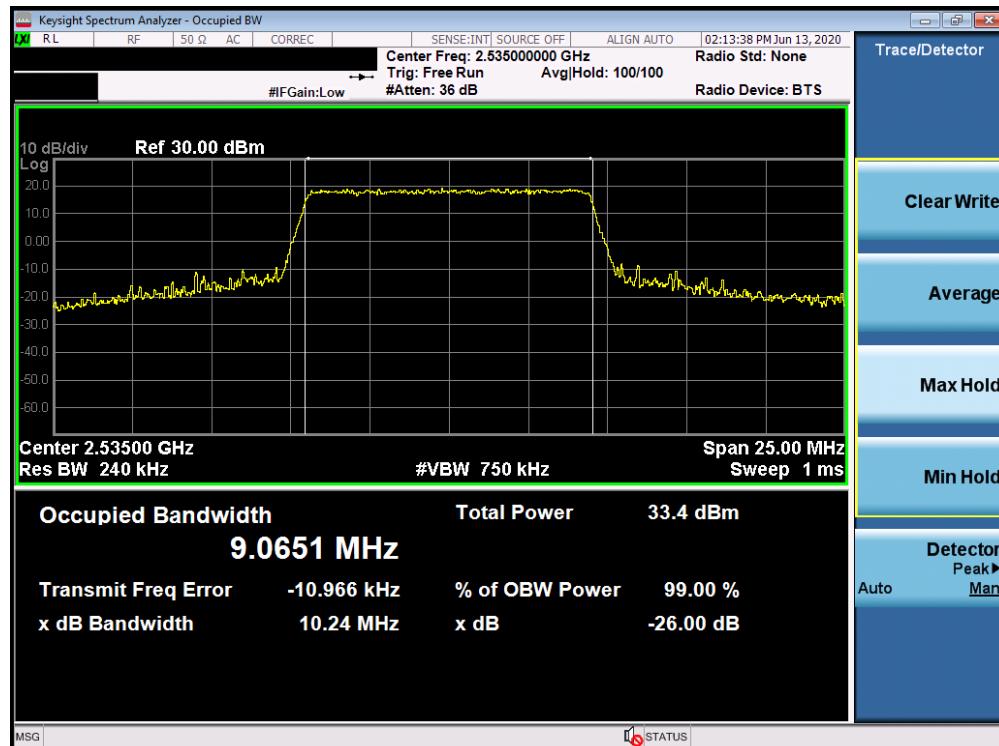


Plot 7-87. Occupied Bandwidth Plot (Band 7 - 5.0MHz 64-QAM - Full RB Configuration)

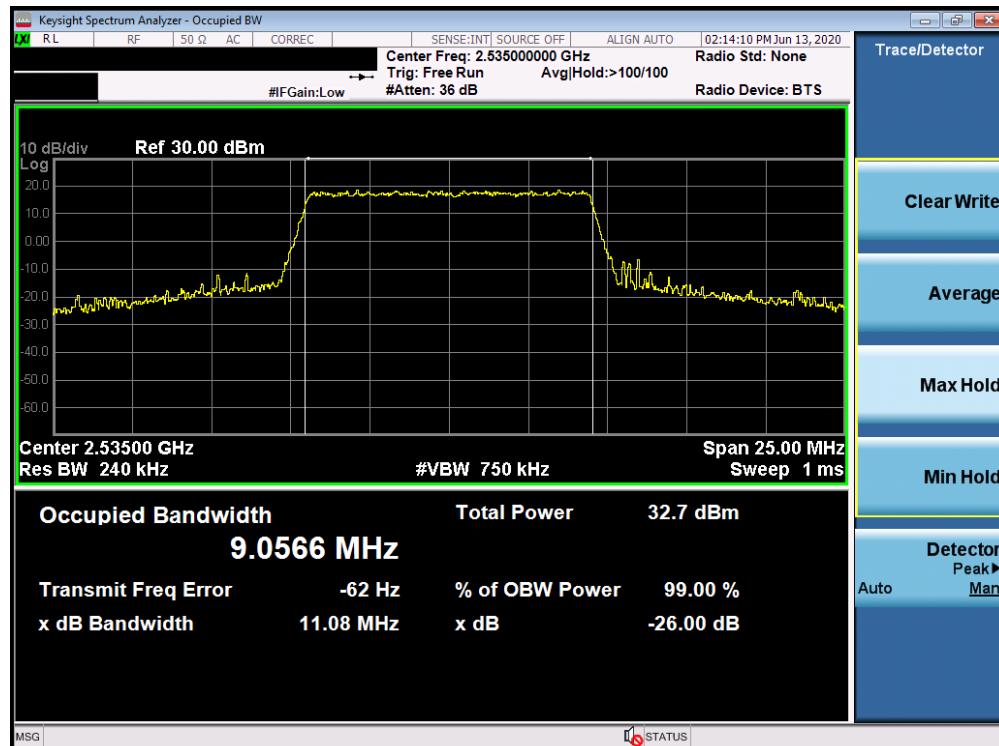


Plot 7-88. Occupied Bandwidth Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 63 of 355	

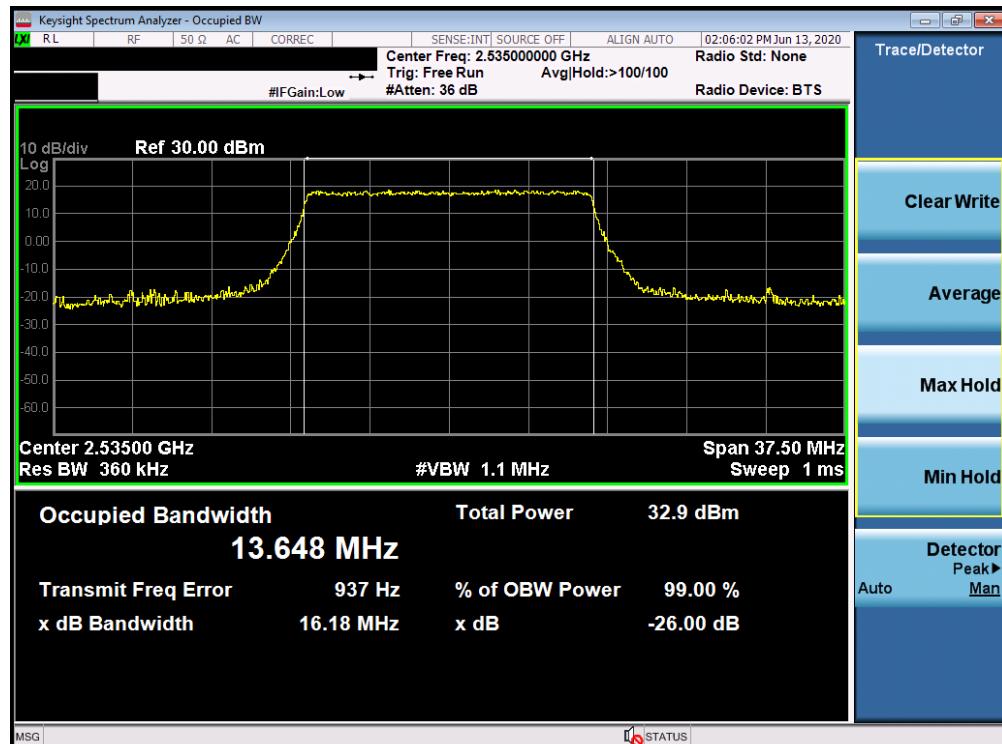


Plot 7-89. Occupied Bandwidth Plot (Band 7 - 10.0MHz 16-QAM - Full RB Configuration)

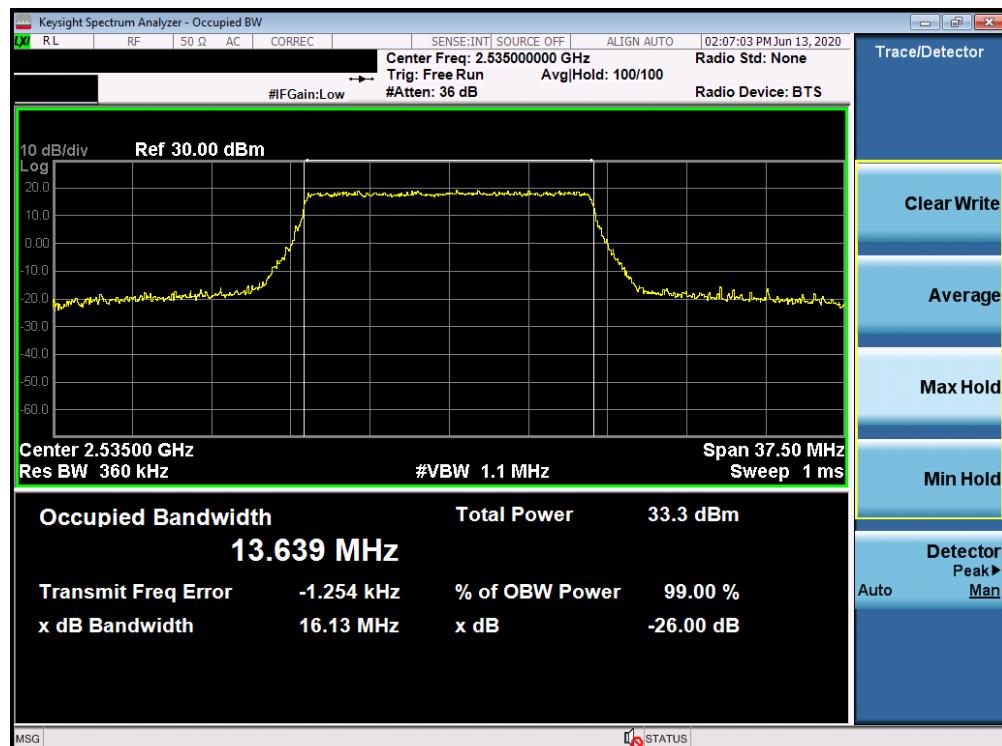


Plot 7-90. Occupied Bandwidth Plot (Band 7 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

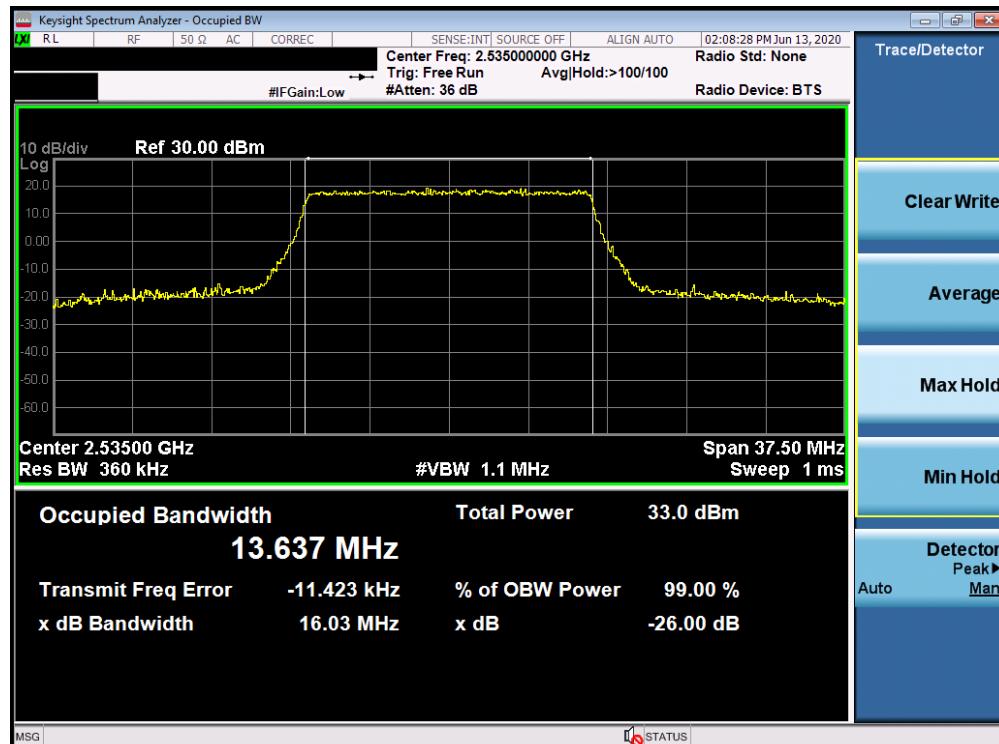


Plot 7-91. Occupied Bandwidth Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

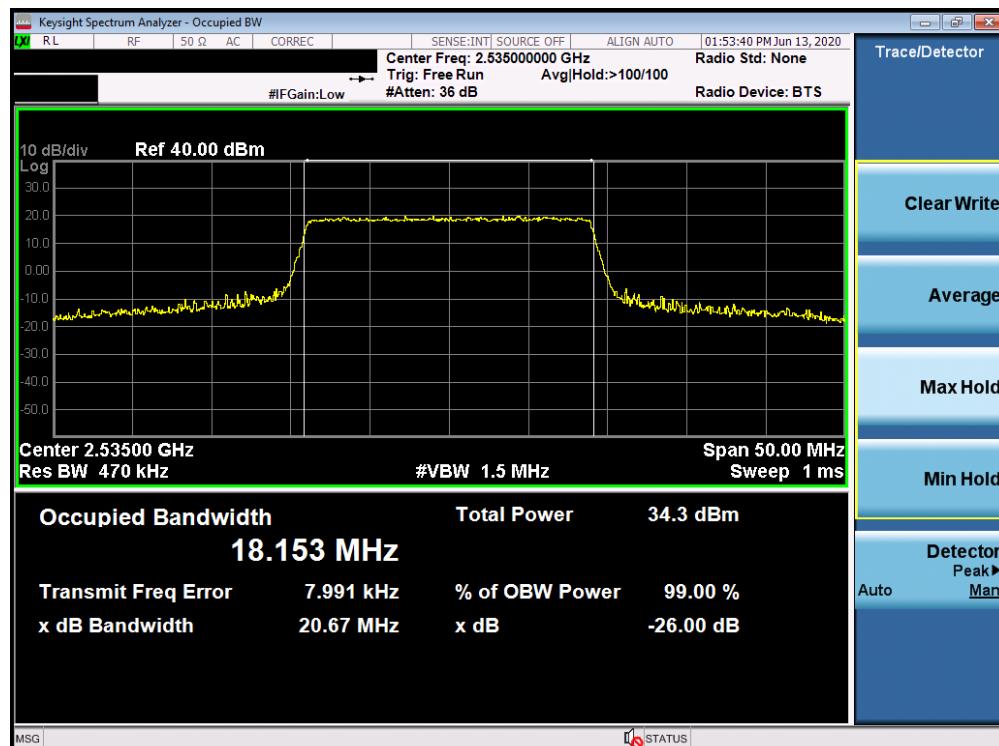


Plot 7-92. Occupied Bandwidth Plot (Band 7 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			

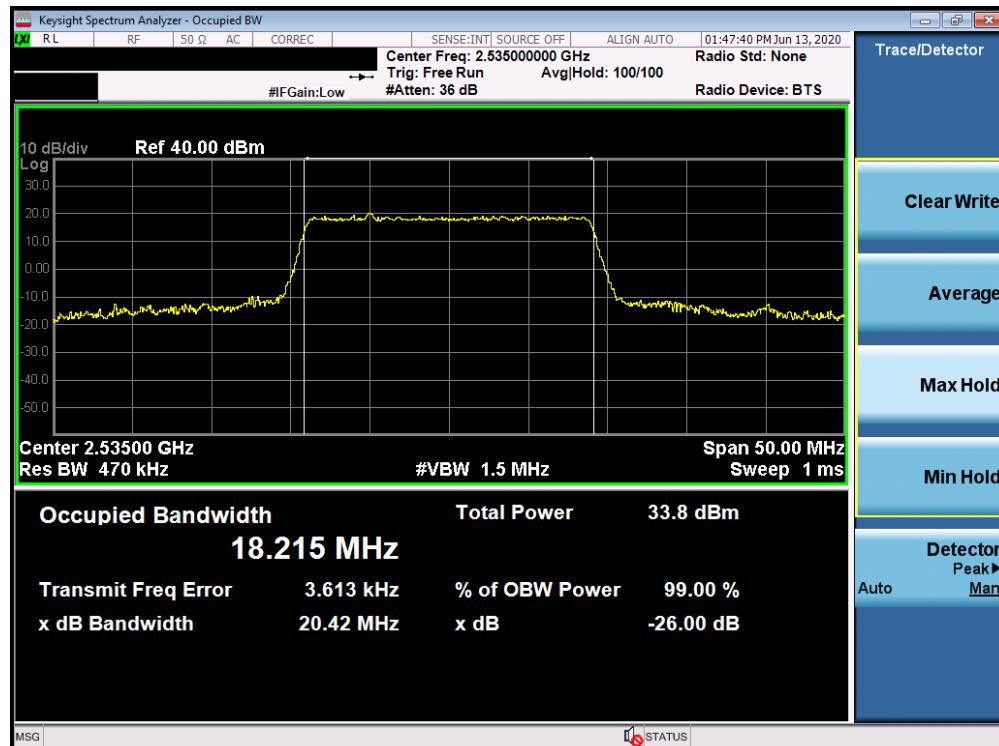


Plot 7-93. Occupied Bandwidth Plot (Band 7 - 15.0MHz 64-QAM - Full RB Configuration)



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

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 66 of 355	



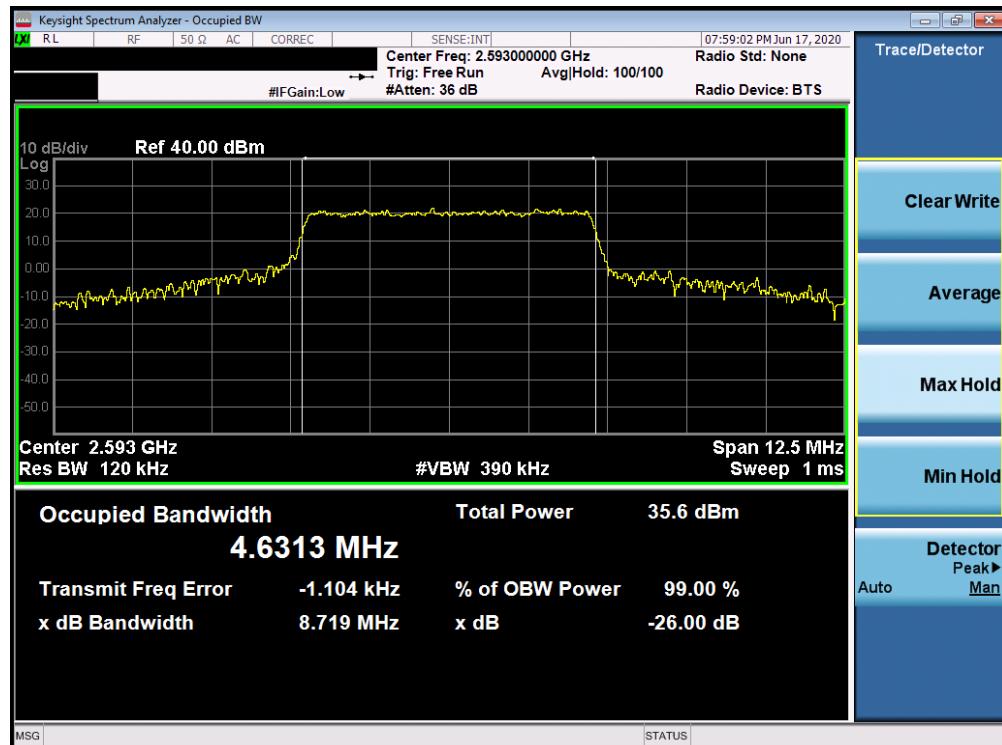
Plot 7-95. Occupied Bandwidth Plot (Band 7 - 20.0MHz 16-QAM - Full RB Configuration)



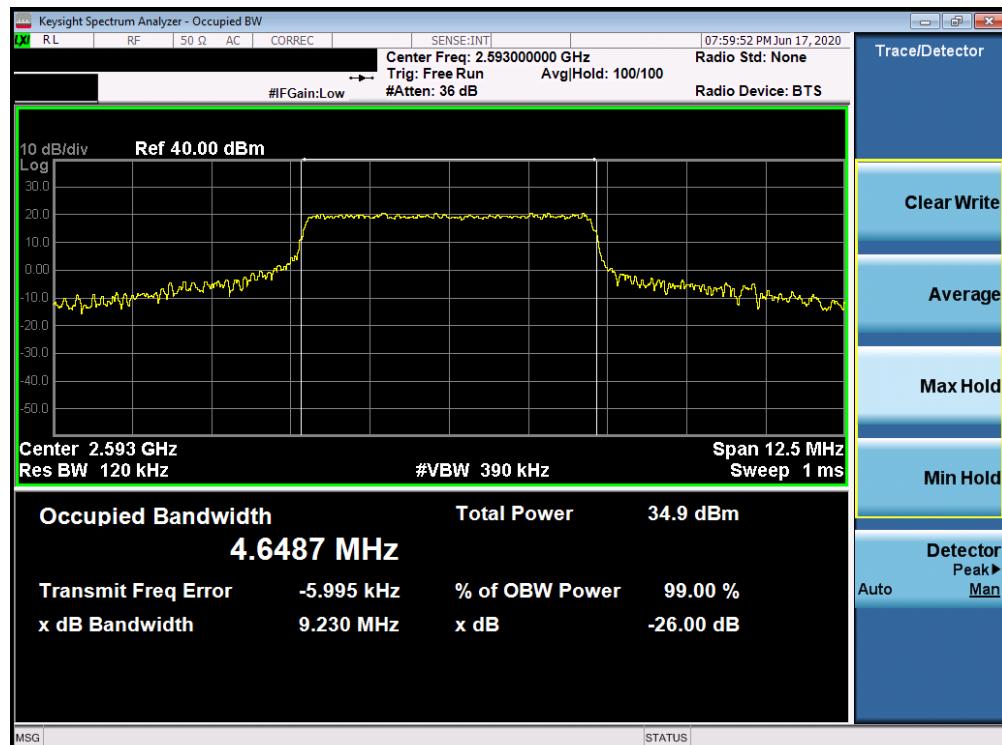
Plot 7-96. Occupied Bandwidth Plot (Band 7 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: BCGA2428	 Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 67 of 355	

Band 41



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

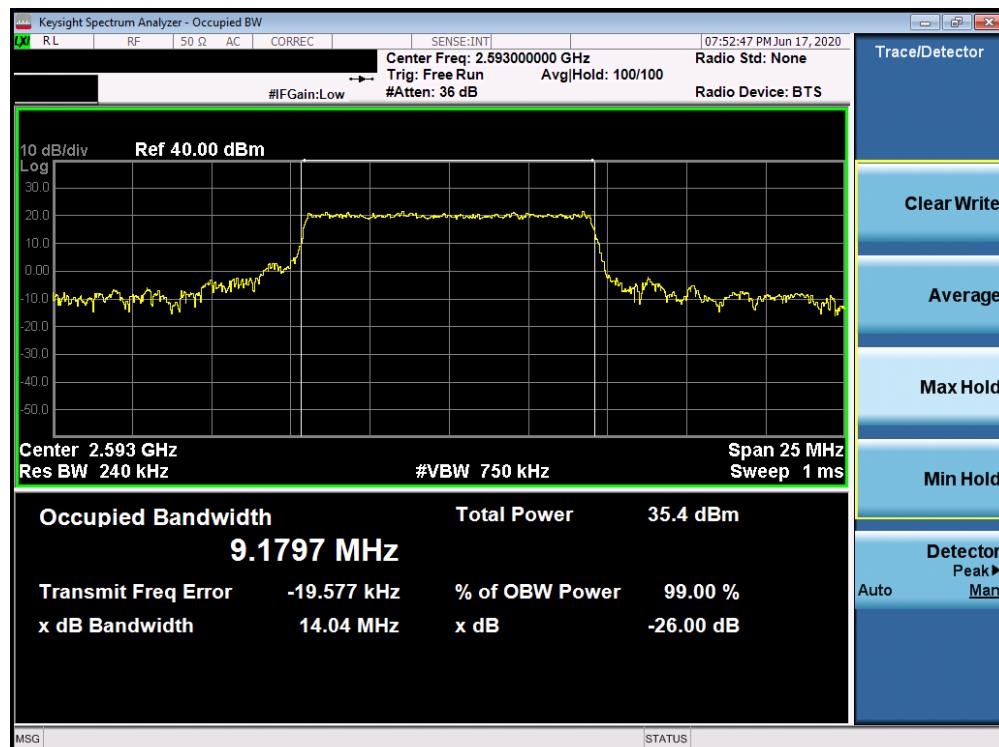


Plot 7-98. Occupied Bandwidth Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: BCGA2428	PCTEST® Proud to be part of element			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			Page 68 of 355

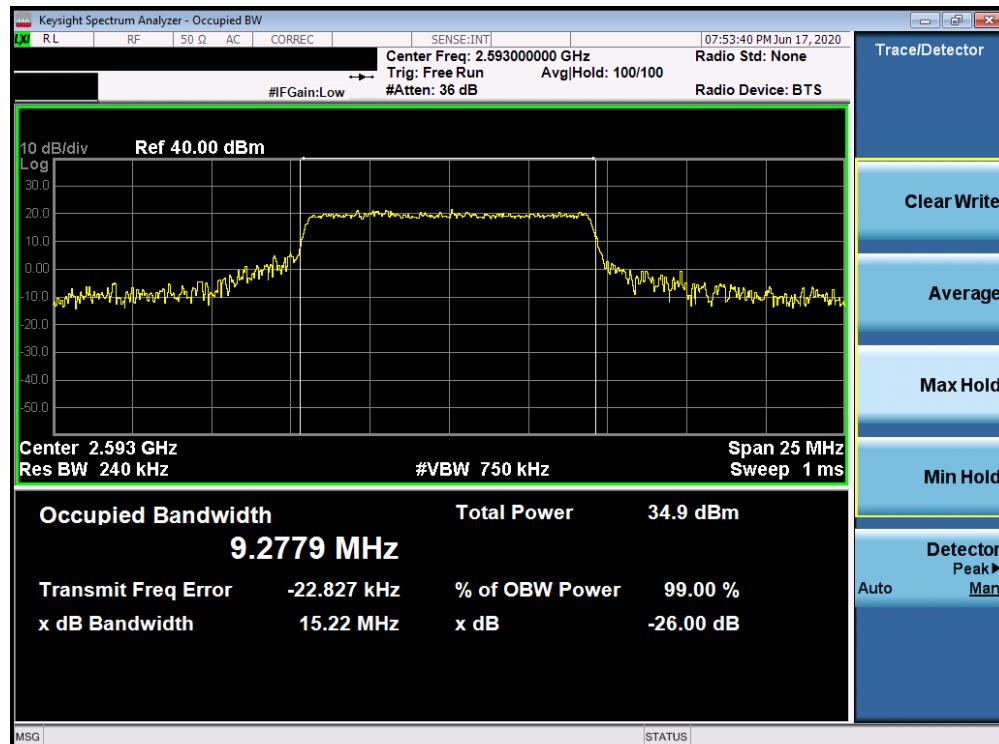


Plot 7-99. Occupied Bandwidth Plot (Band 41 - 5.0MHz 64-QAM - Full RB Configuration)

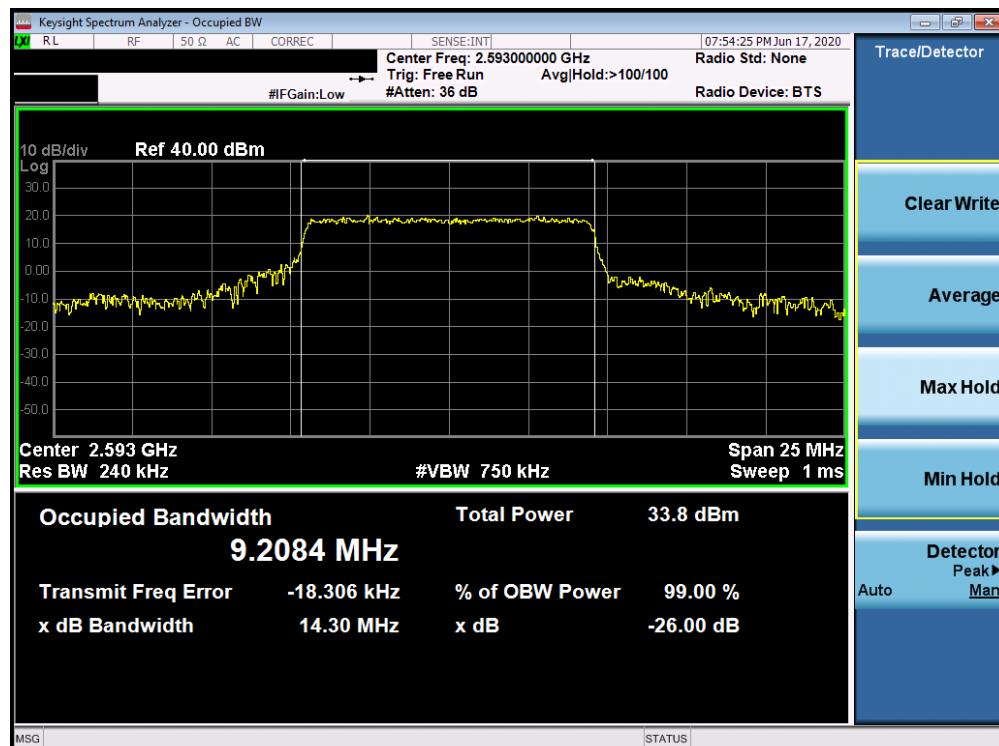


Plot 7-100. Occupied Bandwidth Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: BCGA2428	 PCTEST Proud to be part of 	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 69 of 355	

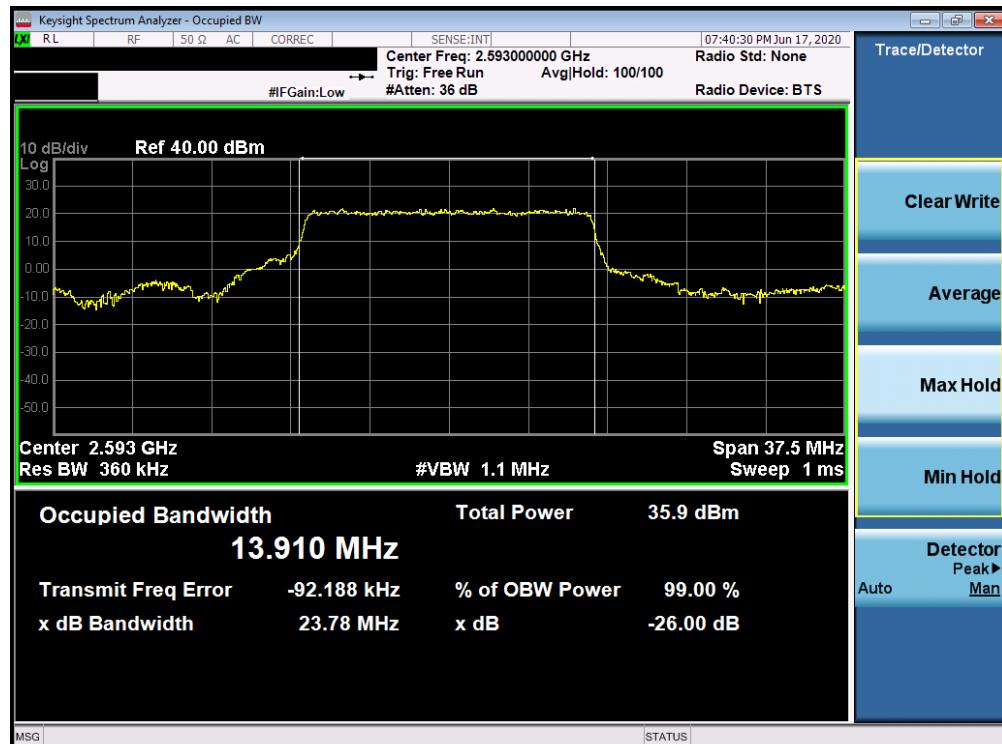


Plot 7-101. Occupied Bandwidth Plot (Band 41 - 10.0MHz 16-QAM - Full RB Configuration)



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

FCC ID: BCGA2428	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device	Page 70 of 355	



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)

FCC ID: BCGA2428	PCTEST Proud to be part of 			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C2004270033-03.BCG	Test Dates: 05/01/2020-07/22/2020	EUT Type: Tablet Device			