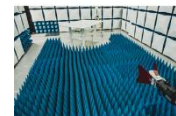




PCTEST
18855 Adams Court, Morgan Hill, CA 95037 USA
Tel. 410.290.6652 / Fax 410.290.6654
<http://www.pctest.com>



MEASUREMENT REPORT LTE

Applicant Name:

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

Date of Testing:

12/10/2019 - 02/24/2020

Test Site/Location:

PCTEST. Morgan Hill, CA, USA

Test Report Serial No.:

1C1912170054-03.BCG

FCC ID:

BCGA2069

APPLICANT:

Apple Inc.

Application Type:

Certification

Model:

A2069

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

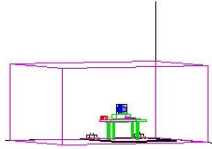


FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 1 of 423

TABLE OF CONTENTS

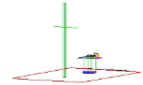
1.0	INTRODUCTION	6
1.1	SCOPE	6
1.2	PCTEST TEST LOCATION	6
1.3	TEST FACILITY / ACCREDITATIONS	6
2.0	PRODUCT INFORMATION	7
2.1	EQUIPMENT DESCRIPTION	7
2.2	DEVICE CAPABILITIES	7
2.3	ANTENNA DESCRIPTION	8
2.4	TEST SUPPORT EQUIPMENT	8
2.5	TEST CONFIGURATION	9
2.6	SOFTWARE AND FIRMWARE	9
2.7	EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	9
3.0	DESCRIPTION OF TESTS	10
3.1	MEASUREMENT PROCEDURE	10
3.2	BLOCK C FREQUENCY RANGE	10
3.3	BLOCK A FREQUENCY RANGE	10
3.4	600MHZ FREQUENCY RANGE	10
3.5	CELLULAR - BASE FREQUENCY BLOCKS	10
3.6	CELLULAR - MOBILE FREQUENCY BLOCKS	11
3.7	PCS - BASE FREQUENCY BLOCKS	11
3.8	PCS - MOBILE FREQUENCY BLOCKS	11
3.9	AWS - BASE FREQUENCY BLOCKS	11
3.10	AWS - MOBILE FREQUENCY BLOCKS	12
3.11	WCS – MOBILE/BASE FREQUENCY BLOCKS	12
3.12	BRS/EBS FREQUENCY BLOCK	12
3.13	RADIATED POWER AND RADIATED SPURIOUS EMISSIONS	13
4.0	MEASUREMENT UNCERTAINTY	14
5.0	TEST EQUIPMENT CALIBRATION DATA	15
6.0	SAMPLE CALCULATIONS	16
7.0	TEST RESULTS	17
7.1	SUMMARY	17
7.2	OCCUPIED BANDWIDTH	19
7.3	SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	77
7.4	BAND EDGE EMISSIONS AT ANTENNA TERMINAL	123
7.5	PEAK-AVERAGE RATIO	207
7.6	ADDITIONAL MAXIMUM POWER REDUCTION (A-MPR)	245
7.7	UPLINK CARRIER AGGREGATION	247
7.8	RADIATED POWER (ERP/EIRP)	268
7.8.1	PORT-A RADIATED POWER (ERP/EIRP)	270
7.8.2	PORT-B RADIATED POWER (ERP/EIRP)	283
7.8.3	PORT-C RADIATED POWER (ERP/EIRP)	296
7.8.4	PORT-D RADIATED POWER (ERP/EIRP)	304
7.9	RADIATED SPURIOUS EMISSIONS MEASUREMENTS	312
7.9.1	ANT 3 (PORT-A) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	315
7.9.2	ANT 4B (PORT-A) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	326
7.9.3	ANT 1 (PORT-B) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	342
7.9.4	ANT 2B (PORT-B) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	350
7.9.5	ANT 4A (PORT-C) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	360
7.9.6	ANT 2A (PORT-D) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	370
	SIMULTANEOUS TX RADIATED SPURIOUS EMISSIONS MEASUREMENTS	380
7.10	UPLINK CARRIER AGGREGATION RADIATED MEASUREMENTS	382
7.10.1	ANT 3 (PORT-A) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	384
7.10.2	ANT 4B (PORT-A) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	386
7.10.3	ANT 1 (PORT-B) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	391
7.10.4	ANT 2B (PORT-B) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	392
7.10.5	ANT 4A (PORT-C) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	396
7.10.6	ANT 2A (PORT-D) RADIATED SPURIOUS EMISSIONS MEASUREMENTS	400
7.11	FREQUENCY STABILITY / TEMPERATURE VARIATION	404
8.0	CONCLUSION	423

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 2 of 423



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	0.133	21.25			4M58G7W	QPSK
LTE Band 71	27	665.5 - 695.5	0.111	20.45			4M56D7W	16QAM
LTE Band 71	27	665.5 - 695.5	0.087	19.41			4M58D7W	64QAM
LTE Band 71	27	668 - 693	0.133	21.25			9M14G7W	QPSK
LTE Band 71	27	668 - 693	0.111	20.45			9M12D7W	16QAM
LTE Band 71	27	668 - 693	0.091	19.57			9M12D7W	64QAM
LTE Band 71	27	670.5 - 690.5	0.133	21.25			14M0G7W	QPSK
LTE Band 71	27	670.5 - 690.5	0.111	20.44			14M0D7W	16QAM
LTE Band 71	27	670.5 - 690.5	0.090	19.52			14M1D7W	64QAM
LTE Band 71	27	673 - 688	0.133	21.25			18M4G7W	QPSK
LTE Band 71	27	673 - 688	0.107	20.29			18M4D7W	16QAM
LTE Band 71	27	673 - 688	0.087	19.39			18M4D7W	64QAM
LTE Band 12	27	699.7 - 715.3	0.133	21.25	0.219	23.40	1M11G7W	QPSK
LTE Band 12	27	699.7 - 715.3	0.108	20.33	0.177	22.48	1M11D7W	16QAM
LTE Band 12	27	699.7 - 715.3	0.086	19.37	0.142	21.52	1M11D7W	64QAM
LTE Band 12	27	700.5 - 714.5	0.133	21.25	0.219	23.40	2M73G7W	QPSK
LTE Band 12	27	700.5 - 714.5	0.111	20.47	0.183	22.62	2M73D7W	16QAM
LTE Band 12	27	700.5 - 714.5	0.091	19.61	0.150	21.76	2M73D7W	64QAM
LTE Band 12	27	701.5 - 713.5	0.133	21.25	0.219	23.40	4M54G7W	QPSK
LTE Band 12	27	701.5 - 713.5	0.109	20.39	0.179	22.54	4M54D7W	16QAM
LTE Band 12	27	701.5 - 713.5	0.088	19.43	0.144	21.58	4M54D7W	64QAM
LTE Band 12	27	704 - 711	0.133	21.25	0.219	23.40	9M08G7W	QPSK
LTE Band 12	27	704 - 711	0.110	20.42	0.181	22.57	9M04D7W	16QAM
LTE Band 12	27	704 - 711	0.087	19.41	0.143	21.56	9M05D7W	64QAM
LTE Band 17	27	706.5 - 713.5	0.133	21.25	0.219	23.40	4M54G7W	QPSK
LTE Band 17	27	706.5 - 713.5	0.106	20.27	0.175	22.42	4M54D7W	16QAM
LTE Band 17	27	706.5 - 713.5	0.087	19.38	0.142	21.53	4M54D7W	64QAM
LTE Band 17	27	709 - 711	0.133	21.25	0.219	23.40	9M08G7W	QPSK
LTE Band 17	27	709 - 711	0.110	20.41	0.180	22.56	9M04D7W	16QAM
LTE Band 17	27	709 - 711	0.093	19.69	0.153	21.84	9M05D7W	64QAM
LTE Band 13	27	779.5 - 784.5	0.133	21.25	0.219	23.40	4M56G7W	QPSK
LTE Band 13	27	779.5 - 784.5	0.111	20.44	0.182	22.59	4M54D7W	16QAM
LTE Band 13	27	779.5 - 784.5	0.087	19.42	0.144	21.57	4M54D7W	64QAM
LTE Band 13	27	782	0.133	21.25	0.219	23.40	9M06G7W	QPSK
LTE Band 13	27	782	0.111	20.47	0.183	22.62	9M04D7W	16QAM
LTE Band 13	27	782	0.094	19.73	0.154	21.88	9M03D7W	64QAM
LTE Band 5	22H	824.7 - 848.3	0.146	21.65	0.240	23.80	1M11G7W	QPSK
LTE Band 5	22H	824.7 - 848.3	0.119	20.76	0.195	22.91	1M11D7W	16QAM
LTE Band 5	22H	824.7 - 848.3	0.096	19.84	0.158	21.99	1M11D7W	64QAM
LTE Band 5	22H	825.5 - 847.5	0.146	21.65	0.240	23.80	2M72G7W	QPSK
LTE Band 5	22H	825.5 - 847.5	0.120	20.78	0.196	22.93	2M73D7W	16QAM
LTE Band 5	22H	825.5 - 847.5	0.096	19.82	0.157	21.97	2M72D7W	64QAM
LTE Band 5	22H	826.5 - 846.5	0.146	21.65	0.240	23.80	4M54G7W	QPSK
LTE Band 5	22H	826.5 - 846.5	0.120	20.80	0.197	22.95	4M53D7W	16QAM
LTE Band 5	22H	826.5 - 846.5	0.099	19.94	0.162	22.09	4M53D7W	64QAM
LTE Band 5	22H	829 - 844	0.146	21.65	0.240	23.80	9M07G7W	QPSK
LTE Band 5	22H	829 - 844	0.121	20.83	0.199	22.98	9M07D7W	16QAM
LTE Band 5	22H	829 - 844	0.094	19.73	0.154	21.88	9M06D7W	64QAM
LTE Band 26	22H	824.7 - 848.3	0.146	21.65	0.240	23.80	1M11G7W	QPSK
LTE Band 26	22H	824.7 - 848.3	0.124	20.95	0.204	23.10	1M11D7W	16QAM
LTE Band 26	22H	824.7 - 848.3	0.097	19.86	0.159	22.01	1M11D7W	64QAM
LTE Band 26	22H	825.5 - 847.5	0.146	21.65	0.240	23.80	2M72G7W	QPSK
LTE Band 26	22H	825.5 - 847.5	0.119	20.77	0.196	22.92	2M73D7W	16QAM
LTE Band 26	22H	825.5 - 847.5	0.101	20.05	0.166	22.20	2M72D7W	64QAM
LTE Band 26	22H	826.5 - 846.5	0.146	21.65	0.240	23.80	4M54G7W	QPSK
LTE Band 26	22H	826.5 - 846.5	0.118	20.73	0.194	22.88	4M53D7W	16QAM
LTE Band 26	22H	826.5 - 846.5	0.097	19.85	0.158	22.00	4M53D7W	64QAM
LTE Band 26	22H	829 - 844	0.146	21.65	0.240	23.80	9M07G7W	QPSK
LTE Band 26	22H	829 - 844	0.124	20.95	0.204	23.10	9M07D7W	16QAM
LTE Band 26	22H	829 - 844	0.102	20.09	0.167	22.24	9M06D7W	64QAM

EUT Overview (Low Bands)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 3 of 423

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	0.232	23.66	1M11G7W	QPSK
LTE Band 4	27	1710.7 - 1754.3	0.190	22.79	1M10D7W	16QAM
LTE Band 4	27	1710.7 - 1754.3	0.154	21.88	1M11D7W	64QAM
LTE Band 4	27	1711.5 - 1753.5	0.232	23.66	2M72G7W	QPSK
LTE Band 4	27	1711.5 - 1753.5	0.189	22.76	2M73D7W	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.156	21.92	2M72D7W	64QAM
LTE Band 4	27	1712.5 - 1752.5	0.237	23.75	4M55G7W	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.184	22.65	4M54D7W	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.154	21.88	4M54D7W	64QAM
LTE Band 4	27	1715 - 1750	0.234	23.70	9M07G7W	QPSK
LTE Band 4	27	1715 - 1750	0.181	22.57	9M07D7W	16QAM
LTE Band 4	27	1715 - 1750	0.157	21.97	9M06D7W	64QAM
LTE Band 4	27	1717.5 - 1747.5	0.236	23.73	13M6G7W	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.190	22.79	13M6D7W	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.155	21.90	13M6D7W	64QAM
LTE Band 4	27	1720 - 1745	0.237	23.75	18M1G7W	QPSK
LTE Band 4	27	1720 - 1745	0.190	22.79	18M2D7W	16QAM
LTE Band 4	27	1720 - 1745	0.160	22.04	18M1D7W	64QAM
LTE Band 66	27	1710.7 - 1779.3	0.232	23.66	1M11G7W	QPSK
LTE Band 66	27	1710.7 - 1779.3	0.185	22.68	1M10D7W	16QAM
LTE Band 66	27	1710.7 - 1779.3	0.149	21.74	1M11D7W	64QAM
LTE Band 66	27	1711.5 - 1778.5	0.233	23.67	2M72G7W	QPSK
LTE Band 66	27	1711.5 - 1778.5	0.182	22.60	2M73D7W	16QAM
LTE Band 66	27	1711.5 - 1778.5	0.151	21.79	2M72D7W	64QAM
LTE Band 66	27	1712.5 - 1777.5	0.234	23.69	4M55G7W	QPSK
LTE Band 66	27	1712.5 - 1777.5	0.181	22.57	4M54D7W	16QAM
LTE Band 66	27	1712.5 - 1777.5	0.150	21.75	4M54D7W	64QAM
LTE Band 66	27	1715 - 1775	0.235	23.71	9M07G7W	QPSK
LTE Band 66	27	1715 - 1775	0.191	22.81	9M07D7W	16QAM
LTE Band 66	27	1715 - 1775	0.152	21.83	9M06D7W	64QAM
LTE Band 66	27	1717.5 - 1772.5	0.235	23.71	13M6G7W	QPSK
LTE Band 66	27	1717.5 - 1772.5	0.190	22.79	13M6D7W	16QAM
LTE Band 66	27	1717.5 - 1772.5	0.155	21.89	13M6D7W	64QAM
LTE Band 66	27	1720 - 1770	0.240	23.80	18M1G7W	QPSK
LTE Band 66	27	1720 - 1770	0.193	22.86	18M2D7W	16QAM
LTE Band 66	27	1720 - 1770	0.161	22.08	18M1D7W	64QAM
LTE Band 2	24E	1850.7 - 1909.3	0.294	24.68	1M11G7W	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.244	23.87	1M11D7W	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.204	23.09	1M11D7W	64QAM
LTE Band 2	24E	1851.5 - 1908.5	0.295	24.70	2M72G7W	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.259	24.14	2M73D7W	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.202	23.06	2M73D7W	64QAM
LTE Band 2	24E	1852.5 - 1907.5	0.295	24.70	4M55G7W	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.262	24.19	4M53D7W	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.204	23.10	4M52D7W	64QAM
LTE Band 2	24E	1855 - 1905	0.299	24.75	9M07G7W	QPSK
LTE Band 2	24E	1855 - 1905	0.264	24.22	9M07D7W	16QAM
LTE Band 2	24E	1855 - 1905	0.201	23.04	9M07D7W	64QAM
LTE Band 2	24E	1857.5 - 1902.5	0.301	24.78	13M6G7W	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.261	24.17	13M6D7W	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.203	23.07	13M6D7W	64QAM
LTE Band 2	24E	1860 - 1900	0.302	24.80	18M0G7W	QPSK
LTE Band 2	24E	1860 - 1900	0.261	24.17	18M1D7W	16QAM
LTE Band 2	24E	1860 - 1900	0.209	23.20	18M0D7W	64QAM
LTE Band 25	24E	1850.7 - 1914.3	0.302	24.80	1M11G7W	QPSK
LTE Band 25	24E	1850.7 - 1914.3	0.254	24.04	1M11D7W	16QAM
LTE Band 25	24E	1850.7 - 1914.3	0.204	23.09	1M11D7W	64QAM
LTE Band 25	24E	1851.5 - 1913.5	0.301	24.78	2M72G7W	QPSK
LTE Band 25	24E	1851.5 - 1913.5	0.265	24.24	2M73D7W	16QAM
LTE Band 25	24E	1851.5 - 1913.5	0.202	23.05	2M73D7W	64QAM
LTE Band 25	24E	1852.5 - 1912.5	0.299	24.76	4M55G7W	QPSK
LTE Band 25	24E	1852.5 - 1912.5	0.254	24.04	4M53D7W	16QAM
LTE Band 25	24E	1852.5 - 1912.5	0.208	23.19	4M52D7W	64QAM
LTE Band 25	24E	1855 - 1910	0.302	24.80	9M07G7W	QPSK
LTE Band 25	24E	1855 - 1910	0.255	24.07	9M07D7W	16QAM
LTE Band 25	24E	1855 - 1910	0.201	23.04	9M07D7W	64QAM
LTE Band 25	24E	1857.5 - 1907.5	0.294	24.69	13M6G7W	QPSK
LTE Band 25	24E	1857.5 - 1907.5	0.252	24.02	13M6D7W	16QAM
LTE Band 25	24E	1857.5 - 1907.5	0.208	23.19	13M6D7W	64QAM
LTE Band 25	24E	1860 - 1905	0.301	24.78	18M0G7W	QPSK
LTE Band 25	24E	1860 - 1905	0.259	24.14	18M1D7W	16QAM
LTE Band 25	24E	1860 - 1905	0.198	22.97	18M0D7W	64QAM

EUT Overview (Mid Bands)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 4 of 423

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	0.202	23.05	4M55G7W	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.168	22.26	4M55D7W	16QAM
LTE Band 30	27	2307.5 - 2312.5	0.136	21.33	4M54D7W	64QAM
LTE Band 30	27	2310	0.202	23.05	9M06G7W	QPSK
LTE Band 30	27	2310	0.173	22.37	9M03D7W	16QAM
LTE Band 30	27	2310	0.139	21.42	9M04D7W	64QAM
LTE Band 7	27	2502.5 - 2567.5	0.432	26.35	4M55G7W	QPSK
LTE Band 7	27	2502.5 - 2567.5	0.386	25.87	4M54D7W	16QAM
LTE Band 7	27	2502.5 - 2567.5	0.296	24.72	4M54D7W	64QAM
LTE Band 7	27	2505 - 2565	0.437	26.40	9M06G7W	QPSK
LTE Band 7	27	2505 - 2565	0.383	25.83	9M06D7W	16QAM
LTE Band 7	27	2505 - 2565	0.294	24.68	9M04D7W	64QAM
LTE Band 7	27	2507.5 - 2562.5	0.431	26.34	13M6G7W	QPSK
LTE Band 7	27	2507.5 - 2562.5	0.385	25.86	13M5D7W	16QAM
LTE Band 7	27	2507.5 - 2562.5	0.295	24.70	13M6D7W	64QAM
LTE Band 7	27	2510 - 2560	0.437	26.40	18M1G7W	QPSK
LTE Band 7	27	2510 - 2560	0.375	25.74	18M0D7W	16QAM
LTE Band 7	27	2510 - 2560	0.296	24.72	18M1D7W	64QAM
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.859	29.34	4M55G7W	QPSK
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.687	28.37	4M56D7W	16QAM
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.558	27.47	4M53D7W	64QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.822	29.15	9M06G7W	QPSK
LTE Band 41 (PC2)	27	2501 - 2685	0.750	28.75	9M06D7W	16QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.579	27.63	9M04D7W	64QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.832	29.20	13M6G7W	QPSK
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.726	28.61	13M6D7W	16QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.577	27.61	13M6D7W	64QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.820	29.14	18M1G7W	QPSK
LTE Band 41 (PC2)	27	2506 - 2680	0.733	28.65	18M1D7W	16QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.570	27.56	18M1D7W	64QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.436	26.39	4M55G7W	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.346	25.39	4M56D7W	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.278	24.44	4M53D7W	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.437	26.40	9M06G7W	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.356	25.51	9M06D7W	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.270	24.31	9M04D7W	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.432	26.35	13M6G7W	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.343	25.35	13M6D7W	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.268	24.28	13M6D7W	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.437	26.40	18M1G7W	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.348	25.41	18M1D7W	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.275	24.40	18M1D7W	64QAM

EUT Overview (High Bands)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 5 of 423

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

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

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 6 of 423

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2069**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: DLXZV00EPQLD, DLXZV017PQLD

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)

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.

This device supports BT Beamforming

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

Simultaneous Tx	Antenna							
	4a				2a			
	Config 1	Config 2	Config 3	Config 4	Config 5	Config 6	Config 7	Config 8
WIFI 2.4GHz	✓	✓	✗	✗	✓	✓	✗	✗
Bluetooth (1x, EDR, LE, HDR4, HDR8)	✗	✗	✓	✓	✗	✗	✓	✓
LTE Mid Bands	✓	✗	✓	✗	✓	✗	✓	✗
LTE High Bands	✗	✓	✗	✓	✗	✓	✗	✓

Table 2-1. Simultaneous Tx Configurations

✓ = Support ; ✗ = NOT Support

Worst Case Configuration

Description	Bluetooth BDR	LTE
Antenna	4a	4a
Channel	78	39750
Operating Frequency (MHz)	2480	2506
Mode/Modulation	GFSK ePA	QPSK/1RB/20MHz

Table 2-2. Worst Case Configuration

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 7 of 423

2.3 Antenna Description

Following antennas were used for the testing.

Frequency [MHz]	Antennas			
	Port A	Port B	Port C	Port D
650-800	ANT 3	ANT 1	N/A	
820-960				
1700-1800	ANT 4b	ANT 2b	ANT 4a	ANT 2a
1820-2100				
2300-2320				
2400-2700				

Table 2-3. Antennas vs Ports

Frequency [MHz]	Antenna Gain (dBi)					
	ANT 3	ANT 1	ANT 4b	ANT 2b	ANT 4a	ANT 2a
650-800	-2.3	-2.0	N/A			
820-960	-1.9	-1.5				
1700-1800	N/A		-2.8	-3.2	-1.2	-0.4
1820-2100			-0.9	-1.7	-0.3	0.3
2300-2320			0.5	-0.2	-0.3	0.2
2400-2700			0.7	0.8	-1.3	-0.2

Table 2-4. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple MacBook	Model: A1398	S/N: C2QKP008F6F3
	w/ AC/DC Adapter	Model: A1435	S/N: C04325505K1F288BG
2	Apple USB-C Cable	Model: Chimp	S/N: 304523
3	USB-C Cable	Model: A1997	S/N: N/A
	w / AC/DC Adapter	Model: A1720	S/N: C3D9274B06YLHDAE
4	Apple Pencil	Model: A2051	S/N: GQXYGSXCJKM9
5	DC Power Supply	Model: KPS3010D	S/N N/A

Table 2-5. Test Support Equipment Used

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device		Page 8 of 423

2.5 Test Configuration

The EUT was tested per the guidance of ANSI/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 17E228 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: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 9 of 423

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 Block C Frequency Range

Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

3.3 Block A Frequency Range

698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

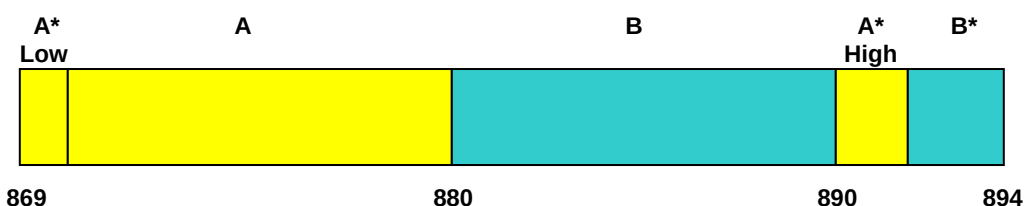
Block A: 698-704 MHz and 728-734 MHz;
Block B: 704-710 MHz and 734-740 MHz; and
Block C: 710-716 MHz and 740-746 MHz.

3.4 600MHz Frequency Range

600MHz band. The following frequencies are available for licensing pursuant to this part in the 600 MHz band: (1) Seven paired channel blocks of 5 megahertz each are available for assignment as follows:

Block A: 617-622 MHz and 663-668 MHz;
Block B: 622-627 MHz and 668-673 MHz;
Block C: 627-632 MHz and 673-678 MHz;
Block D: 632-637 MHz and 678-683 MHz;
Block E: 637-642 MHz and 683-688 MHz;
Block F: 642-647 MHz and 688-693 MHz; and
Block G: 647-652 MHz and 693-698 MHz

3.5 Cellular - Base Frequency Blocks

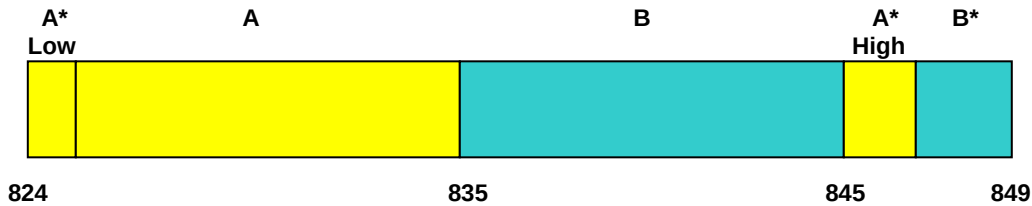


BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 10 of 423

3.6 Cellular - Mobile Frequency Blocks



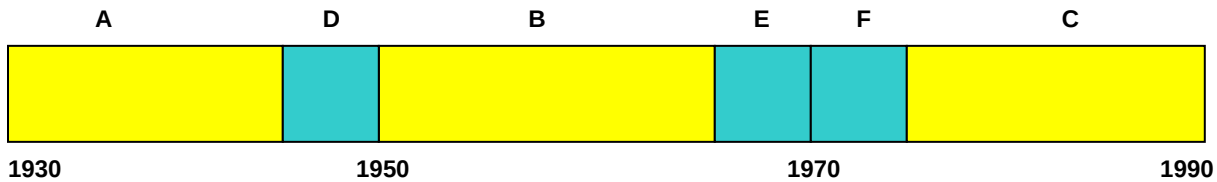
BLOCK 1: 824 – 835 MHz (A* Low + A)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)

BLOCK 4: 846.5 – 849 MHz (B*)

3.7 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 2: 1945 – 1950 MHz (D)

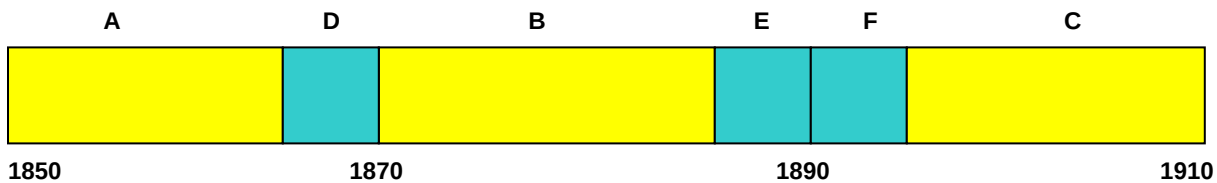
BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 6: 1975 – 1990 MHz (C)

3.8 PCS - Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)

BLOCK 2: 1865 – 1870 MHz (D)

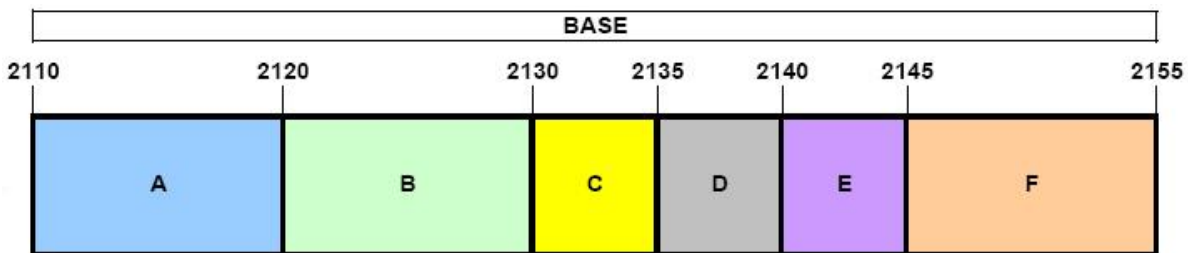
BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 6: 1895 – 1910 MHz (C)

3.9 AWS - Base Frequency Blocks



BLOCK 1: 2110 – 2120 MHz (A)

BLOCK 2: 2120 – 2130 MHz (B)

BLOCK 3: 2130 – 2135 MHz (C)

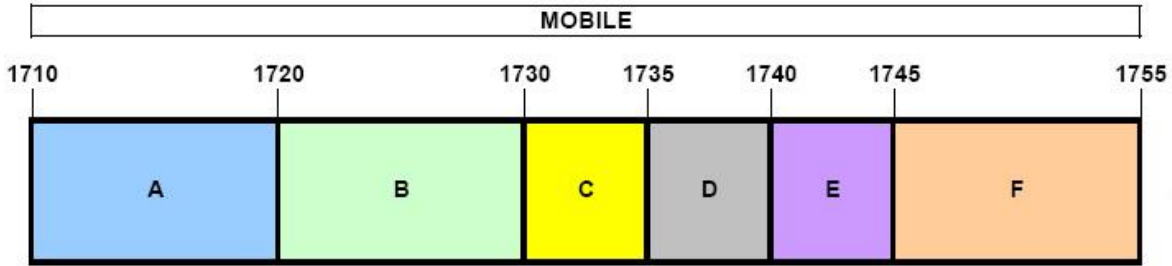
BLOCK 4: 2135 – 2140 MHz (D)

BLOCK 5: 2140 – 2145 MHz (E)

BLOCK 6: 2145 – 2155 MHz (F)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 11 of 423

3.10 AWS - Mobile Frequency Blocks



BLOCK 1: 1710 – 1720 MHz (A)
 BLOCK 2: 1720 – 1730 MHz (B)
 BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 4: 1735 – 1740 MHz (D)
 BLOCK 5: 1740 – 1745 MHz (E)
 BLOCK 6: 1745 – 1755 MHz (F)

3.11 WCS – Mobile/Base Frequency Blocks

The following frequencies are available for WCS in the 2305-2320 MHz and 2345-2360 MHz bands:

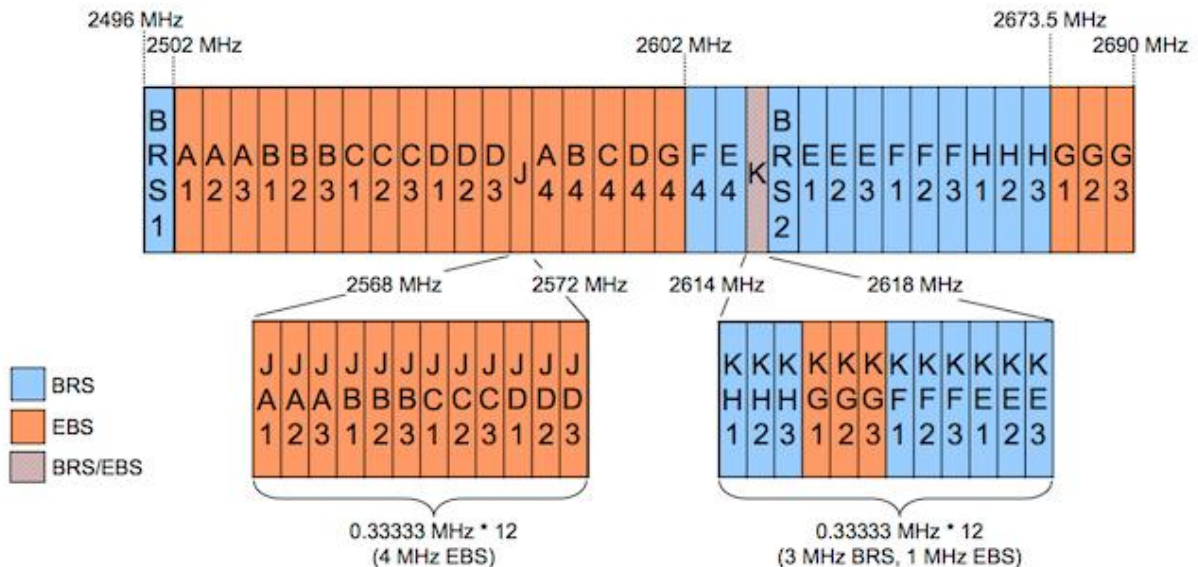
BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

BLOCK 2: 2310-2315 and 2355-236 MHz (B)

BLOCK 3: 2315-2320 MHz (C)

BLOCK 4: 2345-2350 MHz (D)

3.12 BRS/EBS Frequency Block



FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 12 of 423

3.13 Radiated Power and Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Per the guidelines of KDB 412172 D01 v01r01, radiated power levels are measured using the following formula:

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

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/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:

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

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 $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

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

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 13 of 423

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	1.29
Radiated Disturbance (<1GHz)	4.15
Radiated Disturbance (>1GHz)	4.70
Radiated Disturbance (>18GHz)	5.01
Temperature	0.01

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 14 of 423

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	3/13/2019	Annual	3/13/2020	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)	8/14/2019	Annual	8/14/2020	224569
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/12/2019	Annual	3/12/2020	205956
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	2/27/2019	Annual	2/27/2020	101619
Rohde & Schwarz	ESW26	EMI Test Receiver	5/21/2019	Annual	5/21/2020	101299
Rohde & Schwarz	ESW44	EMI Test Receiver	7/27/2019	Annual	7/27/2020	101668
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	4/20/2019	Annual	4/20/2020	161617
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	8/8/2019	Annual	8/8/2020	151888
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	3/21/2019	Annual	3/21/2020	100519

Table 5-1. Test Equipment

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: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 15 of 423

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: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 16 of 423

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCGA2069
 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 2.917(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	$< 13 \text{ dB}$			Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			Section 7.8
2.1046	Additional Maximum Power Reduction (A-MPR)	N/A			Section 7.6
27.53(m)	Uplink Carrier Aggregation	N/A			Section 7.7
2.1055 22.355 24.235 27.54	Frequency Stability	$< 2.5 \text{ ppm}$ (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: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 17 of 423

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 5, 26)	< 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 2, 25, 7, 41)	< 2 Watts max. EIRP			Section 7.8
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4, 66)	< 1 Watts max. EIRP			Section 7.8
27.50(a)(3)	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 + 10log ₁₀ (P[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 + 10log 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 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.

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 18 of 423

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 $\geq 3 \times$ 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.

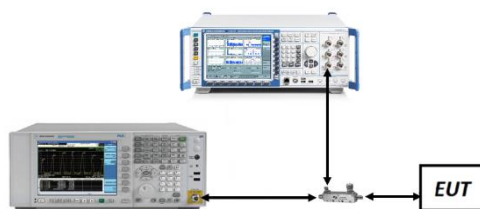


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. All ports were tested and only the worst case data were reported.
2. Refer to Table 2-1 Section 2.3 of this test report for correlation between Antennas and Ports.

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 19 of 423

Mode	BW (MHz)	Modulation	Occupied BW [kHz]
LTE Band 71	5	QPSK	4575.02
LTE Band 71	5	16QAM	4559.74
LTE Band 71	5	64QAM	4579.93
LTE Band 71	10	QPSK	9136.07
LTE Band 71	10	16QAM	9116.04
LTE Band 71	10	64QAM	9123.23
LTE Band 71	15	QPSK	13981.43
LTE Band 71	15	16QAM	14010.79
LTE Band 71	15	64QAM	14078.87
LTE Band 71	20	QPSK	18387.61
LTE Band 71	20	16QAM	18414.14
LTE Band 71	20	64QAM	18427.09
LTE Band 12	1.4	QPSK	1105.84
LTE Band 12	1.4	16QAM	1106.52
LTE Band 12	1.4	64QAM	1111.16
LTE Band 12	3	QPSK	2730.44
LTE Band 12	3	16QAM	2733.36
LTE Band 12	3	64QAM	2726.33
LTE Band 12	5	QPSK	4542.51
LTE Band 12	5	16QAM	4542.35
LTE Band 12	5	64QAM	4540.43
LTE Band 12	10	QPSK	9076.83
LTE Band 12	10	16QAM	9041.24
LTE Band 12	10	64QAM	9045.01
LTE Band 17	5	QPSK	4542.51
LTE Band 17	5	16QAM	4542.35
LTE Band 17	5	64QAM	4540.43
LTE Band 17	10	QPSK	9076.83
LTE Band 17	10	16QAM	9041.24
LTE Band 17	10	64QAM	9045.01
LTE Band 13	5	QPSK	4556.28
LTE Band 13	5	16QAM	4538.49
LTE Band 13	5	64QAM	4541.75
LTE Band 13	10	QPSK	9055.07
LTE Band 13	10	16QAM	9044.55
LTE Band 13	10	64QAM	9034.19
LTE Band 5	1.4	QPSK	1105.18
LTE Band 5	1.4	16QAM	1107.04
LTE Band 5	1.4	64QAM	1109.23
LTE Band 5	3	QPSK	2722.49
LTE Band 5	3	16QAM	2730.34
LTE Band 5	3	64QAM	2724.63
LTE Band 5	5	QPSK	4535.01
LTE Band 5	5	16QAM	4529.24
LTE Band 5	5	64QAM	4533.08
LTE Band 5	10	QPSK	9066.79
LTE Band 5	10	16QAM	9069.83
LTE Band 5	10	64QAM	9057.80
LTE Band 26	1.4	QPSK	1105.18
LTE Band 26	1.4	16QAM	1107.04
LTE Band 26	1.4	64QAM	1109.23
LTE Band 26	3	QPSK	2722.49
LTE Band 26	3	16QAM	2730.34
LTE Band 26	3	64QAM	2724.63
LTE Band 26	5	QPSK	4535.01
LTE Band 26	5	16QAM	4529.24
LTE Band 26	5	64QAM	4533.08
LTE Band 26	10	QPSK	9066.79
LTE Band 26	10	16QAM	9069.83
LTE Band 26	10	64QAM	9057.80

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

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 20 of 423

Mode	BW (MHz)	Modulation	Occupied BW [kHz]
LTE Band 4	1.4	QPSK	1107.58
LTE Band 4	1.4	16QAM	1102.52
LTE Band 4	1.4	64QAM	1106.76
LTE Band 4	3	QPSK	2723.83
LTE Band 4	3	16QAM	2730.78
LTE Band 4	3	64QAM	2722.72
LTE Band 4	5	QPSK	4549.67
LTE Band 4	5	16QAM	4539.89
LTE Band 4	5	64QAM	4536.32
LTE Band 4	10	QPSK	9070.28
LTE Band 4	10	16QAM	9074.35
LTE Band 4	10	64QAM	9062.04
LTE Band 4	15	QPSK	13593.52
LTE Band 4	15	16QAM	13602.18
LTE Band 4	15	64QAM	13575.32
LTE Band 4	20	QPSK	18124.89
LTE Band 4	20	16QAM	18153.92
LTE Band 4	20	64QAM	18089.95
LTE Band 66	1.4	QPSK	1107.58
LTE Band 66	1.4	16QAM	1102.52
LTE Band 66	1.4	64QAM	1106.76
LTE Band 66	3	QPSK	2723.83
LTE Band 66	3	16QAM	2730.78
LTE Band 66	3	64QAM	2722.72
LTE Band 66	5	QPSK	4549.67
LTE Band 66	5	16QAM	4539.89
LTE Band 66	5	64QAM	4536.32
LTE Band 66	10	QPSK	9070.28
LTE Band 66	10	16QAM	9074.35
LTE Band 66	10	64QAM	9062.04
LTE Band 66	15	QPSK	13593.52
LTE Band 66	15	16QAM	13602.18
LTE Band 66	15	64QAM	13575.32
LTE Band 66	20	QPSK	18124.89
LTE Band 66	20	16QAM	18153.92
LTE Band 66	20	64QAM	18089.95
LTE Band 2	1.4	QPSK	1110.07
LTE Band 2	1.4	16QAM	1111.64
LTE Band 2	1.4	64QAM	1111.98
LTE Band 2	3	QPSK	2724.29
LTE Band 2	3	16QAM	2732.07
LTE Band 2	3	64QAM	2729.50
LTE Band 2	5	QPSK	4551.84
LTE Band 2	5	16QAM	4533.21
LTE Band 2	5	64QAM	4523.80
LTE Band 2	10	QPSK	9071.31
LTE Band 2	10	16QAM	9070.61
LTE Band 2	10	64QAM	9073.10
LTE Band 2	15	QPSK	13597.36
LTE Band 2	15	16QAM	13583.10
LTE Band 2	15	64QAM	13570.21
LTE Band 2	20	QPSK	18043.43
LTE Band 2	20	16QAM	18050.99
LTE Band 2	20	64QAM	18043.98
LTE Band 25	1.4	QPSK	1110.07
LTE Band 25	1.4	16QAM	1111.64
LTE Band 25	1.4	64QAM	1111.98
LTE Band 25	3	QPSK	2724.29
LTE Band 25	3	16QAM	2732.07
LTE Band 25	3	64QAM	2729.50
LTE Band 25	5	QPSK	4551.84
LTE Band 25	5	16QAM	4533.21
LTE Band 25	5	64QAM	4523.80
LTE Band 25	10	QPSK	9071.31
LTE Band 25	10	16QAM	9070.61
LTE Band 25	10	64QAM	9073.10
LTE Band 25	15	QPSK	13597.36
LTE Band 25	15	16QAM	13583.10
LTE Band 25	15	64QAM	13570.21
LTE Band 25	20	QPSK	18043.43
LTE Band 25	20	16QAM	18050.99
LTE Band 25	20	64QAM	18043.98

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

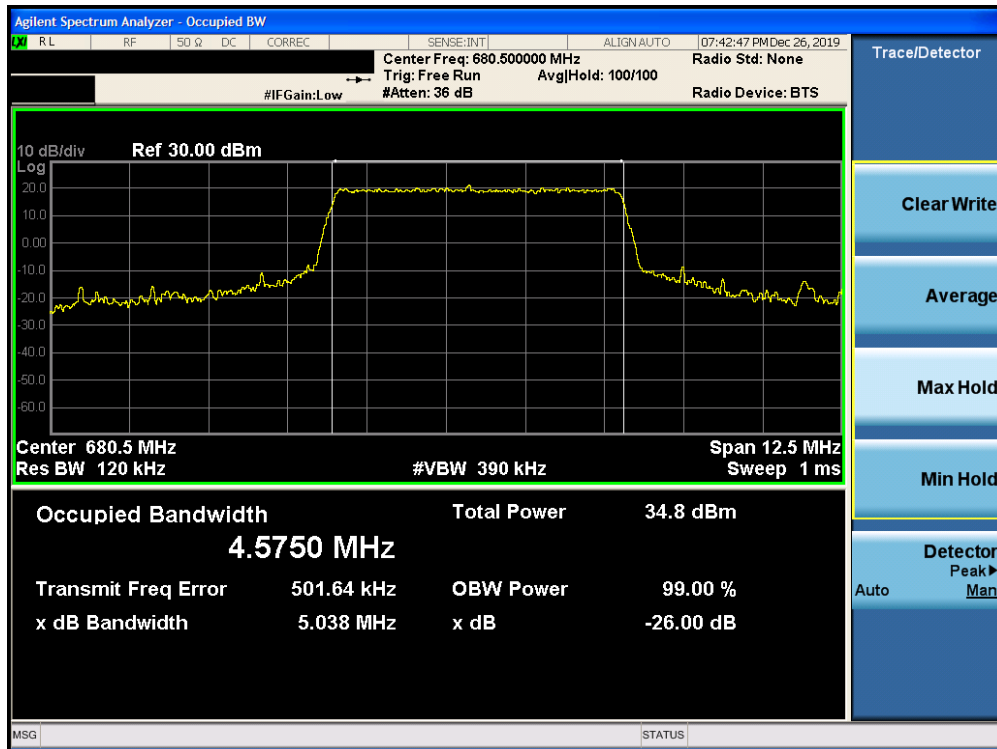
FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 21 of 423

Mode	BW (MHz)	Modulation	Occupied BW [kHz]
LTE Band 30	5	QPSK	4549.10
LTE Band 30	5	16QAM	4550.99
LTE Band 30	5	64QAM	4538.55
LTE Band 30	10	QPSK	9056.96
LTE Band 30	10	16QAM	9030.07
LTE Band 30	10	64QAM	9035.33
LTE Band 7	5	QPSK	4546.80
LTE Band 7	5	16QAM	4539.40
LTE Band 7	5	64QAM	4536.40
LTE Band 7	10	QPSK	9061.70
LTE Band 7	10	16QAM	9055.80
LTE Band 7	10	64QAM	9041.70
LTE Band 7	15	QPSK	13578.00
LTE Band 7	15	16QAM	13545.00
LTE Band 7	15	64QAM	13583.00
LTE Band 7	20	QPSK	18093.00
LTE Band 7	20	16QAM	18046.00
LTE Band 7	20	64QAM	18053.00
LTE Band 41	5	QPSK	4546.50
LTE Band 41	5	16QAM	4557.60
LTE Band 41	5	64QAM	4526.70
LTE Band 41	10	QPSK	9057.70
LTE Band 41	10	16QAM	9063.50
LTE Band 41	10	64QAM	9043.40
LTE Band 41	15	QPSK	13604.00
LTE Band 41	15	16QAM	13619.00
LTE Band 41	15	64QAM	13586.00
LTE Band 41	20	QPSK	18103.00
LTE Band 41	20	16QAM	18126.00
LTE Band 41	20	64QAM	18070.00

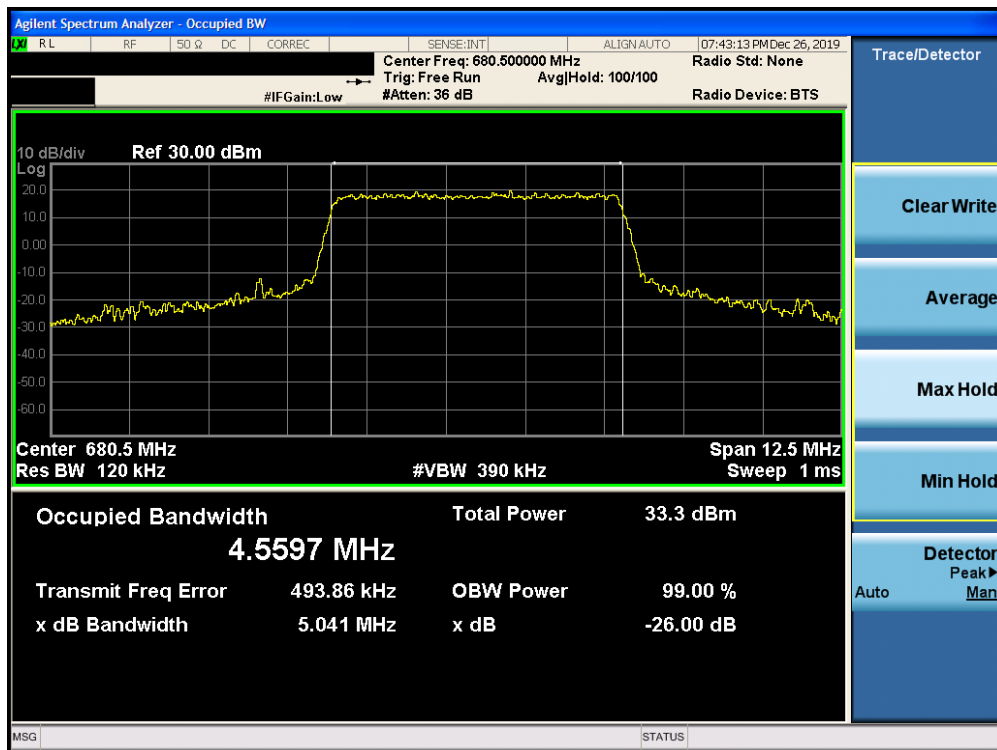
Table 7-5. Occupied Band Width Results (High Bands)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 22 of 423

Band 71

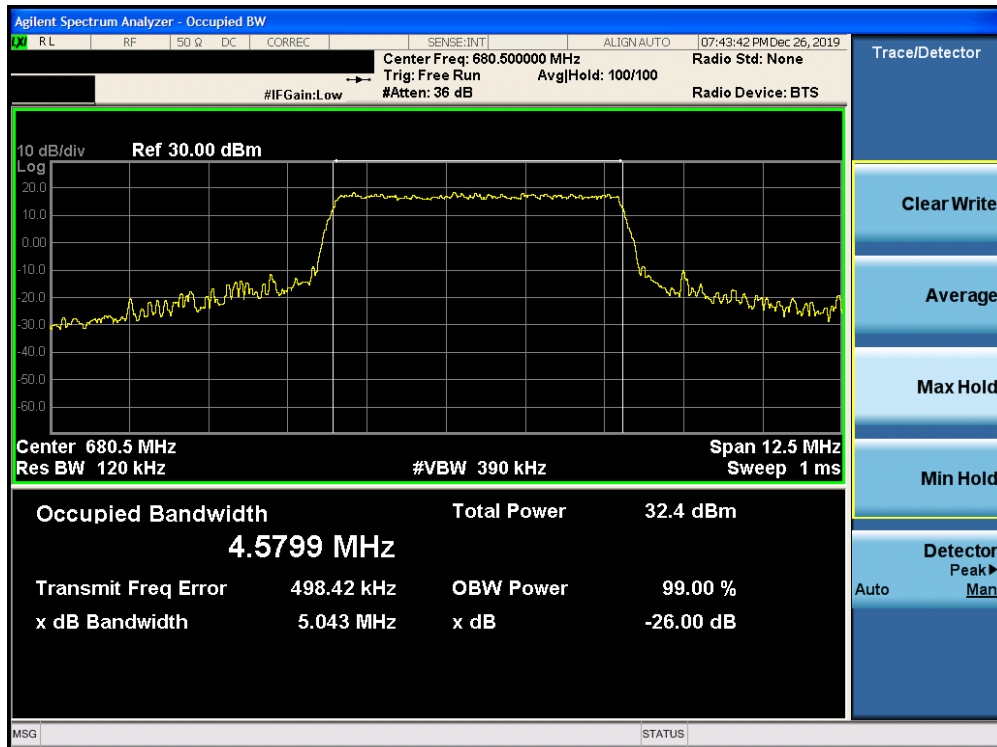


Plot 7-1. Occupied Bandwidth Plot (Band 71 – 5.0MHz QPSK – RB Size 25)

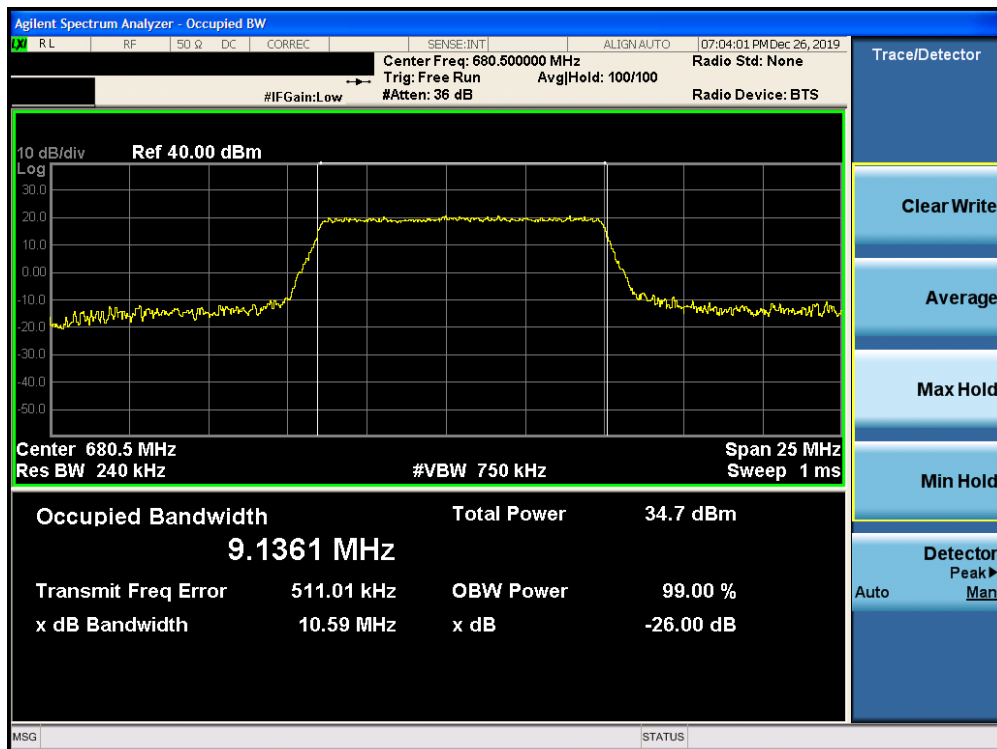


Plot 7-2. Occupied Bandwidth Plot (Band 71 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 23 of 423

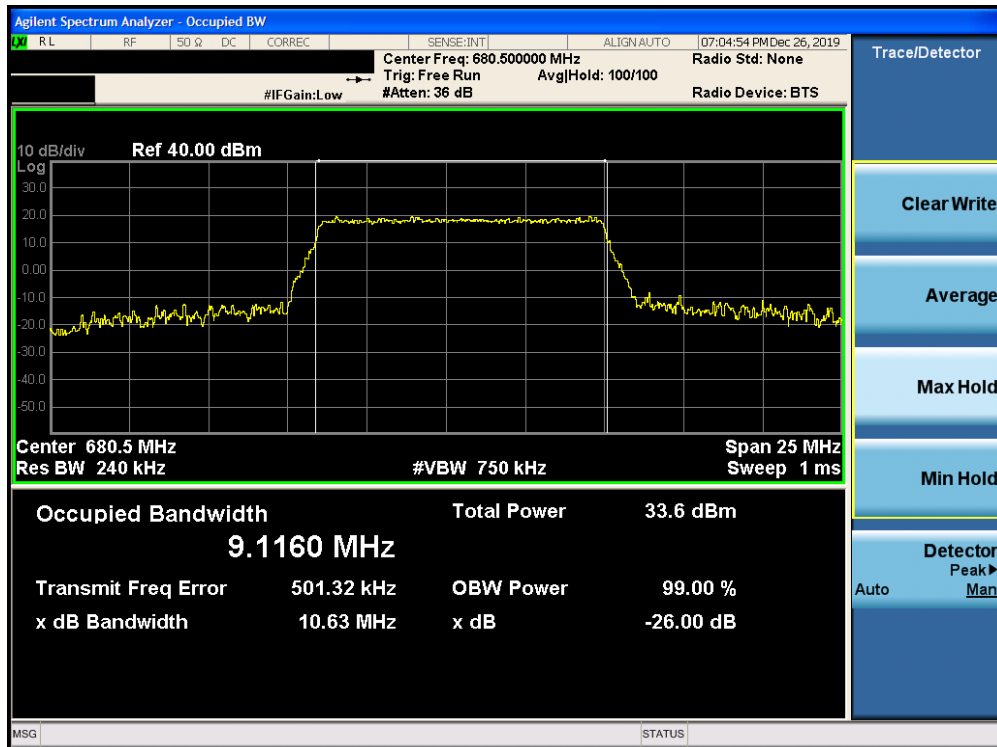


Plot 7-3. Occupied Bandwidth Plot (Band 71 – 5.0MHz 64-QAM – RB Size 25)

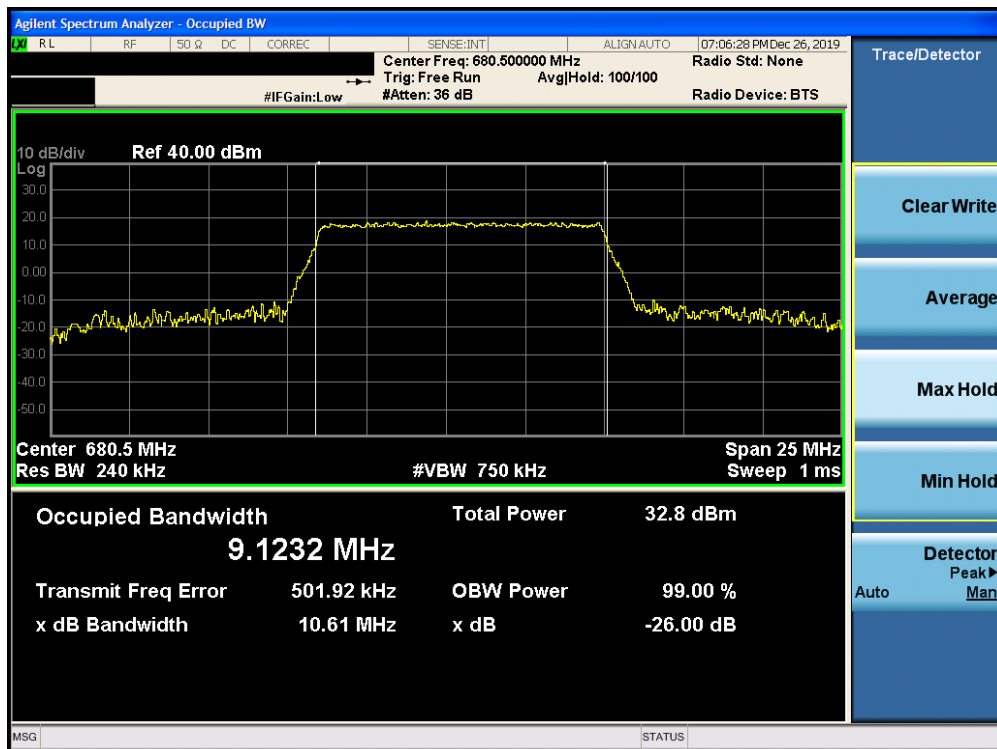


Plot 7-4. Occupied Bandwidth Plot (Band 71 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 24 of 423

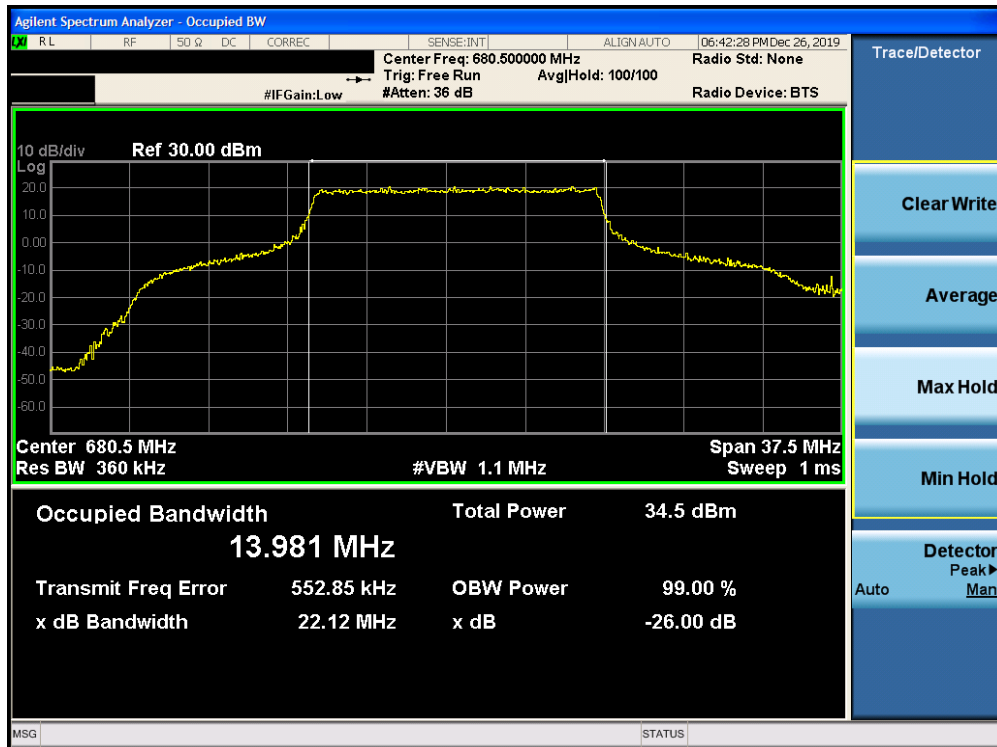


Plot 7-5. Occupied Bandwidth Plot (Band 71 – 10.0MHz 16-QAM – RB Size 50)

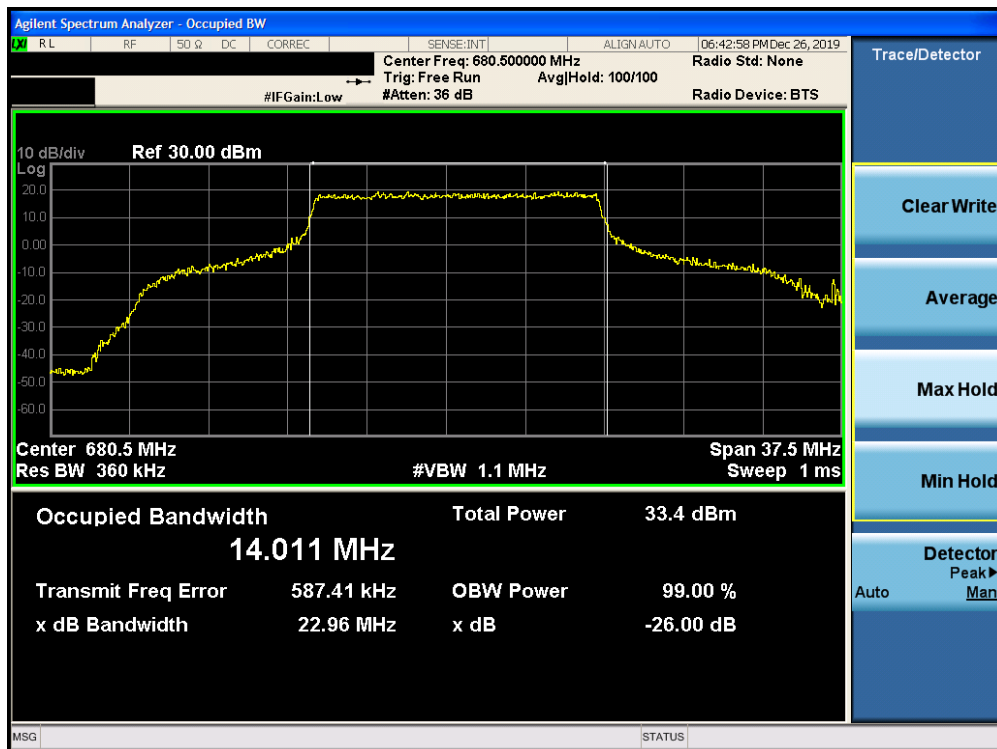


Plot 7-6. Occupied Bandwidth Plot (Band 71 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 25 of 423

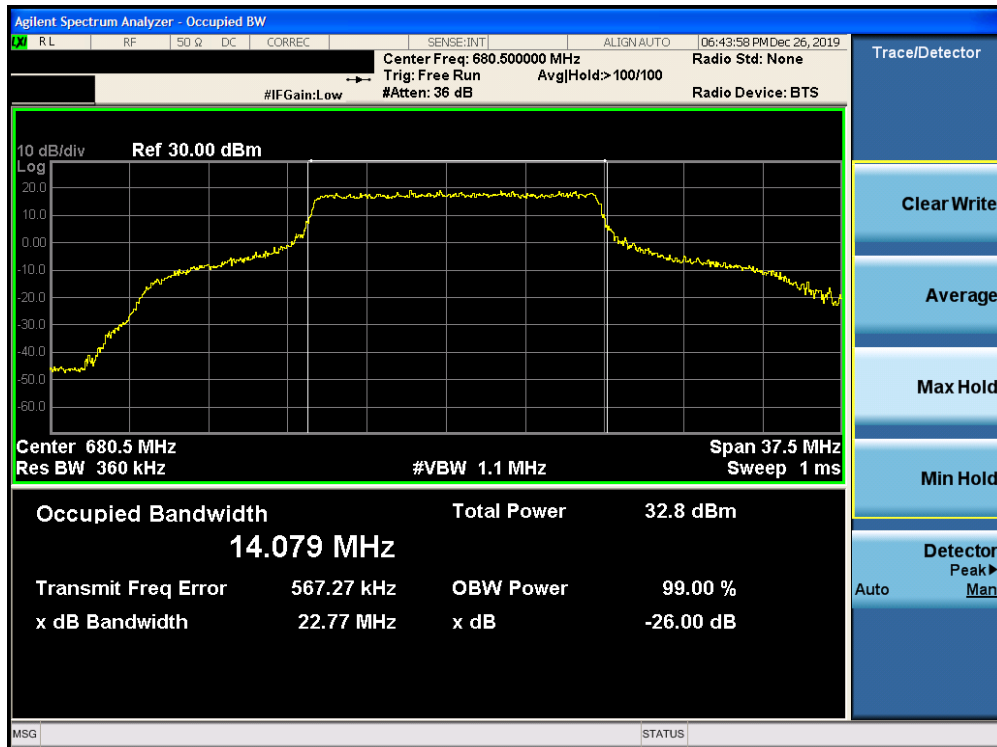


Plot 7-7. Occupied Bandwidth Plot (Band 71 – 15.0MHz QPSK – RB Size 75)

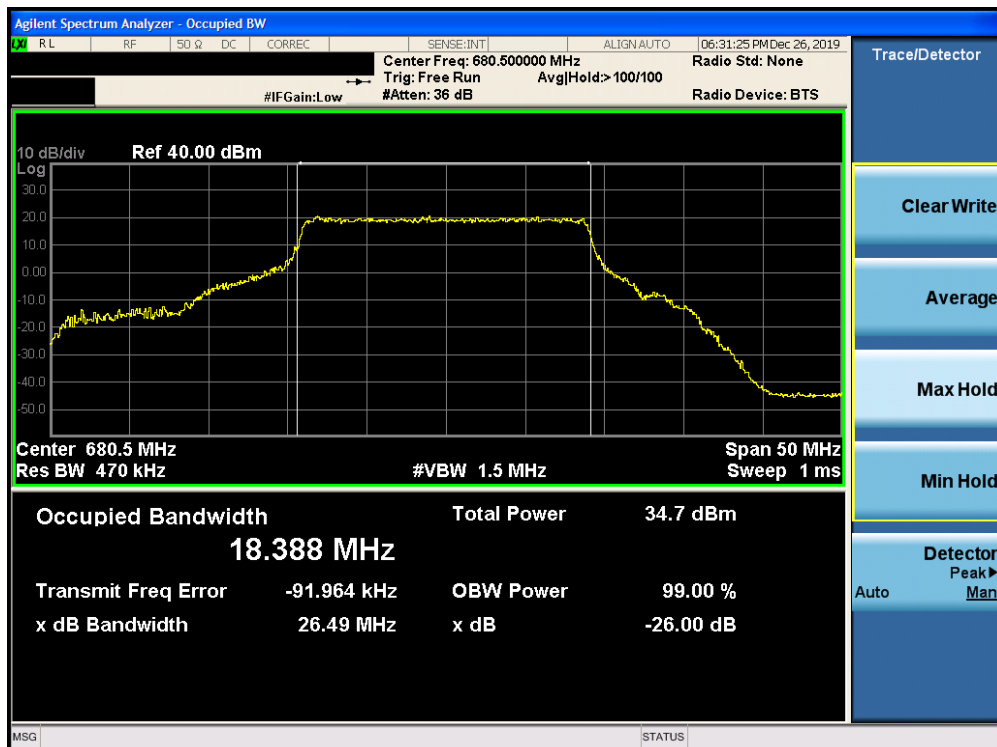


Plot 7-8. Occupied Bandwidth Plot (Band 71 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 26 of 423

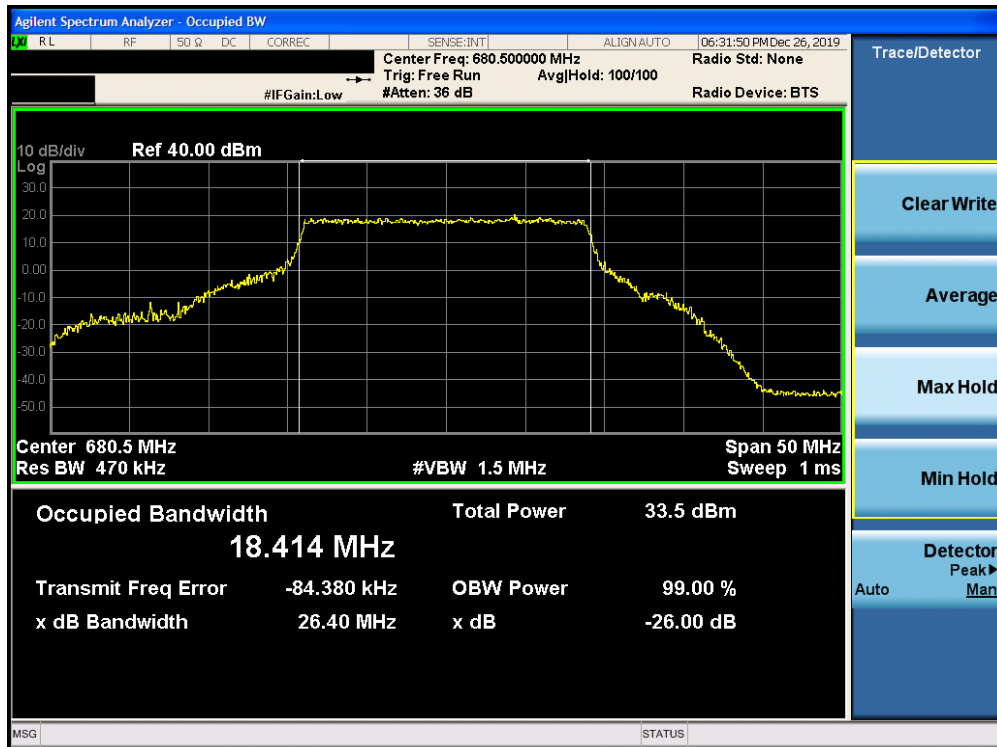


Plot 7-9. Occupied Bandwidth Plot (Band 71 – 15.0MHz 64-QAM – RB Size 75)

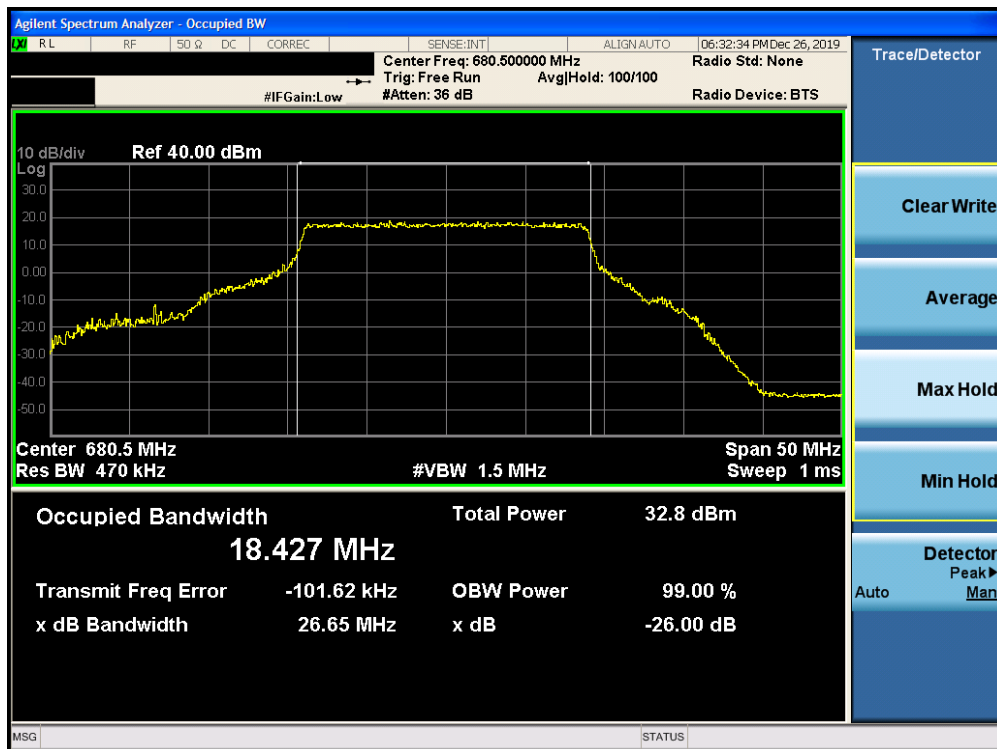


Plot 7-10. Occupied Bandwidth Plot (Band 71 – 20.0MHz QPSK – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 27 of 423

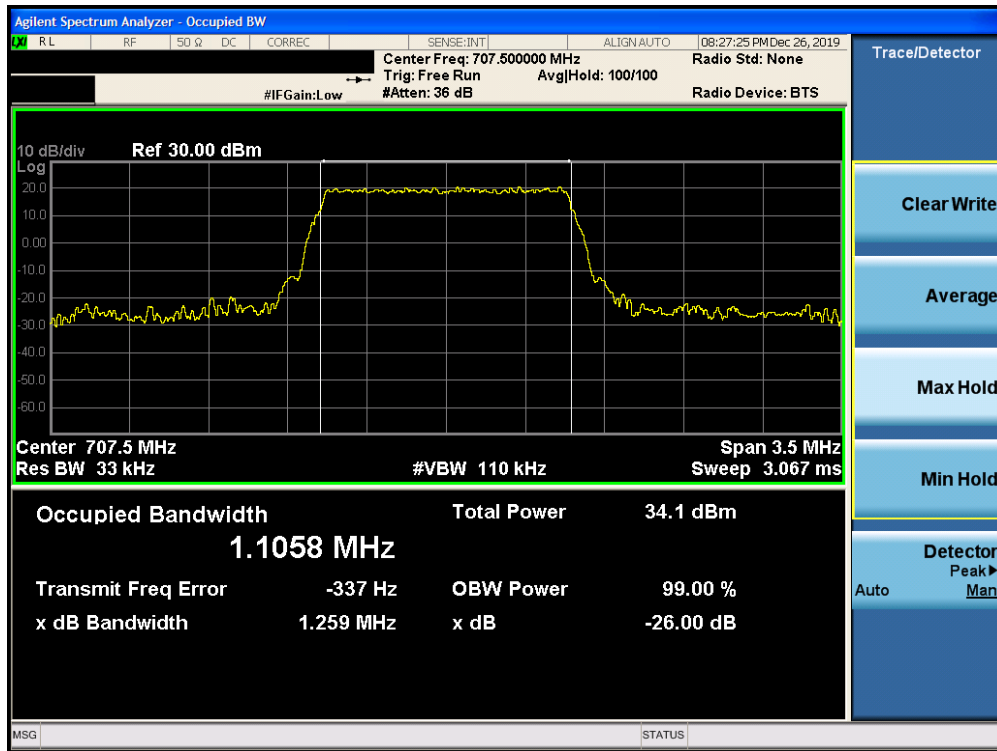


Plot 7-11. Occupied Bandwidth Plot (Band 71 – 20.0MHz 16-QAM – RB Size 100)

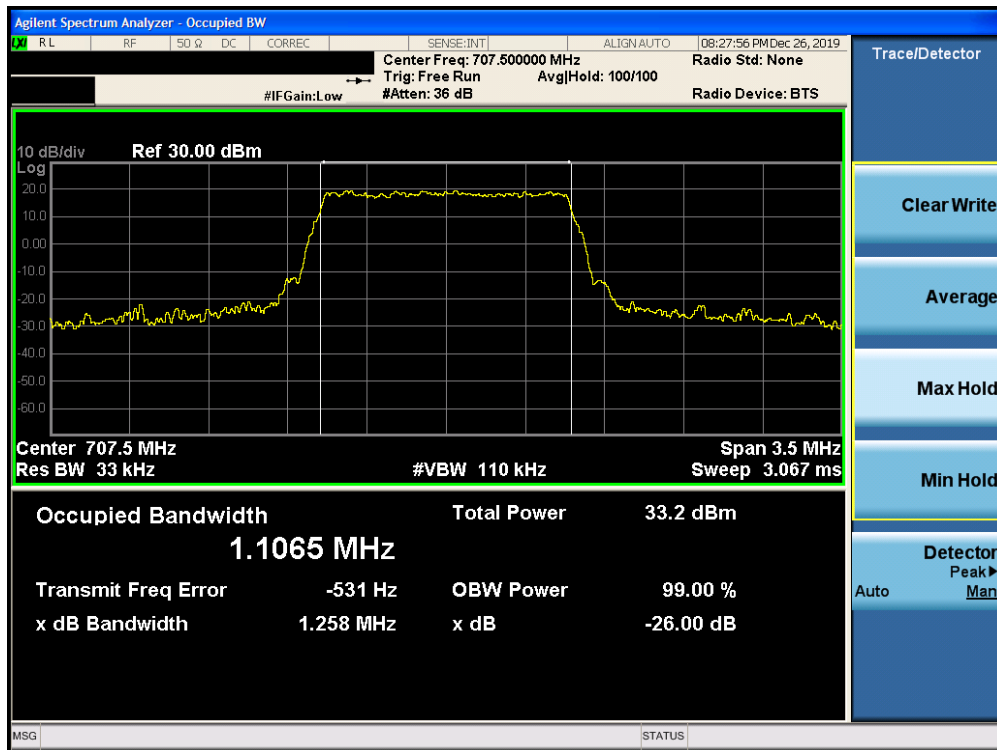


Plot 7-12. Occupied Bandwidth Plot (Band 71 – 20.0MHz 64-QAM – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 28 of 423

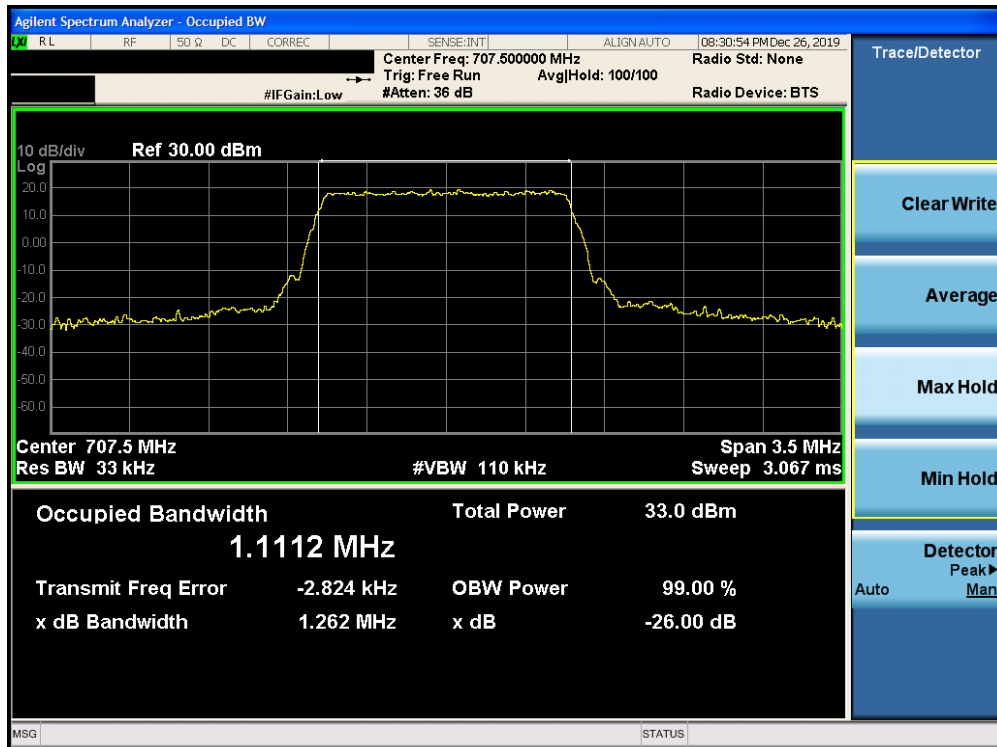


Plot 7-13. Occupied Bandwidth Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

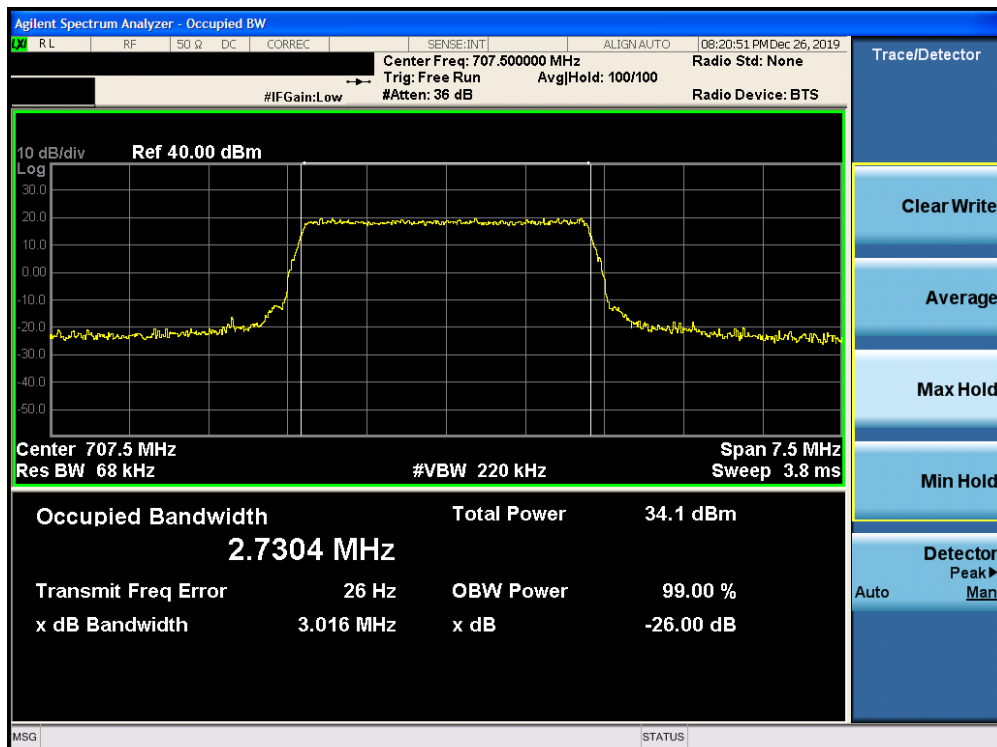


Plot 7-14. Occupied Bandwidth Plot (Band 12 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 29 of 423

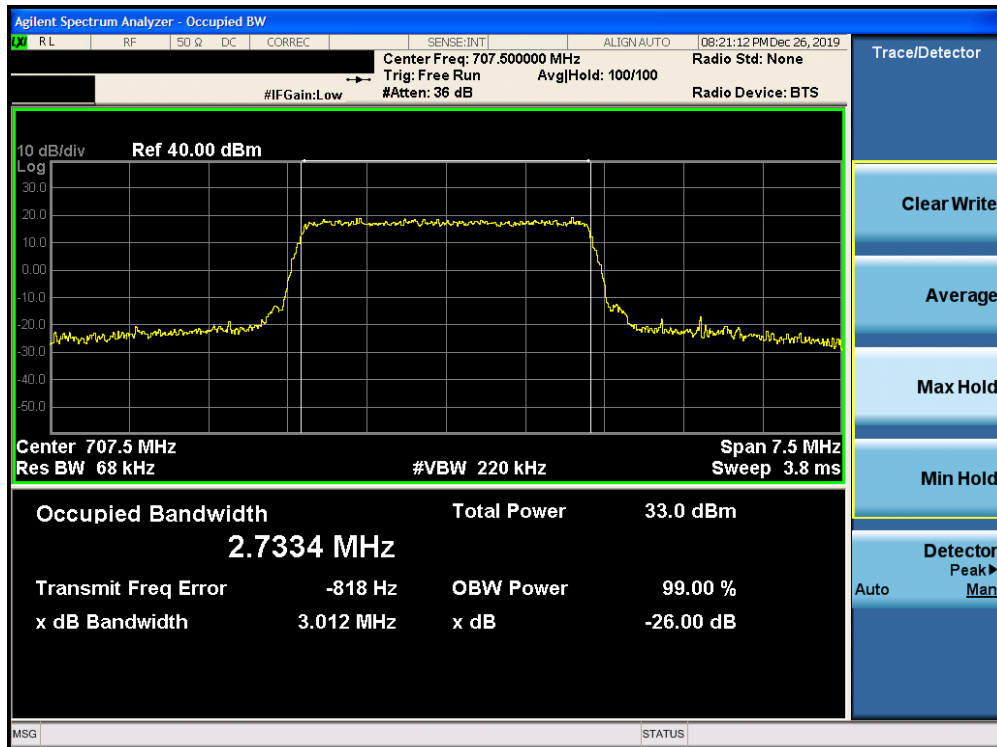


Plot 7-15. Occupied Bandwidth Plot (Band 12 – 1.4MHz 64-QAM – RB Size 6)

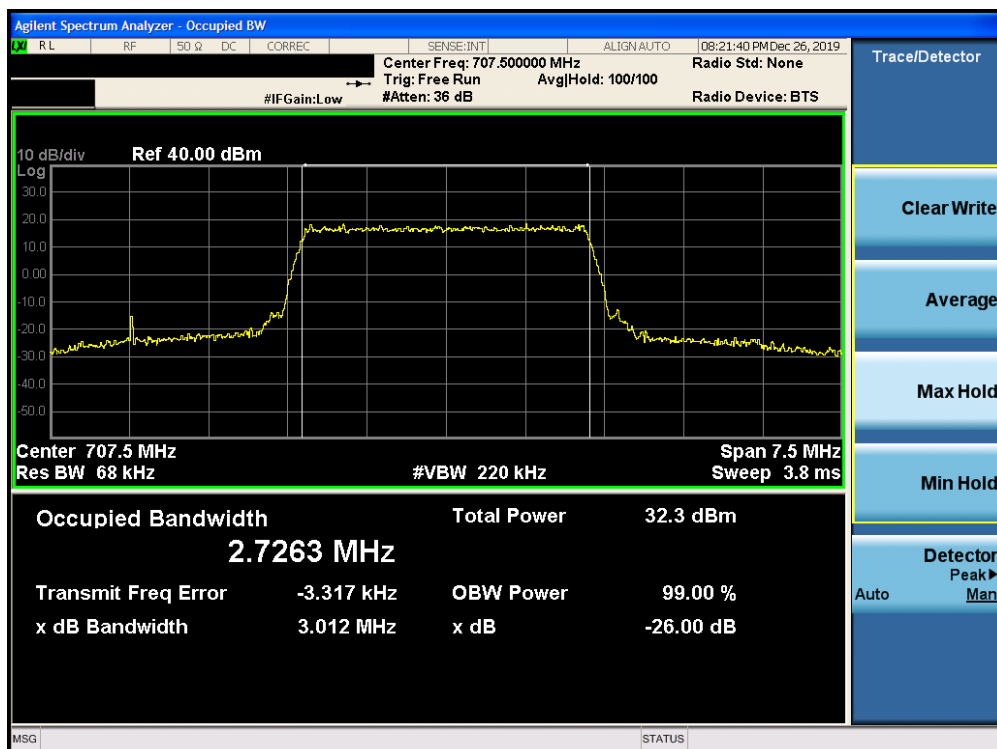


Plot 7-16. Occupied Bandwidth Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 30 of 423

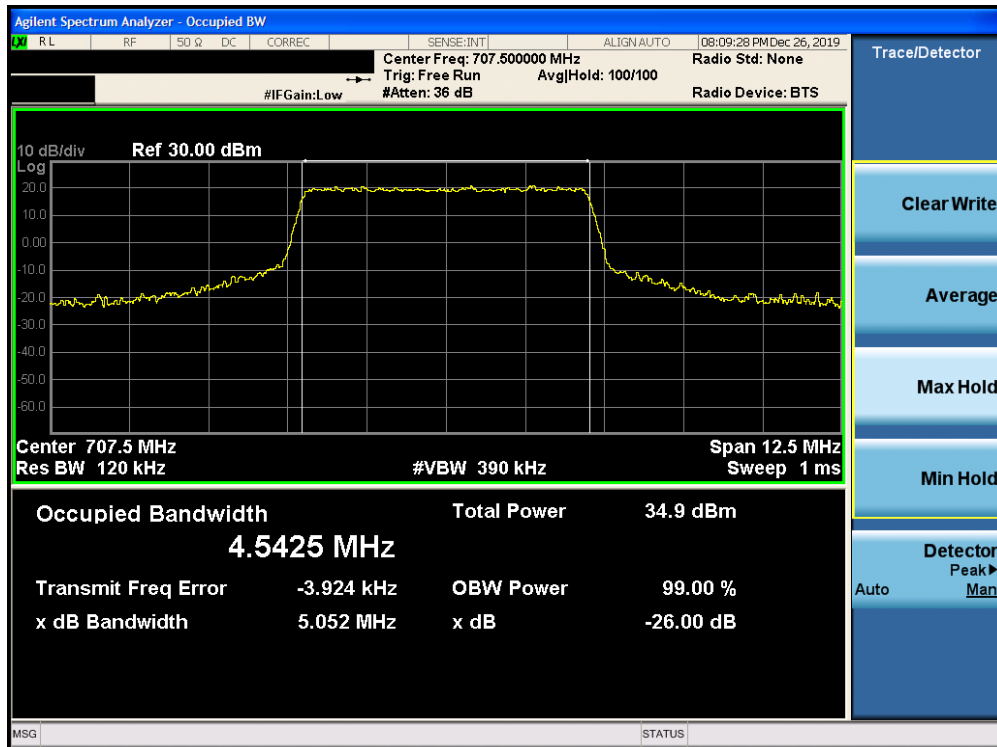


Plot 7-17. Occupied Bandwidth Plot (Band 12 – 3.0MHz 16-QAM – RB Size 15)

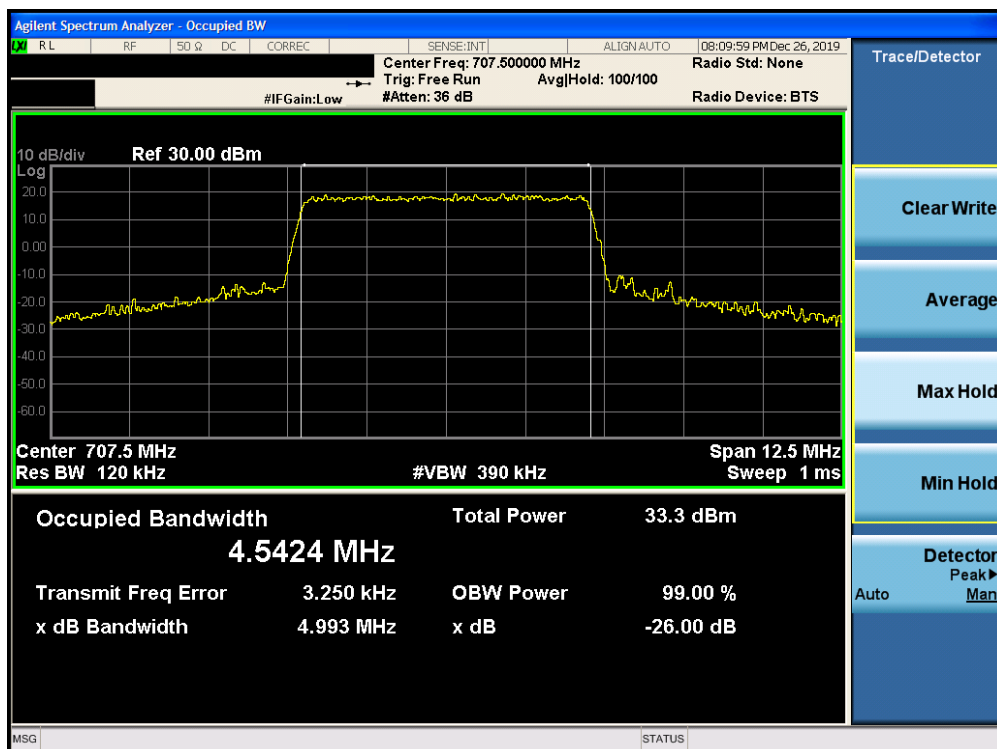


Plot 7-18. Occupied Bandwidth Plot (Band 12 – 3.0MHz 64-QAM – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 31 of 423

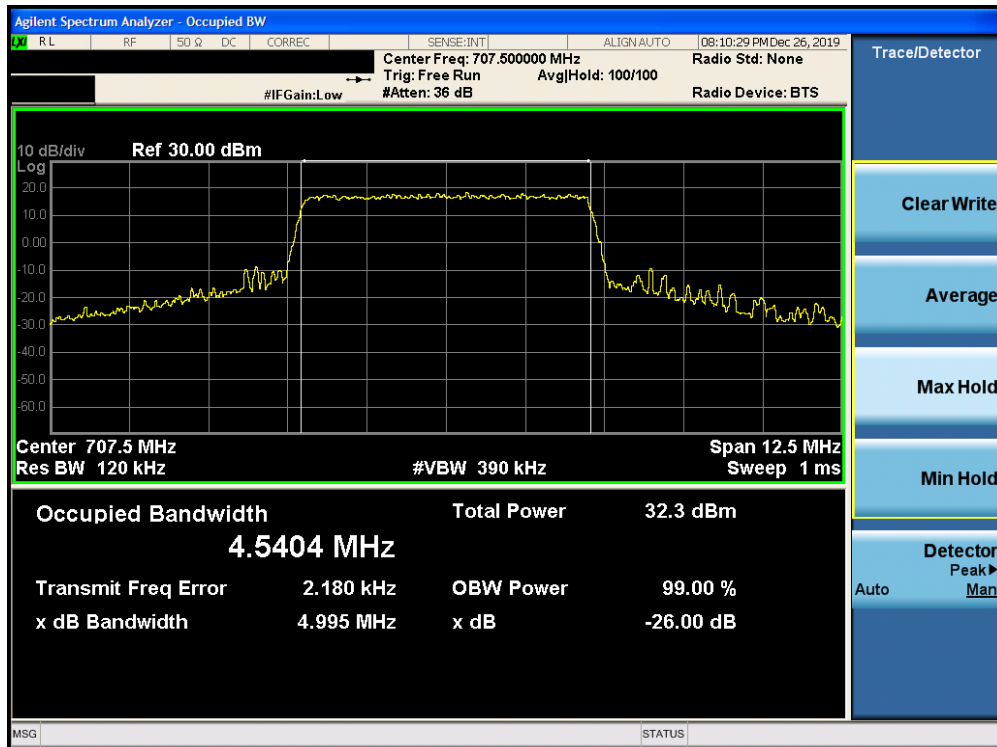


Plot 7-19. Occupied Bandwidth Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

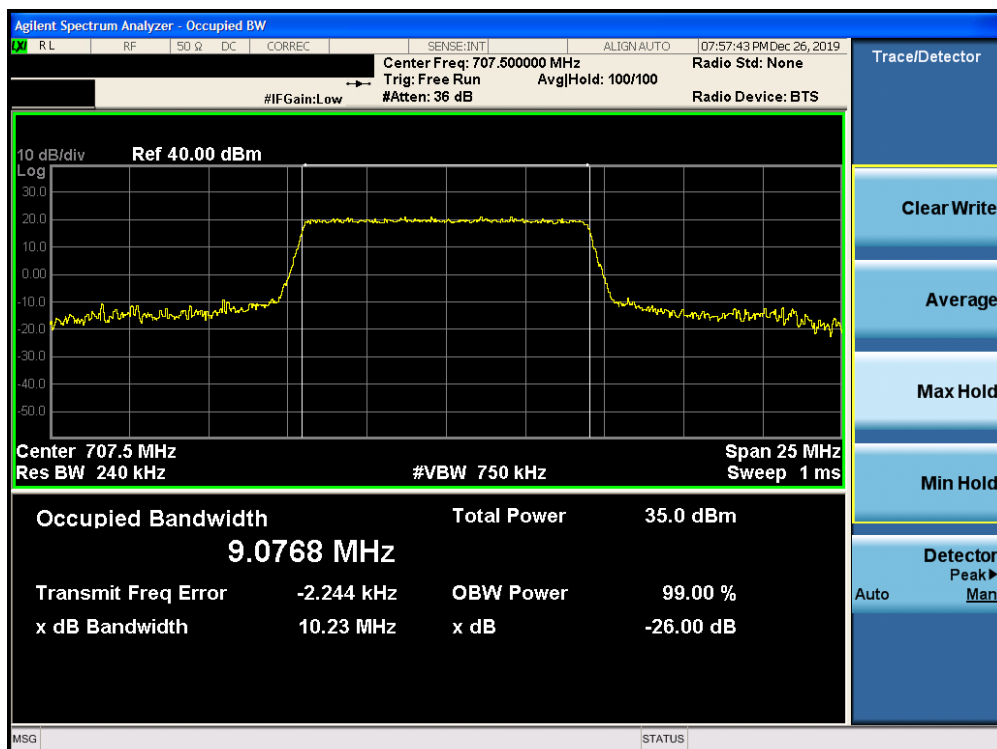


Plot 7-20. Occupied Bandwidth Plot (Band 12/17 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 32 of 423

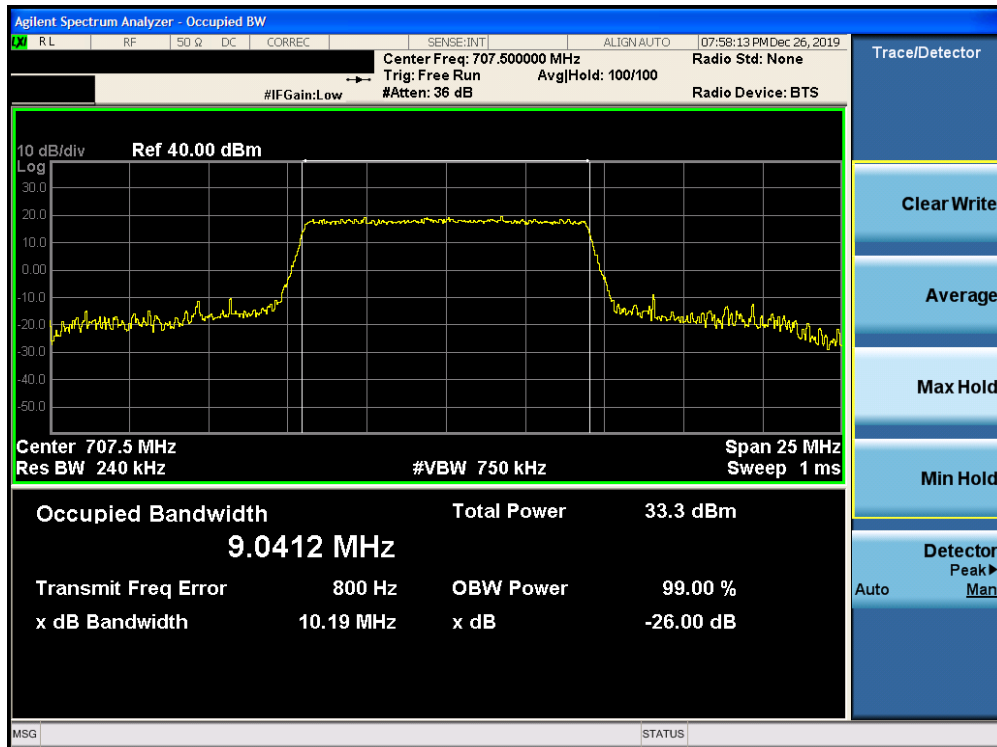


Plot 7-21. Occupied Bandwidth Plot (Band 12/17 – 5.0MHz 64-QAM – RB Size 25)

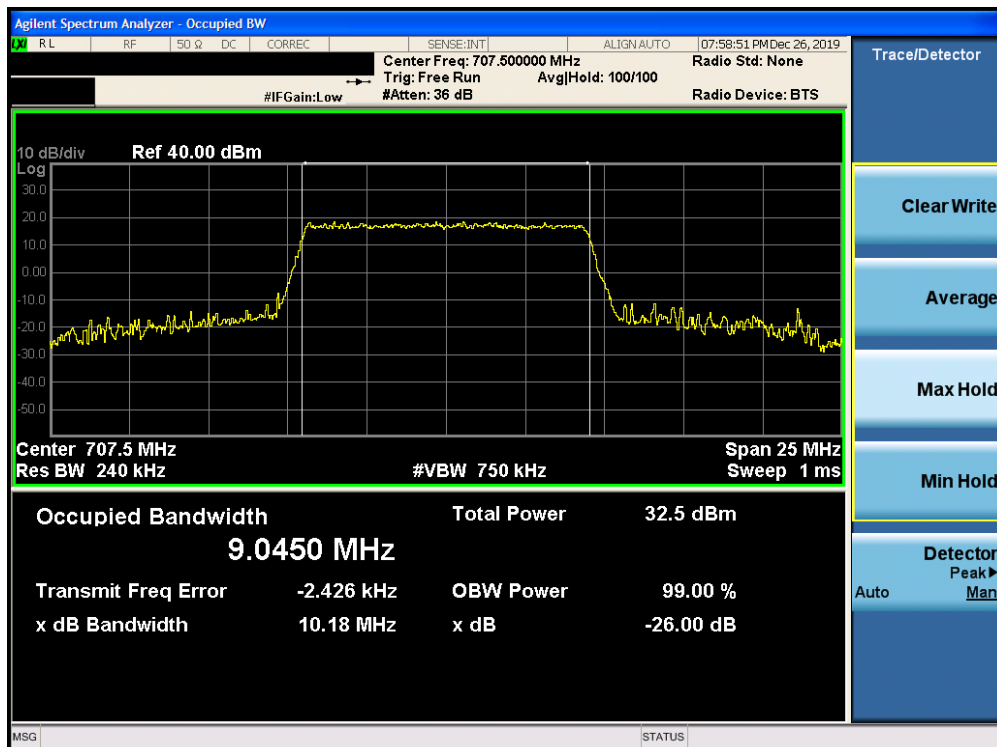


Plot 7-22. Occupied Bandwidth Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 33 of 423



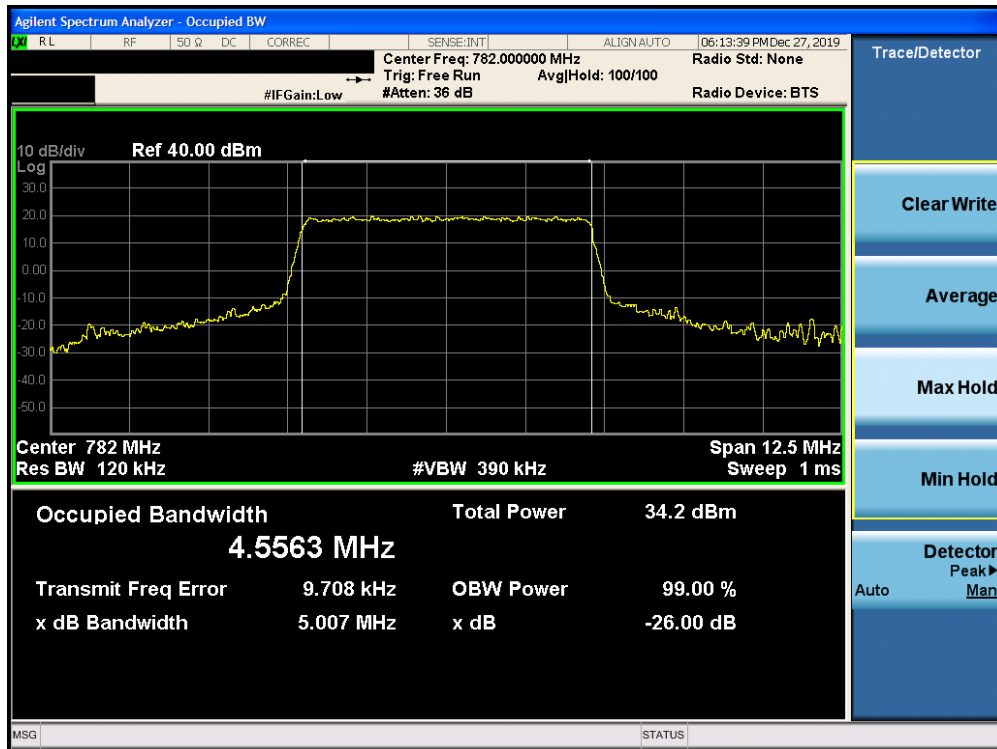
Plot 7-23. Occupied Bandwidth Plot (Band 12/17 – 10.0MHz 16-QAM – RB Size 50)



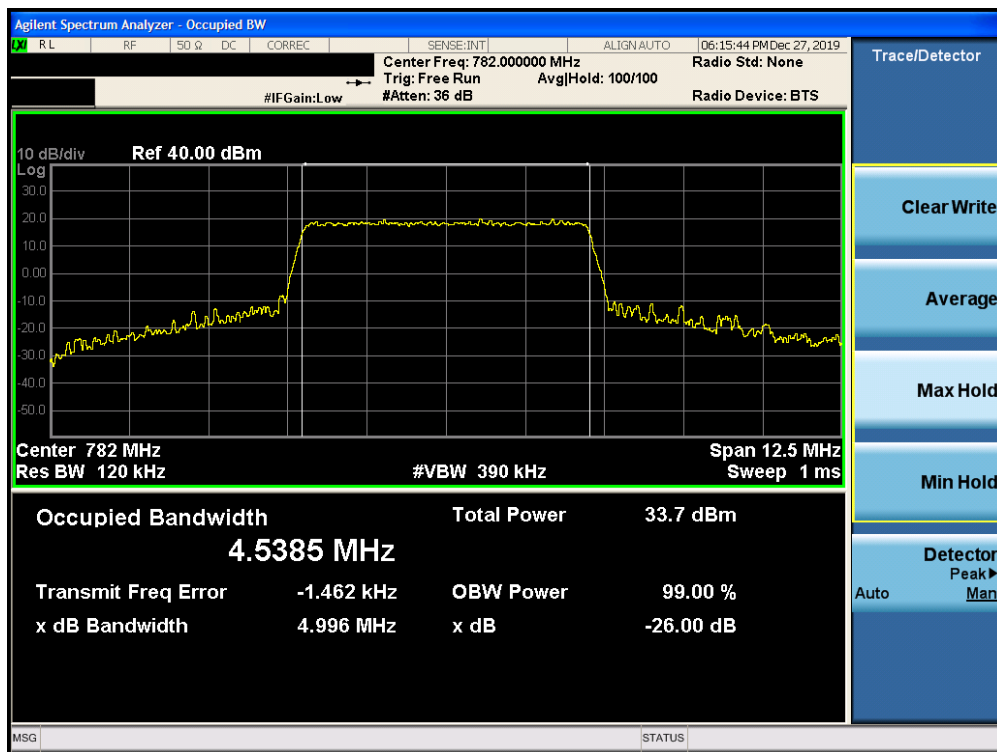
Plot 7-24. Occupied Bandwidth Plot (Band 12/17 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 34 of 423

Band 13

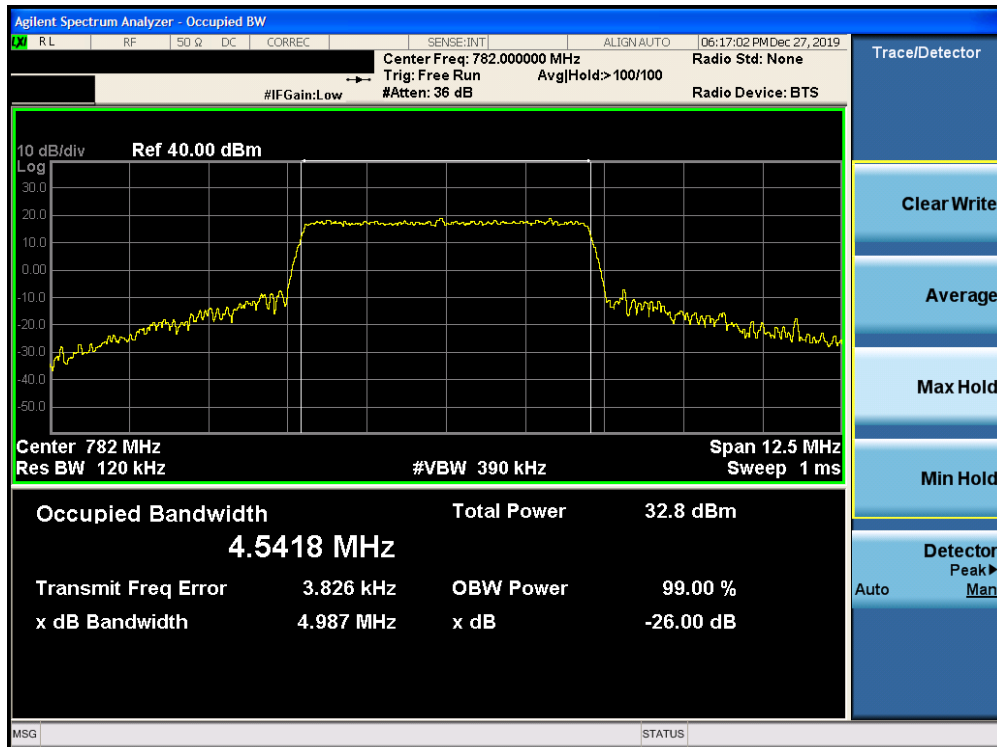


Plot 7-25. Occupied Bandwidth Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

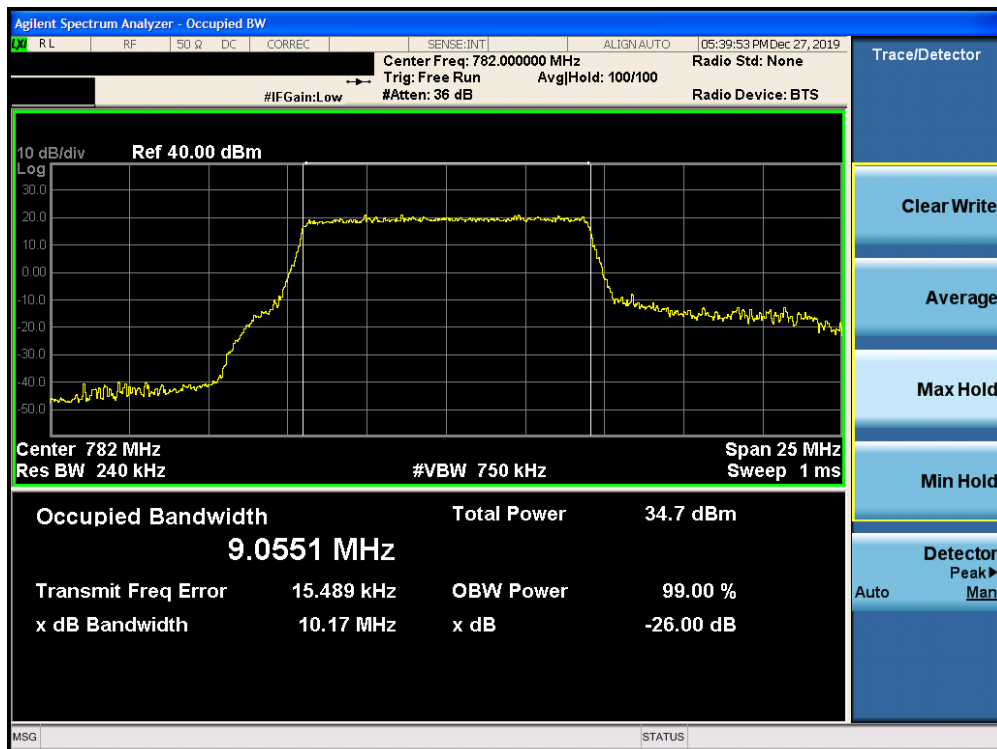


Plot 7-26. Occupied Bandwidth Plot (Band 13 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 35 of 423

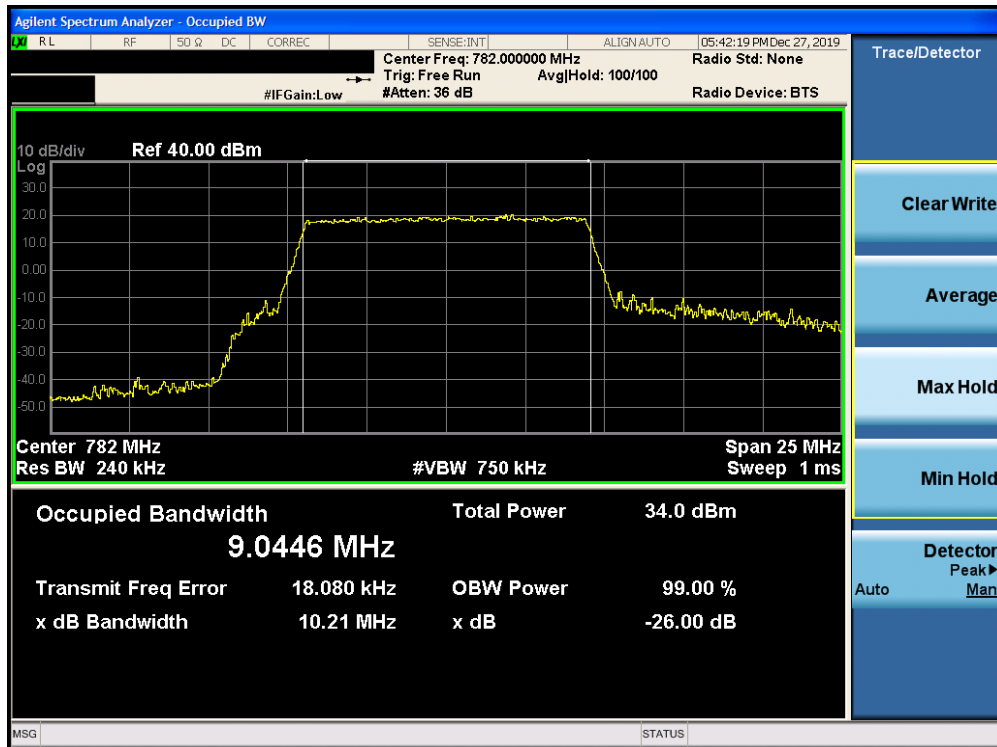


Plot 7-27. Occupied Bandwidth Plot (Band 13 – 5.0MHz 64-QAM – RB Size 25)

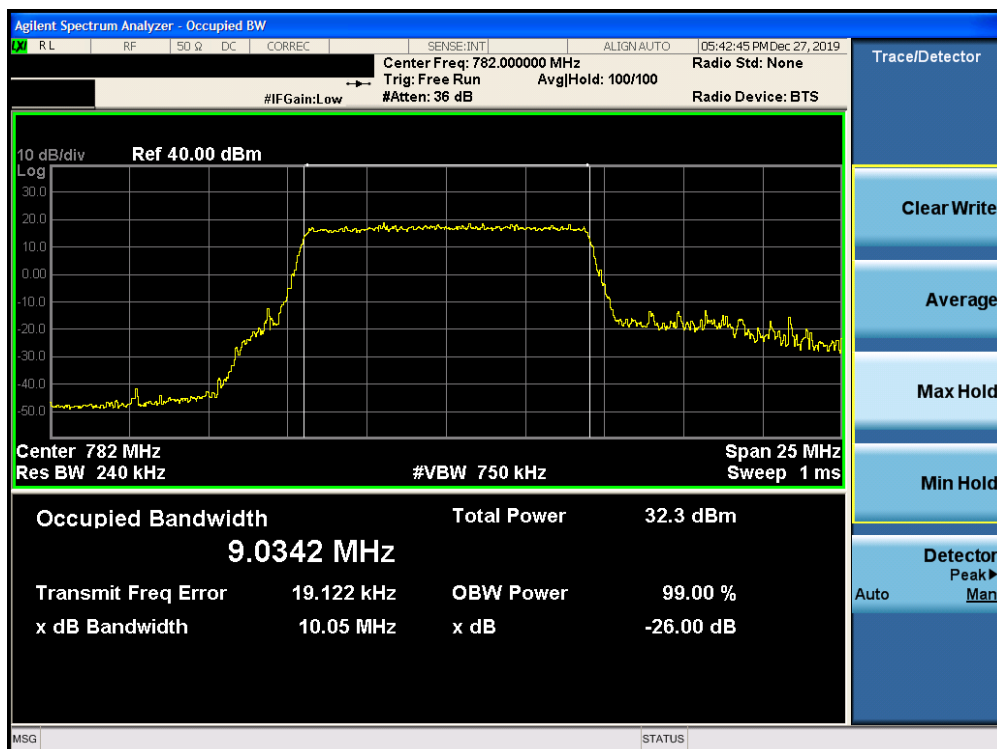


Plot 7-28. Occupied Bandwidth Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 36 of 423

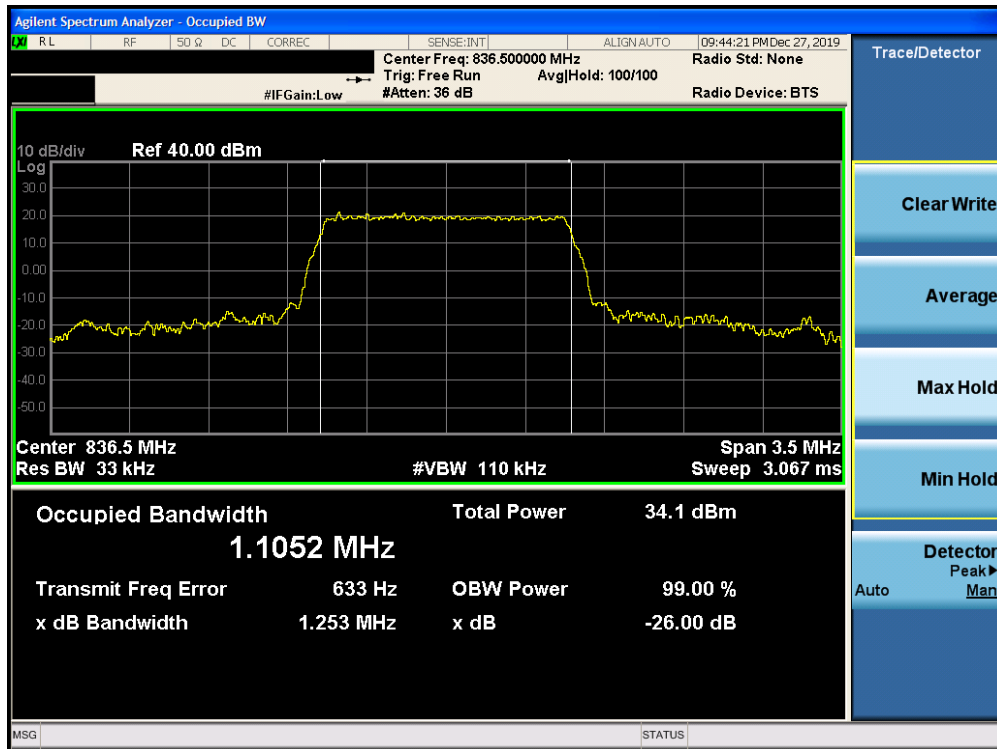


Plot 7-29. Occupied Bandwidth Plot (Band 13 – 10.0MHz 16-QAM – RB Size 50)

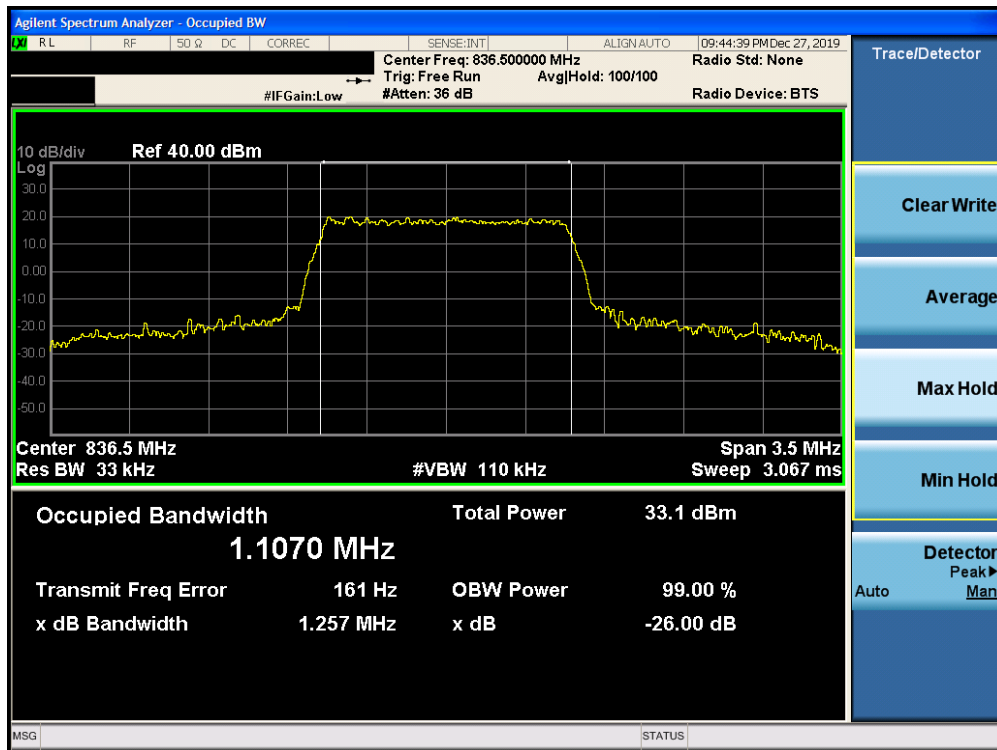


Plot 7-30. Occupied Bandwidth Plot (Band 13 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 37 of 423

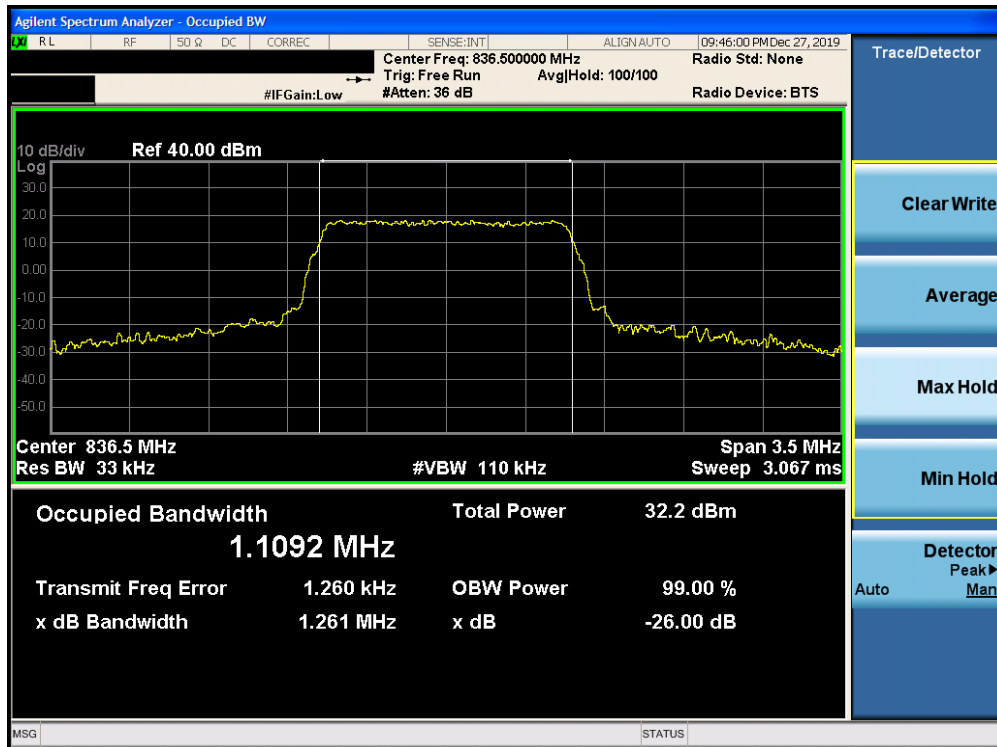


Plot 7-31. Occupied Bandwidth Plot (Band 26/5 – 1.4MHz QPSK – RB Size 6)

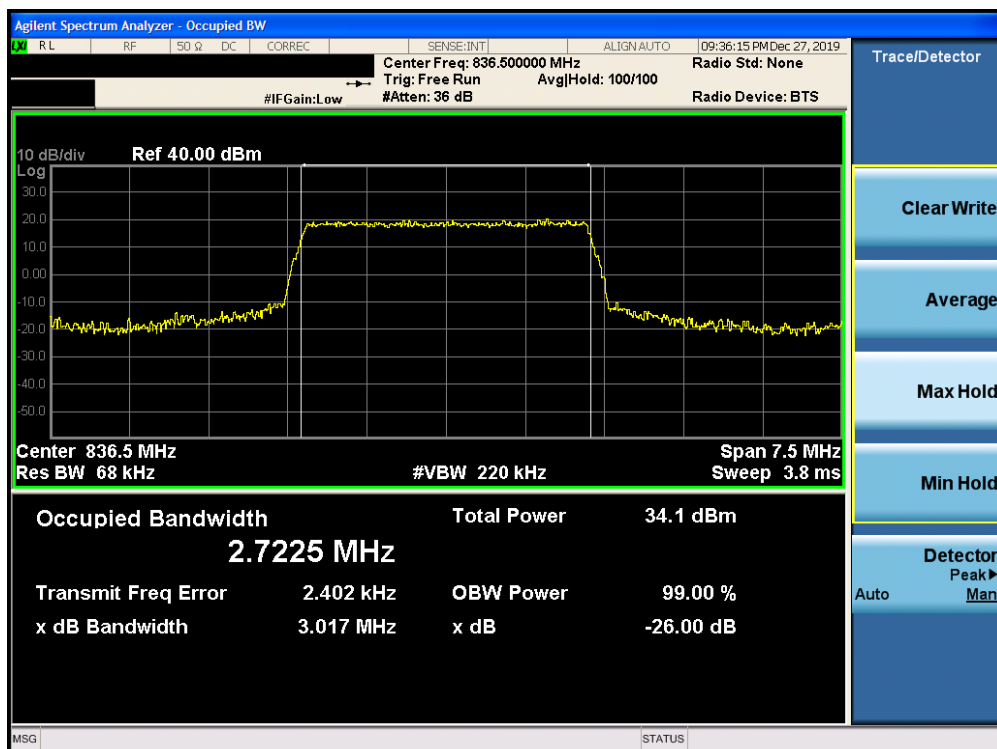


Plot 7-32. Occupied Bandwidth Plot (Band 26/5 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 38 of 423

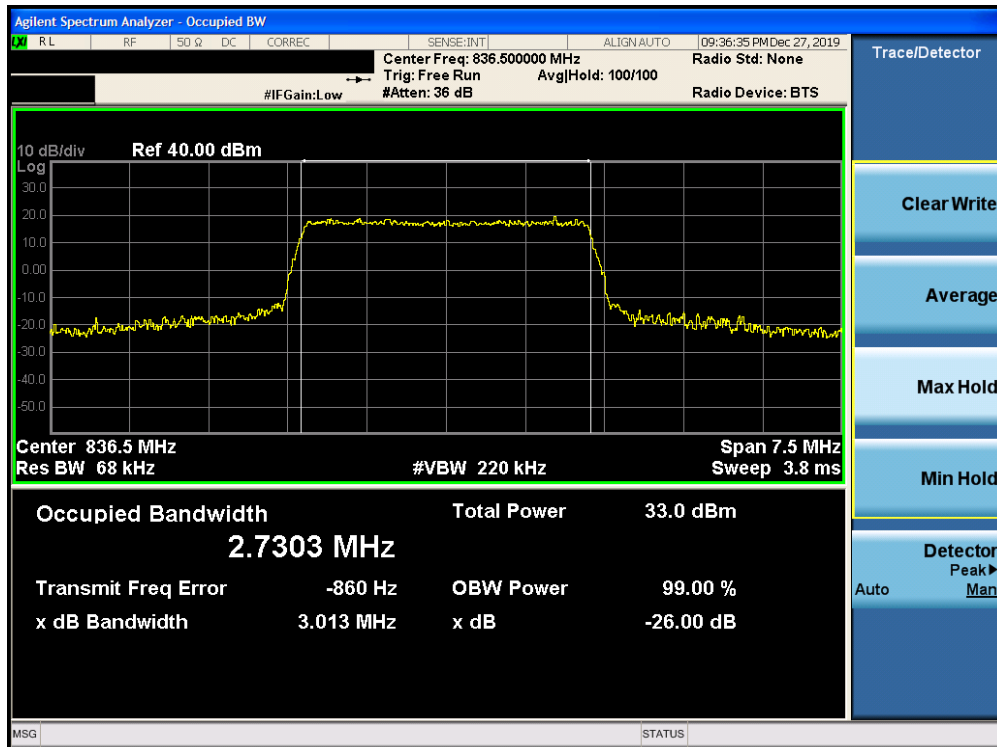


Plot 7-33. Occupied Bandwidth Plot (Band 26/5 – 1.4MHz 64-QAM – RB Size 6)

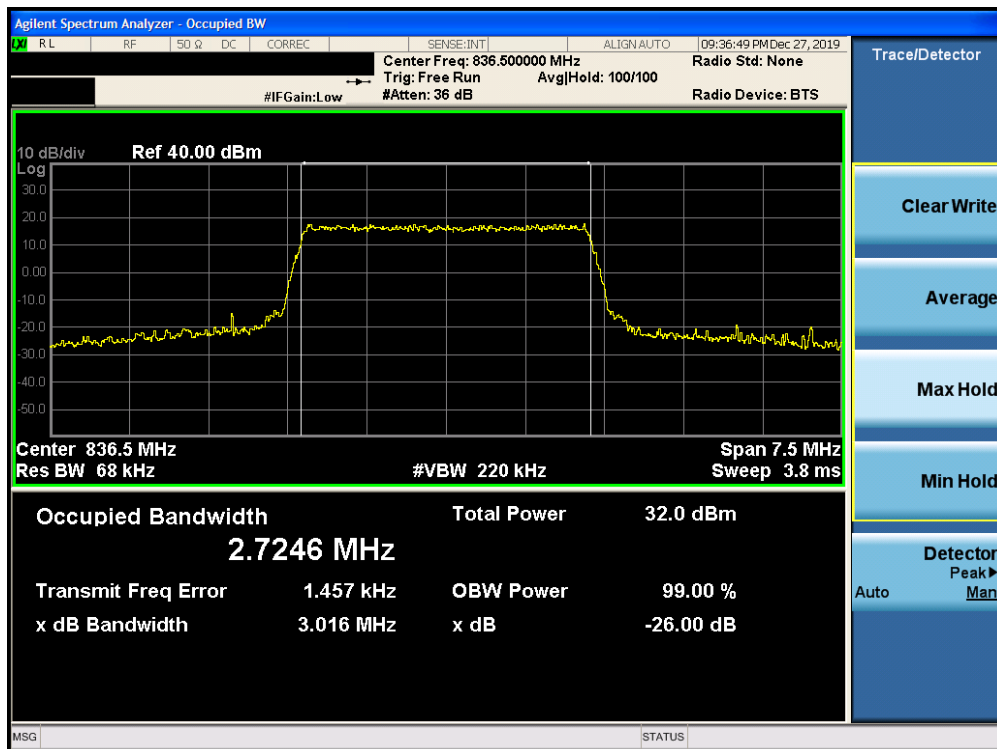


Plot 7-34. Occupied Bandwidth Plot (Band 26/5 – 3.0MHz QPSK – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 39 of 423

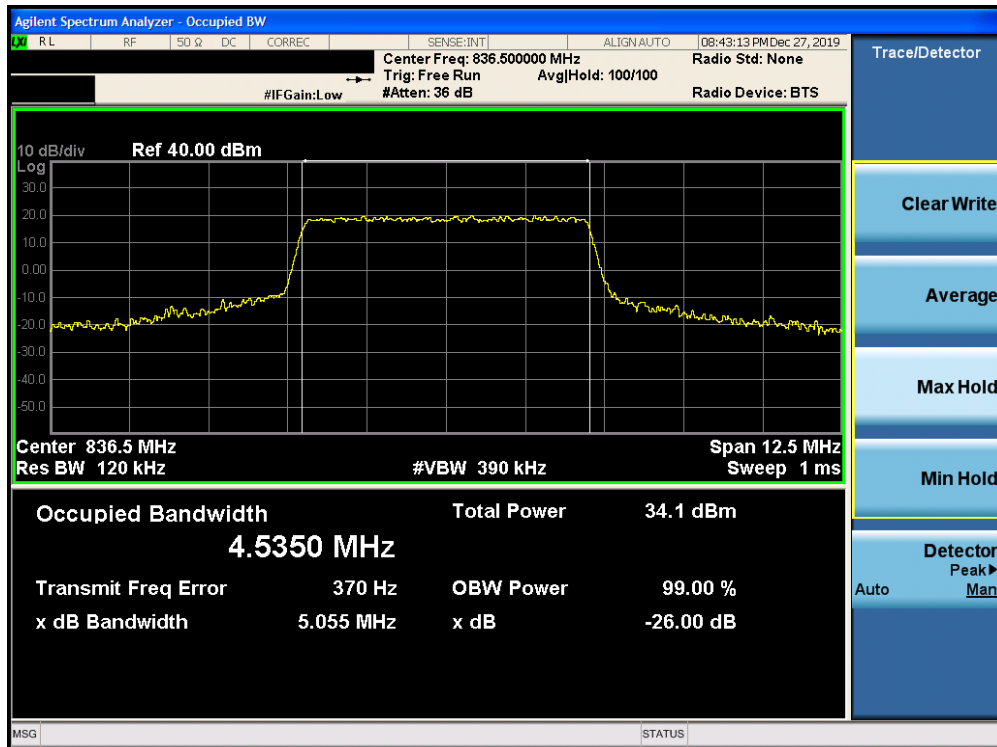


Plot 7-35. Occupied Bandwidth Plot (Band 26/5 – 3.0MHz 16-QAM – RB Size 15)



Plot 7-36. Occupied Bandwidth Plot (Band 26/5 – 3.0MHz 64-QAM – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 40 of 423

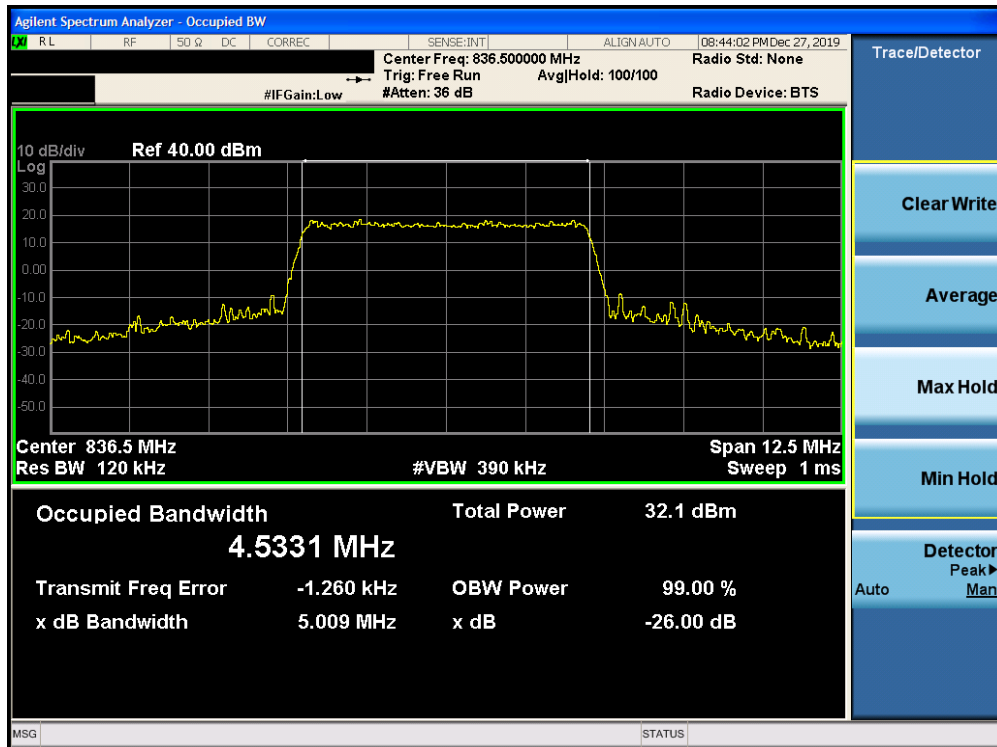


Plot 7-37. Occupied Bandwidth Plot (Band 26/5 – 5.0MHz QPSK – RB Size 25)

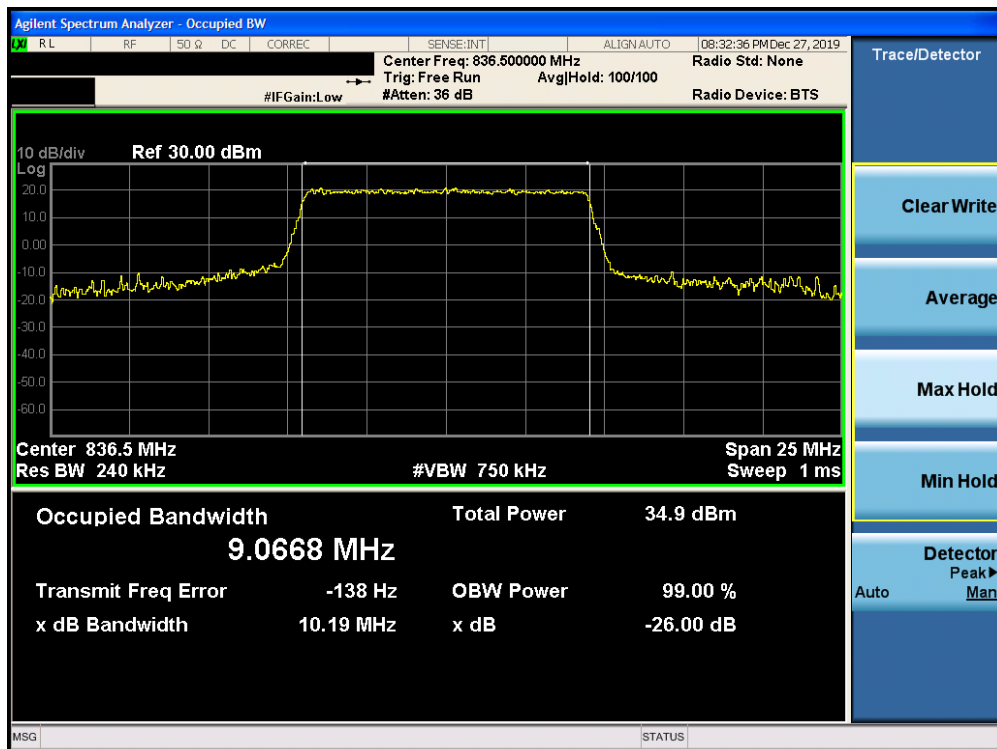


Plot 7-38. Occupied Bandwidth Plot (Band 26/5 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 41 of 423

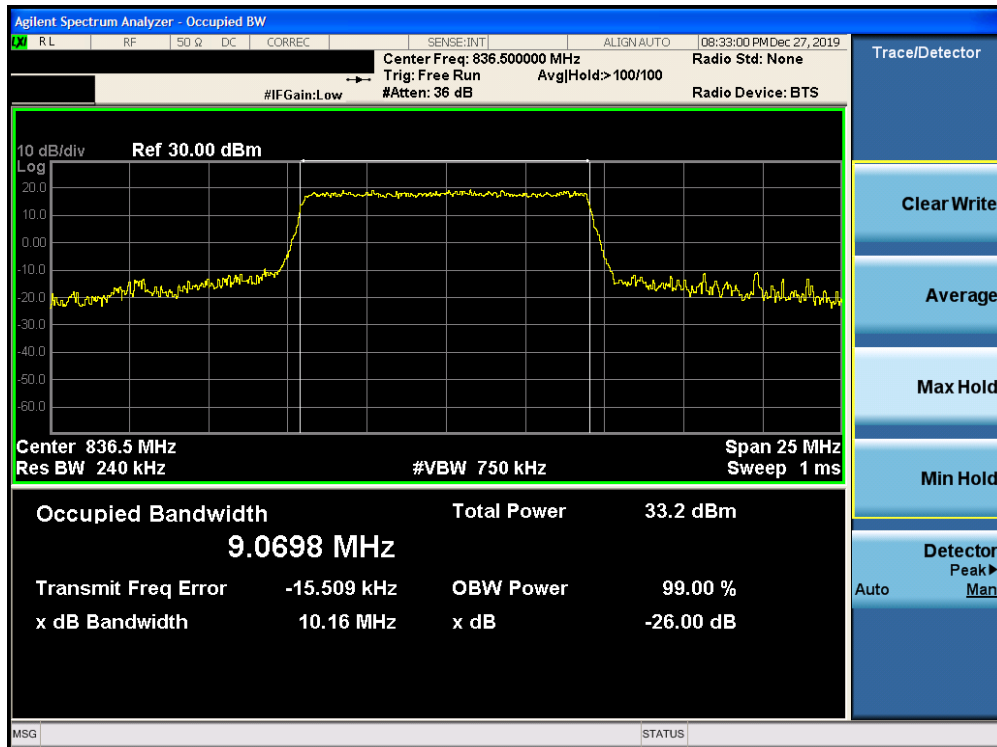


Plot 7-39. Occupied Bandwidth Plot (Band 26/5 – 5.0MHz 64-QAM – RB Size 25)

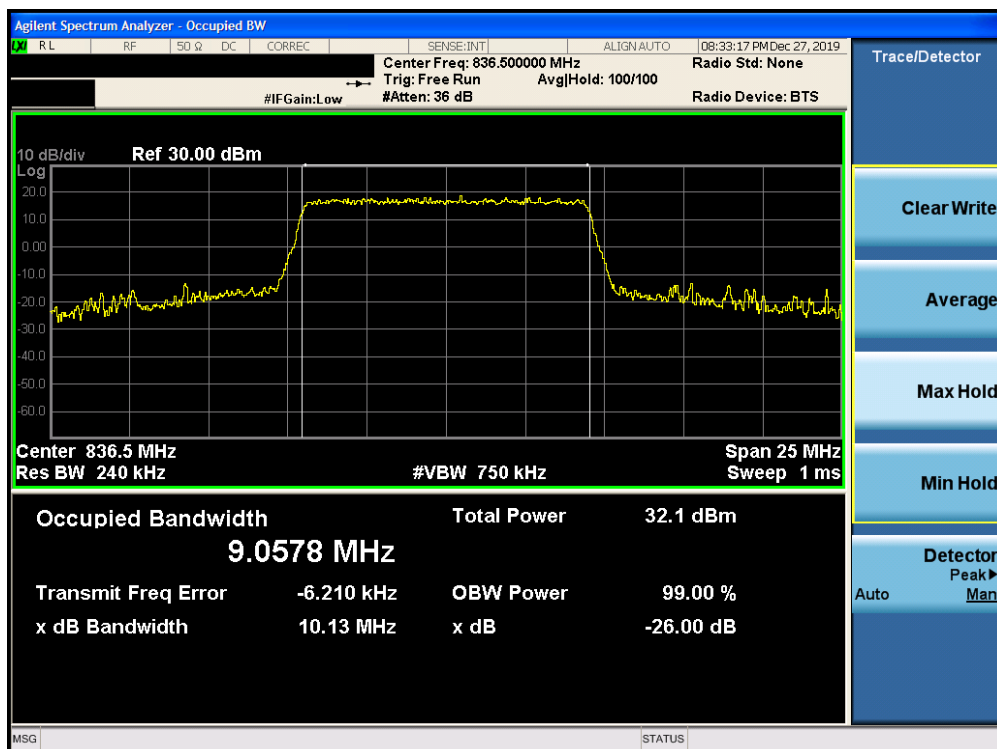


Plot 7-40. Occupied Bandwidth Plot (Band 26/5 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 42 of 423

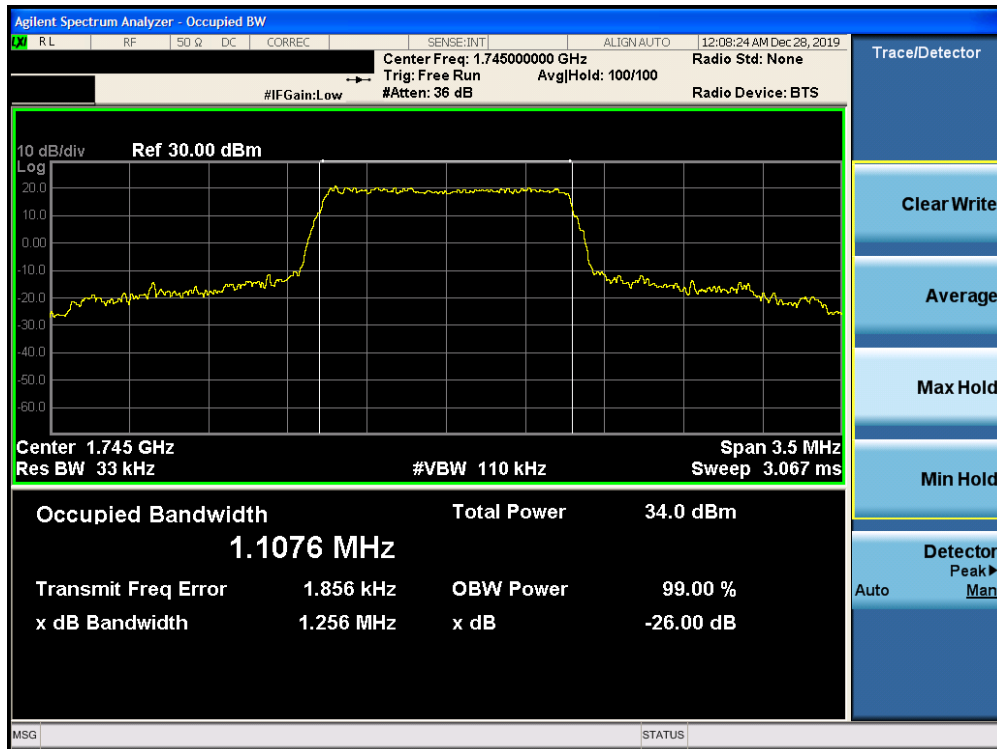


Plot 7-41. Occupied Bandwidth Plot (Band 26/5 – 10.0MHz 16-QAM – RB Size 50)

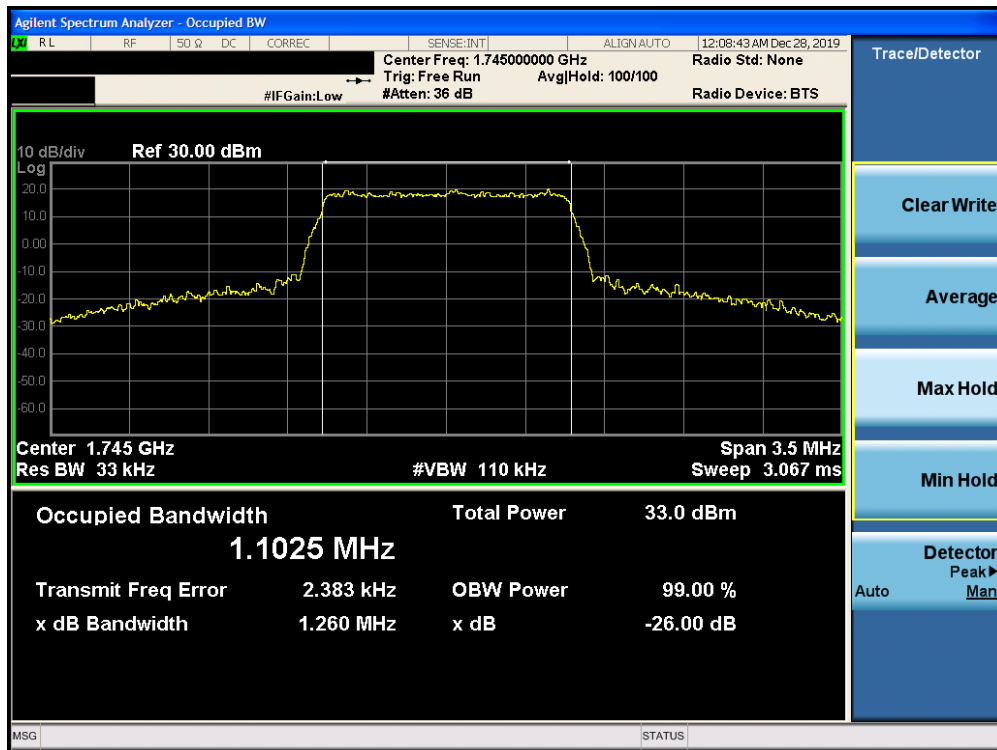


Plot 7-42. Occupied Bandwidth Plot (Band 26/5 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 43 of 423

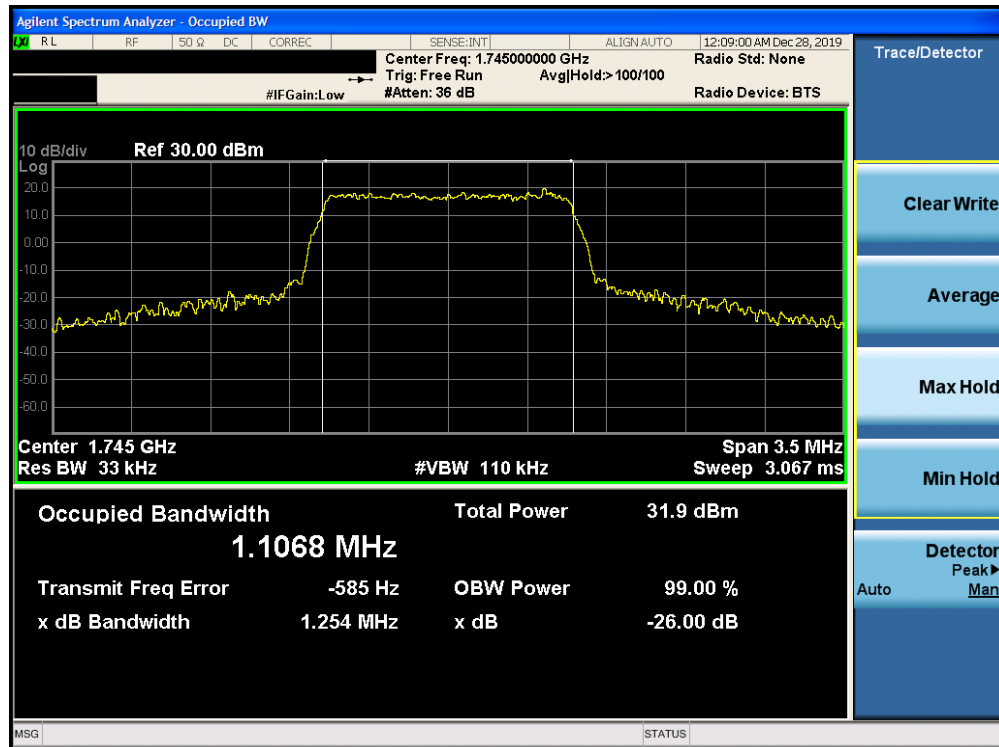


Plot 7-43. Occupied Bandwidth Plot (Band 66/4 – 1.4MHz QPSK – RB Size 6)

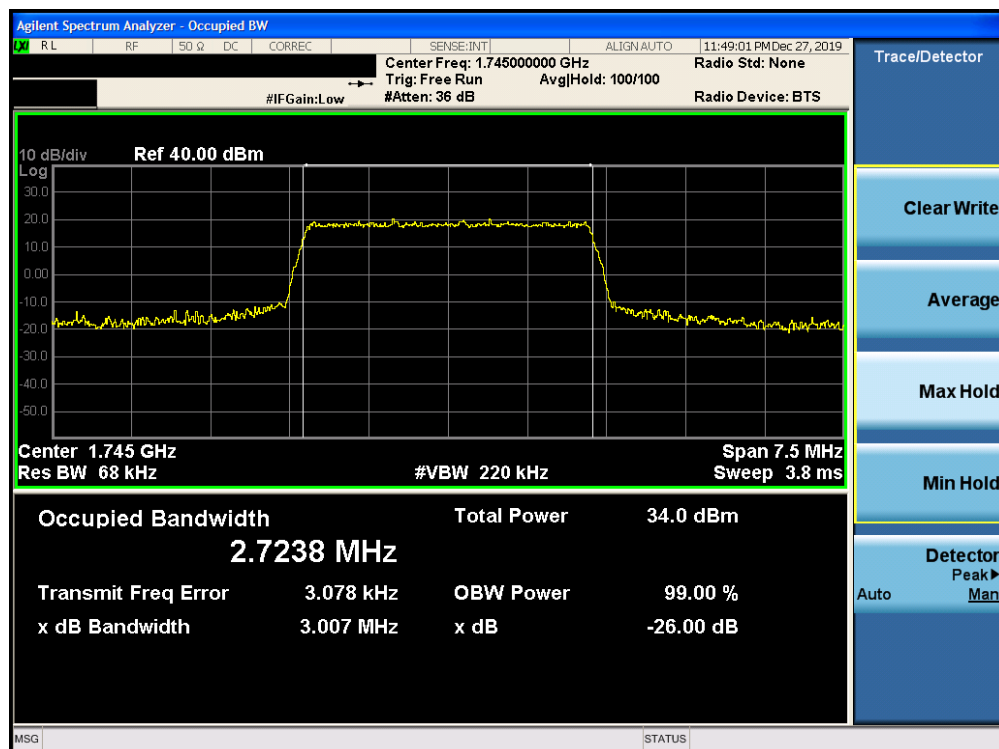


Plot 7-44. Occupied Bandwidth Plot (Band 66/4 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 44 of 423

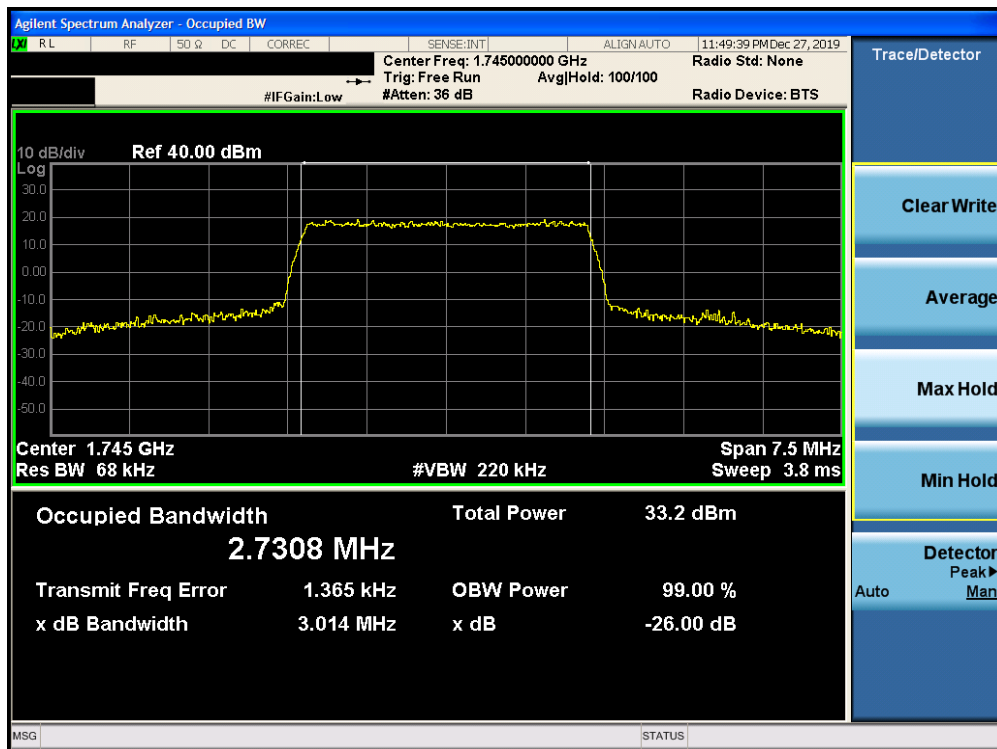


Plot 7-45. Occupied Bandwidth Plot (Band 66/4 – 1.4MHz 64-QAM – RB Size 6)

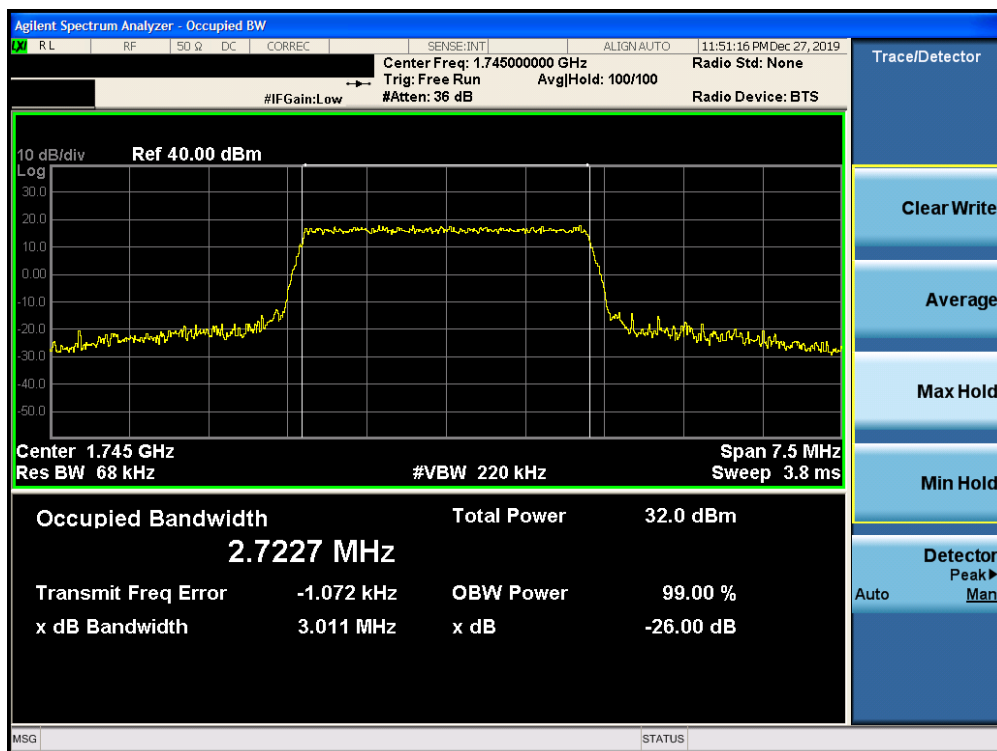


Plot 7-46. Occupied Bandwidth Plot (Band 66/4 – 3.0MHz QPSK – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 45 of 423

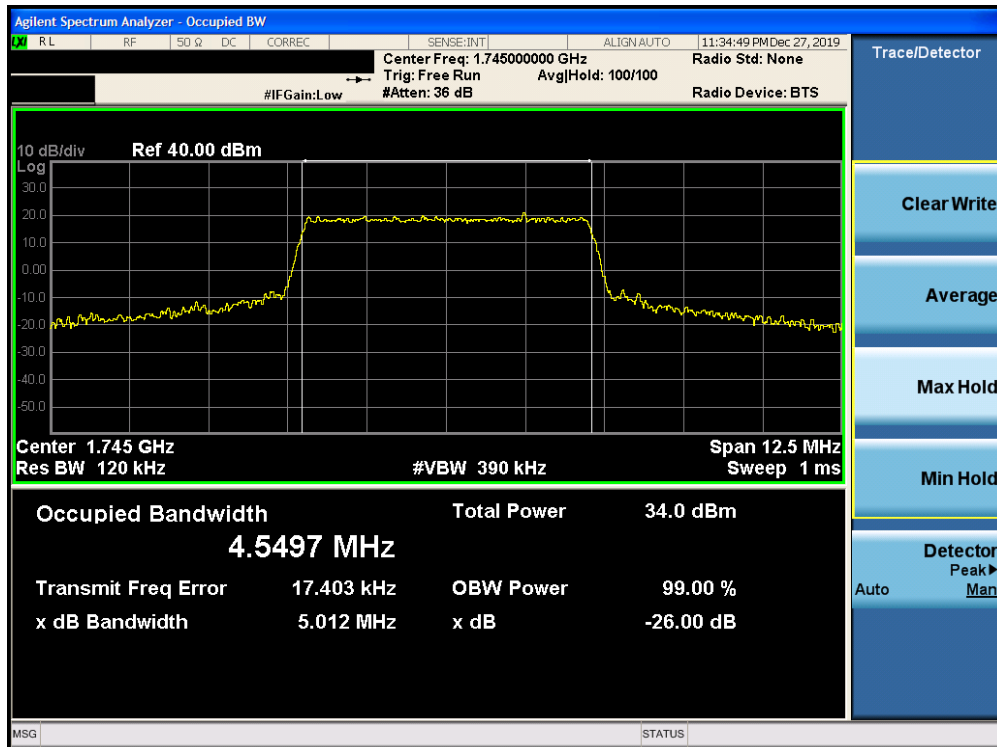


Plot 7-47. Occupied Bandwidth Plot (Band 66/4 – 3.0MHz 16-QAM – RB Size 15)



Plot 7-48. Occupied Bandwidth Plot (Band 66/4 – 3.0MHz 64-QAM – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 46 of 423

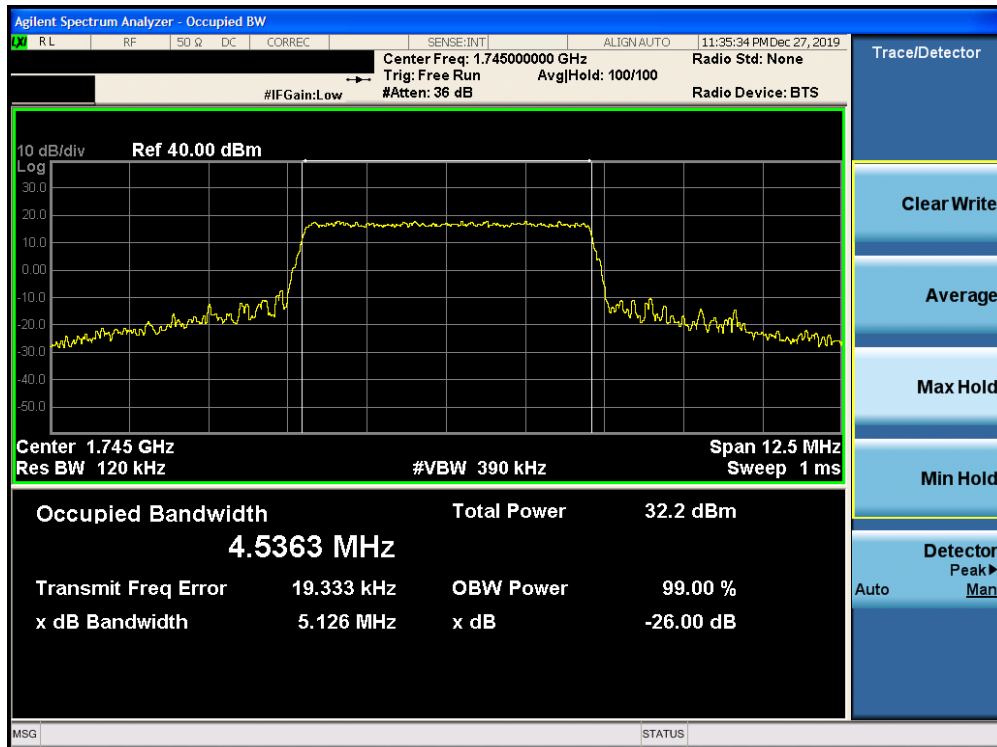


Plot 7-49. Occupied Bandwidth Plot (Band 66/4 – 5.0MHz QPSK – RB Size 25)

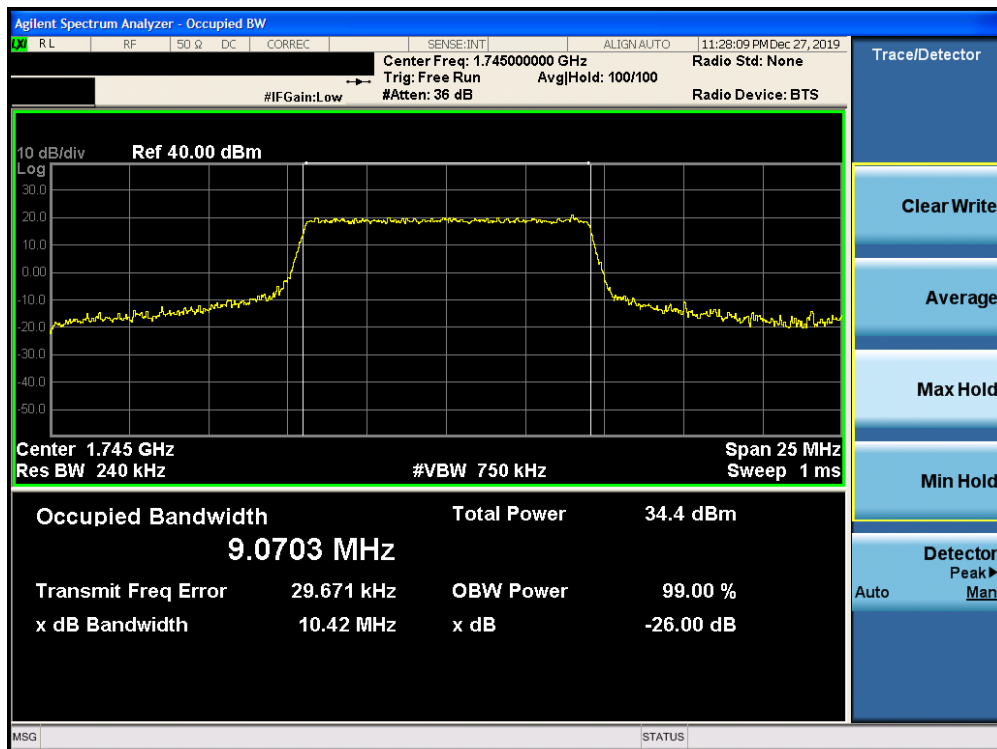


Plot 7-50. Occupied Bandwidth Plot (Band 66/4 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 47 of 423

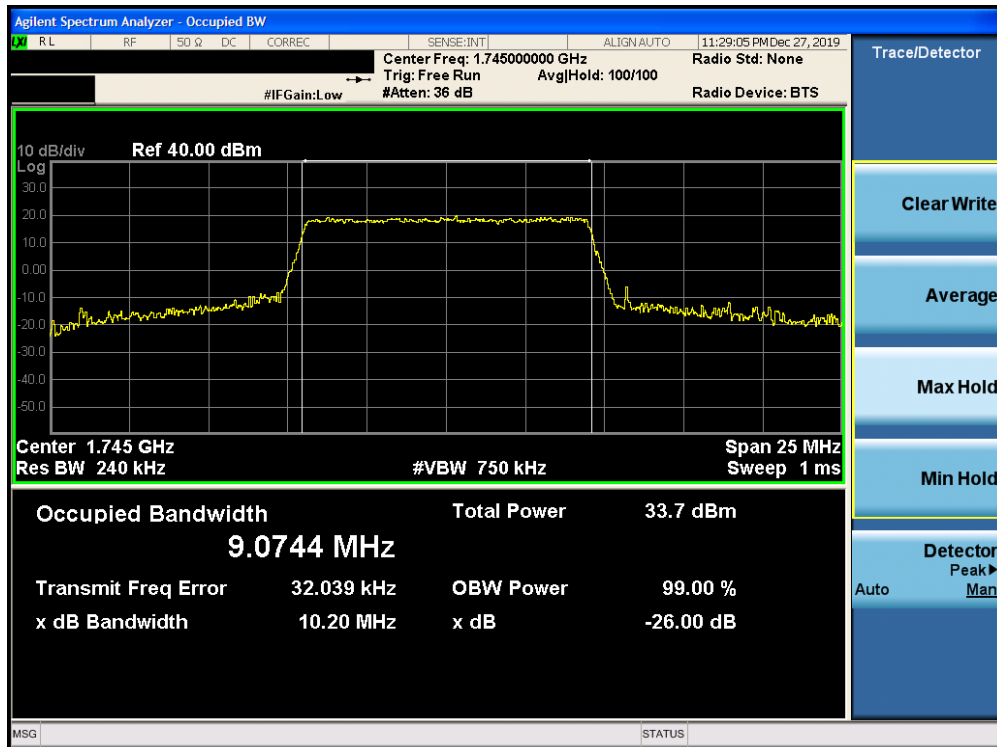


Plot 7-51. Occupied Bandwidth Plot (Band 66/4 – 5.0MHz 64-QAM – RB Size 25)

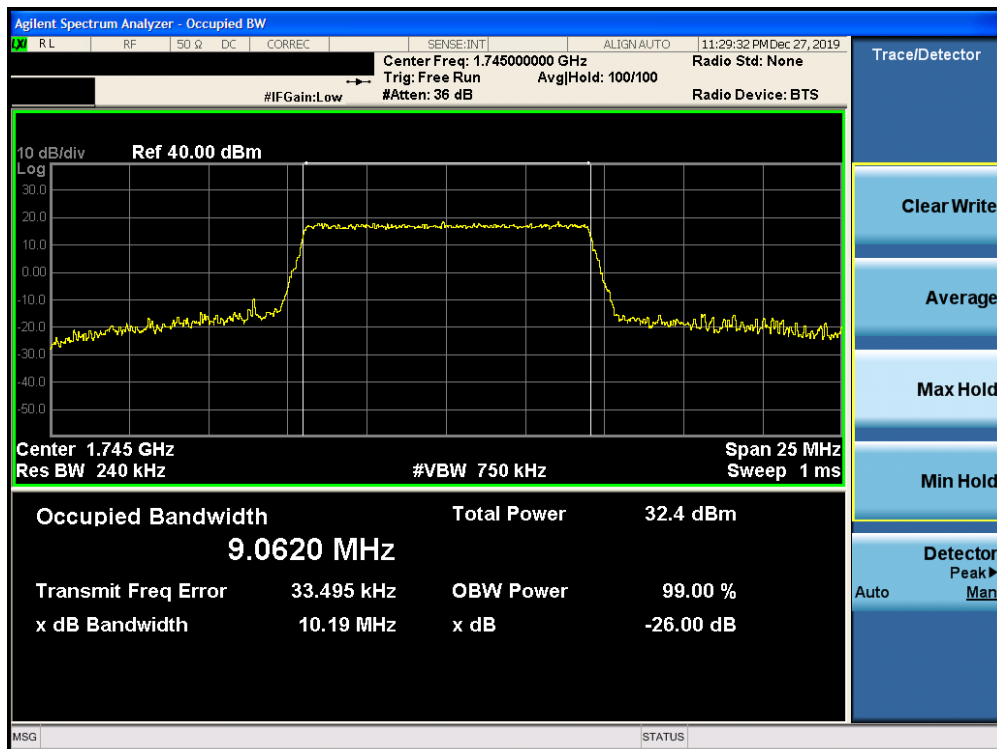


Plot 7-52. Occupied Bandwidth Plot (Band 66/4 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 48 of 423

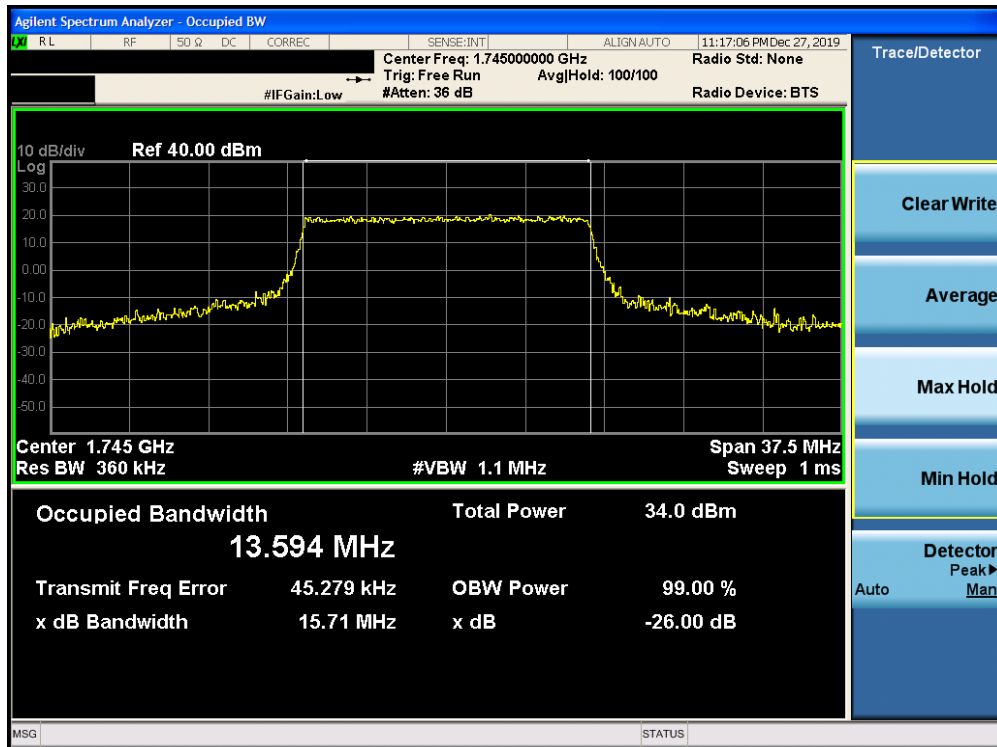


Plot 7-53. Occupied Bandwidth Plot (Band 66/4 – 10.0MHz 16-QAM – RB Size 50)

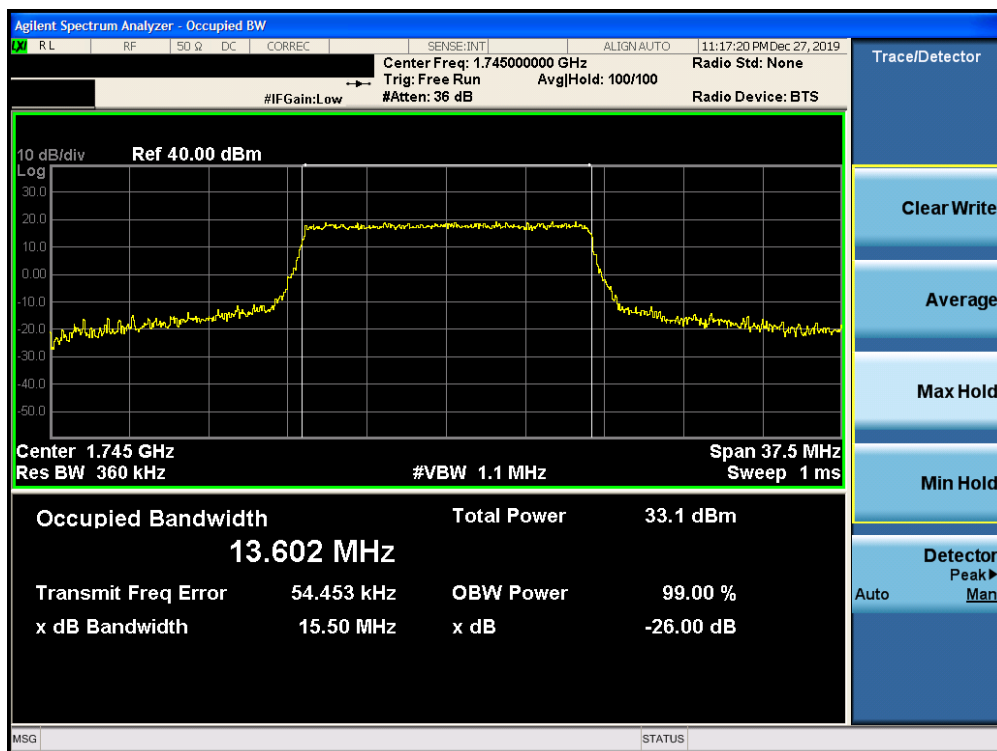


Plot 7-54. Occupied Bandwidth Plot (Band 66/4 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 49 of 423

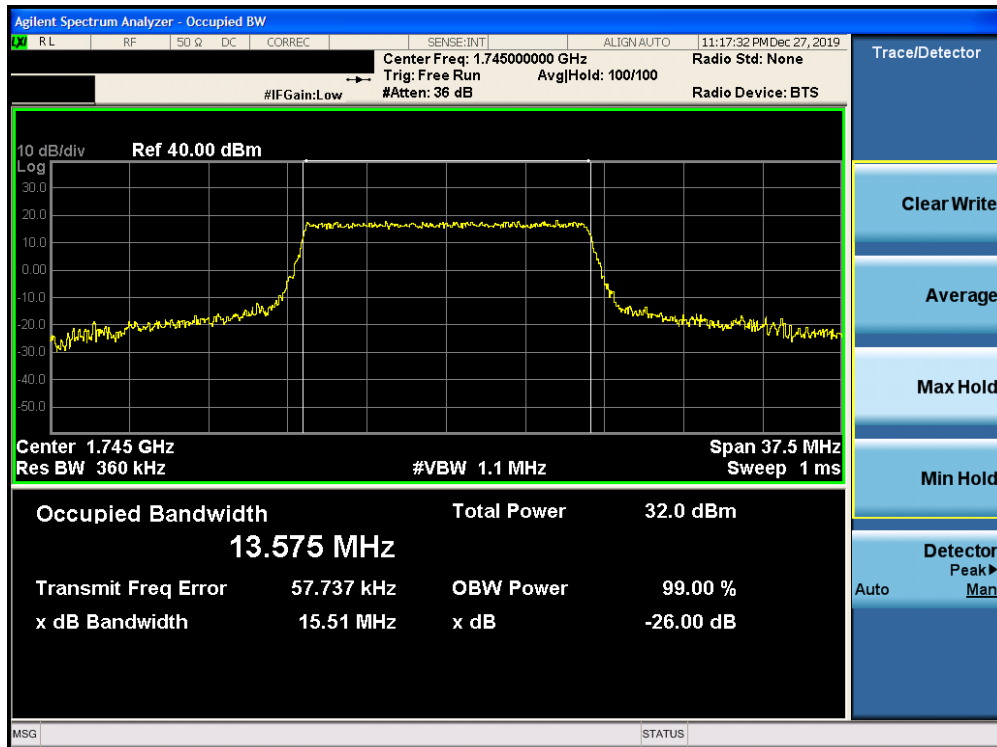


Plot 7-55. Occupied Bandwidth Plot (Band 66/4 – 15.0MHz QPSK – RB Size 75)

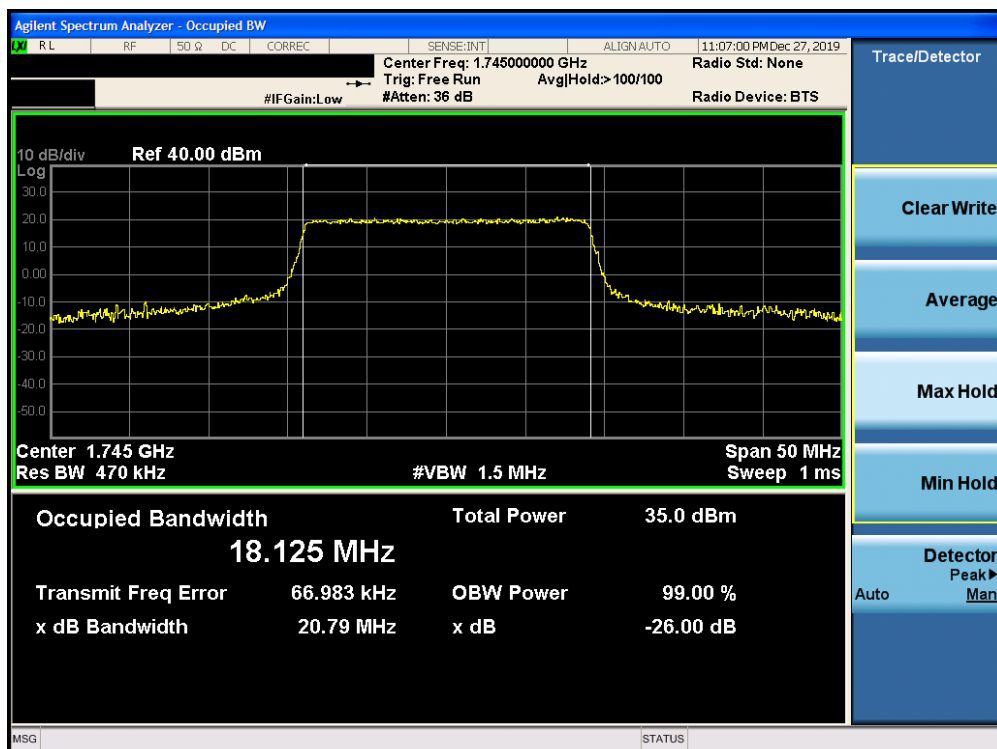


Plot 7-56. Occupied Bandwidth Plot (Band 66/4 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 50 of 423

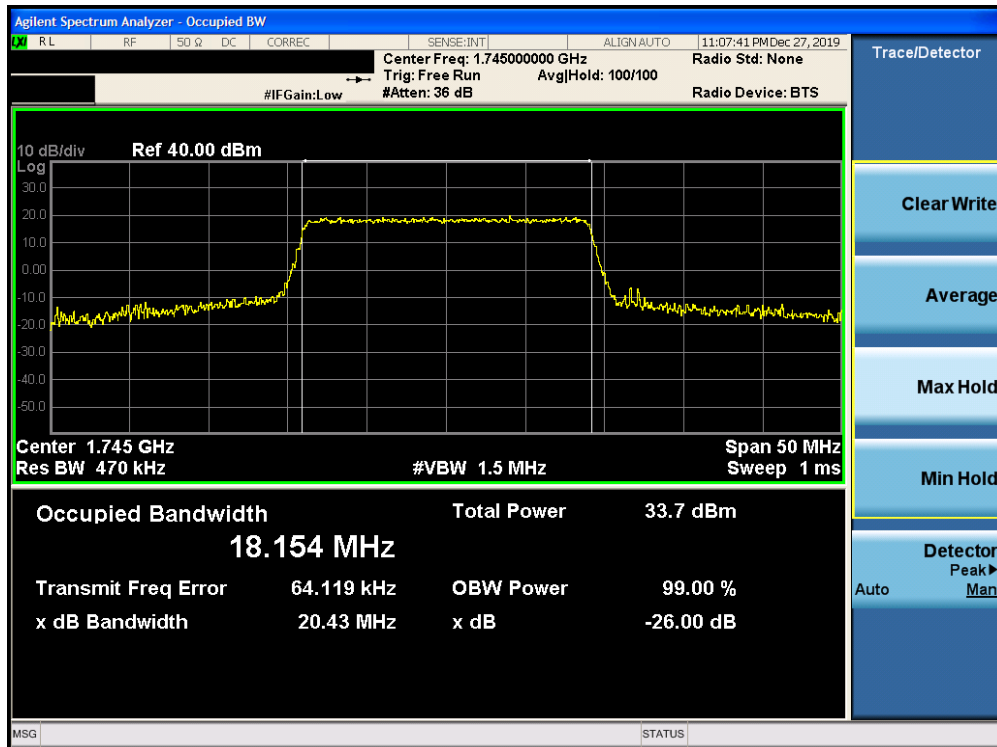


Plot 7-57. Occupied Bandwidth Plot (Band 66/4 – 15.0MHz 64-QAM – RB Size 75)

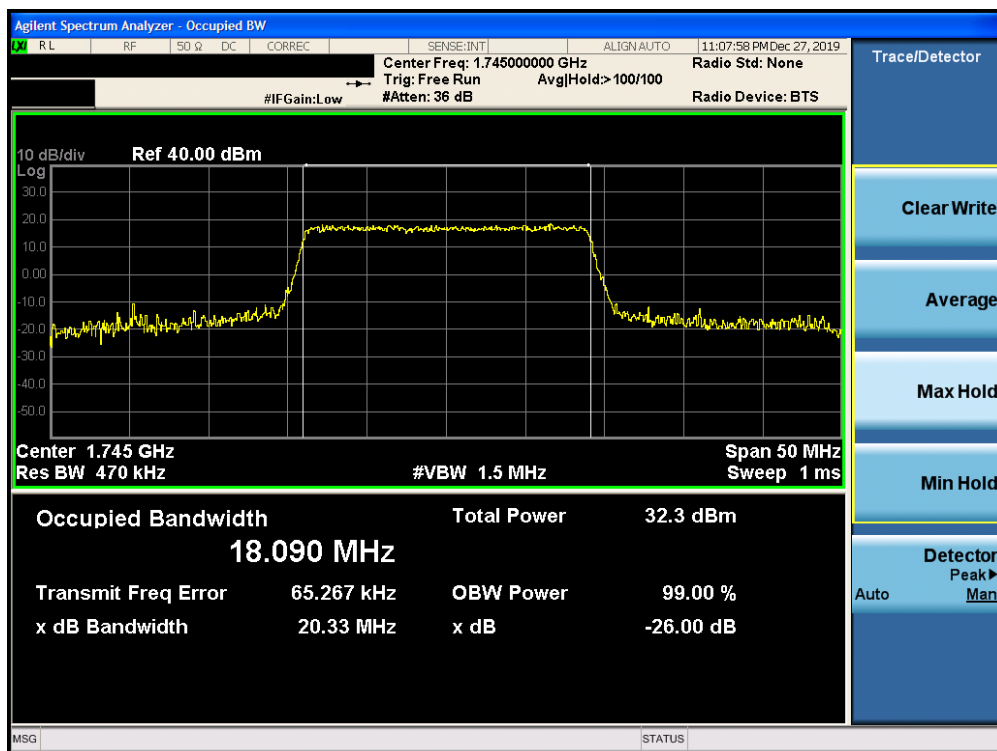


Plot 7-58. Occupied Bandwidth Plot (Band 66/4 – 20.0MHz QPSK – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 51 of 423

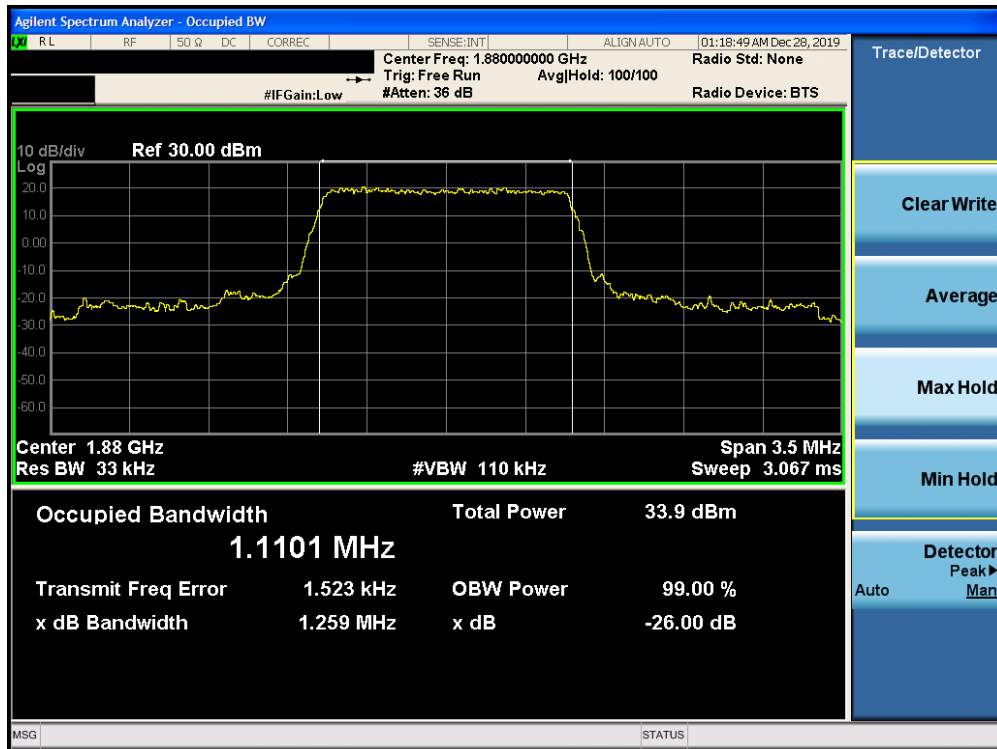


Plot 7-59. Occupied Bandwidth Plot (Band 66/4 – 20.0MHz 16-QAM – RB Size 100)

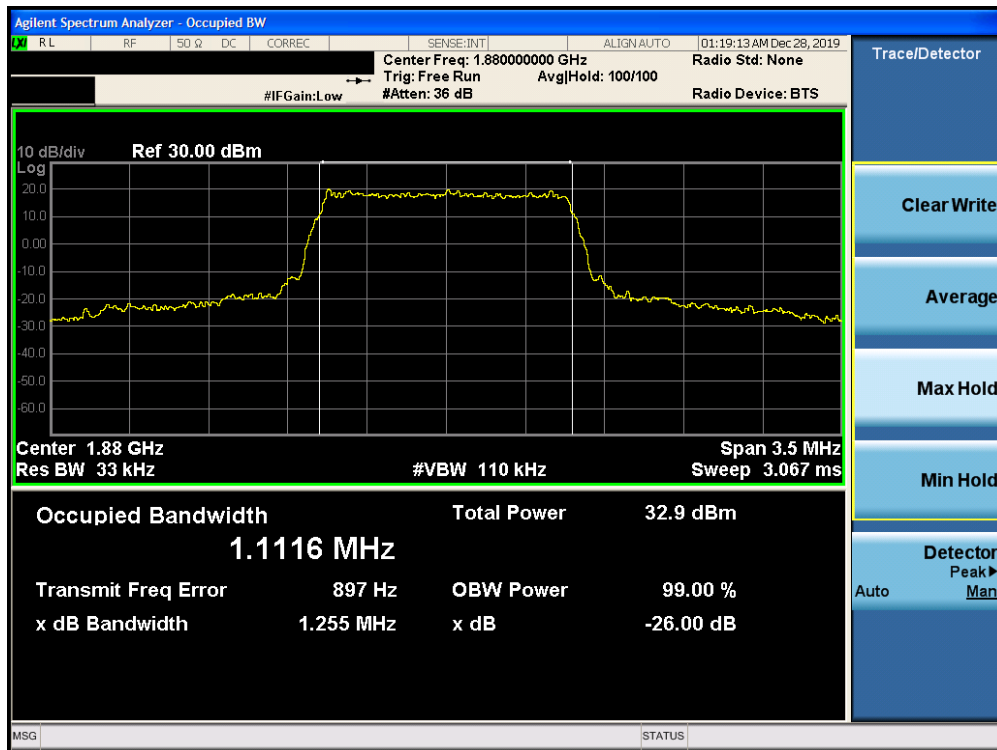


Plot 7-60. Occupied Bandwidth Plot (Band 66/4 – 20.0MHz 64-QAM – RB Size 100)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 52 of 423

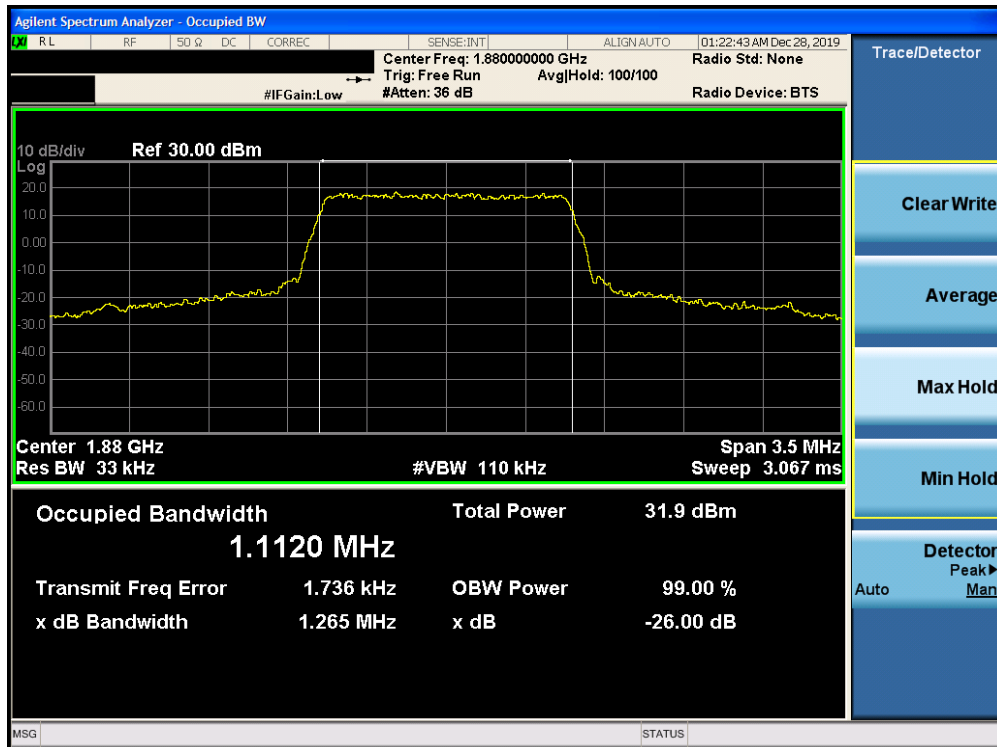


Plot 7-61. Occupied Bandwidth Plot (Band 25/2 – 1.4MHz QPSK – RB Size 6)

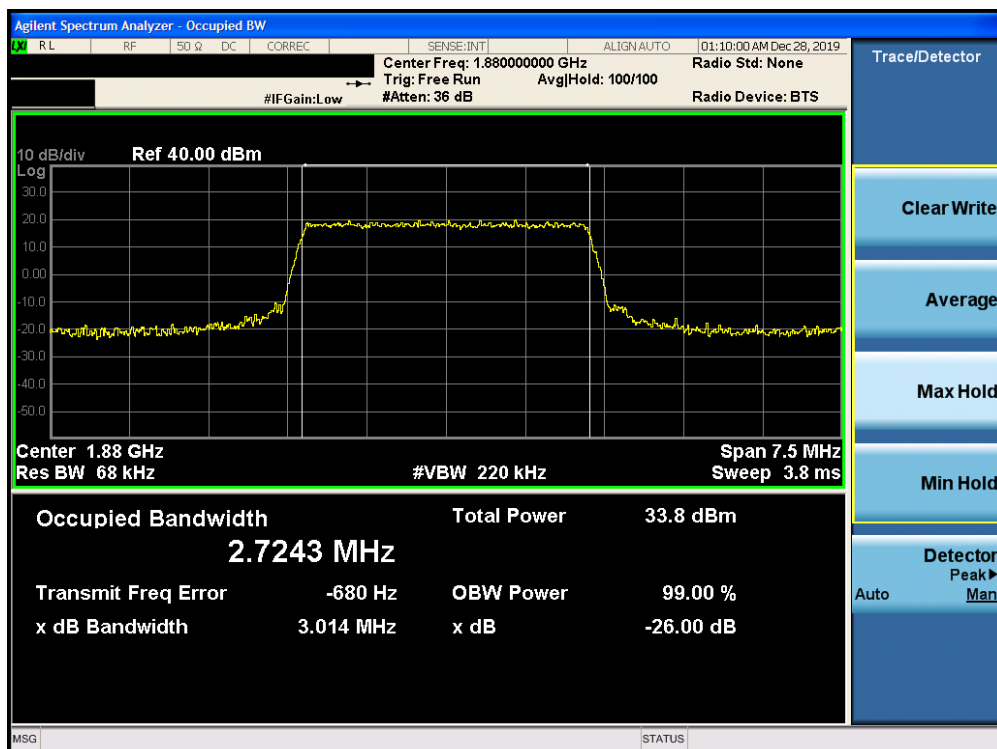


Plot 7-62. Occupied Bandwidth Plot (Band 25/2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 53 of 423

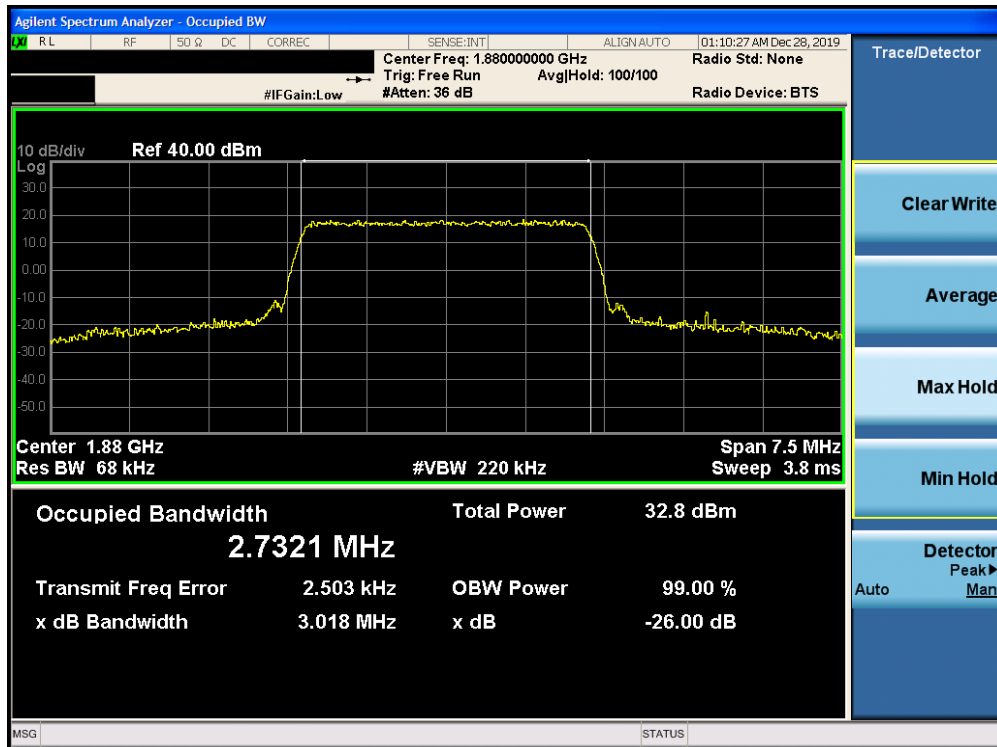


Plot 7-63. Occupied Bandwidth Plot (Band 25/2 – 1.4MHz 64-QAM – RB Size 6)

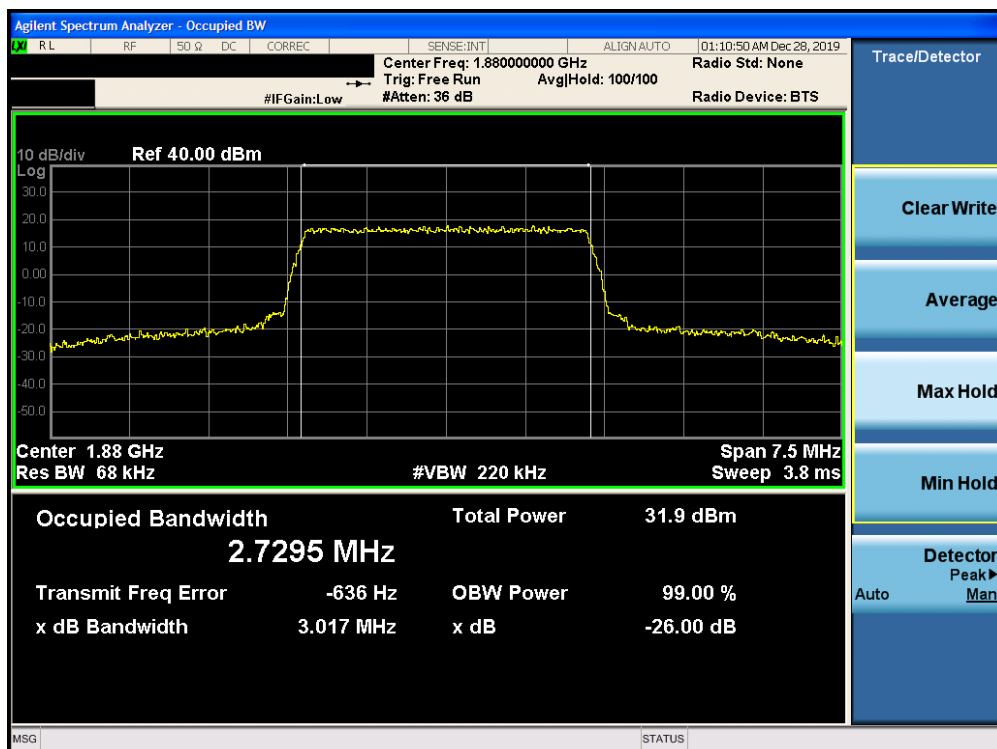


Plot 7-64. Occupied Bandwidth Plot (Band 25/2 – 3.0MHz QPSK – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 54 of 423

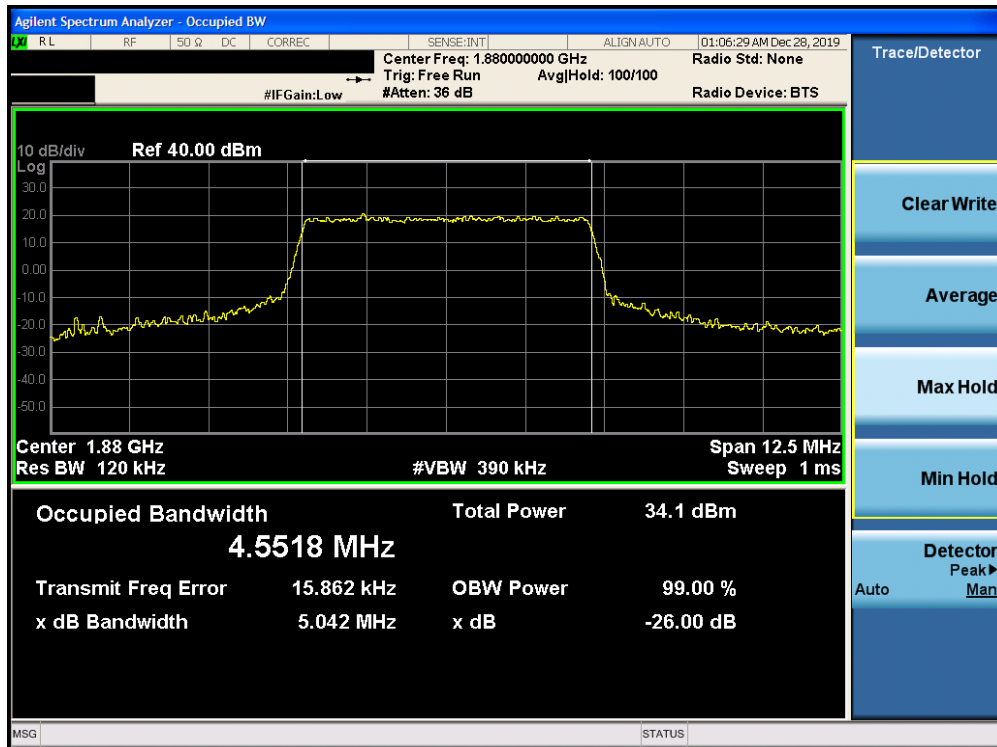


Plot 7-65. Occupied Bandwidth Plot (Band 25/2 – 3.0MHz 16-QAM – RB Size 15)

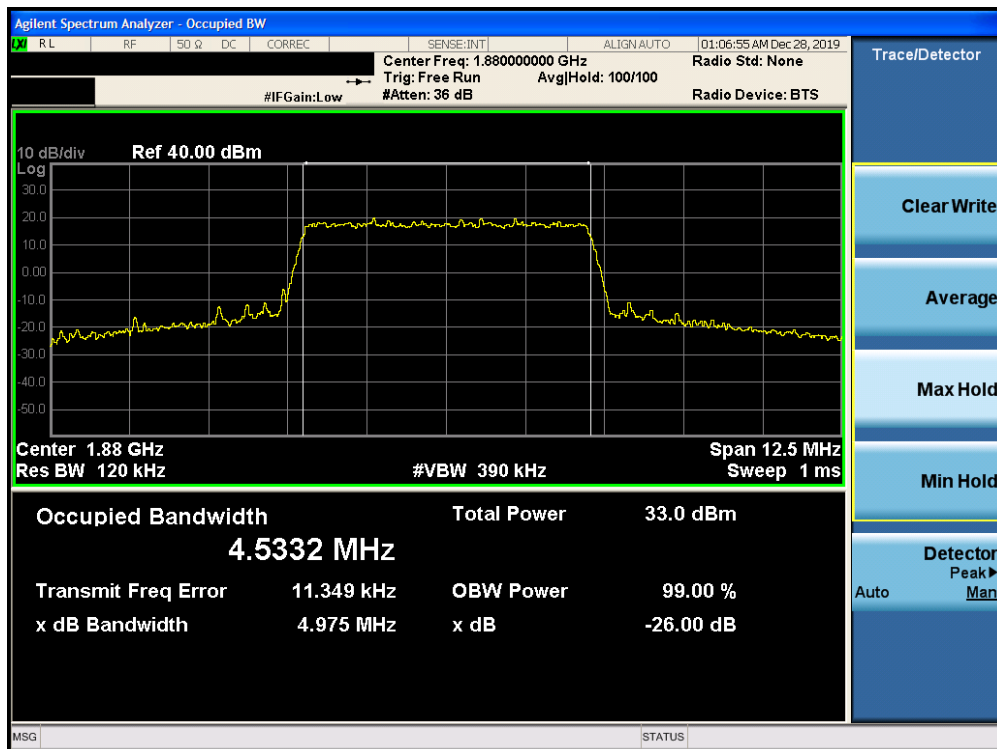


Plot 7-66. Occupied Bandwidth Plot (Band 25/2 – 3.0MHz 64-QAM – RB Size 15)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 55 of 423

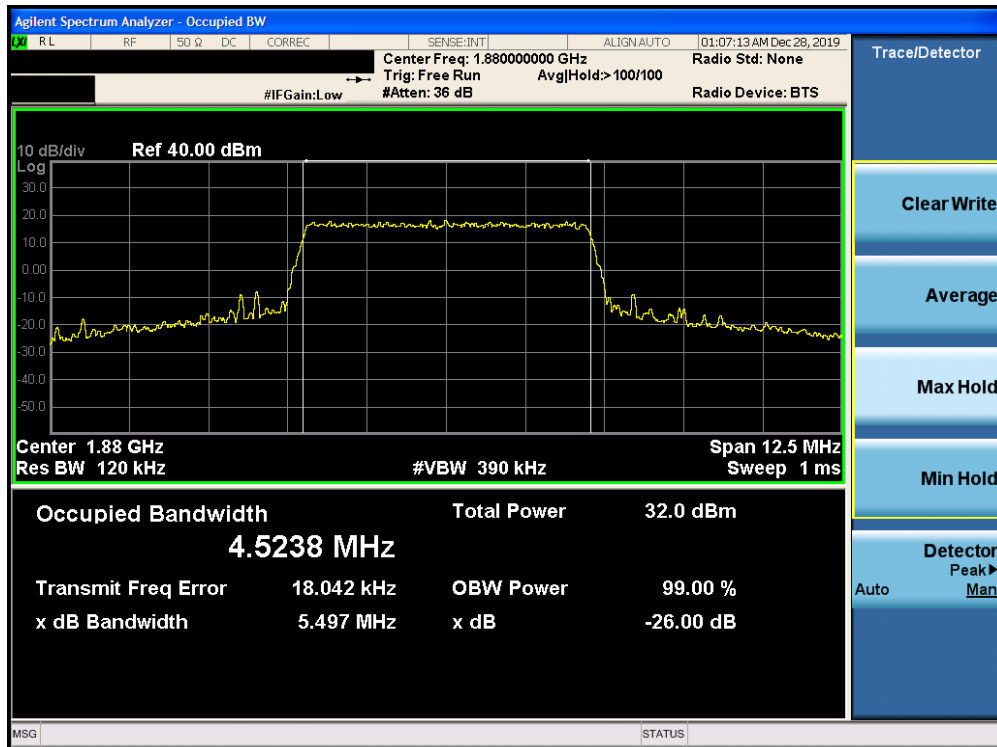


Plot 7-67. Occupied Bandwidth Plot (Band 25/2 – 5.0MHz QPSK – RB Size 25)

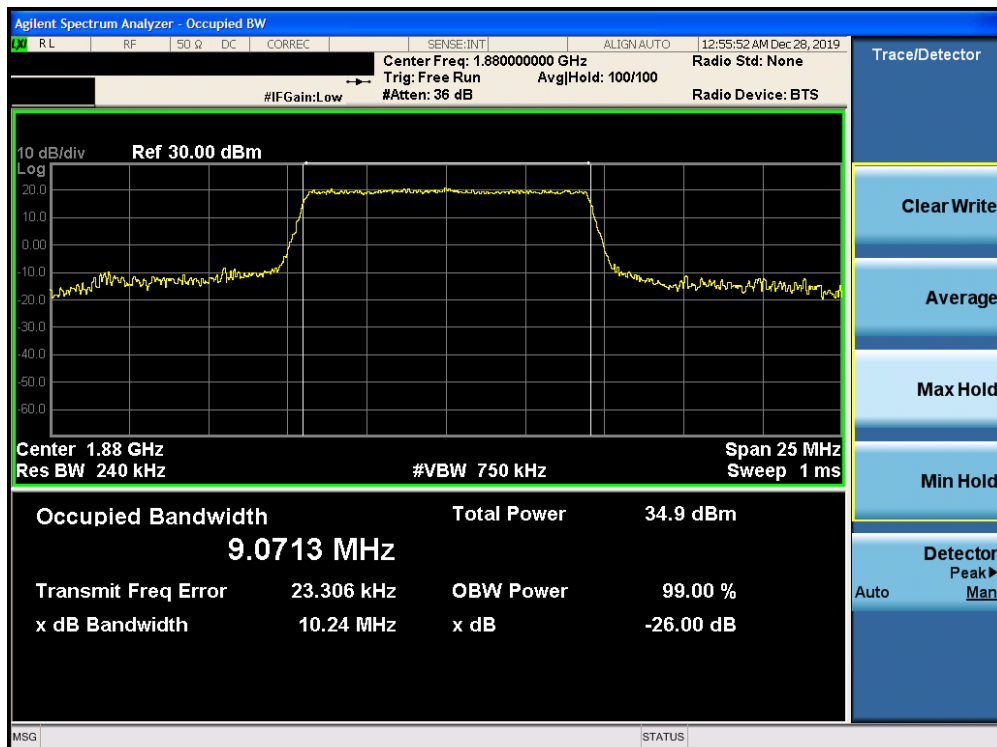


Plot 7-68. Occupied Bandwidth Plot (Band 25/2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 56 of 423

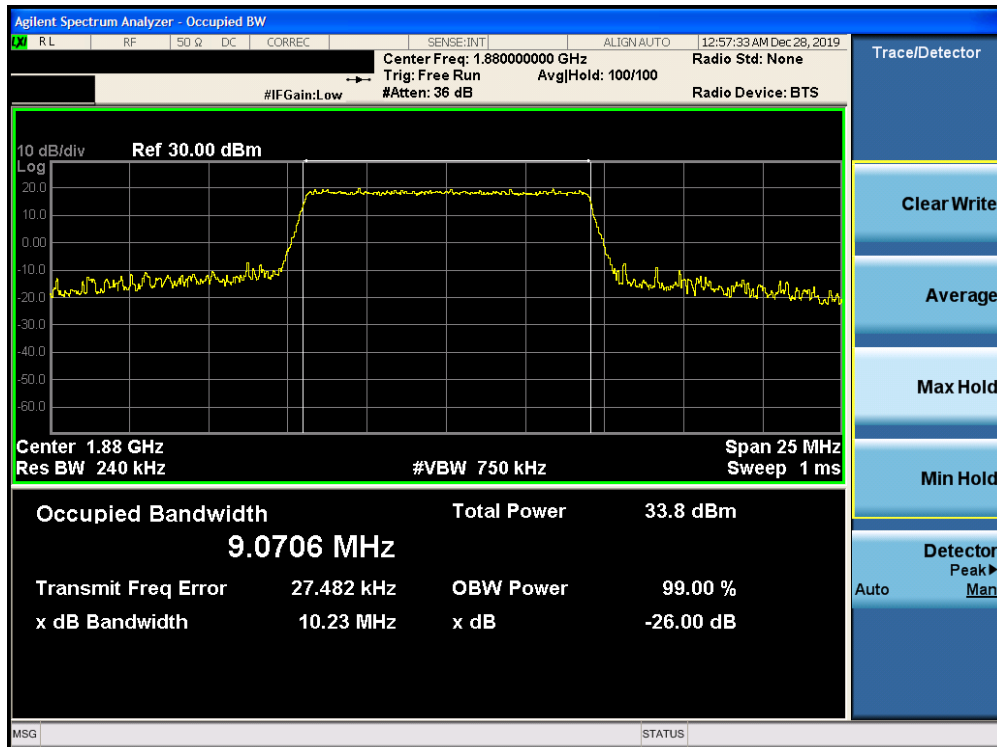


Plot 7-69. Occupied Bandwidth Plot (Band 25/2 – 5.0MHz 64-QAM – RB Size 25)

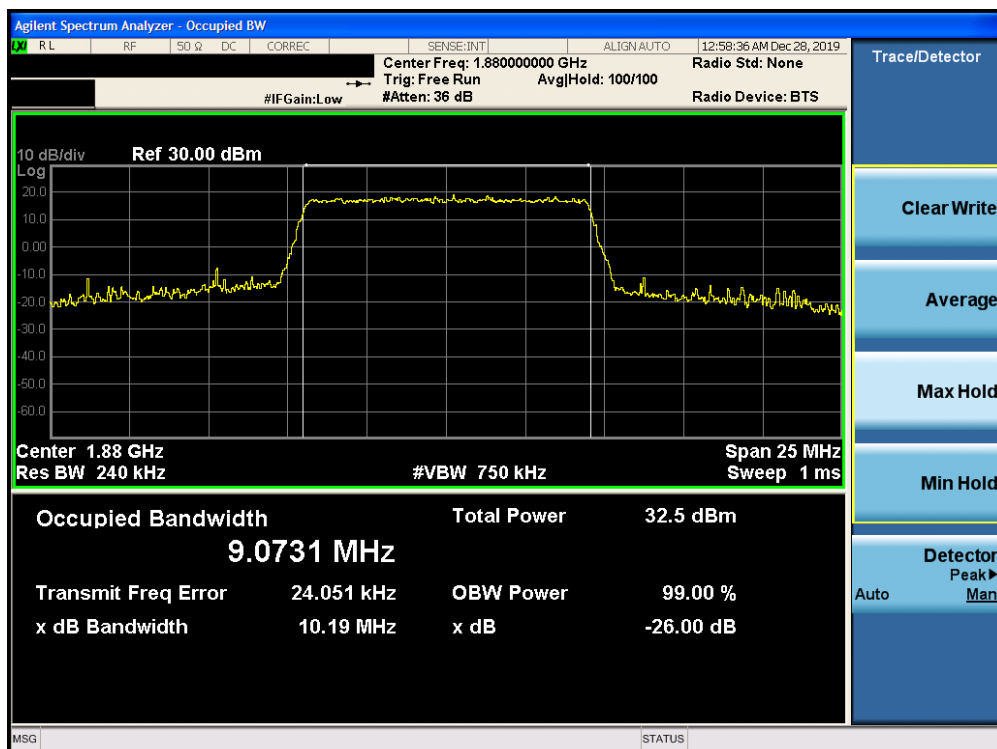


Plot 7-70. Occupied Bandwidth Plot (Band 25/2 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 57 of 423

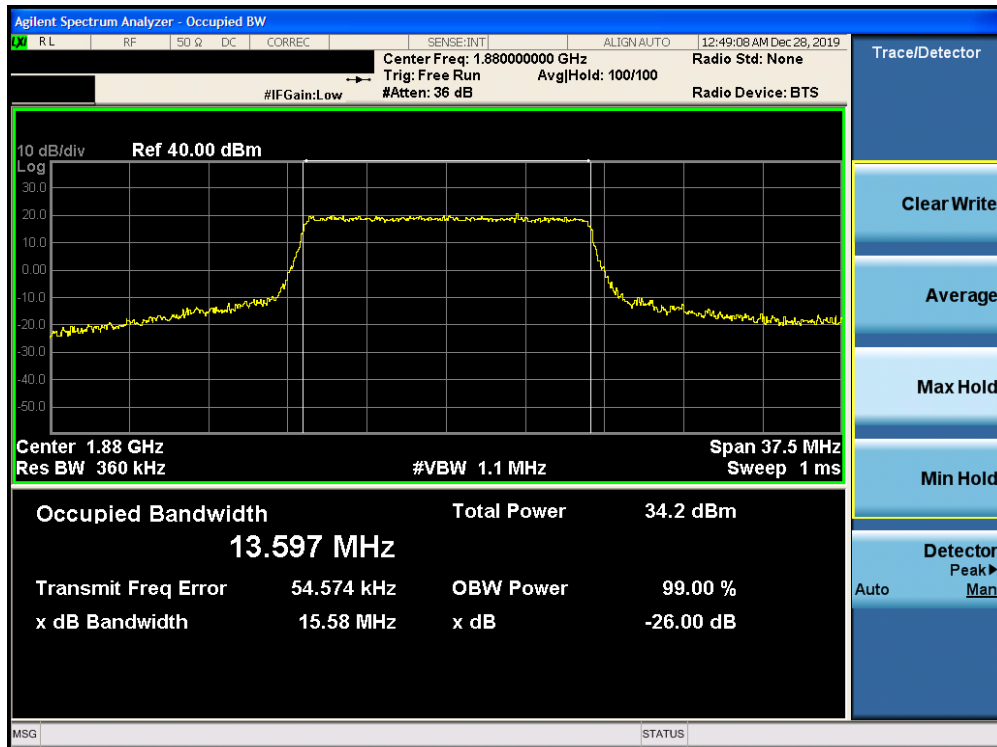


Plot 7-71. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 16-QAM - RB Size 50)

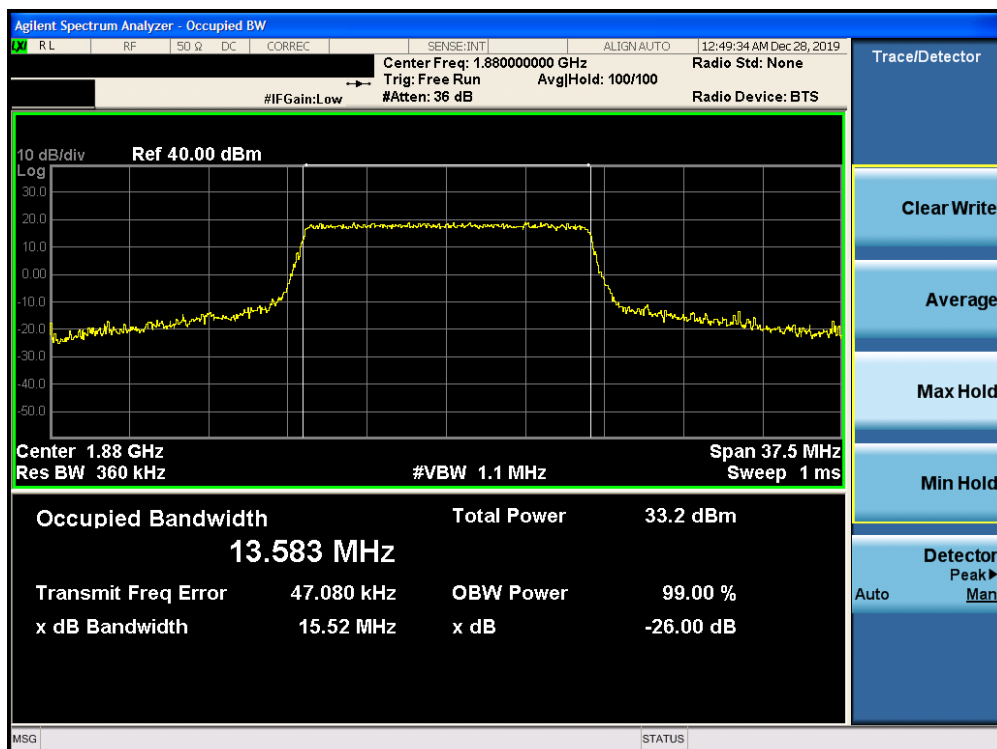


Plot 7-72. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 64-QAM - RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 58 of 423

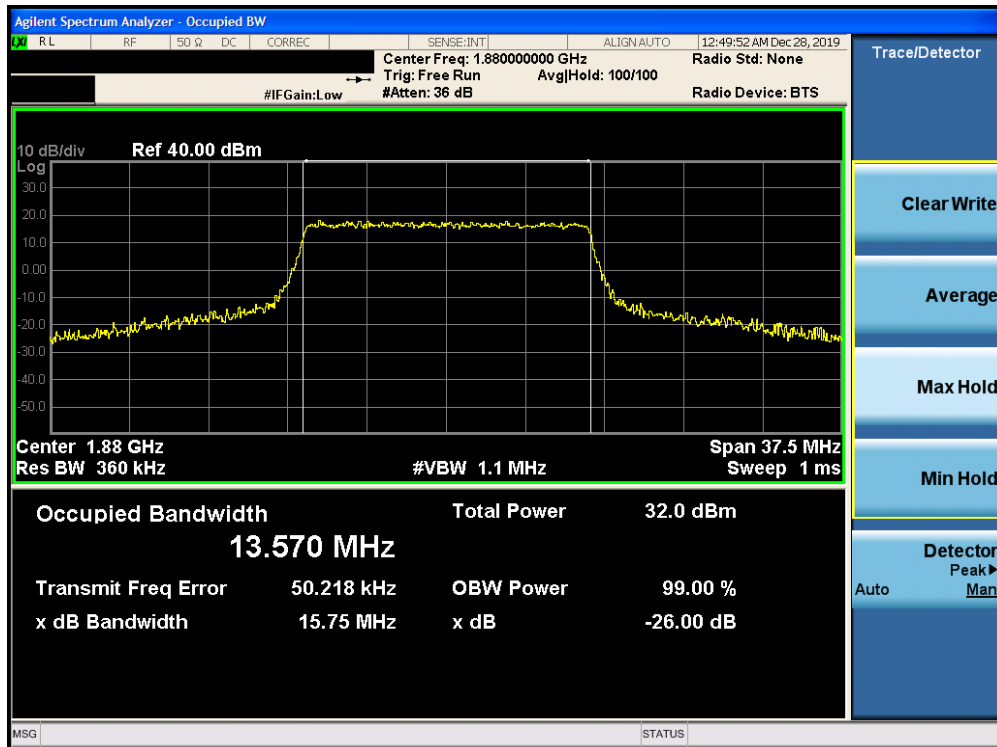


Plot 7-73. Occupied Bandwidth Plot (Band 25/2 – 15.0MHz QPSK – RB Size 75)

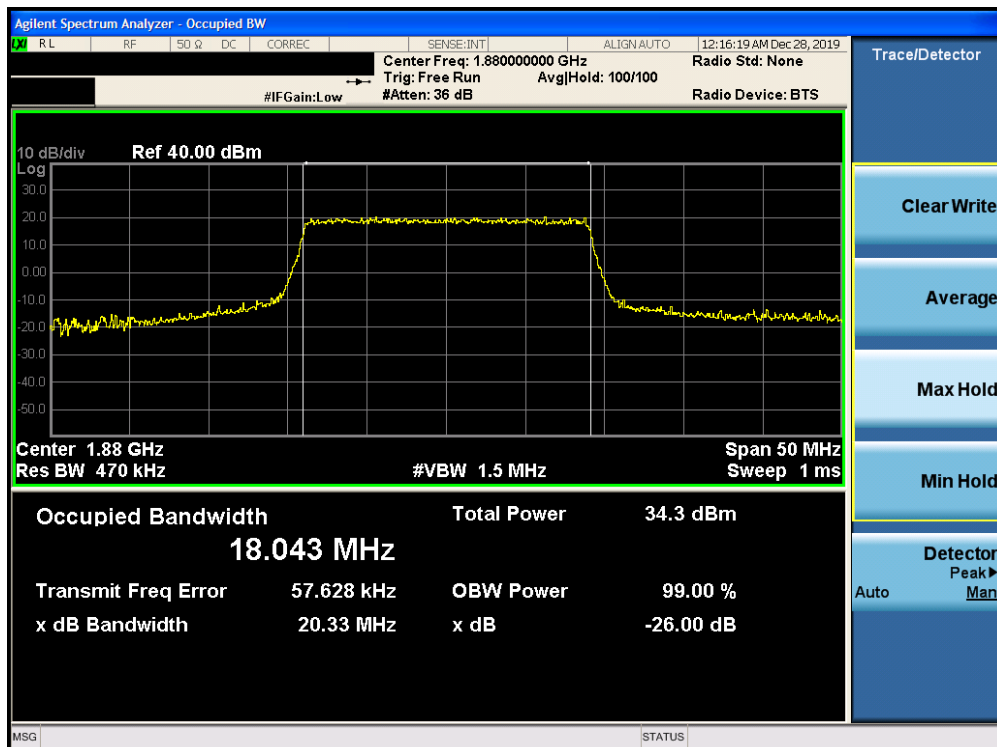


Plot 7-74. Occupied Bandwidth Plot (Band 25/2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 59 of 423

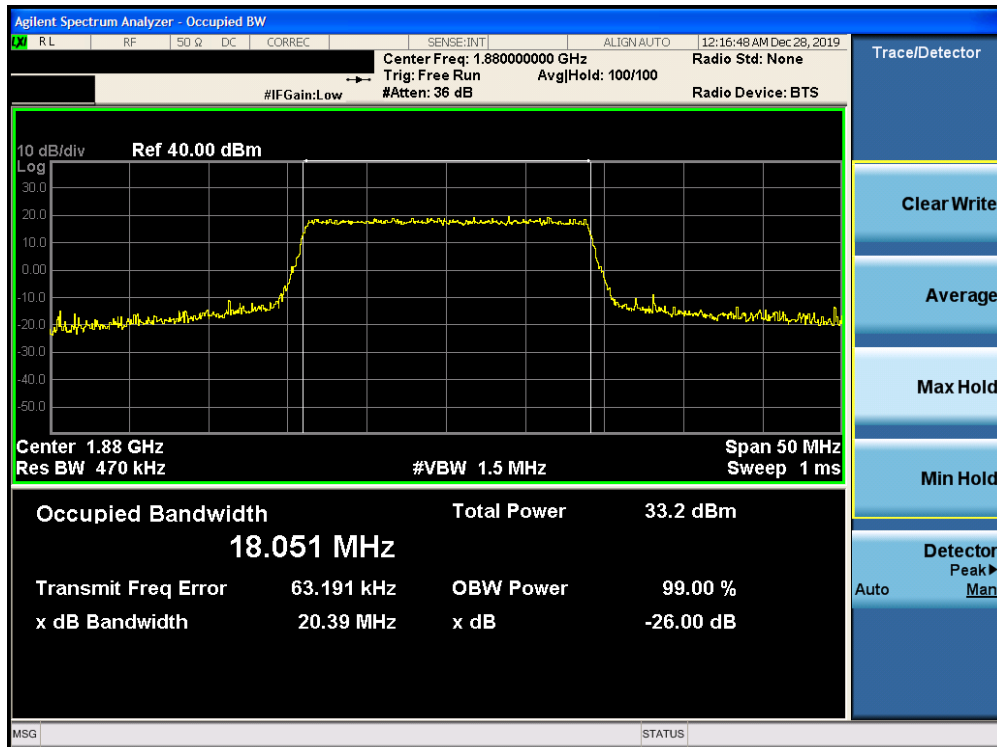


Plot 7-75. Occupied Bandwidth Plot (Band 25/2 – 15.0MHz 64-QAM – RB Size 75)

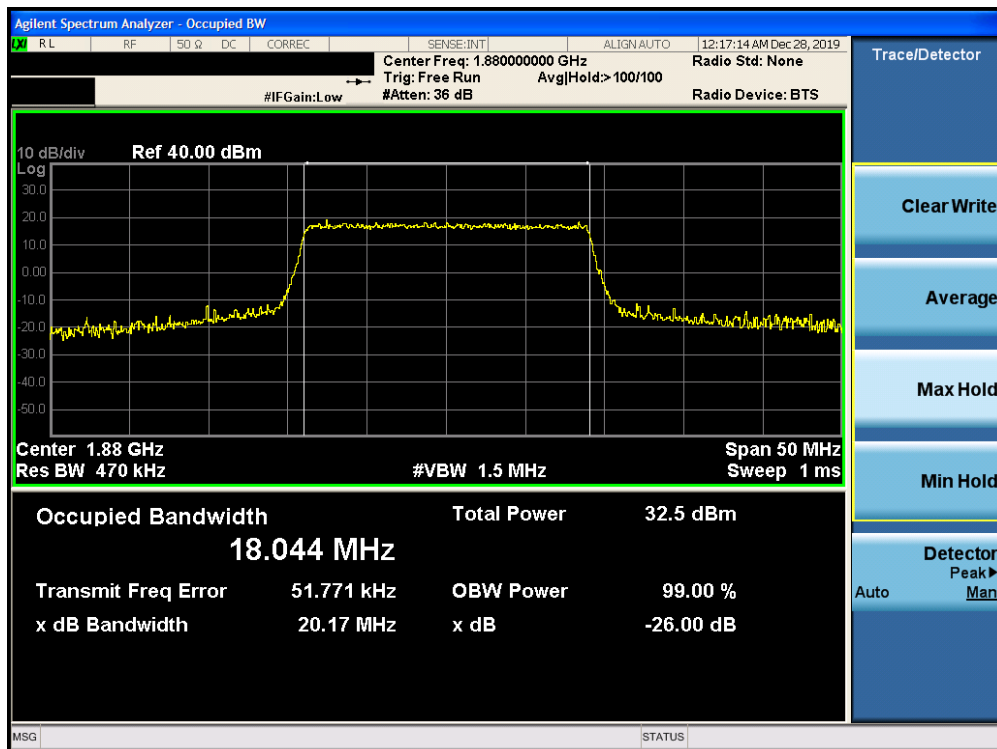


Plot 7-76. Occupied Bandwidth Plot (Band 25/2 – 20.0MHz QPSK – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 60 of 423



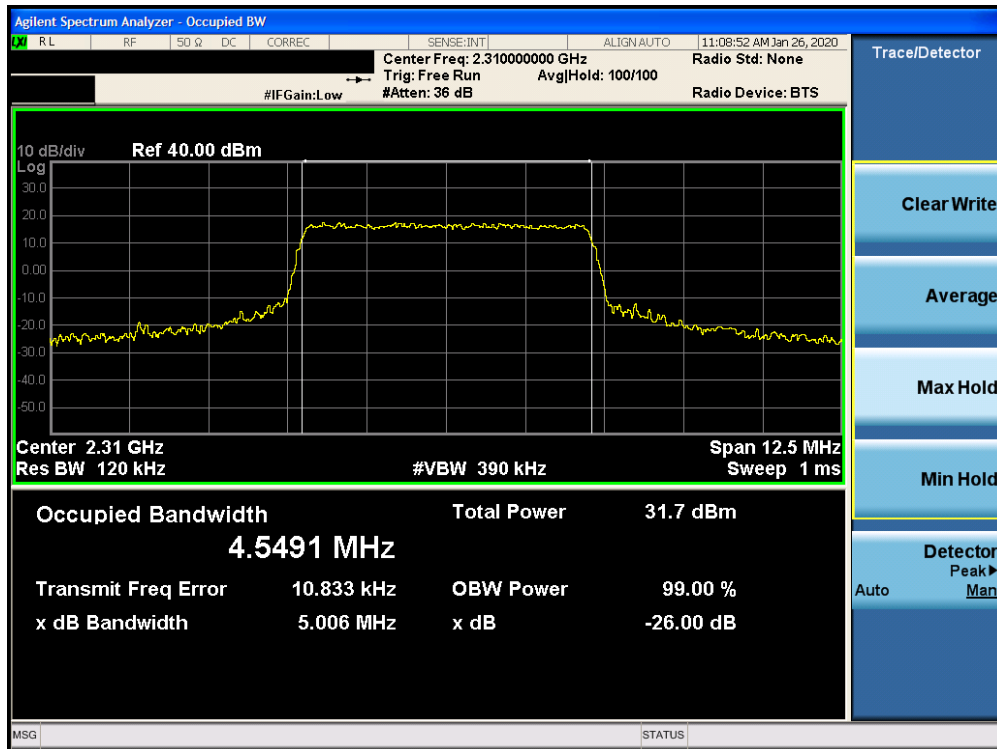
Plot 7-77. Occupied Bandwidth Plot (Band 25/2 – 20.0MHz 16-QAM – RB Size 100)



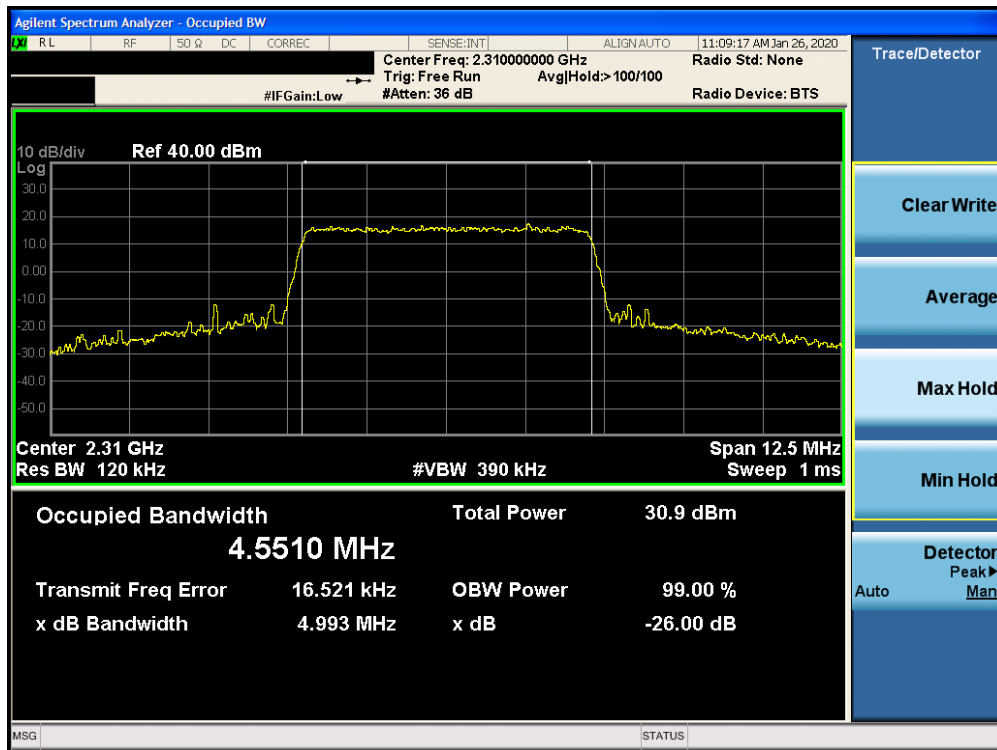
Plot 7-78. Occupied Bandwidth Plot (Band 25/2 – 20.0MHz 64-QAM – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 61 of 423

Band 30

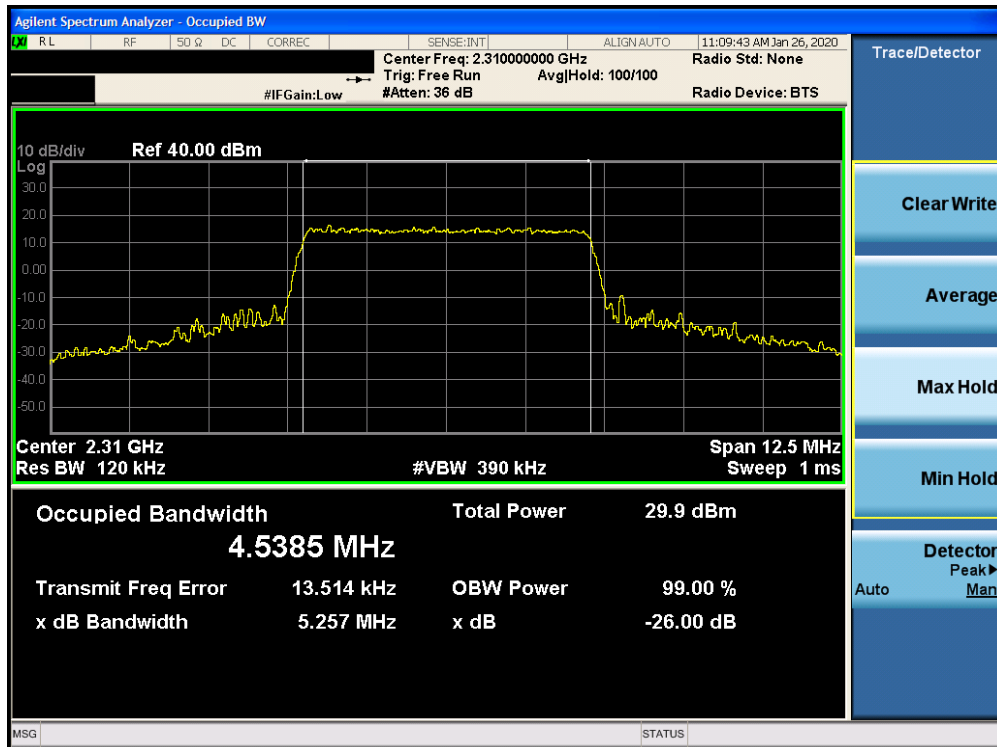


Plot 7-79. Occupied Bandwidth Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

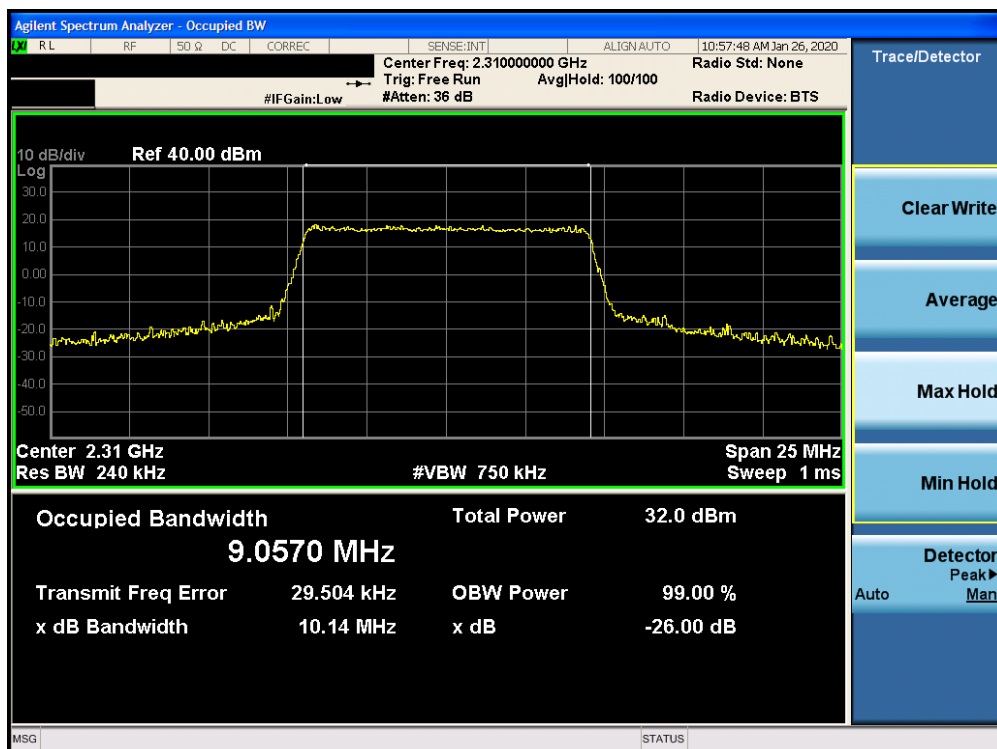


Plot 7-80. Occupied Bandwidth Plot (Band 30 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 62 of 423

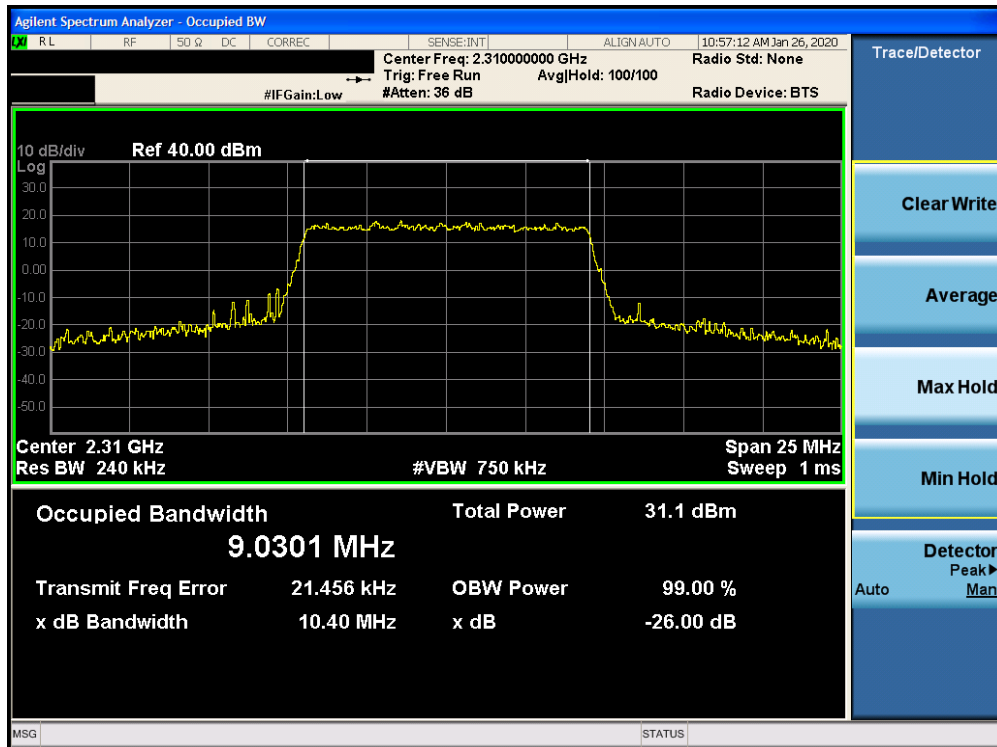


Plot 7-81. Occupied Bandwidth Plot (Band 30 – 5.0MHz 64-QAM – RB Size 25)

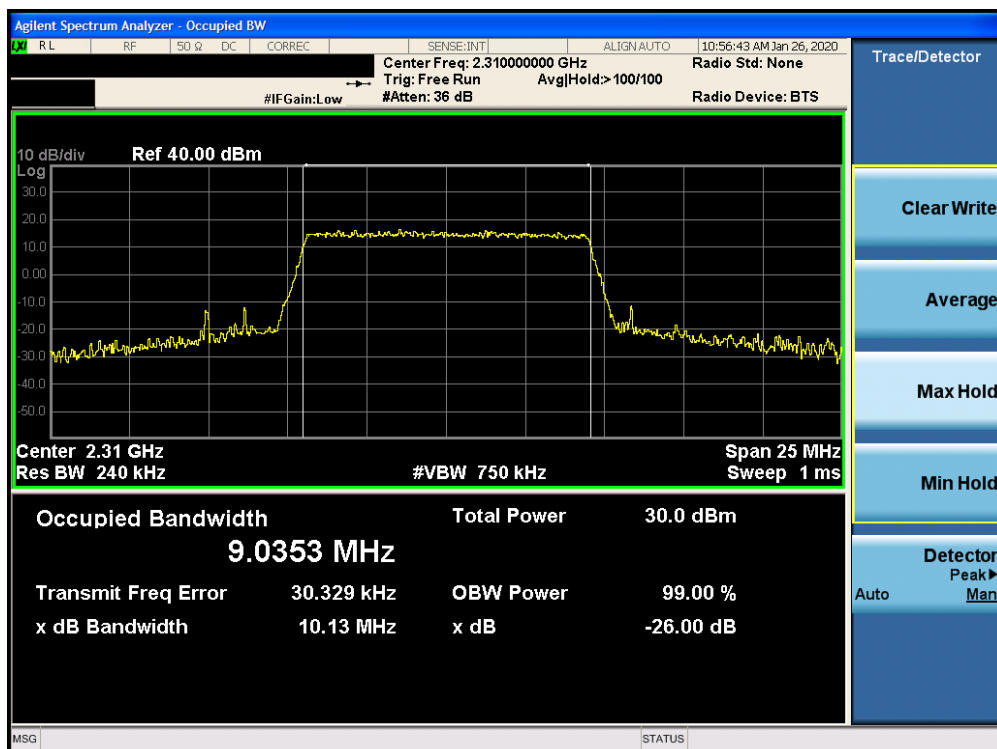


Plot 7-82. Occupied Bandwidth Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 63 of 423



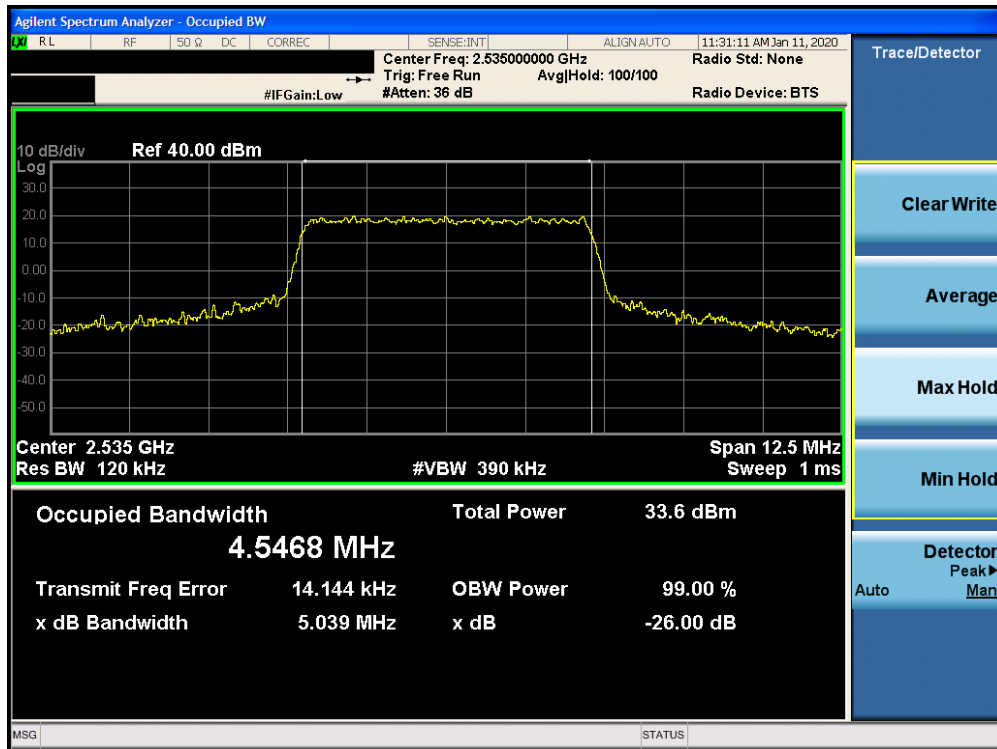
Plot 7-83. Occupied Bandwidth Plot (Band 30 – 10.0MHz 16-QAM – RB Size 50)



Plot 7-84. Occupied Bandwidth Plot (Band 30 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 64 of 423

Band 7

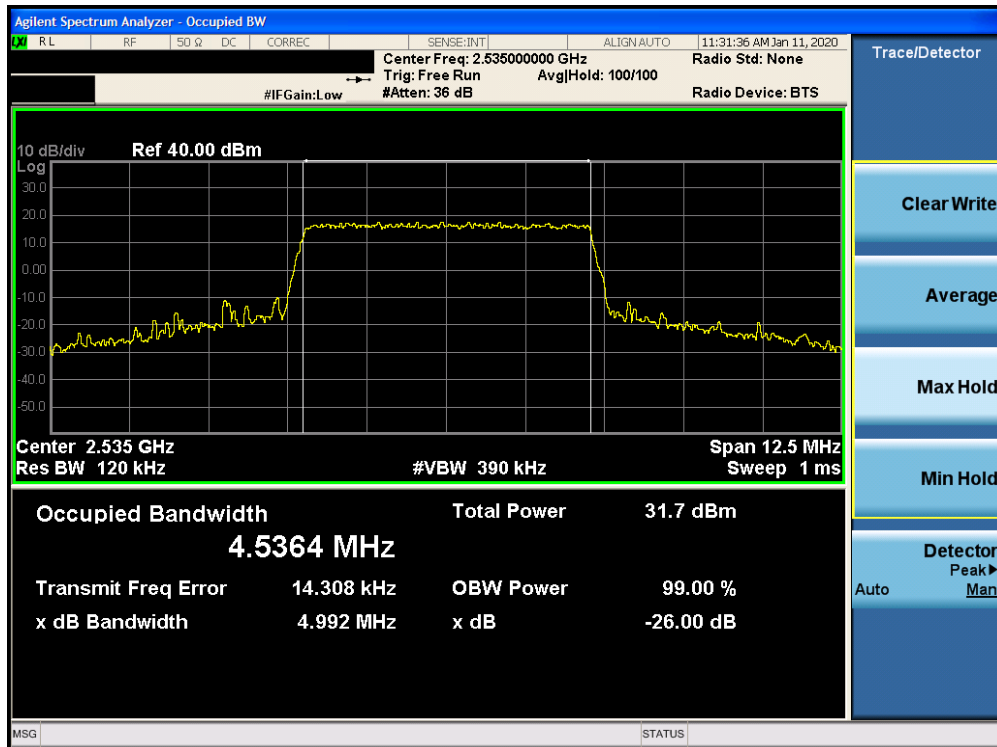


Plot 7-85. Occupied Bandwidth Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

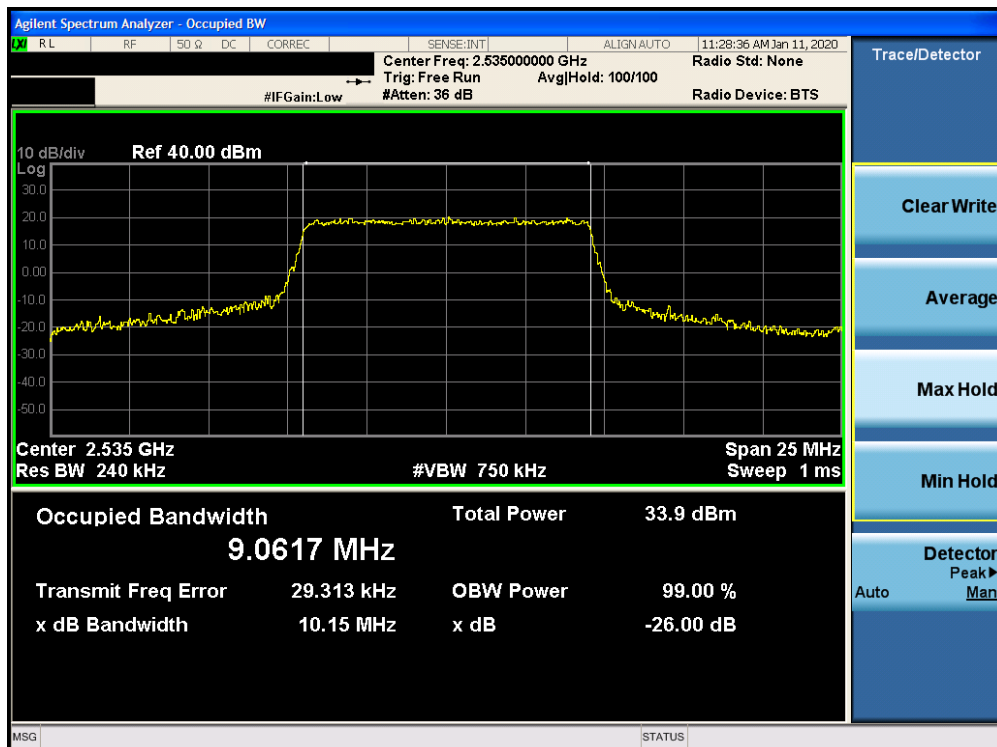


Plot 7-86. Occupied Bandwidth Plot (Band 7 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 65 of 423

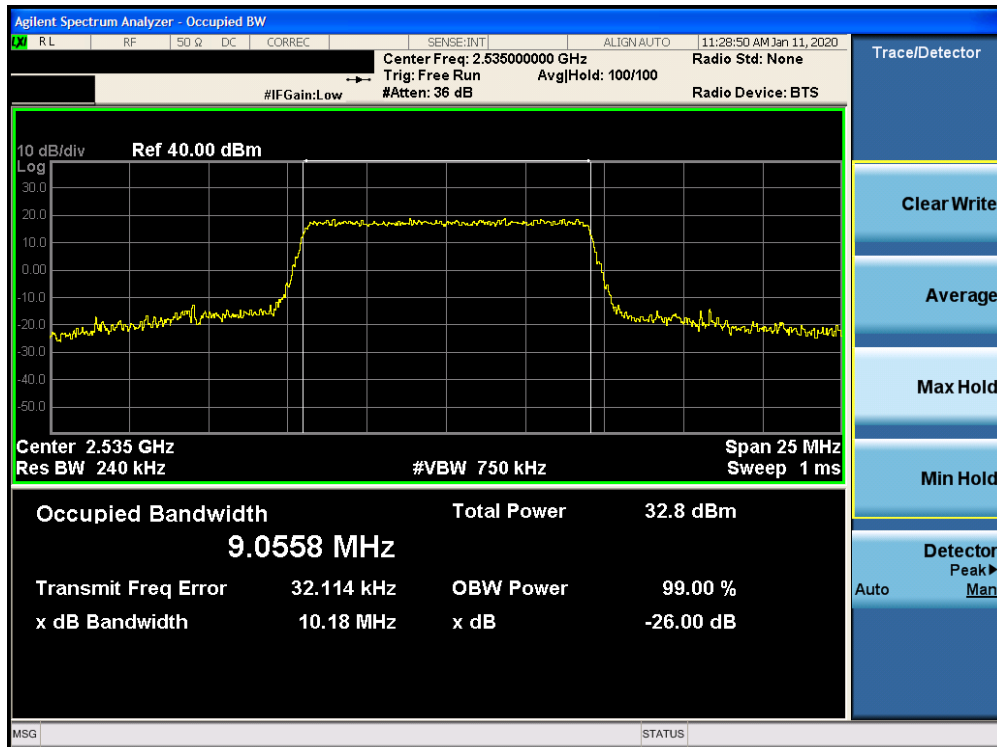


Plot 7-87. Occupied Bandwidth Plot (Band 7 – 5.0MHz 64-QAM – RB Size 25)

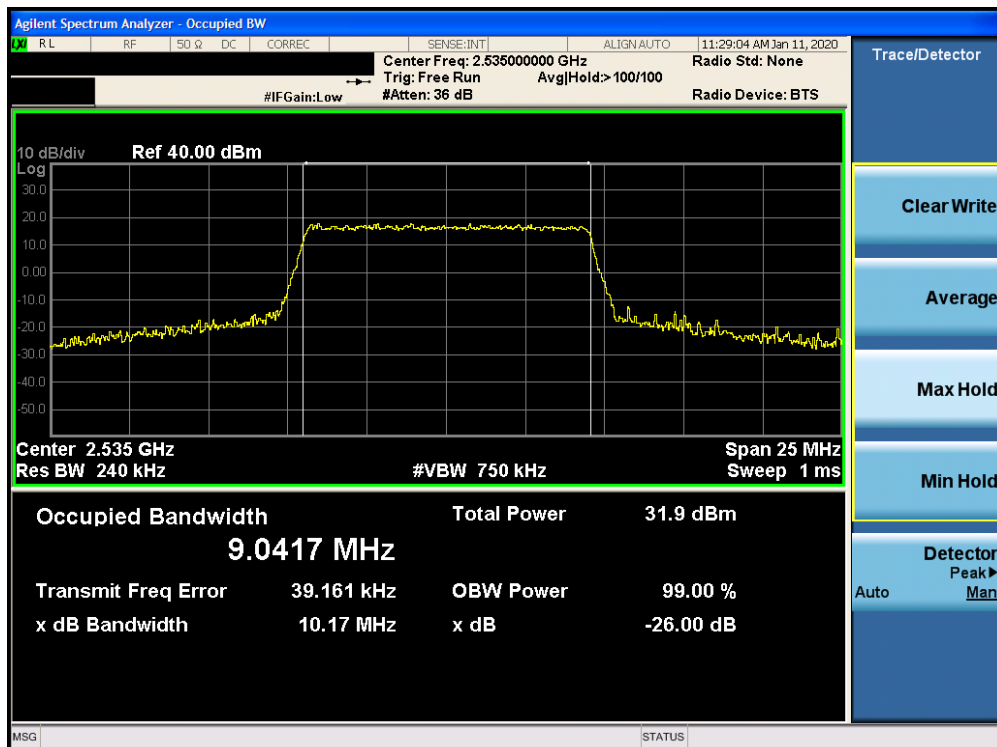


Plot 7-88. Occupied Bandwidth Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 66 of 423

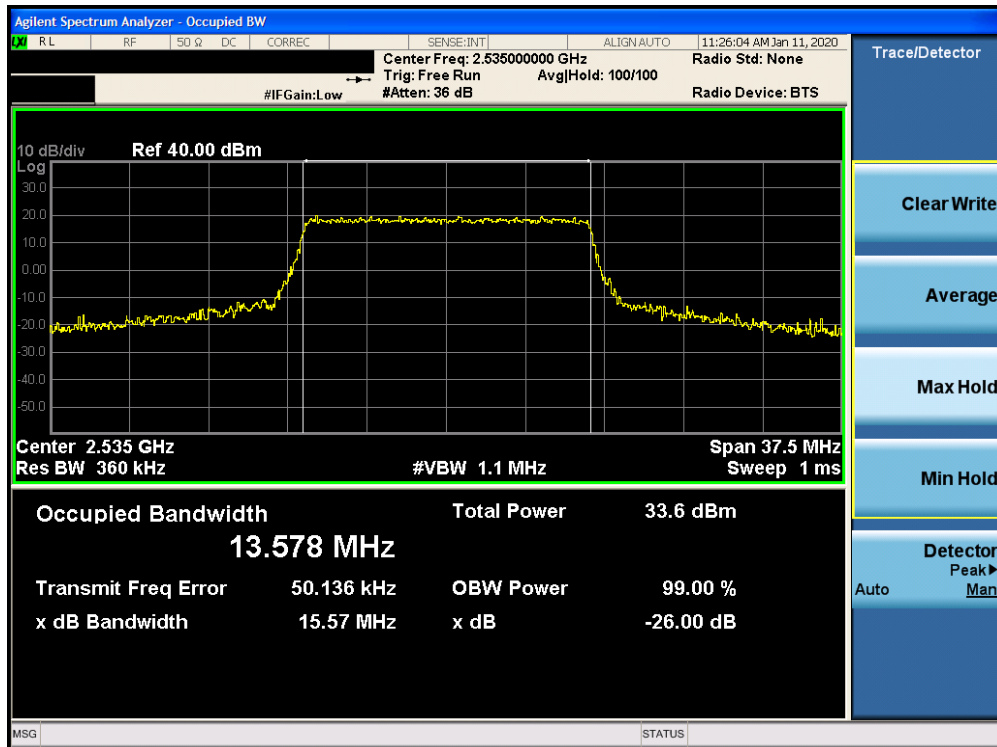


Plot 7-89. Occupied Bandwidth Plot (Band 7 – 10.0MHz 16-QAM – RB Size 50)

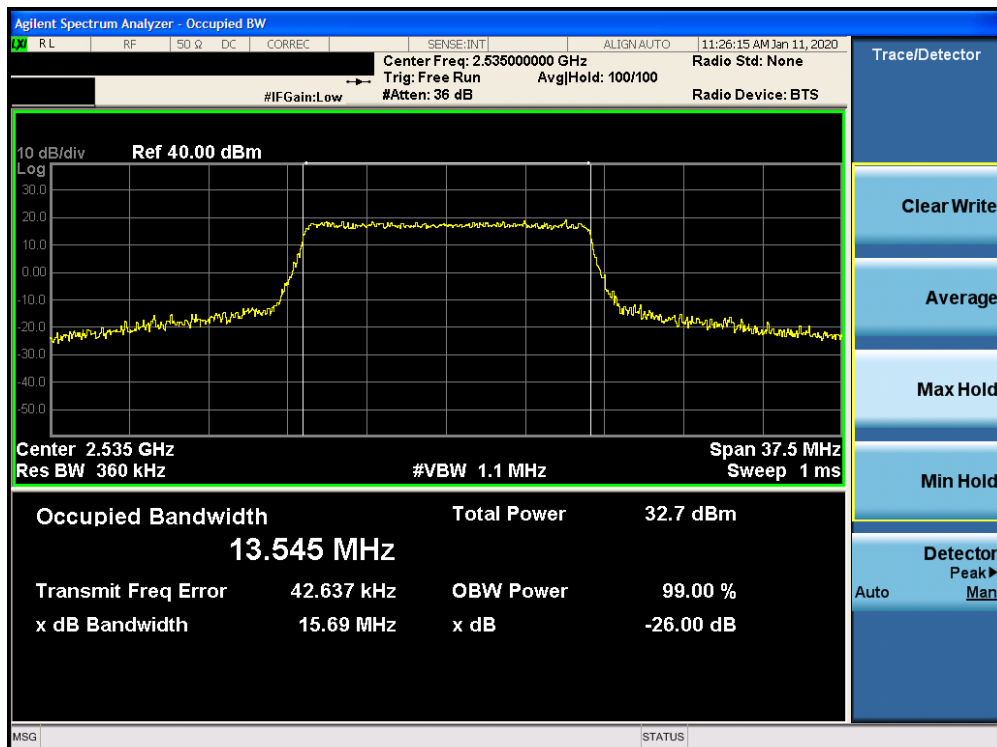


Plot 7-90. Occupied Bandwidth Plot (Band 7 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 67 of 423

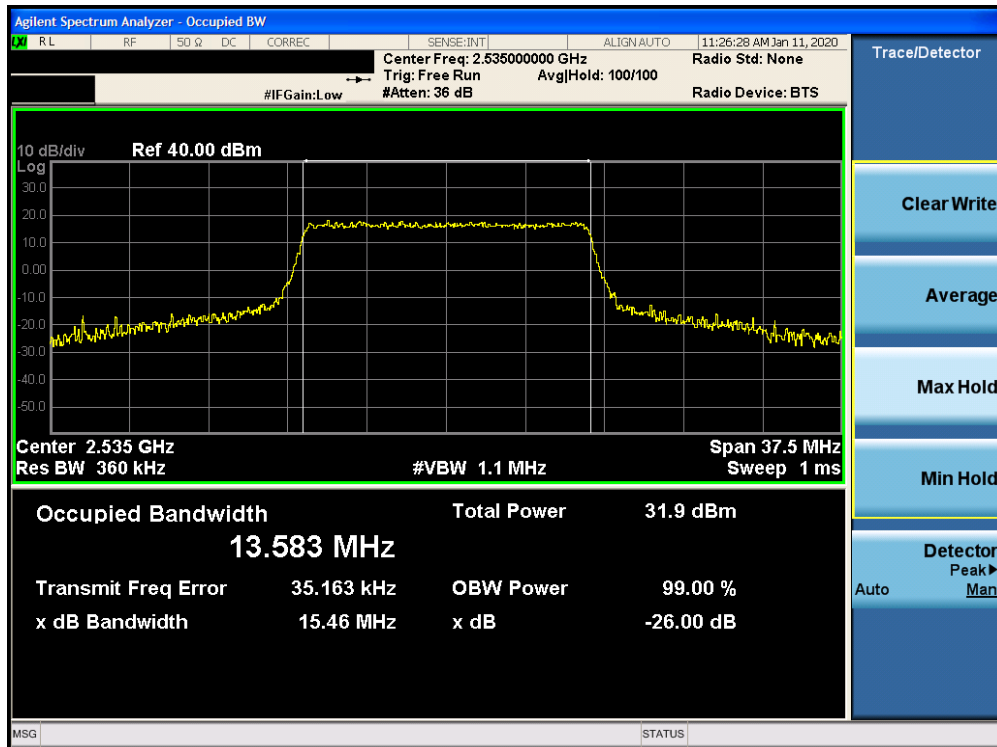


Plot 7-91. Occupied Bandwidth Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

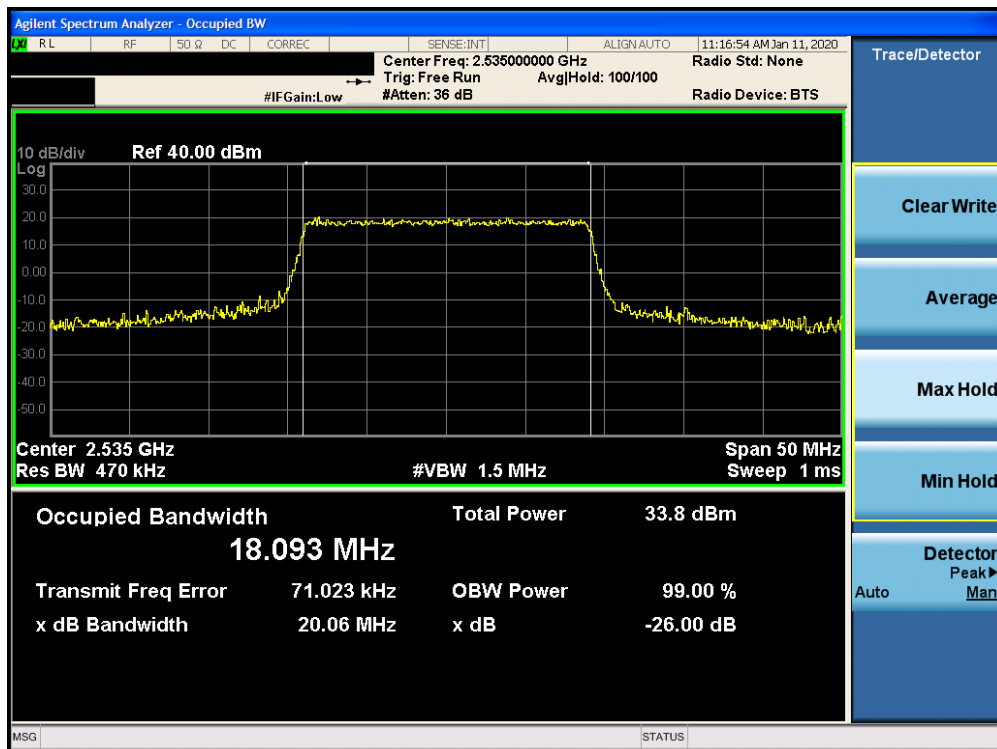


Plot 7-92. Occupied Bandwidth Plot (Band 7 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: BCGA2069	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 68 of 423

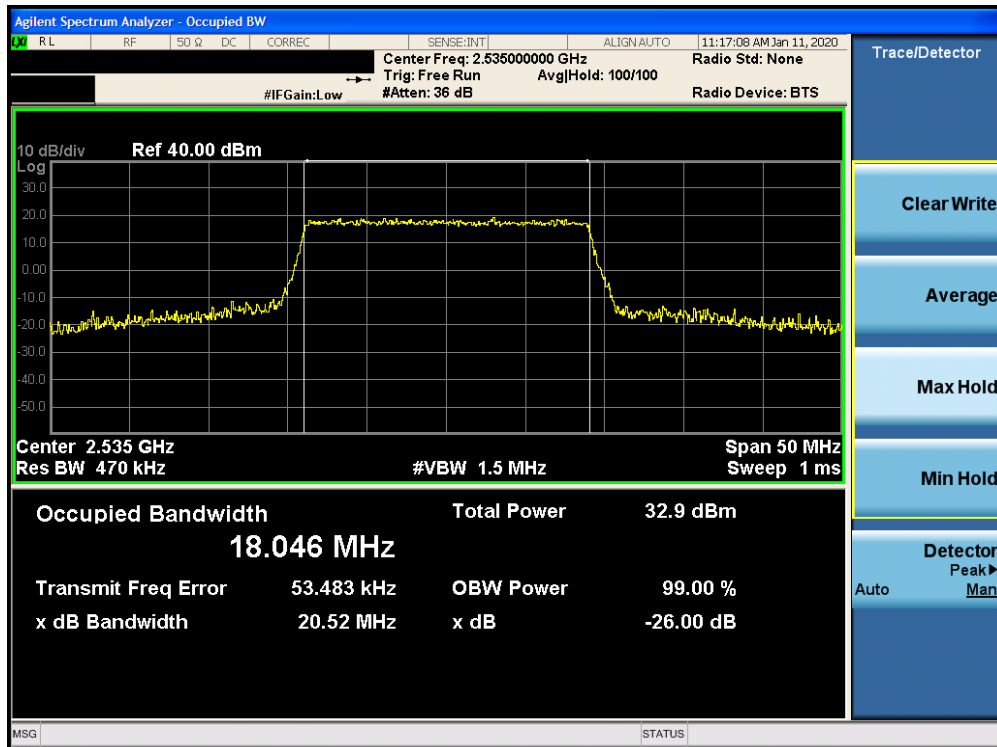


Plot 7-93. Occupied Bandwidth Plot (Band 7 – 15.0MHz 64-QAM – RB Size 75)

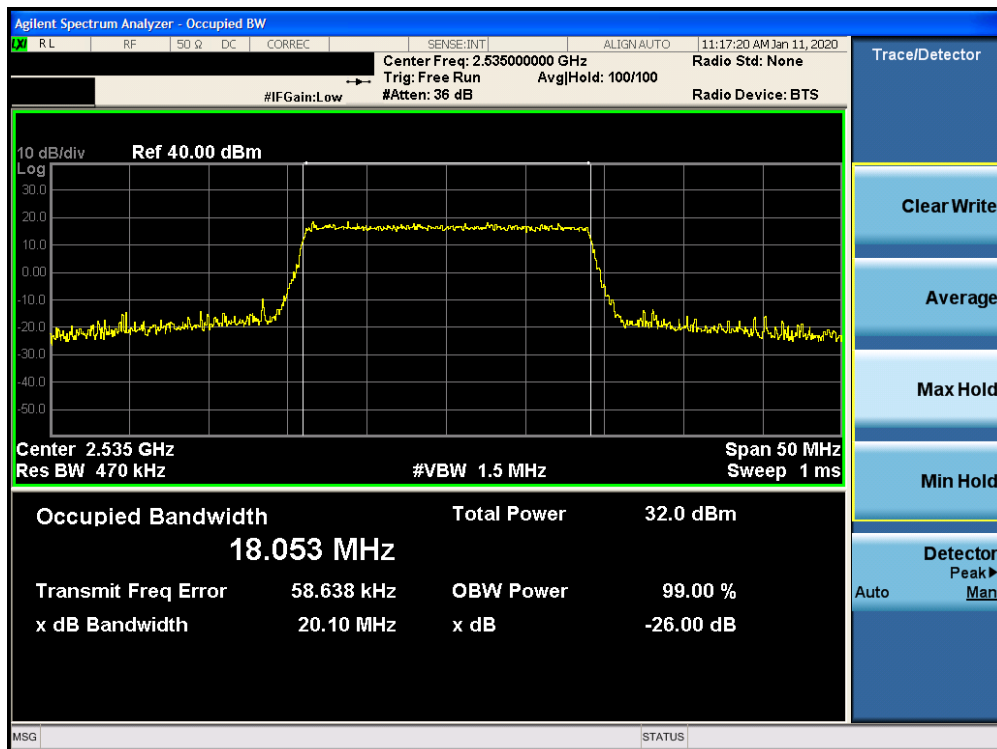


Plot 7-94. Occupied Bandwidth Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 69 of 423



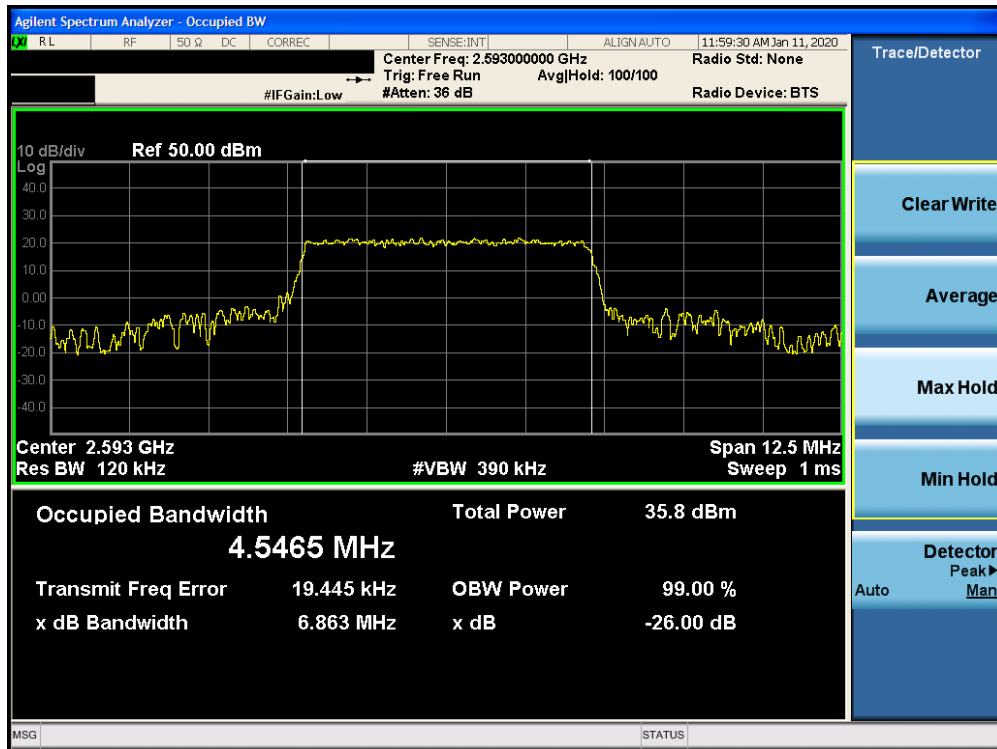
Plot 7-95. Occupied Bandwidth Plot (Band 7 – 20.0MHz 16-QAM – RB Size 100)



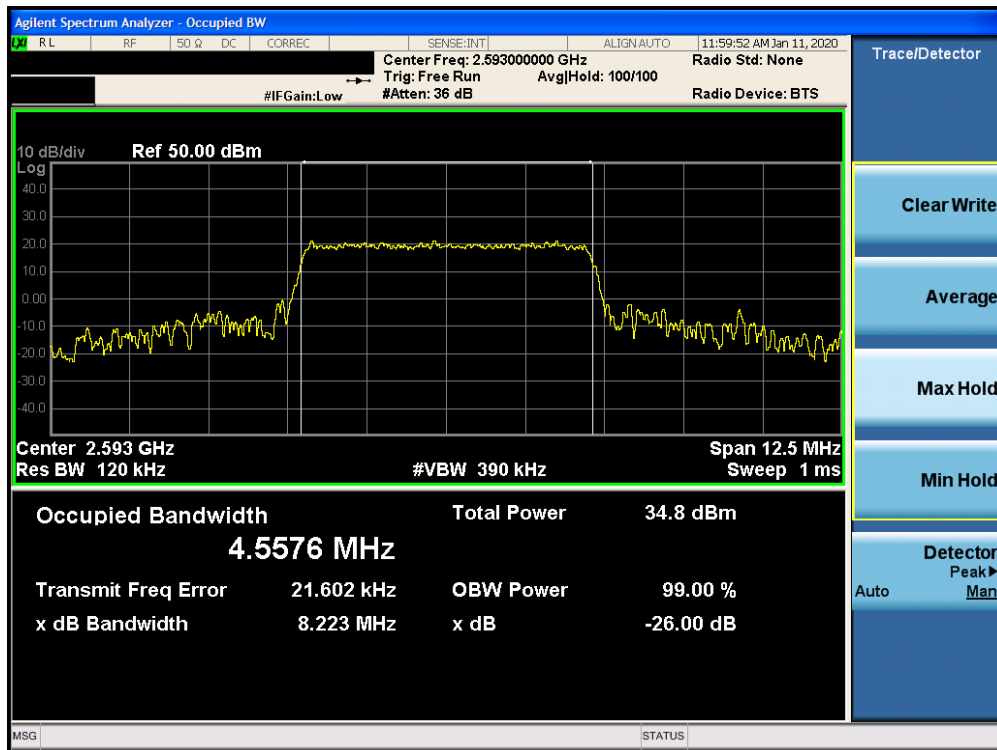
Plot 7-96. Occupied Bandwidth Plot (Band 7 – 20.0MHz 64-QAM – RB Size 100)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 70 of 423

Band 41

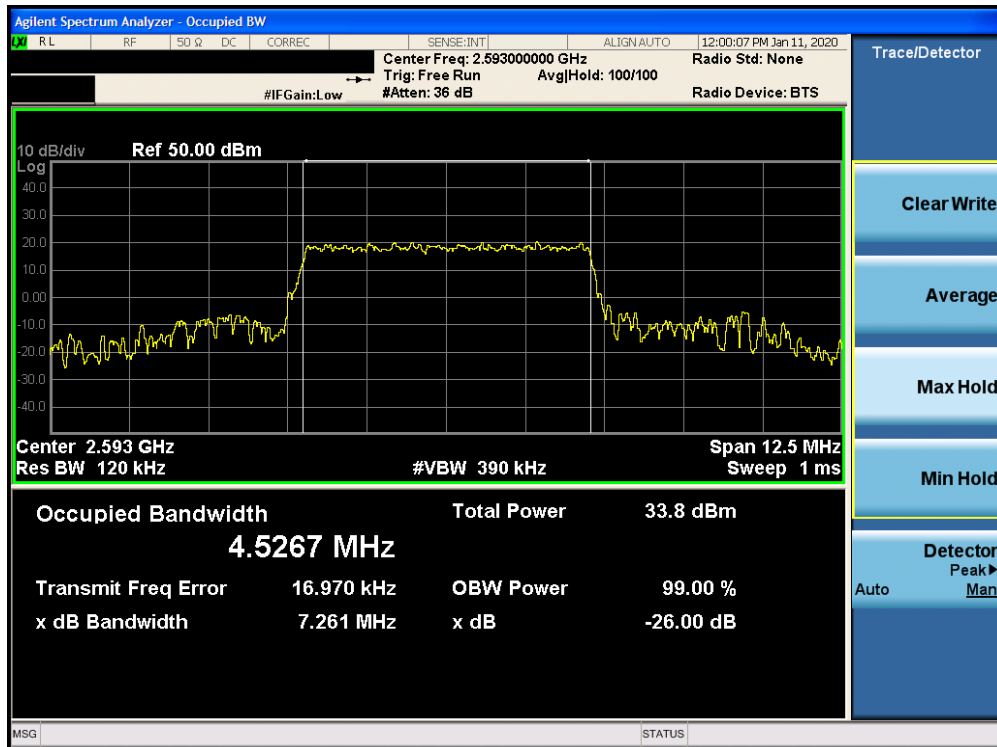


Plot 7-97. Occupied Bandwidth Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

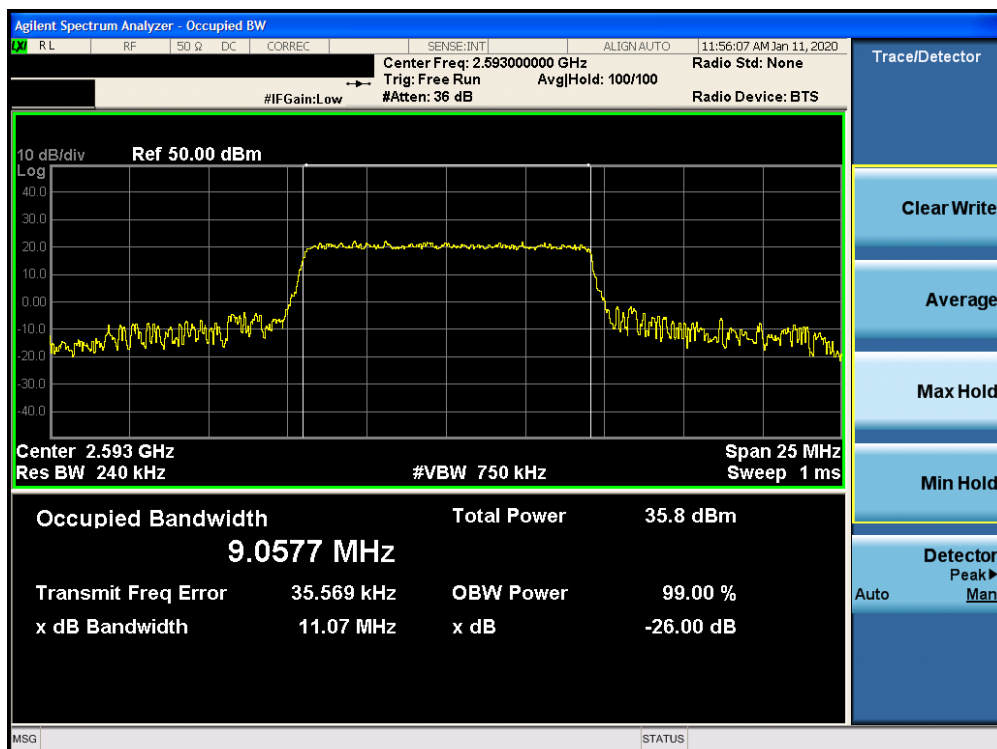


Plot 7-98. Occupied Bandwidth Plot (Band 41 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 71 of 423

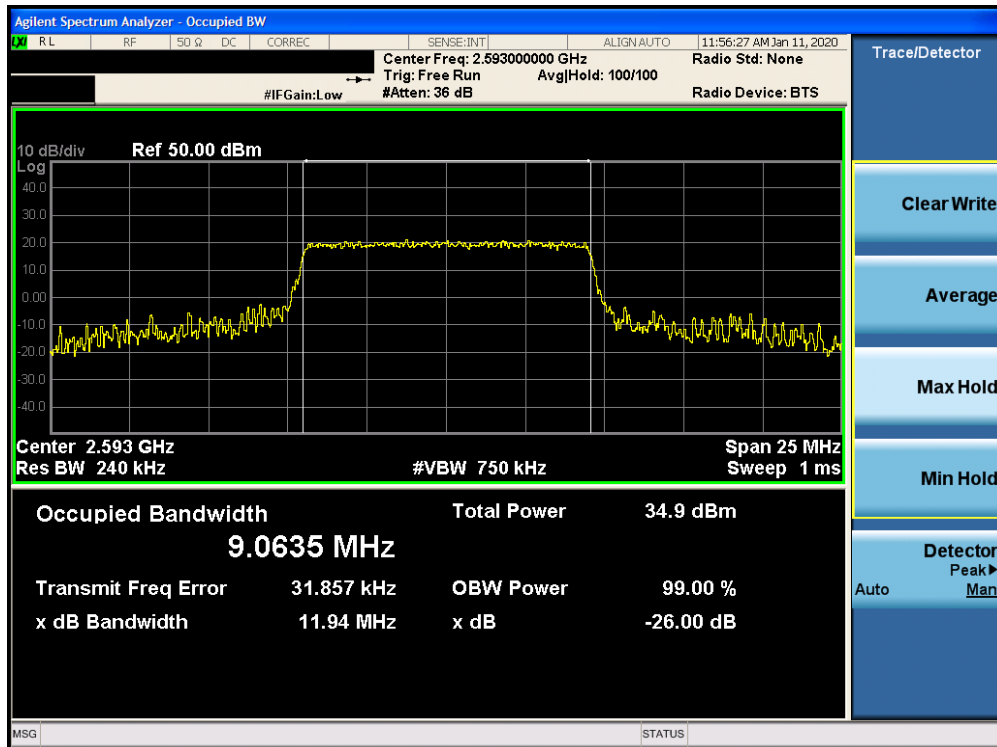


Plot 7-99. Occupied Bandwidth Plot (Band 41 – 5.0MHz 64-QAM – RB Size 25)

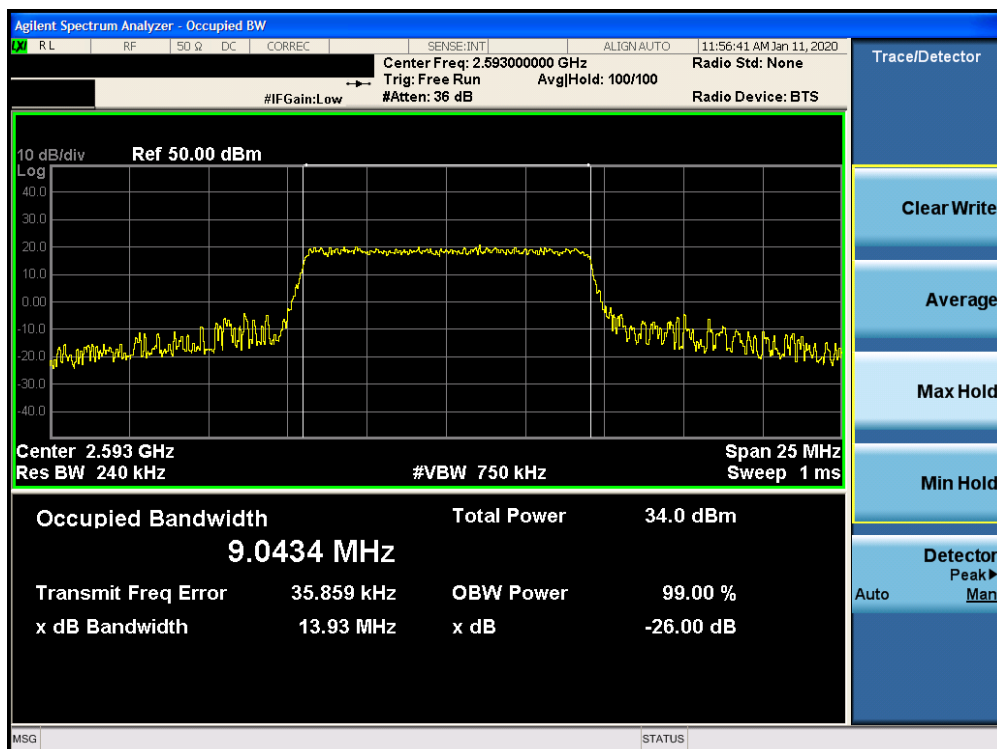


Plot 7-100. Occupied Bandwidth Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 72 of 423

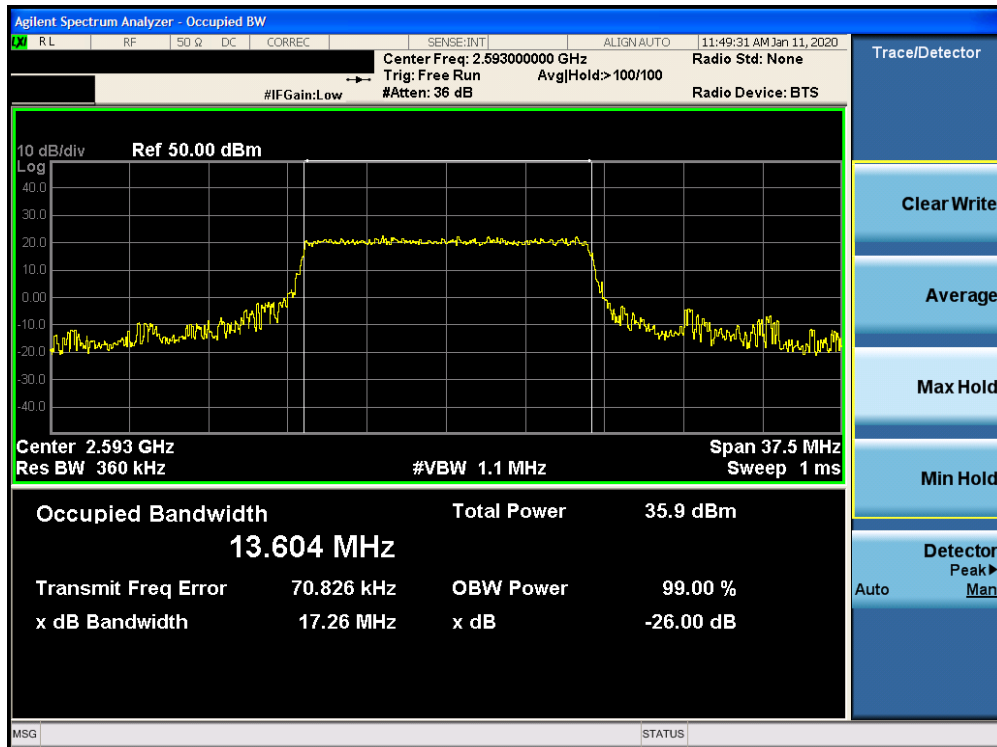


Plot 7-101. Occupied Bandwidth Plot (Band 41 – 10.0MHz 16-QAM – RB Size 50)

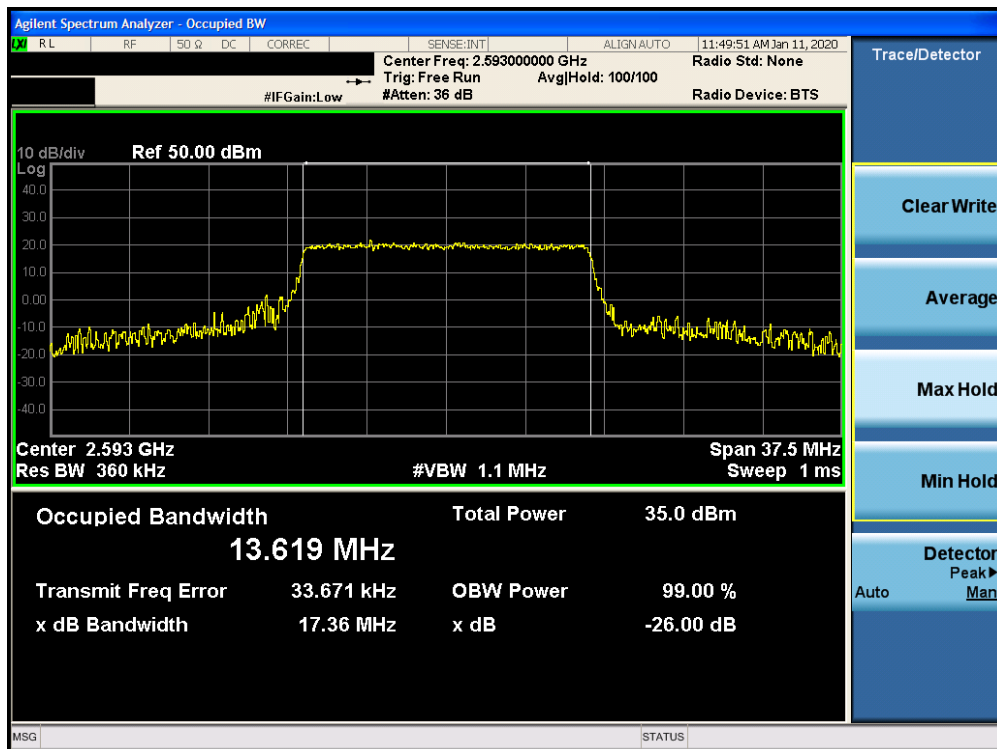


Plot 7-102. Occupied Bandwidth Plot (Band 41 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 73 of 423



Plot 7-103. Occupied Bandwidth Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



Plot 7-104. Occupied Bandwidth Plot (Band 41 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: BCGA2069		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170054-03.BCG	Test Dates: 12/10/2019 - 02/24/2020	EUT Type: Tablet Device	Page 74 of 423