

PART 27 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

05/30/2022 - 09/13/2022

Test Site/Location:

Element Washington DC LLC Morgan Hill, CA, USA

Test Report Serial No.:

1C2205090023-03.BCG

FCC ID:

BCGA2757

APPLICANT:

Apple Inc.

Application Type:

Certification

Model:

A2757(A2777)

EUT Type:

Tablet Device

FCC Classification:

PCS Licensed Transmitter (PCB)

FCC Rule Part:

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.

RJ Ortanez
Executive Vice President




FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device
		Page 1 of 315

V2.1 11/9/2021

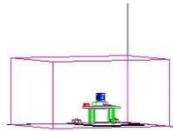
TABLE OF CONTENTS

1.0	INTRODUCTION	7
1.1	Scope	7
1.2	Element Washington DC LLC Test Location	7
1.3	Test Facility / Accreditations.....	7
2.0	PRODUCT INFORMATION.....	8
2.1	Equipment Description	8
2.2	Device Capabilities.....	8
2.3	Antenna Description	9
2.4	Test Support Equipment.....	9
2.5	Test Configuration	10
2.6	Software and Firmware	10
2.7	EMI Suppression Device(s)/Modifications	10
3.0	DESCRIPTION OF TESTS	11
3.1	Evaluation Procedure	11
3.2	Radiated Spurious Emissions	11
4.0	MEASUREMENT UNCERTAINTY	12
5.0	TEST EQUIPMENT CALIBRATION DATA	13
6.0	SAMPLE CALCULATIONS	14
7.0	TEST RESULTS.....	15
7.1	Summary.....	15
7.2	Occupied Bandwidth	17
7.3	Spurious and Harmonic Emissions at Antenna Terminal	86
7.4	Band Edge Emissions at Antenna Terminal	130
7.5	Peak-Average Ratio	193
7.6	Radiated Power (ERP/EIRP).....	234
7.7	Radiated Spurious Emissions	268
7.8	Frequency Stability / Temperature Variation	306
8.0	CONCLUSION.....	315

FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 2 of 315

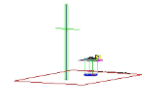
V2.1 11/9/2021

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MEASUREMENT REPORT

FCC Part 27



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	ERP		EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
LTE Band 71	5 MHz	QPSK	665.5 - 695.5	4.5488	0.157	21.95	0.257	24.10	4M55G7W
		16QAM	665.5 - 695.5	4.5258	0.133	21.24	0.218	23.39	4M53D7W
		64QAM	665.5 - 695.5	4.5358	0.108	20.33	0.177	22.48	4M54D7W
		256QAM	665.5 - 695.5	4.5288	0.053	17.22	0.086	19.37	4M53D7W
	10 MHz	QPSK	668.0 - 693.0	9.0184	0.157	21.95	0.257	24.10	9M02G7W
		16QAM	668.0 - 693.0	9.0203	0.134	21.27	0.220	23.42	9M02D7W
		64QAM	668.0 - 693.0	9.0070	0.113	20.54	0.186	22.69	9M01D7W
		256QAM	668.0 - 693.0	9.0080	0.056	17.51	0.092	19.66	9M01D7W
	15 MHz	QPSK	670.5 - 690.5	13.4760	0.157	21.95	0.257	24.10	13M5G7W
		16QAM	670.5 - 690.5	13.4992	0.129	21.10	0.211	23.25	13M5D7W
		64QAM	670.5 - 690.5	13.4679	0.114	20.56	0.187	22.71	13M5D7W
		256QAM	670.5 - 690.5	13.4933	0.055	17.41	0.090	19.56	13M5D7W
	20 MHz	QPSK	673.0 - 688.0	17.9763	0.157	21.95	0.257	24.10	18M0G7W
		16QAM	673.0 - 688.0	17.9657	0.132	21.19	0.216	23.34	18M0D7W
		64QAM	673.0 - 688.0	18.0081	0.116	20.64	0.190	22.79	18M0D7W
		256QAM	673.0 - 688.0	17.9778	0.054	17.36	0.089	19.51	18M0D7W
LTE Band 12	1.4 MHz	QPSK	699.7 - 715.3	1.1000	0.172	22.35	0.282	24.50	1M10G7W
		16QAM	699.7 - 715.3	1.1071	0.137	21.38	0.225	23.53	1M11D7W
		64QAM	699.7 - 715.3	1.0893	0.120	20.79	0.197	22.94	1M09D7W
		256QAM	699.7 - 715.3	1.0939	0.059	17.73	0.097	19.88	1M09D7W
	3 MHz	QPSK	700.5 - 714.5	2.7176	0.172	22.35	0.282	24.50	2M72G7W
		16QAM	700.5 - 714.5	2.7144	0.148	21.70	0.243	23.85	2M71D7W
		64QAM	700.5 - 714.5	2.7188	0.125	20.97	0.205	23.12	2M72D7W
		256QAM	700.5 - 714.5	2.7145	0.062	17.95	0.102	20.10	2M71D7W
	5 MHz	QPSK	701.5 - 713.5	4.5671	0.172	22.35	0.282	24.50	4M57G7W
		16QAM	701.5 - 713.5	4.5282	0.143	21.55	0.234	23.70	4M53D7W
		64QAM	701.5 - 713.5	4.5476	0.117	20.69	0.192	22.84	4M55D7W
		256QAM	701.5 - 713.5	4.5263	0.058	17.66	0.096	19.81	4M53D7W
	10 MHz	QPSK	704.0 - 711.0	8.9982	0.172	22.35	0.282	24.50	9M00G7W
		16QAM	704.0 - 711.0	9.0226	0.146	21.65	0.240	23.80	9M02D7W
		64QAM	704.0 - 711.0	9.0007	0.122	20.88	0.201	23.03	9M00D7W
		256QAM	704.0 - 711.0	8.9801	0.061	17.83	0.100	19.98	8M98D7W
LTE Band 17	5 MHz	QPSK	706.5 - 713.5	4.5671	0.172	22.35	0.282	24.50	4M57G7W
		16QAM	706.5 - 713.5	4.5282	0.146	21.63	0.239	23.78	4M53D7W
		64QAM	706.5 - 713.5	4.5476	0.117	20.70	0.193	22.85	4M55D7W
		256QAM	706.5 - 713.5	4.5263	0.058	17.63	0.095	19.78	4M53D7W
	10 MHz	QPSK	709.0 - 711.0	8.9982	0.172	22.35	0.282	24.50	9M00G7W
		16QAM	709.0 - 711.0	9.0226	0.145	21.61	0.238	23.76	9M02D7W
		64QAM	709.0 - 711.0	9.0007	0.126	21.01	0.207	23.16	9M00D7W
		256QAM	709.0 - 711.0	8.9801	0.063	17.96	0.103	20.11	8M98D7W
LTE Band 13	5 MHz	QPSK	779.5 - 784.5	4.5389	0.172	22.35	0.282	24.50	4M54G7W
		16QAM	779.5 - 784.5	4.5189	0.156	21.94	0.256	24.09	4M52D7W
		64QAM	779.5 - 784.5	4.5385	0.123	20.90	0.202	23.05	4M54D7W
		256QAM	779.5 - 784.5	4.5115	0.058	17.67	0.096	19.82	4M51D7W
	10 MHz	QPSK	782.0	8.9854	0.172	22.35	0.282	24.50	8M99G7W
		16QAM	782.0	9.0121	0.137	21.37	0.225	23.52	9M01D7W
		64QAM	782.0	9.0108	0.114	20.58	0.187	22.73	9M01D7W
		256QAM	782.0	8.9803	0.059	17.73	0.097	19.88	8M98D7W

Overview Table (<1GHz Band)


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Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 3 of 315

V2.1 11/9/2021

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	ERP		EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
NR Band n71	5 MHz	$\pi/2$ BPSK	665.5 - 695.5	4.4864	0.157	21.95	0.257	24.10	4M49G7W
		QPSK	665.5 - 695.5	4.5276	0.148	21.70	0.243	23.85	4M53G7W
		16QAM	665.5 - 695.5	4.5390	0.119	20.76	0.196	22.91	4M54D7W
		64QAM	665.5 - 695.5	4.5091	0.088	19.44	0.144	21.59	4M51D7W
		256QAM	665.5 - 695.5	4.5141	0.055	17.41	0.090	19.56	4M51D7W
	10 MHz	$\pi/2$ BPSK	668.0 - 693.0	8.9986	0.157	21.95	0.257	24.10	9M00G7W
		QPSK	668.0 - 693.0	9.3400	0.150	21.77	0.247	23.92	9M34G7W
		16QAM	668.0 - 693.0	9.3203	0.118	20.71	0.193	22.86	9M32D7W
		64QAM	668.0 - 693.0	9.3433	0.085	19.29	0.139	21.44	9M34D7W
		256QAM	668.0 - 693.0	9.3180	0.059	17.70	0.097	19.85	9M32D7W
	15 MHz	$\pi/2$ BPSK	670.5 - 690.5	13.5078	0.157	21.95	0.257	24.10	13M5G7W
		QPSK	670.5 - 690.5	14.1917	0.150	21.77	0.247	23.92	14M2G7W
		16QAM	670.5 - 690.5	14.1630	0.133	21.25	0.219	23.40	14M2D7W
		64QAM	670.5 - 690.5	14.2033	0.090	19.56	0.148	21.71	14M2D7W
		256QAM	670.5 - 690.5	14.1580	0.057	17.57	0.094	19.72	14M2D7W
	20 MHz	$\pi/2$ BPSK	673.0 - 688.0	17.9712	0.157	21.95	0.257	24.10	18M0G7W
		QPSK	673.0 - 688.0	18.9542	0.147	21.67	0.241	23.82	19M0G7W
		16QAM	673.0 - 688.0	18.9891	0.125	20.98	0.205	23.13	19M0D7W
		64QAM	673.0 - 688.0	19.0347	0.086	19.32	0.140	21.47	19M0D7W
		256QAM	673.0 - 688.0	18.9797	0.055	17.37	0.089	19.52	19M0D7W
NR Band n12	5 MHz	$\pi/2$ BPSK	701.5 - 713.5	4.5049	0.167	22.24	0.275	24.39	4M50G7W
		QPSK	701.5 - 713.5	4.5049	0.172	22.35	0.282	24.50	4M50G7W
		16QAM	701.5 - 713.5	4.5180	0.135	21.31	0.222	23.46	4M52D7W
		64QAM	701.5 - 713.5	4.5125	0.101	20.05	0.166	22.20	4M51D7W
		256QAM	701.5 - 713.5	4.5336	0.060	17.76	0.098	19.91	4M53D7W
	10 MHz	$\pi/2$ BPSK	704.0 - 711.0	8.9851	0.171	22.33	0.280	24.48	8M99G7W
		QPSK	704.0 - 711.0	9.3017	0.172	22.35	0.282	24.50	9M30G7W
		16QAM	704.0 - 711.0	9.3150	0.146	21.64	0.239	23.79	9M32D7W
		64QAM	704.0 - 711.0	9.3128	0.097	19.88	0.160	22.03	9M31D7W
		256QAM	704.0 - 711.0	9.2744	0.069	18.42	0.114	20.57	9M27D7W
	15 MHz	$\pi/2$ BPSK	706.5 - 708.5	13.5217	0.170	22.30	0.278	24.45	13M5G7W
		QPSK	706.5 - 708.5	14.1851	0.172	22.35	0.282	24.50	14M2G7W
		16QAM	706.5 - 708.5	14.1507	0.138	21.41	0.227	23.56	14M2D7W
		64QAM	706.5 - 708.5	14.1882	0.101	20.03	0.165	22.18	14M2D7W
		256QAM	706.5 - 708.5	14.1391	0.063	18.01	0.104	20.16	14M1D7W


Overview Table (<1GHz Band)

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Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 4 of 315

V2.1 11/9/2021

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	PAR at 0.1% [dB]	EIRP		Emission Designator
						Max. Power [W]	Max. Power [dBm]	
WCDMA1700	5 MHz	Spread Spectrum	1712.4 - 1752.6	4.1717	2.85	0.501	27.00	4M17F9W
LTE Band 4	1.4 MHz	QPSK	1710.7 - 1754.3	1.1008	5.44	0.501	27.00	1M10G7W
		16QAM	1710.7 - 1754.3	1.1001	6.17	0.383	25.83	1M10D7W
		64QAM	1710.7 - 1754.3	1.0922	6.93	0.312	24.94	1M09D7W
		256QAM	1710.7 - 1754.3	1.0921	6.90	0.180	22.55	1M09D7W
	3 MHz	QPSK	1711.5 - 1753.5	2.7162	5.22	0.501	27.00	2M72G7W
		16QAM	1711.5 - 1753.5	2.7211	6.14	0.433	26.36	2M72D7W
		64QAM	1711.5 - 1753.5	2.7189	6.82	0.370	25.68	2M72D7W
		256QAM	1711.5 - 1753.5	2.7143	7.04	0.181	22.57	2M71D7W
	5 MHz	QPSK	1712.5 - 1752.5	4.5690	5.37	0.501	27.00	4M57G7W
		16QAM	1712.5 - 1752.5	4.5269	5.98	0.434	26.37	4M53D7W
		64QAM	1712.5 - 1752.5	4.5429	6.70	0.331	25.20	4M54D7W
		256QAM	1712.5 - 1752.5	4.5484	7.00	0.173	22.38	4M55D7W
	10MHz	QPSK	1715.0 - 1750.0	9.0186	5.32	0.501	27.00	9M02G7W
		16QAM	1715.0 - 1750.0	9.0240	6.07	0.432	26.35	9M02D7W
		64QAM	1715.0 - 1750.0	9.0059	6.63	0.364	25.61	9M01D7W
		256QAM	1715.0 - 1750.0	8.9902	7.11	0.182	22.61	8M99D7W
	15 MHz	QPSK	1717.5 - 1747.5	13.5038	5.57	0.501	27.00	13M5G7W
		16QAM	1717.5 - 1747.5	13.5103	6.16	0.416	26.19	13M5D7W
		64QAM	1717.5 - 1747.5	13.5032	6.68	0.364	25.61	13M5D7W
		256QAM	1717.5 - 1747.5	13.4939	7.34	0.179	22.53	13M5D7W
	20 MHz	QPSK	1720.0 - 1745.0	18.0091	5.23	0.501	27.00	18M0G7W
		16QAM	1720.0 - 1745.0	17.9898	6.06	0.423	26.26	18M0D7W
		64QAM	1720.0 - 1745.0	17.9909	6.64	0.372	25.70	18M0D7W
		256QAM	1720.0 - 1745.0	17.9757	6.76	0.172	22.36	18M0D7W
LTE Band 66	1.4 MHz	QPSK	1710.7 - 1779.3	1.1008	5.54	0.501	27.00	1M10G7W
		16QAM	1710.7 - 1779.3	1.1001	6.28	0.406	26.08	1M10D7W
		64QAM	1710.7 - 1779.3	1.0922	6.86	0.349	25.43	1M09D7W
		256QAM	1710.7 - 1779.3	1.0921	6.85	0.218	23.38	1M09D7W
	3 MHz	QPSK	1711.5 - 1778.5	2.7162	5.20	0.501	27.00	2M72G7W
		16QAM	1711.5 - 1778.5	2.7211	6.17	0.443	26.46	2M72D7W
		64QAM	1711.5 - 1778.5	2.7189	6.73	0.373	25.72	2M72D7W
		256QAM	1711.5 - 1778.5	2.7143	7.12	0.219	23.40	2M71D7W
	5 MHz	QPSK	1712.5 - 1777.5	4.5690	5.32	0.501	27.00	4M57G7W
		16QAM	1712.5 - 1777.5	4.5269	6.09	0.426	26.29	4M53D7W
		64QAM	1712.5 - 1777.5	4.5429	6.75	0.338	25.29	4M54D7W
		256QAM	1712.5 - 1777.5	4.5484	6.68	0.211	23.24	4M55D7W
	10 MHz	QPSK	1715.0 - 1775.0	9.0186	5.28	0.501	27.00	9M02G7W
		16QAM	1715.0 - 1775.0	9.0240	6.05	0.434	26.37	9M02D7W
		64QAM	1715.0 - 1775.0	9.0059	6.69	0.368	25.66	9M01D7W
		256QAM	1715.0 - 1775.0	8.9902	7.09	0.219	23.40	8M99D7W
	15 MHz	QPSK	1717.5 - 1772.5	13.5038	5.56	0.501	27.00	13M5G7W
		16QAM	1717.5 - 1772.5	13.5103	6.23	0.421	26.24	13M5D7W
		64QAM	1717.5 - 1772.5	13.5032	6.72	0.372	25.71	13M5D7W
		256QAM	1717.5 - 1772.5	13.4939	6.75	0.182	22.60	13M5D7W
	20 MHz	QPSK	1720.0 - 1770.0	18.0091	5.28	0.501	27.00	18M0G7W
		16QAM	1720.0 - 1770.0	17.9898	6.04	0.423	26.26	18M0D7W
		64QAM	1720.0 - 1770.0	17.9909	6.67	0.376	25.75	18M0D7W
		256QAM	1720.0 - 1770.0	17.9757	6.81	0.173	22.39	18M0D7W

Overview Table (>1GHz Bands)


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Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 5 of 315

V2.1 11/9/2021

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	PAR at 0.1% [dB]	EIRP		Emission Designator
						Max. Power [W]	Max. Power [dBm]	
ULCA Band 66	20 + 20 MHz	QPSK	1720.0 - 1770.0	37.7621	-	0.492	26.92	37M8G7W
		16QAM	1720.0 - 1770.0	37.7801	-	0.261	24.17	37M8D7W
		64QAM	1720.0 - 1770.0	37.6948	-	0.252	24.01	37M7D7W
		256QAM	1720.0 - 1770.0	37.6932	-	0.160	22.05	37M7D7W
NR Band n66	5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	4.5411	4.22	0.501	27.00	4M54G7W
		QPSK	1712.5 - 1777.5	4.5047	5.49	0.490	26.91	4M50G7W
		16QAM	1712.5 - 1777.5	4.5183	6.34	0.432	26.36	4M52D7W
		64QAM	1712.5 - 1777.5	4.5169	6.55	0.295	24.70	4M52D7W
		256QAM	1712.5 - 1777.5	4.5405	6.47	0.175	22.42	4M54D7W
	10 MHz	$\pi/2$ BPSK	1715.0 - 1775.0	8.9858	3.97	0.501	27.00	8M99G7W
		QPSK	1715.0 - 1775.0	9.3300	5.45	0.496	26.95	9M33G7W
		16QAM	1715.0 - 1775.0	9.3539	6.40	0.399	26.01	9M35D7W
		64QAM	1715.0 - 1775.0	9.3805	6.64	0.290	24.63	9M38D7W
		256QAM	1715.0 - 1775.0	9.3108	6.79	0.182	22.59	9M31D7W
	15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	13.5150	4.11	0.487	26.87	13M5G7W
		QPSK	1717.5 - 1772.5	14.1737	5.47	0.501	27.00	14M2G7W
		16QAM	1717.5 - 1772.5	14.2047	6.43	0.414	26.17	14M2D7W
		64QAM	1717.5 - 1772.5	14.1945	6.52	0.288	24.59	14M2D7W
		256QAM	1717.5 - 1772.5	14.1907	6.64	0.178	22.50	14M2D7W
	20 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	17.9599	3.93	0.485	26.86	18M0G7W
		QPSK	1720.0 - 1770.0	19.0224	5.42	0.501	27.00	19M0G7W
		16QAM	1720.0 - 1770.0	18.9769	6.22	0.415	26.18	19M0D7W
		64QAM	1720.0 - 1770.0	19.0192	6.51	0.274	24.38	19M0D7W
		256QAM	1720.0 - 1770.0	18.9685	6.65	0.167	22.24	19M0D7W
	30 MHz	$\pi/2$ BPSK	1725.0 - 1765.0	28.7524	3.83	0.501	27.00	28M8G7W
		QPSK	1725.0 - 1765.0	28.7397	5.44	0.500	26.99	28M7G7W
		16QAM	1725.0 - 1765.0	28.7518	6.35	0.396	25.98	28M8D7W
		64QAM	1725.0 - 1765.0	28.7535	6.51	0.273	24.36	28M8D7W
		256QAM	1725.0 - 1765.0	28.6793	6.64	0.167	22.22	28M7D7W
	40 MHz	$\pi/2$ BPSK	1730.0 - 1760.0	38.5021	3.96	0.501	27.00	38M5G7W
		QPSK	1730.0 - 1760.0	38.7077	5.45	0.487	26.87	38M7G7W
		16QAM	1730.0 - 1760.0	38.6294	6.26	0.437	26.40	38M6D7W
		64QAM	1730.0 - 1760.0	38.7349	6.58	0.293	24.66	38M7D7W
		256QAM	1730.0 - 1760.0	38.5387	6.65	0.180	22.55	38M5D7W

Overview Table (>1GHz Bands)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 6 of 315

V2.1 11/9/2021

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.


1.2 Element Washington DC LLC Test Location

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

1.3 Test Facility / Accreditations

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

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Washington DC LLC facility is a registered (22831) test laboratory with the site description on file with ISED.

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device
		Page 7 of 315

V2.1 11/9/2021

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2757**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: P6CR9617VV, HHKX91H60W, 220526CA04

2.2 Device Capabilities

This device contains the following capabilities:

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

This device supports BT Beamforming

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

Antenna	Simultaneous Tx Config	WiFi 2.4GHz	Bluetooth	WiFi 5GHz	WCDMA / LTE / FR1 NR		
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE1/2M	802.11 a/n/ac/ax	Mid Band	High Band	Ultra High Band
3a	Config 1	✗	✓	✓	✗	✗	✗
3a	Config 2	✓	✗	✗	✓	✗	✗
3a	Config 3	✓	✗	✗	✗	✓	✗
3a	Config 4	✗	✓	✓	✓	✗	✗
3a	Config 5	✗	✓	✓	✗	✓	✗
1b	Config 6	✗	✗	✓	✓	✗	✗
1b	Config 7	✗	✗	✓	✗	✓	✗
1a	Config 8	✓	✗	✗	✗	✗	✓
1a	Config 9	✗	✓	✗	✗	✗	✓


Table 2-1. Simultaneous Transmission Configurations

✓ = Support; ✗ = Not Support

Note:

All the above simultaneous transmission configurations have been tested and the worst case configuration was found to be Config 3 and reported in RF WLAN and RF Part 27b reports.

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

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 8 of 315

V2.1 11/9/2021

2.3 Antenna Description

Following antenna gains provided by manufacturer were used for testing.


Band	Antenna Gain [dBi]				
	Antenna 1b	Antenna 2b	Antenna 3a	Antenna 3b	Antenna 4
LTE Band 12/17				-2.6	-1.2
NR Band 12					
LTE Band 13				-2.5	-1.2
LTE Band 4/66	-1.2	-1.7	0.1		1.3
NR Band 66					
LTE Band 71				-2.9	-1.6
NR Band 71					
WCDMA1700	-1.2	-1.7	0.1		1.3

Table 2-2. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple MacBook Pro	Model: A2141	S/N: C02DV7VKMD6T
	w/AC/DC Adapter	Model: A2166	S/N: N/A
2	Apple USB-C Cable	Model: Spartan	S/N: 000MKTR02U
3	USB-C Cable	Model: A246	S/N: N/A
	w/ AC Adapter	Model: A2305	S/N: N/A
4	DC Power Supply	Model: KPS3010D	S/N: N/A

Table 2-3. Test Support Equipment

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 9 of 315

V2.1 11/9/2021

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2.5 Test Configuration

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

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


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

2.6 Software and Firmware

The test was conducted with firmware version 20A32640u 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: BCGA2757	 PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device
		Page 10 of 315

V2.1 11/9/2021

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI C63.26-2015/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

3.2 Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{[\text{dB}\mu\text{V/m}]} = \text{Measured amplitude level}_{[\text{dBm}]} + 107 + \text{Cable Loss}_{[\text{dB}]} + \text{Antenna Factor}_{[\text{dB/m}]}$$


And

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

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

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

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


FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 11 of 315

V2.1 11/9/2021

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (\pm dB)
Conducted Bench Top Measurements	1.77
Radiated Disturbance (<30MHz)	4.38
Radiated Disturbance (30MHz-1GHz)	4.75
Radiated Disturbance (1-18GHz)	5.20
Radiated Disturbance (>18GHz)	4.72

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device
		Page 12 of 315

V2.1 11/9/2021

5.0 TEST EQUIPMENT CALIBRATION DATA


Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/10/2022	Annual	6/10/2023	MY49430244
Agilent Technologies	N9020A	MXA Signal Analyzer	4/26/2022	Annual	4/26/2023	MY56470202
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	1/19/2022	Annual	1/19/2023	T058701-02
ETS-Lindgren	3142E	Biconilog Antenna (26-6000MHz)	10/21/2021	Annual	10/21/2022	208204
ETS-Lindgren	3117	Double Ridged Guide Horn Antenna (1-18GHz)	10/25/2021	Annual	10/25/2022	227597
ETS-Lindgren	SU-241	Table Top Temperature Chamber	10/6/2021	Annual	10/6/2022	92009574
Keysight Technology	N9040B	UXA Signal Analyzer	2/8/2022	Annual	2/8/2023	MY57212015
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz-6GHz)	1/6/2022	Annual	1/6/2023	102328
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	10/11/2021	Annual	10/11/2022	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/4/2021	Annual	11/4/2022	151888
Rohde & Schwarz	ESW26	EMI Test Receiver	5/19/2022	Annual	5/19/2023	101299
Rohde & Schwarz	ESW44	EMI Test Receiver	12/2/2021	Annual	12/2/2022	101570
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	3/4/2022	Annual	3/4/2023	101619
Rohde & Schwarz	FSVA3044	Signal Analyzer (up to 44 GHz)	5/12/2022	Annual	5/12/2023	101098
Rohde & Schwarz	HFH2-Z2	Loop Antenna	4/3/2022	Annual	4/3/2023	100546
Rohde & Schwarz	TC-TA18	Cross-Polarized Antenna 400MHz-18GHz	1/25/2022	Annual	1/25/2023	101063
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz-18GHz)	1/6/2022	Annual	1/6/2023	101639
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz-40GHz)	4/18/2022	Annual	4/18/2023	100050

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: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 13 of 315

V2.1 11/9/2021

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6.0 SAMPLE CALCULATIONS

Emission Designator

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

$\pi/2$ BPSK / QPSK Modulation

Emission Designator = 8M62G7W

BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination of Any

QAM Modulation

Emission Designator = 8M45D7W

LTE BW = 8.45 MHz

D = Amplitude/Angle Modulated


7 = Quantized/Digital Info

W = Combination of Any

Spurious Radiated Emission

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

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum 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: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 14 of 315

V2.1 11/9/2021

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7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCGA2757
 FCC Classification: PCS Licensed Transmitter (PCB)
 Mode(s): WCDMA/LTE/NR/UL-CA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Occupied Bandwidth	2.1049	N/A	N/A	Section 7.2
	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	-13 dBm at Band Edge and for all out-of-band emissions	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (LTE B13)	2.1051, 27.53	-13 dBm at Band Edge and for all out-of-band emissions < -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz.	PASS	Sections 7.3, 7.4
	Peak-Average Ratio	27.50(d)(5)	< 13 dB	PASS	Section 7.5
	Transmitter Conducted Output Power	2.1046	N/A	N/A	See RF Exposure Report
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 71)	27.50(b)(10)	< 3 Watts max. ERP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n71)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12/17)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band 12)			PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 13)	27.50(c)(10)	< 3 Watts max. ERP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (WCDMA)	27.50(d)(4)	< 1 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (NR Band n66)			PASS	Section 7.6
	Equivalent Isotropic Radiated Power (LTE Band 4/66)			PASS	Section 7.6
RADIATED	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	-13 dBm for all out-of-band emissions < -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Section 7.7
	Radiated Spurious Emissions	2.1053, 27.53	-13 dBm for all out-of-band emissions	PASS	Section 7.7


Table 7-1. Summary of Test Results

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 15 of 315

V2.1 11/9/2021

Notes:

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
3. All antenna 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. All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is Element EMC Software Tool v1.1.

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 16 of 315

V2.1 11/9/2021

7.2 Occupied Bandwidth

\$2.1049

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ 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.

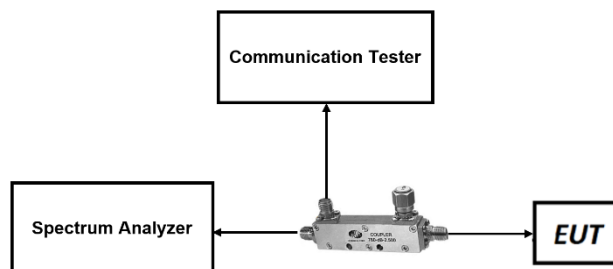



Figure 7-1. Test Instrument & Measurement Setup

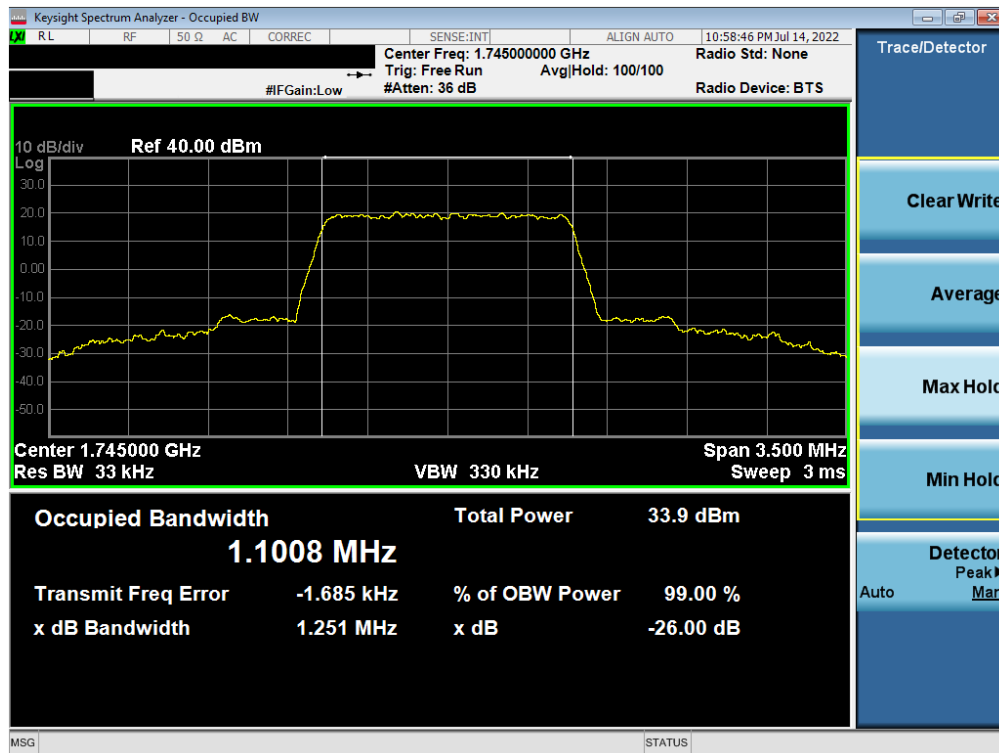
Test Notes

None.

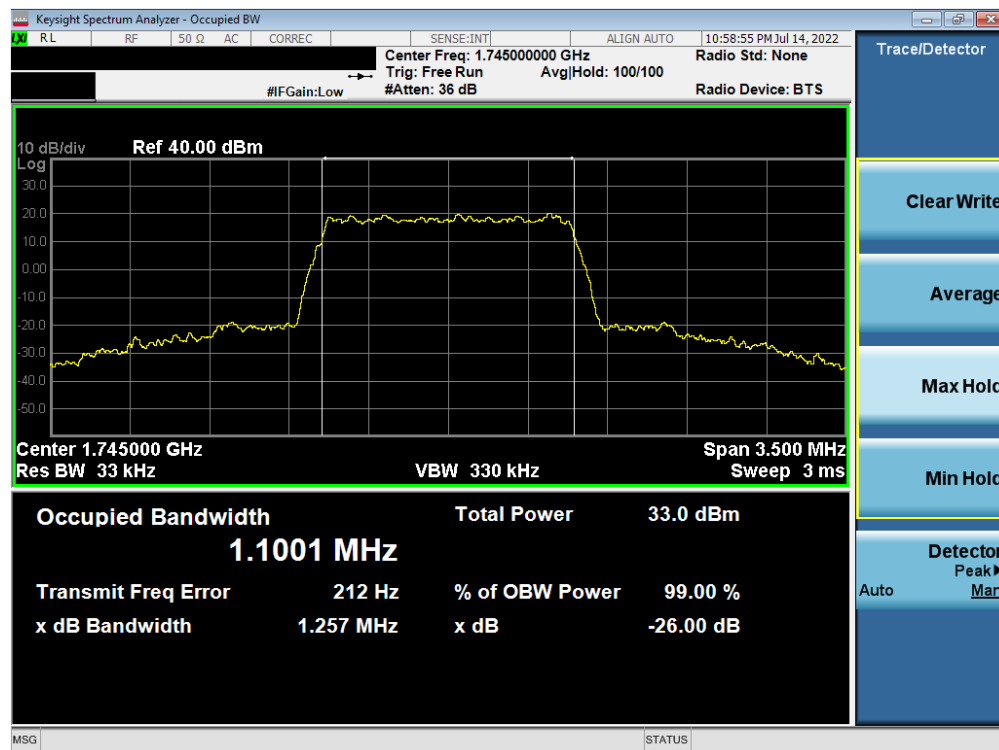
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 17 of 315

V2.1 11/9/2021


LTE Band 66/4



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

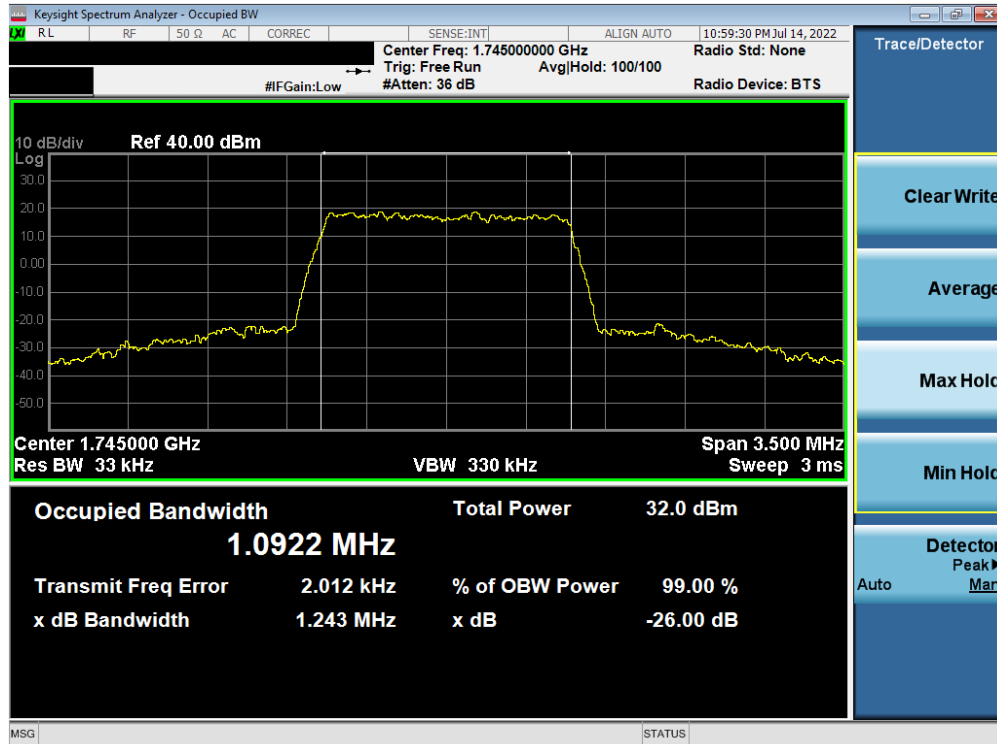


Plot 7-2. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB)

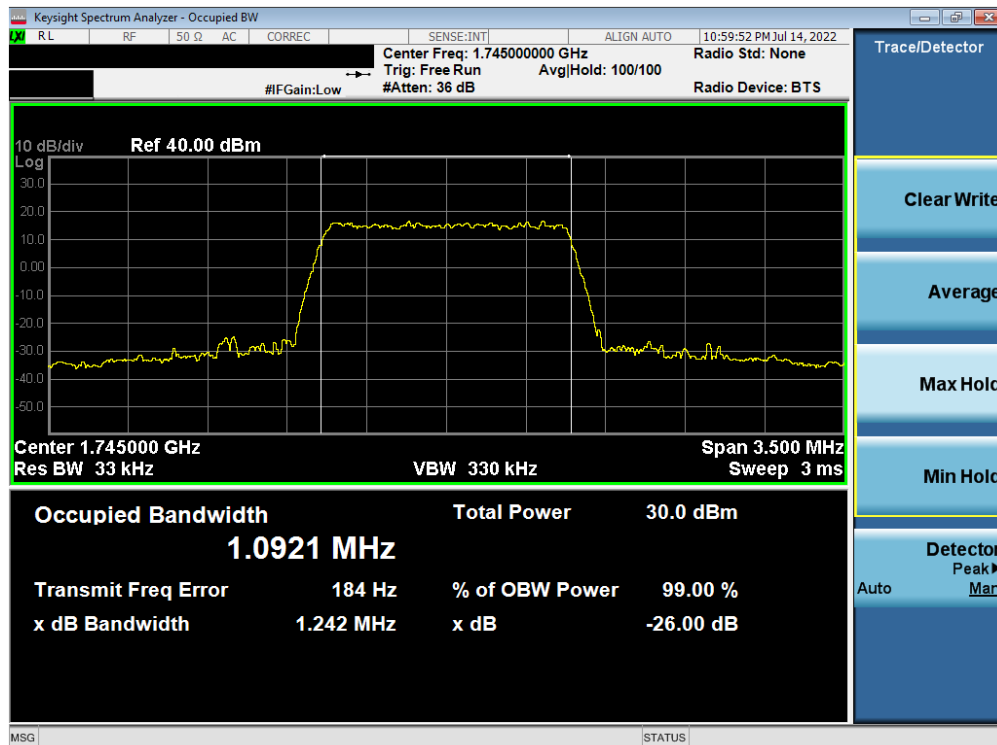
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 18 of 315

V2.1 11/9/2021


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

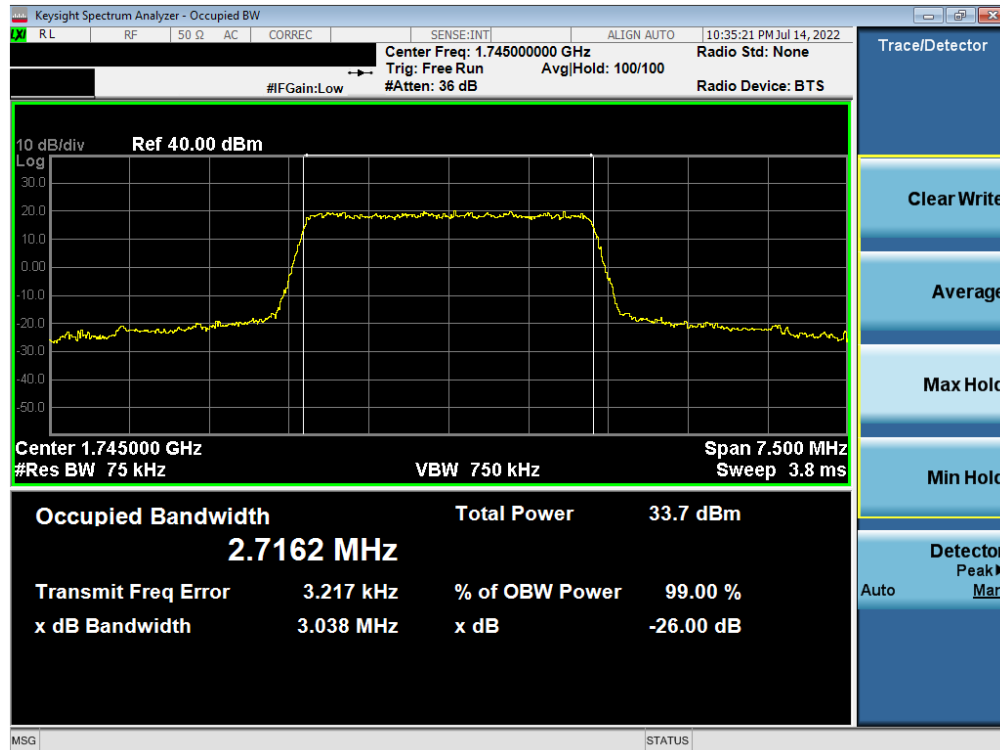


Plot 7-4. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 256-QAM - Full RB)

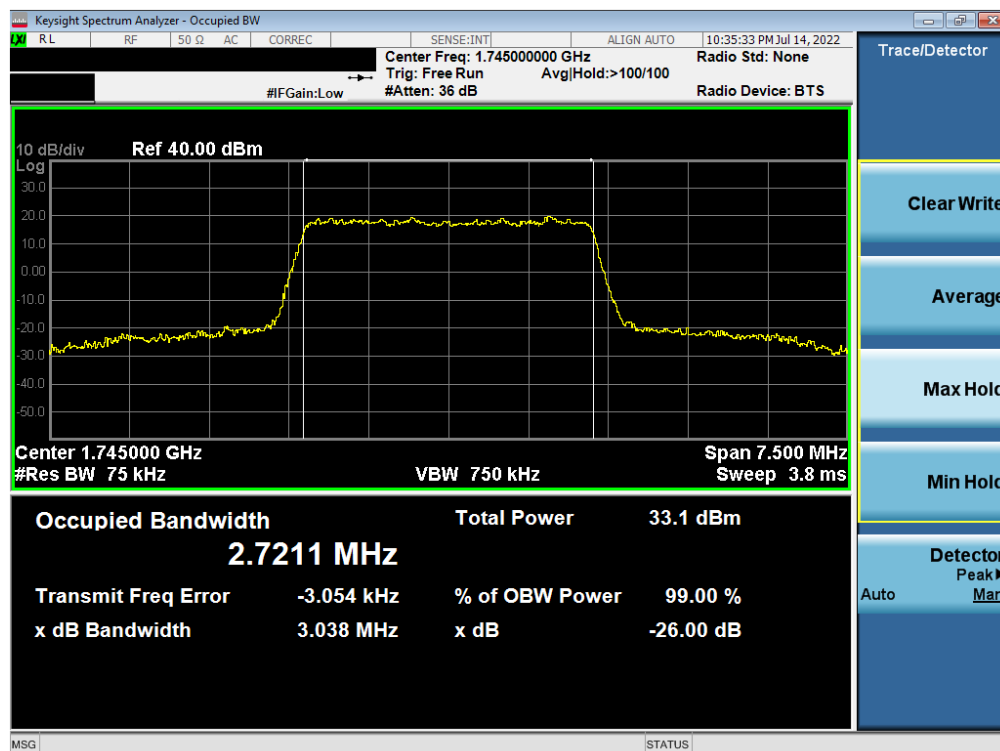
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 19 of 315

V2.1 11/9/2021


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

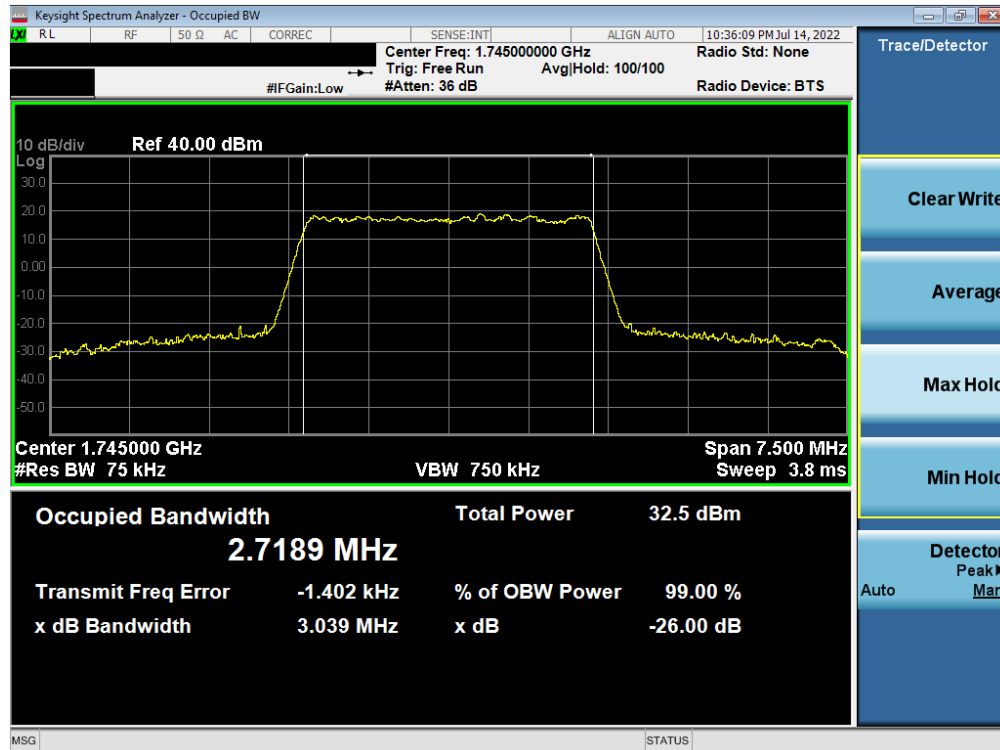


Plot 7-6. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB)

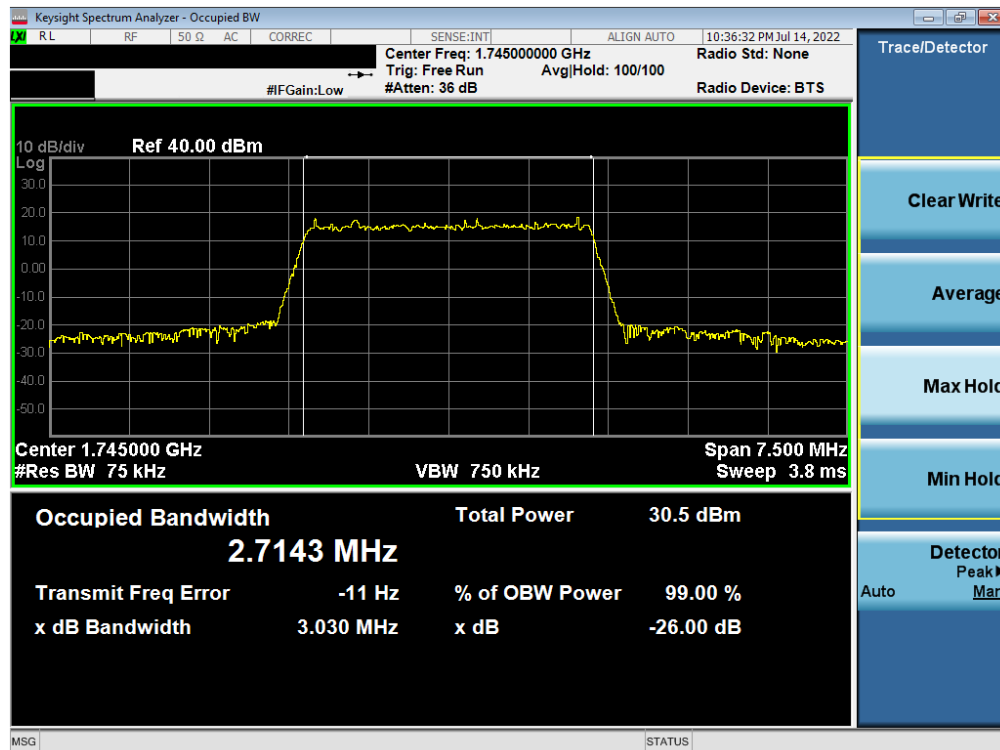
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 20 of 315

V2.1 11/9/2021


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

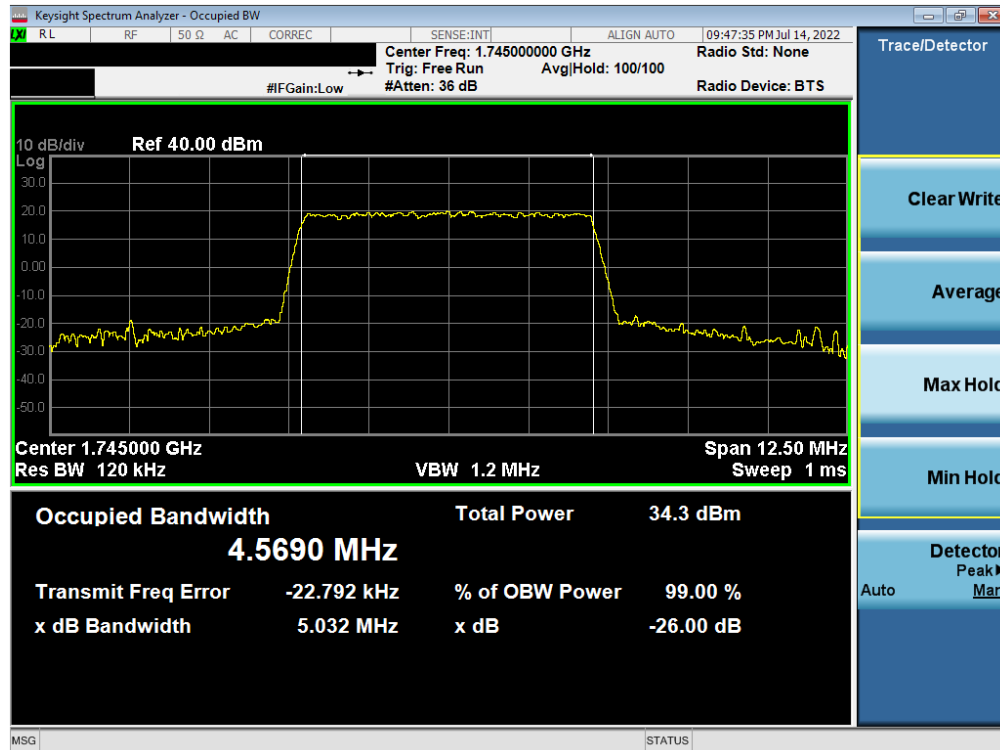


Plot 7-8. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 256-QAM - Full RB)

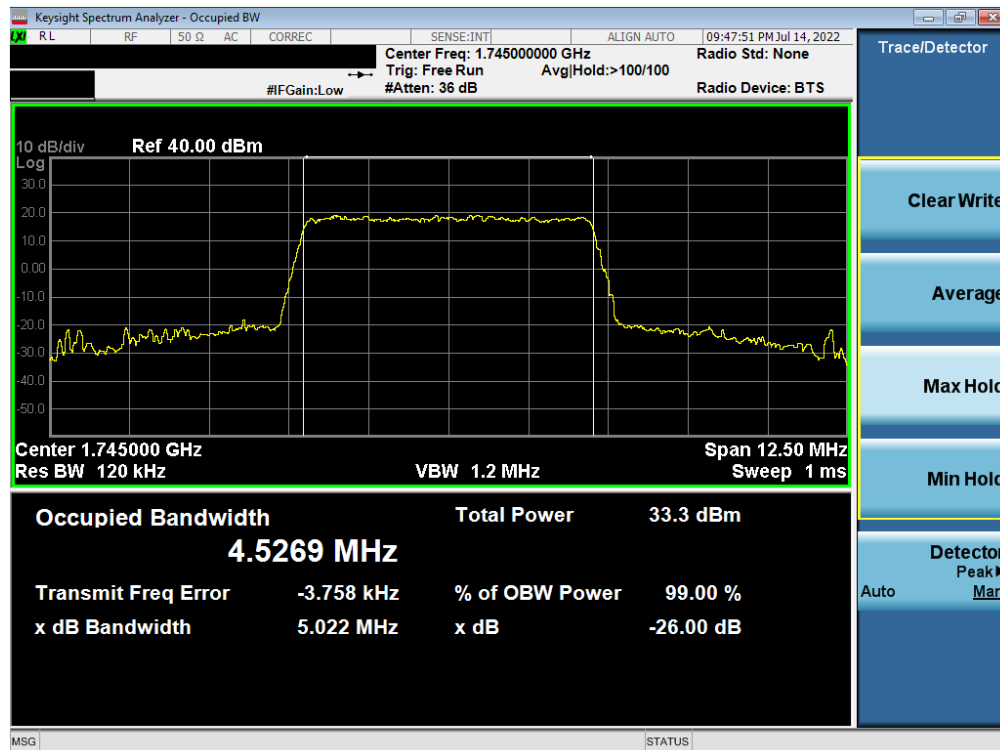
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 21 of 315

V2.1 11/9/2021


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

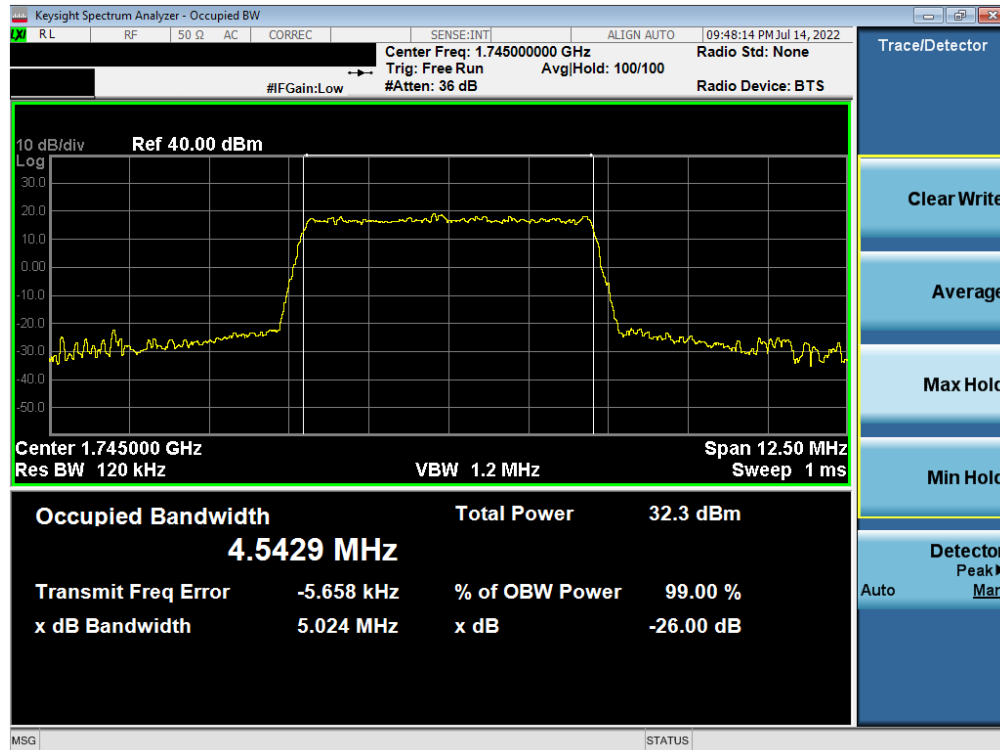


Plot 7-10. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB)

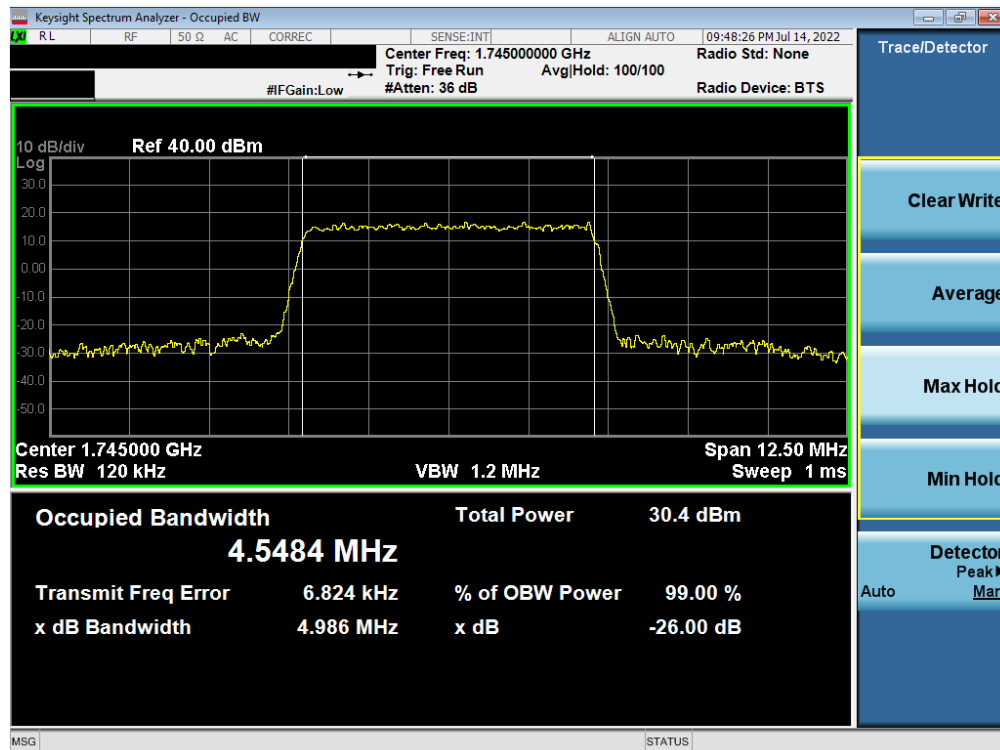
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 22 of 315

V2.1 11/9/2021


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

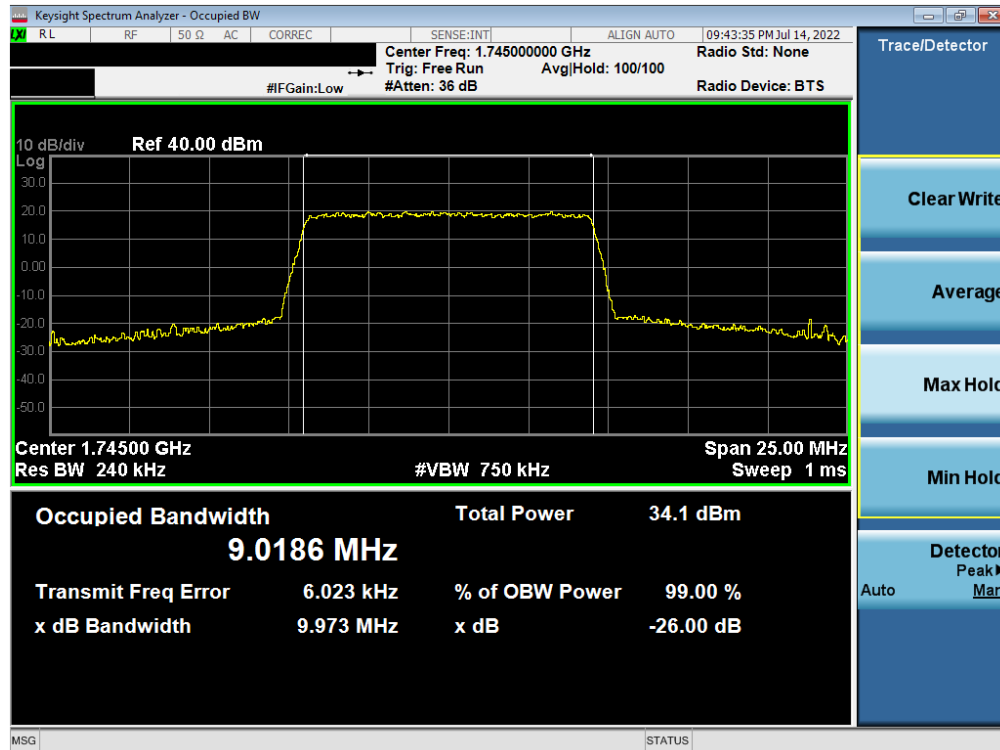


Plot 7-12. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 256-QAM - Full RB)

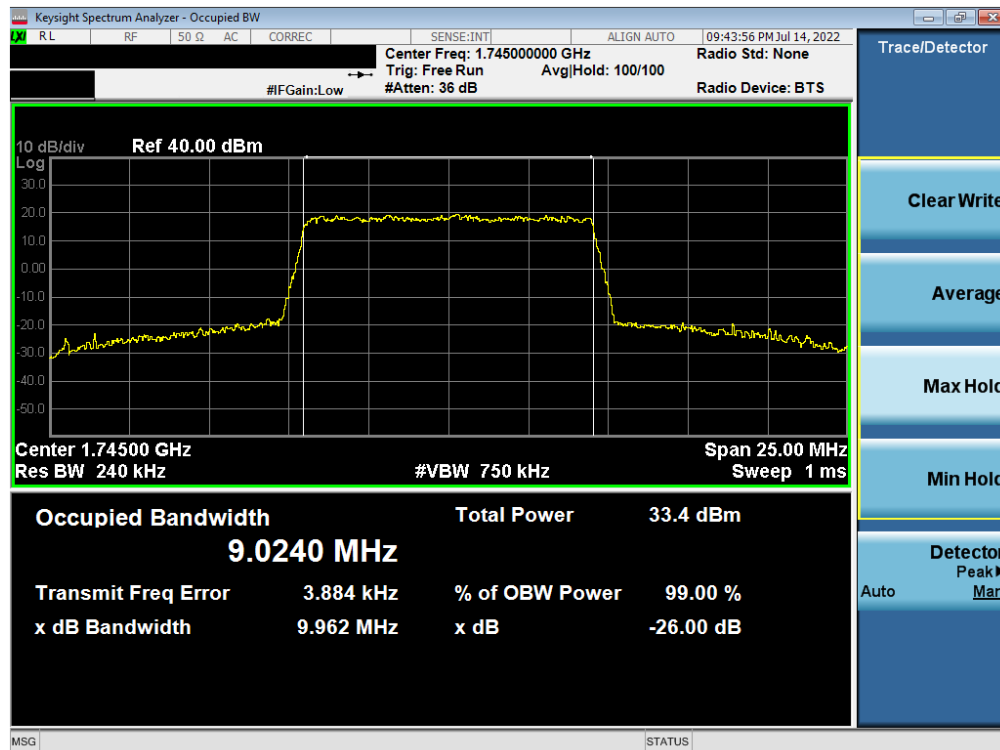
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 23 of 315

V2.1 11/9/2021


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

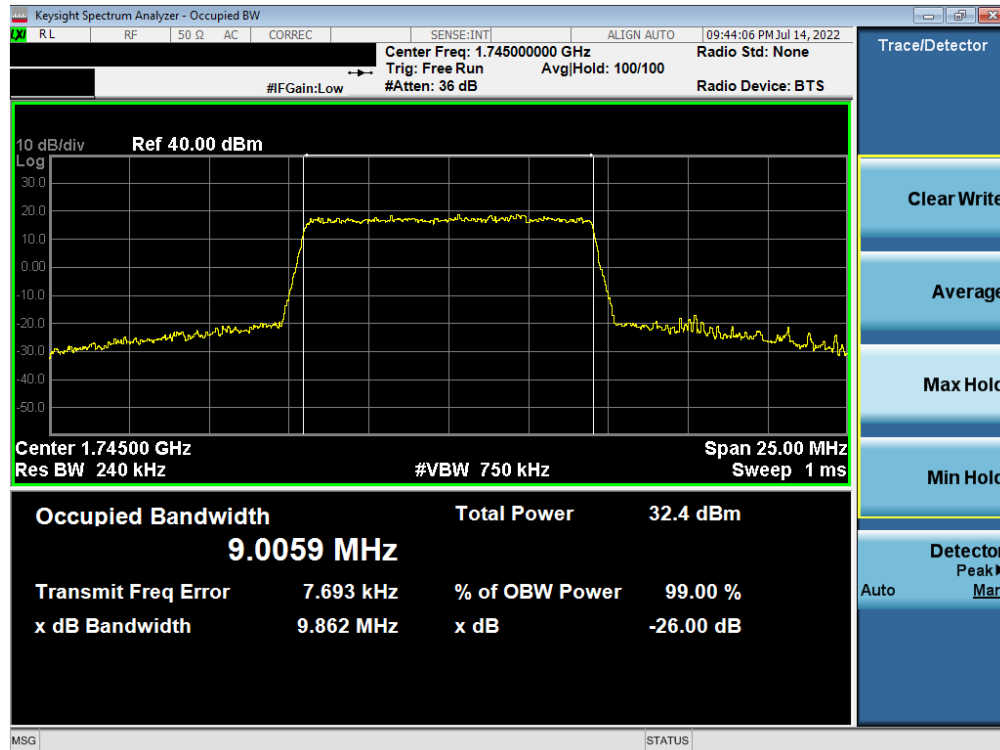


Plot 7-14. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB)

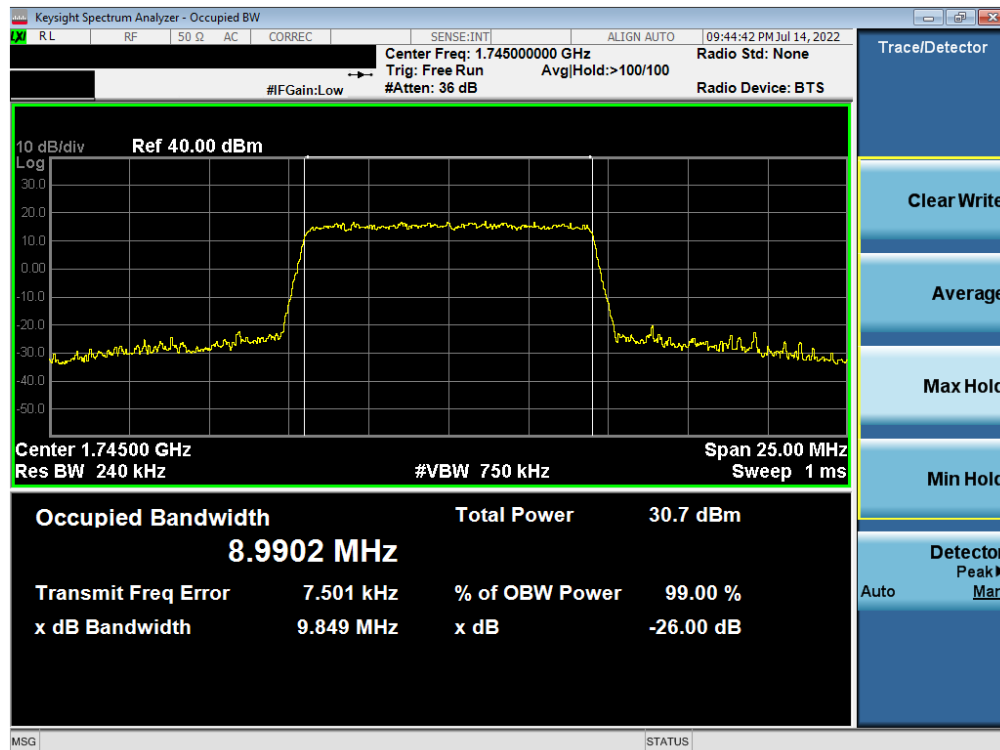
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 24 of 315

V2.1 11/9/2021


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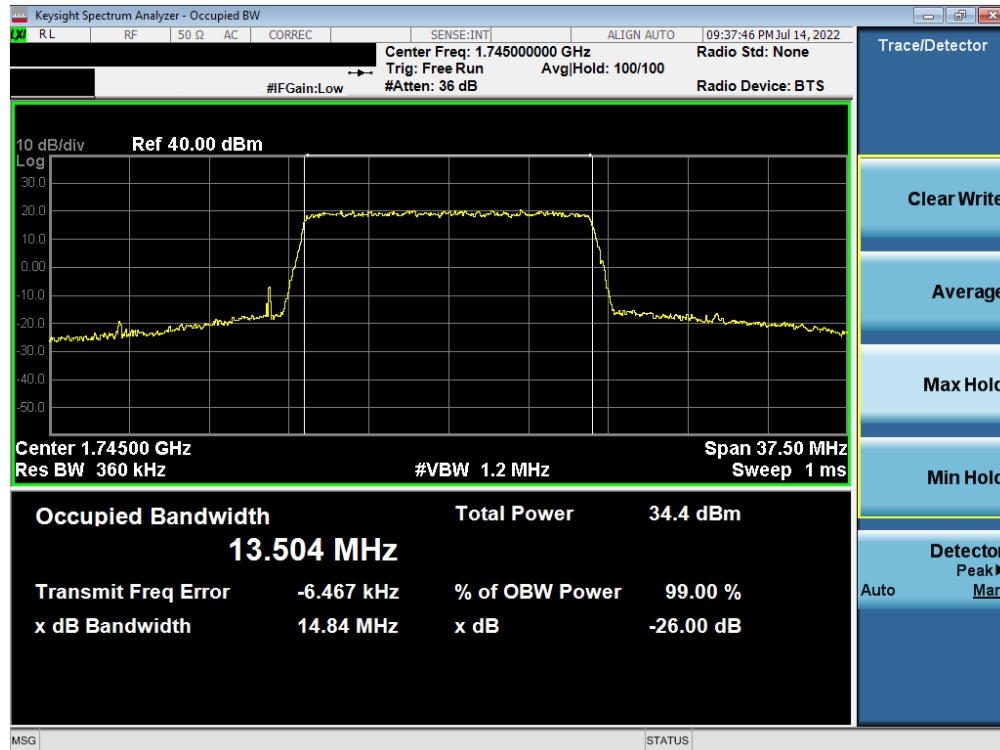
Plot 7-15. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB)



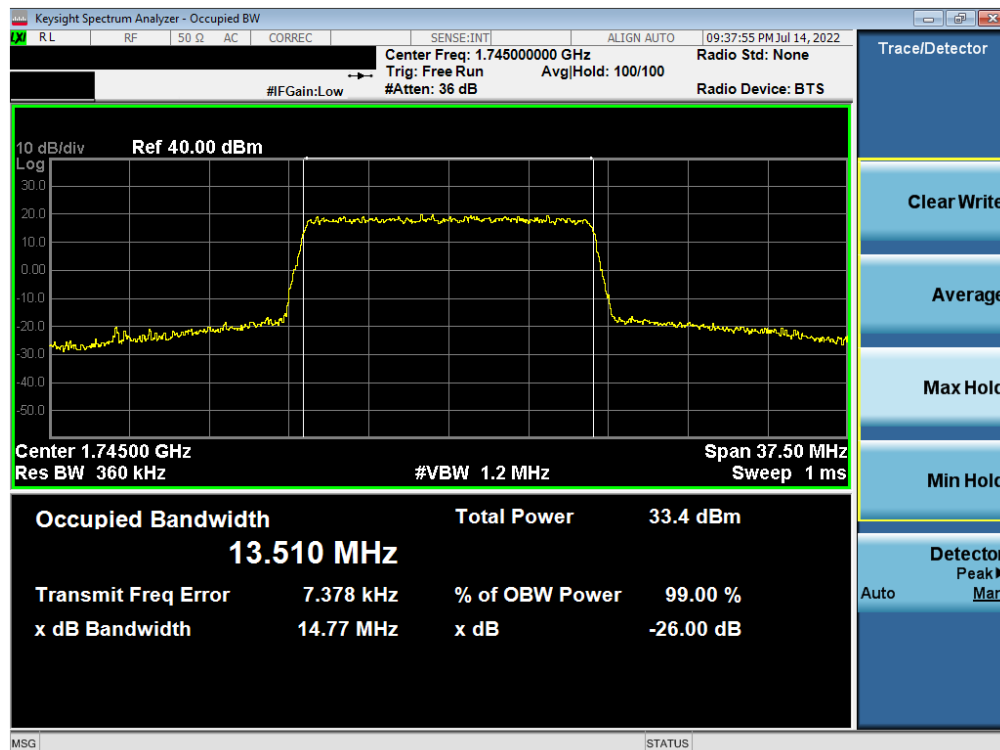
Plot 7-16. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 25 of 315


V2.1 11/9/2021



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

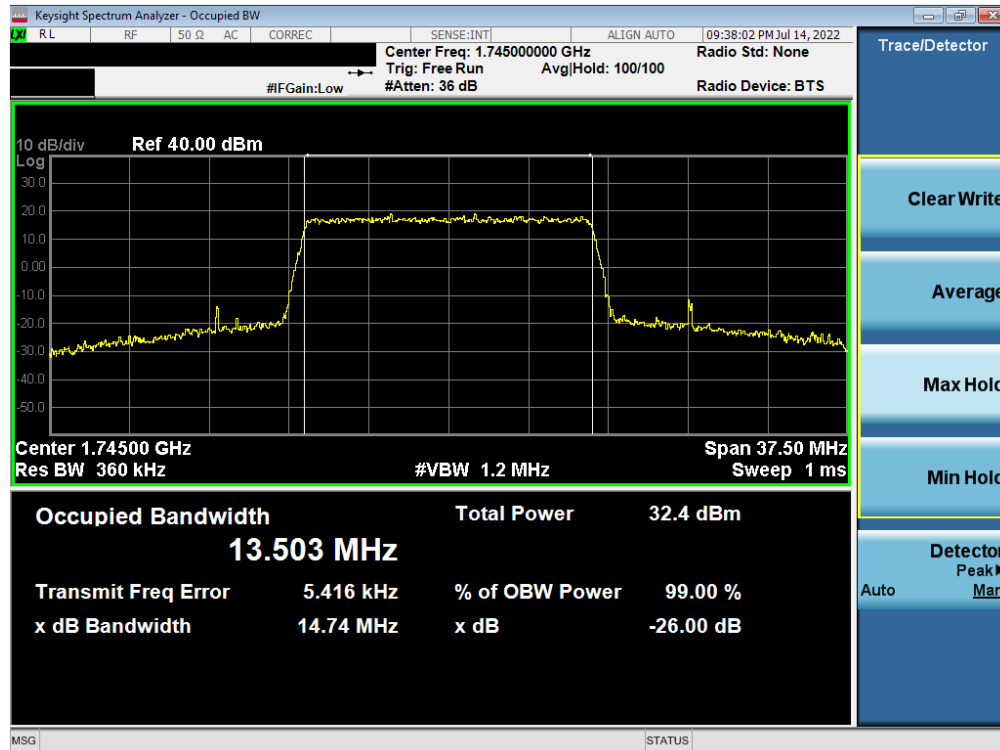


Plot 7-18. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB)

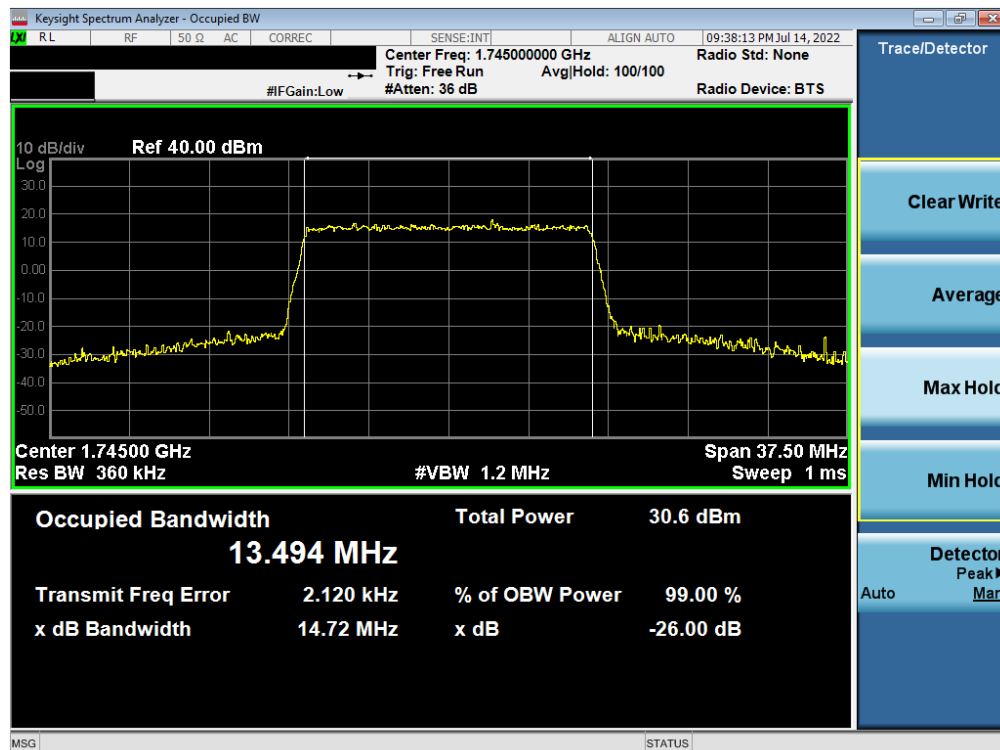
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 26 of 315

V2.1 11/9/2021


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

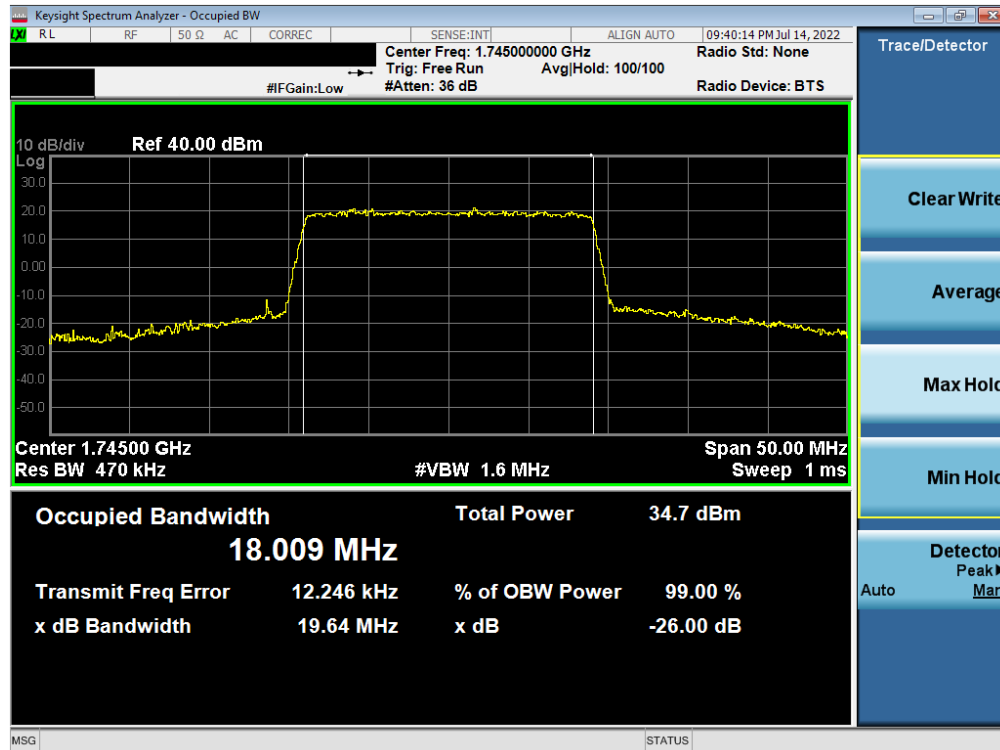


Plot 7-20. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 256-QAM - Full RB)

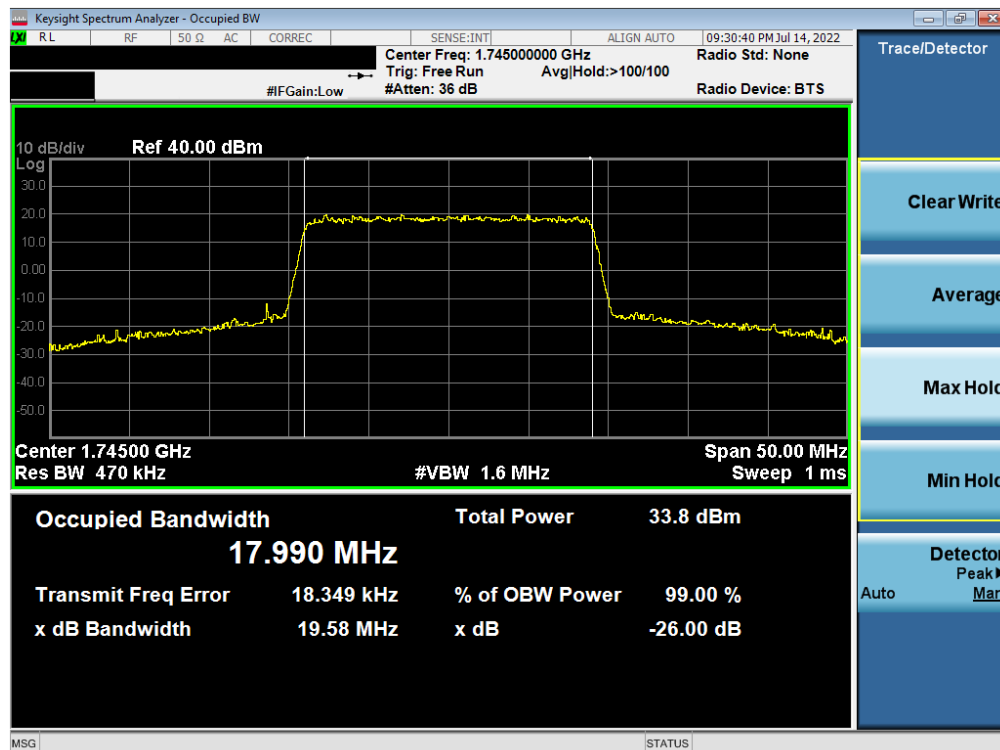
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 27 of 315

V2.1 11/9/2021


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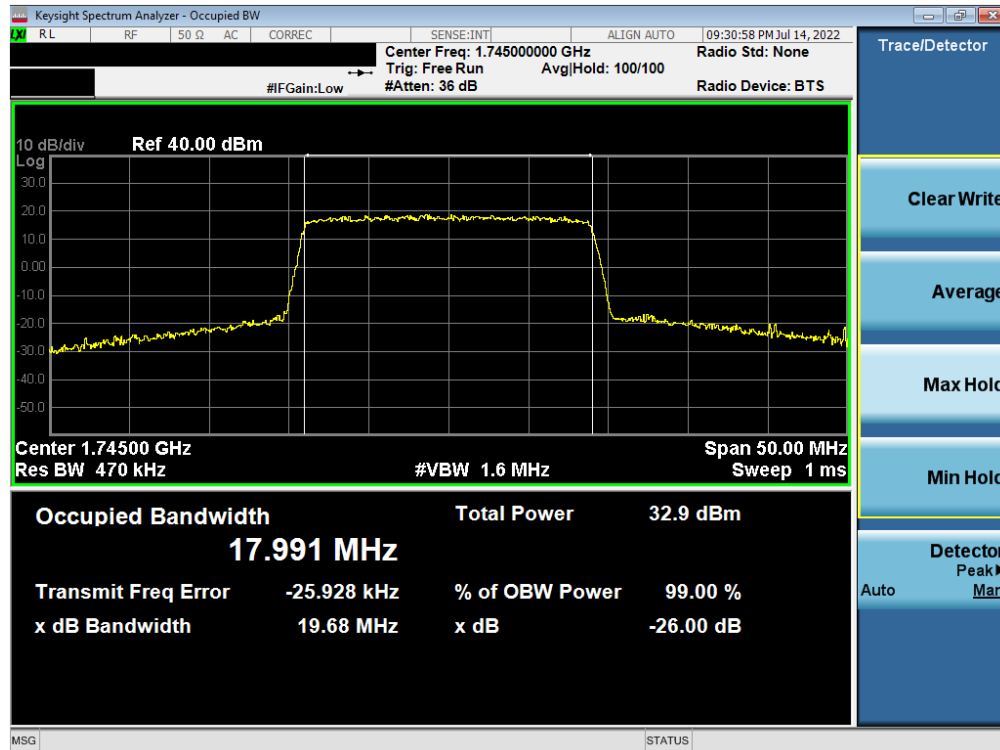
Plot 7-21. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB)



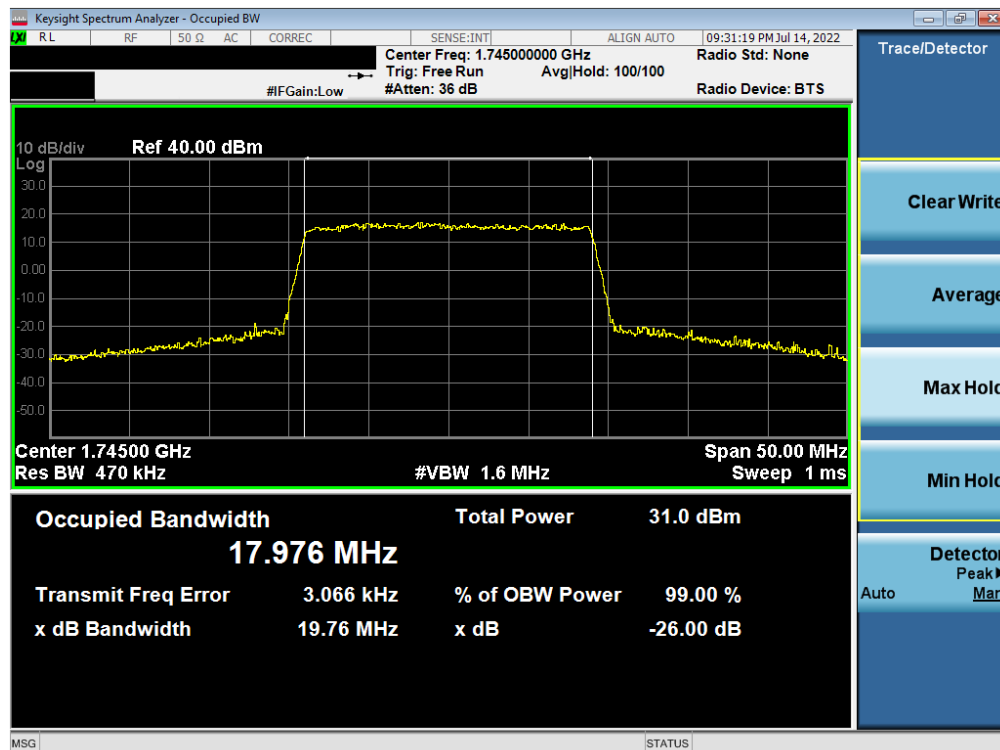
Plot 7-22. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 28 of 315


V2.1 11/9/2021



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



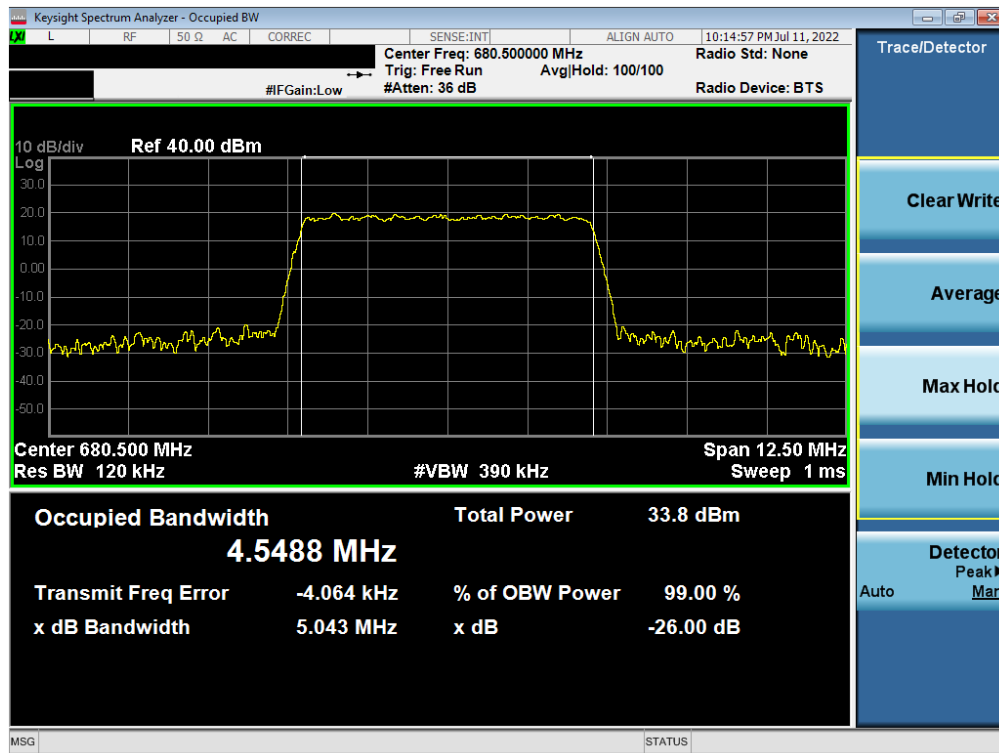
Plot 7-24. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 29 of 315

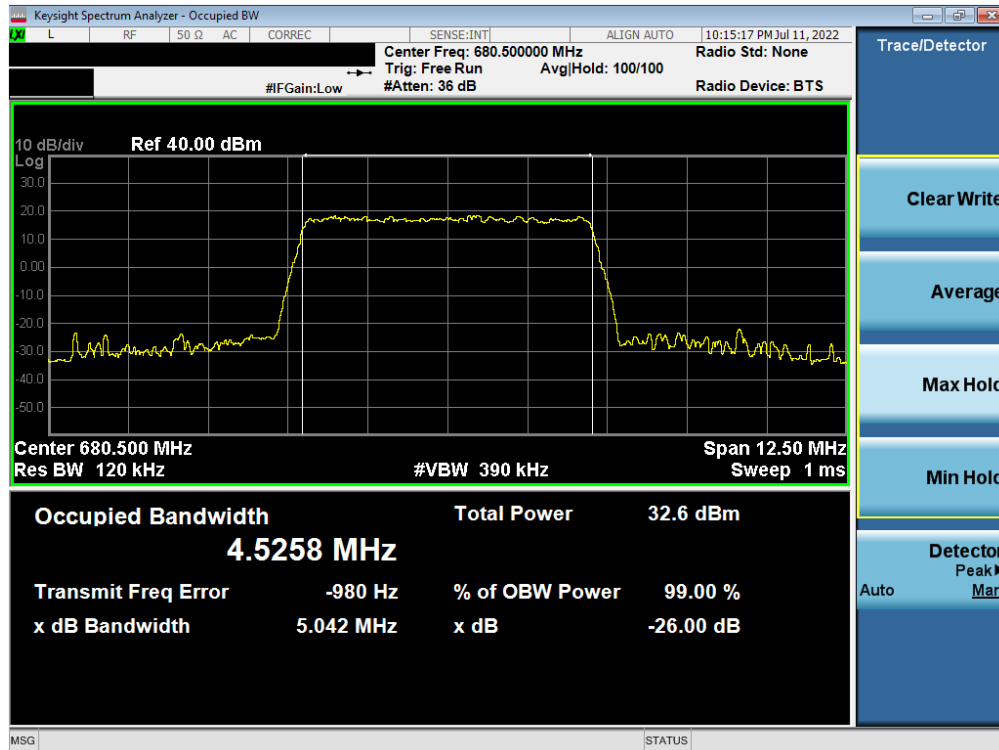
V2.1 11/9/2021

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LTE Band 71



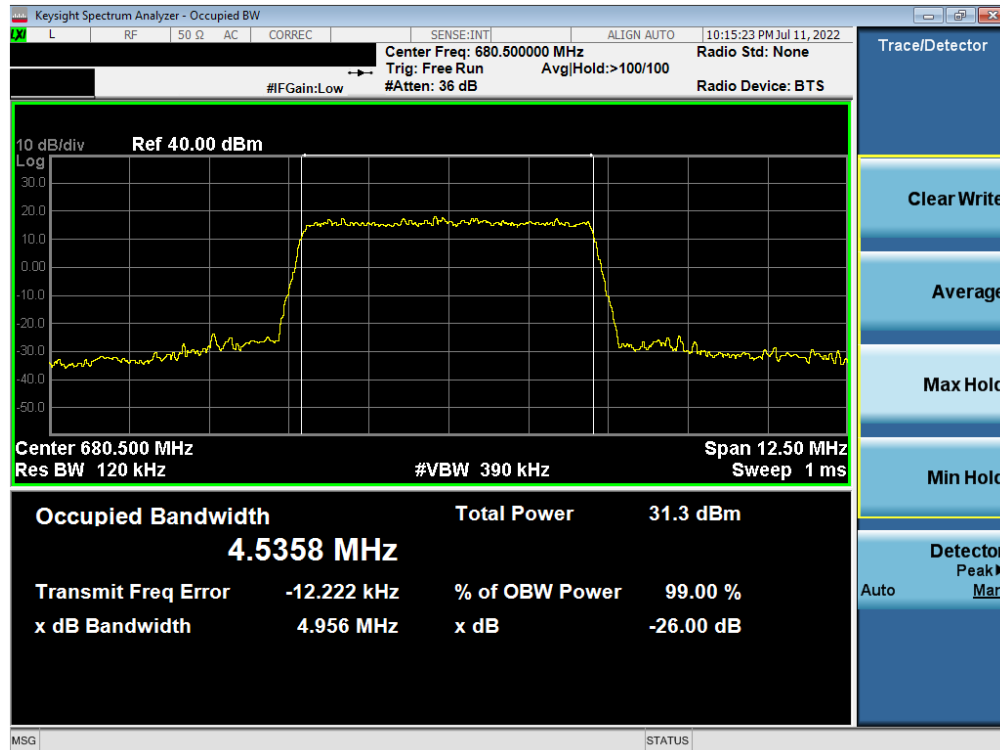
Plot 7-25. Occupied Bandwidth Plot (LTE Band 71 - 5MHz QPSK - Full RB)



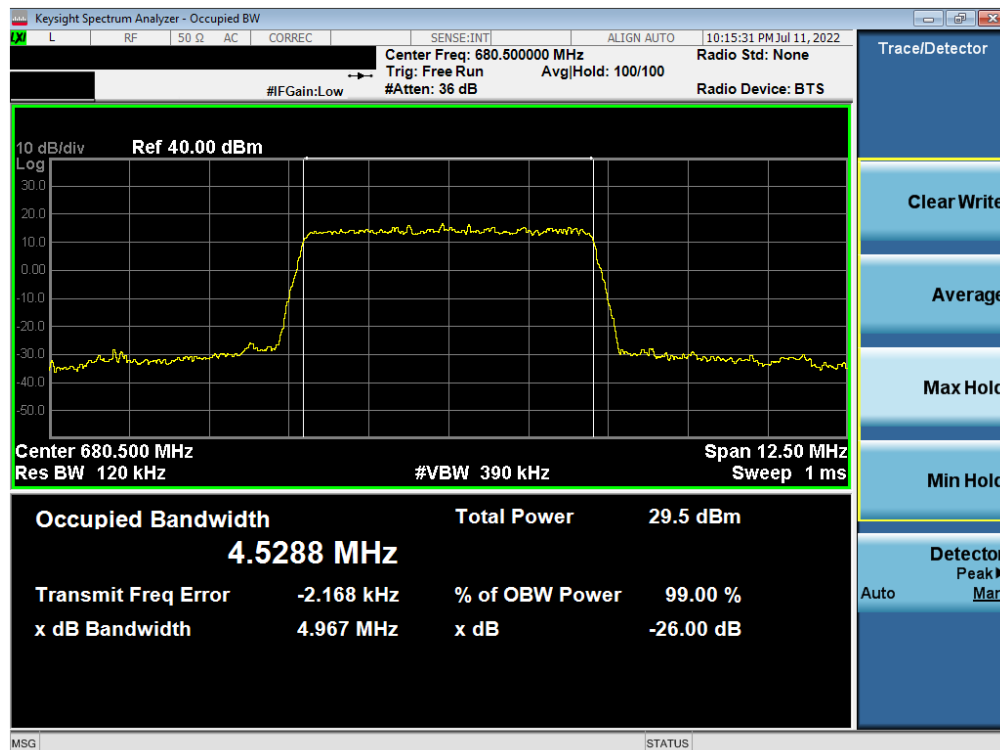
Plot 7-26. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 16-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 30 of 315


V2.1 11/9/2021



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

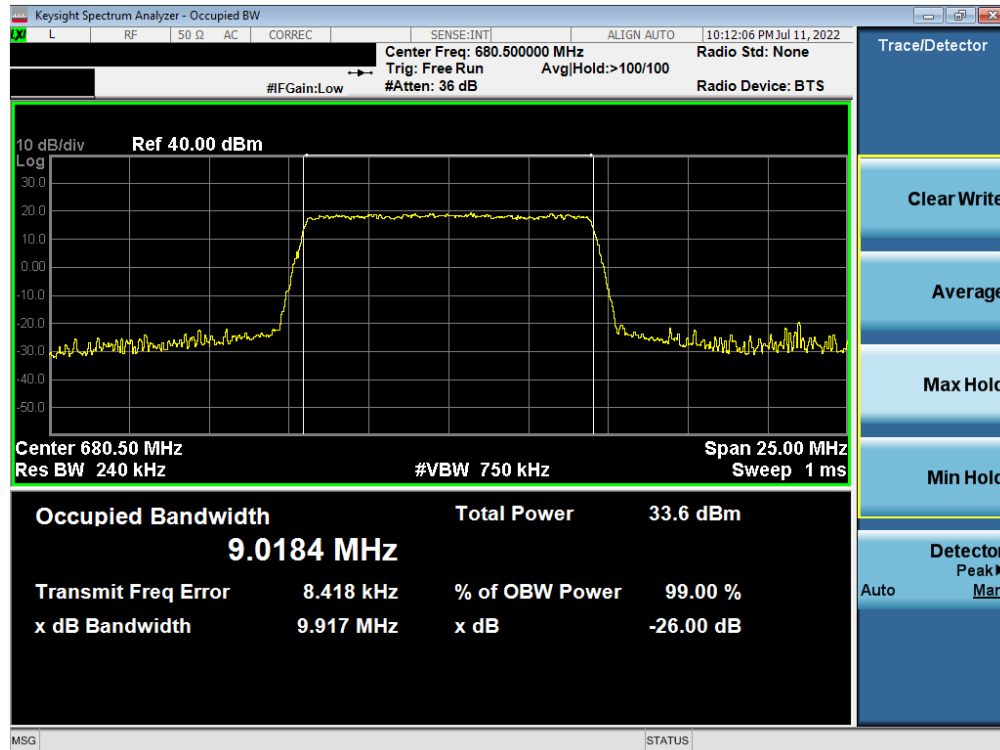


Plot 7-28. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 256-QAM - Full RB)

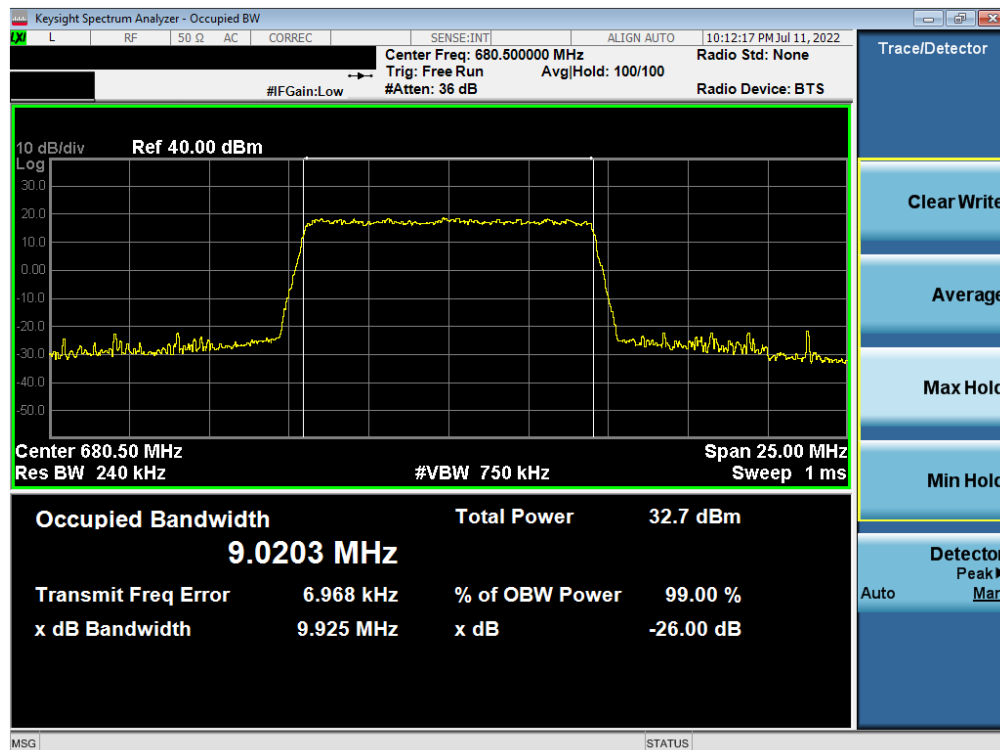
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 31 of 315

V2.1 11/9/2021


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

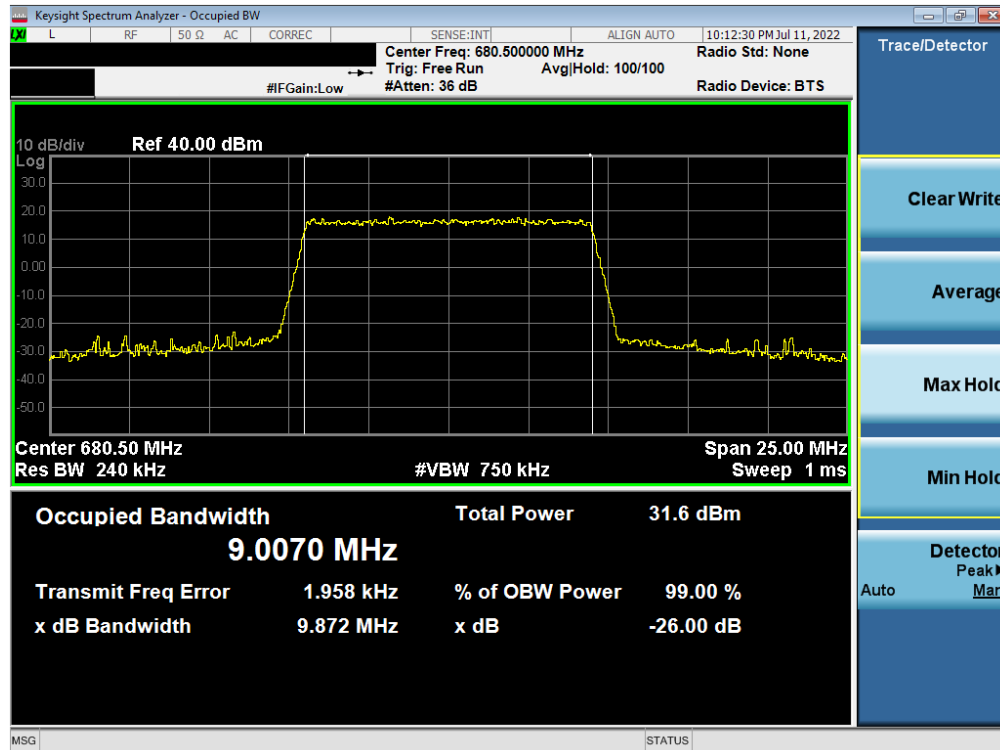


Plot 7-30. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 16-QAM - Full RB)

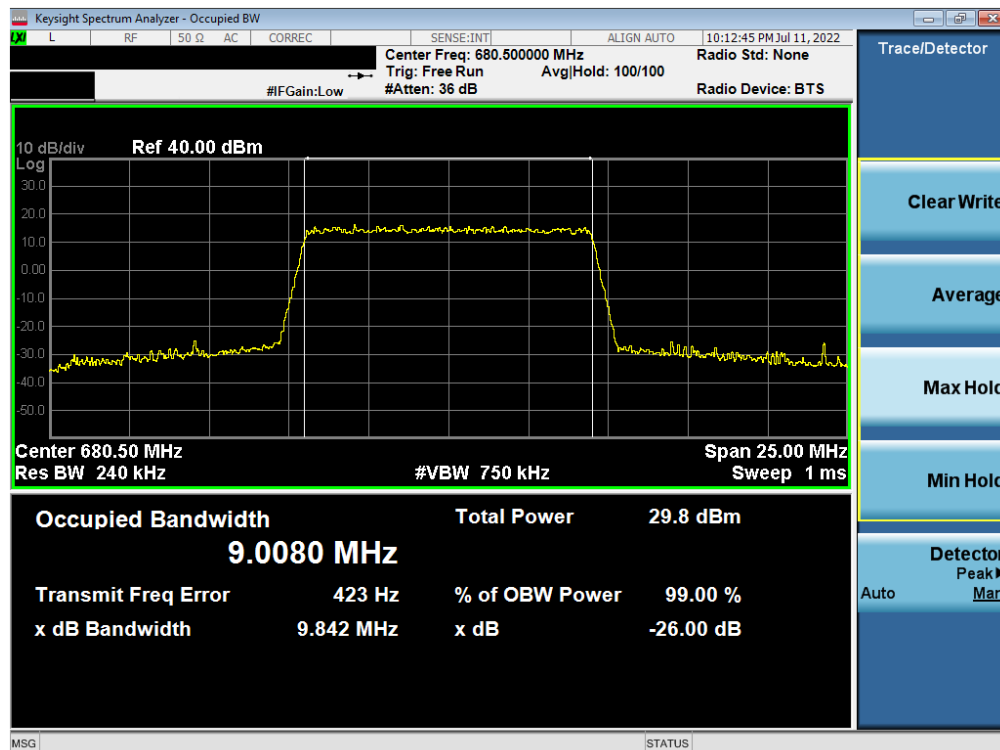
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 32 of 315

V2.1 11/9/2021


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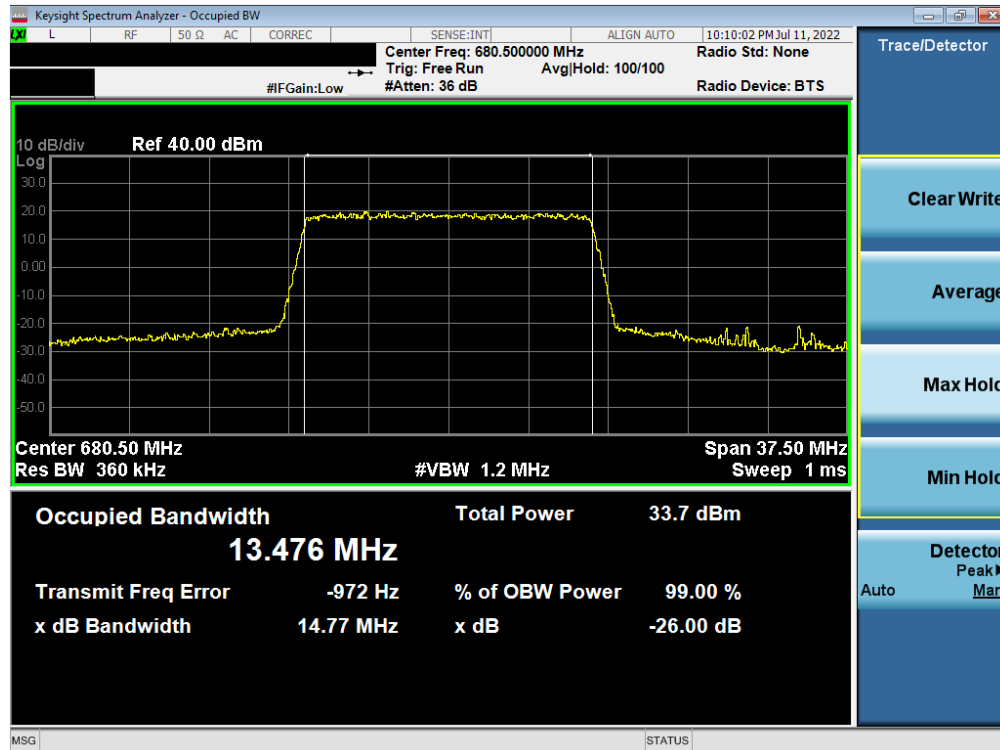


Plot 7-31. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 64-QAM - Full RB)

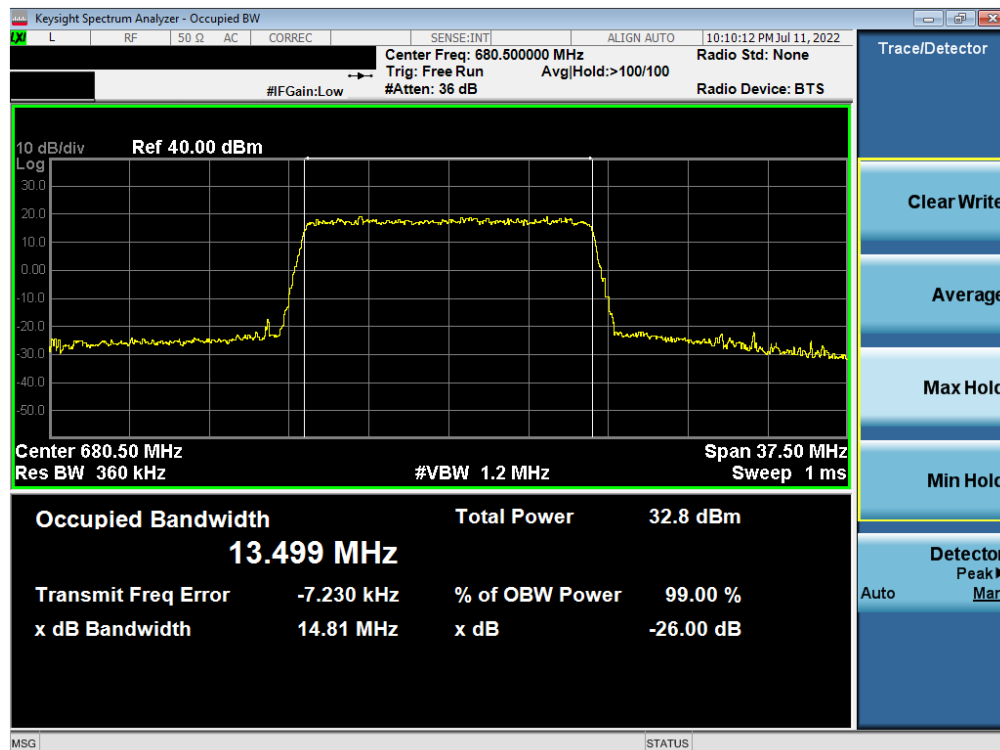


Plot 7-32. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 256-QAM - Full RB)


FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 33 of 315



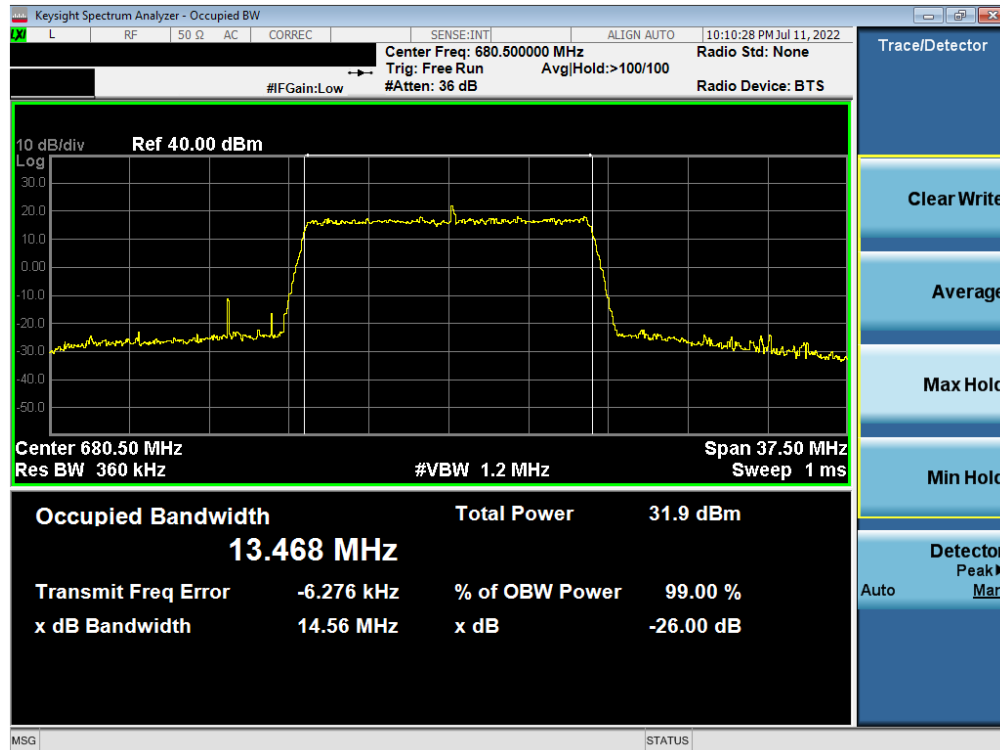
Plot 7-33. Occupied Bandwidth Plot (LTE Band 71 - 15MHz QPSK - Full RB)



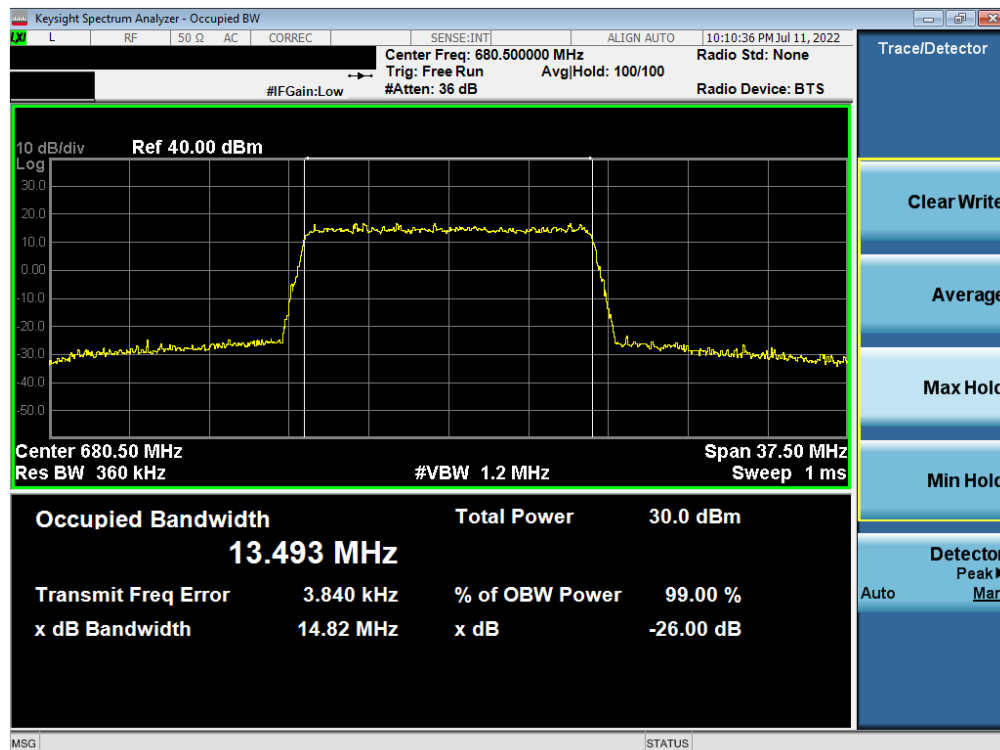
Plot 7-34. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 16-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 34 of 315


V2.1 11/9/2021



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

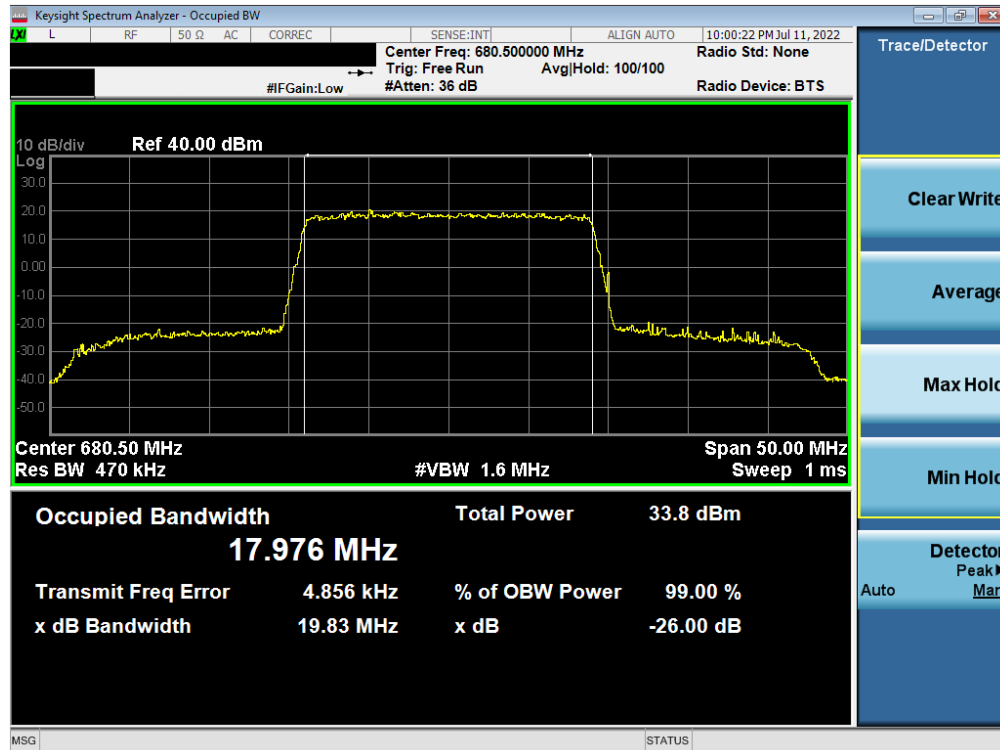


Plot 7-36. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 256-QAM - Full RB)

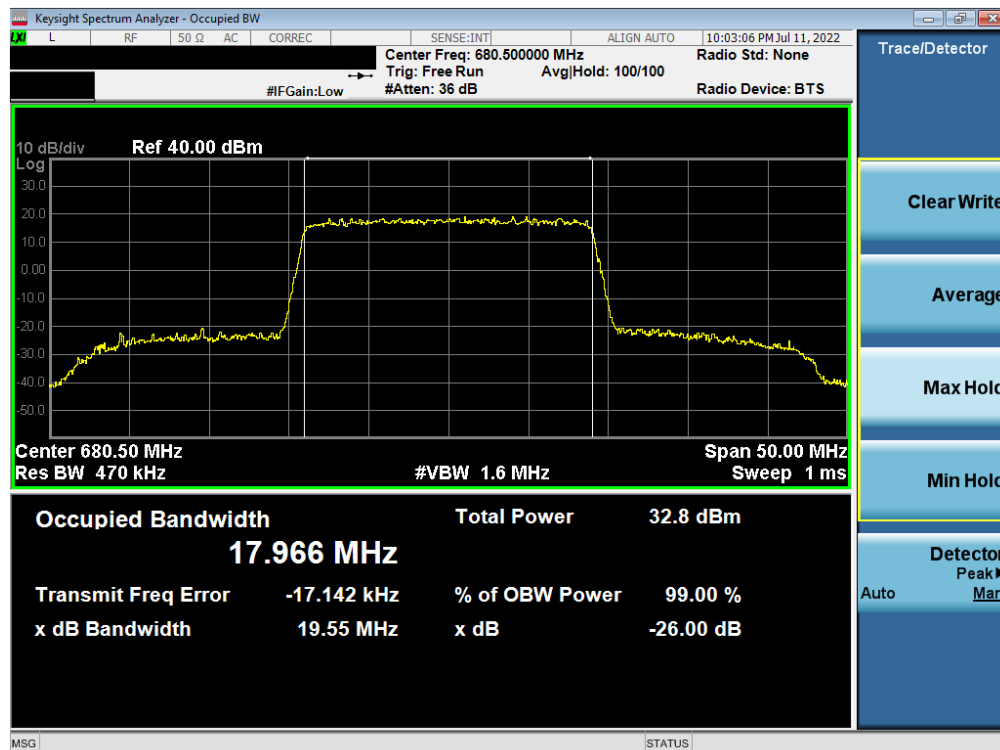
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 35 of 315

V2.1 11/9/2021


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

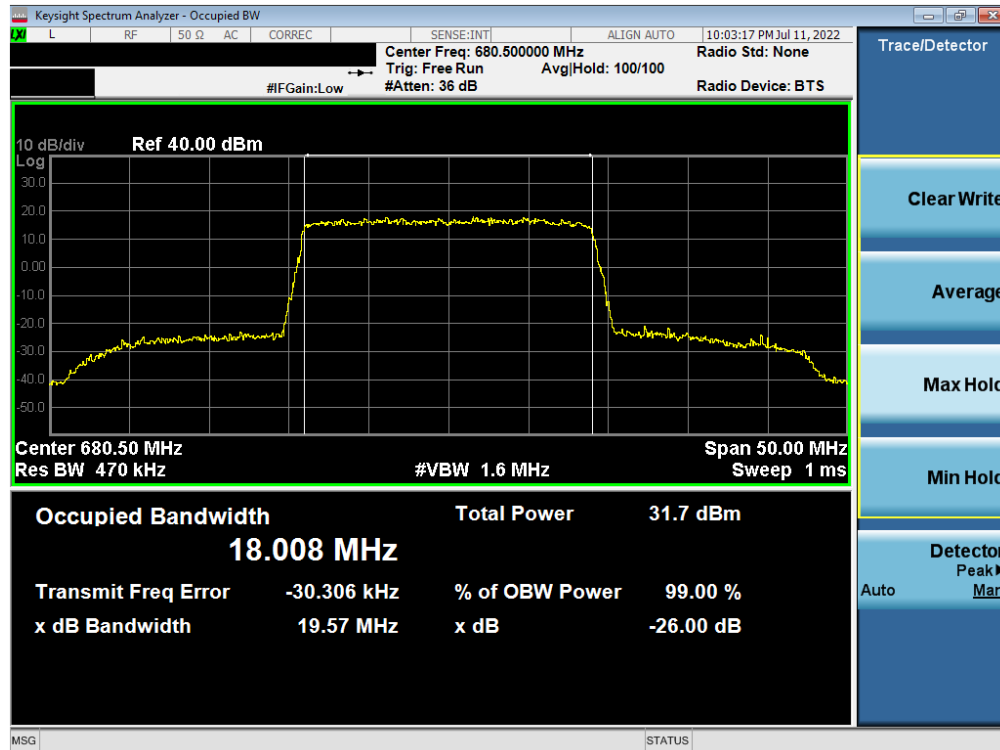


Plot 7-38. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 16-QAM - Full RB)

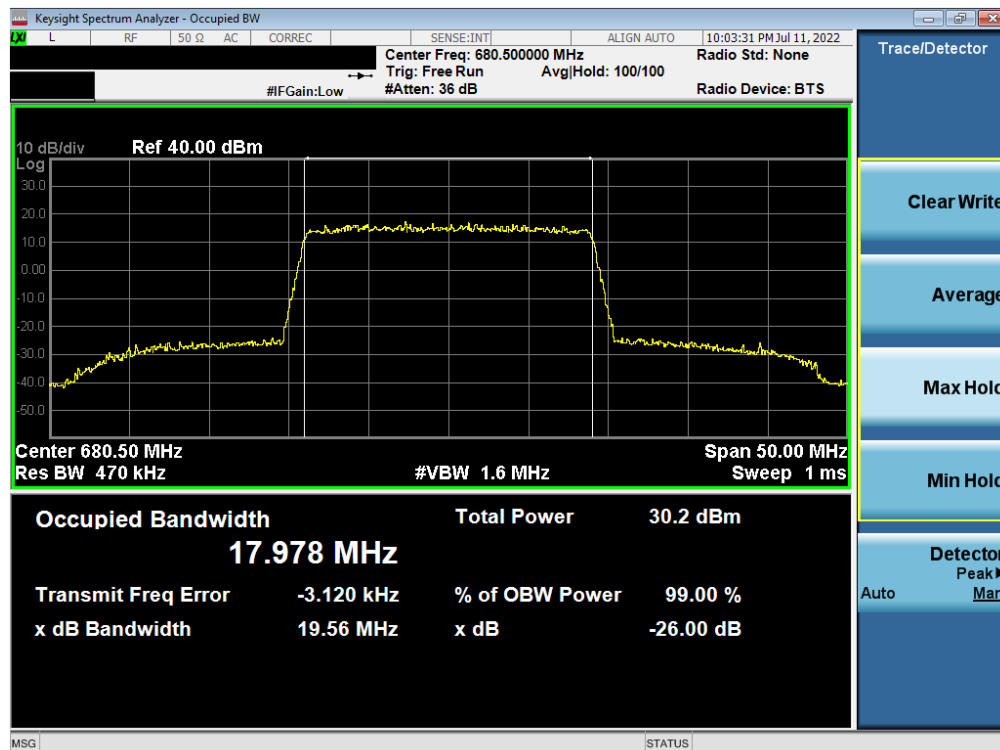
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 36 of 315

V2.1 11/9/2021


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



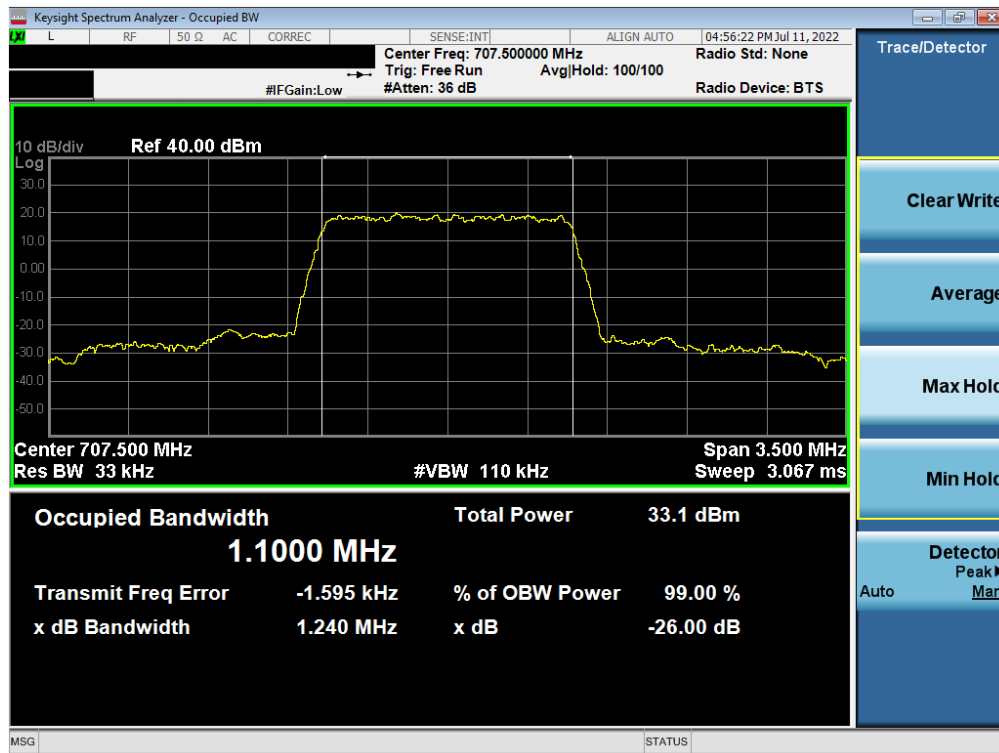
Plot 7-40. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 37 of 315

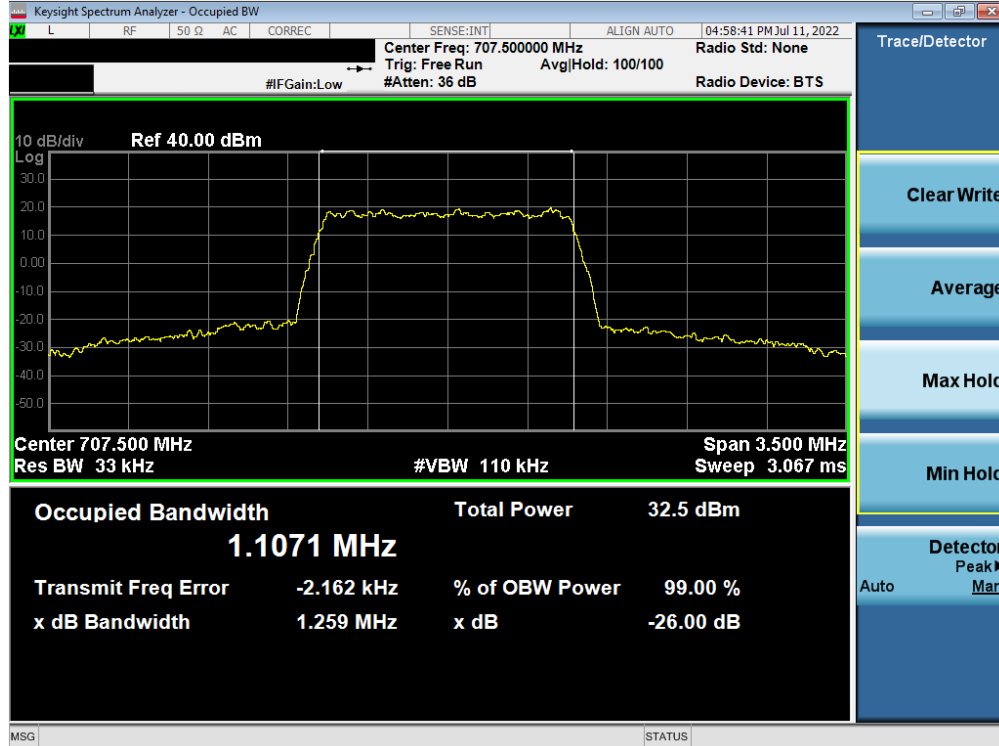
V2.1 11/9/2021

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LTE Band 12/17



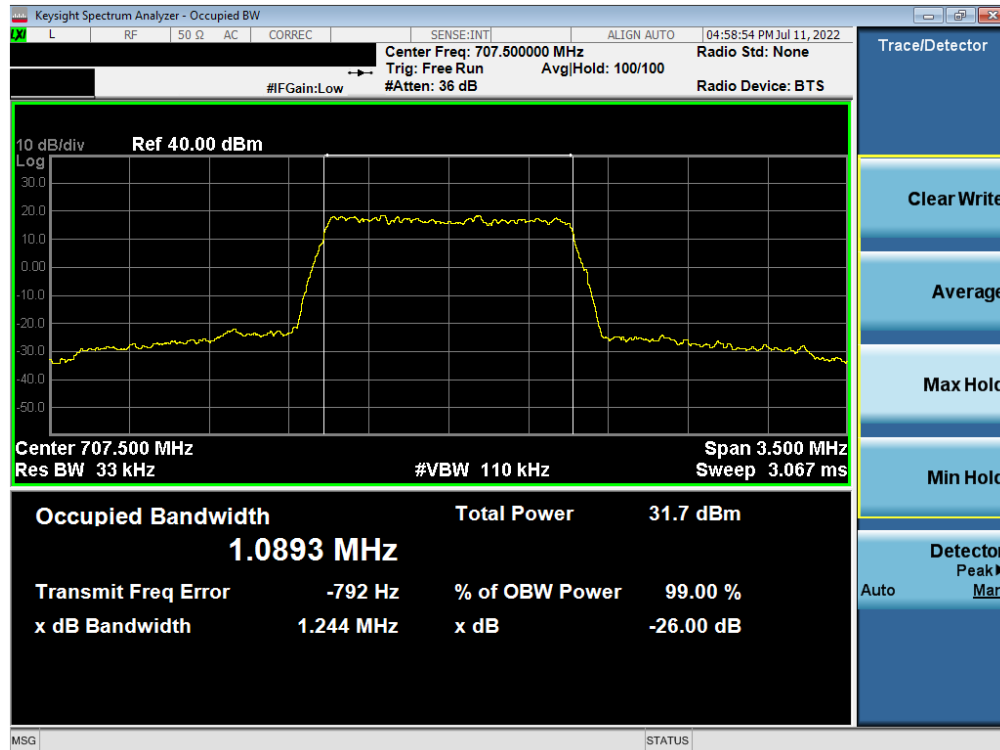
Plot 7-41. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB)



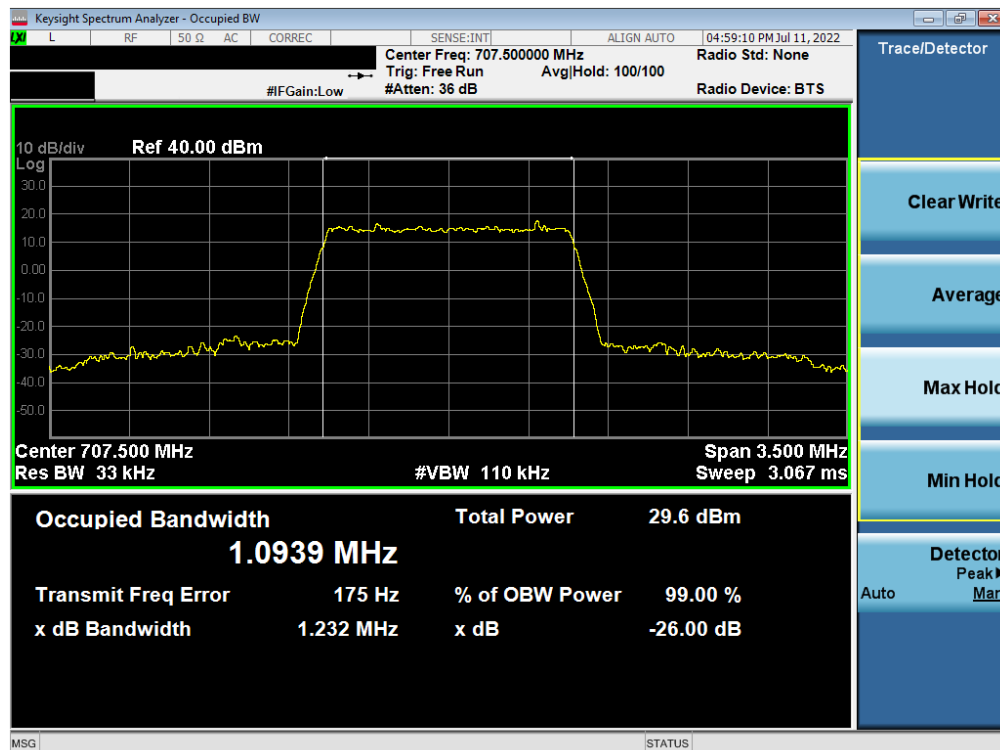
Plot 7-42. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB)

FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 38 of 315


V2.1 11/9/2021

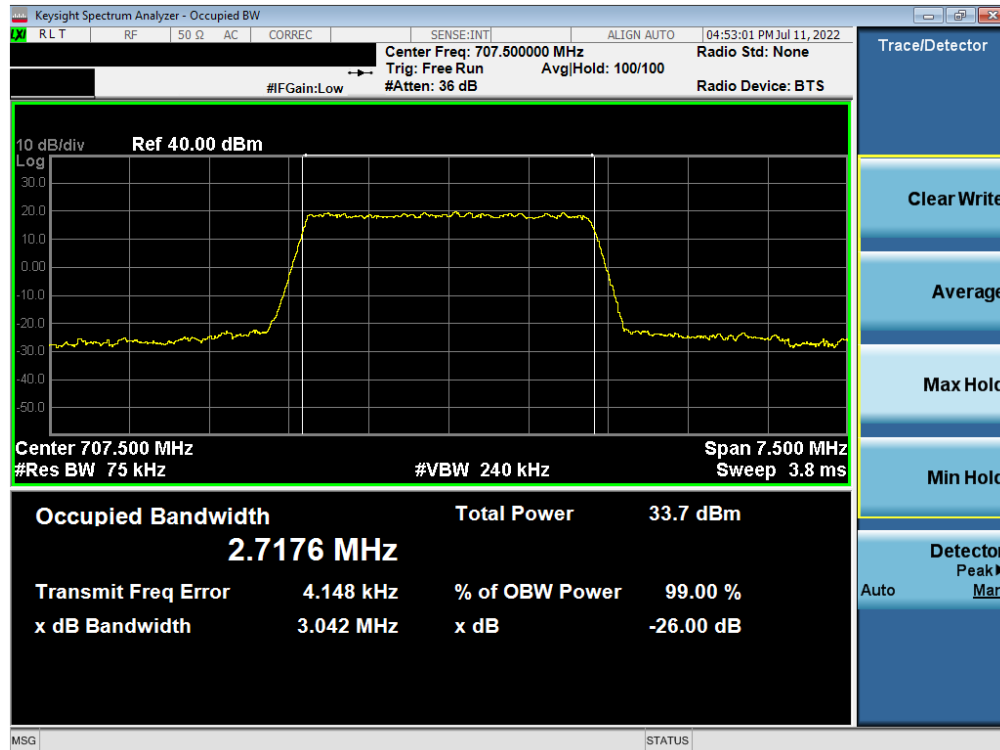


Plot 7-43. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 64-QAM - Full RB)

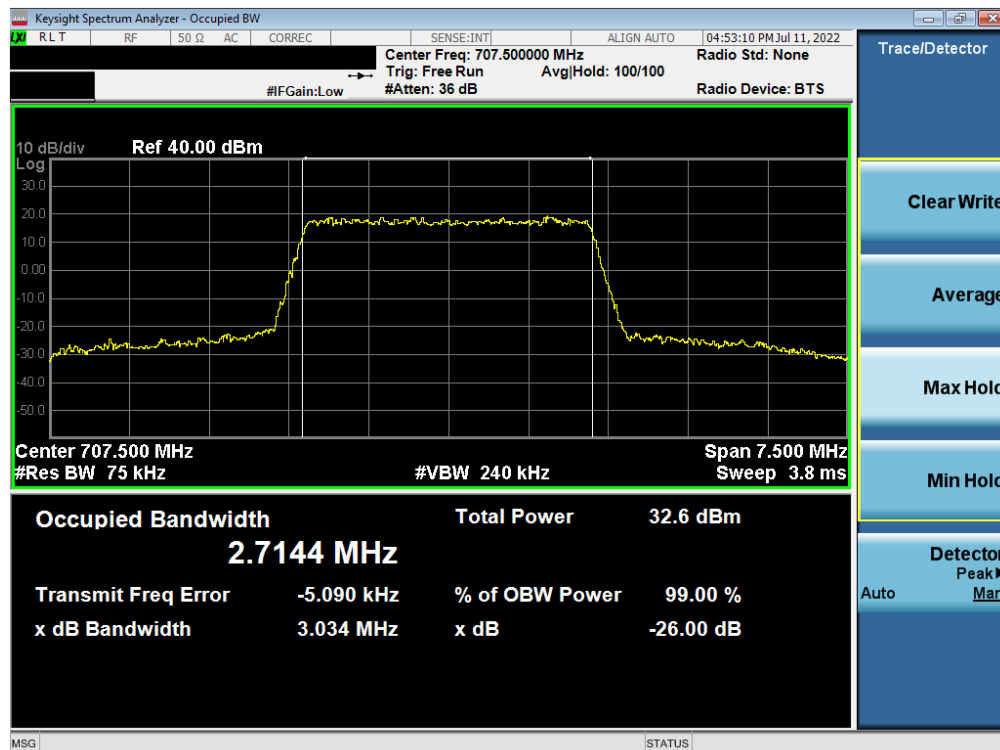


Plot 7-44. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 256-QAM - Full RB)


FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 39 of 315



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

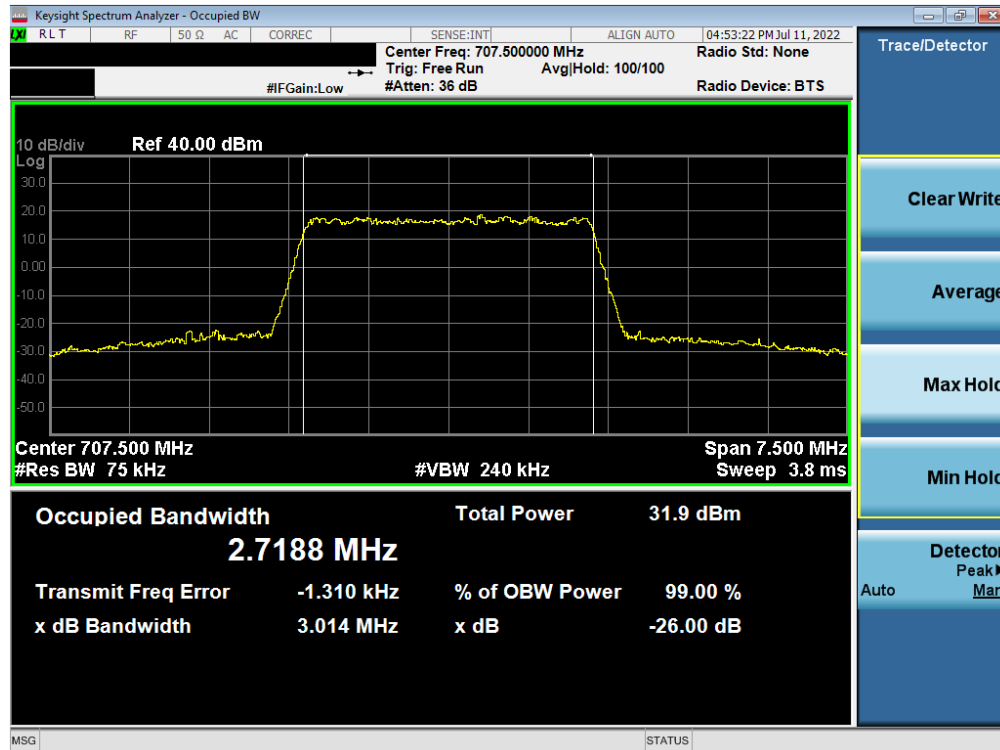


Plot 7-46. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB)

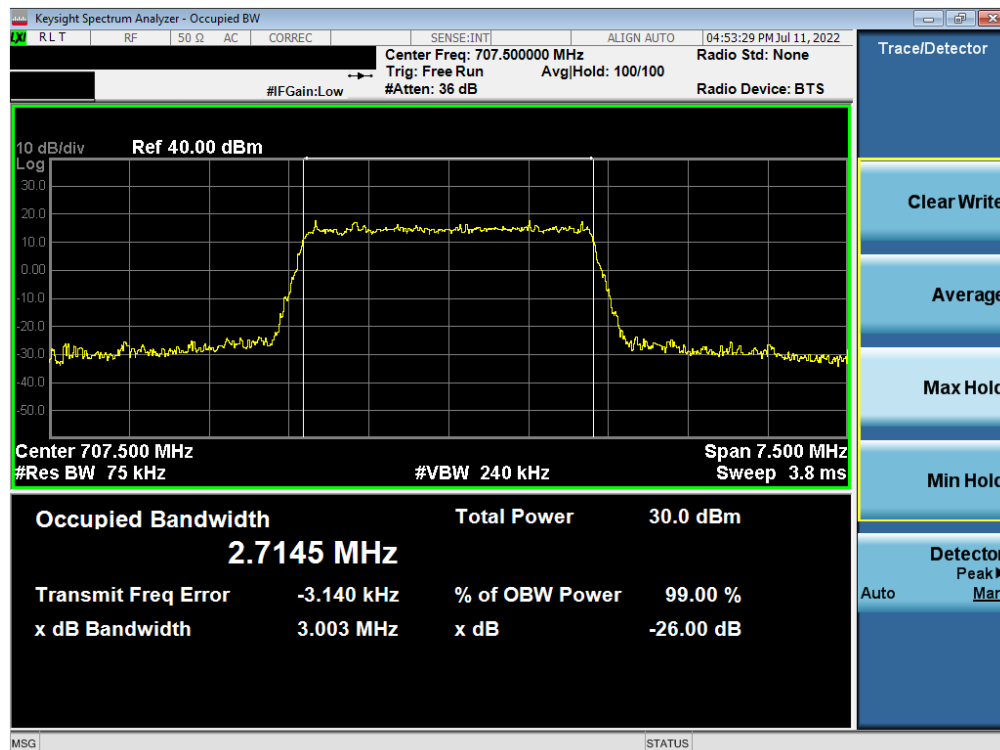
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 40 of 315

V2.1 11/9/2021


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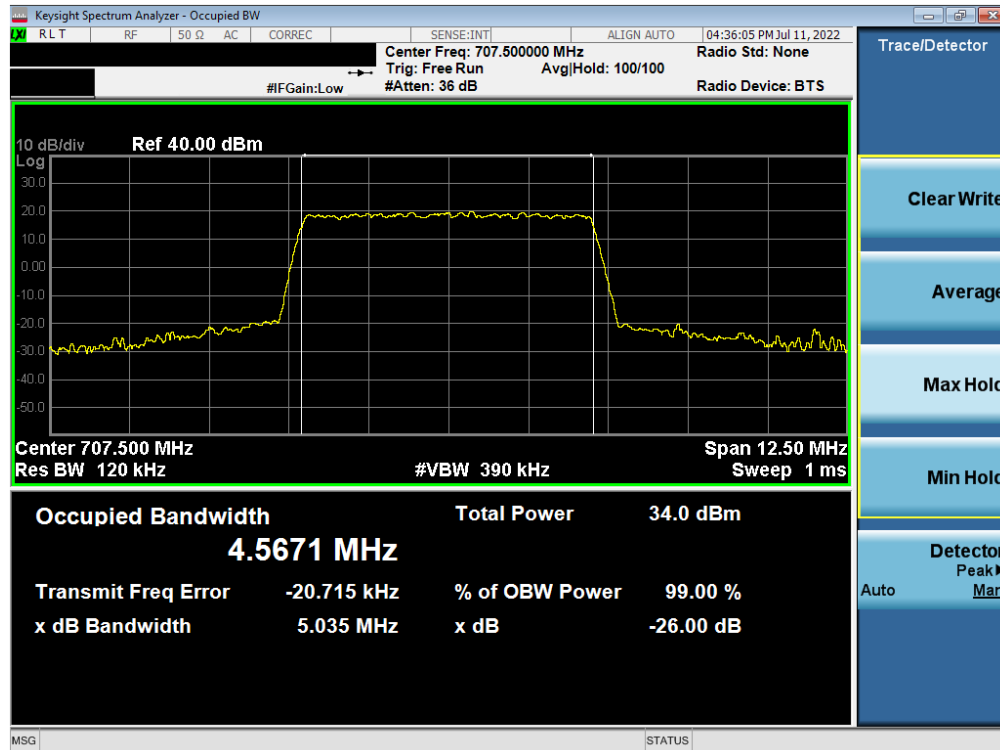
Plot 7-47. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 64-QAM - Full RB)



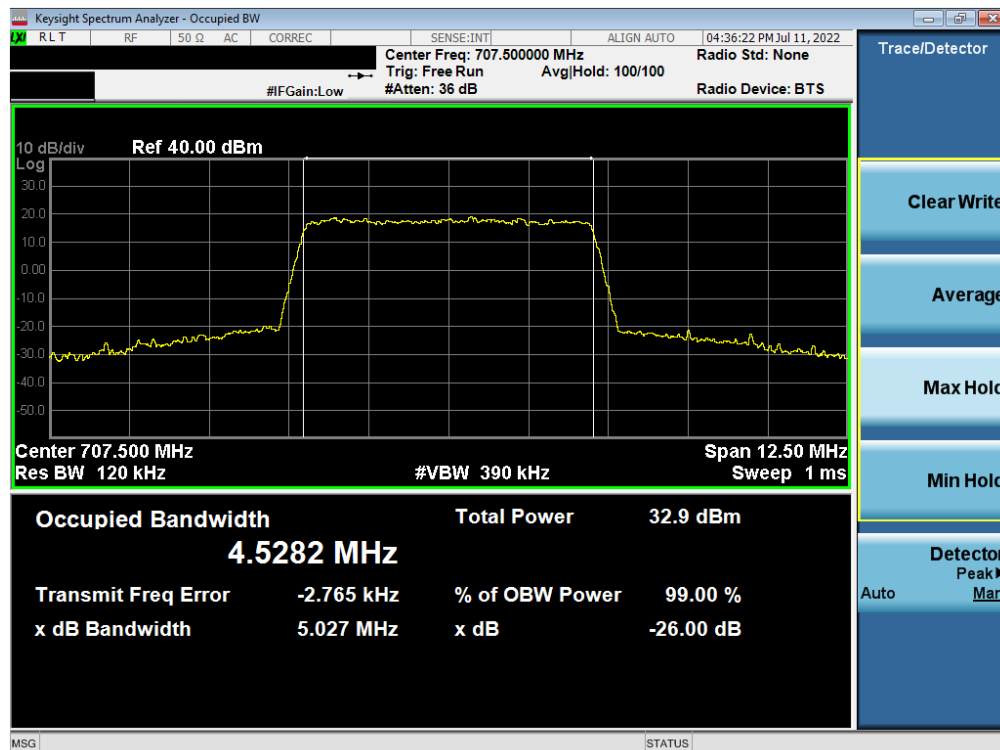
Plot 7-48. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 41 of 315


V2.1 11/9/2021



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

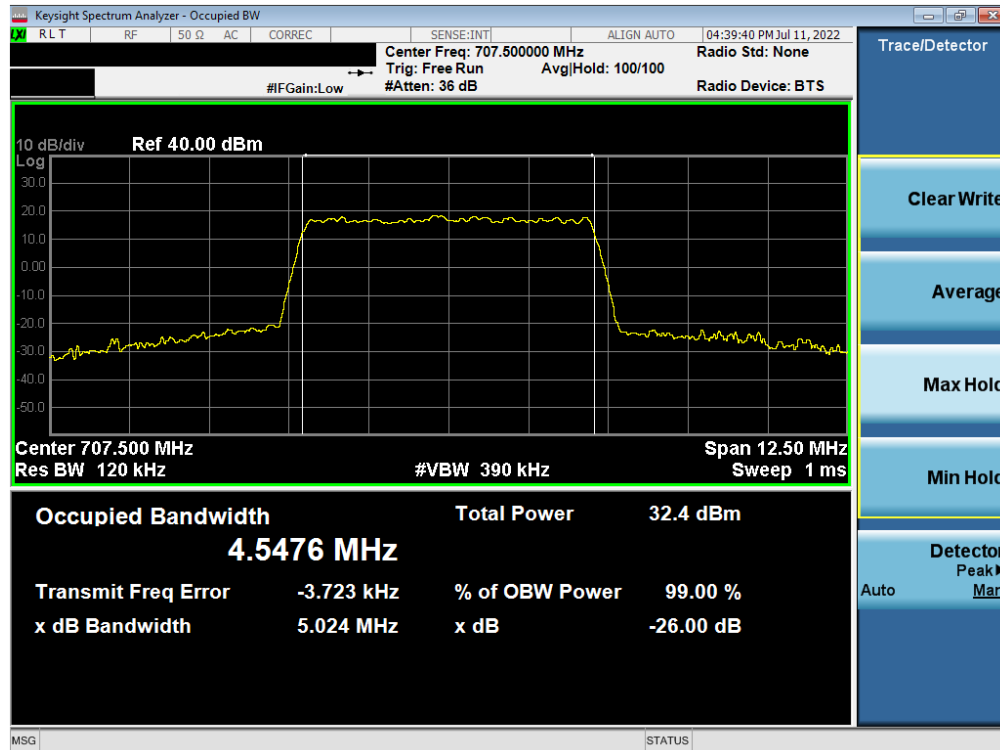


Plot 7-50. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 16-QAM - Full RB)

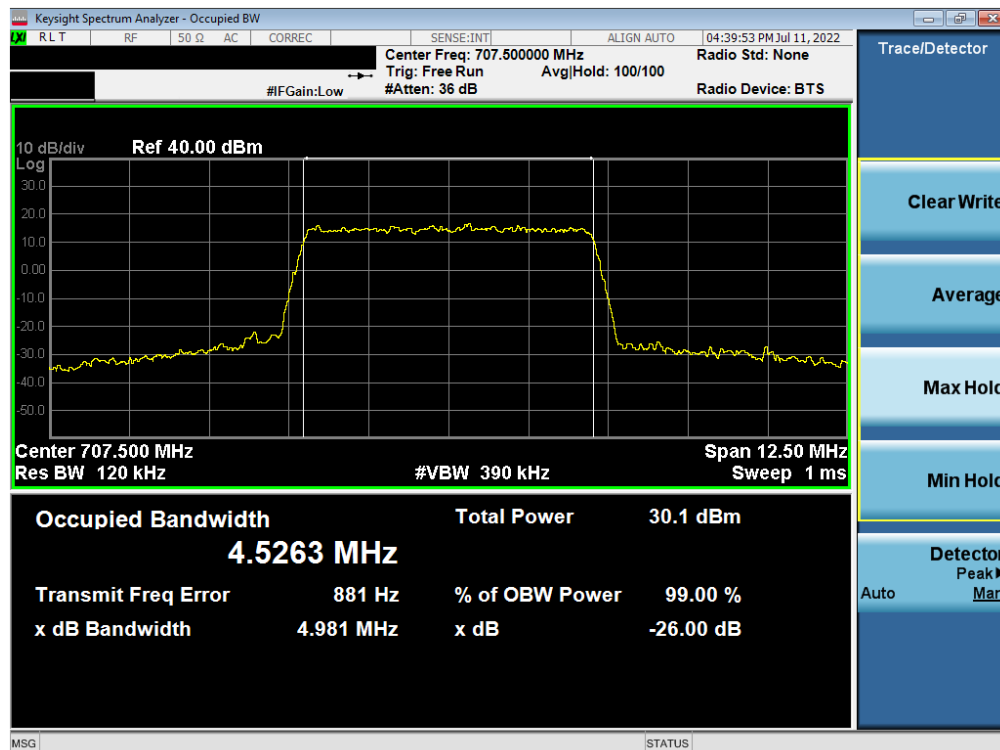
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 42 of 315

V2.1 11/9/2021


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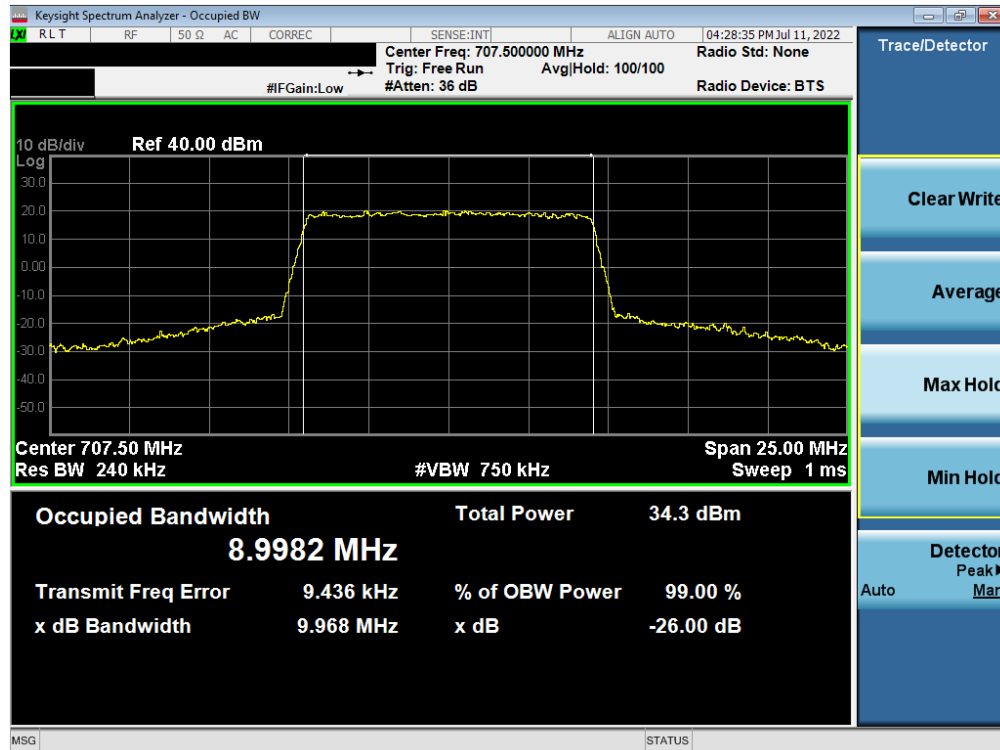
Plot 7-51. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 64-QAM - Full RB)



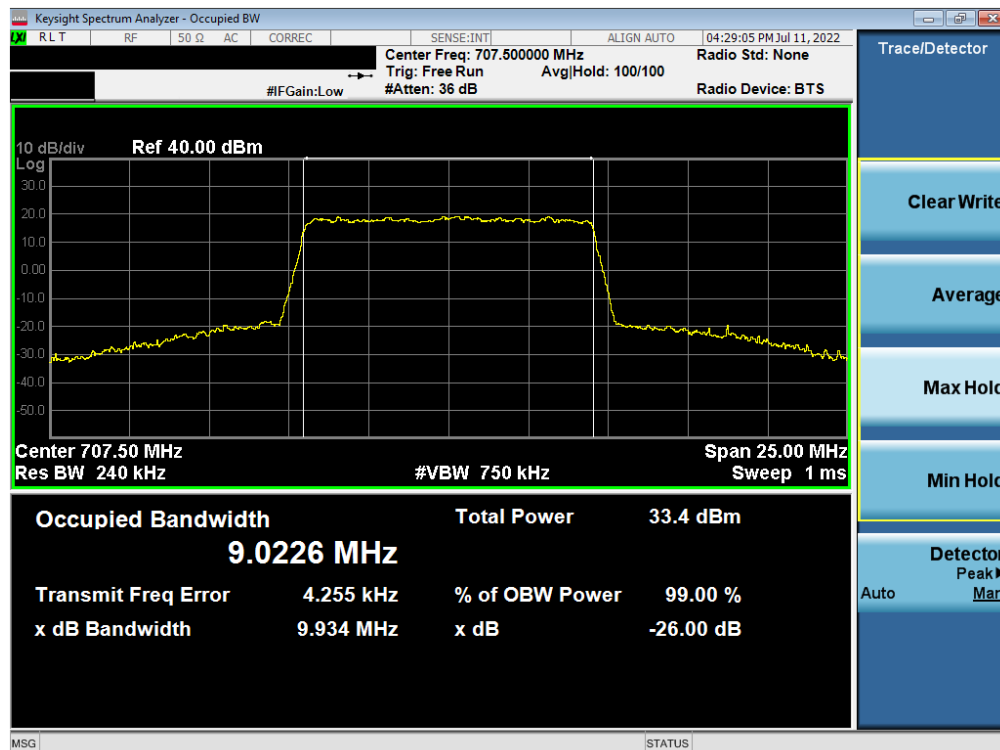
Plot 7-52. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 43 of 315


V2.1 11/9/2021



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



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

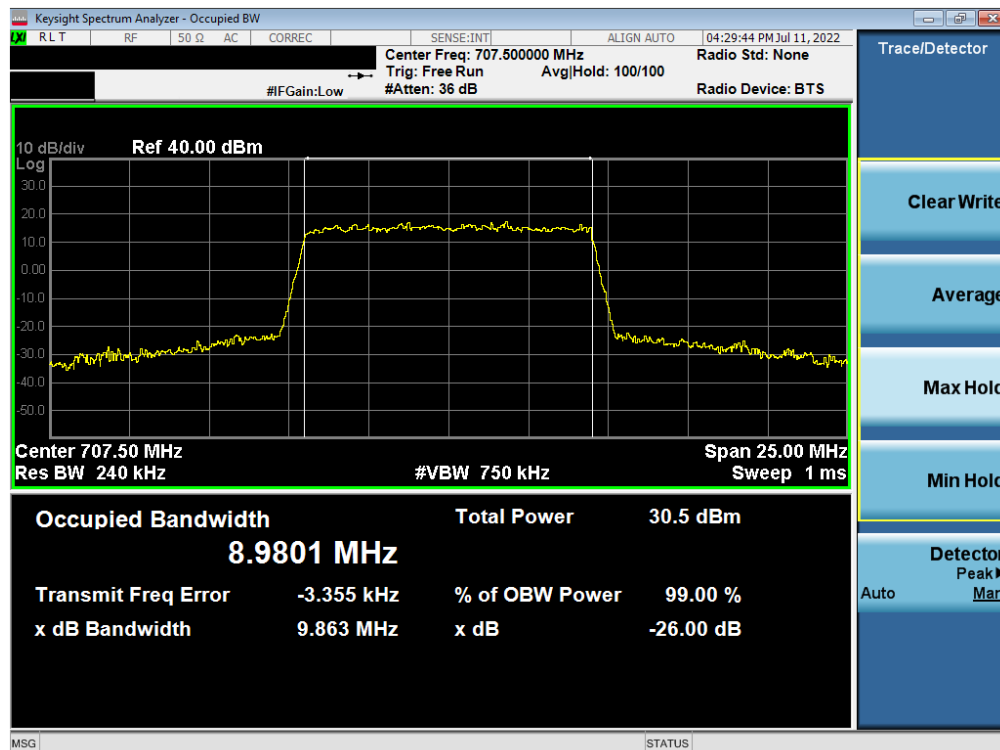
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 44 of 315

V2.1 11/9/2021


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



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

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 45 of 315

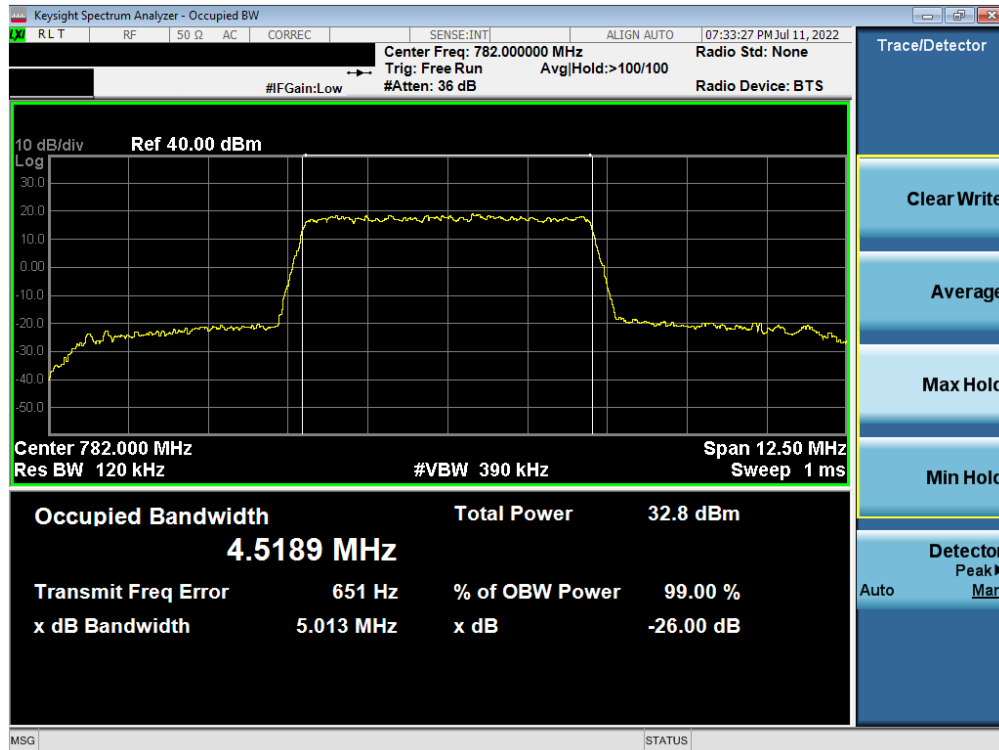
V2.1 11/9/2021

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LTE Band 13



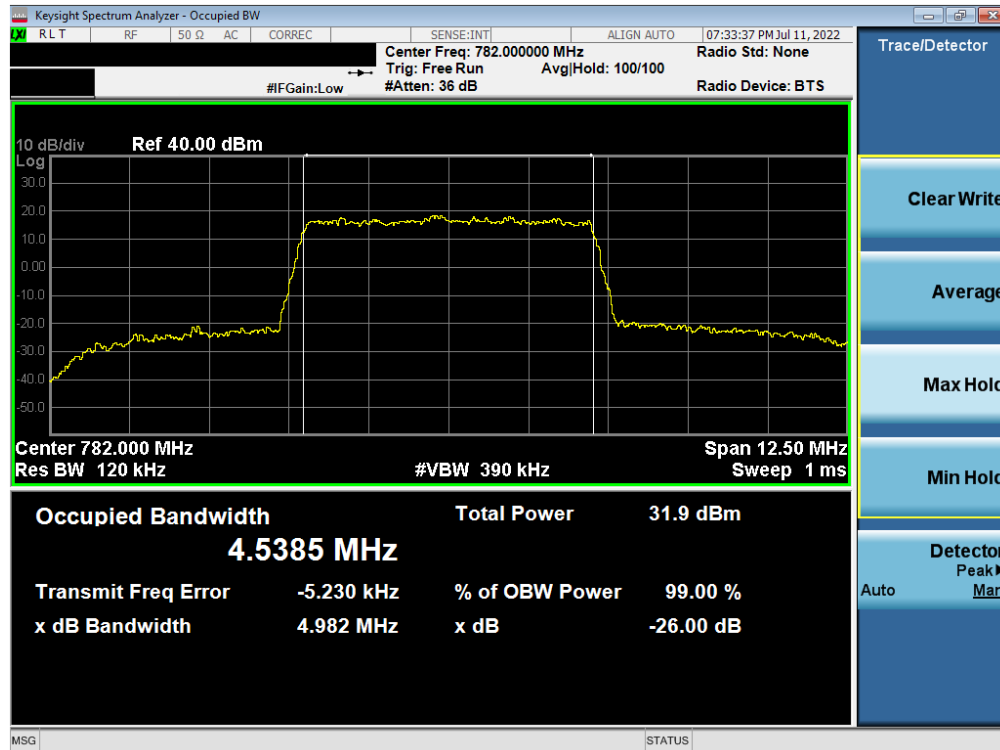
Plot 7-57. Occupied Bandwidth Plot (LTE Band 13 - 5MHz QPSK - Full RB)



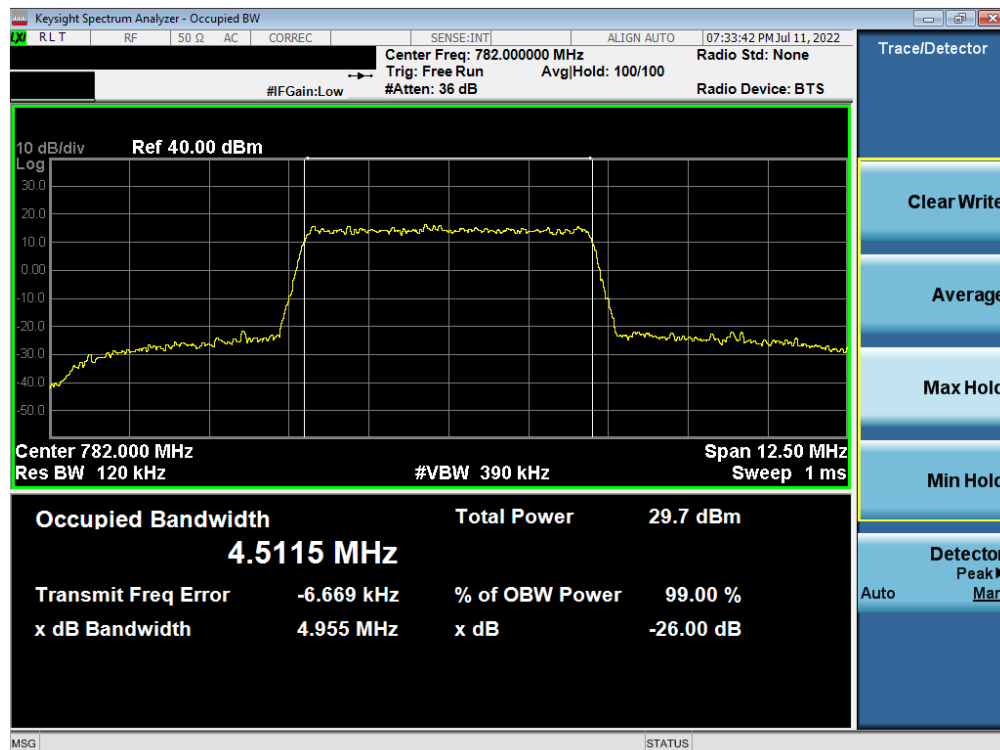
Plot 7-58. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 46 of 315


V2.1 11/9/2021



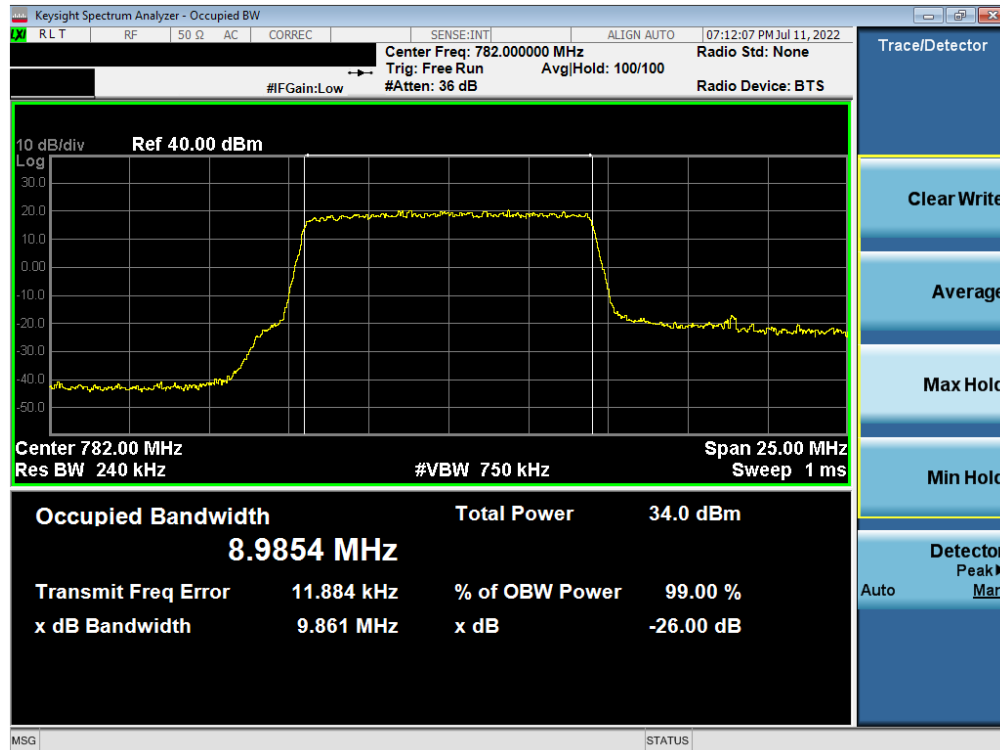
Plot 7-59. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 64-QAM - Full RB)



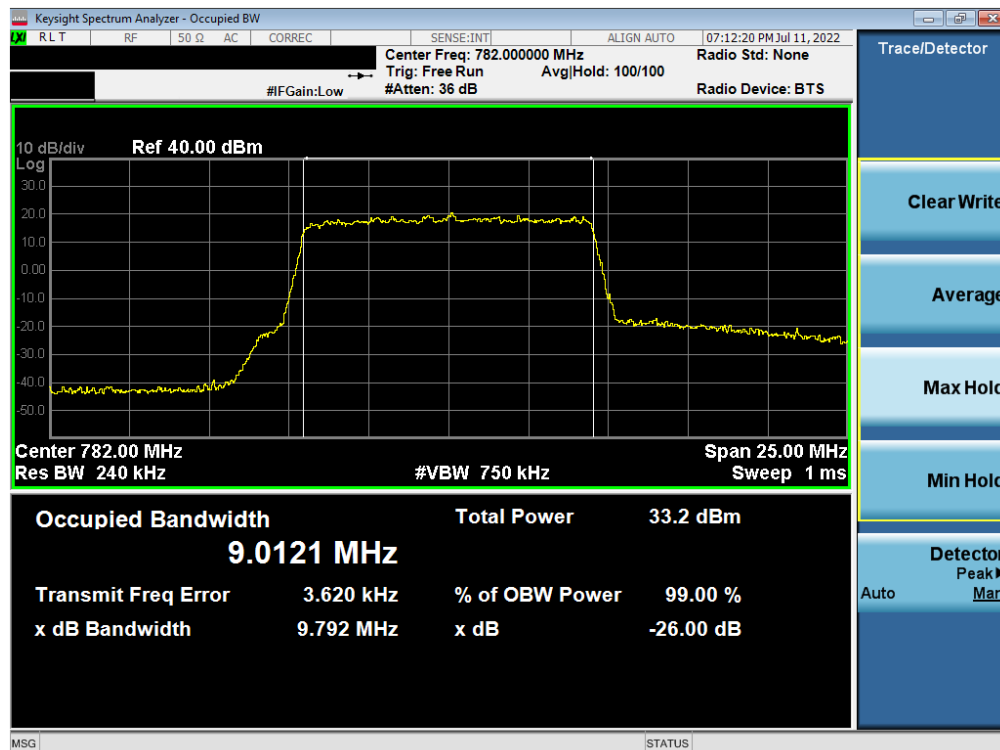
Plot 7-60. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 256-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 47 of 315


V2.1 11/9/2021

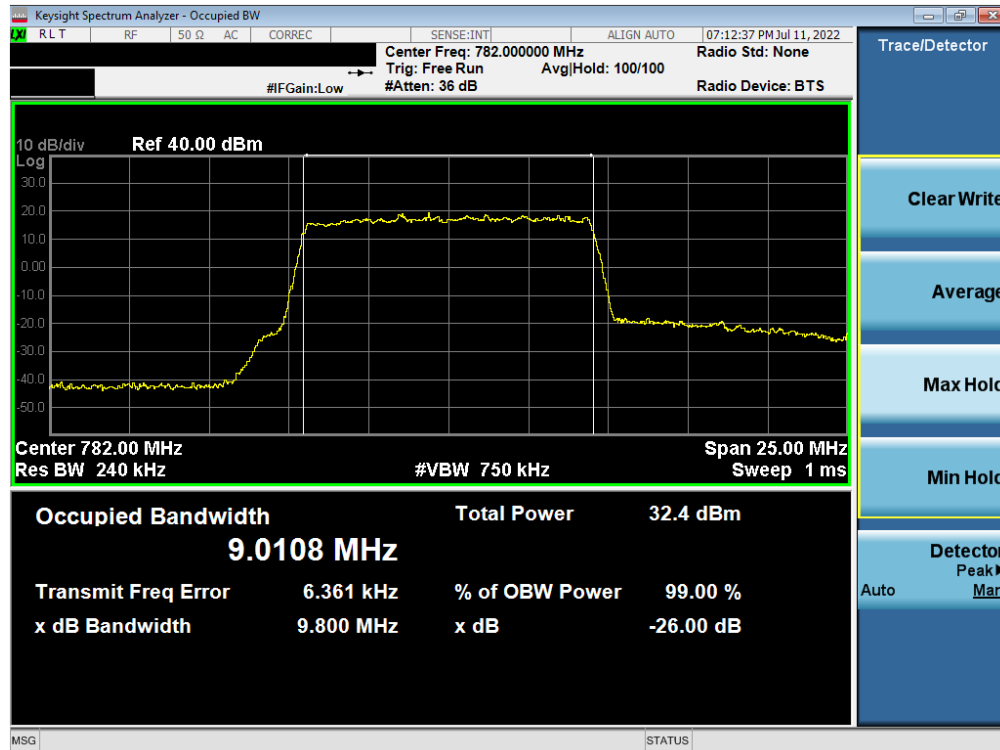


Plot 7-61. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB)

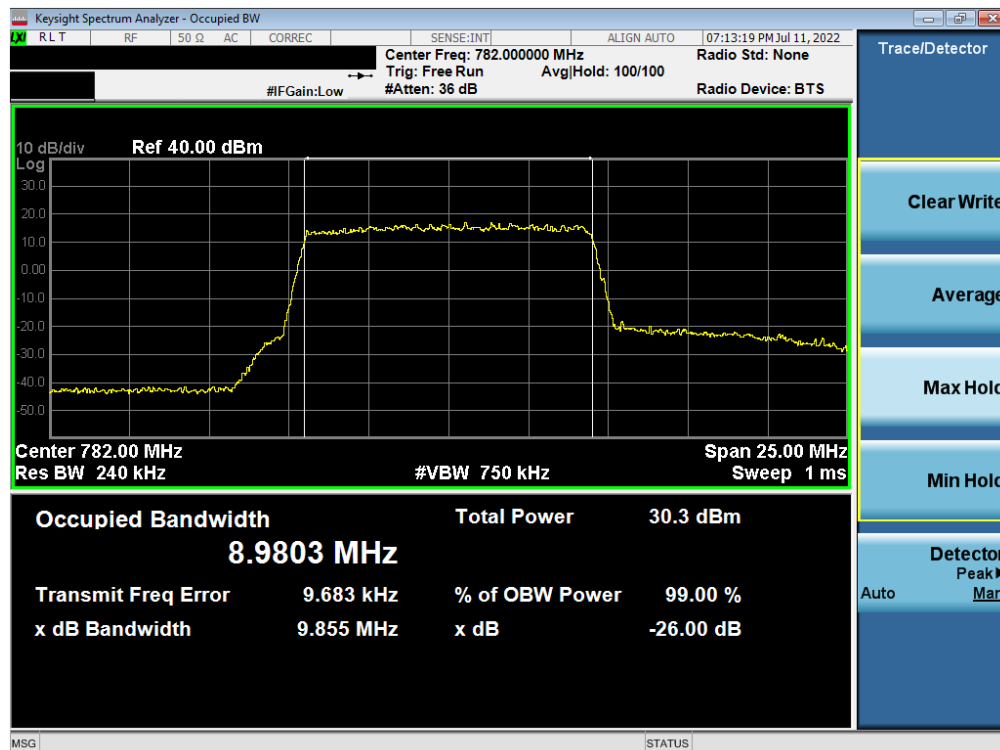


Plot 7-62. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 48 of 315



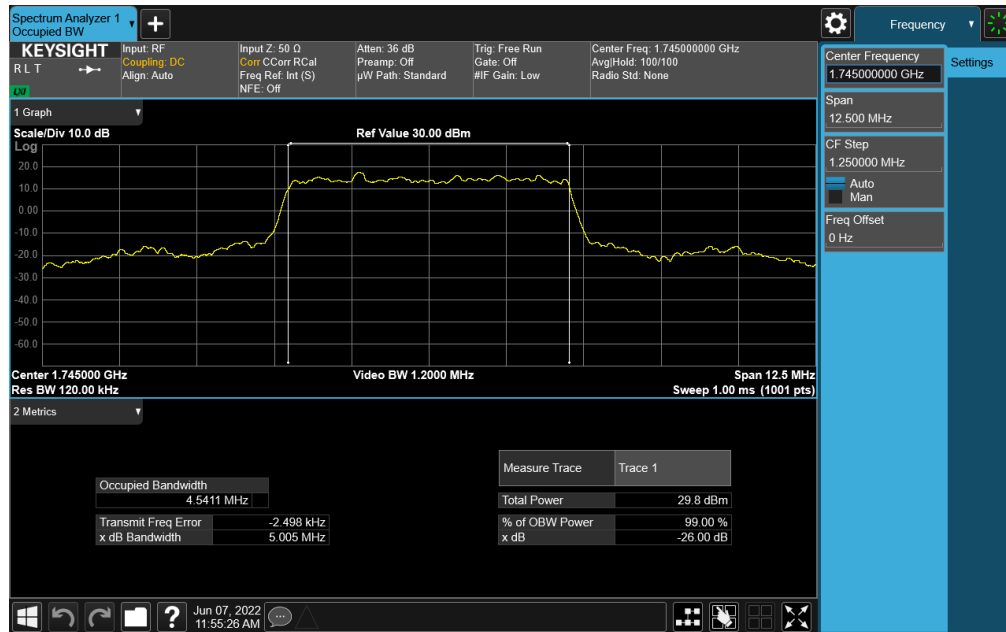
Plot 7-63. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 64-QAM - Full RB)



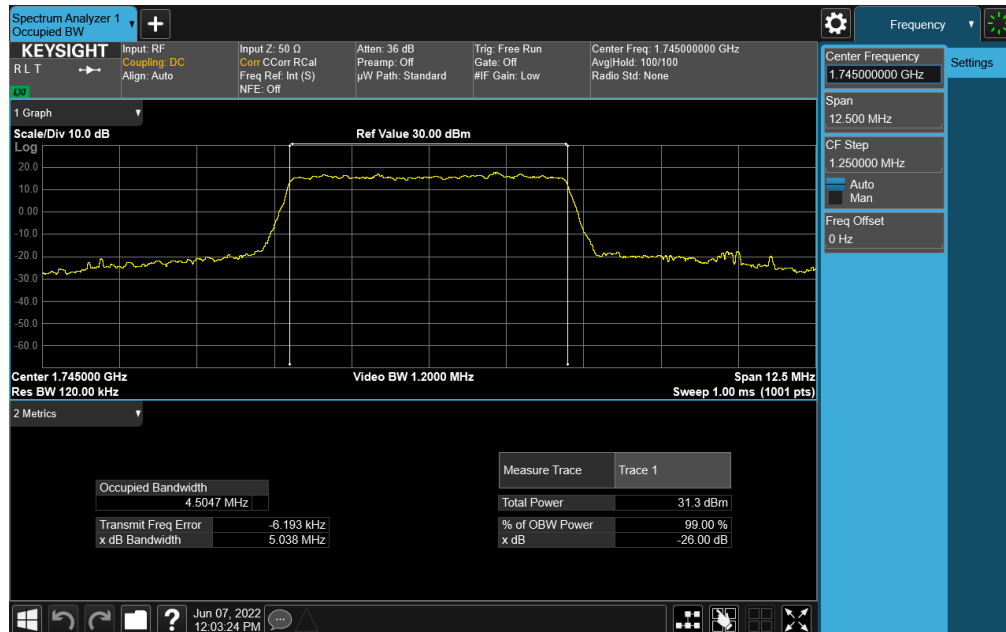
Plot 7-64. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 256-QAM - Full RB)

FCC ID: BCGA2757	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 49 of 315


NR Band n66



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

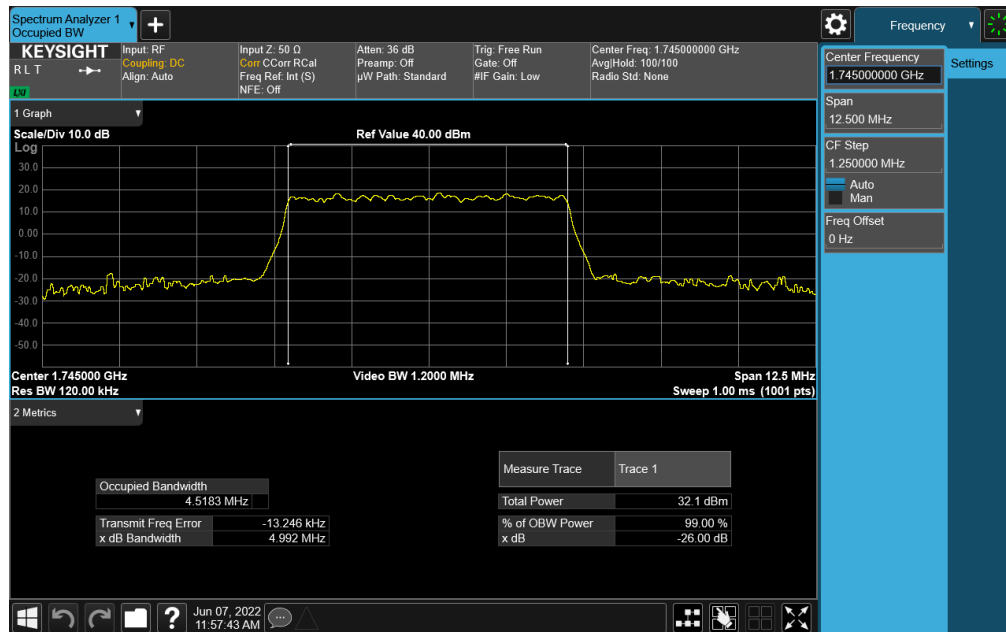


Plot 7-66. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB)

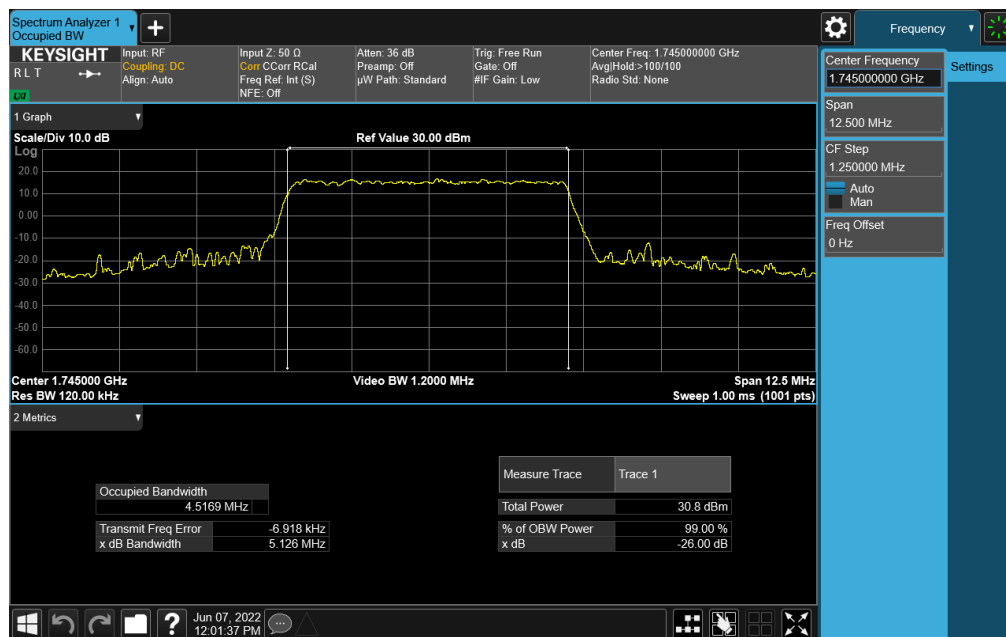
FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 50 of 315

V2.1 11/9/2021


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

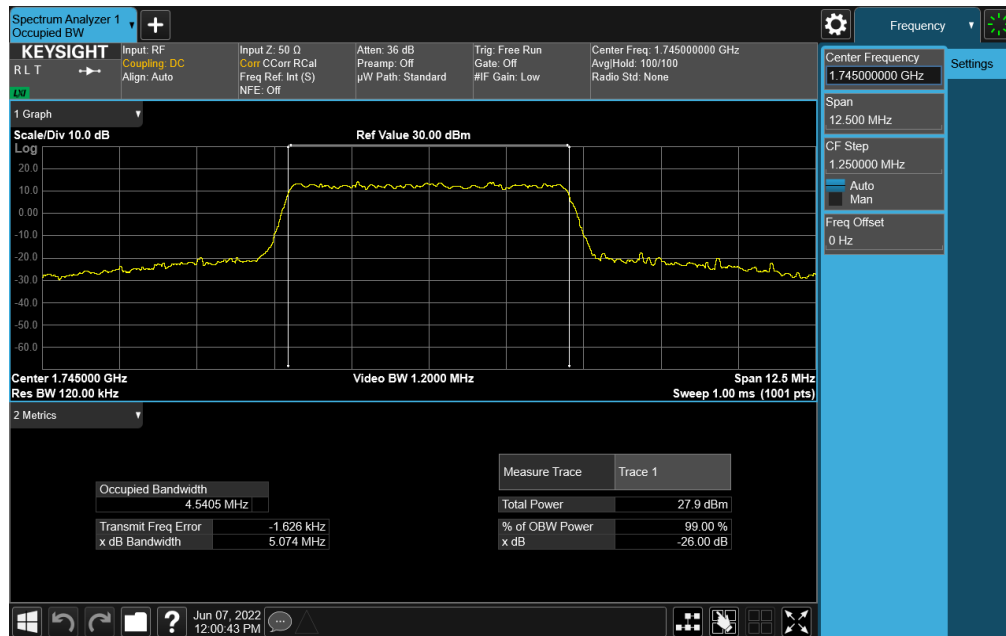


Plot 7-68. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 64QAM - Full RB)

FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 51 of 315

V2.1 11/9/2021


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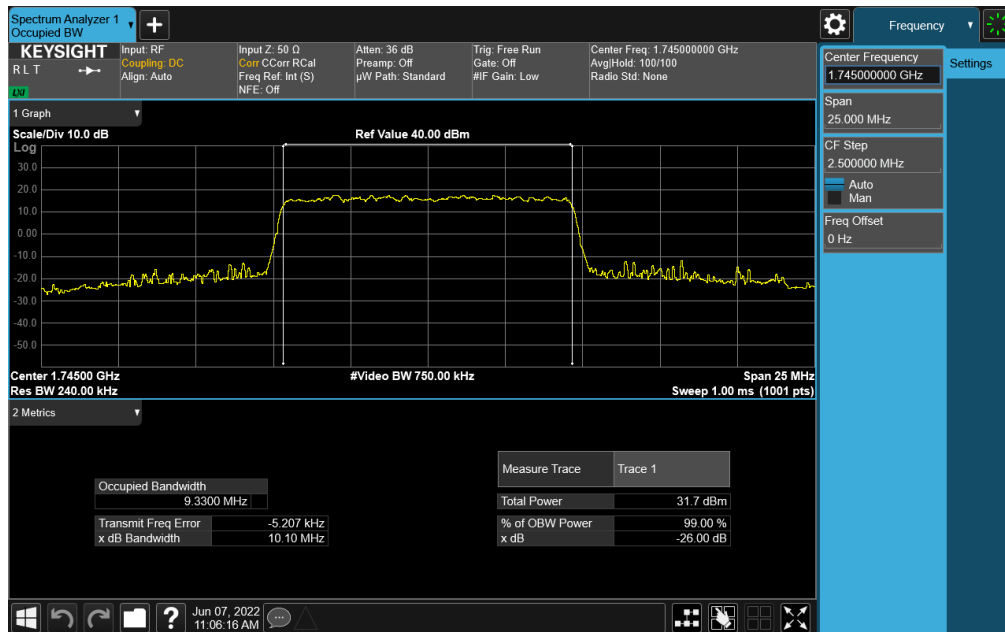


Plot 7-69. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 256QAM - Full RB)

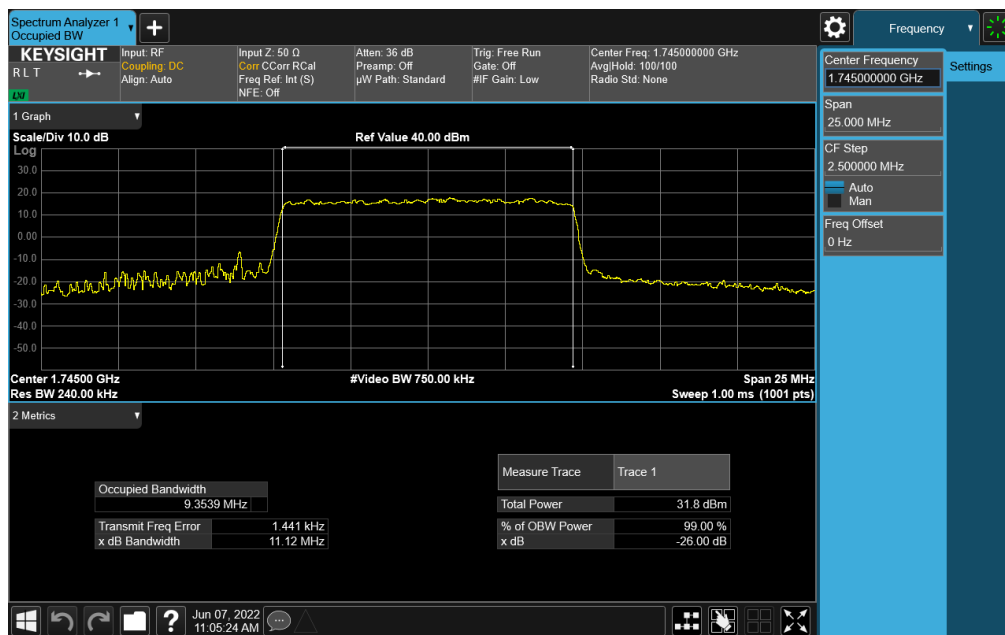


Plot 7-70. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 52 of 315



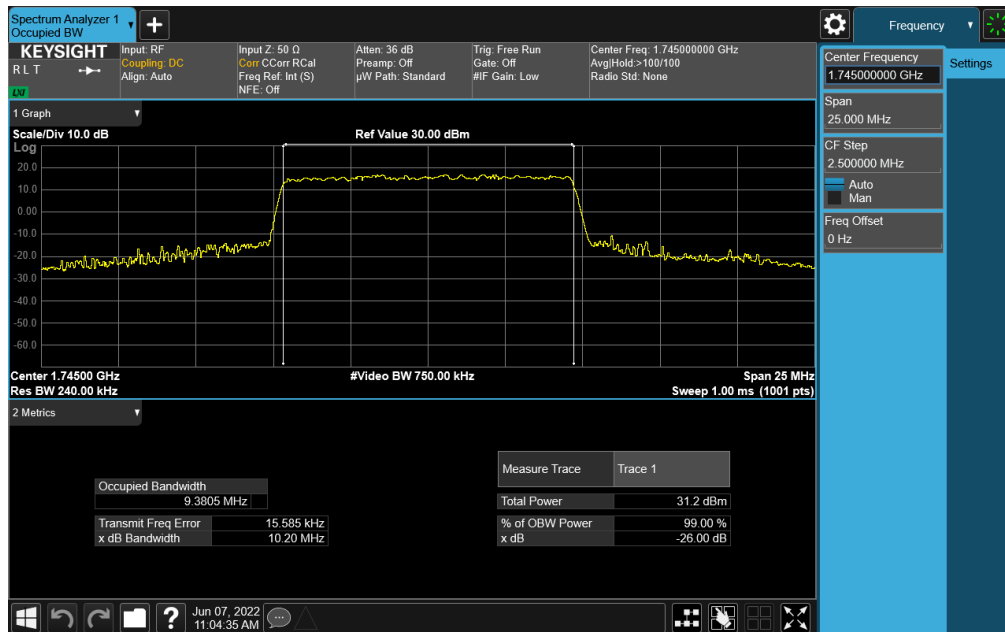
Plot 7-71. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB)



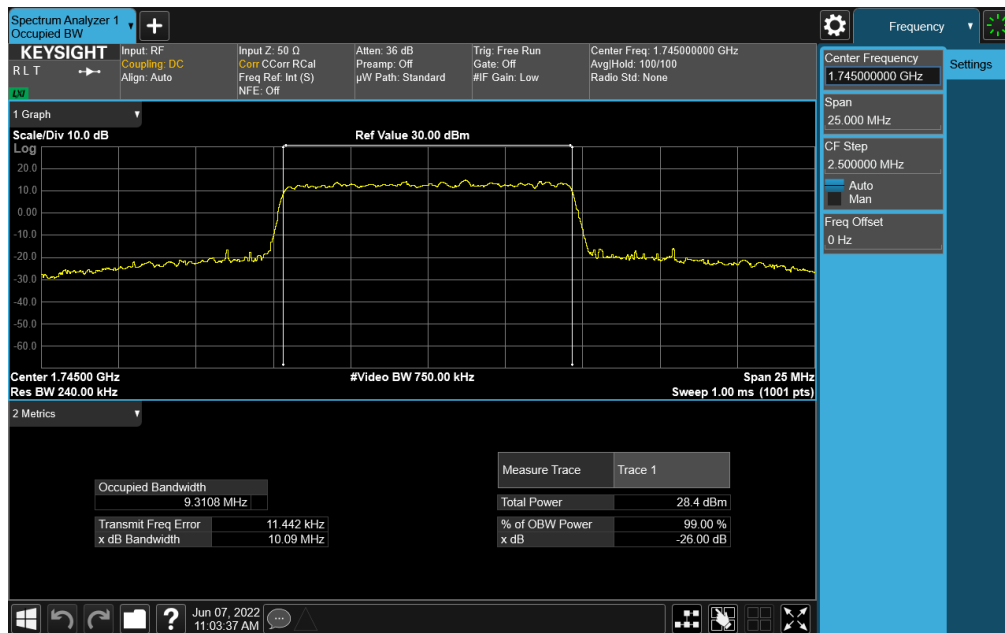
Plot 7-72. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: BCGA2757	<p>element</p> <p>PART 27 MEASUREMENT REPORT</p>		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 53 of 315


V2.1 11/9/2021



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

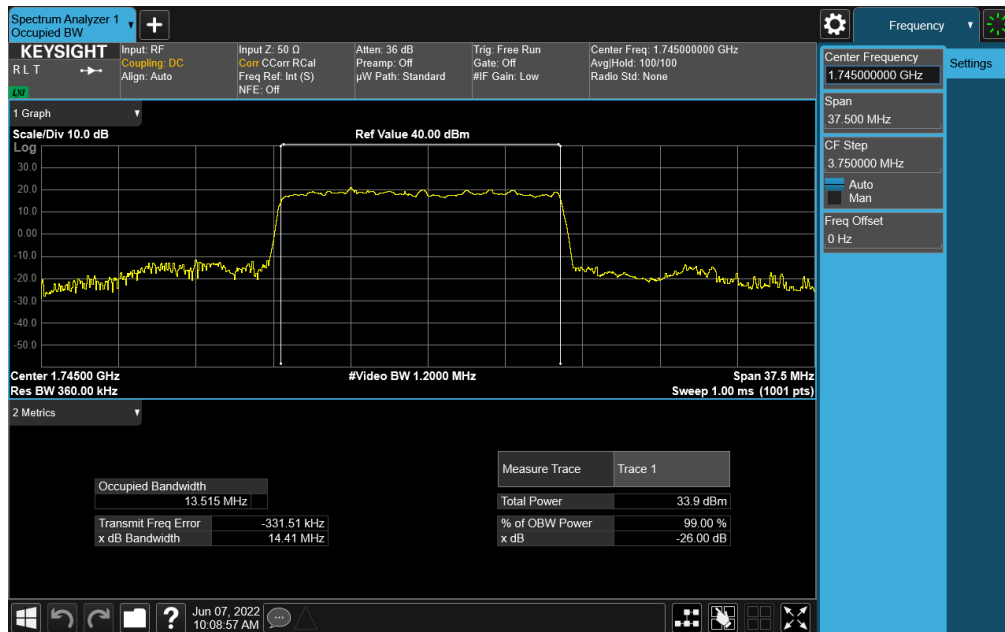


Plot 7-74. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 256QAM - Full RB)

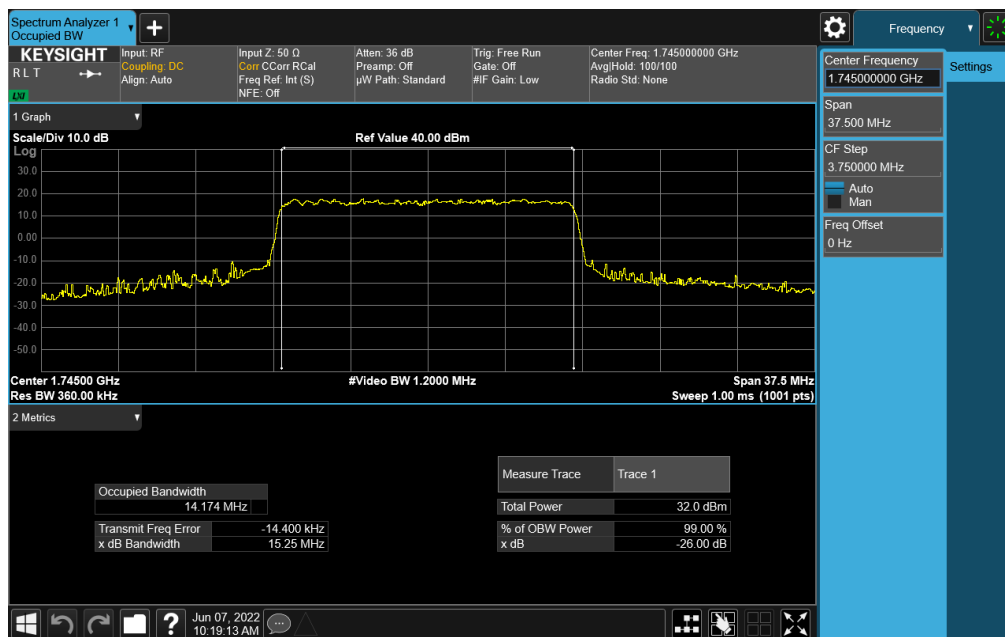
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 54 of 315

V2.1 11/9/2021


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

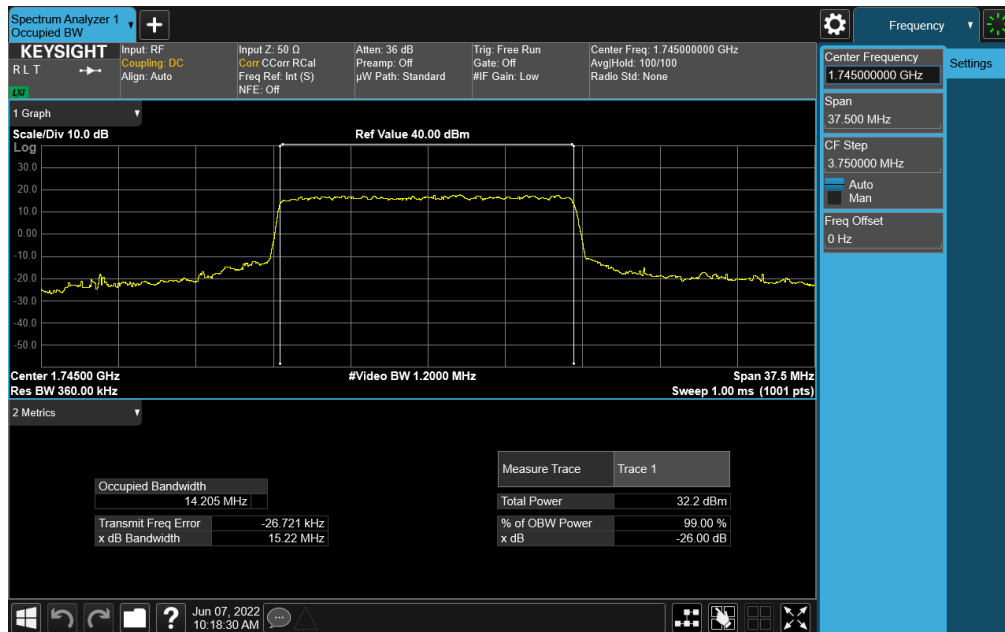


Plot 7-76. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB)

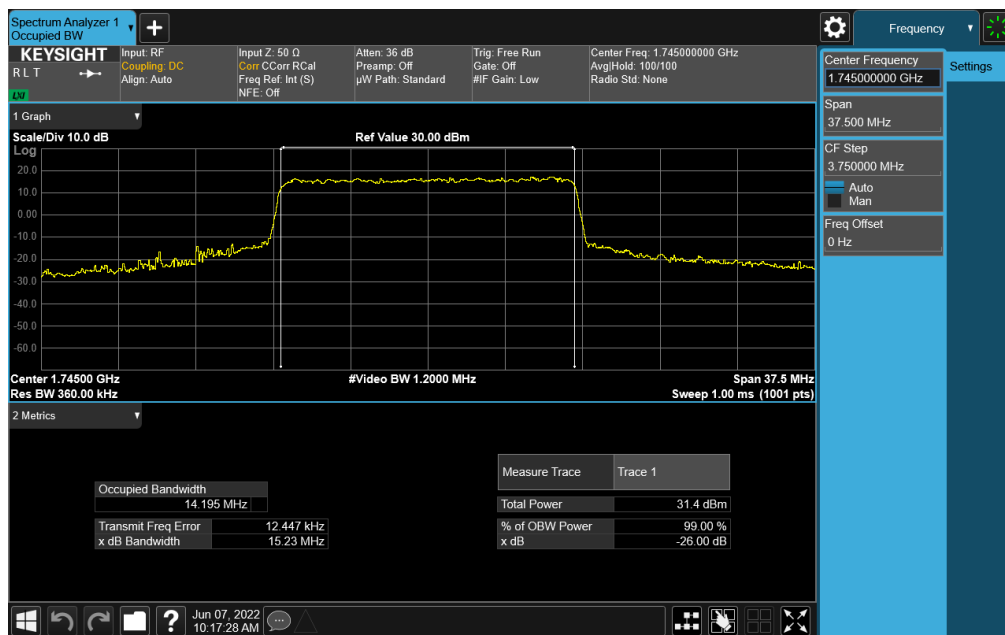
FCC ID: BCGA2757		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 55 of 315

V2.1 11/9/2021

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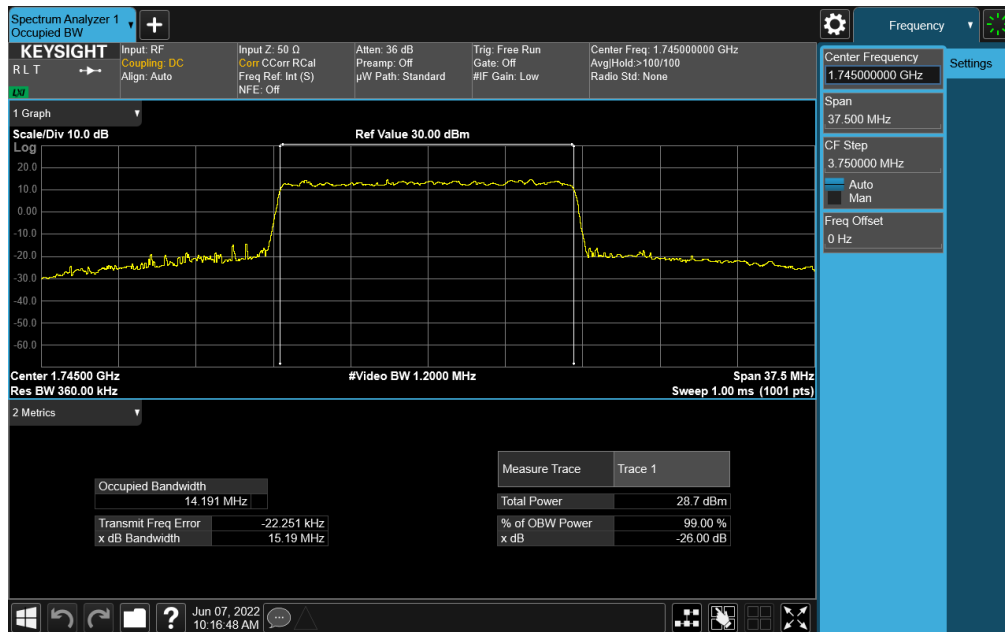


Plot 7-77. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 16QAM - Full RB)

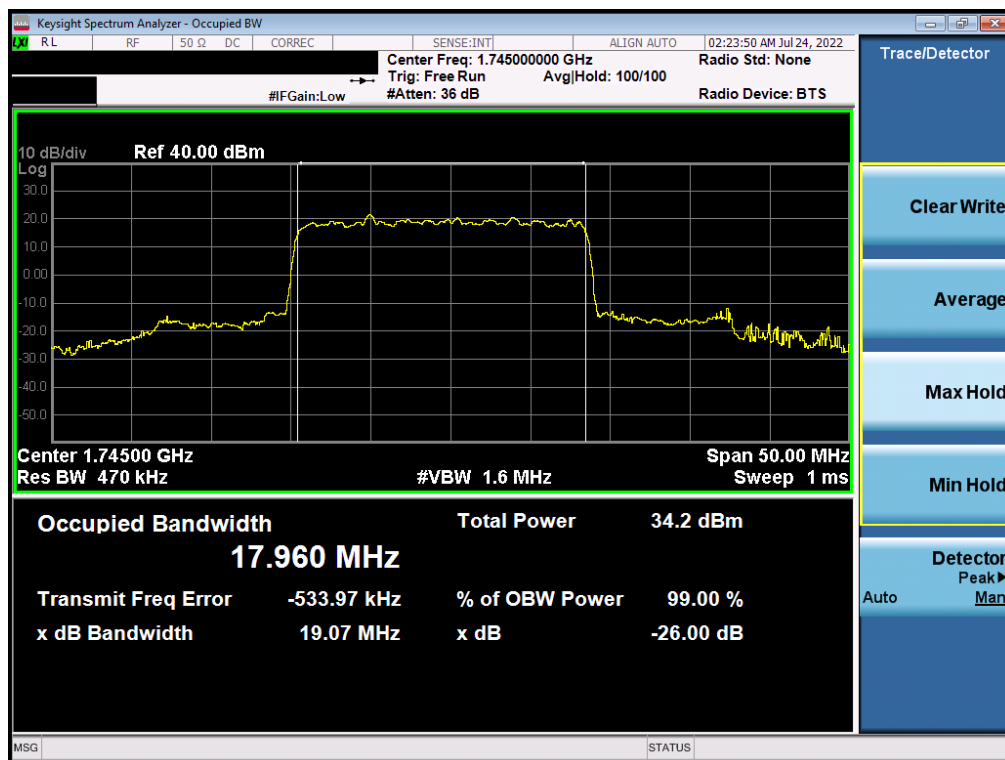


Plot 7-78. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 64QAM - Full RB)

FCC ID: BCGA2757	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 56 of 315



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

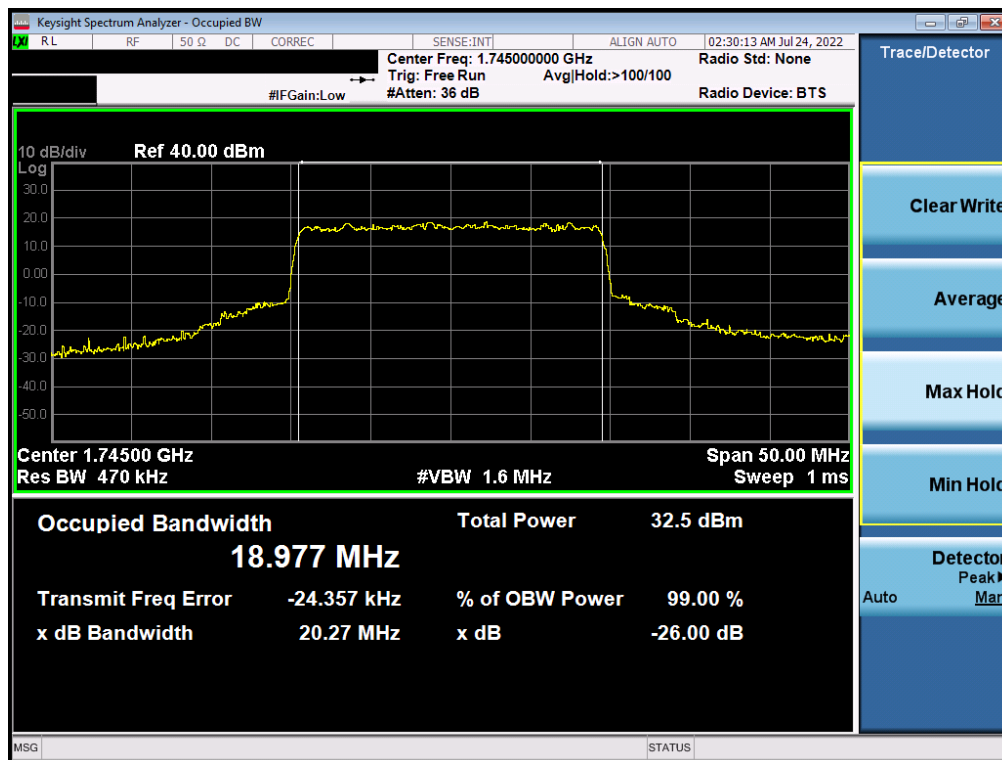


Plot 7-80. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB)


FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 57 of 315



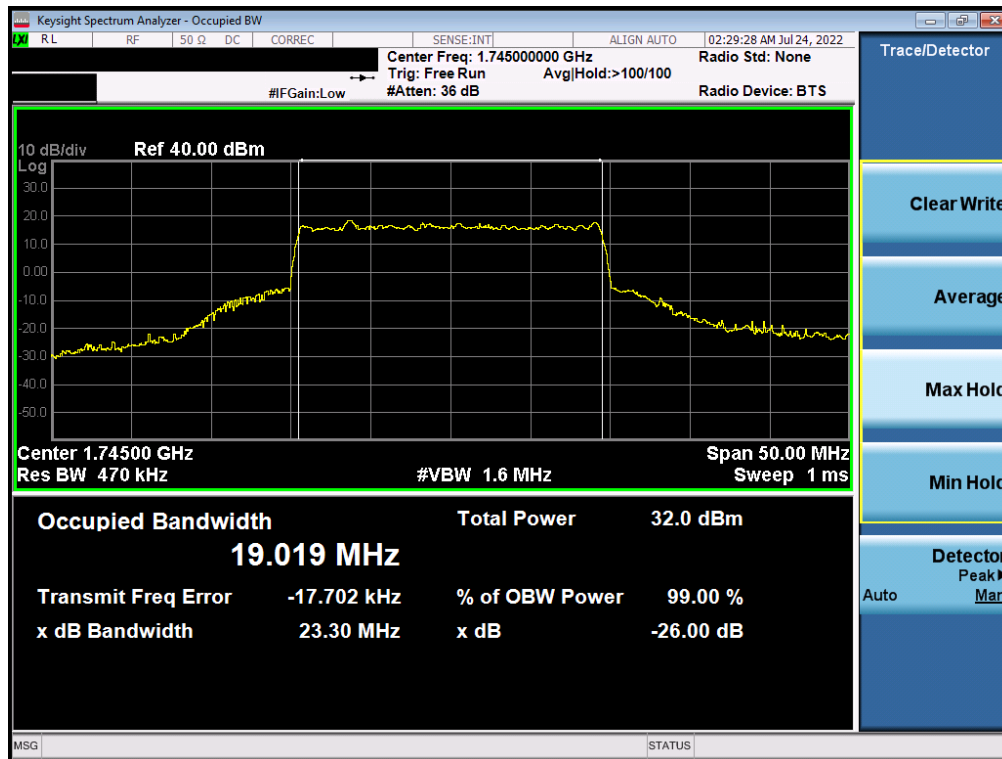
Plot 7-81. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB)



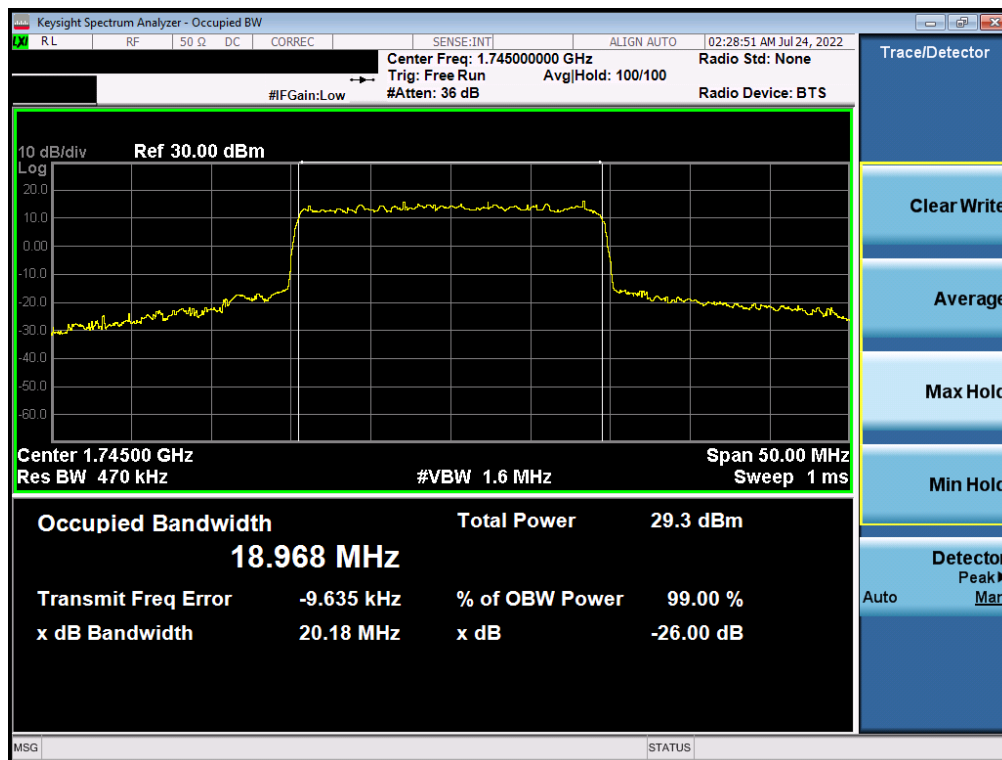
Plot 7-82. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device
		Page 58 of 315


V2.1 11/9/2021

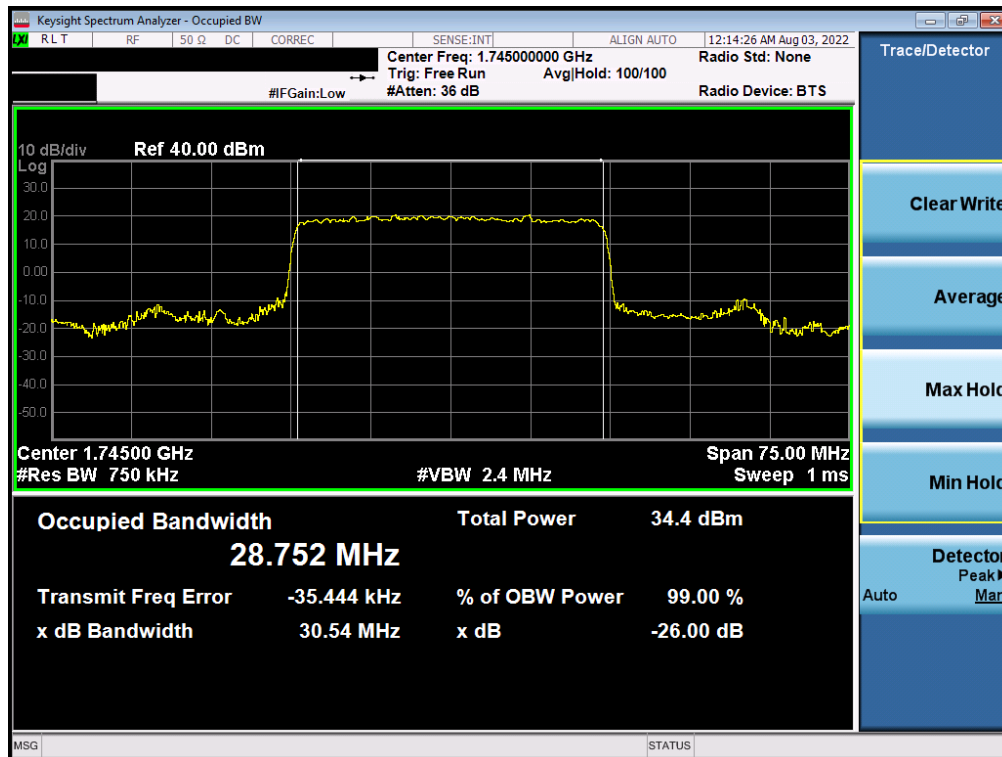


Plot 7-83. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM 64QAM - Full RB)



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


FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 59 of 315



Plot 7-85. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB)

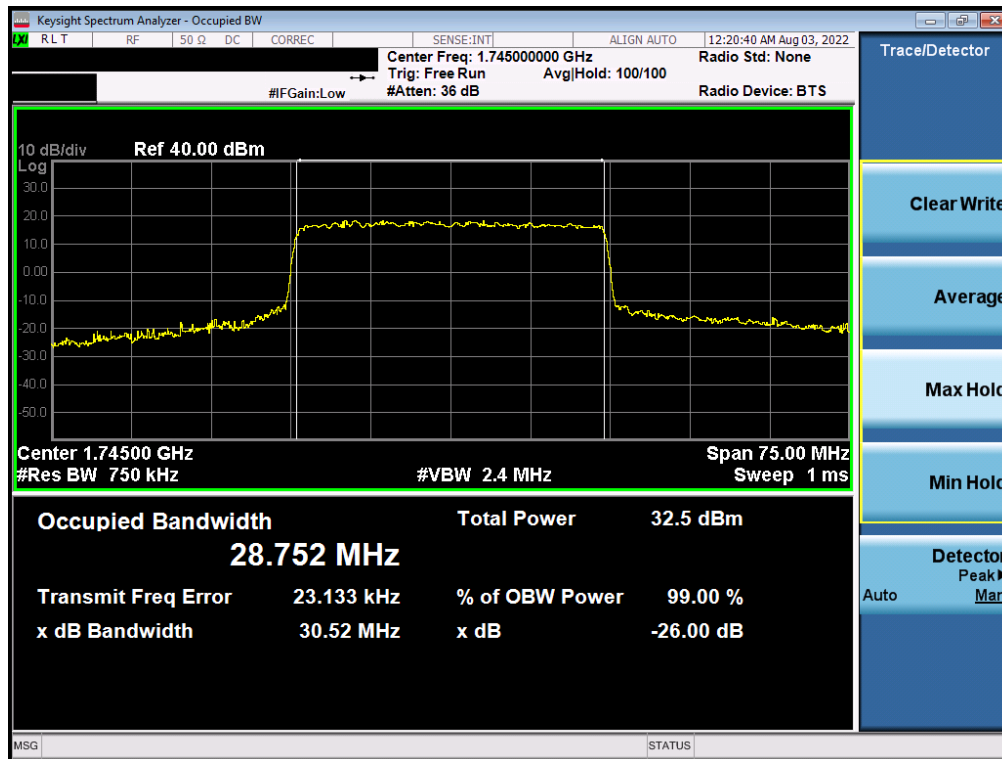


Plot 7-86. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM QPSK - Full RB)

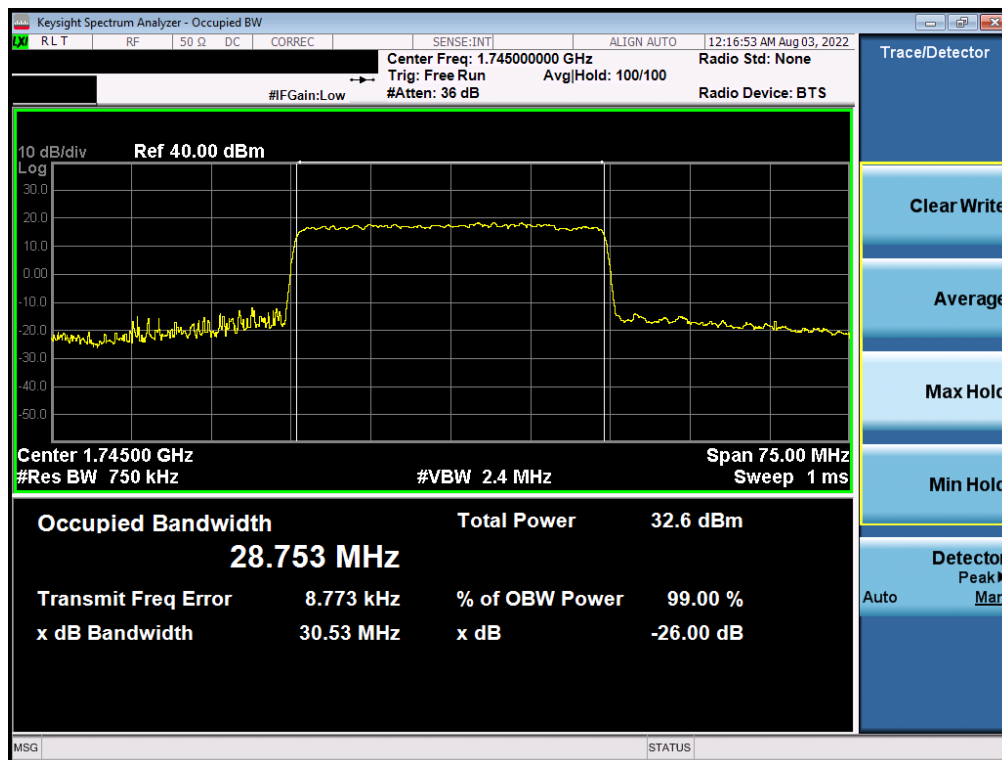
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 60 of 315

V2.1 11/9/2021


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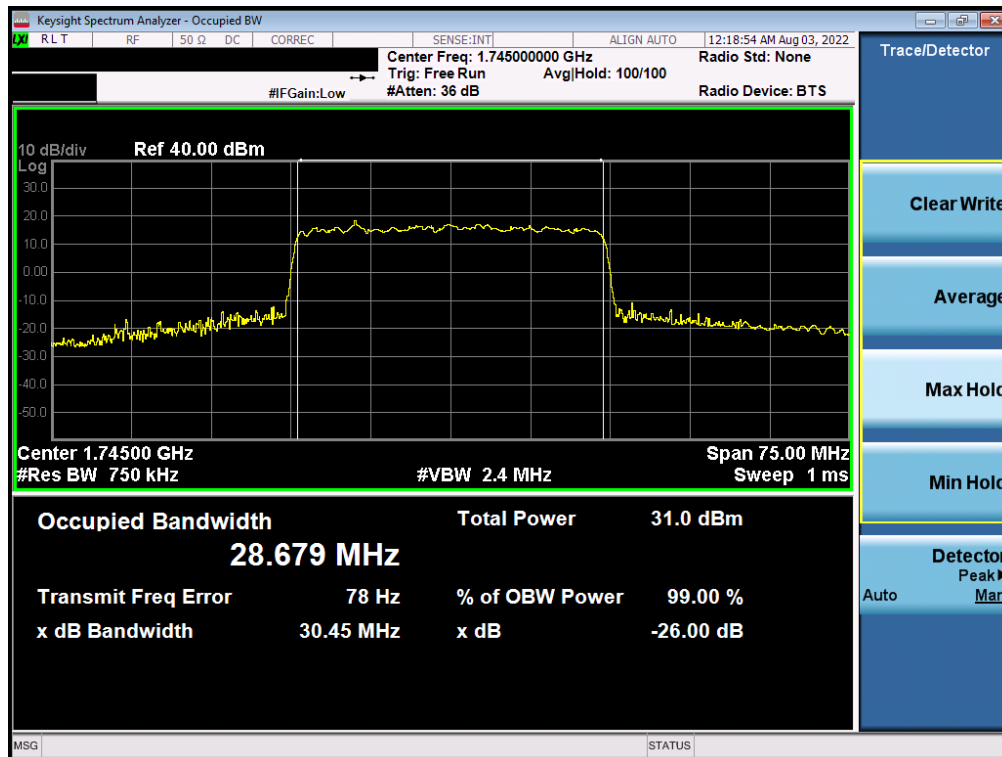


Plot 7-87. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM 16QAM - Full RB)

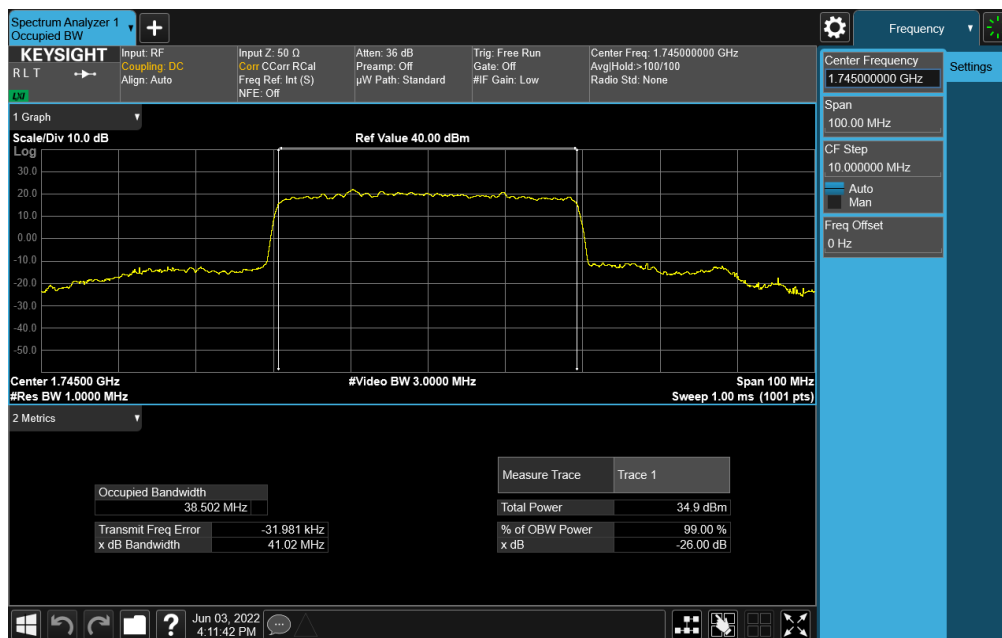


Plot 7-88. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM 64QAM - Full RB)

FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 61 of 315



Plot 7-89. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM 256QAM - Full RB)

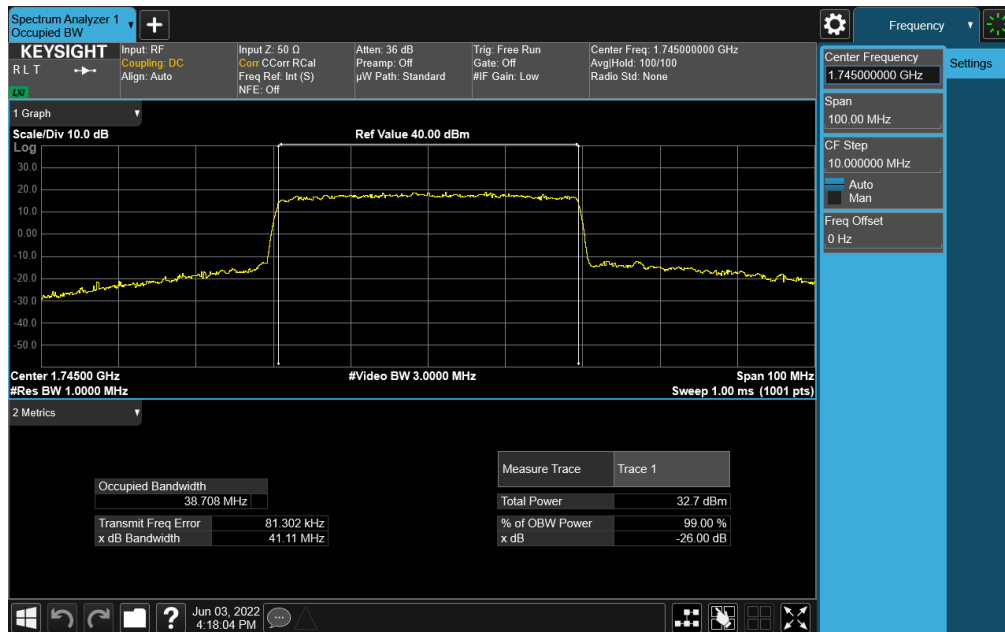


Plot 7-90. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB)

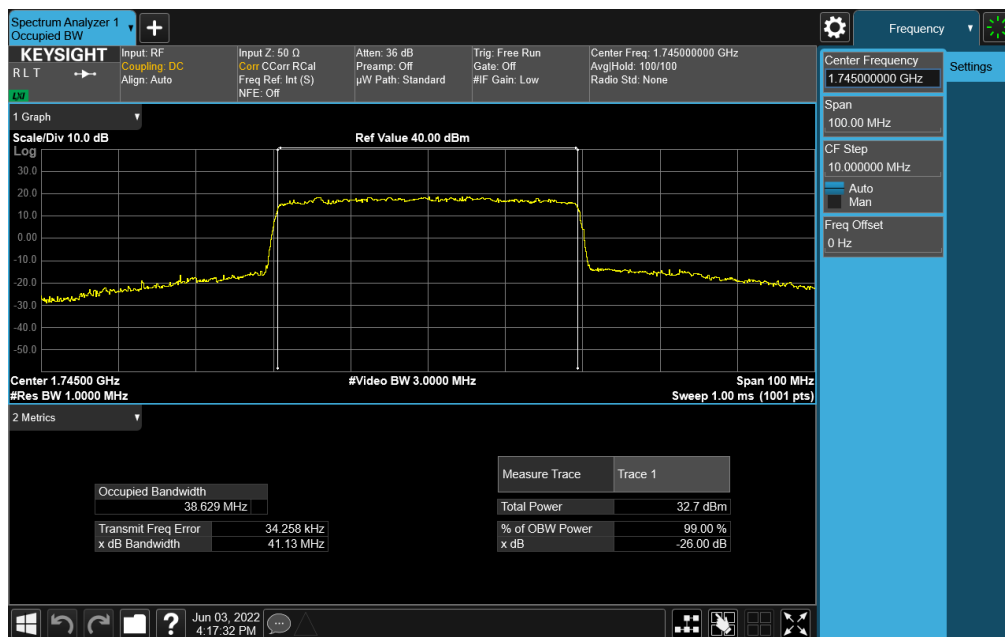
FCC ID: BCGA2757	element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 62 of 315

V2.1 11/9/2021

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Plot 7-91. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM QPSK - Full RB)

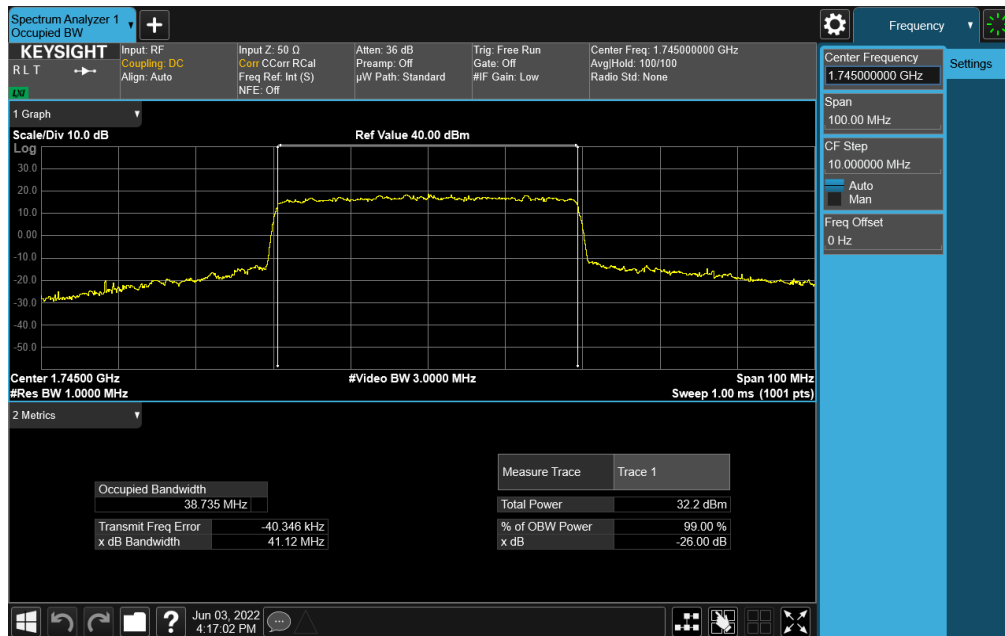


Plot 7-92. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 16QAM - Full RB)

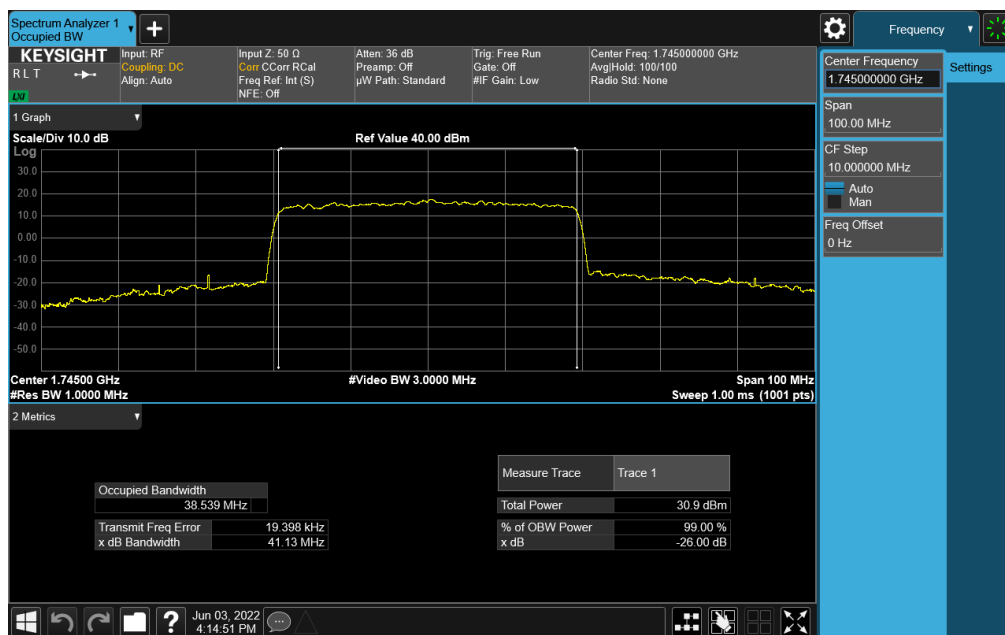
FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 63 of 315

V2.1 11/9/2021

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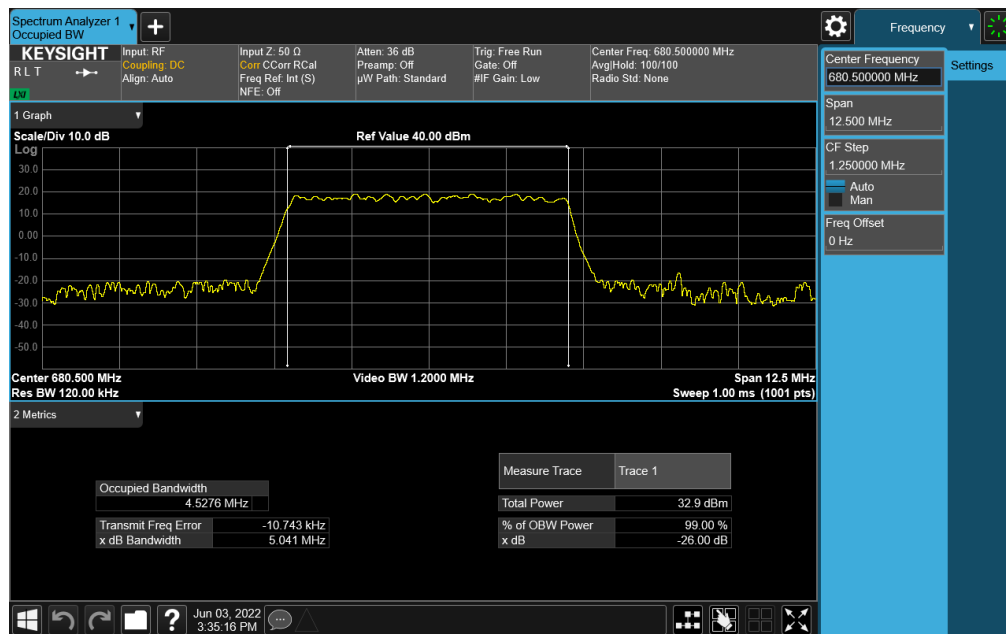
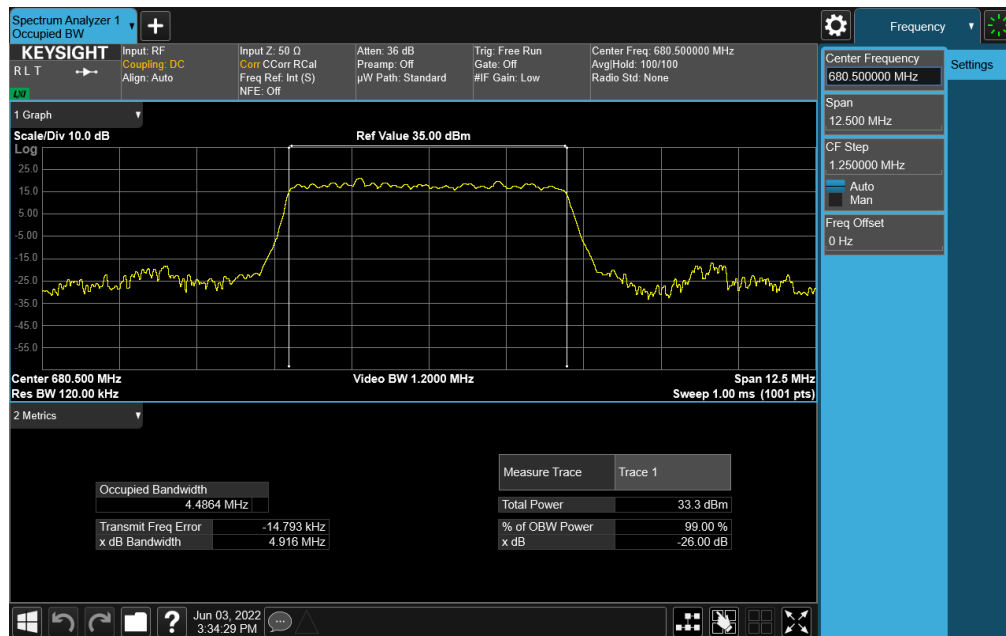
Plot 7-93. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 64QAM - Full RB)




Plot 7-94. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz DFT-s-OFDM 256QAM - Full RB)

FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 64 of 315

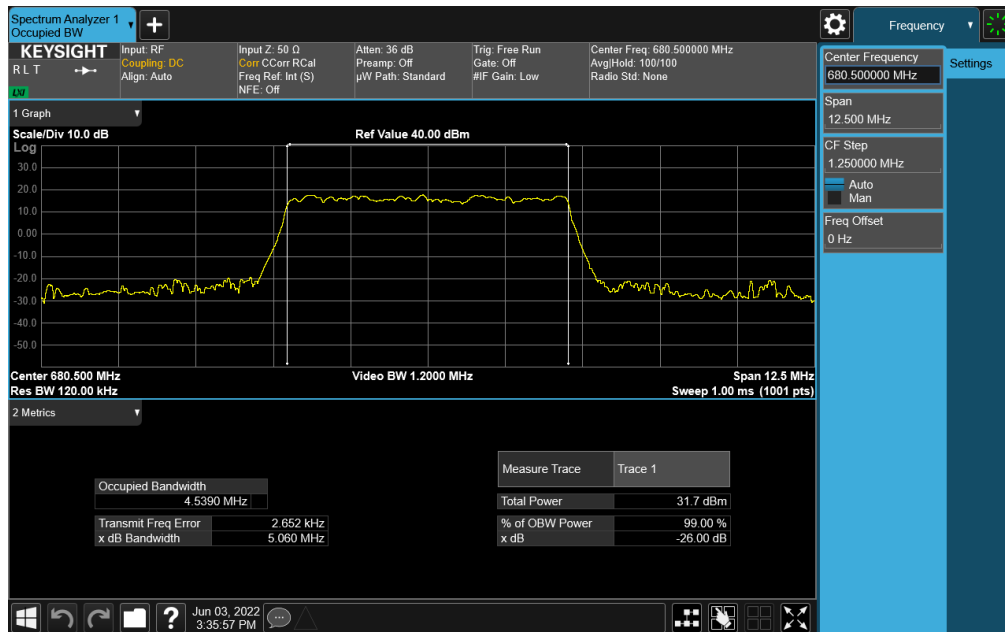
NR Band n71



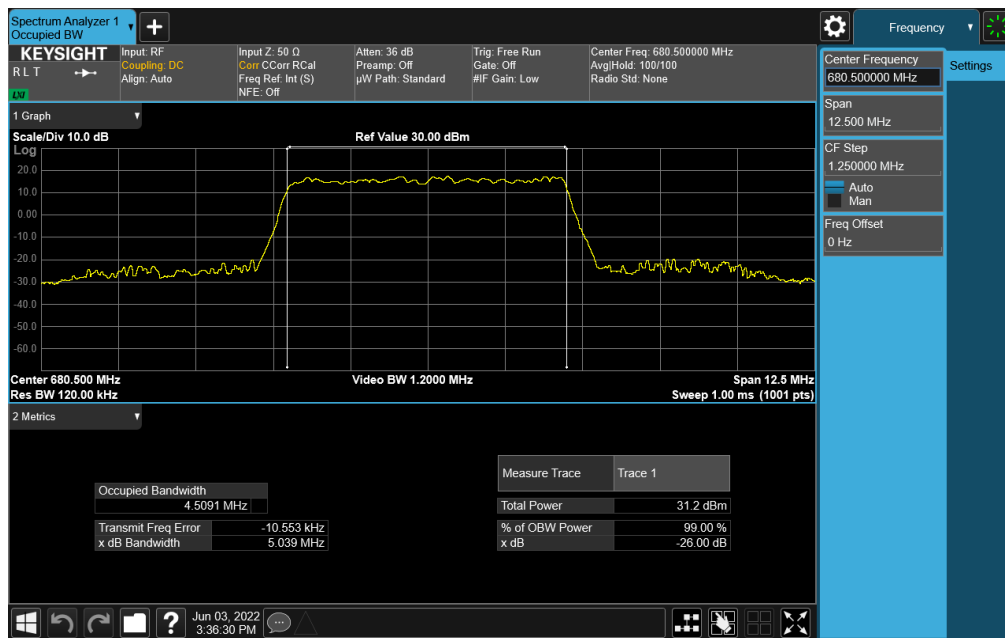
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 65 of 315

V2.1 11/9/2021

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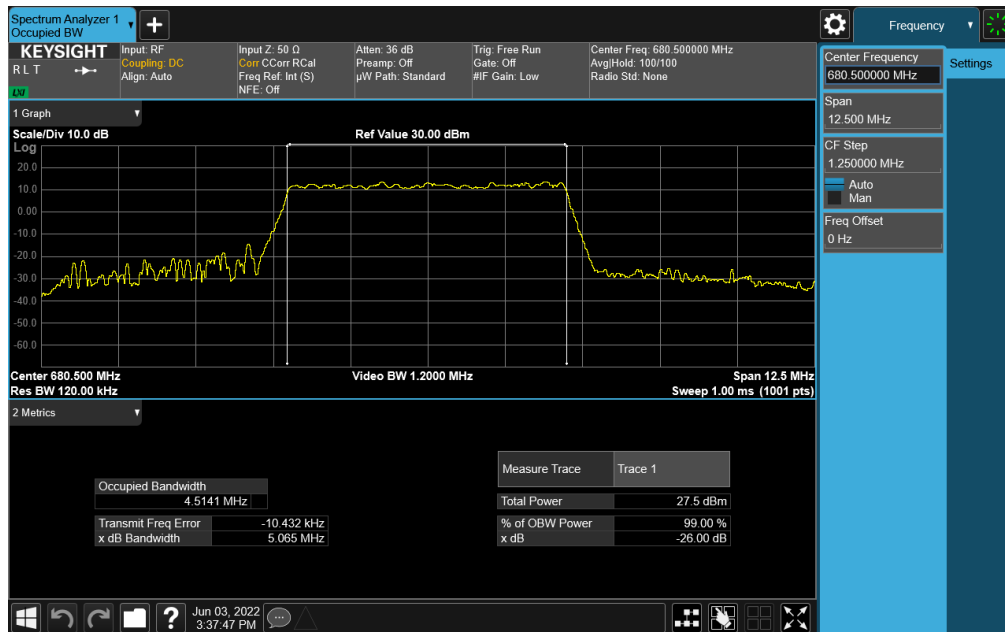


Plot 7-97. Occupied Bandwidth Plot (NR Band n71 - 5MHz DFT-s-OFDM 16-QAM - Full RB)

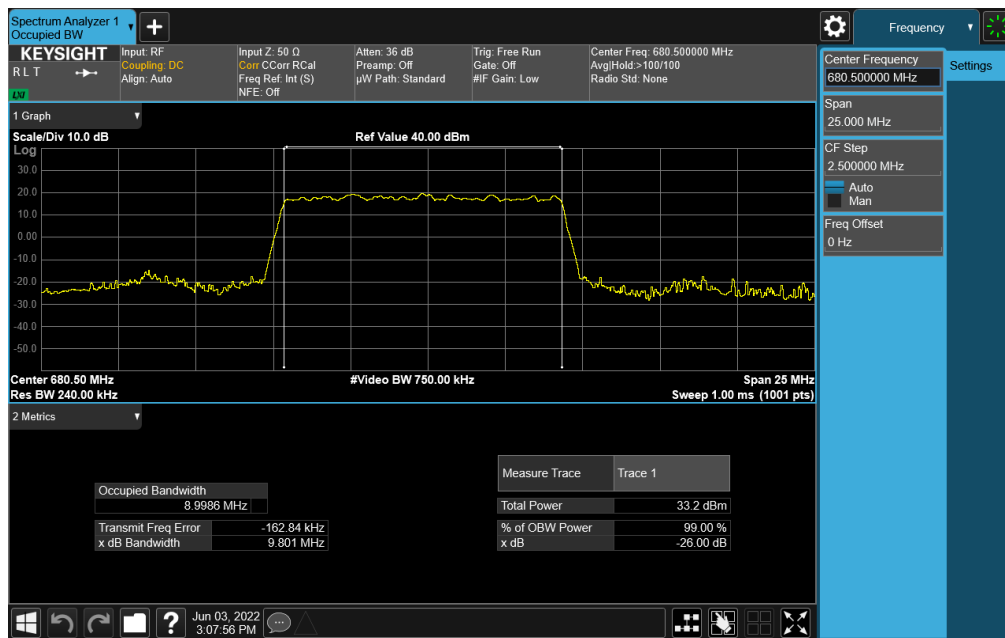


Plot 7-98. Occupied Bandwidth Plot (NR Band n71 - 5MHz DFT-s-OFDM 64-QAM - Full RB)

FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 66 of 315

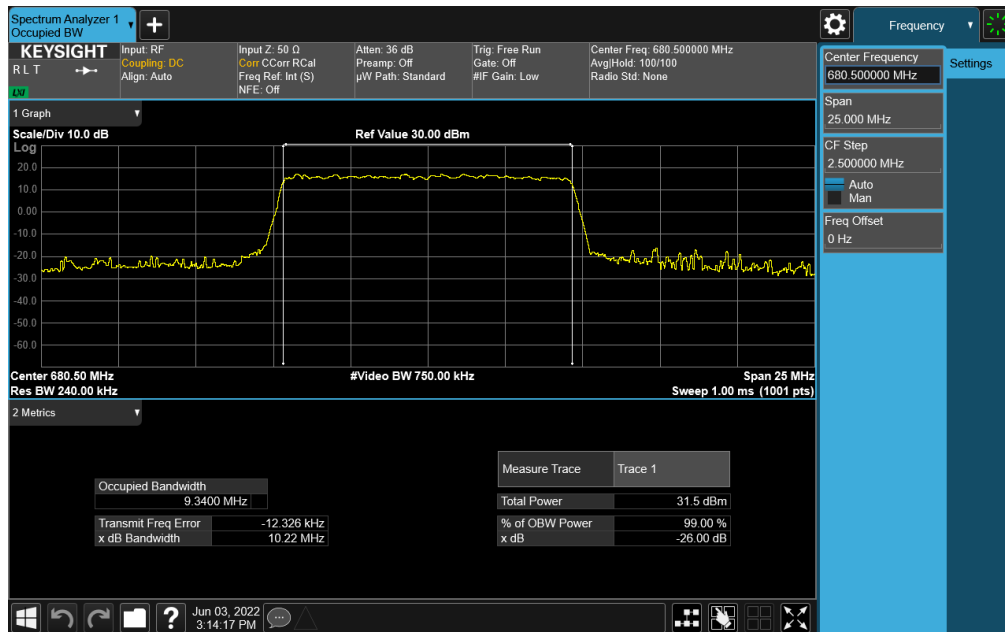


Plot 7-99. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM 256-QAM - Full RB)

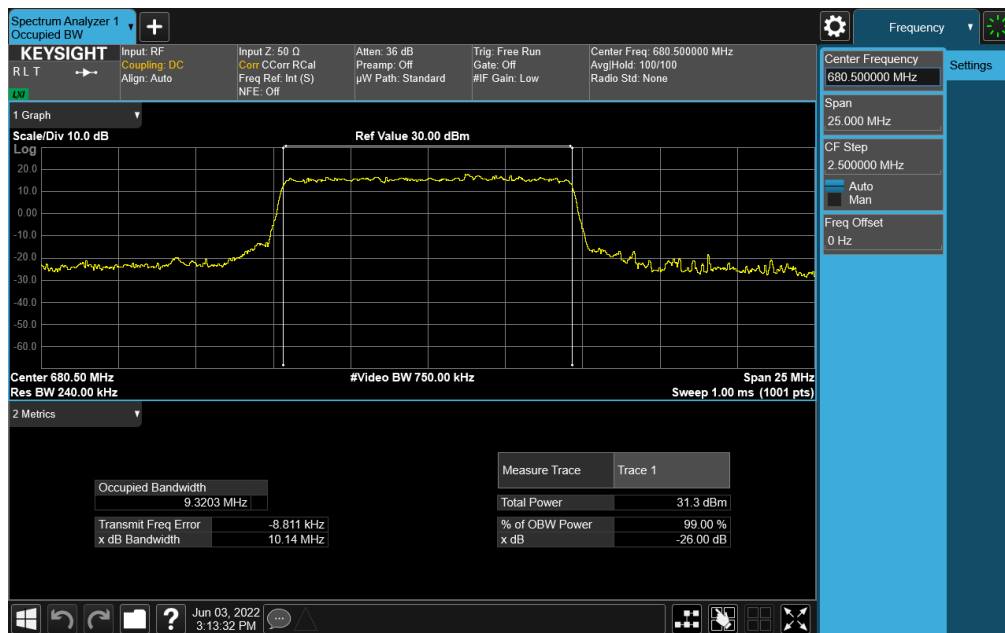


Plot 7-100. Occupied Bandwidth Plot (NR Band n71 - 10MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB)

FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 67 of 315



Plot 7-101. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM QPSK - Full RB)

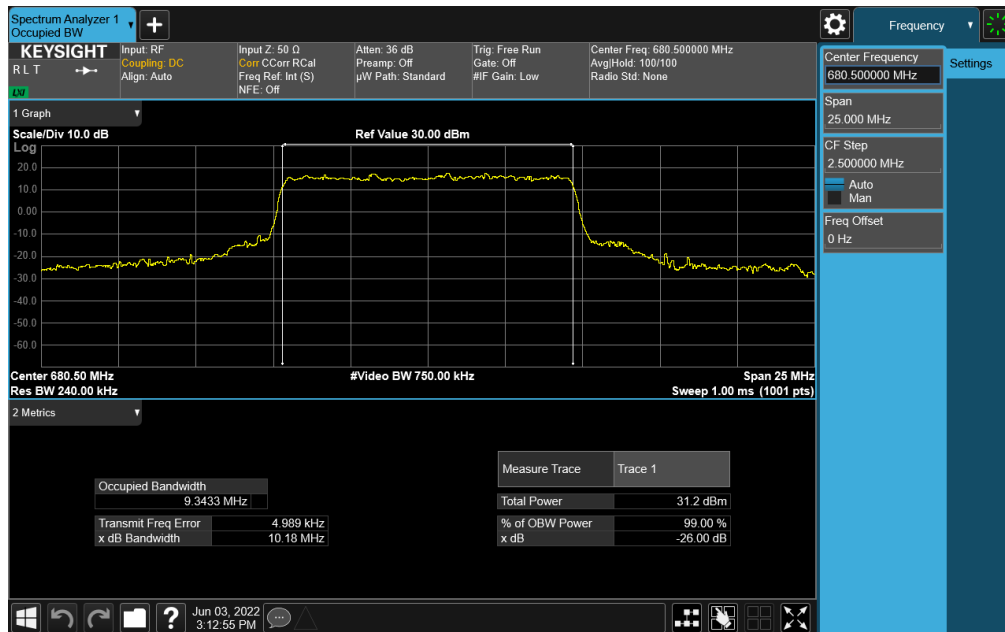


Plot 7-102. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 16-QAM - Full RB)

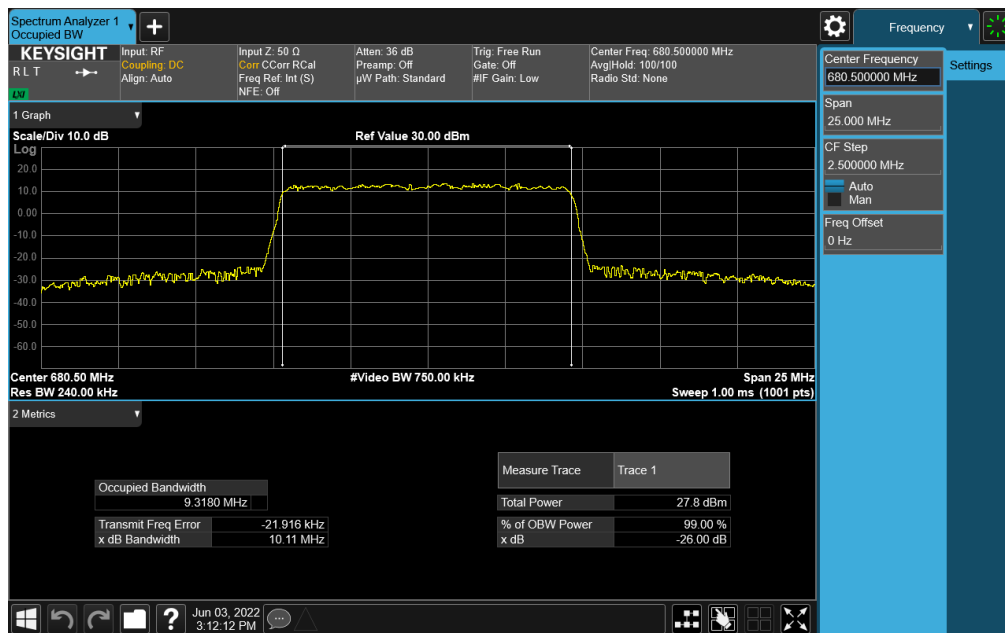
FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 68 of 315

V2.1 11/9/2021

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Plot 7-103. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 64-QAM - Full RB)

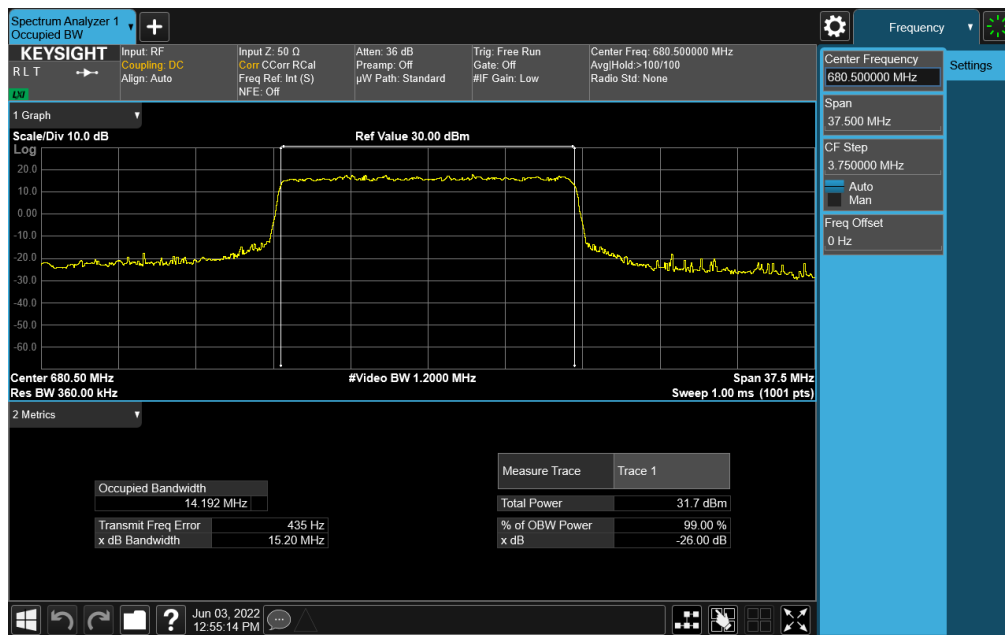
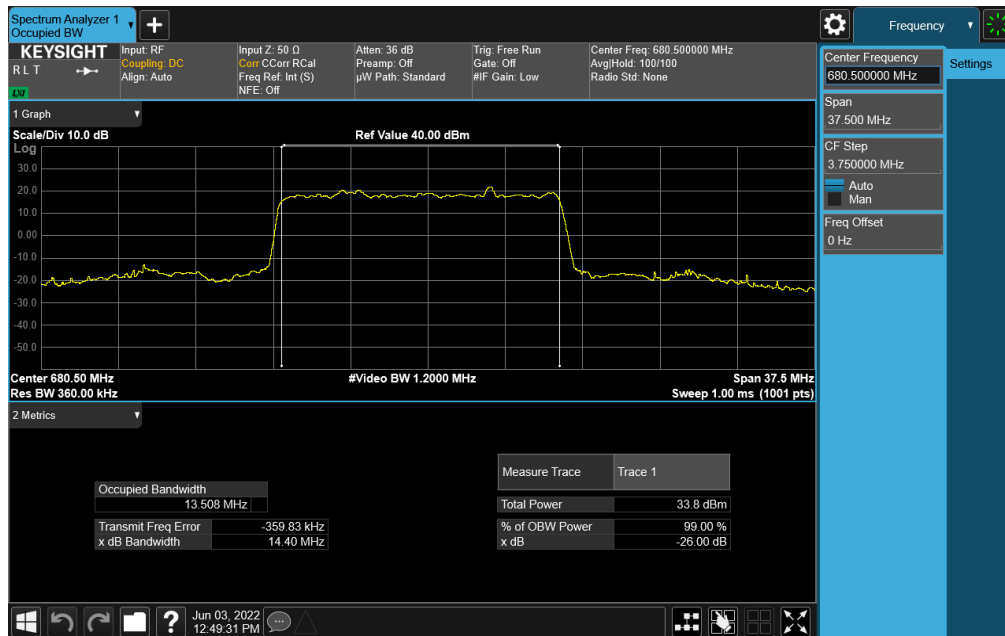



Plot 7-104. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 256-QAM - Full RB)

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Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 69 of 315

V2.1 11/9/2021

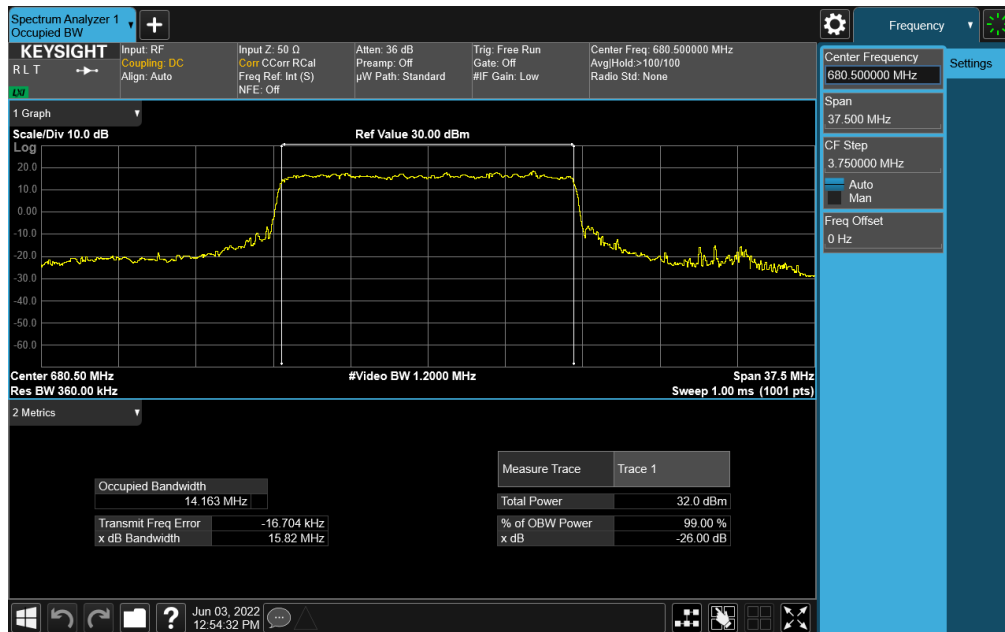
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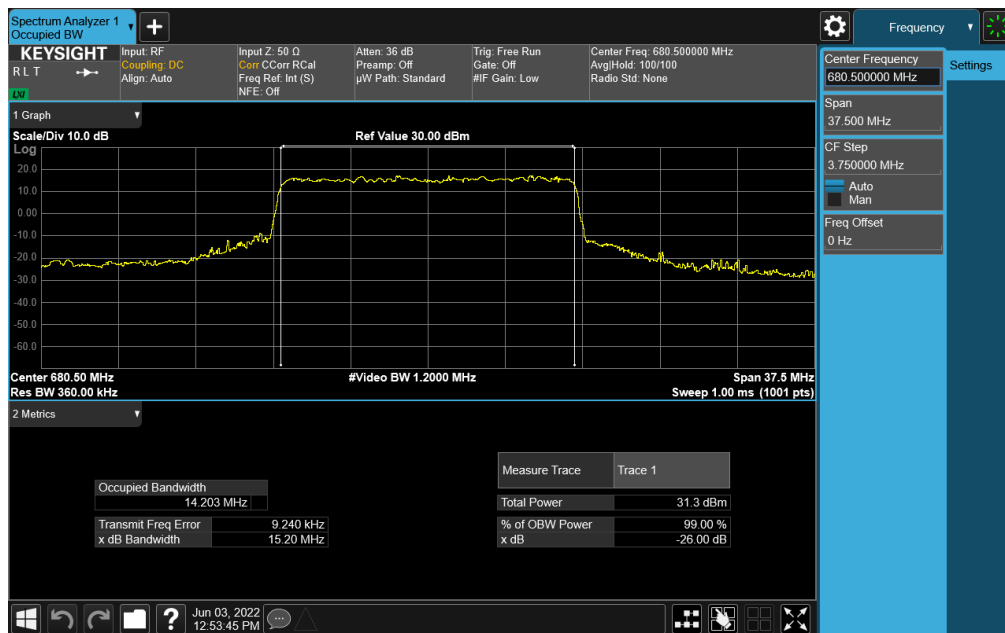
FCC ID: BCGA2757	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 70 of 315

V2.1 11/9/2021

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Plot 7-107. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 16-QAM - Full RB)



Plot 7-108. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 64-QAM - Full RB)

FCC ID: BCGA2757	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1C2205090023-03.BCG	Test Dates: 05/30/2022 - 09/13/2022	EUT Type: Tablet Device	Page 71 of 315