

MEASUREMENT REPORT

LTE

Applicant Name:

Samsung Electronics Co., Ltd.
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Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:

6/11 - 8/19/2020

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2005200087-03.A3L

FCC ID:

A3LSMF916U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-F916U

Additional Model(s):

SM-F916U1, SM-F916U1, SM-F916W

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

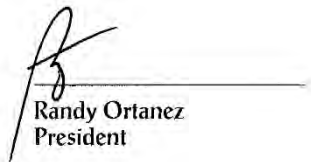
22, 24, & 27

Test Procedure(s):

ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01,
KDB 648474 D03 v01r04

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

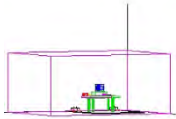


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T A B L E O F C O N T E N T S

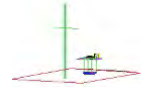
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FCC Part 22, 24, & 27



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 26/5	5MHz (Band 26 only)	QPSK	831.5 - 841.5	0.056	17.49	13M5G7D
		16QAM	831.5 - 841.5	0.045	16.55	13M5W7D
		64QAM	831.5 - 841.5	0.037	15.65	13M5W7D
		256QAM	831.5 - 841.5	0.022	13.43	13M5W7D
	10 MHz	QPSK	829.0 - 844.0	0.053	17.26	9M02G7D
		16QAM	829.0 - 844.0	0.050	17.00	8M99W7D
		64QAM	829.0 - 844.0	0.037	15.63	8M99W7D
		256QAM	829.0 - 844.0	0.022	13.45	8M98W7D
	5 MHz	QPSK	826.5 - 846.5	0.054	17.35	4M51G7D
		16QAM	826.5 - 846.5	0.050	16.98	4M51W7D
		64QAM	826.5 - 846.5	0.037	15.72	4M52W7D
		256QAM	826.5 - 846.5	0.023	13.56	4M49W7D
	3 MHz	QPSK	825.5 - 847.5	0.054	17.36	2M70G7D
		16QAM	825.5 - 847.5	0.049	16.94	2M72W7D
		64QAM	825.5 - 847.5	0.037	15.71	2M70W7D
		256QAM	825.5 - 847.5	0.022	13.38	2M71W7D
	1.4 MHz	QPSK	824.7 - 848.3	0.055	17.38	1M10G7D
		16QAM	824.7 - 848.3	0.049	16.92	1M10W7D
		64QAM	824.7 - 848.3	0.037	15.72	1M10W7D
		256QAM	824.7 - 848.3	0.022	13.41	1M09W7D
NR Band n5	20 MHz	$\pi/2$ BPSK	834.0 - 839.0	0.091	19.61	18M0G7D
		QPSK	834.0 - 839.0	0.097	19.85	18M9G7D
		16QAM	834.0 - 839.0	0.080	19.05	19M0W7D
		64QAM	834.0 - 839.0	0.061	17.83	19M0W7D
		256QAM	834.0 - 839.0	0.031	14.95	19M0W7D
	15 MHz	$\pi/2$ BPSK	831.5 - 841.5	0.090	19.52	13M4G7D
		QPSK	831.5 - 841.5	0.096	19.82	14M2G7D
		16QAM	831.5 - 841.5	0.078	18.93	14M2W7D
		64QAM	831.5 - 841.5	0.056	17.52	14M2W7D
		256QAM	831.5 - 841.5	0.047	16.72	14M2W7D
	10 MHz	$\pi/2$ BPSK	829.0 - 844.0	0.092	19.65	8M98G7D
		QPSK	829.0 - 844.0	0.096	19.81	9M35G7D
		16QAM	829.0 - 844.0	0.084	19.24	9M35W7D
		64QAM	829.0 - 844.0	0.056	17.48	9M31W7D
		256QAM	829.0 - 844.0	0.037	15.63	9M35W7D
	5 MHz	$\pi/2$ BPSK	826.5 - 846.5	0.092	19.65	4M55G7D
		QPSK	826.5 - 846.5	0.097	19.85	4M51G7D
		16QAM	826.5 - 846.5	0.081	19.10	4M54W7D
		64QAM	826.5 - 846.5	0.058	17.66	4M52W7D
		256QAM	826.5 - 846.5	0.035	15.48	4M51W7D

EUT Overview (Part 22)

FCC ID: A3LSMF916U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 25/2	20 MHz	QPSK	1860 - 1905	0.219	23.40	18M0G7D
		16QAM	1860 - 1905	0.151	21.79	17M9W7D
		64QAM	1860 - 1905	0.125	20.98	18M0W7D
		256QAM	1860 - 1905	0.080	19.03	17M9W7D
	15 MHz	QPSK	1857.5 - 1907.5	0.220	23.43	13M5G7D
		16QAM	1857.5 - 1907.5	0.149	21.72	13M5W7D
		64QAM	1857.5 - 1907.5	0.116	20.64	13M5W7D
		256QAM	1857.5 - 1907.5	0.075	18.77	13M5W7D
	10 MHz	QPSK	1855 - 1910	0.209	23.19	9M03G7D
		16QAM	1855 - 1910	0.147	21.68	8M99W7D
		64QAM	1855 - 1910	0.112	20.50	9M00W7D
		256QAM	1855 - 1910	0.073	18.66	8M99W7D
	5 MHz	QPSK	1852.5 - 1912.5	0.217	23.36	4M51G7D
		16QAM	1852.5 - 1912.5	0.151	21.78	4M50W7D
		64QAM	1852.5 - 1912.5	0.116	20.64	4M52W7D
		256QAM	1852.5 - 1912.5	0.079	18.95	4M51W7D
	3 MHz	QPSK	1851.5 - 1913.5	0.220	23.42	2M70G7D
		16QAM	1851.5 - 1913.5	0.153	21.84	2M71W7D
		64QAM	1851.5 - 1913.5	0.110	20.42	2M71W7D
		256QAM	1851.5 - 1913.5	0.084	19.25	2M71W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	0.221	23.45	1M91G7D
		16QAM	1850.7 - 1914.3	0.144	21.59	1M95W7D
		64QAM	1850.7 - 1914.3	0.119	20.75	1M09W7D
		256QAM	1850.7 - 1914.3	0.082	19.13	1M84W7D
NR Band n25/2	20 MHz	$\pi/2$ BPSK	1860 - 1905	0.317	25.00	18M0G7D
		QPSK	1860 - 1905	0.304	24.83	19M0G7D
		16QAM	1860 - 1905	0.227	23.55	19M0W7D
		64QAM	1860 - 1905	0.165	22.16	19M1W7D
		256QAM	1860 - 1905	0.106	20.25	19M0W7D
	15 MHz	$\pi/2$ BPSK	1857.5 - 1907.5	0.304	24.82	13M5G7D
		QPSK	1857.5 - 1907.5	0.327	25.15	14M2G7D
		16QAM	1857.5 - 1907.5	0.176	22.47	14M1W7D
		64QAM	1857.5 - 1907.5	0.131	21.18	14M2W7D
		256QAM	1857.5 - 1907.5	0.082	19.11	14M2W7D
	10 MHz	$\pi/2$ BPSK	1855 - 1910	0.304	24.83	8M99G7D
		QPSK	1855 - 1910	0.317	25.01	9M31G7D
		16QAM	1855 - 1910	0.184	22.65	9M33W7D
		64QAM	1855 - 1910	0.133	21.22	9M38W7D
		256QAM	1855 - 1910	0.080	19.05	9M33W7D
	5 MHz	$\pi/2$ BPSK	1852.5 - 1912.5	0.297	24.72	4M52G7D
		QPSK	1852.5 - 1912.5	0.293	24.66	4M49G7D
		16QAM	1852.5 - 1912.5	0.178	22.49	4M51W7D
		64QAM	1852.5 - 1912.5	0.134	21.26	4M53W7D
		256QAM	1852.5 - 1912.5	0.085	19.30	4M52W7D

EUT Overview (Part 24)

FCC ID: A3LSMF916U	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 71	20 MHz	QPSK	673.0 - 688.0	0.057	17.55	18M0G7D
		16QAM	673.0 - 688.0	0.048	16.84	18M0W7D
		64QAM	673.0 - 688.0	0.042	16.24	18M0W7D
		256QAM	673.0 - 688.0	0.019	12.76	18M0W7D
	15 MHz	QPSK	670.5 - 690.5	0.053	17.28	13M5G7D
		16QAM	670.5 - 690.5	0.044	16.41	13M5W7D
		64QAM	670.5 - 690.5	0.039	15.88	13M5W7D
		256QAM	670.5 - 690.5	0.018	12.51	13M6W7D
	10 MHz	QPSK	668.0 - 693.0	0.053	17.25	9M01G7D
		16QAM	668.0 - 693.0	0.043	16.37	9M04W7D
		64QAM	668.0 - 693.0	0.039	15.96	9M02W7D
		256QAM	668.0 - 693.0	0.018	12.52	9M02W7D
	5 MHz	QPSK	665.5 - 695.5	0.053	17.25	4M52G7D
		16QAM	665.5 - 695.5	0.044	16.48	4M52W7D
		64QAM	665.5 - 695.5	0.038	15.84	4M55W7D
		256QAM	665.5 - 695.5	0.018	12.54	4M52W7D
NR Band n71	20 MHz	$\pi/2$ BPSK	673.0 - 688.0	0.073	18.62	18M0G7D
		QPSK	673.0 - 688.0	0.073	18.66	19M0G7D
		16QAM	673.0 - 688.0	0.061	17.83	19M0W7D
		64QAM	673.0 - 688.0	0.046	16.67	19M1W7D
		256QAM	673.0 - 688.0	0.027	14.33	19M0W7D
	15 MHz	$\pi/2$ BPSK	670.5 - 690.5	0.071	18.51	13M5G7D
		QPSK	670.5 - 690.5	0.074	18.68	14M2G7D
		16QAM	670.5 - 690.5	0.061	17.85	14M2W7D
		64QAM	670.5 - 690.5	0.047	16.69	14M2W7D
		256QAM	670.5 - 690.5	0.027	14.35	14M3W7D
	10 MHz	$\pi/2$ BPSK	668.0 - 693.0	0.068	18.36	9M02G7D
		QPSK	668.0 - 693.0	0.069	18.37	9M00G7D
		16QAM	668.0 - 693.0	0.060	17.78	8M98W7D
		64QAM	668.0 - 693.0	0.047	16.72	8M97W7D
		256QAM	668.0 - 693.0	0.027	14.35	8M97W7D
	5 MHz	$\pi/2$ BPSK	665.5 - 695.5	0.062	17.96	4M51G7D
		QPSK	665.5 - 695.5	0.064	18.08	4M49G7D
		16QAM	665.5 - 695.5	0.054	17.34	4M55W7D
		64QAM	665.5 - 695.5	0.045	16.51	4M51W7D
		256QAM	665.5 - 695.5	0.040	16.05	4M50W7D
LTE Band 12	10 MHz	QPSK	704.0 - 711.0	0.053	17.27	9M01G7D
		16QAM	704.0 - 711.0	0.042	16.19	8M97W7D
		64QAM	704.0 - 711.0	0.032	15.04	8M97W7D
		256QAM	704.0 - 711.0	0.023	13.61	8M97W7D
	5 MHz	QPSK	701.5 - 713.5	0.050	17.02	4M50G7D
		16QAM	701.5 - 713.5	0.044	16.40	4M50W7D
		64QAM	701.5 - 713.5	0.029	14.64	4M52W7D
		256QAM	701.5 - 713.5	0.021	13.19	4M50W7D
	3 MHz	QPSK	700.5 - 714.5	0.049	16.92	2M70G7D
		16QAM	700.5 - 714.5	0.045	16.51	2M72W7D
		64QAM	700.5 - 714.5	0.029	14.61	2M71W7D
		256QAM	700.5 - 714.5	0.042	16.24	2M71W7D
	1.4 MHz	QPSK	699.7 - 715.3	0.049	16.87	1M10G7D
		16QAM	699.7 - 715.3	0.042	16.18	1M10W7D
		64QAM	699.7 - 715.3	0.029	14.56	1M10W7D
		256QAM	699.7 - 715.3	0.035	15.44	1M09W7D
LTE Band 13	10 MHz	QPSK	782.0	0.073	18.62	8M93G7D
		16QAM	782.0	0.063	17.98	8M98W7D
		64QAM	782.0	0.049	16.88	8M95W7D
		256QAM	782.0	0.022	13.51	8M92W7D
	5 MHz	QPSK	779.5 - 784.5	0.078	18.93	4M53G7D
		16QAM	779.5 - 784.5	0.068	18.32	4M49W7D
		64QAM	779.5 - 784.5	0.051	17.05	4M53W7D
		256QAM	779.5 - 784.5	0.023	13.66	4M50W7D

EUT Overview (Part 27 <1GHz)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 66/4	20 MHz	QPSK	1720.0 - 1770.0	0.197	22.94	18M0G7D
		16QAM	1720.0 - 1770.0	0.159	22.00	18M0W7D
		64QAM	1720.0 - 1770.0	0.135	21.32	18M0W7D
		256QAM	1720.0 - 1770.0	0.098	19.91	18M0W7D
	15 MHz	QPSK	1717.5 - 1772.5	0.189	22.76	17M5G7D
		16QAM	1717.5 - 1772.5	0.140	21.47	13M5W7D
		64QAM	1717.5 - 1772.5	0.122	20.86	13M5W7D
		256QAM	1717.5 - 1772.5	0.090	19.56	13M5W7D
	10 MHz	QPSK	1715.0 - 1775.0	0.195	22.90	8M99G7D
		16QAM	1715.0 - 1775.0	0.150	21.75	9M01W7D
		64QAM	1715.0 - 1775.0	0.121	20.83	8M98W7D
		256QAM	1715.0 - 1775.0	0.092	19.65	9M00W7D
	5 MHz	QPSK	1712.5 - 1777.5	0.191	22.80	4M50G7D
		16QAM	1712.5 - 1777.5	0.138	21.40	4M51W7D
		64QAM	1712.5 - 1777.5	0.122	20.87	4M51W7D
		256QAM	1712.5 - 1777.5	0.092	19.62	4M52W7D
	3 MHz	QPSK	1711.5 - 1778.5	0.189	22.77	2M70G7D
		16QAM	1711.5 - 1778.5	0.141	21.48	2M70W7D
		64QAM	1711.5 - 1778.5	0.128	21.09	2M70W7D
		256QAM	1711.5 - 1778.5	0.093	19.69	2M72W7D
	1.4 MHz	QPSK	1710.7 - 1779.3	0.189	22.76	1M10G7D
		16QAM	1710.7 - 1779.3	0.140	21.47	1M10W7D
		64QAM	1710.7 - 1779.3	0.122	20.85	1M10W7D
		256QAM	1710.7 - 1779.3	0.093	19.67	1M11W7D
NR Band n66	20 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	0.228	23.58	18M0G7D
		QPSK	1720.0 - 1770.0	0.234	23.69	19M0G7D
		16QAM	1720.0 - 1770.0	0.185	22.67	19M0W7D
		64QAM	1720.0 - 1770.0	0.145	21.60	19M1W7D
		256QAM	1720.0 - 1770.0	0.083	19.17	19M0W7D
	15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	0.229	23.60	13M5G7D
		QPSK	1717.5 - 1772.5	0.232	23.66	14M2G7D
		16QAM	1717.5 - 1772.5	0.191	22.82	14M2W7D
		64QAM	1717.5 - 1772.5	0.139	21.42	14M2W7D
		256QAM	1717.5 - 1772.5	0.081	19.06	14M2W7D
	10 MHz	$\pi/2$ BPSK	1715.0 - 1775.0	0.230	23.61	9M02G7D
		QPSK	1715.0 - 1775.0	0.234	23.70	9M34G7D
		16QAM	1715.0 - 1775.0	0.196	22.92	9M29W7D
		64QAM	1715.0 - 1775.0	0.145	21.60	9M31W7D
		256QAM	1715.0 - 1775.0	0.078	18.91	9M34W7D
	5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	0.228	23.57	4M47G7D
		QPSK	1712.5 - 1777.5	0.228	23.59	4M49G7D
		16QAM	1712.5 - 1777.5	0.193	22.86	4M49W7D
		64QAM	1712.5 - 1777.5	0.144	21.58	4M50W7D
		256QAM	1712.5 - 1777.5	0.084	19.26	4M49W7D

EUT Overview (Part 27 >1GHz)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 30	10 MHz	QPSK	2310.0	0.192	22.83	9M00G7D
		16QAM	2310.0	0.160	22.04	9M02W7D
		64QAM	2310.0	0.126	21.01	9M00W7D
		256QAM	2310.0	0.082	19.12	9M00W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.191	22.81	4M53G7D
		16QAM	2307.5 - 2312.5	0.178	22.50	4M53W7D
		64QAM	2307.5 - 2312.5	0.125	20.99	4M52W7D
		256QAM	2307.5 - 2312.5	0.087	19.39	4M52W7D
LTE Band 7	20 MHz	QPSK	2510.0 - 2560.0	0.261	24.17	18M0G7D
		16QAM	2510.0 - 2560.0	0.212	23.26	18M0W7D
		64QAM	2510.0 - 2560.0	0.171	22.33	18M0W7D
		256QAM	2510.0 - 2560.0	0.121	20.83	18M0W7D
	15 MHz	QPSK	2507.5 - 2562.5	0.257	24.10	13M5G7D
		16QAM	2507.5 - 2562.5	0.205	23.12	13M5W7D
		64QAM	2507.5 - 2562.5	0.160	22.04	13M5W7D
		256QAM	2507.5 - 2562.5	0.120	20.78	13M5W7D
	10 MHz	QPSK	2505.0 - 2565.0	0.258	24.11	9M02G7D
		16QAM	2505.0 - 2565.0	0.205	23.12	8M97W7D
		64QAM	2505.0 - 2565.0	0.159	22.02	8M99W7D
		256QAM	2505.0 - 2565.0	0.120	20.80	9M01W7D
	5 MHz	QPSK	2502.5 - 2567.5	0.263	24.20	4M51G7D
		16QAM	2502.5 - 2567.5	0.210	23.23	4M51W7D
		64QAM	2502.5 - 2567.5	0.168	22.26	4M52W7D
		256QAM	2502.5 - 2567.5	0.118	20.73	4M51W7D
LTE Band 41(PC2)	20 MHz	QPSK	2506.0 - 2680.0	0.573	27.58	18M0G7D
		16QAM	2506.0 - 2680.0	0.518	27.14	17M9W7D
		64QAM	2506.0 - 2680.0	0.341	25.32	18M0W7D
		256QAM	2506.0 - 2680.0	0.200	23.00	17M9W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.553	27.43	13M5G7D
		16QAM	2503.5 - 2682.5	0.518	27.14	13M5W7D
		64QAM	2503.5 - 2682.5	0.304	24.82	13M5W7D
		256QAM	2503.5 - 2682.5	0.179	22.53	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.570	27.56	8M99G7D
		16QAM	2501.0 - 2685.0	0.537	27.30	8M95W7D
		64QAM	2501.0 - 2685.0	0.306	24.85	9M00W7D
		256QAM	2501.0 - 2685.0	0.184	22.64	8M99W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.570	27.56	4M51G7D
		16QAM	2498.5 - 2687.5	0.530	27.24	4M51W7D
		64QAM	2498.5 - 2687.5	0.311	24.93	4M51W7D
		256QAM	2498.5 - 2687.5	0.181	22.58	4M48W7D
NR Band n41	100 MHz	$\pi/2$ BPSK	2546.0 - 2640.0	0.106	20.27	96M7G7D
		QPSK	2546.0 - 2640.0	0.121	20.82	98M0G7D
		16QAM	2546.0 - 2640.0	0.091	19.57	97M6W7D
		64QAM	2546.0 - 2640.0	0.068	18.34	97M7W7D
		256QAM	2546.0 - 2640.0	0.046	16.64	97M0W7D
	90 MHz	$\pi/2$ BPSK	2541.0 - 2645.0	0.112	20.51	87M5G7D
		QPSK	2541.0 - 2645.0	0.122	20.87	87M9G7D
		16QAM	2541.0 - 2645.0	0.092	19.62	87M7W7D
		64QAM	2541.0 - 2645.0	0.069	18.39	87M8W7D
		256QAM	2541.0 - 2645.0	0.047	16.69	87M7W7D
	80 MHz	$\pi/2$ BPSK	2536.0 - 2650.0	0.108	20.34	77M5G7D
		QPSK	2536.0 - 2650.0	0.121	20.82	77M7G7D
		16QAM	2536.0 - 2650.0	0.091	19.57	77M8W7D
		64QAM	2536.0 - 2650.0	0.068	18.34	77M7W7D
		256QAM	2536.0 - 2650.0	0.046	16.64	77M7W7D
	60 MHz	$\pi/2$ BPSK	2526.0 - 2660.0	0.114	20.57	58M3G7D
		QPSK	2526.0 - 2660.0	0.115	20.59	58M1G7D
		16QAM	2526.0 - 2660.0	0.086	19.34	58M2W7D
		64QAM	2526.0 - 2660.0	0.065	18.14	58M2W7D
		256QAM	2526.0 - 2660.0	0.044	16.41	58M2W7D
	50 MHz	$\pi/2$ BPSK	2521.0 - 2665.0	0.114	20.59	46M3G7D
		QPSK	2521.0 - 2665.0	0.123	20.89	47M9G7D
		16QAM	2521.0 - 2665.0	0.092	19.64	48M1W7D
		64QAM	2521.0 - 2665.0	0.069	18.41	47M8W7D
		256QAM	2521.0 - 2665.0	0.047	16.71	47M8W7D
	40 MHz	$\pi/2$ BPSK	2516.0 - 2670.0	0.115	20.59	35M9G7D
		QPSK	2516.0 - 2670.0	0.130	21.13	35M9G7D
		16QAM	2516.0 - 2670.0	0.097	19.88	35M9W7D
		64QAM	2516.0 - 2670.0	0.073	18.65	35M9W7D
		256QAM	2516.0 - 2670.0	0.050	16.95	36M0W7D
	20 MHz	$\pi/2$ BPSK	2506.0 - 2680.0	0.113	20.54	18M0G7D
		QPSK	2506.0 - 2680.0	0.125	20.97	18M4G7D
		16QAM	2506.0 - 2680.0	0.094	19.72	18M3W7D
		64QAM	2506.0 - 2680.0	0.071	18.49	18M3W7D
		256QAM	2506.0 - 2680.0	0.048	16.79	18M3W7D

EUT Overview (Part 27 >1GHz continued)

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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 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 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 (2451B) test laboratory with the site description on file with ISSED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF916U**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 0848M, 0855M, 0854M, 0857M, 1141M, 1137M, 1129M, 1120M, 1131M, 1115M, 0891M, 0066M, 1273M, 1740M, 1807M, 0774M, 0773M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900, WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n71, n41, n66, n2/n25, n260, n261), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

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.

This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space" condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.

The EUT is capable of operating in folded closed and unfolded open configurations. The worst-case configuration for radiated emissions was determined from open and closed configurations in X, Y, and Z orientations for horizontal and vertical antenna polarizations. The worst case radiated emissions data is shown in this report.

2.3 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.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

3.2 Radiated 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. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.

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 $43 + 10 \log_{10}(\text{Power [Watts]})$. All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

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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	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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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
-	LTX2	Licensed Transmitter Cable Set	4/9/2020	Annual	4/9/2021	LTX2
Agilent	8648D	(9kHz-4GHz) Signal Generator	6/23/2020	Annual	6/23/2021	3613A00315
Anritsu	MT8821C	Radio Communication Analyzer	3/10/2020	Annual	3/10/2021	6200901190
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/13/2019	Annual	8/13/2020	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			107826
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	Radio Communication Tester	8/26/2019	Annual	8/26/2020	100976
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	7/8/2020	Biennial	7/8/2022	101058
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/21/2020	Annual	2/21/2021	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

Table 5-1. Test Equipment

Notes:

Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

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).

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMF916U
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	$> 43 + 10 \log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions			Section 7.3, 7.4
27.53(m)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3, 7.4
27.53(a)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(a)			Section 7.3, 7.4
24.232(d) 27.50	Peak-Average Ratio	$< 13 \text{ dB}$			Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			See RF Exposure Report
22.917(a) 27.53(h)	Uplink Carrier Aggregation	$> 43 + 10 \log(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions			Section 7.6
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 7.10

Table 7-1. Summary of Conducted Test Results

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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 7.7
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 71, 12, 13)	< 3 Watts max. ERP			Section 7.7
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2/25, 41)	< 2 Watts max. EIRP			Section 7.7
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4/66)	< 1 Watts max. EIRP			Section 7.7
27.50(a)(3)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 Watts max. EIRP			Section 7.7
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12, 13, 26/5, 66/4, 25/2)	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.8
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 7.8
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10 log ₁₀ (P[Watts])			Section 7.8
27.53(m)	Undesirable Emissions (Band 7, 41)	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.8
27.53(m) 27.53(c) 27.53(g)	Uplink Carrier Aggregation	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.9

Table 7-2. Summary of Radiated Test Results

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Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots (Sections 7.2, 7.3, 7.4, 7.5) were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version 5.3.
- 5) For operation <1GHz, the EIRP limits in the table above are referenced to the specifications written in the relevant Radio Standards Specifications for Innovation, Science, and Economic Development Canada.

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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.

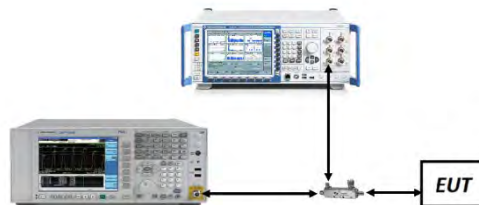


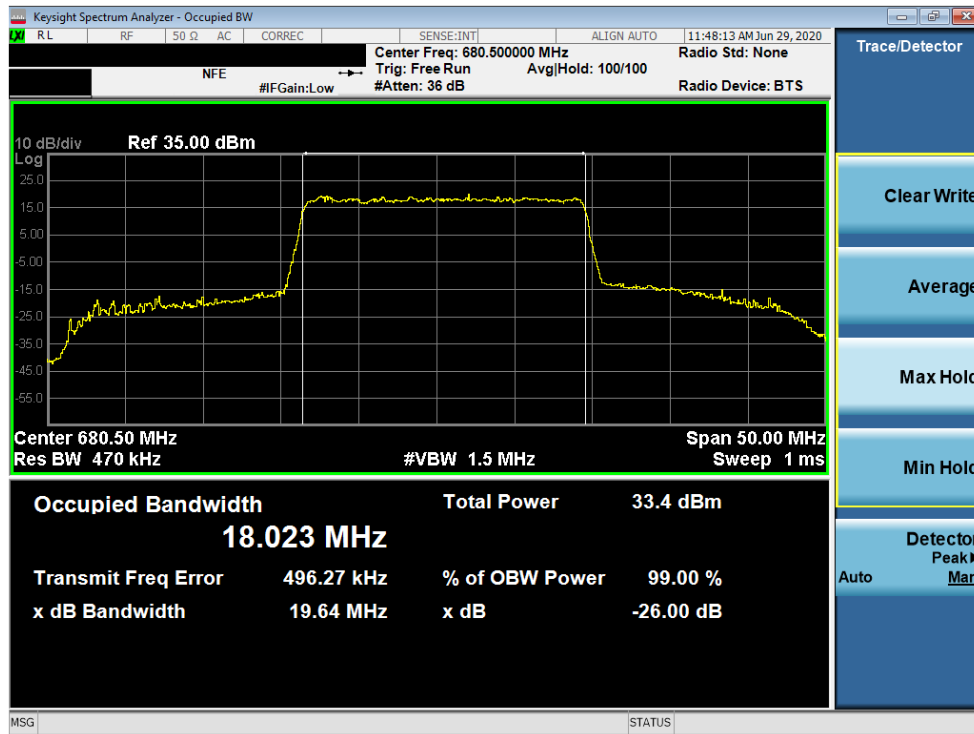
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

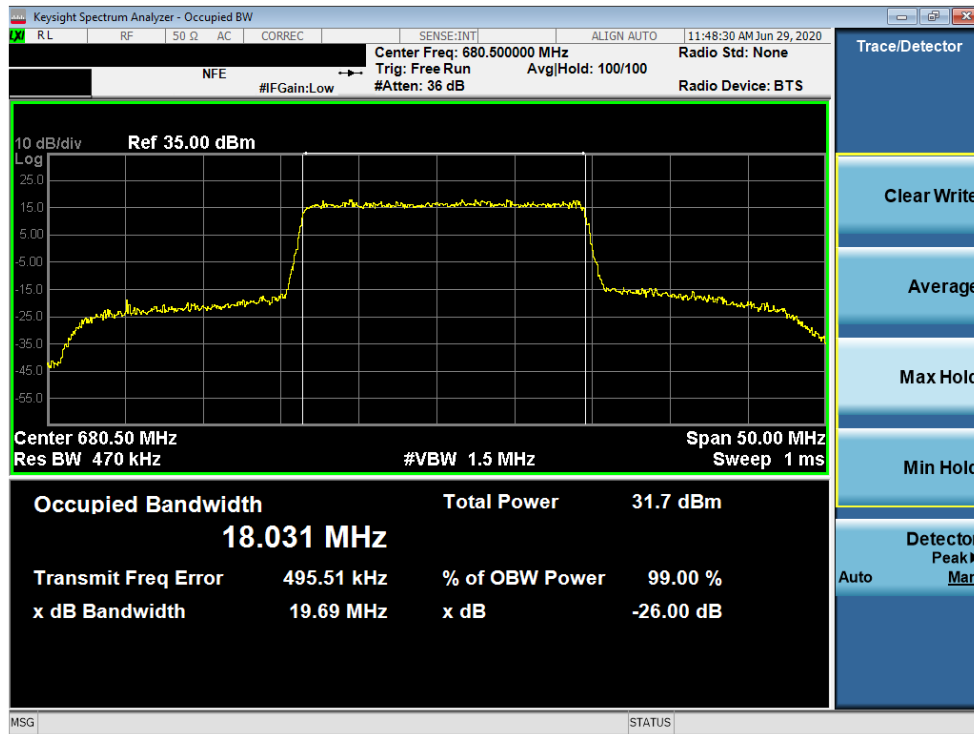
None.

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Band 71

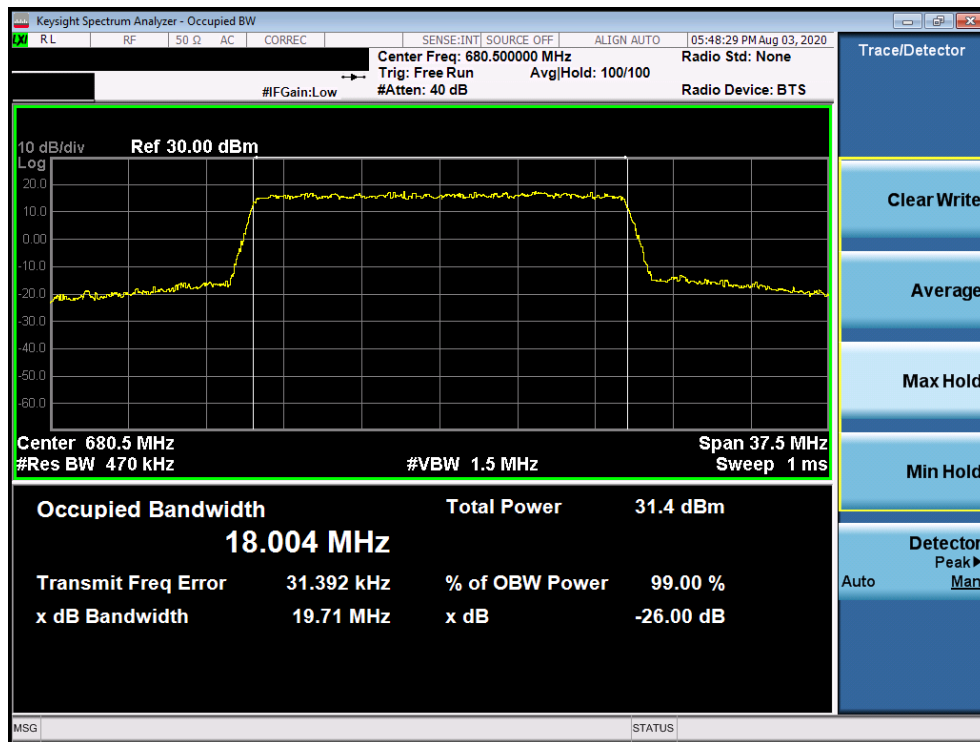


Plot 7-1. Occupied Bandwidth Plot (Band 71 - 20.0MHz QPSK - Full RB Configuration)

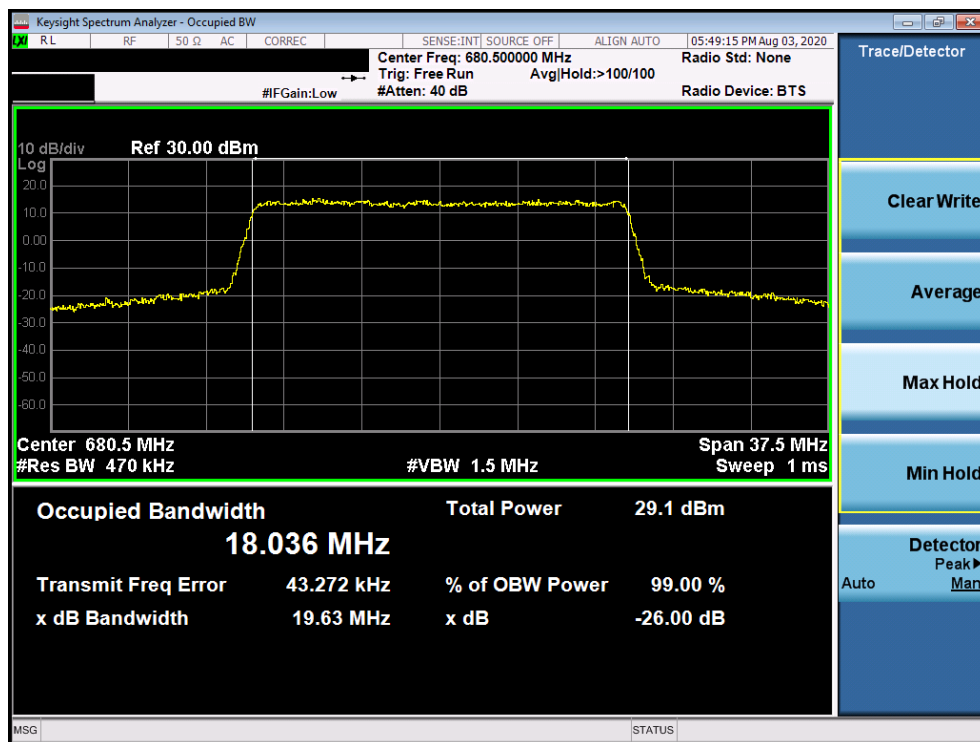


Plot 7-2. Occupied Bandwidth Plot (Band 71 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 18 of 466



Plot 7-3. Occupied Bandwidth Plot (Band 71 - 20.0MHz 64-QAM - Full RB Configuration)

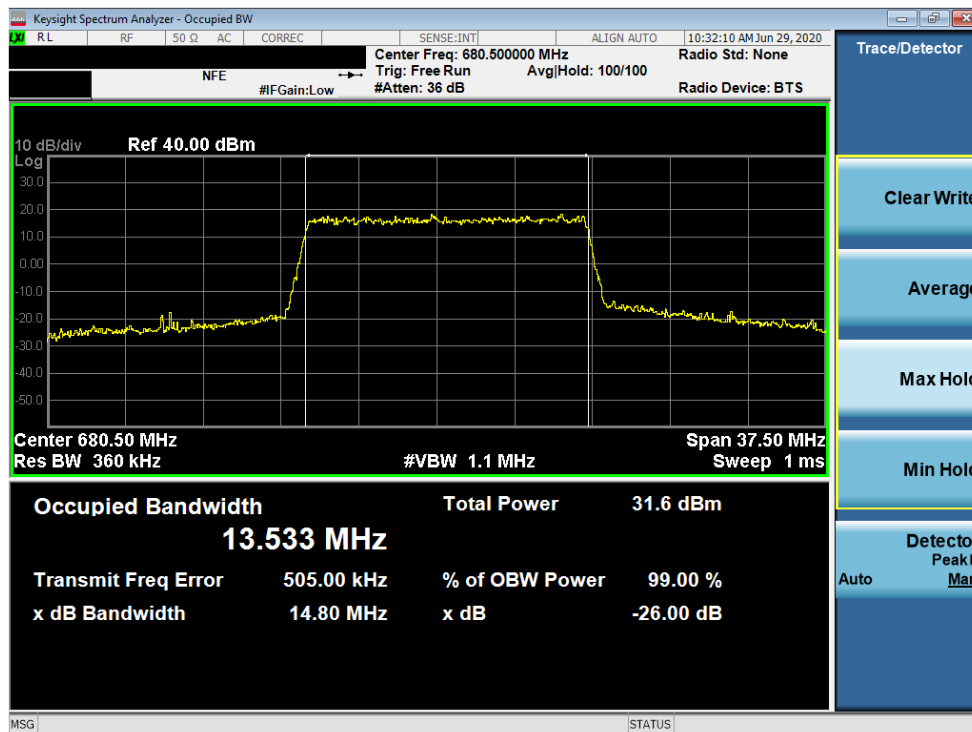


Plot 7-4. Occupied Bandwidth Plot (Band 71 - 20.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 19 of 466

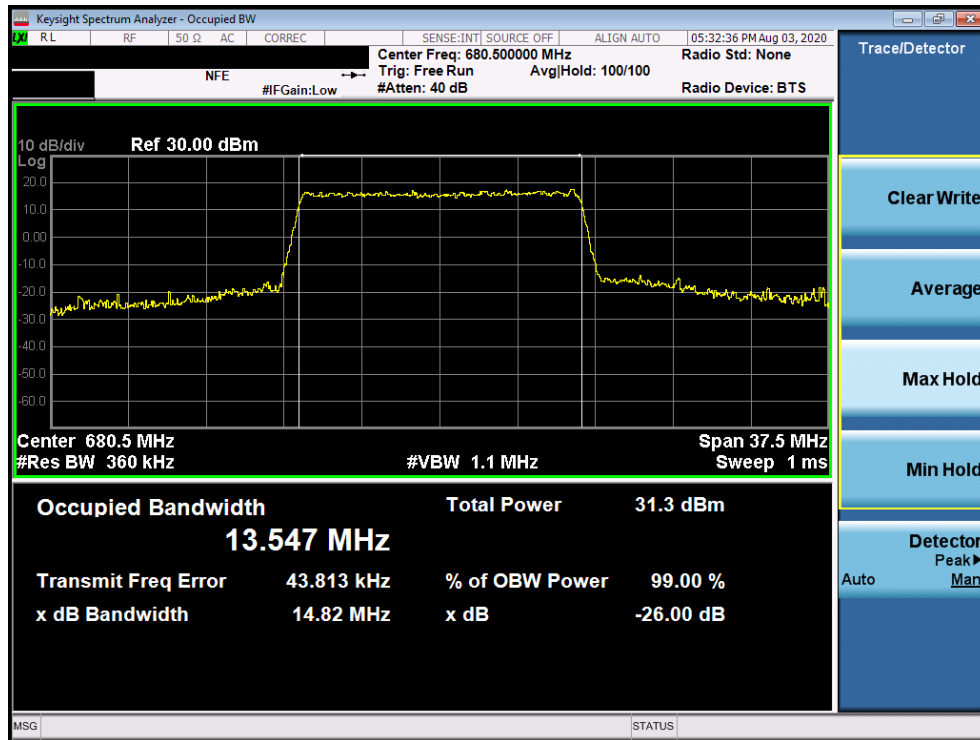


Plot 7-5. Occupied Bandwidth Plot (Band 71 - 15.0MHz QPSK - Full RB Configuration)

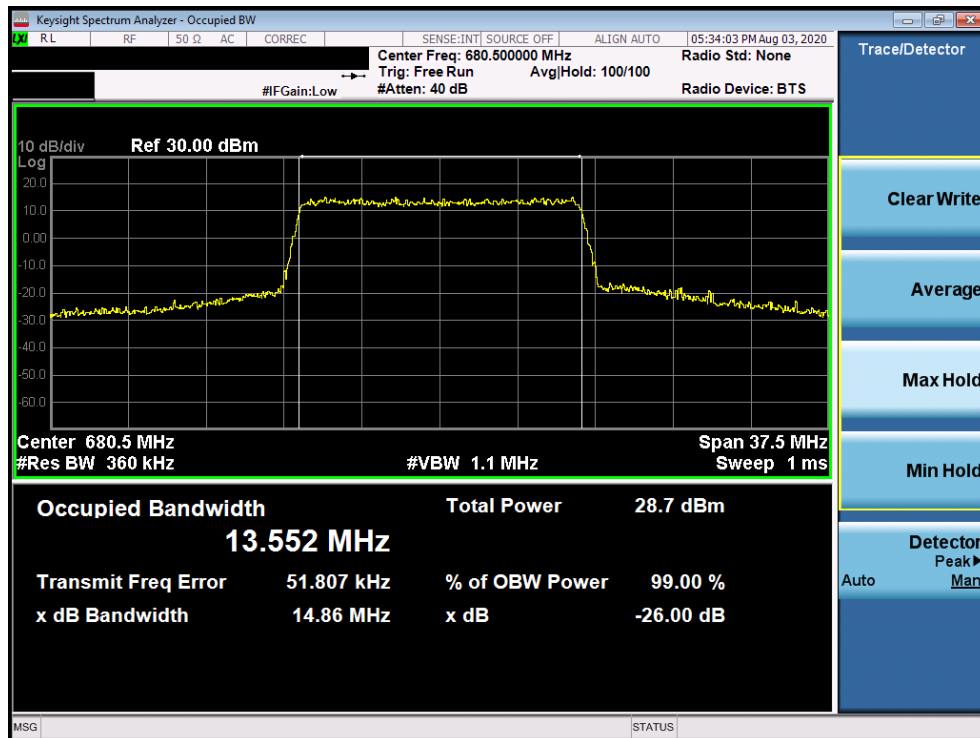


Plot 7-6. Occupied Bandwidth Plot (Band 71 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 20 of 466



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



Plot 7-8. Occupied Bandwidth Plot (Band 71 - 15.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 21 of 466

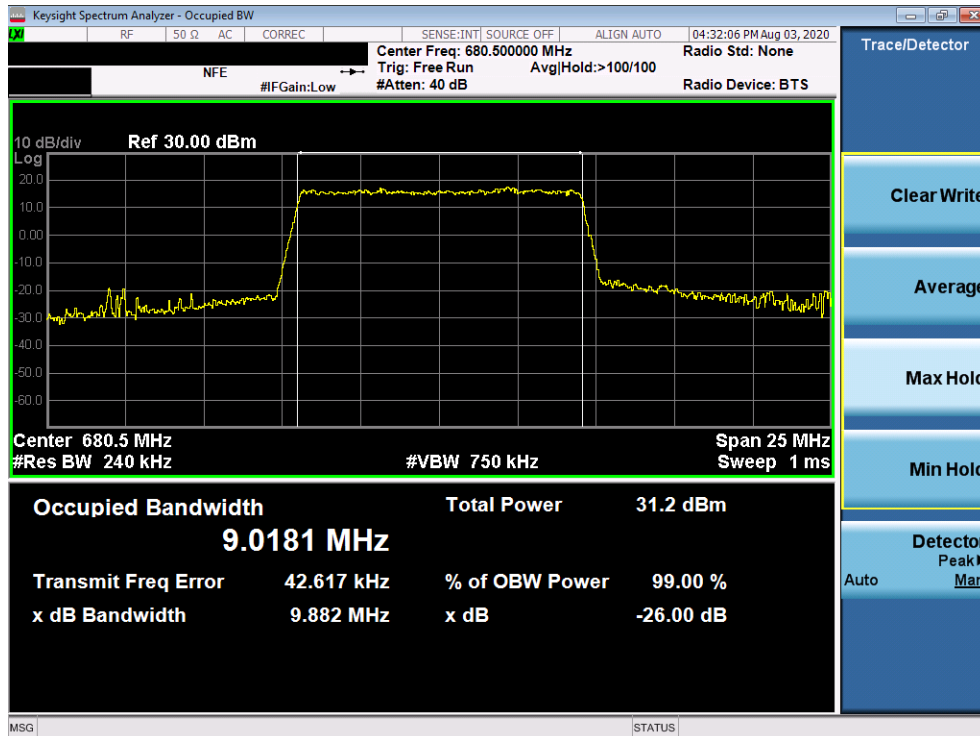


Plot 7-9. Occupied Bandwidth Plot (Band 71 - 10.0MHz QPSK - Full RB Configuration)

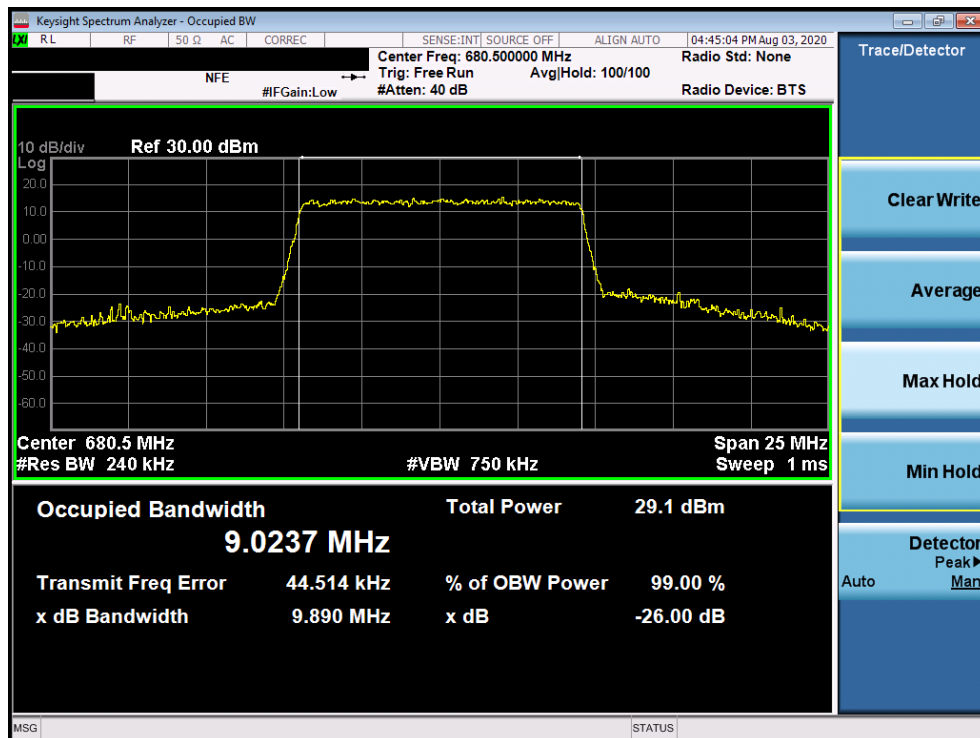


Plot 7-10. Occupied Bandwidth Plot (Band 71 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 22 of 466

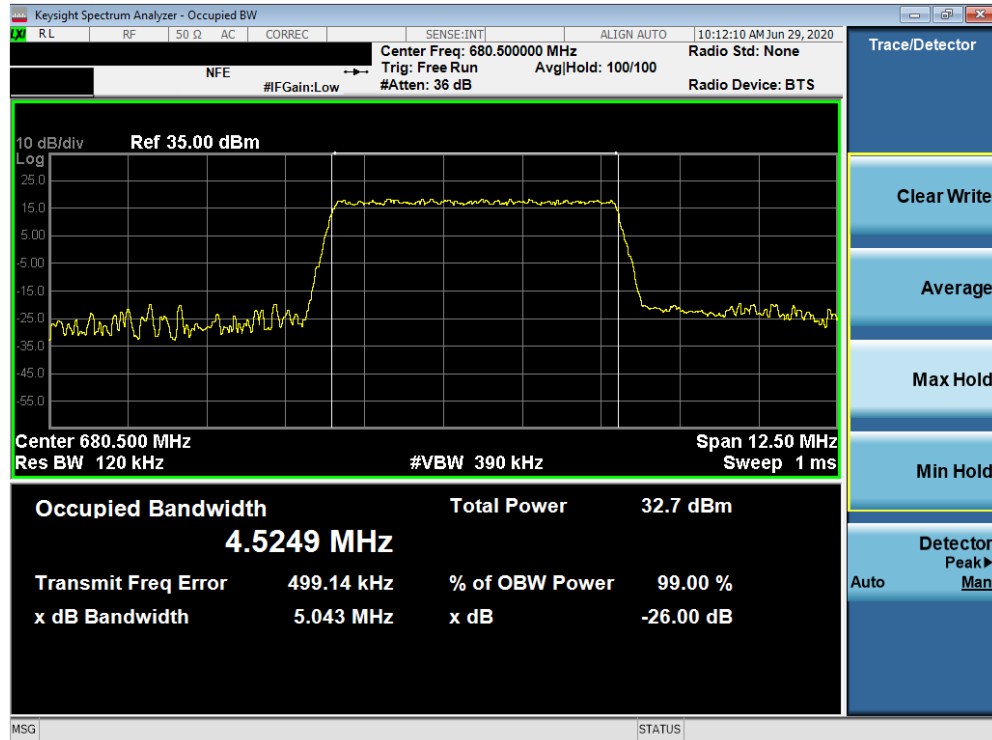


Plot 7-11. Occupied Bandwidth Plot (Band 71 - 10.0MHz 64-QAM - Full RB Configuration)

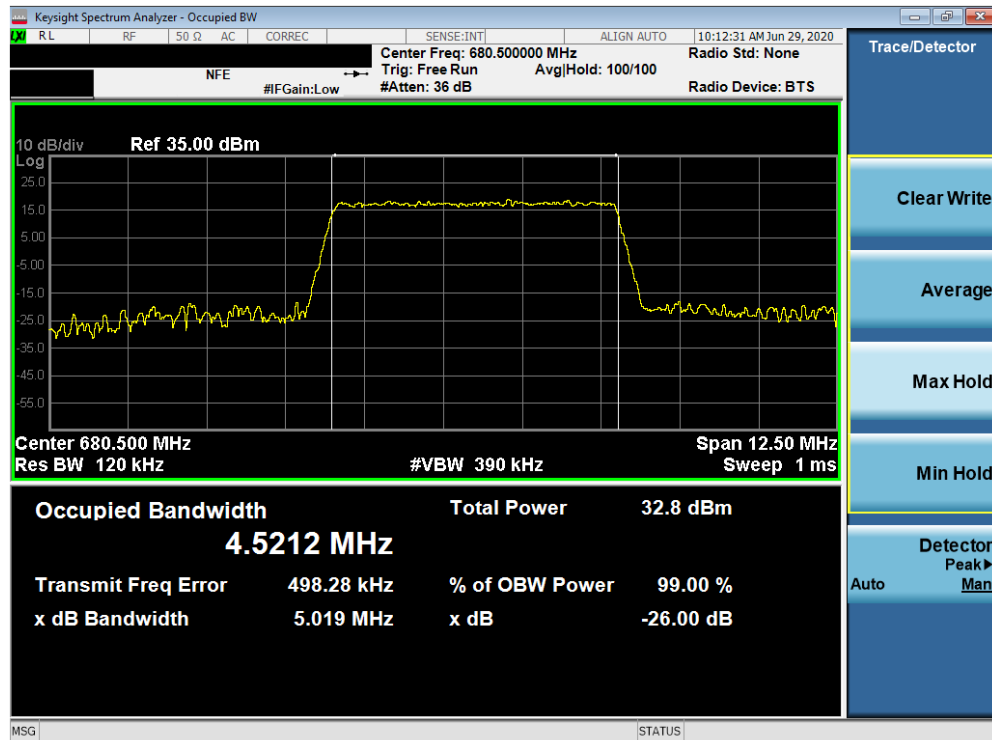


Plot 7-12. Occupied Bandwidth Plot (Band 71 - 10.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 23 of 466

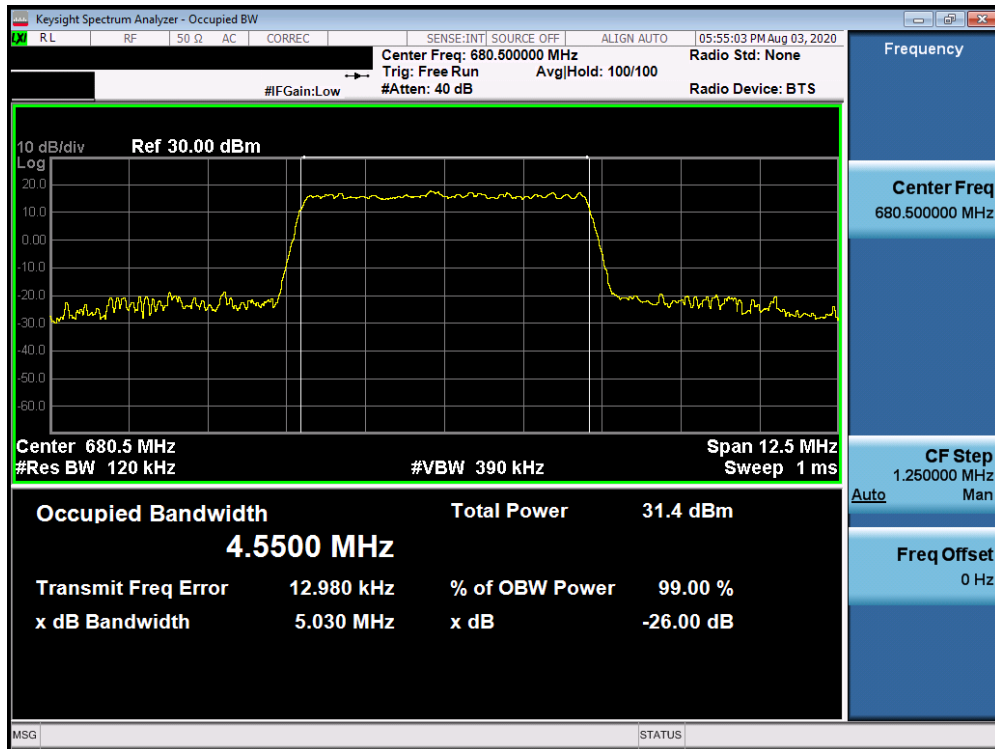


Plot 7-13. Occupied Bandwidth Plot (Band 71 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (Band 71 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 24 of 466



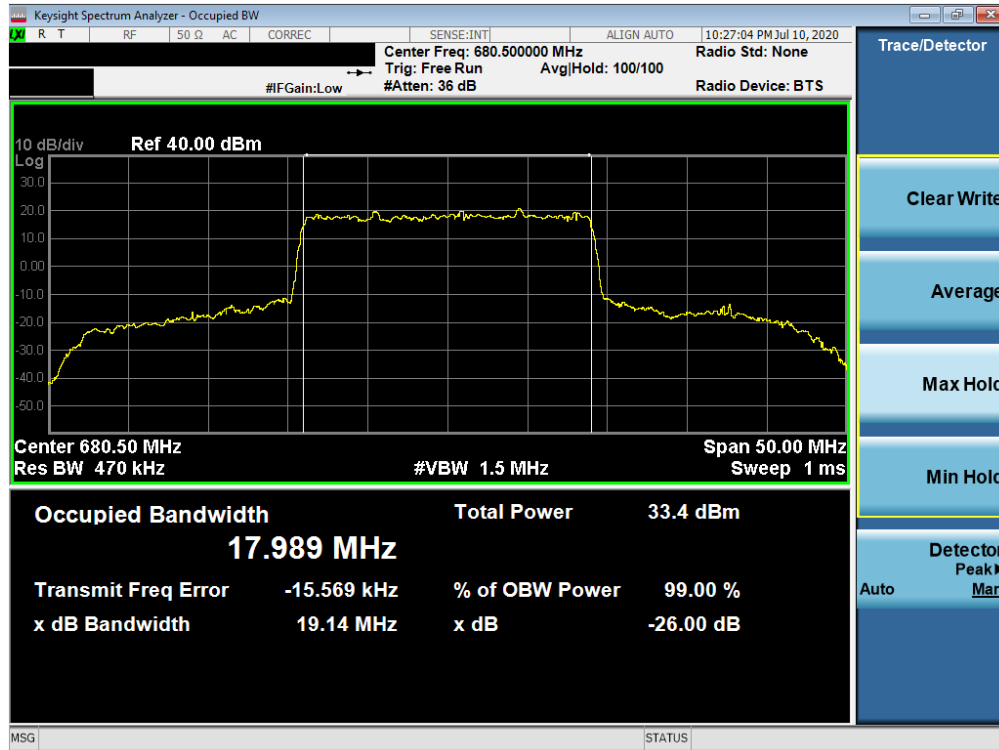
Plot 7-15. Occupied Bandwidth Plot (Band 71 - 5.0MHz 64-QAM - Full RB Configuration)



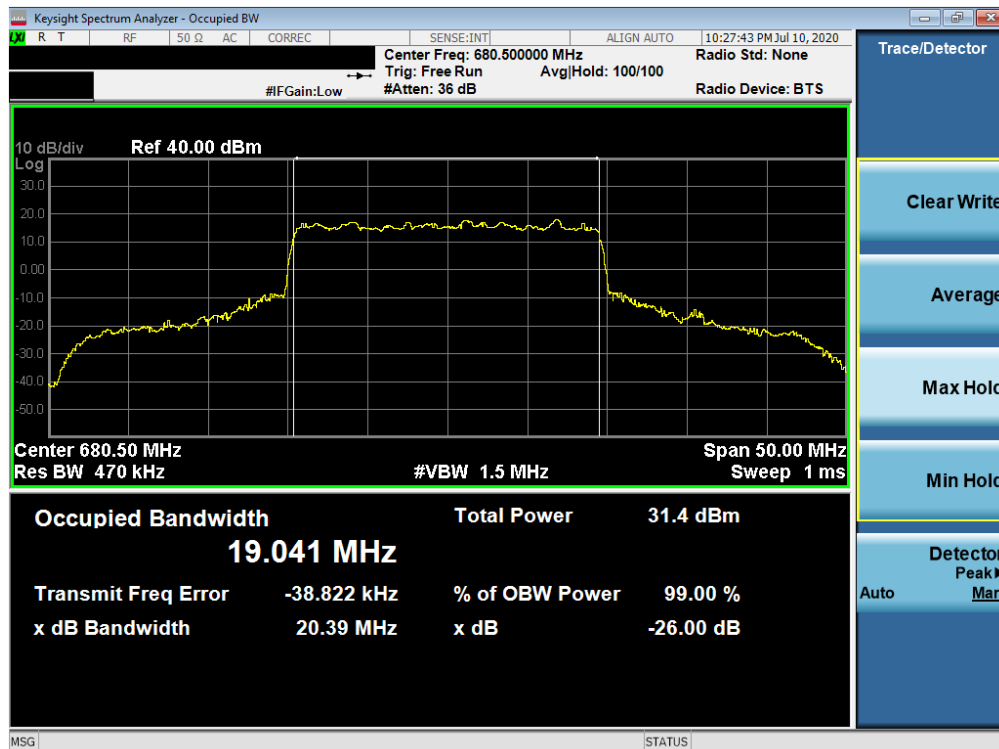
Plot 7-16. Occupied Bandwidth Plot (Band 71 - 5.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 25 of 466

NR Band n71



Plot 7-17. Occupied Bandwidth Plot (NR Band n71 - 20MHz DFT-s-OFDM BPSK - Full RB)

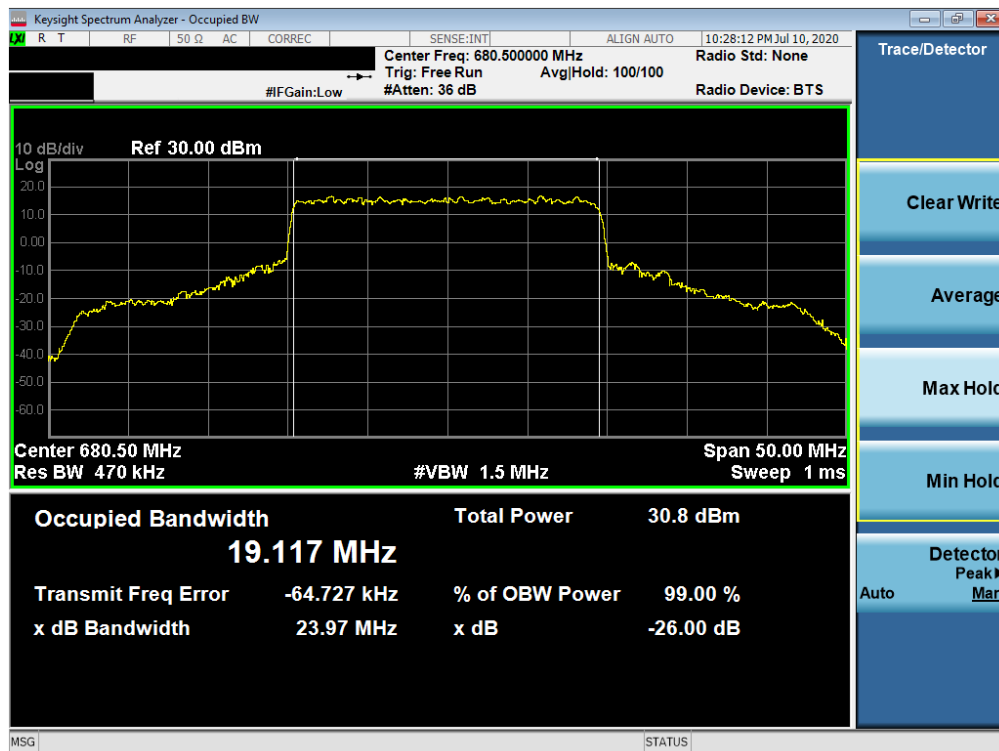


Plot 7-18. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 26 of 466



Plot 7-19. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM 16-QAM - Full RB)



Plot 7-20. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM 64-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 27 of 466

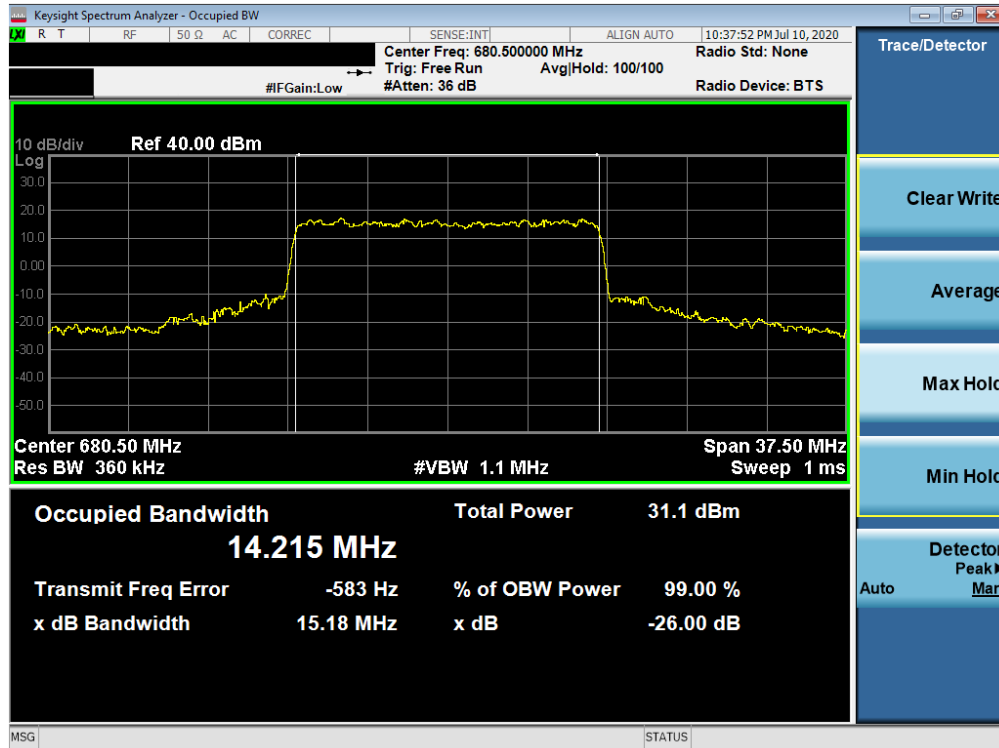


Plot 7-21. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM 256-QAM - Full RB)

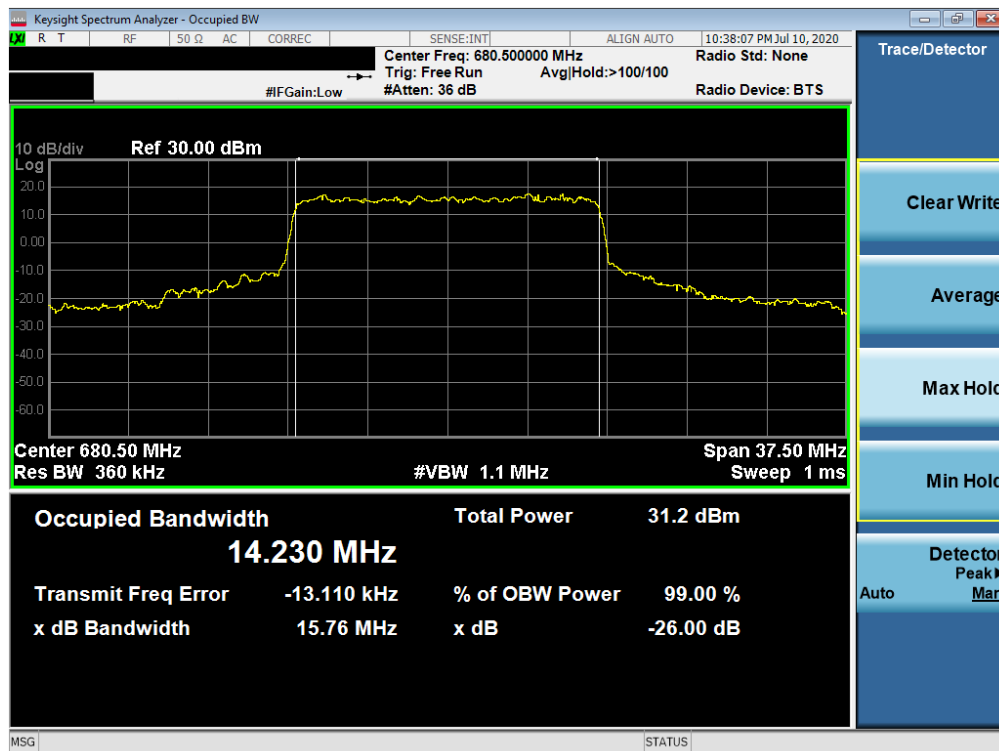


Plot 7-22. Occupied Bandwidth Plot (NR Band n71 - 15MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 28 of 466

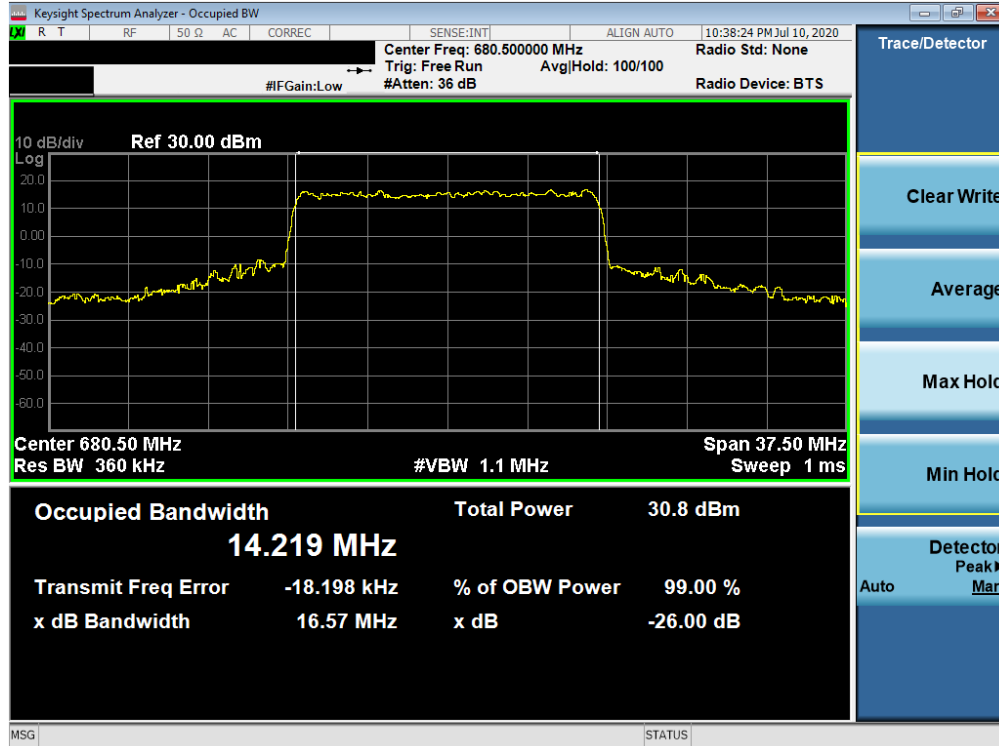


Plot 7-23. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM QPSK - Full RB)

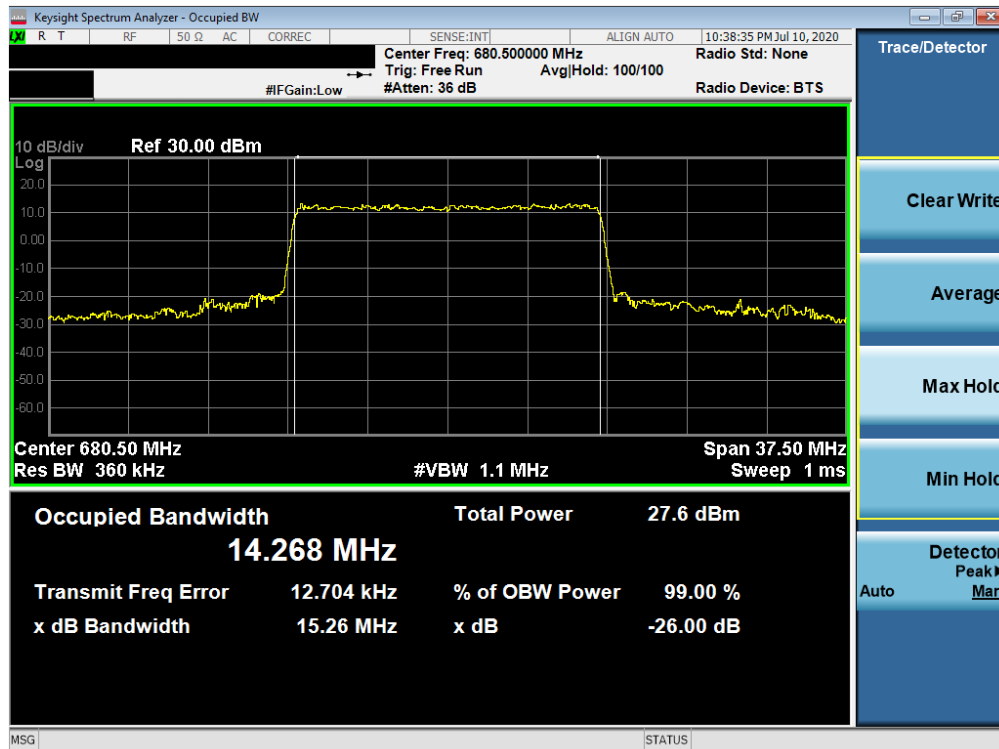


Plot 7-24. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 16-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 29 of 466

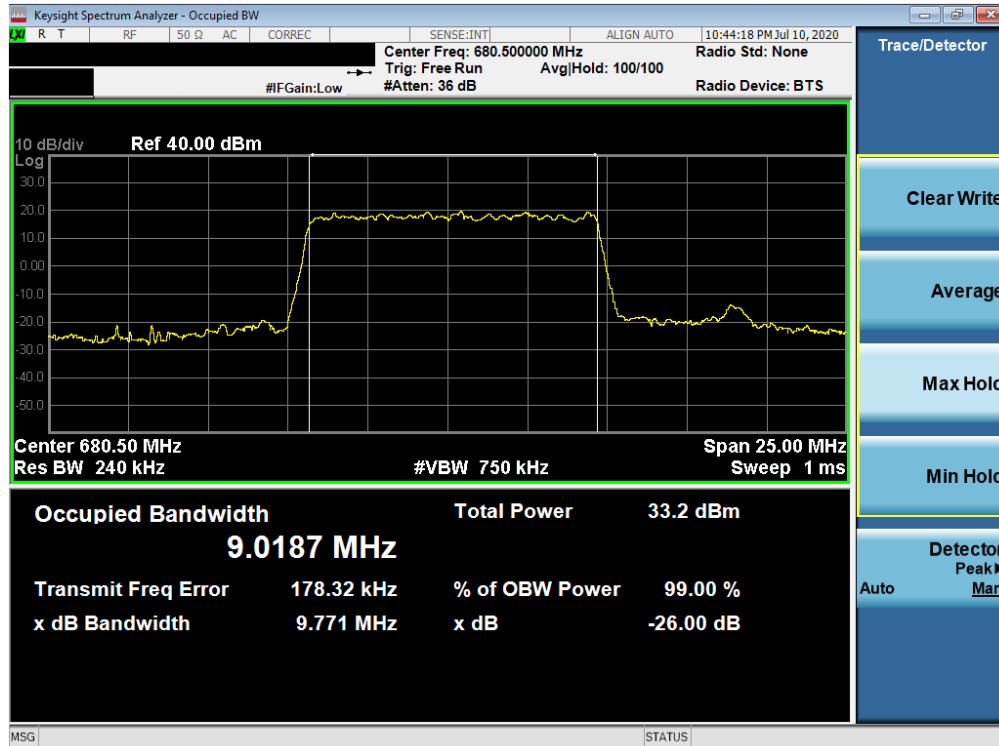


Plot 7-25. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 64-QAM - Full RB)



Plot 7-26. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 256-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 30 of 466

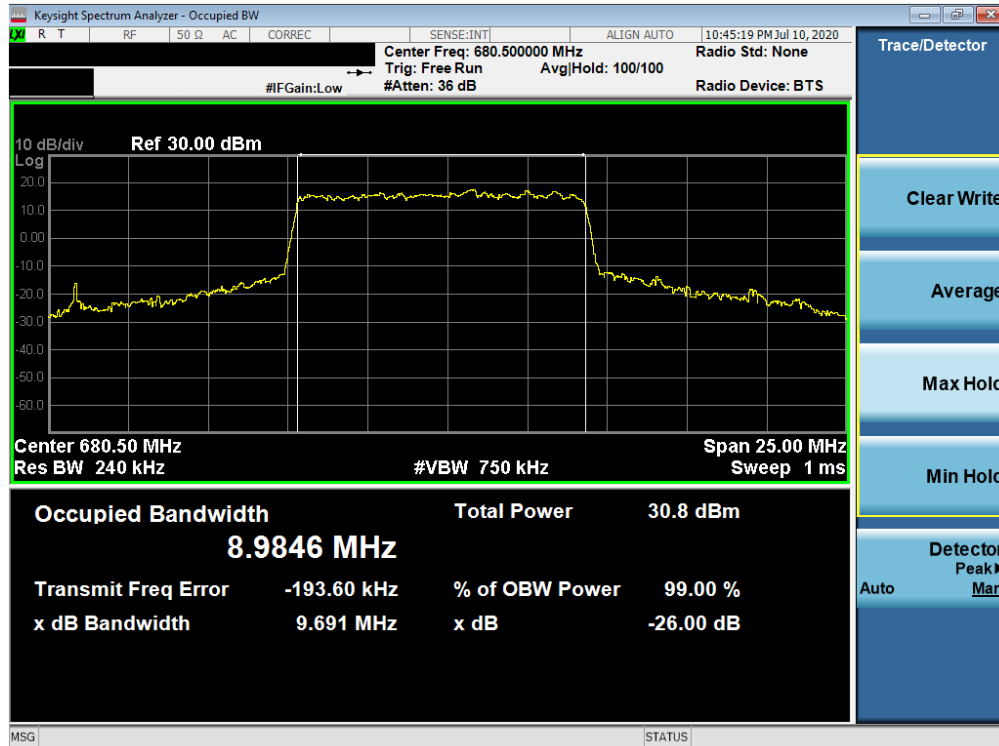


Plot 7-27. Occupied Bandwidth Plot (NR Band n71 - 10MHz DFT-s-OFDM BPSK - Full RB)

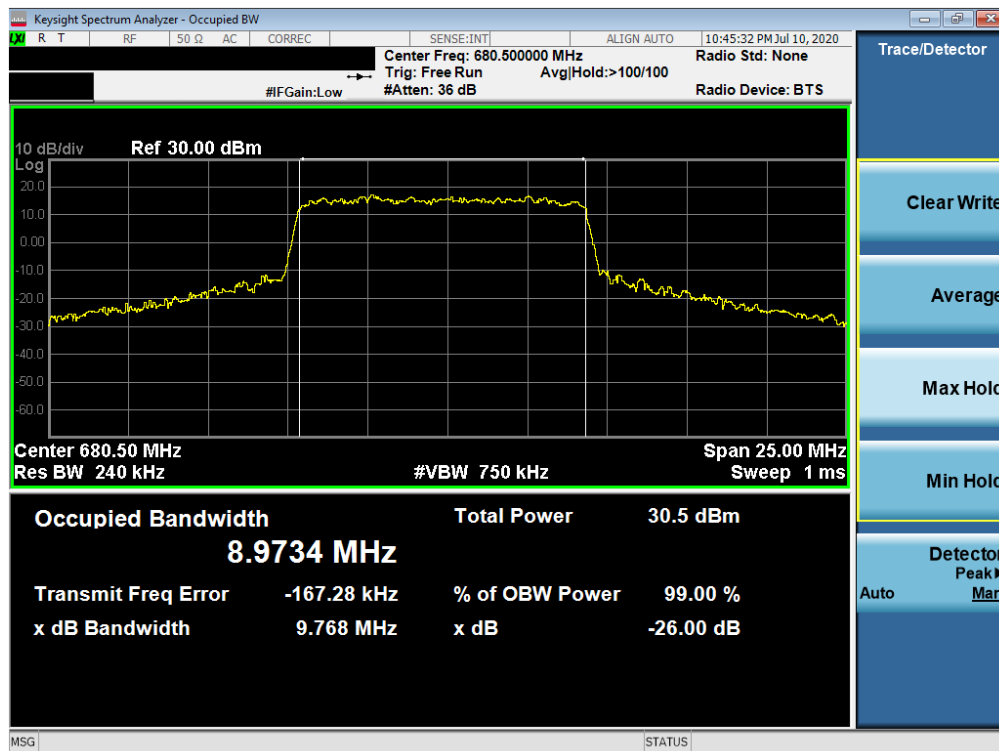


Plot 7-28. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 31 of 466

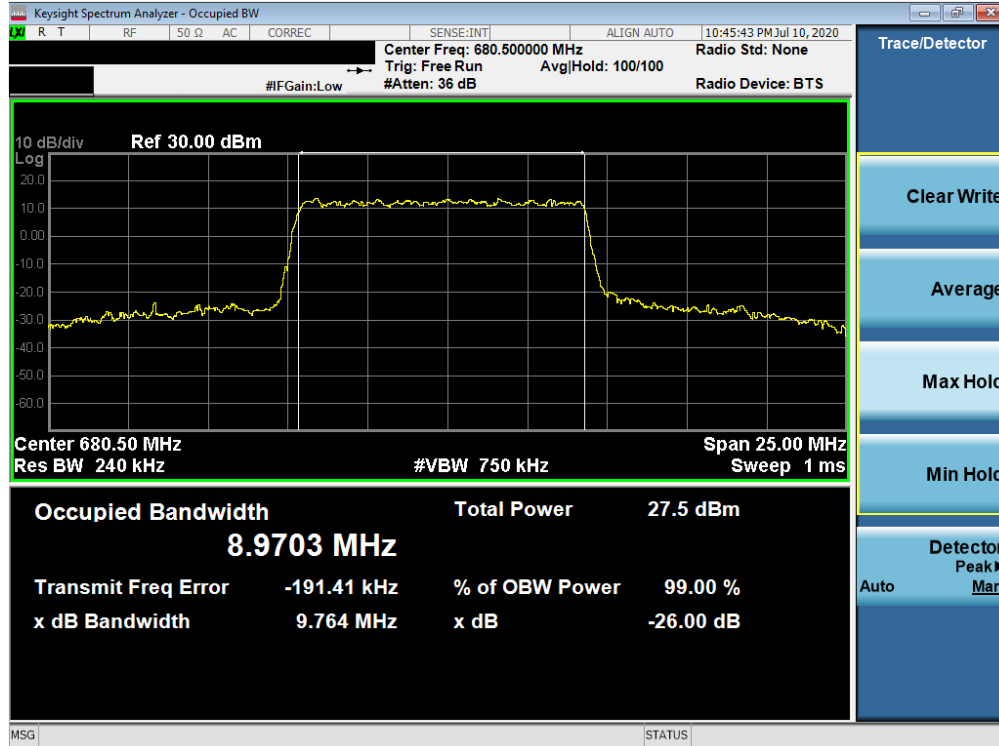


Plot 7-29. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 16-QAM - Full RB)

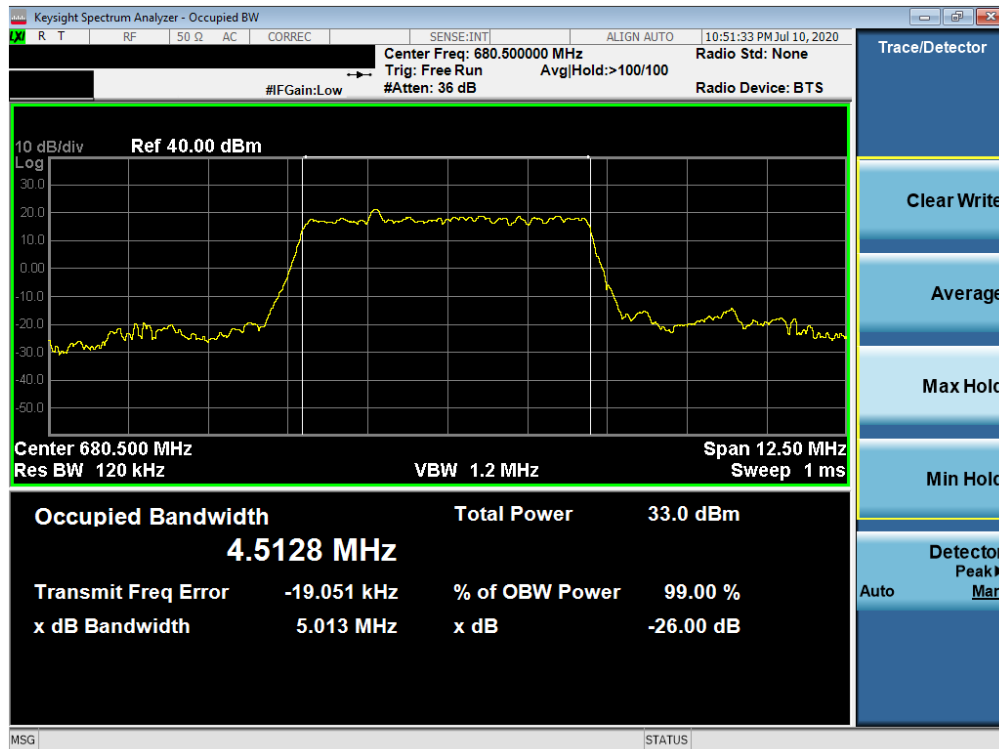


Plot 7-30. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 64-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 32 of 466

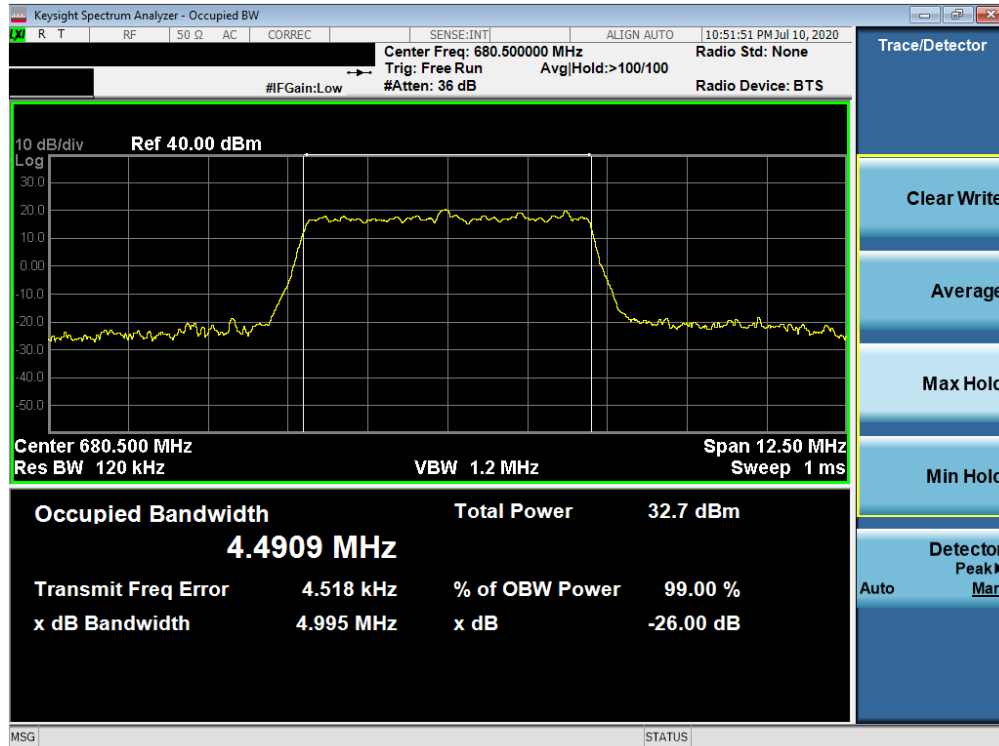


Plot 7-31. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 256-QAM - Full RB)

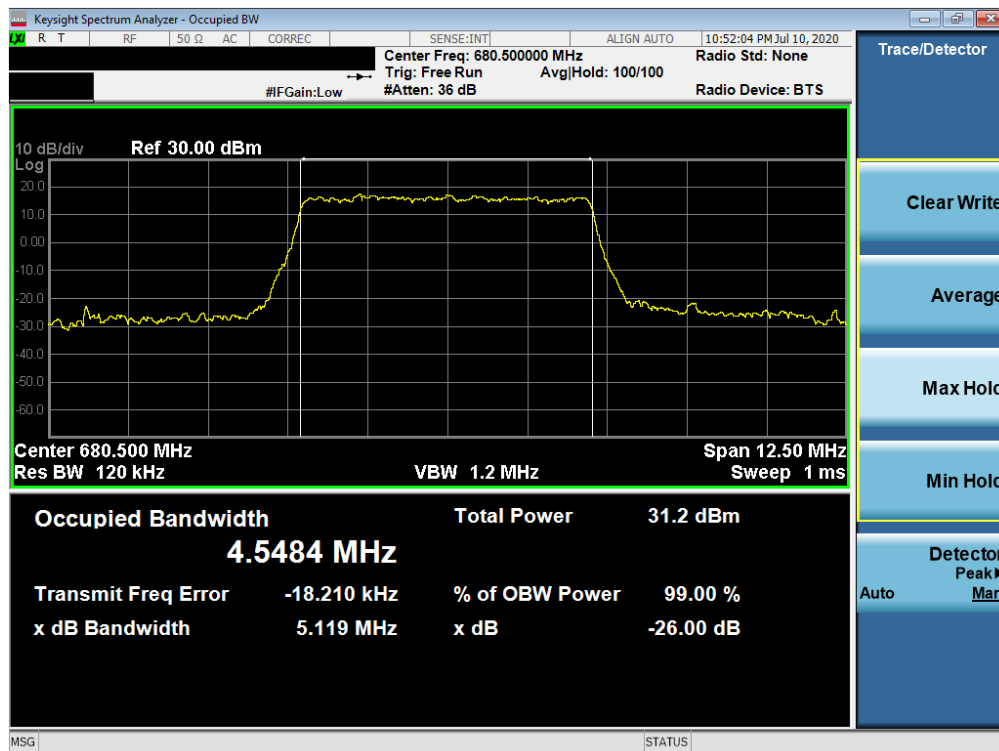


Plot 7-32. Occupied Bandwidth Plot (NR Band n71 - 5.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 33 of 466

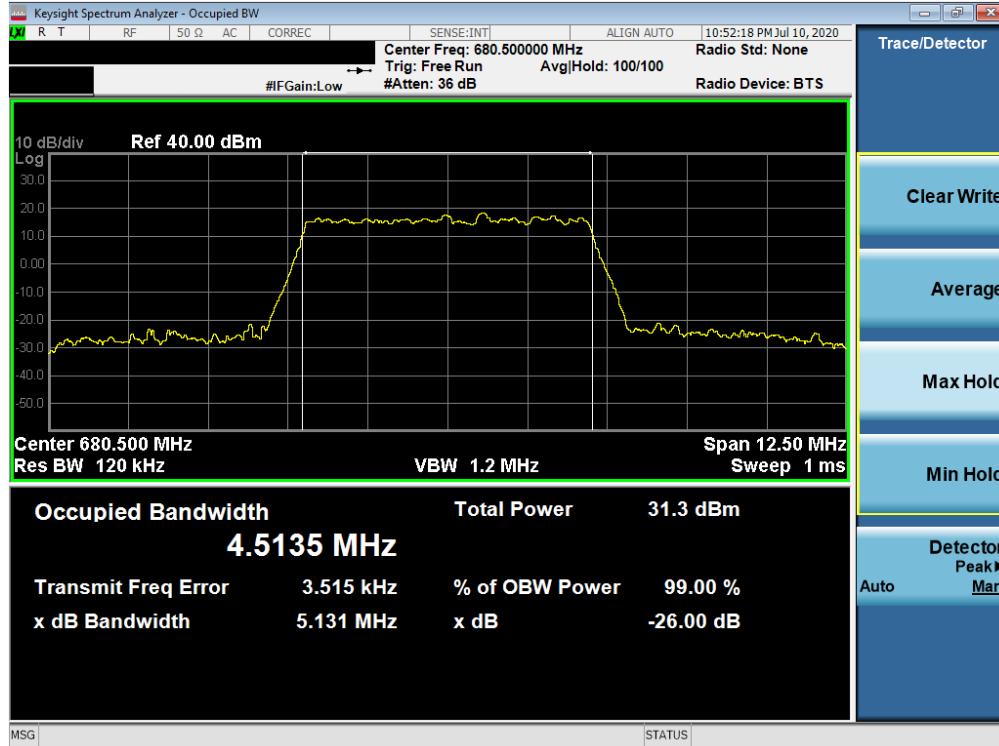


Plot 7-33. Occupied Bandwidth Plot (NR Band n71 - 5.0MHz CP-OFDM QPSK - Full RB)

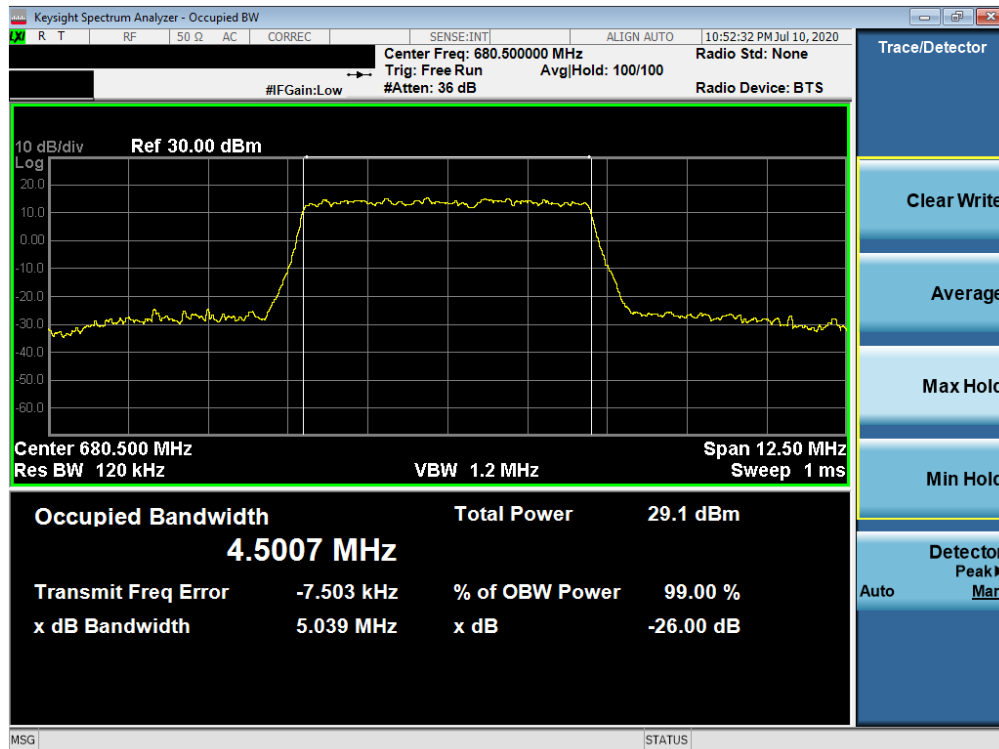


Plot 7-34. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM 16-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 34 of 466



Plot 7-35. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM 64-QAM - Full RB)



Plot 7-36. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM 256-QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 35 of 466

Band 12



Plot 7-37. Occupied Bandwidth Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

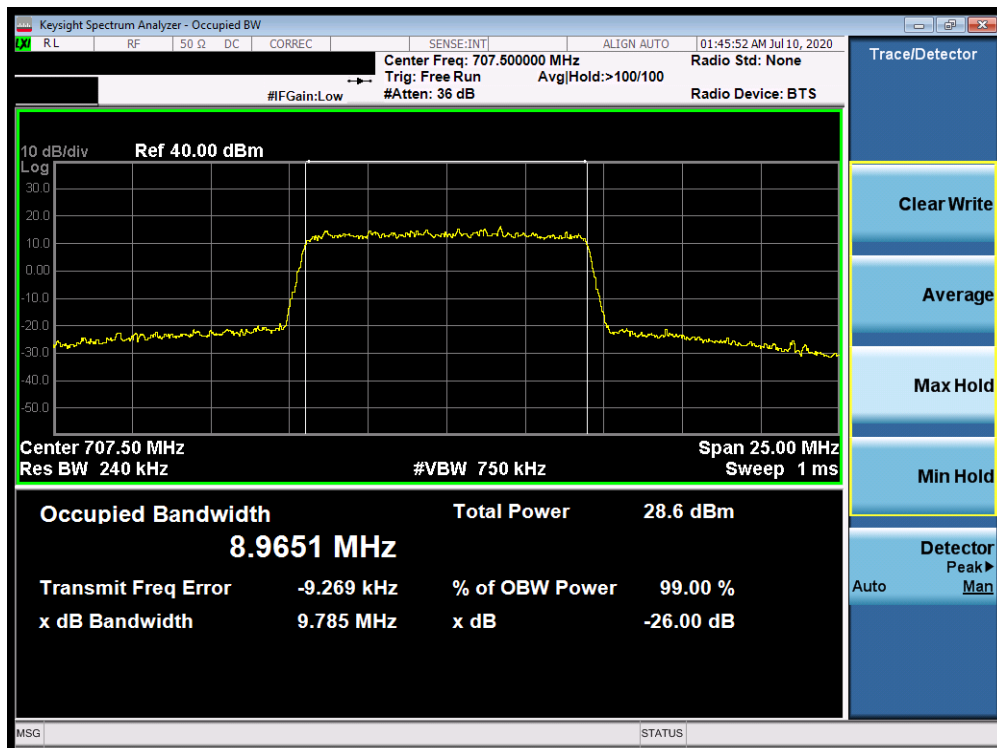


Plot 7-38. Occupied Bandwidth Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 36 of 466

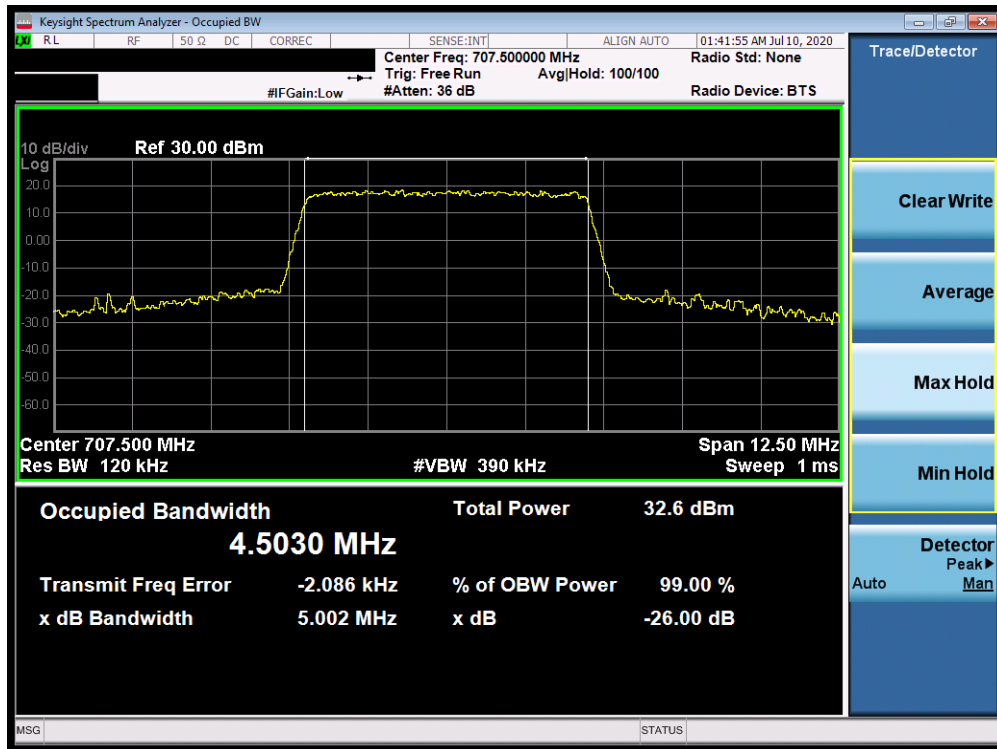


Plot 7-39. Occupied Bandwidth Plot (Band 12 - 10.0MHz 64-QAM - Full RB Configuration)

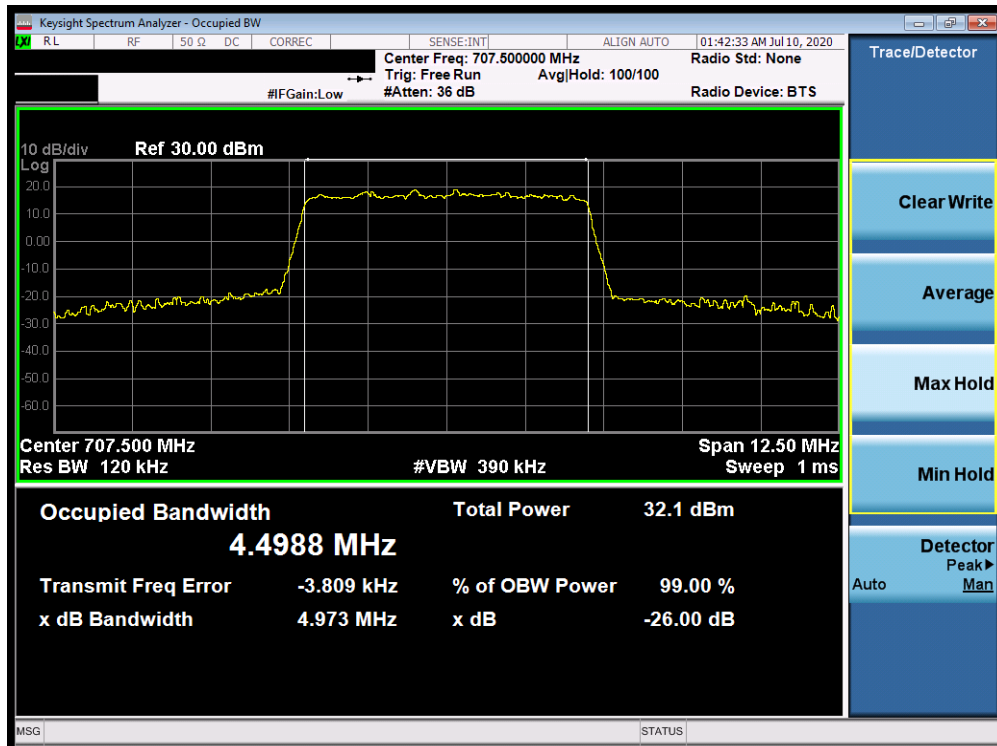


Plot 7-40. Occupied Bandwidth Plot (Band 12 - 10.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 37 of 466

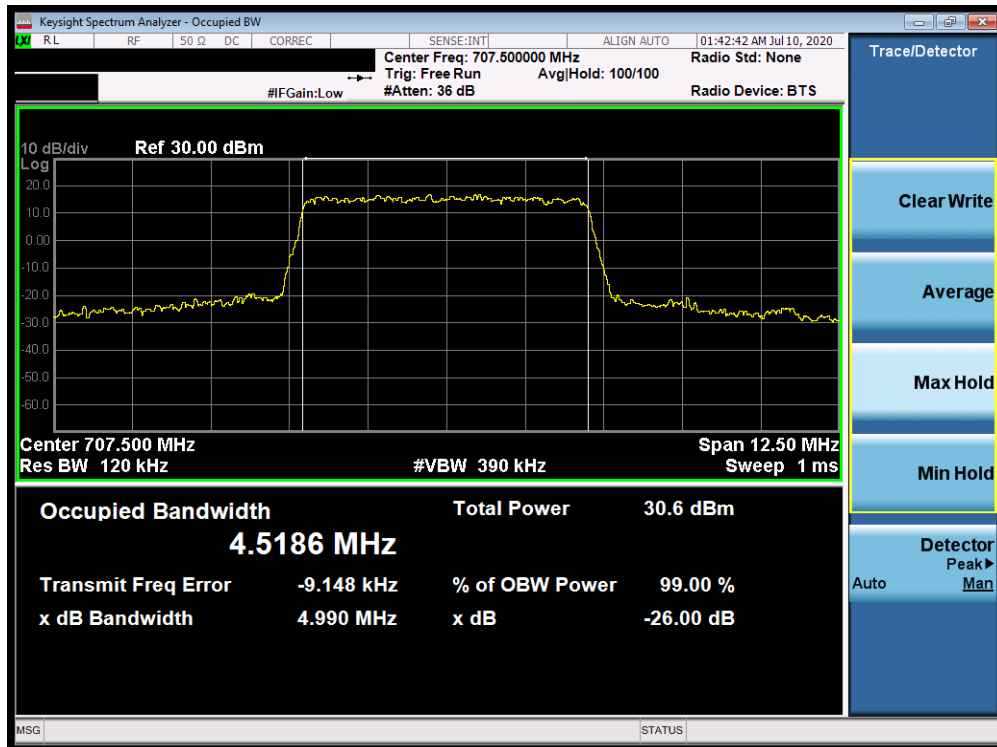


Plot 7-41. Occupied Bandwidth Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

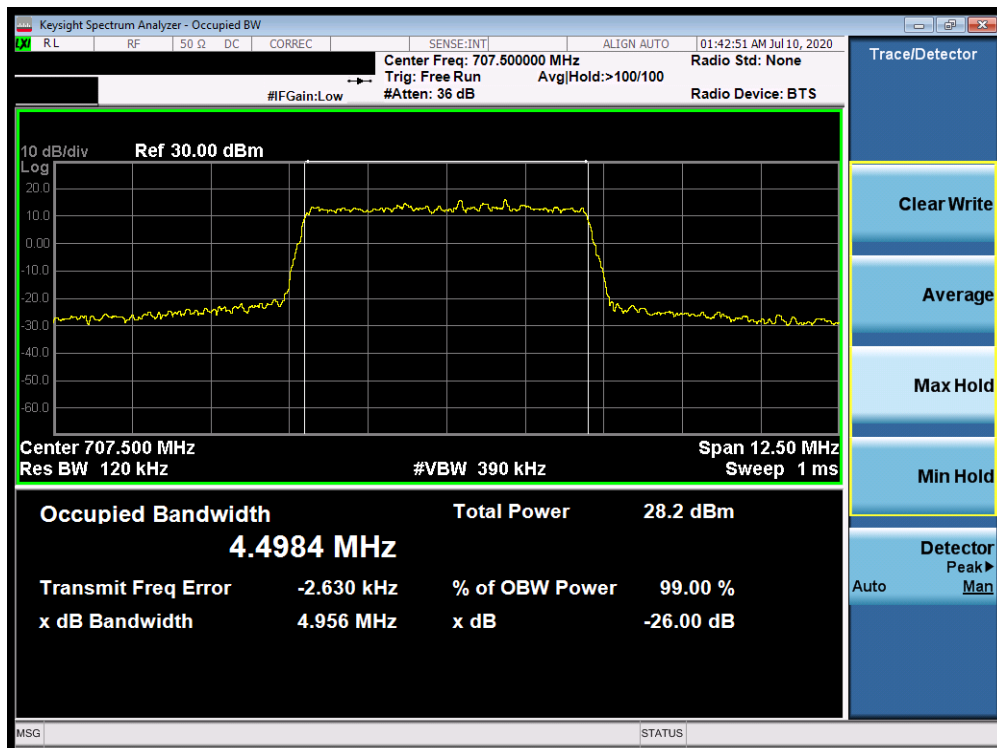


Plot 7-42. Occupied Bandwidth Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 38 of 466

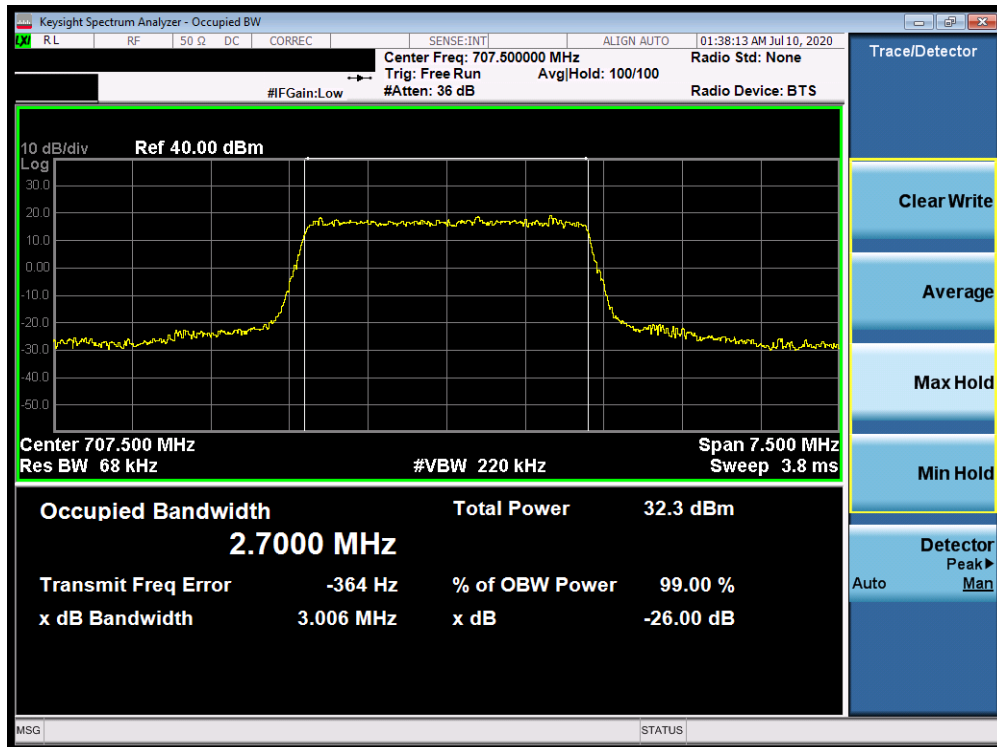


Plot 7-43. Occupied Bandwidth Plot (Band 12 - 5.0MHz 64-QAM - Full RB Configuration)

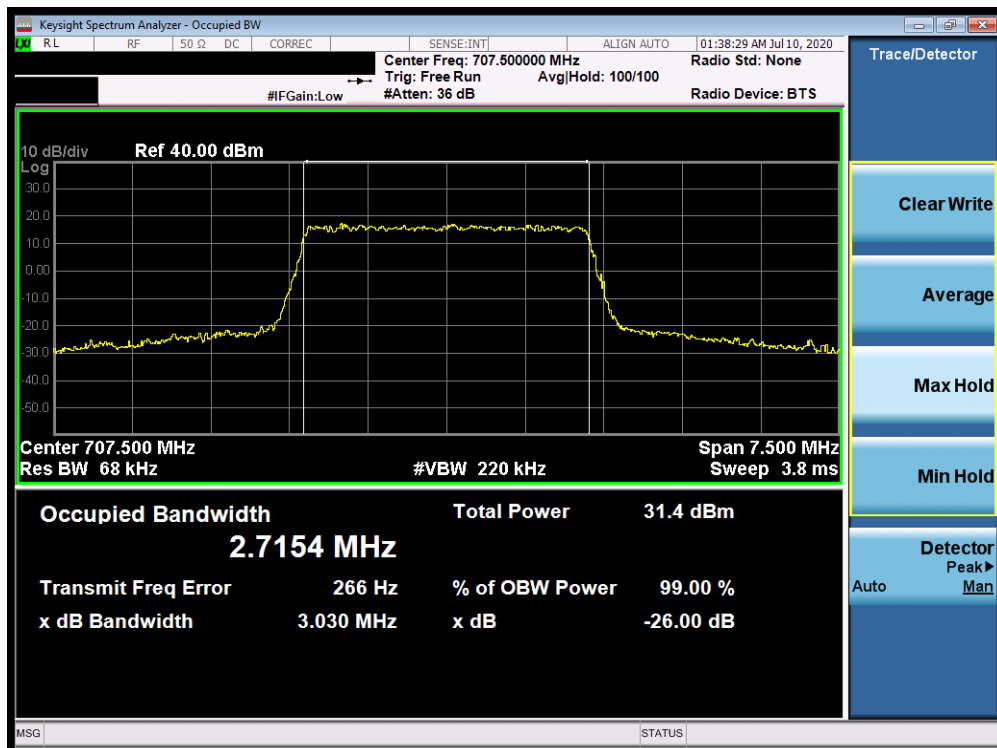


Plot 7-44. Occupied Bandwidth Plot (Band 12 - 5.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 39 of 466

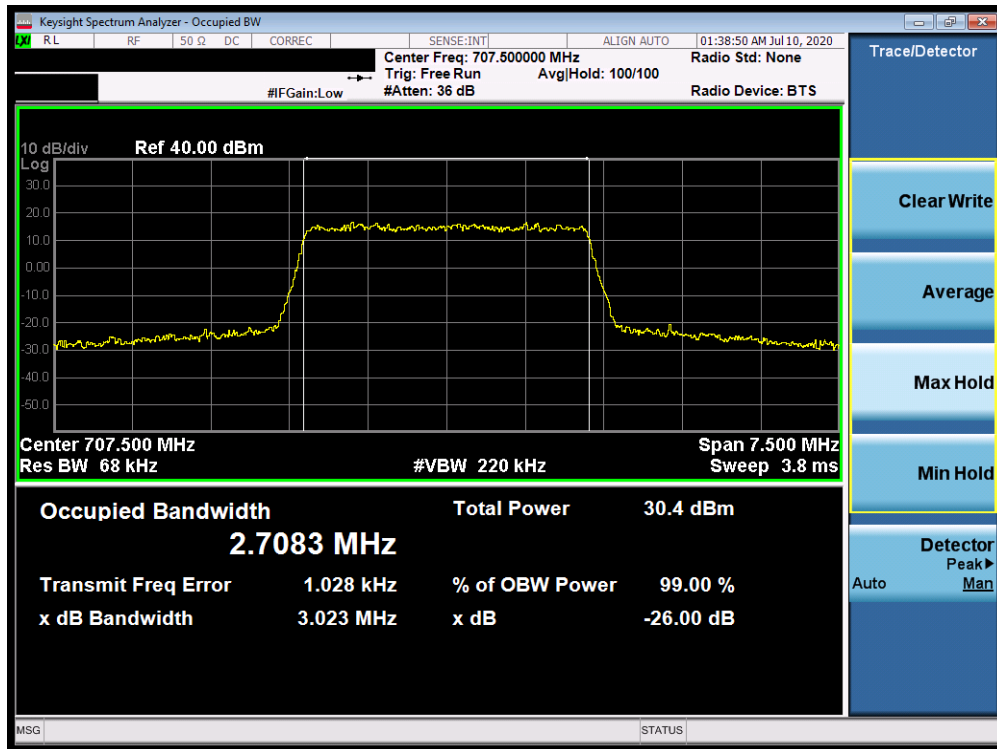


Plot 7-45. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

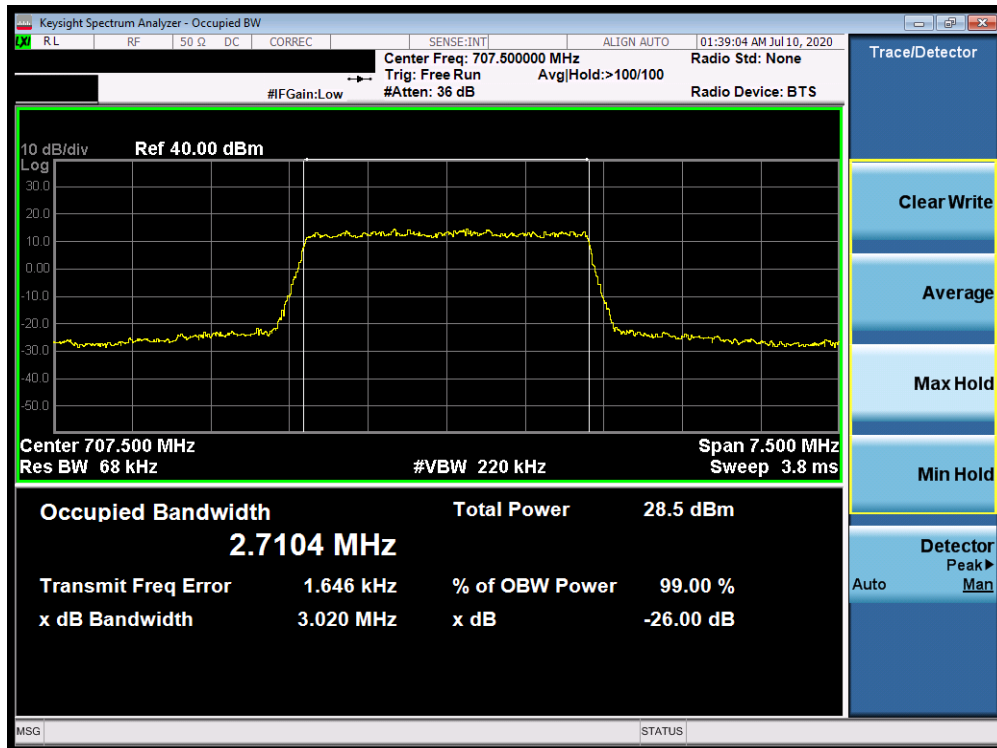


Plot 7-46. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 40 of 466

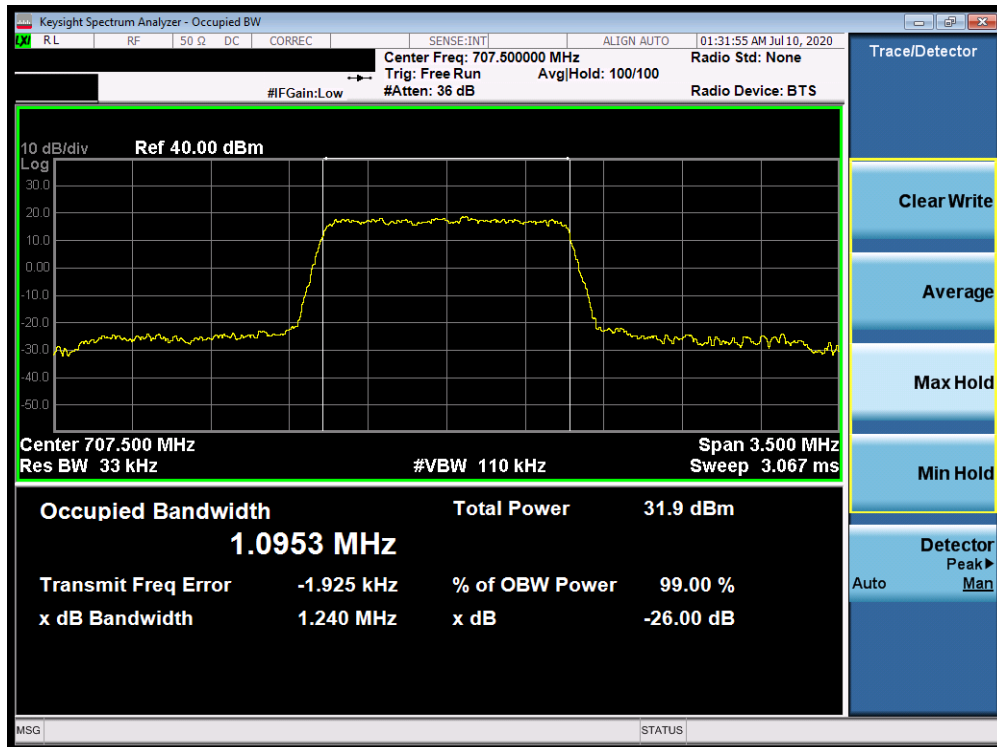


Plot 7-47. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

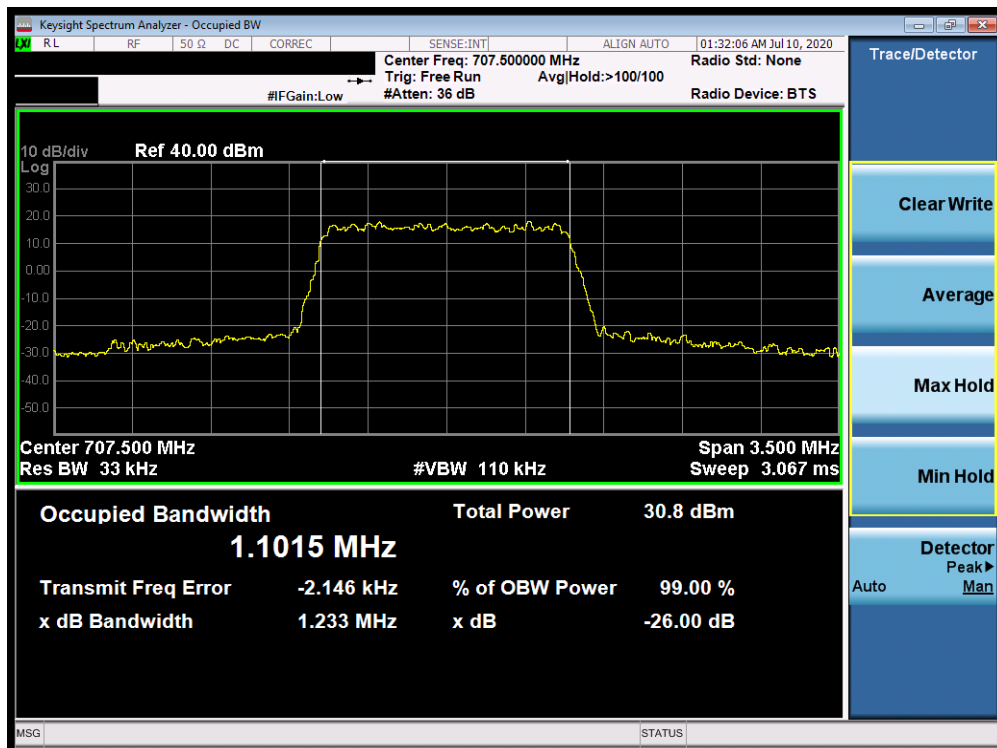


Plot 7-48. Occupied Bandwidth Plot (Band 12 - 3.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 41 of 466

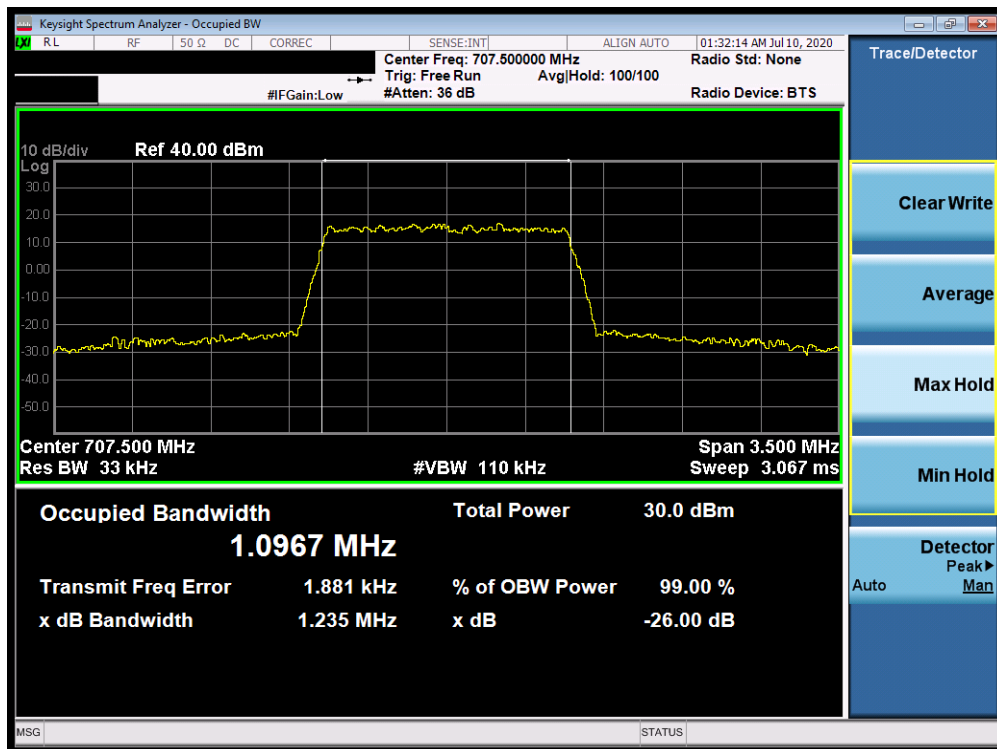


Plot 7-49. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-50. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 42 of 466



Plot 7-51. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)



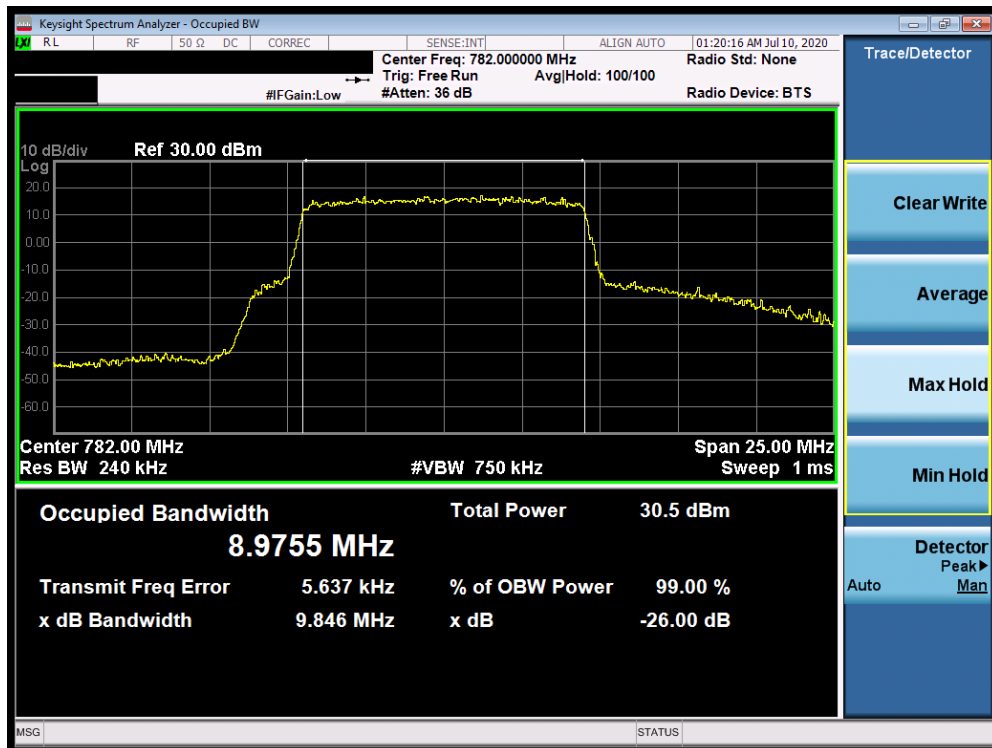
Plot 7-52. Occupied Bandwidth Plot (Band 12 - 1.4MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 43 of 466

Band 13



Plot 7-53. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

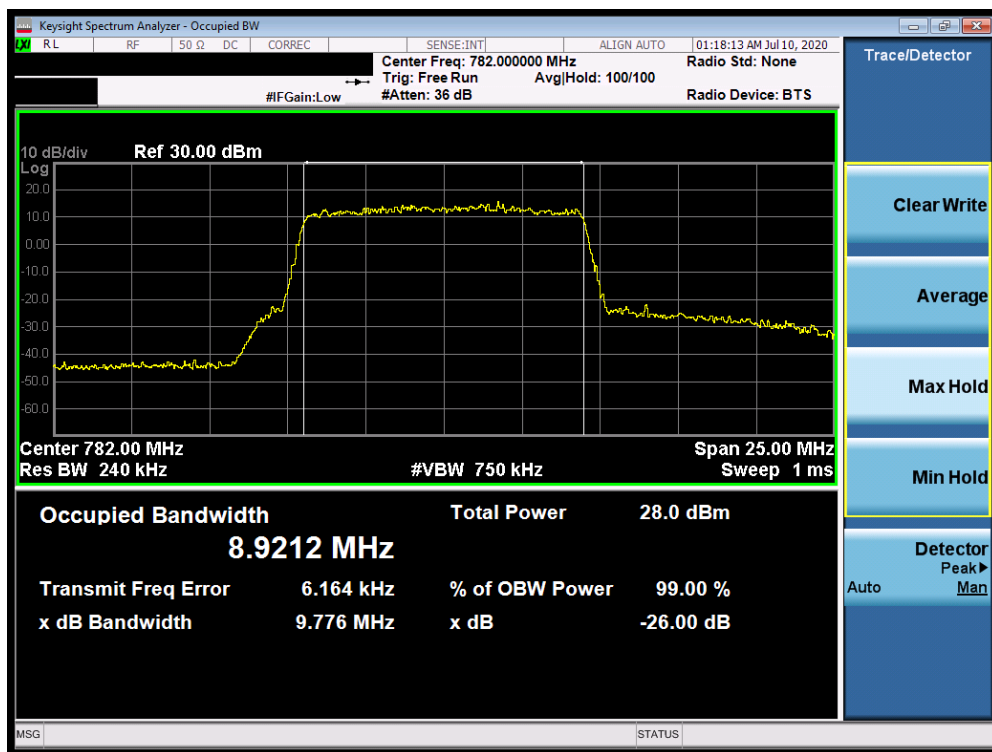


Plot 7-54. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 44 of 466



Plot 7-55. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)



Plot 7-56. Occupied Bandwidth Plot (Band 13 - 10.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 45 of 466



Plot 7-57. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-58. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 46 of 466



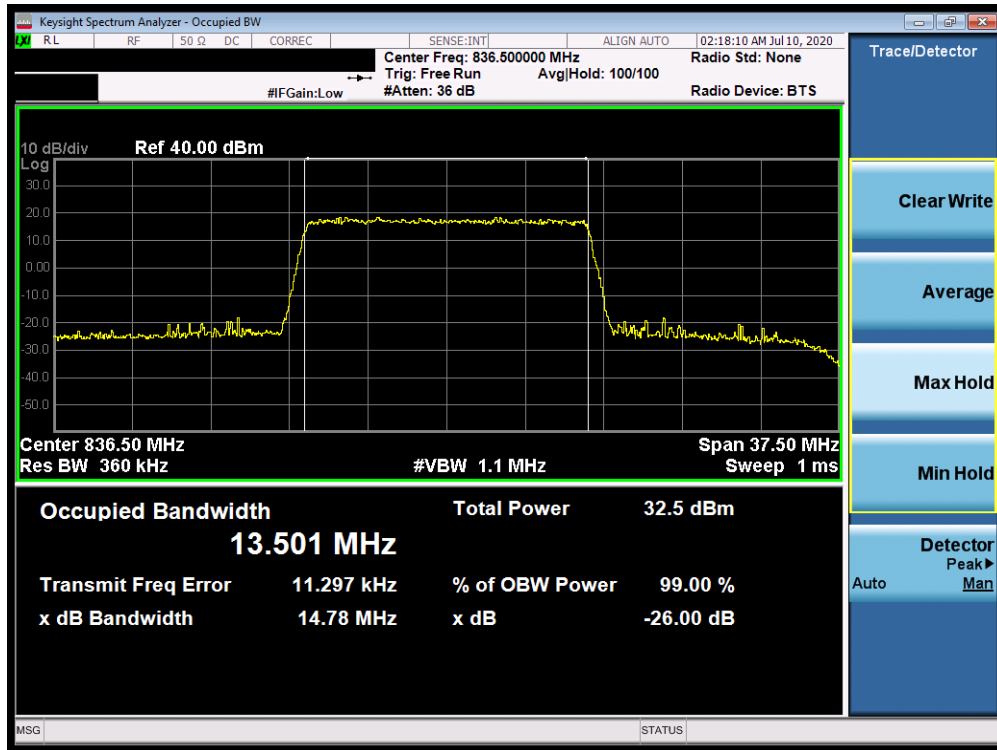
Plot 7-59. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)



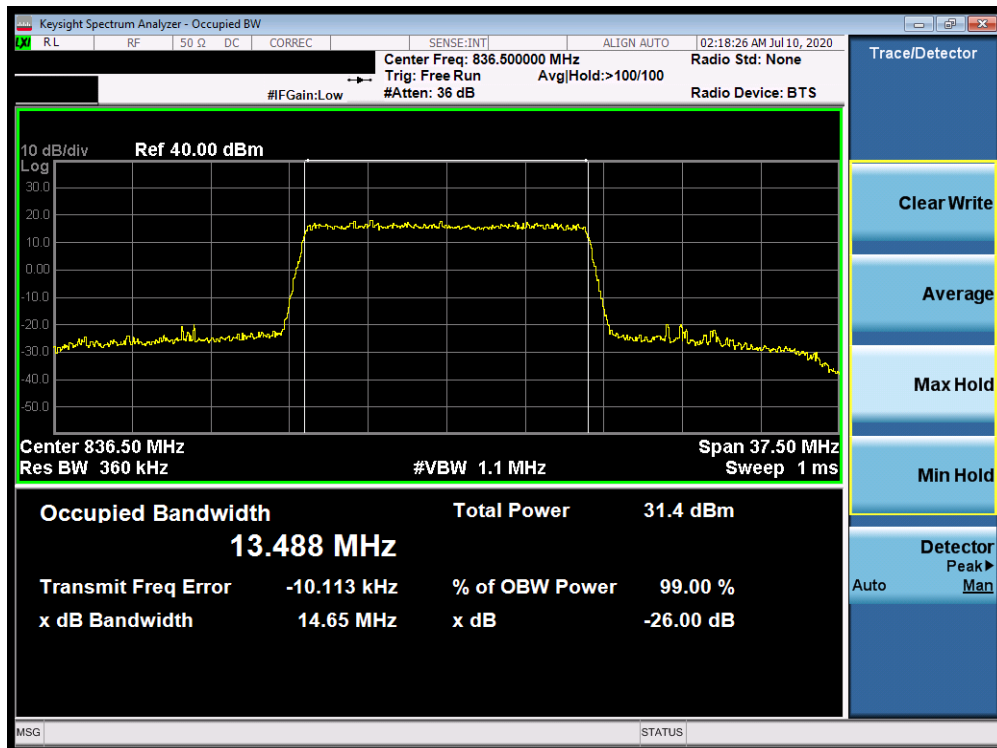
Plot 7-60. Occupied Bandwidth Plot (Band 13 - 5.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 47 of 466

Band 26/5

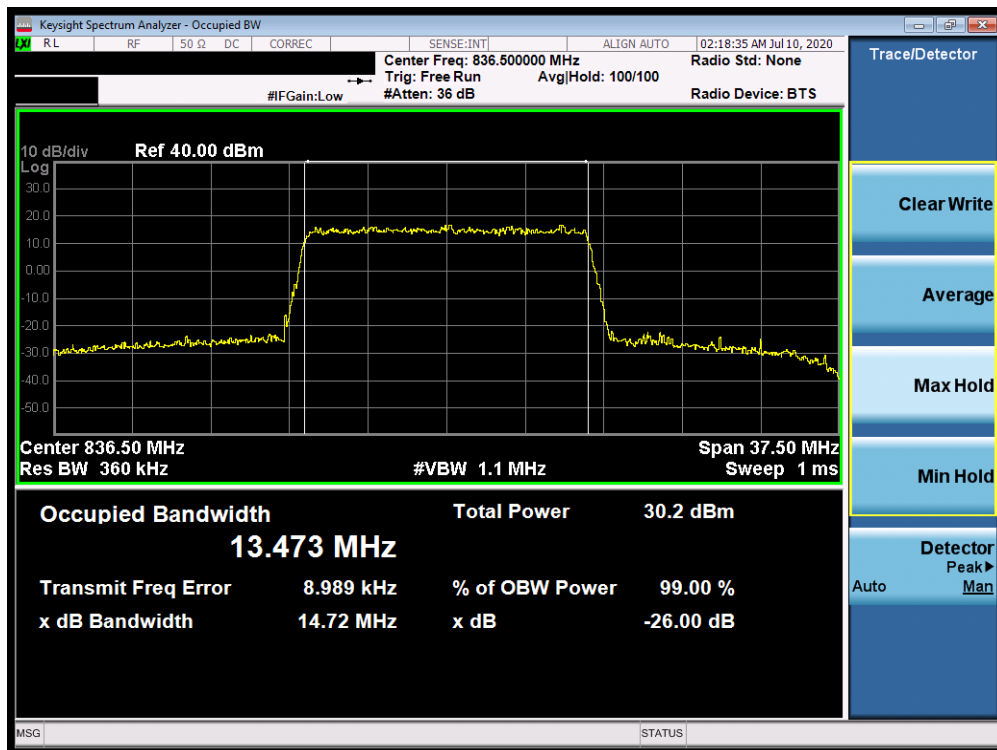


Plot 7-61. Occupied Bandwidth Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)

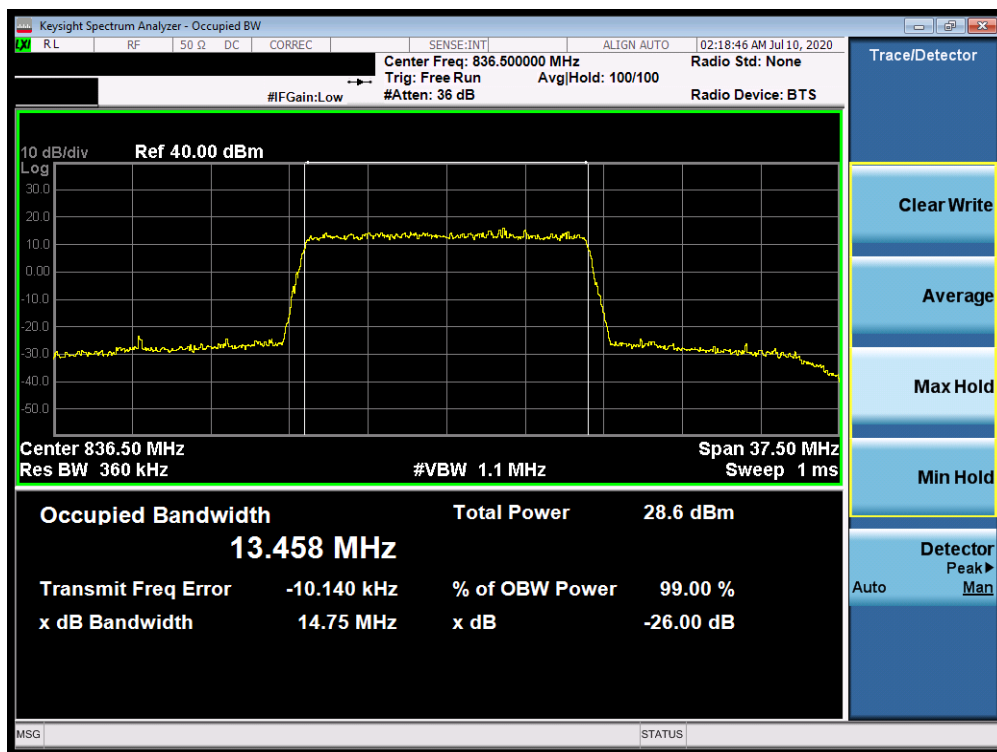


Plot 7-62. Occupied Bandwidth Plot (Band 26 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 48 of 466

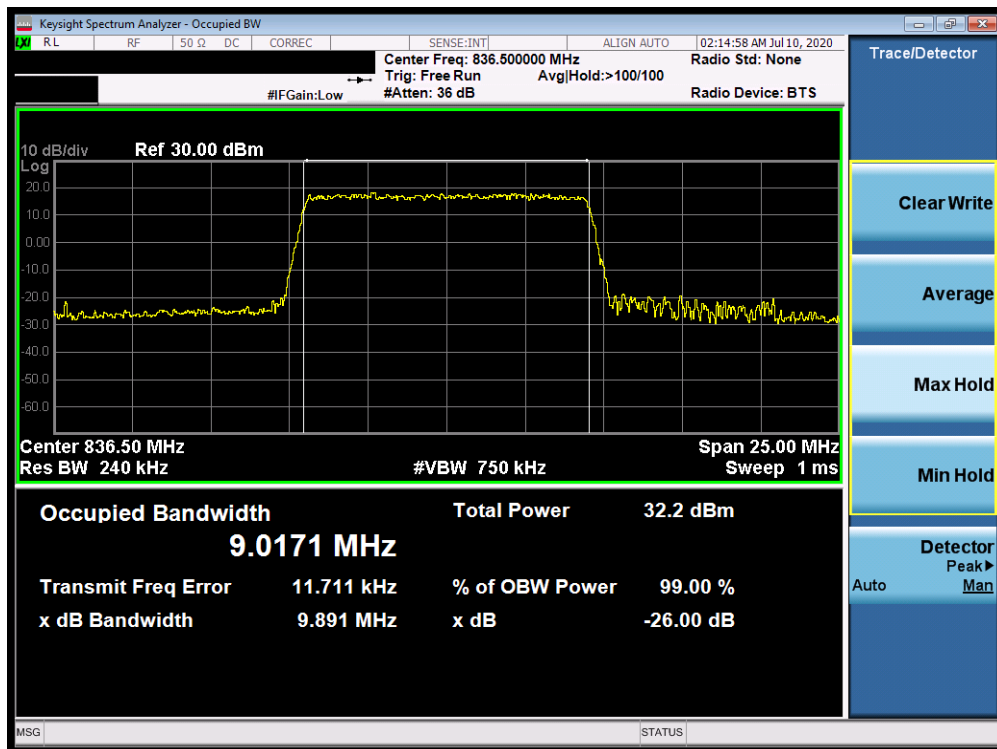


Plot 7-63. Occupied Bandwidth Plot (Band 26 - 15.0MHz 64-QAM - Full RB Configuration)

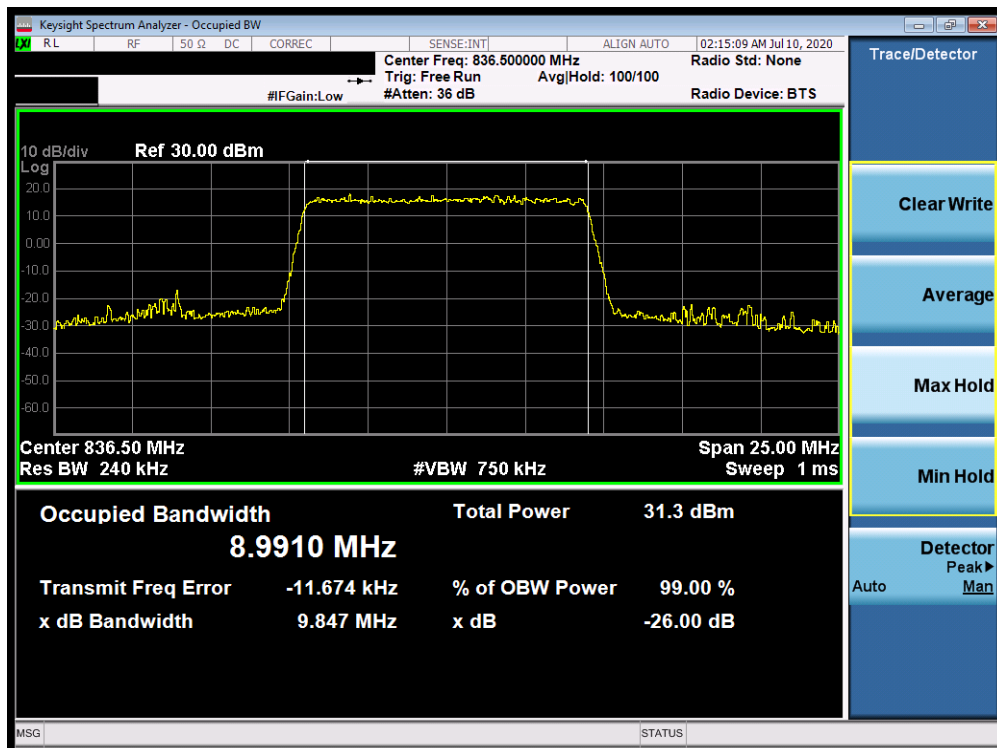


Plot 7-64. Occupied Bandwidth Plot (Band 26 - 15.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 49 of 466

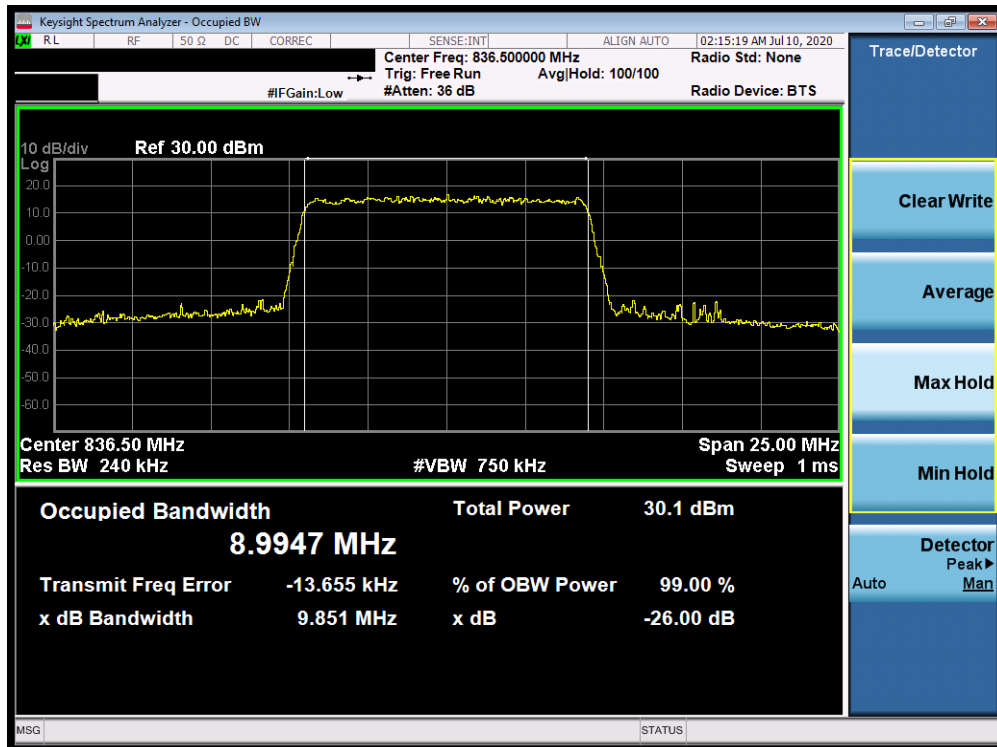


Plot 7-65. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-66. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 50 of 466

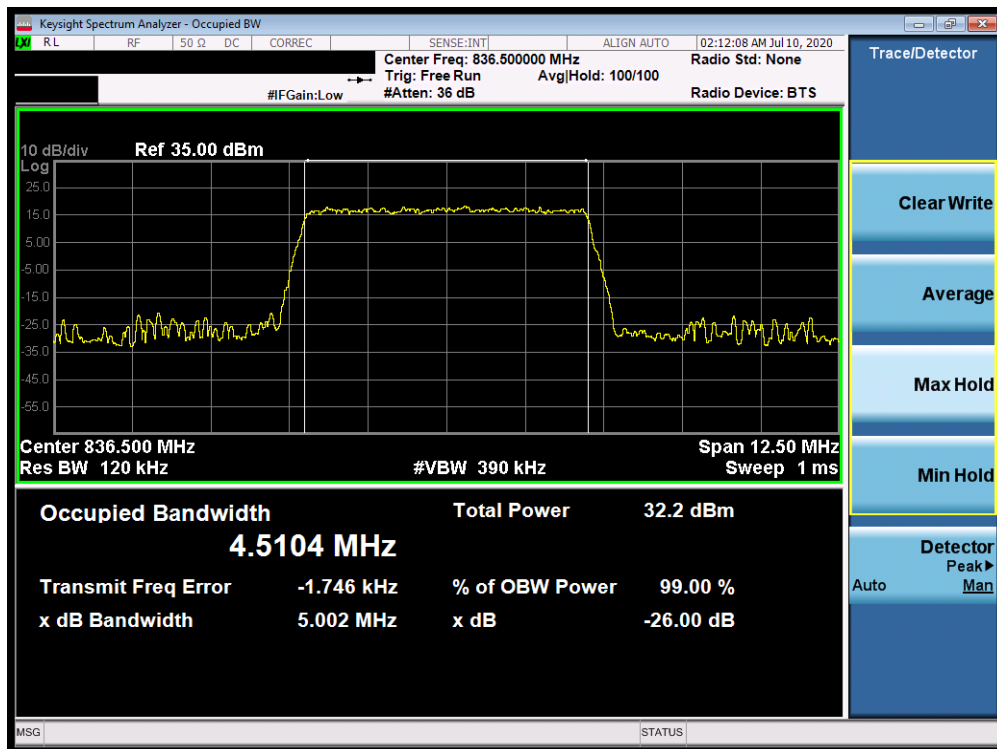


Plot 7-67. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 64-QAM - Full RB Configuration)

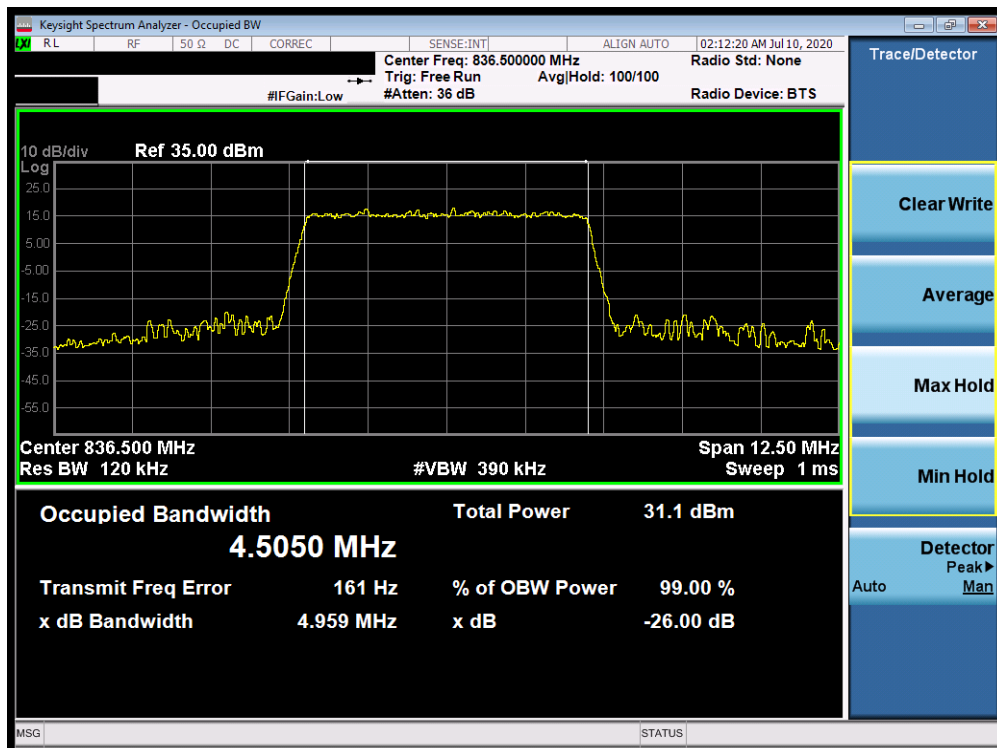


Plot 7-68. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 51 of 466

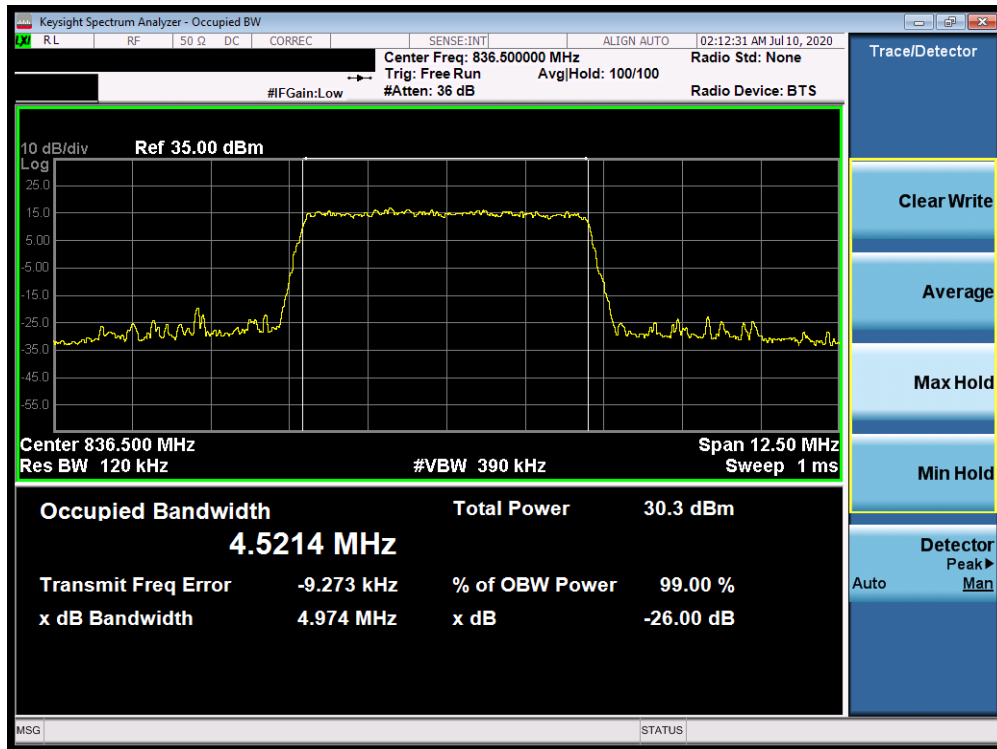


Plot 7-69. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

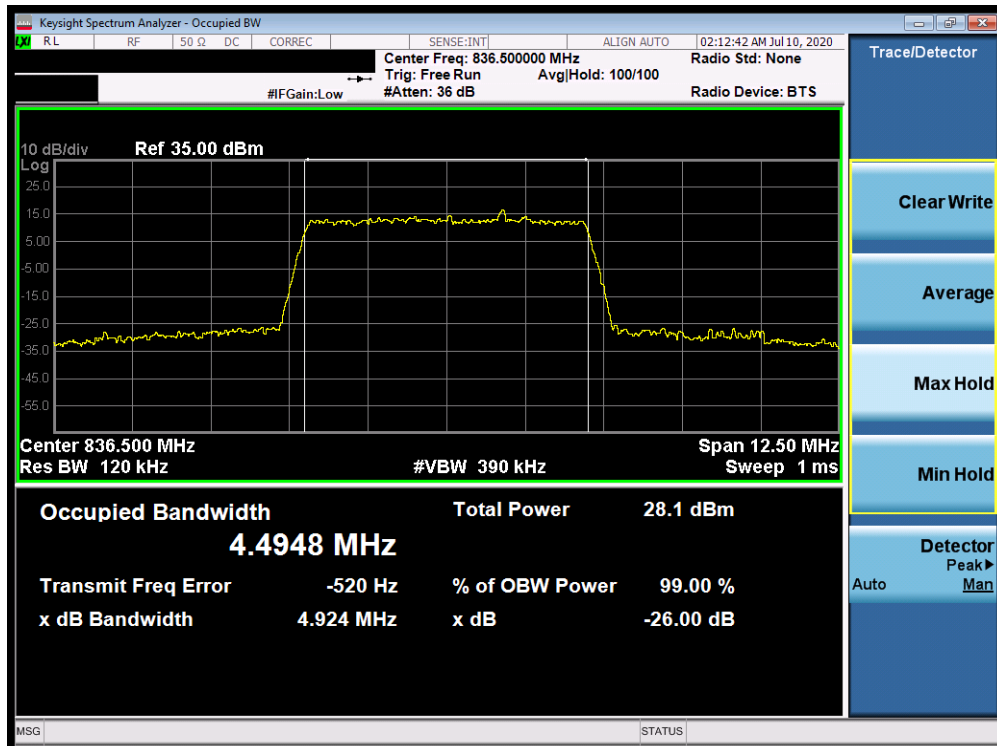


Plot 7-70. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 52 of 466

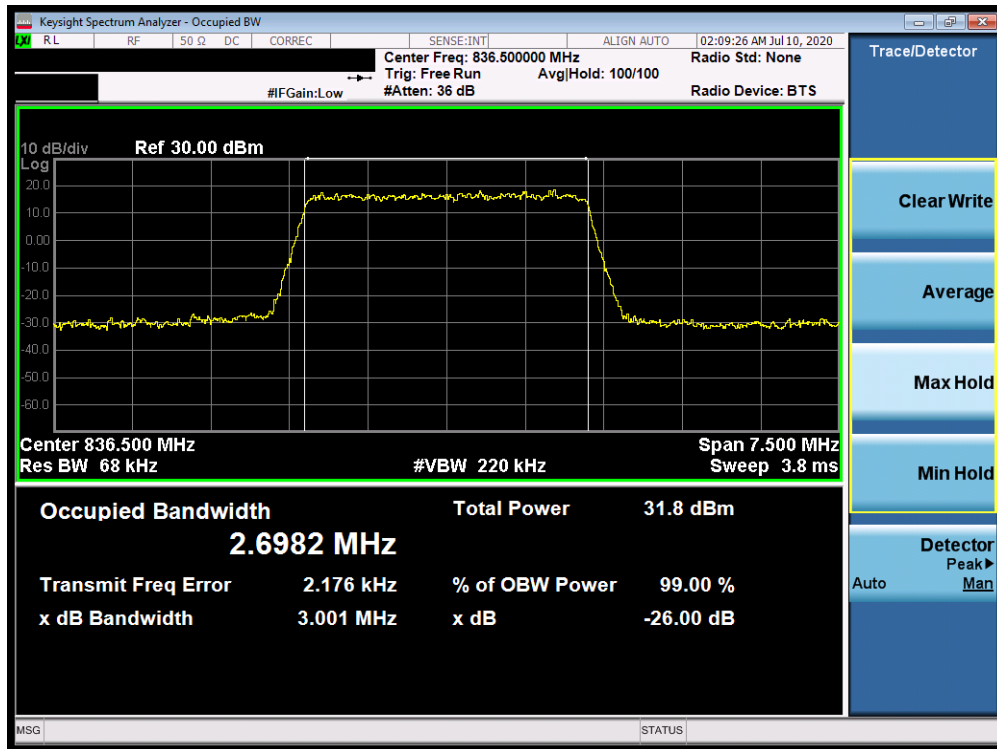


Plot 7-71. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 64-QAM - Full RB Configuration)

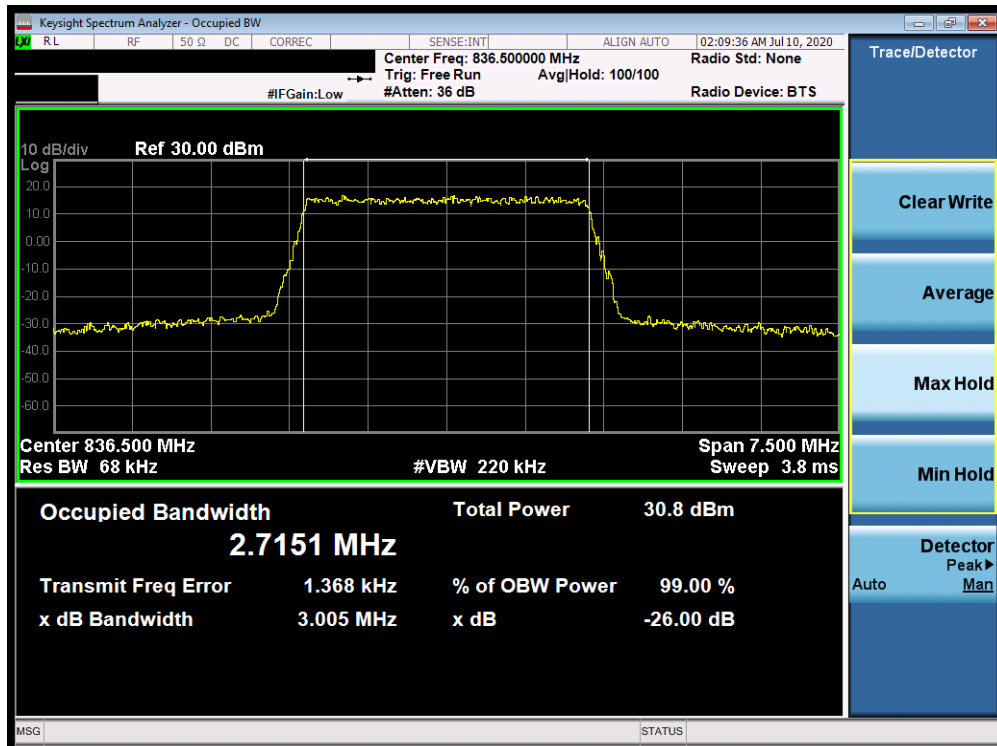


Plot 7-72. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 53 of 466

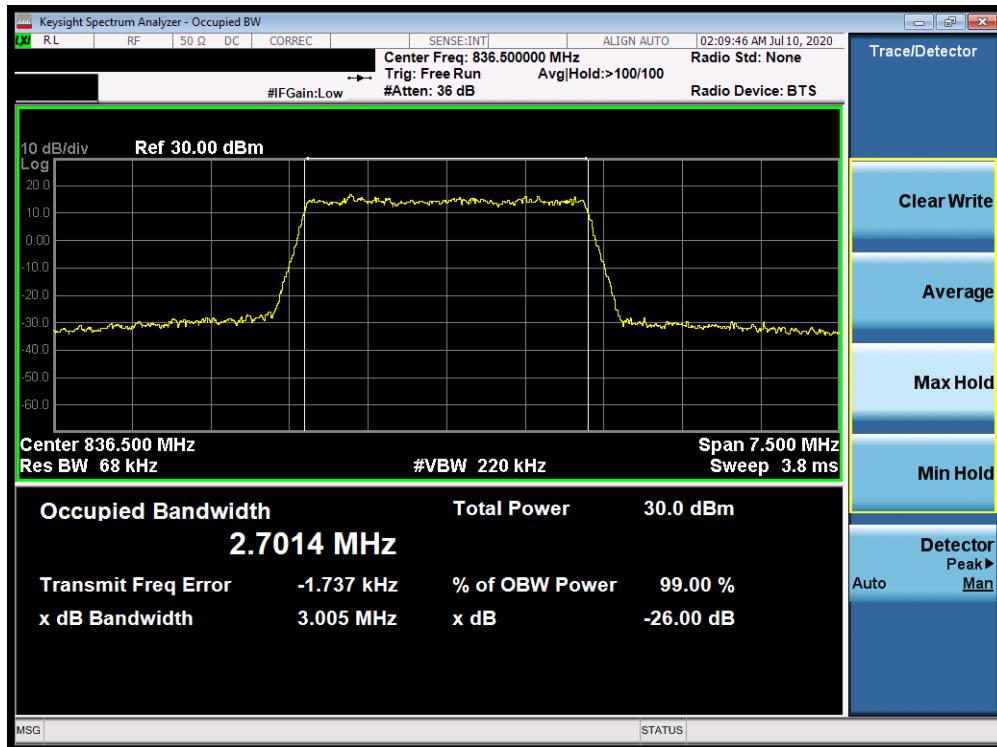


Plot 7-73. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

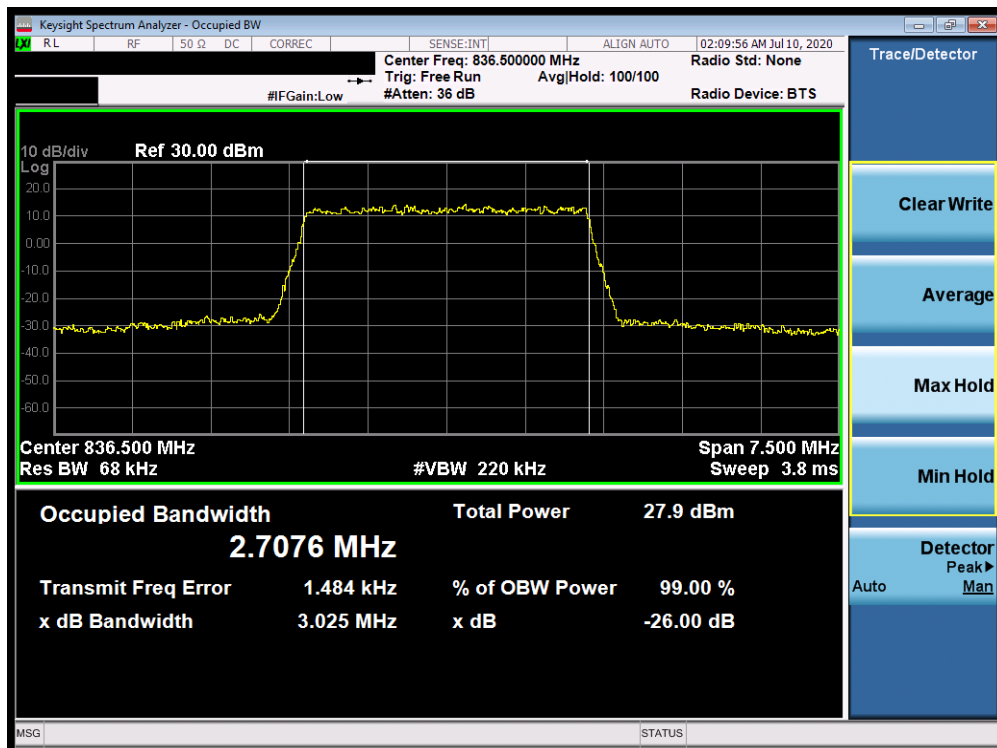


Plot 7-74. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 54 of 466

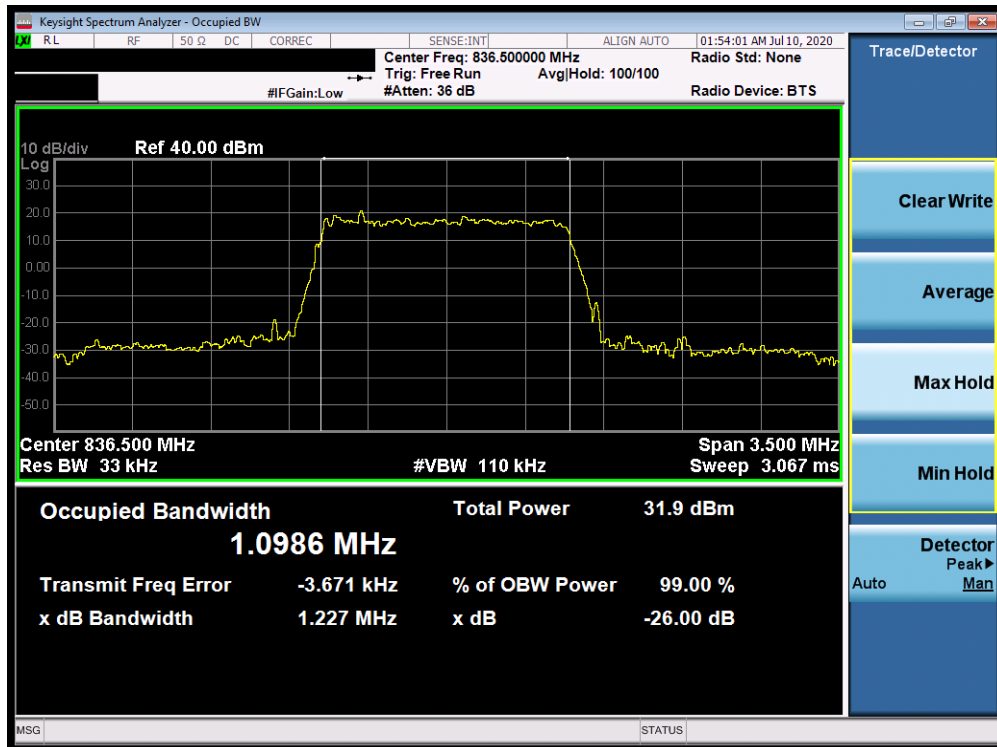


Plot 7-75. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 64-QAM - Full RB Configuration)

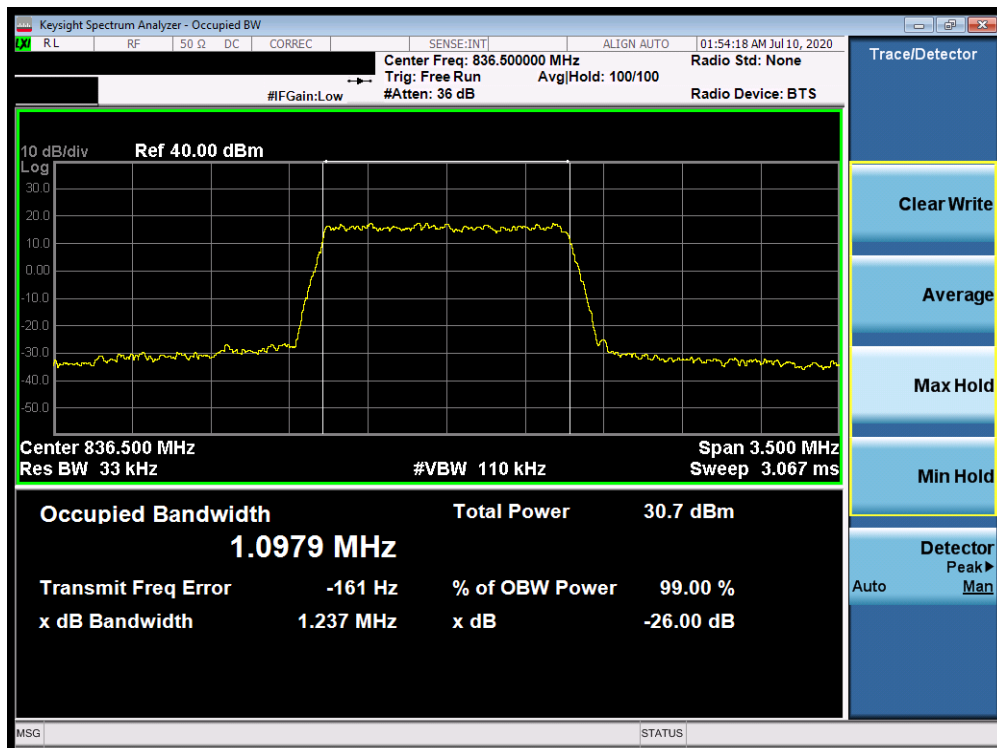


Plot 7-76. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 55 of 466

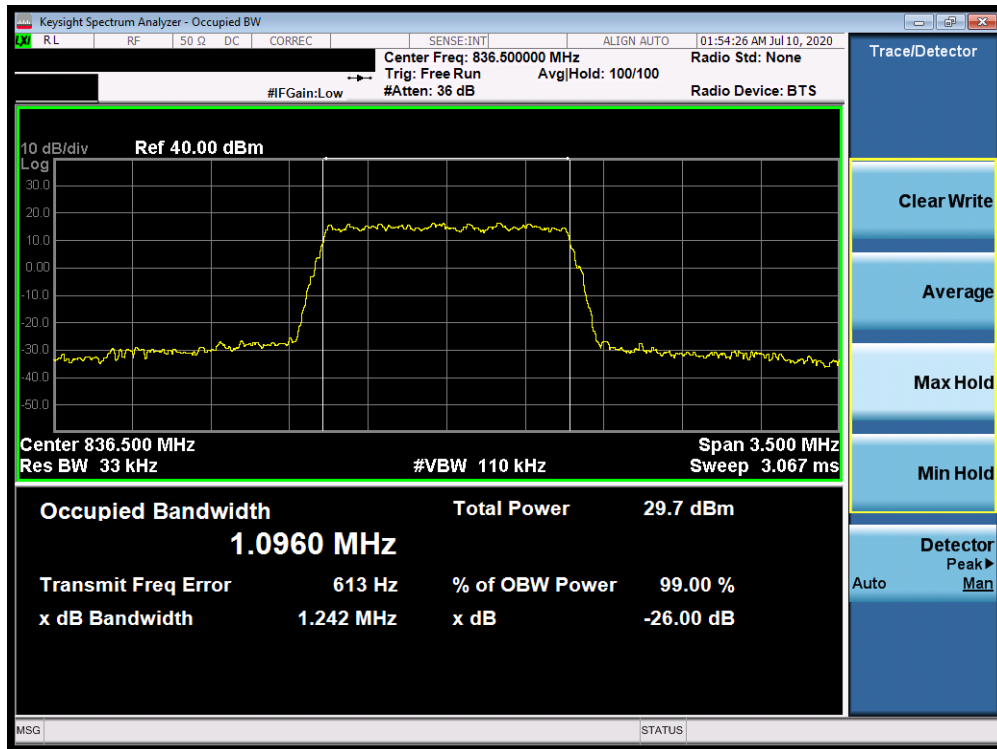


Plot 7-77. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)

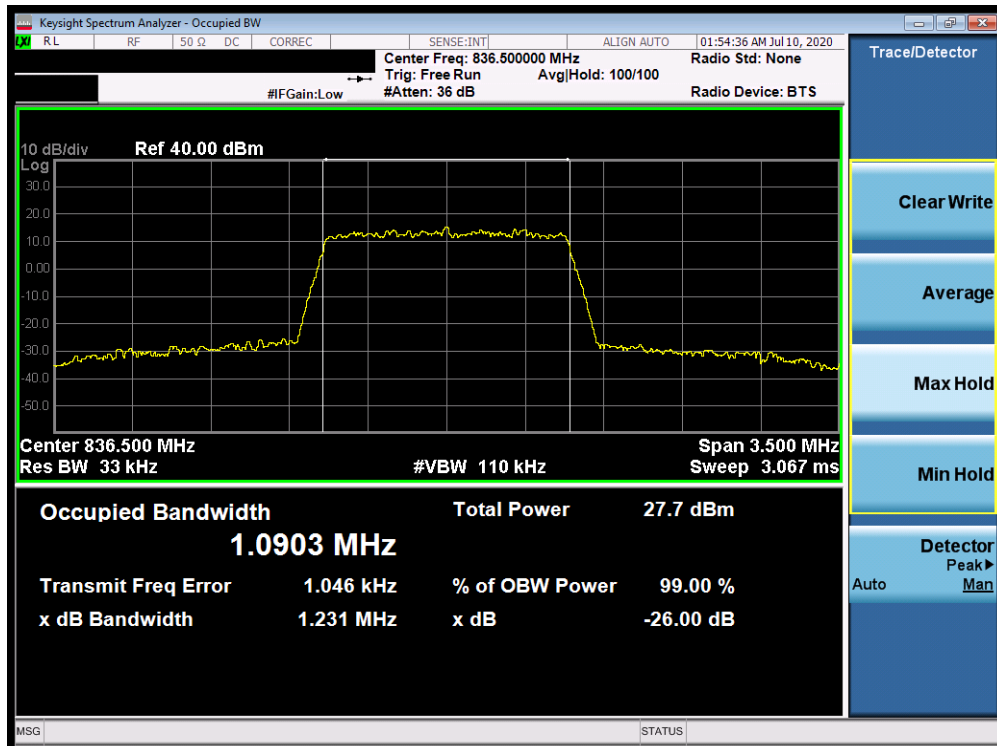


Plot 7-78. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 56 of 466



Plot 7-79. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 64-QAM - Full RB Configuration)



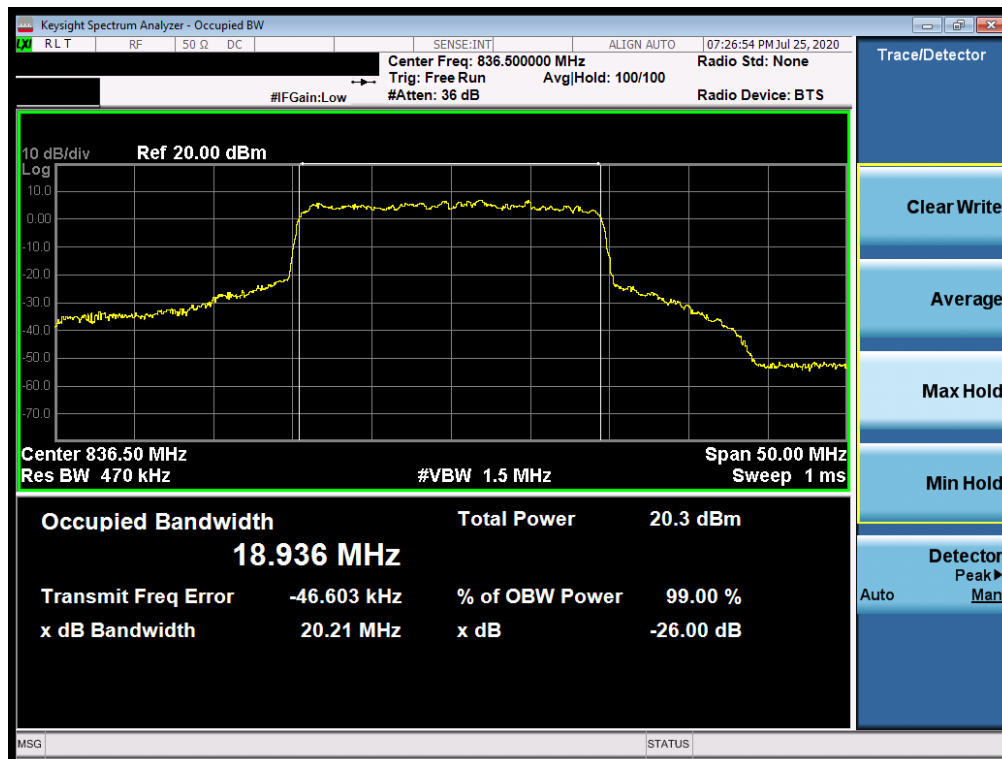
Plot 7-80. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 57 of 466

NR Band n5



Plot 7-81. Occupied Bandwidth Plot (NR Band n5 - 20.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-82. Occupied Bandwidth Plot (NR Band n5 - 20.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 58 of 466



Plot 7-83. Occupied Bandwidth Plot (NR Band n5 - 20.0MHz CP-OFDM 16QAM - Full RB)

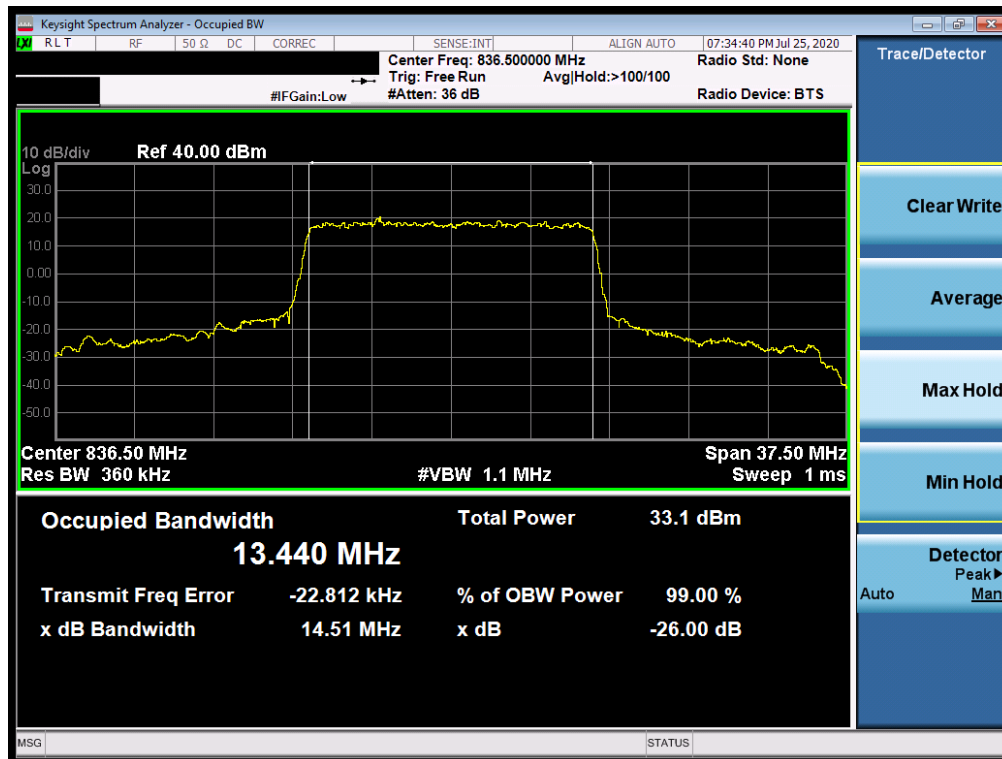


Plot 7-84. Occupied Bandwidth Plot (NR Band n5 - 20.0MHz CP-OFDM 64QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 59 of 466



Plot 7-85. Occupied Bandwidth Plot (NR Band n5 - 20.0MHz CP-OFDM 256QAM - Full RB)

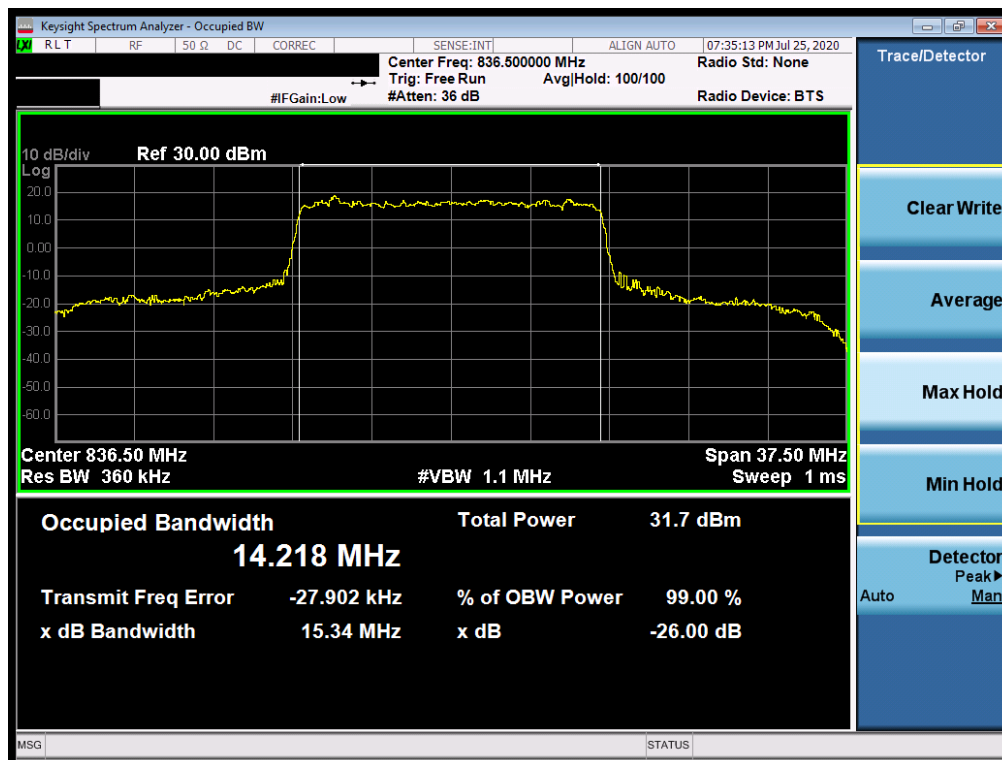


Plot 7-86. Occupied Bandwidth Plot (NR Band n5 - 15.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 60 of 466



Plot 7-87. Occupied Bandwidth Plot (NR Band n5 - 15.0MHz CP-OFDM QPSK - Full RB)



Plot 7-88. Occupied Bandwidth Plot (NR Band n5 - 15.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMF916U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005200087-03.A3L	Test Dates: 6/11 - 8/19/2020	EUT Type: Portable Handset		Page 61 of 466