



## MEASUREMENT REPORT FCC Part 27

**Applicant Name:**  
 Samsung Electronics Co., Ltd.  
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 Yeongtong-gu, Suwon-si  
 Gyeonggi-do, 16677, Korea

**Date of Testing:**  
 09/15/2020 – 12/05/2020  
**Test Site/Location:**  
 PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
 1M2009140143-20-R1.A3L

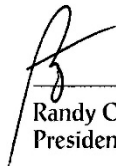
<b>FCC ID:</b>	<b>A3LSMG996U</b>
<b>APPLICANT:</b>	<b>Samsung Electronics Co., Ltd.</b>

**Application Type:** Certification  
**Model:** SM-G996U  
**Additional Model(s):** SM-G996U1  
**EUT Type:** Portable Handset  
**FCC Classification:** PCS Licensed Transmitter Held to Ear (PCE)  
**FCC Rule Part:** 27  
**Test Procedure(s):** ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04



Note: This revised Test Report (S/N: 1M2009140143-20-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

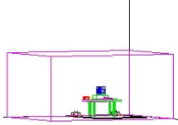


<b>FCC ID:</b> A3LSMG996U		<b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M2009140143-20-R1.A3L	<b>Test Dates:</b> 09/15/2020 – 12/05/2020	<b>EUT Type:</b> Portable Handset		Page 1 of 332

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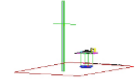
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		ERP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
LTE Band 12	10 MHz	QPSK	704.0 - 711.0	0.107	20.27	0.065	18.12	9M00G7D
		16QAM	704.0 - 711.0	0.094	19.75	0.058	17.60	9M03W7D
		64QAM	704.0 - 711.0	0.064	18.04	0.039	15.89	8M98W7D
		256QAM	704.0 - 711.0	0.035	15.41	0.021	13.26	8M99W7D
	5 MHz	QPSK	701.5 - 713.5	0.110	20.43	0.067	18.28	4M55G7D
		16QAM	701.5 - 713.5	0.107	20.31	0.066	18.16	4M51W7D
		64QAM	701.5 - 713.5	0.069	18.40	0.042	16.25	4M53W7D
		256QAM	701.5 - 713.5	0.037	15.65	0.022	13.50	4M52W7D
	3 MHz	QPSK	700.5 - 714.5	0.108	20.33	0.066	18.18	2M72G7D
		16QAM	700.5 - 714.5	0.095	19.76	0.058	17.61	2M70W7D
		64QAM	700.5 - 714.5	0.065	18.10	0.039	15.95	2M71W7D
		256QAM	700.5 - 714.5	0.088	19.46	0.054	13.17	2M71W7D
	1.4 MHz	QPSK	699.7 - 715.3	0.105	20.23	0.064	18.08	1M10G7D
		16QAM	699.7 - 715.3	0.093	19.67	0.057	17.52	1M11W7D
		64QAM	699.7 - 715.3	0.064	18.03	0.039	15.88	1M09W7D
		256QAM	699.7 - 715.3	0.033	15.24	0.020	13.09	1M10W7D
LTE Band 13	10 MHz	QPSK	782.0	0.130	21.15	0.079	19.00	8M99G7D
		16QAM	782.0	0.119	20.76	0.073	18.61	8M96W7D
		64QAM	782.0	0.087	19.37	0.053	17.22	8M96W7D
		256QAM	782.0	0.041	16.16	0.025	14.01	8M98W7D
	5 MHz	QPSK	779.5 - 784.5	0.135	21.31	0.082	19.16	4M55G7D
		16QAM	779.5 - 784.5	0.121	20.82	0.074	18.67	4M52W7D
		64QAM	779.5 - 784.5	0.093	19.66	0.056	17.51	4M51W7D
		256QAM	779.5 - 784.5	0.047	16.75	0.029	14.60	4M52W7D
LTE Band 71	20 MHz	QPSK	673.0 - 688.0	0.060	17.75	0.036	15.60	18M0G7D
		16QAM	673.0 - 688.0	0.051	17.07	0.031	14.92	18M0W7D
		64QAM	673.0 - 688.0	0.034	15.28	0.021	13.13	17M9W7D
		256QAM	673.0 - 688.0	0.020	13.01	0.012	10.86	17M9W7D
	15 MHz	QPSK	670.5 - 690.5	0.061	17.83	0.037	15.68	13M5G7D
		16QAM	670.5 - 690.5	0.052	17.19	0.032	15.04	13M5W7D
		64QAM	670.5 - 690.5	0.034	15.29	0.021	13.14	13M5W7D
		256QAM	670.5 - 690.5	0.020	13.06	0.012	10.91	13M5W7D
	10 MHz	QPSK	668.0 - 693.0	0.059	17.74	0.036	15.59	9M03G7D
		16QAM	668.0 - 693.0	0.052	17.14	0.032	14.99	9M03W7D
		64QAM	668.0 - 693.0	0.033	15.12	0.020	12.97	9M03W7D
		256QAM	668.0 - 693.0	0.020	12.91	0.012	10.76	9M03W7D
	5 MHz	QPSK	665.5 - 695.5	0.060	17.78	0.037	15.63	4M56G7D
		16QAM	665.5 - 695.5	0.051	17.04	0.031	14.89	4M56W7D
		64QAM	665.5 - 695.5	0.035	15.39	0.021	13.24	4M56W7D
		256QAM	665.5 - 695.5	0.019	12.78	0.012	10.63	4M56W7D

**Overview Table (<1GHz Bands)**

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Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset	Page 3 of 332	



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		ERP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
NR Band n71	20 MHz	π/2 BPSK	673.0 - 688.0	0.061	17.86	0.037	15.71	18M0G7D
		QPSK	673.0 - 688.0	0.059	17.71	0.036	15.56	19M1G7D
		16QAM	673.0 - 688.0	0.045	16.54	0.027	14.39	19M0W7D
		64QAM	673.0 - 688.0	0.028	14.40	0.017	12.25	19M0W7D
		256QAM	673.0 - 688.0	0.019	12.72	0.011	10.57	19M0W7D
	15 MHz	π/2 BPSK	670.5 - 690.5	0.061	17.89	0.037	15.74	13M5G7D
		QPSK	670.5 - 690.5	0.059	17.74	0.036	15.59	14M2G7D
		16QAM	670.5 - 690.5	0.046	16.67	0.028	14.52	14M2W7D
		64QAM	670.5 - 690.5	0.033	15.17	0.020	13.02	14M2W7D
		256QAM	670.5 - 690.5	0.018	12.55	0.011	10.40	14M2W7D
	10 MHz	π/2 BPSK	668.0 - 693.0	0.060	17.78	0.037	15.63	9M00G7D
		QPSK	668.0 - 693.0	0.059	17.70	0.036	15.55	9M34G7D
		16QAM	668.0 - 693.0	0.049	16.90	0.030	14.75	9M31W7D
		64QAM	668.0 - 693.0	0.030	14.80	0.018	12.65	9M37W7D
		256QAM	668.0 - 693.0	0.018	12.55	0.011	10.40	9M34W7D
	5 MHz	π/2 BPSK	665.5 - 695.5	0.062	17.93	0.038	15.78	4M51G7D
		QPSK	665.5 - 695.5	0.059	17.69	0.036	15.54	4M49G7D
		16QAM	665.5 - 695.5	0.051	17.05	0.031	14.90	4M49W7D
		64QAM	665.5 - 695.5	0.033	15.20	0.020	13.05	4M51W7D
		256QAM	665.5 - 695.5	0.018	12.55	0.011	10.40	4M48W7D
NR Band n12	15 MHz	π/2 BPSK	706.5 - 708.5	0.108	20.32	0.066	18.17	13M5G7D
		QPSK	706.5 - 708.5	0.090	19.54	0.055	17.39	14M1G7D
		16QAM	706.5 - 708.5	0.069	18.39	0.042	16.24	14M1W7D
		64QAM	706.5 - 708.5	0.046	16.63	0.028	14.48	14M1W7D
		256QAM	706.5 - 708.5	0.029	14.66	0.018	12.51	14M1W7D
	10 MHz	π/2 BPSK	704.0 - 711.0	0.096	19.82	0.058	17.67	8M95G7D
		QPSK	704.0 - 711.0	0.088	19.43	0.053	17.28	9M32G7D
		16QAM	704.0 - 711.0	0.070	18.45	0.043	16.30	9M33W7D
		64QAM	704.0 - 711.0	0.037	15.63	0.022	13.48	9M33W7D
		256QAM	704.0 - 711.0	0.032	15.04	0.019	12.89	9M32W7D
	5 MHz	π/2 BPSK	701.5 - 713.5	0.091	19.60	0.056	17.45	4M47G7D
		QPSK	701.5 - 713.5	0.085	19.30	0.052	17.15	4M47G7D
		16QAM	701.5 - 713.5	0.065	18.16	0.040	16.01	4M48W7D
		64QAM	701.5 - 713.5	0.036	15.57	0.022	13.42	4M47W7D
		256QAM	701.5 - 713.5	0.028	14.54	0.017	12.39	4M48W7D

Overview Table (<1GHz Bands)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
WCDMA1700	N/A	Spread Spectrum	1712.4 - 1752.6	0.291	24.64	4M15F9W
LTE Band 66/4	20 MHz	QPSK	1720.0 - 1770.0	0.257	24.09	18M0G7D
		16QAM	1720.0 - 1770.0	0.210	23.22	18M0W7D
		64QAM	1720.0 - 1770.0	0.162	22.09	18M0W7D
		256QAM	1720.0 - 1770.0	0.085	19.28	18M0W7D
	15 MHz	QPSK	1717.5 - 1772.5	0.258	24.12	13M5G7D
		16QAM	1717.5 - 1772.5	0.218	23.38	13M5W7D
		64QAM	1717.5 - 1772.5	0.163	22.11	13M5W7D
		256QAM	1717.5 - 1772.5	0.112	20.48	13M4W7D
	10 MHz	QPSK	1715.0 - 1775.0	0.248	23.95	9M01G7D
		16QAM	1715.0 - 1775.0	0.220	23.42	9M00W7D
		64QAM	1715.0 - 1775.0	0.145	21.61	9M00W7D
		256QAM	1715.0 - 1775.0	0.076	18.81	9M00W7D
	5 MHz	QPSK	1712.5 - 1777.5	0.258	24.11	4M54G7D
		16QAM	1712.5 - 1777.5	0.219	23.40	4M54W7D
		64QAM	1712.5 - 1777.5	0.158	21.98	4M55W7D
		256QAM	1712.5 - 1777.5	0.088	19.42	4M53W7D
	3 MHz	QPSK	1711.5 - 1778.5	0.254	24.05	2M72G7D
		16QAM	1711.5 - 1778.5	0.226	23.53	2M71W7D
		64QAM	1711.5 - 1778.5	0.149	21.74	2M71W7D
		256QAM	1711.5 - 1778.5	0.083	19.17	2M71W7D
	1.4 MHz	QPSK	1710.7 - 1779.3	0.254	24.04	1M10G7D
		16QAM	1710.7 - 1779.3	0.202	23.06	1M11W7D
		64QAM	1710.7 - 1779.3	0.143	21.55	1M09W7D
		256QAM	1710.7 - 1779.3	0.078	18.91	1M10W7D

Overview Table (>1GHz Bands)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator	
				Max. Power [W]	Max. Power [dBm]		
NR Band n66 AntA	40 MHz	$\pi/2$ BPSK	1730.0 - 1760.0	0.336	25.26	38M7G7D	
		QPSK	1730.0 - 1760.0	0.337	25.27	38M7G7D	
		16QAM	1730.0 - 1760.0	0.257	24.09	38M6W7D	
		64QAM	1730.0 - 1760.0	0.206	23.14	38M6W7D	
		256QAM	1730.0 - 1760.0	0.127	21.04	38M6W7D	
	30 MHz	$\pi/2$ BPSK	1725.0 - 1765.0	0.292	24.66	28M6G7D	
		QPSK	1725.0 - 1765.0	0.340	25.31	28M6G7D	
		16QAM	1725.0 - 1765.0	0.259	24.13	28M7W7D	
		64QAM	1725.0 - 1765.0	0.184	22.64	28M7W7D	
		256QAM	1725.0 - 1765.0	0.117	20.70	28M6W7D	
	20 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	0.260	24.16	17M9G7D	
		QPSK	1720.0 - 1770.0	0.311	24.92	18M0G7D	
		16QAM	1720.0 - 1770.0	0.230	23.62	18M0W7D	
		64QAM	1720.0 - 1770.0	0.182	22.61	18M0W7D	
		256QAM	1720.0 - 1770.0	0.109	20.38	17M9W7D	
	15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	0.277	24.42	13M5G7D	
		QPSK	1717.5 - 1772.5	0.317	25.01	14M2G7D	
		16QAM	1717.5 - 1772.5	0.237	23.75	14M2W7D	
		64QAM	1717.5 - 1772.5	0.181	22.57	14M2W7D	
		256QAM	1717.5 - 1772.5	0.115	20.60	14M2W7D	
	10 MHz	$\pi/2$ BPSK	1715.0 - 1775.0	0.274	24.38	8M65G7D	
		QPSK	1715.0 - 1775.0	0.313	24.96	8M64G7D	
		16QAM	1715.0 - 1775.0	0.240	23.81	8M65W7D	
		64QAM	1715.0 - 1775.0	0.191	22.81	8M63W7D	
		256QAM	1715.0 - 1775.0	0.112	20.49	8M63W7D	
	5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	0.280	24.47	4M51G7D	
		QPSK	1712.5 - 1777.5	0.316	25.00	4M53G7D	
		16QAM	1712.5 - 1777.5	0.241	23.82	4M50W7D	
		64QAM	1712.5 - 1777.5	0.189	22.77	4M51W7D	
		256QAM	1712.5 - 1777.5	0.117	20.68	4M50W7D	
	NR Band n66 Ant I	40 MHz	$\pi/2$ BPSK	1720.0 - 1770.0	0.201	23.03	38M8G7D
			QPSK	1720.0 - 1770.0	0.158	21.99	38M7G7D
16QAM			1720.0 - 1770.0	0.146	21.63	38M6W7D	
64QAM			1720.0 - 1770.0	0.104	20.19	38M7W7D	
256QAM			1720.0 - 1770.0	0.077	18.89	38M7W7D	
30 MHz		$\pi/2$ BPSK	1717.5 - 1772.5	0.270	24.31	28M6G7D	
		QPSK	1717.5 - 1772.5	0.272	24.34	28M5G7D	
		16QAM	1717.5 - 1772.5	0.211	23.25	28M6W7D	
		64QAM	1717.5 - 1772.5	0.146	21.63	28M6W7D	
		256QAM	1717.5 - 1772.5	0.094	19.72	28M7W7D	
20 MHz		$\pi/2$ BPSK	1715.0 - 1775.0	0.240	23.81	18M0G7D	
		QPSK	1715.0 - 1775.0	0.248	23.95	19M0G7D	
		16QAM	1715.0 - 1775.0	0.187	22.73	19M0W7D	
		64QAM	1715.0 - 1775.0	0.145	21.60	19M0W7D	
		256QAM	1715.0 - 1775.0	0.087	19.40	19M1W7D	
15 MHz		$\pi/2$ BPSK	1712.5 - 1777.5	0.255	24.07	13M5G7D	
		QPSK	1712.5 - 1777.5	0.253	24.03	14M2G7D	
		16QAM	1712.5 - 1777.5	0.193	22.86	14M2W7D	
		64QAM	1712.5 - 1777.5	0.143	21.56	14M3W7D	
		256QAM	1712.5 - 1777.5	0.091	19.61	14M2W7D	
10 MHz		$\pi/2$ BPSK	1730.0 - 1730.0	0.253	24.03	8M96G7D	
		QPSK	1730.0 - 1730.0	0.250	23.98	9M33G7D	
		16QAM	1730.0 - 1730.0	0.196	22.92	9M33W7D	
		64QAM	1730.0 - 1730.0	0.151	21.80	9M32W7D	
		256QAM	1730.0 - 1730.0	0.089	19.51	9M36W7D	
5 MHz		$\pi/2$ BPSK	1745.0 - 1720.0	0.258	24.12	4M54G7D	
		QPSK	1745.0 - 1720.0	0.253	24.03	4M49G7D	
		16QAM	1745.0 - 1720.0	0.196	22.93	4M51W7D	
		64QAM	1745.0 - 1720.0	0.150	21.76	4M51W7D	
		256QAM	1745.0 - 1720.0	0.093	19.70	4M52W7D	

Overview Table (>1GHz Bands)

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Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 6 of 332

## 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 Engineering Laboratory, Inc. 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 Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 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 ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG996U**. 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.:** 0551M, 0564M, 0501M

### 2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EVDO Rev. 0/A (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1/FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer



### 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) Model: 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 Evaluation 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 wooden turntable 80cm above the ground plane and 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  $P_g \text{ [dBm]} - \text{cable loss [dB]}$ .

For fundamental radiated power measurements, the guidance of KDB 971168 D01 v03r01 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-E-2016.



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  $U_{\text{CISPR}}$  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
-	LTx3	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
-	LTx4	Licensed Transmitter Cable Set	7/9/2020	Annual	7/9/2021	LTx4
Agilent	N9020A	MXA Signal Analyzer	8/4/2020	Annual	8/4/2021	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/17/2020	Annual	7/17/2021	MY52350166
Agilent	E5515C	Wireless Communications Test Set	N/A			GB45360985
Anritsu	MT8820C	Radio Communication Analyzer	N/A			6201300731
Anritsu	MT8821C	Radio Communication Analyzer	N/A			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
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
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	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

**Table 5-1. Summary of Test Results**

**Notes:**

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
2. 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 2<sup>nd</sup> 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: A3LSMG996U  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 Mode(s): LTE/NR/ULCA

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
<b>CONDUCTED</b>	Occupied Bandwidth	2.1049	RSS-139(2.3)	N/A	PASS	Section 7.2
	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	RSS-139(6.6)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.3, 7.4
	Transmitter Conducted Output Power	2.1046	RSS-139(4.1)	N/A	PASS	See RF Exposure Report
	Frequency Stability	2.1055, 27.54	RSS-139(6.4)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
<b>RADIATED</b>	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 71)	27.50(b)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	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 (LTE Band 13)	27.50(c)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (WCDMA)	27.50(d)(4)	RSS-139(6.5)	< 1 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (CDMA)				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 Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	RSS-139(6.6)	< -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	RSS-139(6.6)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7

**Table 7-1. Summary of Test Results**



#### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section 7.0 were 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

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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 2G/3G Automation Version 4.2.

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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.

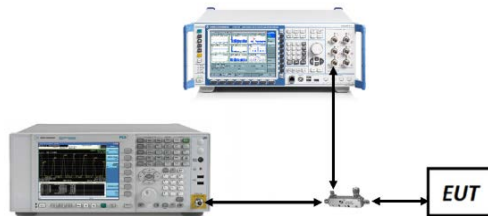




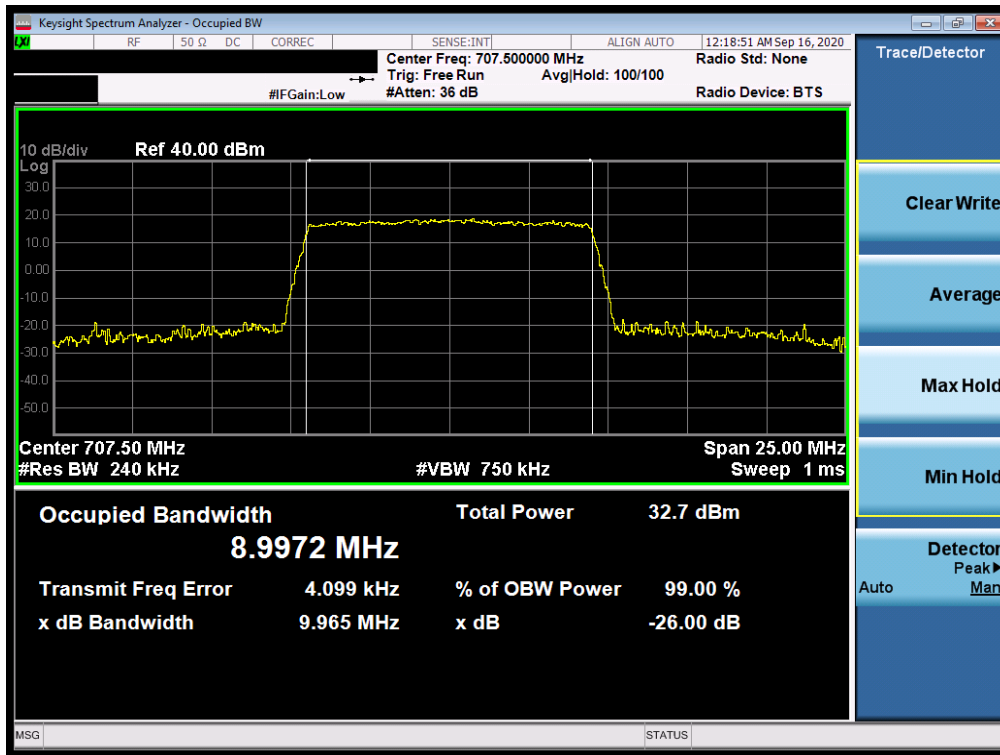
Figure 7-1. Test Instrument & Measurement Setup

### Test Notes

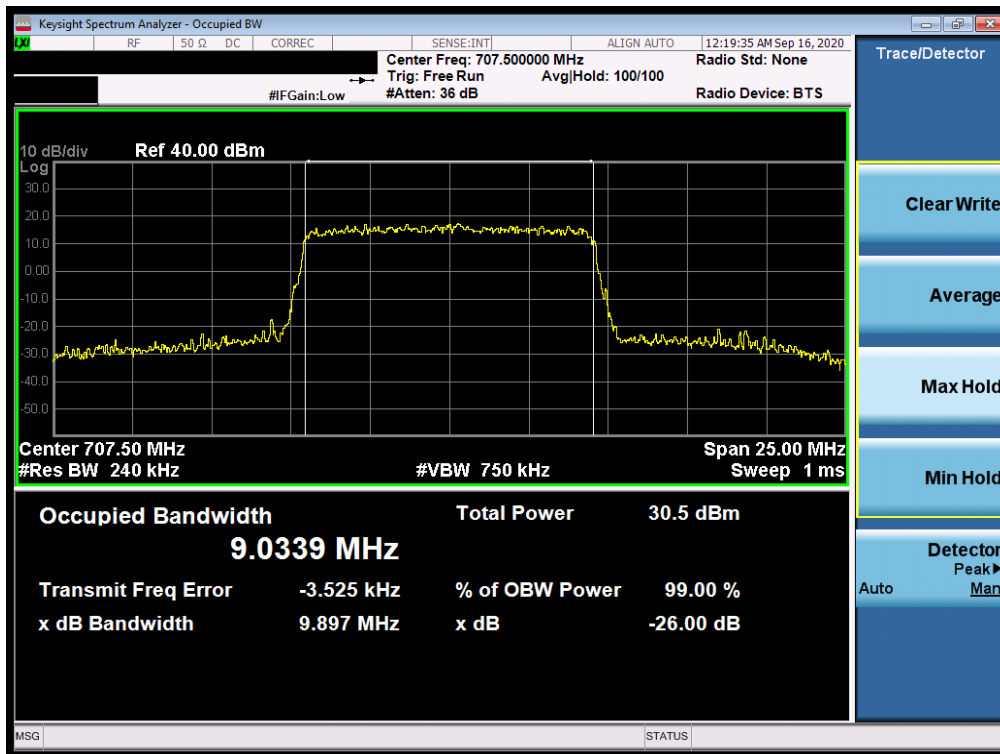
None.

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## LTE Band 12



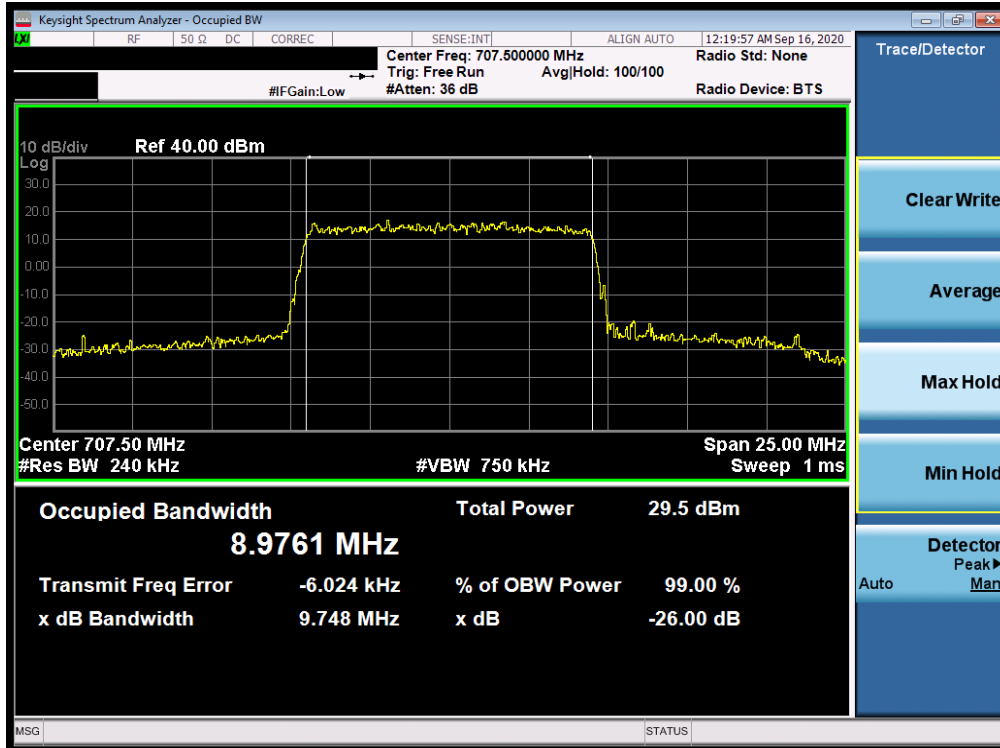
Plot 7-1. Occupied Bandwidth Plot (LTE Band 12 - 10MHz QPSK - Full RB Configuration)



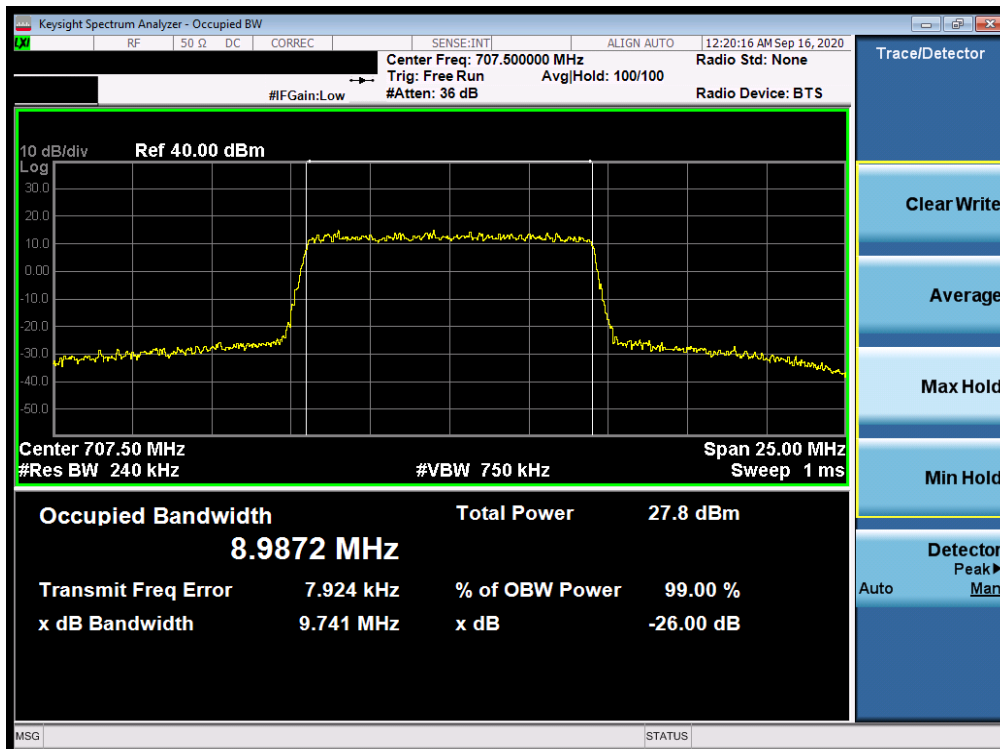
Plot 7-2. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 16-QAM - Full RB Configuration)

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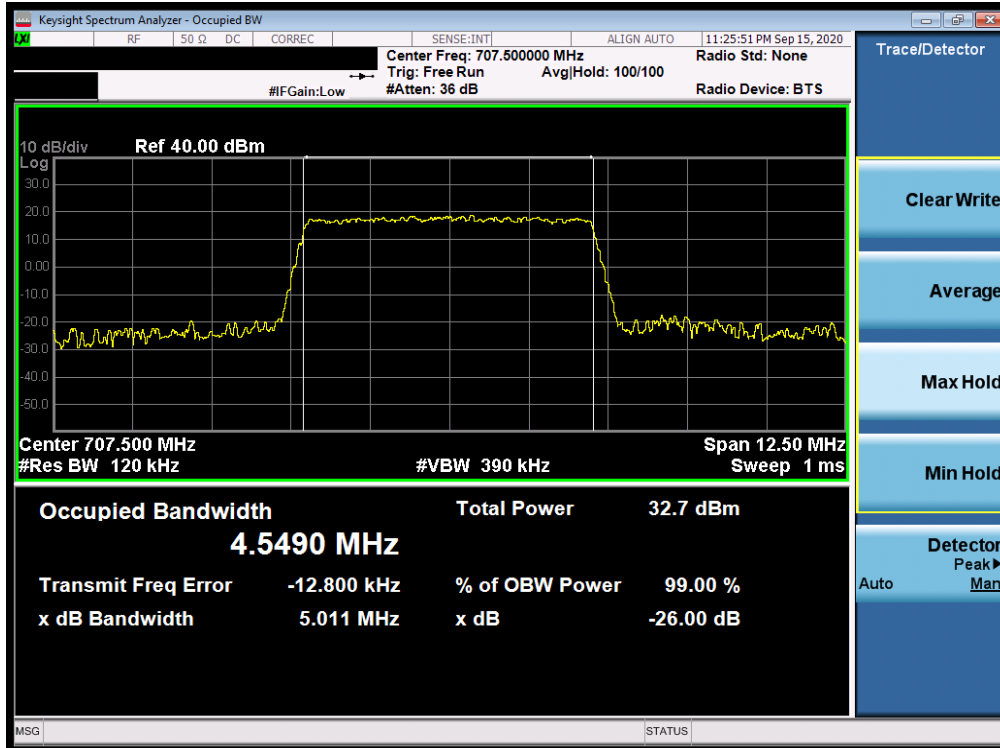


Plot 7-3. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 64-QAM - Full RB Configuration)

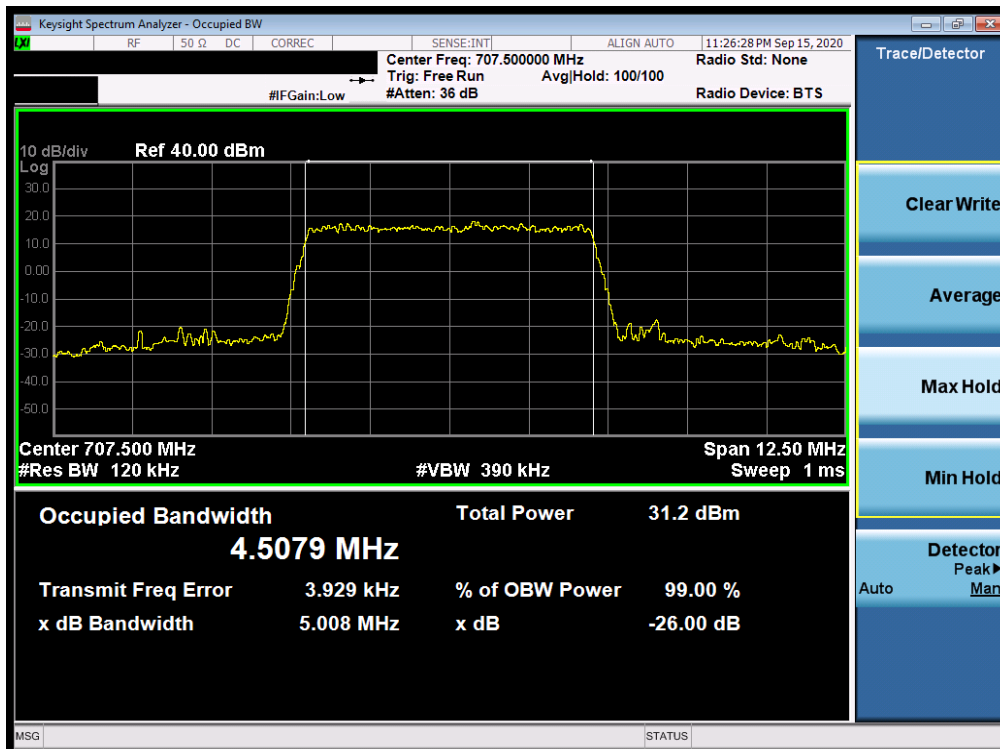


Plot 7-4. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 256-QAM - Full RB Configuration)

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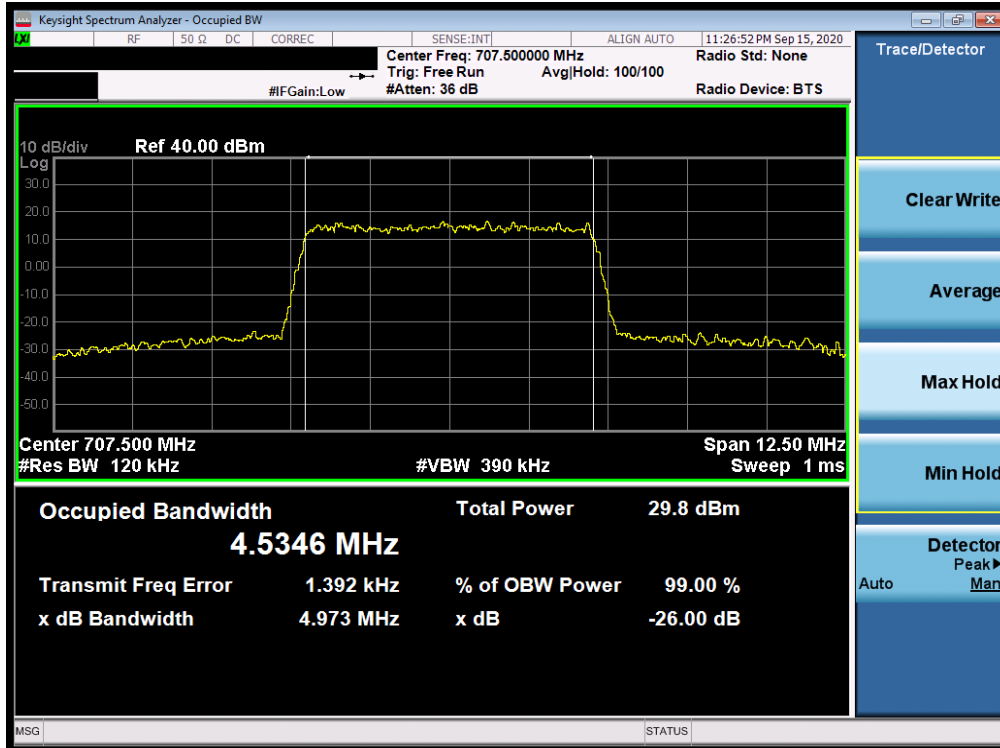


Plot 7-5. Occupied Bandwidth Plot (LTE Band 12 - 5MHz QPSK - Full RB Configuration)

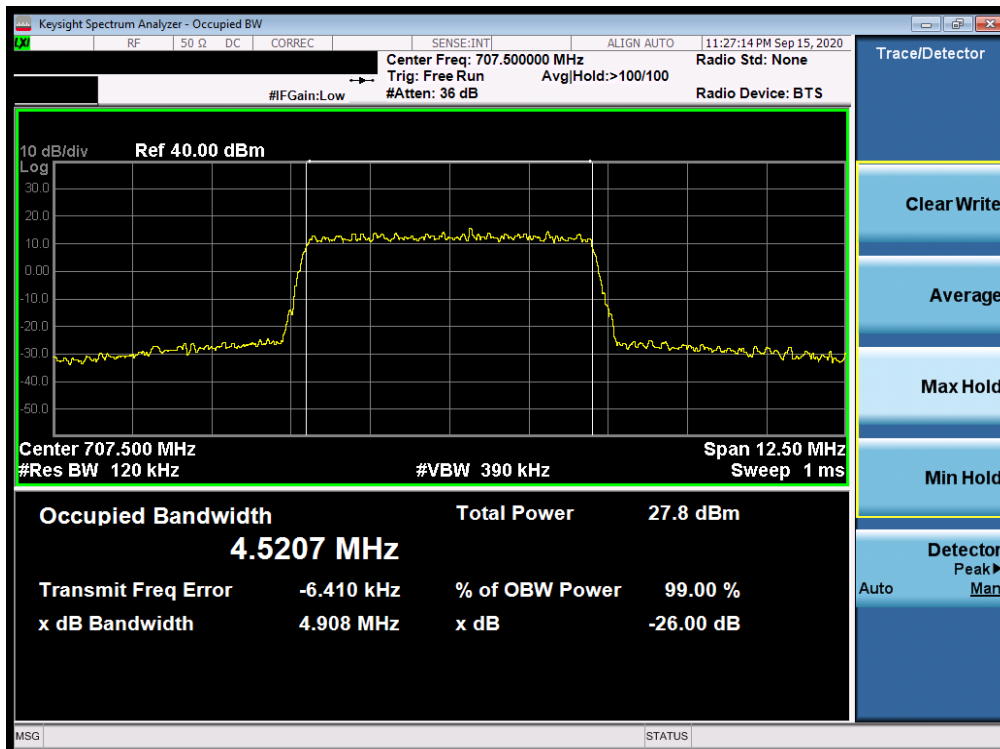


Plot 7-6. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 16-QAM - Full RB Configuration)



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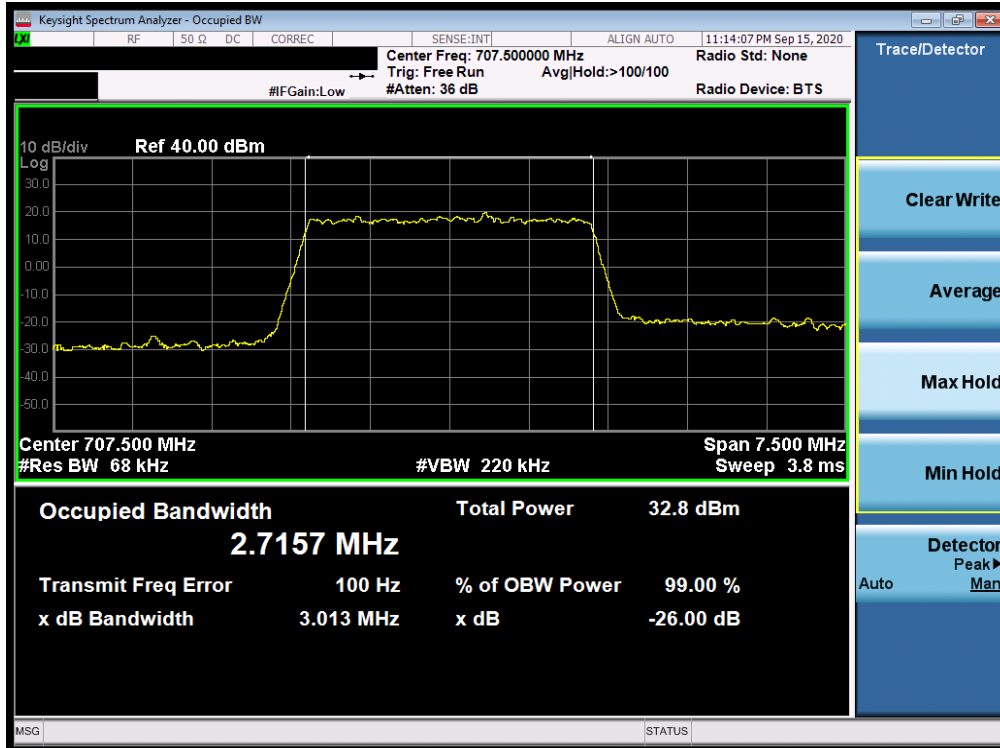


Plot 7-7. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 64-QAM - Full RB Configuration)

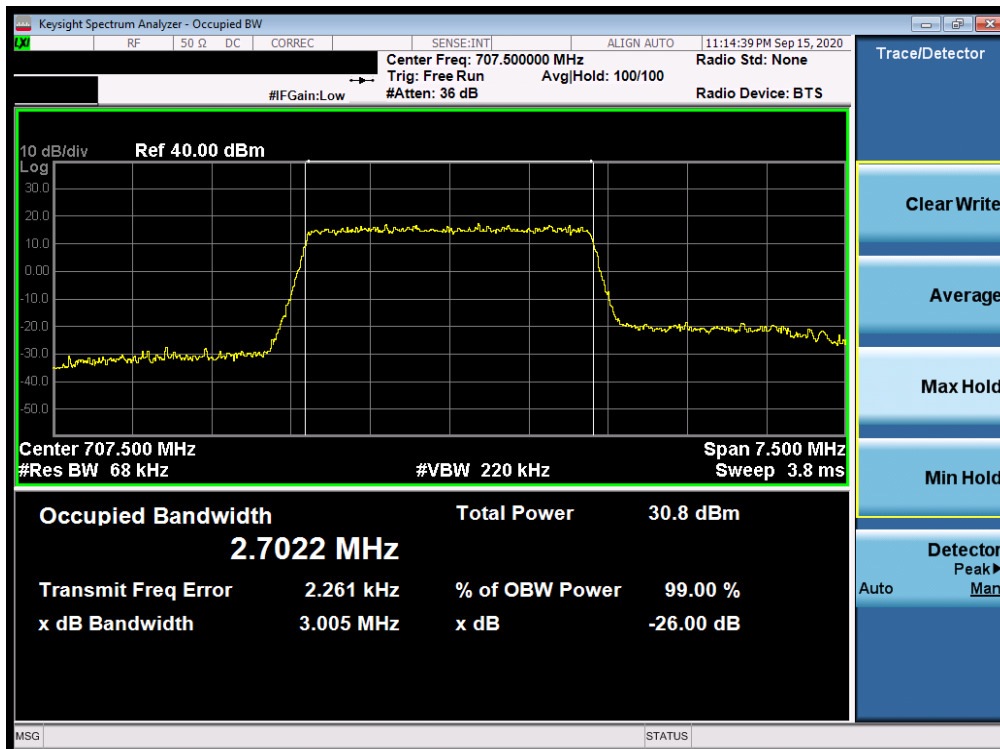


Plot 7-8. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 256-QAM - Full RB Configuration)



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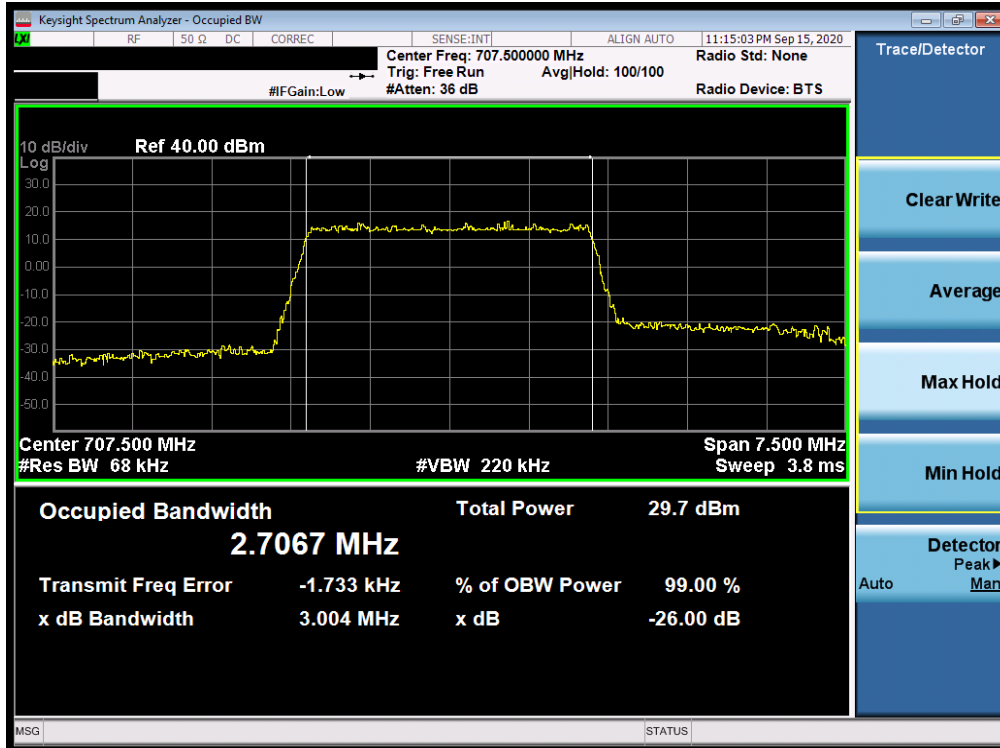


**Plot 7-9. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB Configuration)**

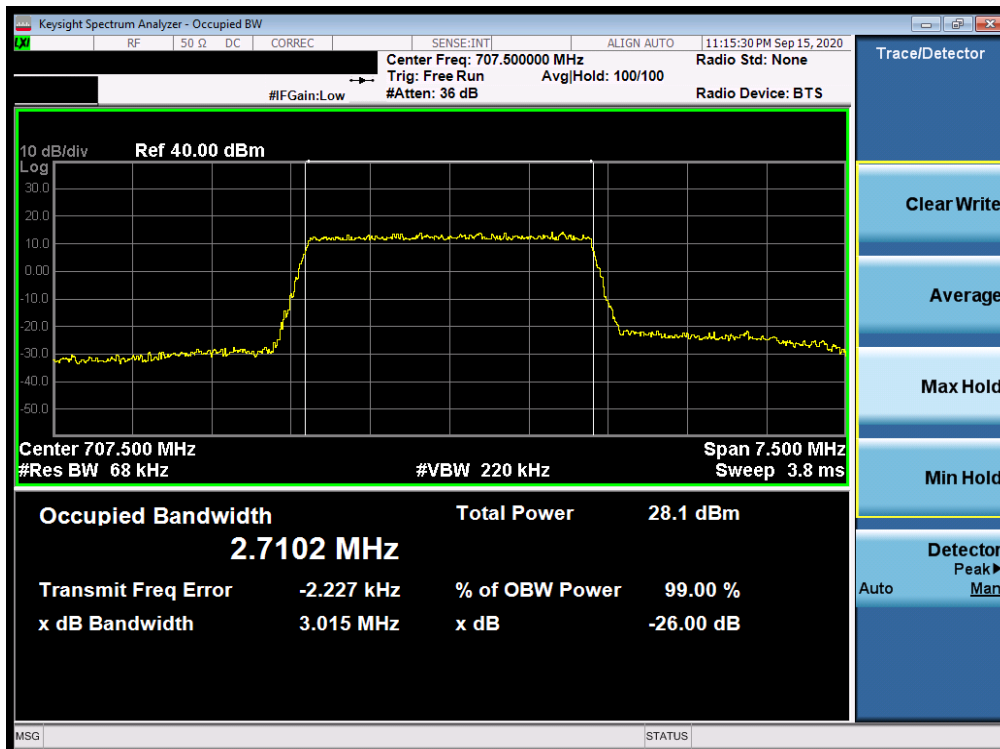


**Plot 7-10. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB Configuration)**

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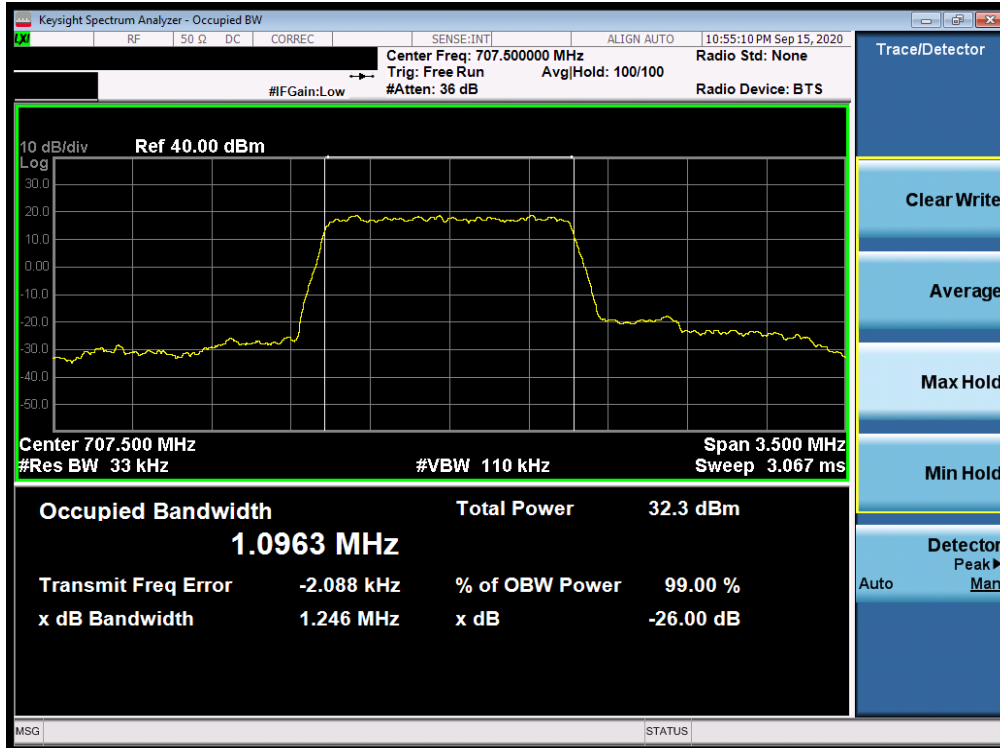


Plot 7-11. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 64-QAM - Full RB Configuration)

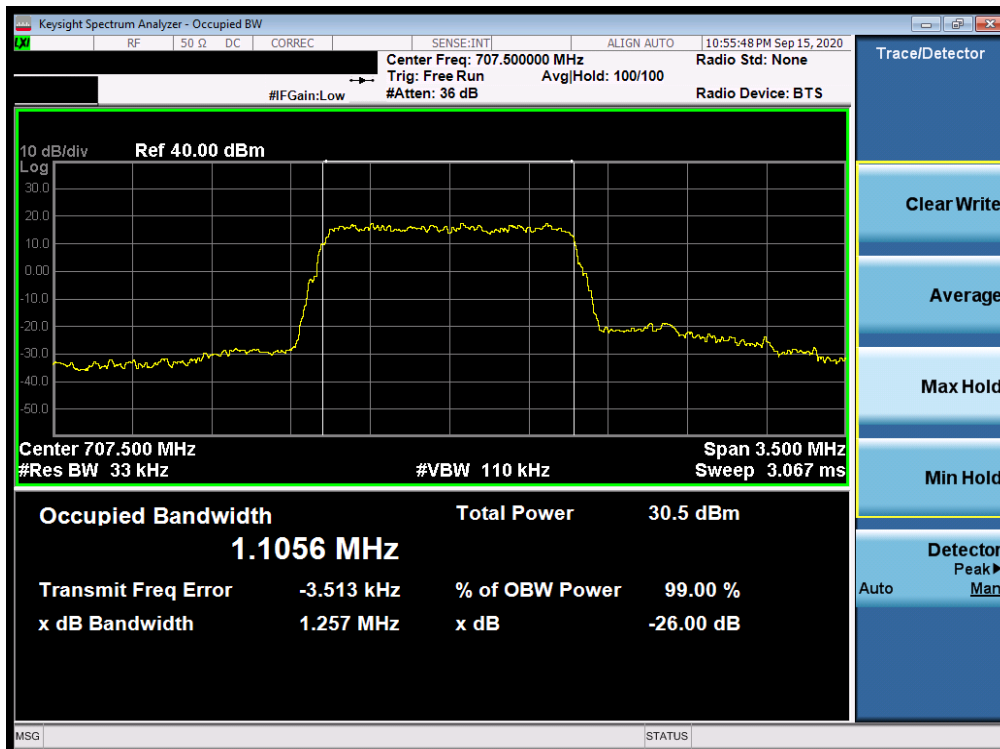


Plot 7-12. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 256-QAM - Full RB Configuration)

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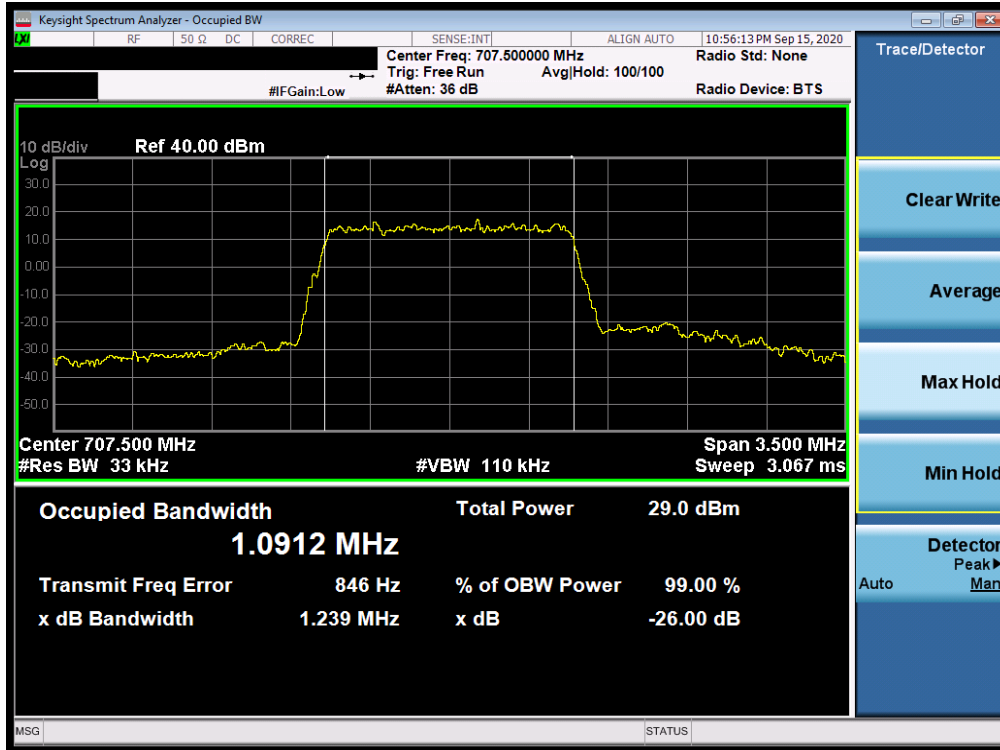


Plot 7-13. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB Configuration)

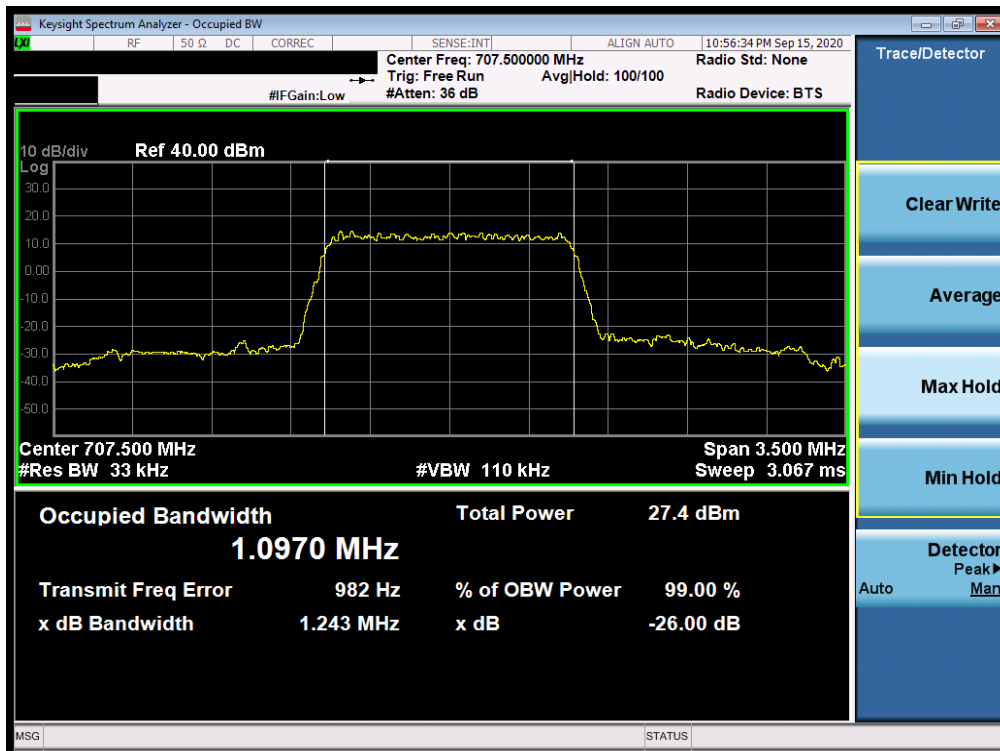


Plot 7-14. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
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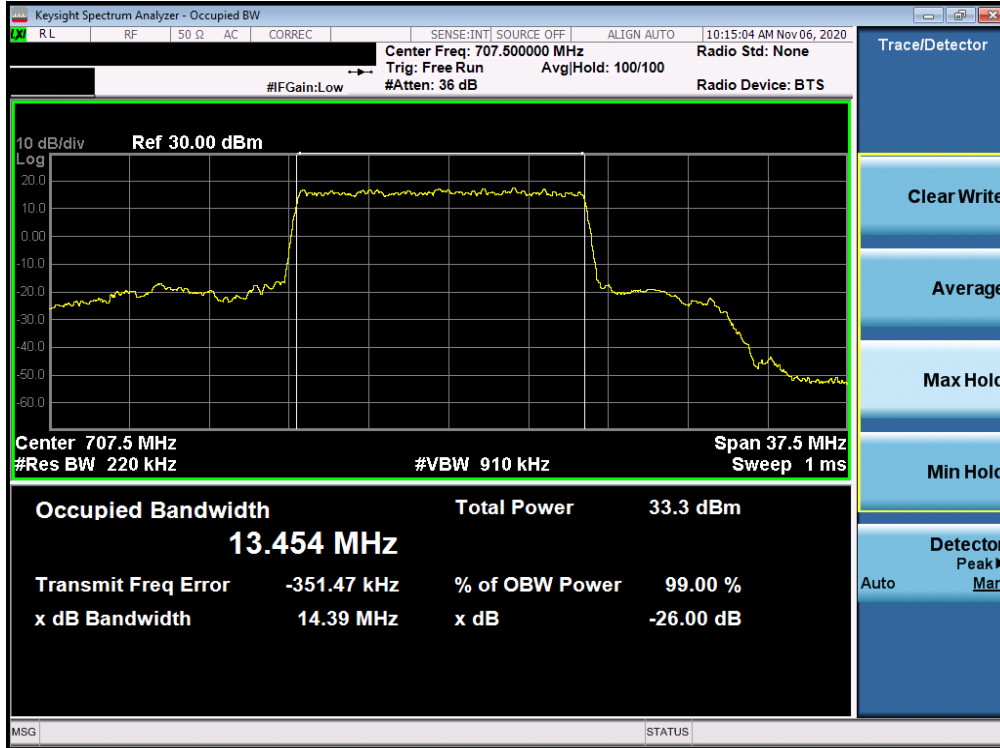
Plot 7-15. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 64-QAM - Full RB Configuration)



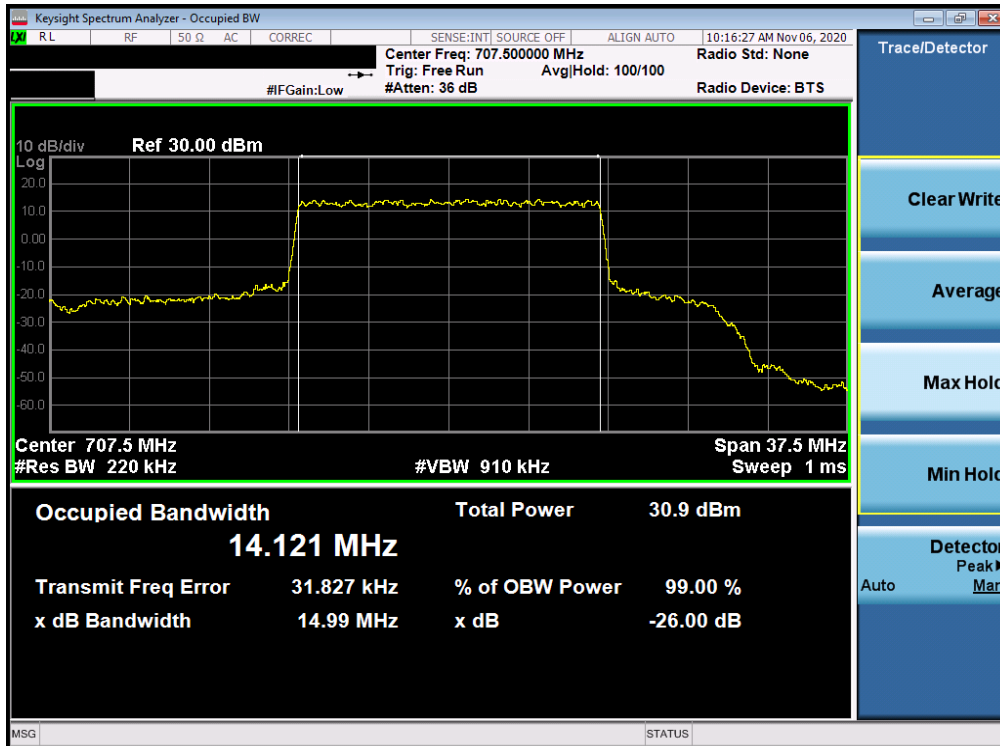
Plot 7-16. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 256-QAM - Full RB Configuration)

**NR Band n12**



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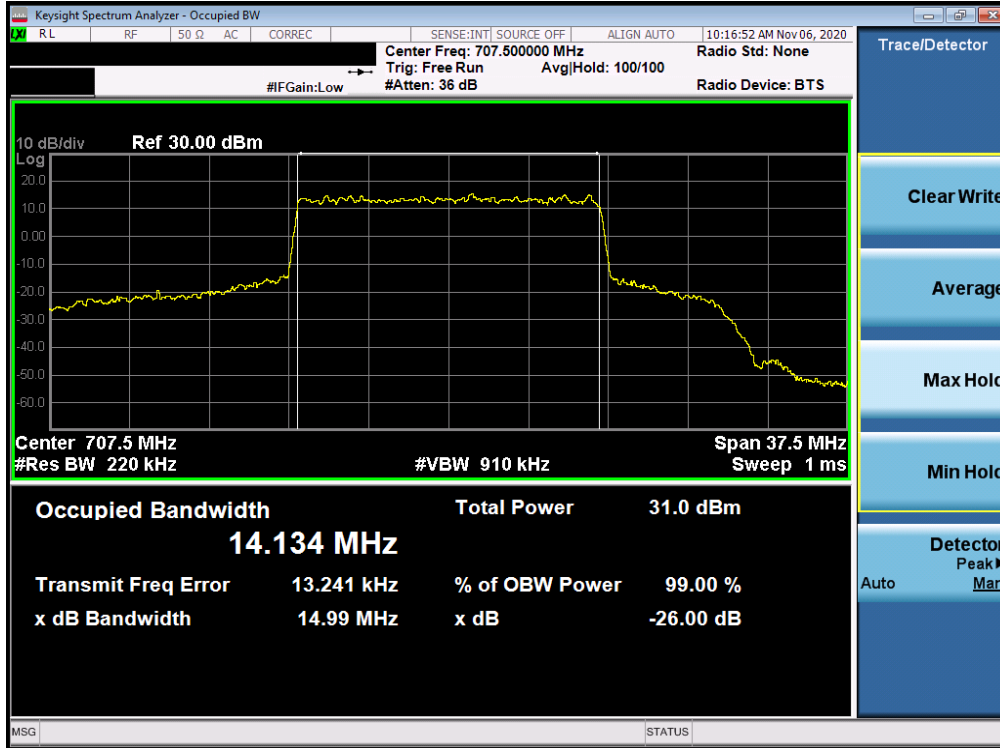
Plot 7-17. Occupied Bandwidth Plot (NR Band n12 - 15.0MHz DFT-s-OFDM BPSK - Full RB)



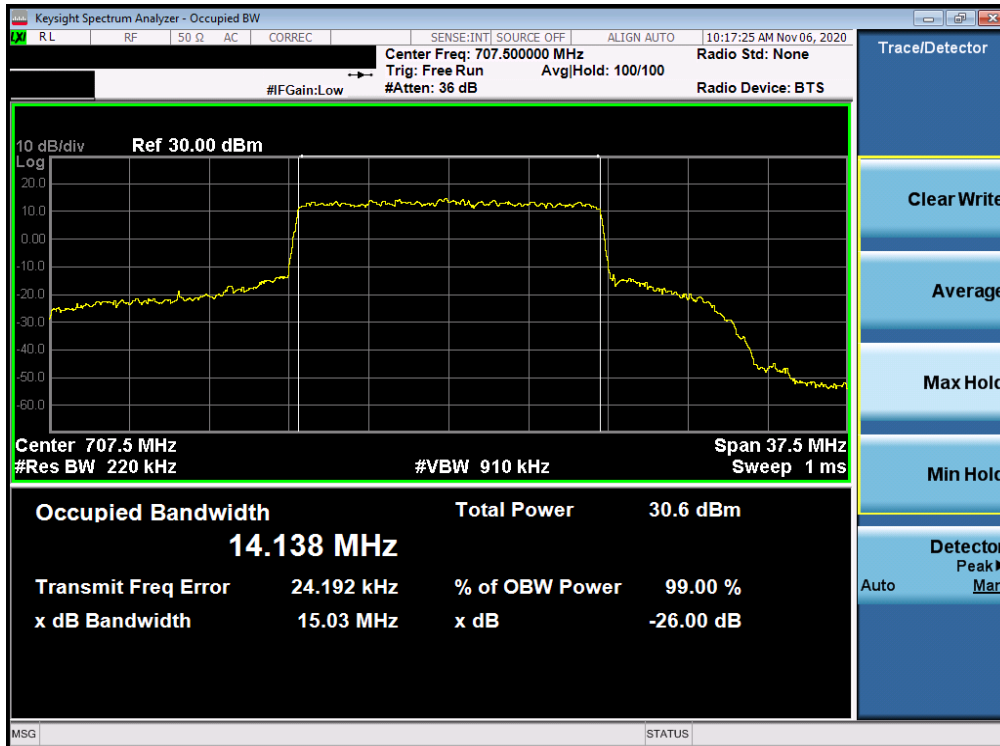
Plot 7-18. Occupied Bandwidth Plot (NR Band n12 - 15.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 24 of 332



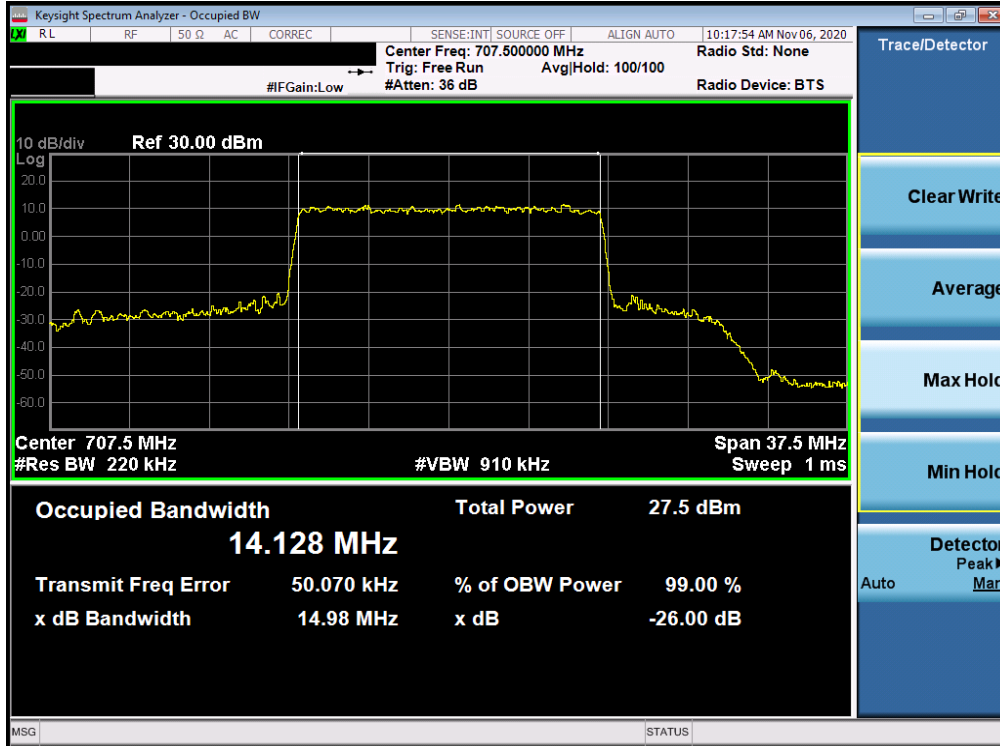


Plot 7-19. Occupied Bandwidth Plot (NR Band n12 - 15.0MHz CP-OFDM 16QAM - Full RB)

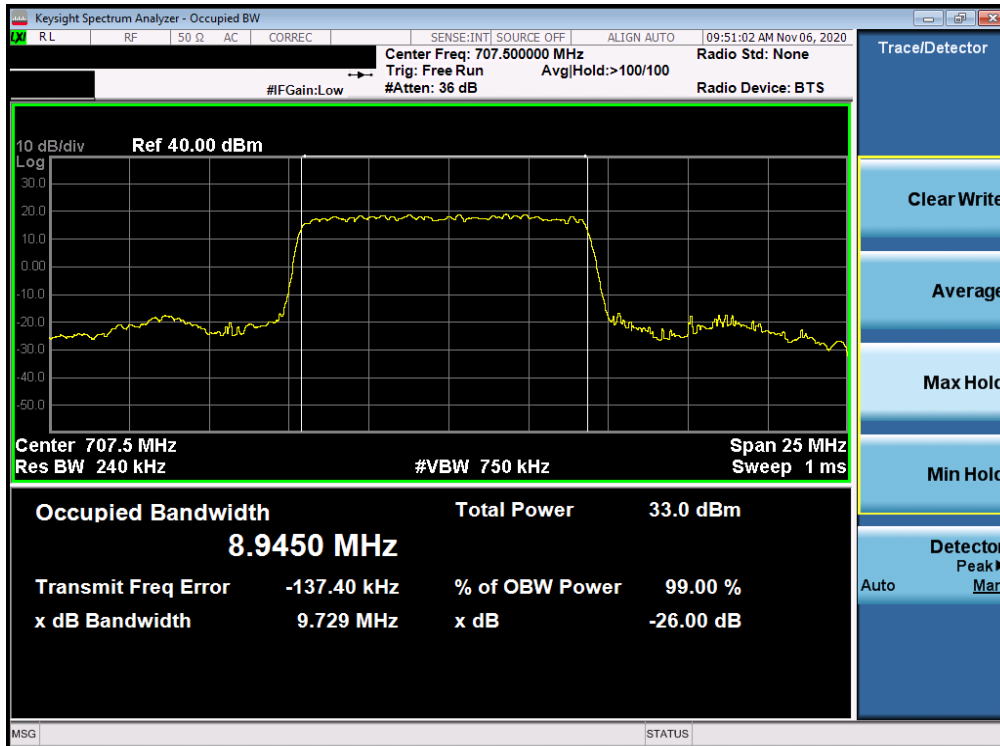


Plot 7-20. Occupied Bandwidth Plot (NR Band n12 - 15.0MHz CP-OFDM 64QAM - Full RB)



FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 25 of 332

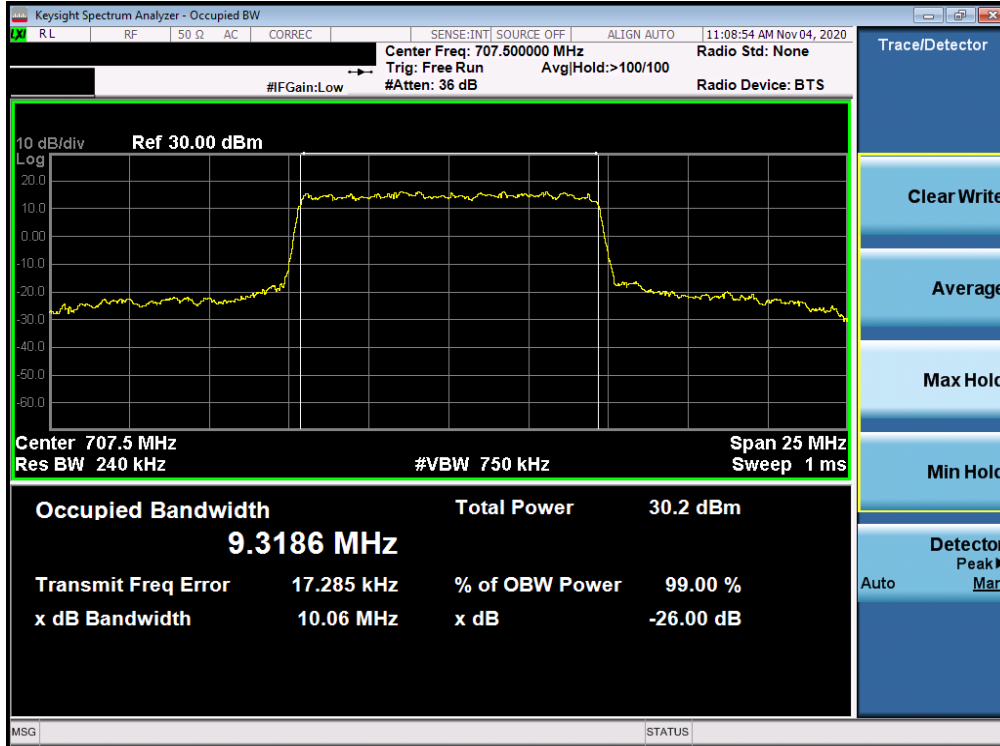


Plot 7-21. Occupied Bandwidth Plot (NR Band n12 - 15.0MHz CP-OFDM 256QAM - Full RB)

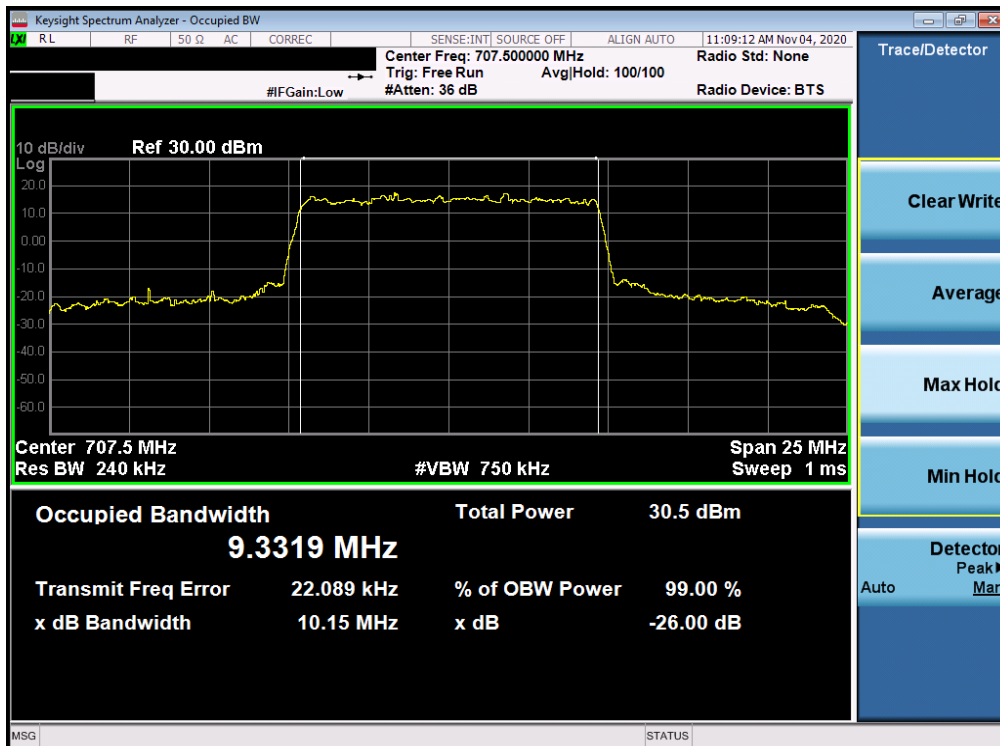


Plot 7-22. Occupied Bandwidth Plot (NR Band n12 - 10.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 26 of 332

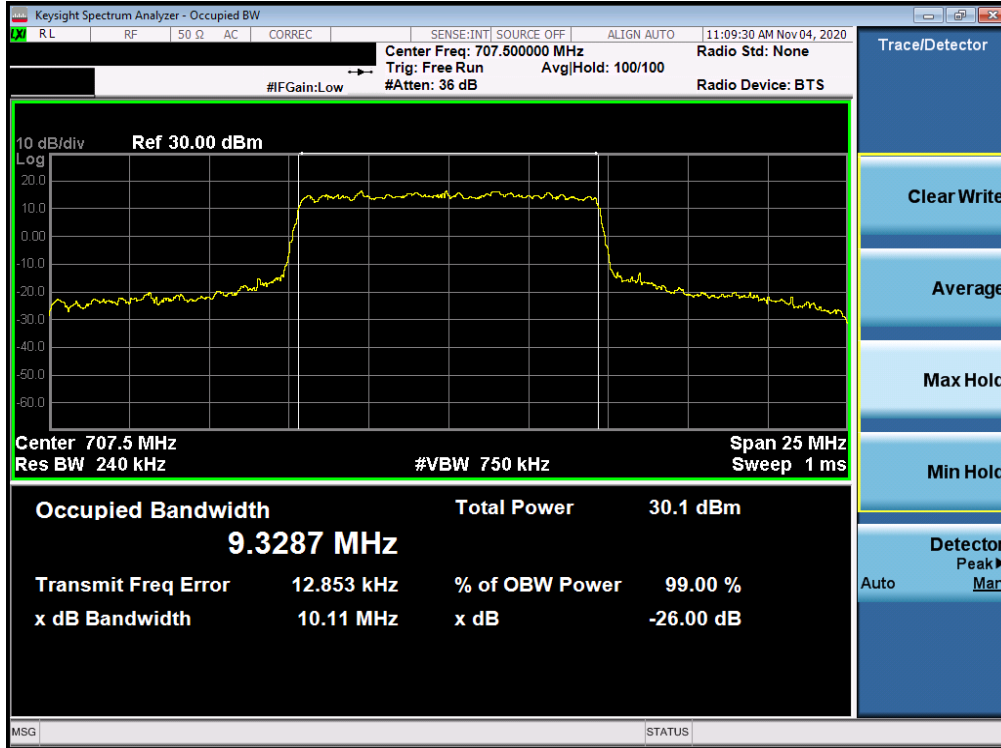


Plot 7-23. Occupied Bandwidth Plot (NR Band n12 - 10.0MHz CP-OFDM QPSK - Full RB)

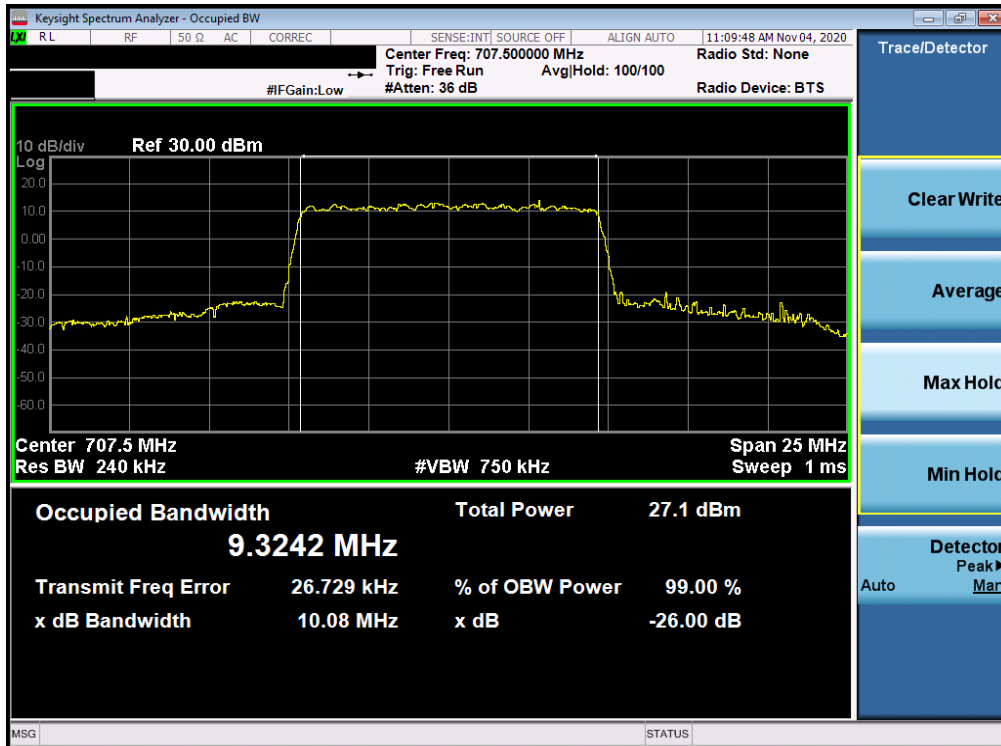


Plot 7-24. Occupied Bandwidth Plot (NR Band n12 - 10.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 27 of 332

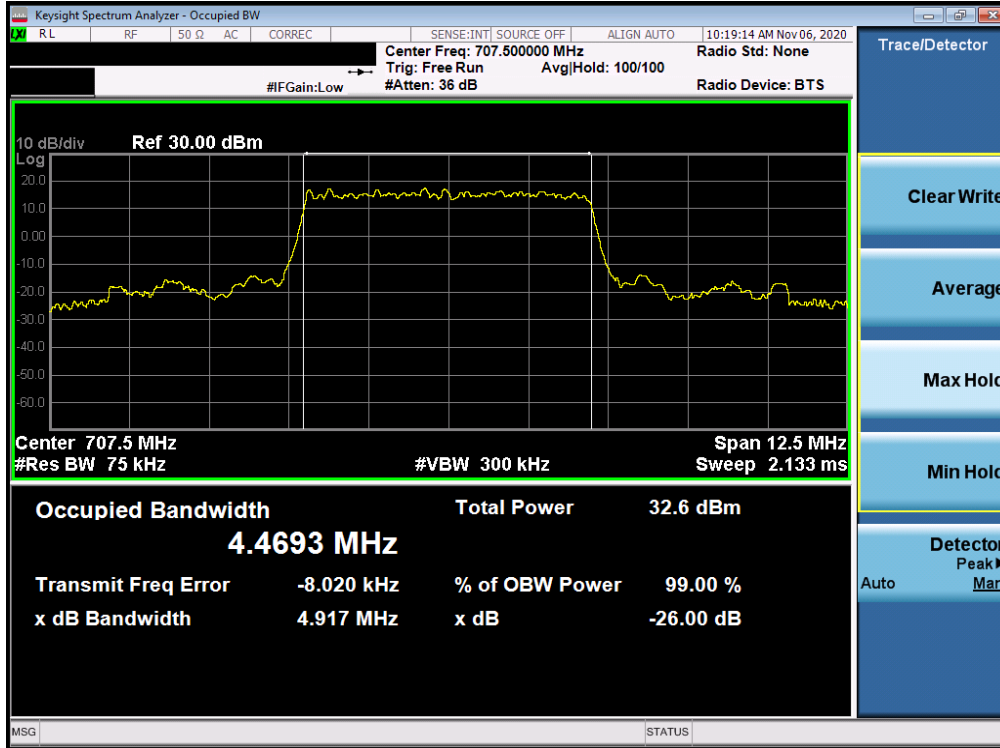


Plot 7-25. Occupied Bandwidth Plot (NR Band n12 - 10.0MHz CP-OFDM 64QAM - Full RB)

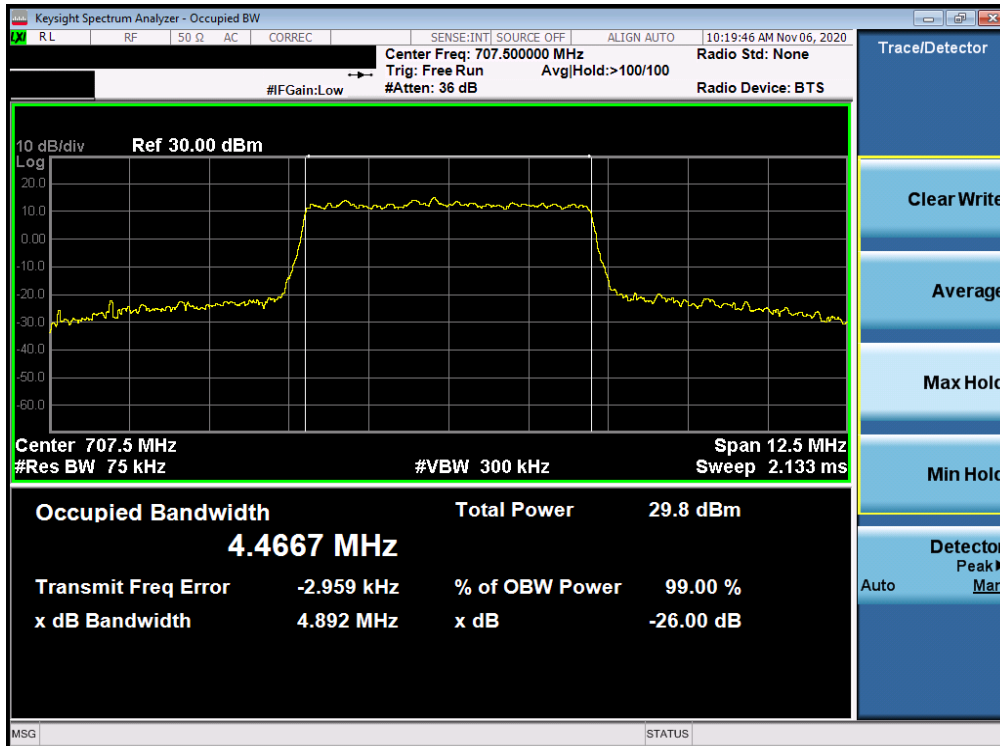


Plot 7-26. Occupied Bandwidth Plot (NR Band n12 - 10.0MHz CP-OFDM 256QAM - Full RB)



FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 28 of 332

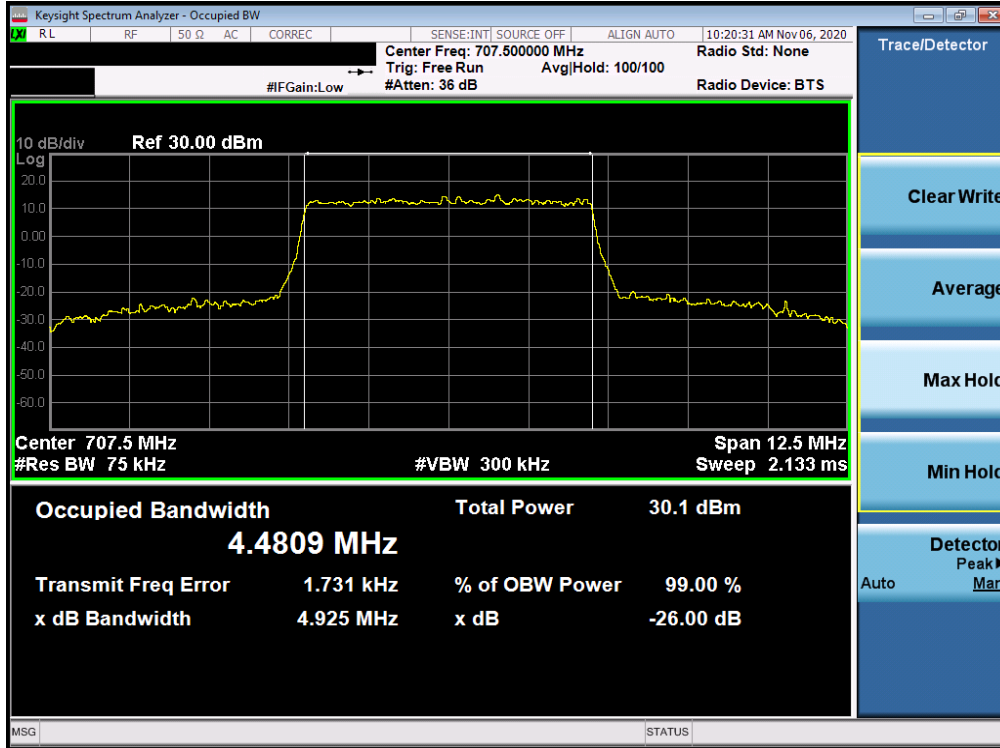


Plot 7-27. Occupied Bandwidth Plot (NR Band n12 - 5.0MHz DFT-s-OFDM BPSK - Full RB)

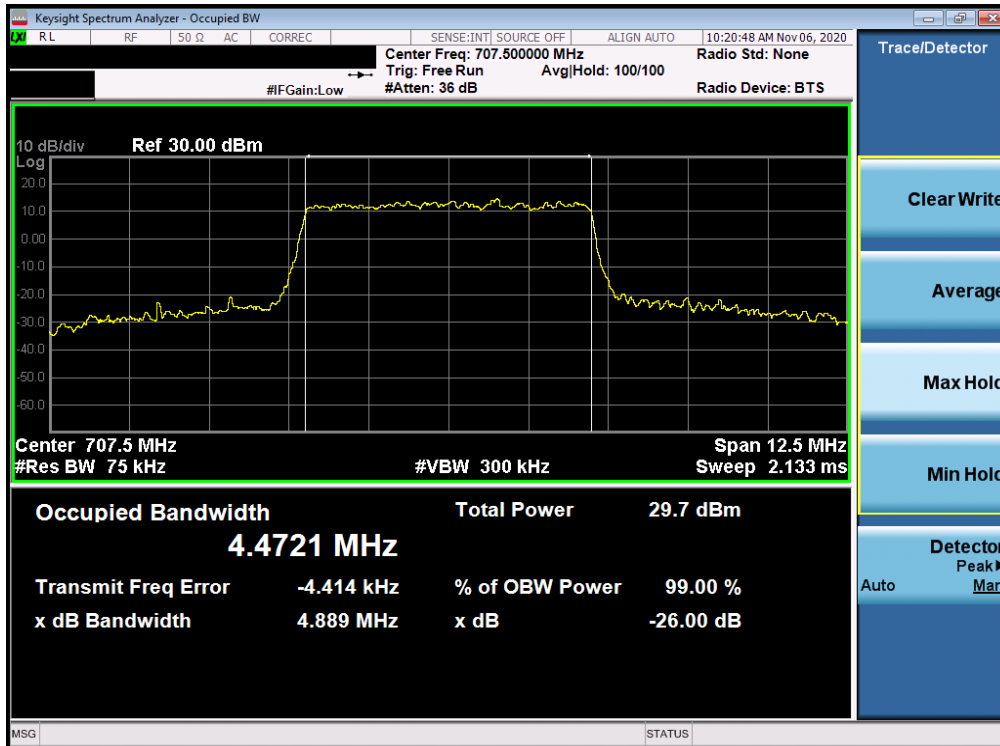


Plot 7-28. Occupied Bandwidth Plot (NR Band n12 - 5.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 29 of 332

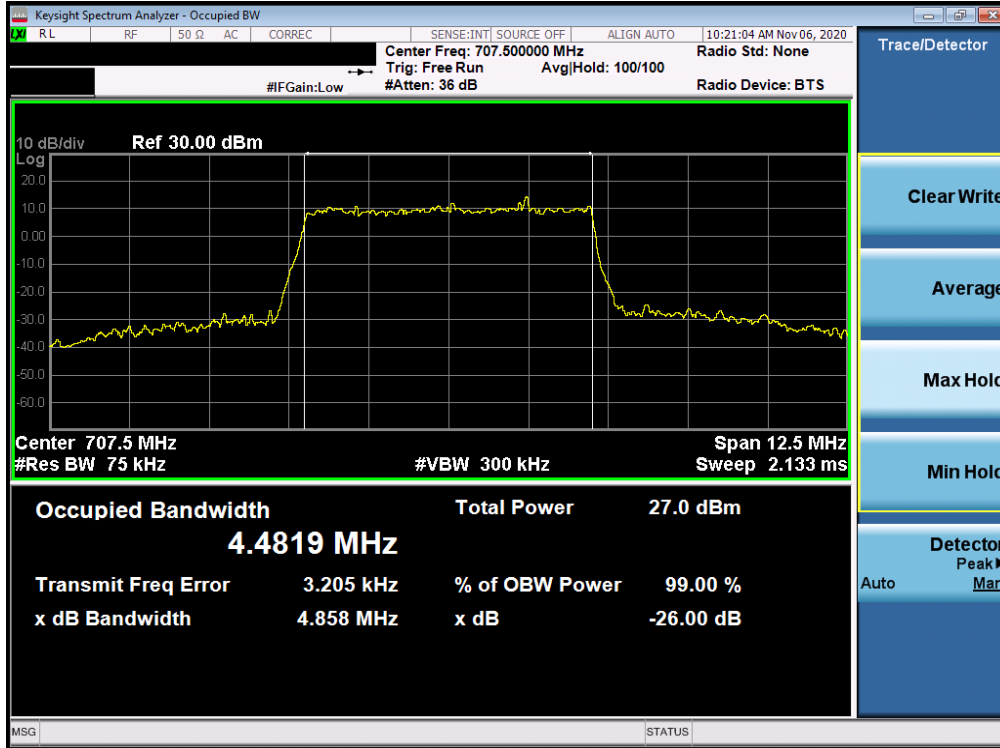


Plot 7-29. Occupied Bandwidth Plot (NR Band n12 - 5.0MHz CP-OFDM 16QAM - Full RB)





Plot 7-30. Occupied Bandwidth Plot (NR Band n12 - 5.0MHz CP-OFDM 64QAM - Full RB)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 30 of 332



Plot 7-31. Occupied Bandwidth Plot (NR Band n12 - 5.0MHz CP-OFDM 256QAM - Full RB)

FCC ID: A3LSMG996U		<b>PART 27 MEASUREMENT REPORT</b>		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 31 of 332

### LTE Band 13



Plot 7-32. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB Configuration)



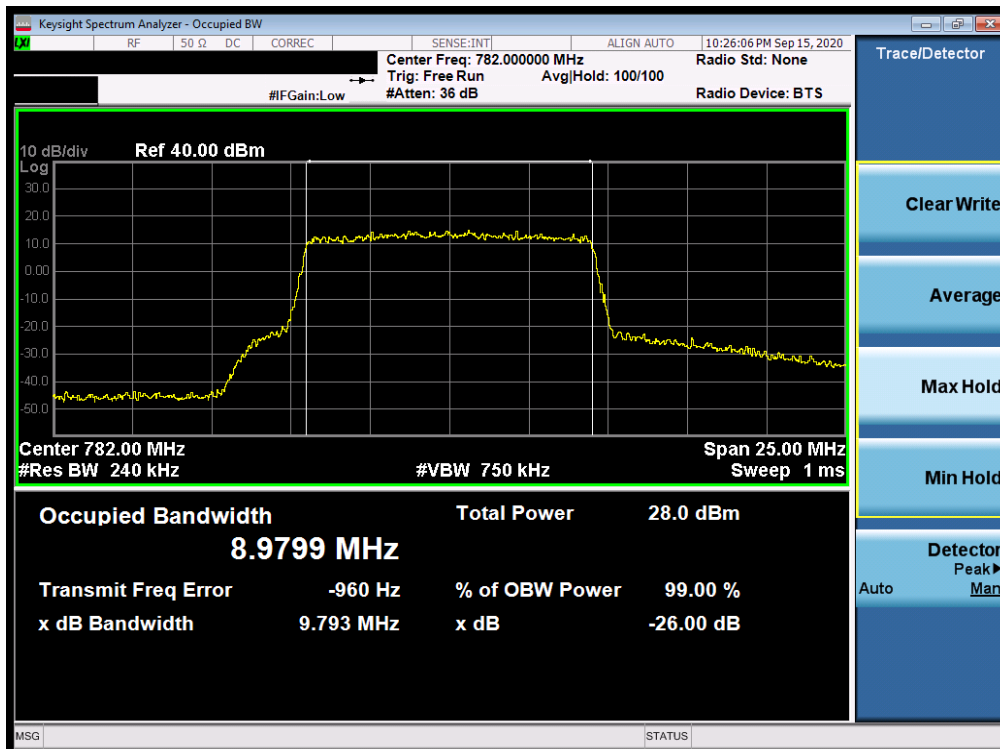
Plot 7-33. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 32 of 332



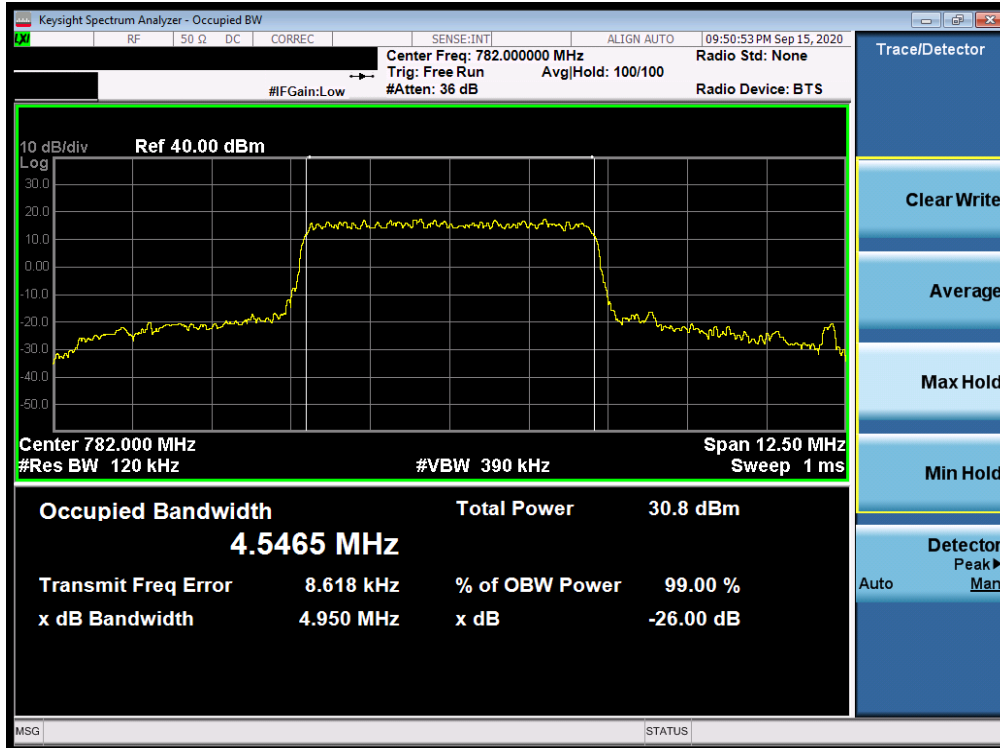


Plot 7-34. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 64-QAM - Full RB Configuration)

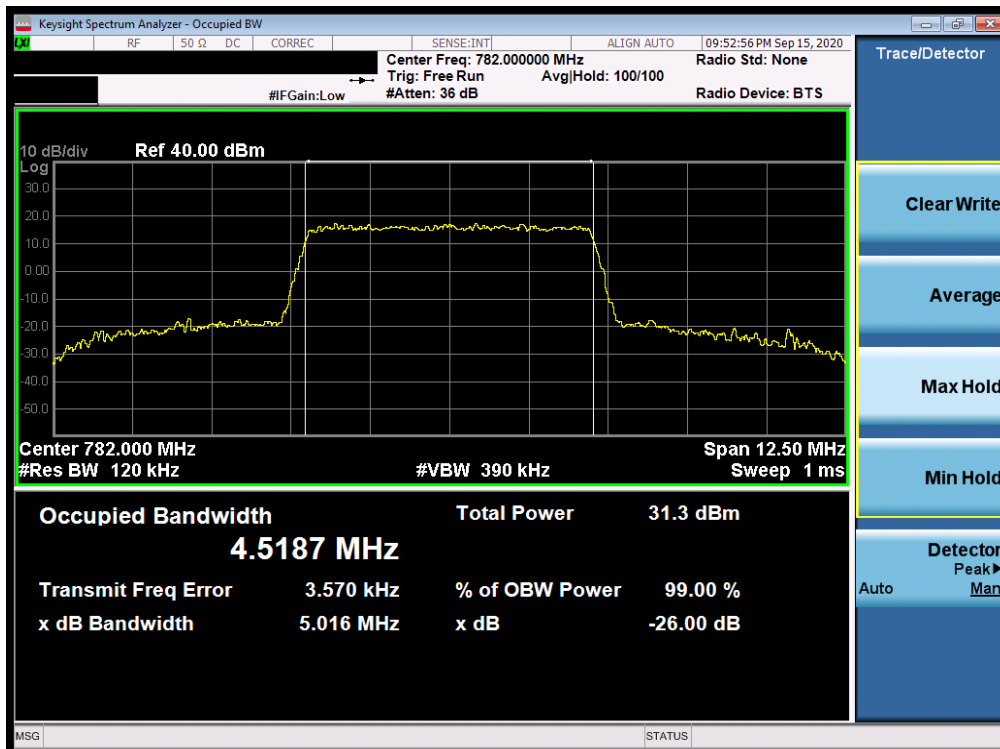


Plot 7-35. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 33 of 332



Plot 7-36. Occupied Bandwidth Plot (LTE Band 13 - 5MHz QPSK - Full RB Configuration)

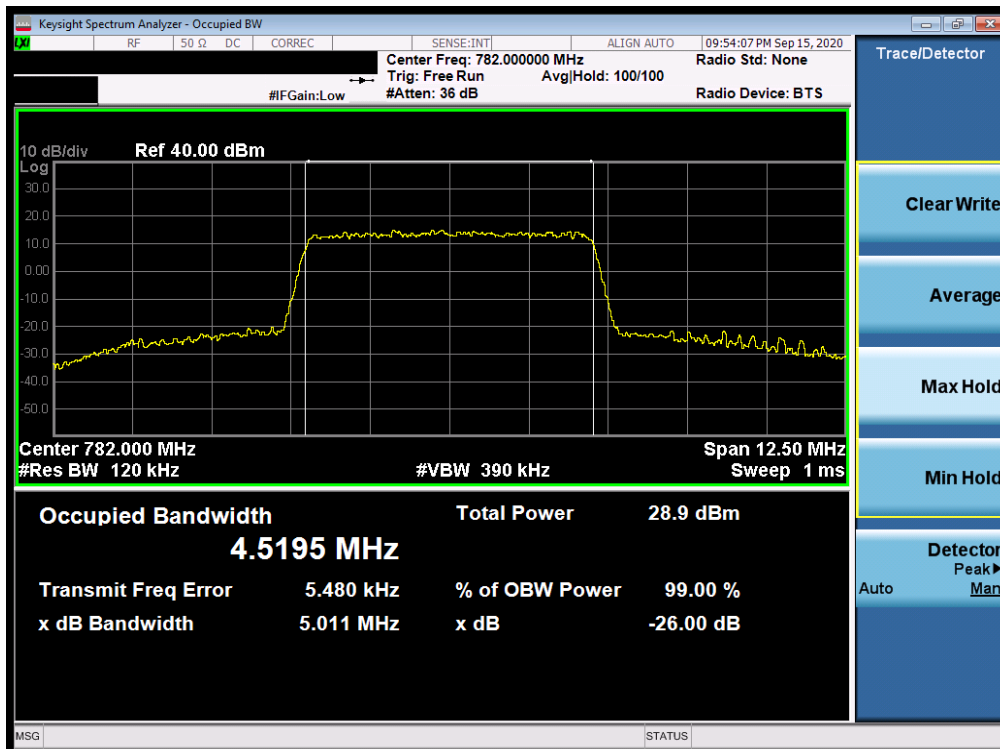


Plot 7-37. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB Configuration)



FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 34 of 332



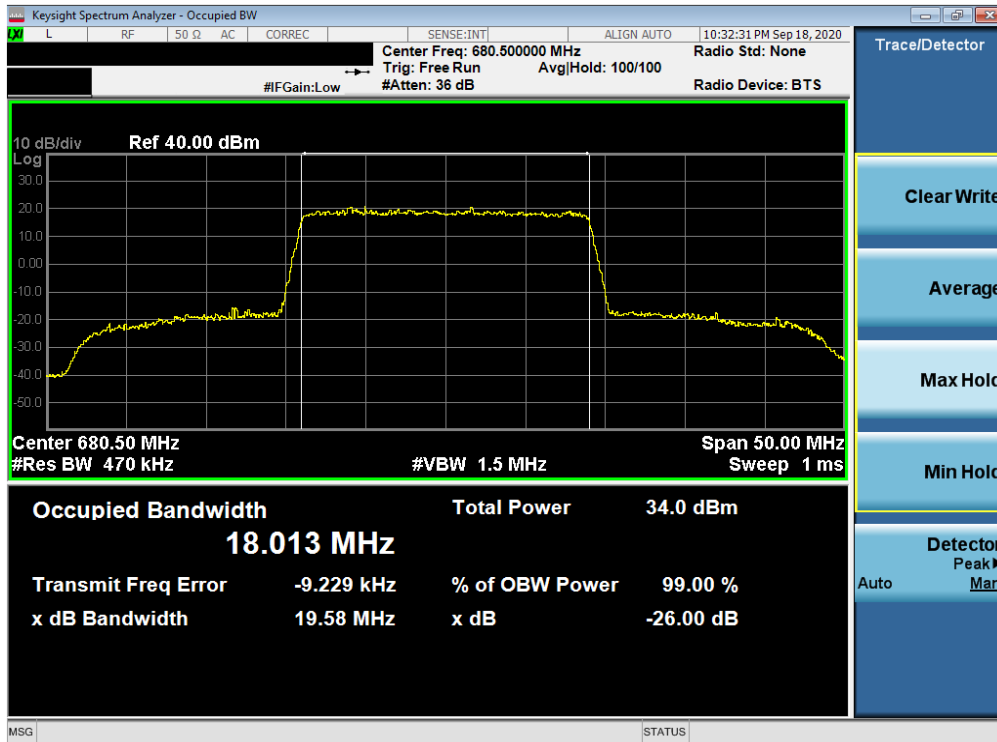
Plot 7-38. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 64-QAM - Full RB Configuration)



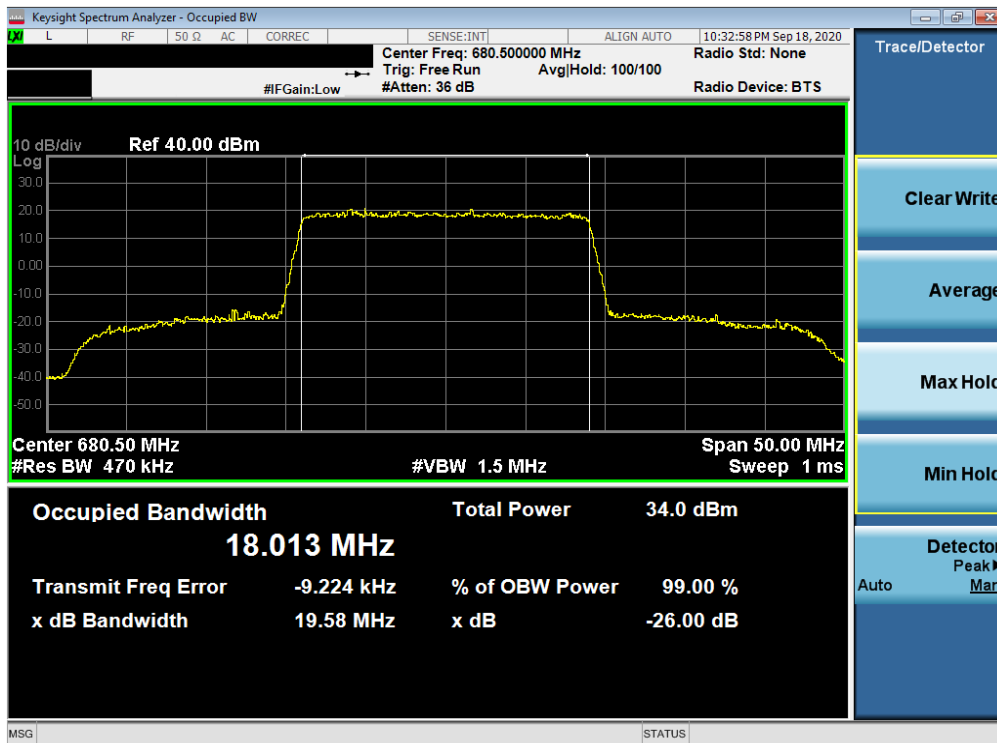
Plot 7-39. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 35 of 332

## LTE Band 71



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



Plot 7-41. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 36 of 332

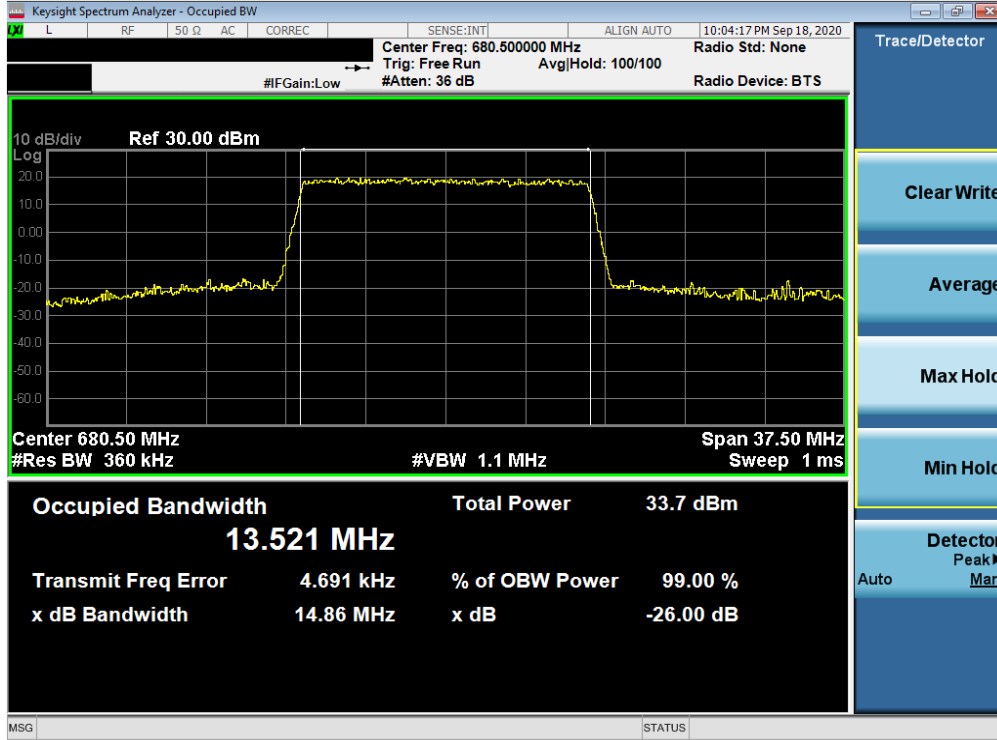


Plot 7-42. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 64-QAM - Full RB Configuration)

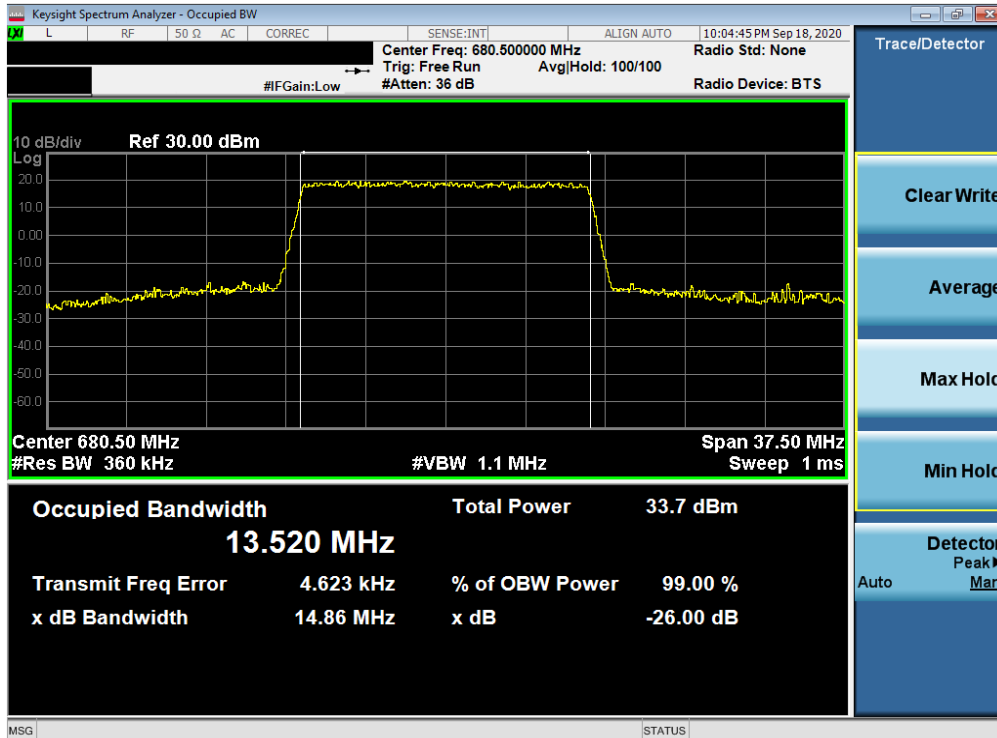


Plot 7-43. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 256-QAM - Full RB Configuration)



FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 37 of 332

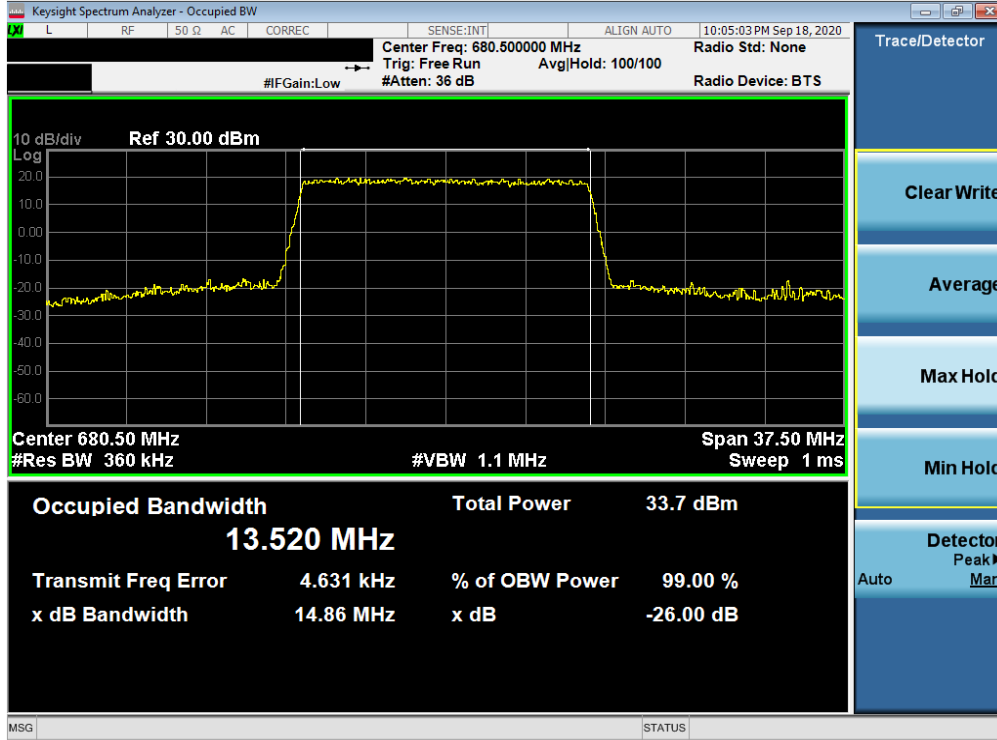


Plot 7-44. Occupied Bandwidth Plot (LTE Band 71 - 15MHz QPSK - Full RB Configuration)

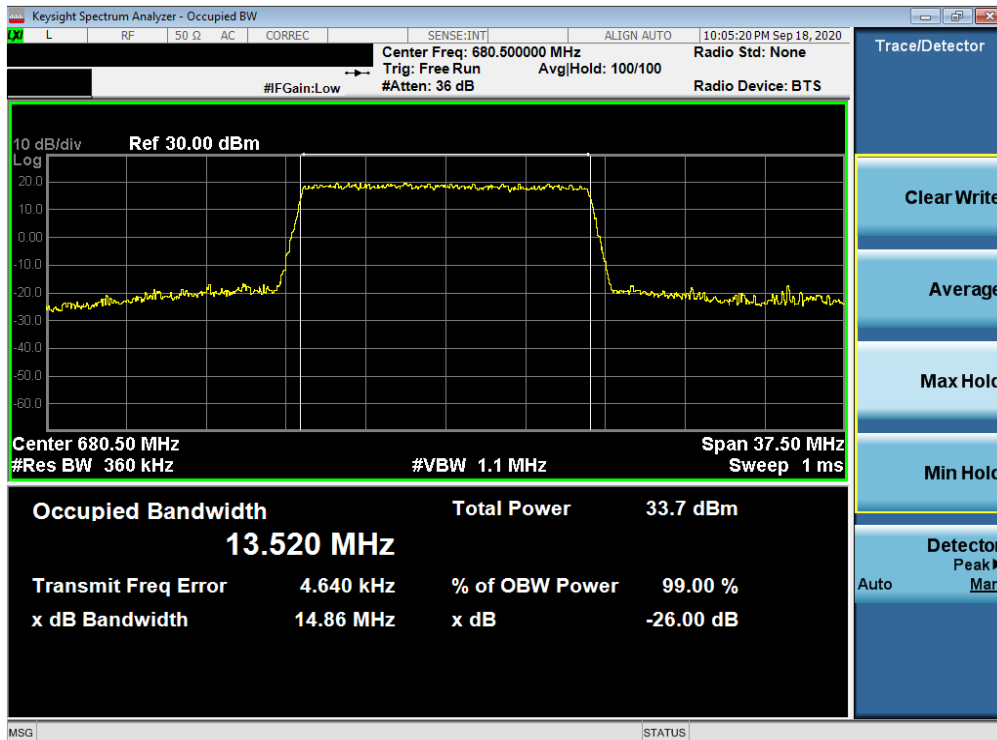


Plot 7-45. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 38 of 332

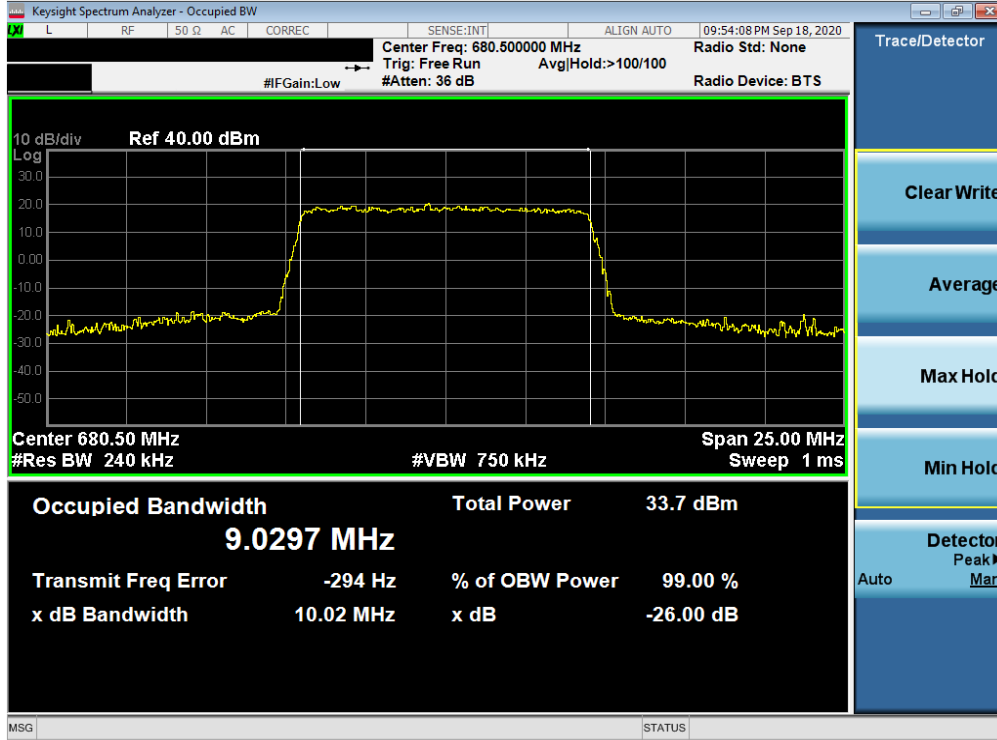


Plot 7-46. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 64-QAM - Full RB Configuration)

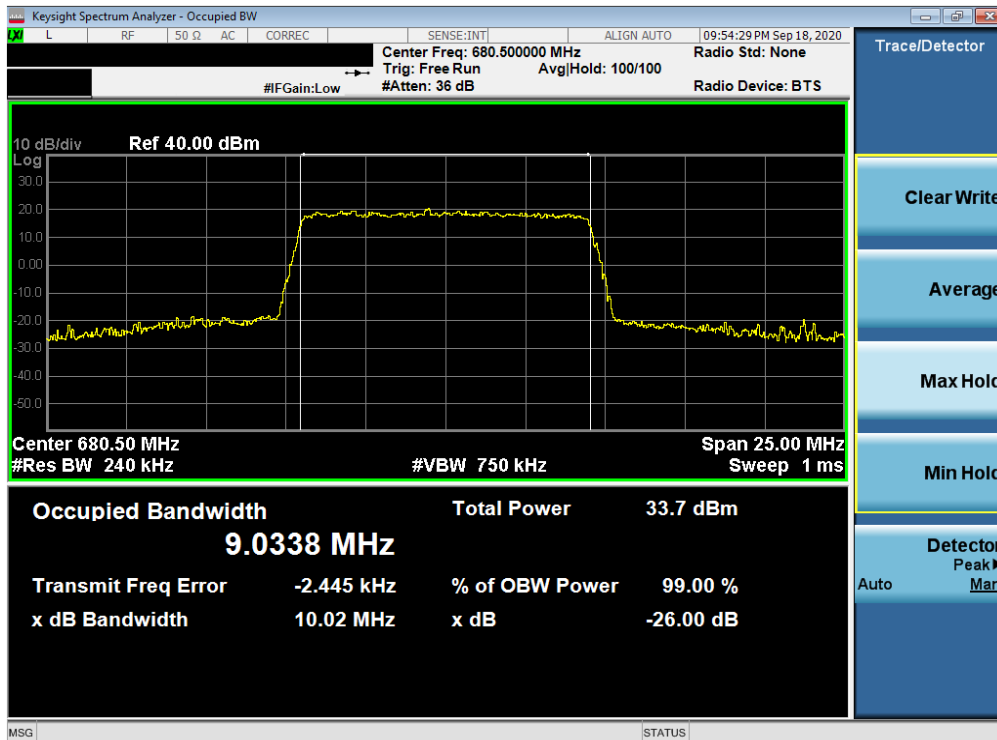


Plot 7-47. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 39 of 332



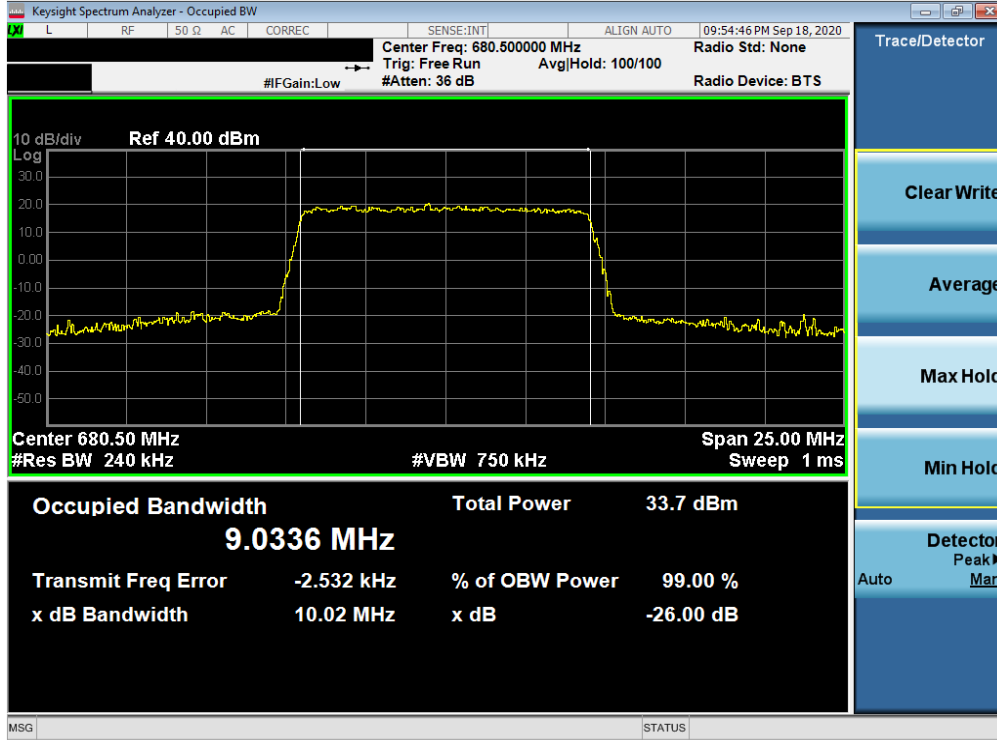
Plot 7-48. Occupied Bandwidth Plot (LTE Band 71 - 10MHz QPSK - Full RB Configuration)



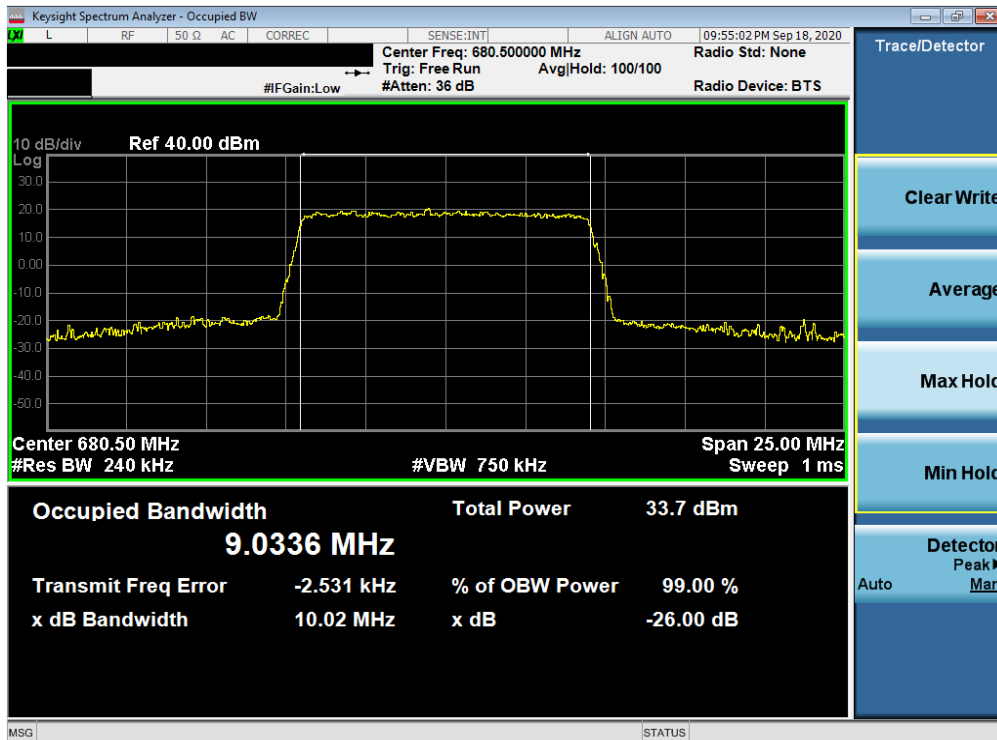
Plot 7-49. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 40 of 332



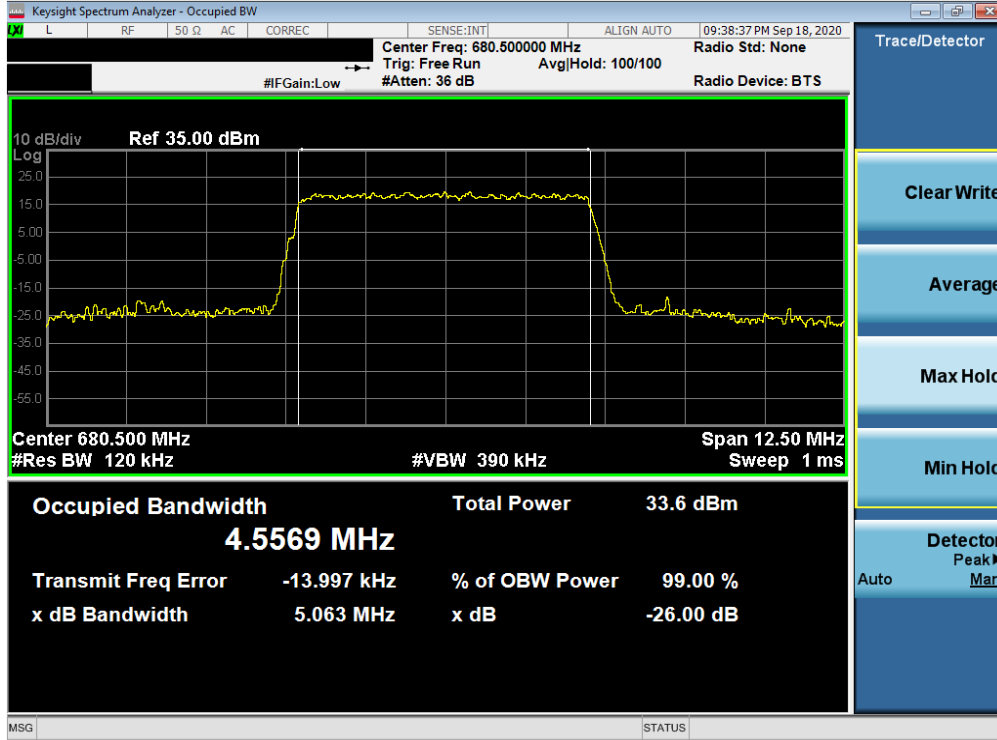


Plot 7-50. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-51. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 41 of 332

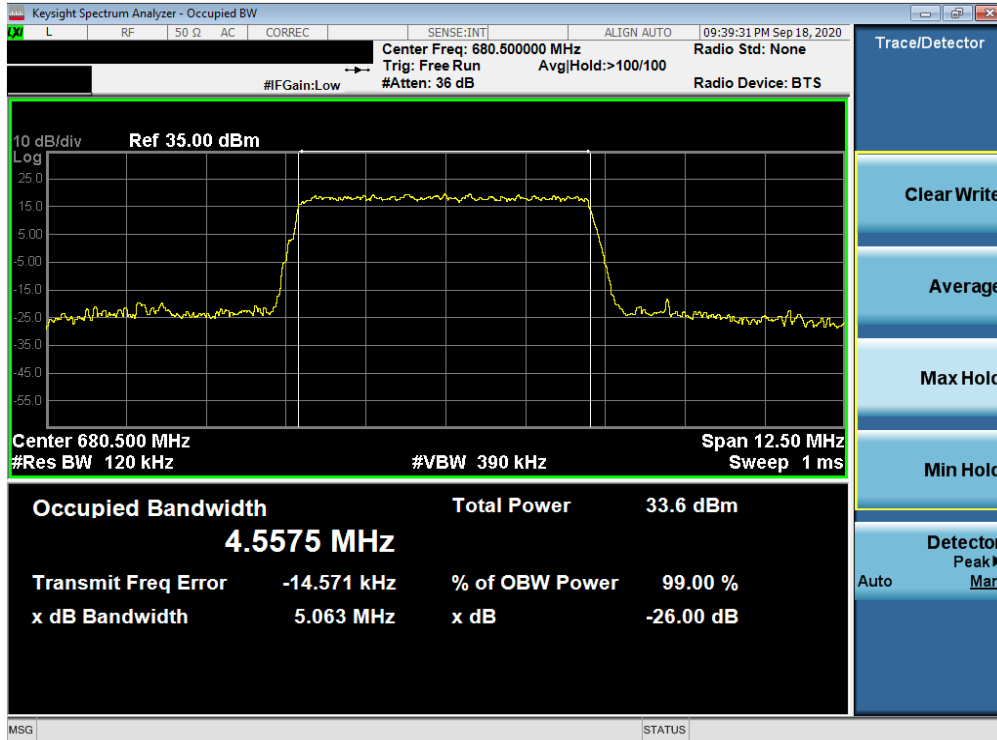


Plot 7-52. Occupied Bandwidth Plot (LTE Band 71 - 5MHz QPSK - Full RB Configuration)

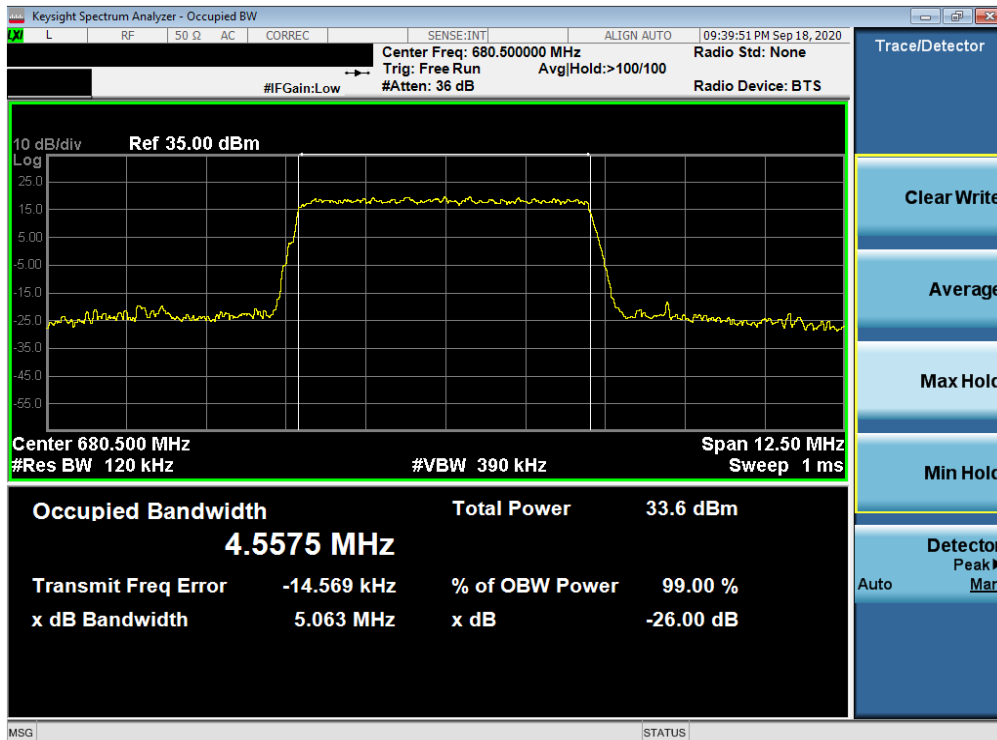


Plot 7-53. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 42 of 332



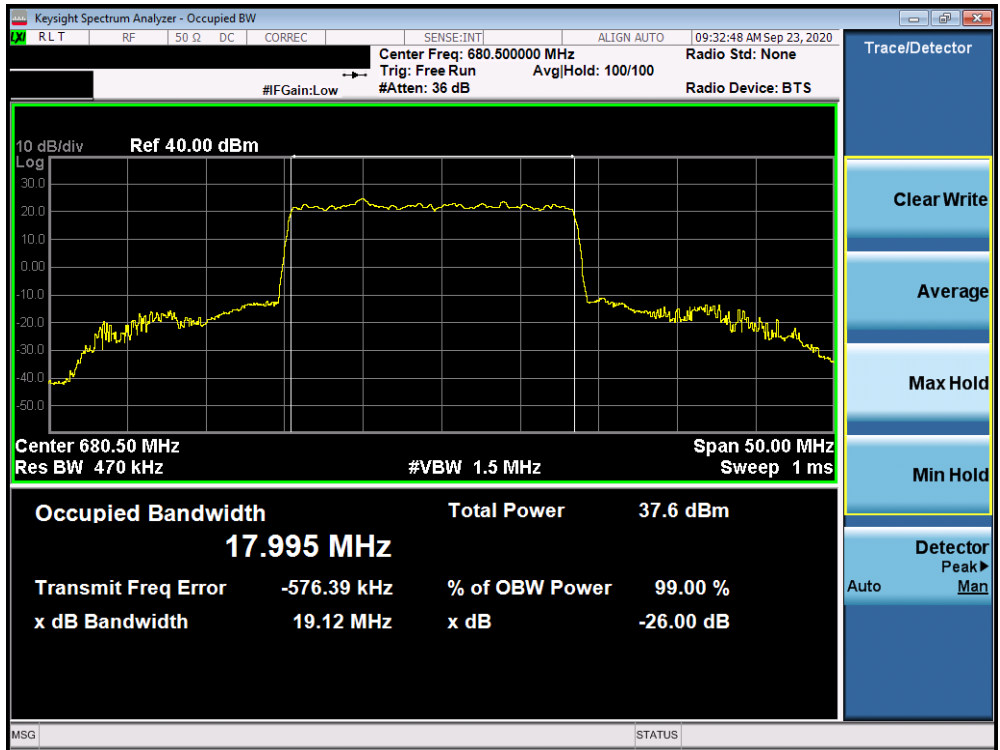
Plot 7-54. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 64-QAM - Full RB Configuration)



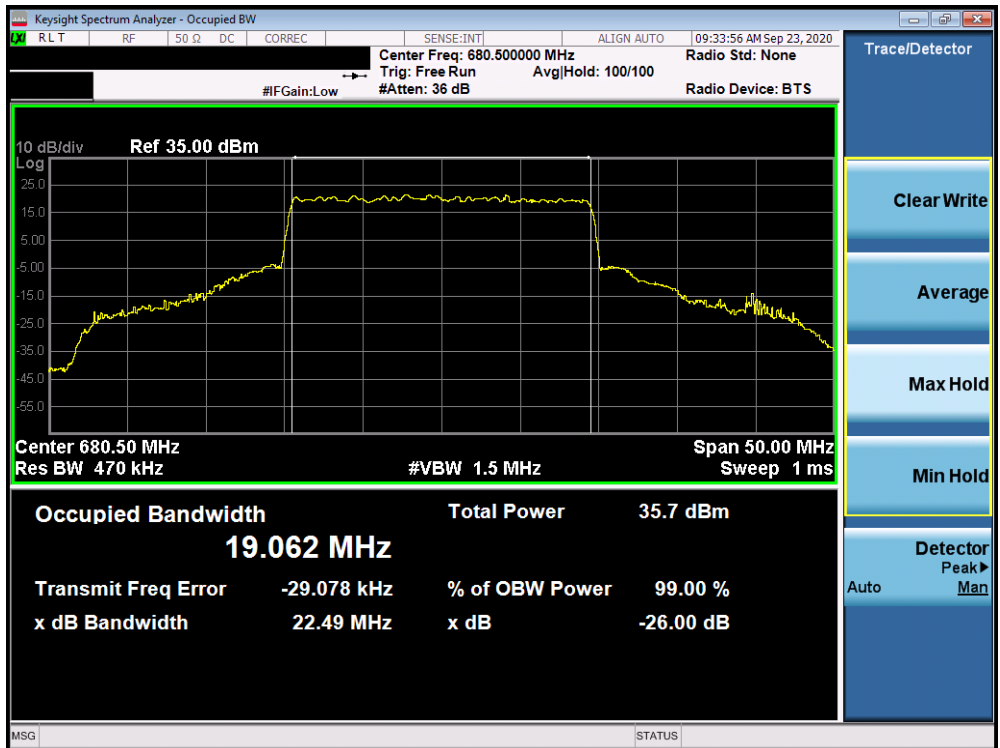
Plot 7-55. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 43 of 332

## NR Band n71

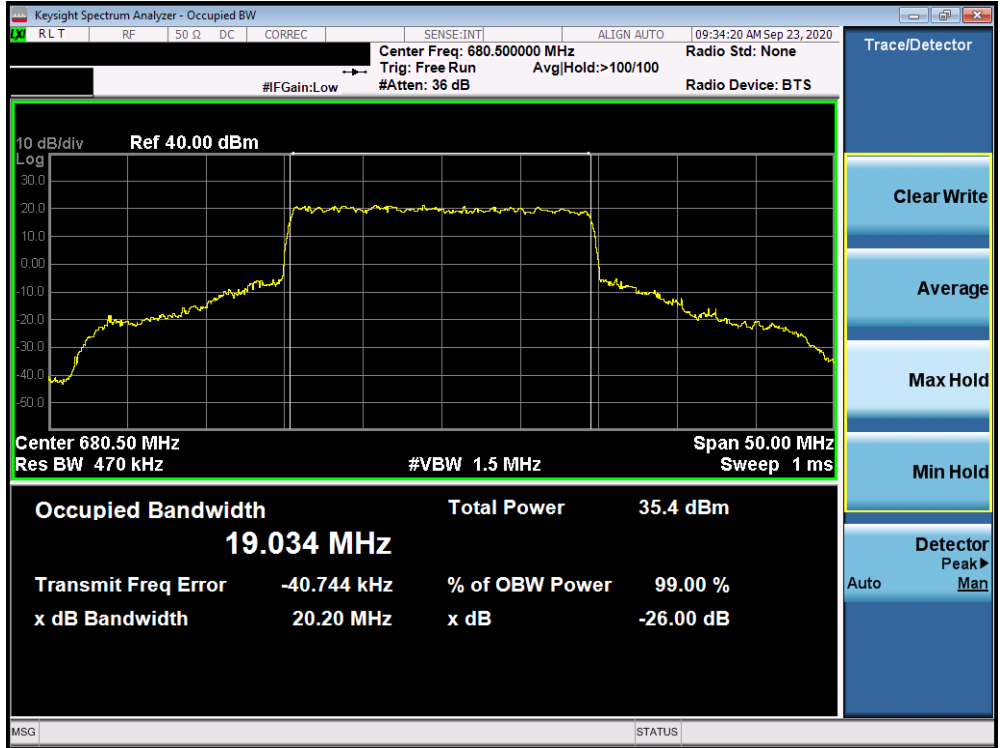


Plot 7-56. Occupied Bandwidth Plot (n71 20MHz BPSK-DFT-s-OFDM - Full RB Configuration)

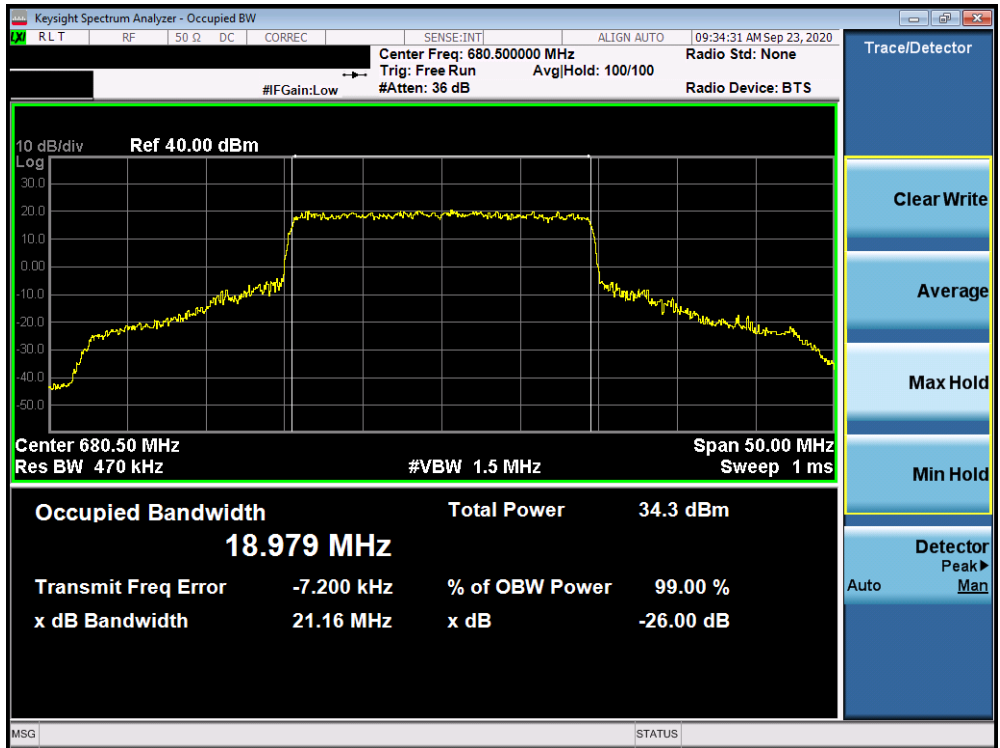


Plot 7-57. Occupied Bandwidth Plot (n71 20MHz QPSK-CP-OFDM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 44 of 332

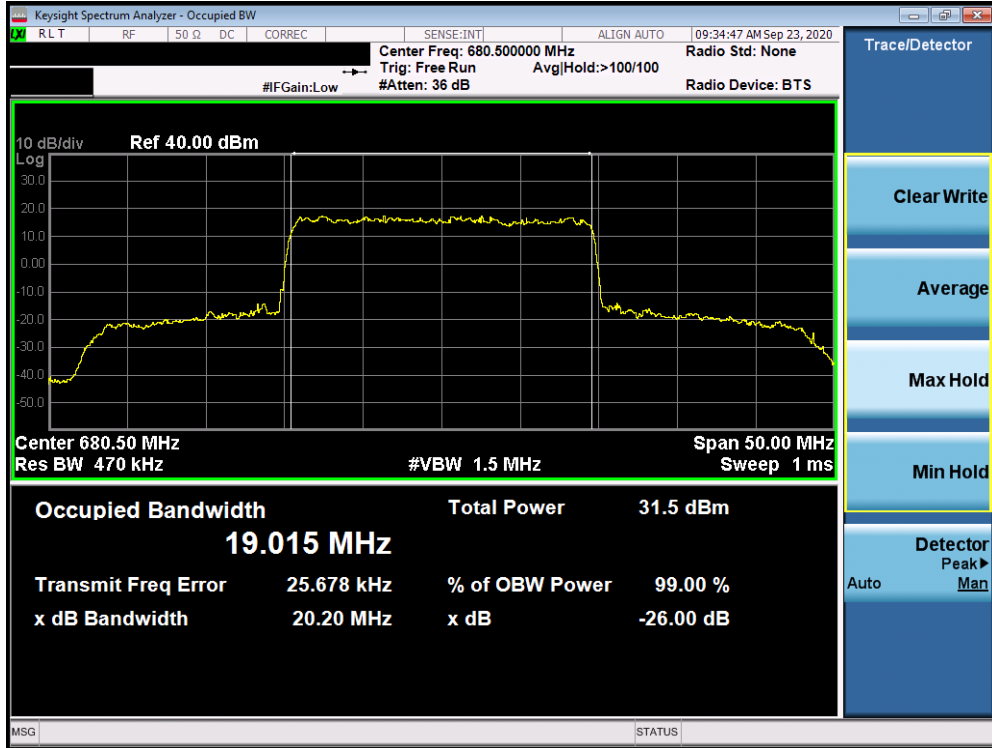


Plot 7-58. Occupied Bandwidth Plot (n71 20MHz 16QAM-CP-OFDM - Full RB Configuration)

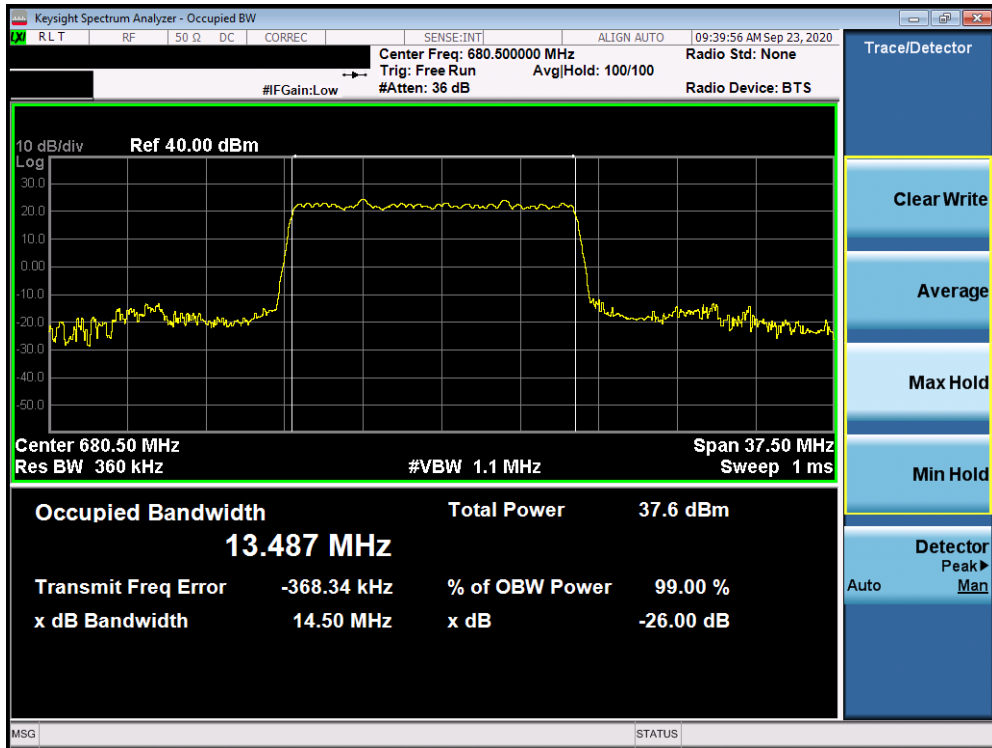


Plot 7-59. Occupied Bandwidth Plot (n71 20MHz 64QAM-CP-OFDM- Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 45 of 332

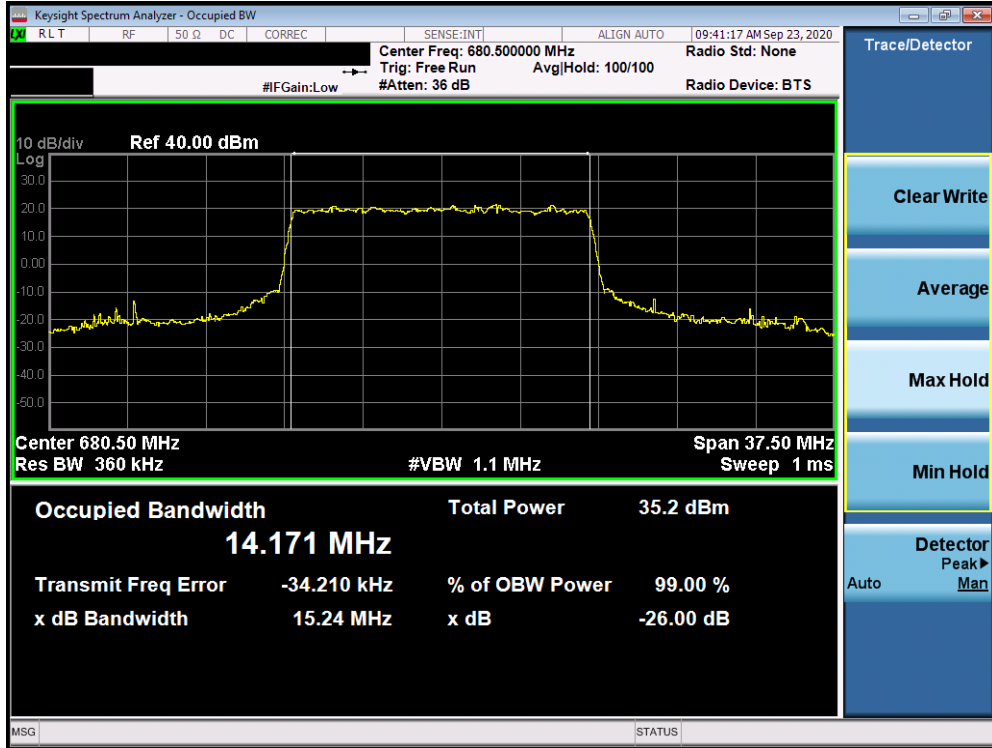


Plot 7-60. Occupied Bandwidth Plot (n71 20MHz 256QAM-CP-OFDM- Full RB Configuration)

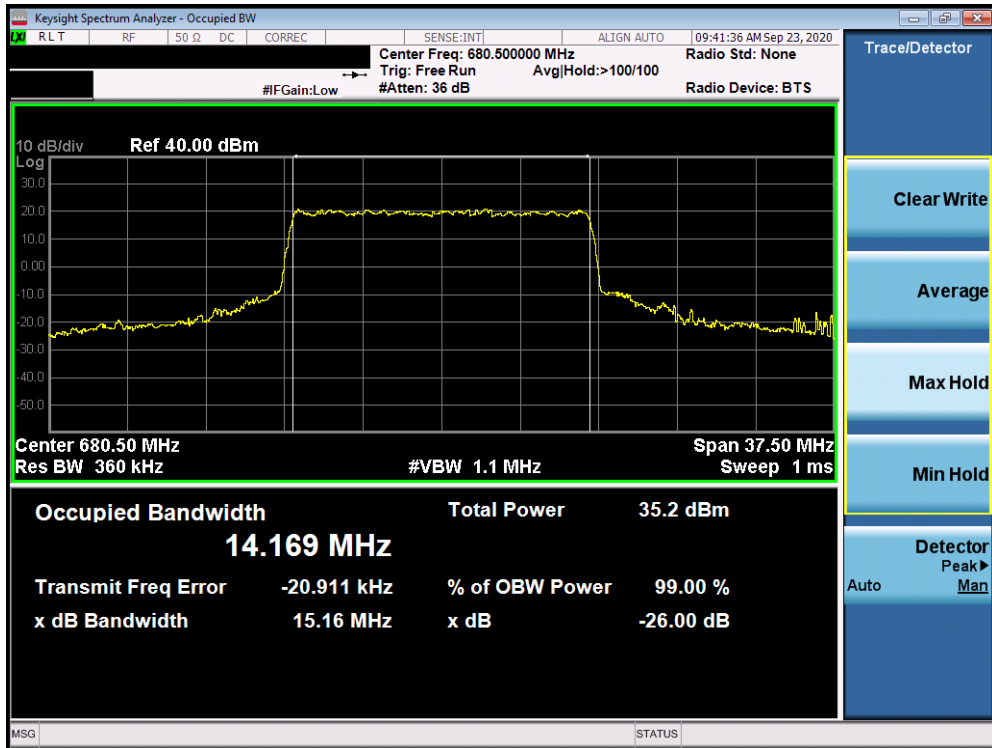


Plot 7-61. Occupied Bandwidth Plot (n71 15MHz BPSK-DFT-s-OFDM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 46 of 332



Plot 7-62. Occupied Bandwidth Plot (n71 15MHz QPSK-CP-OFDM - Full RB Configuration)

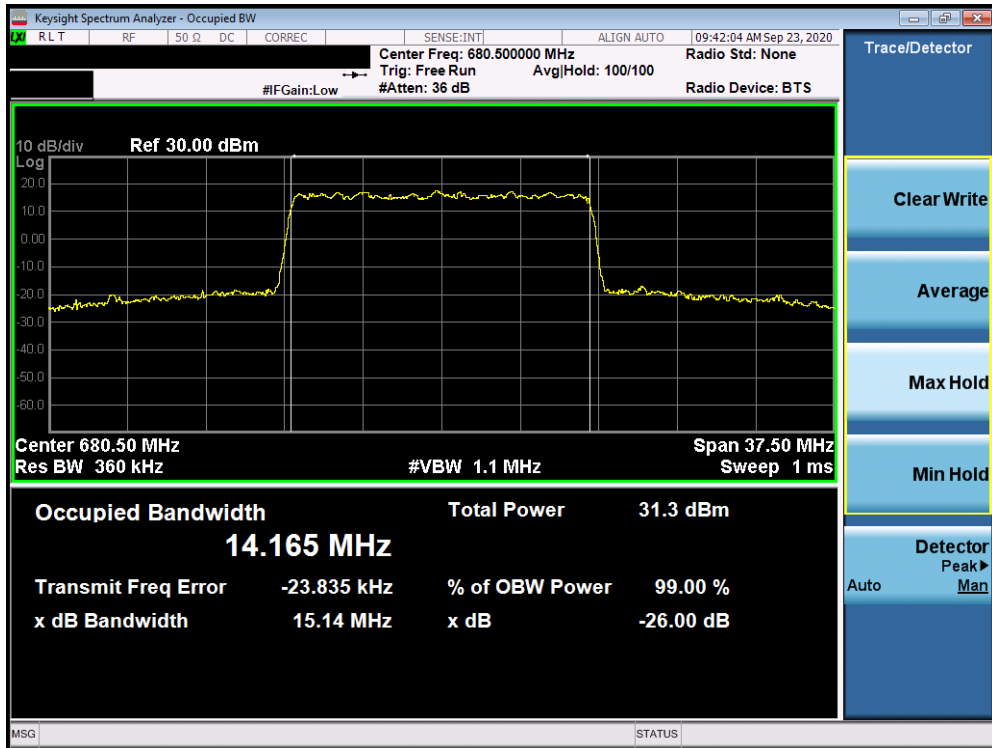


Plot 7-63. Occupied Bandwidth Plot (n71 15MHz 16QAM-CP-OFDM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 47 of 332



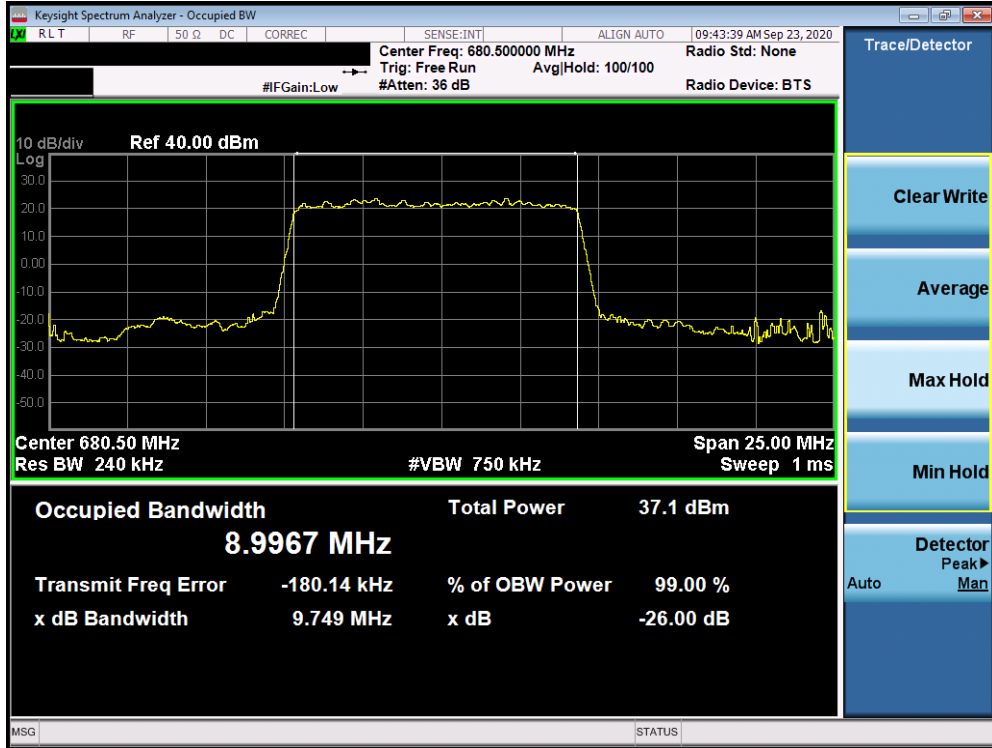
Plot 7-64. Occupied Bandwidth Plot (n71 15MHz 64QAM-CP-OFDM- Full RB Configuration)



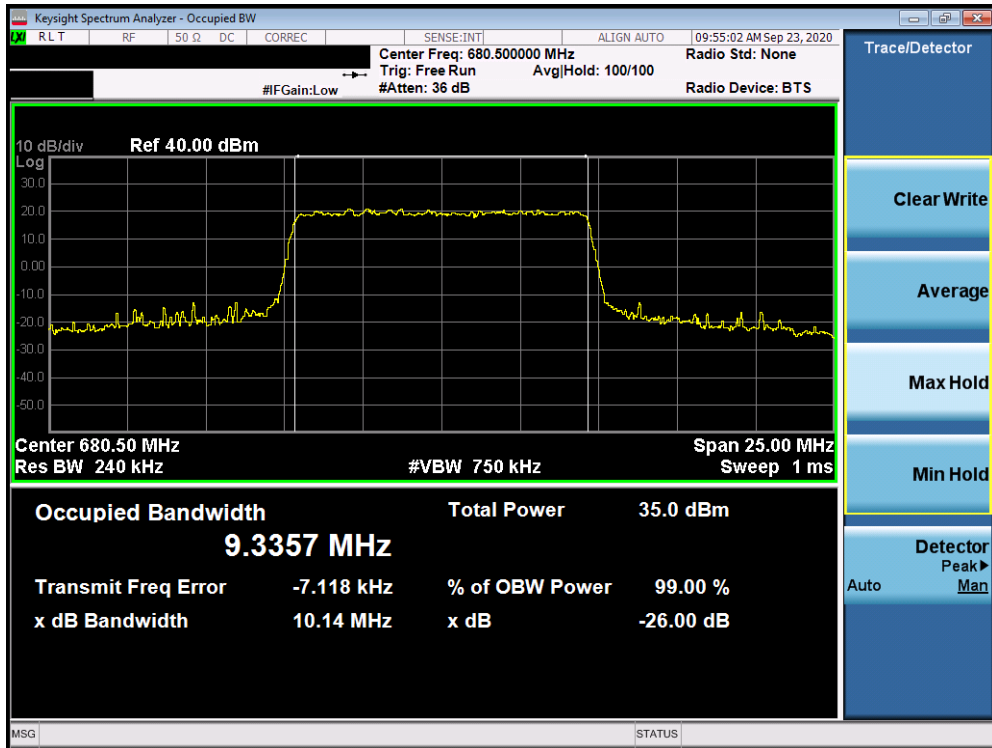
Plot 7-65. Occupied Bandwidth Plot (n71 15MHz 256QAM-CP-OFDM- Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 48 of 332



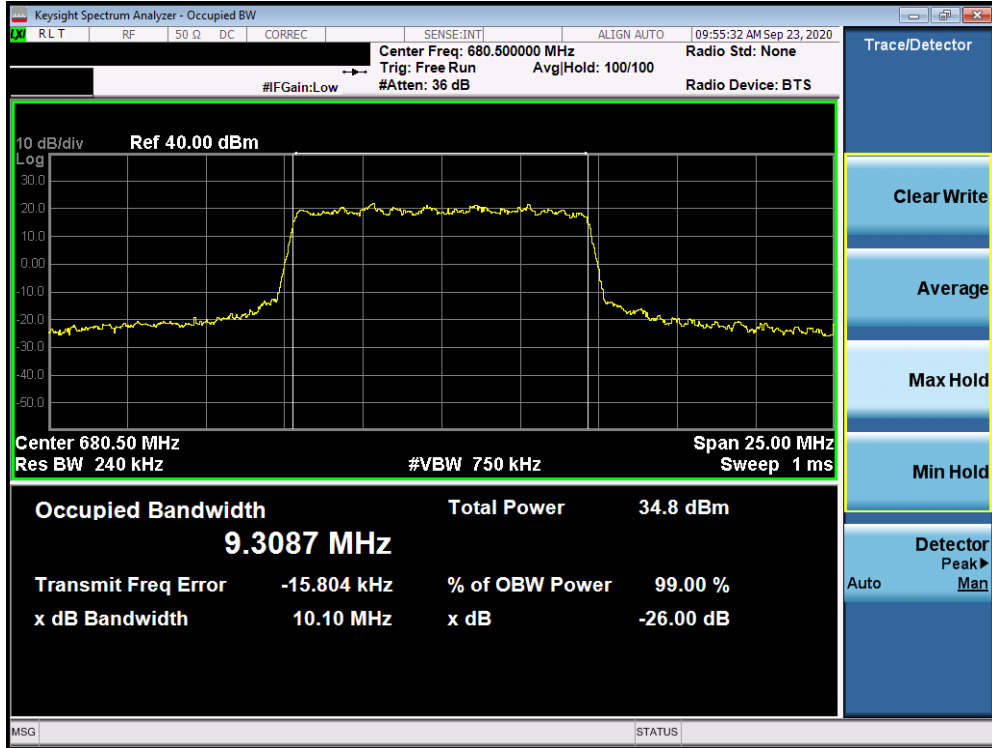


Plot 7-66. Occupied Bandwidth Plot (n71 10MHz BPSK-DFT-s-OFDM - Full RB Configuration)

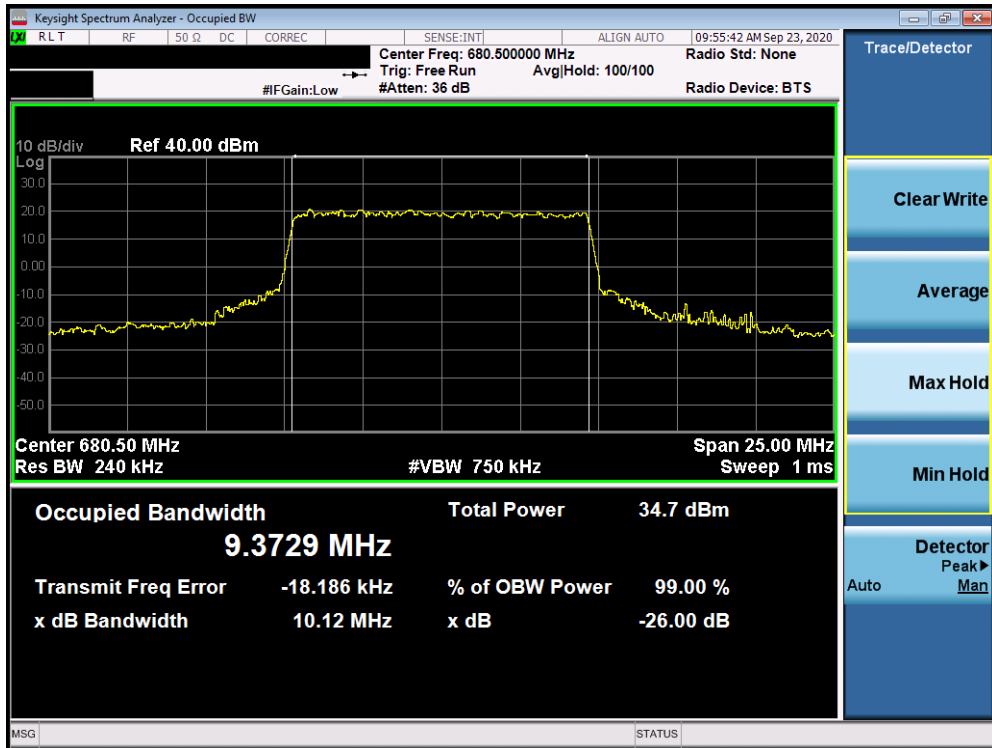


Plot 7-67. Occupied Bandwidth Plot (n71 10MHz QPSK-CP-OFDM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 49 of 332

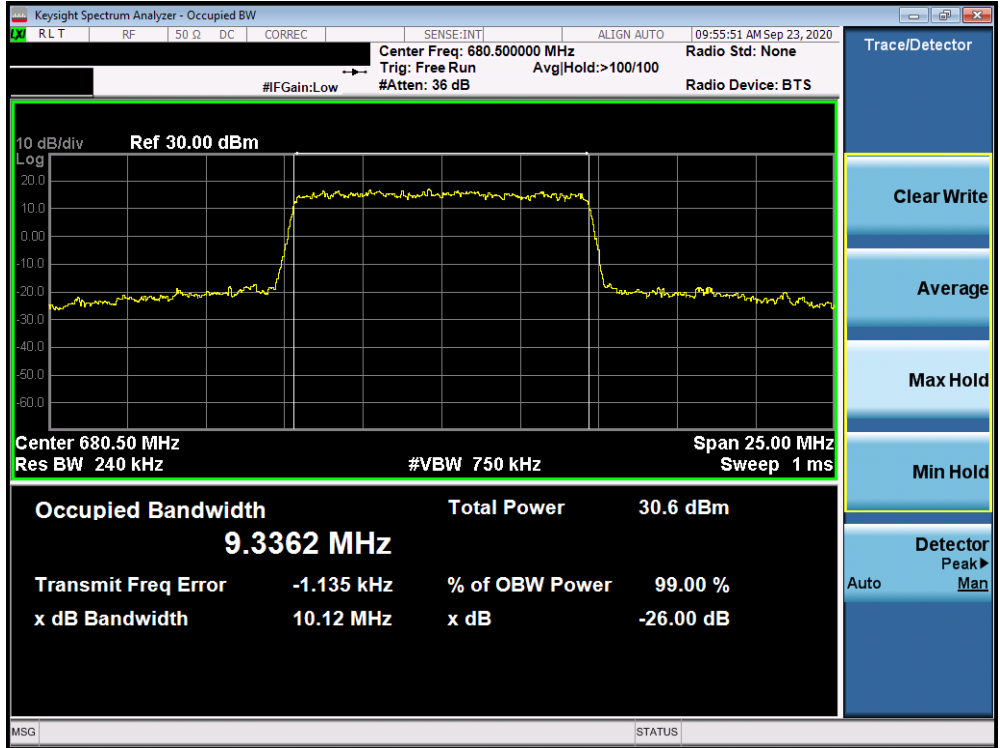


Plot 7-68. Occupied Bandwidth Plot (n71 10MHz 16QAM-CP-OFDM - Full RB Configuration)

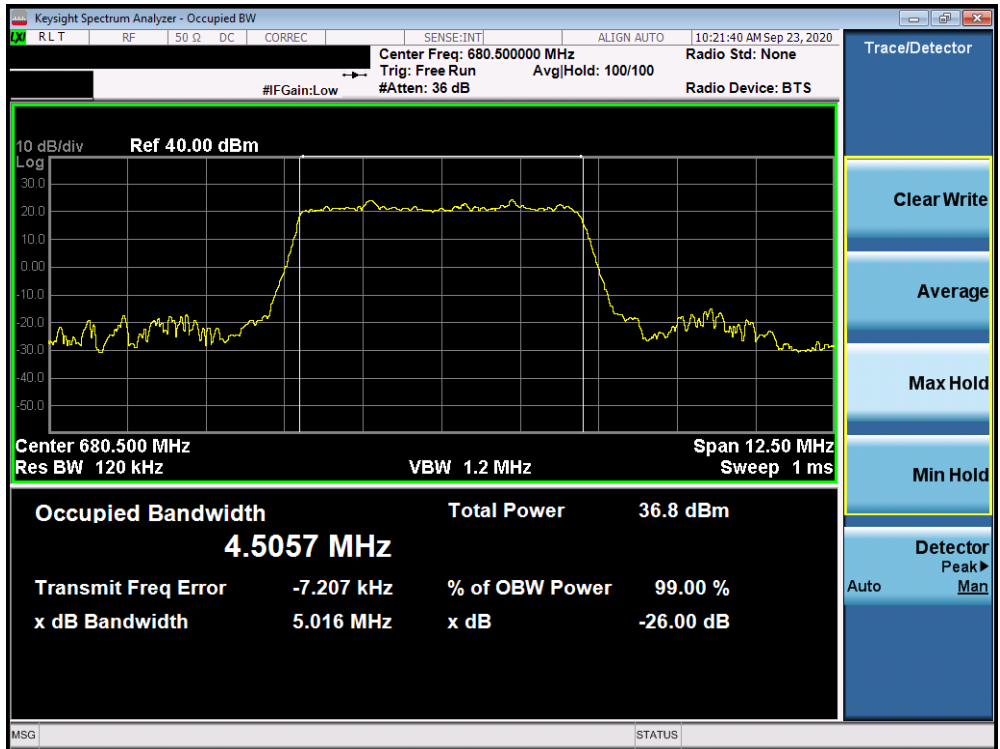


Plot 7-69. Occupied Bandwidth Plot (n71 10MHz 64QAM-CP-OFDM- Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 50 of 332

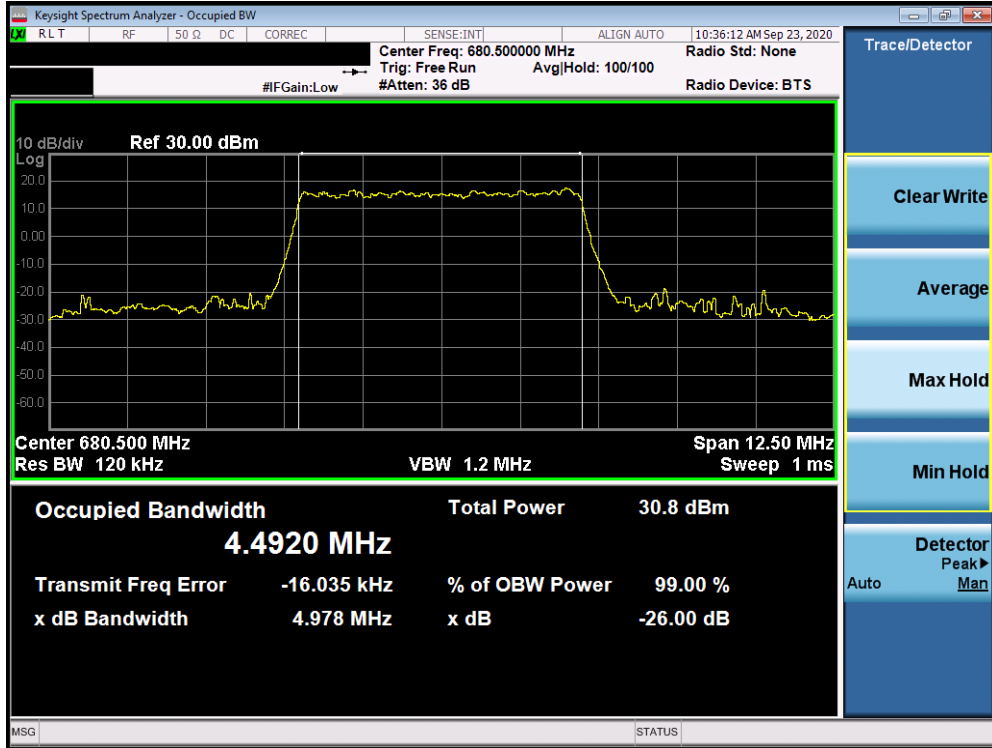


Plot 7-70. Occupied Bandwidth Plot (n71 10MHz 256QAM-CP-OFDM- Full RB Configuration)

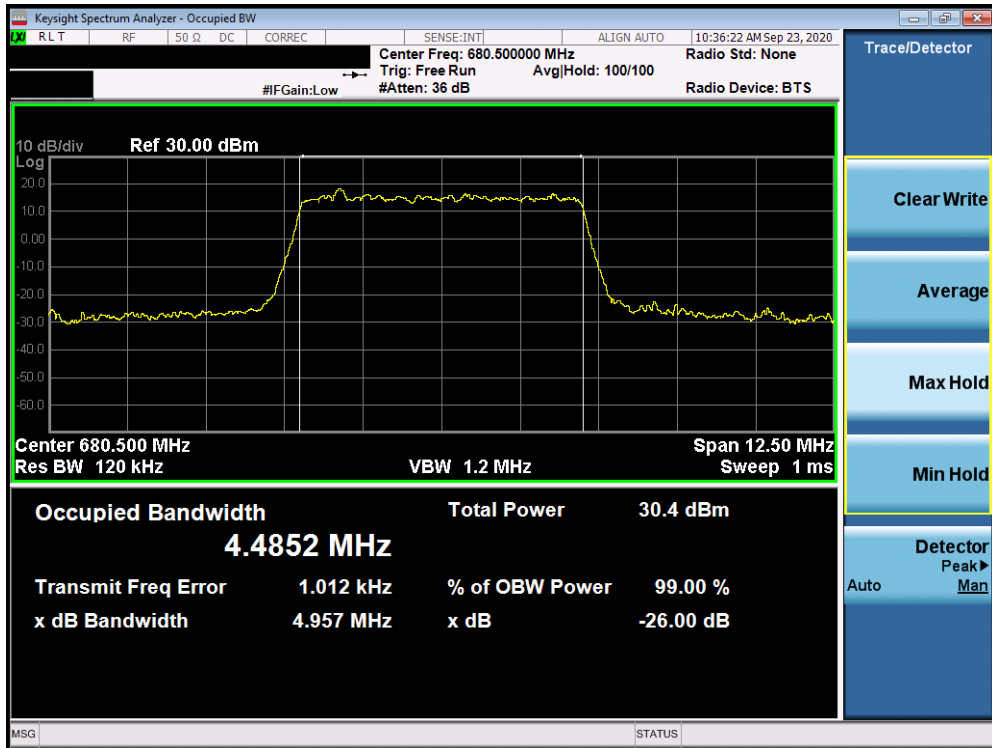


Plot 7-71. Occupied Bandwidth Plot (n71 5MHz BPSK-DFT-s-OFDM- Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 51 of 332

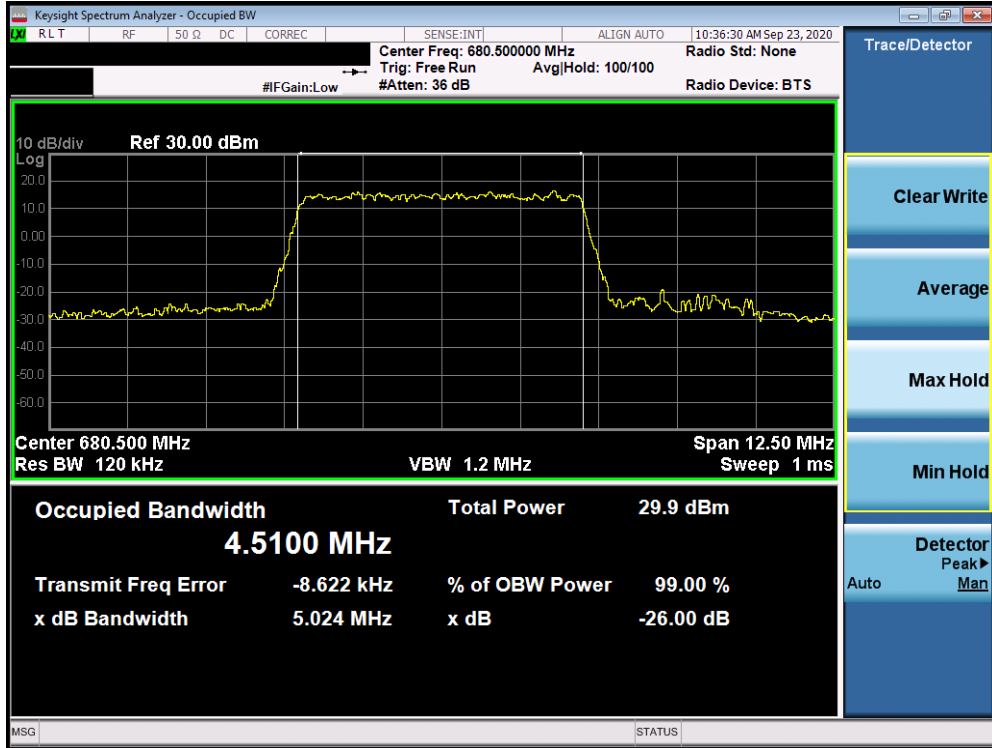


Plot 7-72. Occupied Bandwidth Plot (n71 5MHz QPSK-CP-OFDM - Full RB Configuration)

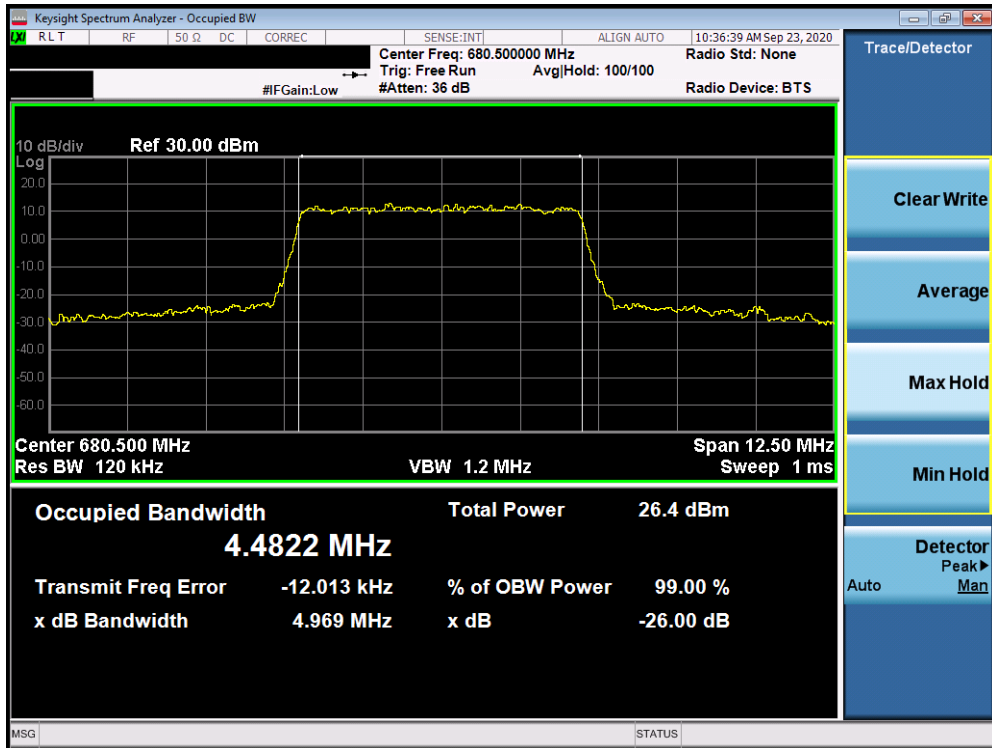


Plot 7-73. Occupied Bandwidth Plot (n71 5MHz 16QAM-CP-OFDM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 52 of 332



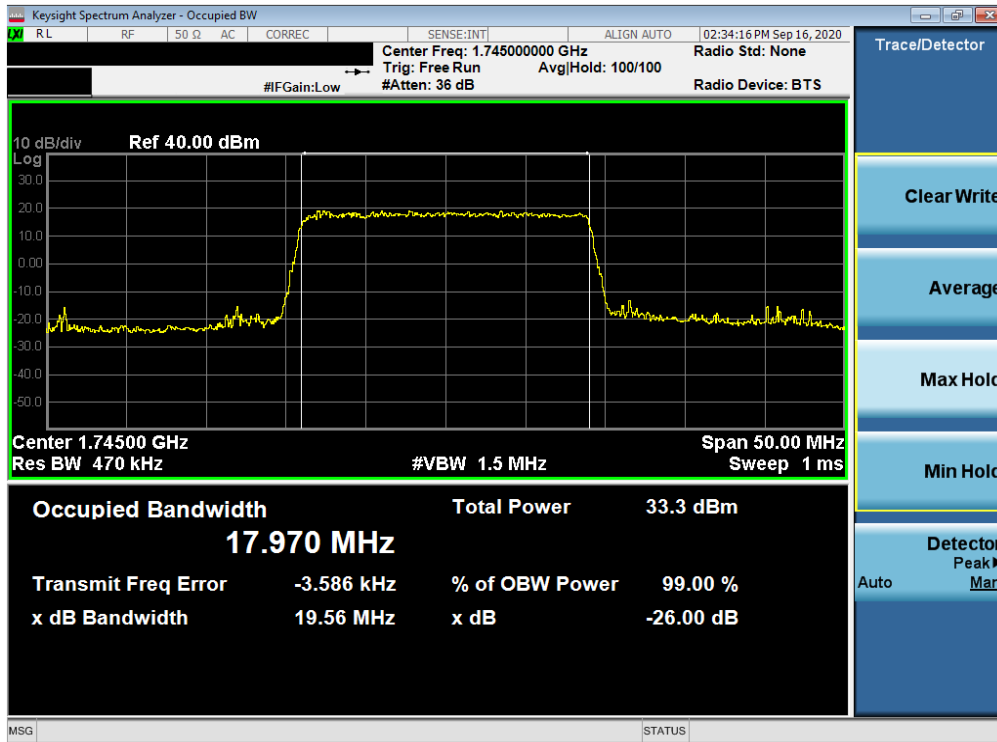
Plot 7-74. Occupied Bandwidth Plot (n71 5MHz 64QAM-CP-OFDM- Full RB Configuration)



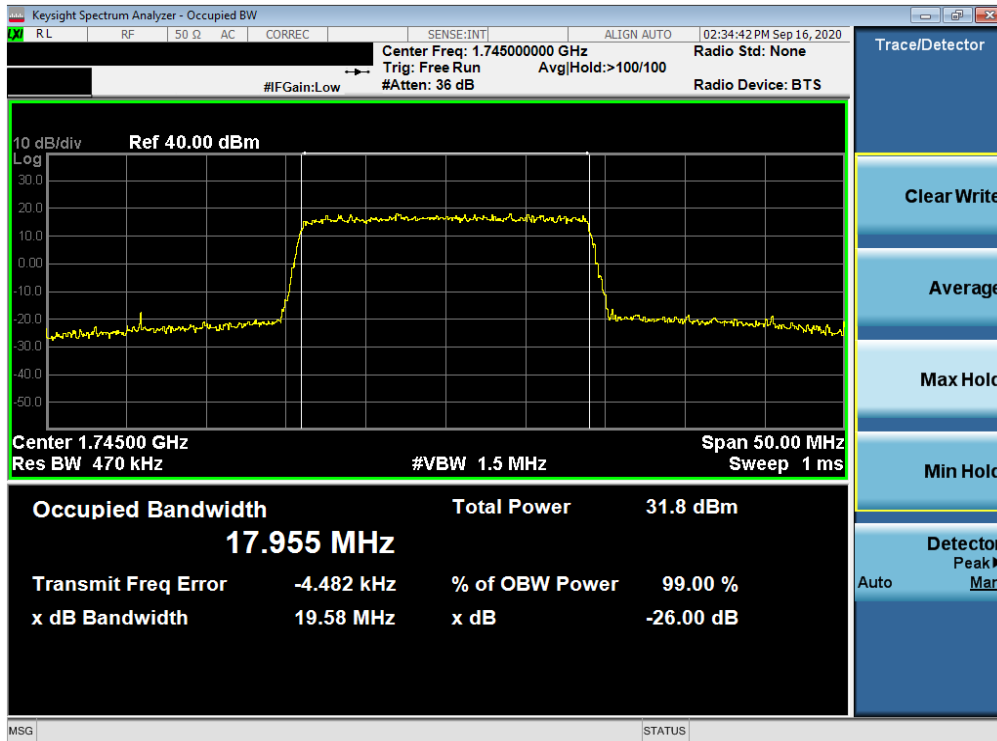
Plot 7-75. Occupied Bandwidth Plot (n71 5MHz 256QAM-CP-OFDM- Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 53 of 332

### LTE Band 66/4

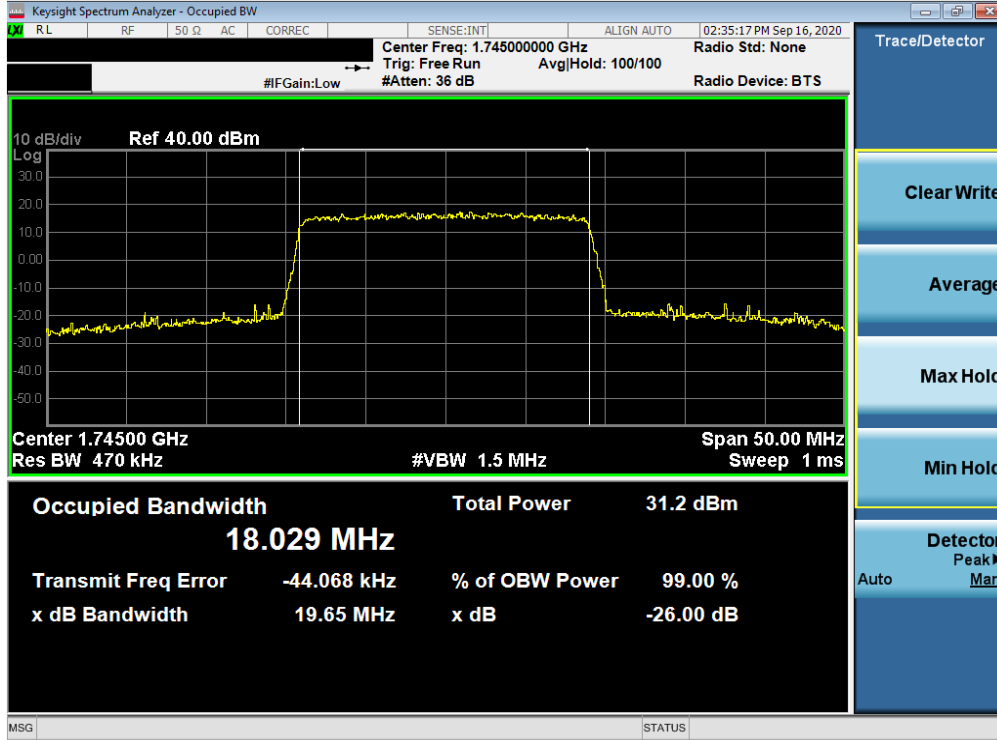


Plot 7-76. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)

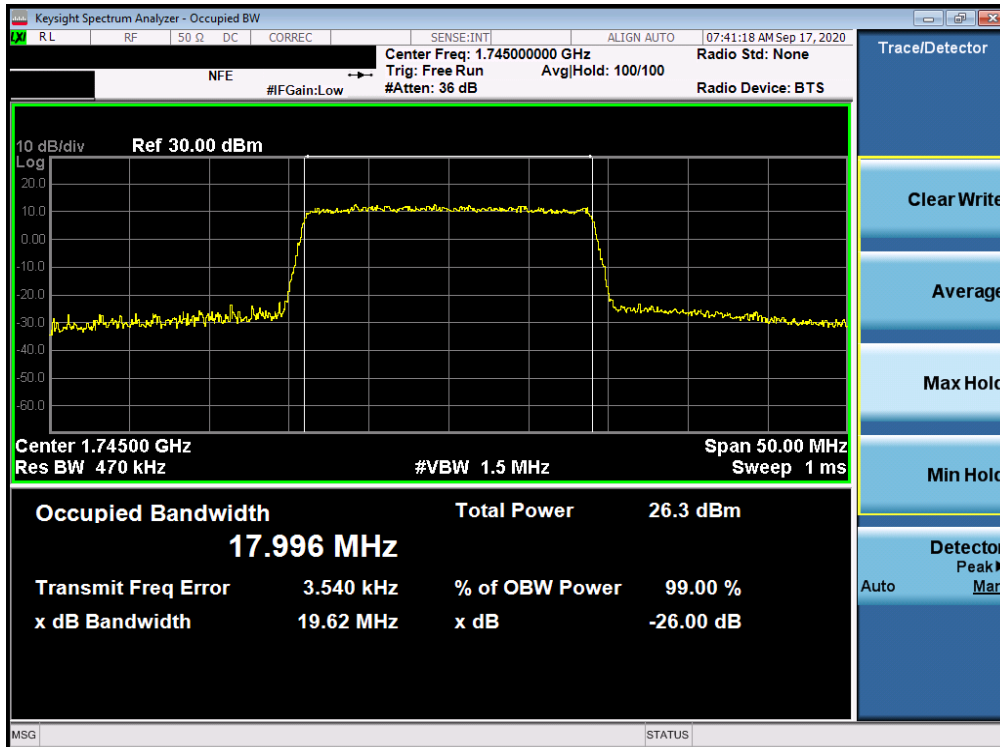


Plot 7-77. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	<b>PART 27 MEASUREMENT REPORT</b>	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 54 of 332

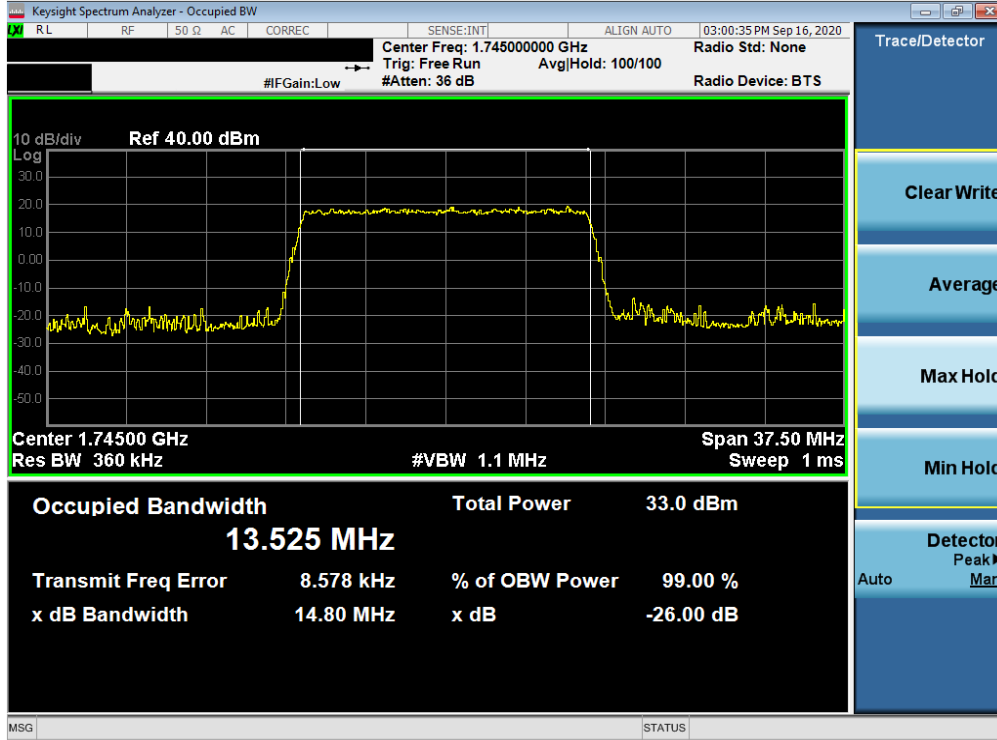


Plot 7-78. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB Configuration)



Plot 7-79. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 55 of 332



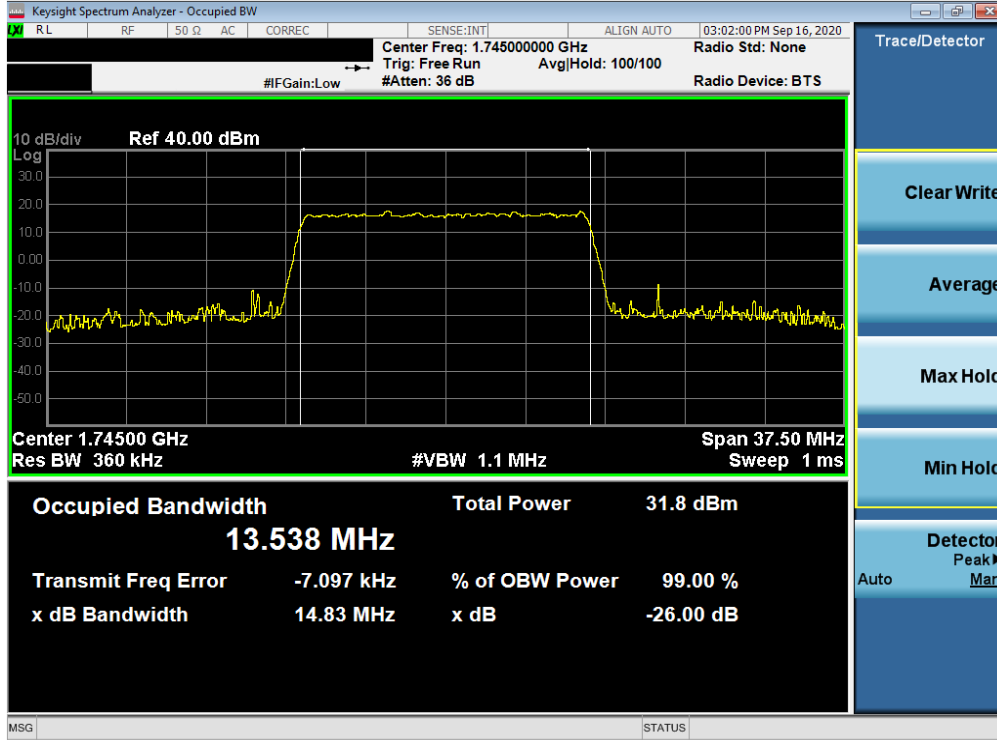
Plot 7-80. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)



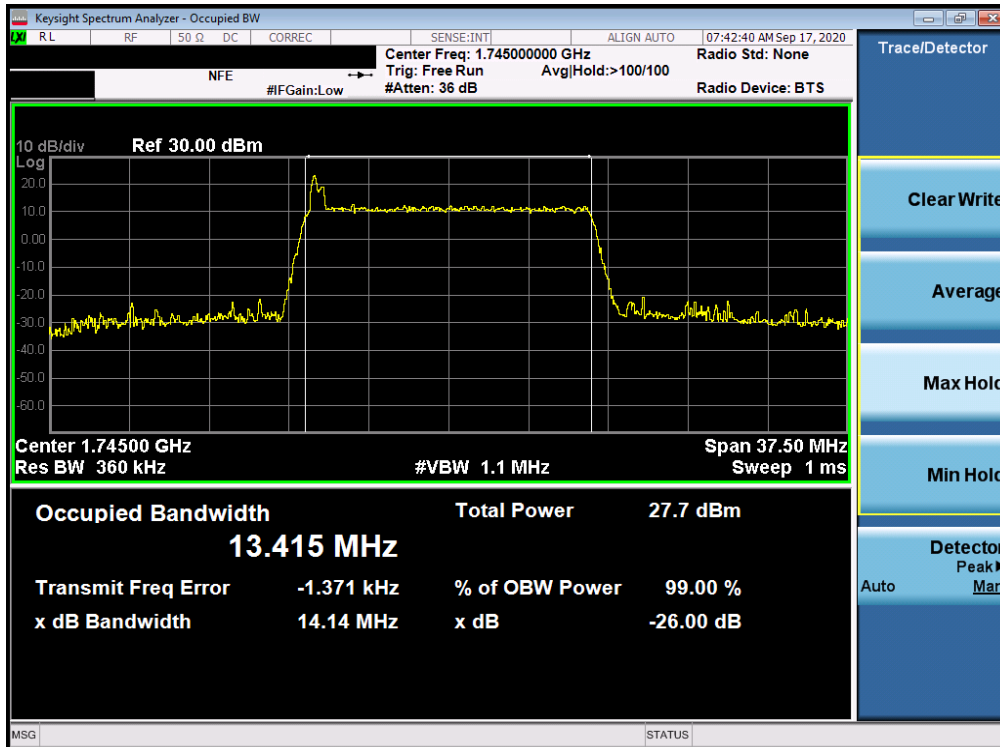
Plot 7-81. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 56 of 332





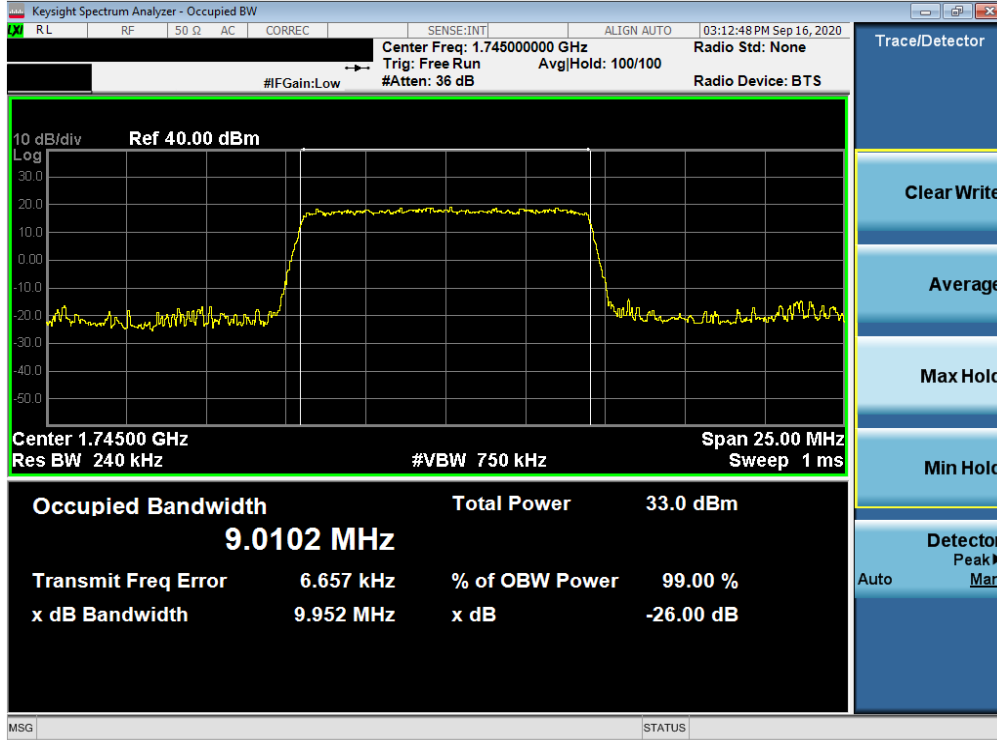


Plot 7-82. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)

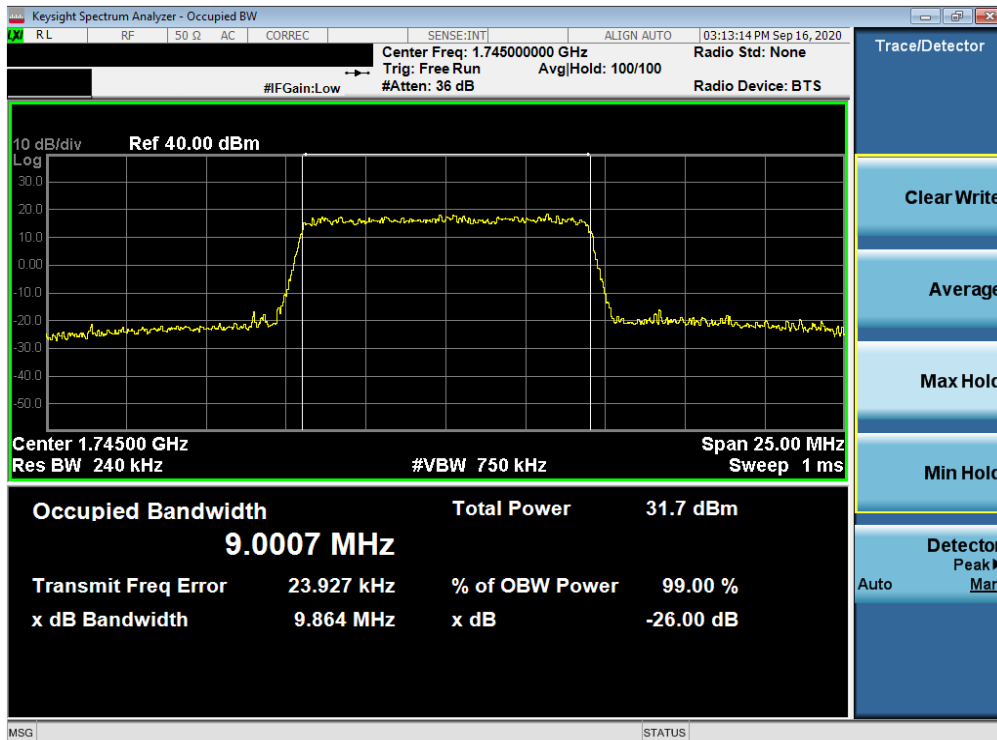


Plot 7-83. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 57 of 332

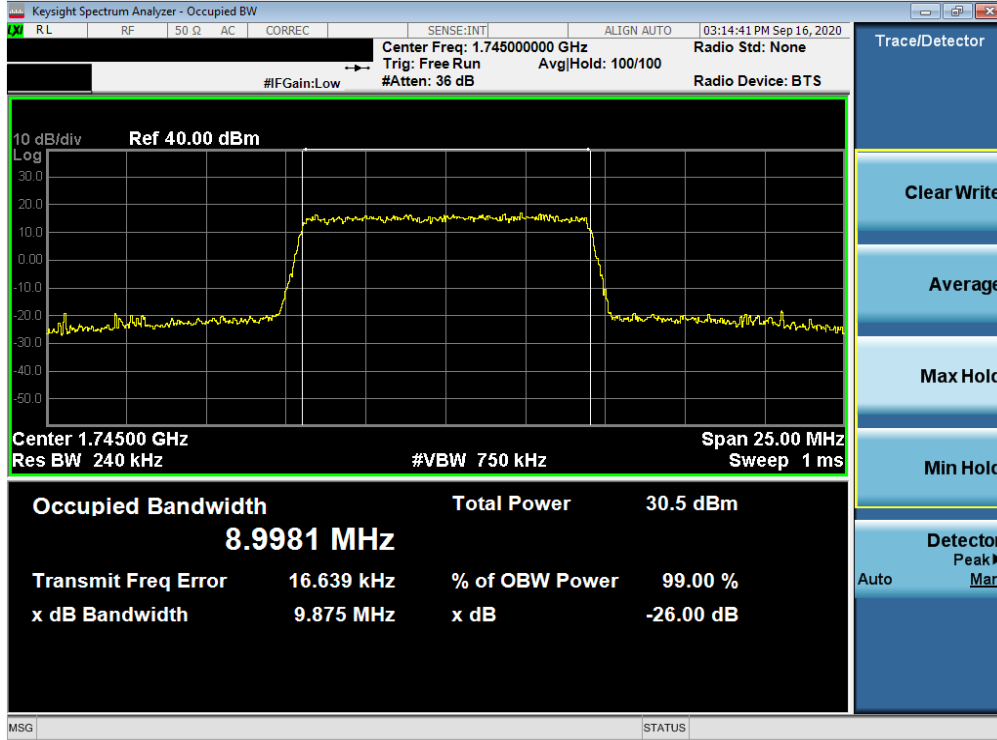


Plot 7-84. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)

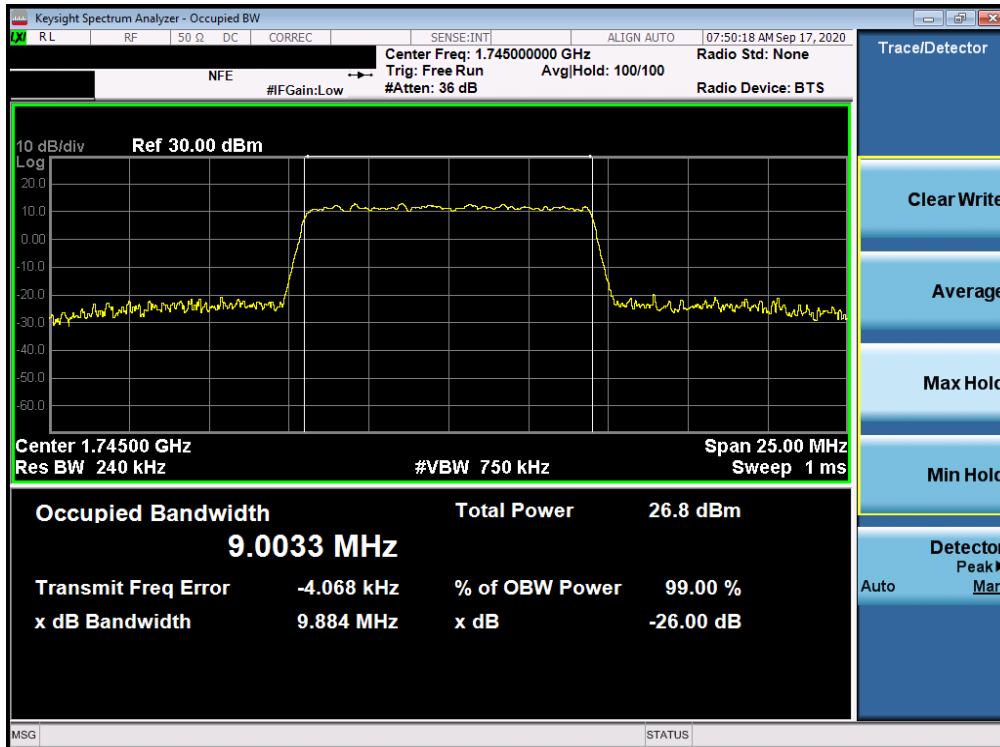


Plot 7-85. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 58 of 332

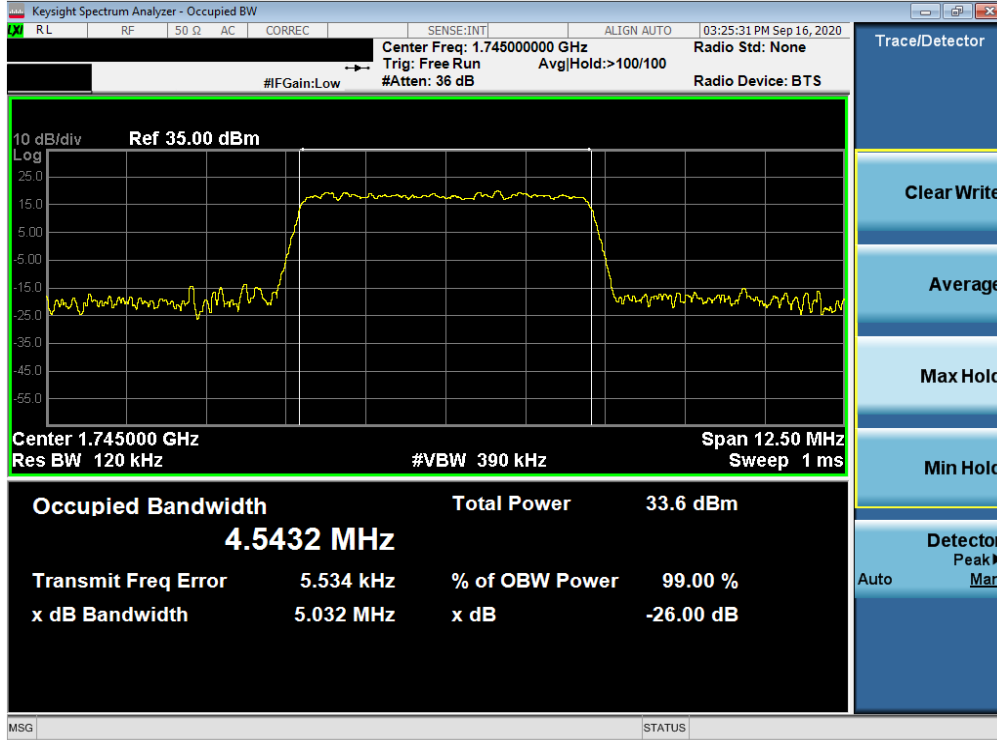


Plot 7-86. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB Configuration)

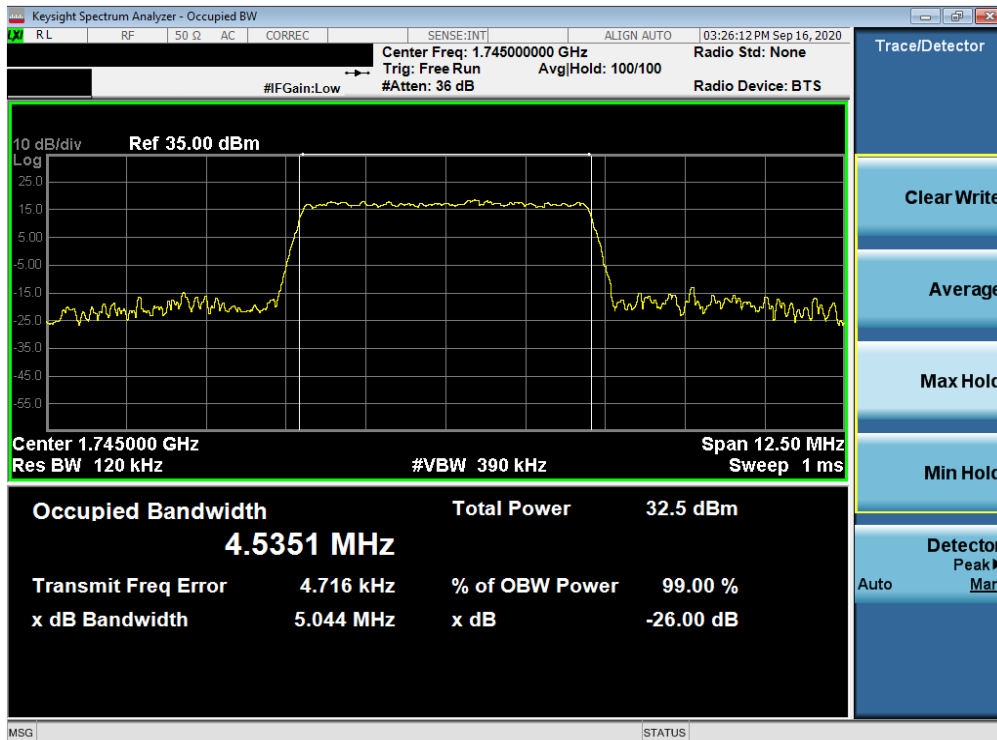


Plot 7-87. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 59 of 332

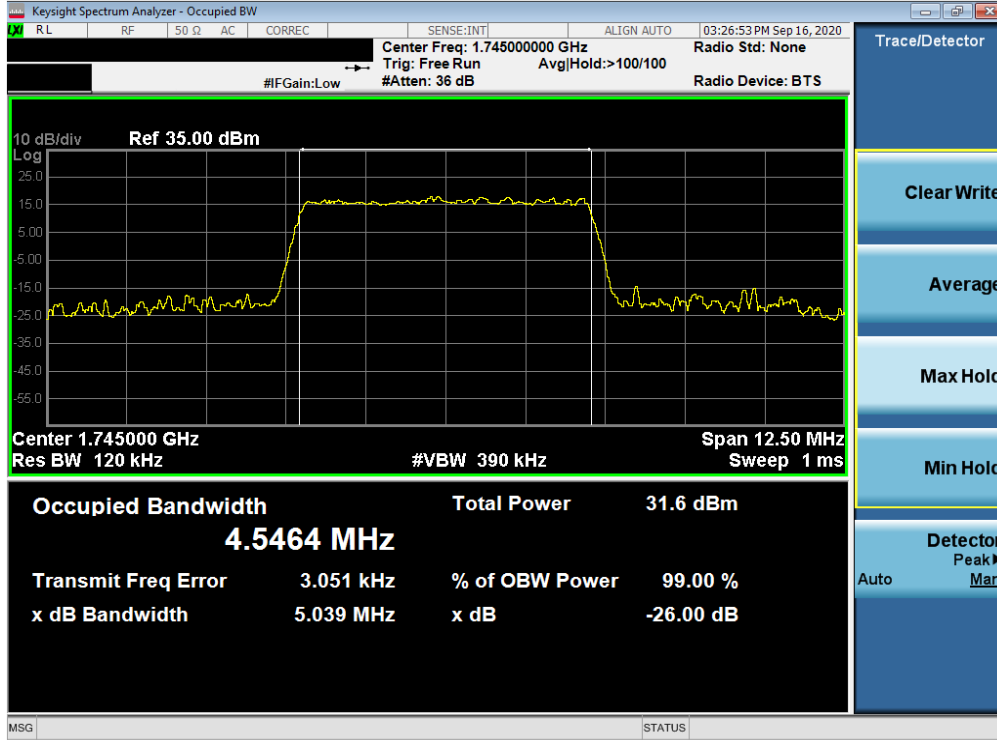


Plot 7-88. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)

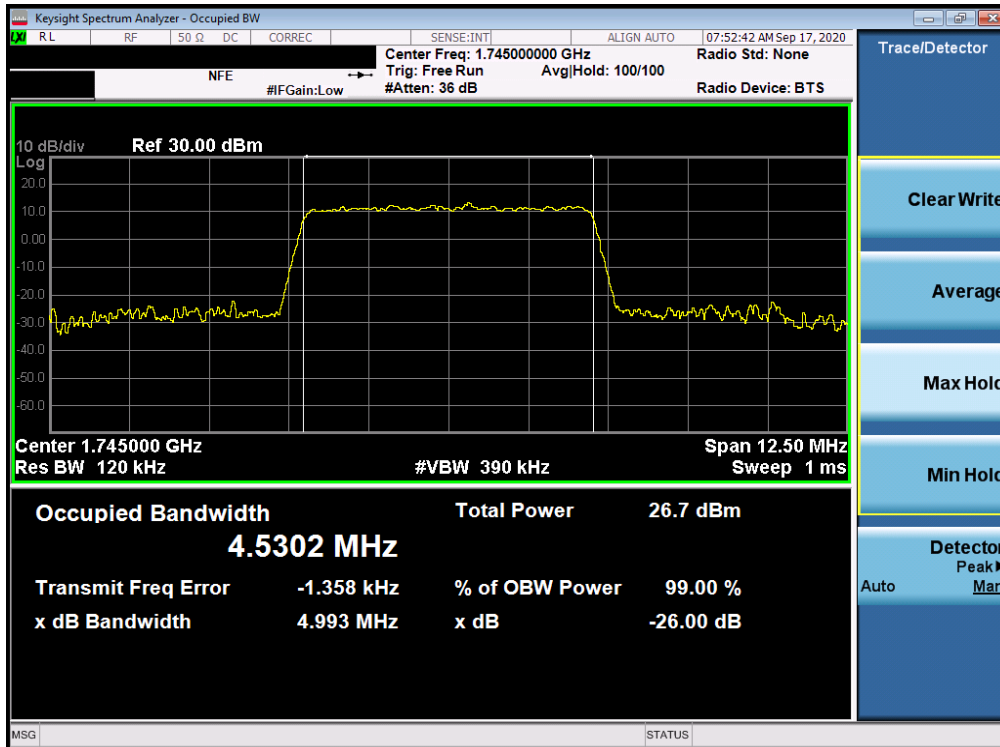


Plot 7-89. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 60 of 332

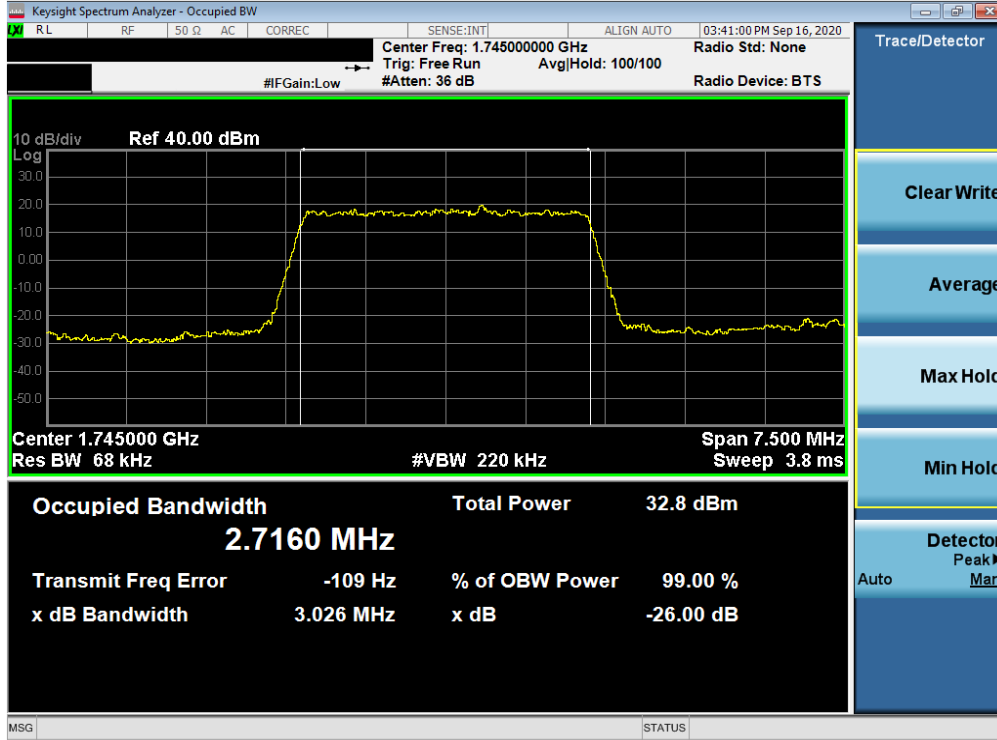


Plot 7-90. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)

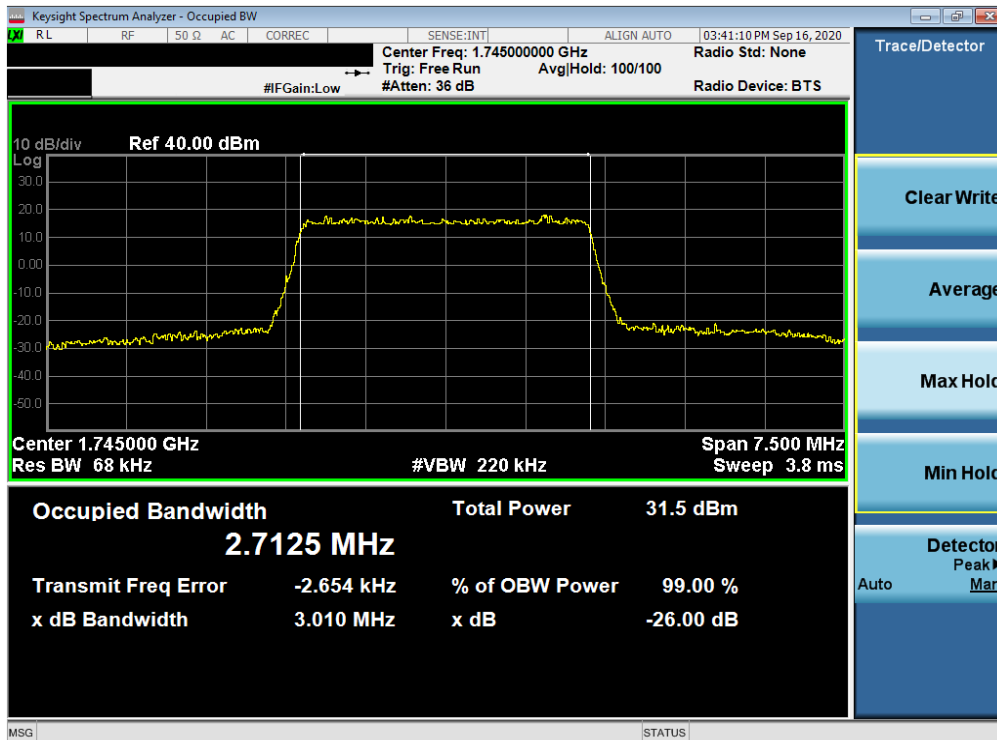


Plot 7-91. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 - 12/05/2020	EUT Type: Portable Handset		Page 61 of 332

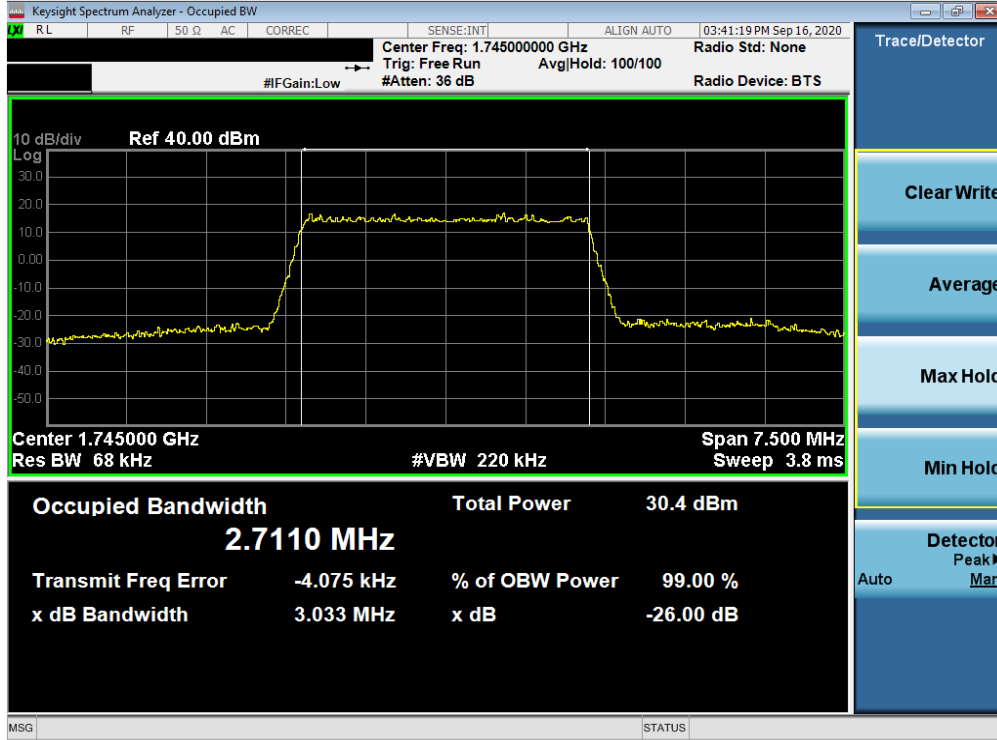


Plot 7-92. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)

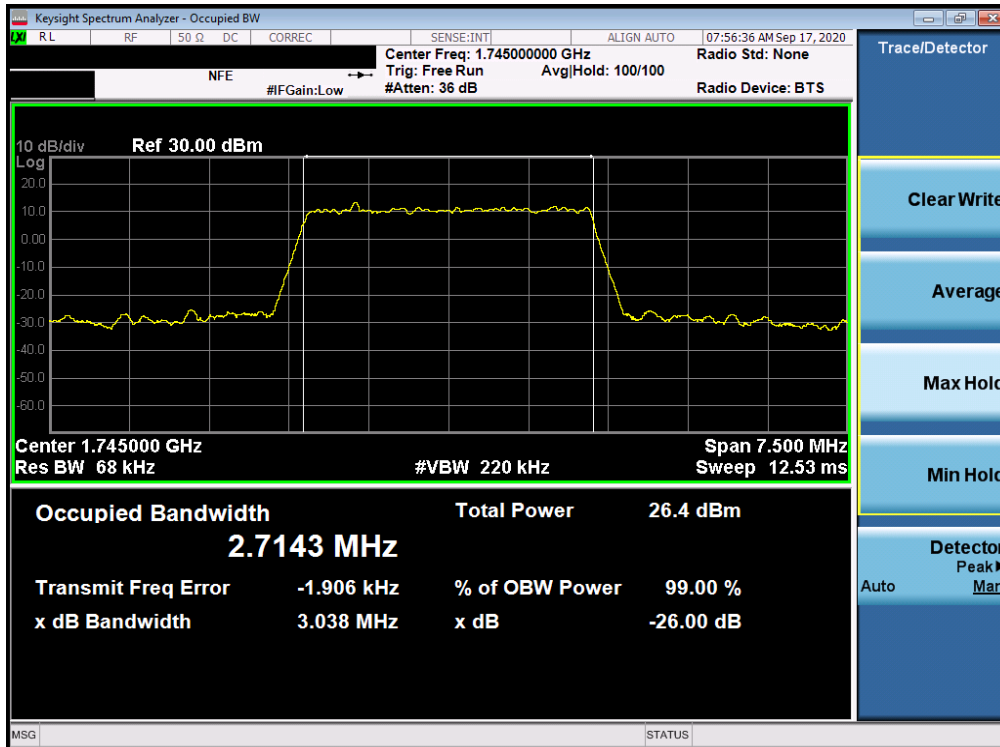


Plot 7-93. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 62 of 332



Plot 7-94. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-95. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	<b>PCTEST</b> Proud to be part of element	PART 27 MEASUREMENT REPORT	<b>SAMSUNG</b>	Approved by: Quality Manager
Test Report S/N: 1M2009140143-20-R1.A3L	Test Dates: 09/15/2020 – 12/05/2020	EUT Type: Portable Handset		Page 63 of 332