

MEASUREMENT REPORT

LTE / Sub-6GHz NR

Applicant Name:
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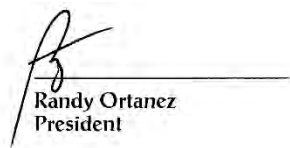
Date of Testing:
4/29 - 8/12/2020
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2004140062-03.A3L

FCC ID:	A3LSMH204V
APPLICANT:	Samsung Electronics Co., Ltd.

Application Type: Certification
Model: SM-H204V
EUT Type: Indoor Customer Premises Equipment (CPE)
FCC Classification: PCS Licensed Transmitter(PCB)
FCC Rule Part(s): 22, 24 & 27
Test Procedure(s): ANSI C63.26-2015, ANSI/TIA-603-E-2016, ANSI C63.4-2014, KDB 971168 D01 v03r01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Randy Ortanez
President

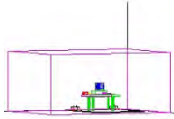


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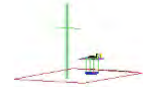
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MEASUREMENT REPORT

FCC Part 22, 24 & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 13	27	779.5 - 784.5	0.125	20.98	4M52G7D	QPSK
LTE Band 13	27	779.5 - 784.5	0.102	20.07	4M50W7D	16QAM
LTE Band 13	27	779.5 - 784.5	0.072	18.55	4M51W7D	64QAM
LTE Band 13	27	782	0.047	16.68	8M98G7D	QPSK
LTE Band 13	27	782	0.037	15.65	8M97W7D	16QAM
LTE Band 13	27	782	0.022	13.50	8M98W7D	64QAM
LTE Band 5	22H	824.7 - 848.3	0.082	19.14	1M10G7D	QPSK
LTE Band 5	22H	824.7 - 848.3	0.072	18.56	1M09W7D	16QAM
LTE Band 5	22H	824.7 - 848.3	0.056	17.50	1M10W7D	64QAM
LTE Band 5	22H	825.5 - 847.5	0.083	19.20	2M71G7D	QPSK
LTE Band 5	22H	825.5 - 847.5	0.070	18.46	2M70W7D	16QAM
LTE Band 5	22H	825.5 - 847.5	0.056	17.48	2M71W7D	64QAM
LTE Band 5	22H	826.5 - 846.5	0.085	19.32	4M52G7D	QPSK
LTE Band 5	22H	826.5 - 846.5	0.071	18.53	4M51W7D	16QAM
LTE Band 5	22H	826.5 - 846.5	0.057	17.55	4M52W7D	64QAM
LTE Band 5	22H	829 - 844	0.085	19.32	9M01G7D	QPSK
LTE Band 5	22H	829 - 844	0.068	18.31	9M04W7D	16QAM
LTE Band 5	22H	829 - 844	0.052	17.20	9M00W7D	64QAM

EUT LTE Overview (<1 GHz)

Mode	FCC Rule Part	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
NR Band n5	22H	20 MHz	π/2 BPSK	834.0 - 839.0	0.071	18.50	17M9G7D
			QPSK	834.0 - 839.0	0.054	17.30	19M0G7D
			16QAM	834.0 - 839.0	0.040	16.04	19M0W7D
			64QAM	834.0 - 839.0	0.026	14.11	19M1W7D
			256QAM	834.0 - 839.0	0.019	12.77	18M9W7D
		15 MHz	π/2 BPSK	831.5 - 841.5	0.040	16.03	13M5G7D
			QPSK	831.5 - 841.5	0.032	15.11	14M2G7D
			16QAM	831.5 - 841.5	0.022	13.47	14M2W7D
			64QAM	831.5 - 841.5	0.013	11.17	14M2W7D
			256QAM	831.5 - 841.5	0.009	9.36	14M3W7D
		10 MHz	π/2 BPSK	829.0 - 844.0	0.041	16.12	9M01G7D
			QPSK	829.0 - 844.0	0.031	14.87	9M36G7D
			16QAM	829.0 - 844.0	0.021	13.18	9M36W7D
			64QAM	829.0 - 844.0	0.014	11.35	9M34W7D
			256QAM	829.0 - 844.0	0.009	9.60	9M37W7D
		5 MHz	π/2 BPSK	826.5 - 846.5	0.040	16.04	4M52G7D
			QPSK	826.5 - 846.5	0.031	14.96	4M54G7D
			16QAM	826.5 - 846.5	0.022	13.34	4M57W7D
			64QAM	826.5 - 846.5	0.013	11.10	4M54W7D
			256QAM	826.5 - 846.5	0.009	9.52	4M53W7D

EUT Sub6 Overview (<1 GHz)

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Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
			Max. Power (W)	Max. Power (dBm)		
LTE Band 66/4	27	1710.7 - 1779.3	0.677	28.31	1M09G7D	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.496	26.96	1M07W7D	16QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.351	25.46	1M07W7D	64QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.663	28.21	2M70G7D	QPSK
LTE Band 66/4	27	1711.5 - 1778.5	0.505	27.03	2M70W7D	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.360	25.56	2M71W7D	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.680	28.32	4M45G7D	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.536	27.29	4M52W7D	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.373	25.71	4M44W7D	64QAM
LTE Band 66/4	27	1715 - 1775	0.632	28.01	9M02G7D	QPSK
LTE Band 66/4	27	1715 - 1775	0.547	27.38	9M00W7D	16QAM
LTE Band 66/4	27	1715 - 1775	0.332	25.22	9M00W7D	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.672	28.27	13M5G7D	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.563	27.50	13M6W7D	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.347	25.40	13M5W7D	64QAM
LTE Band 66/4	27	1720 - 1770	0.690	28.39	18M1G7D	QPSK
LTE Band 66/4	27	1720 - 1770	0.563	27.51	18M1W7D	16QAM
LTE Band 66/4	27	1720 - 1770	0.412	26.15	18M0W7D	64QAM
LTE Band 2	24E	1850.7 - 1909.3	0.818	29.13	1M09G7D	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.653	28.15	1M10W7D	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.537	27.30	1M10W7D	64QAM
LTE Band 2	24E	1851.5 - 1908.5	0.819	29.13	2M71G7D	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.648	28.12	2M71W7D	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.512	27.10	2M71W7D	64QAM
LTE Band 2	24E	1852.5 - 1907.5	0.846	29.27	4M51G7D	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.664	28.22	4M51W7D	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.526	27.21	4M51W7D	64QAM
LTE Band 2	24E	1855 - 1905	0.892	29.50	8M99G7D	QPSK
LTE Band 2	24E	1855 - 1905	0.712	28.52	9M00W7D	16QAM
LTE Band 2	24E	1855 - 1905	0.541	27.33	8M99W7D	64QAM
LTE Band 2	24E	1857.5 - 1902.5	0.882	29.45	13M5G7D	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.717	28.55	13M5W7D	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.611	27.86	13M5W7D	64QAM
LTE Band 2	24E	1860 - 1900	0.896	29.52	17M9G7D	QPSK
LTE Band 2	24E	1860 - 1900	0.742	28.70	17M9W7D	16QAM
LTE Band 2	24E	1860 - 1900	0.567	27.53	17M9W7D	64QAM

EUT LTE Overview (Mid Bands)

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Mode	FCC Rule Part	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
NR Band n66	27	20 MHz	$\pi/2$ BPSK	1720 - 1770	0.307	24.87	18M0G7D
			QPSK	1720 - 1770	0.330	25.19	19M0G7D
			16QAM	1720 - 1770	0.275	24.40	19M0W7D
			64QAM	1720 - 1770	0.170	22.31	19M0W7D
			256QAM	1720 - 1770	0.109	20.38	19M0W7D
		15 MHz	$\pi/2$ BPSK	1717.5 - 1772.5	0.312	24.95	13M5G7D
			QPSK	1717.5 - 1772.5	0.335	25.25	14M2G7D
			16QAM	1717.5 - 1772.5	0.295	24.70	14M1W7D
			64QAM	1717.5 - 1772.5	0.178	22.50	14M2W7D
			256QAM	1717.5 - 1772.5	0.105	20.22	14M2W7D
		10 MHz	$\pi/2$ BPSK	1715 - 1775	0.306	24.86	9M04G7D
			QPSK	1715 - 1775	0.333	25.23	9M31G7D
			16QAM	1715 - 1775	0.287	24.58	9M31W7D
			64QAM	1715 - 1775	0.179	22.53	9M35W7D
			256QAM	1715 - 1775	0.104	20.16	9M35W7D
		5 MHz	$\pi/2$ BPSK	1712.5 - 1777.5	0.309	24.90	4M58G7D
			QPSK	1712.5 - 1777.5	0.359	25.55	4M51G7D
			16QAM	1712.5 - 1777.5	0.283	24.51	4M50W7D
			64QAM	1712.5 - 1777.5	0.177	22.48	4M50W7D
					256QAM	1712.5 - 1777.5	0.126

EUT Sub6 Overview (NR Band n66)

Mode	FCC Rule Part	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
NR Band n2	24E	20 MHz	$\pi/2$ BPSK	1860 - 1900	0.606	27.82	18M0G7D
			QPSK	1860 - 1900	0.633	28.02	19M0G7D
			16QAM	1860 - 1900	0.484	26.85	19M0W7D
			64QAM	1860 - 1900	0.361	25.57	19M0W7D
			256QAM	1860 - 1900	0.215	23.31	18M9W7D
		15 MHz	$\pi/2$ BPSK	1857.5 - 1902.5	0.663	28.22	13M5G7D
			QPSK	1857.5 - 1902.5	0.768	28.85	14M2G7D
			16QAM	1857.5 - 1902.5	0.624	27.95	14M2W7D
			64QAM	1857.5 - 1902.5	0.386	25.87	14M2W7D
			256QAM	1857.5 - 1902.5	0.218	23.38	14M2W7D
		10 MHz	$\pi/2$ BPSK	1855 - 1905	0.613	27.87	9M03G7D
			QPSK	1855 - 1905	0.632	28.01	9M33G7D
			16QAM	1855 - 1905	0.595	27.74	9M34W7D
			64QAM	1855 - 1905	0.349	25.43	9M39W7D
			256QAM	1855 - 1905	0.218	23.38	9M30W7D
		5 MHz	$\pi/2$ BPSK	1852.5 - 1907.5	0.848	29.29	4M51G7D
			QPSK	1852.5 - 1907.5	0.851	29.30	4M53G7D
			16QAM	1852.5 - 1907.5	0.651	28.13	4M55W7D
			64QAM	1852.5 - 1907.5	0.360	25.57	4M54W7D
					256QAM	1852.5 - 1907.5	0.231

EUT Sub6 Overview (NR Band n2)

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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 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 Indoor Customer Premises Equipment (CPE) FCC ID: A3LSMH204V**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 04930, 03963, 03922, 04955

2.2 Device Capabilities

This device contains the following capabilities:

Multi-band LTE, 5G NR (n5, n66, n2, n261, n260), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (LE)

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.

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.

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

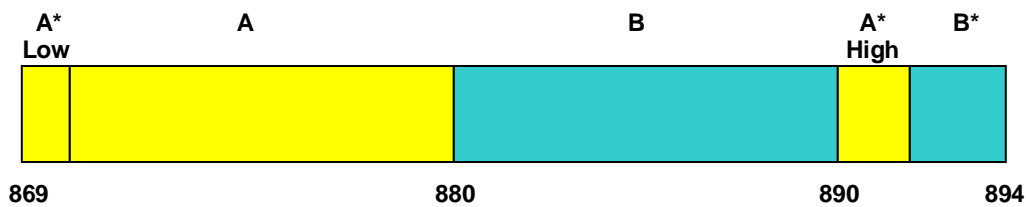
3.1 Measurement Procedure

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 Block C Frequency Range

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

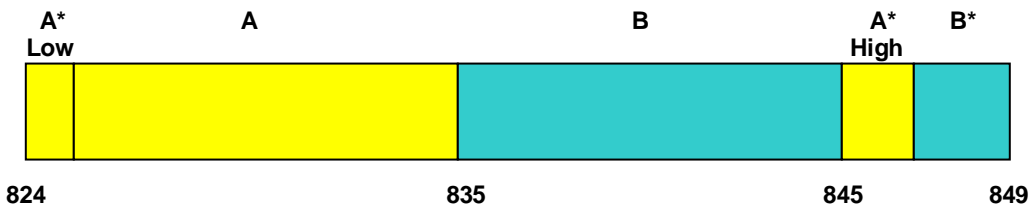
3.3 Cellular - Base Frequency Blocks



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

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

3.4 Cellular - Mobile Frequency Blocks

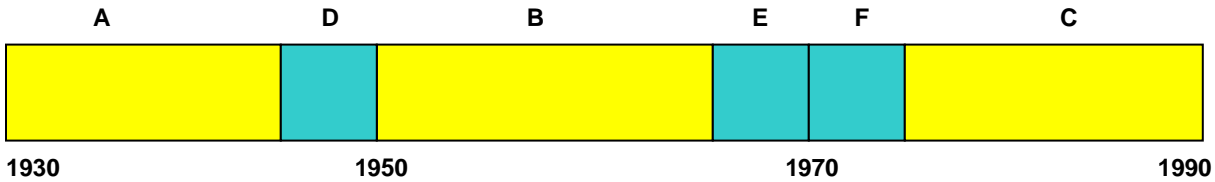


BLOCK 1: 824 – 835 MHz (A* Low + A)
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)
BLOCK 4: 846.5 – 849 MHz (B*)

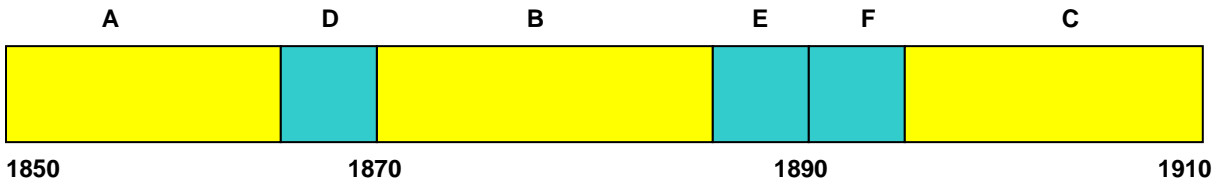
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3.5 PCS - Base Frequency Blocks



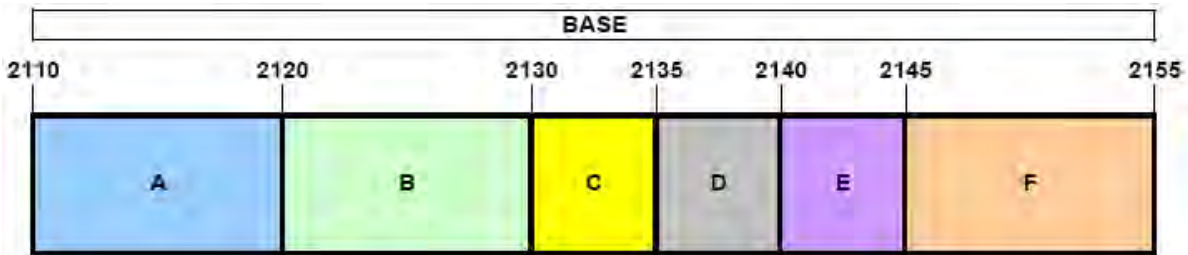
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|-------------------------------------|-------------------------------------|
| BLOCK 1: 1930 – 1945 MHz (A) | BLOCK 4: 1965 – 1970 MHz (E) |
| BLOCK 2: 1945 – 1950 MHz (D) | BLOCK 5: 1970 – 1975 MHz (F) |
| BLOCK 3: 1950 – 1965 MHz (B) | BLOCK 6: 1975 – 1990 MHz (C) |

3.6 PCS - Mobile Frequency Blocks



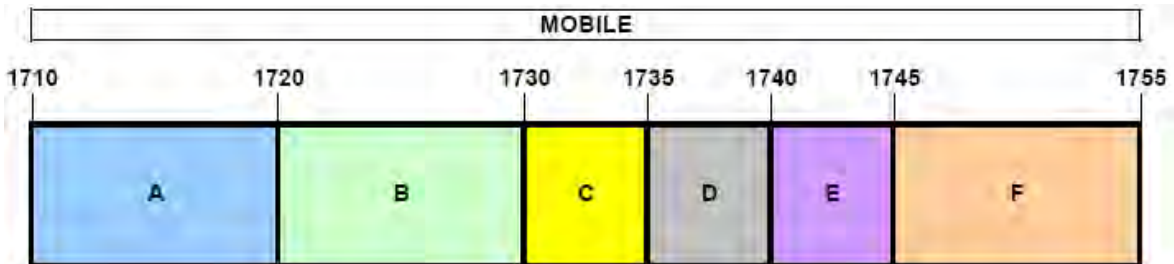
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|-------------------------------------|-------------------------------------|
| BLOCK 1: 1850 – 1865 MHz (A) | BLOCK 4: 1885 – 1890 MHz (E) |
| BLOCK 2: 1865 – 1870 MHz (D) | BLOCK 5: 1890 – 1895 MHz (F) |
| BLOCK 3: 1870 – 1885 MHz (B) | BLOCK 6: 1895 – 1910 MHz (C) |

3.7 AWS - Base Frequency Blocks



- | | |
|-------------------------------------|-------------------------------------|
| BLOCK 1: 2110 – 2120 MHz (A) | BLOCK 4: 2135 – 2140 MHz (D) |
| BLOCK 2: 2120 – 2130 MHz (B) | BLOCK 5: 2140 – 2145 MHz (E) |
| BLOCK 3: 2130 – 2135 MHz (C) | BLOCK 6: 2145 – 2155 MHz (F) |

3.8 AWS - Mobile Frequency Blocks



- | | |
|-------------------------------------|-------------------------------------|
| BLOCK 1: 1710 – 1720 MHz (A) | BLOCK 4: 1735 – 1740 MHz (D) |
| BLOCK 2: 1720 – 1730 MHz (B) | BLOCK 5: 1740 – 1745 MHz (E) |
| BLOCK 3: 1730 – 1735 MHz (C) | BLOCK 6: 1745 – 1755 MHz (F) |

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3.9 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 $43 + 10 \log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 48, the calculated P_d levels are compared to the absolute spurious emission limit of -40dBm which is equivalent to the required minimum attenuation of $70 + 10 \log_{10}(\text{Power}_{\text{[Watts]}})$.

Per the guidance of ANSI C63.26-2015, field strength method may be performed for both Radiated power and Radiated Spurious Emissions. The filed strength is converted direct from radiated emission measurement.

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
-	LTx3	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Espec	ESX-2CA	Environmental Chamber	8/13/2019	Annual	8/13/2020	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
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
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	8/26/2019	Annual	8/26/2020	100976
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
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
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
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

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: A3LSMH204V
 FCC Classification: PCS Licensed Transmitter(PCB)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(c) 27.53(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
24.232(d)	Peak-Average Ratio	< 13 dB			Section 7.5
2.1046	Transmitter Conducted Output Power	N/A			Section 7.6
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 7.9
2.1055 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)			Section 7.11

Table 7-1. Summary of Conducted Test Results

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.8
27.50(b)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 13)	< 3 Watts max. ERP			Section 7.8
24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP			Section 7.8
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4/66)	< 1 Watts max. EIRP			Section 7.8
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(h)	Undesirable Emissions (Band 13/5, 66/4/2)	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.9
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz			Section 7.9

Table 7-2. Summary of Radiated Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots (Sections 7.2, 7.3, 7.4,7.5) were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "LTE Automation," Version 5.3.
- 5) For 5G NR, both DFT-s and CP-OFDM transmission scheme were investigated. The worst case test result is included.

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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.

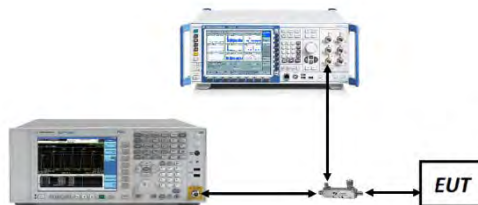


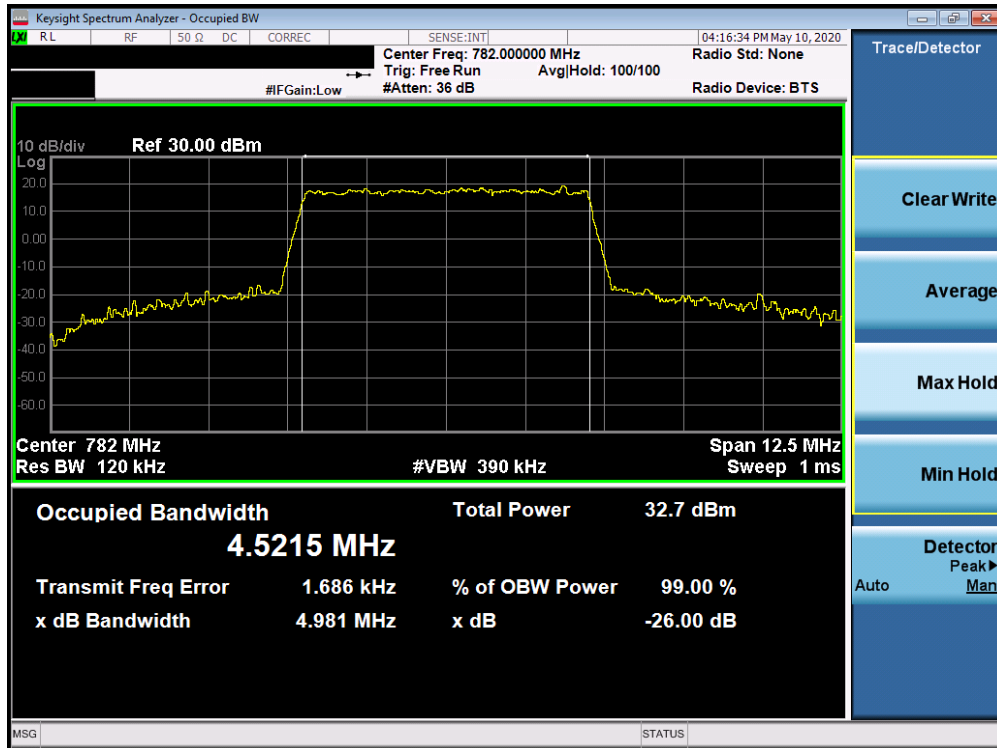
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

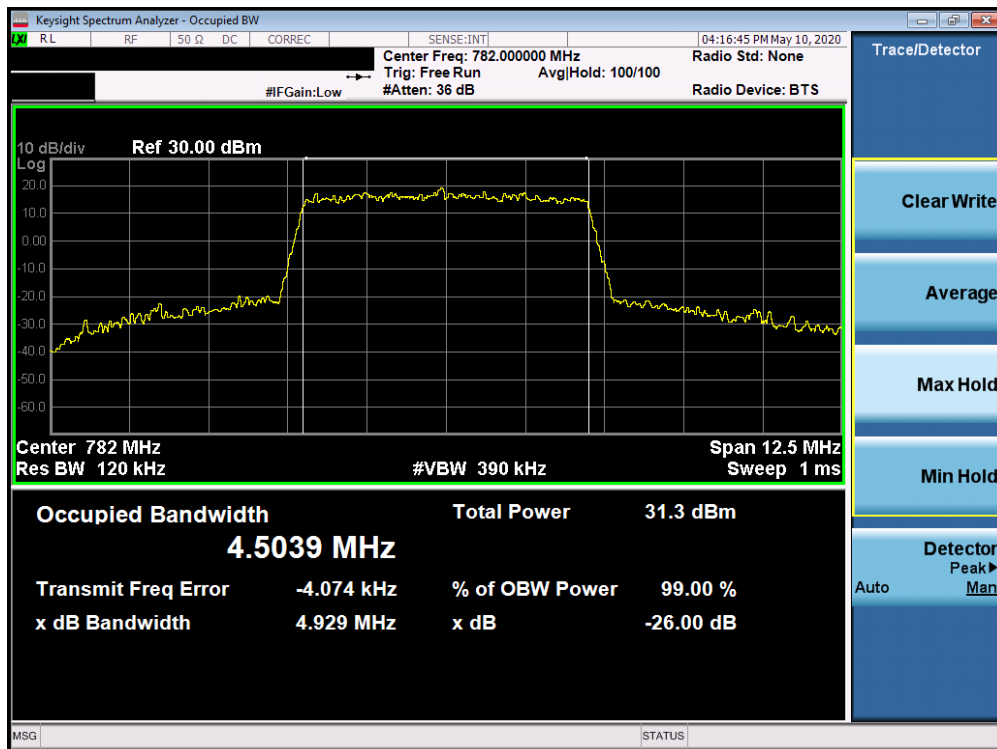
None.

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 13

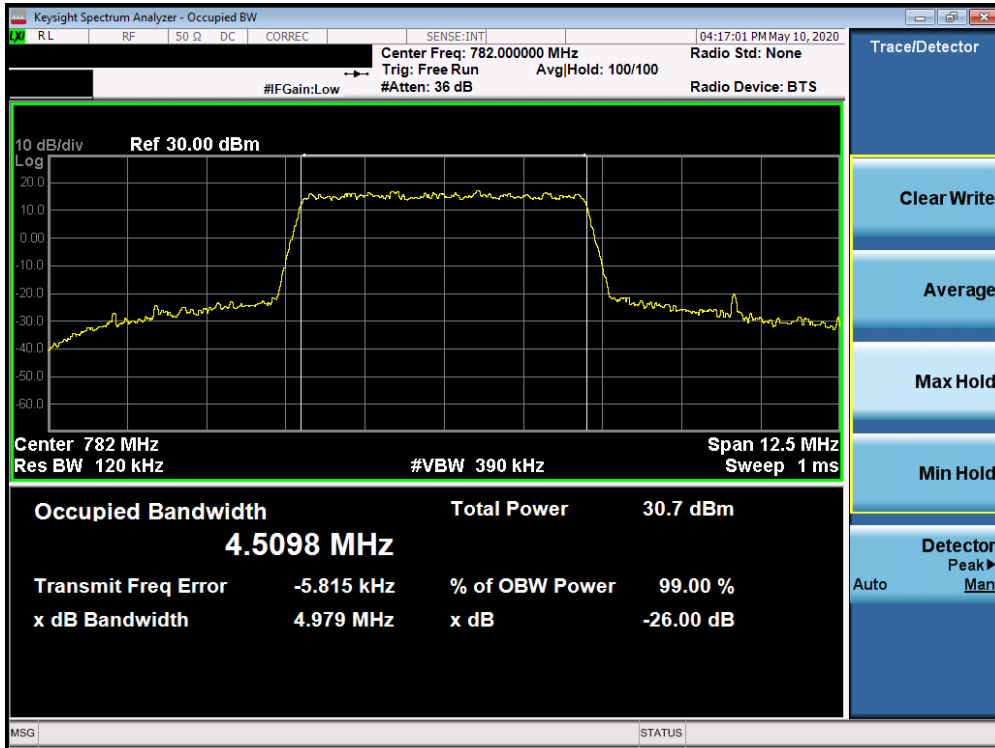


Plot 7-1. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

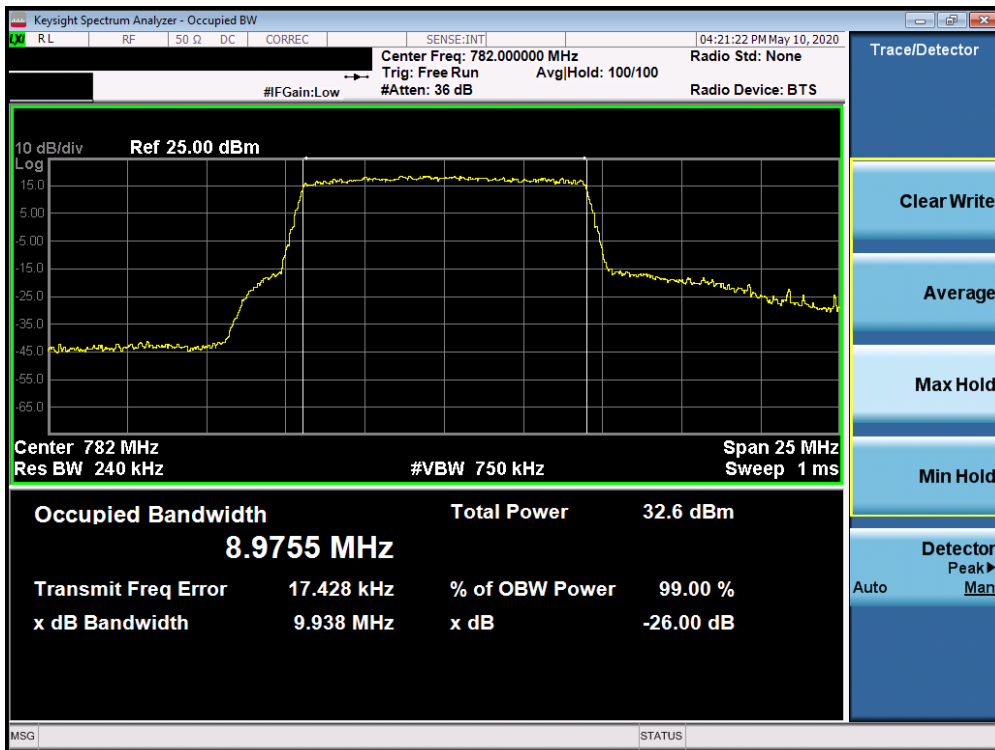


Plot 7-2. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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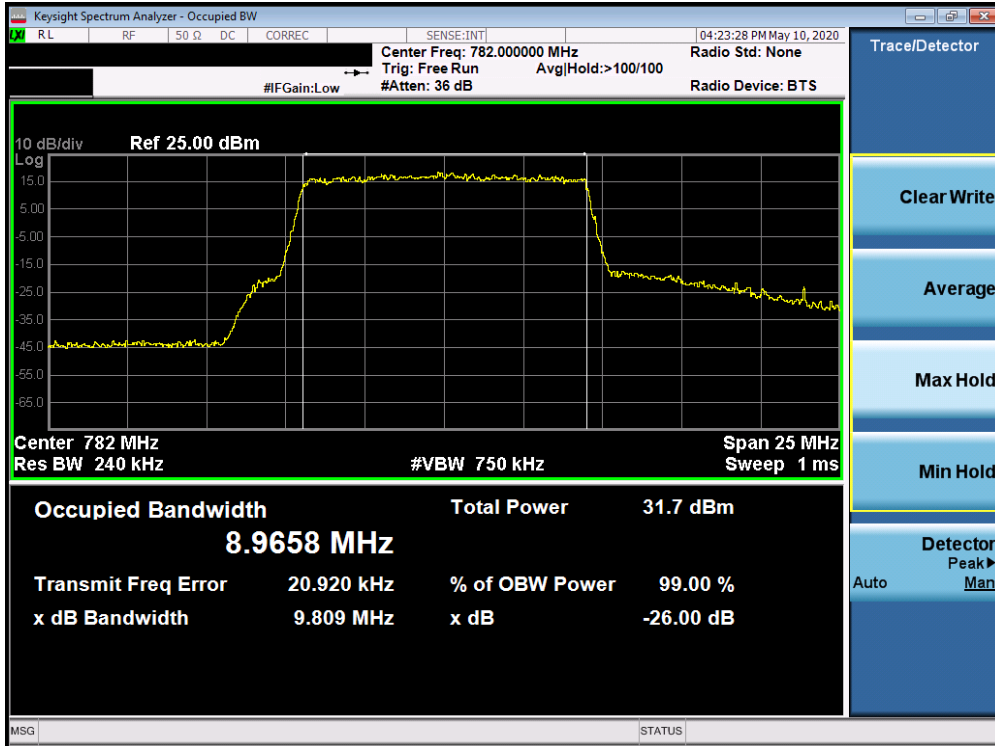


Plot 7-3. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)

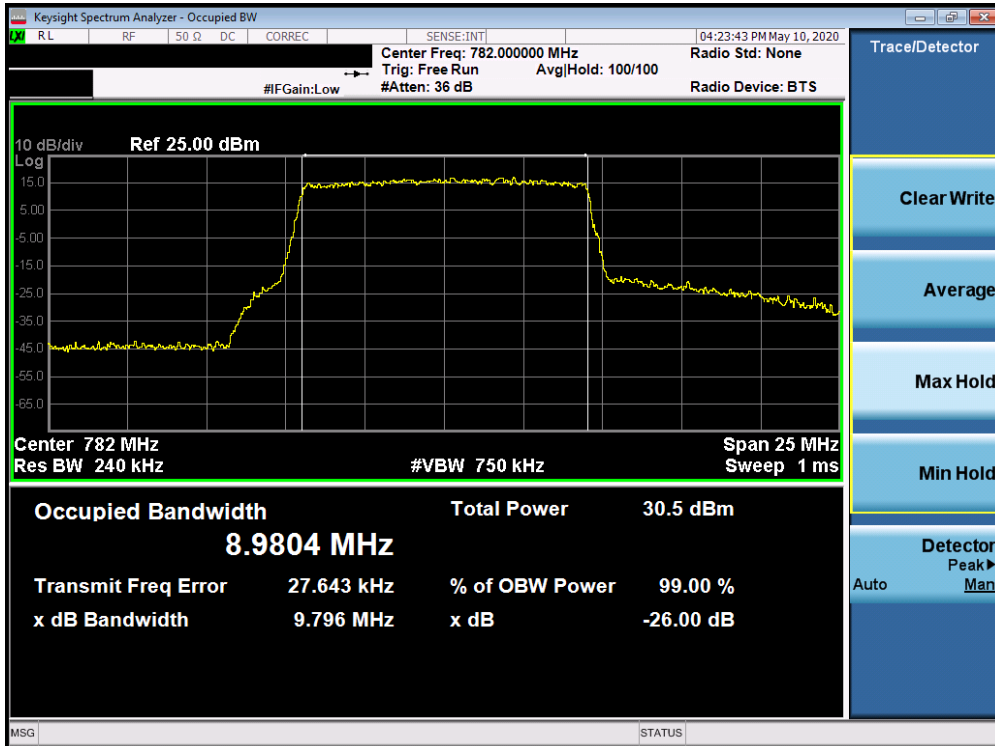


Plot 7-4. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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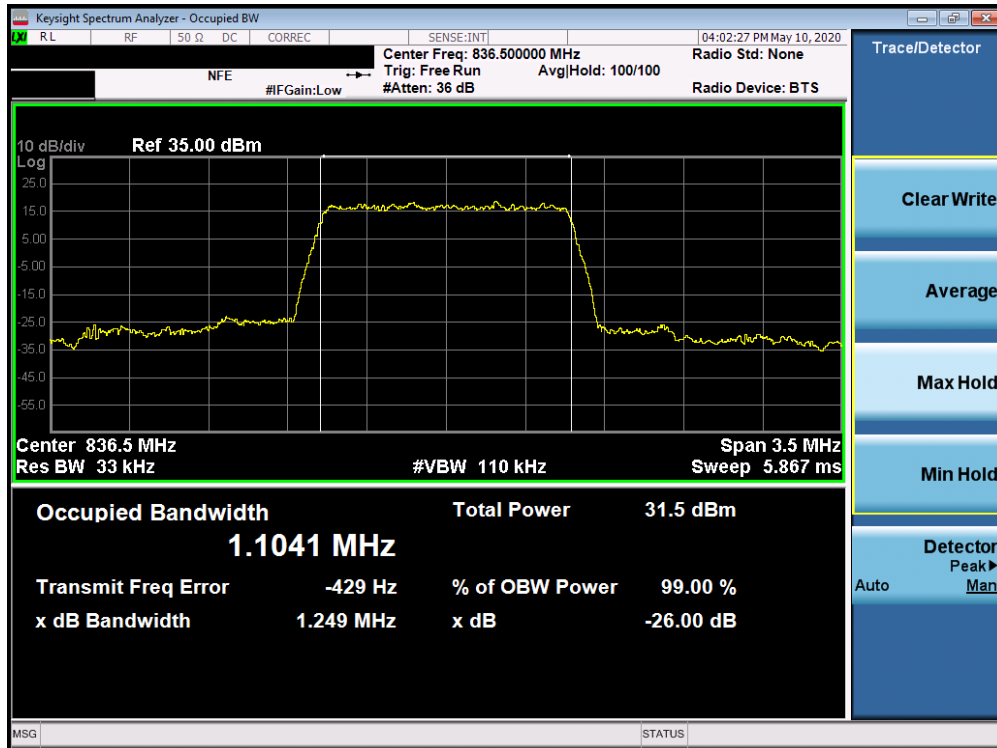
Plot 7-5. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



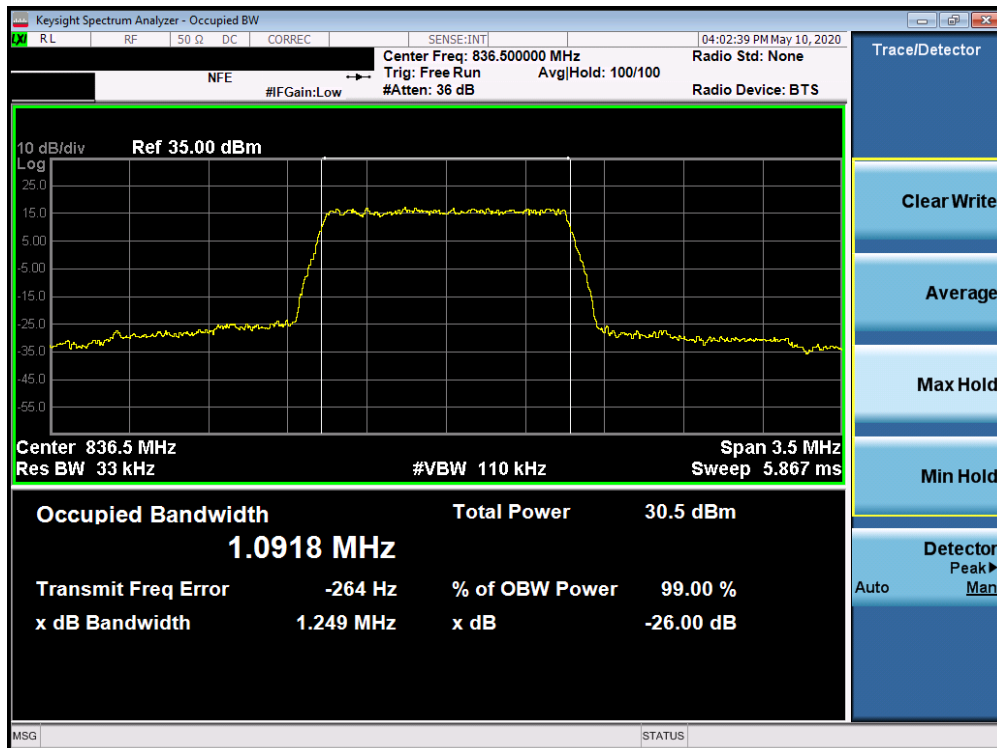
Plot 7-6. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 5

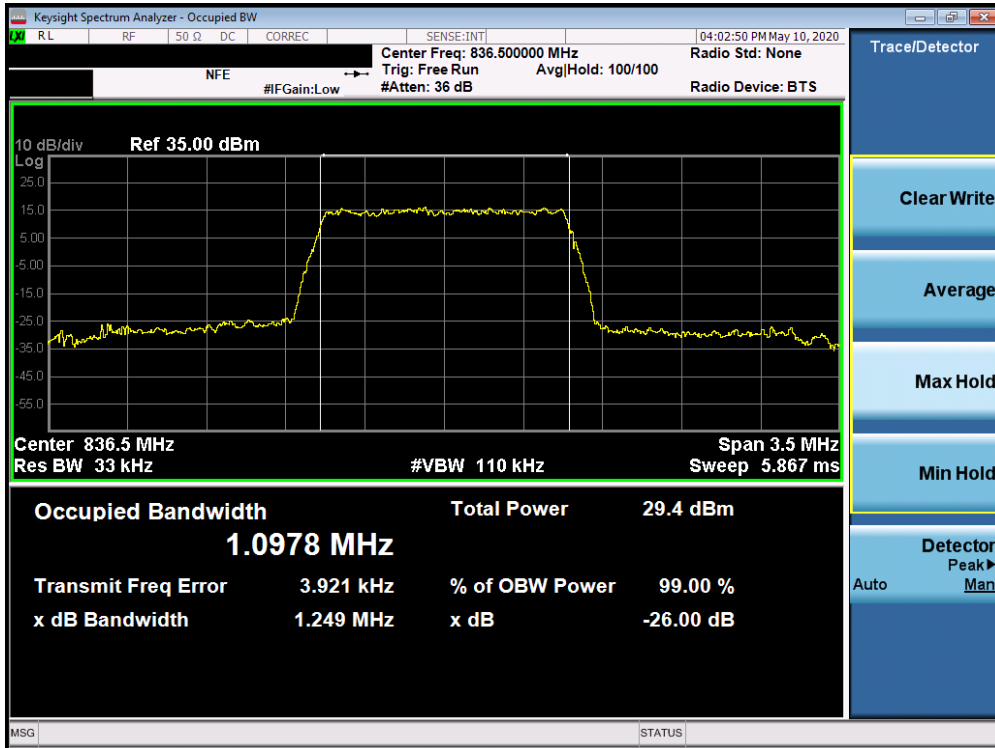


Plot 7-7. Occupied Bandwidth Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

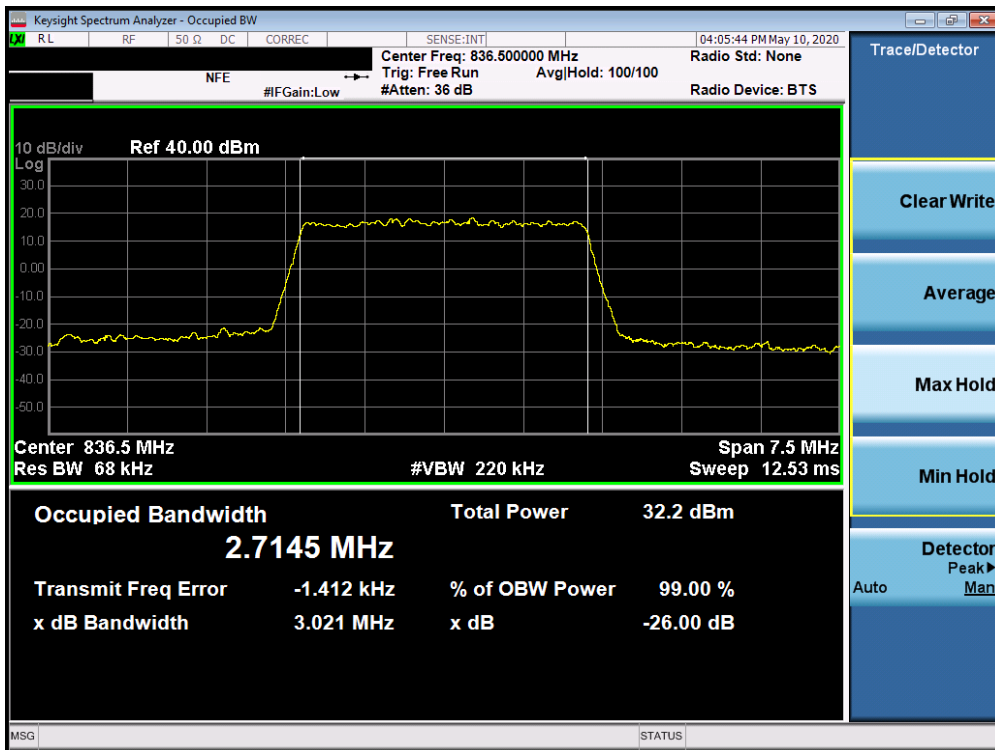


Plot 7-8. Occupied Bandwidth Plot (Band 5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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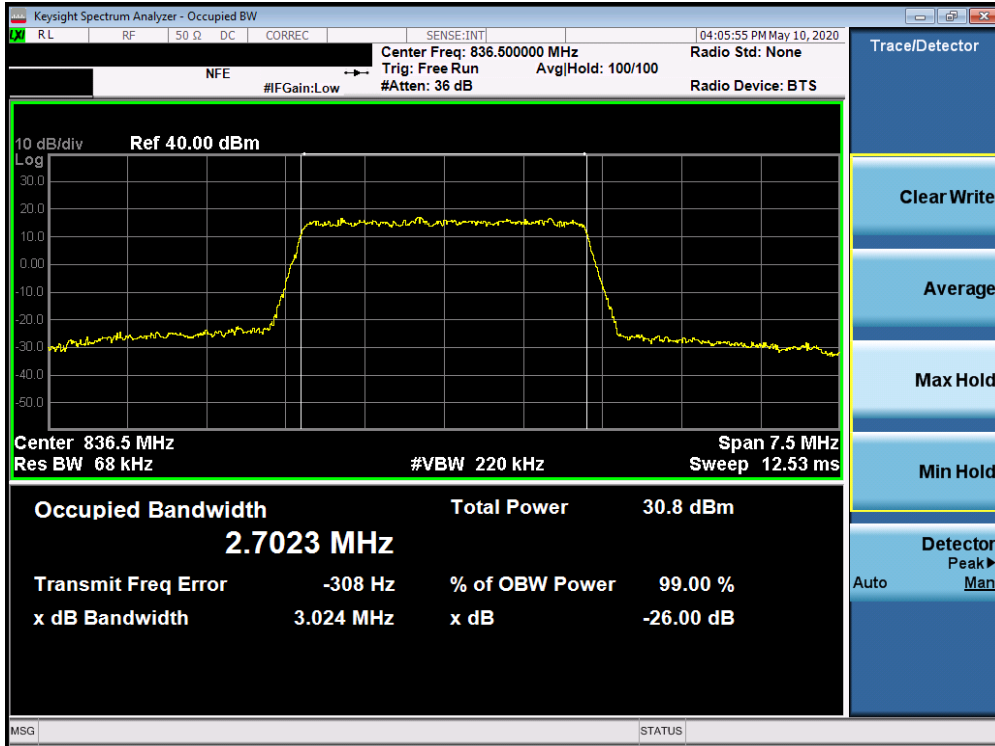


Plot 7-9. Occupied Bandwidth Plot (Band 5 - 1.4MHz 64-QAM - Full RB Configuration)

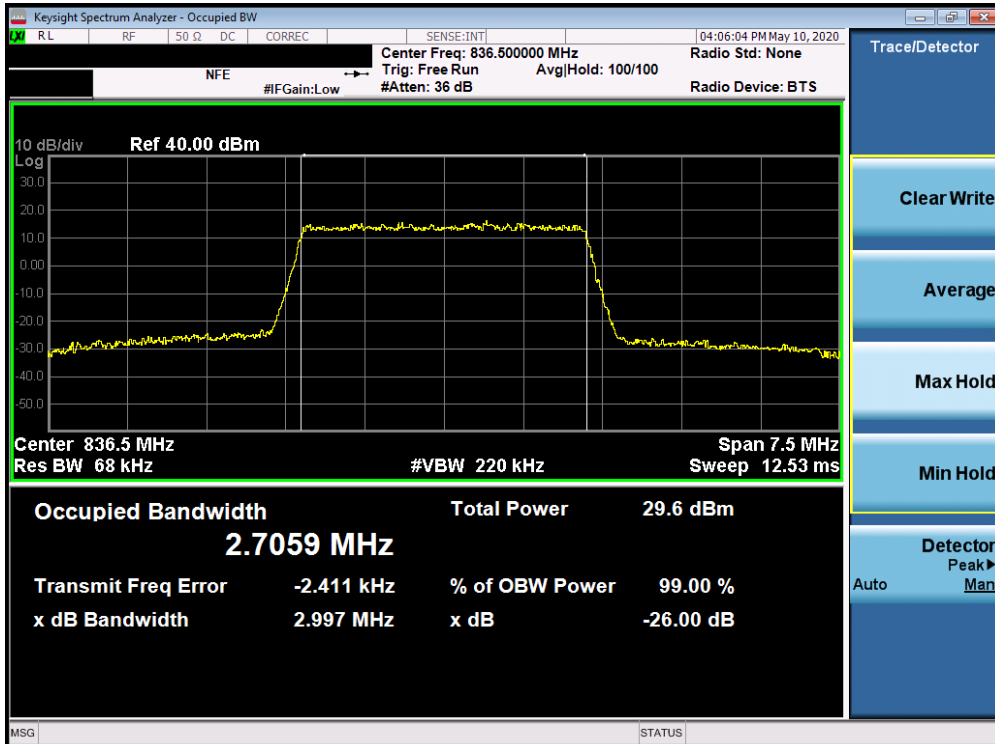


Plot 7-10. Occupied Bandwidth Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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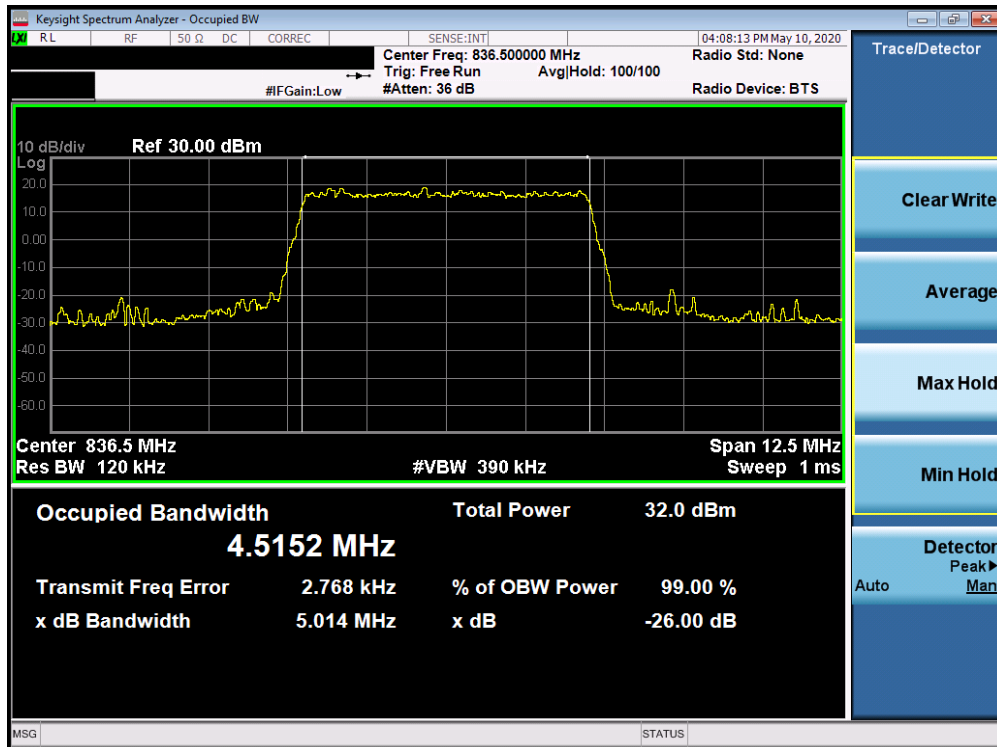


Plot 7-11. Occupied Bandwidth Plot (Band 5 - 3.0MHz 16-QAM - Full RB Configuration)

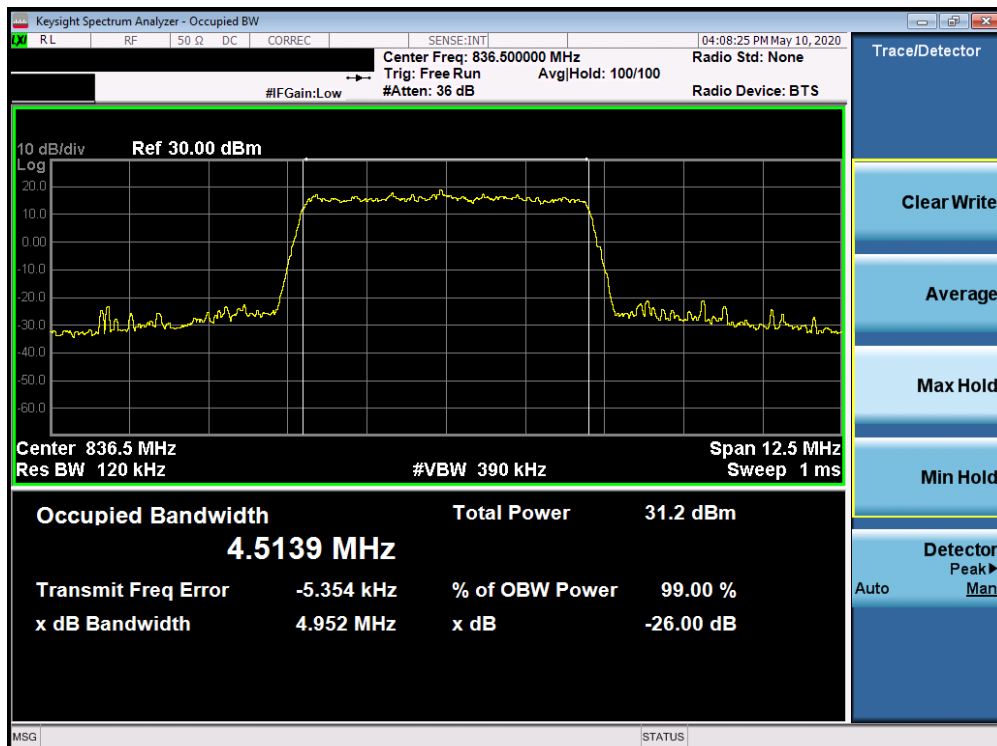


Plot 7-12. Occupied Bandwidth Plot (Band 5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 22 of 285

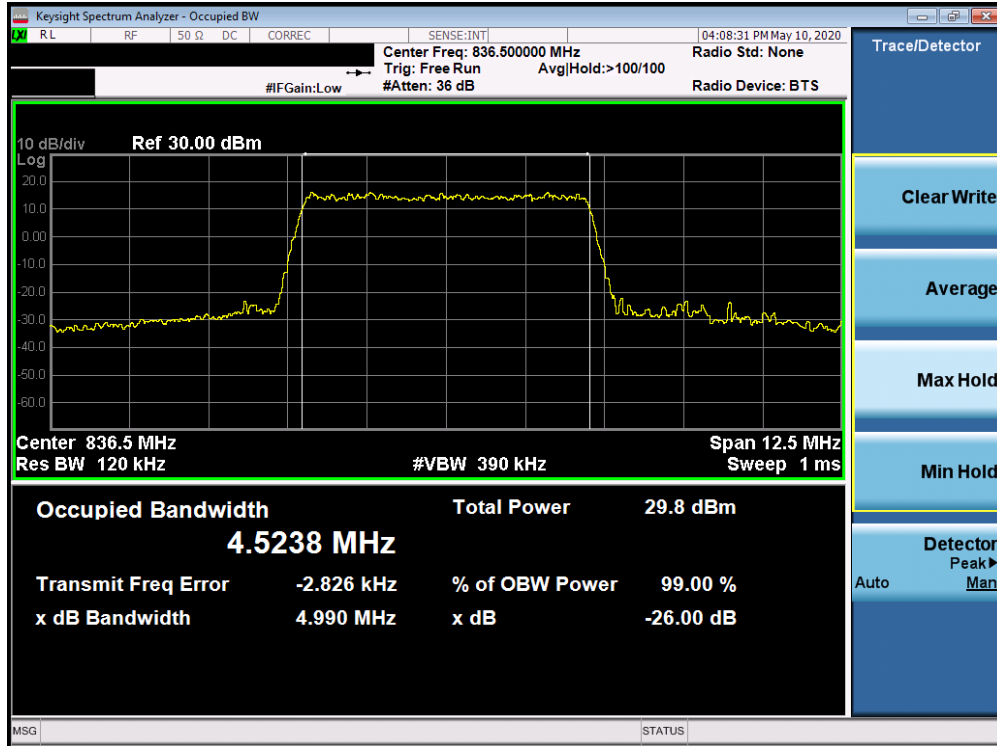


Plot 7-13. Occupied Bandwidth Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

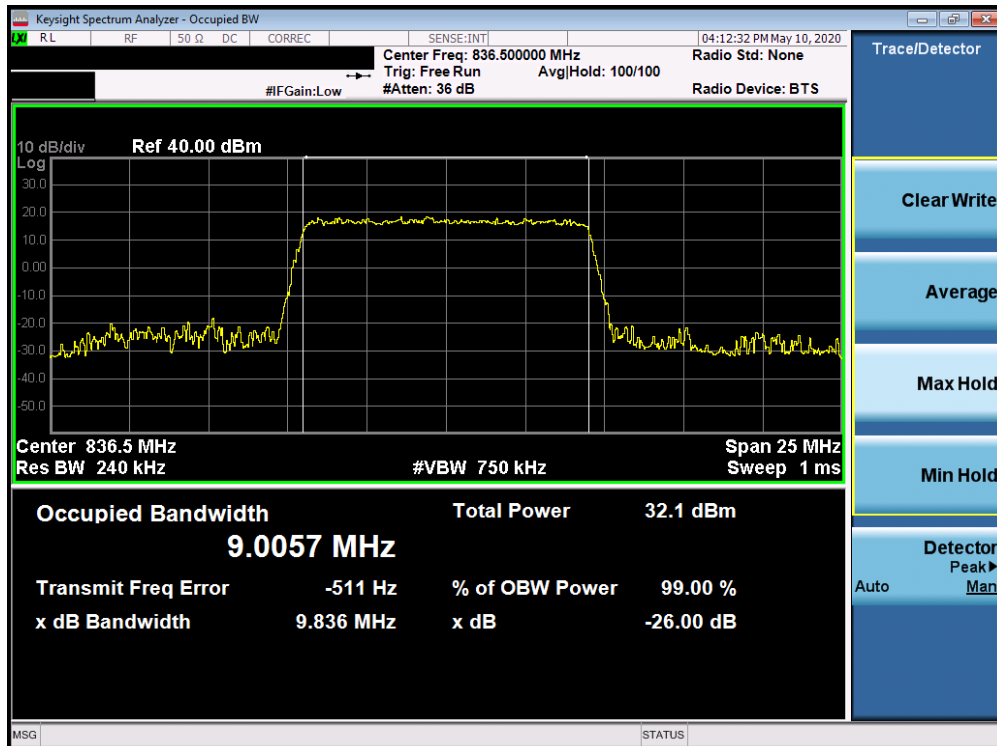


Plot 7-14. Occupied Bandwidth Plot (Band 5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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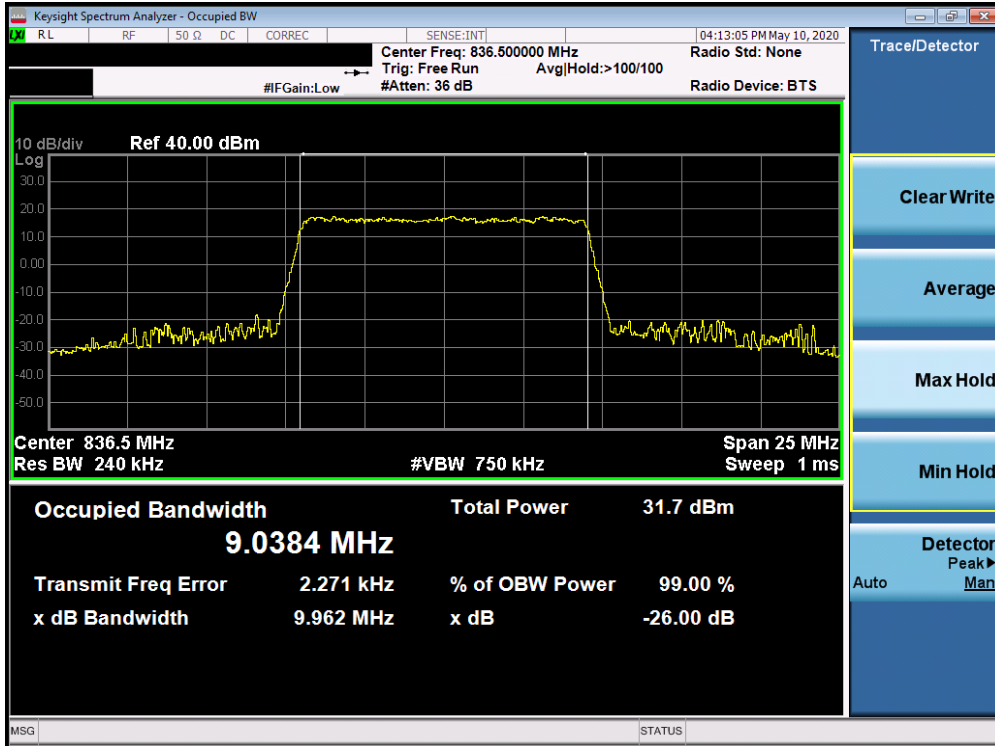


Plot 7-15. Occupied Bandwidth Plot (Band 5 - 5.0MHz 64-QAM - Full RB Configuration)

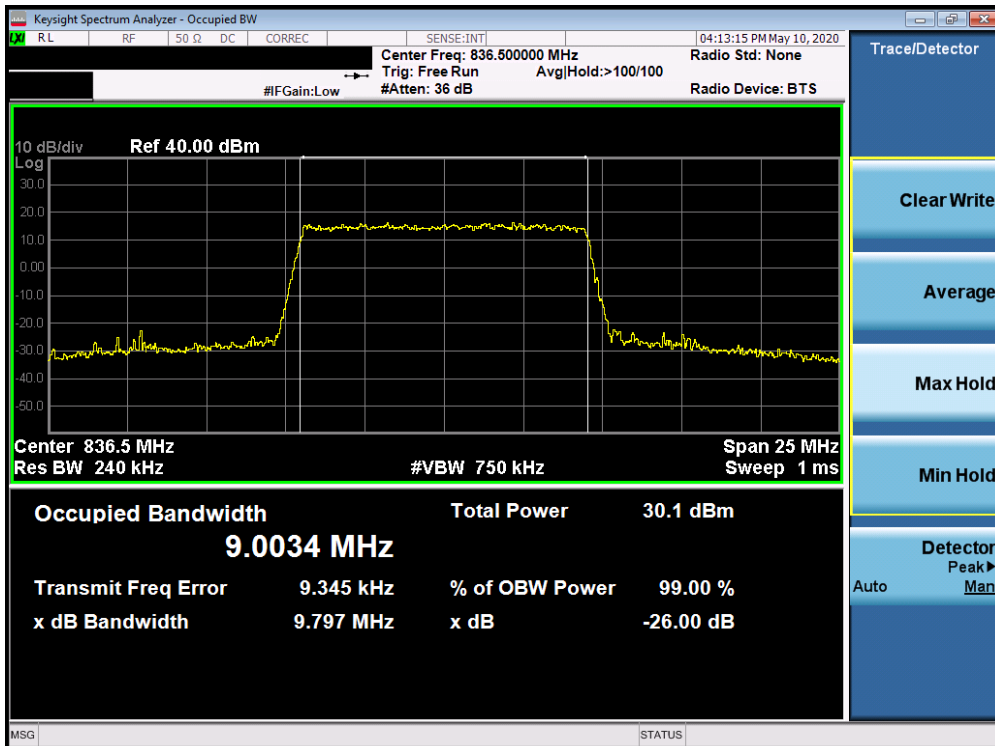


Plot 7-16. Occupied Bandwidth Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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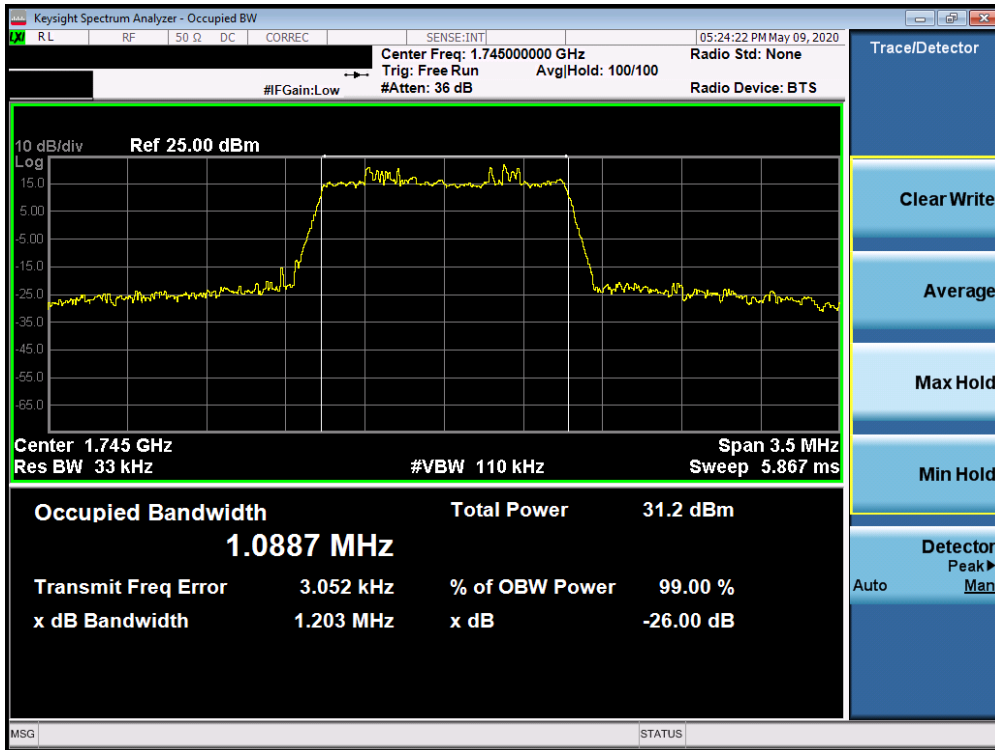
Plot 7-17. Occupied Bandwidth Plot (Band 5 - 10.0MHz 16-QAM - Full RB Configuration)



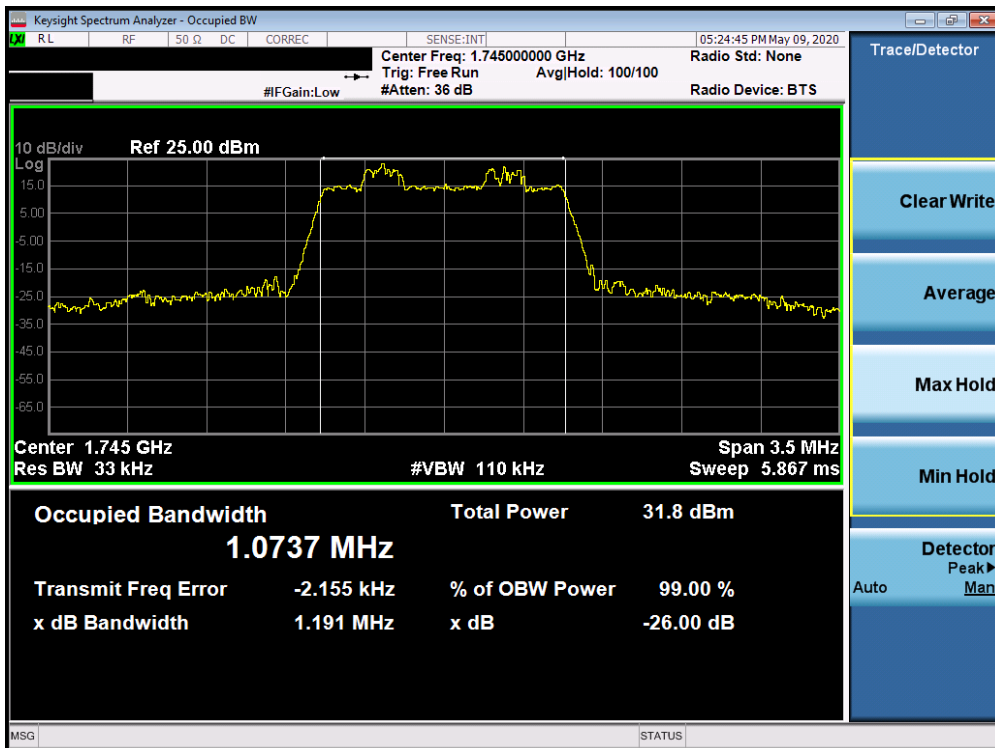
Plot 7-18. Occupied Bandwidth Plot (Band 5 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Band 66/4

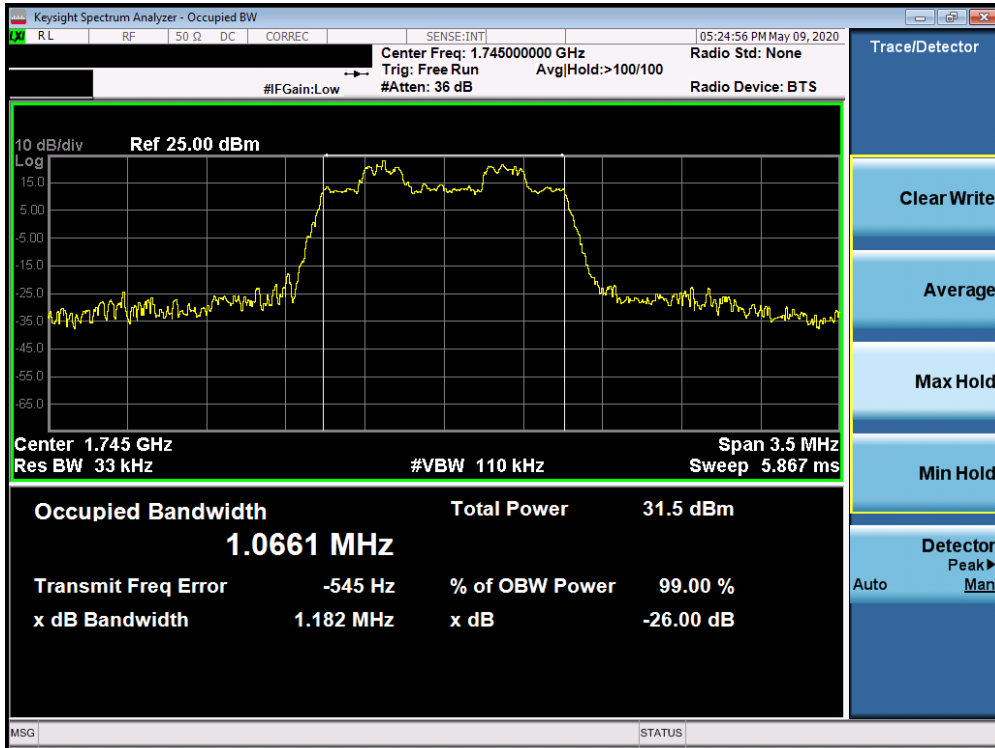


Plot 7-19. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

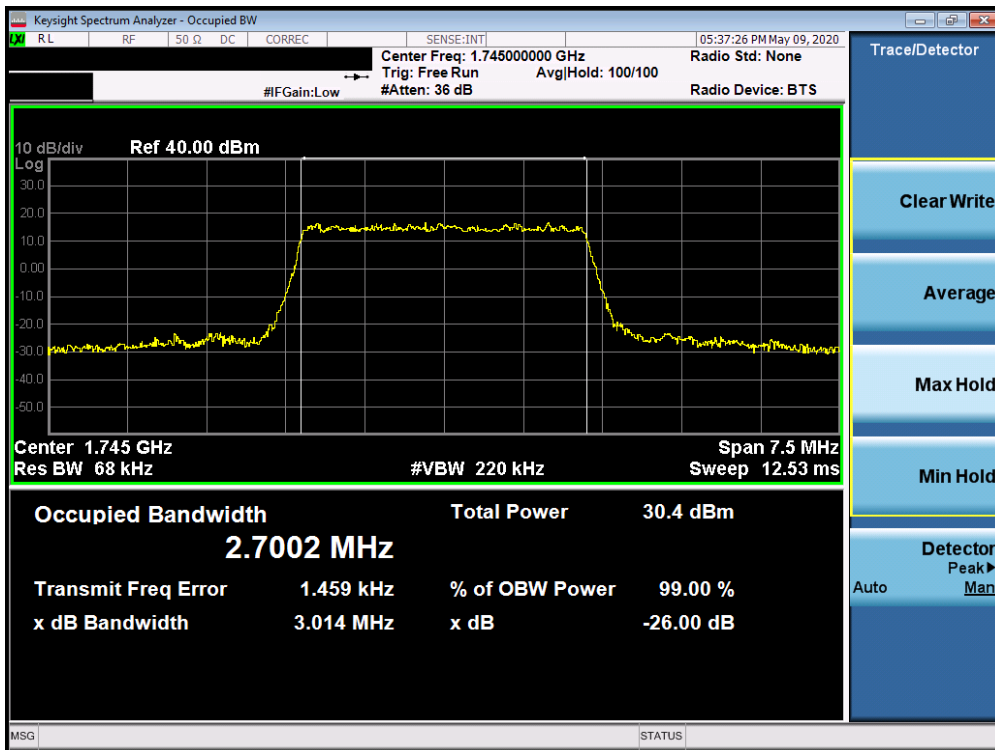


Plot 7-20. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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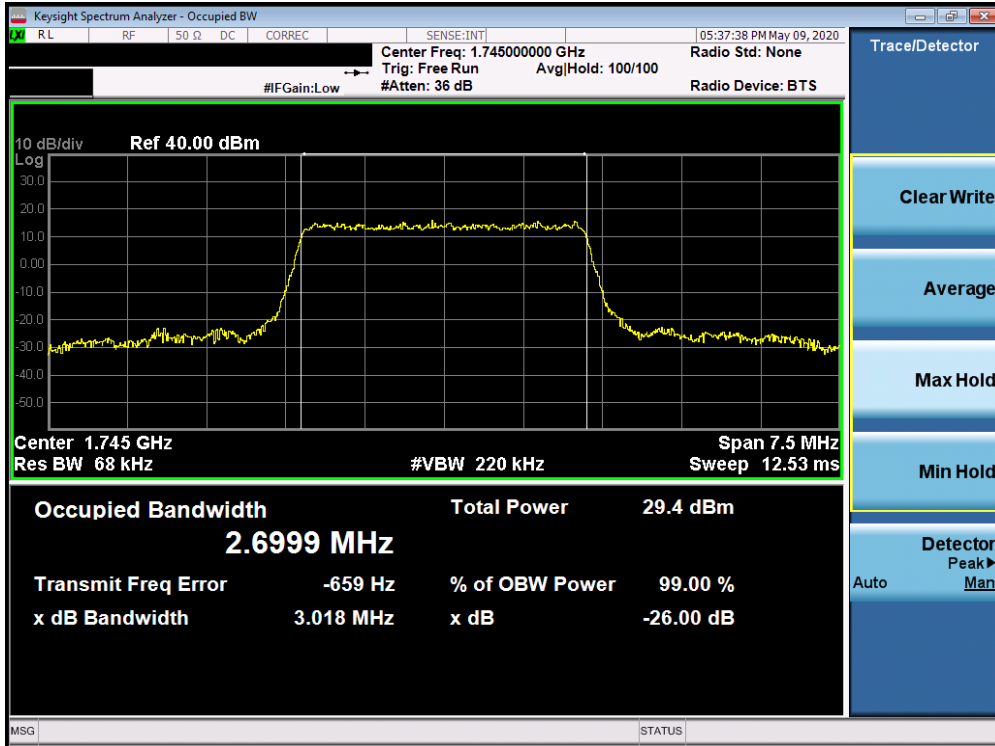


Plot 7-21. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

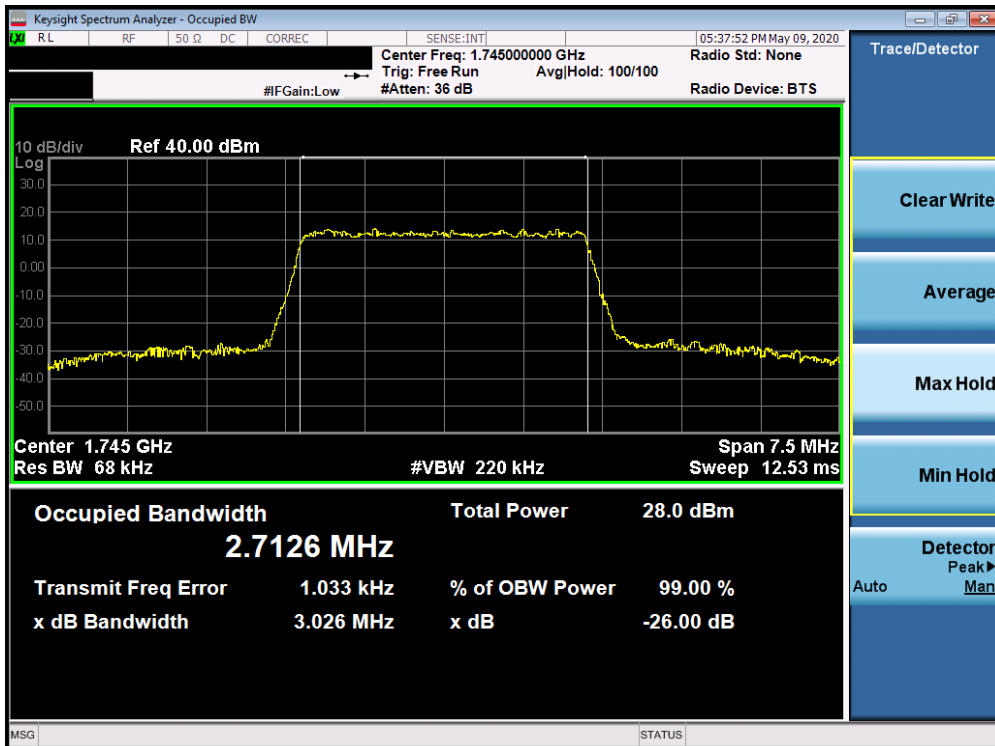


Plot 7-22. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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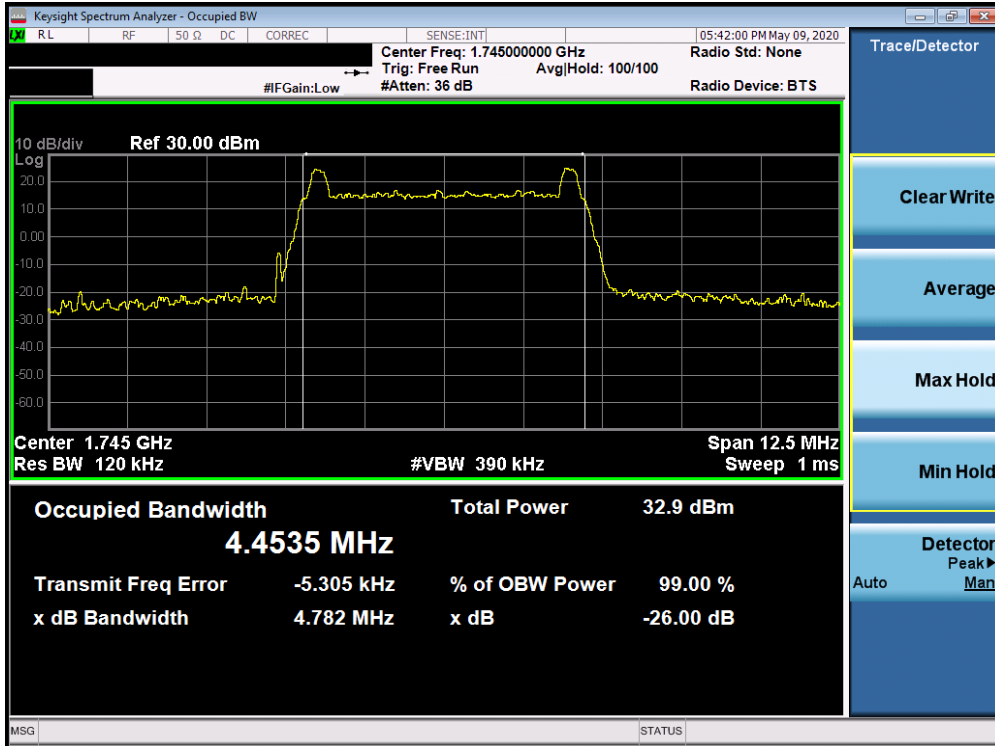


Plot 7-23. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

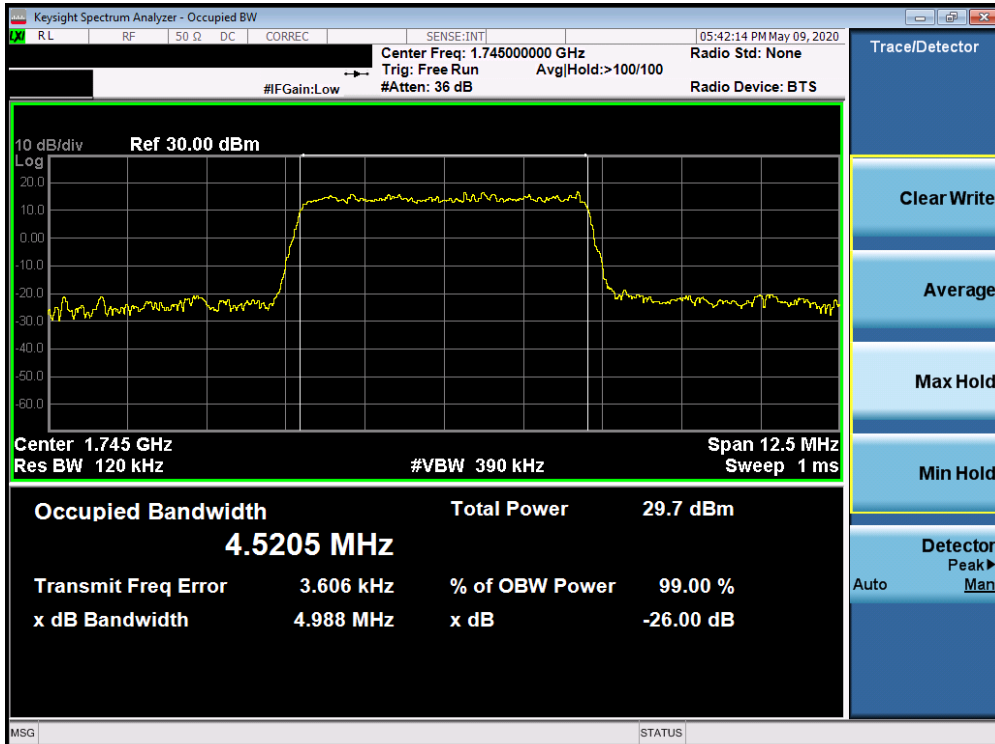


Plot 7-24. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 28 of 285

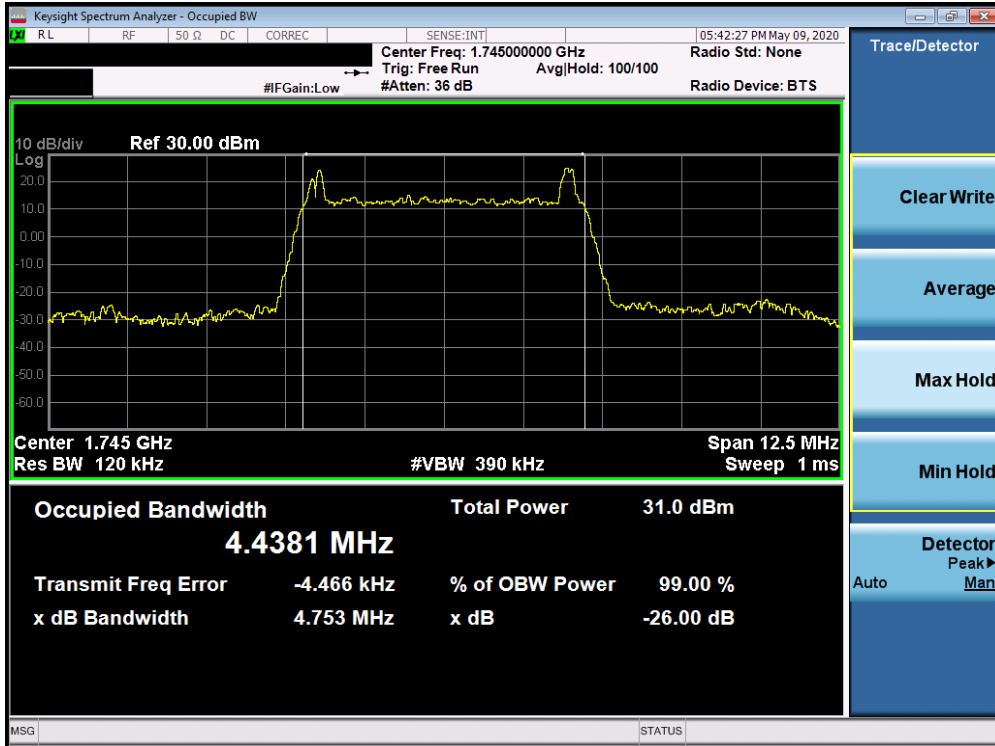


Plot 7-25. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

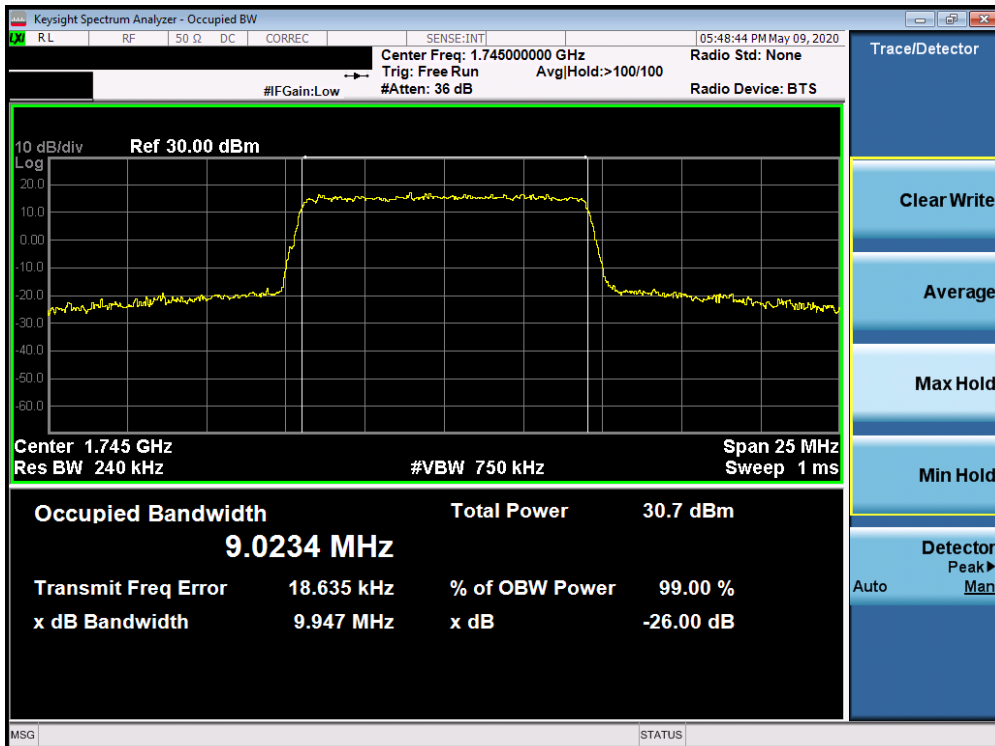


Plot 7-26. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 29 of 285

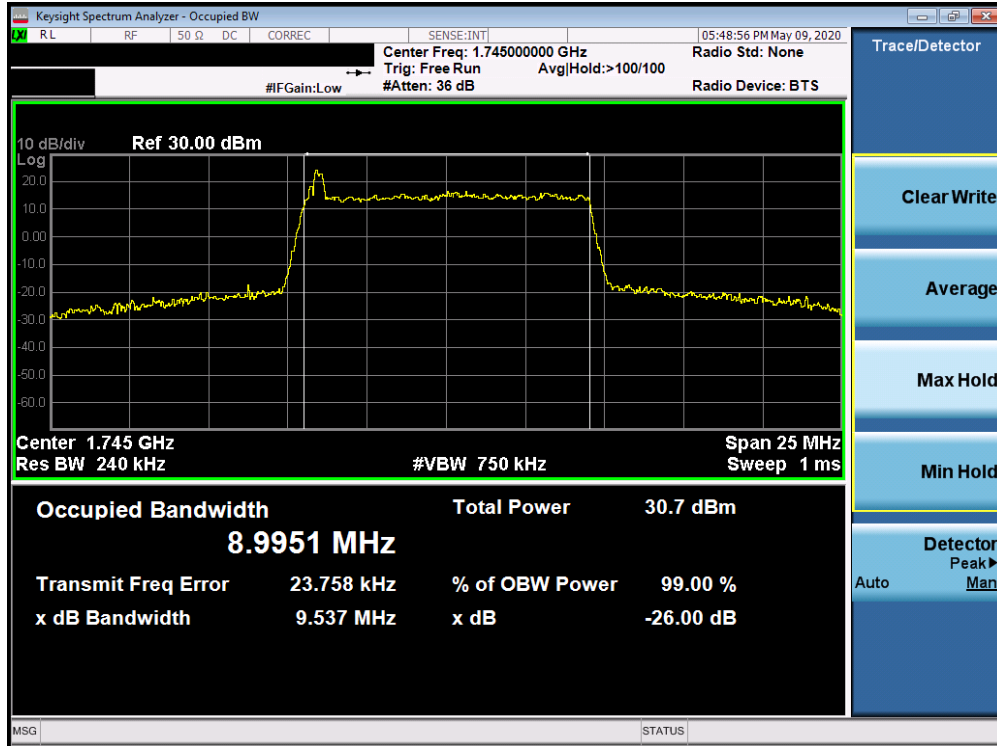


Plot 7-27. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)

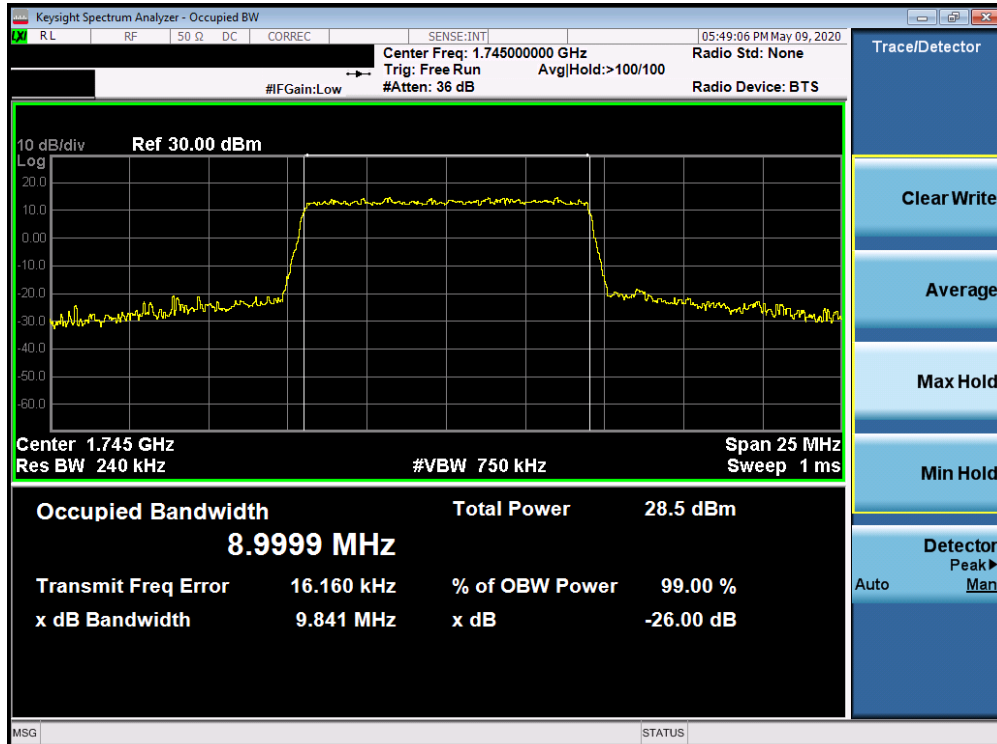


Plot 7-28. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 30 of 285

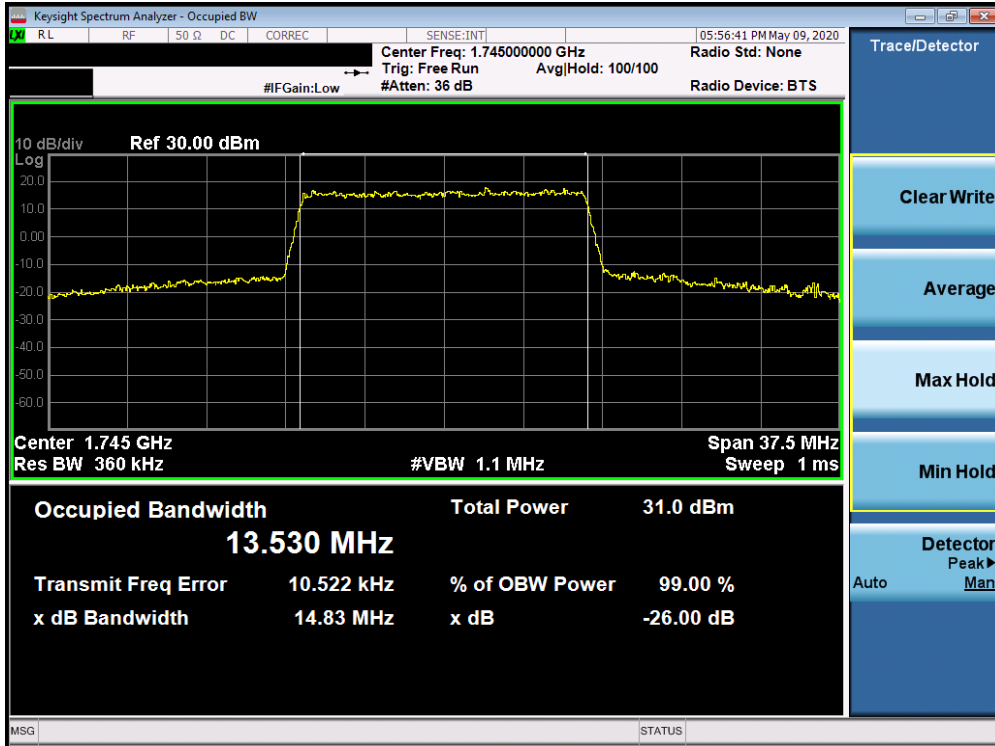


Plot 7-29. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

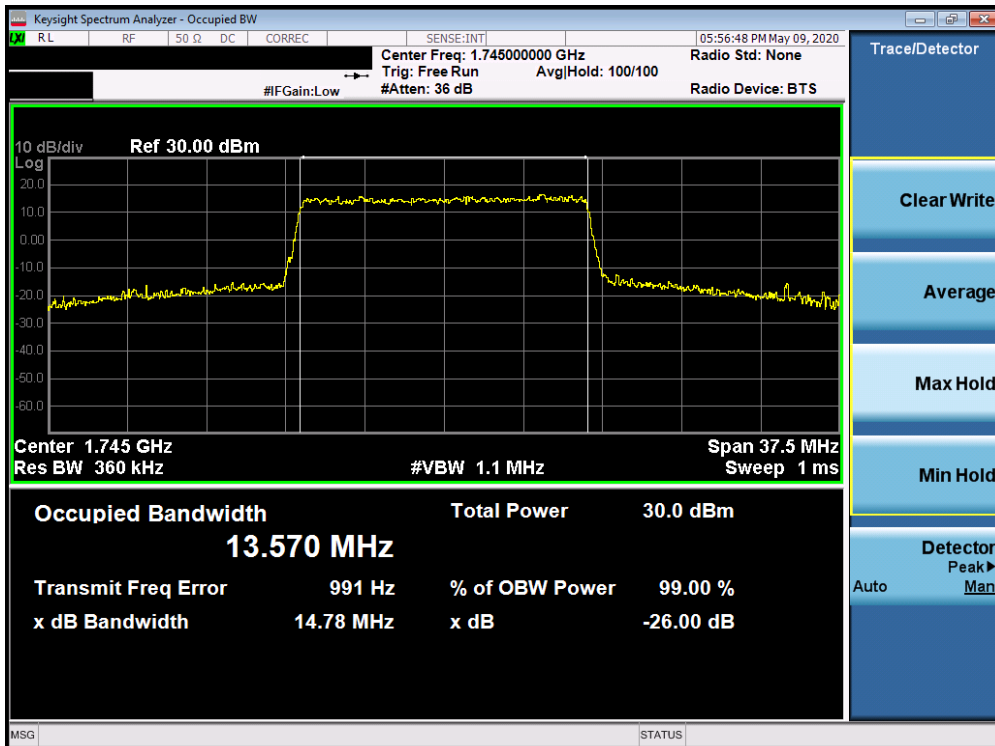


Plot 7-30. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 31 of 285

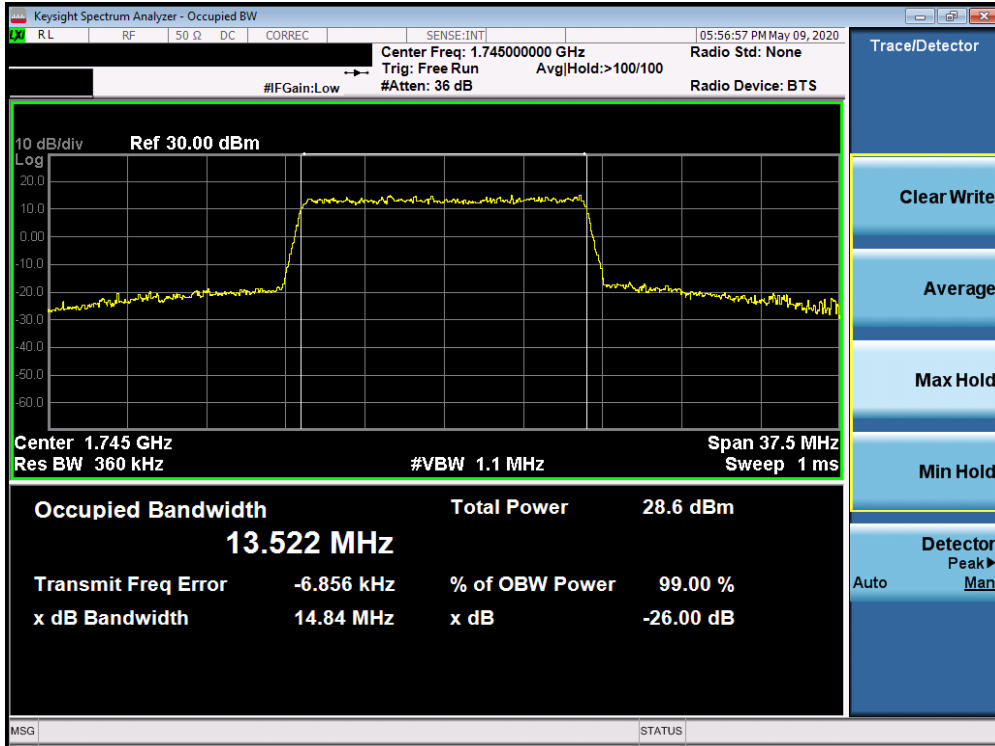


Plot 7-31. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-32. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 32 of 285

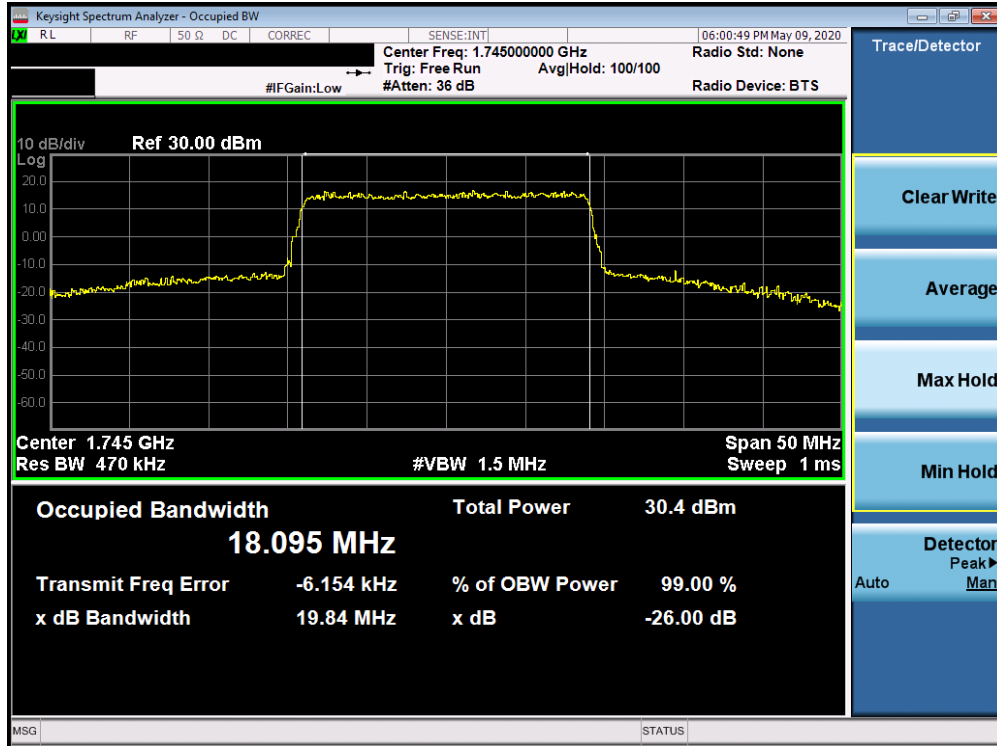


Plot 7-33. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)

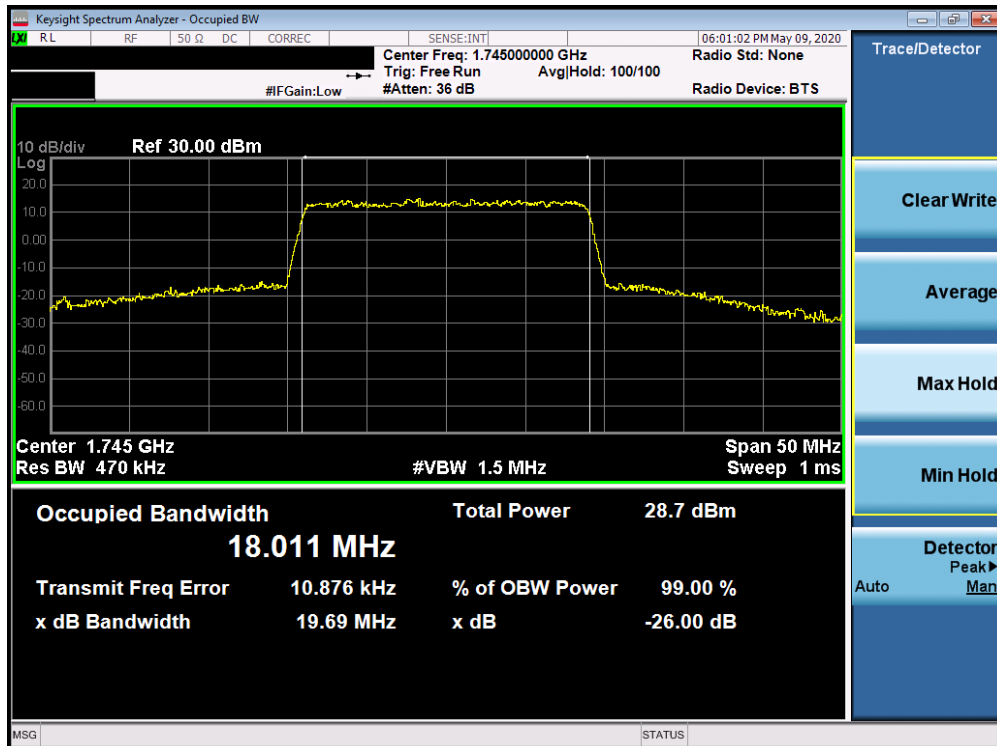


Plot 7-34. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 33 of 285



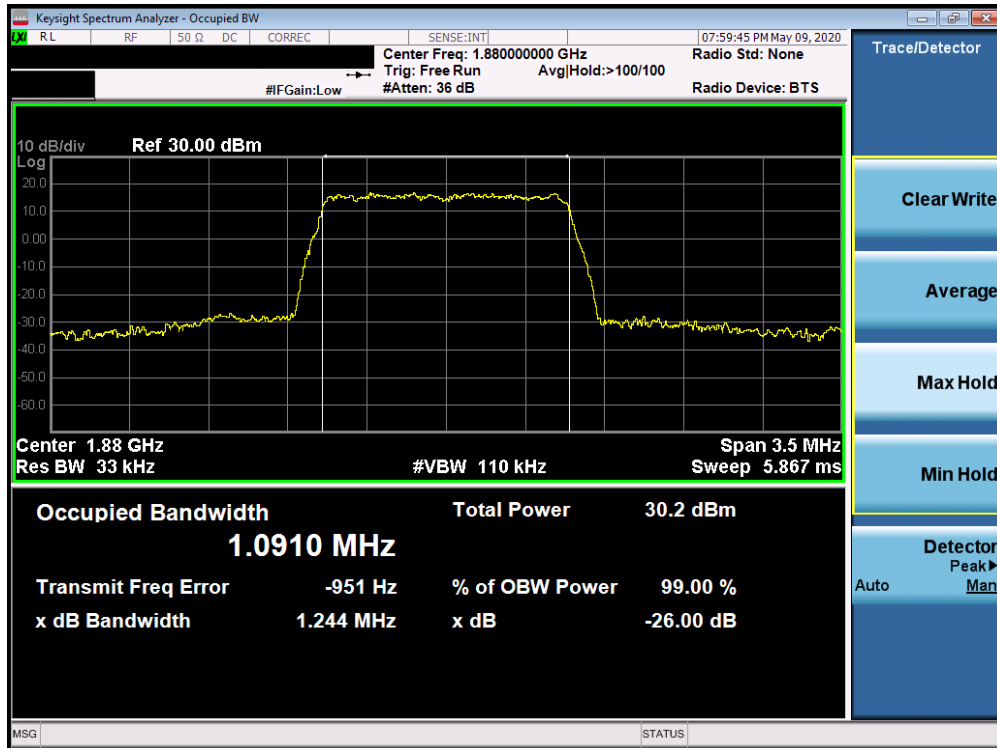
Plot 7-35. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



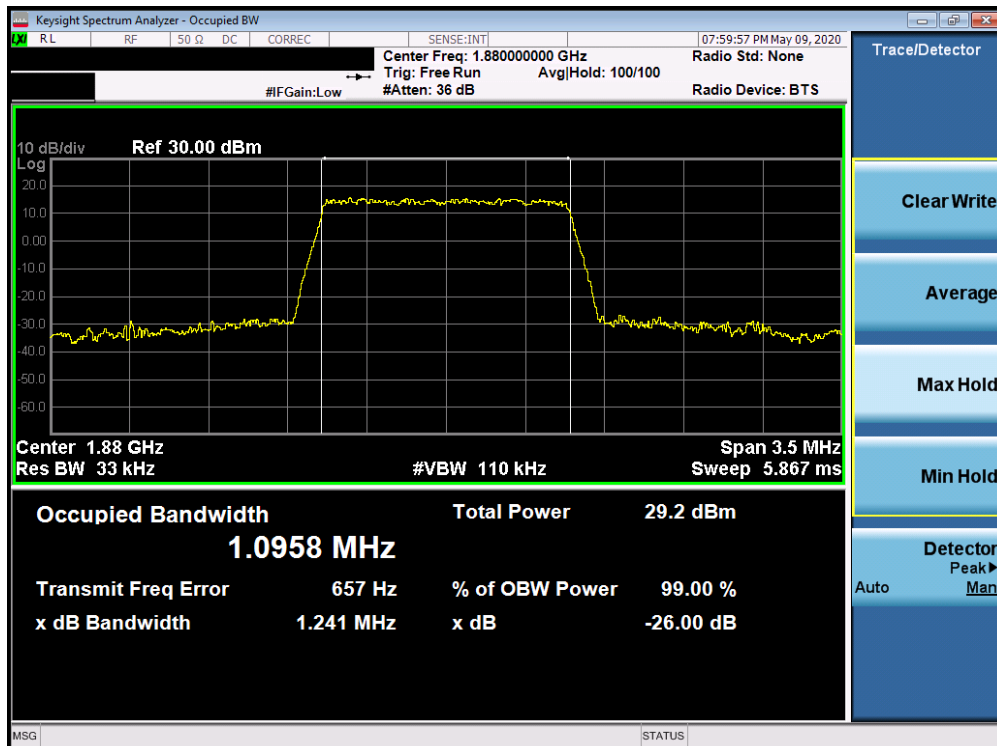
Plot 7-36. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 34 of 285

Band 2

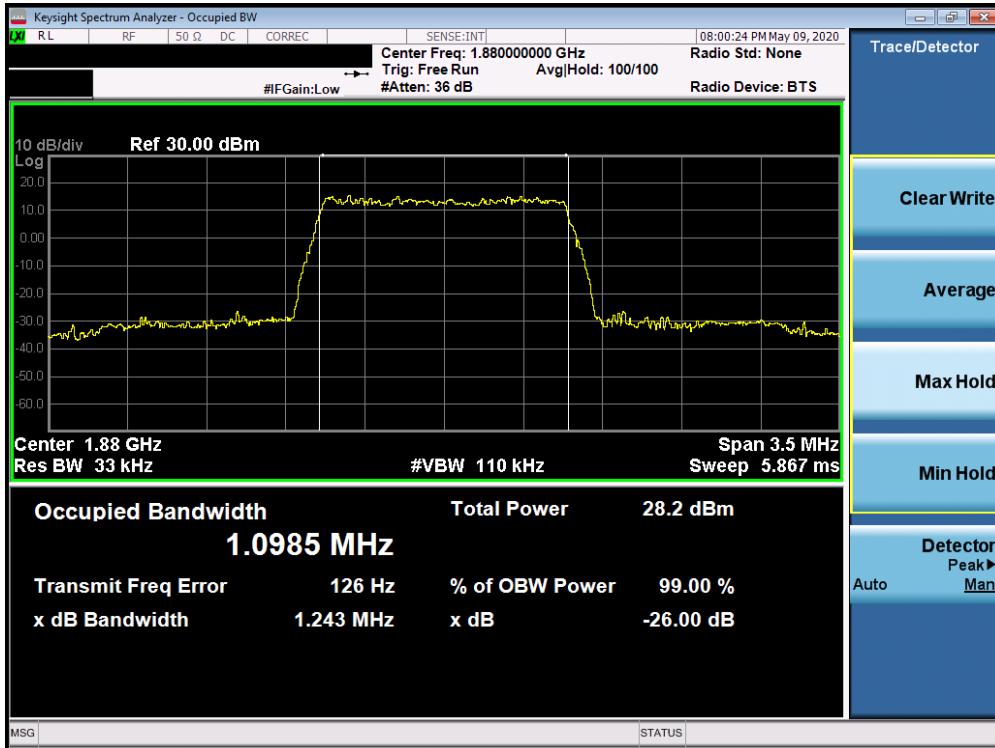


Plot 7-37. Occupied Bandwidth Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

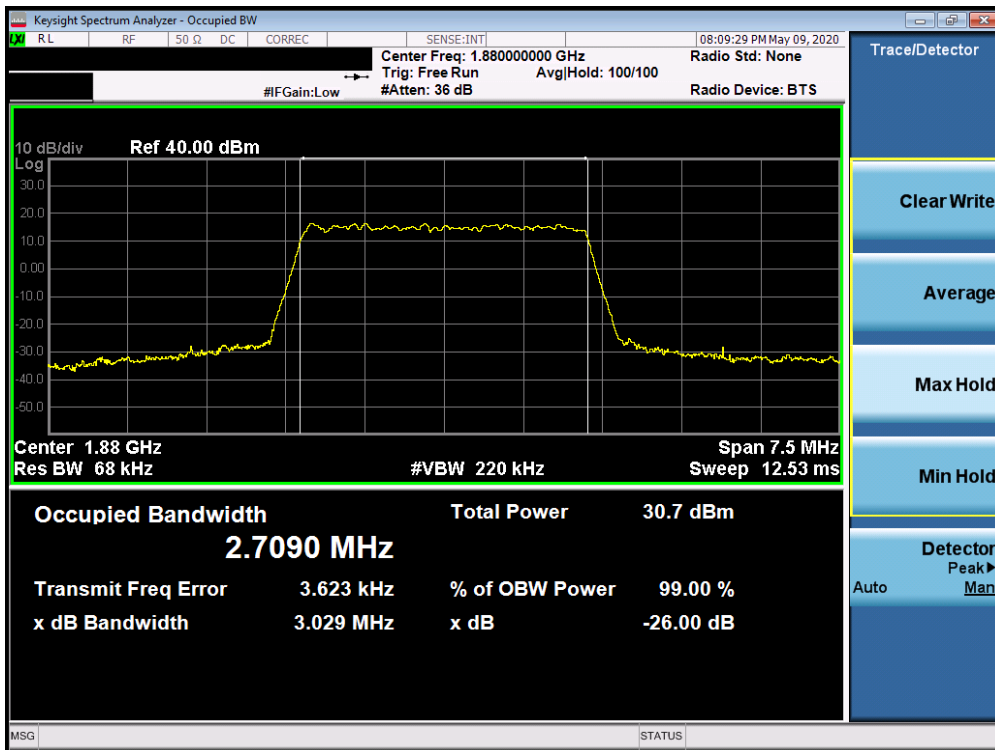


Plot 7-38. Occupied Bandwidth Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)	Page 35 of 285	

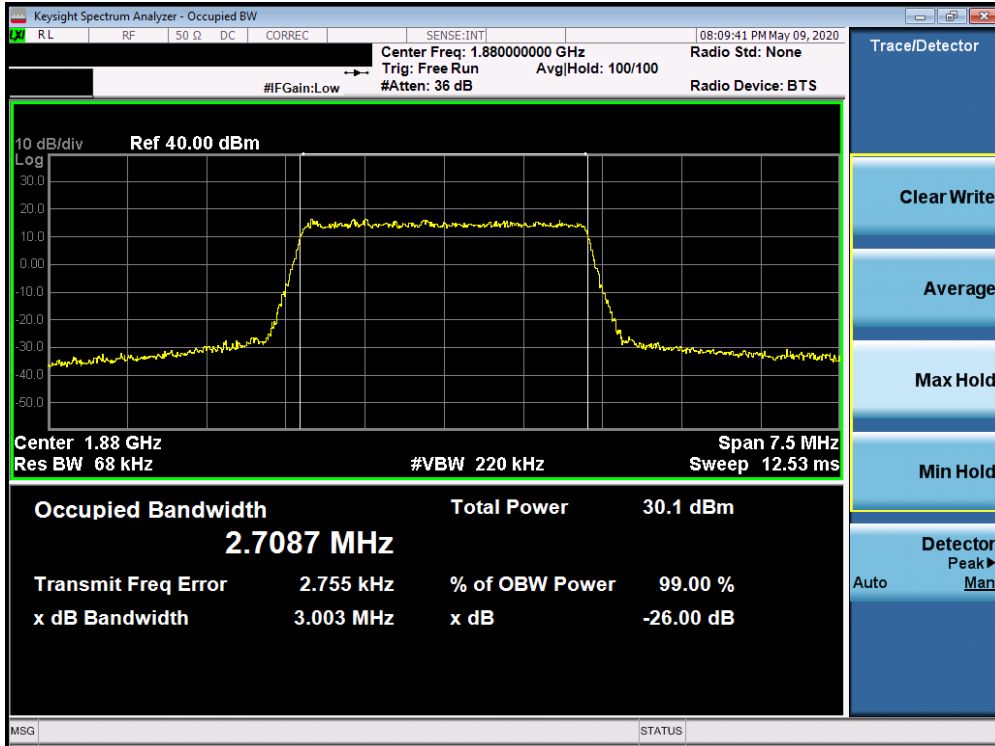


Plot 7-39. Occupied Bandwidth Plot (Band 2 - 1.4MHz 64-QAM - Full RB Configuration)

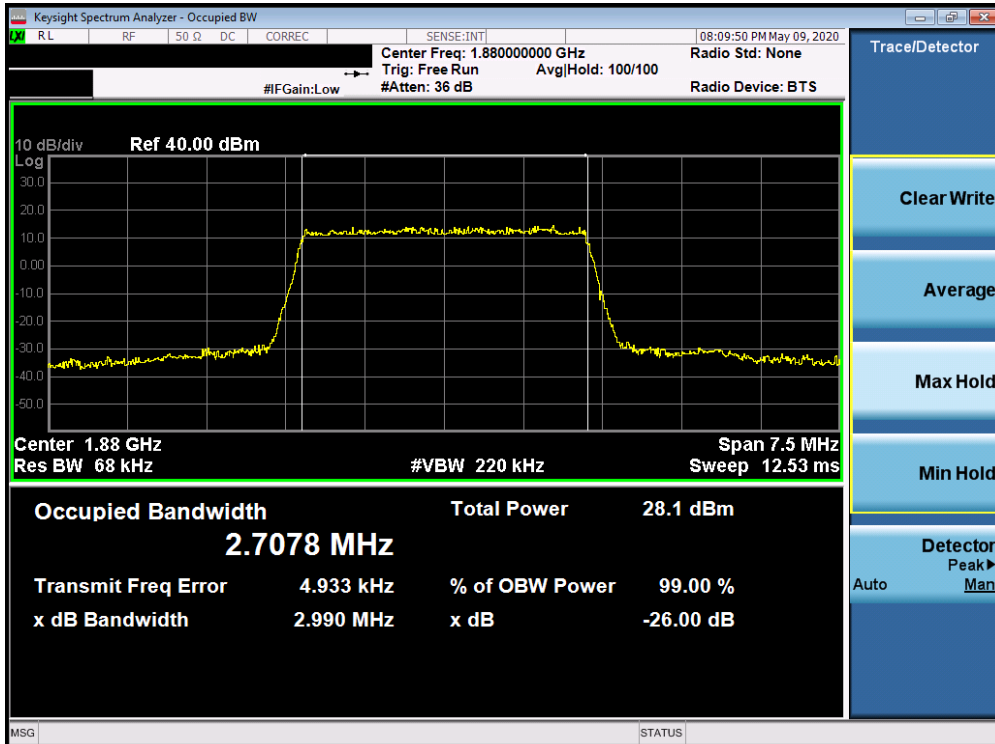


Plot 7-40. Occupied Bandwidth Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 36 of 285

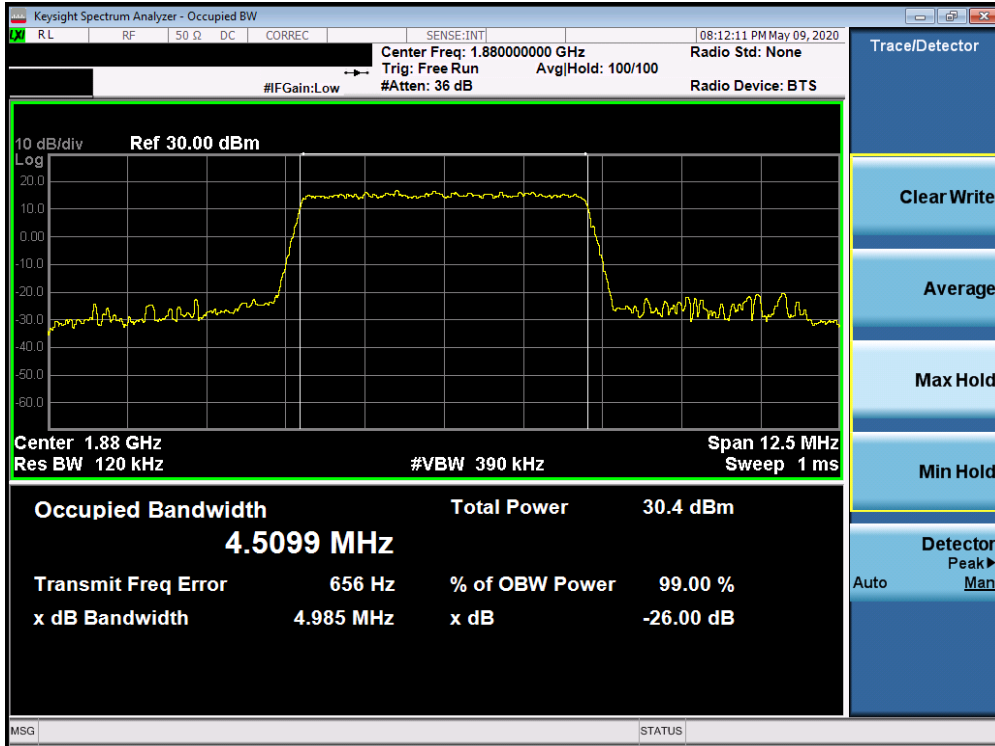


Plot 7-41. Occupied Bandwidth Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

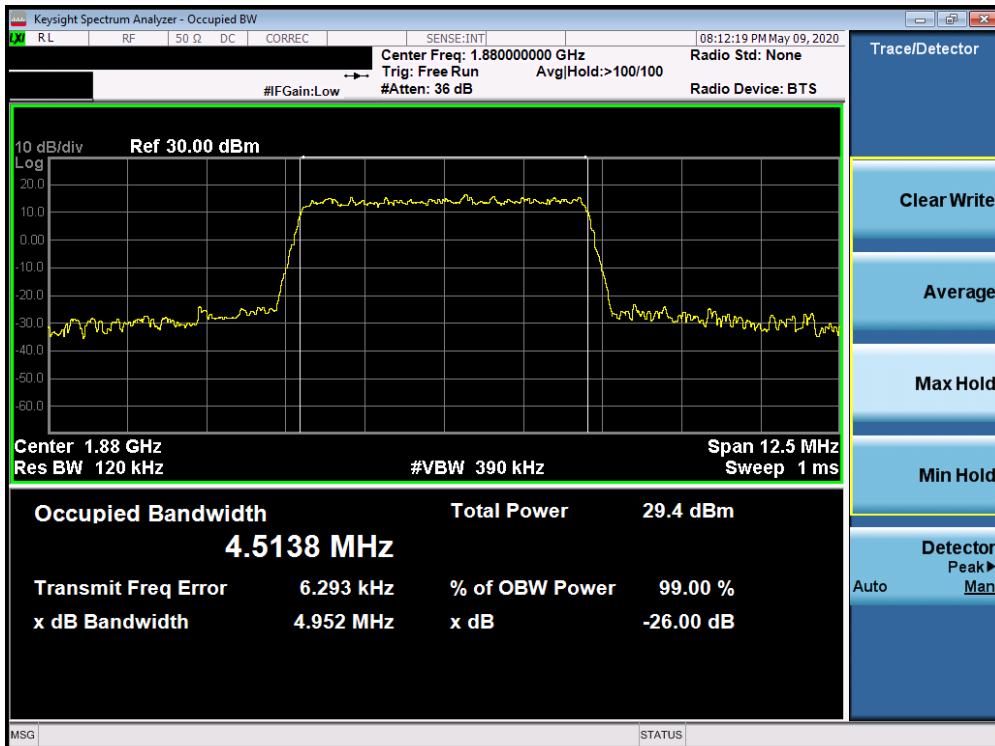


Plot 7-42. Occupied Bandwidth Plot (Band 2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 37 of 285

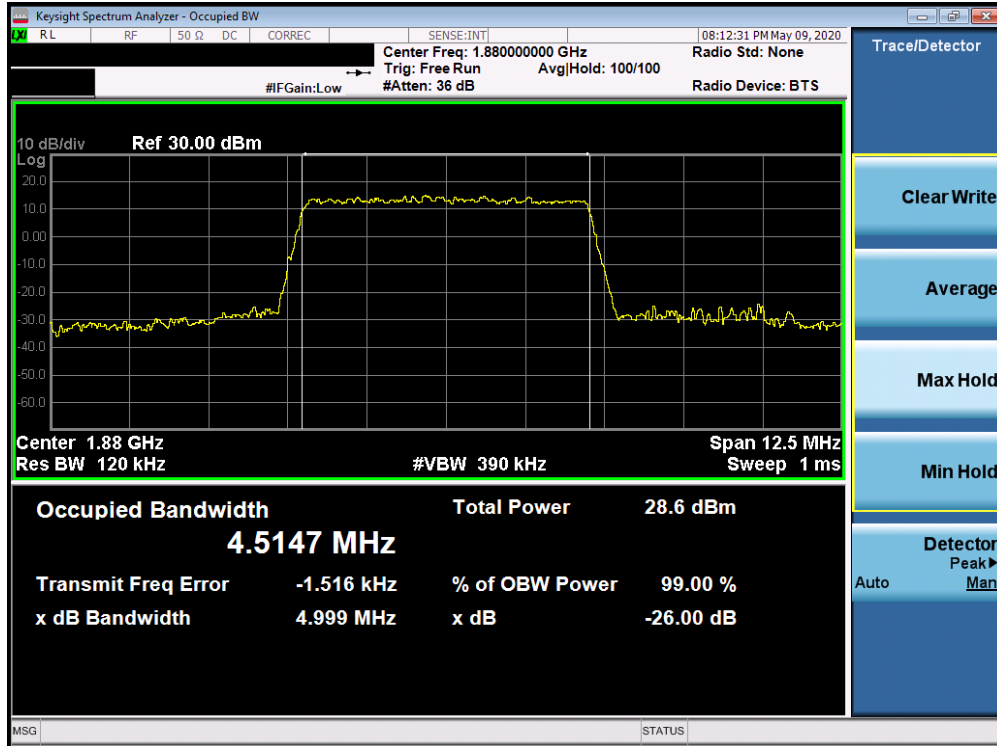


Plot 7-43. Occupied Bandwidth Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

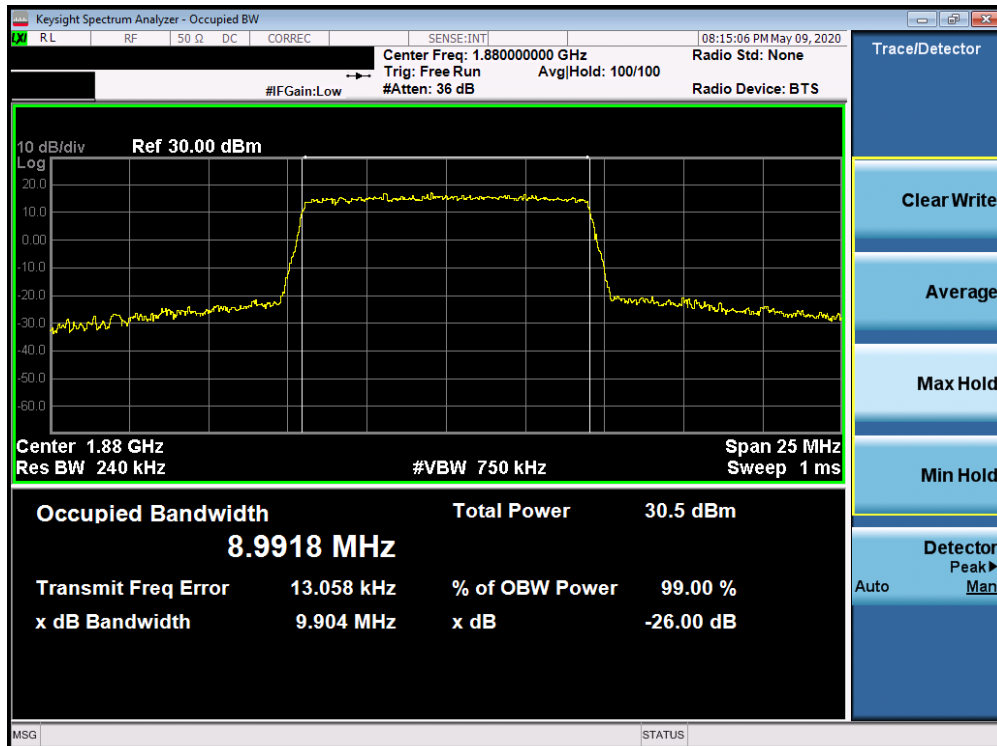


Plot 7-44. Occupied Bandwidth Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 38 of 285

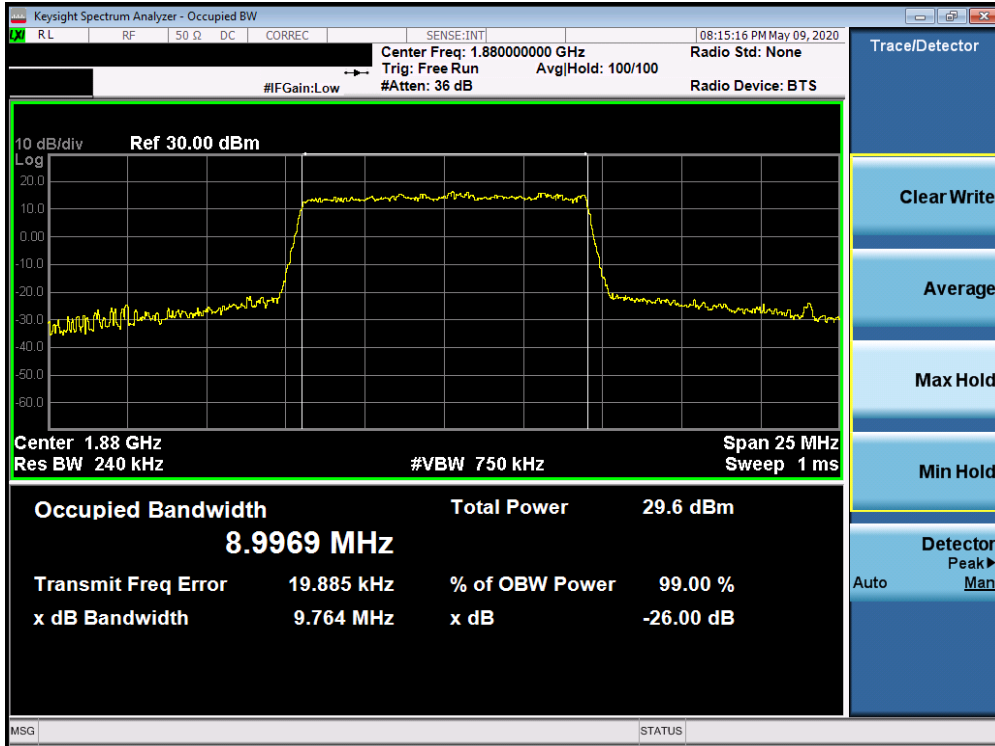


Plot 7-45. Occupied Bandwidth Plot (Band 2 - 5.0MHz 64-QAM - Full RB Configuration)

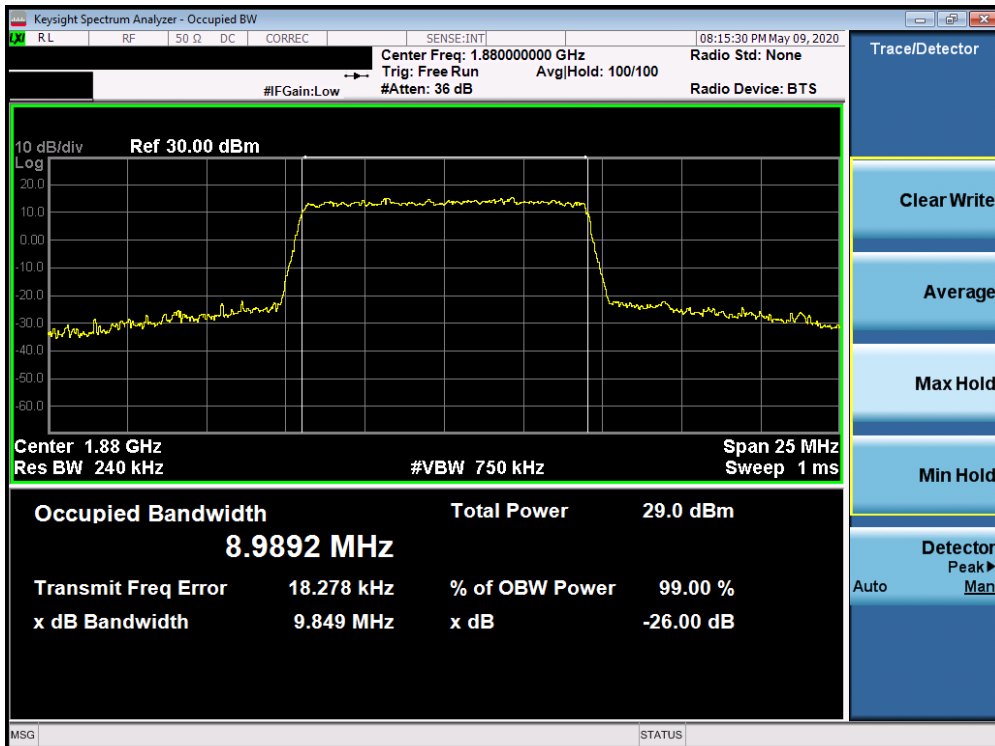


Plot 7-46. Occupied Bandwidth Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)	Page 39 of 285	

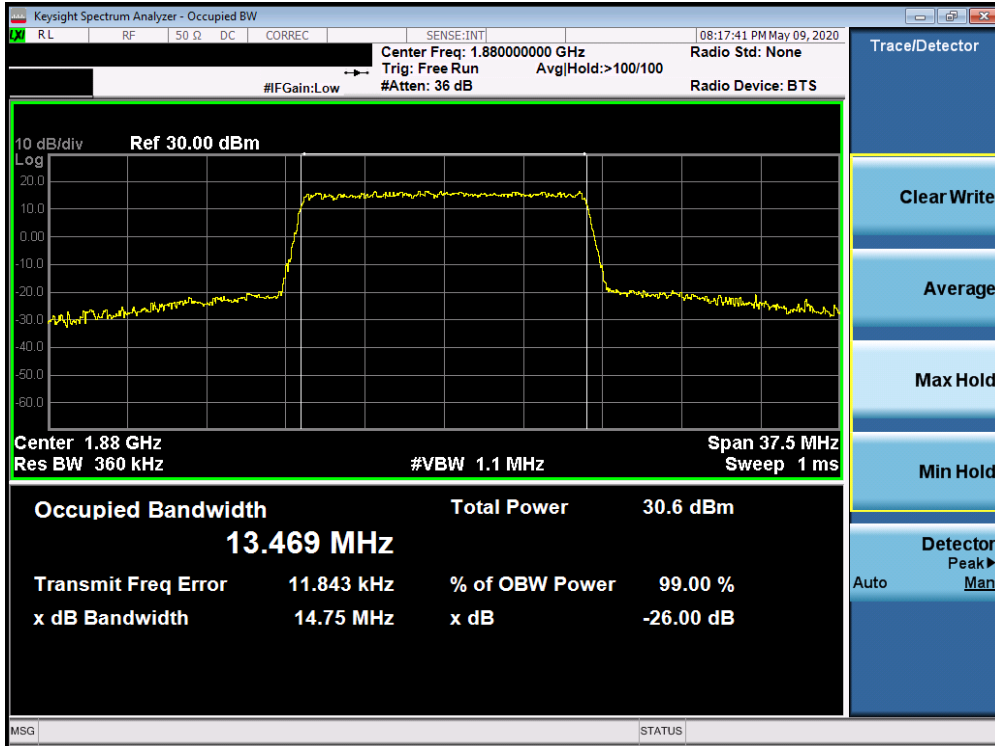


Plot 7-47. Occupied Bandwidth Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

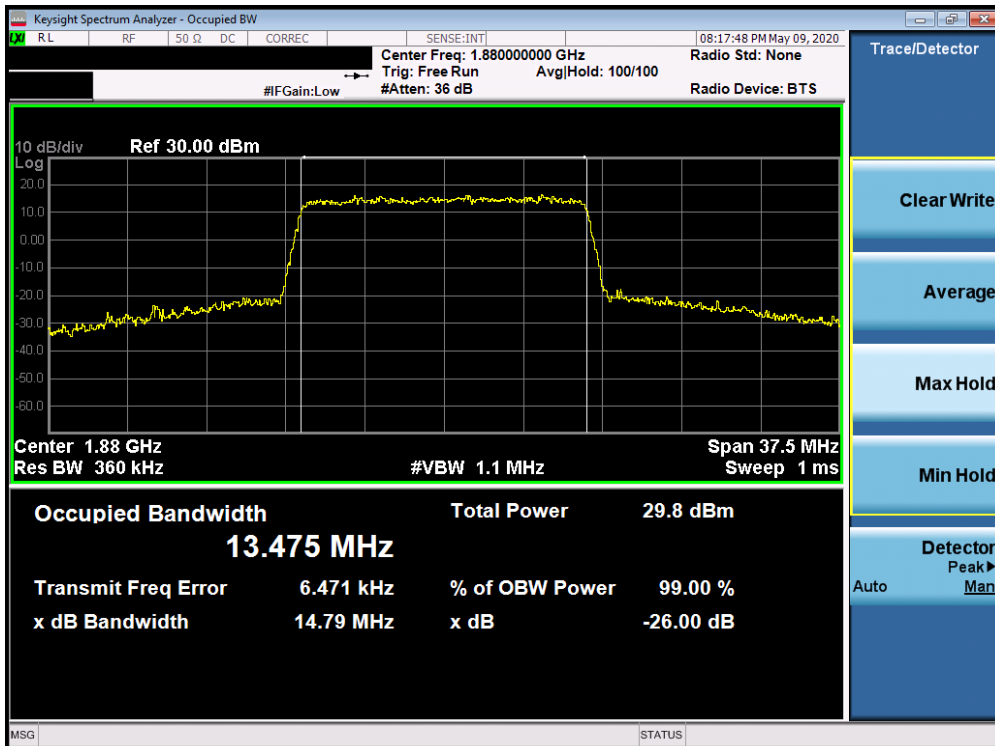


Plot 7-48. Occupied Bandwidth Plot (Band 2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 40 of 285

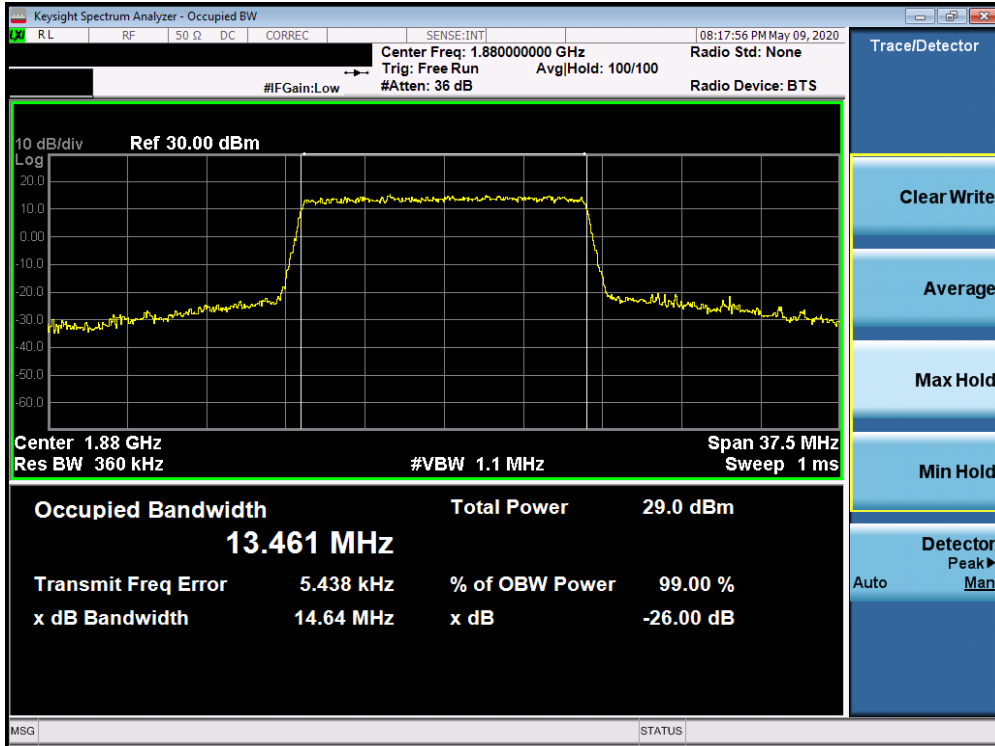


Plot 7-49. Occupied Bandwidth Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

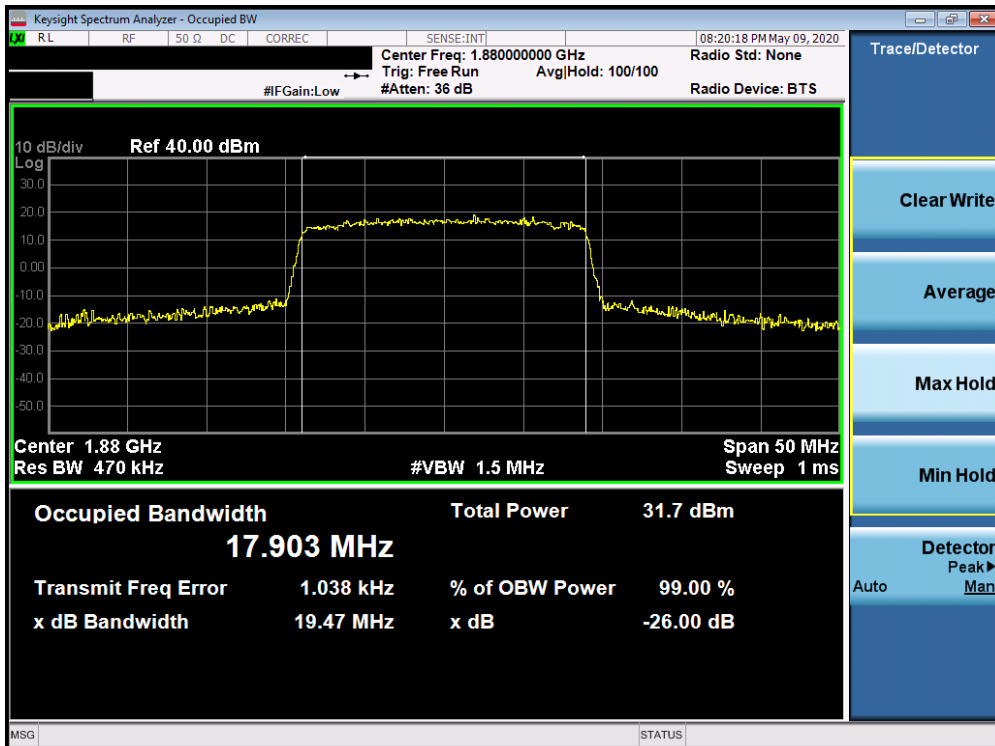


Plot 7-50. Occupied Bandwidth Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 41 of 285

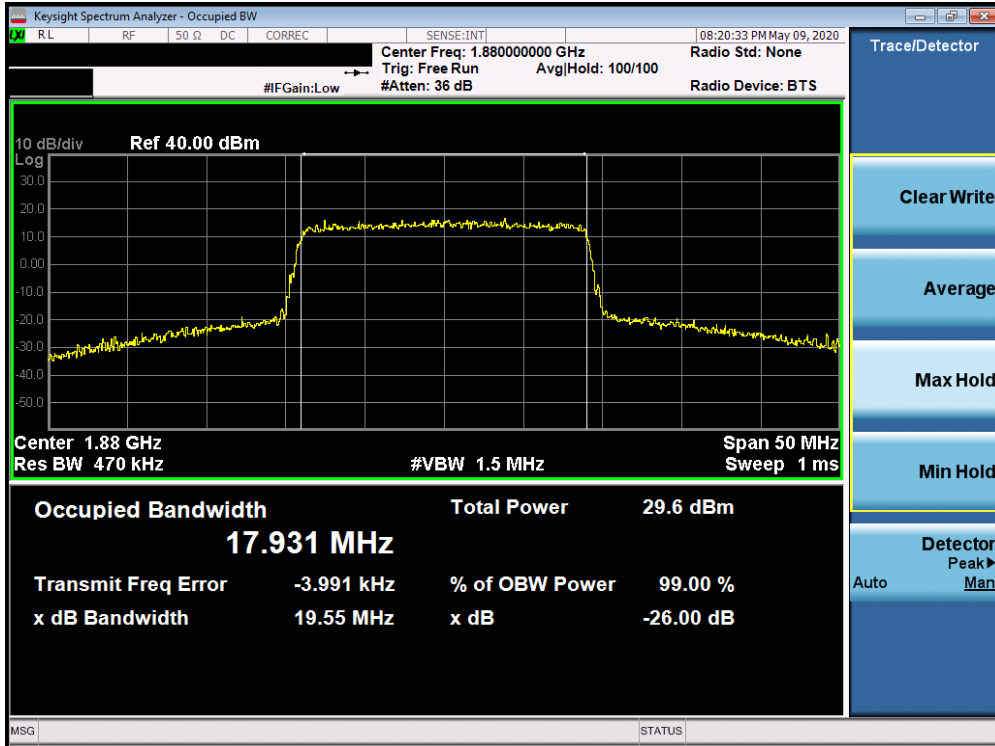


Plot 7-51. Occupied Bandwidth Plot (Band 2 - 15.0MHz 64-QAM - Full RB Configuration)

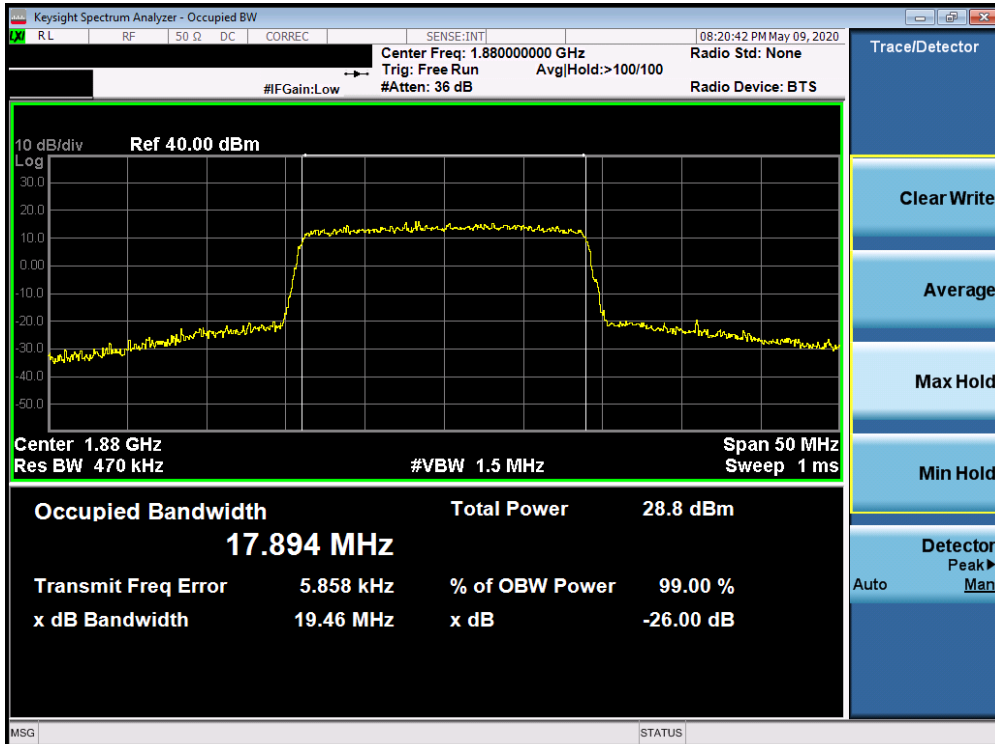


Plot 7-52. Occupied Bandwidth Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 42 of 285



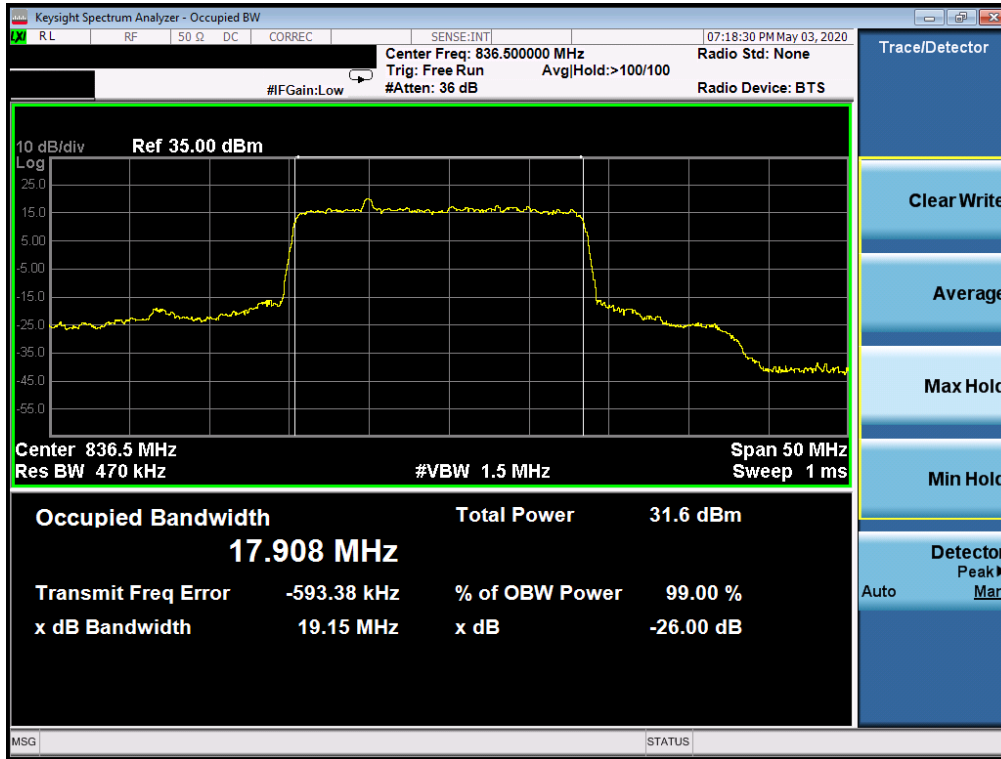
Plot 7-53. Occupied Bandwidth Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-54. Occupied Bandwidth Plot (Band 2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 43 of 285

NR Band n5

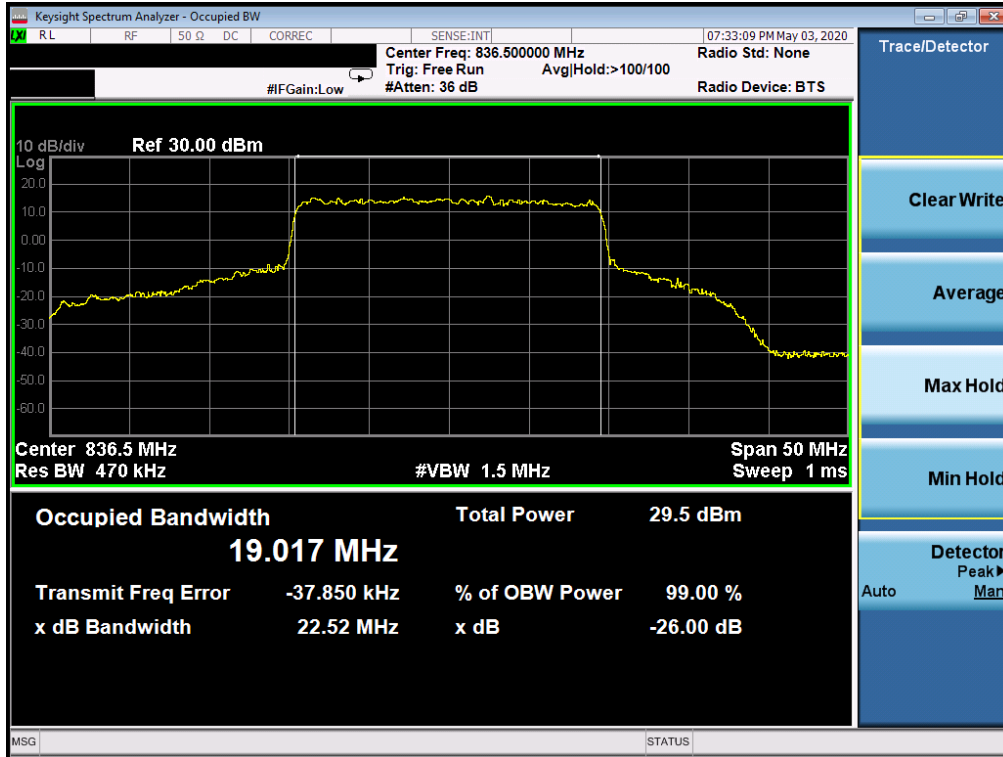


Plot 7-55. Occupied Bandwidth Plot (NR Band n5 - 20MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

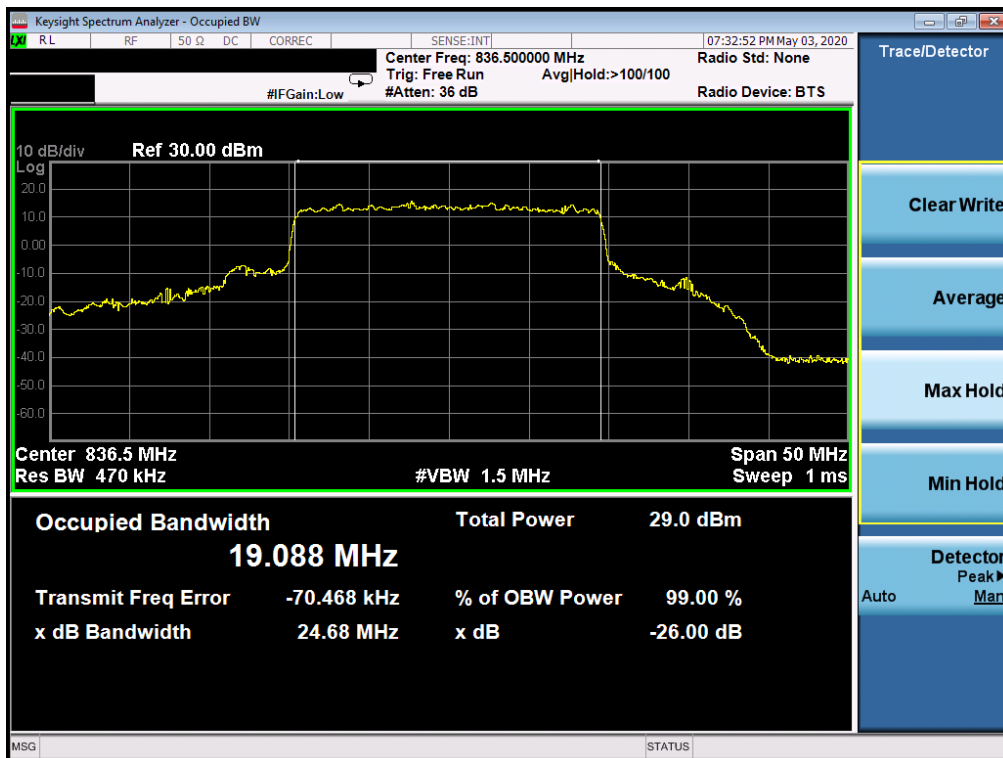


Plot 7-56. Occupied Bandwidth Plot (NR Band n5 - 20MHz CP-OFDM QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 44 of 285

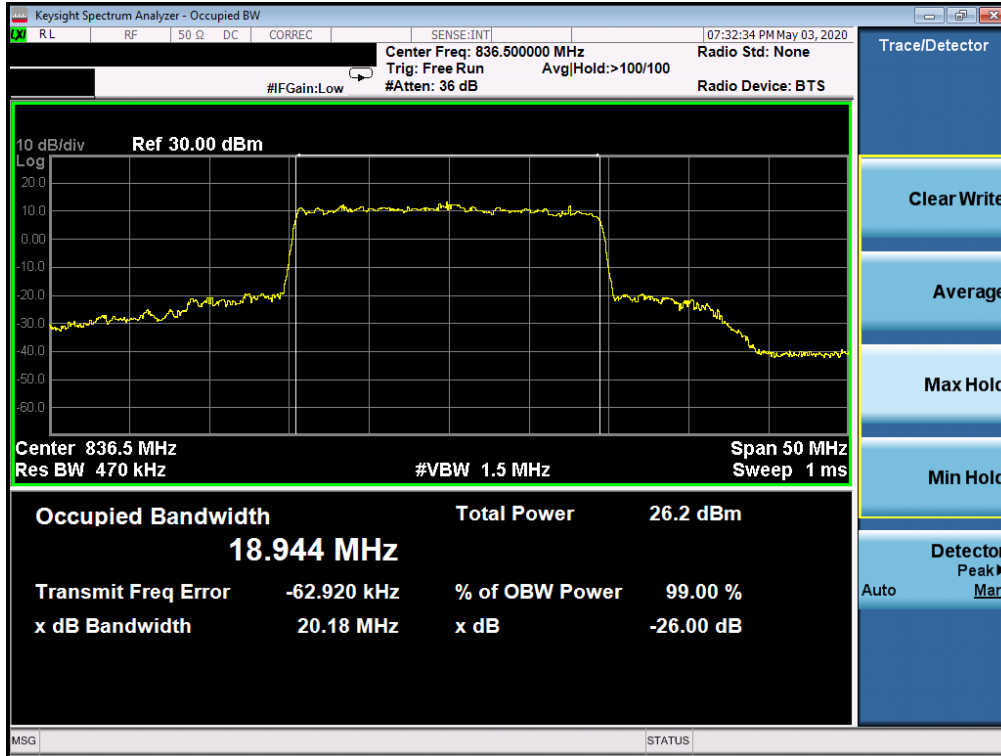


Plot 7-57. Occupied Bandwidth Plot (NR Band n5 – 20MHz CP-OFDM 16-QAM – Full RB Configuration)

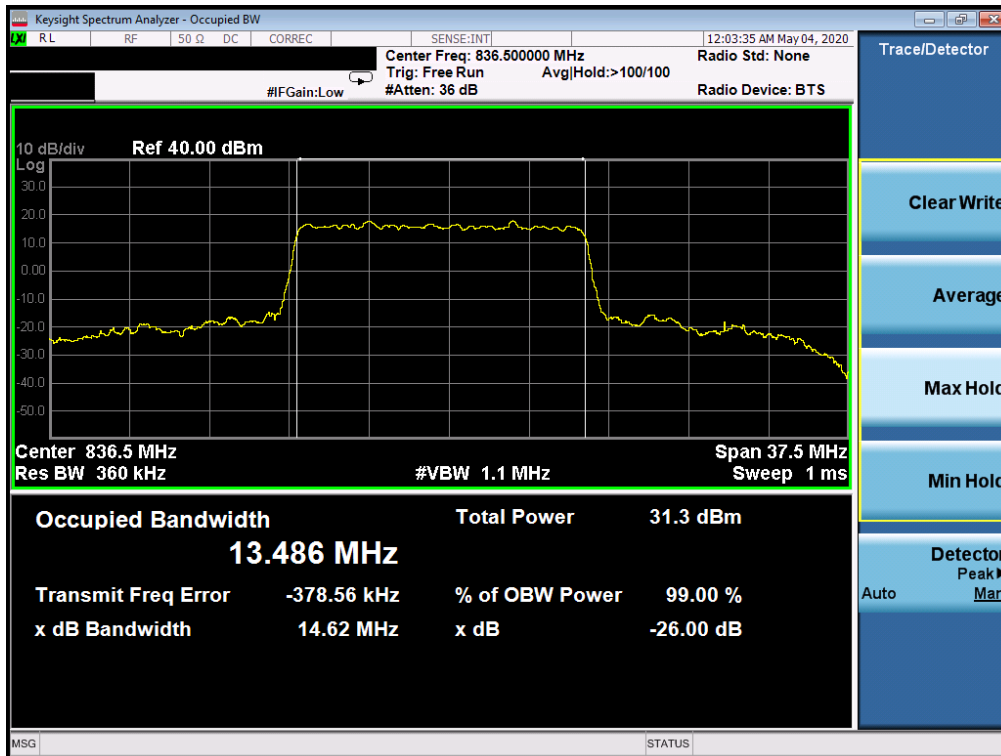


Plot 7-58. Occupied Bandwidth Plot (NR Band n5 - 20MHz CP-OFDM 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 45 of 285

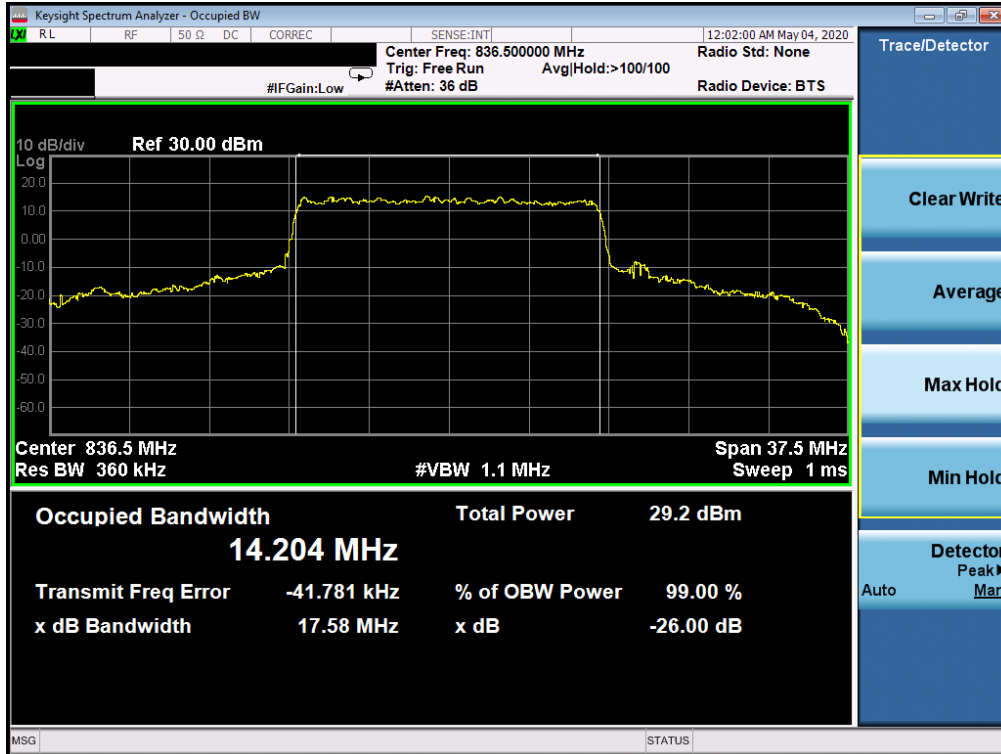


Plot 7-59. Occupied Bandwidth Plot (NR Band n5 - 20MHz CP-OFDM 256-QAM - Full RB Configuration)

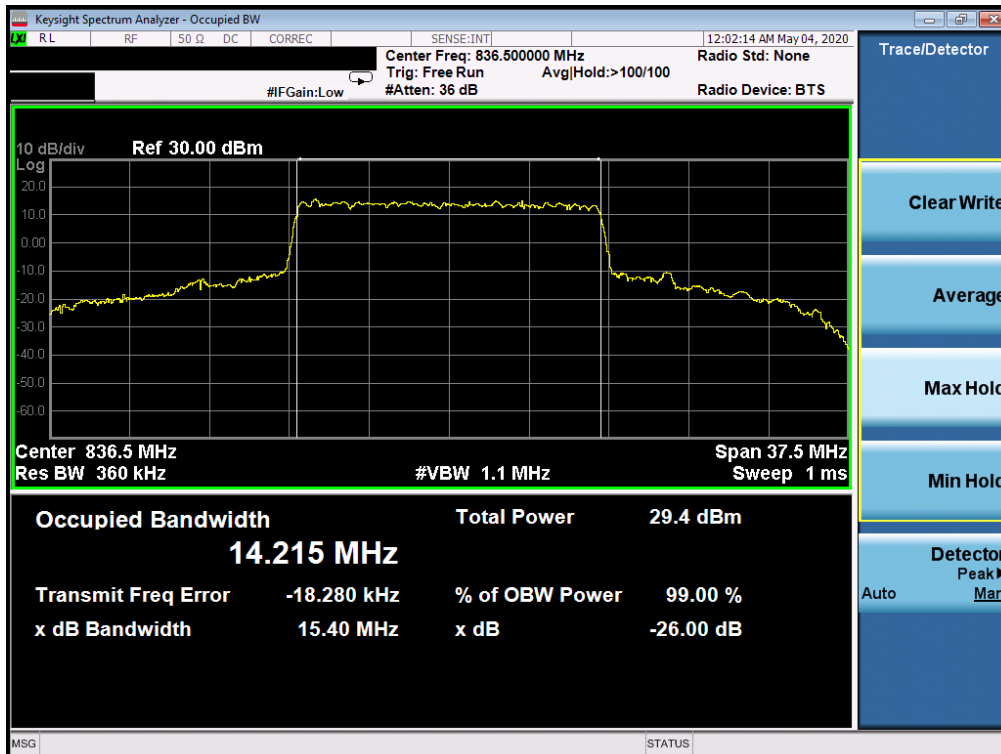


Plot 7-60. Occupied Bandwidth Plot (NR Band n5 - 15MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 46 of 285

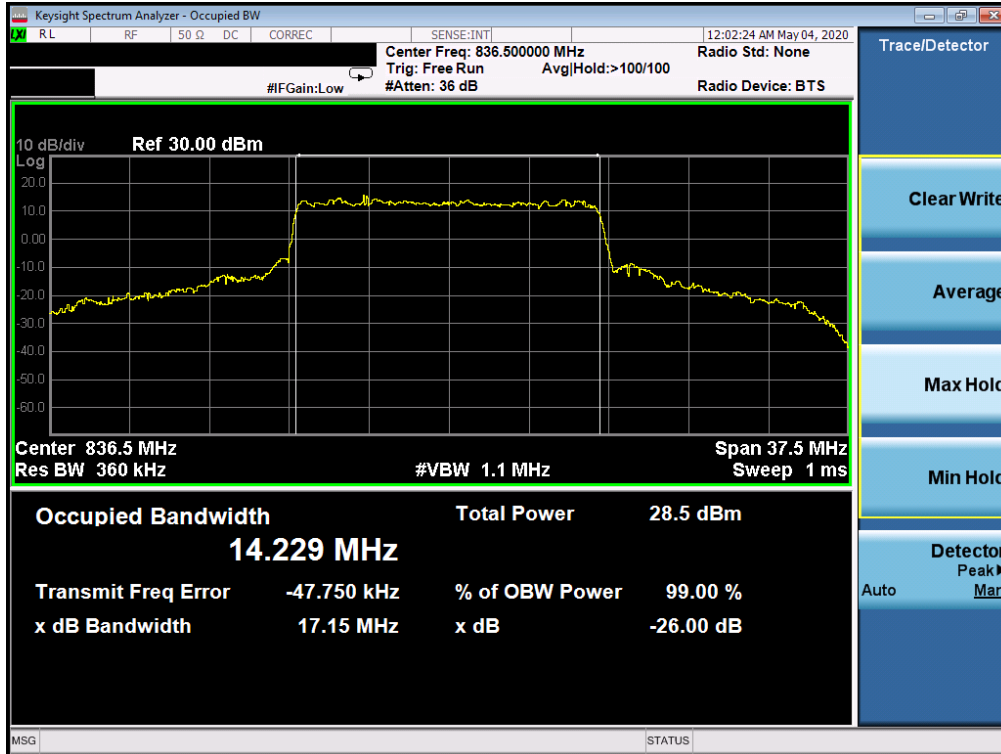


Plot 7-61. Occupied Bandwidth Plot (NR Band n5 - 15MHz CP-OFDM QPSK - Full RB Configuration)



Plot 7-62. Occupied Bandwidth Plot (NR Band n5 - 15MHz CP-OFDM 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 47 of 285

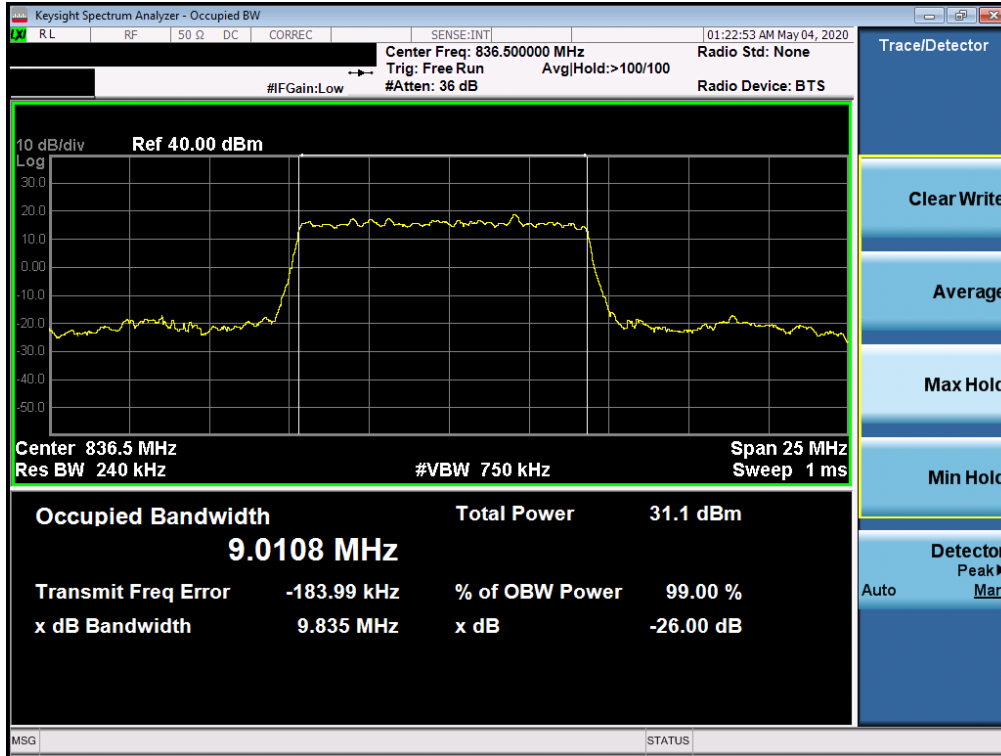


Plot 7-63. Occupied Bandwidth Plot (NR Band n5 - 15MHz CP-OFDM 64-QAM - Full RB Configuration)

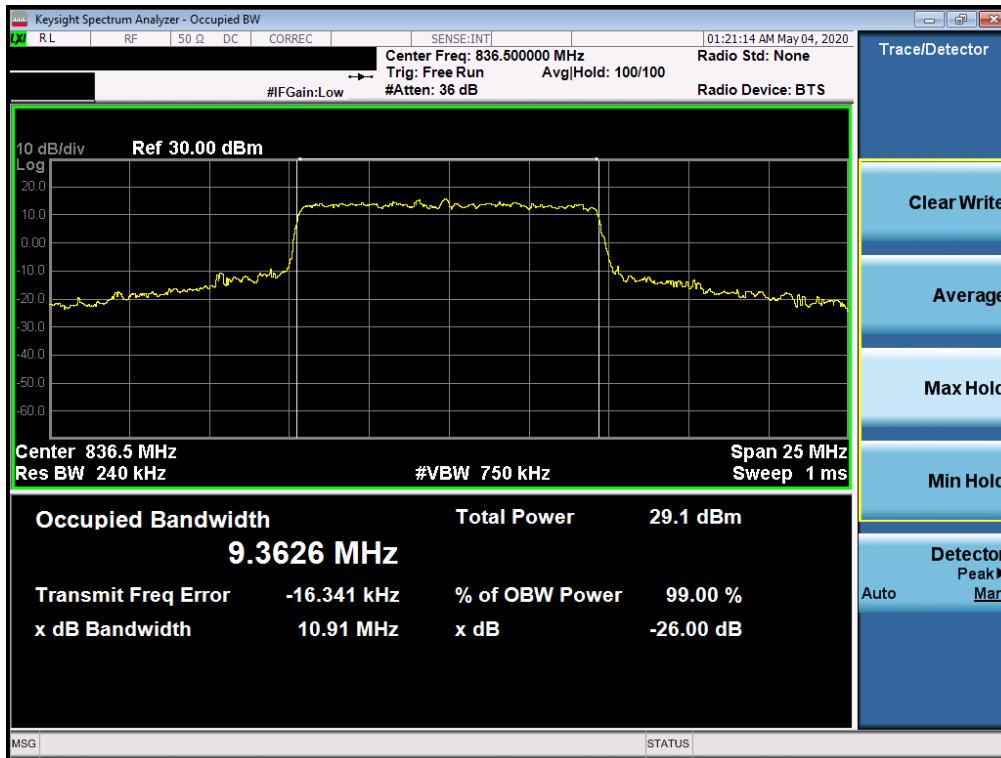


Plot 7-64. Occupied Bandwidth Plot (NR Band n5 - 15MHz CP-OFDM 256-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 48 of 285

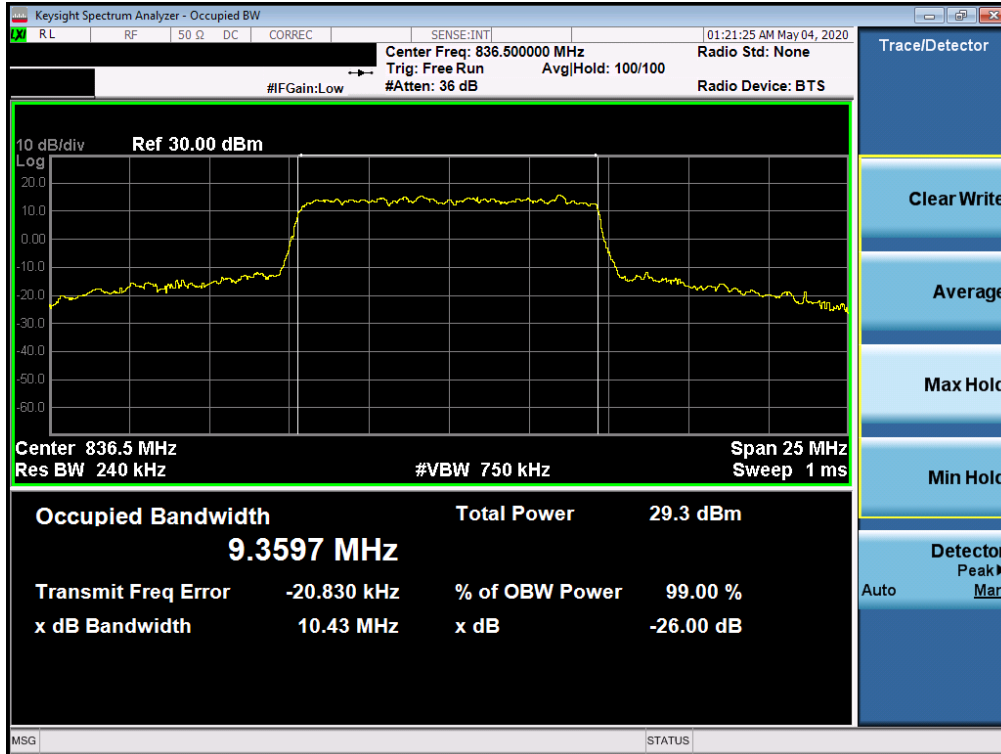


Plot 7-65. Occupied Bandwidth Plot (NR Band n5 - 10MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

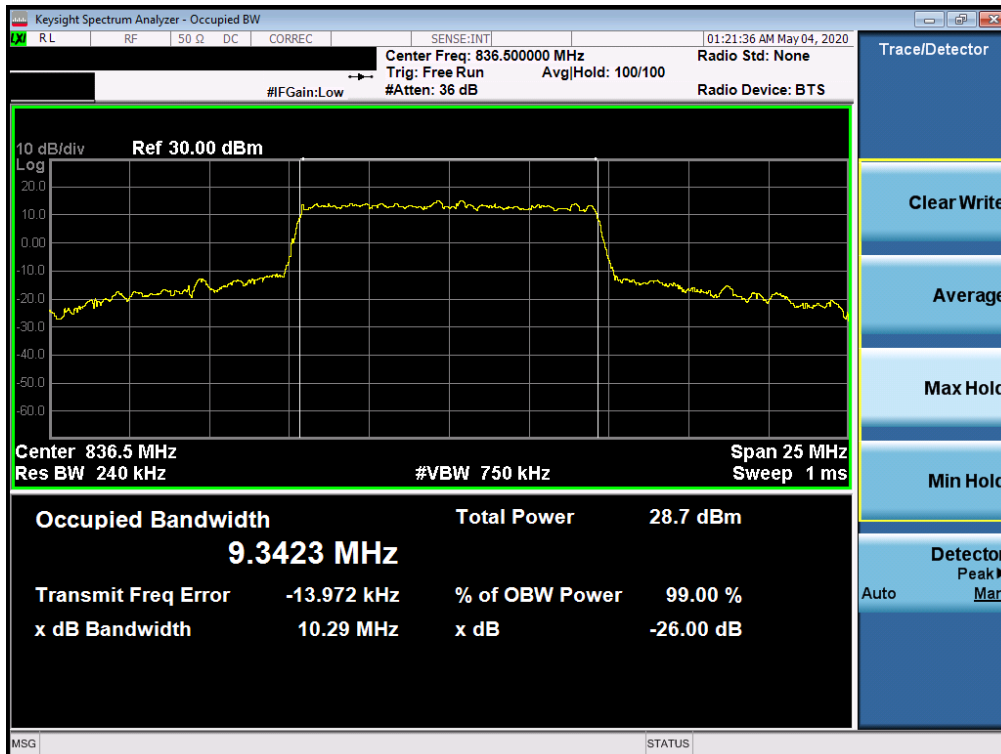


Plot 7-66. Occupied Bandwidth Plot (NR Band n5 - 10MHz CP-OFDM QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 49 of 285



Plot 7-67. Occupied Bandwidth Plot (NR Band n5 – 10MHz CP-OFDM 16-QAM – Full RB Configuration)

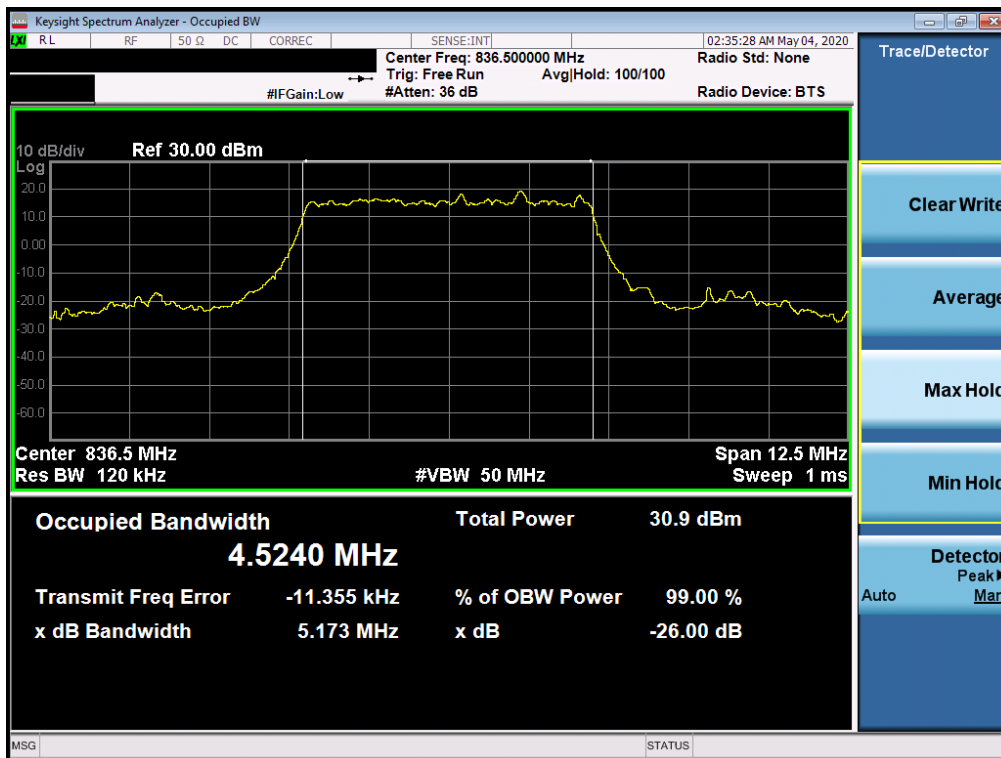


Plot 7-68. Occupied Bandwidth Plot (NR Band n5 - 10MHz CP-OFDM 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 50 of 285

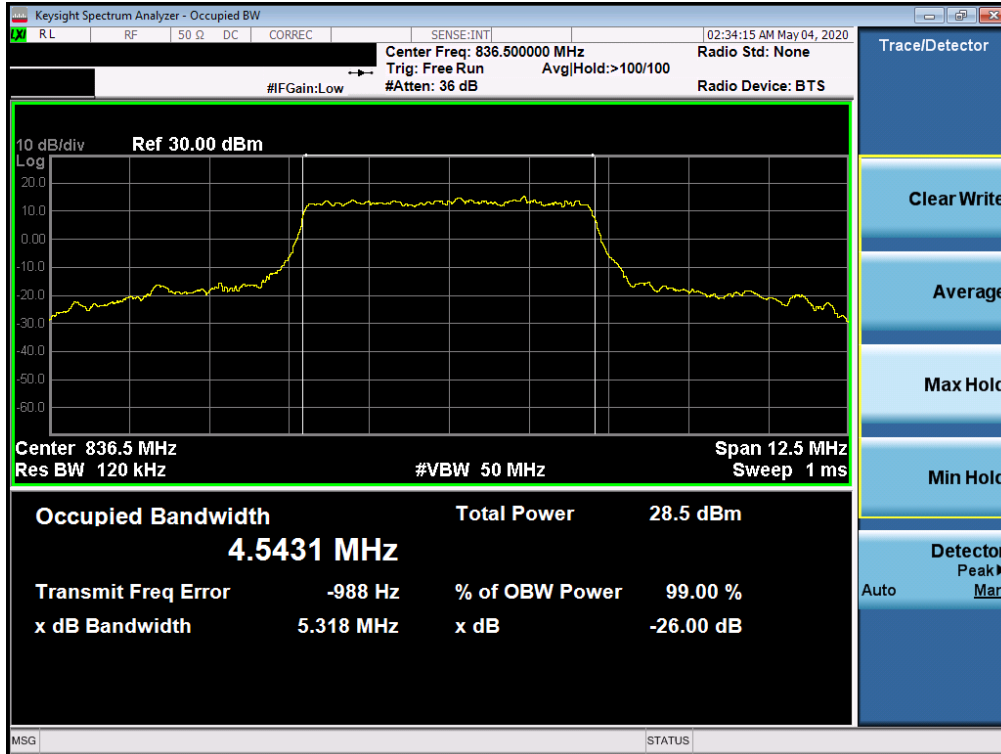


Plot 7-69. Occupied Bandwidth Plot (NR Band n5 - 10MHz CP-OFDM 256-QAM - Full RB Configuration)

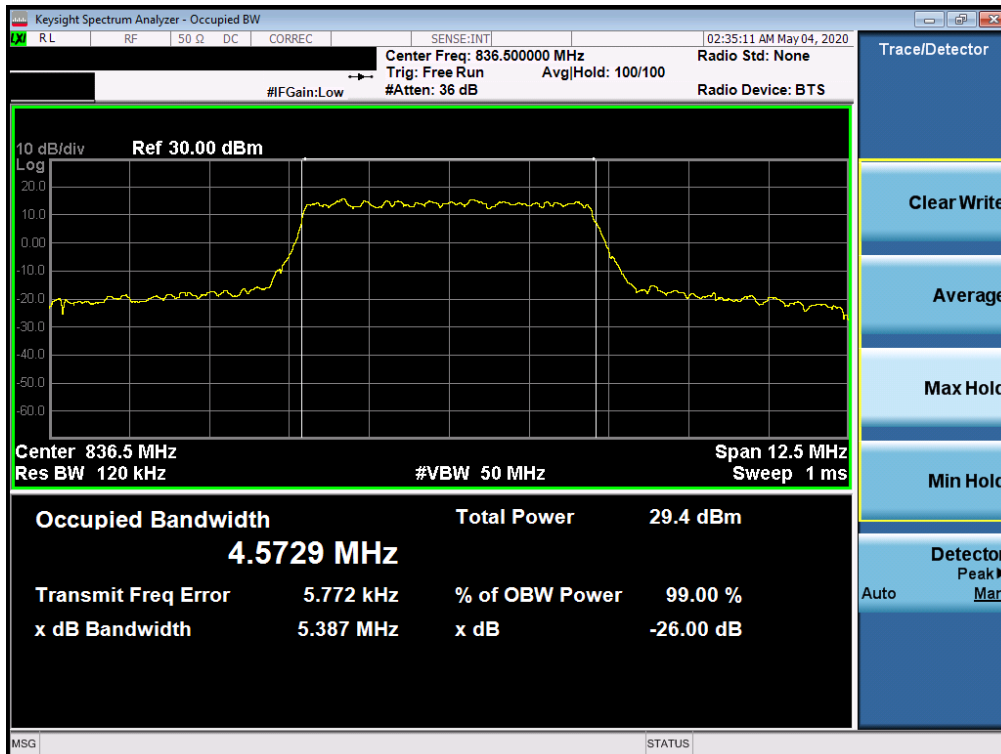


Plot 7-70. Occupied Bandwidth Plot (NR Band n5 - 5MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 51 of 285

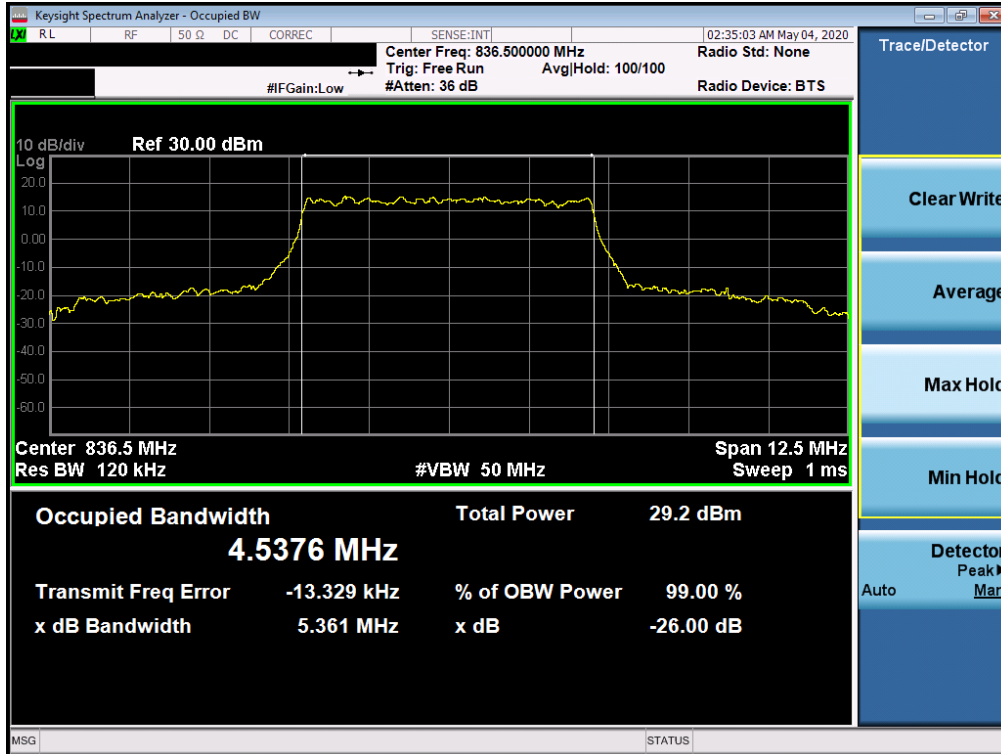


Plot 7-71. Occupied Bandwidth Plot (NR Band n5 - 5MHz CP-OFDM QPSK - Full RB Configuration)

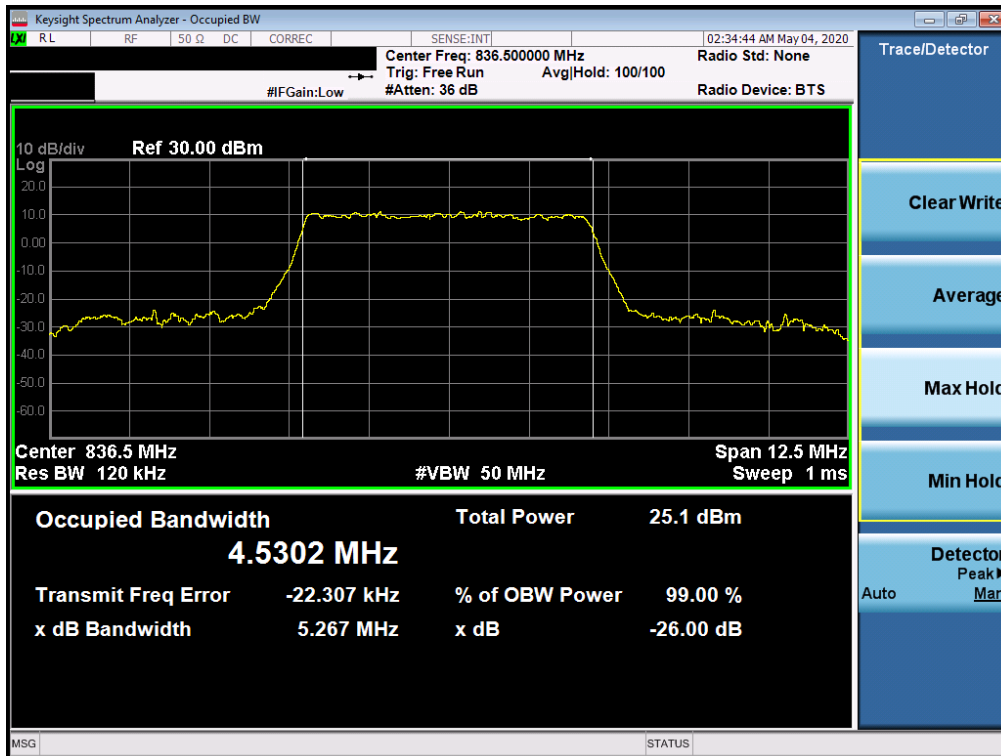


Plot 7-72. Occupied Bandwidth Plot (NR Band n5 - 5MHz CP-OFDM 16-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 52 of 285



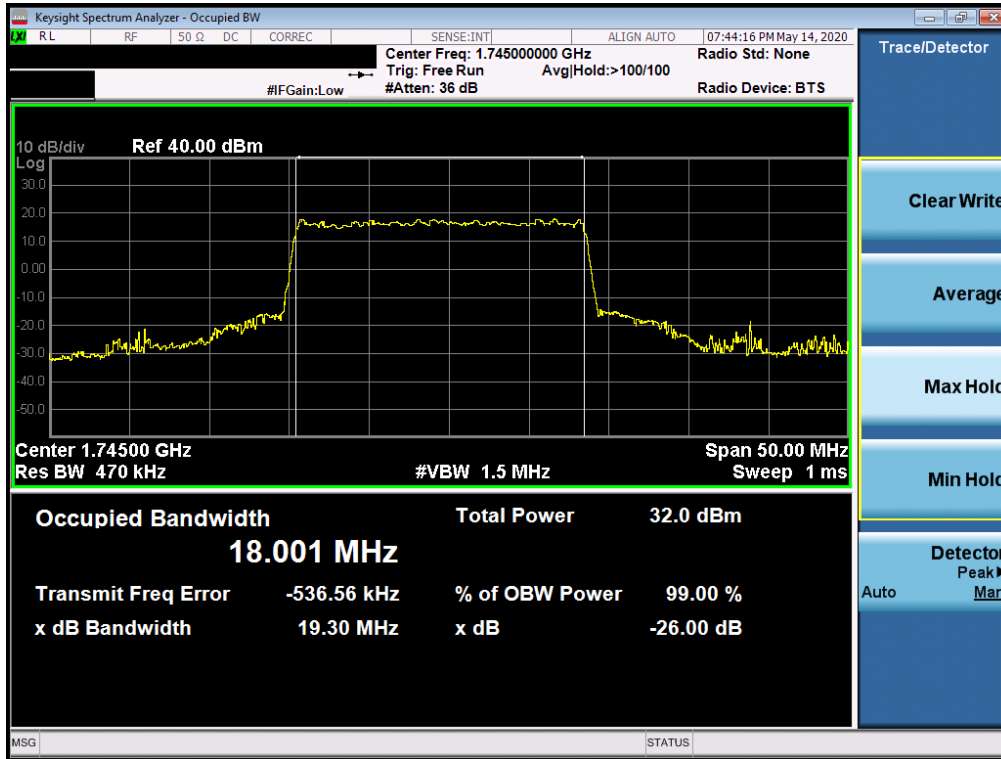
Plot 7-73. Occupied Bandwidth Plot (NR Band n5 - 5MHz CP-OFDM 64-QAM - Full RB Configuration)



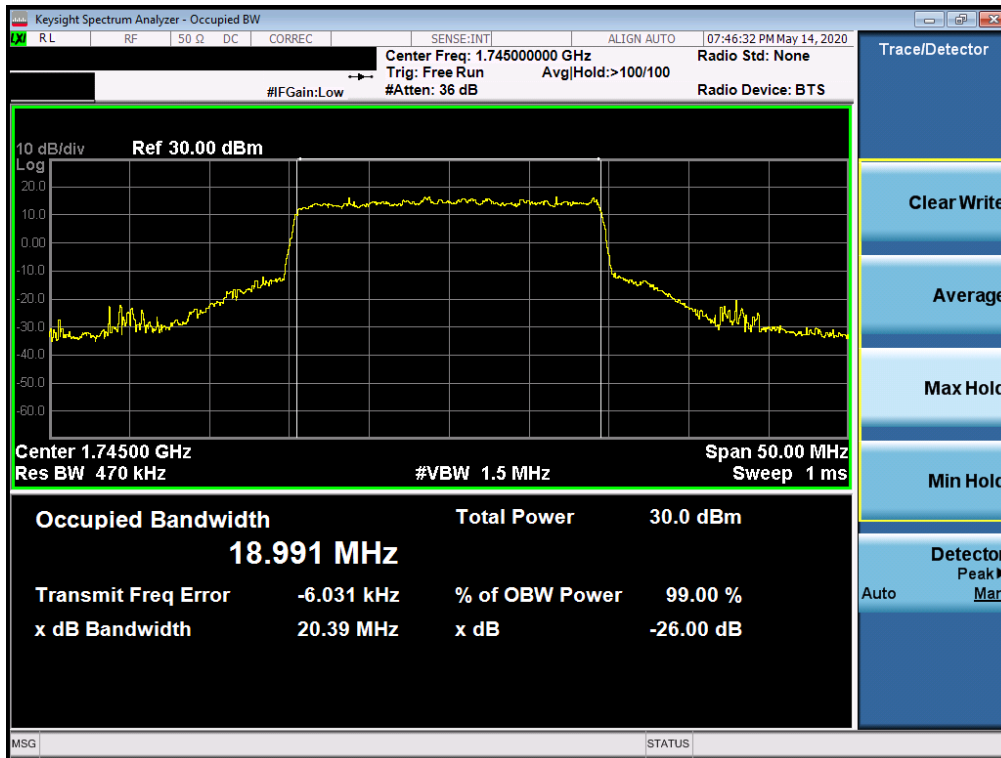
Plot 7-74. Occupied Bandwidth Plot (NR Band n5 - 5MHz CP-OFDM 256-QAM - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 53 of 285

NR Band n66

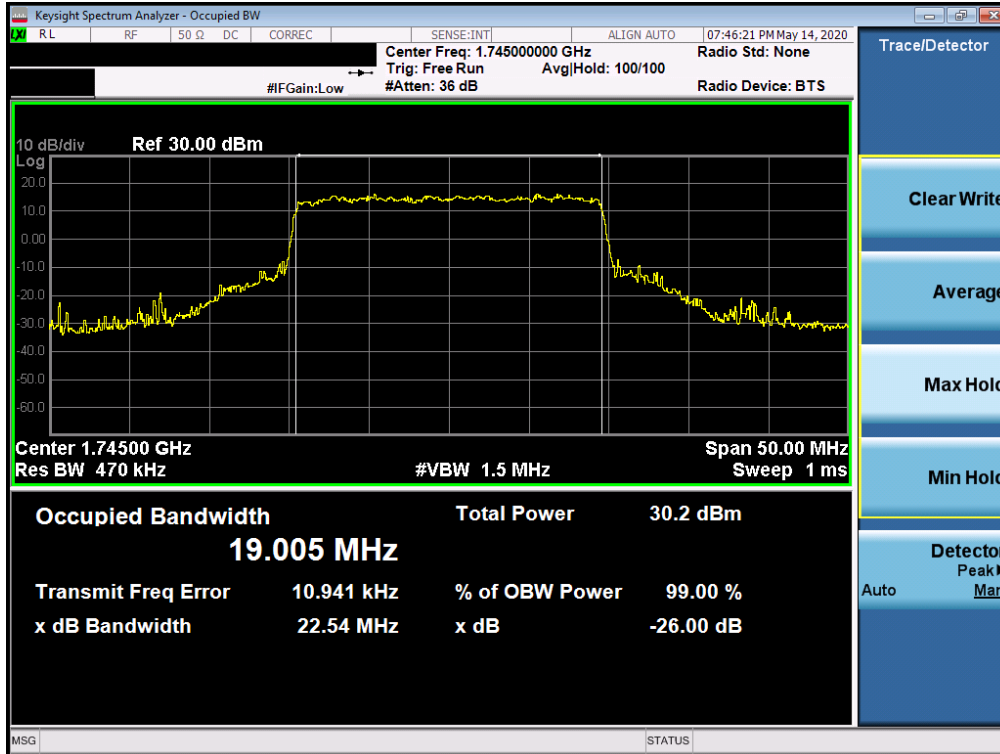


Plot 7-75. Occupied Bandwidth Plot (NR Band n66 - 20MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

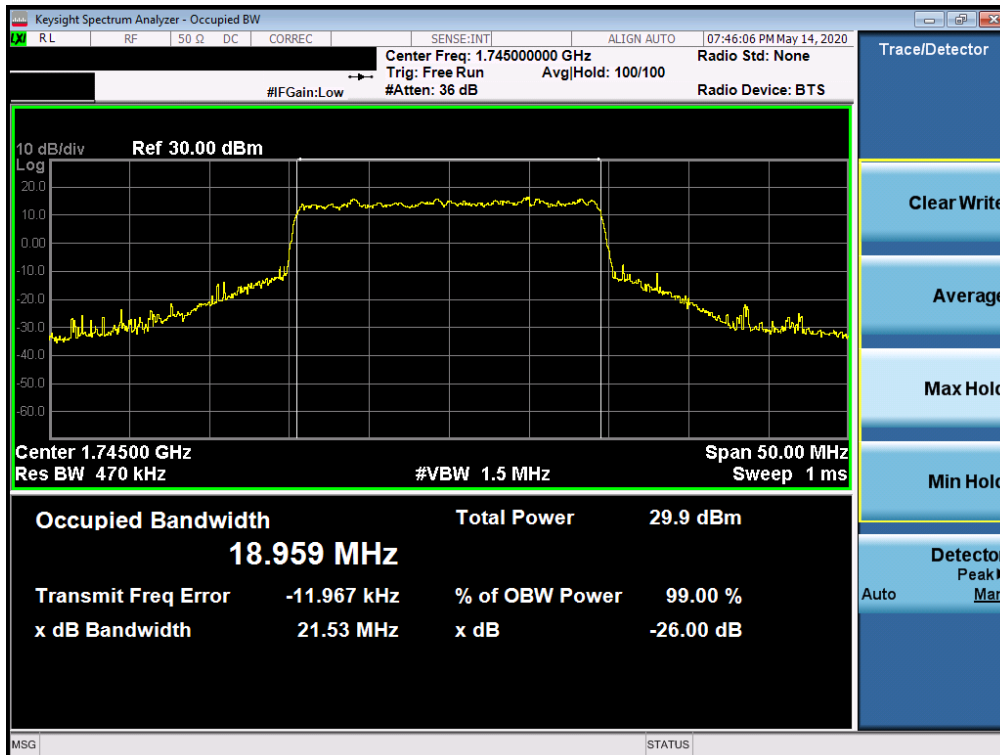


Plot 7-76. Occupied Bandwidth Plot (NR Band n66 - 20MHz CP-OFDM QPSK - Full RB Configuration)

FCC ID: A3LSMH204V		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 54 of 285

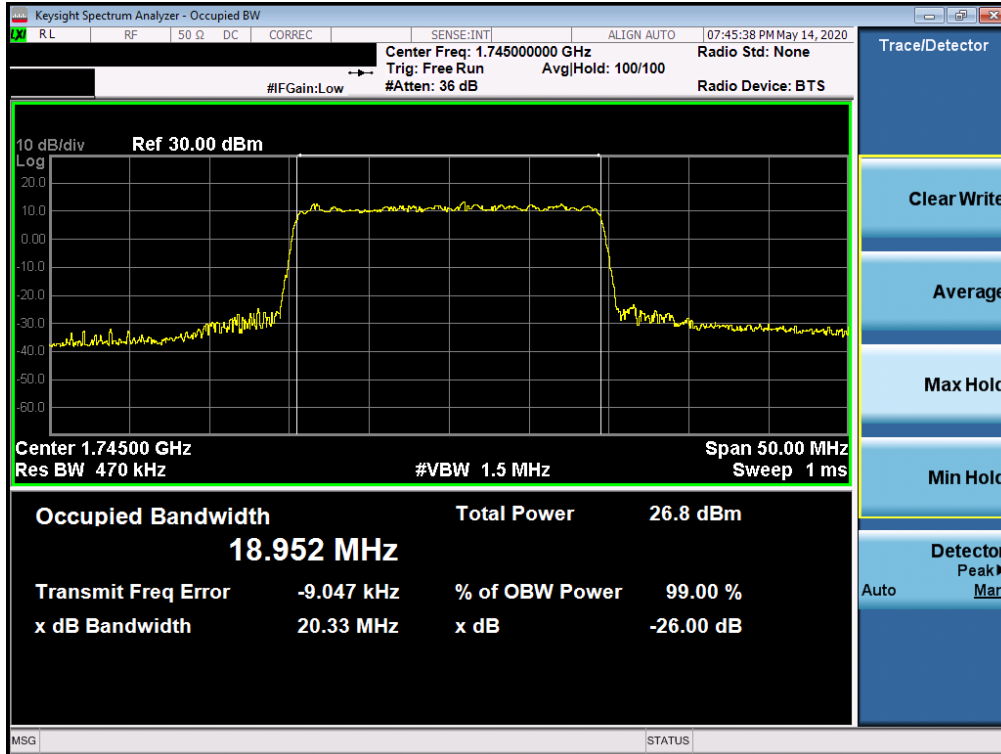


Plot 7-77. Occupied Bandwidth Plot (NR Band n66 - 20MHz CP-OFDM 16-QAM - Full RB Configuration)

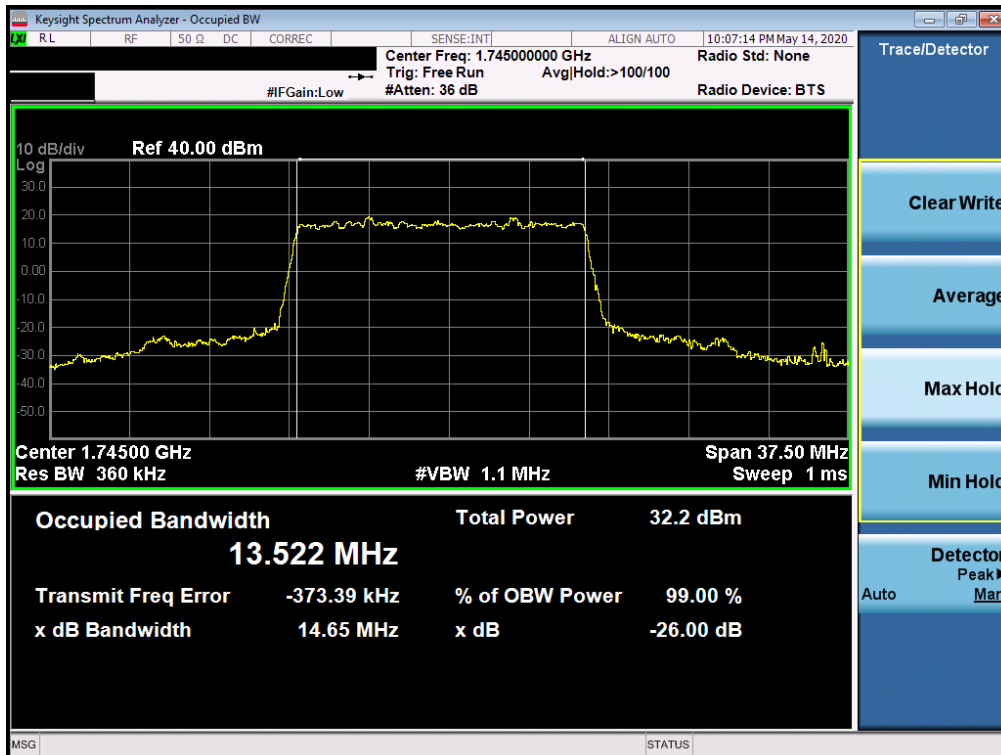


Plot 7-78. Occupied Bandwidth Plot (NR Band n66 - 20MHz CP-OFDM 64-QAM - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 55 of 285



Plot 7-79. Occupied Bandwidth Plot (NR Band n66 - 20MHz CP-OFDM 256-QAM - Full RB Configuration)



Plot 7-80. Occupied Bandwidth Plot (NR Band n66 - 15MHz DFT-s-OFDM $\pi/2$ BPSK - Full RB Configuration)

FCC ID: A3LSMH204V	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2004140062-03.A3L	Test Dates: 4/29 - 8/12/2020	EUT Type: Indoor Customer Premises Equipment (CPE)		Page 56 of 285