

PCTEST

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PART 24 MEASUREMENT REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si

Gyeonggi-do, 16677, Korea

Date of Testing: 09/15 - 11/15/2020 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2009140143-19.A3L

FCC ID: A3LSMG996U

Applicant Name: Samsung Electronics Co., Ltd.

Application Type:CertificationModel:SM-G996UAdditional Model(s):SM-G996U1EUT Type:Portable Handset

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part: 24

Test Procedure(s): ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168

D01 v03r01, KDB 648474 D03 v01r04

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

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

Randy Ortanez President





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			Tx Frequency		RP	Emission
Mode	Bandwidth	Modulation	Range [MHz]	Max. Power [W]	Max. Power [dBm]	Designator
		QPSK	1860.0 - 1905.0	0.178	22.51	18M0G7D
	00 MH	16QAM	1860.0 - 1905.0	0.167	22.22	18M0W7D
	20 MHz	64QAM	1860.0 - 1905.0	0.122	20.87	18M0W7D
		256QAM	1860.0 - 1905.0	0.054	17.30	18M0W7D
		QPSK	1857.5 - 1907.5	0.162	22.09	13M5G7D
	15 MHz	16QAM	1857.5 - 1907.5	0.130	21.14	13M5W7D
	15 MHz	64QAM	1857.5 - 1907.5	0.114	20.55	13M5W7D
		256QAM	1857.5 - 1907.5	0.105	20.20	13M5W7D
		QPSK	1855.0 - 1910.0	0.153	21.85	9M02G7D
	10 MHz	16QAM	1855.0 - 1910.0	0.128	21.07	8M99W7D
		64QAM	1855.0 - 1910.0	0.113	20.54	9M01W7D
LTE Band 25/2		256QAM	1855.0 - 1910.0	0.106	20.24	8M99W7D
		QPSK 16OAM	1852.5 - 1912.5 1852.5 - 1912.5	0.160 0.142	22.04	4M55G7D
	5 MHz	16QAM 64QAM	1852.5 - 1912.5	0.142	21.52 20.11	4M52W7D 4M54W7D
		256QAM	1852.5 - 1912.5	0.103	19.75	4M53W7D
		QPSK	1851.5 - 1913.5	0.034	21.98	2M71G7D
		16QAM	1851.5 - 1913.5	0.131	21.18	2M70W7D
	3 MHz	64QAM	1851.5 - 1913.5	0.131	20.51	2M71W7D
		256QAM	1851.5 - 1913.5	0.106	20.24	2M71W7D
		QPSK	1850.7 - 1914.3	0.157	21.96	1M10G7D
		16QAM	1850.7 - 1914.3	0.125	20.96	1M11W7D
	1.4 MHz	64QAM	1850.7 - 1914.3	0.095	19.76	1M09W7D
		256QAM	1850.7 - 1914.3	0.089	19.48	1M10W7D
		π/2 BPSK	1870.0 - 1895.0	0.302	24.81	38M7G7D
		QPSK	1870.0 - 1895.0	0.305	24.85	38M6G7D
	40 MHz	16QAM	1870.0 - 1895.0	0.239	23.79	38M6W7D
		64QAM	1870.0 - 1895.0	0.171	22.33	38M7W7D
		256QAM	1870.0 - 1895.0	0.112	20.50	38M7W7D
		π/2 BPSK	1865.0 - 1900.0	0.285	24.54	28M6G7D
		QPSK	1865.0 - 1900.0	0.286	24.57	28M6G7D
NR Band n25	30 MHz	16QAM	1865.0 - 1900.0	0.236	23.72	28M6W7D
711 C Dana 1120	00 1111 12	64QAM	1865.0 - 1900.0	0.163	22.13	28M6W7D
		256QAM	1865.0 - 1900.0	0.105	19.77	28M6W7D
		π/2 BPSK	1862.5 - 1902.5	0.266	24.24	23M0G7D
		QPSK	1862.5 - 1902.5	0.284	24.54	23M8G7D
	25 MHz			0.204	23.41	
	25 IVITIZ	16QAM	1862.5 - 1902.5			23M8W7D
		64QAM 256QAM	1862.5 - 1902.5	0.140	21.46 19.20	23M8W7D
			1862.5 - 1902.5	0.083		23M8W7D
		π/2 BPSK	1860.0 - 1905.0	0.253	24.03	18M0G7D
	00.841.1	QPSK	1860.0 - 1905.0	0.268	24.28	19M0G7D
	20 MHz	16QAM	1860.0 - 1905.0	0.199	22.98	19M0W7D
		64QAM	1860.0 - 1905.0	0.143	21.54	18M9W7D
		256QAM	1860.0 - 1905.0	0.089	19.48	18M9W7D
		π/2 BPSK	1857.5 - 1907.5	0.256	24.08	13M5G7D
		QPSK	1857.5 - 1907.5	0.263	24.21	14M2G7D
	15 MHz	16QAM	1857.5 - 1907.5	0.208	23.18	14M2W7D
		64QAM	1857.5 - 1907.5	0.144	21.57	14M2W7D
NR Band n25/n2		256QAM	1857.5 - 1907.5	0.095	19.79	14M2W7D
. Tr Dana 1120/112		π/2 BPSK	1855.0 - 1910.0	0.263	24.20	9M01G7D
		QPSK	1855.0 - 1910.0	0.267	24.26	9M35G7D
	10 MHz	16QAM	1855.0 - 1910.0	0.201	23.04	9M34W7D
		64QAM	1855.0 - 1910.0	0.140	21.47	9M34W7D
		256QAM	1855.0 - 1910.0	0.090	19.53	9M41W7D
		π/2 BPSK	1852.5 - 1912.5	0.259	24.13	4M51G7D
		QPSK	1852.5 - 1912.5	0.267	24.27	4M51G7D
	5 MHz	16QAM	1852.5 - 1912.5	0.203	23.07	4M52W7D
		64QAM	1852.5 - 1912.5	0.148	21.71	4M51W7D
		256QAM	1852.5 - 1912.5	0.090	19.54	4M50W7D
		2000,	. 302.0 10.2.0	0.000	.0.0	

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		Tx Frequency	EIRP		Emission
Mode	Modulation	Range [MHz]	Max. Power [W]	Max. Power [dBm]	Designator
GSM/GPRS	GMSK	1850.2 - 1909.8	0.708	28.50	245KGXW
EDGE	8-PSK	1850.2 - 1909.8	0.313	24.96	248KG7W
WCDMA	Spread Spectrum	1852.4 - 1907.6	0.229	23.59	4M15F9W
CDMA	Spread Spectrum	1851.25 - 1908.75	0.243	23.85	1M28F9W

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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 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 24.

Test Device Serial No.: 0526M, 0564M, 0501M, 0562, 0520M, 0420M

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

This EUT supports 2 antennas (Antenna A and Antenna I) for n2/n25 operations. This report includes conducted and radiated data from both antennas to ensure compliance.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 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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DESCRIPTION OF TESTS 3.0

3.1 **Evaluation Procedure**

The measurement procedures described in the "Land Mobile FM or PM - Communications Equipment -Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure......None 3.2 PCS - Base Frequency Blocks Α D В Ε F С 1930 1950 1970 1990 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) 3.3 **PCS - Mobile Frequency Blocks** C Α D В Ε F 1850 1870 1910 1890 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)

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BLOCK 6: 1895 - 1910 MHz (C)



Radiated Power and Radiated Spurious Emissions 3.4

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

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

For radiated power measurements, substitution method is used per the guidance of ANSI/TIA-603-E-2016. A halfwave dipole is 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:

 $P_{d [dBm]} = P_{g [dBm]} - cable loss [dB] + antenna gain [dBd/dBi];$ where P_d is the dipole equivalent power, P_d 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 Pq [dBm] – cable loss [dB].

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

> E[dBµV/m] = Measured amplitude level[dBm] + 107 + Cable Loss[dB] + Antenna Factor[dB/m] $EIRP_{[dBm]} = E_{[dB\mu\nu/m]} + 20logD - 104.8$; where D is the measurement distance in meters.

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.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

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MEASUREMENT UNCERTAINTY 4.0

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 (±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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TEST EQUIPMENT CALIBRATION DATA 5.0

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
-	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		GB46310798
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	Quad Ridge Horn Antenna 2/22/2019 Biennial 2/22/2021		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
Micro-Tronics	BRM50706	Notch filter for B5/26/8	N/A		G036	
Micro-Tronics	BRM20472	Notch filter for B71/12/17/13/14		N/A		G001
Micro-Tronics	BRM50710	Notch filter for B30		N/A		G017
Micro-Tronics	BRM50713	Notch filter for B66		N/A		G020
Micro-Tronics	BRM50711	Notch filter for B48		N/A		G039

Table 5-1. Test Equipment

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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SAMPLE CALCULATIONS 6.0

GSM Emission Designator

Emission Designator = 250KGXW

GSM BW = 250 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 250KG7W

EDGE BW = 250 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

CDMA Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

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 MHzW = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

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Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive 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 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm - (-24.80) = 50.3 dBc.

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TEST RESULTS 7.0

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

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FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): GSM/GPRS/EDGE/WCDMA/CDMA/LTE/NR

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
Ë	Transmitter Conducted Output Power	2.1046	RSS-133(4.1)	N/A	PASS	See RF Exposure Report
CONDUCTED	Occupied Bandwidth	2.1049	RSS-133(2.3)	N/A	PASS	Section 7.2
CONI	Conducted Band Edge / Spurious Emissions	2.1051, 24.238(a)	RSS-133(6.5)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of- band emissions	PASS	Sections 7.3, 7.4
	Frequency Stability	2.1055, 24.235	RSS-133(6.3)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power	24.232(c)	RSS-132(5.4)	< 7 Watts max. ERP	PASS	Section 7.6
RADI	Radiated Spurious Emissions	2.1053, 24.238(a)	RSS-133(6.5)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST 2G/3G Automation Version 4.5, LTE Automation Version 5.3.

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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 ≥ 3 x 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 25/2



Plot 7-1. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz QPSK - Full RB Configuration)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB Configuration)

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Plot 7-3. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 64-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 256-QAM - Full RB Configuration)

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Plot 7-5. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz QPSK - Full RB Configuration)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 16-QAM - Full RB Configuration)

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Plot 7-7. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 64-QAM - Full RB Configuration)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 256-QAM - Full RB Configuration)

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Plot 7-9. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz QPSK - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 16-QAM - Full RB Configuration)

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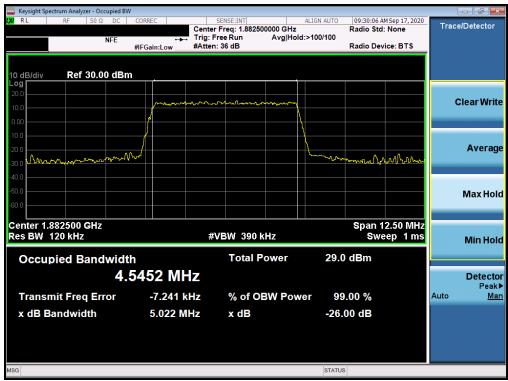
Plot 7-11. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 256-QAM - Full RB Configuration)

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Plot 7-13. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 16-QAM - Full RB Configuration)

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Plot 7-15. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 64-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 256-QAM - Full RB Configuration)

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Plot 7-17. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz QPSK - Full RB Configuration)



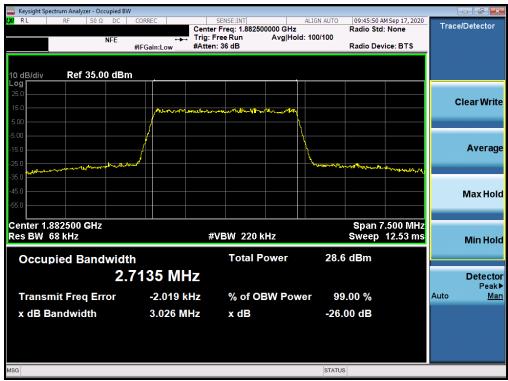
Plot 7-18. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 16-QAM - Full RB Configuration)

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Plot 7-19. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 256-QAM - Full RB Configuration)

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Plot 7-21. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

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Plot 7-23. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-24. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 256-QAM - Full RB Configuration)

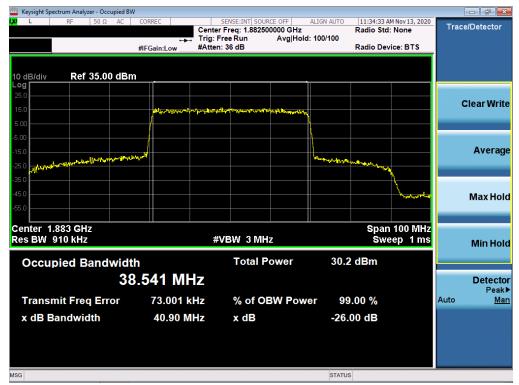
FCC ID: A3LSMG996U	PCTEST*	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Quality Manager
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NR Band n25 Ant A



Plot 7-25. Occupied Bandwidth Plot (NR Band n25 Ant A - 40.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-26. Occupied Bandwidth Plot (NR Band n25 Ant A - 40.0MHz CP-OFDM QPSK - Full RB)

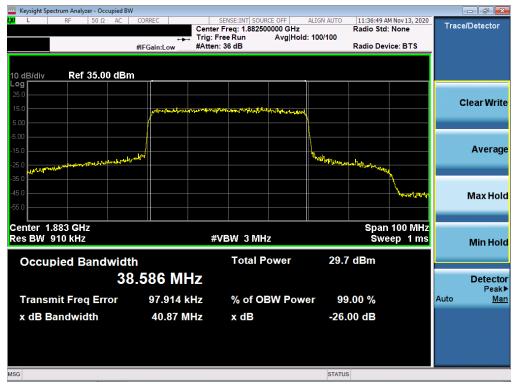
FCC ID: A3LSMG996U	PCTEST*	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Quality Manager
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Plot 7-27. Occupied Bandwidth Plot (NR Band n25 Ant A - 40.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-28. Occupied Bandwidth Plot (NR Band n25 Ant A - 40.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-29. Occupied Bandwidth Plot (NR Band n25 Ant A - 40.0MHz CP-OFDM 256QAM - Full RB)



Plot 7-30. Occupied Bandwidth Plot (NR Band n25 Ant A - 30.0MHz DFT-s-OFDM BPSK - Full RB)

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Plot 7-31. Occupied Bandwidth Plot (NR Band n25 Ant A - 30.0MHz CP-OFDM QPSK - Full RB)



Plot 7-32. Occupied Bandwidth Plot (NR Band n25 Ant A - 30.0MHz CP-OFDM 16QAM - Full RB)

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Plot 7-33. Occupied Bandwidth Plot (NR Band n25 Ant A - 30.0MHz CP-OFDM 64QAM - Full RB)



Plot 7-34. Occupied Bandwidth Plot (NR Band n25 Ant A - 30.0MHz CP-OFDM 256QAM - Full RB)

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Plot 7-35. Occupied Bandwidth Plot (NR Band n25 Ant A - 25.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-36. Occupied Bandwidth Plot (NR Band n25 Ant A - 25.0MHz CP-OFDM QPSK - Full RB)

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Plot 7-37. Occupied Bandwidth Plot (NR Band n25 Ant A - 25.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-38. Occupied Bandwidth Plot (NR Band n25 Ant A - 25.0MHz CP-OFDM 64QAM - Full RB)

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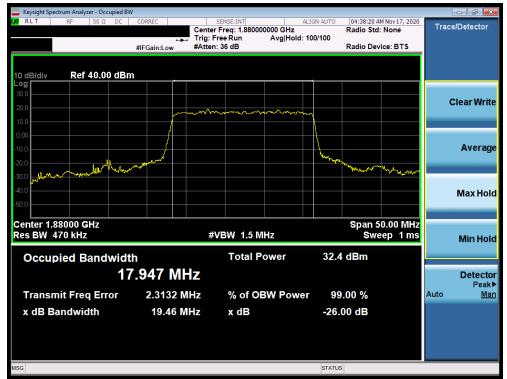


Plot 7-39. Occupied Bandwidth Plot (NR Band n25 Ant A - 25.0MHz CP-OFDM 256QAM - Full RB)

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NR Band n2 Ant A



Plot 7-40. Occupied Bandwidth Plot (NR Band n2 Ant A - 20.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-41. Occupied Bandwidth Plot (NR Band n2 Ant A - 20.0MHz CP-OFDM QPSK - Full RB)

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Plot 7-42. Occupied Bandwidth Plot (NR Band n2 Ant A - 20.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-43. Occupied Bandwidth Plot (NR Band n2 Ant A - 20.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-44. Occupied Bandwidth Plot (NR Band n2 Ant A - 20.0MHz CP-OFDM 256QAM - Full RB)



Plot 7-45. Occupied Bandwidth Plot (NR Band n2 Ant A - 15.0MHz DFT-s-OFDM BPSK - Full RB)

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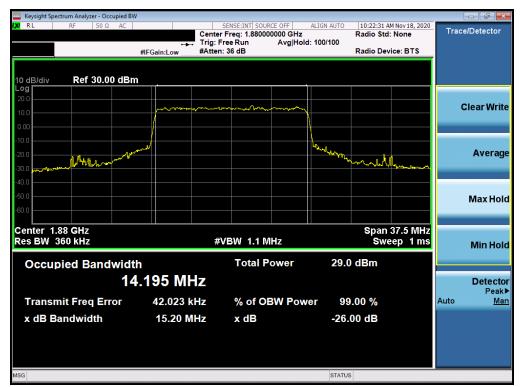
Plot 7-46. Occupied Bandwidth Plot (NR Band n2 Ant A - 15.0MHz CP-OFDM QPSK - Full RB)



Plot 7-47. Occupied Bandwidth Plot (NR Band n2 Ant A - 15.0MHz CP-OFDM 16QAM - Full RB)

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Plot 7-48. Occupied Bandwidth Plot (NR Band n2 Ant A - 15.0MHz CP-OFDM 64QAM - Full RB)



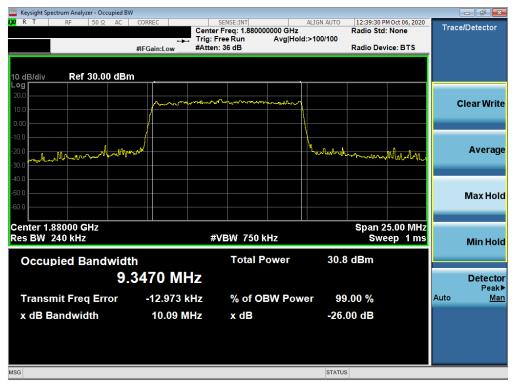
Plot 7-49. Occupied Bandwidth Plot (NR Band n2 Ant A - 15.0MHz CP-OFDM 256QAM - Full RB)

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Plot 7-50. Occupied Bandwidth Plot (NR Band n2 Ant A - 10.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-51. Occupied Bandwidth Plot (NR Band n2 Ant A - 10.0MHz CP-OFDM QPSK - Full RB)

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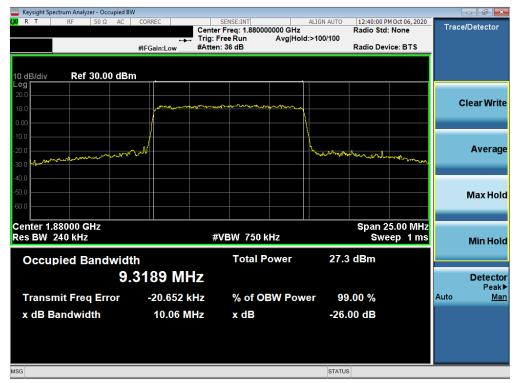
Plot 7-52. Occupied Bandwidth Plot (NR Band n2 Ant A - 10.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-53. Occupied Bandwidth Plot (NR Band n2 Ant A - 10.0MHz CP-OFDM 64QAM - Full RB)

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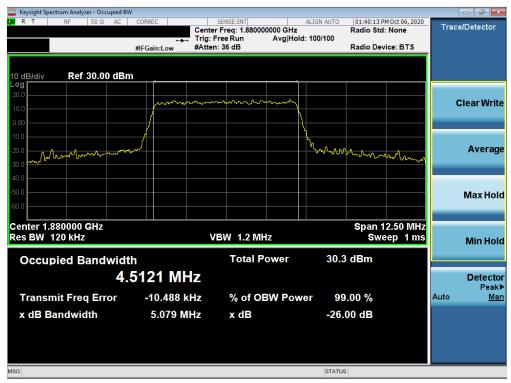
Plot 7-54. Occupied Bandwidth Plot (NR Band n2 Ant A - 10.0MHz CP-OFDM 256QAM - Full RB)



Plot 7-55. Occupied Bandwidth Plot (NR Band n2 Ant A - 5.0MHz DFT-s-OFDM BPSK - Full RB)

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Plot 7-56. Occupied Bandwidth Plot (NR Band n2 Ant A - 5.0MHz CP-OFDM QPSK - Full RB)



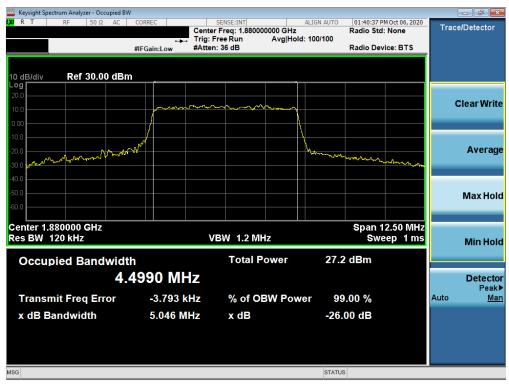
Plot 7-57. Occupied Bandwidth Plot (NR Band n2 Ant A - 5.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMG996U	PCTEST*	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Quality Manager
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Plot 7-58. Occupied Bandwidth Plot (NR Band n2 Ant A - 5.0MHz CP-OFDM 64QAM - Full RB)



Plot 7-59. Occupied Bandwidth Plot (NR Band n2 Ant A - 5.0MHz CP-OFDM 256QAM - Full RB)

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NR Band n25 Ant I



Plot 7-60. Occupied Bandwidth Plot (NR Band n25 Ant I- 40.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-61. Occupied Bandwidth Plot (NR Band n25 Ant I- 40.0MHz CP-OFDM QPSK - Full RB)

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Plot 7-62. Occupied Bandwidth Plot (NR Band n25 Ant I- 40.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-63. Occupied Bandwidth Plot (NR Band n25 Ant I- 40.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-64. Occupied Bandwidth Plot (NR Band n25 Ant I- 40.0MHz CP-OFDM 256QAM - Full RB)



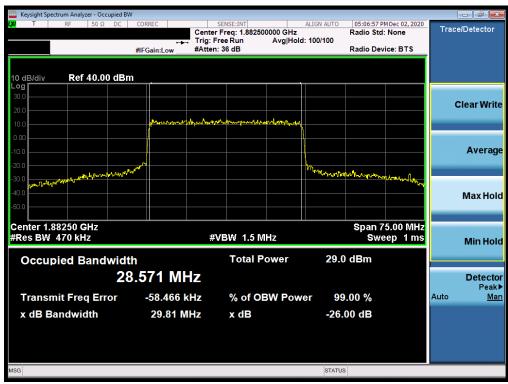
Plot 7-65. Occupied Bandwidth Plot (NR Band n25 Ant I- 30.0MHz DFT-s-OFDM BPSK - Full RB)

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Plot 7-66. Occupied Bandwidth Plot (NR Band n25 Ant I- 30.0MHz CP-OFDM QPSK - Full RB)



Plot 7-67. Occupied Bandwidth Plot (NR Band n25 Ant I- 30.0MHz CP-OFDM 16QAM - Full RB)

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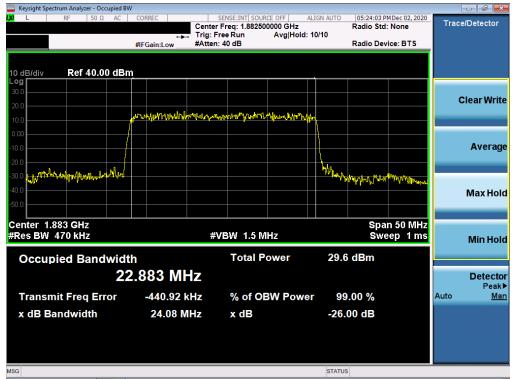
Plot 7-68. Occupied Bandwidth Plot (NR Band n25 Ant I- 30.0MHz CP-OFDM 64QAM - Full RB)



Plot 7-69. Occupied Bandwidth Plot (NR Band n25 Ant I- 30.0MHz CP-OFDM 256QAM - Full RB)

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Plot 7-70. Occupied Bandwidth Plot (NR Band n25 Ant I- 25.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-71. Occupied Bandwidth Plot (NR Band n25 Ant I- 25.0MHz CP-OFDM QPSK - Full RB)

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Plot 7-72. Occupied Bandwidth Plot (NR Band n25 Ant I- 25.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-73. Occupied Bandwidth Plot (NR Band n25 Ant I- 25.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-74. Occupied Bandwidth Plot (NR Band n25 Ant I- 25.0MHz CP-OFDM 256QAM - Full RB)

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NR Band n2 Ant I



Plot 7-75. Occupied Bandwidth Plot (NR Band n2 Ant I- 20.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-76. Occupied Bandwidth Plot (NR Band n2 Ant I- 20.0MHz CP-OFDM QPSK - Full RB)

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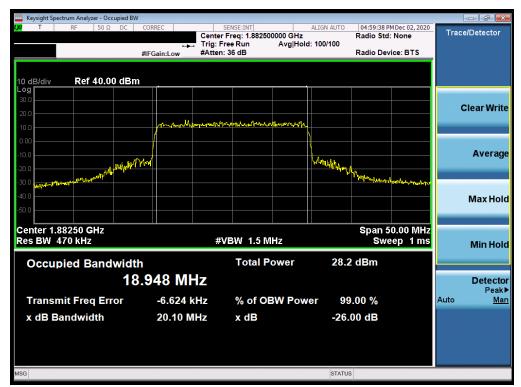
Plot 7-77. Occupied Bandwidth Plot (NR Band n2 Ant I- 20.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-78. Occupied Bandwidth Plot (NR Band n2 Ant I- 20.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-79. Occupied Bandwidth Plot (NR Band n2 Ant I- 20.0MHz CP-OFDM 256QAM - Full RB)



Plot 7-80. Occupied Bandwidth Plot (NR Band n2 Ant I- 15.0MHz DFT-s-OFDM BPSK - Full RB)

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Plot 7-81. Occupied Bandwidth Plot (NR Band n2 Ant I- 15.0MHz CP-OFDM QPSK - Full RB)



Plot 7-82. Occupied Bandwidth Plot (NR Band n2 Ant I- 15.0MHz CP-OFDM 16QAM - Full RB)

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Plot 7-83. Occupied Bandwidth Plot (NR Band n2 Ant I- 15.0MHz CP-OFDM 64QAM - Full RB)



Plot 7-84. Occupied Bandwidth Plot (NR Band n2 Ant I- 15.0MHz CP-OFDM 256QAM - Full RB)

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Plot 7-85. Occupied Bandwidth Plot (NR Band n2 Ant I- 10.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-86. Occupied Bandwidth Plot (NR Band n2 Ant I- 10.0MHz CP-OFDM QPSK - Full RB)

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Plot 7-87. Occupied Bandwidth Plot (NR Band n2 Ant I- 10.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-88. Occupied Bandwidth Plot (NR Band n2 Ant I- 10.0MHz CP-OFDM 64QAM - Full RB)

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Plot 7-89. Occupied Bandwidth Plot (NR Band n2 Ant I- 10.0MHz CP-OFDM 256QAM - Full RB)



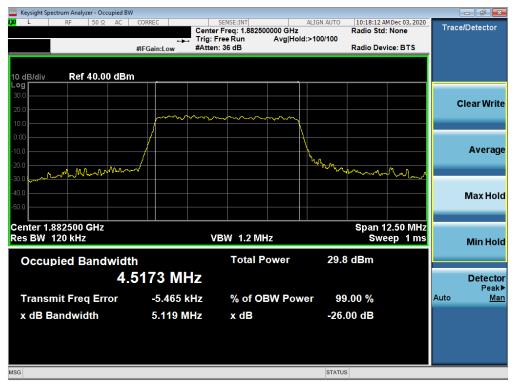
Plot 7-90. Occupied Bandwidth Plot (NR Band n2 Ant I- 5.0MHz DFT-s-OFDM BPSK - Full RB)

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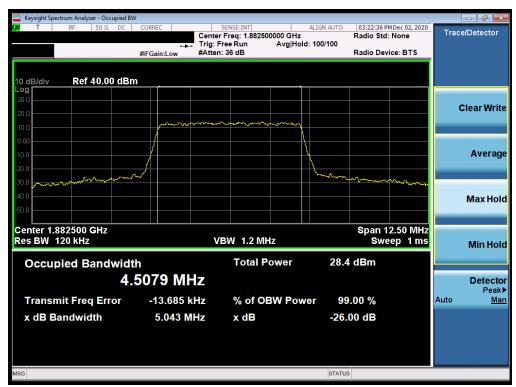
Plot 7-91. Occupied Bandwidth Plot (NR Band n2 Ant I- 5.0MHz CP-OFDM QPSK - Full RB)



Plot 7-92. Occupied Bandwidth Plot (NR Band n2 Ant I- 5.0MHz CP-OFDM 16QAM - Full RB)

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Plot 7-93. Occupied Bandwidth Plot (NR Band n2 Ant I- 5.0MHz CP-OFDM 64QAM - Full RB)



Plot 7-94. Occupied Bandwidth Plot (NR Band n2 Ant I- 5.0MHz CP-OFDM 256QAM - Full RB)

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