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PART 27 MEASUREMENT REPORT

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea

Date of Testing:

09/08/2021 – 11/10/2021 **Test Report Issue Date:** 12/02/2021 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2109080099-05-R3.A3L

FCC ID:

A3LSMS901U

Applicant Name:

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s):

Certification SM-S901U SM-S901U1 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 27 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.

This revised Test Report (S/N: 1M2109080099-05-R3.A3L) supersedes and replaces the previously issued test report (S/N: 1M2109080099-05.A3L) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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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				EIRP		
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	10 MHz	QPSK	2310.0	0.181	22.59	9M04G7D
LTE Dond 20 (Ant D)		16QAM	2310.0	0.149	21.73	9M06W7D
LTE Band 30 (Ant B)	5 MHz	QPSK	2307.5 - 2312.5	0.187	22.73	4M55G7D
	5 MHZ	16QAM	2307.5 - 2312.5	0.148	21.70	4M55W7D
	10 MHz	QPSK	2310.0	0.197	22.95	9M05G7D
LTE Band 30 (Ant A)		16QAM	2310.0	0.186	22.71	9M05W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.198	22.97	4M55G7D
	5 1011 12	16QAM	2307.5 - 2312.5	0.186	22.69	4M54W7D
	20 MHz	QPSK	2510.0 - 2560.0	0.162	22.08	18M1G7D
	20 1011 12	16QAM	2510.0 - 2560.0	0.138	21.40	18M0W7D
	15 MHz	QPSK	2507.5 - 2562.5	0.151	21.79	13M5G7D
LTE Band 7	13 10112	16QAM	2507.5 - 2562.5	0.128	21.06	13M5W7D
	10 MHz	QPSK	2505.0 - 2565.0	0.155	21.89	9M04G7D
	10 10112	16QAM	2505.0 - 2565.0	0.132	21.19	9M03W7D
	5 MHz	QPSK	2502.5 - 2567.5	0.156	21.93	4M54G7D
	5 10112	16QAM	2502.5 - 2567.5	0.136	21.35	4M53W7D
	20 MHz	QPSK	2506.0 - 2680.0	0.327	25.14	18M0G7D
	20 10112	16QAM	2506.0 - 2680.0	0.258	24.11	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.325	25.12	13M5G7D
LTE Band 41(PC2)	13 101 12	16QAM	2503.5 - 2682.5	0.257	24.09	13M5W7D
1	10 MHz 5 MHz	QPSK	2501.0 - 2685.0	0.304	24.84	9M03G7D
		16QAM	2501.0 - 2685.0	0.251	24.00	9M07W7D
		QPSK	2498.5 - 2687.5	0.316	25.00	4M54G7D
	0 10112	16QAM	2498.5 - 2687.5	0.251	23.99	4M53W7D
	20 MHz	QPSK	2506.0 - 2680.0	0.252	23.18	18M1G7D
	20 10112	16QAM	2506.0 - 2680.0	0.175	22.42	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.252	24.01	13M5G7D
LTE Band 41(PC3)/38	10 10112	16QAM	2503.5 - 2682.5	0.171	22.32	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.238	23.76	9M03G7D
	10 10112	16QAM	2501.0 - 2685.0	0.160	22.04	9M06W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.210	23.22	4M54G7D
	5 WI 12	16QAM	2498.5 - 2687.5	0.185	22.67	4M53W7D
		π/2 BPSK	2310.0	0.187	22.71	9M02G7D
	10 MHz	QPSK	2310.0	0.182	22.60	9M37G7D
NR Band n30 (Ant B)		16QAM	2310.0	0.151	21.80	9M33W7D
NIX Daliu 1150 (Alit D)	5 MHz	π/2 BPSK	2307.5 - 2312.5	0.195	22.91	4M53G7D
		QPSK	2307.5 - 2312.5	0.192	22.84	4M52G7D
		16QAM	2307.5 - 2312.5	0.169	22.27	4M51W7D
		π/2 BPSK	2310.0	0.066	18.17	9M02G7D
	10 MHz	QPSK	2310.0	0.077	18.86	9M37G7D
ND Dond = 20 (Art A)		16QAM	2310.0	0.050	17.00	9M33W7D
NR Band n30 (Ant A)		π/2 BPSK	2307.5 - 2312.5	0.057	17.60	4M53G7D
	5 MHz	QPSK	2307.5 - 2312.5	0.083	19.20	4M52G7D
		16QAM	2307.5 - 2312.5	0.036	15.55	4M51W7D
		π/2 BPSK	2310.0	0.191	22.81	9M02G7D
	10 MHz	QPSK	2310.0	0.198	22.96	9M37G7D
		16QAM	2310.0	0.168		9M33W7D
NR Band n30 (Ant F)			2010.0	0.100	22.26	31033070
			2207 5 2212 5	0.101	00.07	4M62C7D
		π/2 BPSK	2307.5 - 2312.5	0.194	22.87	4M53G7D
	5 MHz		2307.5 - 2312.5 2307.5 - 2312.5 2307.5 - 2312.5	0.194 0.196 0.175	22.87 22.93 22.44	4M53G7D 4M52G7D 4M51W7D

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		Ty Fraguand		EI	Emission	
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power	Designator
		π/2 BPSK	2520.0-2550.0	0.279	[dBm] 24.45	38M9G7D
	40 MHz	QPSK	2520.0-2550.0	0.279	24.43	39M0G7D
	40 10112	16QAM	2520.0-2550.0	0.272	23.45	38M9W7D
		π/2 BPSK	2515.0-2555.0	0.221	24.36	28M8G7D
	30 MHz	QPSK	2515.0-2555.0	0.270	24.30	28M7G7D
	30 10112	16QAM	2515.0-2555.0	0.270	22.95	28M7W7D
		π/2 BPSK	2512.5-2557.5	0.197	24.60	23M1G7D
	25 MHz	QPSK	2512.5-2557.5	0.238	24.00	23M1G7D 23M9G7D
	25 1011 12	16QAM	2512.5-2557.5	0.238	21.88	23M9G7D 23M9W7D
		π/2 BPSK	2510.0 - 2560.0	0.325	25.12	18M0G7D
NR Band n7 (Ant B)	20 MHz	QPSK	2510.0 - 2560.0	0.325	25.08	19M0G7D
		16QAM	2510.0 - 2560.0	0.322		19M0G7D
	15 MHz			-	23.44	
		π/2 BPSK	2507.5 - 2562.5	0.279	24.46	13M5G7D
		QPSK	2507.5 - 2562.5	0.278	24.44	14M2G7D
		16QAM	2507.5 - 2562.5	0.197	22.95	14M2W7D
		π/2 BPSK	2505.0 - 2565.0	0.274	24.37	8M94G7D
	10MHz	QPSK	2505.0 - 2565.0	0.260	24.14	9M36G7D
	-	16QAM	2505.0 - 2565.0	0.186	22.69	9M31W7D
		π/2 BPSK	2502.5 - 2567.5	0.248	23.95	4M53G7D
	5 MHz	QPSK	2502.5 - 2567.5	0.256	24.08	4M50G7D
<u></u>		16QAM	2502.5 - 2567.5	0.188	22.75	4M55W7D

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	andwidth 100 MHz 90 MHz	Modulation π/2 BPSK QPSK 16QAM π/2 BPSK	Tx Frequency Range [MHz] 2546.0 - 2640.0 2546.0 - 2640.0 2546.0 - 2640.0	Max. Power [W] 0.316 0.299	Max. Power [dBm] 25.00	Emission Designator 97M0G7D
		QPSK 16QAM π/2 BPSK	2546.0 - 2640.0			97M0G7D
		16QAM π/2 BPSK		0.299	04.75	
	90 MHz	π/2 BPSK	2546.0 - 2640.0		24.75	97M9G7D
	90 MHz			0.153	21.84	97M9W7D
	90 MHz		2541.0 - 2645.0	0.317	25.00	87M4G7D
1		QPSK	2541.0 - 2645.0	0.293	24.66	88M0G7D
		16QAM	2541.0 - 2645.0	0.143	21.54	87M8W7D
		π/2 BPSK	2536.0 - 2650.0	0.316	24.99	77M3G7D
	80 MHz	QPSK	2536.0 - 2650.0	0.297	24.73	77M8G7D
ND Dond p (1 (Apt E)		16QAM	2536.0 - 2650.0	0.141	21.50	77M8W7D
NR Band n41 (Ant F)		π/2 BPSK	2531.0 - 2655.0	0.300	24.77	64M5G7D
	70 MHz	QPSK	2531.0 - 2655.0	0.288	24.60	67M7G7D
		16QAM	2531.0 - 2655.0	0.141	21.48	67M7W7D
	60 MHz	π/2 BPSK	2526.0 - 2660.0	0.318	25.02	58M4G7D
		QPSK	2526.0 - 2660.0	0.299	24.75	58M3G7D
		16QAM	2526.0 - 2660.0	0.155	21.90	58M2W7D
		π/2 BPSK	2521.0 - 2665.0	0.294	24.68	46M0G7D
	50 MHz	QPSK	2521.0 - 2665.0	0.291	24.64	47M7G7D
		16QAM	2521.0 - 2665.0	0.142	21.53	47M7W7D
		π/2 BPSK	2516.0 - 2670.0	0.280	24.47	35M9G7D
	40 MHz	QPSK	2516.0 - 2670.0	0.277	24.42	38M1G7D
		16QAM	2516.0 - 2670.0	0.150	21.75	38M0W7D
		π/2 BPSK	2511.0 - 2675.0	0.219	23.41	27M1G7D
NR Band n41/n38 (Ant F)	30 MHz	QPSK	2511.0 - 2675.0	0.239	23.78	28M0G7D
		16QAM	2511.0 - 2675.0	0.118	20.72	28M0W7D
		π/2 BPSK	2506.0 - 2680.0	0.259	24.13	18M1G7D
	20 MHz	QPSK	2506.0 - 2680.0	0.239	23.79	18M4G7D
		16QAM	2506.0 - 2680.0	0.122	20.85	18M3W7D

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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: A3LSMS901U**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 0559M, 0301M, 0563M, 0528M, 0871M, 0291M, 0261M, 0977M, 0539M, 0277M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1 and FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer

The device has 1 Tx antenna for n41 data (Ant F) and 3 Rx antennas (Ant B, E, D). With SRS operations, all 4 antennas can transmit the SRS signal to check for the channel quality of n41. The antennas cannot simultaneously transmit. Only the single TX/RX antenna is used for Data transmission.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 3.4 of this test report for a description of the radiated and antenna port conducted emissions tests.

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

2.4 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the "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

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3.2 Radiated Power and Radiated Spurious Emissions

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

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

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_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 [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:

 $E_{[dB\mu V/m]} =$ Measured amplitude level_[dBm] + 107 + Cable Loss_[dB] + Antenna Factor_[dB/m] And EIRP_[dBm] = E_[dB\mu V/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 414788 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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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 (±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). Measurement 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
-	AP2	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx4	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx4
-	LTx5	LIcensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Anritsu	MT8821C	Radio Communication Analyzer	N/A		6201525694	
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY52350166
Keysight Technologies	N9030A	PXA Signal Analyzer	10/16/2020	Annual	12/16/2021	MY54490576
Keysight Technologies	N9030A	PXA Signal Analyzer	9/20/2020	Annual	12/20/2021	MY55410501
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	12/11/2021	MY51210133
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A		112347	
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	4/30/2021	Annual	4/30/2022	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and Spectrum Analyzer	2/10/2021	Annual	2/10/2022	103187

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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6.0 SAMPLE CALCULATIONS

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

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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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS901U
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE/NR/ULCA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	N∕A	PASS	Section 7.2
	ULCA Transmitter Conducted Output Power* (LTE ULCA Band 41)	2.1046(a), 2.1046(c)	N∕A	PASS	Section 7.5
E	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
CONDUCTED	Conducted Band Edge / Spurious Emissions (LTE Band 30; NR Band n30)	2.1051, 27.53(a)(4)	Undesirable emissions must meet the limits detailed in 27.53(a)(4)	PASS	Sections 7.4, 7.6
S	Conducted Band Edge / Spurious Emissions (LTE Band 7, 38, 41; NR Band n7, n38, n41)	2.1051, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Sections 7.4, 7.6
	Conducted Band Edge / Spurious Emissions (LTE ULCA Band 41)	2.1051, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section7.5
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.9
	Equivalent Isotropic Radiated Power (LTE Band 30; NR Band n30)	27.50(a)(3)	≤ 250mW / 5MHz max. EIRP	PASS	Section 7.7
A	Equivalent Isotropic Radiated Power (LTE Band 7, 38, 41; NR Band n7, n38, n41)	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.7
RADIATED	Radiated Spurious Emissions (LTE Band 30; NR Band n30)	2.1053, 27.53(a)(4)	Undesirable emissions must meet the limits detailed in 27.53(a)(4)	PASS	Section 7.8
Ř	Radiated Spurious Emissions (LTE Band 7, 38, 41; NR Band n7, n38, n41)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.8
	Radiated Spurious Emissions (LTE ULCA Band 41)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.8

* The only transmitter output conducted powers included in this report are those where the Pmax value, per the tune-up document, is higher than any of the DSI power levels. For the remaining conducted power measurements, see the **RF Exposure Report**.

Table 7-1. Summary of Test Results (FCC)

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Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots 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.
- 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 EMC Software Tool v1.0.

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7.2 Conducted Power Output Data §2.1046

Test Overview

The EUT is set up to transmit at maximum power for LTE. All power levels are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

A-MPR is implemented in this device per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Span = $2 \times OBW$ to $3 \times OBW$
- 2. RBW = 1% to 5% of the OBW
- 3. Number of measurement points in sweep \geq 2 x span / RBW
- 4. Sweep = auto-couple (less than transmission burst duration)
- 5. Detector = RMS (power)
- 6. Trigger was set to enable power measurements only on full power bursts
- 7. Trace was allowed to stabilize
- 8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-1. Test Instrument & Measurement Setup

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
	π/2 BPSK	27710	2310.0	1 / 13	22.92
10 MHz	QPSK	27710	2310.0	1 / 13	22.98
	16-QAM	27710	2310.0	1 / 13	21.95
		27685	2307.5	1/6	22.93
	π/2 BPSK	27710	2310.0	1 / 6	22.81
		27735	2312.5	1/6	22.98
5 MHz		27685	2307.5	1/6	22.95
	QPSK	27710	2310.0	1 / 6	22.31
		27735	2312.5	1 / 6	22.84
	16-QAM	27735	2312.5	1 / 6	22.13

Table 7-2. Conducted Power Output Data (n30 – ANT F)

FCC ID: A3LSMS901U	PCTEST Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		504000	2520.0	1 / 79	23.05
	π/2 BPSK	507000	2535.0	1 / 79	23.39
Hz		510000	2550.0	1 / 53	23.69
40 MHz		504000	2520.0	1 / 79	22.93
40	QPSK	507000	2535.0	1 / 79	23.48
		510000	2550.0	1 / 53	23.71
	16-QAM	510000	2550.0	1 / 53	23.10
		503000	2515.0	1 / 26	22.49
N	π/2 BPSK	507000	2535.0	1 / 26	23.67
30 MHz		511000	2555.0	1 / 26	23.73
N O		503000	2515.0	1 / 26	22.18
3(QPSK	507000	2535.0	1 / 26	23.76
	40.0414	511000	2555.0	1 / 26	23.98
	16-QAM	511000	2555.0	1 / 26	23.06
		502500	2512.5	1 / 53	22.56
N	π/2 BPSK	507000	2535.0	1 / 79	23.92
25 MHz		511500	2557.5	1 / 26	21.90
5 N		502500	2512.5	1 / 53	21.44
5	QPSK	507000	2535.0	1 / 79	23.22
		511500	2557.5	1 / 26	20.47
	16-QAM	507000	2535.0	1 / 79	21.73
		502000	2510.0	1 / 79	23.72
N	π/2 BPSK	507000	2535.0	1 / 53	23.83
20 MHz		512000	2560.0	1 / 53	23.72
O N		502000	2510.0	1 / 79	23.67
5	QPSK	507000	2535.0	1 / 53	23.63
	40.0414	512000	2560.0	1 / 53	23.71
	16-QAM	507000	2535.0	1 / 53	23.04
		501500	2507.5	1 / 58	23.06
N	π/2 BPSK	507000	2535.0	1 / 20	23.76
ни		512500	2562.5	1/20	23.54
15 MHz	QPSK	501500 507000	2507.5 2535.0	1 / 58 1 / 58	23.03 22.99
1	QFOR	512500	2562.5	1 / 20	23.56
	16-QAM	512500	2562.5	1 / 20	22.79
		501000	2502.5	1 / 38	22.85
	π/2 BPSK	507000	2535.0	1 / 13	23.69
N	III/2 BI OIK	513000	2565.0	1 / 38	23.41
M		501000	2505.0	1 / 38	22.73
10 MHz	QPSK	507000	2535.0	1 / 13	23.60
		513000	2565.0	1 / 38	23.40
	16-QAM	513000	2565.0	1 / 38	22.45
		500500	2502.5	1 / 18	22.14
	π/2 BPSK	507000	2535.0	1 / 18	23.27
Ā		513500	2567.5	1 / 12	23.47
5 MHz		500500	2502.5	1 / 18	22.18
5	QPSK	507000	2535.0	1 / 18	23.54
	<u> </u>	513500	2567.5	1 / 12	23.24
	16-QAM	507000	2535.0	1 / 18	22.60
Table	72 Cond	ucted Power	Output D	ata (n7 A	

Table 7-3. Conducted Power Output Data (n7 – ANT B)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		509202	2546.0	1 / 68	26.33
N	π/2 BPSK	518598	2593.0	1 / 68	25.47
100 MHz		528000	2640.0	1/68	26.86
g	QPSK	509202 518598	2546.0 2593.0	1 / 68 1 / 68	26.23
, ¥	QPSK	528000	2593.0	1/68	25.53 26.94
	16-QAM	528000	2640.0	1 / 68	26.16
		508200	2541.0	1 / 61	25.95
	π/2 BPSK	518592	2593.0	1 / 183	25.96
보		529002	2645.0	1 / 61	26.86
90 MHz		508200	2541.0	1 / 61	26.13
06	QPSK	518592	2593.0	1 / 183	26.07
		529002	2645.0	1 / 61	26.86
	16-QAM	529002	2645.0	1 / 61	25.89
	π/2 BPSK	507204	2536.0	1 / 108	25.92
N	II/2 DPSK	518598 529998	2593.0 2650.0	1 / 162 1 / 108	26.01 26.85
80 MHz		507204	2536.0	1 / 108	25.84
l õ	QPSK	518598	2593.0	1 / 162	25.84
~	Q. 0.1	529998	2650.0	1 / 102	26.92
	16-QAM	529998	2650.0	1 / 108	26.09
		506196	2531.0	1 / 121	26.04
	π/2 BPSK	518598	2593.0	1 / 121	26.64
보		531000	2655.0	1 / 81	26.09
70 MHz		506196	2531.0	1 / 121	26.60
24	QPSK	518598	2593.0	1 / 40	26.41
		531000	2655.0	1 / 81	26.34
	16-QAM	518598	2593.0	1 / 121	25.73
	(0.000)/	505200	2526.0	1 / 40	26.45
N	π/2 BPSK	518598 531996	2593.0	1 / 40 1 / 40	25.95
60 MHz		505200	2660.0 2526.0	1 / 40	26.88 26.58
- 00	QPSK	518598	2593.0	1 / 40	26.14
		531996	2660.0	1 / 40	26.94
	16-QAM	531996	2660.0	1 / 40	25.85
		504204	2521.0	1 / 99	26.14
	π/2 BPSK	518598	2593.0	1 / 33	26.54
Ŧ		532998	2665.0	1 / 33	25.65
50 MHz		504204	2521.0	1 / 99	26.29
2(QPSK	518598	2593.0	1 / 33	26.45
	10.0011	532998	2665.0	1/33	25.63
	16-QAM	518598	2593.0	1/33	25.58
	π/2 BPSK	503202 518598	2516.0 2593.0	1 / 79 1 / 26	26.38 26.33
붓	II/2 DI OIT	534000	2670.0	1 / 26	25.46
		503202	2516.0	1 / 79	26.38
40 M	QPSK	518598	2593.0	1 / 26	26.23
		534000	2670.0	1 / 26	25.60
	16-QAM	503202	2516.0	1 / 79	25.50
		502203	2511.0	1 / 58	25.68
	π/2 BPSK	518598	2593.0	1 / 19	25.56
Ŧ		534999	2675.0	1 / 19	25.67
30 MHz	0001/	502203	2511.0	1 / 58	25.51
ñ	QPSK	518598	2593.0	1 / 19	25.59
	16-QAM	534999 534999	2675.0 2675.0	1 / 19 1 / 19	25.60
	TO-Q/AIVI	501204	2506.0	1 / 19	24.68 25.47
	π/2 BPSK	518598	2593.0	1 / 13	25.99
Ř		535998	2680.0	1 / 13	25.96
20 MHz		501204	2506.0	1 / 13	25.77
20	QPSK	518598	2593.0	1 / 13	25.60
		535998	2680.0	1 / 13	25.98
	16-QAM	501204	2506.0	1 / 13	24.60

Table 7-4. Conducted Power Output Data (n41 PC2 – ANT F)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
	π/2 BPSK	509202	2546.0	1/68	23.12
		518598	2593.0	1/204	22.10
MHz		528000	2640.0	1/68	23.14
		509202	2546.0	1/68	23.04
100	QPSK	518598	2593.0	1/204	22.56
		528000	2640.0	1/68	23.15
	16-QAM	518598	2593.0	1/204	20.35

Table 7-5. Conducted Power Output Data (n41 PC2 – SRS-2 – ANT B)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
	T/2 BPSK QPSK	509202	2546.0	1/68	21.71
		518598	2593.0	1/68	21.10
MHz		528000	2640.0	1/136	20.47
		509202	2546.0	1/68	21.94
100		518598	2593.0	1/68	20.89
		528000	2640.0	1/136	20.10
	16-QAM	509202	2546.0	1/68	19.92

Table 7-6. Conducted Power Output Data (n41 PC2 – SRS-3 – ANT E)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		509202	2546.0	1/68	20.85
	π/2 BPSK	518598	2593.0	1/204	20.83
MHz		528000	2640.0	1/68	19.93
	QPSK	509202	2546.0	1/68	20.95
100		518598	2593.0	1/204	20.95
		528000	2640.0	1/68	20.04
	16-QAM	518598	2593.0	1/204	20.00

Table 7-7. Conducted Power Output Data (n41 PC2 – SRS-4 – ANT D)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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		PCC					SCC					
PCC Band	PCC Bandwidth [MHz]	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset	Power	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/39				π/2 BPSK	1/205	21.01	20.77	23.9
			QPSK	50/0				QPSK	270 / 0	20.17	20.00	23.1
n30	10	Mid	QPSK	1/13	n77	100	Mid	QPSK	1/68	20.80	20.71	23.77
130	10	IVIIG	QPSK	1/26	n//	100	iviid	QPSK	1/137	20.86	20.83	23.86
			QPSK	1/39				QPSK	1/205	20.89	20.82	23.87
			16Q	1/39				16Q	1/205	20.88	20.69	23.8

Table 7-8. Conducted Power Output Data (ULCA NR Bands n30-n77)

		PCC					SCC					
PCC Band	PCC Bandwidth [MHz]	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset	Power	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/205				π/2 BPSK	1/79	21.26	19.91	23.65
			QPSK	270/0			Low	QPSK	100/0	20.89	19.57	23.29
		Low	QPSK	1/68				QPSK	1/26	21.18	19.71	23.52
		LOW	QPSK	1/137				QPSK	1/53	21.18	19.70	23.51
			QPSK	1/205				QPSK	1/79	21.22	19.80	23.58
			16Q	1/205				16Q	1/79	21.01	19.60	23.37
			π/2 BPSK	1/205				π/2 BPSK	1/79	22.17	19.87	24.18
			QPSK	270/0				QPSK	100/0	21.67	19.62	23.78
n41	100	Mid	QPSK	1/68	n71	20	Mid	QPSK	1/26	22.22	19.78	24.18
1141	100	IVIIG	QPSK	1/137	1171	20	IVIIG	QPSK	1/53	22.18	19.70	24.12
			QPSK	1/205				QPSK	1/79	22.32	19.99	24.32
			16Q	1/205				16Q	1/79	21.99	19.89	24.08
			π/2 BPSK	1/68				π/2 BPSK	1/26	21.68	19.88	23.88
		QPSK 270 / 0		QPSK	100/0	21.41	19.67	23.64				
		High	QPSK	1/68			High	QPSK	1/26	21.73	19.95	23.94
		ingli	QPSK	1/137				QPSK	1/53	21.67	19.72	23.81
			QPSK	1/205				QPSK	1/79	21.45	19.66	23.66
			16Q	1/68				16Q	1/26	21.63	19.94	23.88

Table 7-9. Conducted Power Output Data (ULCA NR Bands n41-n71)

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	PCC SCC			SCC								
PCC Band	PCC Bandwidth [MHz]	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset	Power	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/205				π/2 BPSK	1/162	22.31	20.77	24.62
			QPSK	270/0				QPSK	216/0	21.32	20.11	23.77
		Low	QPSK	1/68			Low	QPSK	1/54	21.77	20.44	24.17
		Low	QPSK	1/137	- - - n66	40	Low	QPSK	1/108	21.86	20.77	24.36
			QPSK	1/205				QPSK	1/162	22.14	20.57	24.44
			16Q	1/205				16Q	1/162	22.02	20.33	24.27
		Mid	π/2 BPSK	1/68) Mid	π/2 BPSK	1/54	21.98	19.77	24.02
			QPSK	270/0				QPSK	216/0	19.23	19.10	22.18
n41	100		QPSK	1/68				QPSK	1/54	22.02	19.82	24.07
1141	100		QPSK	1/137				QPSK	1/108	20.67	20.01	23.36
			QPSK	1/205				QPSK	1/162	20.38	20.25	23.33
			16Q	1/68				16Q	1/54	21.72	19.80	23.88
			π/2 BPSK	1/137				π/2 BPSK	1/108	21.77	20.48	24.18
			QPSK	270/0				QPSK	216/0	21.49	20.11	23.86
		High	QPSK	1/68			High	QPSK	1/54	21.88	20.34	24.19
		i ligi i	QPSK	1/137			i ligit	QPSK	1/108	22.03	20.58	24.38
			QPSK	1/205				QPSK	1/162	22.08	20.43	24.34
			16Q	1/137				16Q	1/108	22.04	20.19	24.22

Table 7-10. Conducted Power Output Data (ULCA NR Bands n41-n66)

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7.3 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 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 7-2. Test Instrument & Measurement Setup

Test Notes

None.

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LTE Band 30 – Ant B

🔤 Keysight Spectrum Analyzer - Occupied B					
IXIRL RF 50Ω DC	Trig:	sense:INT er Freq: 2.310000000 GH Free Run Avg H en: 36 dB	ALIGN AUTO Iz Iold: 100/100	04:50:58 PM Sep 10, 202 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBi	n				
30.0		Miner Manner	\		Clear Write
10.0 0.00 -10.0 -20.0	where a start sta		A A A A A A A A A A A A A A A A A A A	with the strengt of piles a	Average
-30.0				- maked his for the	Max Hold
Center 2.31000 GHz Res BW 240 kHz		¢VBW 750 kHz		Span 25.00 MH Sweep 1 m	
Occupied Bandwid 9. Transmit Freg Error	th 0415 MHz -16.752 kHz	Total Power % of OBW Po		6 dBm 9.00 %	Detector Peak
x dB Bandwidth	10.07 MHz	x dB		00 dB	
MSG			STATU	S	

Plot 7-1. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB - Ant B)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 16-QAM - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occup	pied BW				
<mark>χύ</mark> RL RF 50 Ω		SENSE:INT Center Freq: 2.310000000 GH Frig: Free Run Avg H Atten: 36 dB	ALIGN AUTO Iz Iold: 100/100	05:05:48 PM Sep 10, 2021 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00	in ounieow				
30.0		man marker	~		Clear Write
0.00 10.0 20.0	and a line of the second secon		h h h h h h h h h h h h h h h h h h h	and a strange with the	Averag
40.0					Max Hol
Center 2.310000 GHz Res BW 120 kHz		VBW 1.2 MHz		Span 12.50 MHz Sweep 1 ms	Min Hol
Occupied Bandw	4.5482 MHz	Total Power	31.5	5 dBm	Detecto Peak
Transmit Freq Erro x dB Bandwidth	r -10.191 kH: 5.224 MH:			0.00 % 00 dB	Auto <u>Ma</u>
SG			STATUS	3	

Plot 7-3. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB - Ant B)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occupied BW					
XIRL RF 50Ω AC	Trig:	sense:INT er Freq: 2.310000000 GH Free Run Avg H n: 36 dB	ALIGN AUTO z old: 100/100	12:26:44 PM Nov 04, 2021 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBm					
30.0 20.0 10.0	phanna and a second	wanter and a start of the start	n_1		Clear Writ
20.0 20.0	weble		Man Murio	ماليه المعارفين من المعارفين المعارفين المعارفين المعارفين المعارفين المعارفين المعارفين المعارفين المعارفين ا	Averag
					Max Ho
enter 2.31000 GHz tes BW 240 kHz	#	VBW 750 kHz		Span 25.00 MHz Sweep 1 ms	Min Ho
Occupied Bandwidth 9.(י 0482 MHz	Total Power	30.8	dBm	Detecto
Transmit Freq Error x dB Bandwidth	-5.074 kHz 10.17 MHz	% of OBW Po x dB		0.00 % 00 dB	Auto <u>Ma</u>
5G			STATUS	5	

Plot 7-5. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB - Ant A)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 16-QAM - Full RB - Ant A)

FCC ID: A3LSMS901U	PCTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW	/				
X RL RF 50Ω AC	CORREC	SENSE:INT Center Freq: 2.3100000	ALIGN AUTO	12:33:12 PM Nov 04, 2021 Radio Std: None	Trace/Detector
	- -	Trig: Free Run	Avg Hold: 100/100		
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBm	<u> </u>				
30.0					
20.0					Clear Write
10.0	man	Annone	many		
0.00	1		A land		
	ſ		1		Average
-10.0	م بر		No.		Average
-20.0 mmmm Ann Marrie and			- Martin	mar and marture for more	
-40.0					Max Hold
-50.0					
Center 2.310000 GHz				Span 12.50 MHz	
Res BW 120 kHz		VBW 1.2 MHz		Sweep 1 ms	Min Hold
					MITTOIC
Occupied Bandwidt	h	Total Por	wer 30.6	6 dBm	
4.	5468 MH	Z			Detector
					Peak►
Transmit Freq Error	2.268 k	Hz % of OB	N Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	5.188 M	Hz x dB	-26.	00 dB	
MSG			STATU	S	

Plot 7-7. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB - Ant A)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB - Ant A)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BV RL RF 50 Ω DC - 6 07:24:46 PM Sep 10, 2021 SENSE:IN ALIGN AUTO Center Freq: 2.535000000 GHz Trig: Free Run Avg|Hol #Atten: 36 dB Trace/Detector Radio Std: None Avg|Hold: 100/100 Radio Device: BTS #IFGain:Low Ref 40.00 dBm 0 dB/div .og **Clear Write** Average الديانياني Max Hold Center 2.53500 GHz Span 50.00 MHz Res BW 470 kHz VBW 5 MHz Sweep 1 ms **Min Hold** Occupied Bandwidth Total Power 31.8 dBm 18.065 MHz Detector Peak **Transmit Freq Error** 4.463 kHz % of OBW Power 99.00 % Auto Man x dB Bandwidth 19.92 MHz x dB -26.00 dB STATUS SG

Plot 7-9. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB)



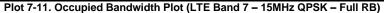
Plot 7-10. Occupied Bandwidth Plot (LTE Band 7 – 20MHz 16-QAM – Full RB)

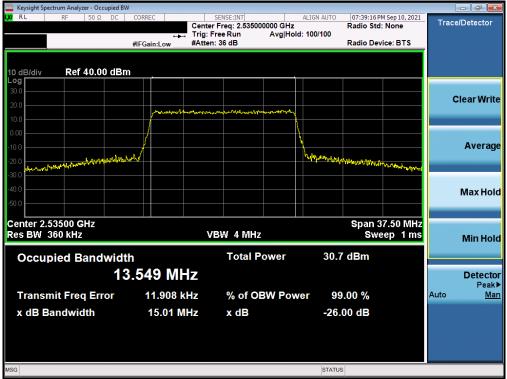
FCC ID: A3LSMS901U	PCTEST* Preud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied E							
RL RF 50Ω DC	Trig	SENSE:INT nter Freq: 2.535000000 GH g: Free Run Avg H tten: 36 dB	ALIGN AUTO z old: 100/100	07:39:05 PM Radio Std: 1 Radio Devic	None	Trace/De	tector
0 dB/div Ref 40.00 dB	m						
20.0	per-classing	nlanannonnon (marannon)				Clea	ar Writ
0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.			4 A A A A A A A A A A A A A A A A A A A	re-hat show you way	(mal	A	vera
						Ma	ax Ho
enter 2.53500 GHz es BW 360 kHz		VBW 4 MHz			.50 MHz ep 1 ms	м	in Ho
Occupied Bandwid	th 3.518 MHz	Total Power	31.5	i dBm		D	etect
Transmit Freq Error	900 Hz	% of OBW Po	wer 99	.00 %		Auto	M
x dB Bandwidth	14.98 MHz	x dB	-26.	00 dB			
G			STATUS	5			





Plot 7-12. Occupied Bandwidth Plot (LTE Band 7 – 15MHz 16-QAM – Full RB)

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



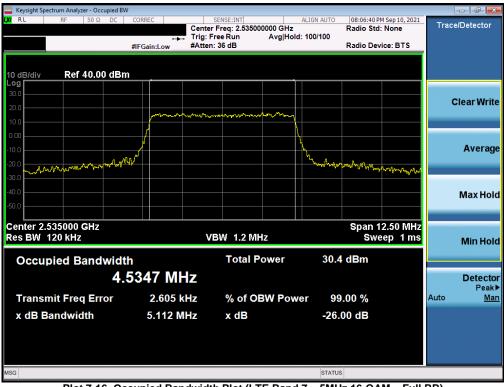
Plot 7-14. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB)

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Plot 7-15. Occupied Bandwidth Plot (LTE Band 7 – 5MHz QPSK – Full RB)



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

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Keysight Spectrum Analyzer - Occupied BW					
XIRLT RF 50Ω DC		SENSE:INT Center Freq: 2.593000000 GH: Trig: Free Run Avg He #Atten: 36 dB	z Radio old: 100/100	:48 PM Sep 16, 2021 Std: None Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBn	n				
30.0		VIIma Malanta and a state of the state of th	4		Clear Wri
10.0 0.00 10.0 20.0 <mark>МАРИНИЙ МУНДИЙИИ^{МА}</mark>	AWW H		Whitemakaway	apagethytelyters	Avera
40.0 50.0					Max Ho
Center 2.59300 GHz Res BW 470 kHz		#VBW 1.5 MHz		in 50.00 MHz Sweep 1 ms	Min Ho
Occupied Bandwidt	հ 8.048 MH:	Total Power	34.1 dBm		Detect
Transmit Freq Error	-18.485 kH		wer 99.00 %	2	Peal Auto <u>M</u> i
x dB Bandwidth	21.82 MH	z x dB	-26.00 dE	3	
SG			STATUS		

Plot 7-17. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz 16-QAM - Full RB)

FCC ID: A3LSMS901U	PCTEST Provid to be port of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occupied BW	
Correc SENSE:INT ALIGN AUTO 12:17:01 AM Sep 17, 2021 Center Freq: 2.593000000 GHz Radio Std: None	Trace/Detector
Trig: Free Run Avg Hold:>100/100	
#IFGain:Low #Atten: 36 dB Radio Device: BTS	
10 dB/div Ref 40.00 dBm	
Log 30.0	
	Clear Write
20.0 mile and a second se	
	Average
-10.0	
30.0	
-40.0	Max Hold
-50.0	Max Hold
Center 2.59300 GHz Span 37.50 MHz	
Res BW 360 kHz #VBW 1.1 MHz Sweep 1 ms	Min Hold
Occupied Bandwidth Total Power 33.6 dBm	
13.532 MHz	Detector
	Peak► Map
Transmit Freq Error -6.958 kHz % of OBW Power 99.00 %	ito <u>Man</u>
x dB Bandwidth 15.34 MHz x dB -26.00 dB	
MSG	





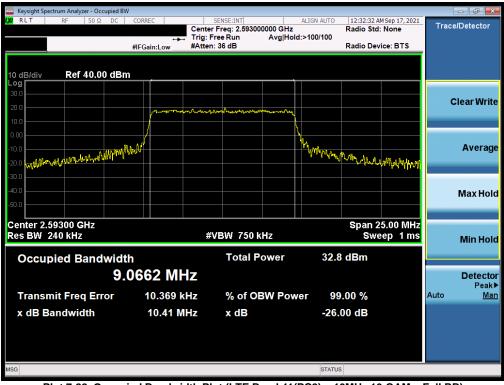
Plot 7-20. Occupied Bandwidth Plot (LTE Band 41(PC2) – 15MHz 16-QAM – Full RB)

FCC ID: A3LSMS901U	PCTEST* Proud to be part of @wienweit	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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M RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 12:32:15 AM Sep 17, 2021 Trace/D Center Freq: 2.593000000 GHz Radio Std: None Trig: Free Run Avg Hold:>100/100 Radio Device: BTS Trace/D	- 1 - 1 - 1
Trig: Free Run Avg Hold:>100/100	rejector
	elector
#IFGalliLUW #Attent of ab	
10 dB/div Ref 40.00 dBm	
	ar Write
	Average
10.0 Tomber March	
-40.0	lax Hold
-50.0	
Center 2.59300 GHz Span 25.00 MHz	
Res BW 240 kHz #VBW 750 kHz Sweep 1 ms	Vin Hold
Occupied Bandwidth Total Power 34.0 dBm	
9.0267 MHz	Detector
	Peak▶
Transmit Freq Error -4.089 kHz % of OBW Power 99.00 %	<u>Man</u>
x dB Bandwidth 10.56 MHz x dB -26.00 dB	
MSG	

Plot 7-21. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 41(PC2) – 10MHz 16-QAM – Full RB)

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Plot 7-23. Occupied Bandwidth Plot (LTE Band 41(PC2) – 5MHz QPSK – Full RB)



Plot 7-24. Occupied Bandwidth Plot (LTE Band 41(PC2) – 5MHz 16-QAM – Full RB)

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Keysight Spectrum Analyzer - Occupied B 02:43:56 AM Sep 17, 2021 Radio Std: None RI ALIGN AUTO Trace/Detector Center Freq: 2.593000000 GHz Avg|Hold:>100/100 Trig: Free Run #Atten: 36 dB Radio Device: BTS #IFGain:Low Ref 40.00 dBm l0 dB/div Log **Clear Write** and white the second Average hand way too when the place ALL HE HAD Max Hold Center 2.59300 GHz Span 50.00 MHz Res BW 470 kHz #VBW 1.5 MHz Sweep 1 ms **Min Hold Occupied Bandwidth** Total Power 32.8 dBm 18.065 MHz Detector Peak▶ **Transmit Freq Error** -26.077 kHz % of OBW Power Auto 99.00 % Man x dB Bandwidth -26.00 dB 22.10 MHz x dB STATUS

Plot 7-25. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 – 20MHz QPSK – Full RB)



Plot 7-26. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 20MHz 16-QAM - Full RB)

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🔤 Keysight Spectrum Analyzer - Occupied BW					
XX RLT RF 50Ω DC CORREC	SENSE:INT	ALIGN AUTO 03:41:16 AM Sep 0 GHz Radio Std: No			
	ne				
#IFGain:I	Low #Atten: 36 dB	Radio Device:	BTS		
10 dB/div Ref 40.00 dBm					
10.0					
20.0			Clear Write		
	mart all a second and the second second and the second second and the second second second second second second				
0.00					
-10.0		Malling and Markerson and	Average		
Address A. B. Haranak .		The second secon	WMW .		
-30.0					
-40.0			Max Hold		
-50.0					
		0			
Center 2.59300 GHz Res BW 360 kHz	#VBW 1.1 MHz	Span 37.5 Sweep	1 mo		
ACS DW SOO KIIZ	#4044 1.1 MILZ	онсер	Min Hold		
Occupied Bandwidth	Total Pow	er 32.1 dBm			
13.540	Detector				
15.540			Peak		
Transmit Freq Error -14.	850 kHz % of OBW	Power 99.00 %	Auto <u>Man</u>		
	.93 MHz x dB	-26.00 dB			
		-20.00 dB			
MSG		STATUS			

Plot 7-27. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 15MHz QPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 – 15MHz 16-QAM – Full RB)

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Keysight Spectrum Analyzer - Occu	upied BW				
LXI RLT RF 50Ω	DC CORREC	SENSE:INT	ALIGN AUTO	03:53:59 AM Sep 17, 202	Trace/Detector
		Center Freq: 2.593000 Trig: Free Run	000 GHz Avg Hold:>100/100	Radio Std: None	
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00) dBm				
Log 30.0	المعر المعام				
	ر کے پاکستا				Clear Write
20.0	mon	mmmm.t.menthethethethethethethethethethethethethet			
10.0					
0.00					
-10.0			Math III.		Average
-20.0 anglumath And Malanda M	www.ww		TULWW	wlladdalladatudhatudha	
-30.0				And the food of the food of	•
-40.0	ر حص المجمع				
	ر حص المصلح				Max Hold
-50.0	الكتاكم				
Center 2.59300 GHz				Span 25.00 MH	7
Res BW 240 kHz		#VBW 750 ki	Hz	Sweep 1 m	
					WIITHOID
Occupied Bandy	width	Total Po	ower 32.1	dBm	
	9.0284 MH	-			Detector
	3.0204 Min	Z			Detector Peak▶
Transmit Freq Erro	or -2.567 kl	Hz % of OB	W Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	10.32 MI			00 dB	
	10.32 Wi		-201		
MSG			STATUS	3	

Plot 7-29. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 10MHz QPSK - Full RB)



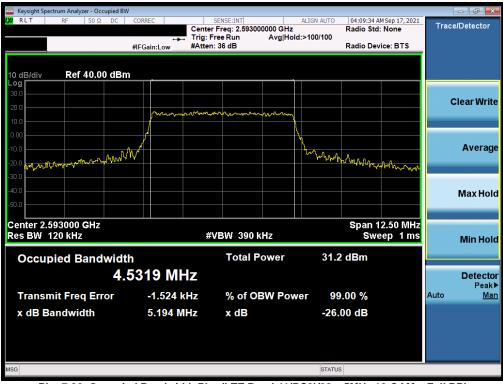
Plot 7-30. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 – 10MHz 16-QAM – Full RB)

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Plot 7-31. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 5MHz QPSK - Full RB)



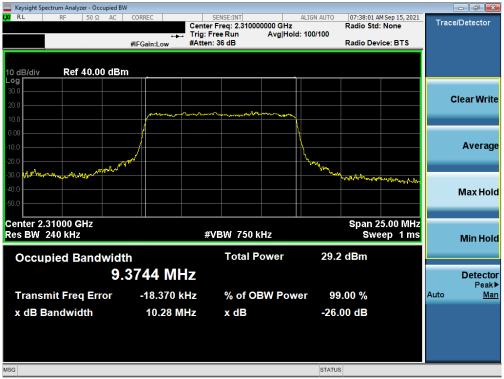
Plot 7-32. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 – 5MHz 16-QAM – Full RB)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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🚾 Keysight Spectrum Analyzer - Occupied B	W						
KU RF 50Ω AC	🛶 Trig: F	SENSE:INT r Freq: 2.310000000 GHz Free Run Avg Hold: 1: 36 dB		07:36:30 AM Radio Std: Radio Devi		Trace/E)etector
10 dB/div Ref 40.00 dB	m						
20.0						Cle	ear Write
10.0	~						Average
-30.0					And and a second	N	lax Holo
Center 2.31000 GHz Res BW 240 kHz	#	VBW 750 kHz			5.00 MHz ep 1 ms		Vin Hole
Occupied Bandwid 9	th .0152 MHz	Total Power	30.8	dBm			Detecto Peak
Transmit Freq Error x dB Bandwidth	-186.40 kHz 9.875 MHz	% of OBW Powe x dB	er 99. -26.0	00 % 0 dB		Auto	Mar
MSG			STATUS				

Plot 7-33. Occupied Bandwidth Plot (NR Band n30 – 10MHz π/2 BPSK – Full RB – Ant B)



Plot 7-34. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant B)

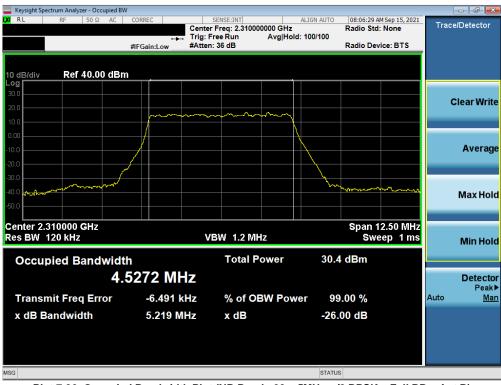
FCC ID: A3LSMS901U	PCTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 39 of 242	
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Plot 7-35. Occupied Bandwidth Plot (NR Band n30 – 10MHz 16-QAM – Full RB – Ant B)



Plot 7-36. Occupied Bandwidth Plot (NR Band n30 – 5MHz π/2 BPSK – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW					
RL RF 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO	08:06:58 AM Sep 15, 2021 Radio Std: None	Trace/Detector
		Center Freq: 2.3100 Trig: Free Run	Avg Hold: 100/100	Radio Std: None	
		#Atten: 36 dB		Radio Device: BTS	
dB/div Ref 40.00 dBn	<u> </u>				
pg					
0.0					Clear Writ
D.0					Cical With
0.0	m	mon manual	mary		
.00					
	/		8		A
J.O					Averag
J.O	/				
1.0			\.		
D.O month man Man Mar /			~~ <u>^</u> ^	The marine	
					Max Ho
1.0					
enter 2.310000 GHz				Span 12.50 MHz	
es BW 120 kHz		VBW 1.2 M	HZ	Sweep 1 ms	Min Ho
Occupied Bandwidt	h	Total F	ower 28.	6 dBm	
1	5184 MH	-			Detect
		Z			Peak
Transmit Freq Error	-7.012 kH	lz % of O	BW Power 9	9.00 %	Auto <u>Ma</u>
x dB Bandwidth	5.282 MF	z x dB	-26	.00 dB	
			STATU		

Plot 7-37. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant B)



Plot 7-38. Occupied Bandwidth Plot (NR Band n30 – 5MHz 16-QAM – Full RB – Ant B)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BV							
ά RL RF 50Ω DC	Trig: I	sense:INT r Freq: 2.535000000 GHz Free Run Avg Ho n: 36 dB	ALIGN AUTO	08:33:58 PM Radio Std: Radio Devic	None	Trace/D	etector
10 dB/div Ref 40.00 dBn -og 30.0	1						
20.0	jom market and the second seco					Cle	ear Writ
20.0 Contraction of the contract			limennes	www.www	and the state of the set		Averaç
0.0						N	lax Ho
enter 2.53500 GHz Res BW 1 MHz		/BW 8 MHz		Swee	90.0 MHz ep 1 ms	r	Vin Ho
Occupied Bandwidt	^h 8.855 MHz	Total Power	31.1	dBm			Detect Pea
Transmit Freq Error	-55.173 kHz	% of OBW Pov	wer 99	.00 %		Auto	M
x dB Bandwidth	41.17 MHz	x dB	-26.	00 dB			
G			STATUS	5			

Plot 7-39. Occupied Bandwidth Plot (NR Band n7 – 40MHz π/2 BPSK – Full RB – Ant B)



Plot 7-40. Occupied Bandwidth Plot (NR Band n7 - 40MHz QPSK - Full RB - Ant B)

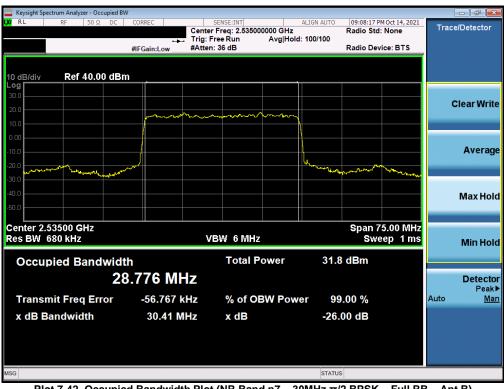
FCC ID: A3LSMS901U	PCTEST* Troud to be part of @wietment	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 42 of 242	
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🔤 Keysight Spectrum Analyzer - Occu							
<mark>(X)</mark> RL RF 50Ω	DC CORREC	SENSE:INT Center Freq: 2.53500	ALIGN AUTO	08:35:12 PM Radio Std:	Oct 14, 2021	Trac	e/Detector
		Trig: Free Run	Avg Hold:>100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00	dBm						
Log 30.0							
20.0						(Clear Write
	mm	man and and and a second	mm				
10.0							
0.00							_
-10.0	A						Average
-20.0	any for and V		Multiple And a state of the sta	where the there was	www.		
-30.0					لايدار		
-40.0							Max Hold
-50.0							
					0.0.8411-		
Center 2.53500 GHz #Res BW 1 MHz		VBW 8 MHz		Span 10	00.0 MHz ep 1 ms		
		4 D 44 0 1411 12		OWC	cp ma		Min Hold
Occupied Bandy	vidth	Total P	ower 30.6	i dBm			
	38.865 MH	J-7					Detector
	30.000 IVIT	12					Peak
Transmit Freq Erro	or 3.448 k	Hz % of OE	3W Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	41.25 M	Hz x dB	-26	00 dB			
	41.20 1		20.				
MSG			STATUS	5			

Plot 7-41. Occupied Bandwidth Plot (NR Band n7 - 40MHz 16-QAM - Full RB - Ant B)



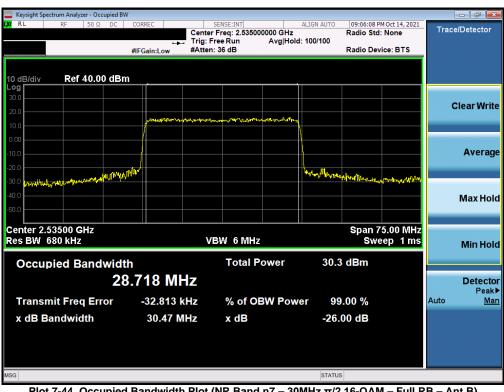
Plot 7-42. Occupied Bandwidth Plot (NR Band n7 – 30MHz π/2 BPSK – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied						×
LXIRL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 2.53500	ALIGN AUTO	09:06:33 PM Oct 14, Radio Std: None	.2021 Trace/Detecto	or
		Trig: Free Run	Avg Hold: 100/100			
,	#IFGain:Low	#Atten: 36 dB		Radio Device: BT	-S	
10 dB/div Ref 40.00 dl	3m					
Log 30.0						
20.0					Clear Wr	rite
	m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m			
10.0						
0.00						
-10.0					Avera	ige
-20.0	water and the second se		Longer and the			
-30.0			- · · ·		ountre	
-40.0					MaxHo	old
-50.0						
Center 2.53500 GHz				Span 75.00 N		
Res BW 680 kHz		VBW 6 MHz		Sweep 1	ms Min Ho	old
Occupied Bandwi	dth	Total P	ower 32.0	dBm		
			01101			
	28.651 MF	1Z			Detec Pea	
Transmit Freq Error	-39.689 k	Hz % of O	3W Power 99	.00 %		⊿n ► ∕lan
-						
x dB Bandwidth	30.44 M	Hz xdB	-20.	00 dB		
MSG			STATUS	3		

Plot 7-43. Occupied Bandwidth Plot (NR Band n7 – 30MHz π/2 QPSK – Full RB – Ant B)



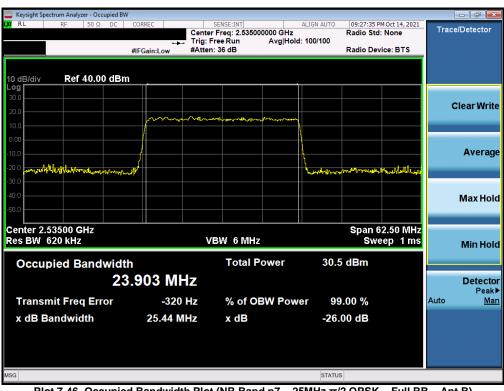
Plot 7-44. Occupied Bandwidth Plot (NR Band n7 – 30MHz π/2 16-QAM – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BV	N .					-	
L <mark>X/</mark> RL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 2.53500	ALIGN	AUTO 09:28:17 PM Radio Std:	10ct 14, 2021	Trace	Detector
		Trig: Free Run	Avg Hold: 100/1	100			
	#IFGain:Low	#Atten: 36 dB		Radio Devi	ice: BTS		
10 dB/div Ref 40.00 dBr	n						
Log 30.0							
20.0						С	lear Write
	h	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
10.0							
0.00							A
-10.0			the second				Average
-20.0					mound		
-30.0							
-40.0							Max Hold
-50.0							
				0			
Center 2.53500 GHz Res BW 620 kHz		VBW 6 MHz			2.50 MHz ep 1 ms		
NCS BW 020 KHZ		4D44 0 141112		OWC	cp i illa		Min Hold
Occupied Bandwidt	h	Total P	ower	32.4 dBm			
	3.064 MH	-					Detector
2.	9.004 WIN	Z					Peak ►
Transmit Freq Error	-473.47 kH	lz % of OE	BW Power	99.00 %		Auto	Man
x dB Bandwidth	24.66 MH	lz xdB		-26.00 dB			
	24.00 111			-20.00 dB			
MSG				STATUS			

Plot 7-45. Occupied Bandwidth Plot (NR Band n7 – 25MHz π/2 BPSK – Full RB – Ant B)



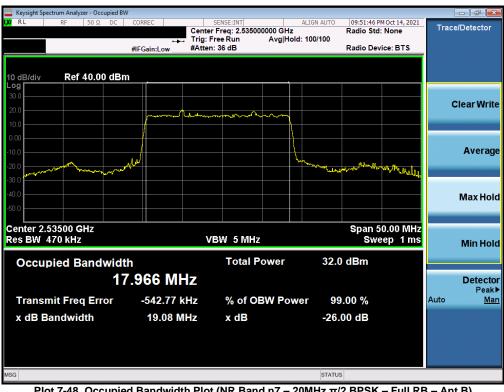
Plot 7-46. Occupied Bandwidth Plot (NR Band n7 – 25MHz π/2 QPSK – Full RB – Ant B)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ elected	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW									
LX/ RL RF 50 Ω DC CO	RREC		ISE:INT eq: 2.53500	0000 GHz	ALIGN AUTO	09:27:17 P	M Oct 14, 2021	Trac	e/Detector
	• • •	Trig: Free	Run	Avg Hold	I: 100/100				
#IF	Gain:Low	#Atten: 36	dB			Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBm									
30.0									
20.0									Clear Write
10.0		por on order	- Munited Marine	m					
0.00	/								
-10.0					<u></u>				Average
-20.0					Welling Joons	markerlythayself	at at sollar a		
-30.0					An della in				
-40.0									Max Hold
-50.0									Maxinoia
Center 2.53500 GHz Res BW 620 kHz		\/D\/	V 6 MHz				2.50 MHz ep 1 ms		
Res BW 020 KHZ		A D A	V VIVINZ			awe	ep Tills		Min Hold
Occupied Bandwidth			Total P	ower	30.1	dBm			
	00 MH	7							Detector
20.0		2							Peak►
Transmit Freq Error	-320 I	Ηz	% of OE	BW Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	25.46 MH	Ηz	x dB		-26.	00 dB			
MSG					STATUS	;			

Plot 7-47. Occupied Bandwidth Plot (NR Band n7 – 25MHz π/2 16-QAM – Full RB – Ant B)



Plot 7-48. Occupied Bandwidth Plot (NR Band n7 – 20MHz π/2 BPSK – Full RB – Ant B)

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Plot 7-49. Occupied Bandwidth Plot (NR Band n7 - 20MHz QPSK - Full RB - Ant B)



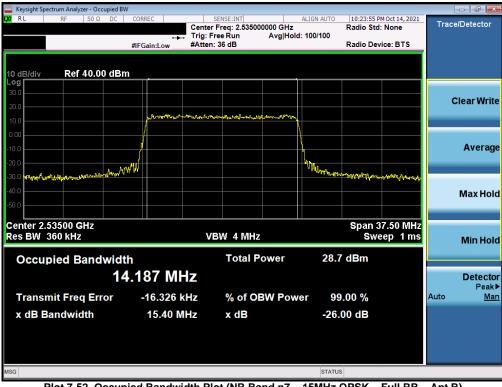
Plot 7-50. Occupied Bandwidth Plot (NR Band n7 – 20MHz 16-QAM – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied					
α RL RF 50 Ω DC	CORREC	SENSE:INT Center Freq: 2.535000000 GH Trig: Free Run Avg #Atten: 36 dB	ALIGN AUTO Iz Iold: 100/100	10:24:20 PM Oct 14, 2021 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dE	Sm				
20.0	manna	enerality of the floor of the second of the	λ		Clear Writ
	Alexand and a second se			www.wallenadie	Averag
					Max Hol
enter 2.53500 GHz es BW 360 kHz		VBW 4 MHz		Span 37.50 MHz Sweep 1 ms	Min Hol
Occupied Bandwic	^{ith} 3.535 MH	Total Power	30.7	7 dBm	Detecto
Transmit Freq Error x dB Bandwidth	-368.51 k 14.40 M			9.00 % 00 dB	Auto <u>Ma</u>
G			STATU	s	

Plot 7-51. Occupied Bandwidth Plot (NR Band n7 – 15MHz π/2 BPSK – Full RB – Ant B)



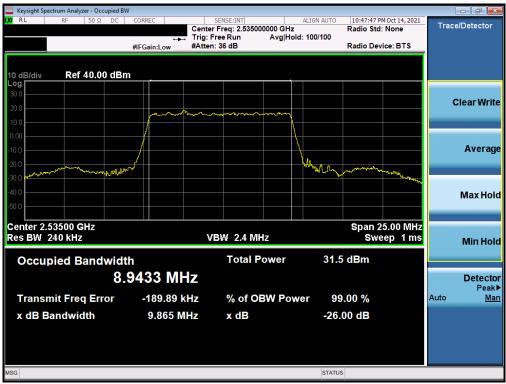
Plot 7-52. Occupied Bandwidth Plot (NR Band n7 - 15MHz QPSK - Full RB - Ant B)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @elected	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							
LX/ RL RF 50Ω DC 0	CORREC	SENSE:INT	ALIGN AUTO	10:23:34 PM Radio Std:	None	Trace	/Detector
	🛶 Tri	g: Free Run tten: 36 dB	Avg Hold: 100/100				
#	IFGain:Low #At	tten: 36 dB		Radio Devi	CE: BIS		
10 dB/div Ref 40.00 dBm							
30.0							
20.0						C	lear Write
10.0	marthe for all the	legent worker m	mould				
0.00			\\				
-10.0			<u> </u>				Average
-20.0	_ <mark> </mark>		k				
-30.0 www.mahananortainerahaldid	N		՝ Կ <mark>Ասվեմ</mark>	May yok Autology	a		
-40.0				1.11.2010-0494	and the second of the second		Max Hold
-50.0							
Center 2.53500 GHz					7.50 MHz		
Res BW 360 kHz		VBW 4 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwidth		Total P	ower 28	.4 dBm			
	169 MHz						Detector
14.							Peak ►
Transmit Freq Error	-20.101 kHz	% of O	BW Power 9	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	15.17 MHz	x dB	-26	6.00 dB			
MSG			STAT	บร			

Plot 7-53. Occupied Bandwidth Plot (NR Band n7 - 15MHz 16-QAM - Full RB - Ant B)



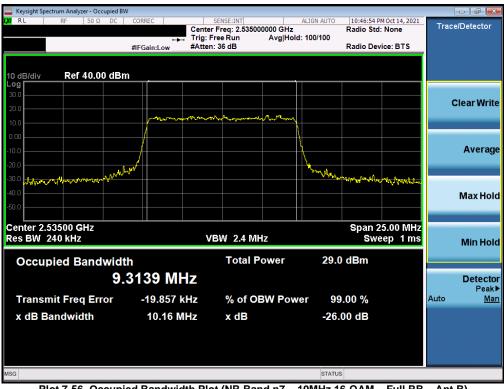
Plot 7-54. Occupied Bandwidth Plot (NR Band n7 – 10MHz π/2 BPSK – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occup						-	- 7
LX RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 2.53500000	ALIGN AUTO	10:47:20 PM Radio Std:		Trace	/Detector
		Trig: Free Run A #Atten: 36 dB	vg Hold: 100/100	Radio Devid	NO BTS		
	#IFGain:Low	#Atten: 30 dB		Radio Devic	Je. DT3		
10 dB/div Ref 40.00	dBm						
30.0							
20.0						С	lear Write
10.0	Manna	myles were and were the second	-p-nh				
0.00							
-10.0	/ +						Average
-20.0			[]				
-30.0 WWWWWWWWWWWWWWWW	Shipping The		" Hydralda	Marana And	whether		
-40.0							Max Hold
-50.0							
Center 2.53500 GHz				Span 25	.00 MHz		
Res BW 240 kHz		VBW 2.4 MHz			ep 1 ms		Min Hold
Occupied Bandu	(idth	Total Pov	ver 28.3	dBm			
Occupied Bandw			20.5	ubm			
	9.3605 MH	Ζ					Detector Peak▶
Transmit Freq Erro	r -30.765 kl	Hz % of OBW	Power 99	.00 %		Auto	Man
x dB Bandwidth	10.19 MI	Hz xdB	-26.	00 dB			
MSG			STATUS	5			

Plot 7-55. Occupied Bandwidth Plot (NR Band n7 - 10MHz QPSK - Full RB - Ant B)



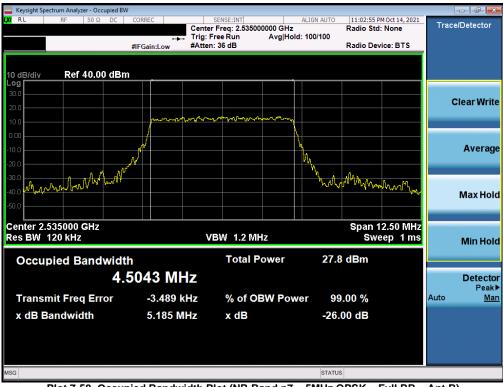
Plot 7-56. Occupied Bandwidth Plot (NR Band n7 – 10MHz 16-QAM – Full RB – Ant B)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Plot 7-57. Occupied Bandwidth Plot (NR Band n7 – 5MHz π/2 BPSK – Full RB – Ant B)



Plot 7-58. Occupied Bandwidth Plot (NR Band n7 – 5MHz QPSK – Full RB – Ant B)

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Keysight Spectrum Analyzer - Occupied BW							
LXIRL RF 50Ω DC	CORREC	SENSE:INT nter Freg: 2.53500	ALIGN A	UTO 11:02:26 P Radio Std	M Oct 14, 2021	Trace	Detector
	Tri	g: Free Run	Avg Hold: 100/10	00			
	#IFGain:Low #A	tten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBm Log	•						
30.0							
20.0						C	lear Write
10.0	p.m.m.m.m.m.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	4 mar and				
0.00							
-10.0	~~ [*]		<u> </u>				Average
-20.0			"Why				-
-30.0 Januar margar Alland			K_	Maryman	<u>ለ በ ለጣሉ ሱ</u>		
-40.0				- M - M - M	2409 000		Maxilald
-50.0							Max Hold
Center 2.535000 GHz					2.50 MHz		
Res BW 120 kHz		VBW 1.2 MH	IZ	Swe	ep 1 ms		Min Hold
Occupied Bandwidt	h	Total P	ower	27.9 dBm			
4.;	5469 MHz						Detector Peak▶
Transmit Freq Error	1.491 kHz	% of O	3W Power	99.00 %		Auto	Man
x dB Bandwidth	5.371 MHz	x dB		-26.00 dB			
	0.01111112	A GB		20.00 48			
100				STATUS			
MSG				STATUS			

Plot 7-59. Occupied Bandwidth Plot (NR Band n7 - 5MHz 16-QAM - Full RB - Ant B)

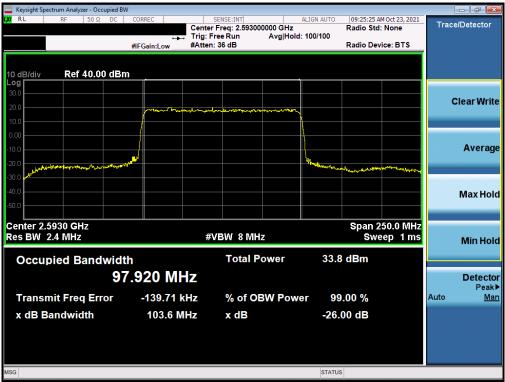
FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ eliensed	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager		
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NR Band n41 – Ant F

	🛶 Trig:		ALIGN AUTO Iz Iold: 100/100	09:26:29 AM OC Radio Std: No	one	Trace/Detector
	#IFGain:Low #Atte	en: 36 dB		Radio Device	BTS	
10 dB/div Ref 40.00 dBm			_			
20.0		····	~~~			Clear Write
10.0						
-10.0						Average
-30.0					~~~	Max Hold
-50.0						Max Hold
Center 2.5930 GHz Res BW 2.4 MHz	ŧ	≇VBW 8 MHz		Span 250 Sweep	.0 MHz o 1 ms	Min Hold
Occupied Bandwidth		Total Power	34.9	dBm		
96.	975 MHz					Detecto Peak
Transmit Freq Error	-555.41 kHz	% of OBW Po	ower 99	.00 %		Auto <u>Mar</u>
x dB Bandwidth	102.6 MHz	x dB	-26.	00 dB		
MSG			STATUS	5		

Plot 7-60. Occupied Bandwidth Plot (NR Band n41 – 100MHz π/2 BPSK – Full RB – Ant F)



Plot 7-61. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS901U	PCTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Plot 7-62. Occupied Bandwidth Plot (NR Band n41 – 100MHz 16-QAM – Full RB – Ant F)



Plot 7-63. Occupied Bandwidth Plot (NR Band n41 – 90MHz $\pi/2$ BPSK – Full RB – Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Plot 7-64. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB - Ant F)



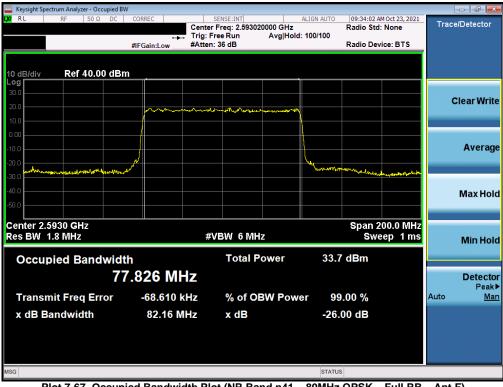
Plot 7-65. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	AMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW						-	
LXU R L RF 50Ω DC	CORREC	SENSE:INT Center Freg: 2.59302		N AUTO 09:33:42 Radio S	AM Oct 23, 2021	Trace	Detector
		Trig: Free Run #Atten: 36 dB	Avg Hold: 10		evice: BTS		
	#IFGain:Low	#Atten: 36 dB		Radio D	evice: D13		
10 dB/div Ref 40.00 dBm Log							
30.0							
20.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m			С	lear Write
10.0			N				
0.00							
-10.0							Average
-20.0	L			Marialization (1911)			
-30.0				a service and a service of the servi	- when my The		
-40.0							Max Hold
-50.0							
Center 2.5930 GHz Res BW 1.8 MHz		#VBW 6 MH	_		200.0 MHz		
Res BW 1.8 MHZ			2	51	veep 1 ms		Min Hold
Occupied Bandwidth	1	Total P	ower	35.1 dBm			
	.320 MH	7					Detector
		2					Peak
Transmit Freq Error	-410.17 kH	Iz % of OE	BW Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	82.04 MH	lz xdB		-26.00 dB			
MSG				STATUS			

Plot 7-66. Occupied Bandwidth Plot (NR Band n41 – 80MHz π/2 BPSK – Full RB – Ant F)



Plot 7-67. Occupied Bandwidth Plot (NR Band n41 - 80MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied B							
LXI RL RF 50Ω DC	CORREC	SENSE:INT Center Freq: 2.59302	ALIGN AU 20000 GHz	TO 09:34:30 Al Radio Std:	None	Trace/Deteo	tor
	- -	Talas France Draw	Avg Hold: 100/100		DTC		
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ICE: BIS		
10 dB/div Ref 40.00 dB	m						
30.0							
20.0	and the state of the	Jangungan Jangun	war and the statement			Clear	Nrite
10.0							-
0.00							
-10.0						Ave	erage
-20.0			<i>ا</i> ر				
-30.0 what a hit was a start and a start a	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		******	have the strategy the and	futherment		
-40.0						Max	Hold
-50.0						Mux	
Center 2.5930 GHz Res BW 1.8 MHz		#VBW_6 MH	17		00.0 MHz ep 1 ms		
			2	SWC	ep mis	Min	Hold
Occupied Bandwid	th	Total P	ower 3	3.3 dBm			
	7.810 MF	7				Det	ector
						F	Peak►
Transmit Freq Error	-122.47 k	Hz % of O	BW Power	99.00 %		Auto	Man
x dB Bandwidth	82.30 M	Hz x dB	-	26.00 dB			
MSG			ST	ATUS			

Plot 7-68. Occupied Bandwidth Plot (NR Band n41 - 80MHz 16-QAM - Full RB - Ant F)



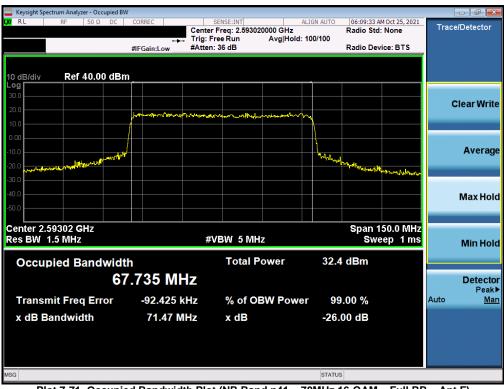
Plot 7-69. Occupied Bandwidth Plot (NR Band n41 – 70MHz π/2 BPSK – Full RB – Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-70. Occupied Bandwidth Plot (NR Band n41 - 70MHz QPSK - Full RB - Ant F)



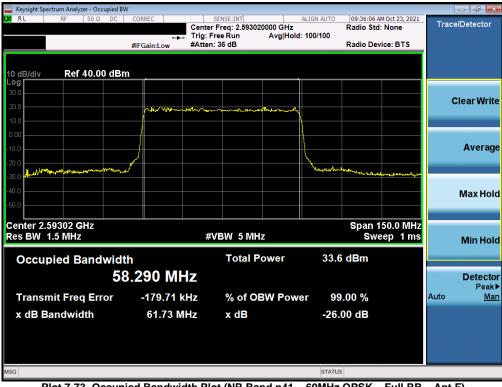
Plot 7-71. Occupied Bandwidth Plot (NR Band n41 - 70MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occup					
α RL RF 50 Ω	DC CORREC #FFGain:Low	SENSE:INT Center Freq: 2.593020000 GHz Trig: Free Run Avg Hol #Atten: 36 dB	ALIGN AUTO	09:35:51 AM Oct 23, 202 Radio Std: None Radio Device: BTS	Trace/Detector
10 dB/div Ref 40.00	dBm				ClearWrit
20.0					Clear Writ
10.0 20.0 30.0			han		Averag
40.0					Max Hol
Center 2.59302 GHz Res BW 1.5 MHz	.: .141.	#VBW 5 MHz	25.0	Span 150.0 MH Sweep 1 m	
Occupied Bandw	58.420 MH		35.0	авш	Detecto Peak
Transmit Freq Erro x dB Bandwidth	r 14.046 k 61.64 M			.00 % 00 dB	Auto <u>Ma</u>
iG			STATUS		

Plot 7-72. Occupied Bandwidth Plot (NR Band n41 – 60MHz π/2 BPSK – Full RB – Ant F)



Plot 7-73. Occupied Bandwidth Plot (NR Band n41 - 60MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager		
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Keysight Spectrum Analyzer - Occupied	BW				
X RL RF 50Ω DC		SENSE:INT enter Freg: 2.593020000 GH	ALIGN AUTO	09:36:18 AM Oct 23, 2021 Radio Std: None	Trace/Detector
			z old: 100/100	Radio Std: None	
	#IFGain:Low #/	Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dl	Rm				
Log					
30.0					
20.0	Allenth	the allocation to the state of the state of the			Clear Writ
10.0					
0.00			1		
-10.0			1		Averag
					Averag
-20.0			- Uh	alle de la constance de la const	
-30.0 Man palente portugation of the				hundrandrawn anna h	
-40.0			_		Max Hole
-50.0					
Center 2.59302 GHz				Span 150.0 MHz	
Res BW 1.5 MHz		#VBW 5 MHz		Sweep 1 ms	Min Hole
	-141-	Total Power	22.0) dBm	
Occupied Bandwi			55.0	UBIII	
	58.190 MHz				Detecto
	470 75 111		0.0		Peak
Transmit Freq Error	-172.75 kHz	% of OBW Po	wer 99	0.00 %	Auto <u>Ma</u>
x dB Bandwidth	61.86 MHz	x dB	-26.	00 dB	
ISG			STATUS	5	

Plot 7-74. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB - Ant F)



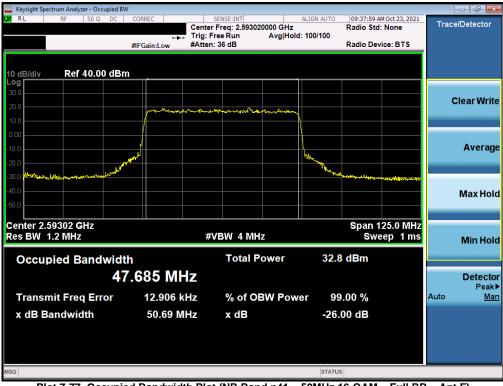
Plot 7-75. Occupied Bandwidth Plot (NR Band n41 – 50MHz π/2 BPSK – Full RB – Ant F)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
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Plot 7-76. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB - Ant F)



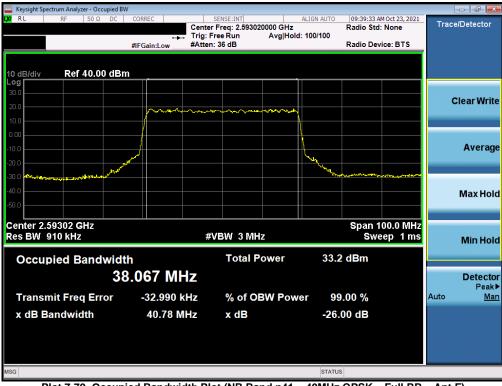
Plot 7-77. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS901U				Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 61 of 242	
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Keysight Spectrum Analyzer - Occupied BW							
LX/ RL RF 50Ω DC COF		ENSE:INT Freq: 2.593020000 GHz	ALIGN AUTO	09:39:03 Al Radio Std:	10ct 23, 2021	Trace	/Detector
	Trig: Fre	eeRun Avg Hol	d: 100/100				
#IF0	Gain:Low #Atten:	36 dB		Radio Dev	ICE: BIS		
10 dB/div Ref 40.00 dBm Log							
30.0							
20.0	ma may have a	mmm				C	lear Write
10.0	/						
0.00		A					
-10.0							Average
-20.0			mon	$\sim \sim \sim$	menon		
-30.0							
-40.0							Max Hold
-50.0							WIAX HOIG
Center 2.59302 GHz	40.1				00.0 MHz		
Res BW 910 kHz	#V	BW 3 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwidth		Total Power	34.8	dBm			
	18 MHz						Detector
55.5							Peak►
Transmit Freq Error -	1.1464 MHz	% of OBW Pow	ver 99.	.00 %		Auto	<u>Man</u>
x dB Bandwidth	38.39 MHz	x dB	-26.0	00 dB			
MSG			STATUS				

Plot 7-78. Occupied Bandwidth Plot (NR Band n41 – 40MHz π/2 BPSK – Full RB – Ant F)



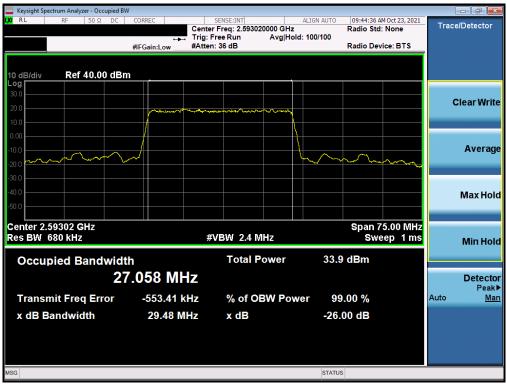
Plot 7-79. Occupied Bandwidth Plot (NR Band n41 – 40MHz QPSK – Full RB – Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Plot 7-80. Occupied Bandwidth Plot (NR Band n41 – 40MHz 16-QAM – Full RB – Ant F)



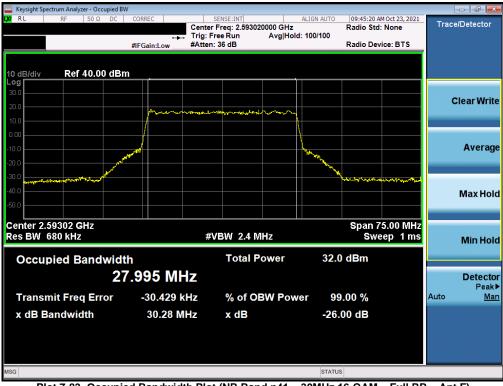
Plot 7-81. Occupied Bandwidth Plot (NR Band n41 – 30MHz π/2 BPSK – Full RB – Ant F)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
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Plot 7-82. Occupied Bandwidth Plot (NR Band n41 - 30MHz QPSK - Full RB - Ant F)



Plot 7-83. Occupied Bandwidth Plot (NR Band n41 – 30MHz 16-QAM – Full RB – Ant F)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied B							
LXI RL RF 50Ω DC	CORREC	SENSE:INT enter Freq: 2.59302		IN AUTO 09:46:32 Radio Sto	AM Oct 23, 2021	Trace	Detector
	ter Tr	ig: Free Run	Avg Hold: 100	0/100			
	#IFGain:Low #A	tten: 36 dB		Radio De	vice: BTS		
10 dB/div Ref 40.00 dB	<u>m</u>						
30.0							
20.0						С	lear Write
10.0							
0.00							
-10.0							Average
-20.0			٠.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~		
-30.0							
-40.0							Max Hold
-50.0							Maxinoiu
Center 2.59302 GHz Res BW 470 kHz		#VBW 1.5 M	U		50.00 MHz		
RES DW 470 KHZ			п2	5₩	eep 1 ms		Min Hold
Occupied Bandwid	th	Total P	ower	33.5 dBm			
	8.086 MHz						Detector
							Peak►
Transmit Freq Error	-262.61 kHz	% of OE	3W Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	20.02 MHz	x dB		-26.00 dB			
MSG				STATUS			

Plot 7-84. Occupied Bandwidth Plot (NR Band n41 – 20MHz π/2 BPSK – Full RB – Ant F)



Plot 7-85. Occupied Bandwidth Plot (NR Band n41 - 20MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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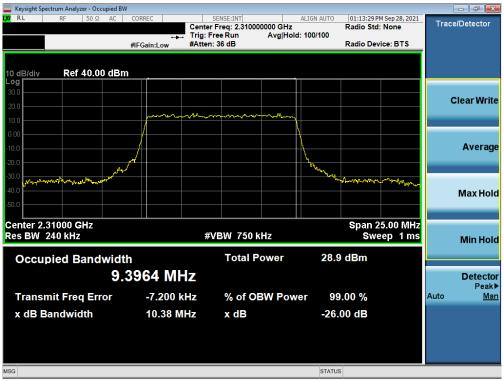
Plot 7-86. Occupied Bandwidth Plot (NR Band n41 - 20MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer								- 0
XIRL RF 5	50 Ω AC	CORREC	SENSE:INT		GN AUTO 01:13:05 Radio St	PM Sep 28, 2021	Tracell	Detector
			Center Freq: 2.310	Avg Hold: 10		a: None		
		#IFGain:Low	#Atten: 36 dB	, and the second s		evice: BTS		
10 dB/div Ref 40	0.00 dBi	m						
30.0								
20.0							CI	ear Writ
		~~~~~	mon	mm				
10.0								
0.00		/		<u></u>				
-10.0		/						Averag
-20.0								
-30.0								
-40.0							I	Max Ho
-50.0								
Center 2.31000 GH Res BW 240 kHz	Z		#VBW 750			25.00 MHz		
Res DW 240 KHZ			#VDVV /30	КПZ	SW	/eep 1 ms		Min Ho
Occupied Ba	ndwid	th	Total	Power	31.2 dBm			
Occupied Ba								
	9.	0212 M	Hz					Detecto
-		474.00			00 00 0/		0	Peak
Transmit Freq	Error	-174.93	KHZ % of C	DBW Power	99.00 %		Auto	<u>Ma</u>
x dB Bandwidt	h	9.809	MHz xdB		-26.00 dB			
ISG					STATUS			

Plot 7-87. Occupied Bandwidth Plot (NR Band n30 - 10MHz π/2 BPSK - Full RB - Ant A)

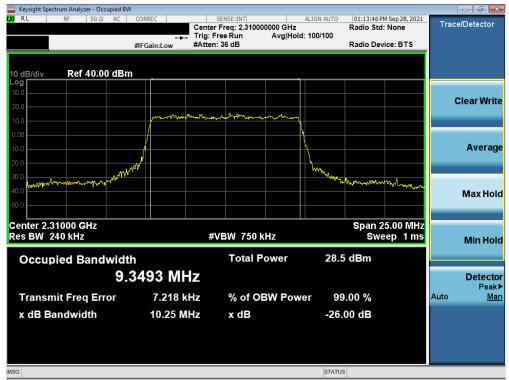


Plot 7-88. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant A)

FCC ID: A3LSMS901U	PCTEST* Troud to be part of @wietment	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-89. Occupied Bandwidth Plot (NR Band n30 - 10MHz 16-QAM - Full RB - Ant A)



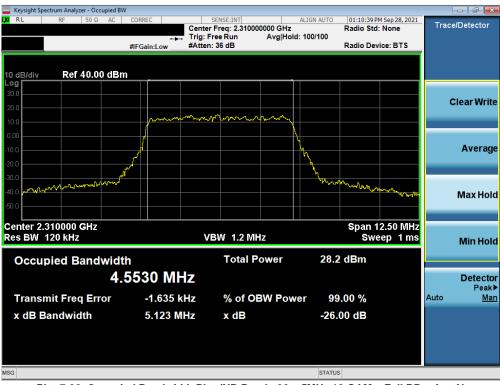
Plot 7-90. Occupied Bandwidth Plot (NR Band n30 – 5MHz π/2 BPSK – Full RB – Ant A)

FCC ID: A3LSMS901U		PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyze	r - Occuj	pied BW										
RL RF	50 Ω	AC	CORREC			NSE:INT		ALIGN AUTO		M Sep 28, 2021	Trac	e/Detector
						req: 2.3100		ld: 100/100	Radio Std	: None	mac	CIDetector
			#IFGain		#Atten: 3		Avgino	10:100/100	Radio Dev	vice: BTS		
		t	AFGain	LOW	Written. (				Itadio Dev	nce. DT3		
0 dB/div Ref 4	10.00	dBm										
og												
30.0												
20.0											(	Clear Writ
.0.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		m						
0.0			-+									
.00			/					\				
0.0								X				Avera
0.0			7									Avera
0.0		/						+				
0.0												
- And And	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim 1^{\circ}$						Jerry	handywa	www.www.		
0.0 -												Max Ho
0.0			$\rightarrow$									
enter 2.310000 G	SHz								Span 1	2.50 MHz		
es BW 120 kHz					VB	W 1.2 M	Hz		SWe	eep 1 ms		Min Ho
Occupied Ba	andv	vidth				Total P	ower	28.	/ dBm			
		4.5	19	9 MH	IZ							Detecto
_	_											Peak
Transmit Freq	Erro	or	-2	2.577 k	Hz	% of O	BW Pov	ver 99	9.00 %		Auto	Ma
x dB Bandwid	th		5	237 M	47	x dB		_26	00 dB			
	un		J.	231 10	<b>MZ</b>	X UD		-20				
G								STATU	S			

Plot 7-91. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant A)



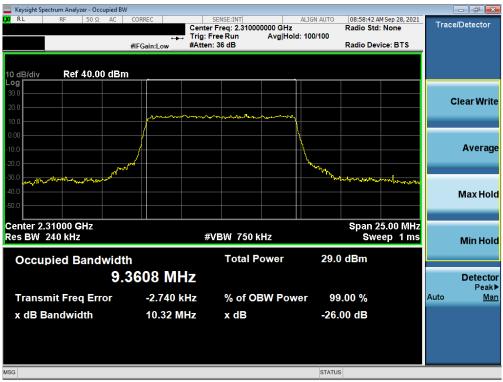
Plot 7-92. Occupied Bandwidth Plot (NR Band n30 – 5MHz 16-QAM – Full RB – Ant A)

FCC ID: A3LSMS901U	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-93. Occupied Bandwidth Plot (NR Band n30 – 10MHz π/2 BPSK – Full RB – Ant F)



Plot 7-94. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS901U	PCTEST Proud to be part of the element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyze								_	
R L RF	50 Ω AC	CORREC	SENSE:IN	.310000000 GHz	ALIGN AUTO	08:58:57 AM		Trace	Detector
		4			d: 100/100	Radio Std: r	vone		
		#IFGain:Low	#Atten: 36 dB			Radio Devic	e: BTS		
	0.00 dBn	n							
'g									
								С	lear Wri
.0								-	
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		J			1				Avera
.0		f			1				Avera
.0		nh ^{ull}			N.				
	- Marin	· · ·			Www.wh				
all all and a should be and	manner				· wr	window	www.www.		
									Max Ho
.0									
enter 2.31000 GI	IZ					Span 25			
es BW 240 kHz			#VBW	750 kHz		Swee	ep 1 ms		Min Ho
		-	-	(-1 D	00.0				
Occupied Ba	indwidt	h	10	tal Power	28.3	dBm			
	9	3535 M	H7						Detect
	ν.		112						Pea
Transmit Freq	Error	-14.680	kHz %	of OBW Pow	ver 99	.00 %		Auto	N
x dB Bandwid	th	10.28	MHz xo	В	-26.	00 dB			
					STATUS	3			

Plot 7-95. Occupied Bandwidth Plot (NR Band n30 - 10MHz 16-QAM - Full RB - Ant F)



Plot 7-96. Occupied Bandwidth Plot (NR Band n30 – 5MHz π/2 BPSK – Full RB – Ant F)

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Keysight Spectrum Analyzer - C	<u> </u>								-   #
RL RF 50	Ω AC	CORREC	SENSE:INT Center Freg: 2.3	1000000 GH-	ALIGN AUTO	09:43:22 AM	Sep 28, 2021	Trace	/Detector
			Trig: Free Run		d: 100/100	Raulo Stu.	None		
		#IFGain:Low	#Atten: 36 dB			Radio Devi	ce: BTS		
dB/div Ref 40.	00 dBn	n							
g									
I.O								c	lear Wri
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I.O		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				_	
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.0		7			$\sim$	-0			
- man man mouth	man					a markense	maria		
									Max Ho
.0									
									_
enter 2.310000 GH:	z					Span 12	2.50 MHz		
es BW 120 kHz			VBW 1.2	MHz		Swe	ep 1 ms		Min Ho
Occupied Ban	dwidt	h	Tota	al Power	28.8	dBm			
	4.	5083 M	HZ						Detect
Transmit Franc		-7.094	kU= 0/ a	f OBW Pov		.00 %		Auto	Pea M
Transmit Freq E		-7.094	кни % о		ver 99	.00 %		Adio	111
x dB Bandwidth		5.319	MHz xdE	3	-26.	00 dB			

Plot 7-97. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant F)



Plot 7-98. Occupied Bandwidth Plot (NR Band n30 – 5MHz 16-QAM – Full RB – Ant F)

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### 7.4 Spurious and Harmonic Emissions at Antenna Terminal

#### **Test Overview**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is  $43 + 10 \log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.

For Band 30, the minimum permissible attenuation level of any spurious emission <2288MHz and >2365MHz is 70 + 10 log10(P[Watts]).

For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log₁₀(*P*[*w*atts]).

#### **Test Procedure Used**

KDB 971168 D01 v03r01 - Section 6.0

#### Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-3. Test Instrument & Measurement Setup

#### Test Notes

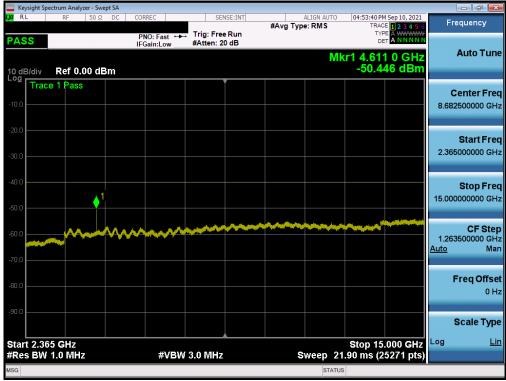
- Per Part 27, RSS-195 and RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- 2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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Image: start Free start		Start Freq       30.000000 MHz       Stop Freq       2.288000000 GHz
1.15900000 G		Start Free 30.000000 MHz Stop Free
1.15900000 GH		Start Fre 30.000000 МН
1.15900000 G		Start Free
1.15900000 G		
1.15900000 GH		
	1.155	1.10300000 01
	10.0	1 15900000 GE
Center Er/		Center Fre

Plot 7-99. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0 - Ant B)



Plot 7-100. Conducted Spurious Plot (LTE Band 30 – 10MHz QPSK – RB Size 1, RB Offset 0 – Ant B)

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	pectrum Analy												
RL	RF	50 Ω D	IC CO	RREC	_		ISE:INT	#Avg Typ	ALIGN AUTO	TRA	M Sep 10, 2021 CE <b>1 2 3 4 5 6</b>	Fre	equency
PASS				NO: Fast Gain:Low		ig: Free tten: 10							
0 dB/div	Ref 0.	00 dBm							Mkr	1 26.65 -57.4	7 0 GHz 52 dBm		Auto Tun
og Trac	ce 1 Pass											С	enter Fre
10.0													000000 GH
20.0													
												45.000	Start Fre
30.0												15.000	000000 GH
40.0													Stop Fre
50.0												27.000	0000000 GH
50.0											<b>♦</b> ¹		
60.0						the state	No. of Concession, Name			مينوالاند موجاوي	m		CF Ste
70.0												<u>Auto</u>	Ma
												F	Freq Offse
80.0													0 H
90.0													
												;	Scale Typ
	000 GHz 1.0 MH			-#\/	BW 3.0	MU-7				Stop 27	24001 GHz 24001 pts)	Log	Li
				#V	5W 3.U				status		400 F pts)		

Plot 7-101. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0 - Ant B)

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# LTE Band 7

🚾 Keysight Spe												
X/RL	RF	50 Ω	DC	CORREC	SEI	SE:INT		ALIGN AUTO		4 Sep 10, 2021	F	requency
PASS				PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 30		#Avg Typ	e: RIVIS	TYP	CE 1 2 3 4 5 6 PE A WWWW T A NNNNN		
10 dB/div	Ref 20	).00 dl	Bm					Μ	kr1 2.42 -51.	6 5 GHz 53 dBm		Auto Tur
Log Trace	e 1 Pass											
10.0												Center Fre
10.0											1.25	2500000 GI
0.00												
												Start Fr
-10.0											30	0.000000 M
20.0												Stop Fr
											2 47	5000000 G
30.0												
												05.04
40.0											244	CF St 4.500000 M
										1	<u>Auto</u>	М
-50.0												
60.0				*****		and the second second second	and the second					Freq Offs
80.0												0
70.0												
												Scale Ty
Start 0.03				49 (D)				0	Stop 2	.475 GHz	Log	L
#Res BW	1.0 WH	2		#VBV	V 3.0 MHz					4891 pts)		
ISG								STATU	IS			

Plot 7-102. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-103. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

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X/RL I	RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO	07:33:38 PM Sep 10, 2021	Frequency
PASS		PNO: Fast ↔ IFGain:Low	→ Trig: Free Run Atten: 10 dB	#Avg Type: RMS	TRACE 123456 TYPE A WWWW DET A NNNN	
10 dB/div R	ef 0.00 dBm			Mkr	1 26.639 5 GHz -56.653 dBm	Auto Tune
Trace 1	Pass		Ĭ			Center Fred
-10.0						21.000000000 GHz
-20.0						Start Fred
-30.0						15.00000000 GHz
-40.0						Stop Fred
-50.0					1	27.00000000 GHz
-60.0			- state at a sublem on a			CF Step 1.20000000 GH
						Auto Mar
-70.0						Freq Offse
-80.0						0 H;
-90.0						Scale Type
Start 15.000	GH7				Stop 27.000 GHz	
#Res BW 1.0		#VBN	/ 3.0 MHz		.80 ms (24001 pts)	
MSG				STATU		
	m Analyzer - Swept SA	irious Plot (L	$I \in Band 7 - 2$	0MHz QPSK – RB	Size 1, RB Offse	et 0 – Low Char
	RF 50 Ω DC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	07:28:06 PM Sep 10, 2021 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
PASS		IFGain:Low	Atten: 30 dB	MI	cr1 2.480 5 GHz	Auto Tune
10 dB/div R	ef 20.00 dBm				-51.24 dBm	
Trace 1	Pass		Í			Center Fred
10.0						1.265000000 GHz
0.00						Start Fred
-10.0						30.000000 MHz
-20.0						Stop Fred

Plot 7-105. Conducted Spurious Plot (LTE Band 7 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

#VBW 3.0 MHz

Start 0.030 GHz #Res BW 1.0 MHz

CF Step 247.00000 MHz uto Man

Freq Offset 0 Hz

Scale Type Lin

<u>Auto</u>

Log

Stop 2.500 GHz Sweep 3.293 ms (4941 pts)

STATUS

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Keysight Spectrum Analyz RL RF	50 Ω DC	CORREC	SENSE:INT	ALIGN AUT	07:28:51 PM Sep 10, 2021	
	20.32 DC			#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
ASS		PNO: Fast ↔ IFGain:Low	Atten: 30 dB			
				M	kr1 14.376 5 GHz	Auto Tur
og	.00 dBm				-44.282 dBm	
Trace 1 Pass						Center Fre
0.0						8.785000000 G
.00						Start Fr
0.0						2.57000000 G
0.0						Stop Fr
0.0						15.00000000 G
0.0						
0.0					<b>1</b>	CF St 1.243000000 G
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and the second s	Auto M
	~~~~~~					
0.0						Freq Offs
						0
0.0						
						Scale Ty
tart 2.570 GHz				_		Log <u>l</u>
Res BW 1.0 MHz		#VBN	/ 3.0 MHz	Sweep	21.55 ms (24861 pts)	
G				STA	TUS	

Plot 7-106. Conducted Spurious Plot (LTE Band 7 – 20MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-107. Conducted Spurious Plot (LTE Band 7 – 20MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

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🔤 Keysight Sp	ectrum Analyz	er - Swept SA	4									- 0
X/RL	RF	50 Ω D	C CORF	EC	SE	NSE:INT	#Avg Typ	ALIGN AUTO		4 Sep 10, 2021 E <b>1 2 3 4 5 6</b>	Fre	quency
PASS				0: Fast ↔↔ ain:Low	Trig: Fre Atten: 30		" <b>ə</b> . jp		TYF DE			
10 dB/div	Ref 20.	.00 dBn	n					Mk	r1 2.47 -51.	5 5 GHz 37 dBm		Auto Tun
^{-og} Trac	e 1 Pass					Ĭ					C	enter Fre
10.0												000000 GH
0.00												Start Fre
-10.0											30.	ооооо мн
-20.0												Stop Fre
-30.0											2.500	000000 GH
0.0.0												
40.0											247.	CF Ste
										1	<u>Auto</u>	Ma
-50.0										and the second second		
60.0											F	reqOffse ⊣0
												UH
70.0												cale Typ
Start 0.03				#\/D\M	20144-			Bureen 2	Stop 2	.500 GHz	Log	Li
Res BW	TUMHZ			#VBW	3.0 MHz					4941 pts)		
SG								STATUS				

Plot 7-108. Conducted Spurious Plot (LTE Band 7 – 20MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-109. Conducted Spurious Plot (LTE Band 7 – 20MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

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