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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:

9/14 - 11/12/2021 **Test Report Issue Date:** 12/02/2021 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2109090102-05-R1.A3L

FCC ID:

A3LSMS908U

Applicant Name:

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s): Certification SM-S908U SM-S908U1 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.

Note: This revised Test Report (S/N: 1M2109090102-05-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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
		QPSK	2310.0	0.170	22.31	9M04G7D
LTE Band 30 -	10 MHZ	16QAM	2310.0	0.158	21.99	9M00W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.177	22.47	4M55G7D
		16QAM	2307.5 - 2312.5	0.170	22.31	4M55W7D
	20 MH-	QPSK	2510.0 - 2560.0	0.163	22.11	18M0G7D
	20 10112	16QAM	2510.0 - 2560.0	0.142	21.52	18M0W7D
	15 MU-	QPSK	2507.5 - 2562.5	0.164	22.14	13M5G7D
I TE Bond 7		16QAM	2507.5 - 2562.5	0.145	21.60	13M5W7D
LIE Dallu 7	10 MH-	QPSK	2505.0 - 2565.0	0.170	22.31	9M03G7D
		16QAM	2505.0 - 2565.0	0.151	21.79	9M04W7D
	5 MU-	QPSK	2502.5 - 2567.5	0.175	22.42	4M54G7D
		16QAM	2502.5 - 2567.5	0.153	21.85	4M54W7D
		QPSK	2506.0 - 2680.0	0.401	26.03	18M0G7D
		16QAM	2506.0 - 2680.0	0.357	25.53	18M0W7D
		QPSK	2503.5 - 2682.5	0.395	25.96	13M5G7D
	15 MHZ	16QAM	2503.5 - 2682.5	0.359	25.55	13M6W7D
LIE Band 41(PC2)	10 MHz	QPSK	2501.0 - 2685.0	0.385	25.85	9M05G7D
		16QAM	2501.0 - 2685.0	0.306	24.85	9M03W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.404	26.06	4M52G7D
		16QAM	2498.5 - 2687.5	0.383	25.83	4M55W7D
	20 MHz	QPSK	2506.0 - 2680.0	0.286	24.56	18M0G7D
		16QAM	2506.0 - 2680.0	0.187	22.72	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.285	24.54	13M6G7D
		16QAM	2503.5 - 2682.5	0.179	22.53	13M6W7D
LTE Band 41(PC3)/38	10 MHz	QPSK	2501.0 - 2685.0	0.284	24.54	9M03G7D
		16QAM	2501.0 - 2685.0	0.187	22.72	9M04W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.288	24.59	4M54G7D
		16QAM	2498.5 - 2687.5	0.205	23.12	4M54W7D
		π/2 BPSK	2310.0	0.102	20.10	9M00G7D
	10 MHz	QPSK	2310.0	0.101	20.03	9M33G7D
NR Band n30		16QAM	2310.0	0.083	19.20	9M34W7D
ANT A		π/2 BPSK	2307.5 - 2312.5	0.104	20.18	4M54G7D
	5 MHz	QPSK	2307.5 - 2312.5	0.105	20.19	4M51G7D
	-	16QAM	2307.5 - 2312.5	0.087	19.39	4M52W7D
		π/2 BPSK	2310.0	0.149	21.75	9M02G7D
	10 MHz	QPSK	2310.0	0.145	21.61	9M37G7D
NR Band n30		16QAM	2310.0	0.131	21.17	9M37W7D
ANT J		π/2 BPSK	2307.5 - 2312.5	0 154	21.86	4M55G7D
	5 MHz	OPSK	2307.5 - 2312.5	0.142	21.53	4M53G7D
	0 111 12	16QAM	2307.5 - 2312.5	0.125	20.98	4M53W7D

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				EI	RP	
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
		π/2 BPSK	2520.0-2550.0	0.207	23.16	38M8G7D
	40 MHz	QPSK	2520.0-2550.0	0.204	23.10	38M7G7D
		16QAM	2520.0-2550.0	0.169	22.28	38M7W7D
		π/2 BPSK	2515.0-2555.0	0.207	23.16	28M6W7D
	30 MHz	QPSK	2515.0-2555.0	0.199	22.98	28M7W7D
		16QAM	2515.0-2555.0	0.168	22.25	28M7G7D
		π/2 BPSK	2512.5-2557.5	0.221	23.44	23M1G7D
	25 MHz	QPSK	2512.5-2557.5	0.212	23.26	23M1G7D
		16QAM	2512.5-2557.5	0.179	22.52	23M0W7D
	20MHz	π/2 BPSK	2510.0 - 2560.0	0.194	22.89	17M9G7D
NR Band n7		QPSK	2510.0 - 2560.0	0.188	22.75	19M0G7D
ANT B		16QAM	2510.0 - 2560.0	0.156	21.94	19M1W7D
	15 MHz	π/2 BPSK	2507.5 - 2562.5	0.200	23.02	13M5G7D
		QPSK	2507.5 - 2562.5	0.192	22.83	14M2G7D
		16QAM	2507.5 - 2562.5	0.166	22.20	14M2W7D
		π/2 BPSK	2505.0 - 2565.0	0.210	23.22	9M05G7D
	10MHz	QPSK	2505.0 - 2565.0	0.198	22.97	9M37G7D
		16QAM	2505.0 - 2565.0	0.176	22.46	9M37W7D
		π/2 BPSK	2502.5 - 2567.5	0.212	23.26	4M54G7D
	5 MHz	QPSK	2502.5 - 2567.5	0.195	22.90	4M54G7D
		16QAM	2502.5 - 2567.5	0.172	22.34	4M54W7D

EUT Overview

	Bandwidth			EI	EIRP	
Mode		Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
		π/2 BPSK	2546.0 - 2640.0	0.276	24.41	97M1G7D
	100 MHz	QPSK	2546.0 - 2640.0	0.255	24.07	98M4G7D
		16QAM	2546.0 - 2640.0	0.240	23.80	98M3W7D
		π/2 BPSK	2541.0 - 2645.0	0.277	24.43	87M4G7D
	90 MHz	QPSK	2541.0 - 2645.0	0.261	24.17	88M3G7D
		16QAM	2541.0 - 2645.0	0.228	23.58	88M3W7D
		π/2 BPSK	2536.0 - 2650.0	0.277	24.43	77M8G7D
	80 MHz	QPSK	2536.0 - 2650.0	0.264	24.21	78M1G7D
		16QAM	2536.0 - 2650.0	0.255	24.06	78M0W7D
		π/2 BPSK	2531.0 - 2655.0	0.314	24.96	64M8G7D
	70 MHz	QPSK	2531.0 - 2655.0	0.274	24.37	67M9G7D
		16QAM	2531.0 - 2655.0	0.251	24.00	67M9W7D
ND Bond n41 DC2	60 MHz	π/2 BPSK	2526.0 - 2660.0	0.277	24.42	58M6G7D
		QPSK	2526.0 - 2660.0	0.298	24.74	58M2G7D
ANT J		16QAM	2526.0 - 2660.0	0.233	23.68	58M3W7D
	50 MHz	π/2 BPSK	2521.0 - 2665.0	0.326	25.13	46M1G7D
		QPSK	2521.0 - 2665.0	0.293	24.67	47M8G7D
		16QAM	2521.0 - 2665.0	0.214	23.31	47M9W7D
		π/2 BPSK	2516.0 - 2670.0	0.323	25.09	35M9G7D
	40 MHz	QPSK	2516.0 - 2670.0	0.277	24.43	38M1G7D
		16QAM	2516.0 - 2670.0	0.244	23.87	38M1W7D
		π/2 BPSK	2511.0 - 2675.0	0.289	24.60	27M0G7D
	30 MHz	QPSK	2511.0 - 2675.0	0.296	24.71	28M1G7D
		16QAM	2511.0 - 2675.0	0.242	23.83	28M1W7D
		π/2 BPSK	2506.0 - 2680.0	0.270	24.32	18M0G7D
	20 MHz	QPSK	2506.0 - 2680.0	0.277	24.43	18M4G7D
		16QAM	2506.0 - 2680.0	0.209	23.20	18M4W7D

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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 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:A3LSMS908U**. 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.: 1261M, 1167M, 0323M, 0341M, 1125M, 1158M, 1128M, 0283M, 0584M,

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 (5 and 6GHz), Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer

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

The device has 1 Tx antenna for n41 data (Ant J) and 3 Rx antennas (Ant B, D, E). 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.

2.5 Software and Firmware

The test was conducted with software/firmware version S908USQU0AUJK installed on the EUT.

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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 $P_{g \text{ [dBm]}}$ – 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). 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
-	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
-	LTx1	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx1
-	LTx2	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx2
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Anritsu	MT8821C	Radio Communication Analyzer	N/A		6201381794	
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
Keysight Technologies	N9020A	MXA Signal Analyzer	12/22/2020	Annual	12/22/2021	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
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
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

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:	A3LSMS908U
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
ĘD	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
NDUCT	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, 7.5
ខ	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, 7.5
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	Equivalent Isotropic Radiated Power (LTE Band 30; NR Band n30)	27.50(a)(3)	≤ 250mW / 5MHz max. EIRP	PASS	Section 7.6
ATED	Equivalent Isotropic Radiated Power (LTE Band 7, 38, 41; NR Band n7, n38, n41)	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.6
RADI	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 7.7
	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 7.7
* 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.

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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- Conducted power measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
- Conducted power measurements are also evaluated for simultaneous transmission of two NR FR1 carriers operating in different bands (interband NR FR1 ULCA). The powers were investigated while both bands are operating at their widest supported channel bandwidth.
- 3. All other conducted power measurements are contained in the RF exposure report for this filing.

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
	π/2 BPSK	27710	2310.0	1 / 13	22.04
10 MHz	QPSK	27710	2310.0	1 / 13	22.04
	16-QAM	27710	2310.0	1 / 13	21.43
		27685	2307.5	1 / 18	22.09
	π/2 BPSK	27710	2310.0	1 / 6	21.92
우		27735	2312.5	1 / 18	22.16
Σ		27685	2307.5	1 / 18	21.97
CJ	QPSK	27710	2310.0	1 / 6	21.75
		27735	2312.5	1 / 18	21.54
	16-QAM	27685	2307.5	1 / 18	21.25

Table 7-1. Conducted Power Output Data (n30 – ANT J)

FCC ID: A3LSMS908U	Proud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		509202	2546.0	1 / 204	25.30
	π/2 BPSK	518598	2593.0	1 / 68	25.46
뛰		528000	2640.0	1 / 68	25.73
N		509202	2546.0	1 / 204	25.60
10	QPSK	518598	2593.0	1 / 68	25.06
		528000	2640.0	1 / 68	25.74
	16-QAM	528000	2640.0	1 / 68	24.86
		508200	2541.0	1 / 183	25.61
	π/2 BPSK	518592	2593.0	1 / 61	25.49
Ĥ		529002	2645.0	1 / 61	25.75
N N		508200	2541.0	1 / 183	25.35
06	QPSK	518592	2593.0	1 / 61	25.47
		529002	2645.0	1 / 61	25.72
	16-QAM	529002	2645.0	1 / 61	24.64
		507204	2536.0	1 / 162	25.44
	π/2 BPSK	518598	2593.0	1 / 54	25.58
포		529998	2650.0	1 / 54	25.74
N N		507204	2536.0	1 / 162	25.41
80	QPSK	518598	2593.0	1 / 54	25.32
		529998	2650.0	1 / 54	25.87
	16-QAM	529998	2650.0	1 / 54	25.12
		506200	2531.0	1 / 40	25.38
	π/2 BPSK	518598	2593.0	1 / 40	25.62
Ĥ		531000	2655.0	1 / 40	26.28
Σ		506200	2531.0	1 / 40	25.05
20	QPSK	518598	2593.0	1 / 40	25.47
		531000	2655.0	1 / 40	26.04
	16-QAM	531000	2655.0	1 / 40	25.06
		505200	2526.0	1 / 121	25.43
	π/2 BPSK	518598	2593.0	1 / 40	25.83
至		531996	2660.0	1 / 81	25.60
N		505200	2526.0	1 / 121	25.45
90	QPSK	518598	2593.0	1 / 40	26.04
		531996	2660.0	1 / 81	25.72
	16-QAM	531996	2660.0	1 / 81	24.74
		504204	2521.0	1/33	25.32
N	π/2 BPSK	518598	2593.0	1/33	26.54
臣		532998	2665.0	1/33	25.83
20	0001/	504204	2521.0	1/33	25.31
2	QPSK	518598	2593.0	1/33	25.96
	10.011	532998	2665.0	1/33	25.56
	16-QAM	532998	2665.0	1/33	24.37
		503202	2516.0	1/53	25.69
N	II/2 BPSK	524000	2093.0	1/20	25.91
H		502202	2070.0	1/53	20.41
, e	ODEK	503202	2510.0	1/53	20.17
4	QFSK	534000	2595.0	1/20	20.73
	16 0014	534000	2070.0	1/53	24.83
	TO-QAIVI	534000	2670.0	1/53	24.93
		519509	2511.0	1 / 19	25.70
N	II/2 DF OK	534000	2675.0	1/19	25.90
T T		502203	2511.0	1 / 10	25.52
8	OPSK	518598	2593.0	1/10	20.00
		534999	2675.0	1 / 10	25.01
	16-0AM	534999	2675.0	1 / 19	23.30
	10 32/101	501204	2506.0	1/13	25.63
	π/2 BPSK	518598	2593.0	1 / 13	25.73
N	II/2 DI OIX	535998	2680.0	1/13	25.73
T T		501204	2506.0	1/13	25.07
	OPSK	518598	2593.0	1/13	25.73
		535998	2680.0	1/13	25.17
	40.0414	540500	2502.0	1/10	24.00

 16-QAM
 518598
 2593.0
 1 / 13
 24.86

 Table 7-2. Conducted Power Output Data (n41 PC2 – ANT J)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		510000	2550.0	1 / 68	20.48
	π/2 BPSK	518598	2593.0	1 / 68	20.73
H		528000	2640.0	1 / 204	18.61
N N		510000	2550.0	1 / 68	20.65
100	QPSK	518598	2593.0	1 / 68	20.68
		528000	2640.0	1 / 204	18.37
	16-QAM	510000	2550.0	1 / 68	19.43

Table 7-3. Conducted Power Output Data (n41 PC2 - SRS1 – ANT E)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		510000	2550.0	1 / 204	22.91
	π/2 BPSK	518598	2593.0	1 / 68	22.45
H		528000	2640.0	1 / 204	21.98
100 M		510000	2550.0	1 / 204	22.99
	QPSK	518598	2593.0	1 / 68	22.26
		528000	2640.0	1 / 204	22.04
	16-QAM	510000	2550.0	1 / 204	22.10

Table 7-4. Conducted Power Output Data (n41 PC2 - SRS2 - ANT B)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		510000	2550.0	1 / 204	20.92
	π/2 BPSK	518598	2593.0	1 / 68	20.41
H		528000	2640.0	1 / 204	19.42
N N N	QPSK	510000	2550.0	1 / 204	20.99
100		518598	2593.0	1 / 68	20.21
		528000	2640.0	1 / 204	19.46
	16-QAM	510000	2550.0	1 / 204	20.15

Table 7-5. Conducted Power Output Data (n41 PC2 - SRS3 - ANT D)

	A PCTEST		Approved by:	
FCC ID: A3LSMS908U	Proud to be part of @ element	PART 27 MEASUREMENT REPORT	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	PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/13	n77	100	00 Mid	π/2 BPSK	1/68	19.73	21.33	23.61
			QPSK	50/0				QPSK	270 / 0	19.71	21.22	23.54
	10	Mid	QPSK	1/13				QPSK	1/68	19.83	21.39	23.69
130	10	Mid	QPSK	1/26		100		QPSK	1/137	19.73	21.14	23.50
			QPSK	1/39				QPSK	1/205	19.66	21.19	23.50
			16Q	1/13				16Q	1/68	19.93	21.38	23.73

Table 7-6. Conducted Power Data (ULCA NR 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	PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/205				π/2 BPSK	1/79	21.34	19.43	23.5
			QPSK	270/0		20	Low	QPSK	100/0	20.98	19.42	23.28
		Low	QPSK	1/68				QPSK	1/26	21.12	19.52	23.4
		LOW	QPSK	1/137				QPSK	1/53	21.25	19.35	23.41
			QPSK	1/205				QPSK	1/79	21.29	19.45	23.48
			16Q	1/205				16Q	1/79	21.56	19.21	23.55
	Ī		π/2 BPSK	1/68				π/2 BPSK	1/26	21.44	19.36	23.53
			QPSK	270/0				QPSK	100/0	20.97	19.37	23.25
- 41	100	N 4: -I	QPSK	1/68				QPSK	1/26	21.48	19.37	23.56
n41	100	IVIId	QPSK	1/137	n/1		IVIId	QPSK	1/53	21.05	19.41	23.32
			QPSK	1/205				QPSK	1/79	20.73	19.38	23.12
			16Q	1/68				16Q	1/26	21.59	19.65	23.74
			π/2 BPSK	1/68				π/2 BPSK	1/26	20.92	19.29	23.19
			QPSK	270/0				QPSK	100/0	20.74	19.37	23.12
		11.1	QPSK	1/68				QPSK	1/26	21.01	19.45	23.31
		High	QPSK	1/137			High	QPSK	1/53	20.76	19.48	23.18
			QPSK	1/205				QPSK	1/79	20.74	19.42	23.14
			16Q	1/68				16Q	1/26	21.63	19.02	23.53

Table 7-7. Conducted Power Data (ULCA NR n41 – n71)

FCC ID: A3LSMS908U	PCTEST [®] Proud to be post of ® element	PART 27 MEASUREMENT REPORT	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	PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
			π/2 BPSK	1/205		40		π/2 BPSK	1/162	21.61	19.05	23.53
		Low	QPSK	270/0				QPSK	216/0	21.45	19.05	23.42
			QPSK	1/68			Low	QPSK	1/54	21.51	18.77	23.36
			QPSK	1/137	n66		LOW	QPSK	1/108	21.61	19.01	23.51
			QPSK	1/205				QPSK	1/162	21.60	19.03	23.51
	-		16Q	1/205				16Q	1/162	21.89	19.33	23.81
			π/2 BPSK	1/68			Mid	π/2 BPSK	1/54	21.17	19.07	23.26
			QPSK	270/0				QPSK	216/0	21.49	19.11	23.47
p41	100		QPSK	1/68				QPSK	1/54	21.88	19.05	23.70
1141	100	IVIIU	QPSK	1/137				QPSK	1/108	21.37	19.21	23.43
			QPSK	1 / 205				QPSK	1/162	21.14	19.11	23.25
			16Q	1/68				16Q	1/54	21.38	19.41	23.52
			π/2 BPSK	1/137				π/2 BPSK	1/108	21.46	19.17	23.47
			QPSK	270/0				QPSK	216/0	21.08	19.11	23.22
		High	QPSK	1/68			High	QPSK	1/54	21.38	19.21	23.44
		riigii	QPSK	1/137			ingn	QPSK	1/108	21.52	19.11	23.49
			QPSK	1/205				QPSK	1/162	21.48	19.16	23.48
			16Q	1/137				16Q	1/108	21.21	19.38	23.40

Table 7-8. Conducted Power Data (ULCA NR n41 – n66)

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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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🔤 Keysight Spectrum Analyzer - Occu	upied BW						[- d ×
LXI RL RF 50 Ω	DC CORREC	SENSE:IN	IT 231000000 GHz	ALIGN AUTO	06:02:41 AM	Sep 14, 2021	Trace	e/Detector
		Trig: Free Run	n Avg Hold	: 100/100	auto sta. i	Volle		
	#IFGain:Lov	w #Atten: 36 dB		R	adio Devid	e: BTS		
10 dB/div Ref 40.00	dBm							
30.0								
20.0							C	lear Write
10.0	~~~~	warden Man have been a	and the second				_	
0.00	/							
10.0	/							Average
20.0	Mar B. Mar			hy Mr.				
20.0 Manutana and and and and and and and and and				A Star Marken Ball Construction	๛๛๛๚๛๛๚๚	4 MU WANTER		
-30.0								
-40.0								Max Hold
-50.0								
Center 2.31000 GHz					Span 25	.00 MHz		
Res BW 240 kHz		#VBW	750 kHz		Swee	ep 1 ms		Min Hold
		То	tal Power	20 7 d	Pm			
Occupied Bandy	wiath			30.7 u	ыш			
	9.0365	MHz						Detector
Transmit Freq Erro	or -16.1	31 kHz %	of OBW Pow	er 99.0	0 %		Auto	Peak► <u>Man</u>
x dB Bandwidth	10.2	2 MHz x d	IB	-26.00	dB			
MSG				STATUS				
								<u> </u>

Plot 7-9. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB)



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

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Keysight Spectrum Analyzer - Occupied BW			
X RL RF 50 Ω DC CORREC	SENSE:INT A	LIGN AUTO 06:26:13 AM Sep 14, 20	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			
20.0			Clear Write
20.0	work when we we we we we we we wanted		
10.0			
0.00	La		Average
-10.0		ha ca	Average
-20.0		Vig har work when the second	
-30.0			7
-40.0			Max Hold
-50.0			
Contor 2 210000 CHz		Span 12 50 ML	
Res BW 120 kHz	VBW 1.2 MHz	Sweep 1 m	2 S Min Hold
Occupied Bandwidth	Total Power	30.6 dBm	
4,5455 N	/Hz		Detector
			Peak▶
Transmit Freq Error -7.831	1 kHz % of OBW Powe	r 99.00 %	Auto <u>Man</u>
x dB Bandwidth 5.166	MHz x dB	-26.00 dB	
MSG		STATUS	





Plot 7-12. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB)

LTE Band 7

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Plot 7-13. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 16-QAM - Full RB)

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🔤 Keysight Spectrum Analyzer - Occ	upied BW					==	
<mark>(X/</mark> RL RF 50Ω	DC CORREC	SENSE:INT	ALIGN AUTO	07:45:13 AM	Sep 14, 2021	Trace/I	Detector
	·→	. Trig: Free Run	Avg Hold:>100/100	Radio Stu. I	None		
	#IFGain:Low	#Atten: 36 dB		Radio Devid	e: BTS		
10 dB/div Ref 40.00	dBm		,				
30.0							
20.0						Cl	ear Write
40.0	presented and	hourse man popor and man	ML_mprov				
10.0			l.				
0.00	/		V				A
-10.0	ad a looked		M. a				Average
-20.0			- Can Charly March	hasher when he when	Moon ash have		
-30.0					Well Brod		
-40.0						I	Max Hold
-50.0							
				0			
Center 2.53500 GHZ Res BW 360 kHz		VBW 4 MHz		Span 37 Swee	.ou IVINZ		
ICS BW SOO KIIZ				OWE	sh i ilia		Min Hold
Occupied Band	width	Total Po	wer 31.0	dBm			
	13 530 MI	1 -7					Detector
	13.550 101	12					Peak ►
Transmit Freq Err	or 5.254 l	(Hz % of OB)	W Power 99	.00 %		Auto	Man
x dB Bandwidth	15 04 N	Hz vdB	-26	00 dB			
	10.04		-20.				
MSG			STATUS	6			

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



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

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			Technical Manager	
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🔤 Keysight Spectrum Analyzer - Occupie	ed BW						
LX/RL RF 50ΩD	C CORREC	SENSE:INT	ALIGN AUT	07:47:32 A	M Sep 14, 2021	_ Trace	/Detector
	••	Trig: Free Run	Avg Hold: 100/100	Radio Stu	None		
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 d	IBm						
30.0							
20.0						c	lear Write
10.0	- walnut and a second	when the formed the property and	hannon				
0.00			l A				
0.00	/						Average
-10.0	. A. A		h				Average
-20.0	ATT A		MANCAR	Hyber man and the solution	marilian		
-30.0							
-40.0							Max Hold
-50.0							
Contor 2 52500 CHz				Cnon 1			
Res BW 240 kHz		VBW 2.4 M	17	span z Swe	ep 1 ms		
			16	0.111			Min Hold
Occupied Bandw	idth	Total P	ower 30).8 dBm			
	9 0305 ML	7					Detector
	5.0505 MI	12					Peak►
Transmit Freq Error	-9.132 k	Hz % of Ol	BW Power	99.00 %		Auto	Man
x dB Bandwidth	10.02 M	Hz xdB	-2	6.00 dB			
	10102						
MSG			STA	TUS			

Plot 7-17. Occupied Bandwidth Plot (LTE Band 7 - 10MHz QPSK - Full RB)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB)

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🔤 Keysight Spectrum Analyzer - Occupie	ed BW						
<mark>(X)</mark> RL RF 50Ω D	C CORREC	SENSE:INT	ALIGN AUTO	07:49:43 AM	1Sep 14, 2021	Trace	Detector
		rig: Free Run	Avg Hold: 100/100	Rudio Sta.	None		
	#IFGain:Low #	Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 d	IBm						
30.0							
20.0						С	lear Write
10.0	mmm	well-monto mark	mon			_	
0.00							
10.0	<i>ل</i> م		М				Average
20.0	, b.W.						Average
200 a man and more more than				h por and the property of	wann		
-30.0							
-40.0							Max Hold
-50.0							
Center 2.535000 GHz				Span 1	2.50 MHz		
Res BW 120 kHz		VBW 1.2 MF	lz	Swe	ep 1 ms		Min Hold
		T-4-1 D	20	C dDm			
Occupied Bandwi	idth	l otal P	ower 30	.6 dBm			
	4.5399 MHz	Z					Detector
Tronomit Frog Error	622 LI			0 00 %		Auto	Peak►
Transmit Frey Error	033 H	2 % 01 01	SW FOWER S	9.00 %		Auto	Intari
x dB Bandwidth	5.191 MH	z xdB	-26	5.00 dB			
MSG			STAT	US			

Plot 7-19. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-21. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz 16-QAM - Full RB)

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🔤 Keysight Spectrum Analyzer - Occi	upied BW				
LXI R L RF 50 Ω	DC CORREC	SENSE:INT	ALIGN AUTO	09:50:39 AM Sep 14, 2	Trace/Detector
		Trig: Free Run	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					Clear Write
20.0	بالمالي بيه ما الحسالية المالي بيه ما الحسالية	the second second second	Water lywelling		
10.0					
0.00					
-10.0	A DI		Manded .	1	Average
	M. Make and an a		1940194 ₀ 4	MANAMANA	
-30.0					
-40.0					MaxHold
.50.0					Max Holu
-30.0					
Center 2.59300 GHz				Span 37.50 N	IHz
Res BW 360 kHz		#VBW 1.1	//Hz	Sweep 1	ms Min Hold
		Total	24	2 dDm	
Occupied Bandy	width	Total I	-ower 34.	2 aBm	
	13.518 MI	z			Detector
	1 0 10 1			0.00.0/	Peak►
Transmit Freq Erro	or -4.349 k	(Hz % of O	BW Power 9	9.00 %	Auto <u>Man</u>
x dB Bandwidth	15.81 M	Hz x dB	-26	.00 dB	
MSC			STATI	10	
Wod			onne	55	





Plot 7-24. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Plot 7-25. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB)



Plot 7-26. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occ	upied BW						
<mark>ιχι</mark> RL RF 50 Ω	DC CORREC	SENSE:INT	ALIGN AUTO	10:15:46 A	M Sep 14, 2021	Trace	/Detector
	÷	Trig: Free Run	Avg Hold: 100/100	Rudio Stu	None		
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00	dBm						
30.0							
20.0						C	lear Write
10.0	procession of the second se	and the state of the second second					
0.00							
10.0			The second se				Average
man my grown on what	Mr MA		Magn	mary an	na An		Arenuge
				AND A	and a support		
-30.0							
-4U.U							Max Hold
-50.0							
Center 2.593000 GHz				Span 1	2.50 MHz		
Res BW 120 kHz		#VBW 390	kHz	Swe	ep 1 ms		Min Hold
		Total	Power 22	5 dBm			
Occupied Band	wiath		-ower 55.	5 ubiii			
	4.5228 M	Hz					Detector
Transmit Freg Err	or -3 093	kHz % of C	BW Power 9	9 00 %		Auto	Peak▶ Man
	5.070						
x dB Bandwidth	5.272	MHZ X dB	-26	.00 dB			
MSG			STATU	JS			

Plot 7-27. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz QPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-29. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 20MHz QPSK - Full RB)



Plot 7-30. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 20MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-31. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 15MHz QPSK - Full RB)



Plot 7-32. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U	PCTEST Poud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupie	ed BW					(- d ×
<mark>(X)</mark> RL RF 50Ω D	C CORREC	SENSE:INT	ALIGN AUTO	11:27:39 A	M Sep 14, 2021	Trace	e/Detector
		Trig: Free Run	Avg Hold:>100/100	Radio Stu.	None		
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 c	dBm						
Log							
30.0							lear Write
20.0	promotion	ᡁᡊᡎ᠇ᢛᡅᠰᠬ <i>ᠰᢑᡗᢛᠲ</i> ᢣᡟ᠇ᡗᡁᠷᢧᡟᢛᢦᠯᠮᡃ᠋ᡫ	unon				
10.0							
0.00	/		<u>}</u>				
-10.0	ta block		hills 1 .	N1 (Average
-20.0 million hand Miler hours	MAN MAN		ՠֈՠֈՠ	WHATHAN	แล้งโรง ประวัติการเร		
-30.0					and a Winter district		
-40.0							Max Hold
-50.0							Max Holu
Center 2.59300 GHz				Span 2	5.00 MHz		
Res BW 240 kHz		#VBW 750 k	Hz	Swe	ep 1 ms		Min Hold
Occupied Bandur	idth	Total P	ower 32	0 dBm			
		i otal i	52 .	0 ubm			
	9.0330 MH	Z					Detector
Transmit Fred Error	-9951	tz % of O	SW Power 9	9 00 %		Auto	Peak ► Man
				0.00 /0			
x dB Bandwidth	10.17 MH	lz xdB	-26	.00 dB			
MSG			STATU	JS			





Plot 7-34. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-35. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 5MHz QPSK - Full RB)



Plot 7-36. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Plot 7-37. Occupied Bandwidth Plot (NR Band n30 - 10MHz π/2 BPSK - Full RB - Ant A)



Plot 7-38. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant A)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied B ¹	W						
LXIRL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	08:50:10 PM	1 Oct 08, 2021	Trees	Detector
	С	enter Freq: 2.31000000	GHz	Radio Std:	None	Trace	Detector
	T	rig: Free Run Av	g Hold: 100/100				
	#IFGain:Low #	Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dBr	m						
LOG							
30.0							loar Write
20.0						, v	ieai wiiite
10.0	man man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
10.0							
0.00			<u>}</u>				
-10.0							Average
	- J		N				
-20.0			11.				
-30.0	ur and a second se		Manufant	An. 11	hd. A		
(m~ ⁷				A A A A A A A A A A A A A A A A A A A	Ul marker of the for		
-40.0							Max Hold
-50.0							
Center 2.31000 GHz				Span 2	5.00 MHz		
Res BW 240 kHz		#VBW 750 kHz		Swe	ep 1 ms		
							Winthold
Occupied Bandwid	th	Total Powe	er 27.7	′ dBm			
Occupied Ballowid							
9.	.3406 MHz						Detector
							Peak▶
Transmit Freq Error	-37.500 kHz	% of OBW	Power 99	.00 %		Auto	Man
x dB Bandwidth	10 17 MHz	y dB	-26	00 dB			
	10.17 10112		-20.				
MSG			STATUS	5			

Plot 7-39. Occupied Bandwidth Plot (NR Band n30 - 10MHz 16-QAM - Full RB - Ant A)



Plot 7-40. Occupied Bandwidth Plot (NR Band n30 - 5MHz π/2 BPSK - Full RB - Ant A)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Plot 7-41. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant A)



Plot 7-42. Occupied Bandwidth Plot (NR Band n30 - 5MHz 16-QAM - Full RB - Ant A)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW							_	
LXI RL RF 50Ω AC C	CORREC	SENSE:INT	0000 GH-	ALIGN AUTO	07:41:56 P	M Oct 08, 2021	Trac	e/Detector
		Trig: Free Run	Avg Hold	: 100/100	Radio Stu	. None		
#	IFGain:Low	#Atten: 36 dB			Radio Dev	rice: BTS		
10 dB/div Ref 40.00 dBm								
Log								
30.0								Clear Write
20.0			0					
10.0								
0.00	- <u>}</u>		\vdash					
-10.0	/		\					Average
-20.0	/			Jalla C				
-30.0				Ville Ville	- man	\sim		
-40.0								Maxilald
50.0								Max Hold
-30.0								
Center 2.31000 GHz					Span 2	5.00 MHz		
Res BW 240 kHz	#VBW 750 kHz Sweep 1 ms					eep 1 ms		Min Hold
		Total D		20.7	Z al Dura			
Occupied Bandwidth		Total P	ower	29.1	иыш			
9.0	242 MHz	Z						Detector
The second it first a first a				00			A	Peak►
Transmit Freq Error	-190.56 KH	2 % 01 01	SW POW	er 99	0.00 %		Auto	Iviari
x dB Bandwidth	10.05 MH	z xdB		-26.	00 dB			
MSG				STATUS	5			

Plot 7-43. Occupied Bandwidth Plot (NR Band n30 - 10MHz π/2 BPSK - Full RB - Ant J)



Plot 7-44. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant J)

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www. Keysight Spectrum Analyzer - Occupied BW							
LX/ RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	07:42:20 PM	Oct 08, 2021	Trac	e/Detector
		Trig: Free Run	Avg Hold:>100/100	Rudio Sta. I	tone		
,	#IFGain:Low #	#Atten: 36 dB		Radio Devic	e: BTS		
10 dB/div Ref 40.00 dBm							
Log							
30.0							Clear Write
20.0							
10.0		har and a second second	man				
0.00	_/		<u>\</u>				
-10.0			<u>\</u>				Average
-20.0	/ ^{//}		in the second				
-30.0 Autor Aller -			- "\v	harry hard and	w Mar March 1		
-40.0							Maxilald
50.0							Max Hold
-30.0							
Center 2.31000 GHz				Span 25	.00 MHz		
Res BW 240 kHz		#VBW 750 kH	z	Swee	ep 1ms		Min Hold
		T-4-LD-					
Occupied Bandwidth	1	l otal Po	wer 21.2	aBm			
9.3	3674 MHz	Z					Detector
							Peak▶
I ransmit Freq Error	-29.097 kH	z % of OB	W Power 99	.00 %		Auto	Man
x dB Bandwidth	10.21 MH	z x dB	-26.	00 dB			
MSC			OTATIO				

Plot 7-45. Occupied Bandwidth Plot (NR Band n30 - 10MHz 16-QAM - Full RB - Ant J)



Plot 7-46. Occupied Bandwidth Plot (NR Band n30 - 5MHz π/2 BPSK - Full RB - Ant J)

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Keysight Spectrum Analyzer - Occupied	BW						
LXI RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	08:12:22 PM	Oct 08, 2021	Trace/D	etector
	Trig	: Free Run Avg H	lold: 100/100	Radio Stu.	None		
	#IFGain:Low #Att	en: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dE	3m						
Log							
30.0						Cle	ar Write
20.0							
10.0	man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	∖				
0.00	/						
-10.0						4	Average
-20.0			\				
30.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
40.0					~		
-40.0						м	lax Hold
-50.0							
Center 2 310000 GHz				Snan 12	2 50 MHz		
Res BW 120 kHz		VBW 1.2 MHz		Swe	ep 1 ms		lin Hold
						IV	
Occupied Bandwig	dth	Total Power	27.1	dBm			
	5260 MH-						Notostor
						-	Peak ►
Transmit Freq Error	-15.921 kHz	% of OBW Po	ower 99	.00 %		Auto	Man
x dB Bandwidth	5.401 MHz	x dB	-26.	00 dB			
MSG			STATUS				

Plot 7-47. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant J)



Plot 7-48. Occupied Bandwidth Plot (NR Band n30 - 5MHz 16-QAM - Full RB - Ant J)

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Spectrur	n Analyze d BW	r 1 🔻	+									Frequency	· · · ※
KEYSI RL		out: RF oupling: DC ign: Auto	Input Z: Corr CC Freq Re NFE: Of	50 Ω orr f: Int (S) ff	Atten: 36 dB	Trig Gat #IF	: Free Run e: Off Gain: Low	Center Fr Avg Hold Radio Sto	eq: 2.53500000 100/100 I: None	00 GHz	Center Fr 2.535000	equency 0000 GHz	Settings
1 Graph		T									Span 100.00 M	1Hz	
Scale/D Log 30.0 20.0 10.0	iv 10.0 dE	3			Ref Value 40.	.00 dBm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				CF Step 10.00000 Auto Man	00 MHz	
0.00 -10.0 -20.0 -30.0 -40.0	and a start of the	ger and the standy good for						L	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	h	Freq Offs 0 Hz	et	
-50.0 Center 2 #Res BV	2.53500 G V 1.0000	Hz MHz		\\	/ideo BW 8.0	000 MHz			Sj Sweep 1.00 m	pan 100 MHz ns (1001 pts)			
2 Metrics		T											
	Occupied	d Bandwidth 38.80	02 MHz			То	tal Power		31.8 d	IBm			
	Transmit x dB Bar	Freq Error		81.714 kH 41.04 MH	z	% x (of OBW Pow iB	ver	99.0 -26.00	0 %) dB			
	って		Oct 19	9, 2021 37 AM									

Plot 7-49. Occupied Bandwidth Plot (NR Band n7 - 40MHz π/2 BPSK - Full RB - Ant B)

KEYSIGHT Input: RF Input: Z: 50 0 Atten: 36 dB Trig: Free Run Center Freq: 2:535000000 GHz AvglHold: 100/100 RL Imput: RF Align: Auto Free Ref: Int (S) Atten: 36 dB Trig: Free Run Center Freq: 2:535000000 GHz AvglHold: 100/100 I Graph Imput: Sector Scale/Div 10.0 dB Ref Value 40.00 dBm Center Freq: 2:55000000 GHz Span 100.00 MHz 200 Imput: Sector Scale/Div 10.0 dB Ref Value 40.00 dBm Center Freq: Center Freq: Center Frequency Settings 100 Imput: Sector Ref Value 40.00 dBm Imput: Sector Center Freq: Center Frequency Settings 200 Imput: Sector Ref Value 40.00 dBm Imput: Sector Center Freq: Center Frequency Settings 200 Imput: Sector Ref Value 40.00 dBm Imput: Sector Center Freq: Sector Settings 200 Imput: Sector Imput: Sector Imput: Sector Imput: Sector Sector Sector 200 Imput: Sector Imput: Sector Imput: Sector Imput: Sector Sector Imput: Sector Sector Imput: Sector Sector Imput: Sector Sect	Spectrum Ana Occupied BW	alyzer 1	+							Frequency		
1 Graph Scale/Div 10.0 dB Ref Value 40.00 dBm CF Step 200	KEYSIGH RL +>-	T Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (NFE: Off	Atten: 36 dB (S)	Trig: Free R Gate: Off #IF Gain: Lo	un Center Avg Ho w Radio S	Freq: 2.53500 ld: 100/100 std: None	0000 GHz	Center F 2.53500	Frequency 00000 GHz	Setting	s
Scale/Div 10.0 dB Ref Value 40.00 dBm Log Image: Constraint of the second seco	1 Graph	•							100.00	MHz		
2 Metrics	Scale/Div 10 Log 30.0 20.0 10.0 -20.0 -20.0 -30.0 -40.0 -50.0 Center 2.535 #Res BW 1.0	0 dB		Ref Value 40	00 dBm		Sweep 1.0	Span 100 MHz 0 ms (1001 pts)	CF Step 10.0000 Aut Mar Freq Off 0 Hz	000 MHz on		
Occupied Bandwidth 38.659 MHz Total Power 30.0 dBm Transmit Freq Error 50.016 kHz % of OBW Power 99.00 % x dB Bandwidth 41.23 MHz x dB -26.00 dB	2 Metrics Occ Trar x dE	upied Bandwidth 38.1 asmit Freq Error 8 Bandwidth	n 659 MHz 50.01 41.20 Oct 19, 202	6 kHz 3 MHz	Total Pow % of OBV x dB	er / Power	30. 9 -26	0 dBm 9.00 % 9.00 dB				

Plot 7-50. Occupied Bandwidth Plot (NR Band n7 - 40MHz QPSK - Full RB - Ant B)

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Plot 7-51. Occupied Bandwidth Plot (NR Band n7 - 40MHz 16-QAM - Full RB - Ant B)



Plot 7-52. Occupied Bandwidth Plot (NR Band n7 - 30MHz π/2 BPSK - Full RB - Ant B)

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🔤 Keysight Sp	ectrum Analyzer - Occu	upied BW									
LXI RL	RF 50 Ω	DC COR	REC	SE Contor E	NSE:INT	0000 GH7	ALIGN AUTO	07:08:09 A	M Oct 13, 2021	_ Trac	:e/Detector
			÷	Trig: Fre	e Run	Avg Hold	: 100/100	Radio Stu	None		
		#IFG	ain:Low	#Atten: 3	86 dB			Radio Dev	ice: BTS		
10 dB/div	Ref 40.00	dBm	,								
20 0											
20.0											Clear Write
20.0			harmon	mun	man	mmm					
10.0		,									
0.00		f									_
-10.0											Average
-20.0		In some lab					helionom	have a			
-30.0 	and a star a								muner		
-40.0											Max Hold
-50.0											Maxmona
Center 2.	53500 GHz							Span 7	5.00 MHz		
Res BW	680 kHz			VB	W 6 MHz			Swe	ep 1 ms		Min Hold
000	nied Dond	width			Total P	ower	20.0	dBm			
Occu					Total I		20.0				
		28.7	14 M	HZ							Detector
Tranc	mit Fred Frrd	or	0 /27		% of O		or 00	00 %		Auto	Peak ► Man
Tians		01	3.421	KIIZ	/6 01 01		GI 99	.00 /0		Auto	interi
x dB E	Bandwidth		30.46 N	ИHz	x dB		-26.	00 dB			
MSG							STATUS	;			

Plot 7-53. Occupied Bandwidth Plot (NR Band n7 - 30MHz QPSK - Full RB - Ant B)



Plot 7-54. Occupied Bandwidth Plot (NR Band n7 - 30MHz 16-QAM - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occupied BW							
LXI RE RF 50 Ω DC CORR	EC SE	ENSE:INT Freq: 2.535000000 GH;	ALIGN AUTO	08:33:46 At Radio Std:	10ct 13, 2021 None	Trace	/Detector
	Trig: Fre	e Run Avg Ho	old: 100/100				
#IFGa	ain:Low #Atten: 3	36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBm							
30.0							
20.0						C	lear Write
10.0	and a second and a second s	Martin Martin Stration					
0.00							
-10.0							Average
-20.0			L.a.				
300 mouth man hug martin			" wow	and the second	hardow		
40.0							
40.0							Max Hold
Center 2.53500 GHz				Span 6	2.50 MHz		
Res BW 620 kHz	VB	W 6 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwidth		Total Power	31.8	dBm			
	70 MILL-		0110				-
23.07							Detector Peak
Transmit Freq Error -4	470.55 kHz	% of OBW Po	wer 99	.00 %		Auto	Man
x dB Bandwidth	24.47 MHz	x dB	-26.	00 dB			
MSG			STATUS				

Plot 7-55. Occupied Bandwidth Plot (NR Band n7 - 25MHz π/2 BPSK - Full RB - Ant B)



Plot 7-56. Occupied Bandwidth Plot (NR Band n7 - 25MHz QPSK - Full RB - Ant B)

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Eviloper Content and Street And Street And Street Eviloper Content and Street Eviloper			
LXU RL RF 50 Ω DC CORREC	SENSE:INT A	LIGN AUTO 08:34:37 AM Oct 13, 202: Radio Std: None	Trace/Detector
	Trig: Free Run Avg Hold:	100/100	
#IFGain:Low	#Atten: 36 dB	Radio Device: B I S	-
10 dB/div Ref 40.00 dBm			
30.0			
20.0			Clear Write
10.0	man		
0.00			
-10.0			Average
20.0		Λ.	
-30.0 July of some many many many many many many many many		. Martine Martine M	
-40.0			Maxilaid
50.0			Max Hold
Center 2.53500 GHz		Span 62.50 MH	2
Res BW 620 kHz	VBW 6 MHz	Sweep 1 m	Min Hold
Occupied Bandwidth	Total Power	30.6 dBm	
	I		
23.035 MF	1Z		Detector Peak▶
Transmit Freq Error -477.02 k	Hz % of OBW Power	r 99.00 %	Auto <u>Man</u>
x dB Bandwidth 24.56 M	lHz x dB	-26.00 dB	
MSG		STATUS	

Plot 7-57. Occupied Bandwidth Plot (NR Band n7 - 25MHz 16-QAM - Full RB - Ant B)



Plot 7-58. Occupied Bandwidth Plot (NR Band n7 - 20MHz π/2 BPSK - Full RB - Ant B)

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🛄 Keysight Spectrum Analy	zer - Occupied BW									
LXI RL RF	50 Ω DC C	ORREC	SEN	NSE:INT	000 GH-	ALIGN AUTO	12:21:10 P	M Sep 21, 2021	Trac	e/Detector
			Trig: Free	eq. 2.00000 e Run	Avg Hold	d: 100/100	Raulo Stu.	None		
	#	FGain:Low	#Atten: 3	6 dB			Radio Dev	ice: BTS		
10 dB/div Ref	40.00 dBm	_			,					
Log 30.0										
20.0										Clear Write
10.0		Jamos	mitren	\sim	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
0.00		l I								
0.00										Avorago
-10.0]								Average
-20.0	. mark to graph to					Mar Malur	Monume	aa.d.		
-30.0 martin and a second seco								The The Party of		
-40.0										Max Hold
-50.0										
Center 2 53500 G							Snan 5	0 00 MHz		
Res BW 470 kHz	2		VBV	N/5 MHz			Swe	ep 1 ms		Min Hold
								· · · ·		MITHOU
Occupied B	andwidth			Total Po	ower	29.7	dBm			
	19.	019 MI	Hz							Detector
	_									Peak▶
Transmit Free	q Error	19.293	kHz	% of OE	SW Pow	er 99	.00 %		Auto	Man
x dB Bandwid	dth	20.37 N	IHz	x dB		-26.	00 dB			
MSG						STATUS				

Plot 7-59. Occupied Bandwidth Plot (NR Band n7 - 20MHz QPSK - Full RB - Ant B)



Plot 7-60. Occupied Bandwidth Plot (NR Band n7 - 20MHz 16-QAM - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occupied	BW						
LX RL RF 50 Ω DC	CORREC	SENSE:INT Center Freg: 2.53500	ALIGN AUTO	09:38:58 AM Radio Std:	Oct 13, 2021 None	Trace/Det	ector
		Trig: Free Run	Avg Hold: 100/100	Dedie Deut	DTC		
	#IFGain:Low	#Atten: 36 dB		Radio Devi	Ce: BTS		
10 dB/div Ref 40.00 dE	sm						
30.0						0	101-14-
20.0	the part of the		*0-0			Clear	vvrite
10.0							
0.00							
-10.0			<u> </u>			A۱	/erage
-20.0	11ml		- My	~~~			
-30.0				- John John John John John John John John	www.wahiji jika		
-40.0						Ма	x Hold
-50.0							
Center 2 53500 GHz				Snan 37	7.50 MHz		
Res BW 360 kHz		VBW 4 MHz		Swee	ep 1 ms	Mi	n Hold
							THOIL
Occupied Bandwic	ith	Total P	ower 30	.9 dBm			
1	3.540 MH	Z				De	tector
Tranomit Frog Error	264 24 64	da % of OF		0 00 %		Auto	Peak► Man
Transmit Freq Error	-304.21 Kr		Sw Fower 9	9.00 %		Auto	IVIAII
x dB Bandwidth	14.66 MI	lz xdB	-26	5.00 dB			
MSG			STAT	US			

Plot 7-61. Occupied Bandwidth Plot (NR Band n7 - 15MHz π/2 BPSK - Full RB - Ant B)



Plot 7-62. Occupied Bandwidth Plot (NR Band n7 - 15MHz QPSK - Full RB - Ant B)

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🔤 Keysight Spectrum Analyzer - Occupie							
LXI RL RF 50 Ω D	C CORREC	SENSE:INT	ALIGN AUTO	09:38:25 AM Radio Std:	Oct 13, 2021	Trace	/Detector
	• • ••	Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 d	Bm						
30.0							
20.0						C	lear Write
10.0	furnowskin	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	mony				
0.00							
-10.0			\				Average
-20.0							
-30.0 marshamman - Marshamman - 30.0	Ç,Aµ~∕r		mmulin	millipperor	an war the		
-40.0							Max Hold
-50.0							Maxinoia
Center 2.53500 GHz				Span 37	2.50 MHz		
Kes BW JOO KH2				Swee	ep i lins		Min Hold
Occupied Bandwi	dth	Total Po	ower 29.2	2 dBm		_	
	1 <i>4</i> 177 MH	7					Detector
	1- 1 . 1 <i>/ /</i> 1011 1						Peak►
Transmit Freq Error	-9.017 kl	Iz % of OE	W Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	15.36 MF	z xdB	-26.	00 dB			
MSG			STATUS	6			

Plot 7-63. Occupied Bandwidth Plot (NR Band n7 - 15MHz 16-QAM - Full RB - Ant B)



Plot 7-64. Occupied Bandwidth Plot (NR Band n7 - 10MHz π/2 BPSK - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occupied BW								
LX/ RL RF 50Ω AC O	ORREC	SENSE:INT		IGN AUTO	07:30:38 PM	Nov 10, 2021	Trac	e/Detector
	Tr	ig: Free Run	Avg Hold: 1	100/100	auto stu.	None		
#1	FGain:Low #A	tten: 36 dB		R	adio Devi	ce: BTS		
10 dB/div Ref 40.00 dBm								
Log								
30.0								Clear Write
20.0			0					
10.0								
0.00								
-10.0	/		\vdash					Average
-20.0			\ \	What .	л			
-30.0 almost mouth mouth and				and the state of the second	white	mally		
-40.0								
50.0								Max Hold
-30.0								
Center 2.53500 GHz					Span 25	5.00 MHz		
Res BW 240 kHz		VBW 2.4 MH	IZ		Swe	ep 1 ms		Min Hold
		Tatal D		00 F -1	Deer			
Occupied Bandwidth		l otal P	ower	28.5 a	Bm			
9.30	658 MHz							Detector
								Peak►
Transmit Freq Error	270 Hz	% of O	BW Power	r 99.0	0 %		Auto	<u>Man</u>
x dB Bandwidth	10.31 MHz	x dB		-26.00	dB			
MSC				STATUS				

Plot 7-65. Occupied Bandwidth Plot (NR Band n7 - 10MHz QPSK - Full RB - Ant B)



Plot 7-66. Occupied Bandwidth Plot (NR Band n7 - 10MHz 16-QAM - Full RB - Ant B)

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www.common.common.common.common.common.common.common.common.common.common.common.common.common.common.common.com			
LXU RL RF 50 Ω DC CORREC	SENSE:INT A	LIGN AUTO 10:22:22 AM Oct 13, 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			
30.0			
20.0			Clear Write
10.0	······································		
0.00			
-10.0			Average
-20.0		M.M.A.	, i i i i i i i i i i i i i i i i i i i
30 0 may walk was have		* Mingar Jun Mandan ma	
40.0		End how	
50.0			Max Hold
Center 2.535000 GHz		Span 12.50 MHz	
Res BW 120 kHz	VBW 1.2 MHz	Sweep 1 ms	Min Hold
Occupied Bandwidth	Total Power	30.6 dBm	
	1		Detector
4.5367 MI	12		Detector Peak▶
Transmit Freq Error -20.944 k	Hz % of OBW Power	r 99.00 %	Auto <u>Man</u>
x dB Bandwidth 5.228 M	IHz x dB	-26.00 dB	
MSG		STATUS	

Plot 7-67. Occupied Bandwidth Plot (NR Band n7 - 5MHz π/2 BPSK - Full RB - Ant B)



Plot 7-68. Occupied Bandwidth Plot (NR Band n7 - 5MHz QPSK - Full RB - Ant B)

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Keysight Spectrum Analyzer - Occupied E	3W						x
LXX RL RF 50Ω DC	CORREC	SENSE:INT	ALIGN AU	TO 10:22:04 A	M Oct 13, 2021	Trace/Detector	
	T	rig: Free Run	Avg Hold: 100/10	0			
	#IFGain:Low #	Atten: 36 dB		Radio Dev	rice: BTS		
10 dB/div Ref 40.00 dB	m						
20.0						Clear Wri	ite
10.0	m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m				
0.00							
0.00			<u> </u>			Avera	a 0
-10.0	54		× 1			Avera	ye
-20.0	<u>م</u> ر		w	hanne had an			
-30.0					[₩] ₩ _₩ ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩		
-40.0						Max Ho	ld
-50.0							
Center 2 535000 GHz				Snan 1	2 50 MHz		
Res BW 120 kHz		VBW 1.2 M	łz	Swe	ep 1 ms	Min Ho	Jd
					<u> </u>	WIITHO	iu.
Occupied Bandwid	th	Total P	ower 2	8.6 dBm			
4	5380 MHz	,				Detect	or
-						Peal	k►
Transmit Freq Error	2.473 kHz	s % of O	BW Power	99.00 %		Auto <u>M</u>	an
x dB Bandwidth	5.248 MHz	x dB		26.00 dB			
MSG			ST	TATUS			_
							_

Plot 7-69. Occupied Bandwidth Plot (NR Band n7 - 5MHz 16-QAM - Full RB - Ant B)

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NR Band n41 - Ant J

Spectrun Occupied	n Analyzer 1 d BW	• +									Ö	Frequency	· • • •	22
REYSI RL	GHT Input: RF Coupling: Align: Auto	DC Corr C o Freq F NFE:	Z: 50 Ω CCorr Ref: Int (S) Off	Atten: 30 dB	Trig: F Gate: #IF Ga	iree Run Off ain: Low	Center I Avg Hol Radio S	Freq: 2. d:>100 td: Nor	593000000 /100 ie	GHz	Center Fr 2.593000	equency 0000 GHz	Settings	
1 Graph	•										Span 250.00 M	1Hz		
Scale/Di Log 30.0 20.0	iv 10.0 dB		R	ef Value 40.00	dBm						CF Step 25.00000 Auto	00 MHz		
10.0 0.00 -10.0 -20.0		~~~~							~~~~		Man Freq Offs 0 Hz	et		
-30.0	2.5930 GHz		#V	ideo BW 8.000	0 MHz				Sn	an 250 MHz				
Res BW	2.4000 MHz							Swee	p 1.00 ms	(1001 pts)				
2 Metrics	▼ Occupied Band	width 97.102 MHz			Total	Power			33.2 dE	3m				
	Transmit Freq E x dB Bandwidth	Error	-580.12 kHz 102.6 MHz		% of x dB	OBW Pow	/er		99.00 -26.00 d	% 1B				
	って「	Oct : 4:32	20, 2021 2:42 AM											

Plot 7-70. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant J)

Spectrum Occupied	n Analy: d BW	zer 1	•	+											Fr	requency	v	
KEYSI RL	GHT ↔	Input: RF Coupling: Align: Aut	DC o	Input Z: Corr CC Freq Re NFE: Of	50 Ω corr ef: Int (S) ff	Atten: 30 dB	Ti G #	rig: Fr Sate: C IF Gai	ee Run)ff in: Low	Center Avg Ho Radio S	Freq: ld: 10 std: N	2.59300000 0/100 one	0 GHz	Center 2.593	r Freque 000000	ncy GHz	Settin	gs
1 Graph		v												250.0	0 MHz			
Scale/Di Log 30.0 20.0 10.0 -10.0 -20.0 -30.0	v 10.0			and the state of the		tef Value 40.0	00 dBn	n 	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~- 1 (1)	موجود ^{ور} و ^ر برا در ال	a juna da tana	CF Sta 25.00 A M Freq C 0 Hz	ep 0000 MH uto lan Dffset	Hz		
-40.0																		
Center 2 Res BW	.5930 (2.4000	SHz MHz			#V	ideo BW 8.00	000 MH	ΙZ			Swe	Sp ep 1.00 m	oan 250 MHz s (1001 pts)					
2 Metrics	Occup Transr x dB B	▼ ied Band nit Freq E andwidth	width 98.4 Error	 17 MHz -	48.131 kHz 104.0 MHz		-	Total % of 0 x dB	Power OBW Powe	er		31.9 d 99.00 -26.00	Bm) % dB					
	า (2		? Oct 20 4:30:4), 2021 41 AM													

Plot 7-71. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant J)

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Spectrui Occupie	m Analyzer 1 ed BW	+						*	Frequency	- * 禄
KEYS RL	IGHT Input: RF Coupling: DC Align: Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S) NEE: Off	Atten: 30 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq Avg Hold: 10 Radio Std: N	: 2.593000000 GHz 00/100 None		Center Fre 2.593000	equency 000 GHz	Settings
1 Graph								Span 250.00 M	Hz	
Scale/D	9iv 10.0 dB		Ref Value 40.0	0 dBm	1			CF Step		
20.0 10.0			man	ىلىچىرىيەلىسىمى _{لى} رىيىرىيىر	•			25.00000 Auto Man	0 MHz	
0.00					l.			Freq Offse	:t	
-20.0	and provident and particular standing of the	W - Annora Mark			"Valuesper	ent level and a second and the	h have a second	UHZ		
-40.0 -50.0										
Center : Res BW	2.5930 GHz / 2.4000 MHz		≇Video BW 8.00	000 MHz	Sw	Span 25 eep 1.00 ms (100	0 MHz)1 pts)			
2 Metrics	5 T									
	Occupied Bandwid	th 251 MHz		Total Power		31.2 dBm				
	Transmit Freq Erro	or -112.48 kł 103.8 Mł	Hz Hz	% of OBW Pow x dB	er	99.00 % -26.00 dB				
			<u> </u>							
	~	2 Oct 20, 2021 4:29:59 AM	$\mathbb{P} \triangle$				\mathbf{X}			

Plot 7-72. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant J)

Spectrur Occupie	n Analyze d BW	er 1 🔻	+								\$	Frequency	- * 法
KEYSI RL		put: RF oupling: DC lign: Auto	Input Z: Corr CC Freq Ret NFF: Of	50 Ω orr f: Int (S) f	Atten: 30 dB	Trig: F Gate: #IF Ga	ree Run Off iin: Low	Center Fre Avg Hold: Radio Std:	eq: 2.59302000 100/100 : None	0 GHz	Center F 2.59302	Frequency 20000 GHz	Settings
1 Graph		v									Span 225.00	MHz	
Scale/D	iv 10.0 di	в		R	ef Value 40.00	dBm					CE Sten		
Log 30.0											22 5000	00 MH 7	
20.0				m							22.0000	0	
10.0			/								Mai	ม 1	
0.00			- 1								Freg Off	set	
-20.0		man	~~~~					m	\sim		0 Hz	501	
-30.0													
-40.0													
-50.0													
Center 2	2.5930 GI	Iz		#V	ideo BW 8.0000) MHz		_	Sp	an 225 MHz			
Res BW	2.2000 N	MHz						s	weep 1.00 m	s (1001 pts)			
2 Metrics		•											
	Occupie	d Bandwidth											
	occupio	87.3	54 MHz			Total	Power		34.0 d	Bm			
	Transmi	t Frea Error		165.86 kHz		% of	OBW Powe	er	99.00) %			
	x dB Bai	ndwidth		92.39 MHz		x dB			-26.00	dB			
	า เ		Oct 20 4:31:5	, 2021 55 AM									

Plot 7-73. Occupied Bandwidth Plot (NR Band n41 - 90MHz π/2 BPSK - Full RB - Ant J)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Spectrur Occupie	m Analy. d BW	zer 1	• +	·										Frequency	- 湯
RL	IGHT ↔	Input: RF Coupling: Align: Aut	DC to	Input Z: Corr CC Freq Re	50 Ω orr f: Int (S) f	Atten: 30 dB	Trig: Gate: #IF G	Free Run Off ain: Low	Center Avg Hol Radio S	Freq: 2. ld: 100/ std: Nori	.593020000 100 1e	GHz	Center 2.593	Frequency 020000 GHz	Settings
1 Graph	_	•		NI E. OI									Span 225.0	0 MHz	
Scale/D	0iv 10.0	dB			R	ef Value 40.0	0 dBm		•				CF Ste	ep	
30.0													22.50	0000 MHz	
20.0							~~~~~						A	uto	
0.00				/									M	an	
-10.0				كسسر					Jan 1				Freq C	Offset	
-20.0		man	and and	"						~~~	**********		UHZ		
-40.0															
-50.0									l						
Center 2	2.5930	GHz			#V	ideo BW 8.00	00 MHz			C	Spa	an 225 MHz			
O Matrice	-	- WIFIZ								Swee	p 1.00 ms	(1001 pts)			
2 metrics	5	v													
	Occup	ied Band	lwidth								01.0 10				
	_		88.303 1	MHZ]		Tota				31.6 dB	sm			
	Transr x dB B	nit Freq I Sandwidth	Error	-	179.24 kHz 93 47 MHz		% O x dF	f OBW Pow	er		99.00 -26.00 c	% 1B			
	A OD L	anaviau			VO. IVI IVI IZ		X dL				20.00 0				
				\											
	5 (]?	Oct 20 4:36:4	0, 2021 14 AM					•••					

Plot 7-74. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB - Ant J)

Spectrun Occupied	n Analy d BW	zer 1 🔻	+									Frequency	- * ※
KEYSI RL	GHT ·≁·	Input: RF Coupling: DC Align: Auto	Input Z: Corr CC Freq Rel NEF: Of	50 Ω orr f: Int (S) f	Atten: 30 dB Trig: Free Run Cent Gate: Off Avg]i #IF Gain: Low Radi				:: 2.59302000 00/100 None	0 GHz	Center 2.593	Frequency 020000 GHz	Settings
1 Graph		T			I						Span 225.0	0 MHz	
Scale/Di Log 30.0 20.0 10.0	iv 10.0	dB		F	Ref Value 40.00) dBm					CF Ste 22.50 Au	p 0000 MHz uto an	
0.00 -10.0 -20.0 -30.0 -40.0	Postartifica	197 ⁴	and all and a second					- March - Million	Same and Sa	ر میں میں اور میں اور میں میں میں میں م مراجع میں	Freq C 0 Hz	ıffset	
Center 2 Res BW	2.5930	GHz) MHz		#\	/ideo BW 8.000	00 MHz		Sv	Sp veep 1.00 m	oan 225 MHz s (1001 pts)			
2 Metrics	Occup	▼ bied Bandwidt	h										
	Transi x dB E	88. mit Freq Error 3andwidth	275 MHz -6	63.500 kHz 93.19 MHz		Tota % o x dE	Il Power f OBW Powe 3	er	30.9 d 99.00 -26.00	Bm) % dB			
	າ (? Oct 20 4:36:5	, 2021 8 AM									

Plot 7-75. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB - Ant J)

FCC ID: A3LSMS908U		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Spectrur Occupie	m Analy d BW	zer 1	•	+										Frequency	• • 迷
KEYS RL	IGHT ↔	Input: RF Coupling Align: Au	: to	Input Z: Corr CC Freq Re NFF ⁻ Of	50 Ω orr f: Int (S) f	Atten: 30 dB	Trig: Gate #IF (Free Run e: Off Gain: Low	Center F Avg Holo Radio Si	Freq: 2. d: 100/1 td: Non	593020000 100 e) GHz	Center 2.593	r Frequency 020000 GHz	Settings
1 Graph													Span 200.0	0 MHz	
Scale/D	iv 10.0	dB			٦	ef Value 40.0	00 dBm						CF Ste	эр	1
30.0 20.0													20.00	0000 MHz uto	
10.0 0.00													M	lan	
-10.0									L				Freq C 0 Hz	offset	
-30.0 -40.0	*******	-									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	warta ang mga manang ting tang tang tang tang tang tang tang ta			
-50.0	2 5020										C n	an 200 Milia			
Res BW	2.5930	MHz			#V					Swee	p 1.00 ms	an 200 MH2 s (1001 pts)			
2 Metrics			1												
	Occur	ied Ban	dwidth												
	Cocup		77.84	0 MHz			Tot	al Power			33.0 dE	βm			
	Transi x dB E	mit Freq 3andwidt	Error h	-	319.62 kHz 81.83 MHz		% (x d	of OBW Pow B	er		99.00 -26.00	% dB			
	う (Oct 20 4:38:	, 2021 I3 AM										

Plot 7-76. Occupied Bandwidth Plot (NR Band n41 - 80MHz π/2 BPSK - Full RB - Ant J)

Spectrum Occupied	n Analy. I BW	zer 1	• +											\$	Frequency	- * ※
KEYSI RL	GHT ·≁·	Input: RF Coupling: Align: Aut	Atten: 30 dB	n: 30 dB Ing. Free Run Center Fred. 2: 93020000 GHz Gate: Off AvgHeid: 100/100 #IF Gain: Low Radio Std: None						0 GHz	Center 2.5930	Frequency 20000 GHz	Settings			
1 Graph		•	,											200.00	MHz	
Scale/Di	v 10.0	dB			R	ef Value 40.0	0 dBm		,					CF Ste	D	
30.0				\rightarrow										20.000	000 MHz	
20.0				ſ			9-4 ⁻ A							Au Ma	to an	
-10.0										\				Freq Of	ffset	
-20.0	Same Pr	Margaret war	م موجود الم	STAR AND						North March	Jun	and the second	monathrow	0 Hz		
-30.0																
-50.0																
Center 2 Res BW	.5930 (1.8000	GHz MHz			#V	ideo BW 6.00	00 MH	z	•		Swe	۶p ep 1.00 m	oan 200 MHz is (1001 pts)			
2 Metrics		•	,													
	Occup	ied Band	iwidth													
			78.096 M	Ηz			Т	otal	Power			31.6 d	Bm			
	Transr	nit Freq I	Error	-1:	35.01 kHz		9	6 of (OBW Powe	r		99.00) %			
	X UB E	anowidu		0	2.2110112		X	uВ				-26.00	UB			
	<u>ר</u>		?	Oct 20, 4:37:52	2021											

Plot 7-77. Occupied Bandwidth Plot (NR Band n41 - 80MHz QPSK - Full RB - Ant J)

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Plot 7-78. Occupied Bandwidth Plot (NR Band n41 - 80MHz 16-QAM - Full RB - Ant J)



Plot 7-79. Occupied Bandwidth Plot (NR Band n41 - 70MHz π/2 BPSK - Full RB - Ant J)

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🔤 Keysight Spectr	rum Analyzer - Occ	upied BW											_	
LXI RL	RF 50 Ω	AC	COF	RREC	SE Contor E	NSE:INT		LIG	N AUTO	10:29:23 P	M Nov (01,2021	Tra	ce/Detector
					Trig: Fre	e Run	Avg Hold:	100	0/100	Raulo Stu	. Non	e		
			#IF	Gain:Low	#Atten: 3	2 dB				Radio Dev	vice: E	BTS		
10 dB/div	Ref 40.0	0 dBm												
Log														
30.0														Clear Write
20.0			mal	- Multineer	M. costos	م الم الع		~						Ciedi Wille
10.0			ŗ_		, adas ka ak									
0.00									\					
-10.0									\					Average
20.0 manufall	mounter	and the second							and the state of the	-	MANY	MA AN		J
-20.0														
-30.0														
-40.0														Max Hold
-50.0														
Contor 2.50	202 042		<u> </u>							Enon 1	150.0			
Des BM 1	5 MH7				#\/	ВМ 5 MH	7			span Sw	een	1 me		
Res BM 1.							6				oop	T IIIe		Min Hold
Occupi	ed Band	widt	า			Total P	ower		31.7	′ dBm				
		67	•	2 4 MAI										
		67	.9	34 IVII										Detector
Transmi	it Freq Err	or		-93.935	kHz	% of O	BW Powe	r	99	.00 %			Auto	Man
x dB Ba	ndwidth			71.37 N	IHz	x dB			-26.	00 dB				
MSG									STATUS	3				

Plot 7-80. Occupied Bandwidth Plot (NR Band n41 - 70MHz QPSK - Full RB - Ant J)



Plot 7-81. Occupied Bandwidth Plot (NR Band n41 - 70MHz 16-QAM - Full RB - Ant J)

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Spectrur Occupie	n Analy d BW	zer 1	• +	•										Frequency	· · · 法
KEYSI RL	GHT ↔	Input: RF Coupling Align: Au	: DC to	Input Z: Corr CC Freq Re NFE: Of	50 Ω orr f: Int (S) ff	Atten: 30 dB	Trig: Gate #IF (Free Run e: Off Gain: Low	Center Avg Ho Radio S	Freq: 2 Id: 100 Std: No	2.59302000 /100 ne	0 GHz	Cente 2.593	r Frequency 020000 GHz	Settings
1 Graph						I							Span 150.0	0 MHz	
Scale/D	iv 10.0	dB			F	Ref Value 40.0	0 dBm						CF St	en	
30.0													15.00	00000 MHz	
20.0						~~~~~	~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	X				A	uto	
0.00													N	lan	
-10.0													Freq (Offset	
-20.0	\sim			~~~					1 m		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		0 Hz	,	
-40.0															
-50.0															
Center 2	2.59302	GHz			#\	/ideo BW 5.00	00 MHz			Swo	Sp op 1.00 m	an 150 MHz			
2 Metrics	1.5000	10112								owe	ep 1.00 m	s (1001 pts)			
	Ossur	ied Dens	da a de de las												
	Occup	neu pano	58.571	MHz			Tot	al Power			32.7 di	Зm			
	Transi	mit Freg	Error		178.81 kHz	2	% (of OBW Pow	er		99.00	1%			
	x dB E	Bandwidtl	h		61.89 MHz	z	x d	В			-26.00	dB			
	う (2]?	Oct 20 4:38:5	0, 2021 53 AM										

Plot 7-82. Occupied Bandwidth Plot (NR Band n41 - 60MHz π/2 BPSK - Full RB - Ant J)

Spectrum Occupied	Analyz BW	ter 1	• +									Frequency	- * ※
KEYSK RL	GHT ·≁·	Input: RF Coupling: Align: Aut	DC Corr C co Freq I NFE:	Z: 50 Ω COrr Ref: Int (S) Off	Atten: 30 dB	Trig: Fi Gate: (#IF Ga	ree Run Off in: Low	Center Freq: Avg Hold: 10 Radio Std: N	2.593020000 00/100 Ione	GHz	Center F 2.59302 Span	requency 20000 GHz	Settings
1 Graph		•									150.00	MHz	
Scale/Div	v 10.0 o	lΒ		F	Ref Value 40.00 o	dBm					CE Sten		
30.0											15.0000	00 MHz	
20.0					· · · · · · · · · · · · · · · · · · ·	مهرم معاد					Auto Mar	יייייין כ ו	
0.00				/				l .			Freq Offs	set	
-20.0	the second second	n		J				home is a			0 Hz		
-30.0									the state of the sector	manne			
-40.0													
Contor 2	50202	04-			(ideo BW/ 5 0000	MHz			En	150 MU-			
Res BW '	1.5000	MHz		#1	NGEO BW 5.0000			Sw	eep 1.00 ms	(1001 pts)			
2 Metrics		۲											
	Occupi	ed Band	width			Total	Dower		31 5 dB	m			
	T	-14 F		400.04.111				-	00.00	0(
	x dB B	andwidth	1 Inor	-162.34 KHz 61.93 MHz		x dB	OBW Powe	1	-26.00	[%] iB			
	n (7	? Oct 4:3	20, 2021 9:20 AM									

Plot 7-83. Occupied Bandwidth Plot (NR Band n41 - 60MHz QPSK - Full RB - Ant J)

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Spectru Occupie	m Analyzer 1	+				Frequency	- * 宗
KEYS RL	IGHT Input: RF ← Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S)	Atten: 30 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq. 2.593020000 GHz Avg Hold: 100/100 Radio Std: None	Center Frequency 2.593020000 GHz	Settings
1 Graph	. ▼					Span 150.00 MHz	
Scale/D	Div 10.0 dB		Ref Value 40.0	0 dBm		CF Step 15.000000 MHz	
20.0			mannana	and the second		Auto Man	
-10.0						Freq Offset 0 Hz	
-30.0 W	WPW-MMILybournerously						
Center	2.59302 GHz	#	Video BW 5.00	00 MHz	Span 150 M	Hz	
2 Metric	s v						
	Occupied Bandwidt	h					
	58.	316 MHz		Total Power	30.6 dBm		
	Transmit Freq Error x dB Bandwidth	-104.03 kH 61.95 MH	z z	% of OBW Powe x dB	er 99.00 % -26.00 dB		
	50	? Oct 20, 2021 4:39:35 AM					

Plot 7-84. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB - Ant J)

Spectrum Occupied	Analyzer 1 BW	- -	÷						\$	Frequency	- * 影
RL .	GHT Input: F Couplin Align: A	RF Ig: DC Iuto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S) NEE: Off	Atten: 30 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Avg He Radio	Freq: 2.5930200 bld: 100/100 Std: None	00 GHz	Center 2.5930	Frequency 20000 GHz	Settings
1 Graph		•							Span 125.00) MHz	
Scale/Div	v 10.0 dB			Ref Value 40.00	dBm				CF Ste	p	
30.0									12.500	000 MHz	
10.0									Au Ma	ito an	
-10.0			/			{			Freq O	ffset	
-20.0			mand			hourson		mon	0 Hz		
-40.0											
Center 2.	59302 GHz		!	Video BW 4.000	0 MHz		s	pan 125 MHz			
Res BW '	1.2000 MHz						Sweep 1.00 n	ns (1001 pts)			
2 Metrics		•									
	Occupied Ba	ndwidth						_			
		46.10	6 MHz		Total Power		33.1 (Bm			
	Transmit Free x dB Bandwid	q Error dth	-1.0361 MH 49.06 MH	lz Iz	% of OBW Pov x dB	ver	99.0 -26.00	0 % 0 dB			
	って	7?	Oct 20, 2021 4:41:07 AM								

Plot 7-85. Occupied Bandwidth Plot (NR Band n41 - 50MHz π/2 BPSK - Full RB - Ant J)

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Plot 7-86. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB - Ant J)

Spectrur Occupie	n Analy d BW	zer 1 🔻	+								\$	Frequency	- * 影
KEYS RL	IGHT ·✦·	Input: RF Coupling: DC Align: Auto	Input Z: Corr CC Freq Re NFE: O	50 Ω corr ef: Int (S) ff	Atten: 30 dB	Trig: Gate #IF C	Free Run : Off Gain: Low	Center Fred Avg Hold: 1 Radio Std:	a: 2.593020000 00/100 None) GHz	Center 2.5930	Frequency 20000 GHz	Settings
1 Graph		•									Span 125.00	MHz	
Scale/D	iv 10.0	dB		F	Ref Value 40.00) dBm					CF Ste	D	
30.0											12.500	000 MHz	
20.0				man		man	angel and a have				Au Au	to	
0.00								1				11 I 55 4	
-10.0			and presenting					Mary Mark Bar an			Freq O	iset	
-30.0	م _ا وينهايينيان	han ng kang kang kang kang kang kang kang						100 100	all and the second s	with for a second star			
-40.0													
Center 3	2 50302	GH7		#\	/ideo BW/ 4.000				Sn	an 125 MHz			
Res BW	1.2000	MHz			1000 011 4.000	00 1011 12		Sv	veep 1.00 ms	6 (1001 pts)			
2 Metrics													
	Occup	ied Bandwid	th										
		47	.879 MHz			Tota	al Power		31.0 dE	ßm			
	Transi	nit Freq Erro	r -	103.61 kHz	2	% c	of OBW Powe	er	99.00	%			
	x dB E	landwidth		50.88 MHz	2	x di	В		-26.00 (dB			
	5		? Oct 20 4:40:), 2021 18 AM									

Plot 7-87. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB - Ant J)

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Plot 7-88. Occupied Bandwidth Plot (NR Band n41 - 40MHz π/2 BPSK - Full RB - Ant J)

Spectrum Occupied	n Analyzei d BW	r 1 🛛 🔻	+								\$	Frequency	- * 影
KEYSI RL	GHT Ing ↔→ Co Ali	out: RF oupling: DC gn: Auto	Input Z: 50 Corr CCor Freq Ref: NFE: Off)Ω At r Int(S)	tten: 30 dB	Trig: Fr Gate: C #IF Gai	ee Run)ff n: Low	Center Fred Avg Hold: 1 Radio Std: 1	: 2.593020000 00/100 None	GHz	Center 2.5930	Frequency 20000 GHz	Settings
1 Graph		V									Span 100.00	MHz	
Scale/Di Log 30.0 20.0 10.0	iv 10.0 dE	3		Rei	f Value 40.00 d	Bm					CF Step 10.000 Au Ma	o 000 MHz to n	
-10.0 -20.0 -30.0 -40.0 -50.0	W ^e levennen	«ارر ۱۳۰۰ میلید»»						Law Jacobs	al Myles Myles and a second as	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Freq Of 0 Hz	fset	
Center 2 Res BW	.59302 G 910.00 ki	Hz Hz	1	#Vid	leo BW 3.0000	MHz		Sw	Spa veep 1.00 ms	an 100 MHz (1001 pts)			
2 Metrics		v											
	Occupied	d Bandwidth 38.1	48 MHz			Total	Power		30.0 dE	Im			
	Transmit x dB Ban	Freq Error Idwidth	-32 4	2.443 kHz 0.93 MHz		% of 0 x dB	OBW Powe	:r	99.00 -26.00 d	% iB			
	<u>ר</u>		Oct 20, 14:45:25	2021	\triangle								

Plot 7-89. Occupied Bandwidth Plot (NR Band n41 - 40MHz QPSK - Full RB - Ant J)

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Plot 7-90. Occupied Bandwidth Plot (NR Band n41 - 40MHz 16-QAM - Full RB - Ant J)

Spectrun Occupied	n Analy d BW	zer 1 🔻	+									\$	Frequency	- * ※
KEYSI RL	GHT ·≁·	Input: RF Coupling: DC Align: Auto	Input Z: Corr CCo Freq Ref NFE: Of	50 Ω orr f: Int (S) f	Atten: 30 dB	Trig: F Gate: (#IF Ga	ree Run Off in: Low	Cento Avg I Radio	er Freq: Hold: 10 o Std: N	2.59302000 0/100 one	0 GHz	Center I 2.5930	Frequency 20000 GHz	Settings
1 Graph		•										75.000	MHz	
Scale/Di Log 30.0 20.0 10.0 -10.0 -20.0 -30.0 -30.0 -40.0 -50.0 Center 2 Res BW	v 10.0	dB GHz kHz	~~~	#\	Ref Value 40.00	0 dBm			 Swe	Seep 1.00 m	pan 75 MHz s (1001 pts)	CF Step 7.5000 Aut Ma Freq Of 0 Hz	oo MHz, io n fset	
2 Metrics	Occup Transı x dB E	tied Bandwidth 26.s nit Freq Error andwidth	1 955 MHz -€	618.29 kHz 28.93 MHz	z	Total % of x dB	Power OBW Pow	ver		33.5 df 99.00 -26.00	Bm) % dB			
	う (? Oct 20 4:48:2	, 2021 20 AM	$\bullet \triangle$									

Plot 7-91. Occupied Bandwidth Plot (NR Band n41 - 30MHz π/2 BPSK - Full RB - Ant J)

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Plot 7-92. Occupied Bandwidth Plot (NR Band n41 - 30MHz QPSK - Full RB - Ant J)



Plot 7-93. Occupied Bandwidth Plot (NR Band n41 - 30MHz 16-QAM - Full RB - Ant J)

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Plot 7-94. Occupied Bandwidth Plot (NR Band n41 - 20MHz π/2 BPSK - Full RB - Ant J)



Plot 7-95. Occupied Bandwidth Plot (NR Band n41 - 20MHz QPSK - Full RB - Ant J)

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Spectrum Analyzer 1 Occupied BW	+						₽	Frequency	- * 法
KEYSIGHT Input: RF RL Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFF ⁻ Off	Atten: 30 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 2. Avg Hold:>100 Radio Std: Non	593020000 GHz /100 ne		Center 2.5930	Frequency 20000 GHz	Settings
1 Graph							Span	MHZ	
Scale/Div 10.0 dB	,	Ref Value 40.00	dBm				00.000		
Log 30.0							5.0000	00 MHz	
20.0		reefer-greeferrollburger	a shar the second s				Au Ma	to in	
-10.0	ment						Freq Of	fset	
-20.0	- All All All All All All All All All Al			Nor marked			0 Hz		
-40.0 Monnew warth					have been broken broken	n Mr. de			
-50.0									
Center 2.59302 GHz Res BW 470.00 kHz	#\	/ideo BW 1.500	0 MHz	Swee	Span 5 0 1.00 ms (100	0 MHz 1 pts)			
2 Metrics V									
Occupied Bandwidth 18.41	6 MHz		Total Power		29.1 dBm				
Transmit Freq Error	-71.237 kH:	z	% of OBW Pow	<i>i</i> er	99.00 %				
x dB Bandwidth	19.94 MH:	Z	x dB		-26.00 dB				
1 n n I :	Oct 20, 2021 4:50:15 AM					X			

Plot 7-96. Occupied Bandwidth Plot (NR Band n41 - 20MHz 16-QAM - Full RB - Ant J)

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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*[*Watts*]).

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 = $\dot{R}MS$
- 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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🔤 Keysight Sp	ectrum Analyzer - Swept SA	4						
l <mark>XI</mark> RL	RF 50 Ω DC	CORREC	SENSE:INT	#Ava Tvp	ALIGN AUTO	06:13:17 AM Sep 1 TRACE	4,2021	Frequency
PASS		PNO: Fast ++- IFGain:Low	Trig: Free Run Atten: 30 dB	• ,.		TYPE A W DET A N		
					Mk	(r1 2.281 5 (GHz	Auto Tune
10 dB/div Log	Ref 20.00 dBm	n				-51.16 0	IBM	
10.0	e 1 Pass							Center Freq
0.00								1.139000000 GH2
0.00								Start Freq
-10.0								
-20.0								Stop Freq 2.288000000 GHz
-30.0								
-40.0							_	CF Step 225.800000 MHz
-50.0							1	<u>Auto</u> Man
-60.0	Weinput of America States and American States and	and a state of the	a hang tagan dan pang pang bang bang bang bang bang bang bang b					Freq Offset 0 Hz
-70.0								
								Scale Type
Start 0.03 #Res BW	1.0 MHz	#VBW	3.0 MHz		Sweep_3	Stop 2.288 011 ms (4 <u>517</u>	GHz pts)	Log <u>Lin</u>
MSG					STATUS	3		

Plot 7-97. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-98. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0)

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🔤 Key	ysight Spec	trum Analyzer - S	wept SA									
lxi Ri	L	RF 50	ΩDC	CORREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	06:15:32 AI	M Sep 14, 2021	F	requency
PAS	S	Pef 0 00 (1Bm	PNO: Fast IFGain:Low	Trig: Free Atten: 10	Run dB	0 ,1	Mk	r1 26.30 -57.1	9 0 GHz 76 dBm		Auto Tune
-10.0	Trace	1 Pass									21.00	Center Freq 10000000 GHz
-20.0											15.00	Start Freq 0000000 GHz
-40.0 -50.0										1	27.00	Stop Freq 0000000 GHz
-60.0 -70.0											1.20 <u>Auto</u>	CF Step 0000000 GHz Man
-80.0												Freq Offset 0 Hz
-90.0	+ 15 04								Stop 27		Log	Scale Type
#Res	s BW 1	I.0 MHz		#VE	3.0 MHz		s	weep 2	0.80 ms (2	4001 pt <u>s)</u>		
MSG								STATU	JS			

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

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