

ELEMENT WASHINGTON DC LLC

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PART 22 & 90 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

5/23/2024 - 6/13/2024 **Test Report Issue Date:** 7/22/2024 **Test Site/Location:** Element lab., Columbia, MD, USA **Test Report Serial No.:** 1M2405140039-06.A3L

FCC ID:

A3LSMX828U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type: Model: EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s): Certification SM-X828U Portable Tablet PCS Licensed Transmitter (PCB) §22(H), §90(S), §90(R) ANSI C63.26-2015, KDB 648474 D03 v01r04

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

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

RJ Ortanez Executive Vice President



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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Measurement	Max. Power [W]	Max. Power [dBm]	Emission Designator
10.1	10 MHz	QPSK	793.0	ERP	0.155	21.91	9M03G7D
LTE Dond 14		16QAM	793.0	ERP	0.126	21.01	9M00W7D
LTE Band 14	5 MU-	QPSK	790.5 - 795.5	ERP	0.159	22.03	4M51G7D
	5 MHz	16QAM	790.5 - 795.5	ERP	0.132	21.20	4M51W7D
	15 MHz	QPSK	821.5	ERP	0.140	21.46	13M5G7D
		16QAM	821.5	ERP	0.121	20.82	13M5W7D
	15 MHz	QPSK	821.5	Conducted	0.258	24.12	13M5G7D
		16QAM	821.5	Conducted	0.231	23.64	13M5W7D
	10 MHz	QPSK	819.0	Conducted	0.261	24.17	8M99G7D
LTE Band 26		16QAM	819.0	Conducted	0.222	23.47	9M01W7D
LTE Dariu 20	5 MHz	QPSK	816.5 - 821.5	Conducted	0.260	24.15	4M51G7D
		16QAM	816.5 - 821.5	Conducted	0.224	23.50	4M49W7D
	3 MHz	QPSK	815.5 - 822.5	Conducted	0.265	24.23	2M71G7D
	3 IVIEZ	16QAM	815.5 - 822.5	Conducted	0.223	23.49	2M71W7D
	1.4 MHz	QPSK	814.7 - 823.3	Conducted	0.259	24.13	1M10G7D
		16QAM	814.7 - 823.3	Conducted	0.228	23.59	1M10W7D
	20 MHz	π/2 BPSK	824.0	ERP	0.145	21.60	18M0G7D
		QPSK	824.0	ERP	0.144	21.58	19M0G7D
		16QAM	824.0	ERP	0.121	20.81	19M0W7D
		π/2 BPSK	821.5	ERP	0.148	21.69	13M5G7D
	15 MHz	QPSK	821.5	ERP	0.146	21.65	14M2G7D
		16QAM	821.5	ERP	0.131	21.16	14M3W7D
		π/2 BPSK	824.0	Conducted	0.257	24.10	18M0G7D
	20 MHz	QPSK	824.0	Conducted	0.261	24.17	19M0G7D
NR Band n26		16QAM	824.0	Conducted	0.205	23.11	19M0W7D
INR Danu nzo		π/2 BPSK	821.5	Conducted	0.263	24.20	13M5G7D
	15 MHz	QPSK	821.5	Conducted	0.266	24.24	14M2G7D
		16QAM	821.5	Conducted	0.222	23.46	14M3W7D
		π/2 BPSK	819.0	Conducted	0.264	24.22	9M00G7D
	10 MHz	QPSK	819.0	Conducted	0.273	24.36	9M33G7D
		16QAM	819.0	Conducted	0.196	22.92	9M35W7D
		π/2 BPSK	816.5 - 821.5	Conducted	0.254	24.05	4M51G7D
	5 MHz	QPSK	816.5 - 821.5	Conducted	0.269	24.30	4M49G7D
		16QAM	816.5 - 821.5	Conducted	0.205	23.11	4M51W7D

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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 Element Test Location

These measurement tests were conducted at the Element laboratory 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 Element lab located in Columbia, MD 21046, U.S.A.

- Element Washington DC LLC 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.
- Element Washington DC LLC 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).
- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Electronics Co., Ltd. FCC ID: A3LSMX828U**. 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 90 and 22H.

Test Device Serial No.: 2003M

2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1 and FR2), 802.11b/g/n/ac/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer

2.3 Test Configuration

The EUT was tested per the guidance of ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version X828USQU0AXFE installed on the EUT.

2.5 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 "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) were used in the measurement of the EUT.

Deviation from Measurement Procedure......None

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 C63.26-2015. For emissions below 1GHz, a half-wave 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, the field strength conversion method is used per the formulas in Section 5.2.7 of ANSI C63.26-2015. Field Strength (EIRP) is calculated using the following formulas:

 $E_{[dB\muV/m]} =$ Measured amplitude level_[dBm] + 107 + Cable Loss_[dB] + Antenna Factor_[dB/m] And EIRP_[dBm] = $E_{[dBuV/m]}$ + 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 v01r01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015.

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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	4/2/2024	Annual	4/2/2025	AP2
-	LTx2	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx2
-	LTx3	LIcensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx3
-	LTx5	LIcensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx5
Agilent	N9030A	50GHz PXA Signal Analyzer	4/23/2024	Annual	4/23/2025	US51350301
Anritsu	MT8821C	Radio Communication Analyzer		N/A		6201381794
Com-Power	AL-130R	Active Loop Antenna	2/22/2024	Biennial	2/22/2026	121085
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/5/2023	Triennial	7/5/2025	9203-2178
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/22/2024	Biennial	2/22/2026	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/29/2023	Biennial	3/29/2025	128337
ETS Lindgren	3164-10	Quad Ridge Horn 400MHz - 10000MHz	7/13/2023	Biennial	7/13/2025	166283
ETS Lindgren	3816/2NM	LISN	8/11/2022	Biennial	8/11/2024	114451
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/29/2023	Annual	8/29/2024	MY49430494
Keysight Technologies	N9030A	PXA Signal Analyzer	8/7/2023	Annual	8/7/2024	MY54490576
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator N/A		11403100002		
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	9/25/2023	Annual	9/25/2024	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/11/2023	Annual	9/11/2024	100348
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and Spectrum Analyzer	3/8/2024	Annual	3/8/2025	103187
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	8/30/2022	Biennial	8/30/2024	A051107

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

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm - (-24.80) = 50.3 dBc.

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
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FCC Classification:	PCS Licensed Transmitter (PCB)
Mode(s):	LTE/NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
	Transmitter Conducted Output Pow er*	2.1046(a), 90.635(b)	< 100 Watts	PASS	Section 7.2
	Occupied Bandw idth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious		On all frequencies betw een 769-775 MHz and 799- 805 MHz, attenuation by a factor not less than 65 + 10 log(P) dB in a 6.25 kHz band segment, for mobile and portable stations.	PASS	Sections
CTED	Emissions (LTE Band 14)	2.1051, 90.543(c)(e)	On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, attenuation by at least 43 + 10 log(P) dB		7.4, 7.5
CONDUCTED			> 43 + 10log10(P[Watts]) for all out-of-band emissions outside of those specified in 90.543(e)		
00	Conducted Band Edge / Spurious Emissions	2.1051, 90.691(a)	> 43 + 10 log10(P[Watts]) for all out-of-band emissions except emissions beyond 37.5kHz from the block edge	PASS	Sections 7.4, 7.5
	(LTE Band 26; NR Band n26)		> 50 + 10 log10(P[Watts]) at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge		
	Peak-to-Average Ratio	N⁄A	≤ 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 90.213	< 2.5 ppm **Fundamental emissions stay within authorized frequency block	PASS	Section 7.9
	Effective Radiated Pow er (LTE Band 14)	90.542(a)(7)	< 3 Watts max. ERP	PASS	Section 7.7
	Effective Radiated Pow er (LTE Band 26; NR Band n26)	22.913(a)(2)	< 7 Watts max. ERP	PASS	Section 7.7
RADIATED	Radiated Spurious Emissions (LTE Band 14)	2.1053, 90.543(e)(f)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions except emissions in the 1559 - 1610MHz band are subject to a limit of -40dBm/MHz for wideband signals	PASS	Section 7.8
	Radiated Spurious Emissions (LTE Band 26; NR Band n26)	2.1053, 90.691(a)	> 43 + 10 log10(P[Watts]) for all out-of-band emissions except emissions beyond 37.5kHz from the block edge	PASS	Section 7.8
		in all all in Aldia and and	> 50 + 10 log10(P[Watts]) at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge		

* 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

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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 shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and 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.
- For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool v2.3.2.

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7.2 Conducted Output Power Data

Test Overview

All emissions 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

ANSI C63.26-2015 - Section 5.2

Test Settings

- 1. Span = $2 \times OBW$ to $3 \times OBW$
- 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 7-1. Test Instrument & Measurement Setup

Test Notes

- 1. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
- 2. Conducted power measurements were evaluated 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.
- 3. All other conducted power measurements are contained in the RF exposure report for this filing.
- 4. Conducted power was found to reduce for the higher order QAM modulations when compared to 16QAM. Due to this trend, only the worst-case QAM (16QAM) powers are included in this section.

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
10 MHz	QPSK	23330	793.0	1 / 25	24.13	0.259	50.00	-25.87
	16-QAM	23330	793.0	1 / 25	23.39	0.218	50.00	-26.61
	QPSK	23305	790.5	1 / 12	24.13	0.259	50.00	-25.87
		23330	793.0	1 / 12	24.24	0.266	50.00	-25.76
5 MHz		23355	795.5	1 / 12	24.10	0.257	50.00	-25.90
э мнz 16-QAM	23305	790.5	1 / 12	23.58	0.228	50.00	-26.42	
	16-QAM	23330	793.0	1 / 12	23.40	0.219	50.00	-26.60
		23355	795.5	1 / 12	23.34	0.216	50.00	-26.66

Table 7-2. LTE Band 14 Conducted Powers

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
15 MHz	QPSK	26765	821.5	1/0	24.12	0.258	50.00	-25.88
	16-QAM	26765	821.5	1/0	23.64	0.231	50.00	-26.36
10 MHz	QPSK	26740	819.0	1/0	24.17	0.261	50.00	-25.83
	16-QAM	26740	819.0	1/0	23.47	0.222	50.00	-26.53
	QPSK	26715	816.5	1 / 24	24.15	0.260	50.00	-25.85
5 MHz	QFSK	26765	821.5	1/0	24.08	0.256	50.00	-25.92
	16-QAM	26715	816.5	1 / 24	23.29	0.213	50.00	-26.71
	10-QAIVI	26765	821.5	1/0	23.50	0.224	50.00	-26.50
	QPSK	26705	815.5	1/0	24.23	0.265	50.00	-25.77
3 MHz	QFSK	26775	822.5	1/0	24.02	0.252	50.00	-25.98
3 IVII 12	16-QAM	26705	815.5	1/0	23.39	0.218	50.00	-26.61
16-QAI		26775	822.5	1/0	23.49	0.223	50.00	-26.51
	ODSK	26697	814.7	1 / 5	24.13	0.259	50.00	-25.87
QPSK -	26783	823.3	1/5	23.97	0.250	50.00	-26.03	
1.4 10112	16 OAM	26697	814.7	1/5	23.59	0.228	50.00	-26.41
	16-QAM	26783	823.3	1 / 5	23.33	0.215	50.00	-26.67

Table 7-3. LTE Band 26 Conducted Powers

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
	π/2 BPSK	164800	824.0	1/1	24.10	0.257	50.00	-25.90
20 MHz	QPSK	164800	824.0	1 / 53	24.17	0.261	50.00	-25.83
	16-QAM	164800	824.0	1/1	23.11	0.205	50.00	-26.89
	π/2 BPSK	164300	821.5	1 / 1	24.20	0.263	50.00	-25.80
15 MHz	QPSK	164300	821.5	1/1	24.24	0.266	50.00	-25.76
	16-QAM	164300	821.5	1 / 39	23.46	0.222	50.00	-26.54
	π/2 BPSK	163800	819.0	1/1	24.22	0.264	50.00	-25.78
10 MHz	QPSK	163800	819.0	1 / 26	24.36	0.273	50.00	-25.64
	16-QAM	163800	819.0	1 / 26	22.92	0.196	50.00	-27.08
		163300	816.5	1 / 1	24.05	0.254	50.00	-25.95
	π/2 BPSK	164300	821.5	1 / 1	24.01	0.252	50.00	-25.99
5 MHz	QPSK	163300	816.5	1/1	24.30	0.269	50.00	-25.70
	UL 2V	164300	821.5	1 / 1	24.21	0.264	50.00	-25.79
	16-QAM	163300	816.5	1 / 1	23.11	0.205	50.00	-26.89
		164300	821.5	1 / 23	22.93	0.196	50.00	-27.07

Table 7-4. NR Band n26 Conducted Powers

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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

ANSI C63.26-2015 - Section 5.4.4

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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Mode	Bandwidth	Modulation	OBW [MHz]
		QPSK	9.03
LTE-B14	10 MHz	16QAM	9.00
		QPSK	4.51
	5 MHz	16QAM	4.51
		QPSK	13.46
	15 MHz	16QAM	13.51
	10 MHz	QPSK	8.99
		16QAM	9.01
		QPSK	4.51
	5 MHz	QPSK	4.50
		16QAM	4.49
LTE-B26		16QAM	4.49
		QPSK	2.71
	3 MHz	QPSK	2.70
	S IVI⊓Z	16QAM	2.71
		16QAM	2.71
	1.4 MHz	QPSK	1.10
		QPSK	1.10
		16QAM	1.10
		16QAM	1.10
		π/2 BPSK	17.97
	20 MHz	QPSK	19.00
		16QAM	18.97
		π/2 BPSK	13.48
	15 MHz	QPSK	14.17
		16QAM	14.26
		π/2 BPSK	9.00
NR-n26	10 MHz	QPSK	9.33
		16QAM	9.35
		π/2 BPSK	4.51
		π/2 BPSK	4.51
		QPSK	4.49
	5 MHz	QPSK	4.49
		16QAM	4.49
		16QAM	4.51

Table 7-5. Occupied Bandwidth Test Results

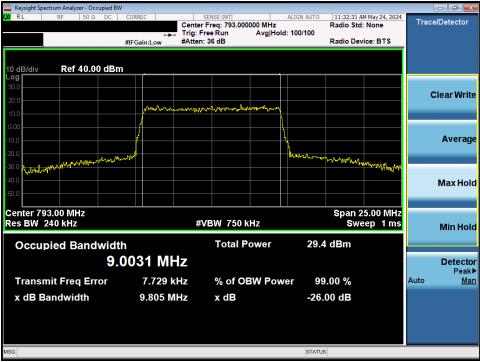
FCC ID: A3LSMX828U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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LTE Band 14

Keysight Spectrum Analyzer - Occupied BV					
LXIRL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 793.0000	ALIGN AUTO	11:32:26 AM May 24, 2024 Radio Std: None	Trace/Detector
	↔ #IFGain:Low	Trig: Free Run #Atten: 36 dB	Avg Hold: 100/100	Radio Device: BTS	
	#IFGaIn:Low	#Atten: 50 dB		Radio Device. D13	
10 dB/div Ref 40.00 dBn	n				
Log					
30.0					Clear Write
20.0	mono	ᡎᡗ᠆᠆᠕ᡔᡍ᠇᠋ᠴᡊᢐᢧ᠊ᠮᢛᢝᢐᢛᠬᠴᢉ᠙ᠱᡱᡨᡣᠴᡨᡅ	mun		
10.0	1				
0.00					Average
-10.0					Average
-20.0 Hyraphaneligy Mana	h-reall		and a second and a second a s	Monther my have the street	
-40.0				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
-40.0					Max Hold
-50.0					
Center 793.00 MHz				Span 25.00 MHz	
Res BW 240 kHz		#VBW 750 ki	Hz	Sweep 1 ms	Min Hold
Occupied Bandwidt	h	Total Po	ower 30.3	dBm	
	0322 M⊦	7			Detector
		12			Peak►
Transmit Freq Error	7.987 k	Hz % of OB	W Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	9.718 M	Hz xdB	-26.	00 dB	
MSG			STATUS	3	

Plot 7-1. Occupied Bandwidth Plot (LTE Band 14 - 10MHz QPSK - Full RB)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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🔤 Keysight Spectrum Analyzer - Occupied BV	/					-	- 6 💌
LXI RL RF 50Ω DC	CORREC	SENSE:INT enter Freq: 793.000000 I	ALIGN AUTO	11:29:36 / Radio Sto	AM May 24, 2024	Trace	Detector
	i i i i i i i i i i i i i i i i i i i	rig: Free Run Av	g Hold: 100/100	Raulo Ste	. None		
	#IFGain:Low #/	Atten: 36 dB		Radio De	vice: BTS		
10 dB/div Ref 40.00 dBn	า						
Log							
30.0						с	lear Write
20.0		www.	~~				
10.0							
0.00			<u>}</u>				
-10.0							Average
-20.0			wwww	www.hms.wh	0		
-20.0 -30.0 MM ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
-40.0							
-50.0							Max Hold
-30.0							
Center 793.000 MHz				Span '	2.50 MHz		
Res BW 120 kHz		#VBW 390 kHz		Sw	eep 1 ms		Min Hold
Occupied Bandwidt		Total Powe	er 30.	0 dBm			
4.	5107 MHz						Detector
							Peak▶
Transmit Freq Error	3.149 kHz	% of OBW	Power 9	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	5.005 MHz	x dB	-26	.00 dB			
1100				10			
MSG			STATU	15			

Plot 7-3. Occupied Bandwidth Plot (LTE Band 14 - 5MHz QPSK - Full RB)

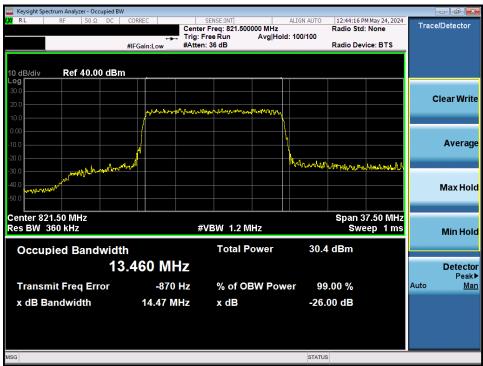


Plot 7-4. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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LTE Band 26



Plot 7-5. Occupied Bandwidth Plot (LTE Band 26 - 15MHz QPSK - Full RB)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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Plot 7-7. Occupied Bandwidth Plot (LTE Band 26 - 10MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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Keysight Spectrum Analyzer - Occup	pied BW					-	
LXI RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 816.500	ALIGN AUT	0 12:47:51 PI Radio Std:	May 24, 2024	Trace	Detector
		Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00	dBm						
Log 30.0							
20.0						С	lear Write
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	manni	howard				
10.0							
0.00			1				_
-10.0	N		1				Average
-20.0	0.00 000		1	www			
-20.0 -30.0 Unin man An Marine	(Jearty) i				Man Marker		
-40.0							Max Hold
-50.0							
				<b>6</b>			
Center 816.500 MHz Res BW 120 kHz		#VBW 390 k	<b>U</b> 7		2.50 MHz ep 1 ms		
Res DW 120 KHZ		#8098 330 K	112	300	ep mis		Min Hold
Occupied Bandy	vidth	Total P	ower 30	).2 dBm			
	4.5147 MH	-					Detector
	4.514/ MIN	2					Detector Peak▶
Transmit Freq Erro	or -3.210 kl	lz % of OE	BW Power	99.00 %		Auto	Man
x dB Bandwidth	4.930 MI	lz xdB	-0	6.00 dB			
	4.550 MI		-2	0.00 00			
MSG			STA	TUS			

Plot 7-9. Occupied Bandwidth Plot (LTE Band 26 - 5MHz QPSK Low Channel- Full RB)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 26 - 5MHz QPSK High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dega 21 of 69	
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🔤 Keysight Spectrum Analyzer - Occu					
<mark>(X)</mark> R L RF 50 Ω	DC CORREC	SENSE:INT Center Freq: 816.500	ALIGN AUTO	12:47:58 PM May 24, 2024 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	marine	mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	Am.n		
10.0					
0.00			h.		
-10.0					Average
-20.0			hand of	Mmmmm	
-30.0 monorhout with	MMM -		all the selection of th	Mar Marine March	
-40.0					Max Hold
-50.0					Nuxtiona
Center 816.500 MHz		#\/D\// 0001		Span 12.50 MHz	
Res BW 120 kHz		#VBW 390 k	(HZ	Sweep 1 ms	Min Hold
Occupied Bandy	width	Total P	ower 29.0	) dBm	
	4.4897 M	ΠZ			Detector Peak►
Transmit Freq Erro	or -8.352	kHz % of Ol	BW Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	4.892 N	∬Hz xdB	-26	00 dB	
	4.092		-20.	UU UB	
			,		
MSG			STATUS	5	

Plot 7-11. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 16-QAM Low Channel - Full RB)



Plot 7-12. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 16-QAM High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occ										
<b>(X)</b> RL RF 50 Ω	DC CORRE	EC	SENSE:INT	500000 MHz	ALIGN	AUTO	12:50:25 P	M May 24, 2024	Trac	:e/Detector
		- <b>-</b>	Trig: Free Run	Avg Ho	ld: 100/	/100				
	#IFGa	in:Low	#Atten: 36 dB				Radio Dev	ice: BTS		
10 dB/div Ref 40.00	0 dBm									
Log 30.0										
20.0									1	Clear Write
10.0		mound	and the second second	marthane from the state						
0.00										Average
-10.0	/									Average
-20.0 -30.0	Washington				JIM	with white	umany	maken will such		
-40.0										Max Hold
-50.0										
Center 815.500 MHz							Snan 7	.500 MHz		
#Res BW 75 kHz			#VBW 24	l0 kHz				12.53 ms		Min Hold
										Min Hold
Occupied Band	width		Tota	I Power		30.8	dBm			
	2 707	78 MH	7							Detector
										Peak▶
Transmit Freq Err	or	-2.180 kl	lz % of	OBW Pov	ver	99.	.00 %		Auto	<u>Man</u>
x dB Bandwidth		2.957 MI	lz xdE	3		-26.0	00 dB			
MSG						STATUS				
mod						0114100				

Plot 7-13. Occupied Bandwidth Plot (LTE Band 26 - 3MHz QPSK Low Channel- Full RB)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 26 - 3MHz QPSK High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occupied BW								
LXI RL RF 50 Ω DC C	ORREC	SENSE:INT Center Freg: 815.500		LIGN AUTO	12:50:32 Pf Radio Std:	May 24, 2024	Trac	e/Detector
	· • •	Trig: Free Run	Avg Hold: 1	100/100				
#1	FGain:Low	#Atten: 36 dB			Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBm								
30.0								
							(	Clear Write
20.0	and when the marked and the second	were warman and the	many					
10.0								
0.00								_
-10.0	/							Average
-20.0	4			the state	ulla ann an a			
-20.0 -30.0					a an an an in faile an	Marchingworph		
-40.0								Max Hold
-50.0								Muxitolu
Center 815.500 MHz						.500 MHz		
#Res BW 75 kHz		#VBW 2401	(HZ		Sweep	12.53 ms		Min Hold
Occupied Bandwidth		Total P	ower	30.0	dBm			
				50.0	abiii			
2.70	073 MH	Z						Detector
Transmit Freq Error	67 H	z % of O	BW Power	r 00	.00 %		Auto	Peak▶ Man
-			DWIOWEI				/ lato	man
x dB Bandwidth	2.975 MH	z xdB		-26.0	)0 dB			
MSG				STATUS				

Plot 7-15. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 16-QAM Low Channel - Full RB)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 16-QAM High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occ	upied BW						
<b>(X)</b> RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 814.700	ALIGN AUTO	12:53:37 P Radio Std	M May 24, 2024	Trac	e/Detector
	÷	Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00	0 dBm						
Log 30.0							
20.0						(	Clear Write
	مهمهم	www.www.www.www.	mermy				
10.0							
0.00			N ₁				Augroad
-10.0							Average
-20.0	as M. M		Www.LL	yhty wywyw	0		
-30.0 mm/mm/ml/m/1/1/mm/ml/m/	WH H I WAR			n www.yr	where of the los		
-40.0							Max Hold
-50.0							
0				0	COO MILL-		
Center 814.700 MHz Res BW 33 kHz		#VBW 110			.500 MHz 5.867 ms		
Kes DW JJ KHZ				Sweep	J.007 m3		Min Hold
Occupied Band	width	Total P	ower 29.	5 dBm		_	
	1.1041 M						Detector
	1.1041 1	ПZ					Detector Peak▶
Transmit Freq Err	or -1.160	kHz % of Ol	BW Power 9	9.00 %		Auto	Man
x dB Bandwidth	1.316	MHz xdB	-26	.00 dB			
	1.5101			.00 00			
MSG			STATU	JS			

Plot 7-17. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz 16-QAM Low Channel - Full RB)



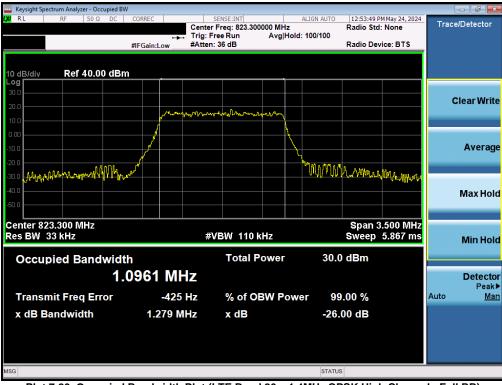
Plot 7-18. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz 16-QAM High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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🔤 Keysight Spectrum Analyzer - Occupied	d BW					
<mark>(XI</mark> RL RF 50ΩDC	CORREC	SENSE:INT Center Freg: 814.700		GN AUTO 12:53:30 Radio Sto	PM May 24, 2024	Trace/Detector
		Trig: Free Run	Avg Hold: 10	00/100		
	#IFGain:Low	#Atten: 36 dB		Radio De	vice: BTS	
10 dB/div Ref 40.00 dl	Bm					
Log 30.0						
						Clear Write
20.0	~~~~~	Mun Charman was plan an	www.			
10.0			l N			
0.00			<u>}</u>			
-10.0	/					Average
-20.0	MAL -		- Jouli	^{իհ} տարնե _կ /Լլ _{ԿԴԱՎ} ԳՈՈ		
-20.0 -30.0 pm may 20 m MM MM	Grý.			· •••• •{[]••••••	manghywray	
-40.0						Max Hold
-50.0						
Center 814.700 MHz Res BW 33 kHz		#VBW 110 k			3.500 MHz 5.867 ms	
RES DW JJ KHZ		#APAA LIAN	ПZ	Sweep	5.807 ms	Min Hold
Occupied Bandwi	dth	Total P	ower	30.3 dBm		
		I				Detector
	1.0955 M⊦	12				Detector Peak▶
Transmit Freg Error	-271	Hz % of O	BW Power	99.00 %		Auto <u>Man</u>
x dB Bandwidth	1.287 M	Hz xdB		-26.00 dB		
	1.207 1			-20.00 UB		
MSG				STATUS		

Plot 7-19. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz QPSK Low Channel- Full RB)



Plot 7-20. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz QPSK High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occ	upied BW						
<b>(X)</b> RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 814.700	ALIGN AUTO	12:53:37 P Radio Std	M May 24, 2024	Trac	e/Detector
	÷	Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00	0 dBm						
Log 30.0							
20.0						(	Clear Write
	مهمهم	www.www.www.www.	mermy				
10.0							
0.00			N ₁				Augroad
-10.0							Average
-20.0	as M. M		Www.LL	yhty wywyw	0		
-30.0 mm/mm/ml/m/1/1/mm/ml/m/	White I want			n www.yr	where of the los		
-40.0							Max Hold
-50.0							
0				0	COO MILL-		
Center 814.700 MHz Res BW 33 kHz		#VBW 110			.500 MHz 5.867 ms		
Kes DW JJ KHZ				Sweep	J.007 m3		Min Hold
Occupied Band	width	Total P	ower 29.	5 dBm		_	
	1.1041 M						Detector
	1.1041 1	ПZ					Detector Peak▶
Transmit Freq Err	or -1.160	kHz % of Ol	BW Power 9	9.00 %		Auto	Man
x dB Bandwidth	1.316	MHz xdB	-26	.00 dB			
	1.5101			.00 00			
MSG			STATU	JS			

Plot 7-21. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz 16-QAM Low Channel - Full RB)



Plot 7-22. Occupied Bandwidth Plot (LTE Band 26 – 1.4MHz 16-QAM High Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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# NR Band n26



Plot 7-23. Occupied Bandwidth Plot (NR Band n26 - 20MHz  $\pi/2$  BPSK - Full RB)



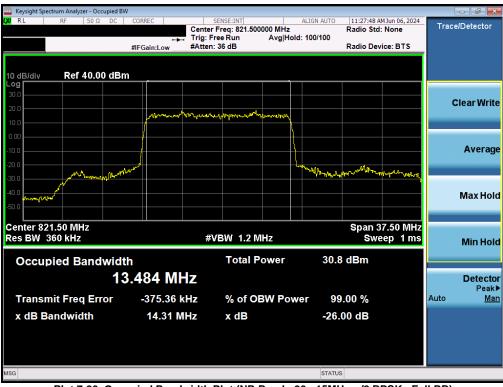
Plot 7-24. Occupied Bandwidth Plot (NR Band n26 - 20MHz QPSK - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 60	
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🔤 Keysight Spectrum Analyzer - Occupie	ed BW					
<mark>(X)</mark> RL RF 50 Ω D	C CORREC	SENSE:INT Center Freg: 824.000	ALIGN AUTO	10:58:02 A	MJun 06, 2024	Trace/Detector
		Trig: Free Run	Avg Hold: 100/100			
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS	
10 dB/div Ref 40.00 d	IBm					
Log 30.0						
20.0						Clear Write
10.0	maliton	mon allen he may you so you	the when the second			
0.00	/					
						Avorago
-10.0			Աերևլ,			Average
-20.0			tuthey when	494av ad Dyara	M.M.M.	
l l P					T T P	
-40.0 anon hunder						Max Hold
-50.0						
Center 824.00 MHz				Snan 5	0.00 MHz	
Res BW 470 kHz		#VBW 1.2 M	Hz		ep 1 ms	Min Hold
						WIIITTOIG
Occupied Bandwi	idth	Total P	ower 28.6	6 dBm		
	18.972 MF	z				Detector
						Peak►
Transmit Freq Error	-14.785 k	Hz % of Ol	BW Power 99	0.00 %		Auto <u>Man</u>
x dB Bandwidth	20.08 M	Hz xdB	-26.	00 dB		
MSG			STATUS	5		

Plot 7-25. Occupied Bandwidth Plot (NR Band n26 - 20MHz 16-QAM - Full RB)



Plot 7-26. Occupied Bandwidth Plot (NR Band n26 - 15MHz π/2 BPSK - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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Keysight Spectrum Analyzer - Occup						
<mark>LXI</mark> R L RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 821.500	ALIGN AUTO	11:27:12 AM Ju Radio Std: N		Trace/Detector
	·→	Trig: Free Run	Avg Hold: 100/100			
	#IFGain:Low	#Atten: 36 dB		Radio Device	e: BTS	
10 dB/div Ref 40.00	dBm					
Log 30.0						
20.0						Clear Write
10.0	manantian	annal seaschaster and have a May	marthough			
0.00	4					
-10.0						Average
	اسان ا		William a a			///orugo
-20.0 -30.0	and the second sec		And the set of the	Maphhannon and	march	
م الم الم الم الم الم الم الم الم الم ال						
-40.0 000 000 000 000 000 000 000 000 000						Max Hold
-50.0						
Center 821.50 MHz				Span 37.	50 MHz	
Res BW 360 kHz		#VBW 1.2 N	IHz		p 1 ms	Min Hold
		T-4-LB	20	7		
Occupied Bandw		Total P	ower 28.	7 dBm		
	14.174 MI	-IZ				Detector
Transmit Freq Erro	r 1.973 k		BW Power 99	9.00 %		Peak▶ Auto Man
x dB Bandwidth	15.05 M	lHz x dB	-26.	00 dB		
MSG			STATU	S		

Plot 7-27. Occupied Bandwidth Plot (NR Band n26 - 15MHz QPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (NR Band n26 - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMX828U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Demo 20 of 69
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Keysight Spectrum Analyzer - Occupied B\	N						
<b>LXI</b> RL RF 50 Ω DC	CORREC	SENSE:INT Freq: 819.000000 MHz	ALIGN AUTO	11:38:26 AM	1Jun 06, 2024	Trac	e/Detector
	Trig: I	Free Run Avg Hol	d: 100/100				
	#FGain:Low #Atten: 36 dB Radio Device: BTS						
10 dB/div Ref 40.00 dBr	n						
Log 30.0							
20.0						C	Clear Write
	man man and	mammum					
10.0							
0.00							_
-10.0							Average
-20.0	Mark .		have been	, and the star	merh		
-30.0 mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm			~~~~	1° °'Wa	WA MAY		
-40.0 v							Max Hold
-50.0							
Center 819.00 MHz Res BW 240 kHz		VBW 750 kHz			5.00 MHz ep 1 ms		
RES BW 240 KHZ	#			Swe	ep mis		Min Hold
Occupied Bandwidt	th	Total Power	30.6	dBm			
9.	0049 MHz						Detector Peak▶
Transmit Freq Error	-188.12 kHz	% of OBW Pow	ver 99.	00 %		Auto	Man
x dB Bandwidth	9.541 MHz	x dB	-26.0	0 dB			
			0.000				
MSG			STATUS				

Plot 7-29. Occupied Bandwidth Plot (NR Band n26 - 10MHz π/2 BPSK - Full RB)



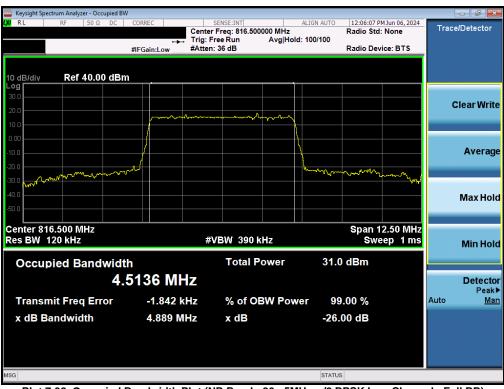
Plot 7-30. Occupied Bandwidth Plot (NR Band n26 - 10MHz QPSK - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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🔤 Keysight Spectrum Analyzer - Occ	upied BW				
LX/ RL RF 50 Ω		SENSE:INT Center Freq: 819.000 Trig: Free Run		11:53:26 AM Jun 06, 2024 Radio Std: None	Trace/Detector
	₩IFGain:Low	#Atten: 36 dB	Avg Hold: 100/100	Radio Device: BTS	
					Í
10 dB/div Ref 40.00	0 dBm				
30.0					
20.0					Clear Write
10.0	manyham	WWWWWWWWWWWWWWWWWWWWW	mar and a state		
0.00	/				
-10.0	/				Average
-20.0	hahdener			h Hill I an	
-20.0 -30.0	1			WWW. Ingrither work the	
-40.0 wh					Max Hold
-50.0					Maxilola
Center 819.00 MHz Res BW 240 kHz		#VBW 750 k	(H7	Span 25.00 MHz Sweep 1 ms	
		"•BH 1001		oweep rms	Min Hold
Occupied Band	width	Total P	ower 28.7	′ dBm	
	9.3509 MH	17			Detector
					Peak►
Transmit Freq Err	or 888	Hz % of O	BW Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	9.902 M	Hz x dB	-26.	00 dB	
MSG			STATUS	3	

Plot 7-31. Occupied Bandwidth Plot (NR Band n26 - 10MHz 16-QAM - Full RB)



Plot 7-32. Occupied Bandwidth Plot (NR Band n26 - 5MHz π/2 BPSK Low Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occupied BV	V				
LXIRL RF 50Ω DC	CORREC	SENSE:INT A	ALIGN AUTO 12:31:12 P Radio Std	M Jun 06, 2024	Trace/Detector
	Trig:	Free Run Avg Hold:	100/100		
	#IFGain:Low #Atte	en: 36 dB	Radio Dev	/ice: BTS	
10 dB/div Ref 40.00 dBn	n				
Log 30.0					
20.0					Clear Write
10.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
0.00					
		<u> </u>			A
-10.0					Average
-20.0	ma		mon and	-	
-30.0			• • • • • • • •	many May	
-40.0					Max Hold
-50.0					
Center 821.500 MHz				2.50 MHz	
Res BW 120 kHz		#VBW 390 kHz		eep 1 ms	
					Min Hold
Occupied Bandwidt	h	Total Power	31.0 dBm		
Δ	5090 MHz				Detector
					Peak►
Transmit Freq Error	4.944 kHz	% of OBW Powe	r 99.00 %		Auto <u>Man</u>
x dB Bandwidth	4.919 MHz	x dB	-26.00 dB		
MSG			STATUS		
			314103		

Plot 7-33. Occupied Bandwidth Plot (NR Band n26 - 5MHz π/2 BPSK High Channel - Full RB)



Plot 7-34. Occupied Bandwidth Plot (NR Band n26 - 5MHz QPSK Low Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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🔤 Keysight Spectrum Analyzer - Occupied B	W						
KI RE 50Ω DC	CORREC	SENSE:INT er Freg: 821.500000 Mi	ALIGN AUTO	12:30:45 P	MJun 06, 2024	Trac	e/Detector
			Hold: 100/100	Radio Stu.	None		
	#IFGain:Low #Atte	en: 36 dB	-	Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dB	m						
Log							
30.0							Clear Write
20.0							neur mile
10.0		where	~				
0.00	/						
-10.0							Average
-20.0			1				
-20.0 -30.0	Nul *		ՠՠՠՠՠՠ	$m_{M}$	ന്നം		
-40.0 ymm					x vol source		
							Max Hold
-50.0						_	
Center 821.500 MHz				Span 1	2.50 MHz		
Res BW 120 kHz		#VBW 390 kHz			ep 1 ms		Min Hold
							Milling
Occupied Bandwid	th	Total Power	r 27.	6 dBm			
4	.4924 MHz						Detector
							Peak▶
Transmit Freq Error	-12.014 kHz	% of OBW F	ower 99	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	4.892 MHz	x dB	-26	.00 dB			
MSG			STATU	IS			

Plot 7-35. Occupied Bandwidth Plot (NR Band n26 - 5MHz QPSK High Channel - Full RB)



Plot 7-36. Occupied Bandwidth Plot (NR Band n26 - 5MHz 16-QAM Low Channel - Full RB)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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W       RL       RF       SO S. D.C.       CORREC       Sensent       ALLOR AUTO       12:30:55 PM Jun 05, 2024         Radio Std: None         10       #FGain:Low       #FGain:Low       AuglHold: 100/100       Radio Device: BTS       Radio Device: BTS         10       dB/dd       data       data       data       data       data       data         100       dB/dd       data       data <thdata< th=""> <thdata< th=""> <thdata< th="" thr<=""><th>Keysight Spectrum Analyzer - Occupied BW</th><th></th><th></th><th></th><th></th><th></th></thdata<></thdata<></thdata<>	Keysight Spectrum Analyzer - Occupied BW					
10 dB/div       Ref 40.00 dBm         200       100         200       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       120         100	LX RL RF 50Ω DC	Cente Trig:	er Freq: 821.500000 MHz Free Run Avg Hold	Radio St d: 100/100	td: None	Trace/Detector
Log       Image: Clear Write         200       Image: Clear Write <td< td=""><td></td><td>#IFGain:Low #Atte</td><td>n: 36 dB</td><td>Radio De</td><td>evice: BTS</td><td></td></td<>		#IFGain:Low #Atte	n: 36 dB	Radio De	evice: BTS	
300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       300       3						
100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       100       1	30.0					Clear Write
Average and a second s			mannontrageman			
200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       2000       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200       200				\		Average
Solo       Span 12.50 MHz         Center 821.500 MHz       #VBW 390 kHz       Span 12.50 MHz         Res BW 120 kHz       #VBW 390 kHz       Sweep 1 ms         Occupied Bandwidth       Total Power       27.8 dBm         4.5063 MHz       Min Hold         Transmit Freq Error       -7.766 kHz       % of OBW Power       99.00 %         x dB Bandwidth       4.860 MHz       x dB       -26.00 dB	-20.0	N ^N		Wanny Rodalo a		
Solo       Span 12.50 MHz         Center 821.500 MHz       #VBW 390 kHz       Span 12.50 MHz         Res BW 120 kHz       #VBW 390 kHz       Sweep 1 ms         Occupied Bandwidth       Total Power       27.8 dBm         4.5063 MHz       Min Hold         Transmit Freq Error       -7.766 kHz       % of OBW Power       99.00 %         x dB Bandwidth       4.860 MHz       x dB       -26.00 dB	-30.0 -40.0 m / / / / / / / / / / / / / / / / / /				MUT MAN	Max Hold
Res BW 120 kHz     #VBW 390 kHz     Sweep 1 ms       Occupied Bandwidth     Total Power     27.8 dBm       4.5063 MHz     Detector       Transmit Freq Error     -7.766 kHz     % of OBW Power     99.00 %       x dB Bandwidth     4.860 MHz     x dB     -26.00 dB						Maxilola
4.5063 MHz     Detector       Transmit Freq Error     -7.766 kHz     % of OBW Power     99.00 %       x dB Bandwidth     4.860 MHz     x dB     -26.00 dB		#	≄VBW 390 kHz			Min Hold
Transmit Freq Error -7.766 kHz % of OBW Power 99.00 % x dB Bandwidth 4.860 MHz x dB -26.00 dB	Occupied Bandwidth	1	Total Power	27.8 dBm		
x dB Bandwidth 4.860 MHz x dB -26.00 dB	4.5	5063 MHz				
			% of OBW Pow			
	x dB Bandwidth	4.860 MHz	x dB	-26.00 dB		
STATUS	MSG			STATUS		

Plot 7-37. Occupied Bandwidth Plot (NR Band n26 - 5MHz 16-QAM High Channel - Full RB)

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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.

#### Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

#### 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. RBW ≥ 100kHz
- 3. VBW  $\geq$  3 x RBW
- 4. Detector = RMS
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

#### 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

- 1. Per Part 22H and 90, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
- 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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Mode	Bandwidth	Channel	Range	Level	Limit	Margin
			[MHz]	[dBm]	[dBm]	[dB]
		Mid	30.0 - 788.0	-61.50	-35	-26.50
LTE-B14	10MHz	Mid	798.0 - 1000.0	-54.59	-35	-19.59
		Mid	1000.0 -10000.0	-42.58	-13	-29.58
		Mid	30.0 - 814.0	-48.22	-13	-35.22
LTE-B26	15 MHz	Mid	824.0 - 1000.0	-30.47	-13	-17.47
		Mid	1000.0 -10000.0	-42.68	-13	-29.68
		Mid	30.0 - 814.0	-54.02	-13	-41.02
NR-n26	NR-n26 20 MHz	Mid	824.0 - 1000.0	-46.48	-13	-33.48
		Mid	1000.0 -10000.0	-42.89	-13	-29.89

Table 7-6. Conducted Spurious Emission Results

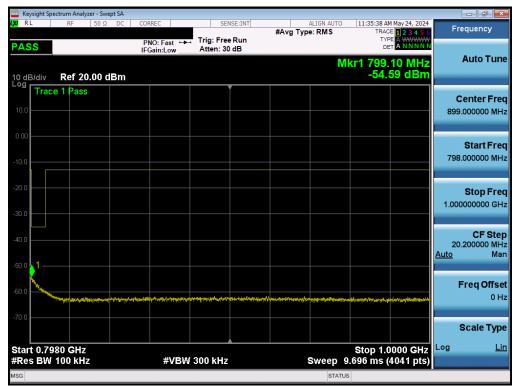
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## LTE Band 14

	nt Spectrum A											
LXI RL	RF	50 Ω	DC	CORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO		M May 24, 2024	F	requency
PASS				PNO: Fast + IFGain:Low	Trig: Fre Atten: 3		#1181JP		TYI DI			
10 dB/di Log	iv <b>Ref</b>	20.00 c	1Bm					Μ	kr1 772. -61.	.90 MHz 50 dBm		Auto Tune
10.0	race 1 Pa	ISS										Center Freq 9.000000 MHz
-10.0											30	<b>Start Freq</b> 0.000000 MHz
-20.0											788	Stop Freq 3.000000 MHz
-40.0											7t <u>Auto</u>	CF Step 5.800000 MHz Man
-50.0				an ar an air tha air t								Freq Offset 0 Hz
-70.0												Scale Type
	0.0 MHz								Stop 7	88.0 MHz	Log	<u>Lin</u>
	SW 100 H	HZ		#VB	W 300 kHz		s			5161 pts)		
MSG								STATUS	S			

Plot 7-38. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 25)



Plot 7-39. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 25)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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Plot 7-40. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 25)

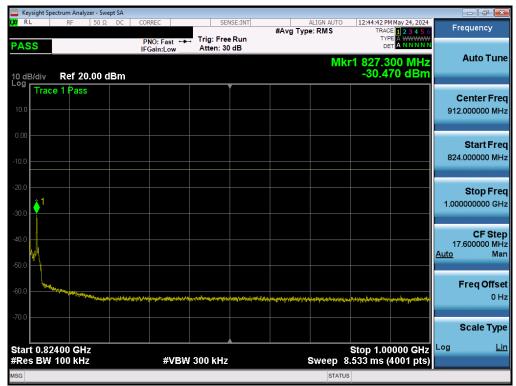
FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 69		
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## LTE Band 26

CORREC	SENSE:INT			Frequency
PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 30 dB			
		Mk	r1 813.843 2 MHz -48.221 dBm	Auto Tune
				Center Freq
				422.000000 MHz
				Otort From
				Start Freq 30.000000 MHz
				Stop Freq
				814.000000 MHz
				CF Step
			1	78.400000 MHz <u>Auto</u> Man
		la cia di talmina anna anti di interne di di attatti dagon		Freq Offset 0 Hz
	a stable or election i destrict and and			
				Scale Type
#)(B)M		Swaan		Log <u>Lin</u>
#VBW	300 KHZ			
		PNO: Fast +++ Trig: Free Run	PNO: Fast IFGain:Low       Trig: Free Run Atten: 30 dB       #Avg Type: RMS         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB       Image: Stree Run Atten: 30 dB         Image: Stree Run Atten: 30 dB	PNO: Fast → IfGain:Low       Trig: Free Run Atten: 30 dB       #Avg Type: RMS       TRACE IF 23.43.5 G         Mikr1 813,843 2 MHz -48.221 dBm         Image: State of the state of

Plot 7-41. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 37)



Plot 7-42. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 37)

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	ectrum Analyz	er - Swep	t SA										- 0 ×
LX/RL	RF	50 Ω	DC CC	RREC		SEN	ISE:INT	#Avg Typ	ALIGN AUT		B PM May 24, 2024	Fre	quency
PASS				NO: Fast Gain:Low		Trig: Free Atten: 30		"a)r		1			=
10 dB/div	Ref 20	.00 dE	3m						Ν	42. 1kr1	22 5 GHz 680 dBm		Auto Tune
	e 1 Pass					,							enter Freq
10.0												5.5000	000000 GHz
0.00													Start Freq
-10.0												1.0000	00000 GH2
-20.0													Stop Freq
-30.0													
-40.0										المرينة المترجع		900.0 <u>Auto</u>	CF Step 000000 MHz Man
-50.0													Wan
-60.0												F	r <b>eq Offset</b> 0 Hz
-70.0													
Start 1.00	0.647									Stop 1	10.000 GHz	Log	cale Type
#Res BW				#V	'BW 3.	.0 MHz		8	weep	15.60 ms	(18001 pts)	_	
MSG									STA	TUS			

Plot 7-43. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 37)

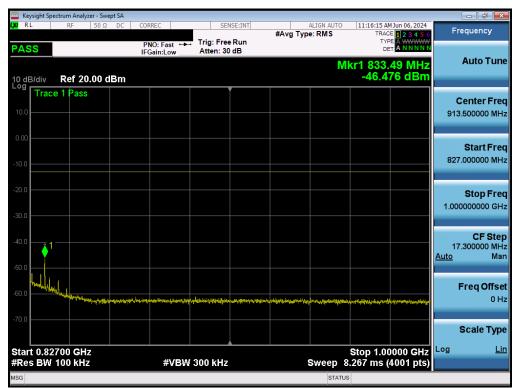
FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	Test Dates: EUT Type:			
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## NR Band n26

	ectrum Analyzer							
LXI RL	RF 5	0Ω DC	CORREC	SENSE:		ALIGN AUTO Type: RMS	11:16:03 AM Jun 06, TRACE 1 2 3	
PASS			PNO: Fast ↔ IFGain:Low	Trig: Free Ro Atten: 30 d	un	.,,,		
10 dB/div Log	Ref 20.0	0 dBm				Mkr	812.588 8 M -54.024 dl	1Hz Auto Tun Bm
10.0 Trac	e 1 Pass							Center Fre 422.000000 MH
-10.0								Start Free 30.000000 MH
-20.0								Stop Fre 814.000000 MH
-40.0								CF Stej 78.400000 MH <u>Auto</u> Ma
-50.0					n an			Freq Offse
-70.0								Scale Type
Start 30.0 #Res BW			#VBW	300 kHz		Sweep_3	Stop 814.0 M 7.33 ms (20001	MHz Log Li pts)
MSG						STATL		

Plot 7-44. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-45. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)

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Plot 7-46. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)

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### 7.5 Band Edge Emissions at Antenna Terminal

#### **Test Overview**

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.

For LTE B26 operation under Part 90.691, the minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by greater than 37.5 kHz is  $43 + 10\log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts. The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by up to and including 37.5 kHz is 50 +  $10\log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.

For LTE Band 14 operation under Part 90.543, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

Additionally, for LTE Band 14 operation, on all frequencies between 769-775 MHz and 799-805 MHz, the power of any emission shall be attenuated by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

#### **Test Procedure Used**

ANSI C63.26-2015 - Section 5.7.3

#### **Test Settings**

- 1. Span was set large enough so as to capture all out of band emissions near the band edge
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = RMS
- 5. Trace mode = trace average
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

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### Test Notes

- 1. For channel edge emission, the signal analyzer's "ACP" measurement capability is used.
- 2. Per 22.917(b) 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 to demonstrate compliance with the out-of-band emissions limit. 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.
- 3. 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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Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
		Low	Band Edge	-31.51	-13	-18.51
		Low EmMask	Band Edge	-67.71	-35	-32.71
	10 MHz	High	Band Edge	-31.51	-13	-18.51
LTE-B14		High EmMask	Band Edge	-41.19	-35	-6.19
LIE-BI4		Low	Band Edge	-26.32	-13	-13.32
	5 MHz	Low EmMask	Band Edge	-67.78	-35	-32.78
		High	Band Edge	-25.63	-13	-12.63
		High EmMask	Band Edge	-43.12	-35	-8.12
	15 MHz	Mid	Band Edge	-40.49	-20	-20.49
	10 MHz	Mid	Band Edge	-37.97	-20	-17.97
	5 MHz	Low	Band Edge	-32.35	-20	-12.35
LTE-B26		High	Band Edge	-33.64	-20	-13.64
LIE-DZ0	3 MHz	Low	Band Edge	-31.53	-20	-11.53
		High	Band Edge	-32.92	-20	-12.92
	1.4 MHz	Low	Band Edge	-27.69	-20	-7.69
		High	Band Edge	-29.21	-20	-9.21
	20 MHz	Mid	Band Edge	-37.84	-20	-17.84
	15 MHz	Mid	Band Edge	-36.83	-20	-16.83
NR-n26	10 MHz	Mid	Band Edge	-36.17	-20	-16.17
		Low	Band Edge	-32.56	-20	-12.56
	5 MHz	High	Band Edge	-32.82	-20	-12.82

Table 7-7. Band Edge Test Results

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## LTE Band 14

Mkr1 787.812 5 MHz -31.51 dBm       Auto Tune         Og Bidiv       Ref 25.00 dBm       -31.51 dBm         Og Trace 1 Pass		ectrum Analyze	er - Swept SA							×
ASS PNO: Wide Trig: Free Run HFGaintLow #Atten: 36 dB Mkr1 787.812 5 MHz -31.51 dBm Center Freq 788.00000 MHz Start Freq 781.750000 MHz CF Step 1250 CF Step 1250 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts) Auto Tune Auto Tune Auto Tune Auto Tune Auto Tune Center Freq 782.00000 MHz Start Freq 781.75000 MHz Sweep 1.000 ms (1001 pts)	LXI RL	RF	50 Ω DC	CORREC	SENSE:INT				Frequency	
MKKT 1767.312 3 MHz         -31.51 dBm         -31.51 dBm         Center Freq         7B8.00000 MHz         Start Freq         7B8.0000 MHz         Start Freq         7B8.000 MHz         7B8.000 MHz         7B8.000 MHz         7B8.000 MHz         7B8.000 MHz         7B8.000 MHz            7B	PASS					#/ trg Type. tti				
Trace 1 Pass       Center Freq         150       Start Freq         500       Start Freq         500       Start Freq         500       Start Freq         500       Stop Freq	10 dB/div	Ref 25.	00 dBm			r	/kr1 787.81 -31.	2 5 MHz 51 dBm	Auto Ti	une
Start Freq 781.750000 MHz Stop Freq 794.250000 MHz CF Step 1.250000 MHz Start Freq 794.250000 MHz Start Freq 794.250000 MHz Stop Freq 794.250000 MHz Stop Freq 794.250000 MHz Log Ling Scale Type Log Ling Start Freq 794.25000 MHz Log Ling Start Freq 794.25000 MHz Start Freq 794.25000 MHz Log Ling Start Freq 794.25000 MHz Start Freq 794.25000 MHz Start Freq 794.25000 MHz Start Freq Offset DHz Start Freq Start Freq 794.25000 MHz Start Freq Start Freq S	15.0 Trac	e 1 Pass								
Stop Fred 794.250000 MHz Auto Man Fred Offset 0 Hz enter 788.000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)	-5.00					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		mm		
Auto Man Auto Man Freq Offset 0 Hz scole enter 788.000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)	-15.0									
enter 788.000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)	-35.0	~~~~	~~~~	~~~~~A~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~				1.250000	MHz
enter 788.000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)	-55.0								· · · · · · · · · · · · · · · · · · ·	
Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)	-65.0								Scale T	уре
211112			Hz	#VBW	300 kHz	Swe	Span 1 ep 1.000 ms (	2.50 MHz 1001 pts)	Log	Lin
of A do	MSG						STATUS			

Plot 7-47. Lower Band Edge Plot (LTE Band 14, 10MHz QPSK - RB Size 50)



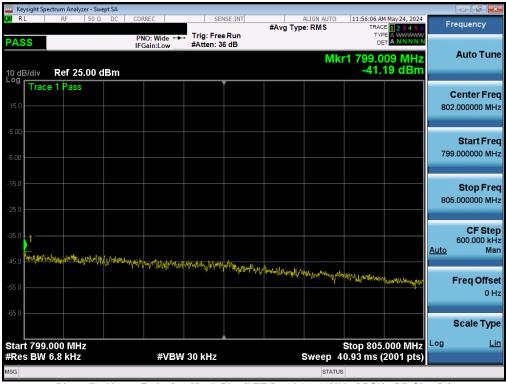
Plot 7-48. Lower Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

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Keysight Spectr	um Analyzer - Sv										
LXI RL	RF 50 9	Ω DC	CORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO		May 24, 2024	Fi	equency
PASS			PNO: Wide ↔ IFGain:Low	Trig: Free #Atten: 3				TYP DE			
10 dB/div	Ref 25.00	dBm					Mkr1	787.812 -31.	2 5 MHz 51 dBm		Auto Tune
15.0	l Pass										Center Freq 8.000000 MHz
-5.00						~~~~~~	V	m	- Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine Marine	781	Start Freq .750000 MHz
-15.0										794	Stop Freq 1.250000 MHz
-35.0	~~~~	~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www	<i>٢</i>					Auto ¹	CF Step .250000 MHz Man
-55.0											Freq Offset 0 Hz
-65.0											Scale Type
Center 788. #Res BW 10			#VBW	300 kHz			Sweep 1	Span 12 () 000 ms.	2.50 MHz 1001 pts)	Log	<u>Lin</u>
MSG							STATUS	;			

Plot 7-49. Upper Band Edge Plot (LTE Band 14, 10MHz QPSK - RB Size 50)



Plot 7-50. Upper Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

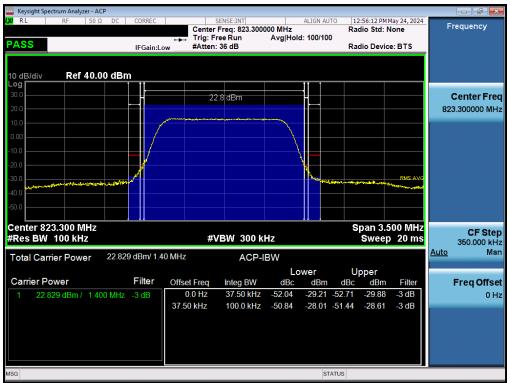
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## LTE Band 26

Keysight Spectrum Analyzer - ACP					
KM RL RF 50Ω DC CORREC	SENSE:INT Center Freq: 814	ALIGN AL	UTO 12:55:04 PM PAID Radio Std: N		Frequency
PASS	🛶 Trig: Free Run	Avg Hold: 100/10			
IFGain:	_ow#Atten: 36 dB		Radio Devic	e: B15	
10 dB/div Ref 40.00 dBm		•• •			
30.0	23.1 dBm				Center Freq
20.0	23.10011				814.700000 MHz
10.0					
0.00					
-10.0		$\langle \rangle$			
		l l			
-20.0				RMS AVG	
-30.0			- State of the second state of the second	manufarere	
-40.0					
-50.0					
Center 814.700 MHz			Span 3.5	00 MH2	
#Res BW 100 kHz	#VBW 30	0 kHz		20 ms	CF Step 350.000 kHz
					Auto Man
Total Carrier Power 23.088 dBm/ 1	40 MHZ AC	P-IBW			
Carrier Power Filter		Lower W dBc dBm	Upper	<b>F</b> :14	Ener Offerst
1 23.088 dBm / 1.400 MHz -3 dB	Offset Freq Integ B 0.0 Hz 37.50 k		dBc dBm	Filter -3 dB	Freq Offset 0 Hz
23.000 dBitt7 1.400 MHZ -3 dB	37.50 kHz 100.0 kHz		-49.20 -26.11	-3 dB	0 Hz
	01:00 KHZ 100:01	-10.11 -20.00	10.20 -20.11	0 db	
MSG		S	TATUS		

Plot 7-51. Channel - Edge Plot (LTE Band 26 - 1.4MHz QPSK - Low Channel)



Plot 7-52. Channel - Edge Plot (LTE Band 26 - 1.4MHz QPSK - High Channel)

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## NR Band n26

Keysight Spectrum Anal										
LXIRL RF	50 Ω DC	CORREC		INSE:INT Freg: 816.5000	000 MHz	ALIGN AUTO		3 PM Jun 06, 2024 td: None	-	Frequency
			Trig: Fre	e Run	Avg Hold	I: 100/100	Radio 3	tu. None		
PASS		IFGain:Lo	w #Atten:	30 dB			Radio D	evice: BTS	_	
	f 30.00 di	Bm								
20.0		<u>  </u>				11				
			23.	0 dBm		l				Center Freq
10.0		~	, mar an	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					8	16.500000 MHz
0.00										
-10.0										
-20.0										
-30.0		- church				how		RMS AV		
-40.0	- and the second									
-50.0										
-60.0										
Center 816.500	MHz					••	Span	12.50 MH		
#Res BW 100 k			#V	BW 300 k	Hz			eep 20 m		CF Step 1.250000 MHz
Total Carrier Pov	ver 23	011 dBm/ 5.0	0 MHz	ACP-I	RW/				Auto	
	Vei 20.	011 0.0		A01 -1		wer	Uppe			
Carrier Power		Filter	Offset Freq	Integ BW	dBc	dBm		Bm Filter		Freq Offset
1 23.011 dBm	/ 5 000 MI	-1z -3 dB	0.0 Hz	37.50 kHz			5.57 -32			0 Hz
Lo.orn dom	510 00 1111		37.50 kHz	100.0 kHz			2.72 -29			0112
NGO						STAT	10			
MSG						STAT	05			

Plot 7-53. Channel Edge Plot (NR Band n26 - 5MHz BPSK - Low Channel)



Plot 7-54. Channel Edge Plot (NR Band n26 - 5MHz BPSK - High Channel)

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### 7.6 Radiated Power (ERP)

#### **Test Overview**

Effective Radiated Power (ERP) measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

#### Test Procedures Used

ANSI C63.26-2015 - Section 5.2.4.4

#### **Test Settings**

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW  $\geq$  3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize.

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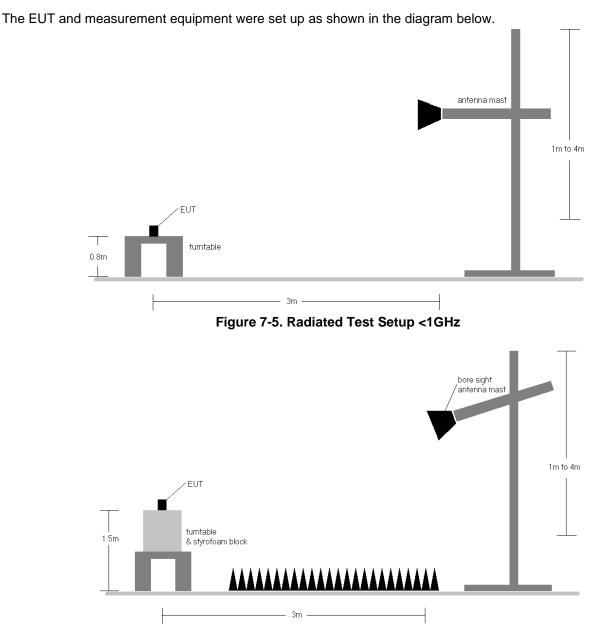


Figure 7-6. Radiated Test Setup > 1GHz

### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) 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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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]
10 MHz	QPSK	793.00	V	139	119	0.70	1 / 49	23.36	21.91	0.155	34.77
TUMHZ	16-QAM	793.00	V	139	119	0.70	1 / 49	22.46	21.01	0.126	34.77
	QPSK	790.50	V	139	119	0.74	1 / 12	23.32	21.91	0.155	34.77
	QPSK	793.00	V	139	119	0.70	1 / 12	23.48	22.03	0.159	34.77
5 MHz	QPSK	795.50	V	139	119	0.65	1 / 12	23.38	21.88	0.154	34.77
2 MILZ	16-QAM	790.50	V	139	119	0.74	1 / 12	22.61	21.20	0.132	34.77
	16-QAM	793.00	V	139	119	0.70	1 / 12	22.48	21.02	0.127	34.77
	16-QAM	795.50	V	139	119	0.65	1 / 12	22.46	20.96	0.125	34.77

Table 7-8. ERP Data (LTE Band 14)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]
15 MHz	QPSK	821.50	V	136	57	1.04	1 / 37	22.57	21.46	0.140	38.45
	16-QAM	821.50	V	136	57	1.04	1 / 37	21.93	20.82	0.121	38.45
10 MHz	QPSK	819.00	V	136	57	0.98	1/0	22.67	21.51	0.142	38.45
	16-QAM	819.00	V	136	57	0.98	1/0	21.81	20.64	0.116	38.45
	QPSK	816.50	V	136	57	0.93	1 / 24	22.70	21.48	0.141	38.45
5 MHz	QPSK	821.50	V	136	57	1.04	1 / 0	22.53	21.41	0.138	38.45
	16-QAM	816.50	V	136	57	0.93	1 / 24	21.69	20.47	0.111	38.45
	16-QAM	821.50	V	136	57	1.04	1/0	21.79	20.68	0.117	38.45
	QPSK	815.50	V	136	57	0.91	1/0	22.81	21.57	0.143	38.45
3 MHz	QPSK	822.50	V	136	57	1.06	1 / 0	22.45	21.35	0.137	38.45
3 IVITIZ	16-QAM	815.50	V	136	57	0.91	1/0	21.80	20.56	0.114	38.45
	16-QAM	822.50	V	136	57	1.06	1/0	21.75	20.66	0.116	38.45
	QPSK	814.70	V	136	57	0.89	1/5	22.72	21.46	0.140	38.45
1.4 MHz	QPSK	823.30	V	136	57	1.08	1 / 5	22.38	21.31	0.135	38.45
1.4 10112	16-QAM	814.70	V	136	57	0.89	1 / 5	22.02	20.76	0.119	38.45
	16-QAM	823.30	V	136	57	1.08	1 / 5	21.58	20.51	0.112	38.45

Table 7-9. ERP Data (LTE Band 26)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]
	π/2 BPSK	824.00	V	14	89	1.09	1 / 53	22.66	21.60	0.145	38.45
20 MHz	QPSK	824.00	V	14	89	1.09	1 / 53	22.64	21.58	0.144	38.45
	16-QAM	824.00	V	14	89	1.09	1 / 53	21.87	20.81	0.121	38.45
	π/2 BPSK	821.50	V	14	89	1.04	1 / 1	22.81	21.69	0.148	38.45
15 MHz	QPSK	821.50	V	14	89	1.04	1/1	22.76	21.65	0.146	38.45
	16-QAM	821.50	V	14	89	1.04	1 / 39	22.28	21.16	0.131	38.45
	π/2 BPSK	819.00	V	14	89	0.98	1/1	22.88	21.72	0.148	38.45
10 MHz	QPSK	819.00	V	14	89	0.98	1 / 26	22.94	21.77	0.150	38.45
	16-QAM	819.00	V	14	89	0.98	1 / 26	21.79	20.62	0.115	38.45
	π/2 BPSK	816.50	V	14	89	0.93	1 / 1	22.77	21.55	0.143	38.45
	π/2 BPSK	821.50	V	14	89	1.04	1 / 1	22.63	21.51	0.142	38.45
5 MHz	QPSK	816.50	V	14	89	0.93	1 / 1	22.93	21.71	0.148	38.45
5 1411 12	QPSK	821.50	V	14	89	1.04	1/1	22.74	21.62	0.145	38.45
	16-QAM	816.50	V	14	89	0.93	1/1	22.03	20.81	0.121	38.45
	16-QAM	821.50	V	14	89	1.04	1 / 23	21.74	20.63	0.116	38.45
	QPSK (CP-OFDM)	824.00	V	136	89	1.09	1 / 1	21.43	20.37	0.109	38.45

Table 7-10. ERP Data (NR Band n26)

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### 7.7 Radiated Spurious Emissions Measurements

#### **Test Overview**

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

#### **Test Procedures Used**

ANSI C63.26-2015 - Section 5.5.4

#### **Test Settings**

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW  $\geq$  3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

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

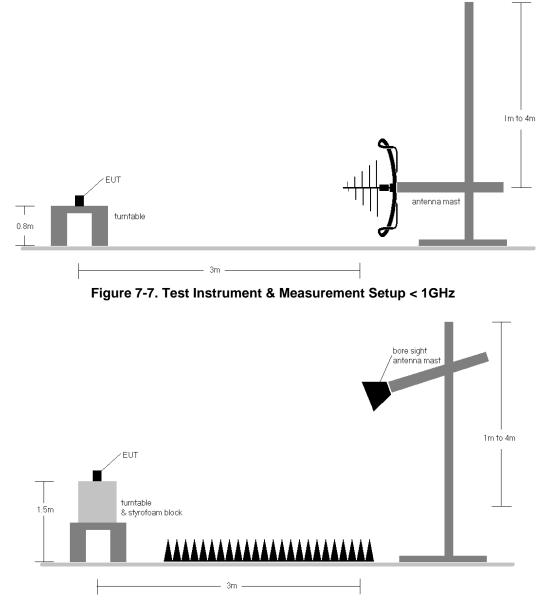


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

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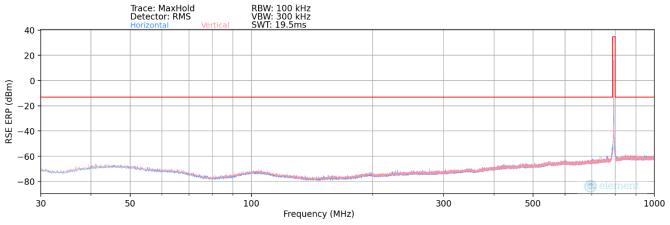
### Test Notes

- 1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
  - a)  $E(dB\mu V/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m) b) EIRP (dBm) = E(dB\mu V/m) + 20logD 104.8; where D is the measurement distance in meters.$
- 2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 3) This unit was tested with its standard battery.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
- 6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 7) 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.
- 8) Spurious emission in EN-DC Operating mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor) has been checked and was found to not to be the worst case. Spurious emissions from the NR carrier device are subject to the rules under which the NR carrier operates. Spurious emissions caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates..

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# LTE Band 14



#### Plot 7-55. Radiated Spurious Plot Below 1GHz (LTE Band 14)

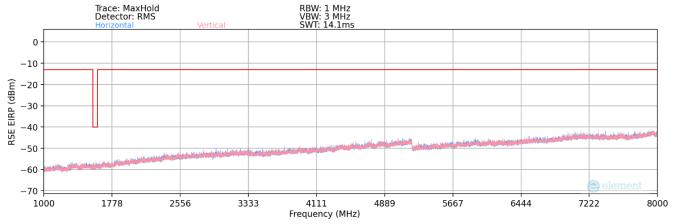
Bandwidth (MHz):	5
Frequency (MHz):	793
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
109.53	Н	-	-	-91.57	-13.80	1.63	-95.78	-13.00	-82.78
303.79	Н	-	-	-91.20	-11.17	4.63	-92.78	-13.00	-79.78
591.30	Н	-	-	-90.64	-4.70	11.66	-85.75	-13.00	-72.75

Table 7-11. Radiated Spurious Data (LTE Band 14)

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#### Plot 7-56. Radiated Spurious Plot Above 1GHz (LTE Band 14)

Bandwidth (MHz):	5
Frequency (MHz):	790.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]		Margin [dB]
1581.00	Н	-	-	-78.11	-0.73	28.16	-67.09	-40.00	-27.09
2371.50	Н	131	296	-76.43	3.78	34.35	-60.91	-13.00	-47.91
3162.00	Н	-	-	-79.93	6.47	33.54	-61.72	-13.00	-48.72
3952.50	Н	-	-	-80.14	8.10	34.96	-60.30	-13.00	-47.30
4743.00	Н	-	-	-80.62	9.84	36.22	-59.04	-13.00	-46.04

Table 7-12. Radiated Spurious Data (LTE Band 14 – Low Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]		Margin [dB]
1586.00	Н	-	-	-78.21	-0.56	28.23	-67.03	-40.00	-27.03
2379.00	Н	119	292	-75.44	3.84	35.40	-59.86	-13.00	-46.86
3172.00	Н	-	-	-79.74	6.38	33.64	-61.61	-13.00	-48.61
3965.00	Н	-	-	-80.18	8.03	34.85	-60.41	-13.00	-47.41
4758.00	Н	-	-	-80.21	9.48	36.27	-58.98	-13.00	-45.98

Table 7-13. Radiated Spurious Data (LTE Band 14 - Mid Channel)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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Bandwidth (MHz):	5
Frequency (MHz):	795.5
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 12

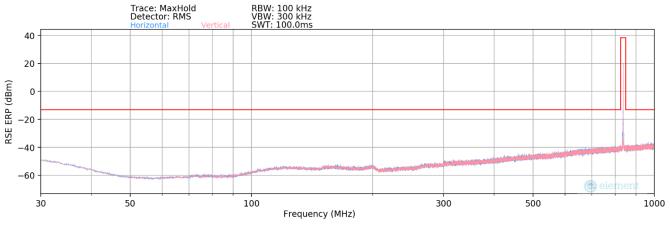
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]		Margin [dB]
1591.00	Н	-	-	-78.34	-0.41	28.25	-67.00	-40.00	-27.00
2386.50	Н	151	296	-76.63	3.94	34.31	-60.95	-13.00	-47.95
3182.00	Н	-	-	-79.73	6.29	33.56	-61.69	-13.00	-48.69
3977.50	Н	-	-	-79.43	7.91	35.48	-59.78	-13.00	-46.78
4773.00	Н	-	-	-80.07	9.13	36.06	-59.20	-13.00	-46.20

Table 7-14. Radiated Spurious Data (LTE Band 14 – High Channel)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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# LTE Band 26



#### Plot 7-57. Radiated Spurious Plot Below 1GHz (LTE Band 26)

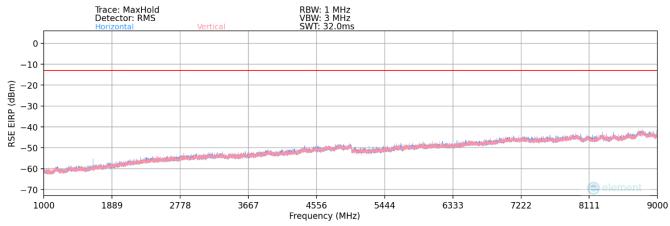
Bandwidth (MHz):	10
Frequency (MHz):	819
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]		Margin [dB]
109.95	Н	-	-	-91.76	-13.86	1.38	-96.02	-13.00	-83.02
302.81	Н	-	-	-90.93	-11.16	4.91	-92.50	-13.00	-79.50
507.39	Н	-	-	-89.61	-6.74	10.65	-86.76	-13.00	-73.76

Table 7-15. Radiated Spurious Data (LTE Band 26)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	Test Dates: EUT Type:	
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Bandwidth (MHz):	10
Frequency (MHz):	819
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 25
, v	

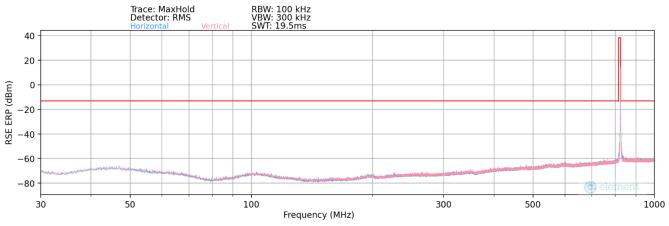
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]		Margin [dB]
1638.00	Н	-	-	-76.90	-0.43	29.67	-65.59	-13.00	-52.59
2457.00	Н	145	298	-71.70	3.79	39.09	-56.17	-13.00	-43.17
3276.00	Н	-	-	-77.63	6.41	35.78	-59.48	-13.00	-46.48
4095.00	Н	-	-	-77.67	8.33	37.66	-57.60	-13.00	-44.60
4914.00	Н	-	-	-77.08	9.70	39.62	-55.64	-13.00	-42.64

Table 7-16. Radiated Spurious Data (LTE Band 26 - Mid Channel)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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# NR Band n26



#### Plot 7-59. Radiated Spurious Plot Below 1GHz (NR Band n26)

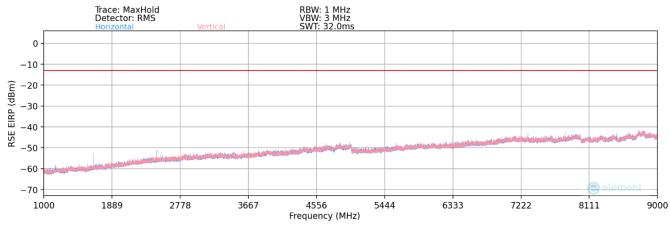
Bandwidth (MHz):	20
Frequency (MHz):	824
Modulation Signal:	QPSK
RB/Offset:	1 / 53

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
84.93	V	-	-	-89.99	14.35	31.36	-66.05	-13.00	-53.05
197.11	V	-	-	-88.90	19.77	37.87	-59.54	-13.00	-46.54
477.32	V	-	-	-88.87	25.60	43.73	-53.68	-13.00	-40.68

Table 7-17. Radiated Spurious Data (NR Band n26 - Mid Channel)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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Bandwidth (MHz):	20
Frequency (MHz):	824
Modulation Signal:	QPSK
RB/Offset:	1 / 53
h-	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]		Margin [dB]
1648.00	V	-	-	-76.09	-6.74	24.17	-71.09	-13.00	-58.09
2472.00	V	333	275	-69.78	-2.95	34.27	-60.99	-13.00	-47.99
3296.00	V	-	-	-77.51	0.29	29.78	-65.48	-13.00	-52.48
4120.00	V	-	-	-77.71	1.82	31.11	-64.15	-13.00	-51.15
4944.00	V	-	-	-78.05	2.80	31.75	-63.51	-13.00	-50.51

Table 7-18. Radiated Spurious Data (NR Band n26 - Mid Channel)

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)			
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### 7.8 Frequency Stability / Temperature Variation

#### **Test Overview and Limit**

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency.

#### Test Procedure Used

ANSI C63.26-2015 – Section 5.6

#### Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

#### Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

#### Test Notes

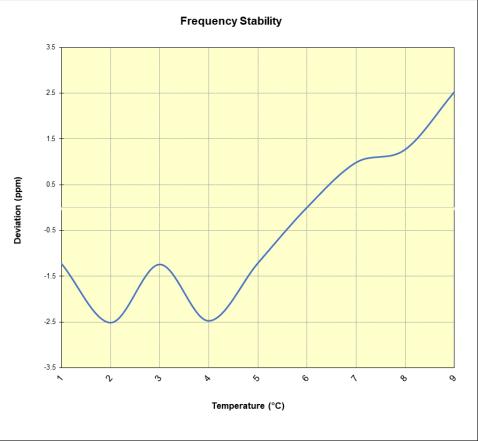
None

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LTE Band 14								
	Operating	Frequency (Hz):	793,00	00,000				
	Ref	. Voltage (VDC):	3.	86				
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)			
		- 30	793,011,470	-974	-0.0001228			
		- 20	793,010,447	-1,997	-0.0002518			
		- 10	793,011,457	-987	-0.0001245			
		0	793,010,478	-1,966	-0.0002479			
100 %	3.86	+ 10	793,011,479	-965	-0.0001217			
		+ 20 (Ref)	793,012,444	0	0.0000000			
		+ 30	793,013,224	780	0.0000984			
		+ 40	793,013,449	1,005	0.0001267			
		+ 50	793,014,446	2,002	0.0002525			
Battery Endpoint	3.174	+ 20	793,011,457	-987	-0.0001245			

Table 7-19. LTE Band 14 Frequency Stability Data



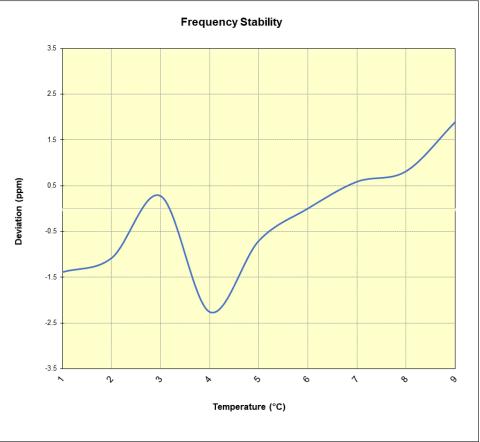
Plot 7-61. LTE Band 14 Frequency Stability Chart

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dege CE of CO	
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LTE Band 26								
	Operating	Frequency (Hz):	819,00	00,000				
	Ref	. Voltage (VDC):	3.8	363				
		Deviation Limit:	± 0.00025%	or 2.5 ppm				
					-			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)			
		- 30	819,206,860	-1,139	-0.0001390			
		- 20	819,207,111	-888	-0.0001084			
		- 10	819,208,222	223	0.0000272			
		0	819,206,144	-1,855	-0.0002264			
100 %	3.863	+ 10	819,207,421	-578	-0.0000706			
		+ 20 (Ref)	819,207,999	0	0.0000000			
		+ 30	819,208,479	480	0.0000586			
		+ 40	819,208,666	667	0.0000814			
		+ 50	819,209,547	1,548	0.0001890			
Battery Endpoint	3.174	+ 20	819,208,223	224	0.0000273			

Table 7-20. LTE Band 26 Frequency Stability Data



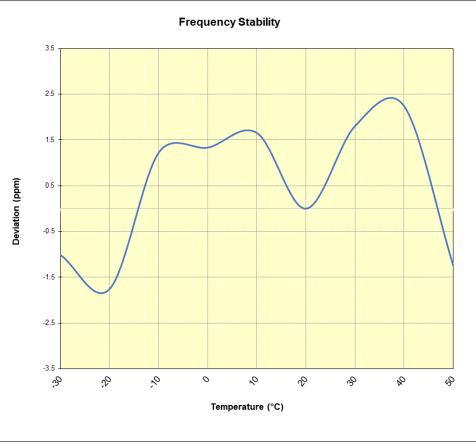
Plot 7-62. LTE Band 26 Frequency Stability Chart

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage CC of CD
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NR Band n26							
	Operating	Frequency (Hz):	819,000,000				
	Ref. Voltage (VDC):		3.863				
	Deviation Limit:		± 0.00025% or 2.5 ppm				
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)		
100 %	3.863	- 30	819,092,662	-828	-0.0001011		
		- 20	819,092,053	-1,437	-0.0001754		
		- 10	819,094,491	1,001	0.0001222		
		0	819,094,581	1,091	0.0001332		
		+ 10	819,094,844	1,354	0.0001653		
		+ 20 (Ref)	819,093,490	0	0.0000000		
		+ 30	819,094,966	1,476	0.0001802		
		+ 40	819,095,322	1,832	0.0002237		
		+ 50	819,092,477	-1,013	-0.0001237		
Battery Endpoint	3.174	+ 20	819,092,333	-1,157	-0.0001413		

Table 7-21. NR Band n26 Frequency Stability Data



Plot 7-63. NR Band n26 Frequency Stability Chart

FCC ID: A3LSMX828U		MEASUREMENT REPORT (CERTIFICATION)	
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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Tablet FCC ID: A3LSMX828U** complies with all the requirements of Parts 22(H) and 90 of the FCC rules.

FCC ID: A3LSMX828U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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