

### PCTEST

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### PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT

#### **Applicant Name:**

Microsoft Corporation One Microsoft way Redmond, WA, 98052 United States

#### Date of Testing: 05/25/2021 - 08/18/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2105200048-04-R1.C3K

## FCC ID: IC: APPLICANT:

### C3K1995 3048A-1995

Certification

**Microsoft Corporation** 

Application Type: Model/HVIN: EUT Type: FCC Classification: FCC Rule Part:

**ISED Specification:** 

Test Procedure(s):

1995 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 27 RSS-130 Issue 2, RSS-139 Issue 3 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01

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

Note: This revised Test Report (S/N: 1M2105060048-04-R1.C3K) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly

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

Randy Ortanez President



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## MEASUREMENT REPORT FCC Part 27 / RSS-130 / RSS-139



				ERP		EIRP		
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	20 MHz	QPSK	673.0 - 688.0	0.106	20.27	0.175	22.42	18M0G7D
	20 10112	16QAM	673.0 - 688.0	0.089	19.50	0.146	21.65	18M0W7D
	15 MHz	QPSK	670.5 - 690.5	0.104	20.16	0.170	22.31	13M5G7D
LTE Rand 71	13 101 12	16QAM	670.5 - 690.5	0.089	19.48	0.146	21.63	13M5W7D
	10 MHz	QPSK	668.0 - 693.0	0.107	20.30	0.176	22.45	8M98G7D
	10 10112	16QAM	668.0 - 693.0	0.085	19.32	0.140	21.47	9M02W7D
	5 MHz	QPSK	665.5 - 695.5	0.106	20.27	0.175	22.42	4M51G7D
	5 10112	16QAM	665.5 - 695.5	0.095	19.77	0.156	21.92	4M52W7D
	10 MHz	QPSK	704.0 - 711.0	0.090	19.52	0.147	21.67	9M00G7D
		16QAM	704.0 - 711.0	0.078	18.91	0.128	21.06	9M03W7D
	5 MHz	QPSK	701.5 - 713.5	0.092	19.62	0.150	21.77	4M53G7D
LTE Band 12	5 10112	16QAM	701.5 - 713.5	0.079	18.97	0.129	21.12	4M53W7D
LIE Danu 12	3 MHz	QPSK	700.5 - 714.5	0.093	19.68	0.152	21.83	2M71G7D
		16QAM	700.5 - 714.5	0.076	18.81	0.125	20.96	2M71W7D
	1.4 MHz	QPSK	699.7 - 715.3	0.087	19.40	0.143	21.55	1M10G7D
-		16QAM	699.7 - 715.3	0.074	18.68	0.121	20.83	1M11W7D
	10 MHz	QPSK	782.0	0.192	22.83	0.315	24.98	8M96G7D
LTE Band 13	10 11112	16QAM	782.0	0.140	21.47	0.230	23.62	8M97W7D
ETE Balla To	5 MHz	QPSK	779.5 - 784.5	0.173	22.39	0.285	24.54	4M52G7D
		16QAM	779.5 - 784.5	0.151	21.80	0.248	23.95	4M52W7D
		π/2 BPSK	673.0 - 688.0	0.041	16.12	0.067	18.27	18M0G7D
	20 MHz	QPSK	673.0 - 688.0	0.040	16.06	0.066	18.21	19M0G7D
		16QAM	673.0 - 688.0	0.035	15.46	0.058	17.61	19M0W7D
		π/2 BPSK	670.5 - 690.5	0.041	16.16	0.068	18.31	13M5G7D
	15 MHz	QPSK	670.5 - 690.5	0.040	16.06	0.066	18.21	14M2G7D
NP Rand p71		16QAM	670.5 - 690.5	0.037	15.70	0.061	17.85	14M2W7D
NIX Dallu II/ I		π/2 BPSK	668.0 - 693.0	0.042	16.21	0.069	18.36	8M95G7D
	10 MHz	QPSK	668.0 - 693.0	0.041	16.14	0.067	18.29	9M33G7D
		16QAM	668.0 - 693.0	0.037	15.69	0.061	17.84	9M36W7D
		π/2 BPSK	665.5 - 695.5	0.043	16.34	0.071	18.49	4M51G7D
	5 MHz	QPSK	665.5 - 695.5	0.042	16.21	0.068	18.36	4M49G7D
		16QAM	665.5 - 695.5	0.037	15.66	0.060	17.81	4M50W7D

Overview Table (<1GHz Bands)

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				EIRP		
Mode	Bandwidth	Modulation Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator	
20 M	20 MH <del>-</del>	QPSK	1720.0 - 1770.0	0.361	25.58	18M0G7D
		16QAM	1720.0 - 1770.0	0.317	25.01	18M0W7D
	15 MHz	QPSK	1717.5 - 1772.5	0.367	25.65	13M5G7D
		16QAM	1717.5 - 1772.5	0.317	25.02	13M5W7D
	10 MH <del>7</del>	QPSK	1715.0 - 1775.0	0.354	25.49	9M02G7D
LTE Band 66/4		16QAM	1715.0 - 1775.0	0.325	25.11	9M01W7D
	5 MHz	QPSK	1712.5 - 1777.5	0.367	25.65	4M51G7D
	5 1011 12	16QAM	1712.5 - 1777.5	0.339	25.30	4M53W7D
	3 MHz	QPSK	1711.5 - 1778.5	0.382	25.82	2M72G7D
	5 10112	16QAM	1711.5 - 1778.5	0.309	24.90	2M72W7D
	1 / MH <del>7</del>	QPSK	1710.7 - 1779.3	0.354	25.49	1M09G7D
1.4 10	1.4 101112	16QAM	1710.7 - 1779.3	0.316	24.99	1M10W7D
	40 MHz	π/2 BPSK	1730.0 - 1760.0	0.335	25.25	36M0G7D
		QPSK	1730.0 - 1760.0	0.337	25.27	38M8G7D
		16QAM	1730.0 - 1760.0	0.295	24.70	38M7W7D
	30 MHz	π/2 BPSK	1725.0 - 1765.0	0.356	25.52	28M9G7D
		QPSK	1725.0 - 1765.0	0.356	25.51	28M7G7D
		16QAM	1725.0 - 1765.0	0.299	24.76	28M7W7D
		π/2 BPSK	1720.0 - 1770.0	0.345	25.38	17M9G7D
	20 MHz	QPSK	1720.0 - 1770.0	0.381	25.81	19M0G7D
NR Band n66		16QAM	1720.0 - 1770.0	0.349	25.43	19M0W7D
NIX Dana noo		π/2 BPSK	1717.5 - 1772.5	0.369	25.67	13M5G7D
	15 MHz	QPSK	1717.5 - 1772.5	0.387	25.88	14M2G7D
		16QAM	1717.5 - 1772.5	0.347	25.40	14M1W7D
		π/2 BPSK	1715.0 - 1775.0	0.342	25.34	9M01G7D
	10 MHz	QPSK	1715.0 - 1775.0	0.344	25.37	9M32G7D
		16QAM	1715.0 - 1775.0	0.289	24.61	9M35W7D
		π/2 BPSK	1712.5 - 1777.5	0.341	25.32	4M52G7D
	5 MHz	QPSK	1712.5 - 1777.5	0.337	25.28	4M51G7D
		16QAM	1712.5 - 1777.5	0.301	24.79	4M50W7D

**Overview Table (>1GHz Bands)** 

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### **1.0 INTRODUCTION**

#### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

### 1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

#### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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### 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Microsoft Corporation Portable Handset FCC ID: C3K1995** / **IC: 3048A-1995**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27 & RSS-130 & RSS-139.

Test Device Serial No.: 45346, 47888, 48084, 50387, 46326, M4211

#### 2.2 Device Capabilities

This device contains the following capabilities:

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

### 2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports open and closed configurations. Multiple angles are tested and the worst case radiated emissions data is shown in the report.

#### 2.4 Software and Firmware

The firmware installed during testing was Build number developer - generic 2021.728.20.

#### 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 document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

### 3.2 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 wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.

Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

 $P_{d [dBm]} = P_{g [dBm]} - cable loss [dB] + antenna gain [dBd/dBi]$ 

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 fundamental radiated power measurements, the guidance of KDB 971168 D01 v03r01 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-E-2016.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

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# 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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### 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx4	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx4
-	LTx5	LIcensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Agilent	E5515C	Wireless Communications Test Set		N/A		GB45360985
Agilent	E5515C	Wireless Communications Test Set		N/A		GB46310798
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021 Annual 1/20/2022		1/20/2022	US51350301
Anritsu	MT8821C	Radio Communication Analyzer	N/A		6200901190	
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201525694
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17 <mark>6</mark> 20
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	00114451
Keysight Technologies	N9020A	MXA Signal Analyzer	9/22/2020	Annual	9/22/2021	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer	10/16/2020	Annual	10/16/2021	MY54490576
Keysight Technologies	N9030A	PXA Signal Analyzer	9/2/2020	Annual	9/2/2021	MY55410501
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	9/17/2020	Annual	9/17/2021	MY57141001
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A		112347	
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz) 9/9/2020 Annual 9/9/2021		100348		
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and Spectrum Analyzer	2/10/2021	Annual	2/10/2022	103187

#### Table 5-1. Test Equipment

#### Notes:

- 1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
- 2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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### 6.0 SAMPLE CALCULATIONS

### **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 2<sup>nd</sup> 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 analzyer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name:	Microsoft Corporation
FCC ID:	<u>C3K1995</u>
IC:	<u>3048A-1995</u>
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE/NR/UL-CA

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.3
Ð	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	RSS-139(6.6)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of- band emissions	PASS	Sections 7.4, 7.5
DNC	Transmitter Conducted Output Power	2.1046	RSS-139(4.1)	N/A	PASS	Section 7.2
CO	Peak-to-Average Ratio (LTE Band 7, 38, 41, NR Band n41)	27.50(d)(5)	RSS-199(4.4)	< 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	RSS-139(6.4)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.10
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 71)		RSS-130(4.4)		PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n71)	27.50(c)(10)		< 3 Watts max. ERP	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12)			< 5 Watts max. EIRP	PASS	Section 7.8
E	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n12)				PASS	Section 7.8
RADIA <sup>-</sup>	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 13)	27.50(b)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.8
	Equivalent Isotropic Radiated Power (NR Band n66)	27 50(4)(4)	BSS 120(6.5)	< 1 Wate may FIPP	PASS	Section 7.8
	Equivalent Isotropic Radiated Power (LTE Band 4/66)	27.30(0)(4)	RSS-139(6.5)	< I Watts filds. Einr	PASS	Section 7.8
	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	RSS-139(6.6)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Section 7.9
	Radiated Spurious Emissions	2.1053, 27.53	RSS-139(6.6)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.9

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.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST 2G/3G Automation Version 4.2.

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# 7.2 Conducted Power Output Data §2.1046

#### **Test Overview**

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

#### **Test Procedure Used**

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

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

#### Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be part of @element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
N		132072	1720.0	1 / 50	24.84
H	QPSK	132322	1745.0	1/0	24.87
0		132572	1770.0	1/0	24.86
5	16-QAM	132072	1720.0	1 / 50	24.24
N		132047	1717.5	1/0	24.93
H	QPSK	132322	1745.0	1 / 74	25.00
2		132597	1772.5	1/0	24.87
-	16-QAM	132047	1717.5	1/0	24.47
N		132022	1715.0	1/0	24.85
HV	QPSK	132322	1745.0	1/0	25.01
0		132622	1775.0	1 / 25	24.80
-	16-QAM	132022	1715.0	1/0	24.34
N	QPSK	131997	1712.5	1 / 24	24.86
Ë		132322	1745.0	1 / 24	25.12
2		132647	1777.5	1/0	25.06
4	16-QAM	131997	1712.5	1 / 24	24.25
N		131987	1711.5	1/7	24.98
E E	QPSK	132322	1745.0	1/7	24.87
≥ ∞		132657	1778.5	1 / 14	24.91
	16-QAM	131987	1711.5	1/7	24.27
N		131979	1710.7	1 / 0	24.86
H H	QPSK	132322	1745.0	1/3	24.83
4		132665	1779.3	1/0	25.00
<del>.</del>	16-QAM	131979	1710.7	1 / 0	24.17

Table 7-2. Conducted Power Output Data (LTE Band 66/4 - North)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		346000	1730.0	1 / 108	22.94
	π/2 BPSK	349000	1745.0	1 / 54	23.11
Hz		352000	1760.0	1 / 54	23.03
N N		346000	1730.0	1 / 108	22.91
40	QPSK	349000	1745.0	1 / 108	22.74
		352000	1760.0	1 / 54	22.62
	16-QAM	349000	1745.0	1 / 108	22.43
		345000	1725.0	1 / 40	23.08
	π/2 BPSK	349000	1745.0	1 / 80	22.90
Hz		353000	1765.0	1 / 40	22.84
W		345000	1725.0	1 / 40	22.96
30	QPSK	349000	1745.0	1 / 80	22.79
		353000	1765.0	1 / 40	22.72
	16-QAM	353000	1765.0	1 / 40	22.42
		344000	1720.0	1 / 53	23.12
20 MHz	π/2 BPSK	349000	1745.0	1 / 53	23.20
		354000	1770.0	1 / 26	23.14
		344000	1720.0	1 / 53	23.27
	QPSK	349000	1745.0	1 / 53	23.03
		354000	1770.0	1 / 79	23.04
	16-QAM	349000	1745.0	1 / 53	21.95
		343500	1717.5	1 / 58	23.10
	π/2 BPSK	349000	1745.0	1 / 20	23.21
Hz		354500	1772.5	1 / 20	23.06
N N		343500	1717.5	1 / 39	23.13
15	QPSK	349000	1745.0	1 / 39	23.30
		354500	1772.5	1 / 39	23.05
	16-QAM	349000	1745.0	1 / 39	21.82
		343000	1715.0	1 / 26	23.04
	π/2 BPSK	349000	1745.0	1 / 38	23.12
Hz		355000	1775.0	1 / 38	23.08
N N		343000	1715.0	1 / 38	23.21
10	QPSK	349000	1745.0	1 / 26	23.22
		355000	1775.0	1 / 38	23.14
	16-QAM	349000	1745.0	1 / 26	22.00
		342500	1712.5	1 / 18	23.09
	π/2 BPSK	349000	1745.0	1/6	23.08
Hz		355500	1777.5	1 / 18	23.07
Σ		342500	1712.5	1/6	23.13
2	QPSK	349000	1745.0	1 / 18	23.13
		355500	1777.5	1 / 18	23.13
	16-QAM	349000	1745.0	1 / 12	21.91

Table 7-3. Conducted Power Output Data (NR Band n66 – North)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Pexel to be past of @ element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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### 7.3 Occupied Bandwidth

#### **Test Overview**

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

#### **Test Settings**

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW  $\geq$  3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
  - 1-5% of the 99% occupied bandwidth observed in Step 7

#### Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

None.

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### LTE Band 71



Plot 7-1. Occupied Bandwidth Plot (LTE Band 71 - 20MHz QPSK - Full RB)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 71 - 20MHz 16-QAM - Full RB)

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Plot 7-3. Occupied Bandwidth Plot (LTE Band 71 - 15MHz QPSK - Full RB)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 71 - 15MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occu	upied BW						
<mark>LX/</mark> RL RF 50Ω	DC CORREC	SENSE:INT	ALIGN AUT	0 12:43:09 A	M May 28, 2021	Trace	Detector
	·•	Trig: Free Run	Avg Hold: 100/100	Radio Std.	None		
	#IFGain:Low	#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00	dBm						
Log							
30.0						С	lear Write
20.0	mon	hun man	muhhanny				
10.0							
0.00			<u> </u>				
-10.0	A						Average
-20.0	6 mm mm						
-30.0	-u1 -u		- in the	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.www.		
-40.0							Max Hold
-50.0							
Center 680.50 MHz				Span 2	5.00 MHz		
Res BW 240 KHZ		#VEVV / 30 K	лz	SWe	ep 1 ms		Min Hold
Occupied Bandy	width	Total P	ower 3	).7 dBm			
		I_					
	8.9824 MI	1Z					Detector
Transmit Freg Erro	or 1.590 k	Hz % of O	3W Power	99.00 %		Auto	Man
	0.000						_
x dB Bandwidth	9.689 M	IHZ X dB	-2	6.00 dB			
MSG			ST/	TUS			

Plot 7-5. Occupied Bandwidth Plot (LTE Band 71 - 10MHz QPSK - Full RB)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 71 - 10MHz 16-QAM - Full RB)

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Plot 7-7. Occupied Bandwidth Plot (LTE Band 71 - 5MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 71 - 5MHz 16-QAM - Full RB)

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### LTE Band 12

🔤 Ke	ysight Spec	trum A	nalyzer - O	ccupied BV	V										
l <b>XI</b> R	L	RF	50 \$	2 DC	CORR	EC	Center	SENSE:INT	0000 MH-	AL	IGN AUTO	01:35:03 A	M May 28, 2021	Trac	e/Detector
						+	Trig: F	Free Run	Avg Ho	ld: 1	100/100	Raulo Stu	. None		
					#IFG	#IFGain:Low #Atten: 36 dB Radio Device: BTS						ice: BTS			
10 dl	10 dB/div Ref 40.00 dBm														
30.0															
20.0															Clear Write
10.0						monnon	with marker by	man and	mary mary						
0.00						1				l I					
10.00					1					N					Average
-10.0											8 - 0 - <b>A</b>				Average
-20.0	1.1	henna	mmlynw	and a start and a start and a start a s							Carlow All and the Start of	ᡣ᠕᠕ᠰᠰ᠕᠕	homen		
-30.0	haut hant														
-40.0															Max Hold
-50.0															
Cen	ter 70	7.50	MHz									Span 2	5.00 MHz		
Res	BW 2	40 k	Hz				#	VBW 750	kHz			Swe	ep 1 ms		Min Hold
															minnora
0	ccup	ied	Band	dwidt	h			Total F	ower		31.0	dBm			
				8.	997	73 M	Hz								Detector
						4 070		0/ - 5 0				00.0/		A	Peak►
	ransn	IIT F	req Er	ror		1.376	KHZ	% of O	BW POV	ver	99	.00 %		Auto	ivian
x	dB Ba	andv	vidth			9.856	MHz	x dB			-26.0	00 dB			
MSG											STATUS				
_		_								_					

Plot 7-9. Occupied Bandwidth Plot (LTE Band 12 - 10MHz QPSK - Full RB)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 16-QAM - Full RB)

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Plot 7-11. Occupied Bandwidth Plot (LTE Band 12 - 5MHz QPSK - Full RB)



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

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Plot 7-13. Occupied Bandwidth Plot (LTE Band 12 – 3MHz QPSK – Full RB)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB)

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🔤 Keysight Spec	trum Analyzer - Occup	pied BW										
L <mark>XI</mark> RL	RF 50 Ω	DC CORR	EC	SE	NSE:INT		-	ALIGN AUTO	01:45:48 A	M May 28, 2021	Trac	e/Detector
				Trig: Fre	e Run	Aval	iz Hold:	100/100	Radio Sta	: None		
		#IFGa	in:Low	#Atten: 3	6 dB				Radio Dev	vice: BTS		
10 dB/div	Ref 40.00	dBm										
Log												
30.0												Clear Write
20.0			~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	man	mm						
10.0			1									
0.00			1				\					
-10.0			1				١ <u>ـ</u>					Average
-20.0			[									
-30 0 VJ am o	an a marine	mand					<u>ر</u>	mumm	and and a contraction	h . An Alman . C		
40.0	404 P + +									And Branning of		
-40.0												Max Hold
-50.0											_	
Center 707	7.500 MHz								Span 3	.500 MHz		
Res BW 3	3 kHz			#VE	3W 110	٢Hz			Sweep	3.067 ms		Min Hold
												Minitiona
Occup	ied Bandw	vidth			Total F	ower		30.9	dBm			
		1.097	'3 MI	IZ								Detector
												Peak►
Transm	nit Freq Erro	r ·	-1.646	<b>kHz</b>	% of O	BW P	owe	er 99	.00 %		Auto	Man
x dB Ba	andwidth		1.237 N	IHz	x dB			-26.	00 dB			
MSG								STATUS	5			

Plot 7-15. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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### LTE Band 13



Plot 7-17. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

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sysight Spectr	um Analyze	er - Occ	cupied BV	v											
L	RF	50 Ω	DC	CORRE	EC		SEI	NSE:INT	000 MHz	ŀ	ALIGN AUTO	02:27:39 /	M May 28, 2021	Tra	ce/Detector
							Trig: Free	e Run	Avg Ho	ld:	100/100	Raulo Stu	. None		
				#IFGa	in:Lov	N	#Atten: 3	6 dB				Radio Dev	vice: BTS		
B/div	Ref 4	10.0	0 dBn	n											
															Clear Write
					m	when	man	mm	mon						
										Ļ					
										١					Avarage
															Average
	كمهاسمهم	when	www	~							Whow here	Munn	And more thank		
A Mandres m															
															Max Hold
ator 792	000 M	<b>U</b> 7										Snan 1	2.60 MHz		
BW 12	0 kHz	14					#VE	3W 390 k	Hz			Swan	eep 1 ms		Min Hald
			_					_							Min Hold
occupi	ed Ba	and	widt	h				Total P	ower		30.9	dBm			
			4	524	13	MH	7								Detector
															Peak►
ransmi	t Freq	Err	or		-1.8	14 k	Hz	% of O	BW Pov	ve	r 99	.00 %		Auto	Man
dB Bar	ndwid	th			4.94	7 M	Hz	x dB			-26.	00 dB			
			_								STATUS				
	sysight Spectru	sight Spectrum Analyze	sight Spectrum Analyzer - Occ RF 50 Ω B/div Ref 40.00 B/div Ref 40.00 B/div Ref 40.00 Complex Ref 40.00 Ref 40.00 Complex Ref 40.00	sight Spectrum Analyzer - Occupied BW B/div Ref 40.00 dBm	yzight Spectrum Analyzer - Occupied BW L RF 50 Ω DC CORR #IFGa B/div Ref 40.00 dBm 	sysight Spectrum Analyzer - Occupied BW	sysight Spectrum Analyzer - Occupied BW	sysight Spectrum Analyzer - Occupied BW L RF 50 9 DC CORREC Center Fi #IFGain:Low Atten: 3 B/div Ref 40.00 dBm 	ysight Spectrum Analyzer - Occupied BW L RF 50 Q DC CORREC SENSE:INT #FGain:Low #Atten: 36 dB B/div Ref 40.00 dBm B/div Ref 40.00 dBm mathematical data and a data and data and a data and a data	sysight Spectrum Analyzer - Occupied BW L RF 50 Q DC CORREC #IFGain:Low Genter Freq: 782.00000 MHz Trig: Freq Run Avg Ho #Atten: 36 dB S/div Ref 40.00 dBm 	syight Spectrum Analyzer - Occupied BW L RF 50 Ω DC CORREC #IFGain:Low Avg Hold: #IFGain:Low Center Freq: 782.00000 MHz Trig: Free Run Avg Hold: #Atten: 36 dB S/div Ref 40.00 dBm ( 4.5243 MHz Cocupied Bandwidth Total Power 4.5243 MHz Cransmit Freq Error 1.814 kHz % of OBW Power dB Bandwidth 4.947 MHz x dB	yzight Spectrum Analyzer - Occupied BW L RF 50 Q DC CORREC HFGain:Low HFGain:Low Center Freq: 782.00000 MHz Trig: Free Run Avg Hold: 100/100 #Atten: 36 dB S/div Ref 40.00 dBm Matter: 36 dB S/div Ref 40.00 dBm Matter: 782.000 MHz HFGain:Low HFGGIN:GOUND HFGG	yzight Spectrum Analyzer - Occupied BW L RF 50 Ω DC COREC #IFGain:Low Trig: Free Run Avg Hold: 100/100 #Atten: 36 dB Addio Sta Radio Der Center Freq: 782.0000 MHz Trig: Free Run Avg Hold: 100/100 Radio Der S/div Ref 40.00 dBm March Atten: 36 dB Solution Compared to the service of	spight Spectrum Analyzer - Occupied BW L RF 50 9 DC CORREC SENSE:INT ALIGN AUTO 02:27:39 AM May 28, 2021 Radio Std: None Trig: Free Run Avg Hold: 100/100 #Atten: 36 dB B/dlv Ref 40.00 dBm B/dlv Ref 40.00 dBm B/dlv Ref 40.00 dBm B/dlv Ref 40.00 dBm Span 12.50 MHz BW 120 kHz BV 120 kHz Span 12.50 MHz Span 12.50 MHz Sweep 1 ms Doccupied Bandwidth Total Power 30.9 dBm 4.5243 MHz Transmit Freq Error -1.814 kHz % of OBW Power 99.00 % dB Bandwidth 4.947 MHz x dB -26.00 dB Status	spight Spectrum Analyzer - Occupied BW L RF 50 G DC CORREC SENSE:INT ALIGN AUTO 02:27:39 AM May 28, 2021 Trail Free Run Avg Hold: 100/100 #IFGain:Low #Atten: 36 dB Radio Device: BTS B/div Ref 40.00 dBm B/div Ref 40.00 dBm B/div Ref 40.00 dBm B/div Ref 40.00 dBm S/div Ref 40.00 dBm





Plot 7-20. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	Portest Proved to be prest of @releasened	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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### NR Band n71

Spectrum Anal Occupied BW	yzer 1	+								Trace	- * 崇
KEYSIGHT <sup>RL</sup> ↔	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S)	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Cent Avg  Radi	ier Freq: Hold:>10 o Std: No	680.500000 0/100 one	MHz	Trace Type Clear / W	/rite	Trace Control
	_	NFE: Off							A.		Detector
1 Graph Scale/Div 10 (	) dB		Ref Value 40 00	dBm					Trace Av	erage	
Log									Max Hold	t	
20.0									Min Hold		
10.0		/									
-10.0					home	6 BD.	A.M.L.		Restart M	ax Hold	
-20.0	MAN MALLAN						and a state of the	ull-ulda			
-40.0											
-50.0	MUz		Video BW 1.60					nan 50 MHz			
Res BW 470.0	0 kHz					Swe	ep 1.00 m	s (1001 pts)			
2 Metrics	•										
Occu	pied Bandwidth										
	17.952	2 MHz		Total Power			32.7 dE	3m			
Trans	smit Freq Error	-525.22 kH	z	% of OBW Po	wer		99.00	% dB			
X dB	Danuwiuti	19.07 MH	2	-X UD			-20.00	ub.			
1	C [ ?	Jun 09, 2021 5:42:50 AM	$\Box \triangle$								

Plot 7-21. Occupied Bandwidth Plot (NR Band n71 - 20MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)



Plot 7-22. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM QPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be prest of @element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-23. Occupied Bandwidth Plot (NR Band n71 - 20MHz CP-OFDM 16-QAM - Full RB)



Plot 7-24. Occupied Bandwidth Plot (NR Band n71 - 15MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be prest of @relement	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Spectrui Occupie	m Analyzer 1	+						<b>Č</b> Trace	- *   米
KEYS RL	IGHT Input: RF Coupling: DC Align: Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S NFE: Off	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Fr Avg Hold: Radio Sto	req: 680.500000 Mł : 100/100 d: None		Trace Type Clear / Write	Trace Control
1 Graph	•							Trace Average	Detector
Scale/D 20.0 10.0	Div 10.0 dB		Ref Value 30.	00 dBm	~			Max Hold     Min Hold	
0.00 -10.0 -20.0 -30.0	Mar and a start and a start and a start and a start a	m			- Annon		1	Restart Max Hold	
-40.0 -50.0 -60.0									
Center Res BW	680.50 MHz / 360.00 kHz		#Video BW 1.2	000 MHz	5	Span Sweep 1.00 ms (	37.5 MHz 1001 pts)		
2 Metrics	s v								
	Occupied Bandwid	th .155 MHz		Total Power		30.2 dBm	1		
	Transmit Freq Erro x dB Bandwidth	r 2.786 15.13	kHz MHz	% of OBW P x dB	ower	99.00 % -26.00 dE	•		
	500	Jun 09, 2021 6:26:01 AM	$\bigcirc \triangle$						

Plot 7-25. Occupied Bandwidth Plot (NR Band n71 - 15MHz QPSK - Full RB)

Spectrum / Occupied I	Analyzer 1 BW	+					₿	Trace	• 崇
RL +	HT Input: RF ← Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 36 dB	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: Avg Hold: 10 Radio Std: N	680.500000 MHz 00/100 Ione	Trac	e Type llear / Write	Trace Control
1 Graph								race Average	Delector
Scale/Div Log 20.0 10.0 0.00	10.0 dB		Ref Value 30.00	0 dBm				lax Hold lin Hold	
-10.0 -20.0 -30.0 -40.0 -50.0	Natural Contraction				hanger and			estart Max Hold	
-60.0 Center 68 Res BW 3	0.50 MHz 60.00 kHz		#Video BW 1.20	00 MHz	Sw	Span 37.5 eep 1.00 ms (100 <sup>-</sup>	5 MHz 1 pts)		
2 Metrics	▼ Occupied Bandwid	th							
	14	.163 MHz		Total Power		30.5 dBm			
۲ x	Transmit Freq Erro dB Bandwidth	r -21.448 k 15.16 M	Hz Hz	% of OBW Pow x dB	er	99.00 % -26.00 dB			
•		Jun 09, 2021 6:25:36 AM	$\square$				X		

Plot 7-26. Occupied Bandwidth Plot (NR Band n71 - 15MHz CP-OFDM 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Provid to be post of the element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-27. Occupied Bandwidth Plot (NR Band n71 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM QPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Provid to be post of the element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Spectrur Occupie	m Analyzer 1 d BW	- <b>-</b>	+								Trace	- *   米
KEYS RL	IGHT Input ↔ Coup Align	: RF Iling: DC : Auto	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int ( NFE: Off	Atten: 36 dB S)	Trig: F Gate: #IF Gi	Free Run Off ain: Low	Center Freq Avg Hold:>1 Radio Std: N	: 680.500000   00/100 None	MHz	Trace T Clea	ype ar / Write	Trace Control
1 Graph		•								Trac	e Average	Deteotor
Scale/D 20.0 10.0	0iv 10.0 dB			Ref Value 30	.00 dBm	m				<ul> <li>Max</li> <li>Min</li> </ul>	Hold Hold	
-10.0 -20.0 -30.0		imalahana	~~~				L.	mar		Rest	art Max Hold	
-50.0 -60.0	680 50 MHz			#Video BW 75	0 00 kHz			Sr	an 25 MHz			
Res BW	/ 240.00 kHz				0.00 KHZ		Sw	eep 1.00 ms	(1001 pts)			
2 Metrics	s Occupied E	▼ Bandwidth 9.364	l8 MHz		Tota	Power		30.1 dE	im			
	Transmit F x dB Bandv	req Error vidth	-46.92 10.20	5 kHz ) MHz	% of x dB	OBW Powe		99.00 -26.00 d	% iB			
	うっ		Jun 09, 202 6:49:49 AM									

Plot 7-29. Occupied Bandwidth Plot (NR Band n71 - 10MHz CP-OFDM 16-QAM - Full RB)



Plot 7-30. Occupied Bandwidth Plot (NR Band n71 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST: Proud to be peak of @demonst	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-31. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM QPSK - Full RB)



Plot 7-32. Occupied Bandwidth Plot (NR Band n71 - 5MHz CP-OFDM 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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### LTE Band 66/4

<u> </u>	(eysight Sp	ectrum Ana	lyzer - Oce	cupied BW	1										
LXI	RL	RF	50 Ω	DC	CORRE	C	Center	SENSE:INT	00000 GHz		ALIGN AUTO	03:21:13 A	May 28, 2021	Trac	e/Detector
						↔	Trig: Fi	ree Run	Avg Ho	ld:	100/100		None		
					#IFGai	n:Low	#Atten:	: 36 dB				Radio Dev	ice: BTS		
10	dB/div	Re	f 40.0	0 dBm	1					-					
30															
200.															Clear Write
20.						-hl-minsh	an water for the	how-room Whyp	Mary Trady marking						
10.					1					Ì					
U.U										Ì					
-10.1				antiplan	Narm						hanna a				Average
-20.1	A MUNICIPAL	Noralianty	Mar Mar Card								· · · · · · · · · · · · · · · · · · ·	WIL PULL AND	halanna an hai		
-30.1															
-40.1															Max Hold
-50.1															
		74500	<u> </u>									<b>A</b>			
Le Do	nter 1. e BW	.74000 470 kH	GHZ				#\	/BM 161	VIH-7			Span o Swe	0.00 MHZ		
R¢.	3 DVV	47 0 KI	2				771	011 1.01	VIIIIZ			0446	ep mis		Min Hold
	Occu	pied I	Band	widt	h			Total I	Power		31.4	dBm		_	
				17	07	2 M	LI-7								Detector
				11	.97	JIVI	ПΖ								Detector Peak▶
	Frans	mit Fre	əq Err	or	-1	7.638	kHz	% of C	BW Pov	Ne	er 99	.00 %		Auto	Man
Ι.		andw	idth			0 20 1		v dB			-26	00 dB			
'		Januw	Iuui			9.201	1112	X UD			-20.	00 UB			
MSG											STATUS	3			

Plot 7-33. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB)



Plot 7-34. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Pexal to be part of @riemand	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Keysight Spectrum	Analyzer - Oc	cupied BW										
LXU RL RF	50 Ω	DC	CORREC	- DW	SEN Center Fr Trig: Free #Atten: 30	se:INT eq: 1.74500 Run 6 dB	00000 GHz Avg Ho	ALIGN AUT	0 03:28:39 A Radio Std Radio Dev	M May 28, 2021 : None rice: BTS	Trac	e/Detector
10 dB/div Log	Ref 40.0	0 dBm										
30.0 20.0 10.0			-	Jun Mala Jawa	ung life and	Maryan	۲					Clear Write
0.00 -10.0 -20.0	ayuhayilangana	-hannani						L L	๛๚๛๛๚๙๚๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	whentontopy		Average
-30.0 -40.0 -50.0												Max Hold
Center 1.7450 Res BW 360	i0 GHz kHz	width			#VB	W 1.2 M	lHz ower	31	Span 3 Swe	7.50 MHz ep 1 ms		Min Hold
Cocupier	Barra	13	.505	MH	Z							Detector Peak▶
Transmit F x dB Band	Freq Err	ror	14	-822 F .50 MH	lz Iz	% of OE x dB	BW Pov	ver 9 -2	99.00 % 6.00 dB		Auto	Man
MSG								STA	TUS			

Plot 7-35. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz QPSK - Full RB)



Plot 7-36. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Poud to be part of @ simmed	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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💻 Keysight Sp	Keysight Spectrum Analyzer - Occupied BW										
LXI RL	RF 50 Ω	DC CO	RREC	SE Conter E	NSE:INT	0000 GHz	ALIGN AUTO	03:33:23 A	M May 28, 2021	Trac	e/Detector
			-	Trig: Fre	e Run	Avg Hol	d: 100/100	Radio ata.	None		
		#IF	Gain:Low	#Atten: 3	6 dB			Radio Dev	ice: BTS		
10 dB/div	Ref 40.0	0 dBm									
20.0										(	Clear Write
20.0			maryly	why way have	way way	many					
0.00			r								A.uaraga
-10.0							h				Average
-20.0	NY WAR	Mathana					"WWW Inter Color	www.www.antu	manhorn		
-30.0											
-40.0											Max Hold
-50.0											
Contor 1	24600 CH2							- Chan 2	5-00 MUZ		
Res BW	240 kHz			#VF	3W 750 k	H7		Span 2	en 1 ms		
	240 1002					11/2					Min Hola
Occu	pied Band	width			Total P	ower	31.2	dBm			
		9.01	88 M	Hz							Detector
		0.01	00 W								Peak▶
Trans	mit Freq Err	ror	5.531	kHz	% of OE	<b>3W Pow</b>	ver 99	.00 %		Auto	Man
x dB E	Bandwidth		9.744	MHz	x dB		-26.	00 dB			
							OTATIK				
MSG							STATUS	5			





Plot 7-38. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Pexel to be post of the element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager	
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🔤 Keysight Spectrum Analyzer - Occupi	ed BW				
<b>LX/ RL</b> RF 50Ω D	C CORREC	SENSE:INT	ALIGN AUTO	03:38:28 AM May 28, 2021	Trace/Detector
	++-	Trig: Free Run	Avg Hold: 100/100	Radio Stu. None	
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 c	lBm				
Log					
30.0					Clear Write
20.0	mmm	man water was	mm		
10.0					
0.00	1				
-10.0					Average
-20.0	ala/		how how how		
-30.0 Wight from and from the optimited of the optimated	ላ የላ የሳት				
-40.0					No
50.0					Max Hold
-30.0					
Center 1.745000 GHz				Span 12.50 MHz	
Res BW 120 kHz		VBW 1.2 MH	Z	Sweep 1 ms	Min Hold
		<b>T</b> ( 1 D	04.0	10	
Occupied Bandw	idth	Total Po	ower 31.3	dBm	
	4.5108 MH	Z			Detector
					Peak▶
Transmit Freq Error	-945 F	z % of OE	W Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	4.881 MH	z xdB	-26.	00 dB	
MSG			STATUS		

Plot 7-39. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz QPSK - Full RB)



Plot 7-40. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Poxed to be post of the element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occu	ipied BW				
L <mark>XI</mark> RL RF 50Ω	DC CORREC	SENSE:INT	ALIGN AUTO	03:43:39 AM May 28, 2021	Trace/Detector
	++-	Trig: Free Run	Avg Hold: 100/100	Radio Sta: None	
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00	dBm				
Log					
30.0					Clear Write
20.0	mont	amound was the firm	many		
10.0					
0.00					
-10.0			<u> </u>		Average
-20.0	Alle a color		ha flat t	1 1 0 10	
-30.0 www.Waymy. working "Program	""YANN "		- ACCALLINA	ษปพระศักริษฐานที่ เหตุ	
-40.0					Mayliald
50.0					Max Hold
-30.0					
Center 1.745000 GHz				Span 7.500 MHz	
#Res BW 75 kHz		VBW 750 kH	IZ	Sweep 3.8 ms	Min Hold
		Tatal D		- 18	
Occupied Bandy	width	Total P	ower 31.0	dBm	
	2.7179 MH	Z			Detector
	0.045.1				Peak►
Transmit Freq Erro	or -2.645 Ki	Iz % of OF	BW Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	2.993 MI	lz x dB	-26.	00 dB	
NEC			STATI		
mad			STATU	3	

Plot 7-41. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz QPSK - Full RB)



Plot 7-42. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Poxed to be past of the defense	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied	BW						
LX/RL RF 50Ω DC	CORREC	SENSE:INT	ALIGN AL	UTO 03:48:07 Al	May 28, 2021	Trace	Detector
		Frig: Free Run	Avg Hold: 100/10	00	None		
	#IFGain:Low #	Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dE	sm						
Log 30.0							
30.0						С	lear Write
20.0	mm	un honor	~~~~				
10.0							
0.00							
-10.0							Average
-20.0	mont		mr.m	MARAMAR M			
-30.0 WARNEY IN UN WARNEY			• • •	4 14 4 VAA V			
-40.0							Max Hold
-50.0							
Contor 1 745000 CH2				Enon 2	500 MIL-		
Res BW 33 kHz		VBW 330 kH	7	Swe	ep 3 ms		Min Hala
							Min Hold
Occupied Bandwic	ith	Total Po	ower 3	31.1 dBm			
1	0884 MHz	,					Detector
	.0004 10112						Peak►
Transmit Freq Error	773 H	z % of OB	W Power	99.00 %		Auto	Man
x dB Bandwidth	1.236 MH	z xdB	-	-26.00 dB			
MSC				TATUS			
MSG			5	STATUS			

Plot 7-43. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



Plot 7-44. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB)

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### NR Band n66



Plot 7-45. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-46. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM QPSK - Full RB)

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www.www.www.com.com.com.com.com.com.com.com.com.com	ipied BW						
<b>LXI</b> RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 1.7450	00000 GHz	IGN AUTO 08:13:21 F Radio Std	M Jul 07, 2021	Trace	Detector
	••	Trig: Free Run	Avg Hold: 10	00/100			
	#IFGain:Low	#Atten: 36 dB		Radio Dev	vice: BTS		
10 dB/div Ref 40.00	dBm						
30.0							
20.0						С	lear Write
10.0	minun	www.carree.www.rearre					
0.00							
10.0							Average
20.0	كهيم بالله م		<u>ل</u>	~			riteruge
20.0 anterduling and manufacture				and a start of the contraction	- Carty and a card		
-30.0							
-40.0							Max Hold
-50.0						_	
Center 1.74500 GHz				Span 1	00.0 MHz		
#Res BW 1 MHz		#VBW 3 MH	lz	Sw	eep 1 ms		Min Hold
		<b>T</b> - 4 - 1 F		24 2 JDm			
Occupied Bandy	width	lotal	ower	31.2 dBm			
	38.650 MI	-IZ					Detector
Transmit From Erro	or 024001			00.00.%		Auto	Peak▶ Man
Franshit Freq Erro	-03.100		BW Fower	99.00 %		Auto	Intari
x dB Bandwidth	41.12 M	lHz x dB		-26.00 dB			
MSG				STATUS			

Plot 7-47. Occupied Bandwidth Plot (NR Band n66 - 40.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-48. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST: Pound to be part of @ element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occupied BW					
LXU RE 50 Ω DC CORREC	SENSE:INT	ALIGN AUTO	08:11:27 PM Jul 07, 2021 Radio Std: None	Trace/Detector	
	+++ Trig: Free Run	Avg Hold: 100/100			
#IFGain	:Low #Atten: 36 dB		Radio Device: BTS		
10 dB/div Ref 40.00 dBm					
30.0					
20.0				Clear Write	
10.0	Land - and a real shall a set of the state of the set	Amaran			
0.00					
-10.0				Average	
20.0					
30.0 allowed and and and and and and and and and an		and the second sec	Marken warde		
40.0					
-40.0				Max Hold	
-50.0					
Center 1.74500 GHz			Span 75.00 MHz		
#Res BW 750 kHz	#VBW 2.4	MHz	Sweep 1 ms	Min Hold	
Occupied Bandwidth	Total	Power 31.0	dBm		
		10wci 31.0	(IBIII		
28.710	JMHZ			Detector	
Transmit Freq Error -36	.739 kHz % of C	BW Power 99	.00 %	Auto <u>Man</u>	
x dB Bandwidth 30	).47 MHz x dB	-26.	00 dB		
MSG		STATUS			

Plot 7-49. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM QPSK - Full RB)



Plot 7-50. Occupied Bandwidth Plot (NR Band n66 - 30.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-51. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-52. Occupied Bandwidth Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be post of @ element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-54. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz DFT-s-OFDM BPSK - Full RB)

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Plot 7-55. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB)



Plot 7-56. Occupied Bandwidth Plot (NR Band n66 - 15.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: C3K1995	CTEST	PART 27 / RSS-130 / RSS-139	_	Approved by:
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Keysight Spectrum Analyzer - Occupied BW				
LXI RE 50 Ω DC CORREC	SENSE:INT	ALIGN AUTO	11:01:16 PM Jun 14, 2021 Radio Std: None	Trace/Detector
	Trig: Free Run	Avg Hold:>100/100		
#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBm				
30.0				
20.0				Clear Write
10.0	- Contraction of the second se			
0.00				
0.00				Avorado
-10.0				Average
-20.0		4.1		
-30.0 Jonand and the second		- march of	Manun march martine on	
-40.0				Max Hold
-50.0				
Center 1 74500 GHz			Snan 25 00 MHz	
Res BW 240 kHz	#VBW 750 k	Hz	Sweep 1 ms	Min Hold
				MITTOIG
Occupied Bandwidth	Total P	ower 31.5	dBm	
9.0113 MI	z			Detector
				Peak►
Transmit Freq Error -165.24	Hz % of OE	BW Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth 9.790 M	lHz xdB	-26.	00 dB	
MSG		STATUS		

Plot 7-57. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-58. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-59. Occupied Bandwidth Plot (NR Band n66 - 10.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-60. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: C3K1995	CTEST	PART 27 / RSS-130 / RSS-139		Approved by:
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Keysight Spectrum Analyzer - Occupied BW									
LX/ RL RF 50 Ω D	C CORREC	SENSE:INT Center Freg: 1.7450	ALIGN	AUTO 11:10:34 P Radio Std	MJun 14, 2021	Trace	/Detector		
	-+-	Trig: Free Run	Avg Hold: 100/	100					
	#IFGain:Low	#Atten: 36 dB		Radio Dev	rice: BTS				
10 dB/div Ref 30.00 d	IBm								
20.0									
10.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			C	lear Write		
-10.0									
20.0			h				Average		
-20.0	mm		• • •	Λ			Average		
-30.0				Mary more	M. Maro				
-40.0									
-50.0							Max Hold		
-60.0									
Center 1.745000 GHz				Span 1	2.50 MHz				
Res BW 120 kHz		VBW 1.2 M	Hz	Swe	ep 1ms		Min Hold		
				00 0 IB					
Occupied Bandwi	idth	Total F	'ower	28.3 dBm					
	4.5125 M⊦	1z					Detector		
	0.770 1			00.00.0/		A	Peak►		
I ransmit Freq Error	-9.772 K	HZ % OF O	BW Power	99.00 %		Auto	ivian		
x dB Bandwidth	5.000 M	Hz xdB		-26.00 dB					
MSG				STATUS					

Plot 7-61. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB)



Plot 7-62. Occupied Bandwidth Plot (NR Band n66 - 5.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST. Proved to be prost of @demonst	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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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 10<sup>th</sup> 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

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

- 1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (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 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- 2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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### LTE Band 71

🔤 Ke	ysight Spe	ctrum Analy:	zer - Swept	t SA										
<b>l,XI</b> R	L	RF	50 Ω	DC	CORREC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO	12:29:25 AM	May 28, 2021	F	requency
PAS	S				PNO: Fa IFGain:L	ow	Trig: Free Atten: 30	e Run dB			TYF De			
10 di	3/div	Ref 20	.00 dE	3m						N	lkr1 658. -66.3	10 MHz 84 dBm		Auto Tune
10.0	Trace	e 1 Pass											34	<b>Center Freq</b> 6.000000 MHz
													3	Start Freq 0.000000 MHz
													66	Stop Freq 2.000000 MHz
													6 <u>Auto</u>	<b>CF Step</b> 3.200000 MHz Man
-60.0		an and a state of the		e ( salida di ce a sa s	ال اللہ اللہ اللہ اللہ اللہ اللہ اللہ ا	ور باشترین	n fan se in 22 May 2 mar y 1 m			and and the filments of	fer at 100 and 100 and 100 and 100 and	1		Freq Offset 0 Hz
	-	and the second		18.45 <u>6</u> 67 <u>6</u> 7	and the second sec		and the second	and a set of the set of the set of the						Scale Type
Star #Re	t 30.0 s BW	MHz 100 kHz	2		#	VBW	300 kHz		s	weep 3	Stop 6 0.34 ms (1	62.0 MHz 2641 pts)	Log	Lin
MSG										STATU	JS			

Plot 7-63. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Low Channel)



Plot 7-64. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Low Channel)

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🔤 Keysight Sp	ectrum Analyzer - Si	wept SA									
LXI RL	RF 50 9	Ω DC	CORREC	SEN	SE:INT	#Avg Tvp	ALIGN AUTO	12:34:44 A TRAC	M May 28, 2021	Freq	uency
PASS			PNO: Fast ↔ IFGain:Low	Atten: 3	e Run 6 dB			TYI Di			
10 dB/div	Ref 20.00	dBm					Μ	kr1 3.79 -40.7	4 5 GHz 23 dBm	A	uto i une
10.0 Trac	e 1 Pass									Ce 5.5000	<b>nter Freq</b> 00000 GHz
-10.0										S 1.0000	<b>Start Freq</b> D0000 GHz
-20.0										<b>S</b> 10.0000	<b>Stop Freq</b> 00000 GHz
-40.0				,	$\sim$					900.00 <u>Auto</u>	<b>CF Step</b> 00000 MHz Man
-60.0										Fr	e <b>q Offset</b> 0 Hz
-70.0										So	ale Type
Start 1.00 #Res BM	0 GHz 1.0 MHz		#VB	A/ 3.0 MHz			ween_1	Stop 10	.000 GHz 8001 nts)	Log	Lin
MSG	-12-111-						STATU	JS	ocor pro)		

Plot 7-65. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Low Channel)

Keysight Spectrum Analyzer - Swept SA															- ē 💌
<b>l,XI</b> R	L	RF	50 Ω	DC	CORREC		SE	NSE:INT	#Avg	ALI Type:	GN AUTO	12:30:15 A TRA	M May 28, 2021	F	requency
PAS	SS				PNO: F IFGain:L	ast ⊶⊶ ∟ow	Trig: Fre Atten: 3	e Run 0 dB				TY D			
10 4	- Bidiu	Dof 2	0 00 d	Bm							Μ	kr1 604 -66.5	.35 MHz 31 dBm		Auto Tune
Log	Trace	1 Pas	0.00 u	BIII				Y							
		/ 1 43	5												Center Freq
10.0														34	6.500000 MHz
0.00															
0.00															Start Freq
-10.0														3	0.000000 MHz
-20.0															Stop Freq
20.0														66	3.000000 MHz
-30.0															
-40.0	<u> </u>													6	CF Step
														Auto	Man
-50.0	<u> </u>														
60.0															Freq Offset
-60.0													<b>↓</b> <sup>1</sup>		0 Hz
-70.0	incelling a life to		an an an an an an Aragan Ar an ar an an Aragan	Marata at all.						dinin a diti					
															Scale Type
Star	L	MH7						<u> </u>				Stop 6	63.0 MHz	Log	Lin
#Re	s BW	100 kH	z		;	#VBW	300 kHz	z		Sw	eep 30	.38 ms (1	2661 pts)		
MSG											STATUS				

Plot 7-66. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Mid Channel)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be post of @element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Ke	ysight Spe	trum Analyzer - S	Swept SA									
<b>l,XI</b> R	L	RF 50	ΩDC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	12:30:23 AM	May 28, 2021	F	requency
PAS	S			PNO: Fast ↔ IFGain:Low	Atten: 30	) dB			DE	ANNNNN		Auto Tune
10 dE	3/div	Ref 20.00	dBm					M	-65.8	15 MHZ 20 dBm		riato rano
10.0	Trace	1 Pass									849	Center Freq 9.000000 MHz
											691	Start Freq 3.000000 MHz
											1.00	<b>Stop Freq</b> 0000000 GHz
											30 <u>Auto</u>	<b>CF Step</b> 0.200000 MHz Man
			heliterentet	Nich and Handarian Manual Vie	wither with the providence of	press of the states	1	ere, <del>tradicipalitation</del>	in Proparti antistadan	nih yaziri		Freq Offset 0 Hz
												Scale Type
Star #Re:	t 0.69 s BW	30 GHz 100 kHz		#VB\	W 300 kHz			Sweep 1	Stop 1.0 4.50 ms (	000 GHz 6041 pts)	Log	Lin
MSG								STATUS	5			

Plot 7-67. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Mid Channel)



Plot 7-68. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - Mid Channel)

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🔤 Ke	ysight Spe	ctrum Analyzer -	Swept SA									×
<b>l,XI</b> R	L	RF 5	0Ω DC	CORREC	SEN	ISE:INT	#Ava Tvp	ALIGN AUTO e: RMS	12:32:43 AM	1 May 28, 2021	Frequency	
PAS	s			PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 30	e Run I dB			TYF DE		Auto Ti	
10 di	3/div	Ref 20.0	0 dBm					M	kr1 661. -66.1	85 MHz 93 dBm	Auto It	Ine
10.0	Trace	e 1 Pass									Center Fr 346.500000 M	req <sup>VIHz</sup>
											Start Fi 30.000000 M	req <sup>MHz</sup>
											Stop Fr 663.000000 N	req <sup>MHz</sup>
											CF St 63.300000 M <u>Auto</u> M	<b>tep</b> MHz Man
		en e e e elliste dista		channel and a second base	and the day have been to state a state	the design of the state	a sea lles año de setemetro antes gebe			1	Freq Off 0	i <b>set</b> ) Hz
											Scale Ty	уре
Star #Re	t 30.0 s BW	MHz 100 kHz		#VBV	V 300 kHz		s	weep 30	Stop 6 .38 ms (1	63.0 MHz 2661 pts)	Log	Lin
MSG								STATUS				

Plot 7-69. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - High Channel)



Plot 7-70. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - High Channel)

FCC ID: C3K1995	<u>CAPCTEST</u>	PART 27 / RSS-130 / RSS-139	Microsoft	Approved by:
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🔤 Key	/sight Spec	trum Analyzer - S	Swept SA								
<b>lxi</b> Ri	L	RF 50	ΩDC	CORREC	SEN	ISE:INT	#Avg Type	ALIGN AUTO e: RMS	12:33:34 A TRAC	M May 28, 2021	Frequency
PAS	S			PNO: Fast ++ IFGain:Low	#Atten: 3	6 dB			D		
10 dE	3/div	Ref 20.00	dBm					Μ	kr1 3.79 -40.8	8 0 GHz 21 dBm	Auto Tune
10.0	Trace	1 Pass									Center Freq 5.50000000 GHz
0.00 -10.0											Start Freq 1.000000000 GHz
-20.0 -30.0											<b>Stop Freq</b> 10.000000000 GHz
-40.0 -50.0						$\sim$		~~~			CF Step 900.000000 MHz <u>Auto</u> Man
-60.0											Freq Offset 0 Hz
-70.0 Star	t 1 000	GH7							Stop 10	000 GH7	Scale Type
#Res	s BW 1	.0 MHz		#VBW	/ 3.0 MHz		S	weep 1	5.60 ms (1	8001 pts)	
MSG								STATU	IS		

Plot 7-71. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - 1 RB - High Channel)

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### LTE Band 12

🔤 Ke	ysight Spe	ctrum Analy.	zer - Swept	t SA										- P X
<b>l,XI</b> R	L	RF	50 Ω	DC	CORREC		SEN	ISE:INT	#Avg Tvp	ALIGN AUTO E: RMS	01:36:48 A	May 28, 2021	F	requency
PAS	S				PNO: Fa IFGain:L	ast ↔→ .ow	Trig: Free Atten: 30	Run dB			TYF DE			
10 di	3/div	Ref 20	.00 dE	3m						Ν	/kr1 697. -57.3	85 MHz 26 dBm		Auto Tune
10.0	Trace	e 1 Pass											36:	<b>Center Freq</b> 3.950000 MHz
													3(	Start Freq 0.000000 MHz
													691	Stop Freq 7.900000 MHz
-40.0 -50.0													60 <u>Auto</u>	CF Step 6.790000 MHz Man
		a a fa faith sea a		almut at limit	1. 1	d also selle addubate	al at 1 Million at the of School School		ta a set a star at a dan stafa			1		Freq Offset 0 Hz
-70.0		a	6			or landson the solution of	<u>an an tha an tao a</u> thù an tao an							Scale Type
Star #Re	t 30.0 s BW	MHz 100 kHz	2		#	¢VBW	300 kHz		s	weep 3	Stop 6 32.06 ms (1	97.9 MHz 3361 pts)	Log	Lin
MSG										STAT	US			

Plot 7-72. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)



Plot 7-73. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST. Proud to be post of @ simmat	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Keysight	Spectrum Analyze	er - Swept SA									
LXI RL	RF	50 Ω DC	CORREC	SEN	ISE:INT	#Avg Tvp	ALIGN AUTO e: RMS	01:37:34 A	M May 28, 2021	Free	quency
PASS			PNO: Fast ↔ IFGain:Low	Atten: 36	Run 6 dB			TYI Di			
10 dB/div	Ref 20.	00 dBm					Μ	kr1 3.78 -40.7	7 5 GHz 94 dBm	-	auto i une
	ace 1 Pass									Ce 5.5000	e <b>nter Freq</b> 000000 GHz
-10.0										1.0000	<b>Start Freq</b> 000000 GHz
-20.0										10.0000	Stop Freq 000000 GHz
-40.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim$		~			900.0 <u>Auto</u>	<b>CF Step</b> 000000 MHz Man
-60.0										FI	r <b>eq Offset</b> 0 Hz
-70.0										S	cale Type
Start 1. #Res B	000 GHz W 1.0 MHz		#VBV	V 3.0 MHz		s	weep_1	Stop 10 5.60 ms (1	.000 GHz 8001 pts)	Log	Lin
MSG							STAT	US	pro/		

Plot 7-74. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Low Channel)

🔤 Ke	ysight Spe	trum Analy	zer - Swej	pt SA										
LXI R	L	RF	50 Ω	DC	CORREC		SEN	NSE:INT	#Avg Tvp	ALIGN AUT	0 01:37:55 TR	AM May 28, 2021	F	requency
PAS	S				PNO: F IFGain:	ast ↔ Low	Trig: Free Atten: 30	e Run ) dB			т			
10 di	3/div	Ref 20	).00 d	Bm							Mkr1 697 -64	7.80 MHz .92 dBm		Auto Tune
10.0	Trace	1 Pass	;										( 364	Center Freq 4.000000 MHz
0.00													30	Start Freq 0.000000 MHz
-20.0													698	Stop Freq 3.000000 MHz
-40.0													66 <u>Auto</u>	CF Step 5.800000 MHz Man
-50.0 -60.0												1		Freq Offset 0 Hz
-70.0						a na shi ƙara ya sa sanaik a					ennis 33a offan ferfillen offan ferfillen			Scale Type
Star	t 30.0	MHz				43 (1514)	000 1-11-				Stop	698.0 MHz	Log	Lin
#Re	SBW	IUU KH	2			#VBW	300 KHZ			sweep	32.06 ms (	(13361 pts)		
MSG										STA	lus			

Plot 7-75. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Penal to be part of @riemand	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Keysight Spectrur	m Analyzer - Swept SA									
L <mark>XI</mark> RL	RF 50 Ω DC	CORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	01:38:09 AM	May 28, 2021	Fr	equency
PASS		PNO: Fast ++ IFGain:Low	<ul> <li>Trig: Free Atten: 30</li> </ul>	Run dB			TYF DE			Auto Tune
10 dB/div R	ef 20.00 dBm					IVII	-64.3	25 MHZ 83 dBm		
10.0	Pass								<b>(</b> 858	<b>Center Freq</b> 000000 MHz
-10.0									716	Start Freq .000000 MHz
-20.0									1.00	<b>Stop Freq</b> 0000000 GHz
-40.0									28 <u>Auto</u>	<b>CF Step</b> .400000 MHz Man
-60.0 - 1	al of sociality as in the social state	Appl being an	put gggladithe and	(	and a state of the	an second stand of the second stands and second stands are second stands at the second stands at the second st	h <del>maniningan biq</del>	et we sport jurne in we had been		F <b>req Offset</b> 0 Hz
-70.0										Scale Type
Start 0.7160 #Res BW 10	GHz 0 kHz	#VBW	/ 300 kHz			Sweep 1	Stop 1.0 3.63 ms (	000 GHz 5681 pts)	Log	Lin
MSG						STATUS				

Plot 7-76. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)



Plot 7-77. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - Mid Channel)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be part of @ element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Ke	ysight Spe	ctrum Analyzer	- Swept SA									
L <mark>XI</mark> R	L	RF 5	0Ω DC	CORREC	SEN	ISE:INT	#Ava Tvp	ALIGN AUTO	01:38:56 AM	May 28, 2021	Frequ	ency
PAS	S			PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 30	e Run I dB			TYF DE			
10 dE Loa	3/div	Ref 20.0	0 dBm					M	kr1 692. -65.2	40 MHz 65 dBm	Au	ito Tune
10.0	Trace	e 1 Pass									Cen 364.000	<b>ter Freq</b> 0000 MHz
											St 30.000	a <b>rt Freq</b> 0000 MHz
											St 698.000	o <b>p Freq</b> 0000 MHz
											66.800 <u>Auto</u>	CF Step 0000 MHz Man
		and the substantial lines	habidabali sedan se di kera	the case's define the other independent	den Herstell die Jeffernen Auf					need and here the	Fre	<b>q Offset</b> 0 Hz
											Sca	ale Type
Star #Re	t 30.0 s BW	MHz 100 kHz		#VBV	V 300 kHz		s	weep 32	Stop 6 .06 ms (1	98.0 MHz 3361 pts)	Log	Lin
MSG								STATUS				

Plot 7-78. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)



Plot 7-79. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)

FCC ID: C3K1995 IC: 3048A-1995		PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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🔤 Key	/sight Spect	trum Analyzer - S	wept SA									F X
<b>l,XI</b> RI	L	RF 50	Ω DC (	CORREC	SEN	SE:INT	#Avg Typ	ALIGN AUTO e: RMS	01:39:40 A	May 28, 2021	Frequen	сy
PAS	S			PNO: Fast ↔ IFGain:Low	#Atten: 3	e Run 6 dB			TYI Di			
								N	lkr1 3.78	2 5 GHz	Auto	Tune
10 dE Log	3/div	Ref 20.00	dBm						-40.6	99 dBm		
	Trace	1 Pass									Center	Freq
10.0											5.50000000	0 GHz
0.00												
											Start	Freq
-10.0											1.00000000	0 GHz
-20 N												_
											10 0000000	0 GHz
-30.0												
-40.0				<b>♦</b> <sup>1</sup>							CF	Step
-40.0				<u>س</u> مبر	and the second	~~~	and a second second				900.00000 Auto	0 MHz Man
-50.0												
c0 0											FreqC	Offset
-00.0												0 Hz
-70.0												-
											Scale	Туре
Star	t 1.000	GHz		40 (F)14					Stop 10	.000 GHz	Log	Lin
#Res	SBW 1	.U WIHZ		#VBM	3.0 WHZ		5	weep	15.60 ms (1	8001 pts)		
MSG								STAT	US			

Plot 7-80. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - 1 RB - High Channel)

FCC ID: C3K1995 IC: 3048A-1995	PCTEST Proved to be preed at @element	PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager		
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### LTE Band 13

🔤 Keysight Spectrum Analyzer - Swept SA 🛛 💼														
l <b>x</b> i R	L	RF	50 Ω	DC	CORREC		SEI	NSE:INT	#Avg Tvp	ALIGN AUTO	02:24:10 A	M May 28, 2021	F	requency
PAS	S				PNO: Fa	ast ↔→ .ow	Trig: Free Atten: 30	e Run ) dB			TYI DI			
10 dE	3/div	Ref 20	.00 dE	3m						N	lkr1 771. -65.	40 MHz 50 dBm		Auto Tune
10.0	Trace	e 1 Pass											40	<b>Center Freq</b> 3.500000 MHz
													3	Start Freq 0.000000 MHz
													77	<b>Stop Freq</b> 7.000000 MHz
													7 <u>Auto</u>	<b>CF Step</b> 4.700000 MHz Man
		ر بنای (روی اور اور می		ي أي المحالية في الم	من زير المعادية	Role Dati da mar ada				te - to the distance is a second		1. Argenterspielersen		Freq Offset 0 Hz
		and an	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	11. a	and an an an and a set	ر و الله الله الله الله الله الله الله ال								Scale Type
Start 30.0 MHz         Stop 777.0 MHz           #Res BW 100 kHz         #VBW 300 kHz         Sweep 35.86 ms (14941 pts)					Log	<u>Lin</u>								
MSG										STATU	IS			

Plot 7-81. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)



#### Plot 7-82. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)

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