

PCTEST ENGINEERING LABORATORY, INC.

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## MEASUREMENT REPORT

LTE

Applicant Name: LG Electronics USA, INC 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States Date of Testing: 6/29 - 7/31/2018 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1806290137-03-R3.ZNF

FCC ID:		ZNFQ910QM				
APPLICANT:		LG Electronics USA, INC				
Application Type:		Certification				
Model:		LM-Q910QM				
	Additional Model(s):	LMQ910QM, Q910QM, LM-Q910UM, LMQ910UM, Q910UM				
	EUT Type:	Portable Handset				
	FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)				
	FCC Rule Part(s):	22, 24, & 27				
	Test Procedure(s):	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.

The revised Test Report (S/N: 1M1806290137-03-R3.ZNF) supersedes and replaces the previously issued test report (S/N: 1M1806290137-03-R2.ZNF) 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 22, 24, & 27



			ERP			
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Emission Designator	Modulation
LTE Band 12	27	699.7 - 715.3	0.083	19.21	1M10G7D	QPSK
LTE Band 12	27	699.7 - 715.3	0.068	18.31	1M11W7D	16QAM
LTE Band 12	27	699.7 - 715.3	0.054	17.34	1M09W7D	64QAM
LTE Band 12	27	700.5 - 714.5	0.086	19.33	2M71G7D	QPSK
LTE Band 12	27	700.5 - 714.5	0.071	18.49	2M71W7D	16QAM
LTE Band 12	27	700.5 - 714.5	0.055	17.42	2M71W7D	64QAM
LTE Band 12/17	27	701.5 - 713.5	0.087	19.38	4M56G7D	QPSK
LTE Band 12/17	27	701.5 - 713.5	0.073	18.63	4M52W7D	16QAM
LTE Band 12/17	27	701.5 - 713.5	0.056	17.45	4M54W7D	64QAM
LTE Band 12/17	27	704 - 711	0.088	19.44	9M02G7D	QPSK
LTE Band 12/17	27	704 - 711	0.072	18.60	9M03W7D	16QAM
LTE Band 12/17	27	704 - 711	0.055	17.40	9M00W7D	64QAM
LTE Band 13	27	779.5 - 784.5	0.096	19.82	4M52G7D	QPSK
LTE Band 13	27	779.5 - 784.5	0.076	18.81	4M52W7D	16QAM
LTE Band 13	27	779.5 - 784.5	0.060	17.78	4M53W7D	64QAM
LTE Band 13	27	782	0.093	19.69	8M99G7D	QPSK
LTE Band 13	27	782	0.075	18.77	8M97W7D	16QAM
LTE Band 13	27	782	0.058	17.66	8M99W7D	64QAM
LTE Band 26/5	22H	824.7 - 848.3	0.107	20.28	1M10G7D	QPSK
LTE Band 26/5	22H	824.7 - 848.3	0.088	19.46	1M10W7D	16QAM
LTE Band 26/5	22H	824.7 - 848.3	0.066	18.21	1M09W7D	64QAM
LTE Band 26/5	22H	825.5 - 847.5	0.102	20.10	2M72G7D	QPSK
LTE Band 26/5	22H	825.5 - 847.5	0.083	19.19	2M71W7D	16QAM
LTE Band 26/5	22H	825.5 - 847.5	0.066	18.22	2M71W7D	64QAM
LTE Band 26/5	22H	826.5 - 846.5	0.105	20.21	4M54G7D	QPSK
LTE Band 26/5	22H	826.5 - 846.5	0.081	19.10	4M52W7D	16QAM
LTE Band 26/5	22H	826.5 - 846.5	0.065	18.16	4M51W7D	64QAM
LTE Band 26/5	22H	829 - 844	0.111	20.47	9M03G7D	QPSK
LTE Band 26/5	22H	829 - 844	0.092	19.62	9M03W7D	16QAM
LTE Band 26/5	22H	829 - 844	0.070	18.47	9M04W7D	64QAM
LTE Band 26	22H	831.5 - 841.5	0.108	20.34	13M5G7D	QPSK
LTE Band 26	22H	831.5 - 841.5	0.091	19.61	13M4W7D	16QAM
LTE Band 26	22H	831.5 - 841.5	0.075	18.77	13M4W7D	64QAM

EUT Overview (<1GHz)

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			EI	RP		
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Emission Designator	Modulation
LTE Band 66/4	27	1710.7 - 1779.3	0.172	22.36	1M09G7D	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.152	21.83	1M10W7D	16QAM
LTE Band 66/4	27	<u>1710.7 - 1779.3</u> 1711.5 - 1778.5	0.138	21.41	1M09W7D 2M71G7D	64QAM QPSK
LTE Band 66/4 LTE Band 66/4	27 27	1711.5 - 1778.5	0.182	22.60 21.89	2M71W7D	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.100	20.76	2M72W7D	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.173	22.38	4M55G7D	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.159	22.02	4M53W7D	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.129	21.10	4M53W7D	64QAM
LTE Band 66/4 LTE Band 66/4	27 27	<u> 1715 - 1775</u> 1715 - 1775	0.168	22.25 21.45	9M02G7D 8M99W7D	QPSK 16QAM
LTE Band 66/4	27	1715 - 1775	0.140	20.42	9M03W7D	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.164	22.14	13M5G7D	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.153	21.86	13M5W7D	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.124	20.94	13M5W7D	64QAM
LTE Band 66/4 LTE Band 66/4	27 27	<u>1720 - 1770</u> 1720 - 1770	0.169	22.27	18M0G7D 18M0W7D	QPSK 16QAM
LTE Band 66/4	27	1720 - 1770	0.159	22.00 21.00	18M0W7D 18M0W7D	64QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.120	21.80	1M10G7D	QPSK
LTE Band 25/2	24E	1850.7 - 1914.3	0.131	21.17	1M11W7D	16QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.106	20.26	1M10W7D	64QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.136	21.33	2M72G7D	QPSK
LTE Band 25/2	24E 24E	1851.5 - 1913.5	0.126	21.01	2M71W7D	16QAM
LTE Band 25/2 LTE Band 25/2	24E 24E	1851.5 - 1913.5 1852.5 - 1912.5	0.107	20.31 21.63	2M72W7D 4M54G7D	64QAM QPSK
LTE Band 25/2	24L 24E	1852.5 - 1912.5	0.140	21.03	4M53W7D	16QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.098	19.93	4M54W7D	64QAM
LTE Band 25/2	24E	1855 - 1910	0.148	21.69	9M02G7D	QPSK
LTE Band 25/2	24E	1855 - 1910	0.126	21.00	9M05W7D	16QAM
LTE Band 25/2	24E	1855 - 1910	0.107	20.28	9M02W7D	64QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.148	21.70	13M5G7D	QPSK 1604M
LTE Band 25/2 LTE Band 25/2	24E 24E	1857.5 - 1907.5 1857.5 - 1907.5	0.121	20.81 19.87	13M5W7D 13M5W7D	16QAM 64QAM
LTE Band 25/2	24E	1860 - 1905	0.140	21.45	18M0G7D	QPSK
LTE Band 25/2	24E	1860 - 1905	0.121	20.81	18M0W7D	16QAM
LTE Band 25/2	24E	1860 - 1905	0.093	19.66	18M0W7D	64QAM
LTE Band 30	27	2307.5 - 2312.5	0.076	18.81	4M54G7D	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.066	18.21	4M54W7D	16QAM
LTE Band 30 LTE Band 30	27 27	2307.5 - 2312.5 2310	0.056	17.52 17.53	4M54W7D 9M02G7D	64QAM QPSK
LTE Band 30	27	2310	0.037	16.73	9M05W7D	16QAM
LTE Band 30	27	2310	0.041	16.11	9M02W7D	64QAM
LTE Band 7	27	2502.5 - 2567.5	0.146	21.65	4M53G7D	QPSK
LTE Band 7	27	2502.5 - 2567.5	0.133	21.24	4M53W7D	16QAM
LTE Band 7	27	2502.5 - 2567.5 2505 - 2565	0.107	20.31	4M55W7D	64QAM
LTE Band 7 LTE Band 7	27 27	2505 - 2565 2505 - 2565	0.154 0.146	21.88 21.63	9M00G7D 9M01W7D	QPSK 16QAM
LTE Band 7	27	2505 - 2565	0.140	20.18	9M01W7D	64QAM
LTE Band 7	27	2507.5 - 2562.5	0.156	21.93	13M5G7D	QPSK
LTE Band 7	27	2507.5 - 2562.5	0.145	21.62	13M5W7D	16QAM
LTE Band 7	27	2507.5 - 2562.5	0.115	20.61	13M5W7D	64QAM
LTE Band 7	27 27	<u>2510 - 2560</u> 2510 - 2560	0.172	22.36 22.03	18M0G7D	QPSK 160AM
LTE Band 7 LTE Band 7	27	2510 - 2560 2510 - 2560	0.160	22.03	17M9W7D 18M0W7D	16QAM 64QAM
LTE Band 41	27	2498.5 - 2687.5	0.220	23.42	4M52G7D	QPSK
LTE Band 41	27	2498.5 - 2687.5	0.178	22.51	4M50W7D	16QAM
LTE Band 41	27	2498.5 - 2687.5	0.144	21.57	4M52W7D	64QAM
LTE Band 41	27	2501 - 2685	0.242	23.83	9M02G7D	QPSK 4004M
LTE Band 41	27	2501 - 2685	0.196	22.93	9M01W7D	16QAM
LTE Band 41 LTE Band 41	27 27	<u>2501 - 2685</u> 2503.5 - 2682.5	0.148	21.71 23.77	9M01W7D 13M5G7D	64QAM QPSK
LTE Band 41	27	2503.5 - 2682.5	0.193	22.86	13M5W7D	16QAM
LTE Band 41	27	2503.5 - 2682.5	0.146	21.64	13M5W7D	64QAM
LTE Band 41	27	2506 - 2680	0.245	23.89	18M0G7D	QPSK
LTE Band 41	27	2506 - 2680	0.199	22.98	18M0W7D	16QAM
LTE Band 41	27	2506 - 2680	0.150	21.75	17M9W7D	64QAM

## EUT Overview (>1GHz)

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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 17025-2005 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 **LG Portable Handset FCC ID: ZNFQ910QM**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 04274, 04217, 04266, 04290, 04233

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore, test data provided in this report covers Band 17 as well as Band 12.

LTE Band 26 (814.7 – 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.

LTE Band 66 (1710 - 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz). Therefore, test data provided in this report covers Band 4 as well as Band 66.

LTE Band 25 (1850 - 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

### 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.

## 2.4 EMI Suppression Device(s)/Modifications

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

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement 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 Block C Frequency Range

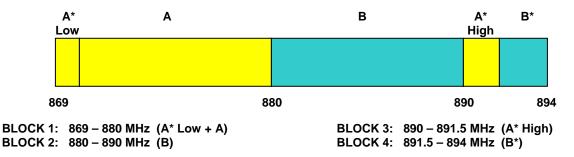
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

## 3.3 Block A Frequency Range

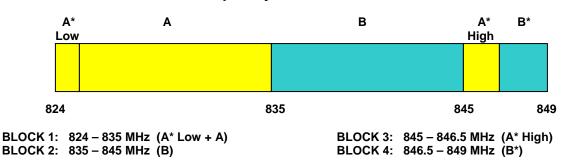
<u>698-746 MHz band</u>. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

Block A: 698-704 MHz and 728-734 MHz; Block B: 704-710 MHz and 734-740 MHz; and Block C: 710-716 MHz and 740-746 MHz.

## 3.4 Cellular - Base Frequency Blocks

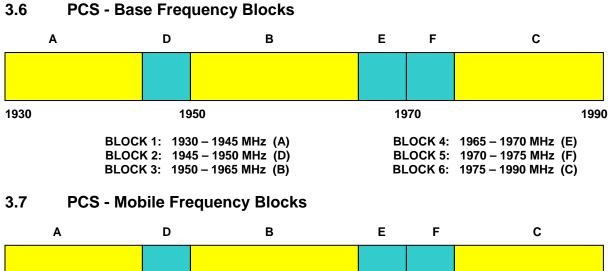


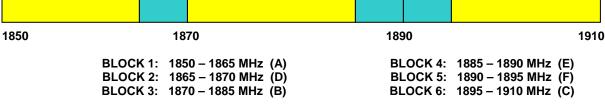
## 3.5 Cellular - Mobile Frequency Blocks



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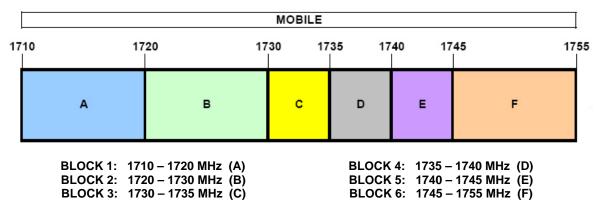
### 3.8 AWS - Base Frequency Blocks

			BASE				Γ
21	10 21	20 21	30 21	35 21	40 21	45 2	155
	A	в	с	D	E	F	
		- 2120 MHz  (A) 20 – 2130 MHz  (B) 30 – 2135 MHz  (C)			( 5:    2140 –	Ю MHz (D) 2145 MHz (E) 2155 MHz (F)	

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## 3.9 AWS - Mobile Frequency Blocks



### 3.10 WCS – Mobile/Base Frequency Blocks

The following frequencies are available for WCS in the 2305-2320 MHz and 2345-2360 MHz bands:

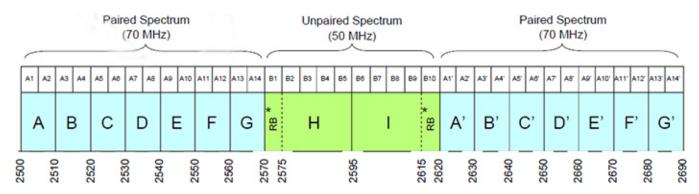
BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

BLOCK 2: 2310-2315 and 2355-236 MHz (B)

BLOCK 3: 2315-2320 MHz (C)

BLOCK 4: 2345-2350 MHz (D)

### 3.11 BRS/EBS Frequency Block



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## 3.12 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. 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].

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10log<sub>10</sub>(Power [Watts]). For Band 7 and 41, the calculated  $P_d$  levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of 55 + 10log<sub>10</sub>(Power [Watts]). For Band 30, the calculated  $P_d$  levels are compared to the absolute spurious emission limit of -40dBm which is equivalent to the required minimum attenuation of 70 + 10log<sub>10</sub>(Power [Watts]).

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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
-	LTx2	Licensed Transmitter Cable Set	8/10/2017	Annual	8/10/2018	LTx2
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Huber + Suhner	Sucoflex 102A	40GHz Radiated Cable Set	1/23/2018	Annual	1/23/2019	251425001
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/20/2018	Annual	3/20/2019	MY49430494
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A		N/A	QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		N/A	11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2017	Annual	10/13/2018	102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/31/2017	Annual	7/31/2018	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/11/2017	Annual	8/11/2018	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	9/11/2017	Annual	9/11/2018	102132
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/25/2018	Annual	6/25/2019	102133
Anritsu	MT8820C	Radio Communication Analyzer	10/25/2017	Annual	10/25/2018	6201144419
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Schwarzbeck	UHA 9105	Dipole Antenna	8/26/2016	Biennial	8/26/2018	2696
Rohde & Schwarz	TS-PR8	Preamplifier-Antenna SYS; 30MHz-8GHz	10/19/2017	Annual	10/19/2018	102324
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Seekonk	NC-100	Torque Wrench	12/28/2017	Annual	12/28/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

### Notes:

1. 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 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).

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## 7.0 TEST RESULTS

## 7.1 Summary

Company Name:	LG Electronics USA, INC
FCC ID:	ZNFQ910QM
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>LTE</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference	
2.1049	Occupied Bandwidth	N/A	CONDUCTED		PASS	Section 7.2
2.1051 2.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Out of Band Emissions	> 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of- band emissions		PASS	Section 7.3, 7.4	
27.53(m)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)		PASS	Section 7.3, 7.4	
27.53(a)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(a)		PASS	Section 7.3, 7.4	
24.232(d)	Peak-Average Ratio	< 13 dB		PASS	Section 7.5	
2.1046	Transmitter Conducted Output Power	N/A		PASS	See RF Exposure Report	
2.1055 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)		PASS	Section 7.8	

Table 7-1. Summary of Conducted Test Results

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FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 26/5)	< 7 Watts max. ERP		PASS	Section 7.6
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 12/17, 13)	< 3 Watts max. ERP		PASS	Section 7.6
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 25/2, 7, 41)	< 2 Watts max. EIRP		PASS	Section 7.6
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 66/4)	< 1 Watts max. EIRP		PASS	Section 7.6
27.50(a)(3)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 Watts max. EIRP		PASS	Section 7.6
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12/17, 26/5, 66/4, 25/2)	> 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions	RADIATED	PASS	Section 7.7
27.53(f)	Undesirable Emissions (Band 13)	< -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 7.7
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10log <sub>10</sub> (P[Watts])		PASS	Section 7.7
27.53(m)	Undesirable Emissions (Band 7, 41)	Undesirable emissions must meet the limits detailed in 27.53(m)		PASS	Section 7.7

Table 7-2. Summary of Radiated Test Results

#### 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 (Sections 7.2, 7.3, 7.4, 7.5) were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) 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 "LTE Automation," Version 4.8.

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## 7.2 Occupied Bandwidth

#### **Test Overview**

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

#### **Test Settings**

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW  $\geq$  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.



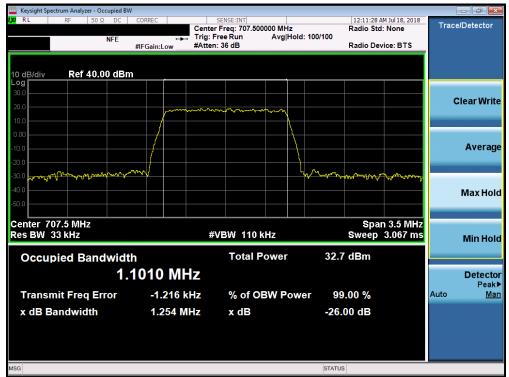
Figure 7-1. Test Instrument & Measurement Setup

#### Test Notes

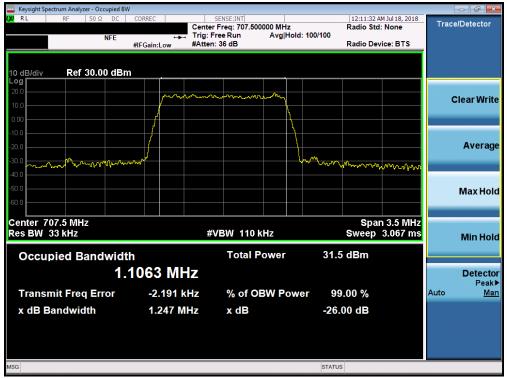
None.

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Plot 7-1. Occupied Bandwidth Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



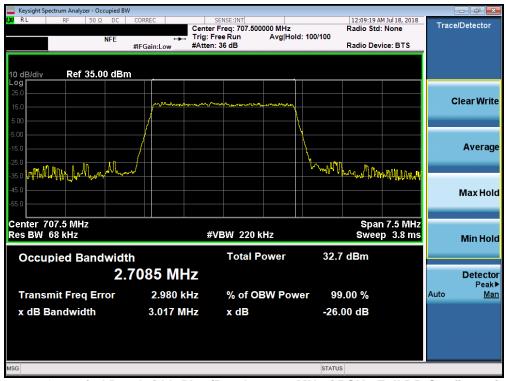
Plot 7-2. Occupied Bandwidth Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

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Plot 7-3. Occupied Bandwidth Plot (Band 12 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

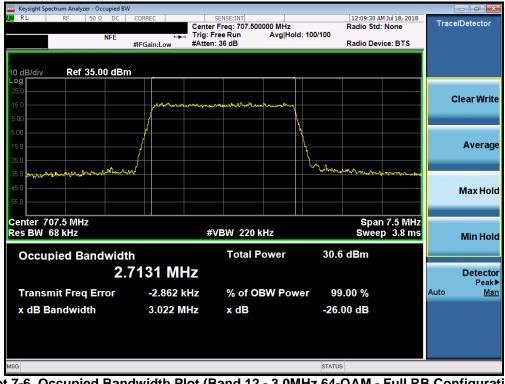
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	.G	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B						
LX/RL RF 50Ω DC	CORREC	SENSE:INT r Freg: 707.500000 MHz	12:09:25 Radio Sto	AM Jul 18, 2018 d: None	Trace/I	Detector
NFE		Free Run Avg Ho n: 36 dB	Id: 100/100 Radio De	vice: BTS		
	#IFGain:Low #Atten	1. 00 GB	Radio Be	vice. DTS		
10 dB/div Ref 35.00 dBr	2					
Log						
25.0					CI	ear Write
15.0					0.	
5.00						
-5.00	/					_
-15.0						Average
-25.0			- Wind Marine			
COLO AL VILLE I I III VILLE I IIII III VILLE I IIII III			- All All All All All All All All All Al	where where a first of		
-45.0					P	Max Hold
-55.0						
Center 707.5 MHz			Spa	n 7.5 MHz		
Res BW 68 kHz	#	VBW 220 kHz	Swee	ep 3.8 ms	1	Min Hold
Occupied Bandwid	ib.	Total Power	31.6 dBm			
			on abin			
Z.	7116 MHz					Detector Peak►
Transmit Freq Error	-1.344 kHz	% of OBW Pov	ver 99.00 %		Auto	Man
x dB Bandwidth	3.001 MHz	x dB	-26.00 dB			
MSG			STATUS			

Plot 7-5. Occupied Bandwidth Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)



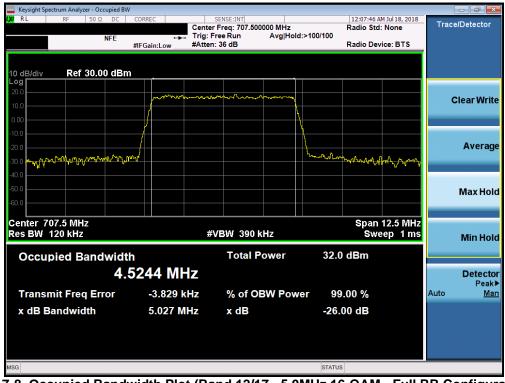
Plot 7-6. Occupied Bandwidth Plot (Band 12 - 3.0MHz 64-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied B	W				- 6 <b>-</b>
LX RL RF 50Ω DC		SENSE:INT Iter Freq: 707.500000 MHz I: Free Run Avg Hold:	Radio Std	M Jul 18, 2018 None	Trace/Detector
NFE		ten: 36 dB	Radio Dev	ice: BTS	
10 dB/div Ref 40.00 dBi	n				
					Clear Writ
10.0	hummen	man man man			
0.00		h h			
-10.0					Averag
-20.0 -30.0 Amangan managene	wal		man who were my	M600000	
-40.0				-049193 WP1	
					Max Hol
-50.0					
Center 707.5 MHz Res BW 120 kHz		#VBW 390 kHz		12.5 MHz ep 1 ms	Min Hol
Occupied Bandwid	th	Total Power	32.7 dBm		
4.	.5634 MHz				Detecto Peak
Transmit Freq Error	-20.204 kHz	% of OBW Powe	er 99.00 %		Auto <u>Ma</u>
x dB Bandwidth	5.005 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-7. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-8. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz 16-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied	BW						- • <b>•</b>
KX RL RF 50Ω DC		SENSE:INT Center Freq: 707.500000 Trig: Free Run A	MHz vg Hold: 100/100	12:07:53 A	1 Jul 18, 2018 None	Trace	Detector
NFE		#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 30.00 dE	3m						
20.0							
10.0	momm	mannon	man			C	lear Write
0.00	/		<u>\</u>				
-10.0							
-20.0							Average
-30.0 B - Alt A - D Ann - Charge	mun l		hammen	and the second	᠁ᢦ᠕ᢝᢏᢞᡙᢦ		Ŭ
-30.0 Jon 14 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1					ຳທາ ບຸງປູ <sub>ນ</sub>		
-50.0							Maxilald
-60.0							Max Hold
Center 707.5 MHz					12.5 MHz		
Res BW 120 kHz		#VBW 390 kHz		Swe	ep 1 ms		Min Hold
Occupied Bandwid	ith	Total Pow	/er 31.3	dBm			
	.5374 MH	7					Detector
							Peak►
Transmit Freq Error	-7.430 kH	z % of OBW	Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	4.988 MH	z xdB	-26.	00 dB			
MSG			STATUS	5			

Plot 7-9. Occupied Bandwidth Plot (Band 12/17 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz QPSK - Full RB Configuration)

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🔤 Keysight Spectrum Analyzer - Occupi	ed BW			
LX RL RF 50Ω [	Cente	SENSE:INT Freq: 707.500000 MHz Free Run Avg Hold: 1	12:02:45 AM Jul 18, 2018 Radio Std: None 00/100	Trace/Detector
		n: 36 dB	Radio Device: BTS	
10 dB/div Ref 40.00 d	iBm			
Log 30.0				
20.0				Clear Write
10.0	proumpanne	margan have a source for the for the source of the source		
0.00				
				Average
-10.0				Average
-20.0	m		when the service of the for th	
-30.0				
-40.0				Max Hold
-50.0				
Center 707.5 MHz			Span 25 MH	z
Res BW 240 kHz	#	¢VBW 750 kHz	Sweep 1 m	
Occupied Bandw	idth	Total Power	32.3 dBm	
	9.0278 MHz			Detector
Transmit Freq Error	7.138 kHz	% of OBW Power	99.00 %	Peak► Auto <u>Man</u>
x dB Bandwidth	9.915 MHz	x dB	-26.00 dB	
	5.515 1112	XUD	-20.00 dB	
MSG			STATUS	

Plot 7-11. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (Band 12/17 - 10.0MHz 64-QAM - Full RB Configuration)

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	ctrum Analyzer	- Occupied B	W										
L <mark>XI</mark> RL	RF	50Ω DC	CORRE	C		ENSE:INT Freg: 782.00	0000 MHz			12:15:04 A Radio Std	M Jul 18, 2018	Trac	e/Detector
		NFE			🕂 Trig: Fre	e Run	Avg Hol	ld:>	100/100				
			#IFGa	in:Low	#Atten: 3	36 dB				Radio Dev	/ice: BTS		
10 dB/div Log	Ref 3	5.00 dB	m	·				_					
25.0													
15.0				man	horm		m						Clear Write
5.00			/					\					
-5.00			- 1					X.					
-15.0			/										Average
-25.0	A man	wymnow w	~~~						Sm Ma	www.www.	man		Ŭ
-35.0	wally	·											
-45.0													
-55.0													Max Hold
-55.0													
Center 78											12.5 MHz		
Res BW 1	20 kHz				#V	BW 390	kHz			Swe	eep 1 ms		Min Hold
Occur	bied Ba	ndwid	th			Total F	ower		33.3	dBm			
Occup	леч Ба				_	Total			00.0	abiii			
		4	523	4 M	HZ								Detector Peak▶
Transn	nit Freq	Error		-362	2 Hz	% of O	BW Pow	vei	r 99	.00 %		Auto	Man
	andwidt			5.003 N		x dB			26	00 dB			
	anuwiui			).003 I		хub			-20.	00 aB			
MSG									STATUS				

Plot 7-13. Occupied Bandwidth Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (Band 13 - 5.0MHz 16-QAM - Full RB Configuration)

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Plot 7-15. Occupied Bandwidth Plot (Band 13 - 5.0MHz 64-QAM - Full RB Configuration)



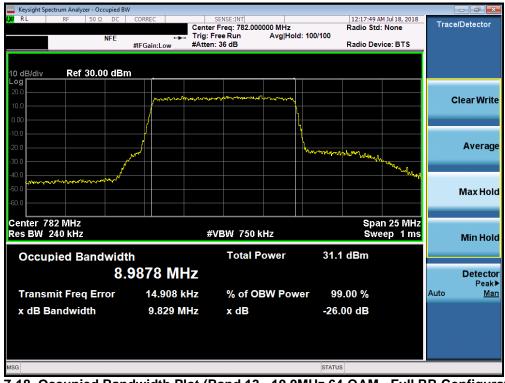
Plot 7-16. Occupied Bandwidth Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Plot 7-17. Occupied Bandwidth Plot (Band 13 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-18. Occupied Bandwidth Plot (Band 13 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW					
X RL RF 50Ω DC	Center Trig: F	SENSE:INT r Freq: 836.500000 MHz Free Run Avg Hold:> 1: 36 dB	Radio Std		Trace/Detector
10 dB/div Ref 35.00 dBm					
25.0		m			Clear Wri
5.00 -5.00 -15.0 -25.0					Avera
25.0			man han have	- NY my	Max Ho
Center 836.5 MHz Res BW 33 kHz	#	VBW 110 kHz		1 3.5 MHz 3.067 ms	Min Ho
Occupied Bandwidt	ո 0955 MHz	Total Power	32.4 dBm		Detect Pea
Transmit Freq Error	-1.875 kHz	% of OBW Power	r 99.00 %		Auto <u>M</u>
x dB Bandwidth	1.238 MHz	x dB	-26.00 dB		
SG			STATUS		

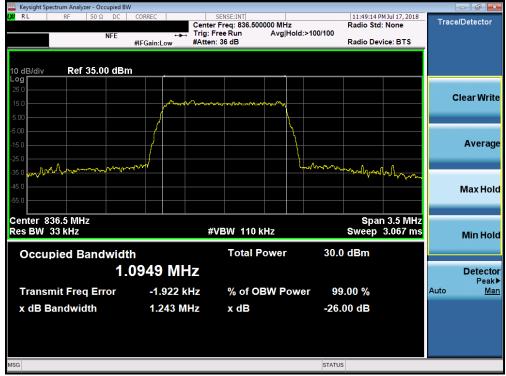
Plot 7-19. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-20. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	G	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 226	
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Plot 7-21. Occupied Bandwidth Plot (Band 26/5 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 07 of 000	
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Eviloar Content Sectrum Analyzer - Occupied BW							- 6 ×
LXX RL RF 50Ω DC		SENSE:INT		11:47:29 PM		Trace	e/Detector
NFE		g:FreeRun Avg ten:36dB	Hold: 100/100	Radio Devic	e: BTS		
10 dB/div Ref 35.00 dBm							
25.0							
15.0	and the second s	monunder Ashranner	- m			C	lear Write
5.00			<u>l</u>				
-5.00	<mark>/</mark>		<u>\</u>				
-15.0			<u>\</u>				Average
-25.0							
-30.0 Bearling and all and				᠕᠃ᠰ᠘ᠬᠬᠬᠧᠹᠲᡃᡁᡫᠮᡃᡪᢛ	monorto		
-45.0							Max Hold
-55.0							
Center 836.5 MHz					7.5 MHz		
Res BW 68 kHz		#VBW 220 kHz		Sweep	3.8 ms		Min Hold
Occupied Bandwidth	n	Total Powe	r 31.0	dBm			
	7098 MHz						Detector
							Peak▶
Transmit Freq Error	-2.154 kHz	% of OBW F	ower 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	3.003 MHz	x dB	-26.0	00 dB			
MSG			STATUS				

Plot 7-23. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)



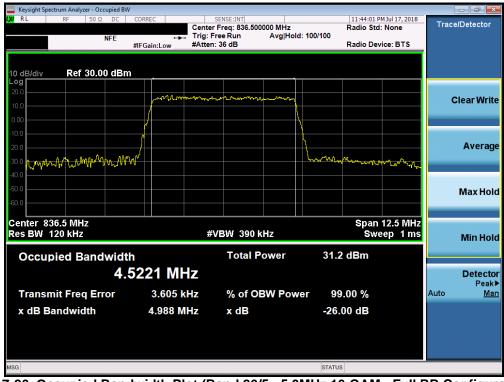
Plot 7-24. Occupied Bandwidth Plot (Band 26/5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW					
NFE	Center	SENSE:INT Freq: 836.500000 MHz iree Run Avg Hold: : 36 dB	Radio Std		Trace/Detector
10 dB/div Ref 30.00 dBm					
Log 20.0 10.0	- Antonio - Anto	manan			Clear Writ
-10.0 -20.0 -30.0			horno and and a second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Averaç
-40.0 -50.0 -60.0					Max Ho
Center 836.5 MHz Res BW 120 kHz	#	VBW 390 kHz		12.5 MHz eep 1 ms	Min Ho
Occupied Bandwidth	1	Total Power	33.0 dBm		
4.5	395 MHz				Detecto Peak
Transmit Freq Error	-2.259 kHz	% of OBW Powe	r 99.00 %		Auto <u>Ma</u>
x dB Bandwidth	5.000 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-25. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-26. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW	/						
IX RL RF 50Ω DC		SENSE:INT Center Freq: 836.500 Trig: Free Run	000 MHz Avg Hold: 100/100	11:44:04 P Radio Std	MJul 17, 2018 None	Trace	/Detector
NFE		#Atten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 30.00 dBn	1						
20.0	nhaharmen	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm			c	lear Write
-10.0							
-20.0 -30.0	-n_		howen	Monten	r. Ma		Average
-40.0							Max Hold
Center 836.5 MHz Res BW 120 kHz		#VBW 390 k	Hz		12.5 MHz ep 1 ms		Min Hold
Occupied Bandwidt		Total Power 30.3 dl					
	5103 MH						Detector Peak▶
Transmit Freq Error	-4.607 kH	z % of OE	3W Power 9	9.00 %		Auto	Man
x dB Bandwidth	4.970 MH	lz x dB	-26	.00 dB			
MSG			STATI	JS			

Plot 7-27. Occupied Bandwidth Plot (Band 26/5 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-28. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW					
RL RF 50Ω DC	CORREC Cente	SENSE:INT r Freg: 836.500000 MHz		1:36:04 PM Jul 17, 2018 adio Std: None	Trace/Detector
NFE	· · · · ·	Free Run Avg Hol n: 36 dB	d: 100/100	adio Device: BTS	
	#IFGain:Low #Atter	1: 36 dB	Ra	adio Device: B I S	
0 dB/div Ref 30.00 dBn	·				
20.0					
0.0					Clear Wri
).00	monorton	°₩₩₽₩₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₩₽₽₽₽₽₽₽₽₽₽			
0.0	1		V		Avera
0.0 mayne month marken with	w		Part and a second second	And man have	Avera
0.0				and the second s	
0.0					
0.0					Max Ho
0.0					
enter 836.5 MHz				Onon 25 Mills	
es BW 240 kHz	#	VBW 750 kHz		Span 25 MHz Sweep 1 ms	
	"			oweep 1 mo	Min Ho
<b>Occupied Bandwidt</b>	h	Total Power	23.1 d	Bm	
9	0338 MHz				Detect
0.					Peal
Transmit Freq Error	-664 Hz	% of OBW Pow	ver 99.00	0 %	Auto <u>M</u>
x dB Bandwidth	9.954 MHz	x dB	-26.00	dB	
			074715		
G			STATUS		

Plot 7-29. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-30. Occupied Bandwidth Plot (Band 26/5 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied I				6
α RL RF 50Ω DC	Trig: F	sense:INT r Freq: 1.745000000 GHz Free Run Avg Hold: 100 n: 36 dB	12:41:21 AM Ju Radio Std: No /100 Radio Device	one Trace/Detect
10 dB/div Ref 35.00 dB	m			
5.00		mmm		Clear W
5.00 15.0 25.0	Marson Mars			Aver
5.0				Max H
enter 1.745 GHz es BW 33 kHz		VBW 110 kHz	Span 3 Sweep 3.0	
Occupied Bandwid	<sup>th</sup> .0943 MHz	Total Power	31.5 dBm	Dete
Transmit Freq Error x dB Bandwidth	-253 Hz 1.239 MHz	% of OBW Power x dB	99.00 % -26.00 dB	Auto
G			STATUS	

Plot 7-31. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



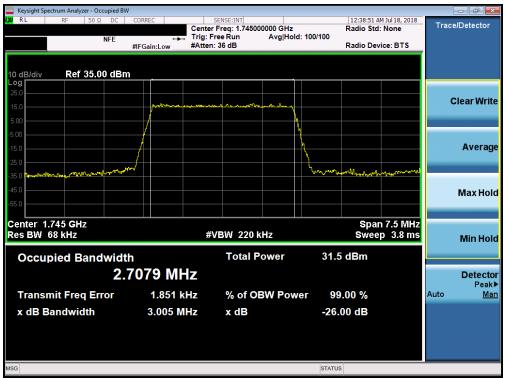
Plot 7-32. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
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Plot 7-33. Occupied Bandwidth Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-34. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🤤 Keysight Spectrum Analyzer - Occupied					
IXIRL RF 50Ω DC	Cent	SENSE:INT ter Freq: 1.745000000 GHz : Free Run Avg Hold:	12:38:59 AM J Radio Std: N 100/100		Trace/Detector
		en: 36 dB	Radio Device	e: BTS	
10 dB/div Ref 35.00 dl	3m				
25.0		who all and a state of the stat			Clear Write
-5.00					
-15.0			∖		Average
-25.0	Junya		warman and marken and	magnet	
-45.0					Max Hold
-55.0					
Center 1.745 GHz Res BW 68 kHz		#VBW 220 kHz		7.5 MHz 3.8 ms	Min Hold
Occupied Bandwi	dth	Total Power	30.7 dBm		
2	2.7102 MHz				Detector Peak▶
Transmit Freq Error	668 Hz	% of OBW Powe	er 99.00 %	/	Auto <u>Man</u>
x dB Bandwidth	3.002 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-35. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)



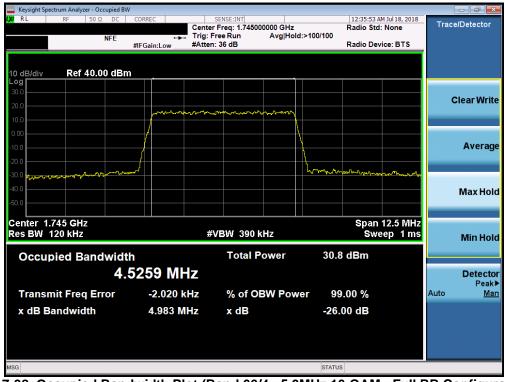
Plot 7-36. Occupied Bandwidth Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied Β' X RL RF 50 Ω DC	CORREC	SENSE:INT	R	12:35:46 AM Jul 18, 2018 adio Std: None	Trace/Detector
NFE		Free Run Avg Hold n: 36 dB	l:>100/100 R:	adio Device: BTS	
10 dB/div Ref 40.00 dBr	n				
Log 30.0					
20.0					Clear Wri
10.0	mon	monton			
0.00		l l			
-10.0			1		Avera
-20.0					Avera
	J. C.		m. m. mm	an and marthan	
-30.0 4 mm m m m m m m m m m m m m m m m m m				and the second se	
-50.0					Max Ho
Center 1.745 GHz	,,			Span 12.5 MHz	
Res BW 120 kHz	#	VBW 390 kHz		Sweep 1 ms	Min Ho
Occupied Bandwid	th	Total Power	31.9 d	Bm	
	5509 MHz				Detect
					Peal
Transmit Freq Error	-17.572 kHz	% of OBW Pow	er 99.0	0 %	Auto <u>M</u>
x dB Bandwidth	5.044 MHz	x dB	-26.00	dB	
SG			STATUS		

Plot 7-37. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-38. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW	/						
LX RL RF 50Ω DC		SENSE:INT Center Freq: 1.745000 Trig: Free Run	0000 GHz Avg Hold:>100/1	Radio Std:	1 Jul 18, 2018 None	Trace	/Detector
NFE		Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dBn	n						
30.0 20.0						с	lear Write
10.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~				
0.00			— <u>h</u> —				
-10.0							Average
-20.0	m		han	www.w.l./www.w.	ᢞᢑ᠆᠕ᡨᡒᡀᠬᡧᠼᡗᡅᡄ		
-40.0							Max Hold
-50.0							
Center 1.745 GHz				Span '	12.5 MHz		
Res BW 120 kHz		#VBW 390 ki	Hz	Swe	ep 1 ms		Min Hold
Occupied Bandwidt	h	Total Po	ower	30.1 dBm			
4.	5299 MHz	2					Detector Peak▶
Transmit Freq Error	1.263 kHz	z % of OB	W Power	99.00 %		Auto	Man
x dB Bandwidth	4.968 MHz	z xdB		-26.00 dB			
MSG			s	STATUS			

Plot 7-39. Occupied Bandwidth Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-40. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied B	W				- 6
LX RL RF 50Ω DC	Tri		Radio Sto ld:>100/100		Trace/Detector
	#IFGain:Low #A	tten: 36 dB	Radio De	vice: BTS	
10 dB/div Ref 30.00 dB	m				
20.0	Mr Mr Arymon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Clear Write
-10.0					
-20.0 -30.0	winner		home man and a second	www.whathurlawa	Average
-40.0					Max Hold
-60.0 Center 1.745 GHz			Sna	an 25 MHz	
Res BW 240 kHz		#VBW 750 kHz		eep 1 ms	Min Hold
Occupied Bandwid	th	Total Power	31.1 dBm		
	.9935 MHz				Detector Peak▶
Transmit Freq Error	-8.158 kHz	% of OBW Pov	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	9.916 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-41. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)



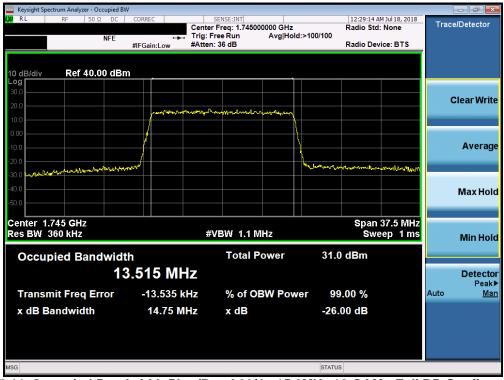
Plot 7-42. Occupied Bandwidth Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW	1						- # <b>X</b>
LXIRL RF 50Ω DC	CORREC	SENSE:INT enter Freg: 1.745000	0000 GHz	12:29:08 Af Radio Std:	4 Jul 18, 2018 None	Trace	Detector
NFE	tan Tr	ig: Free Run	Avg Hold: 100/1	00			
,	#IFGain:Low #A	tten: 36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBm							
30.0							
20.0	مداد مراجع	Mar Con the second				C	lear Write
10.0							
0.00			N				
-10.0							Average
-20.0	_/		<u> </u>				
-30.0 mouther allow more			"h7~hr		her Monstand mar		
-40.0							Max Hold
-50.0							maxmona
Center 1.745 GHz Res BW 360 kHz		#VBW 1.1 M	H7		37.5 MHz ep 1 ms		
		#*B** 1.1 W	112	0.00	сртпа		Min Hold
Occupied Bandwidt	h	Total Po	ower	32.1 dBm			
	.496 MHz						Detector
							Peak▶
Transmit Freq Error	157 Hz	% of OE	W Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	14.66 MHz	x dB		-26.00 dB			
MSG			s	STATUS			

Plot 7-43. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-44. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occup						- P	×
<b>LX/</b> RL RF 50 Ω		SENSE:INT Center Freq: 1.7450000 Trig: Free Run	00 GHz Avg Hold: 100/100	12:29:19 AM Radio Std: 1		Trace/Detec	tor
N	FE ↔ #IFGain:Low	#Atten: 36 dB	Avginola. Teoritee	Radio Devid	e: BTS		
10 dB/div Ref 40.00	dBm						
Log 30.0							
20.0						ClearV	Vrite
10.0	howston	have a hour and the second	memory				
0.00	/		<u>\</u>				
-10.0	/		<u>\</u>			Ave	rage
-20.0				m. n. n. thank			-
-30.0 Jogonalandore bally menne	un al and		an of Come	han There was a free way	and I may the state of the stat		
-40.0						Max	Hold
-50.0							
Center 1.745 GHz				Snan 3	7.5 MHz		
Res BW 360 kHz		#VBW 1.1 MH	z		ep 1 ms	Min	Hold
Occupied Bandy	vidth	Total Pov	wer 30.1	dBm			
	13.488 M	Hz					ector eak▶
Transmit Freq Erro	or 77	Hz % of OBV	V Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	14.72	/Hz xdB	-26.	00 dB			
MSG			STATUS	3			

Plot 7-45. Occupied Bandwidth Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-46. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕑 LG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occ							
<b>LXU</b> RL RF 50 Ω		Center Freq: 1.7450	00000 GHz Avg Hold: 100/100	Radio Std:	M Jul 18, 2018 None	Trace/D	etector
	NFE #IFGain:Low	· · · · · · · · · · · · · · · · · · ·	Avginola. 100/100	Radio Dev	ice: BTS		
10 dB/div Ref 40.00	0 dBm						
30.0							
20.0		unant manager and a strangely with				Cle	ar Write
10.0		den grande, allera al filologie de French (Libert herbergen)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
0.00	<i> </i>						
-10.0			<u>\</u>			4	Average
-20.0	www.www.		h have	mound	and the second of the		
30.0							
-40.0						N	lax Hold
-50.0							
Center 1.745 GHz			a		n 50 MHz		
Res BW 470 kHz		#VBW 1.5 N		Swe	ep 1 ms	Ν	/lin Hold
Occupied Band	width	Total F	Power 31	l.4 dBm			
	17.977	MHz				I	Detector
Tronomit Frog Fr			BW Power	99.00 %		Auto	Peak▶ Man
Transmit Freq Err						Auto	IVIAII
x dB Bandwidth	19.4	1 MHz x dB	-2	6.00 dB			
MSG			STA	TUS			

Plot 7-47. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



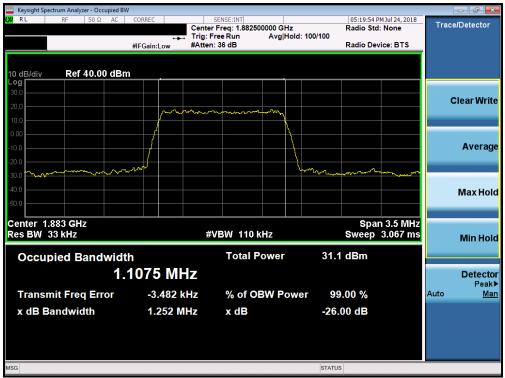
Plot 7-48. Occupied Bandwidth Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-49. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-50. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Plot 7-51. Occupied Bandwidth Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-52. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

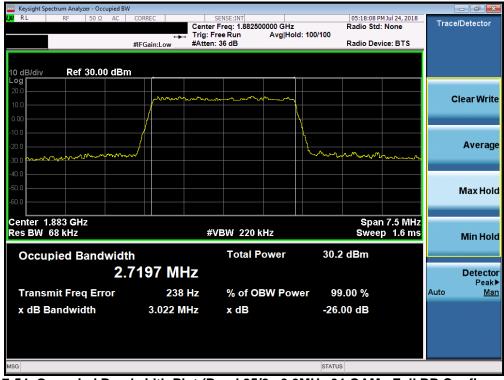
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 of 000	
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🤤 Keysight Spectrum Analyzer - Occupied					
LXIRL RF 50Ω AC	Cent	SENSE:INT er Freq: 1.882500000 GHz	Radio Std	M Jul 24, 2018 : None	Trace/Detector
		Free Run Avg Hold en: 36 dB	: 100/100 Radio Dev	vice: BTS	
10 dB/div Ref 30.00 dl	Bm				
20.0					
10.0	mmm				Clear Write
0.00					
-10.0					
-20.0	f		<u>\</u>		Average
-30.0 mm	_^		munter	man	
-40.0					
-50.0					Max Hold
-60.0					
Center 1.883 GHz				n 7.5 MHz	
Res BW 68 kHz	ŧ	#VBW 220 kHz	Swee	p 1.6 ms	Min Hold
Occupied Bandwi	dth	Total Power	31.2 dBm		
	2.7138 MHz				Detector
					Peak▶
Transmit Freq Error	-545 Hz	% of OBW Powe	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	3.002 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-53. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



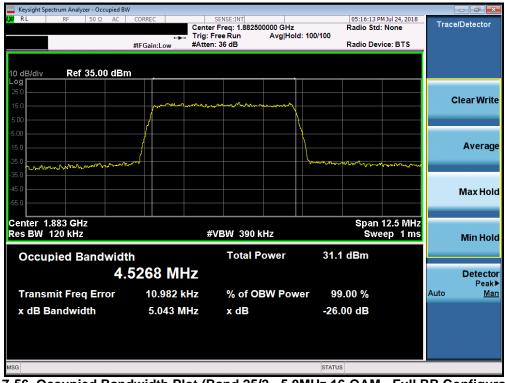
Plot 7-54. Occupied Bandwidth Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Plot 7-55. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-56. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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🧱 Keysight Spectrum Analyzer - Occupied BW	,						- 6 🔀
LXX RL RF 50Ω AC	CORREC	SENSE:INT Center Freq: 1.8825000 Trig: Free Run	00 GHz Avg Hold: 100/100	05:16:18 PM Radio Std: I		Trace	/Detector
	#IFGain:Low	#Atten: 36 dB		Radio Devic	e: BTS		
10 dB/div Ref 35.00 dBm							
25.0	m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	warm			с	lear Write
5.00			<u> </u>				_
-15.0 -25.0	NIX			mar and the second	᠊ᡳᡊᢑᠴᢏ᠇ᡙᠺ		Average
-35.0 -45.0 -55.0							Max Hold
Center 1.883 GHz Res BW 120 kHz		#VBW 390 kH;	2		2.5 MHz ep 1 ms		Min Hold
Occupied Bandwidt	h	Total Pov	ver 30.0	dBm			
4.	5436 MH	Z					Detector Peak▶
Transmit Freq Error	-2.046 kl	Iz % of OBV	V Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	4.974 Mł	Hz xdB	-26.0	00 dB			
MSG			STATUS				

Plot 7-57. Occupied Bandwidth Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-58. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occup								
<b>LX/</b> RL RF 50 Ω		SENSE:INT enter Freq: 1.882500000 GH ig: Free Run Avg H		PM Jul 24, 2018 d: None	Trace/Detector			
	Ing: Free Run Avg Hold: 100/100 #IFGain:Low #Atten: 36 dB Radio Device: BTS							
,								
10 dB/div Ref 40.00	dBm		_					
Log 30.0								
20.0					Clear Write			
10.0	- Marina marina	and the second	m					
0.00			<u>\</u>					
-10.0					Average			
-20.0	<u> </u>							
-30.0 monoral mar Mayor -30.0	manhabl		harrow and the second s	marlin				
-40.0					Max Hold			
-50.0								
Center 1.883 GHz			 	an 25 MHz				
Res BW 240 kHz		#VBW 750 kHz		veep 1 ms	Min Hold			
Occupied Bandw	vidth	Total Power	31.3 dBm					
	9.0543 MHz				Detector			
	9.0943 MITZ				Detector Peak►			
Transmit Freq Erro	r 18.575 kHz	% of OBW Po	ower 99.00 %		Auto <u>Man</u>			
x dB Bandwidth	9.948 MHz	x dB	-26.00 dB					
MSG			STATUS					

Plot 7-59. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-60. Occupied Bandwidth Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied B	W				
<b>(X)</b> RL RF 50 Ω AC	Tri	SENSE:INT nter Freq: 1.882500000 GHz g: Free Run Avg Holo tten: 36 dB	05:10:18 P Radio Std d:>100/100 Radio Dev		Trace/Detector
10 dB/div Ref 40.00 dBr	m				
30.0 20.0	julium pur o	man francista and a state of the			Clear Write
10.0 0.00 -10.0					Average
-20.0 -30.0			four transminute and a start	J. J. Song & March	Maxilald
-50.0			Span	37.5 MHz	Max Hold
Res BW 360 kHz Occupied Bandwid	th	#VBW 1.1 MHz Total Power		eep 1 ms	Min Hold
	3.543 MHz				Detector Peak▶
Transmit Freq Error x dB Bandwidth	21.586 kHz 14.87 MHz	% of OBW Pow x dB	rer 99.00 % -26.00 dB		Auto <u>Man</u>
MSG			STATUS		

Plot 7-61. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-62. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied B\	V						- • <del>•</del>		
LXIRL RF 50Ω AC	CORREC	SENSE:INT enter Freg: 1.882500000	GHz	05:10:34 P Radio Std	M Jul 24, 2018	Trace	/Detector		
	→ Trig: Free Run Avg Hold: 100/100								
	#IFGain:Low #Atten: 36 dB Radio Device: BTS								
10 dB/div Ref 40.00 dBr	n								
30.0									
20.0						C	lear Write		
10.0	manmon	w monore man	~						
0.00	/								
-10.0							Average		
-20.0									
-30.0 martiplater April more and a martin	www		ىر) رومو <sub>ي</sub> ارد اسر	where we are a second	work wellow				
-40.0									
							Max Hold		
-50.0									
Center 1.883 GHz				Span	37.5 MHz				
Res BW 360 kHz		#VBW 1.1 MHz		Swe	eep 1 ms		Min Hold		
		Total Powe	r 20	.2 dBm					
Occupied Bandwidt			i 30.	.2 นอกก					
1.	3.491 MHz						Detector		
Transmit Freq Error	2.673 kHz	% of OBW	Power 9	9.00 %		Auto	Peak▶ <u>Man</u>		
x dB Bandwidth	14.80 MHz		26	6.00 dB					
		хuв	-20	0.00 ab					
MSG			STAT	US					

Plot 7-63. Occupied Bandwidth Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-64. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager					
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🤤 Keysight Spectrum Analyzer - Occup							
<mark>(X)</mark> RL RF 50 Ω	DC CORREC	SENSE:INT Center Freg: 1.88250	00000 GHz	12:49:44 A Radio Std	M Jul 18, 2018	Trace	Detector
NF	FE 😝	Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 36 dB		Radio Dev	vice: BTS		
10 dB/div Ref 30.00	dBm		,				
20.0							
10.0		alight with the second s	Same Labor Barb			С	lear Write
0.00	/		<u> </u>				
-10.0	/		<u> </u>				
				a lun da			Average
-20.0	na I annon ann			and a state of the second	and a start and a start and a start a s		Arenuge
-40.0							
-50.0							Max Hold
-60.0						_	
Center 1.883 GHz				Spa	n 50 MHz		
Res BW 470 kHz		#VBW 1.5 N	IHz		eep 1 ms		Min Hold
		T-4-1 D		4			
Occupied Bandw		Total P	ower 31	.1 dBm			
	18.020 M	Hz					Detector
Transmit Frog Free	or 14.750		BW Power	99.00 %		Auto	Peak▶ Man
Transmit Freq Erro						Aato	wan
x dB Bandwidth	19.62	MHz xdB	-2	6.00 dB			
MSG			STA	TUS			

Plot 7-65. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



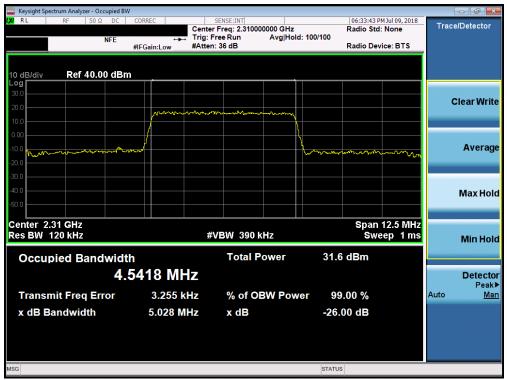
Plot 7-66. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Speed	ctrum Analyze	er - Occupi	ed BW											
LXI RL	RF	50 Ω [	00 00	ORREC	Ce		ISE:INT eq: 2.31000	0000 GHz			06:33:32 P Radio Std	M Jul 09, 2018	Trac	e/Detector
		NF	E		🛶 Tri	g: Free	Run	Avg Hol	d:>	100/100				
			#	FGain:Lo	ow #A	tten: 30	6 dB				Radio Dev	ice: BTS		
10 dB/div Log	Ref	40.00 c	lBm											
30.0														
20.0						<b>v</b>								Clear Write
10.0				m	····	v	ᢣ᠕᠋ᡝᡧ	have						
0.00				/					λ.					
				]					X		-0			Average
-10.0 -20.0									ľ					
-30.0														
-40.0														
														Max Hold
-50.0														
Center 2.	31 GHz											12.5 MHz		
Res BW 1	20 kHz					#VB	W 390 K	Hz			Swe	ep 1ms		Min Hold
0							Total P	ower		30 /	dBm			
Occup	oled Ba						TOtal F	Ower		JZ.4	ubiii			
			4.5	388	MHz									Detector
Transn	nit Fred		-		-989 Hz		% of O			r 99	.00 %		Auto	Peak▶ Man
x dB B	andwid	th		4.9	89 MHz		x dB			-26.0	00 dB			
MSG										STATUS				

Plot 7-67. Occupied Bandwidth Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-68. Occupied Bandwidth Plot (Band 30 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	G	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW							×
LX RL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 2.310000	0000 GHz	06:33:50 Pt Radio Std:	1 Jul 09, 2018 None	Trace/Detect	or
NFE		Trig: Free Run #Atten: 36 dB	Avg Hold: 100/1	00 Radio Devi	ice: BTS		
	#IFGallI:Low	Atten: 00 dB		Radio Dev	ce. DT3		
10 dB/div Ref 40.00 dBm							
Log							_
30.0						Clear W	Irite
20.0	manno	-mar Mar ha	manner			Gical V	THC .
10.0							
0.00						_	
-10.0	- m		- mon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm.	Aver	age
-20.0							
-30.0							
-40.0						Max H	lold
-50.0							
Center 2.31 GHz				Span	12.5 MHz		
Res BW 120 kHz		#VBW 390 ki	Hz		ep 1 ms	Min H	lold
Occupied Bandwidt		Total Po	ower	30.5 dBm			
Occupied Bandwidt			JWGI	50.5 <b>U</b> BIII			
4.	5399 MHz	Z				Dete	ctor eak ►
Transmit Freq Error	-4.048 kH	z % of OE	W Power	99.00 %			Man
x dB Bandwidth	5.007 MH	z xdB		-26.00 dB			
MSG				STATUS			

Plot 7-69. Occupied Bandwidth Plot (Band 30 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-70. Occupied Bandwidth Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B\	N						- • •
XX RL RF 50Ω DC	CORREC		0000 GHz Avg Hold: 100/1	Radio Std: 100		Trace	Detector
	#IFGain:Low	#Atten: 36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 40.00 dBr	n						
30.0						c	lear Write
10.0	- Anone	and the and the section of the secti	man				
0.00			l l				
-10.0	/		<u> </u>				Average
	MARIN		\	and was more			
-20.0 -30.0				Martal Anterior Contractor of the	mm Ambal		
-40.0							Manulata
-50.0							Max Hold
Center 2.31 GHz					n 25 MHz		
Res BW 240 kHz		#VBW 750 k	HZ	Swe	ep 1 ms		Min Hold
Occupied Bandwidt	th	Total P	ower	31.5 dBm			
	0454 MH	17					Detector
							Peak▶
Transmit Freq Error	5.287 k	Hz % of OE	BW Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	9.803 M	lHz x dB		-26.00 dB			
MSG				STATUS			

Plot 7-71. Occupied Bandwidth Plot (Band 30 - 10.0MHz 16-QAM - Full RB Configuration)

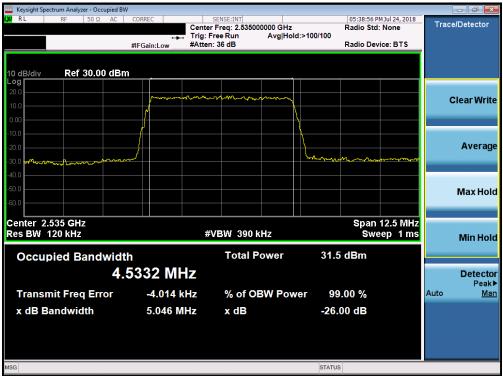


Plot 7-72. Occupied Bandwidth Plot (Band 30 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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## Band 7



Plot 7-73. Occupied Bandwidth Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-74. Occupied Bandwidth Plot (Band 7 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW	1				
<b>LX/</b> RL RF 50Ω AC	CORREC	SENSE:INT r Freg: 2.535000000 GHz	05:39:12 Radio Ste	PM Jul 24, 2018	Trace/Detector
	Trig:		d: 100/100		
	#IFGain:Low #Atte	n: 36 dB	Radio De	vice: BTS	
10 dB/div Ref 30.00 dBm Log					
20.0					
10.0		Mon Marine Marine			Clear Write
0.00			<b></b>		
-10.0			<u>}</u>		
-20.0			Roman a mail		Average
-20.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0 -30.0			fromther when a	wyburg mary	
-40.0					
-50.0					Max Hold
-60.0					
Center 2.535 GHz			<u> </u>	40 6 MUL-	
Res BW 120 kHz	#	VBW 390 kHz		12.5 MHz eep 1 ms	Min Hold
					Min Hold
Occupied Bandwidt	h	Total Power	29.7 dBm		
4.	5491 MHz				Detector
			00.00-00		Peak►
Transmit Freq Error	-1.668 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	5.024 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-75. Occupied Bandwidth Plot (Band 7 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-76. Occupied Bandwidth Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B\	V				- ē 🗾
KX RL RF 50Ω AC			Iz Radi Iold: 100/100	0:37 PM Jul 24, 2018 5 Std: None	Trace/Detector
	#IFGain:Low #	Atten: 36 dB	Radi	Device: BTS	
10 dB/div Ref 30.00 dBr	n				
20.0	John Mannager W	manalla marana	~~ <u>_</u>		Clear Write
-10.0					
-20.0 -30.0 -30.0 -30.0	nupl		hand hand hand hand hand hand hand hand	porton and and and and and and and and and an	Average
-40.0					Max Hold
-60.0 Center 2.535 GHz				Span 25 MHz	
Res BW 240 kHz		#VBW 750 kHz		Sweep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	30.4 dBr	n	
	0110 MHz				Detecto Peak
Transmit Freq Error	1.263 kHz	% of OBW Po	ower 99.00 %	6	Auto <u>Mar</u>
x dB Bandwidth	9.910 MHz	x dB	-26.00 di	В	
MSG			STATUS		

Plot 7-77. Occupied Bandwidth Plot (Band 7 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-78. Occupied Bandwidth Plot (Band 7 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 55 of 226
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W   RF   50.0   AC   CORREC   SENSE:INT   0:54148 PMJU 24, 2018     W   Radio Std: None   Radio Std: None   Radio Std: None   Radio Std: None     W   #FGain:Low   #FGain:Low   Avg Hold: 100/100   Radio Std: None   Radio Std: None     10   dB   dB   dB   dB   dB   dB   dB   dB     10   dB   d	Keysight Spectrum Analyzer - Occupied BW						
#FFGain:Low   #Atten: 36 dB   Radio Device: BTS     10 dB/div   Ref 40.00 dBm   Clear Write     200   Clear Write   Average     300   Average   Max Hold     40   Span 37.5 MHz   Max Hold     Center 2.535 GHz   #VBW 1.1 MHz   Span 37.5 MHz     Min Hold   Transmit Freq Error   -6.030 kHz   % of OBW Power   99.00 %	LX/RL RF 50Ω AC	Cen	ter Freq: 2.535000000 GH	z Radio S		Trace/D	etector
Log   Image: Clear Write     200   Image: Clear Write     200   Image: Clear Write     100   Image: Clear Write     100   Image: Clear Write     200   Image: Clear Write     100   Image: Clear Write     200   Image: Clear Write     201   Image: Clear Write     202   Image: Clear Write <t< td=""><td>#</td><td></td><td></td><td></td><td>evice: BTS</td><td></td><td></td></t<>	#				evice: BTS		
Log   Image: Clear Write     200   Image: Clear Write     200   Image: Clear Write     100   Image: Clear Write     100   Image: Clear Write     200   Image: Clear Write     100   Image: Clear Write     200   Image: Clear Write     201   Image: Clear Write     202   Image: Clear Write <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							
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				-			
200   Image: Constraint of the second of							
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	20.0					Cle	ar Write
100   Image: Constraint of the second sec	10.0	and the Shadhad the Shadhad	<sup>∙</sup> ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩				
2000 3000 4000 5000 Center 2.535 GHz Res BW 360 kHz Transmit Freq Error -6.030 kHz % of OBW Power 99.00 % Max Hold Max Hold Ma	0.00						
300   400     400   400     400   400     400   400     500   400     500   400     500   400     500   400     500   400     500   400     500   400     500   400     500   500     Center 2.535 GHz   Span 37.5 MHz     Strain Strain   500 MHz     Min Hold   500 MHz     Occupied Bandwidth   Total Power     31.8 dBm   13.485 MHz     Transmit Freq Error   -6.030 kHz   % of OBW Power     99.00 %   4uto	-10.0					4	Average
300   400     400   400     400   400     400   400     500   400     500   400     500   400     500   400     500   400     500   400     500   400     500   400     500   500     Center 2.535 GHz   Span 37.5 MHz     Strain Strain   500 MHz     Min Hold   500 MHz     Occupied Bandwidth   Total Power     31.8 dBm   13.485 MHz     Transmit Freq Error   -6.030 kHz   % of OBW Power     99.00 %   4uto	A NANTHAN WARTIN MANY	ц <sub>у</sub> /		hadlederer warman along	morenews		
500   Image: Conternation of the second s	-30.0						
Center 2.535 GHz Res BW 360 kHz   #VBW 1.1 MHz   Span 37.5 MHz Sweep 1 ms     Occupied Bandwidth   Total Power   31.8 dBm     13.485 MHz   Detector     Transmit Freq Error   -6.030 kHz   % of OBW Power   99.00 %						м	ax Hold
Res BW 360 kHz #VBW 1.1 MHz Sweep 1 ms   Occupied Bandwidth Total Power 31.8 dBm   13.485 MHz Detector   Transmit Freq Error -6.030 kHz % of OBW Power 99.00 %	-50.0						
Occupied Bandwidth Total Power 31.8 dBm   13.485 MHz Detector   Transmit Freq Error -6.030 kHz % of OBW Power 99.00 %							
13.485 MHz Detector   Transmit Freq Error -6.030 kHz % of OBW Power 99.00 %	Res BW 360 KHz		#VBW 1.1 MHz	SI	veep 1 ms	N	lin Hold
Transmit Freq Error -6.030 kHz % of OBW Power 99.00 %	Occupied Bandwidth		Total Power	31.8 dBm			
Transmit Freq Error -6.030 kHz % of OBW Power 99.00 %	13.	485 MHz				C	Detector
			8/ -f ODW/ D-	00.00.0/		Auto	
x dB Bandwidth 14.81 MHz x dB -26.00 dB						Auto	IVIAII
	x dB Bandwidth	14.81 MHz	x dB	-26.00 dB			
MSG STATUS	MSG			STATUS			

Plot 7-79. Occupied Bandwidth Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)



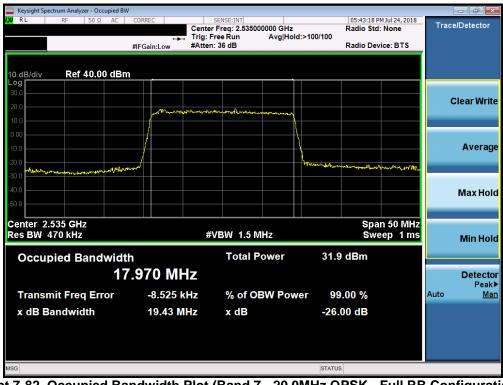
Plot 7-80. Occupied Bandwidth Plot (Band 7 - 15.0MHz 16-QAM - Full RB Configuration)

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Keysight Spectrum Analyzer - Occupied BW	/						
LX RL RF 50Ω AC	CORREC	SENSE:INT Center Freg: 2.53500	0000 GHz	05:41:58 P Radio Std	M Jul 24, 2018	Trace	/Detector
	↔ #IFGain:Low	Trig: Free Run #Atten: 36 dB	Avg Hold:>100/10	0 Radio Dev	ice: BTS		
	#IFGall:LOW	#Atten: 00 ub		Radio Dev	ice. BTS		
10 dB/div Ref 40.00 dBn	n						
Log 30.0							
20.0						c	lear Write
10.0	mm	~ <i>ๅ๛๛๛๚๚๚๛๛๛๛๛๚๚๚๛๚๚๚๛๚๚๚๚๛๛๛๛๚๚๚๚๚๚๚๚๚๚</i>	mmmmak				
0.00							
-10.0	/						Average
							J
-20.0 -30.0 and	l'unter l		"here forest	adaperson from the property of the second	kunhami anyiny tha		
-40.0							Max Hold
-50.0							Muxitolu
				0	07.5.8411-		
Center 2.535 GHz Span 37.5 MHz Spae 37.5 MHz Sweep 1 ms						Min Hold	
					· · · ·		MITHOU
Occupied Bandwidt		Total P	ower 2	9.4 dBm			
13.471 MHz							Detector
Transmit Freq Error	6.865 k	Hz % of OE	BW Power	99.00 %		Auto	Peak▶ <u>Man</u>
x dB Bandwidth	14.78 M	Hz x dB	-2	26.00 dB			
MSG			ST	ATUS			

Plot 7-81. Occupied Bandwidth Plot (Band 7 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-82. Occupied Bandwidth Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

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