

MEASUREMENT REPORT LTE

Applicant Name:

LG Electronics USA, Inc.

1000 Sylvan Avenue

Englewood Cliffs, NJ 07632

United States

Date of Testing:

4/22 - 5/9/2019

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1904220061-03-R1.ZNF

FCC ID:

ZNFQ720PS

APPLICANT:

LG Electronics USA, Inc.

Application Type:

Class II Permissive Change

Model:

LM-Q720PS

Additional Model(s):

LMQ720PS, Q720PS

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

Class II Permissive Change:

Please see FCC change document

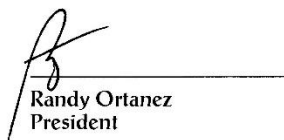
Original Grant Date:

5/10/2019

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

This revised Test Report (S/N: 1M1904220061-03-R1.ZNF) supersedes and replaces the previously issued test report (S/N: 1M1904220061-03.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

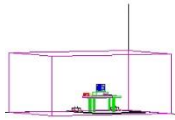


FCC ID: ZNFQ720PS	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset	Page 1 of 42

TABLE OF CONTENTS

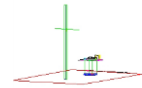
1.0	INTRODUCTION	6
1.1	Scope	6
1.2	PCTEST Test Location.....	6
1.3	Test Facility / Accreditations.....	6
2.0	PRODUCT INFORMATION.....	7
2.1	Equipment Description	7
2.2	Device Capabilities.....	7
2.3	Test Configuration	7
2.4	EMI Suppression Device(s)/Modifications	7
3.0	DESCRIPTION OF TESTS	8
3.1	Measurement Procedure.....	8
3.2	Block C Frequency Range	8
3.3	Block A Frequency Range.....	8
3.4	Cellular - Base Frequency Blocks	8
3.5	Cellular - Mobile Frequency Blocks	8
3.6	PCS - Base Frequency Blocks	9
3.7	PCS - Mobile Frequency Blocks.....	9
3.8	AWS - Base Frequency Blocks	9
3.9	AWS - Mobile Frequency Blocks.....	10
3.10	BRS/EBS Frequency Block	10
3.11	Radiated Power and Radiated Spurious Emissions	10
4.0	MEASUREMENT UNCERTAINTY	12
5.0	TEST EQUIPMENT CALIBRATION DATA	13
6.0	SAMPLE CALCULATIONS	14
7.0	TEST RESULTS.....	15
7.1	Summary.....	15
7.2	Radiated Power (ERP/EIRP).....	16
7.3	Radiated Spurious Emissions Measurements	25
8.0	CONCLUSION.....	42

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 2 of 42



MEASUREMENT REPORT

FCC Part 22, 24, & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	
LTE Band 71	27	665.5 - 695.5	0.036	15.51			QPSK
LTE Band 71	27	665.5 - 695.5	0.026	14.21			16QAM
LTE Band 71	27	665.5 - 695.5	0.029	14.61			64QAM
LTE Band 71	27	668 - 693	0.041	16.16			QPSK
LTE Band 71	27	668 - 693	0.031	14.91			16QAM
LTE Band 71	27	668 - 693	0.000	0.00			64QAM
LTE Band 71	27	670.5 - 690.5	0.044	16.42			QPSK
LTE Band 71	27	670.5 - 690.5	0.032	15.11			16QAM
LTE Band 71	27	670.5 - 690.5	0.028	14.54			64QAM
LTE Band 71	27	673 - 688	0.048	16.81			QPSK
LTE Band 71	27	673 - 688	0.033	15.21			16QAM
LTE Band 71	27	673 - 688	0.029	14.64			64QAM
LTE Band 12	27	699.7 - 715.3	0.049	16.88	0.080	19.03	QPSK
LTE Band 12	27	699.7 - 715.3	0.037	15.68	0.061	17.83	16QAM
LTE Band 12	27	699.7 - 715.3	0.029	14.68	0.048	16.83	64QAM
LTE Band 12	27	700.5 - 714.5	0.049	16.93	0.081	19.08	QPSK
LTE Band 12	27	700.5 - 714.5	0.037	15.73	0.061	17.88	16QAM
LTE Band 12	27	700.5 - 714.5	0.030	14.78	0.049	16.93	64QAM
LTE Band 12/17	27	701.5 - 713.5	0.048	16.83	0.079	18.98	QPSK
LTE Band 12/17	27	701.5 - 713.5	0.037	15.63	0.060	17.78	16QAM
LTE Band 12/17	27	701.5 - 713.5	0.029	14.68	0.048	16.83	64QAM
LTE Band 12/17	27	704 - 711	0.053	17.22	0.086	19.37	QPSK
LTE Band 12/17	27	704 - 711	0.039	15.89	0.064	18.04	16QAM
LTE Band 12/17	27	704 - 711	0.031	14.98	0.052	17.13	64QAM
LTE Band 13	27	779.5 - 784.5	0.056	17.47	0.092	19.62	QPSK
LTE Band 13	27	779.5 - 784.5	0.044	16.42	0.072	18.57	16QAM
LTE Band 13	27	779.5 - 784.5	0.039	15.92	0.064	18.07	64QAM
LTE Band 13	27	782	0.076	18.78	0.124	20.93	QPSK
LTE Band 13	27	782	0.051	17.07	0.084	19.22	16QAM
LTE Band 13	27	782	0.041	16.11	0.067	18.26	64QAM
LTE Band 26/5	22H	824.7 - 848.3	0.053	17.25	0.087	19.40	QPSK
LTE Band 26/5	22H	824.7 - 848.3	0.051	17.08	0.084	19.23	16QAM
LTE Band 26/5	22H	824.7 - 848.3	0.049	16.88	0.080	19.03	64QAM
LTE Band 26/5	22H	825.5 - 847.5	0.054	17.36	0.089	19.51	QPSK
LTE Band 26/5	22H	825.5 - 847.5	0.052	17.18	0.086	19.33	16QAM
LTE Band 26/5	22H	825.5 - 847.5	0.050	16.98	0.082	19.13	64QAM
LTE Band 26/5	22H	826.5 - 846.5	0.053	17.28	0.088	19.43	QPSK
LTE Band 26/5	22H	826.5 - 846.5	0.050	17.03	0.083	19.18	16QAM
LTE Band 26/5	22H	826.5 - 846.5	0.048	16.78	0.078	18.93	64QAM
LTE Band 26/5	22H	829 - 844	0.056	17.48	0.092	19.63	QPSK
LTE Band 26/5	22H	829 - 844	0.053	17.28	0.088	19.43	16QAM
LTE Band 26/5	22H	829 - 844	0.050	16.98	0.082	19.13	64QAM
LTE Band 26	22H	831.5 - 841.5	0.063	17.97	0.103	20.12	QPSK
LTE Band 26	22H	831.5 - 841.5	0.060	17.76	0.098	19.91	16QAM
LTE Band 26	22H	831.5 - 841.5	0.048	16.81	0.079	18.96	64QAM

EUT Overview (<1 GHz)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 3 of 42

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 66/4	27	1710.7 - 1779.3	0.155	21.89	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.123	20.88	16QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.100	19.99	64QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.150	21.76	QPSK
LTE Band 66/4	27	1711.5 - 1778.5	0.126	20.99	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.106	20.24	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.147	21.68	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.124	20.94	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.104	20.18	64QAM
LTE Band 66/4	27	1715 - 1775	0.165	22.17	QPSK
LTE Band 66/4	27	1715 - 1775	0.137	21.37	16QAM
LTE Band 66/4	27	1715 - 1775	0.110	20.42	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.146	21.65	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.126	21.00	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.104	20.15	64QAM
LTE Band 66/4	27	1720 - 1770	0.132	21.19	QPSK
LTE Band 66/4	27	1720 - 1770	0.139	21.44	16QAM
LTE Band 66/4	27	1720 - 1770	0.112	20.48	64QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.130	21.14	QPSK
LTE Band 25/2	24E	1850.7 - 1914.3	0.117	20.67	16QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.074	18.67	64QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.130	21.14	QPSK
LTE Band 25/2	24E	1851.5 - 1913.5	0.119	20.77	16QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.072	18.57	64QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.131	21.17	QPSK
LTE Band 25/2	24E	1852.5 - 1912.5	0.114	20.57	16QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.087	19.42	64QAM
LTE Band 25/2	24E	1855 - 1910	0.130	21.14	QPSK
LTE Band 25/2	24E	1855 - 1910	0.117	20.67	16QAM
LTE Band 25/2	24E	1855 - 1910	0.088	19.47	64QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.128	21.07	QPSK
LTE Band 25/2	24E	1857.5 - 1907.5	0.106	20.27	16QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.083	19.17	64QAM
LTE Band 25/2	24E	1860 - 1905	0.121	20.82	QPSK
LTE Band 25/2	24E	1860 - 1905	0.106	20.27	16QAM
LTE Band 25/2	24E	1860 - 1905	0.082	19.12	64QAM

EUT Overview (Mid Bands)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset	Page 4 of 42	

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.654	28.15	QPSK
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.556	27.45	16QAM
LTE Band 41 (PC2)	27	2498.5 - 2687.5	0.496	26.95	64QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.638	28.05	QPSK
LTE Band 41 (PC2)	27	2501 - 2685	0.582	27.65	16QAM
LTE Band 41 (PC2)	27	2501 - 2685	0.519	27.15	64QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.653	28.15	QPSK
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.556	27.45	16QAM
LTE Band 41 (PC2)	27	2503.5 - 2682.5	0.531	27.25	64QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.680	28.32	QPSK
LTE Band 41 (PC2)	27	2506 - 2680	0.598	27.76	16QAM
LTE Band 41 (PC2)	27	2506 - 2680	0.543	27.34	64QAM

EUT Overview (High Bands)

FCC ID: ZNFQ720PS	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 5 of 42

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 ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 6 of 42

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFQ720PS**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 01553, 01554, 01555, 06113, 00769

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 WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE)

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.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 7 of 42

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

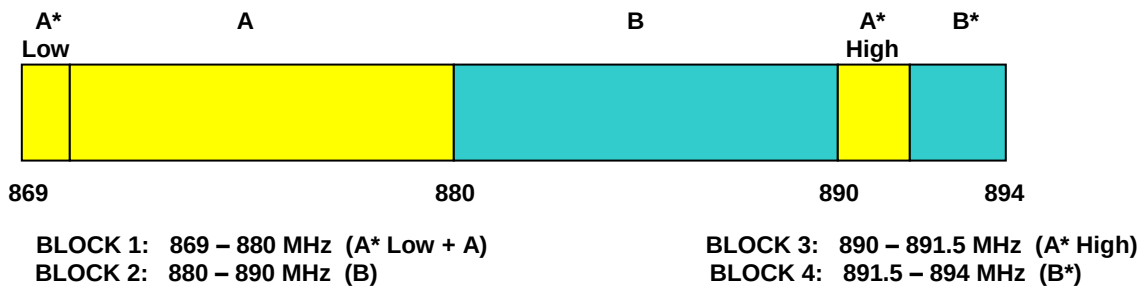
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results 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

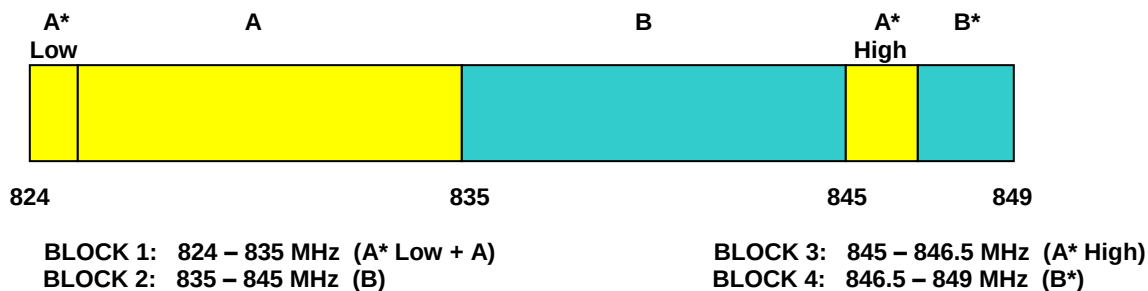
698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

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

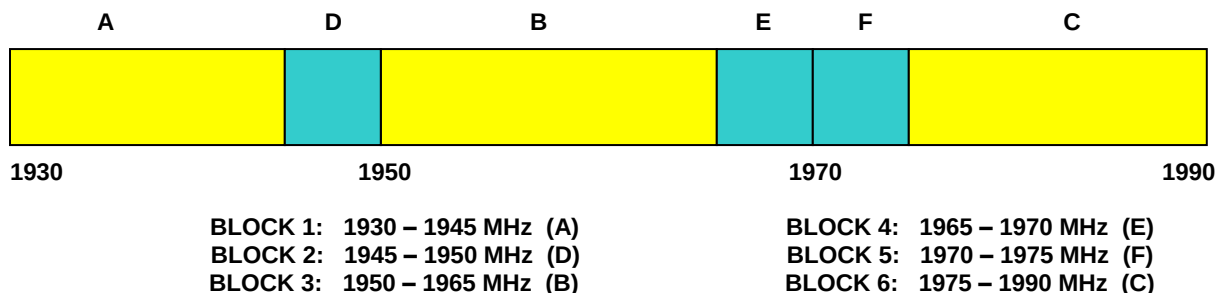


3.5 Cellular - Mobile Frequency Blocks

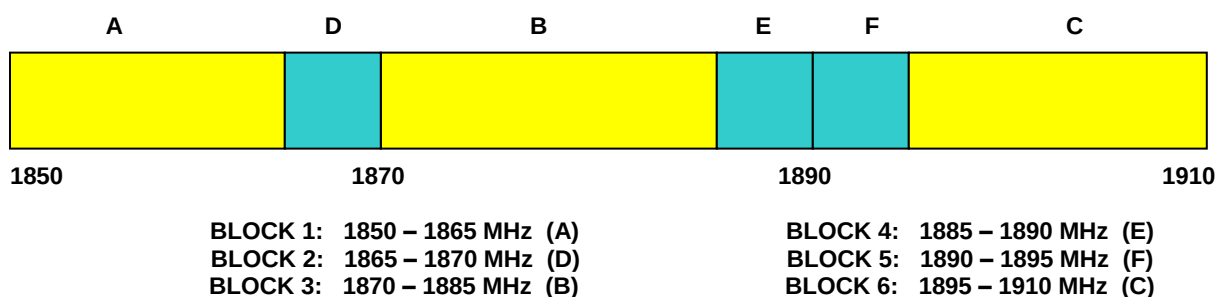


FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 8 of 42

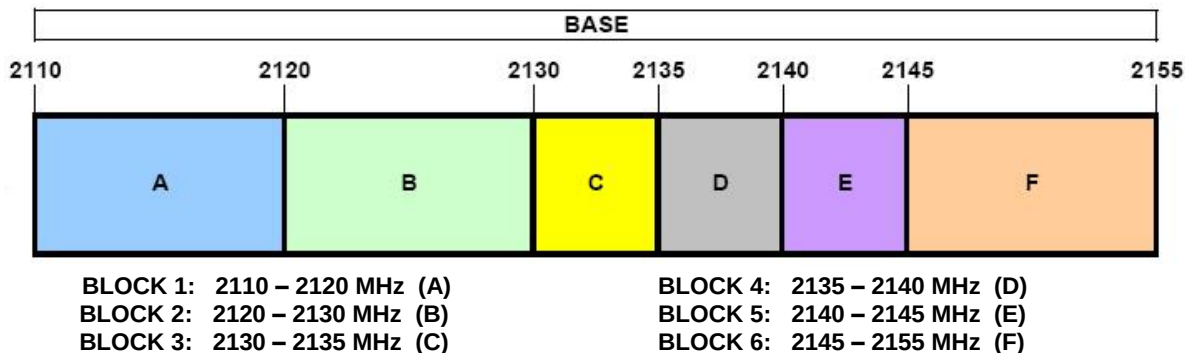
3.6 PCS - Base Frequency Blocks



3.7 PCS - Mobile Frequency Blocks

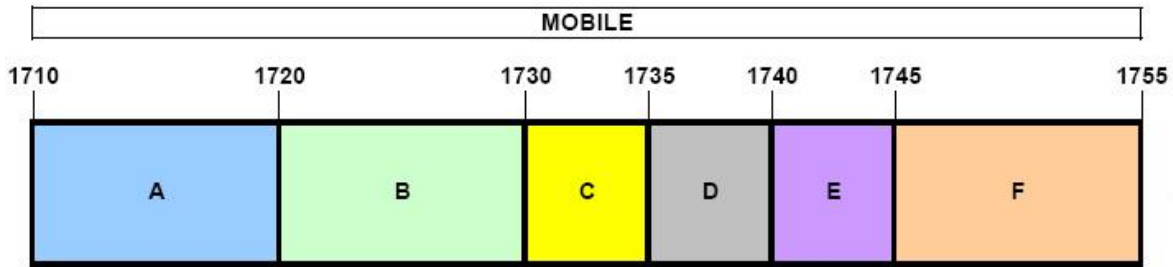


3.8 AWS - Base Frequency Blocks



FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 9 of 42

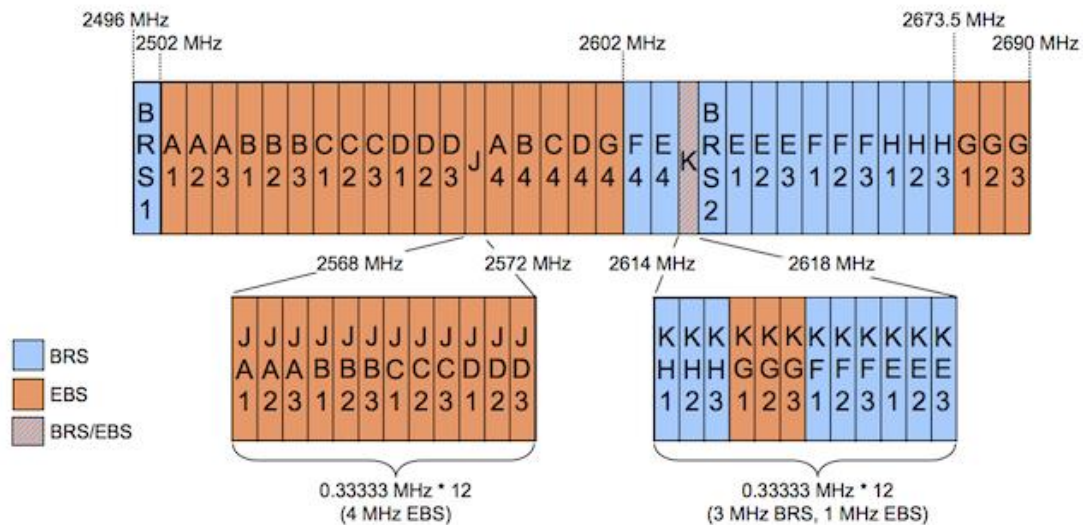
3.9 AWS - Mobile Frequency Blocks



BLOCK 1: 1710 – 1720 MHz (A)
BLOCK 2: 1720 – 1730 MHz (B)
BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 4: 1735 – 1740 MHz (D)
BLOCK 5: 1740 – 1745 MHz (E)
BLOCK 6: 1745 – 1755 MHz (F)

3.10 BRS/EBS Frequency Block



FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 10 of 42

3.11 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:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

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 $43 + 10 \log_{10}(\text{Power}_{\text{[Watts]}})$. For Band 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 $55 + 10 \log_{10}(\text{Power}_{\text{[Watts]}})$.

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.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset	Page 11 of 42	

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 ($\pm$ dB)
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 12 of 42

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
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)	8/9/2018	Biennial	8/9/2020	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/30/2018	Annual	4/30/2019	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Rohde & Schwarz	TC-TA18	Vivaldi Antenna	8/17/2018	Biennial	8/17/2020	101072
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	9/19/2018	Annual	9/19/2019	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	CMW500	Radio Communication Tester	11/14/2018	Annual	11/14/2019	100976
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
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:

- 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.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 13 of 42

6.0 SAMPLE CALCULATIONS

Spurious Radiated Emission – LTE Band

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

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

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 14 of 42

7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.
 FCC ID: ZNFQ720PS
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

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	RADIATED	PASS	Section 7.2
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 71, 12/17, 13)	< 3 Watts max. ERP			Section 7.2
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 25/2, 41)	< 2 Watts max. EIRP			Section 7.2
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 66/4)	< 1 Watts max. EIRP			Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.3
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			Section 7.3
27.53(m)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3

Table 7-1. 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.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1-ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset	Page 15 of 42	

7.2 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1-ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 16 of 42

Test Setup

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

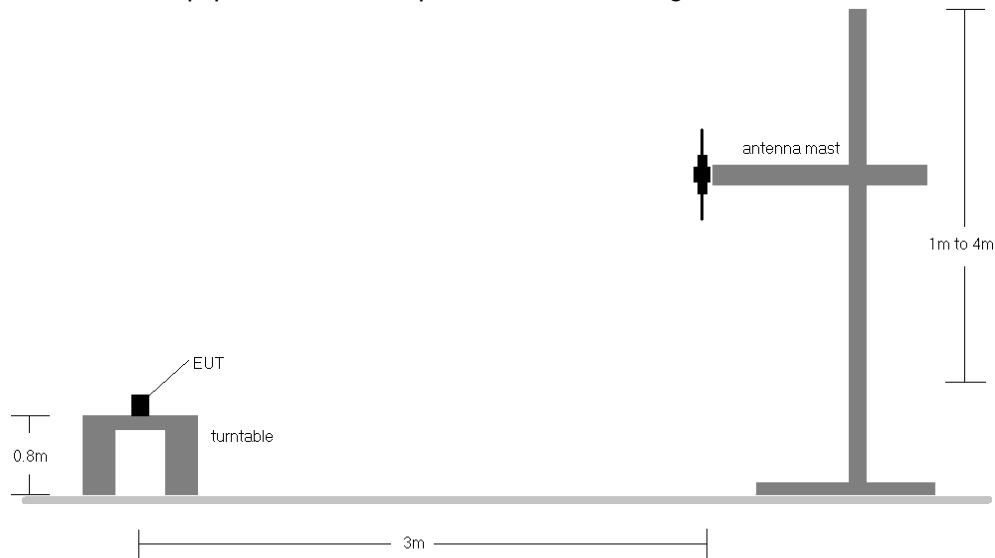


Figure 7-1. Radiated Test Setup <1GHz

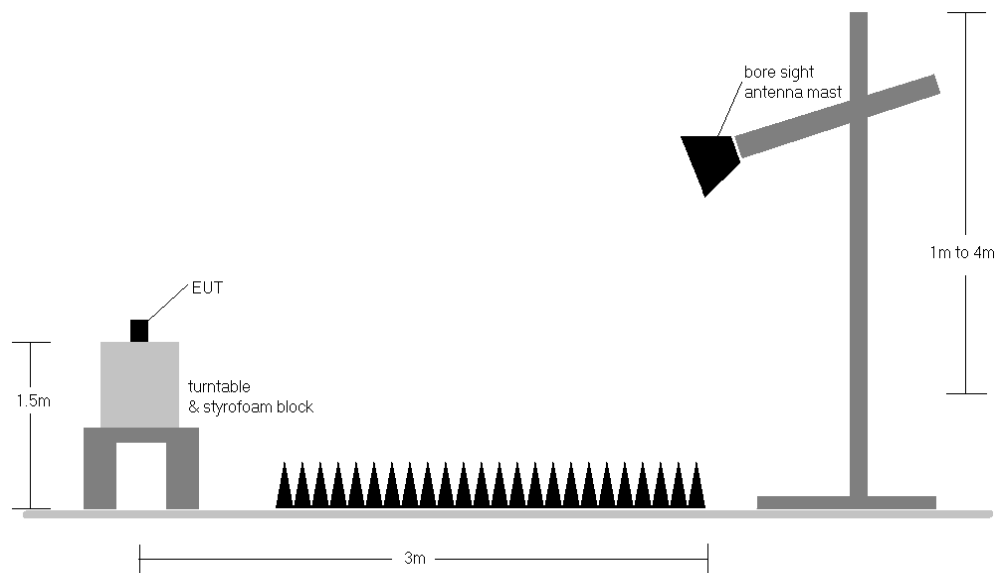


Figure 7-2. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 17 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	V	174	176	1 / 0	13.71	2.90	14.46	0.028	34.77	-20.31
680.50	5	QPSK	V	173	165	1 / 0	14.06	3.20	15.11	0.032	34.77	-19.66
695.50	5	QPSK	V	167	232	1 / 0	14.36	3.30	15.51	0.036	34.77	-19.26
695.50	5	16-QAM	V	167	232	1 / 0	13.06	3.30	14.21	0.026	34.77	-20.56
695.50	5	64-QAM	V	167	232	1 / 0	13.46	3.30	14.61	0.029	34.77	-20.16
668.00	10	QPSK	V	174	176	1 / 0	14.46	2.90	15.21	0.033	34.77	-19.56
680.50	10	QPSK	V	173	165	1 / 0	14.71	3.20	15.76	0.038	34.77	-19.01
693.00	10	QPSK	V	167	232	1 / 0	15.01	3.30	16.16	0.041	34.77	-18.61
693.00	10	16-QAM	V	167	232	1 / 0	13.76	3.30	14.91	0.031	34.77	-19.86
693.00	10	64-QAM	V	167	232	1 / 0	13.26	3.30	14.41	0.028	34.77	-20.36
670.50	15	QPSK	V	174	176	1 / 0	14.72	3.00	15.57	0.036	34.77	-19.20
680.50	15	QPSK	V	173	165	1 / 0	14.98	3.20	16.03	0.040	34.77	-18.74
690.50	15	QPSK	V	167	232	1 / 0	15.27	3.30	16.42	0.044	34.77	-18.35
690.50	15	16-QAM	V	167	232	1 / 0	13.96	3.30	15.11	0.032	34.77	-19.66
690.50	15	64-QAM	V	167	232	1 / 0	13.39	3.30	14.54	0.028	34.77	-20.23
673.00	20	QPSK	V	174	176	1 / 0	13.85	3.10	14.80	0.030	34.77	-19.97
680.50	20	QPSK	V	173	165	1 / 0	15.11	3.20	16.16	0.041	34.77	-18.61
688.00	20	QPSK	V	167	232	1 / 0	15.66	3.30	16.81	0.048	34.77	-17.96
688.00	20	16-QAM	V	167	232	1 / 0	14.06	3.30	15.21	0.033	34.77	-19.56
688.00	20	64-QAM	V	167	232	1 / 0	13.49	3.30	14.64	0.029	34.77	-20.13
688.00	20	QPSK	H	104	188	1 / 0	15.07	3.30	16.22	0.042	34.77	-18.55

Table 7-2. ERP Data (Band 71)

FCC ID: ZNFQ720PS	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 18 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	283	265	1 / 5	15.18	3.40	16.43	0.044	34.77	-18.34	18.58	0.072	36.99	-18.41
707.50	1.4	QPSK	H	281	263	1 / 5	15.15	3.65	16.65	0.046	34.77	-18.12	18.80	0.076	36.99	-18.19
715.30	1.4	QPSK	H	287	256	1 / 5	15.33	3.70	16.88	0.049	34.77	-17.89	19.03	0.080	36.99	-17.96
715.30	1.4	16-QAM	H	287	256	1 / 5	14.13	3.70	15.68	0.037	34.77	-19.09	17.83	0.061	36.99	-19.16
715.30	1.4	64-QAM	H	287	256	1 / 5	13.13	3.70	14.68	0.029	34.77	-20.09	16.83	0.048	36.99	-20.16
700.50	3	QPSK	H	283	265	1 / 14	15.13	3.40	16.38	0.043	34.77	-18.39	18.53	0.071	36.99	-18.46
707.50	3	QPSK	H	281	263	1 / 14	15.23	3.65	16.73	0.047	34.77	-18.04	18.88	0.077	36.99	-18.11
714.50	3	QPSK	H	287	256	1 / 14	15.38	3.70	16.93	0.049	34.77	-17.84	19.08	0.081	36.99	-17.91
714.50	3	16-QAM	H	287	256	1 / 14	14.18	3.70	15.73	0.037	34.77	-19.04	17.88	0.061	36.99	-19.11
714.50	3	64-QAM	H	287	256	1 / 14	13.23	3.70	14.78	0.030	34.77	-19.99	16.93	0.049	36.99	-20.06

Table 7-3. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	283	265	1 / 24	15.09	3.40	16.34	0.043	34.77	-18.43	18.49	0.071	36.99	-18.50
707.50	5	QPSK	H	281	263	1 / 24	15.13	3.65	16.63	0.046	34.77	-18.14	18.78	0.076	36.99	-18.21
713.50	5	QPSK	H	287	256	1 / 24	15.28	3.70	16.83	0.048	34.77	-17.94	18.98	0.079	36.99	-18.01
713.50	5	16-QAM	H	287	256	1 / 24	14.08	3.70	15.63	0.037	34.77	-19.14	17.78	0.060	36.99	-19.21
713.50	5	64-QAM	H	287	256	1 / 24	13.13	3.70	14.68	0.029	34.77	-20.09	16.83	0.048	36.99	-20.16
704.00	10	QPSK	H	283	265	1 / 49	15.10	3.50	16.45	0.044	34.77	-18.32	18.60	0.072	36.99	-18.39
707.50	10	QPSK	H	281	263	1 / 49	15.50	3.65	17.00	0.050	34.77	-17.77	19.15	0.082	36.99	-17.84
711.00	10	QPSK	H	287	256	1 / 49	15.67	3.70	17.22	0.053	34.77	-17.55	19.37	0.086	36.99	-17.62
711.00	10	16-QAM	H	287	256	1 / 49	14.34	3.70	15.89	0.039	34.77	-18.88	18.04	0.064	36.99	-18.95
711.00	10	64-QAM	H	287	256	1 / 49	13.43	3.70	14.98	0.031	34.77	-19.79	17.13	0.052	36.99	-19.86
711.00	10	QPSK	V	100	19	1 / 49	15.95	3.70	17.50	0.056	34.77	-17.27	19.65	0.092	36.99	-17.34

Table 7-4. ERP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	101	295	1 / 24	13.32	5.80	16.97	0.050	34.77	-17.80	19.12	0.082	36.99	-17.87
782.00	5	QPSK	H	101	295	1 / 24	13.82	5.80	17.47	0.056	34.77	-17.30	19.62	0.092	36.99	-17.37
784.50	5	QPSK	H	101	295	1 / 24	13.27	5.90	17.02	0.050	34.77	-17.75	19.17	0.083	36.99	-17.82
782.00	5	16-QAM	H	101	295	1 / 24	12.77	5.80	16.42	0.044	34.77	-18.35	18.57	0.072	36.99	-18.42
782.00	5	64-QAM	H	101	295	1 / 24	12.27	5.80	15.92	0.039	34.77	-18.85	18.07	0.064	36.99	-18.92
782.00	10	QPSK	H	101	295	1 / 49	15.13	5.80	18.78	0.076	34.77	-15.99	20.93	0.124	36.99	-16.06
782.00	10	16-QAM	H	101	295	1 / 49	13.42	5.80	17.07	0.051	34.77	-17.70	19.22	0.084	36.99	-17.77
782.00	10	64-QAM	H	101	295	1 / 49	12.46	5.80	16.11	0.041	34.77	-18.66	18.26	0.067	36.99	-18.73
782.00	10	QPSK	V	157	313	1 / 49	15.43	5.80	19.08	0.081	34.77	-15.69	21.23	0.133	36.99	-15.76

Table 7-5. ERP Data (Band 13)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset	Page 19 of 42	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	144	272	1 / 5	12.48	6.70	17.03	0.050	38.45	-21.42	19.18	0.083	40.61	-21.43
836.50	1.4	QPSK	V	144	274	1 / 5	12.70	6.70	17.25	0.053	38.45	-21.20	19.40	0.087	40.61	-21.21
848.30	1.4	QPSK	V	148	260	1 / 5	12.53	6.70	17.08	0.051	38.45	-21.37	19.23	0.084	40.61	-21.38
836.50	1.4	16-QAM	V	144	274	1 / 5	12.53	6.70	17.08	0.051	38.45	-21.37	19.23	0.084	40.61	-21.38
836.50	1.4	64-QAM	V	144	274	1 / 5	12.33	6.70	16.88	0.049	38.45	-21.57	19.03	0.080	40.61	-21.58
825.50	3	QPSK	V	144	272	1 / 14	12.58	6.70	17.13	0.052	38.45	-21.32	19.28	0.085	40.61	-21.33
836.50	3	QPSK	V	144	274	1 / 14	12.81	6.70	17.36	0.054	38.45	-21.09	19.51	0.089	40.61	-21.10
847.50	3	QPSK	V	148	260	1 / 14	12.68	6.65	17.18	0.052	38.45	-21.27	19.33	0.086	40.61	-21.28
836.50	3	16-QAM	V	144	274	1 / 14	12.63	6.70	17.18	0.052	38.45	-21.27	19.33	0.086	40.61	-21.28
836.50	3	64-QAM	V	144	274	1 / 14	12.43	6.70	16.98	0.050	38.45	-21.47	19.13	0.082	40.61	-21.48
826.50	5	QPSK	V	144	272	1 / 24	12.53	6.70	17.08	0.051	38.45	-21.37	19.23	0.084	40.61	-21.38
836.50	5	QPSK	V	144	274	1 / 24	12.73	6.70	17.28	0.053	38.45	-21.17	19.43	0.088	40.61	-21.18
846.50	5	QPSK	V	148	260	1 / 24	12.60	6.60	17.05	0.051	38.45	-21.40	19.20	0.083	40.61	-21.41
836.50	5	16-QAM	V	144	274	1 / 24	12.48	6.70	17.03	0.050	38.45	-21.42	19.18	0.083	40.61	-21.43
836.50	5	64-QAM	V	144	274	1 / 24	12.23	6.70	16.78	0.048	38.45	-21.67	18.93	0.078	40.61	-21.68
829.00	10	QPSK	V	144	272	1 / 49	12.73	6.70	17.28	0.053	38.45	-21.17	19.43	0.088	40.61	-21.18
836.50	10	QPSK	V	144	274	1 / 49	12.93	6.70	17.48	0.056	38.45	-20.97	19.63	0.092	40.61	-20.98
844.00	10	QPSK	V	148	260	1 / 49	12.81	6.60	17.26	0.053	38.45	-21.19	19.41	0.087	40.61	-21.20
836.50	10	16-QAM	V	144	274	1 / 49	12.73	6.70	17.28	0.053	38.45	-21.17	19.43	0.088	40.61	-21.18
836.50	10	64-QAM	V	144	274	1 / 49	12.43	6.70	16.98	0.050	38.45	-21.47	19.13	0.082	40.61	-21.48

Table 7-6. ERP Data (Band 26/5)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 20 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	144	272	1 / 74	13.08	6.70	17.63	0.058	38.45	-20.82	19.78	0.095	40.61	-20.83
836.50	15	QPSK	V	144	274	1 / 74	13.42	6.70	17.97	0.063	38.45	-20.48	20.12	0.103	40.61	-20.49
841.50	15	QPSK	V	148	260	1 / 74	13.15	6.60	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
836.50	15	16-QAM	V	144	274	1 / 74	13.21	6.70	17.76	0.060	38.45	-20.69	19.91	0.098	40.61	-20.70
836.50	15	64-QAM	V	144	274	1 / 74	12.26	6.70	16.81	0.048	38.45	-21.64	18.96	0.079	40.61	-21.65
836.50	15	QPSK	H	110	270	1 / 74	12.65	6.70	17.20	0.052	38.45	-21.25	19.35	0.086	40.61	-21.26

Table 7-7. ERP Data (Band 26)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 21 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	100	15	1 / 5	12.45	9.44	21.89	0.155	30.00	-8.11
1745.00	1.4	QPSK	V	400	1	1 / 5	12.40	9.23	21.63	0.146	30.00	-8.37
1779.30	1.4	QPSK	V	226	365	1 / 5	11.45	9.26	20.71	0.118	30.00	-9.29
1710.70	1.4	16-QAM	V	100	15	1 / 5	11.44	9.44	20.88	0.123	30.00	-9.12
1710.70	1.4	64-QAM	V	100	15	1 / 5	10.55	9.44	19.99	0.100	30.00	-10.01
1711.50	3	QPSK	V	100	15	1 / 14	12.32	9.44	21.76	0.150	30.00	-8.24
1745.00	3	QPSK	V	400	1	1 / 14	12.25	9.23	21.48	0.141	30.00	-8.52
1778.50	3	QPSK	V	226	365	1 / 14	11.55	9.26	20.81	0.120	30.00	-9.19
1711.50	3	16-QAM	V	100	15	1 / 14	11.55	9.44	20.99	0.126	30.00	-9.01
1711.50	3	64-QAM	V	100	15	1 / 14	10.80	9.44	20.24	0.106	30.00	-9.76
1712.50	5	QPSK	V	100	15	1 / 24	12.25	9.43	21.68	0.147	30.00	-8.32
1745.00	5	QPSK	V	400	1	1 / 24	12.34	9.23	21.57	0.144	30.00	-8.43
1777.50	5	QPSK	V	226	365	1 / 24	11.55	9.26	20.81	0.120	30.00	-9.19
1712.50	5	16-QAM	V	100	15	1 / 24	11.51	9.43	20.94	0.124	30.00	-9.06
1712.50	5	64-QAM	V	100	15	1 / 24	10.75	9.43	20.18	0.104	30.00	-9.82
1715.00	10	QPSK	V	100	15	1 / 49	12.75	9.42	22.17	0.165	30.00	-7.83
1745.00	10	QPSK	V	400	1	1 / 49	11.85	9.23	21.08	0.128	30.00	-8.92
1775.00	10	QPSK	V	226	365	1 / 49	12.35	9.25	21.60	0.145	30.00	-8.40
1715.00	10	16-QAM	V	100	15	1 / 49	11.95	9.42	21.37	0.137	30.00	-8.63
1715.00	10	64-QAM	V	100	15	1 / 49	11.00	9.42	20.42	0.110	30.00	-9.58
1717.50	15	QPSK	V	100	15	1 / 74	12.25	9.40	21.65	0.146	30.00	-8.35
1745.00	15	QPSK	V	400	1	1 / 74	12.35	9.23	21.58	0.144	30.00	-8.42
1772.50	15	QPSK	V	226	365	1 / 74	11.35	9.25	20.60	0.115	30.00	-9.40
1717.50	15	16-QAM	V	100	15	1 / 74	11.60	9.40	21.00	0.126	30.00	-9.00
1717.50	15	64-QAM	V	100	15	1 / 74	10.75	9.40	20.15	0.104	30.00	-9.85
1720.00	20	QPSK	V	100	15	1 / 99	6.96	9.38	16.34	0.043	30.00	-13.66
1745.00	20	QPSK	V	400	1	1 / 99	7.04	9.23	16.27	0.042	30.00	-13.73
1770.00	20	QPSK	V	226	365	1 / 99	11.95	9.24	21.19	0.132	30.00	-8.81
1720.00	20	16-QAM	V	100	15	1 / 99	12.06	9.38	21.44	0.139	30.00	-8.56
1720.00	20	64-QAM	V	100	15	1 / 99	11.10	9.38	20.48	0.112	30.00	-9.52
1720.00	20	QPSK	H	100	15	1 / 0	9.73	9.49	19.22	0.084	30.00	-10.78

Table 7-8. EIRP Data (Band 66/4)

FCC ID: ZNFQ720PS	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1-ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 22 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	14	1 / 5	9.18	9.48	18.66	0.074	33.01	-14.35
1882.50	1.4	QPSK	H	157	9	1 / 5	11.20	9.94	21.14	0.130	33.01	-11.88
1914.30	1.4	QPSK	H	148	9	1 / 5	10.73	10.29	21.02	0.127	33.01	-11.99
1882.50	1.4	16-QAM	H	157	9	1 / 5	10.73	9.94	20.67	0.117	33.01	-12.35
1882.50	1.4	64-QAM	H	157	9	1 / 5	8.73	9.94	18.67	0.074	33.01	-14.35
1851.50	3	QPSK	H	150	14	1 / 14	9.18	9.50	18.68	0.074	33.01	-14.33
1882.50	3	QPSK	H	157	9	1 / 14	11.20	9.94	21.14	0.130	33.01	-11.88
1913.50	3	QPSK	H	148	9	1 / 14	10.23	10.29	20.52	0.113	33.01	-12.50
1882.50	3	16-QAM	H	157	9	1 / 14	10.83	9.94	20.77	0.119	33.01	-12.25
1882.50	3	64-QAM	H	157	9	1 / 14	8.63	9.94	18.57	0.072	33.01	-14.45
1852.50	5	QPSK	H	150	14	1 / 24	9.28	9.51	18.79	0.076	33.01	-14.22
1882.50	5	QPSK	H	157	9	1 / 24	11.23	9.94	21.17	0.131	33.01	-11.85
1912.50	5	QPSK	H	148	9	1 / 24	10.23	10.28	20.51	0.112	33.01	-12.50
1882.50	5	16-QAM	H	157	9	1 / 24	10.63	9.94	20.57	0.114	33.01	-12.45
1882.50	5	64-QAM	H	157	9	1 / 24	9.48	9.94	19.42	0.087	33.01	-13.60
1855.00	10	QPSK	H	150	14	1 / 49	9.48	9.55	19.03	0.080	33.01	-13.98
1882.50	10	QPSK	H	157	9	1 / 49	11.20	9.94	21.14	0.130	33.01	-11.88
1910.00	10	QPSK	H	148	9	1 / 49	10.33	10.26	20.59	0.114	33.01	-12.42
1882.50	10	16-QAM	H	157	9	1 / 49	10.73	9.94	20.67	0.117	33.01	-12.35
1882.50	10	64-QAM	H	157	9	1 / 49	9.53	9.94	19.47	0.088	33.01	-13.55
1857.50	15	QPSK	H	150	14	1 / 74	8.98	9.58	18.56	0.072	33.01	-14.45
1882.50	15	QPSK	H	157	9	1 / 74	11.13	9.94	21.07	0.128	33.01	-11.95
1907.50	15	QPSK	H	148	9	1 / 74	10.73	10.24	20.97	0.125	33.01	-12.04
1882.50	15	16-QAM	H	157	9	1 / 74	10.33	9.94	20.27	0.106	33.01	-12.75
1882.50	15	64-QAM	H	157	9	1 / 74	9.23	9.94	19.17	0.083	33.01	-13.85
1860.00	20	QPSK	H	150	14	1 / 99	9.28	9.62	18.90	0.078	33.01	-14.11
1882.50	20	QPSK	H	157	9	1 / 99	10.88	9.94	20.82	0.121	33.01	-12.20
1905.00	20	QPSK	H	148	9	1 / 99	10.32	10.22	20.54	0.113	33.01	-12.47
1882.50	20	16-QAM	H	157	9	1 / 99	10.33	9.94	20.27	0.106	33.01	-12.75
1882.50	20	64-QAM	H	157	9	1 / 99	9.18	9.94	19.12	0.082	33.01	-13.90
1882.50	20	QPSK	V	192	355	1 / 99	10.58	9.94	20.52	0.113	33.01	-12.49

Table 7-9. EIRP Data (Band 25/2)

FCC ID: ZNFQ720PS	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1-ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 23 of 42

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	V	167	155	1 / 24	18.72	9.43	28.15	0.654	33.01	-4.86
2593.00	5	QPSK	V	157	154	1 / 24	17.69	9.55	27.24	0.530	33.01	-5.77
2687.50	5	QPSK	V	169	154	1 / 24	15.57	9.82	25.39	0.346	33.01	-7.62
2498.50	5	16-QAM	V	167	155	1 / 24	18.02	9.43	27.45	0.556	33.01	-5.56
2498.50	5	64-QAM	V	167	155	1 / 24	17.52	9.43	26.95	0.496	33.01	-6.06
2501.00	10	QPSK	V	167	155	1 / 49	18.62	9.43	28.05	0.638	33.01	-4.96
2593.00	10	QPSK	V	157	154	1 / 49	17.92	9.55	27.47	0.559	33.01	-5.54
2685.00	10	QPSK	V	169	154	1 / 49	16.02	9.82	25.84	0.384	33.01	-7.17
2501.00	10	16-QAM	V	167	155	1 / 49	18.22	9.43	27.65	0.582	33.01	-5.36
2501.00	10	64-QAM	V	167	155	1 / 49	17.72	9.43	27.15	0.519	33.01	-5.86
2503.50	15	QPSK	V	167	155	1 / 74	18.72	9.43	28.15	0.653	33.01	-4.86
2593.00	15	QPSK	V	157	154	1 / 74	18.12	9.55	27.67	0.585	33.01	-5.34
2682.50	15	QPSK	V	169	154	1 / 74	15.52	9.83	25.35	0.343	33.01	-7.66
2503.50	15	16-QAM	V	167	155	1 / 74	18.02	9.43	27.45	0.556	33.01	-5.56
2503.50	15	64-QAM	V	167	155	1 / 74	17.82	9.43	27.25	0.531	33.01	-5.76
2506.00	20	QPSK	V	167	155	1 / 99	18.90	9.42	28.32	0.680	33.01	-4.69
2593.00	20	QPSK	V	157	154	1 / 99	17.93	9.55	27.48	0.560	33.01	-5.53
2680.00	20	QPSK	V	169	154	1 / 99	15.77	9.83	25.60	0.363	33.01	-7.41
2506.00	20	16-QAM	V	167	155	1 / 99	18.34	9.42	27.76	0.598	33.01	-5.25
2506.00	20	64-QAM	V	167	155	1 / 99	17.92	9.42	27.34	0.543	33.01	-5.67
2506.00	20	QPSK	H	224	205	1 / 99	18.26	9.42	27.68	0.586	33.01	-5.33
2506.00	20	QPSK (PC3)	V	106	157	1 / 99	14.47	9.42	23.89	0.245	33.01	-9.12

Table 7-10. EIRP Data (Band 41- PC2 and PC3)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 24 of 42

7.3 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 25 of 42

Test Setup

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

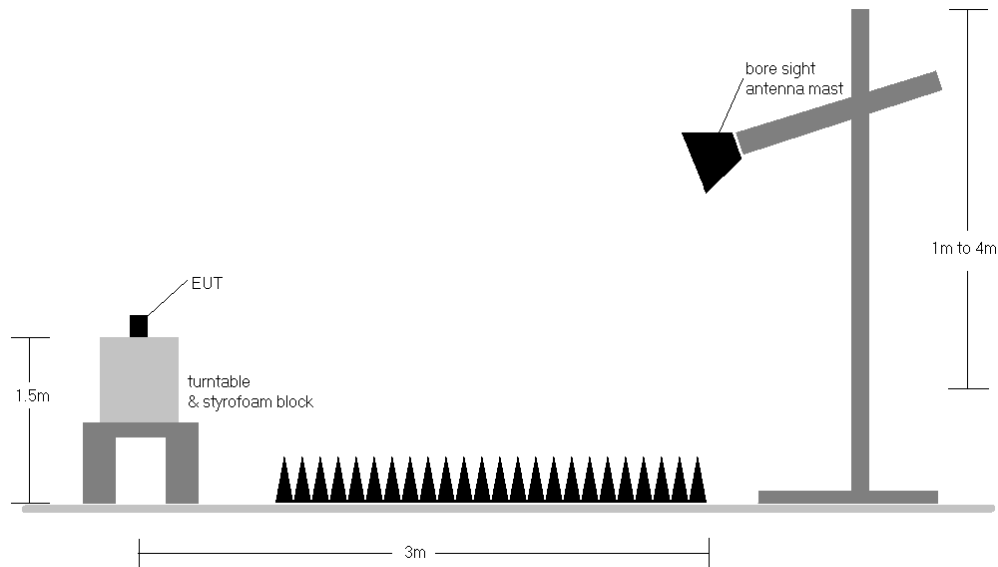


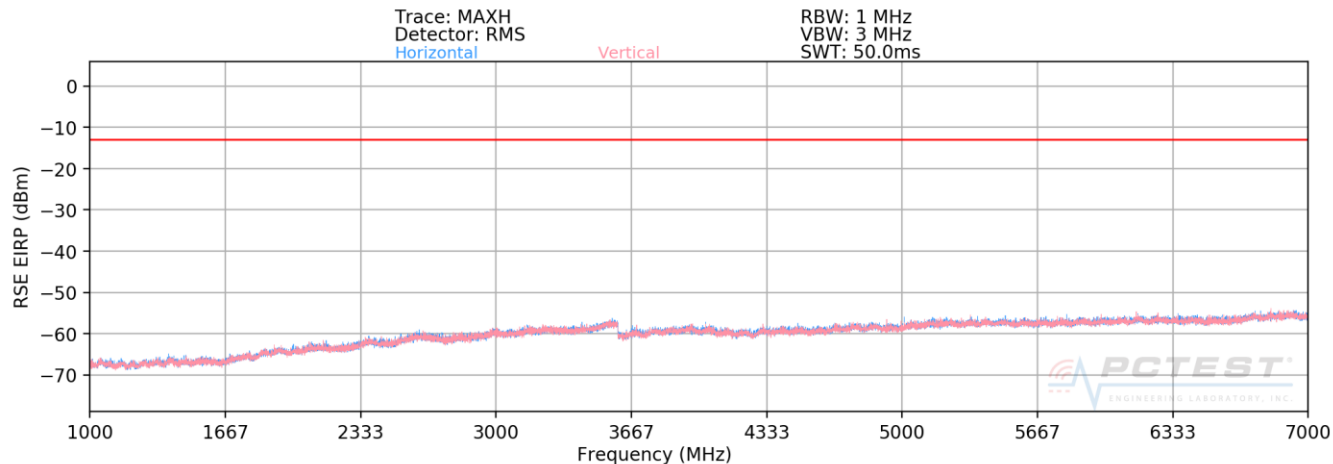
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 26 of 42

Band 71



Plot 7-1. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY: 668.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1336.00	H	122	240	-72.30	7.41	-64.89	-51.9
2004.00	H	152	330	-77.50	8.63	-68.86	-55.9
2672.00	H	-	-	-76.99	9.93	-67.06	-54.1

Table 7-11. Radiated Spurious Data (Band 71 – Low Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 27 of 42

OPERATING FREQUENCY: 680.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1361.00	H	132	44	-76.44	7.48	-68.95	-56.0
2041.50	H	-	-	-77.42	8.76	-68.66	-55.7

Table 7-12. Radiated Spurious Data (Band 71 – Mid Channel)

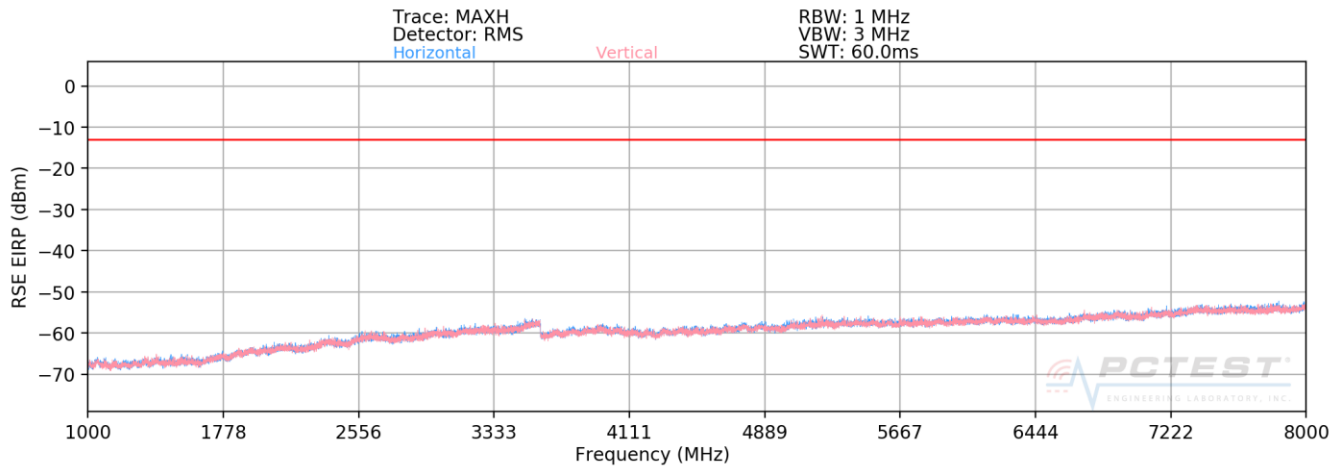
OPERATING FREQUENCY: 693.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1386.00	H	122	266	-76.26	7.45	-68.81	-55.8
2079.00	H	-	-	-77.31	8.82	-68.49	-55.5

Table 7-13. Radiated Spurious Data (Band 71 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 28 of 42

Band 12/17



Plot 7-2. Radiated Spurious Plot above 1GHz (Band 12/17)

OPERATING FREQUENCY: 704.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	V	171	283	-71.64	7.54	-64.10	-51.1
2112.00	V	145	232	-74.81	8.85	-65.96	-53.0
2816.00	V	-	-	-76.68	10.12	-66.56	-53.6

Table 7-14. Radiated Spurious Data (Band 12/17 – Low Channel)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 29 of 42

OPERATING FREQUENCY: 707.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	V	179	242	-74.76	7.63	-67.12	-54.1
2122.50	V	-	-	-76.93	8.86	-68.07	-55.1

Table 7-15. Radiated Spurious Data (Band 12/17 – Mid Channel)

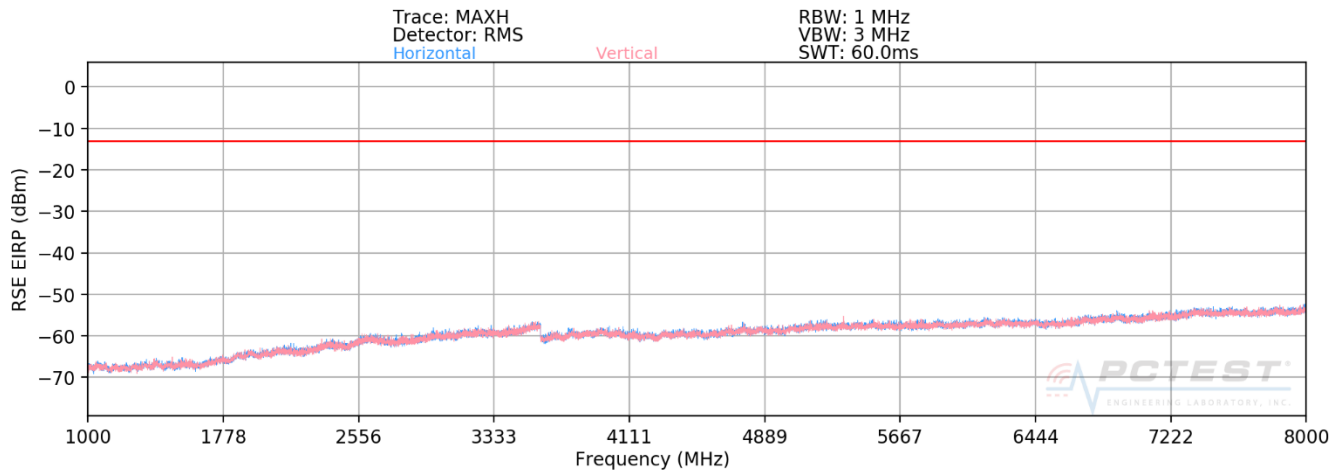
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	V	179	227	-74.90	7.72	-67.18	-54.2
2133.00	V	-	-	-77.12	8.87	-68.25	-55.2

Table 7-16. Radiated Spurious Data (Band 12/17 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 30 of 42

Band 13



Plot 7-3. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY: 782.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	V	-	-	-77.31	9.43	-67.87	-54.9

Table 7-17. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 31 of 42

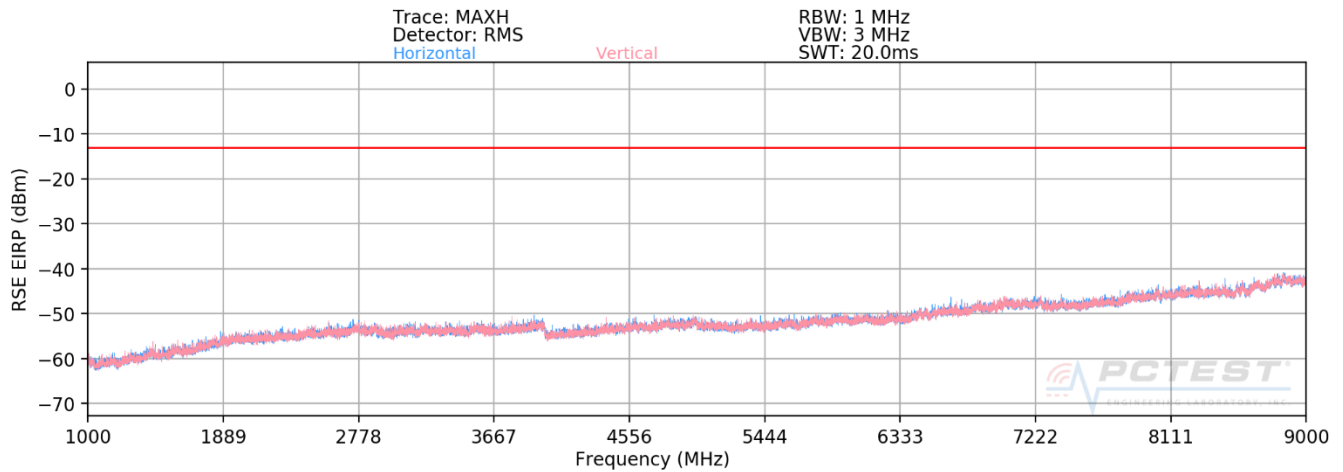
MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	V	145	77	-78.88	8.53	-70.35	-30.4

Table 7-18. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 32 of 42

Band 26



Plot 7-4. Radiated Spurious Plot above 1GHz (Band 26)

OPERATING FREQUENCY: 831.50 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 15.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1663.00	H	174	71	-79.07	8.95	-70.12	-57.1
2494.50	H	-	-	-77.34	9.73	-67.61	-54.6

Table 7-19. Radiated Spurious Data (Band 26 – Low Channel)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 33 of 42

OPERATING FREQUENCY: 836.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	174	400	-79.38	8.95	-70.43	-57.4
2509.50	H	-	-	-76.96	9.75	-67.21	-54.2

Table 7-20. Radiated Spurious Data (Band 26 – Mid Channel)

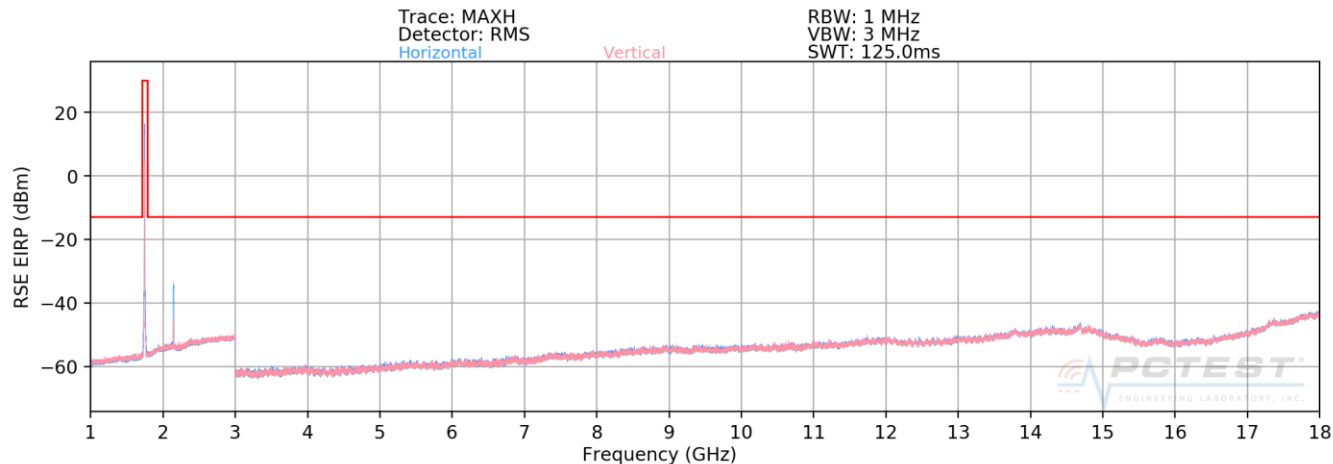
OPERATING FREQUENCY: 841.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1683.00	H	152	70	-77.65	8.95	-68.70	-55.7
2524.50	H	-	-	-76.56	9.75	-66.81	-53.8

Table 7-21. Radiated Spurious Data (Band 26 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 34 of 42

Band 66/4



Plot 7-5. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY: 1720.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	116	342	-67.27	9.84	-57.43	-44.4
5160.00	V	115	342	-71.73	10.71	-61.02	-48.0
6880.00	V	120	300	-68.40	11.68	-56.72	-43.7
8600.00	V	-	-	-67.48	11.08	-56.40	-43.4

Table 7-22. Radiated Spurious Data (Band 66/4 – Low Channel)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 35 of 42

OPERATING FREQUENCY: 1745.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	112	340	-70.56	9.91	-60.65	-47.6
5235.00	V	120	300	-69.86	10.73	-59.12	-46.1
6980.00	V	135	290	-68.85	11.82	-57.02	-44.0
8725.00	V	-	-	-67.54	11.00	-56.54	-43.5

Table 7-23. Radiated Spurious Data (Band 66/4 – Mid Channel)

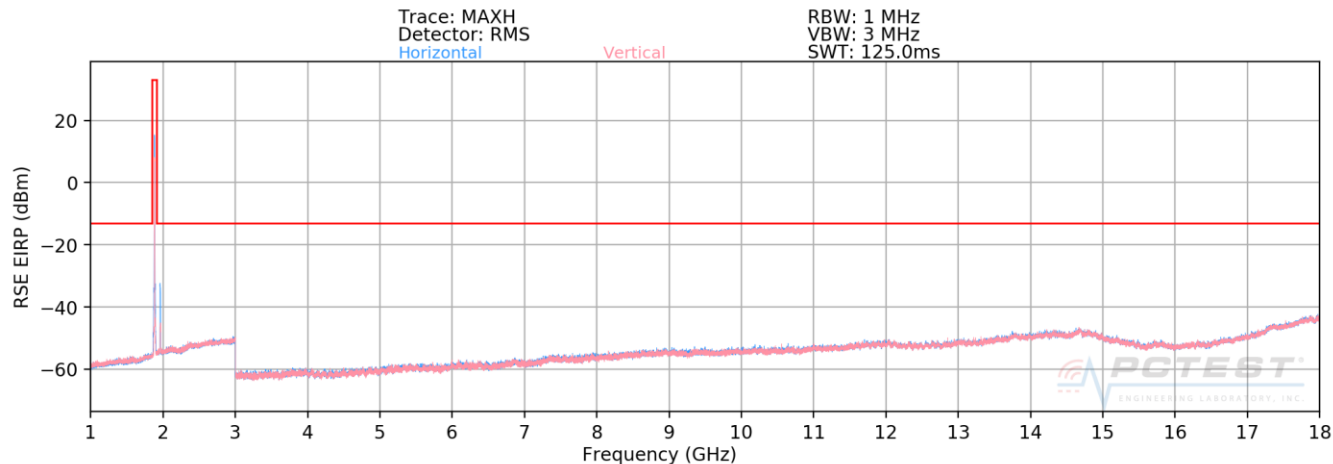
OPERATING FREQUENCY: 1770.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	V	112	100	-68.53	9.89	-58.64	-45.6
5310.00	V	233	250	-70.01	10.69	-59.32	-46.3
7080.00	V	156	275	-67.43	11.79	-55.65	-42.6
8850.00	V	-	-	-66.83	11.00	-55.83	-42.8

Table 7-24. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 36 of 42

Band 25/2



Plot 7-6. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY: 1860.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	H	113	48	-72.62	9.51	-63.11	-50.1
5580.00	H	120	75	-71.37	10.99	-60.39	-47.4
7440.00	H	125	66	-66.47	10.99	-55.48	-42.5
9300.00	H	-	-	-66.96	11.61	-55.35	-42.3

Table 7-25. Radiated Spurious Data (Band 25/2 – Low Channel)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1-ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 37 of 42

OPERATING FREQUENCY: 1882.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3765.00	H	335	333	-71.06	9.36	-61.70	-48.7
5647.50	H	300	300	-70.15	11.19	-58.96	-46.0
7530.00	H	235	245	-66.58	11.13	-55.45	-42.5
9412.50	H	-	-	-66.75	11.57	-55.18	-42.2

Table 7-26. Radiated Spurious Data (Band 25/2 – Mid Channel)

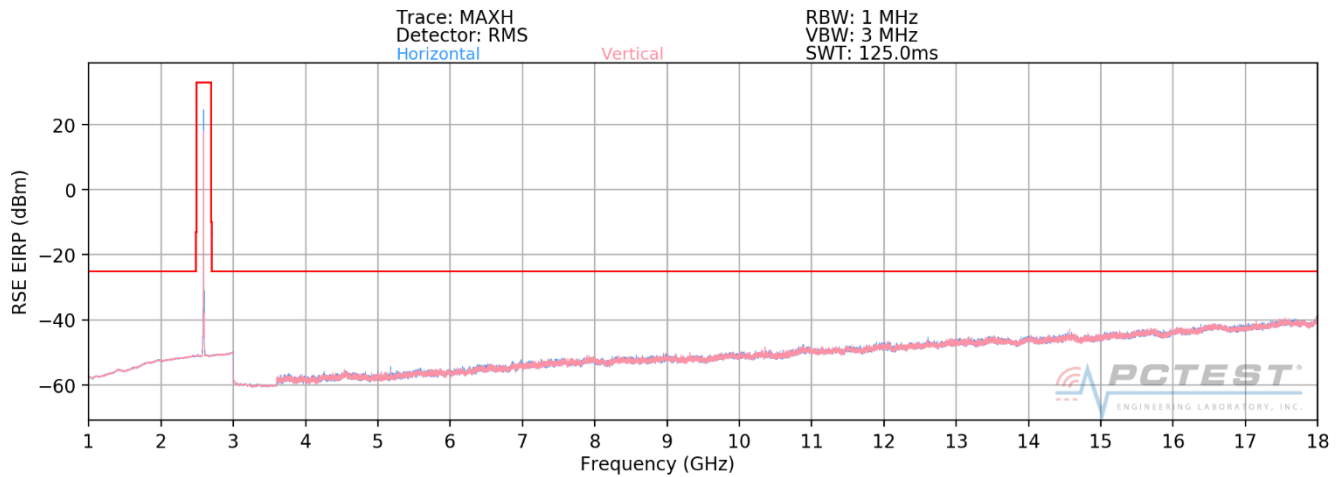
OPERATING FREQUENCY: 1905.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	H	112	272	-70.52	9.29	-61.23	-48.2
5715.00	H	-	-	-71.86	11.35	-60.52	-47.5

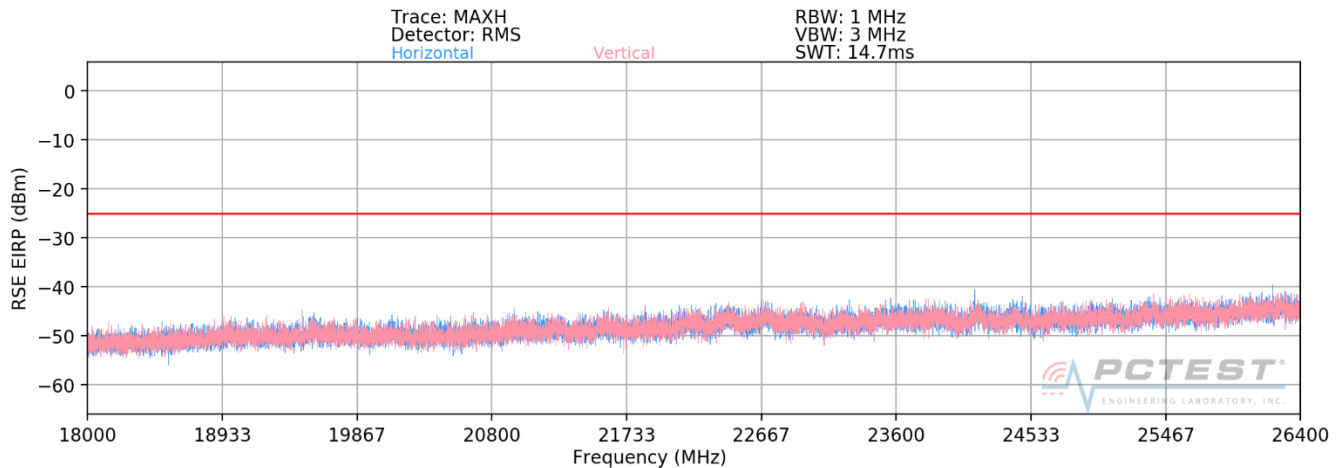
Table 7-27. Radiated Spurious Data (Band 25/2 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 38 of 42

Band 41



Plot 7-7. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-8. Radiated Spurious Plot 18GHz - 26.5GHz (Band 41)

FCC ID: ZNFQ720PS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 39 of 42

OPERATING FREQUENCY: 2510.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	315	266	-56.14	10.88	-45.26	-20.3
7530.00	H	300	233	-66.73	11.13	-55.60	-30.6
10040.00	H	250	162	-54.62	11.99	-42.63	-17.6
12550.00	H	-	-	-66.84	13.56	-53.28	-28.3

Table 7-28. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	135	347	-53.94	10.74	-43.19	-18.2
7779.00	H	165	300	-63.65	11.44	-52.21	-27.2
10372.00	H	175	250	-57.69	12.42	-45.26	-20.3
12965.00	H	-	-	-65.20	13.29	-51.91	-26.9

Table 7-29. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 40 of 42

OPERATING FREQUENCY: 2680.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	H	267	11	-69.51	34.09	-35.43	-10.4
8040.00	H	221	24	-83.84	37.14	-46.70	-21.7
10720.00	H	261	347	-83.85	38.20	-45.65	-20.6
13400.00	H	197	4	-86.36	40.15	-46.22	-21.2
16080.00	H	141	19	-84.55	37.63	-46.92	-21.9

Table 7-30. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 41 of 42

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ720PS** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: ZNFQ720PS		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1904220061-03-R1.ZNF	Test Dates: 4/22 - 5/9/2019	EUT Type: Portable Handset		Page 42 of 42