



MEASUREMENT REPORT

LTE

Applicant Name:

LG Electronics USA, Inc.

1000 Sylvan Avenue

Englewood Cliffs, NJ 07632

United States

Date of Testing:

8/21 - 9/4/2018

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M1808210167-03.ZNF

FCC ID:

ZNFQ910QM

APPLICANT:

LG Electronics USA, Inc.

Application Type:

Class II Permissive Change

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):

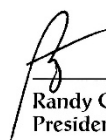
ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01

Class II Permissive Change:

Please see FCC change document

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

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



Randy Ortanez
President

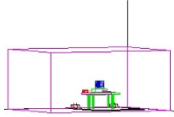


FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 1 of 46

TABLE OF CONTENTS

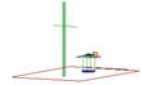
1.0	INTRODUCTION	5
1.1	Scope	5
1.2	PCTEST Test Location.....	5
1.3	Test Facility / Accreditations.....	5
2.0	PRODUCT INFORMATION.....	6
2.1	Equipment Description	6
2.2	Device Capabilities.....	6
2.3	Test Configuration	6
2.4	EMI Suppression Device(s)/Modifications	6
3.0	DESCRIPTION OF TESTS	7
3.1	Measurement Procedure.....	7
3.2	Block C Frequency Range	7
3.3	Block A Frequency Range.....	7
3.4	Cellular - Base Frequency Blocks	7
3.5	Cellular - Mobile Frequency Blocks	7
3.6	PCS - Base Frequency Blocks	8
3.7	PCS - Mobile Frequency Blocks.....	8
3.8	AWS - Base Frequency Blocks	8
3.9	AWS - Mobile Frequency Blocks.....	9
3.10	WCS – Mobile/Base Frequency Blocks.....	9
3.11	BRS/EBS Frequency Block	9
3.12	Radiated Power and Radiated Spurious Emissions	10
4.0	MEASUREMENT UNCERTAINTY	11
5.0	TEST EQUIPMENT CALIBRATION DATA	12
6.0	SAMPLE CALCULATIONS	13
7.0	TEST RESULTS.....	14
7.1	Summary.....	14
7.2	Radiated Power (ERP/EIRP).....	15
7.3	Radiated Spurious Emissions Measurements	24
8.0	CONCLUSION.....	46

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 2 of 46



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 12	27	699.7 - 715.3	0.09	19.55	0.15	21.70	QPSK
LTE Band 12	27	699.7 - 715.3	0.06	18.06	0.10	20.21	16QAM
LTE Band 12	27	699.7 - 715.3	0.05	16.93	0.08	19.08	64QAM
LTE Band 12	27	700.5 - 714.5	0.10	19.86	0.16	22.01	QPSK
LTE Band 12	27	700.5 - 714.5	0.07	18.23	0.11	20.38	16QAM
LTE Band 12	27	700.5 - 714.5	0.05	17.28	0.09	19.43	64QAM
LTE Band 17/12	27	701.5 - 713.5	0.10	19.83	0.16	21.98	QPSK
LTE Band 17/12	27	701.5 - 713.5	0.07	18.38	0.11	20.53	16QAM
LTE Band 17/12	27	701.5 - 713.5	0.05	17.31	0.09	19.46	64QAM
LTE Band 17/12	27	704 - 711	0.09	19.56	0.15	21.71	QPSK
LTE Band 17/12	27	704 - 711	0.06	18.10	0.11	20.25	16QAM
LTE Band 17/12	27	704 - 711	0.05	17.04	0.08	19.19	64QAM
LTE Band 13	27	779.5 - 784.5	0.15	21.82	0.25	23.97	QPSK
LTE Band 13	27	779.5 - 784.5	0.10	20.17	0.17	22.32	16QAM
LTE Band 13	27	779.5 - 784.5	0.08	19.18	0.14	21.33	64QAM
LTE Band 13	27	782	0.14	21.32	0.22	23.47	QPSK
LTE Band 13	27	782	0.10	20.12	0.17	22.27	16QAM
LTE Band 13	27	782	0.09	19.44	0.14	21.59	64QAM
LTE Band 26/5	22H	824.7 - 848.3	0.07	18.67	0.12	20.82	QPSK
LTE Band 26/5	22H	824.7 - 848.3	0.05	17.15	0.09	19.30	16QAM
LTE Band 26/5	22H	824.7 - 848.3	0.04	16.11	0.07	18.26	64QAM
LTE Band 26/5	22H	825.5 - 847.5	0.07	18.29	0.11	20.44	QPSK
LTE Band 26/5	22H	825.5 - 847.5	0.05	16.93	0.08	19.08	16QAM
LTE Band 26/5	22H	825.5 - 847.5	0.04	15.83	0.06	17.98	64QAM
LTE Band 26/5	22H	826.5 - 846.5	0.08	19.20	0.14	21.35	QPSK
LTE Band 26/5	22H	826.5 - 846.5	0.06	17.72	0.10	19.87	16QAM
LTE Band 26/5	22H	826.5 - 846.5	0.05	16.77	0.08	18.92	64QAM
LTE Band 26/5	22H	829 - 844	0.06	17.87	0.10	20.02	QPSK
LTE Band 26/5	22H	829 - 844	0.05	17.06	0.08	19.21	16QAM
LTE Band 26/5	22H	829 - 844	0.04	15.72	0.06	17.87	64QAM
LTE Band 26	22H	831.5 - 841.5	0.07	18.23	0.11	20.38	QPSK
LTE Band 26	22H	831.5 - 841.5	0.05	16.90	0.08	19.05	16QAM
LTE Band 26	22H	831.5 - 841.5	0.04	15.98	0.07	18.13	64QAM

EUT Overview (<1GHz)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 3 of 46

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 66/4	27	1710.7 - 1779.3	0.21	23.30	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.14	21.40	16QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.14	21.44	64QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.21	23.18	QPSK
LTE Band 66/4	27	1711.5 - 1778.5	0.13	21.29	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.14	21.33	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.20	23.09	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.14	21.35	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.13	21.28	64QAM
LTE Band 66/4	27	1715 - 1775	0.20	23.05	QPSK
LTE Band 66/4	27	1715 - 1775	0.13	21.04	16QAM
LTE Band 66/4	27	1715 - 1775	0.12	20.96	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.20	22.94	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.13	21.30	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.14	21.34	64QAM
LTE Band 66/4	27	1720 - 1770	0.20	22.91	QPSK
LTE Band 66/4	27	1720 - 1770	0.12	20.80	16QAM
LTE Band 66/4	27	1720 - 1770	0.13	21.08	64QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.10	20.19	QPSK
LTE Band 25/2	24E	1850.7 - 1914.3	0.09	19.47	16QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.07	18.34	64QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.11	20.29	QPSK
LTE Band 25/2	24E	1851.5 - 1913.5	0.09	19.37	16QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.07	18.40	64QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.11	20.34	QPSK
LTE Band 25/2	24E	1852.5 - 1912.5	0.08	19.20	16QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.07	18.35	64QAM
LTE Band 25/2	24E	1855 - 1910	0.11	20.48	QPSK
LTE Band 25/2	24E	1855 - 1910	0.09	19.61	16QAM
LTE Band 25/2	24E	1855 - 1910	0.07	18.70	64QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.11	20.30	QPSK
LTE Band 25/2	24E	1857.5 - 1907.5	0.09	19.36	16QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.07	18.46	64QAM
LTE Band 25/2	24E	1860 - 1905	0.10	20.05	QPSK
LTE Band 25/2	24E	1860 - 1905	0.08	19.13	16QAM
LTE Band 25/2	24E	1860 - 1905	0.06	18.11	64QAM
LTE Band 30	27	2307.5 - 2312.5	0.07	18.67	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.05	16.57	16QAM
LTE Band 30	27	2307.5 - 2312.5	0.04	16.44	64QAM
LTE Band 30	27	2310	0.07	18.54	QPSK
LTE Band 30	27	2310	0.04	16.53	16QAM
LTE Band 30	27	2310	0.05	16.64	64QAM
LTE Band 7	27	2502.5 - 2567.5	0.14	21.36	QPSK
LTE Band 7	27	2502.5 - 2567.5	0.12	20.78	16QAM
LTE Band 7	27	2502.5 - 2567.5	0.10	19.90	64QAM
LTE Band 7	27	2505 - 2565	0.12	20.87	QPSK
LTE Band 7	27	2505 - 2565	0.10	20.16	16QAM
LTE Band 7	27	2505 - 2565	0.07	18.72	64QAM
LTE Band 7	27	2507.5 - 2562.5	0.13	21.22	QPSK
LTE Band 7	27	2507.5 - 2562.5	0.12	20.65	16QAM
LTE Band 7	27	2507.5 - 2562.5	0.08	18.95	64QAM
LTE Band 7	27	2510 - 2560	0.14	21.51	QPSK
LTE Band 7	27	2510 - 2560	0.11	20.27	16QAM
LTE Band 7	27	2510 - 2560	0.08	19.11	64QAM
LTE Band 41	27	2498.5 - 2687.5	0.26	24.11	QPSK
LTE Band 41	27	2498.5 - 2687.5	0.20	23.04	16QAM
LTE Band 41	27	2498.5 - 2687.5	0.20	23.08	64QAM
LTE Band 41	27	2501 - 2685	0.22	23.38	QPSK
LTE Band 41	27	2501 - 2685	0.15	21.83	16QAM
LTE Band 41	27	2501 - 2685	0.12	20.93	64QAM
LTE Band 41	27	2503.5 - 2682.5	0.22	23.33	QPSK
LTE Band 41	27	2503.5 - 2682.5	0.15	21.62	16QAM
LTE Band 41	27	2503.5 - 2682.5	0.11	20.52	64QAM
LTE Band 41	27	2506 - 2680	0.23	23.62	QPSK
LTE Band 41	27	2506 - 2680	0.11	20.44	16QAM
LTE Band 41	27	2506 - 2680	0.13	21.21	64QAM

EUT Overview (>1GHz)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 4 of 46	

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: ZNFQ910QM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 5 of 46

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.: 19835, 19810, 19827

2.2 Device Capabilities

This device contains the following capabilities:

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.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 6 of 46

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

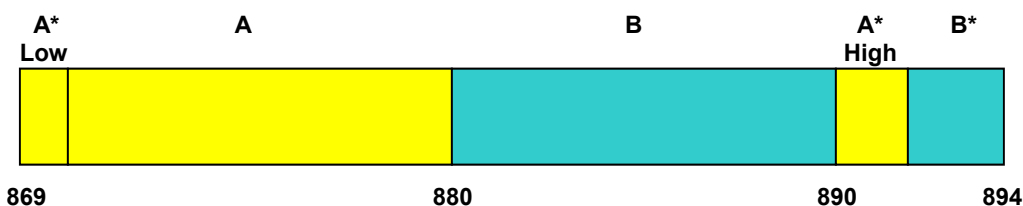
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results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

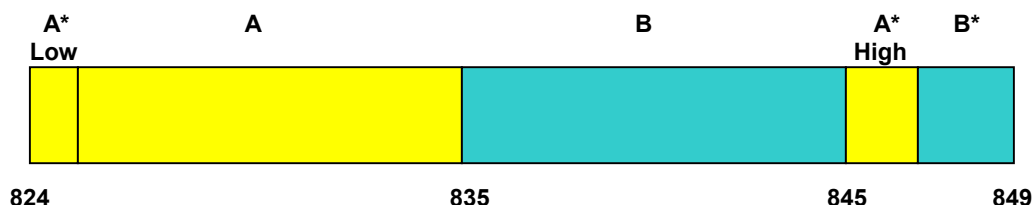
3.4 Cellular - Base Frequency Blocks



BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

3.5 Cellular - Mobile Frequency Blocks

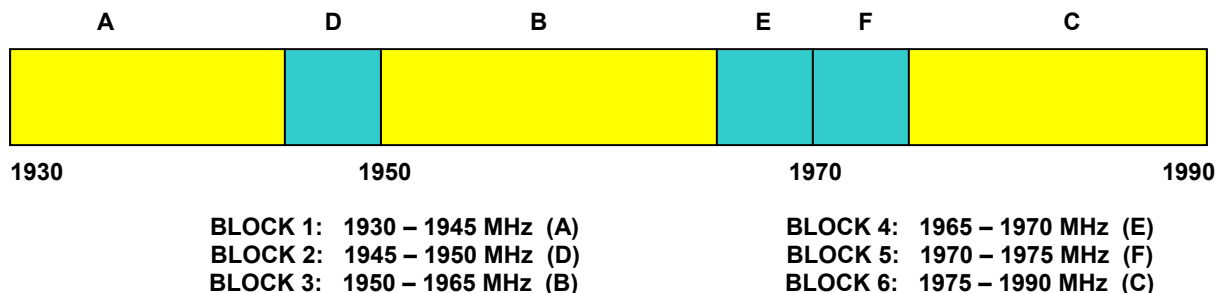


BLOCK 1: 824 – 835 MHz (A* Low + A)
BLOCK 2: 835 – 845 MHz (B)

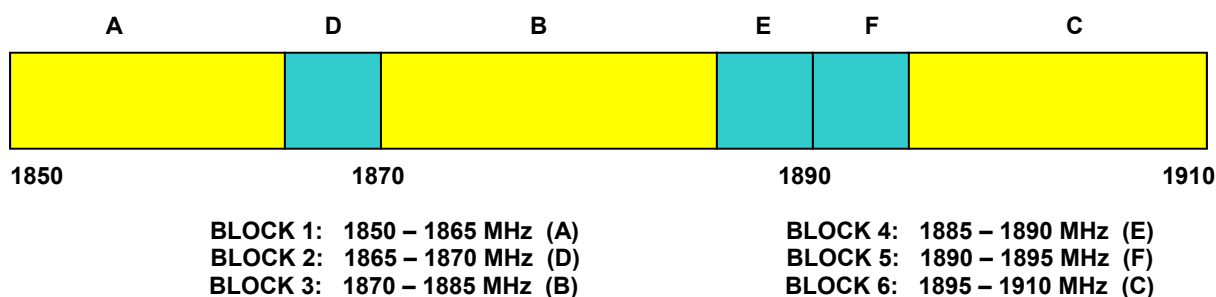
BLOCK 3: 845 – 846.5 MHz (A* High)
BLOCK 4: 846.5 – 849 MHz (B*)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 7 of 46

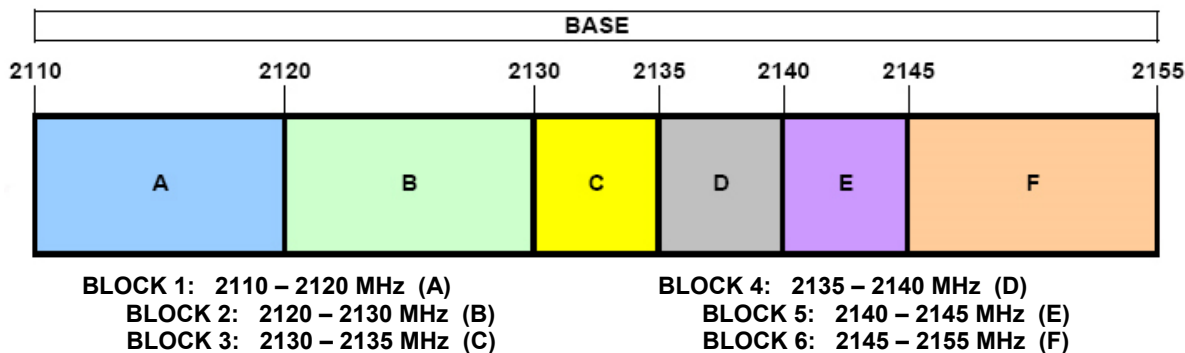
3.6 PCS - Base Frequency Blocks



3.7 PCS - Mobile Frequency Blocks

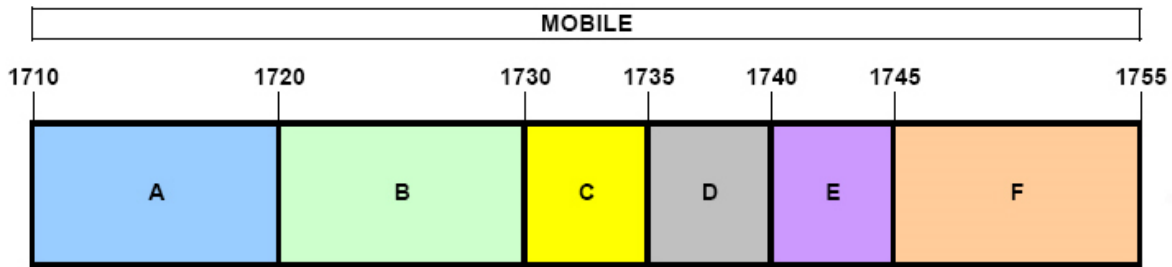


3.8 AWS - Base Frequency Blocks



FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 8 of 46

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 WCS – Mobile/Base Frequency Blocks

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

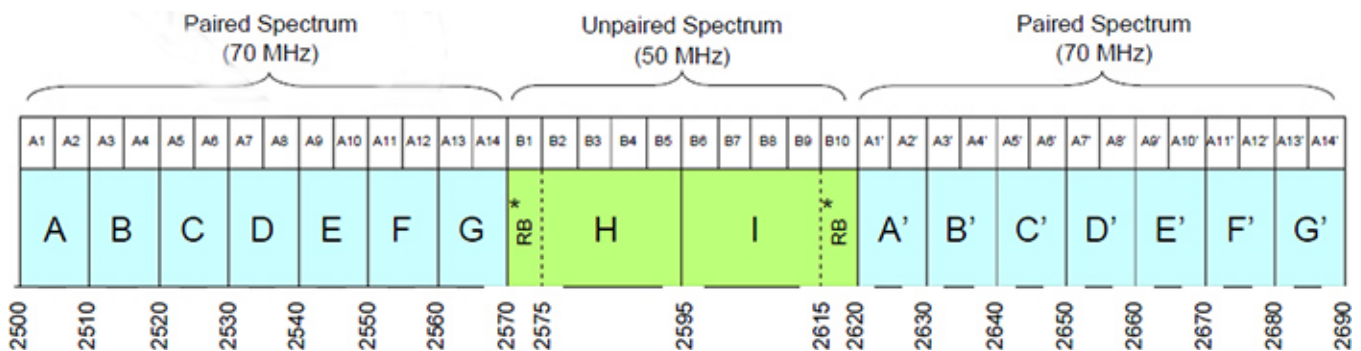
BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

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



FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 9 of 46

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:

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

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 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 $55 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$. 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 $70 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$.

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 10 of 46

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: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 11 of 46

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	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
EMCO	3160-10	Small Horn (26.5 - 40GHz)	8/9/2018	Biennial	8/9/2020	130993
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS-Lindgren	3164-10	Quad Ridge Horn 400MHz - 10000MHz	12/14/2016	Biennial	12/14/2018	166283
Huber + Suhner	Sucoflex 102A	40GHz Radiated Cable Set	1/23/2018	Annual	1/23/2019	251425001
Rohde & Schwarz	CMW500	Radio Communication Tester	11/3/2017	Annual	11/3/2018	100976
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Com-Power	TS-PR40	26.5-40 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100037
Rohde & Schwarz	TS-PR8	Preamplifier-Antenna SYS; 30MHz-8GHz	10/19/2017	Annual	10/19/2018	102324
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	4/30/2018	Biennial	4/30/2020	9105-2404
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	N/A			43961
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 12 of 46	

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: ZNFQ910QM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 13 of 46

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): 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 12/17, 13)	< 3 Watts max. ERP			Section 7.2
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 25/2, 7, 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
27.50(a)(3)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 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 + 10log 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(a)	Undesirable Emissions (Band 30)	> 70 + 10log ₁₀ (P[Watts])			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: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 14 of 46	

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: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 15 of 46

Test Setup

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

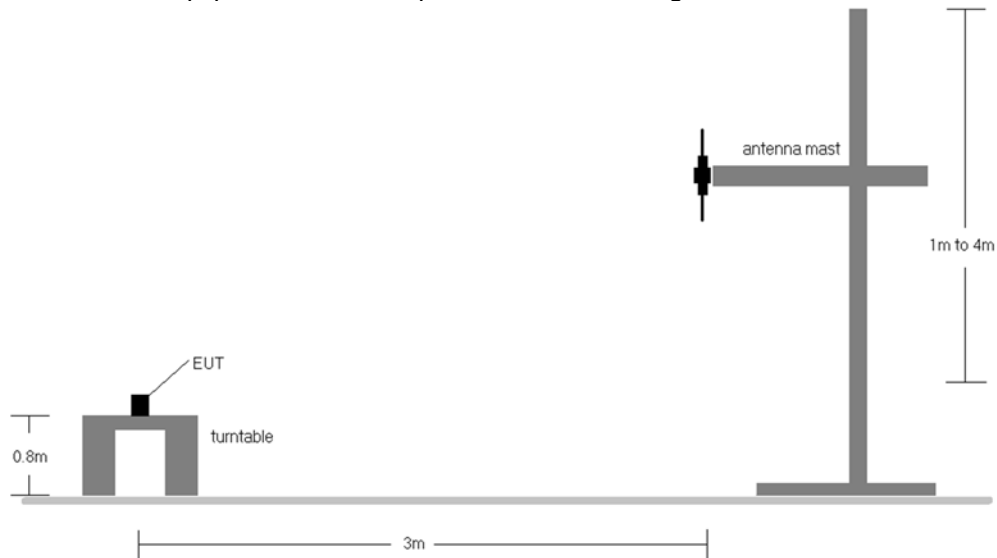


Figure 7-1. Radiated Test Setup <1GHz

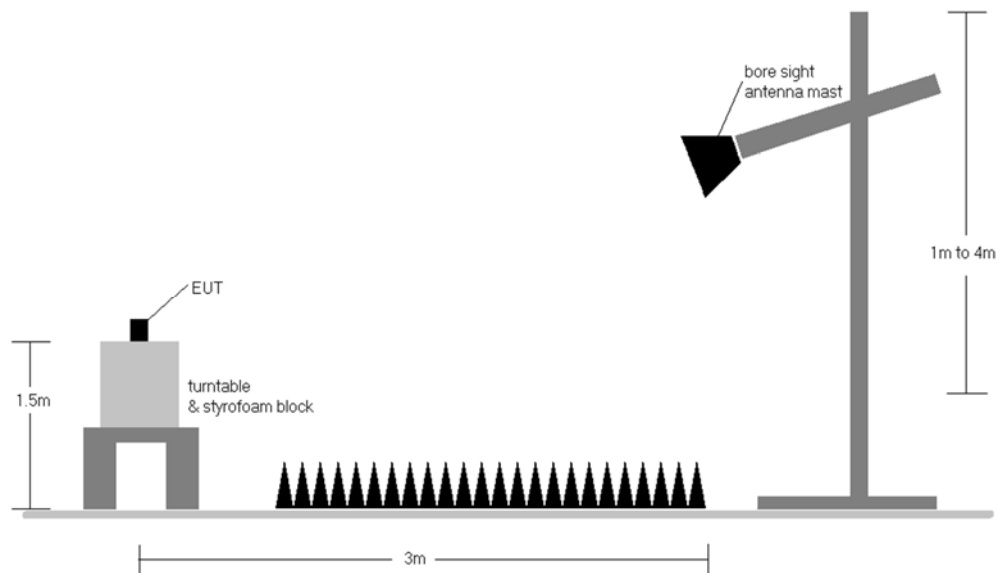


Figure 7-2. Radiated Test Setup >1GHz

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: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 16 of 46

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	150	1	1 / 0	20.05	1.10	19.00	0.079	34.77	-15.77	21.15	0.130	36.99	-15.84
707.50	1.4	QPSK	H	150	1	1 / 0	20.10	1.13	19.08	0.081	34.77	-15.69	21.23	0.133	36.99	-15.76
715.30	1.4	QPSK	H	150	1	3 / 2	20.54	1.16	19.55	0.090	34.77	-15.22	21.70	0.148	36.99	-15.29
715.30	1.4	16-QAM	H	150	1	1 / 0	19.05	1.16	18.06	0.064	34.77	-16.71	20.21	0.105	36.99	-16.78
715.30	1.4	64-QAM	H	150	1	1 / 0	17.92	1.16	16.93	0.049	34.77	-17.84	19.08	0.081	36.99	-17.91
700.50	3	QPSK	H	150	359	1 / 0	20.13	1.10	19.08	0.081	34.77	-15.69	21.23	0.133	36.99	-15.76
707.50	3	QPSK	H	150	359	1 / 0	20.59	1.13	19.57	0.091	34.77	-15.20	21.72	0.149	36.99	-15.27
714.50	3	QPSK	H	150	359	1 / 0	20.85	1.16	19.86	0.097	34.77	-14.91	22.01	0.159	36.99	-14.98
714.50	3	16-QAM	H	150	359	1 / 0	19.22	1.16	18.23	0.067	34.77	-16.54	20.38	0.109	36.99	-16.61
714.50	3	64-QAM	H	150	359	1 / 0	18.27	1.16	17.28	0.053	34.77	-17.49	19.43	0.088	36.99	-17.56

Table 7-2. 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	150	1	1 / 0	20.47	1.11	19.43	0.088	34.77	-15.35	21.58	0.144	36.99	-15.41
707.50	5	QPSK	H	150	1	1 / 0	20.45	1.13	19.43	0.088	34.77	-15.34	21.58	0.144	36.99	-15.41
713.50	5	QPSK	H	150	1	1 / 0	20.83	1.15	19.83	0.096	34.77	-14.94	21.98	0.158	36.99	-15.01
713.50	5	16-QAM	H	150	1	1 / 0	19.38	1.15	18.38	0.069	34.77	-16.39	20.53	0.113	36.99	-16.46
713.50	5	64-QAM	H	150	1	1 / 0	18.31	1.15	17.31	0.054	34.77	-17.46	19.46	0.088	36.99	-17.53
704.00	10	QPSK	H	150	355	1 / 49	20.49	1.12	19.46	0.088	34.77	-15.31	21.61	0.145	36.99	-15.38
707.50	10	QPSK	H	150	355	1 / 49	20.05	1.13	19.03	0.080	34.77	-15.74	21.18	0.131	36.99	-15.81
711.00	10	QPSK	H	150	353	1 / 49	20.57	1.14	19.56	0.090	34.77	-15.21	21.71	0.148	36.99	-15.28
711.00	10	16-QAM	H	150	353	1 / 49	19.11	1.14	18.10	0.065	34.77	-16.67	20.25	0.106	36.99	-16.74
711.00	10	64-QAM	H	150	353	1 / 49	18.05	1.14	17.04	0.051	34.77	-17.73	19.19	0.083	36.99	-17.80
714.50	5	QPSK	V	150	39	1 / 0	19.29	1.16	18.30	0.068	34.77	-16.47	20.45	0.111	36.99	-16.54

Table 7-3. ERP Data (Band 17/12)

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]
779.50	5	QPSK	V	150	82	1 / 0	21.93	1.32	21.10	0.129	34.77	-13.67	23.25	0.211	36.99	-13.74
782.00	5	QPSK	V	150	82	1 / 0	22.43	1.33	21.61	0.145	34.77	-13.16	23.76	0.238	36.99	-13.23
784.50	5	QPSK	V	150	82	1 / 0	22.63	1.34	21.82	0.152	34.77	-12.95	23.97	0.249	36.99	-13.02
784.50	5	16-QAM	V	150	82	1 / 0	20.98	1.34	20.17	0.104	34.77	-14.60	22.32	0.171	36.99	-14.67
784.50	5	64-QAM	V	150	82	1 / 0	19.99	1.34	19.18	0.083	34.77	-15.59	21.33	0.136	36.99	-15.66
782.00	10	QPSK	V	X90	150	1 / 0	22.14	1.33	21.32	0.135	34.77	-13.45	23.47	0.222	36.99	-13.52
782.00	10	16-QAM	V	X90	150	1 / 0	20.94	1.33	20.12	0.103	34.77	-14.65	22.27	0.169	36.99	-14.72
782.00	10	64-QAM	V	X90	150	1 / 0	20.26	1.33	19.44	0.088	34.77	-15.33	21.59	0.144	36.99	-15.40
784.50	5	QPSK	H	150	10	1 / 0	21.49	1.33	20.67	0.117	34.77	-14.10	22.82	0.191	36.99	-14.17

Table 7-4. ERP Data (Band 13)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 17 of 46

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	H	150	8	1 / 5	18.56	1.50	17.91	0.062	38.45	-20.54	20.06	0.101	40.61	-20.55
836.50	1.4	QPSK	H	150	5	1 / 5	19.32	1.50	18.67	0.074	38.45	-19.78	20.82	0.121	40.61	-19.79
848.30	1.4	QPSK	H	150	8	1 / 0	18.58	1.50	17.93	0.062	38.45	-20.52	20.08	0.102	40.61	-20.53
836.50	1.4	16-QAM	H	150	5	1 / 5	17.80	1.50	17.15	0.052	38.45	-21.30	19.30	0.085	40.61	-21.31
848.30	1.4	64-QAM	H	150	8	1 / 0	16.76	1.50	16.11	0.041	38.45	-22.34	18.26	0.067	40.61	-22.35
825.50	3	QPSK	H	150	362	1 / 14	18.60	1.50	17.95	0.062	38.45	-20.50	20.10	0.102	40.61	-20.51
836.50	3	QPSK	H	150	9	1 / 14	18.94	1.50	18.29	0.067	38.45	-20.16	20.44	0.111	40.61	-20.17
847.50	3	QPSK	H	150	358	1 / 0	18.48	1.50	17.83	0.061	38.45	-20.62	19.98	0.100	40.61	-20.63
847.50	3	16-QAM	H	150	358	1 / 0	17.58	1.50	16.93	0.049	38.45	-21.52	19.08	0.081	40.61	-21.53
847.50	3	64-QAM	H	150	358	1 / 0	16.48	1.50	15.83	0.038	38.45	-22.62	17.98	0.063	40.61	-22.63
826.50	5	QPSK	H	150	1	1 / 24	19.14	1.50	18.49	0.071	38.45	-19.96	20.64	0.116	40.61	-19.97
836.50	5	QPSK	H	150	8	1 / 24	19.85	1.50	19.20	0.083	38.45	-19.25	21.35	0.136	40.61	-19.26
846.50	5	QPSK	H	150	7	1 / 0	19.10	1.50	18.45	0.070	38.45	-20.00	20.60	0.115	40.61	-20.01
836.50	5	16-QAM	H	150	8	1 / 24	18.37	1.50	17.72	0.059	38.45	-20.73	19.87	0.097	40.61	-20.74
836.50	5	64-QAM	H	150	8	1 / 24	17.42	1.50	16.77	0.048	38.45	-21.68	18.92	0.078	40.61	-21.69
829.00	10	QPSK	H	150	3	1 / 49	18.40	1.50	17.75	0.060	38.45	-20.70	19.90	0.098	40.61	-20.71
836.50	10	QPSK	H	150	10	1 / 49	18.52	1.50	17.87	0.061	38.45	-20.58	20.02	0.100	40.61	-20.59
844.00	10	QPSK	H	150	258	1 / 0	18.47	1.50	17.82	0.061	38.45	-20.63	19.97	0.099	40.61	-20.64
836.50	10	16-QAM	H	150	10	1 / 49	17.71	1.50	17.06	0.051	38.45	-21.39	19.21	0.083	40.61	-21.40
829.00	10	64-QAM	H	150	3	1 / 49	16.37	1.50	15.72	0.037	38.45	-22.73	17.87	0.061	40.61	-22.74
836.50	1.4	QPSK	V	150	104	1 / 24	16.09	1.50	15.44	0.035	38.45	-23.01	17.59	0.057	40.61	-23.02

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

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	H	150	2	1 / 74	18.55	1.50	17.90	0.062	38.45	-20.55	20.05	0.101	40.61	-20.56
836.50	15	QPSK	H	150	6	1 / 0	18.25	1.50	17.60	0.058	38.45	-20.85	19.75	0.094	40.61	-20.86
841.50	15	QPSK	H	150	10	1 / 0	18.88	1.50	18.23	0.067	38.45	-20.22	20.38	0.109	40.61	-20.23
841.50	15	16-QAM	H	150	10	1 / 0	17.55	1.50	16.90	0.049	38.45	-21.55	19.05	0.080	40.61	-21.56
841.50	15	64-QAM	H	150	10	1 / 0	16.63	1.50	15.98	0.040	38.45	-22.47	18.13	0.065	40.61	-22.48

Table 7-6. ERP Data (Band 26)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 18 of 46

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	150	313	3 / 2	17.74	5.56	23.30	0.214	30.00	-6.70
1745.00	1.4	QPSK	V	150	313	3 / 2	16.83	5.32	22.15	0.164	30.00	-7.85
1779.30	1.4	QPSK	V	150	313	3 / 2	16.81	5.09	21.90	0.155	30.00	-8.10
1710.70	1.4	16-QAM	V	150	313	3 / 2	15.84	5.56	21.40	0.138	30.00	-8.60
1710.70	1.4	64-QAM	V	150	313	3 / 2	15.88	5.56	21.44	0.139	30.00	-8.56
1711.50	3	QPSK	V	150	313	1 / 0	17.63	5.55	23.18	0.208	30.00	-6.82
1745.00	3	QPSK	V	150	313	1 / 0	16.77	5.32	22.09	0.162	30.00	-7.91
1778.50	3	QPSK	V	150	313	1 / 0	16.93	5.10	22.03	0.159	30.00	-7.97
1711.50	3	16-QAM	V	150	313	1 / 0	15.74	5.55	21.29	0.135	30.00	-8.71
1711.50	3	64-QAM	V	150	313	1 / 0	15.78	5.55	21.33	0.136	30.00	-8.67
1712.50	5	QPSK	V	150	313	1 / 0	17.54	5.55	23.09	0.203	30.00	-6.91
1745.00	5	QPSK	V	150	313	1 / 0	16.79	5.32	22.11	0.163	30.00	-7.89
1777.50	5	QPSK	V	150	313	1 / 0	16.71	5.10	21.81	0.152	30.00	-8.19
1712.50	5	16-QAM	V	150	313	1 / 0	15.80	5.55	21.35	0.136	30.00	-8.65
1712.50	5	64-QAM	V	150	313	1 / 0	15.73	5.55	21.28	0.134	30.00	-8.72
1715.00	10	QPSK	V	150	311	1 / 0	17.52	5.53	23.05	0.202	30.00	-6.95
1745.00	10	QPSK	V	150	315	1 / 0	16.39	5.32	21.71	0.148	30.00	-8.29
1775.00	10	QPSK	V	150	314	1 / 0	16.35	5.12	21.47	0.140	30.00	-8.53
1715.00	10	16-QAM	V	150	311	1 / 0	15.51	5.53	21.04	0.127	30.00	-8.96
1745.00	10	16-QAM	V	150	315	1 / 0	14.41	5.32	19.73	0.094	30.00	-10.27
1715.00	10	64-QAM	V	150	311	1 / 0	15.43	5.53	20.96	0.125	30.00	-9.04
1745.00	10	64-QAM	V	150	315	1 / 0	14.39	5.32	19.71	0.094	30.00	-10.29
1717.50	15	QPSK	V	150	310	1 / 0	17.43	5.51	22.94	0.197	30.00	-7.06
1745.00	15	QPSK	V	150	310	1 / 0	16.66	5.32	21.98	0.158	30.00	-8.02
1772.50	15	QPSK	V	150	310	1 / 0	16.77	5.14	21.91	0.155	30.00	-8.09
1717.50	15	16-QAM	V	150	310	1 / 0	15.79	5.51	21.30	0.135	30.00	-8.70
1717.50	15	64-QAM	V	150	310	1 / 0	15.83	5.51	21.34	0.136	30.00	-8.66
1720.00	20	QPSK	V	150	317	1 / 0	17.42	5.49	22.91	0.196	30.00	-7.09
1745.00	20	QPSK	V	150	317	1 / 0	16.60	5.32	21.92	0.156	30.00	-8.08
1770.00	20	QPSK	V	150	317	1 / 0	16.53	5.15	21.68	0.147	30.00	-8.32
1720.00	20	16-QAM	V	150	317	1 / 0	15.31	5.49	20.80	0.120	30.00	-9.20
1720.00	20	64-QAM	V	150	317	1 / 0	15.59	5.49	21.08	0.128	30.00	-8.92
1710.70	1.4	QPSK	H	150	95	3 / 2	16.38	5.56	21.94	0.156	30.00	-8.06

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

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 19 of 46

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	330	1 / 0	15.37	4.82	20.19	0.104	33.01	-12.82
1882.50	1.4	QPSK	H	150	330	1 / 0	15.19	4.73	19.92	0.098	33.01	-13.09
1914.30	1.4	QPSK	H	150	330	1 / 0	15.04	4.68	19.72	0.094	33.01	-13.29
1850.70	1.4	16-QAM	H	150	330	1 / 0	14.65	4.82	19.47	0.088	33.01	-13.54
1850.70	1.4	64-QAM	H	150	330	1 / 0	13.52	4.82	18.34	0.068	33.01	-14.67
1851.50	3	QPSK	H	150	330	1 / 0	15.47	4.82	20.29	0.107	33.01	-12.72
1882.50	3	QPSK	H	150	330	1 / 0	15.34	4.73	20.07	0.102	33.01	-12.94
1913.50	3	QPSK	H	150	330	1 / 0	15.29	4.68	19.97	0.099	33.01	-13.04
1851.50	3	16-QAM	H	150	330	1 / 0	14.55	4.82	19.37	0.086	33.01	-13.64
1851.50	3	64-QAM	H	150	330	1 / 0	13.58	4.82	18.40	0.069	33.01	-14.61
1852.50	5	QPSK	H	150	327	1 / 0	15.53	4.81	20.34	0.108	33.01	-12.67
1882.50	5	QPSK	H	150	327	1 / 0	15.24	4.73	19.97	0.099	33.01	-13.04
1912.50	5	QPSK	H	150	327	1 / 0	15.32	4.68	20.00	0.100	33.01	-13.01
1852.50	5	16-QAM	H	150	327	1 / 0	14.39	4.81	19.20	0.083	33.01	-13.81
1852.50	5	64-QAM	H	150	327	1 / 0	13.54	4.81	18.35	0.068	33.01	-14.66
1855.00	10	QPSK	H	150	328	1 / 0	15.67	4.81	20.48	0.112	33.01	-12.53
1882.50	10	QPSK	H	150	328	1 / 0	15.45	4.73	20.18	0.104	33.01	-12.83
1910.00	10	QPSK	H	150	328	1 / 0	15.08	4.68	19.76	0.095	33.01	-13.25
1855.00	10	16-QAM	H	150	328	1 / 0	14.80	4.81	19.61	0.091	33.01	-13.40
1855.00	10	64-QAM	H	150	328	1 / 0	13.89	4.81	18.70	0.074	33.01	-14.31
1857.50	15	QPSK	H	150	328	1 / 0	15.50	4.80	20.30	0.107	33.01	-12.71
1882.50	15	QPSK	H	150	328	1 / 0	15.22	4.73	19.95	0.099	33.01	-13.06
1907.50	15	QPSK	H	150	328	1 / 0	15.31	4.68	19.99	0.100	33.01	-13.02
1857.50	15	16-QAM	H	150	328	1 / 0	14.56	4.80	19.36	0.086	33.01	-13.65
1857.50	15	64-QAM	H	150	328	1 / 0	13.66	4.80	18.46	0.070	33.01	-14.55
1860.00	20	QPSK	H	150	324	1 / 0	15.26	4.79	20.05	0.101	33.01	-12.96
1882.50	20	QPSK	H	150	324	1 / 0	14.89	4.73	19.62	0.092	33.01	-13.39
1905.00	20	QPSK	H	150	324	1 / 0	15.04	4.68	19.72	0.094	33.01	-13.29
1860.00	20	16-QAM	H	150	324	1 / 0	14.34	4.79	19.13	0.082	33.01	-13.88
1860.00	20	64-QAM	H	150	324	1 / 0	13.32	4.79	18.11	0.065	33.01	-14.90
1855.00	10	QPSK	V	150	78	1 / 0	13.77	4.81	18.58	0.072	33.01	-14.43

Table 7-8. EIRP Data (Band 25/2)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) 			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 20 of 46

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]
2307.50	5	QPSK	V	150	68	1 / 24	12.77	5.74	18.51	0.071	23.98	-5.47
2312.50	5	QPSK	V	150	63	1 / 24	12.93	5.74	18.67	0.074	23.98	-5.31
2312.50	5	16-QAM	V	150	63	1 / 24	10.83	5.74	16.57	0.045	23.98	-7.41
2312.50	5	64-QAM	V	150	63	1 / 24	10.70	5.74	16.44	0.044	23.98	-7.54
2310.00	10	QPSK	V	150	68	1 / 49	12.80	5.74	18.54	0.071	23.98	-5.44
2310.00	10	16-QAM	V	150	68	1 / 49	10.79	5.74	16.53	0.045	23.98	-7.45
2310.00	10	64-QAM	V	150	68	1 / 49	10.90	5.74	16.64	0.046	23.98	-7.34
2312.50	5	QPSK	H	150	256	1 / 24	11.25	5.74	16.99	0.050	23.98	-6.99

Table 7-9. EIRP Data (Band 30)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 21 of 46

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]
2502.50	5	QPSK	V	150	82	1 / 12	14.45	5.74	20.19	0.104	33.01	-12.82
2535.00	5	QPSK	V	150	100	1 / 0	14.58	5.86	20.44	0.111	33.01	-12.57
2567.50	5	QPSK	V	150	242	1 / 0	15.38	5.98	21.36	0.137	33.01	-11.65
2567.50	5	16-QAM	V	150	242	1 / 0	14.80	5.98	20.78	0.120	33.01	-12.23
2567.50	5	64-QAM	V	150	242	1 / 0	13.92	5.98	19.90	0.098	33.01	-13.11
2505.00	10	QPSK	V	150	85	1 / 0	14.59	5.75	20.34	0.108	33.01	-12.67
2535.00	10	QPSK	V	150	77	1 / 49	14.11	5.86	19.97	0.099	33.01	-13.04
2565.00	10	QPSK	V	150	255	1 / 0	14.90	5.97	20.87	0.122	33.01	-12.14
2565.00	10	16-QAM	V	150	255	1 / 0	14.19	5.97	20.16	0.104	33.01	-12.85
2565.00	10	64-QAM	V	150	255	1 / 0	12.75	5.97	18.72	0.074	33.01	-14.29
2507.50	15	QPSK	V	150	109	1 / 0	14.78	5.76	20.54	0.113	33.01	-12.47
2535.00	15	QPSK	V	150	84	1 / 36	14.07	5.86	19.93	0.098	33.01	-13.08
2562.50	15	QPSK	V	150	245	1 / 0	15.26	5.96	21.22	0.132	33.01	-11.79
2562.50	15	16-QAM	V	150	245	1 / 0	14.69	5.96	20.65	0.116	33.01	-12.36
2562.50	15	64-QAM	V	150	245	1 / 0	12.99	5.96	18.95	0.079	33.01	-14.06
2510.00	20	QPSK	V	150	131	1 / 0	15.33	5.77	21.10	0.129	33.01	-11.91
2535.00	20	QPSK	V	150	131	1 / 0	14.87	5.86	20.73	0.118	33.01	-12.28
2560.00	20	QPSK	V	150	239	1 / 0	15.56	5.95	21.51	0.142	33.01	-11.50
2560.00	20	16-QAM	V	150	239	1 / 0	14.32	5.95	20.27	0.106	33.01	-12.74
2560.00	20	64-QAM	V	150	239	1 / 0	13.16	5.95	19.11	0.082	33.01	-13.90
2560.00	20	QPSK	H	150	280	1 / 0	15.08	5.95	21.03	0.127	33.01	-11.98

Table 7-10. EIRP Data (Band 7)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 22 of 46

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	150	85	1 / 12	17.11	5.73	22.84	0.192	33.01	-10.17
2502.50	5	QPSK	V	150	85	1 / 12	18.37	5.74	24.11	0.258	33.01	-8.90
2593.00	5	QPSK	V	150	259	1 / 12	17.17	6.07	23.24	0.211	33.01	-9.77
2687.50	5	QPSK	V	150	49	1 / 12	15.95	6.48	22.43	0.175	33.01	-10.58
2502.50	5	16-QAM	V	150	85	1 / 12	17.30	5.74	23.04	0.201	33.01	-9.97
2502.50	5	64-QAM	V	150	85	1 / 12	14.70	5.74	20.44	0.111	33.01	-12.57
2501.00	10	QPSK	V	150	87	1 / 49	16.95	5.73	22.68	0.186	33.01	-10.33
2505.00	10	QPSK	V	150	87	1 / 49	16.93	5.75	22.68	0.185	33.01	-10.33
2593.00	10	QPSK	V	150	259	1 / 25	17.31	6.07	23.38	0.218	33.01	-9.63
2685.00	10	QPSK	V	150	45	1 / 49	16.00	6.47	22.47	0.177	33.01	-10.54
2593.00	10	16-QAM	V	150	259	1 / 25	14.24	6.07	20.31	0.107	33.01	-12.70
2593.00	10	64-QAM	V	150	259	1 / 25	11.66	6.07	17.73	0.059	33.01	-15.28
2503.50	15	QPSK	V	150	86	1 / 36	16.05	5.74	21.79	0.151	33.01	-11.22
2507.50	15	QPSK	V	150	86	1 / 74	17.57	5.76	23.33	0.215	33.01	-9.68
2593.00	15	QPSK	V	150	266	1 / 36	17.03	6.07	23.10	0.204	33.01	-9.91
2682.50	15	QPSK	V	150	124	1 / 0	15.98	6.46	22.44	0.176	33.01	-10.57
2507.50	15	16-QAM	V	150	86	1 / 74	15.86	5.76	21.62	0.145	33.01	-11.39
2507.50	15	64-QAM	V	150	86	1 / 74	14.76	5.76	20.52	0.113	33.01	-12.49
2506.00	20	QPSK	V	150	86	1 / 50	17.87	5.75	23.62	0.230	33.01	-9.39
2510.00	20	QPSK	V	150	86	1 / 0	17.76	5.77	23.53	0.225	33.01	-9.48
2593.00	20	QPSK	V	150	259	1 / 50	17.17	6.07	23.24	0.211	33.01	-9.77
2680.00	20	QPSK	V	150	44	1 / 50	16.16	6.45	22.61	0.182	33.01	-10.40
2510.00	20	16-QAM	V	150	86	1 / 0	9.96	5.77	15.73	0.037	33.01	-17.28
2510.00	20	64-QAM	V	150	86	1 / 0	12.58	5.77	18.35	0.068	33.01	-14.66
2502.50	5	QPSK	H	150	272	1 / 12	17.28	6.07	23.35	0.216	33.01	-9.66

Table 7-11. EIRP Data (Band 41)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 23 of 46

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: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 24 of 46

Test Setup

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

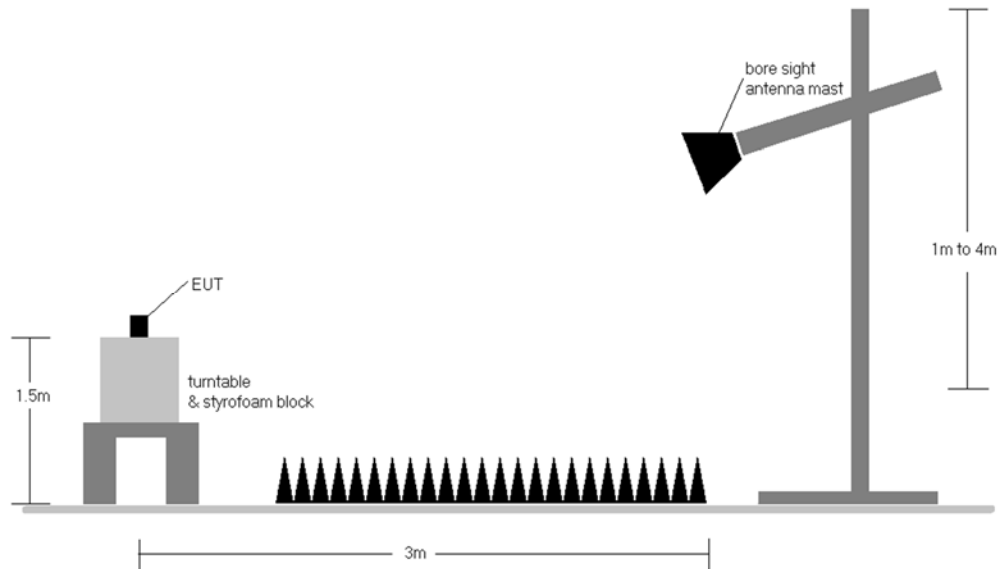


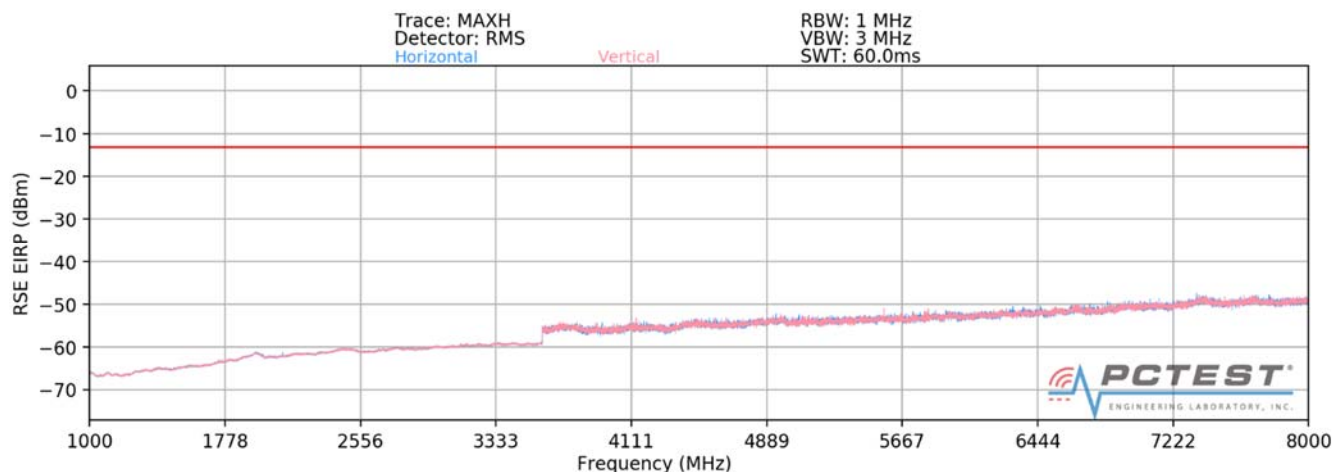
Figure 7-3. Test Instrument & Measurement Setup

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: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 25 of 46

Band 17/12



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

OPERATING FREQUENCY: 701.50 MHz
CHANNEL: 23035
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 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]
1403.00	V	150	124	-70.52	3.78	-66.74	-53.7
2104.50	V	-	-	-69.17	4.80	-64.36	-51.4
2806.00	V	-	-	-68.52	5.64	-62.88	-49.9

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

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 26 of 46

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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	150	163	-69.13	3.90	-65.23	-52.2
2122.50	V	150	355	-66.84	4.78	-62.06	-49.1
2830.00	V	-	-	-68.51	5.73	-62.78	-49.8
3537.50	V	-	-	-68.29	6.54	-61.74	-48.7

Table 7-13. Radiated Spurious Data (Band 17/12 – Mid Channel)

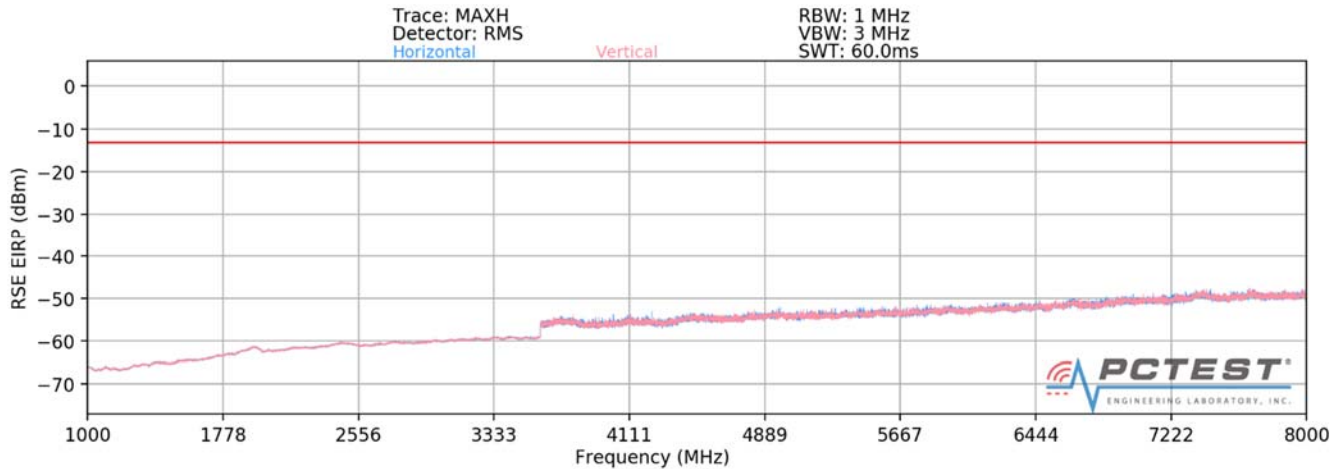
OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1427.00	V	-	-	-70.84	4.03	-66.82	-53.8
2140.50	V	-	-	-69.51	4.77	-64.74	-51.7

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

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 27 of 46

Band 13



Plot 7-2. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY: 779.50 MHz
CHANNEL: 23205
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 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]
2338.50	H	150	330	-64.66	3.96	-60.70	-47.7
3118.00	H	-	-	-66.94	5.34	-61.60	-48.6
3897.50	H	-	-	-67.16	7.03	-60.13	-47.1

Table 7-15. Radiated Spurious Data (Band 13 – Low Channel)

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 28 of 46

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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	H	150	327	-62.69	3.97	-58.72	-45.7
3128.00	H	-	-	-66.77	5.36	-61.41	-48.4
3910.00	H	-	-	-67.12	7.06	-60.06	-47.1

Table 7-16. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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]
2353.50	H	127	357	-63.71	3.99	-59.72	-46.7
3138.00	H	-	-	-66.69	5.37	-61.32	-48.3
3922.50	H	-	-	-67.23	7.10	-60.12	-47.1

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

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 29 of 46

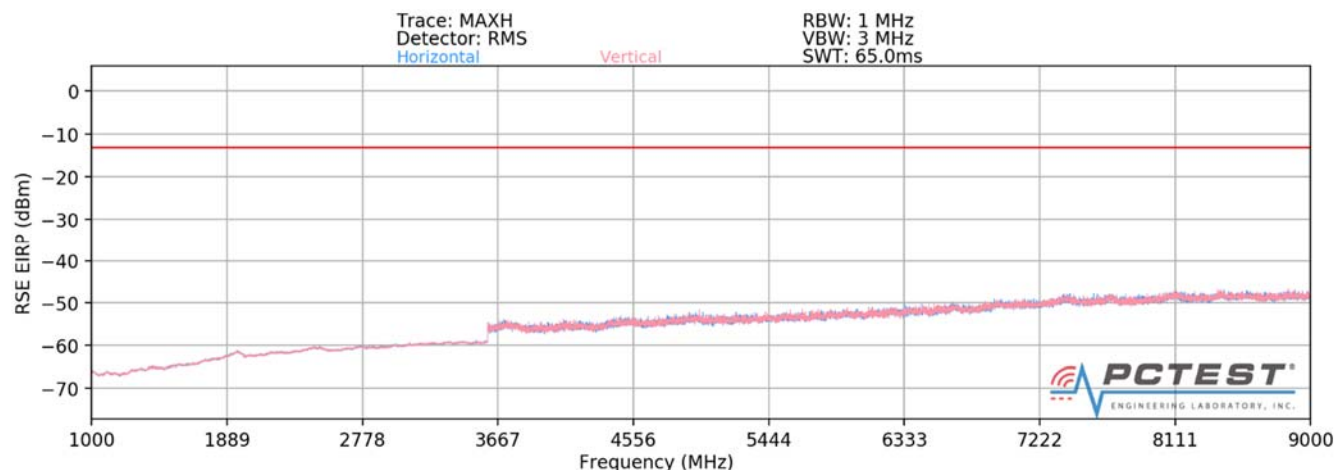
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

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]
1559.00	H	-	-	-69.48	3.50	-65.98	-26.0
1564.00	H	-	-	-70.17	3.50	-66.67	-26.7
1569.00	H	-	-	-69.46	3.51	-65.96	-26.0

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

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 30 of 46

Band 26/5



Plot 7-3. Radiated Spurious Plot above 1GHz (Band 26/5)

OPERATING FREQUENCY: 826.50 MHz
CHANNEL: 26815
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 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]
1653.00	H	-	-	-71.56	4.82	-66.74	-53.7
2479.50	H	-	-	-68.11	5.01	-63.10	-50.1

Table 7-19. Radiated Spurious Data (Band 26/5 – Low Channel)

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 31 of 46

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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	17	228	-69.31	4.86	-64.45	-51.4
2509.50	H	359	159	-66.54	5.10	-61.44	-48.4
3346.00	H	-	-	-67.96	6.25	-61.71	-48.7
4182.50	H	-	-	-68.81	7.67	-61.14	-48.1

Table 7-20. Radiated Spurious Data (Band 26/5 – Mid Channel)

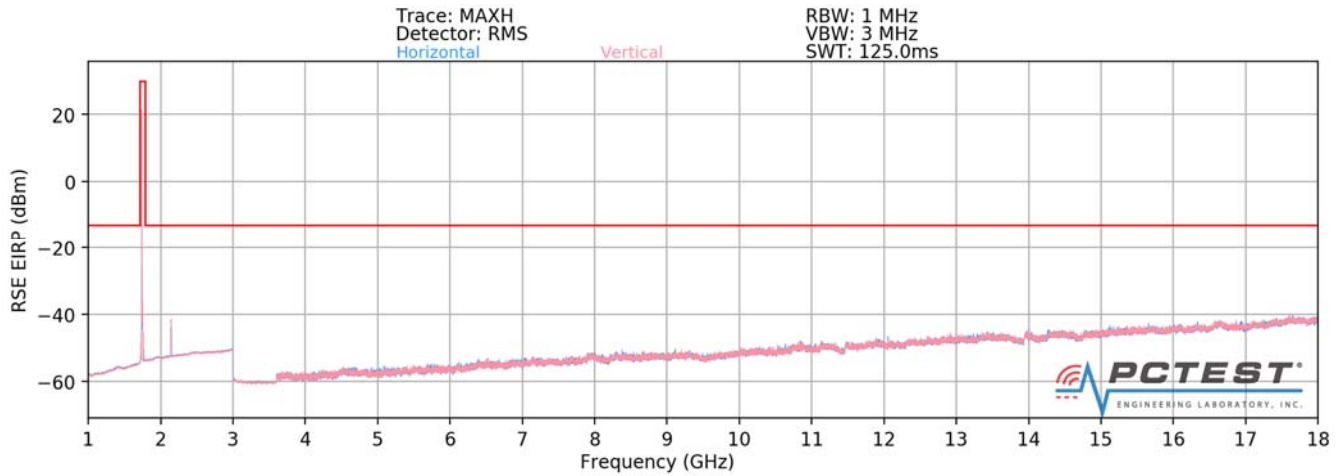
OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 27015
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1693.00	H	351	227	-69.63	4.90	-64.72	-51.7
2539.50	H	-	-	-68.57	5.25	-63.33	-50.3
3386.00	H	-	-	-68.39	6.36	-62.02	-49.0

Table 7-21. Radiated Spurious Data (Band 26/5 – High Channel)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 32 of 46

Band 66/4



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

OPERATING FREQUENCY: 1710.70 MHz
CHANNEL: 131979
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 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]
3421.40	H	150	247	-64.91	6.16	-58.75	-45.7
5132.10	H	-	-	-72.16	8.63	-63.53	-50.5
6842.80	H	-	-	-66.06	8.75	-57.31	-44.3

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

FCC ID: ZNFQ910QM	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 33 of 46

OPERATING FREQUENCY: 1745.00 MHz
 CHANNEL: 132322
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 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	H	-	-	-67.92	6.29	-61.63	-48.6
5235.00	H	46	148	-65.38	8.68	-56.69	-43.7
6980.00	H	-	-	-65.24	8.71	-56.53	-43.5
8725.00	H	-	-	-64.87	9.39	-55.48	-42.5

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

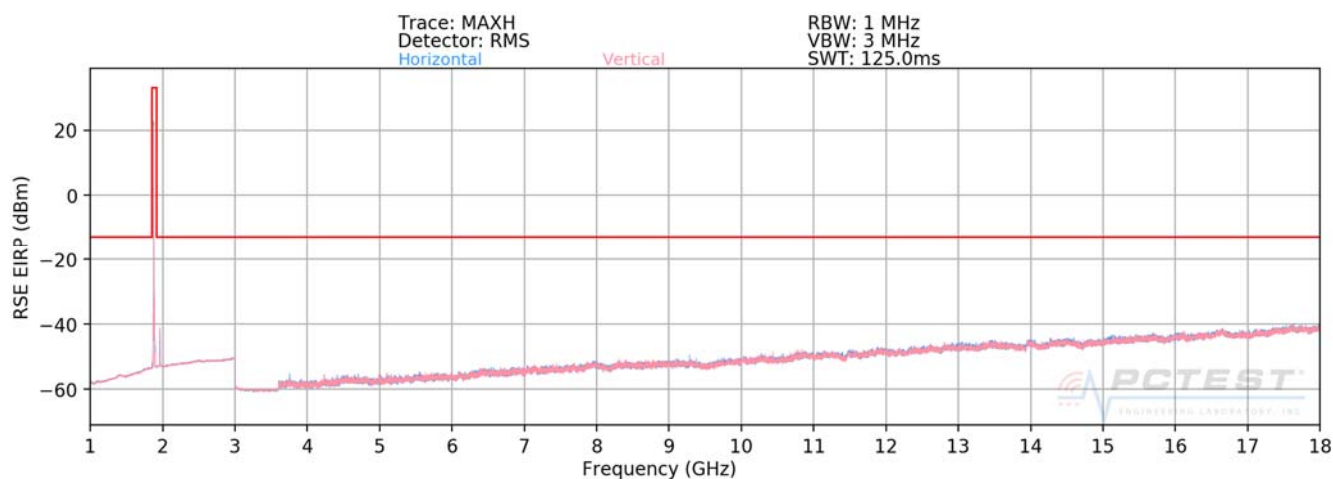
OPERATING FREQUENCY: 1779.30 MHz
 CHANNEL: 132665
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3558.60	H	-	-	-67.11	6.29	-60.81	-47.8
5337.90	H	-	-	-68.50	8.68	-59.82	-46.8

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

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 34 of 46

Band 25/2



Plot 7-5. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY: 1855.00 MHz
CHANNEL: 26090
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]
3710.00	H	169	46	-64.26	6.54	-57.71	-44.7
5565.00	H	-	-	-66.03	8.70	-57.33	-44.3
7420.00	H	-	-	-62.07	8.38	-53.69	-40.7

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

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset			Page 35 of 46

OPERATING FREQUENCY: 1882.50 MHz
 CHANNEL: 26365
 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]
3765.00	H	133	36	-64.42	6.67	-57.75	-44.8
5647.50	H	-	-	-66.42	8.80	-57.62	-44.6
7530.00	H	-	-	-61.98	8.43	-53.55	-40.6

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

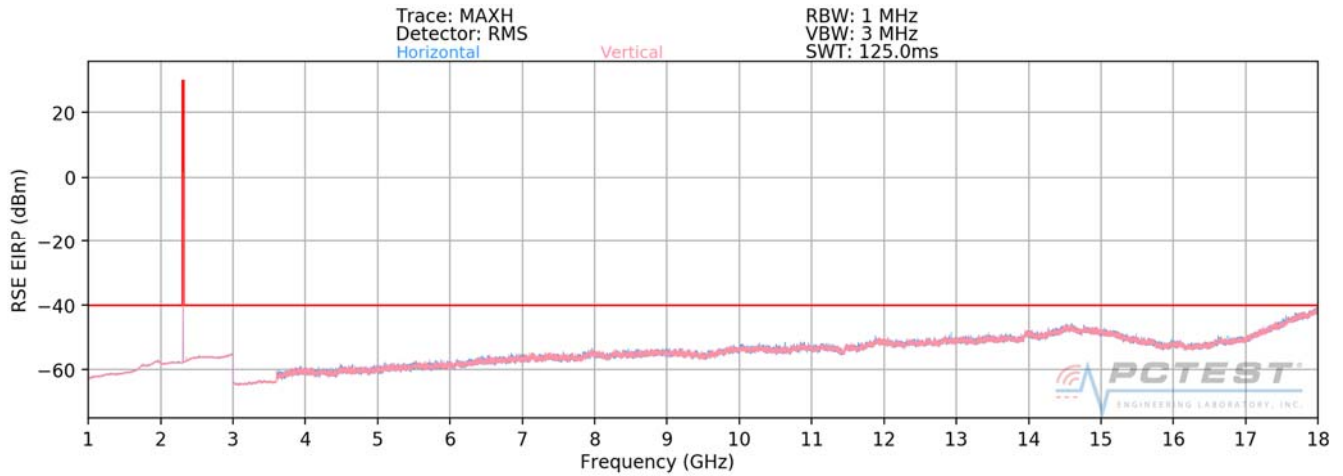
OPERATING FREQUENCY: 1910.00 MHz
 CHANNEL: 26640
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3820.00	H	-	-	-66.39	6.97	-59.43	-46.4
5730.00	H	-	-	-66.14	8.74	-57.40	-44.4
7640.00	H	-	-	-62.61	8.51	-54.10	-41.1

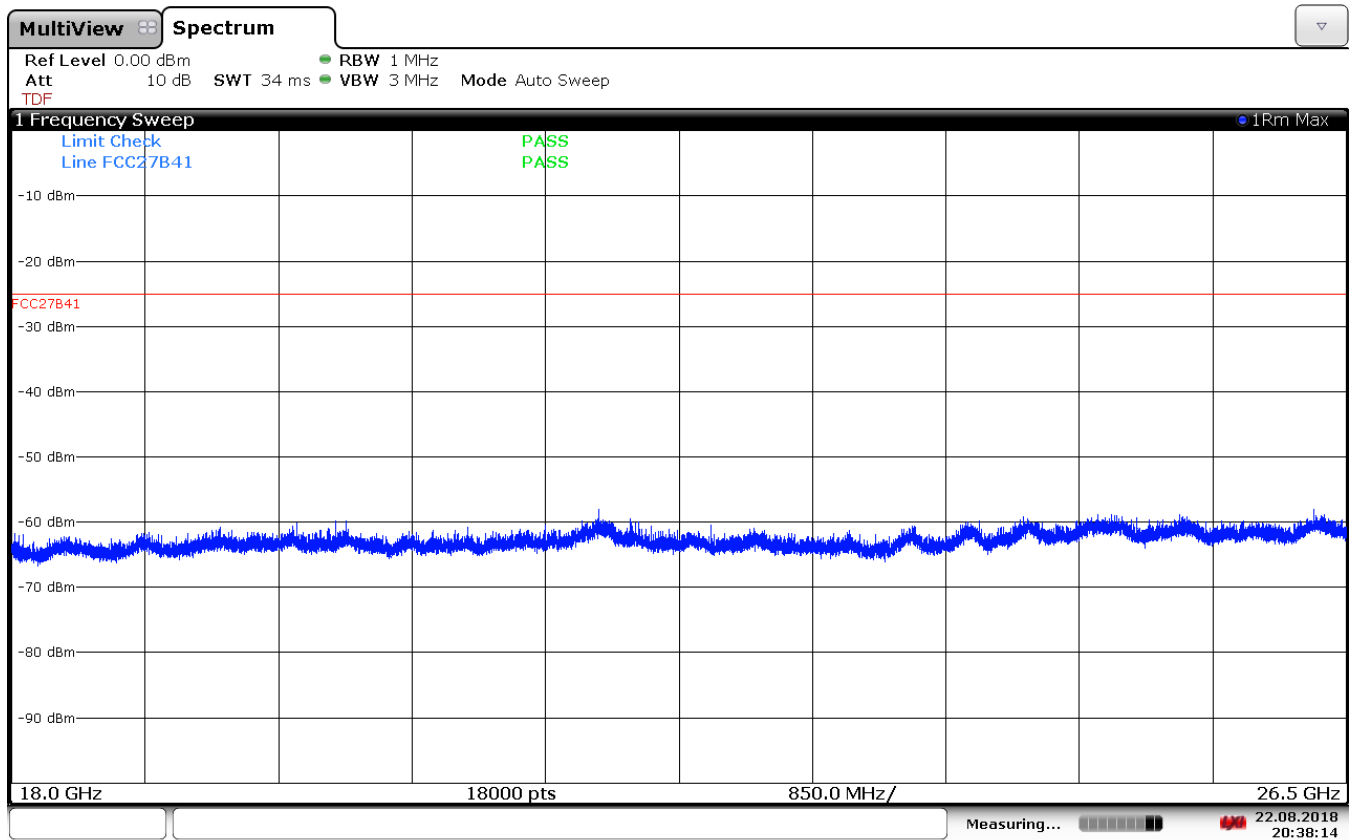
Table 7-27. Radiated Spurious Data (Band 25/2 – High Channel)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 36 of 46

Band 30



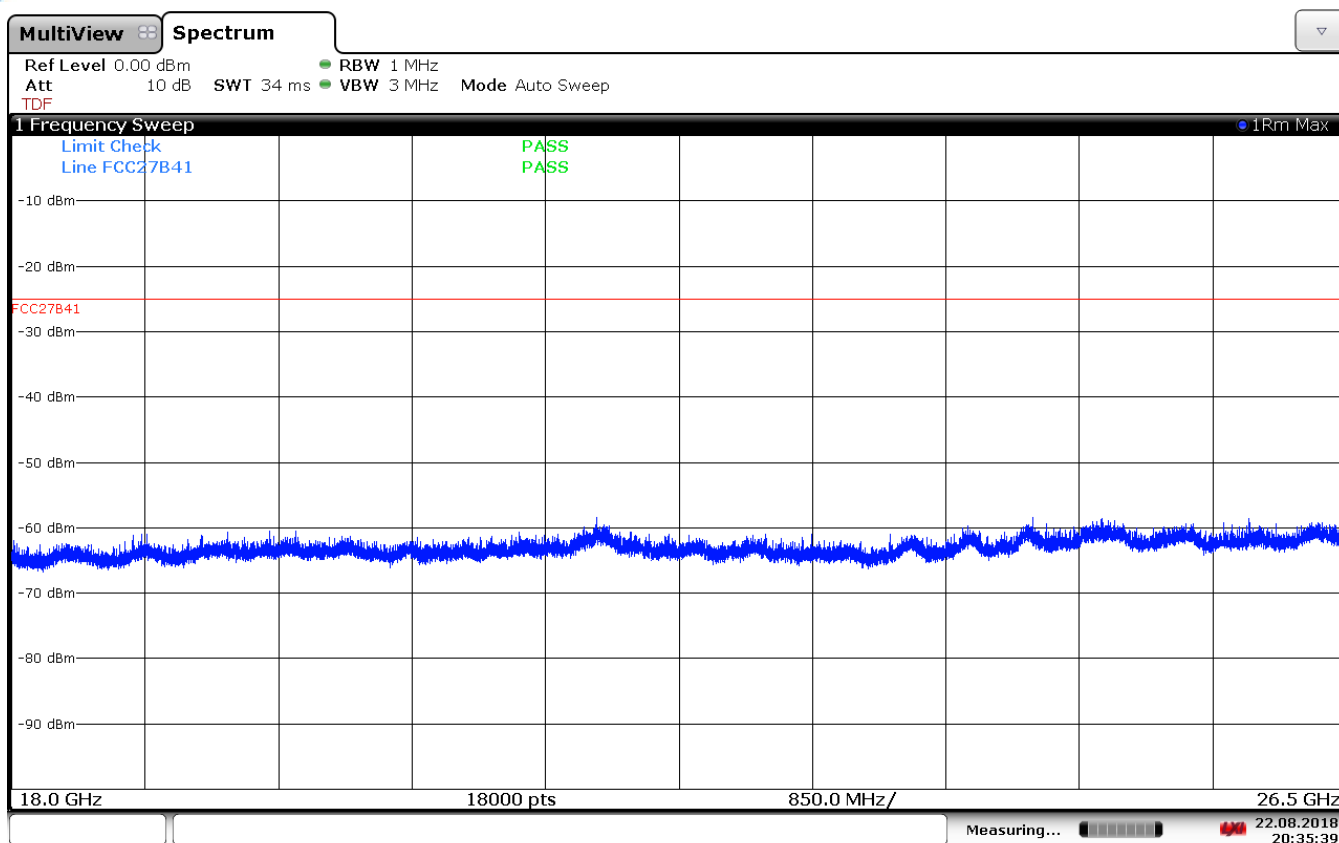
Plot 7-6. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



20:38:14 22.08.2018

Plot 7-7. Radiated Spurious Plot 18GHz - 26.5GHz (Band 30) - Horizontal

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 37 of 46



20:35:39 22.08.2018

Plot 7-8. Radiated Spurious Plot 18GHz – 26.5GHz (Band 30) - Vertical

OPERATING FREQUENCY: 2307.50 MHz

CHANNEL: 27685

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 MHz

DISTANCE: 3 meters

LIMIT: -40 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]
4615.00	V	182	33	-67.65	8.22	-59.42	-19.4
6922.50	V	-	-	-66.31	8.69	-57.62	-17.6

Table 7-28. Radiated Spurious Data (Band 30 – Low Channel)

FCC ID: ZNFQ910QM	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset	Page 38 of 46

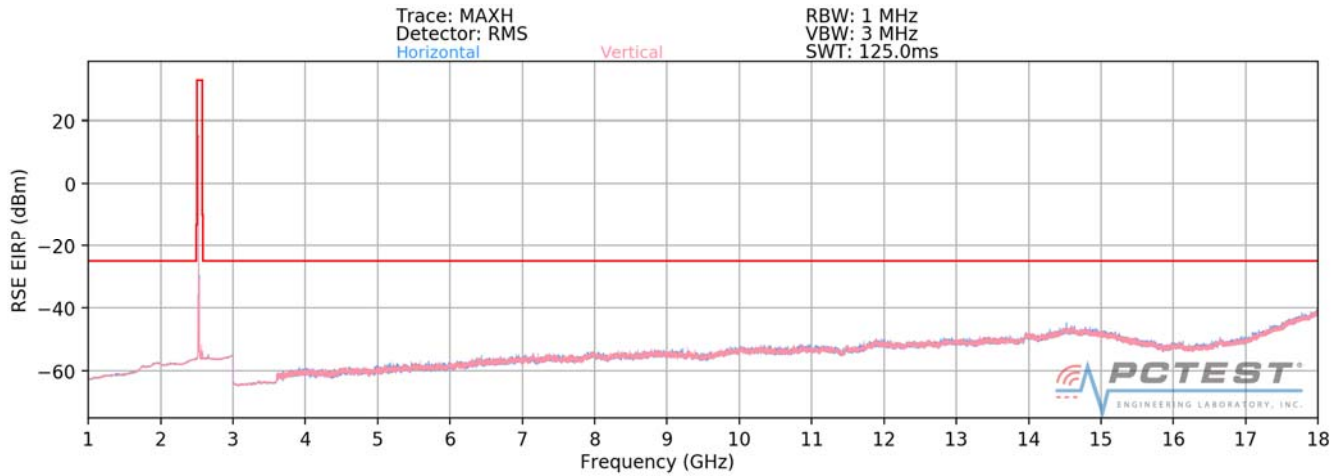
OPERATING FREQUENCY: 2312.50 MHz
 CHANNEL: 27735
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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]
4625.00	V	117	22	-67.47	8.24	-59.23	-19.2
6937.50	V	-	-	-65.89	8.68	-57.21	-17.2

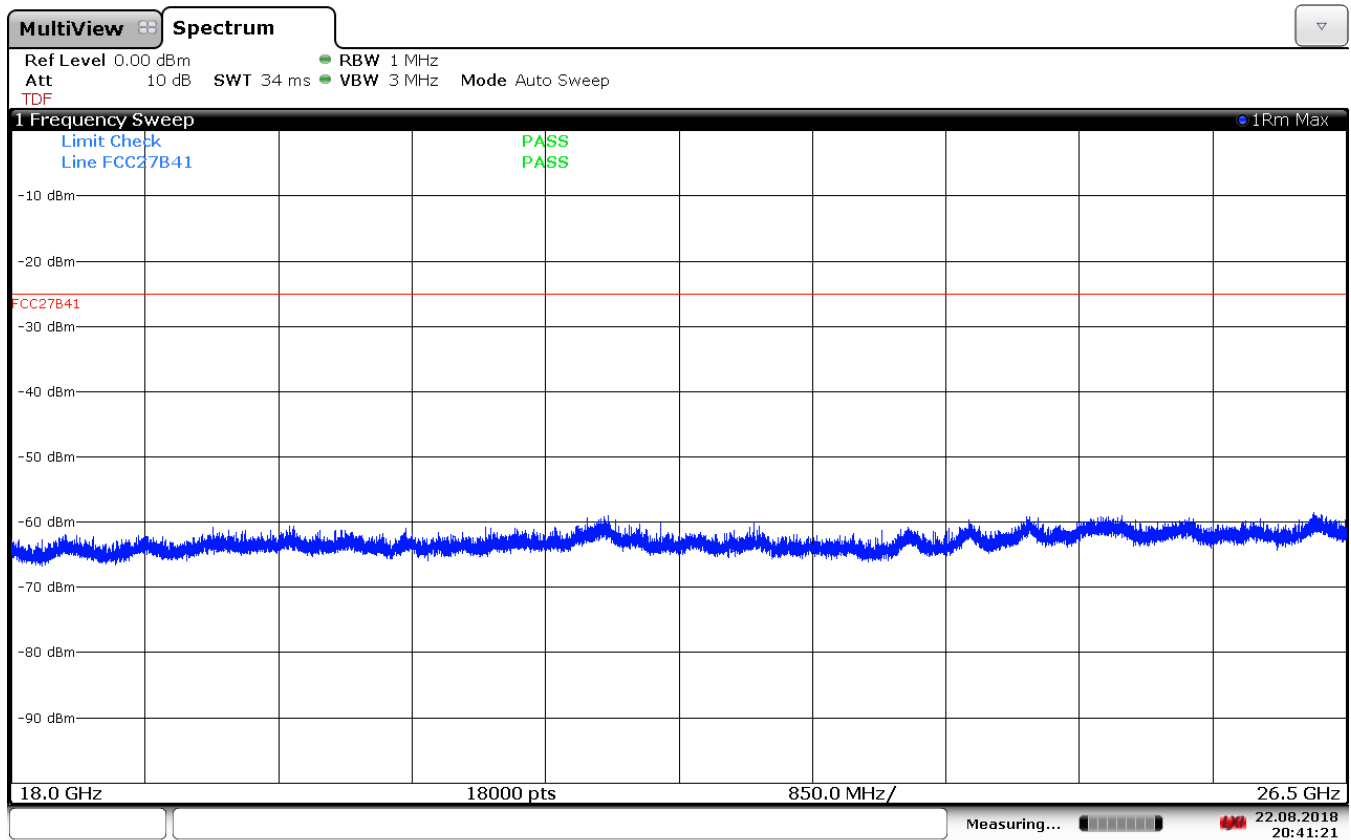
Table 7-29. Radiated Spurious Data (Band 30 – High Channel)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 39 of 46

Band 7



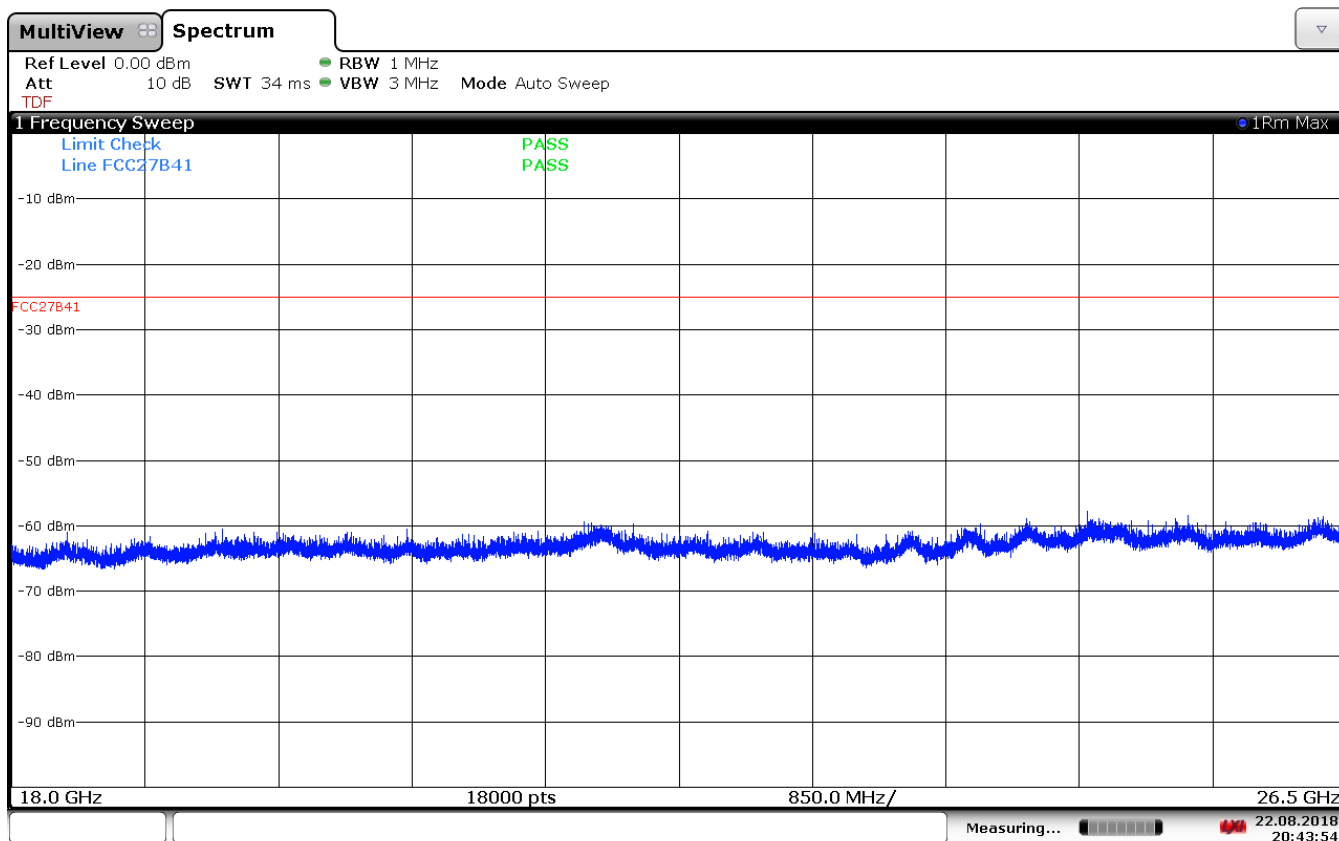
Plot 7-9. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



20:41:21 22.08.2018

Plot 7-10. Radiated Spurious Plot 18GHz - 26.5GHz (Band 7) - Horizontal

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 40 of 46



20:43:54 22.08.2018

Plot 7-11. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7) - Vertical

OPERATING FREQUENCY: 2510.00 MHz
CHANNEL: 20850
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	V	192	52	-65.64	8.53	-57.11	-32.1
7530.00	V	-	-	-65.22	8.43	-56.79	-31.8
10040.00	V	-	-	-63.93	9.82	-54.11	-29.1

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

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 41 of 46

OPERATING FREQUENCY: 2535.00 MHz
 CHANNEL: 21100
 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]
5070.00	V	116	42	-64.50	8.57	-55.93	-30.9
7605.00	V	-	-	-65.01	8.45	-56.55	-31.6
10140.00	V	-	-	-65.44	9.76	-55.69	-30.7

Table 7-31. Radiated Spurious Data (Band 7 – Mid Channel)

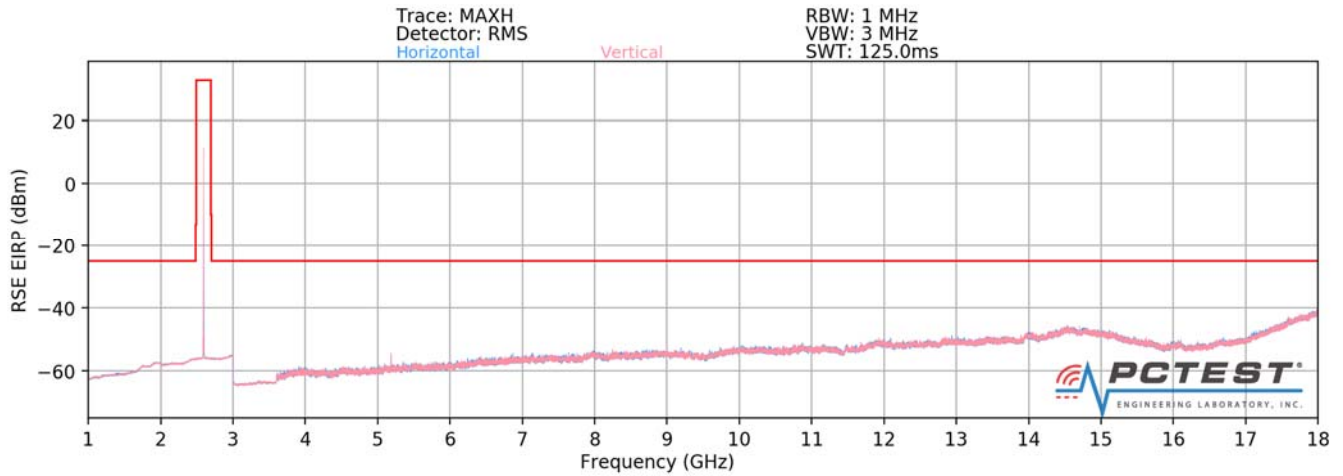
OPERATING FREQUENCY: 2560.00 MHz
 CHANNEL: 21350
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

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]
5120.00	V	102	42	-64.70	8.63	-56.07	-31.1
7680.00	V	-	-	-64.53	8.55	-55.98	-31.0
10240.00	V	-	-	-63.75	9.63	-54.12	-29.1

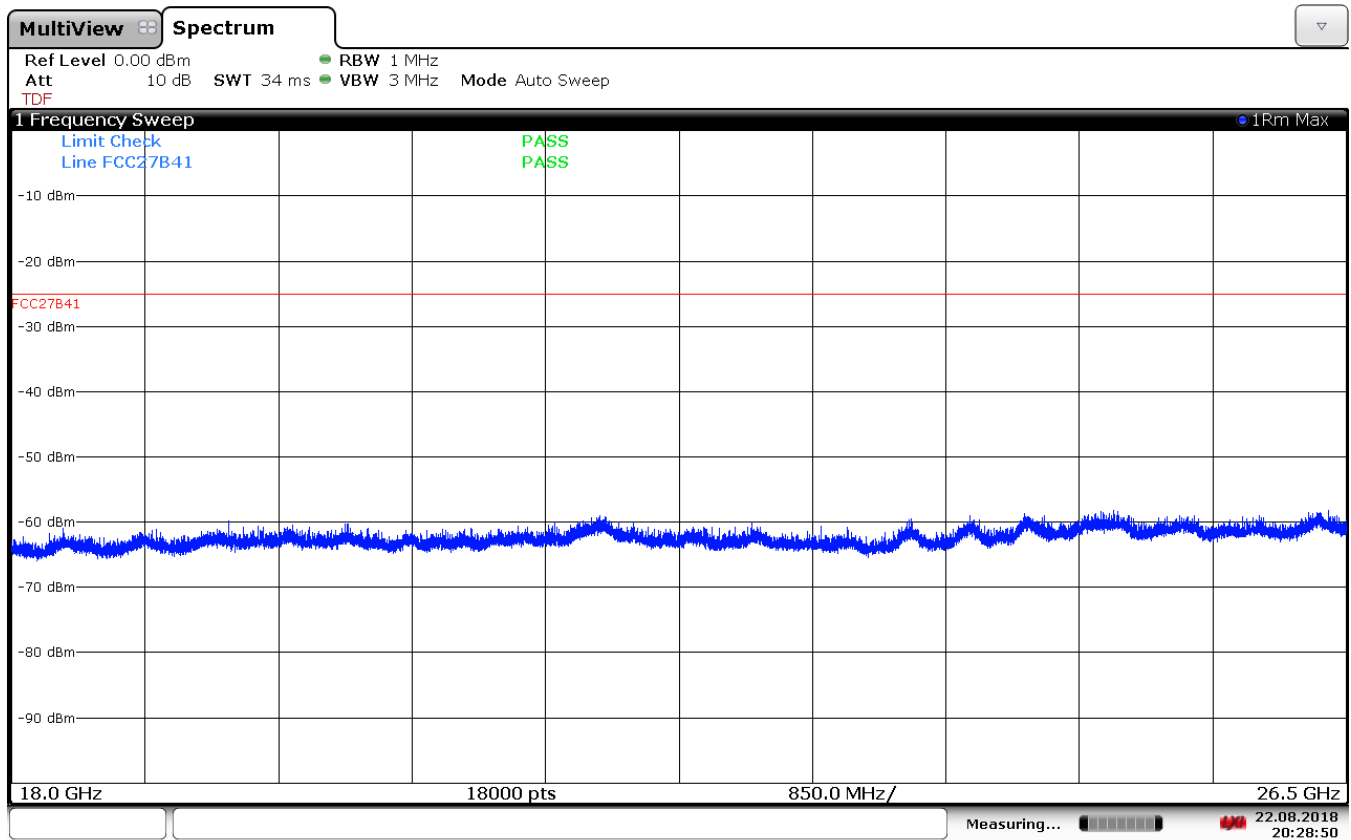
Table 7-32. Radiated Spurious Data (Band 7 – High Channel)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 42 of 46

Band 41



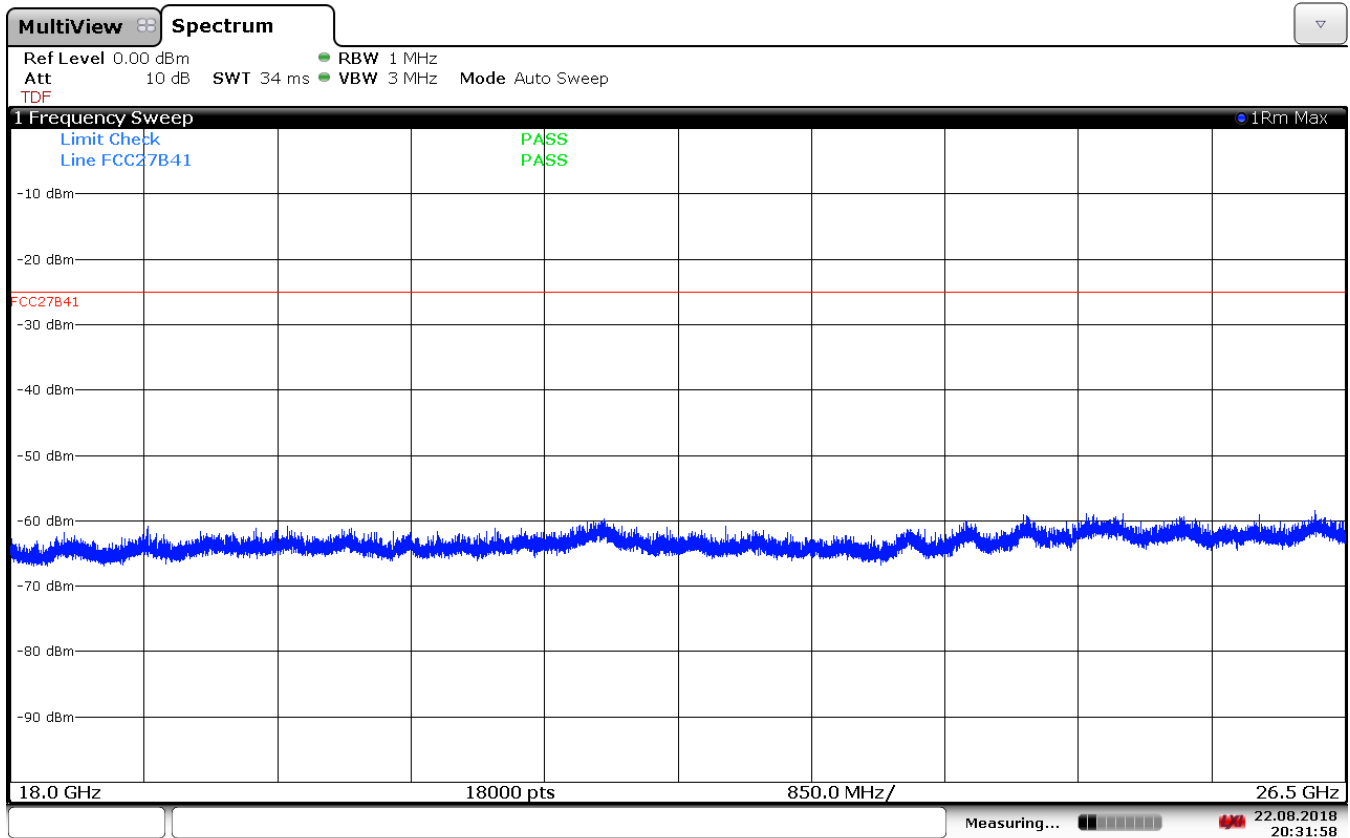
Plot 7-12. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



20:28:51 22.08.2018

Plot 7-13. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

FCC ID: ZNFQ910QM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 43 of 46



20:31:59 22.08.2018

Plot 7-14. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

OPERATING FREQUENCY: 2502.50 MHz

CHANNEL: 39715

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 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]
5005.00	V	144	7	-63.63	8.53	-55.10	-30.1
7507.50	V	-	-	-63.00	8.49	-54.51	-29.5

Table 7-33. Radiated Spurious Data (Band 41 – Low Channel)

FCC ID: ZNFQ910QM	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 44 of 46

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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	V	106	10	-61.45	8.67	-52.78	-27.8
7779.00	V	102	16	-62.39	8.66	-53.74	-28.7
10372.00	V	-	-	-62.25	9.59	-52.66	-27.7

Table 7-34. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY: 2687.50 MHz
 CHANNEL: 41565
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 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]
5375.00	V	102	22	-56.33	8.66	-47.67	-22.7
8062.50	V	182	318	-56.18	8.95	-47.24	-22.2
10750.00	V	126	335	-59.20	9.26	-49.94	-24.9
13437.50	V	-	-	-56.89	8.71	-48.18	-23.2

Table 7-35. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: ZNFQ910QM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 45 of 46

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ910QM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1808210167-03.ZNF	Test Dates: 8/21 - 9/4/2018	EUT Type: Portable Handset		Page 46 of 46