

## MEASUREMENT REPORT LTE

**Applicant Name:**

LG Electronics USA, Inc.

1000 Sylvan Avenue

Englewood Cliffs, NJ 07632

United States

**Date of Testing:**

7/25/2018 - 8/8/2018

**Test Site/Location:**

PCTEST Lab. Columbia, MD, USA

**Test Report Serial No.:**

1M1808070153-03-R2.ZNF

**FCC ID:**

**ZNFV405UA**

**APPLICANT:**

**LG Electronics USA, Inc.**

**Application Type:**

Class II Permissive Change

**Model:**

LM-V405UA

**Additional Model(s):**

LMV405UA, LM-V405TA, LMV405TA, LM-V405MA, LMV405MA,  
LM-V405QA, LMV405QA, LM-V405QA5, LMV405QA5, LM-  
V405QA6, LMV405QA6, LM-V405UAB, LMV405UAB, LM-V405UAL,  
LMV405UAL

**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,  
KDB 648474 D03 v01r04

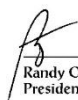
**Class II Permissive Change:**

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.

This revised Test Report (S/N: 1M1808070153-03-R2.ZNF) supersedes and replaces the previously issued test report (S/N: 1M1808070153-03-R1.ZNF) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly

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



Randy Ortanez  
President

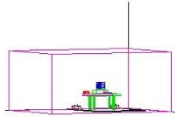


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|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFV405UA                          |  <b>MEASUREMENT REPORT<br/>(CLASS II PERMISSIVE CHANGE)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2.ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                                                                                     | <b>EUT Type:</b><br>Portable Handset                                                  | Page 1 of 70                           |

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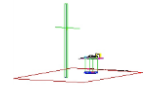
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# MEASUREMENT REPORT

## FCC Part 22, 24, & 27



| Mode           | FCC Rule Part | Tx Frequency (MHz) | ERP            |                  | EIRP           |                  | Emission Designator | Modulation |
|----------------|---------------|--------------------|----------------|------------------|----------------|------------------|---------------------|------------|
|                |               |                    | Max. Power (W) | Max. Power (dBm) | Max. Power (W) | Max. Power (dBm) |                     |            |
| LTE Band 71    | 27            | 665.5 - 695.5      | 0.050          | 17.03            |                |                  | 4M55G7D             | QPSK       |
| LTE Band 71    | 27            | 665.5 - 695.5      | 0.040          | 16.06            |                |                  | 4M51W7D             | 16QAM      |
| LTE Band 71    | 27            | 665.5 - 695.5      | 0.031          | 14.93            |                |                  | 4M53W7D             | 64QAM      |
| LTE Band 71    | 27            | 668 - 693          | 0.056          | 17.46            |                |                  | 9M01G7D             | QPSK       |
| LTE Band 71    | 27            | 668 - 693          | 0.041          | 16.09            |                |                  | 9M01W7D             | 16QAM      |
| LTE Band 71    | 27            | 668 - 693          | 0.031          | 14.95            |                |                  | 9M00W7D             | 64QAM      |
| LTE Band 71    | 27            | 670.5 - 690.5      | 0.045          | 16.49            |                |                  | 13M5G7D             | QPSK       |
| LTE Band 71    | 27            | 670.5 - 690.5      | 0.031          | 14.95            |                |                  | 13M5W7D             | 16QAM      |
| LTE Band 71    | 27            | 670.5 - 690.5      | 0.022          | 13.47            |                |                  | 13M5W7D             | 64QAM      |
| LTE Band 71    | 27            | 673 - 688          | 0.046          | 16.62            |                |                  | 18M0G7D             | QPSK       |
| LTE Band 71    | 27            | 673 - 688          | 0.035          | 15.49            |                |                  | 18M0W7D             | 16QAM      |
| LTE Band 71    | 27            | 673 - 688          | 0.028          | 14.41            |                |                  | 17M9W7D             | 64QAM      |
| LTE Band 12    | 27            | 699.7 - 715.3      | 0.064          | 18.03            | 0.104          | 20.18            | 1M10G7D             | QPSK       |
| LTE Band 12    | 27            | 699.7 - 715.3      | 0.039          | 15.95            | 0.065          | 18.10            | 1M10W7D             | 16QAM      |
| LTE Band 12    | 27            | 699.7 - 715.3      | 0.028          | 14.49            | 0.046          | 16.64            | 1M10W7D             | 64QAM      |
| LTE Band 12    | 27            | 700.5 - 714.5      | 0.064          | 18.06            | 0.105          | 20.21            | 2M72G7D             | QPSK       |
| LTE Band 12    | 27            | 700.5 - 714.5      | 0.046          | 16.61            | 0.075          | 18.76            | 2M72W7D             | 16QAM      |
| LTE Band 12    | 27            | 700.5 - 714.5      | 0.036          | 15.54            | 0.059          | 17.69            | 2M72W7D             | 64QAM      |
| LTE Band 12/17 | 27            | 701.5 - 713.5      | 0.060          | 17.77            | 0.098          | 19.92            | 4M52G7D             | QPSK       |
| LTE Band 12/17 | 27            | 701.5 - 713.5      | 0.048          | 16.78            | 0.078          | 18.93            | 4M52W7D             | 16QAM      |
| LTE Band 12/17 | 27            | 701.5 - 713.5      | 0.040          | 15.97            | 0.065          | 18.12            | 4M52W7D             | 64QAM      |
| LTE Band 12/17 | 27            | 704 - 711          | 0.059          | 17.68            | 0.096          | 19.83            | 9M01G7D             | QPSK       |
| LTE Band 12/17 | 27            | 704 - 711          | 0.049          | 16.89            | 0.080          | 19.04            | 9M02W7D             | 16QAM      |
| LTE Band 12/17 | 27            | 704 - 711          | 0.040          | 16.00            | 0.065          | 18.15            | 9M01W7D             | 64QAM      |
| LTE Band 13    | 27            | 779.5 - 784.5      | 0.052          | 17.15            | 0.085          | 19.30            | 4M53G7D             | QPSK       |
| LTE Band 13    | 27            | 779.5 - 784.5      | 0.037          | 15.65            | 0.060          | 17.80            | 4M52W7D             | 16QAM      |
| LTE Band 13    | 27            | 779.5 - 784.5      | 0.030          | 14.77            | 0.049          | 16.92            | 4M52W7D             | 64QAM      |
| LTE Band 13    | 27            | 782                | 0.041          | 16.18            | 0.068          | 18.33            | 9M00G7D             | QPSK       |
| LTE Band 13    | 27            | 782                | 0.030          | 14.83            | 0.050          | 16.98            | 8M97W7D             | 16QAM      |
| LTE Band 13    | 27            | 782                | 0.023          | 13.55            | 0.037          | 15.70            | 9M01W7D             | 64QAM      |
| LTE Band 26/5  | 22H           | 824.7 - 848.3      | 0.063          | 17.98            | 0.103          | 20.13            | 1M09G7D             | QPSK       |
| LTE Band 26/5  | 22H           | 824.7 - 848.3      | 0.044          | 16.46            | 0.073          | 18.61            | 1M09W7D             | 16QAM      |
| LTE Band 26/5  | 22H           | 824.7 - 848.3      | 0.034          | 15.37            | 0.056          | 17.52            | 1M09W7D             | 64QAM      |
| LTE Band 26/5  | 22H           | 825.5 - 847.5      | 0.066          | 18.17            | 0.108          | 20.32            | 2M71G7D             | QPSK       |
| LTE Band 26/5  | 22H           | 825.5 - 847.5      | 0.046          | 16.63            | 0.076          | 18.78            | 2M71W7D             | 16QAM      |
| LTE Band 26/5  | 22H           | 825.5 - 847.5      | 0.035          | 15.48            | 0.058          | 17.63            | 2M72W7D             | 64QAM      |
| LTE Band 26/5  | 22H           | 826.5 - 846.5      | 0.067          | 18.24            | 0.109          | 20.39            | 4M58G7D             | QPSK       |
| LTE Band 26/5  | 22H           | 826.5 - 846.5      | 0.046          | 16.61            | 0.075          | 18.76            | 4M52W7D             | 16QAM      |
| LTE Band 26/5  | 22H           | 826.5 - 846.5      | 0.034          | 15.35            | 0.056          | 17.50            | 4M55W7D             | 64QAM      |
| LTE Band 26/5  | 22H           | 829 - 844          | 0.064          | 18.04            | 0.104          | 20.19            | 9M02G7D             | QPSK       |
| LTE Band 26/5  | 22H           | 829 - 844          | 0.045          | 16.54            | 0.074          | 18.69            | 9M02W7D             | 16QAM      |
| LTE Band 26/5  | 22H           | 829 - 844          | 0.037          | 15.71            | 0.061          | 17.86            | 9M02W7D             | 64QAM      |
| LTE Band 26    | 22H           | 831.5 - 841.5      | 0.065          | 18.14            | 0.107          | 20.29            | 13M5G7D             | QPSK       |
| LTE Band 26    | 22H           | 831.5 - 841.5      | 0.046          | 16.63            | 0.076          | 18.78            | 13M5W7D             | 16QAM      |
| LTE Band 26    | 22H           | 831.5 - 841.5      | 0.035          | 15.47            | 0.058          | 17.62            | 13M5W7D             | 64QAM      |

### EUT Overview (<1GHz)

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 3 of 70                    |

| Mode          | FCC Rule Part | Tx Frequency (MHz) | EIRP           |                  | Emission Designator | Modulation |
|---------------|---------------|--------------------|----------------|------------------|---------------------|------------|
|               |               |                    | Max. Power (W) | Max. Power (dBm) |                     |            |
| LTE Band 66/4 | 27            | 1710.7 - 1779.3    | 0.246          | 23.90            | 1M09G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1710.7 - 1779.3    | 0.207          | 23.15            | 1M10W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1710.7 - 1779.3    | 0.159          | 22.00            | 1M09W7D             | 64QAM      |
| LTE Band 66/4 | 27            | 1711.5 - 1778.5    | 0.261          | 24.16            | 2M72G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1711.5 - 1778.5    | 0.215          | 23.33            | 2M73W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1711.5 - 1778.5    | 0.165          | 22.18            | 2M72W7D             | 64QAM      |
| LTE Band 66/4 | 27            | 1712.5 - 1777.5    | 0.278          | 24.44            | 4M56G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1712.5 - 1777.5    | 0.230          | 23.62            | 4M51W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1712.5 - 1777.5    | 0.182          | 22.60            | 4M53W7D             | 64QAM      |
| LTE Band 66/4 | 27            | 1715 - 1775        | 0.250          | 23.98            | 9M01G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1715 - 1775        | 0.207          | 23.16            | 9M01W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1715 - 1775        | 0.165          | 22.17            | 9M03W7D             | 64QAM      |
| LTE Band 66/4 | 27            | 1717.5 - 1772.5    | 0.260          | 24.15            | 13M5G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1717.5 - 1772.5    | 0.220          | 23.42            | 13M5W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1717.5 - 1772.5    | 0.170          | 22.31            | 13M5W7D             | 64QAM      |
| LTE Band 66/4 | 27            | 1720 - 1770        | 0.252          | 24.02            | 18M0G7D             | QPSK       |
| LTE Band 66/4 | 27            | 1720 - 1770        | 0.211          | 23.25            | 18M0W7D             | 16QAM      |
| LTE Band 66/4 | 27            | 1720 - 1770        | 0.167          | 22.23            | 18M0W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1850.7 - 1914.3    | 0.149          | 21.74            | 1M09G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1850.7 - 1914.3    | 0.154          | 21.87            | 1M10W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1850.7 - 1914.3    | 0.121          | 20.83            | 1M11W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1851.5 - 1913.5    | 0.153          | 21.86            | 2M72G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1851.5 - 1913.5    | 0.164          | 22.14            | 2M73W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1851.5 - 1913.5    | 0.125          | 20.98            | 2M73W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1852.5 - 1912.5    | 0.157          | 21.96            | 4M54G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1852.5 - 1912.5    | 0.141          | 21.49            | 4M51W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1852.5 - 1912.5    | 0.111          | 20.46            | 4M52W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1855 - 1910        | 0.180          | 22.54            | 9M02G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1855 - 1910        | 0.150          | 21.77            | 9M02W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1855 - 1910        | 0.115          | 20.59            | 9M01W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1857.5 - 1907.5    | 0.193          | 22.85            | 13M5G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1857.5 - 1907.5    | 0.161          | 22.08            | 13M5W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1857.5 - 1907.5    | 0.129          | 21.12            | 13M5W7D             | 64QAM      |
| LTE Band 25/2 | 24E           | 1860 - 1905        | 0.158          | 21.98            | 18M0G7D             | QPSK       |
| LTE Band 25/2 | 24E           | 1860 - 1905        | 0.164          | 22.14            | 18M0W7D             | 16QAM      |
| LTE Band 25/2 | 24E           | 1860 - 1905        | 0.133          | 21.23            | 17M9W7D             | 64QAM      |
| LTE Band 30   | 27            | 2307.5 - 2312.5    | 0.171          | 22.34            | 4M52G7D             | QPSK       |
| LTE Band 30   | 27            | 2307.5 - 2312.5    | 0.144          | 21.58            | 4M51W7D             | 16QAM      |
| LTE Band 30   | 27            | 2307.5 - 2312.5    | 0.115          | 20.62            | 4M52W7D             | 64QAM      |
| LTE Band 30   | 27            | 2310               | 0.176          | 22.45            | 9M00G7D             | QPSK       |
| LTE Band 30   | 27            | 2310               | 0.145          | 21.63            | 9M01W7D             | 16QAM      |
| LTE Band 30   | 27            | 2310               | 0.115          | 20.62            | 9M01W7D             | 64QAM      |
| LTE Band 7    | 27            | 2502.5 - 2567.5    | 0.186          | 22.69            | 4M52G7D             | QPSK       |
| LTE Band 7    | 27            | 2502.5 - 2567.5    | 0.156          | 21.94            | 4M51W7D             | 16QAM      |
| LTE Band 7    | 27            | 2502.5 - 2567.5    | 0.127          | 21.03            | 4M52W7D             | 64QAM      |
| LTE Band 7    | 27            | 2505 - 2565        | 0.188          | 22.75            | 9M00G7D             | QPSK       |
| LTE Band 7    | 27            | 2505 - 2565        | 0.160          | 22.04            | 9M02W7D             | 16QAM      |
| LTE Band 7    | 27            | 2505 - 2565        | 0.123          | 20.90            | 9M02W7D             | 64QAM      |
| LTE Band 7    | 27            | 2507.5 - 2562.5    | 0.192          | 22.83            | 13M5G7D             | QPSK       |
| LTE Band 7    | 27            | 2507.5 - 2562.5    | 0.145          | 21.62            | 13M5W7D             | 16QAM      |
| LTE Band 7    | 27            | 2507.5 - 2562.5    | 0.112          | 20.51            | 13M5W7D             | 64QAM      |
| LTE Band 7    | 27            | 2510 - 2560        | 0.181          | 22.58            | 18M0G7D             | QPSK       |
| LTE Band 7    | 27            | 2510 - 2560        | 0.136          | 21.35            | 18M0W7D             | 16QAM      |
| LTE Band 7    | 27            | 2510 - 2560        | 0.106          | 20.24            | 17M9W7D             | 64QAM      |
| LTE Band 41   | 27            | 2498.5 - 2687.5    | 0.404          | 26.06            | 4M54G7D             | QPSK       |
| LTE Band 41   | 27            | 2498.5 - 2687.5    | 0.327          | 25.14            | 4M49W7D             | 16QAM      |
| LTE Band 41   | 27            | 2498.5 - 2687.5    | 0.257          | 24.09            | 4M51W7D             | 64QAM      |
| LTE Band 41   | 27            | 2501 - 2685        | 0.455          | 26.58            | 9M01G7D             | QPSK       |
| LTE Band 41   | 27            | 2501 - 2685        | 0.359          | 25.55            | 9M05W7D             | 16QAM      |
| LTE Band 41   | 27            | 2501 - 2685        | 0.300          | 24.77            | 8M98W7D             | 64QAM      |
| LTE Band 41   | 27            | 2503.5 - 2682.5    | 0.468          | 26.70            | 13M5G7D             | QPSK       |
| LTE Band 41   | 27            | 2503.5 - 2682.5    | 0.375          | 25.74            | 13M6W7D             | 16QAM      |
| LTE Band 41   | 27            | 2503.5 - 2682.5    | 0.254          | 24.05            | 13M4W7D             | 64QAM      |
| LTE Band 41   | 27            | 2506 - 2680        | 0.431          | 26.34            | 17M9G7D             | QPSK       |
| LTE Band 41   | 27            | 2506 - 2680        | 0.366          | 25.63            | 18M0W7D             | 16QAM      |
| LTE Band 41   | 27            | 2506 - 2680        | 0.286          | 24.56            | 17M9W7D             | 64QAM      |

### EUT Overview (>1GHz)

|                                            |                                                                                                                                                      |                               |                                                                                       |                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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## 1.0 INTRODUCTION

### 1.1 Scope

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

### 1.2 PCTEST Test Location

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

### 1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFV405UA**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

**Test Device Serial No.:** 06507, 06531, 06705, 06515, 06523

### 2.2 Device Capabilities

This device contains the following capabilities:

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

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

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

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

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

This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space" condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.

### 2.3 Test Configuration

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

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

### 2.4 EMI Suppression Device(s)/Modifications

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

|                                                   |                                                                                     |                                                            |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFV405UA                          |  | <b>MEASUREMENT REPORT<br/>(CLASS II PERMISSIVE CHANGE)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2-ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                          | <b>EUT Type:</b><br>Portable Handset                       |                                                                                       | Page 6 of 70                           |

## 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

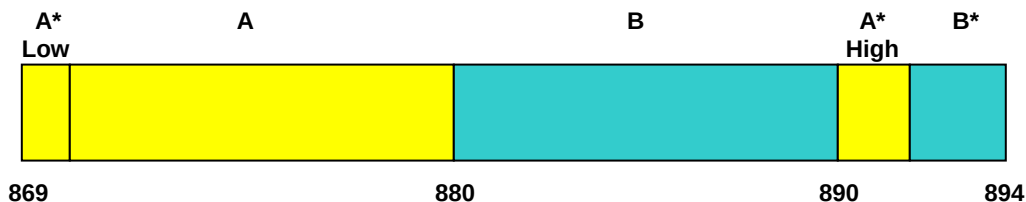
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results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

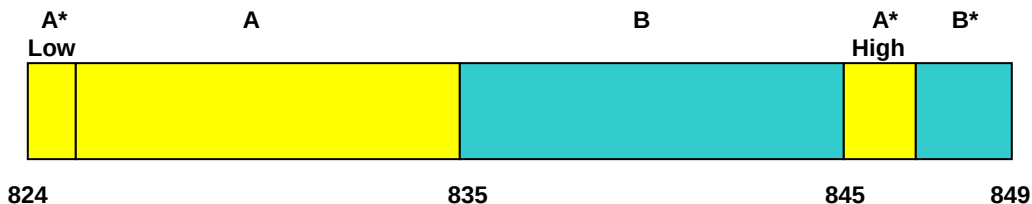
### 3.4 Cellular - Base Frequency Blocks



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

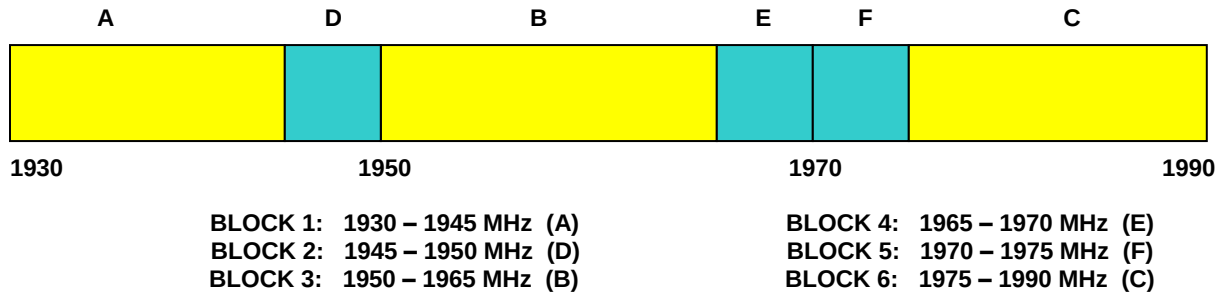


BLOCK 1: 824 – 835 MHz (A\* Low + A)  
BLOCK 2: 835 – 845 MHz (B)

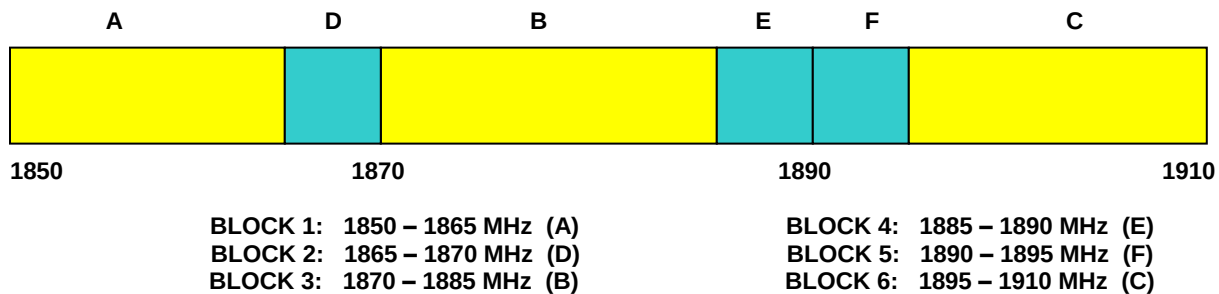
BLOCK 3: 845 – 846.5 MHz (A\* High)  
BLOCK 4: 846.5 – 849 MHz (B\*)

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 7 of 70                    |

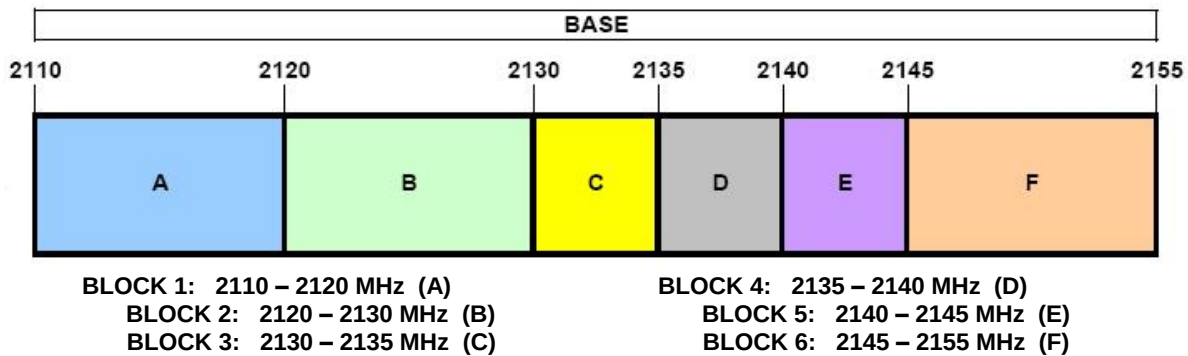
### 3.6 PCS - Base Frequency Blocks



### 3.7 PCS - Mobile Frequency Blocks

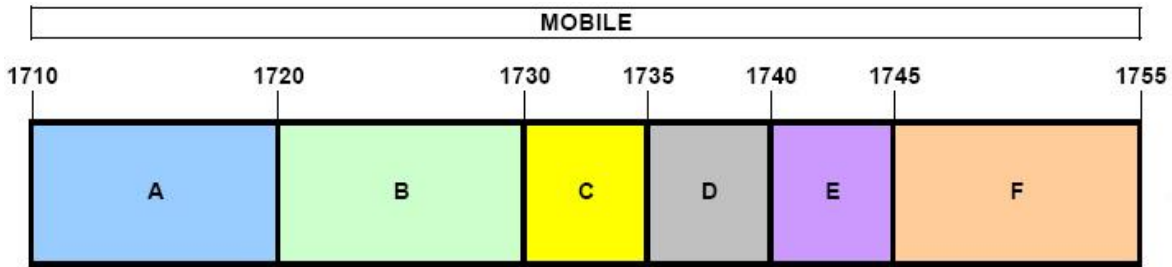


### 3.8 AWS - Base Frequency Blocks



|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
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### 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:

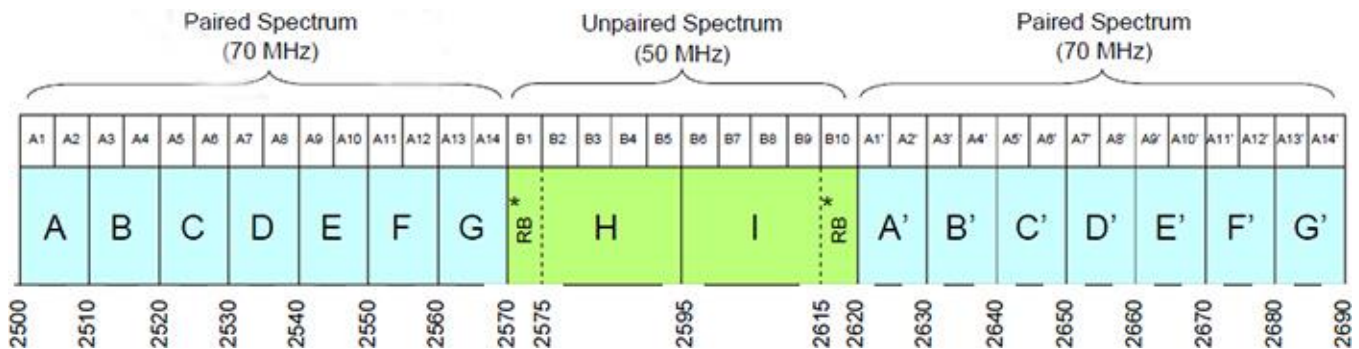
BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

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: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 9 of 70                    |

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

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 10 of 70                   |

## 4.0 MEASUREMENT UNCERTAINTY

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

| Contribution                  | Expanded Uncertainty ( $\pm$ dB) |
|-------------------------------|----------------------------------|
| Radiated Disturbance (<1GHz)  | 4.98                             |
| Radiated Disturbance (>1GHz)  | 5.07                             |
| Radiated Disturbance (>18GHz) | 5.09                             |

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 11 of 70                   |

## 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    |
| Anritsu         | MT8820C      | Radio Communication Analyzer | 1/30/2018  | Annual       | 1/30/2019  | 6201300731    |
| Com-Power       | AL-130       | 9kHz - 30MHz Loop Antenna    | 10/10/2017 | Biennial     | 10/10/2019 | 121034        |
| EMCO            | 3160-09      | Small Horn (18 - 26.5GHz)    | 8/23/2016  | Biennial     | 8/23/2018  | 135427        |
| ETS Lindgren    | 3164-08      | Quad Ridge Horn Antenna      | 3/28/2018  | Biennial     | 3/28/2020  | 128337        |
| ETS Lindgren    | 3117         | 1-18 GHz DRG Horn (Medium)   | 12/1/2016  | Biennial     | 12/1/2018  | 125518        |
| Mini Circuits   | TVA-11-422   | RF Power Amp                 | N/A        |              |            | QA1317001     |
| Mini Circuits   | PWR-SEN-4GHS | USB Power Sensor             | 3/30/2018  | Annual       | 3/30/2019  | 11401010036   |
| Mini-Circuits   | SSG-4000HP   | Synthesized Signal Generator | N/A        |              |            | 11208010032   |
| Rohde & Schwarz | TS-PR26      | 18-26.5 GHz Pre-Amplifier    | 1/24/2018  | Annual       | 1/24/2019  | 100040        |
| Rohde & Schwarz | ESU40        | EMI Test Receiver (40GHz)    | 8/9/2018   | Annual       | 8/9/2019   | 100348        |
| Rohde & Schwarz | CMW500       | Radio Communication Tester   | 11/3/2017  | Annual       | 11/3/2018  | 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           | JB6          | Bi-Log Antenna (30M - 6GHz)  | 9/27/2016  | Biennial     | 9/27/2018  | A082816       |

**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.

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset | Page 12 of 70                                                                         |                                 |

## 6.0 SAMPLE CALCULATIONS

### Spurious Radiated Emission – LTE Band

#### Example: Middle Channel LTE Mode 2<sup>nd</sup> Harmonic (1564 MHz)

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

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
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| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 13 of 70                   |

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: LG Electronics USA, Inc.  
 FCC ID: ZNFV405UA  
 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)<br>27.50(c)(10)                                         | Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 71, 12/17, 13) | < 3 Watts max. ERP                                                                                                                             |                | PASS        | Section 7.2 |
| 24.232(c)<br>27.50(h)(2)                                             | Equivalent Isotropic Radiated Power (Band 25/2, 7, 41)                              | < 2 Watts max. EIRP                                                                                                                            |                | PASS        | Section 7.2 |
| 27.50(d)(4)                                                          | Equivalent Isotropic Radiated Power (Band 66/4)                                     | < 1 Watts max. EIRP                                                                                                                            |                | PASS        | Section 7.2 |
| 27.50(a)(3)                                                          | Equivalent Isotropic Radiated Power (Band 30)                                       | < 0.25 Watts max. EIRP                                                                                                                         |                | PASS        | Section 7.2 |
| 2.1053<br>22.917(a)<br>24.238(a)<br>27.53(c)<br>27.53(g)<br>27.53(h) | Undesirable Emissions                                                               | > 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions                                                                            |                | PASS        | Section 7.3 |
| 27.53(f)                                                             | Undesirable Emissions (Band 13)                                                     | < -70 dBW/MHz (for wideband signals)<br>< -80 dBW (for discrete emissions less than 700Hz BW)<br>For all emissions in the band 1559 – 1610 MHz |                | PASS        | Section 7.3 |
| 27.53(a)                                                             | Undesirable Emissions (Band 30)                                                     | > 70 + 10log <sub>10</sub> (P[Watts])                                                                                                          |                | PASS        | Section 7.3 |
| 27.53(m)                                                             | Undesirable Emissions                                                               | Undesirable emissions must meet the limits detailed in 27.53(m)                                                                                |                | PASS        | Section 7.3 |

Table 7-1. Summary of Radiated Test Results

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 14 of 70                   |

**Notes:**

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The Class II Permissive Change test results reported herein are within the expected measurement tolerances of the original certification test results. It has been determined that the radiated powers did not change.

|                                                   |                                                                                     |                                                            |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFV405UA                          |  | <b>MEASUREMENT REPORT<br/>(CLASS II PERMISSIVE CHANGE)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2.ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                          | <b>EUT Type:</b><br>Portable Handset                       |                                                                                       | Page 15 of 70                          |

## 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

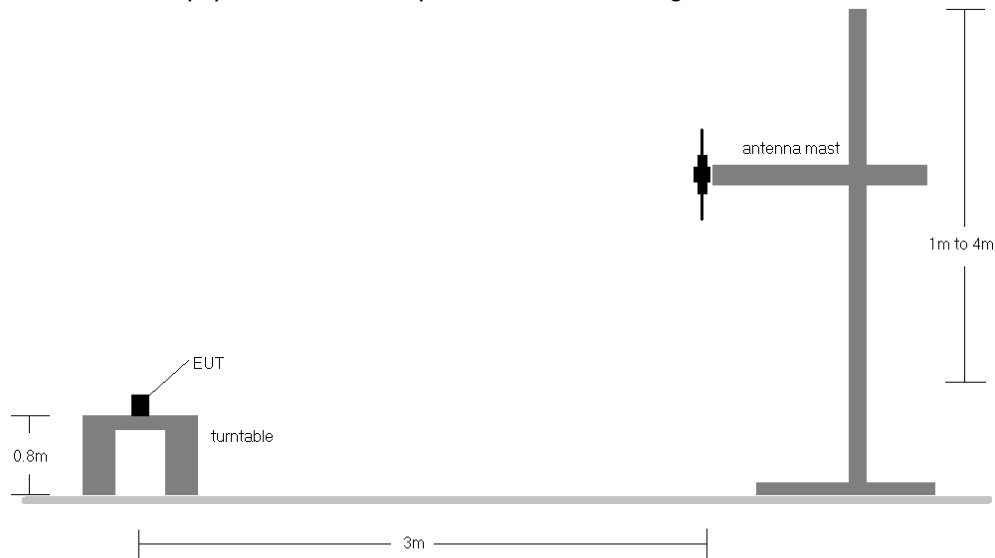
### Test Settings

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

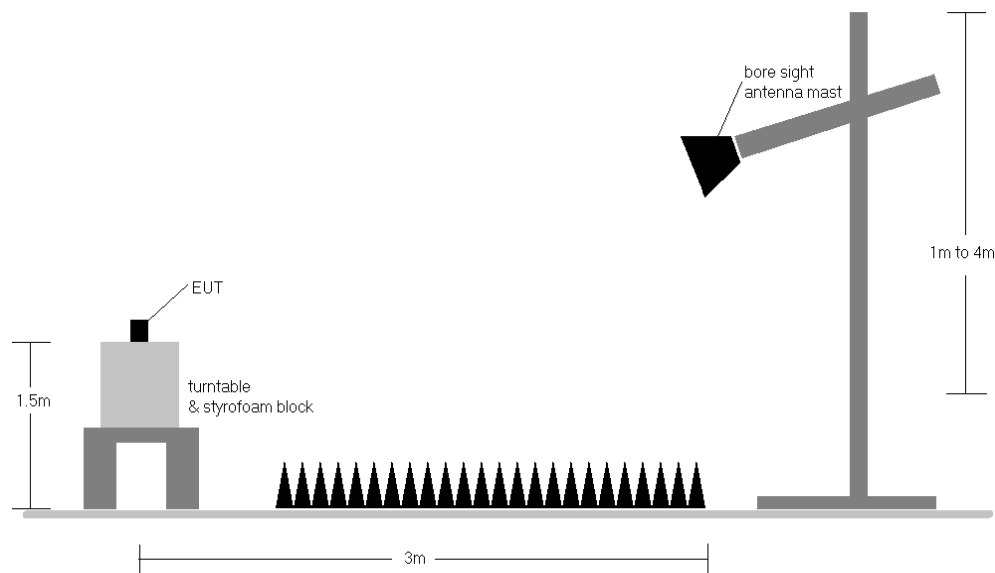
|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2-ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 16 of 70                   |

## 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: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 17 of 70                   |

| 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   | H               | 150                 | 106                        | 1 / 0          | 17.07                  | 1.10            | 16.02        | 0.040        | 34.77           | -18.75      |
| 680.50          | 5                       | QPSK   | H               | 150                 | 100                        | 1 / 24         | 17.69                  | 1.10            | 16.64        | 0.046        | 34.77           | -18.13      |
| 695.50          | 5                       | QPSK   | H               | 150                 | 108                        | 1 / 0          | 18.08                  | 1.10            | <b>17.03</b> | 0.050        | 34.77           | -17.74      |
| 695.50          | 5                       | 16-QAM | H               | 150                 | 108                        | 1 / 0          | 17.11                  | 1.10            | <b>16.06</b> | 0.040        | 34.77           | -18.71      |
| 695.50          | 5                       | 64-QAM | H               | 150                 | 108                        | 1 / 0          | 15.98                  | 1.10            | <b>14.93</b> | 0.031        | 34.77           | -19.84      |
| 668.00          | 10                      | QPSK   | H               | 150                 | 96                         | 1 / 49         | 16.72                  | 1.10            | 15.67        | 0.037        | 34.77           | -19.10      |
| 680.50          | 10                      | QPSK   | H               | 150                 | 99                         | 1 / 49         | 17.94                  | 1.10            | 16.89        | 0.049        | 34.77           | -17.88      |
| 693.00          | 10                      | QPSK   | H               | 150                 | 110                        | 1 / 0          | 18.51                  | 1.10            | <b>17.46</b> | <b>0.056</b> | 34.77           | -17.31      |
| 693.00          | 10                      | 16-QAM | H               | 150                 | 110                        | 1 / 0          | 17.14                  | 1.10            | <b>16.09</b> | 0.041        | 34.77           | -18.68      |
| 693.00          | 10                      | 64-QAM | H               | 150                 | 110                        | 1 / 0          | 16.00                  | 1.10            | <b>14.95</b> | 0.031        | 34.77           | -19.82      |
| 670.50          | 15                      | QPSK   | H               | 150                 | 116                        | 1 / 74         | 16.45                  | 1.10            | 15.40        | 0.035        | 34.77           | -19.37      |
| 680.50          | 15                      | QPSK   | H               | 150                 | 106                        | 1 / 74         | 16.93                  | 1.10            | 15.88        | 0.039        | 34.77           | -18.89      |
| 690.50          | 15                      | QPSK   | H               | 150                 | 99                         | 1 / 36         | 17.54                  | 1.10            | <b>16.49</b> | 0.045        | 34.77           | -18.28      |
| 690.50          | 15                      | 16-QAM | H               | 150                 | 99                         | 1 / 36         | 16.00                  | 1.10            | <b>14.95</b> | 0.031        | 34.77           | -19.82      |
| 690.50          | 15                      | 64-QAM | H               | 150                 | 99                         | 1 / 36         | 14.52                  | 1.10            | <b>13.47</b> | 0.022        | 34.77           | -21.30      |
| 673.00          | 20                      | QPSK   | H               | 150                 | 102                        | 1 / 50         | 17.41                  | 1.10            | 16.36        | 0.043        | 34.77           | -18.41      |
| 683.00          | 20                      | QPSK   | H               | 150                 | 102                        | 1 / 99         | 17.66                  | 1.10            | 16.61        | 0.046        | 34.77           | -18.16      |
| 688.00          | 20                      | QPSK   | H               | 150                 | 109                        | 1 / 50         | 17.67                  | 1.10            | <b>16.62</b> | 0.046        | 34.77           | -18.15      |
| 688.00          | 20                      | 16-QAM | H               | 150                 | 109                        | 1 / 50         | 16.54                  | 1.10            | <b>15.49</b> | 0.035        | 34.77           | -19.28      |
| 688.00          | 20                      | 64-QAM | H               | 150                 | 109                        | 1 / 50         | 15.46                  | 1.10            | <b>14.41</b> | 0.028        | 34.77           | -20.36      |
| 693.00          | 10                      | QPSK   | V               | 150                 | 82                         | 1 / 0          | 15.92                  | 1.10            | 14.87        | 0.031        | 34.77           | -19.90      |
| 693.00          | 10 (WCP)                | QPSK   | H               | 150                 | 106                        | 1 / 0          | 18.29                  | 1.10            | 17.24        | 0.053        | 34.77           | -17.53      |

Table 7-2. ERP Data (Band 71)

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 18 of 70                   |

| 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                 | 190                        | 1 / 5          | 19.08                  | 1.10            | <b>18.03</b> | 0.064        | 34.77           | -16.74      | <b>20.18</b> | 0.104        | 36.99            | -16.81      |
| 707.50          | 1.4                     | QPSK   | H               | 150                 | 190                        | 1 / 5          | 18.47                  | 1.13            | 17.45        | 0.056        | 34.77           | -17.32      | 19.60        | 0.091        | 36.99            | -17.39      |
| 715.30          | 1.4                     | QPSK   | H               | 150                 | 190                        | 1 / 5          | 18.16                  | 1.16            | 17.17        | 0.052        | 34.77           | -17.60      | 19.32        | 0.086        | 36.99            | -17.67      |
| 699.70          | 1.4                     | 16-QAM | H               | 150                 | 190                        | 1 / 5          | 17.00                  | 1.10            | <b>15.95</b> | 0.039        | 34.77           | -18.82      | <b>18.10</b> | 0.065        | 36.99            | -18.89      |
| 699.70          | 1.4                     | 64-QAM | H               | 150                 | 190                        | 1 / 5          | 15.54                  | 1.10            | <b>14.49</b> | 0.028        | 34.77           | -20.28      | <b>16.64</b> | 0.046        | 36.99            | -20.35      |
| 700.50          | 3                       | QPSK   | H               | 150                 | 187                        | 1 / 14         | 19.11                  | 1.10            | <b>18.06</b> | <b>0.064</b> | 34.77           | -16.71      | <b>20.21</b> | <b>0.105</b> | 36.99            | -16.78      |
| 707.50          | 3                       | QPSK   | H               | 150                 | 187                        | 1 / 14         | 18.36                  | 1.13            | 17.34        | 0.054        | 34.77           | -17.43      | 19.49        | 0.089        | 36.99            | -17.50      |
| 714.50          | 3                       | QPSK   | H               | 150                 | 187                        | 1 / 14         | 18.62                  | 1.16            | 17.63        | 0.058        | 34.77           | -17.14      | 19.78        | 0.095        | 36.99            | -17.21      |
| 700.50          | 3                       | 16-QAM | H               | 150                 | 187                        | 1 / 14         | 17.66                  | 1.10            | <b>16.61</b> | 0.046        | 34.77           | -18.16      | <b>18.76</b> | 0.075        | 36.99            | -18.23      |
| 700.50          | 3                       | 64-QAM | H               | 150                 | 187                        | 1 / 14         | 16.59                  | 1.10            | <b>15.54</b> | 0.036        | 34.77           | -19.23      | <b>17.69</b> | 0.059        | 36.99            | -19.30      |
| 700.50          | 3                       | QPSK   | V               | 150                 | 139                        | 1 / 14         | 18.06                  | 1.10            | 17.01        | 0.050        | 34.77           | -17.76      | 19.16        | 0.082        | 36.99            | -17.83      |
| 700.50          | 3 (WCP)                 | QPSK   | H               | 150                 | 186                        | 1 / 14         | 19.05                  | 1.10            | 18.00        | 0.063        | 34.77           | -16.77      | 20.15        | 0.104        | 36.99            | -16.84      |

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               | 150                 | 194                        | 1 / 0          | 18.63                  | 1.11            | 17.59        | 0.057       | 34.77           | -17.19      | 19.74        | 0.094        | 36.99            | -17.25      |
| 707.50          | 5                       | QPSK   | H               | 150                 | 195                        | 1 / 0          | 18.19                  | 1.13            | 17.17        | 0.052       | 34.77           | -17.60      | 19.32        | 0.086        | 36.99            | -17.67      |
| 713.50          | 5                       | QPSK   | H               | 150                 | 194                        | 1 / 24         | 18.77                  | 1.15            | <b>17.77</b> | 0.060       | 34.77           | -17.00      | <b>19.92</b> | 0.098        | 36.99            | -17.07      |
| 701.50          | 5                       | 16-QAM | H               | 150                 | 194                        | 1 / 0          | 17.82                  | 1.11            | <b>16.78</b> | 0.048       | 34.77           | -18.00      | <b>18.93</b> | 0.078        | 36.99            | -18.06      |
| 701.50          | 5                       | 64-QAM | H               | 150                 | 194                        | 1 / 0          | 17.01                  | 1.11            | <b>15.97</b> | 0.040       | 34.77           | -18.81      | <b>18.12</b> | 0.065        | 36.99            | -18.87      |
| 704.00          | 10                      | QPSK   | H               | 150                 | 194                        | 1 / 0          | 18.71                  | 1.12            | <b>17.68</b> | 0.059       | 34.77           | -17.09      | <b>19.83</b> | 0.096        | 36.99            | -17.16      |
| 707.50          | 10                      | QPSK   | H               | 150                 | 201                        | 1 / 0          | 18.07                  | 1.13            | 17.05        | 0.051       | 34.77           | -17.72      | 19.20        | 0.083        | 36.99            | -17.79      |
| 711.00          | 10                      | QPSK   | H               | 150                 | 194                        | 1 / 0          | 18.40                  | 1.14            | 17.39        | 0.055       | 34.77           | -17.38      | 19.54        | 0.090        | 36.99            | -17.45      |
| 704.00          | 10                      | 16-QAM | H               | 150                 | 194                        | 1 / 0          | 17.92                  | 1.12            | <b>16.89</b> | 0.049       | 34.77           | -17.88      | <b>19.04</b> | 0.080        | 36.99            | -17.95      |
| 704.00          | 10                      | 64-QAM | H               | 150                 | 194                        | 1 / 0          | 17.03                  | 1.12            | <b>16.00</b> | 0.040       | 34.77           | -18.77      | <b>18.15</b> | 0.065        | 36.99            | -18.84      |

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

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 19 of 70                   |

| 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               | 150                 | 100                        | 1 / 0          | 17.98                  | 1.32            | <b>17.15</b> | 0.052       | 34.77           | -17.62      | <b>19.30</b> | 0.085        | 36.99            | -17.69      |
| 782.00          | 5                       | QPSK   | H               | 150                 | 107                        | 1 / 12         | 17.75                  | 1.33            | 16.93        | 0.049       | 34.77           | -17.84      | 19.08        | 0.081        | 36.99            | -17.91      |
| 784.50          | 5                       | QPSK   | H               | 150                 | 107                        | 1 / 0          | 17.94                  | 1.34            | 17.13        | 0.052       | 34.77           | -17.64      | 19.28        | 0.085        | 36.99            | -17.71      |
| 779.50          | 5                       | 16-QAM | H               | 150                 | 100                        | 1 / 0          | 16.48                  | 1.32            | <b>15.65</b> | 0.037       | 34.77           | -19.12      | <b>17.80</b> | 0.060        | 36.99            | -19.19      |
| 779.50          | 5                       | 64-QAM | H               | 150                 | 100                        | 1 / 0          | 15.60                  | 1.32            | <b>14.77</b> | 0.030       | 34.77           | -20.00      | <b>16.92</b> | 0.049        | 36.99            | -20.07      |
| 782.00          | 10                      | QPSK   | H               | 150                 | 113                        | 1 / 49         | 17.00                  | 1.33            | <b>16.18</b> | 0.041       | 34.77           | -18.59      | <b>18.33</b> | 0.068        | 36.99            | -18.66      |
| 782.00          | 10                      | 16-QAM | H               | 150                 | 113                        | 1 / 49         | 15.65                  | 1.33            | <b>14.83</b> | 0.030       | 34.77           | -19.94      | <b>16.98</b> | 0.050        | 36.99            | -20.01      |
| 782.00          | 10                      | 64-QAM | H               | 150                 | 113                        | 1 / 49         | 14.37                  | 1.33            | <b>13.55</b> | 0.023       | 34.77           | -21.22      | <b>15.70</b> | 0.037        | 36.99            | -21.29      |
| 779.50          | 5                       | QPSK   | V               | 150                 | 100                        | 1 / 12         | 16.94                  | 1.32            | 16.11        | 0.041       | 34.77           | -18.66      | 18.26        | 0.067        | 36.99            | -18.73      |
| 779.50          | 5 (WCP)                 | QPSK   | H               | 150                 | 96                         | 1 / 0          | 17.78                  | 1.32            | 16.95        | 0.050       | 34.77           | -17.82      | 19.10        | 0.081        | 36.99            | -17.89      |

**Table 7-5. ERP Data (Band 13)**

| 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] |
|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|-------------|-----------------|-------------|--------------|--------------|------------------|-------------|
| 1.4                     | QPSK   | H               | 150                 | 94                         | 1 / 0          | 18.45                  | 1.50            | 17.80        | 0.060       | 38.45           | -20.65      | 19.95        | 0.099        | 40.61            | -20.66      |
| 1.4                     | QPSK   | H               | 150                 | 342                        | 1 / 5          | 18.33                  | 1.50            | 17.68        | 0.059       | 38.45           | -20.77      | 19.83        | 0.096        | 40.61            | -20.78      |
| 1.4                     | QPSK   | H               | 150                 | 353                        | 3 / 2          | 18.63                  | 1.50            | <b>17.98</b> | 0.063       | 38.45           | -20.47      | <b>20.13</b> | 0.103        | 40.61            | -20.48      |
| 1.4                     | 16-QAM | H               | 150                 | 353                        | 1 / 0          | 17.11                  | 1.50            | <b>16.46</b> | 0.044       | 38.45           | -21.99      | <b>18.61</b> | 0.073        | 40.61            | -22.00      |
| 1.4                     | 64-QAM | H               | 150                 | 353                        | 1 / 0          | 16.02                  | 1.50            | <b>15.37</b> | 0.034       | 38.45           | -23.08      | <b>17.52</b> | 0.056        | 40.61            | -23.09      |
| 3                       | QPSK   | H               | 150                 | 105                        | 1 / 7          | 18.41                  | 1.50            | 17.76        | 0.060       | 38.45           | -20.69      | 19.91        | 0.098        | 40.61            | -20.70      |
| 3                       | QPSK   | H               | 150                 | 348                        | 1 / 7          | 18.51                  | 1.50            | 17.86        | 0.061       | 38.45           | -20.59      | 20.01        | 0.100        | 40.61            | -20.60      |
| 3                       | QPSK   | H               | 150                 | 352                        | 1 / 0          | 18.82                  | 1.50            | <b>18.17</b> | 0.066       | 38.45           | -20.28      | <b>20.32</b> | 0.108        | 40.61            | -20.29      |
| 3                       | 16-QAM | H               | 150                 | 352                        | 1 / 0          | 17.28                  | 1.50            | <b>16.63</b> | 0.046       | 38.45           | -21.82      | <b>18.78</b> | 0.076        | 40.61            | -21.83      |
| 3                       | 64-QAM | H               | 150                 | 352                        | 1 / 0          | 16.13                  | 1.50            | <b>15.48</b> | 0.035       | 38.45           | -22.97      | <b>17.63</b> | 0.058        | 40.61            | -22.98      |
| 5                       | QPSK   | H               | 150                 | 98                         | 1 / 0          | 18.19                  | 1.50            | 17.54        | 0.057       | 38.45           | -20.91      | 19.69        | 0.093        | 40.61            | -20.92      |
| 5                       | QPSK   | H               | 150                 | 342                        | 1 / 24         | 18.57                  | 1.50            | 17.92        | 0.062       | 38.45           | -20.53      | 20.07        | 0.102        | 40.61            | -20.54      |
| 5                       | QPSK   | H               | 150                 | 346                        | 1 / 24         | 18.89                  | 1.50            | <b>18.24</b> | 0.067       | 38.45           | -20.21      | <b>20.39</b> | <b>0.109</b> | 40.61            | -20.22      |
| 5                       | 16-QAM | H               | 150                 | 346                        | 1 / 24         | 17.26                  | 1.50            | <b>16.61</b> | 0.046       | 38.45           | -21.84      | <b>18.76</b> | 0.075        | 40.61            | -21.85      |
| 5                       | 64-QAM | H               | 150                 | 346                        | 1 / 24         | 16.00                  | 1.50            | <b>15.35</b> | 0.034       | 38.45           | -23.10      | <b>17.50</b> | 0.056        | 40.61            | -23.11      |
| 10                      | QPSK   | H               | 150                 | 90                         | 1 / 0          | 18.62                  | 1.50            | 17.97        | 0.063       | 38.45           | -20.48      | 20.12        | 0.103        | 40.61            | -20.49      |
| 10                      | QPSK   | H               | 150                 | 349                        | 1 / 49         | 18.54                  | 1.50            | 17.89        | 0.062       | 38.45           | -20.56      | 20.04        | 0.101        | 40.61            | -20.57      |
| 10                      | QPSK   | H               | 150                 | 335                        | 1 / 25         | 18.69                  | 1.50            | <b>18.04</b> | 0.064       | 38.45           | -20.41      | <b>20.19</b> | 0.104        | 40.61            | -20.42      |
| 10                      | 16-QAM | H               | 150                 | 335                        | 1 / 25         | 17.19                  | 1.50            | <b>16.54</b> | 0.045       | 38.45           | -21.91      | <b>18.69</b> | 0.074        | 40.61            | -21.92      |
| 10                      | 64-QAM | H               | 150                 | 335                        | 1 / 25         | 16.36                  | 1.50            | <b>15.71</b> | 0.037       | 38.45           | -22.74      | <b>17.86</b> | 0.061        | 40.61            | -22.75      |
| 5                       | QPSK   | V               | 150                 | 72                         | 1 / 24         | 17.41                  | 1.50            | 16.76        | 0.047       | 38.45           | -21.69      | 18.91        | 0.078        | 40.61            | -21.70      |
| 5 (WCP)                 | QPSK   | H               | 150                 | 335                        | 1 / 24         | 17.90                  | 1.50            | 17.25        | 0.053       | 38.45           | -21.20      | 19.40        | 0.087        | 40.61            | -21.21      |

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

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 20 of 70                   |

| 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] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|-------------|-----------------|-------------|--------------|--------------|------------------|
| 831.50          | 15                      | QPSK   | H               | 150                 | 87                         | 1 / 0          | 18.79                  | 1.50            | <b>18.14</b> | 0.065       | 38.45           | -20.31      | <b>20.29</b> | 0.107        | 40.61            |
| 836.50          | 15                      | QPSK   | H               | 150                 | 345                        | 1 / 74         | 18.67                  | 1.50            | 18.02        | 0.063       | 38.45           | -20.43      | 20.17        | 0.104        | 40.61            |
| 841.50          | 15                      | QPSK   | H               | 150                 | 349                        | 1 / 36         | 18.68                  | 1.50            | 18.03        | 0.064       | 38.45           | -20.42      | 20.18        | 0.104        | 40.61            |
| 831.50          | 15                      | 16-QAM | H               | 150                 | 87                         | 1 / 0          | 17.28                  | 1.50            | <b>16.63</b> | 0.046       | 38.45           | -21.82      | <b>18.78</b> | 0.076        | 40.61            |
| 831.50          | 15                      | 64-QAM | H               | 150                 | 87                         | 1 / 0          | 16.12                  | 1.50            | <b>15.47</b> | 0.035       | 38.45           | -22.98      | <b>17.62</b> | 0.058        | 40.61            |

**Table 7-7. ERP Data (Band 26)**

|                                            |                                                                                                                                                      |                               |                                                                                       |                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br><b>(CLASS II PERMISSIVE CHANGE)</b> |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                                  | EUT Type:<br>Portable Handset |                                                                                       | Page 21 of 70                   |

| 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                 | 252                        | 3 / 2          | 18.13                  | 5.56            | 23.69        | 0.234        | 30.00            | -6.31       |
| 1745.00         | 1.4                     | QPSK   | V               | 150                 | 252                        | 1 / 0          | 18.58                  | 5.32            | <b>23.90</b> | 0.246        | 30.00            | -6.10       |
| 1779.30         | 1.4                     | QPSK   | V               | 150                 | 252                        | 3 / 2          | 18.06                  | 5.09            | 23.15        | 0.207        | 30.00            | -6.85       |
| 1745.00         | 1.4                     | 16-QAM | V               | 150                 | 252                        | 1 / 0          | 17.83                  | 5.32            | <b>23.15</b> | 0.207        | 30.00            | -6.85       |
| 1745.00         | 1.4                     | 64-QAM | V               | 150                 | 252                        | 1 / 0          | 16.68                  | 5.32            | <b>22.00</b> | 0.159        | 30.00            | -8.00       |
| 1711.50         | 3                       | QPSK   | V               | 150                 | 252                        | 1 / 0          | 18.08                  | 5.55            | 23.63        | 0.231        | 30.00            | -6.37       |
| 1745.00         | 3                       | QPSK   | V               | 150                 | 259                        | 1 / 0          | 18.84                  | 5.32            | <b>24.16</b> | 0.261        | 30.00            | -5.84       |
| 1778.50         | 3                       | QPSK   | V               | 150                 | 252                        | 1 / 0          | 18.10                  | 5.10            | 23.20        | 0.209        | 30.00            | -6.80       |
| 1745.00         | 3                       | 16-QAM | V               | 150                 | 259                        | 1 / 0          | 18.01                  | 5.32            | <b>23.33</b> | 0.215        | 30.00            | -6.67       |
| 1745.00         | 3                       | 64-QAM | V               | 150                 | 259                        | 1 / 0          | 16.86                  | 5.32            | <b>22.18</b> | 0.165        | 30.00            | -7.82       |
| 1712.50         | 5                       | QPSK   | V               | 150                 | 252                        | 1 / 24         | 18.68                  | 5.55            | 24.23        | 0.265        | 30.00            | -5.77       |
| 1745.00         | 5                       | QPSK   | V               | 150                 | 256                        | 1 / 0          | 19.12                  | 5.32            | <b>24.44</b> | <b>0.278</b> | 30.00            | -5.56       |
| 1777.50         | 5                       | QPSK   | V               | 150                 | 259                        | 1 / 0          | 18.76                  | 5.10            | 23.86        | 0.243        | 30.00            | -6.14       |
| 1745.00         | 5                       | 16-QAM | V               | 150                 | 256                        | 1 / 0          | 18.30                  | 5.32            | <b>23.62</b> | 0.230        | 30.00            | -6.38       |
| 1745.00         | 5                       | 64-QAM | V               | 150                 | 256                        | 1 / 0          | 17.28                  | 5.32            | <b>22.60</b> | 0.182        | 30.00            | -7.40       |
| 1715.00         | 10                      | QPSK   | V               | 150                 | 255                        | 1 / 49         | 18.24                  | 5.53            | 23.77        | 0.238        | 30.00            | -6.23       |
| 1745.00         | 10                      | QPSK   | V               | 150                 | 255                        | 1 / 0          | 18.66                  | 5.32            | <b>23.98</b> | 0.250        | 30.00            | -6.02       |
| 1775.00         | 10                      | QPSK   | V               | 150                 | 255                        | 1 / 49         | 18.30                  | 5.12            | 23.42        | 0.220        | 30.00            | -6.58       |
| 1745.00         | 10                      | 16-QAM | V               | 150                 | 255                        | 1 / 0          | 17.84                  | 5.32            | <b>23.16</b> | 0.207        | 30.00            | -6.84       |
| 1745.00         | 10                      | 64-QAM | V               | 150                 | 255                        | 1 / 0          | 16.85                  | 5.32            | <b>22.17</b> | 0.165        | 30.00            | -7.83       |
| 1717.50         | 15                      | QPSK   | V               | 150                 | 255                        | 1 / 0          | 18.20                  | 5.51            | 23.71        | 0.235        | 30.00            | -6.29       |
| 1745.00         | 15                      | QPSK   | V               | 150                 | 255                        | 1 / 74         | 18.83                  | 5.32            | <b>24.15</b> | 0.260        | 30.00            | -5.85       |
| 1772.50         | 15                      | QPSK   | V               | 150                 | 255                        | 1 / 0          | 18.90                  | 5.14            | 24.04        | 0.253        | 30.00            | -5.96       |
| 1745.00         | 15                      | 16-QAM | V               | 150                 | 255                        | 1 / 74         | 18.10                  | 5.32            | <b>23.42</b> | 0.220        | 30.00            | -6.58       |
| 1745.00         | 15                      | 64-QAM | V               | 150                 | 255                        | 1 / 74         | 16.99                  | 5.32            | <b>22.31</b> | 0.170        | 30.00            | -7.69       |
| 1720.00         | 20                      | QPSK   | V               | 150                 | 258                        | 1 / 0          | 17.89                  | 5.49            | 23.38        | 0.218        | 30.00            | -6.62       |
| 1745.00         | 20                      | QPSK   | V               | 150                 | 258                        | 1 / 99         | 18.70                  | 5.32            | <b>24.02</b> | 0.252        | 30.00            | -5.98       |
| 1770.00         | 20                      | QPSK   | V               | 150                 | 258                        | 1 / 0          | 18.59                  | 5.15            | 23.74        | 0.237        | 30.00            | -6.26       |
| 1745.00         | 20                      | 16-QAM | V               | 150                 | 258                        | 1 / 99         | 17.93                  | 5.32            | <b>23.25</b> | 0.211        | 30.00            | -6.75       |
| 1745.00         | 20                      | 64-QAM | V               | 150                 | 258                        | 1 / 99         | 16.91                  | 5.32            | <b>22.23</b> | 0.167        | 30.00            | -7.77       |
| 1745.00         | 5                       | QPSK   | H               | 150                 | 117                        | 1 / 0          | 16.41                  | 5.32            | 21.73        | 0.149        | 30.00            | -8.27       |
| 1745.00         | 5 (WCP)                 | QPSK   | V               | 150                 | 120                        | 1 / 0          | 15.98                  | 5.32            | 21.30        | 0.135        | 30.00            | -8.70       |

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

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 22 of 70                   |

| 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                 | 10                         | 3 / 2          | 16.92                  | 4.82            | <b>21.74</b> | 0.149        | 33.01            | -11.27      |
| 1882.50         | 1.4                     | QPSK   | H               | 150                 | 10                         | 3 / 2          | 16.38                  | 4.73            | 21.11        | 0.129        | 33.01            | -11.90      |
| 1914.30         | 1.4                     | QPSK   | H               | 150                 | 10                         | 1 / 0          | 15.55                  | 4.68            | 20.23        | 0.105        | 33.01            | -12.78      |
| 1850.70         | 1.4                     | 16-QAM | H               | 150                 | 10                         | 3 / 2          | 17.05                  | 4.82            | <b>21.87</b> | 0.154        | 33.01            | -11.14      |
| 1850.70         | 1.4                     | 64-QAM | H               | 150                 | 10                         | 3 / 2          | 16.01                  | 4.82            | <b>20.83</b> | 0.121        | 33.01            | -12.18      |
| 1851.50         | 3                       | QPSK   | H               | 150                 | 11                         | 15 / 0         | 17.04                  | 4.82            | <b>21.86</b> | 0.153        | 33.01            | -11.15      |
| 1882.50         | 3                       | QPSK   | H               | 150                 | 11                         | 1 / 0          | 16.48                  | 4.73            | 21.21        | 0.132        | 33.01            | -11.80      |
| 1913.50         | 3                       | QPSK   | H               | 150                 | 11                         | 1 / 0          | 15.84                  | 4.68            | 20.52        | 0.113        | 33.01            | -12.49      |
| 1851.50         | 3                       | 16-QAM | H               | 150                 | 11                         | 1 / 0          | 17.32                  | 4.82            | <b>22.14</b> | 0.164        | 33.01            | -10.87      |
| 1851.50         | 3                       | 64-QAM | H               | 150                 | 11                         | 1 / 0          | 16.16                  | 4.82            | <b>20.98</b> | 0.125        | 33.01            | -12.03      |
| 1852.50         | 5                       | QPSK   | H               | 150                 | 11                         | 1 / 0          | 17.15                  | 4.81            | <b>21.96</b> | 0.157        | 33.01            | -11.05      |
| 1882.50         | 5                       | QPSK   | H               | 150                 | 11                         | 1 / 0          | 16.55                  | 4.73            | 21.28        | 0.134        | 33.01            | -11.73      |
| 1912.50         | 5                       | QPSK   | H               | 150                 | 11                         | 1 / 0          | 17.03                  | 4.68            | 21.71        | 0.148        | 33.01            | -11.30      |
| 1852.50         | 5                       | 16-QAM | H               | 150                 | 11                         | 1 / 0          | 16.68                  | 4.81            | <b>21.49</b> | 0.141        | 33.01            | -11.52      |
| 1852.50         | 5                       | 64-QAM | H               | 150                 | 11                         | 1 / 0          | 15.65                  | 4.81            | <b>20.46</b> | 0.111        | 33.01            | -12.55      |
| 1855.00         | 10                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 16.94                  | 4.81            | 21.75        | 0.149        | 33.01            | -11.26      |
| 1882.50         | 10                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 17.81                  | 4.73            | <b>22.54</b> | 0.180        | 33.01            | -10.47      |
| 1910.00         | 10                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 16.89                  | 4.68            | 21.57        | 0.144        | 33.01            | -11.44      |
| 1882.50         | 10                      | 16-QAM | H               | 150                 | 286                        | 1 / 0          | 17.04                  | 4.73            | <b>21.77</b> | 0.150        | 33.01            | -11.24      |
| 1882.50         | 10                      | 64-QAM | H               | 150                 | 286                        | 1 / 0          | 15.86                  | 4.73            | <b>20.59</b> | 0.115        | 33.01            | -12.42      |
| 1857.50         | 15                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 17.07                  | 4.80            | 21.87        | 0.154        | 33.01            | -11.14      |
| 1882.50         | 15                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 18.12                  | 4.73            | <b>22.85</b> | <b>0.193</b> | 33.01            | -10.16      |
| 1907.50         | 15                      | QPSK   | H               | 150                 | 286                        | 1 / 0          | 17.42                  | 4.68            | 22.10        | 0.162        | 33.01            | -10.91      |
| 1857.50         | 15                      | 16-QAM | H               | 150                 | 286                        | 1 / 0          | 17.28                  | 4.80            | <b>22.08</b> | 0.161        | 33.01            | -10.93      |
| 1857.50         | 15                      | 64-QAM | H               | 150                 | 286                        | 1 / 0          | 16.32                  | 4.80            | <b>21.12</b> | 0.129        | 33.01            | -11.89      |
| 1860.00         | 20                      | QPSK   | H               | 150                 | 14                         | 1 / 0          | 17.19                  | 4.79            | <b>21.98</b> | 0.158        | 33.01            | -11.03      |
| 1882.50         | 20                      | QPSK   | H               | 150                 | 14                         | 1 / 0          | 16.84                  | 4.73            | 21.57        | 0.144        | 33.01            | -11.44      |
| 1905.00         | 20                      | QPSK   | H               | 150                 | 14                         | 1 / 0          | 16.70                  | 4.68            | 21.38        | 0.138        | 33.01            | -11.63      |
| 1860.00         | 20                      | 16-QAM | H               | 150                 | 14                         | 1 / 0          | 17.35                  | 4.79            | <b>22.14</b> | 0.164        | 33.01            | -10.87      |
| 1882.50         | 20                      | 16-QAM | H               | 150                 | 14                         | 1 / 0          | 17.05                  | 4.73            | 21.78        | 0.151        | 33.01            | -11.23      |
| 1860.00         | 20                      | 64-QAM | H               | 150                 | 14                         | 1 / 0          | 16.44                  | 4.79            | <b>21.23</b> | 0.133        | 33.01            | -11.78      |
| 1882.50         | 20                      | 64-QAM | H               | 150                 | 14                         | 1 / 0          | 16.03                  | 4.73            | 20.76        | 0.119        | 33.01            | -12.25      |
| 1882.50         | 15                      | QPSK   | V               | 150                 | 313                        | 1 / 0          | 16.34                  | 4.79            | 21.13        | 0.130        | 33.01            | -11.88      |
| 1882.50         | 15 (WCP)                | QPSK   | H               | 150                 | 353                        | 1 / 0          | 14.98                  | 4.79            | 19.77        | 0.095        | 33.01            | -13.24      |

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

|                                            |                                                                                                                                                      |                               |                                                                                       |                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br><b>(CLASS II PERMISSIVE CHANGE)</b> |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                                  | EUT Type:<br>Portable Handset |                                                                                       | Page 23 of 70                   |

| 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                 | 5                          | 1 / 0          | 16.58                  | 5.74            | 22.32        | 0.171        | 23.98            | -1.66       |
| 2312.50         | 5                       | QPSK   | V               | 150                 | 5                          | 1 / 0          | 16.60                  | 5.74            | <b>22.34</b> | 0.171        | 23.98            | -1.64       |
| 2312.50         | 5                       | 16-QAM | V               | 150                 | 5                          | 1 / 0          | 15.84                  | 5.74            | <b>21.58</b> | 0.144        | 23.98            | -2.40       |
| 2312.50         | 5                       | 64-QAM | V               | 150                 | 5                          | 1 / 0          | 14.88                  | 5.74            | <b>20.62</b> | 0.115        | 23.98            | -3.36       |
| 2310.00         | 10                      | QPSK   | V               | 150                 | 358                        | 1 / 0          | 16.71                  | 5.74            | <b>22.45</b> | <b>0.176</b> | 23.98            | -1.53       |
| 2310.00         | 10                      | 16-QAM | V               | 150                 | 358                        | 1 / 0          | 15.89                  | 5.74            | <b>21.63</b> | 0.145        | 23.98            | -2.35       |
| 2310.00         | 10                      | 64-QAM | V               | 150                 | 358                        | 1 / 0          | 14.88                  | 5.74            | <b>20.62</b> | 0.115        | 23.98            | -3.36       |
| 2310.00         | 10                      | QPSK   | H               | 150                 | 1                          | 1 / 0          | 15.05                  | 5.74            | 20.79        | 0.120        | 23.98            | -3.19       |
| 2310.00         | 10 (WCP)                | QPSK   | V               | 150                 | 44                         | 1 / 0          | 13.30                  | 5.74            | 19.04        | 0.080        | 23.98            | -4.94       |

**Table 7-10. EIRP Data (Band 30)**

|                                                   |                                                                                                                                                      |                                      |                                                                                       |                                        |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| FCC ID: ZNFV405UA                                 |  <b>MEASUREMENT REPORT</b><br><b>(CLASS II PERMISSIVE CHANGE)</b> |                                      |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2.ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                                                                                           | <b>EUT Type:</b><br>Portable Handset |                                                                                       | Page 24 of 70                          |

| 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                 | 5                          | 1 / 0          | 16.23                  | 5.74            | 21.97        | 0.157        | 33.01            | -11.04      |
| 2535.00         | 5                       | QPSK   | V               | 150                 | 5                          | 1 / 0          | 16.83                  | 5.86            | <b>22.69</b> | 0.186        | 33.01            | -10.32      |
| 2567.50         | 5                       | QPSK   | V               | 150                 | 5                          | 1 / 0          | 16.27                  | 5.98            | 22.25        | 0.168        | 33.01            | -10.76      |
| 2535.00         | 5                       | 16-QAM | V               | 150                 | 5                          | 1 / 0          | 16.08                  | 5.86            | <b>21.94</b> | 0.156        | 33.01            | -11.07      |
| 2535.00         | 5                       | 64-QAM | V               | 150                 | 5                          | 1 / 0          | 15.17                  | 5.86            | <b>21.03</b> | 0.127        | 33.01            | -11.98      |
| 2505.00         | 10                      | QPSK   | V               | 150                 | 252                        | 1 / 0          | 16.33                  | 5.75            | 22.08        | 0.161        | 33.01            | -10.93      |
| 2535.00         | 10                      | QPSK   | V               | 150                 | 252                        | 1 / 0          | 16.89                  | 5.86            | <b>22.75</b> | 0.188        | 33.01            | -10.26      |
| 2565.00         | 10                      | QPSK   | V               | 150                 | 252                        | 1 / 0          | 16.27                  | 5.97            | 22.24        | 0.168        | 33.01            | -10.77      |
| 2535.00         | 10                      | 16-QAM | V               | 150                 | 252                        | 1 / 0          | 16.18                  | 5.86            | <b>22.04</b> | 0.160        | 33.01            | -10.97      |
| 2535.00         | 10                      | 64-QAM | V               | 150                 | 252                        | 1 / 0          | 15.04                  | 5.86            | <b>20.90</b> | 0.123        | 33.01            | -12.11      |
| 2507.50         | 15                      | QPSK   | V               | 150                 | 249                        | 1 / 0          | 16.60                  | 5.76            | 22.36        | 0.172        | 33.01            | -10.65      |
| 2535.00         | 15                      | QPSK   | V               | 150                 | 249                        | 1 / 0          | 16.97                  | 5.86            | <b>22.83</b> | <b>0.192</b> | 33.01            | -10.18      |
| 2562.50         | 15                      | QPSK   | V               | 150                 | 249                        | 1 / 74         | 16.47                  | 5.96            | 22.43        | 0.175        | 33.01            | -10.58      |
| 2535.00         | 15                      | 16-QAM | V               | 150                 | 249                        | 1 / 74         | 15.76                  | 5.86            | <b>21.62</b> | 0.145        | 33.01            | -11.39      |
| 2535.00         | 15                      | 64-QAM | V               | 150                 | 249                        | 1 / 74         | 14.65                  | 5.86            | <b>20.51</b> | 0.112        | 33.01            | -12.50      |
| 2510.00         | 20                      | QPSK   | V               | 150                 | 248                        | 1 / 0          | 16.31                  | 5.77            | 22.08        | 0.161        | 33.01            | -10.93      |
| 2535.00         | 20                      | QPSK   | V               | 150                 | 248                        | 1 / 0          | 16.68                  | 5.86            | 22.54        | 0.179        | 33.01            | -10.47      |
| 2560.00         | 20                      | QPSK   | V               | 150                 | 248                        | 1 / 0          | 16.63                  | 5.95            | <b>22.58</b> | 0.181        | 33.01            | -10.43      |
| 2535.00         | 20                      | 16-QAM | V               | 150                 | 248                        | 1 / 0          | 15.49                  | 5.86            | <b>21.35</b> | 0.136        | 33.01            | -11.66      |
| 2535.00         | 20                      | 64-QAM | V               | 150                 | 248                        | 1 / 0          | 14.38                  | 5.86            | <b>20.24</b> | 0.106        | 33.01            | -12.77      |
| 2535.00         | 15                      | QPSK   | H               | 150                 | 314                        | 1 / 0          | 16.92                  | 5.86            | 22.78        | 0.190        | 33.01            | -10.23      |
| 2535.00         | 15 (WCP)                | QPSK   | V               | 150                 | 305                        | 1 / 0          | 14.70                  | 5.86            | 20.56        | 0.114        | 33.01            | -12.45      |

**Table 7-11. EIRP Data (Band 7)**

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 25 of 70                   |

| 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   | H               | 150                 | 8                          | 1 / 0          | 19.61                  | 5.73            | 25.34        | 0.342        | 33.01            | -7.67       |
| 2593.00         | 5                       | QPSK   | H               | 150                 | 8                          | 1 / 0          | 19.99                  | 6.07            | <b>26.06</b> | 0.404        | 33.01            | -6.95       |
| 2687.50         | 5                       | QPSK   | H               | 150                 | 8                          | 1 / 0          | 18.22                  | 6.48            | 24.70        | 0.295        | 33.01            | -8.31       |
| 2593.00         | 5                       | 16-QAM | H               | 150                 | 8                          | 1 / 0          | 19.07                  | 6.07            | <b>25.14</b> | 0.327        | 33.01            | -7.87       |
| 2593.00         | 5                       | 64-QAM | H               | 150                 | 8                          | 1 / 0          | 18.02                  | 6.07            | <b>24.09</b> | 0.257        | 33.01            | -8.92       |
| 2501.00         | 10                      | QPSK   | H               | 150                 | 24                         | 1 / 49         | 19.61                  | 5.73            | 25.34        | 0.342        | 33.01            | -7.67       |
| 2593.00         | 10                      | QPSK   | H               | 150                 | 24                         | 1 / 0          | 20.51                  | 6.07            | <b>26.58</b> | 0.455        | 33.01            | -6.43       |
| 2685.00         | 10                      | QPSK   | H               | 150                 | 24                         | 1 / 0          | 19.47                  | 6.47            | 25.94        | 0.393        | 33.01            | -7.07       |
| 2593.00         | 10                      | 16-QAM | H               | 150                 | 24                         | 1 / 0          | 19.48                  | 6.07            | <b>25.55</b> | 0.359        | 33.01            | -7.46       |
| 2593.00         | 10                      | 64-QAM | H               | 150                 | 24                         | 1 / 0          | 18.70                  | 6.07            | <b>24.77</b> | 0.300        | 33.01            | -8.24       |
| 2503.50         | 15                      | QPSK   | H               | 150                 | 37                         | 1 / 0          | 19.72                  | 5.74            | 25.46        | 0.352        | 33.01            | -7.55       |
| 2593.00         | 15                      | QPSK   | H               | 150                 | 37                         | 1 / 0          | 20.63                  | 6.07            | <b>26.70</b> | <b>0.468</b> | 33.01            | -6.31       |
| 2682.50         | 15                      | QPSK   | H               | 150                 | 37                         | 1 / 74         | 19.48                  | 6.46            | 25.94        | 0.393        | 33.01            | -7.07       |
| 2593.00         | 15                      | 16-QAM | H               | 150                 | 37                         | 1 / 0          | 19.67                  | 6.07            | <b>25.74</b> | 0.375        | 33.01            | -7.27       |
| 2593.00         | 15                      | 64-QAM | H               | 150                 | 37                         | 1 / 0          | 17.98                  | 6.07            | <b>24.05</b> | 0.254        | 33.01            | -8.96       |
| 2506.00         | 20                      | QPSK   | H               | 150                 | 40                         | 1 / 99         | 19.61                  | 5.75            | 25.36        | 0.344        | 33.01            | -7.65       |
| 2593.00         | 20                      | QPSK   | H               | 150                 | 40                         | 1 / 0          | 20.27                  | 6.07            | <b>26.34</b> | 0.431        | 33.01            | -6.67       |
| 2680.00         | 20                      | QPSK   | H               | 150                 | 40                         | 1 / 0          | 19.21                  | 6.45            | 25.66        | 0.368        | 33.01            | -7.35       |
| 2593.00         | 20                      | 16-QAM | H               | 150                 | 40                         | 1 / 0          | 19.56                  | 6.07            | <b>25.63</b> | 0.366        | 33.01            | -7.38       |
| 2593.00         | 20                      | 64-QAM | H               | 150                 | 40                         | 1 / 0          | 18.49                  | 6.07            | <b>24.56</b> | 0.286        | 33.01            | -8.45       |
| 2593.00         | 15                      | QPSK   | V               | 150                 | 100                        | 1 / 0          | 20.28                  | 6.07            | 26.35        | 0.432        | 33.01            | -6.66       |
| 2593.00         | 15 (WCP)                | QPSK   | H               | 150                 | 114                        | 1 / 0          | 18.98                  | 6.07            | 25.05        | 0.320        | 33.01            | -7.96       |

**Table 7-12. EIRP Data (Band 41 PC2)**

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 26 of 70                   |

| 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] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|------------------|-------------|
| 2593.00         | 20                      | QPSK   | H               | 150                 | 8                          | 1 / 0          | 17.80                  | 6.07            | <b>23.87</b> | <b>0.244</b> | 33.01            | -9.14       |
| 2593.00         | 20                      | 16-QAM | H               | 150                 | 8                          | 1 / 0          | 16.77                  | 6.07            | <b>22.84</b> | 0.192        | 33.01            | -10.17      |
| 2593.00         | 20                      | 64-QAM | H               | 150                 | 8                          | 1 / 0          | 15.78                  | 6.07            | <b>21.85</b> | 0.153        | 33.01            | -11.16      |
| 2593.00         | 20                      | QPSK   | V               | 150                 | 270                        | 1 / 0          | 17.38                  | 6.07            | 23.45        | 0.221        | 33.01            | -9.56       |
| 2593.00         | 20 (WCP)                | QPSK   | H               | 150                 | 114                        | 1 / 0          | 16.78                  | 6.07            | 22.85        | 0.193        | 33.01            | -10.16      |

**Table 7-13. EIRP Data (Band 41 PC3)**

|                                            |                                                                                                                                                      |                               |                                                                                       |                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br><b>(CLASS II PERMISSIVE CHANGE)</b> |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                                  | EUT Type:<br>Portable Handset |                                                                                       | Page 27 of 70                   |

## 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

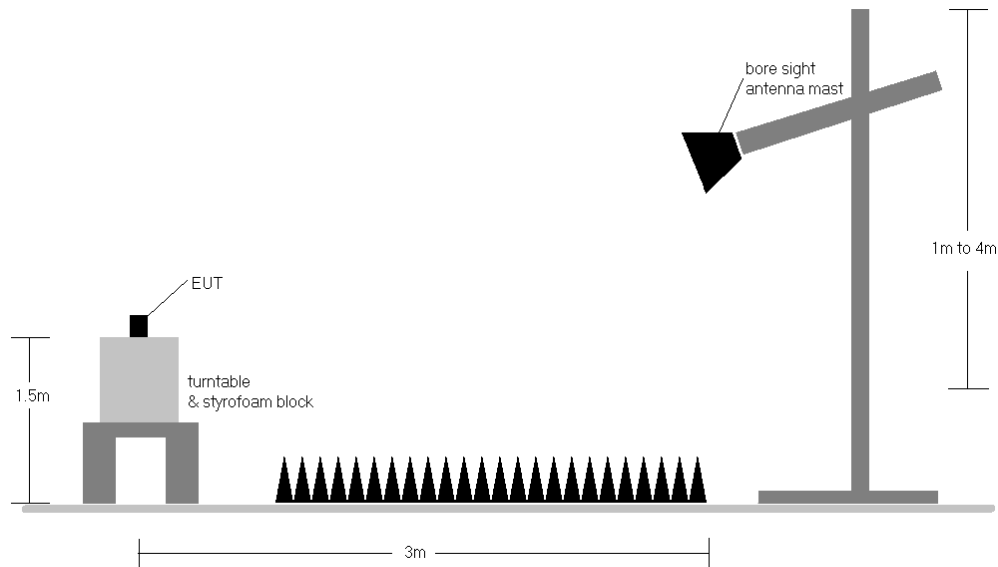
### Test Settings

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: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 28 of 70                   |

## Test Setup

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



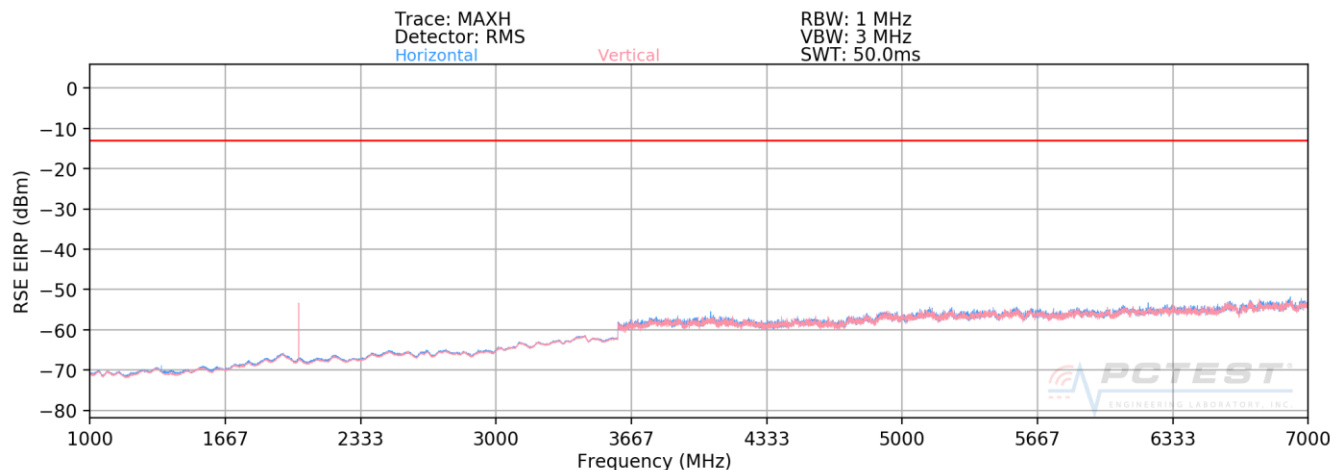
**Figure 7-3. Test Instrument & Measurement Setup**

## 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: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 29 of 70                   |

## Band 71



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

OPERATING FREQUENCY: 668.00 MHz  
CHANNEL: 133172  
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         | V               | 150                 | 129                        | -71.51                           | 3.88                          | -67.63                        | -54.6       |
| 2004.00         | V               | 150                 | 279                        | -60.67                           | 4.74                          | -55.93                        | -42.9       |
| 2672.00         | V               | -                   | -                          | -68.19                           | 5.36                          | -62.83                        | -49.8       |
| 3340.00         | V               | -                   | -                          | -67.71                           | 6.25                          | -61.46                        | -48.5       |

**Table 7-14. Radiated Spurious Data (Band 71 – Low Channel)**

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 30 of 70                   |

OPERATING FREQUENCY: 680.50 MHz  
 CHANNEL: 133297  
 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         | V               | 150                 | 281                        | -67.47                           | 3.90                          | -63.57                        | -50.6       |
| 2041.50         | V               | 150                 | 288                        | -54.63                           | 4.78                          | -49.85                        | -36.9       |
| 2722.00         | V               | -                   | -                          | -68.21                           | 5.49                          | -62.72                        | -49.7       |
| 3402.50         | V               | 150                 | 277                        | -68.05                           | 6.41                          | -61.64                        | -48.6       |
| 4083.00         | V               | -                   | -                          | -67.58                           | 7.47                          | -60.11                        | -47.1       |

Table 7-15. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY: 693.00 MHz  
 CHANNEL: 133422  
 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         | V               | 150                 | 92                         | -69.20                           | 3.82                          | -65.38                        | -52.4       |
| 2079.00         | V               | 150                 | 303                        | -57.99                           | 4.80                          | -53.19                        | -40.2       |
| 2772.00         | V               | -                   | -                          | -68.70                           | 5.66                          | -63.04                        | -50.0       |
| 3465.00         | V               | 150                 | 291                        | -64.27                           | 6.56                          | -57.71                        | -44.7       |
| 4158.00         | V               | -                   | -                          | -68.89                           | 7.64                          | -61.25                        | -48.2       |

Table 7-16. Radiated Spurious Data (Band 71 – High Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 31 of 70                   |

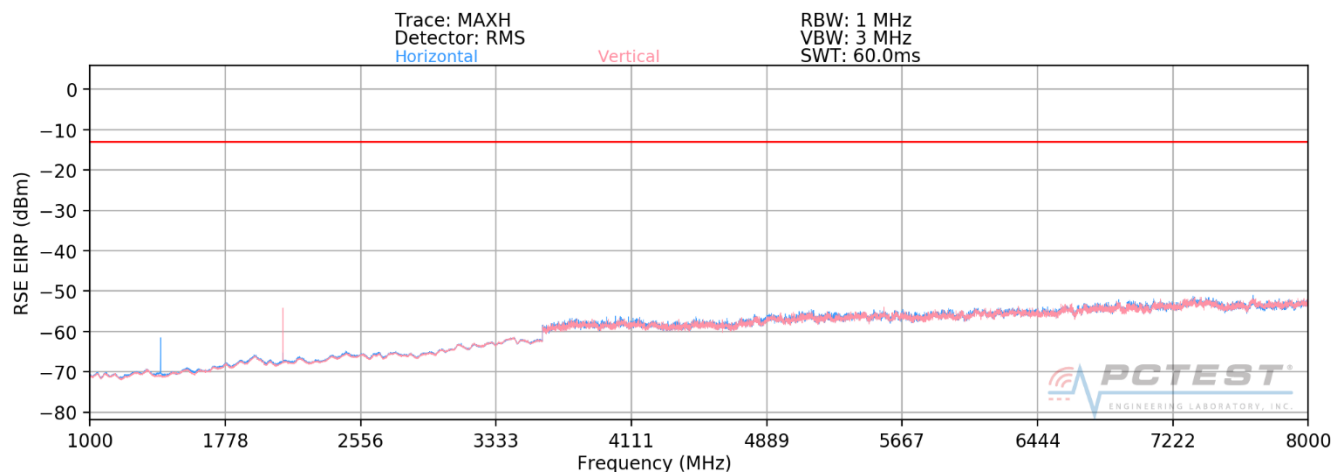
OPERATING FREQUENCY: 680.50 MHz  
 CHANNEL: 133297  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| 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         | V               | 150                 | 277                        | -68.81                           | 3.90                          | -64.91                        | -51.9       |
| 2041.50         | V               | 150                 | 298                        | -57.59                           | 4.78                          | -52.81                        | -39.8       |
| 2722.00         | V               | -                   | -                          | -68.23                           | 5.49                          | -62.74                        | -49.7       |
| 3402.50         | V               | -                   | -                          | -67.95                           | 6.41                          | -61.53                        | -48.5       |

**Table 7-17. Radiated Spurious Data with WCP (Band 71 – Mid Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 32 of 70                   |

## Band 12/17



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

OPERATING FREQUENCY: 700.50 MHz  
CHANNEL: 23025  
MODULATION SIGNAL: QPSK  
BANDWIDTH: 3.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1401.00         | V               | -                   | -                          | -70.11                           | 3.78                          | -66.33                        | -53.3       |
| 2101.50         | V               | 150                 | 41                         | -60.26                           | 4.80                          | -55.46                        | -42.5       |
| 2802.00         | V               | -                   | -                          | -67.91                           | 5.64                          | -62.26                        | -49.3       |

**Table 7-18. Radiated Spurious Data (Band 12/17 – Low Channel)**

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 33 of 70                   |

OPERATING FREQUENCY: 707.50 MHz  
 CHANNEL: 23095  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 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               | -                   | -                          | -70.08                           | 3.90                          | -66.17                        | -53.2       |
| 2122.50         | V               | 150                 | 2                          | -61.47                           | 4.78                          | -56.69                        | -43.7       |
| 2830.00         | V               | -                   | -                          | -68.03                           | 5.73                          | -62.30                        | -49.3       |

**Table 7-19. Radiated Spurious Data (Band 12/17 – Mid Channel)**

OPERATING FREQUENCY: 714.50 MHz  
 CHANNEL: 23165  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1429.00         | V               | -                   | -                          | -69.06                           | 4.03                          | -65.03                        | -52.0       |
| 2143.50         | V               | 150                 | 309                        | -61.46                           | 4.77                          | -56.69                        | -43.7       |
| 2858.00         | V               | -                   | -                          | -68.37                           | 5.79                          | -62.58                        | -49.6       |

**Table 7-20. Radiated Spurious Data (Band 12/17 – High Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 34 of 70                   |

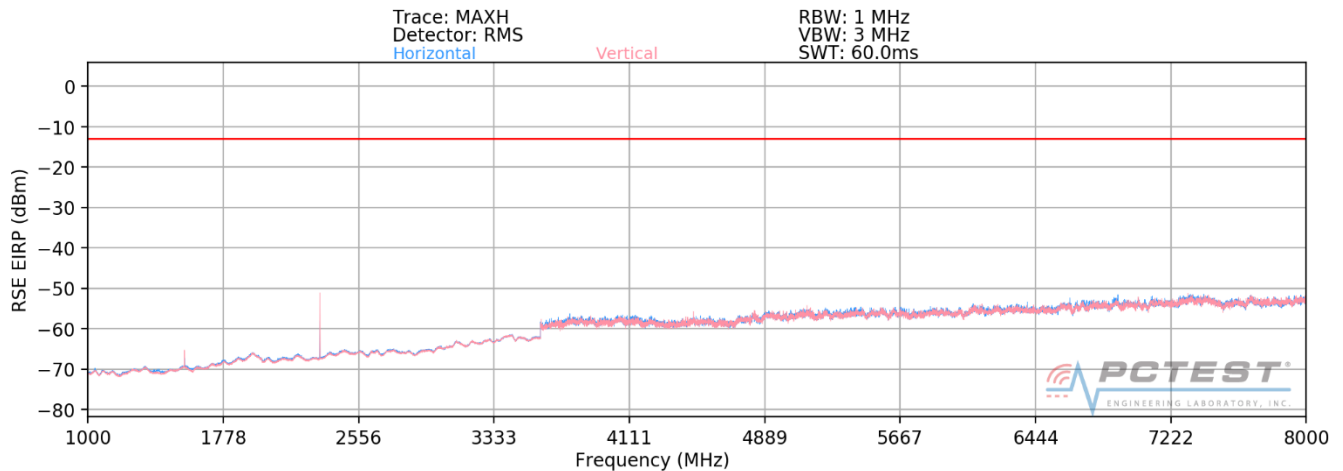
OPERATING FREQUENCY: 700.50 MHz  
 CHANNEL: 23025  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1401.00         | V               | 150                 | 194                        | -69.70                           | 3.78                          | -65.92                        | -52.9       |
| 2101.50         | V               | 150                 | 323                        | -61.37                           | 4.80                          | -56.57                        | -43.6       |
| 2802.00         | V               | -                   | -                          | -68.82                           | 5.64                          | -63.17                        | -50.2       |

Table 7-21. Radiated Spurious Data with WCP (Band 12/17 – Low Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 35 of 70                   |

## Band 13



**Plot 7-3. 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         | V               | 150                 | 8                          | -61.11                           | 4.86                          | -56.25                        | -43.3       |
| 3118.00         | V               | -                   | -                          | -64.97                           | 5.99                          | -58.98                        | -46.0       |
| 3897.50         | V               | -                   | -                          | -65.13                           | 7.26                          | -57.87                        | -44.9       |

**Table 7-22. Radiated Spurious Data (Band 13 – Low Channel)**

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2-ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 36 of 70                   |

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         | V               | 150                 | 8                          | -59.64                           | 4.88                          | -54.76                        | -41.8       |
| 3128.00         | V               | -                   | -                          | -67.72                           | 6.02                          | -61.71                        | -48.7       |
| 3910.00         | V               | -                   | -                          | -67.78                           | 7.25                          | -60.53                        | -47.5       |

**Table 7-23. 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         | V               | 150                 | 359                        | -61.19                           | 4.90                          | -56.29                        | -43.3       |
| 3138.00         | V               | -                   | -                          | -67.92                           | 6.05                          | -61.87                        | -48.9       |
| 3922.50         | V               | -                   | -                          | -68.53                           | 7.22                          | -61.31                        | -48.3       |

**Table 7-24. Radiated Spurious Data (Band 13 – High Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 37 of 70                   |

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         | V               | 150                 | 8                          | -68.33                           | 4.47                          | -63.87                        | -23.9       |
| 1564.00         | V               | 150                 | 358                        | -70.55                           | 4.50                          | -66.06                        | -26.1       |
| 1569.00         | V               | -                   | -                          | -72.60                           | 4.53                          | -68.08                        | -28.1       |

Table 7-25. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 779.50 MHz

CHANNEL: 23205

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 MHz

DISTANCE: 3 meters

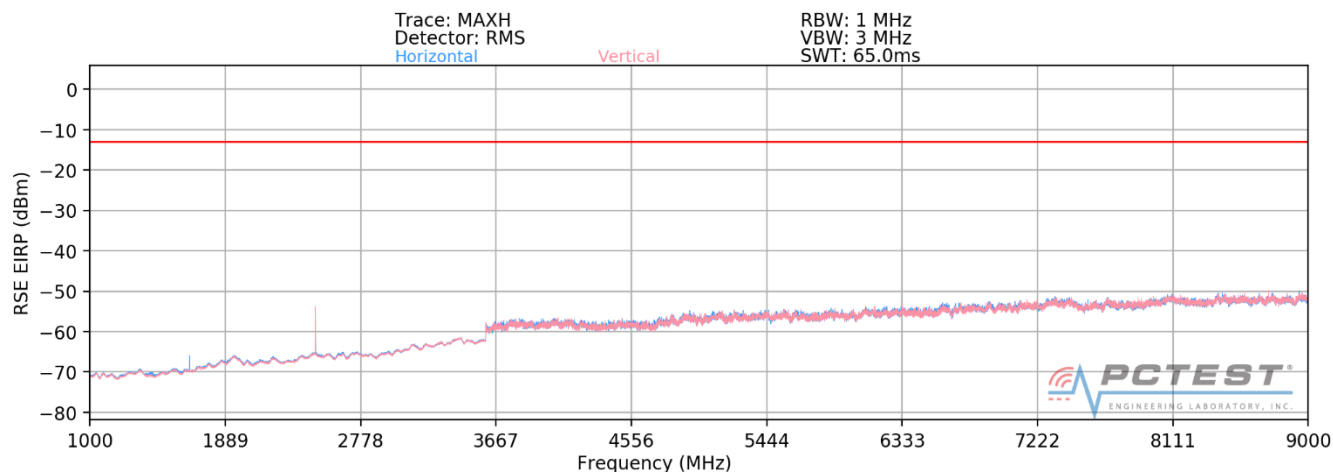
LIMIT: -13 dBm

| 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1559.00         | V               | -                   | -                          | -71.71                           | 4.47                          | -67.24                        | -54.2       |
| 2338.50         | V               | 150                 | 265                        | -67.15                           | 4.86                          | -62.29                        | -49.3       |
| 3118.00         | V               | -                   | -                          | -67.92                           | 5.99                          | -61.93                        | -48.9       |

Table 7-26. Radiated Spurious Data with WCP (Band 13 – Low Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 38 of 70                   |

## Band 26/5



**Plot 7-4. 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         | V               | 150                 | 220                        | -69.02                           | 4.82                          | -64.20                        | -51.2       |
| 2479.50         | V               | 150                 | 35                         | -52.34                           | 5.01                          | -47.33                        | -34.3       |
| 3306.00         | V               | -                   | -                          | -67.00                           | 6.25                          | -60.75                        | -47.8       |

**Table 7-27. Radiated Spurious Data (Band 26/5 – Low Channel)**

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 39 of 70                   |

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         | V               | 150                 | 224                        | -67.92                           | 4.86                          | -63.06                        | -50.1       |
| 2509.50         | V               | 150                 | 43                         | -54.66                           | 5.10                          | -49.56                        | -36.6       |
| 3346.00         | V               | -                   | -                          | -68.28                           | 6.25                          | -62.02                        | -49.0       |

**Table 7-28. 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         | V               | 150                 | 220                        | -62.79                           | 4.90                          | -57.88                        | -44.9       |
| 2539.50         | V               | 150                 | 38                         | -57.12                           | 5.25                          | -51.87                        | -38.9       |
| 3386.00         | V               | -                   | -                          | -67.21                           | 6.36                          | -60.85                        | -47.9       |

**Table 7-29. Radiated Spurious Data (Band 26/5 – High Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 40 of 70                   |

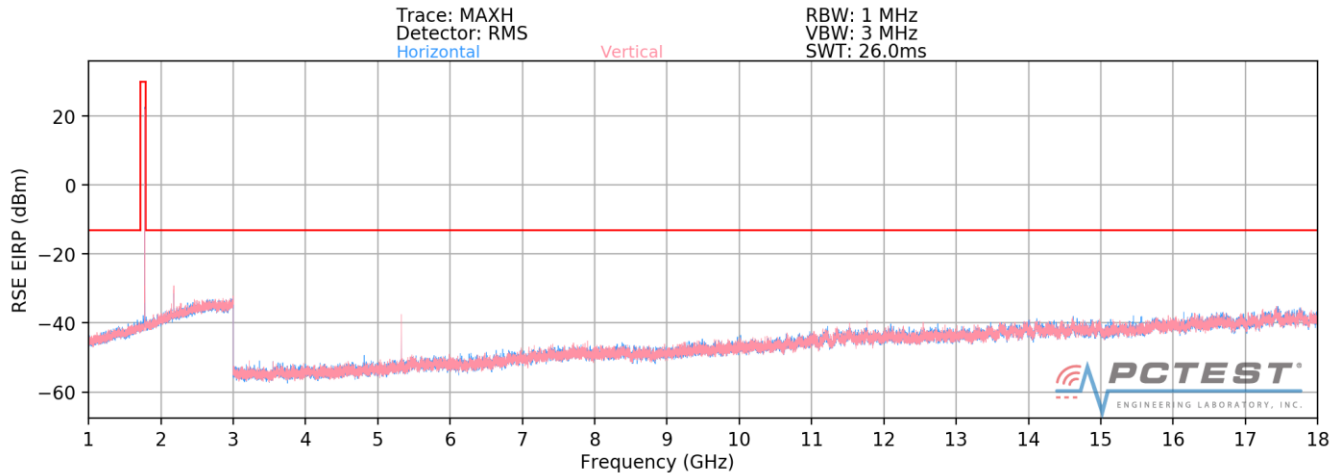
OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 26815  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| 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         | V               | 150                 | 227                        | -69.33                           | 4.82                          | -64.52                        | -51.5       |
| 2479.50         | V               | 150                 | 62                         | -61.68                           | 5.01                          | -56.67                        | -43.7       |
| 3306.00         | V               | -                   | -                          | -68.42                           | 6.25                          | -62.17                        | -49.2       |

Table 7-30. Radiated Spurious Data with WCP (Band 26/5 – Low Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 41 of 70                   |

## Band 66/4



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

OPERATING FREQUENCY: 1712.50 MHz  
CHANNEL: 131997  
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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3425.00         | V               | 150                 | 50                         | -62.93                           | 8.11                          | -54.82                        | -41.8       |
| 5137.50         | V               | 150                 | 20                         | -61.90                           | 10.24                         | -51.66                        | -38.7       |
| 6850.00         | V               | -                   | -                          | -67.80                           | 11.36                         | -56.44                        | -43.4       |

**Table 7-31. Radiated Spurious Data (Band 66/4 – Low Channel)**

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 42 of 70                   |

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3490.00         | V               | 150                 | 46                         | -65.28                           | 8.46                          | -56.82                        | -43.8       |
| 5235.00         | V               | 150                 | 335                        | -50.72                           | 10.28                         | -40.43                        | -27.4       |
| 6980.00         | V               | -                   | -                          | -67.04                           | 11.47                         | -55.57                        | -42.6       |

Table 7-32. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY: 1777.50 MHz  
 CHANNEL: 132647  
 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3555.00         | V               | 150                 | 1                          | -69.27                           | 8.52                          | -60.75                        | -47.8       |
| 5332.50         | V               | 150                 | 328                        | -62.45                           | 10.36                         | -52.09                        | -39.1       |
| 7110.00         | V               | -                   | -                          | -68.01                           | 11.62                         | -56.39                        | -43.4       |

Table 7-33. Radiated Spurious Data (Band 66/4 – High Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 43 of 70                   |

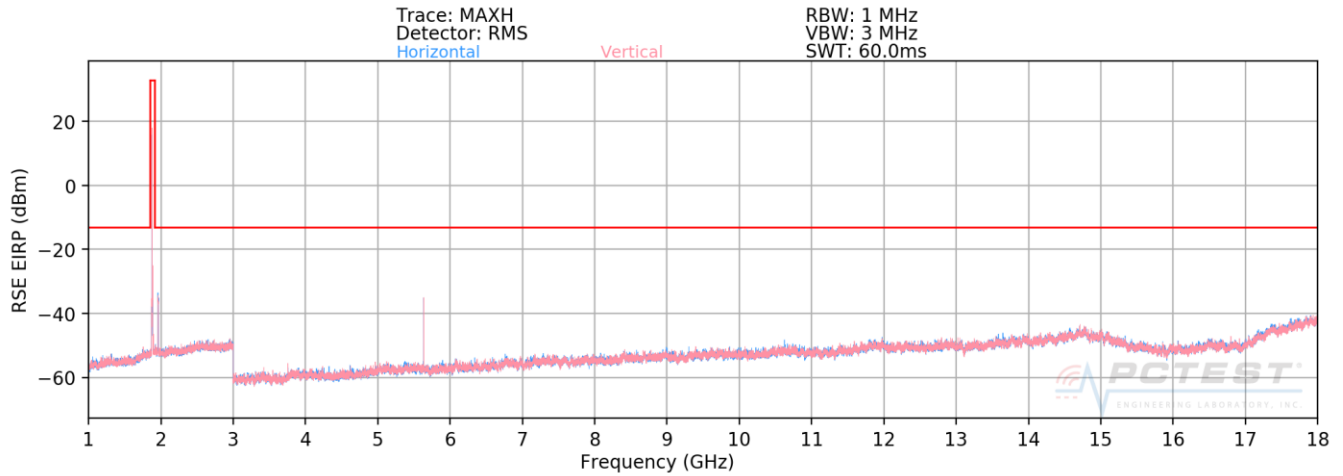
OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3490.00         | V               | 150                 | 179                        | -67.28                           | 8.46                          | -58.82                        | -45.8       |
| 5235.00         | V               | 150                 | 238                        | -51.03                           | 10.28                         | -40.74                        | -27.7       |
| 6980.00         | V               | -                   | -                          | -65.79                           | 11.47                         | -54.33                        | -41.3       |

Table 7-34. Radiated Spurious Data with WCP (Band 66/4 – Mid Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 44 of 70                   |

## Band 25/2



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

OPERATING FREQUENCY: 1857.50 MHz  
CHANNEL: 26115  
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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3715.00         | V               | 340                 | 113                        | -70.90                           | 9.53                          | -61.38                        | -48.4       |
| 5572.50         | V               | 184                 | 347                        | -57.72                           | 10.97                         | -46.75                        | -33.7       |
| 7430.00         | V               | -                   | -                          | -71.01                           | 10.98                         | -60.03                        | -47.0       |
| 9287.50         | V               | -                   | -                          | -70.17                           | 11.61                         | -58.56                        | -45.6       |

**Table 7-35. Radiated Spurious Data (Band 25/2 – Low Channel)**

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2-ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 45 of 70                   |

OPERATING FREQUENCY: 1882.50 MHz  
 CHANNEL: 26365  
 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3765.00         | V               | 387                 | 129                        | -72.26                           | 9.36                          | -62.91                        | -49.9       |
| 5647.50         | V               | 128                 | 358                        | -58.16                           | 11.19                         | -46.96                        | -34.0       |
| 7530.00         | V               | -                   | -                          | -70.98                           | 11.13                         | -59.85                        | -46.8       |
| 9412.50         | V               | -                   | -                          | -68.35                           | 11.57                         | -56.78                        | -43.8       |

**Table 7-36. Radiated Spurious Data (Band 25/2 – Mid Channel)**

OPERATING FREQUENCY: 1907.50 MHz  
 CHANNEL: 26615  
 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3815.00         | V               | 396                 | 127                        | -73.53                           | 9.30                          | -64.23                        | -51.2       |
| 5722.50         | V               | 186                 | 353                        | -59.96                           | 11.37                         | -48.59                        | -35.6       |
| 7630.00         | V               | -                   | -                          | -71.65                           | 11.31                         | -60.34                        | -47.3       |

**Table 7-37. Radiated Spurious Data (Band 25/2 – High Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 46 of 70                   |

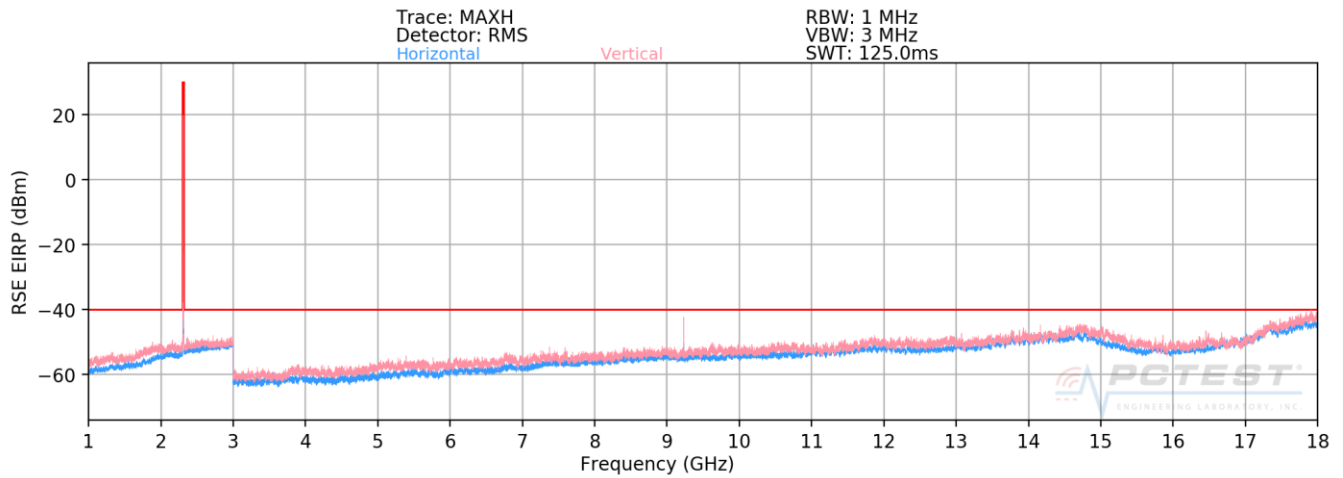
OPERATING FREQUENCY: 1857.50 MHz  
 CHANNEL: 26115  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3715.00         | V               | 366                 | 251                        | -72.63                           | 9.53                          | -63.11                        | -50.1       |
| 5572.50         | V               | 208                 | 22                         | -60.41                           | 10.97                         | -49.43                        | -36.4       |
| 7430.00         | V               | -                   | -                          | -70.71                           | 10.98                         | -59.74                        | -46.7       |

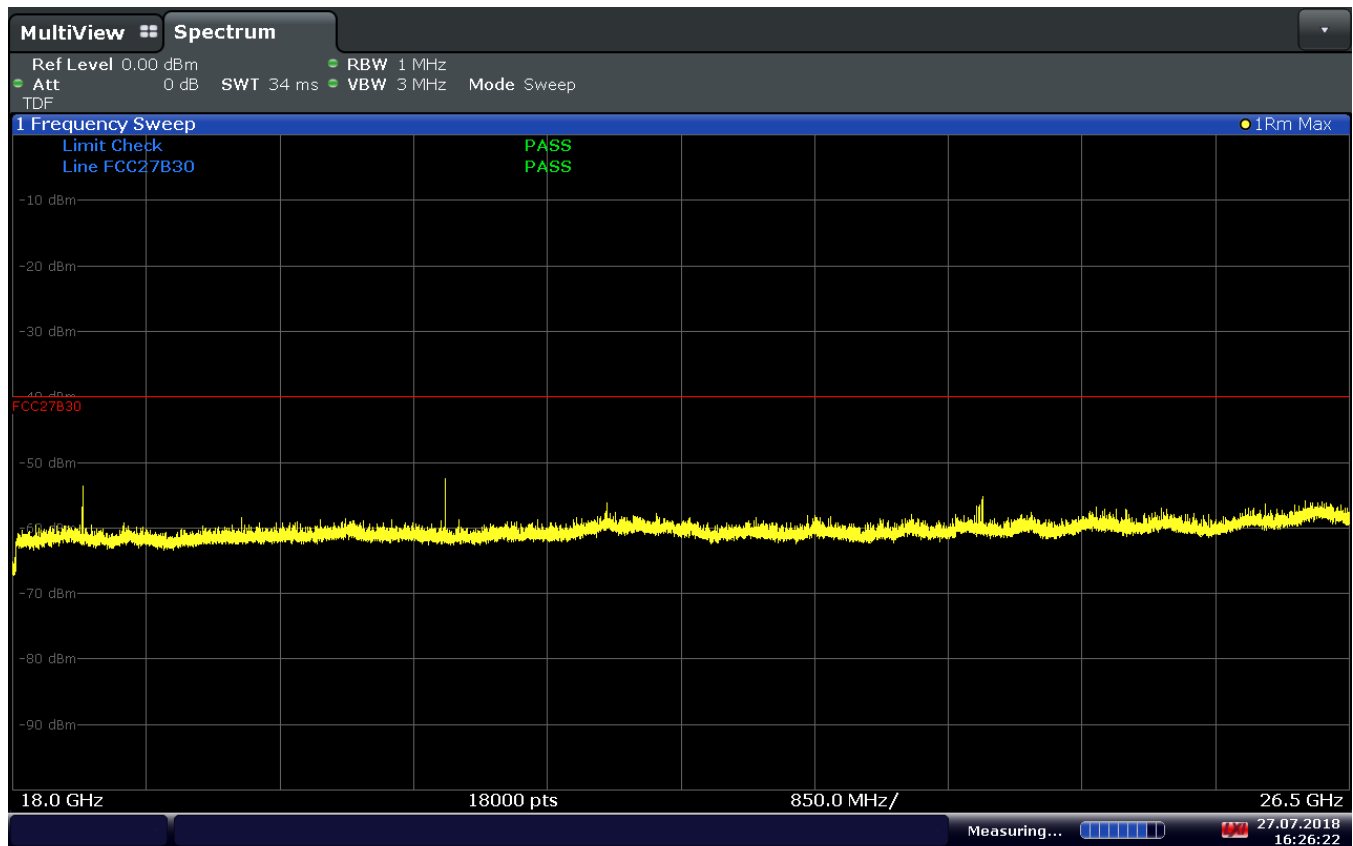
**Table 7-38. Radiated Spurious Data with WCP (Band 25/2 – Low Channel)**

|                                                   |                                                                                                                                                |                                      |                                                                                       |                                        |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| FCC ID: ZNFV405UA                                 |  <b>MEASUREMENT REPORT<br/>(CLASS II PERMISSIVE CHANGE)</b> |                                      |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2.ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                                                                                     | <b>EUT Type:</b><br>Portable Handset |                                                                                       | Page 47 of 70                          |

## Band 30



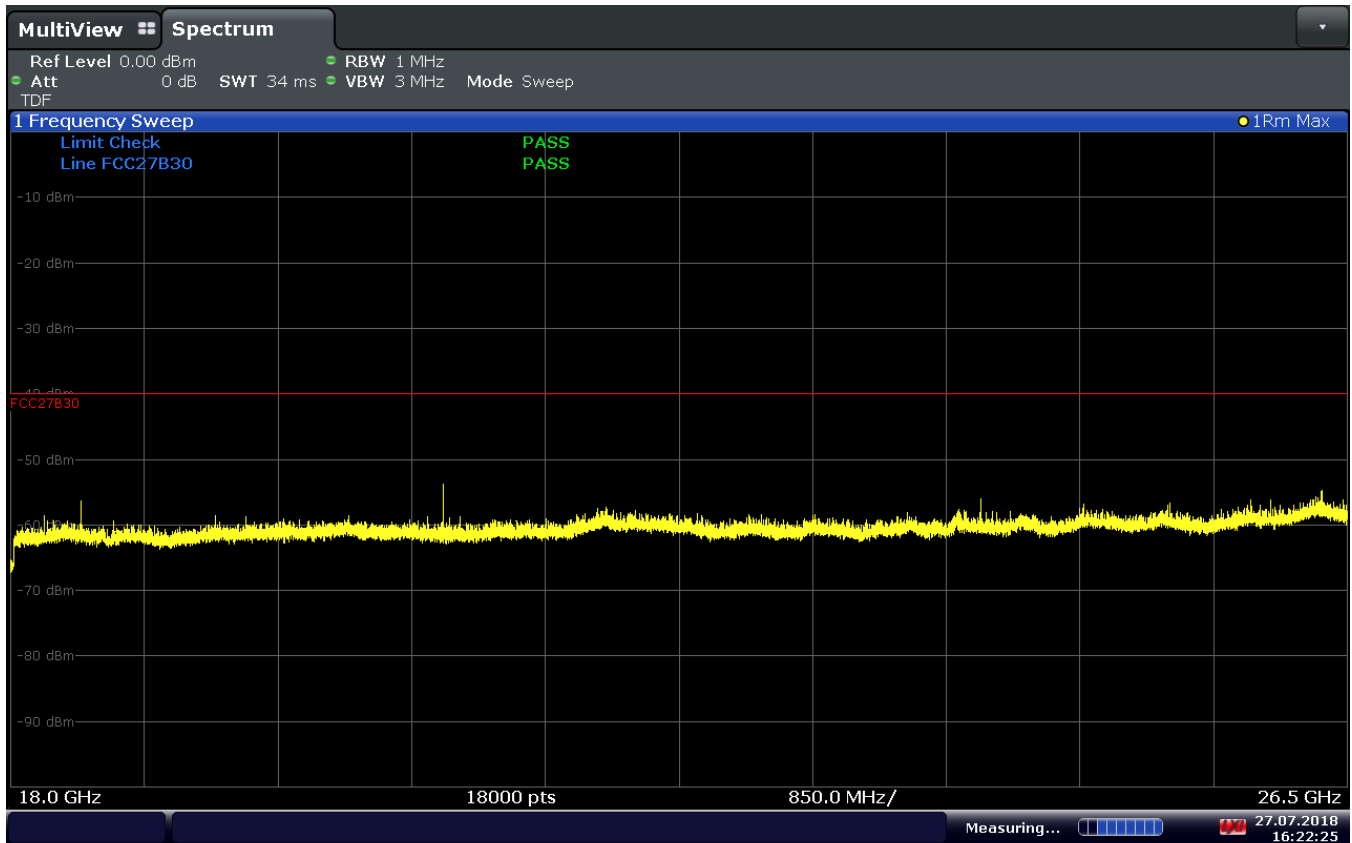
Plot 7-7. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



16:26:23 27.07.2018

Plot 7-8. Radiated Spurious Plot 18GHz – 26.5GHz (Band 30), H Pol.

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 48 of 70                   |



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**Plot 7-9. Radiated Spurious Plot 18GHz – 26.5GHz (Band 30), V Pol.**

|                                            |                                               |                                                    |           |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |           | Page 49 of 70                   |

OPERATING FREQUENCY: 2310.00 MHz  
 CHANNEL: 27710  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 4620.00         | V               | -                   | -                          | -70.13                           | 10.92                         | -59.21                        | -19.2       |
| 6930.00         | V               | -                   | -                          | -68.96                           | 11.74                         | -57.22                        | -17.2       |
| 9240.00         | V               | 150                 | 169                        | -59.92                           | 11.62                         | -48.30                        | -8.3        |
| 11550.00        | V               | -                   | -                          | -62.56                           | 12.72                         | -49.84                        | -9.8        |
| 13860.00        | V               | -                   | -                          | -61.38                           | 11.99                         | -49.39                        | -9.4        |
| 16170.00        | V               | -                   | -                          | -64.76                           | 16.59                         | -48.16                        | -8.2        |

Table 7-39. Radiated Spurious Data (Band 30 – Mid Channel)

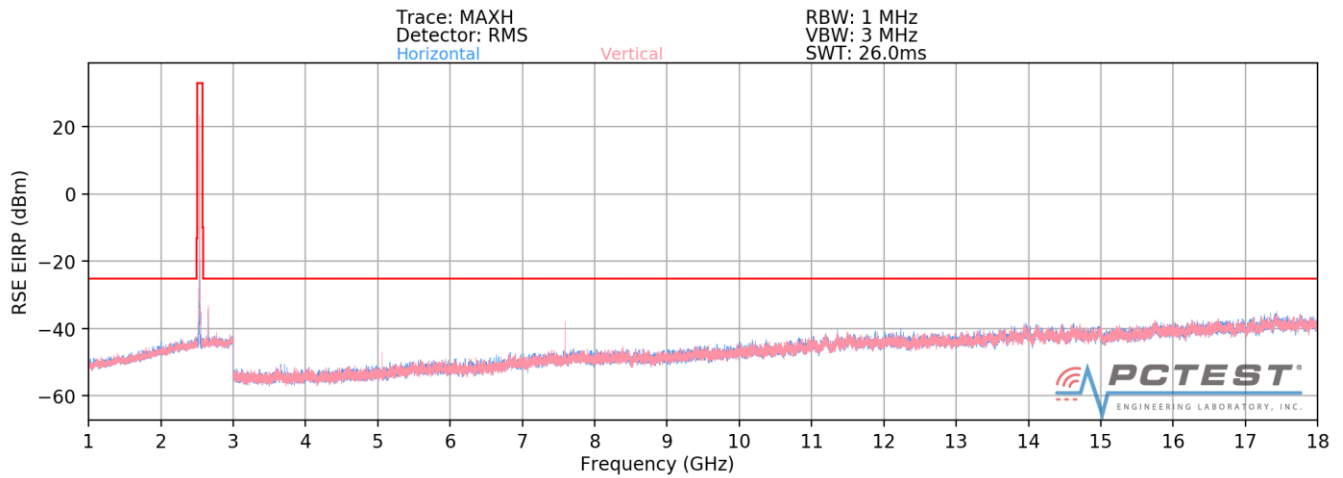
OPERATING FREQUENCY: 2310.00 MHz  
 CHANNEL: 27710  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -40 dBm

| 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 4620.00         | V               | 150                 | 156                        | -67.30                           | 10.92                         | -56.39                        | -16.4       |
| 6930.00         | V               | -                   | -                          | -68.85                           | 11.74                         | -57.11                        | -17.1       |
| 9240.00         | V               | 150                 | 245                        | -56.10                           | 11.62                         | -44.48                        | -4.5        |
| 11550.00        | V               | -                   | -                          | -61.99                           | 12.72                         | -49.28                        | -9.3        |
| 13860.00        | V               | -                   | -                          | -61.41                           | 11.99                         | -49.42                        | -9.4        |
| 16170.00        | V               | -                   | -                          | -63.65                           | 16.59                         | -47.05                        | -7.1        |

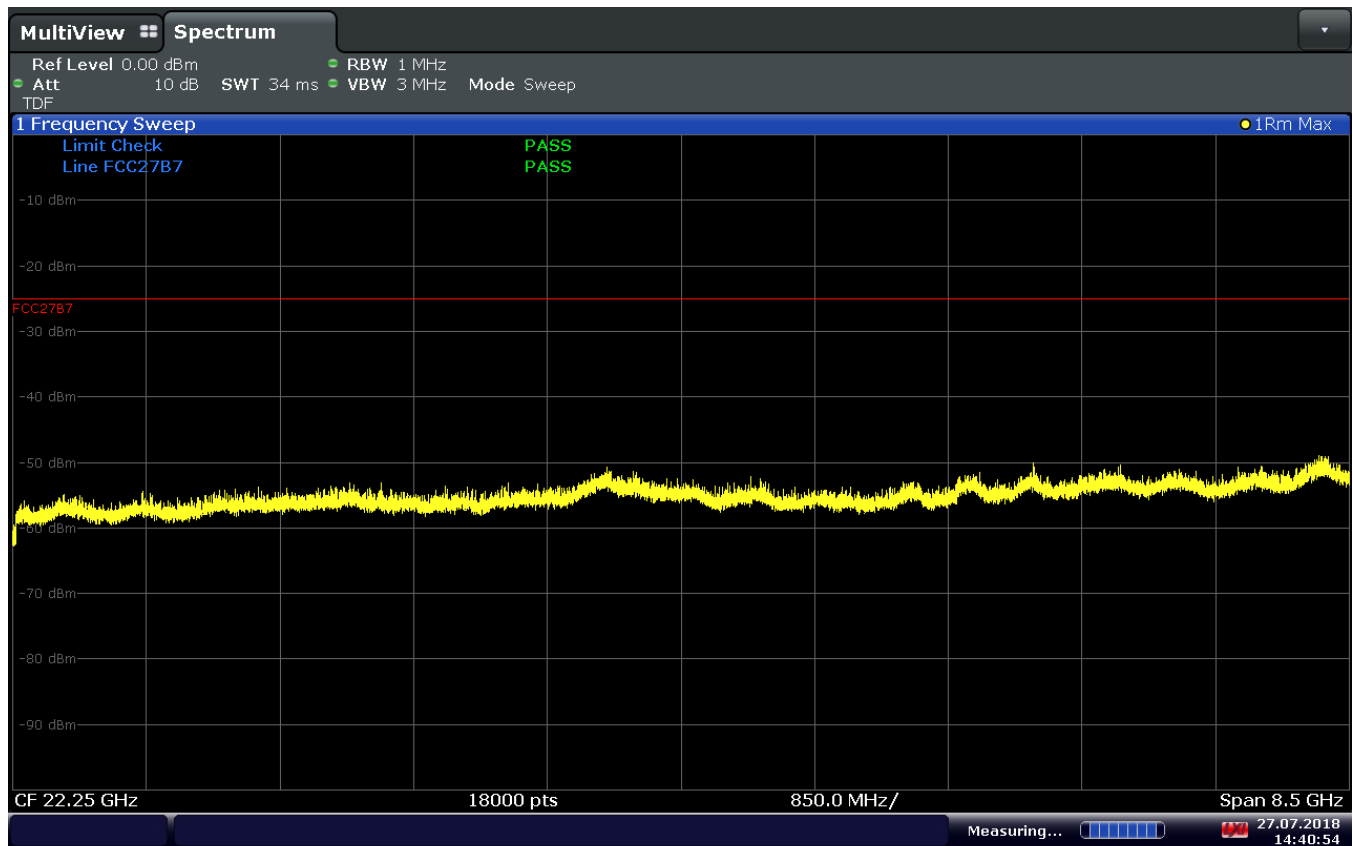
Table 7-40. Radiated Spurious Data with WCP (Band 30 – Mid Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 50 of 70                   |

## Band 7



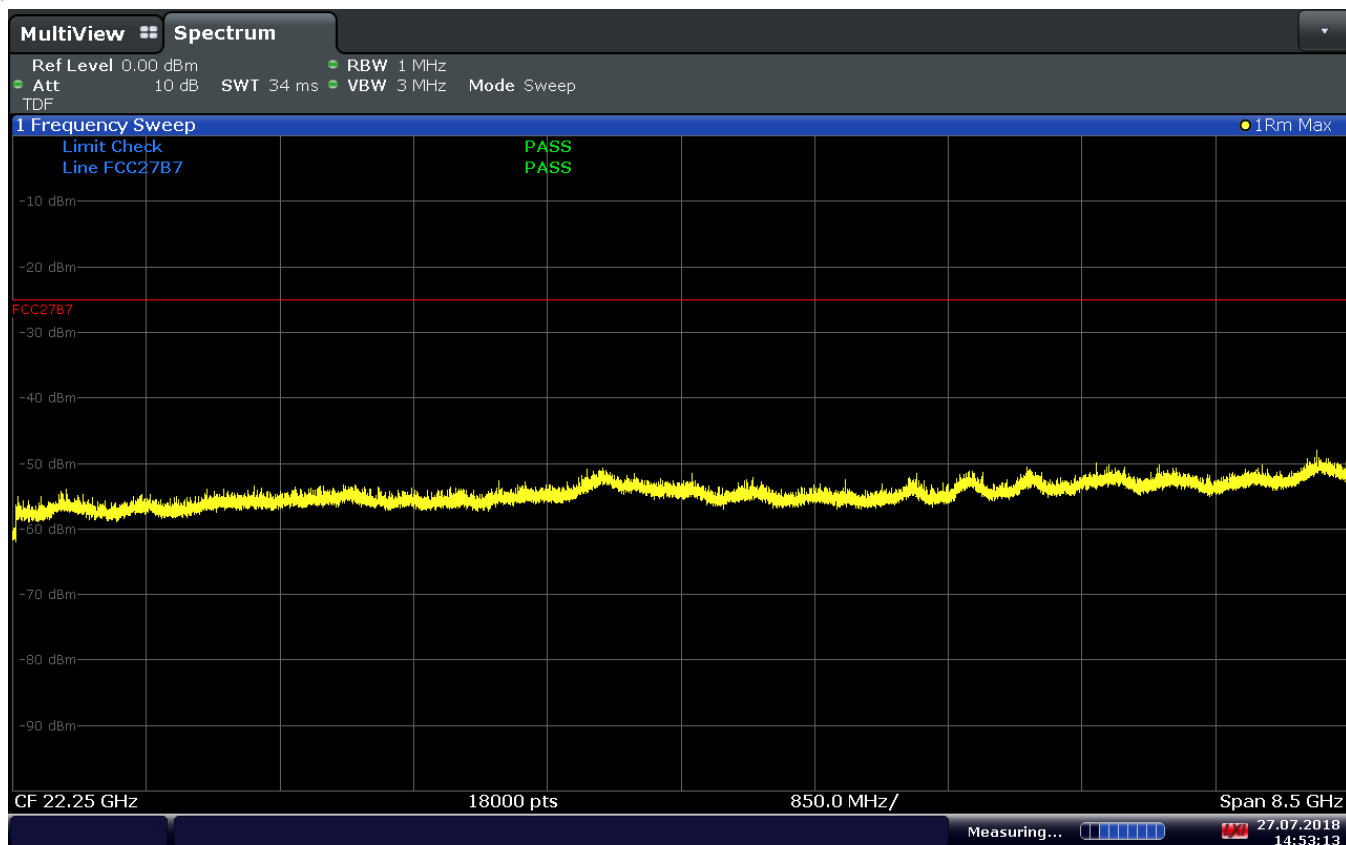
Plot 7-10. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



14:40:55 27.07.2018

Plot 7-11. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7), H Pol.

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 51 of 70                   |



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**Plot 7-12. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7), V Pol.**

OPERATING FREQUENCY: 2507.50 MHz  
 CHANNEL: 20825  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5015.00         | V               | 150                 | 50                         | -57.36                           | 10.10                         | -47.25                        | -22.3       |
| 7522.50         | V               | 150                 | 86                         | -62.68                           | 12.11                         | -50.57                        | -25.6       |
| 10030.00        | V               | -                   | -                          | -65.72                           | 13.17                         | -52.56                        | -27.6       |

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

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 52 of 70                   |

OPERATING FREQUENCY: 2535.00 MHz  
 CHANNEL: 21100  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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               | 150                 | 60                         | -65.69                           | 10.18                         | -55.51                        | -30.5       |
| 7605.00         | V               | 150                 | 303                        | -65.67                           | 12.15                         | -53.52                        | -28.5       |
| 10140.00        | V               | -                   | -                          | -65.11                           | 13.11                         | -52.00                        | -27.0       |

Table 7-42. Radiated Spurious Data (Band 7 – Mid Channel)

OPERATING FREQUENCY: 2562.50 MHz  
 CHANNEL: 21375  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5125.00         | V               | 150                 | 82                         | -68.65                           | 10.23                         | -58.42                        | -33.4       |
| 7687.50         | V               | 150                 | 124                        | -63.39                           | 12.27                         | -51.12                        | -26.1       |
| 10250.00        | V               | -                   | -                          | -65.87                           | 13.12                         | -52.75                        | -27.8       |

Table 7-43. Radiated Spurious Data (Band 7 – High Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 53 of 70                   |

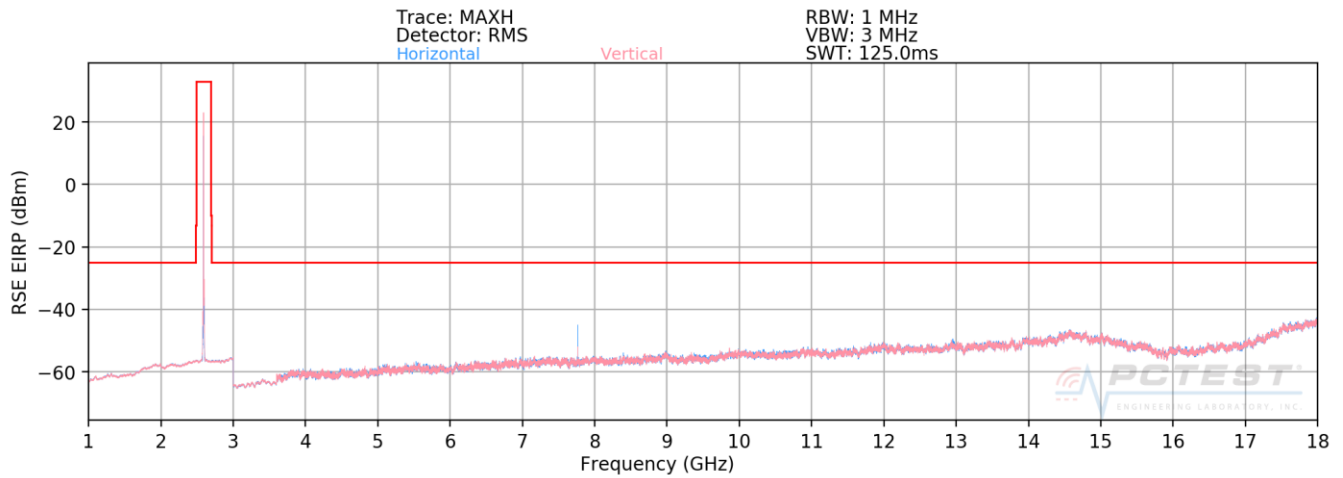
OPERATING FREQUENCY: 2535.00 MHz  
 CHANNEL: 21100  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

| 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         | H               | 150                 | 68                         | -62.99                           | 8.39                          | -54.60                        | -29.6       |
| 7605.00         | H               | 150                 | 300                        | -60.68                           | 8.51                          | -52.17                        | -27.2       |
| 10140.00        | H               | -                   | -                          | -61.89                           | 9.70                          | -52.19                        | -27.2       |

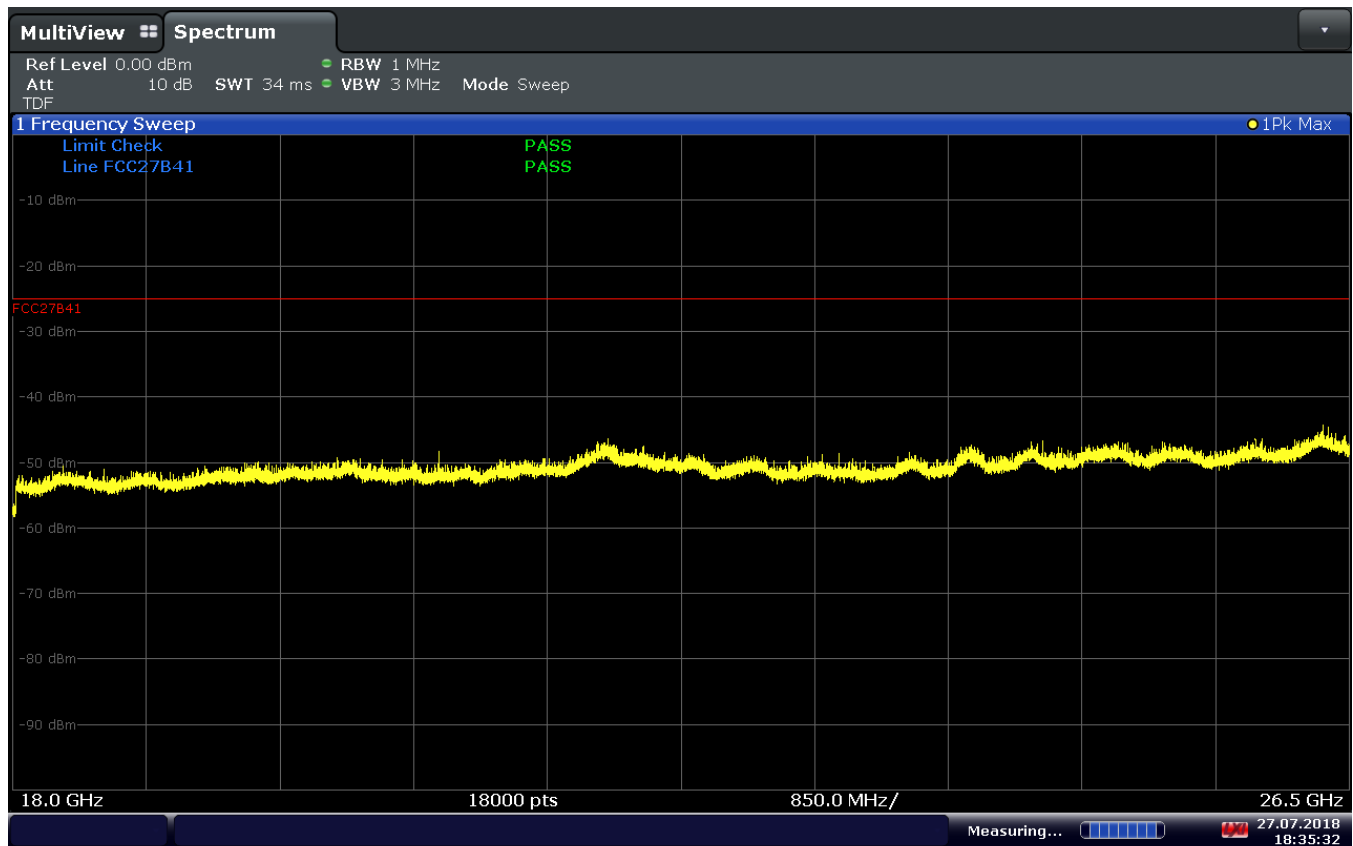
Table 7-44. Radiated Spurious Data with WCP (Band 7 – Mid Channel)

|                                                   |                                                                                                                                               |                                      |                                                                                       |                                        |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| FCC ID: ZNFV405UA                                 |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                                      |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1808070153-03-R2.ZNF | <b>Test Dates:</b><br>7/25/2018 - 8/8/2018                                                                                                    | <b>EUT Type:</b><br>Portable Handset |                                                                                       | Page 54 of 70                          |

## Band 41



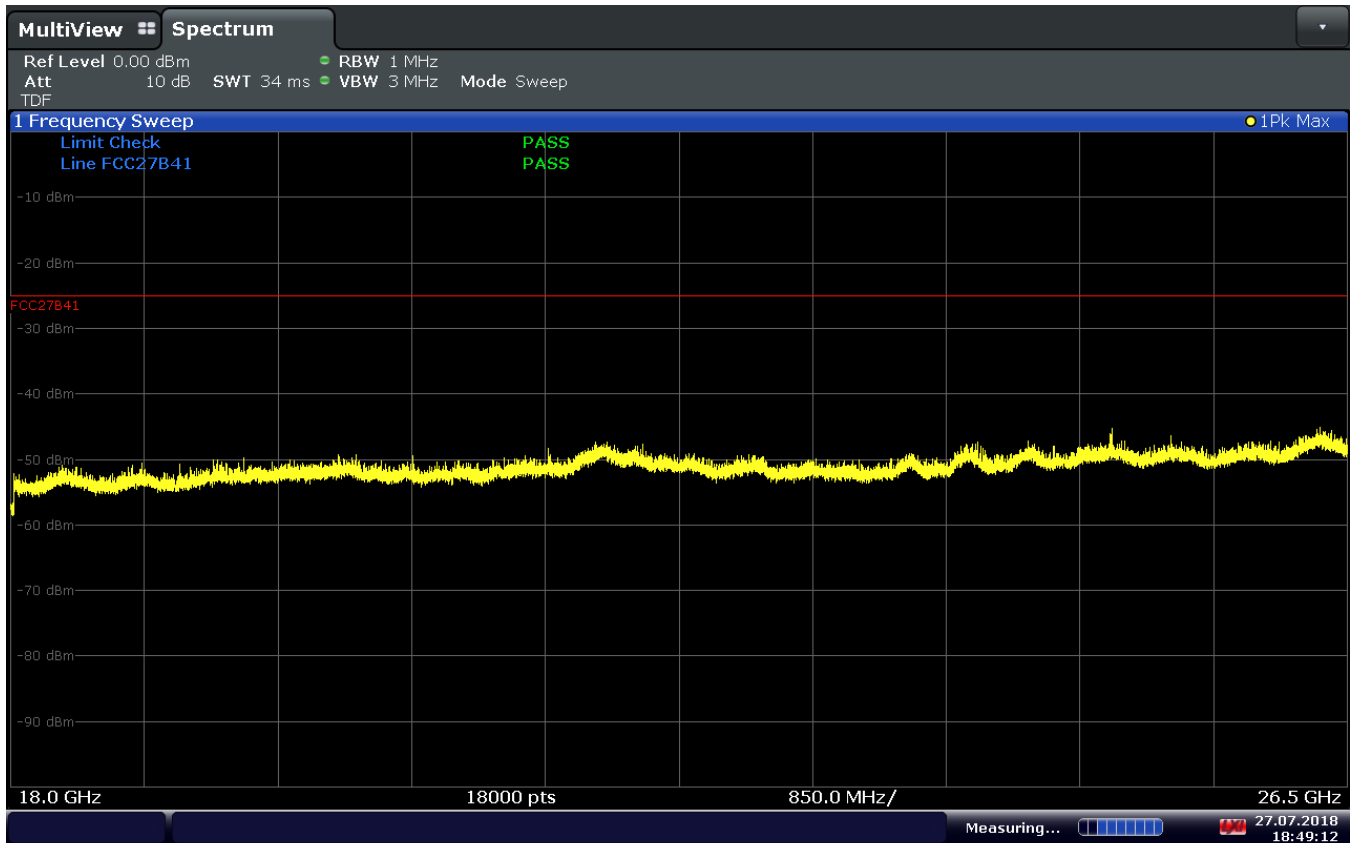
Plot 7-13. Radiated Spurious Plot 1GHz - 18GHz (Band 41 PC2)



18:35:32 27.07.2018

Plot 7-14. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41 PC2), H Pol.

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 55 of 70                   |



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**Plot 7-15. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41 PC2 ), V Pol.**

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 56 of 70                   |

OPERATING FREQUENCY: 2507.50 MHz  
 CHANNEL: 39765  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5015.00         | H               | 245                 | 153                        | -67.95                           | 10.90                         | -57.06                        | -32.1       |
| 7522.50         | H               | 400                 | 191                        | -63.35                           | 11.12                         | -52.24                        | -27.2       |
| 10030.00        | H               | 212                 | 175                        | -64.17                           | 11.99                         | -52.17                        | -27.2       |
| 12537.50        | H               | 365                 | 125                        | -60.74                           | 13.56                         | -47.18                        | -22.2       |
| 15045.00        | H               | 342                 | 143                        | -60.71                           | 13.53                         | -47.18                        | -22.2       |
| 17552.50        | H               | 150                 | 205                        | -56.72                           | 11.65                         | -45.06                        | -20.1       |

**Table 7-45. Radiated Spurious Data (Band 41 PC2 – Low Channel)**

OPERATING FREQUENCY: 2593.00 MHz  
 CHANNEL: 40620  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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               | 158                 | 49                         | -61.72                           | 10.74                         | -50.98                        | -26.0       |
| 7779.00         | H               | 191                 | 53                         | -54.17                           | 11.44                         | -42.72                        | -17.7       |
| 10372.00        | H               | 209                 | 356                        | -62.97                           | 12.42                         | -50.55                        | -25.6       |
| 12965.00        | H               | 205                 | 342                        | -56.79                           | 13.29                         | -43.50                        | -18.5       |
| 15558.00        | H               | 182                 | 15                         | -65.93                           | 16.33                         | -49.61                        | -24.6       |

**Table 7-46. Radiated Spurious Data (Band 41 PC2– Mid Channel)**

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 57 of 70                   |

OPERATING FREQUENCY: 2682.50 MHz  
 CHANNEL: 41515  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5365.00         | H               | 167                 | 235                        | -66.47                           | 10.69                         | -55.77                        | -30.8       |
| 8047.50         | H               | 311                 | 175                        | -61.68                           | 11.16                         | -50.52                        | -25.5       |
| 10730.00        | H               | -                   | -                          | -66.39                           | 12.60                         | -53.78                        | -28.8       |
| 13412.50        | H               | 130                 | 137                        | -61.00                           | 12.59                         | -48.41                        | -23.4       |
| 16095.00        | H               | -                   | -                          | -69.44                           | 16.67                         | -52.78                        | -27.8       |

Table 7-47. Radiated Spurious Data (Band 41 PC2 – High Channel)

OPERATING FREQUENCY: 2593.00 MHz  
 CHANNEL: 40620  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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               | 119                 | 293                        | -61.01                           | 10.74                         | -50.27                        | -25.3       |
| 7779.00         | H               | 329                 | 15                         | -66.42                           | 11.44                         | -54.98                        | -30.0       |
| 10372.00        | H               | -                   | -                          | -66.14                           | 12.42                         | -53.72                        | -28.7       |

Table 7-48. Radiated Spurious Data with WCP (Band 41 PC2 – Mid Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 58 of 70                   |

OPERATING FREQUENCY: 2510.00 MHz  
 CHANNEL: 39790  
 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               | 150                 | 213                        | -68.05                           | 10.11                         | -57.94                        | -32.9       |
| 7527.50         | V               | 150                 | 43                         | -63.65                           | 12.11                         | -51.54                        | -26.5       |
| 10035.00        | V               | -                   | -                          | -65.24                           | 13.16                         | -52.08                        | -27.1       |

Table 7-49. Radiated Spurious Data (Band 41 PC3 – Low Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 59 of 70                   |

## 7.4 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §27.53(m)

### Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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 peak 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 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

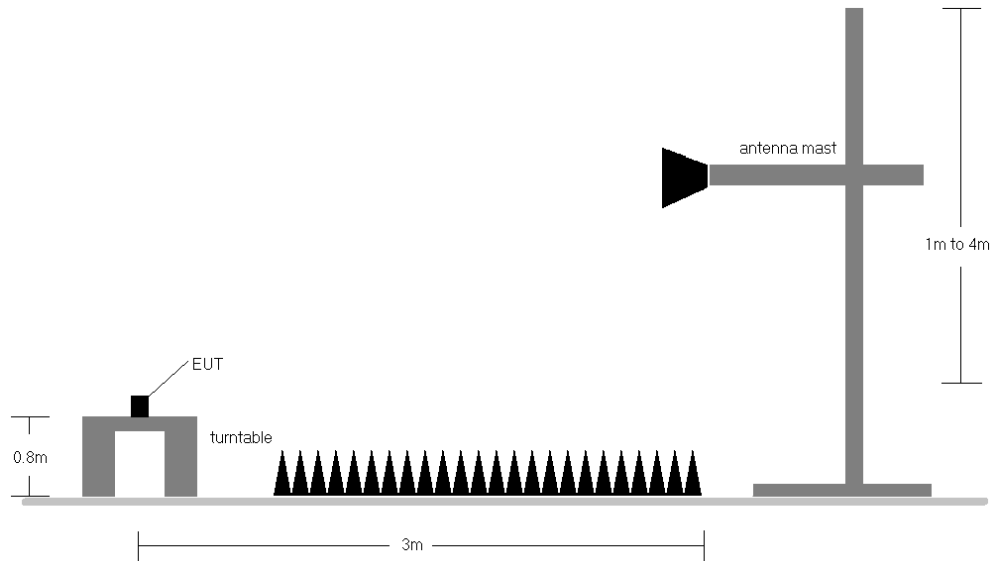
### Test Settings

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

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 60 of 70                   |

## Test Setup

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

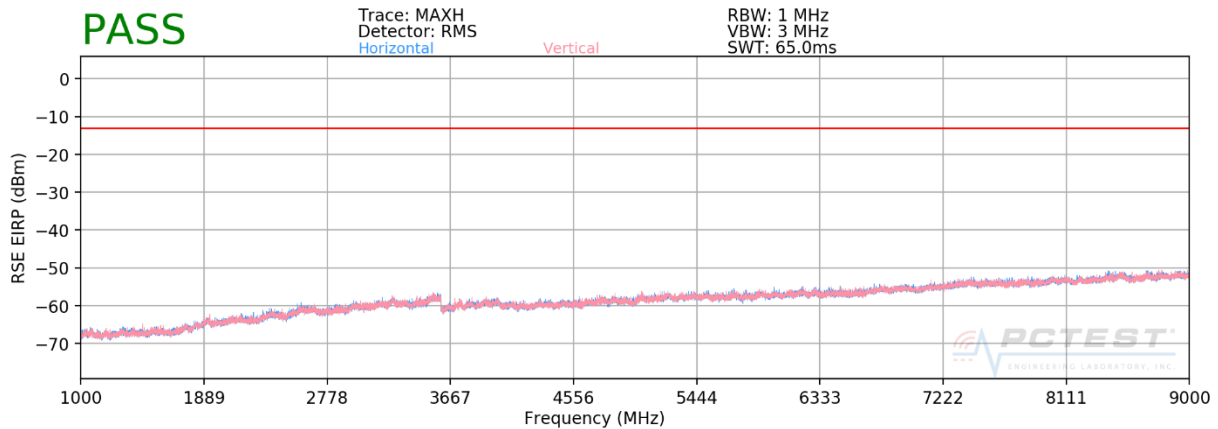


**Figure 7-4. Test Instrument & Measurement Setup**

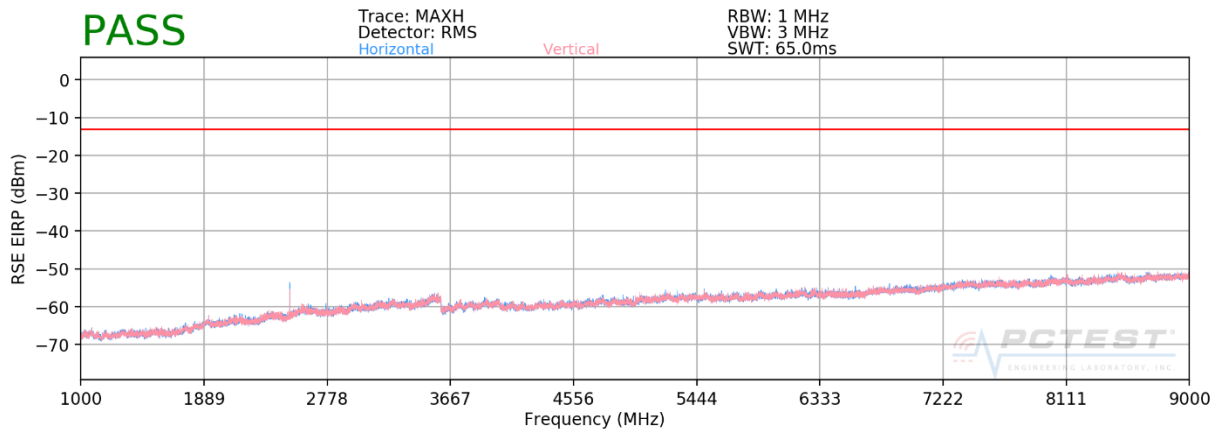
## Test Notes

- 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) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

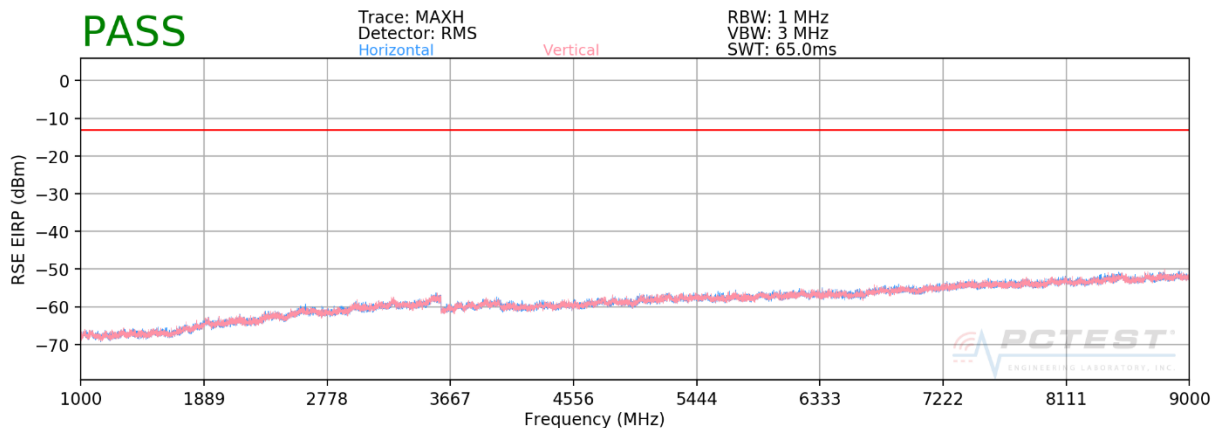
|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 61 of 70                   |



Plot 7-50. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Low Channel)

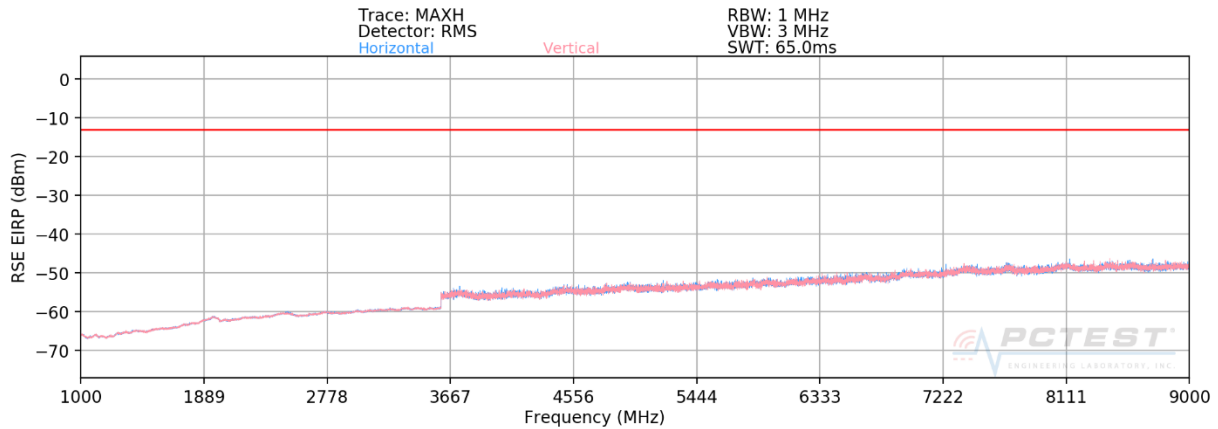


Plot 7-51. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

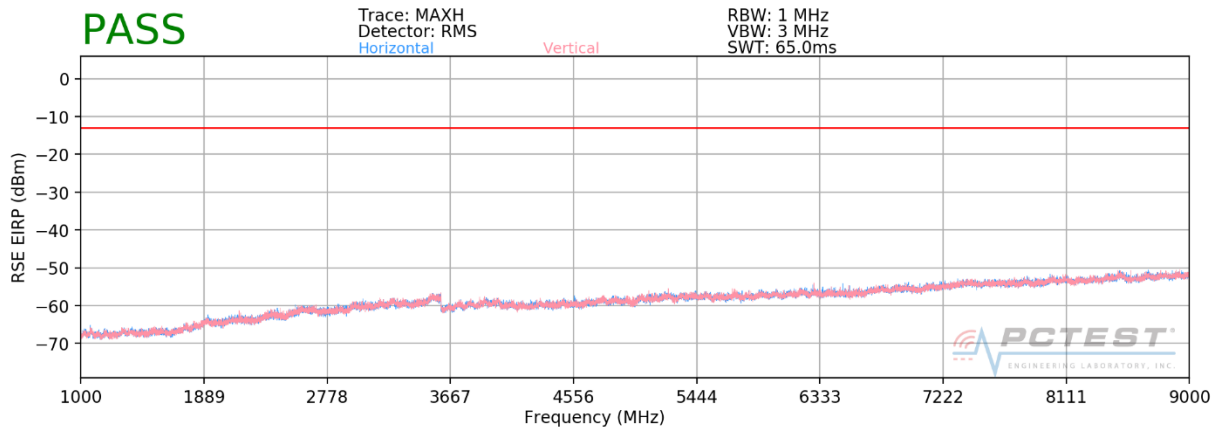


Plot 7-52. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – High Channel)

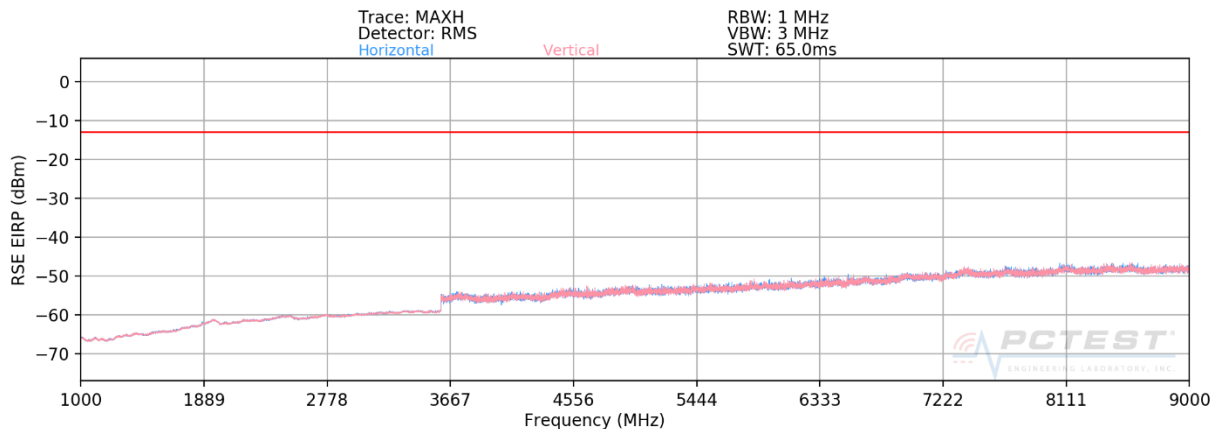
|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 62 of 70                   |



Plot 7-53. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0 – Low Channel)



Plot 7-54. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0 – Mid Channel)



Plot 7-55. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0 – High Channel)

|                                            |                                        |                                                    |    |                                 |
|--------------------------------------------|----------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | PCTEST<br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018    | EUT Type:<br>Portable Handset                      |    | Page 63 of 70                   |

OPERATING FREQUENCY (PCC): 829.00 MHz  
 OPERATING FREQUENCY (SCC): 838.90  
 CHANNEL (PCC): 20450  
 CHANNEL (SCC): 20549  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 + 10 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1658.00         | V               | 145                 | 140                        | -79.39                           | 8.95                          | -70.44                        | -57.4       |
| 2487.00         | V               | 116                 | 138                        | -70.29                           | 9.70                          | -60.58                        | -47.6       |
| 3316.00         | V               | -                   | -                          | -75.60                           | 9.59                          | -66.01                        | -53.0       |

Table 7-56. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC): 831.50 MHz  
 OPERATING FREQUENCY (SCC): 841.50  
 CHANNEL (PCC): 20600  
 CHANNEL (SCC): 20575  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 + 10 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         | V               | 144                 | 147                        | -79.88                           | 8.95                          | -70.93                        | -57.9       |
| 2494.50         | V               | 130                 | 144                        | -72.59                           | 9.73                          | -62.86                        | -49.9       |
| 3326.00         | V               | -                   | -                          | -75.44                           | 9.59                          | -65.84                        | -52.8       |

Table 7-57. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 64 of 70                   |

OPERATING FREQUENCY (PCC): 834.10 MHz  
 OPERATING FREQUENCY (SCC): 844.00  
 CHANNEL (PCC): 20501  
 CHANNEL (SCC): 20600  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 + 10 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1668.20         | V               | 136                 | 141                        | -78.10                           | 8.95                          | -69.15                        | -56.1       |
| 2502.30         | V               | 111                 | 138                        | -69.65                           | 9.75                          | -59.90                        | -46.9       |
| 3336.40         | V               | -                   | -                          | -75.54                           | 9.60                          | -65.94                        | -52.9       |

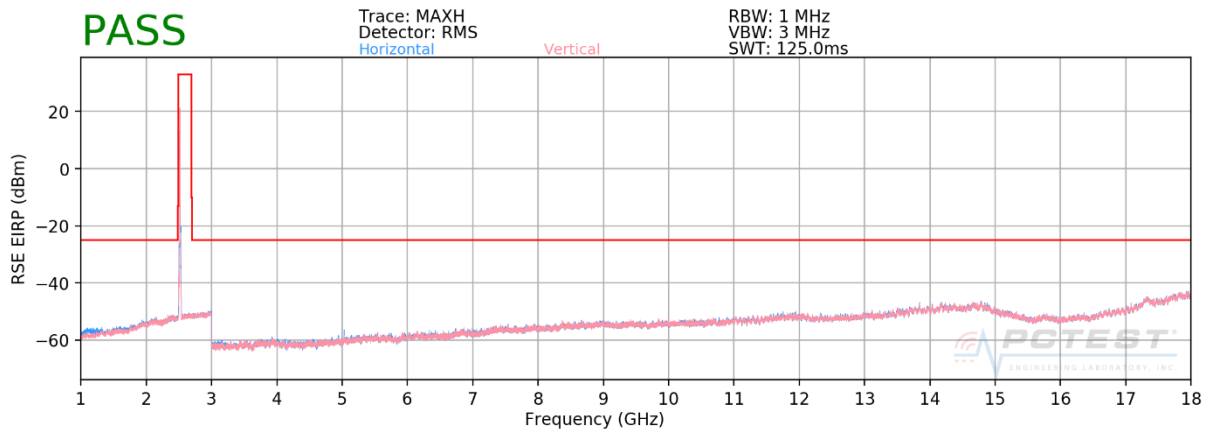
Table 7-58. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – High Channel)

OPERATING FREQUENCY (PCC): 834.10 MHz  
 OPERATING FREQUENCY (SCC): 844.00  
 CHANNEL (PCC): 20501  
 CHANNEL (SCC): 20600  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 + 10 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

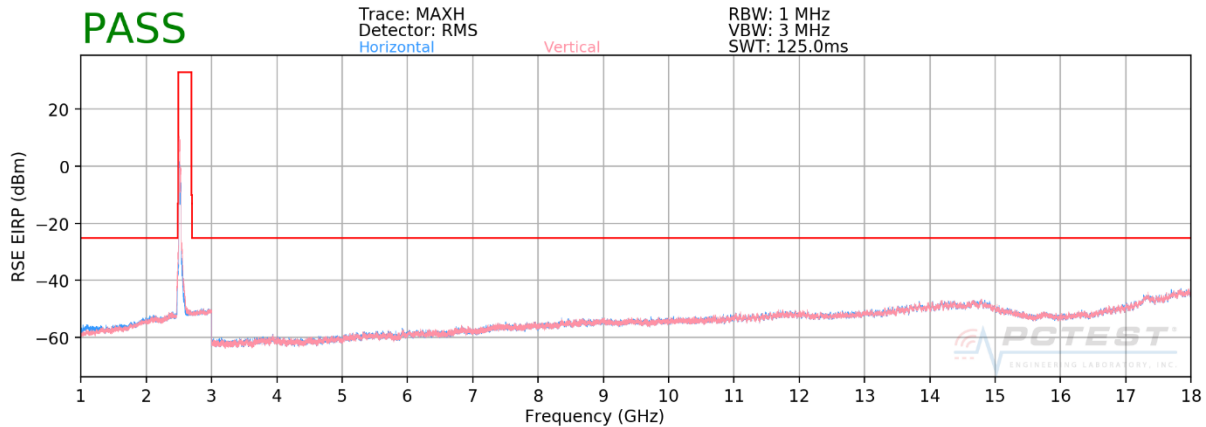
| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1663.00         | V               | 271                 | 131                        | -74.48                           | 5.76                          | -68.72                        | -55.7       |
| 2494.50         | V               | 157                 | 11                         | -69.70                           | 5.75                          | -63.95                        | -51.0       |
| 3326.00         | V               | -                   | -                          | -73.93                           | 7.91                          | -66.03                        | -53.0       |

Table 7-59. Radiated Spurious Data with WCP (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

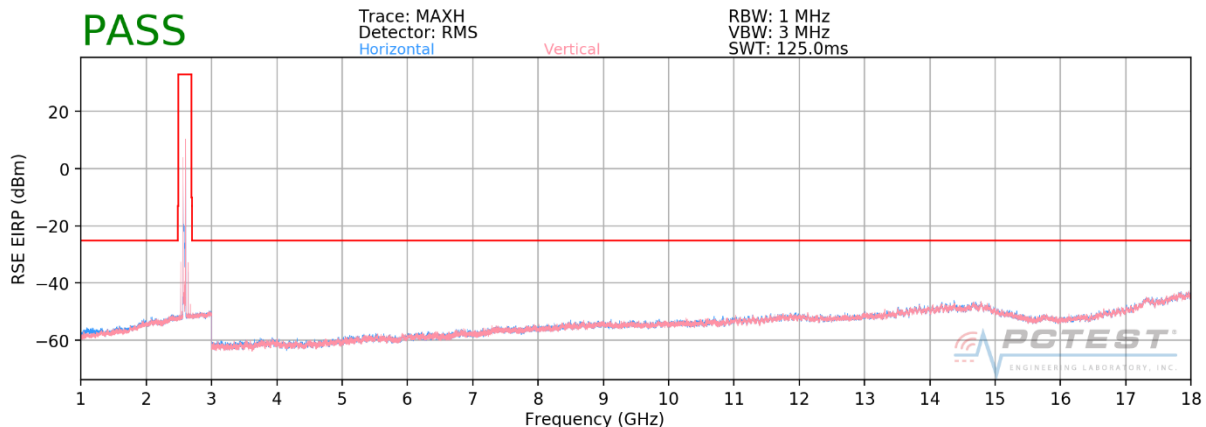
|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 65 of 70                   |



Plot 7-60. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 100 – Low Channel)

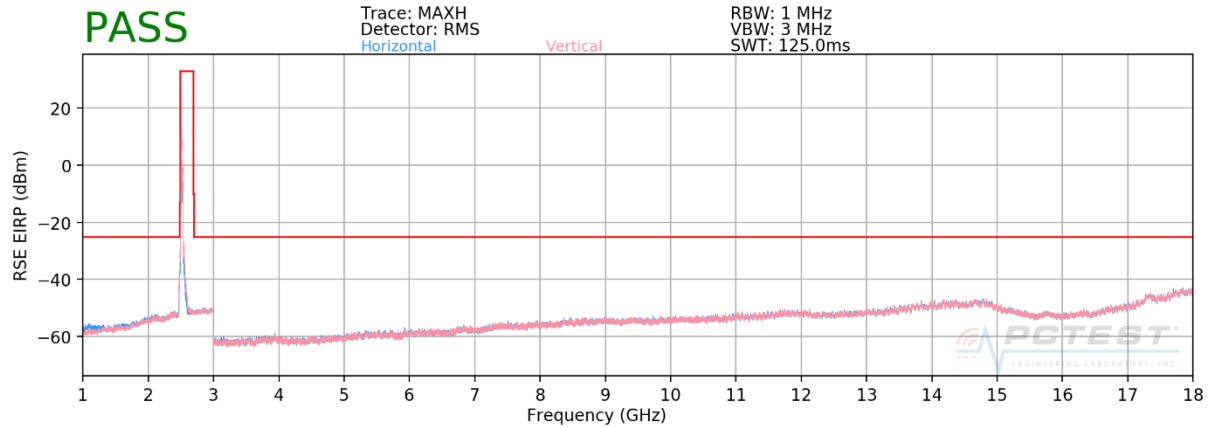


Plot 7-61. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

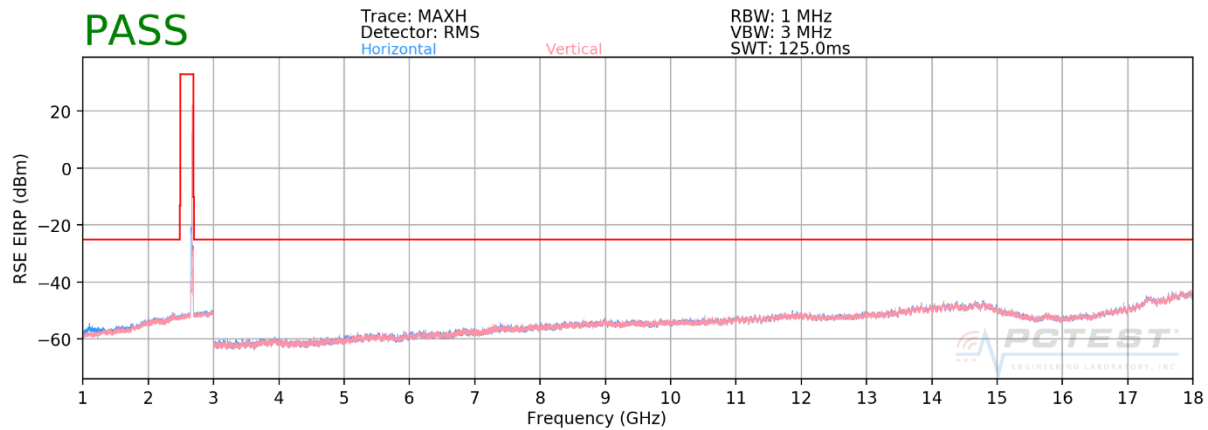


Plot 7-62. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 100 – Mid Channel)

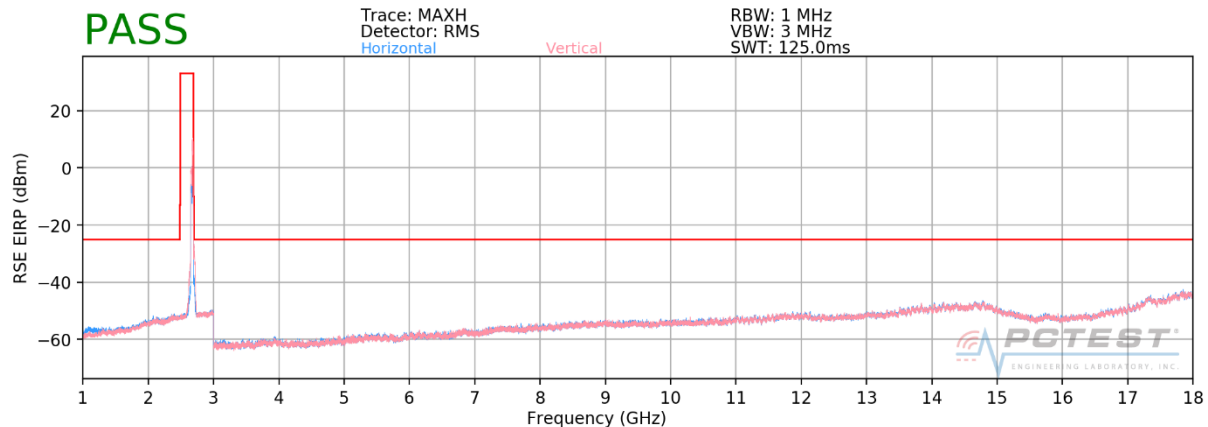
|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 66 of 70                   |



Plot 7-63. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)



Plot 7-64. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 100 – High Channel)



Plot 7-65. Radiated Spurious Plot (ULCA B41 – 20MHz+20MHz - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – High Channel)

|                                            |                                               |                                                    |    |                                 |
|--------------------------------------------|-----------------------------------------------|----------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFV405UA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2-ZNF | Test Dates:<br>7/25/2018 - 8/8/2018           | EUT Type:<br>Portable Handset                      |    | Page 67 of 70                   |

OPERATING FREQUENCY (PCC): 2506.00 MHz  
 OPERATING FREQUENCY (SCC): 2525.80  
 CHANNEL (PCC): 39750  
 CHANNEL (SCC): 39948  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 + 20 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] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5012.00         | H               | 316                 | 30                         | -66.78                           | 10.90                         | -55.88                        | -30.9       |
| 7518.00         | H               | 181                 | 10                         | -65.49                           | 11.11                         | -54.39                        | -29.4       |
| 10024.00        | H               | -                   | -                          | -65.78                           | 11.99                         | -53.78                        | -28.8       |

Table 7-66. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0)

OPERATING FREQUENCY (PCC): 2593.00 MHz  
 OPERATING FREQUENCY (SCC): 2612.80  
 CHANNEL (PCC): 40620  
 CHANNEL (SCC): 40818  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 + 20 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               | 400                 | 35                         | -69.40                           | 10.75                         | -58.65                        | -33.6       |
| 7779.00         | H               | 178                 | 14                         | -66.77                           | 11.40                         | -55.37                        | -30.4       |
| 10372.00        | H               | -                   | -                          | -66.38                           | 12.59                         | -53.79                        | -28.8       |

Table 7-67. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0)

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2-ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 68 of 70                   |

OPERATING FREQUENCY (SCC): 2680.00 MHz  
 OPERATING FREQUENCY (PCC): 2660.20  
 CHANNEL (SCC): 41490  
 CHANNEL (PCC): 41292  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 + 20 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               | 196                 | 43                         | -68.87                           | 10.70                         | -58.17                        | -33.2       |
| 8040.00         | H               | 382                 | 24                         | -66.39                           | 11.16                         | -55.23                        | -30.2       |
| 10720.00        | H               | -                   | -                          | -65.77                           | 12.59                         | -53.18                        | -28.2       |

Table 7-68. Radiated Spruious Data (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99)

OPERATING FREQUENCY: 2593.00 MHz  
 CHANNEL: 40620  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 + 20 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               | -                   | -                          | -70.55                           | 10.74                         | -59.81                        | -34.8       |
| 7779.00         | H               | 355                 | 56                         | -67.03                           | 11.44                         | -55.59                        | -30.6       |
| 10372.00        | H               | -                   | -                          | -66.33                           | 12.42                         | -53.91                        | -28.9       |

Table 7-69. Radiated Spruious Plot with WCP (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0)

|                                            |                                                                                                                                               |                               |                                                                                       |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  <b>MEASUREMENT REPORT</b><br>(CLASS II PERMISSIVE CHANGE) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                                                                           | EUT Type:<br>Portable Handset |                                                                                       | Page 69 of 70                   |

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFV405UA** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

|                                            |                                                                                     |                                                    |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFV405UA                          |  | MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1808070153-03-R2.ZNF | Test Dates:<br>7/25/2018 - 8/8/2018                                                 | EUT Type:<br>Portable Handset                      |                                                                                       | Page 70 of 70                   |