

FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

MODEL NUMBER: VS980, LGVS980 and LG-VS980

FCC ID: ZNFVS980

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| | 07/08/13 | Initial Issue | P. Kim |
| Α | 07/09/13 | Move 802.11ac to UNI Band report rather than DTS. | P. Kim |
| В | 07/15/13 | Update accessory information, Section 5.6 Description of Test Set Up - Support Equipment and Section 5.2 Maximum Output Power | P. Kim |
| С | 07/16/13 | Update max power summary table with correct values Section 5.2 Maximum Output Power | P. Kim |
| D | 7/17/13 | Update test methodology description and radiated harmonic data. | P. Kim |
| E | 7/18/13 | Update administrative information and comments from TCB | P. Kim |
| F | 7/19/13 | Update frequency range table from section 5.2, minor typos and missing data inserted. Duty cycle factor also included under 802.11ac 5.8GHz section under power measurement. | P. Kim |

Page 2 of 405

REPORT NO: 13U15118-2F

TABLE OF CONTENTS

| 1. | ΑΤΤ | ESTATION OF TEST RESULTS | 8 |
|---------|-------------|--|--------|
| 2. | TES | ST METHODOLOGY | 9 |
| 3. | FAC | CILITIES AND ACCREDITATION | 9 |
| 4. | CAL | LIBRATION AND UNCERTAINTY | 9 |
| 4 | 4.1. | MEASURING INSTRUMENT CALIBRATION | 9 |
| 4 | 4.2. | SAMPLE CALCULATION | 9 |
| 4 | 4.3. | MEASUREMENT UNCERTAINTY | 9 |
| 5. | EQI | JIPMENT UNDER TEST1 | 0 |
| 5 | 5.1. | DESCRIPTION OF EUT1 | 0 |
| 5 | 5.2. | MAXIMUM OUTPUT POWER1 | 0 |
| 5 | 5.3. | DESCRIPTION OF AVAILABLE ANTENNAS1 | 0 |
| 5 | 5.4. | SOFTWARE AND FIRMWARE1 | 0 |
| 5 | 5.5. | WORST-CASE CONFIGURATION AND MODE1 | 2 |
| 5 | 5.6. | DESCRIPTION OF TEST SETUP1 | 3 |
| 6. | TES | ST AND MEASUREMENT EQUIPMENT1 | 5 |
| 7. | ON | TIME, DUTY CYCLE AND MEASUREMENT METHODS10 | 6 |
| 7 | 7.1. | ON TIME AND DUTY CYCLE RESULTS1 | 6 |
| 7 | 7.2. | DUTY CYCLE PLOTS1 | 6 |
| 8. | ME | ASUREMENT METHOD1 | 9 |
| 9. | AN | FENNA PORT TEST RESULTS | 0 |
| g | 9.1. | 802.11a MODE IN THE 5.2 GHz BAND2 | 0 |
| | 9.1. | 1. 26 dB BANDWIDTH | 0 |
| | 9.1. 9.1 | 2. 99% BANDWIDTH2 3 AVERAGE POWER 2 | 3 6 |
| | 9.1. | 4. OUTPUT POWER AND PPSD | 7 |
| | 9.1. | 5. PEAK EXCURSION | 1 |
| g | 9.2. | 802.11n HT20 MODE IN THE 5.2 GHz BAND | 2 |
| | 9.2. | 1. 26 dB BANDWIDTH | 2 |
| | 9.2. 9.2 | 3 AVERAGE POWER 3 | ว 8 |
| | 9.2. | 4. OUTPUT POWER AND PPSD | 9 |
| | 9.2. | 5. PEAK EXCURSION | 3 |
| g | 9.3. | 802.11n HT40 MODE IN THE 5.2 GHz BAND | 4 |
| | 9.3. a 2 | 1. 26 ab bandwid i h | 4 6 |
| | 9.3. | 3. AVERAGE POWER | 8 |
| | 9.3. | 4. OUTPUT POWER AND PPSD4 | 9 |
| <u></u> | | | _ |
| UL | VERI | | |

| EUT: GSMCDMAWCDM + LTE Phone Bluetooth, WLAN (2.4GH2 & SGH2) and NFC FCC ID: ZN-VS905 9.4. 802.11ac HT20 MODE IN THE 5.2 GH2 BAND 52 9.4.1. 26 dB BANDWIDTH 55 9.4.3. AVERAGE POWER 58 9.4.4. OUTPUT POWER AND PPSD 59 9.5. 802.11ac HT40 MODE IN THE 5.2 GH2 BAND 63 9.5. 802.11ac HT40 MODE IN THE 5.2 GH2 BAND 63 9.5. 802.11ac HT80 MODE IN THE 5.2 GH2 BAND 70 9.6. 802.11ac HT80 MODE IN THE 5.2 GH2 BAND 70 9.6. 802.11ac HT80 MODE IN THE 5.2 GH2 BAND 70 9.6. 802.11ac HT80 MODE IN THE 5.3 GH2 BAND 71 9.6. 802.11a MDDE IN THE 5.3 GH2 BAND 71 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 80.2 11a MDDE IN THE 5.3 GH2 BAND 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.1.2 Gd B BANDWIDTH 81 9.7.4. OUTPUT POWER AND PPSD 98 98 9.8.4. | REPORT NO: 13U15118-2F | DATE: JULY 19, 2013 |
|---|---|---------------------|
| 9.4.1 26 dB BANDWIDTH | EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC | FCC ID: ZNFVS980 |
| 3.1.1 20 BANDWIDTH | | |
| 9.4.3. AVERAGE POWER. 58 9.4.4. OUTPUT POWER AND PPSD 59 9.5. 802.11 ac HT40 MODE IN THE 5.2 GHz BAND 63 9.5.1. 26 dB BANDWIDTH 63 9.5.2. 99% BANDWIDTH 66 9.5.3. AVERAGE POWER 69 9.5.4. OUTPUT POWER AND PPSD 70 9.6. 802.11 ac HT80 MODE IN THE 5.2 GHz BAND 73 9.6.1. 26 dB BANDWIDTH 73 9.6.1. 26 dB BANDWIDTH 75 9.6.3. AVERAGE POWER 77 9.6.4. 0UTPUT POWER AND PPSD 78 9.7. 802.11 a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH 81 9.7.2. 9% BANDWIDTH 81 9.7.4. OUTPUT POWER AND PPSD 88 9.8.8. 802.11 n H720 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 92 9.8.3. AVERAGE POWER 95 9.8.4. 0UTPUT POWER AND PPSD 98 9.9.9. 802. | 9.4.1. 20 0D DANDWIDTTT | |
| 9.4.4. OUTPUT POWER AND PPSD 59 9.5. 802.11ac HT40 MODE IN THE 5.2 GHz BAND 63 9.5.1. 26 dB BANDWIDTH 63 9.5.2. 99% BANDWIDTH 66 9.5.3. AVERAGE POWER 69 9.5.4. OUTPUT POWER AND PPSD 70 9.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND 73 9.6.1. 26 dB BANDWIDTH 73 9.6.2. 99% BANDWIDTH 73 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7.1. 26 dB BANDWIDTH 81 9.7.1. 26 dB BANDWIDTH 81 9.7.1. 26 dB BANDWIDTH 84 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 92 9.8.3. AVERAGE POWER 93 9.8.4. OUTPUT POWER AND PPSD 93 9.9.8.2 99% BANDWIDTH 93 9.9.9.802.11n HT40 MODE IN THE 5.3 GHz BAND <td>9.4.3 AVERAGE POWER</td> <td>58</td> | 9.4.3 AVERAGE POWER | 58 |
| 9.5. 802.11ac HT40 MODE IN THE 5.2 GHz BAND 63 9.5.1. 26 dB BANDWIDTH. 63 9.5.2. 99% BANDWIDTH. 66 9.5.3. AVERAGE POWER 69 9.5.4. OUTPUT POWER AND PPSD 70 9.6. 802.11ac HT30 MODE IN THE 5.2 GHz BAND 73 9.6.1. 26 dB BANDWIDTH 73 9.6.2. 99% BANDWIDTH 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH 81 9.7.2. 99% BANDWIDTH 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.3. AVERAGE POWER 88 9.8.4. OUTPUT POWER AND PPSD 98 9.9.8.3. AVERAGE POWER 99 9.9.8.4. OUTPUT POWER AND PPSD 103 9.9.1. 26 dB | 944 OUTPUT POWER AND PPSD | 59 |
| 9.5. 802.11ac H140 MODE IN THE 5.2 GHZ BAND 63 9.5.1. 26 dB BANDWIDTH 66 9.5.3. AVERAGE POWER 69 9.5.4. OUTPUT POWER AND PPSD 70 9.6. 802.11ac HT30 MODE IN THE 5.2 GHZ BAND 73 9.6.1. 26 dB BANDWIDTH 73 9.6.2. 99% BANDWIDTH 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 96.6. BANDWIDTH 73 9.6.1. 26 dB BANDWIDTH 81 9.7.1. 26 dB BANDWIDTH 81 9.7.2. 99% BANDWIDTH 84 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHZ BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 92 9.8.3. AVERAGE POWER 92 9.8.4. 0UTPUT POWER AND PPSD 98 9.8.4. 0UTPUT POWER AND PPSD 98 9.8.4. 0UTPUT POWER AND PPSD 99 9.9. 802.11 | | |
| 9.5.1. 26 dB BANDWIDTH. 66 9.5.3. AVERAGE POWER. 69 9.5.4. OUTPUT POWER AND PPSD. 70 9.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND. 73 9.6.1. 26 dB BANDWIDTH. 73 9.6.2. 99% BANDWIDTH. 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND. 81 9.7.1. 26 dB BANDWIDTH. 81 9.7.2. 99% BANDWIDTH. 81 9.7.4. OUTPUT POWER AND PPSD 88 9.8.02.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH. 92 9.8.2. 99% BANDWIDTH. 92 9.8.3. AVERAGE POWER. 98 9.8.4. OUTPUT POWER AND PPSD 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1.2 6 dB BANDWIDTH. 103 9.9.1 802.11ac HT20 MODE IN THE 5.3 GHz BAND 103 9.9.1 | 9.5. 802.11ac HT40 MODE IN THE 5.2 GHz BAND | |
| 9.5.2. 99% BANDWIDTH | 9.5.1. 26 dB BANDWIDTH | |
| 9.5.3. AVERAGE POWER 869 9.5.4. OUTPUT POWER AND PPSD 70 9.6.802.11ac HT80 MODE IN THE 5.2 GHz BAND 73 9.6.1.26 dB BANDWIDTH 73 9.6.2.99% BANDWIDTH 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1.26 dB BANDWIDTH 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1.26 dB BANDWIDTH 92 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 98 9.9.802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1.26 dB BANDWIDTH 103 9.9.3 AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.9.1.26 dB BANDWIDTH 103 103 9.9.2.99% BANDWIDTH 103 103 9.9.3. AVERAG | | |
| 9.5.4. OUTPUT POWER AND PPSD //0 9.6.1 26 dB BANDWIDTH //3 9.6.1. 26 dB BANDWIDTH //3 9.6.2. 99% BANDWIDTH //5 9.6.3. AVERAGE POWER //7 9.6.4. OUTPUT POWER AND PPSD //7 9.6.4. OUTPUT POWER AND PPSD //7 9.6.4. OUTPUT POWER AND PPSD //7 9.7. 802.11a MODE IN THE 5.3 GHz BAND //8 9.7. 802.11a MODE IN THE 5.3 GHz BAND //8 9.7.3. AVERAGE POWER //87 9.7.4. OUTPUT POWER AND PPSD //87 9.8.1 26 dB BANDWIDTH //92 9.8.1 26 dB BANDWIDTH //92 9.8.2 99% BANDWIDTH //92 9.8.3. AVERAGE POWER //98 9.8.4. OUTPUT POWER AND PPSD //98 9.9.802.11n HT40 MODE IN THE 5.3 GHz BAND //03 9.9.1.26 dB BANDWIDTH //103 9.9.3 AVERAGE POWER //107 9.9.4. OUTPUT POWER AND PPSD //108 9.10. 802.11a hT40 MODE IN THE 5 | | |
| 9.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND 73 9.6.1. 26 dB BANDWIDTH. 73 9.6.2. 99% BANDWIDTH. 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 118 9.10. 802.11ac HT20 MODE IN THE 5.3 GHZ BAND </td <td>9.5.4. OUTPUT POWER AND PP3D</td> <td></td> | 9.5.4. OUTPUT POWER AND PP3D | |
| 9.6.1. 26 dB BANDWIDTH. 73 9.6.2. 99% BANDWIDTH. 75 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH. 81 9.7.2. 99% BANDWIDTH. 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n H720 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 92 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 98 9.9. 802.11n H740 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11a C H720 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11a C H720 MODE IN THE 5.3 GHz BAND 111 9.10. | 9.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND | 73 |
| 9.6.2. 99% BANDWIDTH. | 9.6.1. 26 dB BANDWIDTH | 73 |
| 9.6.3. AVERAGE POWER 77 9.6.4. OUTPUT POWER AND PPSD 78 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH 84 9.7.2. 99% BANDWIDTH 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 92 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11a HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.3. AVERAGE POWER 117 9.11.4. OUTPUT POWER AND PPSD 108 9.10.4. | 9.6.2. 99% BANDWIDTH | 75 |
| 9.6.4. OUTPUT POWER AND PPSD .78 9.7. 802.11a MODE IN THE 5.3 GHz BAND .81 9.7.1. 26 dB BANDWIDTH .81 9.7.2. 99% BANDWIDTH .84 9.7.3. AVERAGE POWER .87 9.7.4. OUTPUT POWER AND PPSD .88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND .92 9.8.1. 26 dB BANDWIDTH .92 9.8.2. 99% BANDWIDTH .92 9.8.3. AVERAGE POWER .98 9.8.4. OUTPUT POWER AND PPSD .99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND .103 9.9.1. 26 dB BANDWIDTH .103 9.9.2. 99% BANDWIDTH .103 9.9.3. AVERAGE POWER .107 9.9.4. OUTPUT POWER AND PPSD .108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND .111 9.10.1. 26 dB BANDWIDTH .111 9.10.2 98 BANDWIDTH .111 9.10.3. AVERAGE POWER .111 9.10.4. OUTPUT POWER AND PPSD .118 9 | 9.6.3. AVERAGE POWER | |
| 9.7. 802.11a MODE IN THE 5.3 GHz BAND 81 9.7.1. 26 dB BANDWIDTH 81 9.7.2. 99% BANDWIDTH 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 95 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11a chT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11a chT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11a chT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11a chT40 MODE IN THE 5.3 GHz BAND 111 9.11.4. OUTPUT POWER AND PPSD 118 9.11.2. 99% BANDWIDTH < | 9.6.4. OUTPUT POWER AND PPSD | |
| 9.7.1. 26 db BANDWIDTH. 81 9.7.2. 99% BANDWIDTH. 84 9.7.3. AVERAGE POWER 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 db BANDWIDTH. 92 9.8.2. 99% BANDWIDTH. 92 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 db BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac MT40 MODE IN THE 5.3 GHz BAND 112 9.11. 802.11ac MT40 MODE IN THE 5.3 GHz BAND 112 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND | 9.7. 802.11a MODE IN THE 5.3 GHz BAND | |
| 9.7.2. 99% BANDWIDTH | 9.7.1. 26 dB BANDWIDTH | 81 |
| 9.7.3. AVERAGE POWER. 87 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH. 92 9.8.2. 99% BANDWIDTH. 95 9.8.3. AVERAGE POWER. 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 103 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 112 9.11. 26 dB BANDWIDTH 112 9.10. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11. 26 dB BANDWIDTH 122 9.11. 26 dB BANDWIDTH< | 9.7.2. 99% BANDWIDTH | 84 |
| 9.7.4. OUTPUT POWER AND PPSD 88 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 95 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 105 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 26 dB BANDWIDTH 114 9.11. 26 dB BANDWIDTH 112 9.11. 26 dB BANDWIDTH 122 9.11. 26 dB BANDWIDTH 122 9.11. 26 dB BANDWIDTH 125 9.12. | 9.7.3. AVERAGE POWER | |
| 9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND 92 9.8.1. 26 dB BANDWIDTH 92 9.8.2. 99% BANDWIDTH 95 9.8.3. AVERAGE POWER 98 9.8.4. OUTPUT POWER AND PPSD 99 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND 103 9.9.1. 26 dB BANDWIDTH 103 9.9.2. 99% BANDWIDTH 105 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 111 9.10.3. AVERAGE POWER 111 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 29% BANDWIDTH 114 9.10.4. OUTPUT POWER AND PPSD 112 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12.1. 26 d | 9.7.4. OUTPUT POWER AND PPSD | |
| 9.8.1. 26 dB BANDWIDTH. | 9.8 802 11n HT20 MODE IN THE 5.3 GHz BAND | 92 |
| 9.8.2. 99% BANDWIDTH | 9.8.1. 26 dB BANDWIDTH | |
| 9.8.3. AVERAGE POWER | 9.8.2. 99% BANDWIDTH | |
| 9.8.4. OUTPUT POWER AND PPSD | 9.8.3. AVERAGE POWER | |
| 9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND. 103 9.9.1. 26 dB BANDWIDTH. 103 9.9.2. 99% BANDWIDTH. 105 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 111 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 26 dB BANDWIDTH 112 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.4. OUTPUT POWER AND PPSD 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.8 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 <t< td=""><td>9.8.4. OUTPUT POWER AND PPSD</td><td></td></t<> | 9.8.4. OUTPUT POWER AND PPSD | |
| 9.9.1. 26 dB BANDWIDTH | | 103 |
| 9.9.2 99% BANDWIDTH | 9.9.1 26 dB BANDWIDTH | 103 |
| 9.9.3. AVERAGE POWER 107 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 114 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 125 9.11.4. OUTPUT POWER AND PPSD 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.4. OUTPUT POWER AND PPSD 133 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13 | 9 9 2 99% BANDWIDTH | 105 |
| 9.9.4. OUTPUT POWER AND PPSD 108 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 114 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13.802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. | 9.9.3 AVERAGE POWER | 107 |
| 9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 111 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 143 9.13.2. 99% B | 9.9.4. OUTPUT POWER AND PPSD | |
| 9.10. 802.11ac H120 MODE IN THE 5.3 GH2 BAND 111 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 114 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12. 802.11ac HT80 MODE IN THE 5.6 GHz BAND 133 9.13.1. 26 dB BANDWIDTH 134 9.13.1. 26 dB BANDWIDTH 140 9.13.1. 26 dB BANDWIDTH 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER < | | |
| 9.10.1. 26 dB BANDWIDTH 111 9.10.2. 99% BANDWIDTH 114 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 125 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 137 9.13.1. 26 dB BANDWIDTH 143 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 < | 9.10. 802.11aC H120 MODE IN THE 5.3 GHZ BAND | |
| 9.10.2. 99% DANDWIDTH 114 9.10.3. AVERAGE POWER 117 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 122 9.11.3. AVERAGE POWER 125 9.11.4. OUTPUT POWER AND PPSD 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 137 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 140 9.13.3. AVERAGE POWER 146 Page 4 of 405 146 | | |
| 9.10.3. AVERAGE FOWER 111 9.10.4. OUTPUT POWER AND PPSD 118 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 Page 4 of 405 140 | | |
| 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 140 9.13.3. AVERAGE POWER 140 | | |
| 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND. 122 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 132 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 Page 4 of 405 140 | | |
| 9.11.1. 26 dB BANDWIDTH 122 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 143 9.13.4. Page 4 of 405 146 | 9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND | |
| 9.11.2. 99% BANDWIDTH 125 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 Page 4 of 405 140 | 9.11.1. 26 dB BANDWIDTH | |
| 9.11.3. AVERAGE POWER 128 9.11.4. OUTPUT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 Page 4 of 405 1405 | 9.11.2. 99% BANDWIDTH | |
| 9.11.4. OUTPOT POWER AND PPSD 129 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 Page 4 of 405 1405 | | |
| 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND 132 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 143 9.13.3. AVERAGE POWER 146 | 9.11.4. OUTPUT POWER AND PPSD | 129 |
| 9.12.1. 26 dB BANDWIDTH 132 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 | 9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND | |
| 9.12.2. 99% BANDWIDTH 134 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 | 9.12.1. 26 dB BANDWIDTH | 132 |
| 9.12.3. AVERAGE POWER 136 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 | 9.12.2. 99% BANDWIDTH | 134 |
| 9.12.4. OUTPUT POWER AND PPSD 137 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 | 9.12.3. AVERAGE POWER | |
| 9.13. 802.11a MODE IN THE 5.6 GHz BAND 140 9.13.1. 26 dB BANDWIDTH 140 9.13.2. 99% BANDWIDTH 143 9.13.3. AVERAGE POWER 146 Page 4 of 405 | 9.12.4. OUTPUT POWER AND PPSD | |
| 9.13.1. 26 dB BANDWIDTH | 9.13. 802.11a MODE IN THE 5.6 GHz BAND | |
| 9.13.2. 99% BANDWIDTH | 9.13.1. 26 dB BANDWIDTH | 140 |
| 9.13.3. AVERAGE POWER146 Page 4 of 405 | 9.13.2. 99% BANDWIDTH | 143 |
| Page 4 of 405 | 9.13.3. AVERAGE POWER | 146 |
| | Page 4 of 405 | |

| REPORT NO: 13 | U15118-2F | DATE: JULY 19, 2013 |
|-------------------|------------------------------------|---------------------|
| 9.13.4. | OUTPUT POWER AND PPSD | 147 |
| 9.14. 802. | 11n HT20 MODE IN THE 5.6 GHz BAND | |
| 9.14.1. | 26 dB BANDWIDTH | 151 |
| 9.14.2. | 99% BANDWIDTH | 154 |
| 9.14.3. | AVERAGE POWER | 157 |
| 9.14.4. | OUTPUT POWER AND PPSD | 158 |
| 9.15. 802. | 11n HT40 MODE IN THE 5.6 GHz BAND | |
| 9.15.1. | | |
| 9.15.2. | | |
| 9.15.3. 9.15.4 | OUTPUT POWER AND PPSD | 169 |
| 0.10.4. | | |
| 9.16. 802. | 11ac H120 MODE IN THE 5.6 GHZ BAND | |
| 9.10.1. | 20 00 DAINDWIDTH | |
| 9.16.3 | AVERAGE POWER | |
| 9.16.4. | OUTPUT POWER AND PPSD | |
| 9 17 802 | 11ac HT40 MODE IN THE 5.6 GHz BAND | 184 |
| 9.17.1. | 26 dB BANDWIDTH | |
| 9.17.2. | 99% BANDWIDTH | |
| 9.17.3. | AVERAGE POWER | |
| 9.17.4. | OUTPUT POWER AND PPSD | 191 |
| 9.18. 802. | 11ac HT80 MODE IN THE 5.6 GHz BAND | |
| 9.18.1. | 26 dB BANDWIDTH | 195 |
| 9.18.2. | 99% BANDWIDTH | |
| 9.18.3. | | |
| 9.10.4. | | |
| 9.19. 802. | 11a MODE IN THE 5.8 GHz BAND | |
| 9.19.1. | | 200 |
| 9.19.2 | 99% BANDWIDTH | 209 |
| 9.19.3. | AVERAGE POWER | |
| 9.19.4. | OUTPUT POWER AND PPSD | 213 |
| 9.19.4. | PEAK EXCURSION | 217 |
| 9.20. 802. | 11n HT20 MODE IN THE 5.8 GHz BAND | |
| 9.20.1. | Test Methodology | 218 |
| 9.20.2. | 26 dB BANDWIDTH | 218 |
| 9.20.2. | 99% BANDWIDTH | |
| 9.20.3. | | |
| 9.20.4. | | |
| 9.21. 802. | 11n H140 MODE IN THE 5.8 GHZ BAND | |
| 9.21.1. | 26 dB BANDWIDTH | |
| 9.21.2. | 99% BANDWIDTH | |
| 9.21.3. | AVERAGE POWER | 234 |
| 9.21.3. | OUTPUT POWER AND PPSD | 235 |
| 9.21. 802. | 11ac HT20 MODE IN THE 5.8 GHz BAND | |
| 9.21.1. | Test Methodology | 238 |
| 9.21.2. | 26 dB BANDWIDTH | |
| 9.21.2. | 99% BANDWIDTH | 241 |
| | Page 5 of 405 | |

| REPORT N | O: 13U15118-2F | DATE: JULY 19, 2013 |
|-----------------|---|---------------------|
| EUT: GSM/C | DMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC | FCC ID: ZNFVS980 |
| 9.21.3 | 0. OUTPUT POWER AND PPSD | |
| 9 22 | 802 11ac HT40 MODE IN THE 5.8 GHz BAND | 249 |
| 9.22.1 | . Test Methodology | |
| 9.22.2 | 26 dB BANDWIDTH | 249 |
| 9.22.3 | AVERAGE POWER | |
| 9.22.3 | . OUTPUT POWER AND PPSD | |
| 9.23. 0.23.1 | 802.11ac H180 MODE IN THE 5.8 GHz BAND | |
| 9.23.2 | 26 dB BANDWIDTH | |
| 9.23.1 | . 99% BANDWIDTH | |
| 9.23.2 | | |
| 9.23.3 | PEAK EXCURSION | |
| | | 007 |
| 10. IRA | | |
| 10.1. | TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND | |
| 10.2. | TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BA | ND276 |
| 10.3. | TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BA | ND285 |
| 10.4. | TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND | |
| 10.5. | TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BA | ND302 |
| 10.6. | TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BA | ND311 |
| 10.7. | TX ABOVE 1 GHz 802.11a MODE IN THE 5.6 GHz BAND | |
| 10.8. | TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BA | ND329 |
| 10.9. | TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.6 GHz BA | ND339 |
| 10.1. | TX ABOVE 1 GHz 802.11a HT20 MODE IN THE 5.8 GHz BA | ND349 |
| 10.1. | TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BA | ND358 |
| 10.1. | TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BA | ND367 |
| 10.2. | WORST-CASE BELOW 1 GHz | |
| 11. AC | POWER LINE CONDUCTED EMISSIONS | 376 |
| 12. DYI | NAMIC FREQUENCY SELECTION | |
| 12.1. | OVERVIEW | |
| 12.1.1 | LIMITS | |
| 12.1.2 | TEST AND MEASUREMENT SYSTEM | |
| 12.1.3 | | |
| 12.1.7 | RESULTS FOR 20 MHz BANDWIDTH | 380 |
| 12.2.1 | . TEST CHANNEL | |
| 12.2.2 | RADAR WAVEFORM AND TRAFFIC | |
| 12.2.3 | OVERLAPPING CHANNEL TESTS | |
| 12.2.4 | | |
| 12.3. 12 2 1 | RESULTS FOR 40 MHz BANDWIDTH | |
| 12.3.1 | Page 6 of 405 | |
| | CATION SERVICES INC. | FORM NO: CCSUP4701J |

| 13. | SETUP | PHOTOS | |
|-----|------------|---|---------------------|
| | 12.3.5. | NON-OCCUPANCY PERIOD | 403 |
| | 12.3.4. | MOVE AND CLOSING TIME | |
| | 12.3.3. | OVERLAPPING CHANNEL TESTS | |
| | 12.3.2. | RADAR WAVEFORM AND TRAFFIC | |
| EUT | : GSM/CDMA | WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC | FCC ID: ZNFVS980 |
| REP | ORT NO: 1 | 3U15118-2F | DATE: JULY 19, 2013 |
| | | | |

Page 7 of 405

1. ATTESTATION OF TEST RESULTS

| | STANDARD TEST RESULTS | | | | |
|----------------------|---|--|--|--|--|
| APPLICABLE STANDARDS | | | | | |
| DATE TESTED: | JANUARY 7 TO 25 AN | ND MARCH 14 TO 25, 2013 | | | |
| SERIAL NUMBER: | 99000250000211(CO 256691464000002160 | NDUCTED) AND) (RADIATED) | | | |
| MODEL: | DEL: VS980, LGVS980 and LG-VS980 | | | | |
| EUT DESCRIPTION: | Tri-Band Phone with V | VLAN, Bluetooth, BLE, and NFC | | | |
| COMPANY NAME: | LG ELECTRONICS M 1000 SYLVAN AVENU ENGLEWOOD, NJ 07 | IOBILECOMM USA,INC. JE 7632, USA | | | |

 STANDARD
 TEST RESULTS

 CFR 47 Part 15 Subpart E
 Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL Verification Services Inc. By:

Tested By:

Pai hi

PHILIP KIM WISE PROGRAM MANAGER UL Verification Services Inc.

STEVEN TRAN Wise LAB TECHNICIAN UL Verification Services Inc.

Page 8 of 405

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, ANSI C63.10-2009, RSS-GEN Issue 3, FCC KDB 644545 D01, FCC KDB 644545 D02(Alternative Guidance for 802 11ac V01) and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided: Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.94 dB |

Uncertainty figures are valid to a confidence level of 95%.

Page 9 of 405

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Dual Band phone that also supports BLUETOOTH, WLAN and NFC.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

| Frequency Range | Mode | Output Power | Output Power |
|-----------------|---------------|---------------------|--------------|
| (MHz) | | (dBm) | (mW) |
| 5170-5250 | 802.11a | 12.39 | 17.34 |
| 5170-5250 | 802.11n HT20 | 11.78 | 15.07 |
| 5170-5250 | 802.11n HT40 | 11.62 | 14.52 |
| 5170-5250 | 802.11ac HT20 | 10.44 | 11.07 |
| 5170-5250 | 802.11ac HT40 | 10.72 | 11.80 |
| 5170-5250 | 802.11ac HT80 | 10.52 | 11.27 |
| 5250-5330 | 802.11a | 12.5 | 17.78 |
| 5250-5330 | 802.11n HT20 | 11.61 | 14.49 |
| 5250-5330 | 802.11n HT40 | 12.23 | 16.71 |
| 5250-5330 | 802.11ac HT20 | 10.65 | 11.61 |
| 5250-5330 | 802.11ac HT40 | 10.86 | 12.19 |
| 5250-5330 | 802.11ac HT80 | 10.65 | 11.61 |
| 5490-5730 | 802.11a | 12.16 | 16.44 |
| 5490-5730 | 802.11n HT20 | 11.4 | 13.80 |
| 5490-5730 | 802.11n HT40 | 10.4 | 10.96 |
| 5490-5730 | 802.11ac HT20 | 10.55 | 11.35 |
| 5490-5730 | 802.11ac HT40 | 10.2 | 10.47 |
| 5490-5730 | 802.11ac HT80 | 10.79 | 11.99 |
| 5735-5835 | 802.11a | 11.66 | 14.66 |
| 5735-5835 | 802.11n HT20 | 10.7 | 11.75 |
| 5735-5835 | 802.11n HT40 | 9.92 | 9.82 |
| 5735-5835 | 802.11ac HT20 | 9.42 | 8.75 |
| 5735-5835 | 802.11ac HT40 | 9.09 | 8.11 |
| 5735-5815 | 802.11ac HT80 | 9.17 | 8.26 |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.00 dBi.

5.4. SOFTWARE AND FIRMWARE

Page 10 of 405

REPORT NO: 13U15118-2FDATE: JULY 19, 2013EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFCFCC ID: ZNFVS980The test utility software used during was VS9800RA and firmware used was g2_vzw-userdebug4.2.2 JDQ39B VS9800RA.1368678220.

Page 11 of 405

EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that the Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the X orientation.

Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps 802.11n HT20mode: MCS0 802.11n HT40mode: MCS0

Page 12 of 405

SUPPORT EQUIPMENT

| Support Equipment List | | | | | | | |
|---|---------|-------------|-----|-----|--|--|--|
| Description Manufacturer Model Serial Number FCC ID | | | | | | | |
| AC Adapter | TEN PAO | MCS-04WT2 | N/A | N/A | | | |
| Earphone | I-SOUND | EAB62729001 | N/A | N/A | | | |

I/O CABLES

| I/O Cable List | | | | | | | |
|----------------|--|-------|-----------|------------|------------|-----|--|
| Cable | Cable Port # of identical Connector Cable Type Cable Remarks | | | | | | |
| No | | ports | Туре | | Length (m) | | |
| 1 | DC Power | 1 | Mini-USB | Shielded | 1.2m | N/A | |
| 2 | Audio | 1 | Mini-Jack | Unshielded | 1.0m | N/A | |

TEST SETUP

The EUT is setup as a stand-alone device.

Page 13 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC SETUP DIAGRAM FOR TESTS



Page 14 of 405

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List | | | | | | | |
|--------------------------------|----------------|-------------|--------|------------|--|--|--|
| Description | Manufacturer | Model | Asset | Cal Due | | | |
| Spectrum Analyzer, 44 GHz | Agilent / HP | E4446A | C00986 | 4/1/2014 | | | |
| Spectrum Analyzer, 26.5 GHz | Agilent / HP | E4440A | C01179 | 2/26/2014 | | | |
| EMI Test Receiver, 30 MHz | R & S | ESHS 20 | N02396 | 8/8/2013 | | | |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | C00580 | 1/28/2014 | | | |
| Preamplifier, 26.5 GHz | Agilent / HP | 8449B | C01063 | 10/22/2013 | | | |
| Preamplifier, 40 GHz | Miteq | NSP4000-SP2 | C00990 | 8/2/2013 | | | |
| Antenna, Bilog, 30MHz-1 GHz | Sunol Sciences | JB1 | N/A | 3/6/2014 | | | |
| Antenna, Horn, 18 GHz | ETS | 3117 | C01022 | 2/21/2014 | | | |
| Antenna, Horn, 26.5 GHz | ARA | MWH-1826/B | C00589 | 12/17/2013 | | | |
| Peak Power Meter | Agilent / HP | E4416A | C00963 | 12/13/2013 | | | |
| Peak / Average Power Sensor | Agilent / HP | E9327A | C00964 | 12/13/2013 | | | |
| LISN, 30 MHz | FCC | 50/250-25-2 | C00626 | 01/14/14 | | | |
| Reject Filter, 5.725-5.825 GHz | Micro-Tronics | BRC13192 | N02676 | CNR | | | |

Page 15 of 405

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

| 7.1. O | | AND DU | JIY CYCL | E RES | ULIS | | | |
|----------------|----------------|--------|-------------------|-------|--------------------------|-------------|--|--|
| Mode | ON Time | Period | Duty Cycle | Duty | Duty Cycle | 1/B | | |
| | В | | х | Cycle | Correction Factor | Minimum VBW | | |
| | (msec) | (msec) | (linear) | (%) | (dB) | (kHz) | | |
| 802.11a 20 MHz | 2.065 | 2.165 | 0.954 | 95.4% | 0.21 | 0.484 | | |
| 802.11n HT20 | 1.920 | 2.020 | 0.950 | 95.0% | 0.22 | 0.521 | | |
| 802.11n HT40 | 0.9267 | 1.037 | 0.894 | 89.4% | 0.49 | 1.079 | | |

. DEALU

7.2. **DUTY CYCLE PLOTS**

| en | ter F | req | 5.2000 | 000000 G | iHz PNO: Fast | | Trig Free F | bun | Avg | Type: Lo | Ig-Pwr | 1138 | NACE 1 2 3 4 5 TITE MOMMAN | 5.6 Frequency | Ē. |
|------------------------------|-----------------|--------------|--------------|----------|----------------------------|-----|-----------------------------------|---------|--------|----------|--------|---------|-------------------------------|------------------------|------------|
| | 1000 | Re | Offset 1 | 2 dB | 9 Garin:Lav | | Atten: 10 d | | | | Δ | Mkr3 | 2.165 m | Auto T | une |
| 0 de | Sidiv sile-a | Re | 1 20.00 | dBm | Vigilia | | w. gidlange ikk | Norther | in the | and a | 304 - | فليسيعا | Malandaula | | _ |
| 10.0 | (| | | | | | | | | | | | | Center F 5 20000000 | GH: |
| 20.0 20.0 20.0 40.0 | | | | | | | | | | | | | | Start F 5.200000000 | GH |
| 0.0 0.0 | | | | | | | | | | | | | | Stop F 5.20000000 | rec GH |
| en | ter 5 BW | 2000 8 MH | 000000 Iz | GHz | #\ | BW | 50 MHz | _ | - | Sw | eep 5. | .000 m | Span 0 H s (1001 pt | Hz CF S 8.000000 | iteş MH |
| | | 120 120 | 100 | - | 065 mt | (A) | 0.05 4 | 1 100 | CITUR | AUNCOL | N WOTH | HIS | TEN VALUE | Auto | Mar |
| 2 2 4 5 | F.4 | 1 | ίΔ) | 1 | 460 ms 166 ms 460 ms | (Δ) | 13.96 dBn 0.21 dl 13.96 dBn | 1. 3 | | | | | | FreqOf | fse 0 H |
| 9 7 8 9 | | | | | | _ | | | | | | | | | |

Page 16 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| Frequency | TIACE 1 2 3 4 5 5 | e: Log-Pwr | Avg | Trig Free Run | Fast -+- | 0000 GHz | 5.200000 | Freq | nter | | |
|----------------|---|--------------|---------------|--------------------------|--------------|------------------|--------------|---------|------|--|--|
| Auto Tuni | B GaintLaw Attack 18 dB ΔΔMkr3 2.020 ms Ref 076act 12 dB ΔΔMkr3 2.020 ms D dF 20 00 cHarp 0.43 dB | | | | | | | | | | |
| | 0.45 dB1 | to do d and | ALL AREAS | and to be a local second | | Sm Withoultin | f 20.00 dE | Ref | | | |
| Center Free | Compare indiana and a sol | ul's a self- | | Banan Dakinley | Part and | Margared | or store in | mary | 0 | | |
| 5.290000000 GH | | - | | | | | - | - | a — | | |
| | | | _ | | - | | | - | 0 | | |
| Start Free | | - | | | | | - | - | 0 | | |
| 5 20000000 GH | | - | | - | | | - | - | n | | |
| | 1. | - | | | | 14 | | - | θ | | |
| 0200233 | I | | _ | | | | | - | 0 | | |
| Stop Free | | - | | | - | | | - | 0 | | |
| 5.20000000 GH. | | - | | - | | | | - | 0 | | |
| | Span 0 Hz | 10 A | | and the second | and a second | łz | 00000 GH | 5.2000 | nter | | |
| B 000000 MH | 3.000 ms (601 pts) | Sweep 3 | | 50 MHz | #VBW | 000 A | z | 8 MH | s BW | | |
| Auto Mar | HINGTON VALUE | NOTON MOTION | HARRON | | | 8 | 1000 | 100 500 | MOOS | | |
| | | 2000 - CO. | - AMARDANIA | -0.67 dB | ms (Δ) | 1.920 m | (4) | 1 | A2 | | |
| Freq Offse | | | | 0.43 dB | ms (A) | 2.020 m | (<u>A</u>) | i | 44 | | |
| 0 H | | - | | 13.76 dBm | us . | 0.089 | | 1 | | | |
| | | | | | _ | | | _ | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | - | | | | - | | |

| Frequency | THE NUMBER OF | 11.003 | Log-Pwr | Avg Typ | in | Trig Free R | | Hz PNO: Fast | 0000 GH | 3000 | 5.23 | r Freq | nte |
|-------------------------------|---------------------------|--|------------|---------|--------|----------------------|------------|-------------------|--------------|-------|------------|------------------|--------------|
| Auto Tun | 1.037 ms | Ref Offset 12.5 dB ΔMkr3 1.037 ms 0 dB/dlv Ref 20.00 dBm -1.28 dB | | | | | | | | | | | |
| Center Free 5.230000000 GH | and and a second | | 64 | 142 | e'nees | henne | and a | ليعدارحها | الحدود حريدة | Wa. | | -eyste | - |
| Start Free 5 230000000 GH | | | | | | | - | | | | | | |
| Stop Free 5.230000000 GH | | | | had | | | | | | 4 | he | | |
| CF Step 8 000000 MH | Span 0 Hz ms (601 pts) | 2.000 m | Sweep | | | 50 MHz | VBW | #\ | Hz | 000 G | 0000 Iz | 5.2300 N 8 MH | nter 5 Bl |
| Auto Mar | STATUS VILLE | HINC | ALCH MEDIN | IN NO | 100 | 5.28 dB | <u>(Δ)</u> | 26.7 µs | 92 | | (4) | | |
| Freq Offse 0 H | | | _ | - | | -1.28 dB 7.30 dBm | (Δ) | 037 ms 28.7 µs | 1,0 |) | (4) | į | M |
| | | | _ | - | | | | _ | | | | | |
| | | | | | | | | | | | | | _ |

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Page 17 of 405

| Cen | ter F | req | 5.200 | 0000 | 000 G | 1z NO: Fast | | Trig Free Atten: 16 | Run | 1 | eAvg Ty | pe: Log-Pwr | 10 | CE 1 2 3 4 5 5 | Frequency |
|-------|----------------|--------------|------------|-----------------|--|----------------|----------|------------------------|-------|-------|---------|--------------|---------|--------------------------|----------------------------|
| 10 di | B/div | Re | offse | t 12 d 00 dE | B | GIERLEON | | 74411 10 | | | | L | Mkr3 2 | .025 ms | Auto Tuni |
| .0g | -two- | 440 | sharry. | well } | "glack | Hurber | 400 | deallan | eddun | nelit | 344 | aprolationsk | *** | phanel Response | Contra Con |
| 0.00 | 0 | | | | 2.2 | | | | | | | | | | 5 20000000 GH |
| 10.0 | - | _ | | - | | - | - | | | - | | - | - | | |
| 20.0 | | _ | | - | | | - | | | -+ | - | - | - | (8.17. Pm | Frank Frank |
| 30 D | - | _ | _ | - | - | - | - | | _ | - | - | - | - | | 5 20000000 GH |
| 40.8 | - | - | | - | <u>. </u> | - | + | | - | - | - | - | - | | o zoneoooo on |
| 50.0 | - | - | | | | | + | | | - | | - | - | | - |
| 0.06 | - | | _ | | | | + | | - | - | | - | - | | Stop Free 5 20000000 GH |
| 70.0 | | | | | | | + | | | - | | | | | a good door dri |
| Cen | ter 5. BW 8 | 2000 8 MH | 00000 z | 0 GH | iz | #VE | 3W | 50 MHz | | | | Sweep | 5.000 m | Span 0 Hz s (601 pts) | CF Ster 8.000000 MH |
| | | | (4) | | 15 | 25 ms (| A) | 2.98 | 8 | HALTO | N N | NCTION WOTH | HINCT | | Auto Ma |
| 2 | F. | i | 105 | | 16 | 62 ms | A1 | 12.75 dE | m | | | | - | | E |
| 4 | 7 | î | 1220 | | 12 | 62 ms | <u>.</u> | 12.75 dt | Im | | | | | | Frequise |
| 5 | | - | | | | - | | | | | | | | | 0.8.9 |
| 8 | | - | | | | | | | | | | | | | |
| 9 | - | - | - | | | - | _ | | | | | | - | | |
| 11 | _ | | - | | | | | | _ | | | | - | | |

| | - III. | 51.0 | DC 1 | | | | - | | | AUGUAUTO. | 12:34 | 44 PM Mar 27, 2012 | [|
|--|----------------|----------|---------|-------------------|-----|--------|--------|----------|----------|---------------|---------|---------------------------|-------------------------------|
| Center I | req 5. | 23000 | 00000 G | Hz | | Tria F | ree Ru | | #Avg Typ | e: Log-Pur | - Denix | TRACE 1 2 3 4 5 5 | Frequency |
| | | | | Gaint a | | Atten | 18 dB | S. | | | maco | DET P NIVINI N | |
| Ref Offset 12 dB ΔMkr3 1.050 ms 10 dB/div Ref 20.00 dBm 0.68 dB | | | | | | | | | | Auto Tune | | | |
| -og | 1.01. | | St | | | | 14 32 | 4. | AL. | d Inle | L | a data be | 102808000000 |
| 0.00 | | Xe | | de loca | | - | T | | | | | Are the spec | Center Free 5.230000000 GH |
| 20.0 | | _ | | - | _ | - | | - | _ | | | | Start Fre |
| 40.0 | | An | | | | - | ~ | - | | | 100 | | 5.230000000 GH |
| ac.o | | | | | | | | | | | | | Stop Fre 5,230000000 GH |
| Center 5 Res BW | 23000 8 MHz | 0000 0 | BHz | #\ | BW | 50 MH | z | - | | Sweep | 3.000 | Span 0 Hz ms (601 pts) | CF Ster |
| | 100 510 | | 8 | | | - | | Hatt | 01 100 | NATION WARTER | | CINE WILLIE | Auto Mar |
| 1 A2 | 10 | 0.0 | | 60.0 µs | (Δ) | 4.99 | 2 dBm | 1.111/14 | | 200-201 | 1. 20.2 | | - |
| 4 P | t G | <u>a</u> | 1 | 050 ms 60 0 µs | (6) | 0.6 | dBm | | | | | | Freq Offse 0 H |
| 5 | | | | | | | - | | - | | - | | |
| 8 | | | | | | | _ | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | ++ | | | | - | | | | - | | - | | |

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Page 18 of 405

8. MEASUREMENT METHOD

The Duty Cycle is less than 98% and consistent therefore KDB 789033 Method SA-2 is used for .power and PPSD

The Duty Cycle is less than 98% and consistent, KDB 789033 Method AD with Power RMS Averaging and duty cycle correction is used.

Page 19 of 405

9. ANTENNA PORT TEST RESULTS

9.1. 802.11a MODE IN THE 5.2 GHz BAND

9.1.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5180 | 20.150 |
| Mid | 5200 | 20.100 |
| High | 5240 | 20.075 |

Page 20 of 405





Page 21 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 22 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5180 | 16.607 |
| Mid | 5200 | 16.652 |
| High | 5240 | 16.584 |

Page 23 of 405





Page 24 of 405

| Center Freq 5,240000000 GHz Center Freq 5,24000000 GHz Radio Stat None #I Gata ov #I Gat | | | | | | | | | | | Frequency | |
|--|-----------------------------------|-----|------------|-------------|-----------|-----------|----------------------|---|------------|-------------|--------------------------------|--|
| 10 dB/div | Ref Offset 12 dB Ref 20.00 dBm | | | | | | | | | | | |
| 10.0 0.00 | | | (datab) | andri | e alterna | R (vhere | | | | | Center Freq 5.240000000 GHz | |
| 10.0 20.0 | | al. | y attedd. | ad di la va | Alberidio | . it. it. | ų | 1 | | | | |
| 400 800 | unum da junita | h. | | | | | 1 | hing the second | atuar. | alaalistat. | | |
| 70.0 | alter d | | | | | | | | 1 thed | a la h | CF Step | |
| Center 5.24 Res BW 47 | I GHZ 0 KHZ | | | #VE | 3W 1.5 M | Hz | | | Spa Swi | eep 1 ms | Auto Man | |
| Occupie | ed Bandwidtl 16 | 58- | 4 Mł | ۰łz | Total P | ower | | 11.0 | dBm | | Freq Offset 0 Hz | |
| Transmit Freq Error 44.872 kHz x dB Bandwidth 20.46 MHz | | | dHz NHz | OBW P | ower | | 99.00 % -26.00 dB | | | | | |
| 490 | | | | | | | - | STATUS | i i | | | |

Page 25 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5180 | 12.39 |
| Mid | 5200 | 12.32 |
| High | 5240 | 12.17 |

Page 26 of 405

9.1.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 27 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5180 | 20.150 | 16.607 | -6.40 |
| Mid | 5200 | 20.100 | 16.652 | -6.40 |
| High | 5240 | 20.075 | 16.584 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5180 | 17.00 | 22.20 | 28.60 | 17.00 | 4.00 | 10.00 | 4.00 |
| Mid | 5200 | 17.00 | 22.21 | 28.61 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5240 | 17.00 | 22.20 | 28.60 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 12.826 | 13.04 | 17.00 | -3.96 |
| Mid | 5200 | 11.487 | 11.70 | 17.00 | -5.30 |
| High | 5240 | 11.226 | 11.44 | 17.00 | -5.56 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 1.486 | 1.70 | 4.00 | -2.30 |
| Mid | 5200 | -0.494 | -0.28 | 4.00 | -4.28 |
| High | 5240 | 0.009 | 0.22 | 4.00 | -3.78 |

Page 28 of 405

| enter F | req 5.1 | 8000 | 00000 G | iHz PNO: Wid | | Trig Free | Ru | Avg AvgP | Type: RMS fold: 100/10 | 0 | 7 | ACE 1 2 3 4 5 5 THE A MANNIN H | Frequency |
|------------------------------|-------------------|------------------|-----------|-----------------|-----|-----------|----|-------------|---------------------------|-------|----------------|-----------------------------------|------------------------------|
| 10 dB/div | Ref Of | set 12 0.00 c | dB JBm | FGainta | W | Allen: 10 | ab |) | Band F | Mkr2 | 5.18 er 12. | 0 00 GHz 826 dBm | Auto Tuni |
| 10.0 0.00 | | | - | Q1. | | | 2 | | | ~ | - | | Center Free 5.18000000 GH |
| 20.0 20.0 20.0 40.0 | | 7 | | | | | | | | | Y | SIS DE | Start Free 5.16500000 GH |
| 0.0 0.0 | - | | | | | | | _ | - | | - | | Stop Free 5.19500000 GH |
| enter 5. Res BW | 18000 (1.0 MH | 3Hz Z | - | #1 | /BW | 3.0 MHz | | Sv | veep (#S | wp) | Span 1.00 m | 30.00 MHz is (601 pts) | CF Step 3.000000 MH |
| | | | 5 174 | 60 CH+ | (4) | 1.495.46 | | PERCENCE | AINCHORY | ESTH. | HINC | | <u>Auto</u> Mar |
| 2 N 3 4 5 | 1 m | | 5.180 | CO GHZ | 101 | 0.003 di | 3m | Sand Power | 20.401 | WHz | | 12.626 dBm | Freq Offse 0 H |
| 7 8 9 10 | | | | | | | | | | | | | |



Page 29 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter F | req | 5.240 | 000 | 0000 | GHz PNO: W | 101 -+ | Trig Fre | e Ru | Avg | Type: RMS Hold: 100/100 | 1.00 | 106-26 190 1 | PM May 22, 2012 CE 1 2 3 4 5 5 TE A 94444449 PM May 22, 2012 | Frequency |
|--------------------------------|---------------|--------------|------|------------|--------------------|--------|-----------------------|-----------------------|------------|----------------------------|------------|--------------------|---|------------------------------------|
| 0 dB/div | Ref Ref | Offset | 12 d | iB Bm | If Gainch | aw | Atten: 18 | B |) | Mk Band Pov | 25 ver | .240 | 00 GHz 26 dBm | Auto Tune |
| og (00) | | | | ~ | | | 01 | 0 ² | | _ | | | | Center Free 5.240000000 GH |
| 00 200 200 200 | | / | Å | | | _ | | | | | 2 | 2 | -31.00 m | Start Free 5 22500000 GH |
| 0.0 | | | | | | | | | | - | | | Trans | Stop Free 5.25500000 GH |
| enter 5. Res BW | 2400 1.0 P | 0 GH: MHz | z | | 4 | #VBW | 3.0 MHz | | S | weep (#Swp | S) 1.0 | pan 1 00 ma | 30.00 MHz s (601 pts) | CF Step 3.000000 MH Auto Mar |
| 1 N 2 N 3 4 5 5 | 1 | (4) | | 523 524 | 8 50 GH 0 00 GH | | 0.009 di -1.038 di | Bm. Bm. | Band Power | 20.30 MHz | | 1 | 11.226 dBm | Freq Offse 0 H |
| 7 8 9 10 | | | | | | | | | | | | | | |

Page 30 of 405

9.1.5. PEAK EXCURSION

<u>LIMITS</u>

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

RESULTS

| Channel | Frequency | PK Level | PSD | DCCF | Peak Excursion | Limit | Margin |
|---------|-----------|----------|-------|------|----------------|-------|--------|
| | (MHz) | (dBm) | (dBm) | (dB) | (dB) | (dB) | (dB) |
| Mid | 5200 | 9.02 | -0.28 | 0.20 | 9.10 | 13 | -3.90 |

PEAK EXCURSION



Page 31 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

9.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

9.2.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5180 | 21.00 |
| Mid | 5200 | 20.83 |
| High | 5240 | 20.96 |

Page 32 of 405





Page 33 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 34 of 405

9.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5180 | 17.828 |
| Mid | 5200 | 17.861 |
| High | 5240 | 17.828 |

Page 35 of 405

| Sweep/Control | Radio Stat None | ALIZIAJTO | 0000 GHz | Freq: 5.100 | Center | i 1. | 51 A 52 | oints 601 | |
|-------------------|---------------------------|-----------|----------|-------------|--------|---------------------|-----------------------------------|-------------------------|--|
| Sweep Time | Radio Device: BTS | | | 18 dB | #Atten | #FGain:Low | | | |
| Auto Man | | | 10 | | | 1 | Ref Offset 12 dB Ref 20.00 dBn | 10 dB/div | |
| Sweep Setup | | | | | 20 | | | 10.0 | |
| | | - | 14/14/ | 制作用 | 物种物 | 144 | | 10,0 | |
| Paus | | | | | - | 1 | | 20.0 | |
| | | ñ | | | | J.FI | 1 | 30.0 40.0 | |
| | Wanter they | T WHY | | 4 | | ₽' | property set | ma weekly | |
| | 1 d. Arabah Mal | 101 002 | | - | - | | | 80.0 0 1 1 1 | |
| | | | | | | | | 70.0 | |
| | Span 50 MHz Sweep 1 ms | | Hz | /BW 1.6 | # | | GHZ 0 kHz | Center 5.18 Res BW 5 | |
| Gate [off, Lo] | Total Power 12,4 dBm | | | | MHz | h 7.828 N | ccupied Bandwidth 17.828 | | |
| Beint | .00% | 99.00 % | | | 7 kHz | eq Error 82.387 kHz | | Transmit | |
| 60 | 00 dB | -26.0 | | x dB | 1 MHz | 19.91 | fwidth | x dB Ban | |



Page 36 of 405
| Frequency | Strike Col Strike Col Strike Col Strike Col 15,2400000000 GHz Contert Free, S. 240000000 GHz Rodio Stat. None 15,240000000 GHz Free Run Rodio Stat. None Attribution Attribution Rodio Stat. None Attribution Attribution Rodio Stat. None Attribution Attribution Rodio Stat. None | | | | | | | | | ter Fred | | |
|--------------------------------|---|-----------------------|----------|----------|---------|----------------------------------|--|----------------|------------------------|---------------------|--|--|
| | | | | | | | | 12 dB 0 dBm | Ref Offset Ref 20.0 | B/div | | |
| Center Free 5.240000000 GH: | | | | | | | | | | | | |
| | | - | | 治市市川市の | inite a | phylip | 1 | | | | | |
| | | - | N. | | | - | 1 | | | | | |
| | | - | 1 | | _ | | ł | - ul | - | - | | |
| | | h batte | 14 Marsh | | | | 1 | hy Mill | 10.180 | | | |
| | per hubbres | and advertisially the | a dell'A | | | | | ish. | houde | 1 Party | | |
| CF Step | | | | | | | | | | | | |
| Auto Mar | an 50 MHz veep 1 ms | Spa Swi | | 1.6 MHz | #VE | | | | GHz I0 kHz | ter 5.24 s BW 51 | | |
| Freq Offse 0 H; | | .8 dBm | 11.8 | al Power | 1 | Occupied Bandwidth 17.828 MHz | | | | | | |
| | | 9.00 % | 95 | W Power | | 1.30 k | Transmit Freq Error 111.30 k x dB Bandwidth 20.67 M | | | | | |
| | | 5.00 dB | -26. | в | | .67 M | | | | | | |

Page 37 of 405

9.2.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5180 | 11.70 |
| Mid | 5200 | 11.37 |
| High | 5240 | 11.78 |

Page 38 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 39 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5180 | 21.00 | 17.828 | -6.40 |
| Mid | 5200 | 20.83 | 17.861 | -6.40 |
| High | 5240 | 20.96 | 17.828 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5180 | 17.00 | 22.51 | 28.91 | 17.00 | 4.00 | 10.00 | 4.00 |
| Mid | 5200 | 17.00 | 22.52 | 28.92 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5240 | 17.00 | 22.51 | 28.91 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB) 0.22 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 11.234 | 11.45 | 17.00 | -5.55 |
| Mid | 5200 | 10.237 | 10.46 | 17.00 | -6.54 |
| High | 5240 | 9.732 | 9.95 | 17.00 | -7.05 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | -0.148 | 0.07 | 4.00 | -3.93 |
| Mid | 5200 | -1.297 | -1.08 | 4.00 | -5.08 |
| High | 5240 | -1.986 | -1.77 | 4.00 | -5.77 |

Page 40 of 405

| enter F | req 5. | 18000 | 0000 GH | łz 10. Wie | | Trig Fre | e Ru | n Avg N Avgit | Type: RMS fold: 100/100 | 10/11/00 | ACE 1 2 3 4 5 5 | Frequency |
|------------------------------|----------------|-------------------|-----------|---------------|-----|------------|----------------|------------------|----------------------------|----------------|--------------------------|-------------------------------|
| 0 dB/div | Ref 0 Ref 2 | 00 GHz 234 dBm | Auto Tune | | | | | | | | | |
| (0.0) (0.0) | | | | - | *** | <u>0</u> 1 | ¢ ² | | | | * | Center Free 5.18000000 GH: |
| 20.0 20.0 20.0 40.8 | | / | | | | | | | | / | -35.11.004 | Start Free 5.16500000 GH |
| 10.0 10.0 | | | | | | | | - | | | / | Stop Free 5.19500000 GH |
| enter 5. Res BW | 18000 1.0 M | GHz Hz | | #V | BW | 3.0 MH | r* | S | veep (#Swp) | Span 1.00 m | 30.00 MHz s (601 pts) | CF Step 3.000000 MH |
| | | 44 | | | (Å) | 0.149.4 | 2 | HIRCOON | AUNCHOR MEDTAL | HISC | | Auto Mar |
| 2 N 3 4 5 5 | 1 | | 5.100.0 | 0 GHz | 101 | -2.332 d | Bm. | Band Power | 20.70 MHz | | 11.234 dBm | Freq Offse 0 H |
| 7 8 9 10 | | | | | _ | | | | | | | |



Page 41 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Fr | eq 5.24 | 000000 | 00 GHz | | irig: Free R | Avg un Avg | Type: RMS Hold: 100/100 | TRACE 1 2 3 4 5 5 TUTE A MANNAN | Frequency |
|-------------------------------------|----------------------|--------------------|--------------------------|------------|------------------------|---------------|----------------------------|-------------------------------------|------------------------------------|
| 0 dB/div | Ref Offse Ref 20. | et 12 dB 00 dBm | IF GaincLas | Auto Tune | | | | | |
| og 10.0 0.00 | | | | - 5 | 1 0 | | | | Center Free 5.240000000 GH: |
| 10.0 10.0 10.0 | | | | | | | | | Start Free 5.22500000 GH |
| 0 0 0 0 0 0 | | | | | | _ | | | Stop Free 5 25500000 GH |
| enter 5.2 Res BW | 4000 GH | 4z | #\ | /BW 3. | 0 MHz* | S | weep (#Swp) | Span 30.00 MHz 1.00 ms (601 pts) | CF Step 3.000000 MH Auto Mar |
| 1 N 2 N 3 4 5 5 7 | τ τ | 1 | 237 65 GHz 240 00 GHz | (Δ) - - | 1.986 dBm 3.571 dBm | Eand Power | 20.90 MHz | 9.732 dBm | Freq Offse 0 H |
| 8 9 10 11 | | | | | | | | | |

Page 42 of 405

<u>LIMITS</u>

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

<u>RESULTS</u>

| Channel | Frequency | PK Level | PSD | DCCF | Peak Excursion | Limit | Margin |
|---------|-----------|----------|-------|------|----------------|-------|--------|
| | (MHz) | (dBm) | (dBm) | (dB) | (dB) | (dB) | (dB) |
| Mid | 5200 | 8.928 | -1.08 | 0.22 | 9.79 | 13 | -3.21 |

PEAK EXCURSION



Page 43 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

9.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

9.3.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5190 | 39.8 |
| High | 5230 | 39.4 |

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Page 44 of 405





Page 45 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5190 | 36.481 |
| High | 5230 | 36.570 |

Page 46 of 405

| Center Fre | q 5.19000 | Frequency | | | | | | | | |
|------------------------|-------------------------------|------------------|----------|-----------|------------------------------------|------------|------|-------|--------------|-------------------------------|
| 10 dB/div | Ref Offset Ref 20.00 | 12.5 dB) dBm | | | | 5.00 | | | | |
| 10.0 | | | | | | | | | | Center Freq 5.19000000 GHz |
| 10.0 | 1 | | enter ma | A ADALINA | y familie | keepla and | | | | |
| 20.0 | | -1 | 122 | 1.55 | | | | | | |
| 40.0 | AND AND A | all' | | - | | | h. | | | |
| 800 800 WWW | and and | | | | | | .h.d | 特纳特有 | Plantakyotha | |
| 75.0 | | | | | | | | | | CF Step |
| Center 5.1 Res BW 1 | 9 GHz MHz | | | #\ | /BW 3 MHz | 8 | | Swi | eep 1 ms | <u>Auto</u> Man |
| Occupi | ed Band | width 36.4 | 481 M | Hz | Total Po | wer | 12.0 | dBm | | Freq Offset 0 Hz |
| Transmi | ransmit Freq Error 165.08 kHz | | | | Error 165.08 kHz OBW Power 99.00 % | | | | | |
| x dB Ba | B Bandwidth 38.78 MHz | | | | | | -26. | 00 dB | | |



Page 47 of 405

9.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5190 | 11.62 |
| High | 5230 | 11.54 |

Page 48 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 49 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional | |
|---------|-----------|-------|------------|-------------|--|
| | | 26 dB | 99% | Gain | |
| | | BW | BW | | |
| | (MHz) | (MHz) | (MHz) | (dBi) | |
| Low | 5190 | 39.8 | 36.481 | -6.40 | |
| High | 5230 | 39.4 | 36.570 | -6.40 | |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5190 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5230 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB)0.49Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|-------------------------|------------------------|----------------|-----------------------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | | (dDma) | (al Dura) | (al Dara) | |
| | | (авт) | (авт) | (авт) | (aB) |
| Low | 5190 | (авт) 11.704 | (авт) 12.19 | (dBm) 17.00 | (dB) -4.81 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|----------------------|-----------------|----------------|----------------------|---------------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | | | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | (MHz) 5190 | (dBm) -2.488 | (dBm) -2.00 | (dBm) 4.00 | (dB) -6.00 |

Page 50 of 405

| enter F | req 5.1900 | 000000 G | Hz NO: Fast | Trig Pr | ee Run | Avg 1 AvgH | ype: RMS old: 100/100 | 112.560 | TYTE A WWWWW | Frequency |
|-------------------------|---------------------------|------------------|----------------|----------|----------------|---------------|--------------------------|-------------------|-----------------------------|-----------------------------|
| 0 dB/div | Ref Offset 1 Ref 20.00 | 12.5 dB 0 dBm | GainLow | Atten | IS dB | | Mk Band Po | r2 5.19 wer 11 | 0 00 GHz 704 dBm | Auto Tuni |
| | | | | 01 | ¢ ² | | | | | Center Fre 5.19000000 GH |
| 0.0 0.0 | | I | | | | | 1 | | .25 M | Start Fre 5.15500000 GH |
| | | | | | | | | | | Stop Fre 5 22500000 GH |
| enter 5. Res BW | 19000 GHz 1.0 MHz | | #VBI | W 3.0 MH | z* | Sw | veep (#Swj | Spar 5) 1.00 r | n 70.00 MHz ns (601 pts) | CF Ste 7.000000 MH |
| 1 N | f. (Δ) | 5.185 (| BO GHZ IA | -2.488 | 1Bm | PURCTION | HINGTON MEDI | H HUS | | <u>Auto</u> Ma |
| 2 N 3 4 5 5 | 1 | 5.190 (| 20 GHz | -8.309 | 115m5 | and Prover | 39.20 MH | | 11.704 dBm | Freq Offse 0 H |
| 7 8 9 0 | | | | | | | | | | |



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Page 51 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

9.4. 802.11ac HT20 MODE IN THE 5.2 GHz BAND

9.4.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| (MHz) | | (MHz) |
| Low | 5180 | 20.710 |
| Mid | 5200 | 20.670 |
| High | 5240 | 20.790 |

Page 52 of 405





Page 53 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 54 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5180 | 17.881 |
| Mid | 5200 | 17.932 |
| High | 5240 | 17.876 |

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Page 55 of 405





Page 56 of 405

| Center Fre | q 5.240000000 | GHz #FGale:Low | Center Fr Trig Free ØAtten: 2 | req: 5.2400 e Run 0 dB | 00000 GHz | ALTRACTO. | Radio Stat | MMay 27, 2010 None ice: BTS | Frequency |
|--------------|-----------------------------------|-------------------|-------------------------------------|------------------------------|-----------|-----------|------------------|-----------------------------------|-------------------------------------|
| 10 dB/div | Ref Offset 12 dB Ref 20.00 dBm | | | | | | | | |
| 10.0 0.00 | | uittitu | Laterar | anad | asilind 6 | | | | Center Freq 5.24000000 GHz |
| 10.0 20.0 | | 1 Ann | a. Auth. | a la dud | us ti ha | ù. | | | |
| 40.0 | a solution of | AL_ | _ | | | Ha. | - | | |
| en H | Alternation | T | | | | , and the | 制物 | r Y Y Y Y Y | |
| Center 5.24 | GHz 10 kHz | | #VE | BW 1.6 P | WHz | | Spa | n 50 MHz | CF Step 5.000000 MHz Auto Man |
| Occupie | ed Bandwidth 17 | 876 M | Hz | Total P | ower | 11.0 | 6 dBm | | Freq Offset 0 Hz |
| Transmit | Freq Error | 9.099 20.65 | kHz MHz | OBW F | Power | 99 -26 | 9.00 % .00 dB | | |

Page 57 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5180 | 10.25 |
| Mid | 5200 | 10.44 |
| High | 5240 | 10.14 |

Page 58 of 405

9.4.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 59 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5180 | 20.710 | 17.881 | -6.40 |
| Mid | 5200 | 20.670 | 17.932 | -6.40 |
| High | 5240 | 20.790 | 17.876 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5180 | 17.00 | 22.52 | 28.92 | 17.00 | 4.00 | 10.00 | 4.00 |
| Mid | 5200 | 17.00 | 22.54 | 28.94 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5240 | 17.00 | 22.52 | 28.92 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 11.489 | 11.70 | 17.00 | -5.30 |
| Mid | 5200 | 11.401 | 11.61 | 17.00 | -5.39 |
| High | 5240 | 11.316 | 11.53 | 17.00 | -5.47 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5180 | 0.217 | 0.43 | 4.00 | -3.57 |
| Mid | 5200 | -0.209 | 0.00 | 4.00 | -4.00 |
| High | 5240 | 0.009 | 0.22 | 4.00 | -3.78 |

Page 60 of 405

| THACE 1 2 3 4 5 5 THE A MANNAN A | Type: RMS loid: 100/100 | n Avgitt | Trig Free Ru Atten: 18 dB | 00 GHz PNO: Wide - | 18000000 | req 5 | ter F |
|-------------------------------------|---|--|---|--|---|--|---|
| 5.180 00 GHz er 11.489 dBm | Mkr2 Band Powe | | | n | fiset 12 dB 20.00 dBm | Ref (| B/div |
| | | 4 | ¢2 | | | | |
| | | | | | λ | | - |
| | | _ | | | | | |
| Span 30.00 MHz 1.00 ms (601 pts) | Sweep | - | W 3.0 MHz* | #VB | GHz Hz | 18000 1.0 M | ter 5. s BW |
| | AUXION WOTH | HIRITOOR | -0.217 dBm | 5.182.90 GHz | 5 | | N |
| 11,409 dBm | 20.80 MHz | Band Power | -2.058 dBm | 5.180 CO GHZ | 5 | 1 | N |
| | | | | | | | - |
| | Span 30.00 MHz 1.409 dBm 11.409 dBm | Type RMS MKr2 5.180 00 GHz Band Power 11.489 dBm Arran Span 30.00 MHz Sweep 1.00 ms (601 pts) 400400-000 MHz 20.80 MHz 11.489 dBm | Ming Type: RMS AvgHod: 100/100 Mkr2 5, 180 00 GHz Band Power 11.489 dBm 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 | Trig Free Run Amen 16 dB Mrg Type: RMS AvgHod: 100r00 Mrd (2,2,343 b) Trig Control (2,2,435 b) (2,2,435 b | 0 GHz PB0: Wide → Trig: Free Run Riter: 16 dB Mkr2 5.180 00 GHz Band Power 11.489 dBm 2 1 4 2 1 Band Power 11.489 dBm 2 1 4 2 1 Band Power 11.489 dBm 2 2 1 4 2 1 3 2 1 4 3 5 Trig: Free Run Riter: 16 dB Mkr2 5.180 00 GHz 3 2 1 4 3 5 Trig: Free Run Riter: 16 dB Mkr2 5.180 00 GHz 3 2 1 4 3 5 Trig: Free Run Riter: 16 dB 2 1 4 3 5 Trig: Free Run Riter: 16 dB Mkr2 5.180 00 GHz 3 2 1 4 3 5 Trig: Free Run Riter: 16 dB 1 4 89 dBm 1 4 89 dBm | 180000000 GHz Mvg Type: RMS Mvg Type | Proc. Wide Trig. Pree Run If GancLaw Marg Type: RMS Arighted: 100100 March 12 3/43 5 Trig. Pree Run Arighted: 100100 Ref Offset 12 dB Ref 20.00 dBm Mkr2 5.180 00 GHz Band Power 11.489 dBm 10000 GHz 2 110000 GHz 2 12000 GHz 30.00 MHz 18000 GHz 5.182.90 GHz 15000 GHz 0.217 dBm 1 5.182.90 GHz 2.059 dBm 20.60 MHz 11.489 dBm |



Page 61 of 405

| enter F | req 5.2 | 4000 | 0000 G | Hz NO: Wide - | Trig Fre | Run | #Avg | Type: RMS Hold: 100/100 | 12:25:2 | Detta MINININI | Frequency |
|------------------|---------|---------------------|----------|------------------|-----------|----------------|----------|----------------------------|-------------------|---------------------------|------------------------------|
| dB/div | Ref Off | set 12 e 0.00 di | 18 Bm | GainLaw | Alten: 10 | | | Mkr. Band Pow | 2 5.24 ver 11. | 0 00 GHz 316 dBm | Auto Tune |
| | | | | | 01 | 2 ² | | | | | Center Free 5 24000000 GH |
| 0 0 0 | | / | | | | | | | 1 | -26.17 @ | Start Fre 5.22500000 GH |
| 0 0 | | | | | | | - | | | | Stop Fre 5 25500000 GH |
| nter 5. es BW | 24000 C | aHz z | | #VB | W 3.0 MHz | | 1 | Sweep | Span 1.00 m | 30.00 MHz is (601 pts) | CF Step 3.000000 MH |
| N | 1 | | 5.238 4 | 0 GHz | -0.169 di | 3m | | ADDATOR CODING | HING | | Auto Ma |
| N | , | | 5.240 0 | JO GHZ | -2.304 di | smta | 02 Power | 20.90 MHz | | 11.316 dBm | Freq Offse 0 H |
| | | | | | | + | | | | | |

Page 62 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

9.5. 802.11ac HT40 MODE IN THE 5.2 GHz BAND

9.5.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5190 | 39.670 |
| Mid | 5230 | 40.130 |

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Page 63 of 405



Page 64 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Freq 5.2 | 30000000 G | Hz | Trig Free Bun | #Avg Type: Log-Pr | ar that it | 23456 Frequency |
|---|-----------------------|--------------------------|---------------|-------------------|------------------------------|-----------------------------------|
| Ref Offi 0 dBidiv Ref 20 | set 12 dB 1.00 dBm | PNO: Fast Ca Gain:Law | Atten: 16 dB | 4 | ر مانه Mkr2 40.13 -0.9 | MHz Auto Tun 6 dB |
| 10.0 | | | 1 | | | Center Fre 5 230000000 GH |
| 100 | 1 | | V | | | Start Fre 5.195000000 GH |
| 0.0 | ×3 | | | | 243 | Stop Fre 5.26500000 GH |
| 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 - 410 | sque! | | | | A.W. Hay | CF Step 7.000000 MH Auto Ma |
| 0.0 | | | | | | Freq Offse 0 H |
| no | | | | | | |

Page 65 of 405

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5190 | 36.317 |
| Mid | 5230 | 36.269 |

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Page 66 of 405



Page 67 of 405



Page 68 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5190 | 10.72 |
| Mid | 5230 | 10.05 |

Page 69 of 405

9.5.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 70 of 405

REPORT NO: 13U15118-2F

EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC **RESULTS**

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5190 | 39.670 | 36.317 | -6.40 |
| Mid | 5230 | 40.130 | 36.269 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5190 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |
| Low | 5230 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |

 Duty Cycle CF (dB)
 0.21
 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|---------------|-------------------------|----------------|----------------|---------------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (8.41.1.) | | | | (> |
| | (MHZ) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | (MHZ) 5190 | (dBm) 11.559 | (dBm) 11.77 | (dBm) 17.00 | (dB) -5.23 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| | 5400 | | | | |
| LOW | 5190 | 1.486 | 1.70 | 4.00 | -2.30 |

Page 71 of 405





Page 72 of 405 **UL VERIFICATION SERVICES INC.**
DATE: JULY 19, 2013 FCC ID: ZNFVS980

9.6. 802.11ac HT80 MODE IN THE 5.2 GHz BAND

9.6.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5210 | 81.670 |

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Page 73 of 405



Page 74 of 405

9.6.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5210 | 75.421 |

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Page 75 of 405



Page 76 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5210 | 10.52 |

Page 77 of 405

9.6.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 78 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5210 | 81.670 | 75.421 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5210 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5210 | 12.826 | 13.04 | 17.00 | -3.96 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5210 | 1.486 | 1.70 | 4.00 | -2.30 |

Page 79 of 405

| Center F | req 5.210 | 000000 GHz PNO: Fast | Trig Free | Run Avgi | Type: RMS Hold: 100/100 | BI-40:07 PM May 20, 2012 MACE 1, 2, 3, 4, 5, 5 TYTE A WARMANY DOT A INTERNET | Frequency |
|----------------------|------------------------|-------------------------|-------------|---------------|----------------------------|---|--------------------------------|
| vibiBb 0 | Ref Offset Ref 20.0 | 12 dB 0 dBm | Attent to | - | Mkr Band Pow | 2 5.210 00 GHz er 10.519 dBm | Auto Tune |
| 0.00 | | | 01 | 2 | | | Center Free 5.210000000 GH: |
| 20.0 20.0 40.0 | | | | | | - | Start Free 5.140000000 GH |
| 50.0 80.0 70.0 | | | | | | | Stop Free 5,28000000 GH |
| Center 5. Res BW | 21000 GHz 1.0 MHz | , #V | BW 3.0 MHz* | | Sweep | Span 140.0 MHz 1.00 ms (601 pts) | CF Step 14.000000 MH |
| | | 5 000 00 001 | 6 206 40 | ALCONO. | AUNCTION MOTION | HINE TON VALUE | Auto Mar |
| 2 N 3 4 5 | ł | 5.210.00 GHz | -13.389 dB | im Band Power | 80.27 MHz | 10.519 dBm | Freq Offse 0 H |
| 7 8 9 10 | | | | | | | |

Page 80 of 405

9.7.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5260 | 20.12 |
| Mid | 5300 | 20.13 |
| High | 5320 | 20.04 |

Page 81 of 405

26 dB BANDWIDTH





Page 82 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Freq 5.32000 | 0000 GHz | Transformer Prove | Avg Type: Log-Pwr | TRACE 1 2 3 4 5 5 | Frequency |
|--|--|-------------------|-------------------------------------|---------------------------|-----------------------------------|
| Ref Offset 12 o dBidty Ref 20.00 dl | Pito: Web: Ca Il CaintLaw dB Bm | Atten: 16 dB | ۵N | 1kr2 20.04 MHz 0.30 dB | Auto Tune |
| 0.0 | 01 | | | | Center Free 5.32000000 GH: |
| | Reference for the second | | and the second second second second | M. | Start Free 5.307500000 GH |
| 00 3 | | | | 263_ 230.des | Stop Free 5.332500000 GH |
| ap provide | | | | Tay - | CF Step 2.500000 MH Auto Ma |
| 0.0 | | | | | Freq Offse 0 H |
| uo | | | | | |

Page 83 of 405

9.7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5260 | 16.551 |
| Mid | 5300 | 16.608 |
| High | 5320 | 16.679 |

Page 84 of 405





Page 85 of 405



Page 86 of 405

9.7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5260 | 12.51 |
| Mid | 5300 | 12.50 |
| High | 5320 | 12.32 |

Page 87 of 405

LIMITS

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 88 of 405

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5260 | 20.12 | 16.551 | -6.40 |
| Mid | 5300 | 20.13 | 16.608 | -6.40 |
| High | 5320 | 20.04 | 16.679 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5260 | 24.00 | 23.19 | 29.19 | 23.19 | 11.00 | 11.00 | 11.00 |
| Mid | 5300 | 24.00 | 23.20 | 29.20 | 23.20 | 11.00 | 11.00 | 11.00 |
| High | 5320 | 24.00 | 23.22 | 29.22 | 23.22 | 11.00 | 11.00 | 11.00 |

 Duty Cycle CF (dB)
 0.21
 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 12.335 | 12.55 | 23.19 | -10.64 |
| Mid | 5300 | 12.760 | 12.97 | 23.20 | -10.23 |
| High | 5320 | 12.008 | 12.22 | 23.22 | -11.00 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 0.428 | 0.64 | 11.00 | -10.36 |
| Mid | 5300 | 0.951 | 1.16 | 11.00 | -9.84 |
| High | 5320 | 0.037 | 0.25 | 11.00 | -10.75 |

Page 89 of 405

| Harast | TRACE 1 2 3 4 5 5 THE A MININ N | ype: RMS old: 100/100 | Avg T Avg H | Trig Free Ru | Z Wide -+ | 0000 GHz PNO W | 000000 | 5.26 | ker 2 | Aar |
|----------------|------------------------------------|--------------------------|----------------|--------------|--------------|-------------------|----------------------|----------------|----------------|-----------|
| Marker Tabl | 5.260 00 GHz r 12.335 dBm | Mkr2 Band Pow | | Addit to do | art aw | dB Bm | iffset 12 20.00 d | Ref (| B/div | 0 d |
| Marker Count | | | _ | | | 2003 | 2004 V + Q | - | | og |
| [Off] | - | | | Q' | | | _ | - | - | 1.00 |
| | | X | _ | | | | 1 | + | - | 0.0 |
| Couple | 310.00 | | _ | | | - | 1 | - | 1 | 2.0 |
| On <u>O</u> | N | | | | | | / | - 2 | | |
| | 1 | - | | | | | | | _ | 10 |
| | | | | | _ | | _ | - | - | 0.0 |
| | | | _ | | | | - | - | - | 0.0 |
| | Span 30.00 MHz .00 ms (601 pts) | eep (#Swp) | Sw | 3.0 MHz* | #VBV | 1 | GHz Hz | 26000 1.0 M | ter 5. s BW | er |
| | RINCTON VALUE | AUNCTION WOTH | ABILITION | | | | | | HOLE N | a. |
| | 12.335 dBm | 20.50 MHz | Band Power | -0.714 dBm | GHZ | 5 262 55 GF | <u>a)</u> | 1 | N | |
| All Markers Of | | | | | - | | | | | 4 |
| - | | | | | - | | | \pm | - | 5 |
| Mor | | | | | - | | | ++ | - | 8 |
| 2 | | | | | | | | | - | Ő, |



Page 90 of 405

| ente | r Fn | eq ! | 5,320 | 000 | 0000 | GH: | e With | - | Trig Fr | ee Ra | Av n | g Ty | pe; RMS | 1.02 | 122:53 | PN May 22, 2012 ACE 1 2 3 4 5 5 THE A SMITHIN M | Frequency |
|-------------------|---------------|--------------|---------------|--------|----------|-------|-----------|-----|----------|-------|----------|------|----------------|----------|-------------|---|-----------------------------|
| 0 dB/d | IV. | Ref | Offse 20.0 | t 12 e | iB Bm | IF Ga | into | | Atten | IB dB | 97 | в | Mkr and Pow | 25 er | .320 | 0 00 GHz | Auto Tur |
| | | | | | 7 | | | _ | ⊘¹ | ¢2 | | | - | | | | Center Fre 5.32000000 GH |
| 200 | | _ | 1 | 2 | 0 | | | | | | | | | 1 | × | 3886 | Start Fre 5.30500000 Gi |
| 0.0 0.0 0.0 | | | _ | | | | _ | | | | | | | | | | Stop Fre 5.33500000 GH |
| enter Res E | r 5.3 BW 1 | 200 1.0 P | 0 GH MHz | z | _ | _ | #V | BW | 3.0 MH | z | | Swe | rep (#Swp) | 8 1.0 | pan 00 m | 30.00 MHz s (601 pts) | CF Ste 3.000000 Mi |
| 1 N | | 1 | (4) | | 5.3 | 18 05 | GHz | (Δ) | 0.037 | ißm | PURCTION | 1 | UNCTION WRITH | - | HIN, | IN VALUE | Auto Ma |
| 2 N 3 4 5 5 | 1 | 1 | | | 5.3 | 20.00 | GHZ | | -1.026 : | iBm. | BanaPowe | | 20.10 MHz | | | 12.008 dBm | Freq Offs 01 |
| 7 8 9 | | | | | | | | | | | | | | _ | | | |

Page 91 of 405

9.8. 802.11n HT20 MODE IN THE 5.3 GHz BAND

9.8.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5260 | 20.71 |
| Mid | 5300 | 20.54 |
| High | 5320 | 20.71 |

Page 92 of 405

26 dB BANDWIDTH





Page 93 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| Prequency | 123455 | 1904/ Tot | e: Log-Pwr | Avg Type | Free Dun | IZ To | 00000000 | r Freq | ente |
|--|-------------------------------|---------------|------------|-----------|----------|-------------|---------------------|-----------------------------|-------------|
| Auto Tune | 71 MHz .975 dB | ikr2 20. 0 | ΔN | | n: 16 dB | ininLow At | et 12 dB .00 dBm | Ref |) dB/d |
| Center Freq 5.32000000 GHz | | | | <u></u> 1 | | | | | 0.0 |
| Start Free 5.307500000 GHz | | when for | handra | phantan | rayments | anar-anar-a | nd address the | | 00 |
| Stop Freq 5.332500000 GH/ | ₹ ^{2∆3} _ 300 dbs | | | | | | | X | 10 |
| CF Step 2.500000 MHa <u>Auto</u> Mar | N. | | | | | | | ^م ^{الم} | 10 b |
| Freq Offset 0 Hz | | | | | | | - | _ | x.o |
| | | | | | | | | | 00 |

Page 94 of 405

9.8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5260 | 17.778 |
| Mid | 5300 | 17.918 |
| High | 5320 | 17.896 |

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Page 95 of 405





Page 96 of 405

| Center Fre | enter Freq 5.320000000 GHz Center Freq 5.32000000 GHz Radio Stat None stil Gaind over Research 34 B Radio Device; BTS | | | | | | | |
|--------------|--|-----|---------------|--------------------------------|---------|----------|-------------------|-------------------------------|
| 10 dB/div | Ref Offset 12 dB Ref 20.00 dBm | | | | 167.1 | | | |
| 10.0 0.00 | | | ula crular | | | | | Center Free 5.320000000 GH |
| 10.0 | | r | Under allered | and another provide the second | 114 | - | | |
| 0.0 | | 1 | | | 1 | - | | |
| 00 | | 1 | | | h | | | |
| an Laky | WIN THE PARTY | ų. | | | 1 | dath! | 1. WARLIN | |
| 80.0 1 4 | | | | | M | Am T | 141 . 14 | |
| | 2.011- | | | | | | | CF Step 5.000000 MH |
| Res BW | 510 kHz | | 10 | VBW 1.5 MHz | | Sw | eep 1 ms | <u>Auto</u> Ma |
| Occup | ied Bandwidtl 17 | MHz | Total Power | 1 | 1.4 dBm | | Freq Offse 0 H | |
| Transm | it Freq Error | 107 | .87 kHz | OBW Power | 8 | 99.00 % | | |
| x dB Ba | ndwidth | 20 | .24 MHz | x dB | 4 | 26.00 dB | | |

Page 97 of 405

9.8.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5260 | 11.61 |
| Mid | 5300 | 11.55 |
| High | 5320 | 11.51 |

Page 98 of 405

9.8.4. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 99 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5260 | 20.54 | 17.778 | -6.40 |
| Mid | 5300 | 20.54 | 17.778 | -6.40 |
| High | 5320 | 20.54 | 17.778 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5260 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |
| Mid | 5300 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |
| High | 5320 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB) 0.22 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 11.690 | 11.91 | 23.50 | -11.59 |
| Mid | 5300 | 10.950 | 11.17 | 23.50 | -12.33 |
| High | 5320 | 10.741 | 10.96 | 23.50 | -12.54 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 0.041 | 0.26 | 11.00 | -10.74 |
| Mid | 5300 | -0.544 | -0.32 | 11.00 | -11.32 |
| High | 5320 | -0.904 | -0.68 | 11.00 | -11.68 |

Page 100 of 405

| enter F | req 5.20 | 50000 | 000 GHz PNO WA | | Trig Free R | Avg un Avgil | Type: RMS fold: 100/100 | TACE 1 2 3 4 5 6 | Frequency |
|-------------------------|--------------------|--------------------|-------------------|-----|----------------|-----------------|----------------------------|-------------------------------------|------------------------------|
| 0 dB/div | Ref Offs Ref 20 | et 12 di .00 dB | a m | W | Allen 10 de | 1 | Mkr/ Band Pow | 2 5.260 00 GHz er 11.690 dBm | Auto Tuni |
| 0.00 | | | p1 | | ¢ ² | _ | | | Center Free 5.26000000 GH |
| 20.0 20.0 40.0 | | 4 | | | | | | 3000 | Start Free 5.24500000 GH |
| 0.0 10.0 70.0 | | | | _ | | | | | Stop Free 5.27500000 GH |
| enter 5 Res BW | 26000 G | Hz | # | VBW | 3.0 MHz* | S | weep (#Swp) | Span 30.00 MHz 1.00 ms (601 pts) | CF Step 3.000000 MH |
| | T (A) | | 5 254 20 GHz | (Å) | 0.041 dBm | HURCHOR | AINCODE WOTH | HINAKA MULTURA | Auto Mar |
| 2 N 3 4 5 5 | 1 | | 5.260 00 GHz | | -1.365 dBm | Eand Power | 20.70 MHz | 11.690 dBm | Freq Offse 0 H |
| 7 8 9 10 11 | | | | | | | | | |



Page 101 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter F | req | 5.320 | 0000 | 0000 G | Hz PNO: Wie | | Trig Fre | e Ru | н 1 | Avg | Type: RI fold: 100 | MS W100 | 195.3 | TRACE TITLE | 1 2 3 4 5 6 A Martin | Frequency |
|--------------------------------|----------------|---------------|--------|----------------|------------------|-----|----------------------|----------|--------|-------------|-----------------------|------------|---------------|----------------|-------------------------|-----------------------------------|
| 0 dB/div | Ref | Offse 20.0 | t 12 d | B Sm | lf Gaint La | w | Atten: 1 | 8 48 | e | - 200]; | Band | Mkra | 2 5.3 er 1 | 20 0 | 00 GHz 1 dBm | Auto Tun |
| | | - | | | | | | ¢2 | Q1 | | - | | | | | Center Fre 5.32000000 GH |
| 0.0 | _ | Ζ | 4 | | | | | | | _ | - | _ | 1 | | -28 90 stile | Start Fre 5.30500000 GH |
| 0.0 | | | | | | | | | | | - | _ | | | | Stop Fre 5.33500000 GH |
| enter 5. Res BW | .3200 1.0 P | 0 GH MHz | z | | #\ | /BW | 3.0 MHz | e | - | Sv | weep (| #Swp) | Sp4 1.00 | an 30 ms (| 0.00 MHz (601 pts) | CF Ster 3.000000 MH Auto Ma |
| 1 N 2 N 3 4 5 6 | 1 | (Δ) | | 5.321 5.320 | 30 GHz 00 GHz | (Δ) | -0.904 d -2.683 d | Bm Bm | BanaPi | (1995) | 20.7 | ro MHz | | 10 | 741 dBm | Freq Offse 0 H |
| 7 8 9 0 | | | | | | | | | | | | | | | | |

Page 102 of 405

9.9. 802.11n HT40 MODE IN THE 5.3 GHz BAND

9.9.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5270 | 39.5 |
| High | 5310 | 39.6 |

Page 103 of 405

26 dB BANDWIDTH





Page 104 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5270 | 36.492 |
| High | 5310 | 36.595 |

99% BANDWIDTH



Page 105 of 405

| Center Fre | q 5.310000000 | GHz #FGaintaw | Center P Trig Fre- #Atten: 1 | req: 5.31000 e Run 8 dB | 0000 GHz | ALISIACIO | Radio Stat | None None ice: BTS | Frequency |
|----------------------------------|-------------------------------------|---------------------|------------------------------------|-------------------------------|----------|--------------|------------------|--------------------------|--------------------------------------|
| 10 dB/div | Ref Offset 12.5 dB Ref 10.00 dBm | | | | | | | | |
| 10.0 10.0 20.0 | | 广州 | hill | in line | W. | | | | Center Freq 5.310000000 GHz |
| | acymic a fleddid | # | | | | n Matanga | MM MA | MAR AN | |
| center 5.3 Res BW | 1 GHz MHz | | #VE | SW 3 MH | z | | l Span Swe | 100 MHz ep 1 ms | CF Step 10.000000 MH2 Auto Man |
| Occupied Bandwidth 36.595 MHz | | | | Total Power 11.1 dl | | | dBm | 10 | Freq Offset 0 Hz |
| Transmi x dB Ba | t Freq Error ndwidth | 113.50 k 38.83 M | (Hz NHz | OBW P x dB | ower | 99 -26.0 | .00 % 00 dB | | |

Page 106 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5270 | 12.23 |
| High | 5310 | 11.44 |

Page 107 of 405

LIMITS

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 108 of 405
Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional | |
|---------|-----------|-------|--------|-------------|--|
| | | 26 dB | 99% | Gain | |
| | | BW | BW | | |
| | (MHz) | (MHz) | (MHz) | (dBi) | |
| Low | 5270 | 39.5 | 36.492 | -6.40 | |
| Lliab | 5040 | | | 0 40 | |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5270 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| High | 5310 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB) 0.49 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| | () | (| (| () | |
| Low | 5270 | 11.733 | 12.22 | 24.00 | -11.78 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|----------------------|-----------------|----------------|----------------|----------------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | | | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | (MHz) 5270 | (dBm) -2.559 | (dBm) -2.07 | (dBm) 11.00 | (dB) -13.07 |

Page 109 of 405

| enter F | req 5.2700 | 00000 GH | Z 0: Fast - | Trig Fi | ee Ru | Avg 1 n AvgH | Type: RMS Iold: 100/100 | 12.3 | THE A MINIMUM | Frequency |
|-------------------------|----------------------------|---------------------|----------------|----------|-------|-----------------|----------------------------|-----------------|------------------------------|-------------------------------|
| 10 dB/dby | Ref Offset 1: Ref 20.00 | FG 2.5 dB dBm | ain1.aw | Atten | 16 dB | | Mk Band Po | r2 5.2 wer 1 | 70 00 GHz | Auto Tune |
| 10.0 0.00 | | | | 1 | ¢2 | | | | | Center Free 5.270000000 GH |
| -20.0 | | / | | | | | | | -21/5 (0) | Start Free 5 23500000 GH |
| 40.0 40.0 | | | | | | | | | *** | Stop Free 5.30500000 GH |
| Center 5. Res BW | 27000 GHz 1.0 MHz | | #VB | W 3.0 MH | łz" | Sv | veep (#Swj | Spa b) 1.00 | an 70.00 MHz ms (601 pts) | CF Step 7.000000 MH |
| 1 N | 1 (0) | 5 265 45 | GHz (2 | -2.559 | dBm | 409000 | AUNCTION WIDTH | 1 | SCHORE VALUE | Auto Mar |
| 2 N 3 4 5 | 1 | 5.270.00 | GHz | -8,445 | dBm. | Band Power | 38.97 MH | | 11.733 dBm | Freq Offse 0 H |
| 7 8 9 10 11 | | | | | | | | | | |



Page 110 of 405

9.10. 802.11ac HT20 MODE IN THE 5.3 GHz BAND

9.10.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5260 | 20.540 |
| Mid | 5300 | 20.630 |
| High | 5320 | 20.500 |

Page 111 of 405





Page 112 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 113 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel Frequency | | 99% Bandwidth |
|-------------------|-------|---------------|
| | (MHz) | (MHz) |
| Low | 5260 | 17.692 |
| Mid | 5300 | 18.039 |
| High | 5320 | 17.831 |

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Page 114 of 405





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Page 115 of 405



Page 116 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5260 | 10.65 |
| Mid | 5300 | 10.45 |
| High | 5320 | 10.41 |

Page 117 of 405

9.10.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 118 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5260 | 20.500 | 17.692 | -6.40 |
| Mid | 5300 | 20.500 | 17.692 | -6.40 |
| High | 5320 | 20.500 | 17.692 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5260 | 17.00 | 22.48 | 28.88 | 17.00 | 4.00 | 10.00 | 4.00 |
| Mid | 5300 | 17.00 | 22.48 | 28.88 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5320 | 17.00 | 22.48 | 28.88 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB)0.21Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | 11.421 | 11.63 | 17.00 | -5.37 |
| Mid | 5300 | 11.355 | 11.57 | 17.00 | -5.43 |
| High | 5320 | 11.297 | 11.51 | 17.00 | -5.49 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5260 | -0.251 | -0.04 | 4.00 | -4.04 |
| Mid | 5300 | -0.329 | -0.12 | 4.00 | -4.12 |
| High | 5320 | 0.009 | 0.22 | 4.00 | -3.78 |

Page 119 of 405





Page 120 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Fi | req 5.3 | 2000 | 0000 GHz | Trig Free R | MAvg un AvgH | Type: RMS old: 100/100 | 18402 1.15 PM May 20, 2015 18402 1.2, 7, 13, 5 1996 4 Westman | Frequency |
|---------------------|----------|--------|-------------------|--------------|-----------------|---------------------------|---|----------------------------|
| - ADARD | Ref Offs | iet 12 | If Gain:Law dB | Atten: 18 dE | | Mkr2 | 5.320 00 GHz | Auto Tune |
| 98 | Nel 20 | | | 62 | 6 | | | Center Free |
| 0.0 | | 1 | | - | | | | 5.32000000 GH |
| 0.0 | | 1 | | | _ | | 39.85 | Start Free |
| 0.0 | - | | | | | | - marine | 5 3000000 GH |
| 0,0 | | | | | | | | Stop Frei 5.33500000 GH |
| enter 5.3 Res BW | 32000 G | Hz | #VB | W 3.0 MHz* | | #Sweep | Span 30.00 MHz 1.60 ms (601 pts) | CF Step 3 000000 MH |
| | | | 5 323 05 Chi+ | 0 504 dBm | | ных на обра | NUMBER WOLF | Auto Mar |
| 2 N 3 4 5 | ł | | 6.320 00 GHz | 2.369 dBm | Band Power | 20.80 MHz | 11.287 dBm | Freq Offse 0 H |
| 7 8 9 | | | | | | | | |

Page 121 of 405

9.11. 802.11ac HT40 MODE IN THE 5.3 GHz BAND

9.11.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5270 | 40.020 |
| Mid | 5310 | 40.020 |

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Page 122 of 405



Page 123 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 124 of 405

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Mid | 5270 | 36.172 |
| High | 5310 | 36.145 |

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Page 125 of 405



Page 126 of 405



Page 127 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Mid | 5270 | 10.86 |
| High | 5310 | 10.94 |

Page 128 of 405

9.11.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 129 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC <u>RESULTS</u>

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| | | BW | BW | |
|------|-------|-------|--------|-------|
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Mid | 5270 | 40.02 | 36.145 | -6.40 |
| High | 5310 | 40.02 | 36.145 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Mid | 5270 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |
| High | 5310 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |

 Duty Cycle CF (dB)
 0.21
 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|----------------------|-----------------|-----------------------|-----------------------|---------------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | | | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | (MHz) 5270 | (dBm) 11.351 | (dBm) 11.56 | (dBm) 17.00 | (dB) -5.44 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|---------------|----------------|----------------------|---------------|---------------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | | | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Mid | (MHz) 5270 | (dBm) 1.486 | (dBm) 1.70 | (dBm) 4.00 | (dB) -2.30 |

Page 130 of 405





Page 131 of 405

9.12. 802.11ac HT80 MODE IN THE 5.3 GHz BAND

9.12.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5290 | 82.830 |

Page 132 of 405



Page 133 of 405

9.12.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5290 | 75.805 |

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Page 134 of 405



Page 135 of 405

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5290 | 10.65 |

Page 136 of 405

9.12.4. OUTPUT POWER AND PPSD

<u>LIMITS</u>

FCC §15.407 (a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 137 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5290 | 82.83 | 75.805 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | Max | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | EIRP | IC | Limit | PPSD | eirp | Limit |
| | | Limit | Limit | Power | | Limit | PSD | |
| | | | | | | | Limit | |
| | (MHz) | (dBm) |
| Low | 5290 | 17.00 | 23.00 | 29.40 | 17.00 | 4.00 | 10.00 | 4.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5290 | 10.455 | 10.67 | 17.00 | -6.34 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5290 | -7.123 | -6.91 | 4.00 | -10.91 |

Page 138 of 405

| enter F | req 5.29000 | PNO Fast | Trig Free Ro Atten: 18 dE | Avg1 un AvgP | Type: RMS told: 100/100 | TRACE 12 2 7 4 9 5 TRACE 12 7 4 9 5 TRACE A WARNING | Frequency |
|----------------------|------------------------------|--------------|------------------------------|-----------------|----------------------------|---|------------------------------|
| VINED O | Ref Offset 12 Ref 20.00 d | dB JBm | | | Mkr2 Band Power | 5.290 00 GHz 10.465 dBm | Auto Tune |
| 0.20 | | | 0 | ¢ [∎] | - | | Center Free 5.29000000 GH |
| 0.0 0.0 0.0 | | | | | | | Start Fre 5 220000000 GH |
| 90.0 10.0 10.0 | | | | | > | - | Stop Fre 5.36000000 GH |
| enter 5. Res BW | 29000 GHz 1.0 MHz | #VB | W 3.0 MHz* | | Sweep 1 | Span 140.0 MHz .00 ms (601 pts) | CF Ster 14.000000 MH |
| I N | 2 113 | 5 298 87 GHz | J 123 dBm | PUBLICIA | HISCHER OLDER | FUNCTION VALUE | Auto Mar |
| 2 N 3 4 5 5 | , | 5.290 00 GHz | -13.350 dBm | Band Power | 90.27 MHz | 10.465 dBm | Freq Offse 0 H |
| 7 8 9 10 | | | | | | | |

Page 139 of 405

9.13.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5500 | 20.50 |
| Mid | 5580 | 20.40 |
| High | 5700 | 20.45 |

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Page 140 of 405

26 dB BANDWIDTH





Page 141 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| Frequency | 123456 | TRAC | Log-Pwr | Avg Type | | 1 | GHz | 5.720000000 | nter Fr | en |
|--|------------------|----------------|---------|------------------------|-------------|-------|-----------------------------|---------------------------------|---------|------------|
| Auto Tune | 45 MHz 083 dB | ikr2 20. 1. | ΔN | wgros | 16 dB | Atten | PSO: Web: Ca If Gaint av | ef Offset 12 dB ef 20.00 dBm | Bidly | 0 d |
| Center Free 5.72000000 GH: | | | | | | 1 | | | | 10.0 |
| Start Free 5.70500000 GH | | | Phone - | ^{Aller} Works | er your and | | www. | 1 | | 0.00 |
| Stop Freq 5.73500000 GH/ | 300 | 203 | | | | | | 13 | - | 20.0 |
| CF Step 5.000000 MHz Auto <u>Mar</u> | المايس | <u></u> | | | | | | | yiztha | 410 500 |
| Freq Offse 0 H | | | | | - | | | | - | 10.0 |
| | | | | | | | | | | 00 |

Page 142 of 405

9.13.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5500 | 16.548 |
| Mid | 5580 | 16.784 |
| High | 5700 | 16.601 |

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Page 143 of 405





Page 144 of 405


Page 145 of 405

9.13.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5500 | 12.16 |
| Mid | 5580 | 11.92 |
| High | 5700 | 11.39 |

Page 146 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 147 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5500 | 20.40 | 16.548 | -6.40 |
| Mid | 5580 | 20.40 | 16.548 | -6.40 |
| High | 5700 | 20.40 | 16.548 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5500 | 24.00 | 23.19 | 29.19 | 23.19 | 11.00 | 11.00 | 11.00 |
| Mid | 5580 | 24.00 | 23.19 | 29.19 | 23.19 | 11.00 | 11.00 | 11.00 |
| High | 5700 | 24.00 | 23.19 | 29.19 | 23.19 | 11.00 | 11.00 | 11.00 |

 Duty Cycle CF (dB)
 0.21
 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 11.468 | 11.68 | 23.19 | -11.51 |
| Mid | 5580 | 11.536 | 11.75 | 23.19 | -11.44 |
| High | 5700 | 11.029 | 11.24 | 23.19 | -11.95 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | -0.465 | -0.26 | 11.00 | -11.26 |
| Mid | 5580 | 0.172 | 0.38 | 11.00 | -10.62 |
| High | 5700 | -0.289 | -0.08 | 11.00 | -11.08 |

| enter F | req 5.5 | 00000 | 000 GHz PNO: With | Trig P | ree Ru 16 dB | Avg AvgP | Type: RMS fold: 100/100 | 10/14241 | ACE 1 2 3 4 5 6 | Frequency |
|-------------------------|--------------------|--------------------|----------------------|----------|-----------------|-------------|----------------------------|--------------------|--------------------------|------------------------------|
| 0 dB/div | Ref Offs Ref 20 | et 12 dE .00 dB |) m | | | | Mkr2 Band Pow | 2 5.500 er 11.4 | 0 00 GHz 468 dBm | Auto Tuni |
| 000 | | | | <u>.</u> | ¢2 | | | | | Center Free 5.50000000 GH |
| 20.0 20.0 40.8 | | 4 | | | | | | 1 | -26.06 (07) | Start Free 6.485000000 GH |
| 0 0 0 0 10 0 | | | | | + | | | - | | Stop Fre 5.51500000 GH |
| enter 5. Res BW | 50000 G 1.0 MHz | Hz | #V | BW 3.0 M | Hz* | | Sweep | Span 1.00 m | 30.00 MHz s (601 pts) | CF Step 5.000000 MH |
| | 2122 | | 5 406 65 CHz | 0.465 | dilan | HIGHLIGH | AUNCTION WIDTH | HINC | | Auto <u>Ma</u> |
| 2 N 3 4 5 | 1 | | 5.500 00 GHz | -1.775 | dßm. | Band Power | 19.90 MHz | | 11.468 dBm | Freq Offse 0 H |
| 7 8 9 10 11 | | | | | | | | | | |



Page 149 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter F | req 5.72 | 0000000 | GHz PNO: Wide - | Trig Free Ru | Avg Avg | Type: RMS Hold: 100/100 | 164CE 1 2 3 4 5 5 THE A MANAGEM | Frequency |
|------------------------------|--------------------|--------------------|------------------------|--------------------------|----------------|----------------------------|-------------------------------------|-----------------------------------|
| 0 dB/db | Ref Offs | et 12 dB 00 dBm | If GainsLaw | Atten: 18 dB | 10 - 1830 1 | Mkr. Band Pow | 2 5.720 00 GHz | Auto Tune |
| | | | | ¢2 | _Q1 | - | | Center Free 5.72000000 GH: |
| 20.0 20.0 20.0 40.0 | | / | | | | | 37.00 | Start Free 5.705000000 GH |
| 0.0 | | | | | | | | Stop Free 5.73500000 GH |
| enter 5. Res BW | 72000 G 1.0 MHz | Hz | #VB | W 3.0 MHz* | Auton | Sweep | Span 30.00 MHz 1.00 ms (601 pts) | CF Step 5.00000 MH Auto Mar |
| 1 N 2 N 3 4 5 | 1 | 5.72 5.72 | 22.00 GHz 20.00 GHz | -0.269 dBm -1.743 dBm | BandPower | 19.00 MHz | 11.029 dBm | Freq Offse 0 H |
| 9 9 10 | | | | | | | | |

Page 150 of 405

9.14. 802.11n HT20 MODE IN THE 5.6 GHz BAND

9.14.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5500 | 20.67 |
| Mid | 5580 | 20.50 |
| High | 5700 | 20.67 |

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Page 151 of 405

26 dB BANDWIDTH





Page 152 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Freq 5.72000000 | 0 GHz Tdg Free Pup | Avg Type: Log-Pwr | TRACE 1 2 3 4 5 5 | Frequency |
|--|-----------------------|--------------------------------------|---|------------------------------------|
| Ref Offset 12 dB gB/dtv Ref 20.00 dBm | HGaintaw Atten: 18 dB | ۵N | 0.25 dB | Auto Tune |
| | ×1 | | | Center Free 5.72000000 GH |
| 00 / martin | Manufur second and | alimetric and an and a second second | my | Start Free 5.707500000 GH |
| ao 3 3 | | | ₹2∆3 23.21.4m | Stop Fre 5.732500000 GH |
| nd publication | | | Para Para Para Para Para Para Para Para | CF Step 5.000000 MH Auto Mar |
| 10 | | | | Freq Offse 0 H |
| | | | | |
| enter 5.72000 GHz Res BW 200 kHz | #VBW 620 kHz | Sween | Span 25.00 MHz 1.00 ms (601 pts) | |

Page 153 of 405

9.14.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|----------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5500 | 17.785 |
| Mid 5580 | | 17.904 |
| High | 5700 | 17.889 |

Page 154 of 405





Page 155 of 405



Page 156 of 405

9.14.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

<u>RESULTS</u>

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5500 | 11.4 |
| Mid | 5580 | 11.1 |
| High | 5700 | 10.6 |

Page 157 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 158 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5500 | 20.50 | 17.785 | -6.40 |
| Mid | 5580 | 20.50 | 17.785 | -6.40 |
| High | 5700 | 20.50 | 17.785 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------------|-------|-------|-------|-------|-------|-------|
| | | Power Power | | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) |
| Low | 5500 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |
| Mid | 5580 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |
| High | 5700 | 24.00 | 23.50 | 29.50 | 23.50 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB)0.22Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 11.863 | 12.08 | 23.50 | -11.42 |
| Mid | 5580 | 11.621 | 11.84 | 23.50 | -11.66 |
| High | 5700 | 11.040 | 11.26 | 23.50 | -12.24 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD | |
|---------|-----------|---------|--------|-------|--------|--|
| | | Meas | Corr'd | Limit | Margin | |
| | | PPSD | PPSD | | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) | |
| Low | 5500 | 0.149 | 0.37 | 11.00 | -10.63 | |
| Mid | 5580 | 0.066 | 0.29 | 11.00 | -10.71 | |
| High | 5700 | -0.053 | 0.17 | 11.00 | -10.83 | |

| enter F | req 5.50 | 000000 | O GHz | Trip | Free Ru | Avg n Avgl | Type: RMS fold: 100/100 | 100-56:15 PM May 22, 1 10ACE 1, 2, 3, 4 11/15: A MMM | 5 5 Frequency |
|--|---------------------|--------|------------|---------|----------------|---------------|----------------------------|--|------------------------------|
| Ref Offset 12 dB Mkr2 5.500 00 GHz Ref Offset 12 dB Band Power 11.863 dBm | | | | | | | | | |
| 000 | | | | 01 | ¢ ² | | + | | Center Free 5.50000000 GH |
| 0.0 | | | | | | | | 1 38 | 5 48500000 GH |
| 0.0 | | | | _ | - | - | | | Stop Fre 5.51500000 GH |
| enter 5. Res BW | 50000 GI 1.0 MHz | Hz | #\ | BW 3.0 | MHz* | | Sweep | Span 30.00 M 1.00 ms (601 p | Hz CF Ste ts) 5 00000 MH |
| | | 5 | 497 30 GHz | (A) 0.1 | 49 dBm | HISTOR | RUNCTION WOTH | RINCTON VALUE | Auto Ma |
| 2 N 3 4 5 | 1 | ő | 500 00 GHz | -1.3 | 62 dBm | BanaPower | 20.80 MHz | 11.663 di | im Freq Offse 0 H |
| 7 8 9 10 | | | | | | | | | |



Page 160 of 405

| enter | Freq | 5.72 | 0000 | 0000 G | Hz PNO: Wid | | Trig Fre | Ru | Avg Avgit | Type: RMS fold: 100/100 | 10 | 10.50-26 18 1 | SM May 22, 2013 ACE 1 2 3 4 5 5 THE A MANANAN | Frequency |
|--------------------------------------|----------------|----------------|------------------|----------------|----------------|-------------|-----------|-----|--------------|----------------------------|-------------|---------------------|---|-----------------------------|
| 0 dB/div | Re | roffs f 20. | et 12 c 00 di | iB Bm | FGainta | W | Alten: 16 | dB | | Mk Band Por | r2 5 wer | 5.720 | 0 00 GHz 040 dBm | Auto Tun |
| | | | | | - | | | 2 | 01 | | | | | Center Fre 5.72000000 GH |
| 20.0 20.0 20.0 20.0 20.0 | | > | / | | | _ | | | | | 1 | 1 | .26.50 data | Start Fre 5.70500000 GH |
| 0.0 | | | | | | | | | | | | | | Stop Fre 5.73500000 GH |
| enter Res B | 5.720 W 1.0 | DO GH MHz | łz | | #1 | /BW | 3.0 MHz | | - | Swee | 5 1. | Span 00 m | 30.00 MHz s (601 pts) | CF Step 5.000000 MH |
| | | (4) | | 5.723 5.720 | 75 GHz | <u>(۵</u>) | -0.503 di | šm. | and Divert | 20.40 Mile | | HISC. | Auto | |
| 34557 | | | | 9.129 | ww.write | | 52,000,50 | | 0.64.7.1090 | 20.000 0010 | | | | Freq Offse D H |
| 8 9 0 | | | | | | | | | | | | | | |

Page 161 of 405

9.15. 802.11n HT40 MODE IN THE 5.6 GHz BAND

9.15.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5510 | 39.7 |
| Mid | 5550 | 39.9 |
| High | 5670 | 39.7 |

Page 162 of 405

26 dB BANDWIDTH





Page 163 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Free | 5.67000 | 0000 GH | z | Tele Free | Run | Avg Type | Log-Pwr | 1904 | 123455 | Frequency |
|------------|-------------------------------|------------------|-----------------------------|-----------|-------|------------|---------|---------|--------------------|--|
| g gB/dtv R | ef Offset 12.t ef 20.00 di | en Bin Bin | i0: Fast : C.p. airc1.ow | Atten 18 | dB | | ۵ | Mkr2 39 | 9.7 MHz 1.38 dB | Auto Tune |
| 10.0 | | | | | -01 | | | | | Center Free 5.67000000 GH |
| | | - Alteria | a for loss (may | - mail | - Sin | the second | 0****** | 1 | | Start Free 5.64000000 GH |
| 80 | 3 | | | | | | | ●2∆3 | .24.30 alim | Stop Free 5 70000000 GH |
| 00 | and fail | | | | | | | - M | Contraction of | CF Step 5.000000 MH Auto <u>Ma</u> r |
| 0.0 | - | | | | | | | | | Freq Offse 0 H |
| uo | | | | | | | | | | |

Page 164 of 405

9.15.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

<u>RESULTS</u>

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5510 | 36.622 |
| Mid | 5550 | 36.636 |
| High | 5670 | 36.495 |

Page 165 of 405





Page 166 of 405

| enter Freq 5. | Frequency | | | | | | | | |
|-------------------|---------------------------------|----------|---------|----------|----------|-------|-----------|---------|-------------------------------------|
| Re 0 dB/div Re | f Offset 12.5 dB f 20.00 dBm | | | | | | | | |
| 0.00 10.0 | | NicalPin | KANARAT | anderin | Birlial. | | | | Center Freq 5.67000000 GHz |
| 10.0 | | ATT | 1014 | hild tel | dr.W | | | | |
| 00 | والأفار ليددر | | | | | L | 1900/25 | | |
| | Mbdbulde | | | | | | the state | WWW. | |
| enter 5.67 GH | z | | | | | l h | Span | 100 MHz | CF Step 5.000000 MHz Auto Man |
| Res BW 1 MH | 2 | | #VE | SW 3 MH2 | | | Swe | ep 1 ms | |
| Occupied | Bandwidth 36 | 495 MI | Ηz | Total Po | wer | 11.7 | dBm | | Freq Offset 0 Hz |
| Transmit Fre | eq Error | 281.80 | dHz | OBW Po | ower | 99 | .00 % | | |
| x dB Bandw | idth | 39.80 N | 9Hz | x dB | | -26.0 | 00 dB | | |

Page 167 of 405

9.15.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

<u>RESULTS</u>

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5510 | 11.26 |
| High | 5670 | 10.92 |

Page 168 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 169 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|-------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5510 | 39.7 | 36.495 | -6.40 |
| Mid | 5550 | 39.7 | 36.495 | -6.40 |
| High | 5670 | 39.7 | 36.495 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------------|-------|-------|-------|-------|-------|-------|
| | | Power Power | | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) |
| Low | 5510 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| Mid | 5550 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| High | 5670 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB)0.49Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5510 | 11.591 | 12.08 | 24.00 | -11.92 |
| Mid | 5550 | 11.485 | 11.98 | 24.00 | -12.03 |
| High | 5670 | 11.595 | 12.09 | 24.00 | -11.92 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5510 | -2.900 | -2.41 | 11.00 | -13.41 |
| Mid | 5550 | -3.014 | -2.52 | 11.00 | -13.52 |
| High | 5670 | -2.696 | -2.21 | 11.00 | -13.21 |

Page 170 of 405

| Cen | ter F | req | 5.51000 | 00000 G | Hz PND: Fast | | Trig Fre | e Ru | n | Avg 1 AvgH | ype: RN old: 100 | 15 | (09) | TRACE TITLE | May 22, 2019 1 2 3 4 5 5 A MANANAN | Frequency |
|-------------------------|----------------|------|------------------------|--------------------|------------------|------|----------------------|------------|------------|---------------|---------------------|------|----------------|-----------------|--|-------------------------------|
| 10 di | B/div | Ref | Offset 12 f 20.00 d | 1 15 dB 158m | i Gain:La | 4 | Atten: 1 | 8 48 | 201 | | Band | Mk | r2 5. wer 1 | 510 0 | 0 GHz 1 dBm | Auto Tun |
| 100 100 000 | 1 | | | 6 | | | _ | ¢2 | <u>≬</u> 1 | | - | 2 | | | | Center Free 5.510000000 GH |
| -30.0 -30.0 -40.9 | - | | | ľ | | - | | | | | - | - | | _ | .22 St-alies | Start Free 5.47500000 GH |
| -50 0 -80 0 -70 0 | | _ | | | - | | _ | | | | + | | | | - | Stop Fre 5.54500000 GH |
| Cen | ter 5. s BW | 5100 | 0 GHz MHz | | #\ | BW : | 3.0 MHz | 17 | | | s | wee | Sp 1.00 | an 70) ms (| .00 MHz 601 pts) | CF Ste 5.000000 MH |
| 1 2 3 4 5 | N N | | (43) | 5.513 5.510 | 73 GHz 00 GHz | (Δ) | -2.900 d -8.662 d | Bm. Bm. | Eand) | Proven | 39.2 | 0 MH | 2 | 11. | 591 dBm | Freq Offse |
| 5 7 8 9 10 | | | | | | | | | | | | | | | | |



Page 171 of 405

REPORT NO: 13U15118-2F EUT: GSM/CDMA/WCDMA + LTE Phone Bluetooth, WLAN (2.4GHz & 5GHz) and NFC

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Fr | eq 5.670 | 000000 G | Hz PNO: Fast | Trig Free | Avg Run Avg | Type: RMS Hold: 100/100 | TUACE 1 2 TUACE 1 2 | Frequency |
|---------------------------|------------------------|------------------|----------------------|------------------------|----------------|----------------------------|---------------------------|------------------------------------|
| 10 dB/div | Ref Offset Ref 20.0 | 12.5 dB 0 dBm | GainLaw | Atten: 18 | dB | Mk Band Por | r2 5.670 00 wer 11.595 | GHz Auto Tune |
| | | ~ | | 01 | 2 | | | Center Free 5.67000000 GH |
| 200 200 200 200 | | / | | | | | | Start Free 5.635000000 GH |
| 0 0 0 80 0 70 0 | | | | | | | | Stop Free 5.705000000 GH |
| Center 5.0 Res BW | 37000 GHz 1.0 MHz | | #VBI | V 3.0 MHz* | 1 | Swee | Span 70.00 1.00 ms (60 | 0 MHz CF Step 1 pts) 5 00000 MH |
| 1 N 2 N 3 4 5 | f (A) | 5.665 5.870 | 80 GHz (Δ) 00 GHz | -2.696 dB -8.275 dB | m BanaPower | 39.20 MH | 11.59 | 5.dBm FreqOffse 0 H |
| 7 8 9 10 | | | | | | | | |

Page 172 of 405

9.16. 802.11ac HT20 MODE IN THE 5.6 GHz BAND

9.16.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5500 | 20.200 |
| Mid | 5580 | 20.375 |
| High | 5700 | 20.450 |

Page 173 of 405

26 dB BANDWIDTH





Page 174 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 175 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5500 | 17.818 |
| Mid | 5580 | 17.881 |
| High | 5700 | 17.873 |

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Page 176 of 405





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Page 177 of 405



Page 178 of 405

9.16.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 5500 | 10.6 |
| Mid | 5580 | 10.2 |
| High | 5700 | 9.5 |

Page 179 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 180 of 405
Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional | |
|---------|-----------|--------|------------|-------------|--|
| | | 26 dB | 99% | Gain | |
| | | BW | BW | | |
| | (MHz) | (MHz) | (MHz) | (dBi) | |
| Low | 5500 | 20.200 | 17.818 | -6.40 | |
| Mid | 5580 | 20.200 | 17.818 | -6.40 | |
| High | 5700 | 20.200 | 17.818 | -6.40 | |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5500 | 24.00 | 23.51 | 29.51 | 23.51 | 11.00 | 11.00 | 11.00 |
| Mid | 5580 | 24.00 | 23.51 | 29.51 | 23.51 | 11.00 | 11.00 | 11.00 |
| High | 5700 | 24.00 | 23.51 | 29.51 | 23.51 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB)0.21Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | 9.50 | 9.71 | 23.51 | -13.80 |
| Mid | 5580 | 9.95 | 10.16 | 23.51 | -13.35 |
| High | 5700 | 8.62 | 8.83 | 23.51 | -14.68 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5500 | -2.19 | -1.98 | 11.00 | -12.98 |
| Mid | 5580 | -2.70 | -2.49 | 11.00 | -13.49 |
| High | 5700 | -3.00 | -2.79 | 11.00 | -13.79 |





Page 182 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980

| enter Fre | q 5.70 | 0000 | 000 GHz | Wino -+ | Trig Free R | MAVg un Avg/H | Type: RMS old: 100/100 | 10:11:20 AM May 29, 2013 TRACE 2 3 4 5 5 Triffe & wanted | Frequency |
|-------------------------|-----------------|----------|----------|---------|--------------|------------------|---------------------------|--|-------------------------------|
| n Janeu 🖁 | Ref Offs | et 12 di | IF Ga | inclaw | Atten: 16 dE | | Mkr | 2 5,700 00 GHz | Auto Tune |
| | | | | Q1 | ¢ | | | | Center Freq 5.70000000 GHz |
| 0.0 0.0 0.0 | 1 | ł | | | | | | 1 | Start Free 5.68500000 GH |
| 0.0 0.0 | | | | | | | | nude - | Stop Free 5.716000000 GH; |
| enter 5.70 Res BW 1. | 000 GI 0 MHz | Hz | | #VBV | V 3.0 MHz* | | Sweep | Span 30.00 MHz 1.00 ms (601 pts) | CF Step 3.000000 MH: |
| | | | 5 695 00 | GHz | -3.002 dBm | PUNCTUR | IUSCIEN ODIN | NUMERICA MADE | Auto Man |
| 2 N 3 4 6 6 | , | | 5.700 00 | GHz | 4.056 dBm | Band Power | 20.80 MHz | 8.623 dBm | Freq Offse 0 Ha |
| 7 8 9 0 | | | | | | | | | |

Page 183 of 405

9.17. 802.11ac HT40 MODE IN THE 5.6 GHz BAND

9.17.1. 26 dB BANDWIDTH

<u>LIMITS</u>

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5100 | 39.670 |
| Mid | 5550 | 39.430 |
| High | 5670 | 39.900 |

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Page 184 of 405

26 dB BANDWIDTH





Page 185 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 186 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth | |
|---------|-----------|---------------|--|
| | (MHz) | (MHz) | |
| Low | 5100 | 36.347 | |
| Mid | 5550 | 36.209 | |
| High | 5670 | 36.174 | |

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Page 187 of 405





Page 188 of 405



Page 189 of 405

9.17.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

| Channel Frequency | | Power |
|-------------------|-------|-------|
| | (MHz) | (dBm) |
| Low | 5100 | 10.6 |
| Mid | 5550 | 10.9 |
| High | 5670 | 10.2 |

Page 190 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 191 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min Min | | Directional |
|---------|-----------|---------|------------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5100 | 39.430 | 36.174 | -6.40 |
| Mid | 5550 | 39.430 | 36.174 | -6.40 |
| High | 5670 | 39.430 | 36.174 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5100 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| Mid | 5550 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| High | 5670 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5100 | 9.41 | 9.62 | 24.00 | -14.38 |
| Mid | 5550 | 9.54 | 9.75 | 24.00 | -14.26 |
| High | 5670 | 9.43 | 9.64 | 24.00 | -14.36 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5100 | -4.98 | -4.77 | 11.00 | -15.77 |
| Mid | 5550 | -4.77 | -4.56 | 11.00 | -15.56 |
| High | 5670 | -5.04 | -4.83 | 11.00 | -15.83 |

OUTPUT POWER AND PPSD, Chain 0

Page 192 of 405

| Center Fre | q 5.550000 | 000 GHz PNO Fast | Trig Free | Run | #Avg Type: Avg[Hold: 1 | RMS 00/100 | 1 10:04(31) | AM May 29, 20113 | Frequency |
|--------------------------|------------------|-------------------------|-------------------------|-----------|---------------------------|-----------------|----------------------|--------------------------|-----------------------------|
| n dana i | lef Offset 12 d | IF Gain Le IB Ren | W Atten: 16 | dB | Ba | Mk nd Pr | r2 5.550 ower 9.4 | 00 GHz | Auto Tune |
| 020 | | | | 2 01 | | | | | Center Fre 5.55000000 GH |
| 30.0 30.0 40.0 | | | | | | | | | Start Fre 5.51500000 GH |
| 60.0 /0.0 | | | | | | | | | Stop Fre 5.585000000 GH |
| Center 5.55 Res BW 1. | 000 GHz 0 MHz | #1 | BW 3.0 MHz* | | | Sweer | Span i p 1.00 m | 70.00 MHz s (601 pts) | CF Ste 7.00000 MH |
| 170 10000 NTO 1 | 10 | | | | | EXTREMON | 0.000 | CR COLORED | Auto Ma |
| NNN 34557 | ł | 5.550 00 GHz | -4.975 dB -11.179 dB | im Band F | Nover 38 | 3.43 MHz | | 9.413 dBm | Freq Offse 0 H |
| 8 9 10 11 | | | | | | | | | |



Page 193 of 405

| enter Freq 5.67 | 0000000 GHz PND Fast | Trig Free Run | Marg Type: RMS Avg(Held: 100/100 | 130-27-53 AM May 29, 2013 TRACE 2, 7, 4, 5, 6 Trank A Westman | Frequency |
|-----------------------------------|--------------------------------|-----------------------------|-------------------------------------|---|------------------------------|
| Ref Offs | FGainLaw et 12 dB 00 dBm | Atten: 18 dB | Band Por | 2 5.670 00 GHz | Auto Tune |
| | | 01 02 | | | Center Free 5.67000000 GH |
| 0.0 0.0 | | | | 20.00 | Start Free 5.635000000 GH |
| 0.0 0.0 | | | | | Stop Free 5.70500000 GH |
| enter 5.67000 G Res BW 1.0 MHz | Hz. #VI | 8W 3.0 MHz* | Sweep | Span 70.00 MHz 1.00 ms (601 pts) | CF Step 7 00000 MH |
| | | | | COLUMN DE COLUMN | Auto Mar |
| 1 N F 3 A 5 5 | 5.670 00 GHz 5.670 00 GHz | 40.043 dBm 41.189 dBm Ba | nd Power 39.20 MHz | 9,429 dBm | Freq Offse 0 H |
| 7 8 9 1 1 | | | | | |

Page 194 of 405

9.18. 802.11ac HT80 MODE IN THE 5.6 GHz BAND

9.18.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| | (MHz) | (MHz) |
| Low | 5300 | 81.430 |
| | | |
| High | 5690 | 82.130 |

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Page 195 of 405

26 dB BANDWIDTH



Page 196 of 405

DATE: JULY 19, 2013 FCC ID: ZNFVS980



Page 197 of 405

LIMITS

None; for reporting purposes only.

RESULTS

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5530 | 75.411 |
| | | |
| High | 5690 | 75.865 |

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Page 198 of 405



Page 199 of 405

| Center Fre | rq 5.690000000 | GHz | Center Pr Trig Free Altten: 18 | eq: 5.69000000 GP Run dB | atraixoro tr | Radio Std: Nor Radio Device: | Frequency BTS |
|-------------------------|-----------------------------------|-----------------------|--------------------------------------|--------------------------------|-----------------|---------------------------------|--------------------------------|
| 0 dB/div | Ref Offset 12 dB Ref 20.00 dBm | | | | | | |
| 10.00 10.00 10.00 | | - | orrester. | atry the state | 67 | | Center Freq 5.690000000 GHz |
| 800 800 | 17 MA Marchale | <i>A</i> | | | Maria | hand like a | Wete |
| Center 5.6 Res BW | 9 GHz 820 kHz | | #VB | W 2.4 MHz | | Span 20 Sweep | 0 MHz 1 ms |
| Occup | ied Bandwidtl 75 | 865 MH | z | Total Power | 9.24 | l dBm | Freq Offset 0 Hz |
| Transm x dB Ba | it Freq Error Indwidth | 277.41 ki 78.21 Mi | łz łz | OBW Power x dB | 99 -26. | 9.00 % 00 dB | |

Page 200 of 405

9.18.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

| Channel | Frequency | Power |
|---------|-----------|--------|
| | (MHz) | (dBm) |
| Low | 5300 | 10.790 |
| | | |
| High | 5690 | 10.220 |

Page 201 of 405

LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

IC RSS-210 A9.2 (1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 202 of 405

Bandwidth and Antenna Gain

| Channel | Frequency | Min | Min | Directional |
|---------|-----------|--------|--------|-------------|
| | | 26 dB | 99% | Gain |
| | | BW | BW | |
| | (MHz) | (MHz) | (MHz) | (dBi) |
| Low | 5530 | 81.130 | 75.411 | -6.40 |
| | | | | |
| High | 5690 | 82.130 | 75.411 | -6.40 |

Limits

| Channel | Frequency | FCC | IC | IC | Power | FCC | IC | PPSD |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|
| | | Power | Power | EIRP | Limit | PPSD | PSD | Limit |
| | | Limit | Limit | Limit | | Limit | Limit | |
| | (MHz) | (dBm) |
| Low | 5530 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |
| | | | | | | | | |
| High | 5690 | 24.00 | 24.00 | 30.00 | 24.00 | 11.00 | 11.00 | 11.00 |

Duty Cycle CF (dB) 0.21 Included in Calculations of Corr'd Power & PPSD

Output Power Results

| Channel | Frequency | Chain 0 | Total | Power | Power |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | Power | Power | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5530 | 9.157 | 9.37 | 24.00 | -14.63 |
| | | | | | |
| High | 5690 | 8.442 | 8.65 | 24.00 | -15.35 |

PPSD Results

| Channel | Frequency | Chain 0 | Total | PPSD | PPSD |
|---------|-----------|---------|--------|-------|--------|
| | | Meas | Corr'd | Limit | Margin |
| | | PPSD | PPSD | | |
| | (MHz) | (dBm) | (dBm) | (dBm) | (dB) |
| Low | 5530 | -8.152 | -7.94 | 11.00 | -18.94 |
| | | | | | |
| High | 5690 | -8.945 | -8.74 | 11.00 | -19.74 |