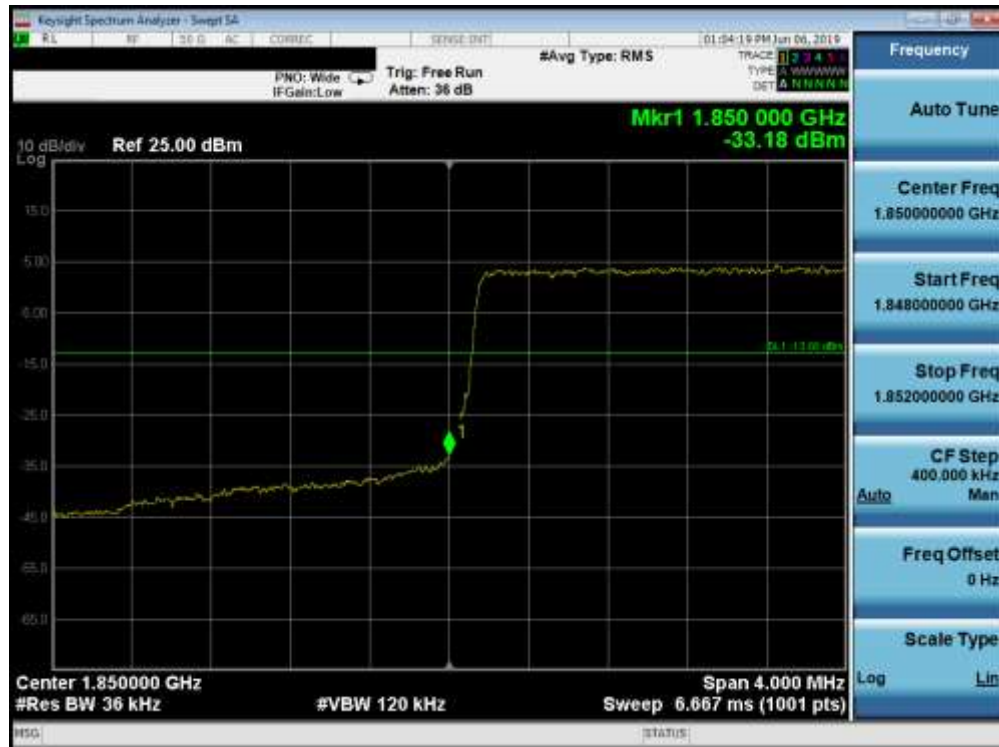
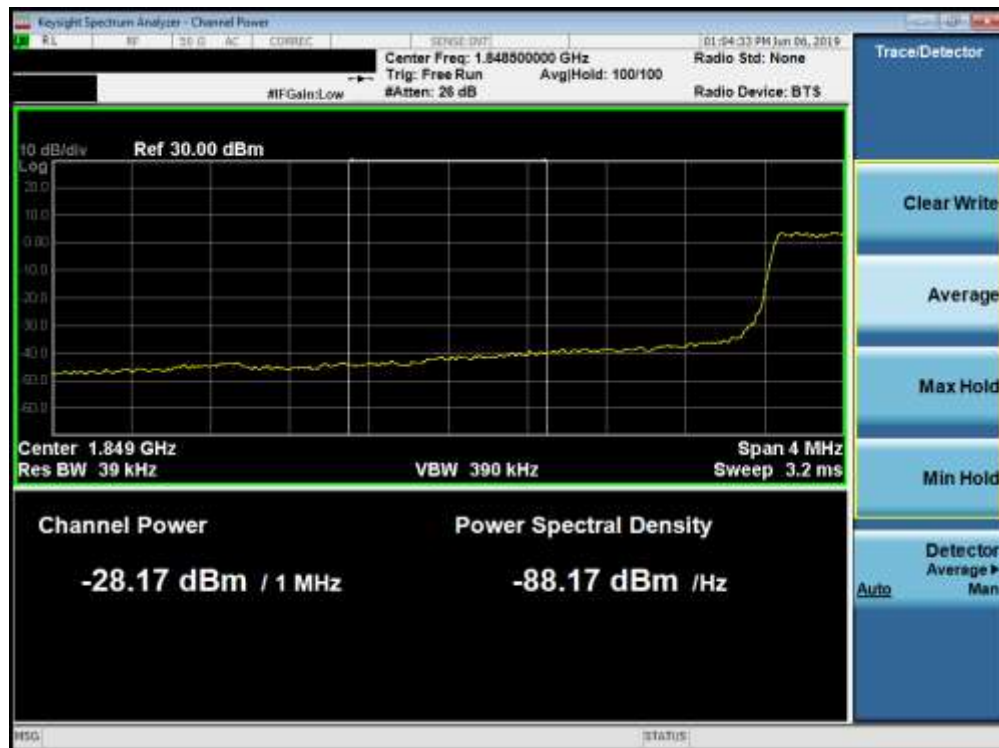




Plot 7-167. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-168. Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 106 of 178                 |

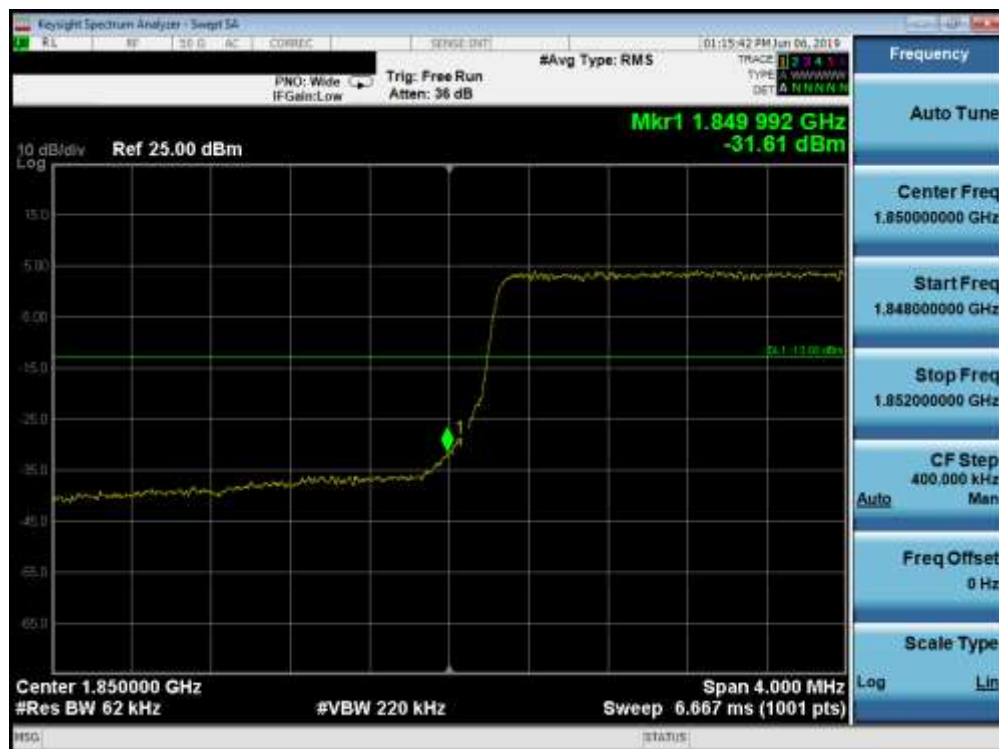


Plot 7-169. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

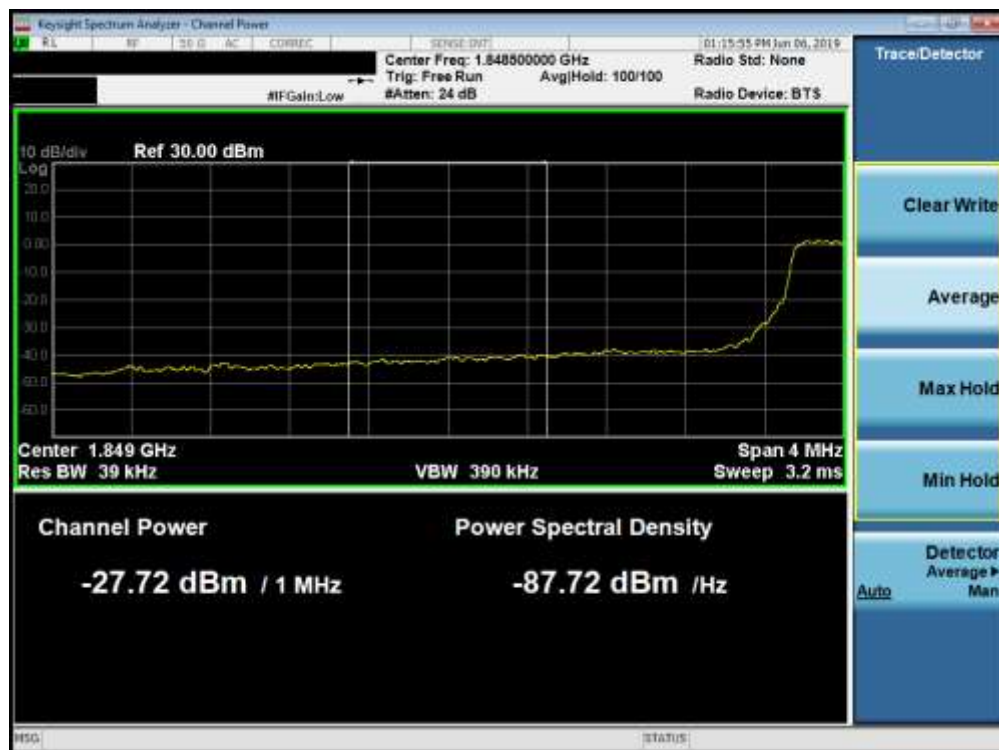


Plot 7-170. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 107 of 178                 |

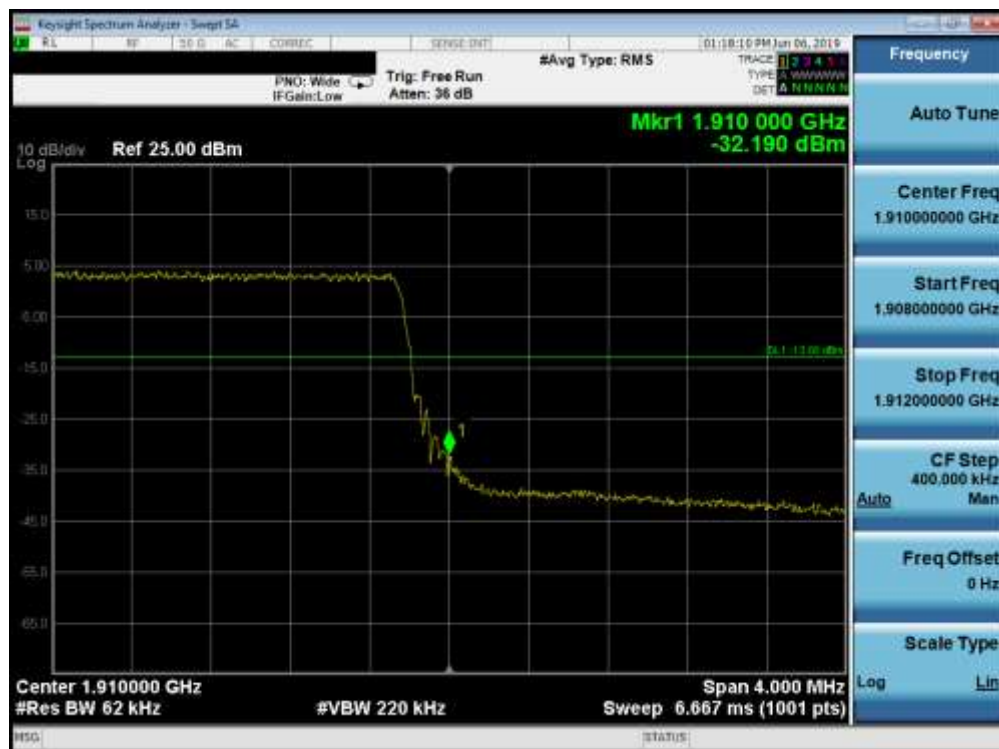


Plot 7-171. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

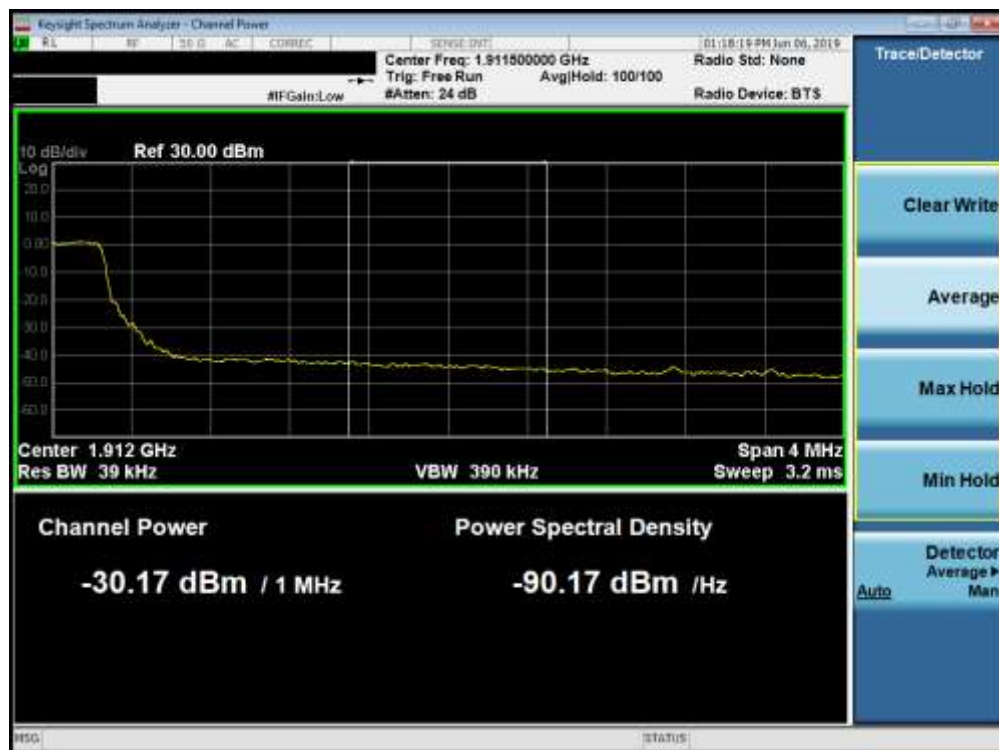


Plot 7-172. Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 108 of 178                 |



Plot 7-173. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

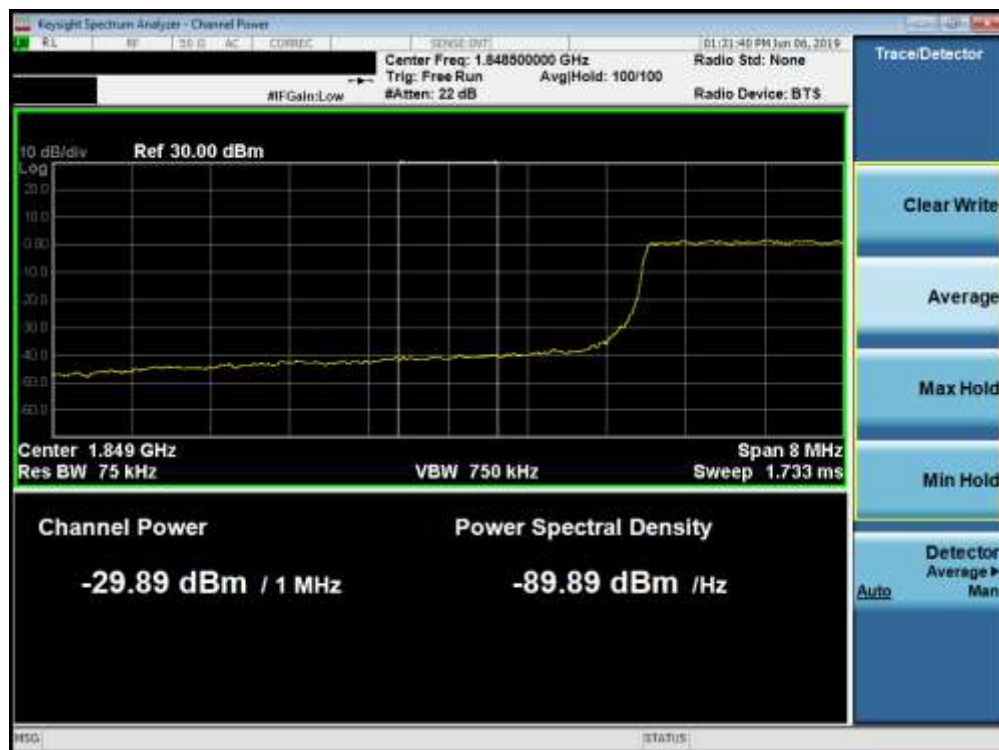


Plot 7-174. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 109 of 178                 |



Plot 7-175. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-176. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 110 of 178                 |

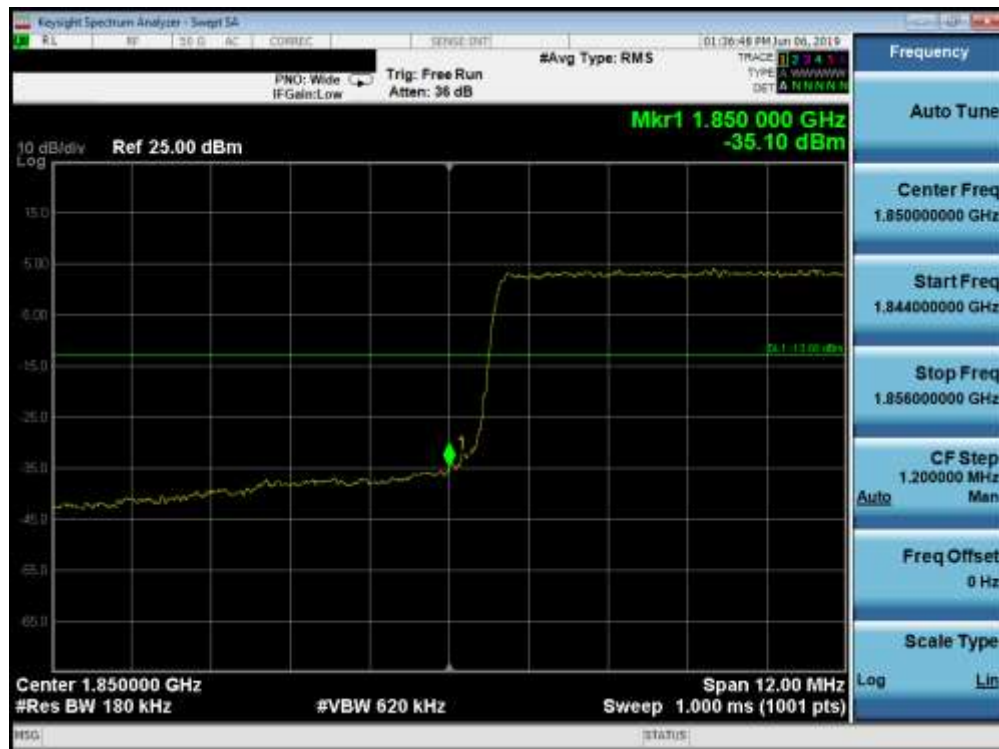


Plot 7-177. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

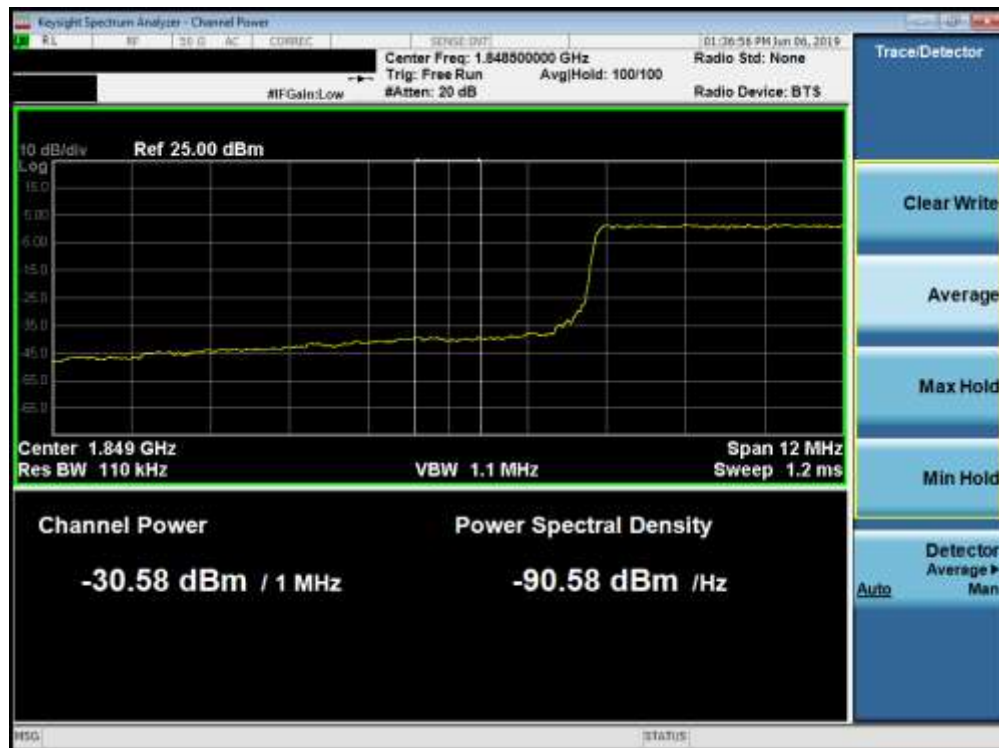


Plot 7-178. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 111 of 178                 |



Plot 7-179. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

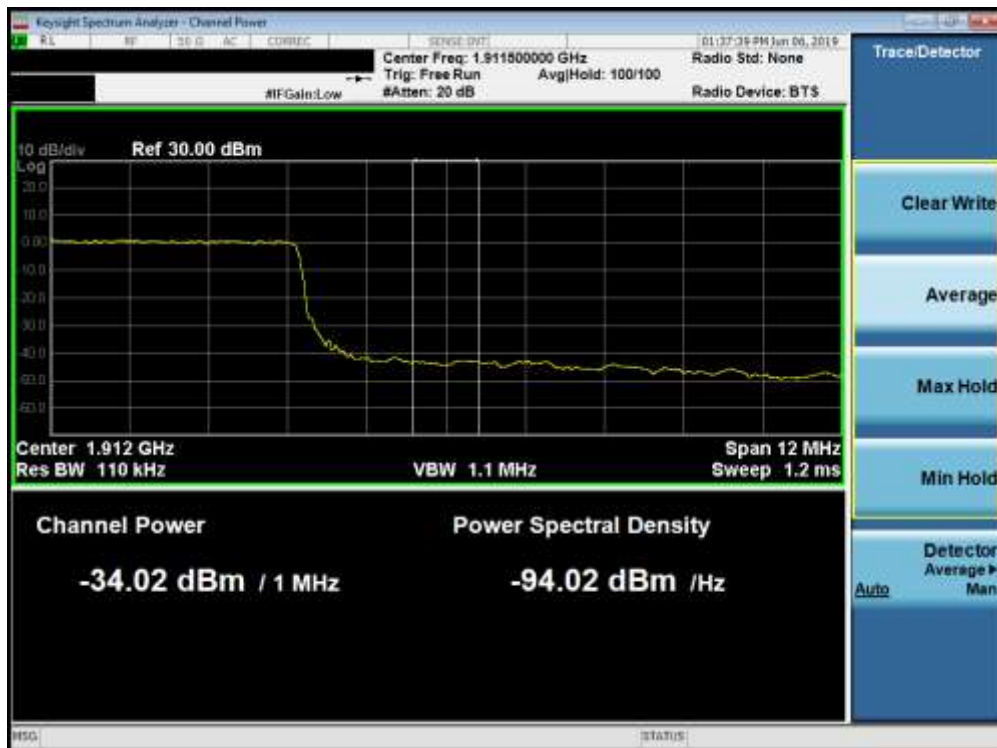


Plot 7-180. Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |           |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |           | Page 112 of 178                 |

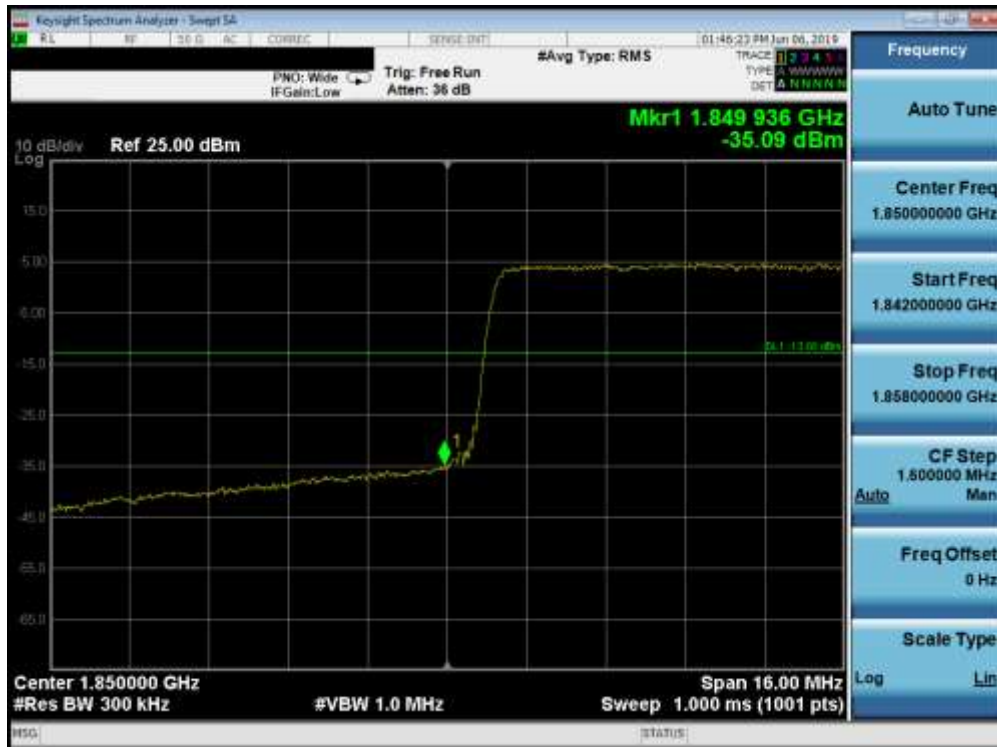


Plot 7-181. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

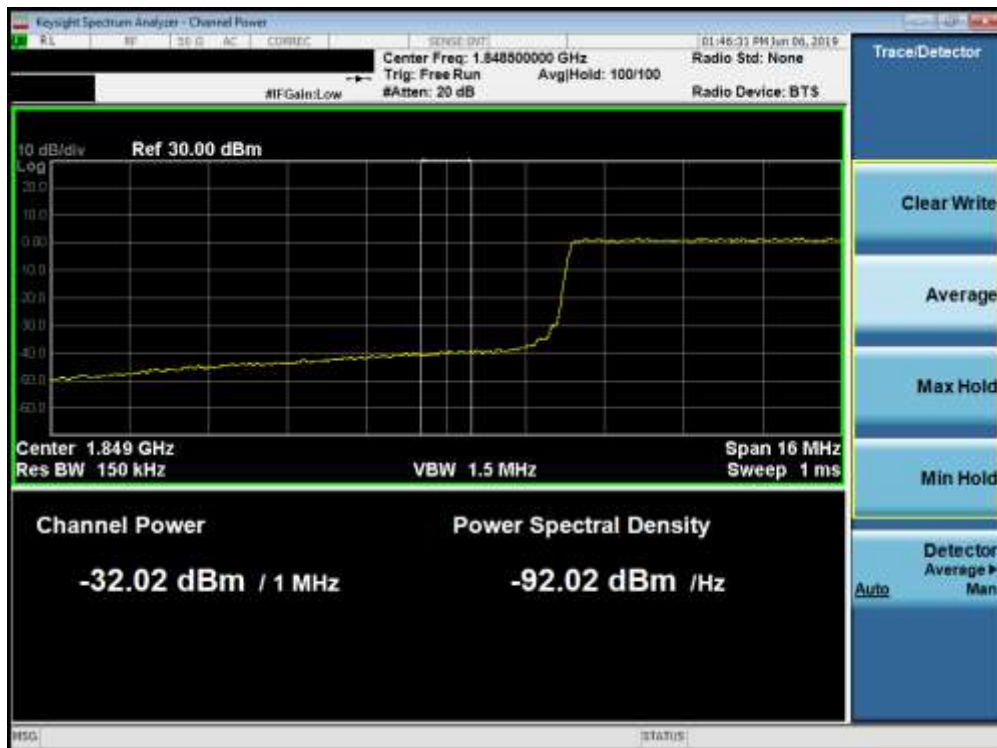


Plot 7-182. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 113 of 178                 |



Plot 7-183. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

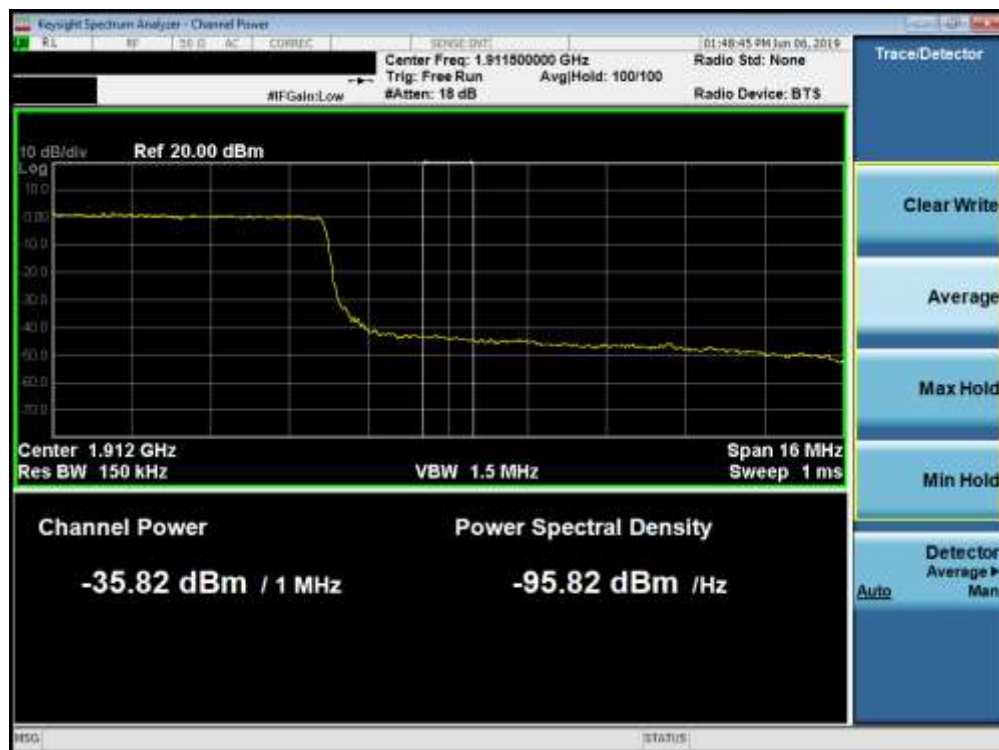


Plot 7-184. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 114 of 178                 |



Plot 7-185. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-186. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 115 of 178                 |

## Band 7



Plot 7-187. Lower ACP Plot Plot (Band 7 – 5.0MHz QPSK - Full RB Configuration)



Plot 7-188. Upper ACP Plot (Band 7 – 5.0MHz QPSK - Full RB Configuration)

|                                            |                                              |                               |                 |                                 |
|--------------------------------------------|----------------------------------------------|-------------------------------|-----------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |                               |                 | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019              | EUT Type:<br>Portable Handset | Page 116 of 178 |                                 |



Plot 7-189. Lower ACP Plot (Band 7 – 10.0MHz QPSK - Full RB Configuration)



Plot 7-190. Upper ACP Plot (Band 7 – 10.0MHz QPSK - Full RB Configuration)

|                                            |                                                                                                                                                                                                                 |                               |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  MEASUREMENT REPORT<br>(CERTIFICATION)  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                 | EUT Type:<br>Portable Handset | Page 117 of 178                 |



Plot 7-191. Lower ACP Plot (Band 7 – 15.0MHz QPSK - Full RB Configuration)



Plot 7-192. Upper ACP Plot (Band 7 – 15.0MHz QPSK - Full RB Configuration)

|                                            |                                                                                                                                  |                               |                                                                                       |                                 |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                  | EUT Type:<br>Portable Handset |                                                                                       | Page 118 of 178                 |



Plot 7-193. Lower ACP Plot (Band 7 – 20.0MHz QPSK - Full RB Configuration)



Plot 7-194. Upper ACP Plot (Band 7 – 20.0MHz QPSK - Full RB Configuration)

|                                            |                                                                                                                                                                                                                 |                               |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  MEASUREMENT REPORT<br>(CERTIFICATION)  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                 | EUT Type:<br>Portable Handset | Page 119 of 178                 |

## 7.5 Peak-Average Ratio

### Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

### Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

### Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW  $\geq$  OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

### Test Setup

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



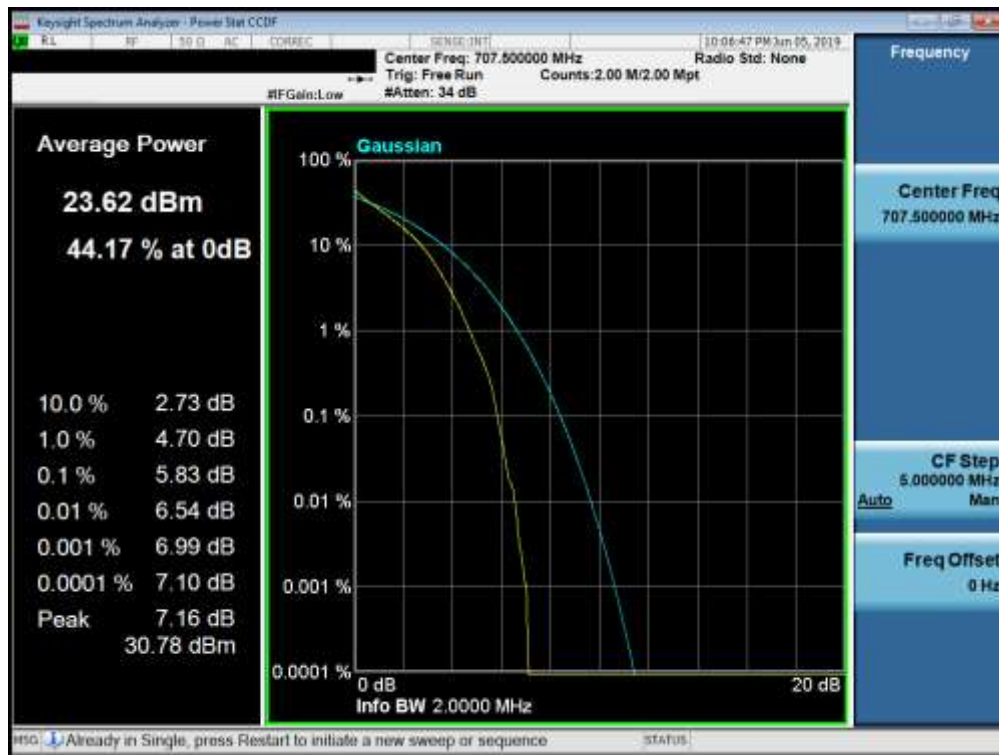
**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

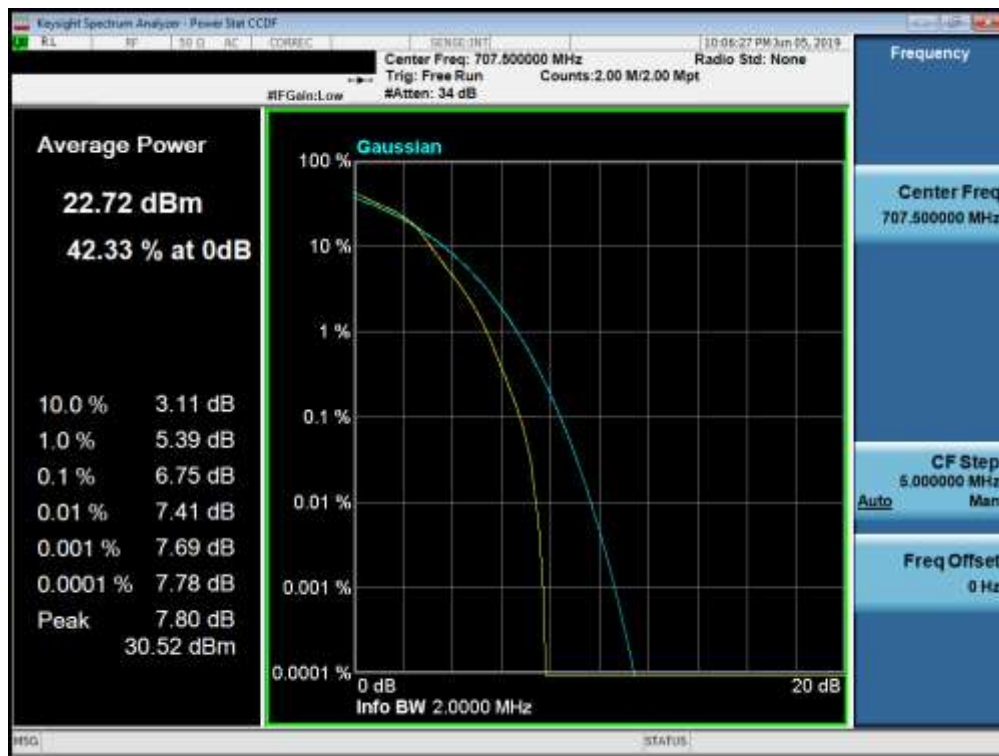
None.

|                                            |                                                                                                                                                                                                                         |                               |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                         | EUT Type:<br>Portable Handset | Page 120 of 178                 |

## Band 12/17

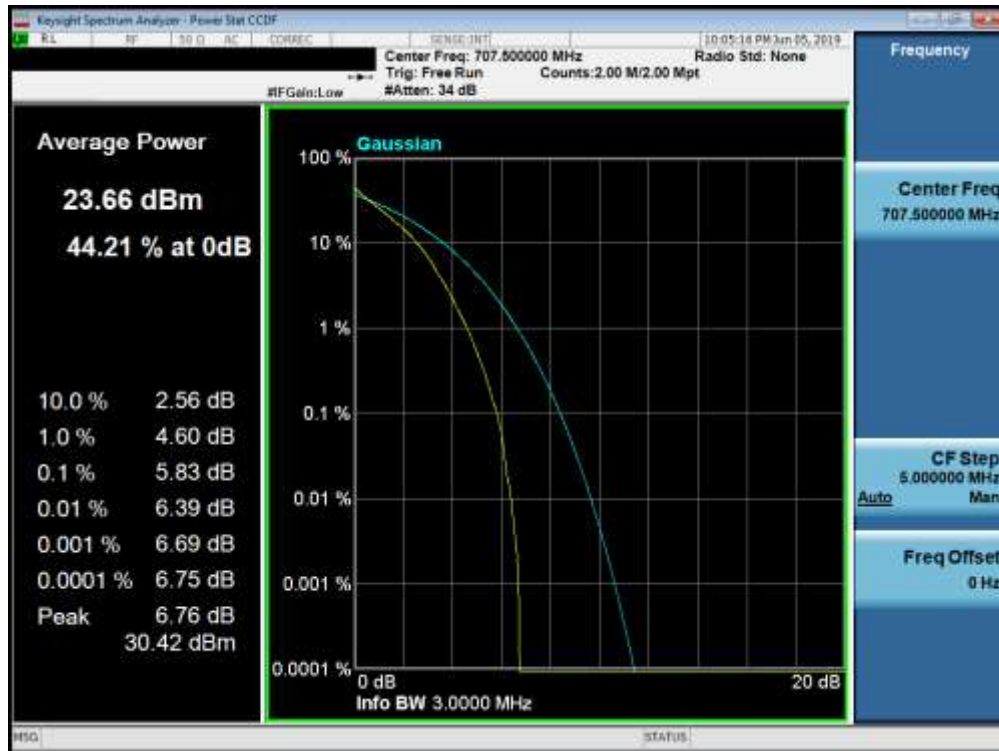


Plot 7-195. PAR Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

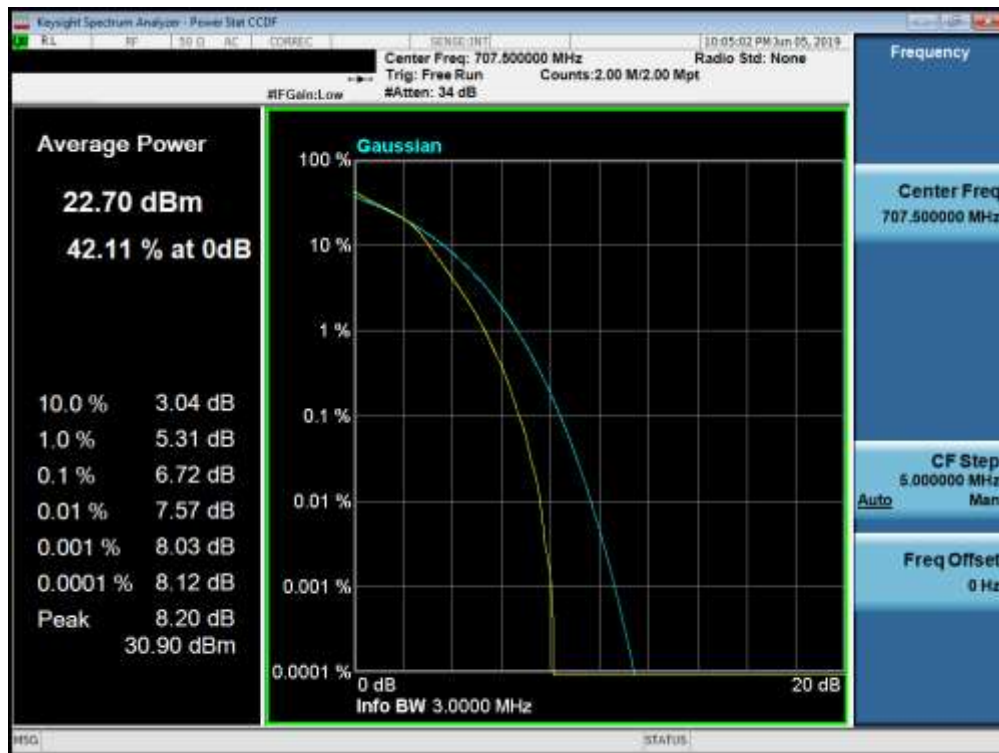


Plot 7-196. PAR Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

|                                            |                                              |                               |  |                                 |
|--------------------------------------------|----------------------------------------------|-------------------------------|--|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019              | EUT Type:<br>Portable Handset |  | Page 121 of 178                 |

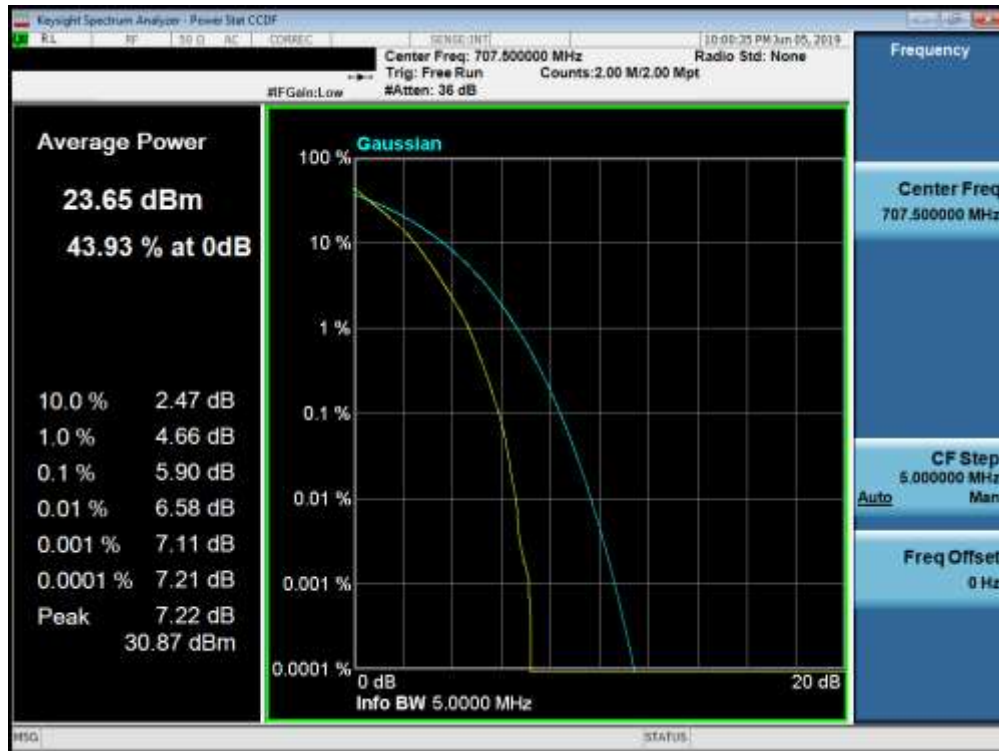


Plot 7-197. PAR Plot (Band 12 – 3.0MHz QPSK - Full RB Configuration)

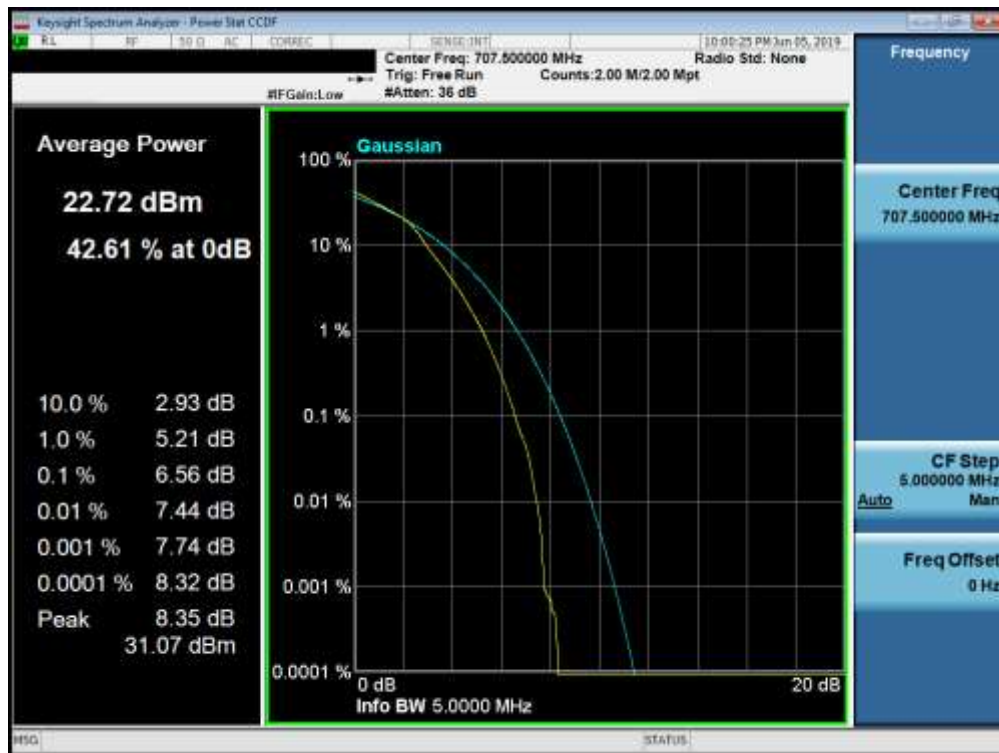


Plot 7-198. PAR Plot (Band 12 – 3.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 122 of 178                 |

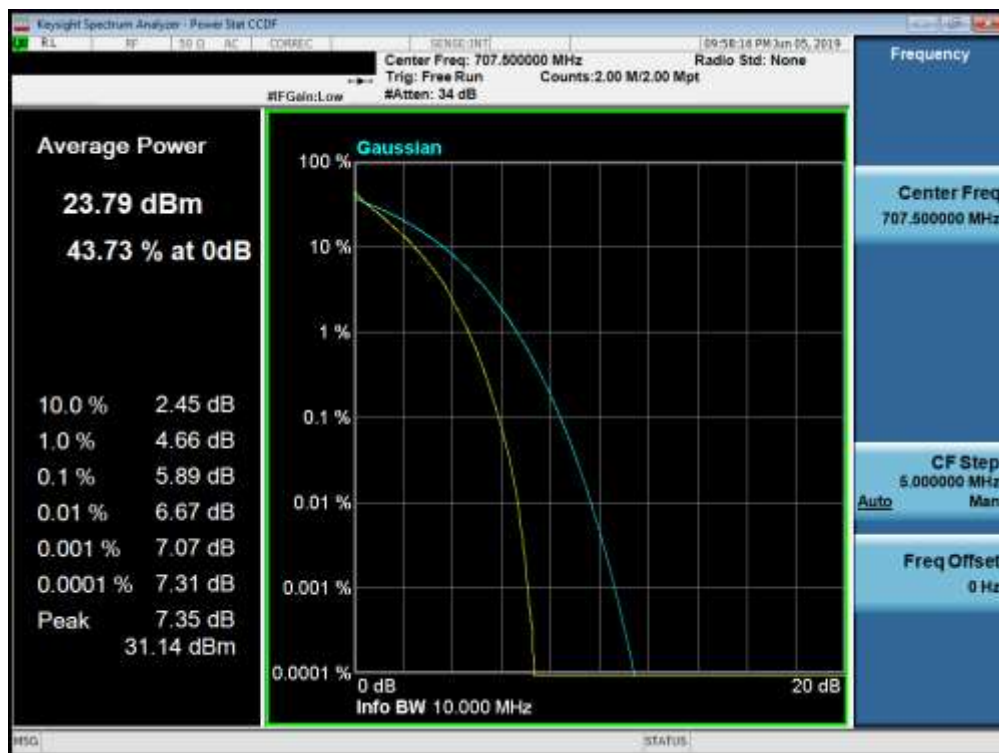


Plot 7-199. PAR Plot (Band 12/17 – 5.0MHz QPSK - Full RB Configuration)

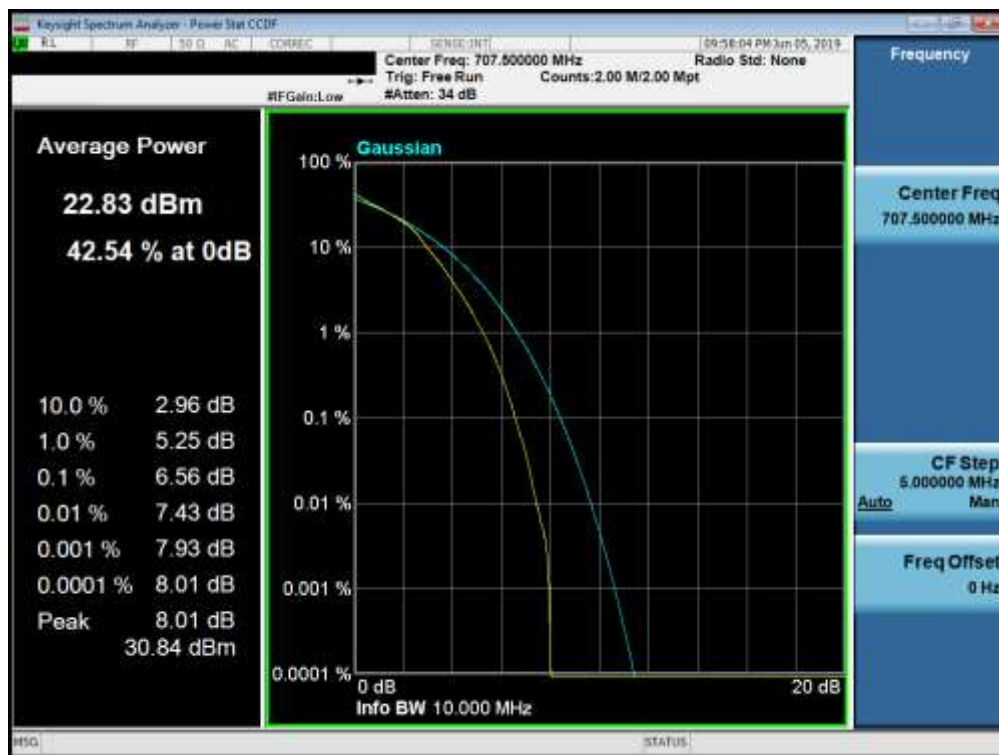


Plot 7-200. PAR Plot (Band 12/17 – 5.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 123 of 178                 |



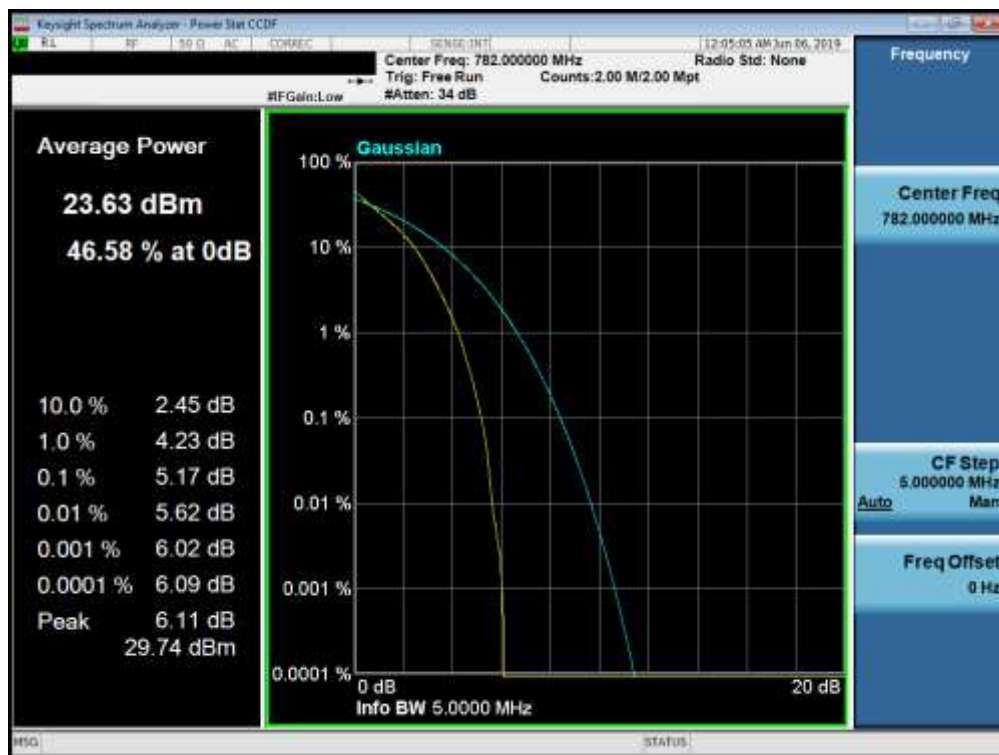
Plot 7-201. PAR Plot (Band 12/17 – 10.0MHz QPSK - Full RB Configuration)



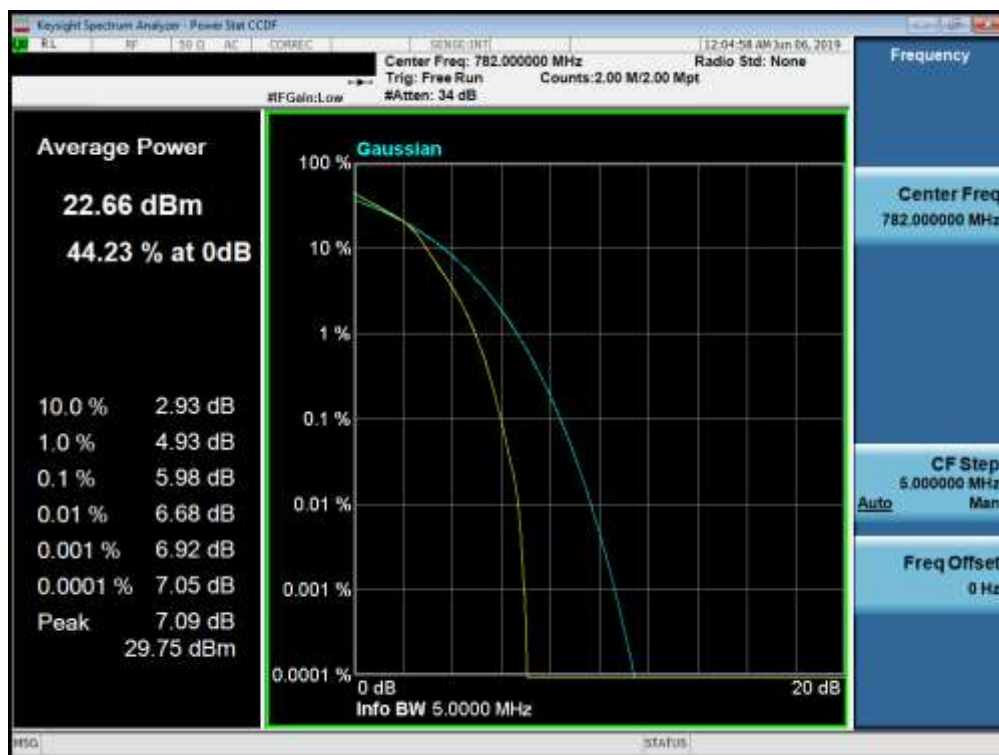
Plot 7-202. PAR Plot (Band 12/17 – 10.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 124 of 178                 |

## Band 13

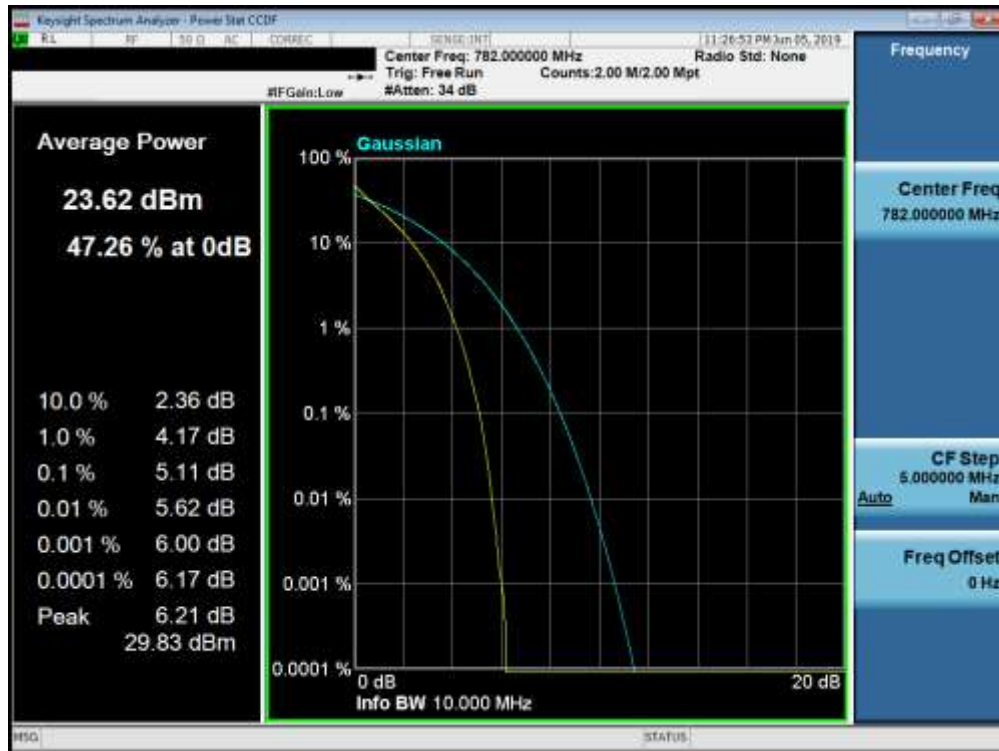


Plot 7-203. PAR Plot (Band 13 – 5.0MHz QPSK - Full RB Configuration)

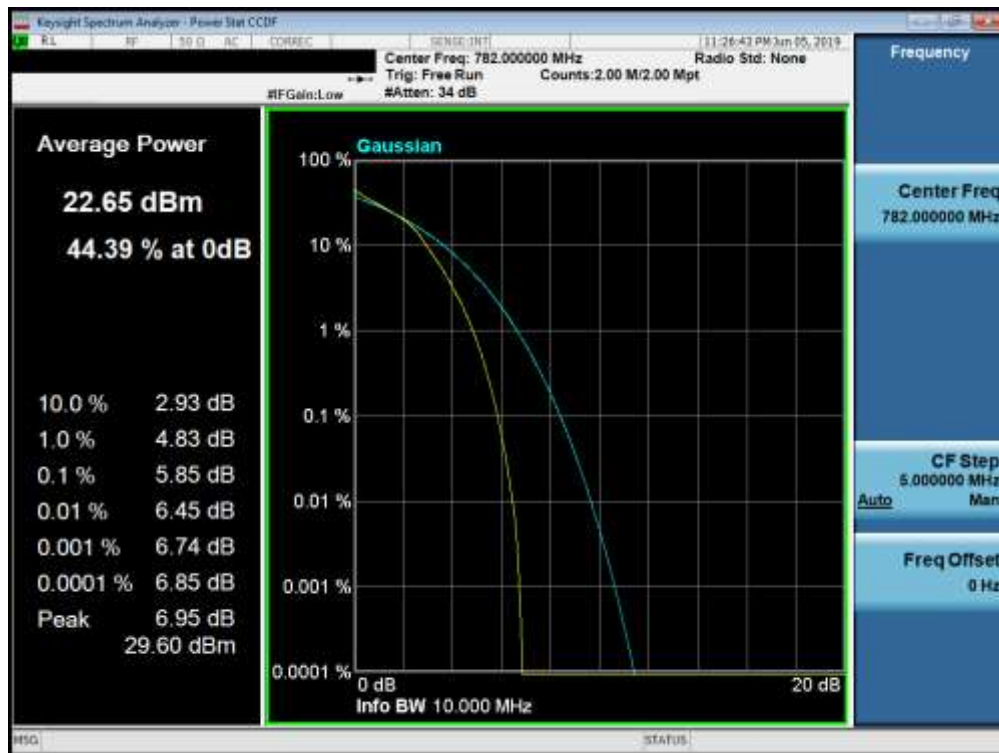


Plot 7-204. PAR Plot (Band 13 – 5.0MHz 16-QAM - Full RB Configuration)

|                                            |                                              |                               |  |                                 |
|--------------------------------------------|----------------------------------------------|-------------------------------|--|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |                               |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019              | EUT Type:<br>Portable Handset |  | Page 125 of 178                 |



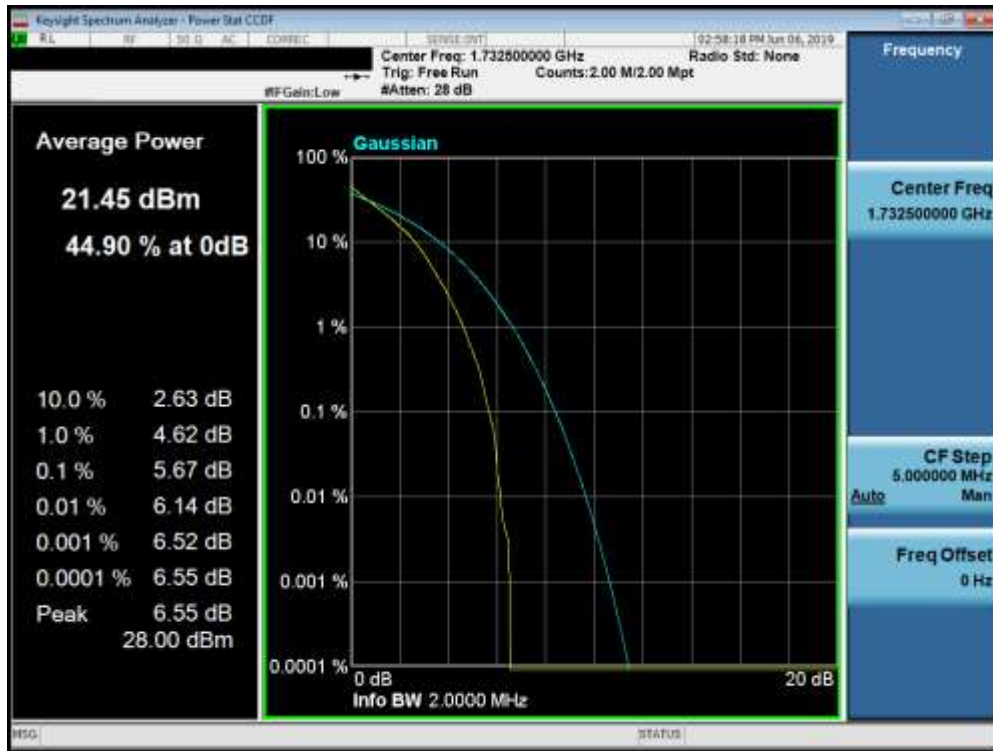
Plot 7-205. PAR Plot (Band 13 – 10.0MHz QPSK - Full RB Configuration)



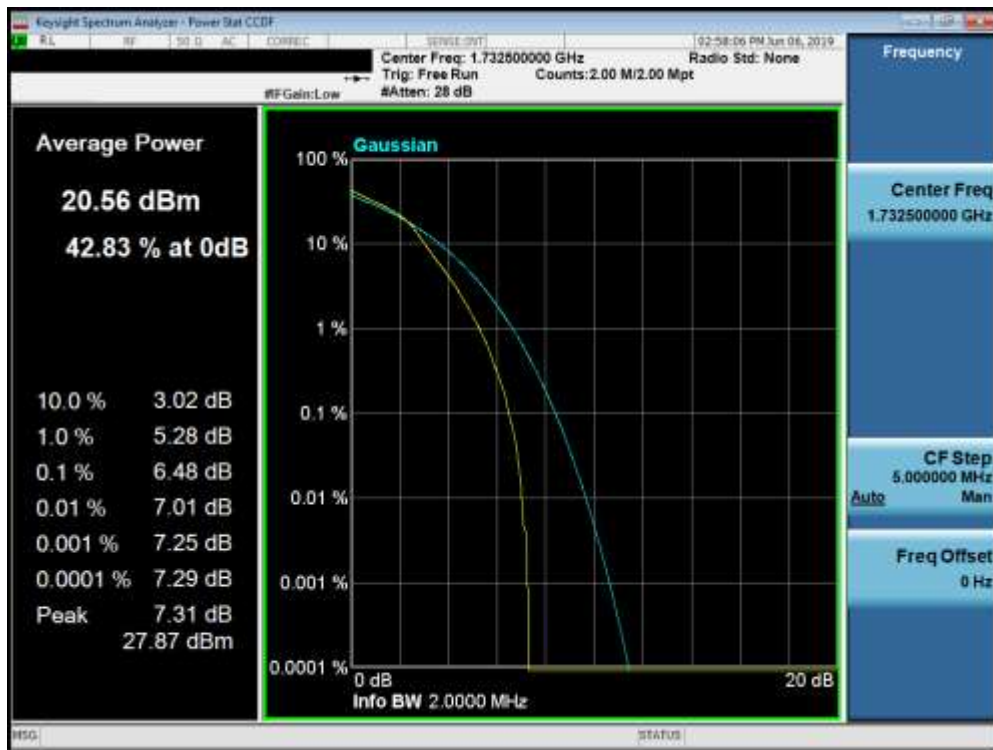
Plot 7-206. PAR Plot (Band 13 – 10.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 126 of 178                 |

## Band 66/4

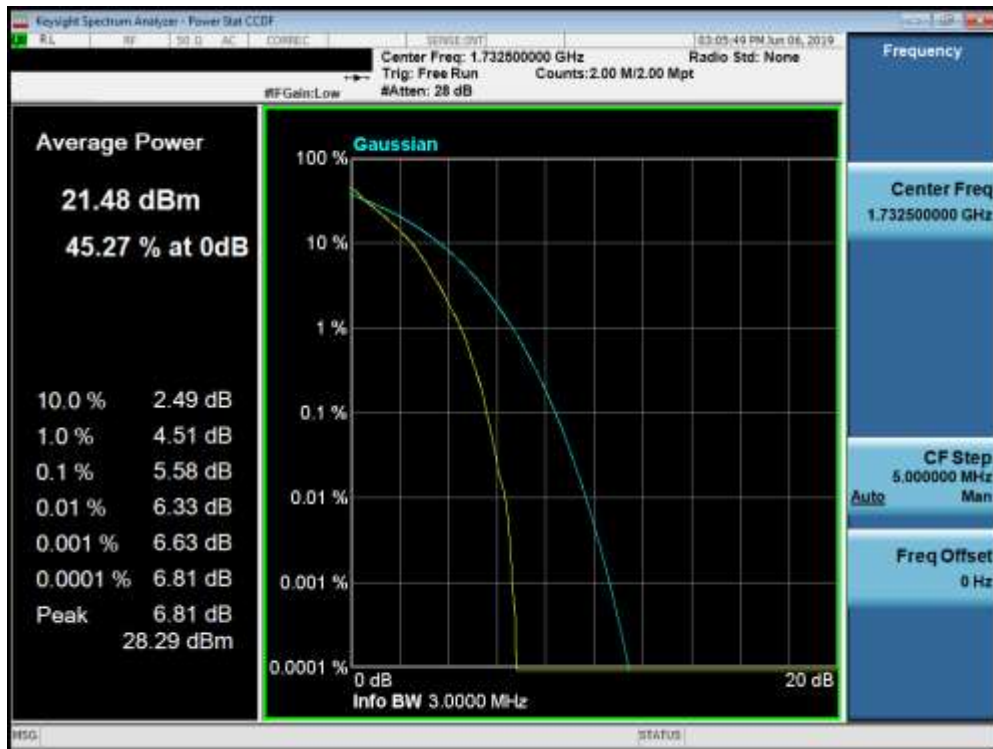


Plot 7-207. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

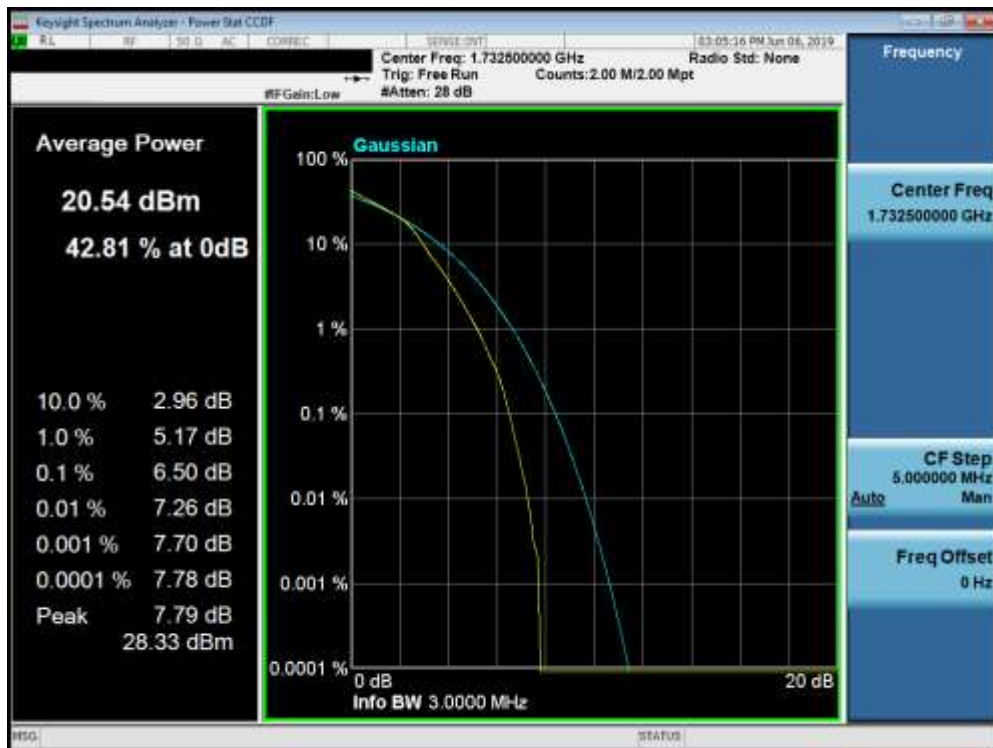


Plot 7-208. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 127 of 178                 |

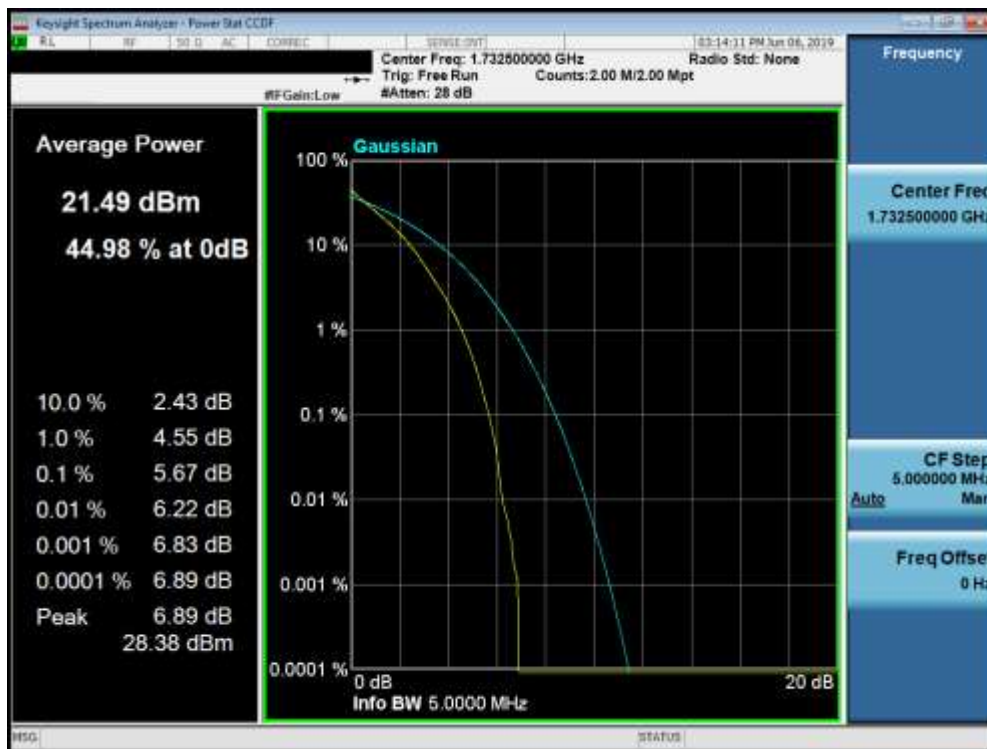


Plot 7-209. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

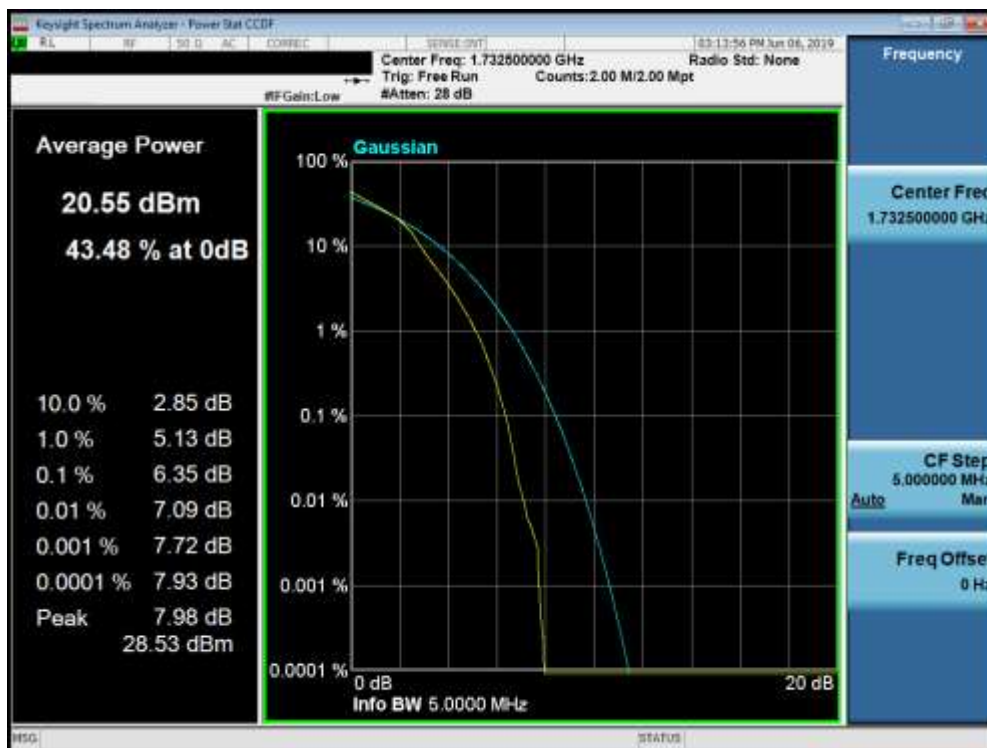


Plot 7-210. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

|                                            |                                                                                                                                                                                                                         |                               |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                         | EUT Type:<br>Portable Handset | Page 128 of 178                 |

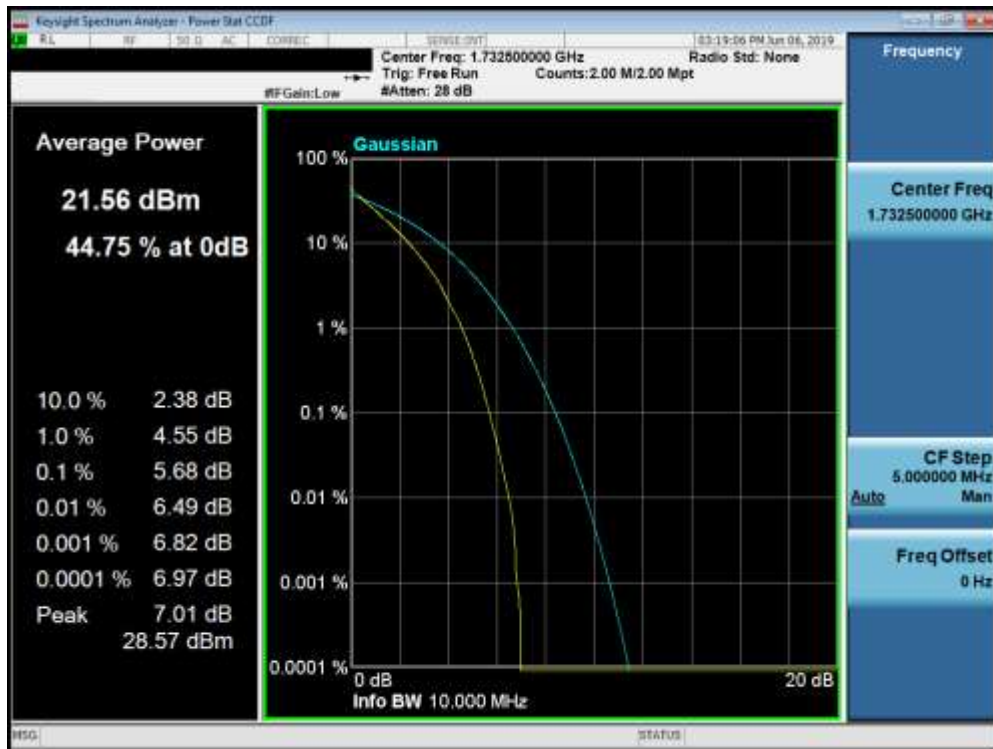


Plot 7-211. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

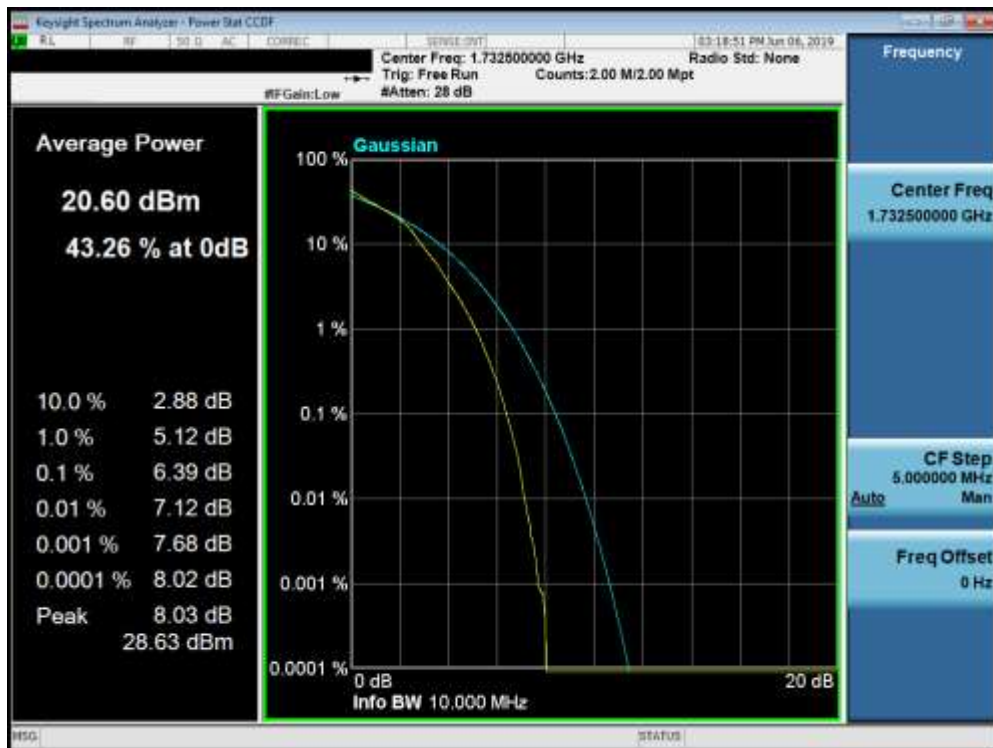


Plot 7-212. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 129 of 178                 |

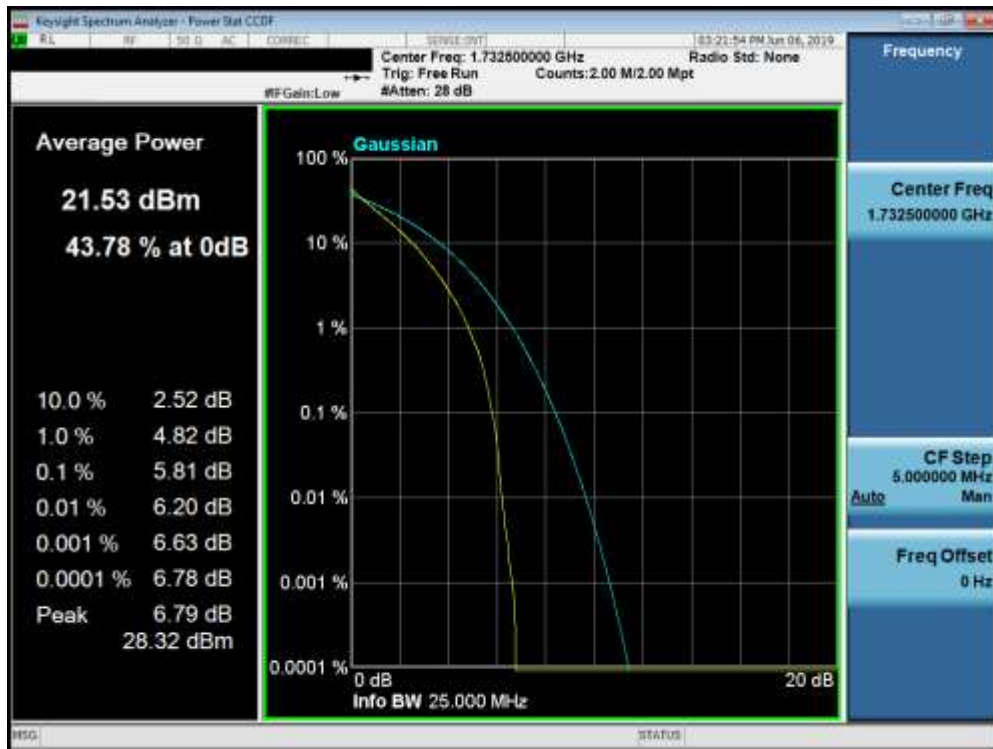


Plot 7-213. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

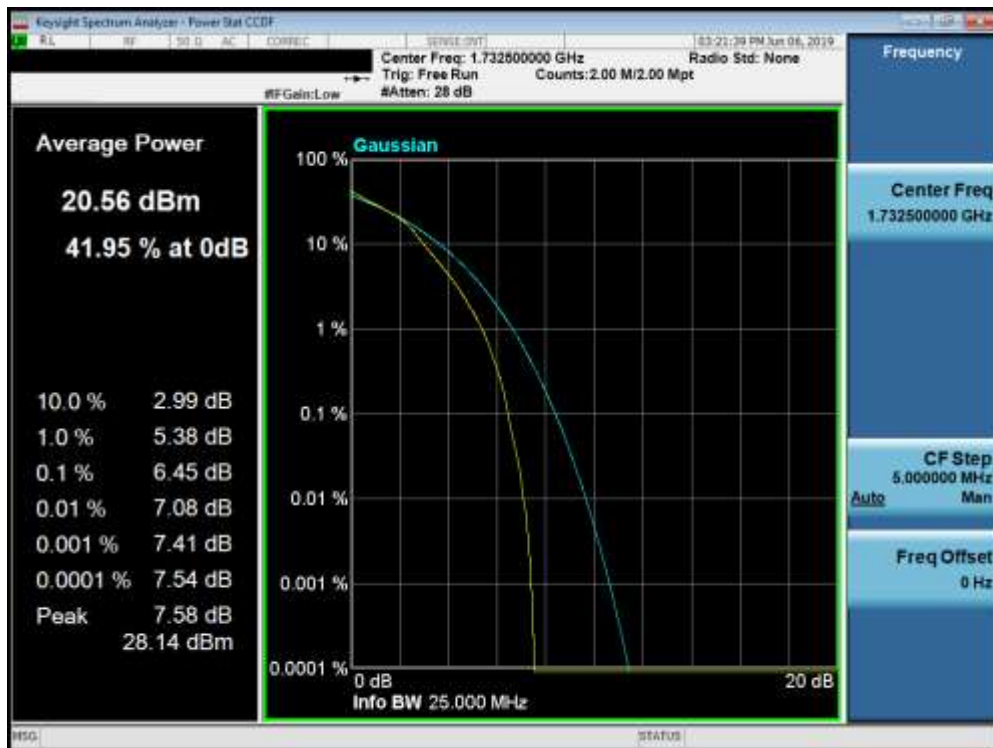


Plot 7-214. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 130 of 178                 |

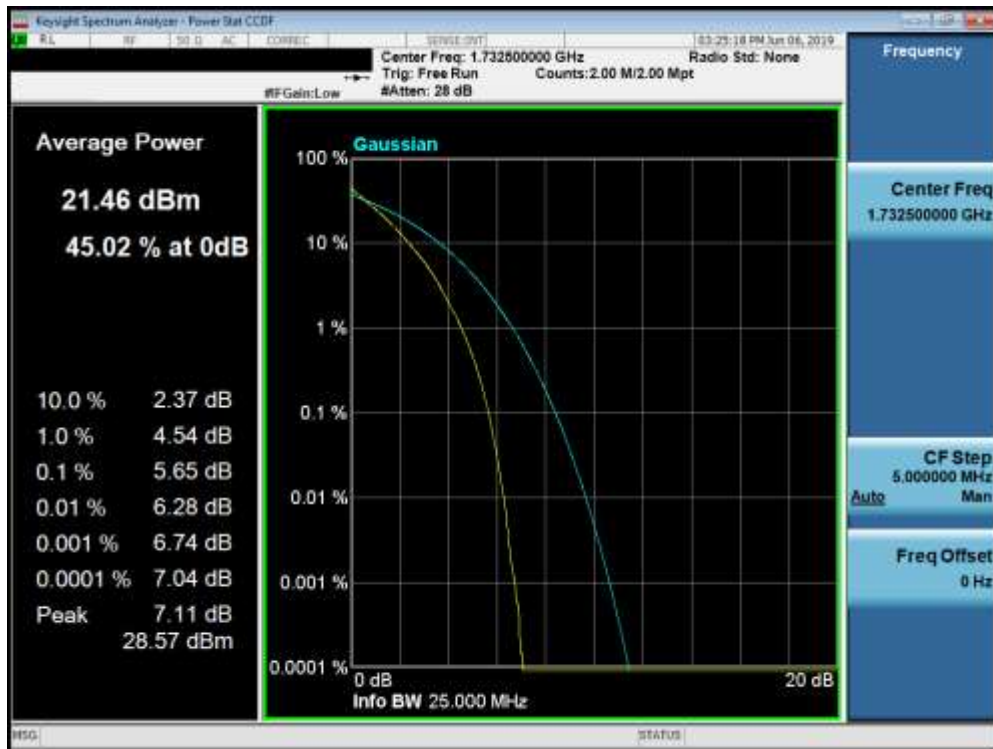


Plot 7-215. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

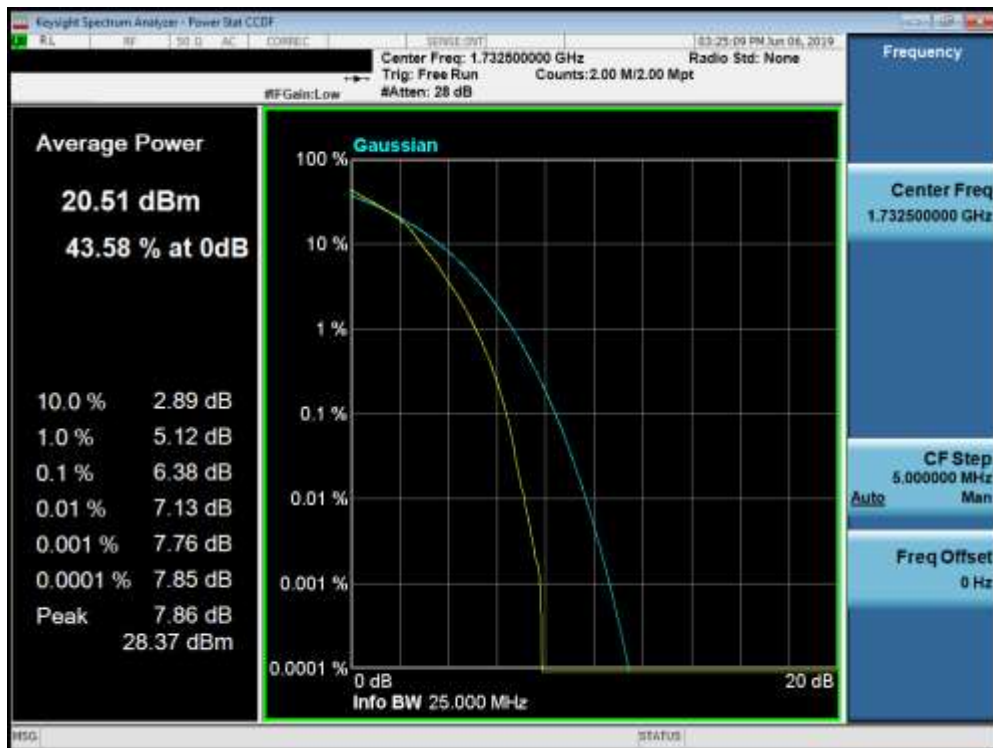


Plot 7-216. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 131 of 178                 |



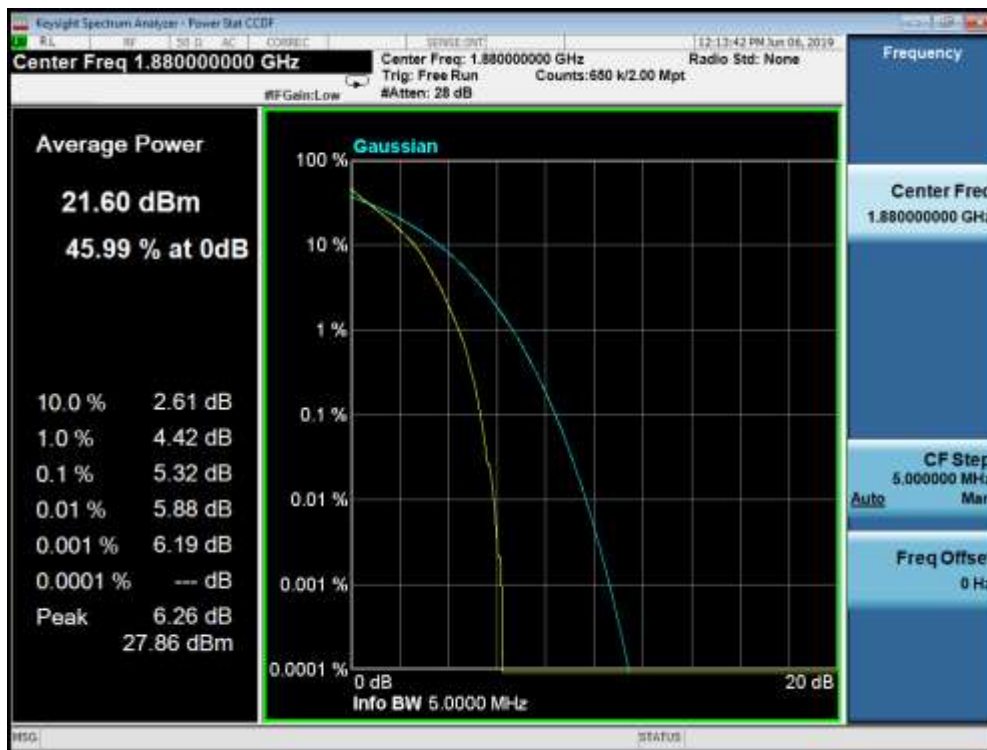
Plot 7-217. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



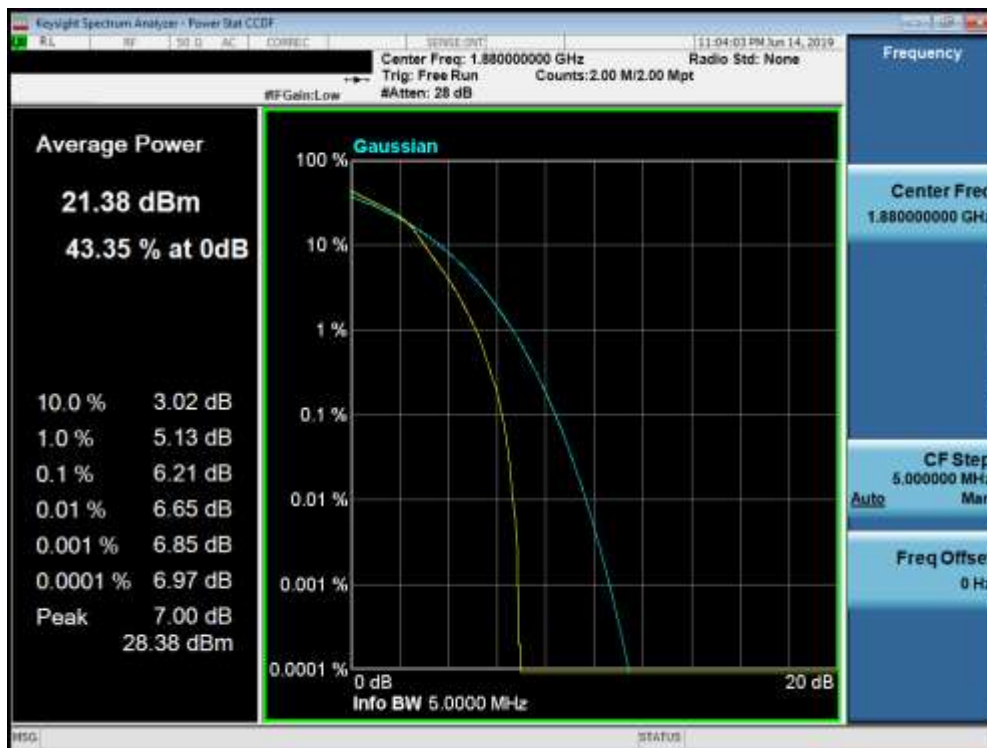
Plot 7-218. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 132 of 178                 |

## Band 2

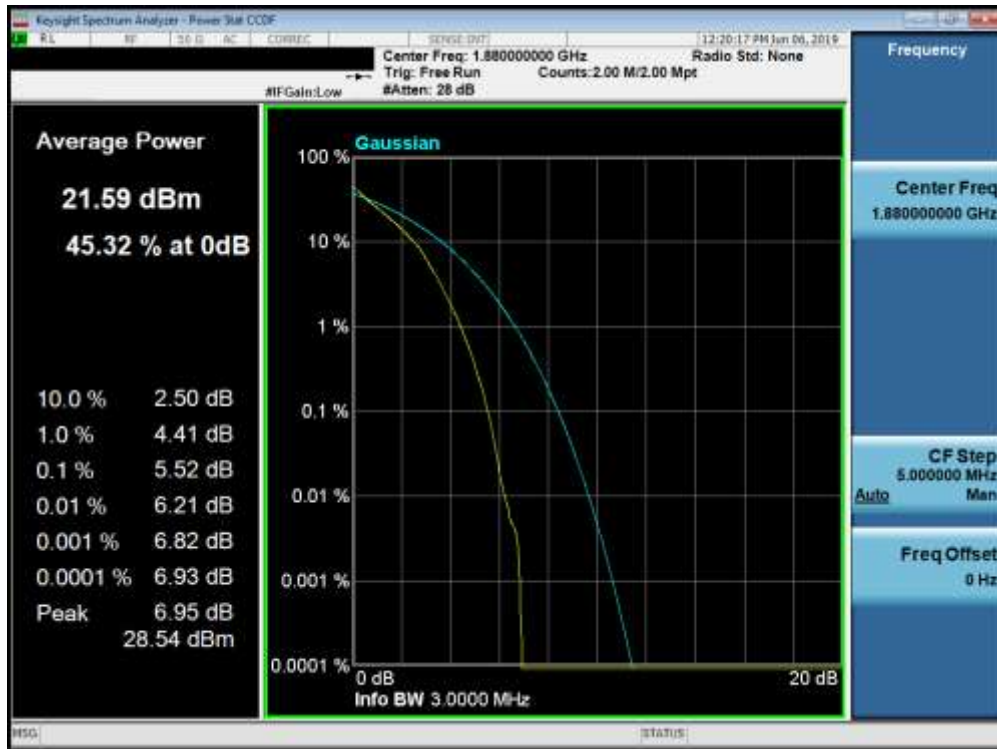


Plot 7-219. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

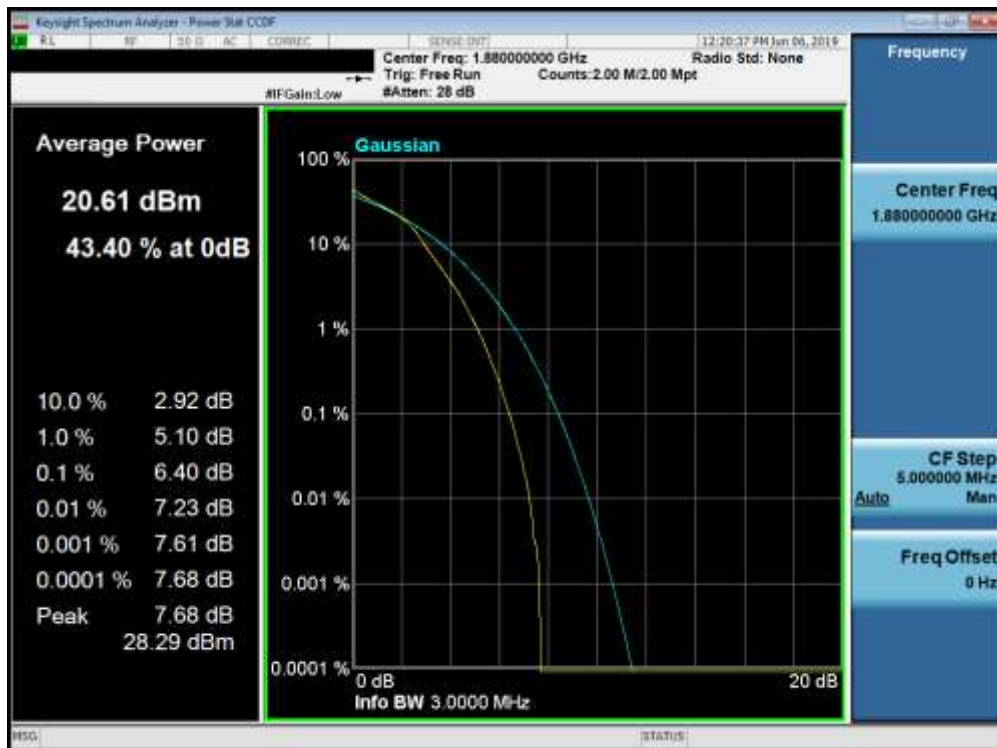


Plot 7-220. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 133 of 178                 |

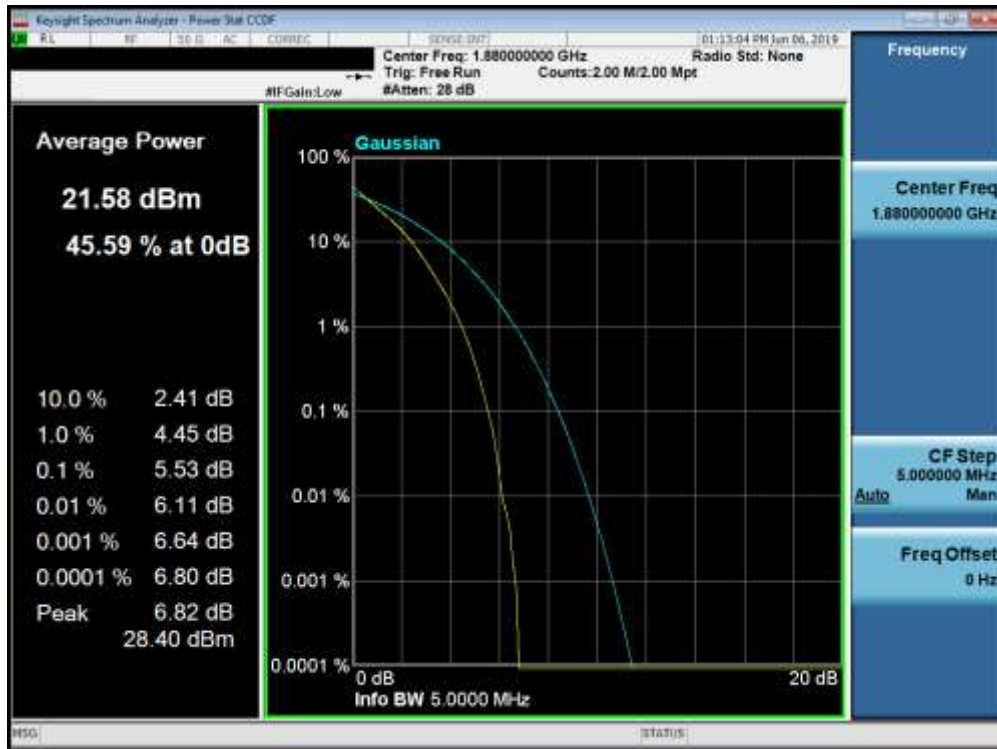


Plot 7-221. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

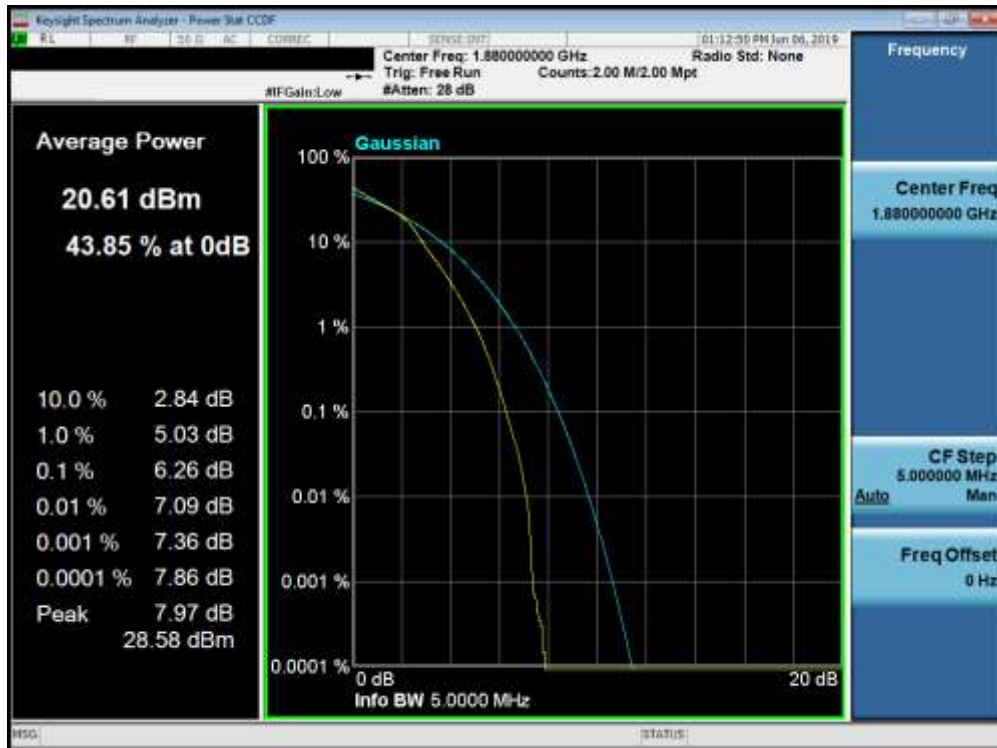


Plot 7-222. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 134 of 178                 |

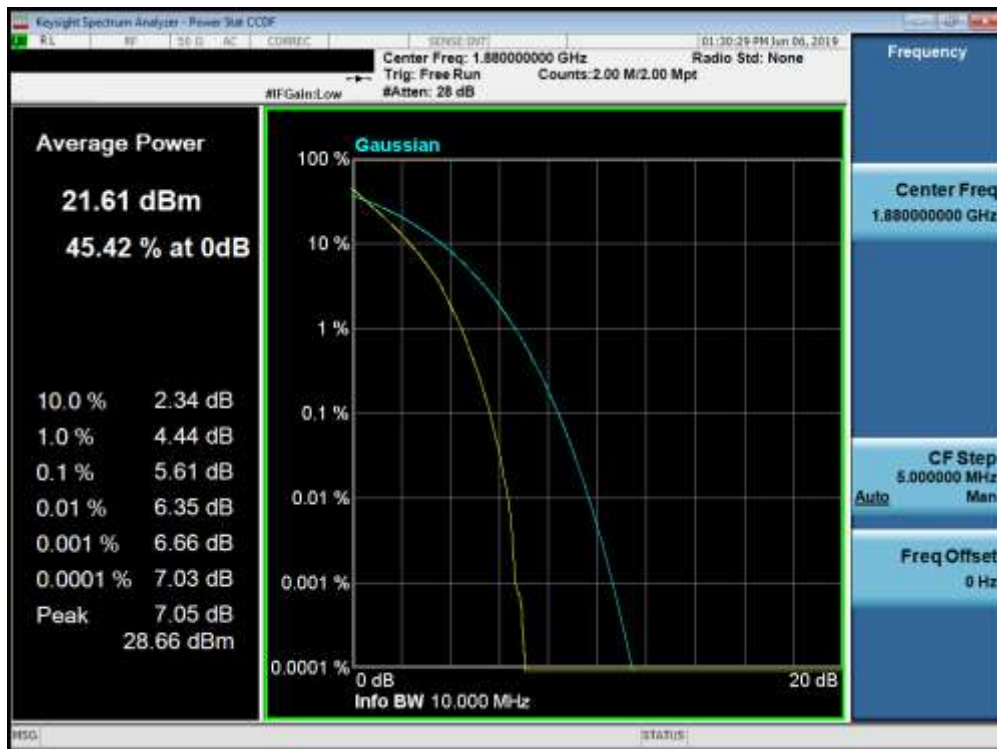


Plot 7-223. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

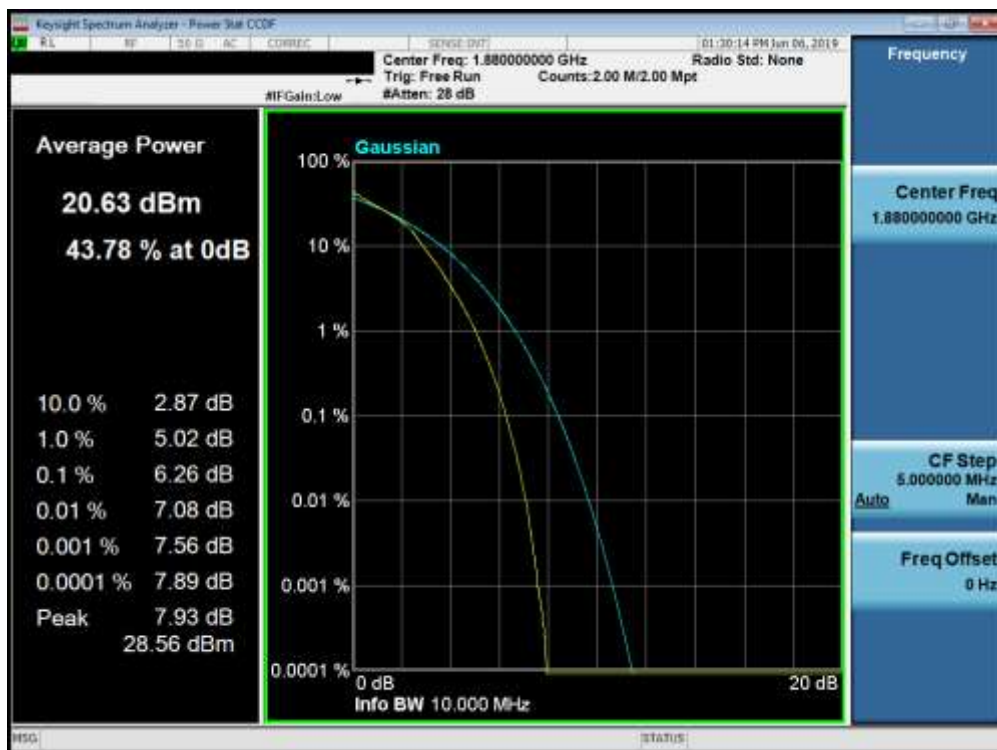


Plot 7-224. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 135 of 178                 |

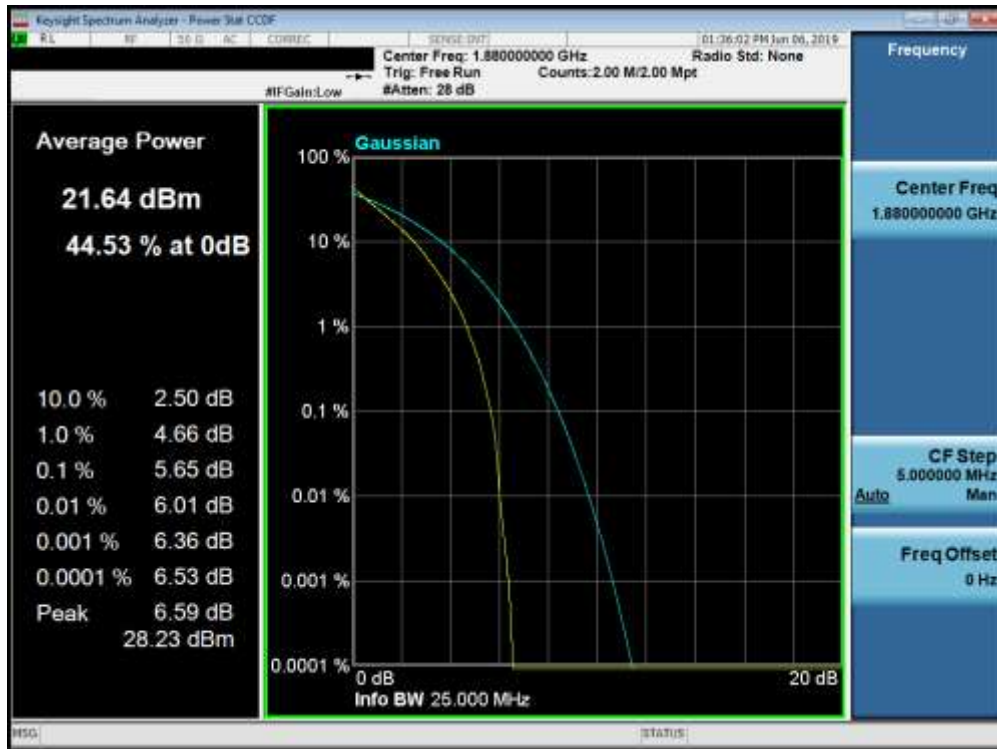


Plot 7-225. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

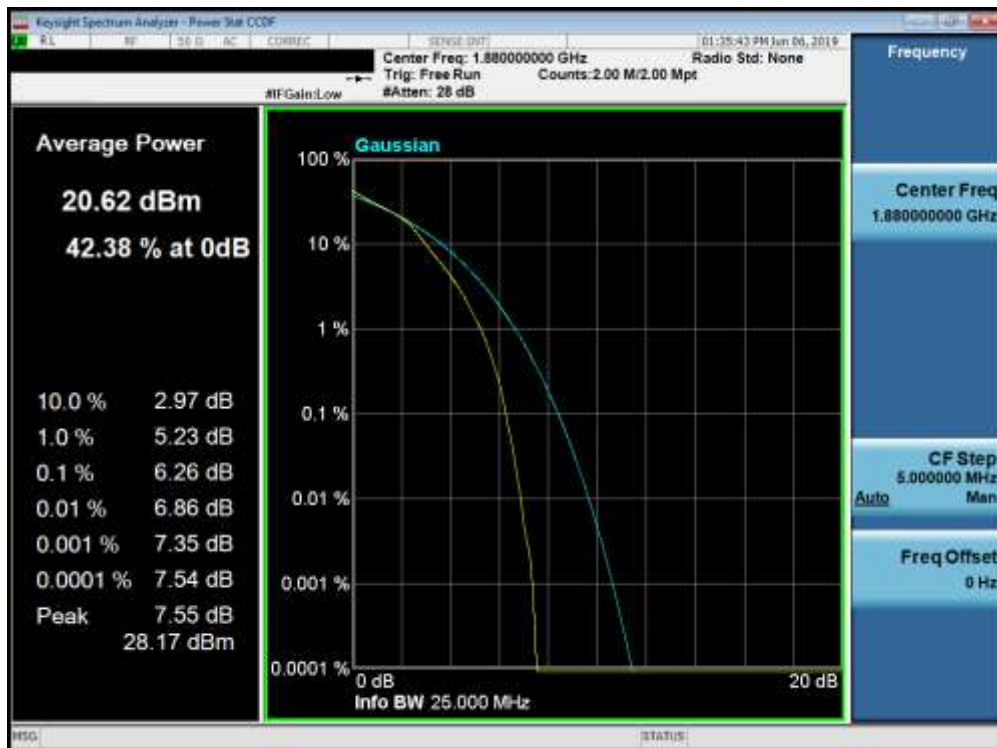


Plot 7-226. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 136 of 178                 |

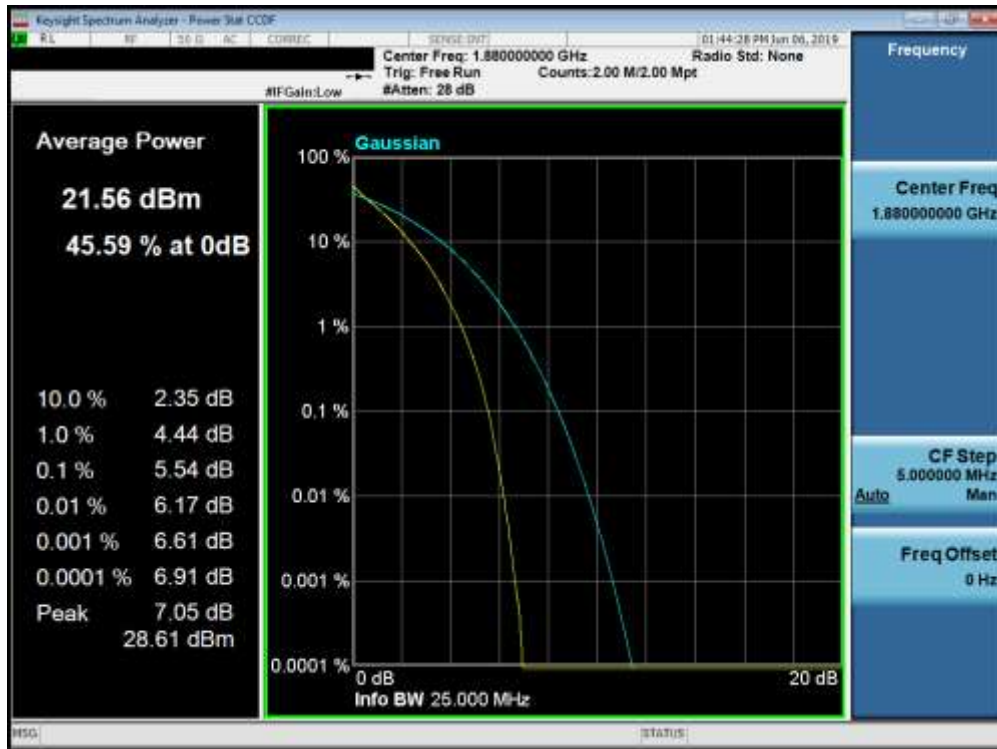


Plot 7-227. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

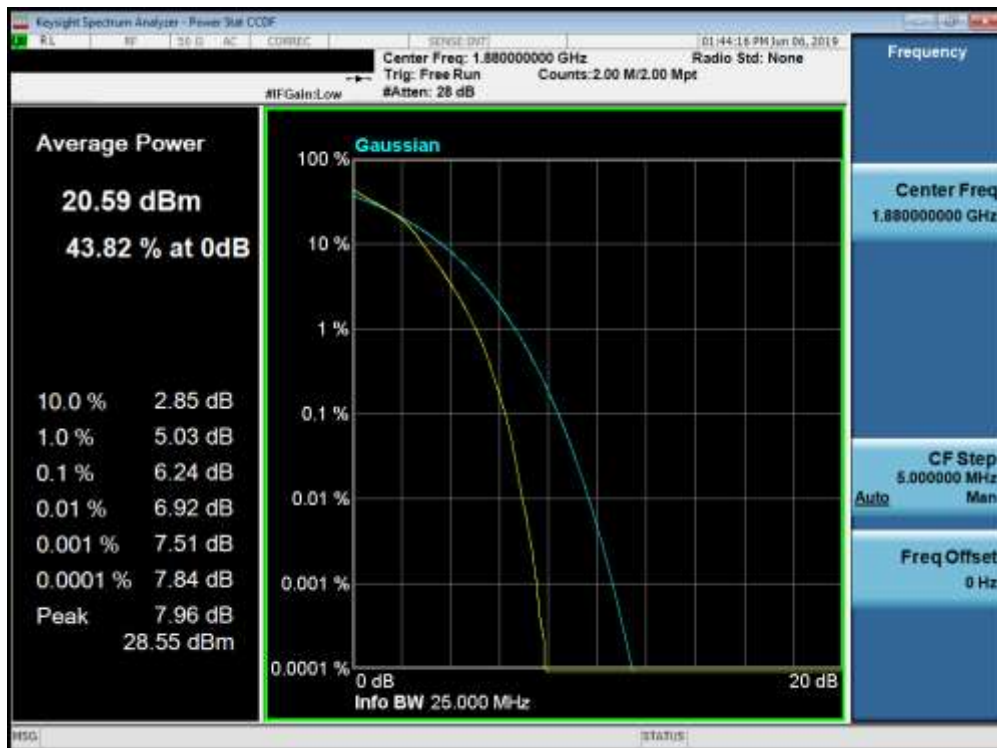


Plot 7-228. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 137 of 178                 |



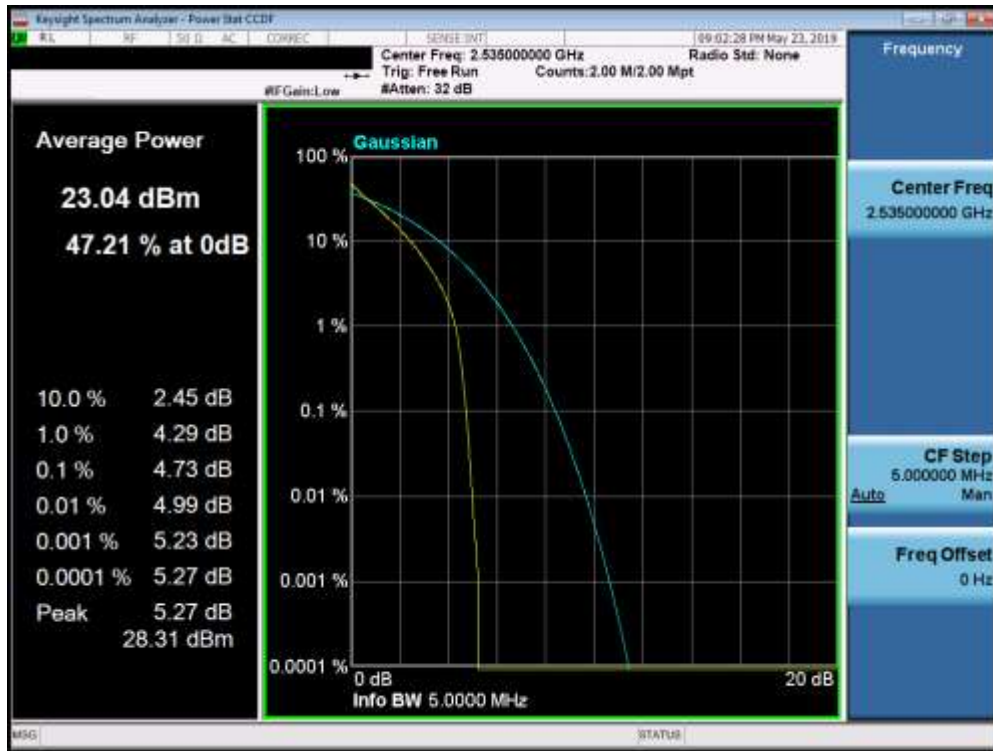
Plot 7-229. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



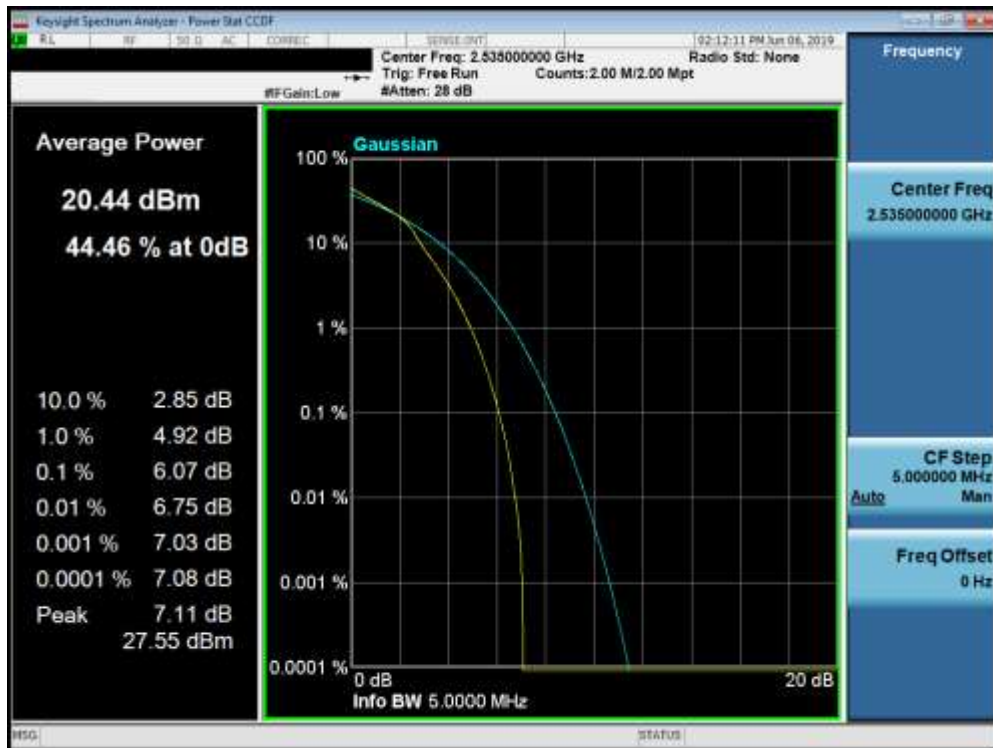
Plot 7-230. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 138 of 178                 |

**Band 7**

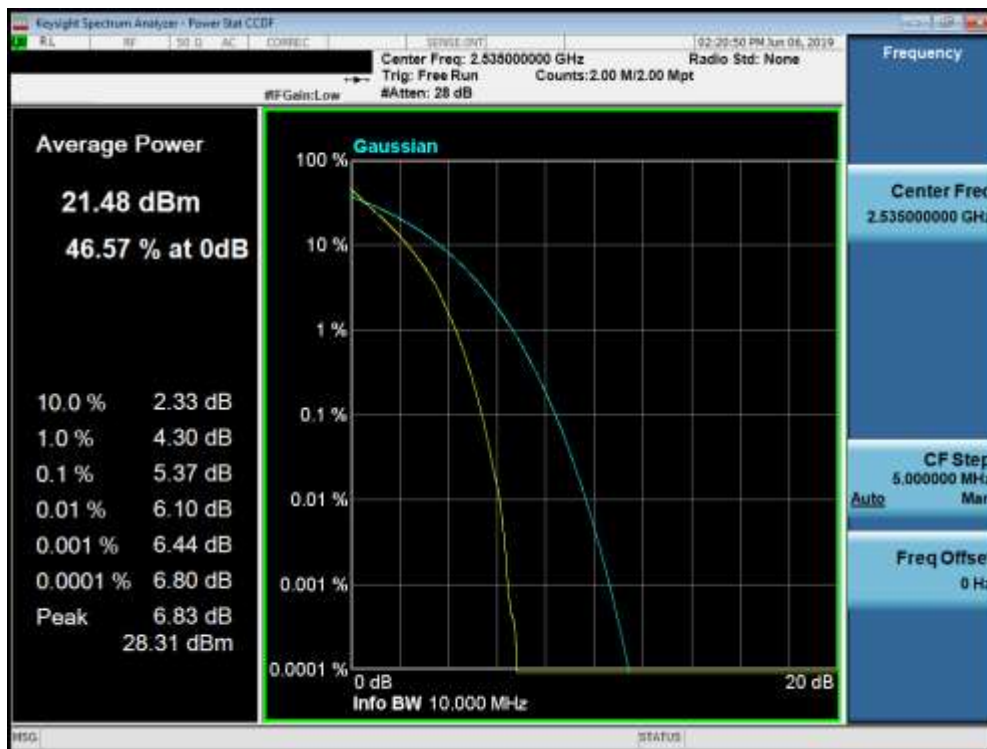


**Plot 7-231. PAR Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)**

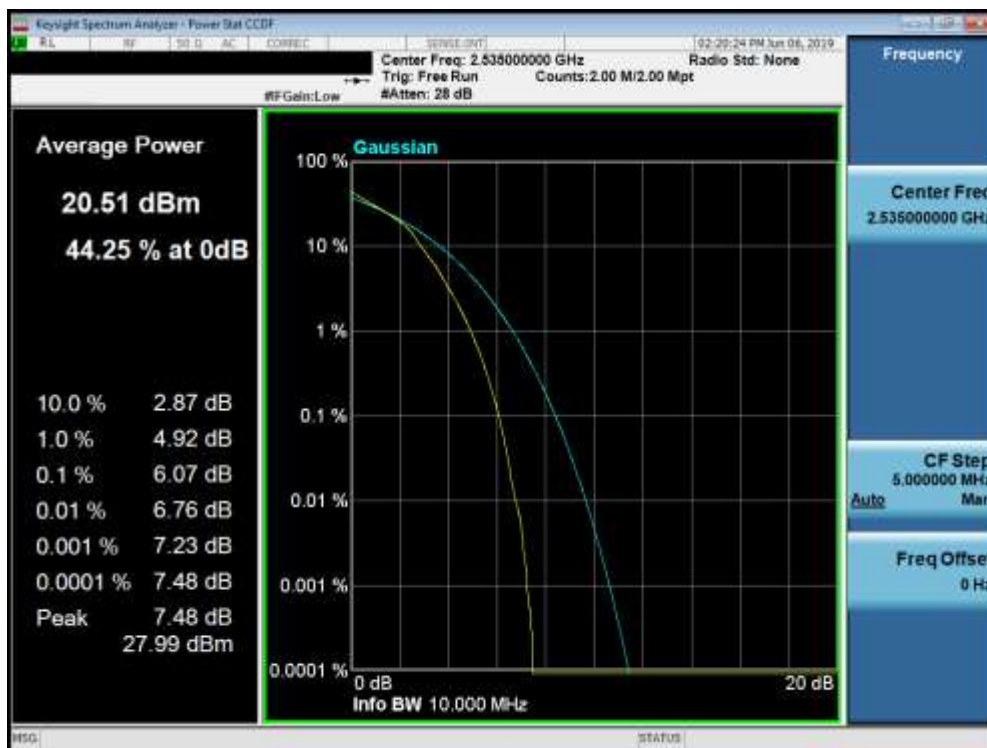


**Plot 7-232. PAR Plot (Band 7 - 5.0MHz 16-QAM - Full RB Configuration)**

|                                            |                                              |                               |                 |                                 |
|--------------------------------------------|----------------------------------------------|-------------------------------|-----------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |                               |                 | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019              | EUT Type:<br>Portable Handset | Page 139 of 178 |                                 |

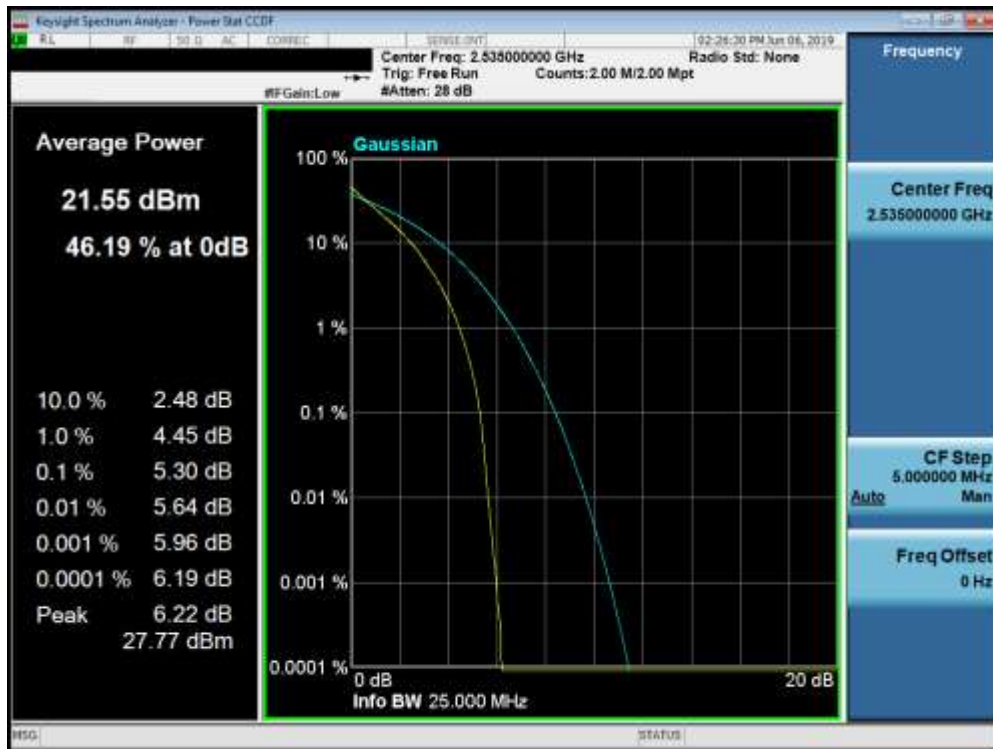


Plot 7-233. PAR Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

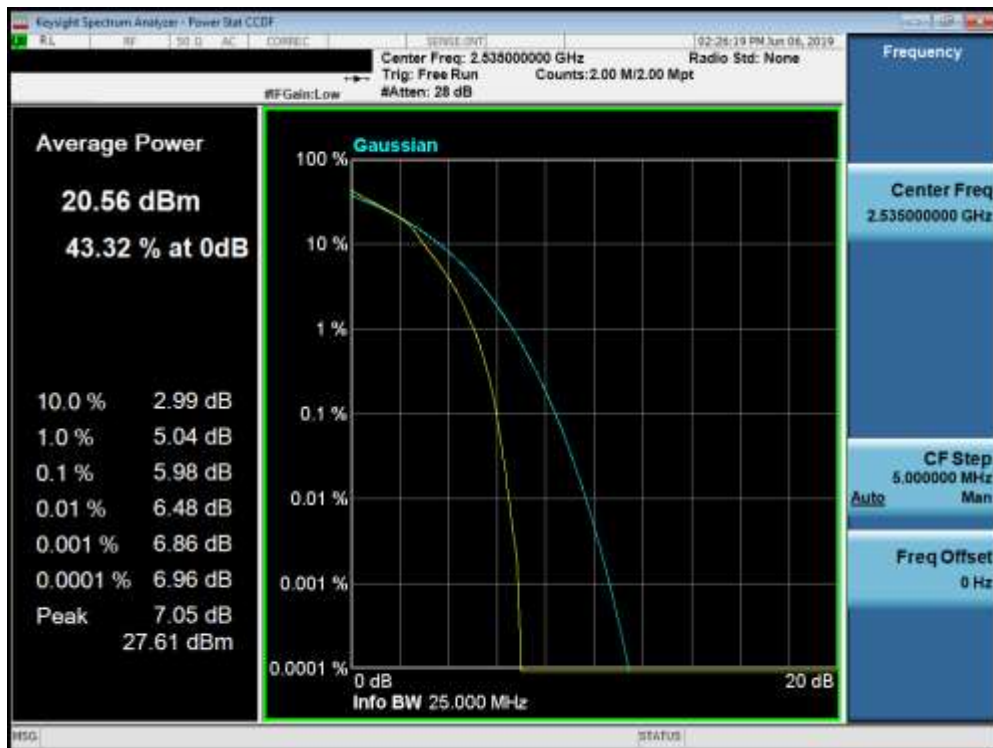


Plot 7-234. PAR Plot (Band 7 - 10.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 140 of 178                 |

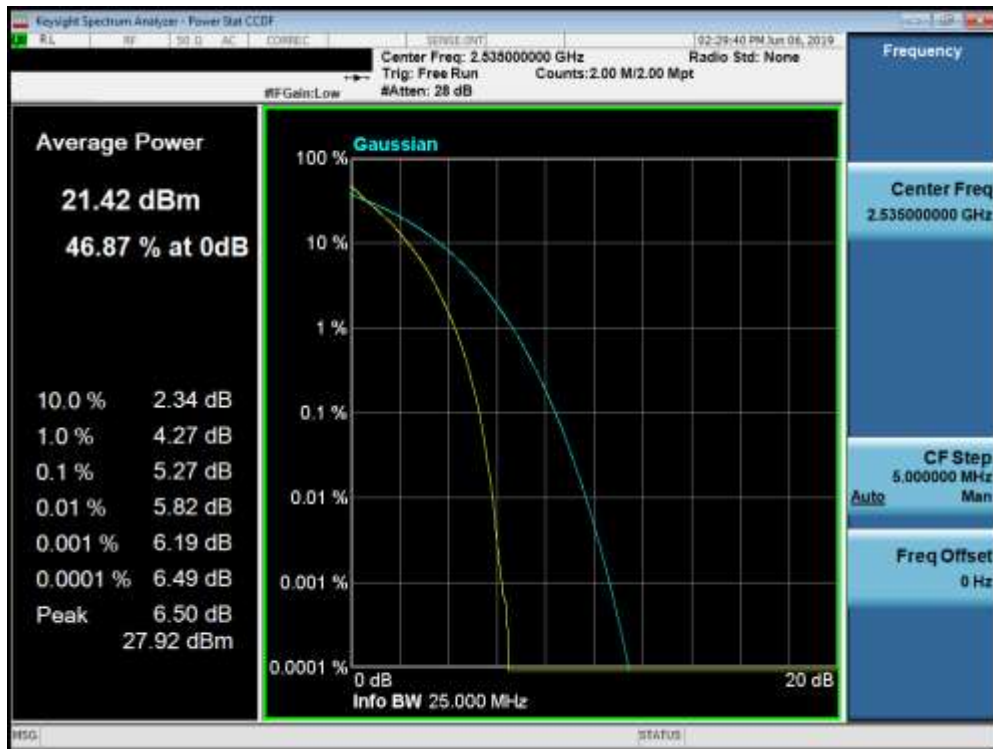


Plot 7-235. PAR Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

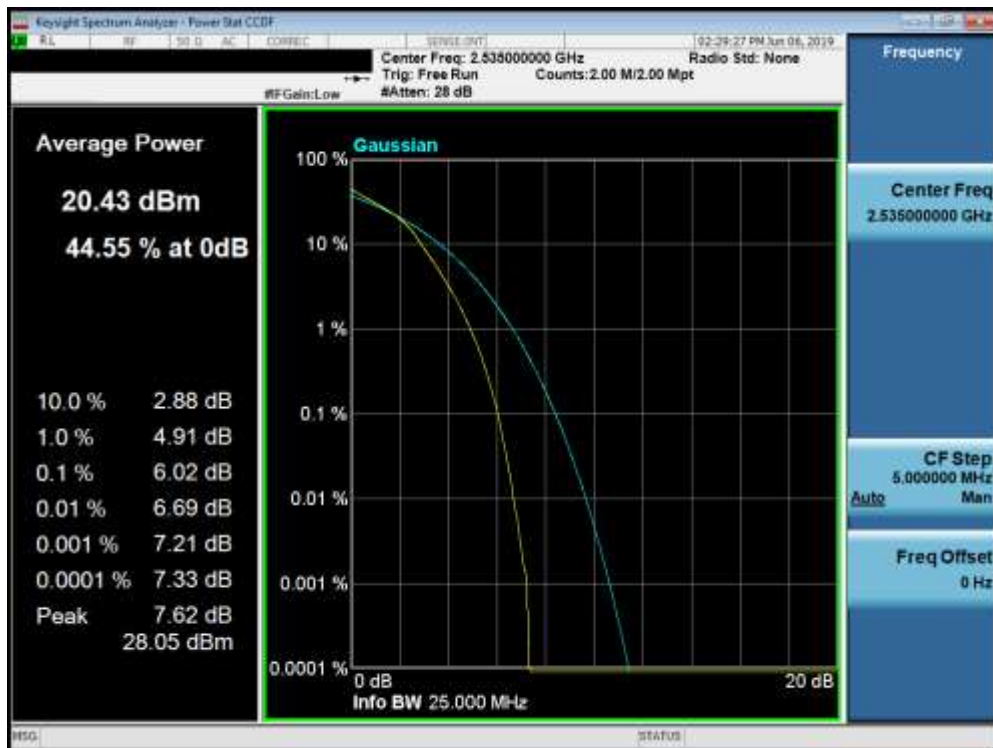


Plot 7-236. PAR Plot (Band 7 - 15.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 141 of 178                 |



Plot 7-237. PAR Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-238. PAR Plot (Band 7 - 20.0MHz 16-QAM - Full RB Configuration)

|                                            |                                               |                               |                                 |
|--------------------------------------------|-----------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset | Page 142 of 178                 |

## 7.6 Radiated Power (ERP/EIRP)

### Test Overview

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

### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

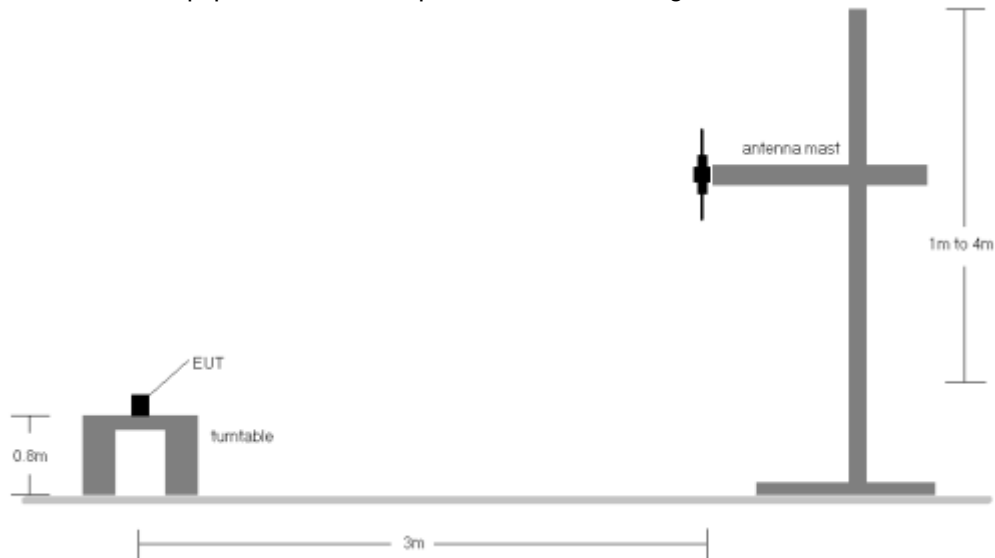
### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW  $\geq 3 \times$  RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $\geq 2 \times$  span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

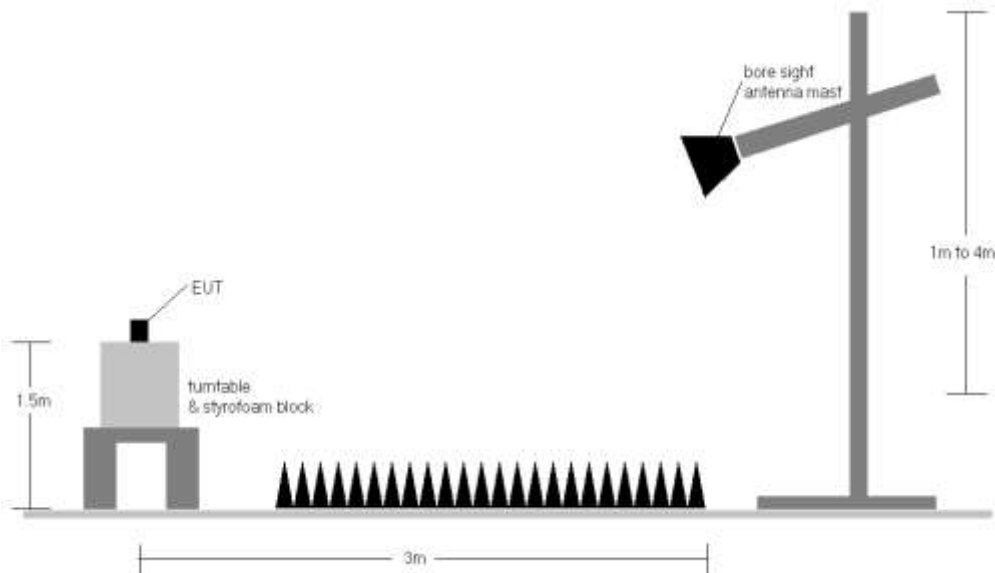
|                                            |                                                                                                                                                                                                                         |                               |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                         | EUT Type:<br>Portable Handset | Page 143 of 178                 |

## Test Setup

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



**Figure 7-5. Radiated Test Setup <1GHz**



**Figure 7-6. Radiated Test Setup >1GHz**

## Test Notes

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

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 144 of 178                 |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm]    | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|-------------|-----------------|-------------|
| 699.70          | 1.4                     | QPSK   | H               | 113                 | 262                        | 1 / 5          | 17.61                  | 1.40            | 16.86        | 0.049       | 34.77           | -17.91      |
| 707.50          | 1.4                     | QPSK   | H               | 120                 | 263                        | 1 / 5          | 18.37                  | 1.43            | 17.65        | 0.058       | 34.77           | -17.12      |
| 715.30          | 1.4                     | QPSK   | H               | 123                 | 112                        | 1 / 5          | 19.22                  | 1.46            | <b>18.53</b> | 0.071       | 34.77           | -16.24      |
| 715.30          | 1.4                     | 16-QAM | H               | 123                 | 112                        | 1 / 5          | 18.30                  | 1.46            | <b>17.61</b> | 0.058       | 34.77           | -17.16      |
| 700.50          | 3                       | QPSK   | H               | 118                 | 261                        | 1 / 14         | 17.92                  | 1.40            | 17.17        | 0.052       | 34.77           | -17.60      |
| 707.50          | 3                       | QPSK   | H               | 123                 | 277                        | 1 / 14         | 18.18                  | 1.43            | 17.46        | 0.056       | 34.77           | -17.31      |
| 714.50          | 3                       | QPSK   | H               | 124                 | 112                        | 1 / 14         | 19.35                  | 1.46            | <b>18.66</b> | 0.073       | 34.77           | -16.11      |
| 714.50          | 3                       | 16-QAM | H               | 124                 | 112                        | 1 / 14         | 18.50                  | 1.46            | <b>17.81</b> | 0.060       | 34.77           | -16.96      |

Table 7-3. ERP Data (Band 12)

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm]    | ERP [Watts]  | ERP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|-----------------|-------------|
| 701.50          | 5                       | QPSK   | H               | 121                 | 71                         | 1 / 24         | 18.78                  | 1.41            | 18.04        | 0.064        | 34.77           | -16.73      |
| 707.50          | 5                       | QPSK   | H               | 125                 | 58                         | 1 / 24         | 19.35                  | 1.43            | 18.63        | 0.073        | 34.77           | -16.14      |
| 713.50          | 5                       | QPSK   | H               | 123                 | 62                         | 1 / 24         | 19.96                  | 1.46            | <b>19.27</b> | 0.084        | 34.77           | -15.50      |
| 713.50          | 5                       | 16-QAM | H               | 123                 | 62                         | 1 / 24         | 19.13                  | 1.46            | <b>18.44</b> | 0.070        | 34.77           | -16.33      |
| 704.00          | 10                      | QPSK   | H               | 123                 | 66                         | 1 / 49         | 19.96                  | 1.42            | 19.23        | 0.084        | 34.77           | -15.54      |
| 707.50          | 10                      | QPSK   | H               | 127                 | 68                         | 1 / 49         | 19.95                  | 1.43            | 19.23        | 0.084        | 34.77           | -15.54      |
| 711.00          | 10                      | QPSK   | H               | 124                 | 68                         | 1 / 49         | 20.08                  | 1.45            | <b>19.38</b> | <b>0.087</b> | 34.77           | -15.39      |
| 711.00          | 10                      | 16-QAM | H               | 124                 | 68                         | 1 / 49         | 19.20                  | 1.45            | <b>18.50</b> | 0.071        | 34.77           | -16.27      |
| 711.00          | 10                      | H      | V               | 154                 | 53                         | 1 / 49         | 19.42                  | 1.45            | 18.72        | 0.074        | 34.77           | -16.05      |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 145 of 178                 |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm]    | ERP [Watts]  | ERP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|-----------------|-------------|
| 779.50          | 5                       | QPSK   | H               | 103                 | 106                        | 1 / 0          | 20.98                  | 1.72            | <b>20.55</b> | <b>0.114</b> | 34.77           | -14.22      |
| 782.00          | 5                       | QPSK   | H               | 101                 | 102                        | 1 / 0          | 20.81                  | 1.73            | 20.39        | 0.109        | 34.77           | -14.38      |
| 784.50          | 5                       | QPSK   | H               | 102                 | 101                        | 1 / 0          | 20.22                  | 1.74            | 19.81        | 0.096        | 34.77           | -14.96      |
| 779.50          | 5                       | 16-QAM | H               | 103                 | 106                        | 1 / 0          | 20.23                  | 1.72            | <b>19.80</b> | 0.096        | 34.77           | -14.97      |
| 782.00          | 10                      | QPSK   | H               | 103                 | 84                         | 1 / 0          | 20.52                  | 1.73            | <b>20.10</b> | 0.102        | 34.77           | -14.67      |
| 782.00          | 10                      | 16-QAM | H               | 103                 | 84                         | 1 / 0          | 19.44                  | 1.73            | <b>19.02</b> | 0.080        | 34.77           | -15.75      |
| 779.50          | 5                       | QPSK   | V               | 105                 | 267                        | 1 / 0          | 20.25                  | 1.72            | 19.82        | 0.096        | 34.77           | -14.95      |

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

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm]    | ERP [Watts]  | ERP Limit [dBm] | Margin [dB] | EIRP [dBm]   | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|-----------------|-------------|--------------|--------------|------------------|-------------|
| 824.70          | 1.4                     | QPSK   | V               | 120                 | 256                        | 1 / 5          | 19.02                  | 1.65            | 18.52        | 0.071        | 38.45           | -19.94      | 20.67        | 0.117        | 40.61            | -19.94      |
| 836.50          | 1.4                     | QPSK   | V               | 111                 | 259                        | 1 / 5          | 20.23                  | 1.57            | 19.65        | 0.092        | 38.45           | -18.80      | 21.80        | 0.151        | 40.61            | -18.80      |
| 848.30          | 1.4                     | QPSK   | V               | 113                 | 74                         | 1 / 5          | 21.44                  | 1.50            | <b>20.79</b> | 0.120        | 38.45           | -17.66      | <b>22.94</b> | 0.197        | 40.61            | -17.67      |
| 848.30          | 1.4                     | 16-QAM | V               | 113                 | 74                         | 1 / 5          | 20.24                  | 1.50            | <b>19.59</b> | 0.091        | 38.45           | -18.86      | <b>21.74</b> | 0.149        | 40.61            | -18.87      |
| 825.50          | 3                       | QPSK   | V               | 116                 | 263                        | 1 / 14         | 18.82                  | 1.64            | 18.31        | 0.068        | 38.45           | -20.14      | 20.46        | 0.111        | 40.61            | -20.15      |
| 836.50          | 3                       | QPSK   | V               | 116                 | 261                        | 1 / 14         | 20.74                  | 1.57            | 20.16        | 0.104        | 38.45           | -18.29      | 22.31        | 0.170        | 40.61            | -18.29      |
| 847.50          | 3                       | QPSK   | V               | 114                 | 66                         | 1 / 14         | 21.63                  | 1.51            | <b>20.99</b> | 0.125        | 38.45           | -17.46      | <b>23.14</b> | 0.206        | 40.61            | -17.47      |
| 847.50          | 3                       | 16-QAM | V               | 114                 | 66                         | 1 / 14         | 20.43                  | 1.51            | <b>19.79</b> | 0.095        | 38.45           | -18.66      | <b>21.94</b> | 0.156        | 40.61            | -18.67      |
| 826.50          | 5                       | QPSK   | V               | 191                 | 102                        | 1 / 24         | 21.24                  | 1.63            | 20.72        | 0.118        | 38.45           | -17.73      | 22.87        | 0.194        | 40.61            | -17.73      |
| 836.50          | 5                       | QPSK   | V               | 106                 | 118                        | 1 / 24         | 21.49                  | 1.57            | <b>20.91</b> | 0.123        | 38.45           | -17.54      | <b>23.06</b> | 0.202        | 40.61            | -17.54      |
| 846.50          | 5                       | QPSK   | V               | 103                 | 113                        | 1 / 24         | 21.08                  | 1.51            | 20.44        | 0.111        | 38.45           | -18.01      | 22.59        | 0.182        | 40.61            | -18.01      |
| 836.50          | 5                       | 16-QAM | V               | 106                 | 118                        | 1 / 24         | 20.55                  | 1.57            | <b>19.97</b> | 0.099        | 38.45           | -18.48      | <b>22.12</b> | 0.163        | 40.61            | -18.48      |
| 829.00          | 10                      | QPSK   | V               | 118                 | 126                        | 1 / 49         | 21.89                  | 1.62            | 21.36        | 0.137        | 38.45           | -17.09      | 23.51        | 0.224        | 40.61            | -17.10      |
| 836.50          | 10                      | QPSK   | V               | 115                 | 141                        | 1 / 49         | 22.42                  | 1.57            | <b>21.84</b> | <b>0.153</b> | 38.45           | -16.61      | <b>23.99</b> | <b>0.251</b> | 40.61            | -16.61      |
| 844.00          | 10                      | QPSK   | V               | 113                 | 71                         | 1 / 49         | 21.60                  | 1.53            | 20.98        | 0.125        | 38.45           | -17.47      | 23.13        | 0.205        | 40.61            | -17.48      |
| 836.50          | 10                      | 16-QAM | V               | 115                 | 141                        | 1 / 49         | 21.38                  | 1.57            | <b>20.80</b> | 0.120        | 38.45           | -17.65      | <b>22.95</b> | 0.197        | 40.61            | -17.65      |
| 836.50          | 10                      | QPSK   | H               | 102                 | 287                        | 1 / 49         | 19.90                  | 1.57            | 19.32        | 0.086        | 38.45           | -19.13      | 21.47        | 0.140        | 40.61            | -19.13      |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 146 of 178                 |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm]   | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|------------------|-------------|
| 1710.70         | 1.4                     | QPSK   | H               | 125                 | 19                         | 1 / 5          | 15.74                  | 8.43            | 24.17        | 0.261        | 30.00            | -5.83       |
| 1745.00         | 1.4                     | QPSK   | H               | 129                 | 10                         | 1 / 5          | 17.49                  | 7.92            | <b>25.41</b> | <b>0.347</b> | 30.00            | -4.59       |
| 1779.30         | 1.4                     | QPSK   | H               | 167                 | 6                          | 1 / 5          | 16.30                  | 8.07            | 24.37        | 0.274        | 30.00            | -5.63       |
| 1745.00         | 1.4                     | 16-QAM | H               | 129                 | 10                         | 1 / 5          | 16.72                  | 7.92            | <b>24.64</b> | 0.291        | 30.00            | -5.36       |
| 1711.50         | 3                       | QPSK   | H               | 175                 | 11                         | 1 / 14         | 16.12                  | 8.42            | 24.54        | 0.284        | 30.00            | -5.46       |
| 1745.00         | 3                       | QPSK   | H               | 131                 | 9                          | 1 / 14         | 17.20                  | 7.92            | <b>25.12</b> | 0.325        | 30.00            | -4.88       |
| 1778.50         | 3                       | QPSK   | H               | 168                 | 3                          | 1 / 14         | 16.65                  | 8.07            | 24.72        | 0.296        | 30.00            | -5.28       |
| 1745.00         | 3                       | 16-QAM | H               | 131                 | 9                          | 1 / 14         | 16.42                  | 7.92            | <b>24.34</b> | 0.272        | 30.00            | -5.66       |
| 1712.50         | 5                       | QPSK   | H               | 130                 | 12                         | 1 / 24         | 15.53                  | 8.41            | 23.94        | 0.247        | 30.00            | -6.06       |
| 1745.00         | 5                       | QPSK   | H               | 129                 | 8                          | 1 / 24         | 17.28                  | 7.92            | <b>25.20</b> | 0.331        | 30.00            | -4.80       |
| 1777.50         | 5                       | QPSK   | H               | 166                 | 4                          | 1 / 24         | 16.28                  | 8.06            | 24.34        | 0.272        | 30.00            | -5.66       |
| 1712.50         | 5                       | 16-QAM | H               | 130                 | 12                         | 1 / 24         | 15.78                  | 8.41            | <b>24.19</b> | 0.262        | 30.00            | -5.81       |
| 1715.00         | 10                      | QPSK   | H               | 175                 | 8                          | 1 / 49         | 15.48                  | 8.37            | 23.85        | 0.243        | 30.00            | -6.15       |
| 1745.00         | 10                      | QPSK   | H               | 128                 | 11                         | 1 / 49         | 16.52                  | 7.92            | 24.44        | 0.278        | 30.00            | -5.56       |
| 1775.00         | 10                      | QPSK   | H               | 168                 | 3                          | 1 / 49         | 16.80                  | 8.04            | <b>24.84</b> | 0.305        | 30.00            | -5.16       |
| 1775.00         | 10                      | 16-QAM | H               | 168                 | 3                          | 1 / 49         | 15.88                  | 8.04            | <b>23.92</b> | 0.247        | 30.00            | -6.08       |
| 1717.50         | 15                      | QPSK   | H               | 168                 | 3                          | 1 / 74         | 15.05                  | 8.33            | 23.38        | 0.218        | 30.00            | -6.62       |
| 1745.00         | 15                      | QPSK   | H               | 132                 | 6                          | 1 / 74         | 16.92                  | 7.92            | <b>24.84</b> | 0.305        | 30.00            | -5.16       |
| 1772.50         | 15                      | QPSK   | H               | 167                 | 4                          | 1 / 74         | 16.53                  | 8.02            | 24.55        | 0.285        | 30.00            | -5.45       |
| 1745.00         | 15                      | 16-QAM | H               | 132                 | 6                          | 1 / 74         | 16.23                  | 7.92            | <b>24.15</b> | 0.260        | 30.00            | -5.85       |
| 1720.00         | 20                      | QPSK   | H               | 130                 | 12                         | 1 / 99         | 16.03                  | 8.29            | <b>24.32</b> | 0.271        | 30.00            | -5.68       |
| 1745.00         | 20                      | QPSK   | H               | 129                 | 3                          | 1 / 99         | 15.76                  | 7.92            | 23.68        | 0.233        | 30.00            | -6.32       |
| 1770.00         | 20                      | QPSK   | H               | 166                 | 4                          | 1 / 99         | 15.97                  | 8.00            | 23.97        | 0.250        | 30.00            | -6.03       |
| 1720.00         | 20                      | 16-QAM | H               | 130                 | 12                         | 1 / 99         | 15.43                  | 8.29            | <b>23.72</b> | 0.236        | 30.00            | -6.28       |
| 1745.00         | 1.4                     | QPSK   | V               | 113                 | 4                          | 1 / 5          | 14.25                  | 7.92            | 22.17        | 0.165        | 30.00            | -7.83       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 147 of 178                 |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm]   | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|------------------|-------------|
| 1850.70         | 1.4                     | QPSK   | H               | 144                 | 122                        | 1 / 0          | 16.50                  | 8.42            | <b>24.92</b> | 0.310        | 33.01            | -8.09       |
| 1880.00         | 1.4                     | QPSK   | H               | 148                 | 184                        | 1 / 0          | 16.61                  | 8.26            | 24.87        | 0.307        | 33.01            | -8.14       |
| 1909.30         | 1.4                     | QPSK   | H               | 157                 | 189                        | 1 / 0          | 16.70                  | 8.16            | 24.86        | 0.306        | 33.01            | -8.15       |
| 1850.70         | 1.4                     | 16-QAM | H               | 144                 | 122                        | 1 / 0          | 15.83                  | 8.42            | <b>24.25</b> | 0.266        | 33.01            | -8.76       |
| 1851.50         | 3                       | QPSK   | H               | 156                 | 156                        | 1 / 0          | 16.65                  | 8.42            | <b>25.07</b> | <b>0.321</b> | 33.01            | -7.94       |
| 1880.00         | 3                       | QPSK   | H               | 162                 | 174                        | 1 / 0          | 16.66                  | 8.26            | 24.92        | 0.310        | 33.01            | -8.09       |
| 1908.50         | 3                       | QPSK   | H               | 141                 | 188                        | 1 / 0          | 16.70                  | 8.16            | 24.86        | 0.306        | 33.01            | -8.15       |
| 1851.50         | 3                       | 16-QAM | H               | 156                 | 156                        | 1 / 0          | 15.73                  | 8.42            | <b>24.15</b> | 0.260        | 33.01            | -8.86       |
| 1852.50         | 5                       | QPSK   | H               | 144                 | 191                        | 1 / 0          | 16.56                  | 8.41            | <b>24.97</b> | 0.314        | 33.01            | -8.04       |
| 1880.00         | 5                       | QPSK   | H               | 148                 | 188                        | 1 / 0          | 15.62                  | 8.26            | 23.88        | 0.244        | 33.01            | -9.13       |
| 1907.50         | 5                       | QPSK   | H               | 157                 | 184                        | 1 / 0          | 15.92                  | 8.16            | 24.08        | 0.256        | 33.01            | -8.93       |
| 1852.50         | 5                       | 16-QAM | H               | 144                 | 191                        | 1 / 0          | 15.82                  | 8.41            | <b>24.23</b> | 0.265        | 33.01            | -8.78       |
| 1855.00         | 10                      | QPSK   | H               | 152                 | 178                        | 1 / 0          | 16.28                  | 8.40            | <b>24.68</b> | 0.294        | 33.01            | -8.33       |
| 1880.00         | 10                      | QPSK   | H               | 147                 | 181                        | 1 / 0          | 15.75                  | 8.26            | 24.01        | 0.252        | 33.01            | -9.00       |
| 1905.00         | 10                      | QPSK   | H               | 156                 | 183                        | 1 / 0          | 14.96                  | 8.15            | 23.11        | 0.205        | 33.01            | -9.90       |
| 1855.00         | 10                      | 16-QAM | H               | 152                 | 178                        | 1 / 0          | 15.50                  | 8.40            | <b>23.90</b> | 0.245        | 33.01            | -9.11       |
| 1857.50         | 15                      | QPSK   | H               | 143                 | 187                        | 1 / 0          | 16.42                  | 8.38            | <b>24.80</b> | 0.302        | 33.01            | -8.21       |
| 1880.00         | 15                      | QPSK   | H               | 136                 | 182                        | 1 / 0          | 15.50                  | 8.26            | 23.76        | 0.237        | 33.01            | -9.25       |
| 1902.50         | 15                      | QPSK   | H               | 157                 | 206                        | 1 / 0          | 14.51                  | 8.15            | 22.66        | 0.184        | 33.01            | -10.35      |
| 1857.50         | 15                      | 16-QAM | H               | 143                 | 187                        | 1 / 0          | 15.60                  | 8.38            | <b>23.98</b> | 0.250        | 33.01            | -9.03       |
| 1860.00         | 20                      | QPSK   | H               | 141                 | 200                        | 1 / 0          | 15.58                  | 8.37            | 23.95        | 0.248        | 33.01            | -9.06       |
| 1880.00         | 20                      | QPSK   | H               | 156                 | 196                        | 1 / 0          | 15.27                  | 8.26            | 23.53        | 0.225        | 33.01            | -9.48       |
| 1900.00         | 20                      | QPSK   | H               | 136                 | 197                        | 1 / 0          | 16.38                  | 8.15            | <b>24.53</b> | 0.283        | 33.01            | -8.48       |
| 1860.00         | 20                      | 16-QAM | H               | 141                 | 200                        | 1 / 0          | 14.83                  | 8.37            | 23.20        | 0.209        | 33.01            | -9.81       |
| 1852.50         | 5                       | H      | V               | 124                 | 137                        | 1 / 0          | 15.72                  | 8.42            | 24.14        | 0.259        | 33.01            | -8.87       |

Table 7-8. EIRP Data (Band 2)

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 148 of 178                 |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm]   | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|---------------------|----------------------------|----------------|------------------------|-----------------|--------------|--------------|------------------|-------------|
| 2502.50         | 5                       | QPSK   | H               | 108                 | 221                        | 1 / 0          | 13.95                  | 9.43            | <b>23.38</b> | 0.218        | 33.01            | -9.63       |
| 2535.00         | 5                       | QPSK   | H               | 106                 | 201                        | 1 / 24         | -9.43                  | 9.39            | 22.78        | 0.190        | 33.01            | -10.23      |
| 2567.50         | 5                       | QPSK   | H               | 112                 | 214                        | 1 / 0          | -9.43                  | 9.45            | 23.22        | 0.210        | 33.01            | -9.79       |
| 2502.50         | 5                       | 16-QAM | H               | 108                 | 221                        | 1 / 0          | -9.43                  | 9.43            | <b>22.69</b> | 0.186        | 33.01            | -10.32      |
| 2505.00         | 10                      | QPSK   | H               | 102                 | 209                        | 1 / 0          | -9.43                  | 9.43            | <b>23.47</b> | <b>0.222</b> | 33.01            | -9.54       |
| 2535.00         | 10                      | QPSK   | H               | 105                 | 217                        | 1 / 49         | -9.43                  | 9.39            | 22.91        | 0.195        | 33.01            | -10.10      |
| 2565.00         | 10                      | QPSK   | H               | 100                 | 215                        | 1 / 0          | -9.43                  | 9.44            | 23.38        | 0.218        | 33.01            | -9.63       |
| 2505.00         | 10                      | 16-QAM | H               | 102                 | 209                        | 1 / 0          | -9.43                  | 9.43            | <b>22.77</b> | 0.189        | 33.01            | -10.24      |
| 2507.50         | 15                      | QPSK   | H               | 102                 | 209                        | 1 / 0          | -9.43                  | 9.42            | <b>23.37</b> | 0.217        | 33.01            | -9.64       |
| 2535.00         | 15                      | QPSK   | H               | 105                 | 217                        | 1 / 74         | -9.43                  | 9.39            | 22.84        | 0.192        | 33.01            | -10.17      |
| 2562.50         | 15                      | QPSK   | H               | 100                 | 215                        | 1 / 0          | -9.43                  | 9.43            | 23.28        | 0.213        | 33.01            | -9.73       |
| 2507.50         | 15                      | 16-QAM | H               | 102                 | 209                        | 1 / 0          | -9.43                  | 9.42            | <b>22.60</b> | 0.182        | 33.01            | -10.41      |
| 2510.00         | 20                      | QPSK   | H               | 102                 | 209                        | 1 / 0          | 14.04                  | 9.42            | <b>23.46</b> | 0.222        | 33.01            | -9.55       |
| 2535.00         | 20                      | QPSK   | H               | 105                 | 217                        | 1 / 99         | 13.78                  | 9.39            | 23.17        | 0.208        | 33.01            | -9.84       |
| 2560.00         | 20                      | QPSK   | H               | 100                 | 215                        | 1 / 0          | 13.72                  | 9.42            | 23.14        | 0.206        | 33.01            | -9.87       |
| 2510.00         | 20                      | 16-QAM | H               | 102                 | 209                        | 1 / 0          | 13.30                  | 9.42            | <b>22.72</b> | 0.187        | 33.01            | -10.29      |
| 10.00           | QPSK                    | H      | V               | 198                 | 321                        | 1 / 0          | 10.77                  | 9.43            | 20.20        | 0.105        | 33.01            | -12.81      |

**Table 7-9. EIRP Data (Band 7)**

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 149 of 178                 |

## 7.7 Radiated Spurious Emissions Measurements

### Test Overview

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

### Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

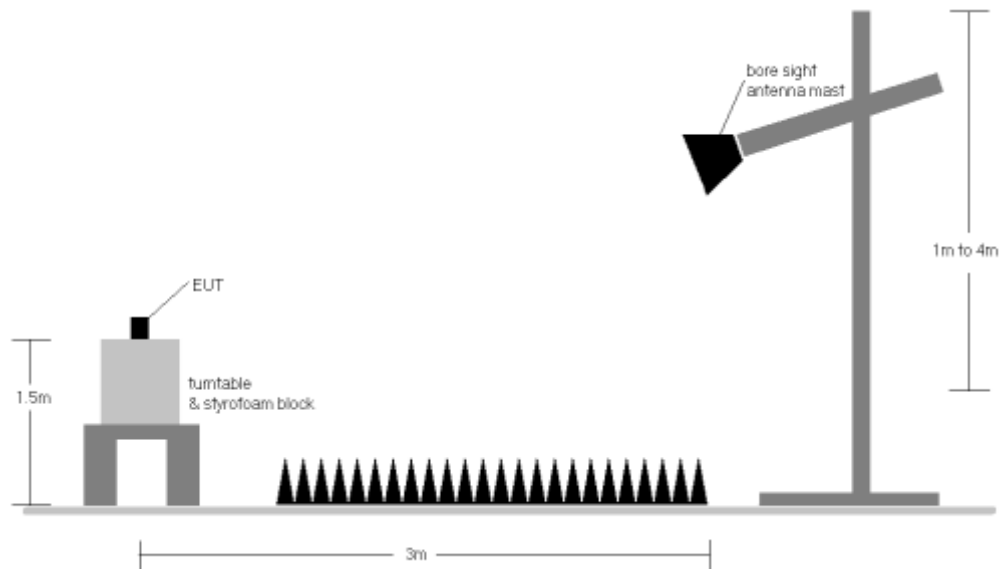
### Test Settings

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

|                                            |                                                                                                                                                                                                                         |                               |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                         | EUT Type:<br>Portable Handset | Page 150 of 178                 |

## Test Setup

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



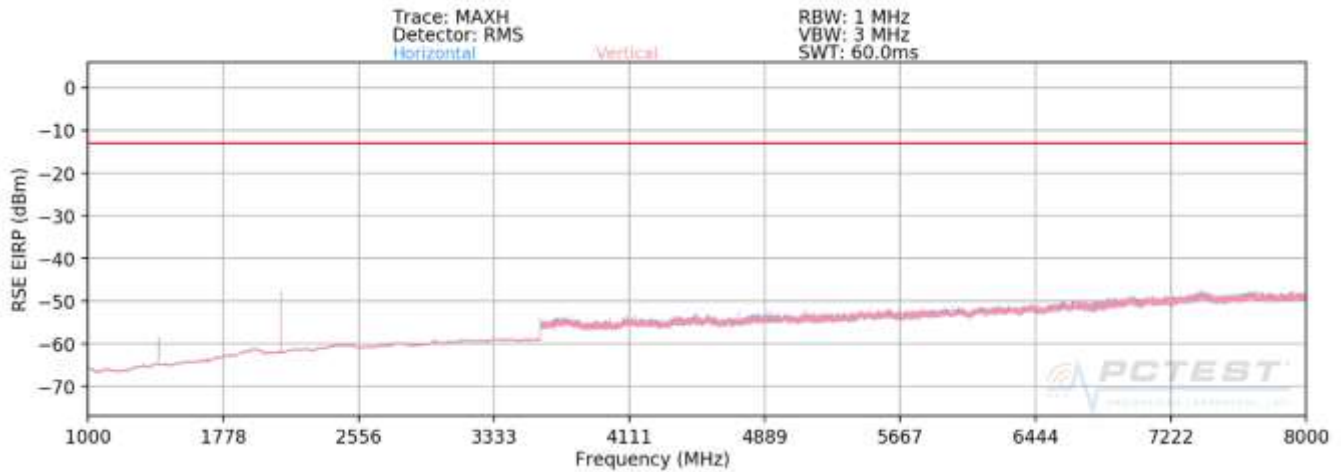
**Figure 7-7. Test Instrument & Measurement Setup**

## Test Notes

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

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 151 of 178                 |

## Band 12/17



Plot 7-239. Radiated Spurious Plot above 1GHz (Band 12/17)

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

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1408.00         | H               | 165                 | 214                        | -67.80                           | 7.99                          | -59.80                        | -46.8       |
| 2112.00         | H               | 169                 | 134                        | -47.69                           | 9.11                          | -38.58                        | -25.6       |
| 2816.00         | H               | -                   | -                          | -68.77                           | 10.11                         | -58.66                        | -45.7       |
| 3520.00         | H               | -                   | -                          | -72.34                           | 9.73                          | -62.60                        | -49.6       |

Table 7-10. Radiated Spurious Data (Band 12/17 – Low Channel)

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 152 of 178                 |

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

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1415.00         | H               | 116                 | 342                        | -69.25                           | 8.09                          | -61.16                        | -48.2       |
| 2122.50         | H               | 108                 | 148                        | -46.61                           | 9.11                          | -37.50                        | -24.5       |
| 2830.00         | H               | -                   | -                          | -70.96                           | 10.14                         | -60.82                        | -47.8       |
| 3537.50         | H               | -                   | -                          | -72.41                           | 9.76                          | -62.65                        | -49.7       |

Table 7-11. Radiated Spurious Data (Band 12/17 – Mid Channel)

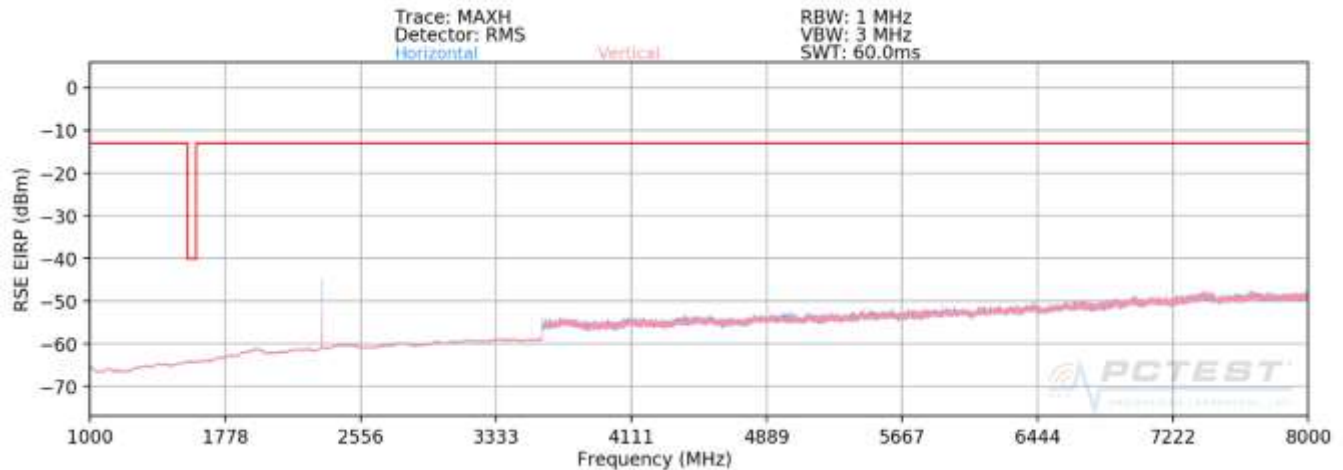
OPERATING FREQUENCY: 711.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1422.00         | H               | 200                 | 305                        | -69.22                           | 8.18                          | -61.04                        | -48.0       |
| 2133.00         | H               | 110                 | 141                        | -50.97                           | 9.11                          | -41.86                        | -28.9       |
| 2844.00         | H               | -                   | -                          | -70.44                           | 10.17                         | -60.27                        | -47.3       |
| 3555.00         | H               | -                   | -                          | -73.41                           | 9.80                          | -63.61                        | -50.6       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 153 of 178                 |

## Band 13



**Plot 7-240. Radiated Spurious Plot above 1GHz (Band 13)**

OPERATING FREQUENCY: 779.50 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 2338.50         | H               | -                   | -                          | -69.65                           | 9.47                          | -60.18                        | -47.2       |
| 3118.00         | H               | 160                 | 188                        | -48.09                           | 9.51                          | -38.58                        | -25.6       |
| 3897.50         | H               | -                   | -                          | -67.41                           | 9.25                          | -58.16                        | -45.2       |
| 4677.00         | H               | -                   | -                          | -70.62                           | 11.40                         | -59.21                        | -46.2       |

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

|                                            |                                               |                                               |           |                                 |
|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> | <b>LG</b> | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset                 |           | Page 154 of 178                 |

OPERATING FREQUENCY: 782.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 2346.00         | H               | 117                 | 58                         | -67.86                           | 9.44                          | -58.43                        | -45.4       |
| 3128.00         | H               | 187                 | 177                        | -57.56                           | 9.48                          | -48.08                        | -35.1       |
| 3910.00         | H               | -                   | -                          | -68.12                           | 9.26                          | -58.86                        | -45.9       |
| 4692.00         | H               | -                   | -                          | -73.39                           | 11.43                         | -61.95                        | -49.0       |

Table 7-14. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY: 784.50 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 2353.50         | H               | 127                 | 244                        | -69.51                           | 9.40                          | -60.11                        | -47.1       |
| 3138.00         | H               | 198                 | 128                        | -52.52                           | 9.45                          | -43.06                        | -30.1       |
| 3922.50         | H               | -                   | -                          | -68.50                           | 9.26                          | -59.23                        | -46.2       |
| 4707.00         | H               | -                   | -                          | -70.56                           | 11.45                         | -59.11                        | -46.1       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1-ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset |                                 |
|                                            |                                                                                                                                                                                                                     |                               | Page 155 of 178                 |

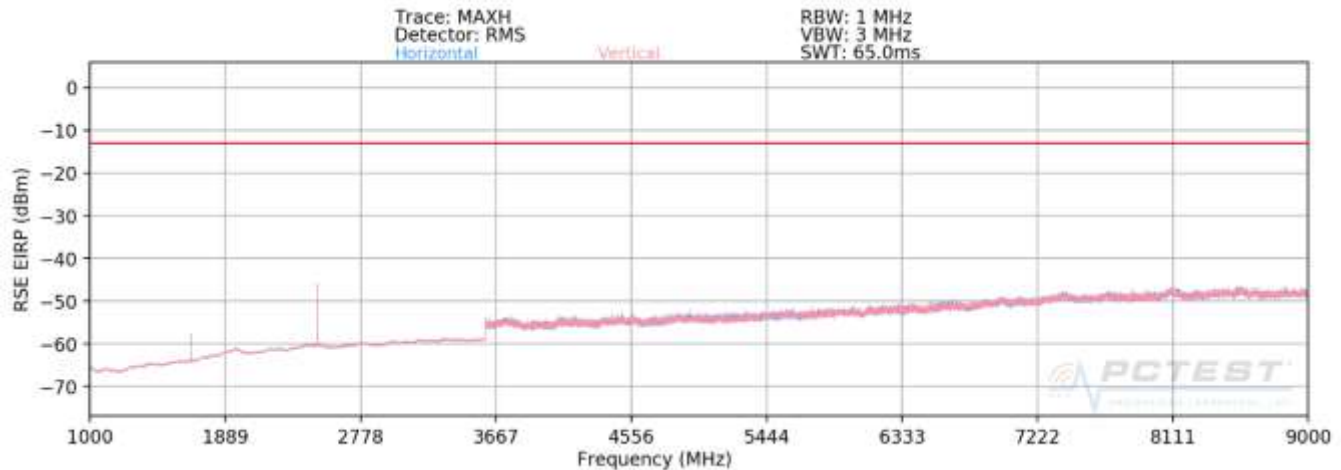
|                            |             |
|----------------------------|-------------|
| MODULATION SIGNAL:         | QPSK        |
| BANDWIDTH:                 | 5.00 MHz    |
| DISTANCE:                  | 3 meters    |
| NARROWBAND EMISSION LIMIT: | -50 dBm     |
| WIDEBAND EMISSION LIMIT:   |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

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1559.00         | H               | 278                 | 190                        | -54.23                           | 3.53                          | -50.70                        | -10.7       |
| 1564.00         | H               | 309                 | 192                        | -56.95                           | 3.53                          | -53.42                        | -13.4       |
| 1569.00         | H               | 299                 | 182                        | -56.99                           | 3.53                          | -53.46                        | -13.5       |

**Table 7-16. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)**

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 156 of 178                 |

## Band 5



**Plot 7-241. Radiated Spurious Plot above 1GHz (Band 5)**

OPERATING FREQUENCY: 829.00 MHz  
MODULATION SIGNAL: QPSK  
BANDWIDTH: 10.0 MHz  
DISTANCE: 3 meters  
LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1658.00         | V               | 131                 | 13                         | -67.12                           | 8.88                          | -58.24                        | -45.2       |
| 2487.00         | V               | 104                 | 361                        | -51.36                           | 9.23                          | -42.13                        | -29.1       |
| 3316.00         | V               | -                   | -                          | -60.86                           | 9.43                          | -51.42                        | -38.4       |
| 4145.00         | V               | -                   | -                          | -60.64                           | 10.13                         | -50.51                        | -37.5       |

**Table 7-17. Radiated Spurious Data (Band 5 – Low Channel)**

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 157 of 178                 |

OPERATING FREQUENCY: 836.50 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1673.00         | V               | 195                 | 146                        | -66.06                           | 8.78                          | -57.28                        | -44.3       |
| 2509.50         | V               | 156                 | 324                        | -52.28                           | 9.27                          | -43.00                        | -30.0       |
| 3346.00         | V               | -                   | -                          | -62.13                           | 9.44                          | -52.69                        | -39.7       |
| 4182.50         | V               | -                   | -                          | -63.18                           | 10.34                         | -52.83                        | -39.8       |

Table 7-18. Radiated Spurious Data (Band 5 – Mid Channel)

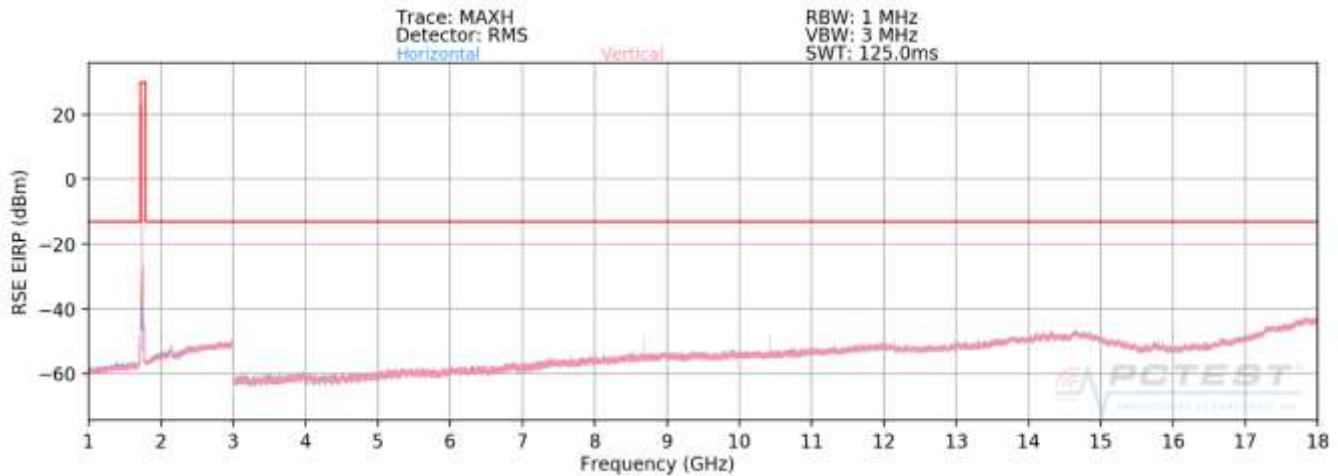
OPERATING FREQUENCY: 844.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 1688.00         | V               | 131                 | 219                        | -66.11                           | 8.68                          | -57.44                        | -44.4       |
| 2532.00         | V               | 104                 | 183                        | -50.47                           | 9.28                          | -41.19                        | -28.2       |
| 3376.00         | V               | -                   | -                          | -62.75                           | 9.50                          | -53.24                        | -40.2       |
| 4220.00         | V               | -                   | -                          | -61.60                           | 10.53                         | -51.07                        | -38.1       |

Table 7-19. Radiated Spurious Data (Band 5 – High Channel)

|                                            |                                                                                                                                                                                                                 |                               |                                 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  MEASUREMENT REPORT<br>(CERTIFICATION)  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                 | EUT Type:<br>Portable Handset | Page 158 of 178                 |

## Band 66/4



**Plot 7-242. Radiated Spurious Plot above 1GHz (Band 66/4)**

OPERATING FREQUENCY: 1710.70 MHz  
MODULATION SIGNAL: QPSK  
BANDWIDTH: 1.4 MHz  
DISTANCE: 3 meters  
LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3421.40         | H               | 195                 | 351                        | -61.24                           | 9.61                          | -51.63                        | -38.6       |
| 5132.10         | H               | 104                 | 33                         | -57.68                           | 11.06                         | -46.62                        | -33.6       |
| 6842.80         | H               | -                   | -                          | -57.49                           | 10.93                         | -46.56                        | -33.6       |
| 8553.50         | H               | -                   | -                          | -58.89                           | 11.79                         | -47.09                        | -34.1       |

**Table 7-20. Radiated Spurious Data (Band 66/4 – Low Channel)**

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 159 of 178                 |

OPERATING FREQUENCY: 1745.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 1.4 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3490.00         | H               | 169                 | 339                        | -59.61                           | 9.70                          | -49.91                        | -36.9       |
| 5235.00         | H               | 168                 | 329                        | -55.47                           | 11.08                         | -44.39                        | -31.4       |
| 6980.00         | H               | -                   | -                          | -59.29                           | 11.04                         | -48.25                        | -35.2       |
| 8725.00         | H               | -                   | -                          | -59.13                           | 11.88                         | -47.25                        | -34.2       |

Table 7-21. Radiated Spurious Data (Band 66/4 – Mid Channel)

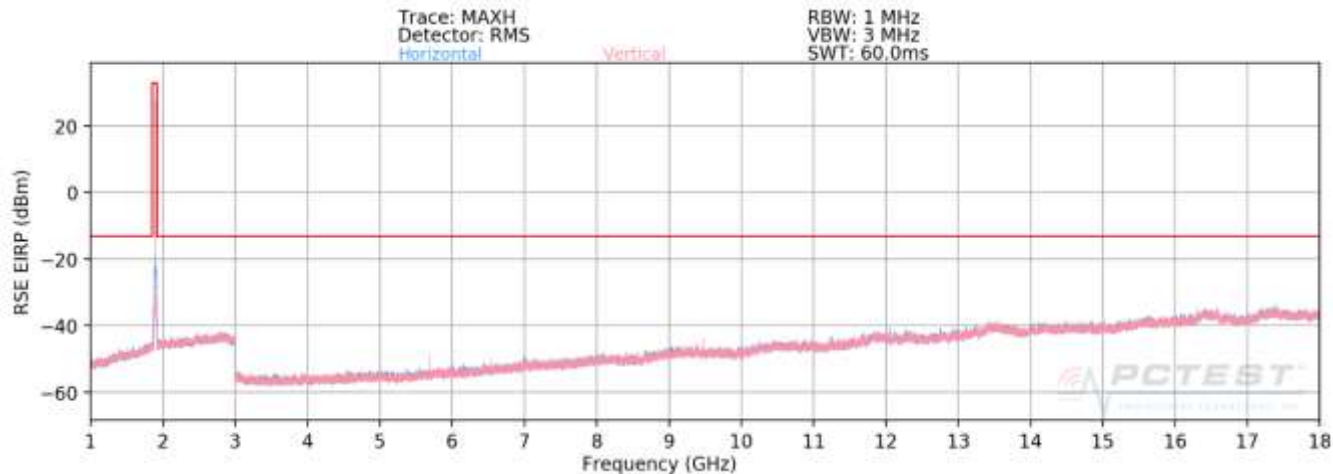
OPERATING FREQUENCY: 1779.30 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 1.4 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3558.60         | H               | 166                 | 349                        | -60.83                           | 9.81                          | -51.02                        | -38.0       |
| 5337.90         | H               | -                   | -                          | -60.66                           | 11.13                         | -49.52                        | -36.5       |
| 7117.20         | H               | -                   | -                          | -57.47                           | 11.07                         | -46.40                        | -33.4       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 160 of 178                 |

## Band 2



**Plot 7-243. Radiated Spurious Plot above 1GHz (Band 2)**

OPERATING FREQUENCY: 1852.50 MHz

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 MHz

DISTANCE: 3 meters

LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3705.00         | H               | 184                 | 28                         | -57.51                           | 9.83                          | -47.68                        | -34.7       |
| 5557.50         | H               | -                   | -                          | -60.77                           | 11.19                         | -49.58                        | -36.6       |
| 7410.00         | H               | -                   | -                          | -58.40                           | 10.88                         | -47.53                        | -34.5       |

**Table 7-23. Radiated Spurious Data (Band 2 – Low Channel)**

|                                            |                                               |                                       |  |  |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|--|--|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) |  |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |  |  | Page 161 of 178                 |

OPERATING FREQUENCY: 1880.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3760.00         | H               | 159                 | 255                        | -53.74                           | 9.59                          | -44.15                        | -31.2       |
| 5640.00         | H               | -                   | -                          | -64.20                           | 11.30                         | -52.89                        | -39.9       |
| 7520.00         | H               | -                   | -                          | -59.73                           | 11.08                         | -48.65                        | -35.6       |

Table 7-24. Radiated Spurious Data (Band 2 – Mid Channel)

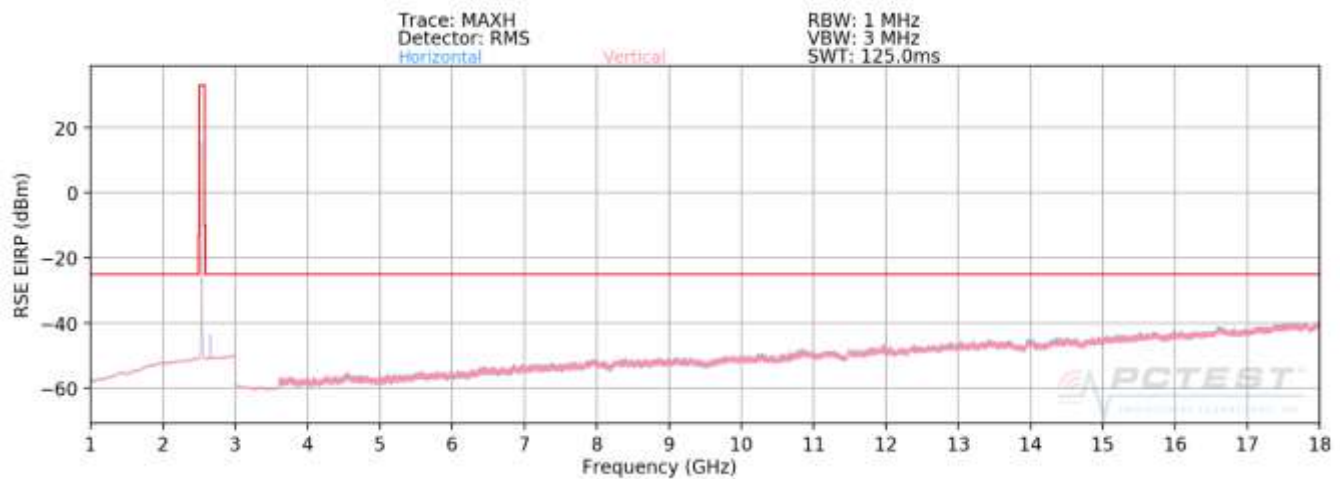
OPERATING FREQUENCY: 1907.50 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 3815.00         | H               | 154                 | 107                        | -55.80                           | 9.28                          | -46.52                        | -33.5       |
| 5722.50         | H               | 120                 | 362                        | -58.13                           | 11.40                         | -46.73                        | -33.7       |
| 7630.00         | H               | -                   | -                          | -58.65                           | 11.33                         | -47.32                        | -34.3       |
| 9537.50         | H               | -                   | -                          | -58.55                           | 12.41                         | -46.14                        | -33.1       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 162 of 178                 |

## Band 7



**Plot 7-244. Radiated Spurious Plot 1GHz - 18GHz (Band 7)**

OPERATING FREQUENCY: 2505.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5010.00         | H               | 153                 | 47                         | -61.26                           | 11.39                         | -49.87                        | -24.9       |
| 7515.00         | H               | 166                 | 216                        | -57.99                           | 11.39                         | -46.60                        | -21.6       |
| 10020.00        | H               | -                   | -                          | -57.08                           | 12.31                         | -44.77                        | -19.8       |
| 12525.00        | H               | -                   | -                          | -54.54                           | 12.85                         | -41.70                        | -16.7       |

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

|                                            |                                               |                                       |    |                                 |
|--------------------------------------------|-----------------------------------------------|---------------------------------------|----|---------------------------------|
| FCC ID: ZNFX525WA                          | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019               | EUT Type:<br>Portable Handset         |    | Page 163 of 178                 |

OPERATING FREQUENCY: 2535.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5070.00         | H               | 142                 | 222                        | -61.24                           | 11.21                         | -50.03                        | -25.0       |
| 7605.00         | H               | 155                 | 217                        | -57.18                           | 11.29                         | -45.89                        | -20.9       |
| 10140.00        | H               | -                   | -                          | -56.94                           | 12.41                         | -44.53                        | -19.5       |
| 12675.00        | H               | -                   | -                          | -53.49                           | 12.85                         | -40.64                        | -15.6       |

Table 7-27. Radiated Spurious Data (Band 7 – Mid Channel)

OPERATING FREQUENCY: 2565.00 MHz  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|-----------------|-----------------|---------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-------------|
| 5130.00         | H               | 147                 | 246                        | -62.17                           | 11.06                         | -51.10                        | -26.1       |
| 7695.00         | H               | 166                 | 216                        | -58.76                           | 11.43                         | -47.33                        | -22.3       |
| 10260.00        | H               | -                   | -                          | -55.92                           | 11.43                         | -44.48                        | -19.5       |
| 12825.00        | H               | -                   | -                          | -51.64                           | 12.55                         | -39.09                        | -14.1       |

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

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 164 of 178                 |

## 7.8 Frequency Stability / Temperature Variation

### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

***For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.***

### Test Procedure Used

ANSI/TIA-603-E-2016

### Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

### Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

### Test Notes

None

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 165 of 178                 |

## Band 12/17 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz  
 CHANNEL: 23790  
 REFERENCE VOLTAGE: 3.82 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 707,499,709    | -291            | -0.0000411    |
| 100 %          |             | - 20      | 707,500,292    | 292             | 0.0000413     |
| 100 %          |             | - 10      | 707,499,759    | -241            | -0.0000341    |
| 100 %          |             | 0         | 707,499,766    | -234            | -0.0000331    |
| 100 %          |             | + 10      | 707,500,088    | 88              | 0.0000124     |
| 100 %          |             | + 20      | 707,500,121    | 121             | 0.0000171     |
| 100 %          |             | + 30      | 707,500,224    | 224             | 0.0000317     |
| 100 %          |             | + 40      | 707,499,980    | -20             | -0.0000028    |
| 100 %          |             | + 50      | 707,499,805    | -195            | -0.0000276    |
| BATT. ENDPOINT | 3.21        | + 20      | 707,500,137    | 137             | 0.0000194     |

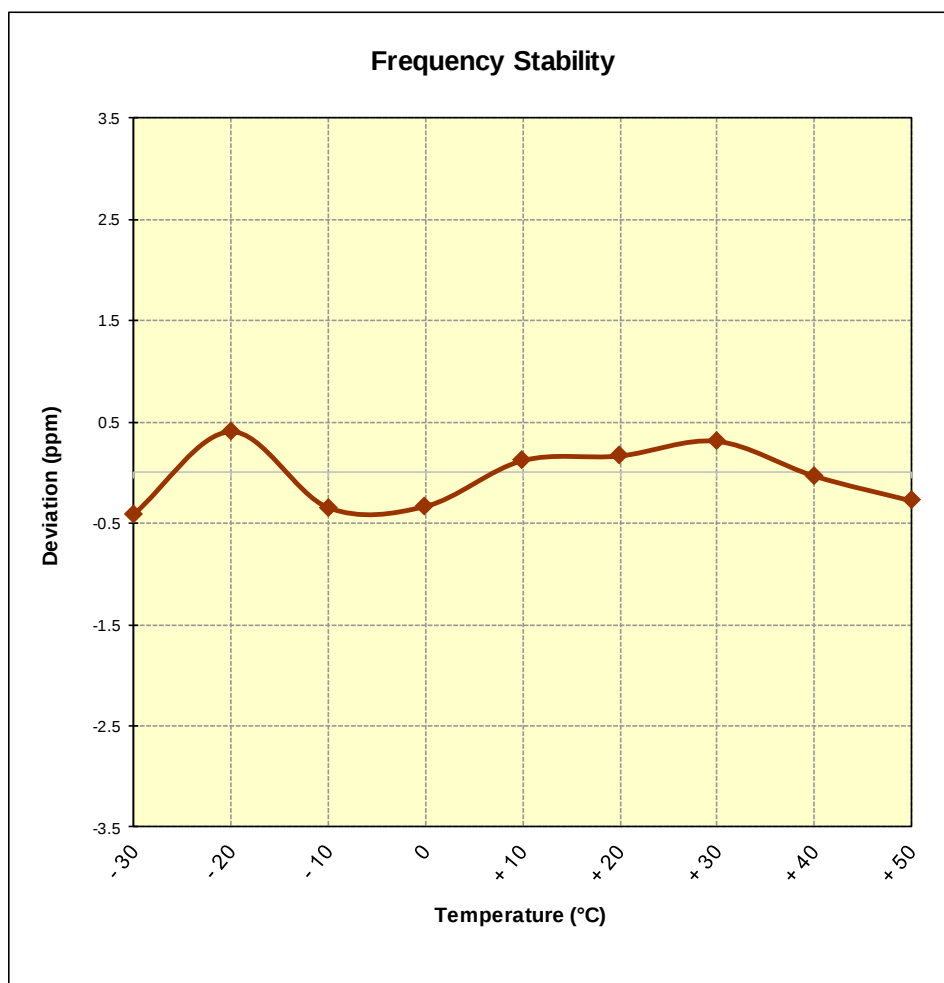
**Table 7-29. Frequency Stability Data (Band 12/17)**

### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 166 of 178                 |

## Band 12/17 Frequency Stability Measurements



**Figure 7-8. Frequency Stability Graph (Band 12/17)**

|                                            |                                                                                                                                                                                                                         |                               |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                         | EUT Type:<br>Portable Handset | Page 167 of 178                 |

## Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz  
 CHANNEL: 23230  
 REFERENCE VOLTAGE: 3.82 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 782,000,025    | 25              | 0.0000032     |
| 100 %          |             | - 20      | 782,000,102    | 102             | 0.0000130     |
| 100 %          |             | - 10      | 782,000,046    | 46              | 0.0000059     |
| 100 %          |             | 0         | 781,999,959    | -41             | -0.0000052    |
| 100 %          |             | + 10      | 781,999,815    | -185            | -0.0000237    |
| 100 %          |             | + 20      | 782,000,088    | 88              | 0.0000113     |
| 100 %          |             | + 30      | 782,000,040    | 40              | 0.0000051     |
| 100 %          |             | + 40      | 782,000,066    | 66              | 0.0000084     |
| 100 %          |             | + 50      | 782,000,010    | 10              | 0.0000013     |
| BATT. ENDPOINT | 3.21        | + 20      | 782,000,306    | 306             | 0.0000391     |

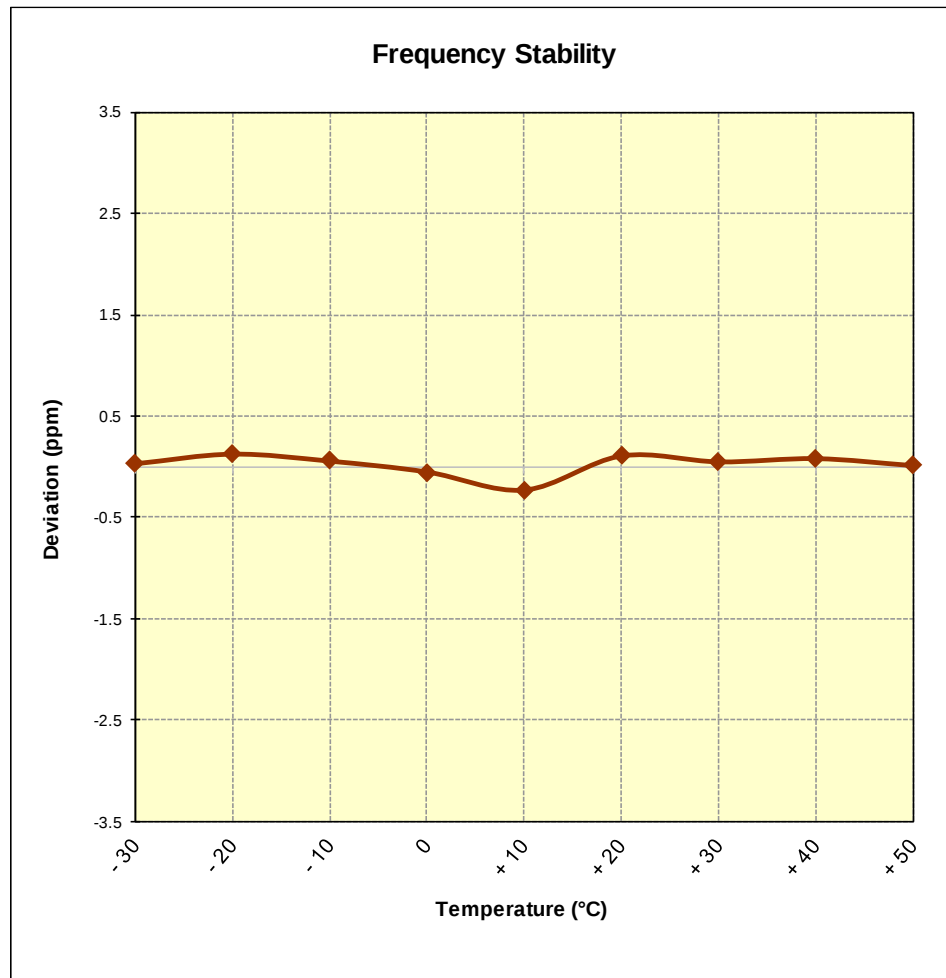
**Table 7-30. Frequency Stability Data (Band 13)**

### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 168 of 178                 |

## Band 13 Frequency Stability Measurements



**Figure 7-9. Frequency Stability Graph (Band 13)**

|                                                   |                                                                                                                                                                                                                         |                                      |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFX525WA                          |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b>  |                                      | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1905300091-03-R1.ZNF | <b>Test Dates:</b><br>5/30 - 6/18/2019                                                                                                                                                                                  | <b>EUT Type:</b><br>Portable Handset | Page 169 of 178                        |

## Band 5 Frequency Stability Measurements

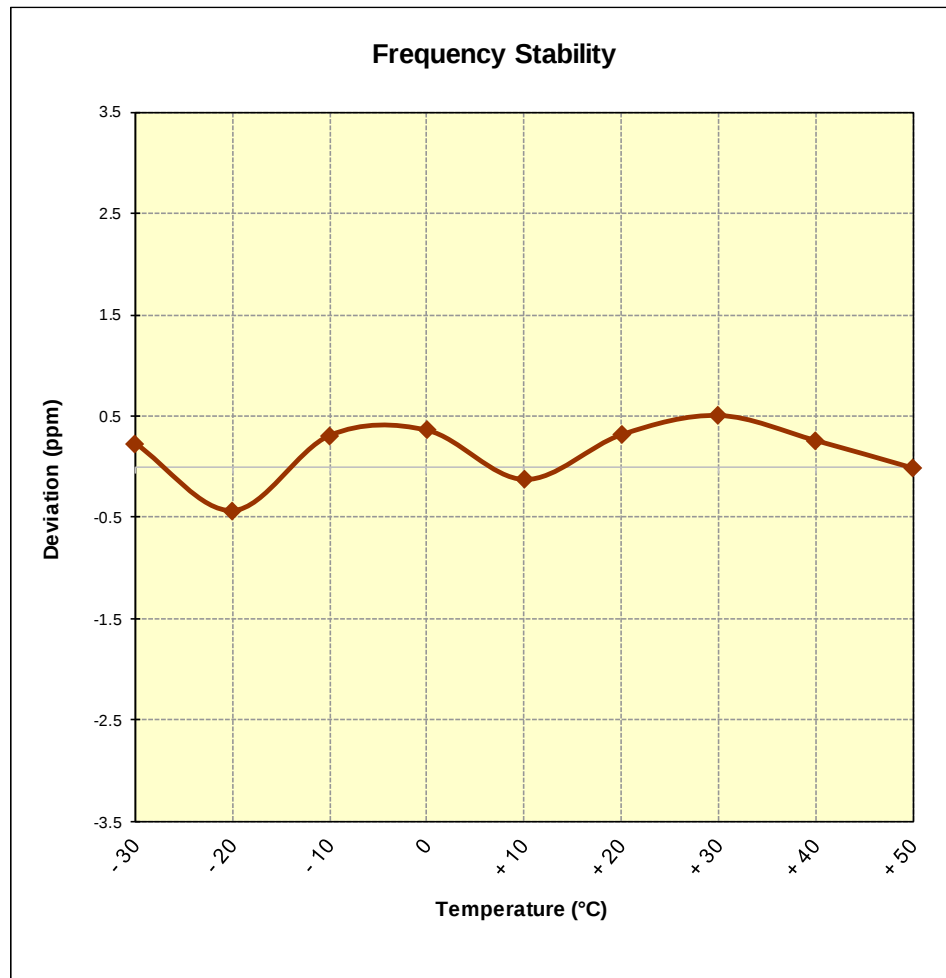
OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.82 VDC  
 DEVIATION LIMIT:  $\pm 0.00025$  % or 2.5 ppm

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 836,500,191    | 191             | 0.0000228     |
| 100 %          |             | - 20      | 836,499,633    | -367            | -0.0000439    |
| 100 %          |             | - 10      | 836,500,258    | 258             | 0.0000308     |
| 100 %          |             | 0         | 836,500,300    | 300             | 0.0000359     |
| 100 %          |             | + 10      | 836,499,891    | -109            | -0.0000130    |
| 100 %          |             | + 20      | 836,500,264    | 264             | 0.0000316     |
| 100 %          |             | + 30      | 836,500,423    | 423             | 0.0000506     |
| 100 %          |             | + 40      | 836,500,214    | 214             | 0.0000256     |
| 100 %          |             | + 50      | 836,499,985    | -15             | -0.0000018    |
| BATT. ENDPOINT | 3.21        | + 20      | 836,499,958    | -42             | -0.0000050    |

Table 7-31. Frequency Stability Data (Band 5)

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 170 of 178                 |

## Band 5 Frequency Stability Measurements



**Figure 7-10. Frequency Stability Graph (Band 5)**

|                                                   |                                                                                     |                                               |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFX525WA                          |  | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1905300091-03-R1.ZNF | <b>Test Dates:</b><br>5/30 - 6/18/2019                                              | <b>EUT Type:</b><br>Portable Handset          |                                                                                       | Page 171 of 178                        |

## Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz  
 CHANNEL: 132322  
 REFERENCE VOLTAGE: 3.82 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 1,744,999,837  | -163            | -0.0000093    |
| 100 %          |             | - 20      | 1,744,999,948  | -52             | -0.0000030    |
| 100 %          |             | - 10      | 1,745,000,122  | 122             | 0.0000070     |
| 100 %          |             | 0         | 1,745,000,014  | 14              | 0.0000008     |
| 100 %          |             | + 10      | 1,745,000,151  | 151             | 0.0000087     |
| 100 %          |             | + 20      | 1,745,000,004  | 4               | 0.0000002     |
| 100 %          |             | + 30      | 1,744,999,730  | -270            | -0.0000155    |
| 100 %          |             | + 40      | 1,744,999,703  | -297            | -0.0000170    |
| 100 %          |             | + 50      | 1,744,999,960  | -40             | -0.0000023    |
| BATT. ENDPOINT | 3.21        | + 20      | 1,744,999,781  | -219            | -0.0000126    |

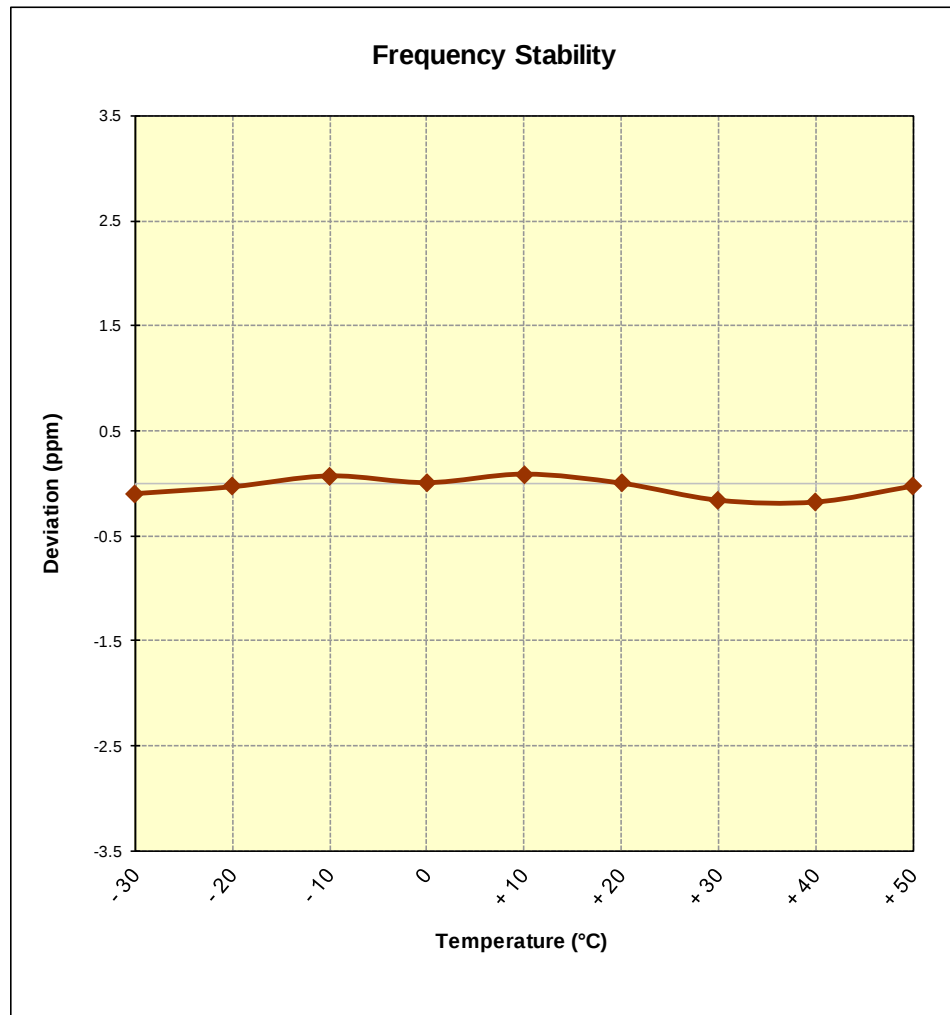
**Table 7-32. Frequency Stability Data (Band 66/4)**

### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 172 of 178                 |

## Band 66/4 Frequency Stability Measurements



**Figure 7-11. Frequency Stability Graph (Band 66/4)**

|                                                   |                                                                                     |                                               |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFX525WA                          |  | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1905300091-03-R1.ZNF | <b>Test Dates:</b><br>5/30 - 6/18/2019                                              | <b>EUT Type:</b><br>Portable Handset          |                                                                                       | Page 173 of 178                        |

## Band 2 Frequency Stability Measurements

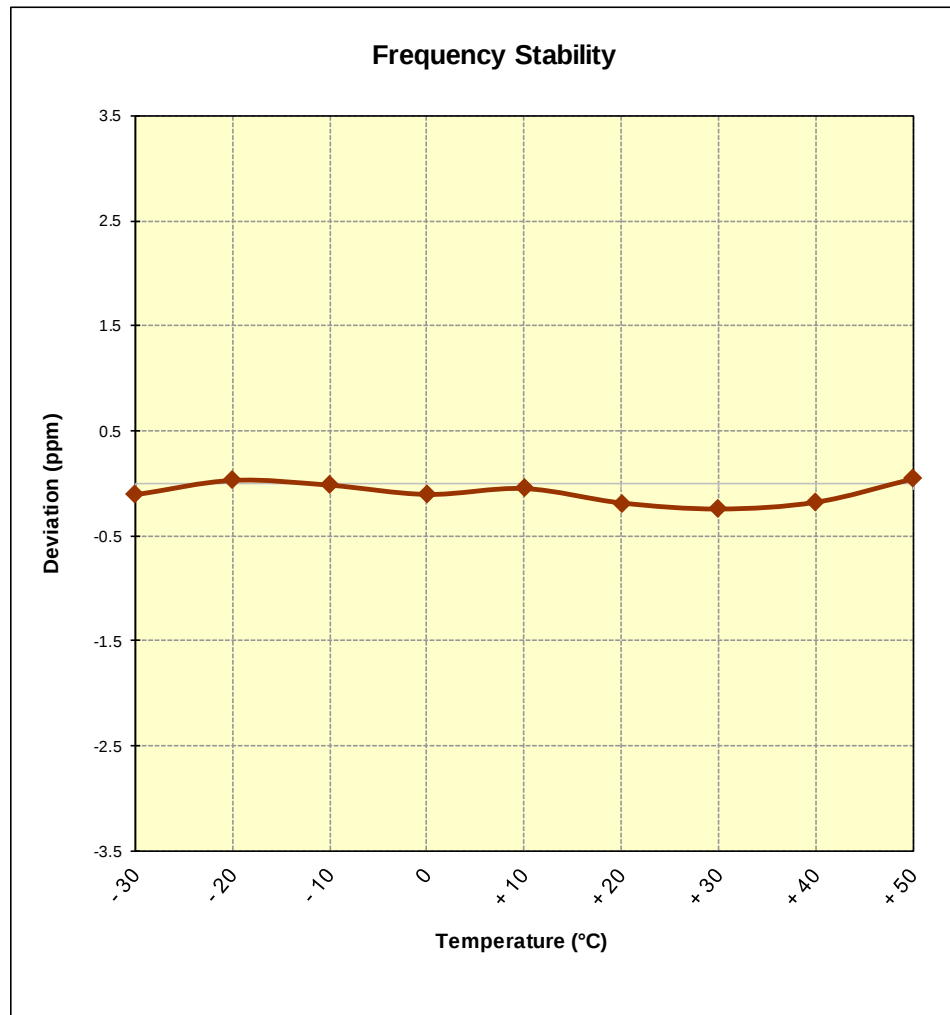
OPERATING FREQUENCY: 1,880,000,000 Hz  
 CHANNEL: 18900  
 REFERENCE VOLTAGE: 3.82 VDC  
 DEVIATION LIMIT:  $\pm 0.00025$  % or 2.5 ppm

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 1,879,999,798  | -202            | -0.0000107    |
| 100 %          |             | - 20      | 1,880,000,059  | 59              | 0.0000031     |
| 100 %          |             | - 10      | 1,879,999,972  | -28             | -0.0000015    |
| 100 %          |             | 0         | 1,879,999,805  | -195            | -0.0000104    |
| 100 %          |             | + 10      | 1,879,999,911  | -89             | -0.0000047    |
| 100 %          |             | + 20      | 1,879,999,650  | -350            | -0.0000186    |
| 100 %          |             | + 30      | 1,879,999,541  | -459            | -0.0000244    |
| 100 %          |             | + 40      | 1,879,999,665  | -335            | -0.0000178    |
| 100 %          |             | + 50      | 1,880,000,089  | 89              | 0.0000047     |
| BATT. ENDPOINT | 3.21        | + 20      | 1,879,999,941  | -59             | -0.0000031    |

Table 7-33. Frequency Stability Data (Band 2)

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 174 of 178                 |

## Band 2 Frequency Stability Measurements



**Figure 7-12. Frequency Stability Graph (Band 2)**

|                                                   |                                                                                     |                                               |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFX525WA                          |  | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1905300091-03-R1.ZNF | <b>Test Dates:</b><br>5/30 - 6/18/2019                                              | <b>EUT Type:</b><br>Portable Handset          |                                                                                       | Page 175 of 178                        |

## Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz  
 CHANNEL: 21100  
 REFERENCE VOLTAGE: 3.82 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|-----------|----------------|-----------------|---------------|
| 100 %          | 3.82        | - 30      | 2,535,000,132  | 132             | 0.0000052     |
| 100 %          |             | - 20      | 2,534,999,986  | -14             | -0.0000006    |
| 100 %          |             | - 10      | 2,534,999,892  | -108            | -0.0000043    |
| 100 %          |             | 0         | 2,535,000,113  | 113             | 0.0000045     |
| 100 %          |             | + 10      | 2,535,000,345  | 345             | 0.0000136     |
| 100 %          |             | + 20      | 2,534,999,995  | -5              | -0.0000002    |
| 100 %          |             | + 30      | 2,535,000,113  | 113             | 0.0000045     |
| 100 %          |             | + 40      | 2,535,000,138  | 138             | 0.0000054     |
| 100 %          |             | + 50      | 2,535,000,099  | 99              | 0.0000039     |
| BATT. ENDPOINT |             | + 20      | 2,534,999,933  | -67             | -0.0000026    |

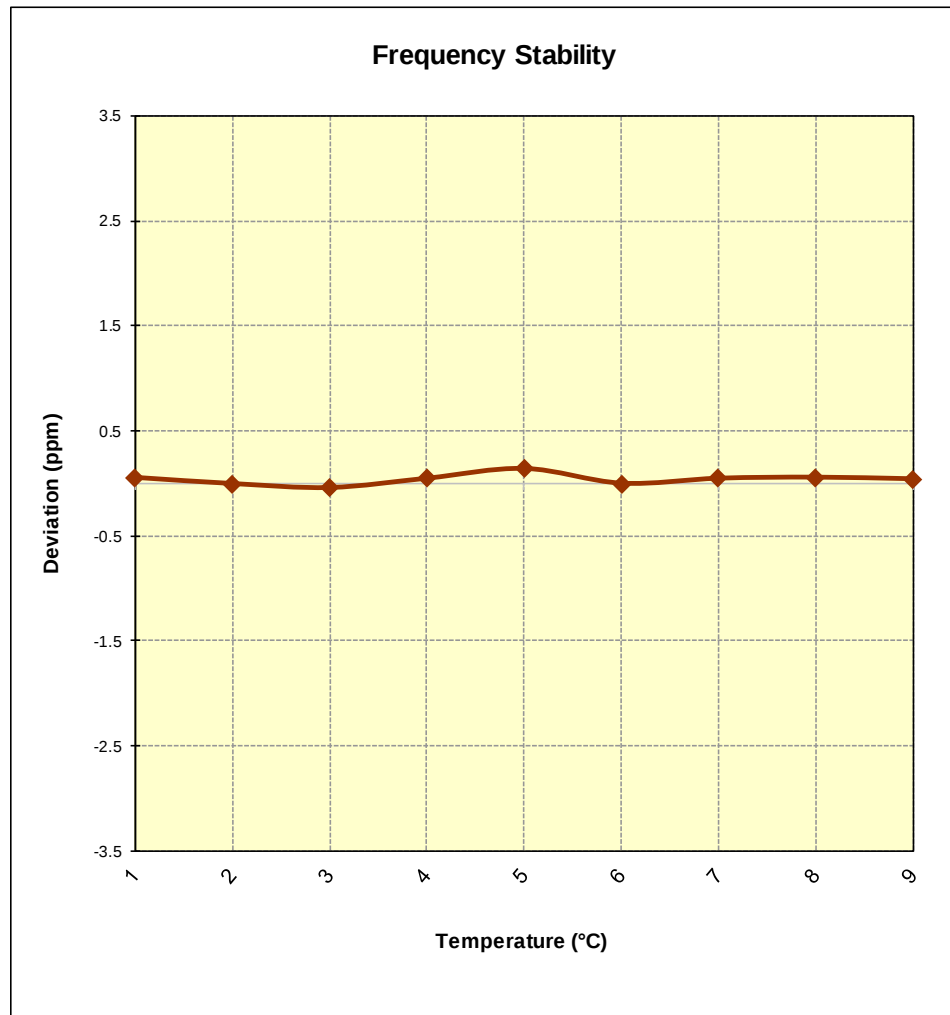
**Table 7-34. Frequency Stability Data (Band 7)**

### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

|                                            |                                                                                                                                                                                                                     |                               |                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  <b>MEASUREMENT REPORT (CERTIFICATION)</b>  |                               | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                                                                                                                                                     | EUT Type:<br>Portable Handset | Page 176 of 178                 |

## Band 7 Frequency Stability Measurements



**Figure 7-13. Frequency Stability Graph (Band 7)**

|                                                   |                                                                                     |                                               |                                                                                       |                                        |
|---------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFX525WA                          |  | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>1M1905300091-03-R1.ZNF | <b>Test Dates:</b><br>5/30 - 6/18/2019                                              | <b>EUT Type:</b><br>Portable Handset          |                                                                                       | Page 177 of 178                        |

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFX525WA** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules and RSS-130, RSS-132, RSS-133, RSS-139, RSS-199 of the Innovation, Science and Economic Development Canada Rules for LTE operation only.

|                                            |                                                                                     |                                       |                                                                                       |                                 |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFX525WA                          |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Quality Manager |
| Test Report S/N:<br>1M1905300091-03-R1.ZNF | Test Dates:<br>5/30 - 6/18/2019                                                     | EUT Type:<br>Portable Handset         |                                                                                       | Page 178 of 178                 |