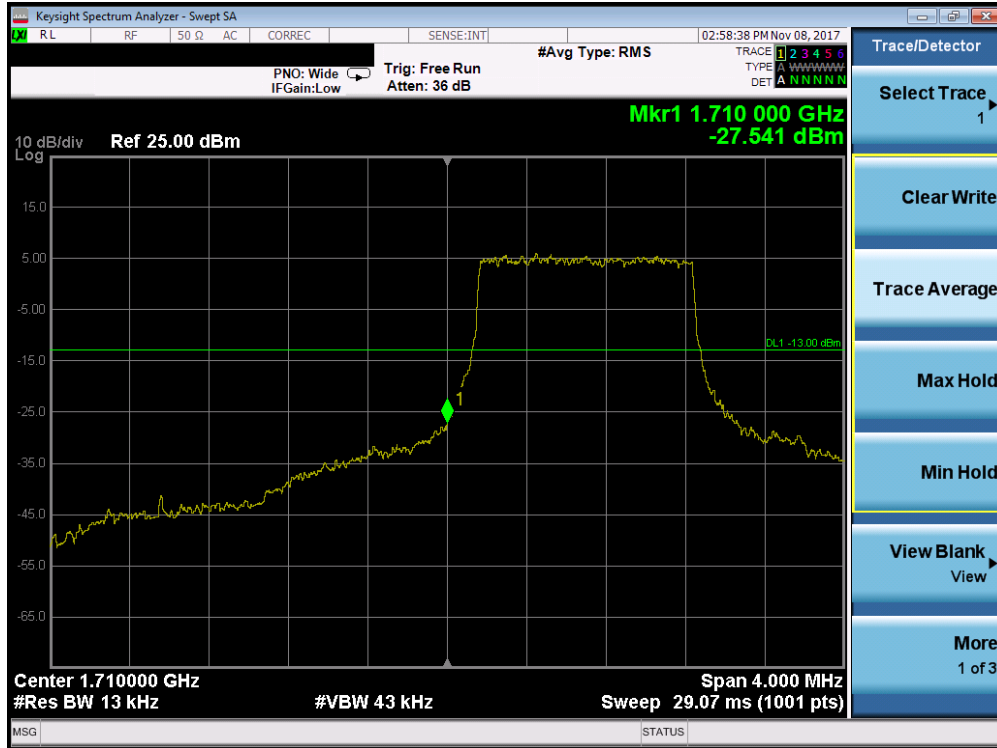
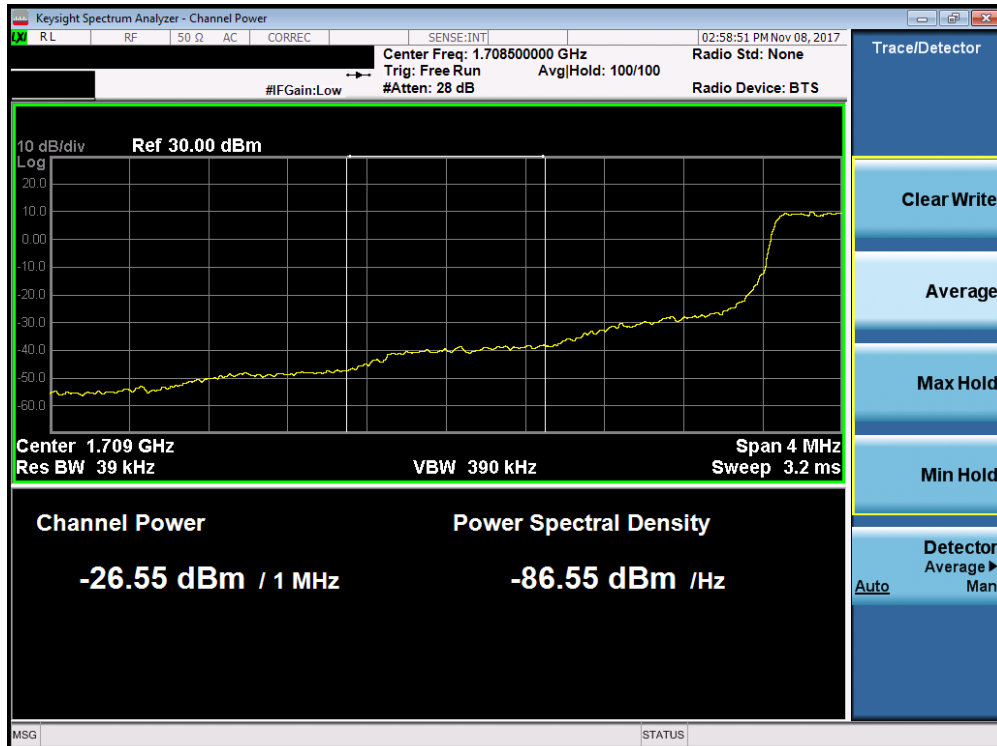


**Band 66**

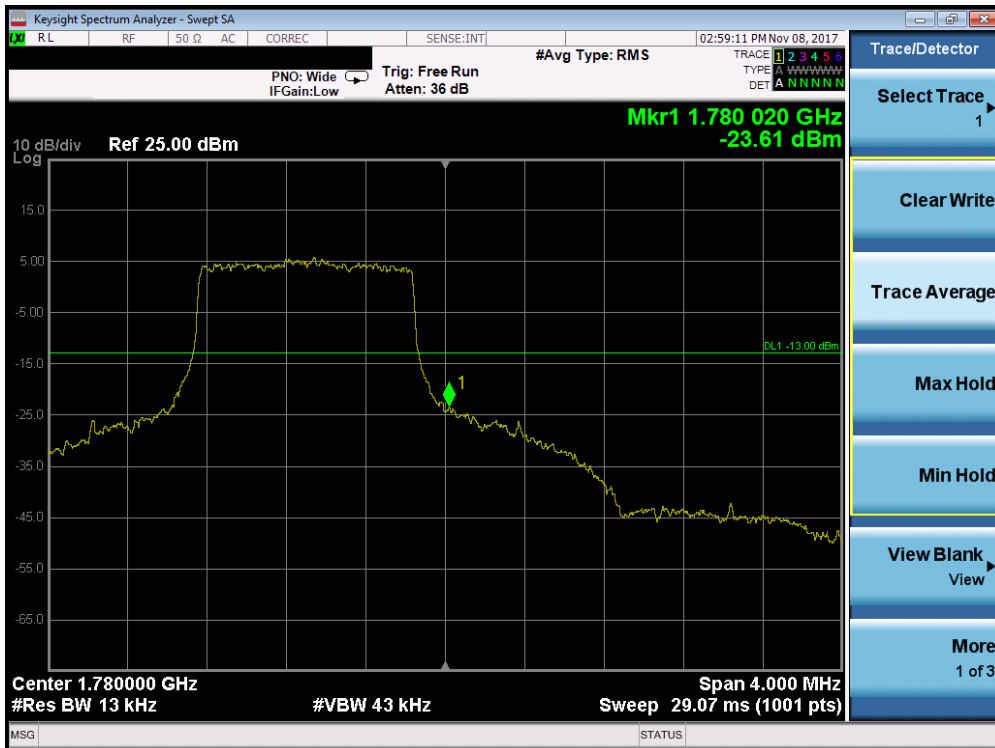


Plot 7-113. Lower Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

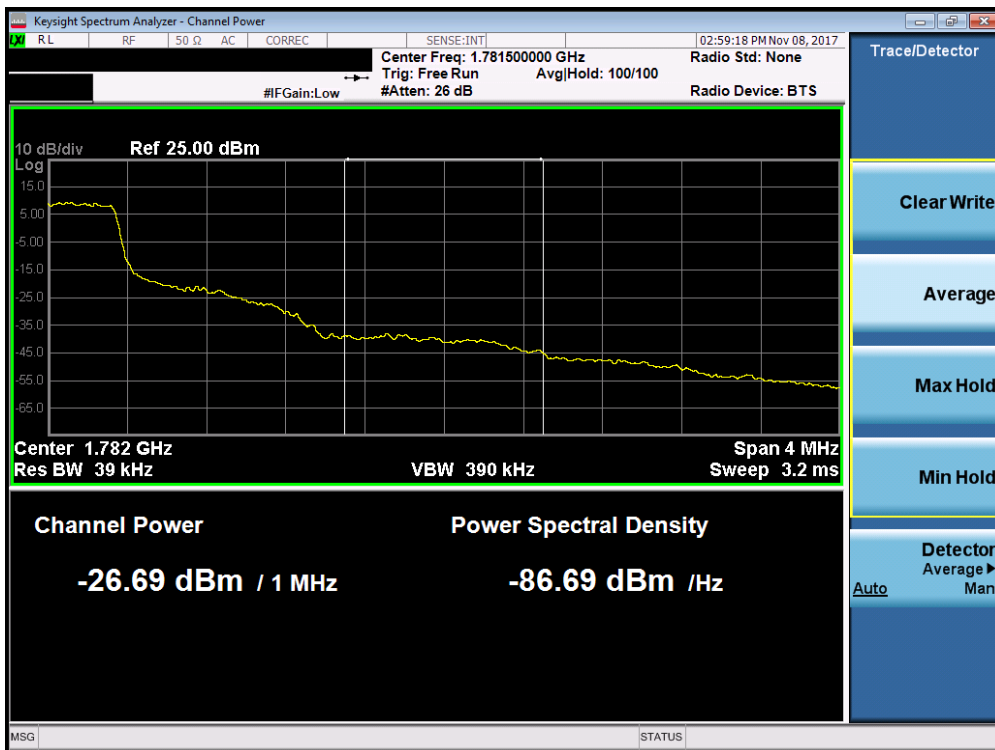


Plot 7-114. . Lower Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 76 of 155



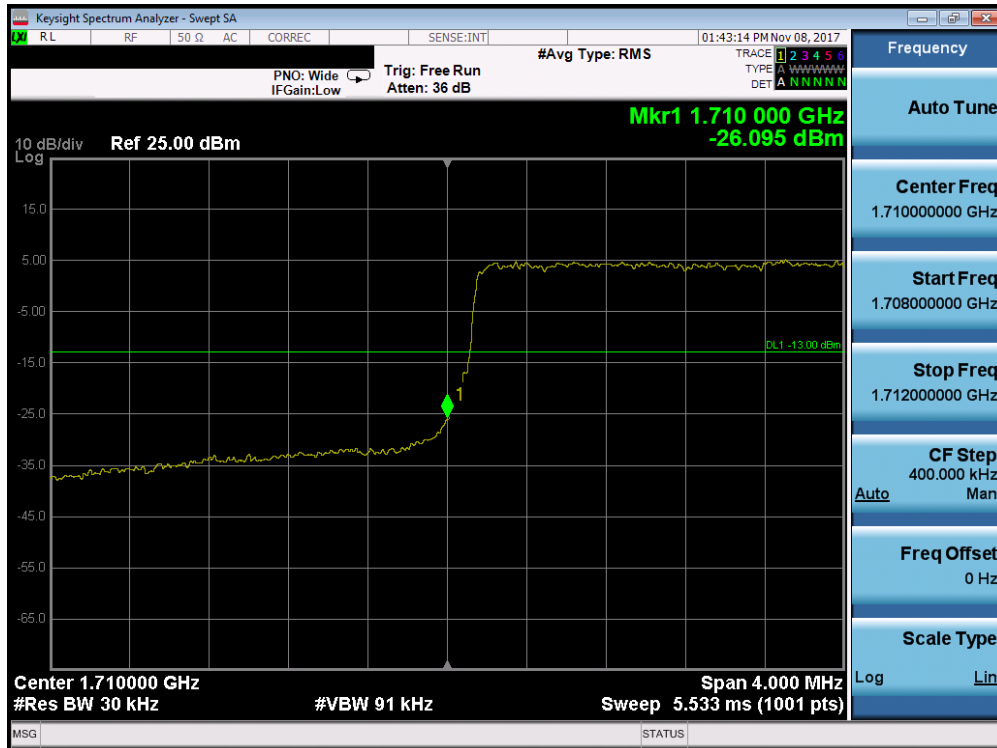
Plot 7-115. Upper Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)



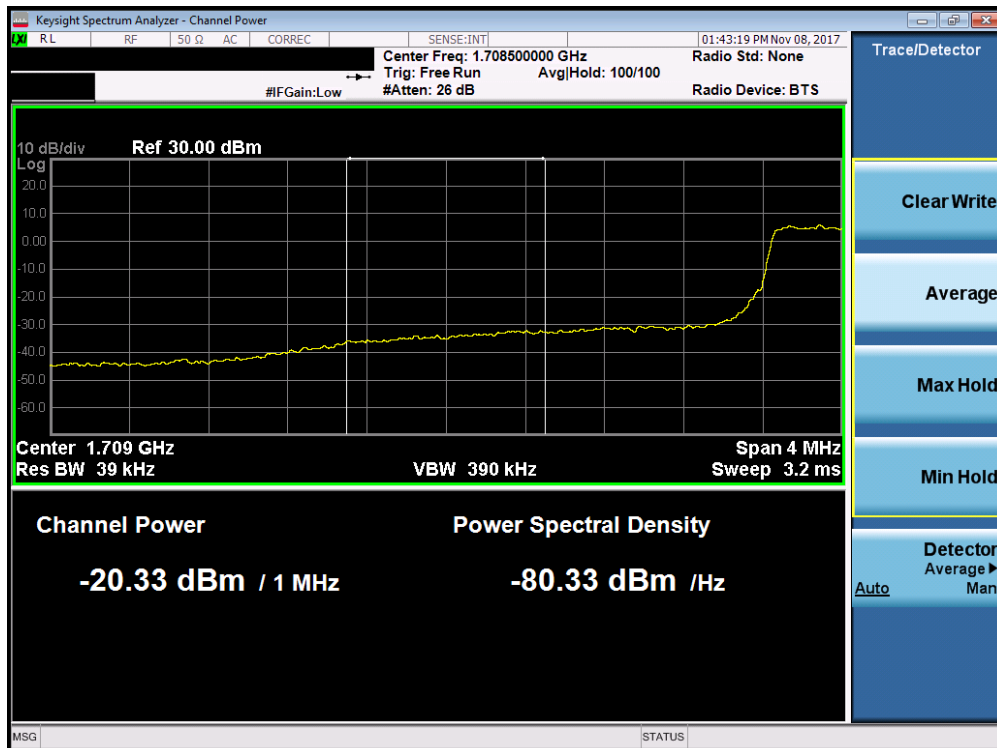
Plot 7-116. . Upper Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 77 of 155

**Band 66**



Plot 7-117. Lower Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

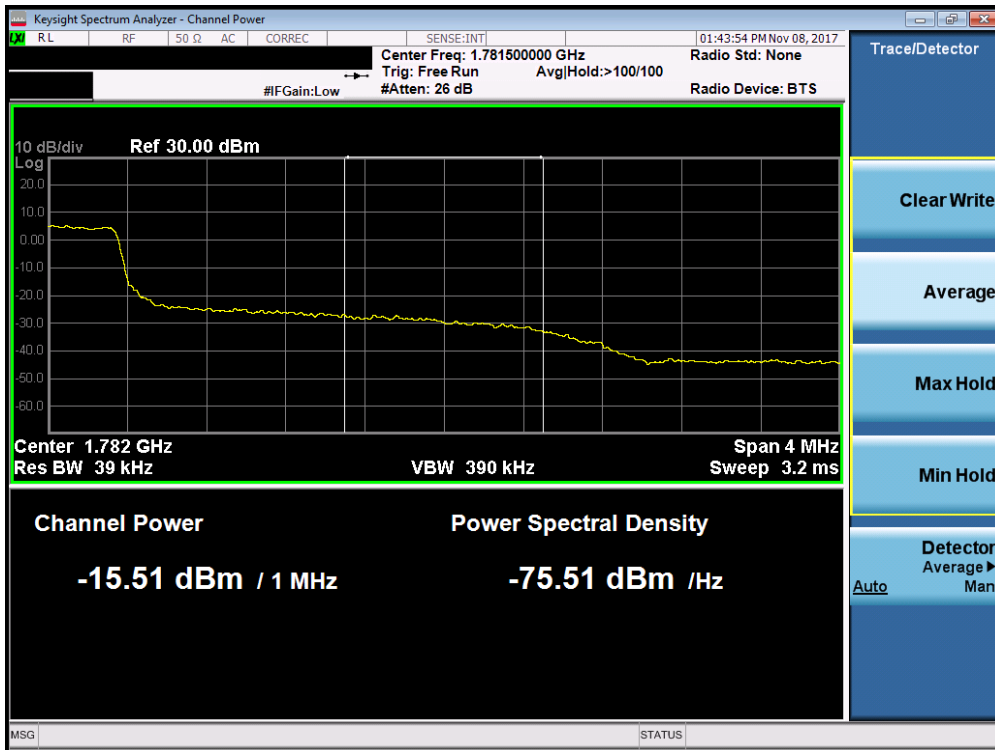


Plot 7-118. Lower Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 78 of 155



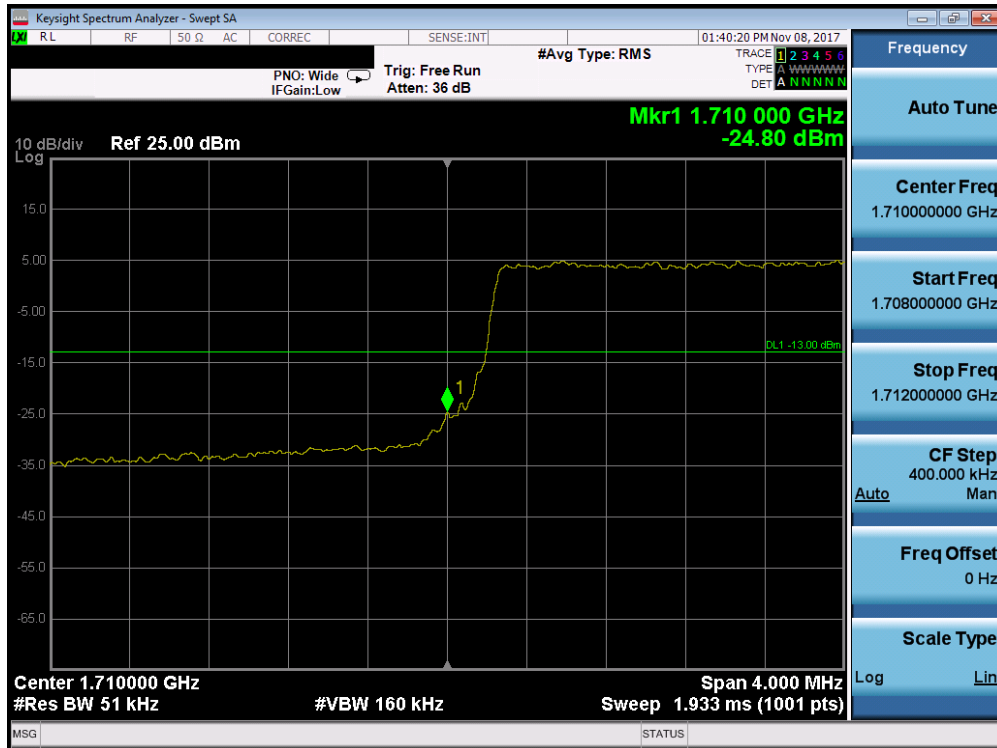
Plot 7-119. Upper Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)



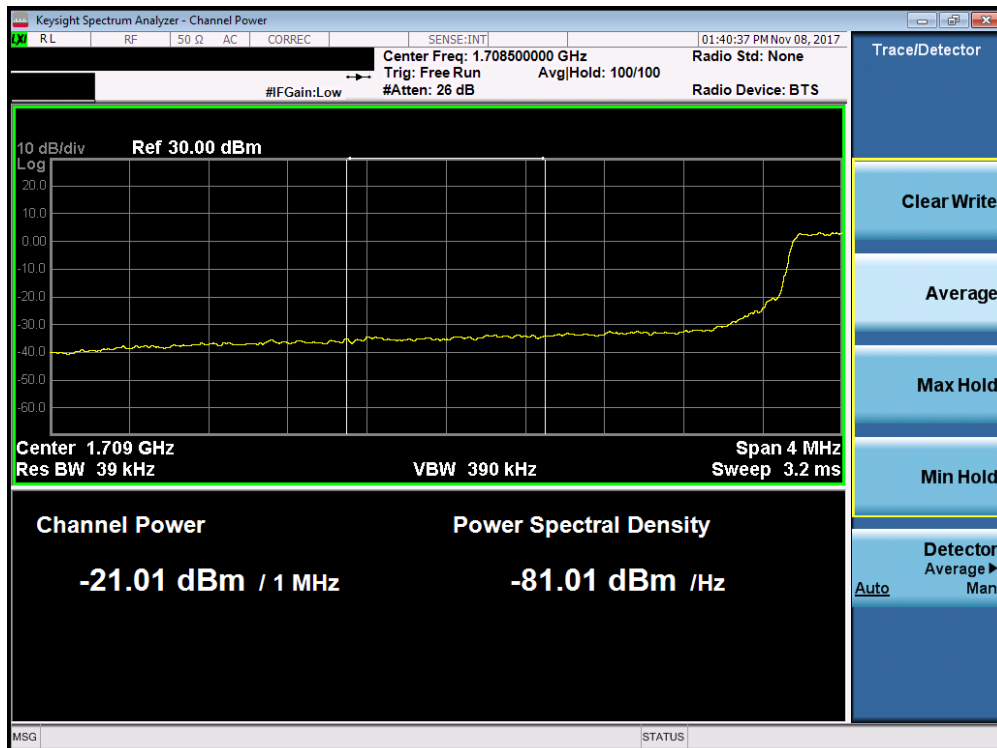
Plot 7-120. . Upper Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 79 of 155

**Band 66**

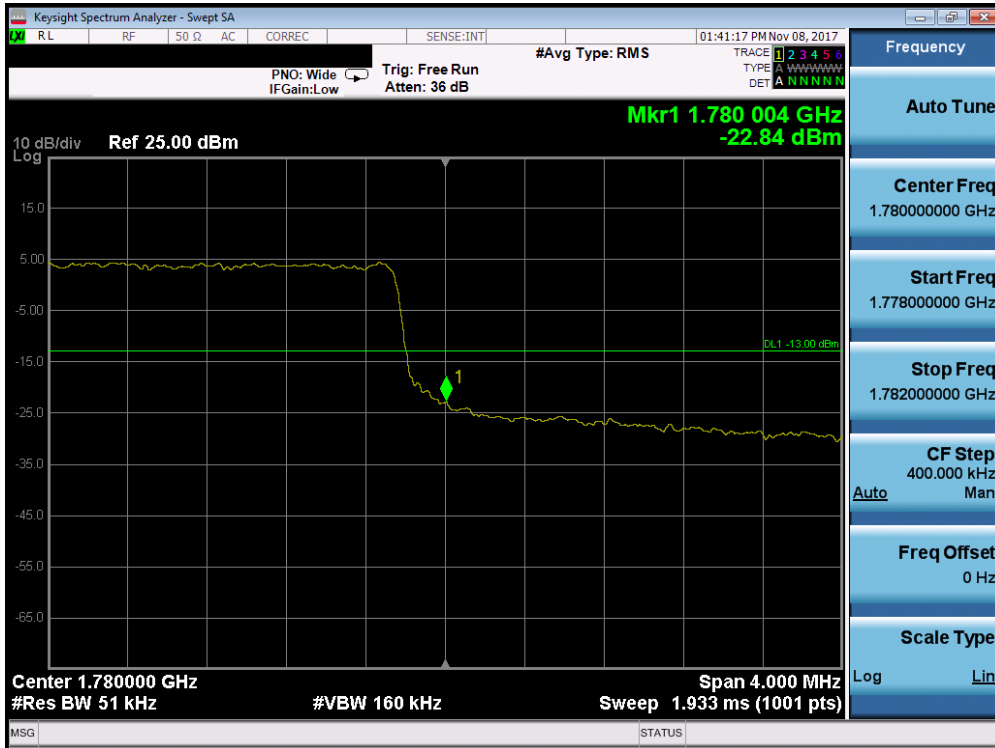


Plot 7-121. Lower Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

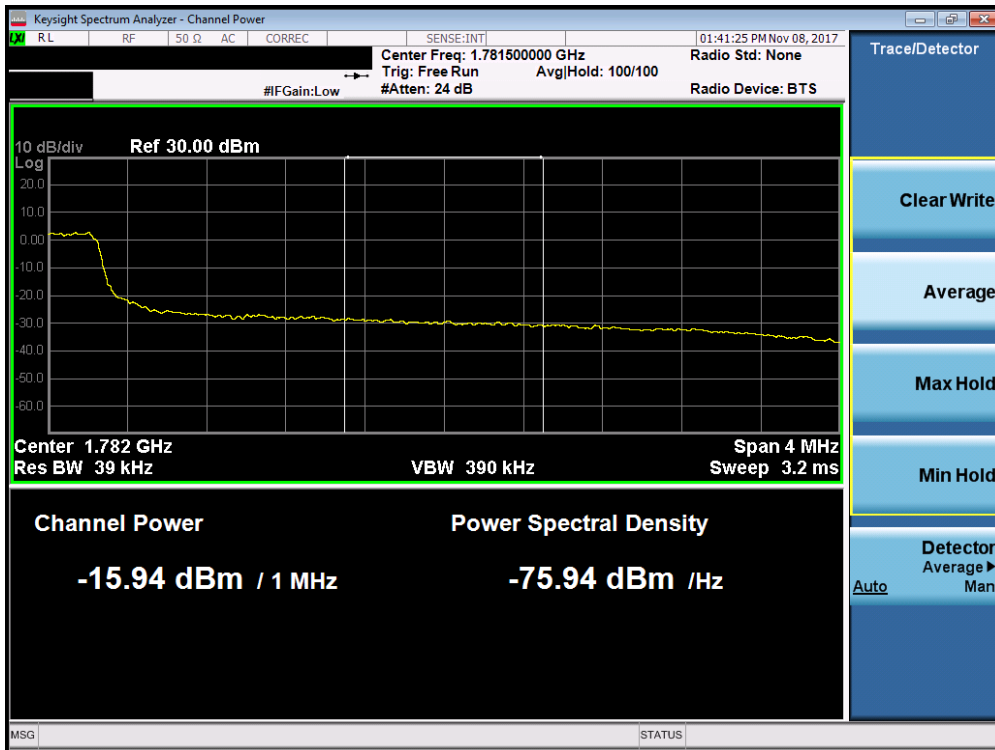


Plot 7-122. . Lower Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 80 of 155



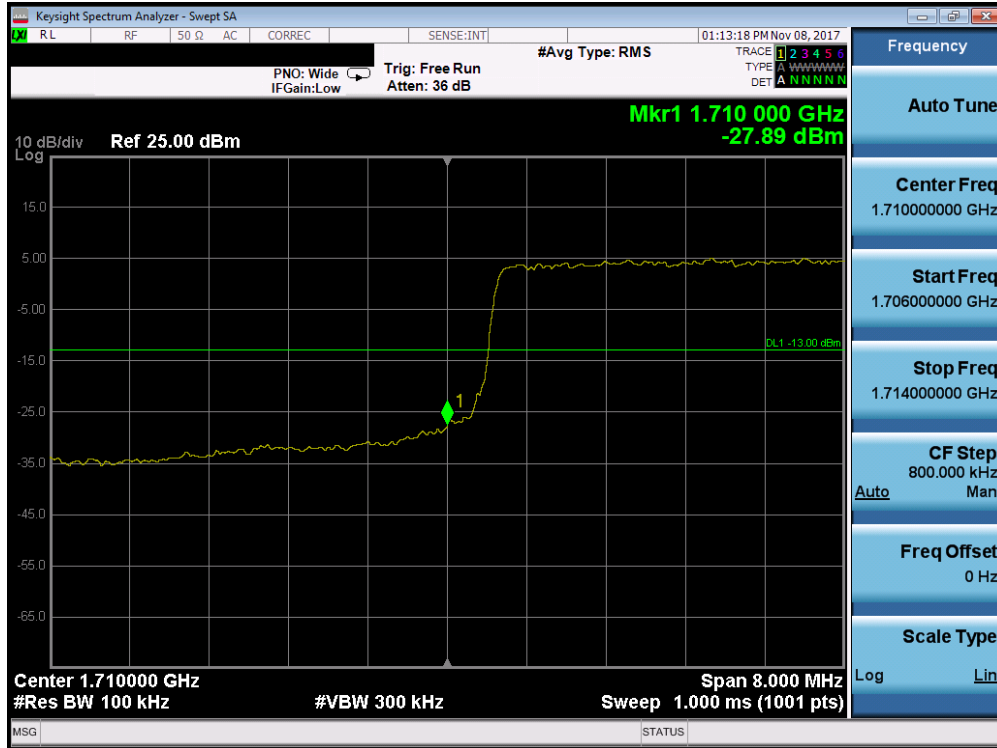
Plot 7-123. Upper Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)



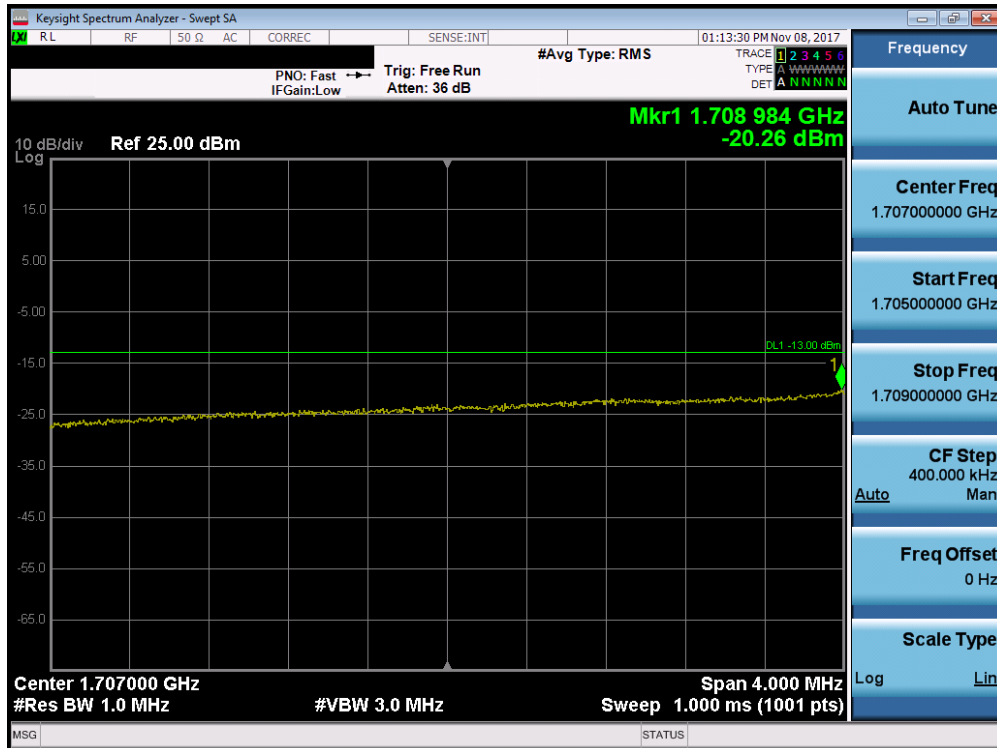
Plot 7-124. . Upper Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 81 of 155

**Band 66**

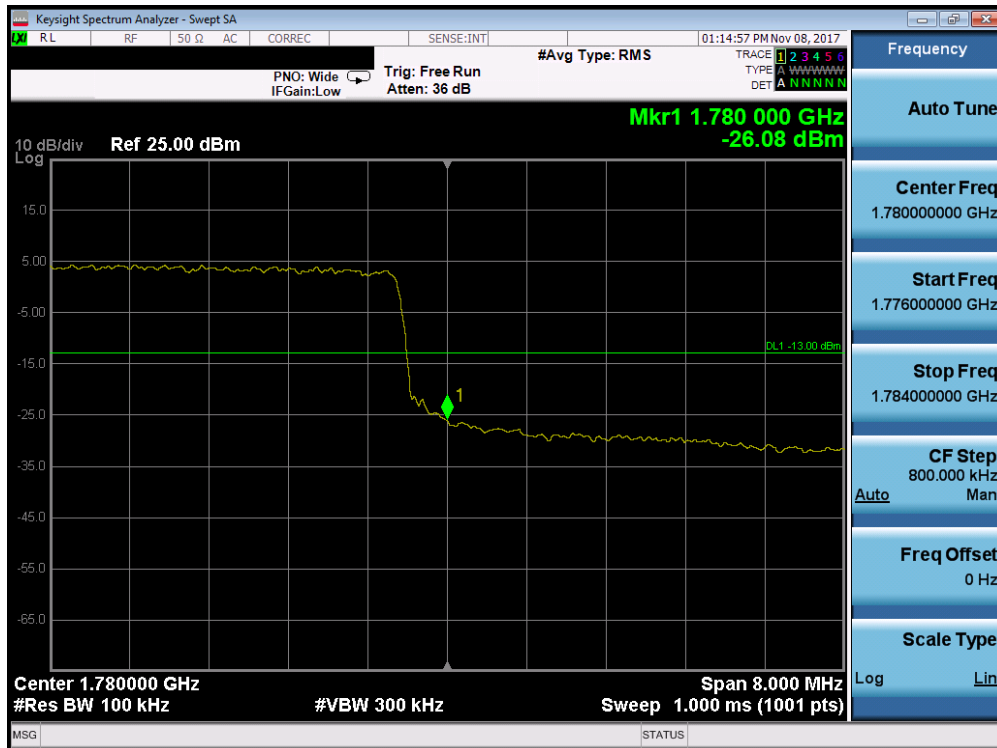


**Plot 7-125. Lower Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)**

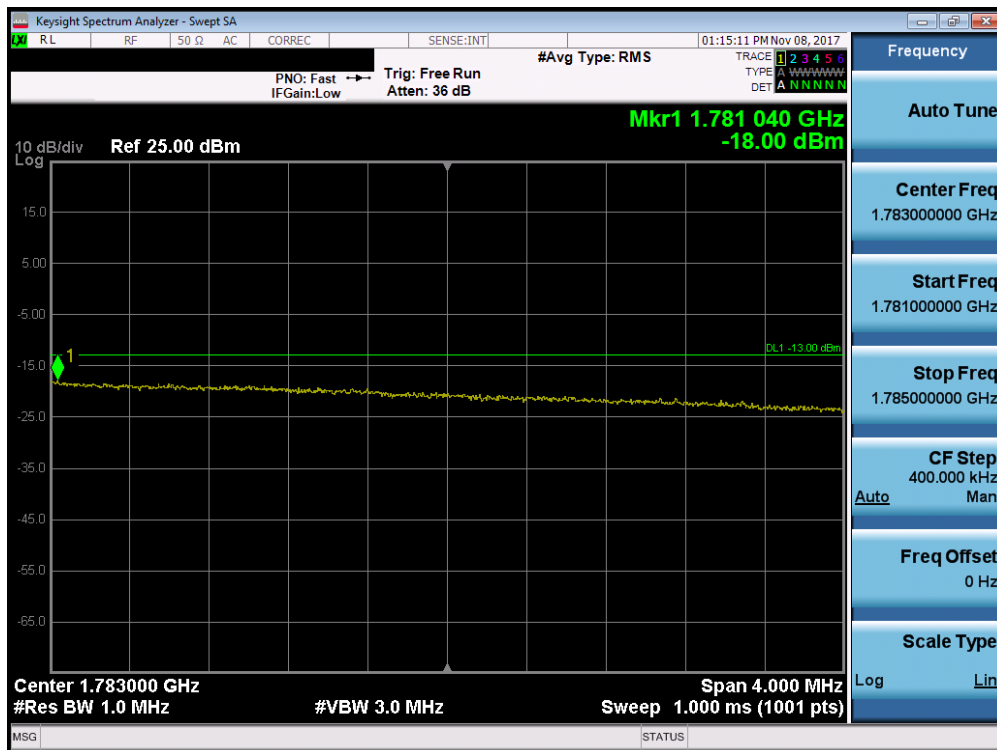


**Plot 7-126. . Lower Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 82 of 155



Plot 7-127. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

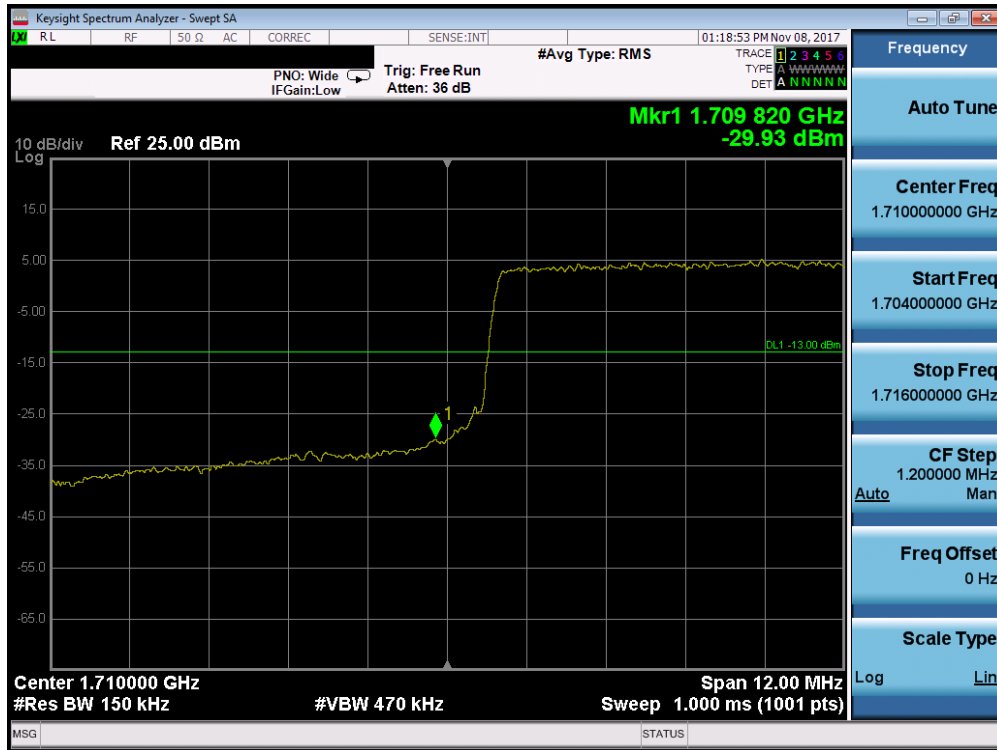


Plot 7-128. . Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 83 of 155



**Band 66**

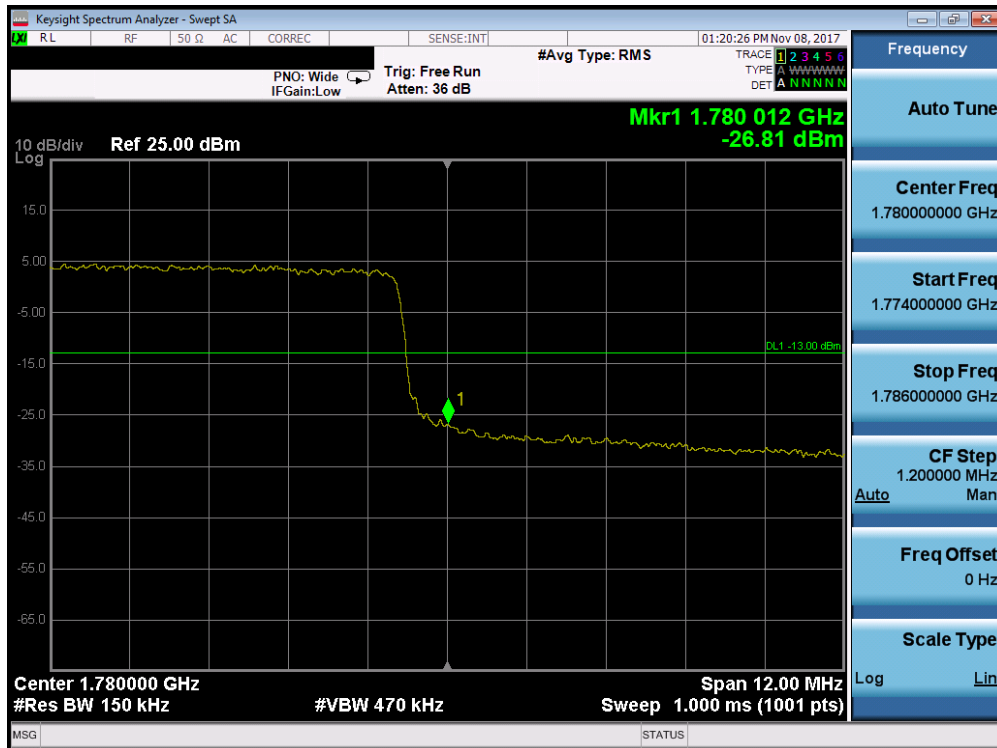


**Plot 7-129. Lower Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)**

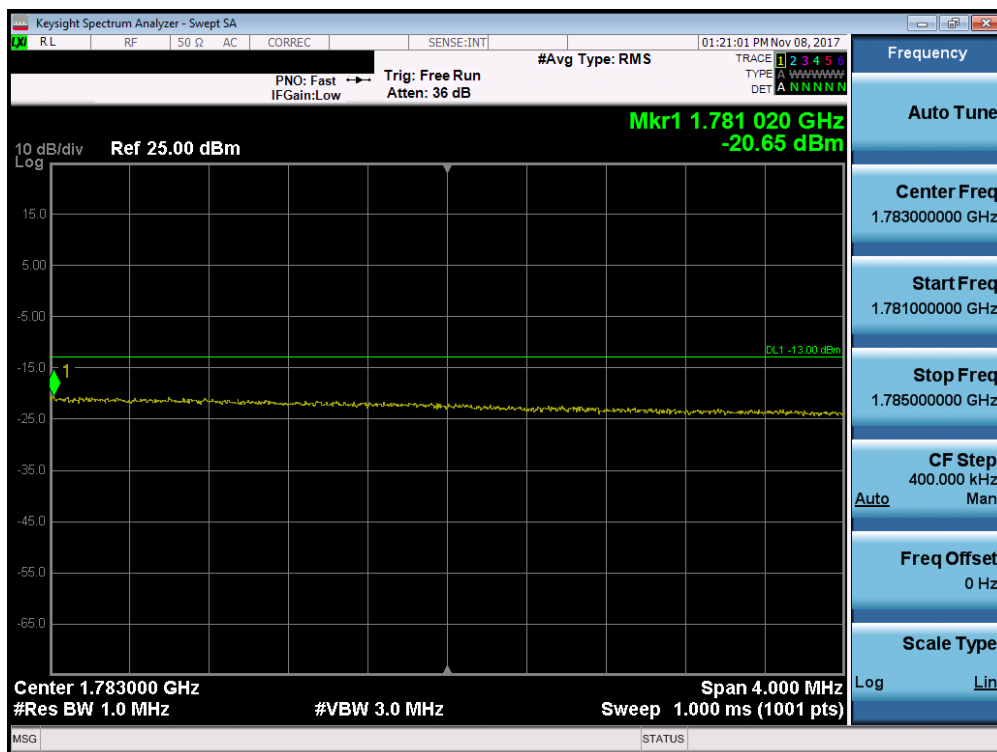


**Plot 7-130. . Lower Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 84 of 155



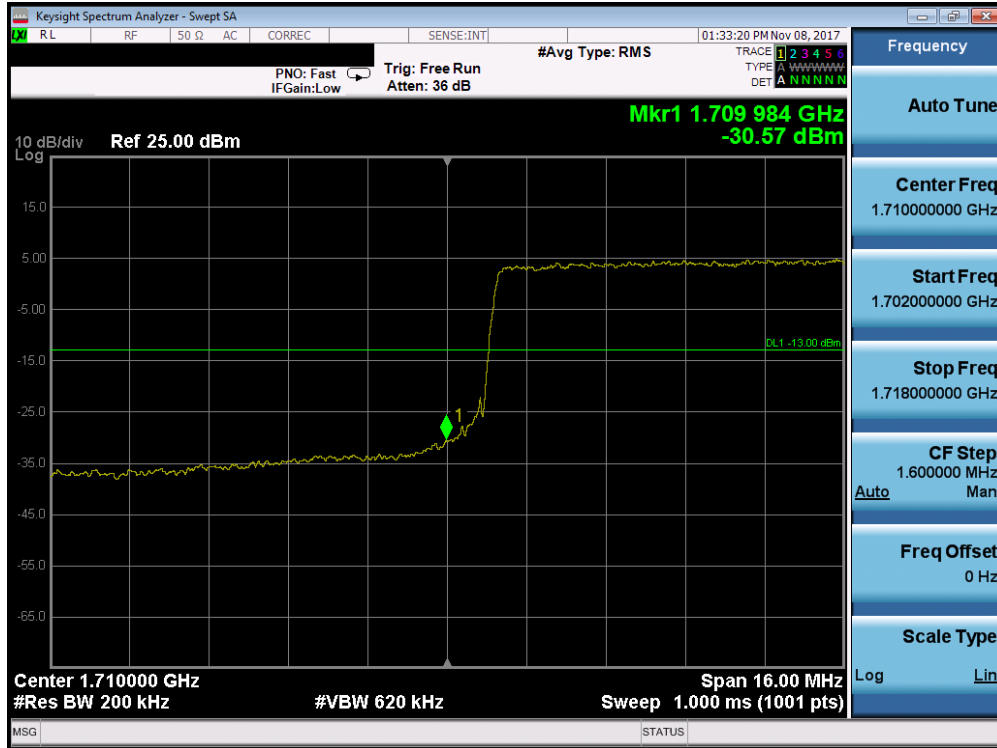
Plot 7-131. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)



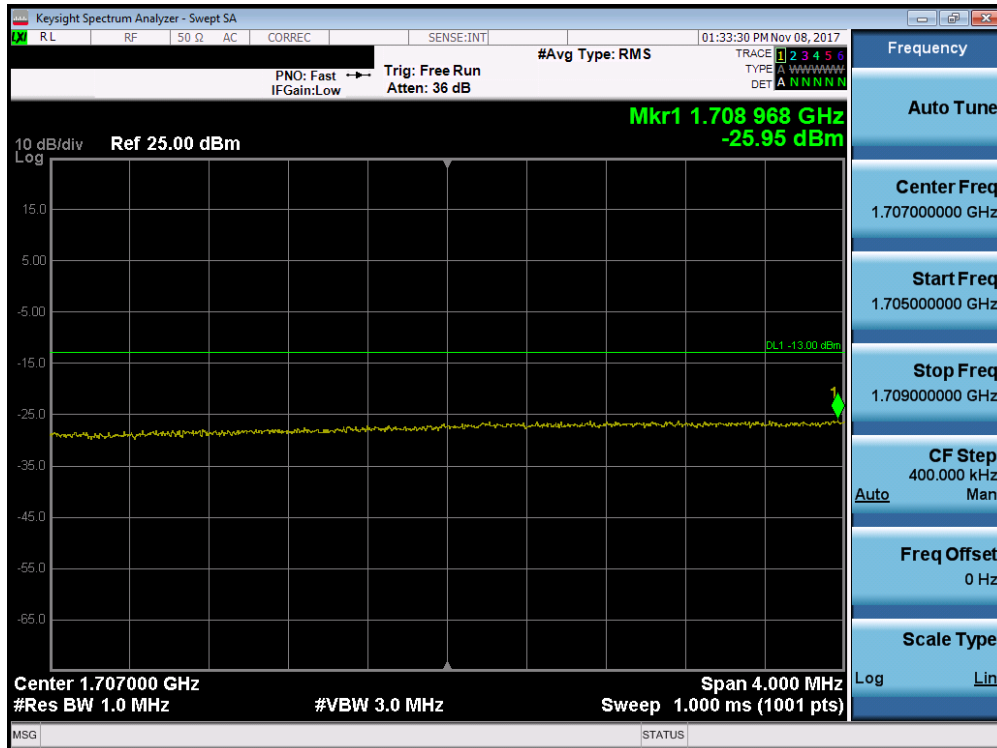
Plot 7-132. . Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 85 of 155

**Band 66**

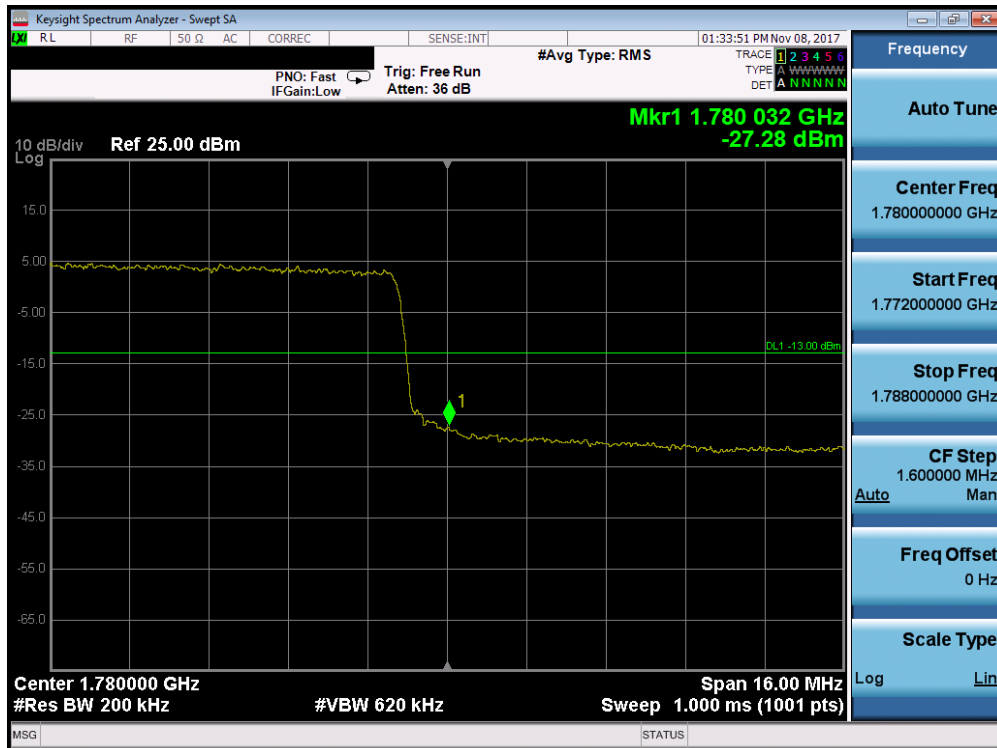


**Plot 7-133. Lower Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)**

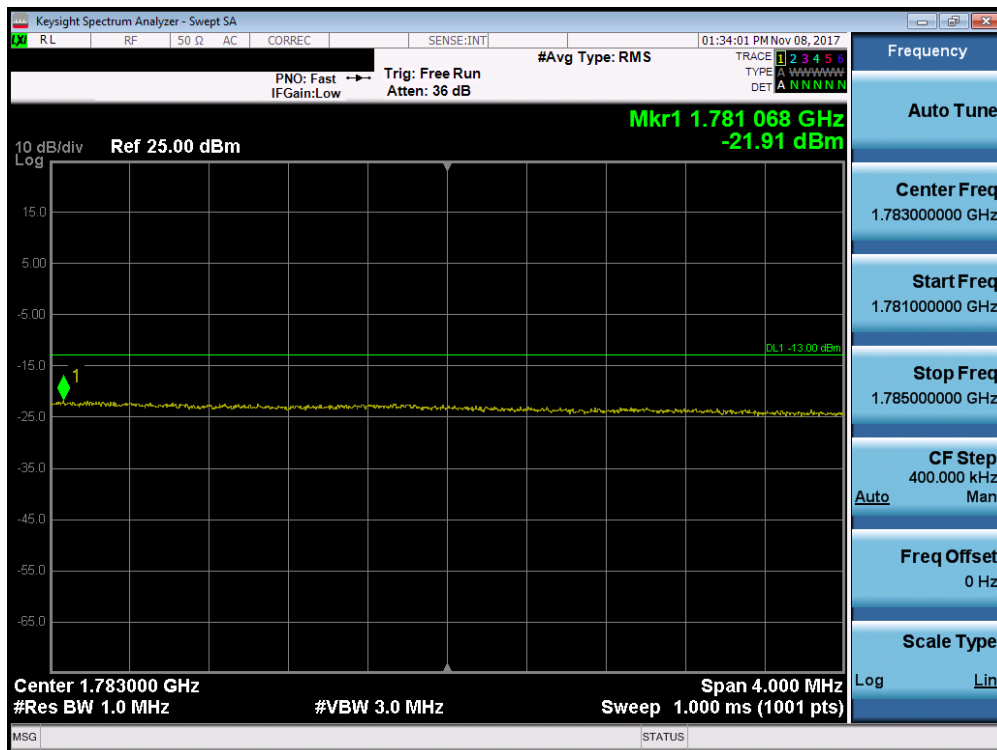


**Plot 7-134. . Lower Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 86 of 155



Plot 7-135. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



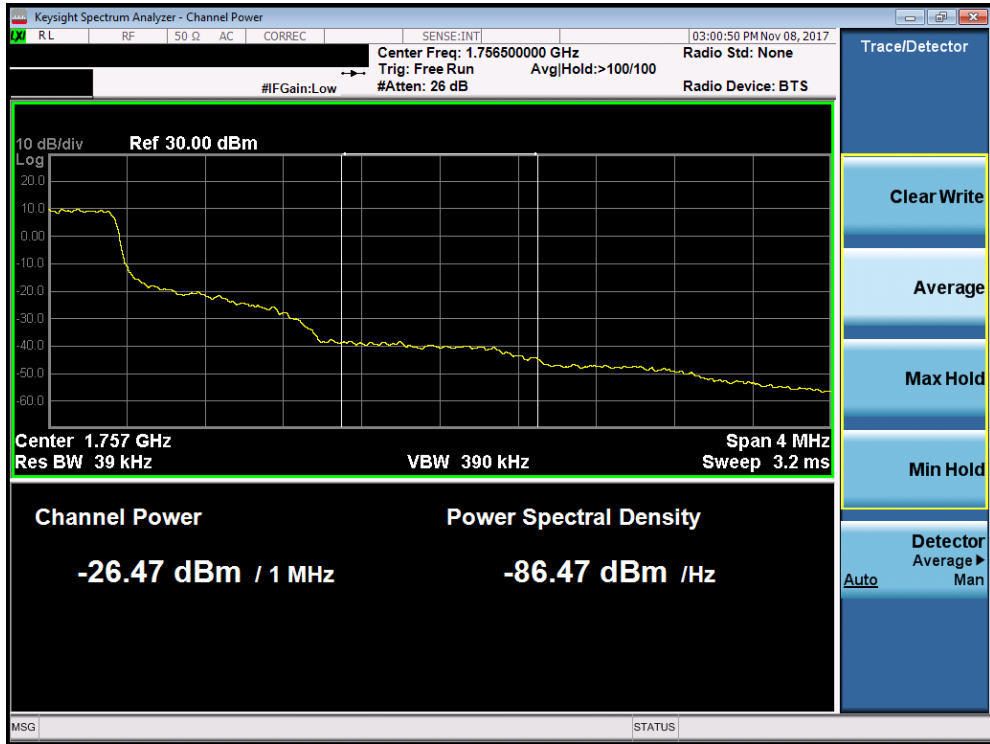
Plot 7-136. . Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 87 of 155

**Band 4**



Plot 7-137. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



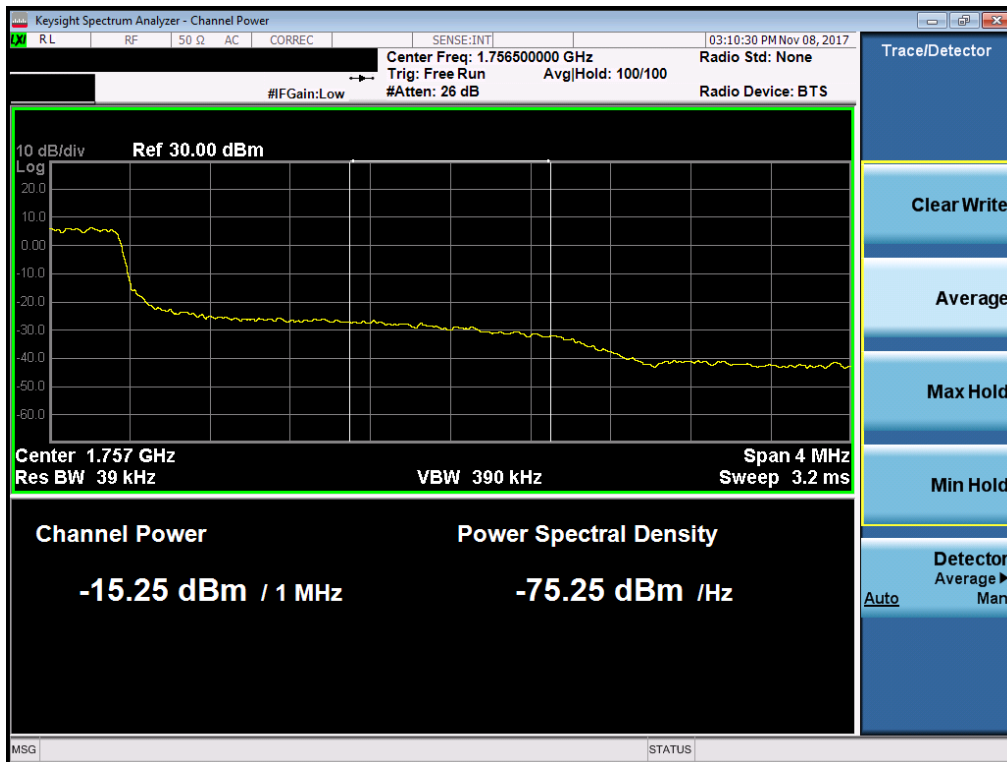
Plot 7-138. . Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 88 of 155

**Band 4**



Plot 7-139. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



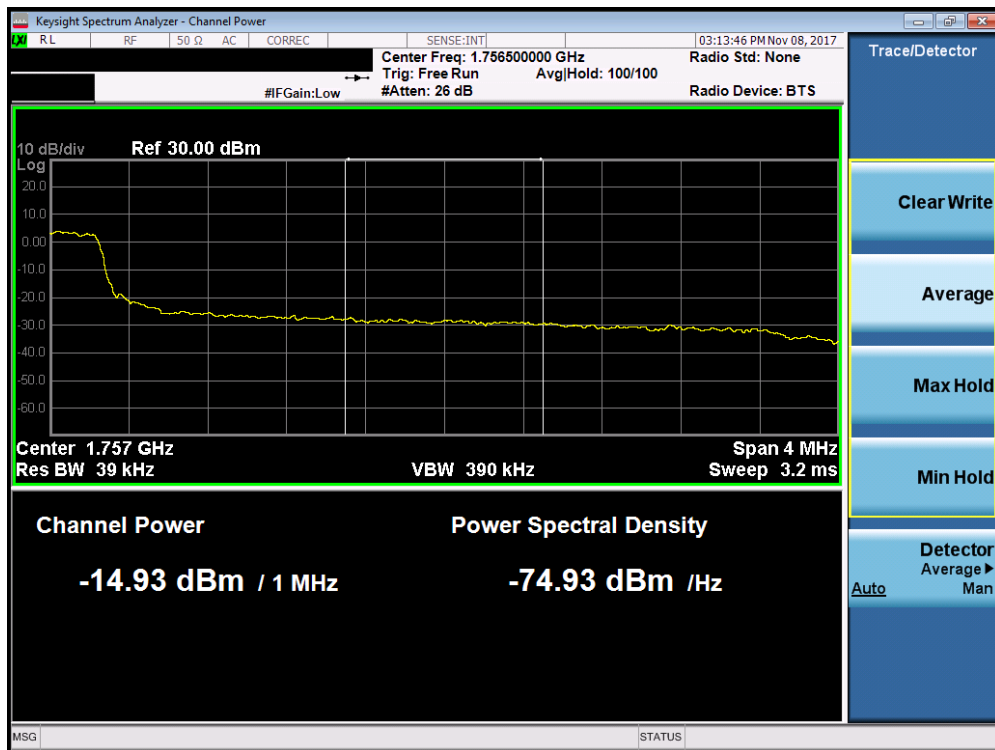
Plot 7-140. . Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 89 of 155

**Band 4**



**Plot 7-141. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)**



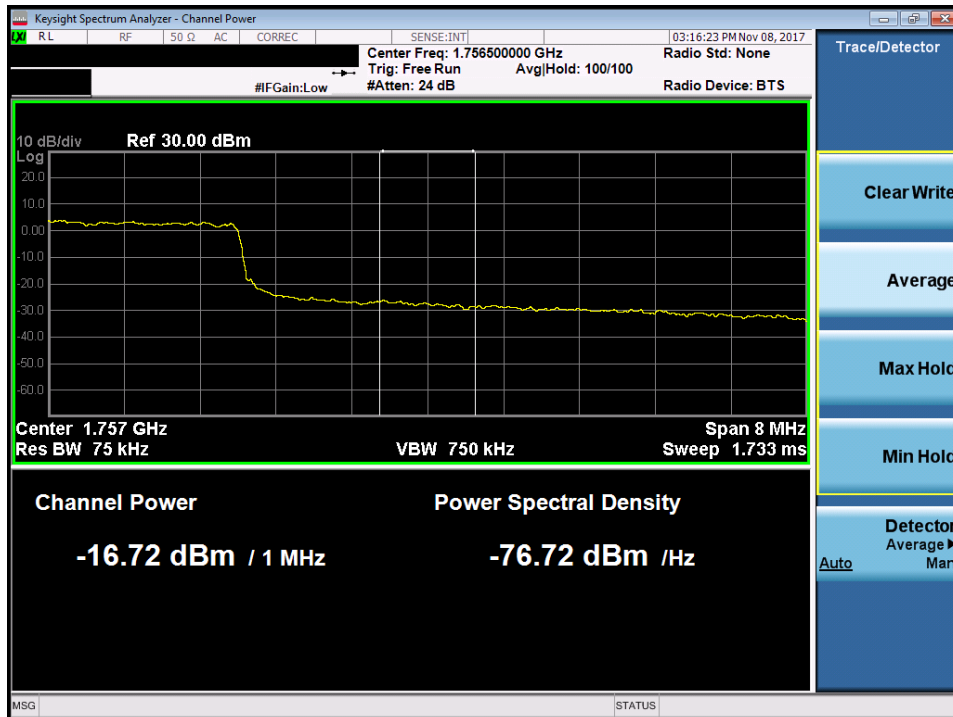
**Plot 7-142. . Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 90 of 155

**Band 4**



Plot 7-143. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

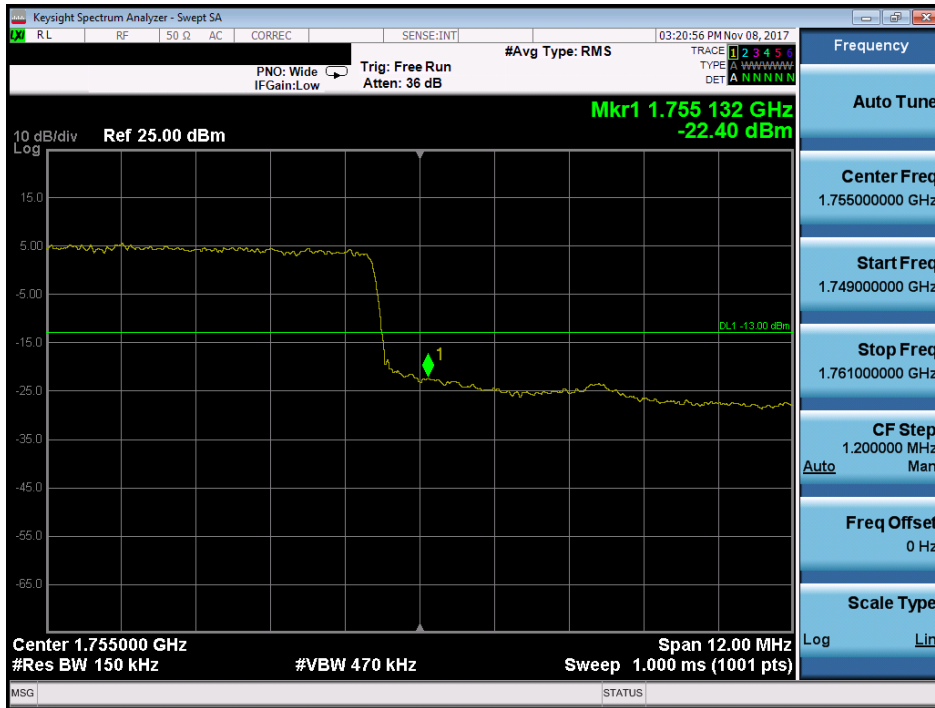


Plot 7-144. . Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

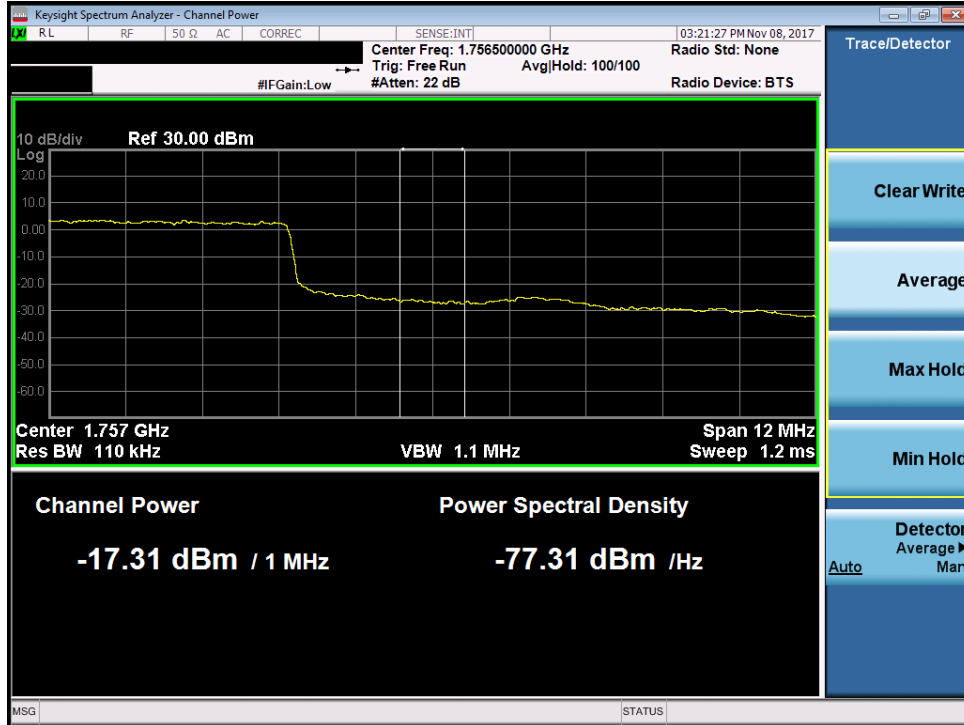
FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 91 of 155



**Band 4**



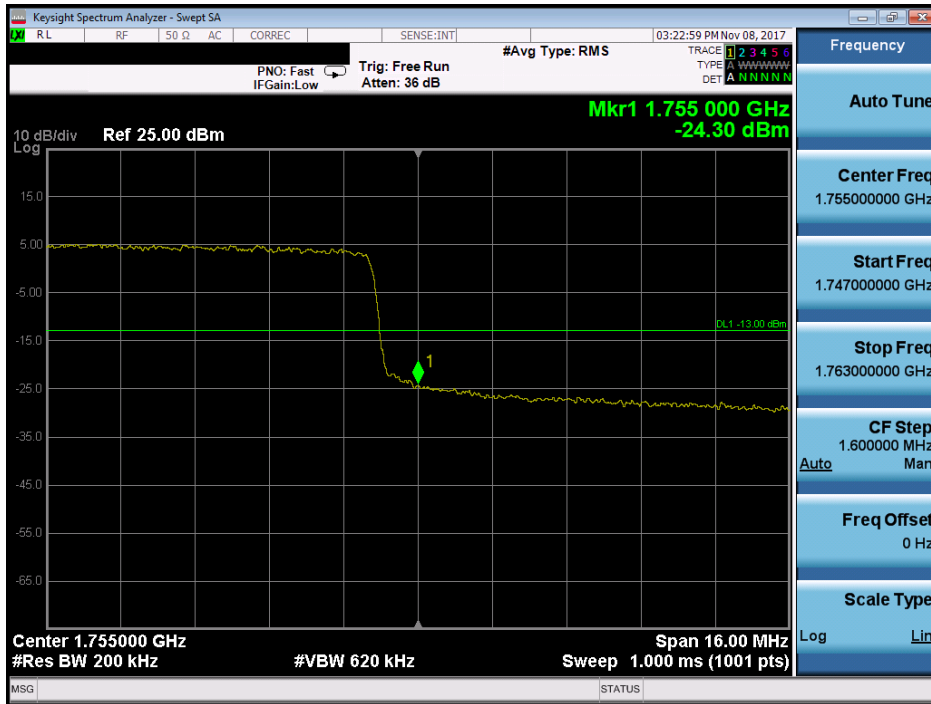
Plot 7-145. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



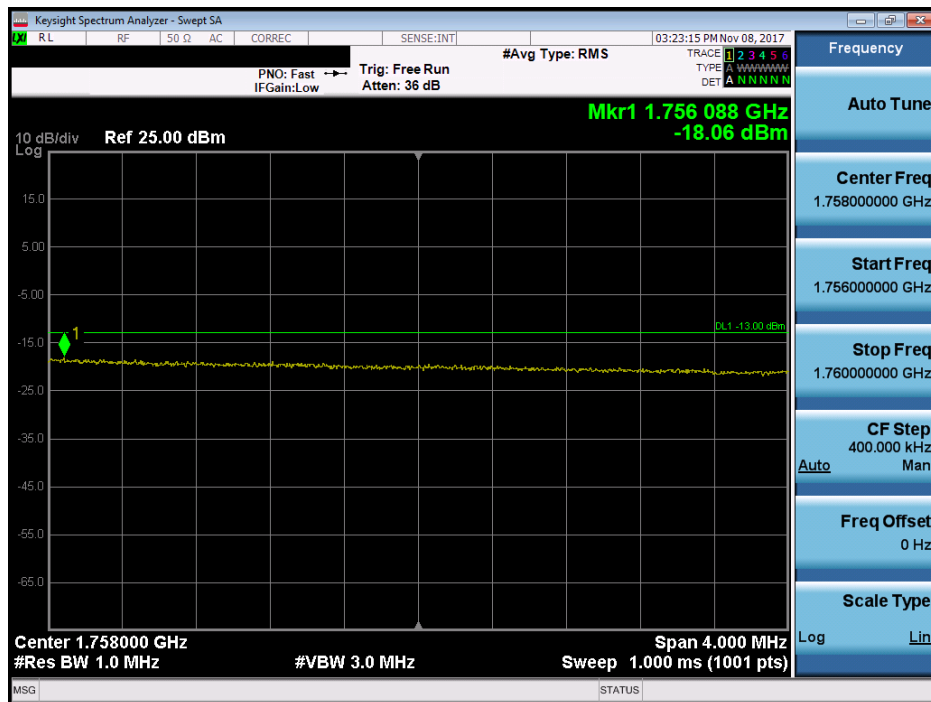
Plot 7-146. . Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 92 of 155

**Band 4**



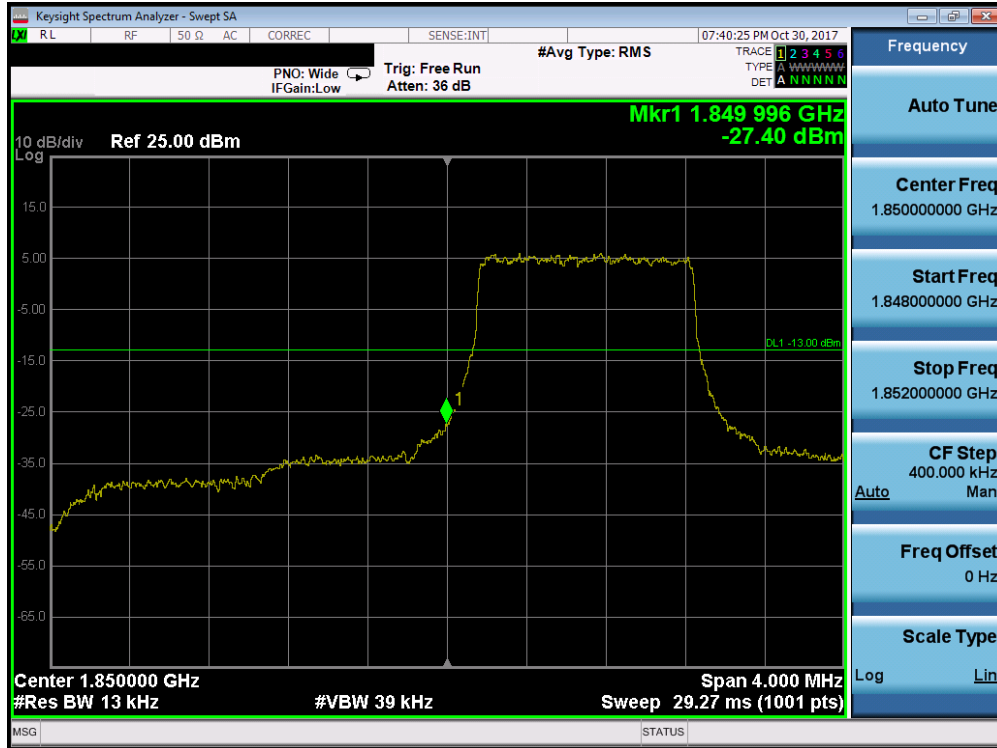
Plot 7-147. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



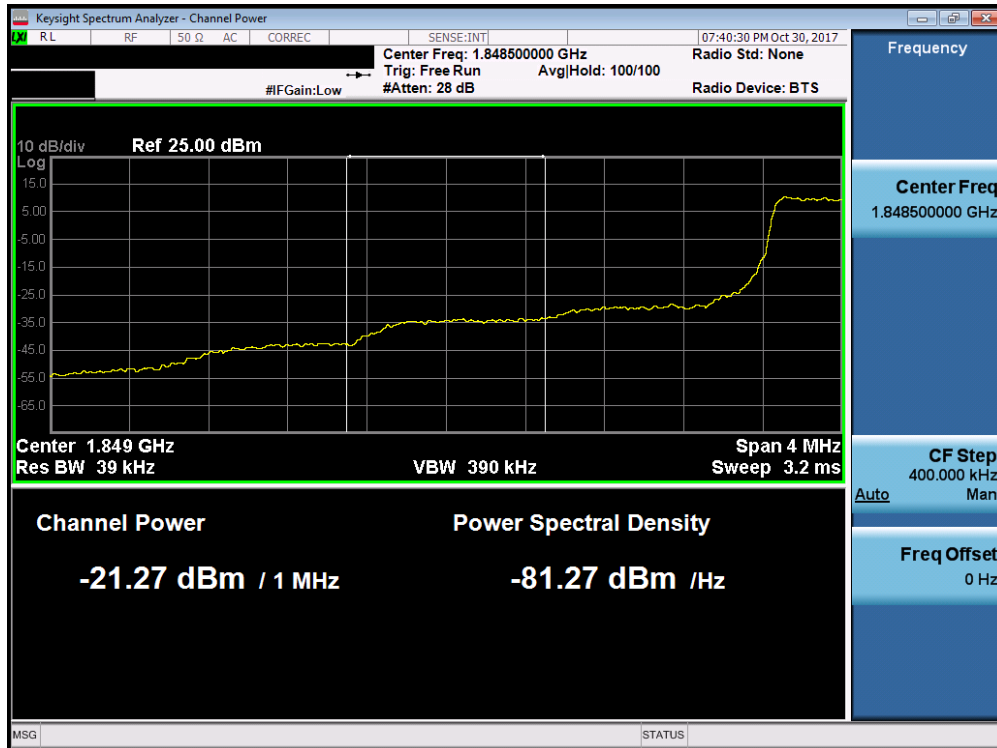
Plot 7-148. . Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 93 of 155

**Band 2**



**Plot 7-149. Lower Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)**

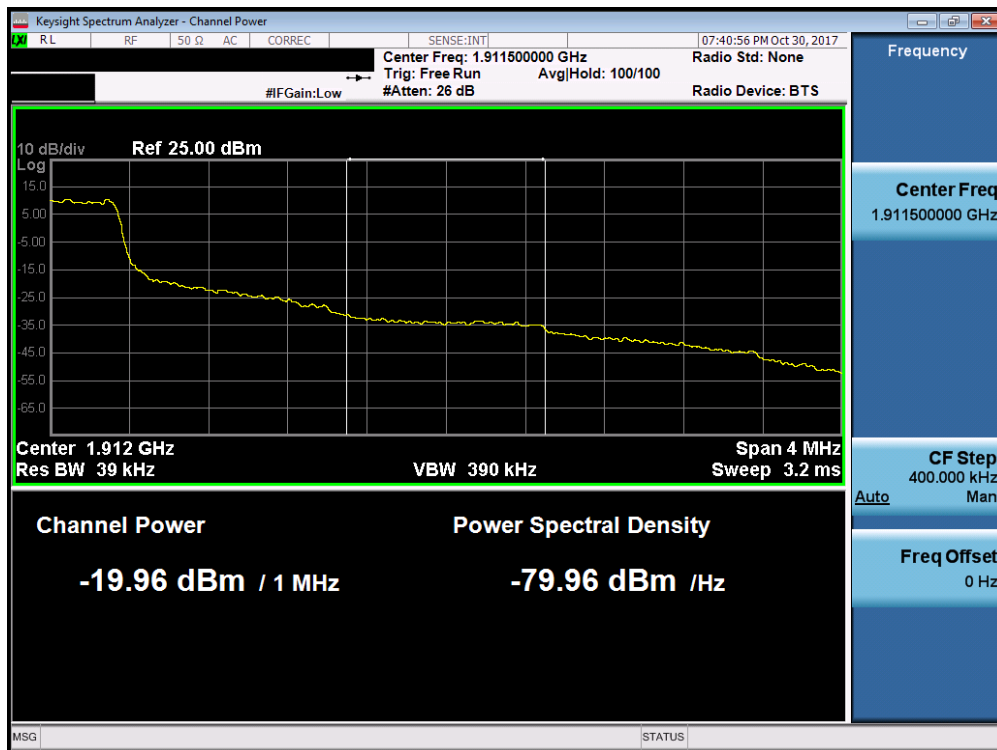


**Plot 7-150. . Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 94 of 155



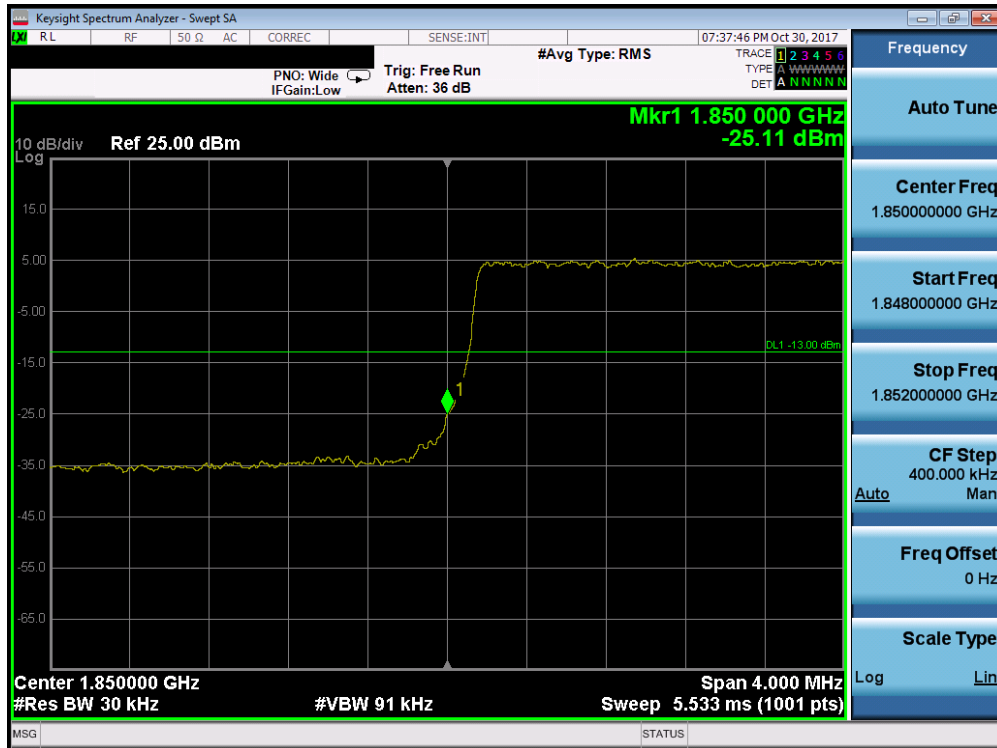
Plot 7-151. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



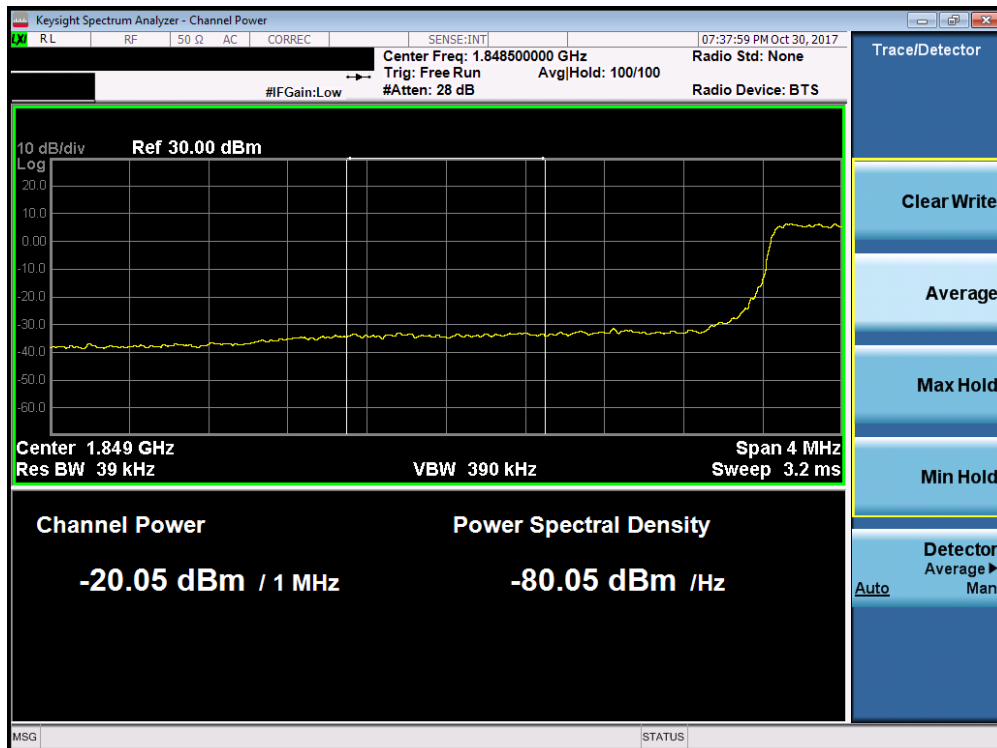
Plot 7-152. . Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 95 of 155

**Band 2**



**Plot 7-153. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)**

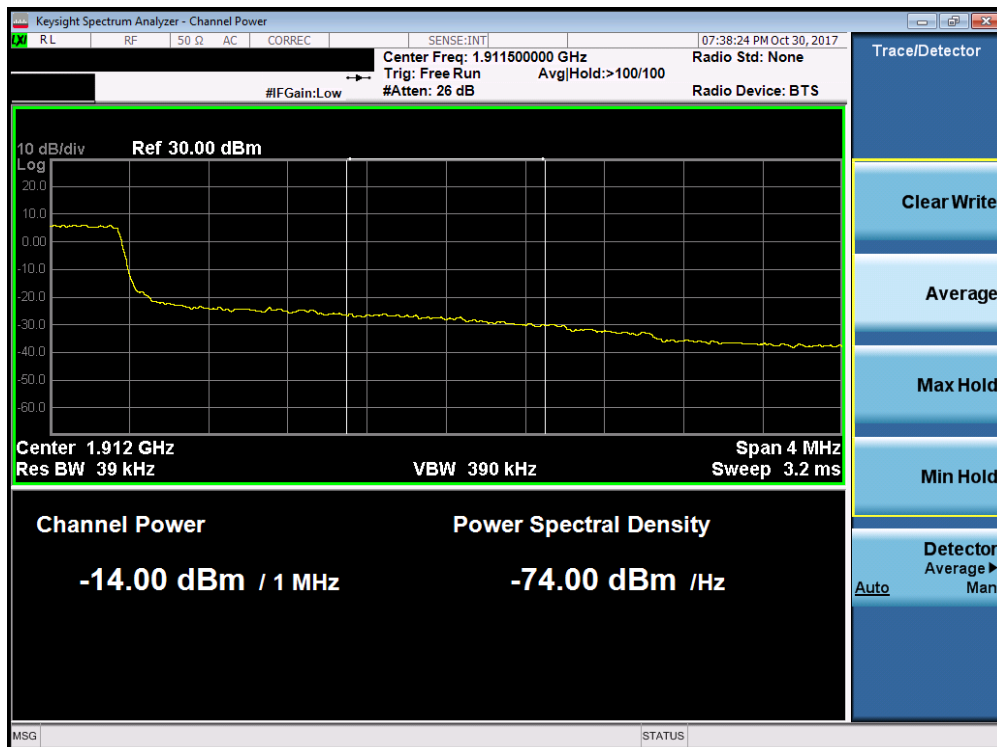


**Plot 7-154. . Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 96 of 155



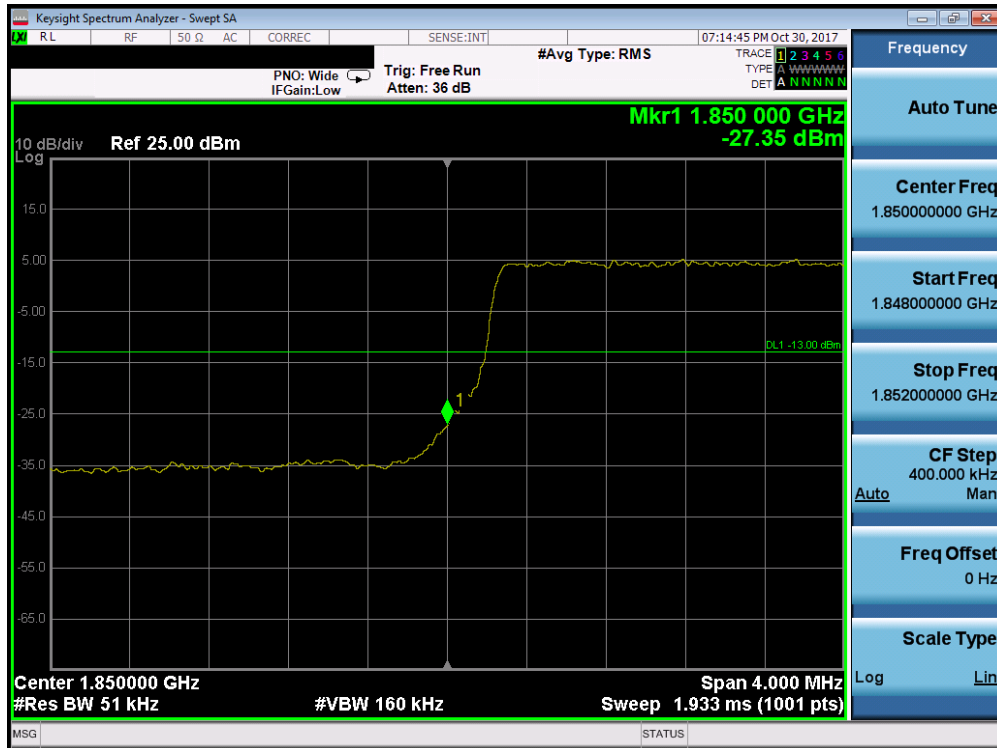
Plot 7-155. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



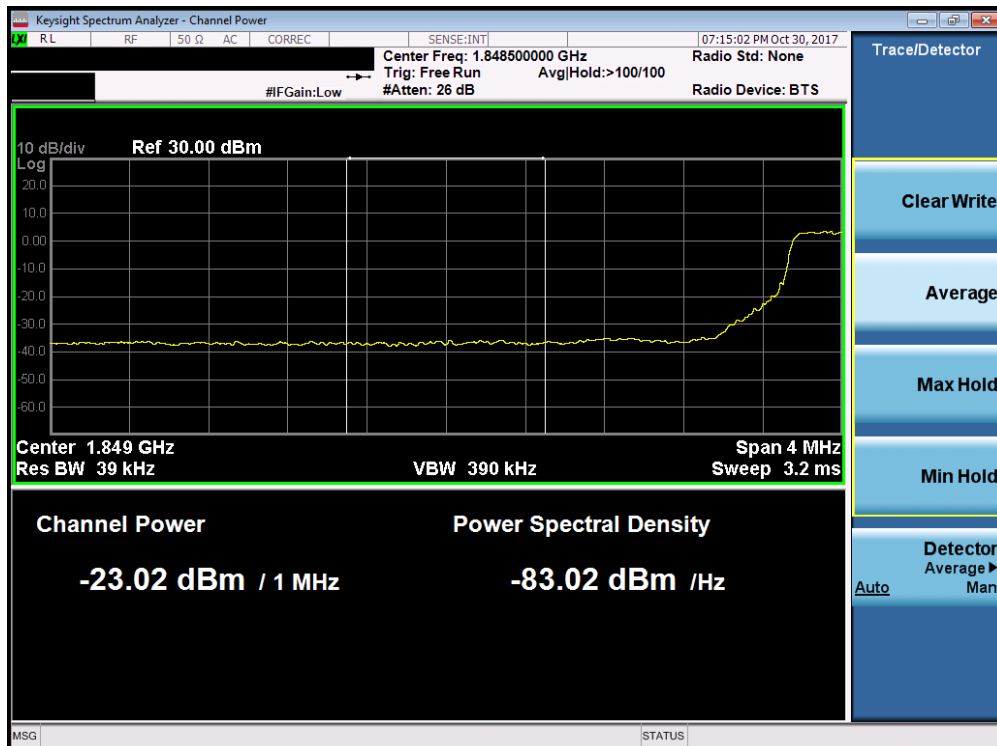
Plot 7-156. . Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 97 of 155

**Band 2**



**Plot 7-157. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)**

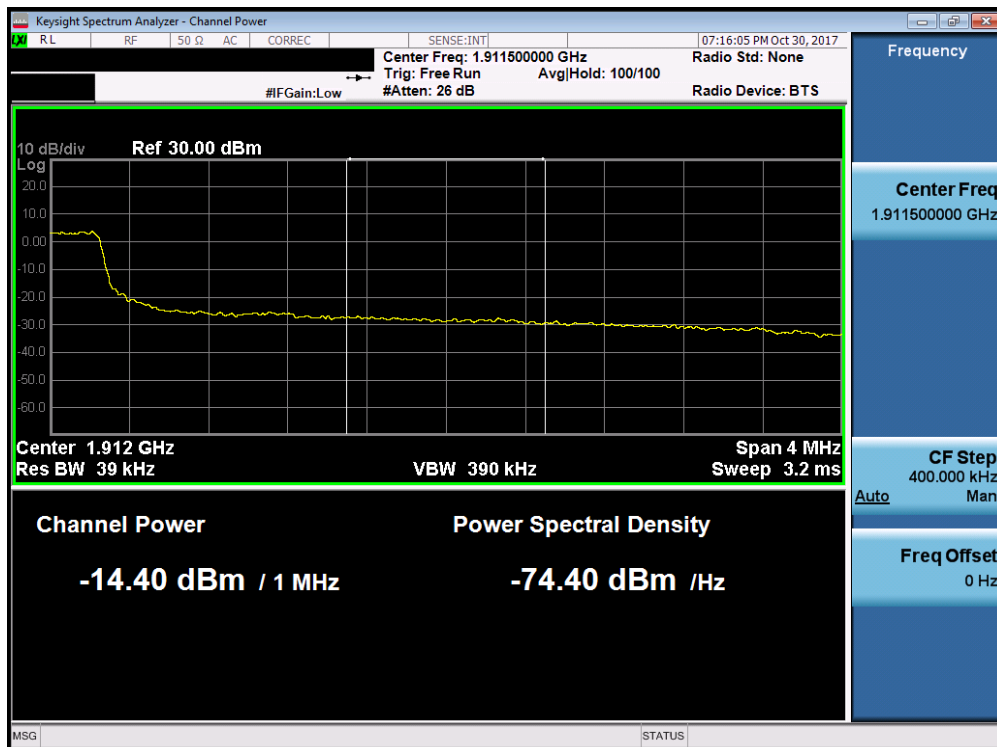


**Plot 7-158. . Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 98 of 155



Plot 7-159. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-160. . Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

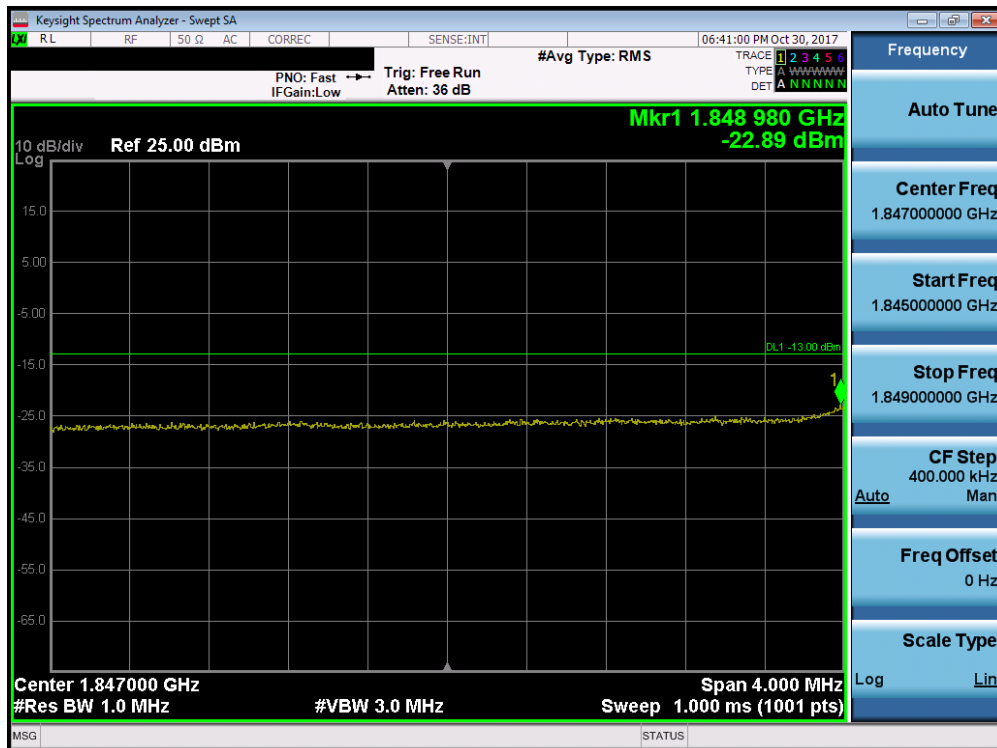
FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 99 of 155



**Band 2**



Plot 7-161. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

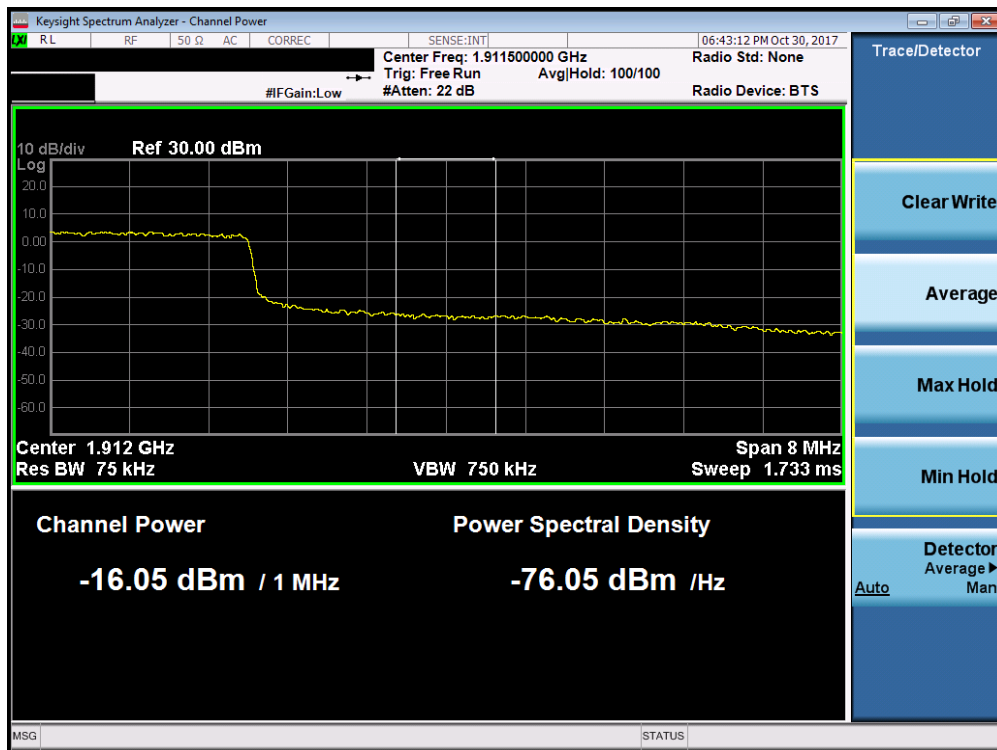


Plot 7-162. . Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 100 of 155



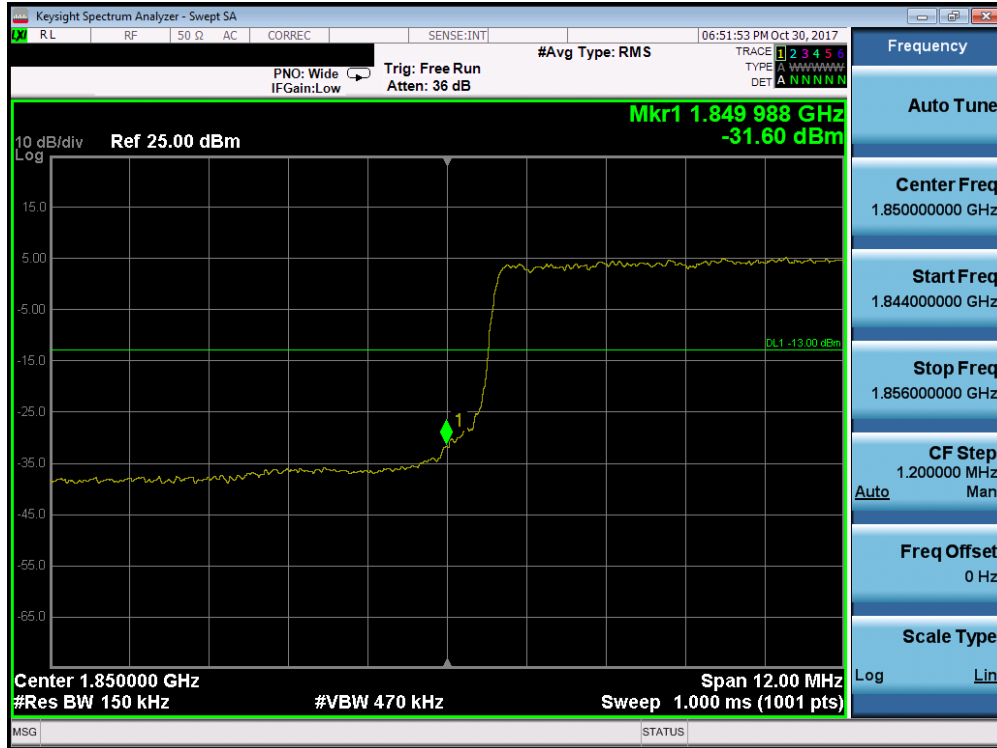
Plot 7-163. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



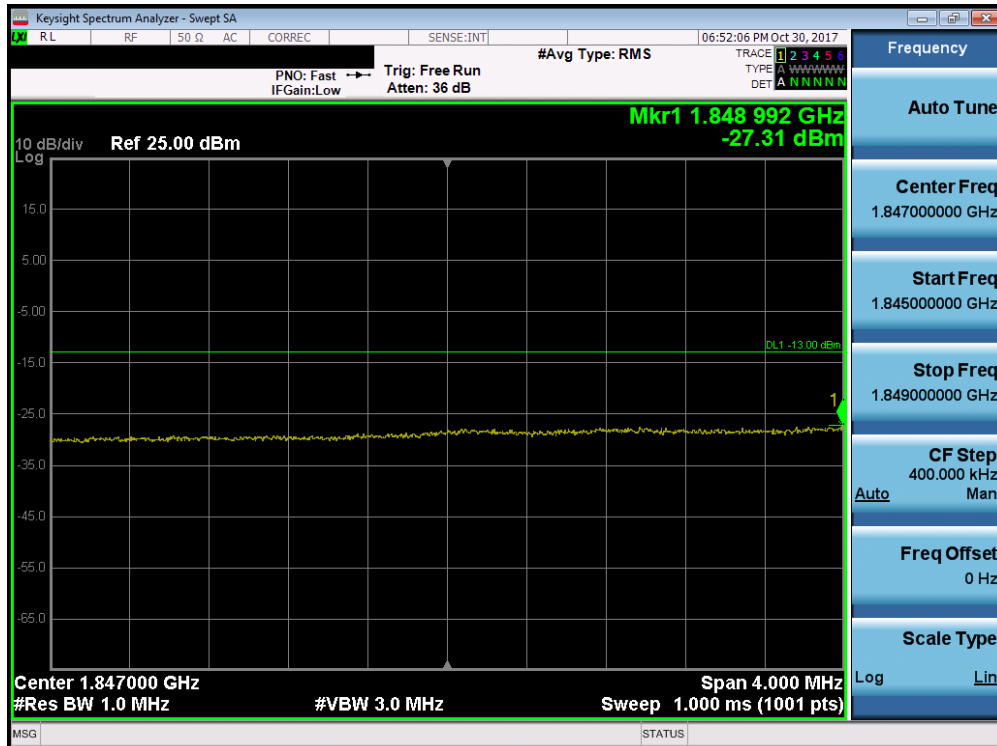
Plot 7-164. . Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 101 of 155

**Band 2**



Plot 7-165. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

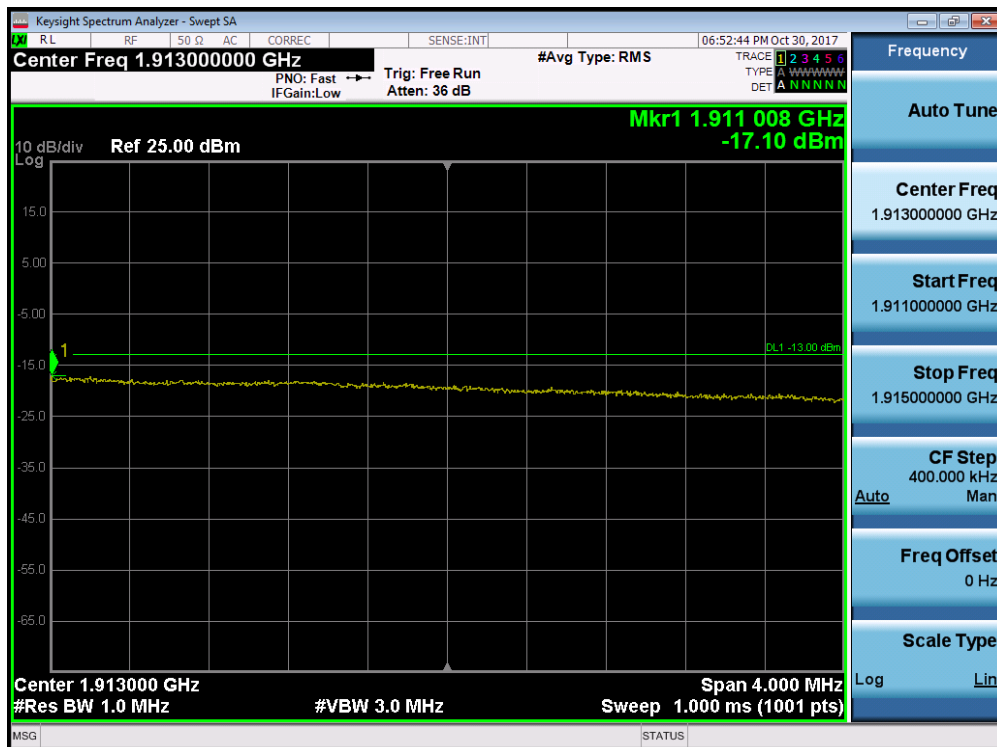


Plot 7-166. . Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 102 of 155



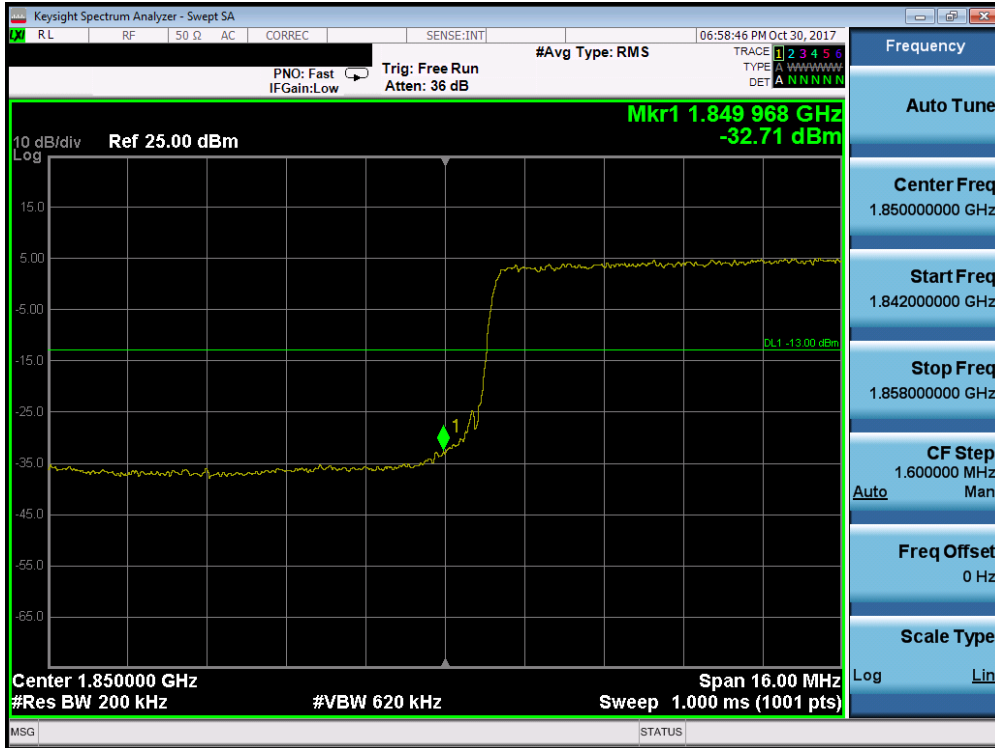
Plot 7-167. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



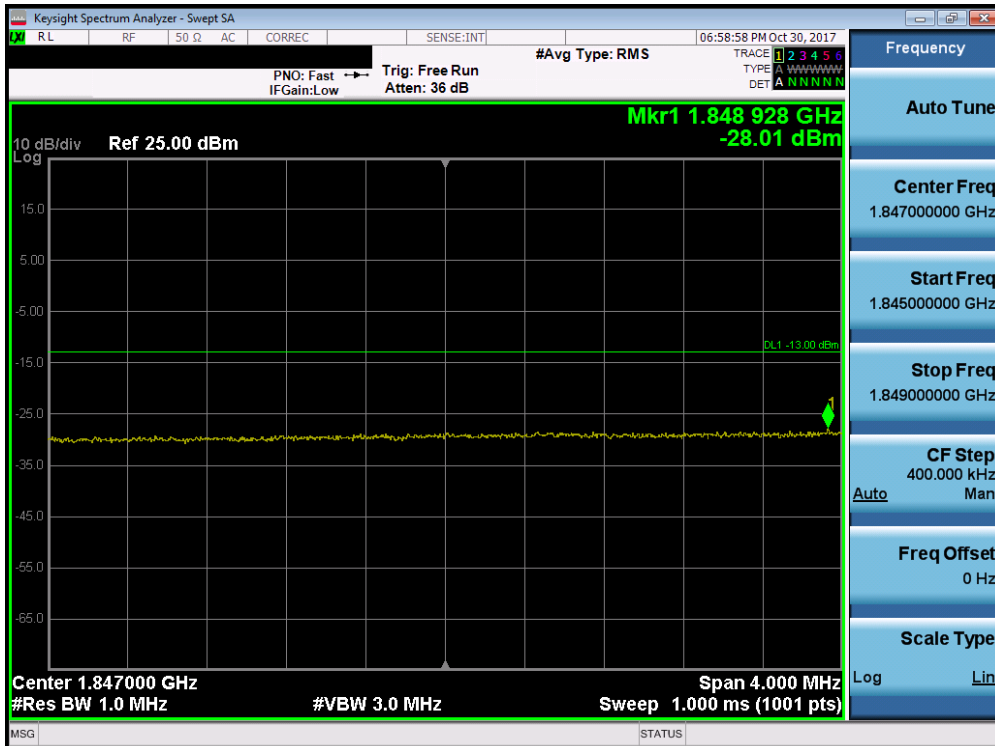
Plot 7-168. . Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 103 of 155

**Band 2**



Plot 7-169. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

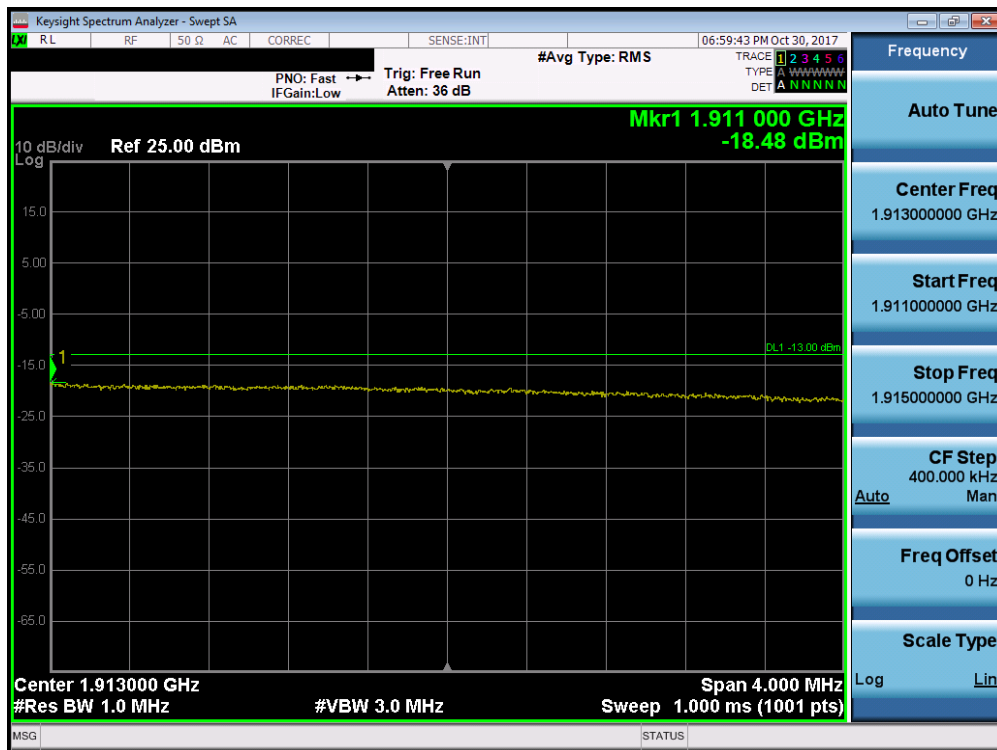


Plot 7-170. . Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 104 of 155



Plot 7-171. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-172. . Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 105 of 155

## 7.5 Peak-Average Ratio

**§24.232(d) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)**

### 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

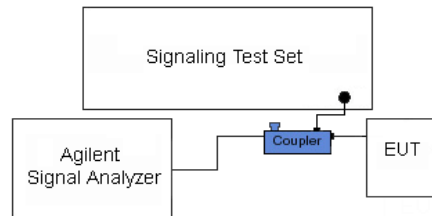
KDB 971168 D01 v03– Section 5.7.1

### Test Settings

1. The signal analyzer’s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
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.



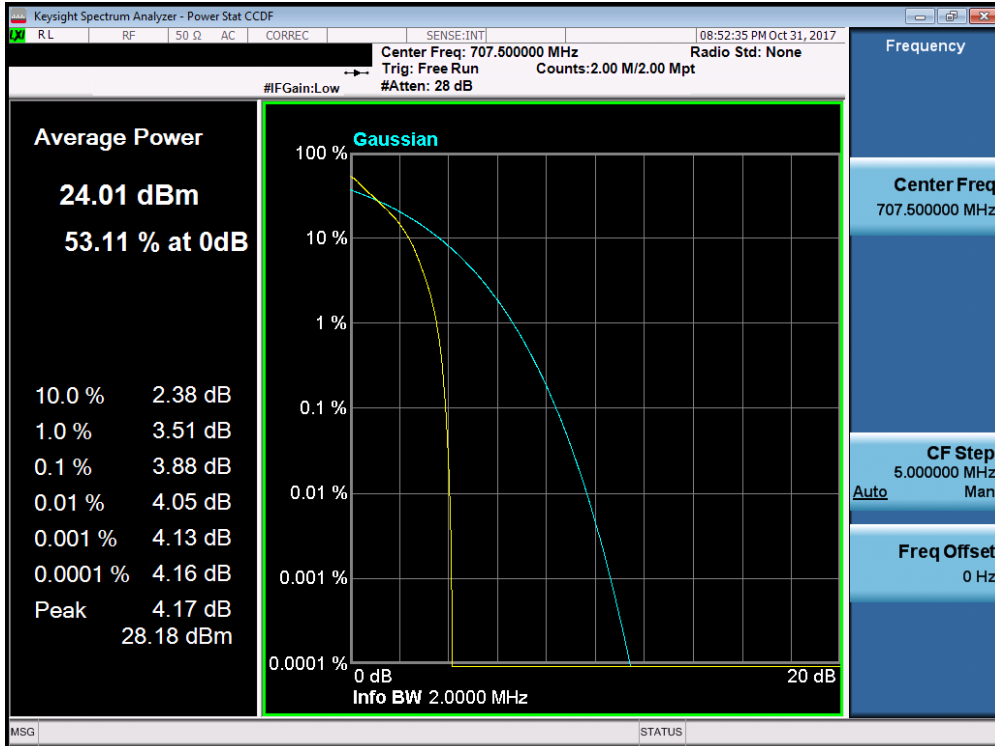
**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

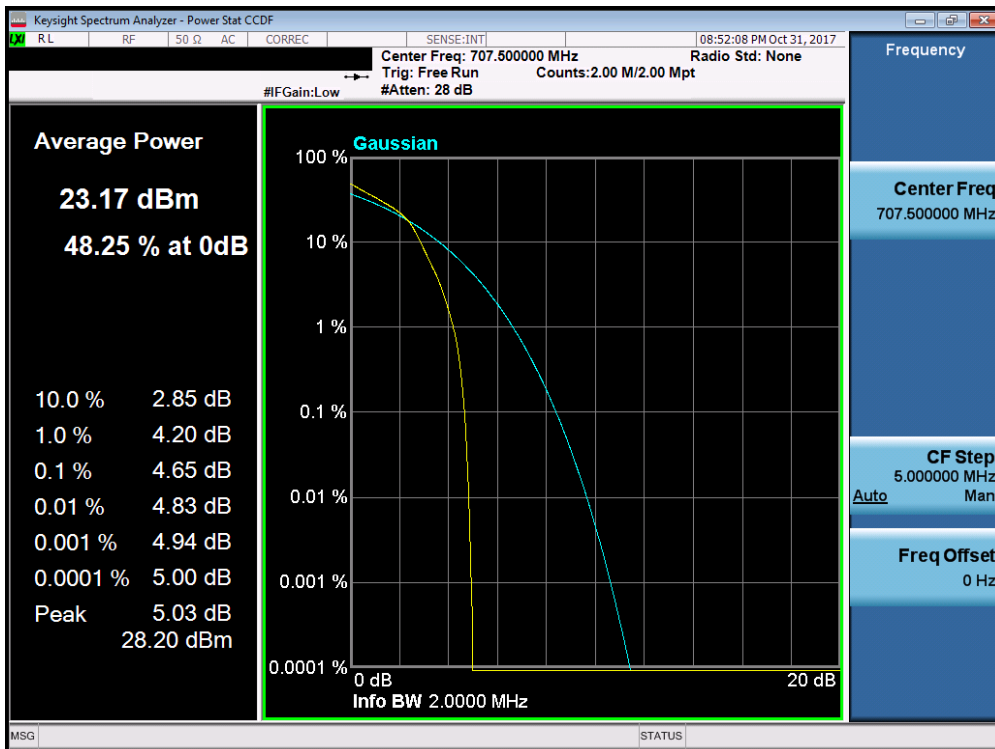
None.

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 106 of 155	

**Band 12**



**Plot 7-173. PAR Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)**

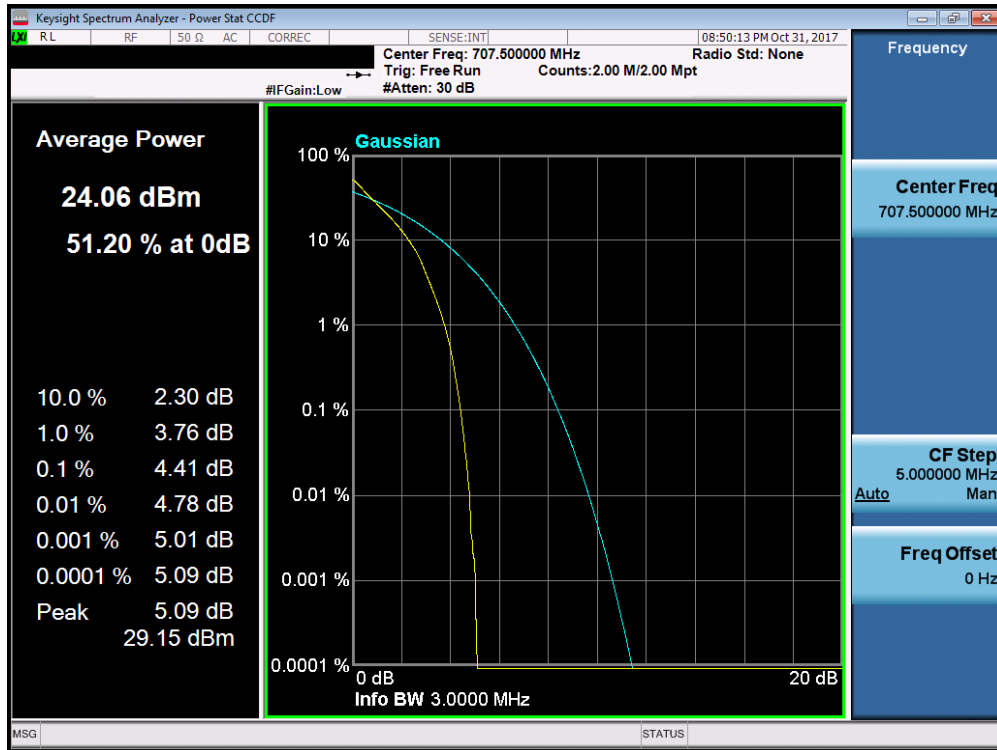


**Plot 7-174. PAR Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)**

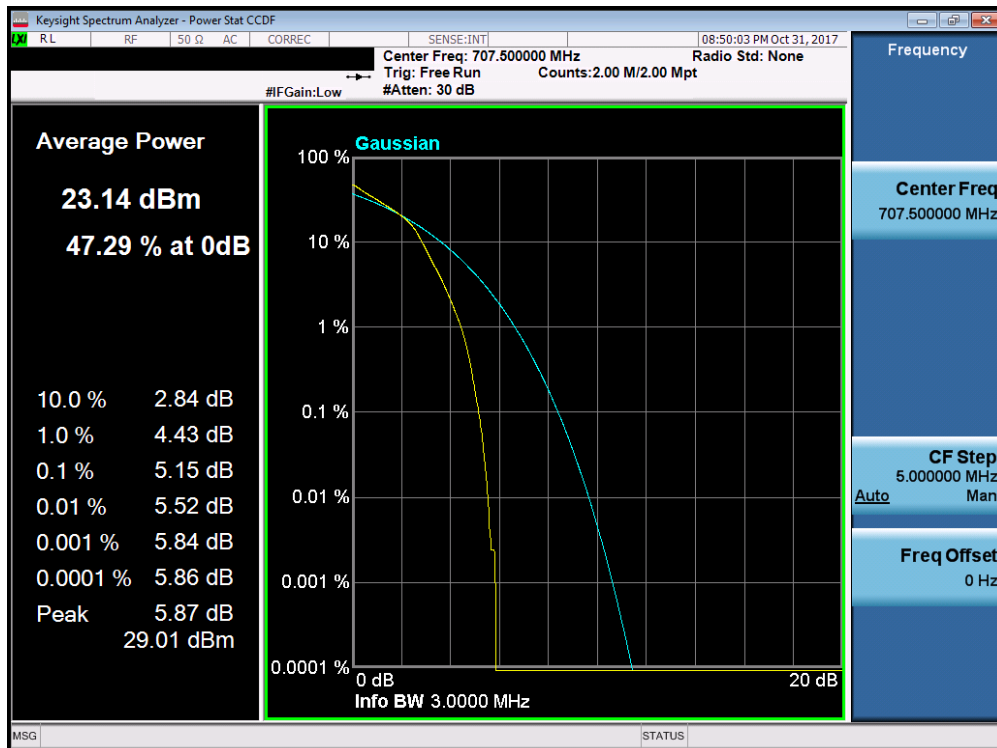
FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 107 of 155



**Band 12**



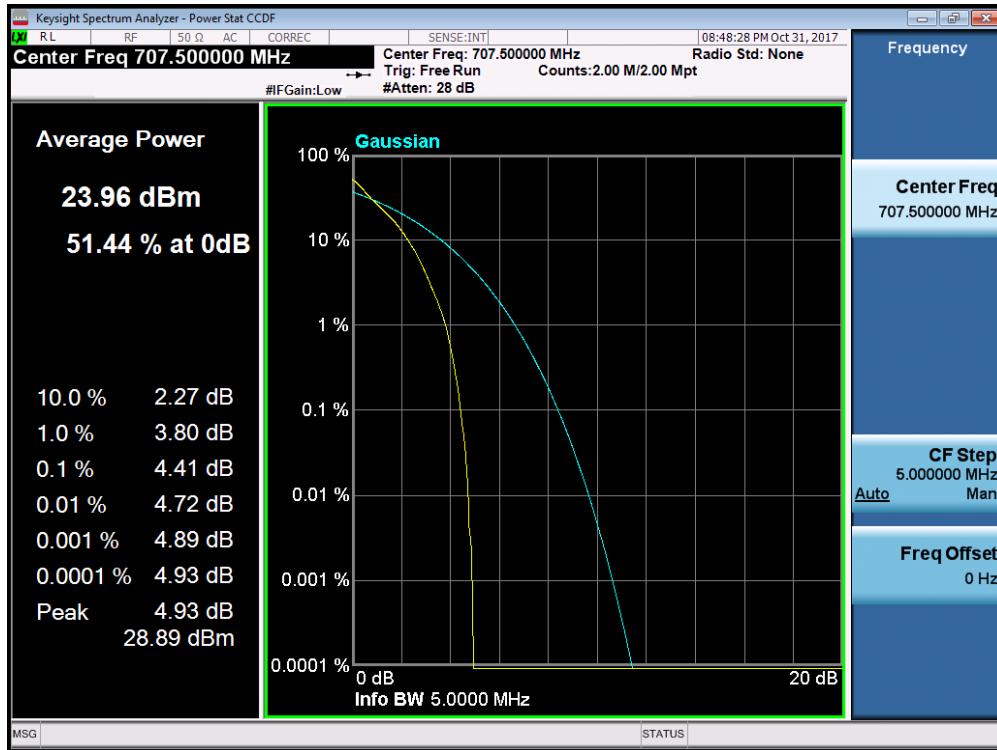
**Plot 7-175. PAR Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)**



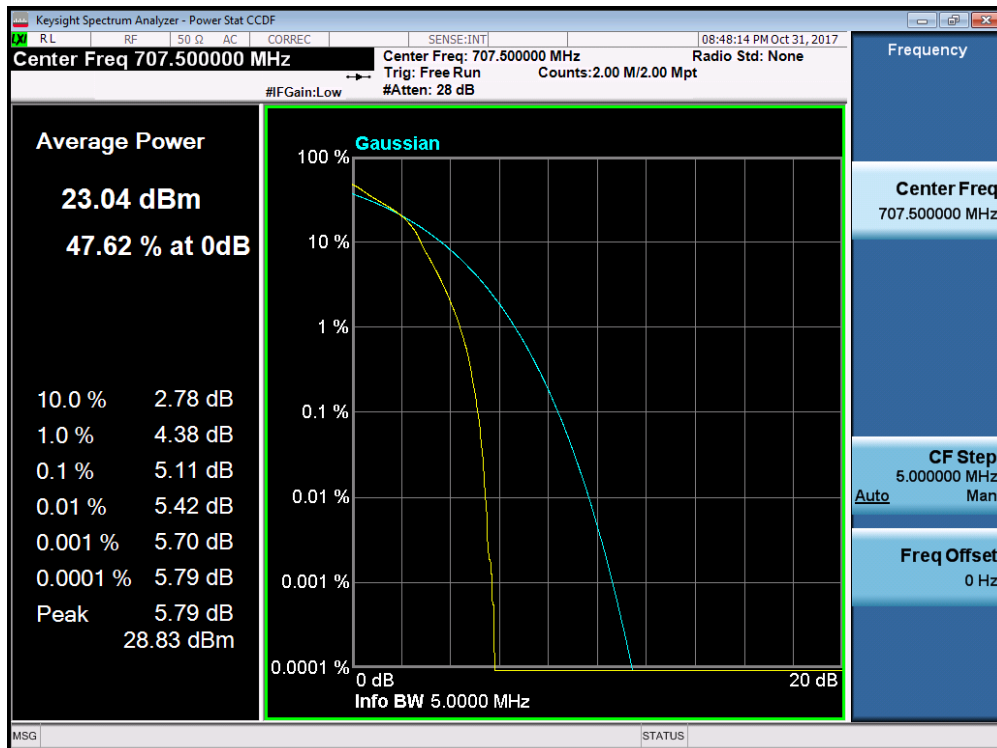
**Plot 7-176. PAR Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 108 of 155

**Band 12**



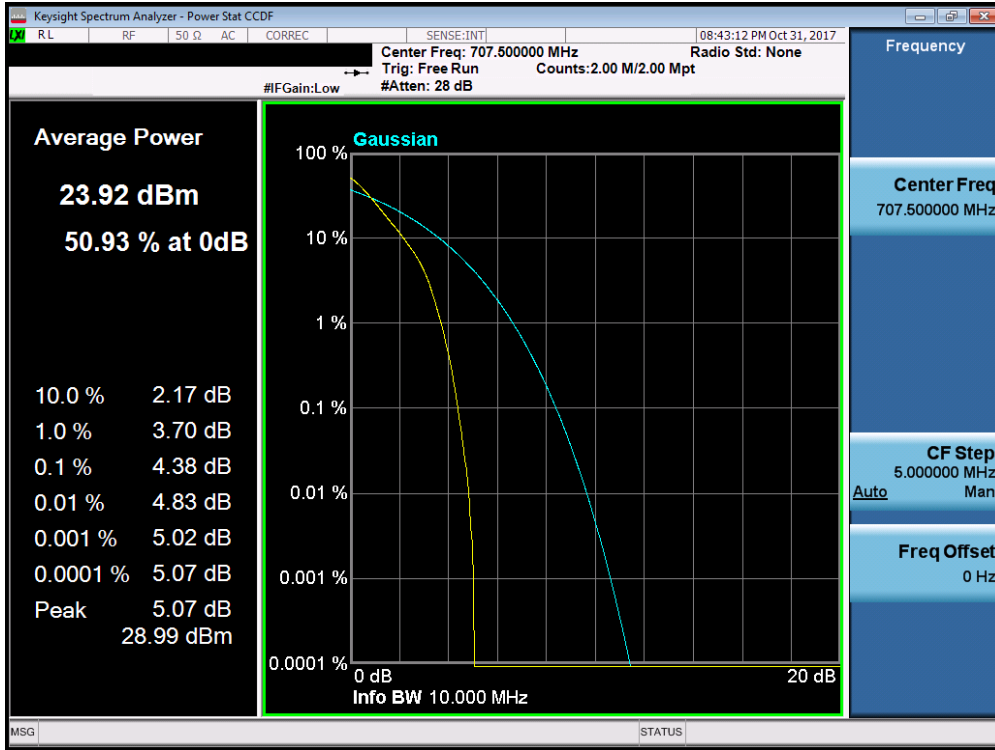
**Plot 7-177. PAR Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)**



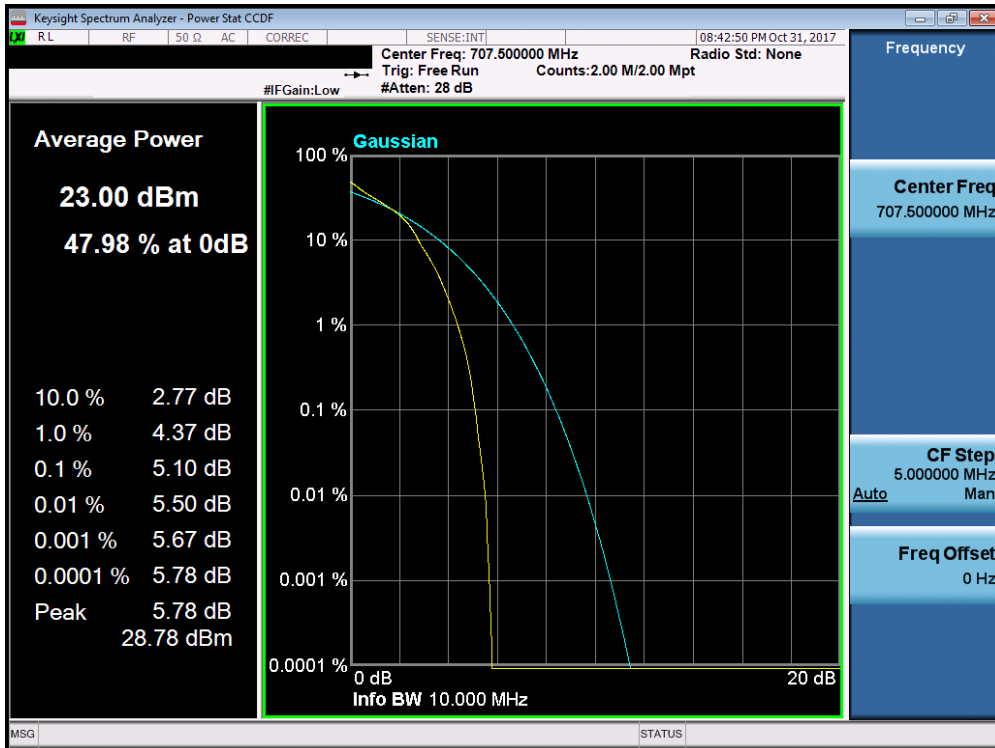
**Plot 7-178. PAR Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 109 of 155

**Band 12**



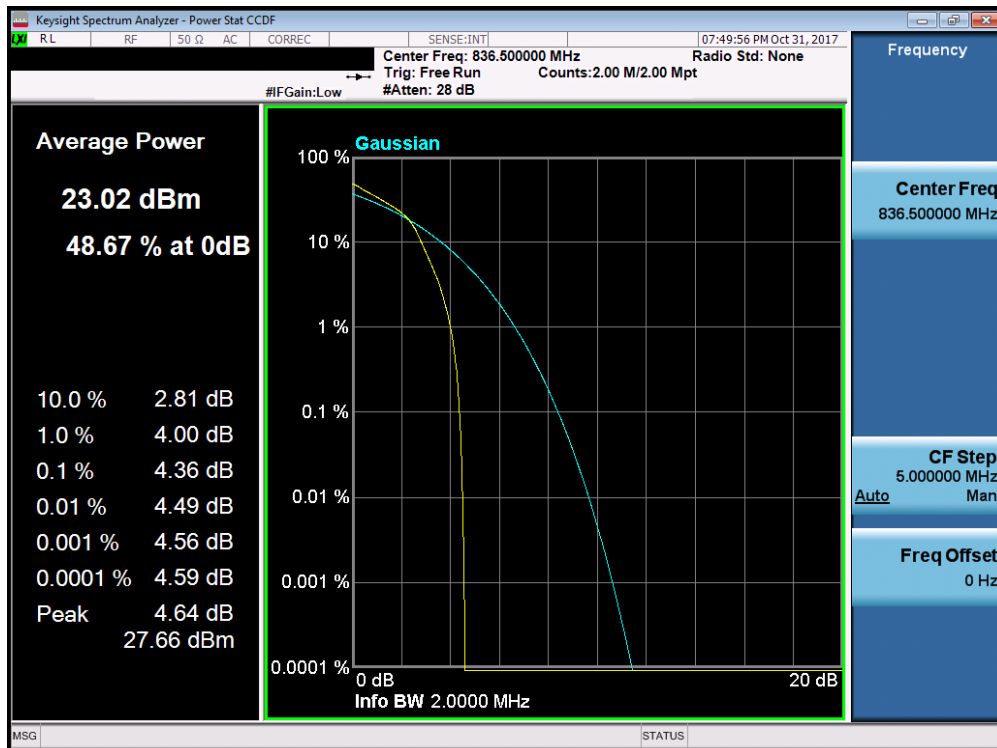
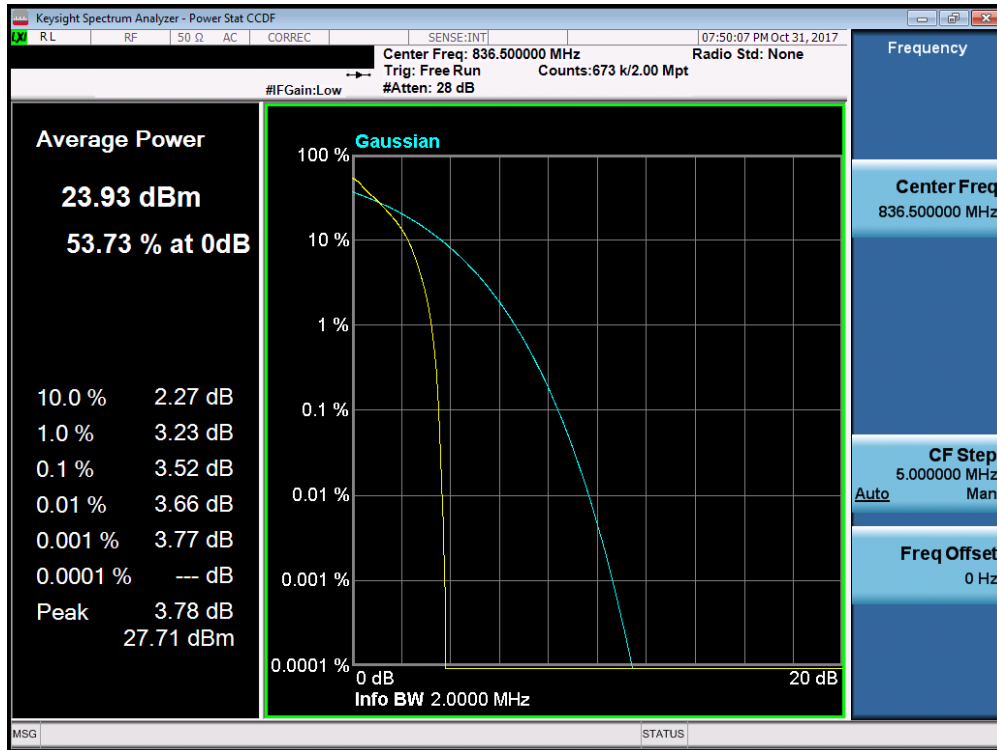
**Plot 7-179. PAR Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)**



**Plot 7-180. PAR Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)**

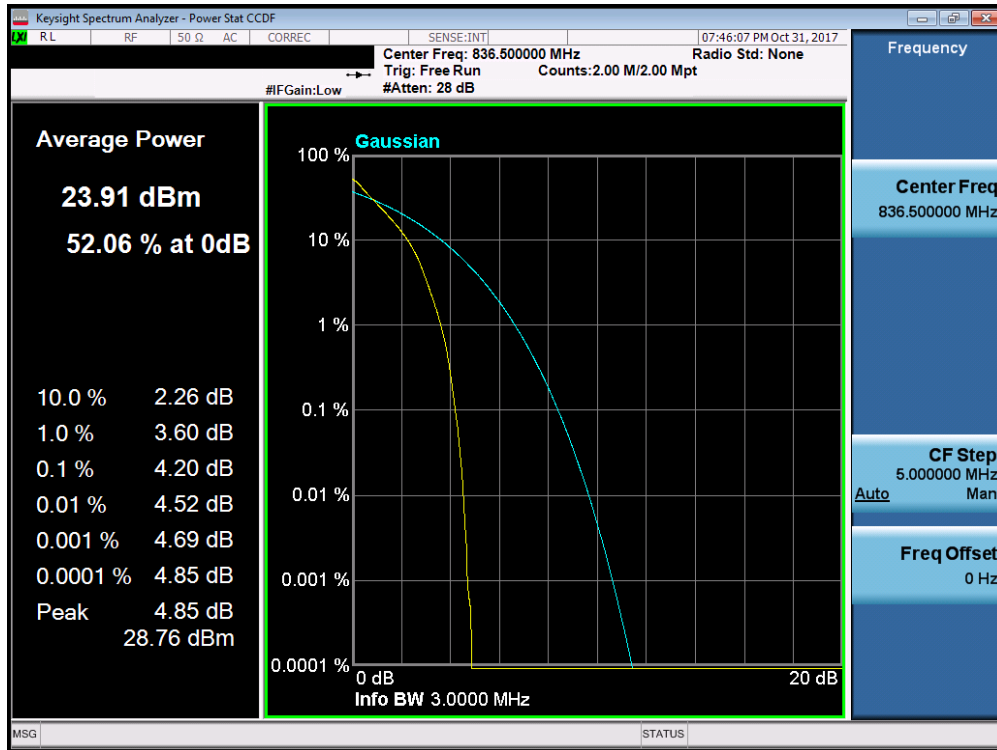
FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 110 of 155

**Band 5**

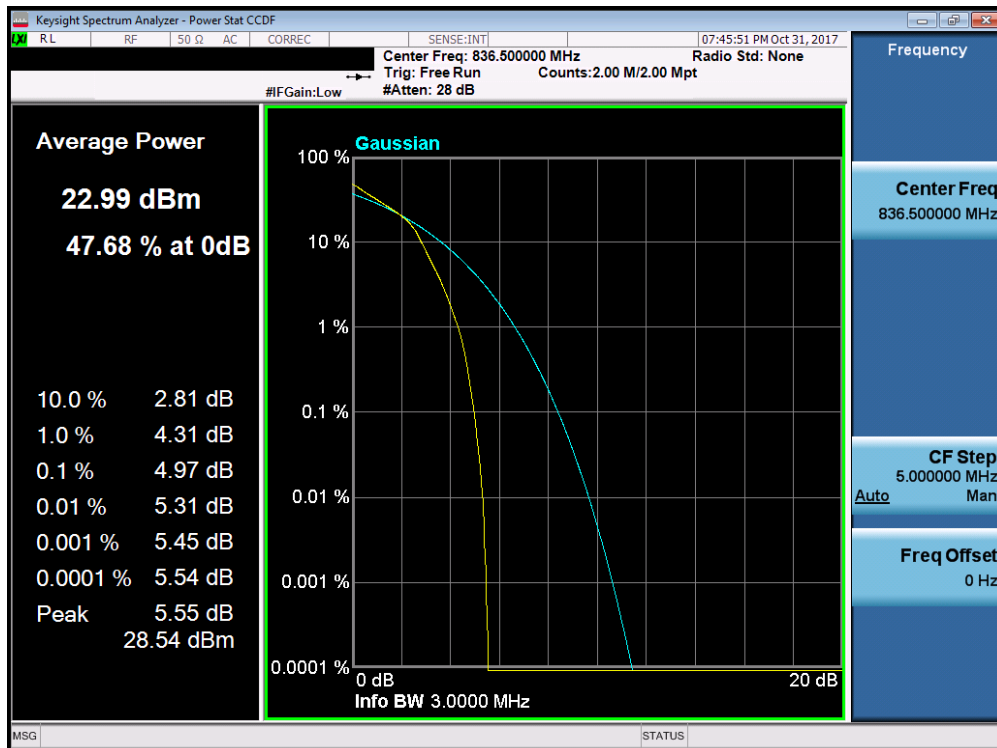


FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 111 of 155

**Band 5**



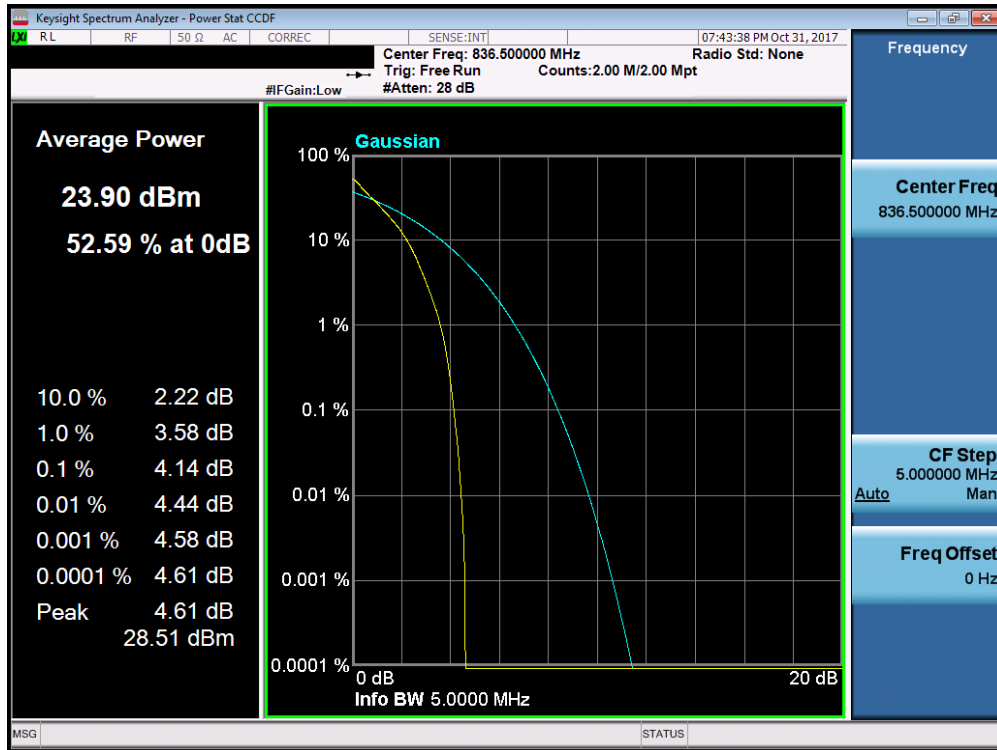
**Plot 7-183. PAR Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)**



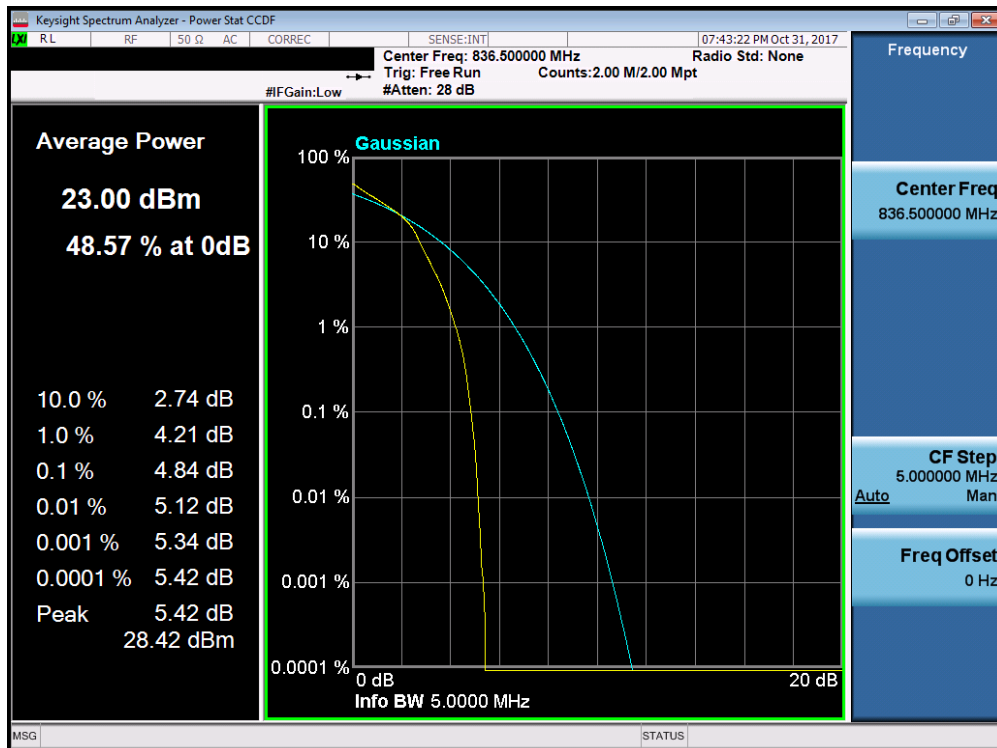
**Plot 7-184. PAR Plot (Band 5 - 3.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 112 of 155

**Band 5**



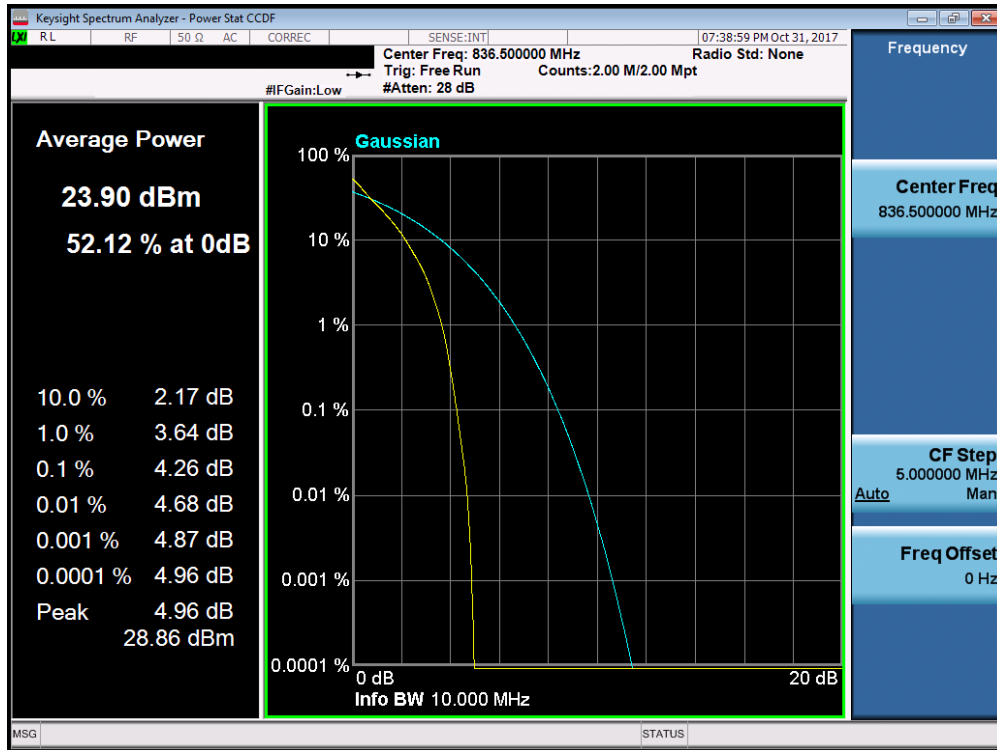
**Plot 7-185. PAR Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)**



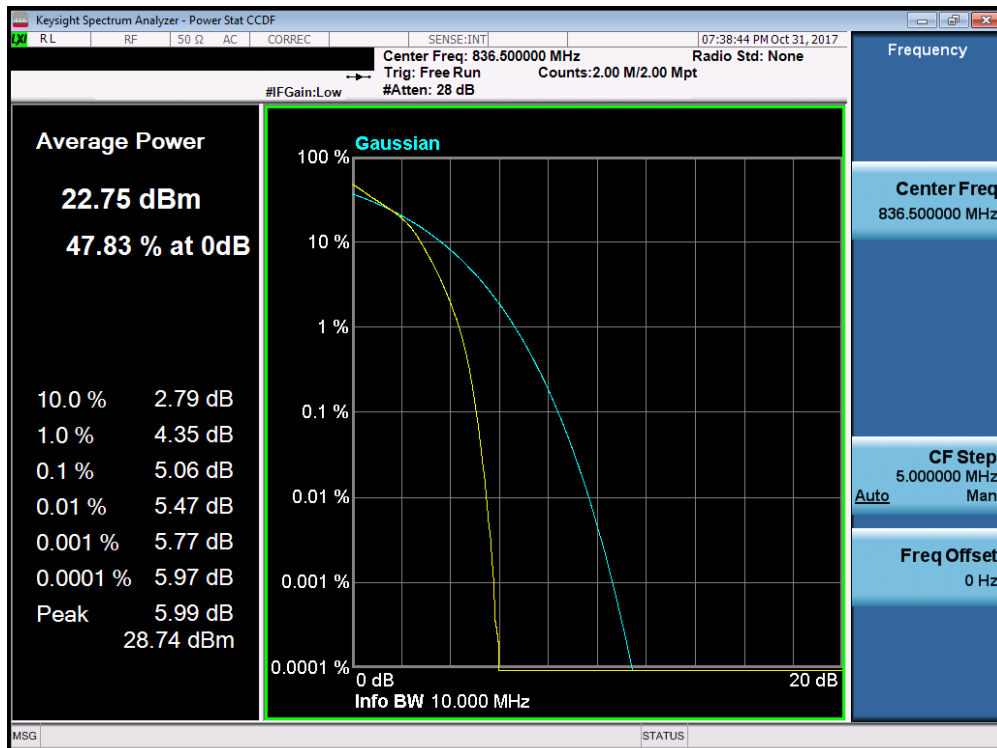
**Plot 7-186. PAR Plot (Band 5 - 5.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 113 of 155

**Band 5**

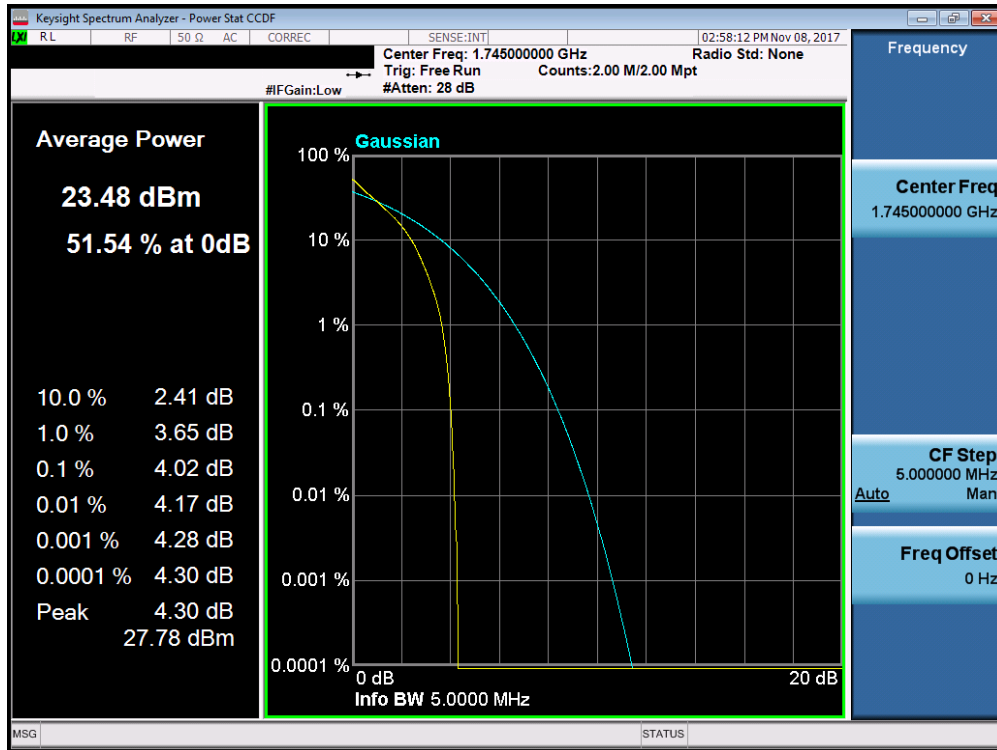


**Plot 7-187. PAR Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)**

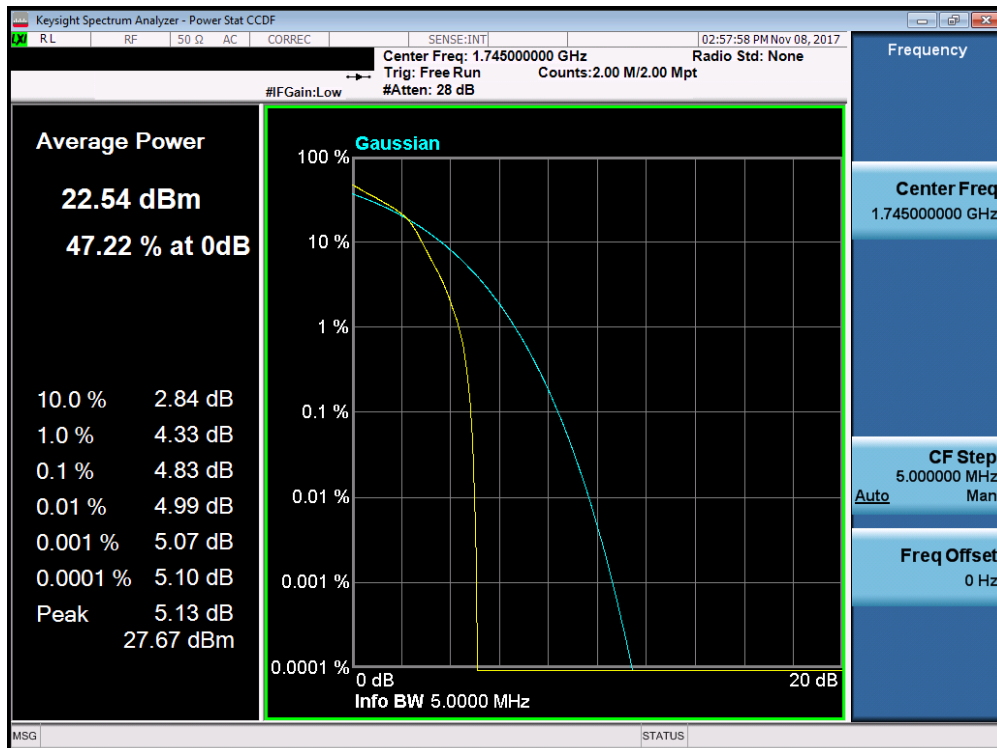


**Plot 7-188. PAR Plot (Band 5 - 10.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 114 of 155



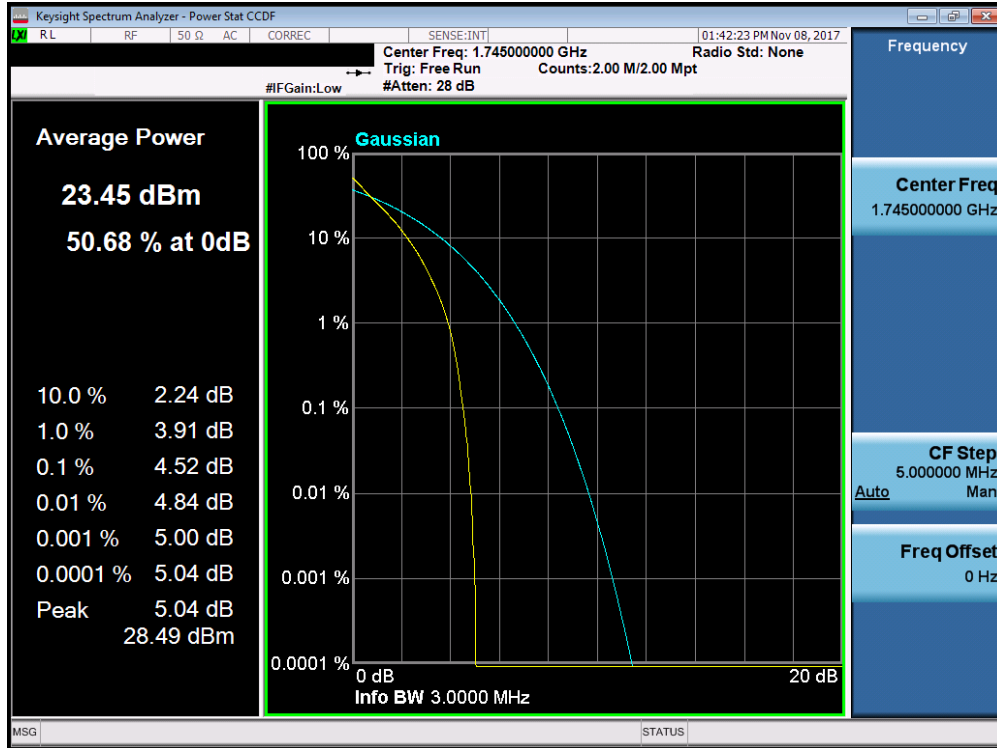
**Plot 7-189. PAR Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)**



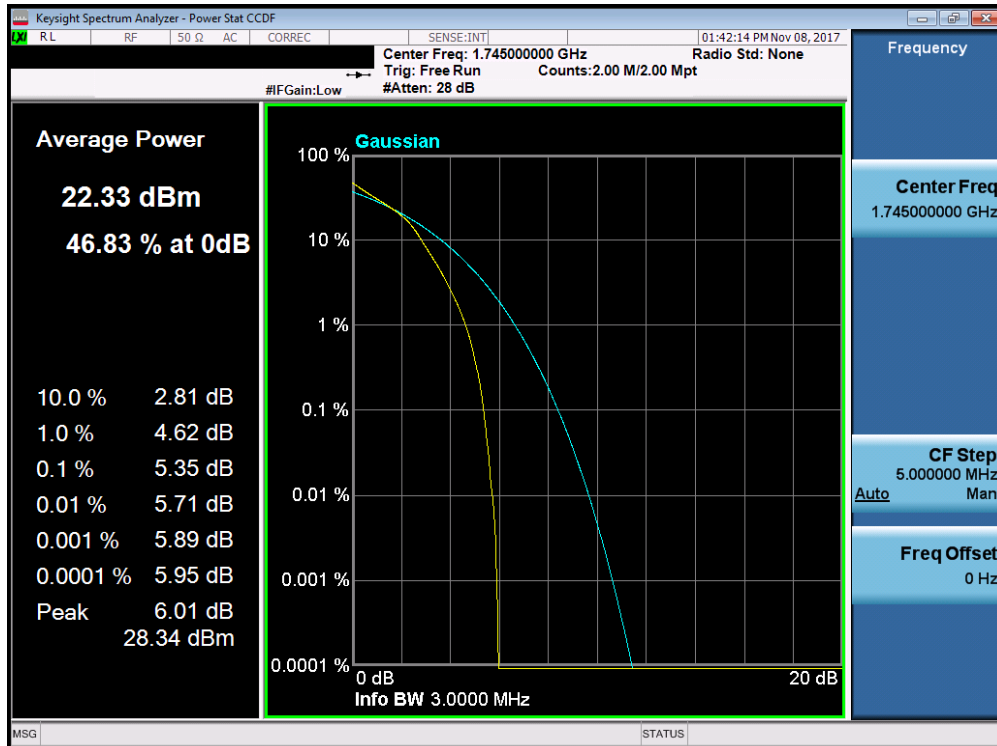
**Plot 7-190. PAR Plot (Band 66 - 1.4MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 115 of 155



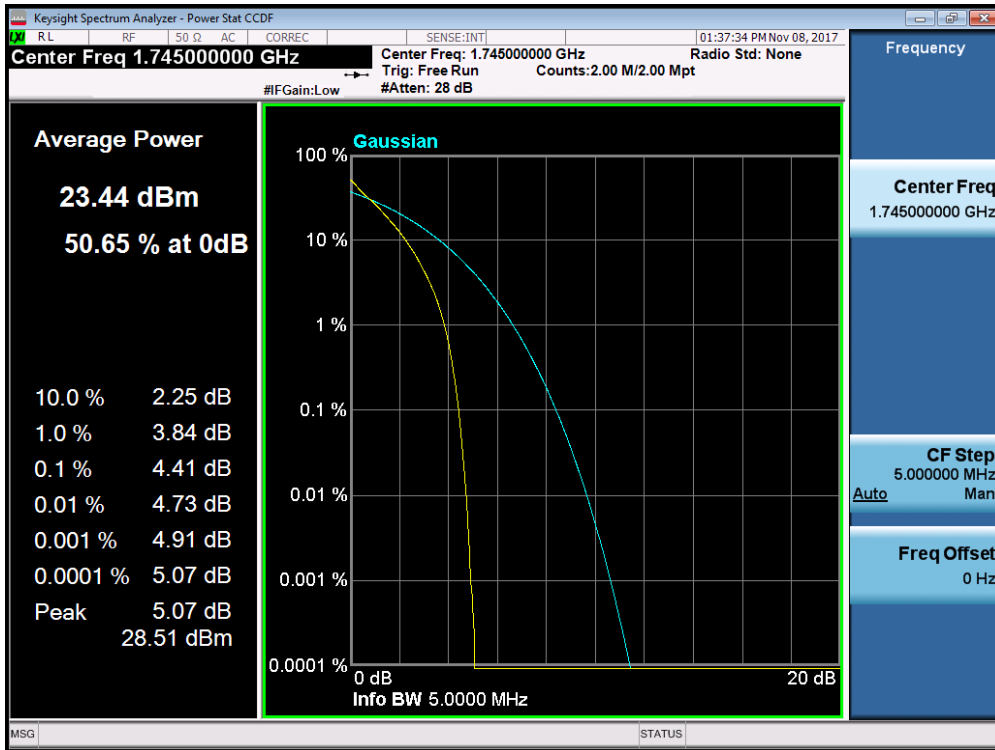


**Plot 7-191. PAR Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)**

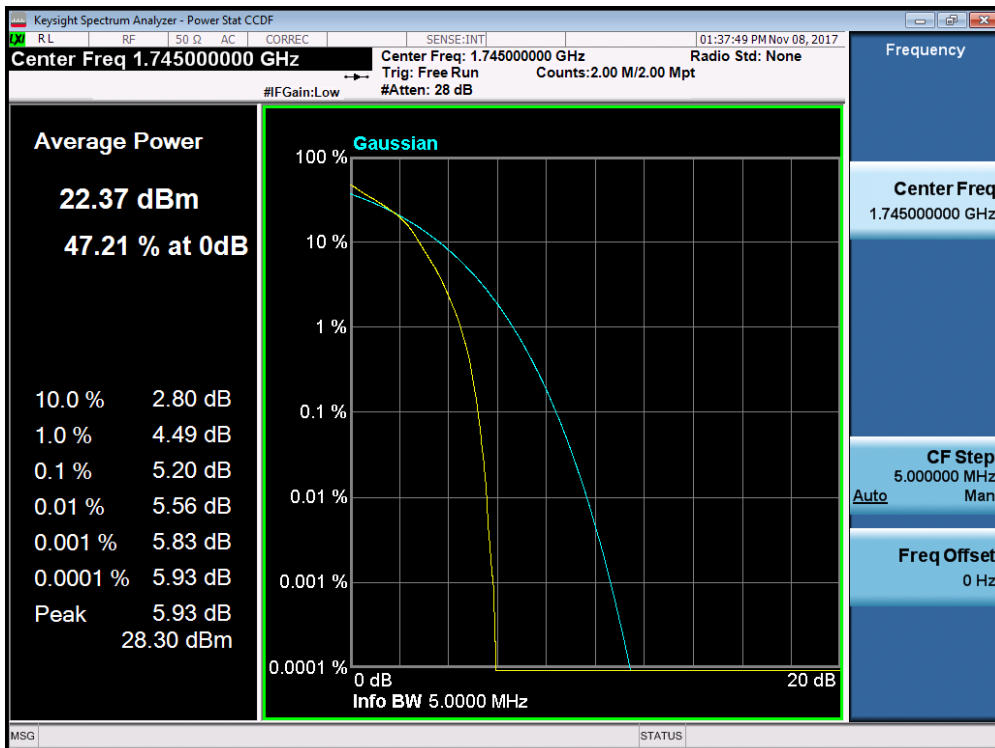


**Plot 7-192. PAR Plot (Band 66 - 3.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 116 of 155



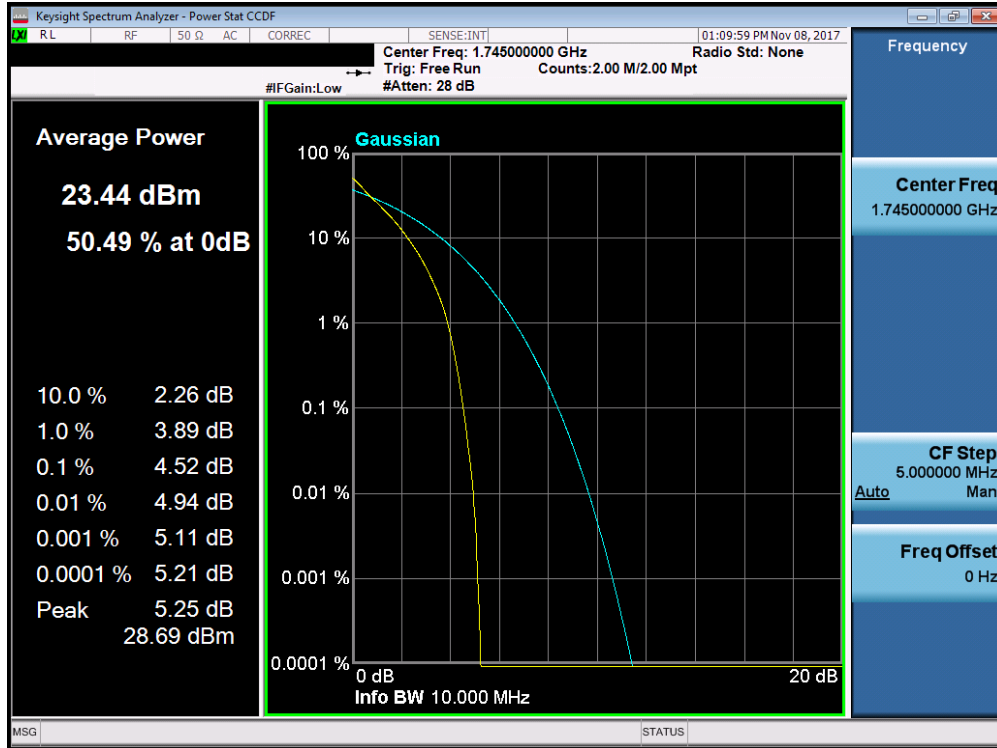
**Plot 7-193. PAR Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)**



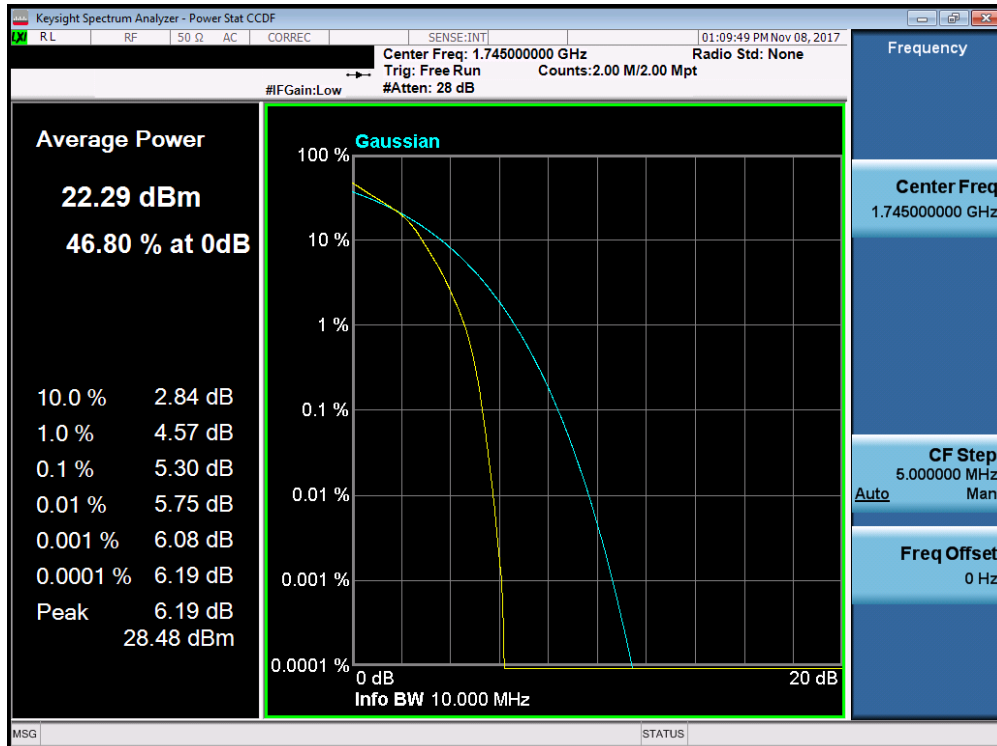
**Plot 7-194. PAR Plot (Band 66 - 5.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 117 of 155

**Band 4/66**



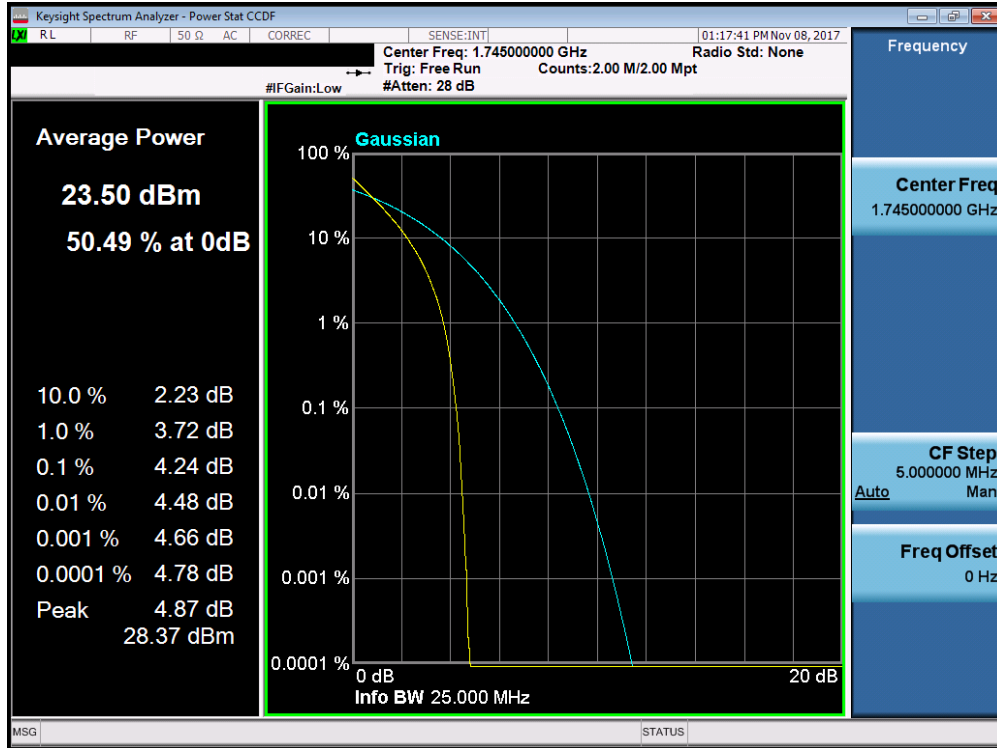
**Plot 7-195. PAR Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)**



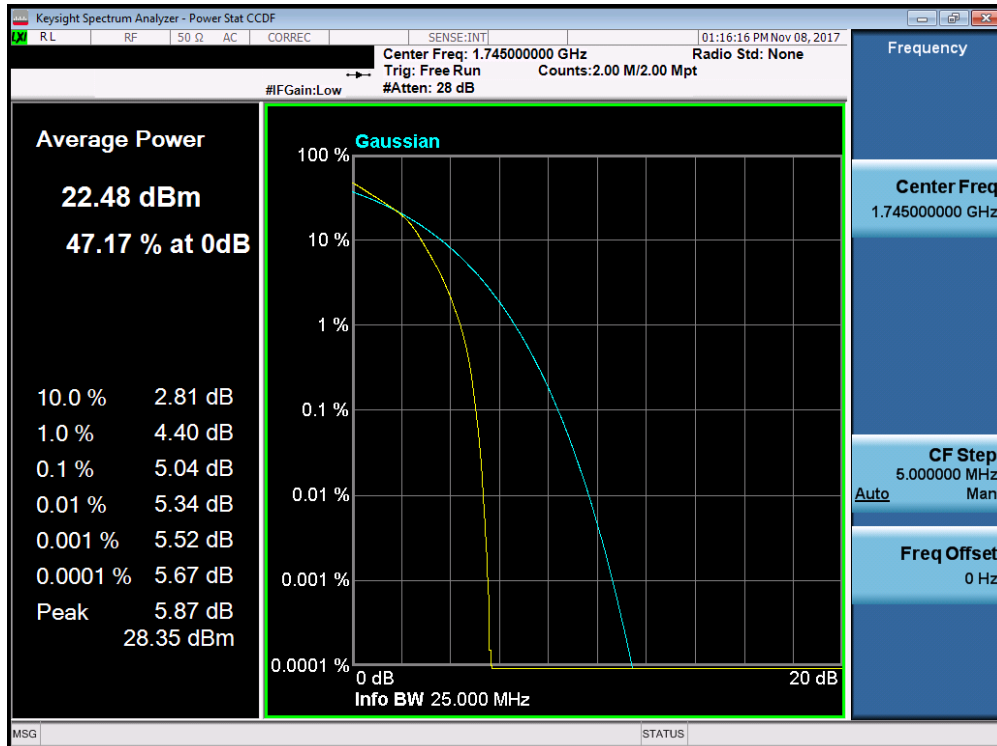
**Plot 7-196. PAR Plot (Band 66 - 10.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 118 of 155

**Band 4/66**

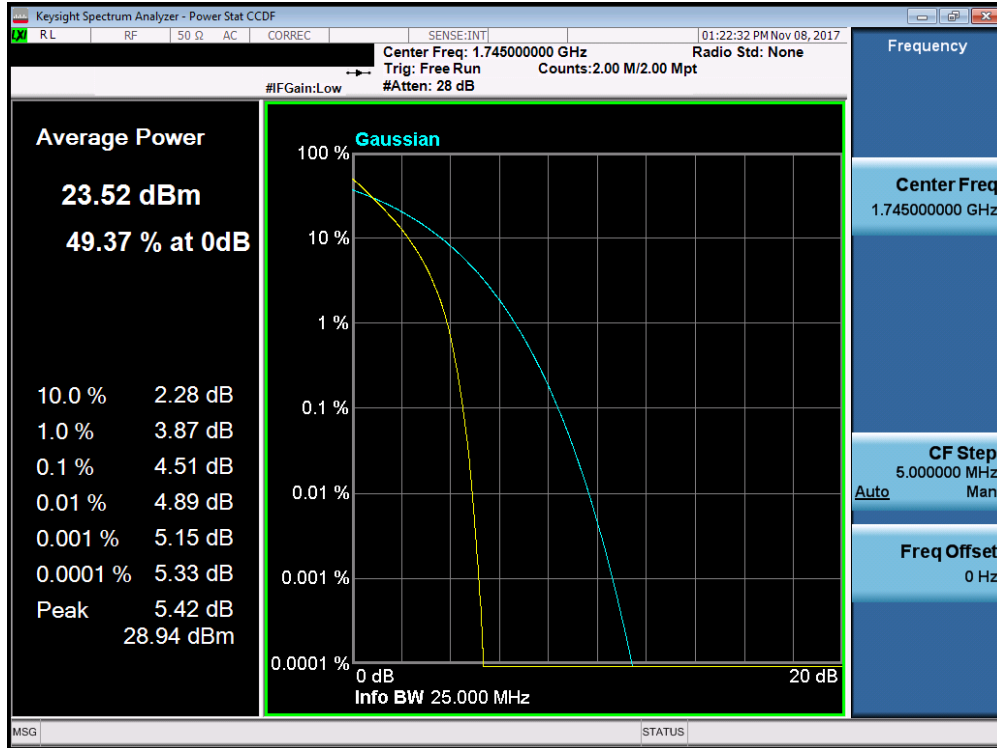


**Plot 7-197. PAR Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)**

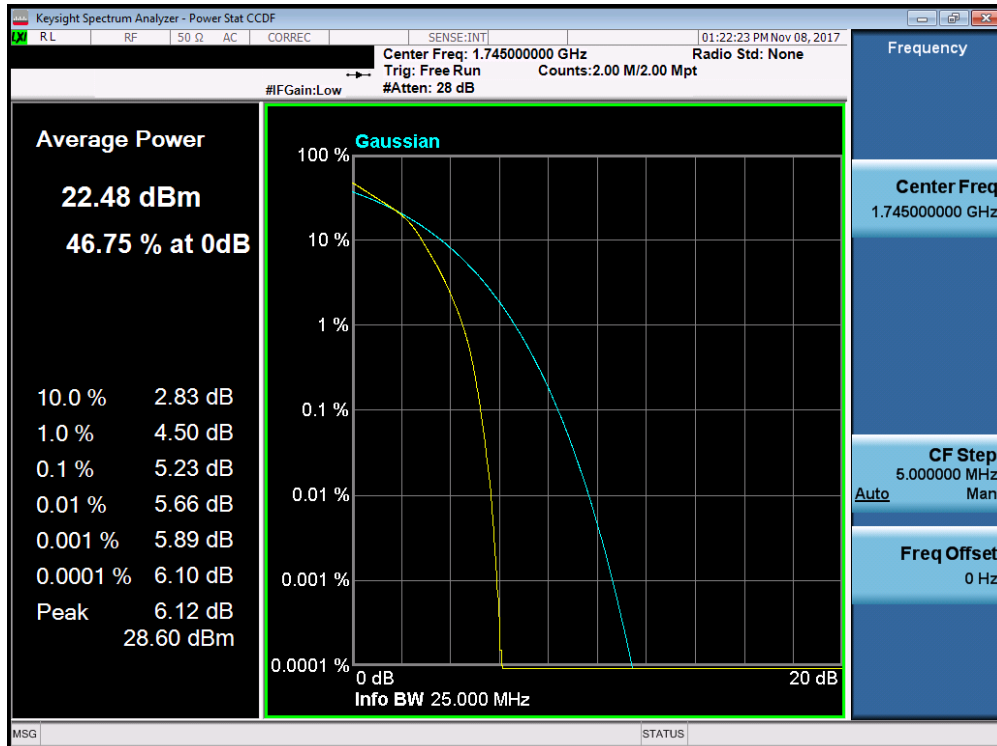


**Plot 7-198. PAR Plot (Band 66 - 15.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 119 of 155



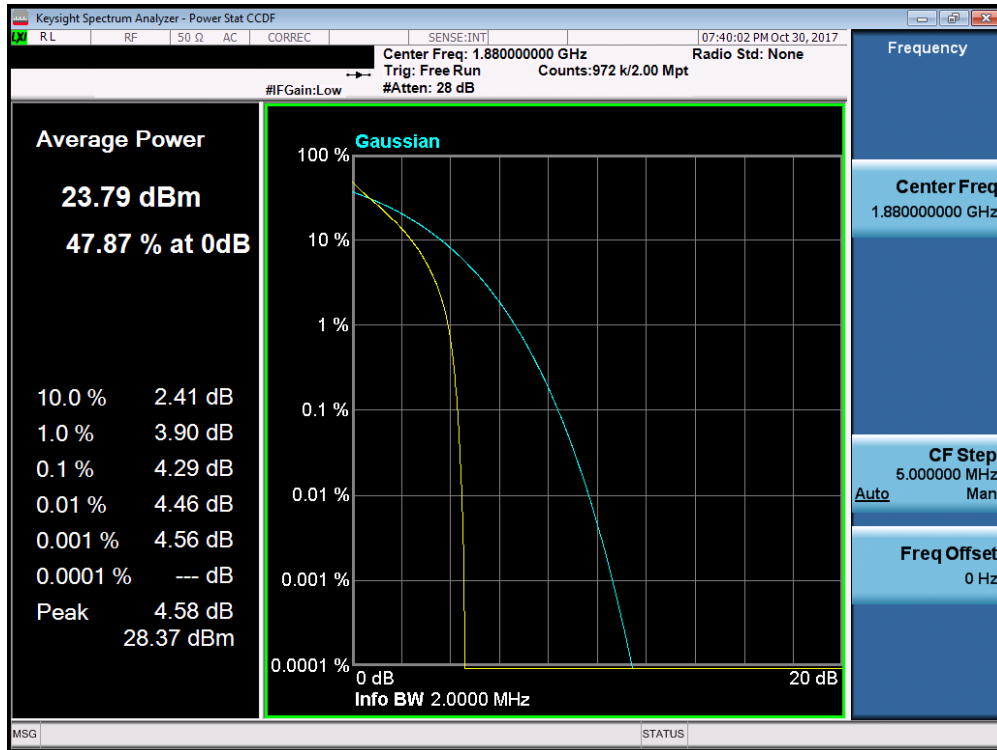
**Plot 7-199. PAR Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)**



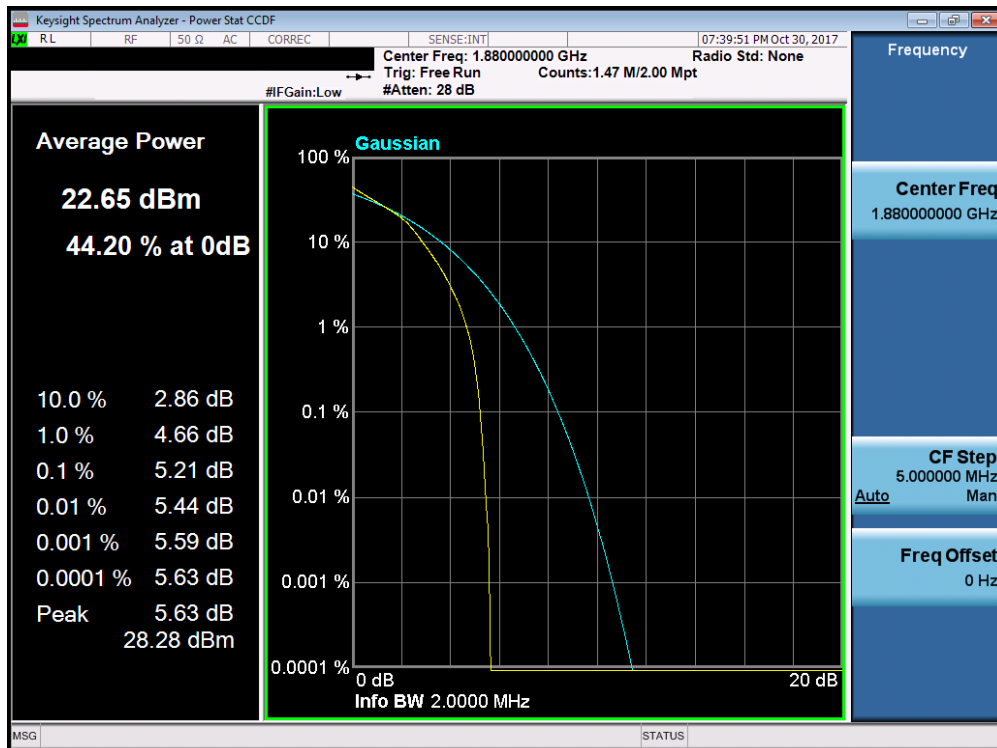
**Plot 7-200. PAR Plot (Band 66 - 20.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 120 of 155

**Band 2**



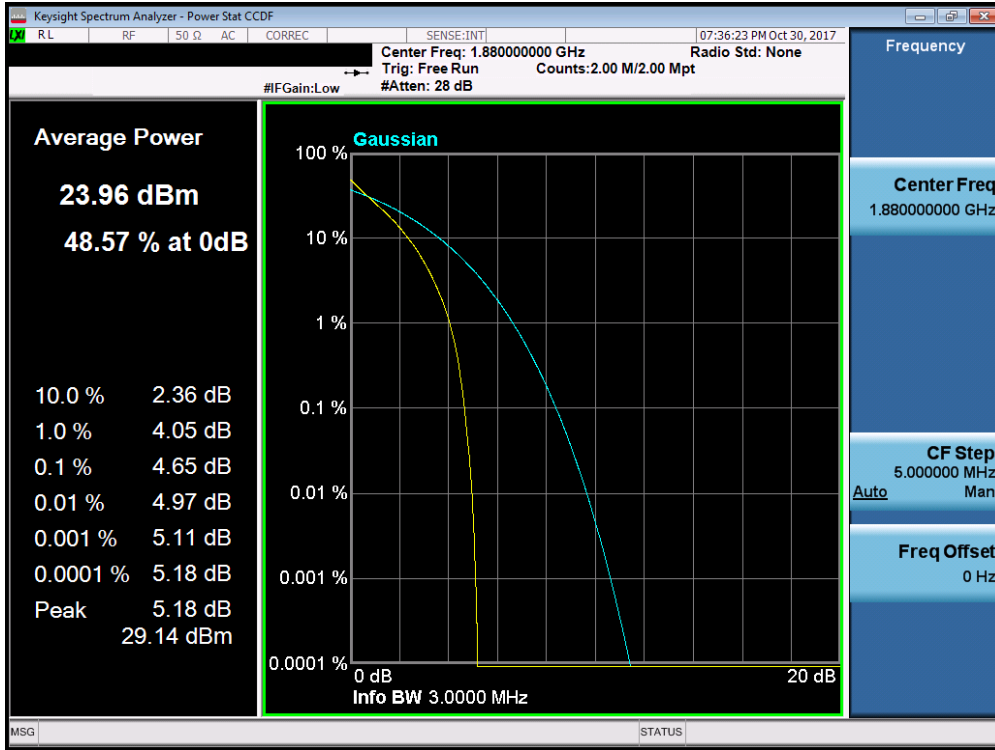
**Plot 7-201. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)**



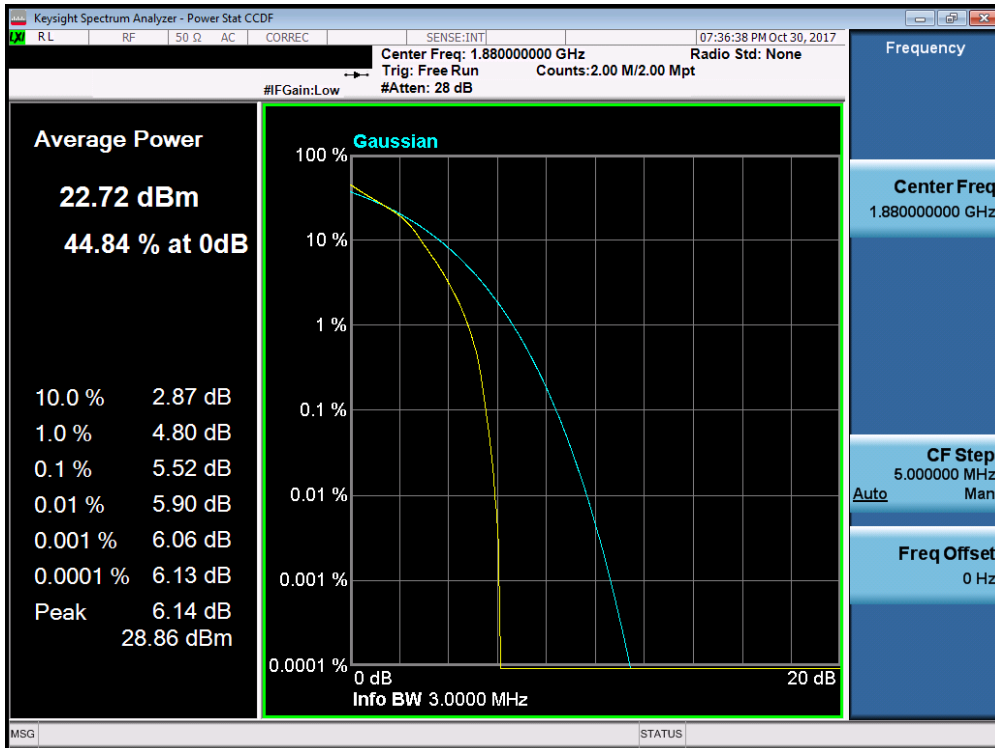
**Plot 7-202. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 121 of 155

**Band 2**



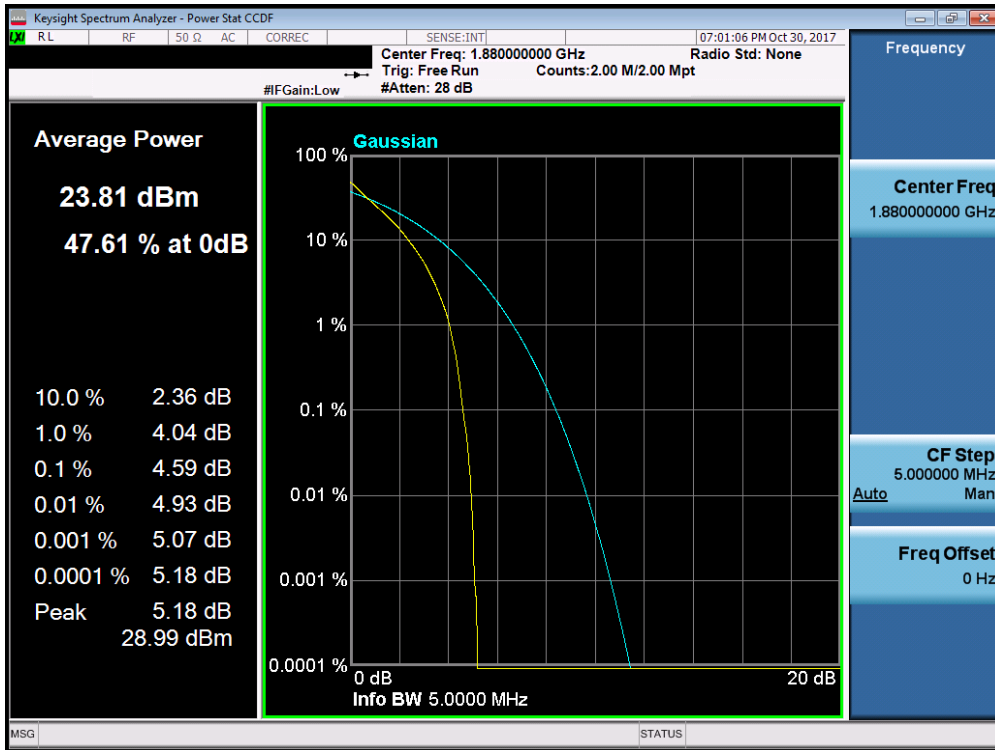
**Plot 7-203. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)**



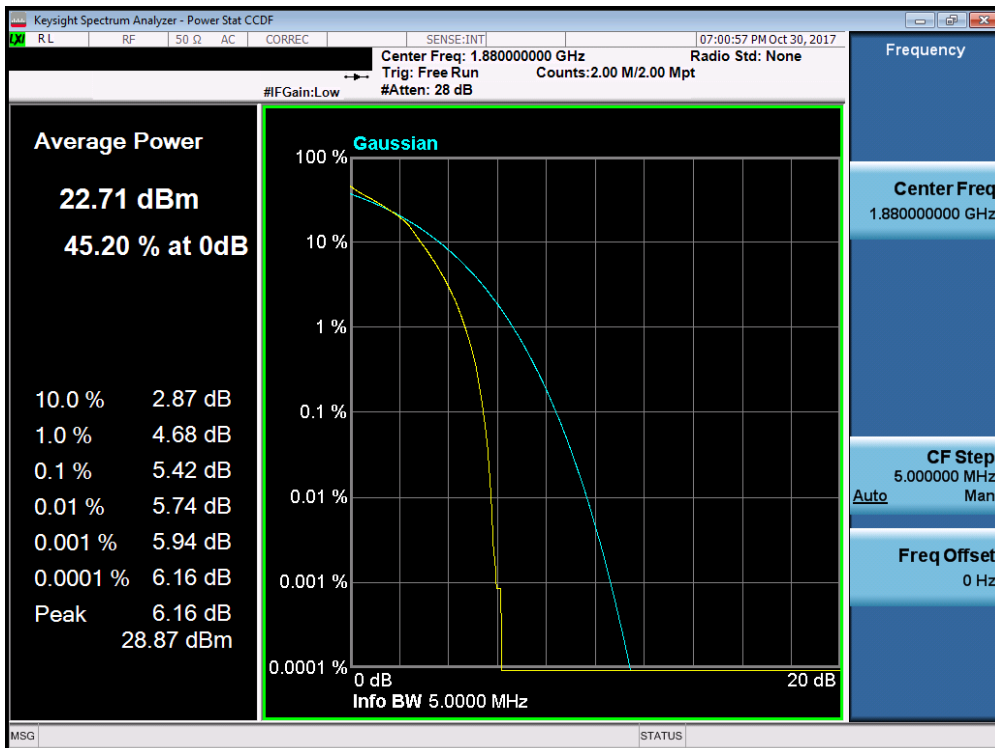
**Plot 7-204. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 122 of 155

**Band 2**



**Plot 7-205. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)**

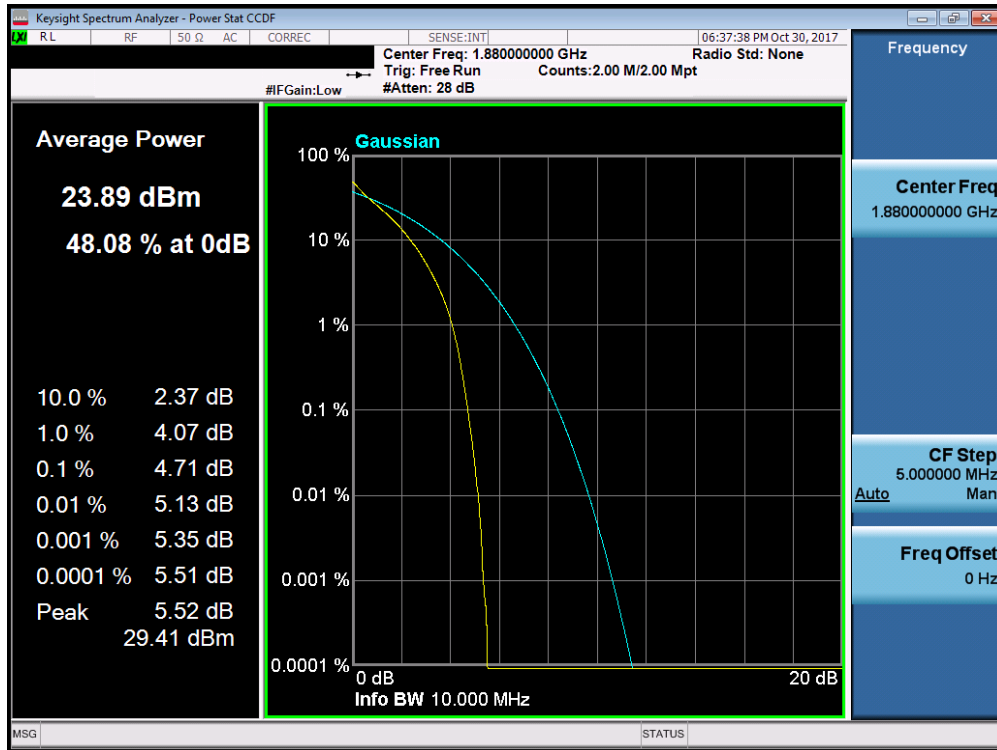


**Plot 7-206. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)**

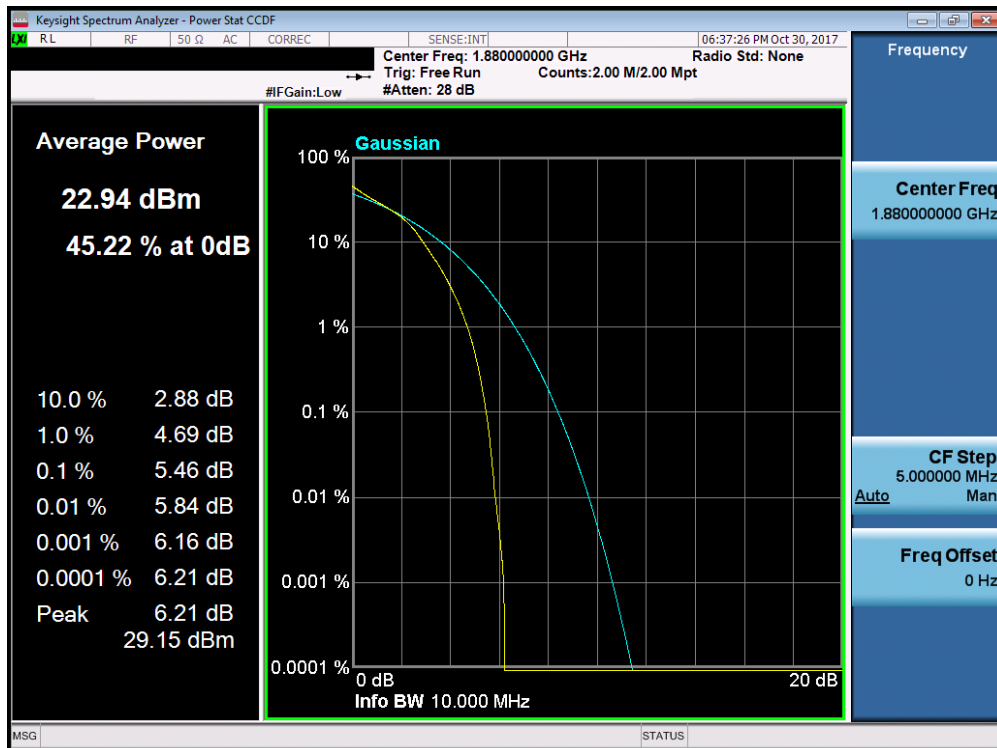
FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 123 of 155



**Band 2**



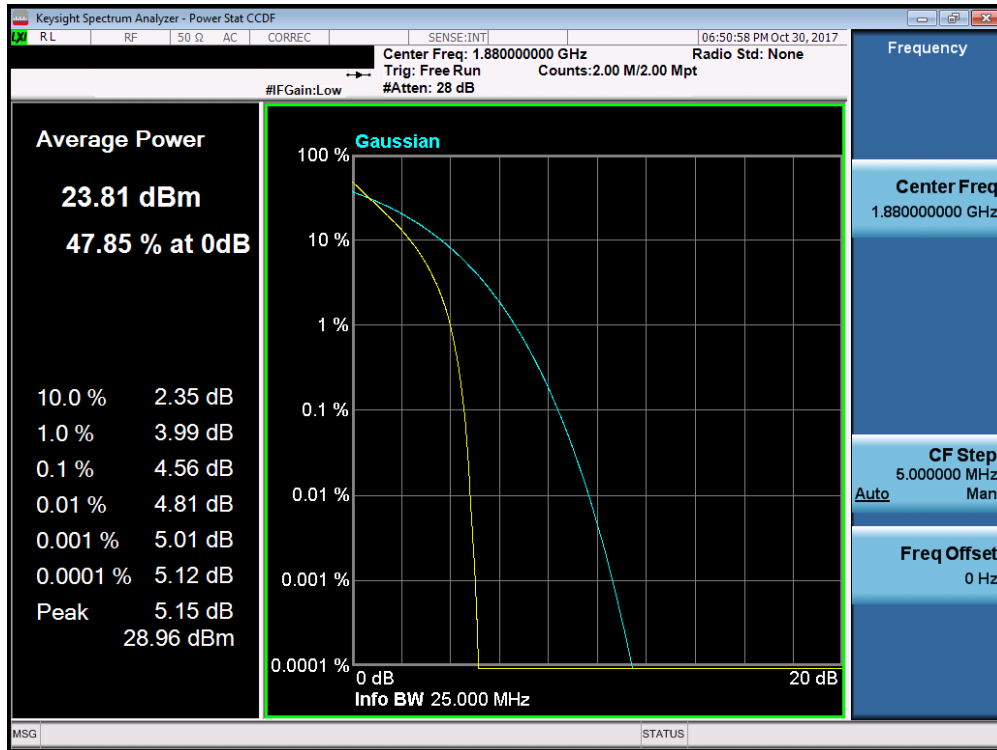
**Plot 7-207. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)**



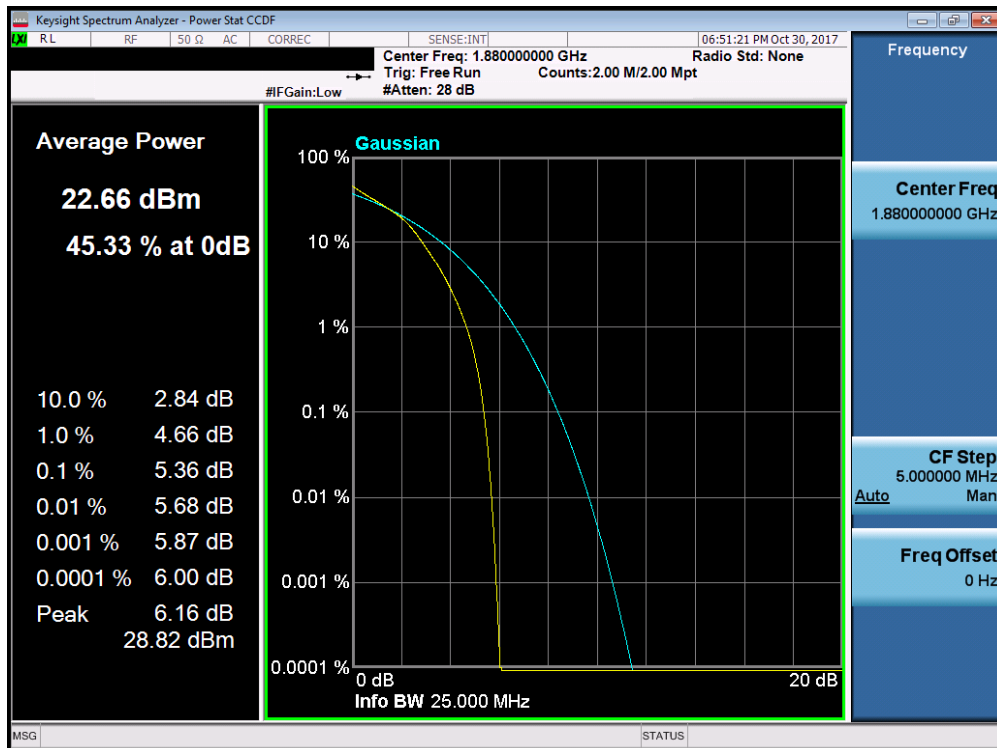
**Plot 7-208. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 124 of 155

**Band 2**



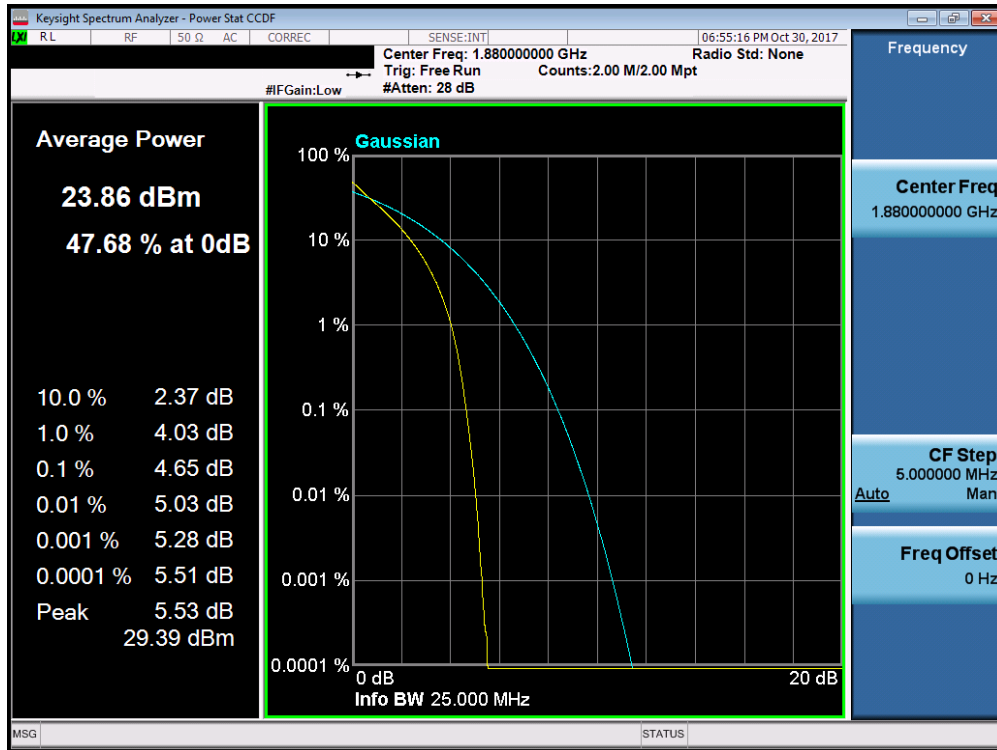
**Plot 7-209. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)**



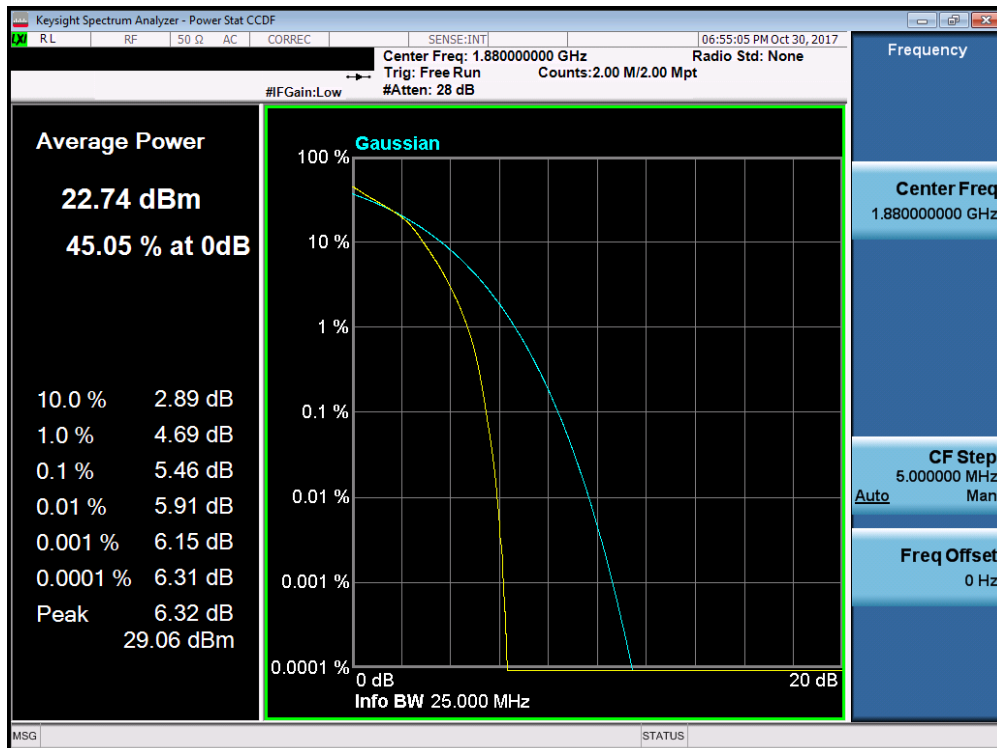
**Plot 7-210. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 125 of 155

**Band 2**



**Plot 7-211. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)**



**Plot 7-212. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 126 of 155

## 7.6 Radiated Power (ERP/EIRP)

§22.913(a)(2) §24.232(c.2) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)

### 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 v03– Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

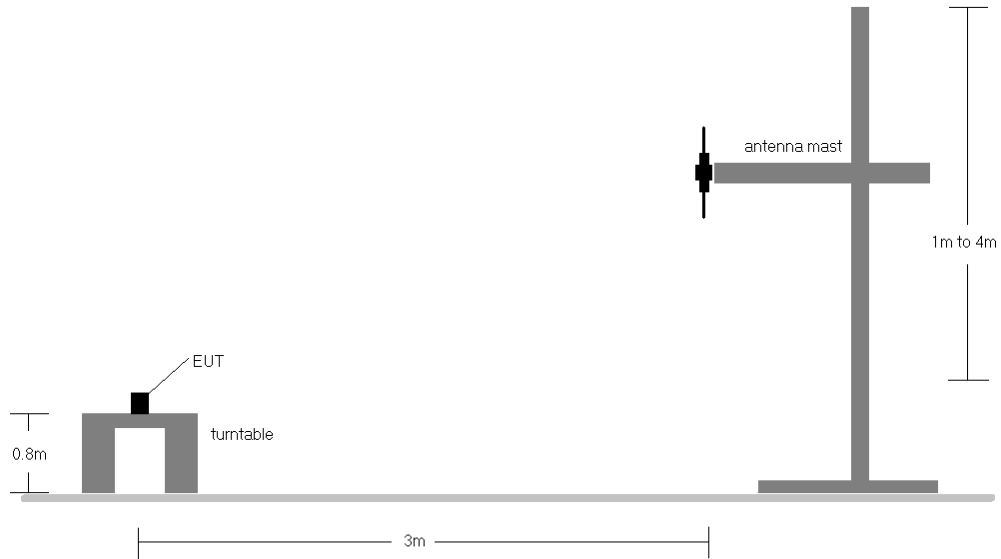
### Test Settings

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 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $\geq$  2 x 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

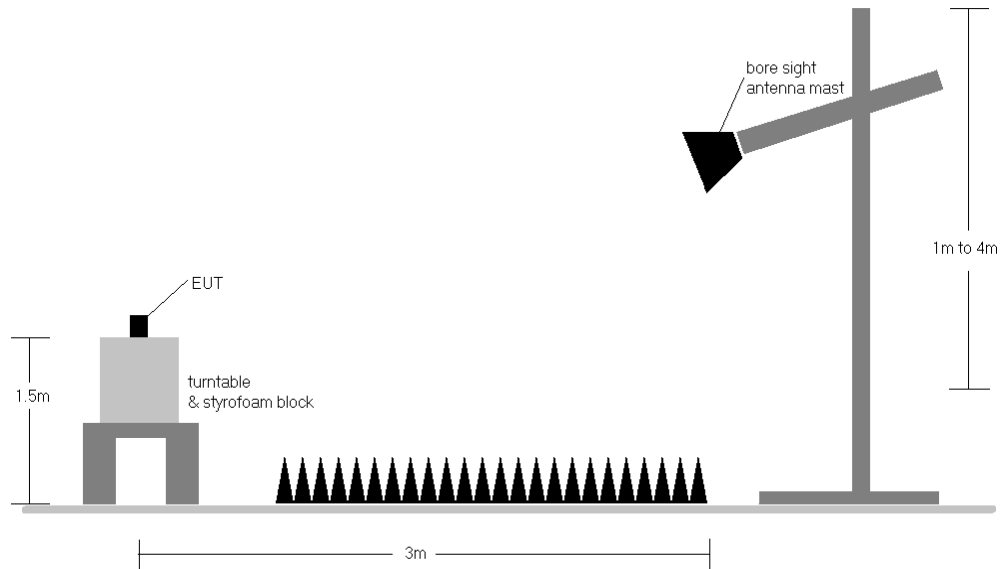
FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 127 of 155	

**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: ZNFL413DL	 <b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT (CERTIFICATION)</b>	 <b>LG</b>	<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1-ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset	Page 128 of 155	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	17	1 / 5	19.41	1.10	18.36	0.069	34.77	-16.41	20.51	0.112	40.61	-20.10
707.50	1.4	QPSK	V	150	22	1 / 5	20.54	1.13	19.52	0.090	34.77	-15.25	21.67	0.147	40.61	-18.94
715.30	1.4	QPSK	V	150	12	1 / 5	20.91	1.16	19.92	0.098	34.77	-14.85	22.07	0.161	40.61	-18.54
715.30	1.4	16-QAM	V	150	12	1 / 5	19.86	1.16	18.87	0.077	34.77	-15.90	21.02	0.127	40.61	-19.59
700.50	3	QPSK	V	150	23	1 / 14	19.76	1.10	18.71	0.074	34.77	-16.06	20.86	0.122	40.61	-19.74
707.50	3	QPSK	V	150	10	1 / 14	20.33	1.13	19.31	0.085	34.77	-15.46	21.46	0.140	40.61	-19.15
714.50	3	QPSK	V	150	27	1 / 14	21.39	1.16	20.40	0.110	34.77	-14.37	22.55	0.180	40.61	-18.06
714.50	3	16-QAM	V	150	27	1 / 14	20.00	1.16	19.01	0.080	34.77	-15.76	21.16	0.131	40.61	-19.45
701.50	5	QPSK	V	150	0	1 / 24	19.77	1.11	18.73	0.075	34.77	-16.05	20.88	0.122	40.61	-19.73
707.50	5	QPSK	V	150	9	1 / 24	20.05	1.13	19.03	0.080	34.77	-15.74	21.18	0.131	40.61	-19.43
713.50	5	QPSK	V	150	5	1 / 24	20.55	1.15	19.55	0.090	34.77	-15.22	21.70	0.148	40.61	-18.90
713.50	5	16-QAM	V	150	5	1 / 24	19.38	1.15	18.38	0.069	34.77	-16.39	20.53	0.113	40.61	-20.07
704.00	10	QPSK	V	150	357	1 / 49	19.99	1.12	18.96	0.079	34.77	-15.81	21.11	0.129	40.61	-19.50
707.50	10	QPSK	V	150	2	1 / 49	20.49	1.13	19.47	0.089	34.77	-15.30	21.62	0.145	40.61	-18.99
711.00	10	QPSK	V	150	6	1 / 49	20.08	1.14	19.07	0.081	34.77	-15.70	21.22	0.133	40.61	-19.38
707.50	10	16-QAM	V	150	2	1 / 49	19.60	1.13	18.58	0.072	34.77	-16.19	20.73	0.118	40.61	-19.88
714.50	3	QPSK	H	150	0	1 / 74	21.23	1.16	20.24	0.106	34.77	-14.53	22.39	0.173	40.61	-18.22

**Table 7-213. ERP/EIRP Data (Band 12)**

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	150	9	1 / 0	23.59	1.32	22.76	0.189	34.77	-12.01	24.91	0.310	40.61	-15.70
782.00	5	QPSK	V	150	14	1 / 0	22.84	1.33	22.02	0.159	34.77	-12.75	24.17	0.261	40.61	-16.44
784.50	5	QPSK	V	150	12	1 / 0	22.69	1.34	21.88	0.154	34.77	-12.89	24.03	0.253	40.61	-16.58
779.50	5	16-QAM	V	150	9	1 / 0	22.23	1.32	21.40	0.138	34.77	-13.37	23.55	0.226	40.61	-17.06
782.00	10	QPSK	V	150	1	1 / 0	23.64	1.33	22.82	0.191	34.77	-11.95	24.97	0.314	40.61	-15.64
782.00	10	16-QAM	V	150	1	1 / 0	22.90	1.33	22.08	0.161	34.77	-12.69	24.23	0.265	40.61	-16.38
782.00	10	QPSK	H	150	193	1 / 0	20.91	1.33	20.09	0.102	34.77	-14.68	22.24	0.167	40.61	-18.37

**Table 7-214. ERP/EIRP Data (Band 13)**

FCC ID: ZNFL413DL		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 129 of 155	

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	150	11	1 / 5	23.22	1.50	22.57	0.181	38.45	-15.88	24.72	0.296	36.99	-12.27
836.50	1.4	QPSK	V	150	0	1 / 5	24.23	1.50	23.58	0.228	38.45	-14.87	25.73	0.374	36.99	-11.26
848.30	1.4	QPSK	V	150	5	1 / 5	24.04	1.50	23.39	0.218	38.45	-15.06	25.54	0.358	36.99	-11.45
824.70	1.4	16-QAM	V	150	11	1 / 5	21.62	1.50	20.97	0.125	38.45	-17.48	23.12	0.205	36.99	-13.87
836.50	1.4	16-QAM	V	150	0	1 / 5	23.11	1.50	22.46	0.176	38.45	-15.99	24.61	0.289	36.99	-12.38
848.30	1.4	16-QAM	V	150	5	1 / 5	22.80	1.50	22.15	0.164	38.45	-16.30	24.30	0.269	36.99	-12.69
825.50	3	QPSK	V	150	6	1 / 14	23.55	1.50	22.90	0.195	38.45	-15.55	25.05	0.320	36.99	-11.94
836.50	3	QPSK	V	150	0	1 / 14	24.22	1.50	23.57	0.228	38.45	-14.88	25.72	0.373	36.99	-11.27
847.50	3	QPSK	V	150	18	1 / 14	23.83	1.50	23.18	0.208	38.45	-15.27	25.33	0.341	36.99	-11.66
825.50	3	16-QAM	V	150	6	1 / 14	22.20	1.50	21.55	0.143	38.45	-16.90	23.70	0.234	36.99	-13.29
836.50	3	16-QAM	V	150	0	1 / 14	23.52	1.50	22.87	0.194	38.45	-15.58	25.02	0.318	36.99	-11.97
847.50	3	16-QAM	V	150	18	1 / 14	22.81	1.50	22.16	0.164	38.45	-16.29	24.31	0.270	36.99	-12.68
826.50	5	QPSK	V	150	12	1 / 0	23.41	1.50	22.76	0.189	38.45	-15.69	24.91	0.310	36.99	-12.08
836.50	5	QPSK	V	150	0	1 / 0	24.02	1.50	23.37	0.217	38.45	-15.08	25.52	0.356	36.99	-11.47
846.50	5	QPSK	V	150	19	1 / 0	23.88	1.50	23.23	0.210	38.45	-15.22	25.38	0.345	36.99	-11.61
826.50	5	16-QAM	V	150	12	1 / 0	22.06	1.50	21.41	0.138	38.45	-17.04	23.56	0.227	36.99	-13.43
836.50	5	16-QAM	V	150	0	1 / 0	22.38	1.50	21.73	0.149	38.45	-16.72	23.88	0.244	36.99	-13.11
846.50	5	16-QAM	V	150	19	1 / 0	22.27	1.50	21.62	0.145	38.45	-16.83	23.77	0.238	36.99	-13.22
829.00	10	QPSK	V	150	5	1 / 0	23.27	1.50	22.62	0.183	38.45	-15.83	24.77	0.300	36.99	-12.22
836.50	10	QPSK	V	150	8	1 / 49	24.20	1.50	23.55	0.226	38.45	-14.90	25.70	0.372	36.99	-11.29
844.00	10	QPSK	V	150	8	1 / 49	23.96	1.50	23.31	0.214	38.45	-15.14	25.46	0.352	36.99	-11.53
829.00	10	16-QAM	V	150	5	1 / 0	22.76	1.50	22.11	0.163	38.45	-16.34	24.26	0.267	36.99	-12.73
836.50	10	16-QAM	V	150	8	1 / 49	23.51	1.50	22.86	0.193	38.45	-15.59	25.01	0.317	36.99	-11.98
844.00	10	16-QAM	V	150	8	1 / 49	23.14	1.50	22.49	0.177	38.45	-15.96	24.64	0.291	36.99	-12.35
836.50	1	QPSK	H	150	18	1 / 74	23.75	1.50	23.10	0.204	38.45	-15.35	25.25	0.335	36.99	-11.74

**Table 7-215. ERP/EIRP Data (Band 5)**

FCC ID: ZNFL413DL		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 130 of 155	

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	150	122	1 / 0	17.35	5.56	22.91	0.195	30.00	-7.09
1745.00	1.4	QPSK	H	150	120	1 / 0	18.16	5.32	23.48	0.223	30.00	-6.52
1779.30	1.4	QPSK	H	150	117	1 / 0	17.64	5.09	22.73	0.188	30.00	-7.27
1710.70	1.4	16-QAM	H	150	122	1 / 0	17.06	5.56	22.62	0.183	30.00	-7.38
1711.50	3	QPSK	H	150	129	1 / 0	17.47	5.55	23.02	0.201	30.00	-6.98
1745.00	3	QPSK	H	150	120	1 / 0	18.40	5.32	23.72	0.236	30.00	-6.28
1778.50	3	QPSK	H	150	117	1 / 0	18.67	5.10	23.77	0.238	30.00	-6.23
1745.00	3	16-QAM	H	150	120	1 / 0	17.78	5.32	23.10	0.204	30.00	-6.90
1712.50	5	QPSK	H	150	122	1 / 0	17.99	5.55	23.54	0.226	30.00	-6.46
1745.00	5	QPSK	H	150	119	1 / 0	17.78	5.32	23.10	0.204	30.00	-6.90
1777.50	5	QPSK	H	150	117	1 / 0	18.48	5.10	23.58	0.228	30.00	-6.42
1777.50	5	16-QAM	H	150	117	1 / 0	17.02	5.10	22.12	0.163	30.00	-7.88
1715.00	10	QPSK	H	150	117	1 / 0	17.36	5.53	22.89	0.194	30.00	-7.11
1745.00	10	QPSK	H	150	122	1 / 0	18.51	5.32	23.83	0.242	30.00	-6.17
1775.00	10	QPSK	H	150	112	1 / 0	18.53	5.12	23.65	0.232	30.00	-6.35
1775.00	10	16-QAM	H	150	112	1 / 0	17.85	5.12	22.97	0.198	30.00	-7.03
1717.50	15	QPSK	H	150	370	1 / 74	17.85	5.51	23.36	0.217	30.00	-6.64
1745.00	15	QPSK	H	150	117	1 / 74	18.33	5.32	23.65	0.232	30.00	-6.35
1772.50	15	QPSK	H	150	119	1 / 74	18.38	5.14	23.52	0.225	30.00	-6.48
1745.00	15	16-QAM	H	150	117	1 / 74	17.66	5.32	22.98	0.199	30.00	-7.02
1720.00	20	QPSK	H	150	121	1 / 0	18.04	5.49	23.53	0.226	30.00	-6.47
1745.00	20	QPSK	H	150	120	1 / 0	18.24	5.32	23.56	0.227	30.00	-6.44
1770.00	20	QPSK	H	150	124	1 / 0	17.70	5.15	22.85	0.193	30.00	-7.15
1745.00	20	16-QAM	H	150	120	1 / 0	16.88	5.32	22.20	0.166	30.00	-7.80
1745.00	10	QPSK	V	150	103	1 / 0	18.46	5.32	23.78	0.239	30.00	-6.22

**Table 7-216. EIRP Data (Band 4/66)**

FCC ID: ZNFL413DL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 131 of 155



Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	11	1 / 3	22.73	4.82	27.55	0.569	33.01	-5.46
1880.00	1.4	QPSK	H	150	11	1 / 3	22.74	4.74	27.48	0.560	33.01	-5.53
1909.30	1.4	QPSK	H	150	12	1 / 3	23.44	4.68	28.12	0.649	33.01	-4.89
1909.30	1.4	16-QAM	H	150	12	1 / 3	22.23	4.68	26.91	0.491	33.01	-6.10
1851.50	3	QPSK	H	150	11	1 / 7	23.26	4.82	28.08	0.642	33.01	-4.93
1880.00	3	QPSK	H	150	16	1 / 7	22.85	4.74	27.59	0.574	33.01	-5.42
1908.50	3	QPSK	H	150	14	1 / 7	23.77	4.68	28.45	0.700	33.01	-4.56
1908.50	3	16-QAM	H	150	14	1 / 7	23.42	4.68	28.10	0.646	33.01	-4.91
1852.50	5	QPSK	H	150	345	1 / 0	21.25	4.81	26.06	0.404	33.01	-6.95
1880.00	5	QPSK	H	150	342	1 / 0	21.52	4.74	26.26	0.423	33.01	-6.75
1907.50	5	QPSK	H	150	348	1 / 12	20.68	4.68	25.36	0.344	33.01	-7.65
1907.50	5	16-QAM	H	150	348	1 / 12	21.20	4.68	25.88	0.387	33.01	-7.13
1855.00	10	QPSK	H	150	351	1 / 49	18.88	4.81	23.69	0.234	33.01	-9.32
1880.00	10	QPSK	H	150	341	1 / 49	21.61	4.74	26.35	0.432	33.01	-6.66
1905.00	10	QPSK	H	150	346	1 / 49	21.05	4.68	25.73	0.374	33.01	-7.28
1880.00	10	16-QAM	H	150	341	1 / 49	20.98	4.74	25.72	0.373	33.01	-7.29
1857.50	15	QPSK	H	150	342	1 / 74	21.38	4.80	26.18	0.415	33.01	-6.83
1880.00	15	QPSK	H	347	341	1 / 74	21.40	4.74	26.14	0.411	33.01	-6.87
1902.50	15	QPSK	H	150	352	1 / 74	20.40	4.69	25.09	0.323	33.01	-7.92
1857.50	15	16-QAM	H	150	342	1 / 74	20.85	4.80	25.65	0.367	33.01	-7.36
1860.00	20	QPSK	H	150	353	1 / 0	19.71	4.79	24.50	0.282	33.01	-8.51
1880.00	20	QPSK	H	343	341	1 / 0	21.27	4.74	26.01	0.399	33.01	-7.00
1900.00	20	QPSK	H	150	111	1 / 0	21.18	4.69	25.87	0.386	33.01	-7.14
1880.00	20	16-QAM	H	343	341	1 / 0	20.44	4.74	25.18	0.330	33.01	-7.83
1908.50	3	QPSK	V	150	282	1 / 99	21.06	4.68	25.74	0.375	33.01	-7.27

**Table 7-217. EIRP Data (Band 2)**

FCC ID: ZNFL413DL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1.ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset	Page 132 of 155	

## 7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(g) §27.53(h) RSS-130(4.6) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)

### 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 v03– Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

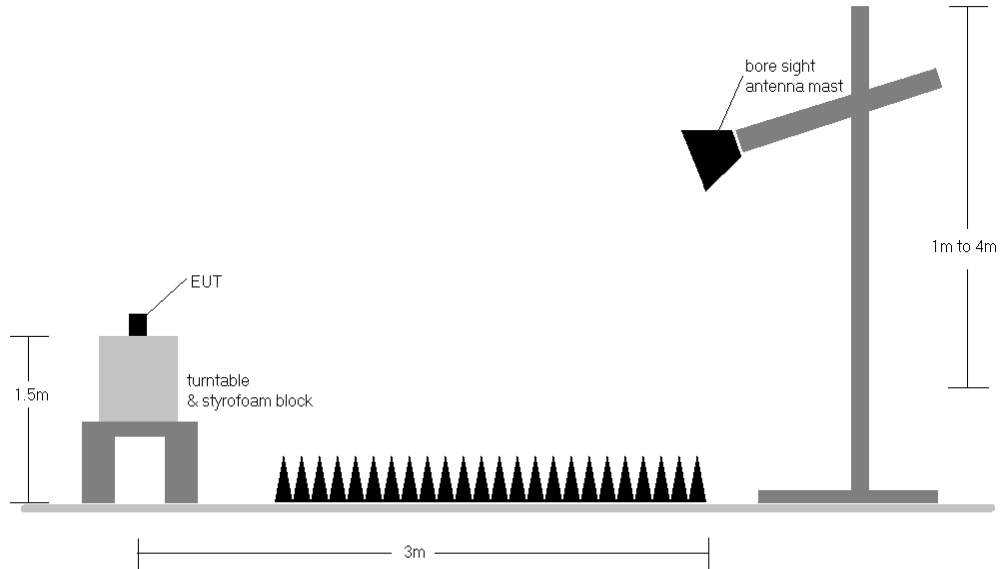
### Test Settings

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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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### Band 12

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1401.00	H	139	155	-78.02	7.92	-70.10	-57.1
2101.50	H	166	316	-66.29	8.91	-57.38	-44.4
2802.00	H	-	-	-77.94	10.06	-67.88	-54.9

**Table 7-218. Radiated Spurious Data (Band 12 – Low Channel)**

OPERATING FREQUENCY: 707.50 MHz  
 CHANNEL: 23095  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	-	-	-78.48	8.09	-70.39	-57.4

**Table 7-219. Radiated Spurious Data (Band 12 – Mid Channel)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 135 of 155

OPERATING FREQUENCY: 714.50 MHz  
 CHANNEL: 23165  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1429.00	H	-	-	-78.46	8.25	-70.21	-57.2

Table 7-220. Radiated Spurious Data (Band 12 – High Channel)

FCC ID: ZNFL413DL			<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1.ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset			Page 136 of 155

### Band 13

OPERATING FREQUENCY: 782.00 MHz  
 CHANNEL: 23230  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	123	311	-70.76	9.49	-61.27	-48.3
3128.00	H	-	-	-74.93	9.53	-65.40	-52.4

**Table 7-221. Radiated Spurious Data (Band 13 – Mid Channel)**

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	296	18	-73.78	8.73	-65.05	-25.1

**Table 7-222. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset			Page 137 of 155

### Band 5

OPERATING FREQUENCY: 824.70 MHz  
 CHANNEL: 20407  
 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]
1649.40	H	178	195	-75.98	9.01	-66.97	-54.0
2474.10	H	247	334	-74.77	9.12	-65.65	-52.6
3298.80	H	-	-	-74.69	9.37	-65.32	-52.3

**Table 7-223. Radiated Spurious Data (Band 5 – Low Channel)**

OPERATING FREQUENCY: 836.50 MHz  
 CHANNEL: 20525  
 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]
1673.00	H	139	141	-77.52	8.85	-68.67	-55.7
2509.50	H	114	289	-77.06	9.17	-67.89	-54.9
3346.00	H	-	-	-75.29	9.36	-65.93	-52.9

**Table 7-224. Radiated Spurious Data (Band 5 – Mid Channel)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 138 of 155

OPERATING FREQUENCY: 848.30 MHz  
 CHANNEL: 20643  
 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]
1696.60	H	145	145	-76.25	8.68	-67.57	-54.6
2544.90	H	122	310	-75.66	9.27	-66.39	-53.4
3393.20	H	-	-	-74.05	9.46	-64.59	-51.6

**Table 7-225. Radiated Spurious Data (Band 5 – High Channel)**

FCC ID: ZNFL413DL			<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1.ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset			Page 139 of 155



### Band 4/66

OPERATING FREQUENCY: 1715.00 MHz  
 CHANNEL: 132022  
 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]
3430.00	H	142	30	-43.83	9.53	-34.31	-21.3
5145.00	H	133	35	-66.03	10.79	-55.24	-42.2
6860.00	H	-	-	-69.25	10.84	-58.41	-45.4

**Table 7-226. Radiated Spurious Data (Band 4/66 – Low Channel)**

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 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]
3490.00	H	134	24	-40.00	9.65	-30.35	-17.4
5235.00	H	129	32	-66.75	10.93	-55.82	-42.8
6980.00	H	-	-	-69.20	10.96	-58.24	-45.2

**Table 7-227. Radiated Spurious Data (Band 4/66 – Mid Channel)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1-ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 140 of 155	

OPERATING FREQUENCY: 1775.00 MHz  
 CHANNEL: 132622  
 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]
3550.00	H	144	26	-37.91	9.70	-28.21	-15.2
5325.00	H	132	39	-66.18	10.98	-55.20	-42.2
7100.00	H	-	-	-69.15	10.99	-58.16	-45.2

**Table 7-228. Radiated Spurious Data (Band 4/66 – High Channel)**

FCC ID: ZNFL413DL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 141 of 155

## Band 2

OPERATING FREQUENCY: 1851.50 MHz  
 CHANNEL: 18615  
 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]
3703.00	H	150	69	-50.64	6.76	-43.87	-30.9
5554.50	H	-	-	-64.00	8.44	-55.57	-42.6

**Table 7-229. Radiated Spurious Data (Band 2 – Low Channel)**

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 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	150	91	-57.34	6.84	-50.50	-37.5
5640.00	H	150	214	-66.43	8.52	-57.91	-44.9
7520.00	H	-	-	-63.13	8.44	-54.69	-41.7

**Table 7-230. Radiated Spurious Data (Band 2 – Mid Channel)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 142 of 155	

OPERATING FREQUENCY: 1908.50 MHz  
 CHANNEL: 19185  
 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]
3817.00	H	150	93	-57.36	6.99	-50.37	-37.4
5725.50	H	150	181	-63.49	8.58	-54.92	-41.9
7634.00	H	-	-	-63.46	8.56	-54.91	-41.9

Table 7-231. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 143 of 155	

## 7.8 Frequency Stability / Temperature Variation

§2.1055 §22.355 §24.235 §27.54 RSS-130(4.3) RSS-132(5.3) RSS-133(6.3) RSS-139(6.3) RSS-195(5.4)

### 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, RSS-132 and RSS-133, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, RSS-130, RSS-139 and RSS-199, 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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**Band 12 Frequency Stability Measurements**  
§2.1055 §27.54 RSS-130(4.3)

OPERATING FREQUENCY: 707,500,000 Hz  
 CHANNEL: 23790  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,995	-5	-0.0000008
100 %		- 30	707,499,980	-20	-0.0000029
100 %		- 20	707,499,842	-158	-0.0000224
100 %		- 10	707,499,922	-78	-0.0000110
100 %		0	707,499,919	-81	-0.0000114
100 %		+ 10	707,499,954	-46	-0.0000065
100 %		+ 20	707,499,849	-151	-0.0000214
100 %		+ 30	707,499,889	-111	-0.0000157
100 %		+ 40	707,499,828	-172	-0.0000243
100 %		+ 50	707,499,930	-70	-0.0000099
BATT. ENDPOINT		3.45	+ 20	707,499,834	-166

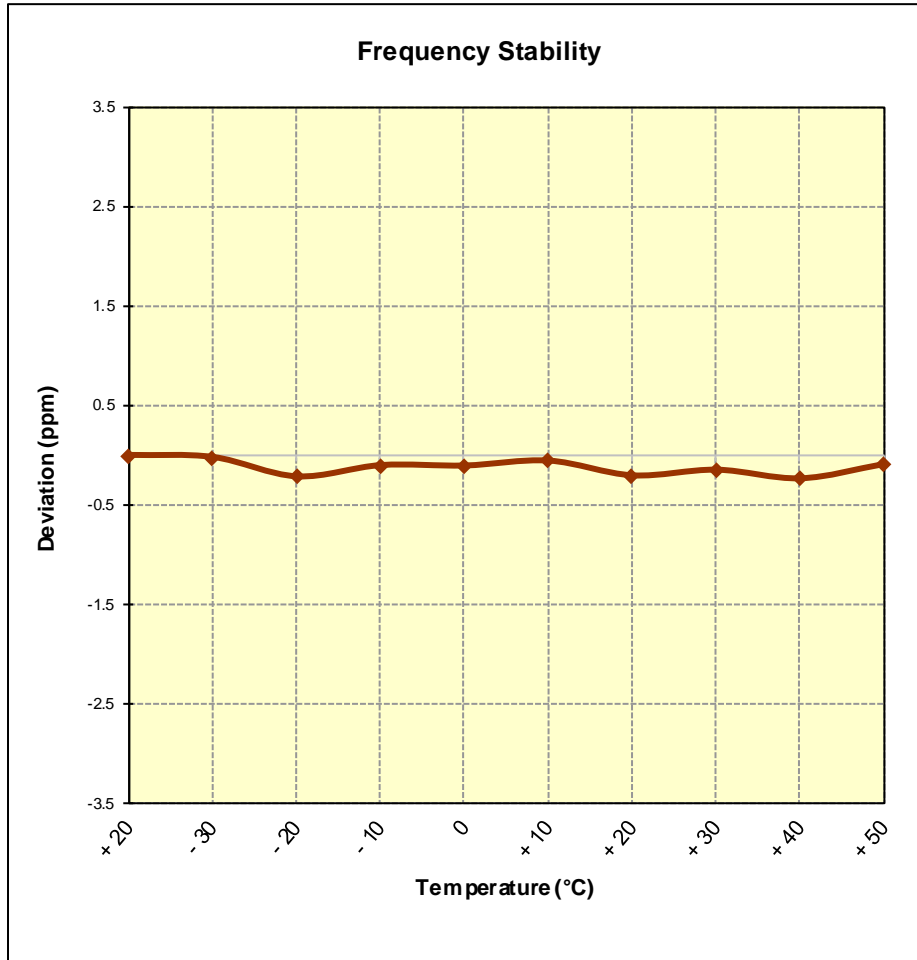
**Table 7-232. Frequency Stability Data (Band 12)**

**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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 145 of 155	

**Band 12 Frequency Stability Measurements**  
§2.1055 §27.54 RSS-130(4.3)



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

FCC ID: ZNFL413DL		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 146 of 155

**Band 13 Frequency Stability Measurements**  
§2.1055 §27.54 RSS-130(4.3)

OPERATING FREQUENCY: 782,000,000 Hz  
 CHANNEL: 23230  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	781,999,837	-163	-0.0000208
100 %		- 30	781,999,905	-95	-0.0000122
100 %		- 20	781,999,864	-136	-0.0000173
100 %		- 10	781,999,941	-59	-0.0000076
100 %		0	781,999,830	-170	-0.0000217
100 %		+ 10	781,999,927	-73	-0.0000093
100 %		+ 20	781,999,855	-145	-0.0000185
100 %		+ 30	781,999,931	-69	-0.0000089
100 %		+ 40	781,999,871	-129	-0.0000165
100 %		+ 50	781,999,920	-80	-0.0000103
BATT. ENDPOINT	3.45	+ 20	781,999,974	-26	-0.0000033

**Table 7-233. Frequency Stability Data (Band 13)**

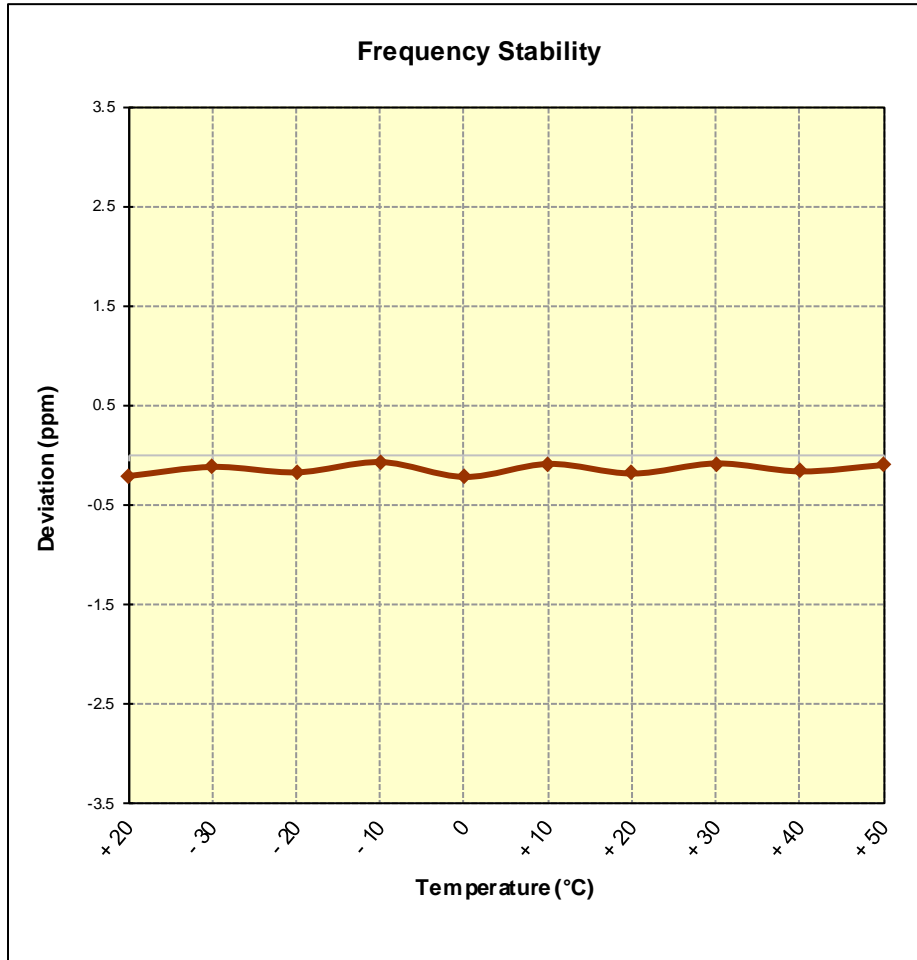
**Note:**

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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 147 of 155	



**Band 13 Frequency Stability Measurements**  
§2.1055 §27.54 RSS-130(4.3)



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

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 148 of 155

**Band 5 Frequency Stability Measurements**  
§2.1055 §22.355 RSS-132(5.3)

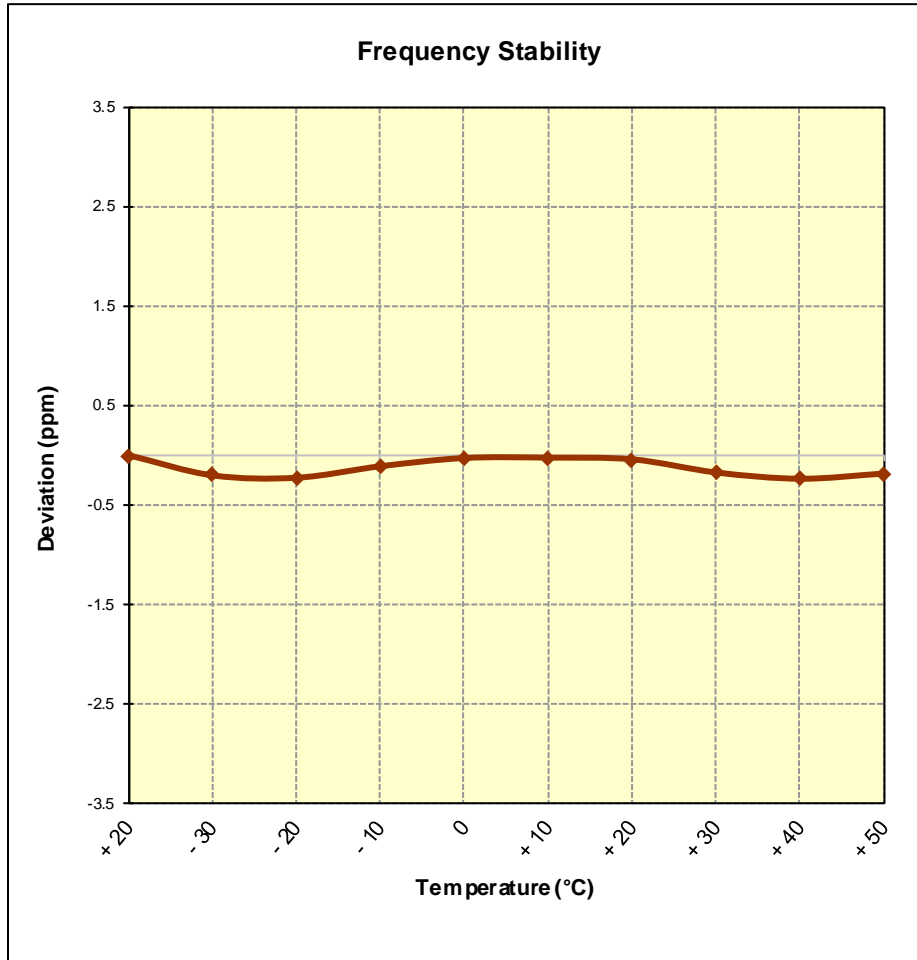
OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,499,989	-11	-0.0000013
100 %		- 30	836,499,828	-172	-0.0000206
100 %		- 20	836,499,810	-190	-0.0000227
100 %		- 10	836,499,902	-98	-0.0000117
100 %		0	836,499,968	-32	-0.0000038
100 %		+ 10	836,499,971	-29	-0.0000035
100 %		+ 20	836,499,957	-43	-0.0000052
100 %		+ 30	836,499,851	-149	-0.0000178
100 %		+ 40	836,499,802	-198	-0.0000237
100 %		+ 50	836,499,843	-157	-0.0000187
BATT. ENDPOINT	3.45	+ 20	836,499,844	-156	-0.0000187

**Table 7-234. Frequency Stability Data (Band 5)**

FCC ID: ZNFL413DL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 149 of 155

**Band 5 Frequency Stability Measurements**  
§2.1055 §22.355 RSS-132(5.3)



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

FCC ID: ZNFL413DL	 <b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>MEASUREMENT REPORT</b> (CERTIFICATION)	 <b>LG</b>	<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1.ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset		Page 150 of 155

**Band 66 Frequency Stability Measurements**  
§2.1055 §§27.54 RSS-139(6.4)

OPERATING FREQUENCY: 1,745,000,000 Hz  
 CHANNEL: 132322  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,744,999,812	-188	-0.0000108
100 %		- 30	1,744,999,896	-104	-0.0000059
100 %		- 20	1,744,999,985	-15	-0.0000009
100 %		- 10	1,744,999,944	-56	-0.0000032
100 %		0	1,744,999,811	-189	-0.0000109
100 %		+ 10	1,744,999,828	-172	-0.0000099
100 %		+ 20	1,744,999,937	-63	-0.0000036
100 %		+ 30	1,744,999,830	-170	-0.0000097
100 %		+ 40	1,744,999,995	-5	-0.0000003
100 %		+ 50	1,744,999,824	-176	-0.0000101
BATT. ENDPOINT		3.45	+ 20	1,744,999,937	-63

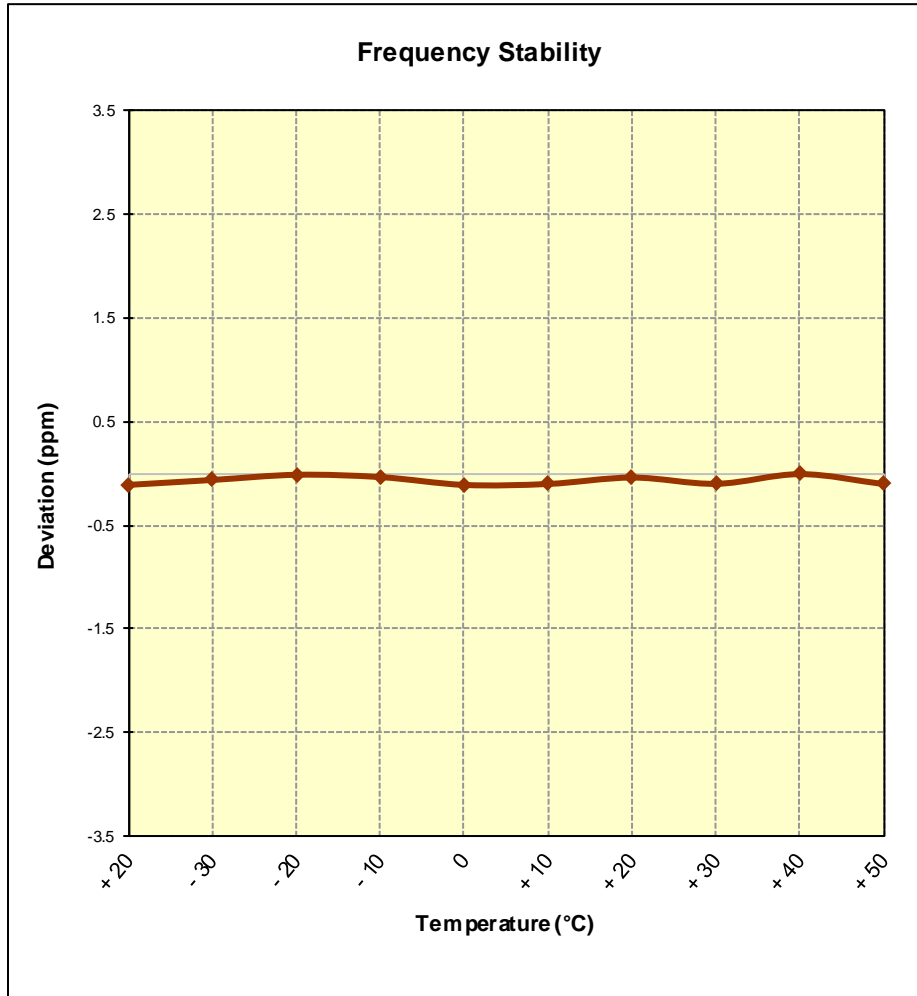
**Table 7-235. Frequency Stability Data (Band 66)**

**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: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 151 of 155	

**Band 66 Frequency Stability Measurements**  
**§2.1055 §§27.54 RSS-139(6.4)**



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

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 152 of 155

**Band 2 Frequency Stability Measurements**  
**§2.1055 §24.235 RSS-133(6.3)**

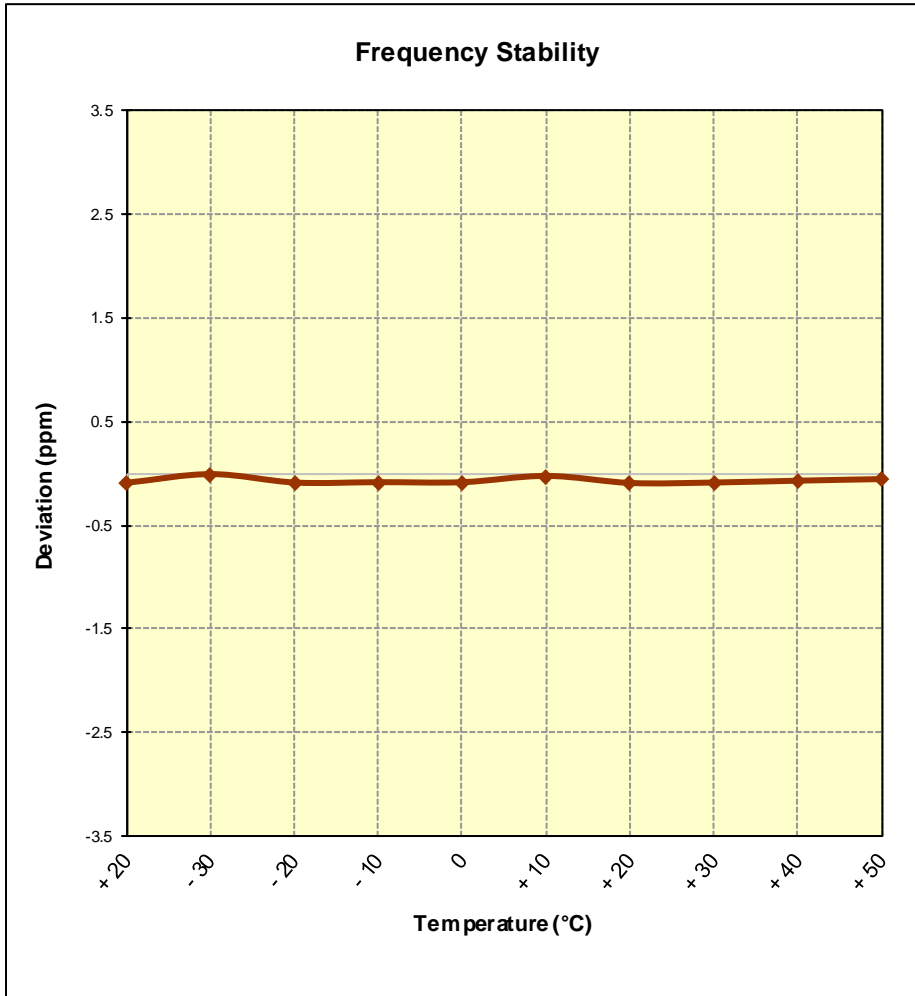
OPERATING FREQUENCY: 1,880,000,000 Hz  
 CHANNEL: 18900  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,813	-187	-0.0000100
100 %		- 30	1,879,999,970	-30	-0.0000016
100 %		- 20	1,879,999,816	-184	-0.0000098
100 %		- 10	1,879,999,823	-177	-0.0000094
100 %		0	1,879,999,823	-177	-0.0000094
100 %		+ 10	1,879,999,938	-62	-0.0000033
100 %		+ 20	1,879,999,808	-192	-0.0000102
100 %		+ 30	1,879,999,817	-183	-0.0000097
100 %		+ 40	1,879,999,851	-149	-0.0000079
100 %		+ 50	1,879,999,880	-120	-0.0000064
BATT. ENDPOINT	3.45	+ 20	1,879,999,917	-83	-0.0000044

**Table 7-236. Frequency Stability Data (Band 2)**

FCC ID: ZNFL413DL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset	Page 153 of 155	

**Band 2 Frequency Stability Measurements**  
**§2.1055 §24.235 RSS-133(6.3)**



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

FCC ID: ZNFL413DL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1710270275-03-R1.ZNF	Test Dates: 10/30 - 11/13/2017	EUT Type: Portable Handset		Page 154 of 155

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LGE Portable Handset FCC ID: ZNFL413DL** complies with all the requirements of Part of the FCC Rules for LTE operation only.

<b>FCC ID:</b> ZNFL413DL	 <b>MEASUREMENT REPORT</b> <b>(CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1710270275-03-R1.ZNF	<b>Test Dates:</b> 10/30 - 11/13/2017	<b>EUT Type:</b> Portable Handset	Page 155 of 155