

7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m) §27.53(a.4)

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level for Band 30 is $> 43 + 10\log_{10}(P[\text{Watts}] \text{ at } 2300\text{-}2305\text{MHz} \text{ \& } 2345\text{-}2360\text{MHz}, > 55 + 10\log_{10}(P[\text{Watts}]) \text{ at } 2320\text{-}2324\text{MHz} \text{ \& } 2341\text{-}2345\text{MHz}, > 61 + 10\log_{10}(P[\text{Watts}]) \text{ at } 2324\text{-}2328\text{MHz} \text{ \& } 2337\text{-}2341\text{MHz}, > 67 + 10\log_{10}(P[\text{Watts}]) \text{ at } 2288\text{-}2292\text{MHz} \text{ \& } 2328\text{-}2337\text{MHz}, \text{ and } > 70 + 10\log_{10}(P[\text{Watts}]) \text{ at frequencies } < 2288\text{MHz} \text{ \& } > 2365\text{MHz}.$

The minimum permissible attenuation level for Band 7 is as noted in the Test Notes on the following page.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[\text{Watts}]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 v02r02 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW $\geq 1\%$ of the emission bandwidth
4. VBW $\geq 3 \times$ RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times$ Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

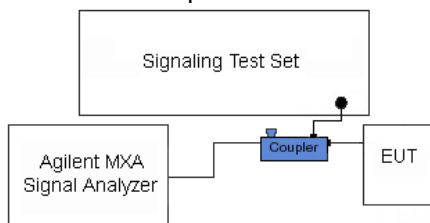


Figure 7-3. Test Instrument & Measurement Setup

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 70 of 160

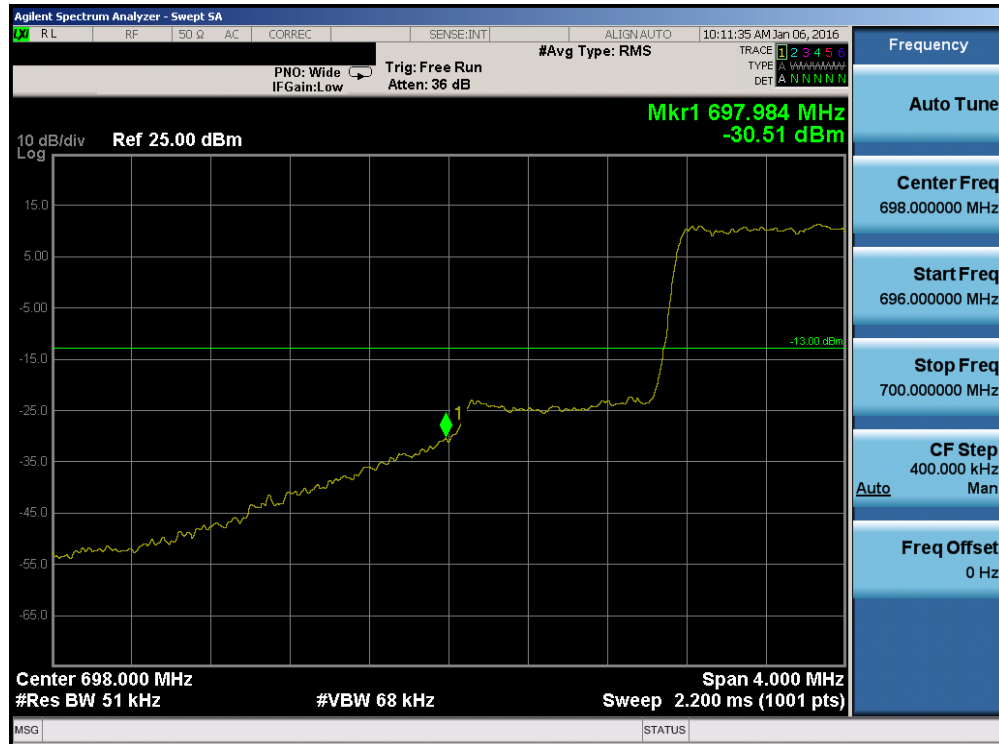
Test Notes

Per 22.917(b) 24.238(a) 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(a)(5) in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 1 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz.

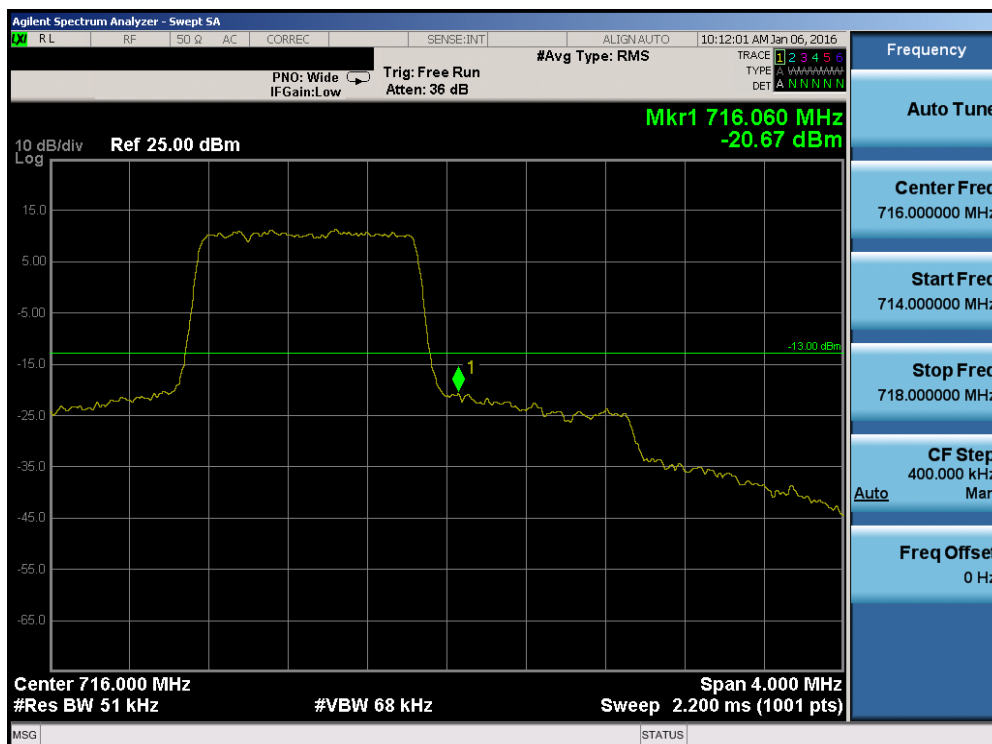


Plot 7-107. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 71 of 160



Plot 7-108. Lower Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

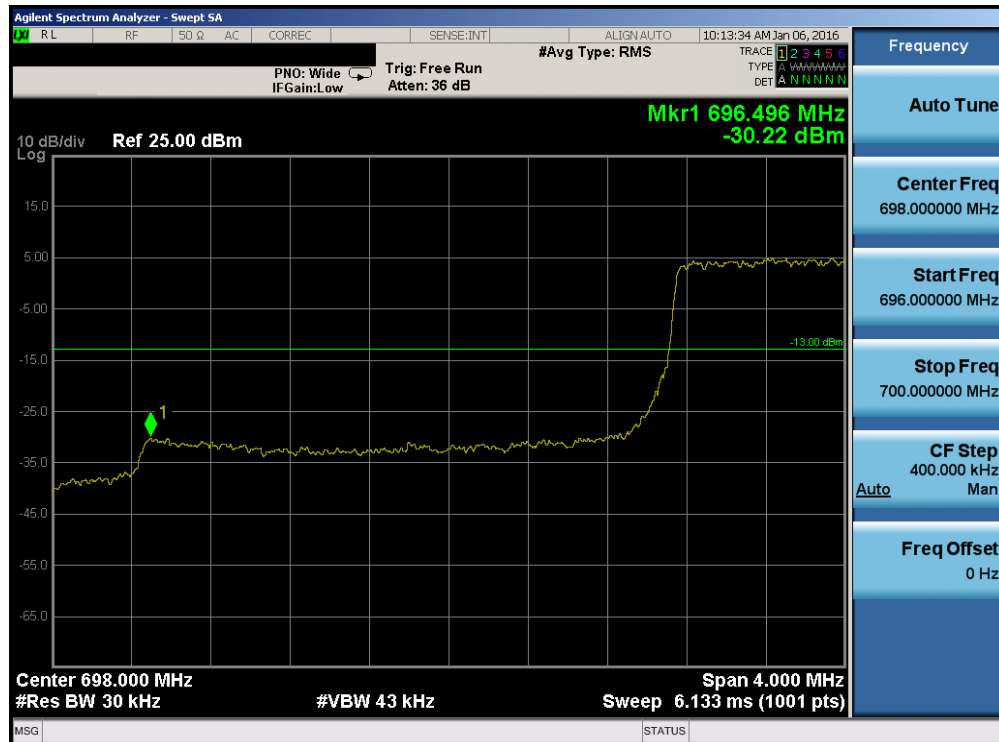


Plot 7-109. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 72 of 160

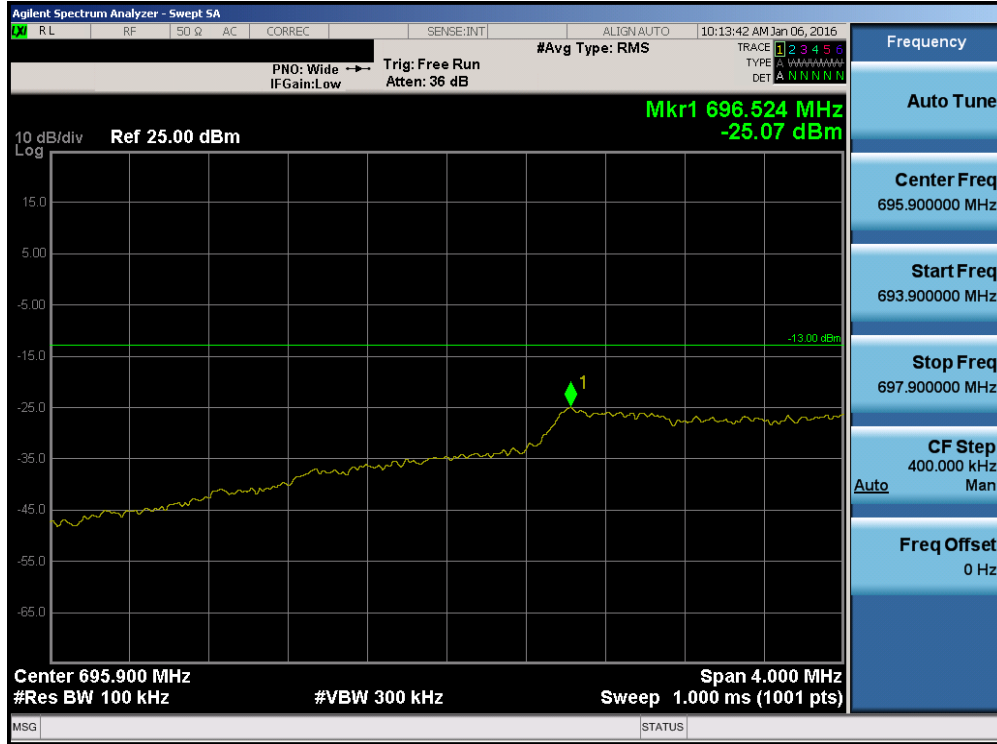


Plot 7-110. Upper Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

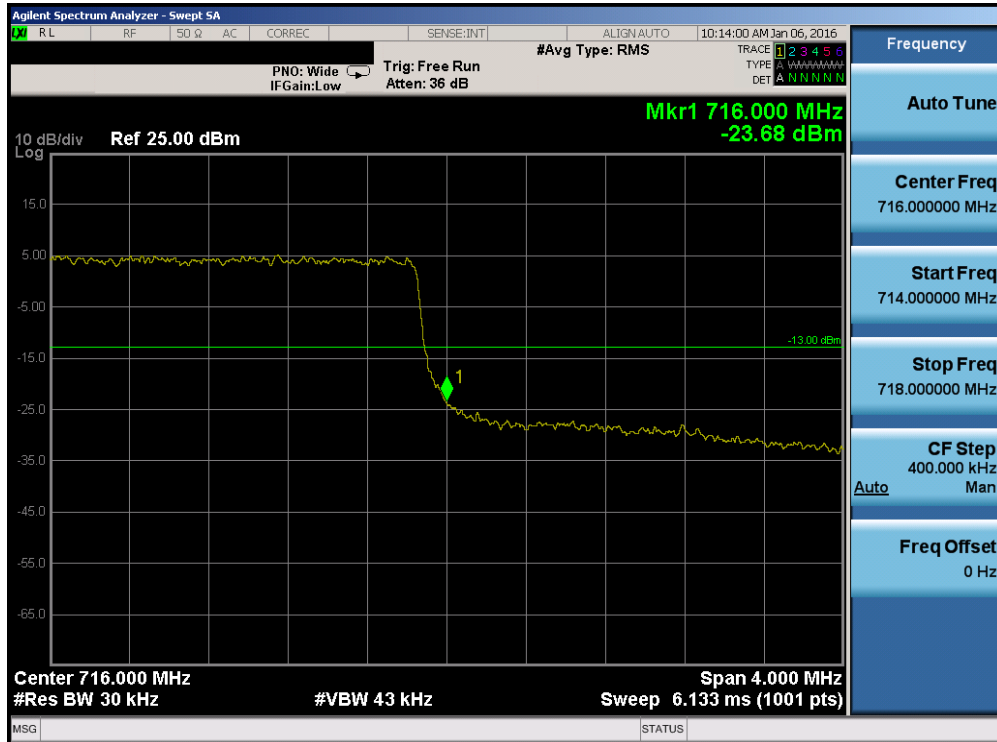


Plot 7-111. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 73 of 160

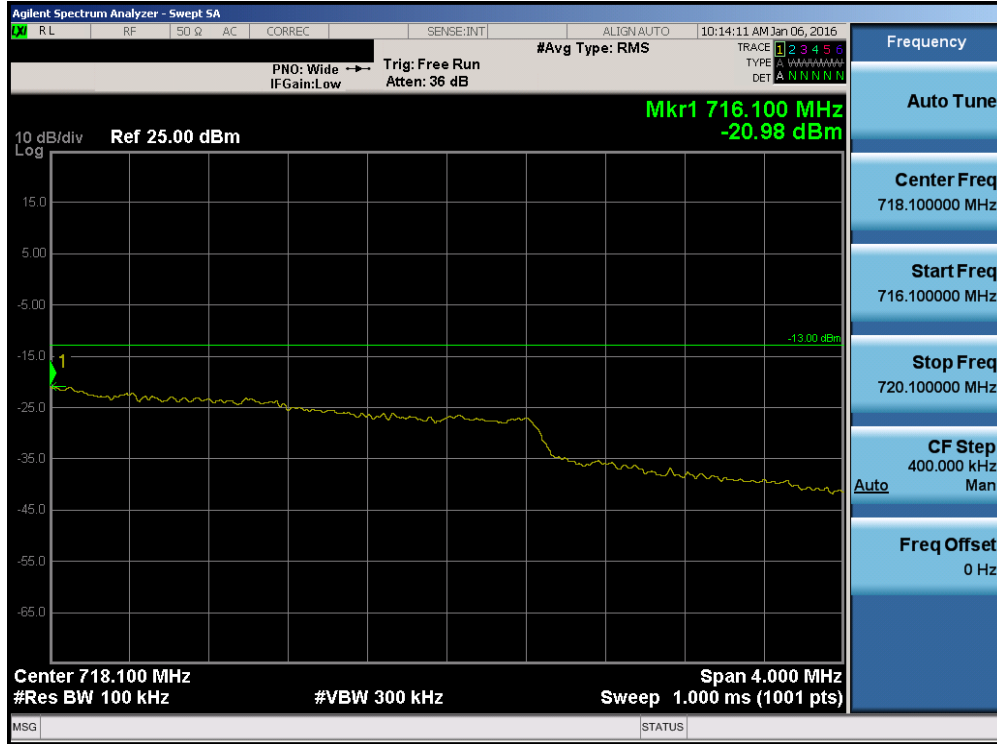


Plot 7-112. Lower Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

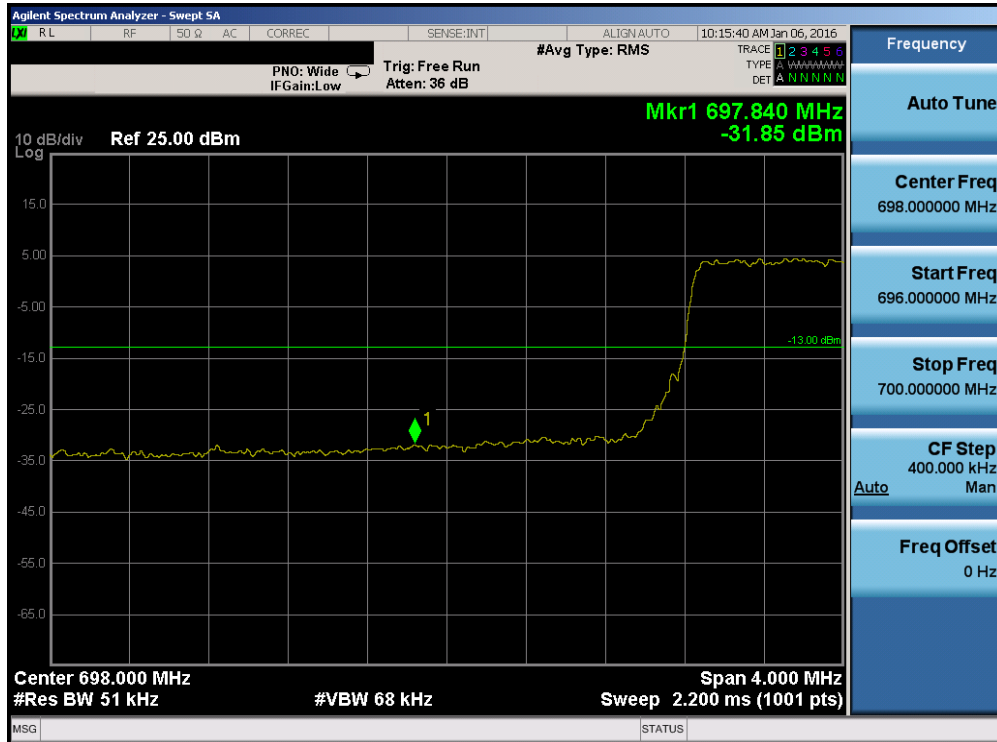


Plot 7-113. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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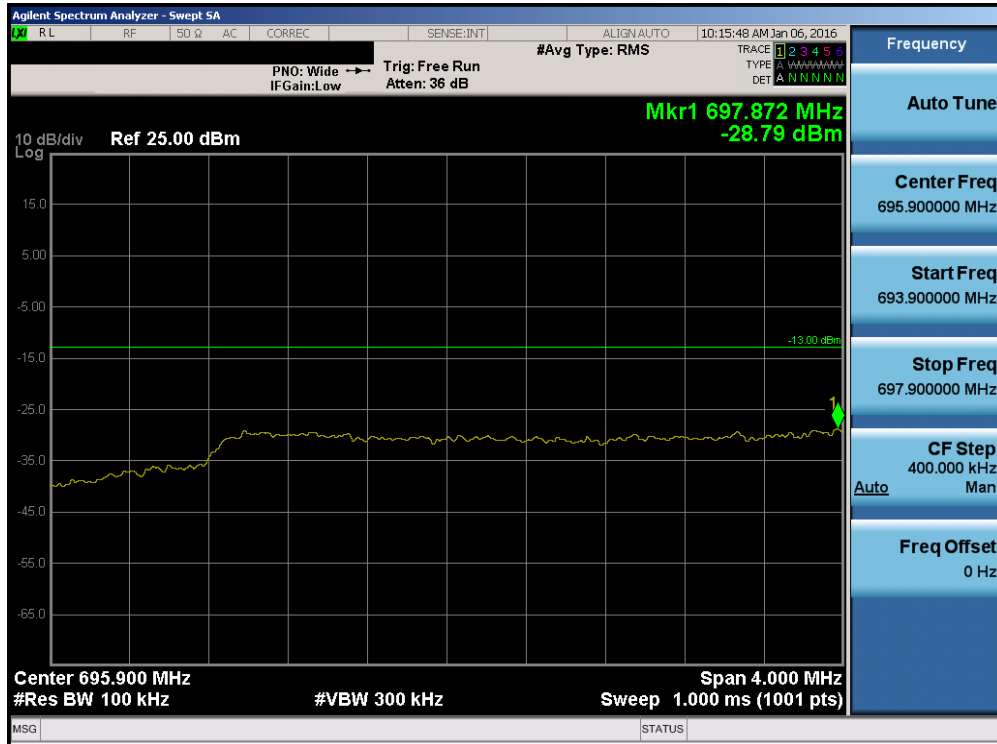


Plot 7-114. Upper Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

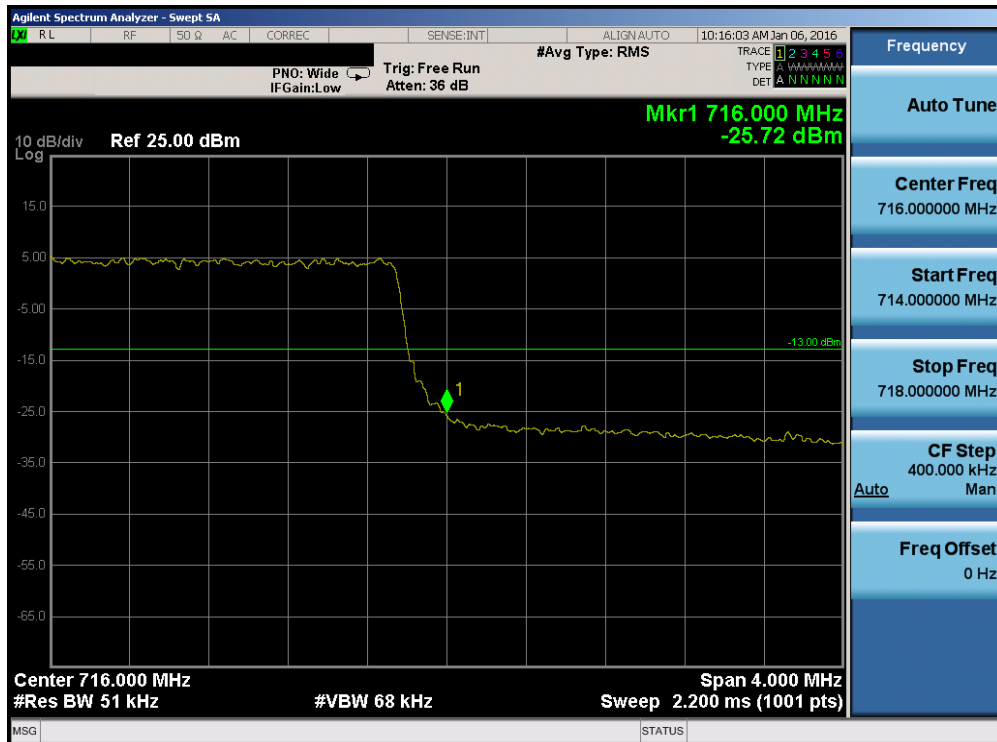


Plot 7-115. Lower Band Edge Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 75 of 160

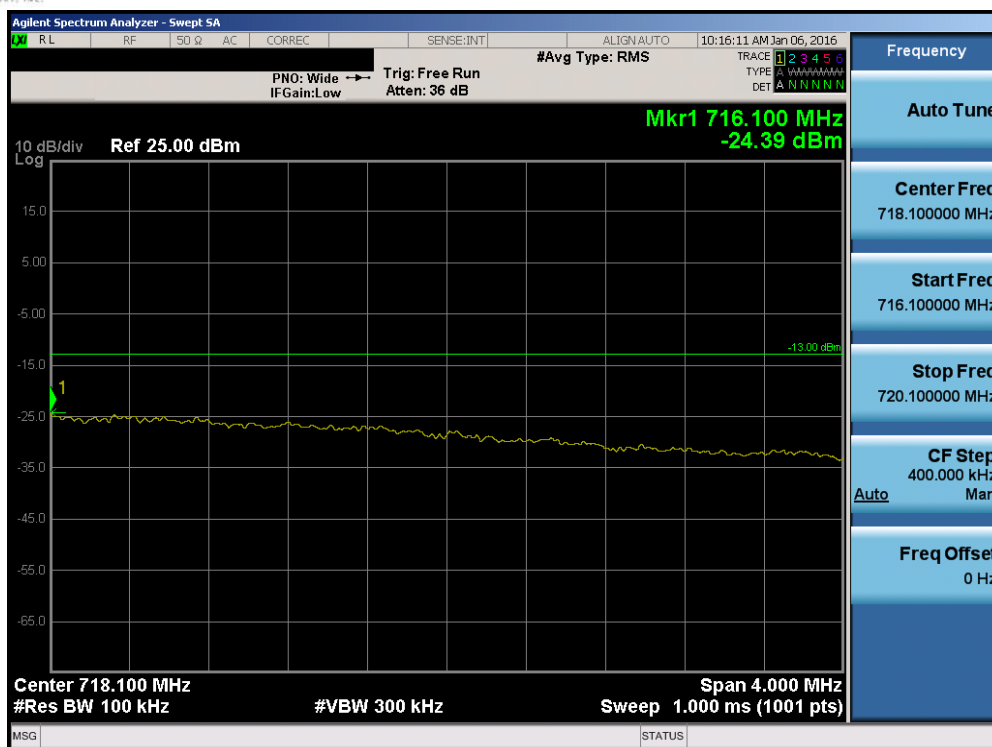


Plot 7-116. Lower Extended Band Edge Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

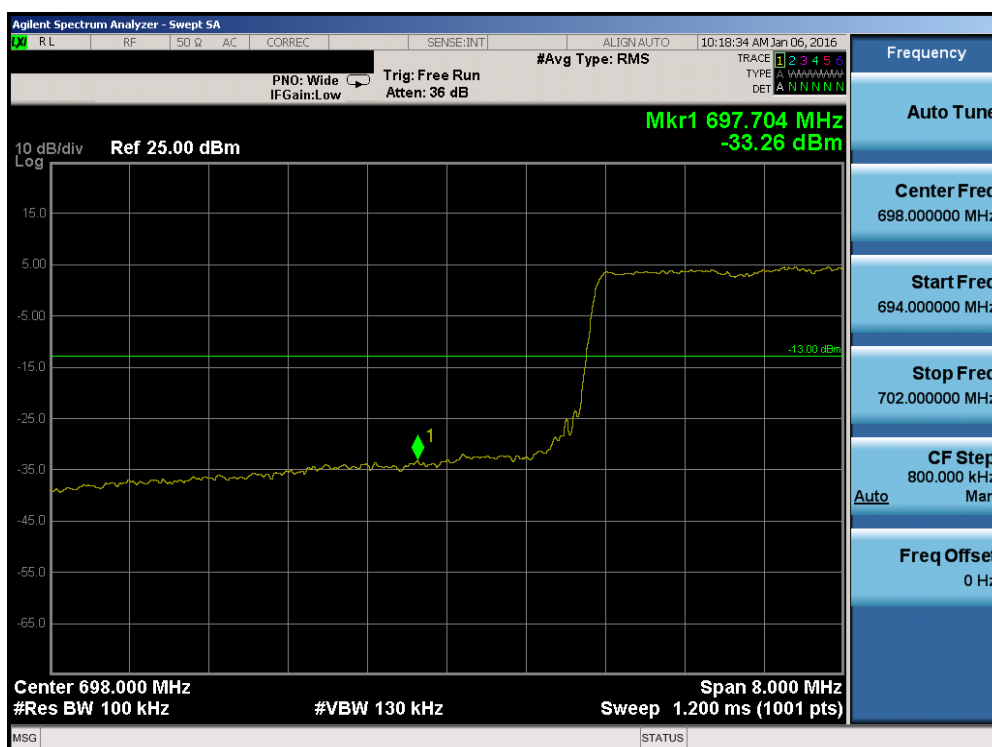


Plot 7-117. Upper Band Edge Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 76 of 160

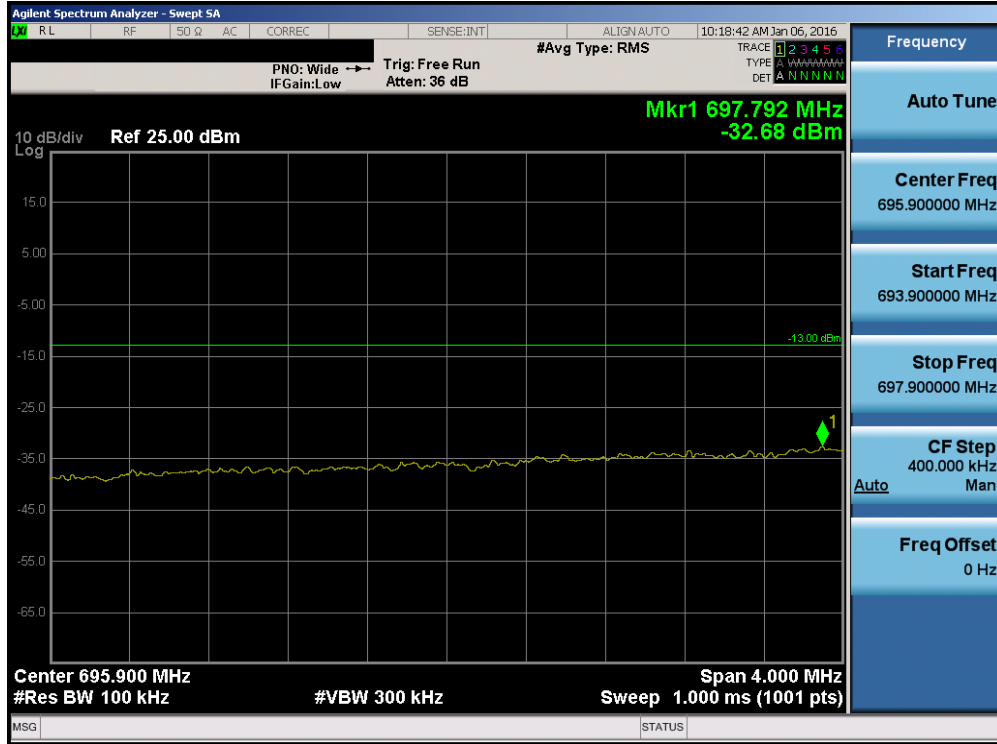


Plot 7-118. Upper Extended Band Edge Plot (Band 12/17 - 5.0MHz QPSK - RB Size 25)

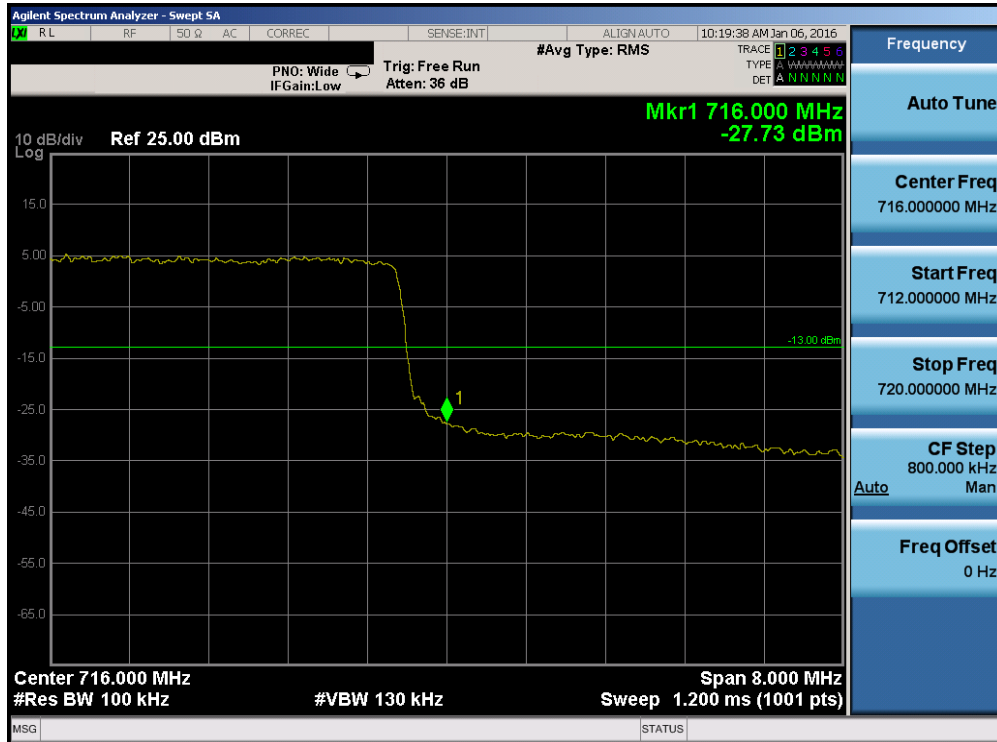


Plot 7-119. Lower Band Edge Plot (Band 12/17 - 10.0MHz QPSK - RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 77 of 160

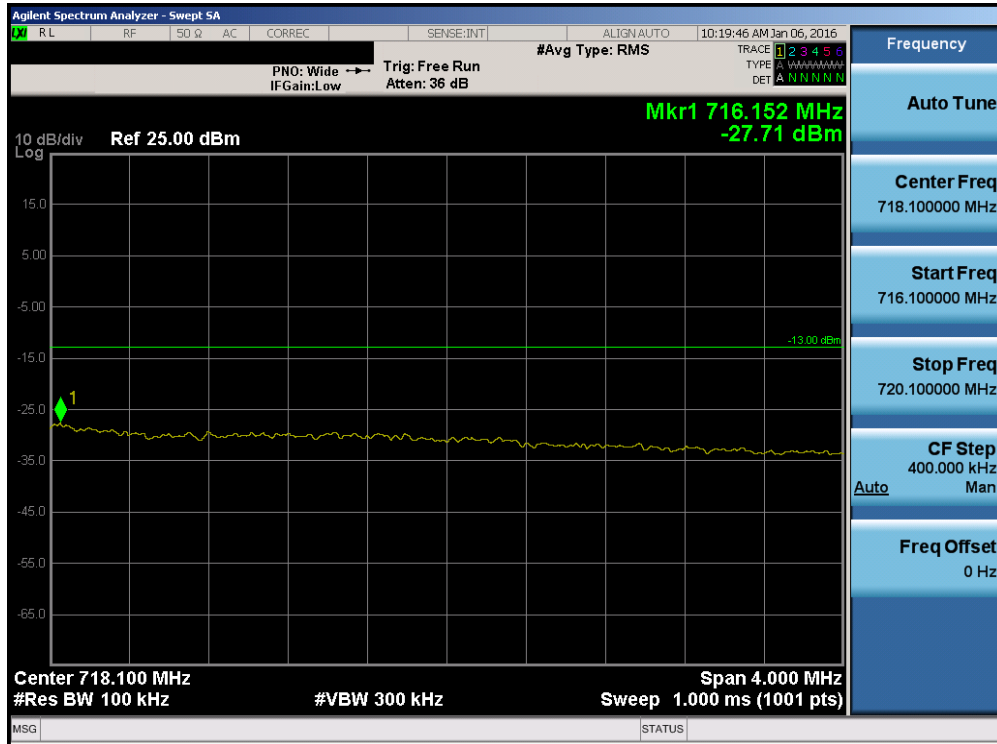


Plot 7-120. Lower Extended Band Edge Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)

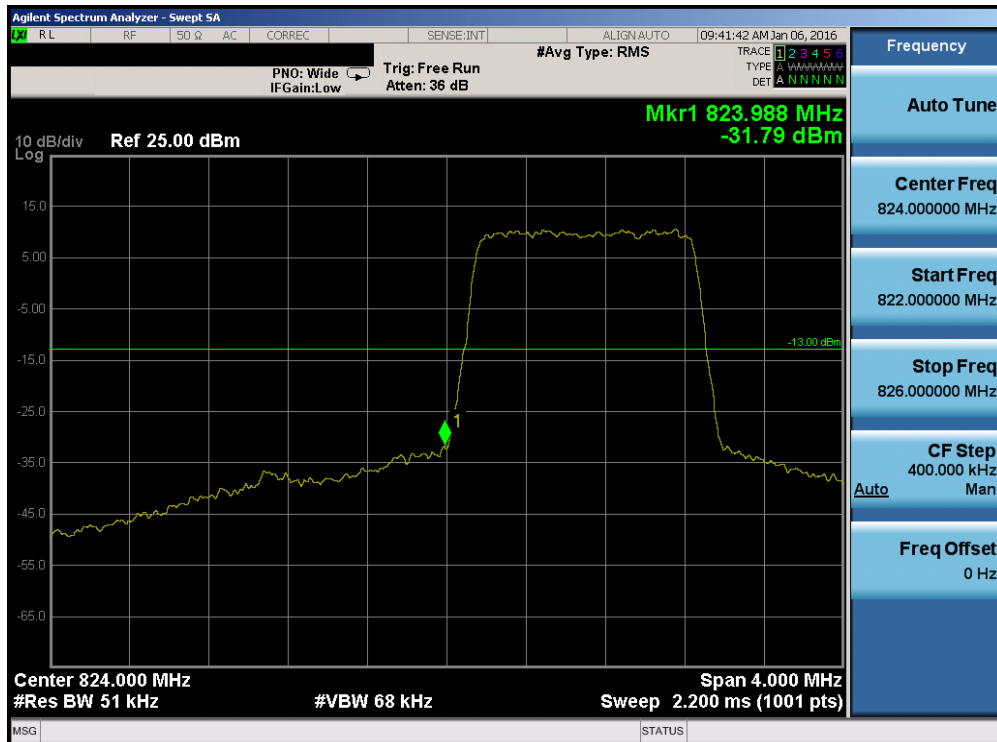


Plot 7-121. Upper Band Edge Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 78 of 160

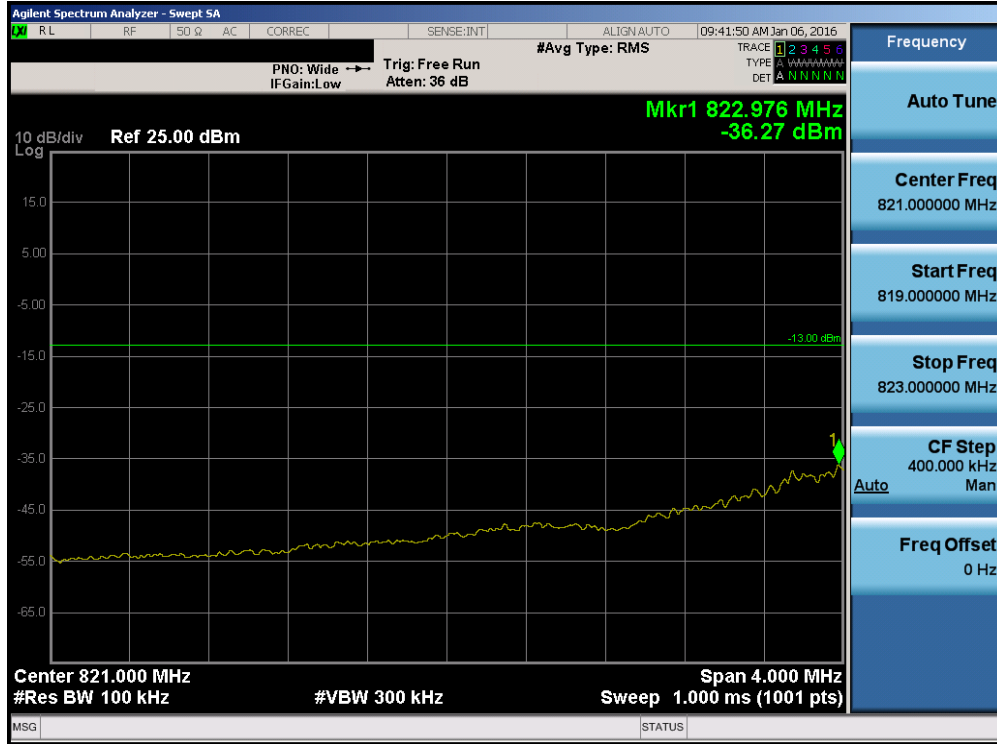


Plot 7-122. Upper Extended Band Edge Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)

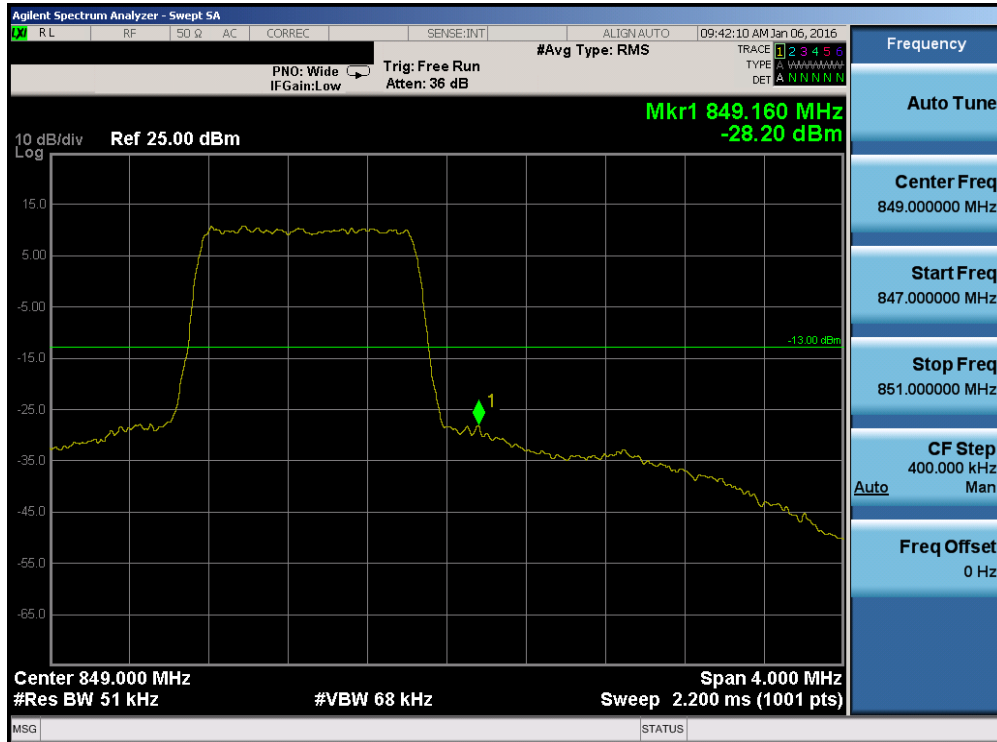


Plot 7-123. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 79 of 160



Plot 7-124. Lower Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

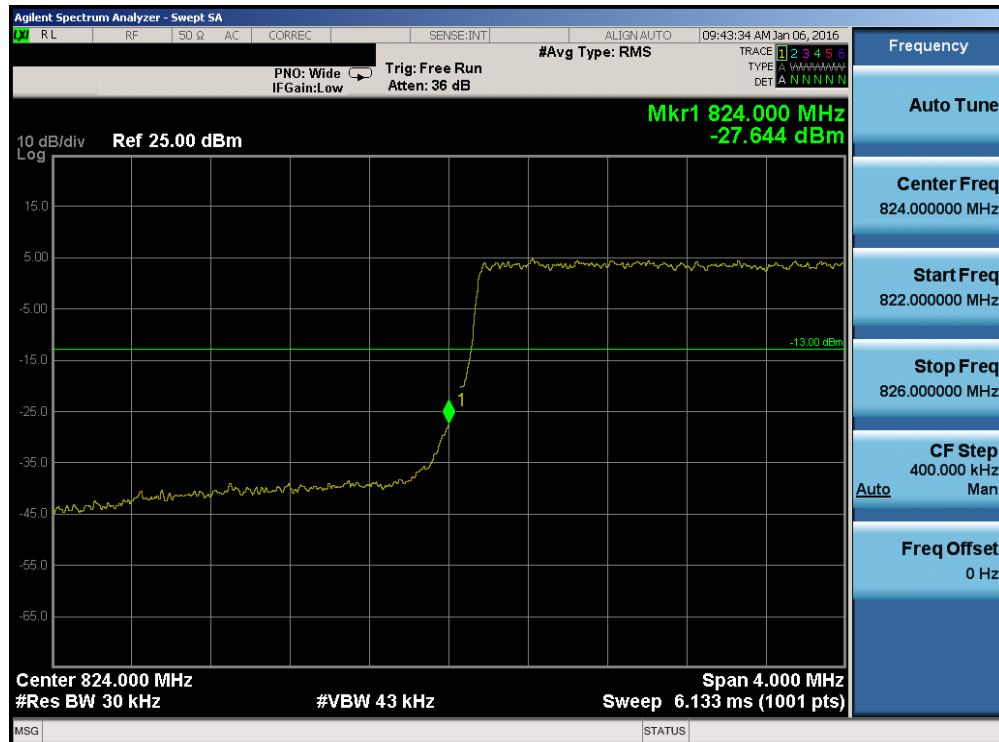


Plot 7-125. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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Plot 7-126. Upper Extended Band Edge Plot (Band 5 - 1.4MHz QPSK - RB Size 6)

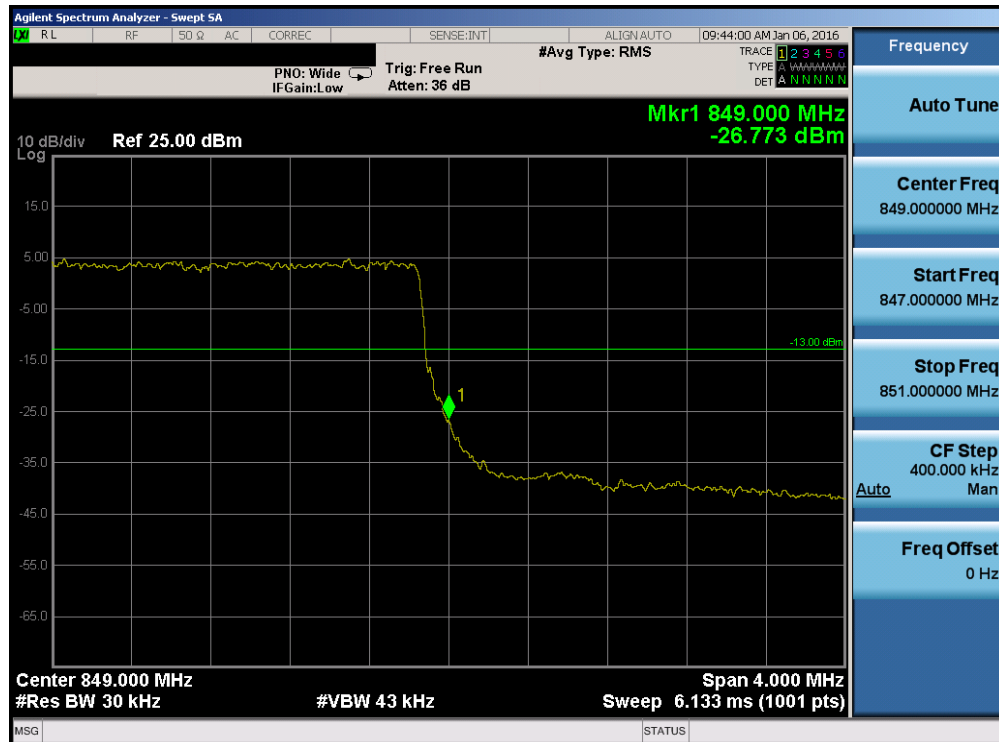


Plot 7-127. Lower Band Edge Plot (Band 5 - 3.0MHz QPSK - RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 81 of 160



Plot 7-128. Lower Extended Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

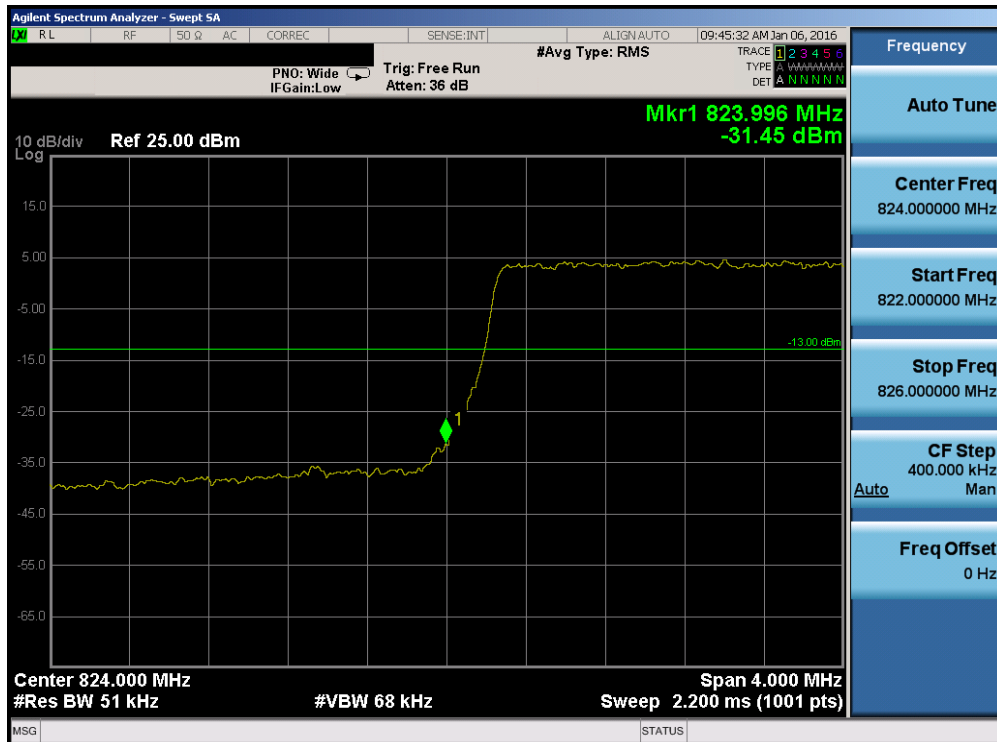


Plot 7-129. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 82 of 160

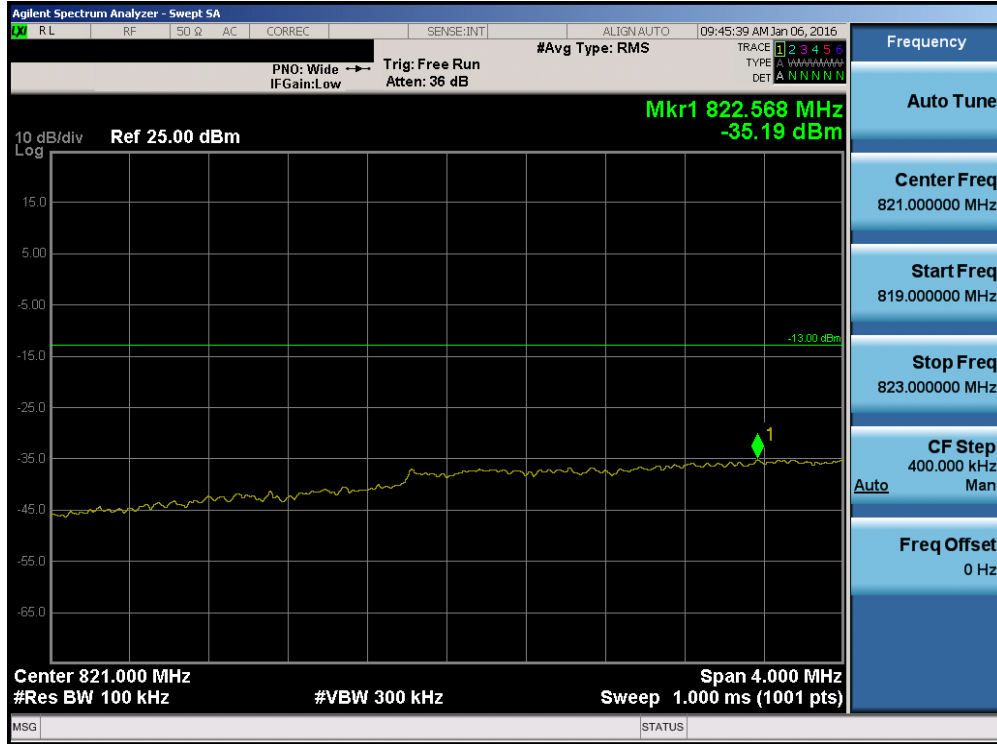


Plot 7-130. Upper Extended Band Edge Plot (Band 5 – Band 5 – 3.0MHz QPSK – RB Size 15)

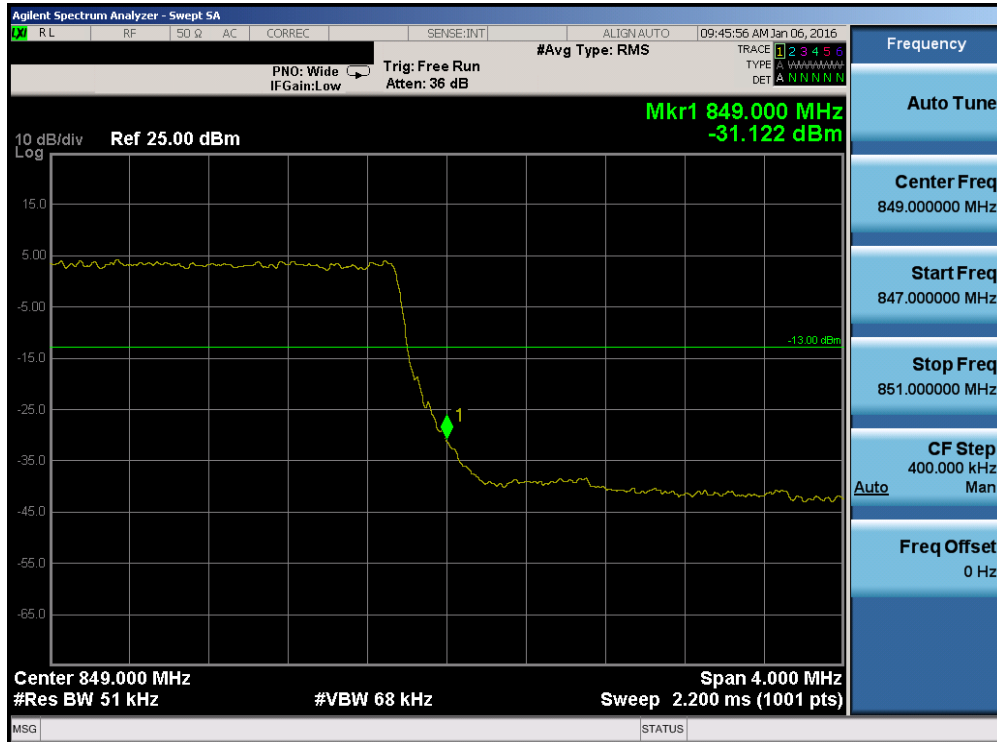


Plot 7-131. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 83 of 160

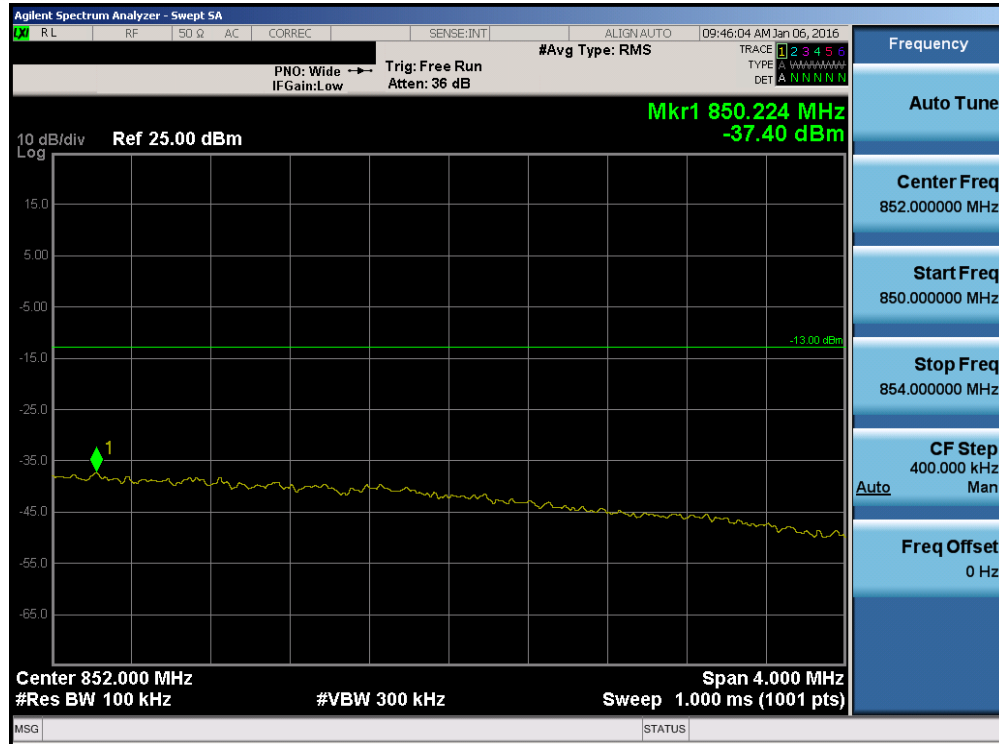


Plot 7-132. Lower Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

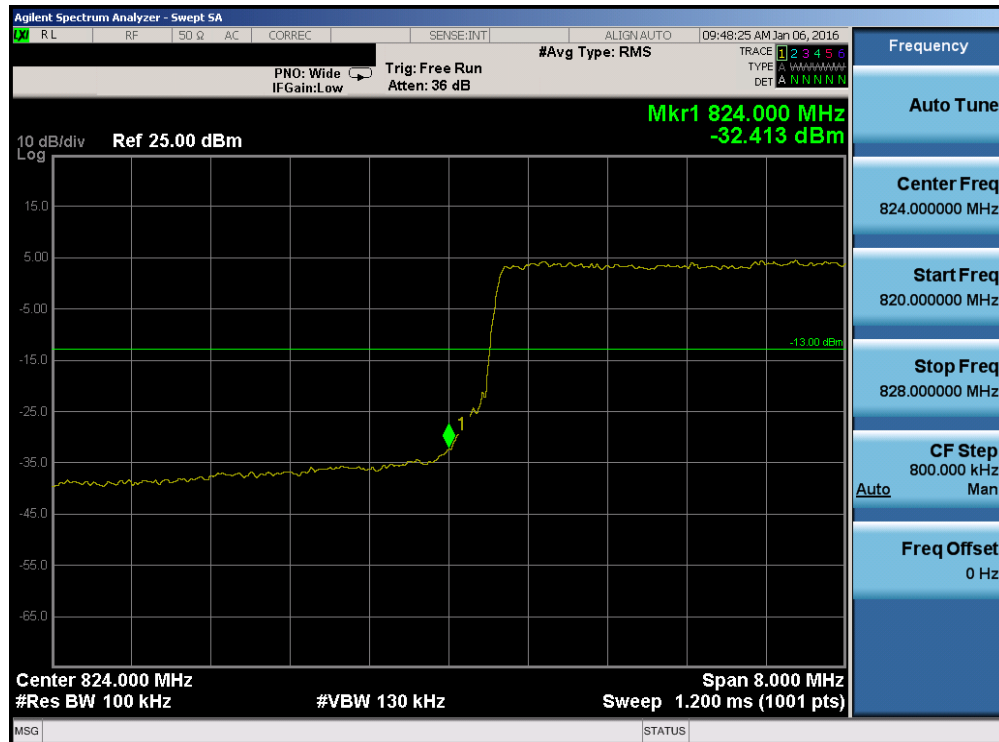


Plot 7-133. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 84 of 160

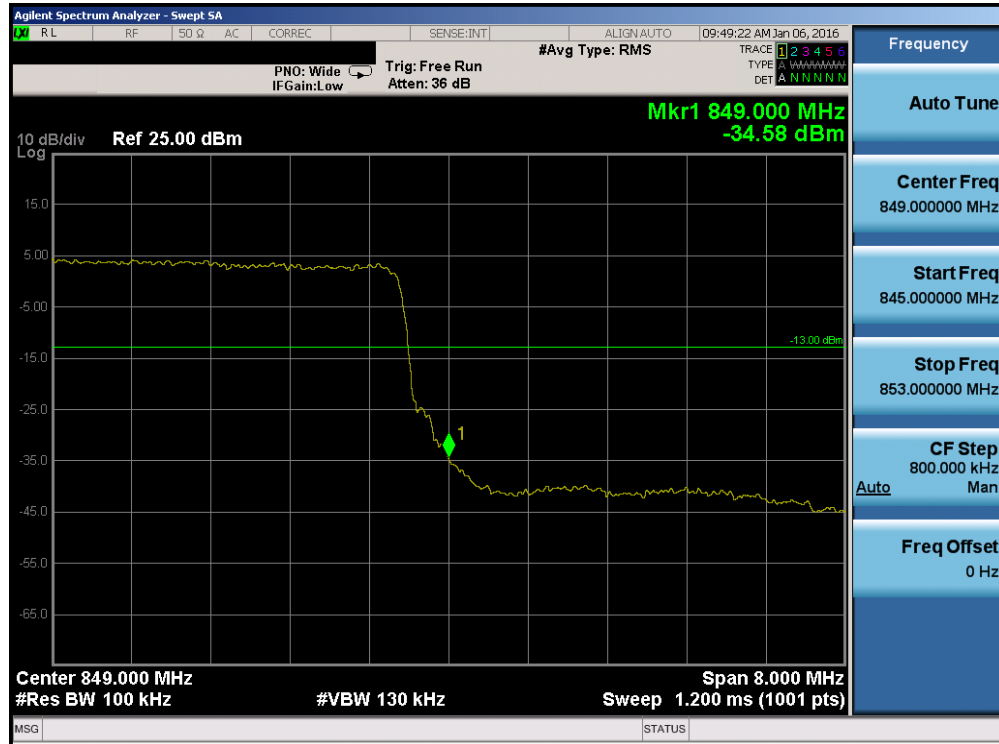


Plot 7-134. Upper Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

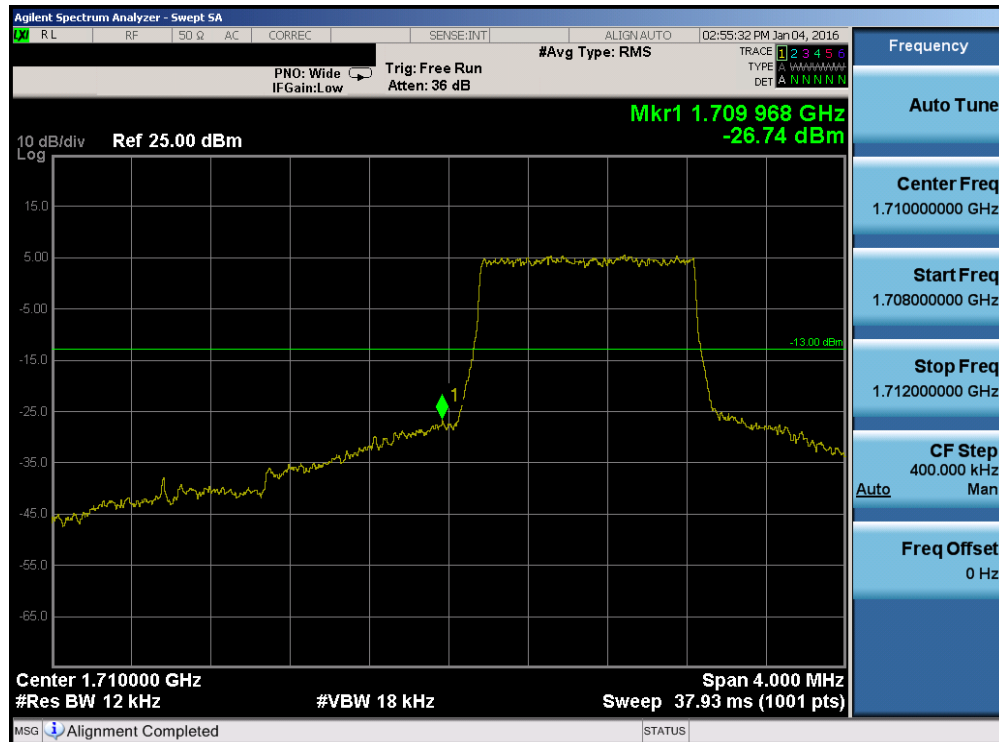


Plot 7-135. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 85 of 160

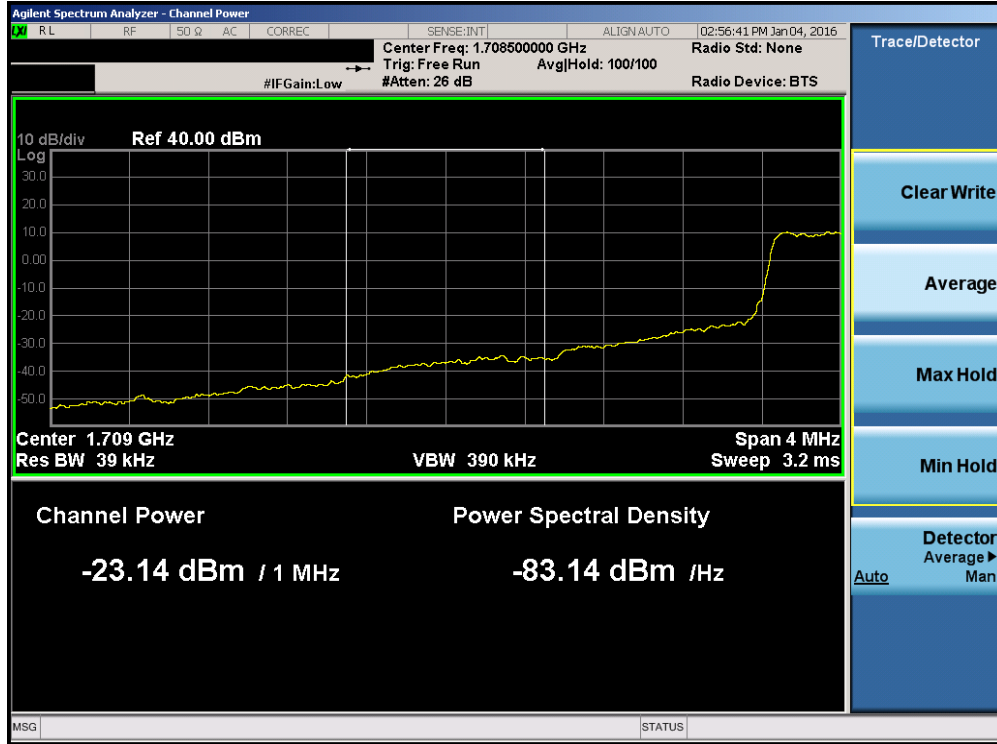


Plot 7-136. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - RB Size 50)

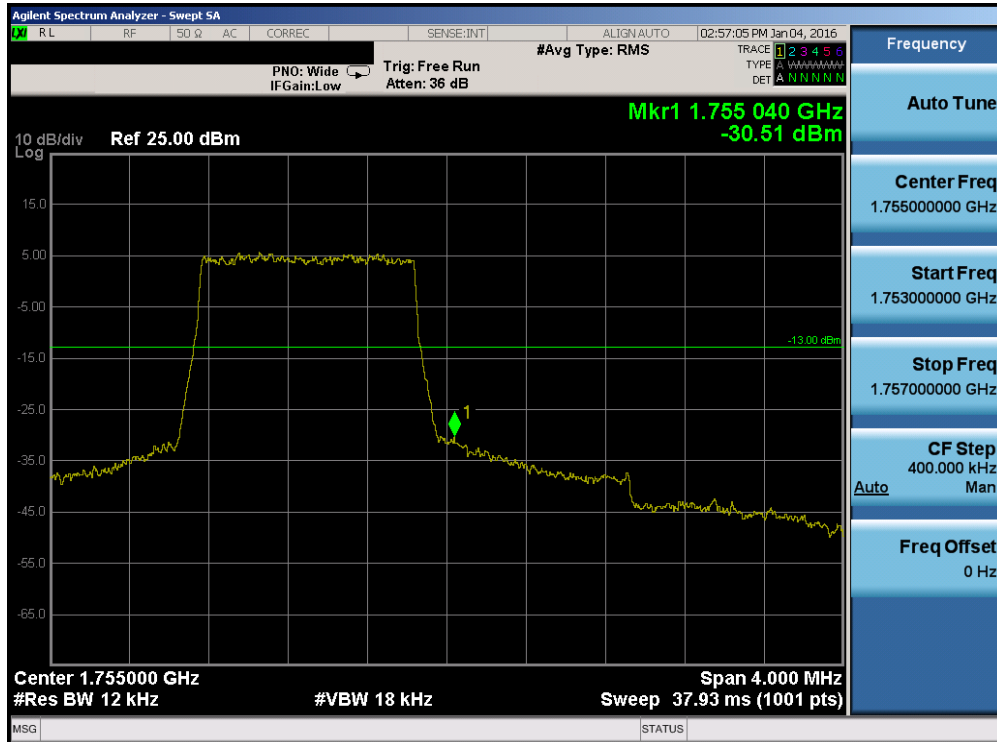


Plot 7-137. Lower Band Edge Plot (Band 4 - 1.4MHz QPSK - RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 86 of 160

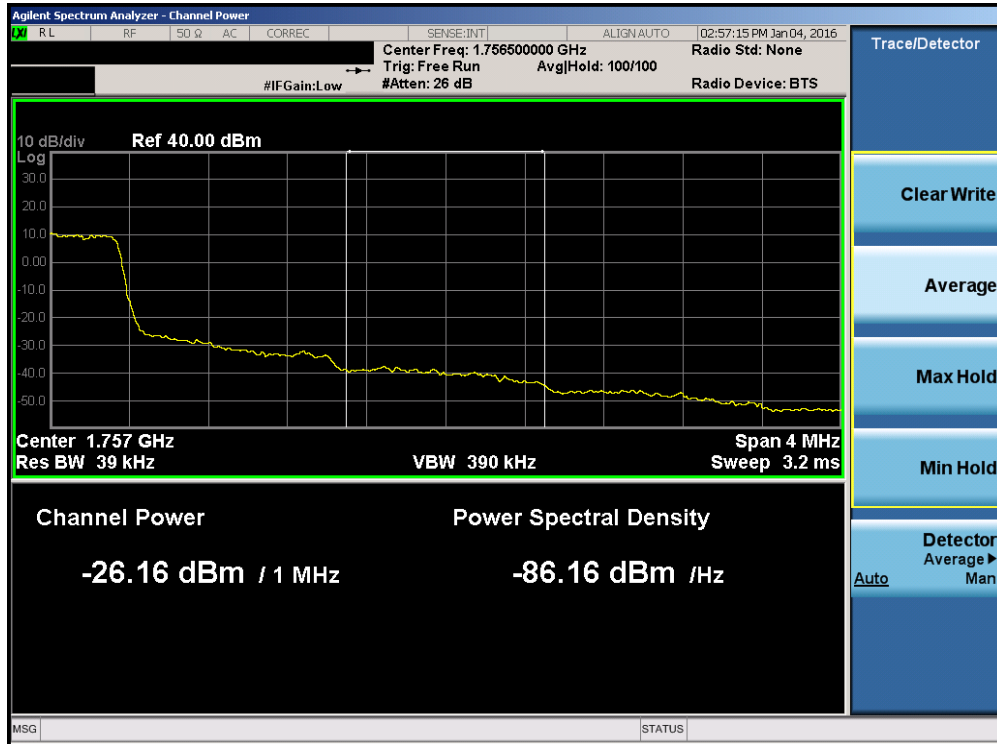


Plot 7-138. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

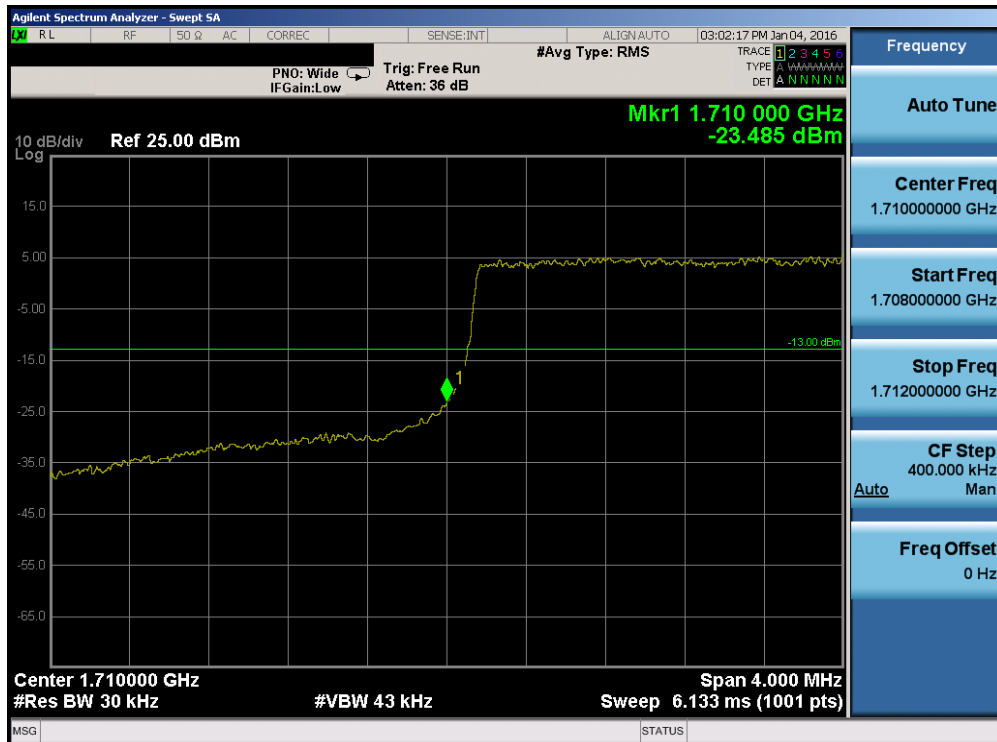


Plot 7-139. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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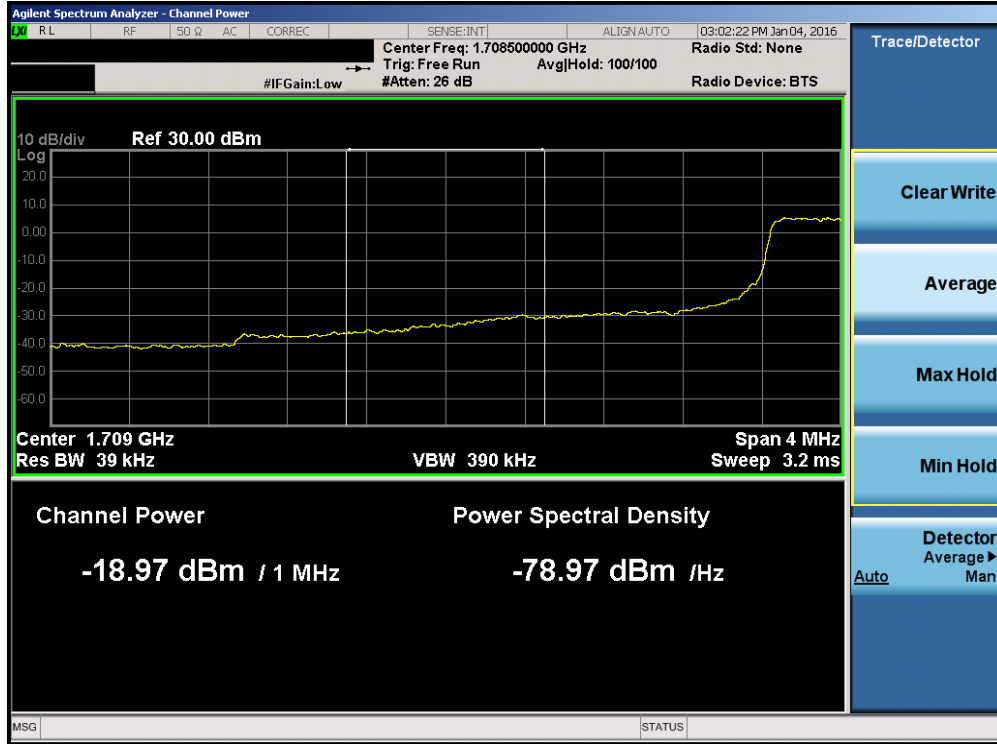


Plot 7-140. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

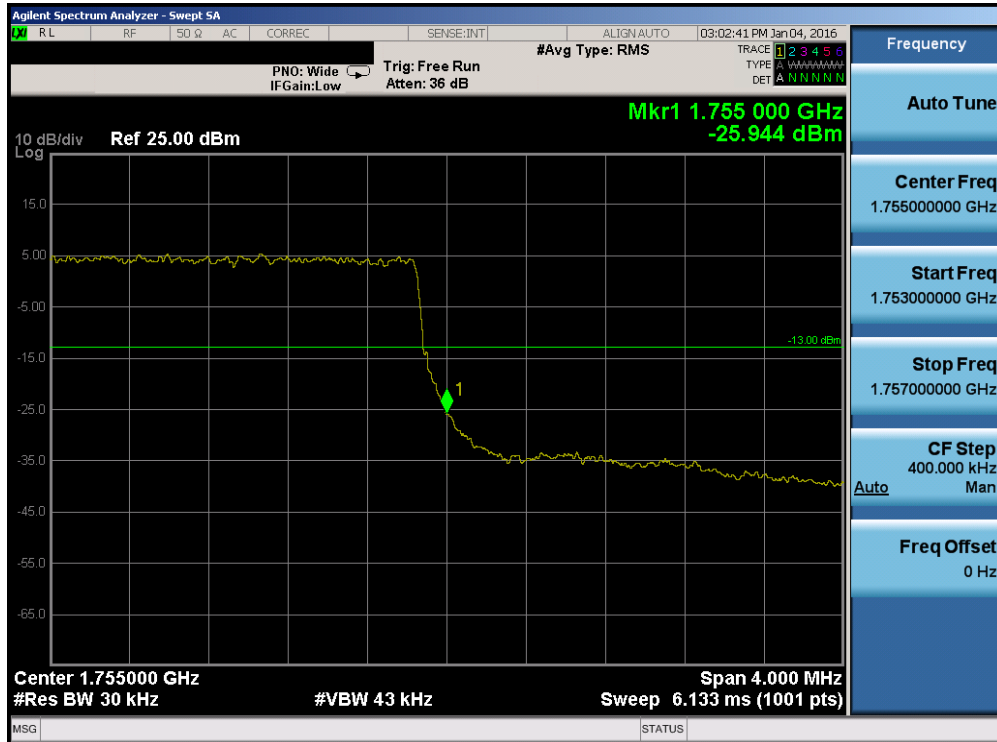


Plot 7-141. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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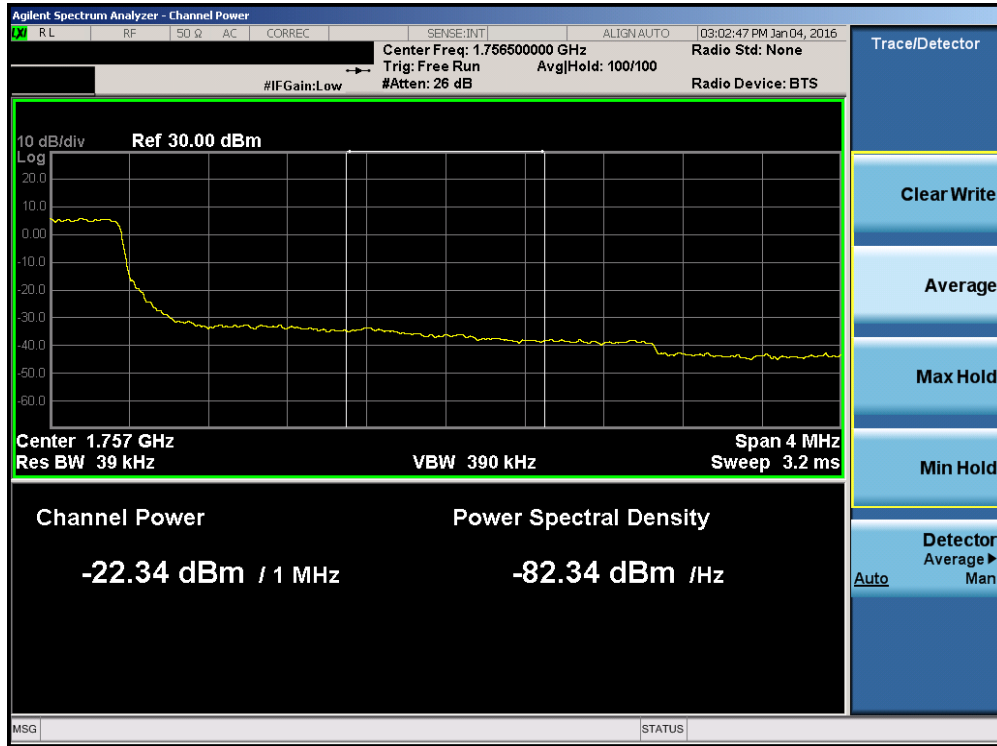


Plot 7-142. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

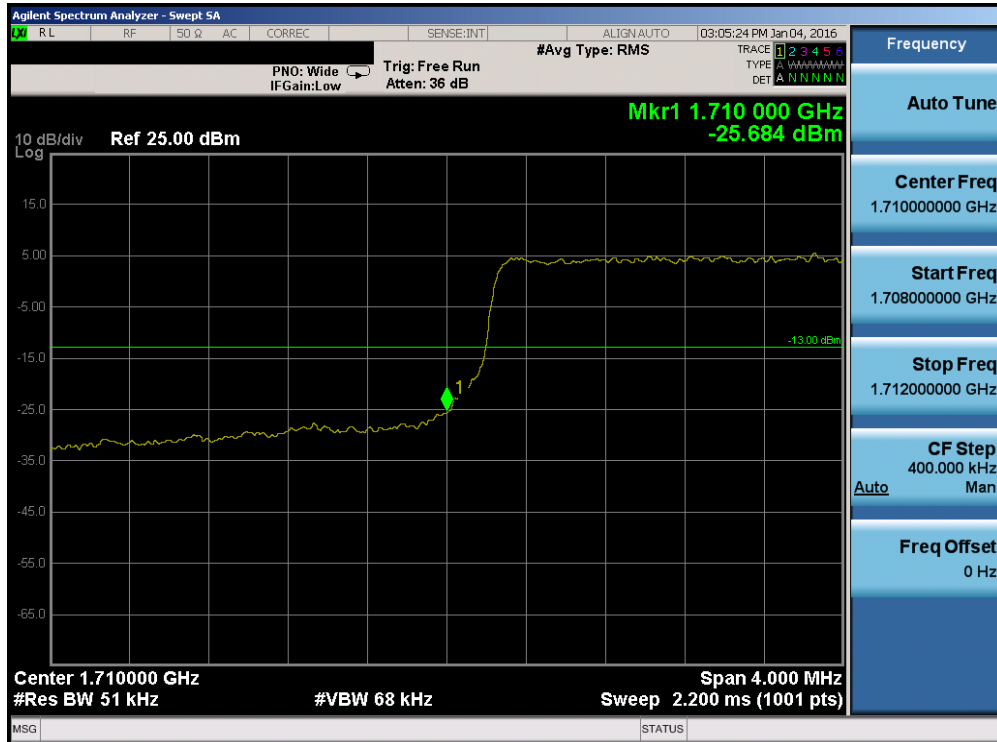


Plot 7-143. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 89 of 160

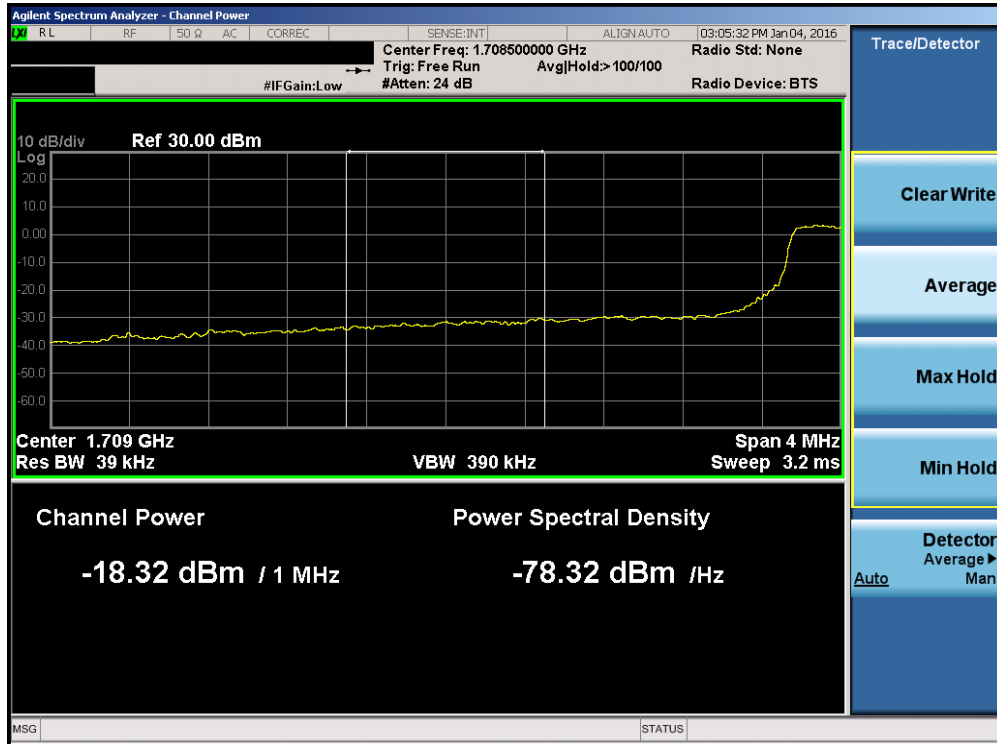


Plot 7-144. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



Plot 7-145. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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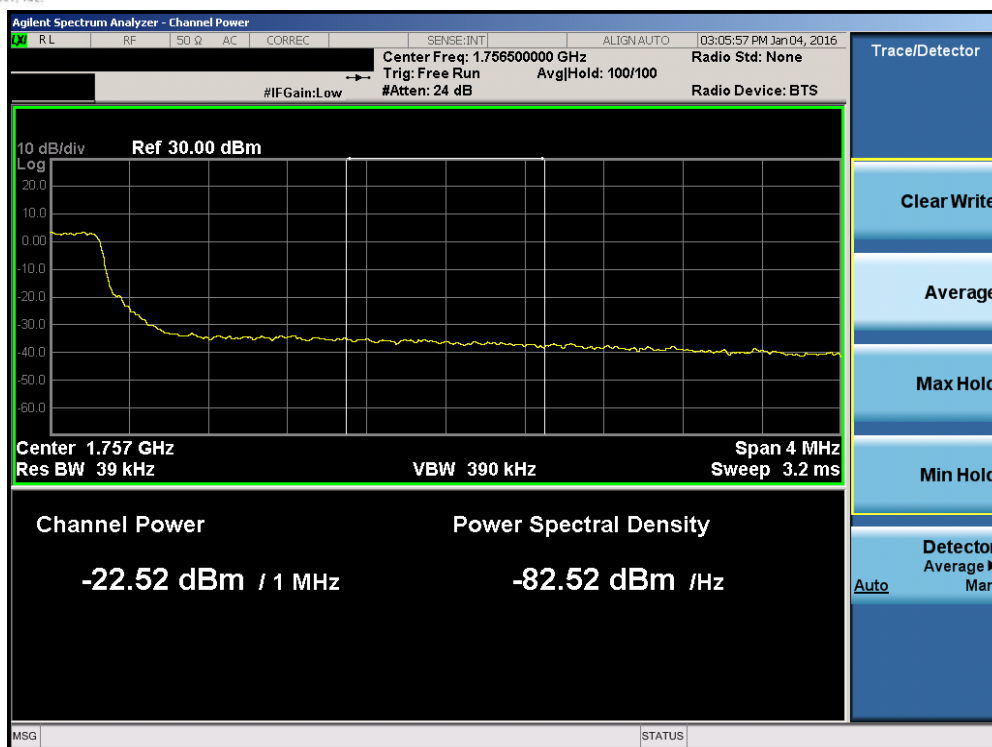


Plot 7-146. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

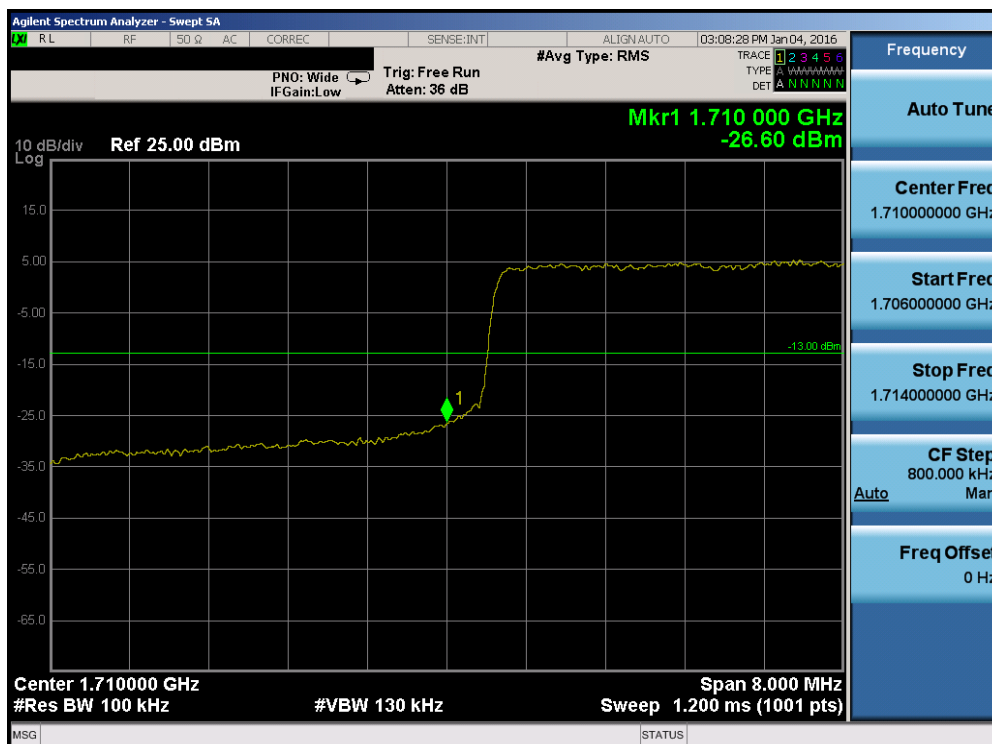


Plot 7-147. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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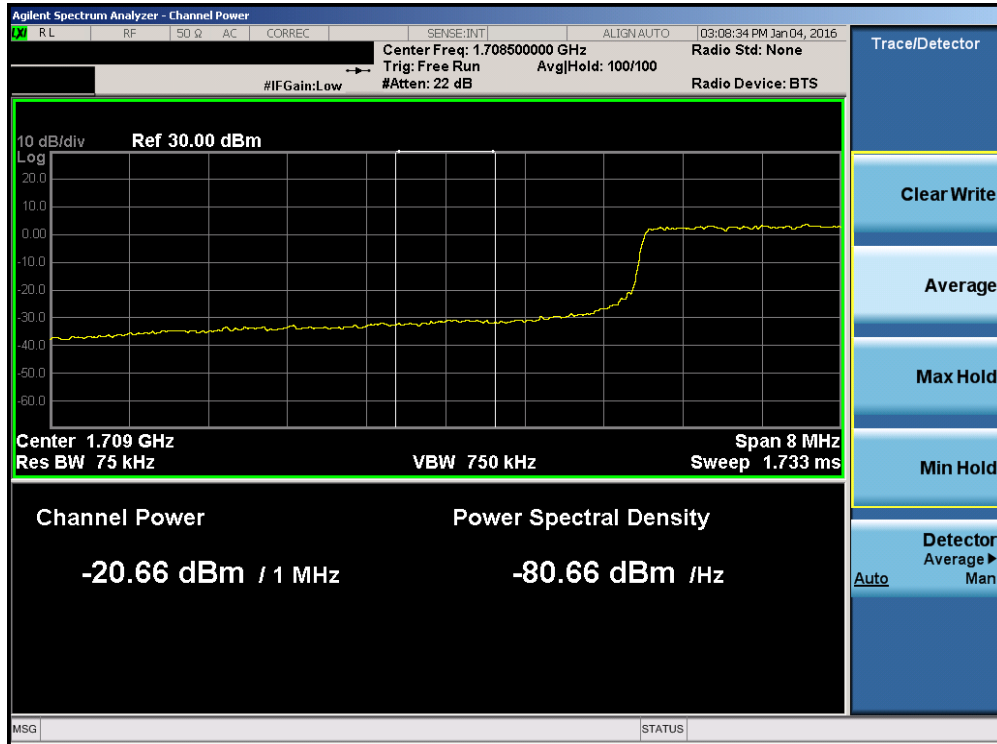


Plot 7-148. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

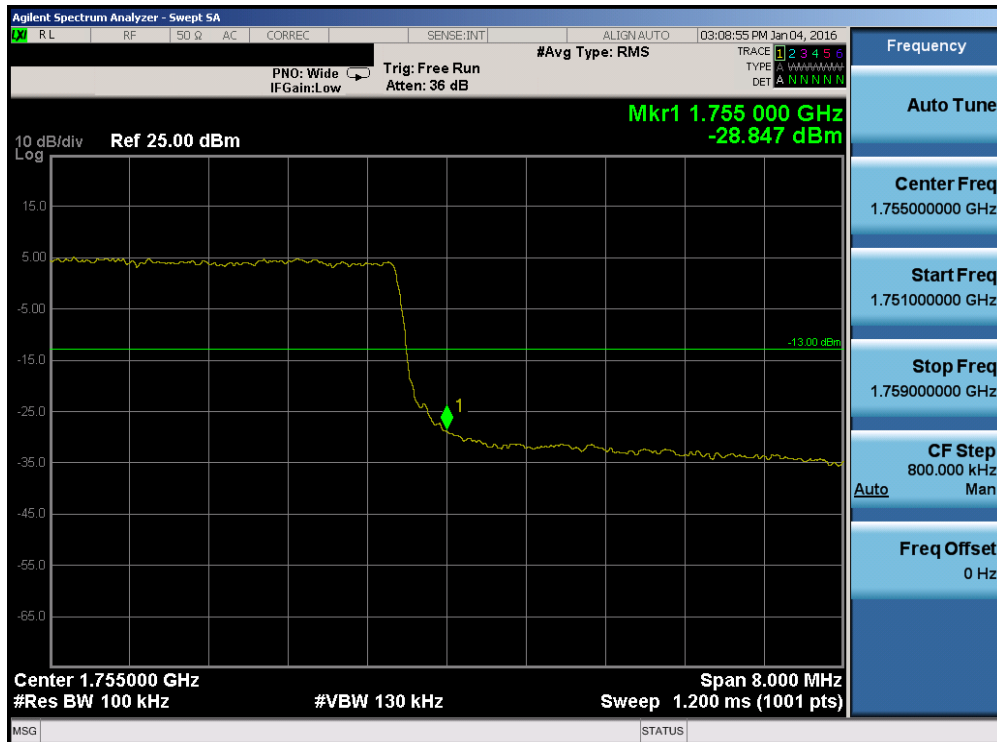


Plot 7-149. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
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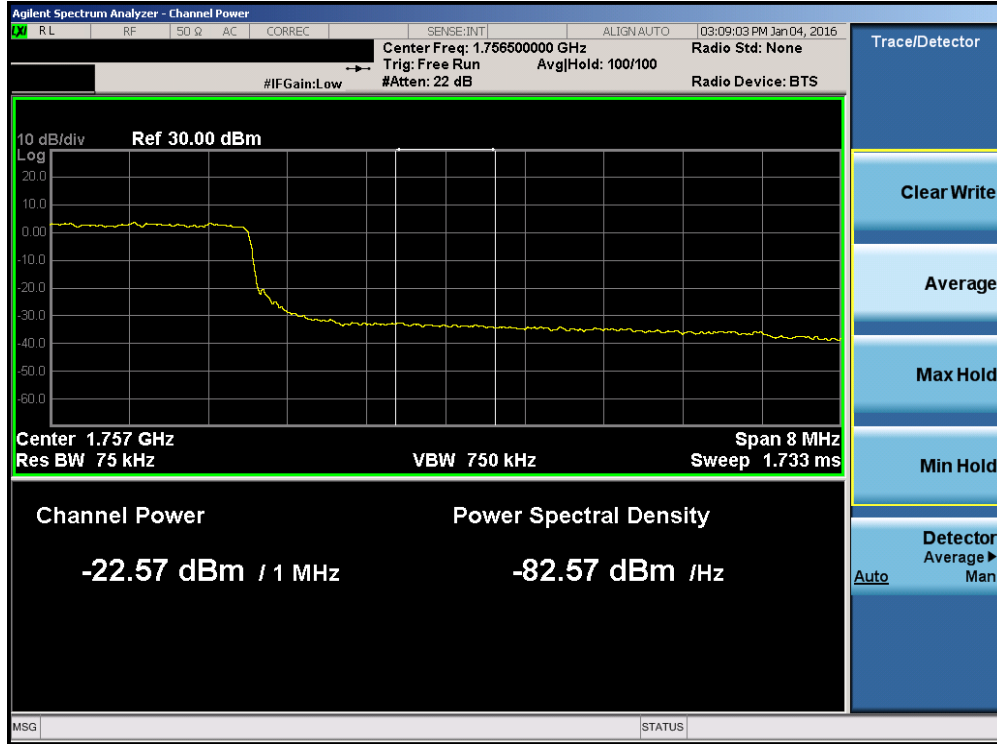


Plot 7-150. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

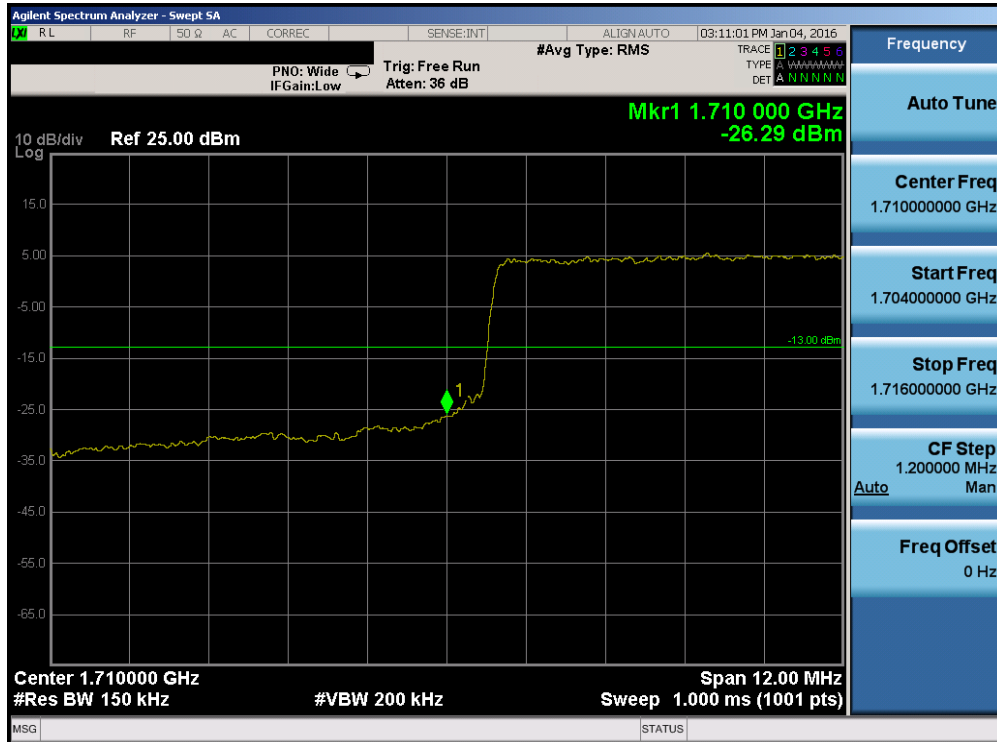


Plot 7-151. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 93 of 160

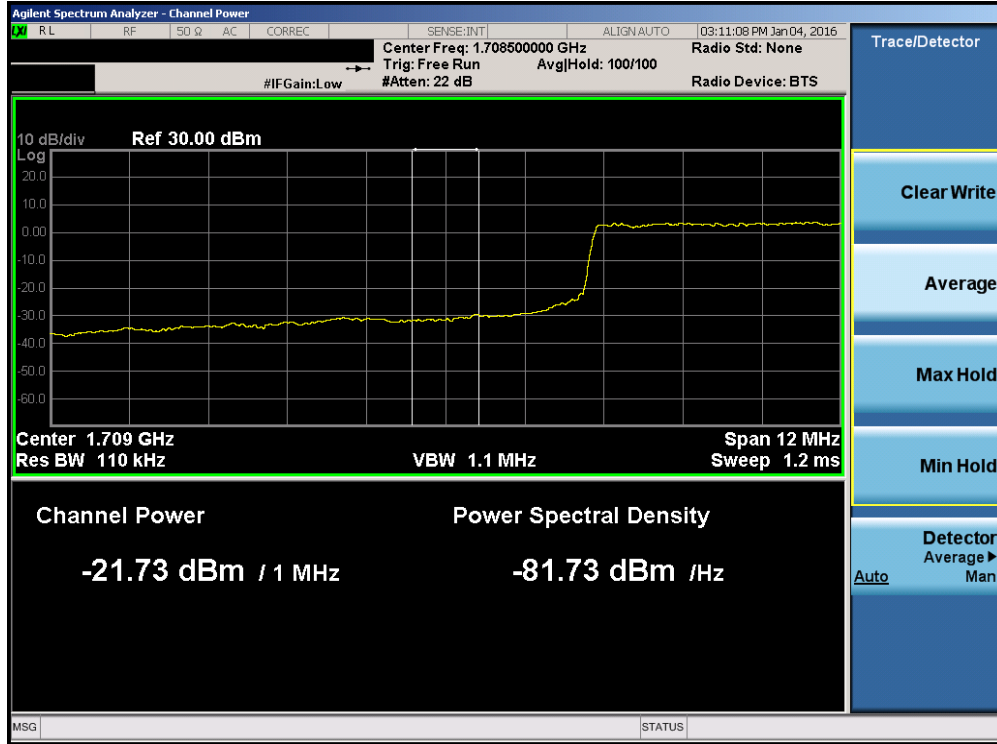


Plot 7-152. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

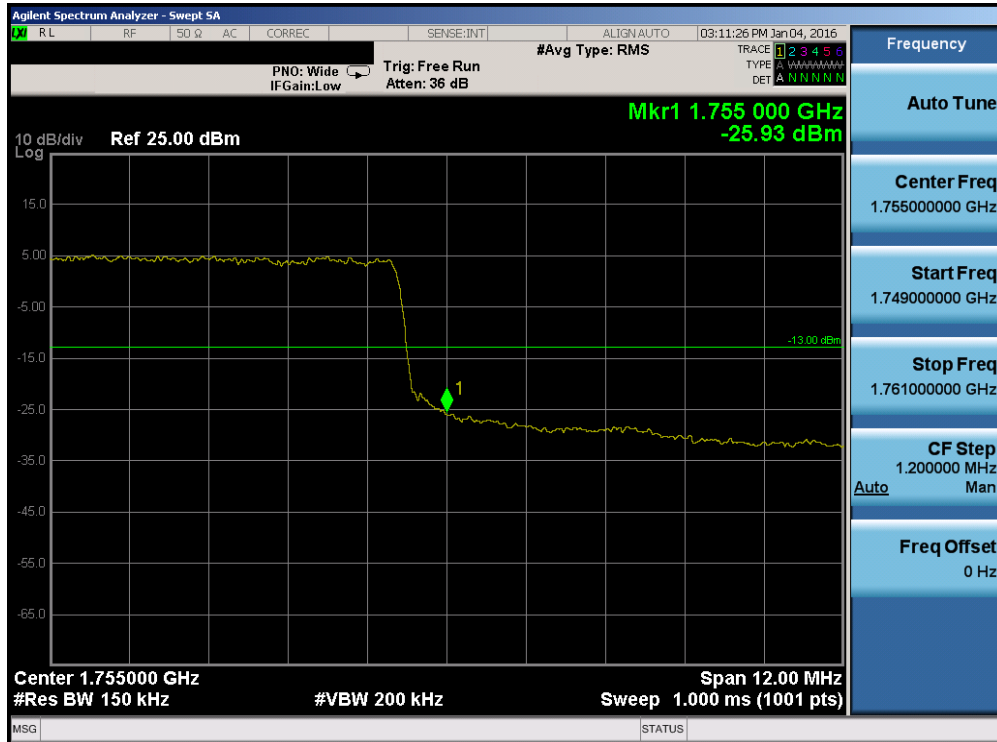


Plot 7-153. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 94 of 160

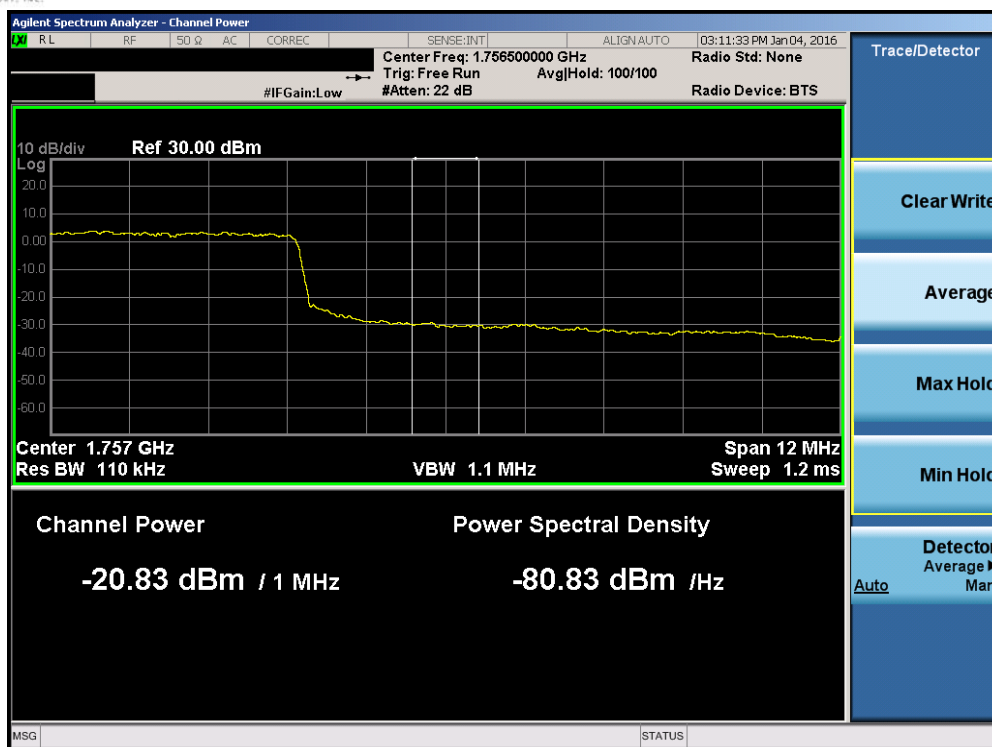


Plot 7-154. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

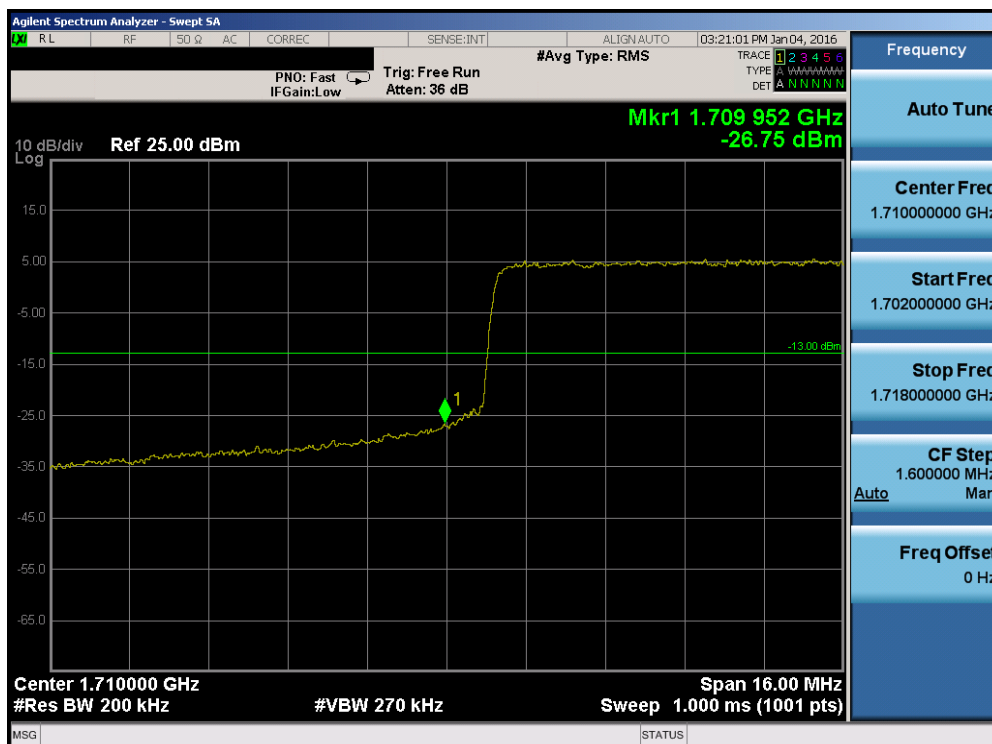


Plot 7-155. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 95 of 160

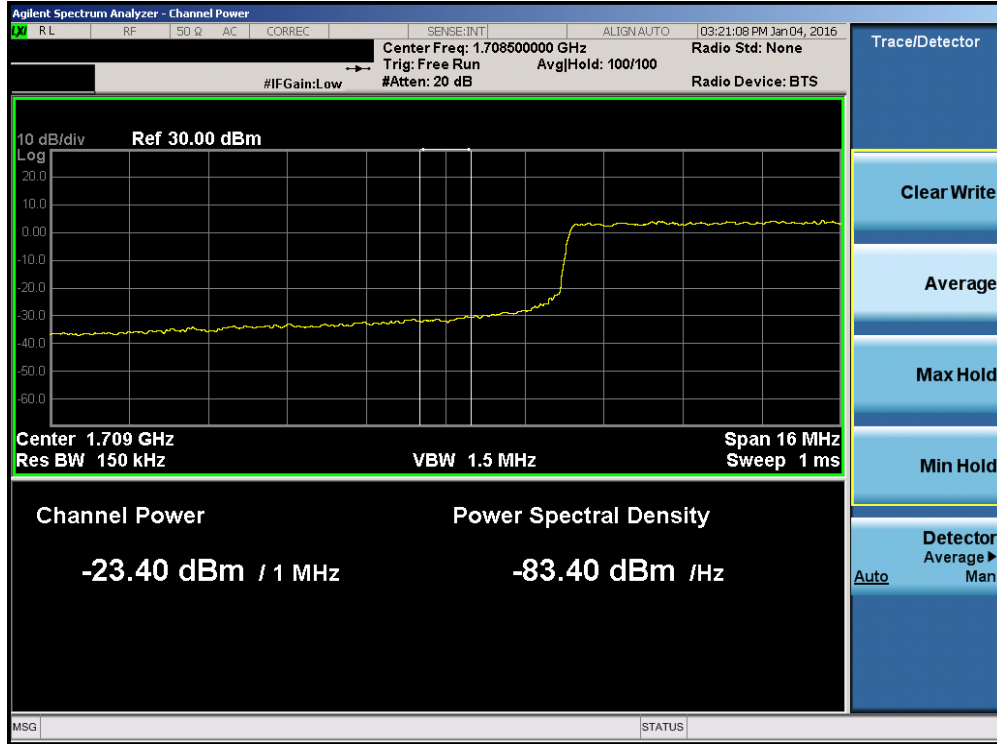


Plot 7-156. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

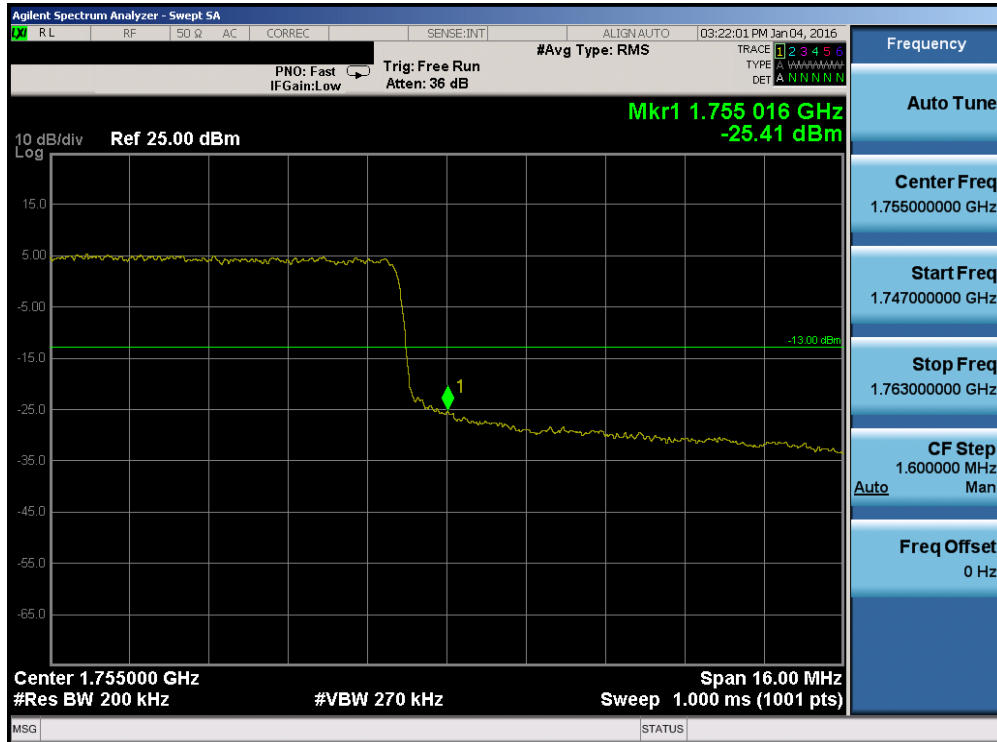


Plot 7-157. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 96 of 160

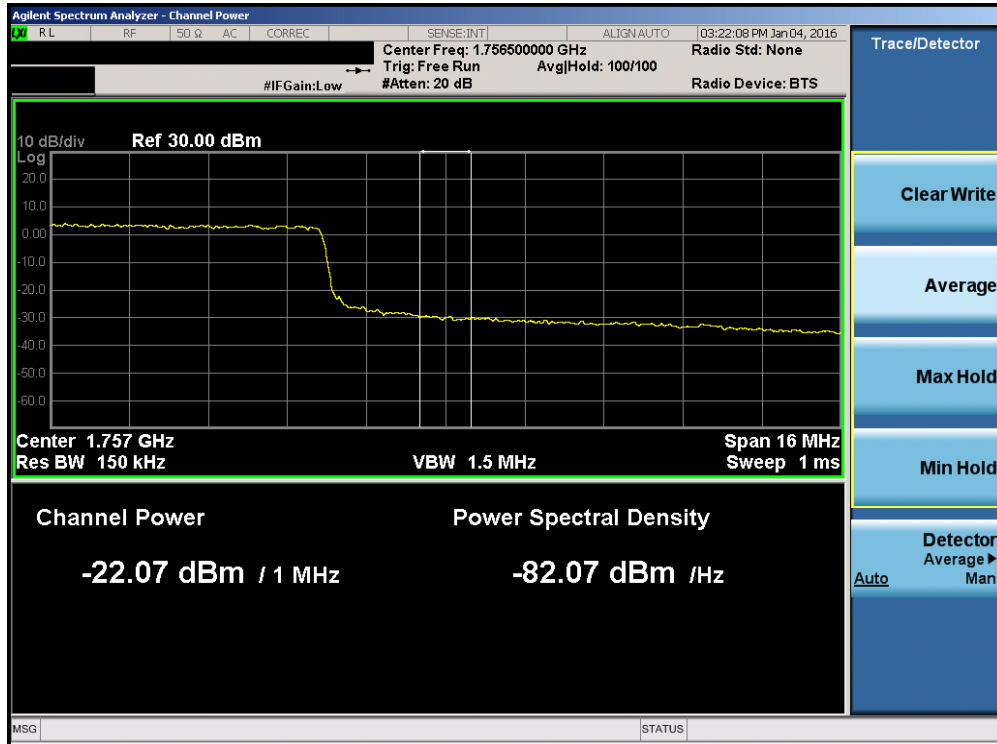


Plot 7-158. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

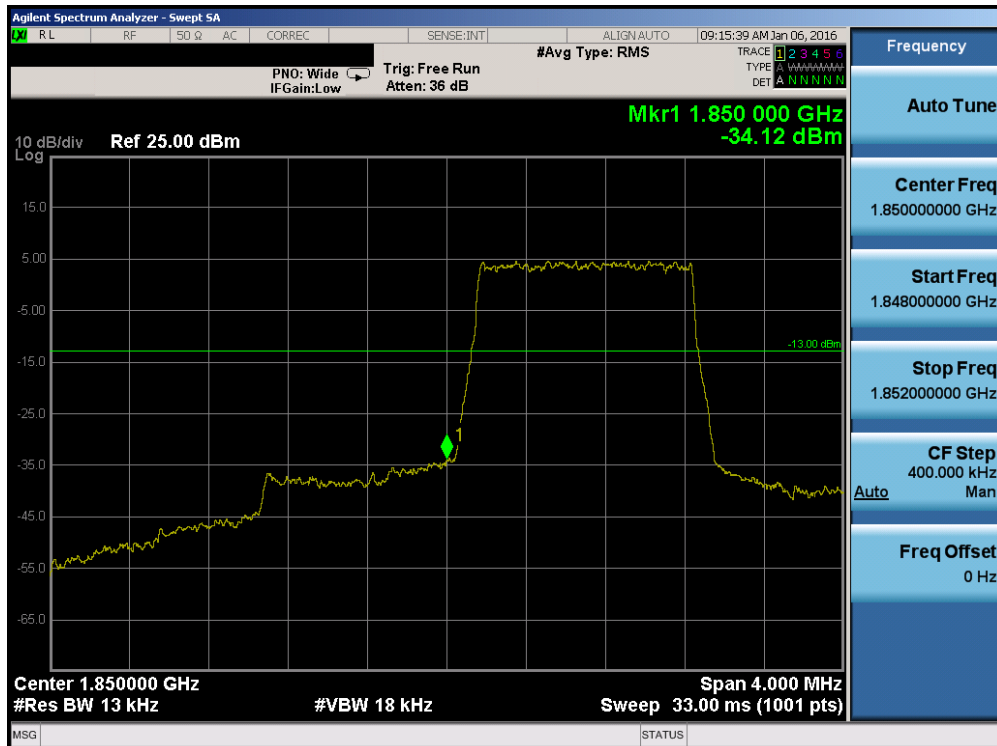


Plot 7-159. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 97 of 160

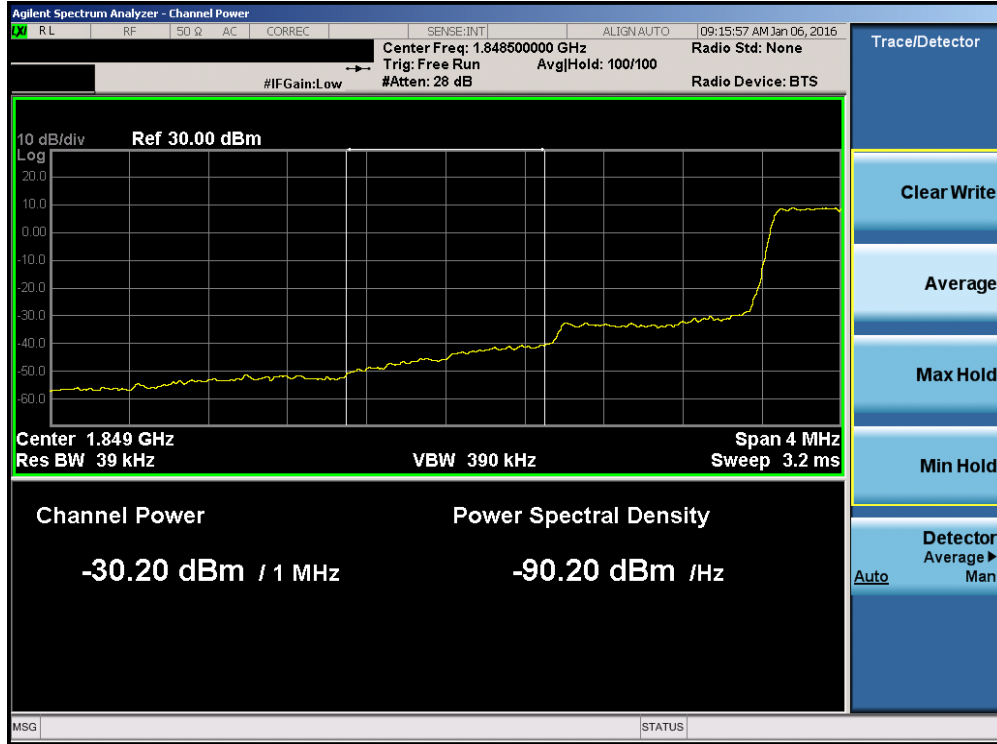


Plot 7-160. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

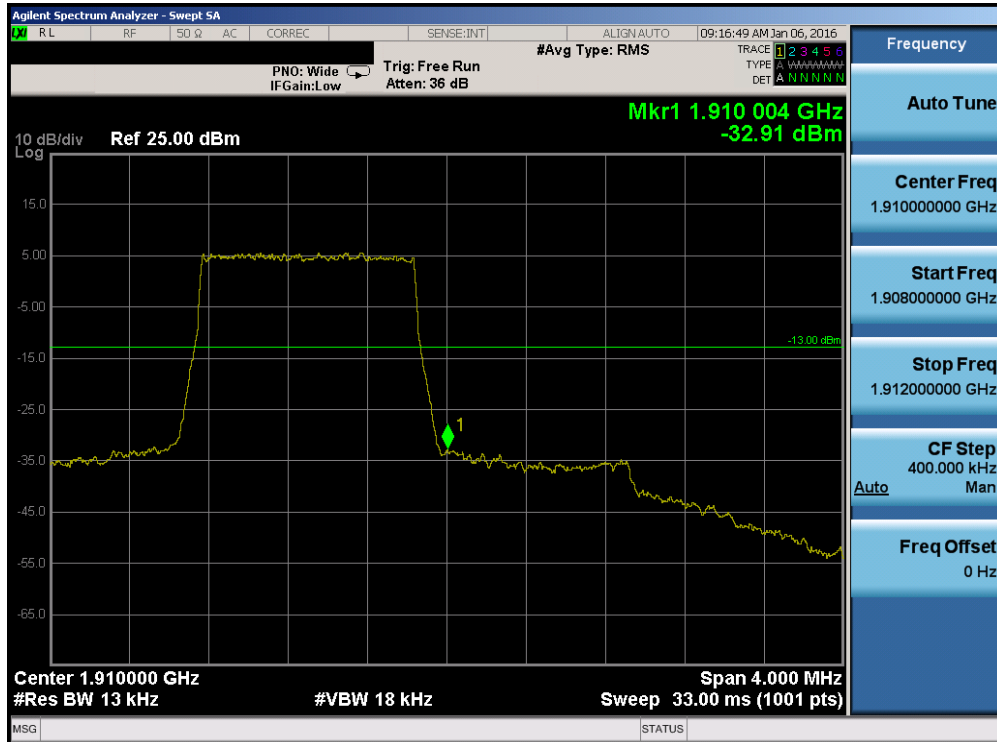


Plot 7-161. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 98 of 160

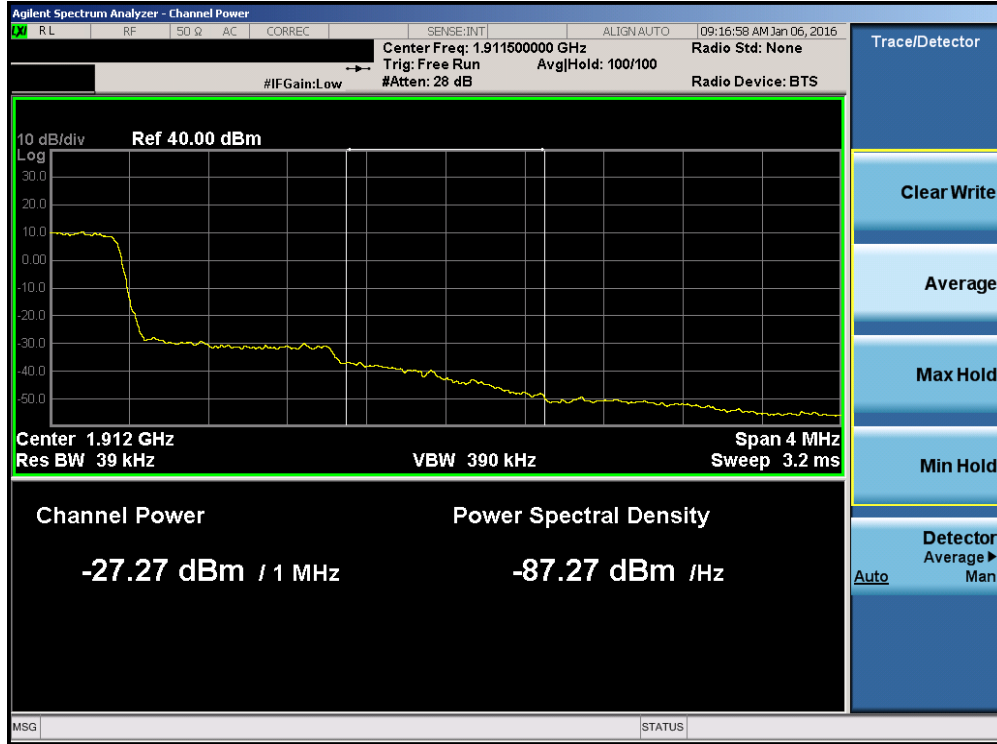


Plot 7-162. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

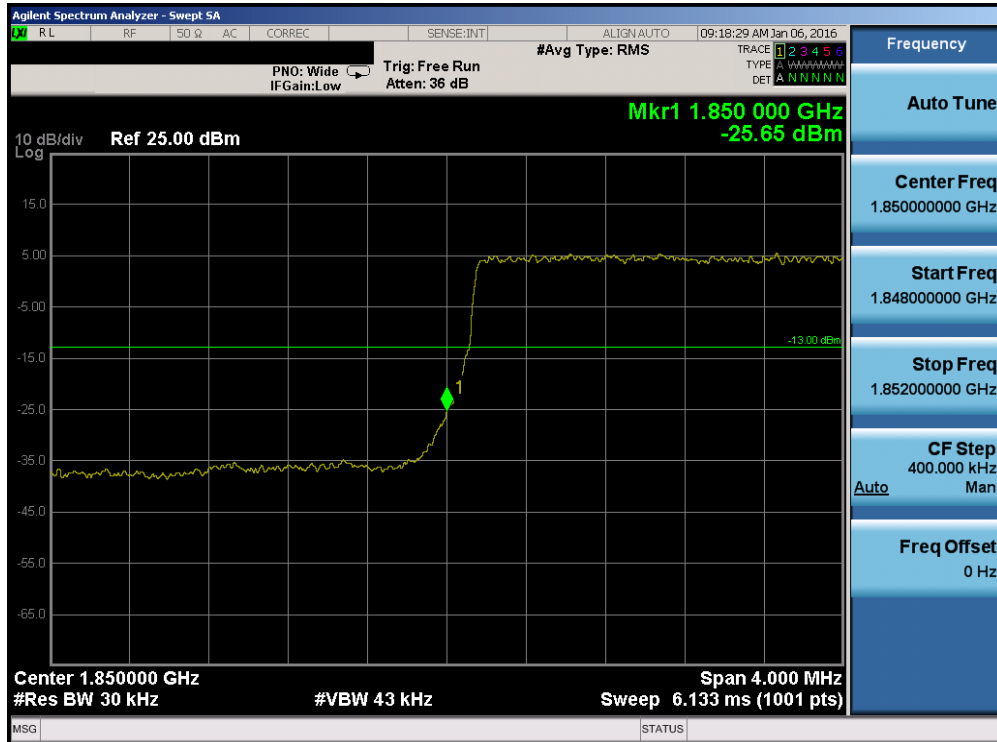


Plot 7-163. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 99 of 160

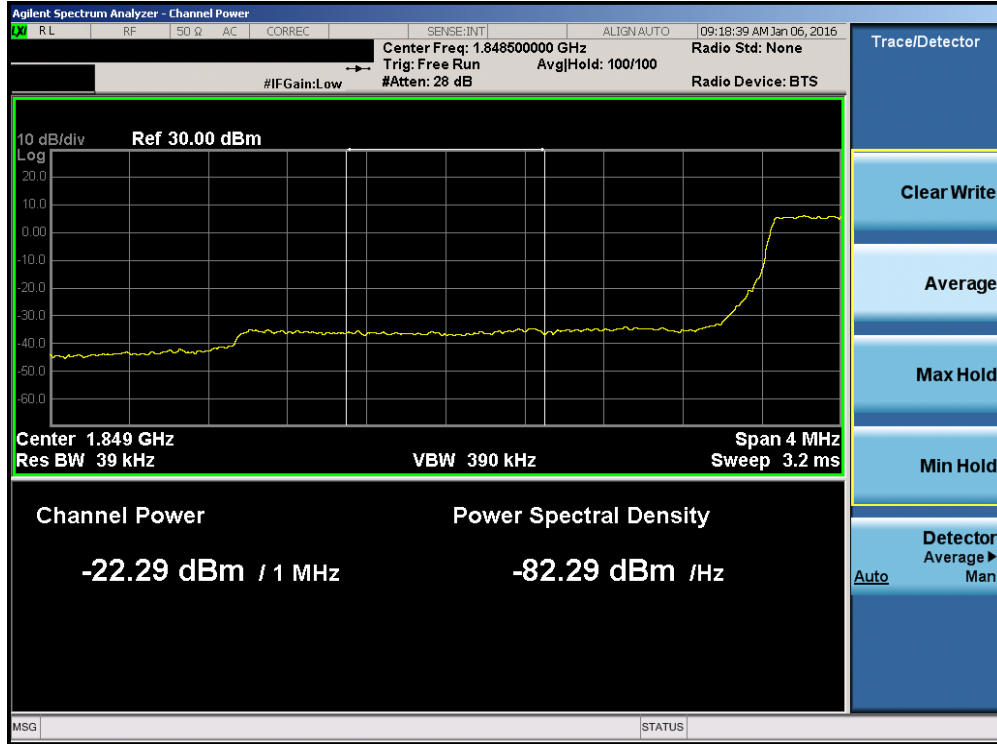


Plot 7-164. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

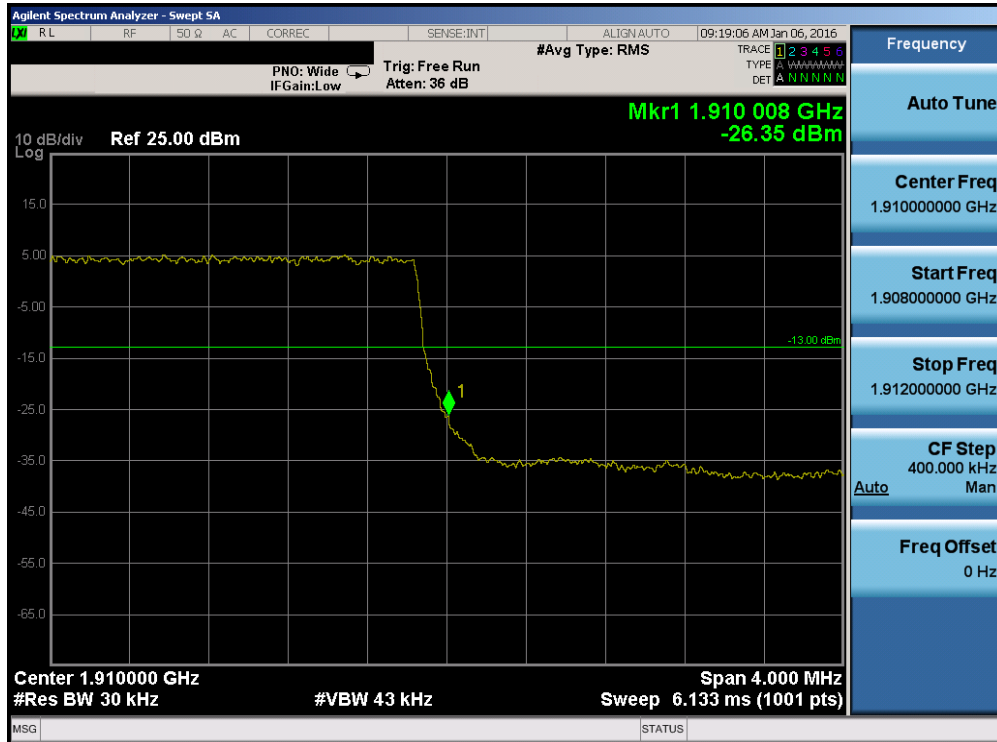


Plot 7-165. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 100 of 160

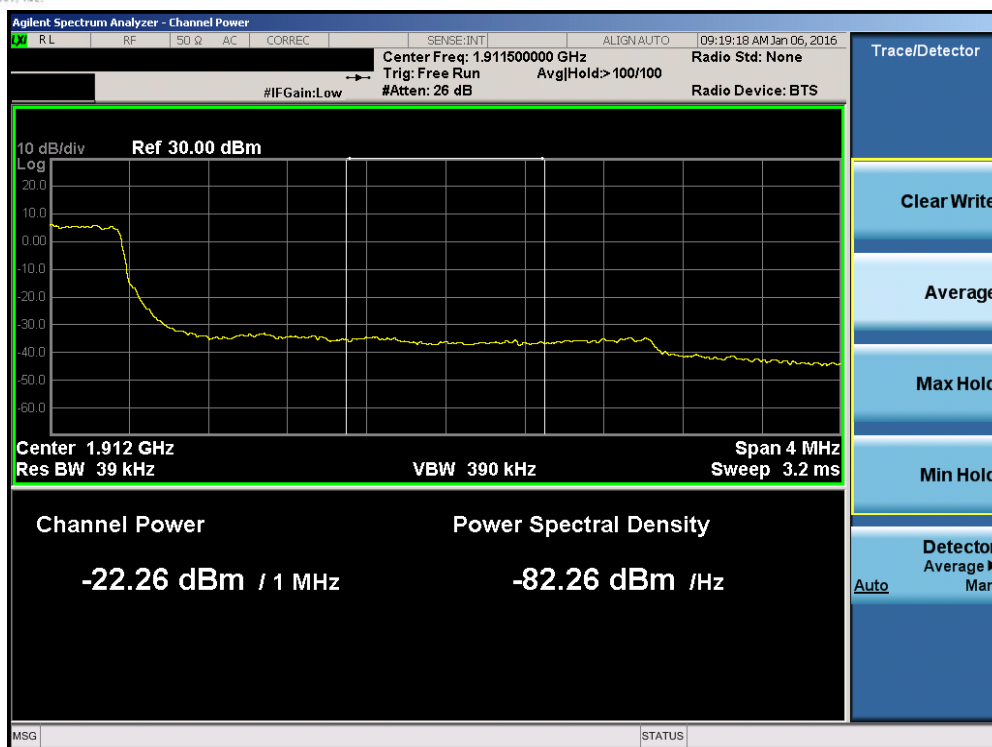


Plot 7-166. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

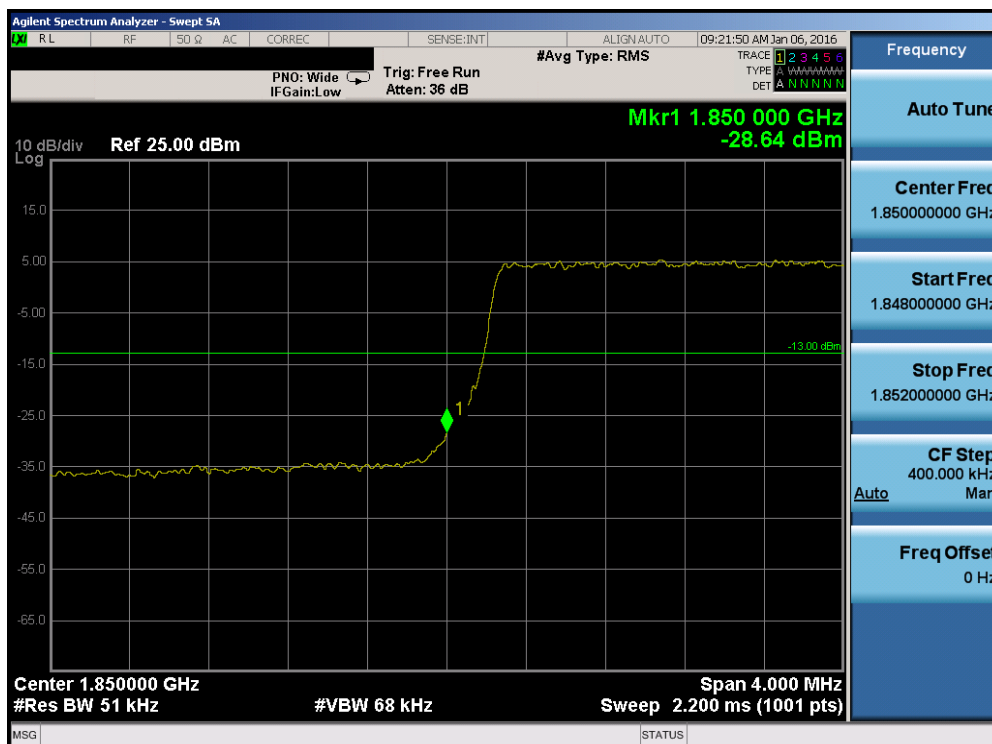


Plot 7-167. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 101 of 160

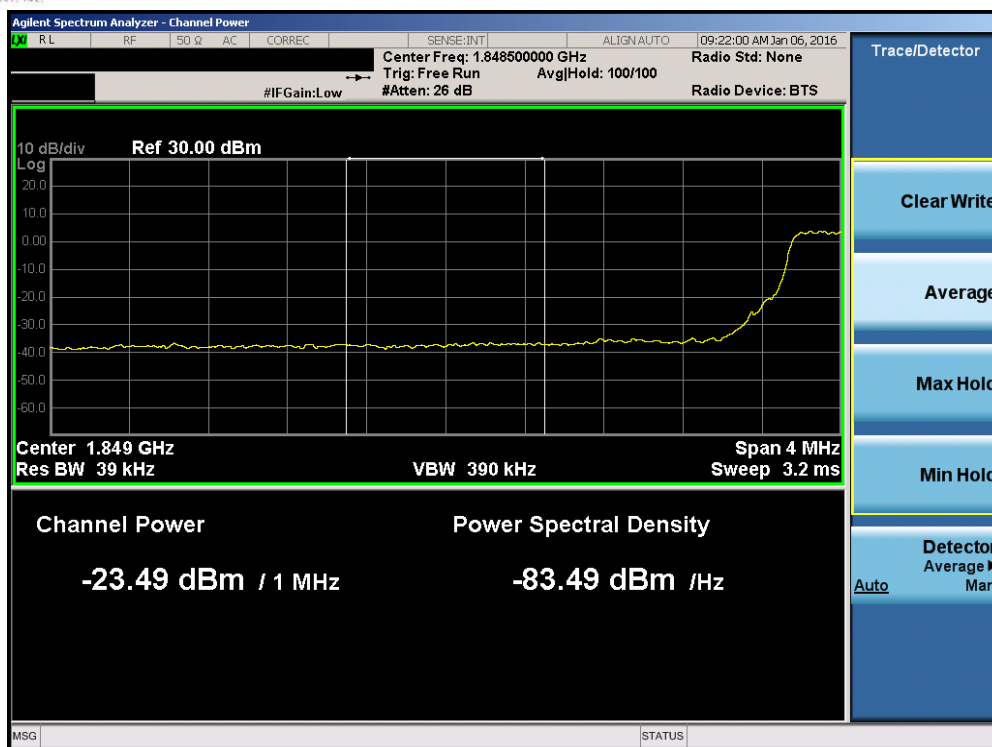


Plot 7-168. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

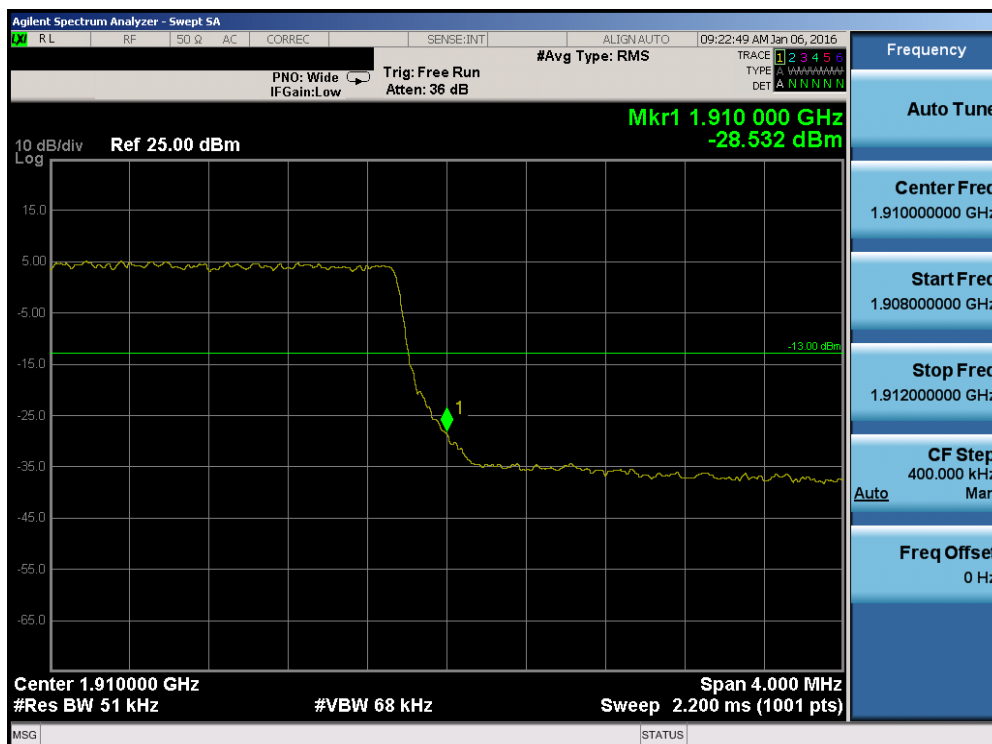


Plot 7-169. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 102 of 160

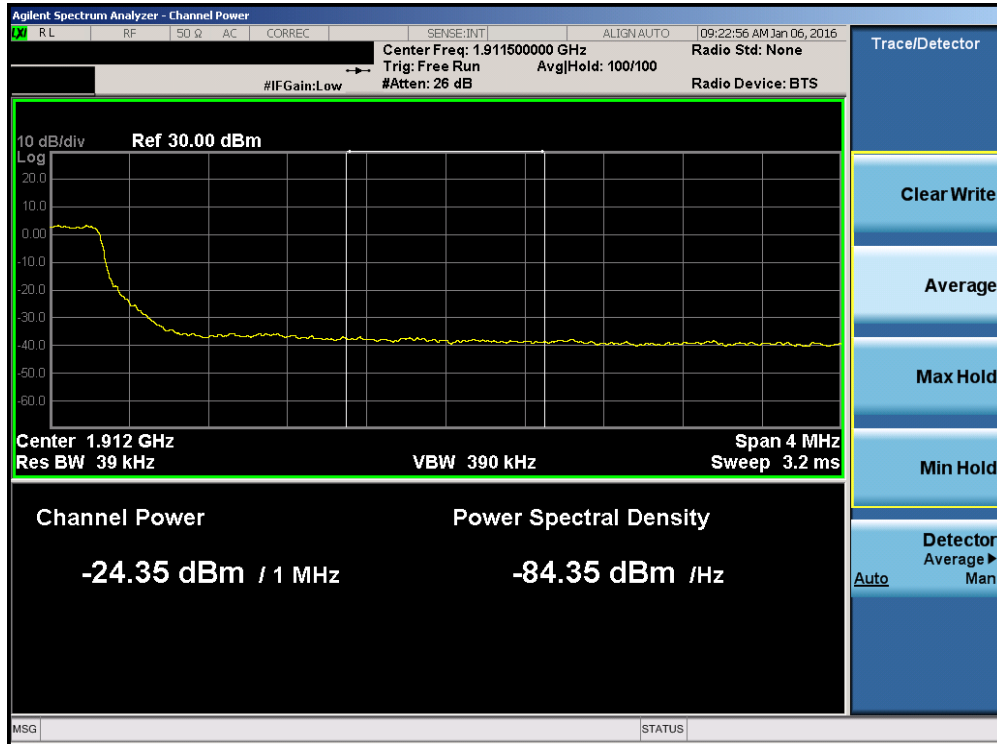


Plot 7-170. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

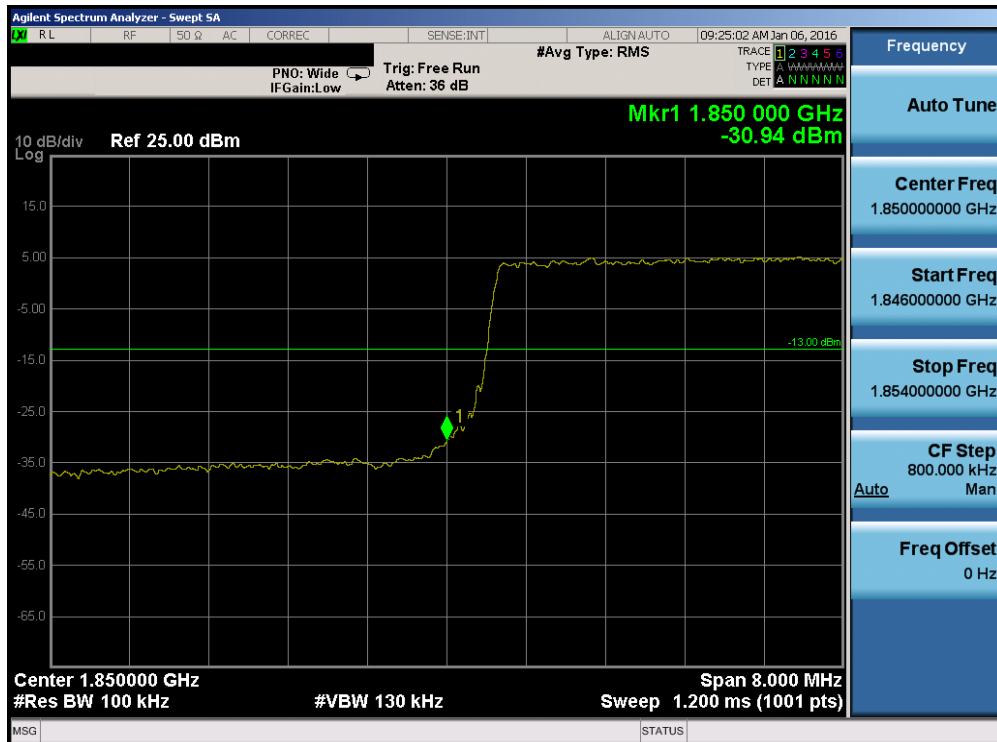


Plot 7-171. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 103 of 160

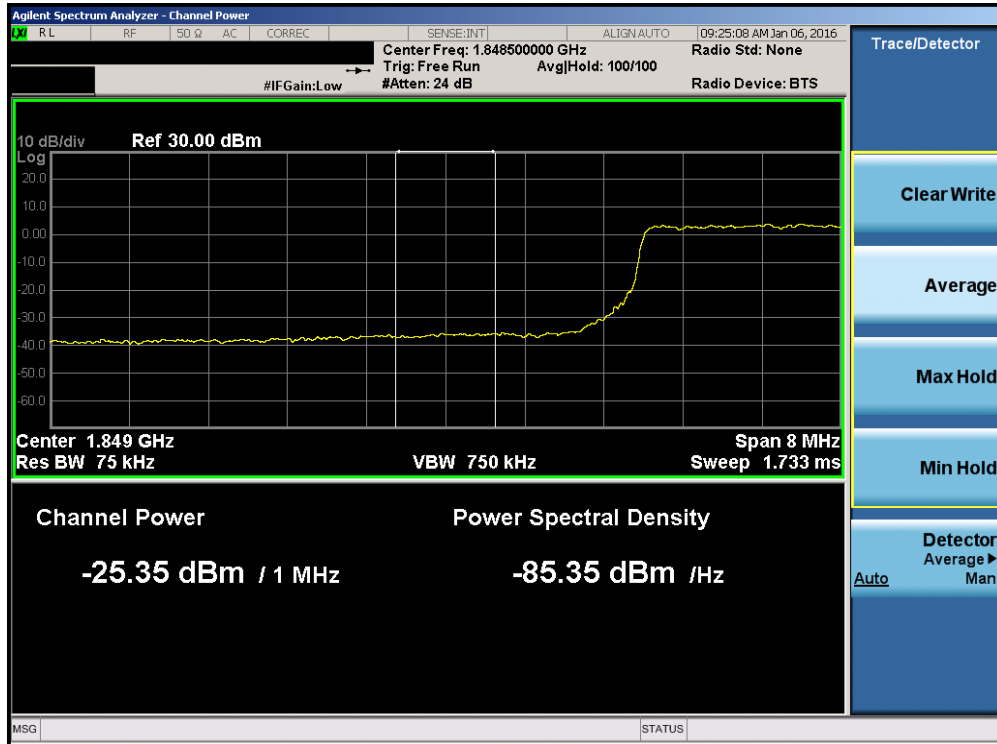


Plot 7-172. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

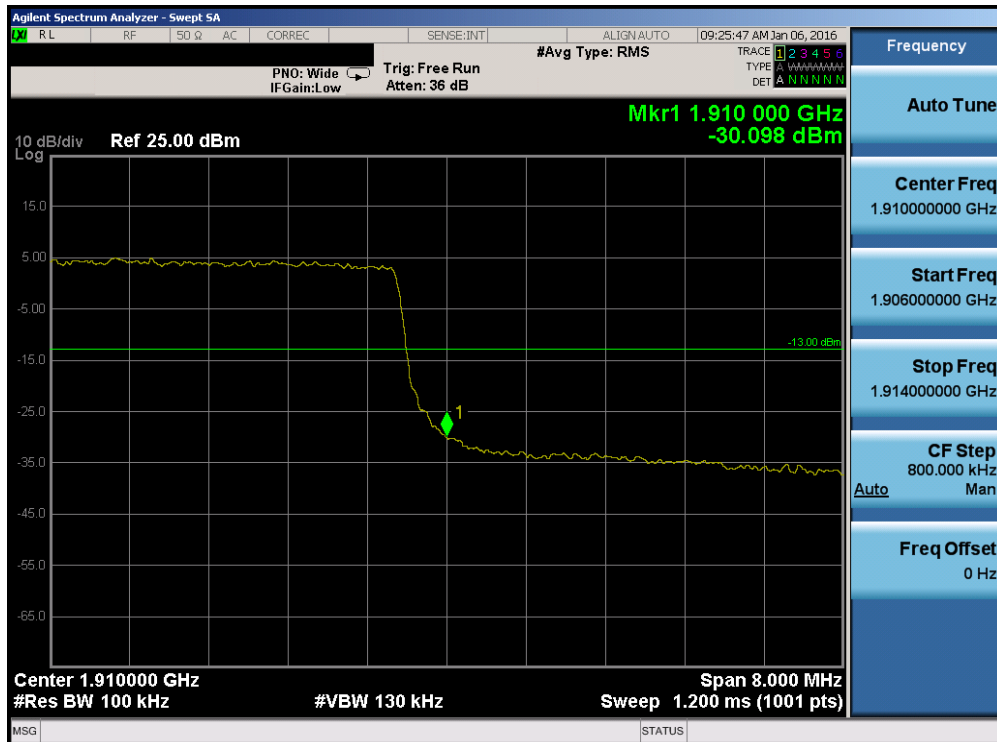


Plot 7-173. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 104 of 160

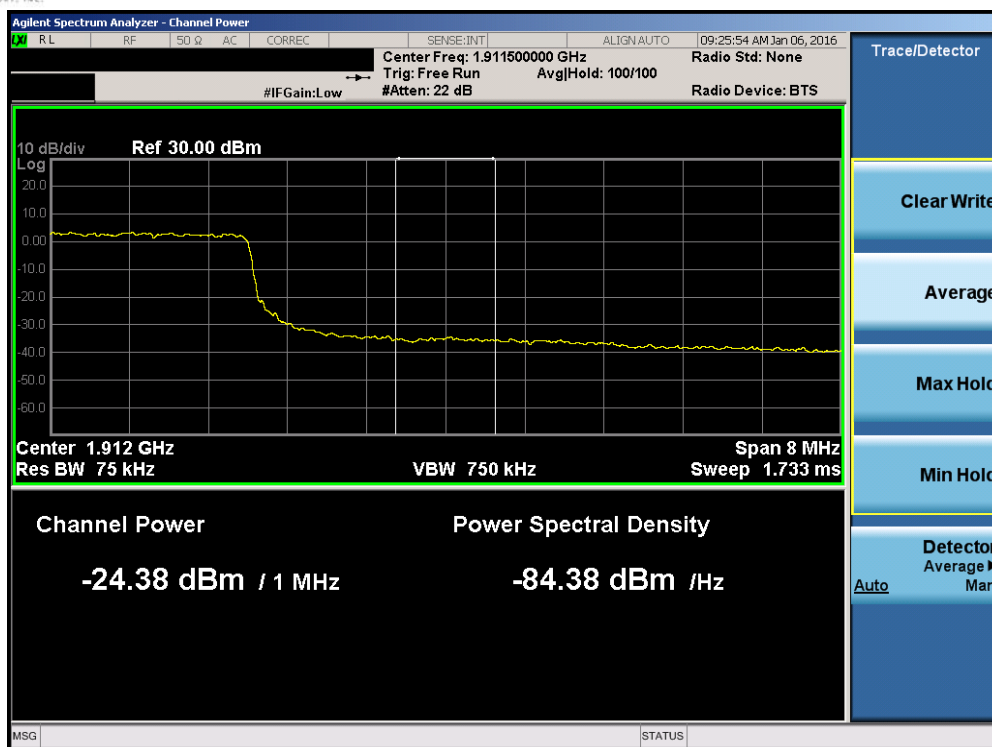


Plot 7-174. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

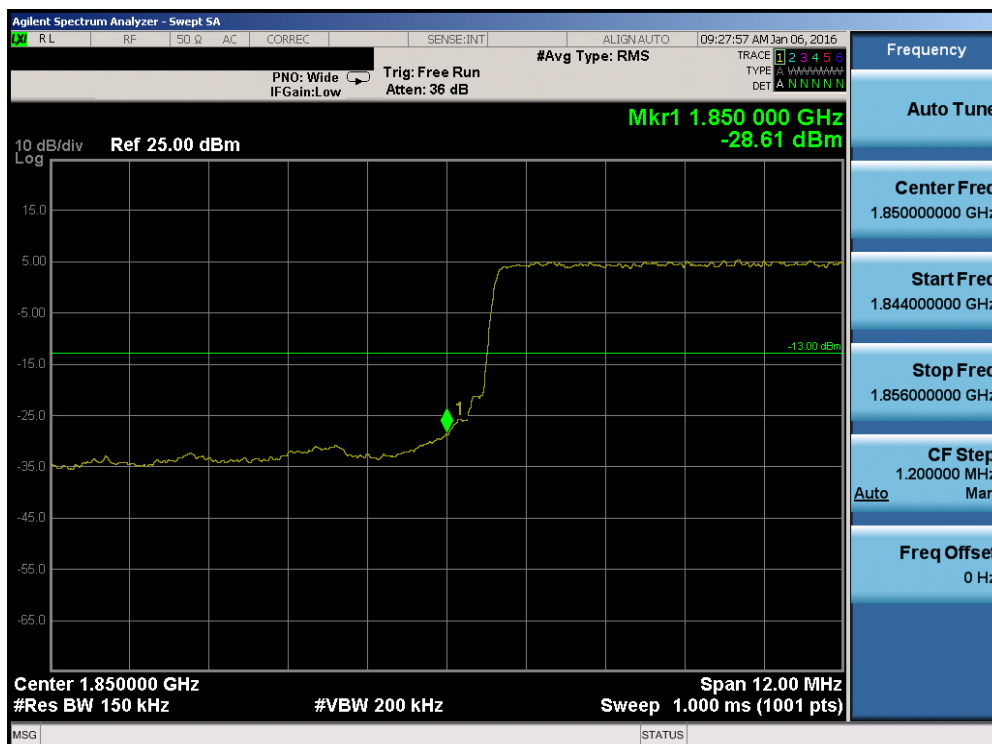


Plot 7-175. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 105 of 160

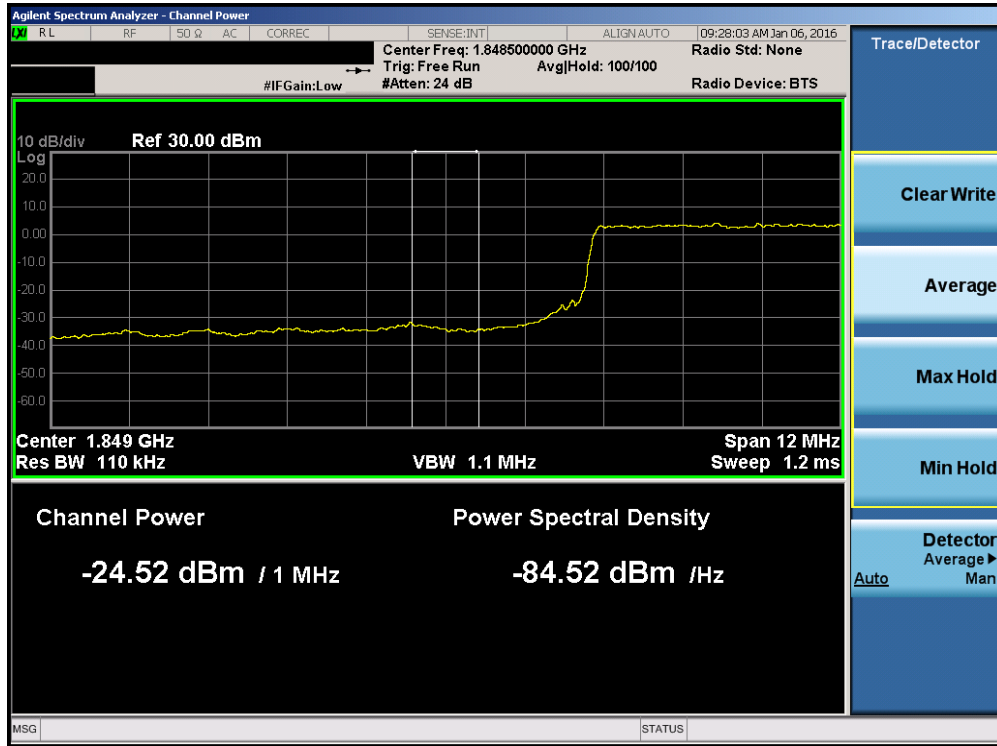


Plot 7-176. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

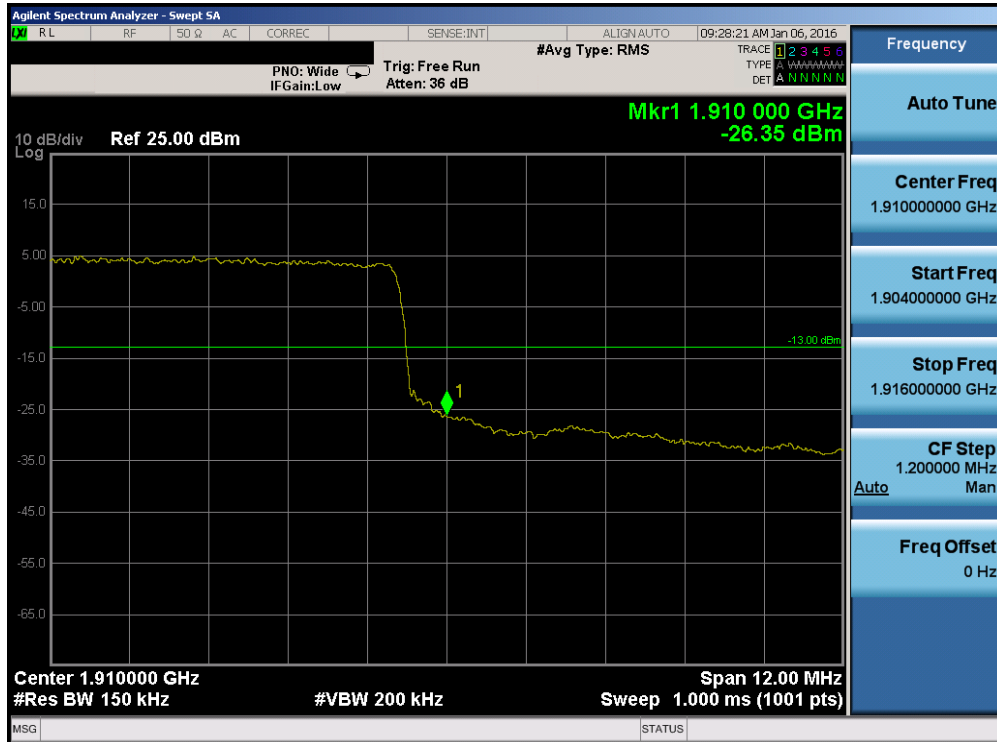


Plot 7-177. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 106 of 160

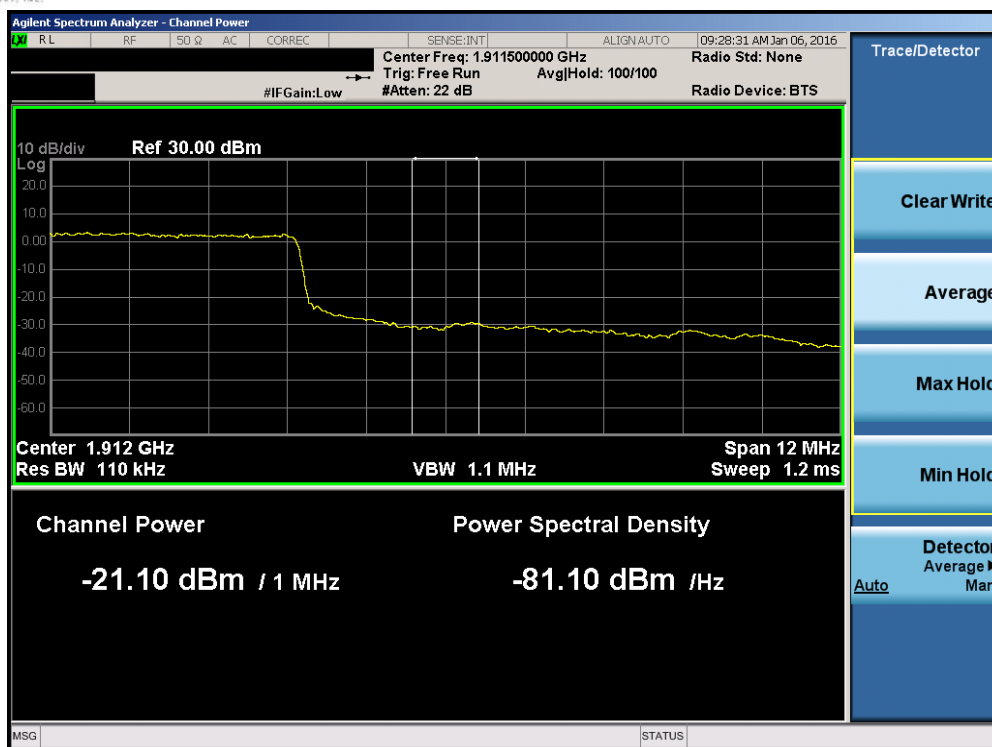


Plot 7-178. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

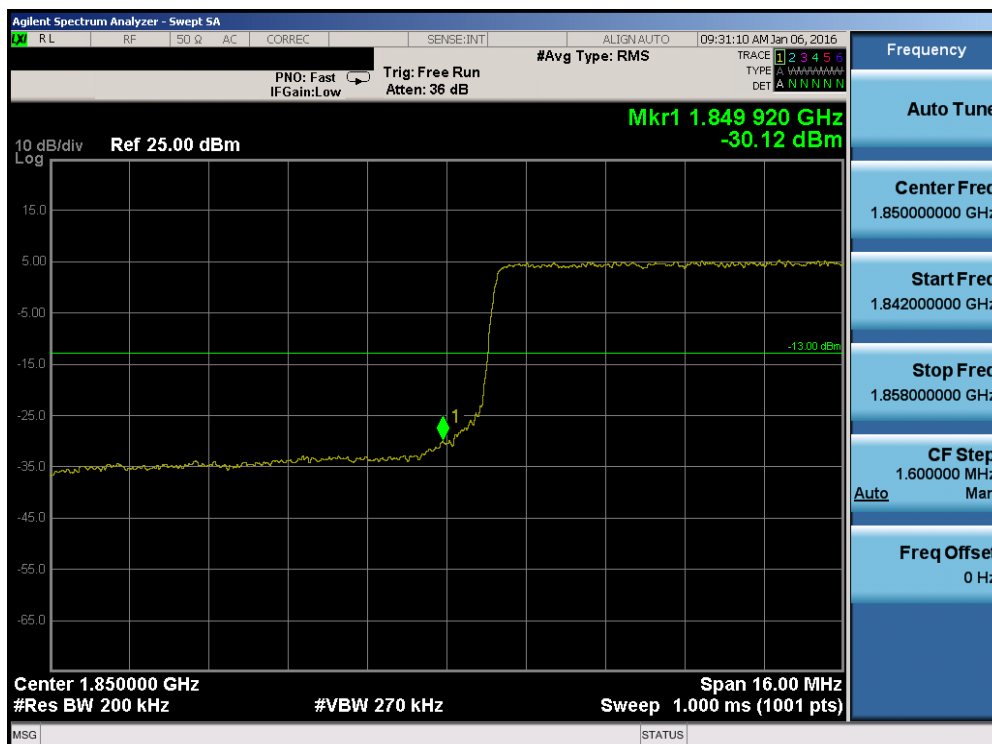


Plot 7-179. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 107 of 160

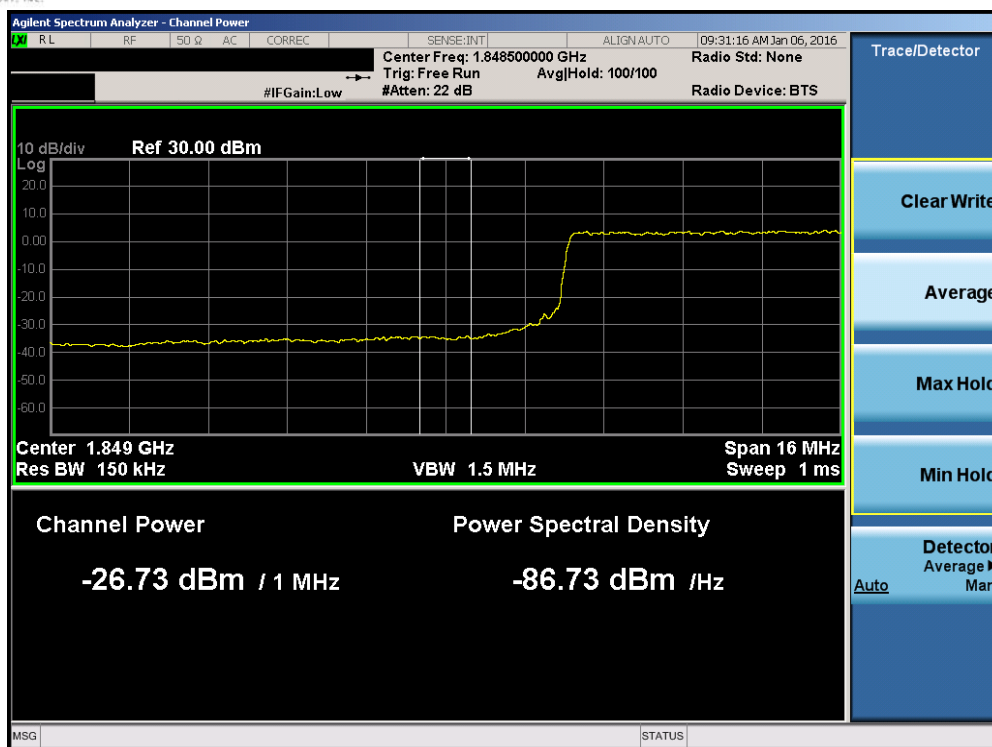


Plot 7-180. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

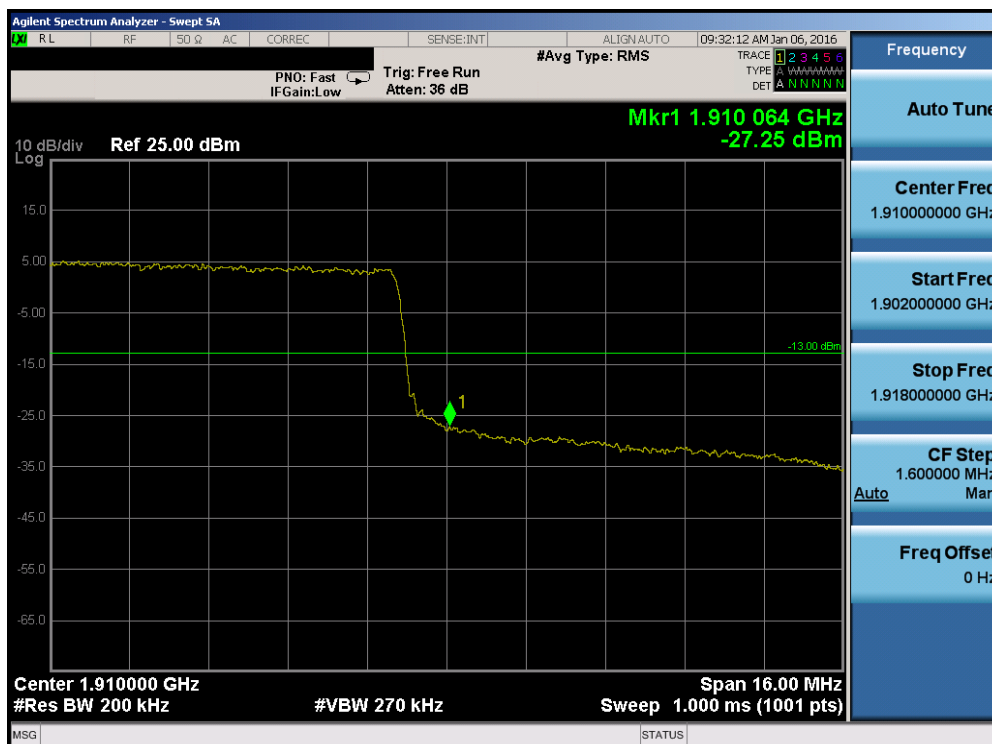


Plot 7-181. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 108 of 160

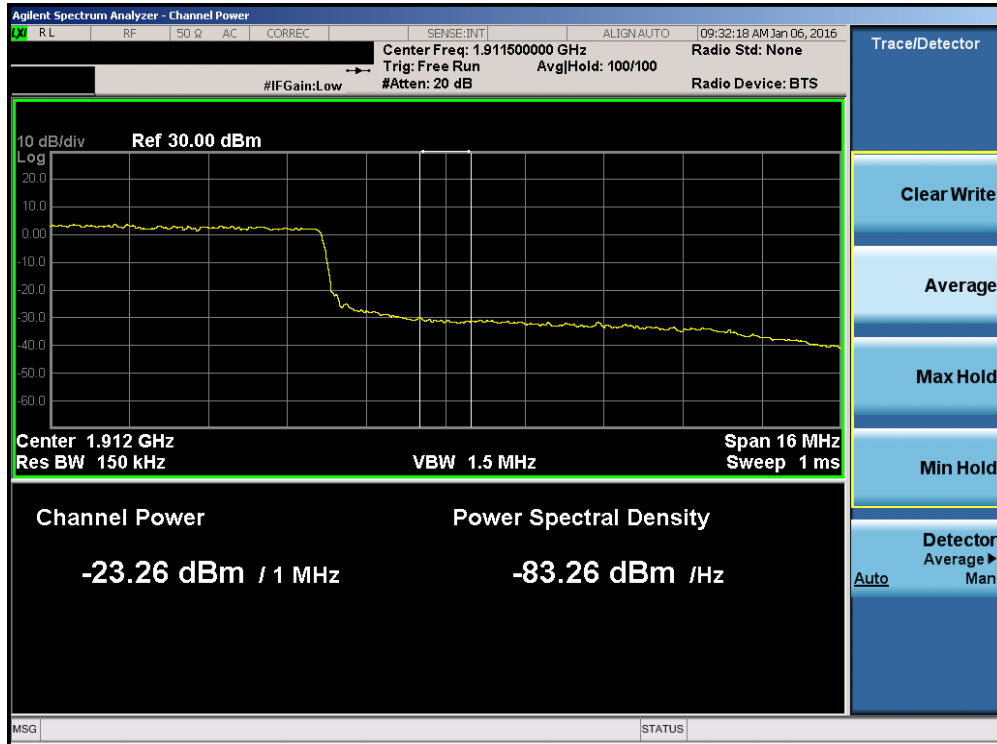


Plot 7-182. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

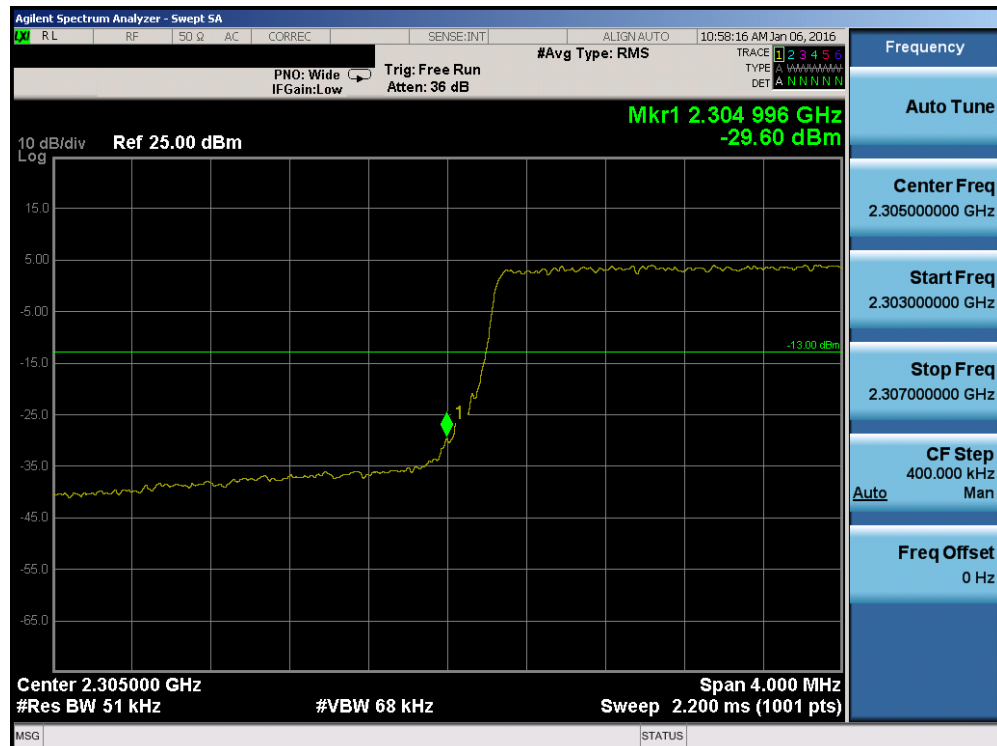


Plot 7-183. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 109 of 160



Plot 7-184. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

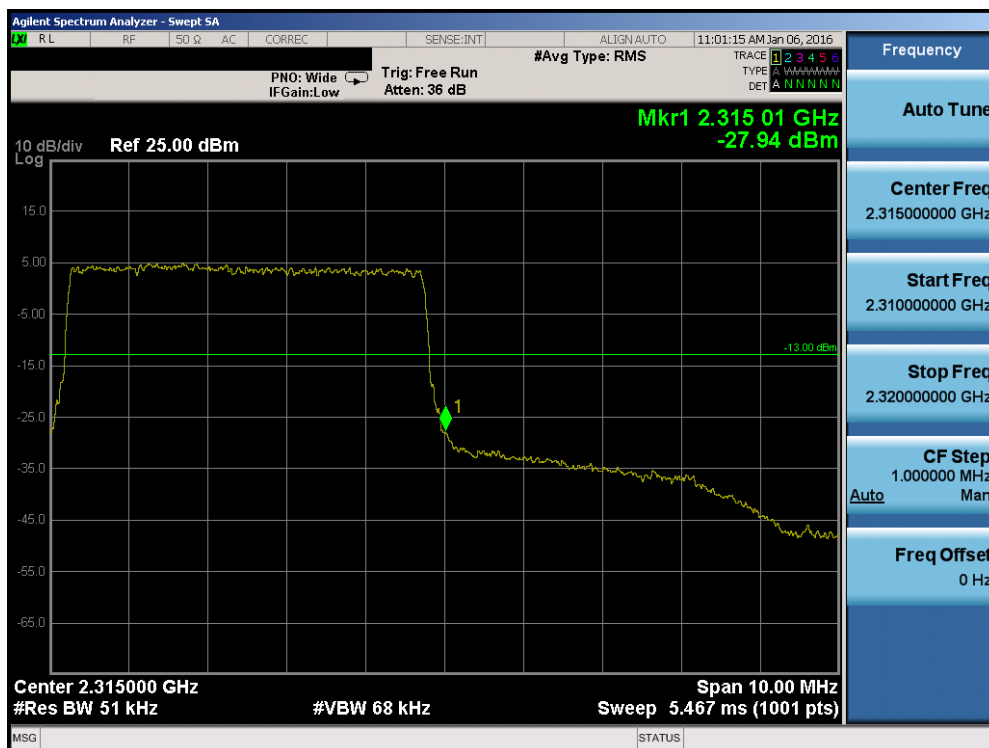


Plot 7-185. Lower Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 110 of 160

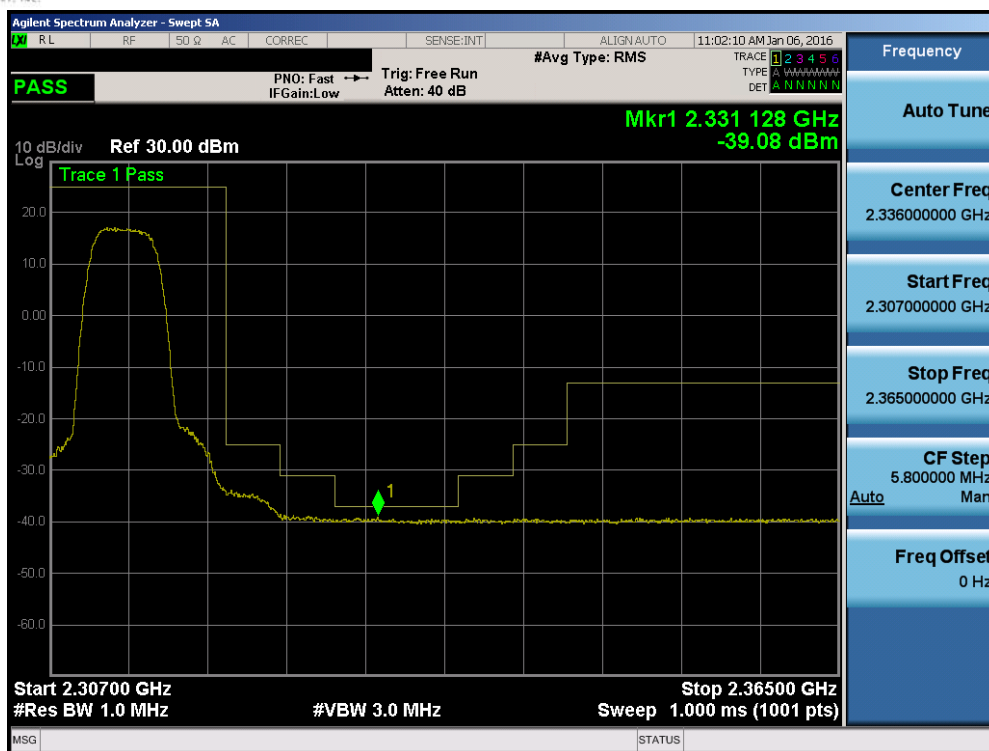


Plot 7-186. Lower Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

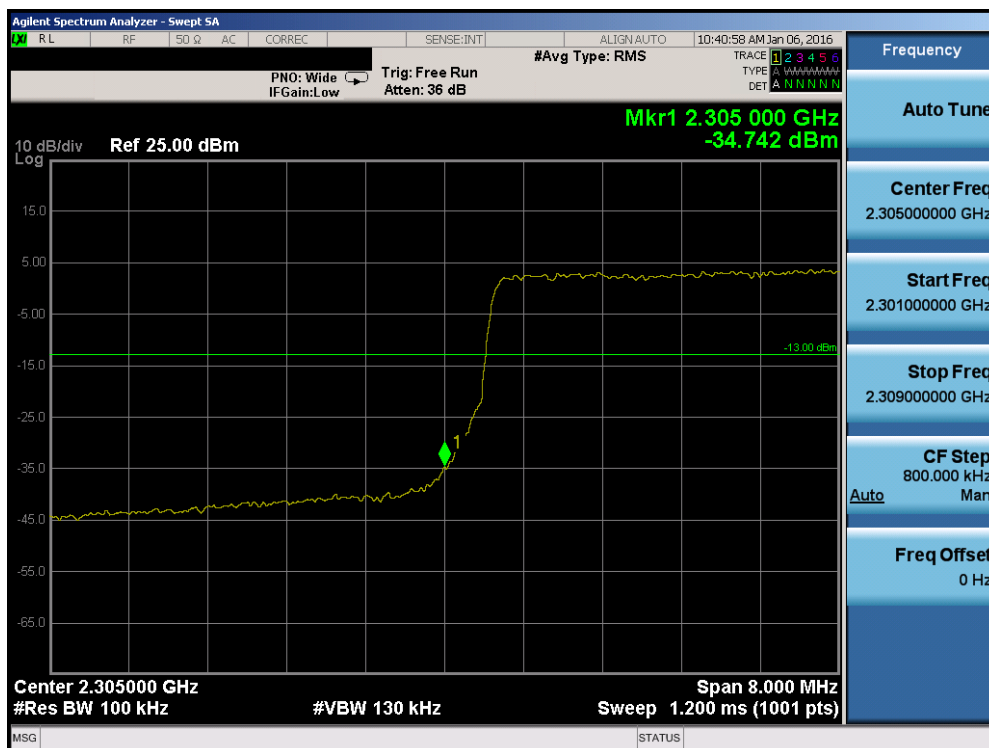


Plot 7-187. Upper Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 111 of 160

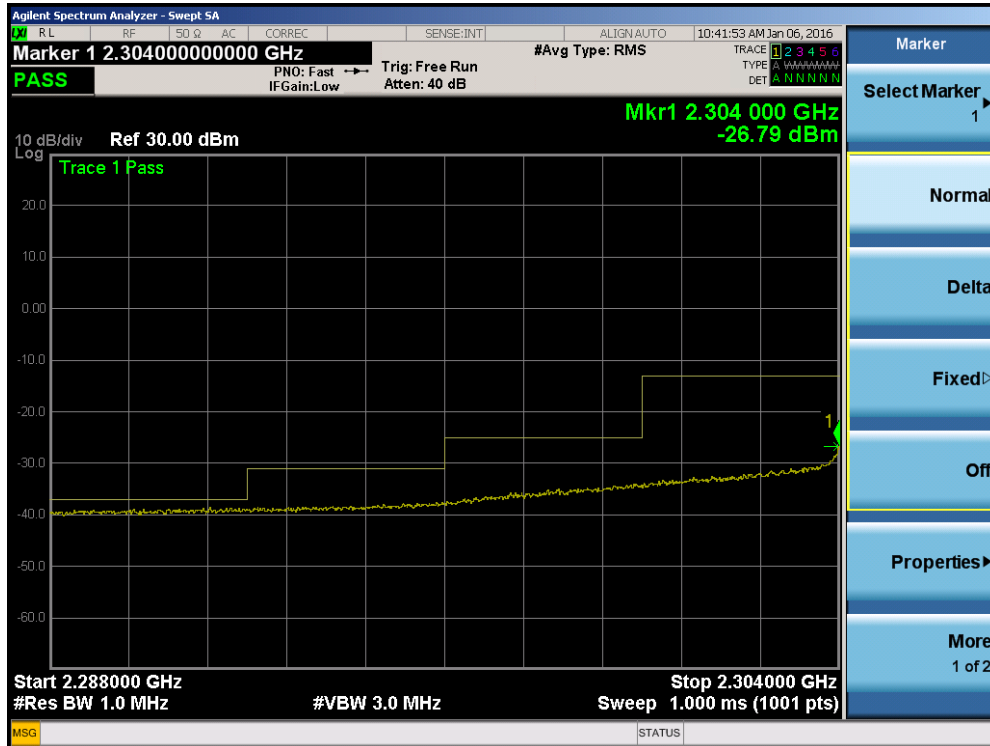


Plot 7-188. Upper Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

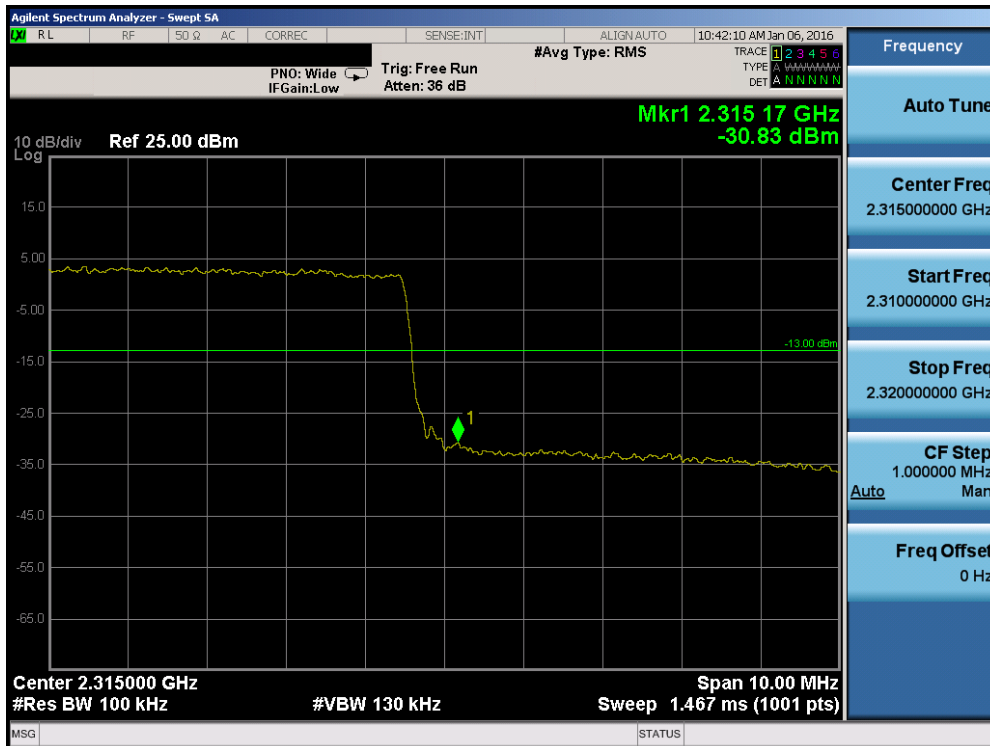


Plot 7-189. Lower Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 112 of 160

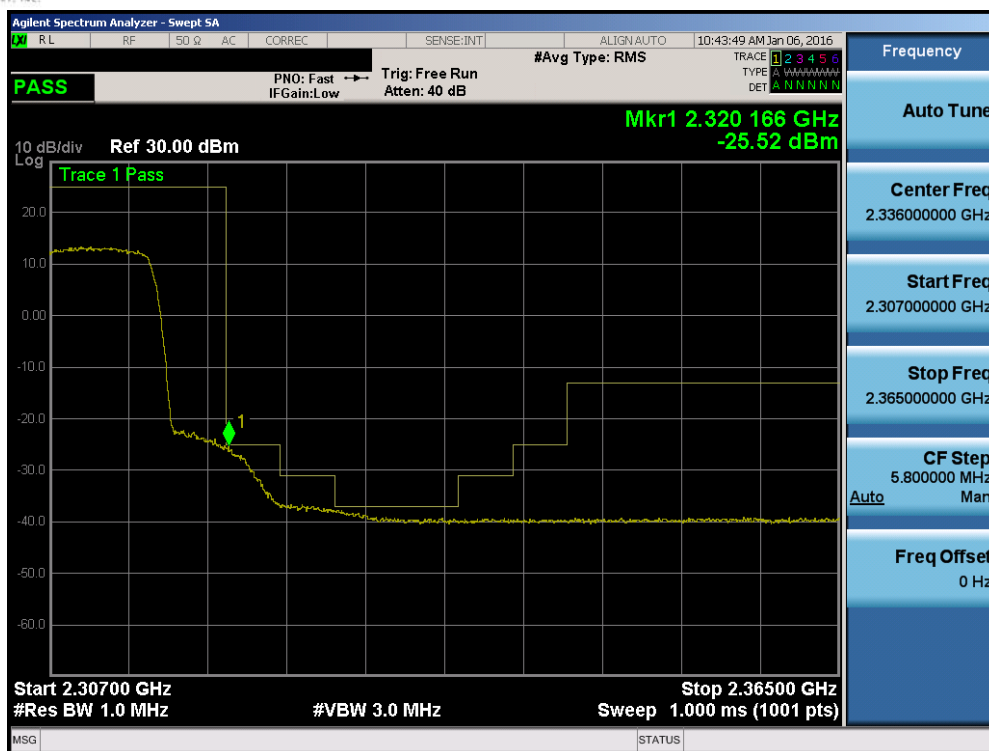


Plot 7-190. Lower Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)



Plot 7-191. Upper Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 113 of 160

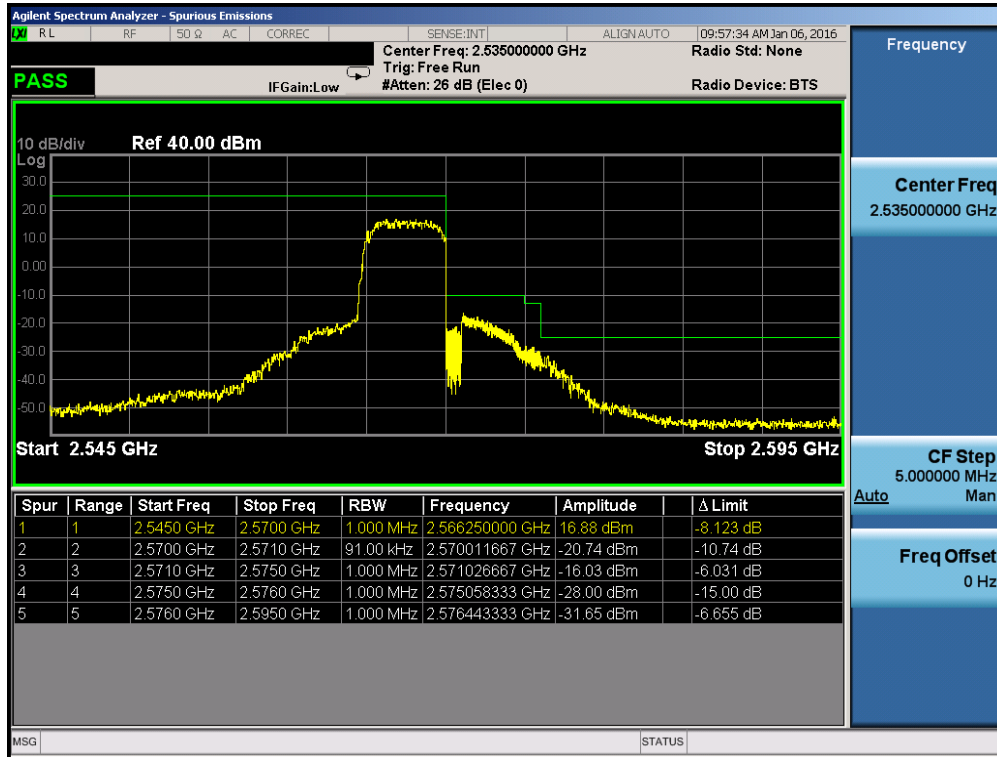


Plot 7-192. Upper Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

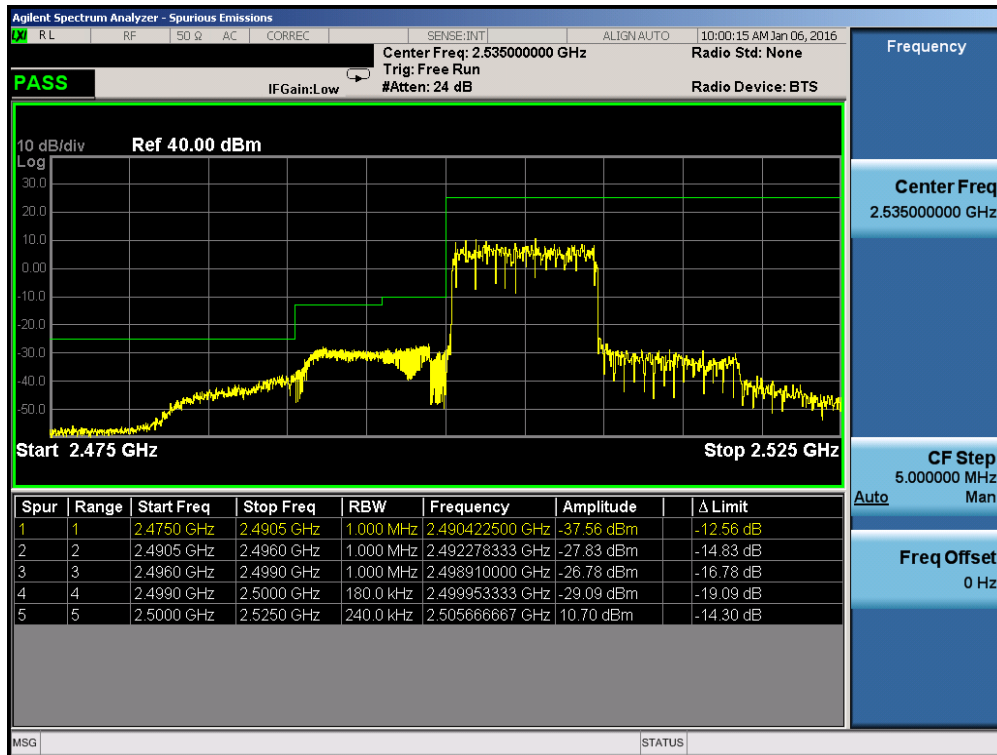


Plot 7-193. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 114 of 160

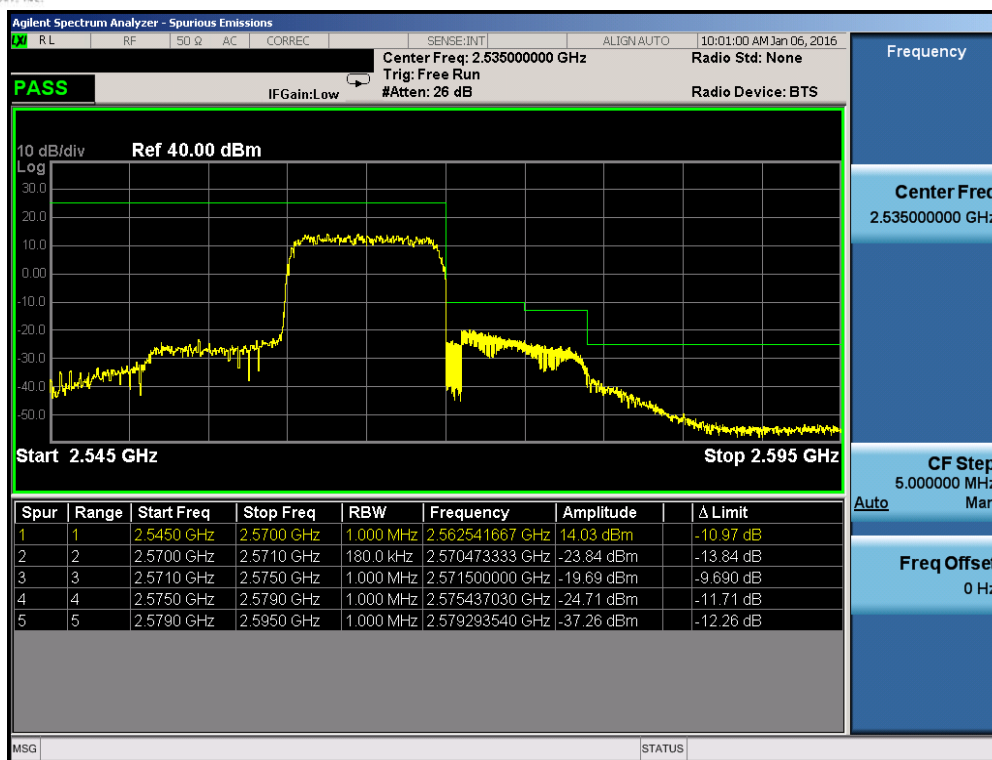


Plot 7-194. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

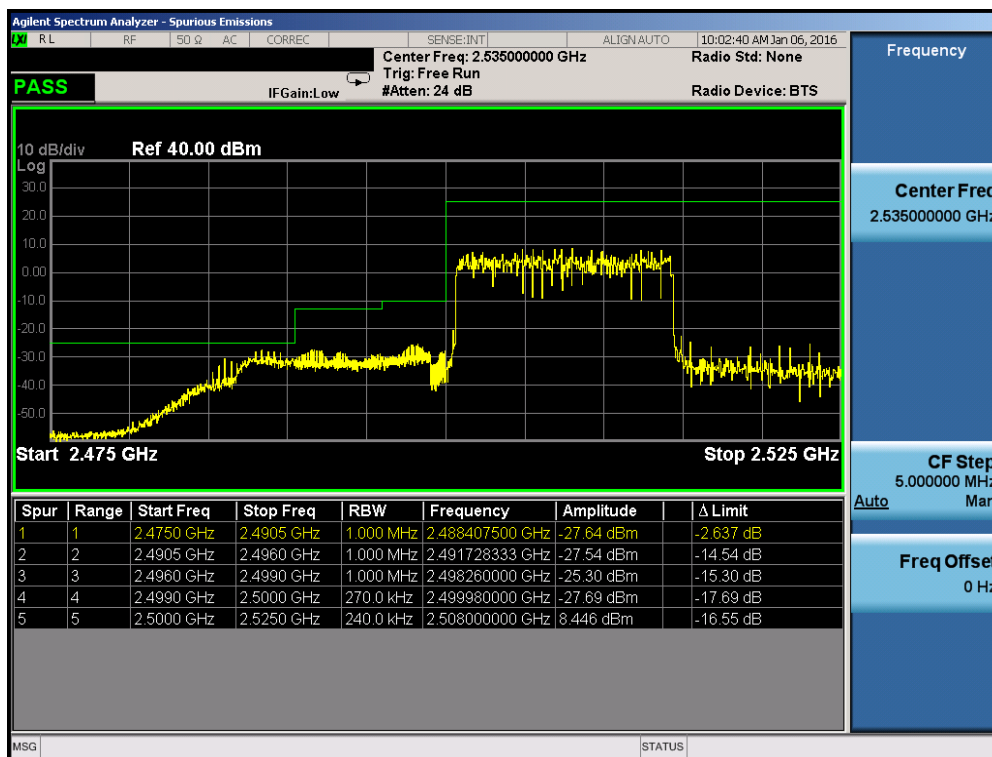


Plot 7-195. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 115 of 160

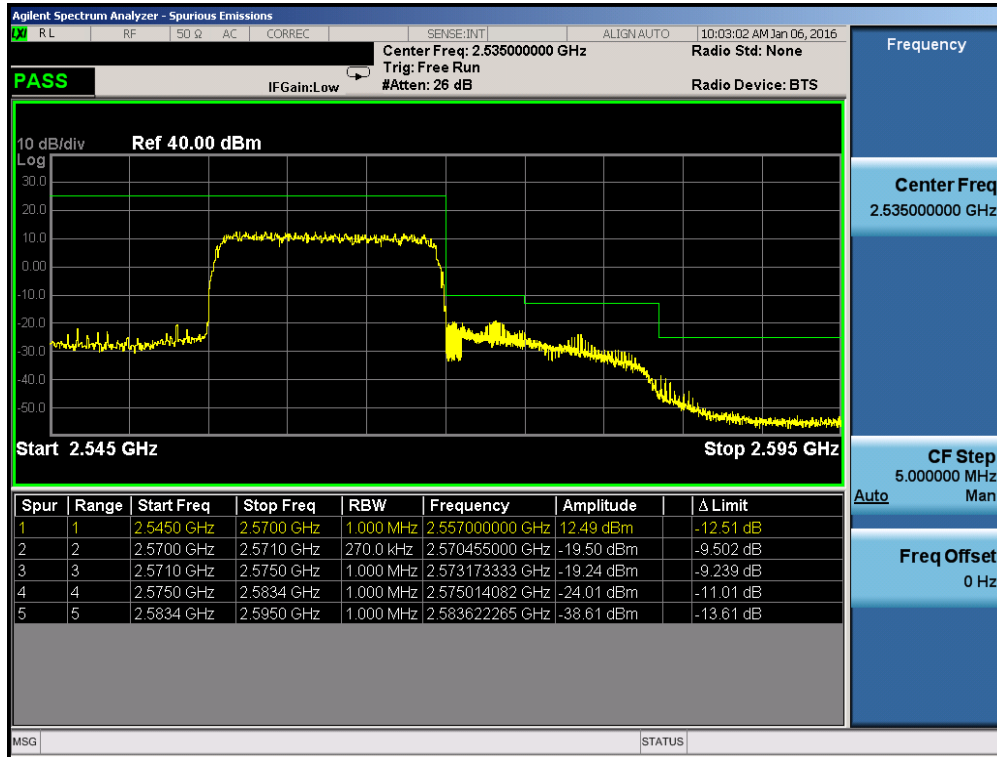


Plot 7-196. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

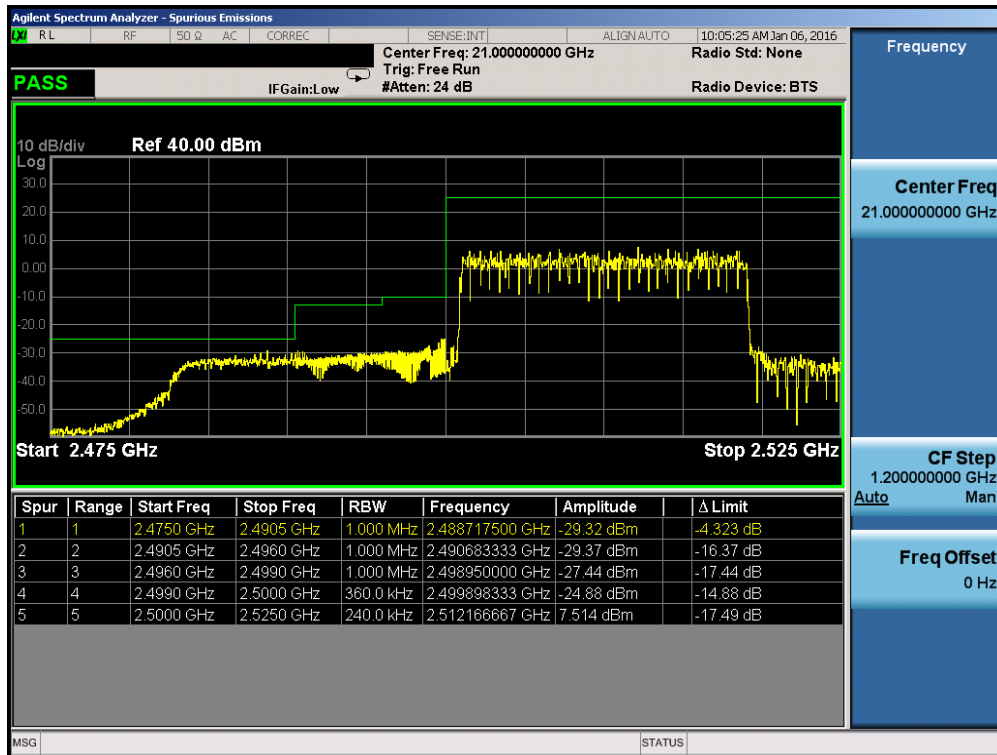


Plot 7-197. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 116 of 160

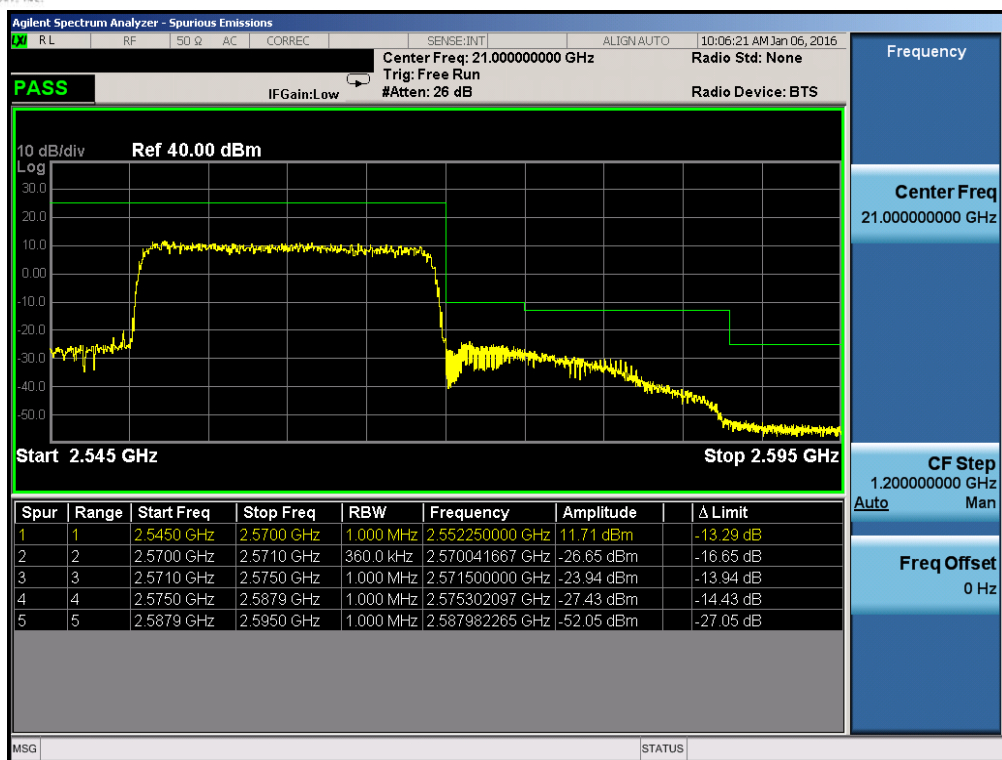


Plot 7-198. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



Plot 7-199. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 117 of 160



Plot 7-200. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 118 of 160

7.5 Peak-Average Ratio

§24.232(d)

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 v02r02 – 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.

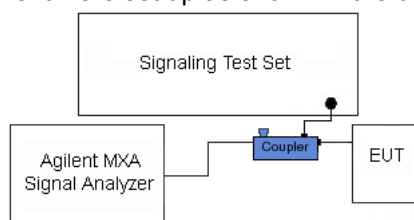
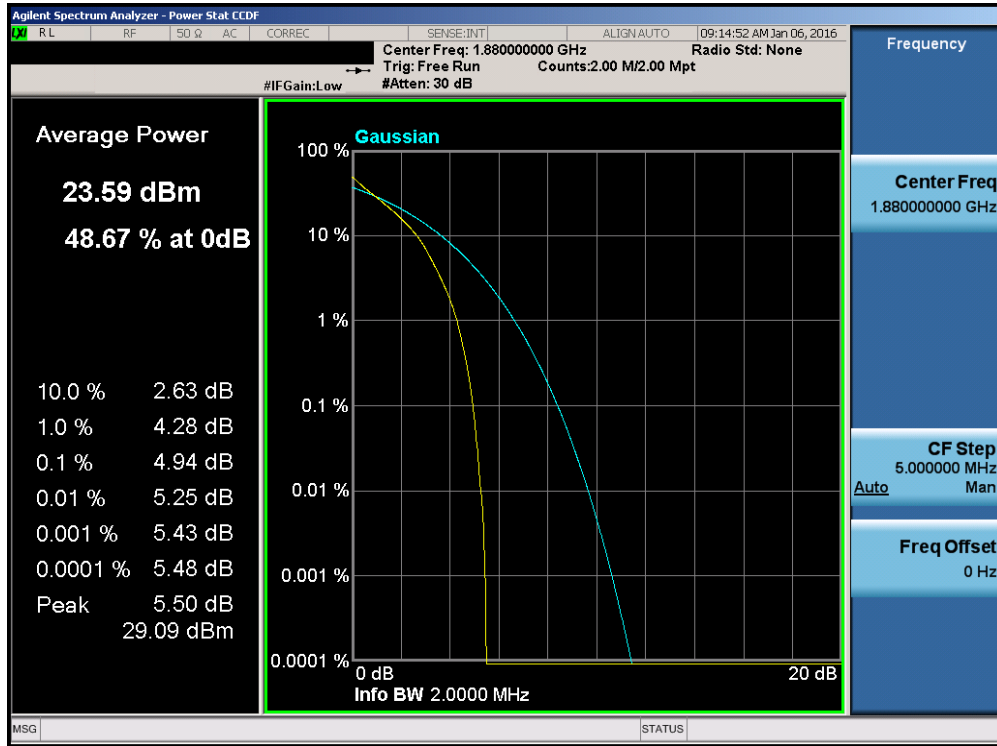


Figure 7-4. Test Instrument & Measurement Setup

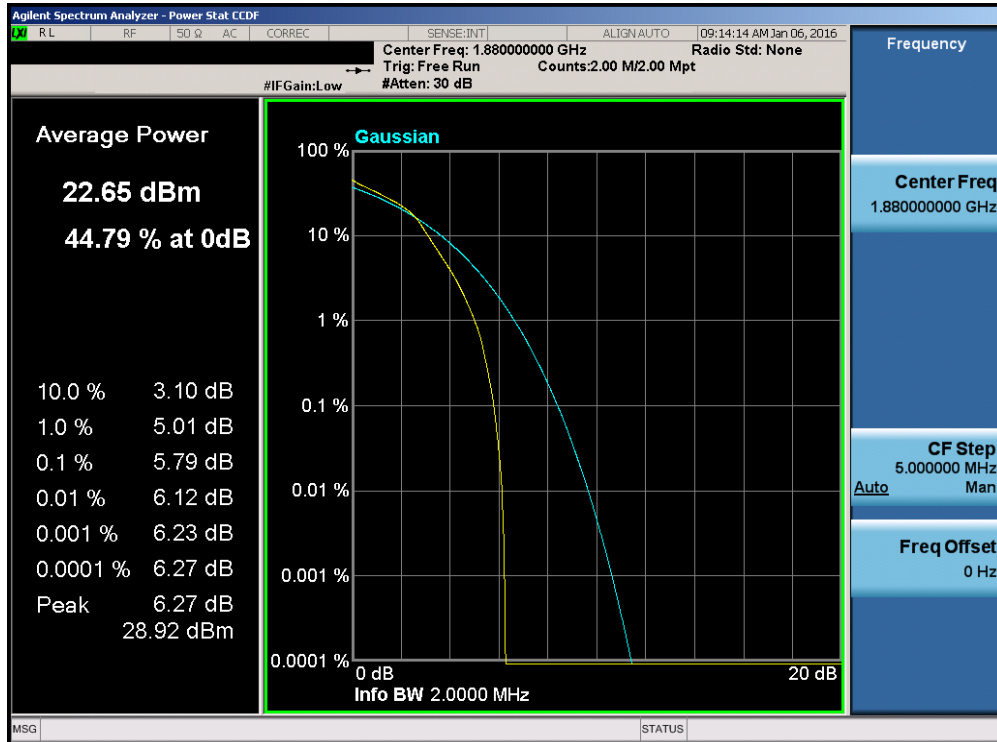
Test Notes

None.

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 119 of 160

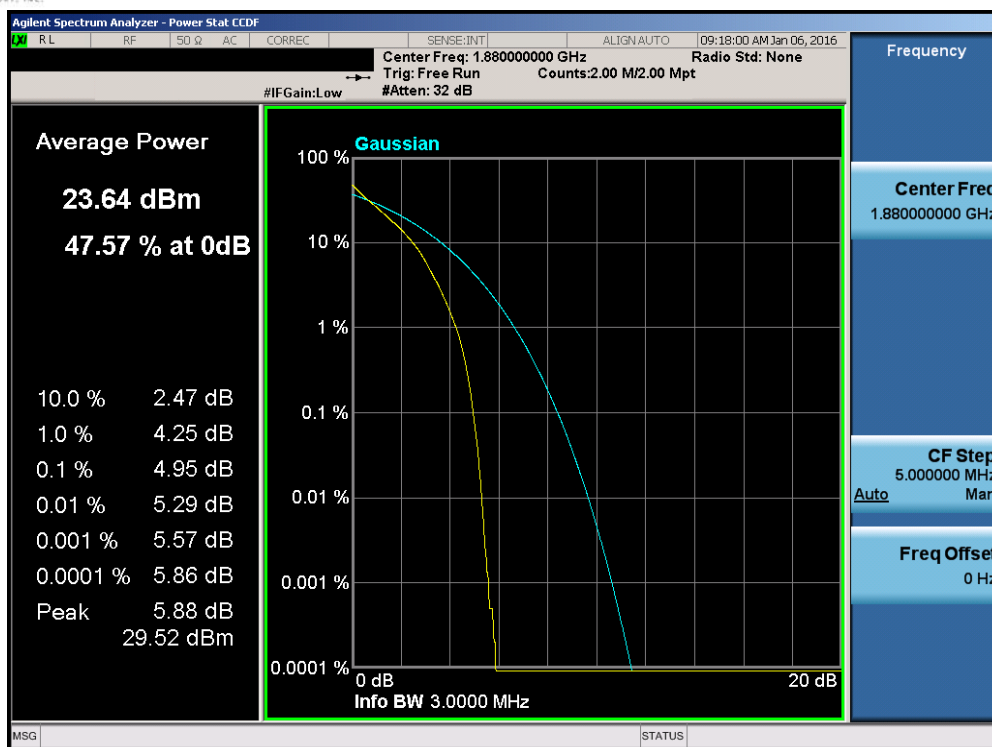


Plot 7-201. PAR Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

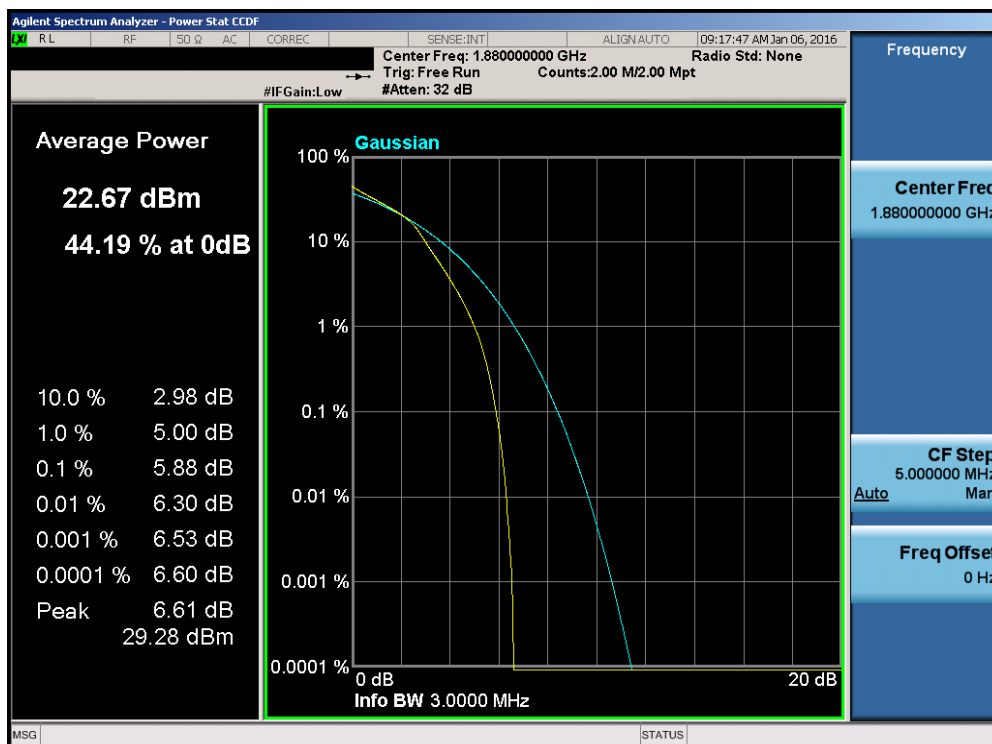


Plot 7-202. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 120 of 160

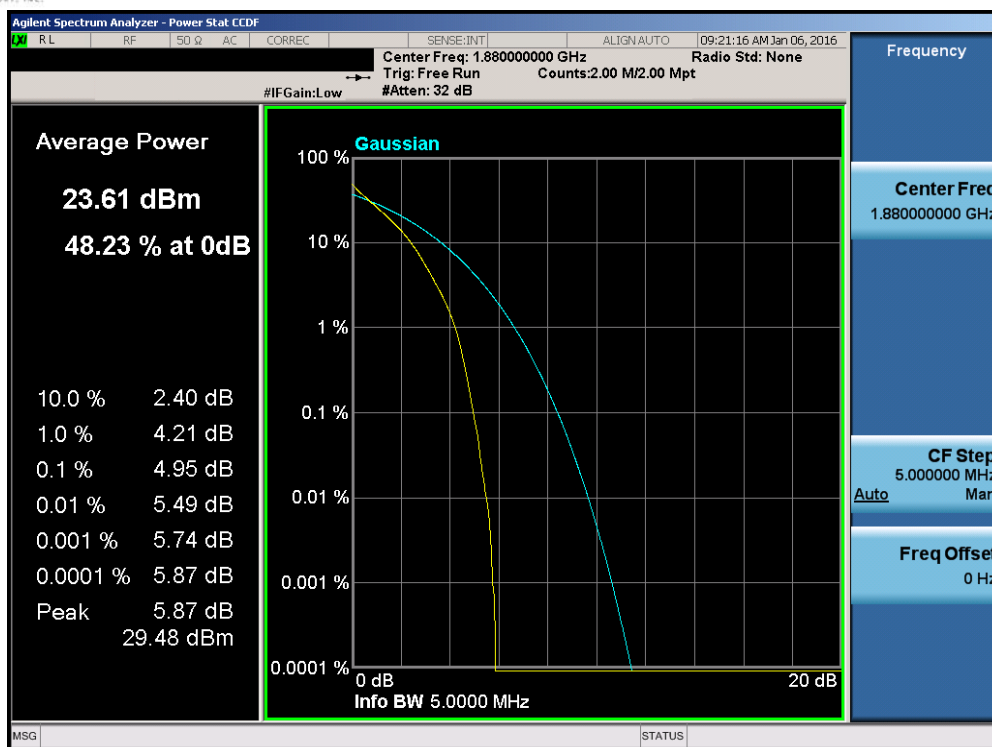


Plot 7-203. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

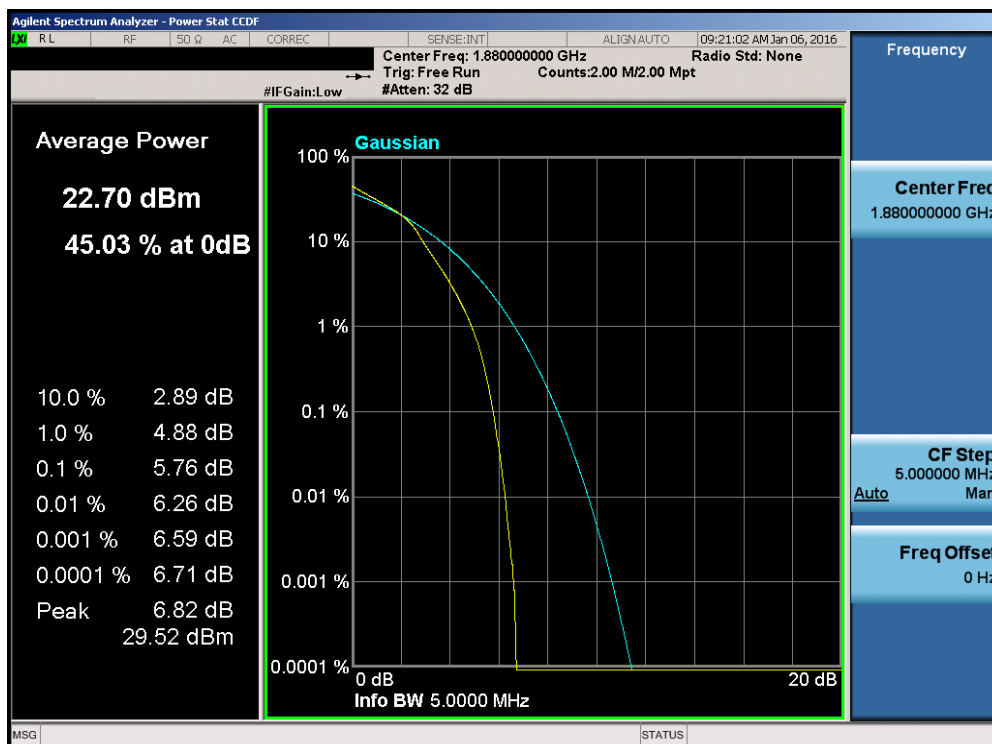


Plot 7-204. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 121 of 160

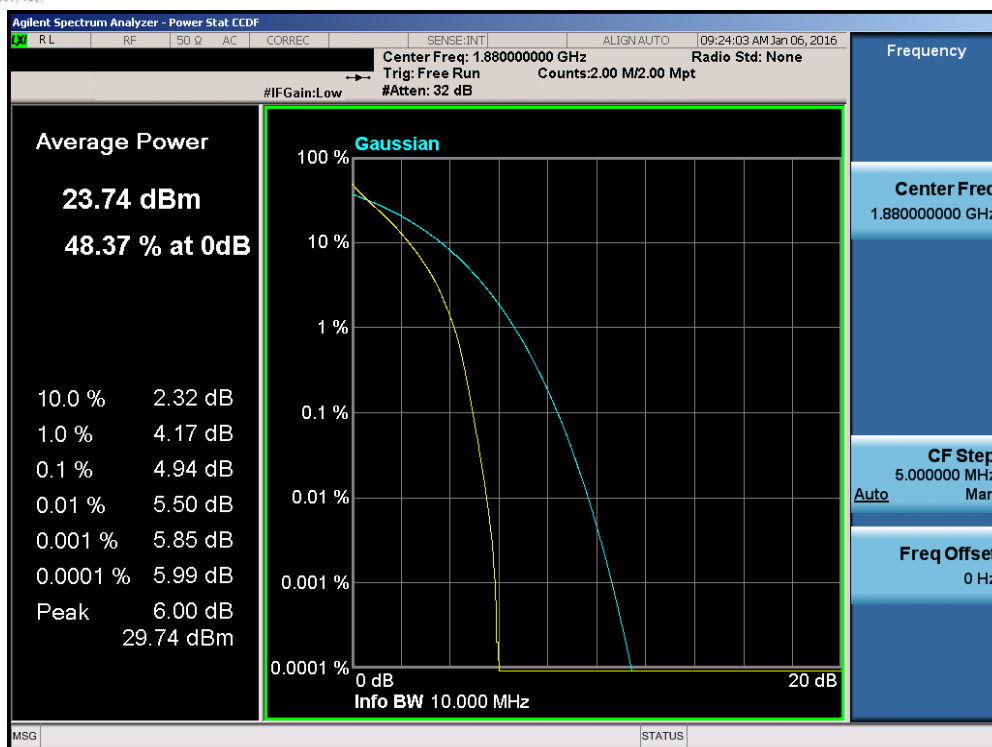


Plot 7-205. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

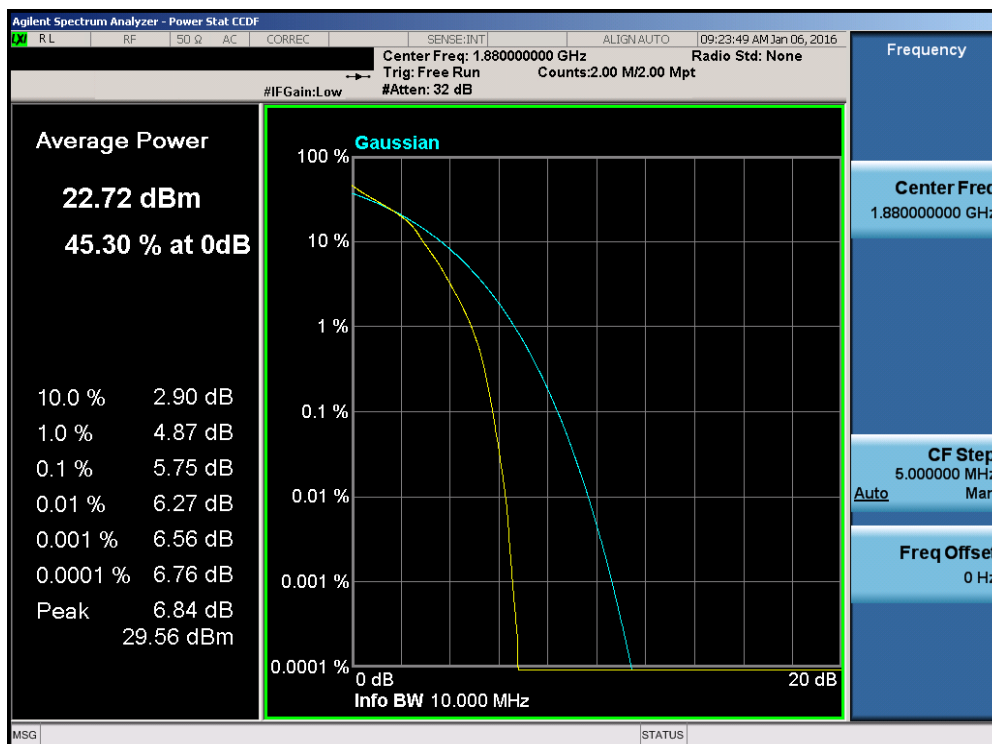


Plot 7-206. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 122 of 160

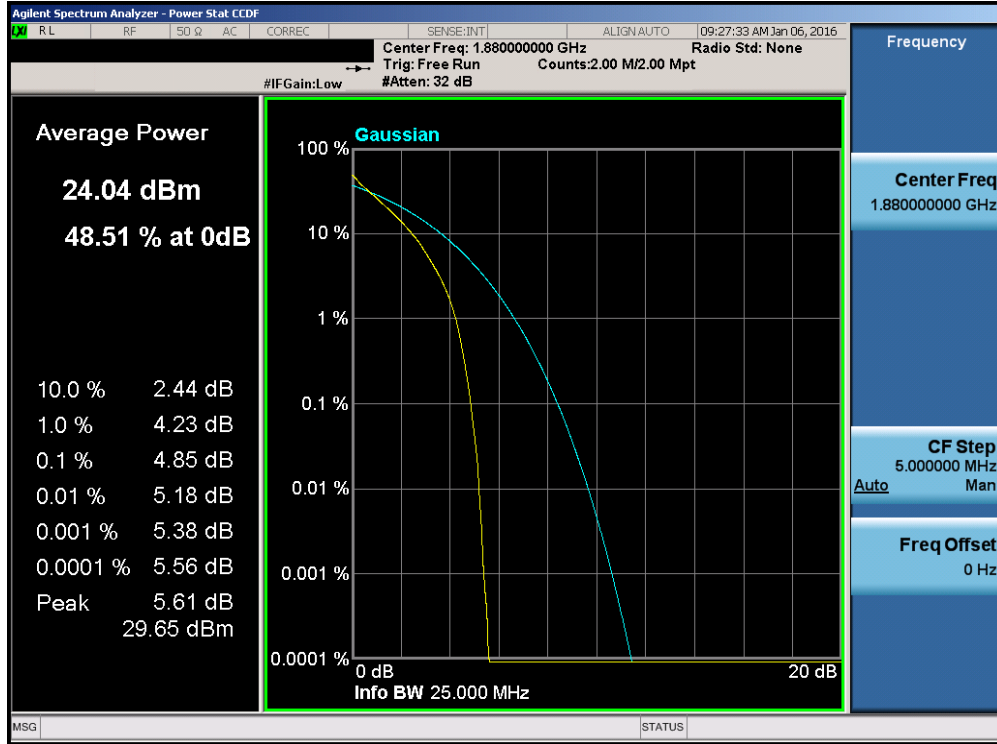


Plot 7-207. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

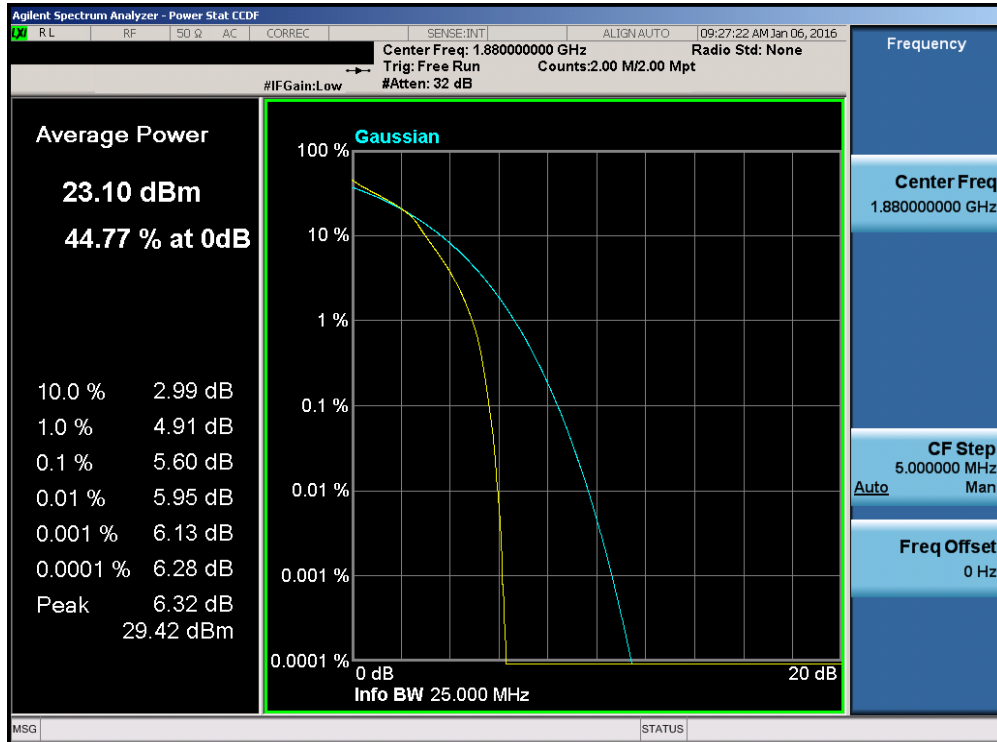


Plot 7-208. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 123 of 160

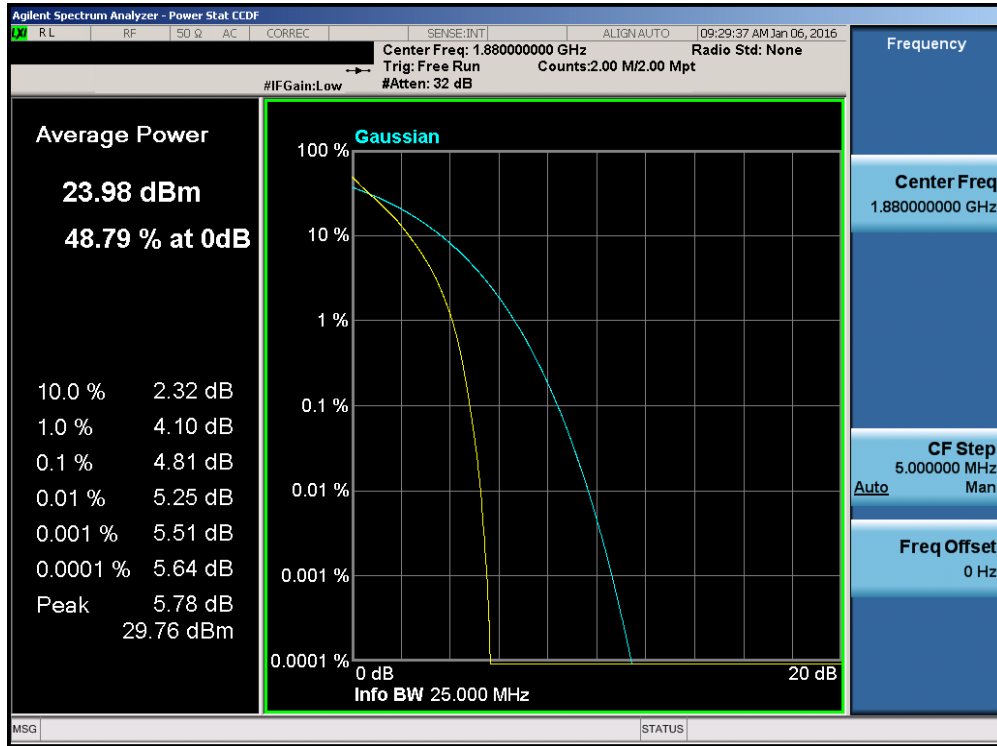


Plot 7-209. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

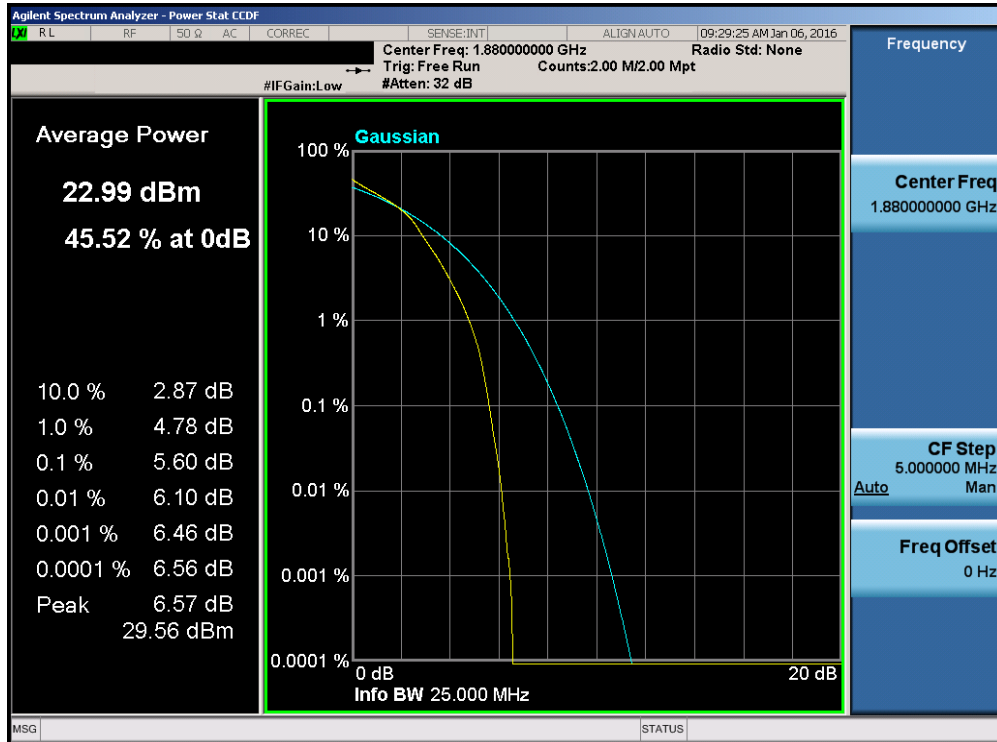


Plot 7-210. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 124 of 160



Plot 7-211. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-212. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: ZNFH820	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 125 of 160

7.6 Radiated Power (ERP/EIRP)

§22.913(a.2) §24.232(c.2) §27.50(h.2) §27.50(c.10) §27.50(d.4) §27.50(a.3)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using horizontally and vertically 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 v02r02 – Section 5.2.1

ANSI/TIA-603-C-2004 – 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: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 126 of 160

Test Setup

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

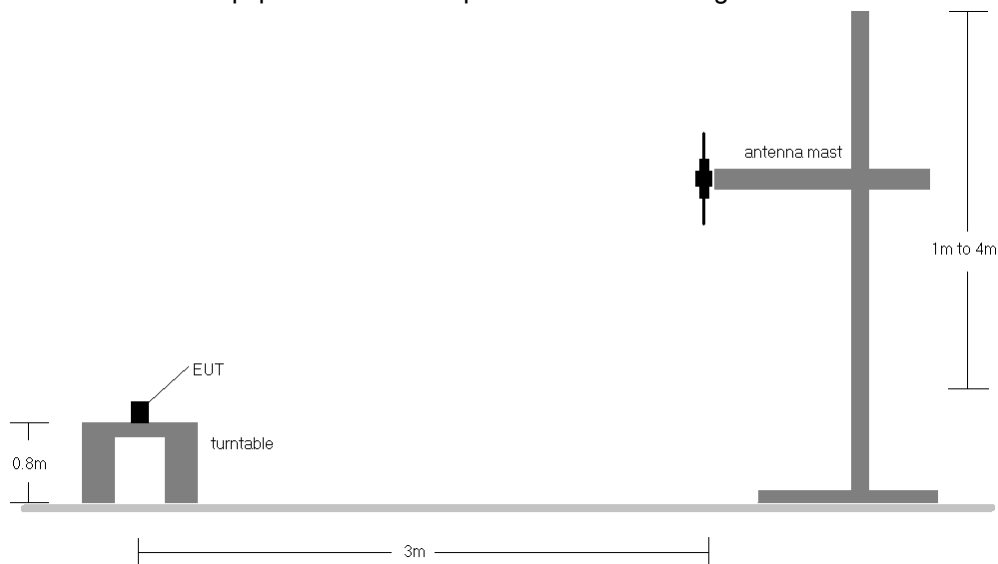


Figure 7-5. Radiated Test Setup <1GHz

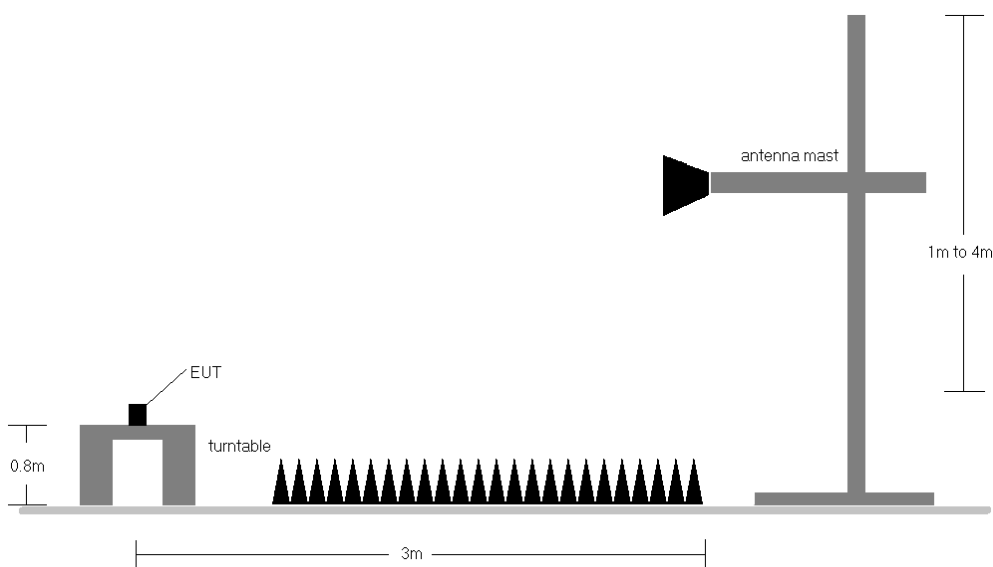


Figure 7-6. Radiated Test Setup >1GHz

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: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 127 of 160

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	Main	223	170	1 / 0	16.02	2.34	18.36	34.77	-16.42
707.50	1.4	QPSK	H	Main	254	166	1 / 0	16.09	2.47	18.56	34.77	-16.21
715.30	1.4	QPSK	H	Main	216	175	1 / 0	16.05	2.63	18.68	34.77	-16.09
699.70	1.4	16-QAM	H	Main	223	170	1 / 0	15.22	2.34	17.56	34.77	-17.22
707.50	1.4	16-QAM	H	Main	254	166	1 / 0	15.13	2.47	17.60	34.77	-17.17
715.30	1.4	16-QAM	H	Main	216	175	1 / 0	15.30	2.63	17.93	34.77	-16.84
700.50	3	QPSK	H	Main	223	170	1 / 7	16.19	2.34	18.53	34.77	-16.25
707.50	3	QPSK	H	Main	254	166	1 / 7	16.16	2.47	18.63	34.77	-16.14
714.50	3	QPSK	H	Main	216	175	1 / 7	16.10	2.61	18.71	34.77	-16.06
700.50	3	16-QAM	H	Main	223	170	1 / 7	15.28	2.34	17.62	34.77	-17.16
707.50	3	16-QAM	H	Main	254	166	1 / 7	15.17	2.47	17.64	34.77	-17.13
714.50	3	16-QAM	H	Main	216	175	1 / 7	15.31	2.61	17.92	34.77	-16.85
701.50	5	QPSK	H	Main	223	170	1 / 24	16.28	2.36	18.64	34.77	-16.14
707.50	5	QPSK	H	Main	254	166	1 / 0	16.22	2.47	18.69	34.77	-16.08
713.50	5	QPSK	H	Main	216	175	1 / 24	16.31	2.59	18.90	34.77	-15.87
701.50	5	16-QAM	H	Main	223	170	1 / 24	15.45	2.36	17.81	34.77	-16.97
707.50	5	16-QAM	H	Main	254	166	1 / 0	15.47	2.47	17.94	34.77	-16.83
713.50	5	16-QAM	H	Main	216	175	1 / 24	15.46	2.59	18.05	34.77	-16.72
704.00	10	QPSK	H	Main	223	170	1 / 49	16.40	2.40	18.80	34.77	-15.97
707.50	10	QPSK	H	Main	254	166	1 / 25	16.27	2.47	18.74	34.77	-16.03
711.00	10	QPSK	H	Main	216	175	1 / 49	16.42	2.54	18.96	34.77	-15.81
704.00	10	16-QAM	H	Main	223	170	1 / 49	15.48	2.40	17.88	34.77	-16.89
707.50	10	16-QAM	H	Main	254	166	1 / 0	15.53	2.47	18.00	34.77	-16.77
711.00	10	16-QAM	H	Main	216	175	1 / 49	15.58	2.54	18.12	34.77	-16.65
704.00	10	QPSK	H	CM	212	176	1 / 49	12.43	2.40	14.83	34.77	-19.94
707.50	10	QPSK	H	CM	201	188	1 / 25	12.64	2.47	15.11	34.77	-19.66
711.00	10	QPSK	H	CM	196	193	1 / 49	12.71	2.54	15.25	34.77	-19.52
704.00	10	16-QAM	H	CM	212	176	1 / 49	11.71	2.40	14.11	34.77	-20.66
707.50	10	16-QAM	H	CM	201	188	1 / 49	11.82	2.47	14.29	34.77	-20.48
711.00	10	16-QAM	H	CM	196	193	1 / 49	11.70	2.54	14.24	34.77	-20.53

Table 7-2. ERP Data (Band 12/17)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 128 of 160	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	Main	176	147	1 / 0	14.88	4.62	19.50	38.45	-18.95
836.50	1.4	QPSK	H	Main	327	154	1 / 0	15.13	4.82	19.95	38.45	-18.50
848.30	1.4	QPSK	H	Main	312	151	1 / 0	15.77	5.02	20.79	38.45	-17.66
824.70	1.4	16-QAM	H	Main	176	147	1 / 0	14.15	4.62	18.77	38.45	-19.68
836.50	1.4	16-QAM	H	Main	327	154	1 / 0	14.36	4.82	19.18	38.45	-19.27
848.30	1.4	16-QAM	H	Main	312	151	1 / 0	15.14	5.02	20.16	38.45	-18.29
825.50	3	QPSK	H	Main	176	147	1 / 0	14.85	4.64	19.49	38.45	-18.96
836.50	3	QPSK	H	Main	327	154	1 / 0	15.21	4.82	20.03	38.45	-18.42
847.50	3	QPSK	H	Main	312	151	1 / 0	15.73	5.00	20.73	38.45	-17.72
825.50	3	16-QAM	H	Main	176	147	1 / 0	14.14	4.64	18.78	38.45	-19.67
836.50	3	16-QAM	H	Main	327	154	1 / 0	14.46	4.82	19.28	38.45	-19.17
847.50	3	16-QAM	H	Main	312	151	1 / 0	15.05	5.00	20.05	38.45	-18.40
826.50	5	QPSK	H	Main	176	147	1 / 24	14.98	4.65	19.63	38.45	-18.82
836.50	5	QPSK	H	Main	327	154	1 / 0	15.25	4.82	20.07	38.45	-18.38
846.50	5	QPSK	H	Main	312	151	1 / 0	15.90	4.99	20.89	38.45	-17.56
826.50	5	16-QAM	H	Main	176	147	1 / 24	14.19	4.65	18.84	38.45	-19.61
836.50	5	16-QAM	H	Main	327	154	1 / 0	14.59	4.82	19.41	38.45	-19.04
846.50	5	16-QAM	H	Main	312	151	1 / 0	15.07	4.99	20.06	38.45	-18.39
829.00	10	QPSK	H	Main	176	147	1 / 49	14.85	4.70	19.55	38.45	-18.90
836.50	10	QPSK	H	Main	327	154	1 / 49	15.07	4.82	19.89	38.45	-18.56
844.00	10	QPSK	H	Main	312	151	1 / 0	15.79	4.95	20.74	38.45	-17.71
829.00	10	16-QAM	H	Main	176	147	1 / 49	14.02	4.70	18.72	38.45	-19.73
836.50	10	16-QAM	H	Main	327	154	1 / 49	14.20	4.82	19.02	38.45	-19.43
844.00	10	16-QAM	H	Main	312	151	1 / 0	14.98	4.95	19.93	38.45	-18.52
826.50	5	QPSK	H	CM	176	147	1 / 24	8.45	4.65	13.10	38.45	-25.35
836.50	5	QPSK	H	CM	327	154	1 / 0	8.15	4.82	12.97	38.45	-25.48
846.50	5	QPSK	H	CM	312	151	1 / 24	8.10	4.99	13.09	38.45	-25.36
826.50	5	16-QAM	H	CM	176	147	1 / 24	7.35	4.65	12.00	38.45	-26.45
836.50	5	16-QAM	H	CM	327	154	1 / 0	7.11	4.82	11.93	38.45	-26.52
846.50	5	16-QAM	H	CM	312	151	1 / 24	7.39	4.99	12.38	38.45	-26.07

Table 7-3. ERP Data (Band 5)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 129 of 160

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	Main	211.0	239	1 / 0	14.08	9.84	23.92	30.00	-6.08
1732.50	1.4	QPSK	H	Main	203.0	234	1 / 0	13.98	9.78	23.76	30.00	-6.24
1754.30	1.4	QPSK	H	Main	199.7	234	1 / 0	14.91	9.73	24.64	30.00	-5.36
1710.70	1.4	16-QAM	H	Main	211.0	239	1 / 0	13.46	9.84	23.30	30.00	-6.70
1732.50	1.4	16-QAM	H	Main	203.0	234	1 / 0	13.24	9.78	23.02	30.00	-6.98
1754.30	1.4	16-QAM	H	Main	199.7	234	1 / 0	14.34	9.73	24.07	30.00	-5.93
1711.50	3	QPSK	H	Main	211.0	239	1 / 0	14.23	9.84	24.07	30.00	-5.93
1732.50	3	QPSK	H	Main	203.0	234	1 / 0	14.08	9.78	23.86	30.00	-6.14
1753.50	3	QPSK	H	Main	199.7	234	1 / 0	15.14	9.74	24.88	30.00	-5.12
1711.50	3	16-QAM	H	Main	211.0	239	1 / 0	13.68	9.84	23.52	30.00	-6.48
1732.50	3	16-QAM	H	Main	203.0	234	1 / 0	13.47	9.78	23.25	30.00	-6.75
1753.50	3	16-QAM	H	Main	199.7	234	1 / 0	14.66	9.74	24.40	30.00	-5.60
1712.50	5	QPSK	H	Main	211.0	239	1 / 0	14.41	9.83	24.24	30.00	-5.76
1732.50	5	QPSK	H	Main	203.0	234	1 / 0	14.25	9.78	24.03	30.00	-5.97
1752.50	5	QPSK	H	Main	199.7	234	1 / 0	15.32	9.74	25.06	30.00	-4.94
1712.50	5	16-QAM	H	Main	211.0	239	1 / 0	13.80	9.83	23.63	30.00	-6.37
1732.50	5	16-QAM	H	Main	203.0	234	1 / 0	13.59	9.78	23.37	30.00	-6.63
1752.50	5	16-QAM	H	Main	199.7	234	1 / 0	14.75	9.74	24.49	30.00	-5.51
1715.00	10	QPSK	H	Main	211.0	239	1 / 0	14.34	9.83	24.17	30.00	-5.83
1732.50	10	QPSK	H	Main	203.0	234	1 / 0	14.18	9.78	23.96	30.00	-6.04
1750.00	10	QPSK	H	Main	199.7	234	1 / 0	15.05	9.74	24.79	30.00	-5.21
1715.00	10	16-QAM	H	Main	211.0	239	1 / 0	13.82	9.83	23.65	30.00	-6.35
1732.50	10	16-QAM	H	Main	203.0	234	1 / 0	13.47	9.78	23.25	30.00	-6.75
1750.00	10	16-QAM	H	Main	199.7	234	1 / 0	14.61	9.74	24.35	30.00	-5.65
1717.50	15	QPSK	H	Main	211.0	239	1 / 0	14.41	9.82	24.23	30.00	-5.77
1732.50	15	QPSK	H	Main	203.0	234	1 / 0	14.11	9.78	23.89	30.00	-6.11
1747.50	15	QPSK	H	Main	199.7	234	1 / 0	15.10	9.75	24.85	30.00	-5.15
1717.50	15	16-QAM	H	Main	211.0	239	1 / 0	13.86	9.82	23.68	30.00	-6.32
1732.50	15	16-QAM	H	Main	203.0	234	1 / 0	13.34	9.78	23.12	30.00	-6.88
1747.50	15	16-QAM	H	Main	199.7	234	1 / 0	14.55	9.75	24.30	30.00	-5.70
1720.00	20	QPSK	H	Main	211.0	239	1 / 0	14.43	9.81	24.24	30.00	-5.76
1732.50	20	QPSK	H	Main	203.0	234	1 / 0	14.17	9.78	23.95	30.00	-6.05
1745.00	20	QPSK	H	Main	199.7	234	1 / 0	15.06	9.76	24.82	30.00	-5.18
1720.00	20	16-QAM	H	Main	211.0	239	1 / 0	13.81	9.81	23.62	30.00	-6.38
1732.50	20	16-QAM	H	Main	203.0	234	1 / 0	13.41	9.78	23.19	30.00	-6.81
1745.00	20	16-QAM	H	Main	199.7	234	1 / 0	14.33	9.76	24.09	30.00	-5.91
1752.50	5	QPSK	H	Div	190	60	1 / 0	8.65	9.74	18.39	30.00	-11.61
1712.50	5	QPSK	H	CM	211.0	239	1 / 0	14.27	9.83	24.10	30.00	-5.90
1732.50	5	QPSK	H	CM	203.0	234	1 / 0	14.25	9.78	24.03	30.00	-5.97
1752.50	5	QPSK	H	CM	199.7	234	1 / 0	15.08	9.74	24.82	30.00	-5.18
1712.50	5	16-QAM	H	CM	211.0	239	1 / 0	13.58	9.83	23.41	30.00	-6.59
1732.50	5	16-QAM	H	CM	203.0	234	1 / 0	13.42	9.78	23.20	30.00	-6.80
1752.50	5	16-QAM	H	CM	199.7	234	1 / 0	14.62	9.74	24.36	30.00	-5.64

Table 7-4. EIRP Data (Band 4)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 130 of 160

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	Main	187	239	1 / 0	13.80	9.54	23.34	33.01	-9.67
1880.00	1.4	QPSK	H	Main	182	239	1 / 0	14.37	9.50	23.87	33.01	-9.14
1909.30	1.4	QPSK	H	Main	232	246	1 / 0	14.98	9.48	24.46	33.01	-8.55
1850.70	1.4	16-QAM	H	Main	187	239	1 / 0	13.11	9.54	22.65	33.01	-10.36
1880.00	1.4	16-QAM	H	Main	182	239	1 / 0	13.32	9.50	22.82	33.01	-10.19
1909.30	1.4	16-QAM	H	Main	232	246	1 / 0	13.70	9.48	23.18	33.01	-9.83
1851.50	3	QPSK	H	Main	187	239	1 / 0	14.02	9.54	23.56	33.01	-9.45
1880.00	3	QPSK	H	Main	182	239	1 / 0	14.59	9.50	24.09	33.01	-8.92
1908.50	3	QPSK	H	Main	232	246	1 / 0	15.04	9.48	24.52	33.01	-8.49
1851.50	3	16-QAM	H	Main	187	239	1 / 0	13.19	9.54	22.73	33.01	-10.28
1880.00	3	16-QAM	H	Main	182	239	1 / 0	13.51	9.50	23.01	33.01	-10.00
1908.50	3	16-QAM	H	Main	232	246	1 / 0	14.03	9.48	23.51	33.01	-9.50
1852.50	5	QPSK	H	Main	187	239	1 / 0	14.21	9.54	23.75	33.01	-9.26
1880.00	5	QPSK	H	Main	182	239	1 / 0	14.83	9.50	24.33	33.01	-8.68
1907.50	5	QPSK	H	Main	232	246	1 / 0	15.08	9.48	24.56	33.01	-8.45
1852.50	5	16-QAM	H	Main	187	239	1 / 0	13.42	9.54	22.96	33.01	-10.05
1880.00	5	16-QAM	H	Main	182	239	1 / 0	13.76	9.50	23.26	33.01	-9.75
1907.50	5	16-QAM	H	Main	232	246	1 / 0	14.19	9.48	23.67	33.01	-9.34
1855.00	10	QPSK	H	Main	187	239	1 / 0	14.29	9.54	23.83	33.01	-9.18
1880.00	10	QPSK	H	Main	182	239	1 / 25	14.89	9.50	24.39	33.01	-8.62
1905.00	10	QPSK	H	Main	232	246	1 / 0	15.21	9.47	24.68	33.01	-8.33
1855.00	10	16-QAM	H	Main	187	239	1 / 0	13.55	9.54	23.09	33.01	-9.92
1880.00	10	16-QAM	H	Main	182	239	1 / 25	13.91	9.50	23.41	33.01	-9.60
1905.00	10	16-QAM	H	Main	232	246	1 / 0	14.33	9.47	23.80	33.01	-9.21
1857.50	15	QPSK	H	Main	187	239	1 / 0	14.18	9.53	23.71	33.01	-9.30
1880.00	15	QPSK	H	Main	182	239	1 / 0	14.74	9.50	24.24	33.01	-8.77
1902.50	15	QPSK	H	Main	232	246	1 / 0	15.17	9.47	24.64	33.01	-8.37
1857.50	15	16-QAM	H	Main	187	239	1 / 0	13.62	9.53	23.15	33.01	-9.86
1880.00	15	16-QAM	H	Main	182	239	1 / 0	13.77	9.50	23.27	33.01	-9.74
1902.50	15	16-QAM	H	Main	232	246	1 / 0	14.20	9.47	23.67	33.01	-9.34
1860.00	20	QPSK	H	Main	187	239	1 / 0	14.14	9.53	23.67	33.01	-9.34
1880.00	20	QPSK	H	Main	182	239	1 / 0	14.82	9.50	24.32	33.01	-8.69
1900.00	20	QPSK	H	Main	232	246	1 / 0	15.09	9.46	24.55	33.01	-8.46
1860.00	20	16-QAM	H	Main	187	239	1 / 0	13.65	9.53	23.18	33.01	-9.83
1880.00	20	16-QAM	H	Main	182	239	1 / 0	13.67	9.50	23.17	33.01	-9.84
1900.00	20	16-QAM	H	Main	232	246	1 / 0	14.11	9.46	23.57	33.01	-9.44
1905.00	10	QPSK	H	Div	166	58	1 / 0	8.74	9.47	18.21	33.01	-14.80
1855.00	10	QPSK	H	CM	241	141	1 / 0	9.04	9.54	18.58	33.01	-14.43
1880.00	10	QPSK	H	CM	100	0	1 / 25	7.47	9.50	16.97	33.01	-16.04
1905.00	10	QPSK	H	CM	231	156	1 / 0	9.89	9.47	19.36	33.01	-13.65
1855.00	10	16-QAM	H	CM	241	141	1 / 0	8.38	9.54	17.92	33.01	-15.09
1880.00	10	16-QAM	H	CM	100	0	1 / 25	6.81	9.50	16.31	33.01	-16.70
1905.00	10	16-QAM	H	CM	231	156	1 / 0	9.17	9.47	18.64	33.01	-14.37

Table 7-5. EIRP Data (Band 2)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 131 of 160

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2307.50	5	QPSK	H	Main	175	124	1 / 0	7.12	9.23	16.35	23.98	-7.63
2310.00	5	QPSK	H	Main	196	118	1 / 0	7.29	9.23	16.52	23.98	-7.46
2312.50	5	QPSK	H	Main	214	113	1 / 0	7.19	9.23	16.42	23.98	-7.56
2307.50	5	16-QAM	H	Main	175	124	1 / 0	6.40	9.23	15.63	23.98	-8.35
2310.00	5	16-QAM	H	Main	196	118	1 / 0	6.58	9.23	15.81	23.98	-8.17
2312.50	5	16-QAM	H	Main	214	113	1 / 0	6.33	9.23	15.56	23.98	-8.42
2310.00	10	QPSK	H	Main	196	118	1 / 49	7.37	9.23	16.60	23.98	-7.38
2310.00	10	16-QAM	H	Main	196	118	1 / 49	6.67	9.23	15.90	23.98	-8.08
2310.00	10	QPSK	H	CM	154	270	1 / 0	8.23	9.23	17.46	23.98	-6.52
2310.00	10	16-QAM	H	CM	154	270	1 / 0	7.47	9.23	16.70	23.98	-7.28

Table 7-6. EIRP Data (Band 30)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 132 of 160	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	Main	180	83	1 / 24	10.19	9.01	19.20	33.01	-13.82
2535.00	5	QPSK	H	Main	178	99	1 / 0	7.54	8.92	16.46	33.01	-16.55
2567.50	5	QPSK	H	Main	213	82	1 / 0	10.98	8.83	19.81	33.01	-13.20
2502.50	5	16-QAM	H	Main	180	83	1 / 24	9.59	9.01	18.60	33.01	-14.42
2535.00	5	16-QAM	H	Main	178	99	1 / 0	7.04	8.92	15.96	33.01	-17.05
2567.50	5	16-QAM	H	Main	213	82	1 / 0	10.38	8.83	19.21	33.01	-13.80
2505.00	10	QPSK	H	Main	180	83	1 / 0	9.77	9.00	18.77	33.01	-14.24
2535.00	10	QPSK	H	Main	178	99	1 / 0	7.41	8.92	16.33	33.01	-16.68
2565.00	10	QPSK	H	Main	213	82	1 / 0	11.15	8.83	19.98	33.01	-13.03
2505.00	10	16-QAM	H	Main	180	83	1 / 0	9.48	9.00	18.48	33.01	-14.53
2535.00	10	16-QAM	H	Main	178	99	1 / 0	6.95	8.92	15.87	33.01	-17.14
2565.00	10	16-QAM	H	Main	213	82	1 / 0	10.46	8.83	19.29	33.01	-13.72
2507.50	15	QPSK	H	Main	182	113	1 / 0	8.00	8.99	16.99	33.01	-16.02
2535.00	15	QPSK	H	Main	174	107	1 / 0	6.59	8.92	15.51	33.01	-17.50
2562.50	15	QPSK	H	Main	178	139	1 / 37	12.43	8.84	21.27	33.01	-11.74
2507.50	15	16-QAM	H	Main	182	113	1 / 0	7.45	8.99	16.44	33.01	-16.57
2535.00	15	16-QAM	H	Main	174	107	1 / 0	6.07	8.92	14.99	33.01	-18.02
2562.50	15	16-QAM	H	Main	178	139	1 / 37	9.33	8.84	18.17	33.01	-14.84
2510.00	20	QPSK	H	Main	182	113	1 / 0	7.98	8.98	16.96	33.01	-16.05
2535.00	20	QPSK	H	Main	174	107	1 / 0	6.44	8.92	15.36	33.01	-17.65
2560.00	20	QPSK	H	Main	178	139	1 / 0	11.81	8.85	20.66	33.01	-12.35
2510.00	20	16-QAM	H	Main	182	113	1 / 0	7.22	8.98	16.20	33.01	-16.81
2535.00	20	16-QAM	H	Main	174	107	1 / 0	5.97	8.92	14.89	33.01	-18.12
2560.00	20	16-QAM	H	Main	178	139	1 / 0	11.20	8.85	20.05	33.01	-12.96
2507.50	15	QPSK	H	CM	182	113	1 / 0	10.21	8.99	19.20	33.01	-13.81
2535.00	15	QPSK	H	CM	141	307	1 / 0	10.47	8.92	19.39	33.01	-13.62
2562.50	15	QPSK	H	CM	178	139	1 / 37	9.02	8.84	17.86	33.01	-15.15
2507.50	15	16-QAM	H	CM	182	113	1 / 0	9.32	8.99	18.31	33.01	-14.70
2535.00	15	16-QAM	H	CM	141	307	1 / 0	9.94	8.92	18.86	33.01	-14.15
2562.50	15	16-QAM	H	CM	178	139	1 / 37	8.00	8.84	16.84	33.01	-16.17

Table 7-7. EIRP Data (Band 7)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 133 of 160

7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m) §27.53(a.4)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r02 – Section 5.8

ANSI/TIA-603-C-2004 – 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 = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 134 of 160

Test Setup

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

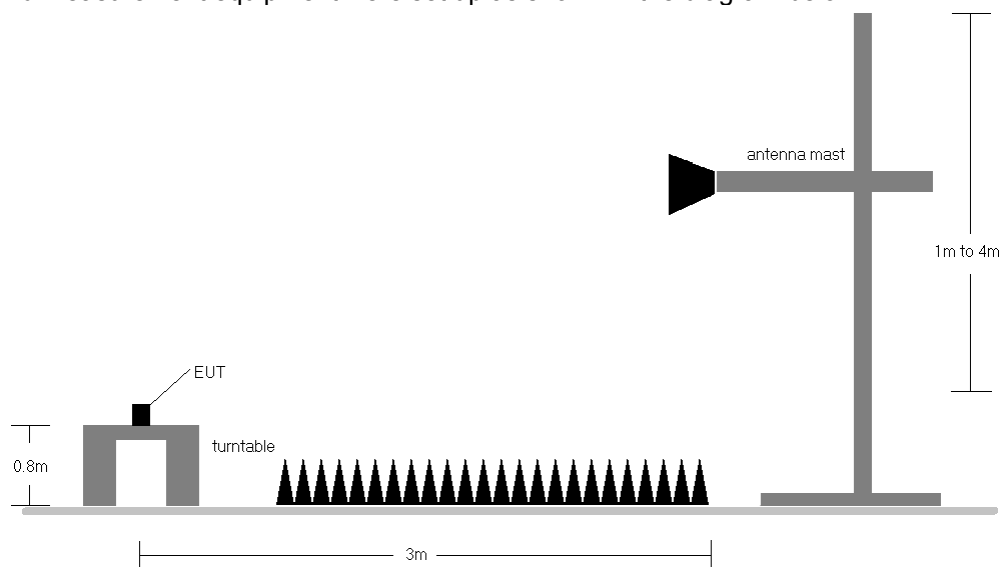


Figure 7-7. Test Instrument & Measurement Setup

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.

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 135 of 160

OPERATING FREQUENCY: 704.00 MHz
 CHANNEL: 23060
 MEASURED OUTPUT POWER: 18.80 dBm = 0.076 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 31.80 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1408.00	H	138	20	-56.10	6.21	-49.89	68.7
2112.00	H	100	259	-43.24	6.78	-36.46	55.3
2816.00	H	100	268	-56.01	8.05	-47.97	66.8
3520.00	H	-	-	-58.16	7.63	-50.52	69.3

Table 7-8. Radiated Spurious Data (Band 12 – Low Channel)

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MEASURED OUTPUT POWER: 18.74 dBm = 0.075 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 31.74 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	110	264	-56.44	6.23	-50.22	69.0
2122.50	H	110	272	-39.83	6.80	-33.03	51.8
2830.00	H	123	280	-54.87	8.07	-46.81	65.6
3537.50	H	-	-	-59.04	7.68	-51.37	70.1

Table 7-9. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY: 711.00 MHz
 CHANNEL: 23130
 MEASURED OUTPUT POWER: 18.96 dBm = 0.079 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 31.96 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1422.00	H	110	268	-56.25	6.25	-50.00	69.0
2133.00	H	113	264	-39.92	6.82	-33.10	52.1
2844.00	H	118	277	-53.83	8.09	-45.75	64.7
3555.00	H	-	-	-59.79	7.72	-52.07	71.0

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

OPERATING FREQUENCY: 711.00 MHz
 CHANNEL: 23130
 MEASURED OUTPUT POWER: 15.25 dBm = 0.034 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 28.25 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1422.00	H	186	244	-63.35	5.77	-57.58	72.8
2133.00	H	198	221	-43.59	6.79	-36.80	52.1
2844.00	H	-	-	-63.97	7.78	-56.19	71.4

Table 7-11. Radiated Spurious Data with CM Accessory (Band 12/17 – High Channel)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)				Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset			Page 137 of 160

OPERATING FREQUENCY: 826.50 MHz
 CHANNEL: 20425
 MEASURED OUTPUT POWER: 19.63 dBm = 0.092 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.63 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	131	231	-55.05	6.23	-48.82	68.4
2479.50	H	121	351	-56.29	6.61	-49.67	69.3
3306.00	H	-	-	-60.02	7.01	-53.01	72.6

Table 7-12. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MEASURED OUTPUT POWER: 20.07 dBm = 0.102 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.07 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	129	236	-54.54	6.13	-48.41	68.5
2509.50	H	116	344	-56.41	6.64	-49.77	69.8
3346.00	H	-	-	-58.11	7.14	-50.97	71.0

Table 7-13. Radiated Spurious Data (Band 5 – Mid Channel)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 138 of 160

OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 20625
 MEASURED OUTPUT POWER: 20.89 dBm = 0.123 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 33.89 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	102	345	-51.27	6.03	-45.24	66.1
2539.50	H	106	26	-56.63	6.72	-49.91	70.8
3386.00	H	-	-	-58.98	7.27	-51.72	72.6

Table 7-14. Radiated Spurious Data (Band 5 – High Channel)

OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 20625
 MEASURED OUTPUT POWER: 13.10 dBm = 0.020 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 26.10 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	111	262	-66.61	6.03	-60.58	73.7
2539.50	H	105	280	-55.80	6.72	-49.08	62.2
3386.00	H	-	-	-65.19	7.27	-57.93	71.0

Table 7-15. Radiated Spurious Data with CM Accessory (Band 5 – High Channel)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 139 of 160

OPERATING FREQUENCY: 1712.50 MHz
 CHANNEL: 19975
 MEASURED OUTPUT POWER: 24.24 dBm = 0.266 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.24 dBc

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]	[dBc]
3425.00	H	130	270	-45.67	9.53	-36.13	60.4
5137.50	H	-	-	-51.35	11.03	-40.32	64.6
6850.00	H	-	-	-48.11	10.75	-37.36	61.6

Table 7-16. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 24.03 dBm = 0.253 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.03 dBc

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]	[dBc]
3465.00	H	136	260	-42.92	9.64	-33.28	57.3
5197.50	H	-	-	-52.33	10.98	-41.35	65.4
6930.00	H	-	-	-48.53	10.85	-37.68	61.7

Table 7-17. Radiated Spurious Data (Band 4 – Mid Channel)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 140 of 160

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20375
 MEASURED OUTPUT POWER: 25.06 dBm = 0.320 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 38.06 dBc

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]	[dBc]
3505.00	H	130	250	-38.86	9.75	-29.11	54.2
5257.50	H	-	-	-51.91	11.06	-40.86	65.9
7010.00	H	-	-	-48.42	11.00	-37.41	62.5

Table 7-18. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20375
 MEASURED OUTPUT POWER: 24.82 dBm = 0.303 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.82 dBc

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]	[dBc]
3505.00	H	211	65	-54.08	9.73	-44.35	69.2
5257.50	H	255	78	-43.73	10.64	-33.09	57.9
7010.00	H	-	-	-53.39	11.75	-41.63	66.4

Table 7-19. Radiated Spurious Data with CM Accessory (Band 4 – High Channel)

OPERATING FREQUENCY: 1855.00 MHz
 CHANNEL: 18650
 MEASURED OUTPUT POWER: 23.83 dBm = 0.241 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.83 dBc

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]	[dBc]
3710.00	H	180	40	-44.69	9.87	-34.82	58.7
5565.00	H	-	-	-52.18	11.18	-41.00	64.8
7420.00	H	-	-	-45.88	10.85	-35.04	58.9

Table 7-20. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 24.39 dBm = 0.275 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.39 dBc

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]	[dBc]
3760.00	H	170	280	-44.47	9.63	-34.84	59.2
5640.00	H	-	-	-53.12	11.29	-41.83	66.2
7520.00	H	-	-	-47.17	11.12	-36.04	60.4

Table 7-21. Radiated Spurious Data (Band 2 – Mid Channel)

FCC ID: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)				Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset			Page 142 of 160

OPERATING FREQUENCY: 1905.00 MHz
 CHANNEL: 19150
 MEASURED OUTPUT POWER: 24.68 dBm = 0.294 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.68 dBc

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]	[dBc]
3810.00	H	179	340	-46.90	9.41	-37.48	62.2
5715.00	H	-	-	-53.52	11.37	-42.16	66.8
7620.00	H	-	-	-48.23	11.33	-36.90	61.6

Table 7-22. Radiated Spurious Data (Band 2 – High Channel)

OPERATING FREQUENCY: 1905.00 MHz
 CHANNEL: 19150
 MEASURED OUTPUT POWER: 19.36 dBm = 0.086 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.36 dBc

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]	[dBc]
3810.00	H	176	217	-56.18	9.41	-46.76	66.1
5715.00	H	190	227	-56.43	11.37	-45.07	64.4
7620.00	H	-	-	-56.82	11.33	-45.49	64.9

Table 7-23. Radiated Spurious Data with CM Accessory (Band 2 – High Channel)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 143 of 160

OPERATING FREQUENCY: 2310.00 MHz
 CHANNEL: 27710
 MEASURED OUTPUT POWER: 16.60 dBm = 0.046 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $70 + 10 \log_{10}(W) = 56.60$ dBc

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]	[dBc]
4620.00	H	102	252	-65.95	11.33	-54.62	71.2
6930.00	H	-	-	-62.14	10.85	-51.29	67.9
9240.00	H	-	-	-62.97	12.31	-50.66	67.3

Table 7-24. Radiated Spurious Data (Band 30)

OPERATING FREQUENCY: 2310.00 MHz
 CHANNEL: 27710
 MEASURED OUTPUT POWER: 17.46 dBm = 0.056 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $70 + 10 \log_{10}(W) = 57.46$ dBc

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]	[dBc]
4620.00	H	110	219	-62.12	11.33	-50.79	68.3
6930.00	H	-	-	-58.25	10.85	-47.40	64.9
9240.00	H	-	-	-57.85	12.31	-45.54	63.0

Table 7-25. Radiated Spurious Data with CM Accessory (Band 30)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 144 of 160

OPERATING FREQUENCY: 2507.50 MHz
 CHANNEL: 20825
 MEASURED OUTPUT POWER: 16.99 dBm = 0.050 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 41.99 dBc

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]	[dBc]
5015.00	H	189	324	-50.59	10.15	-40.44	57.4
7522.50	H	189	324	-55.58	12.11	-43.47	60.5
10030.00	H	189	324	-53.55	13.26	-40.29	57.3
12537.50	H	-	-	-49.72	13.19	-36.54	53.5

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

OPERATING FREQUENCY: 2535.00 MHz
 CHANNEL: 21100
 MEASURED OUTPUT POWER: 15.51 dBm = 0.036 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 40.51 dBc

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]	[dBc]
5070.00	H	162	338	-50.08	10.19	-39.89	55.4
7605.00	H	162	338	-55.41	12.18	-43.22	58.7
10140.00	H	162	338	-53.29	13.29	-40.00	55.5
12675.00	H	-	-	-50.44	13.19	-37.25	52.8

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

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 145 of 160

OPERATING FREQUENCY: 2562.50 MHz
 CHANNEL: 21375
 MEASURED OUTPUT POWER: 21.27 dBm = 0.134 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 46.27 dBc

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]	[dBc]
5125.00	H	135	315	-52.39	10.25	-42.14	63.4
7687.50	H	135	315	-55.35	12.27	-43.08	64.4
10250.00	H	135	315	-50.13	13.28	-36.85	58.1
12812.50	H	-	-	-50.31	13.26	-37.05	58.3

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

OPERATING FREQUENCY: 2535.00 MHz
 CHANNEL: 21100
 MEASURED OUTPUT POWER: 19.39 dBm = 0.087 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 44.39 dBc

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]	[dBc]
5070.00	H	145	342	-45.40	10.25	-35.15	54.5
7605.00	H	145	342	-54.79	12.27	-42.52	61.9
10140.00	H	145	342	-50.75	13.28	-37.47	56.9
12675.00	H	-	-	-50.73	13.26	-37.47	56.9

Table 7-29. Radiated Spurious Data with CM Accessory (Band 7 – Mid Channel)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 146 of 160

7.8 Frequency Stability / Temperature Variation

\$2.1055 \$22.355 \$24.235 \$27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. 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 $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 and 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-C-2004

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: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 147 of 160

Band 12/17 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	707,499,909	-91	-0.0000129
100 %		- 30	707,499,927	-73	-0.0000103
100 %		- 20	707,499,850	-150	-0.0000212
100 %		- 10	707,500,066	66	0.0000093
100 %		0	707,500,015	15	0.0000021
100 %		+ 10	707,500,071	71	0.0000100
100 %		+ 20	707,499,921	-79	-0.0000112
100 %		+ 30	707,500,054	54	0.0000076
100 %		+ 40	707,499,999	-1	-0.0000001
100 %		+ 50	707,499,900	-100	-0.0000141
BATT. ENDPOINT	3.40	+ 20	707,500,108	108	0.0000153

Table 7-30. 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: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 148 of 160

Band 12/17 Frequency Stability Measurements

§2.1055 §27.54

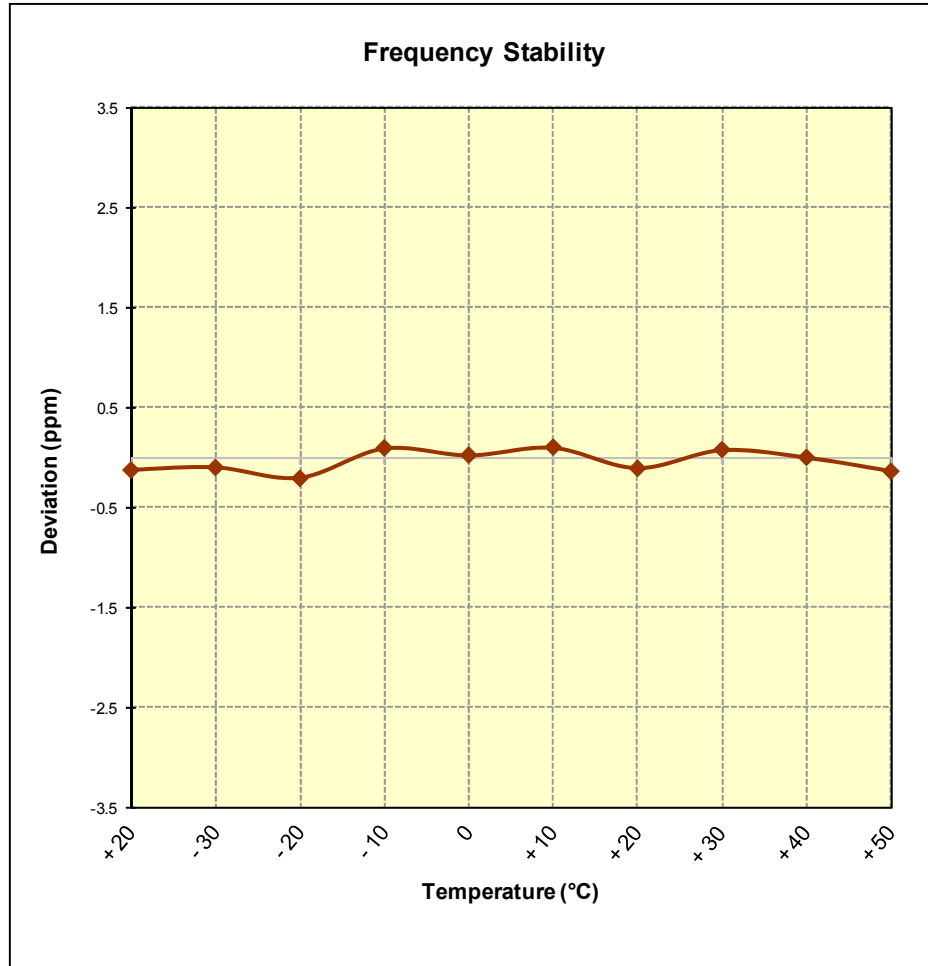


Figure 7-8. Frequency Stability Graph (Band 12/17)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 149 of 160

Band 5 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY: 836,500,000 Hz

CHANNEL: 20525

REFERENCE VOLTAGE: 3.80 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,499,994	-6	-0.0000007
100 %		- 30	836,499,957	-43	-0.0000051
100 %		- 20	836,499,997	-3	-0.0000004
100 %		- 10	836,500,150	150	0.0000179
100 %		0	836,500,090	90	0.0000108
100 %		+ 10	836,500,070	70	0.0000084
100 %		+ 20	836,500,131	131	0.0000157
100 %		+ 30	836,499,883	-117	-0.0000140
100 %		+ 40	836,500,125	125	0.0000149
100 %		+ 50	836,499,889	-111	-0.0000133
BATT. ENDPOINT	3.40	+ 20	836,499,999	-1	-0.0000001

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

Band 5 Frequency Stability Measurements

§2.1055 §22.355

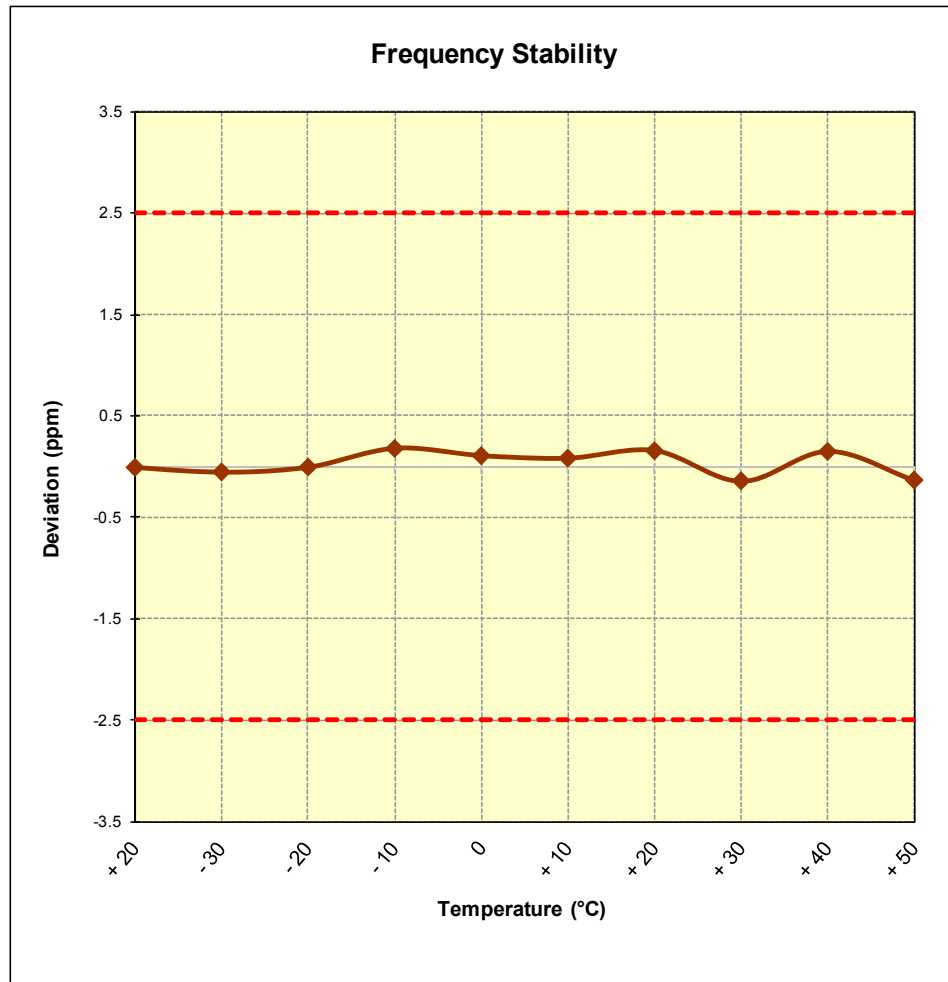


Figure 7-9. Frequency Stability Graph (Band 5)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 151 of 160

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

OPERATING FREQUENCY: 1,732,500,000 Hz
 CHANNEL: 20175
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,499,977	-23	-0.0000013
100 %		- 30	1,732,499,959	-41	-0.0000024
100 %		- 20	1,732,499,902	-98	-0.0000057
100 %		- 10	1,732,499,867	-133	-0.0000077
100 %		0	1,732,499,871	-129	-0.0000074
100 %		+ 10	1,732,499,969	-31	-0.0000018
100 %		+ 20	1,732,499,991	-9	-0.0000005
100 %		+ 30	1,732,500,139	139	0.0000080
100 %		+ 40	1,732,499,958	-42	-0.0000024
100 %		+ 50	1,732,500,053	53	0.0000031
BATT. ENDPOINT	3.40	+ 20	1,732,499,978	-22	-0.0000013

Table 7-32. Frequency Stability Data (Band 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: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 152 of 160

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

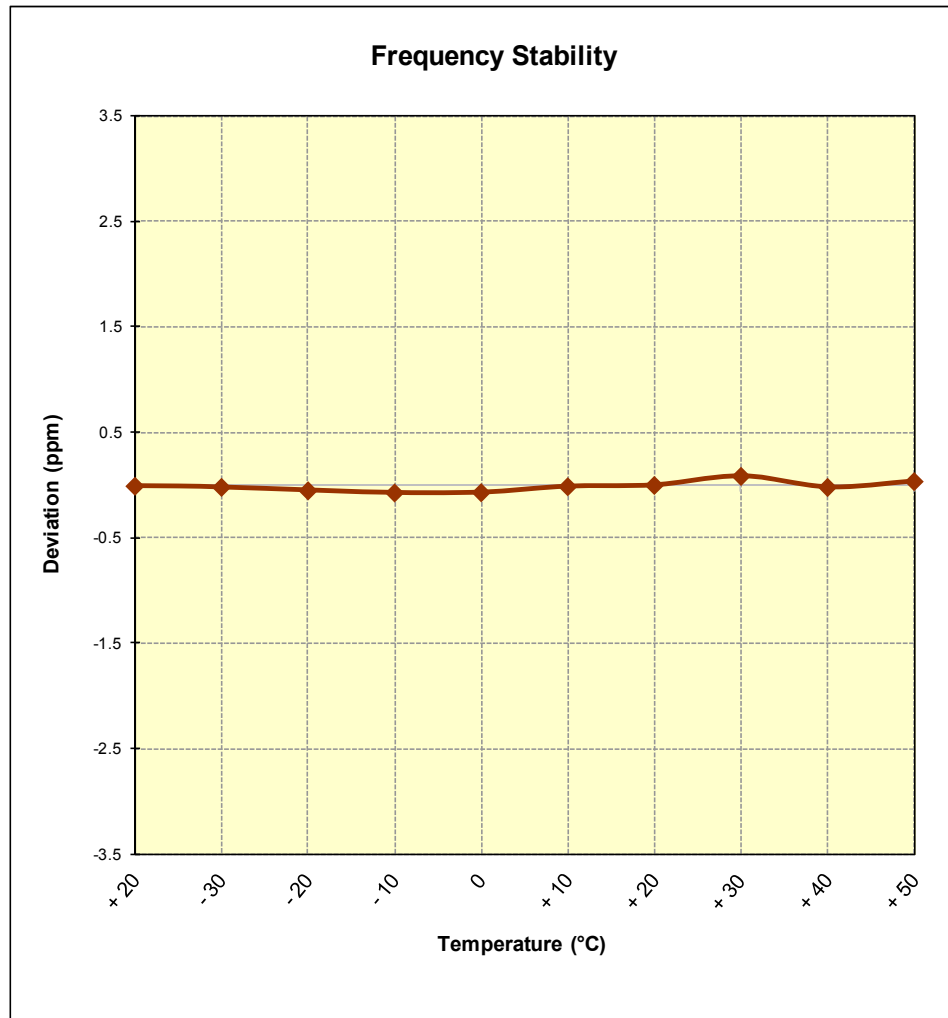


Figure 7-10. Frequency Stability Graph (Band 4)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 153 of 160

Band 2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,999	-1	-0.0000001
100 %		- 30	1,880,000,093	93	0.0000049
100 %		- 20	1,879,999,907	-93	-0.0000049
100 %		- 10	1,879,999,888	-112	-0.0000060
100 %		0	1,879,999,967	-33	-0.0000018
100 %		+ 10	1,880,000,043	43	0.0000023
100 %		+ 20	1,879,999,963	-37	-0.0000020
100 %		+ 30	1,880,000,131	131	0.0000070
100 %		+ 40	1,880,000,142	142	0.0000076
100 %		+ 50	1,879,999,857	-143	-0.0000076
BATT. ENDPOINT	3.40	+ 20	1,880,000,119	119	0.0000063

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

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: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 154 of 160

Band 2 Frequency Stability Measurements

§2.1055 §24.235

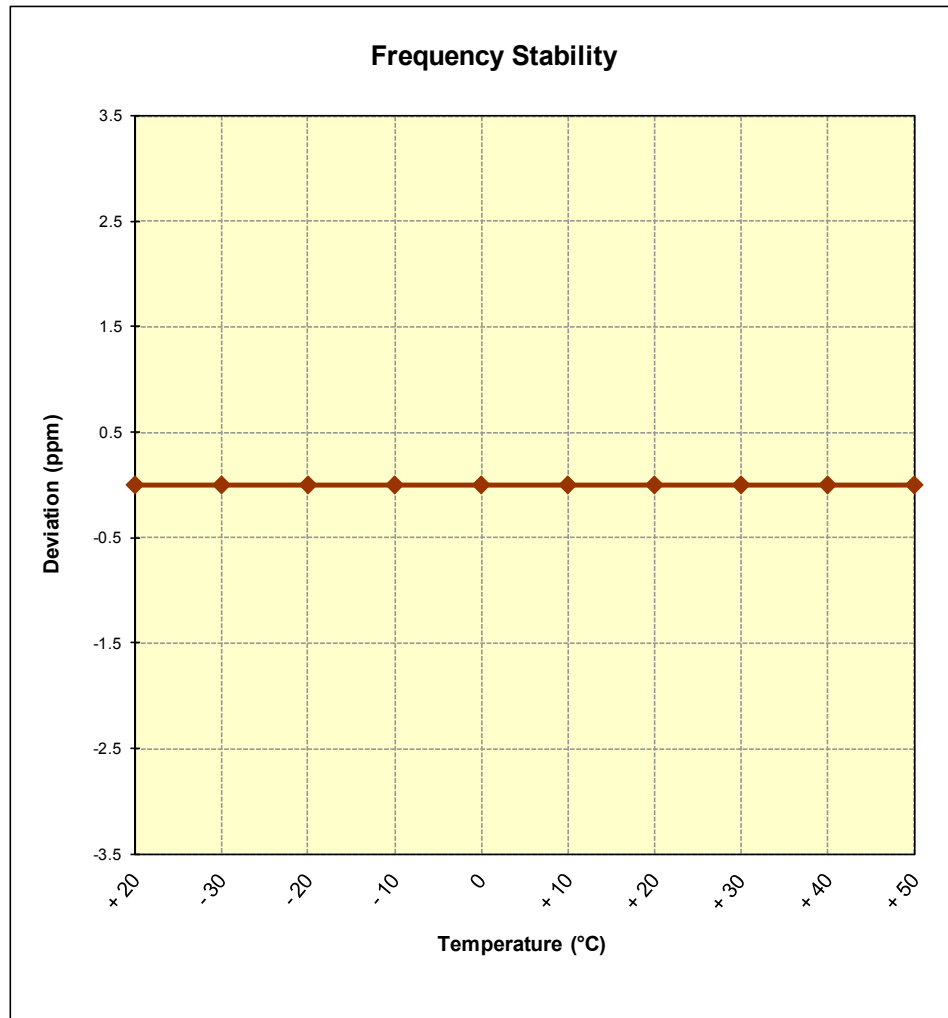


Figure 7-11. Frequency Stability Graph (Band 2)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 155 of 160

Band 30 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 2,310,000,000 Hz

CHANNEL: 27710

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,309,999,989	-11	-0.0000005
100 %		- 30	2,309,999,961	-39	-0.0000017
100 %		- 20	2,310,000,128	128	0.0000055
100 %		- 10	2,310,000,072	72	0.0000031
100 %		0	2,310,000,132	132	0.0000057
100 %		+ 10	2,310,000,089	89	0.0000039
100 %		+ 20	2,310,000,119	119	0.0000052
100 %		+ 30	2,310,000,020	20	0.0000009
100 %		+ 40	2,309,999,985	-15	-0.0000006
100 %		+ 50	2,310,000,072	72	0.0000031
BATT. ENDPOINT	3.40	+ 20	2,309,999,976	-24	-0.0000010

Table 7-34. Frequency Stability Data (Band 30)

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: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset	Page 156 of 160

Band 30 Frequency Stability Measurements

§2.1055 §24.235

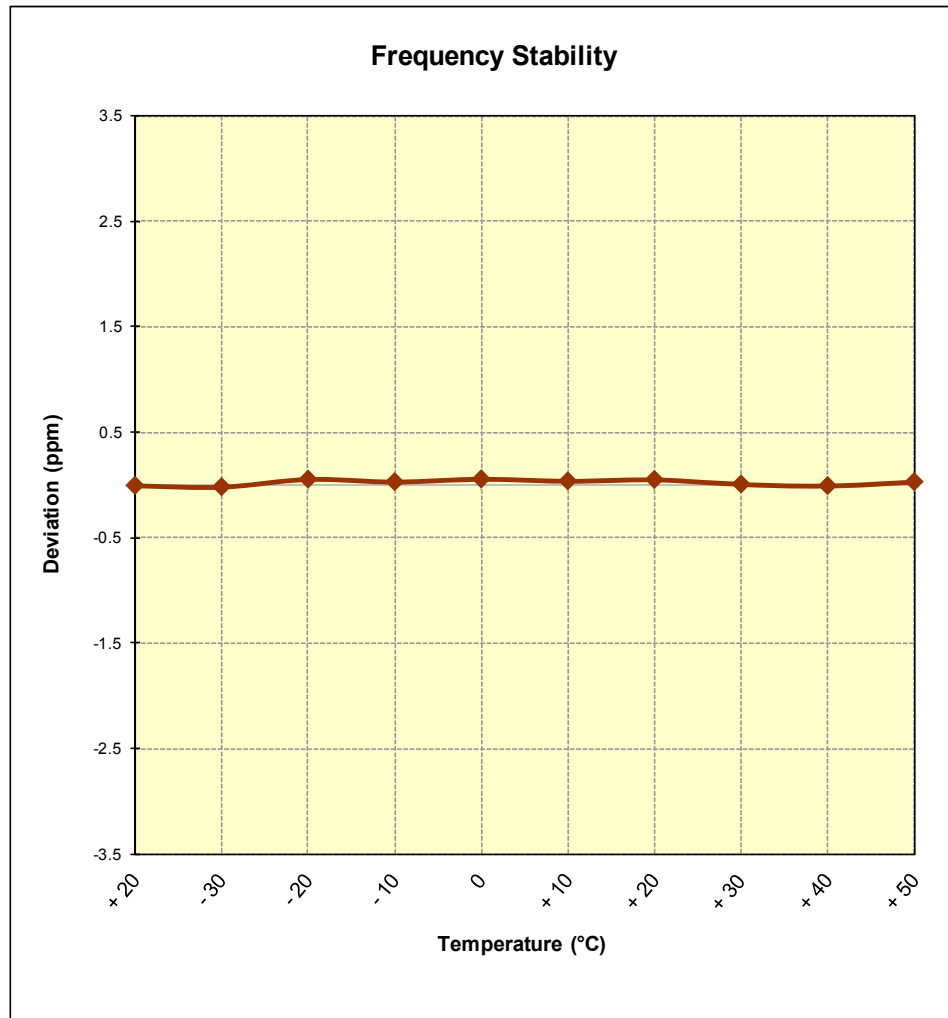


Figure 7-12. Frequency Stability Graph (Band 30)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 157 of 160

Band 7 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 2,535,000,000 Hz
 CHANNEL: 21100
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,534,999,932	-68	-0.0000027
100 %		- 30	2,534,999,913	-87	-0.0000034
100 %		- 20	2,535,000,052	52	0.0000021
100 %		- 10	2,535,000,107	107	0.0000042
100 %		0	2,534,999,950	-50	-0.0000020
100 %		+ 10	2,534,999,853	-147	-0.0000058
100 %		+ 20	2,535,000,144	144	0.0000057
100 %		+ 30	2,534,999,877	-123	-0.0000049
100 %		+ 40	2,534,999,937	-63	-0.0000025
100 %		+ 50	2,534,999,988	-12	-0.0000005
BATT. ENDPOINT	3.40	+ 20	2,535,000,072	72	0.0000028

Table 7-35. 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: ZNFH820	 FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 158 of 160

Band 7 Frequency Stability Measurements

§2.1055 §27.54

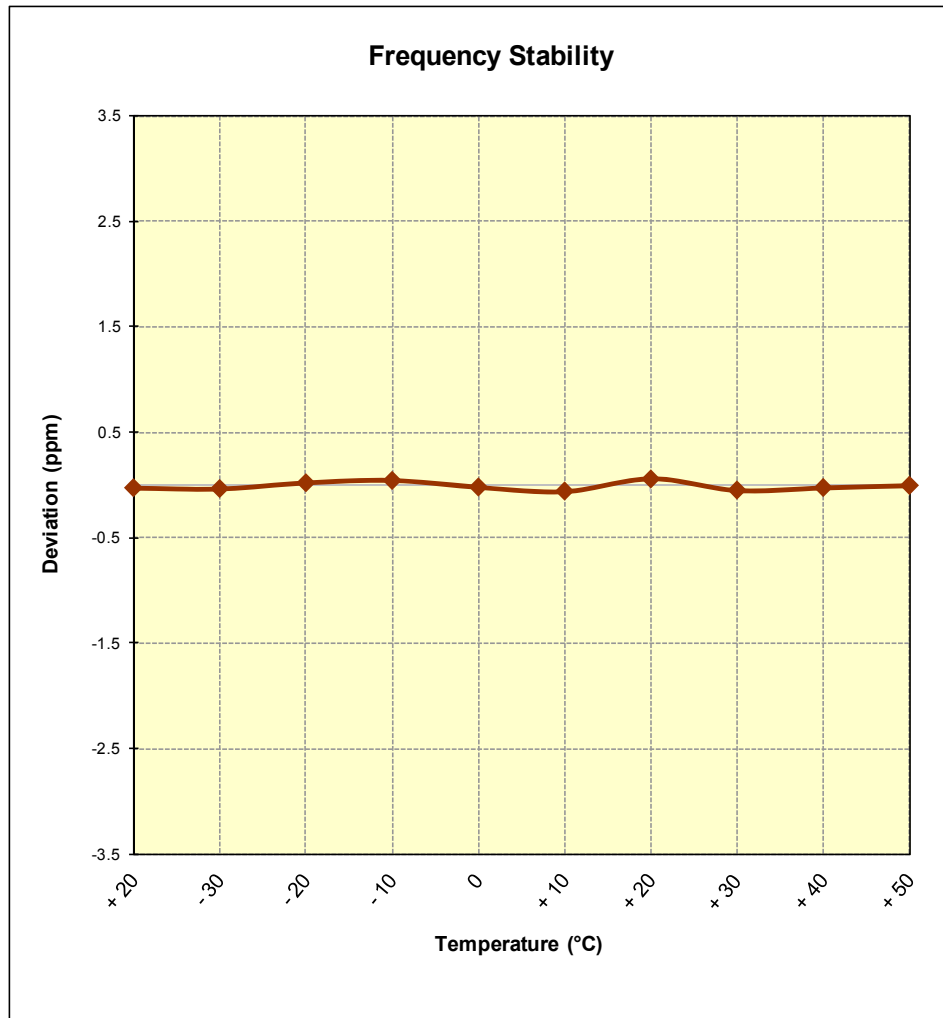


Figure 7-13. Frequency Stability Graph (Band 7)

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 159 of 160

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH820** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: ZNFH820		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1601040003.ZNF	Test Dates: 1/4 - 3/2/2016	EUT Type: Portable Handset		Page 160 of 160