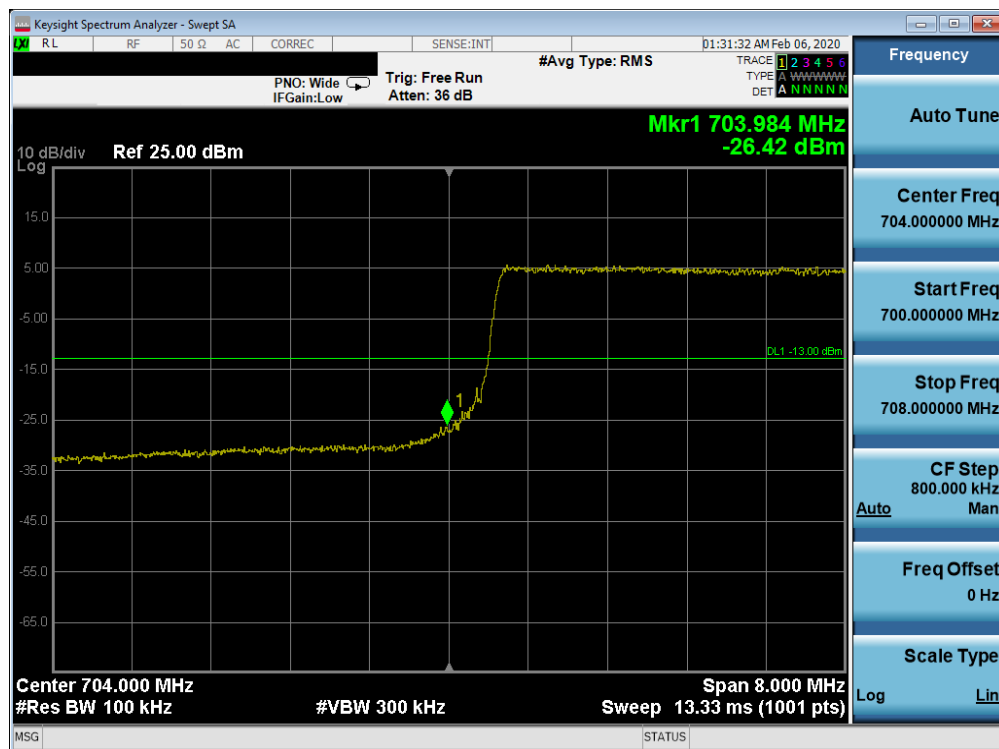
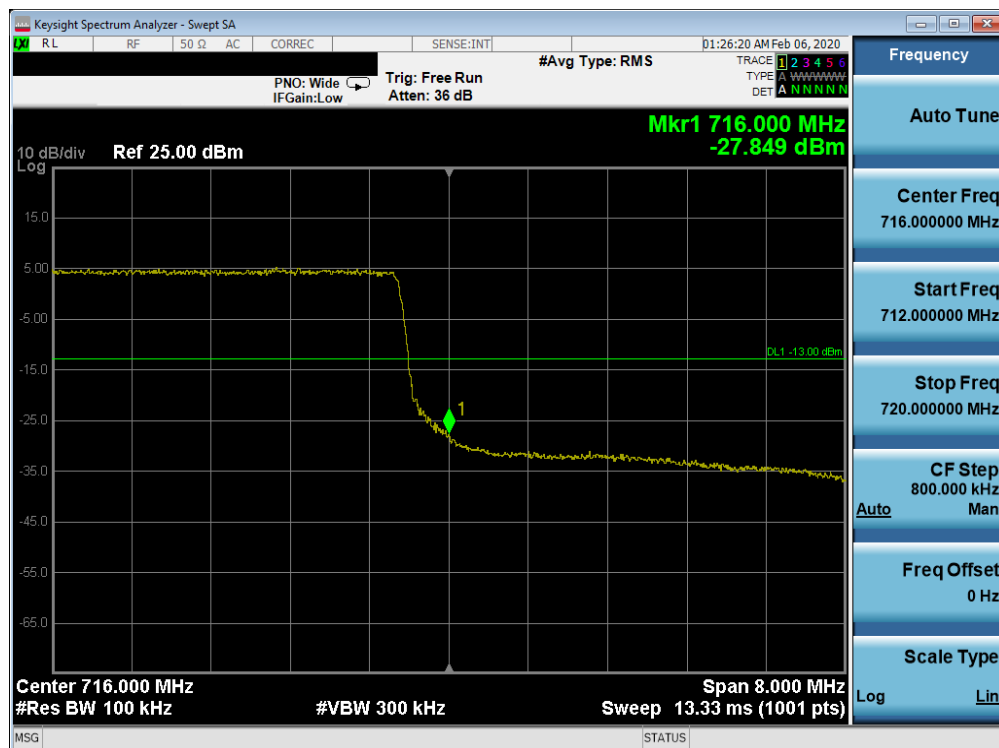




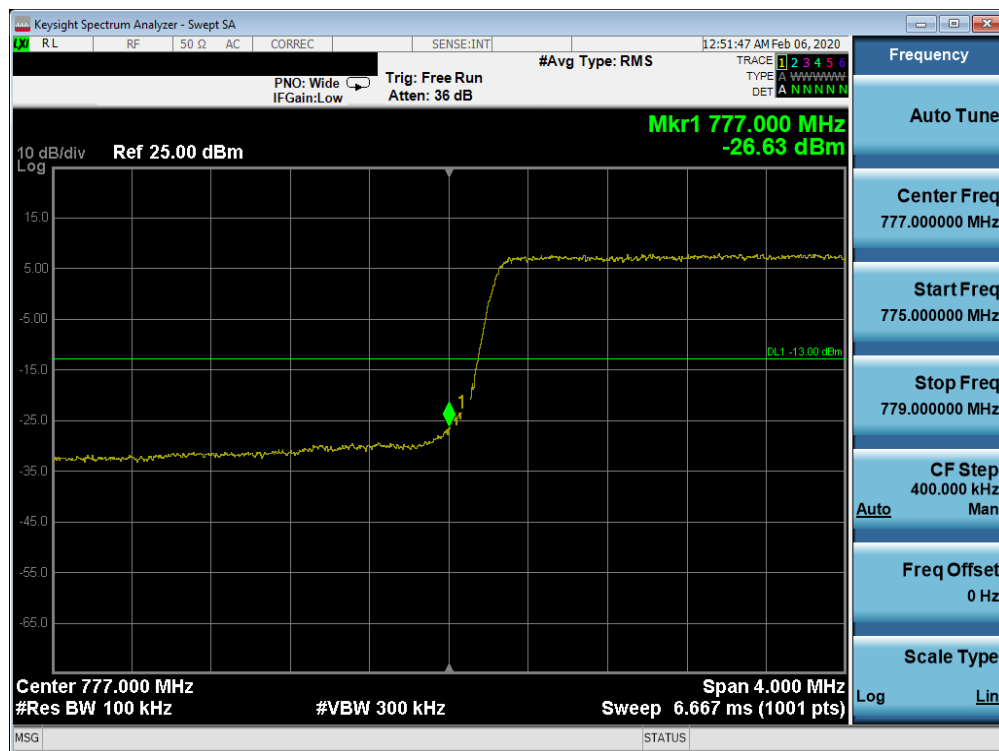
Plot 7-116. Lower Band Edge Plot (Band 17 - 10.0MHz QPSK - Full RB Configuration)



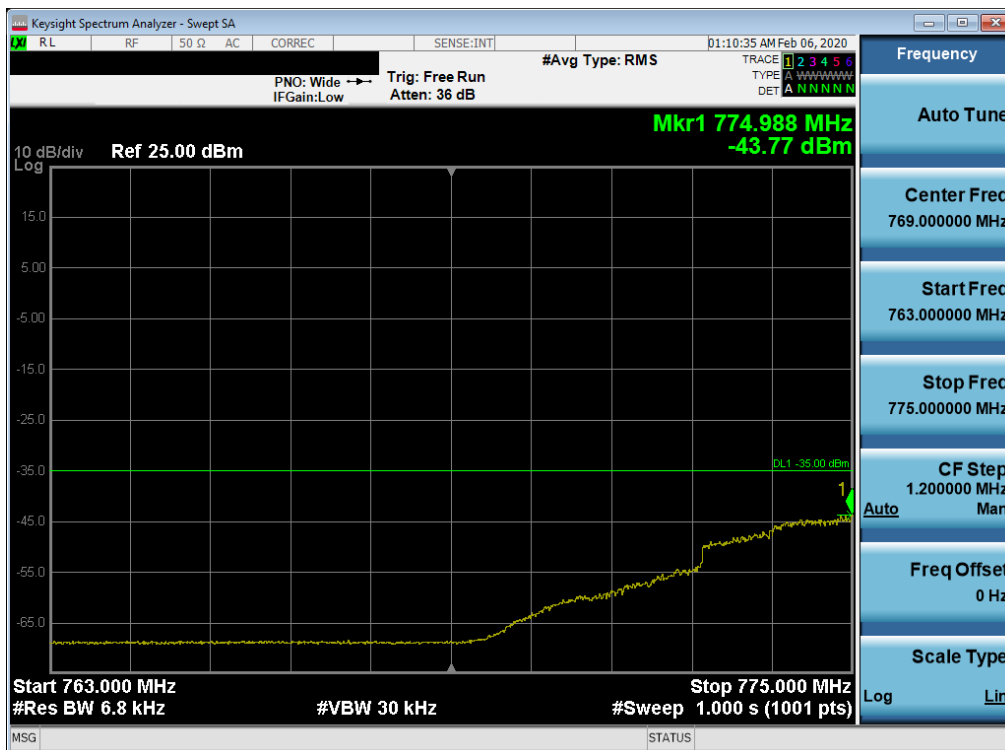
Plot 7-117. Upper Band Edge Plot (Band 12/17 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 81 of 175

Band 13

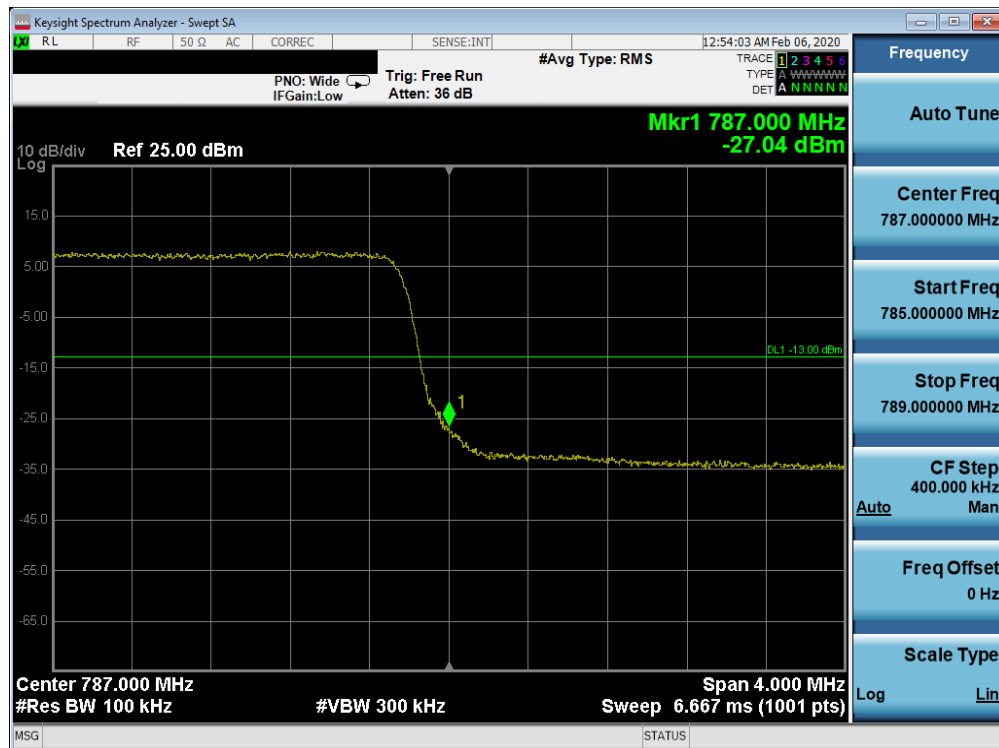


Plot 7-118. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-119. Lower Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 82 of 175

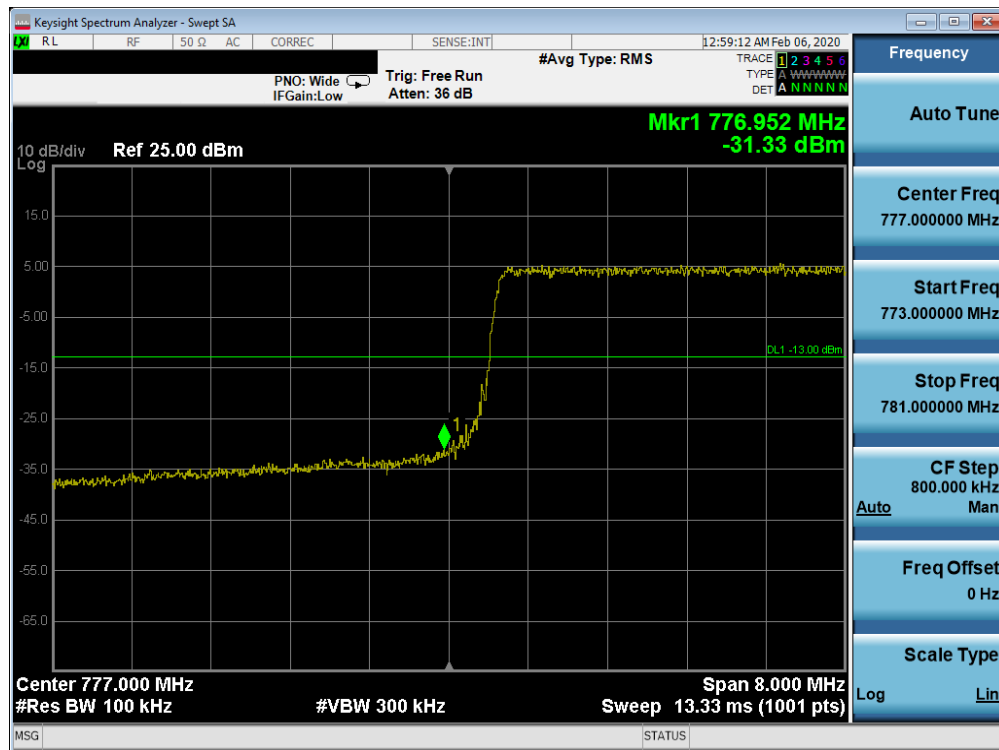


Plot 7-120. Upper Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

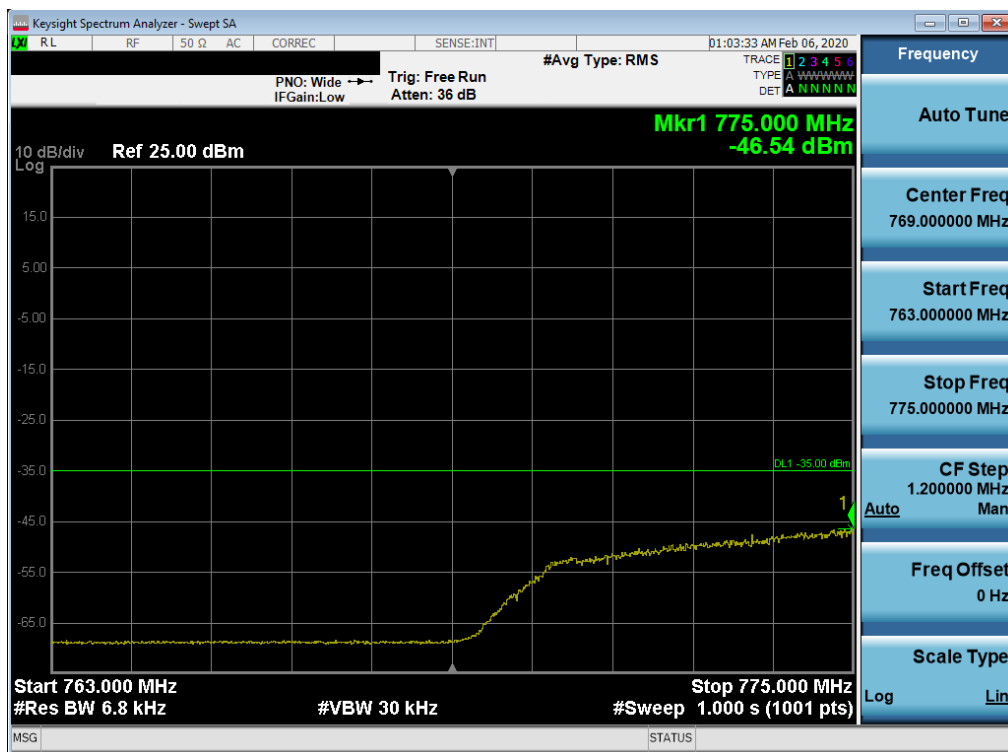


Plot 7-121. Upper Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 83 of 175

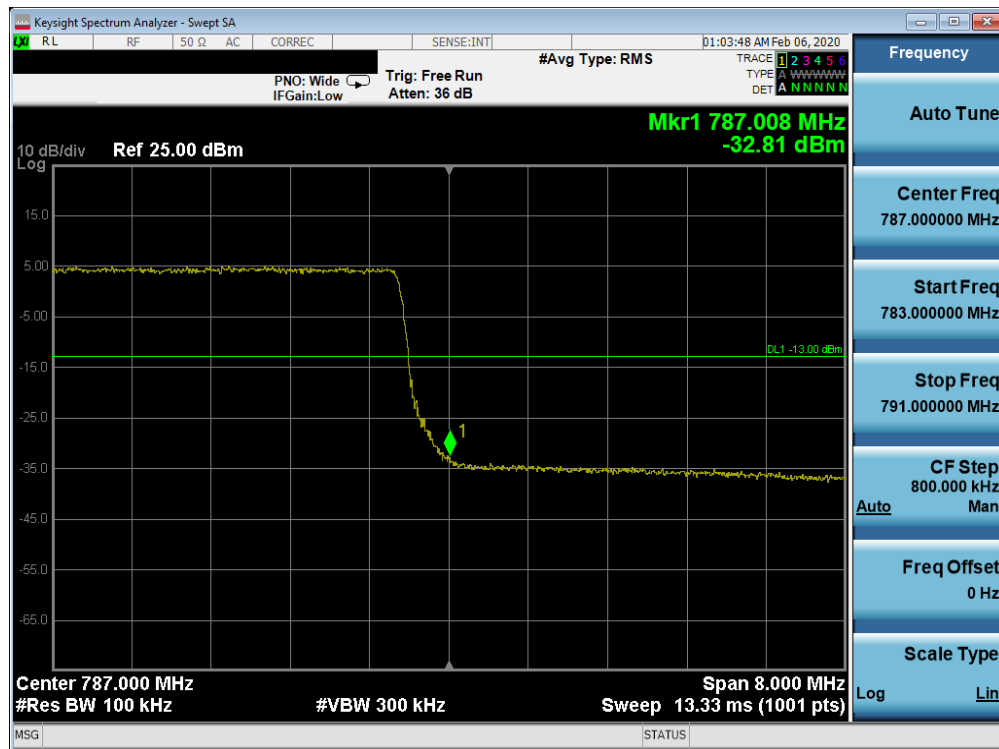


Plot 7-122. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-123. Lower Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 84 of 175

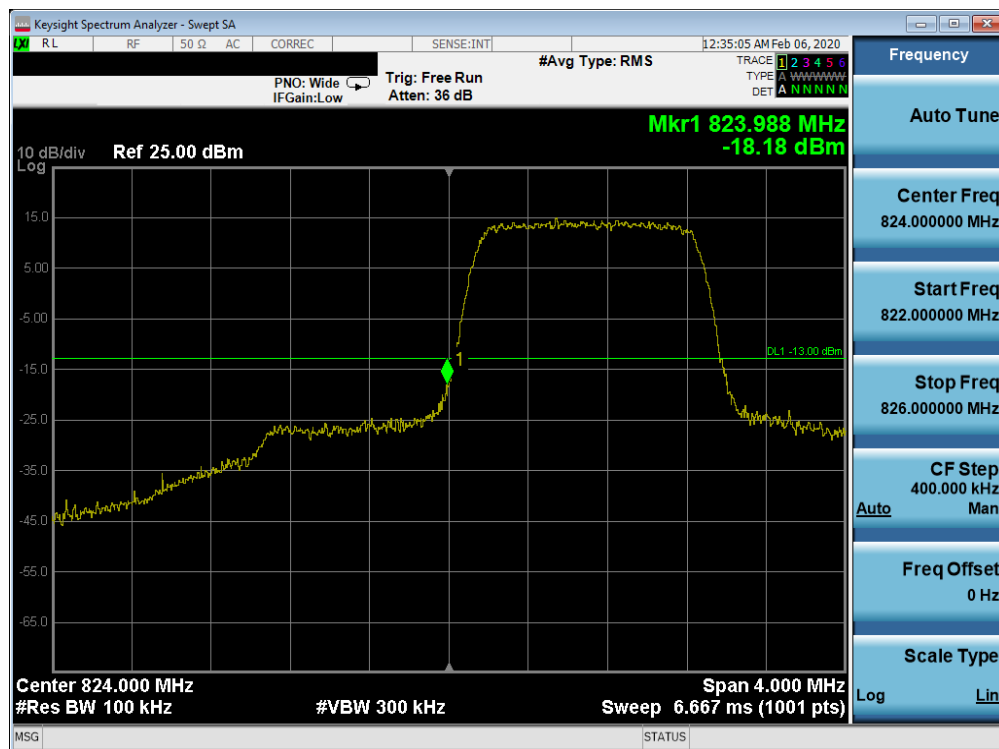


Plot 7-124. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-125. Upper Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)
Band 5

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 85 of 175

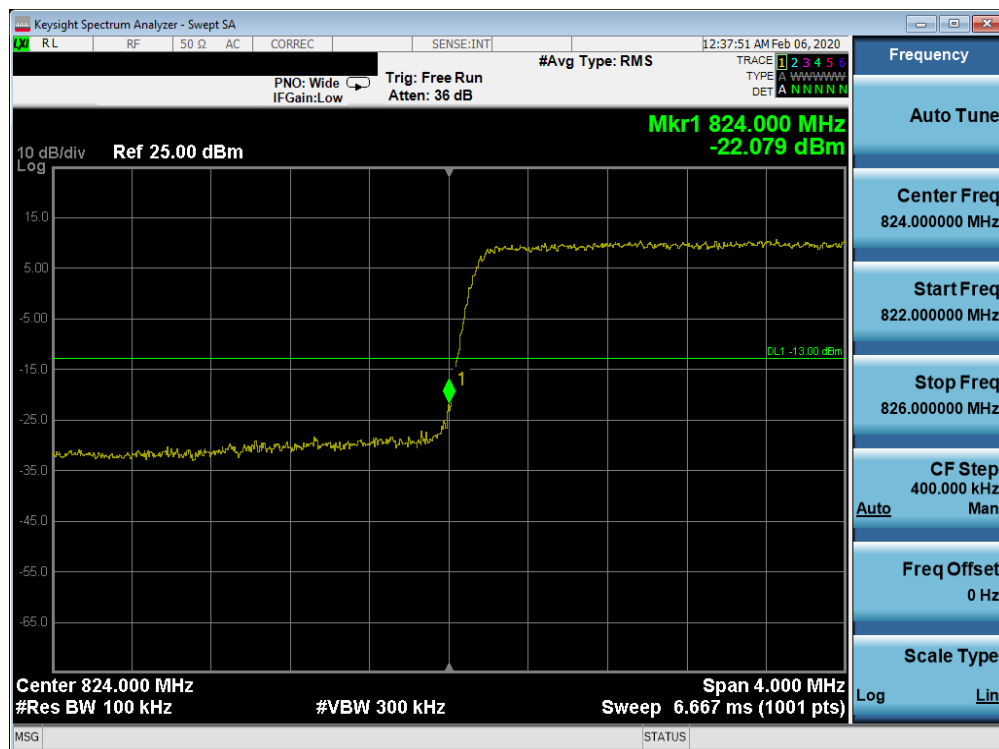


Plot 7-126. Lower Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

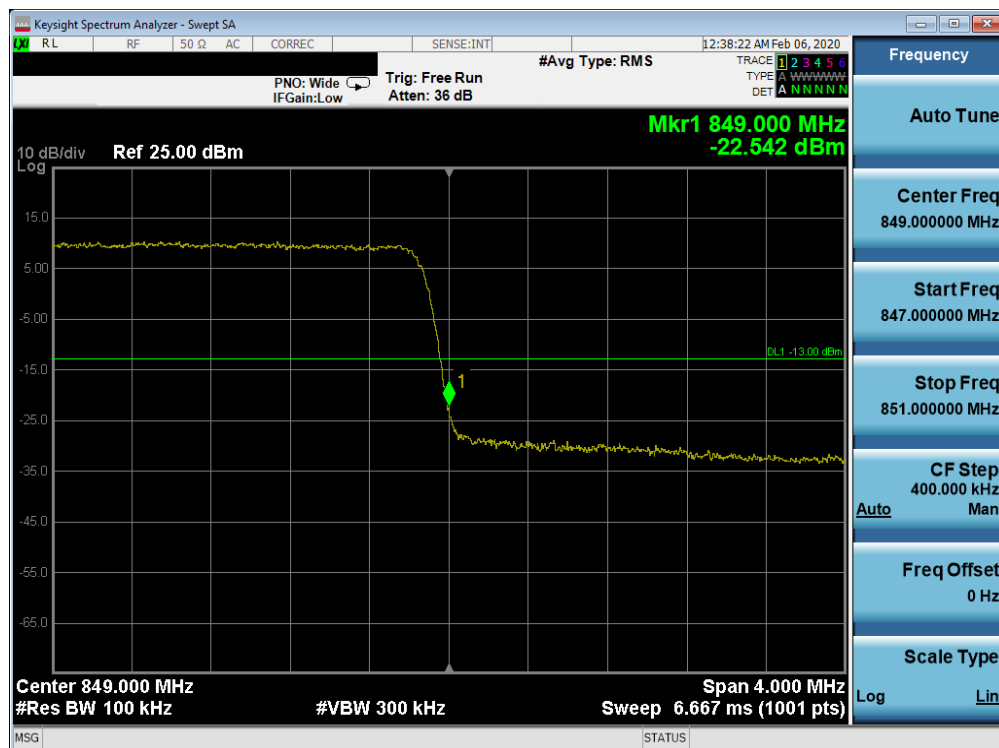


Plot 7-127. Upper Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 86 of 175

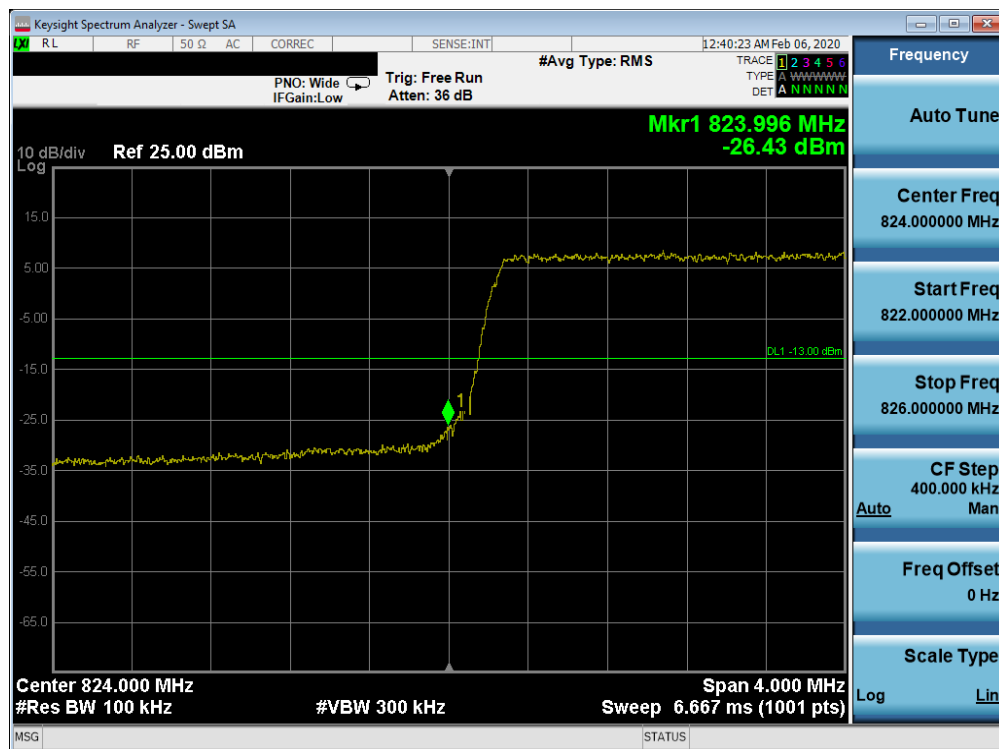


Plot 7-128. Lower Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

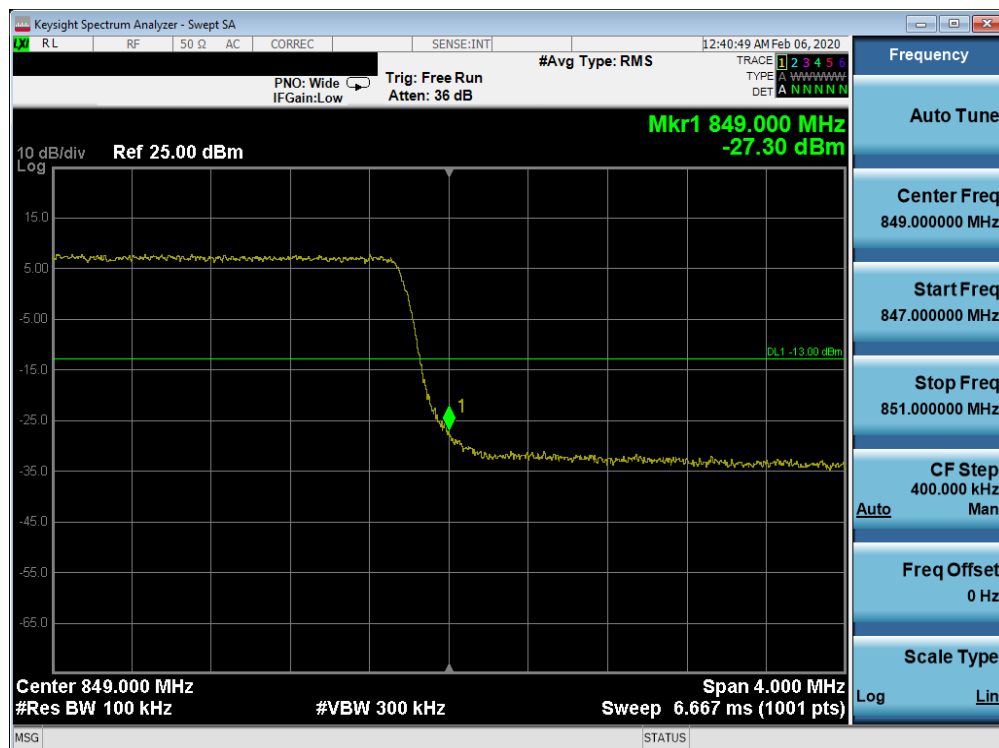


Plot 7-129. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 87 of 175

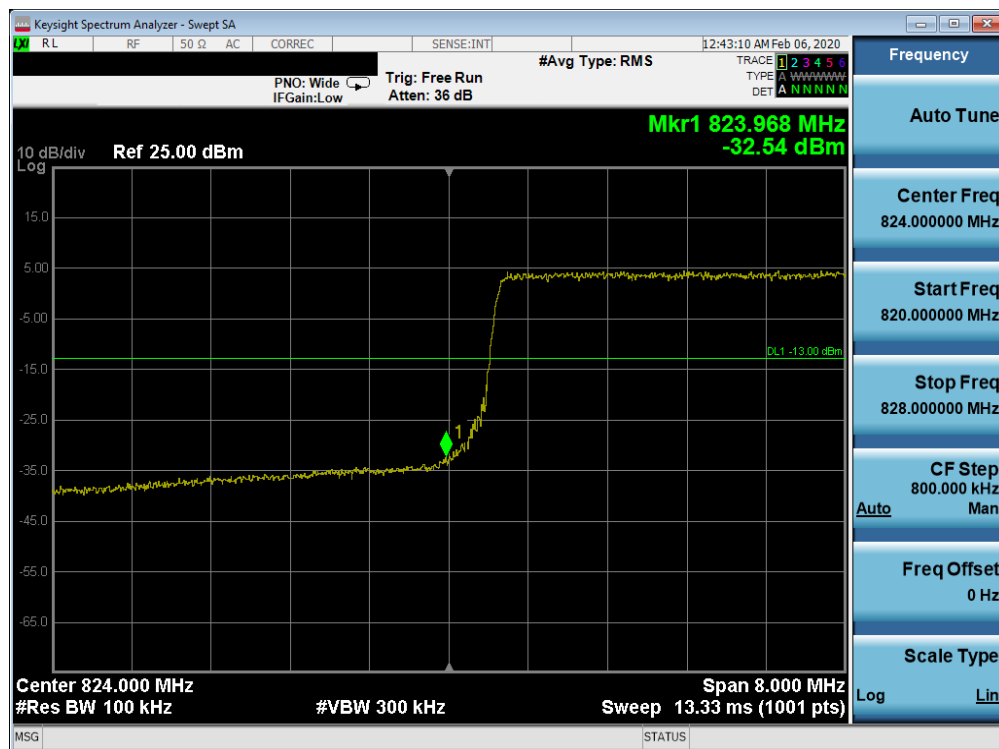


Plot 7-130. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

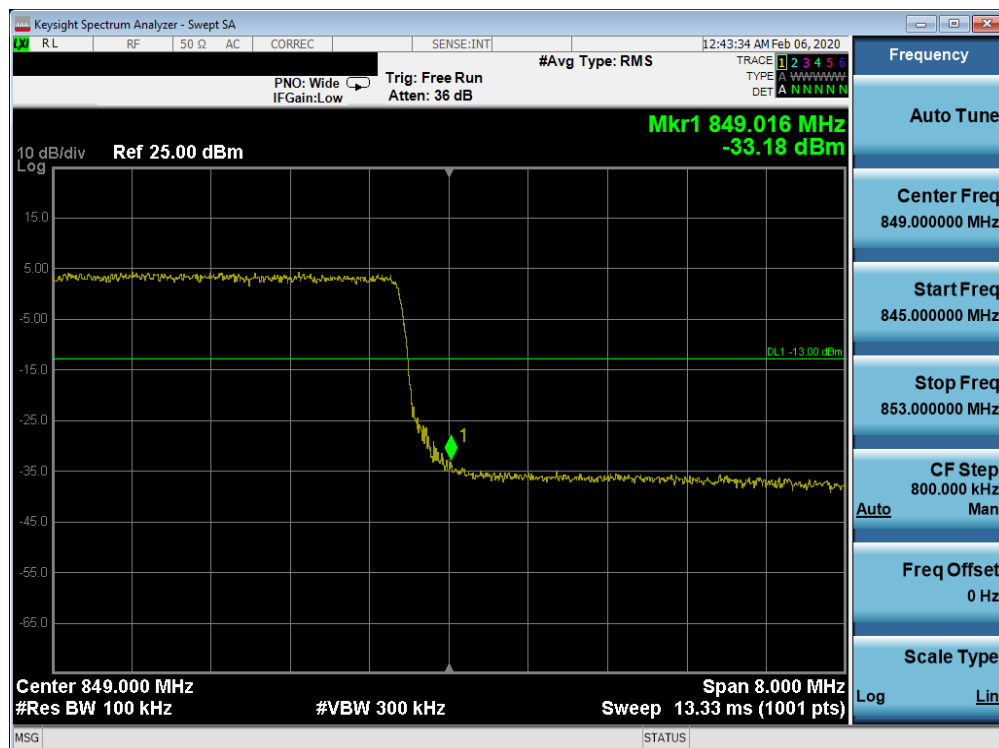


Plot 7-131. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 88 of 175



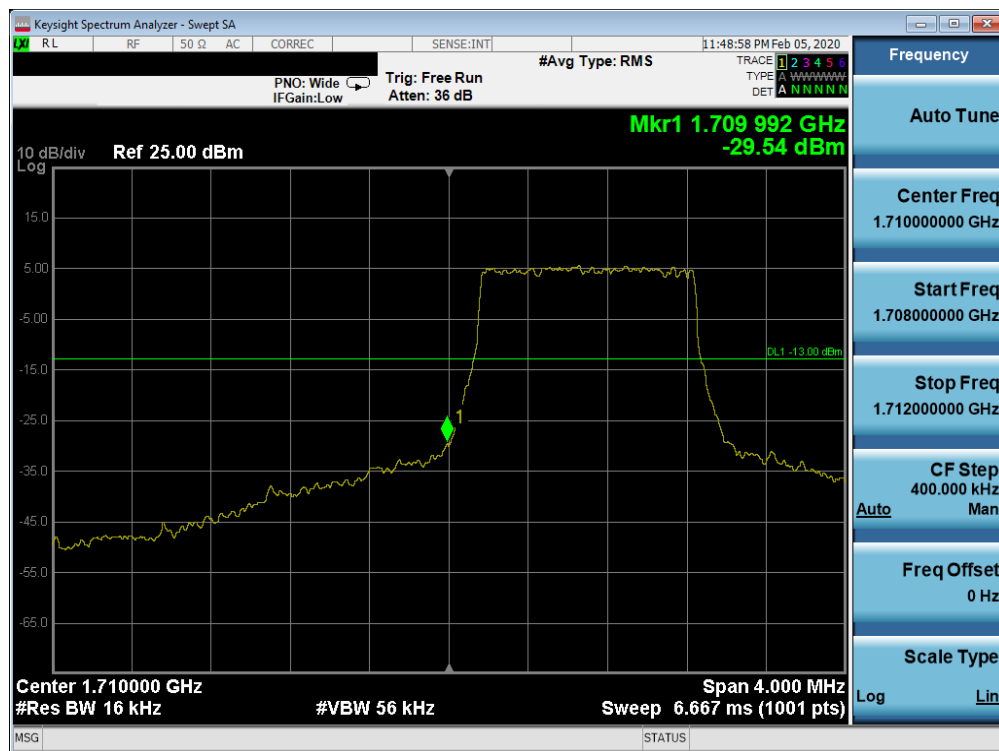
Plot 7-132. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)



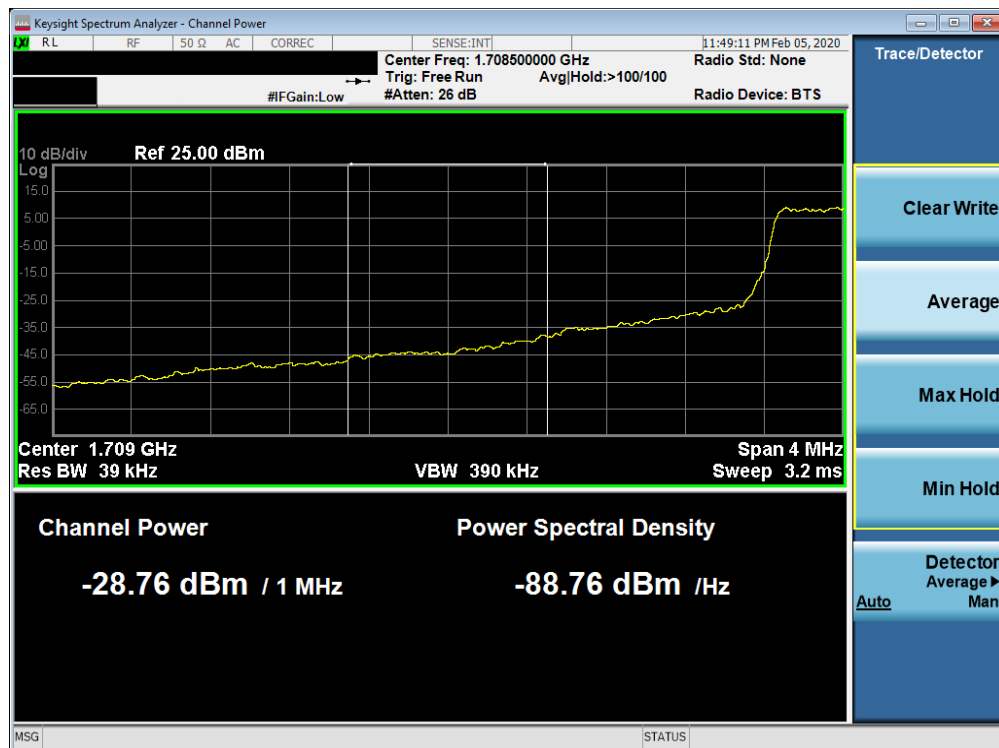
Plot 7-133. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 89 of 175

Band 66/4

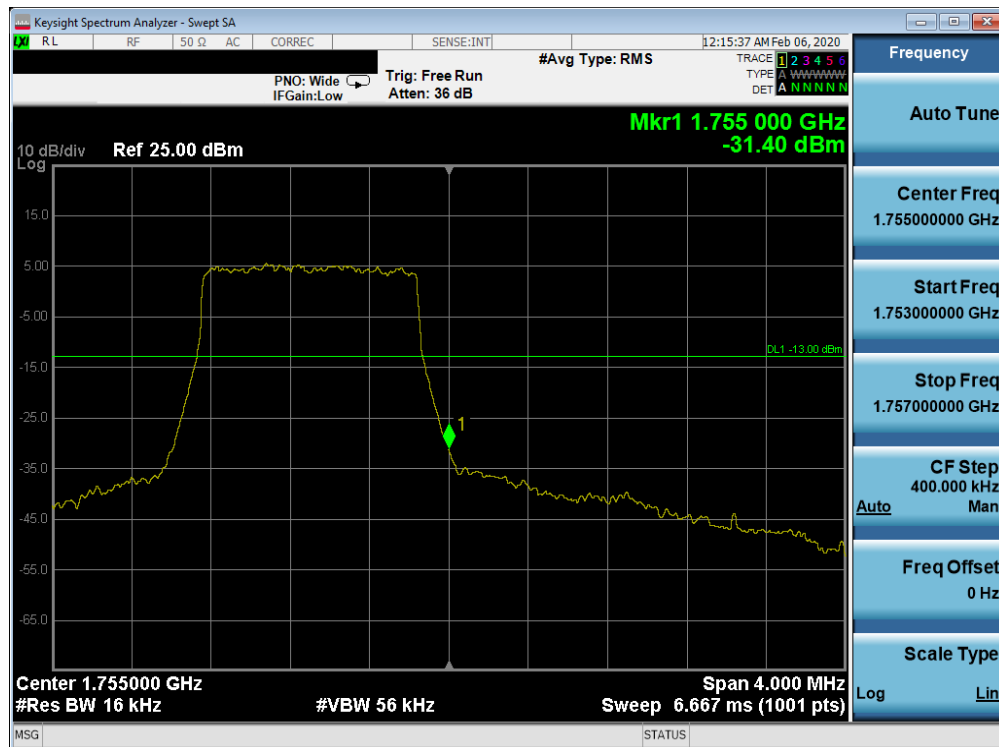


Plot 7-134. Lower Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

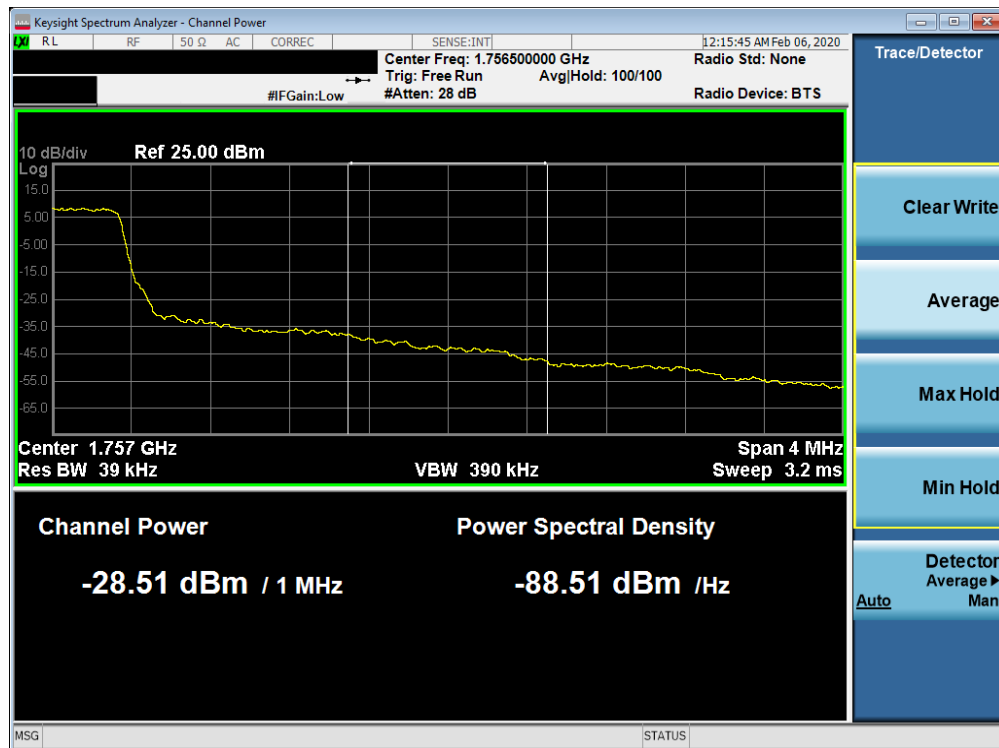


Plot 7-135. Lower Extended Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 90 of 175



Plot 7-136. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

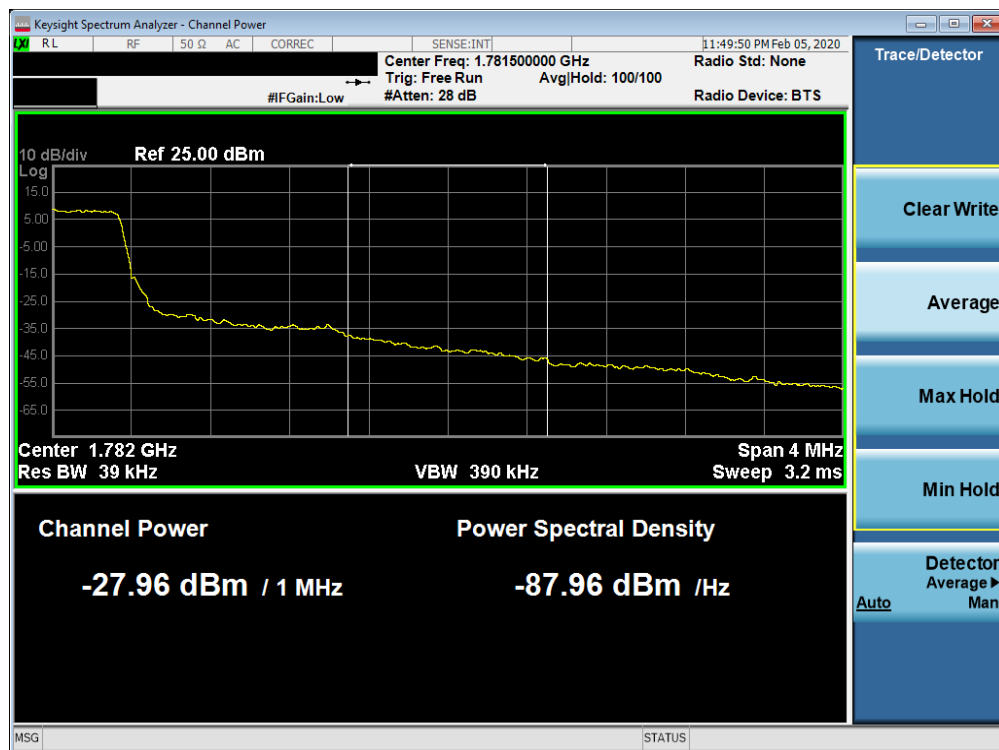


Plot 7-137. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 91 of 175

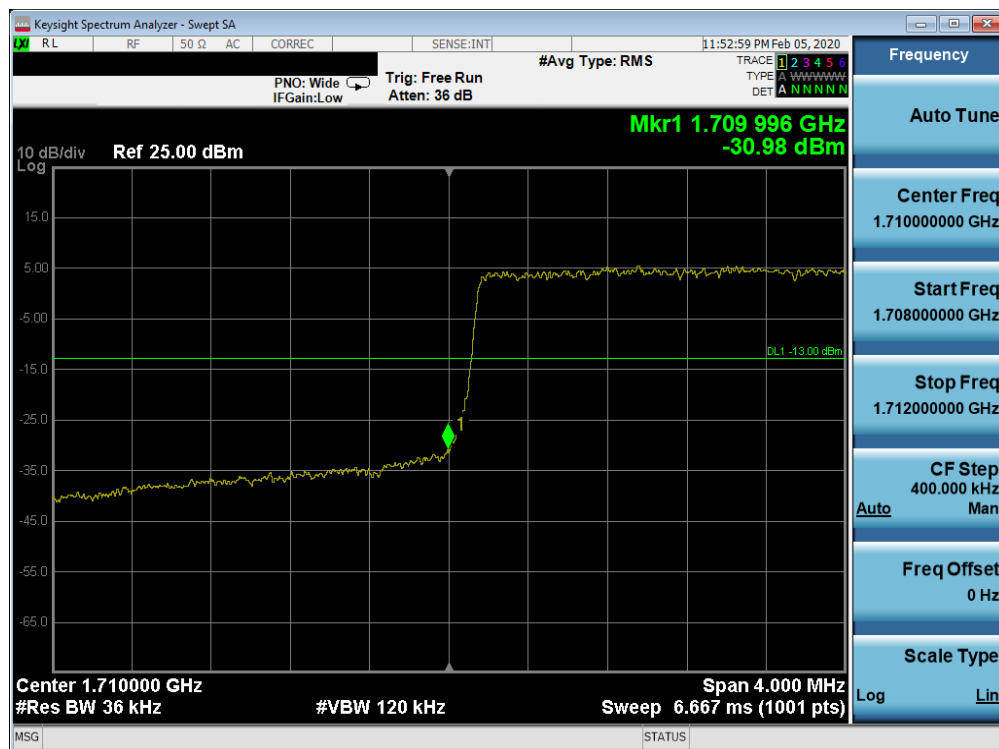


Plot 7-138. Upper Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

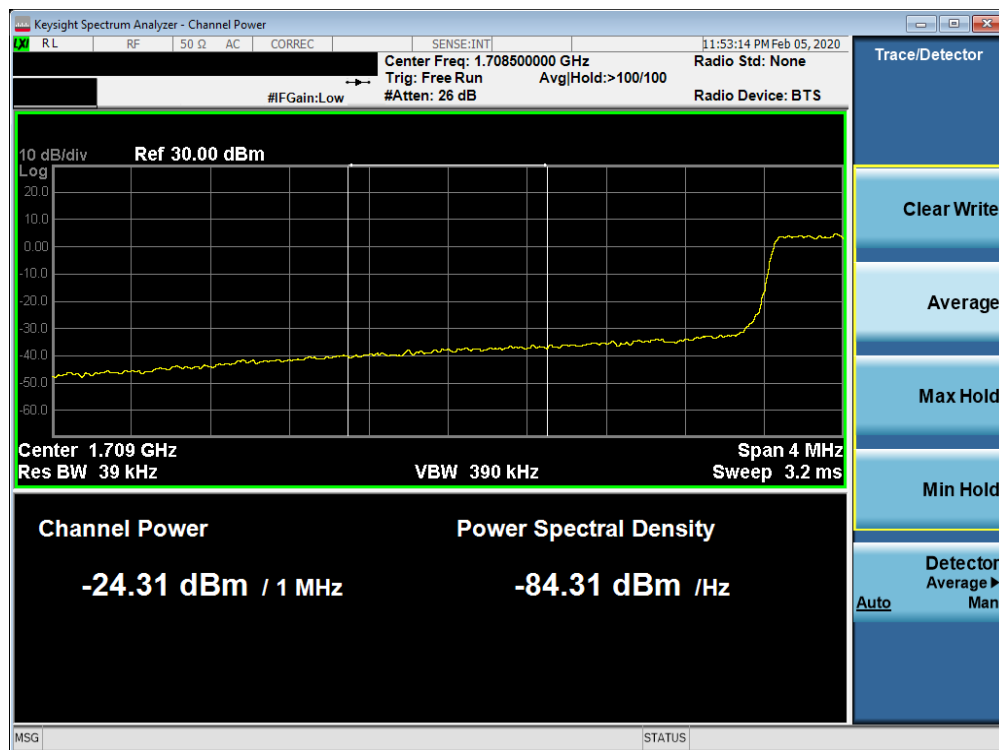


Plot 7-139. Upper Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 92 of 175

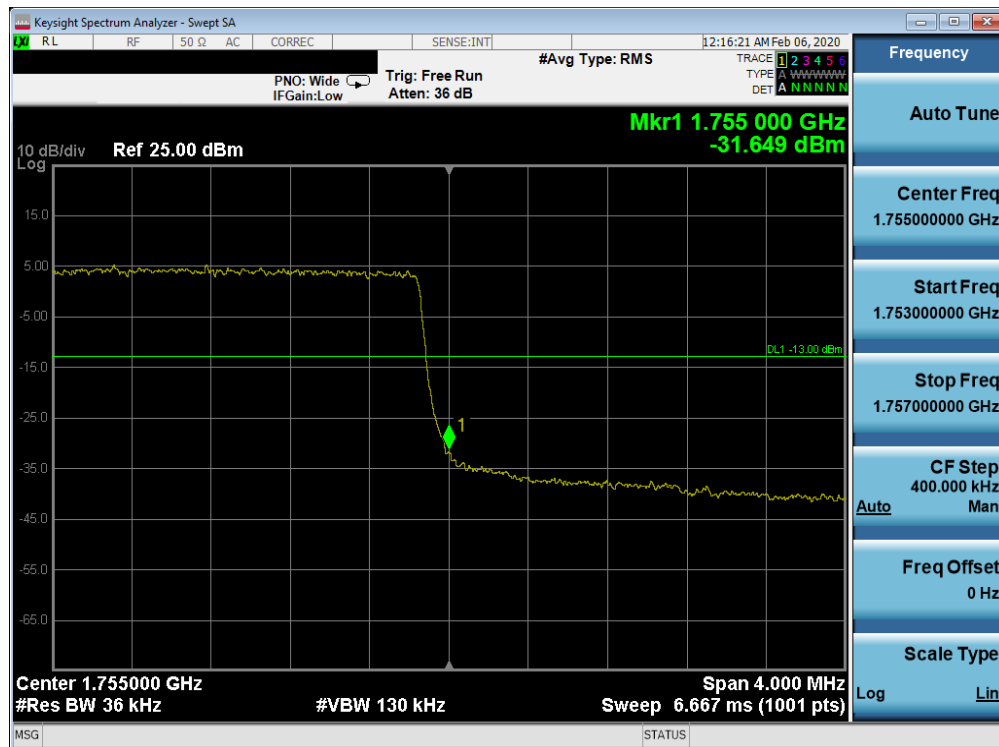


Plot 7-140. Lower Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

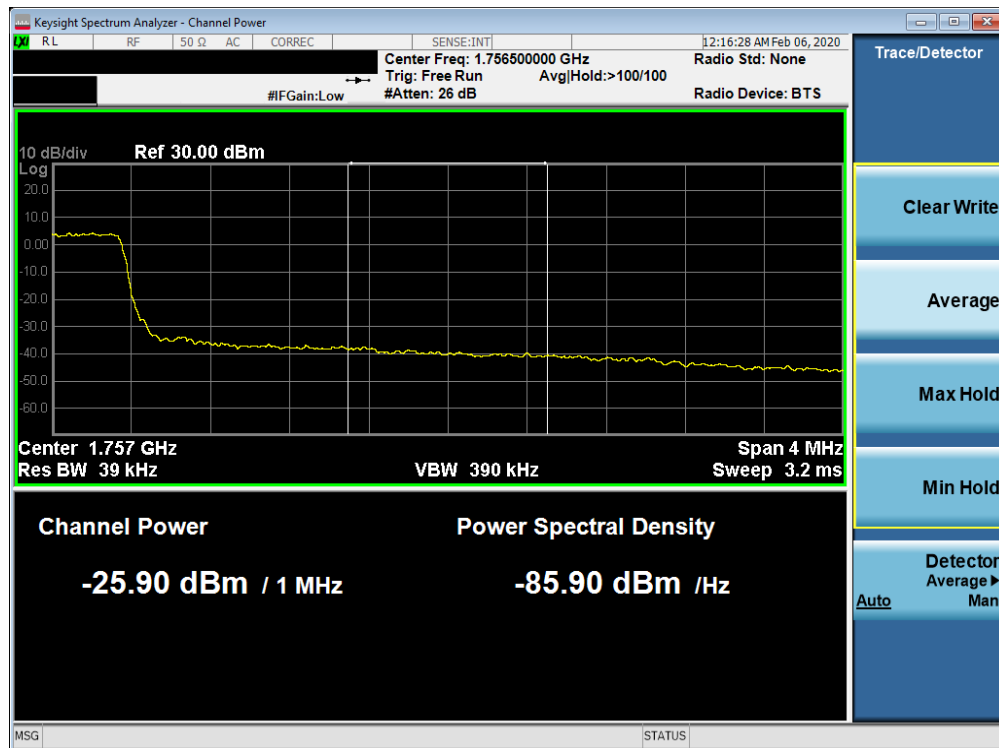


Plot 7-141. Lower Extended Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 93 of 175

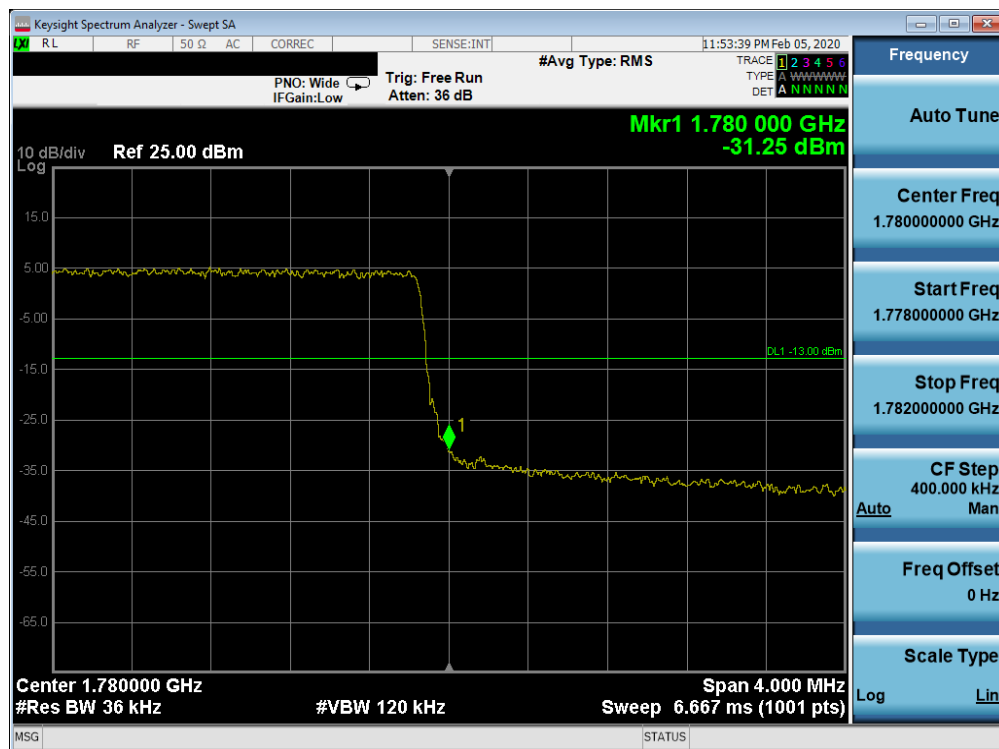


Plot 7-142. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

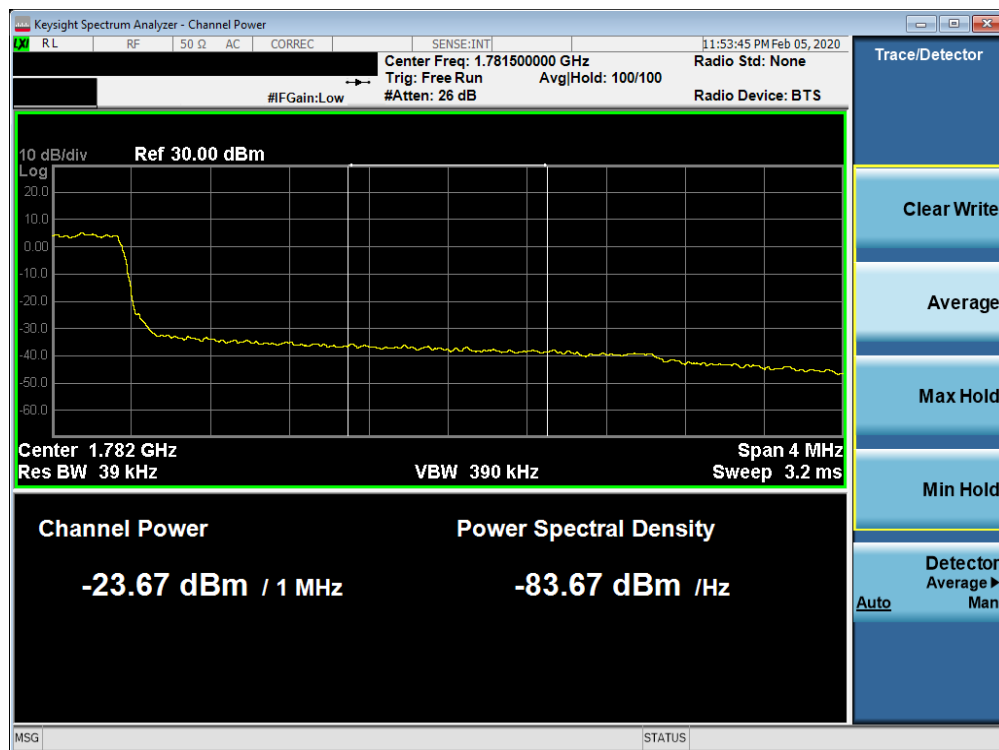


Plot 7-143. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 94 of 175

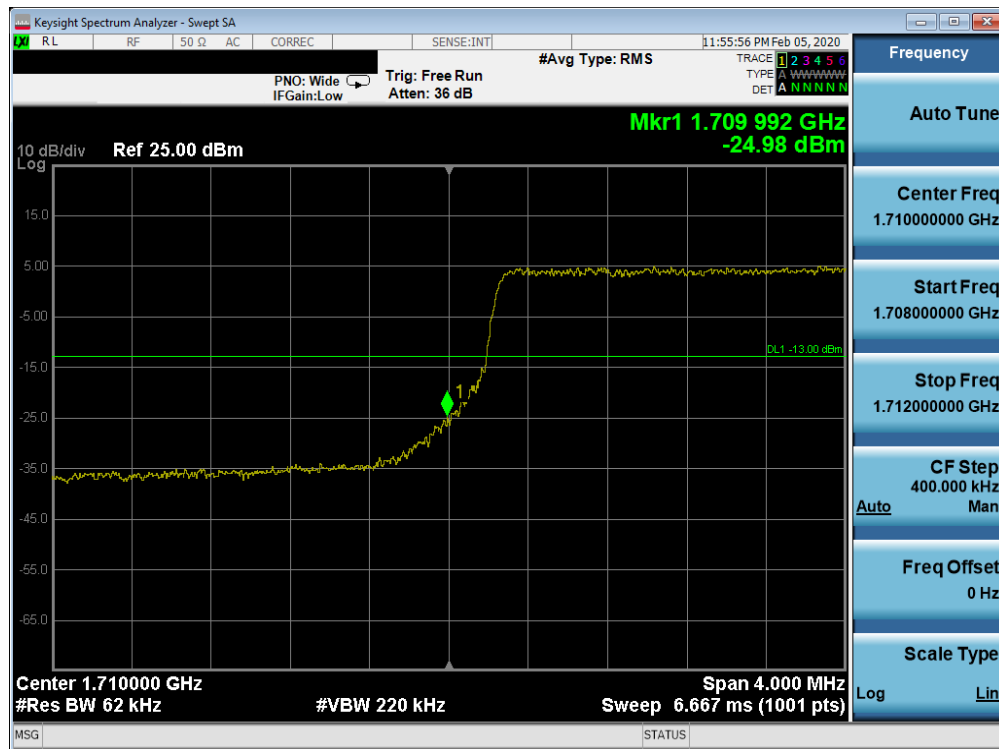


Plot 7-144. Upper Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

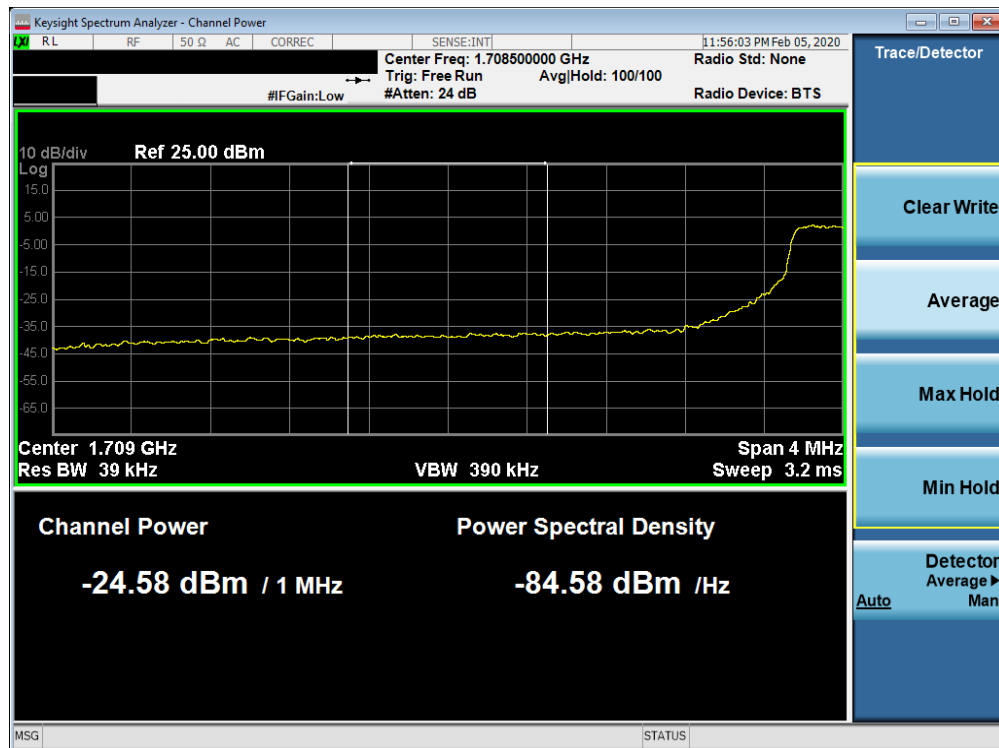


Plot 7-145. Upper Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 95 of 175

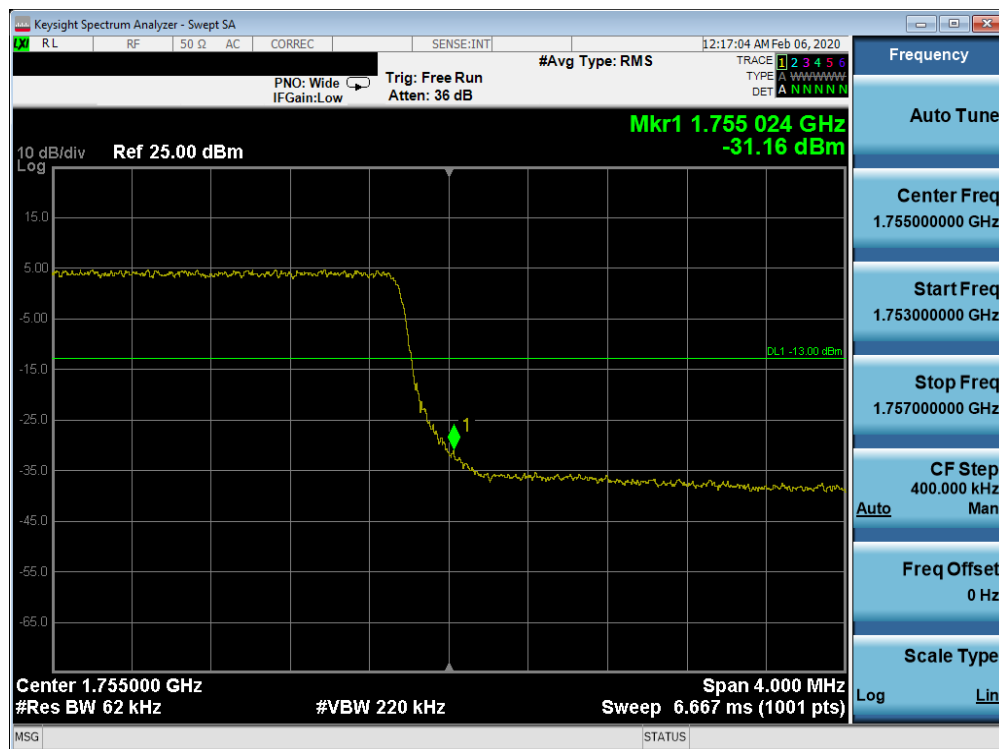


Plot 7-146. Lower Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

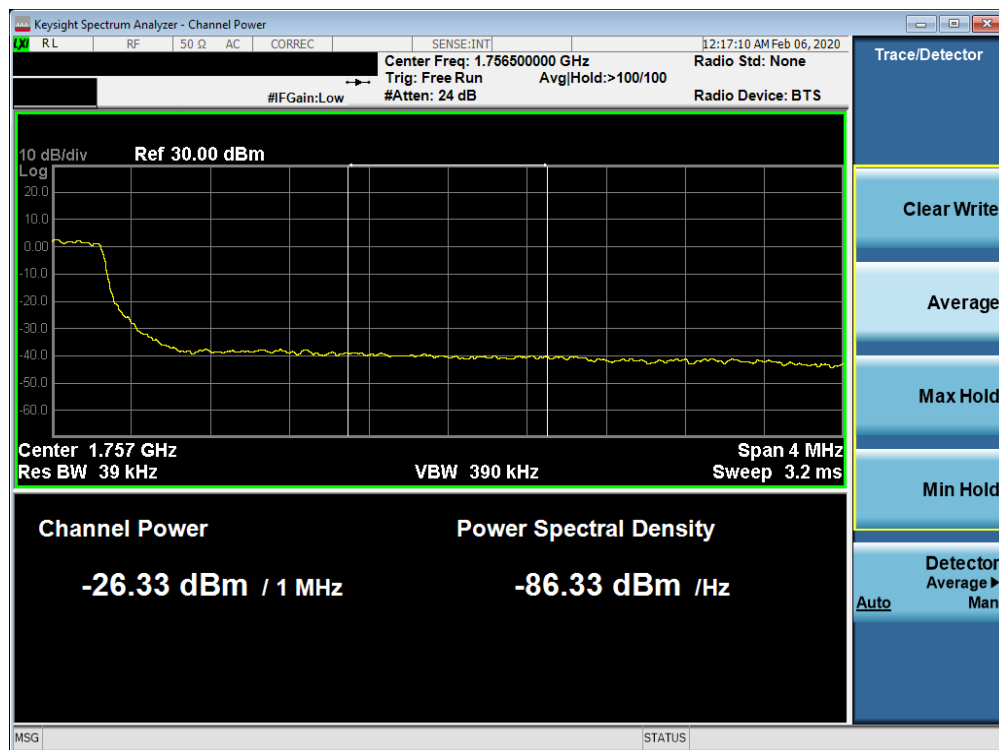


Plot 7-147. Lower Extended Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 96 of 175

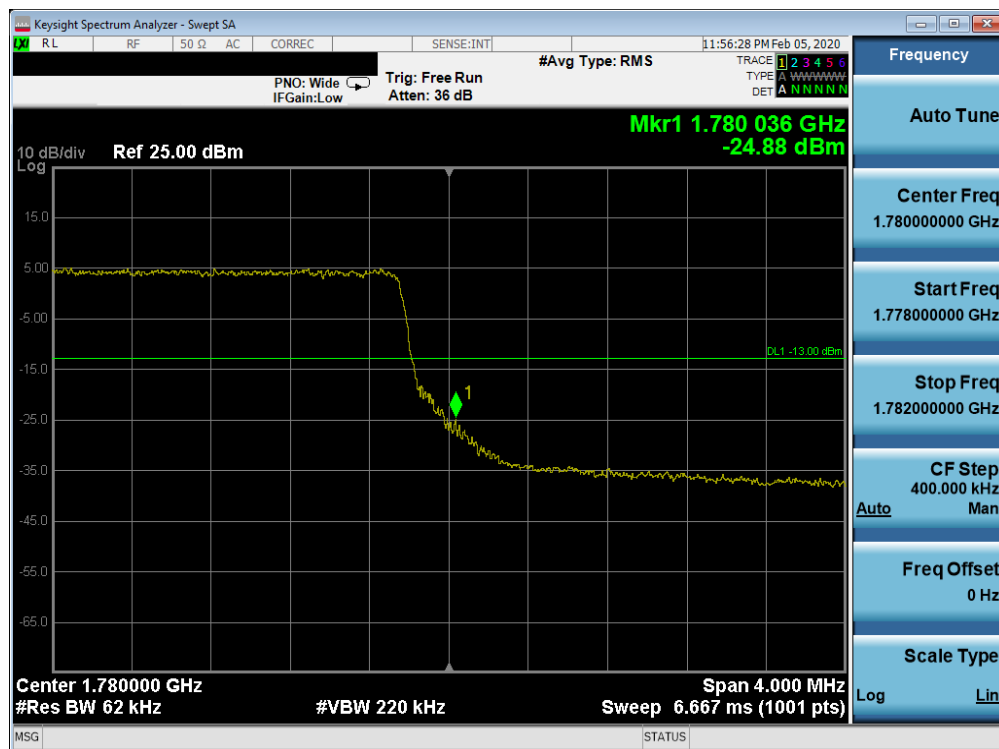


Plot 7-148. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

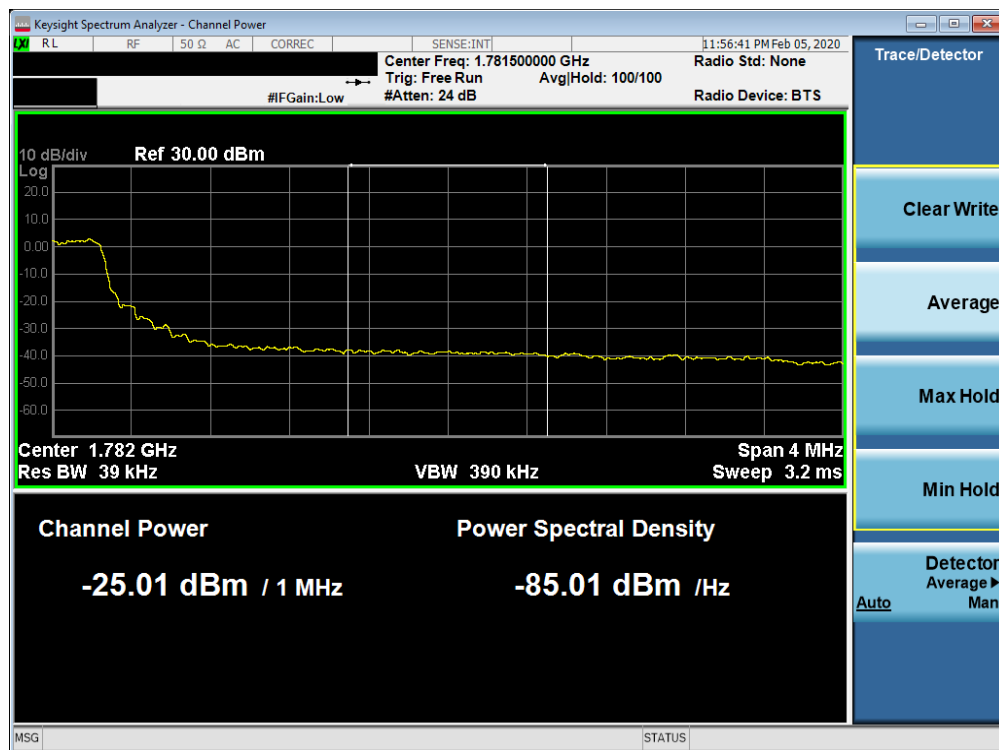


Plot 7-149. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 97 of 175

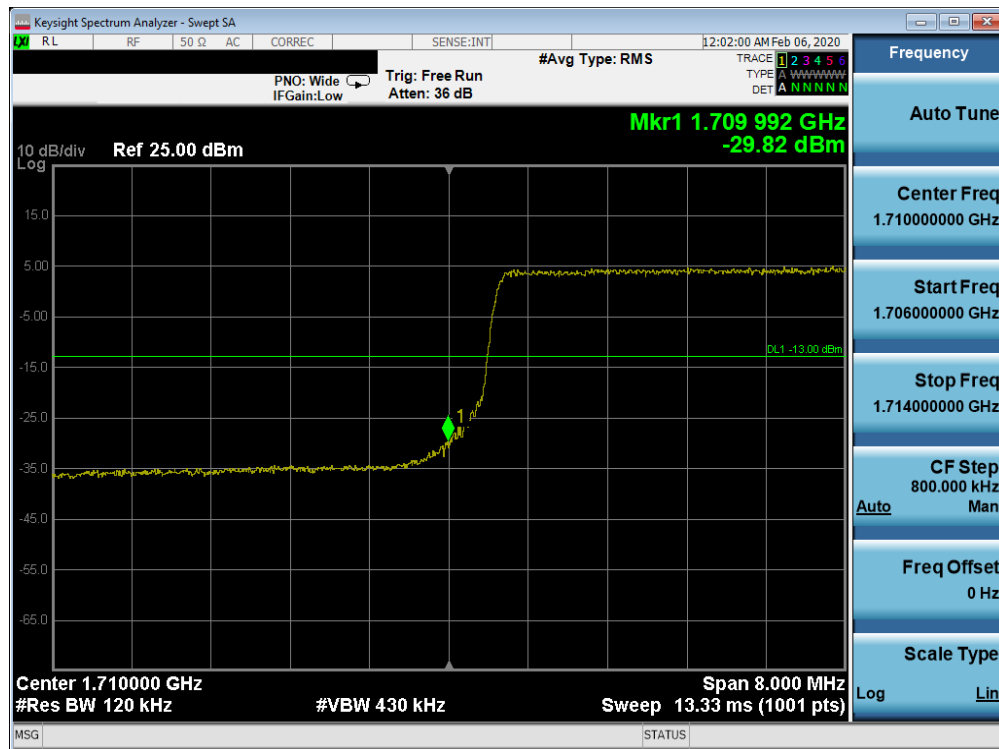


Plot 7-150. Upper Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

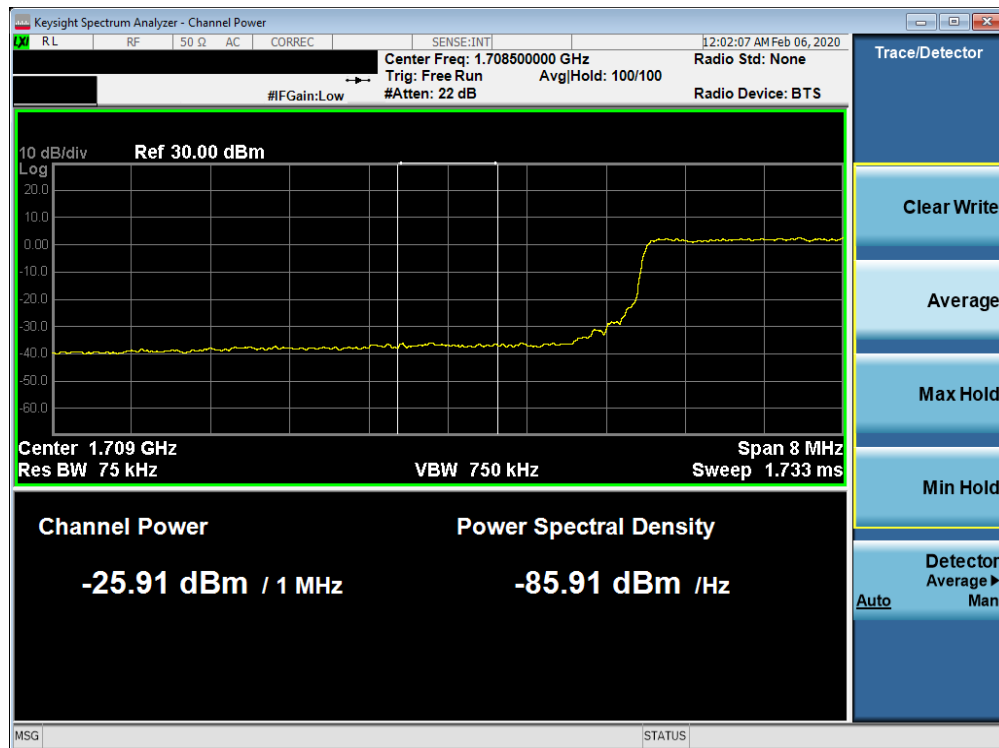


Plot 7-151. Upper Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 98 of 175

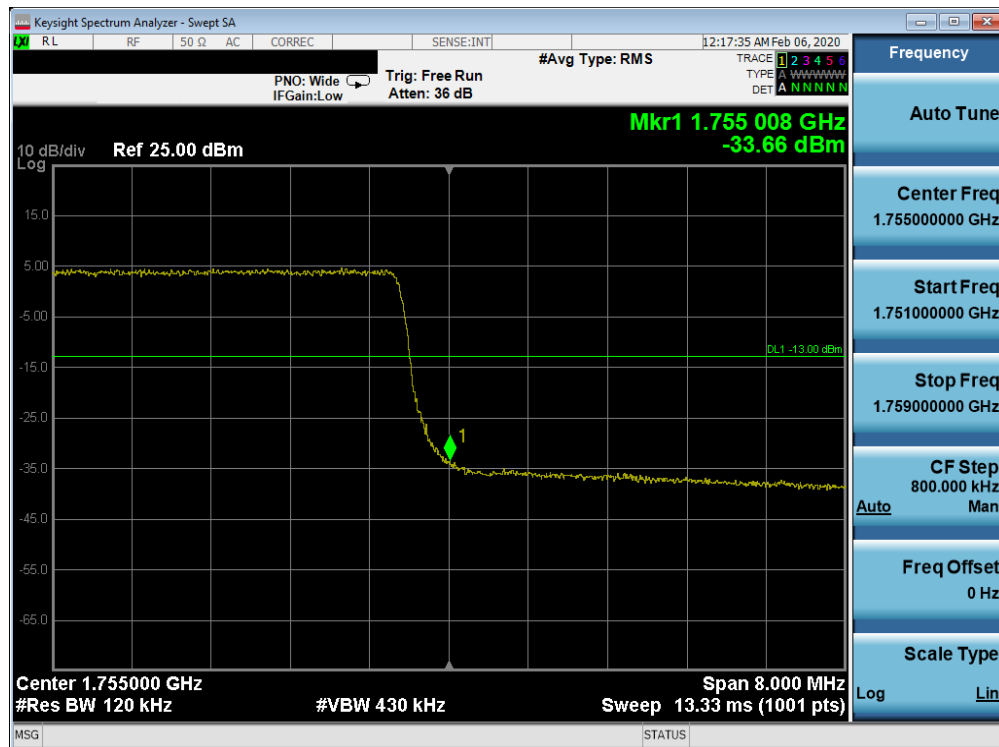


Plot 7-152. Lower Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

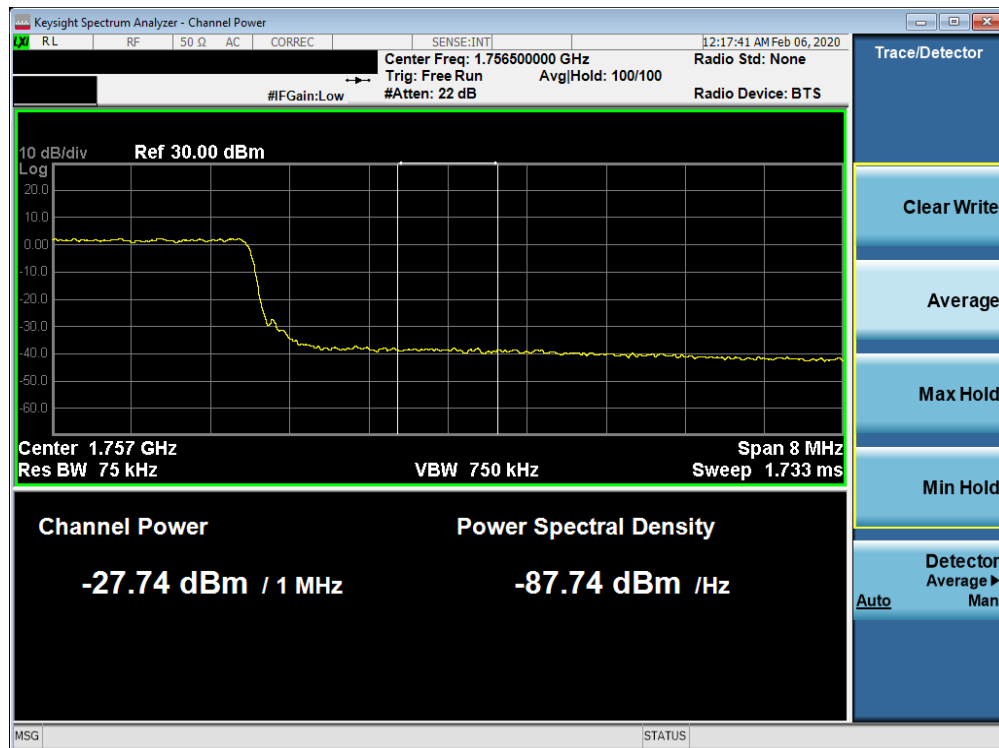


Plot 7-153. Lower Extended Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 99 of 175

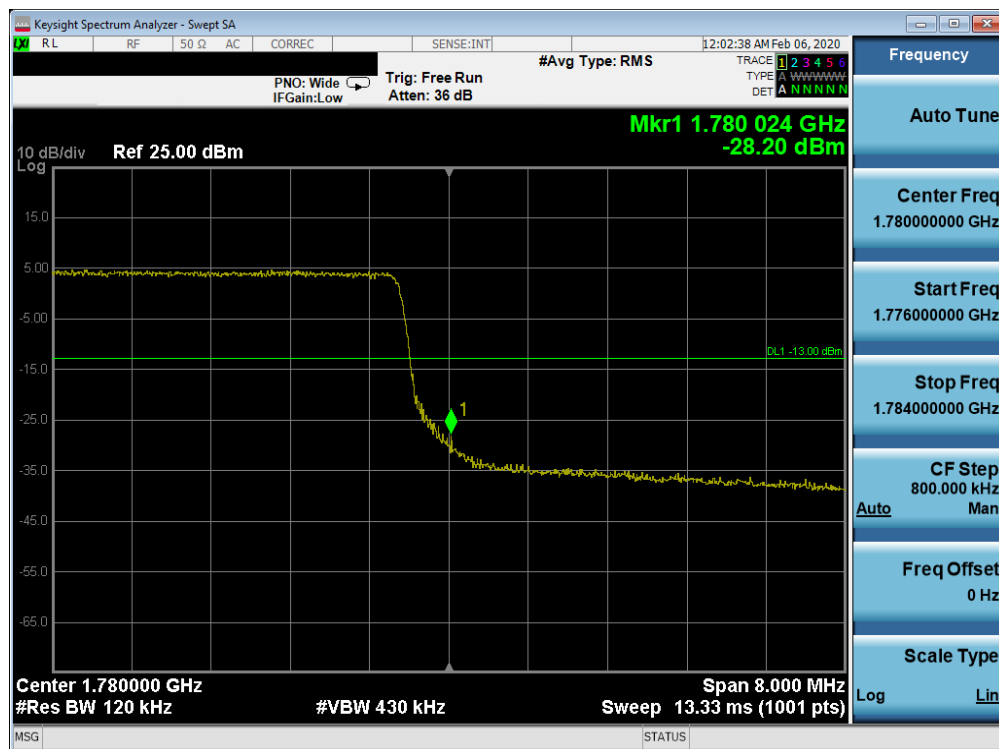


Plot 7-154. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

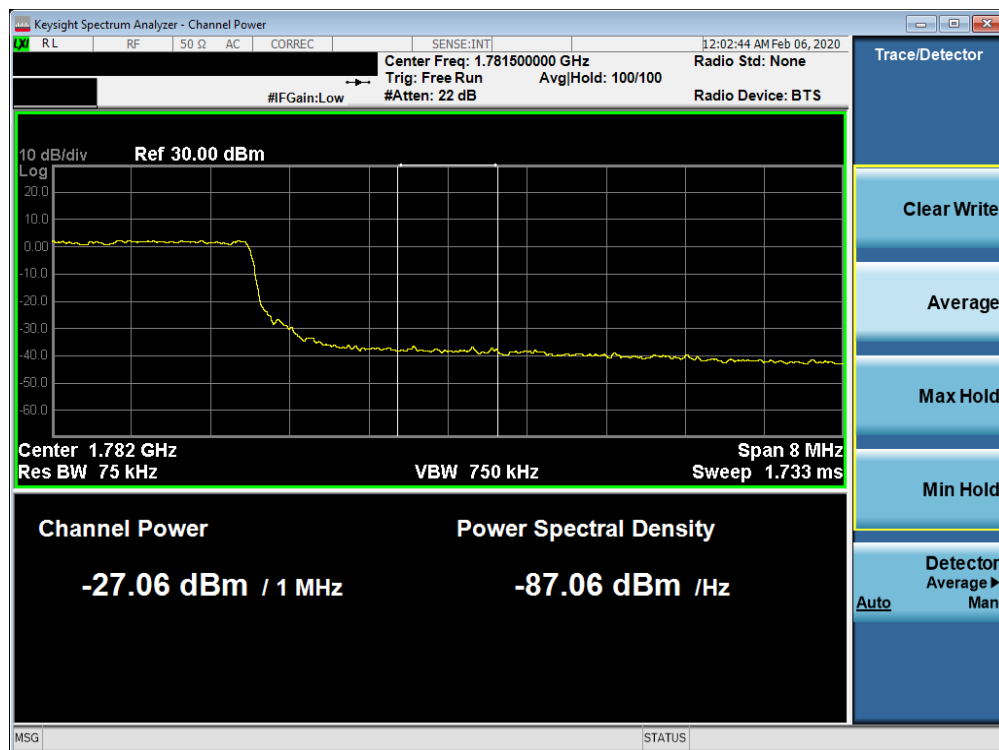


Plot 7-155. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 100 of 175

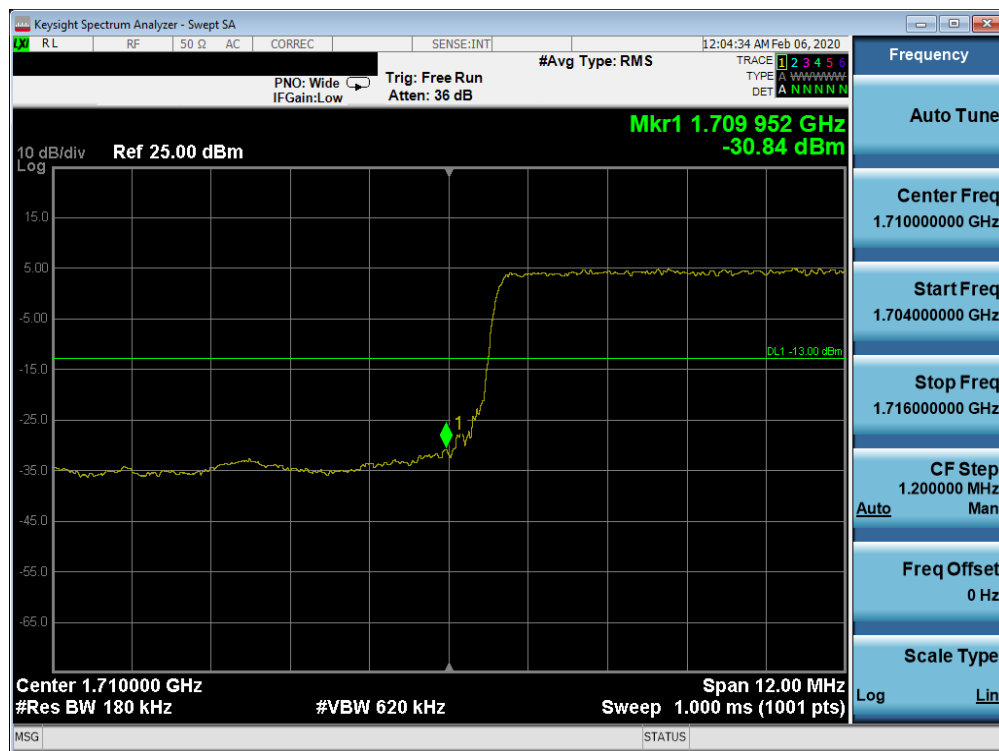


Plot 7-156. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

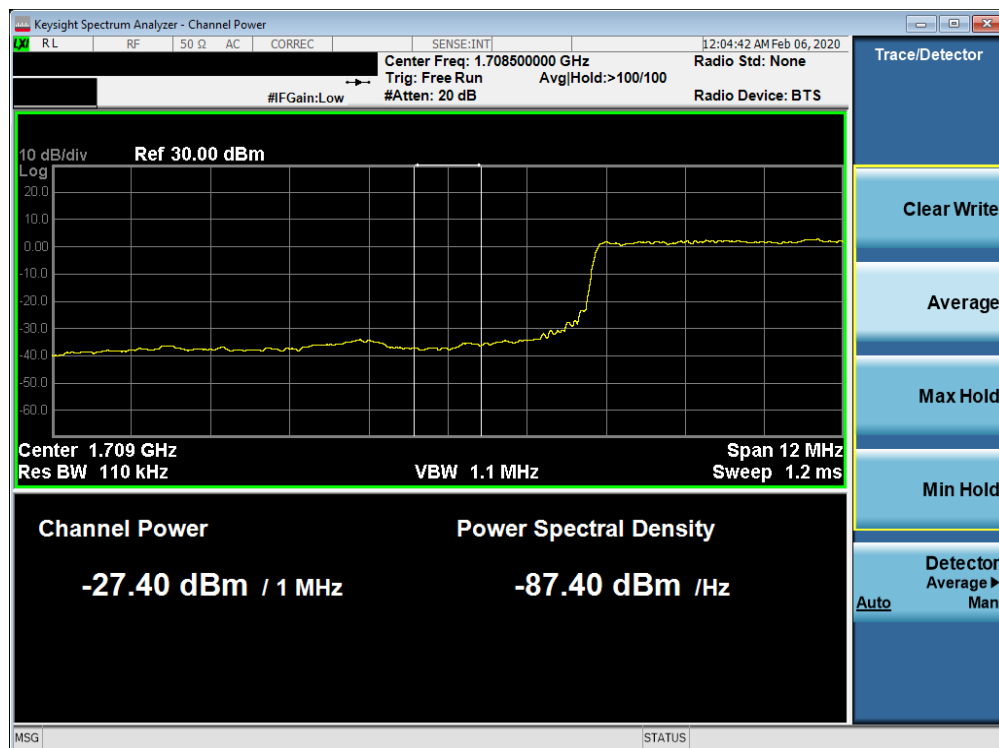


Plot 7-157. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 101 of 175

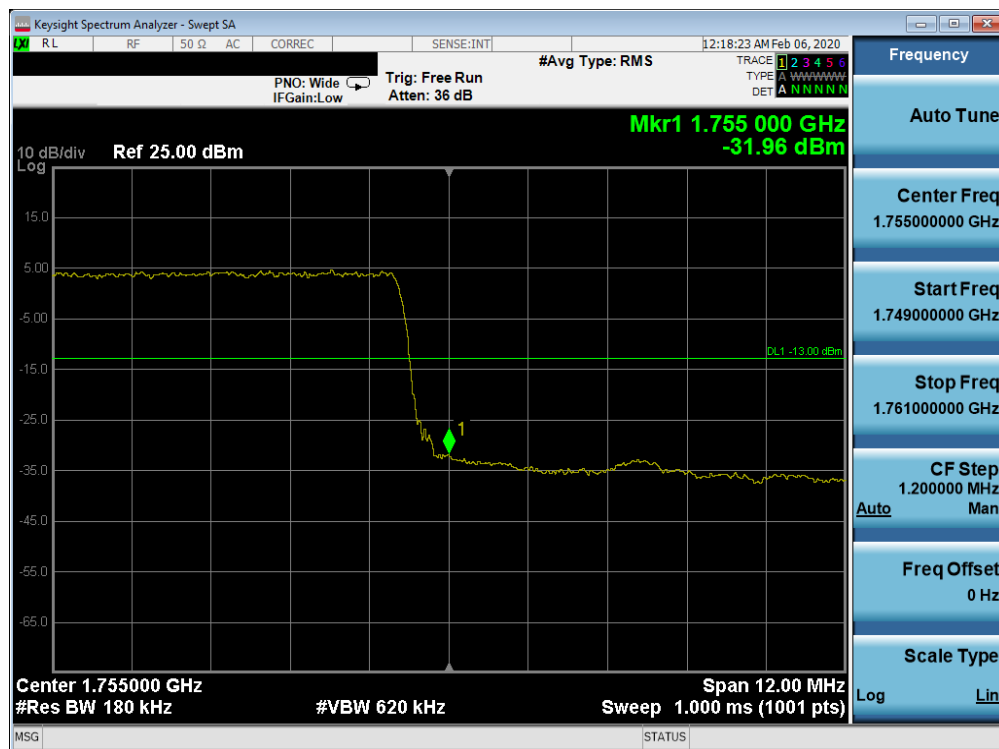


Plot 7-158. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

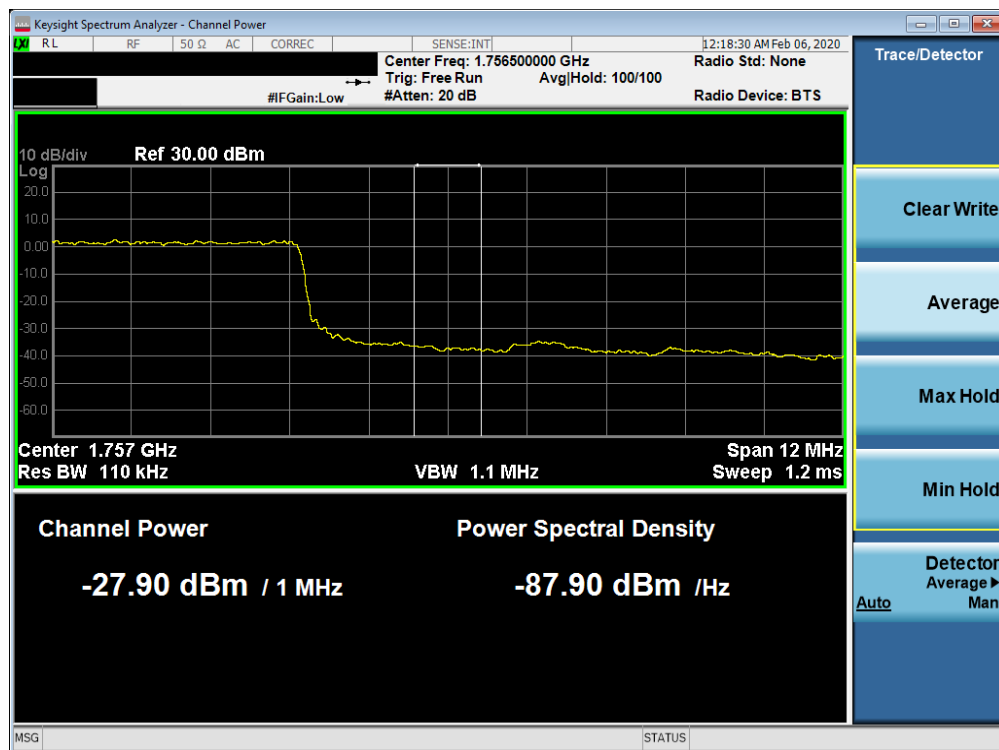


Plot 7-159. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 102 of 175

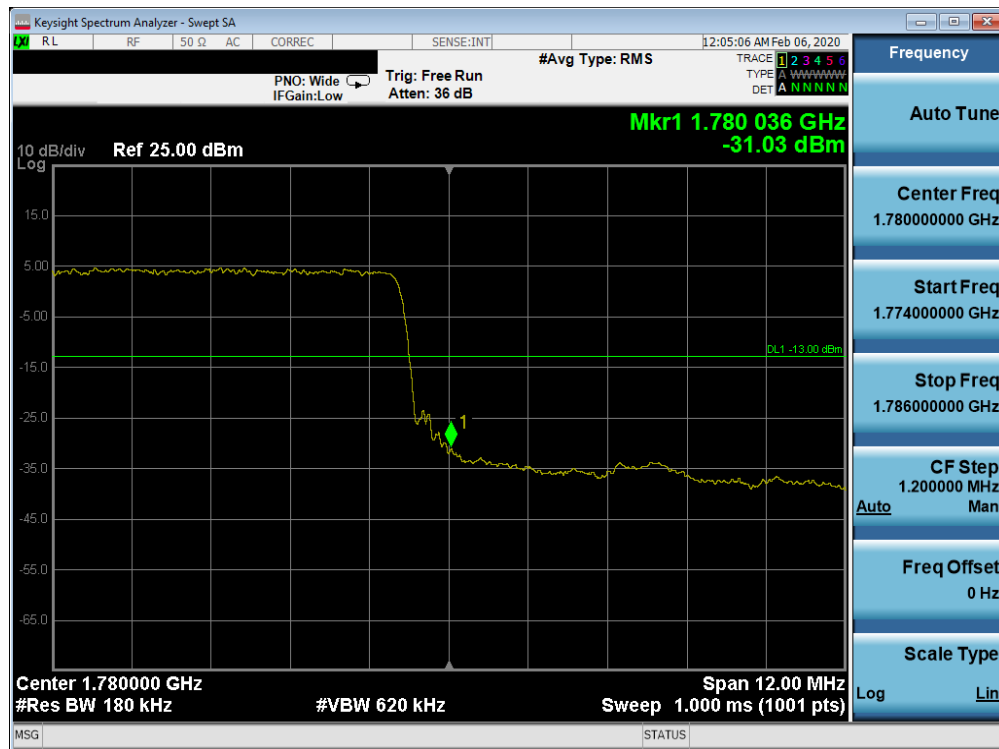


Plot 7-160. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

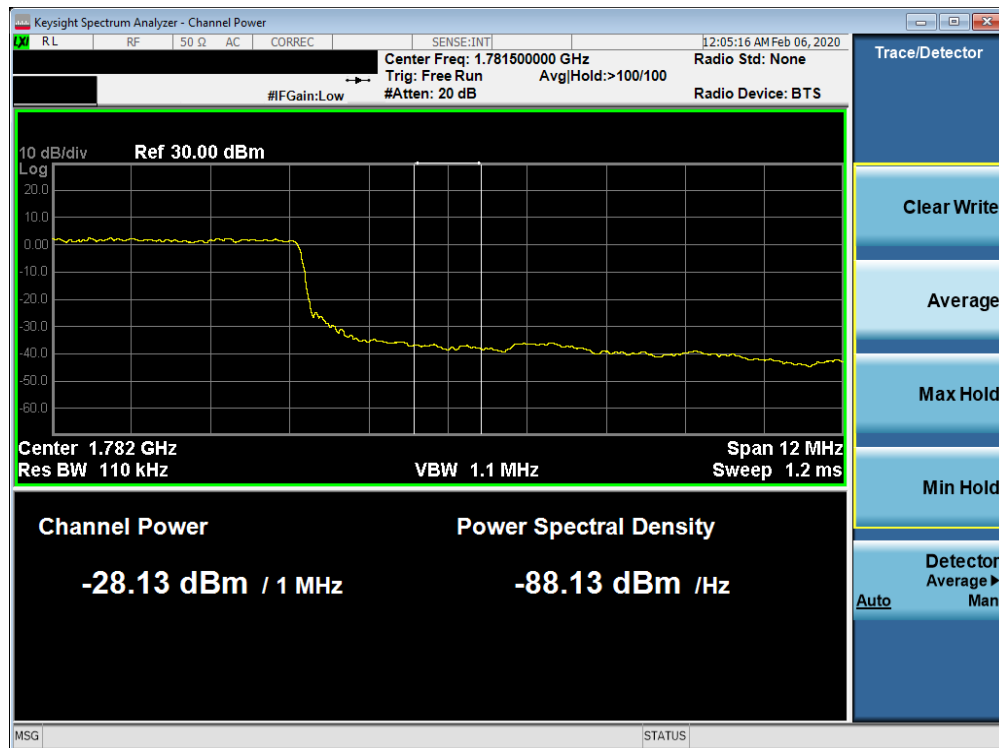


Plot 7-161. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 103 of 175

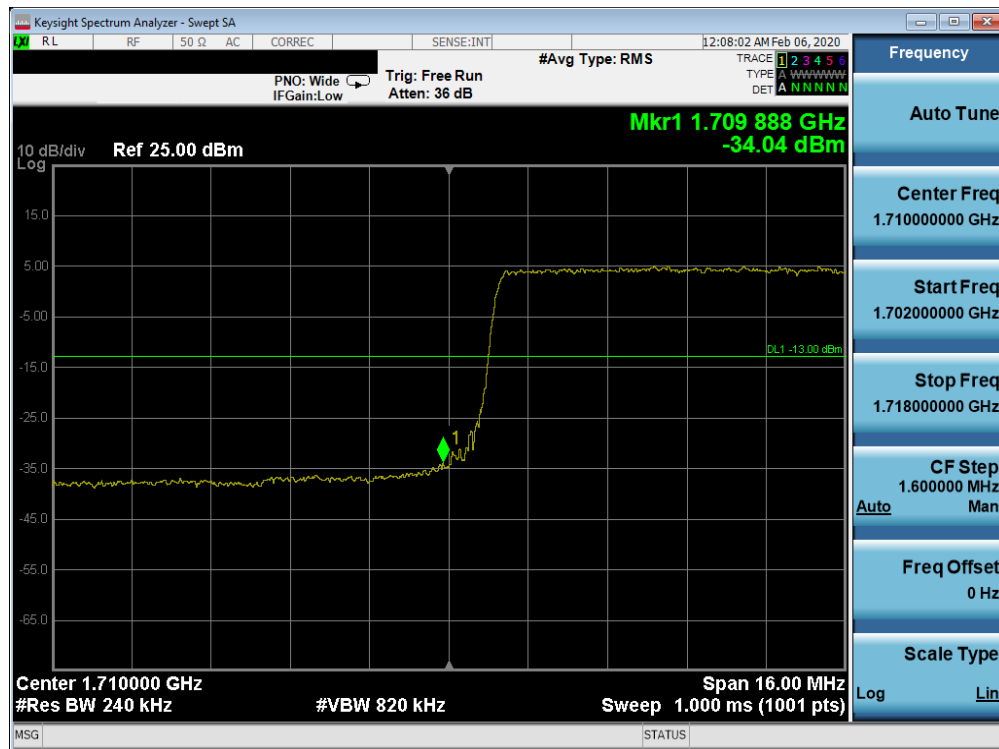


Plot 7-162. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

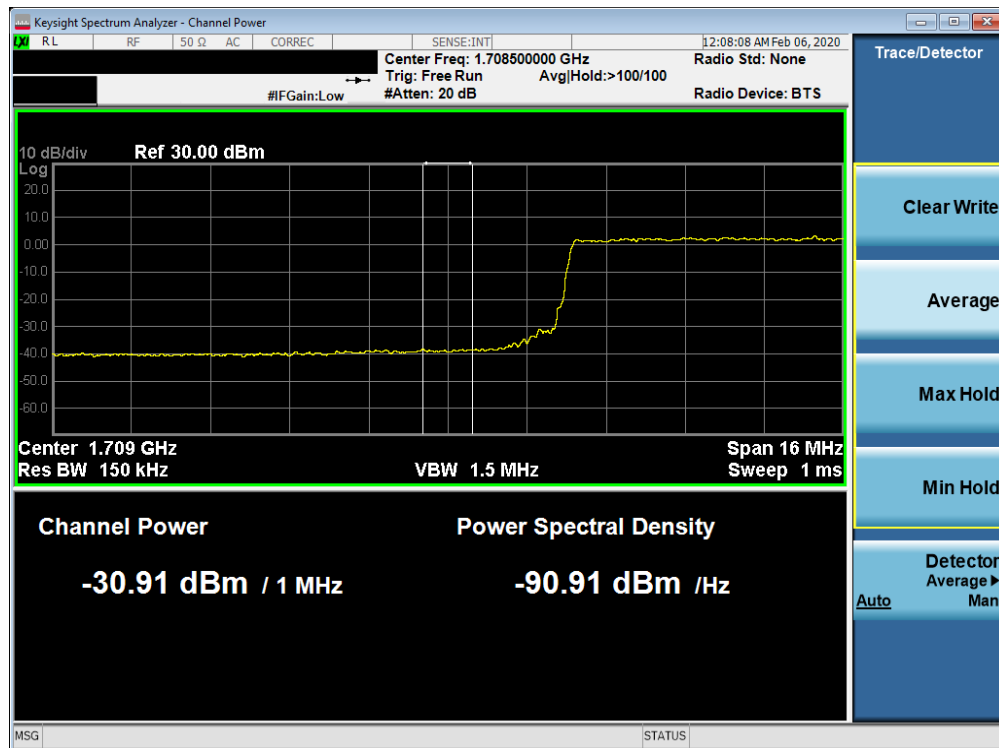


Plot 7-163. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 104 of 175

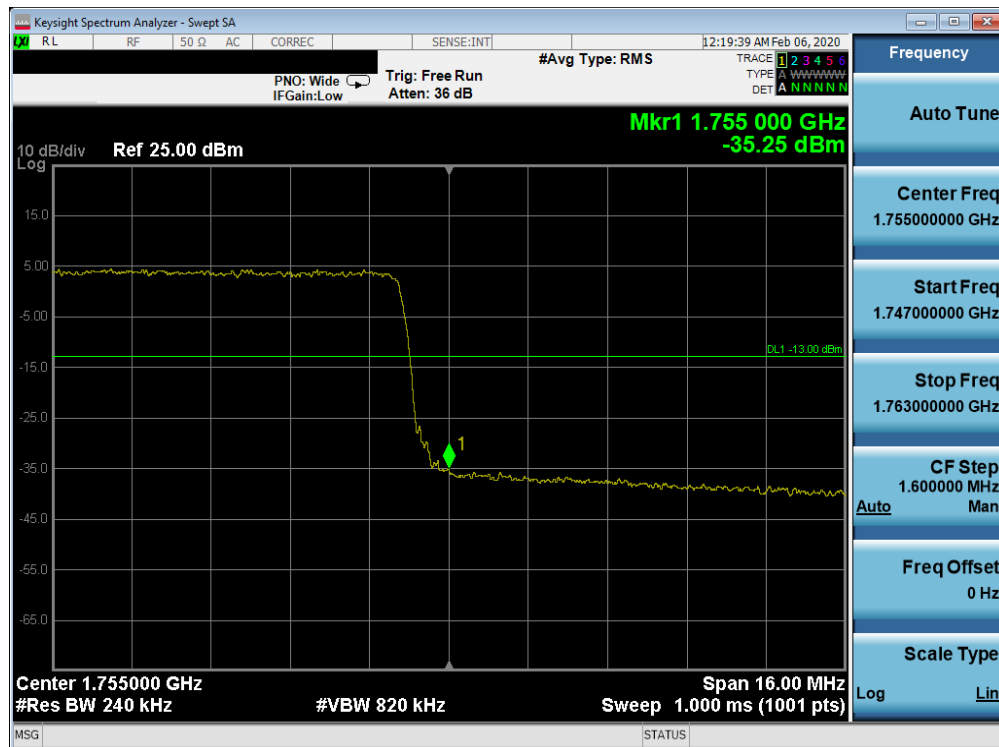


Plot 7-164. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

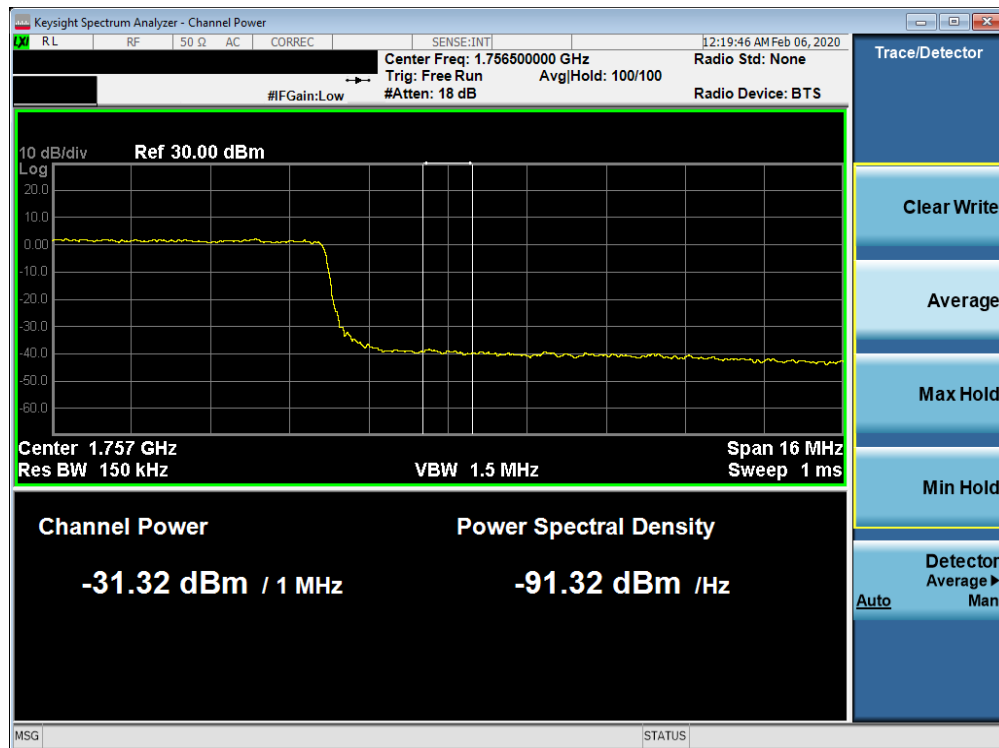


Plot 7-165. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 105 of 175

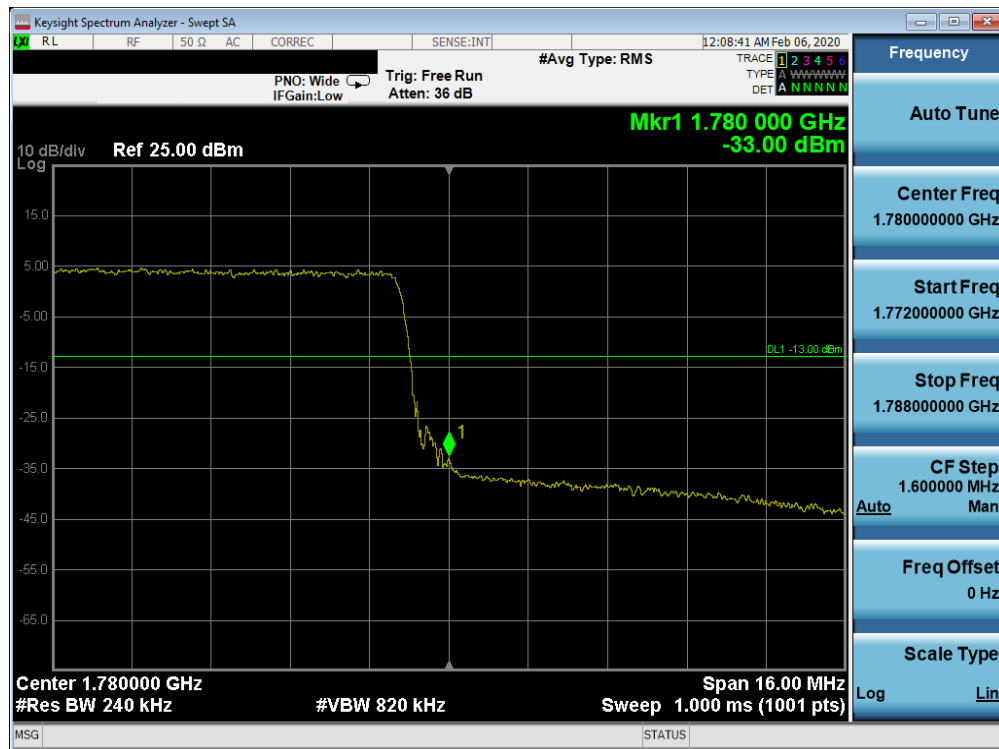


Plot 7-166. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

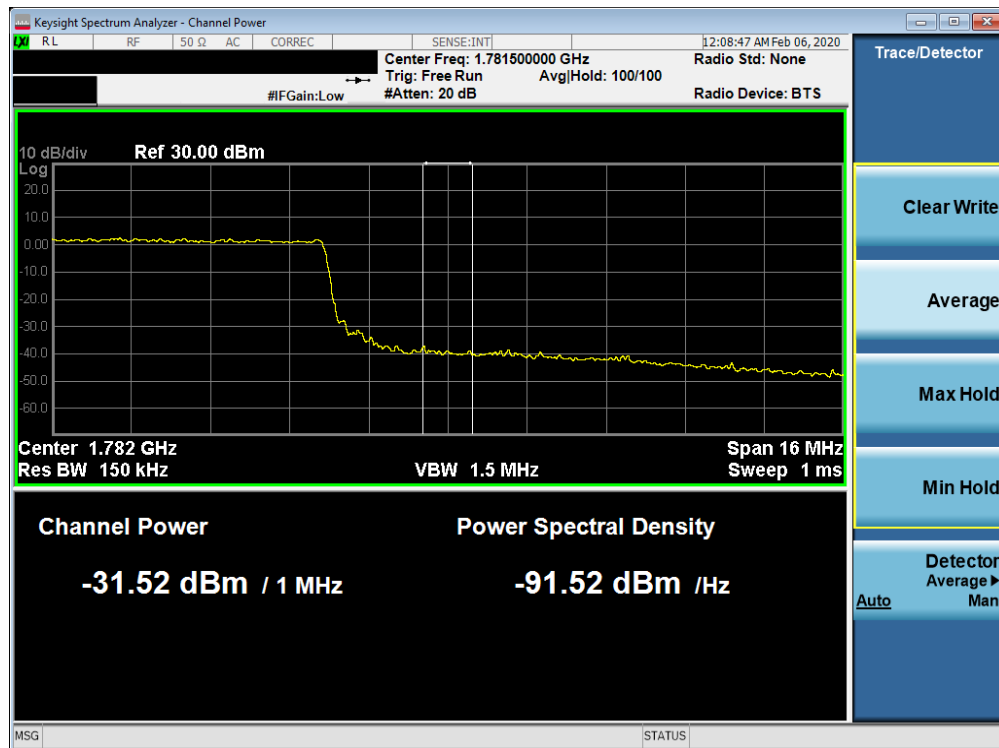


Plot 7-167. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 106 of 175



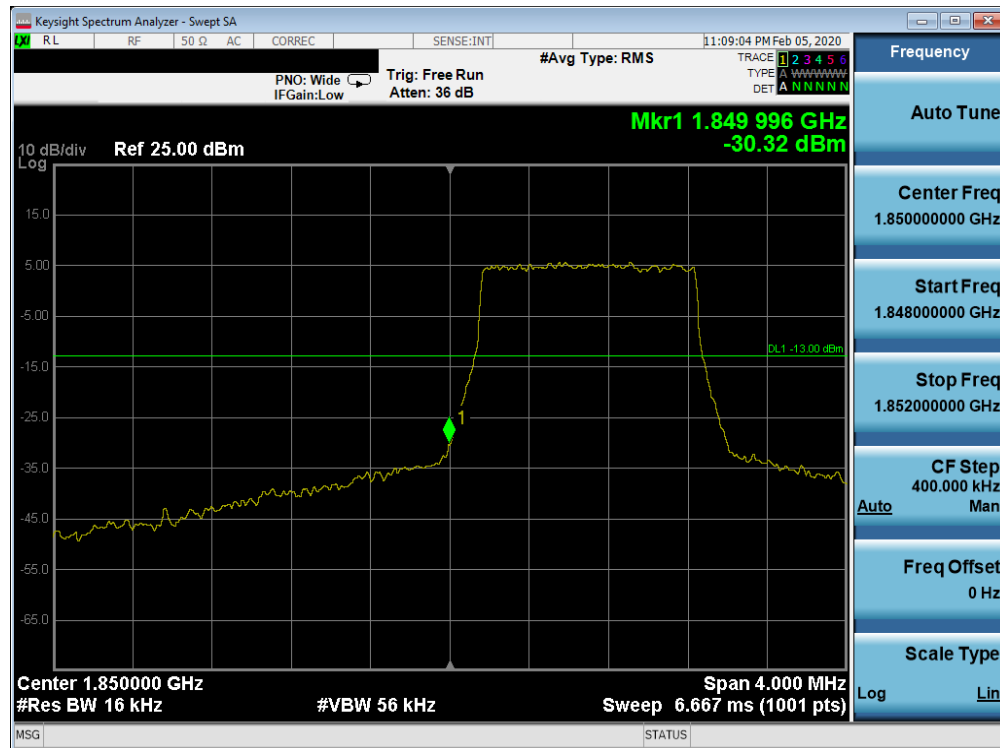
Plot 7-168. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



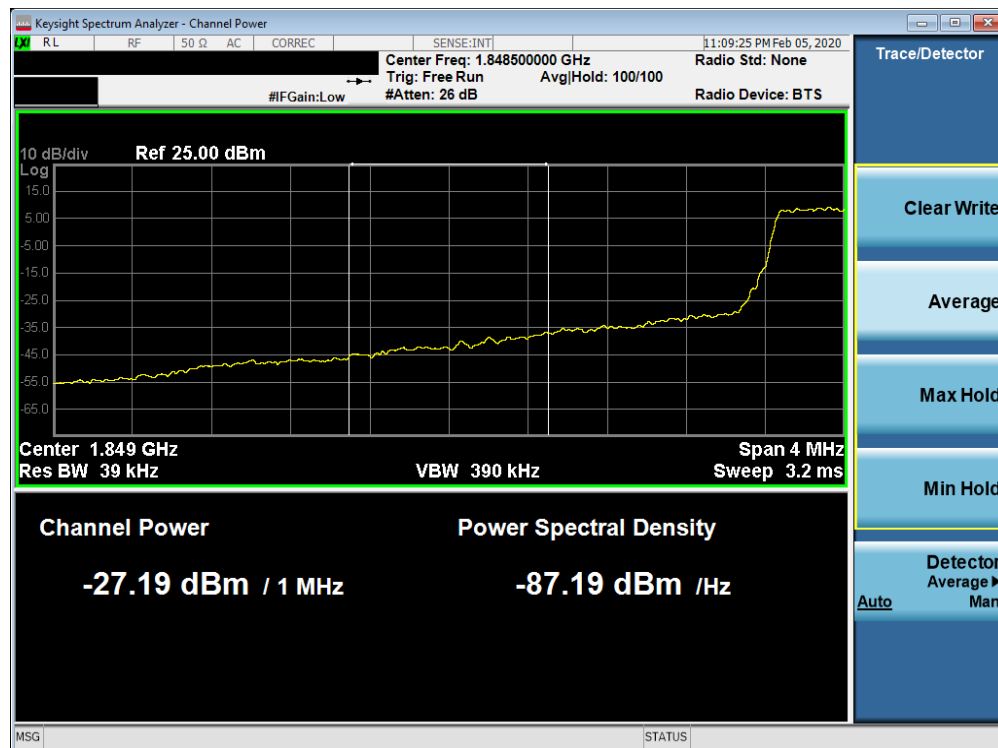
Plot 7-169. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 107 of 175

Band 2

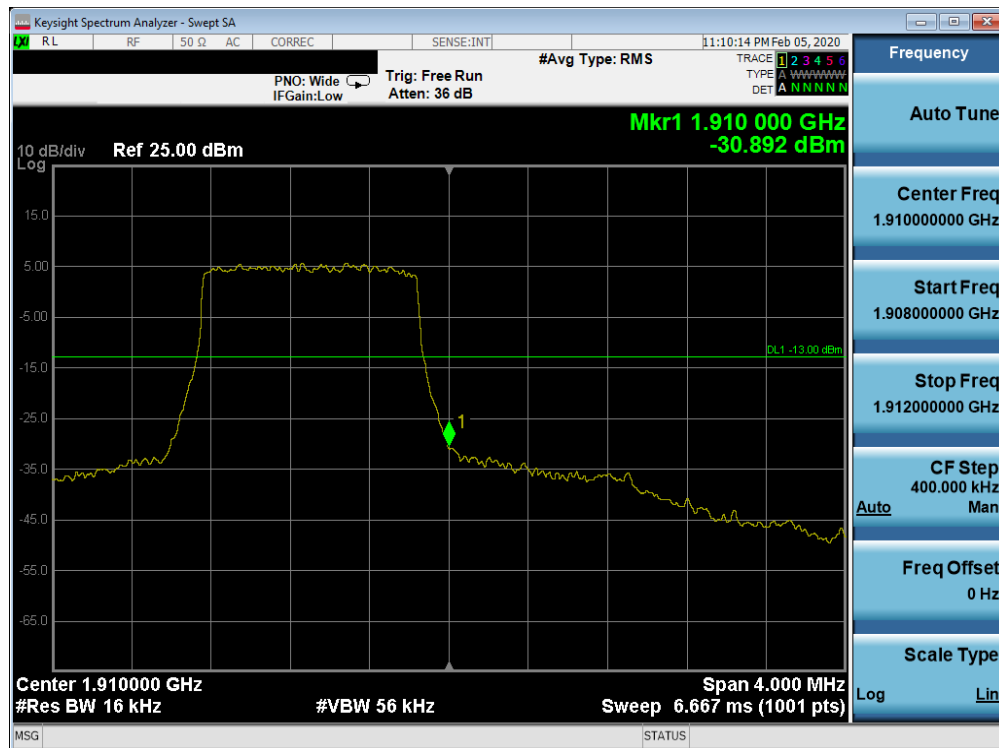


Plot 7-170. Lower Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

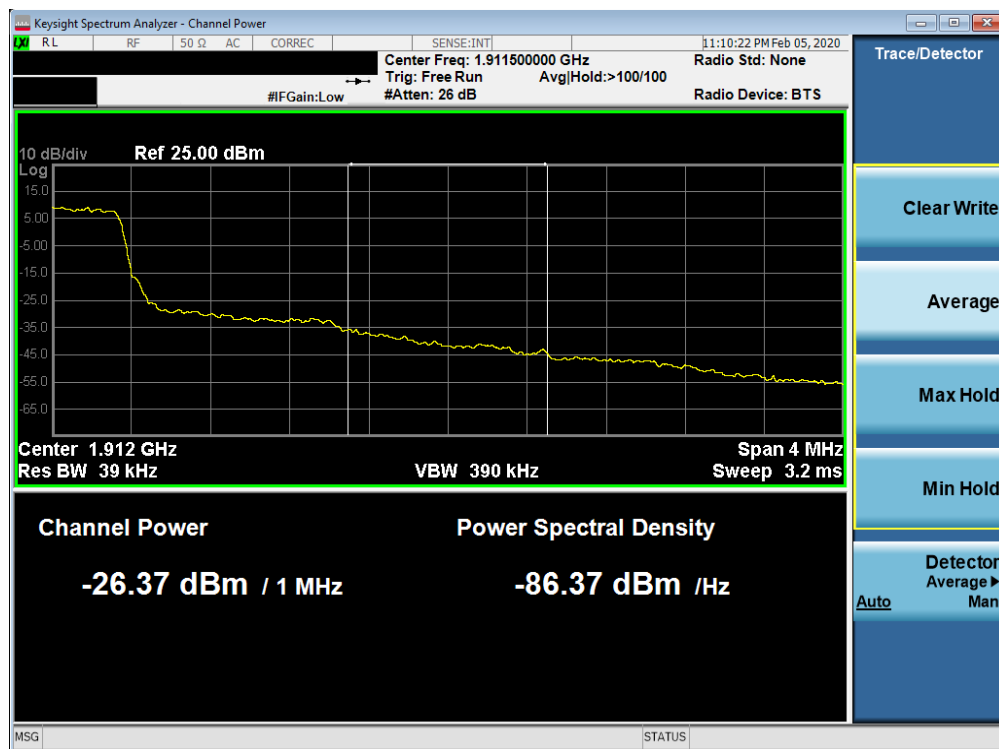


Plot 7-171. Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset	Page 108 of 175

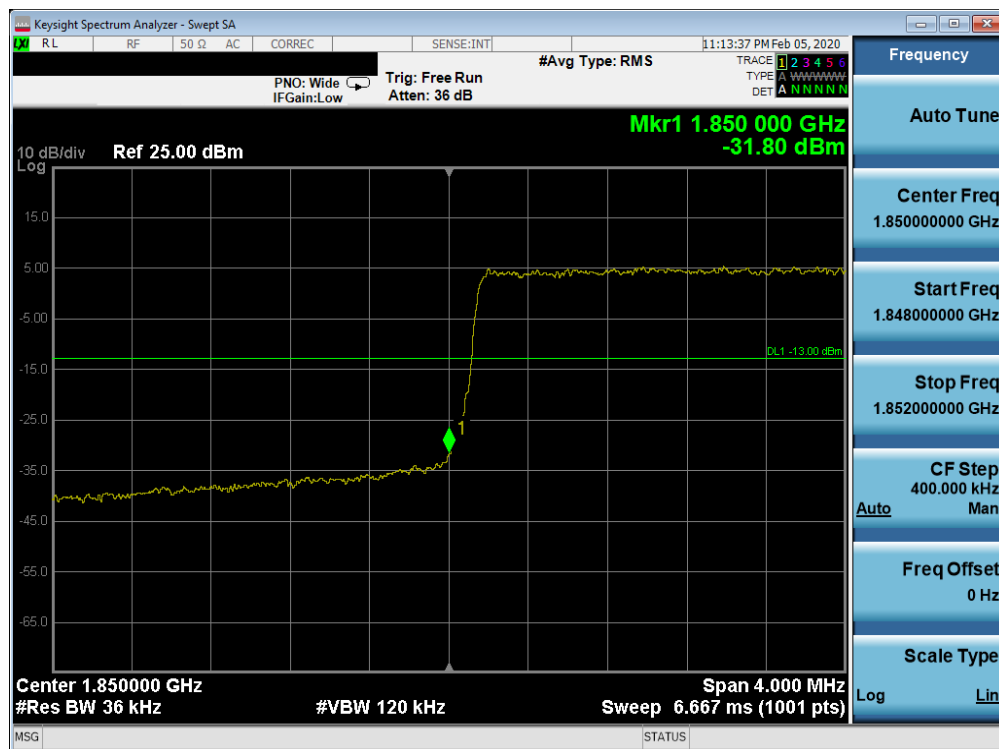


Plot 7-172. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

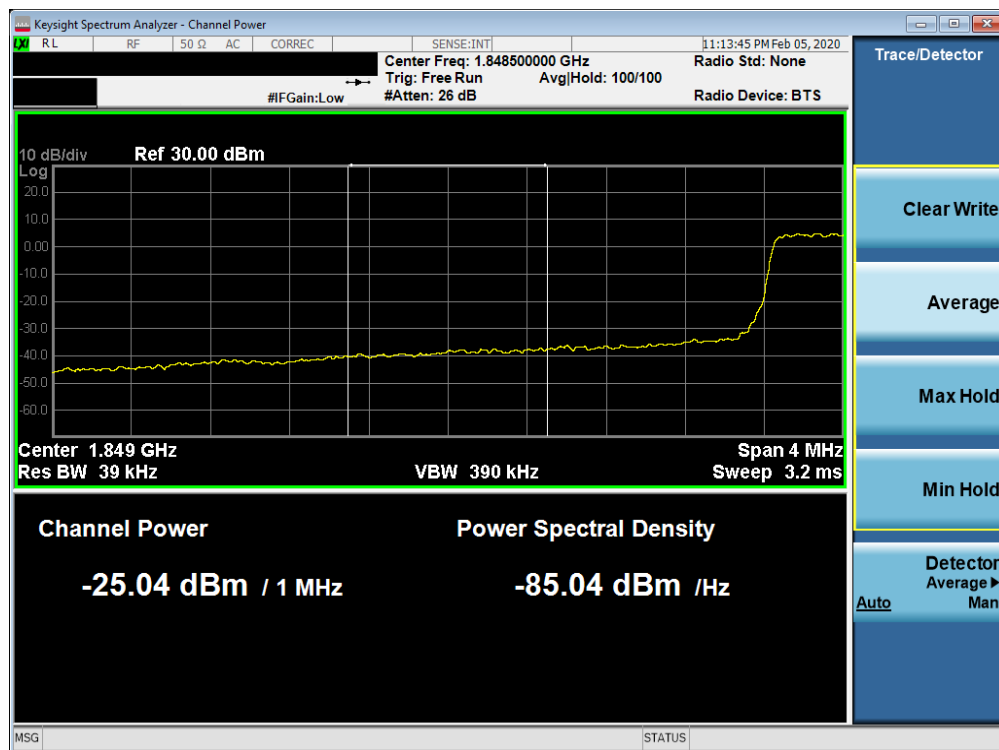


Plot 7-173. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 109 of 175

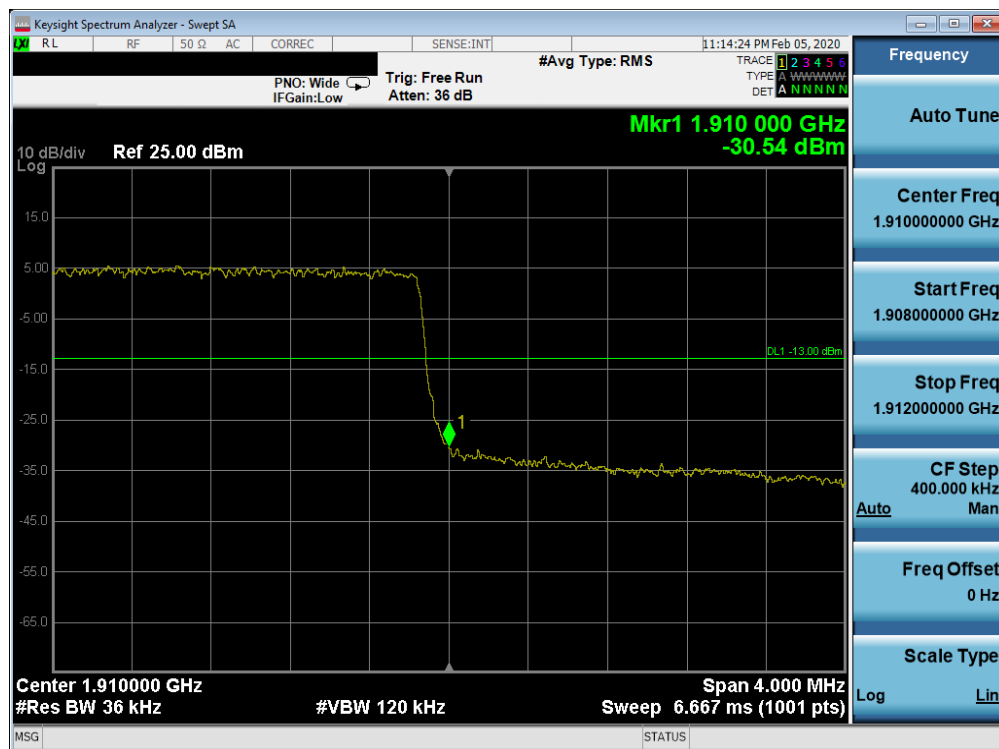


Plot 7-174. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

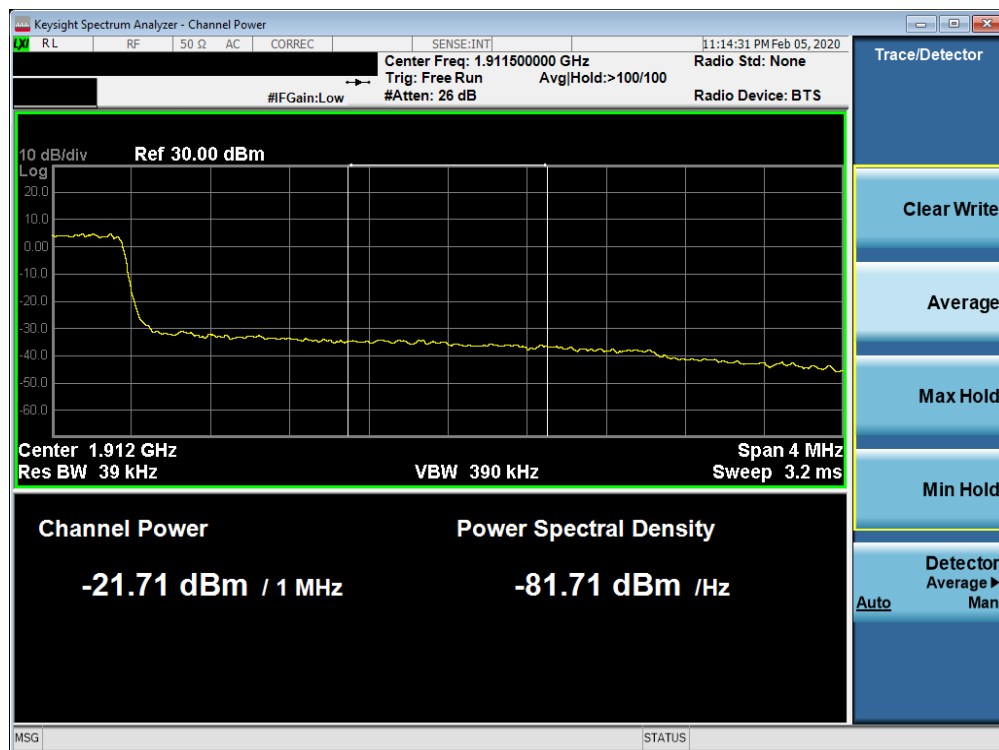


Plot 7-175. Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 110 of 175

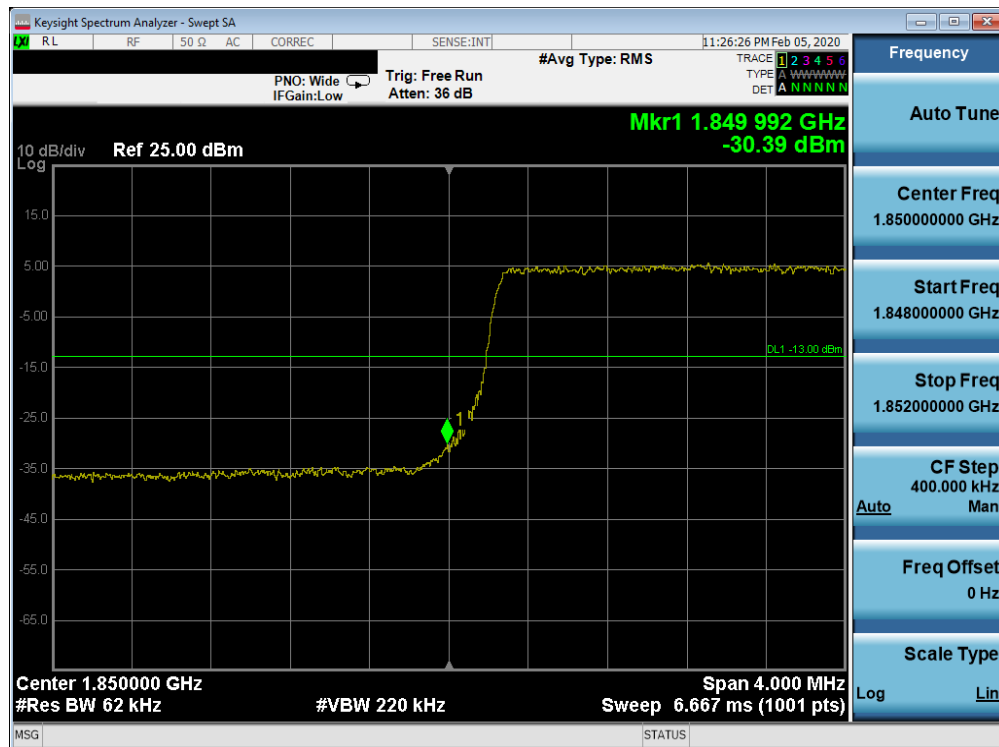


Plot 7-176. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

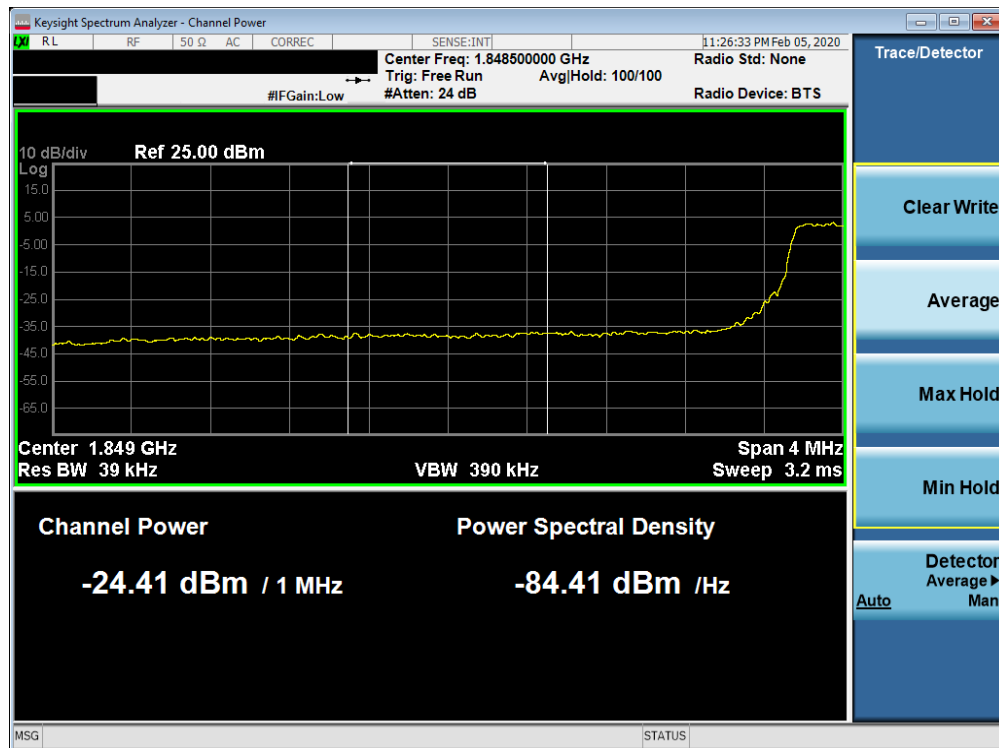


Plot 7-177. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 111 of 175

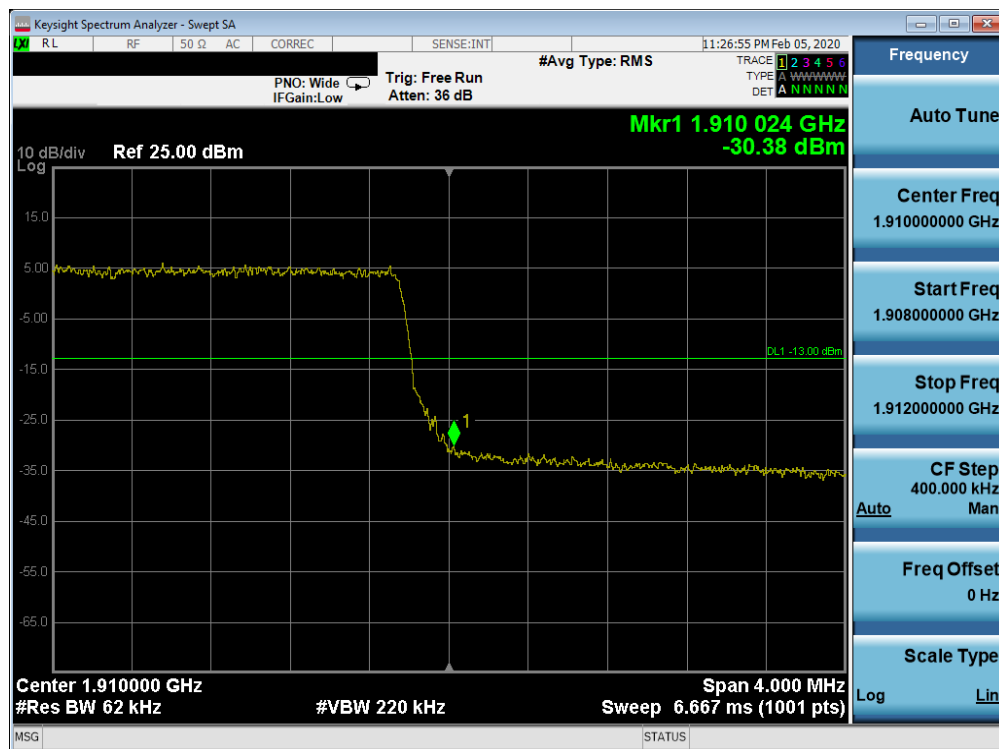


Plot 7-178. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

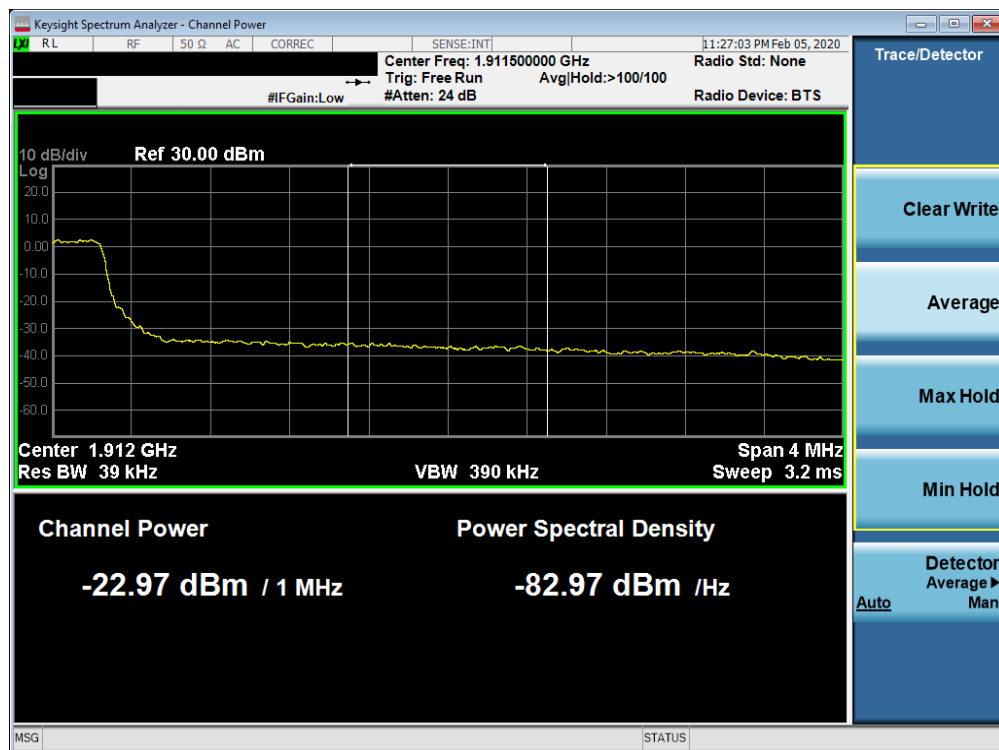


Plot 7-179. Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 112 of 175

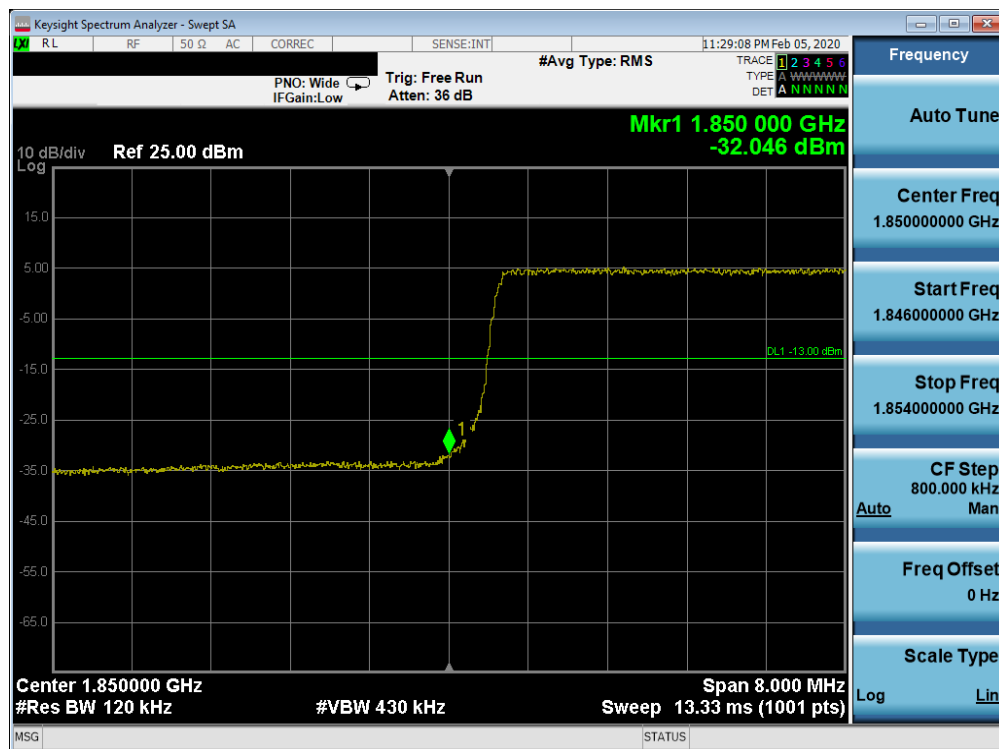


Plot 7-180. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

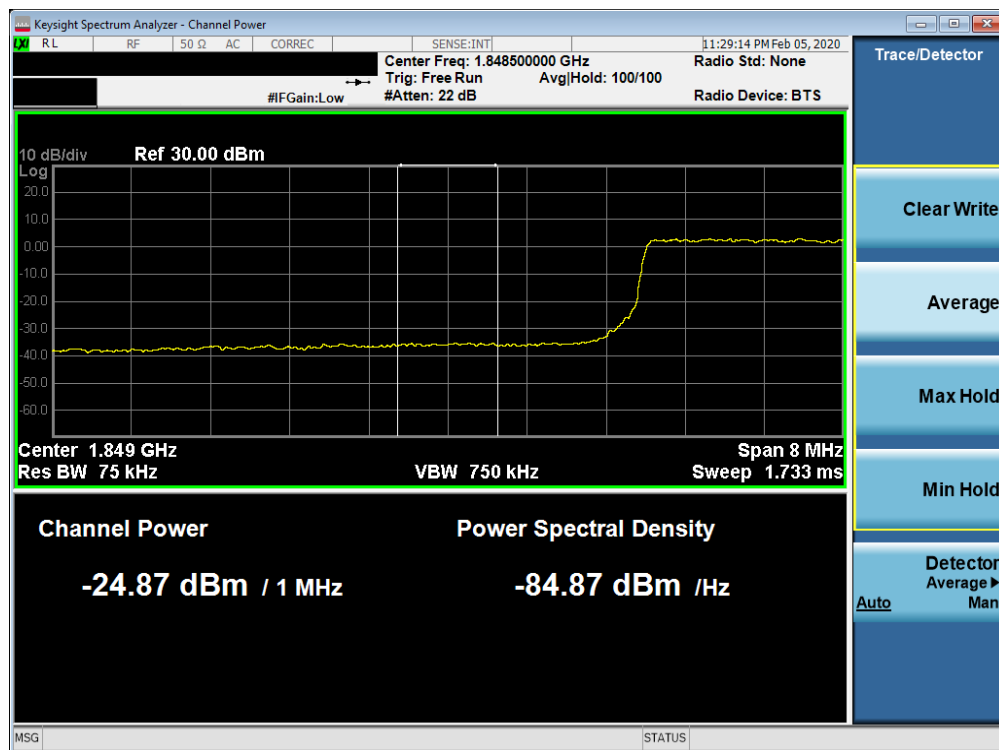


Plot 7-181. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 113 of 175

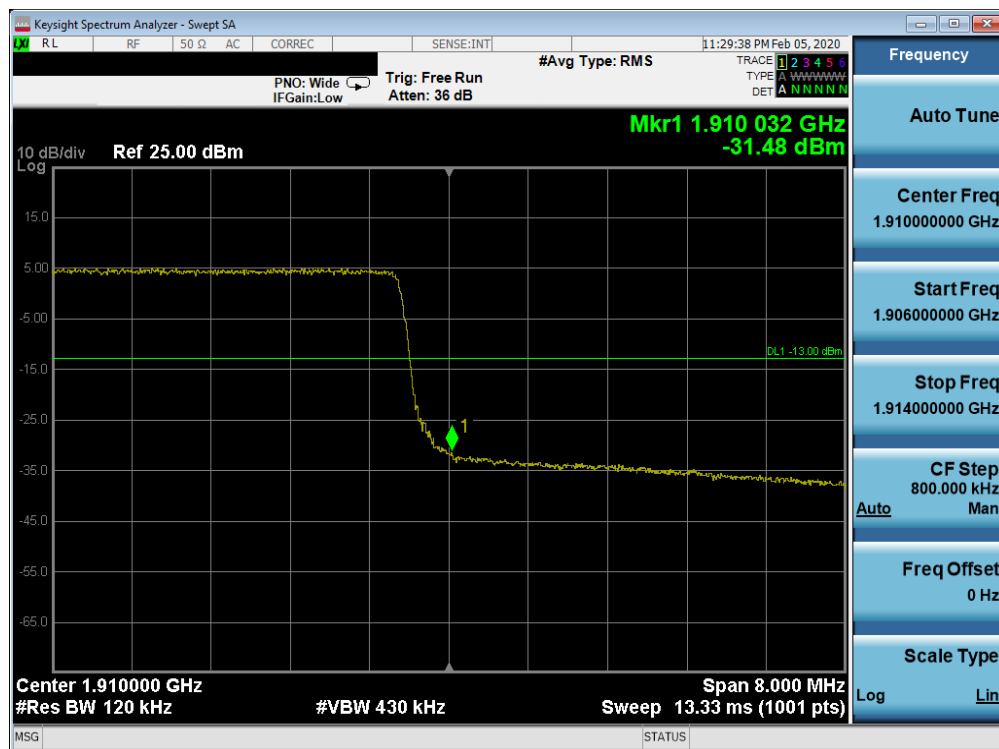


Plot 7-182. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

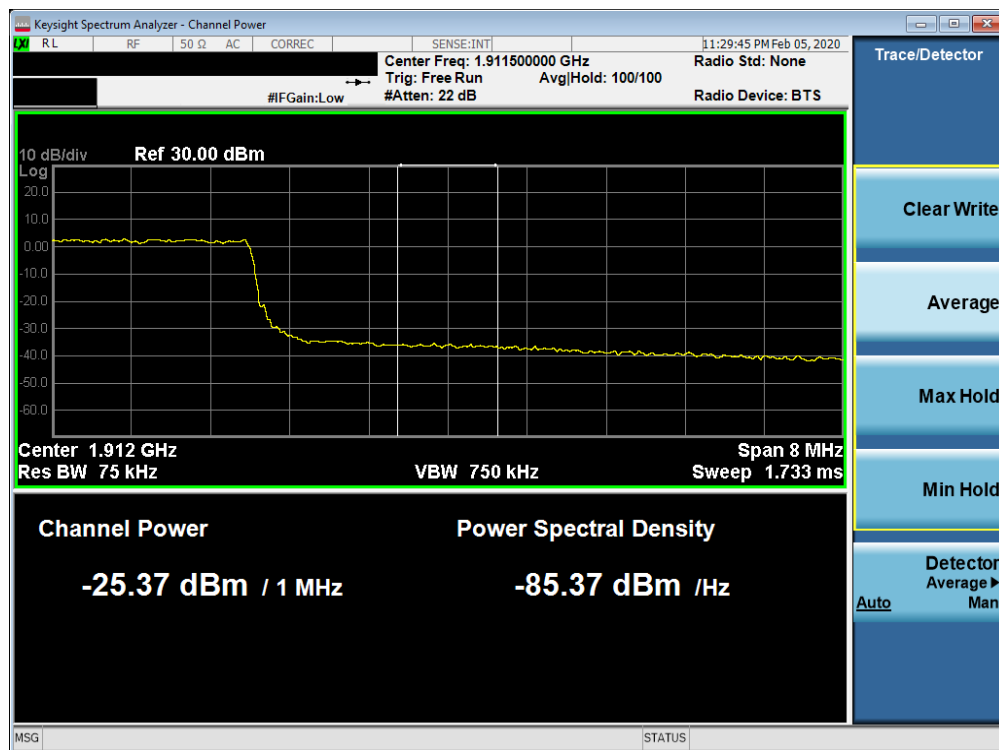


Plot 7-183. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 114 of 175

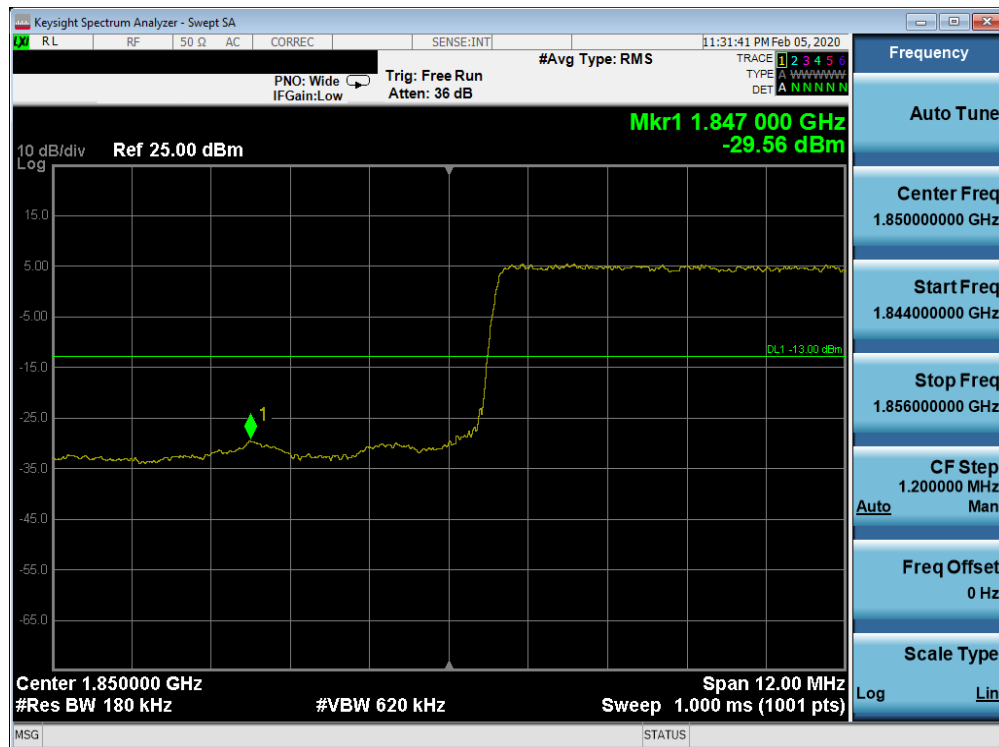


Plot 7-184. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

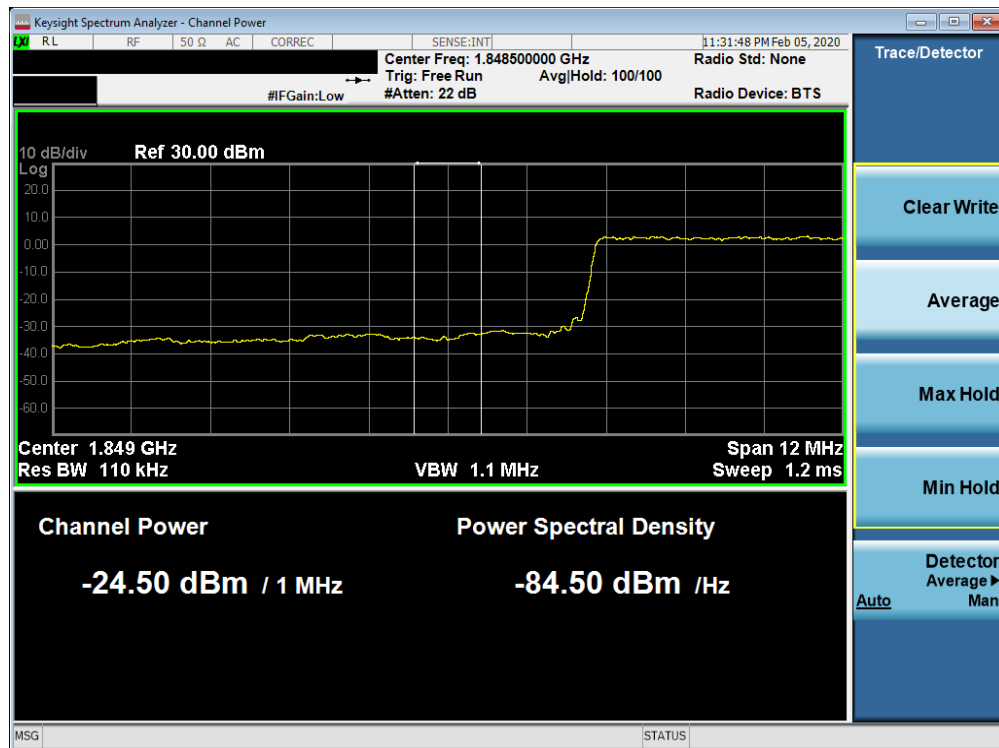


Plot 7-185. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 115 of 175

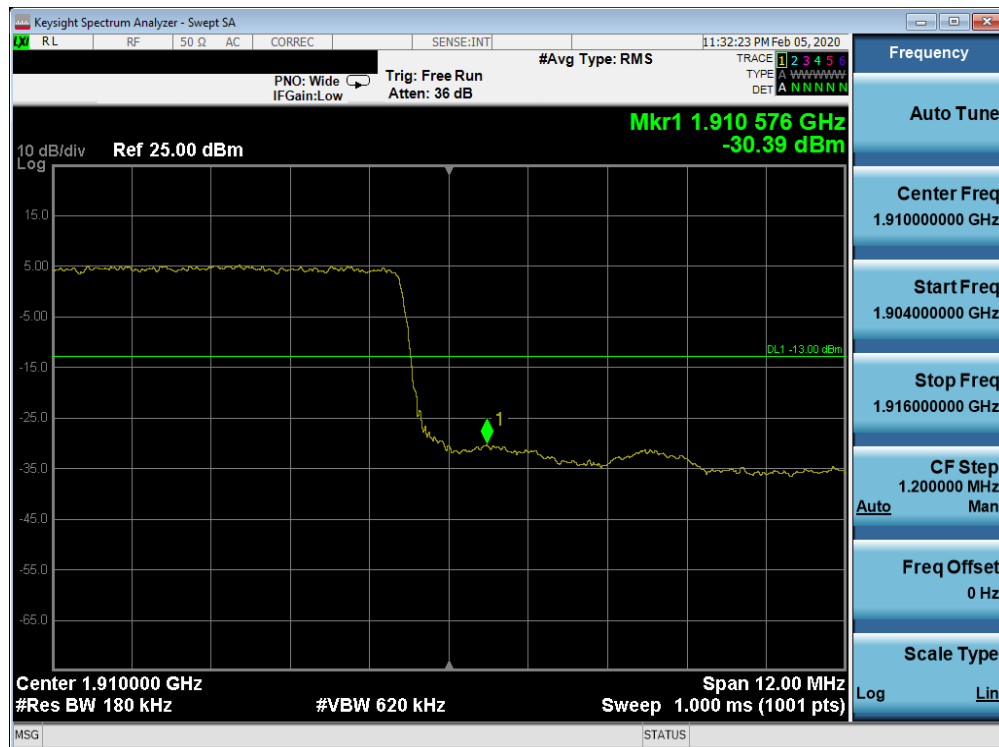


Plot 7-186. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

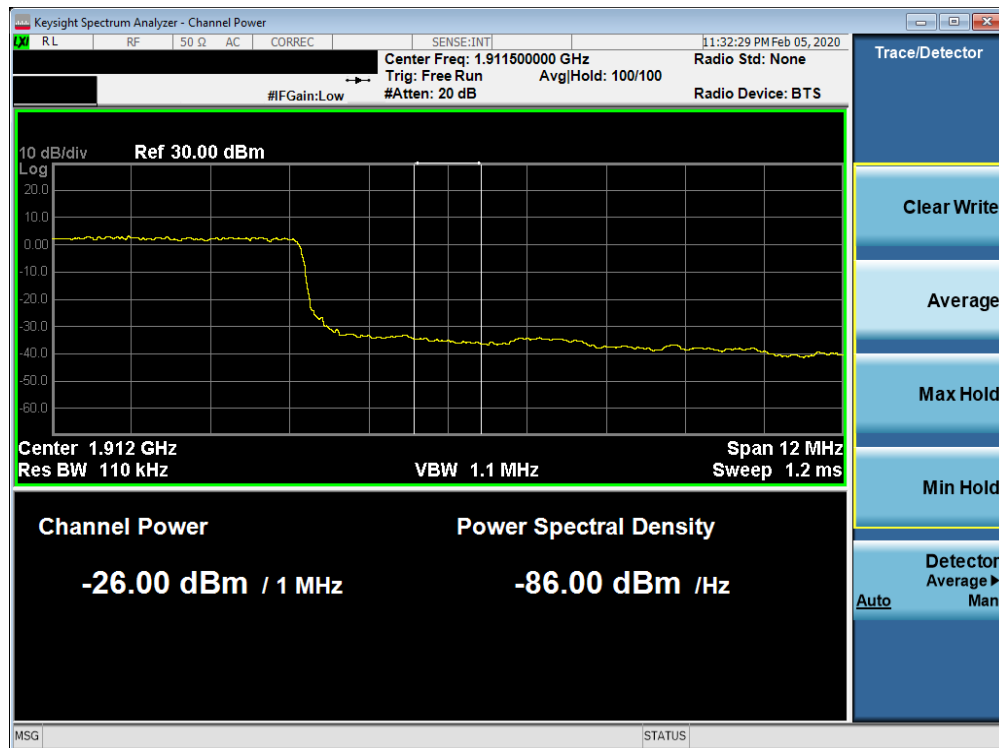


Plot 7-187. Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 116 of 175

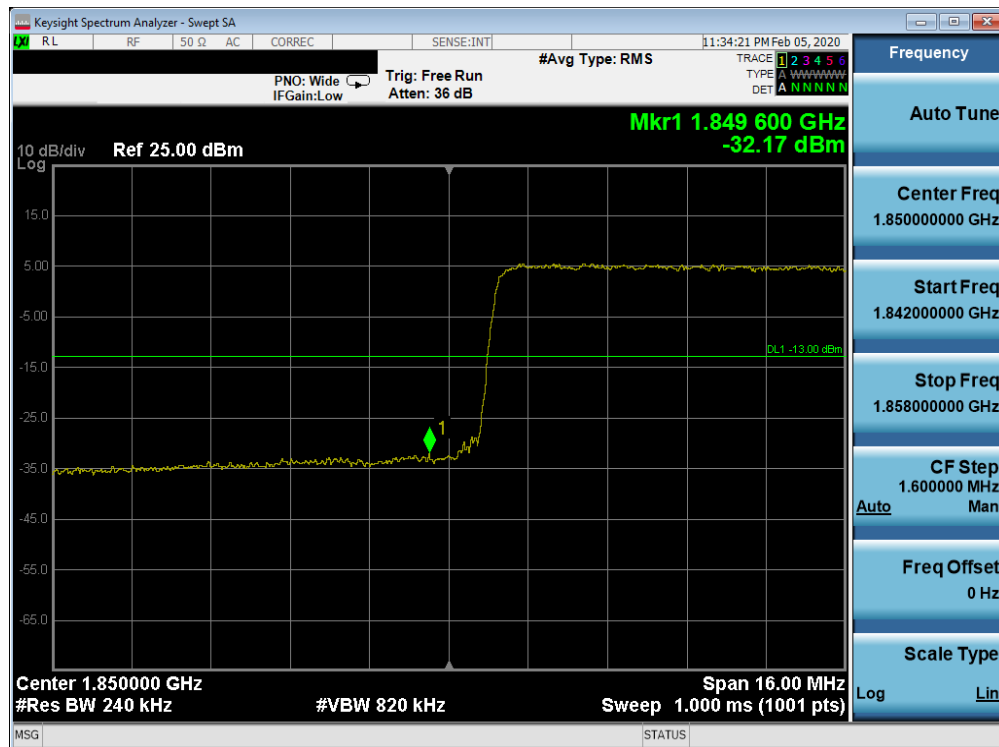


Plot 7-188. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

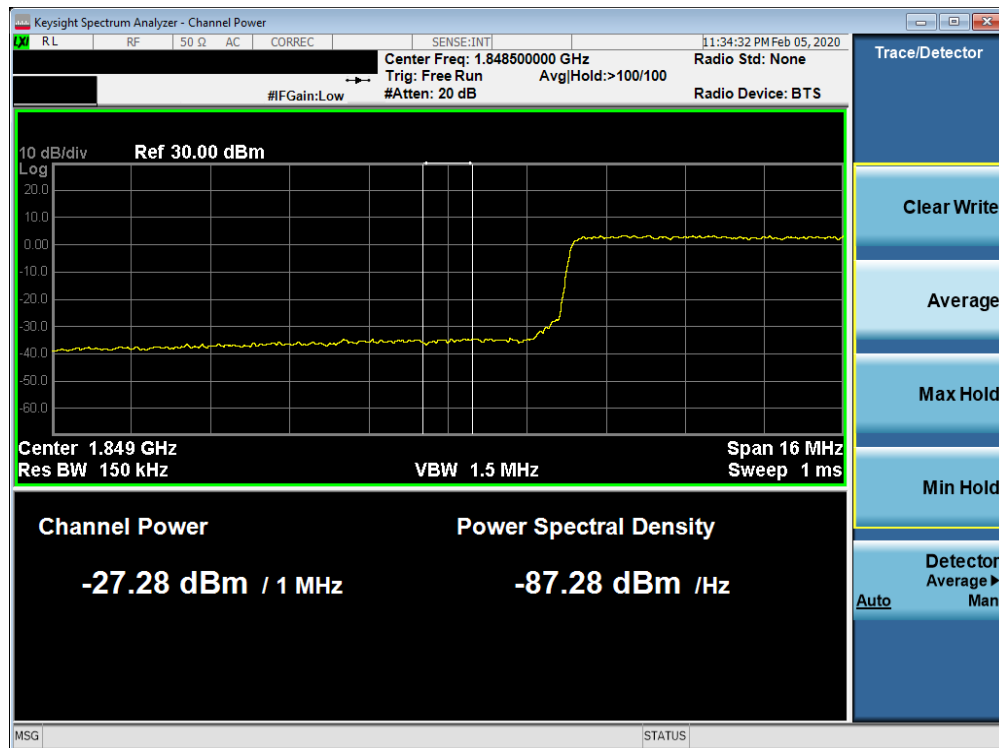


Plot 7-189. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 117 of 175



Plot 7-190. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

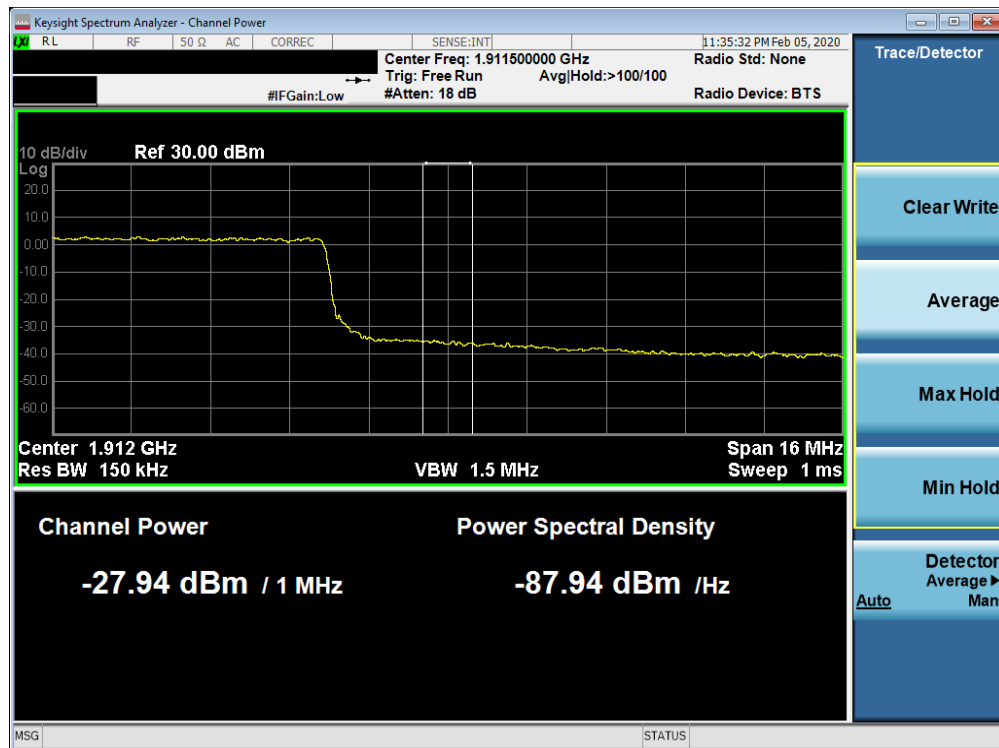


Plot 7-191. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 118 of 175



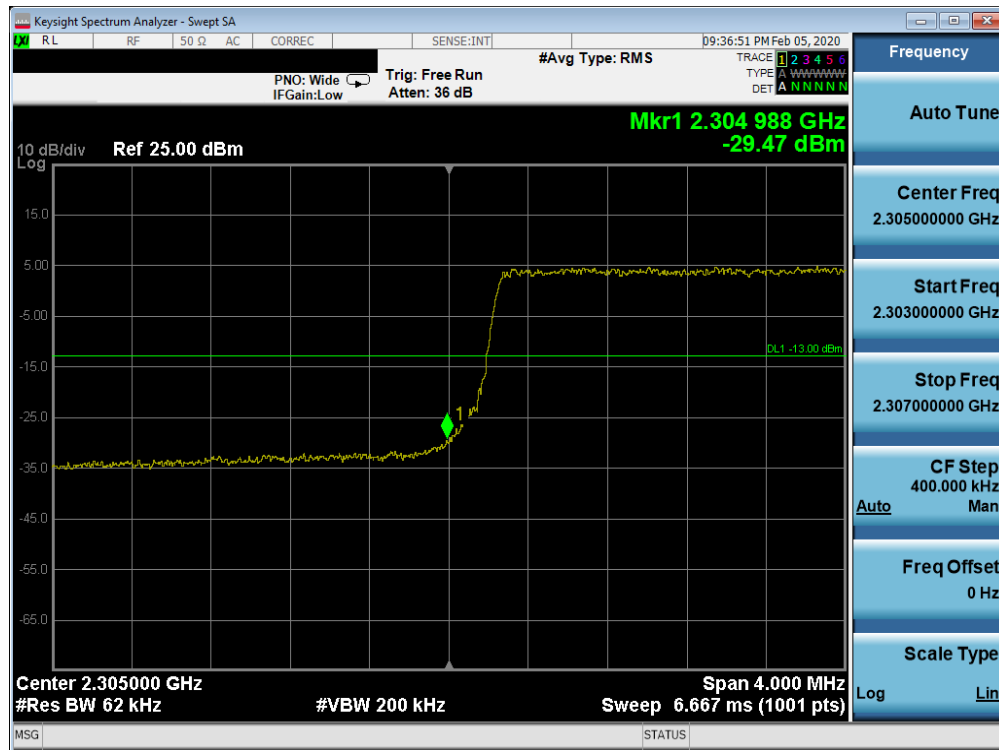
Plot 7-192. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



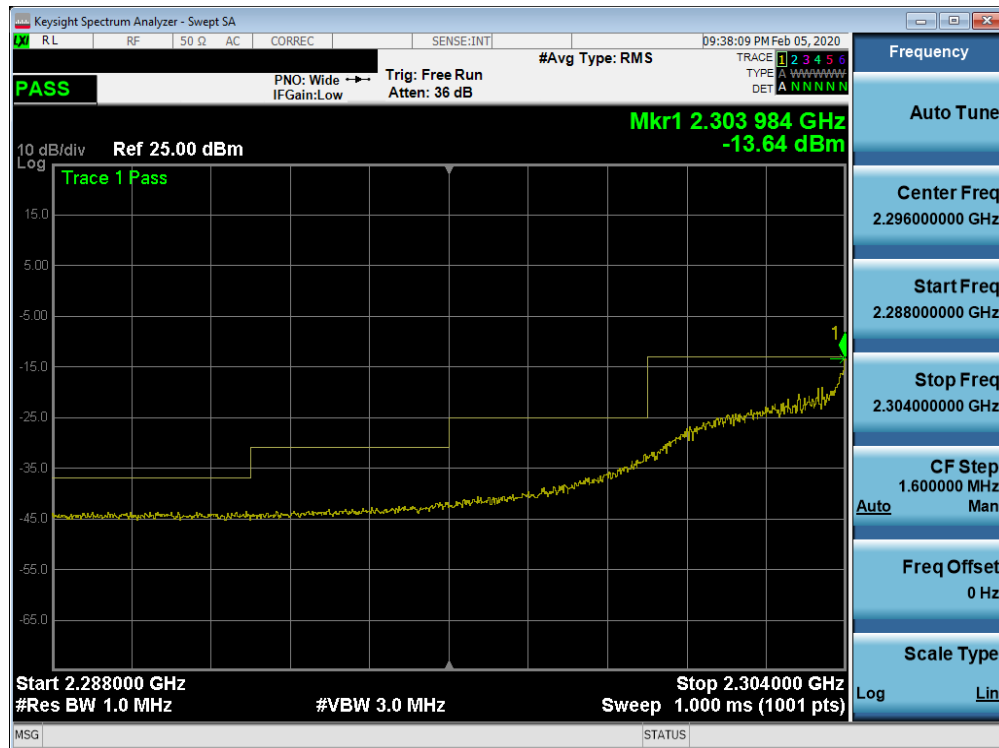
Plot 7-193. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 119 of 175

Band 30



Plot 7-194. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-195. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 120 of 175

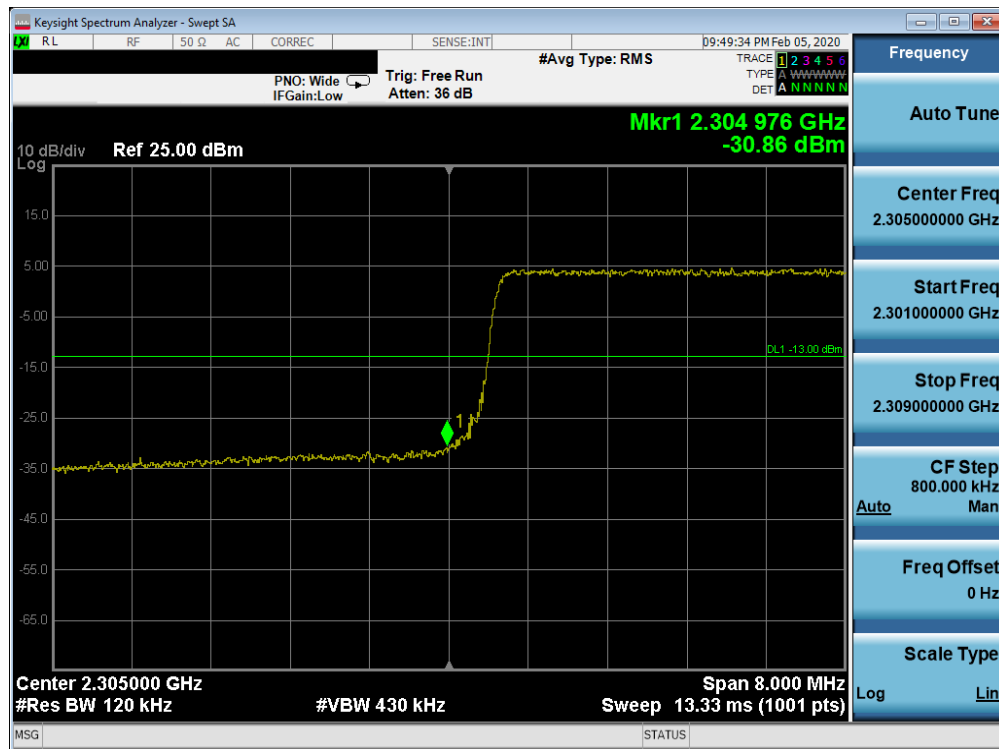


Plot 7-196. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-197. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 121 of 175

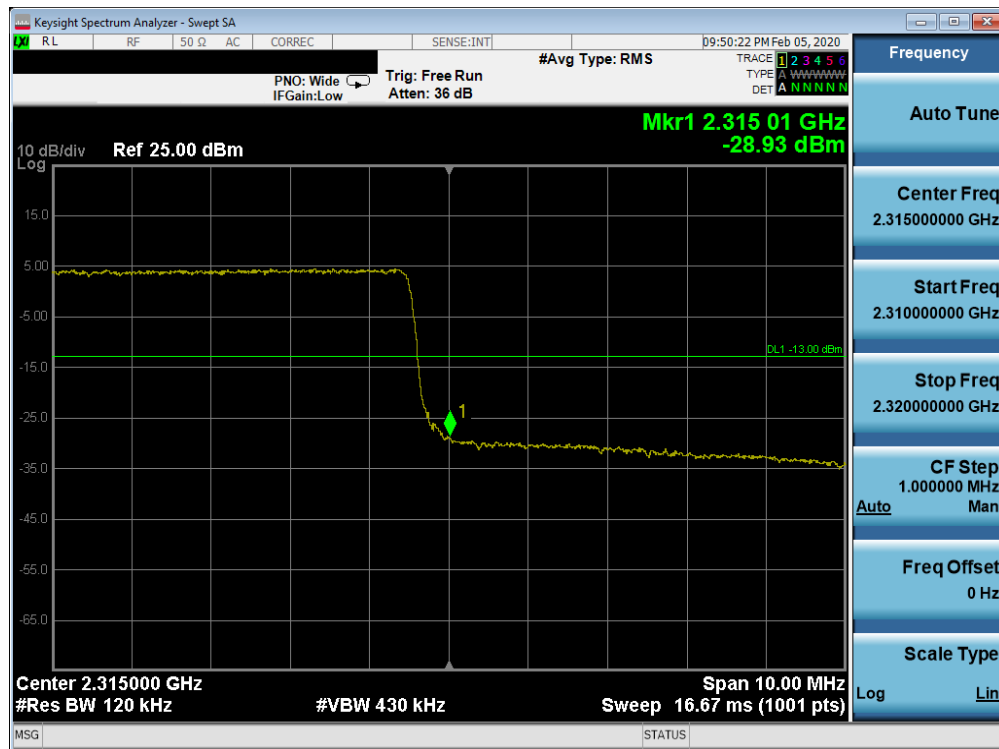


Plot 7-198. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

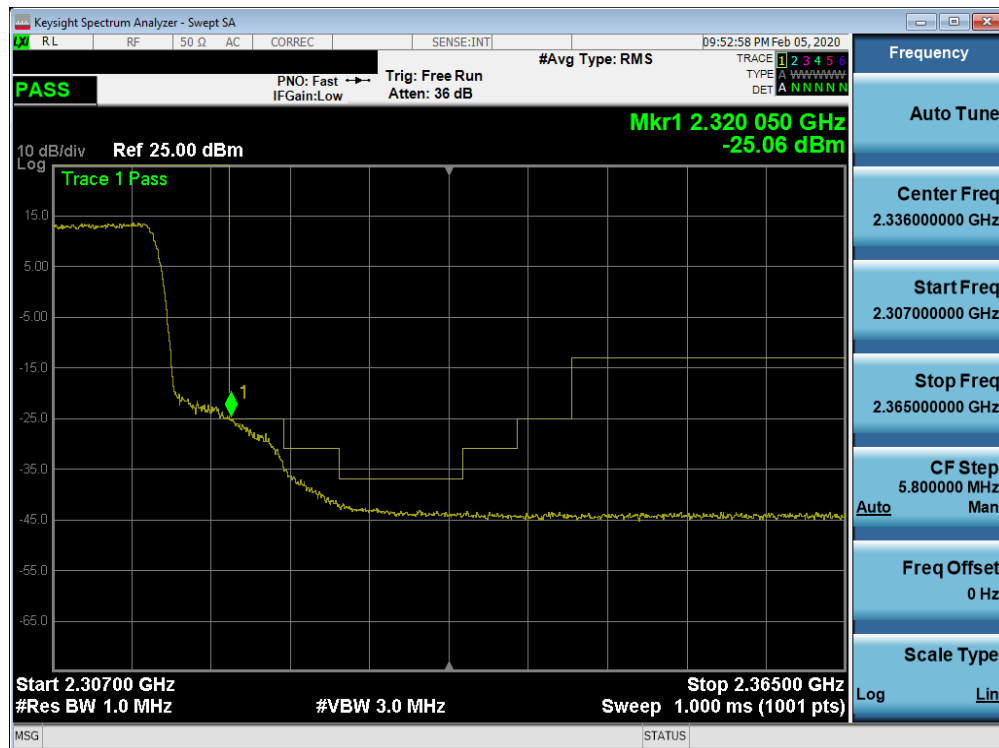


Plot 7-199. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 122 of 175



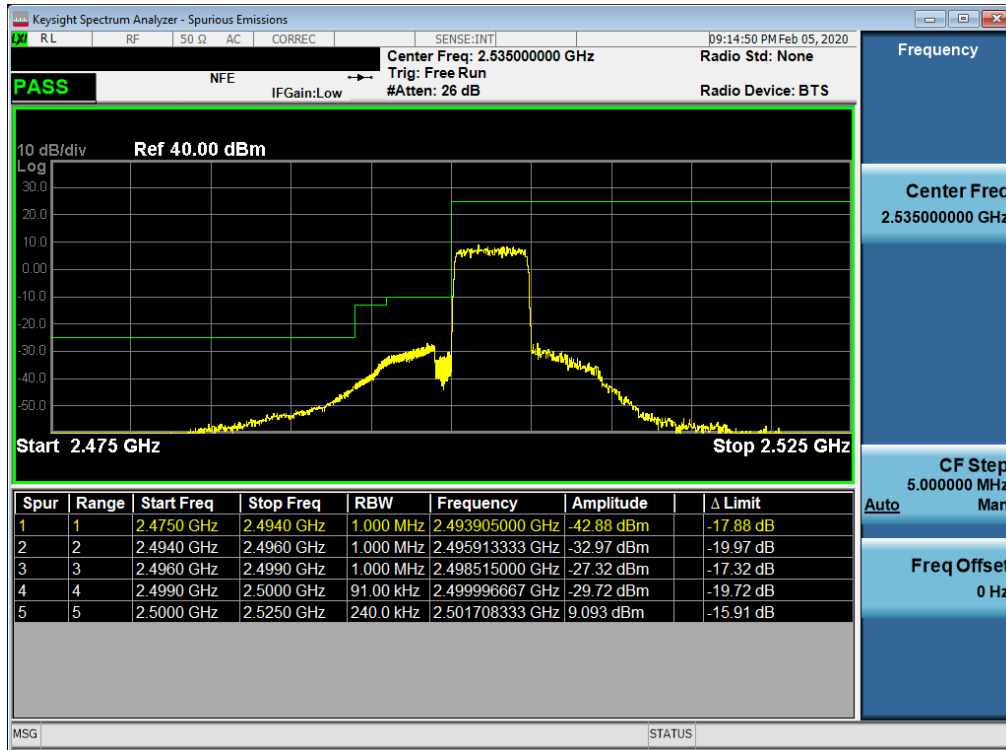
Plot 7-200. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



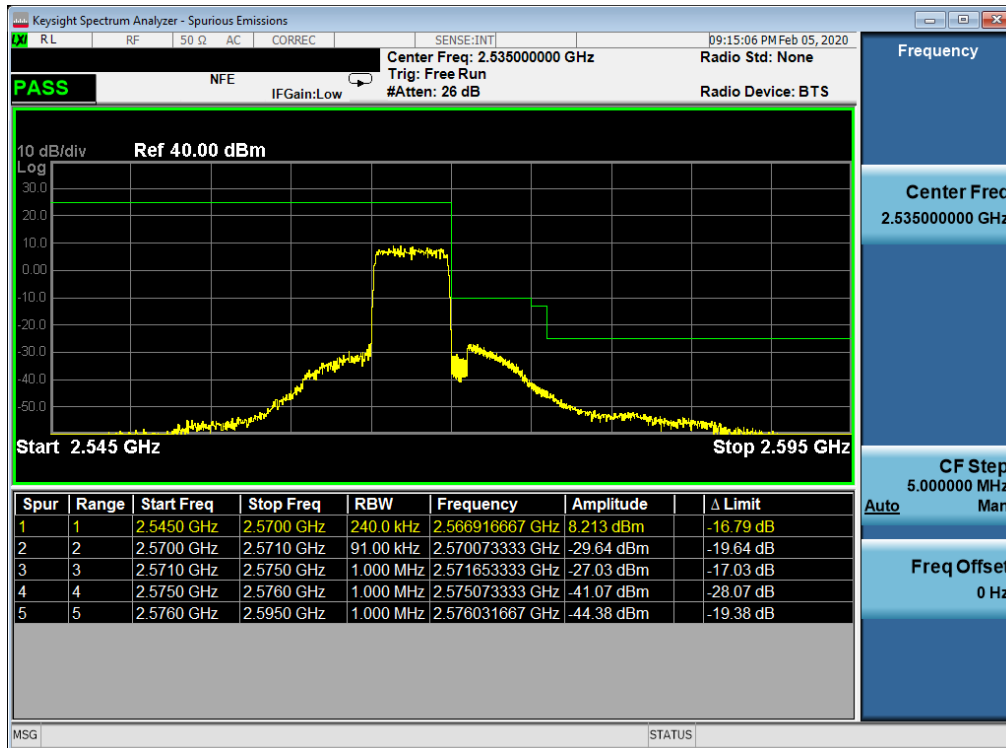
Plot 7-201. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 123 of 175

Band 7

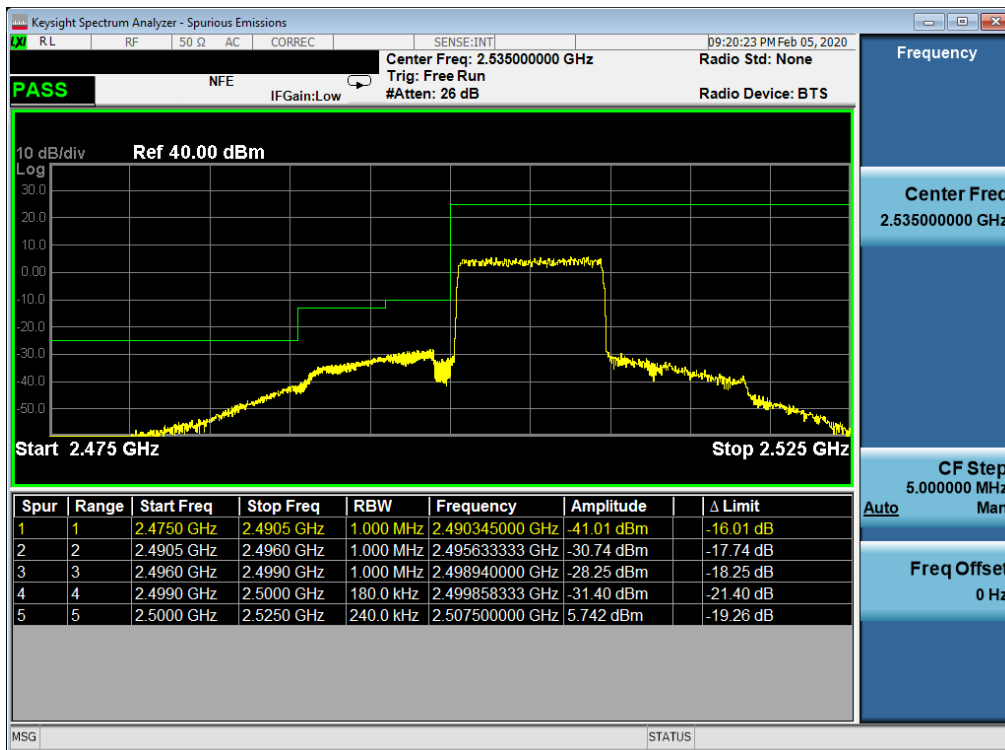


Plot 7-202. Lower ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-203. Upper ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 124 of 175

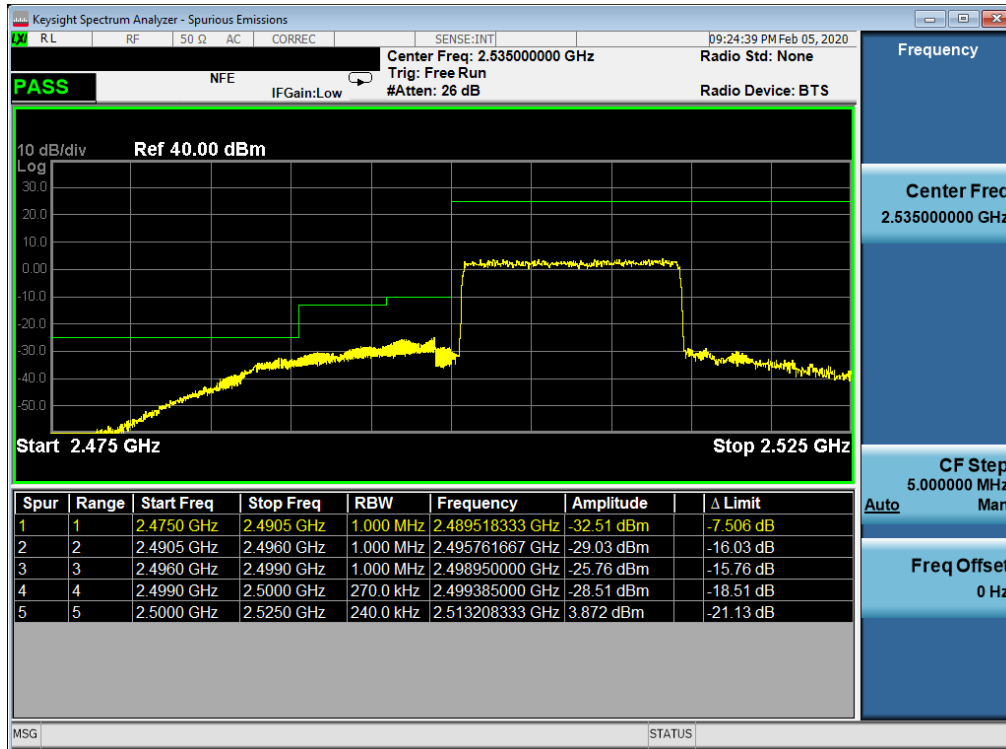


Plot 7-204. Lower ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-205. Upper ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 125 of 175

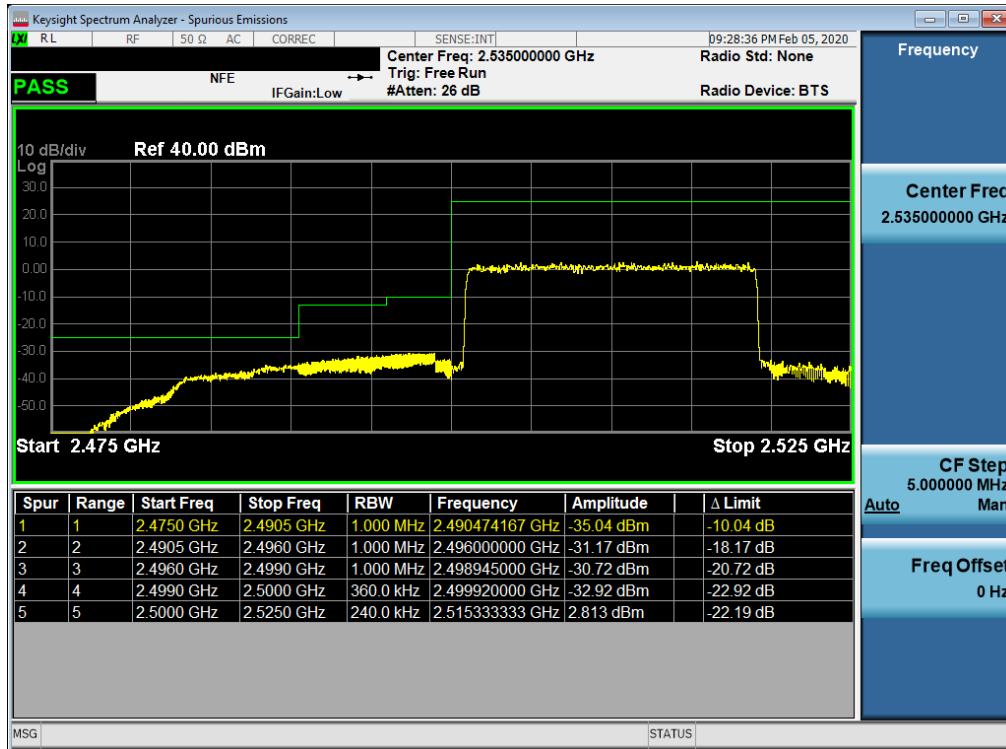


Plot 7-206. Lower ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-207. Upper ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 126 of 175



Plot 7-208. Lower ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-209. Upper ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 127 of 175

7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

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

Test Setup

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

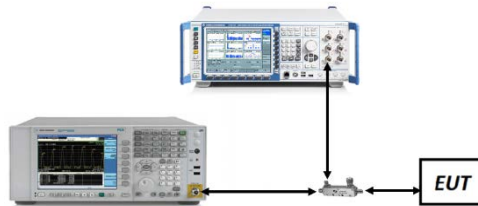


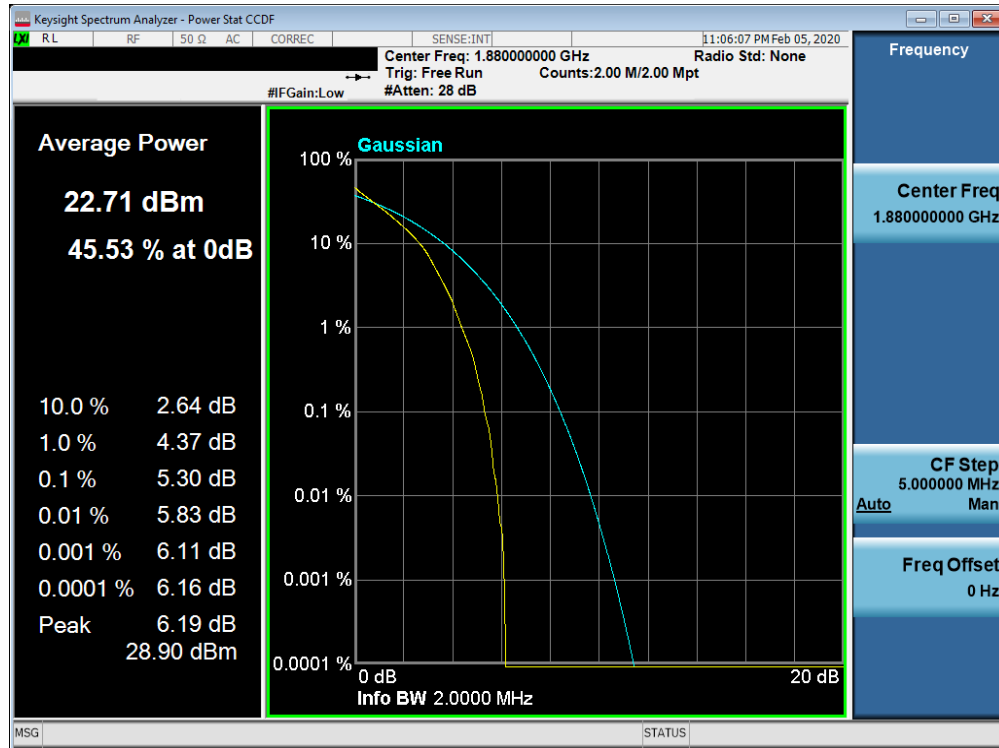
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

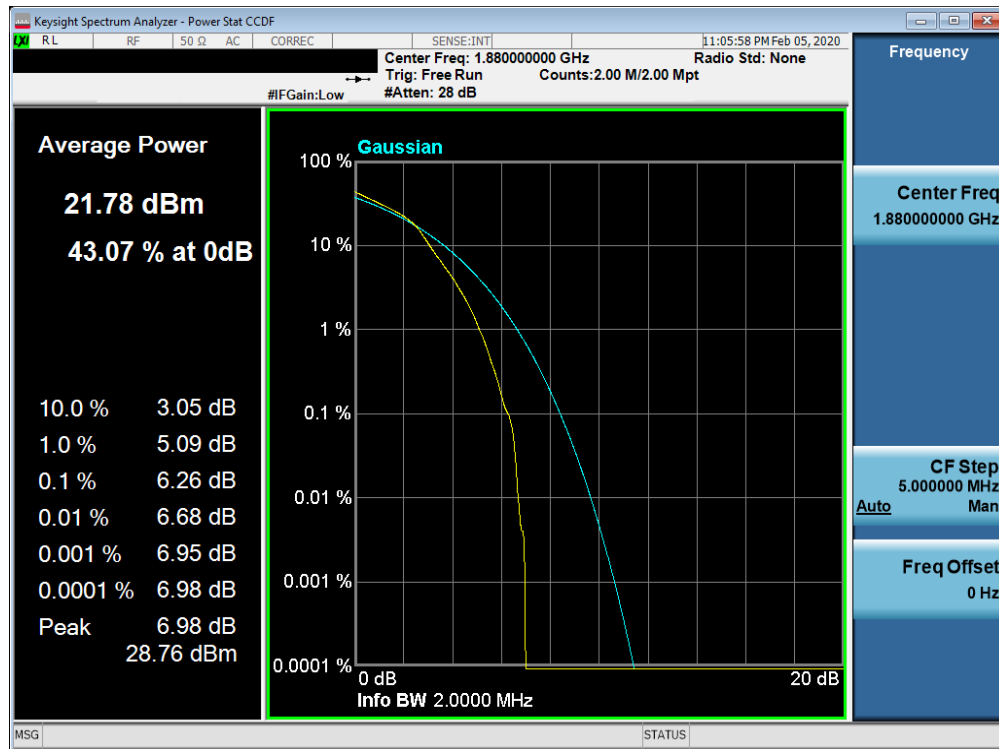
None.

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 128 of 175

Band 2

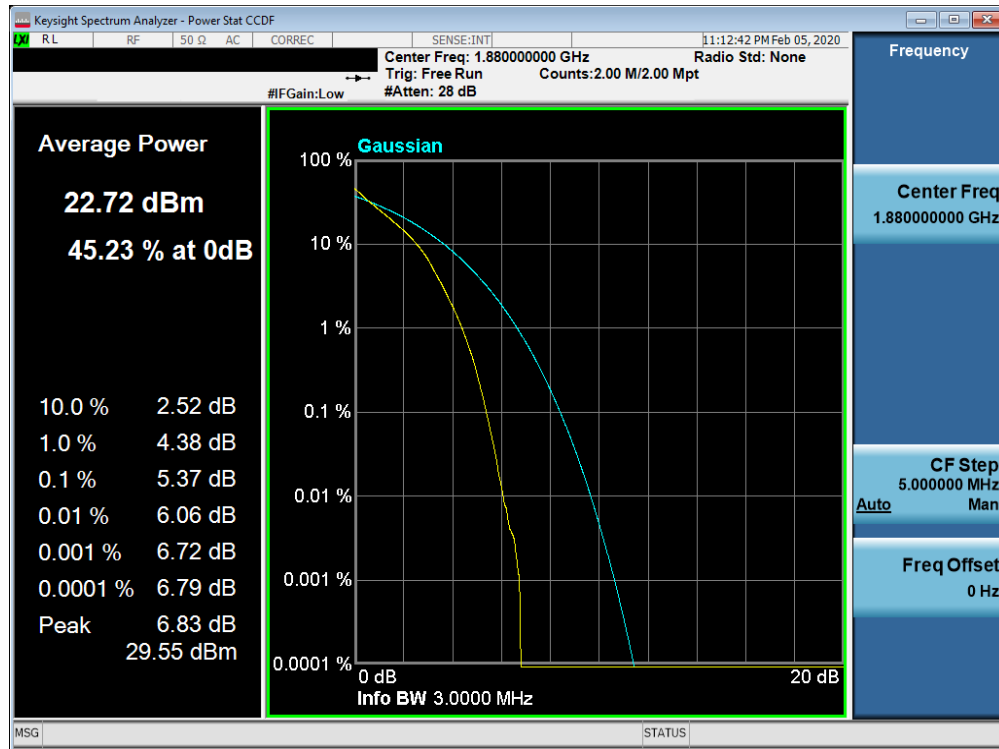


Plot 7-210. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

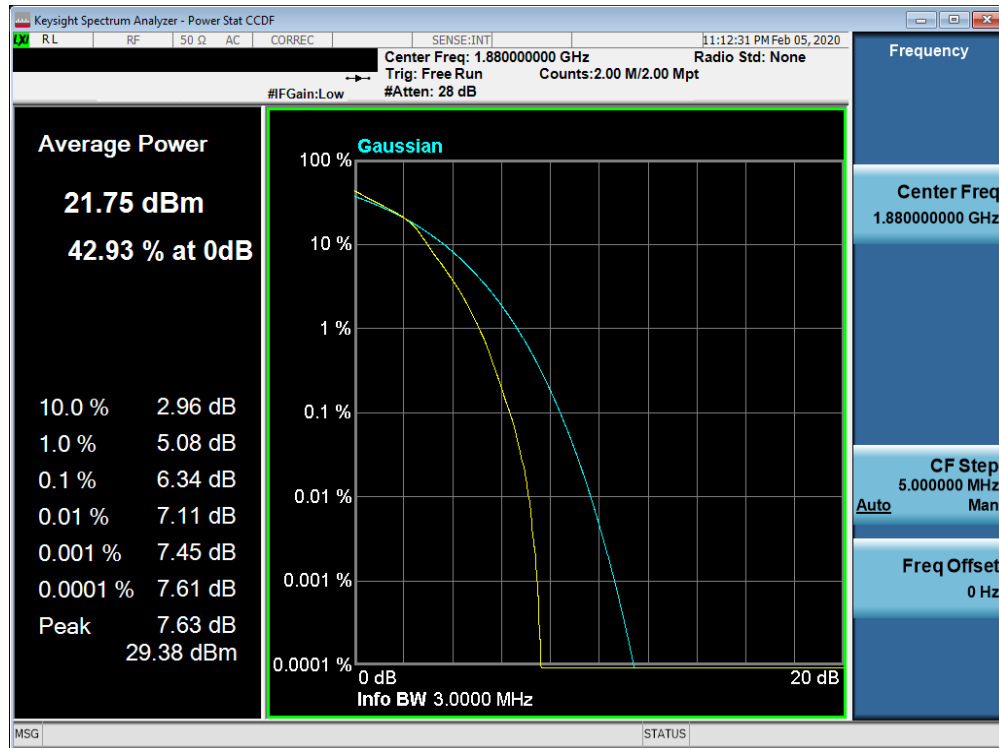


Plot 7-211. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 129 of 175

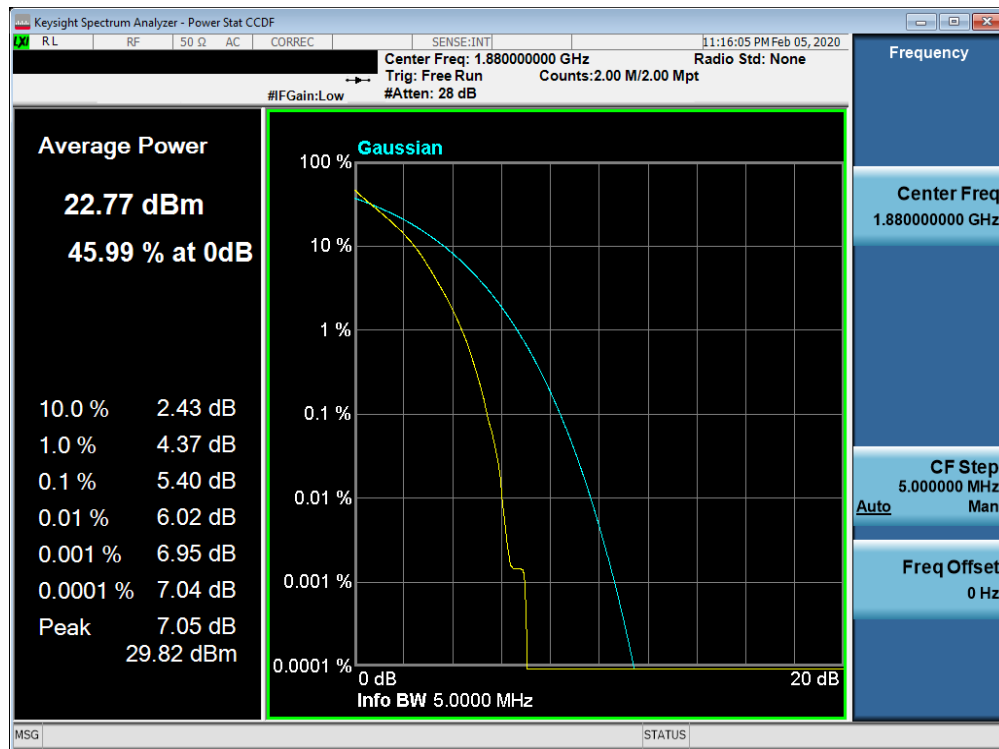


Plot 7-212. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

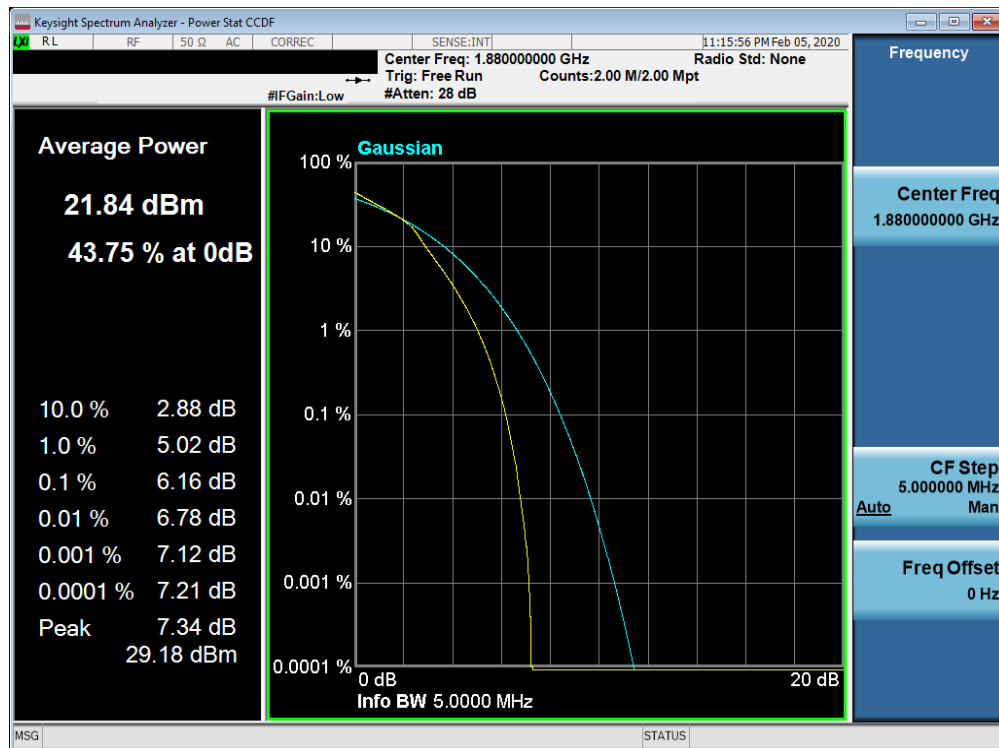


Plot 7-213. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 130 of 175

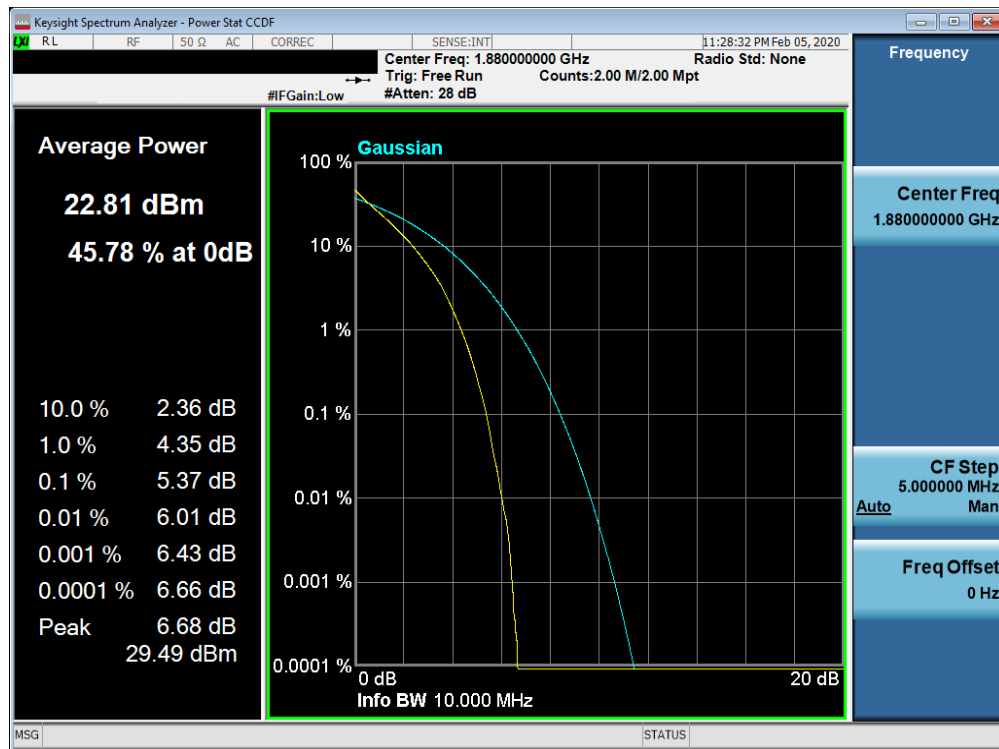


Plot 7-214. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

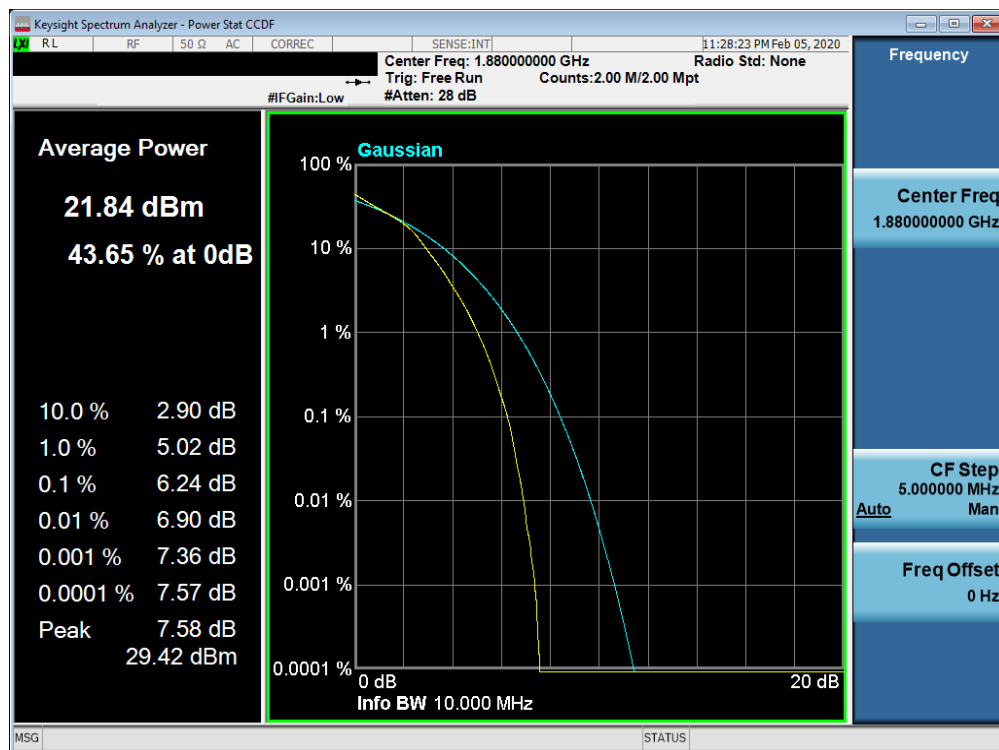


Plot 7-215. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 131 of 175

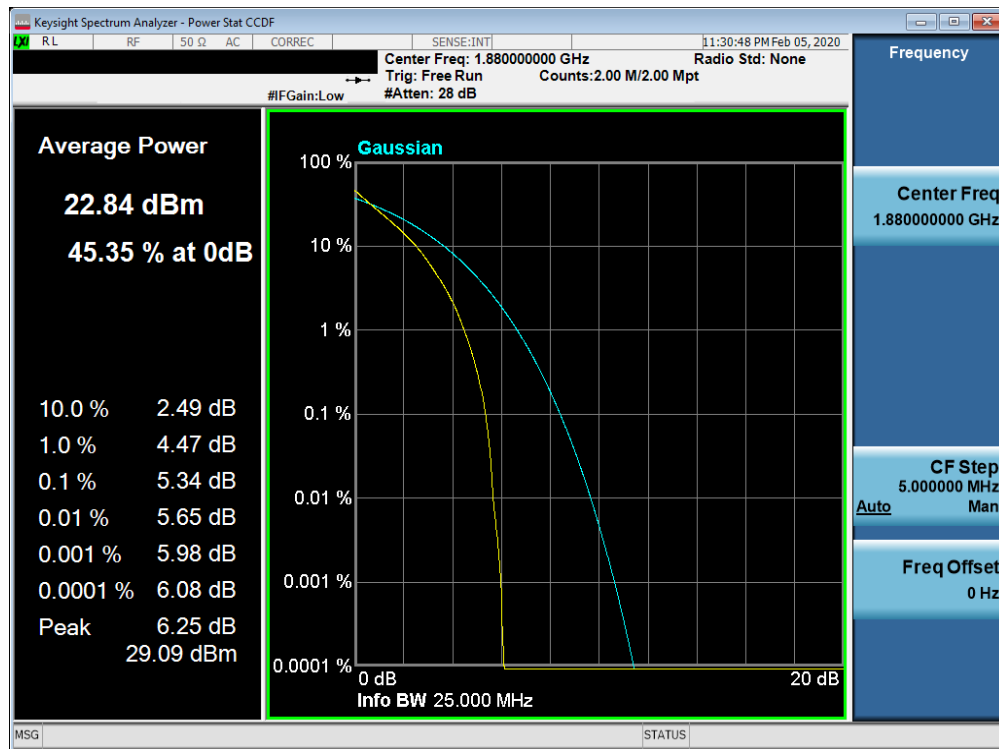


Plot 7-216. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

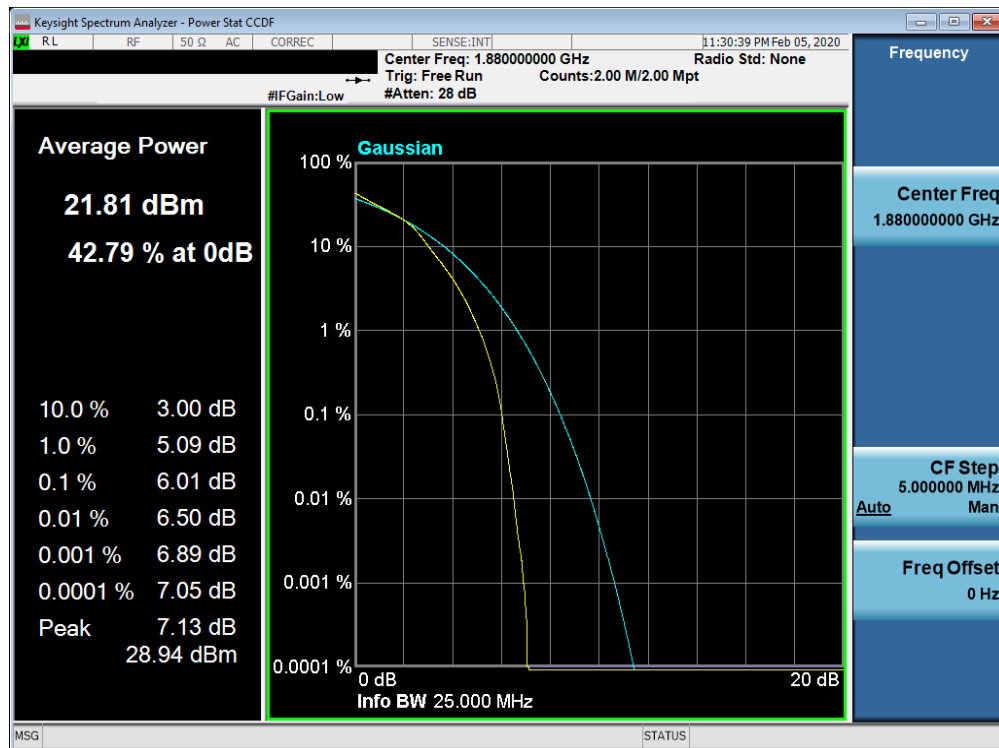


Plot 7-217. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 132 of 175

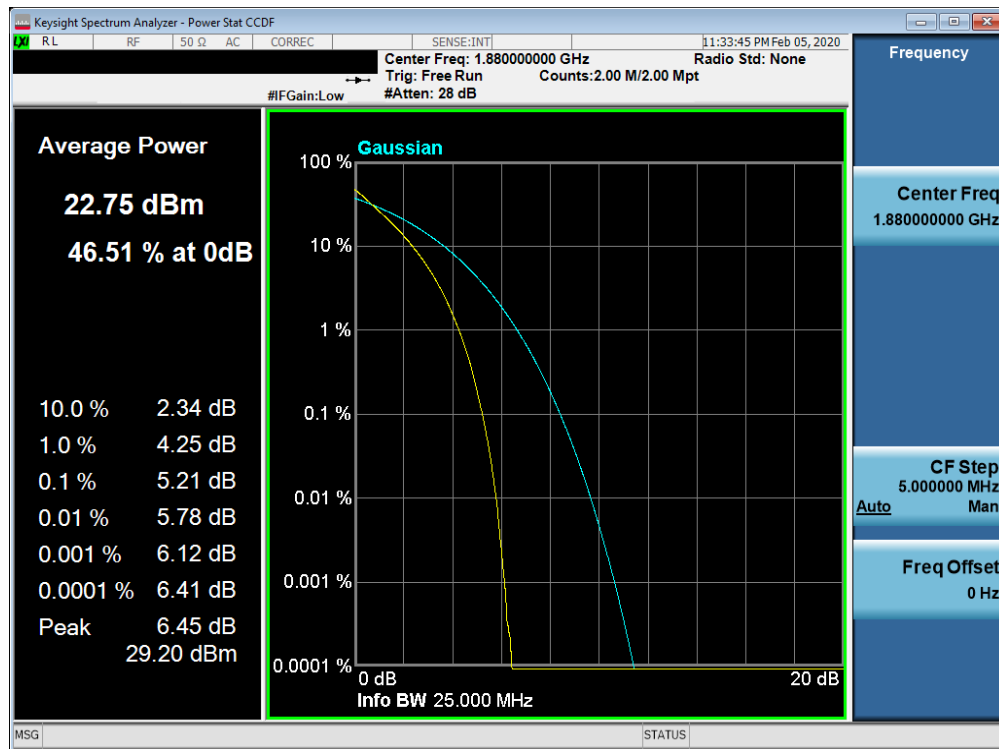


Plot 7-218. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

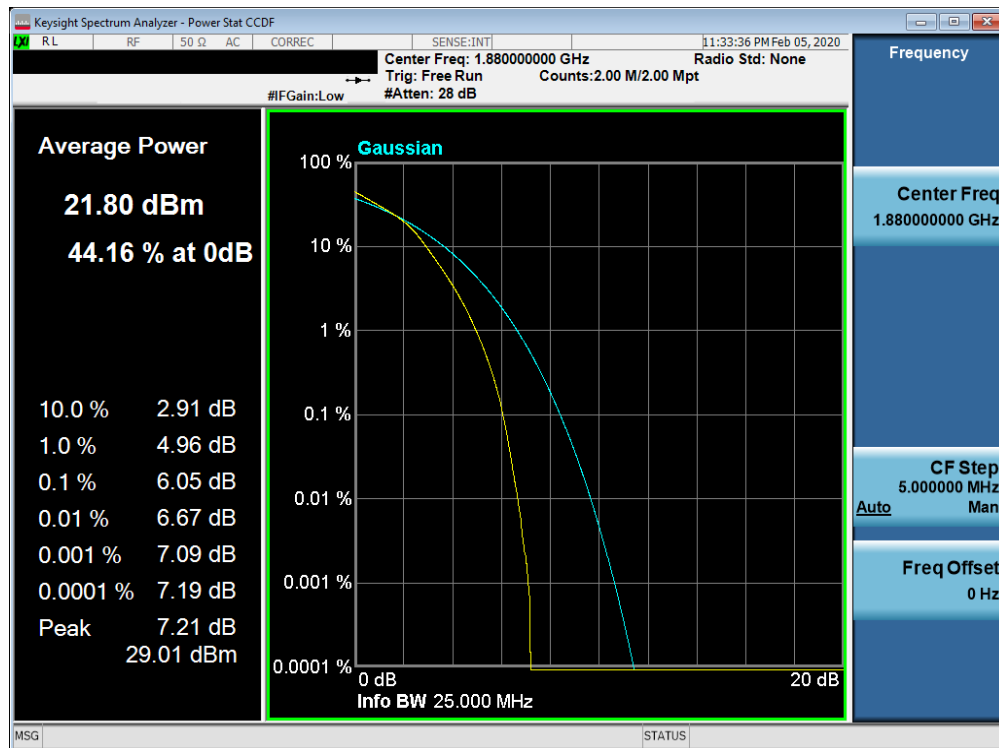


Plot 7-219. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 133 of 175



Plot 7-220. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-221. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK410WM	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset	Page 134 of 175

7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

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Test Setup

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

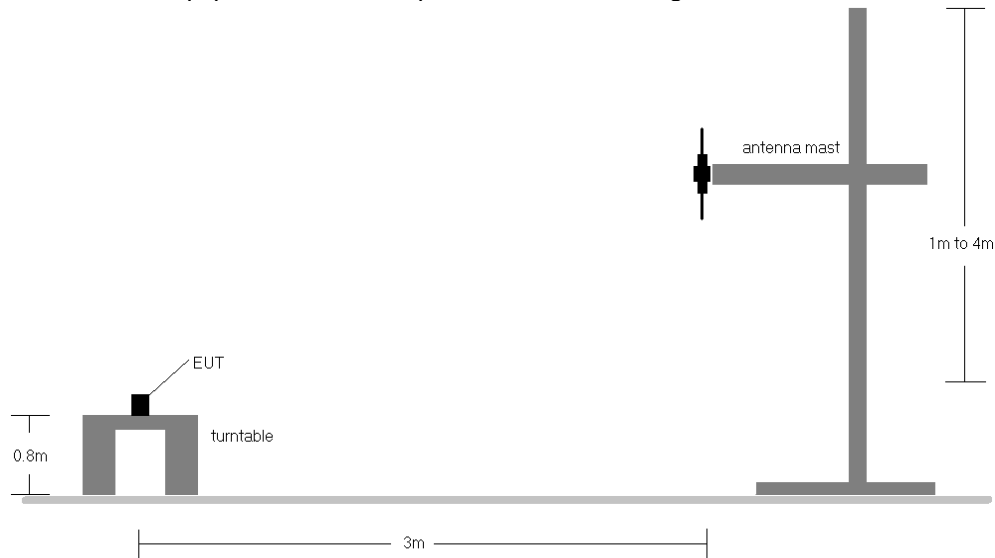


Figure 7-5. Radiated Test Setup <1GHz

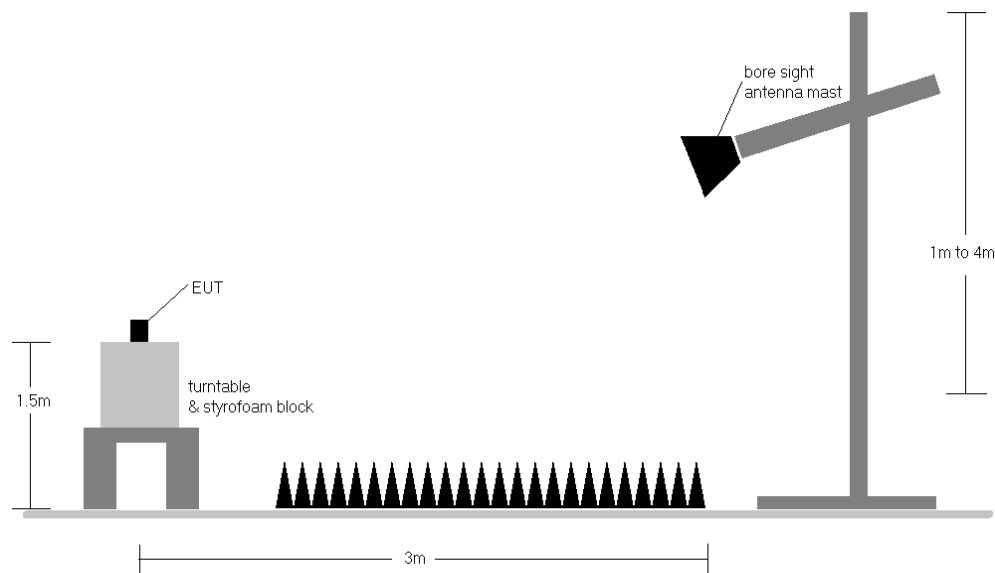


Figure 7-6. Radiated Test Setup >1GHz

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.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	127	13	1 / 5	16.50	3.40	17.75	0.060	34.77	-17.02	19.90	0.098	36.99	-17.09
707.50	1.4	QPSK	H	121	12	3 / 2	16.58	3.65	18.08	0.064	34.77	-16.69	20.23	0.105	36.99	-16.76
715.30	1.4	QPSK	H	110	22	1 / 0	16.69	3.70	18.24	0.067	34.77	-16.53	20.39	0.109	36.99	-16.60
715.30	1.4	16-QAM	H	110	22	3 / 2	16.26	3.70	17.81	0.060	34.77	-16.96	19.96	0.099	36.99	-17.03
700.50	3	QPSK	H	119	4	1 / 0	16.32	3.40	17.57	0.057	34.77	-17.20	19.72	0.094	36.99	-17.27
707.50	3	QPSK	H	111	22	1 / 0	16.42	3.65	17.92	0.062	34.77	-16.85	20.07	0.102	36.99	-16.92
714.50	3	QPSK	H	102	25	1 / 14	16.67	3.70	18.22	0.066	34.77	-16.55	20.37	0.109	36.99	-16.62
714.50	3	16-QAM	H	102	25	1 / 14	16.06	3.70	17.61	0.058	34.77	-17.16	19.76	0.095	36.99	-17.23

Table 7-3. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	125	12	1 / 0	16.39	3.40	17.64	0.058	34.77	-17.13	19.79	0.095	36.99	-17.20
707.50	5	QPSK	H	117	19	1 / 0	16.48	3.65	17.98	0.063	34.77	-16.79	20.13	0.103	36.99	-16.86
713.50	5	QPSK	H	113	27	1 / 24	16.73	3.70	18.28	0.067	34.77	-16.49	20.43	0.110	36.99	-16.56
713.50	5	16-QAM	H	113	27	1 / 24	16.12	3.70	17.67	0.058	34.77	-17.10	19.82	0.096	36.99	-17.17
704.00	10	QPSK	H	120	9	1 / 49	16.24	3.50	17.59	0.057	34.77	-17.18	19.74	0.094	36.99	-17.25
707.50	10	QPSK	H	117	15	1 / 49	16.39	3.65	17.89	0.062	34.77	-16.88	20.04	0.101	36.99	-16.95
711.00	10	QPSK	H	107	24	1 / 49	16.59	3.70	18.14	0.065	34.77	-16.63	20.29	0.107	36.99	-16.70
711.00	10	16-QAM	H	107	24	1 / 49	15.69	3.70	17.24	0.053	34.77	-17.53	19.39	0.087	36.99	-17.60
713.50	5	QPSK	V	171	32	1 / 24	16.17	3.70	17.72	0.059	34.77	-17.05	19.87	0.097	36.99	-17.12

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

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	202	119	1 / 0	13.26	5.70	16.81	0.048	34.77	-17.96	18.96	0.079	36.99	-18.03
782.00	5	QPSK	V	197	130	1 / 0	12.65	5.80	16.30	0.043	34.77	-18.47	18.45	0.070	36.99	-18.54
784.50	5	QPSK	V	216	116	1 / 0	12.92	5.80	16.57	0.045	34.77	-18.20	18.72	0.074	36.99	-18.27
779.50	5	16-QAM	V	202	119	1 / 0	12.45	5.70	16.00	0.040	34.77	-18.77	18.15	0.065	36.99	-18.84
782.00	10	QPSK	V	194	130	1 / 0	13.49	5.80	17.14	0.052	34.77	-17.63	19.29	0.085	36.99	-17.70
782.00	10	16-QAM	V	194	130	1 / 0	12.64	5.80	16.29	0.043	34.77	-18.48	18.44	0.070	36.99	-18.55
782.00	10	QPSK	H	232	35	1 / 0	13.13	5.80	16.78	0.048	34.77	-17.99	18.93	0.078	36.99	-18.06

Table 7-5. ERP Data (Band 13)

FCC ID: ZNFK410WM	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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	145	188	3 / 2	13.64	6.30	17.79	0.060	38.45	-20.66	19.94	0.099	40.61	-20.67
836.50	1.4	QPSK	V	152	177	1 / 5	13.61	6.40	17.86	0.061	38.45	-20.59	20.01	0.100	40.61	-20.60
848.30	1.4	QPSK	V	151	177	3 / 2	13.61	6.50	17.96	0.063	38.45	-20.49	20.11	0.103	40.61	-20.50
836.50	1.4	16-QAM	V	152	177	3 / 2	12.36	6.40	16.61	0.046	38.45	-21.84	18.76	0.075	40.61	-21.85
825.50	3	QPSK	V	143	174	1 / 0	13.72	6.30	17.87	0.061	38.45	-20.58	20.02	0.100	40.61	-20.59
836.50	3	QPSK	V	153	177	1 / 0	13.61	6.40	17.86	0.061	38.45	-20.59	20.01	0.100	40.61	-20.60
847.50	3	QPSK	V	142	169	1 / 0	13.66	6.50	18.01	0.063	38.45	-20.44	20.16	0.104	40.61	-20.45
847.50	3	16-QAM	V	142	169	1 / 0	12.12	6.50	16.47	0.044	38.45	-21.98	18.62	0.073	40.61	-21.99
826.50	5	QPSK	V	141	176	1 / 24	13.40	6.30	17.55	0.057	38.45	-20.90	19.70	0.093	40.61	-20.91
836.50	5	QPSK	V	157	170	1 / 0	13.54	6.40	17.79	0.060	38.45	-20.66	19.94	0.099	40.61	-20.67
846.50	5	QPSK	V	155	177	1 / 24	13.50	6.50	17.85	0.061	38.45	-20.60	20.00	0.100	40.61	-20.61
826.50	5	16-QAM	V	141	176	1 / 24	12.27	6.30	16.42	0.044	38.45	-22.03	18.57	0.072	40.61	-22.04
829.00	10	QPSK	V	144	181	1 / 49	13.51	6.30	17.66	0.058	38.45	-20.79	19.81	0.096	40.61	-20.80
836.50	10	QPSK	V	150	176	1 / 0	13.54	6.40	17.79	0.060	38.45	-20.66	19.94	0.099	40.61	-20.67
844.00	10	QPSK	V	149	170	1 / 0	13.40	6.40	17.65	0.058	38.45	-20.80	19.80	0.095	40.61	-20.81
836.50	10	16-QAM	V	150	176	1 / 0	12.34	6.40	16.59	0.046	38.45	-21.86	18.74	0.075	40.61	-21.87
847.50	3	QPSK	H	220	301	1 / 0	12.77	6.70	17.32	0.054	38.45	-21.13	19.47	0.089	40.61	-21.14

Table 7-6. ERP Data (Band 5)

FCC ID: ZNFK410WM	 PCTEST [®] Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 138 of 175

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	180	227	3 / 2	14.09	9.44	23.53	0.226	30.00	-6.47
1745.00	1.4	QPSK	H	175	24	1 / 5	13.79	9.23	23.02	0.200	30.00	-6.98
1779.30	1.4	QPSK	H	183	30	3 / 2	14.04	9.26	23.30	0.214	30.00	-6.70
1710.70	1.4	16-QAM	H	180	227	1 / 5	13.24	9.44	22.68	0.185	30.00	-7.32
1711.50	3	QPSK	H	189	234	1 / 0	14.03	9.44	23.47	0.222	30.00	-6.53
1745.00	3	QPSK	H	178	15	1 / 0	13.88	9.23	23.11	0.205	30.00	-6.89
1778.50	3	QPSK	H	178	31	1 / 0	13.96	9.26	23.22	0.210	30.00	-6.78
1711.50	3	16-QAM	H	189	234	1 / 0	13.27	9.44	22.71	0.187	30.00	-7.29
1712.50	5	QPSK	H	190	226	1 / 0	13.96	9.43	23.39	0.218	30.00	-6.61
1745.00	5	QPSK	H	169	15	1 / 0	13.56	9.23	22.79	0.190	30.00	-7.21
1777.50	5	QPSK	H	178	22	1 / 24	13.86	9.26	23.12	0.205	30.00	-6.88
1712.50	5	16-QAM	H	190	226	1 / 0	13.26	9.43	22.69	0.186	30.00	-7.31
1715.00	10	QPSK	H	194	235	1 / 0	14.10	9.42	23.52	0.225	30.00	-6.48
1745.00	10	QPSK	H	174	16	1 / 0	13.70	9.23	22.93	0.196	30.00	-7.07
1775.00	10	QPSK	H	170	25	1 / 49	13.82	9.25	23.07	0.203	30.00	-6.93
1715.00	10	16-QAM	H	194	235	1 / 0	13.43	9.42	22.85	0.193	30.00	-7.15
1717.50	15	QPSK	H	188	224	1 / 0	13.79	9.40	23.19	0.208	30.00	-6.81
1745.00	15	QPSK	H	177	12	1 / 0	13.64	9.23	22.87	0.194	30.00	-7.13
1772.50	15	QPSK	H	183	22	1 / 74	13.75	9.25	23.00	0.199	30.00	-7.00
1717.50	15	16-QAM	H	188	224	1 / 0	13.03	9.40	22.43	0.175	30.00	-7.57
1720.00	20	QPSK	H	187	229	1 / 99	13.82	9.38	23.20	0.209	30.00	-6.80
1745.00	20	QPSK	H	175	18	1 / 0	13.50	9.23	22.73	0.188	30.00	-7.27
1770.00	20	QPSK	H	176	27	1 / 99	13.57	9.24	22.81	0.191	30.00	-7.19
1720.00	20	16-QAM	H	187	229	1 / 99	13.12	9.38	22.50	0.178	30.00	-7.50
1710.70	1	QPSK	V	117	101	3 / 2	12.41	9.11	21.52	0.142	30.00	-8.48

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

FCC ID: ZNFK410WM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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	V	107	83	3 / 2	12.66	9.88	22.54	0.179	33.01	-10.47
1880.00	1.4	QPSK	V	110	94	1 / 5	13.35	10.10	23.45	0.222	33.01	-9.56
1909.30	1.4	QPSK	V	109	78	3 / 2	13.65	10.31	23.96	0.249	33.01	-9.05
1909.30	1.4	16-QAM	V	109	78	1 / 5	12.71	10.31	23.02	0.200	33.01	-9.99
1851.50	3	QPSK	V	103	89	1 / 14	12.76	9.88	22.64	0.184	33.01	-10.37
1880.00	3	QPSK	V	104	93	1 / 0	13.30	10.10	23.40	0.219	33.01	-9.61
1908.50	3	QPSK	V	107	85	1 / 0	13.67	10.30	23.97	0.250	33.01	-9.04
1908.50	3	16-QAM	V	107	85	1 / 14	12.75	10.30	23.05	0.202	33.01	-9.96
1852.50	5	QPSK	V	100	83	1 / 0	12.54	9.89	22.43	0.175	33.01	-10.58
1880.00	5	QPSK	V	103	90	1 / 0	13.10	10.10	23.20	0.209	33.01	-9.81
1907.50	5	QPSK	V	113	87	1 / 0	13.47	10.30	23.77	0.238	33.01	-9.24
1880.00	5	16-QAM	V	103	90	1 / 0	12.73	10.10	22.83	0.192	33.01	-10.18
1855.00	10	QPSK	V	106	80	1 / 0	12.75	9.91	22.66	0.185	33.01	-10.35
1880.00	10	QPSK	V	102	92	1 / 0	13.29	10.10	23.39	0.218	33.01	-9.62
1905.00	10	QPSK	V	111	85	1 / 49	13.46	10.28	23.74	0.237	33.01	-9.27
1905.00	10	16-QAM	V	111	85	1 / 0	12.86	10.28	23.14	0.206	33.01	-9.87
1857.50	15	QPSK	V	100	84	1 / 0	12.40	9.93	22.33	0.171	33.01	-10.68
1880.00	15	QPSK	V	103	85	1 / 0	13.20	10.10	23.30	0.214	33.01	-9.71
1902.50	15	QPSK	V	110	81	1 / 74	13.39	10.27	23.66	0.232	33.01	-9.35
1902.50	15	16-QAM	V	110	81	1 / 0	12.80	10.27	23.07	0.203	33.01	-9.94
1860.00	20	QPSK	V	102	83	1 / 99	12.49	9.95	22.44	0.175	33.01	-10.57
1880.00	20	QPSK	V	104	87	1 / 99	13.14	10.10	23.24	0.211	33.01	-9.77
1900.00	20	QPSK	V	109	85	1 / 0	13.21	10.26	23.47	0.222	33.01	-9.54
1900.00	20	16-QAM	V	109	85	1 / 0	12.49	10.26	22.75	0.188	33.01	-10.26
1908.50	3	QPSK	H	110	243	1 / 0	13.21	10.18	23.39	0.218	33.01	-9.62

Table 7-8. EIRP Data (Band 2)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 140 of 175

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2307.50	5	QPSK	H	115	204	1 / 24	9.68	10.31	19.99	0.100	23.98	-3.99
2312.50	5	QPSK	H	116	209	12 / 6	10.16	10.31	20.47	0.111	23.98	-3.51
2312.50	5	16-QAM	H	116	209	12 / 6	9.17	10.31	19.48	0.089	23.98	-4.50
2310.00	10	QPSK	H	121	202	1 / 49	10.83	10.31	21.14	0.130	23.98	-2.84
2310.00	10	16-QAM	H	121	202	1 / 49	10.00	10.31	20.31	0.107	23.98	-3.67
2310.00	10	QPSK	V	191	252	1 / 49	10.54	10.22	20.76	0.119	23.98	-3.22

Table 7-9. EIRP Data (Band 30)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	128	240	1 / 0	9.71	9.43	19.14	0.082	33.01	-13.87
2535.00	5	QPSK	H	126	222	1 / 0	9.42	9.39	18.81	0.076	33.01	-14.20
2567.50	5	QPSK	H	125	239	1 / 24	10.97	9.45	20.42	0.110	33.01	-12.59
2567.50	5	16-QAM	H	125	239	1 / 0	9.96	9.45	19.41	0.087	33.01	-13.60
2505.00	10	QPSK	H	131	229	1 / 0	9.85	9.43	19.28	0.085	33.01	-13.73
2535.00	10	QPSK	H	122	222	1 / 0	9.60	9.39	18.99	0.079	33.01	-14.02
2565.00	10	QPSK	H	120	226	1 / 49	10.90	9.44	20.34	0.108	33.01	-12.67
2565.00	10	16-QAM	H	120	226	1 / 49	10.29	9.44	19.73	0.094	33.01	-13.28
2507.50	15	QPSK	H	119	233	1 / 0	9.55	9.42	18.97	0.079	33.01	-14.04
2535.00	15	QPSK	H	127	232	1 / 0	9.51	9.39	18.90	0.078	33.01	-14.11
2562.50	15	QPSK	H	118	229	1 / 74	10.81	9.43	20.24	0.106	33.01	-12.77
2562.50	15	16-QAM	H	118	229	1 / 74	10.39	9.43	19.82	0.096	33.01	-13.19
2510.00	20	QPSK	H	126	233	1 / 99	9.51	9.42	18.93	0.078	33.01	-14.08
2535.00	20	QPSK	H	121	224	1 / 99	9.38	9.39	18.77	0.075	33.01	-14.24
2560.00	20	QPSK	H	118	233	1 / 99	10.68	9.42	20.10	0.102	33.01	-12.91
2560.00	20	16-QAM	H	118	233	1 / 99	9.86	9.42	19.28	0.085	33.01	-13.73
2567.50	5	QPSK	V	136	267	1 / 24	8.45	9.42	17.87	0.061	33.01	-15.14

Table 7-10. EIRP Data (Band 7)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 141 of 175

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 142 of 175

Test Setup

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

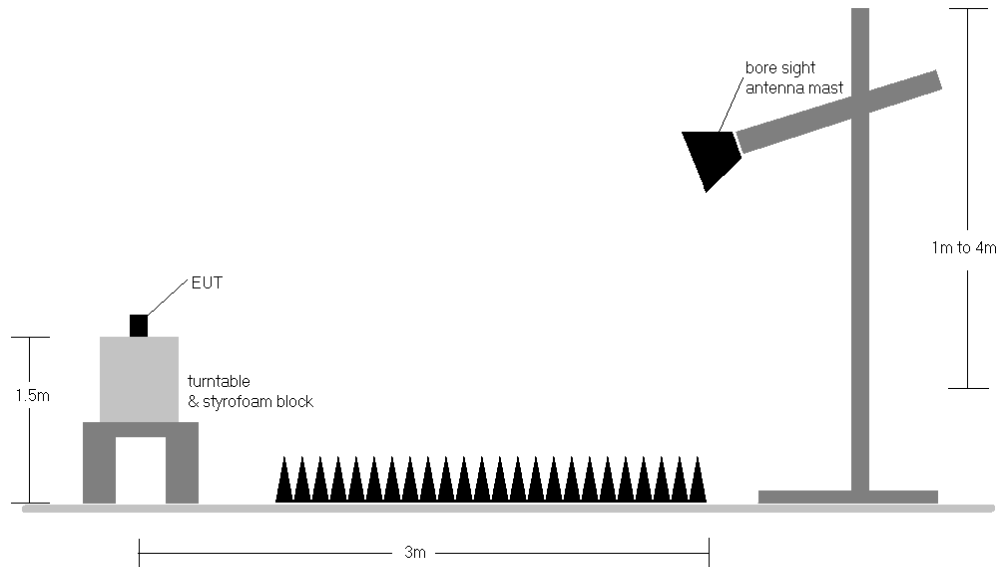


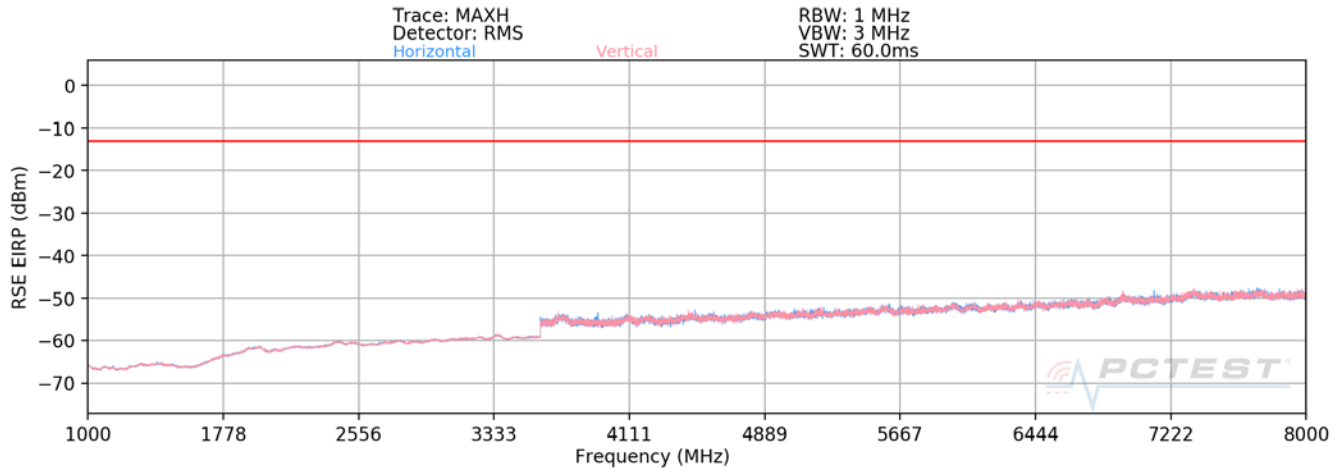
Figure 7-7. Test Instrument & Measurement Setup

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: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 143 of 175

Band 12/17



Plot 7-222. Radiated Spurious Plot above 1GHz (Band 12/17)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	186	149	-60.34	2.71	-57.62	-44.6
2112.00	H	305	148	-58.28	3.57	-54.71	-41.7
2816.00	H	318	315	-58.05	4.98	-53.07	-40.1
3520.00	H	-	-	-55.79	6.33	-49.46	-36.5
4224.00	H	-	-	-59.06	7.75	-51.30	-38.3
4928.00	H	-	-	-58.52	8.56	-49.96	-37.0
5632.00	H	-	-	-57.55	8.80	-48.75	-35.7
6336.00	H	-	-	-55.85	9.01	-46.84	-33.8
7040.00	H	-	-	-55.55	8.73	-46.82	-33.8

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

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 144 of 175

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	116	259	-60.74	2.80	-57.94	-44.9
2122.50	H	186	173	-58.04	3.57	-54.46	-41.5
2830.00	H	156	18	-57.42	5.02	-52.40	-39.4
3537.50	H	136	291	-54.76	6.31	-48.45	-35.5
4245.00	H	-	-	-59.75	7.80	-51.95	-38.9
4952.50	H	-	-	-58.21	8.56	-49.64	-36.6

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

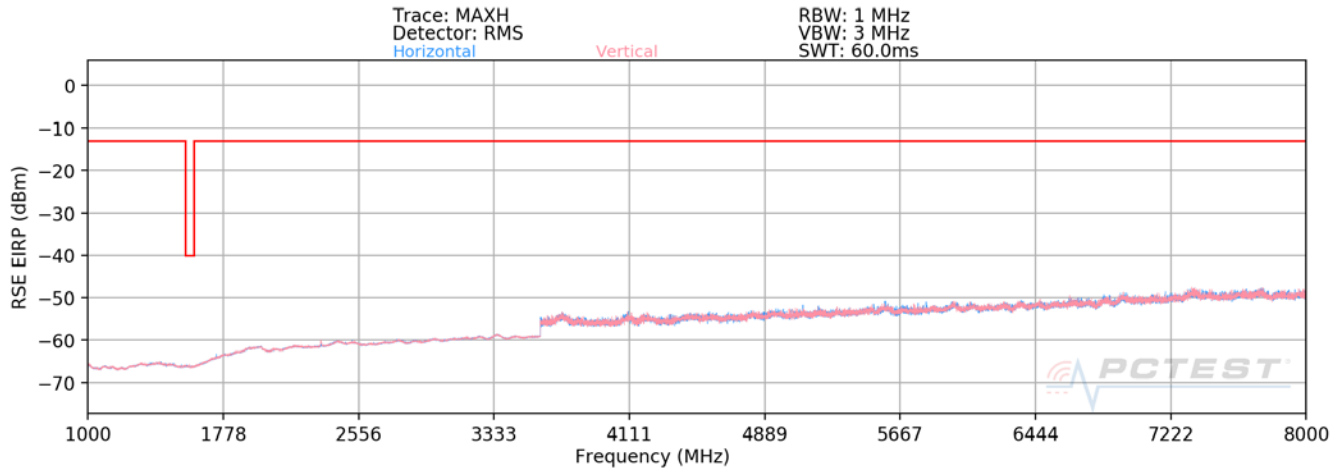
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	398	343	-60.71	2.88	-57.83	-44.8
2133.00	H	208	177	-57.12	3.58	-53.54	-40.5
2844.00	H	302	130	-58.05	5.07	-52.98	-40.0
3555.00	H	-	-	-55.00	6.31	-48.69	-35.7
4266.00	H	-	-	-58.91	7.84	-51.07	-38.1
4977.00	H	-	-	-57.69	8.56	-49.13	-36.1

Table 7-13. Radiated Spurious Data (Band 12/17 – High Channel)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 145 of 175

Band 13



Plot 7-223. Radiated Spurious Plot above 1GHz (Band 13)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2338.50	H	185	89	-61.19	3.53	-57.66	-44.7
3118.00	H	235	221	-58.34	4.00	-54.34	-41.3
3897.50	H	336	79	-56.33	5.38	-50.95	-37.9
4677.00	H	-	-	-57.84	7.09	-50.75	-37.7
5456.50	H	-	-	-59.92	8.37	-51.55	-38.6
6236.00	H	-	-	-57.11	8.73	-48.38	-35.4

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

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 146 of 175

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	264	316	-57.84	4.00	-53.84	-40.8
3128.00	H	157	309	-56.02	5.38	-50.64	-37.6
3910.00	H	173	63	-51.78	7.09	-44.69	-31.7
4692.00	H	-	-	-57.55	8.37	-49.18	-36.2
5474.00	H	-	-	-55.97	8.73	-47.24	-34.2
6256.00	H	-	-	-56.04	9.00	-47.04	-34.0
7038.00	H	-	-	-55.13	8.73	-46.40	-33.4

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2353.50	H	354	175	-56.63	4.00	-52.63	-39.6
3138.00	H	195	165	-56.27	5.38	-50.89	-37.9
3922.50	H	202	354	-58.68	7.09	-51.59	-38.6
4707.00	H	-	-	-58.73	8.37	-50.36	-37.4
5491.50	H	-	-	-57.27	8.73	-48.54	-35.5
6276.00	H	-	-	-55.85	9.00	-46.85	-33.8

Table 7-16. Radiated Spurious Data (Band 13 – High Channel)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 147 of 175

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.00 MHz

DISTANCE: 3 meters

NARROWBAND EMISSION LIMIT: -50 dBm

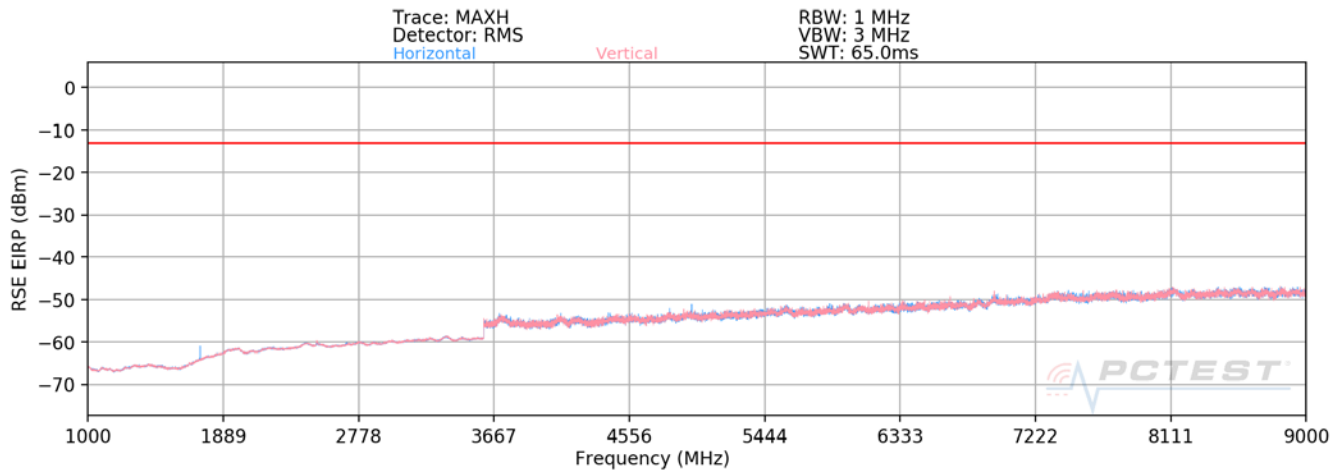
WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	169	147	-75.39	3.53	-71.86	-31.9
1564.00	H	184	54	-74.97	3.53	-71.44	-31.4
1569.00	H	398	52	-75.56	3.53	-72.03	-32.0

Table 7-17. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 148 of 175

Band 5



Plot 7-224. Radiated Spurious Plot above 1GHz (Band 5)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	205	327	-59.61	3.61	-56.00	-43.0
2487.00	H	-	-	-57.55	4.25	-53.31	-40.3
3316.00	H	-	-	-58.95	5.83	-53.13	-40.1
4145.00	H	-	-	-60.14	7.66	-52.48	-39.5

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

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 149 of 175

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	113	341	-59.46	3.62	-55.84	-42.8
2509.50	H	-	-	-56.80	4.33	-52.46	-39.5
3346.00	H	-	-	-58.48	5.92	-52.56	-39.6
4182.50	H	-	-	-59.38	7.69	-51.69	-38.7

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

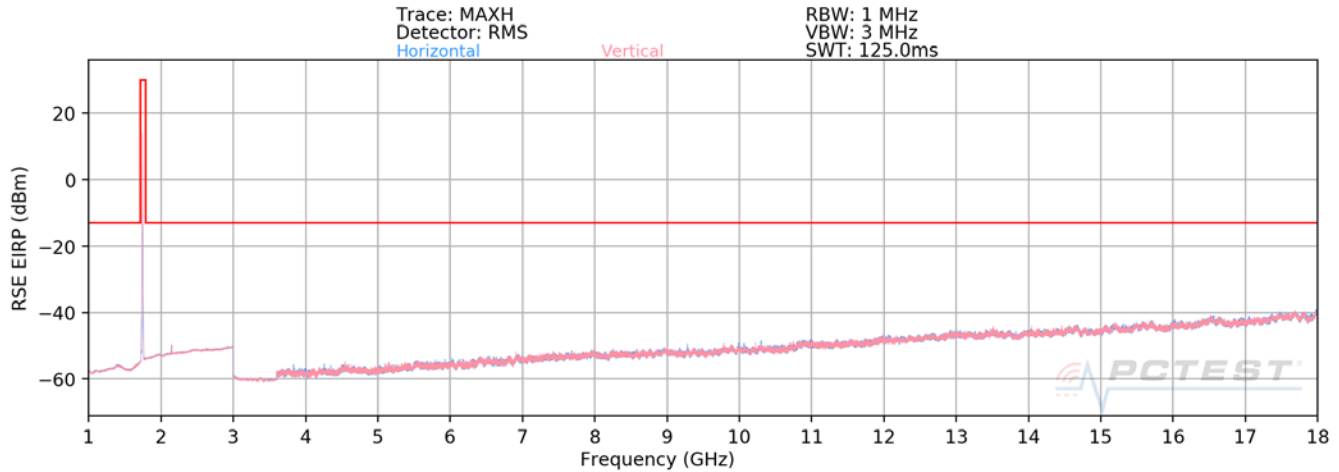
OPERATING FREQUENCY: 844.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	211	-1	-59.35	3.63	-55.72	-42.7
2532.00	H	-	-	-57.41	4.47	-52.94	-39.9
3376.00	H	-	-	-58.42	6.05	-52.38	-39.4
4220.00	H	-	-	-59.95	7.75	-52.20	-39.2

Table 7-20. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 150 of 175

Band 66/4



Plot 7-225. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY: 1720.00 MHz

MODULATION SIGNAL: QPSK

BANDWIDTH: 20.0 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]
3440.00	H	113	141	-68.20	6.22	-61.98	-49.0
5160.00	H	-	-	-70.02	8.68	-61.35	-48.3
6880.00	H	249	50	-68.85	8.76	-60.09	-47.1
8600.00	H	-	-	-68.55	9.17	-59.38	-46.4
10320.00	H	-	-	-65.33	9.64	-55.69	-42.7

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

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 151 of 175

OPERATING FREQUENCY: 1745.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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	115	51	-67.51	6.32	-61.18	-48.2
5235.00	H	-	-	-70.02	8.71	-61.30	-48.3
6980.00	H	238	56	-68.37	8.74	-59.64	-46.6
8725.00	H	-	-	-67.33	9.42	-57.92	-44.9
10470.00	H	-	-	-64.69	9.62	-55.07	-42.1

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

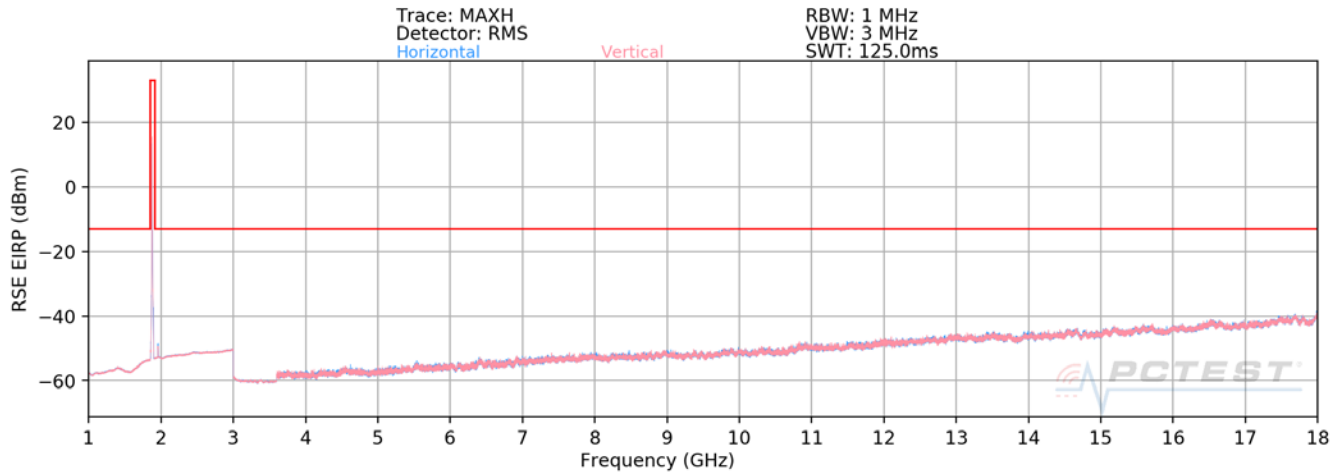
OPERATING FREQUENCY: 1770.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3540.00	H	114	54	-64.03	6.31	-57.72	-44.7
5310.00	H	-	-	-70.70	8.74	-61.96	-49.0
7080.00	H	-	-	-69.19	8.66	-60.53	-47.5
8850.00	H	-	-	-67.38	9.53	-57.85	-44.8

Table 7-23. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 152 of 175

Band 2



Plot 7-226. Radiated Spurious Plot above 1GHz (Band 2)

OPERATING FREQUENCY: 1860.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
3720.00	H	117	152	-68.51	6.58	-61.93	-48.9
5580.00	H	-	-	-69.54	8.74	-60.80	-47.8
7440.00	H	-	-	-68.64	8.41	-60.22	-47.2

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

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 153 of 175

OPERATING FREQUENCY: 1880.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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	109	199	-65.48	6.67	-58.81	-45.8
5640.00	H	-	-	-70.57	8.81	-61.76	-48.8
7520.00	H	-	-	-68.79	8.48	-60.31	-47.3

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

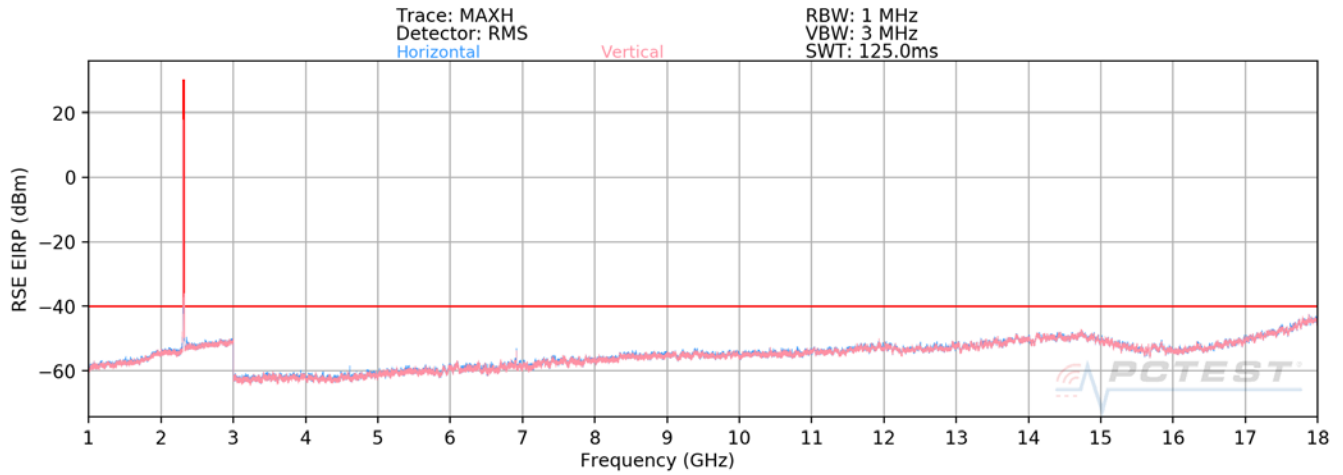
OPERATING FREQUENCY: 1900.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3800.00	H	109	359	-62.98	6.87	-56.11	-43.1
5700.00	H	-	-	-70.92	8.76	-62.15	-49.2
7600.00	H	-	-	-67.90	8.47	-59.43	-46.4

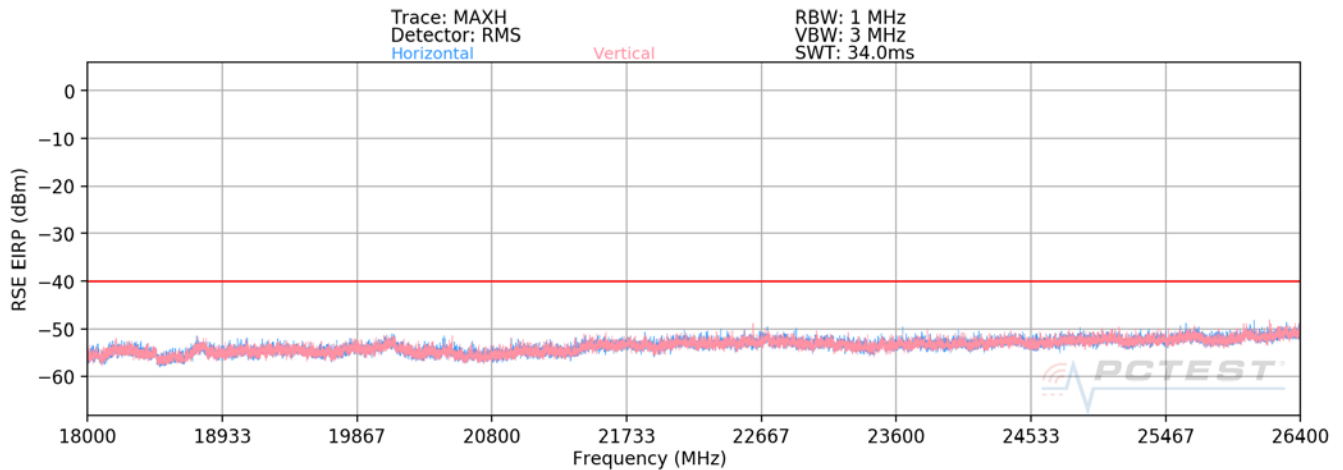
Table 7-26. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 154 of 175

Band 30



Plot 7-227. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



Plot 7-228. Radiated Spurious Plot 18GHz - 26.5GHz (Band 30)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 155 of 175

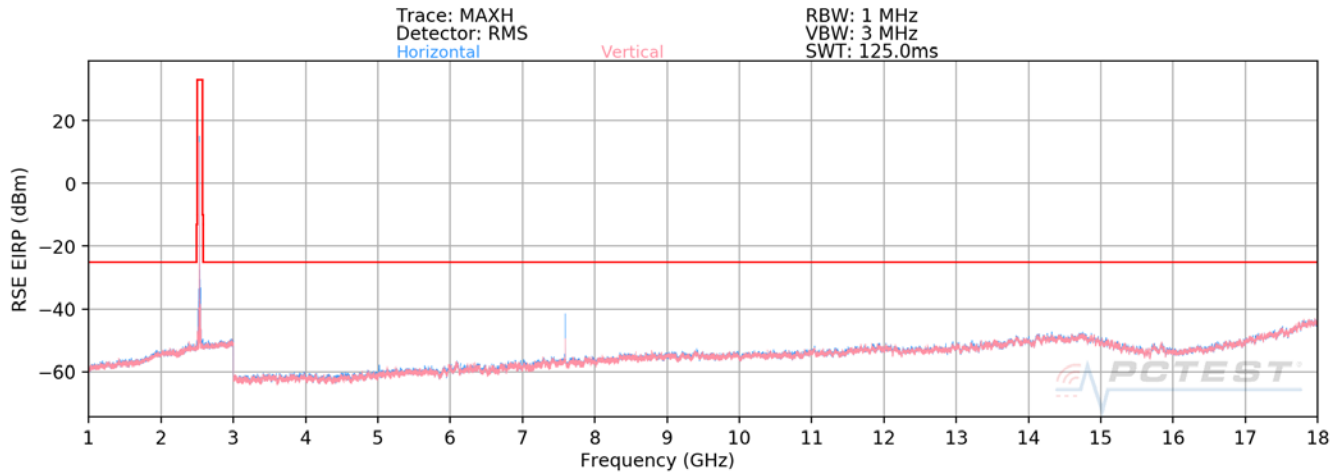
OPERATING FREQUENCY: 2310.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
4620.00	H	-	-	-72.71	8.26	-64.45	-24.4
6930.00	H	127	91	-66.72	8.72	-58.00	-18.0
9240.00	H	-	-	-69.46	9.49	-59.97	-20.0
11550.00	H	-	-	-67.36	9.19	-58.17	-18.2

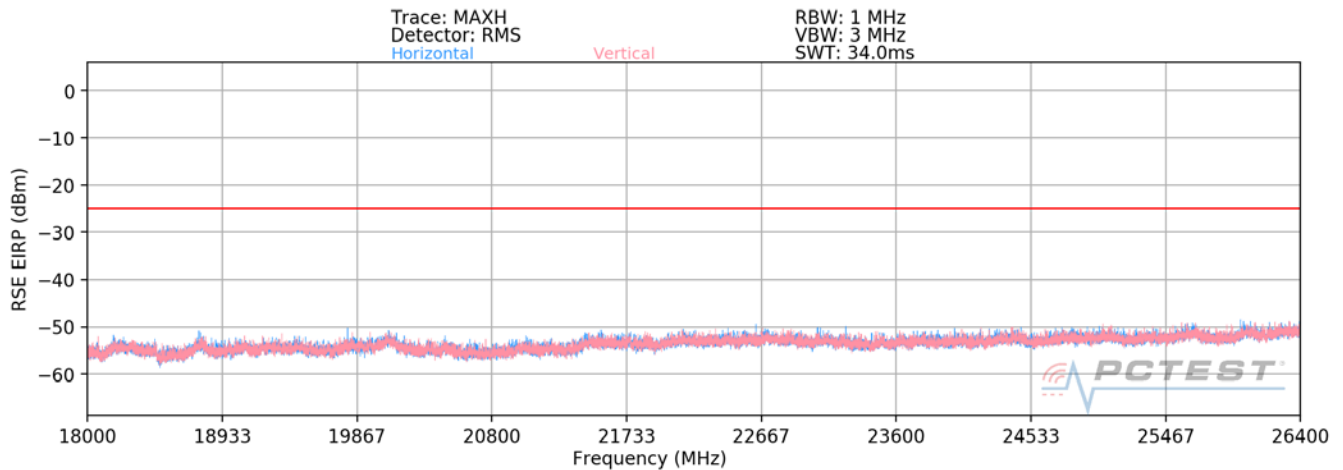
Table 7-27. Radiated Spurious Data (Band 30)

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 156 of 175

Band 7



Plot 7-229. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



Plot 7-230. Radiated Spurious Plot 18GHz - 26.5GHz (Band 7)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 2510.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	-	-	-73.49	8.56	-64.92	-39.9
7530.00	H	-	-	-69.78	8.46	-61.32	-36.3
10040.00	H	-	-	-69.77	9.85	-59.92	-34.9

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

OPERATING FREQUENCY: 2535.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	-	-	-73.99	8.60	-65.39	-40.4
7605.00	H	142	40	-69.73	8.48	-61.25	-36.3
10140.00	H	-	-	-68.86	9.78	-59.08	-34.1

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

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 158 of 175

OPERATING FREQUENCY: 2560.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	-	-	-73.08	8.66	-64.43	-39.4
7680.00	H	-	-	-69.83	8.58	-61.26	-36.3
10240.00	H	-	-	-69.14	9.65	-59.49	-34.5

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

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 159 of 175

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
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Band 12/17 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	707,499,869	-131	-0.0000185
100 %		- 20	707,499,987	-13	-0.0000018
100 %		- 10	707,500,154	154	0.0000218
100 %		0	707,499,642	-358	-0.0000506
100 %		+ 10	707,499,881	-119	-0.0000168
100 %		+ 20	707,499,990	-10	-0.0000014
100 %		+ 30	707,499,889	-111	-0.0000157
100 %		+ 40	707,500,203	203	0.0000287
100 %		+ 50	707,500,064	64	0.0000090
BATT. ENDPOINT	3.48	+ 20	707,499,730	-270	-0.0000382

Table 7-31. 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: ZNFK410WM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 12/17 Frequency Stability Measurements

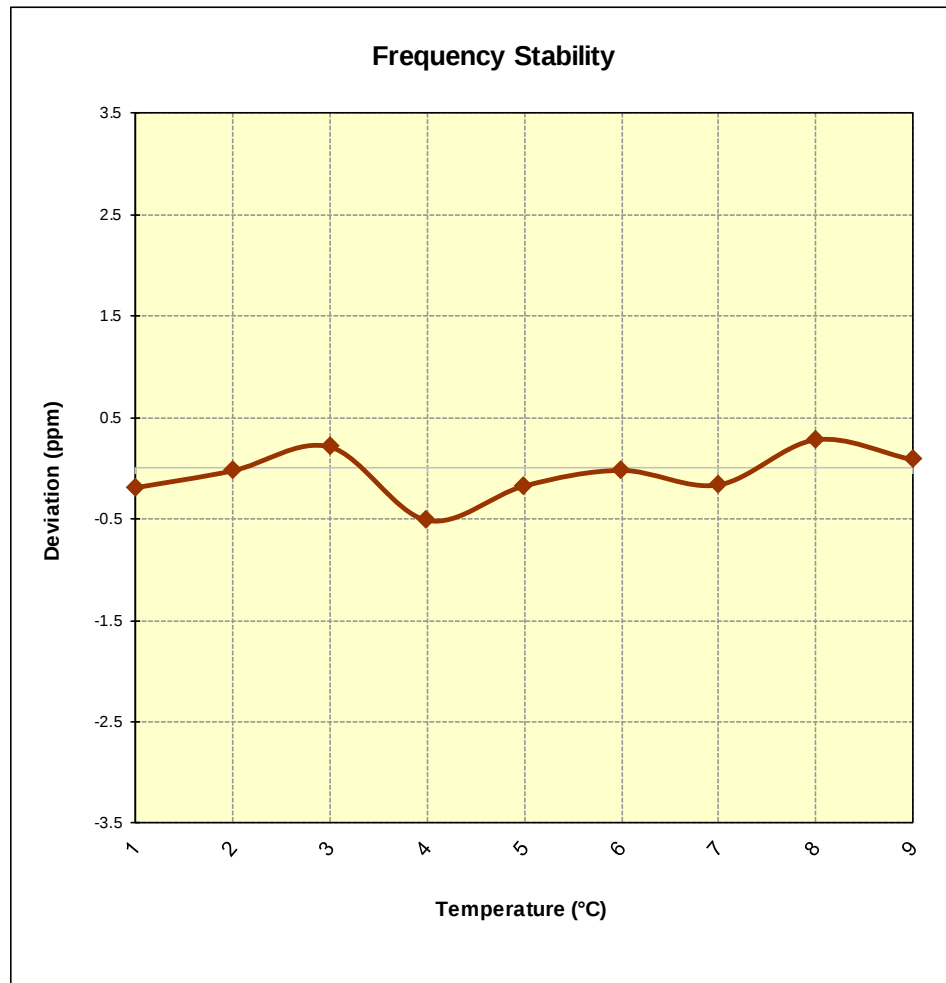


Figure 7-8. Frequency Stability Graph (Band 12/17)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 162 of 175

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz
 CHANNEL: 23230
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	781,999,800	-200	-0.0000256
100 %		- 20	781,999,730	-270	-0.0000345
100 %		- 10	782,000,111	111	0.0000142
100 %		0	781,999,951	-49	-0.0000063
100 %		+ 10	781,999,871	-129	-0.0000165
100 %		+ 20	782,000,013	13	0.0000017
100 %		+ 30	782,000,073	73	0.0000093
100 %		+ 40	782,000,079	79	0.0000101
100 %		+ 50	781,999,836	-164	-0.0000210
BATT. ENDPOINT	3.48	+ 20	782,000,298	298	0.0000381

Table 7-32. 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: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
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Band 13 Frequency Stability Measurements

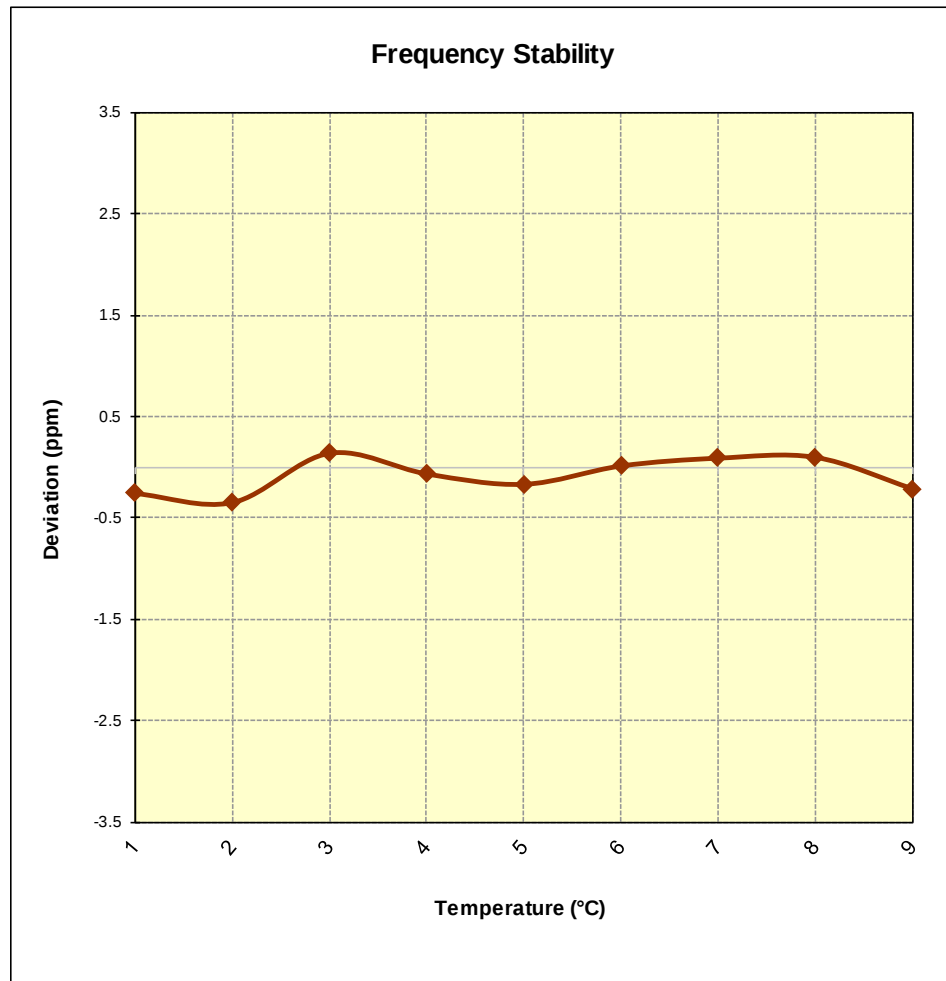


Figure 7-9. Frequency Stability Graph (Band 13)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset	Page 164 of 175

Band 5 Frequency Stability Measurements

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525
 REFERENCE VOLTAGE: 4.39 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	836,499,989	-11	-0.0000013
100 %		- 20	836,499,812	-188	-0.0000225
100 %		- 10	836,500,096	96	0.0000115
100 %		0	836,499,936	-64	-0.0000077
100 %		+ 10	836,500,184	184	0.0000220
100 %		+ 20	836,500,260	260	0.0000311
100 %		+ 30	836,500,255	255	0.0000305
100 %		+ 40	836,500,142	142	0.0000170
100 %		+ 50	836,500,165	165	0.0000197
BATT. ENDPOINT	3.48	+ 20	836,500,308	308	0.0000368

Table 7-33. Frequency Stability Data (Band 5)

FCC ID: ZNFK410WM	 Proud to be part of  Samsung		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset			Page 165 of 175

Band 5 Frequency Stability Measurements

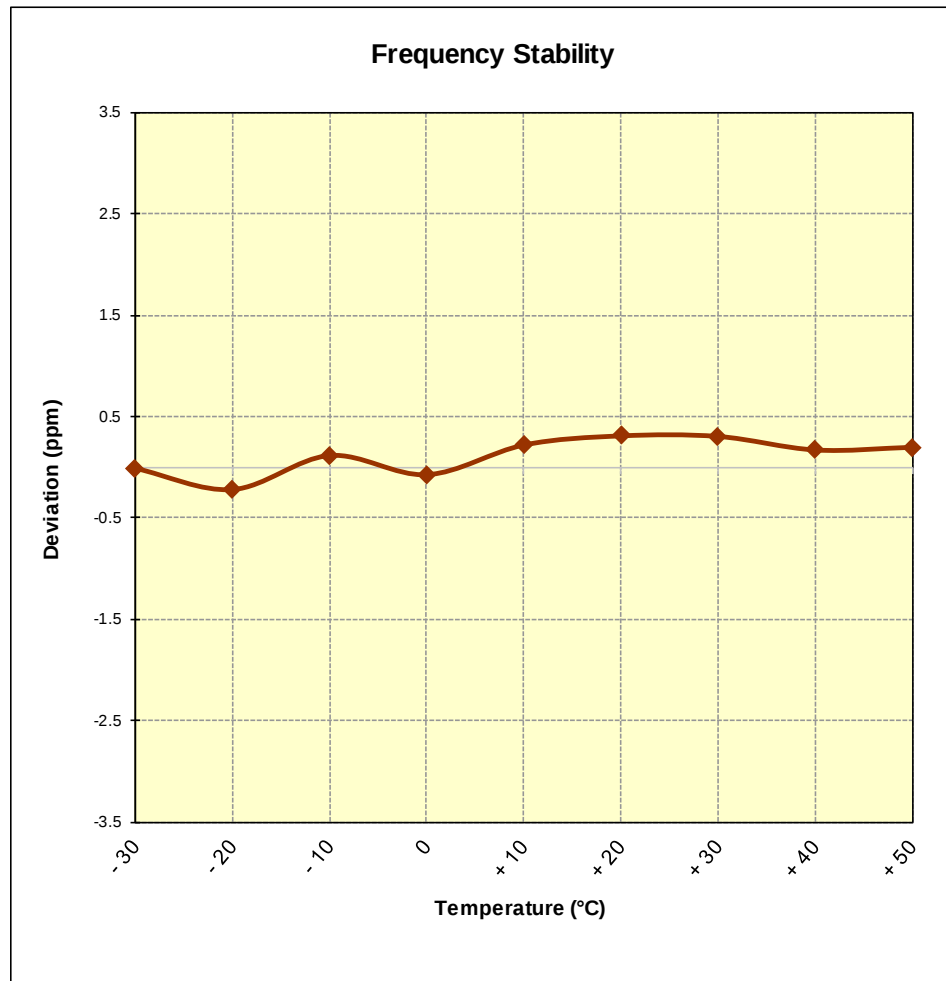


Figure 7-10. Frequency Stability Graph (Band 5)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 166 of 175

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz
 CHANNEL: 132322
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,745,000,336	336	0.0000193
100 %		- 20	1,745,000,337	337	0.0000193
100 %		- 10	1,745,000,009	9	0.0000005
100 %		0	1,744,999,967	-33	-0.0000019
100 %		+ 10	1,744,999,746	-254	-0.0000146
100 %		+ 20	1,745,000,025	25	0.0000014
100 %		+ 30	1,745,000,183	183	0.0000105
100 %		+ 40	1,745,000,024	24	0.0000014
100 %		+ 50	1,744,999,960	-40	-0.0000023
BATT. ENDPOINT	3.48	+ 20	1,745,000,123	123	0.0000070

Table 7-34. Frequency Stability Data (Band 66/4)

Note:

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

FCC ID: ZNFK410WM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 66/4 Frequency Stability Measurements

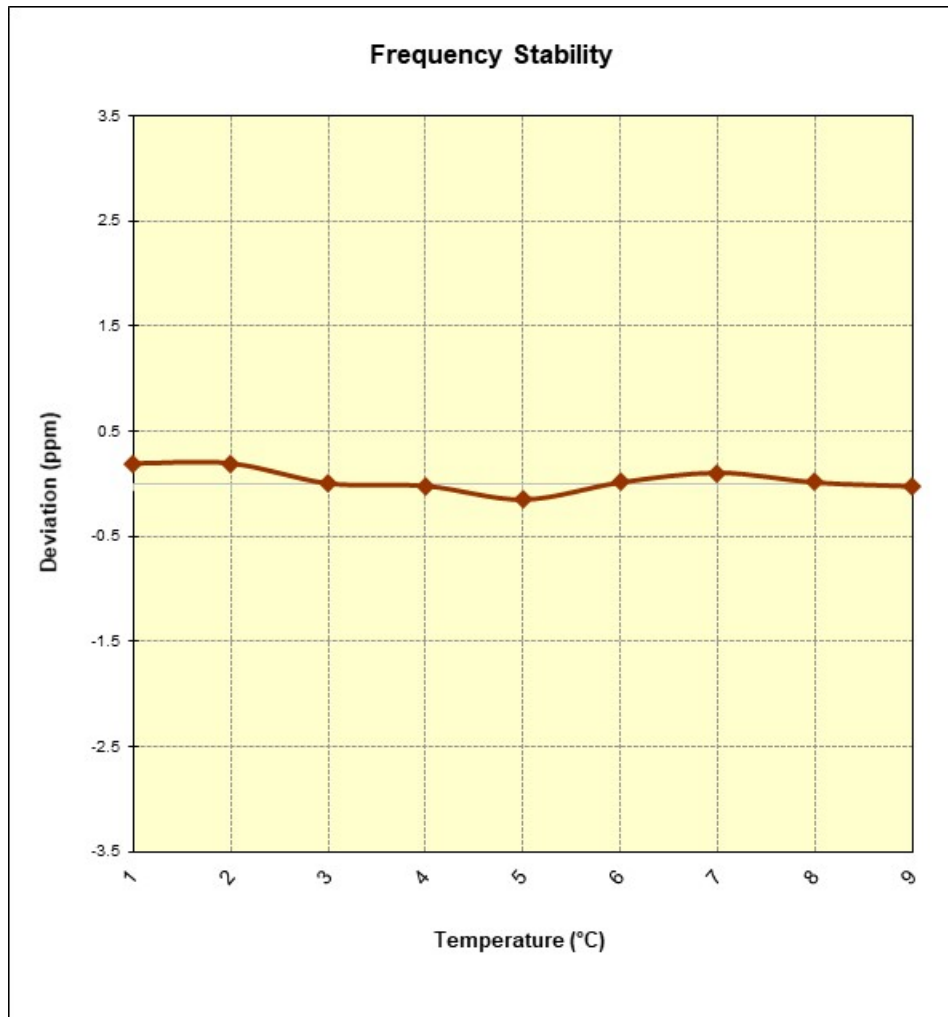


Figure 7-11. Frequency Stability Graph (Band 66/4)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 168 of 175

Band 2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 18900
 REFERENCE VOLTAGE: 4.39 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,880,000,057	57	0.0000030
100 %		- 20	1,879,999,577	-423	-0.0000225
100 %		- 10	1,880,000,077	77	0.0000041
100 %		0	1,880,000,248	248	0.0000132
100 %		+ 10	1,880,000,044	44	0.0000023
100 %		+ 20	1,879,999,984	-16	-0.0000009
100 %		+ 30	1,879,999,950	-50	-0.0000027
100 %		+ 40	1,879,999,700	-300	-0.0000160
100 %		+ 50	1,880,000,362	362	0.0000193
BATT. ENDPOINT	3.48	+ 20	1,880,000,182	182	0.0000097

Table 7-35. Frequency Stability Data (Band 2)

FCC ID: ZNFK410WM	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset	Page 169 of 175

Band 2 Frequency Stability Measurements

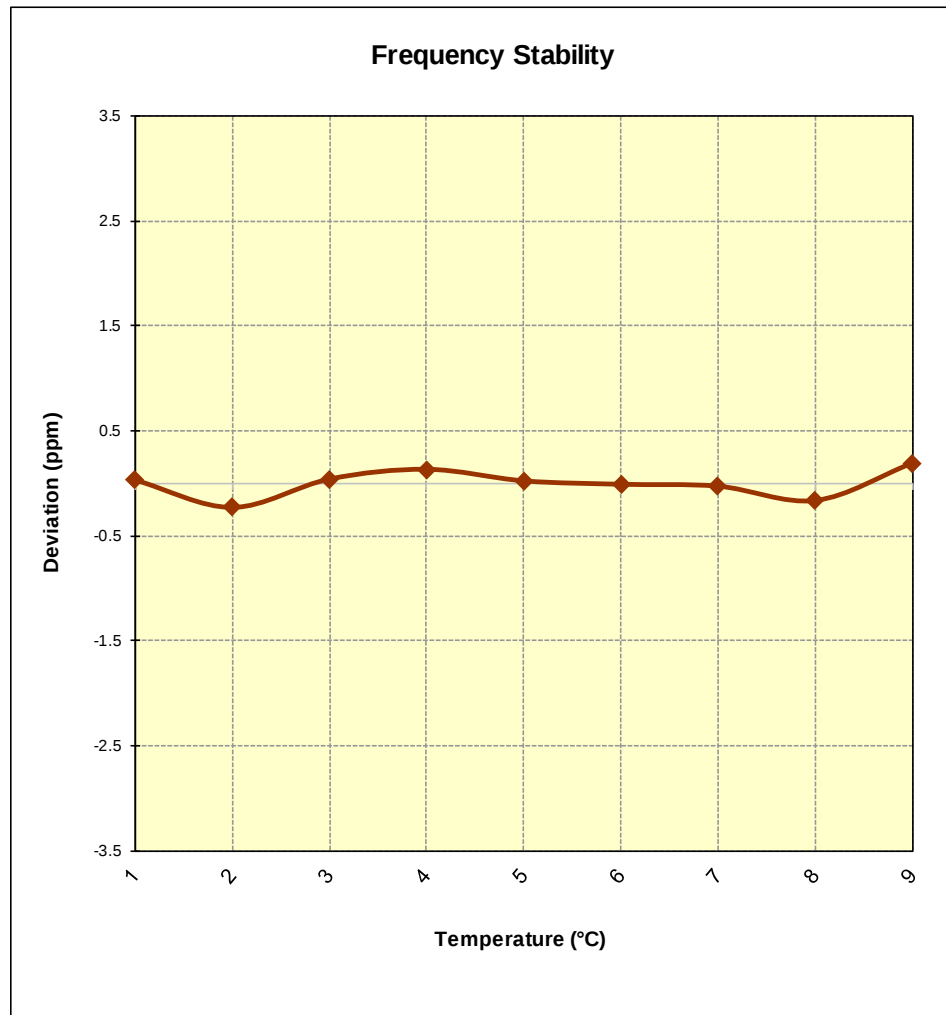


Figure 7-12. Frequency Stability Graph (Band 2)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Band 30 Frequency Stability Measurements

OPERATING FREQUENCY: 2,310,000,000 Hz
 CHANNEL: 27710
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	2,309,999,927	-73	-0.0000032
100 %		- 20	2,310,000,328	328	0.0000142
100 %		- 10	2,310,000,320	320	0.0000139
100 %		0	2,310,000,230	230	0.0000100
100 %		+ 10	2,309,999,822	-178	-0.0000077
100 %		+ 20	2,309,999,903	-97	-0.0000042
100 %		+ 30	2,310,000,101	101	0.0000044
100 %		+ 40	2,309,999,992	-8	-0.0000003
100 %		+ 50	2,310,000,068	68	0.0000029
BATT. ENDPOINT	3.48	+ 20	2,309,999,696	-304	-0.0000132

Table 7-36. 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: ZNFK410WM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 30 Frequency Stability Measurements

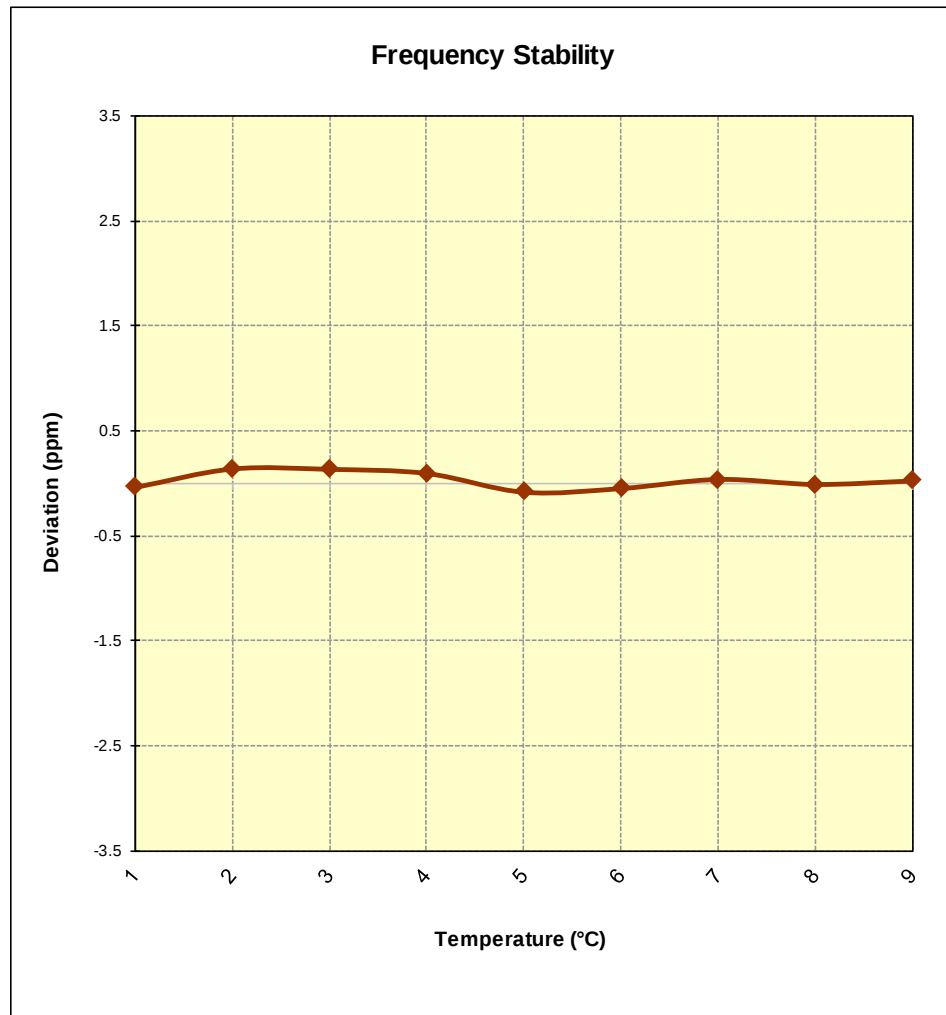


Figure 7-13. Frequency Stability Graph (Band 30)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz
 CHANNEL: 21100
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	2,535,000,198	198	0.0000078
100 %		- 20	2,535,000,066	66	0.0000026
100 %		- 10	2,535,000,417	417	0.0000164
100 %		0	2,534,999,973	-27	-0.0000011
100 %		+ 10	2,534,999,777	-223	-0.0000088
100 %		+ 20	2,535,000,117	117	0.0000046
100 %		+ 30	2,534,999,648	-352	-0.0000139
100 %		+ 40	2,534,999,803	-197	-0.0000078
100 %		+ 50	2,534,999,861	-139	-0.0000055
BATT. ENDPOINT	3.48	+ 20	2,534,999,964	-36	-0.0000014

Table 7-37. 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: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
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Band 7 Frequency Stability Measurements

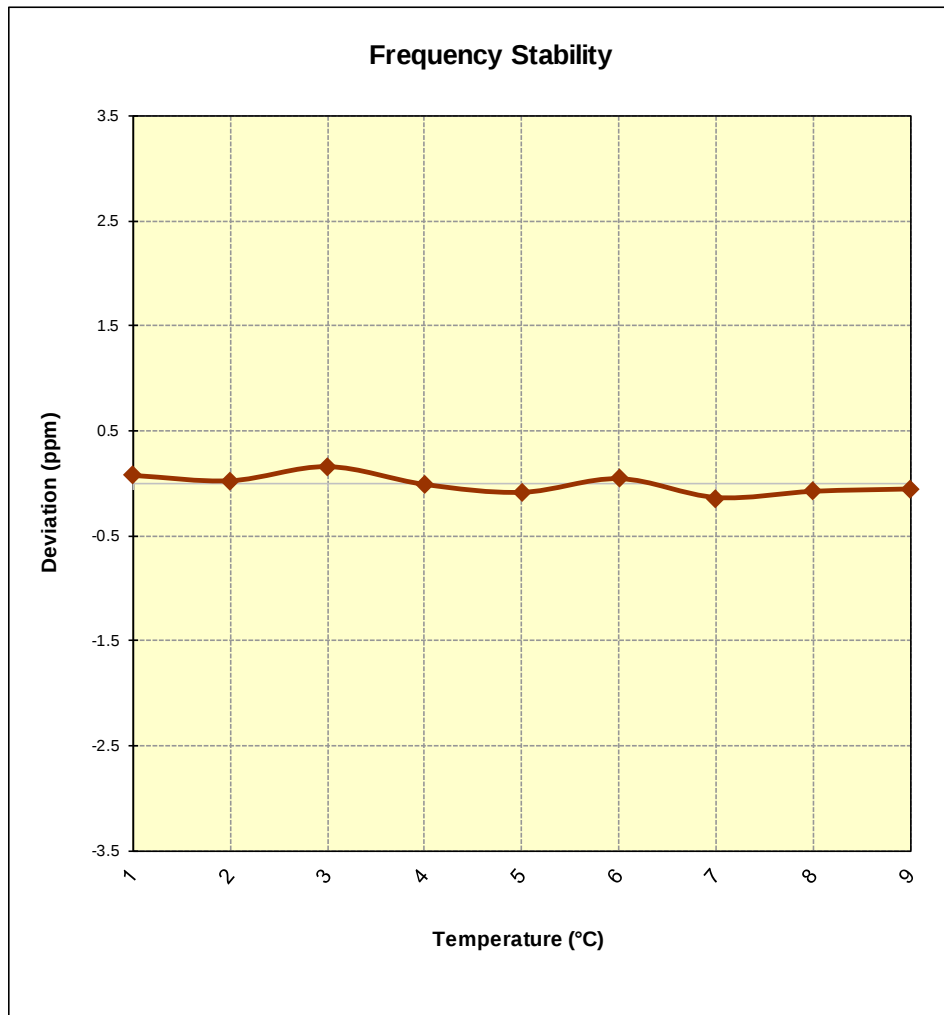


Figure 7-14. Frequency Stability Graph (Band 7)

FCC ID: ZNFK410WM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFK410WM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: ZNFK410WM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2001290013-03.ZNF	Test Dates: 02/03 - 03/06/2020	EUT Type: Portable Handset		Page 175 of 175