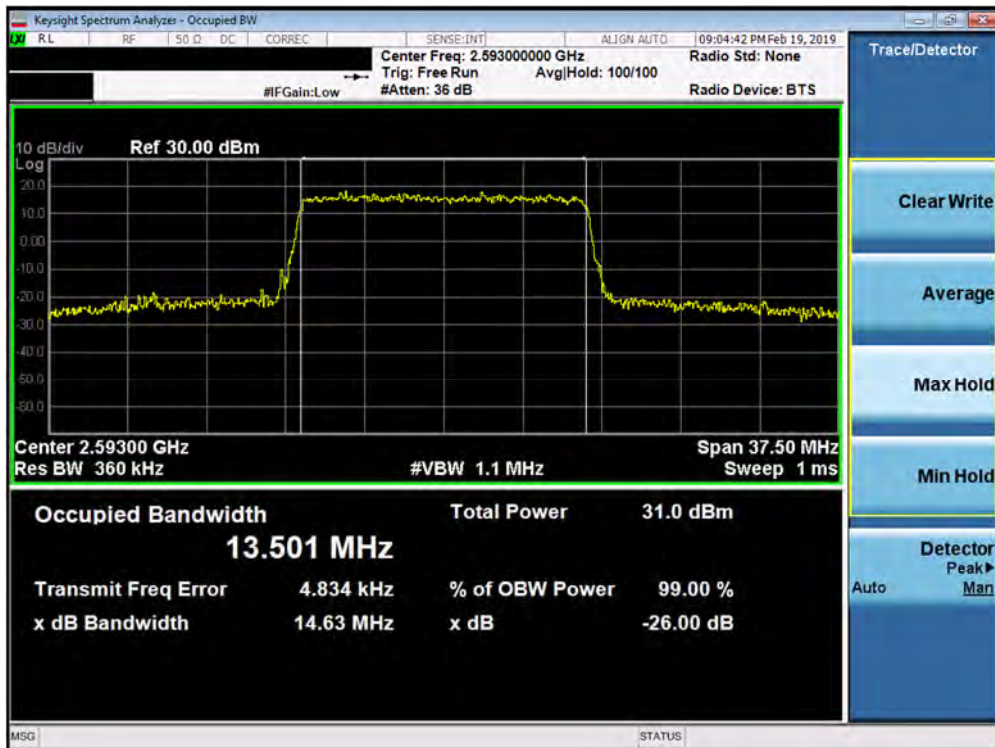
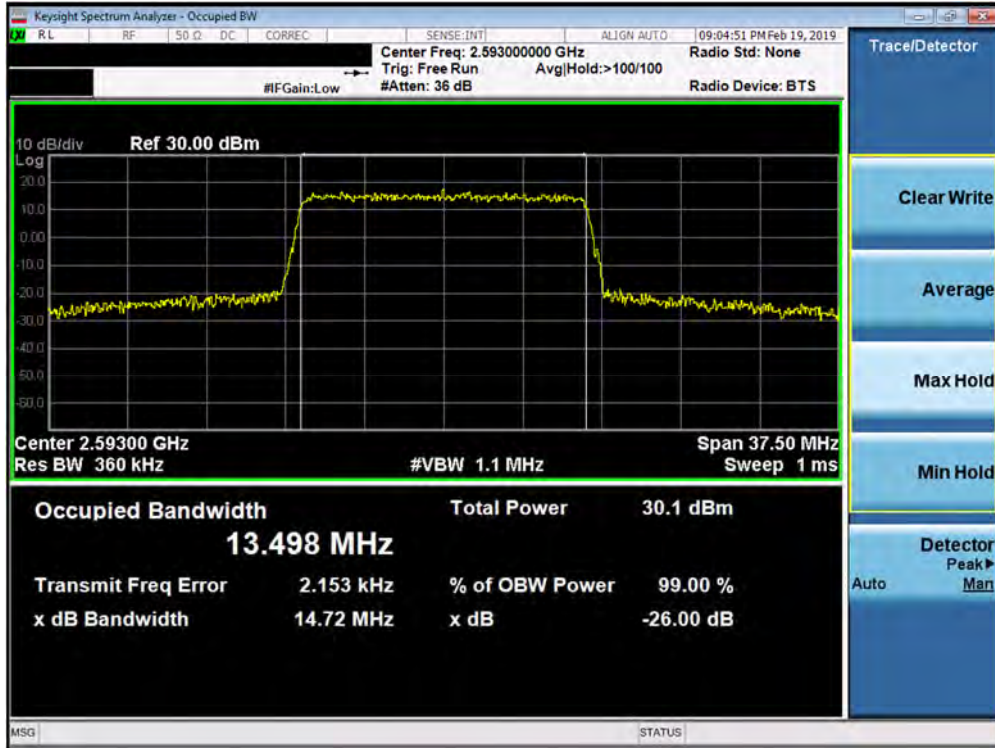


Plot 7-125. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 15.0MHz QPSK - Full RB Configuration)

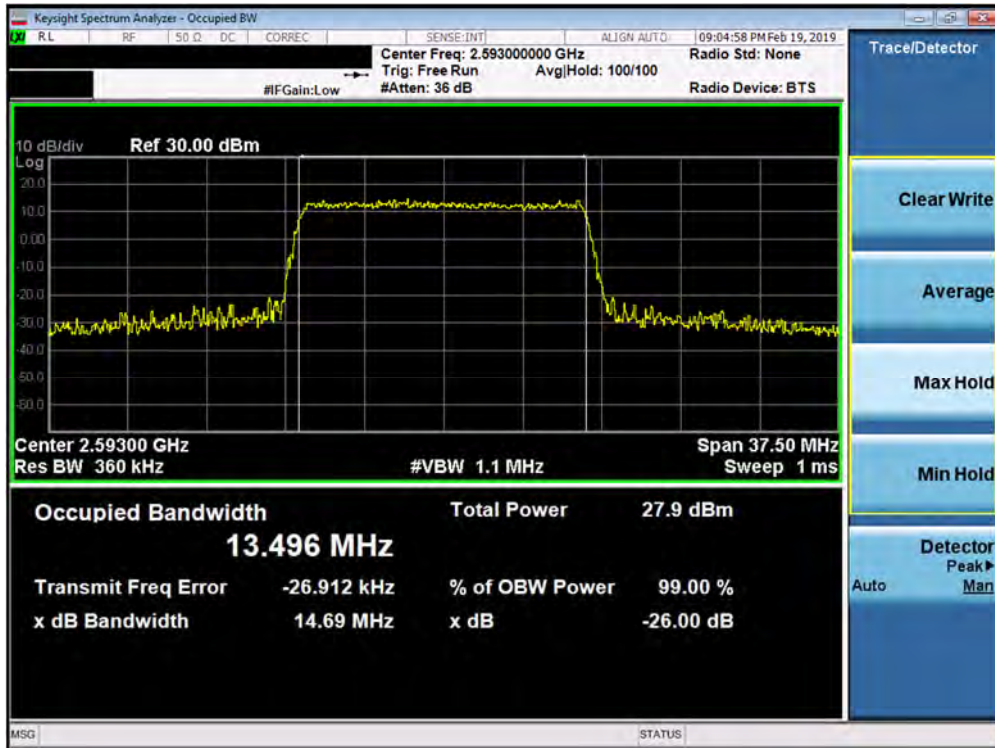


Plot 7-126. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 80 of 289

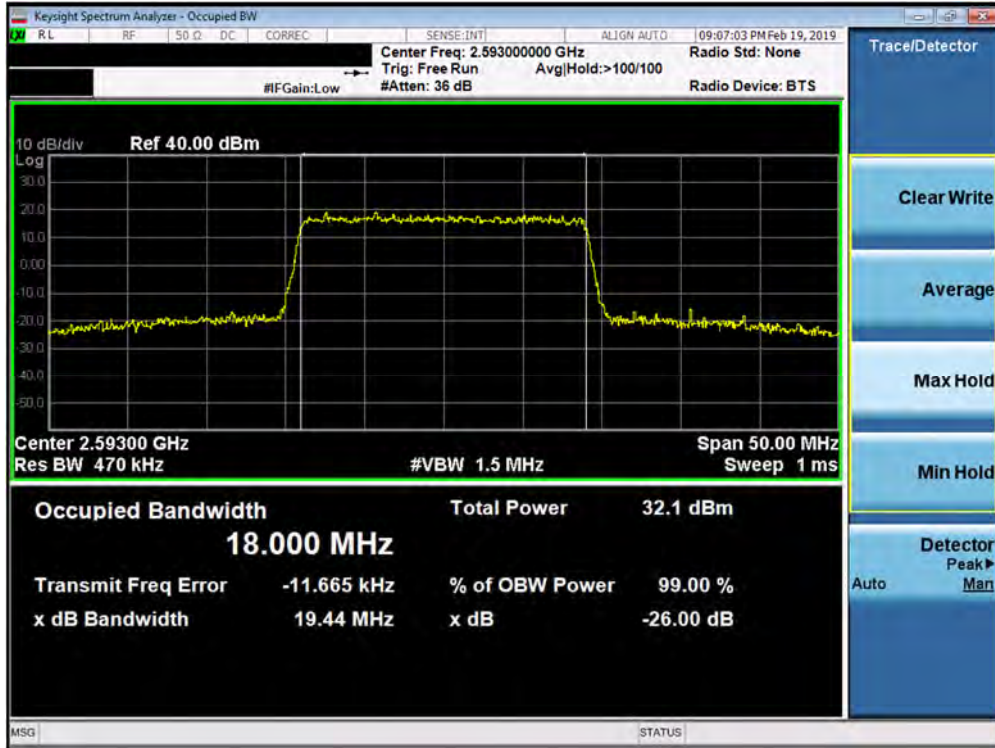


Plot 7-127. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-128. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 15.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 81 of 289

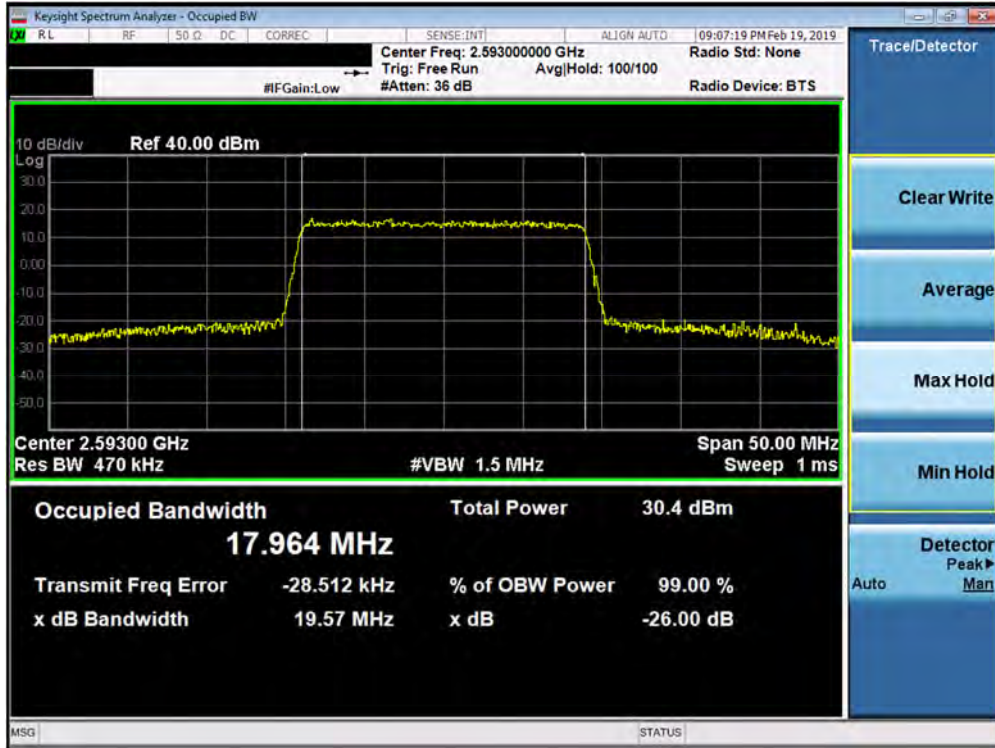


Plot 7-129. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - Full RB Configuration)

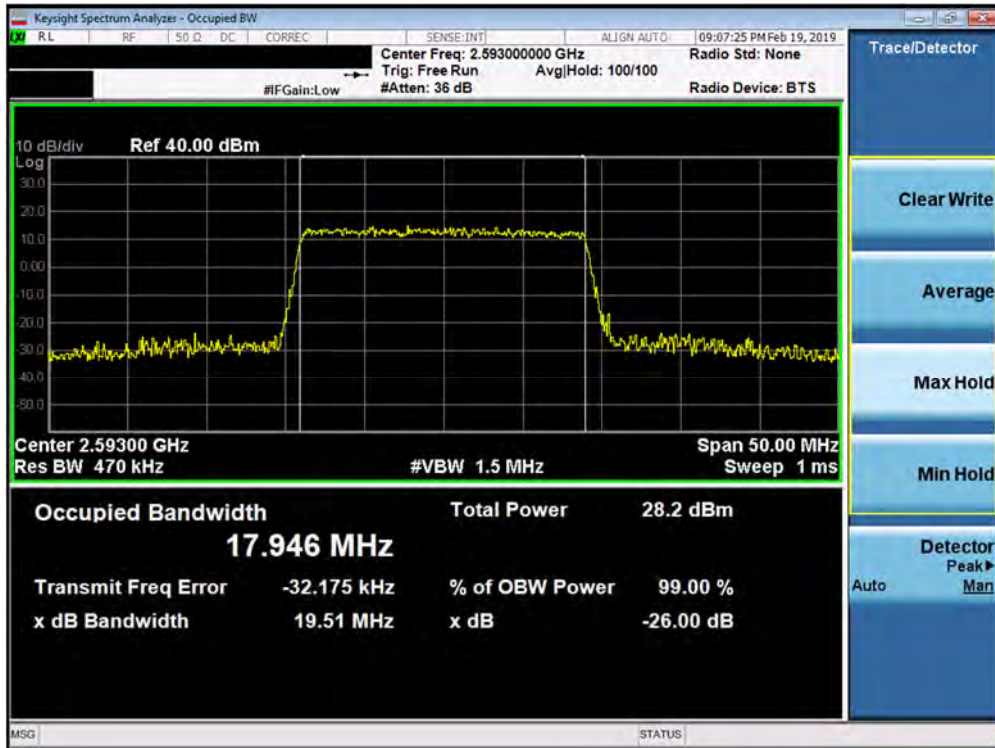


Plot 7-130. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
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Plot 7-131. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 20.0MHz 64-QAM - Full RB Configuration)



Plot 7-132. Occupied Bandwidth Plot (Band 41 PC3 / Band 38 - 20.0MHz 256-QAM - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 83 of 289

## 7.3 Spurious and Harmonic Emissions at Antenna Terminal

### Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. 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 of any spurious emission is  $43 + 10 \log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.**

### Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 \* the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

### Test Setup

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



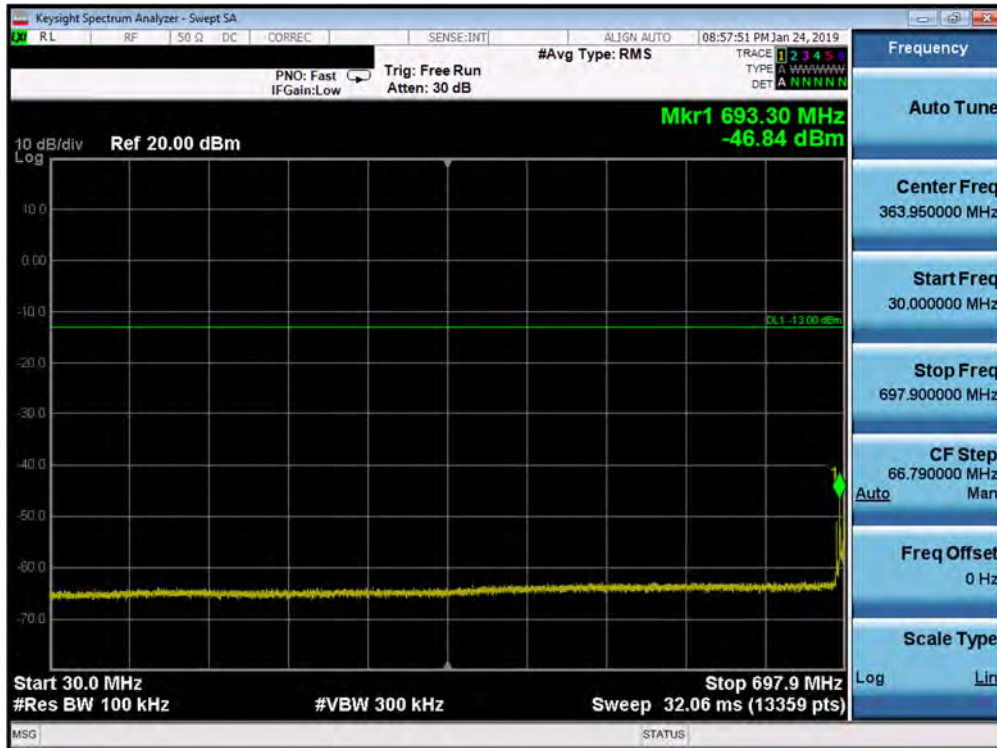
**Figure 7-2. Test Instrument & Measurement Setup**

### Test Notes

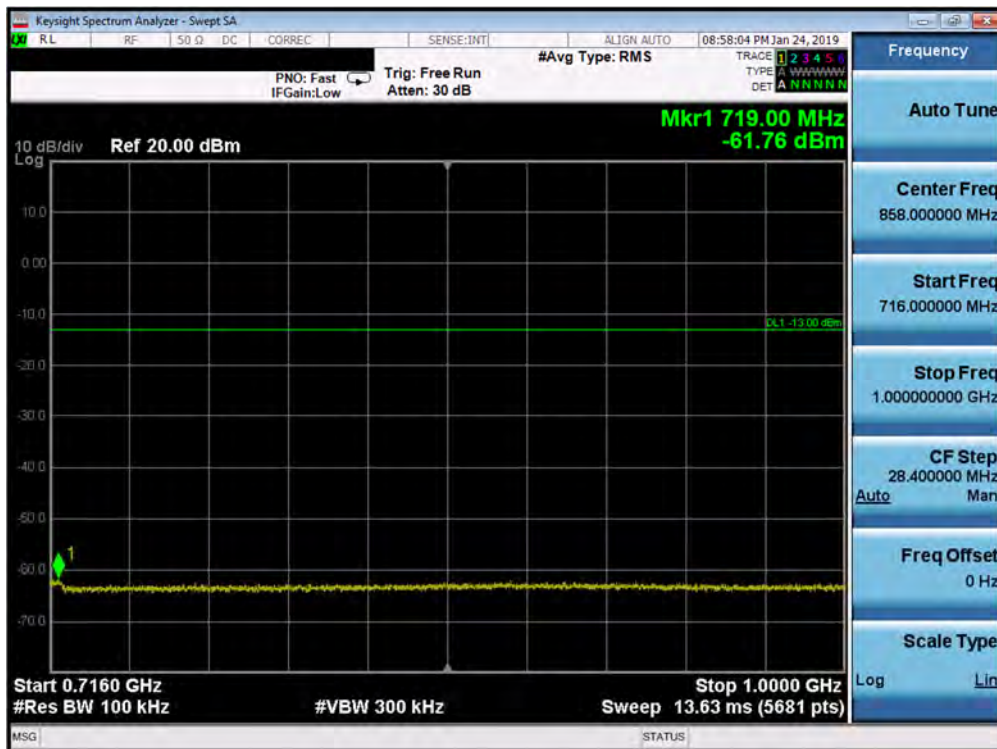
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**Band 12**

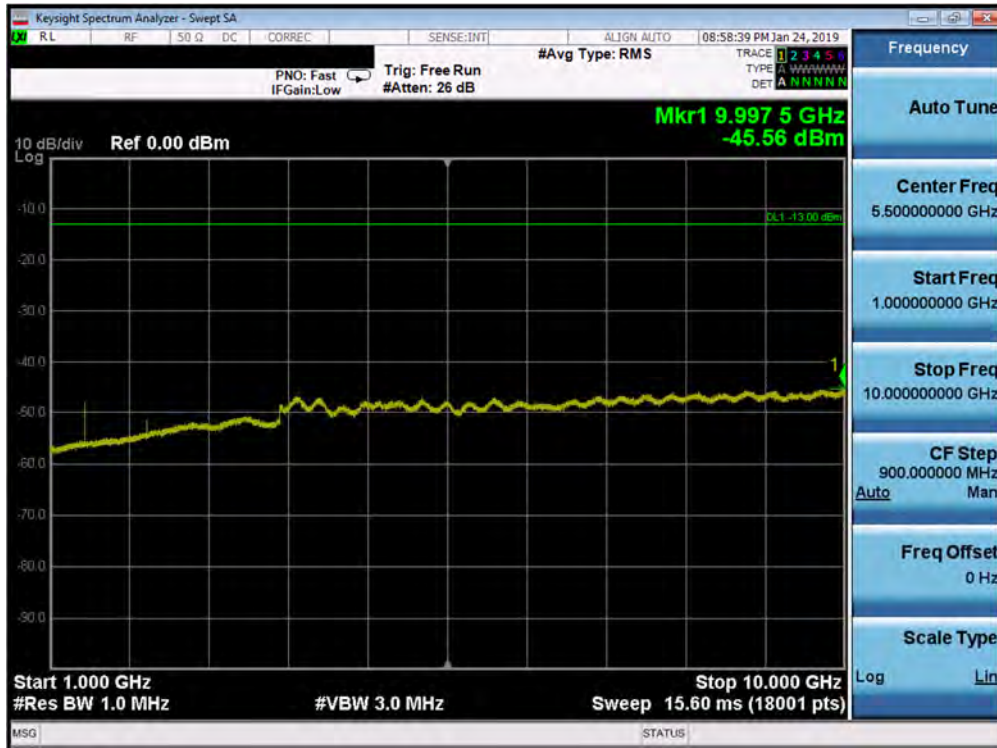


Plot 7-133. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

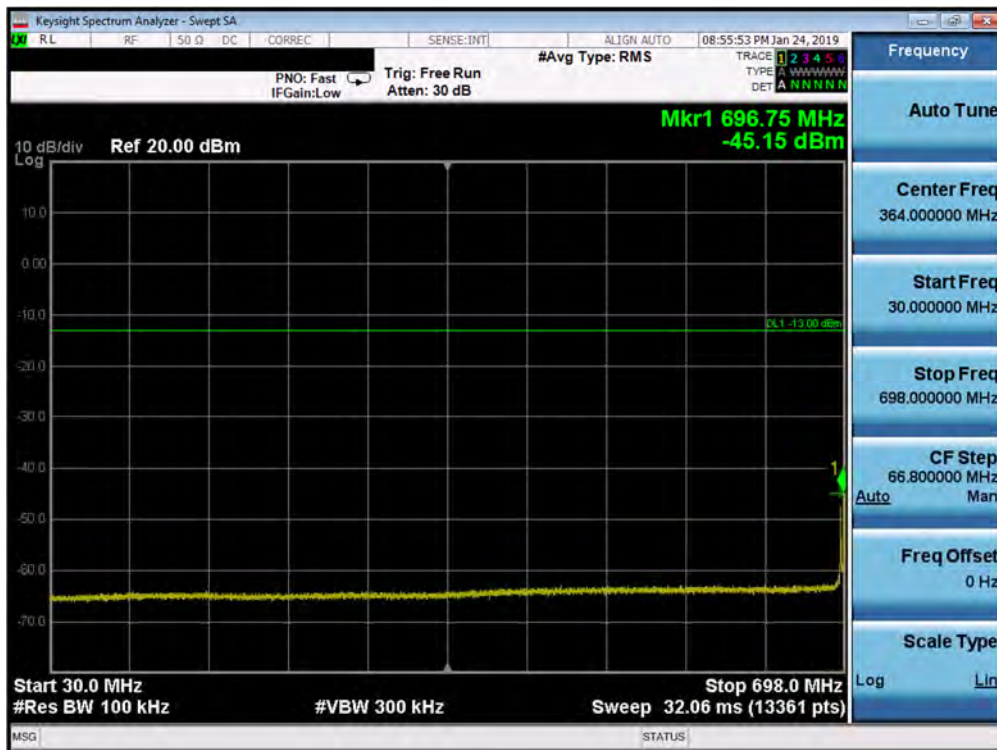


Plot 7-134. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 85 of 289

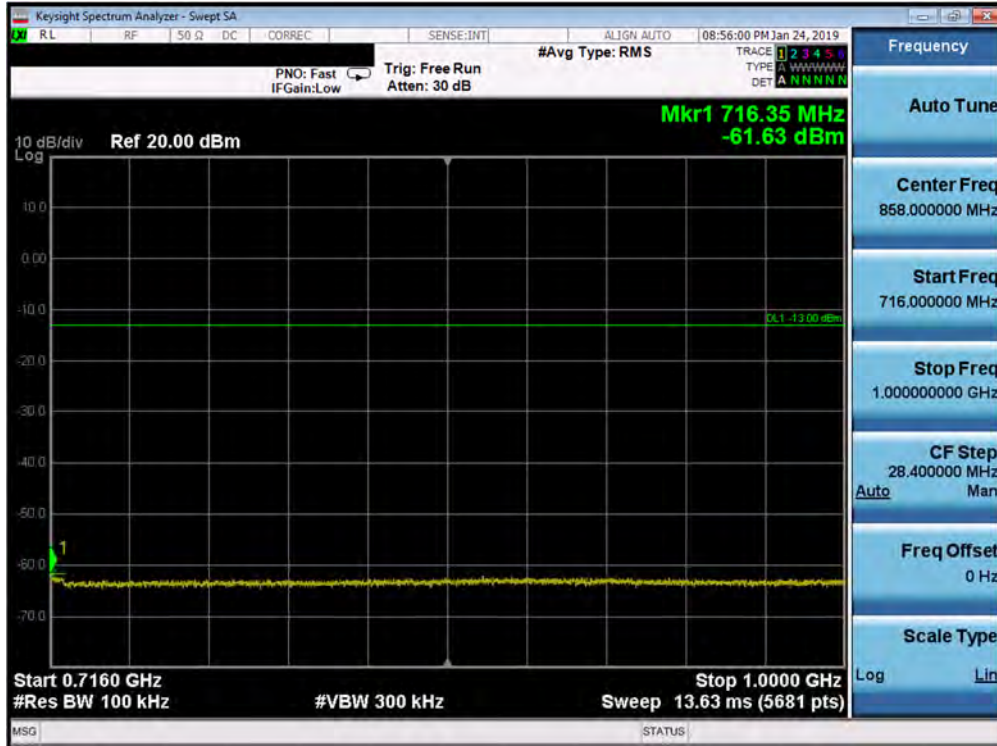


Plot 7-135. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

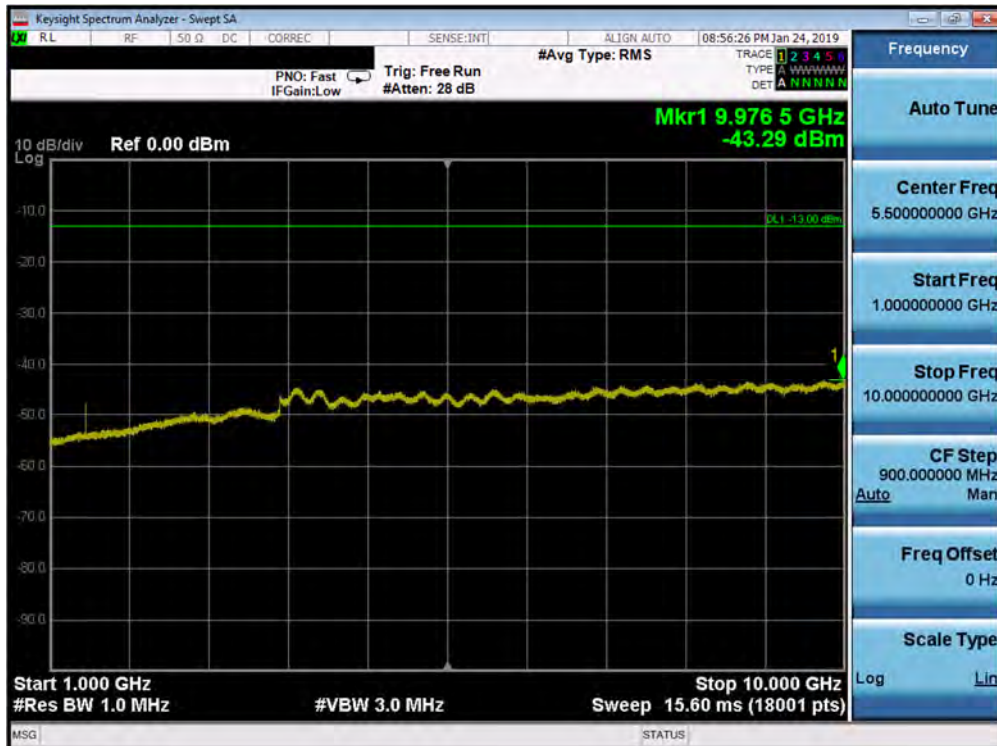


Plot 7-136. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 86 of 289



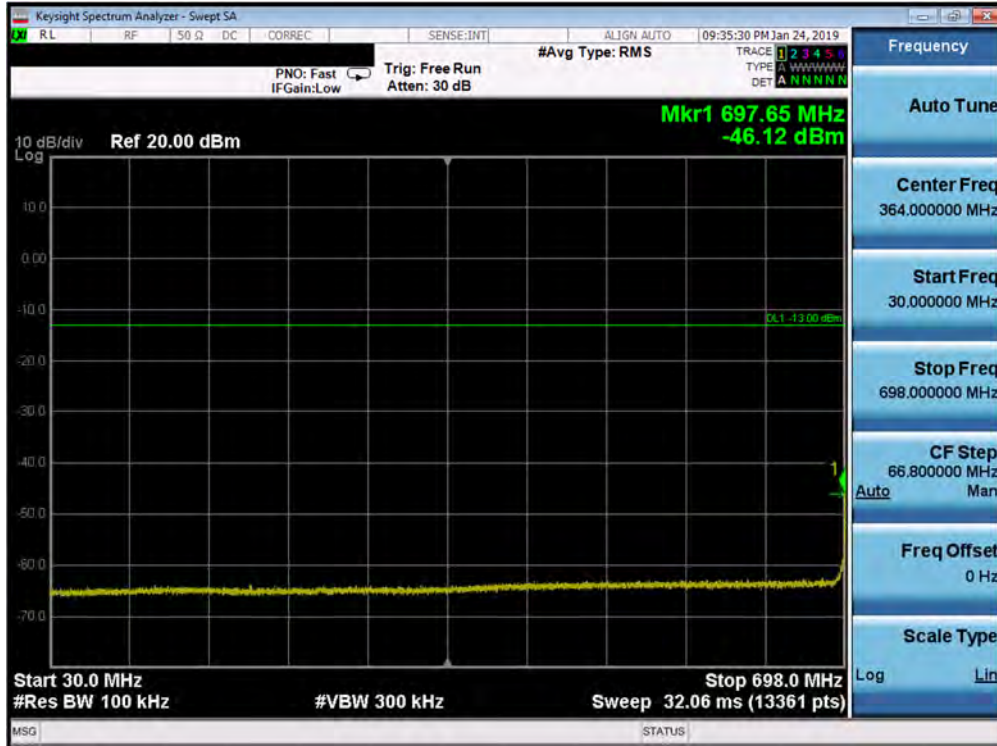
Plot 7-137. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



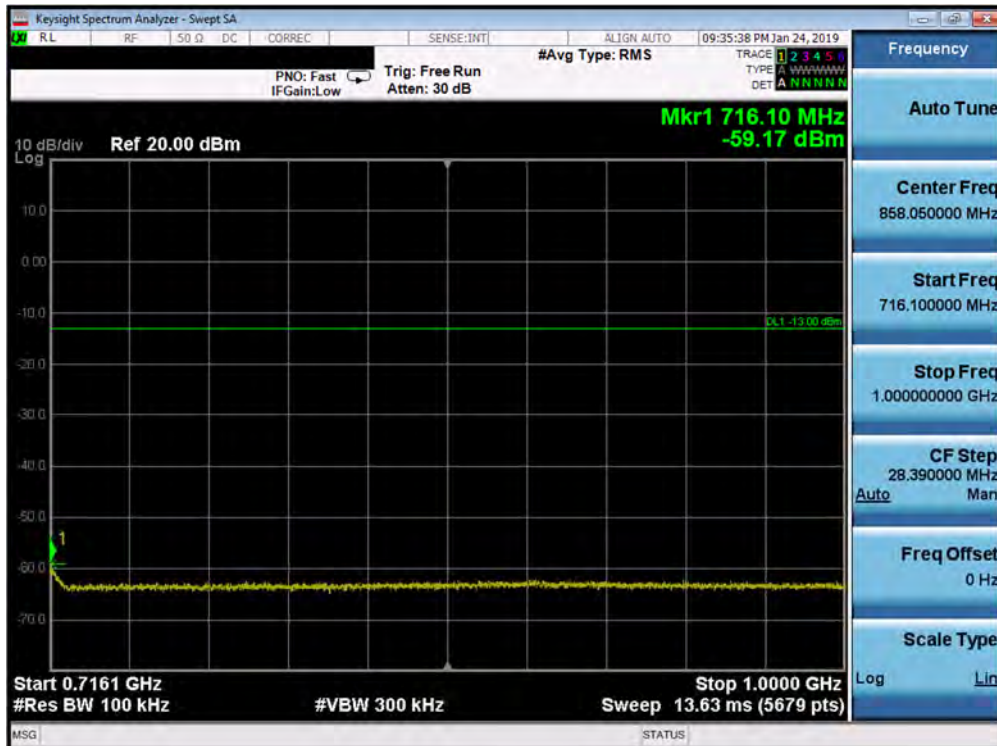
Plot 7-138. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-139. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-140. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

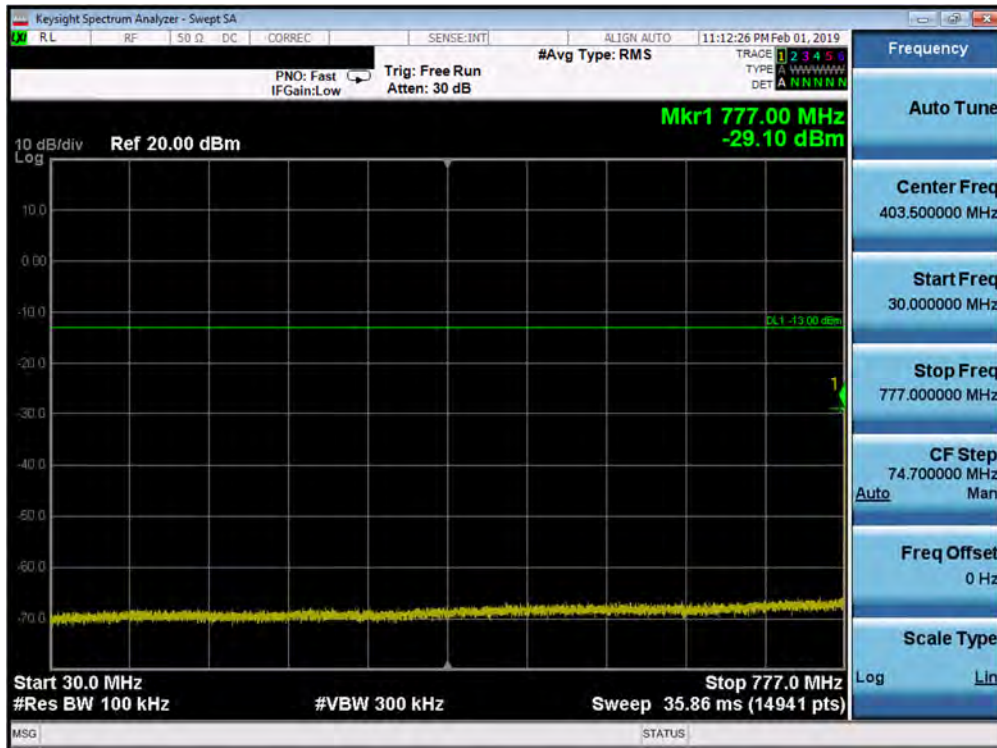
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 88 of 289



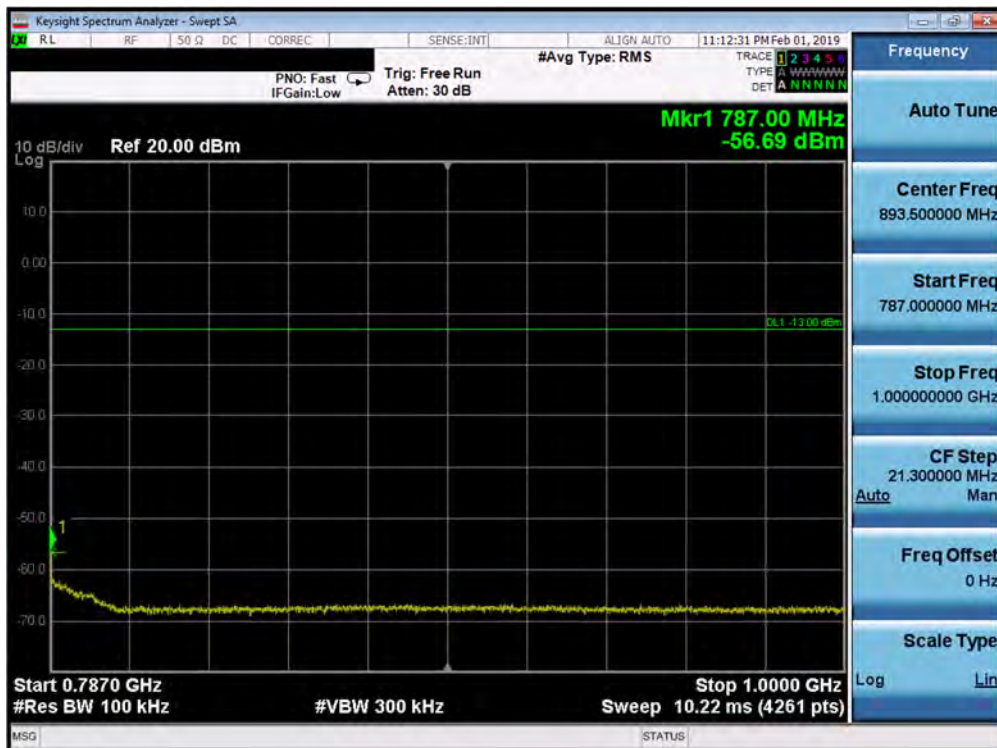
Plot 7-141. Conducted Spurious Plot (Band 12 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 89 of 289

**Band 13**



Plot 7-142. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-143. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

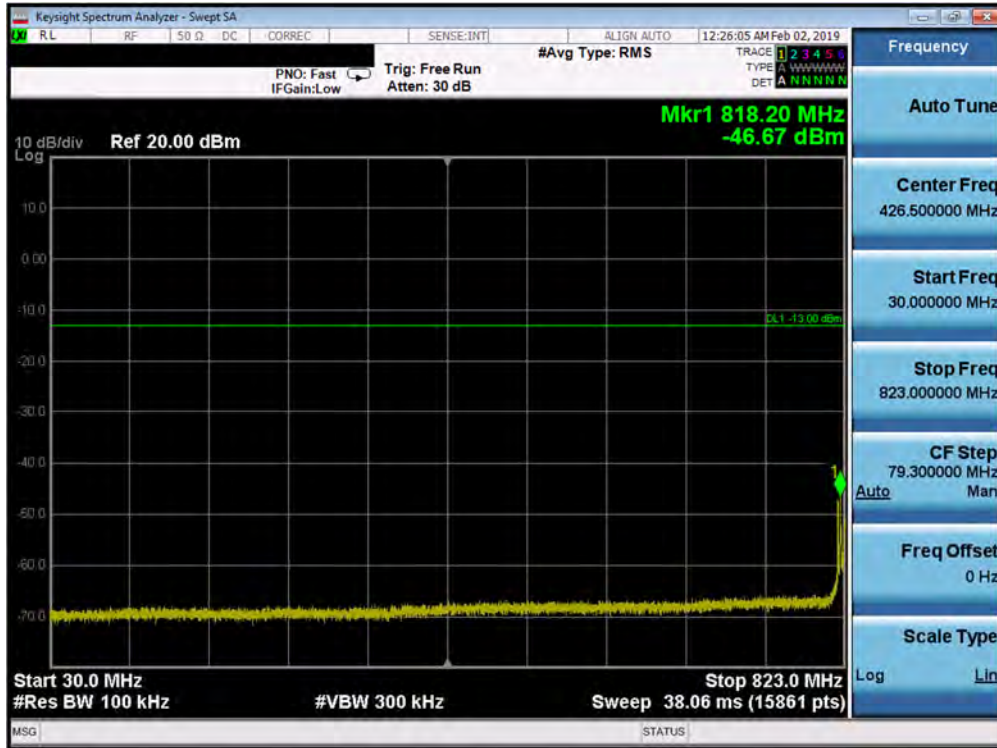
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 90 of 289



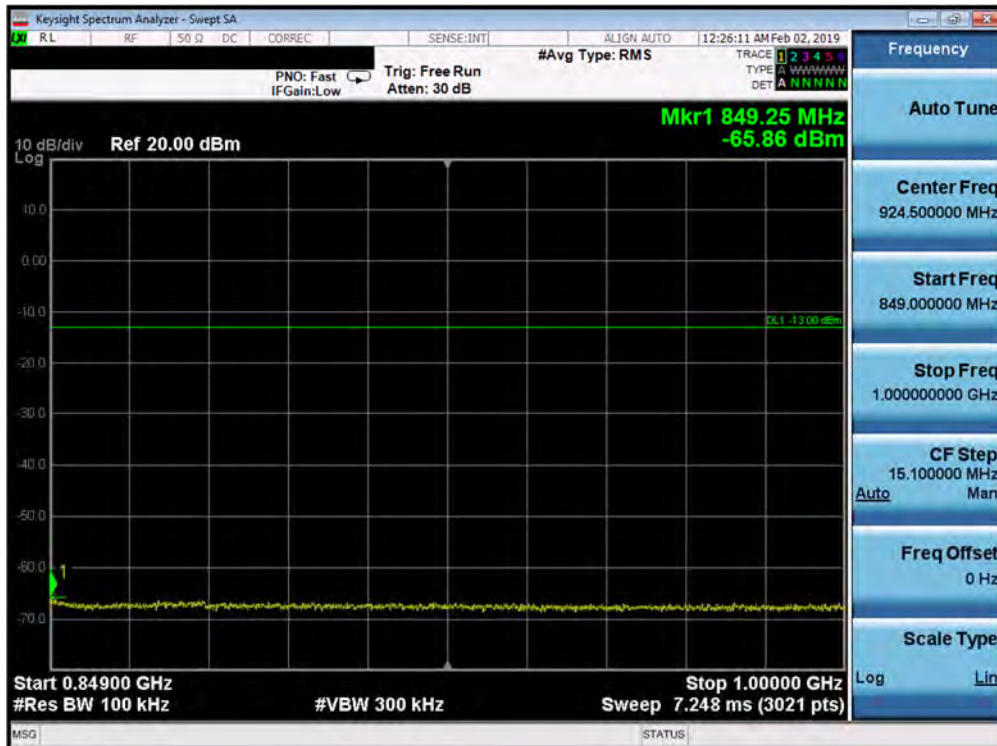
Plot 7-144. Conducted Spurious Plot (Band 13 - 10.0MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 91 of 289

**Band 26/5**

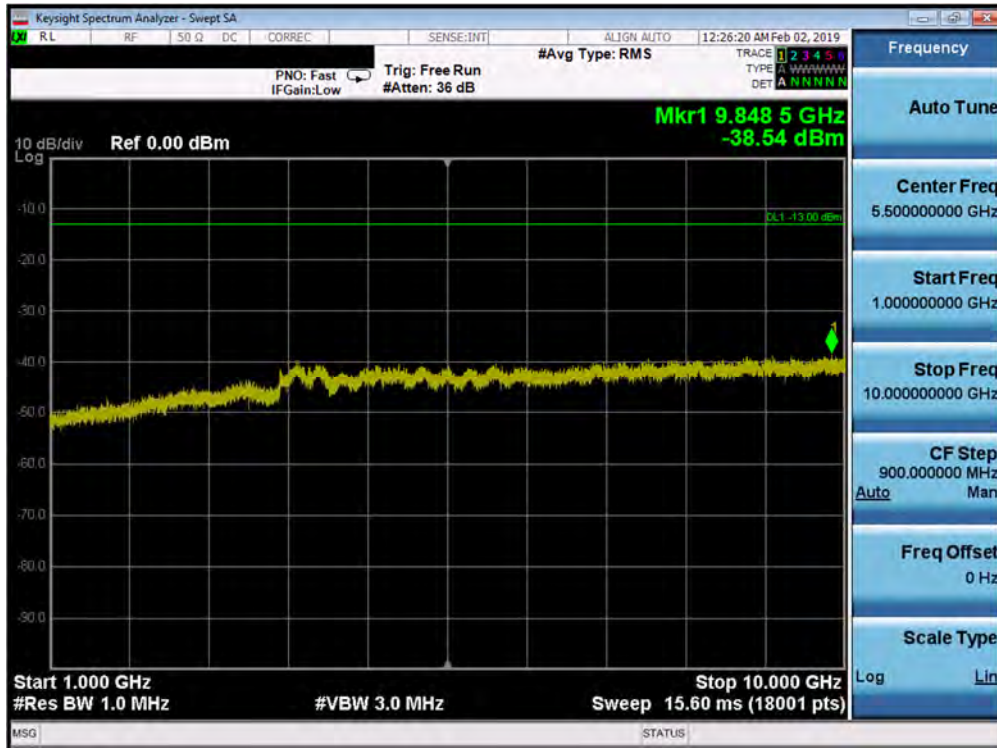


**Plot 7-145. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)**

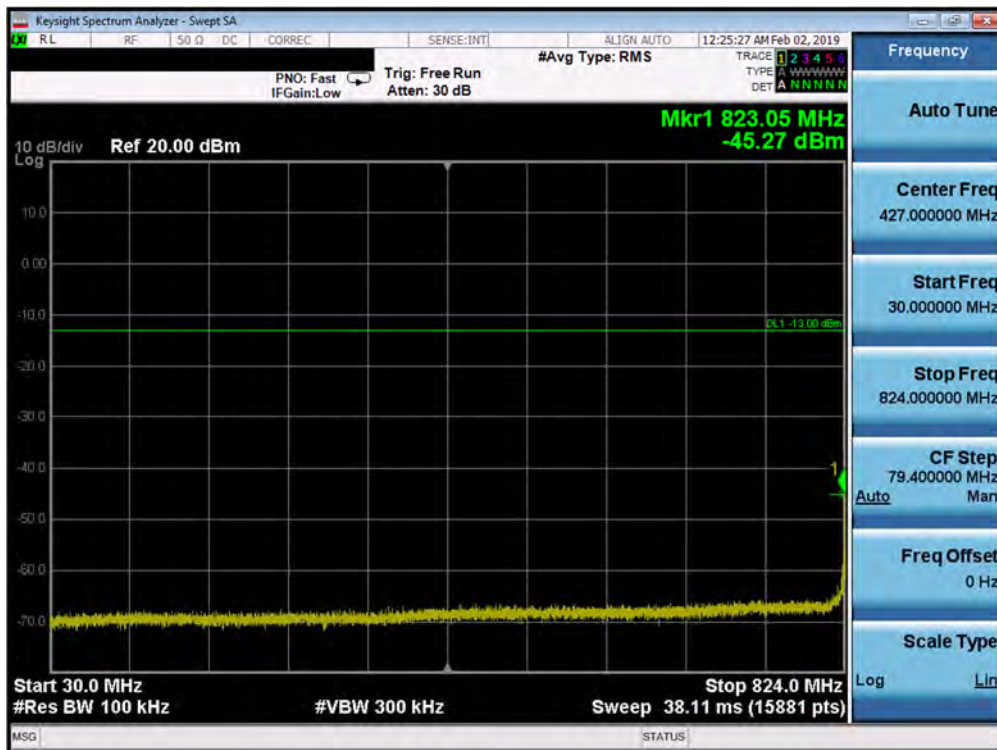


**Plot 7-146. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)**

FCC ID: A3LSMG977U		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 92 of 289

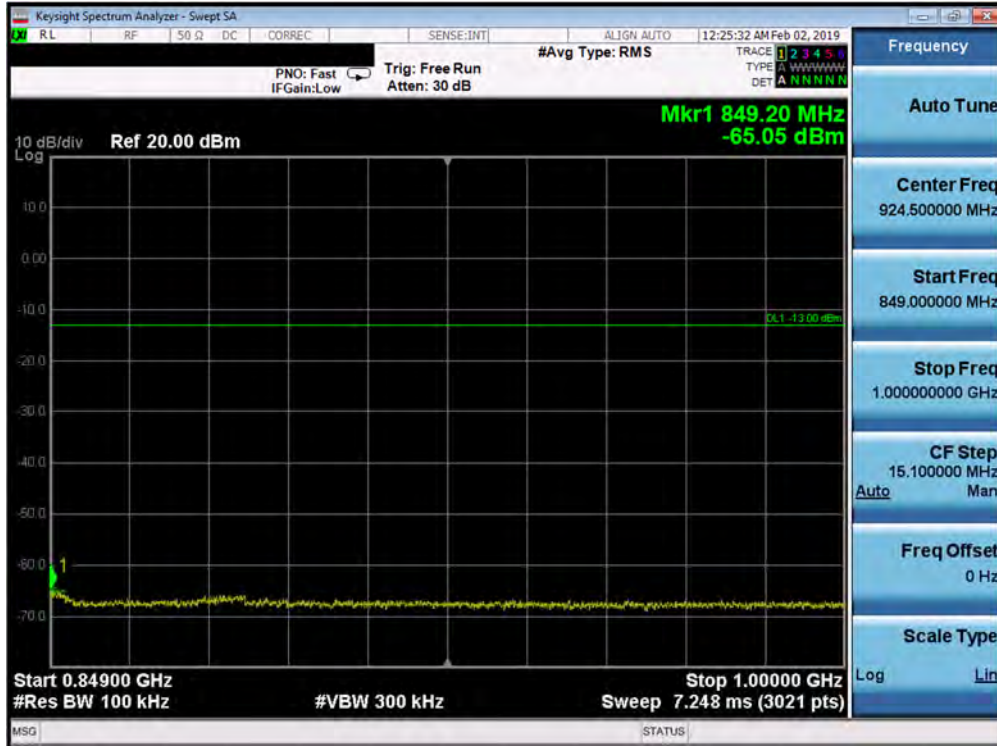


Plot 7-147. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

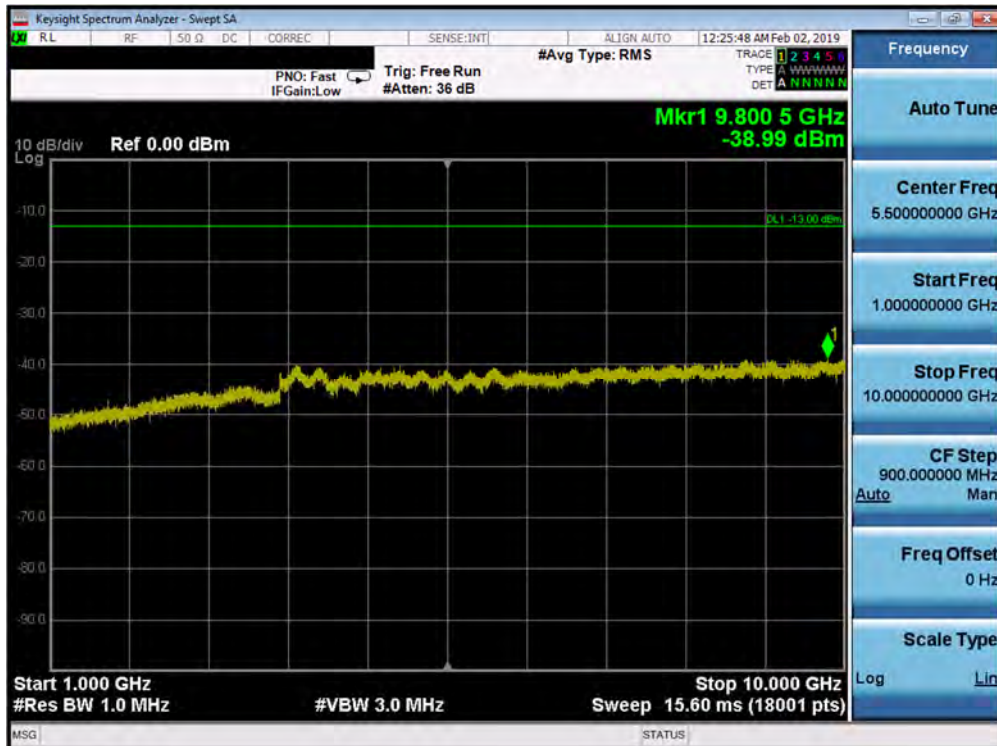


Plot 7-148. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 93 of 289

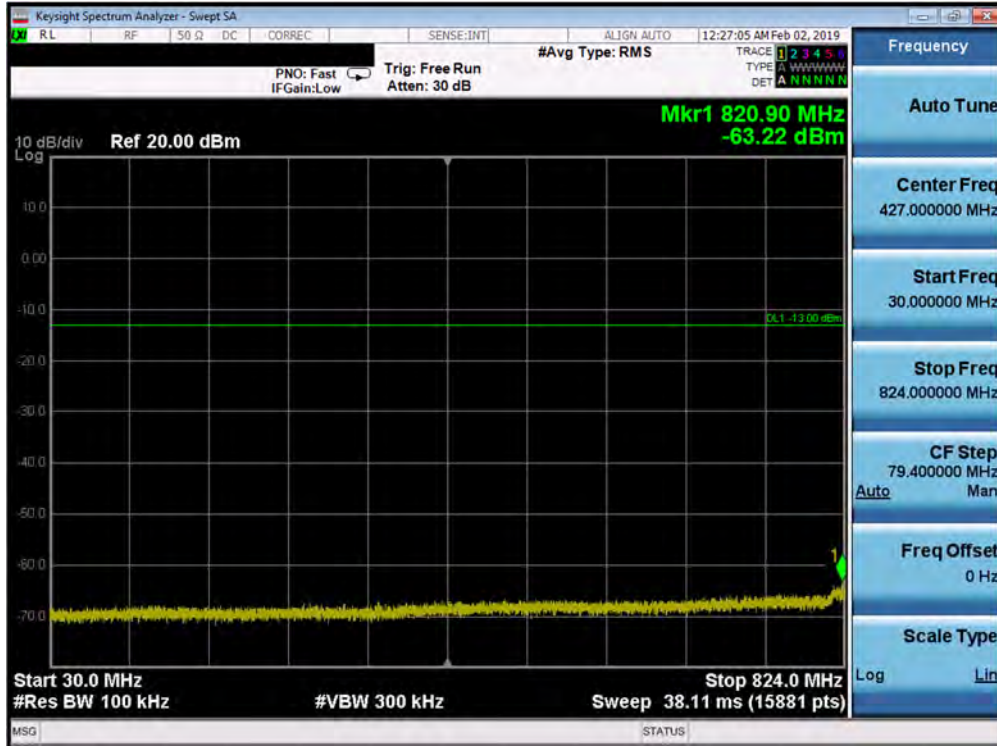


Plot 7-149. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

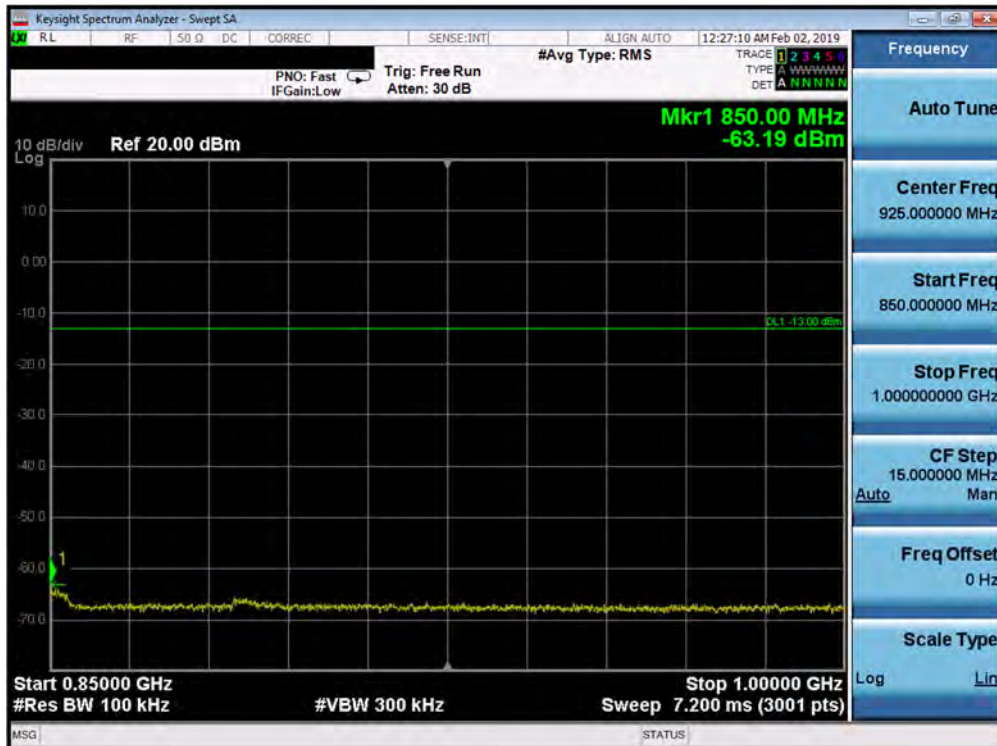


Plot 7-150. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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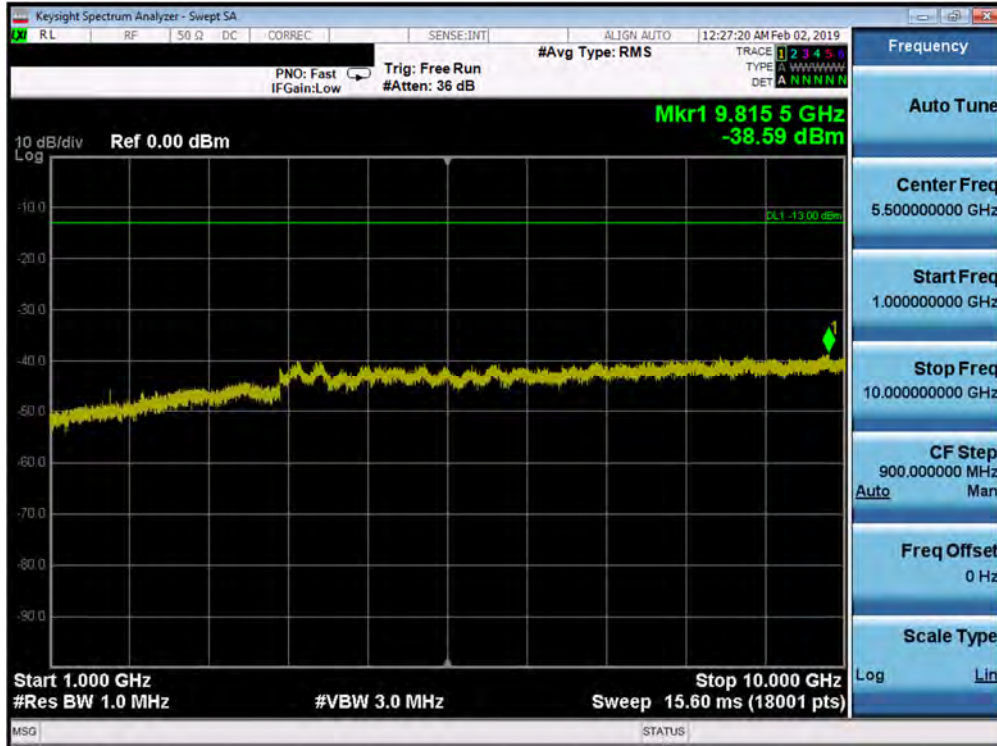
Plot 7-151. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-152. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 95 of 289

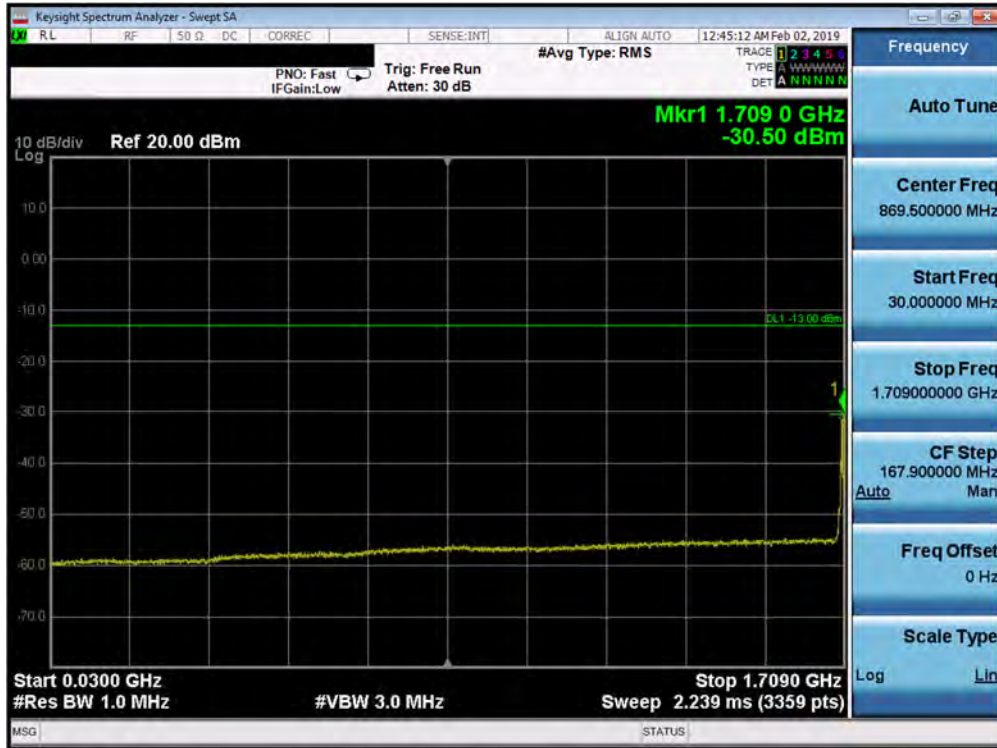




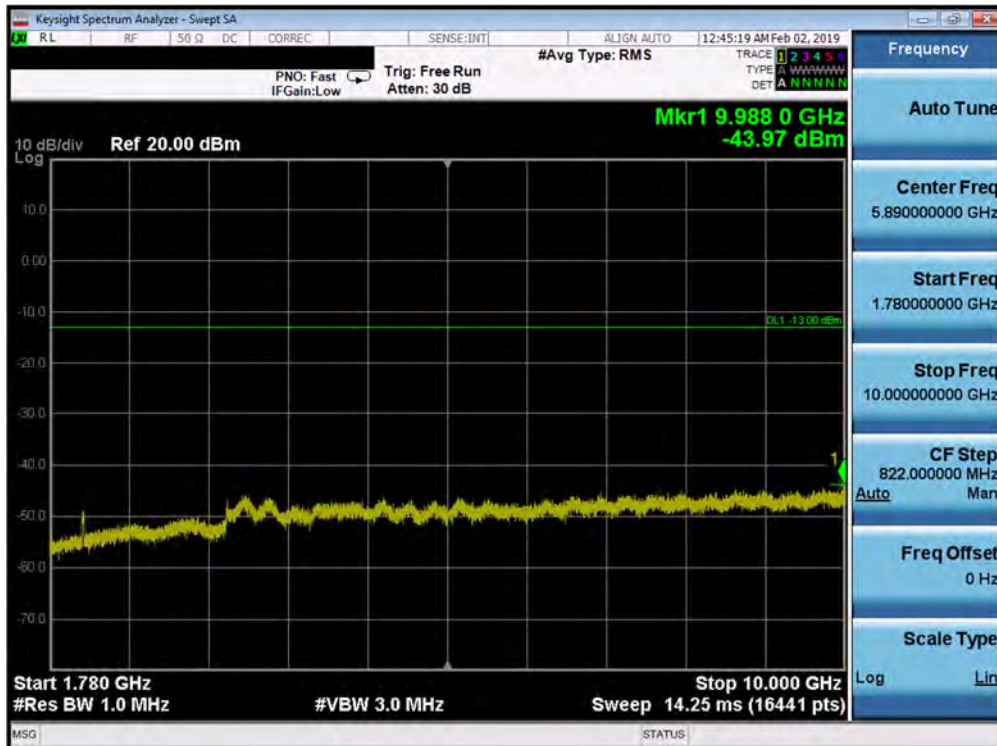
Plot 7-153. Conducted Spurious Plot (Band 26/5 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset	Page 96 of 289	

**Band 66/4**

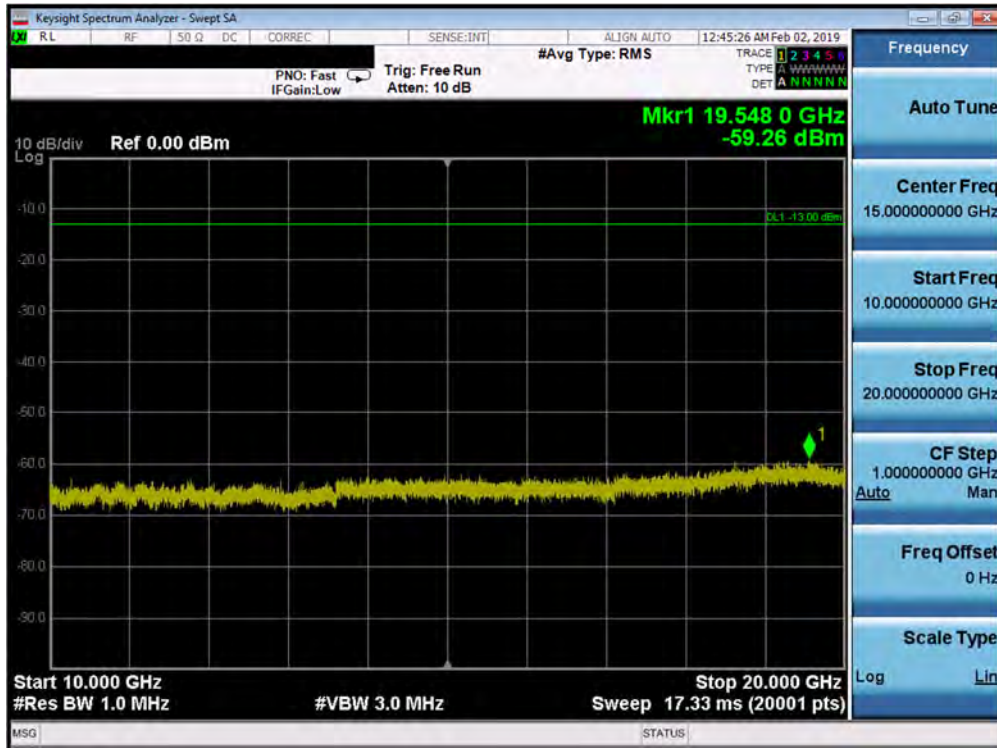


**Plot 7-154. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)**

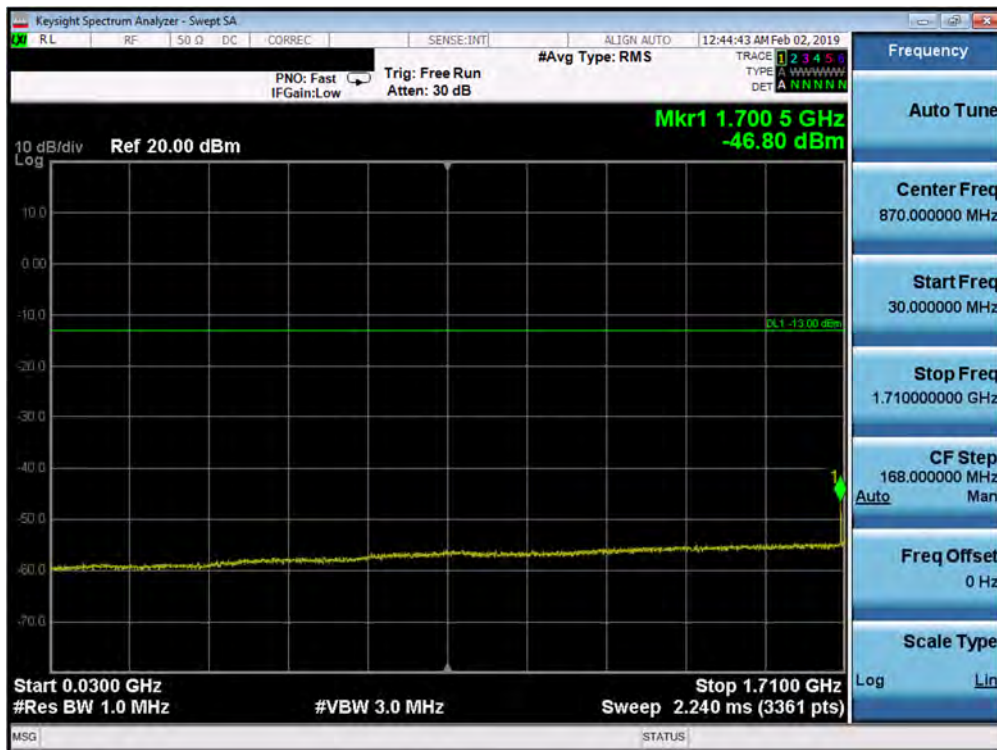


**Plot 7-155. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 97 of 289

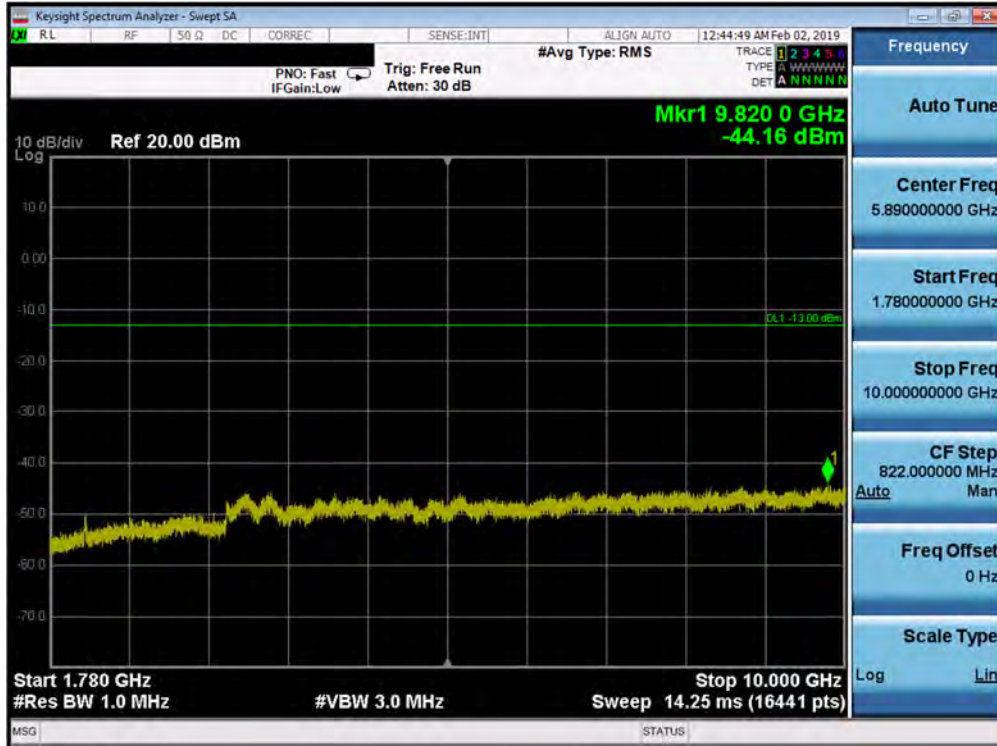


Plot 7-156. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

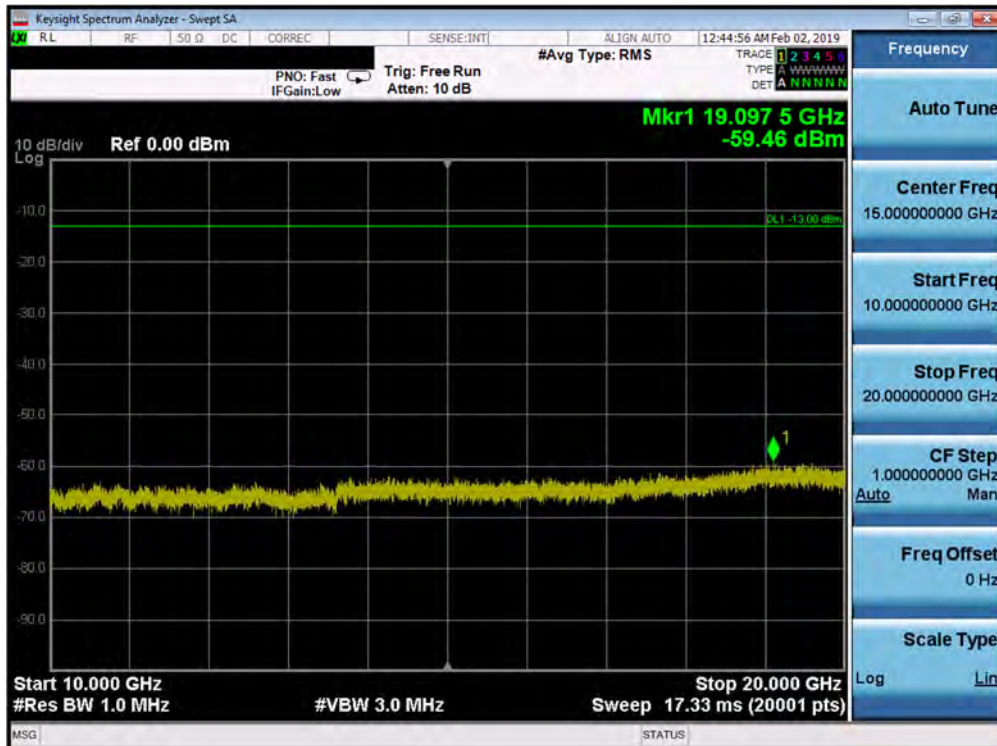


Plot 7-157. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 98 of 289

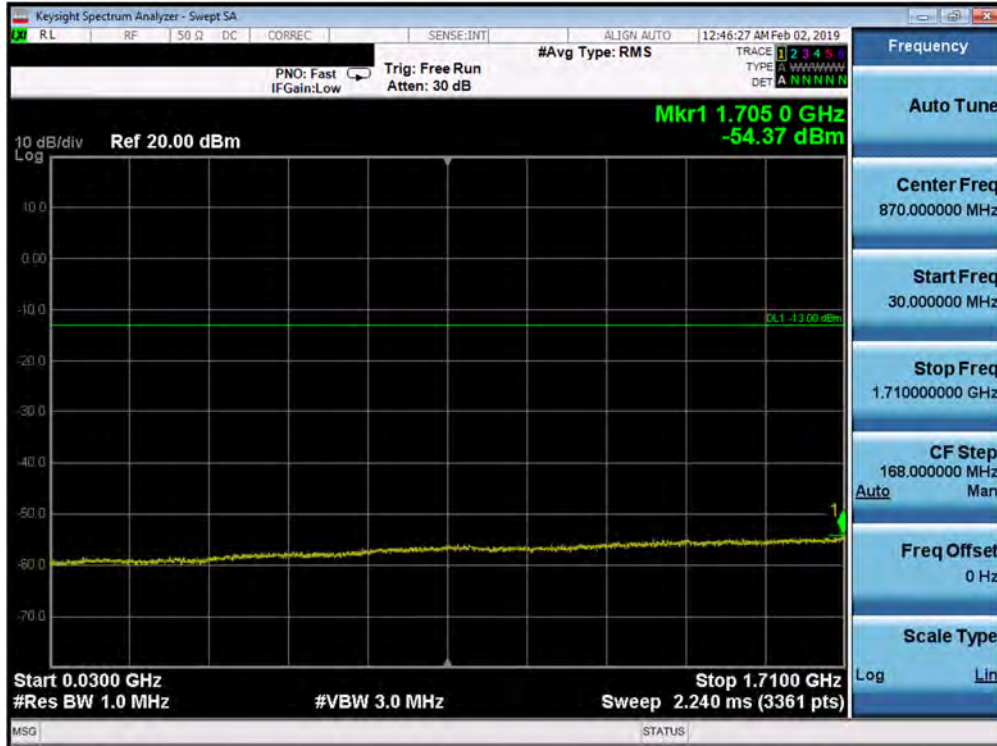


Plot 7-158. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

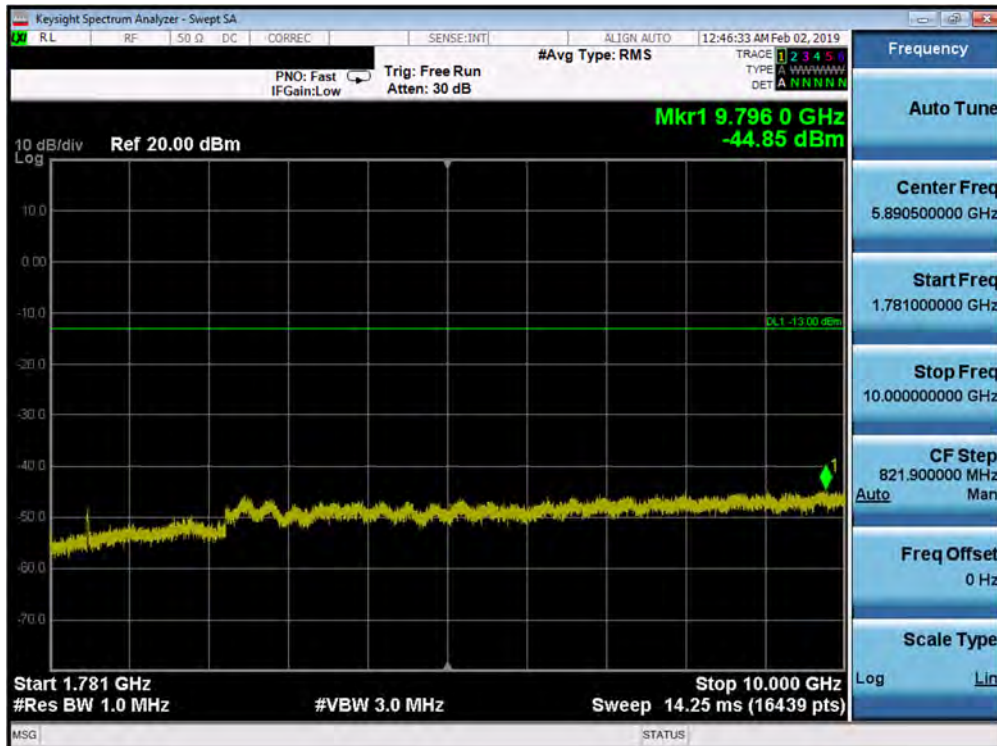


Plot 7-159. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 99 of 289

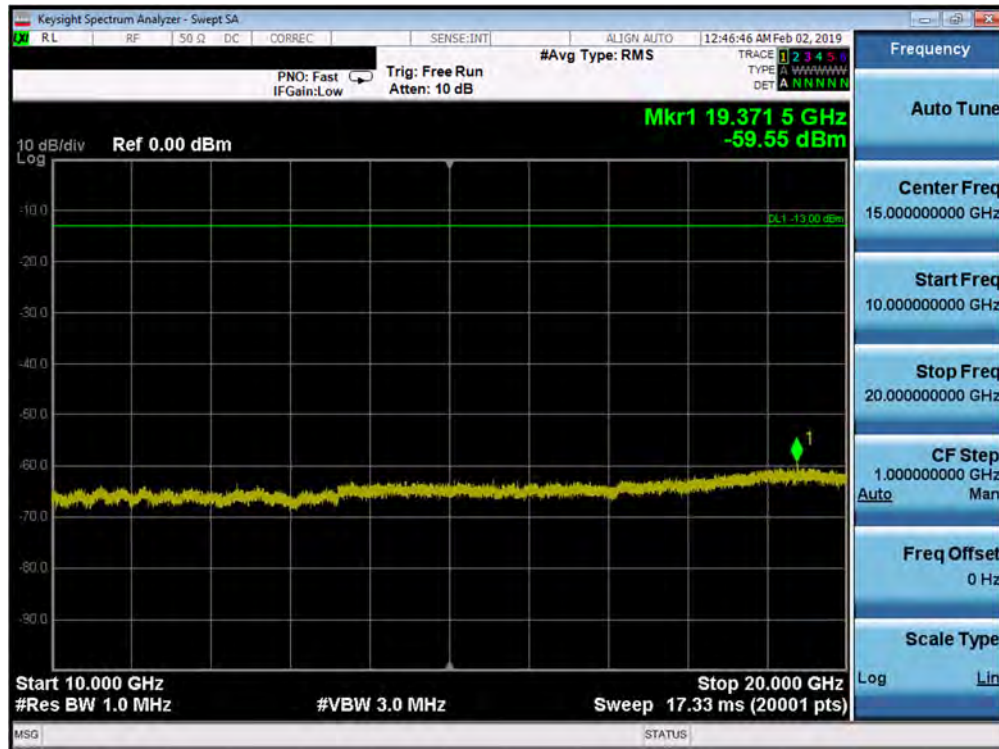


Plot 7-160. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-161. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

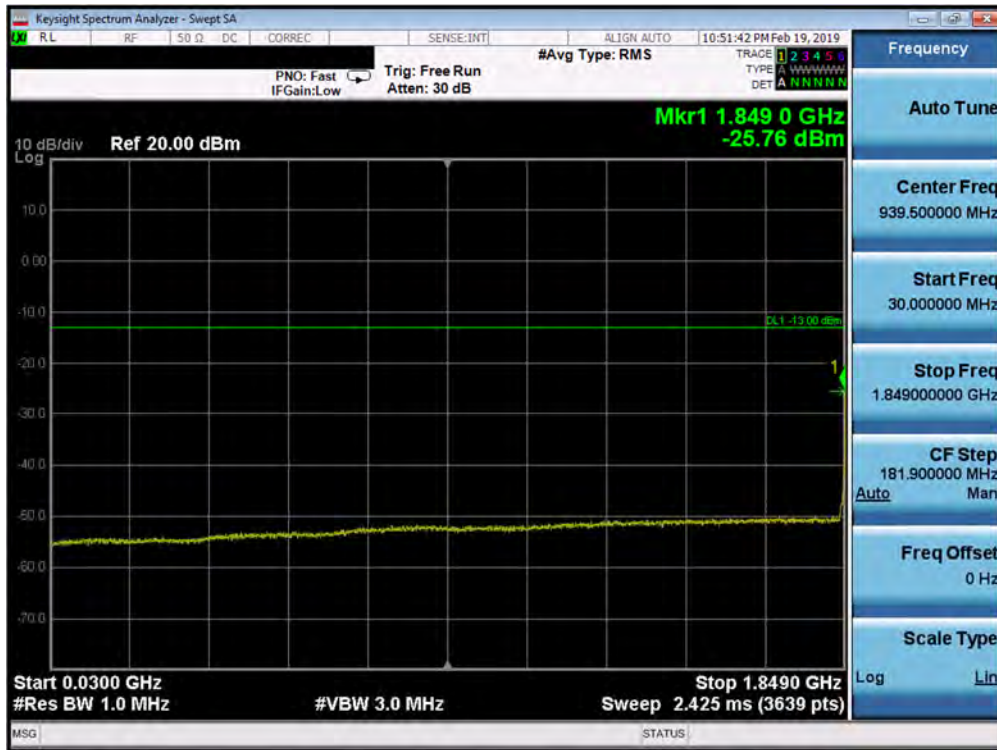
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 100 of 289



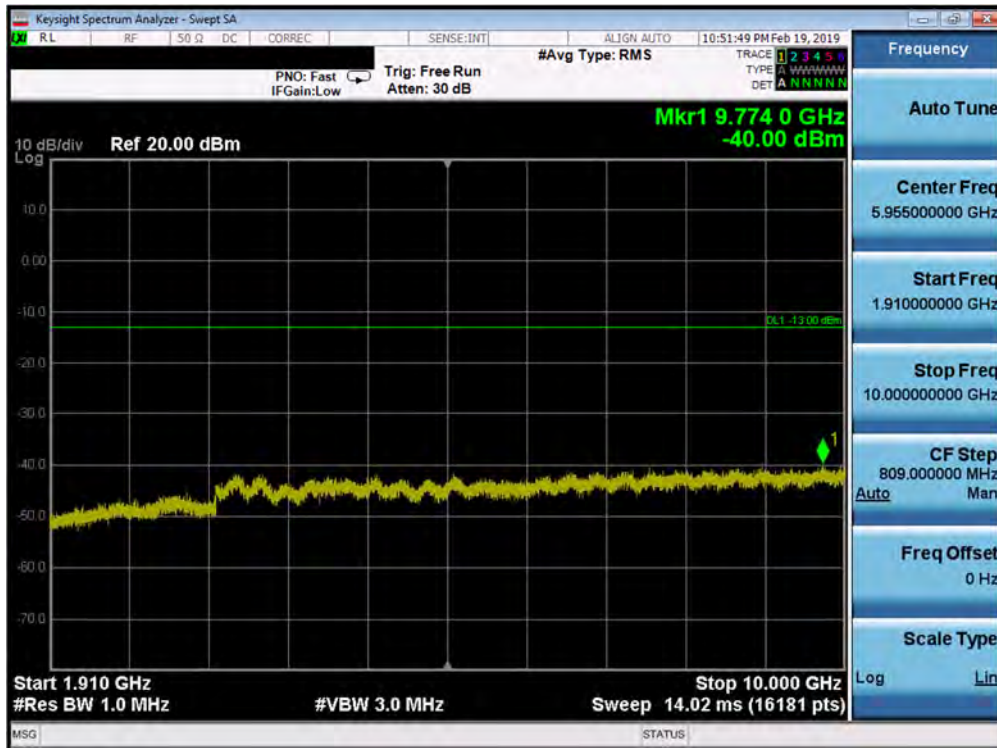
Plot 7-162. Conducted Spurious Plot (Band 66/4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 101 of 289

**Band 2**

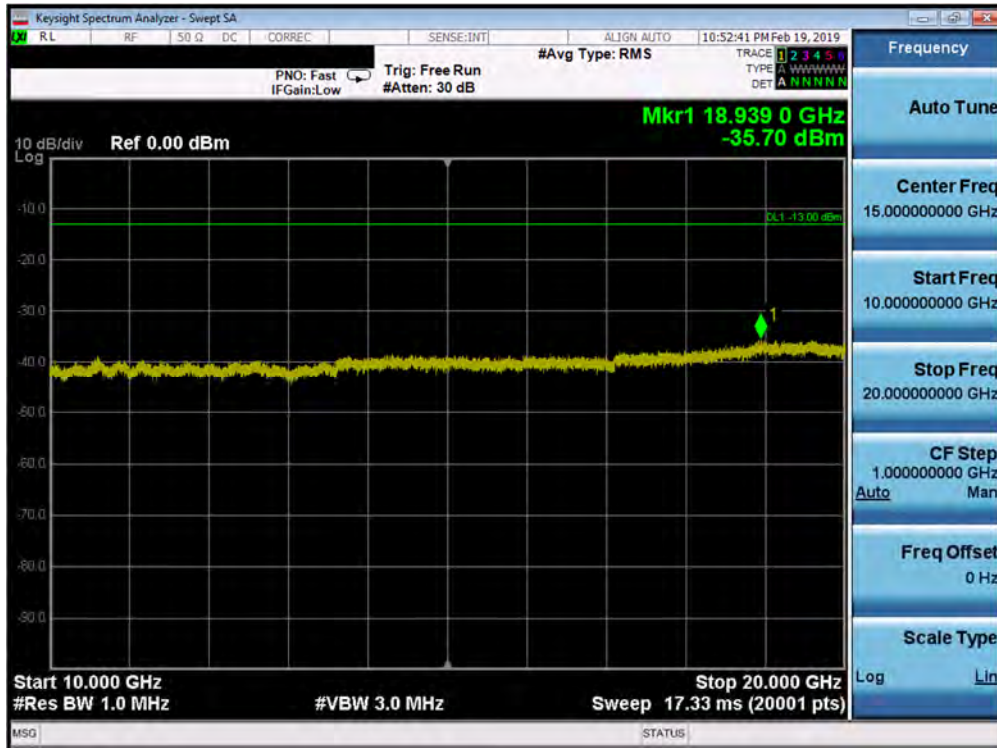


Plot 7-163. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

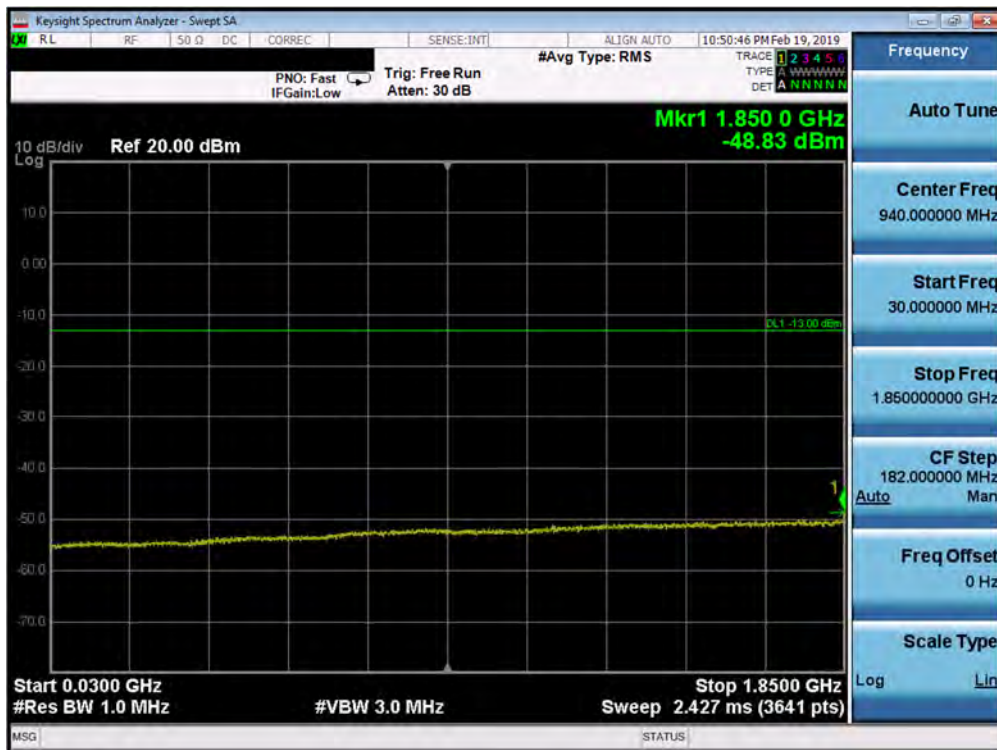


Plot 7-164. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 102 of 289



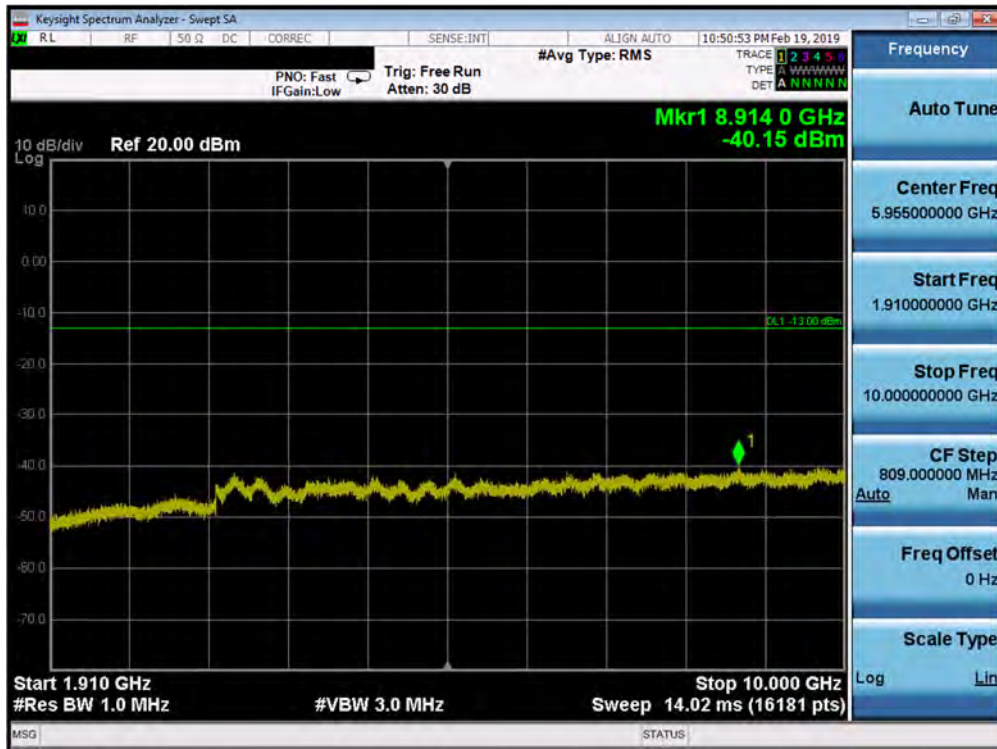
Plot 7-165. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



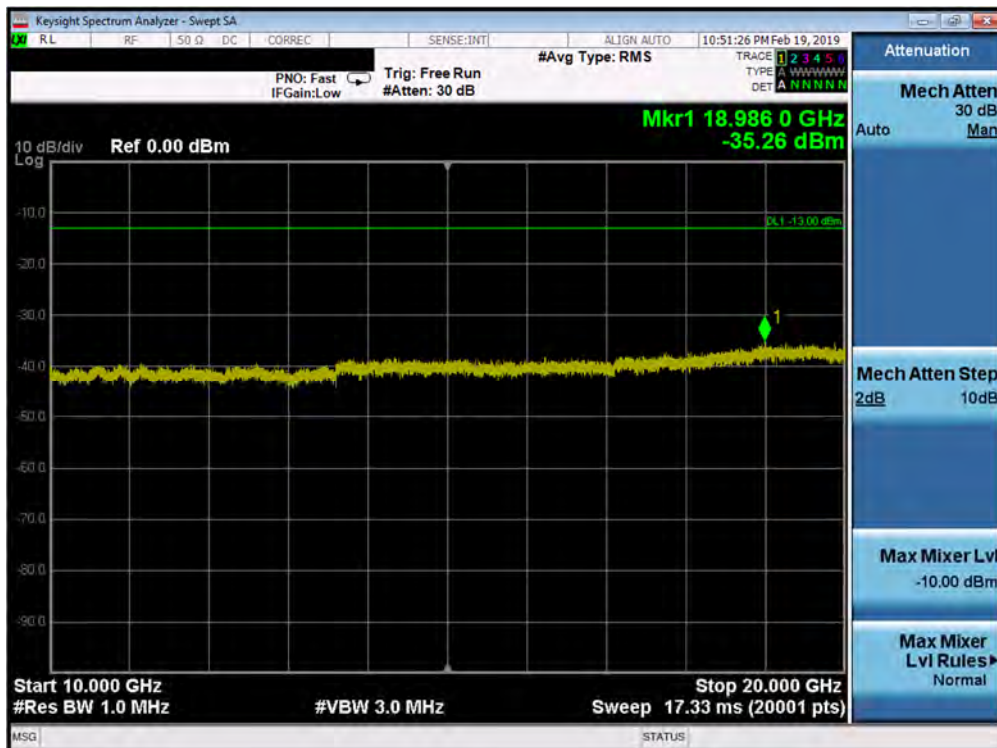
Plot 7-166. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 103 of 289



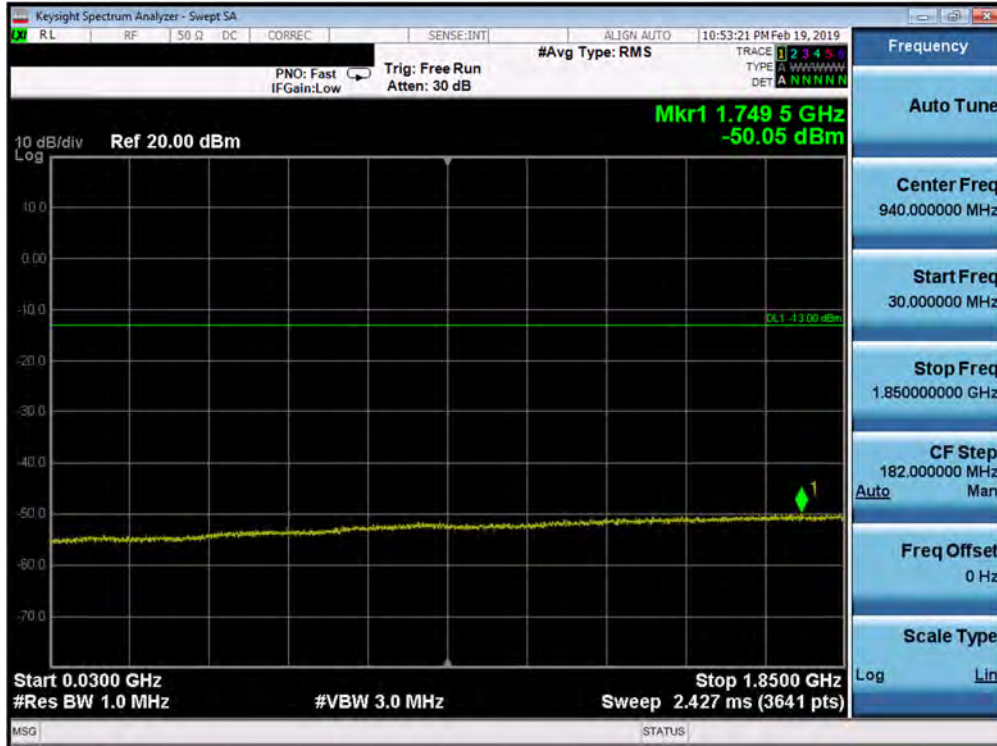


Plot 7-167. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

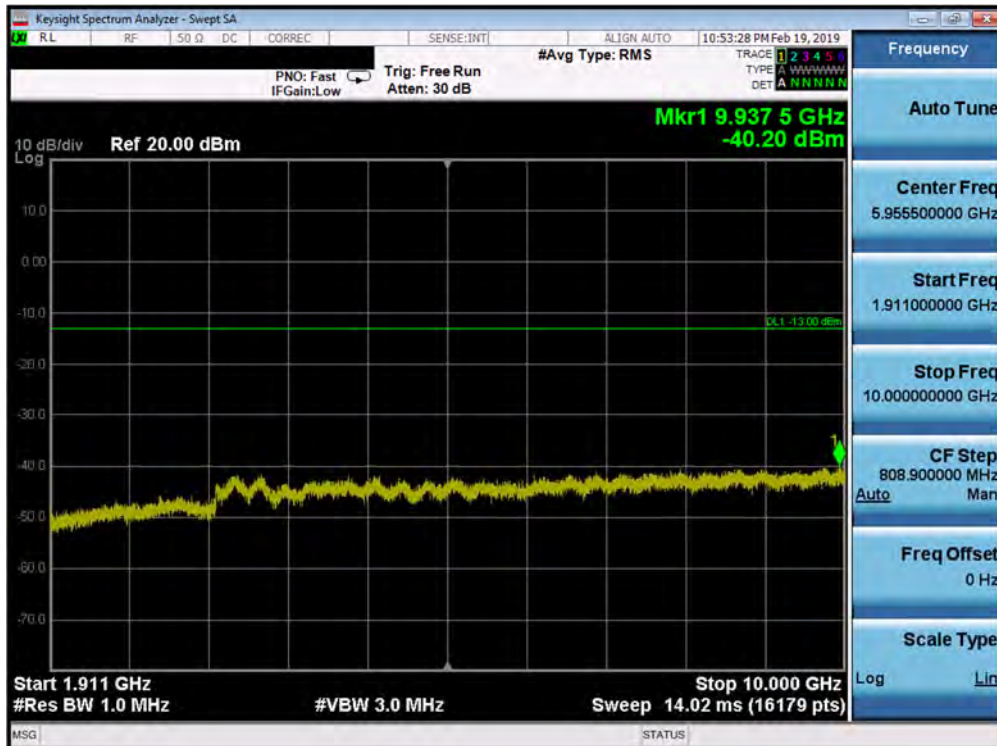


Plot 7-168. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 104 of 289

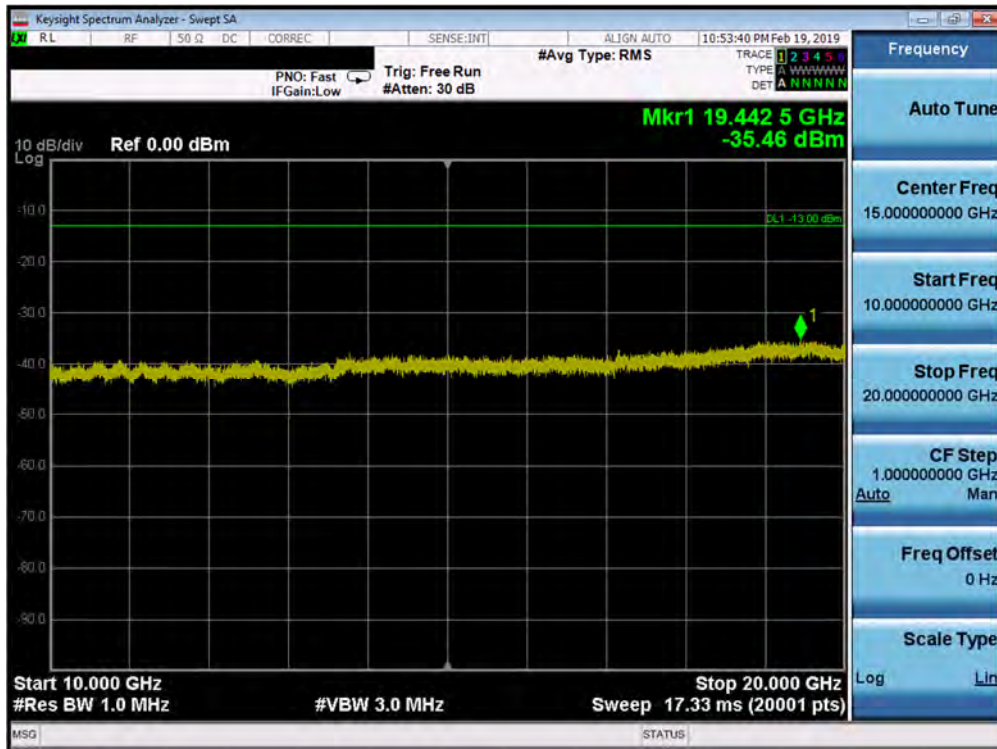


Plot 7-169. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-170. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 105 of 289



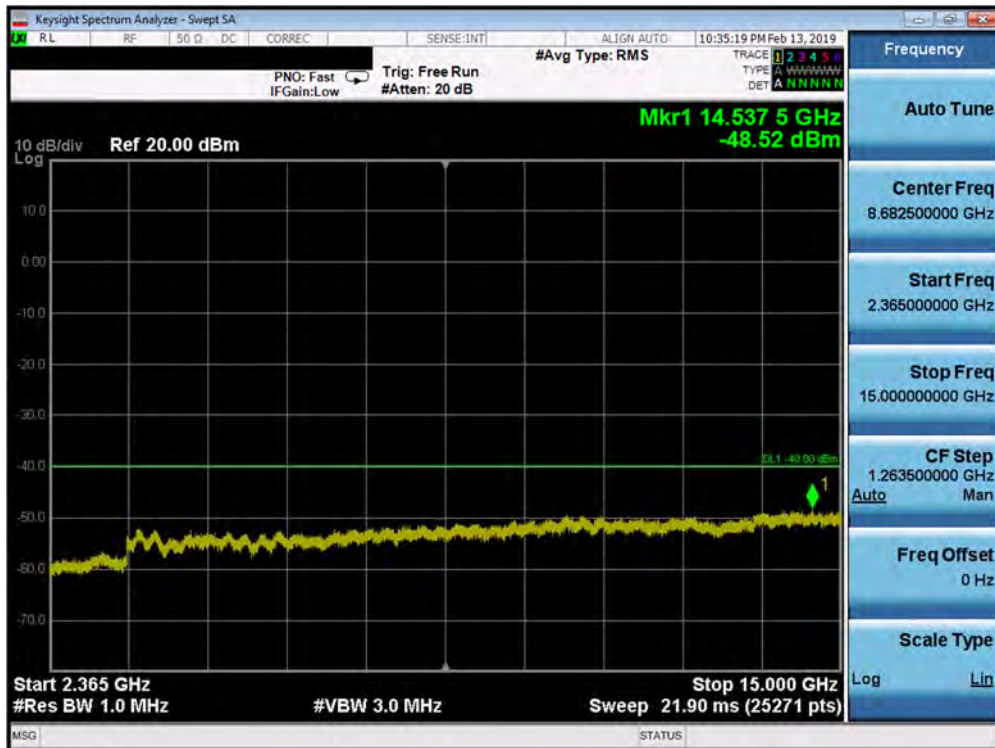
Plot 7-171. Conducted Spurious Plot (Band 2 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
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**Band 30**

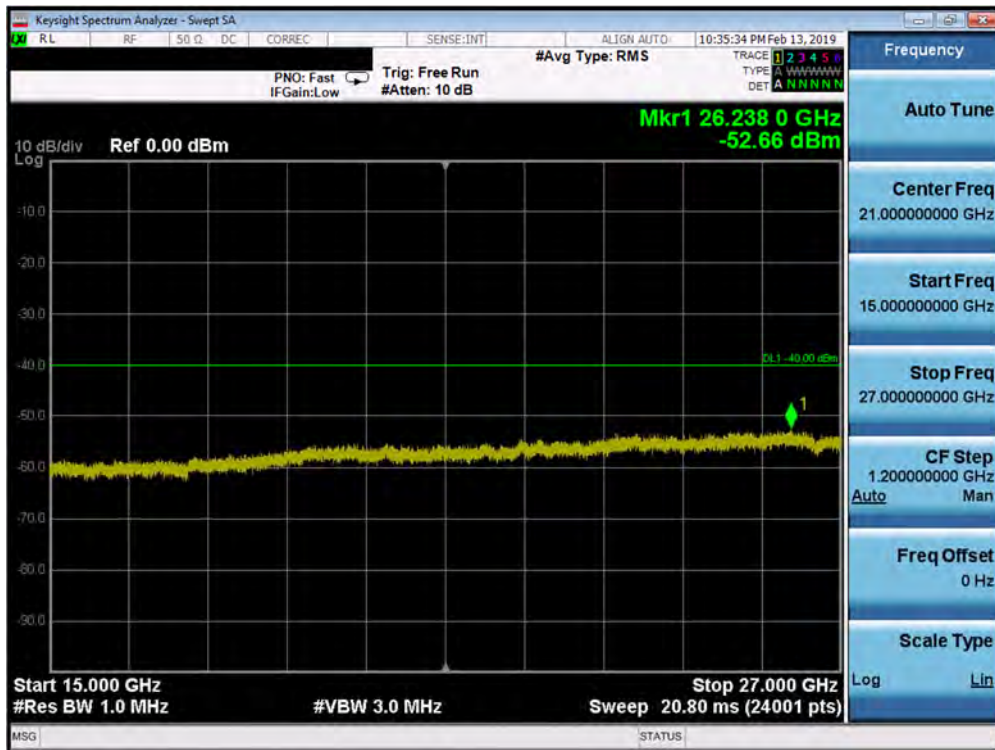


Plot 7-172. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-173. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 107 of 289

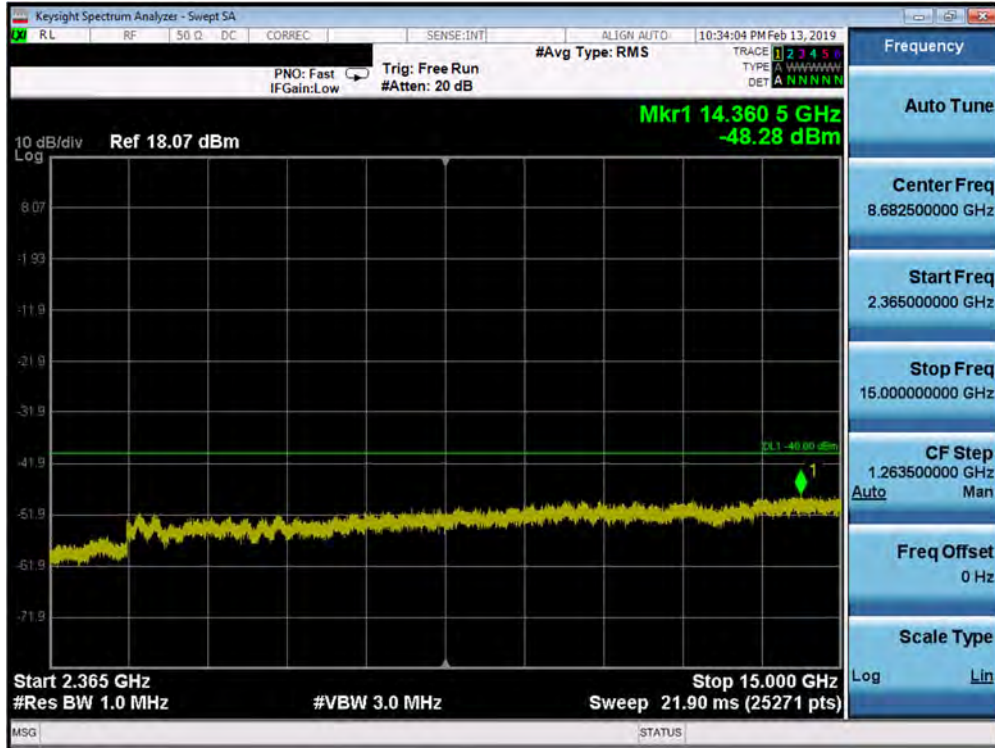


Plot 7-174. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

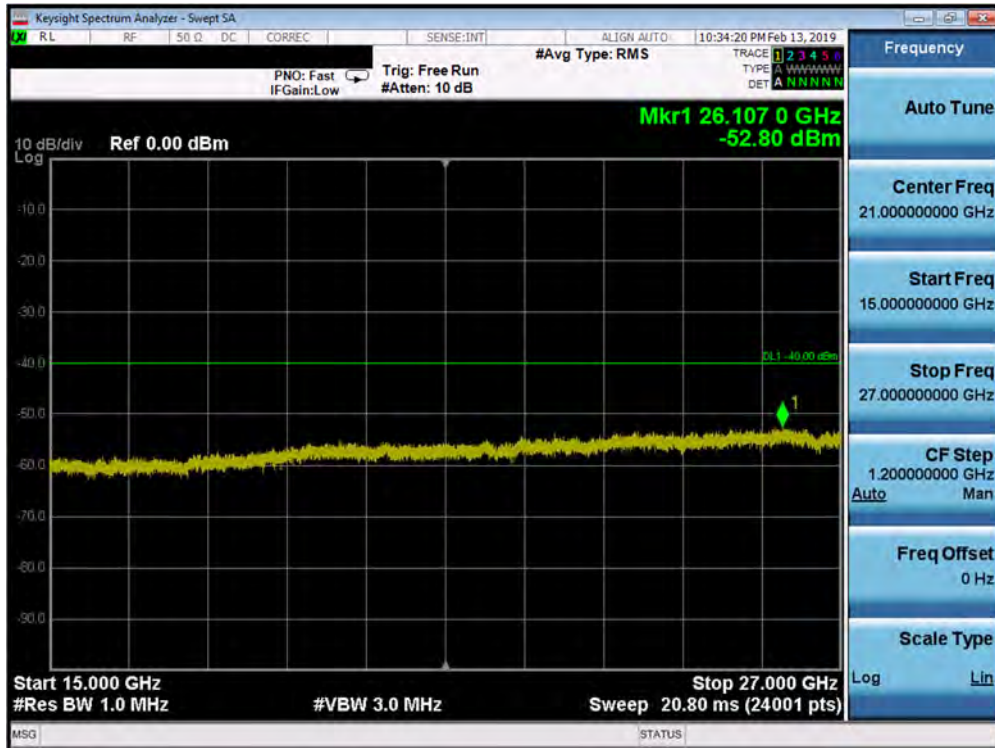


Plot 7-175. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 108 of 289

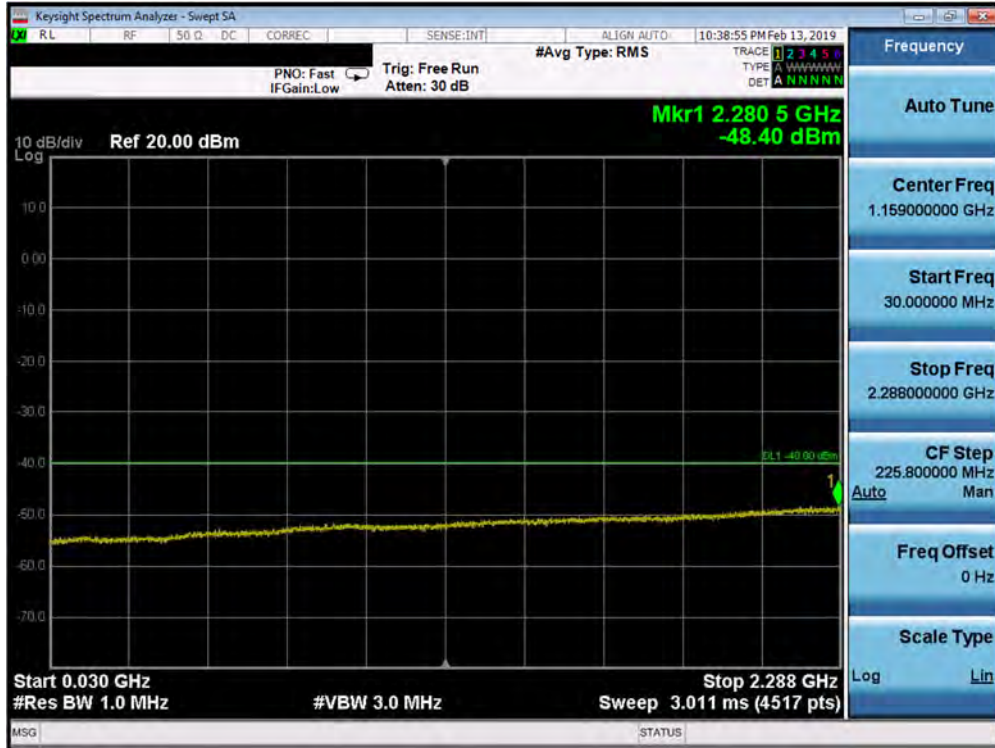


Plot 7-176. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

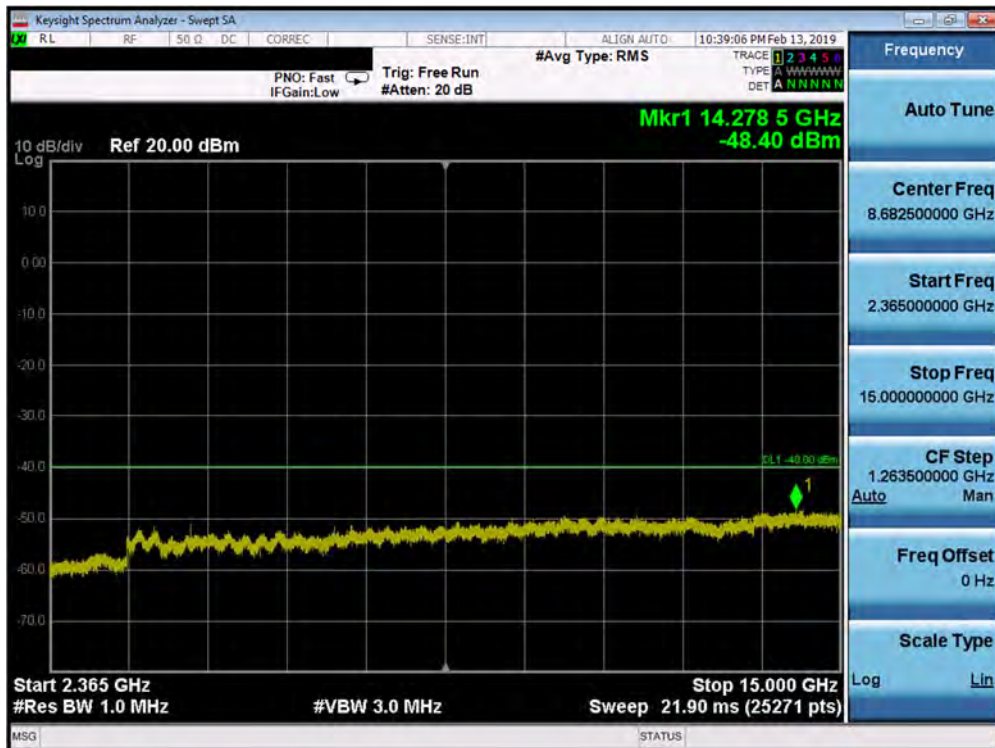


Plot 7-177. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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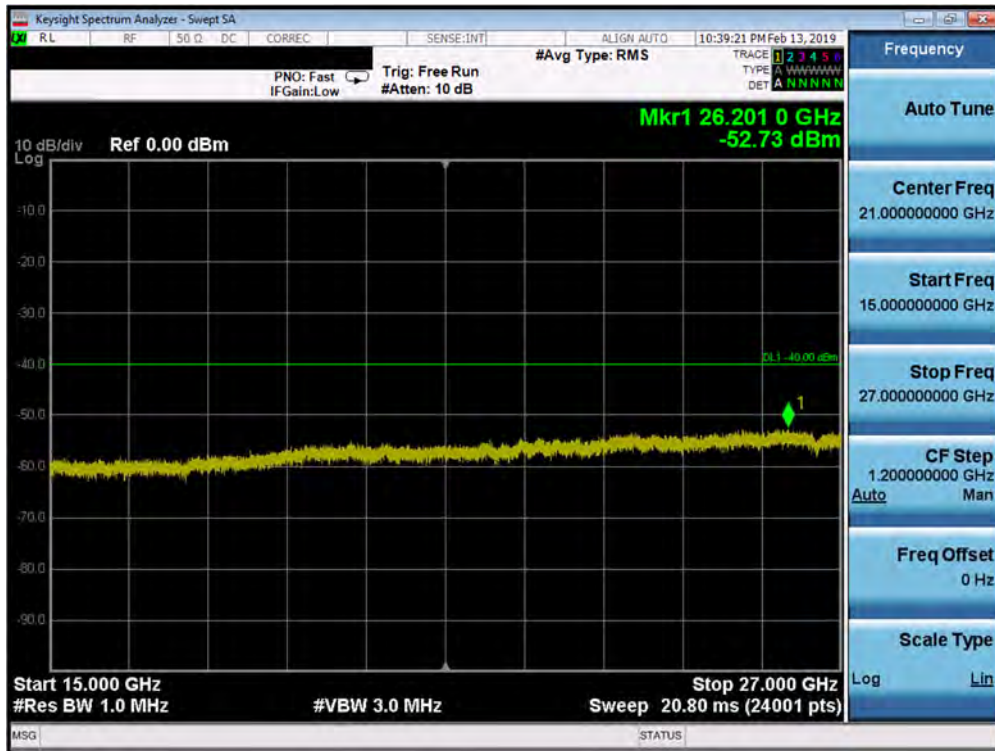


Plot 7-178. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-179. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 110 of 289

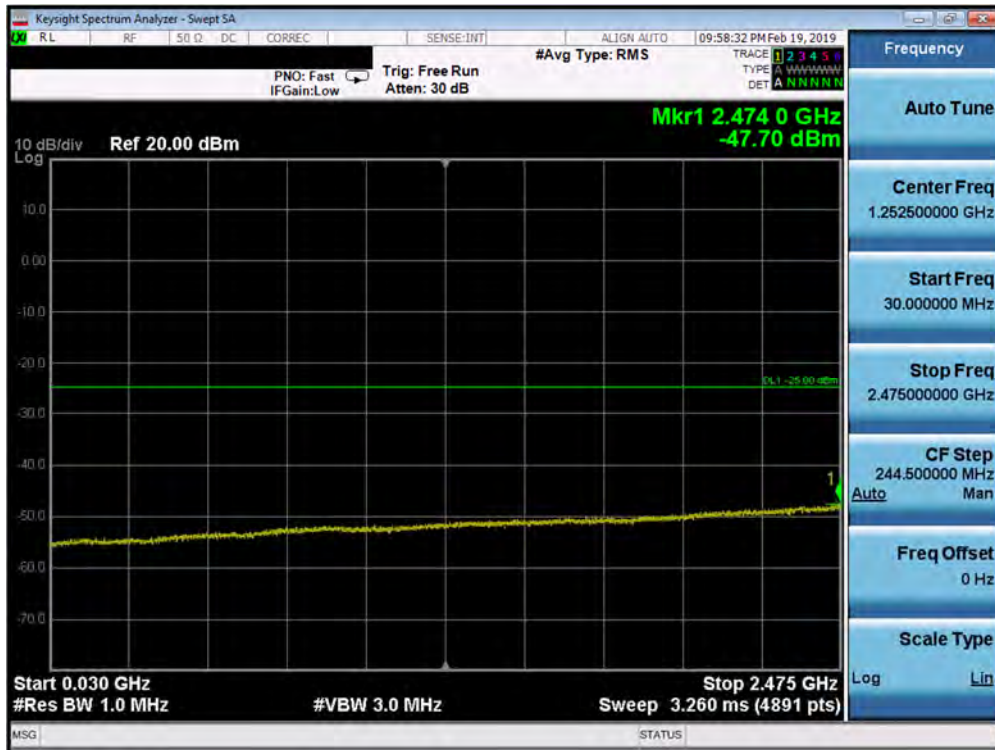


Plot 7-180. Conducted Spurious Plot (Band 30 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 111 of 289

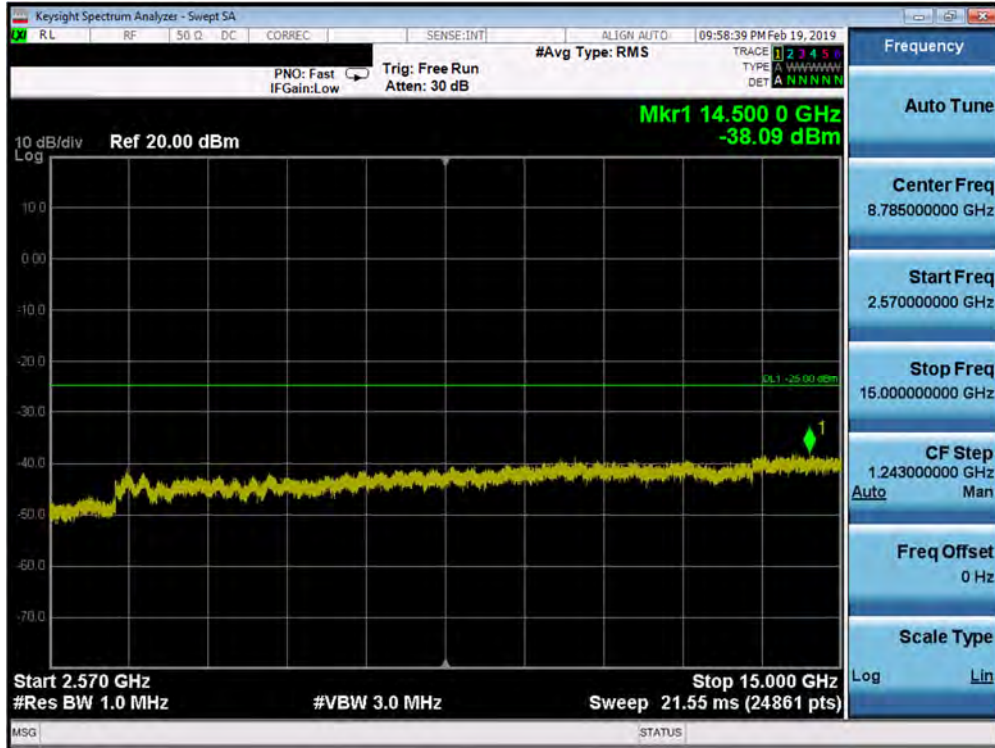


**Band 7**

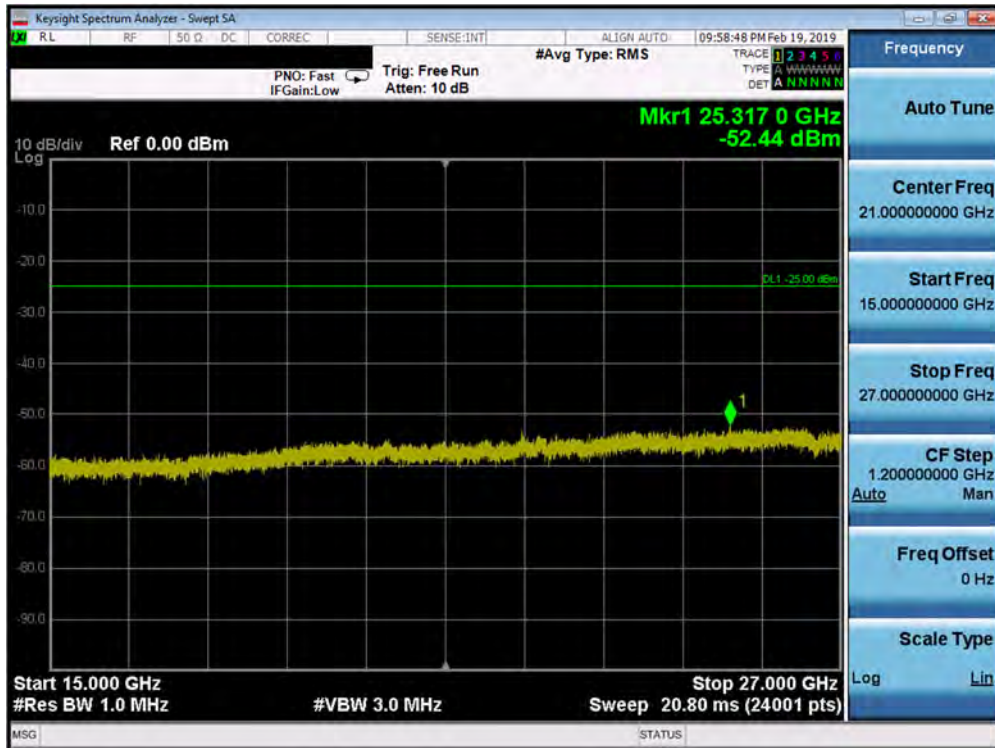


Plot 7-181. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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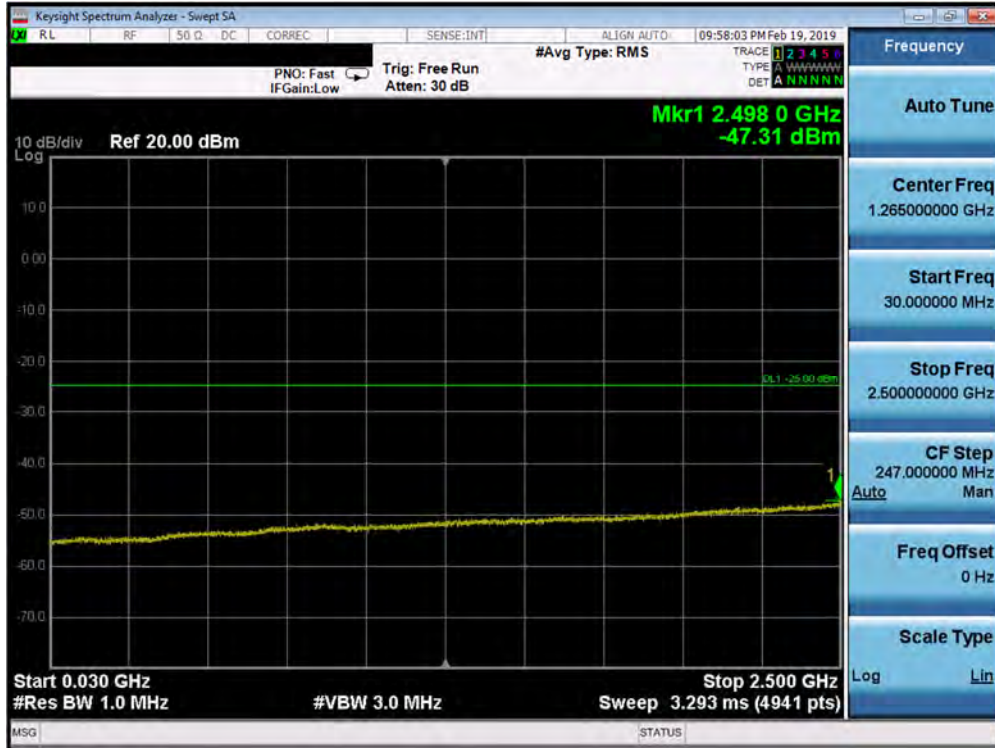


Plot 7-182. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

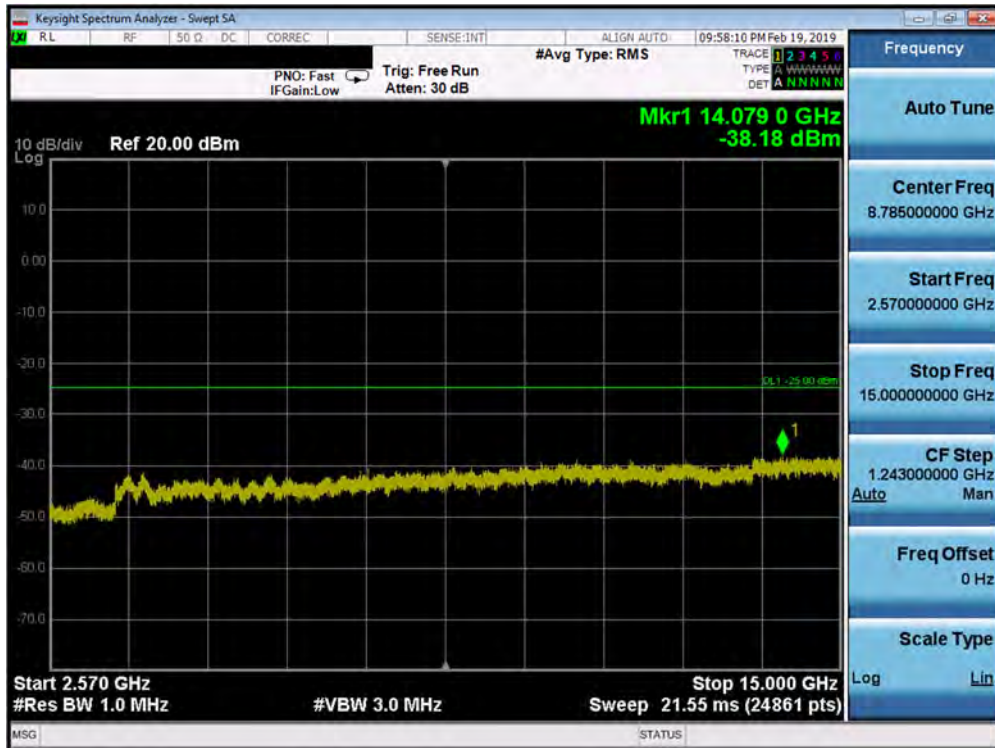


Plot 7-183. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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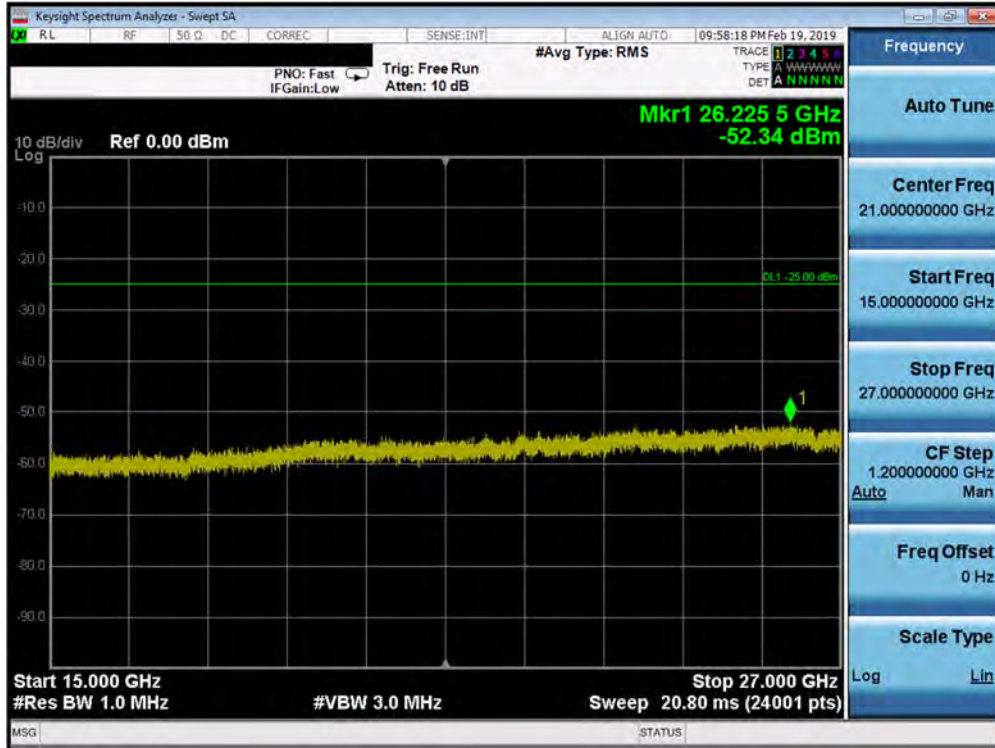


Plot 7-184. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

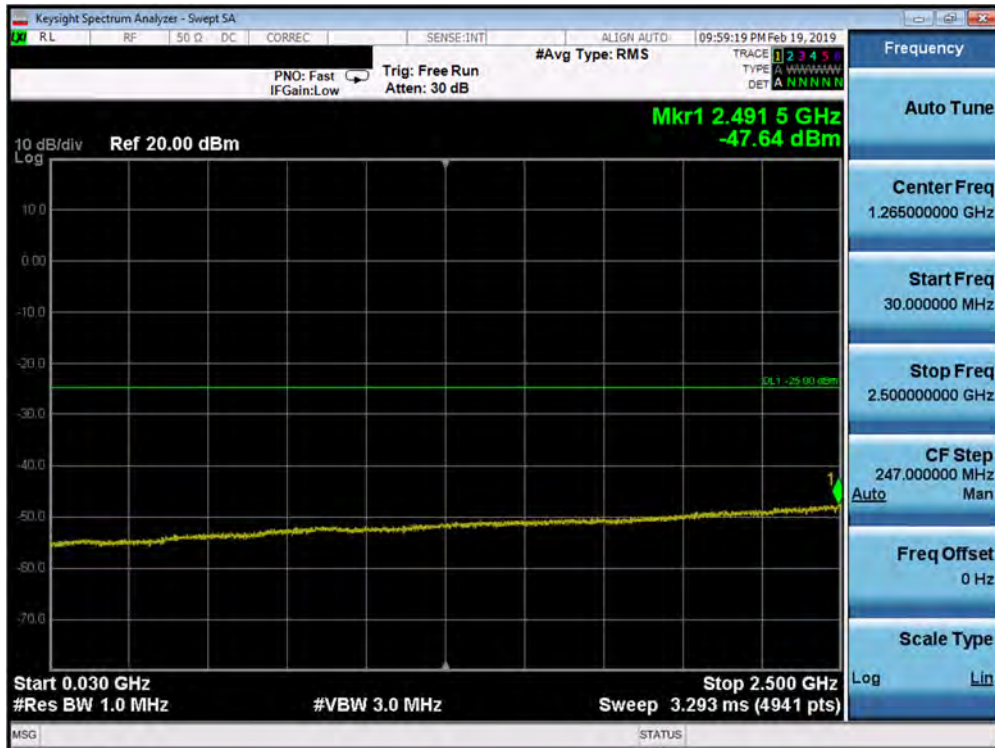


Plot 7-185. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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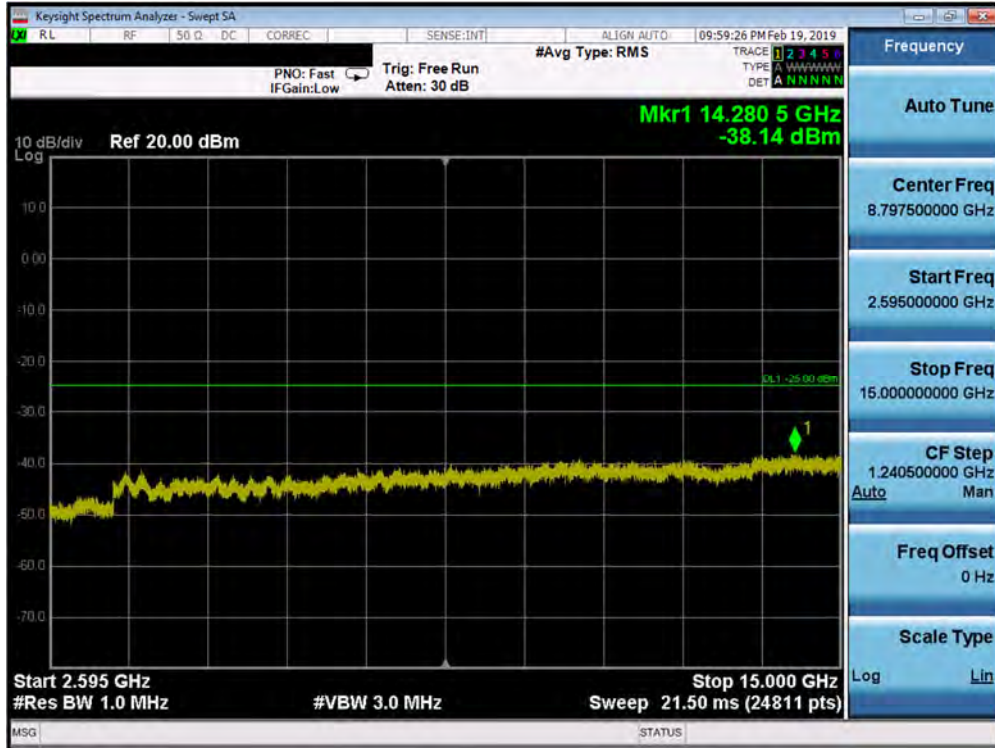


Plot 7-186. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

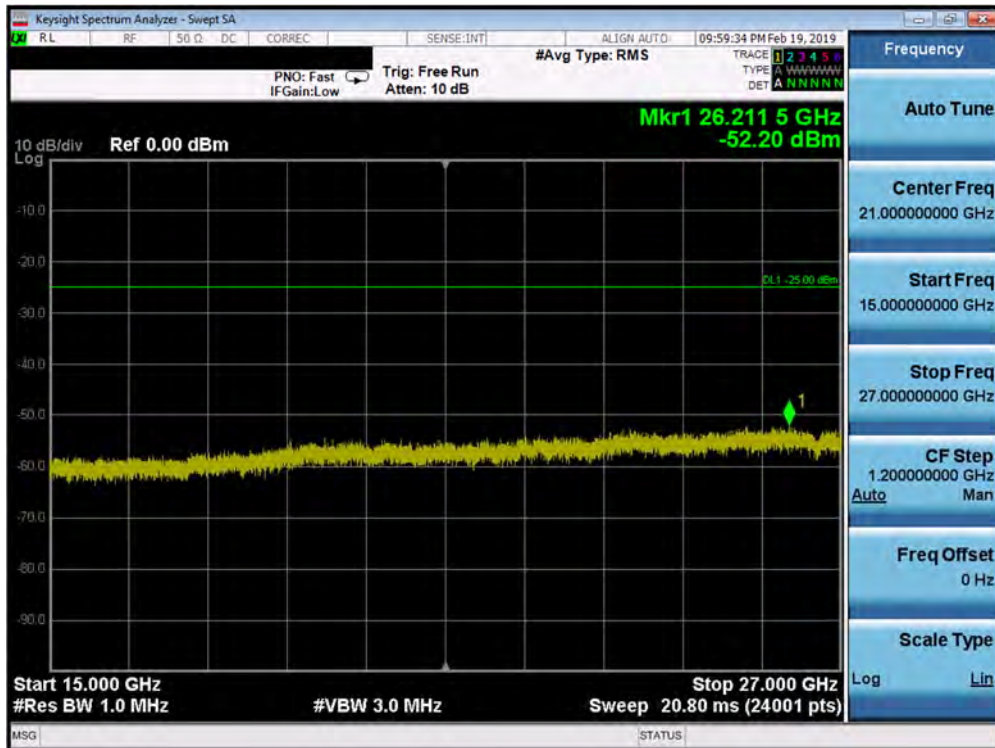


Plot 7-187. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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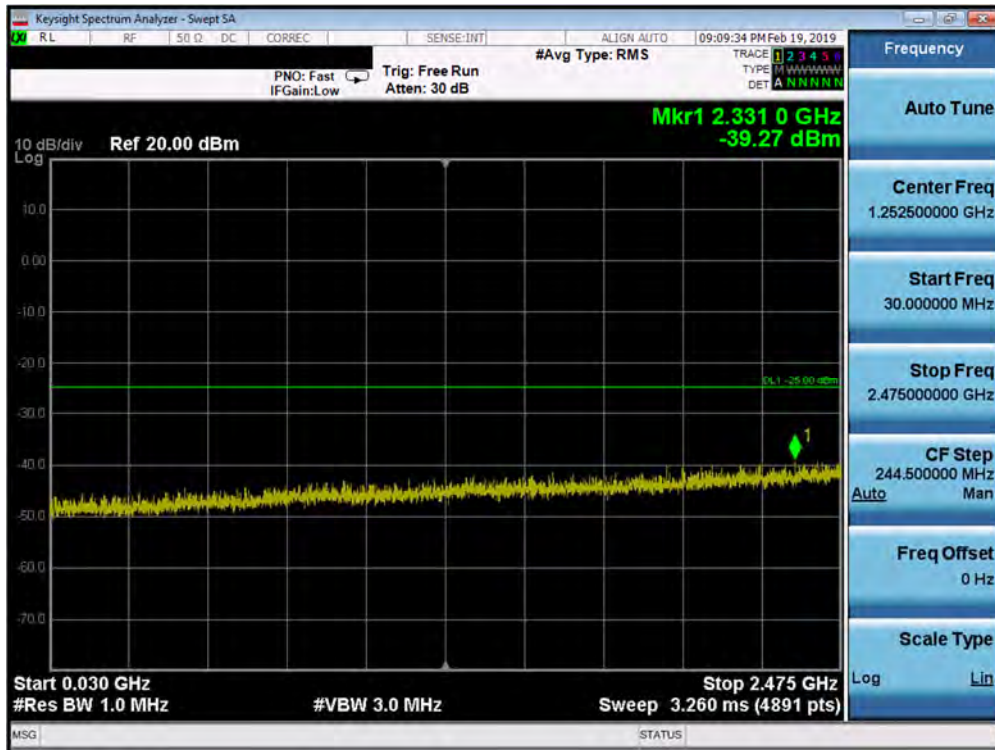
Plot 7-188. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



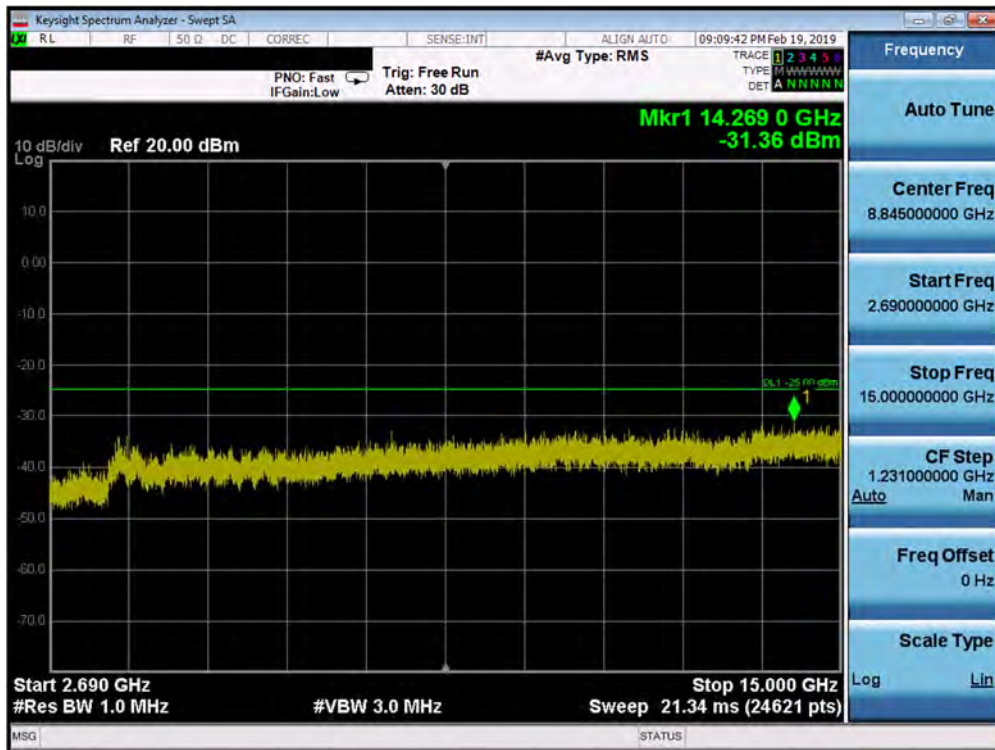
Plot 7-189. Conducted Spurious Plot (Band 7 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**Band 41 (PC3) / Band 38**

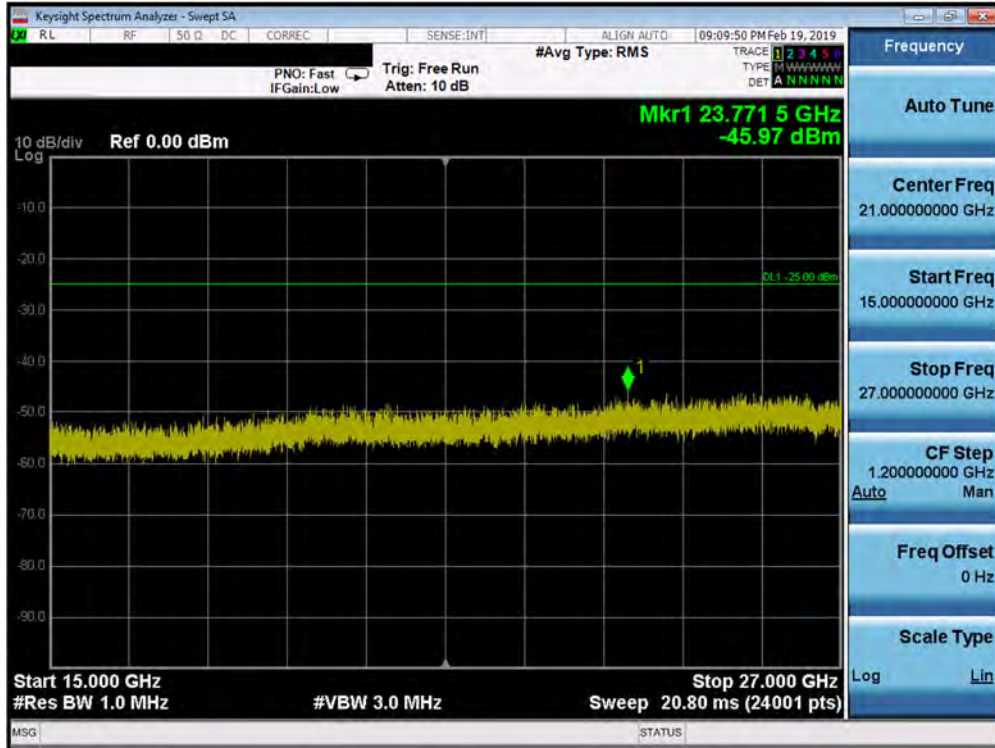


Plot 7-190. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

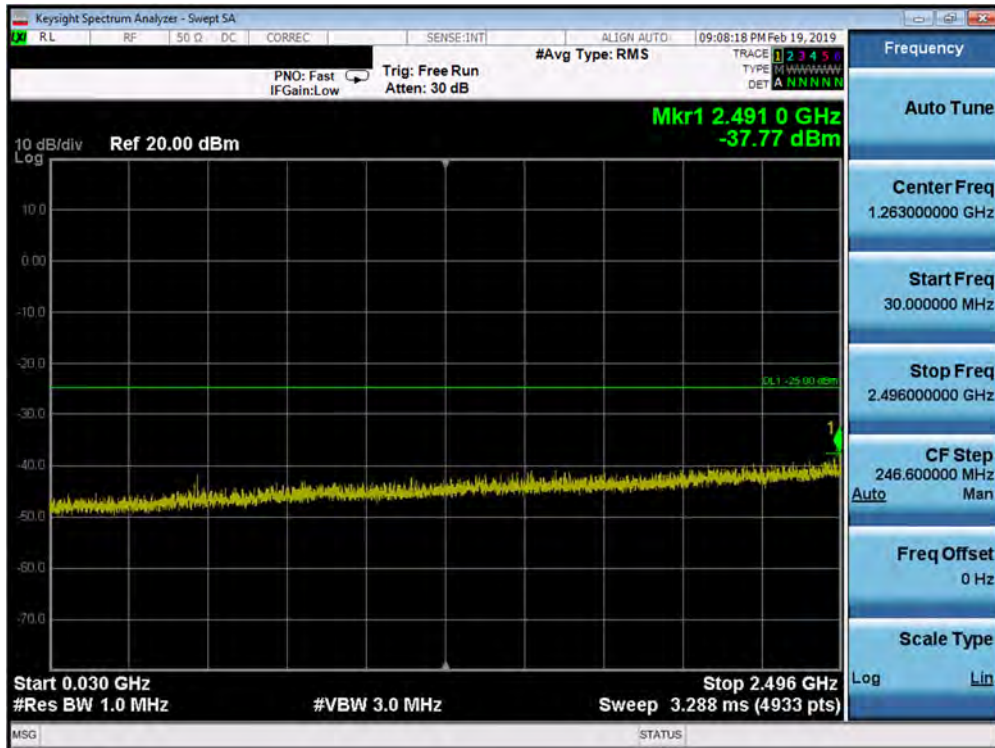


Plot 7-191. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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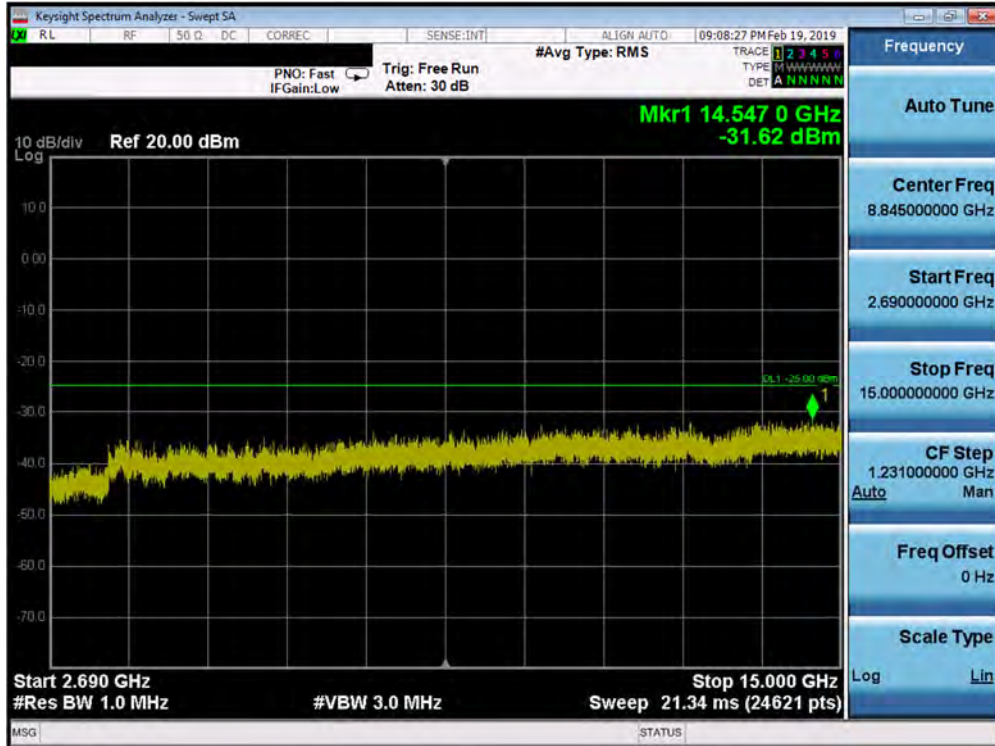


Plot 7-192. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

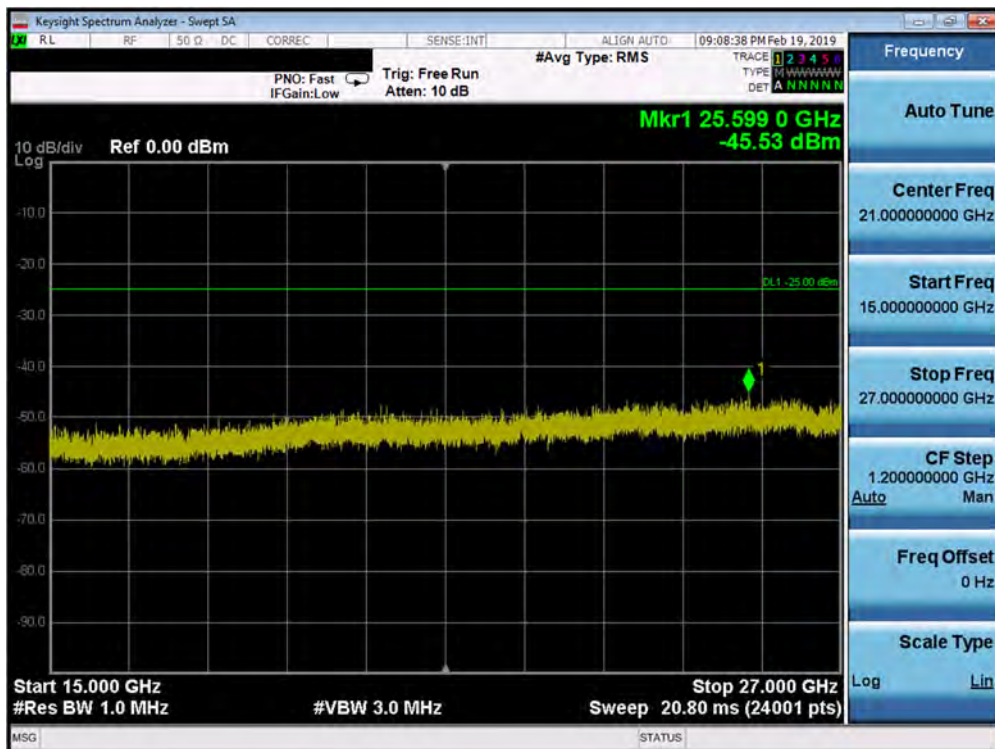


Plot 7-193. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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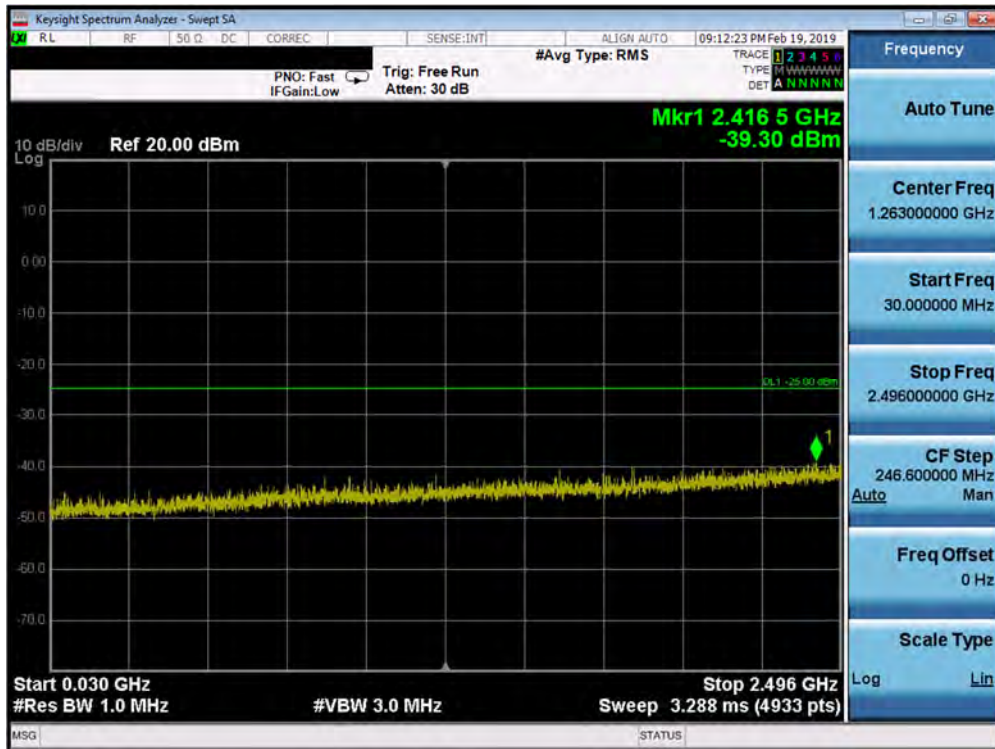
Plot 7-194. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



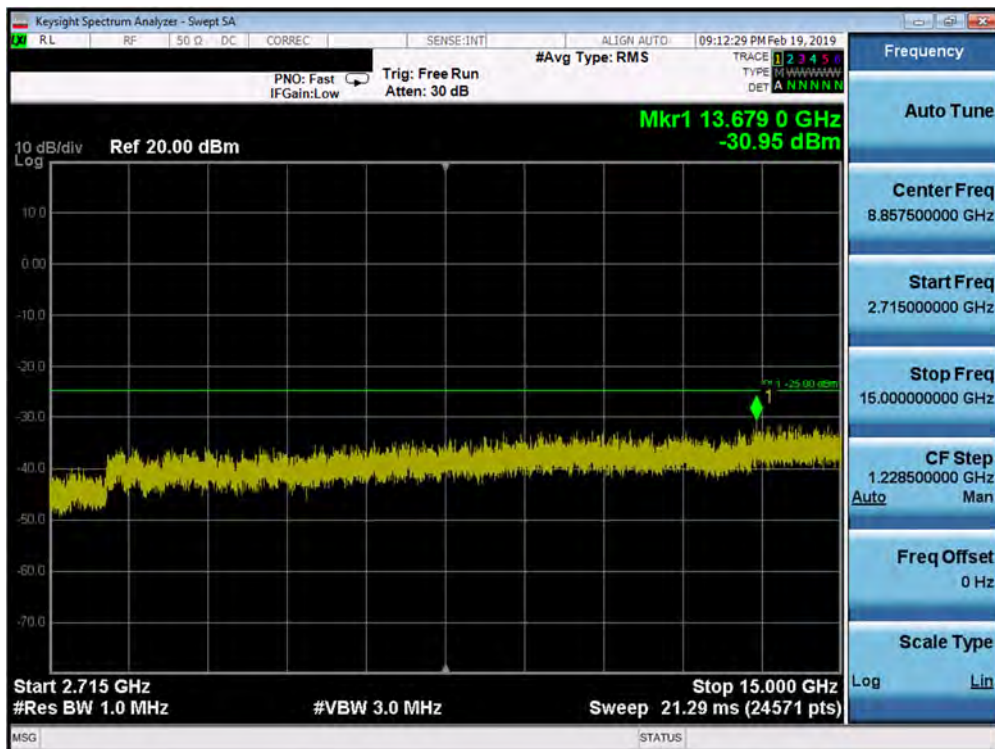
Plot 7-195. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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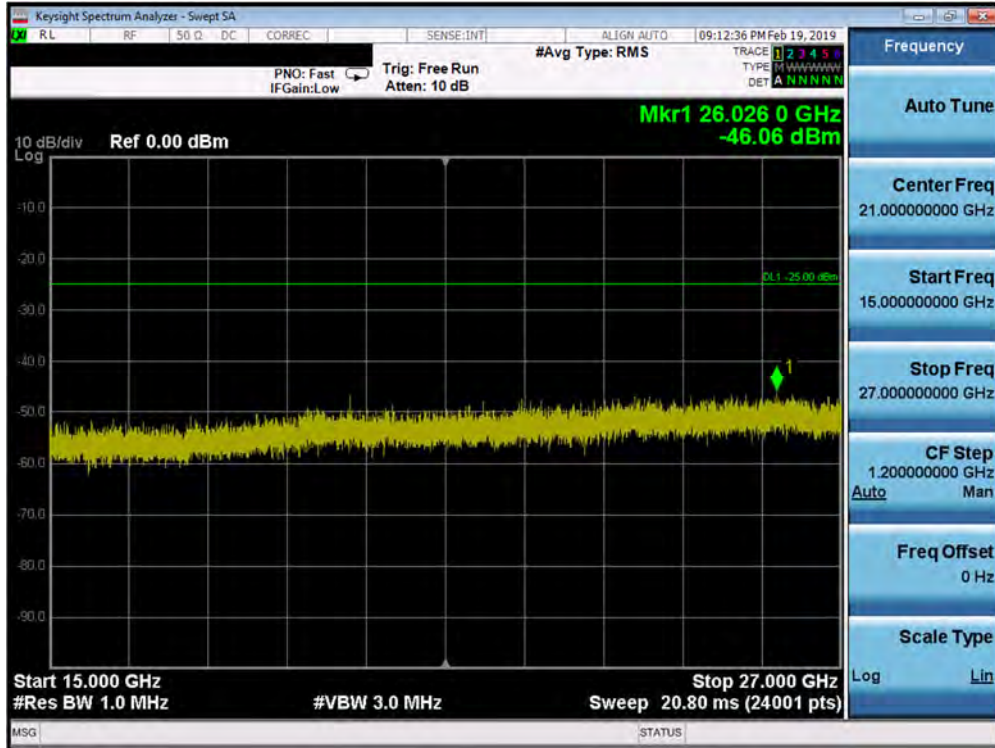


Plot 7-196. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-197. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-198. Conducted Spurious Plot (Band 41 PC3 / Band 38 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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## 7.4 Band Edge Emissions at Antenna Terminal

### 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 of any spurious emission is  $43 + 10 \log_{10}(P_{[Watts]})$ , where  $P$  is the transmitter power in Watts.**

**For LTE B13, the minimum permissible attenuation level of all emissions in the 763 – 775MHz and 793 – 805MHz band is  $65 + 10 \log_{10}(P_{[Watts]})$  in a 6.25kHz bandwidth, where  $P$  is the transmitter power in Watts.**

**For LTE B30, the minimum permissible attenuation levels are  $43 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation,  $55 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz,  $61 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz,  $67 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2328 and 2337 MHz,  $43 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2288 and 2292 MHz,  $70 + 10 \log (P_{[Watts]})$  dB below 2288 MHz,  $43 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2360 and 2365 MHz, and  $70 + 10 \log (P_{[Watts]})$  dB above 2365 MHz.**

**For LTE B7, B41/38, the minimum permissible attenuation levels are  $40 + 10 \log (P_{[Watts]})$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P_{[Watts]})$  dB on all frequencies between 5 megahertz and  $X$  megahertz from the channel edge, and  $55 + 10 \log (P_{[Watts]})$  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 minimum permissible attenuation levels shall not be less than  $43 + 10 \log (P_{[Watts]})$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P_{[Watts]})$  dB at or below 2490.5 MHz.**

### Test Procedure Used

KDB 971168 D01 v03r01 – 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 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq$  2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. 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 7-3. Test Instrument & Measurement Setup**

**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.

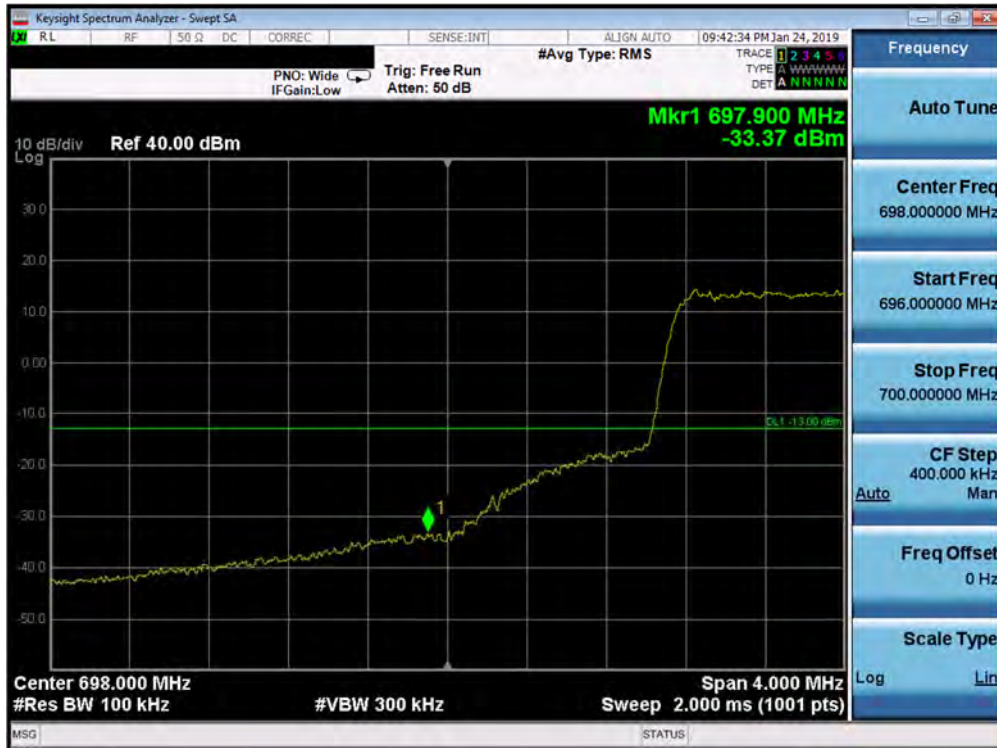
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c)(5) for operations in the 776-788 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.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is  $65 + 10 \log_{10}(P) = -35\text{dBm}$  in a 6.25kHz bandwidth.

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**Band 12**

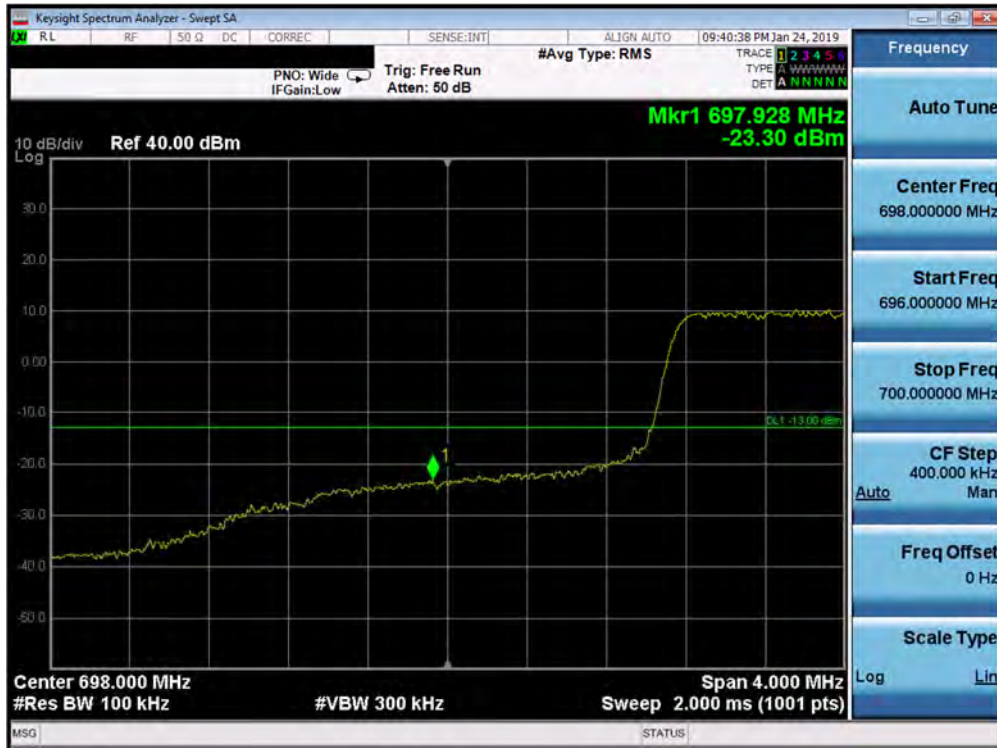


**Plot 7-199. Lower Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)**



**Plot 7-200. Upper Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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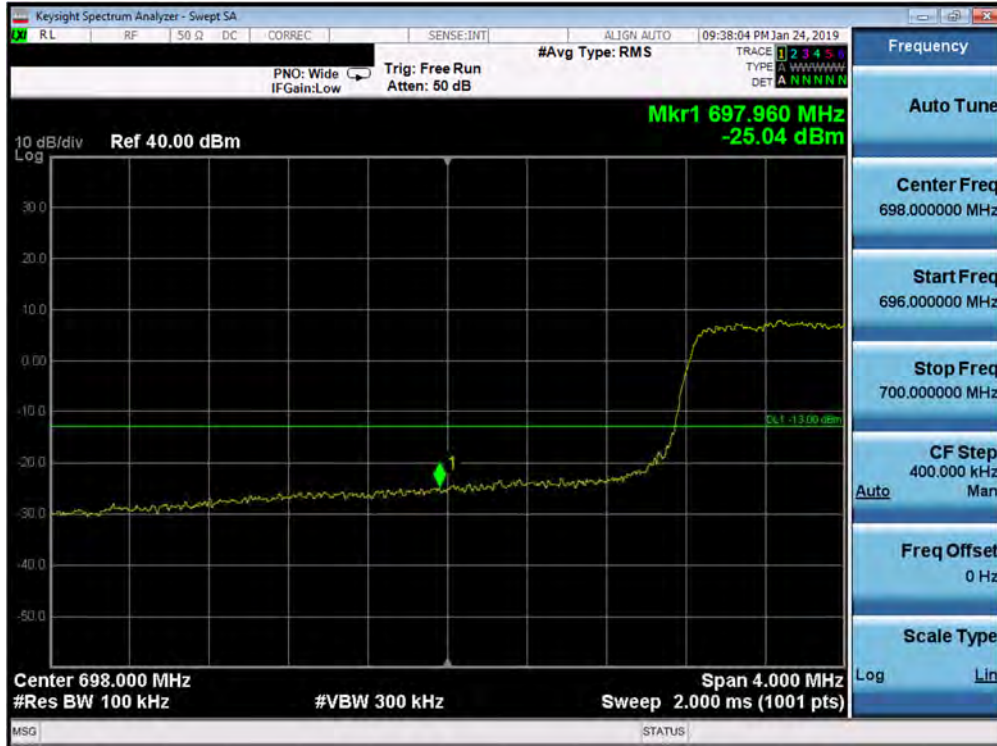


Plot 7-201. Lower Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-202. Upper Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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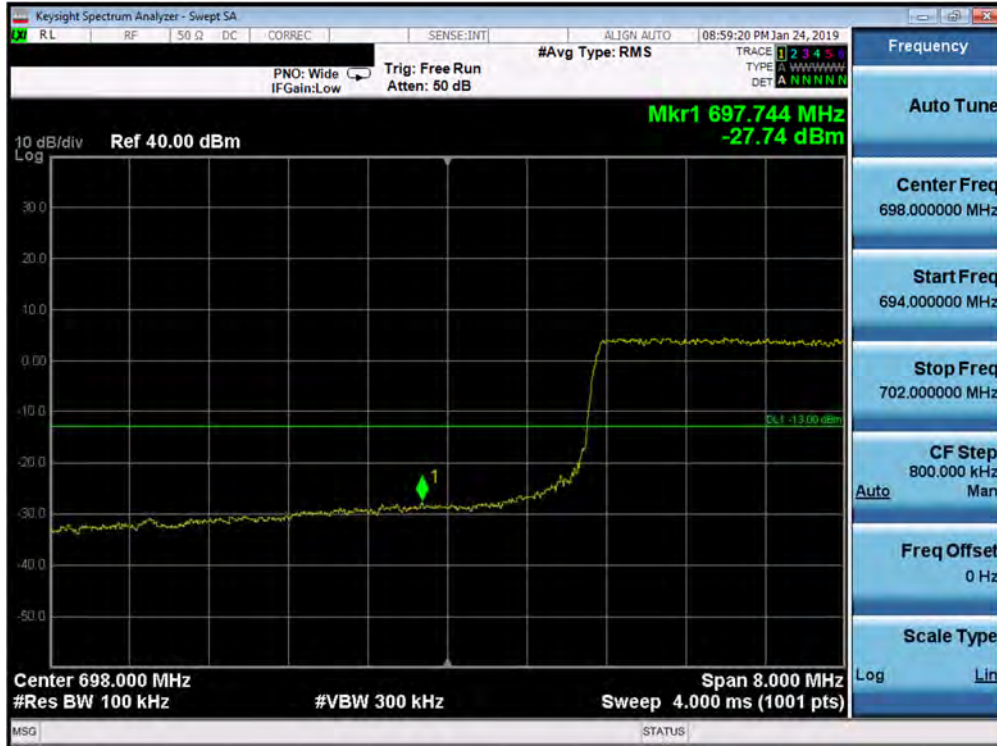


Plot 7-203. Lower Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

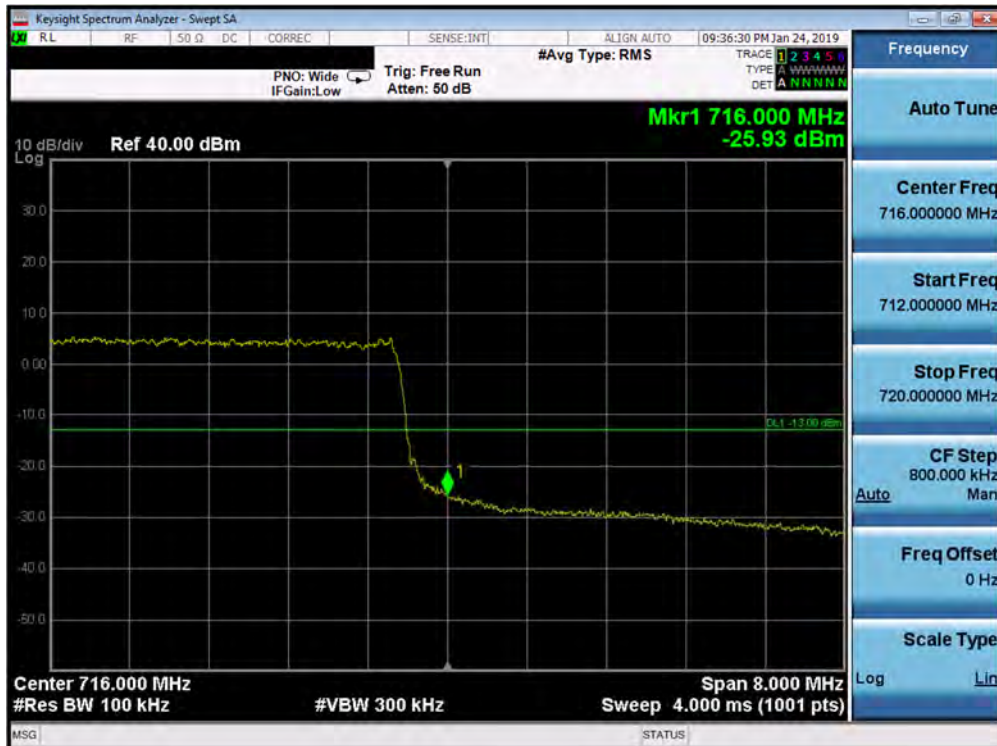


Plot 7-204. Upper Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-205. Lower Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

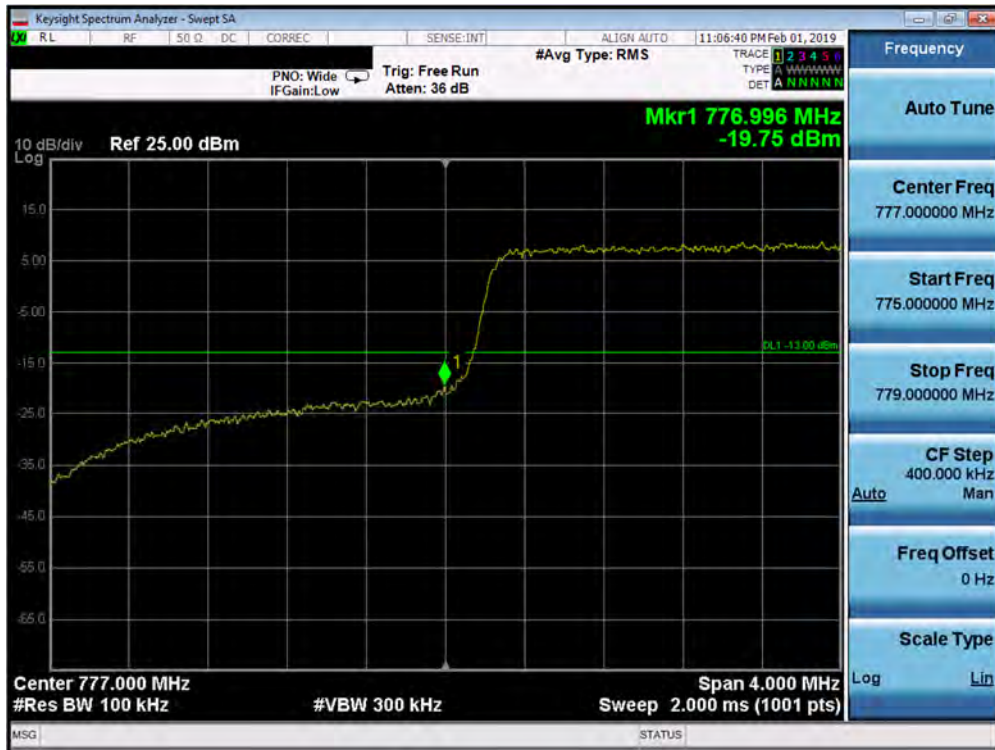


Plot 7-206. Upper Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

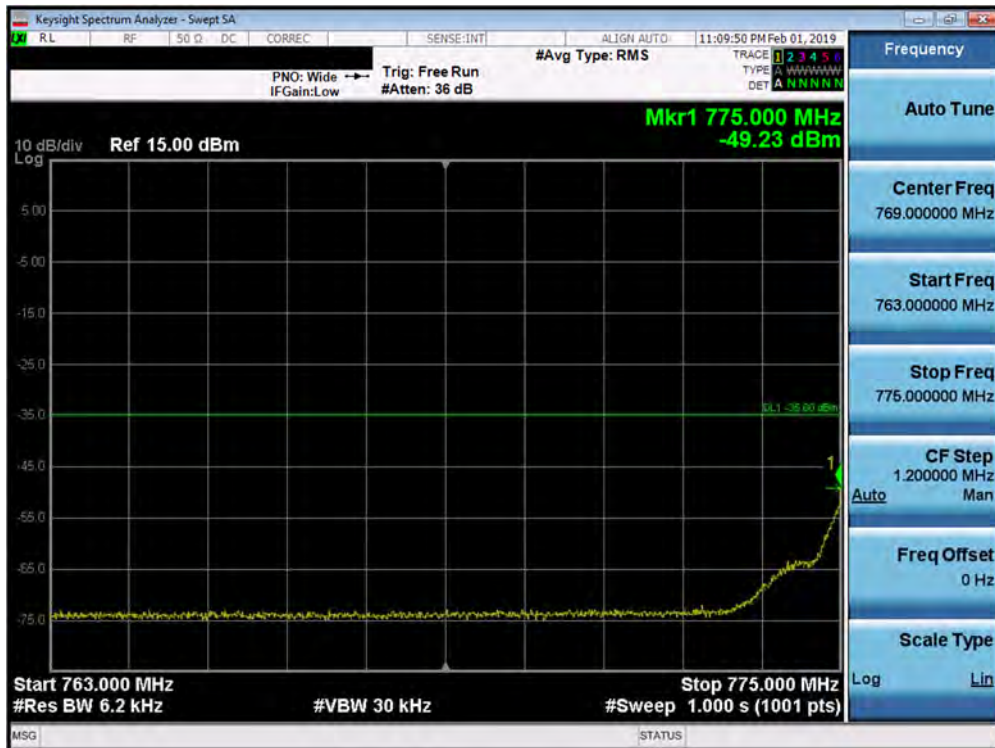
FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**Band 13**

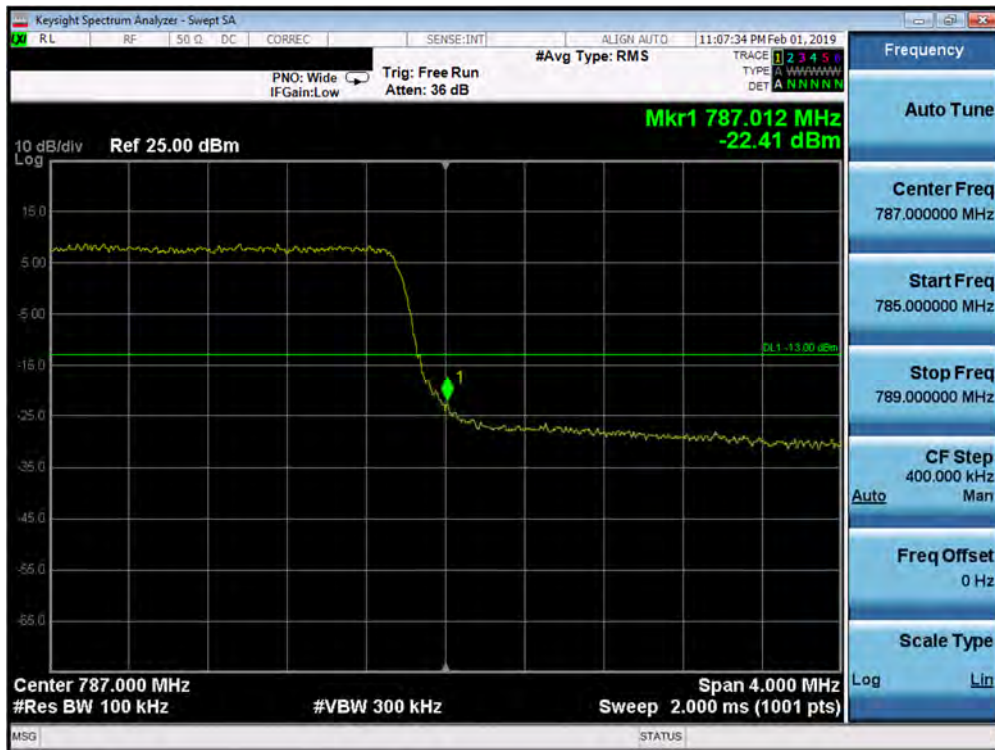


**Plot 7-207. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)**

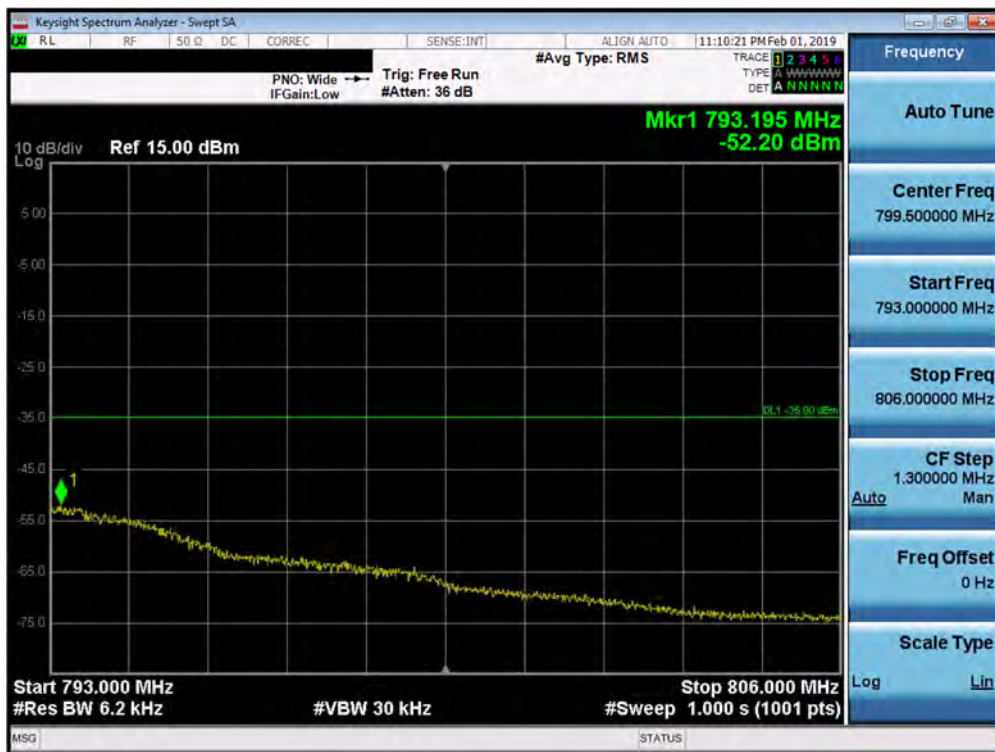


**Plot 7-208. Lower Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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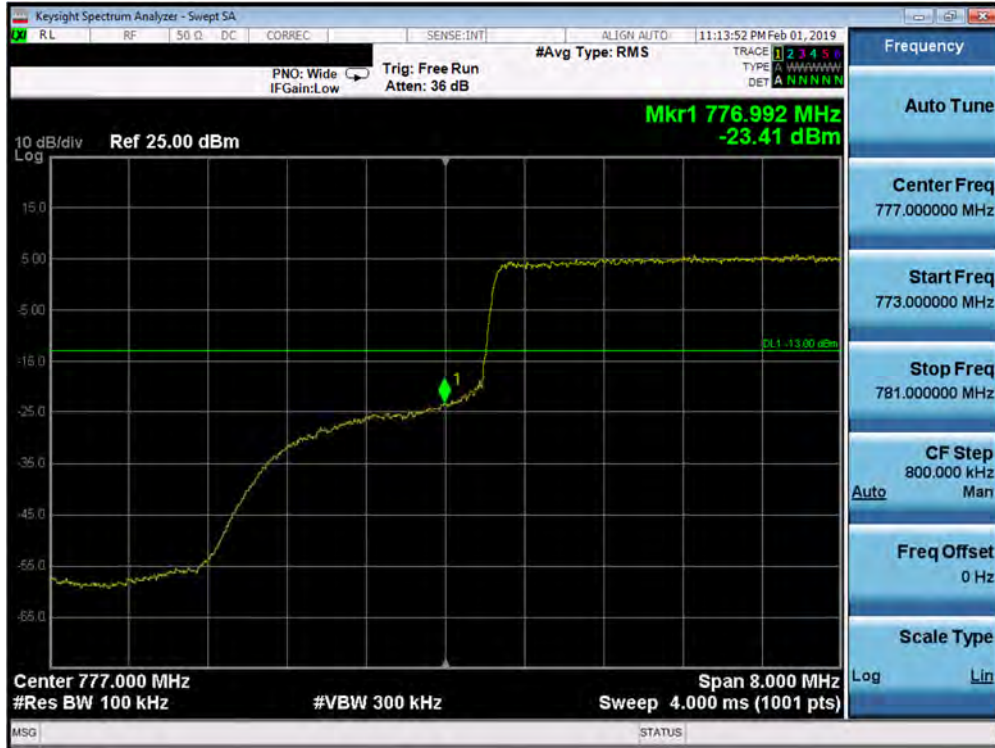


Plot 7-209. Upper Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

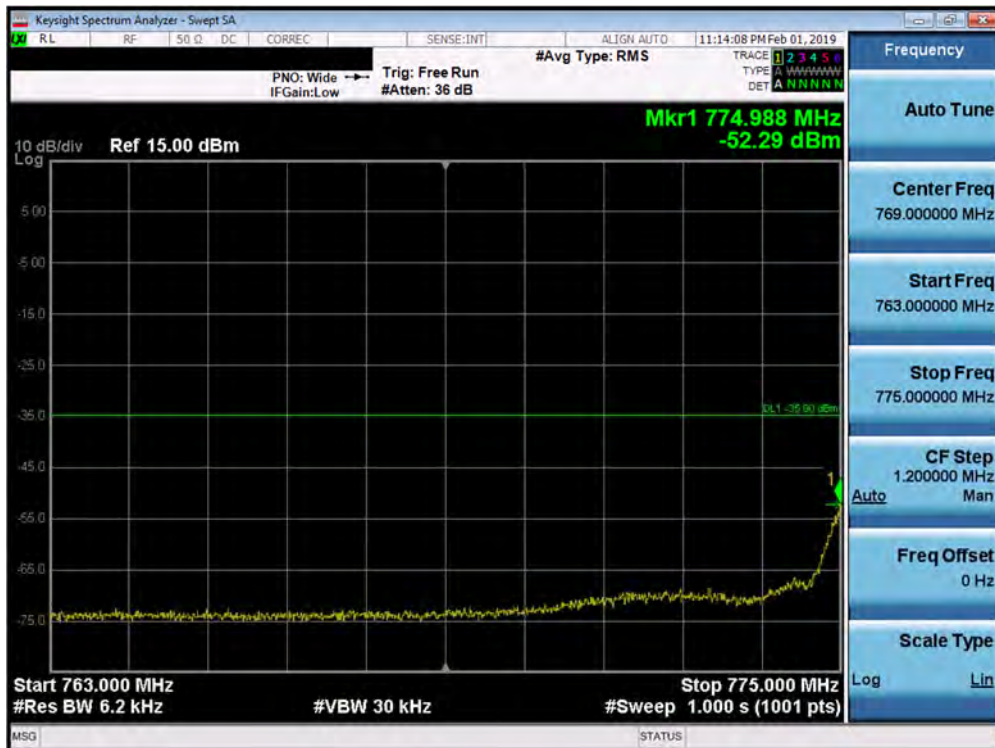


Plot 7-210. Upper Emission Mask Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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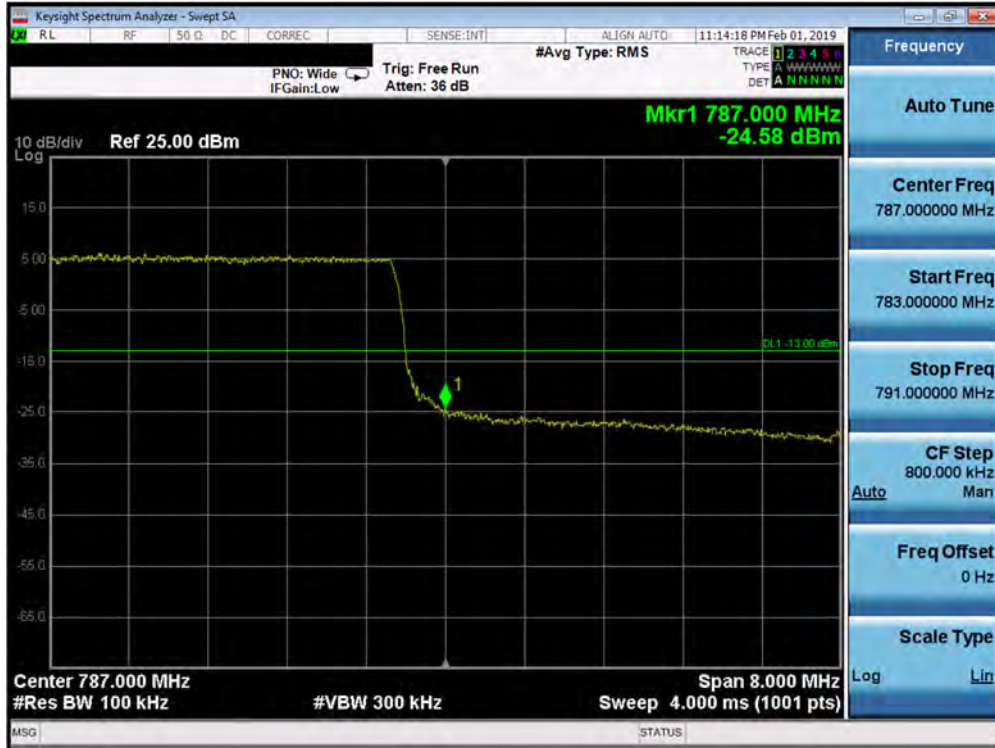


Plot 7-211. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-212. Lower Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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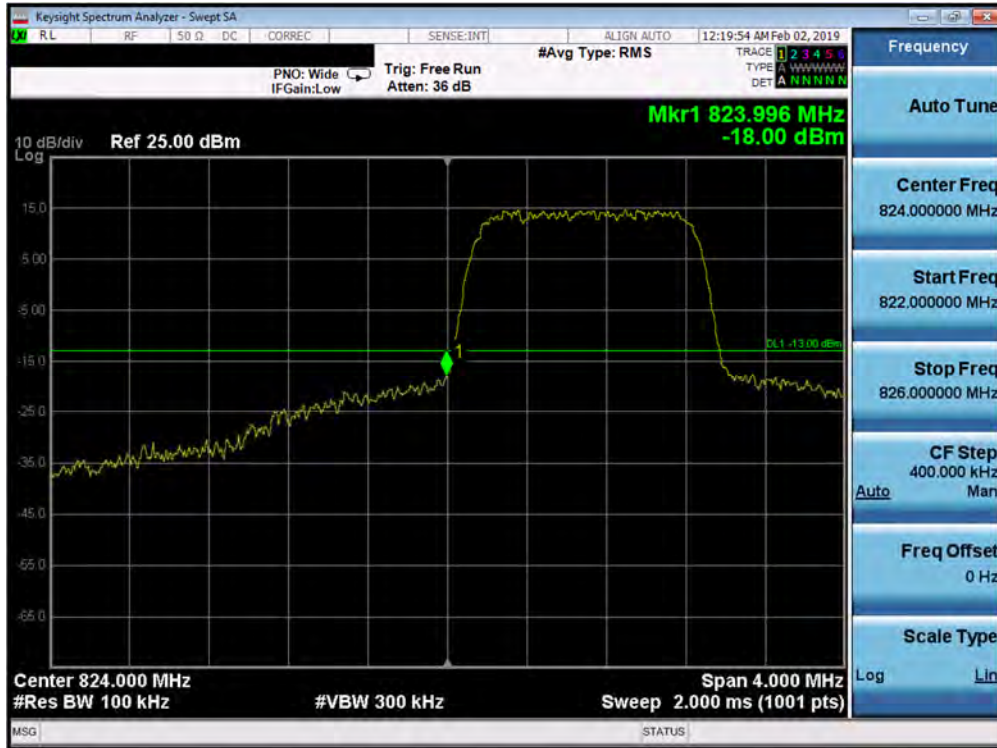
Plot 7-213. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)



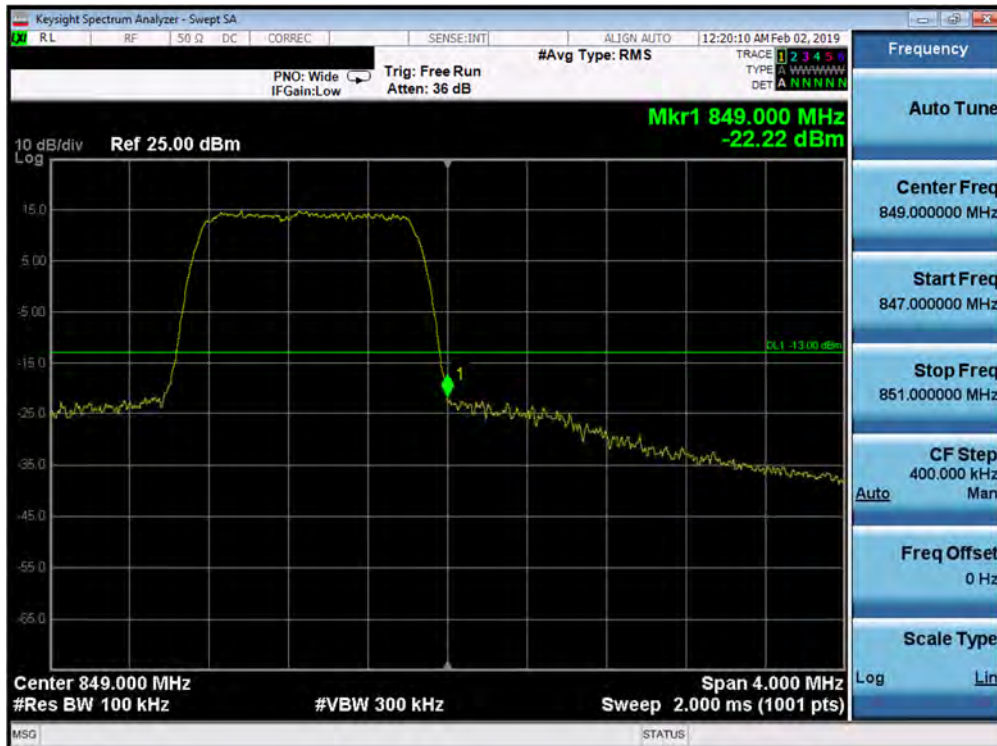
Plot 7-214. Upper Emission Mask Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 131 of 289

**Band 26/5**

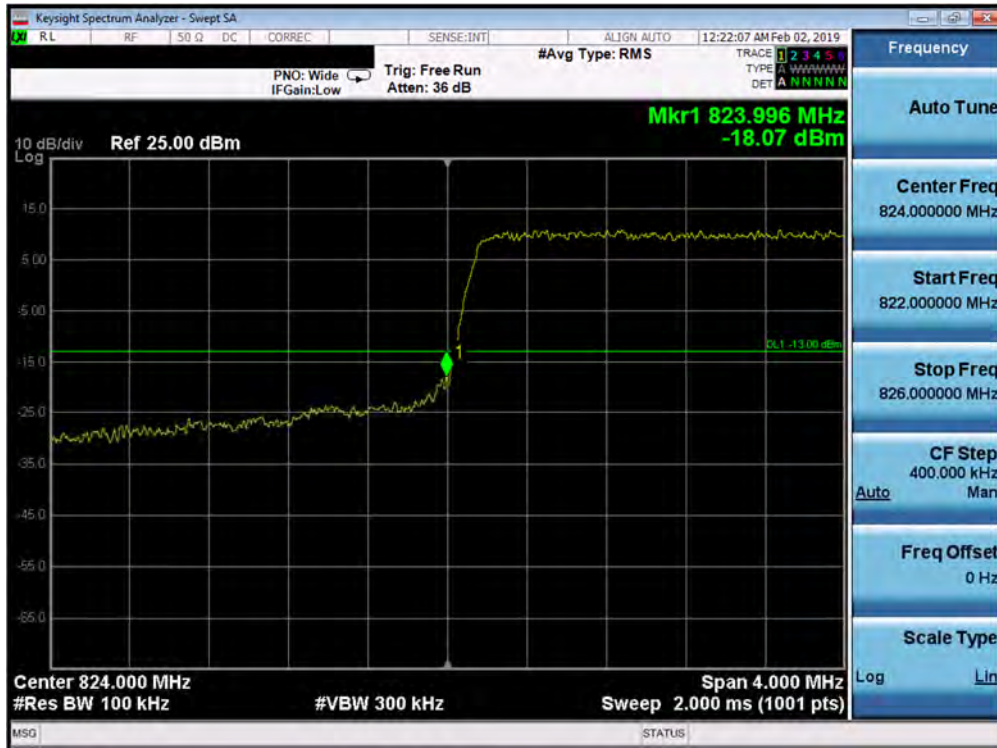


**Plot 7-215. Lower Band Edge Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)**



**Plot 7-216. Upper Band Edge Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 132 of 289

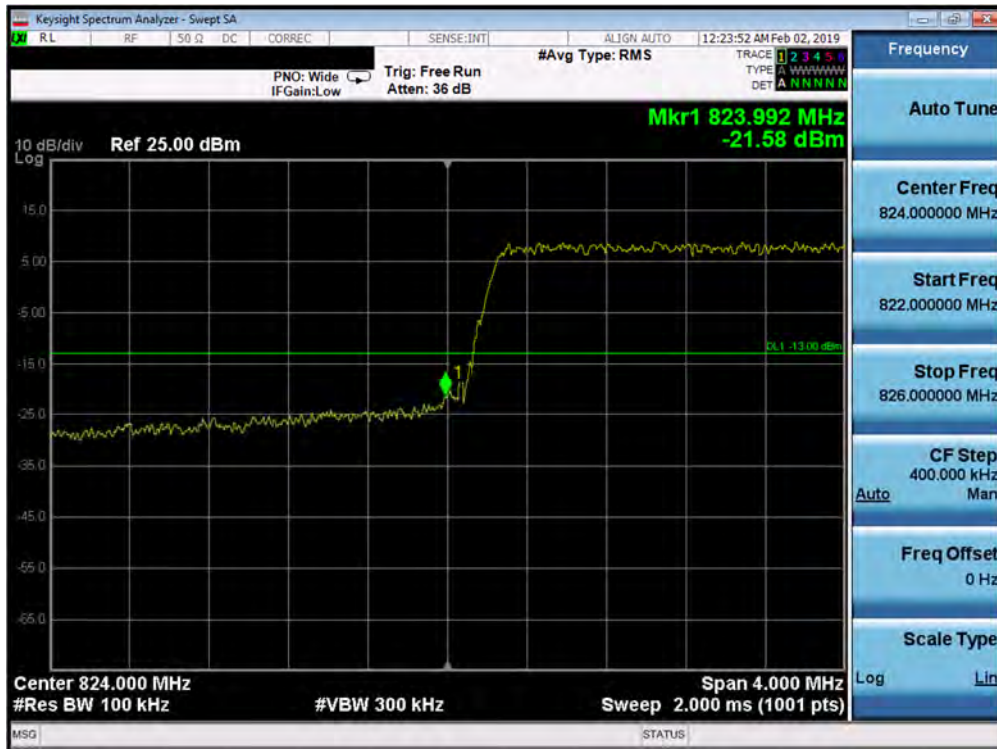


Plot 7-217. Lower Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

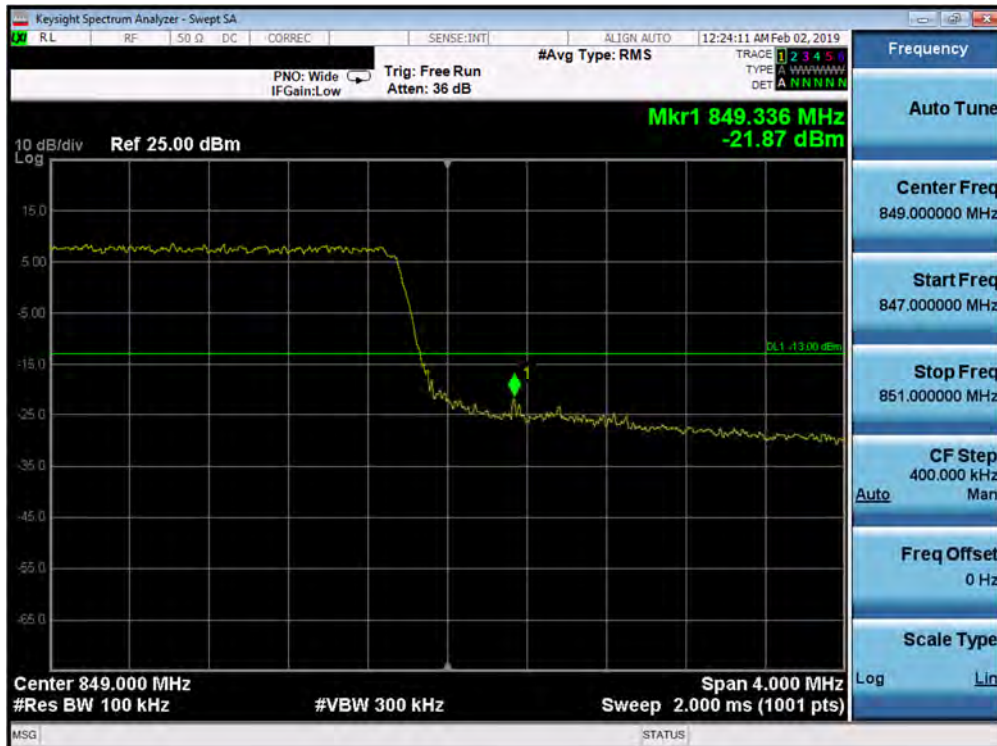


Plot 7-218. Upper Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 133 of 289

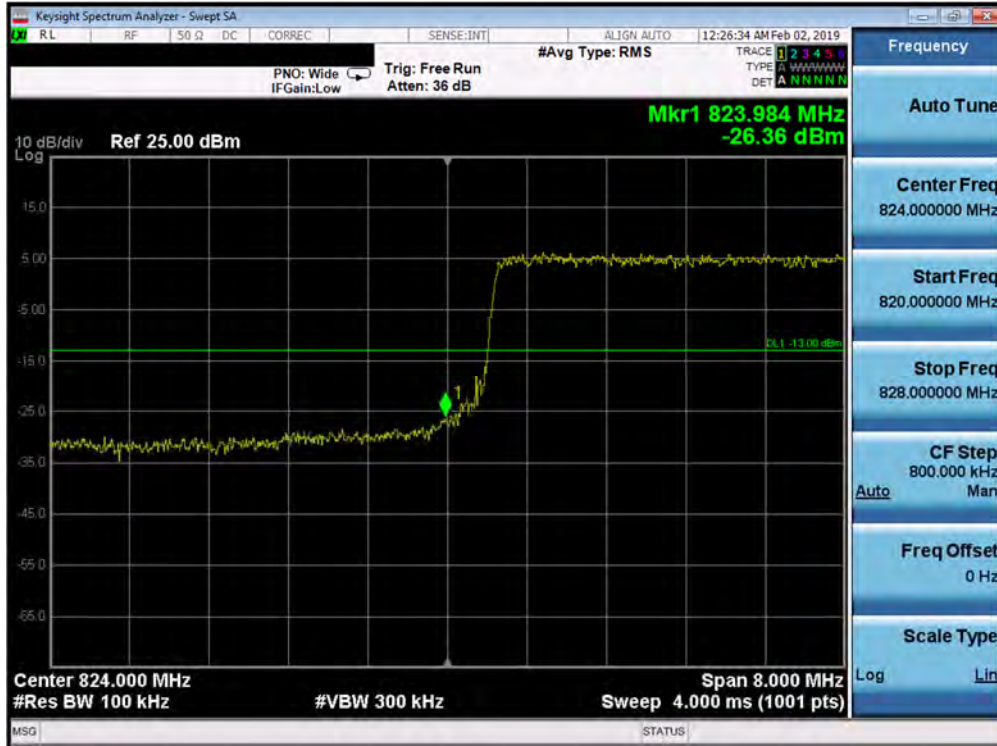


Plot 7-219. Lower Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

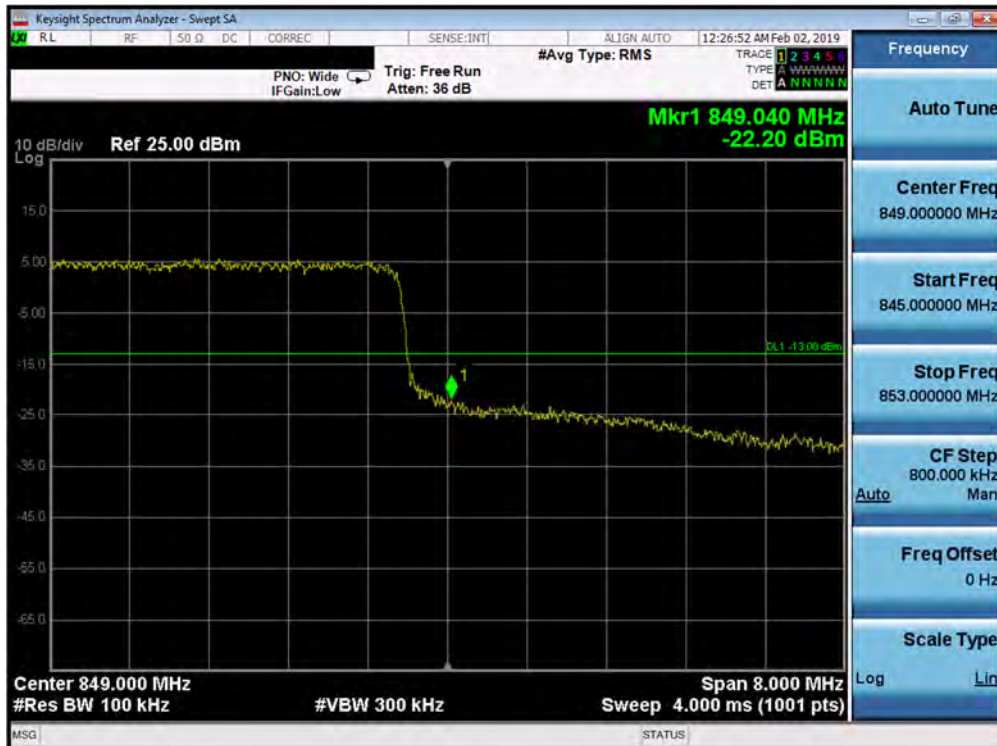


Plot 7-220. Upper Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 134 of 289



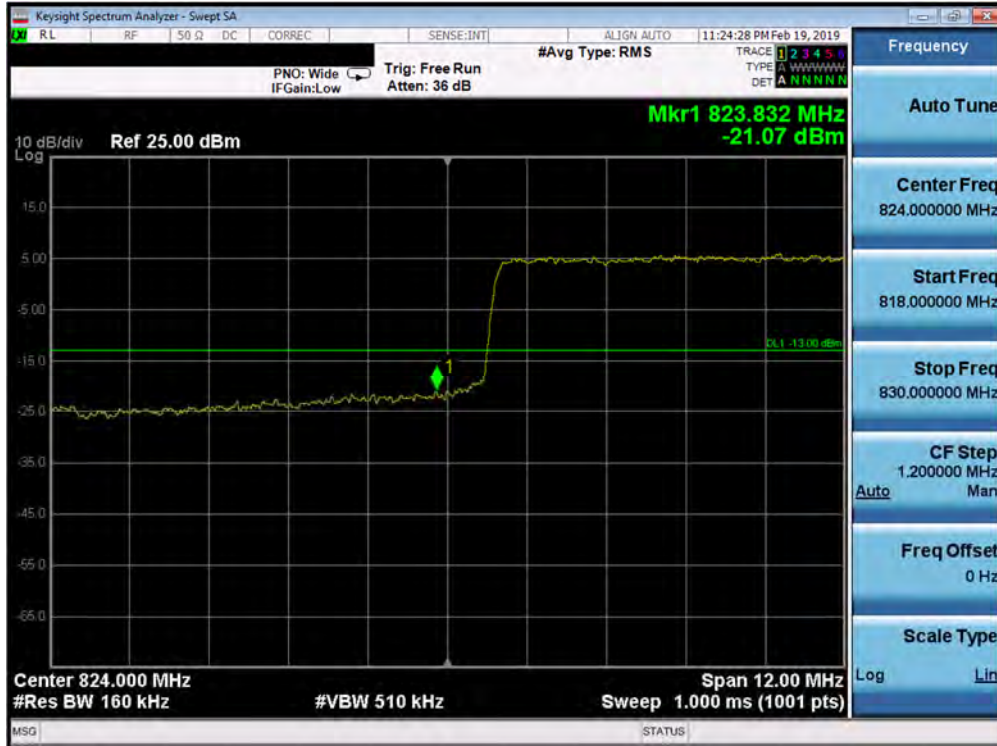
Plot 7-221. Lower Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-222. Upper Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 135 of 289





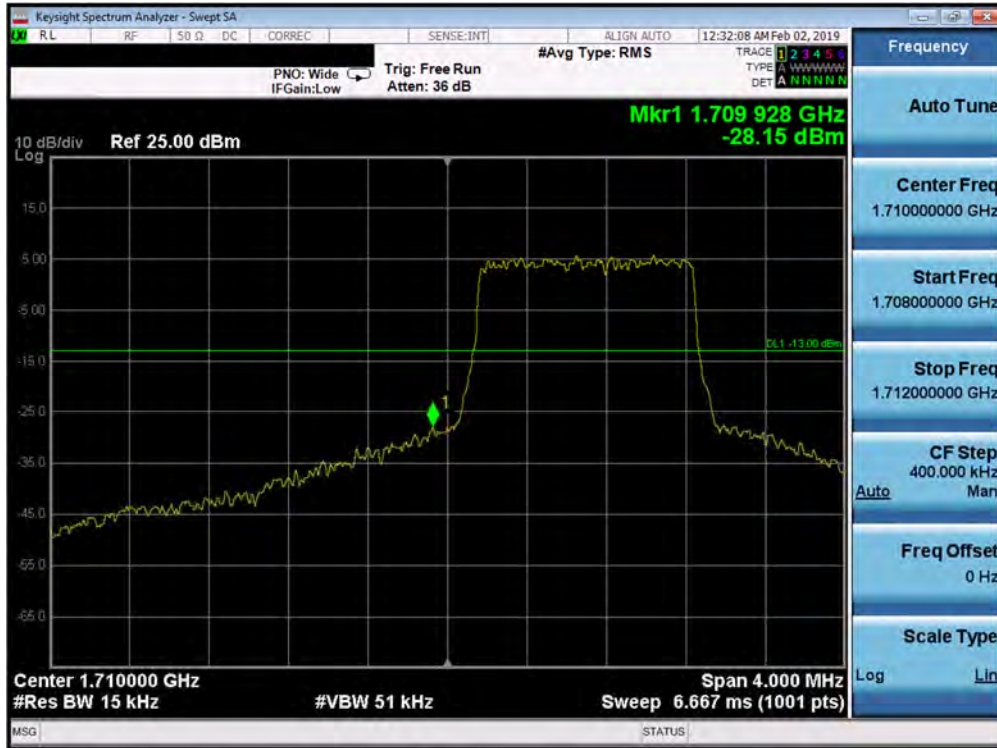
Plot 7-223. Lower Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)



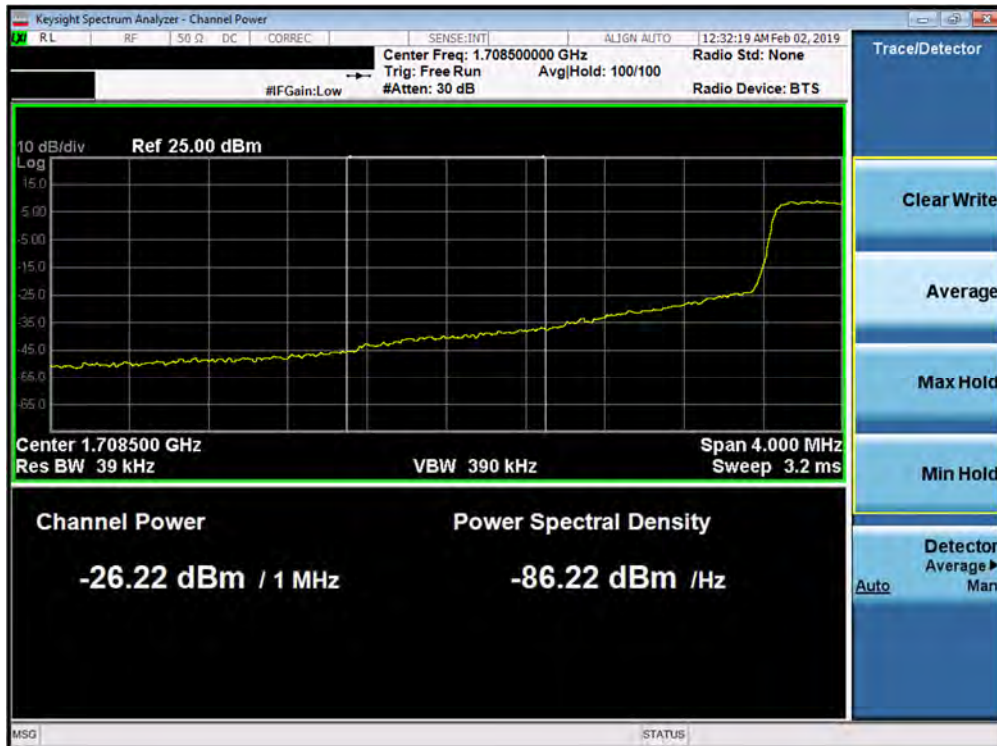
Plot 7-224. Upper Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 136 of 289

**Band 66/4**

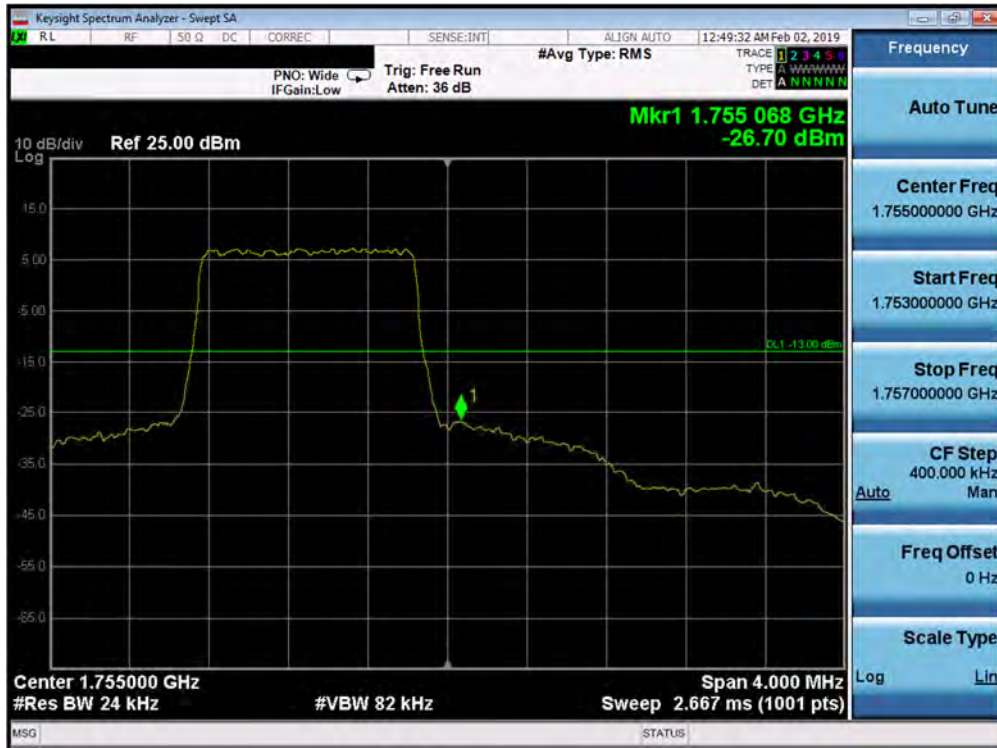


**Plot 7-225. Lower Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)**

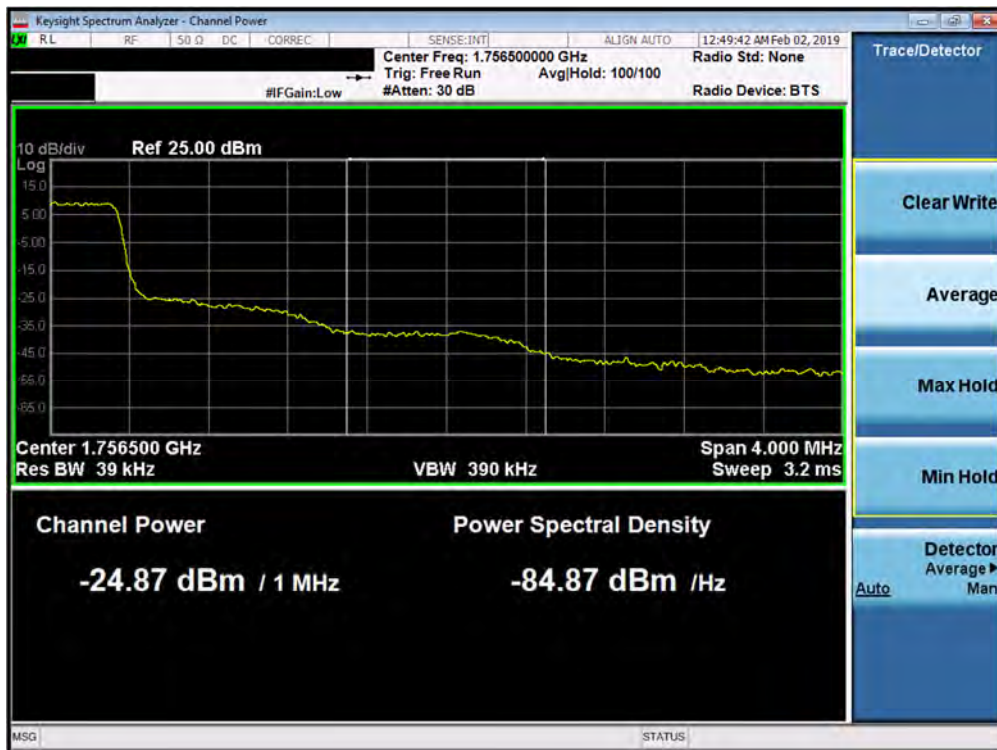


**Plot 7-226. Lower Extended Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)**

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 137 of 289



Plot 7-227. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

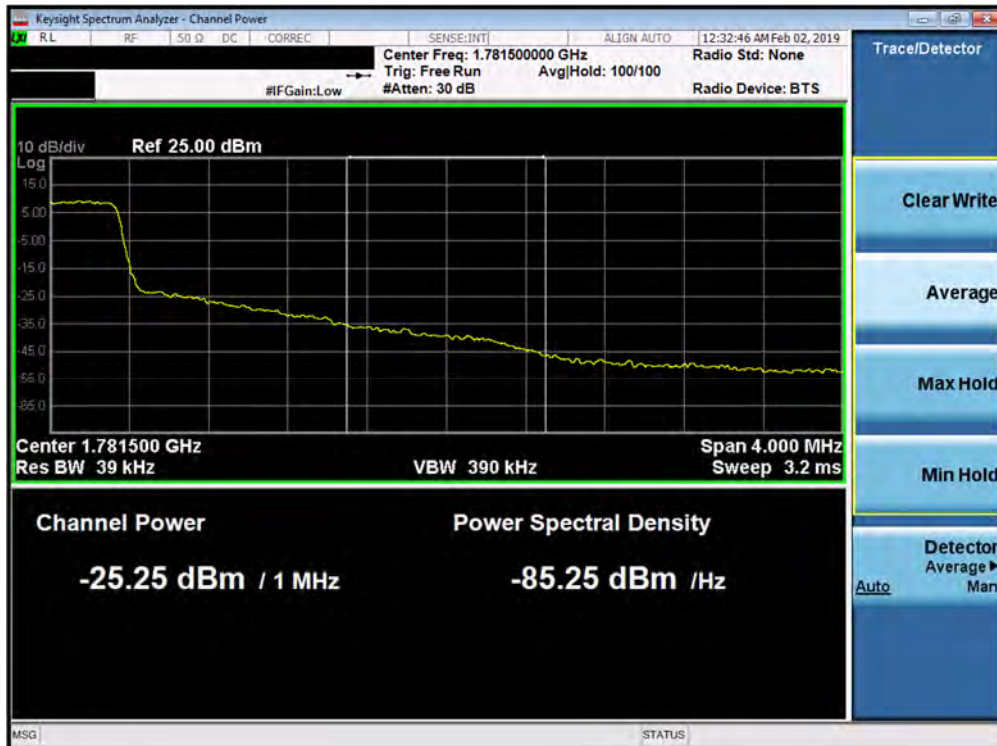


Plot 7-228. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 138 of 289

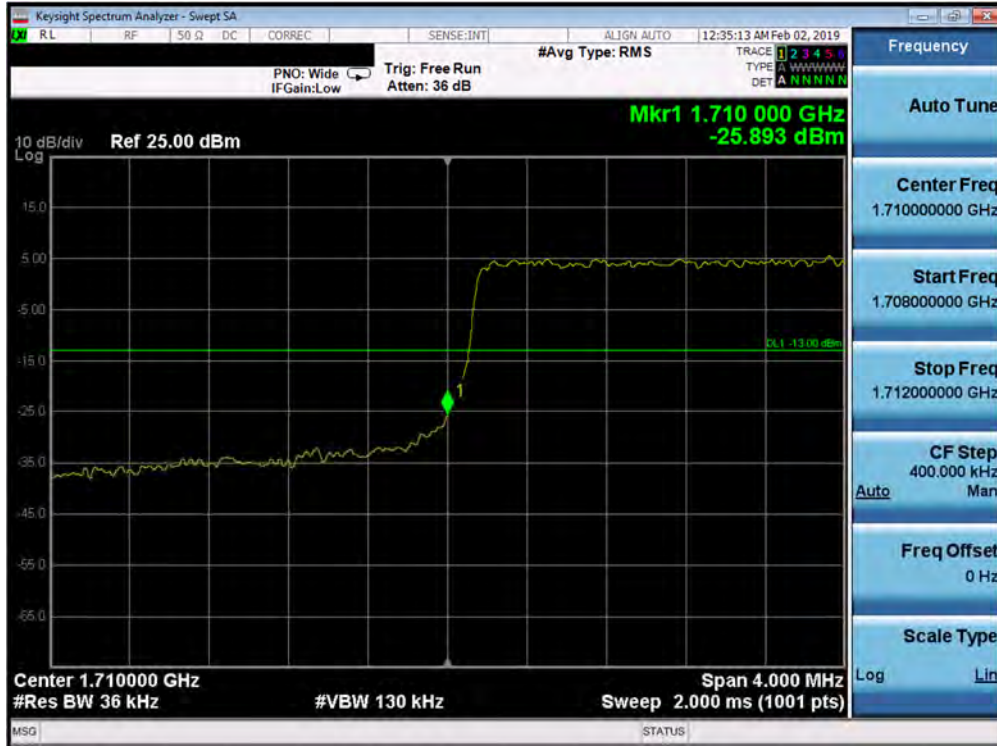


Plot 7-229. Upper Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

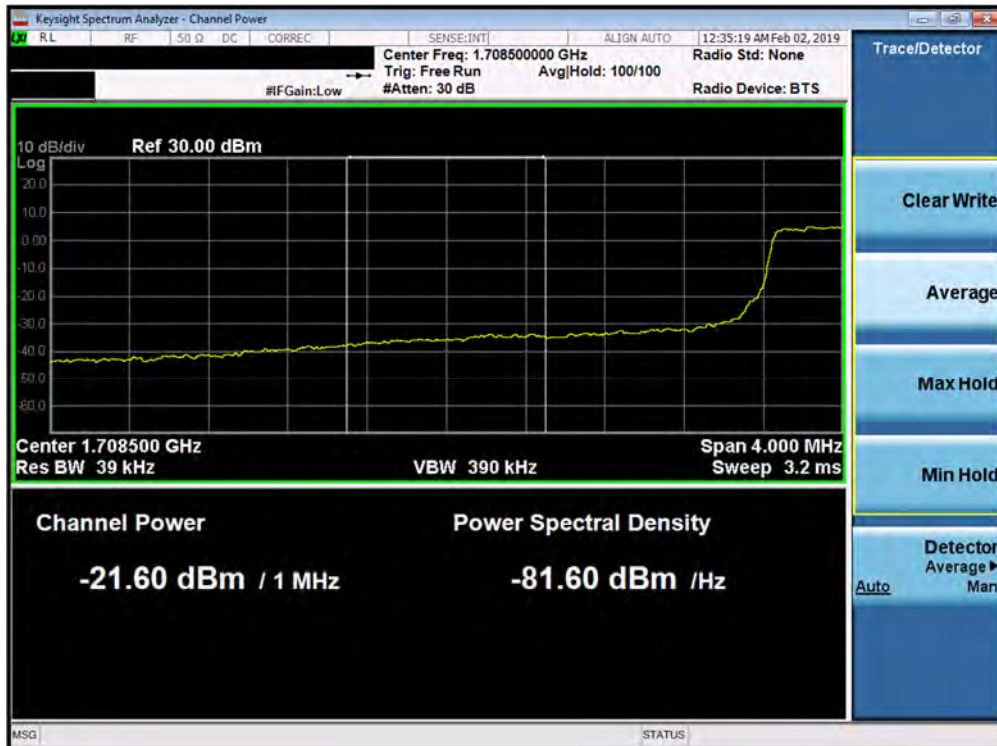


Plot 7-230. Upper Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 139 of 289



Plot 7-231. Lower Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

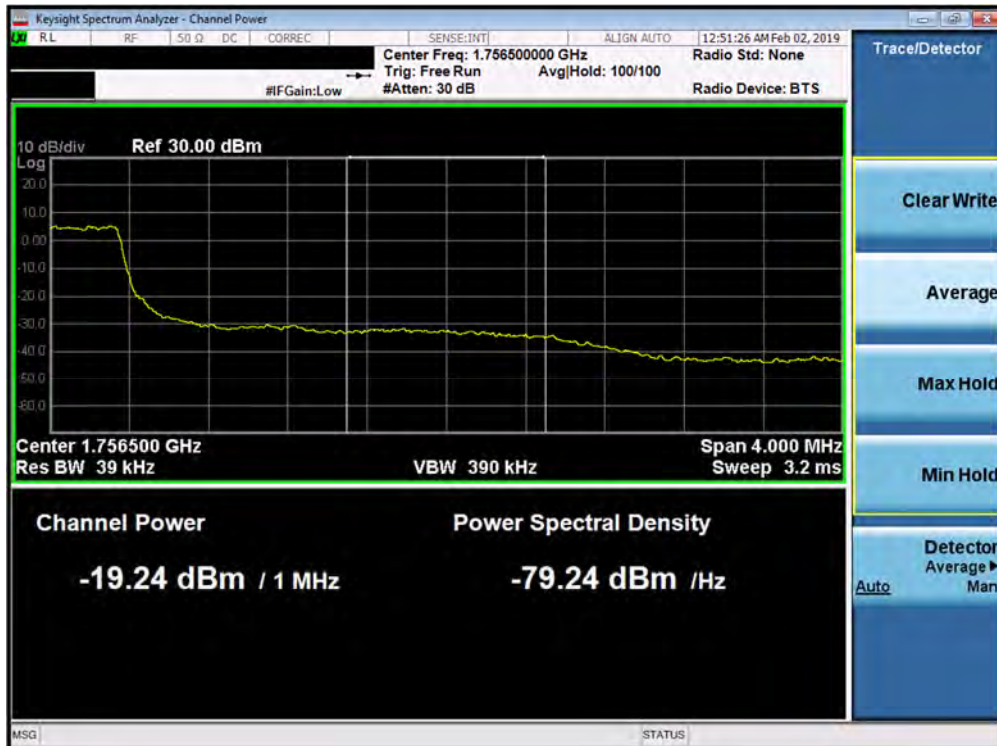


Plot 7-232. Lower Extended Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 140 of 289

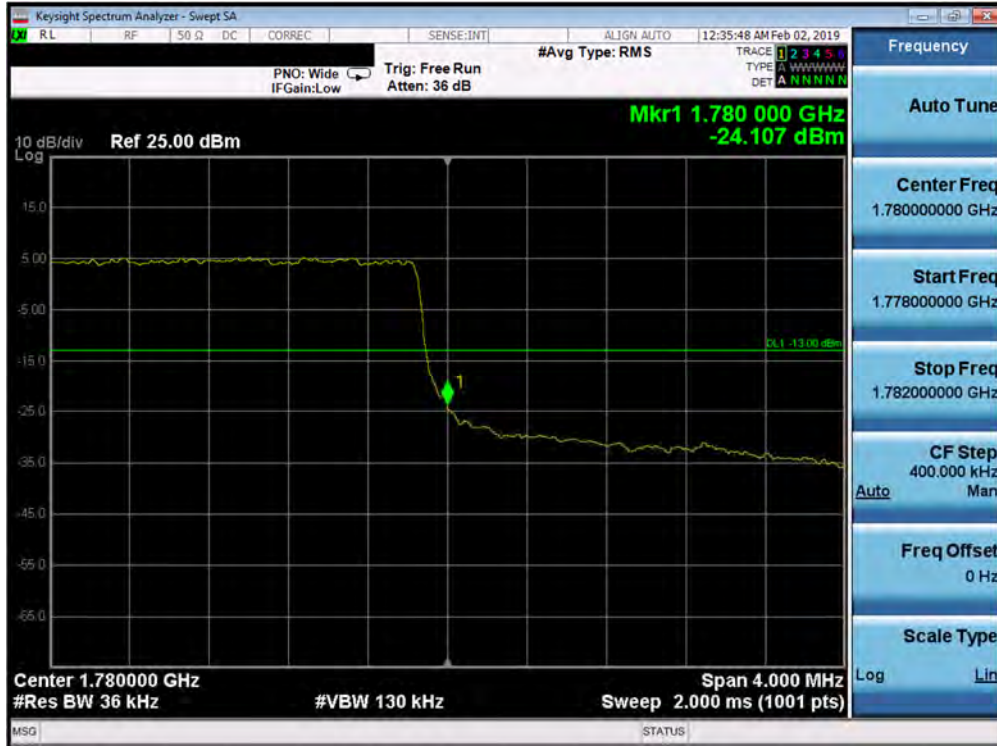


Plot 7-233. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

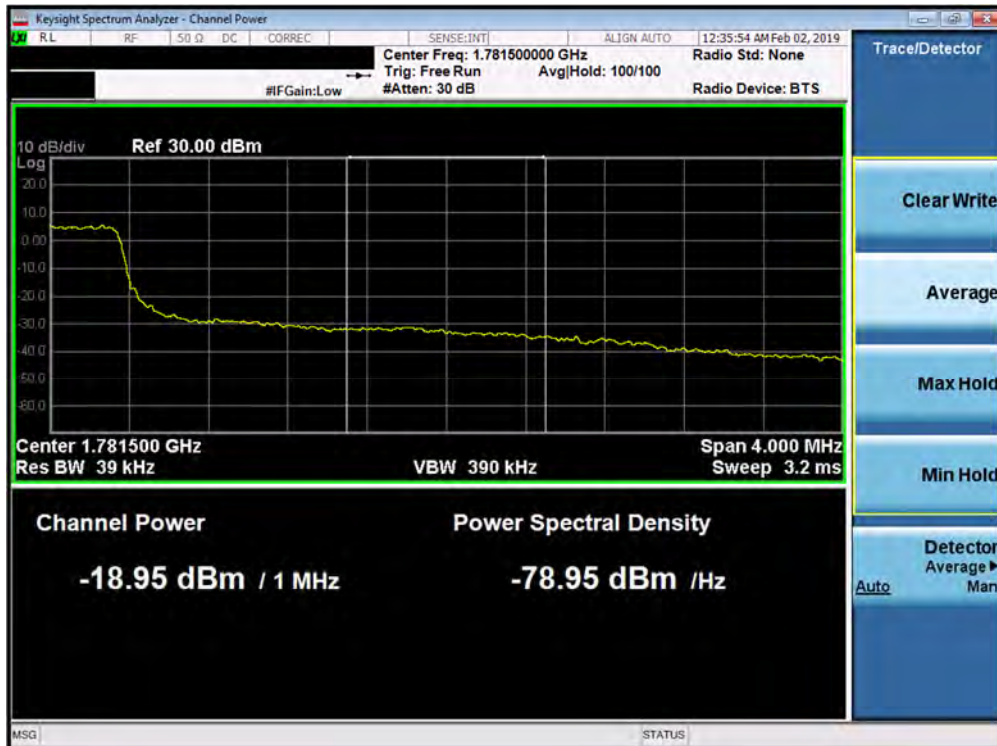


Plot 7-234. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 141 of 289

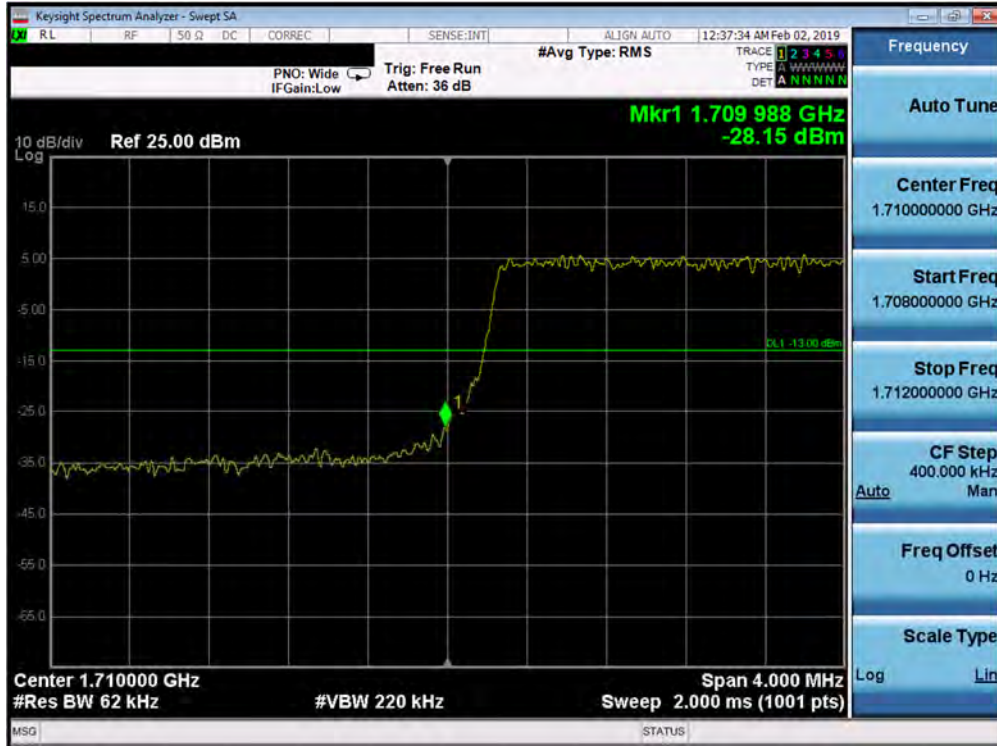


Plot 7-235. Upper Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

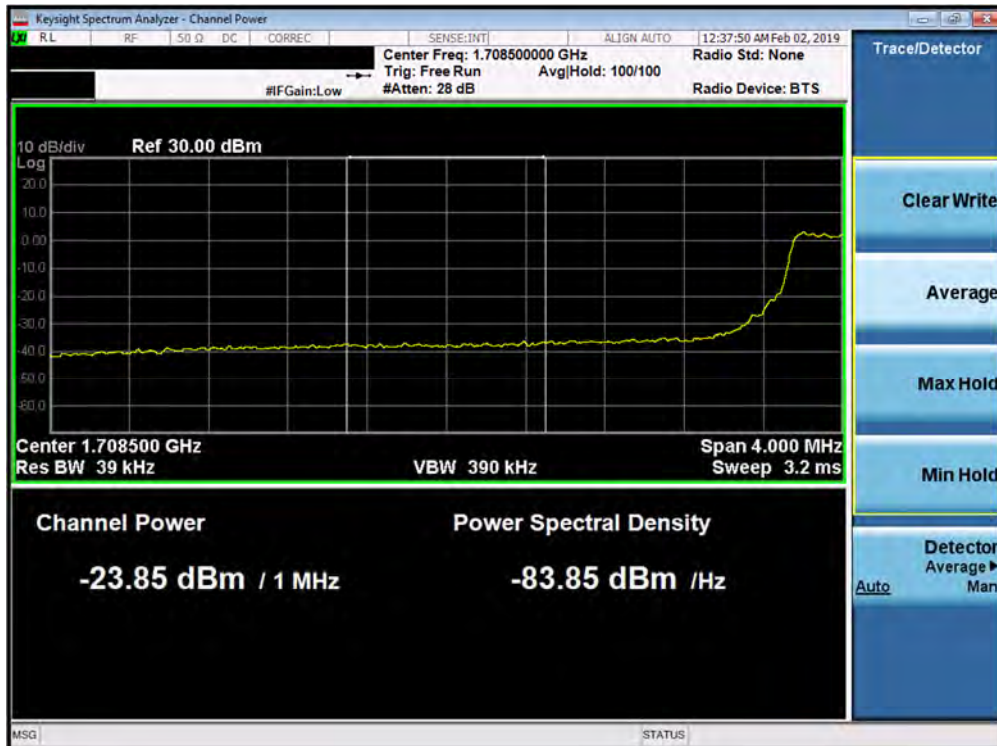


Plot 7-236. Upper Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 142 of 289



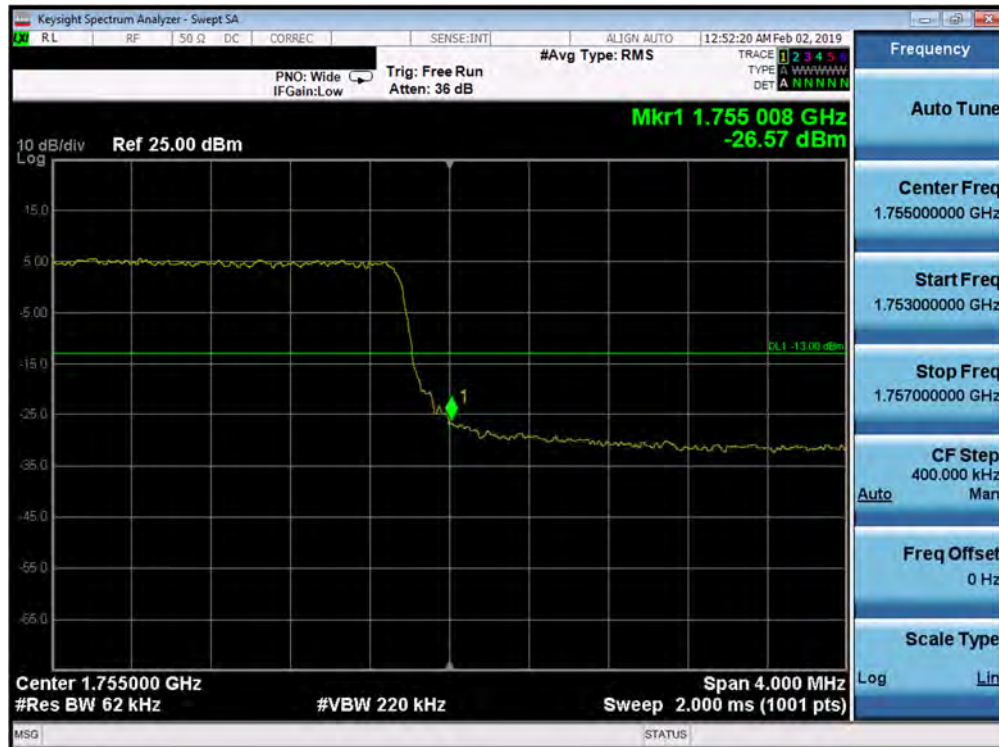
Plot 7-237. Lower Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



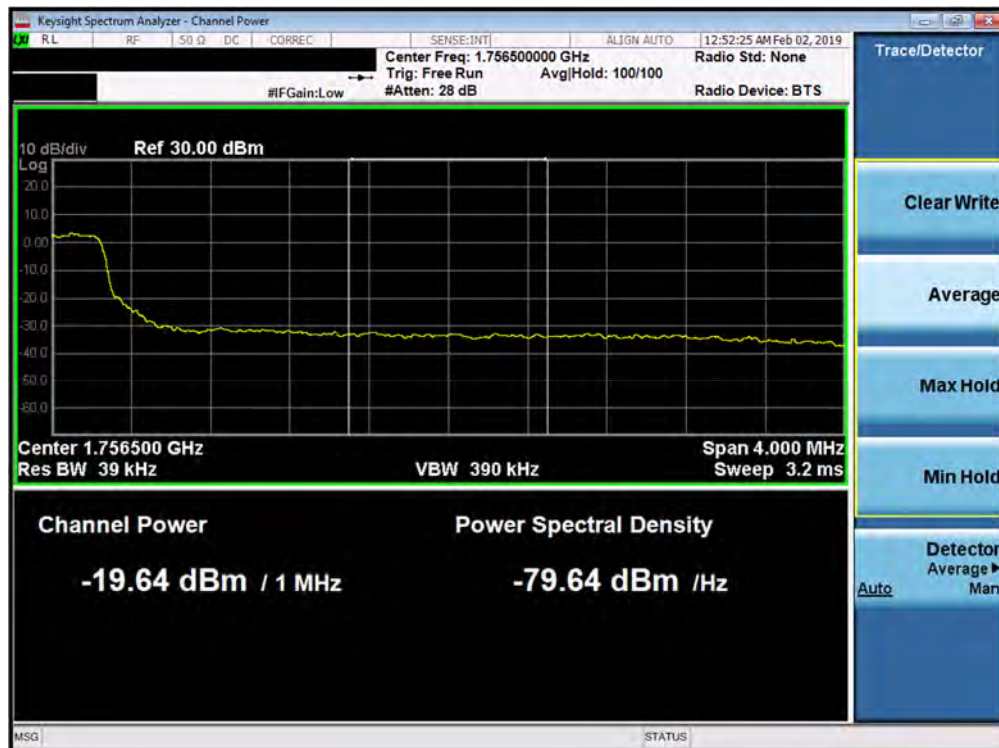
Plot 7-238. Lower Extended Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 143 of 289



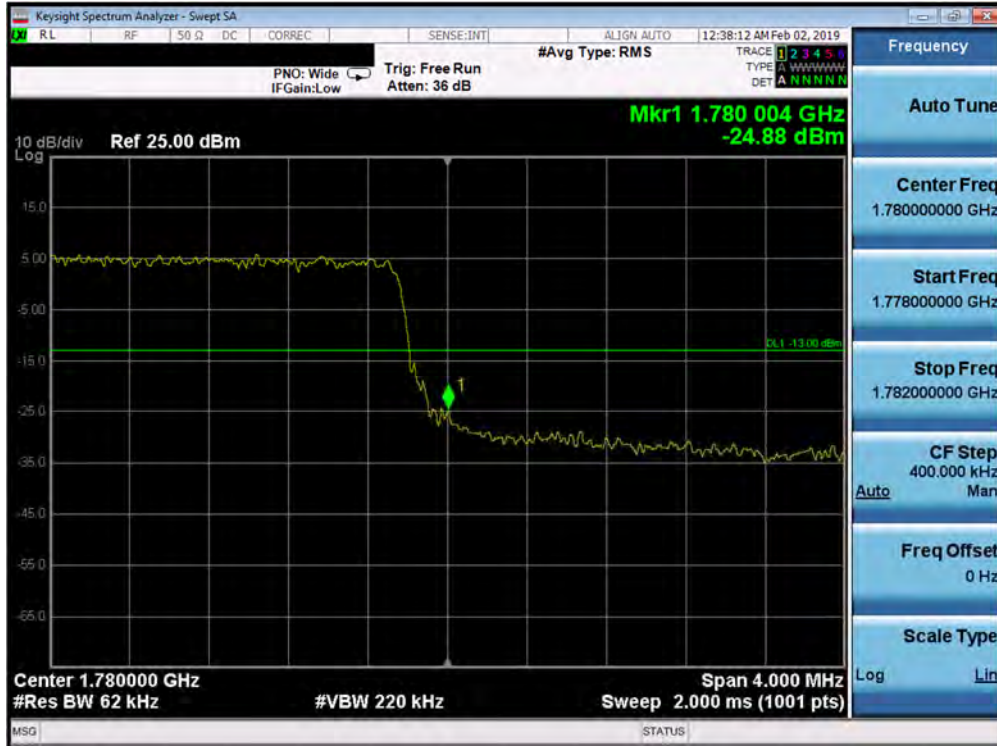


Plot 7-239. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

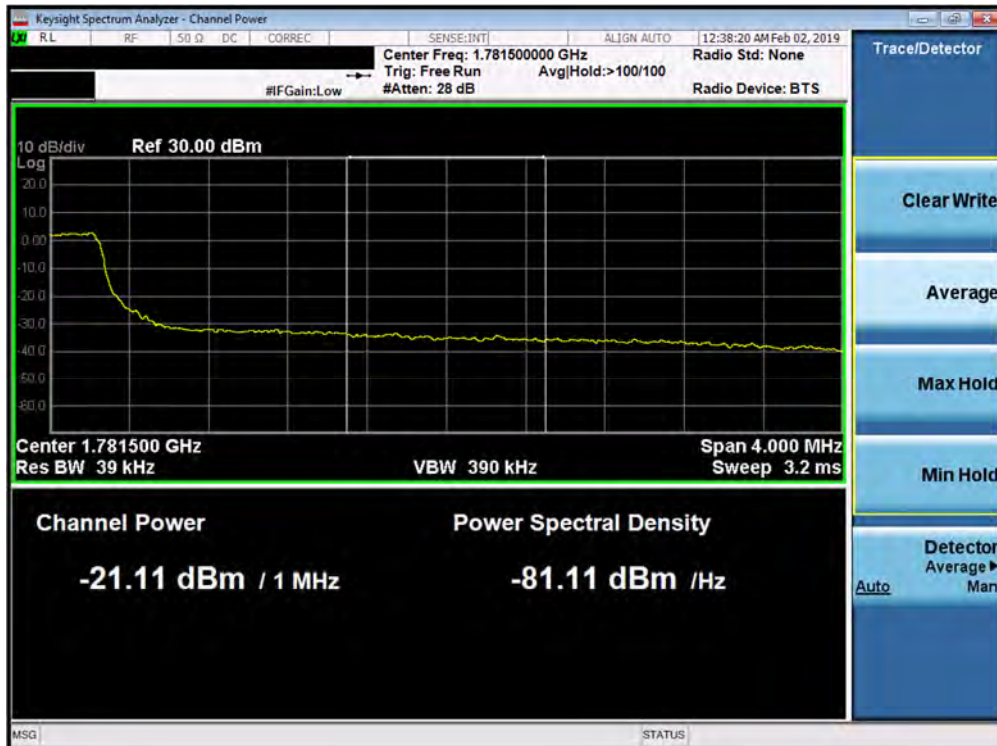


Plot 7-240. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 144 of 289

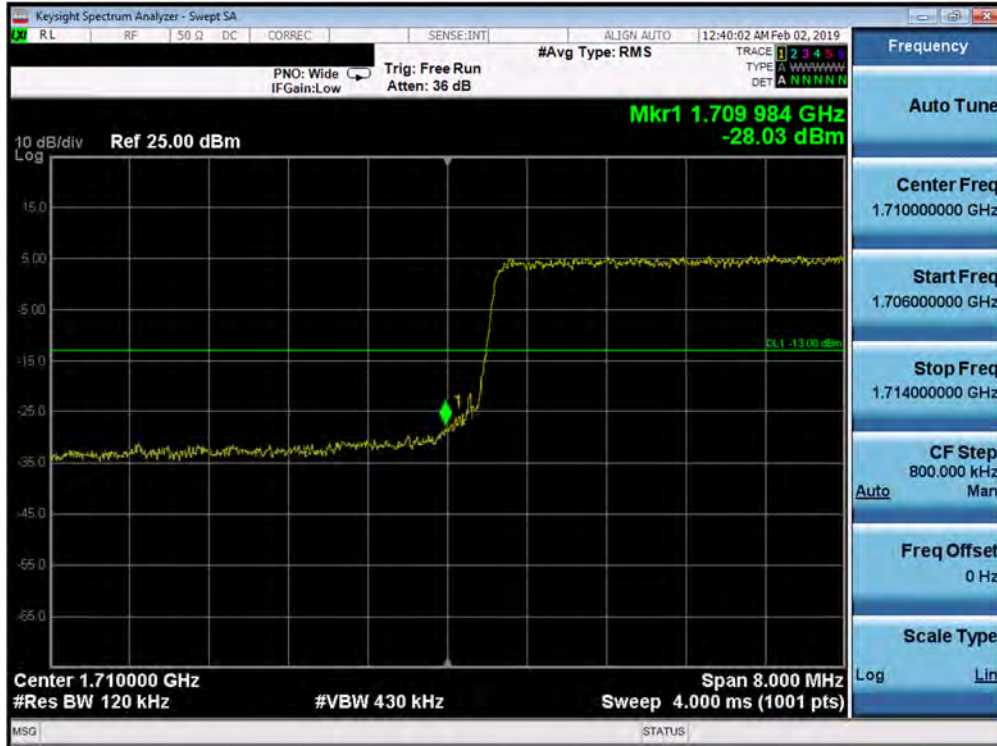


Plot 7-241. Upper Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

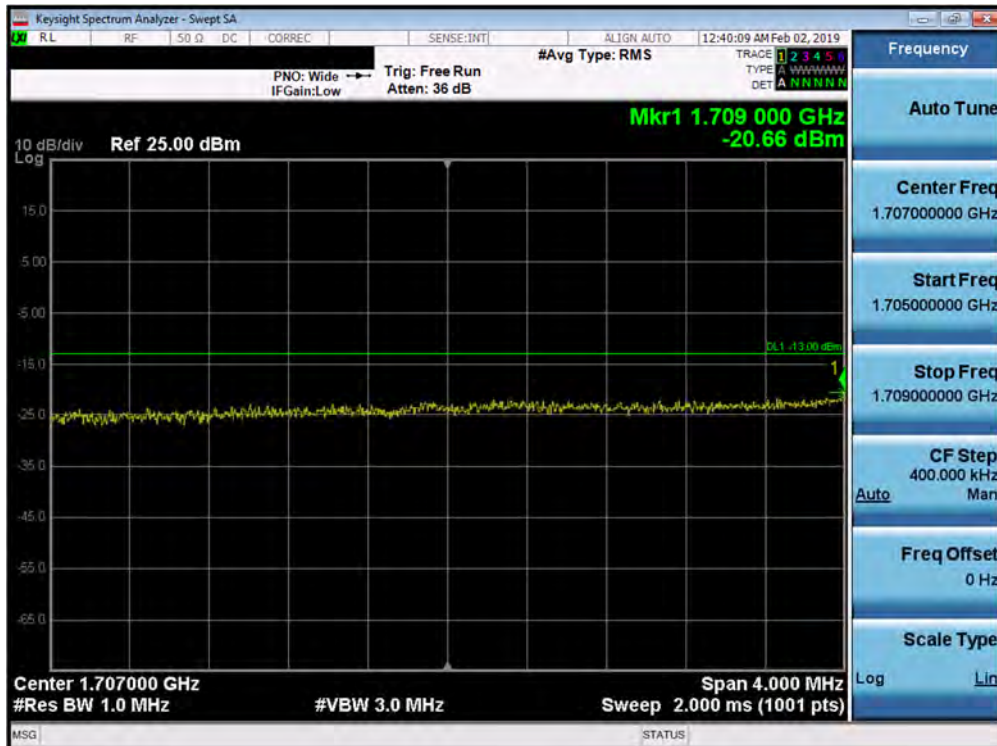


Plot 7-242. Upper Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 145 of 289

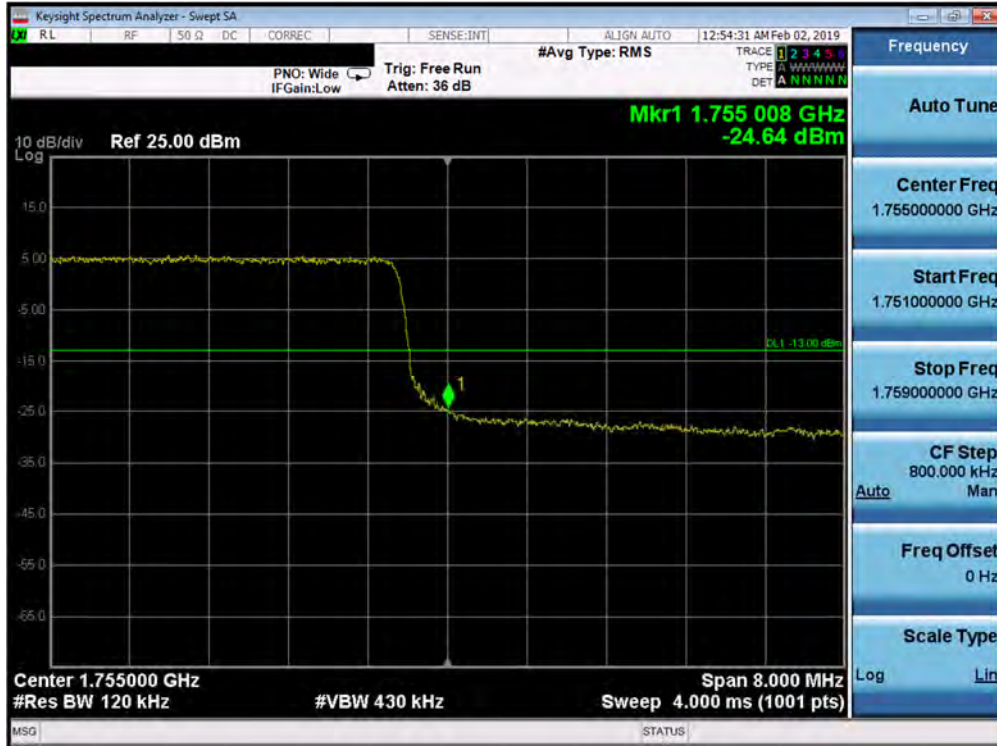


Plot 7-243. Lower Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

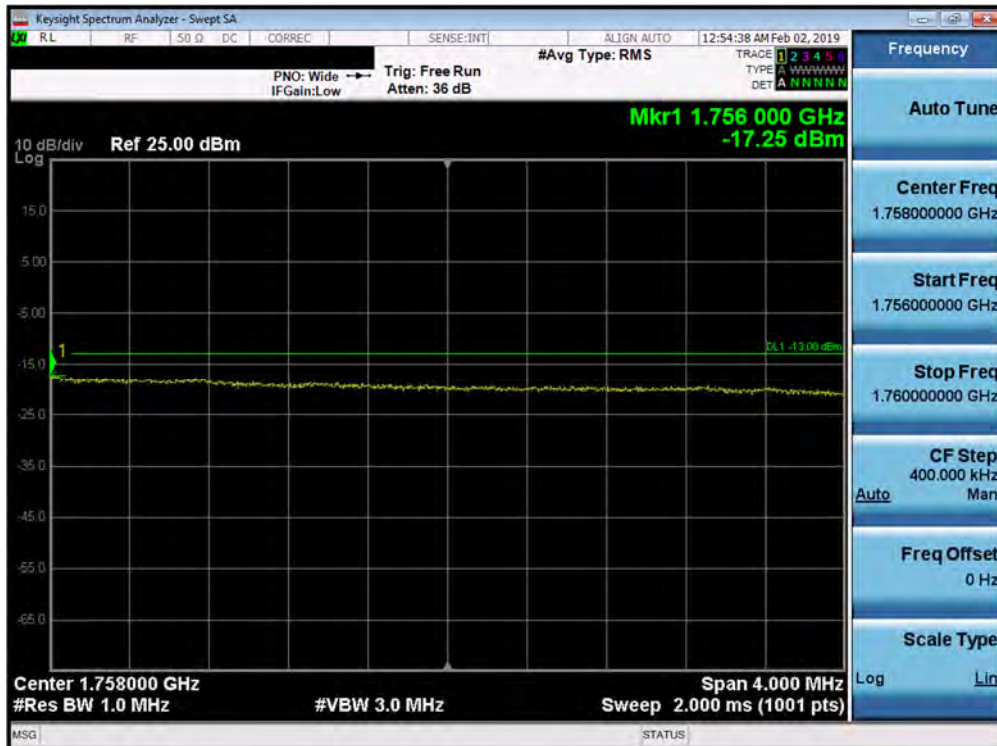


Plot 7-244. Lower Extended Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 146 of 289

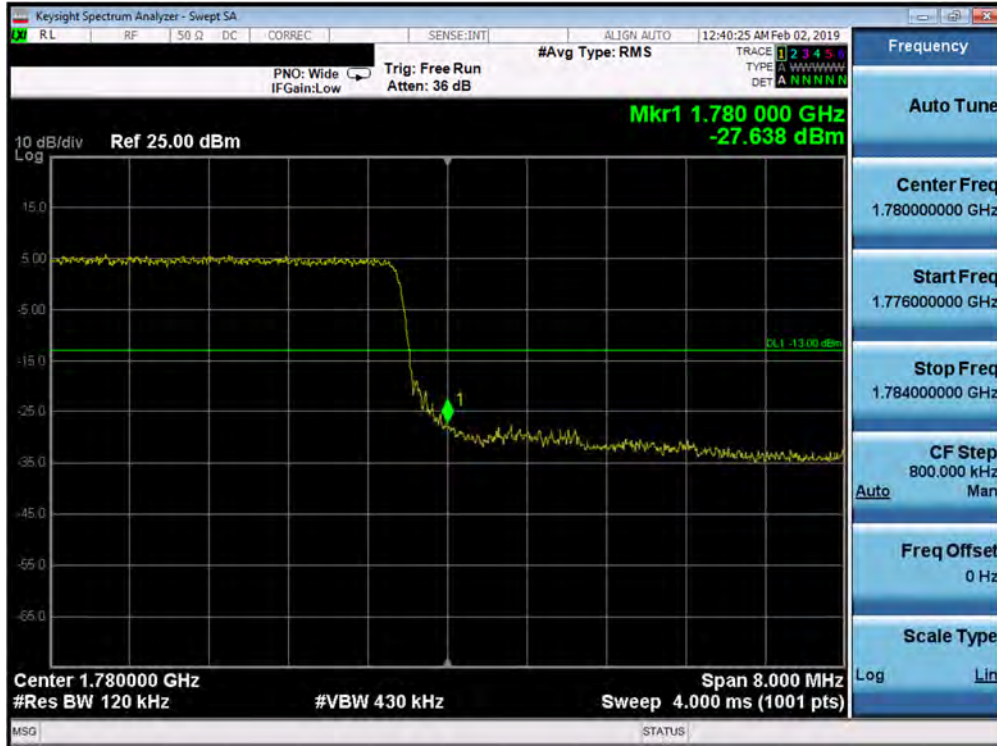


Plot 7-245. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

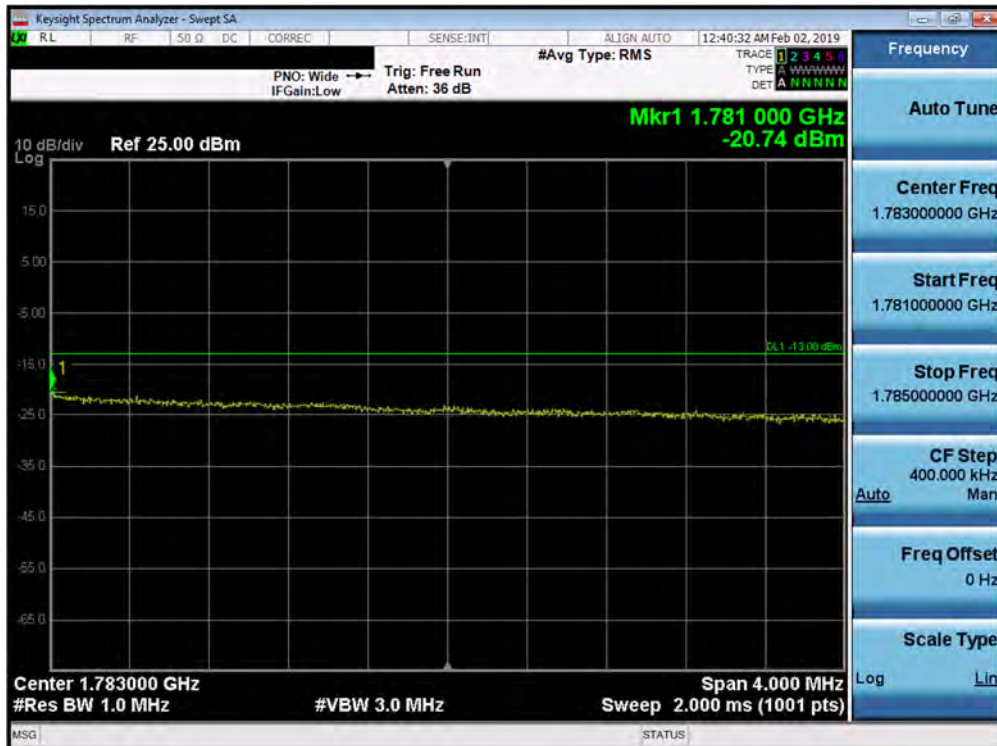


Plot 7-246. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 147 of 289

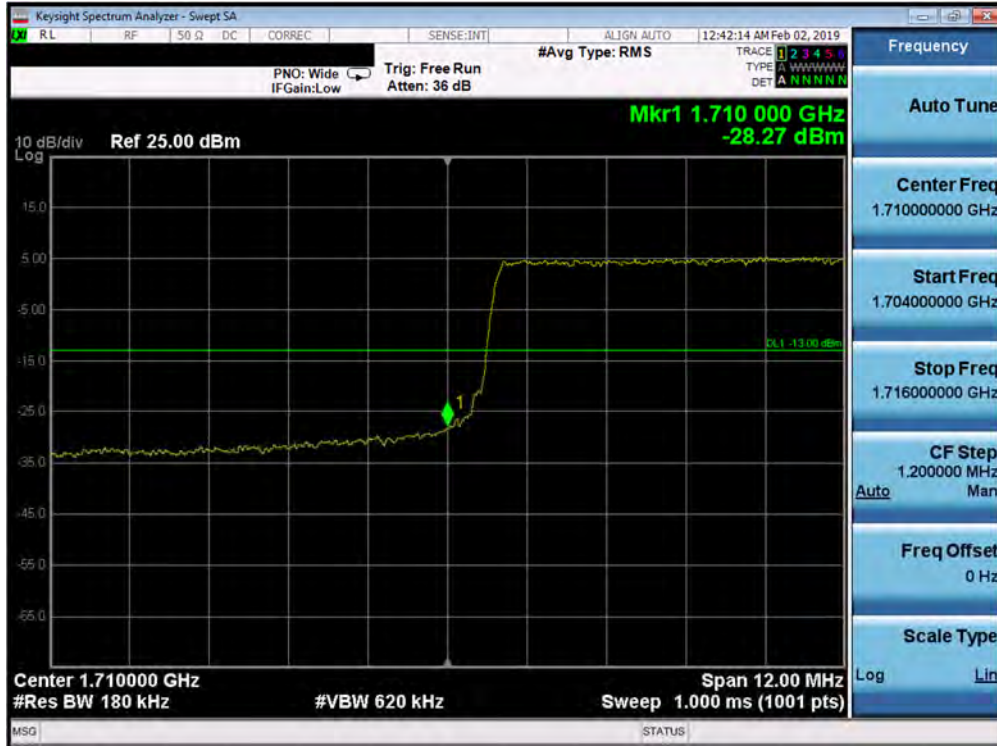


Plot 7-247. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

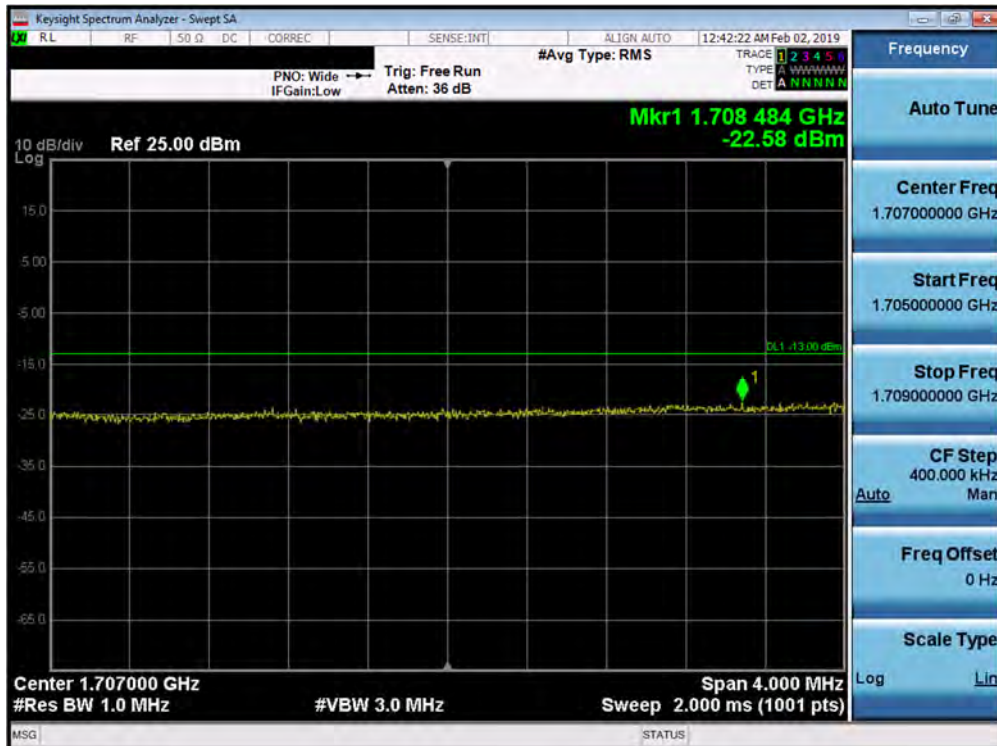


Plot 7-248. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 148 of 289

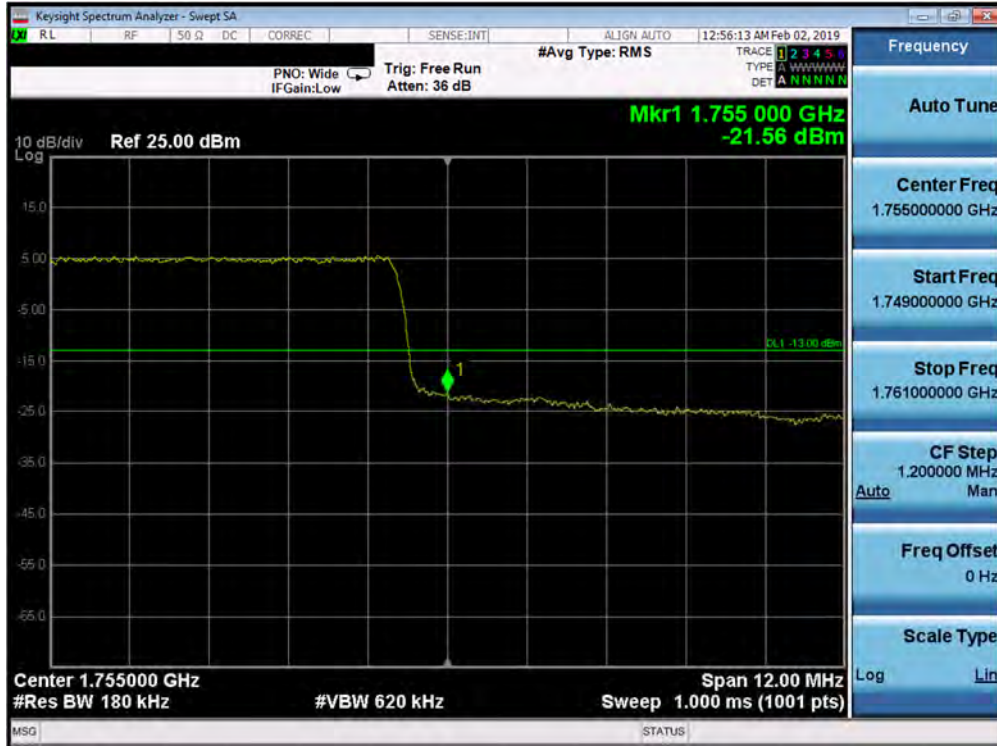


Plot 7-249. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

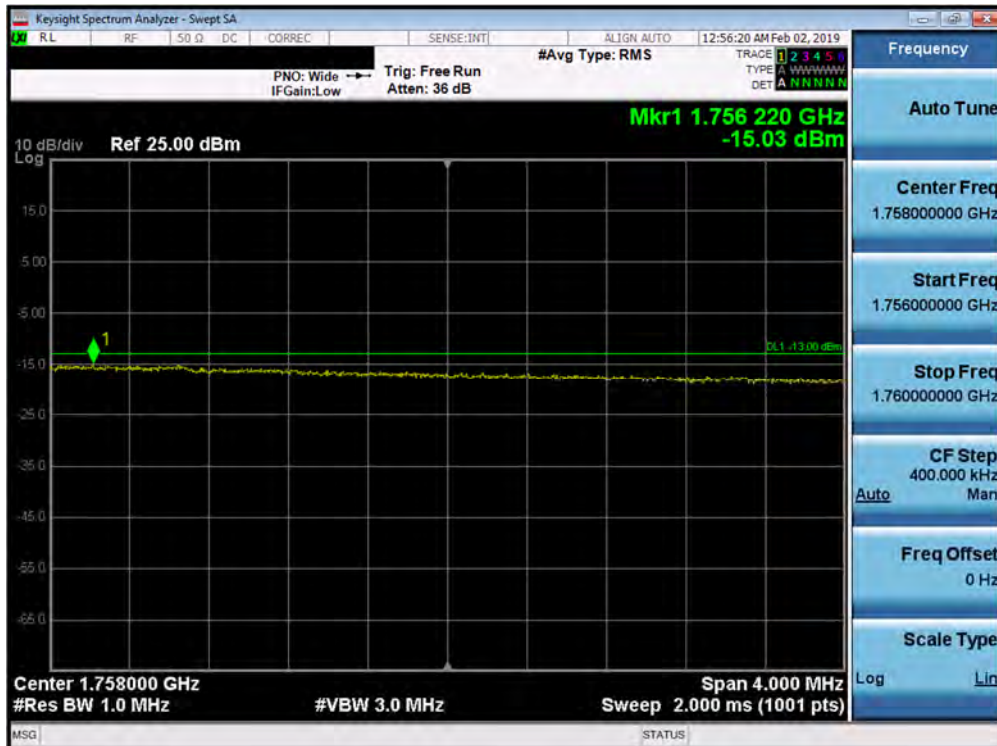


Plot 7-250. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 149 of 289

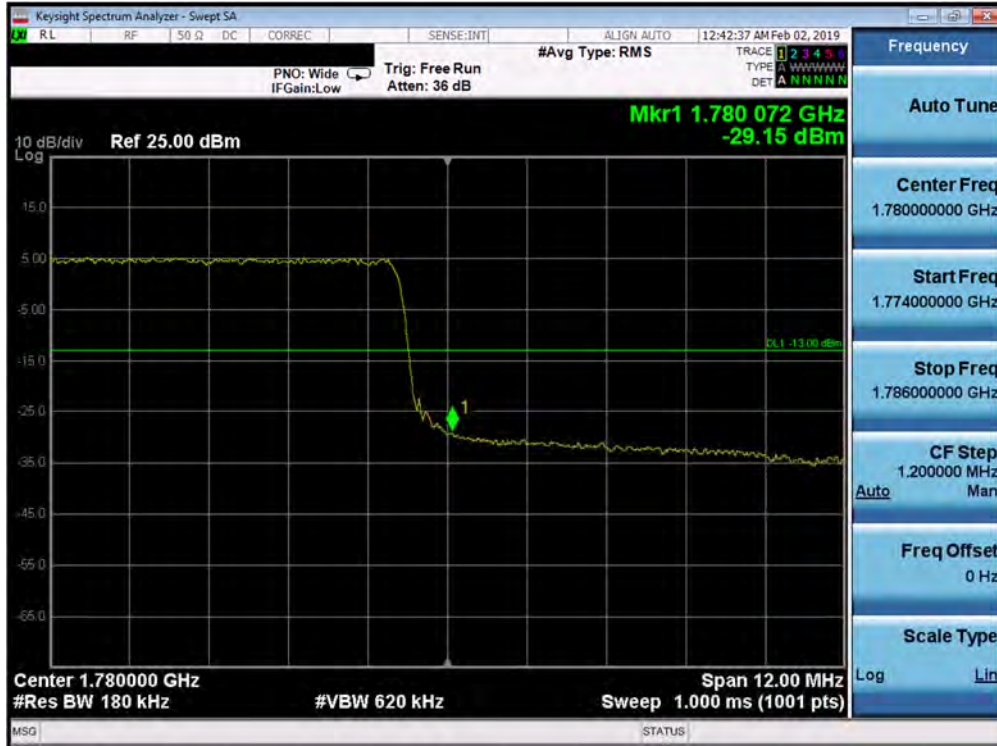


Plot 7-251. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

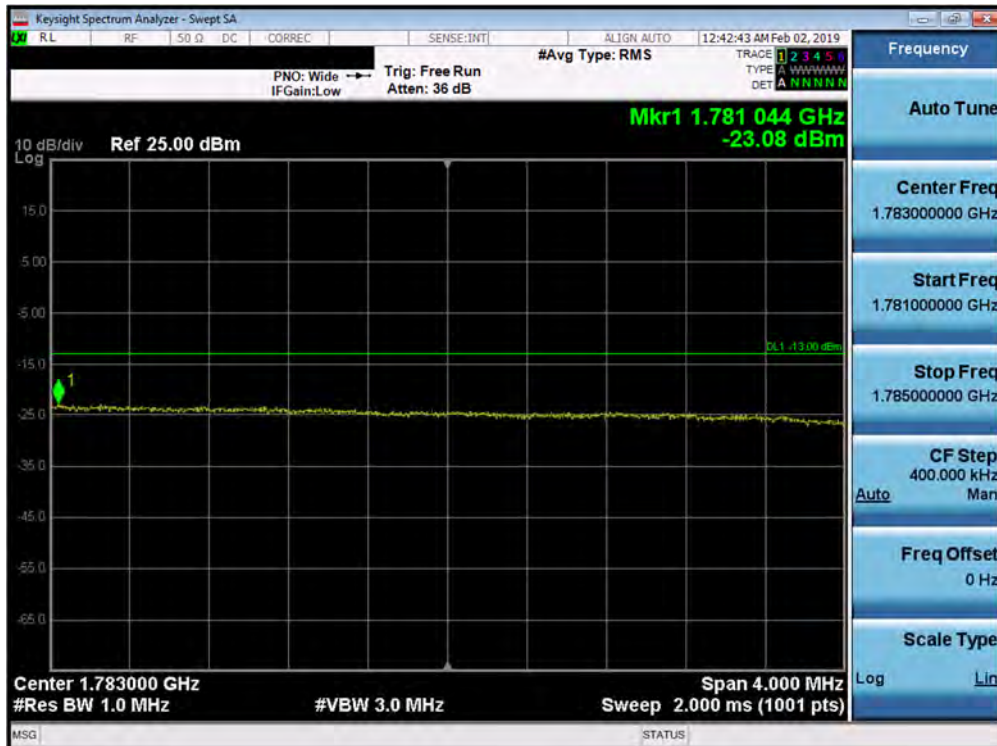


Plot 7-252. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 150 of 289



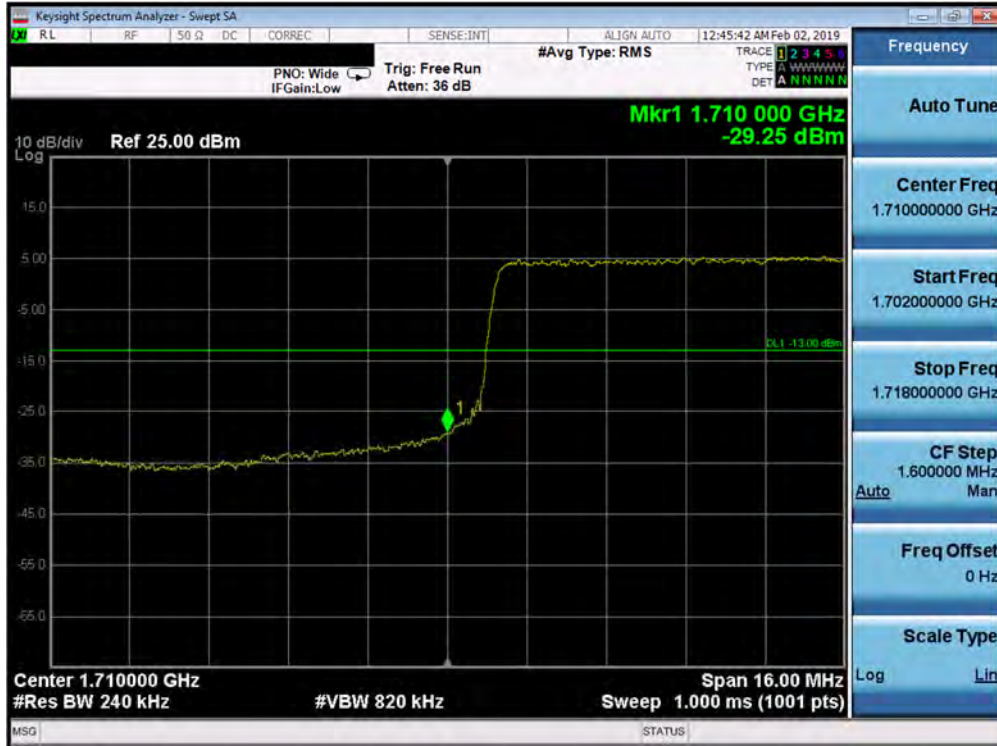
Plot 7-253. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)



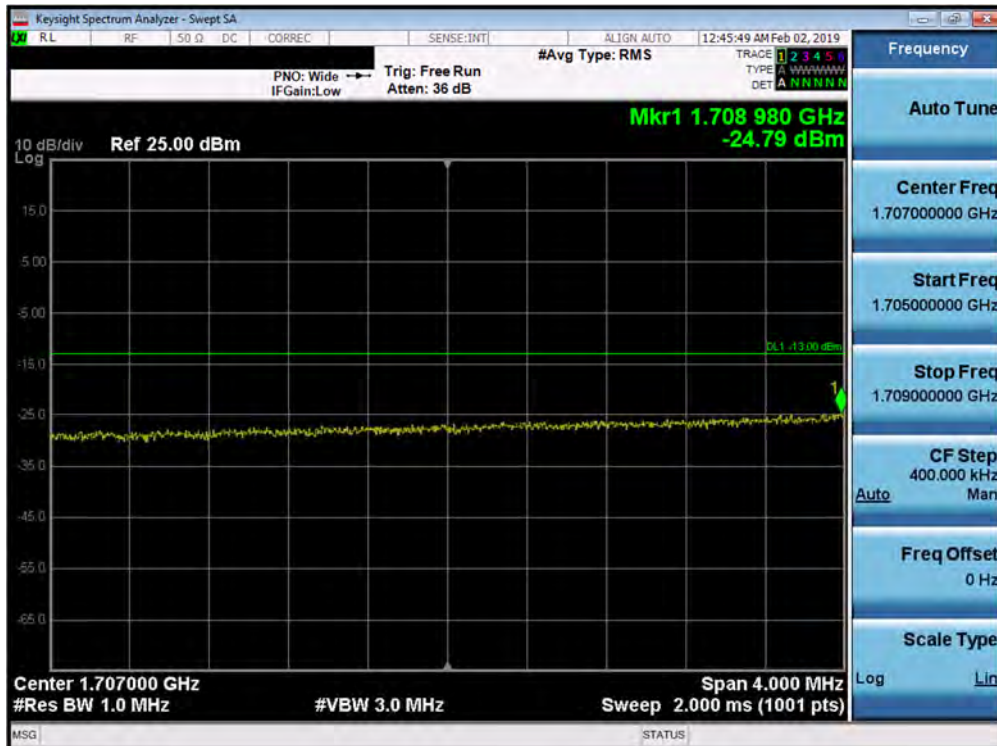
Plot 7-254. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 151 of 289



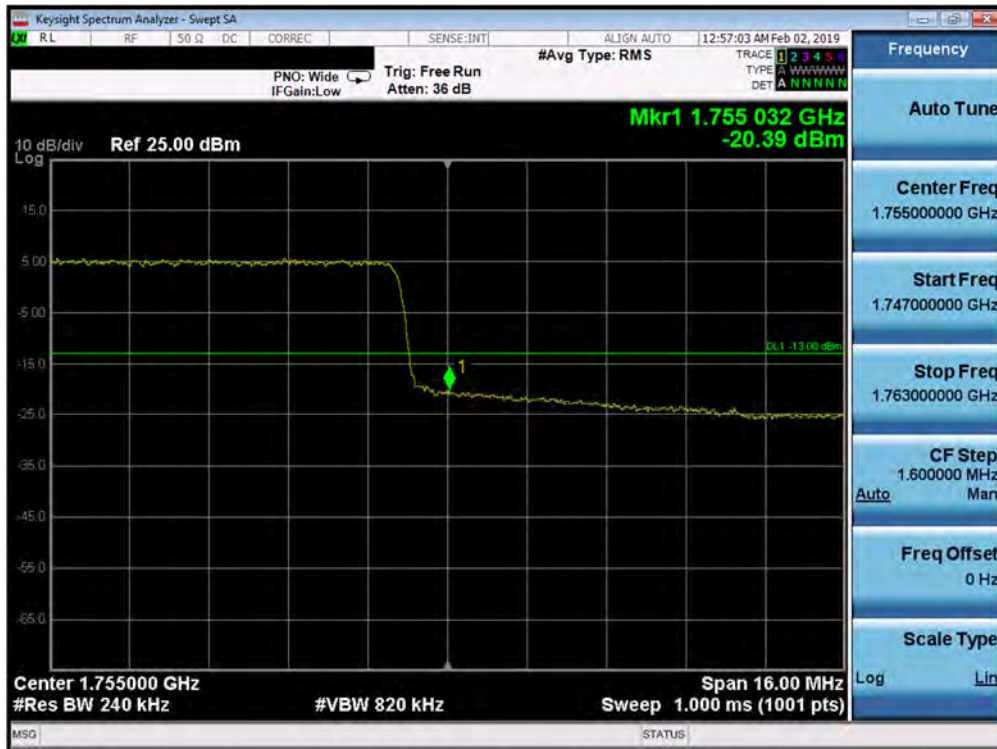


Plot 7-255. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

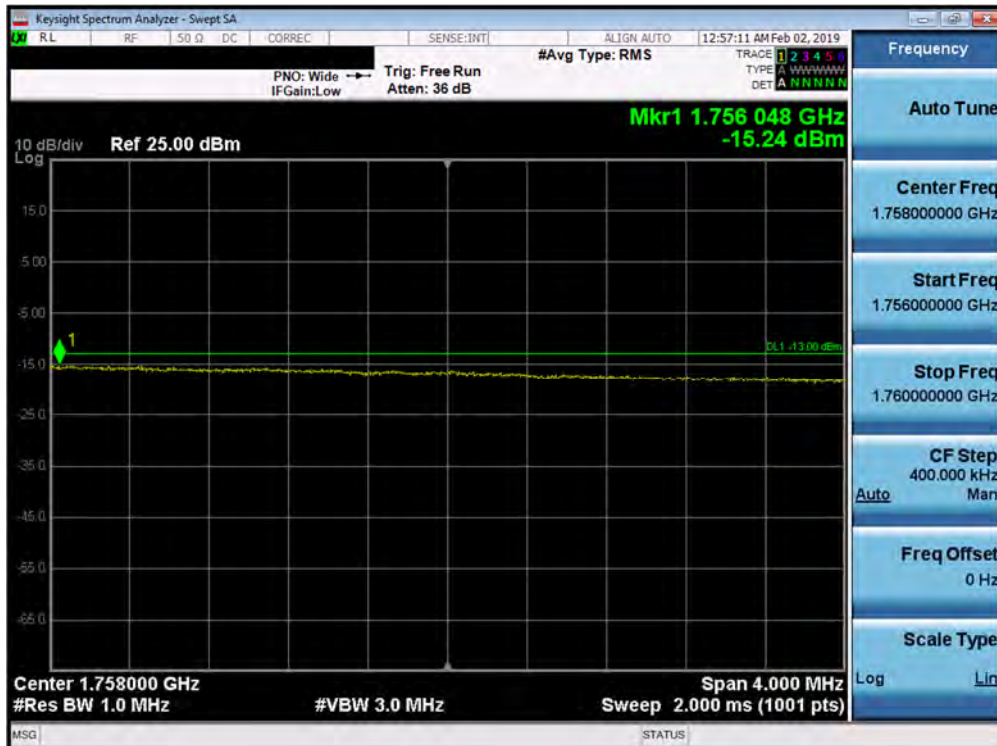


Plot 7-256. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 152 of 289

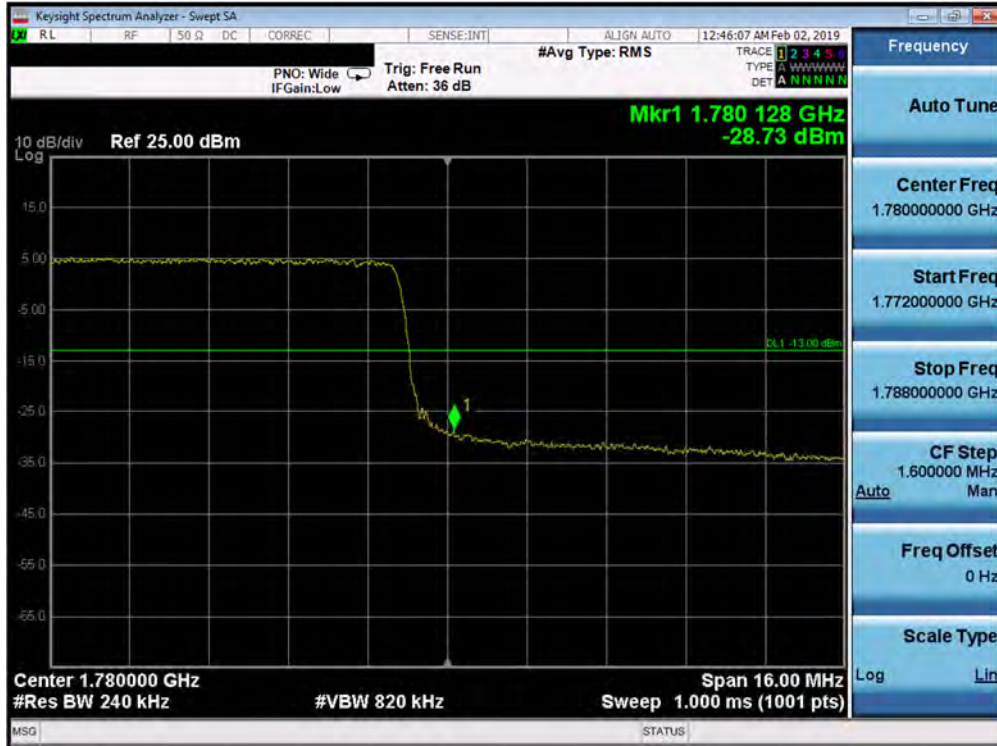


Plot 7-257. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

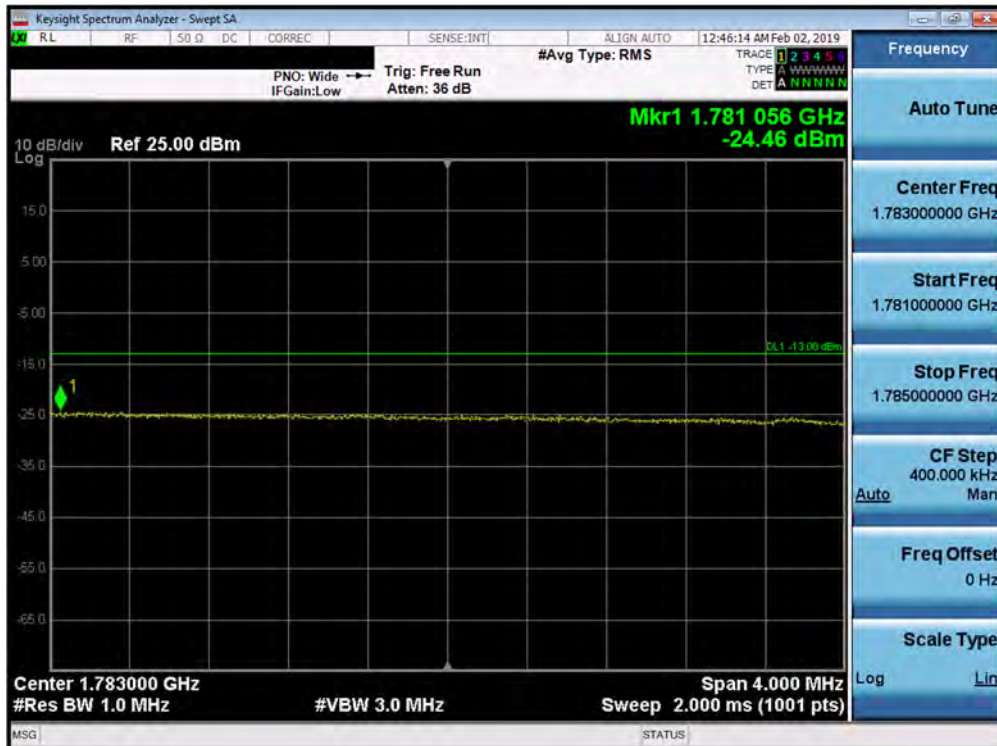


Plot 7-258. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 153 of 289



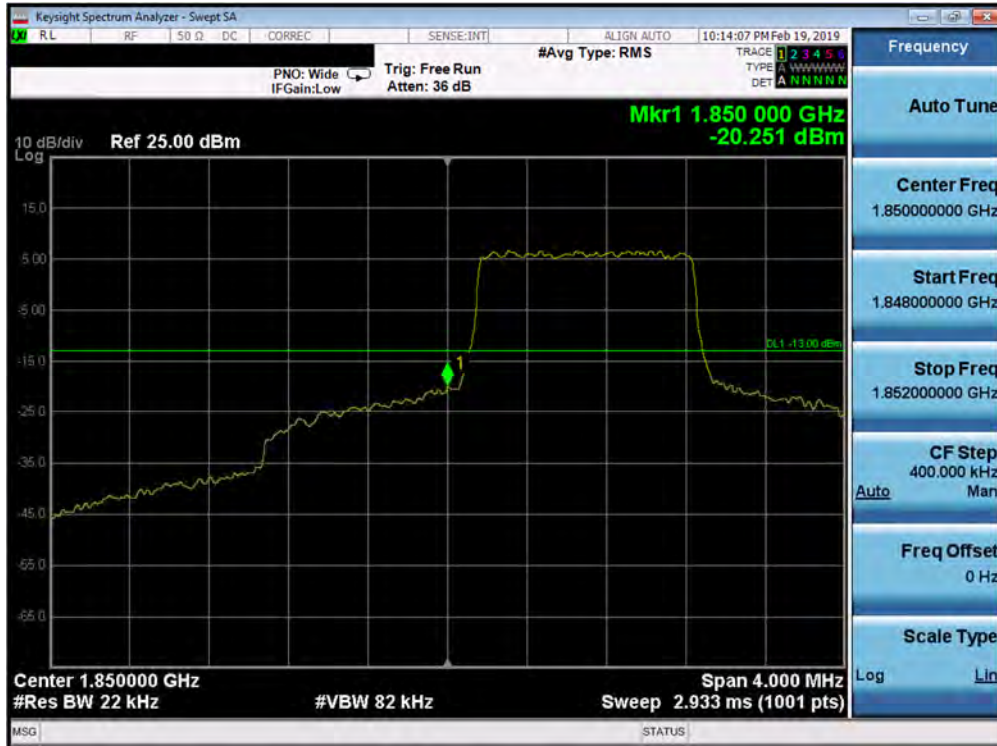
Plot 7-259. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



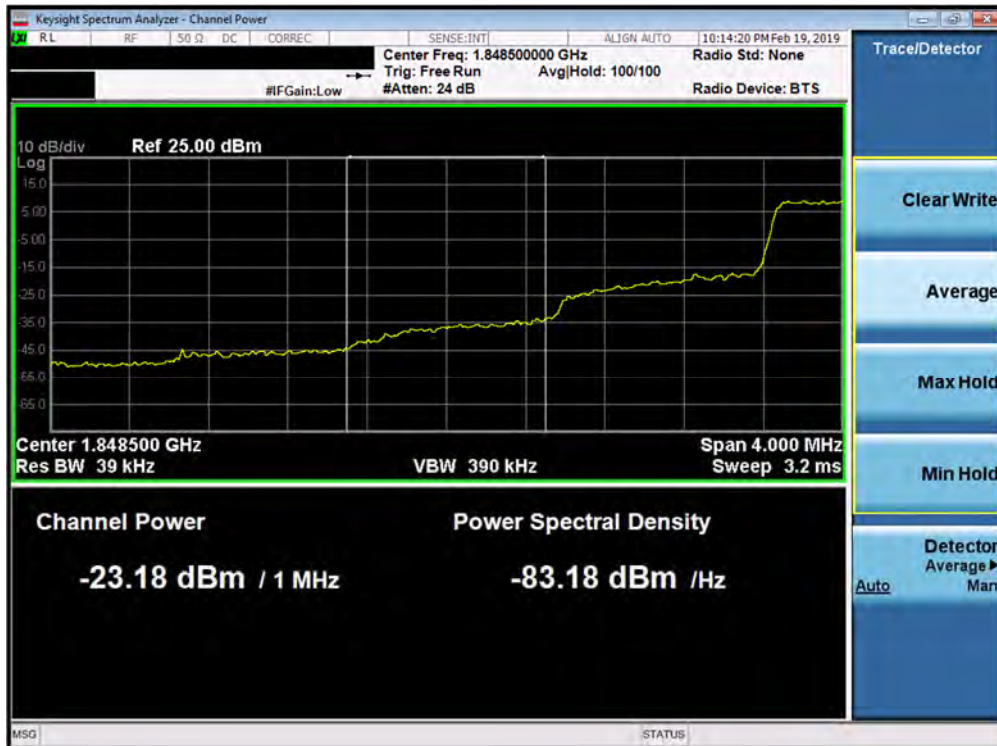
Plot 7-260. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 154 of 289

**Band 2**



Plot 7-261. Lower Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

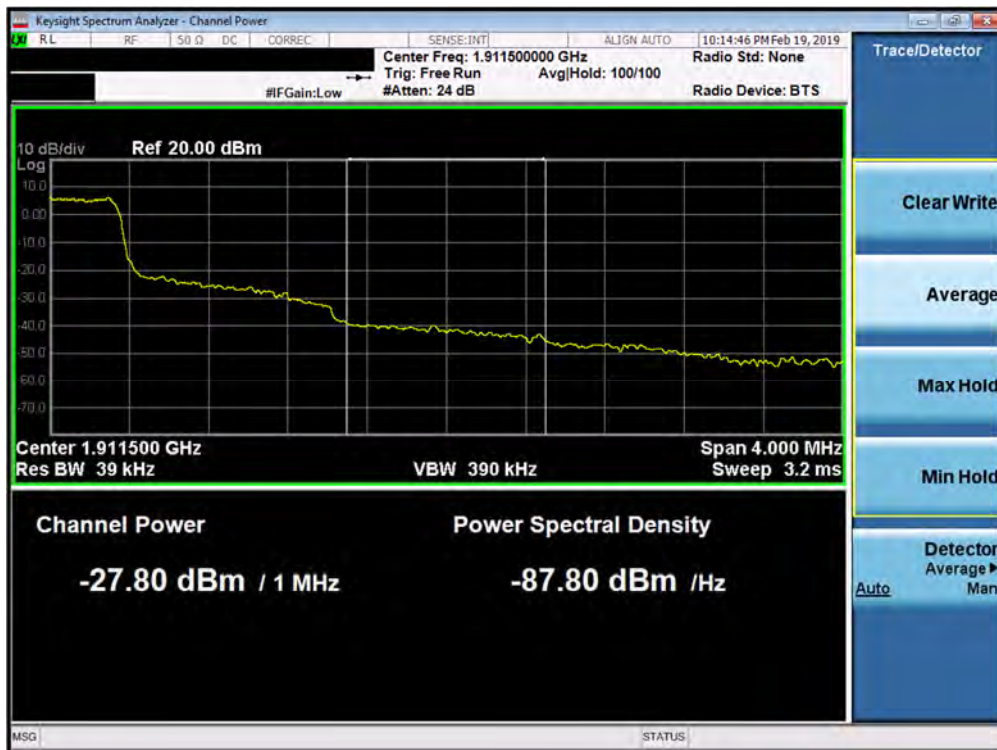


Plot 7-262. Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 155 of 289



Plot 7-263. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-264. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG977U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1901100003-03.A3L	Test Dates: 01/22/2019 - 03/25/2019	EUT Type: Portable Handset		Page 156 of 289