7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §22.917(a) §24.238(a) §27.53(c) §27.53(g) §27.53(h) §27.53(m)

Test Overview

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

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

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

Test Procedure Used

KDB 971168 v02r02 – Section 6.0

Test Settings

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

Test Setup

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

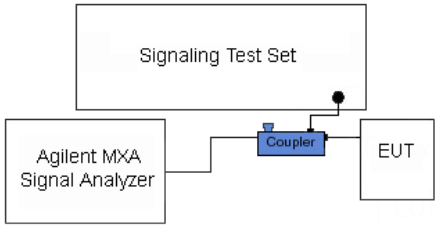


Figure 7-3. Test Instrument & Measurement Setup

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.

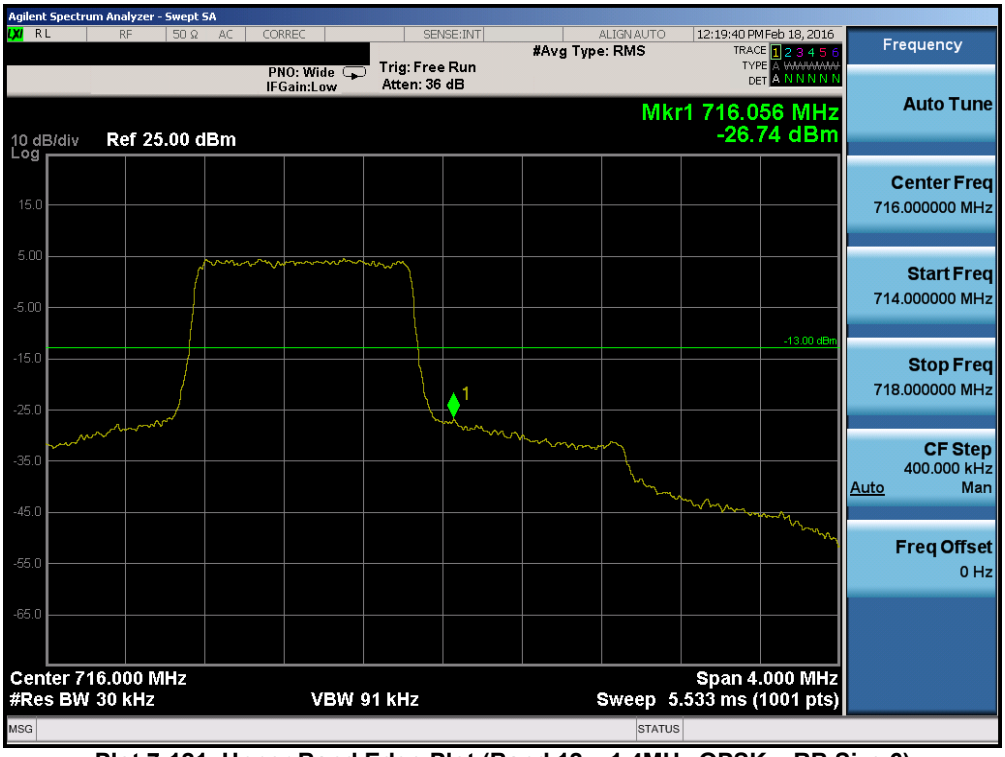
Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

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

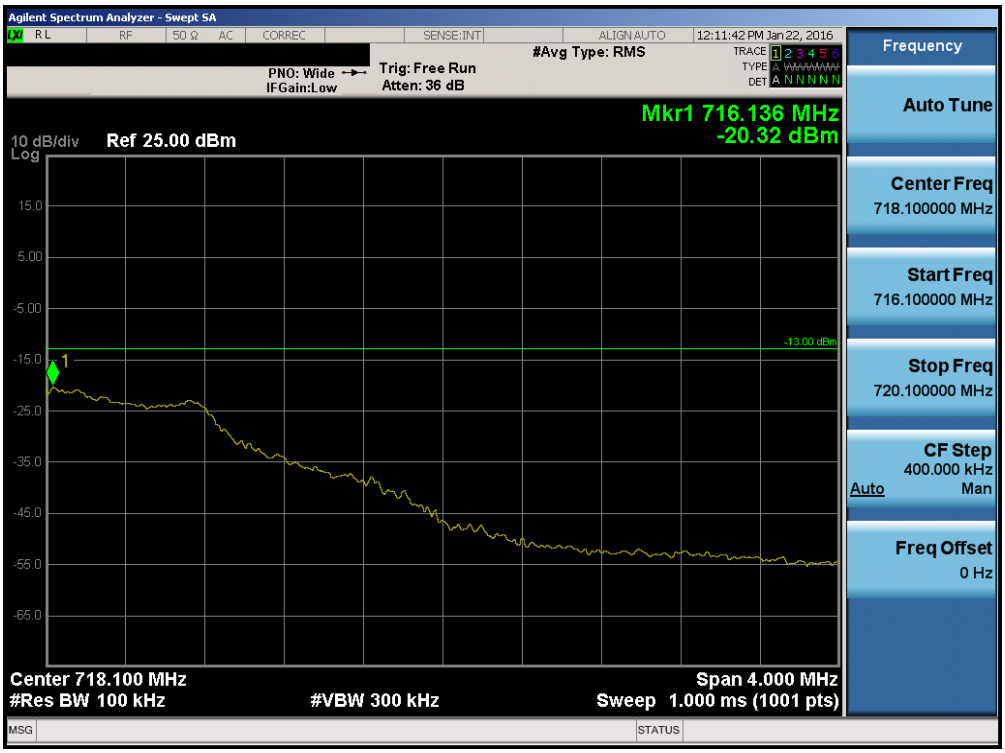
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55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

Plot 7-119. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

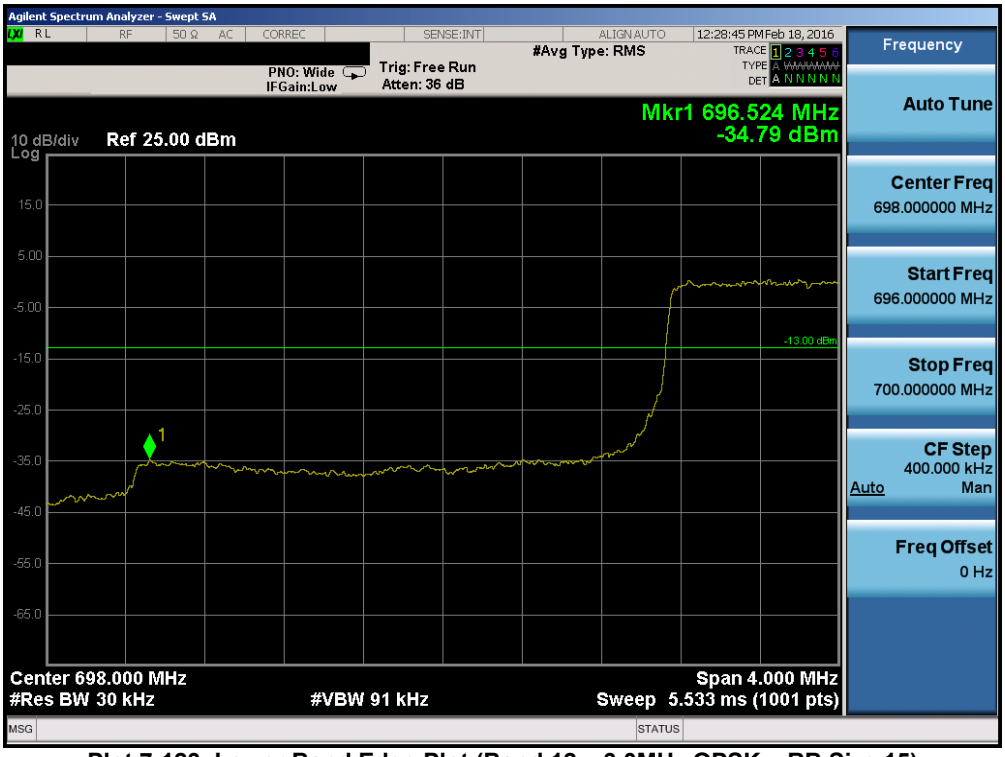
Plot 7-120. Lower Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



Plot 7-121. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



Plot 7-122. Upper Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

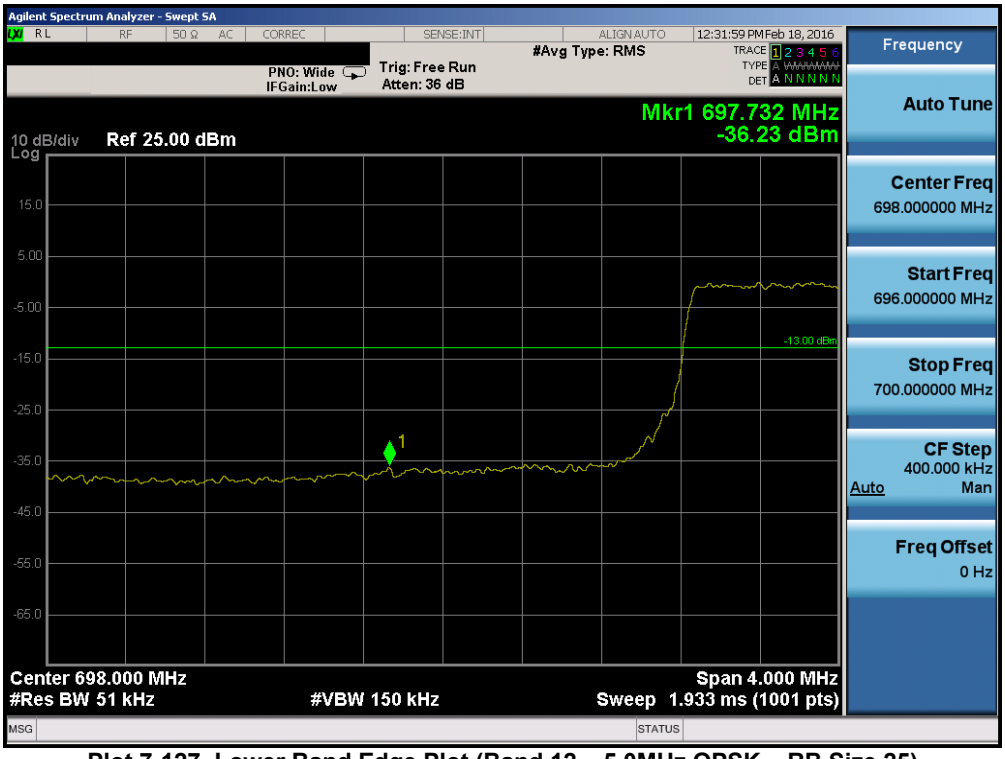


Plot 7-123. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

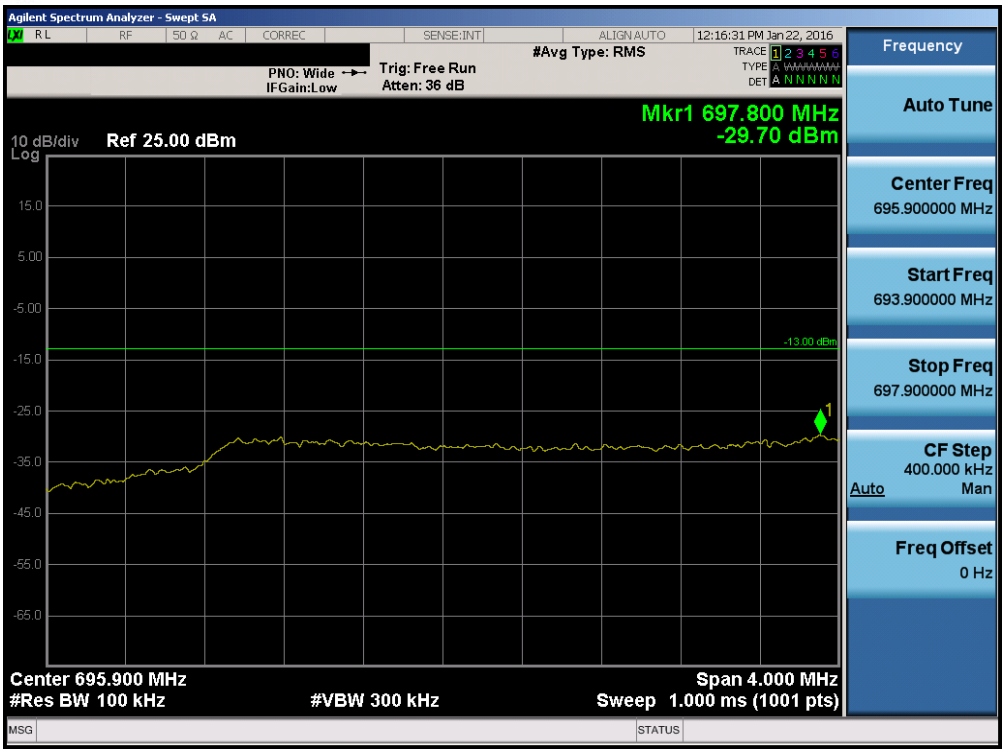
Plot 7-124. Lower Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

Plot 7-125. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

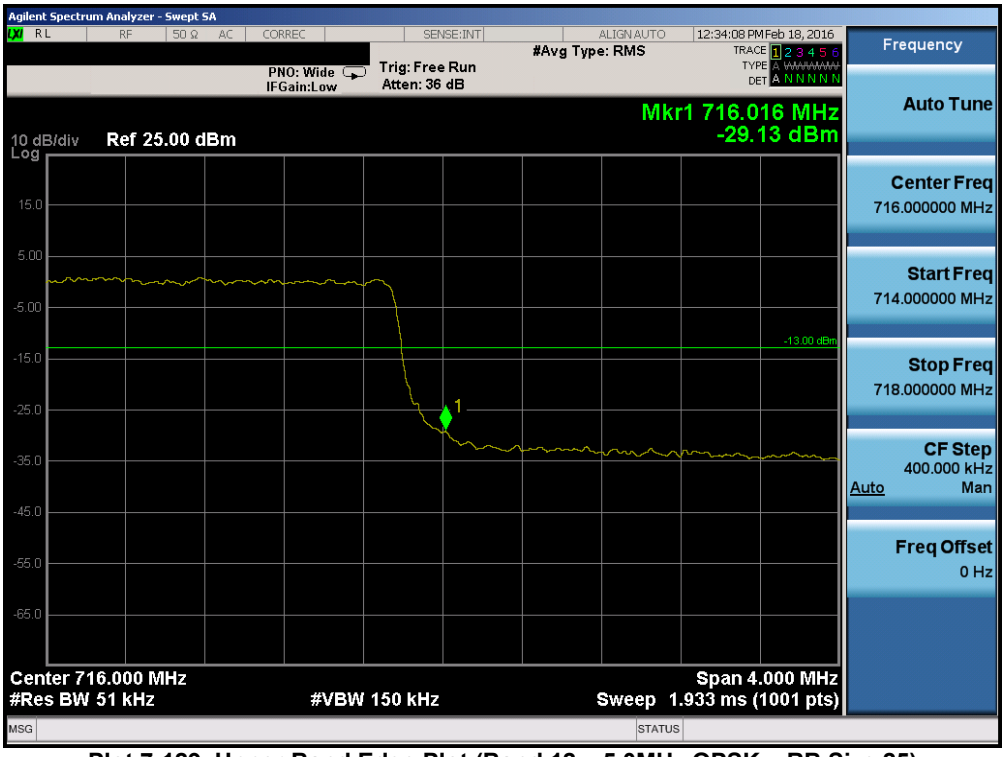
Plot 7-126. Upper Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)



Plot 7-127. Lower Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

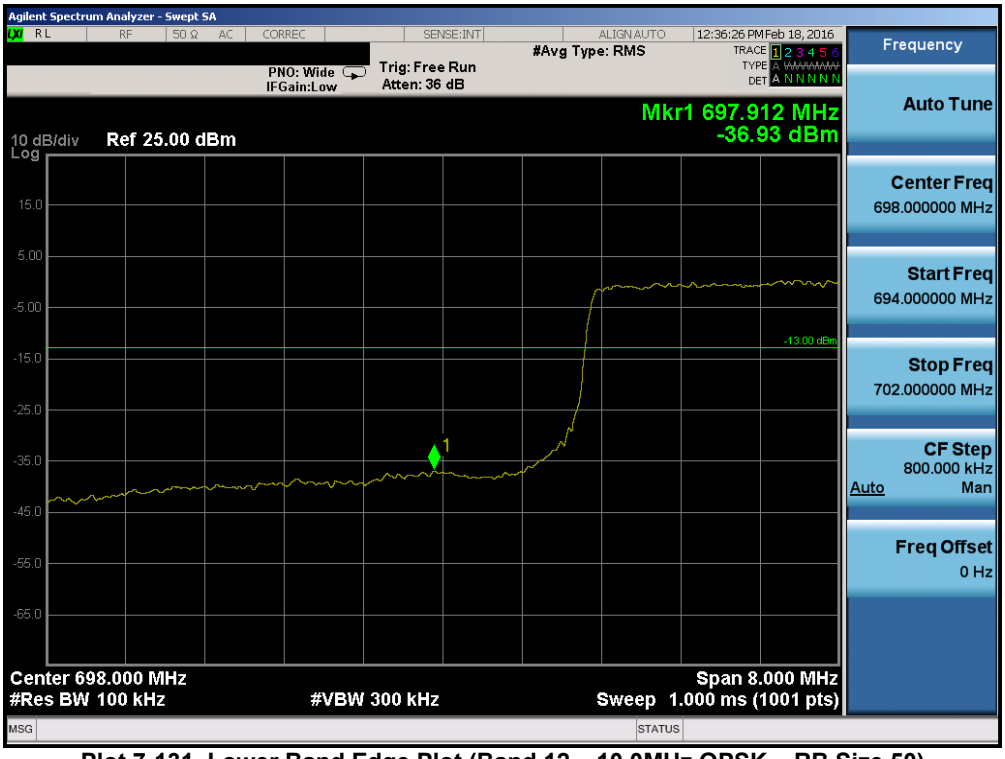


Plot 7-128. Lower Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



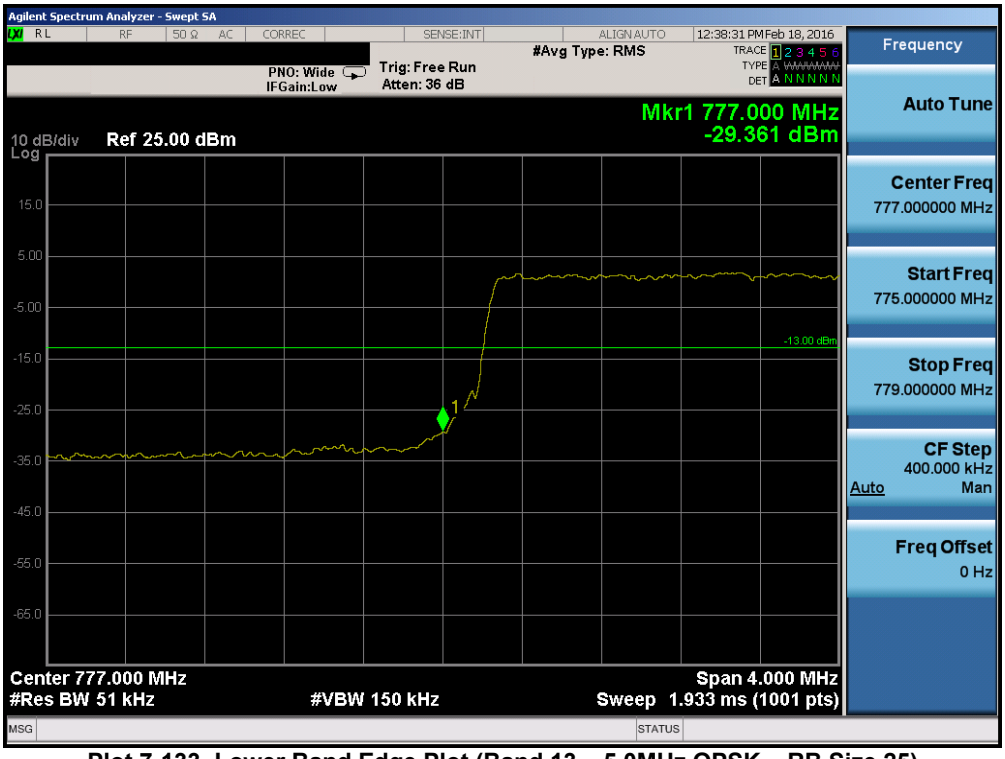
Plot 7-129. Upper Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

Plot 7-130. Upper Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



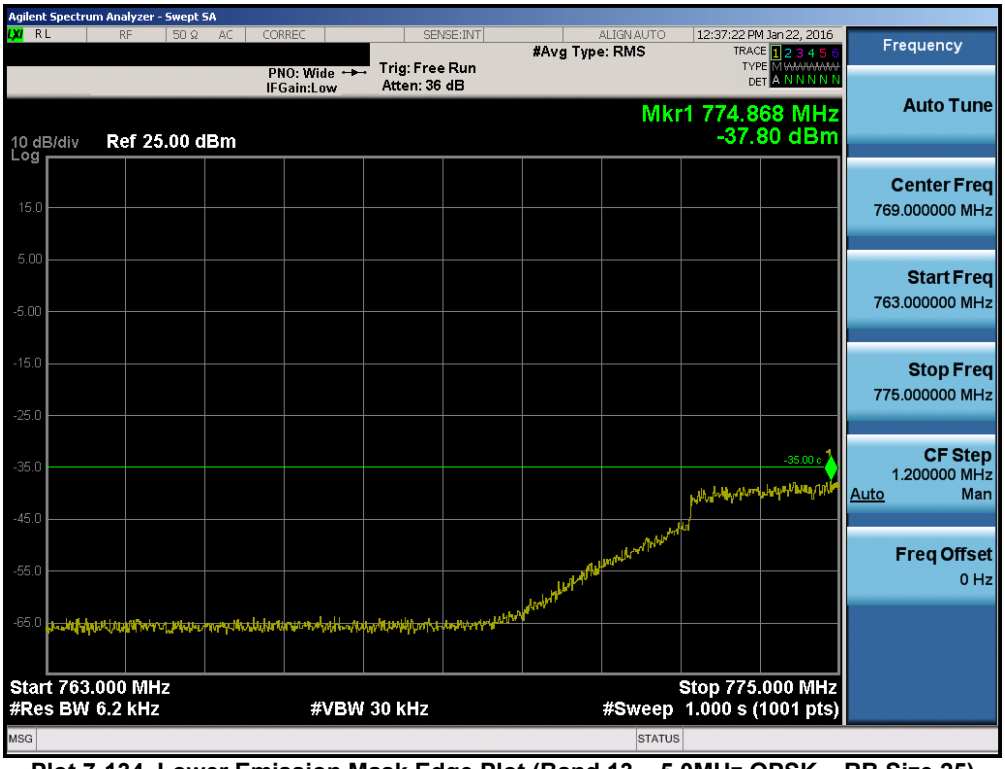
Plot 7-131. Lower Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

Plot 7-132. Upper Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)



Plot 7-133. Lower Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

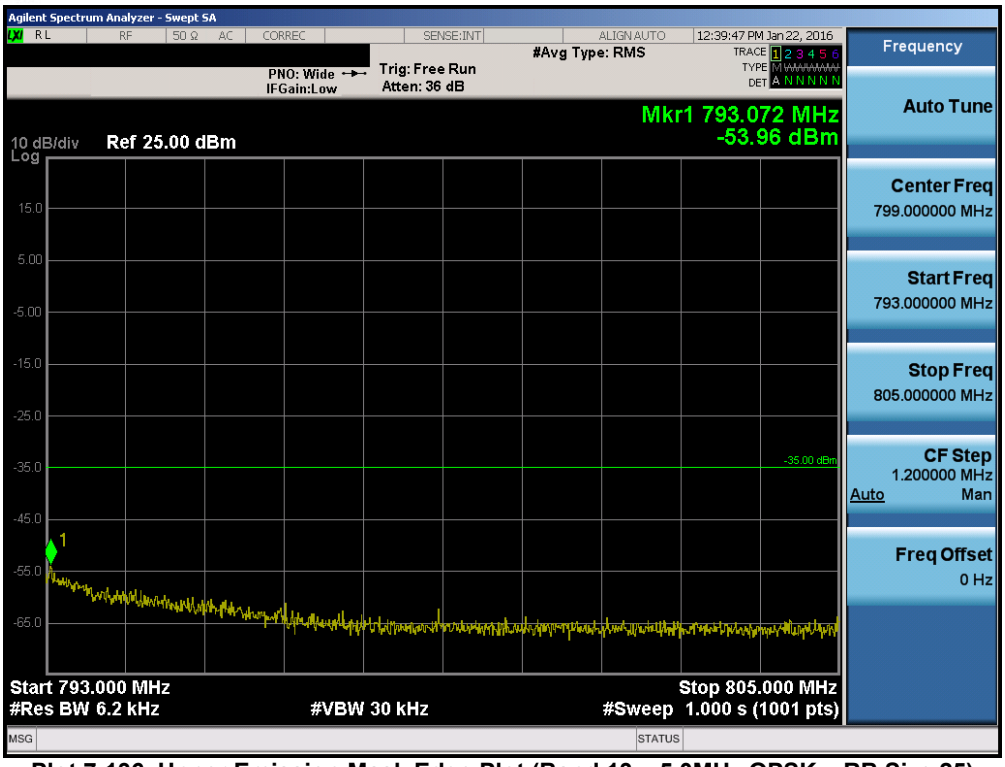
Plot 7-2. Lower Extended Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



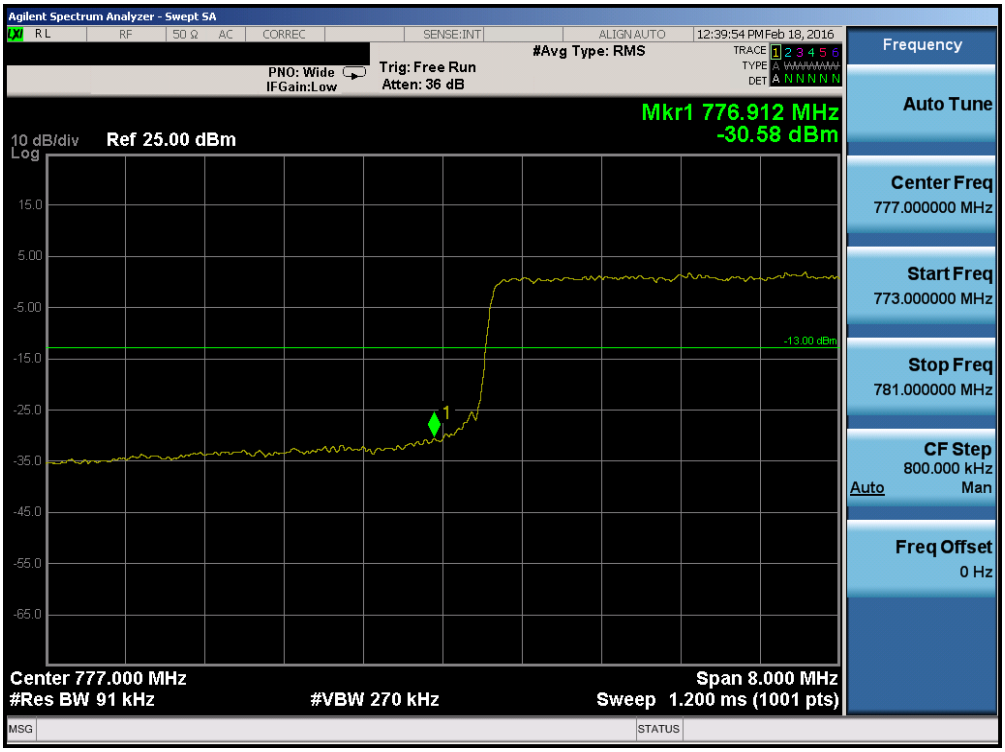
Plot 7-134. Lower Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

Plot 7-135. Upper Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

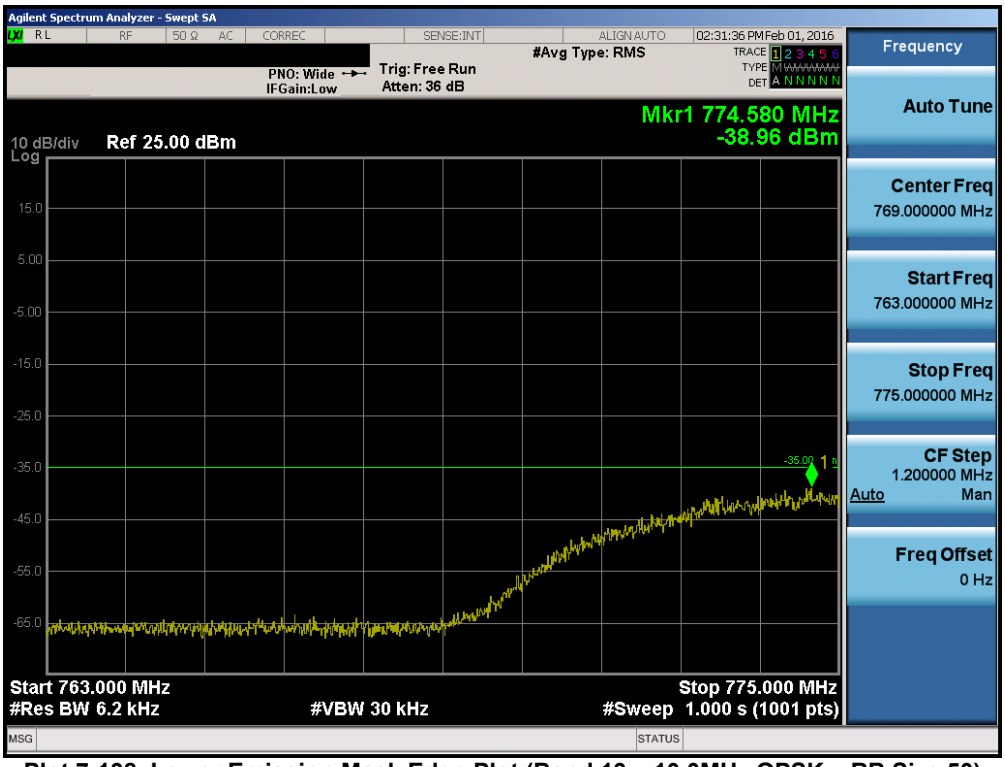
Plot 7-3. Upper Extended Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



Plot 7-136. Upper Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



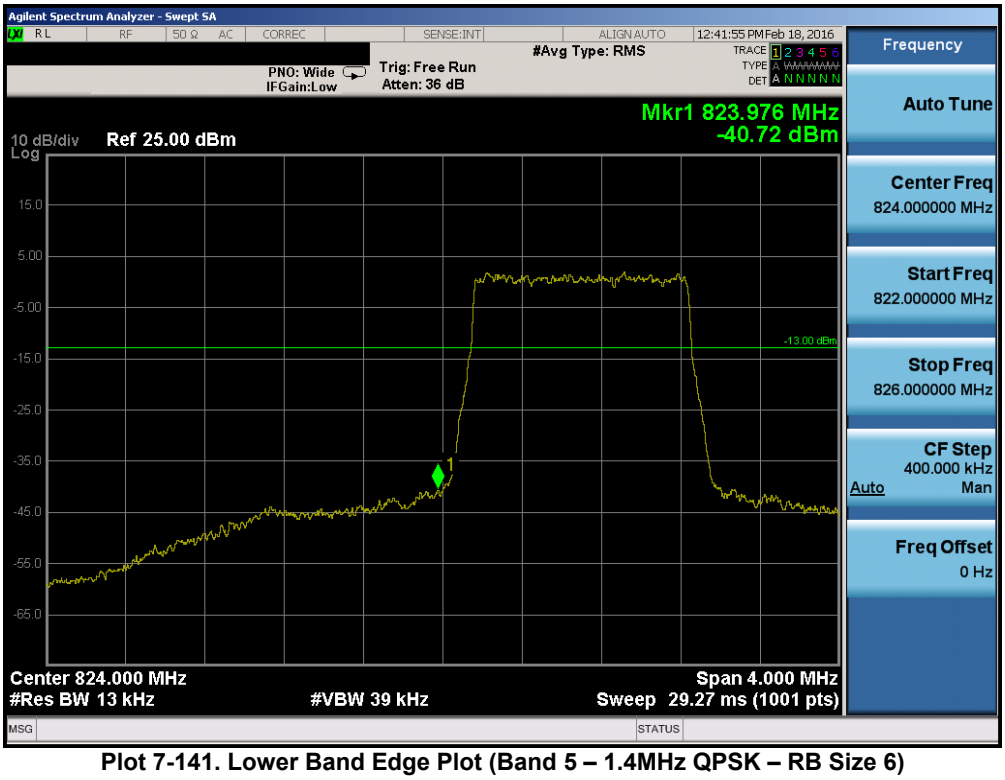
Plot 7-137. Lower Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)



Plot 7-138. Lower Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

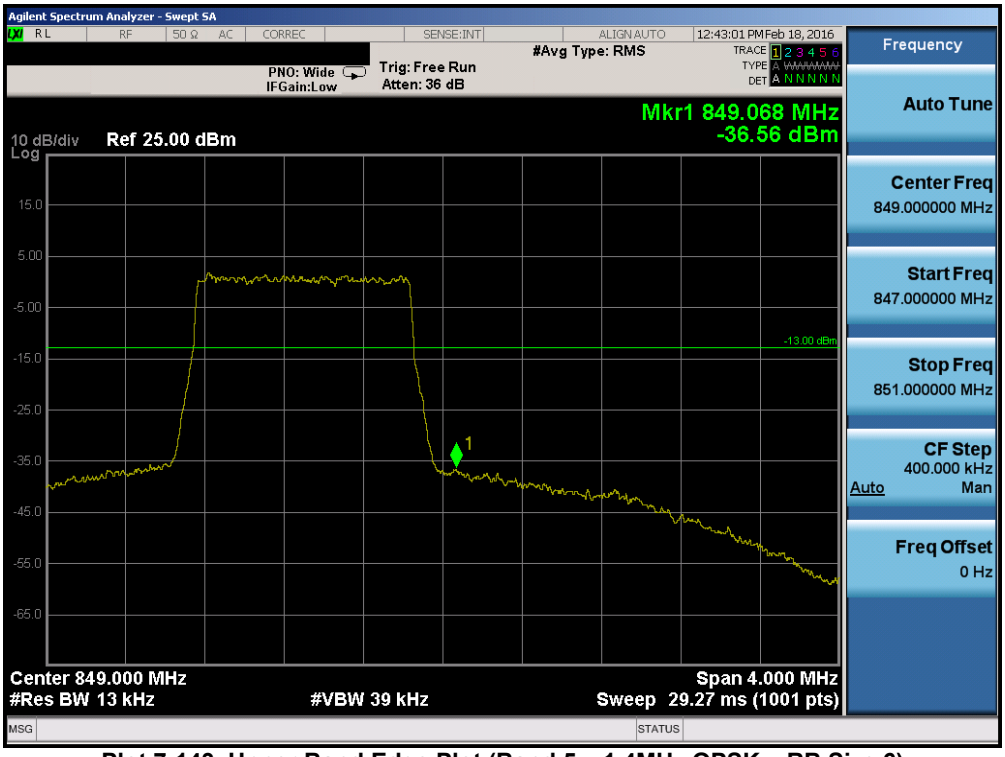
Plot 7-139. Upper Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

Plot 7-140. Upper Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

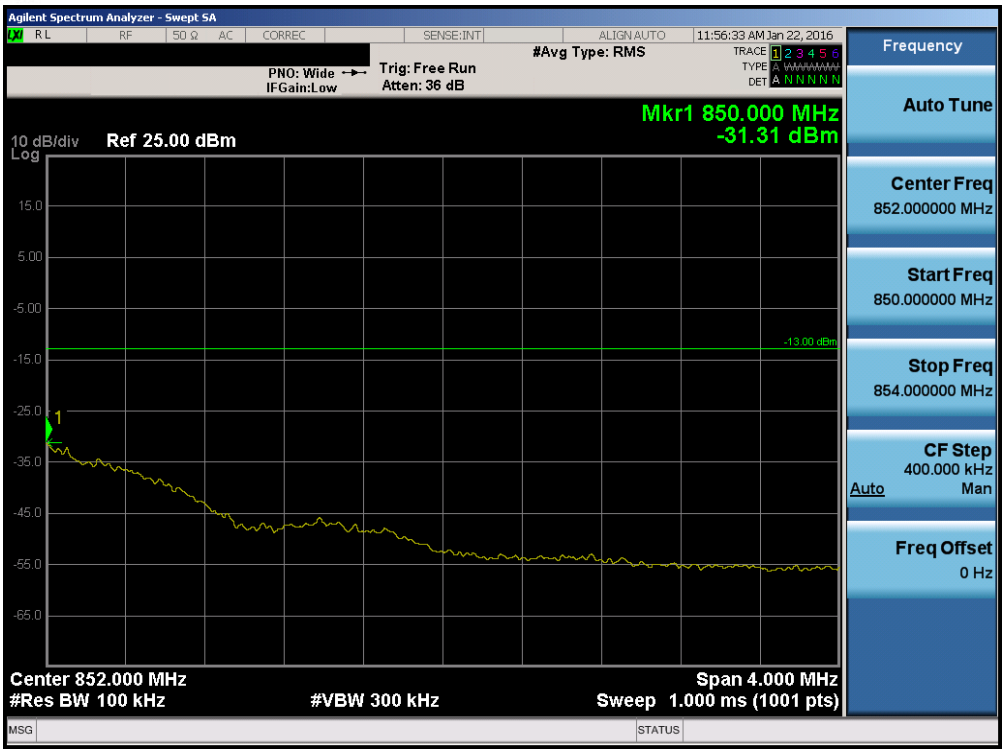


Plot 7-141. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

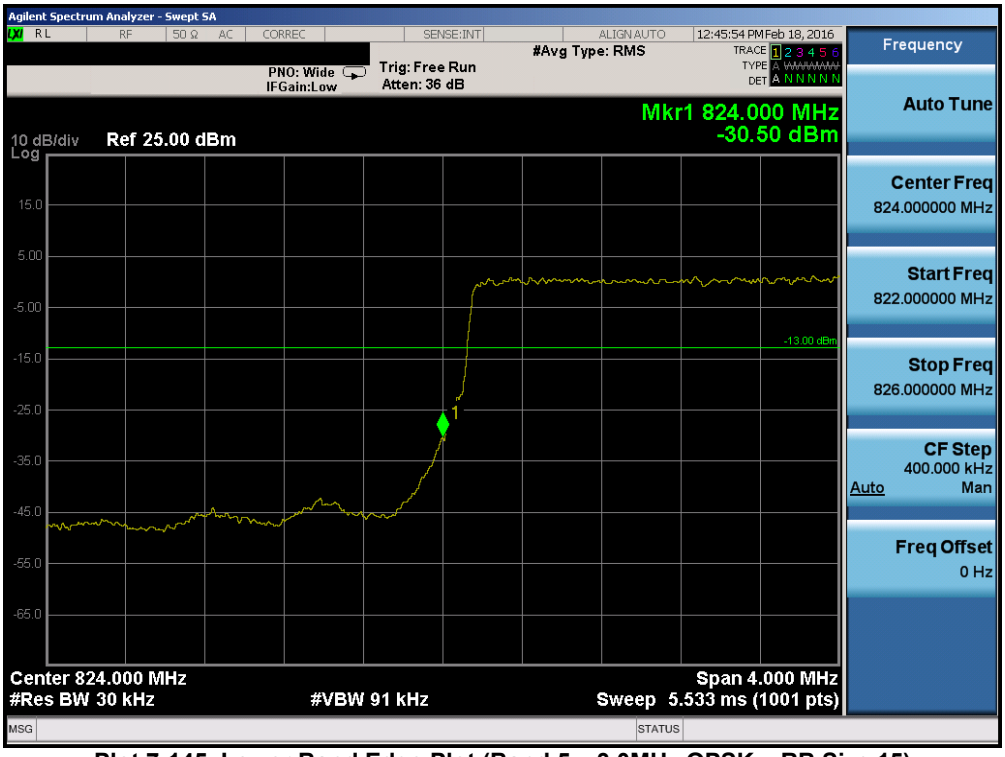
Plot 7-142. Lower Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



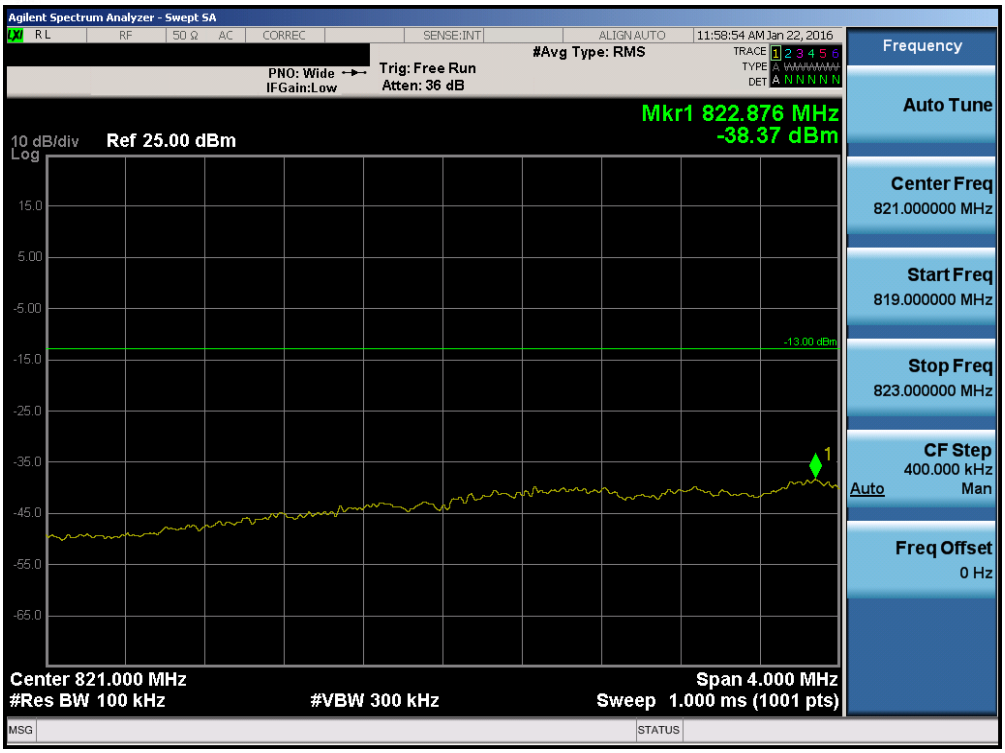
Plot 7-143. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



Plot 7-144. Upper Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



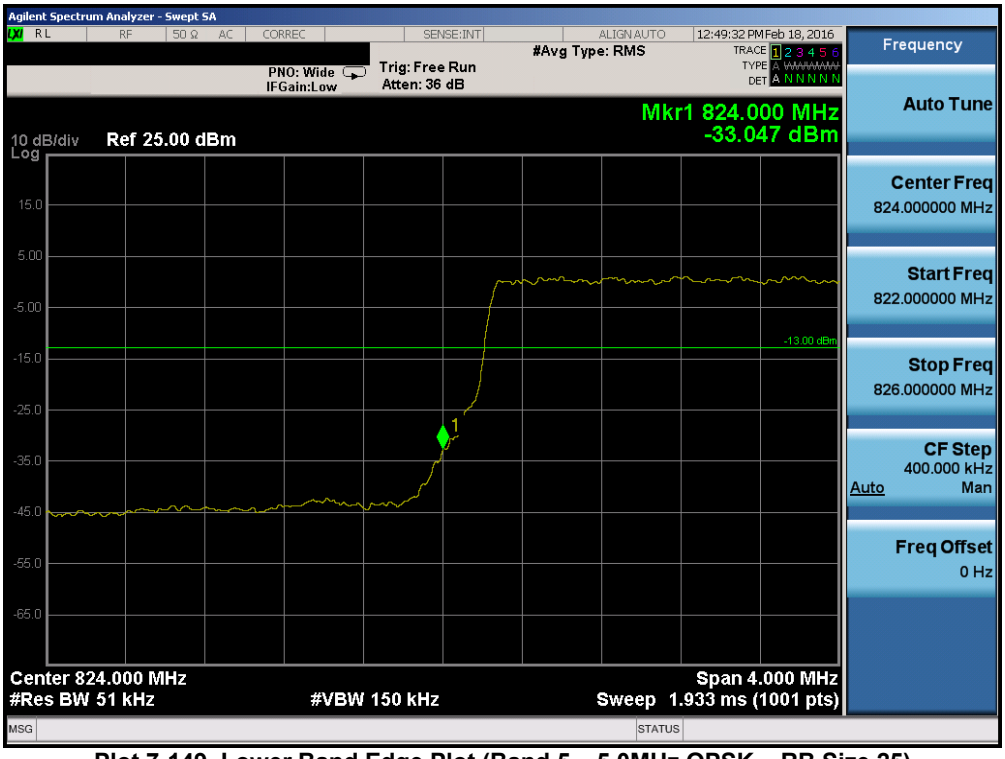
Plot 7-145. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



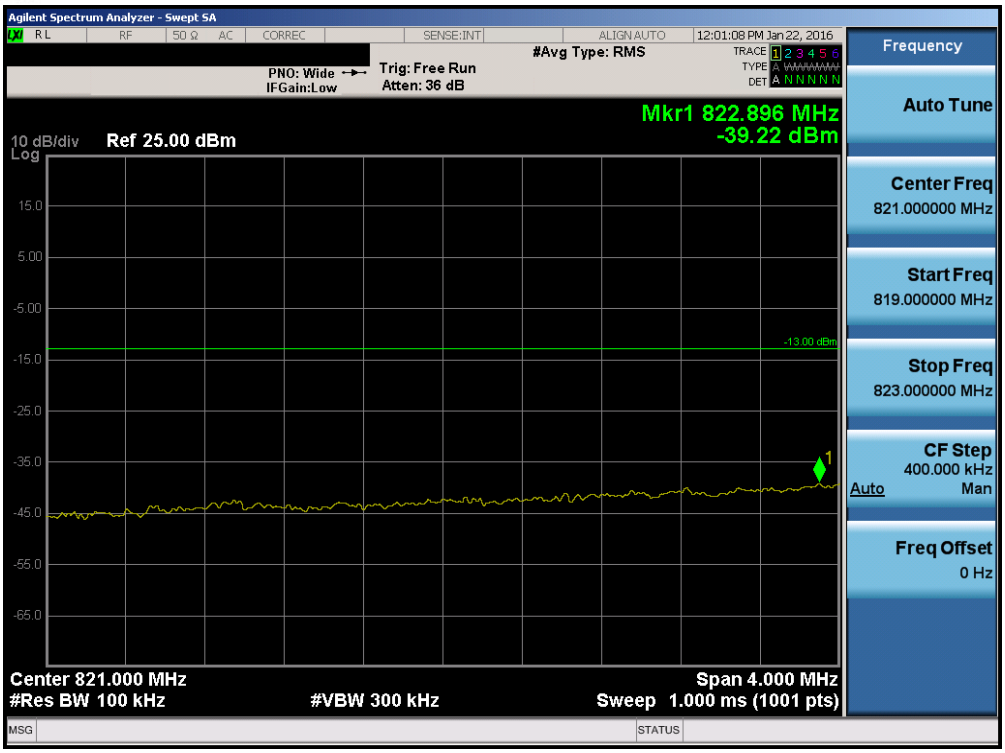
Plot 7-146. Lower Extended Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

Plot 7-147. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

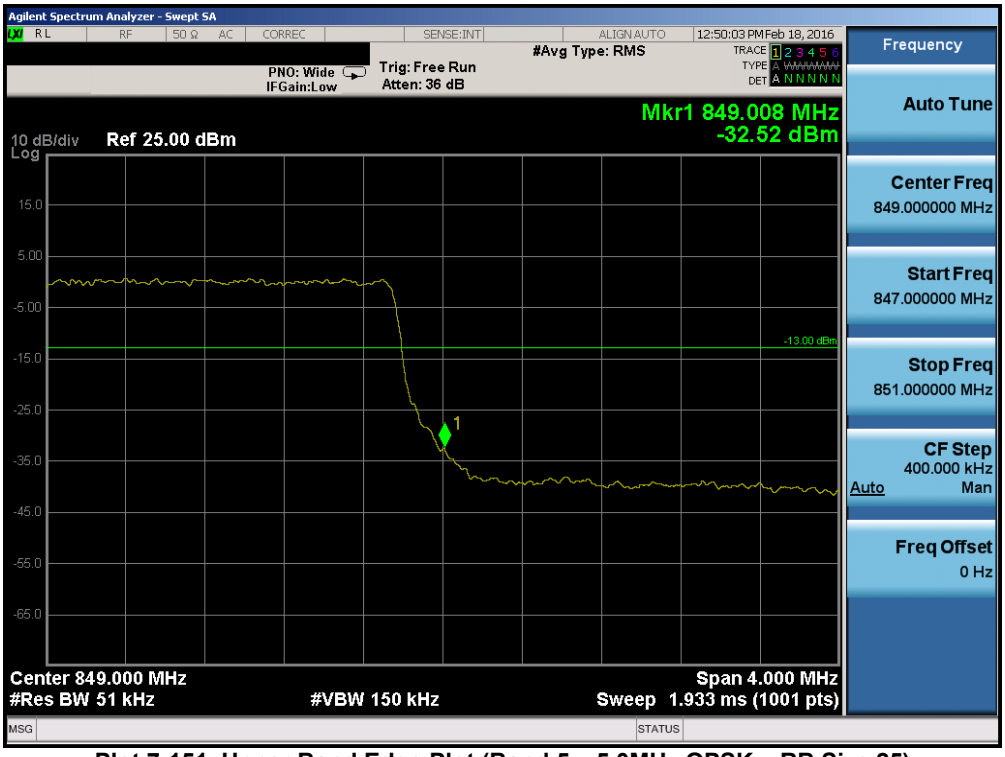
Plot 7-148. Upper Extended Band Edge Plot (Band 5 – Band 5 – 3.0MHz QPSK – RB Size 15)



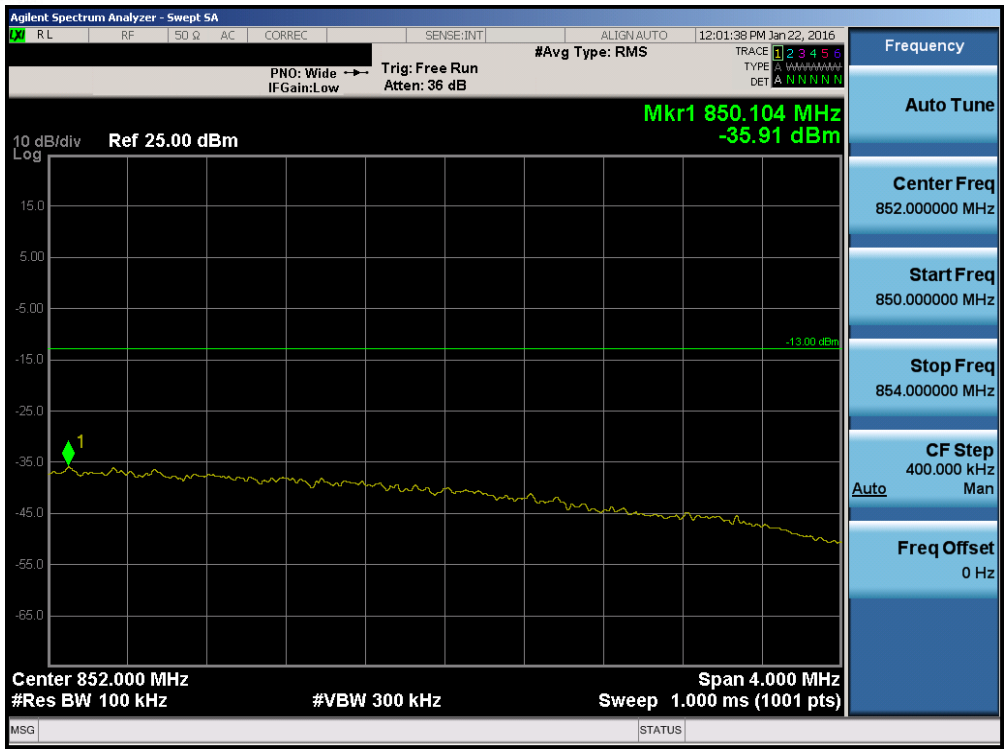
Plot 7-149. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



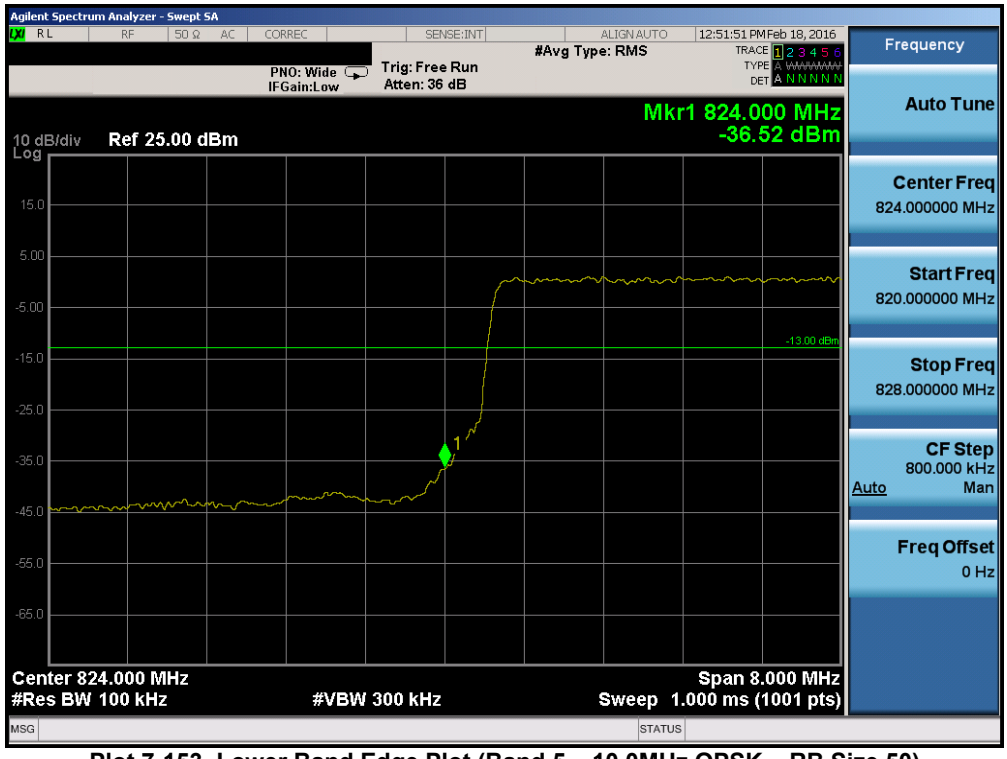
Plot 7-150. Lower Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



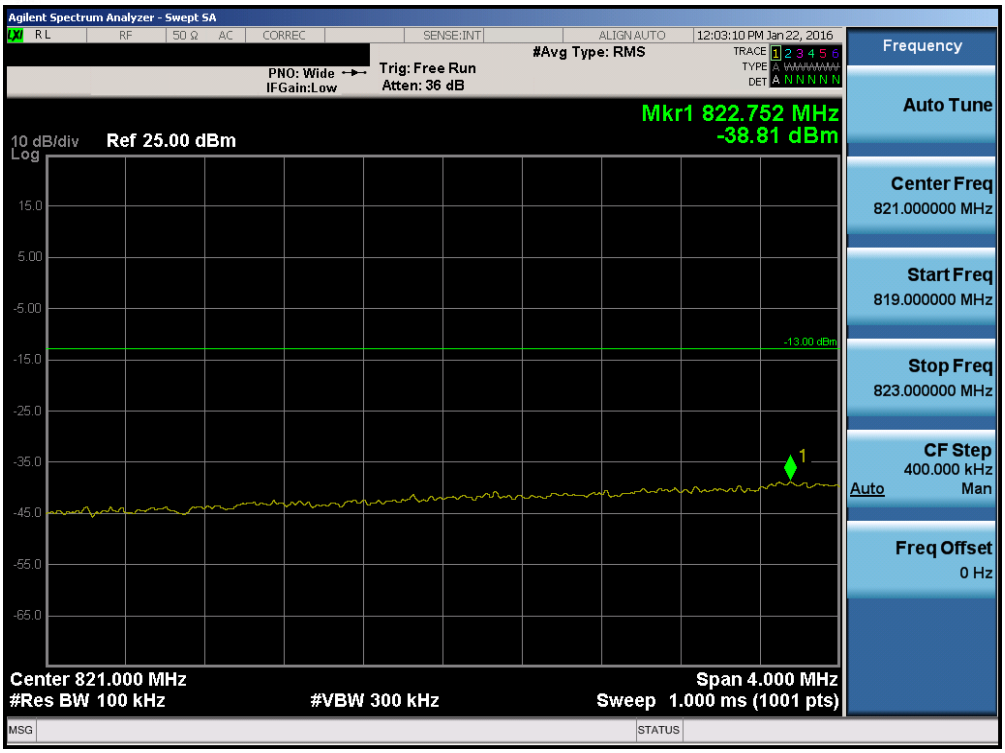
Plot 7-151. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



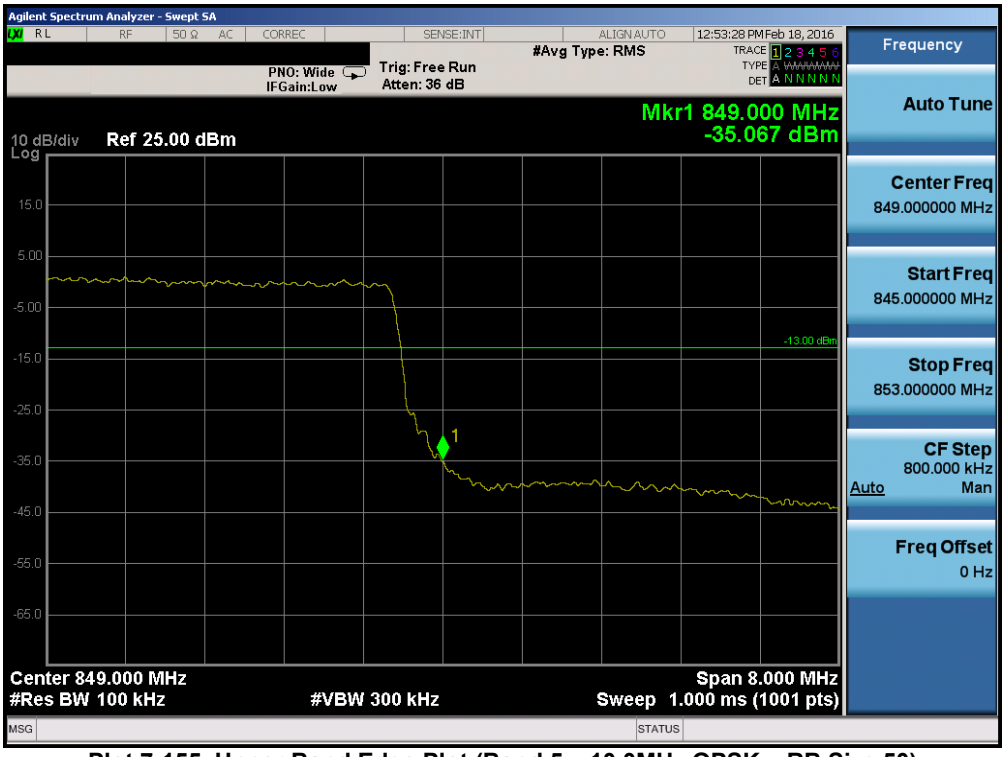
Plot 7-152. Upper Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



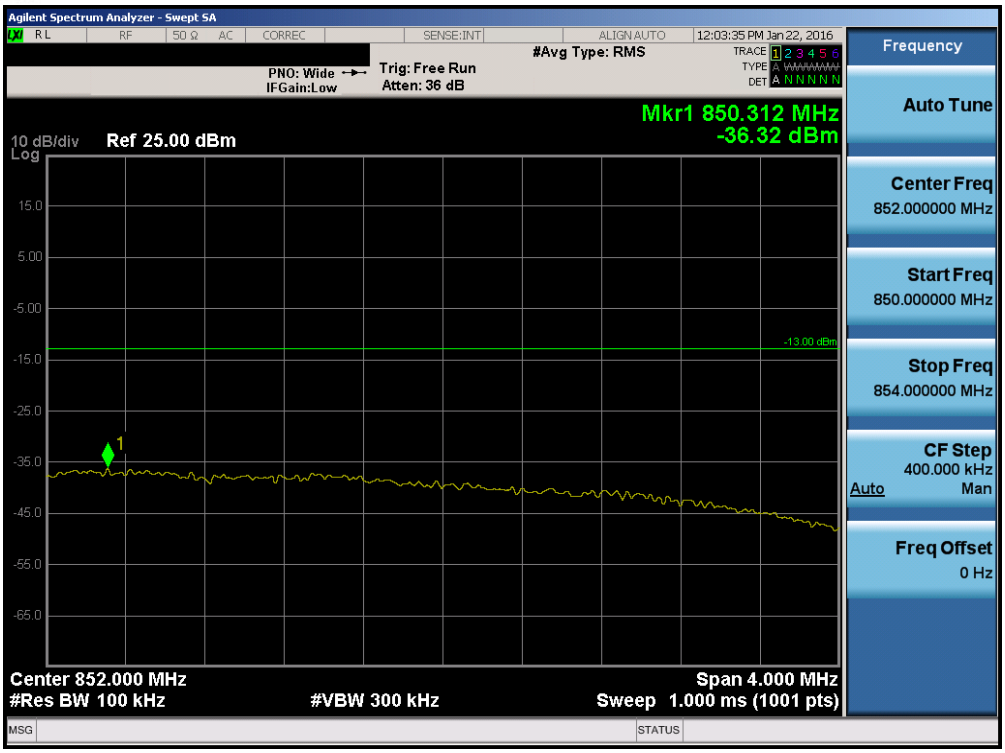
Plot 7-153. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



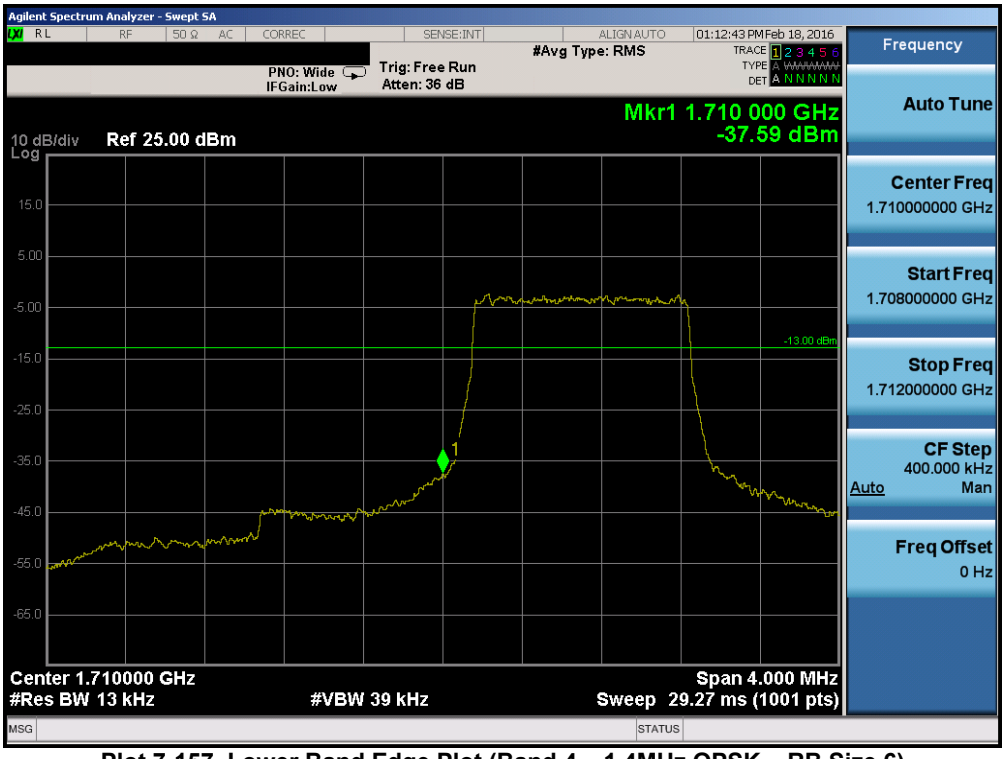
Plot 7-154. Lower Extended Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



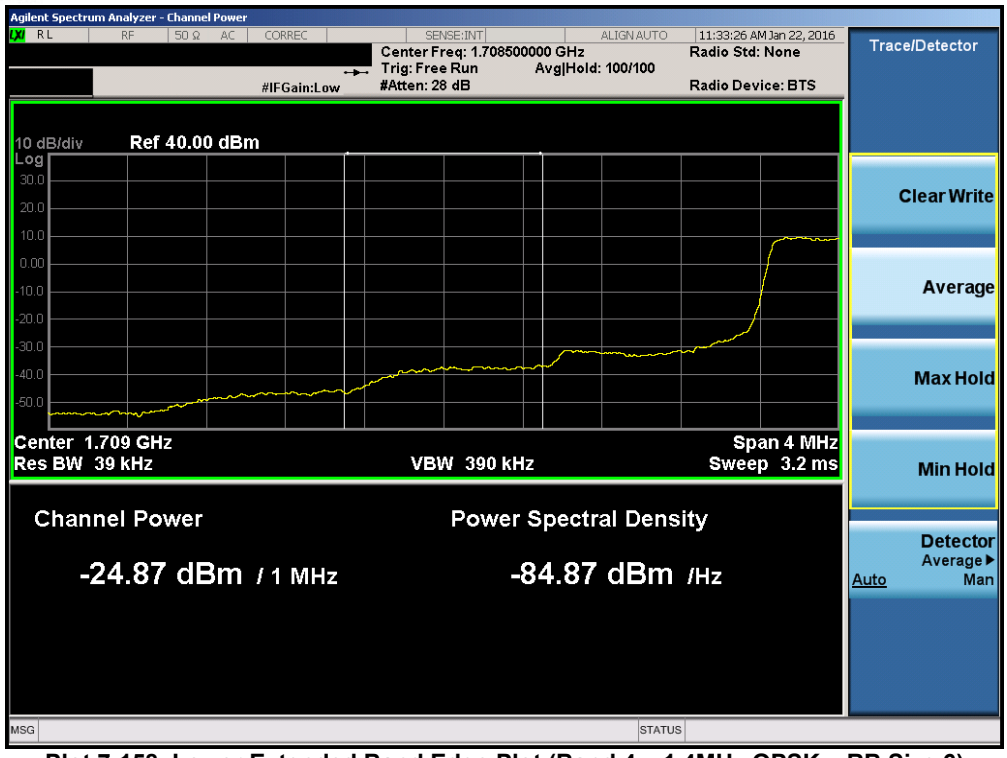
Plot 7-155. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-156. Upper Extended Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

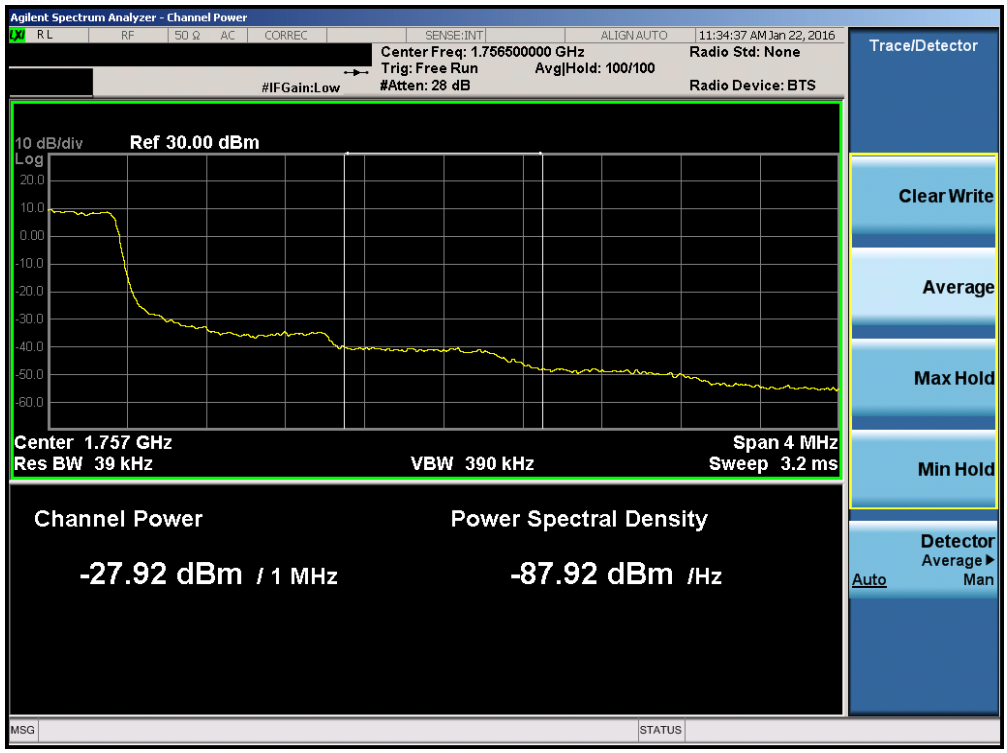


Plot 7-157. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

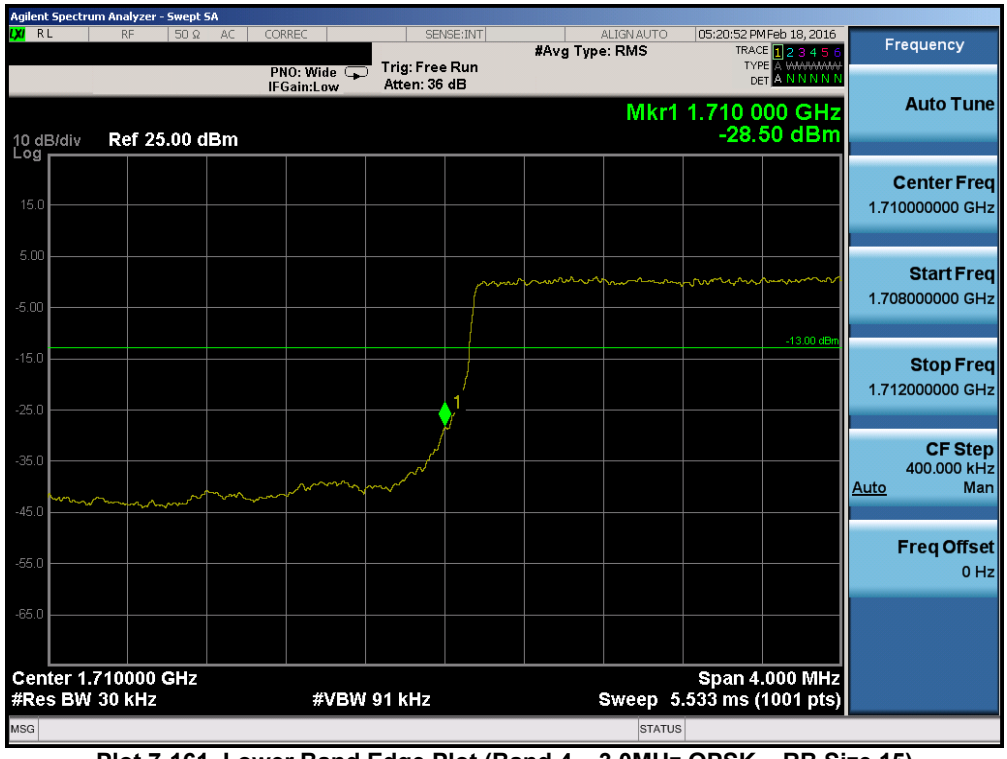


Plot 7-158. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

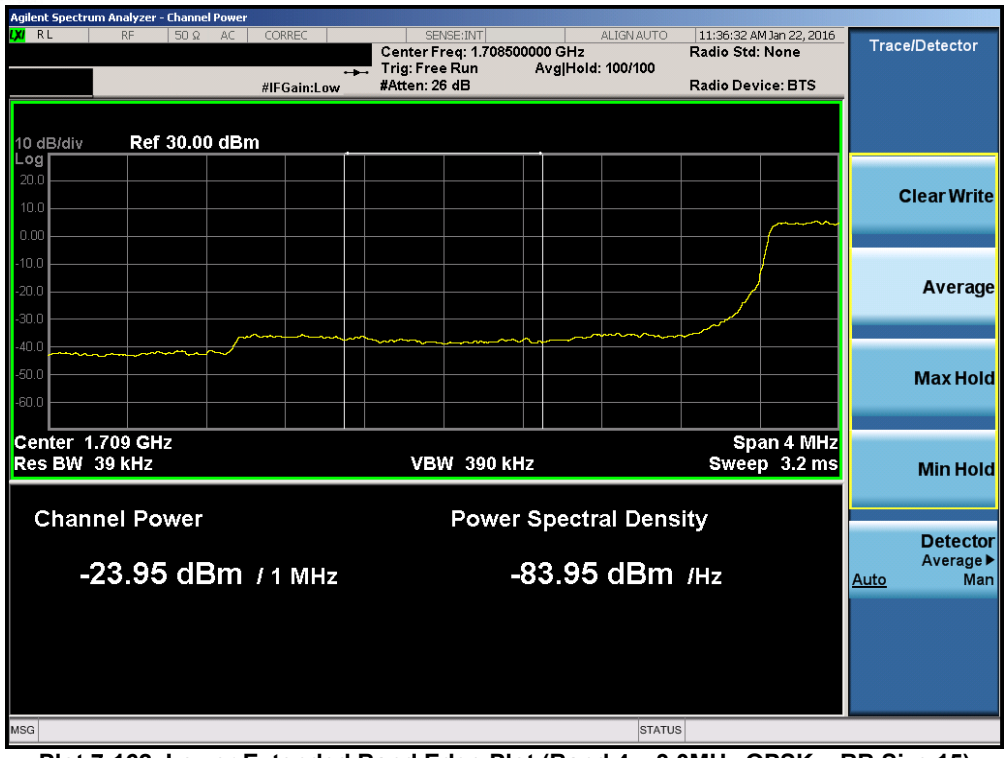
Plot 7-159. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



Plot 7-160. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

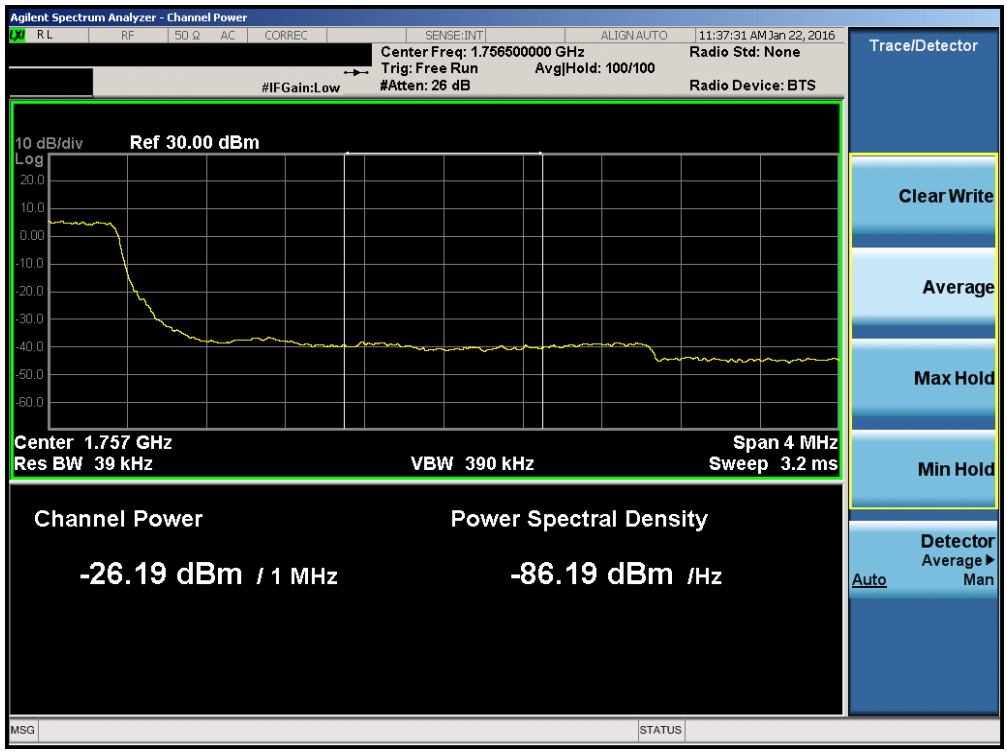


Plot 7-161. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

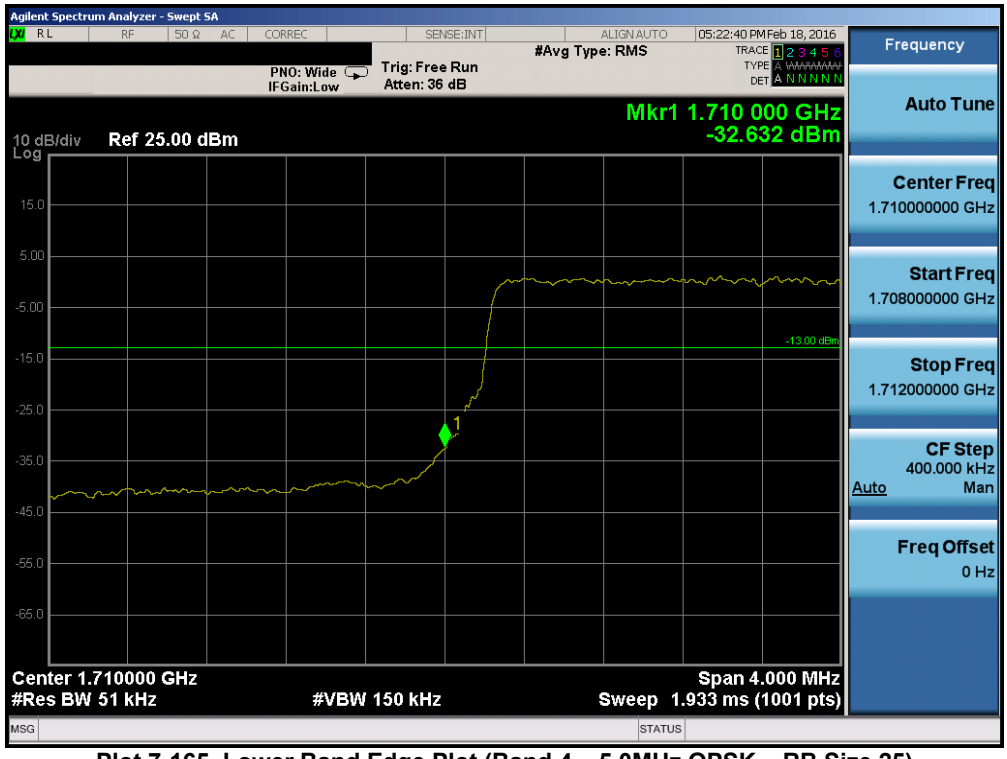


Plot 7-162. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

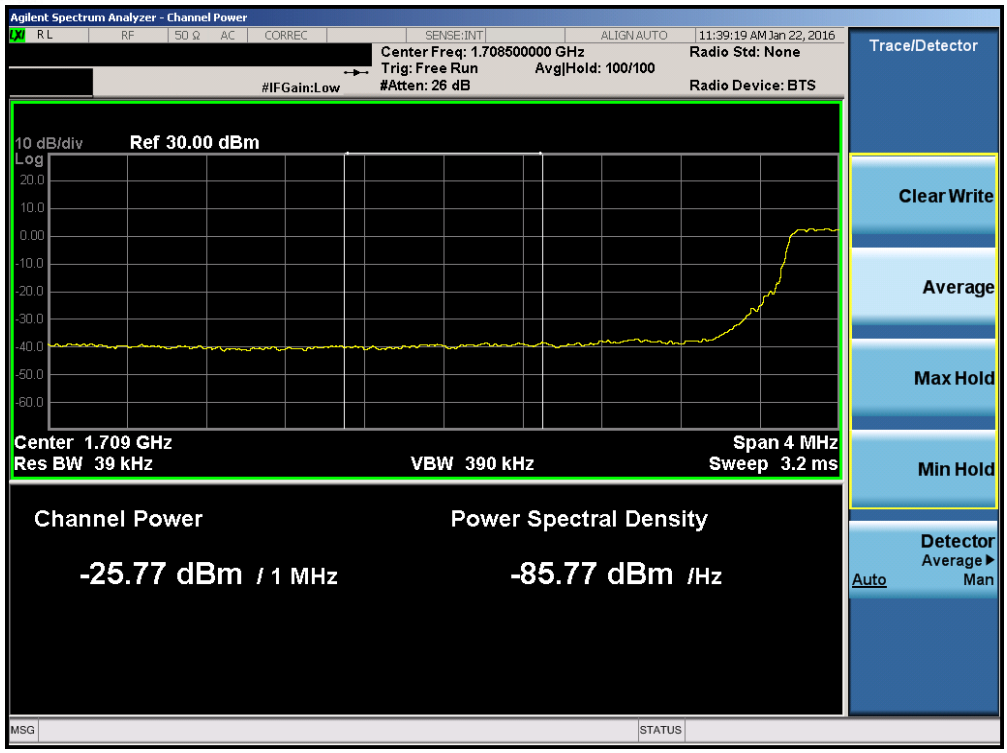
Plot 7-163. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



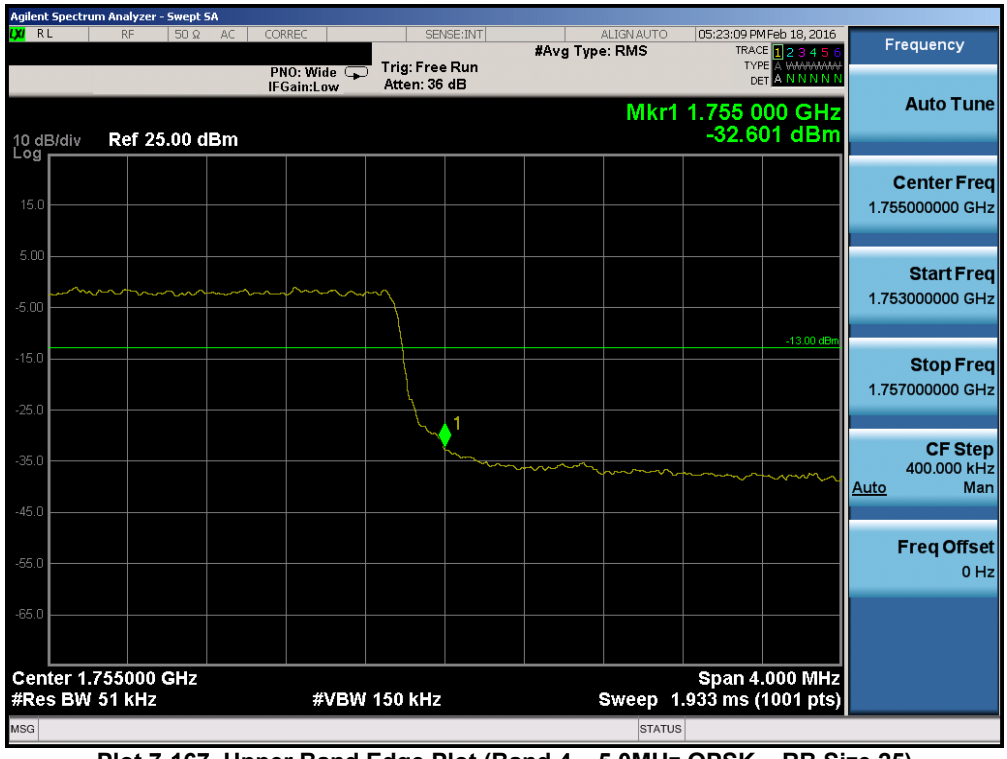
Plot 7-164. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



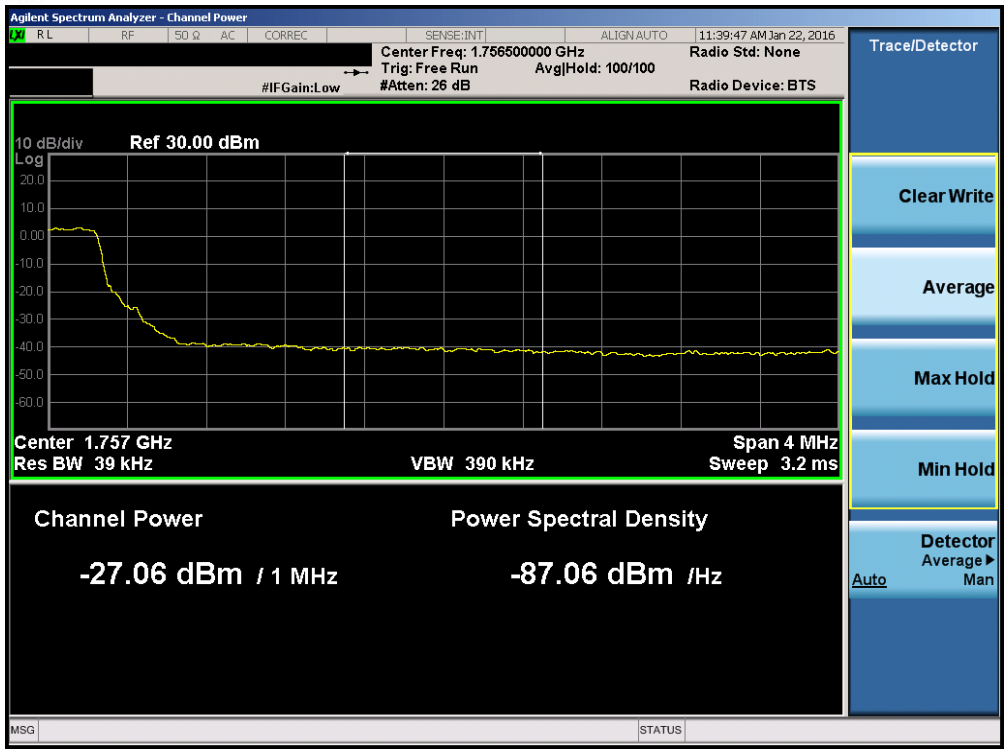
Plot 7-165. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



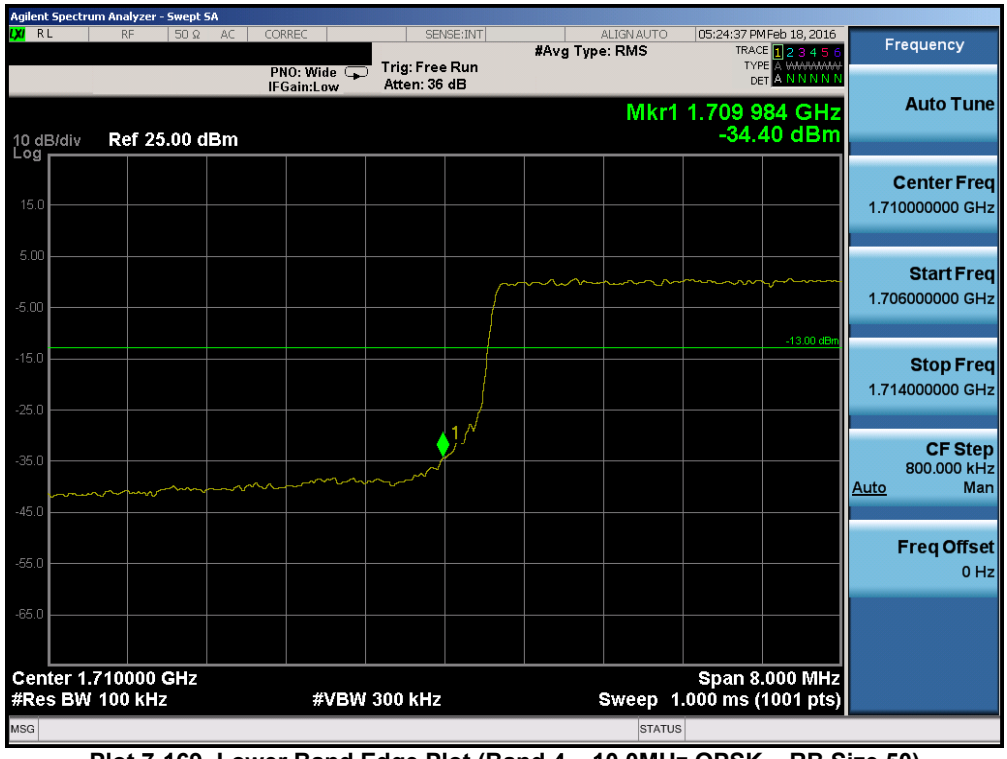
Plot 7-166. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



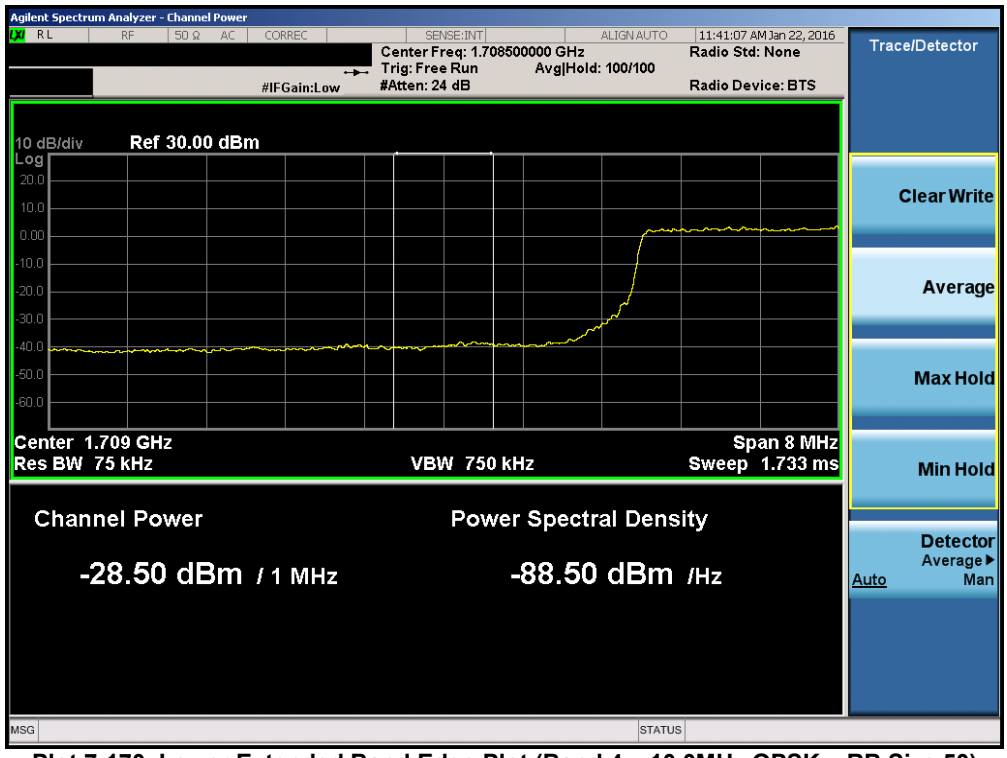
Plot 7-167. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



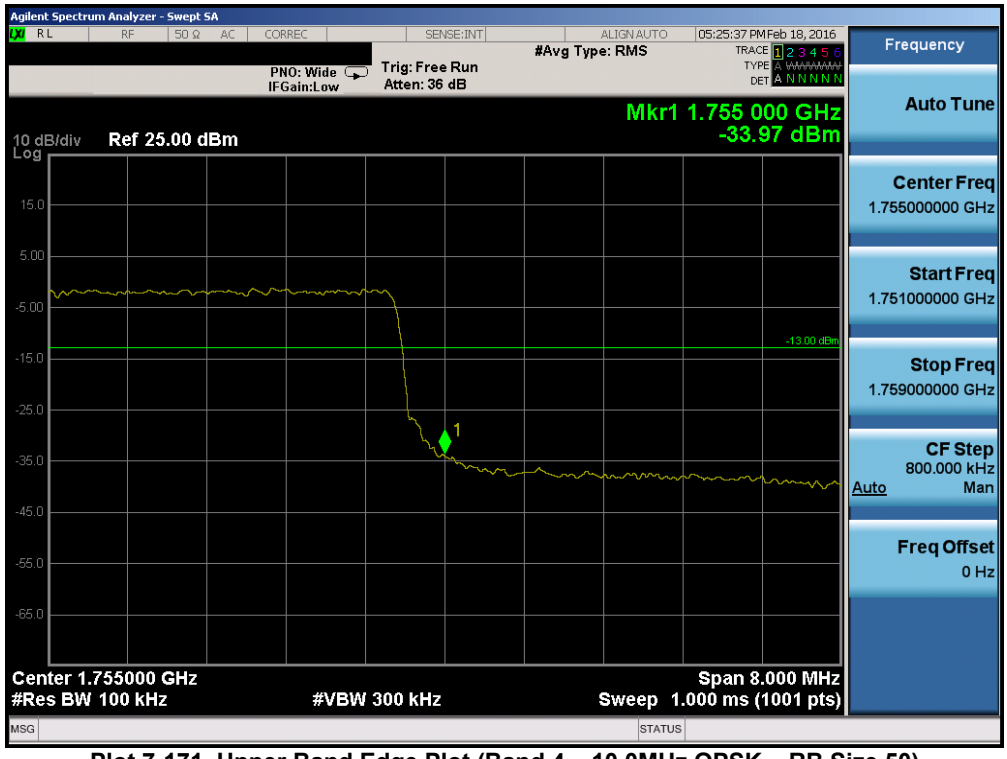
Plot 7-168. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



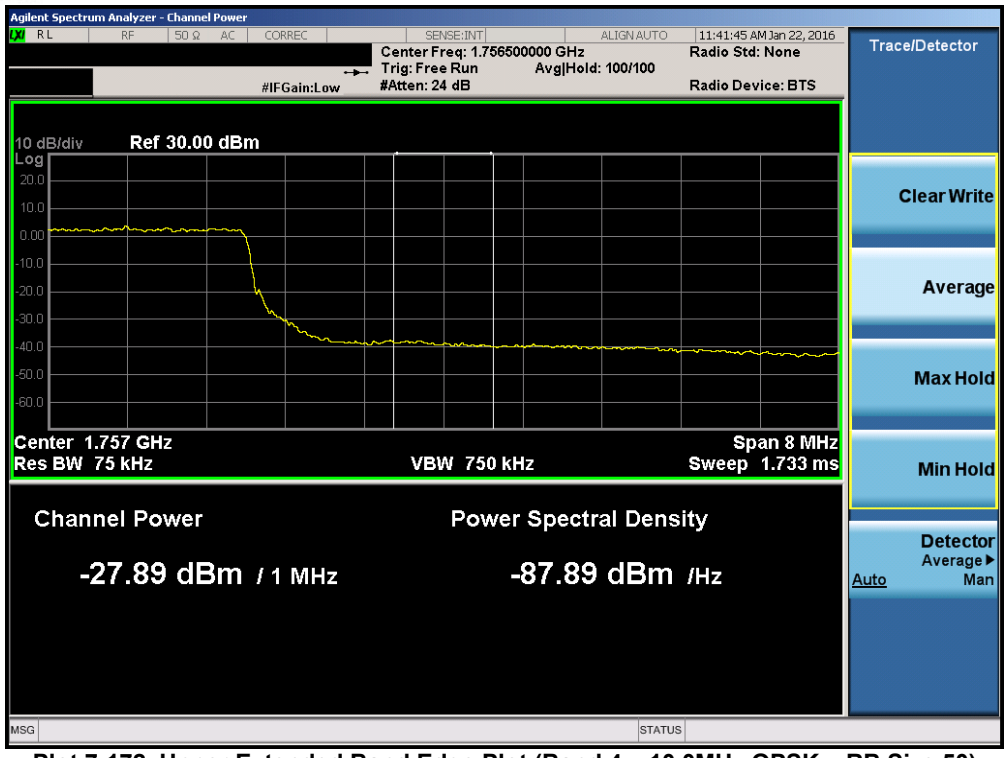
Plot 7-169. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



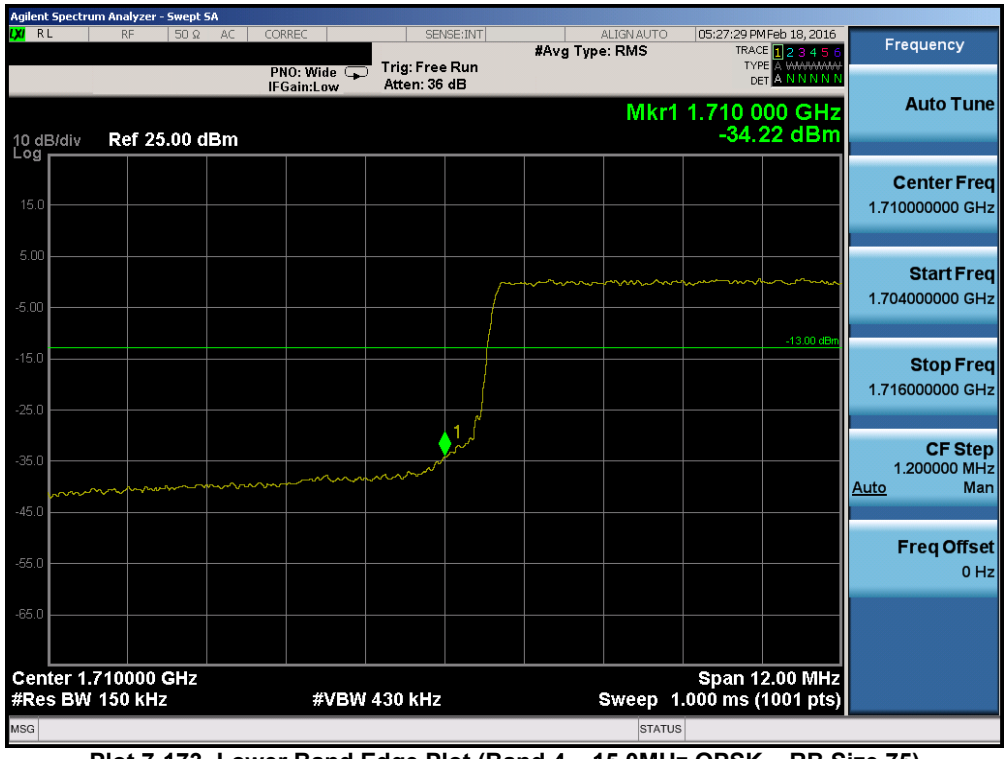
Plot 7-170. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



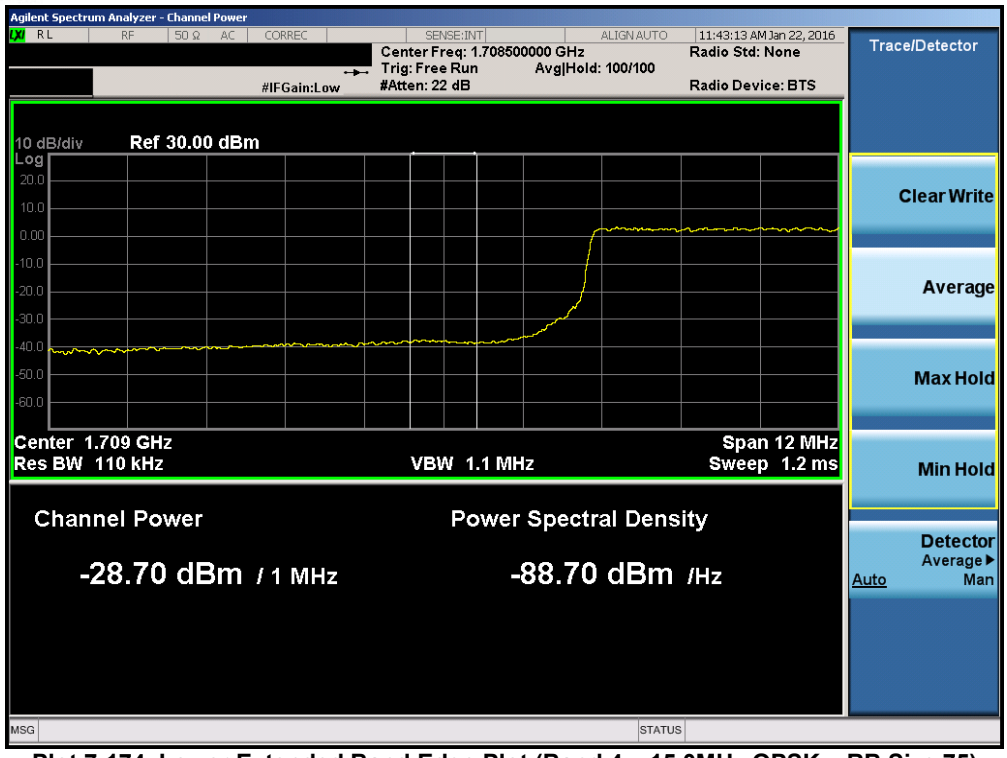
Plot 7-171. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



Plot 7-172. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

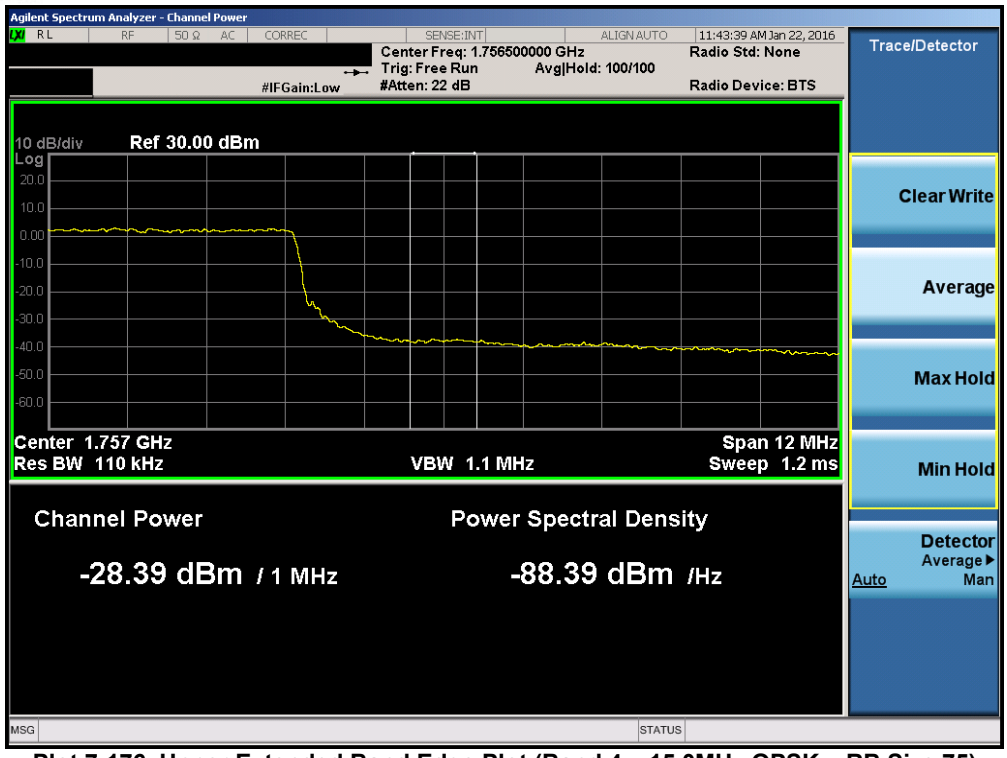


Plot 7-173. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

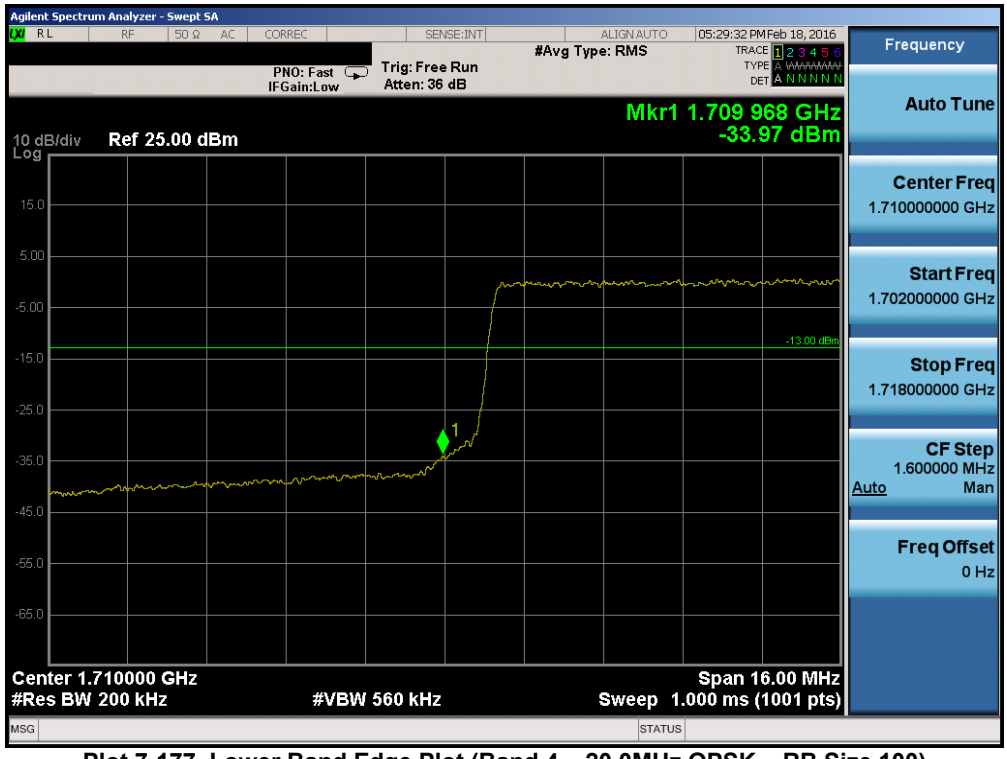


Plot 7-174. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

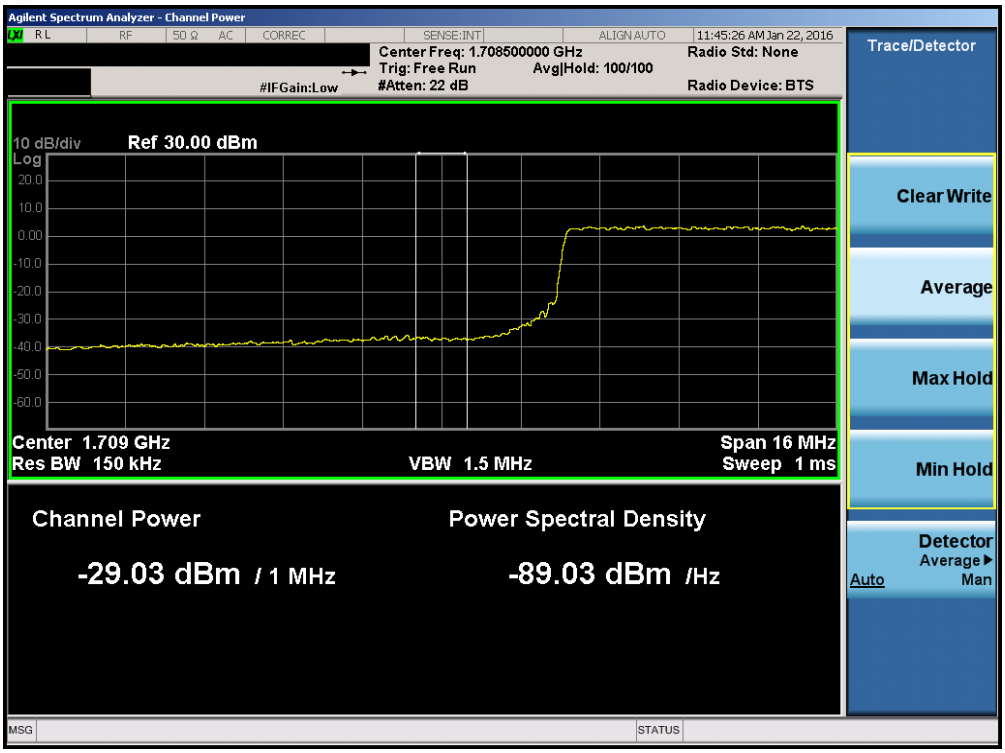
Plot 7-175. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



Plot 7-176. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

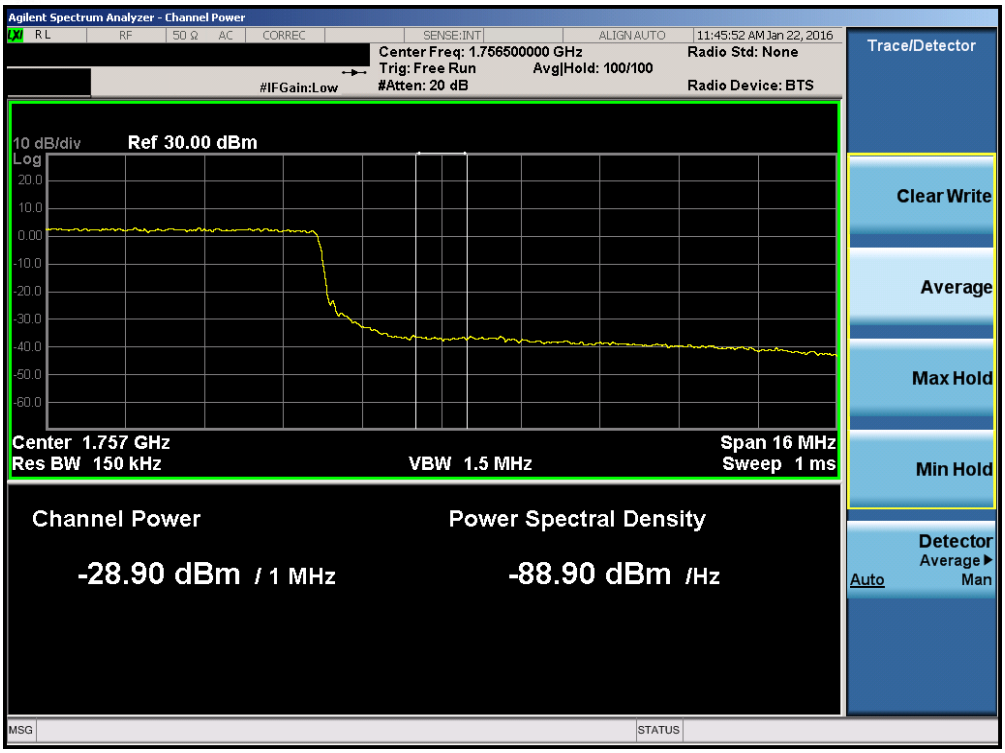


Plot 7-177. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



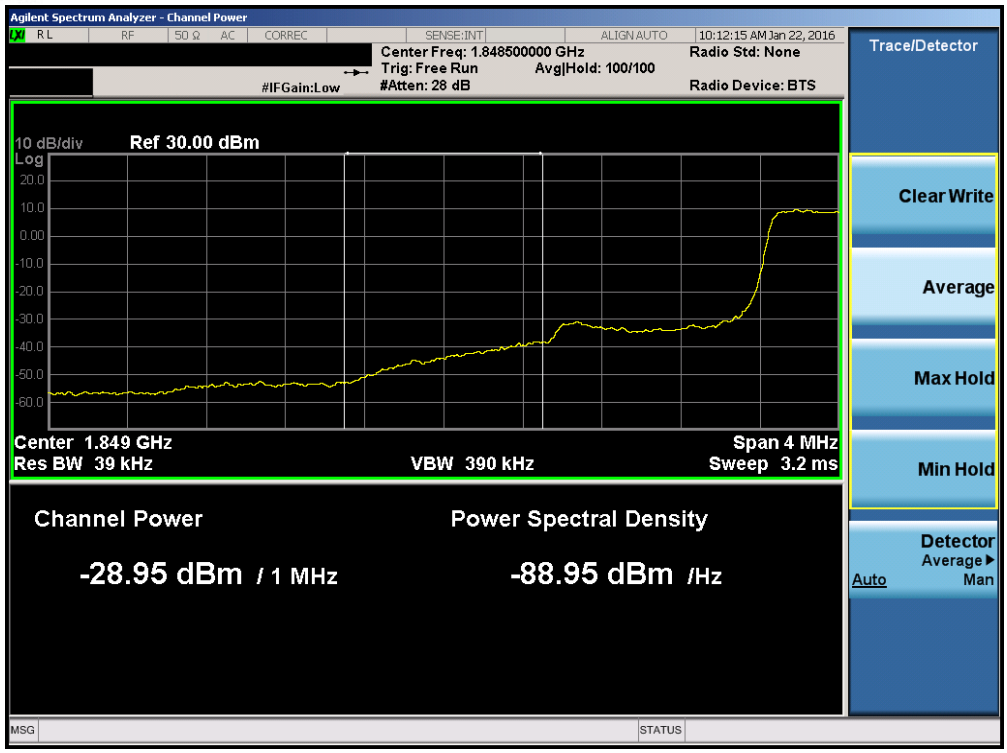
Plot 7-178. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

Plot 7-179. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



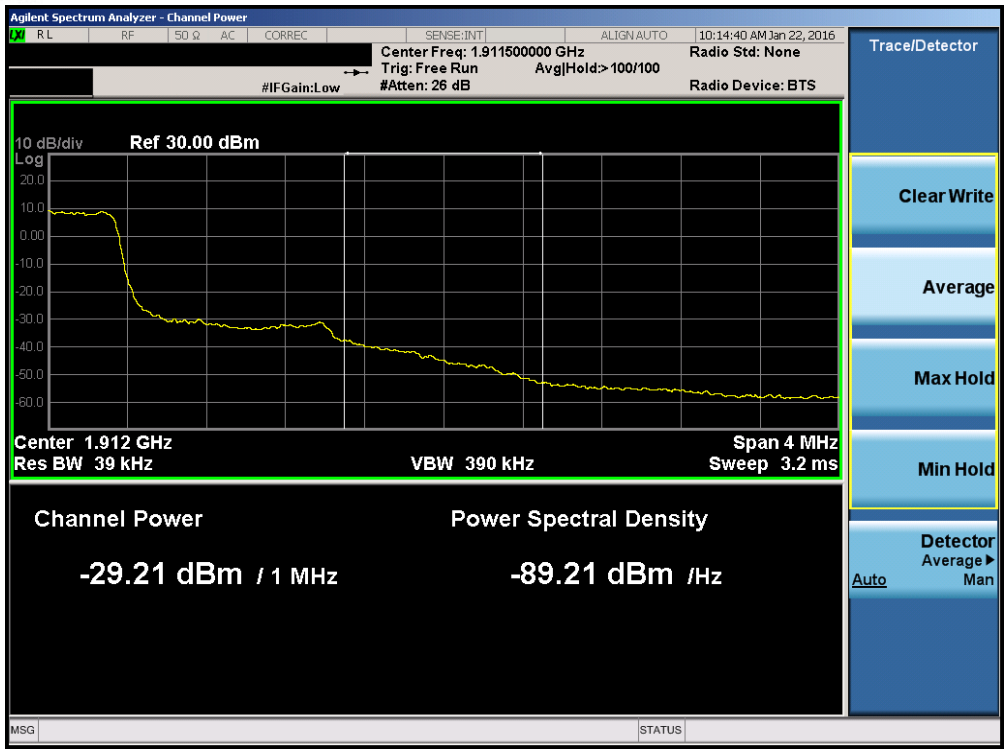
Plot 7-180. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

Plot 7-181. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

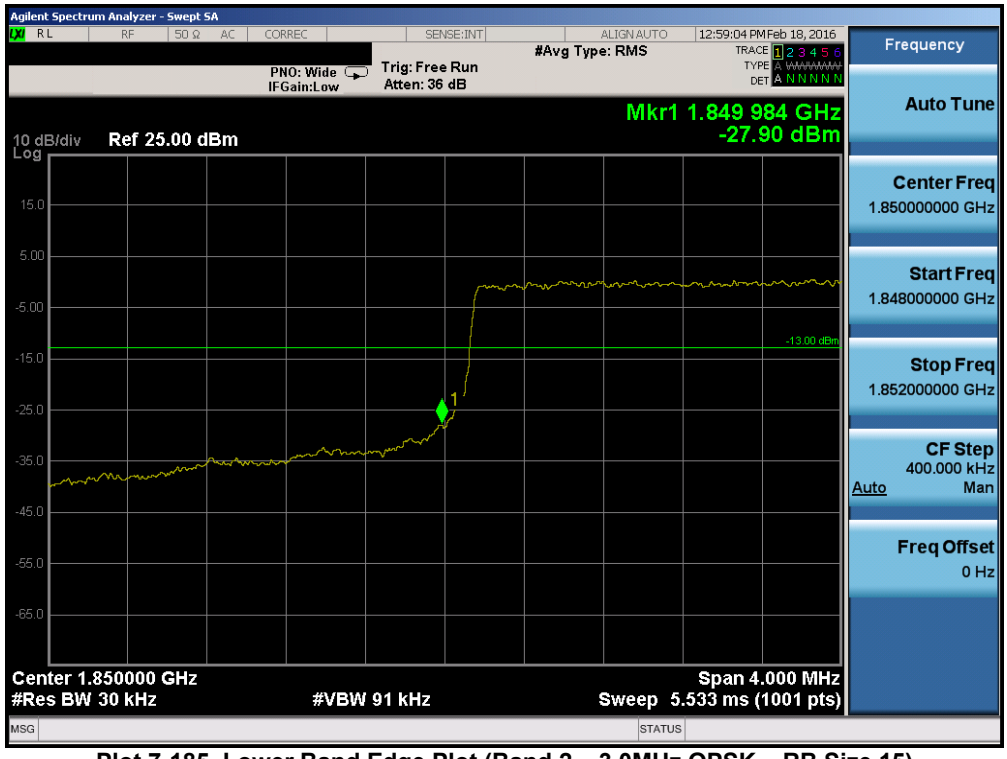


Plot 7-182. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

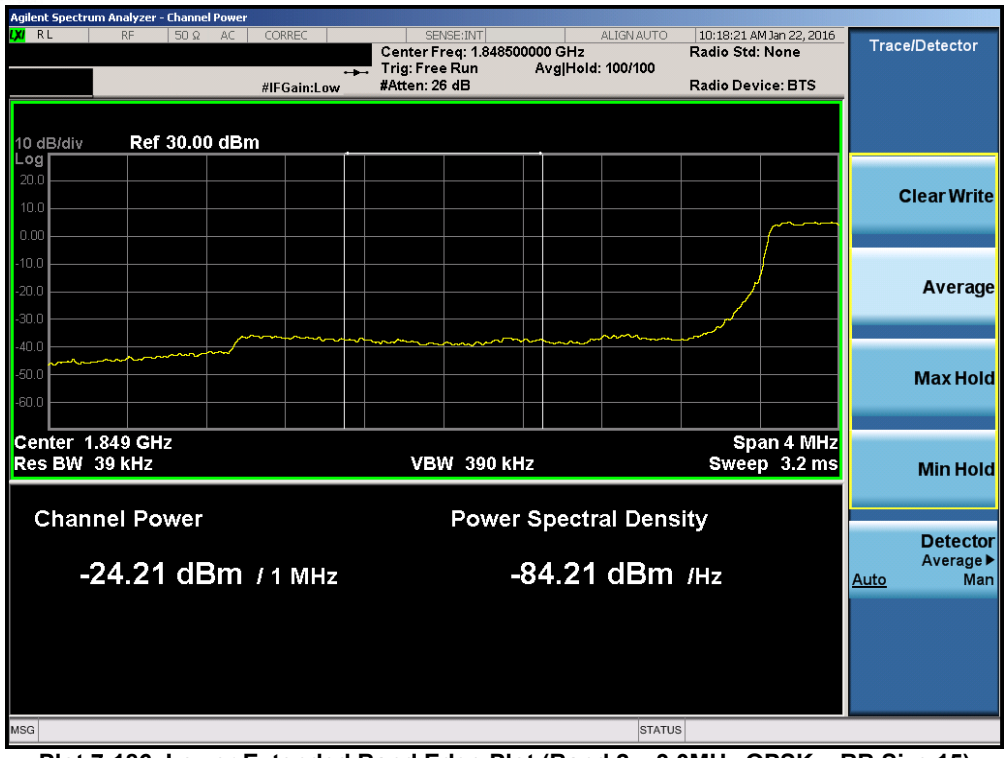
Plot 7-183. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 7-184. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

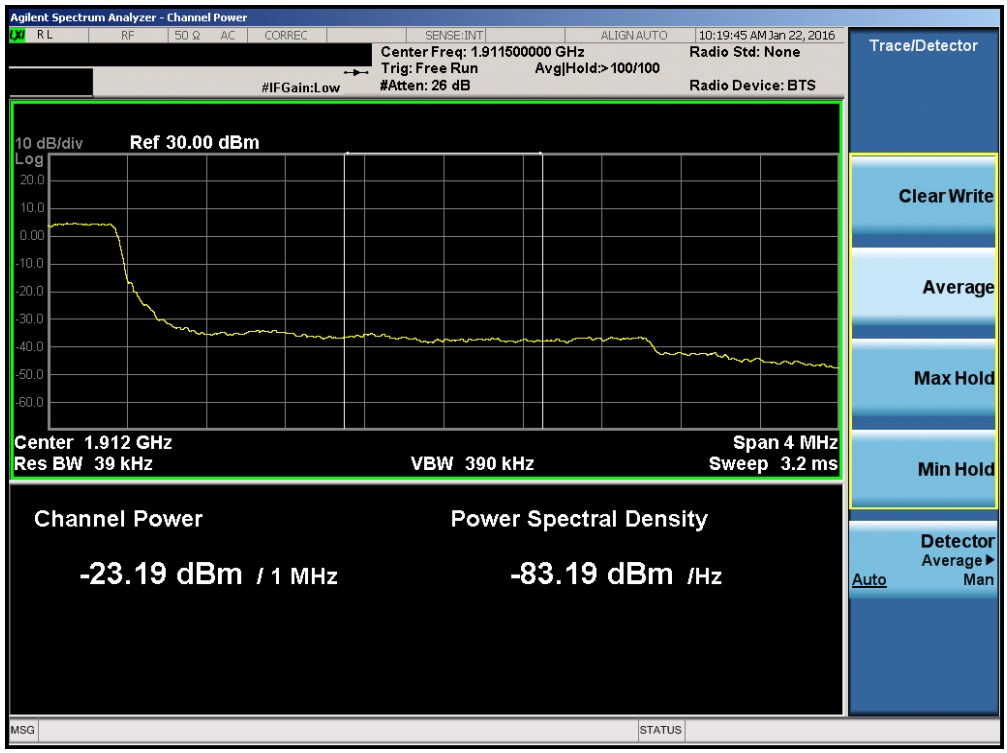


Plot 7-185. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



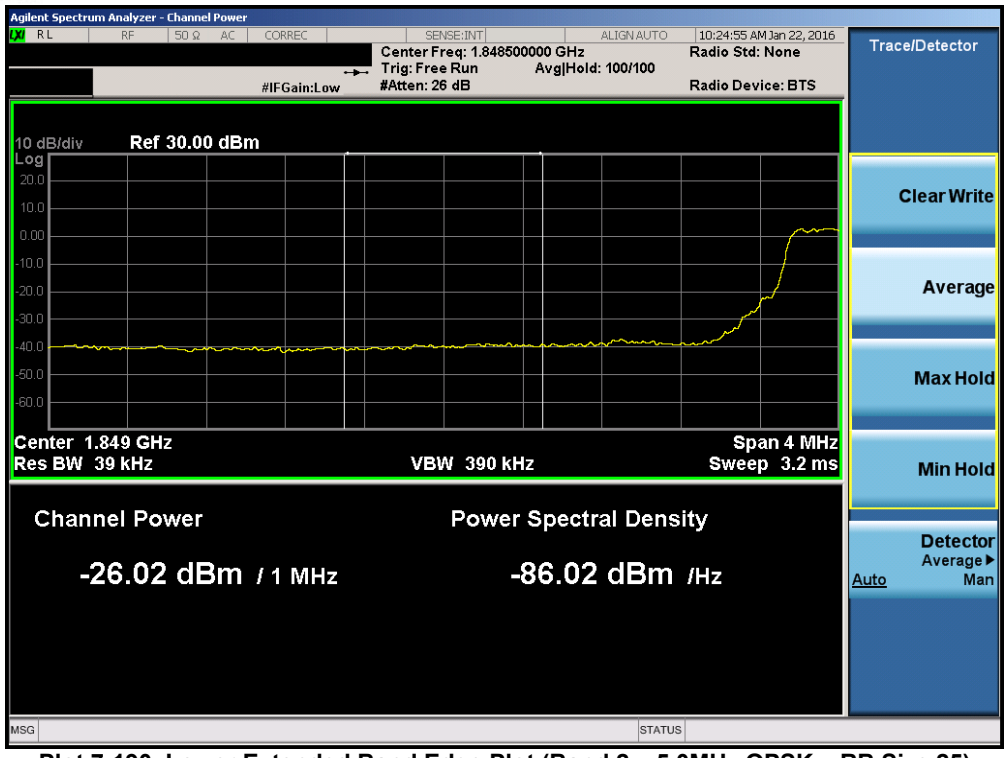
Plot 7-186. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

Plot 7-187. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



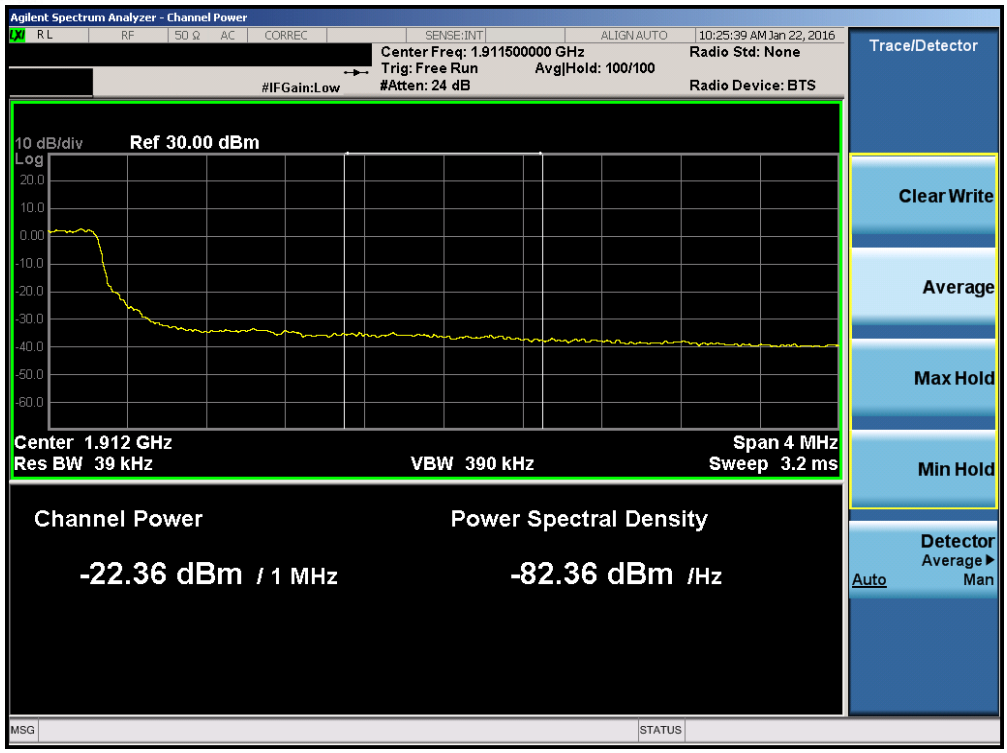
Plot 7-188. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

Plot 7-189. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

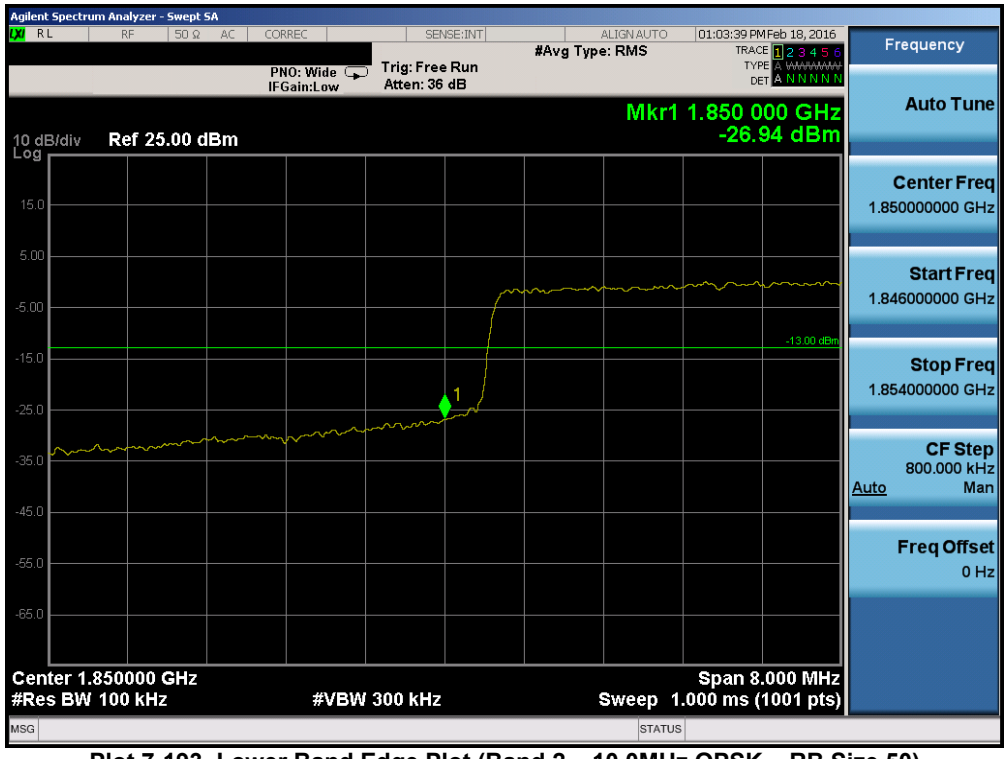


Plot 7-190. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

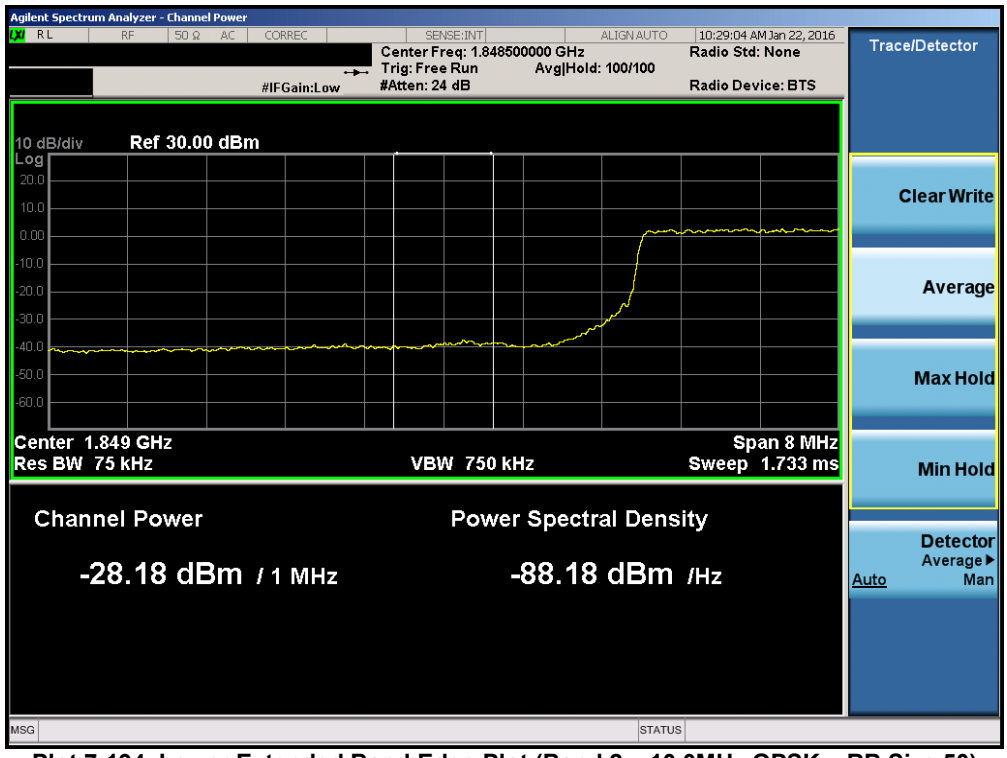
Plot 7-191. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



Plot 7-192. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

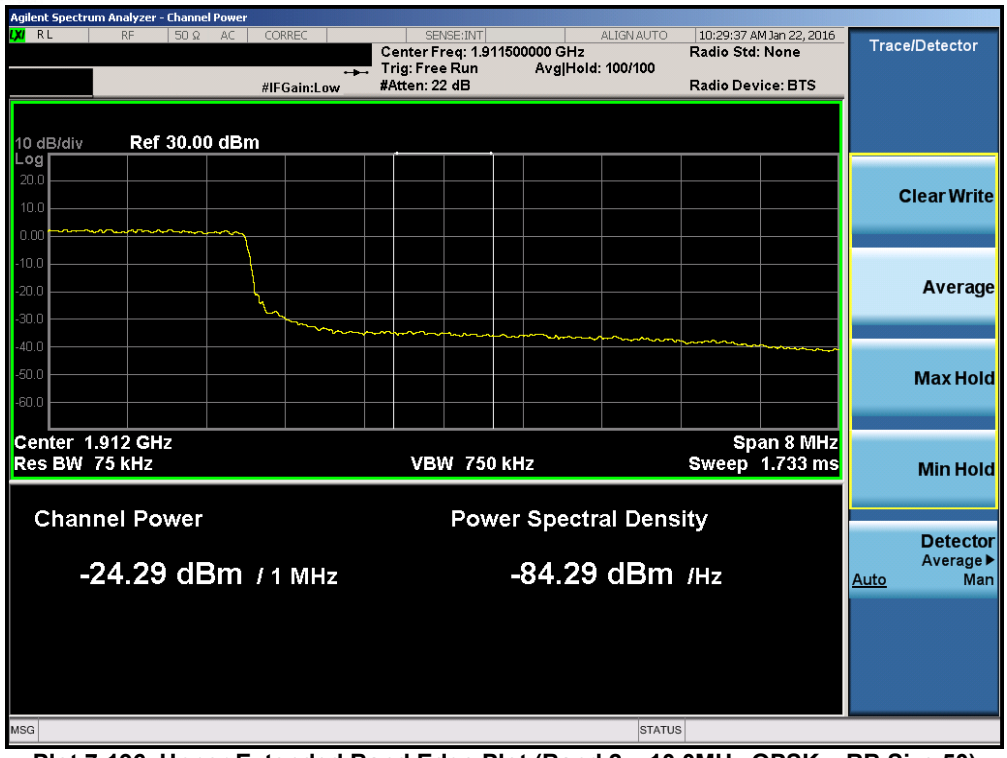


Plot 7-193. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

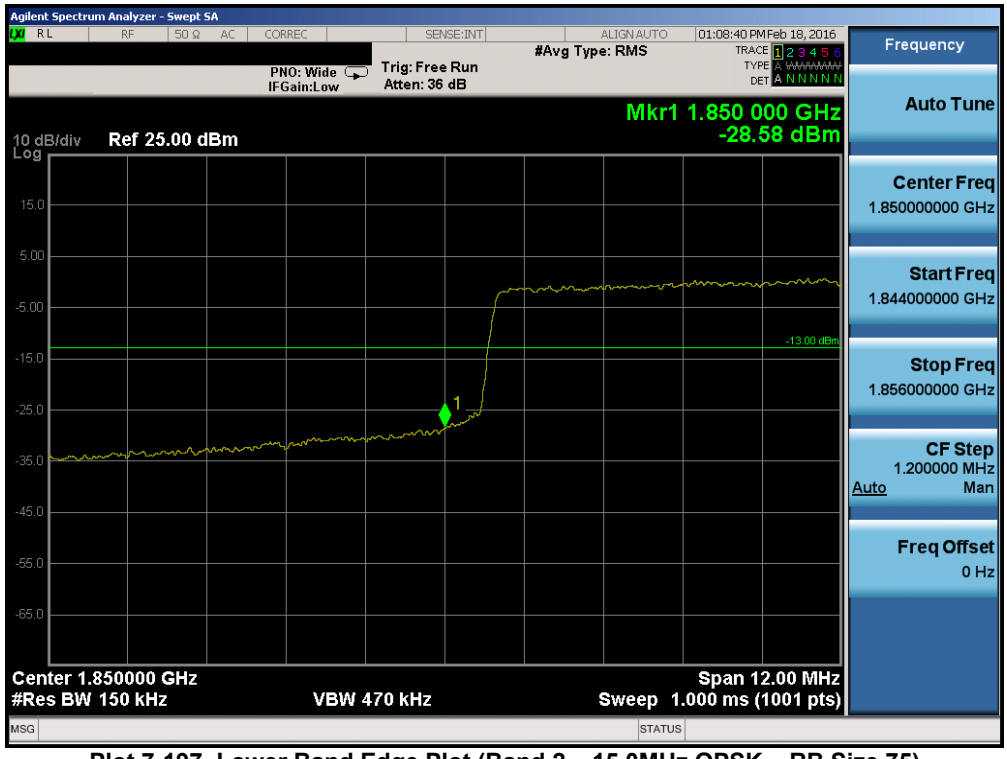


Plot 7-194. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

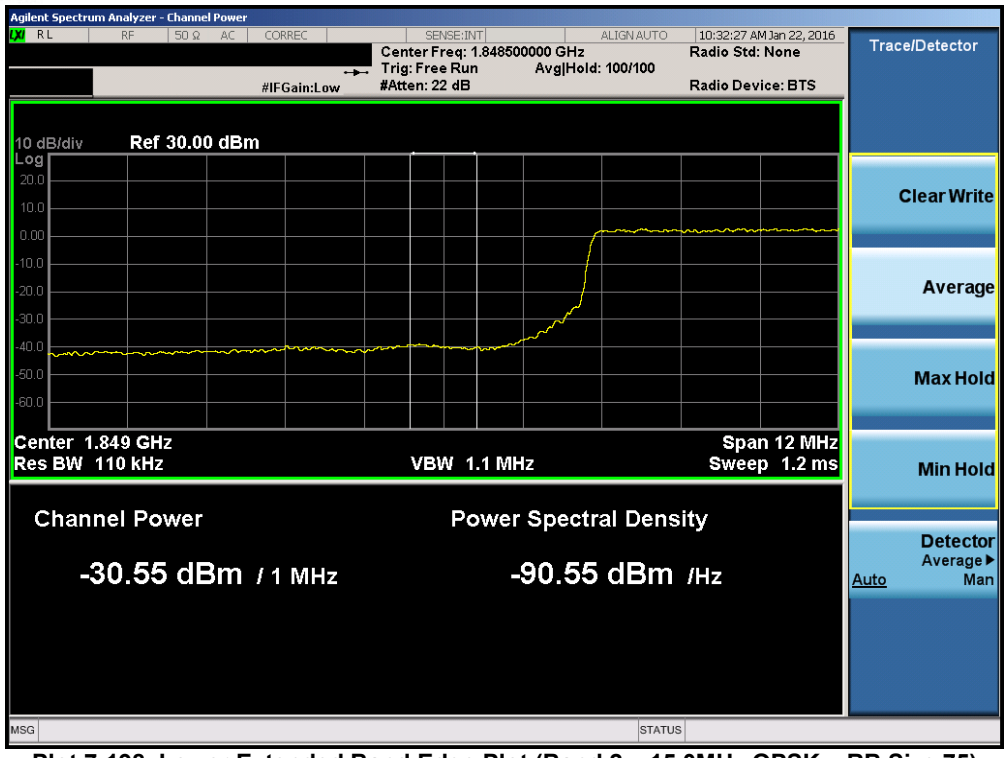
Plot 7-195. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



Plot 7-196. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

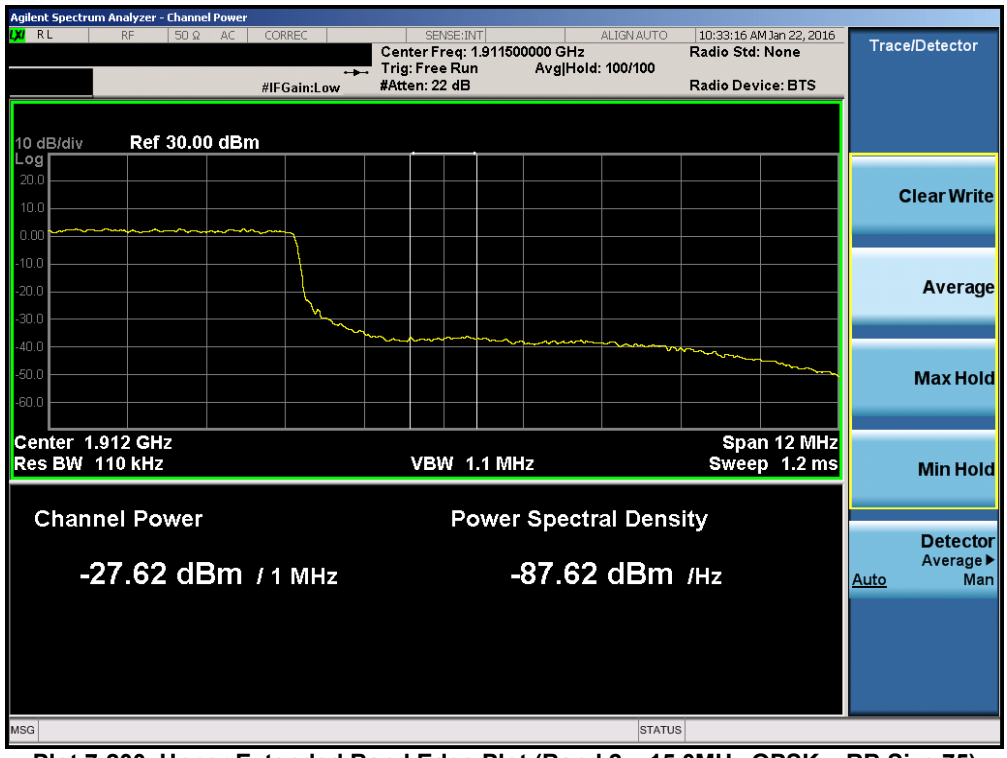


Plot 7-197. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

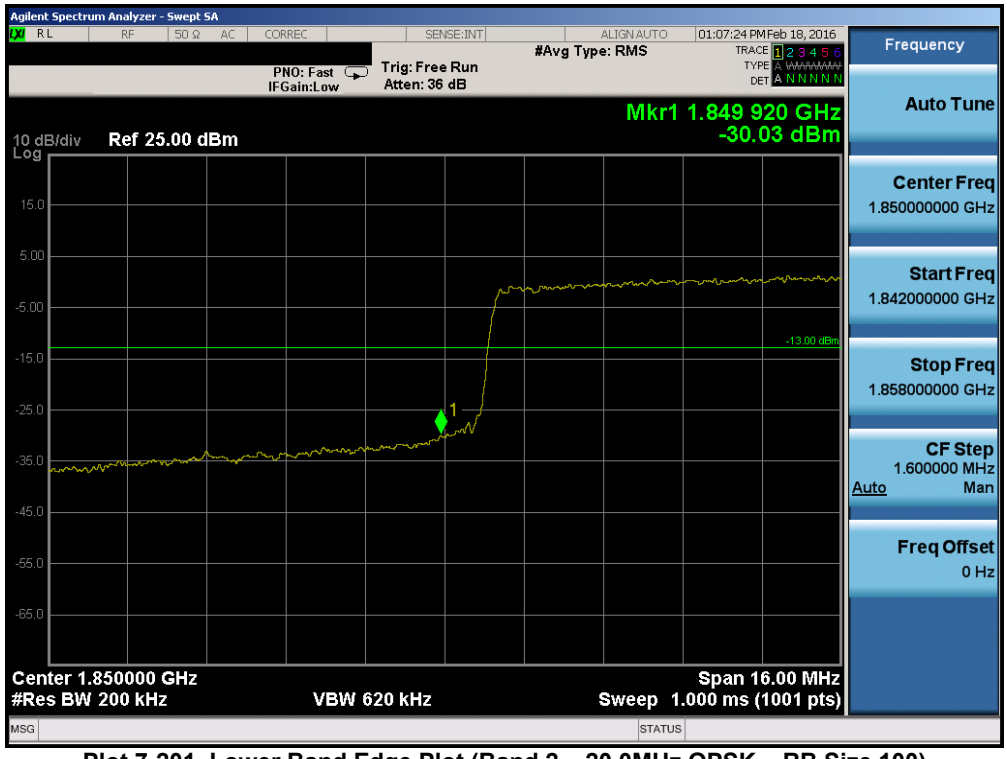


Plot 7-198. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

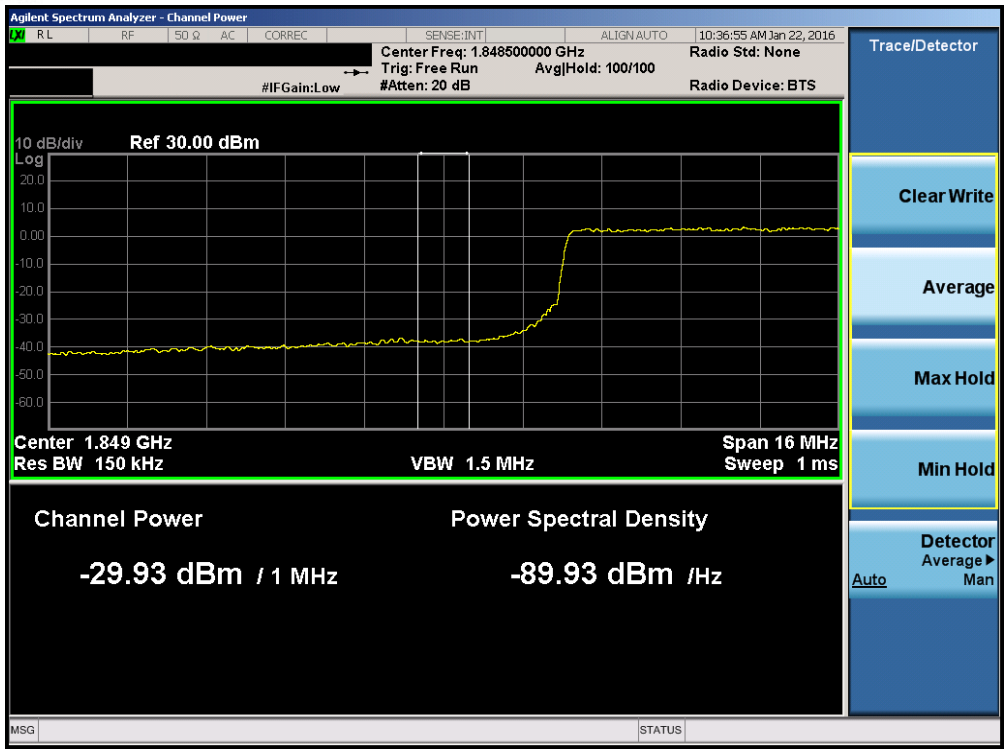
Plot 7-199. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



Plot 7-200. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

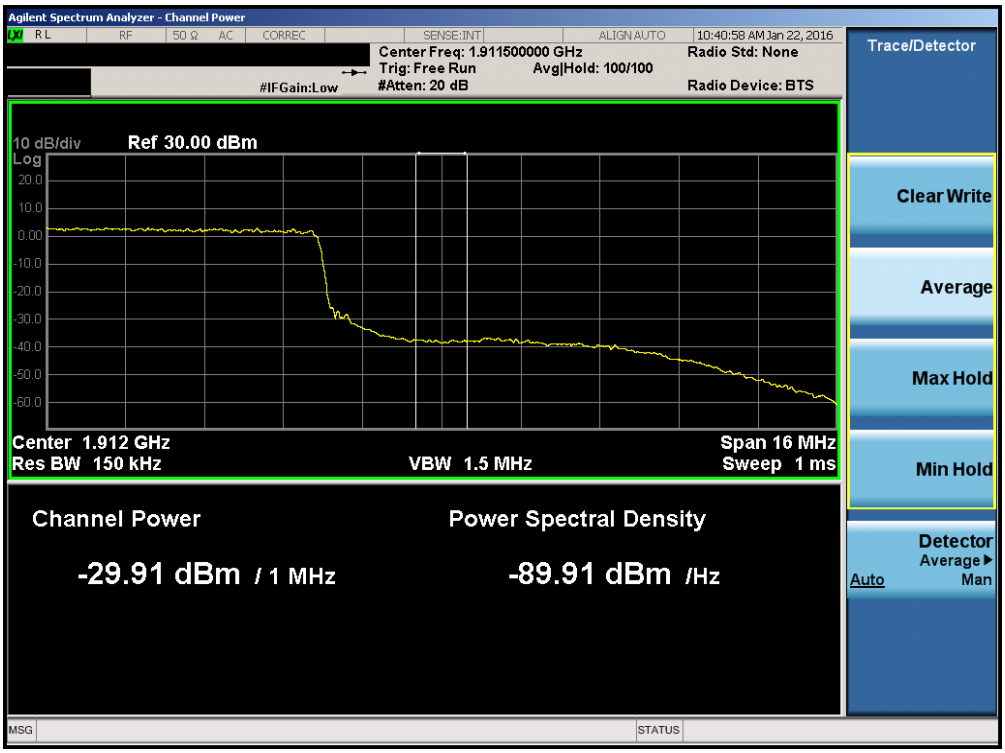


Plot 7-201. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

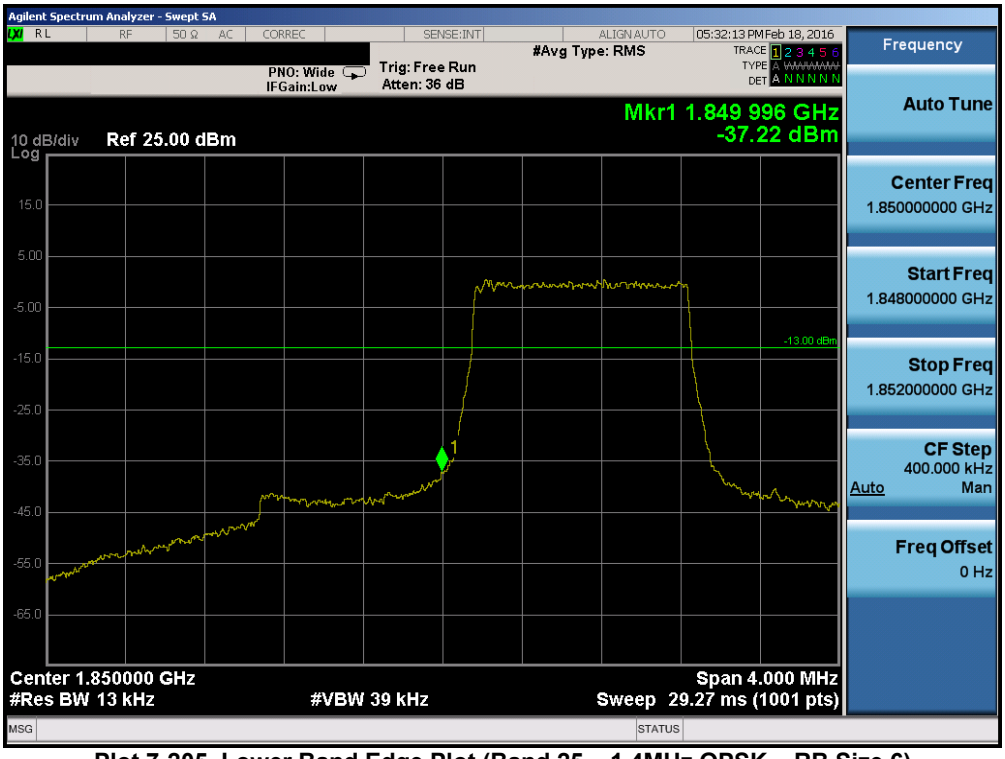


Plot 7-202. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

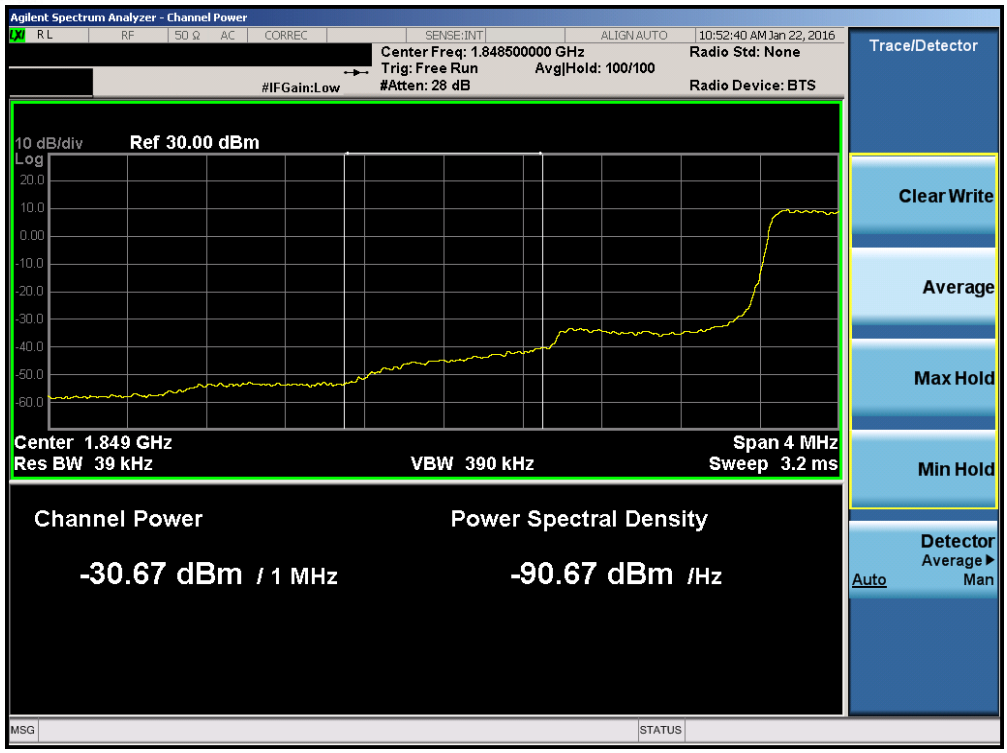
Plot 7-203. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



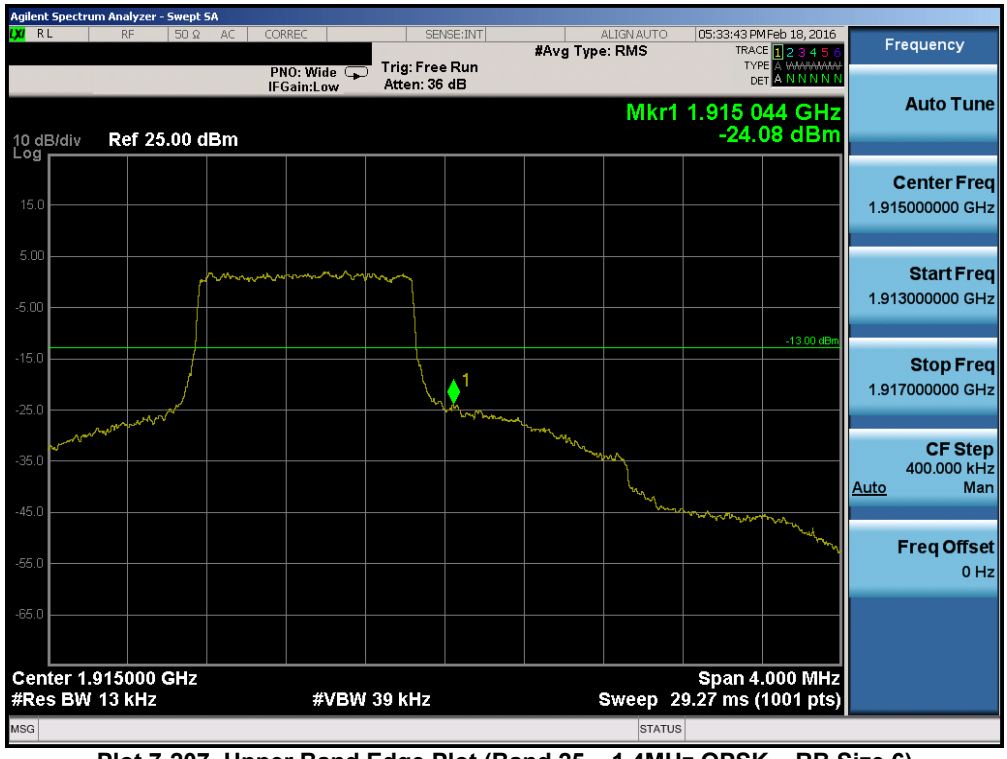
Plot 7-204. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



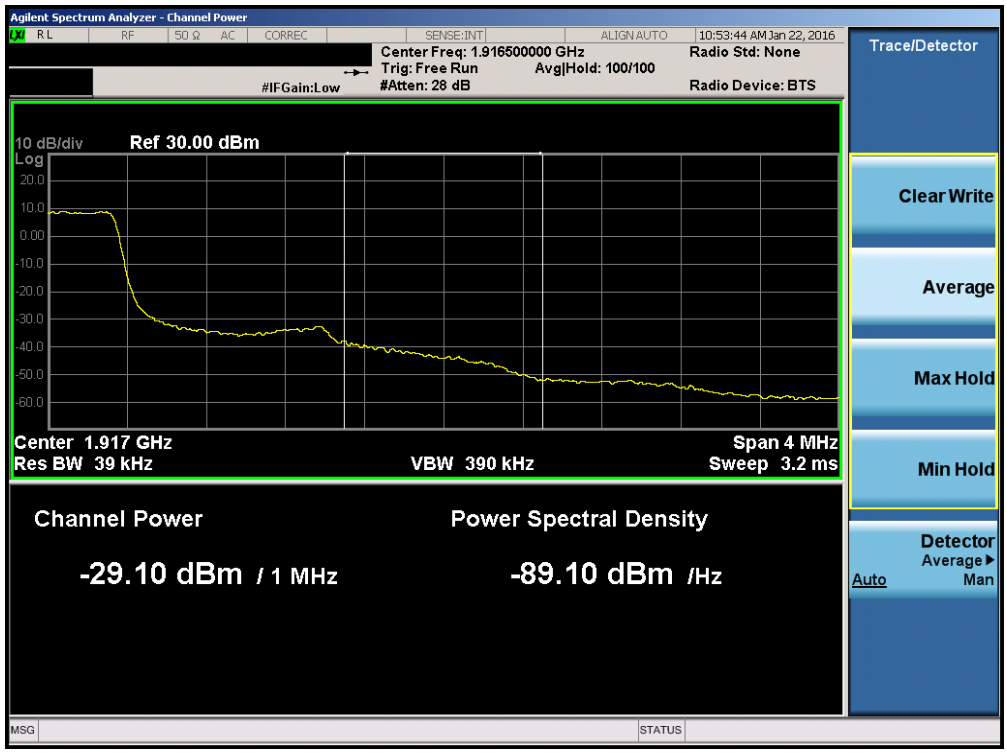
Plot 7-205. Lower Band Edge Plot (Band 25 – 1.4MHz QPSK – RB Size 6)



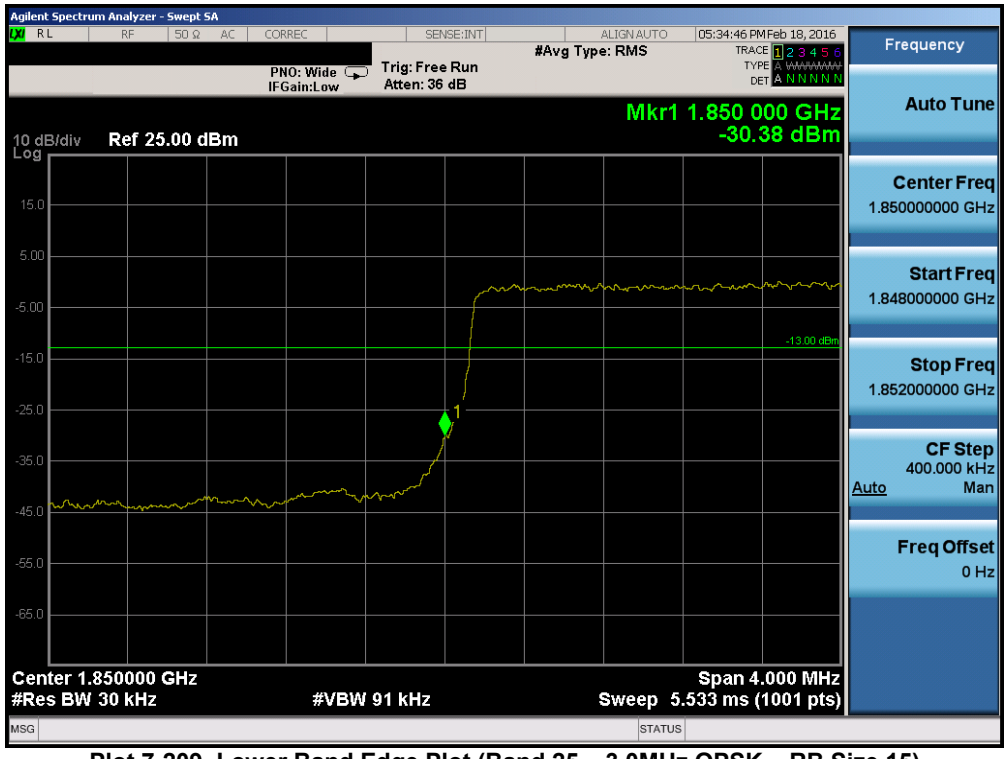
Plot 7-206. Lower Extended Band Edge Plot (Band 25 – 1.4MHz QPSK – RB Size 6)



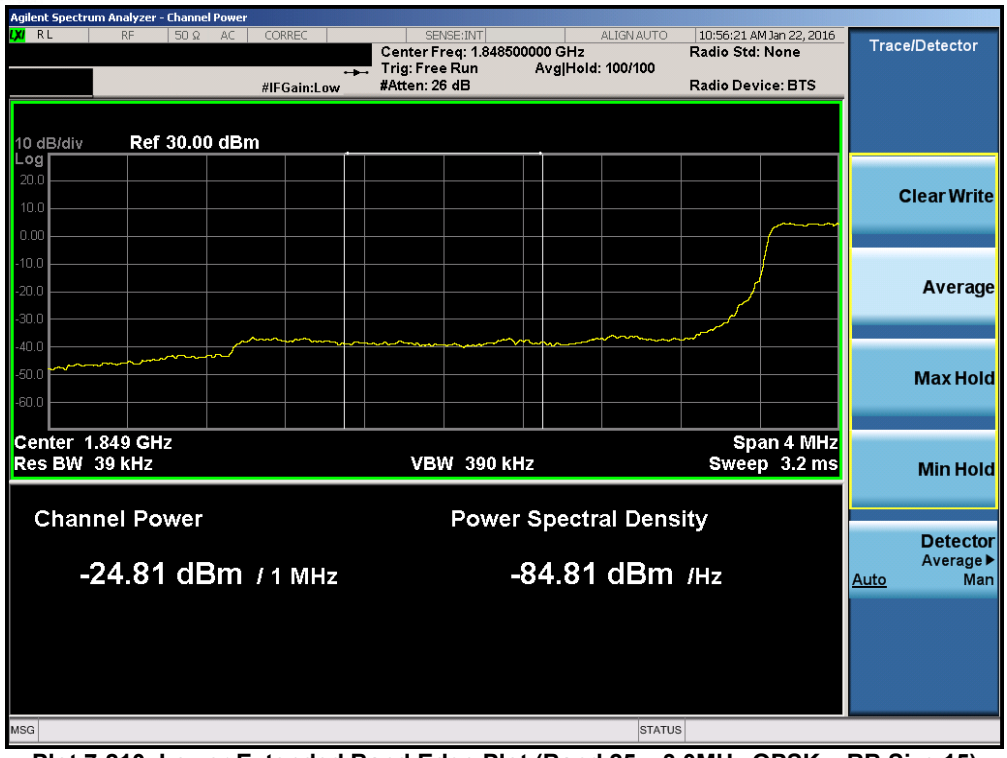
Plot 7-207. Upper Band Edge Plot (Band 25 – 1.4MHz QPSK – RB Size 6)



Plot 7-208. Upper Extended Band Edge Plot (Band 25 – 1.4MHz QPSK – RB Size 6)

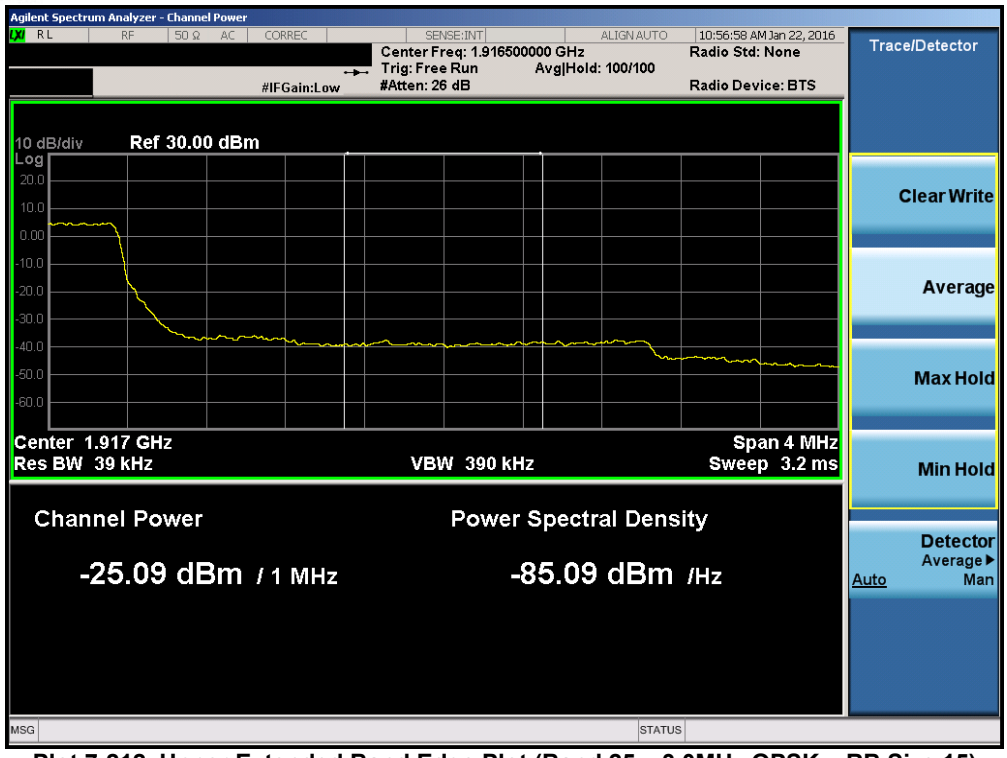


Plot 7-209. Lower Band Edge Plot (Band 25 – 3.0MHz QPSK – RB Size 15)

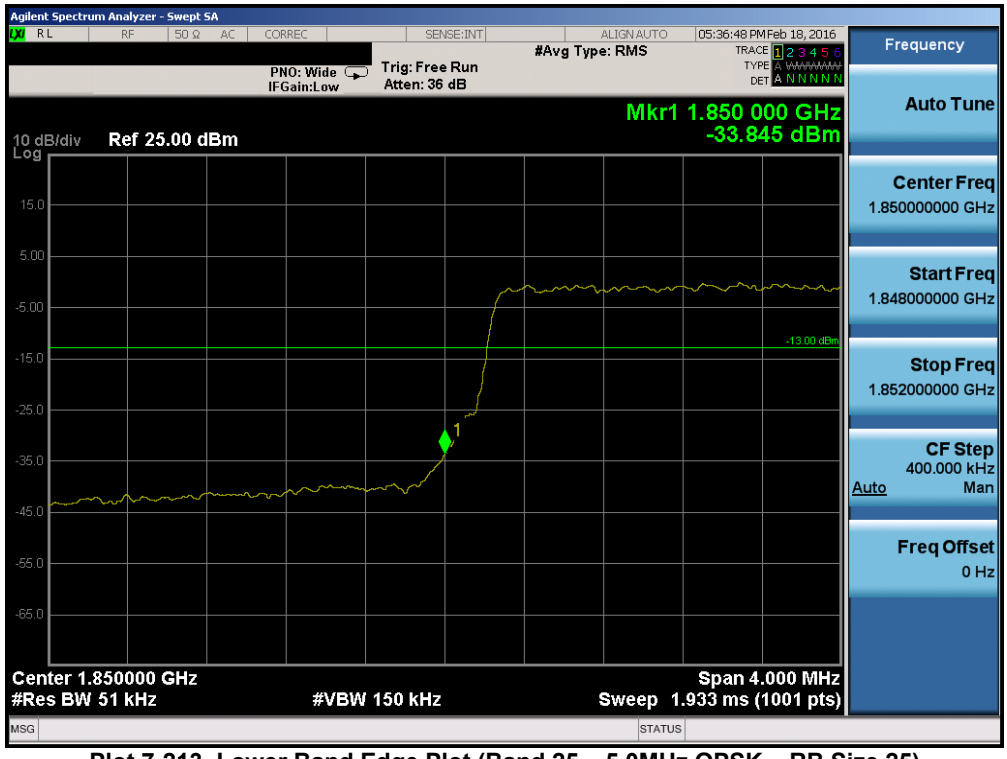


Plot 7-210. Lower Extended Band Edge Plot (Band 25 – 3.0MHz QPSK – RB Size 15)

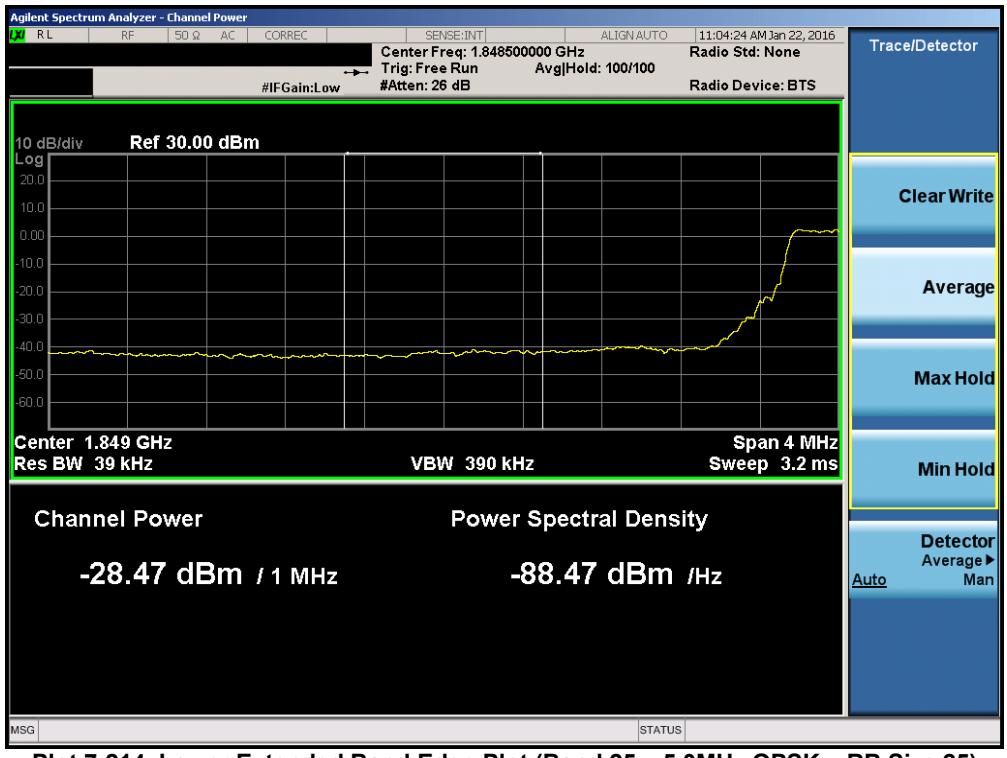
Plot 7-211. Upper Band Edge Plot (Band 25 – 3.0MHz QPSK – RB Size 15)



Plot 7-212. Upper Extended Band Edge Plot (Band 25 – 3.0MHz QPSK – RB Size 15)

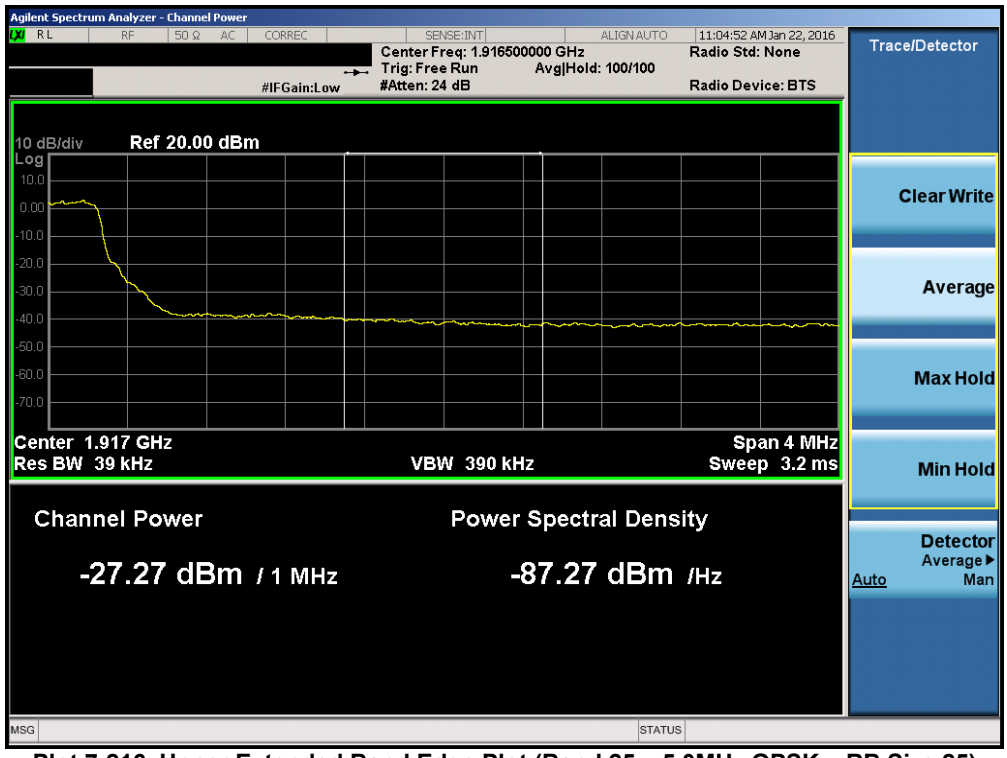


Plot 7-213. Lower Band Edge Plot (Band 25 – 5.0MHz QPSK – RB Size 25)



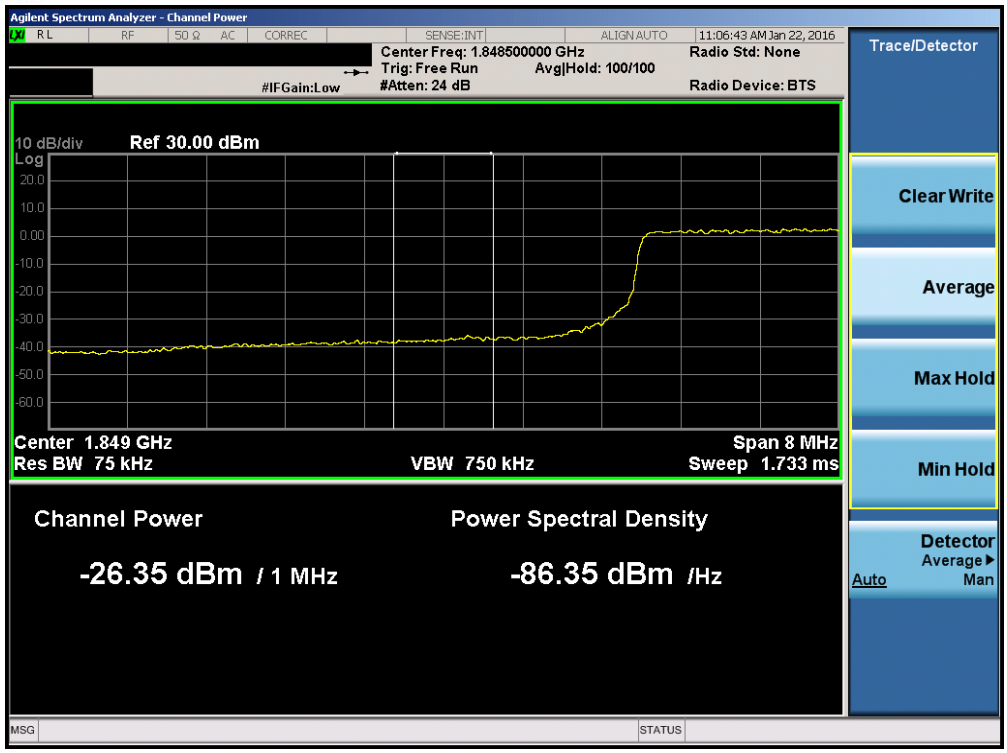
Plot 7-214. Lower Extended Band Edge Plot (Band 25 – 5.0MHz QPSK – RB Size 25)

Plot 7-215. Upper Band Edge Plot (Band 25 – 5.0MHz QPSK – RB Size 25)



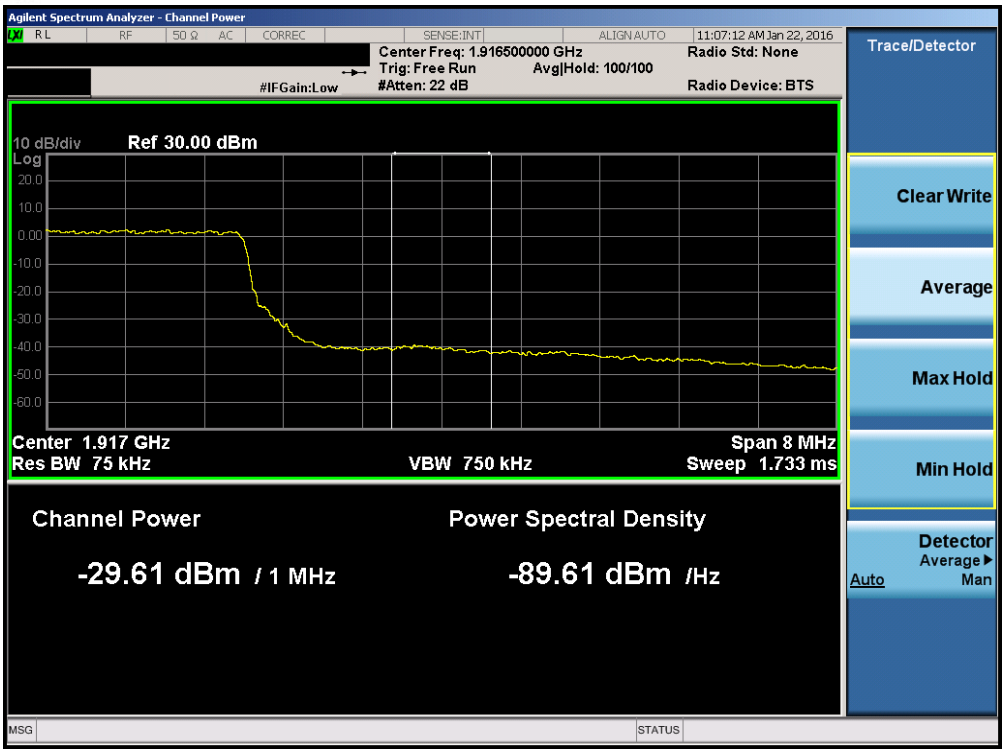
Plot 7-216. Upper Extended Band Edge Plot (Band 25 – 5.0MHz QPSK – RB Size 25)

Plot 7-217. Lower Band Edge Plot (Band 25 – 10.0MHz QPSK – RB Size 50)

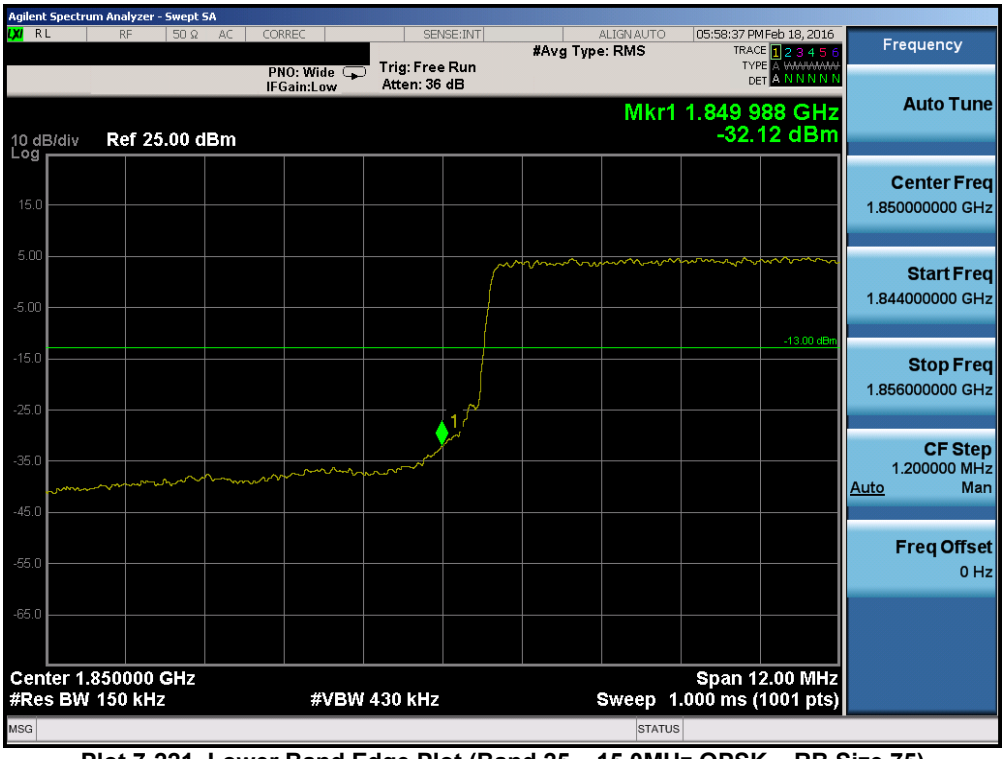


Plot 7-218. Lower Extended Band Edge Plot (Band 25 – 10.0MHz QPSK – RB Size 50)

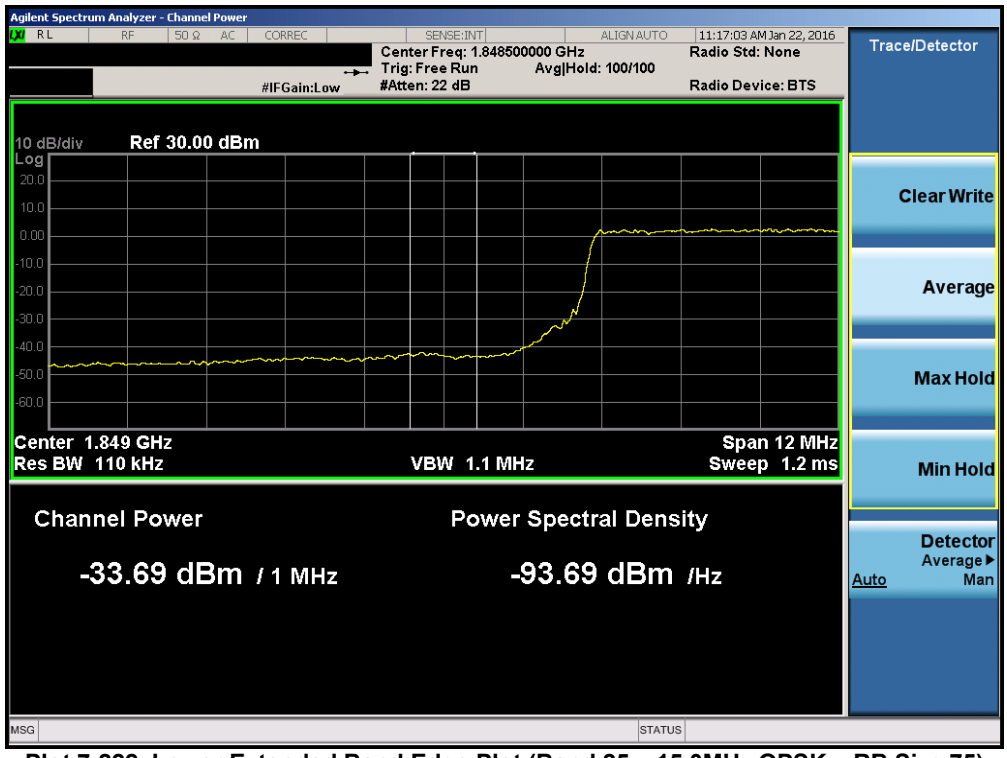
Plot 7-219. Upper Band Edge Plot (Band 25 – 10.0MHz QPSK – RB Size 50)



Plot 7-220. Upper Extended Band Edge Plot (Band 25 – 10.0MHz QPSK – RB Size 50)

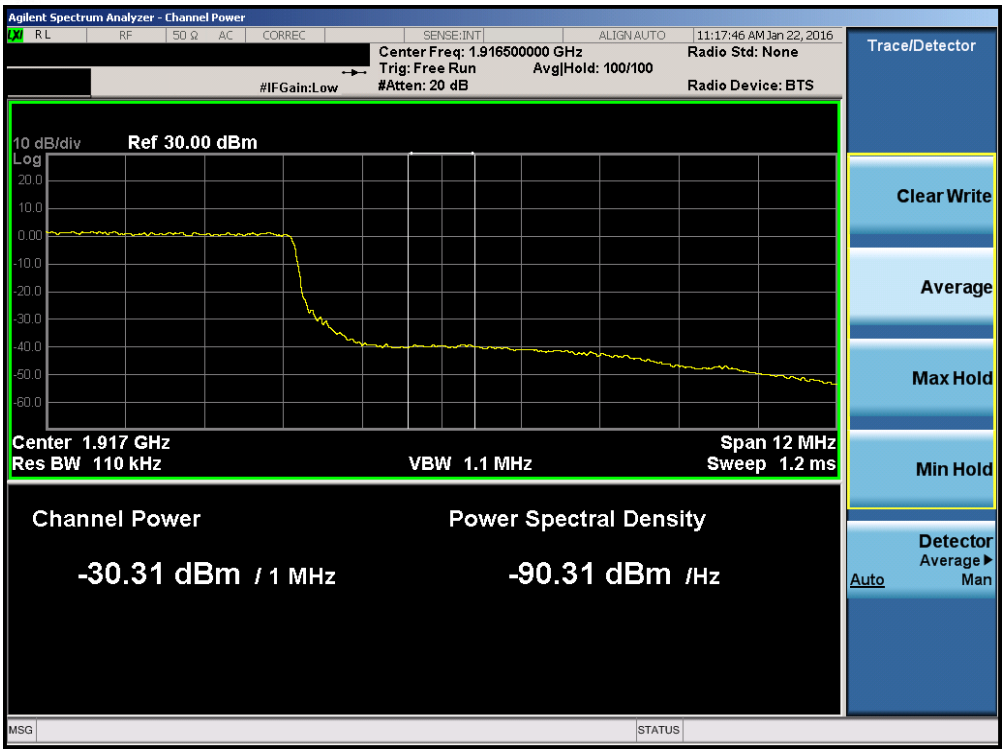


Plot 7-221. Lower Band Edge Plot (Band 25 – 15.0MHz QPSK – RB Size 75)

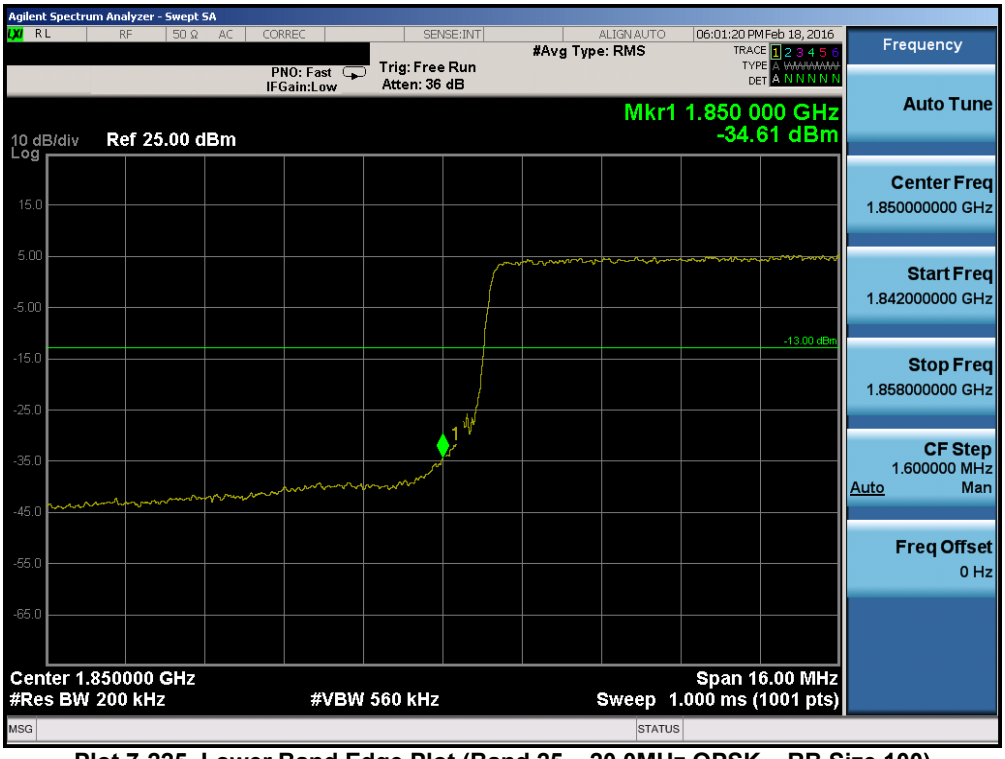


Plot 7-222. Lower Extended Band Edge Plot (Band 25 – 15.0MHz QPSK – RB Size 75)

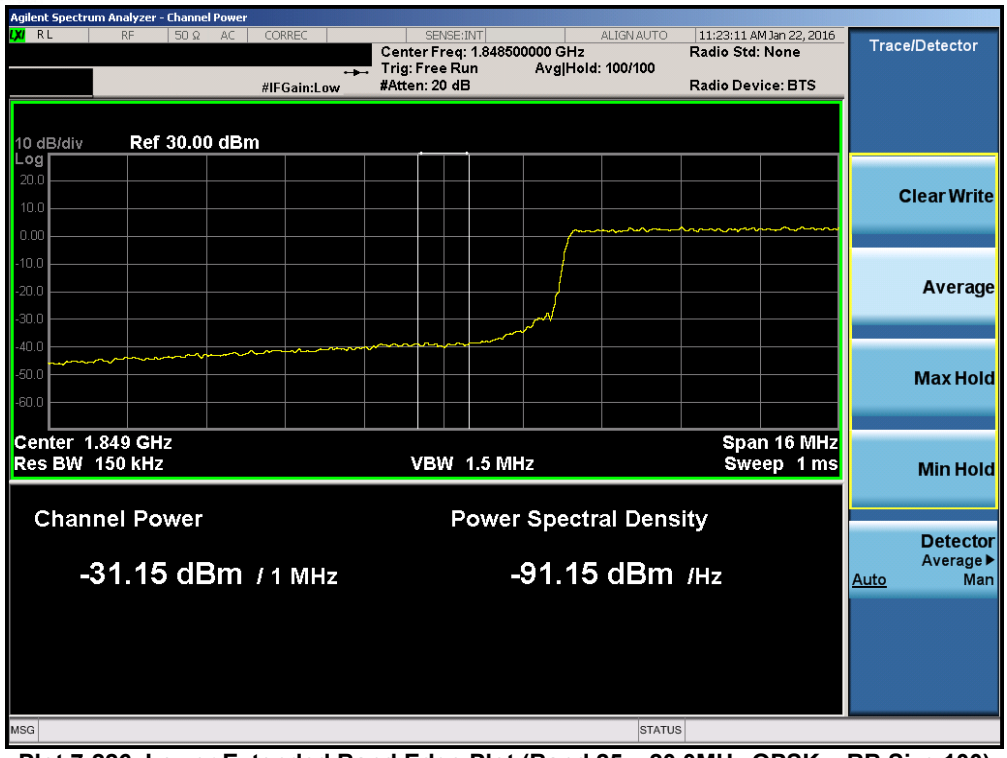
Plot 7-223. Upper Band Edge Plot (Band 25 – 15.0MHz QPSK – RB Size 75)



Plot 7-224. Upper Extended Band Edge Plot (Band 25 – 15.0MHz QPSK – RB Size 75)

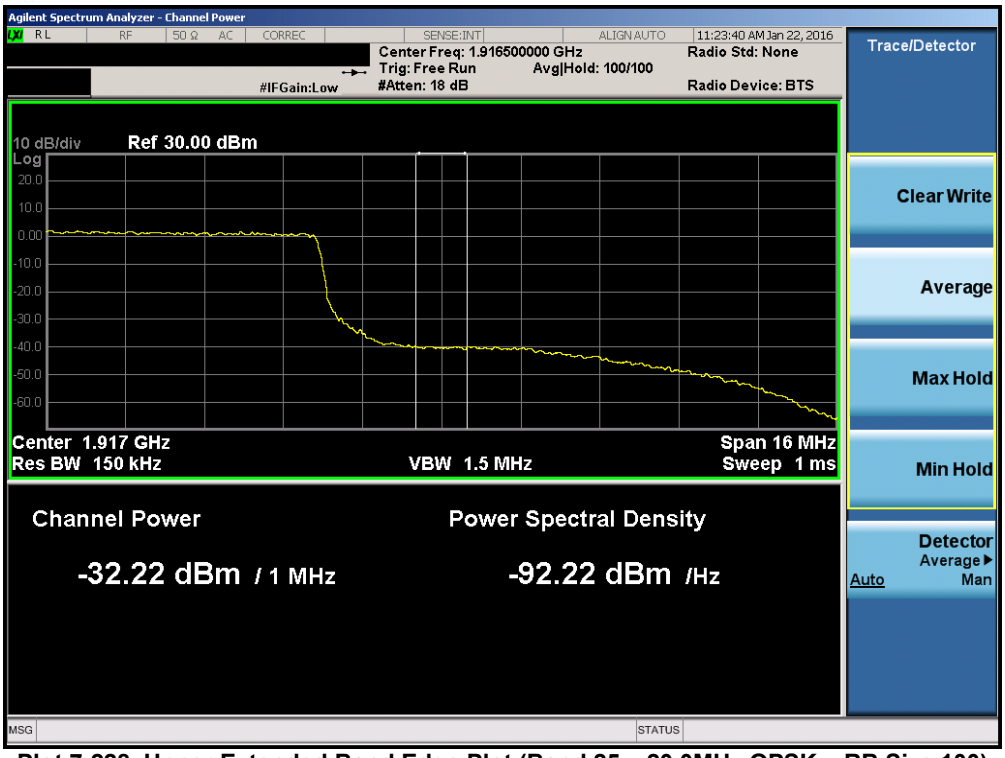


Plot 7-225. Lower Band Edge Plot (Band 25 – 20.0MHz QPSK – RB Size 100)

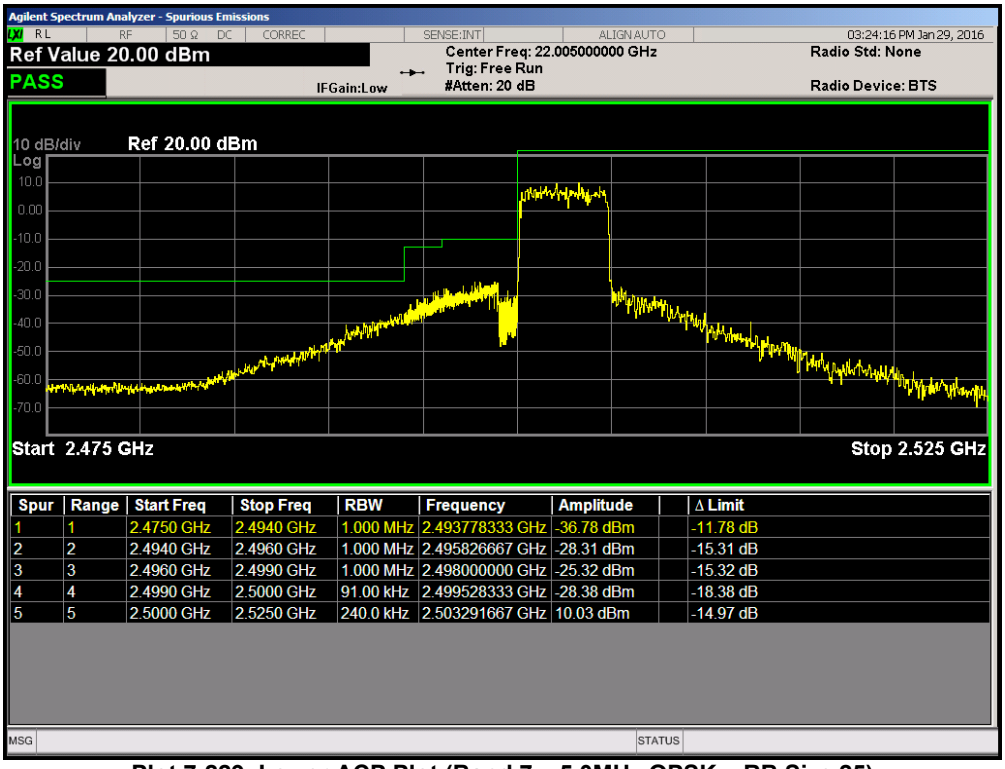


Plot 7-226. Lower Extended Band Edge Plot (Band 25 – 20.0MHz QPSK – RB Size 100)

Plot 7-227. Upper Band Edge Plot (Band 25 – 20.0MHz QPSK – RB Size 100)

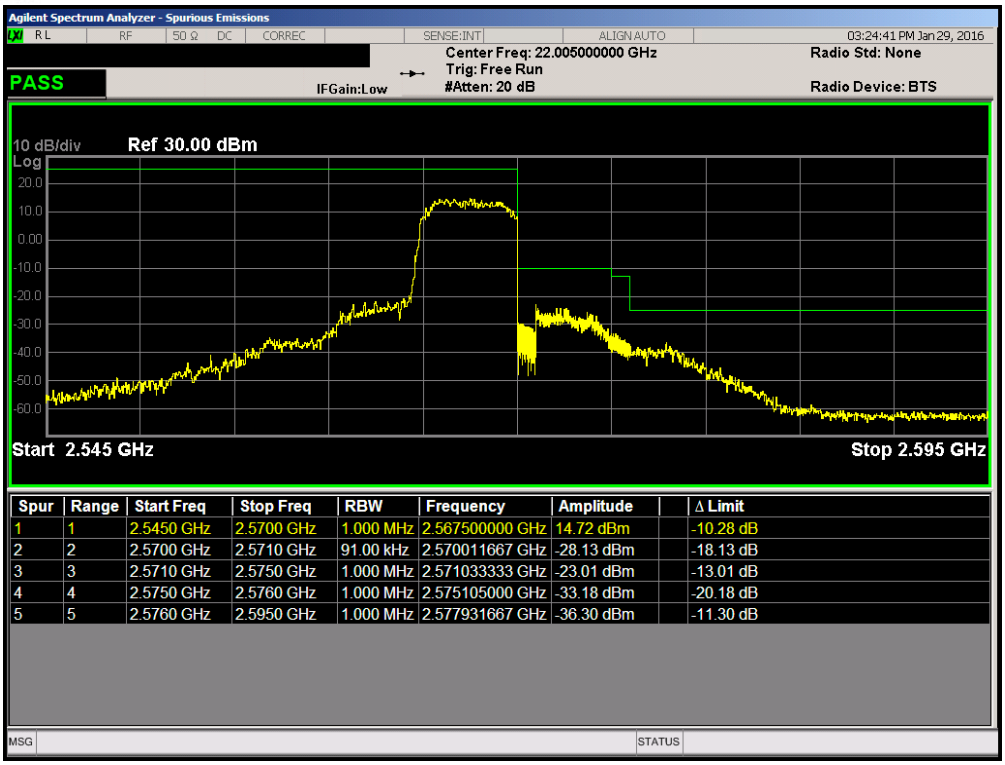


Plot 7-228. Upper Extended Band Edge Plot (Band 25 – 20.0MHz QPSK – RB Size 100)



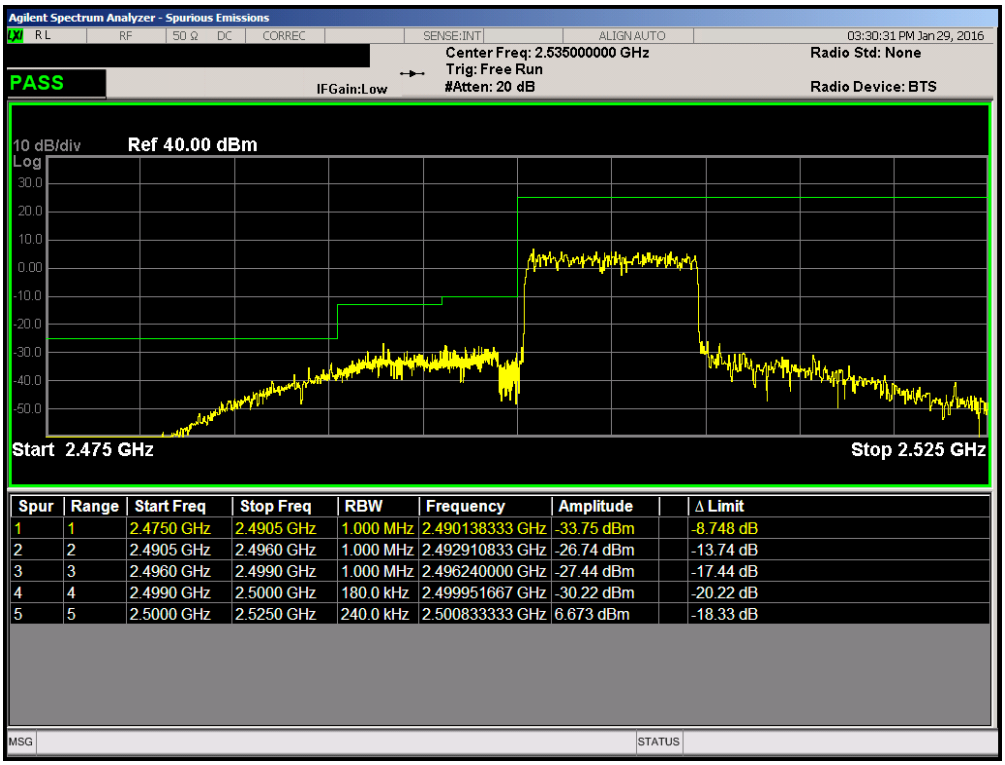
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4940 GHz	1.000 MHz	2.493778333 GHz	-36.78 dBm	-11.78 dB
2	2	2.4940 GHz	2.4960 GHz	1.000 MHz	2.495826667 GHz	-28.31 dBm	-15.31 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498000000 GHz	-25.32 dBm	-15.32 dB
4	4	2.4990 GHz	2.5000 GHz	91.00 kHz	2.499528333 GHz	-28.38 dBm	-18.38 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.503291667 GHz	10.03 dBm	-14.97 dB

Plot 7-229. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



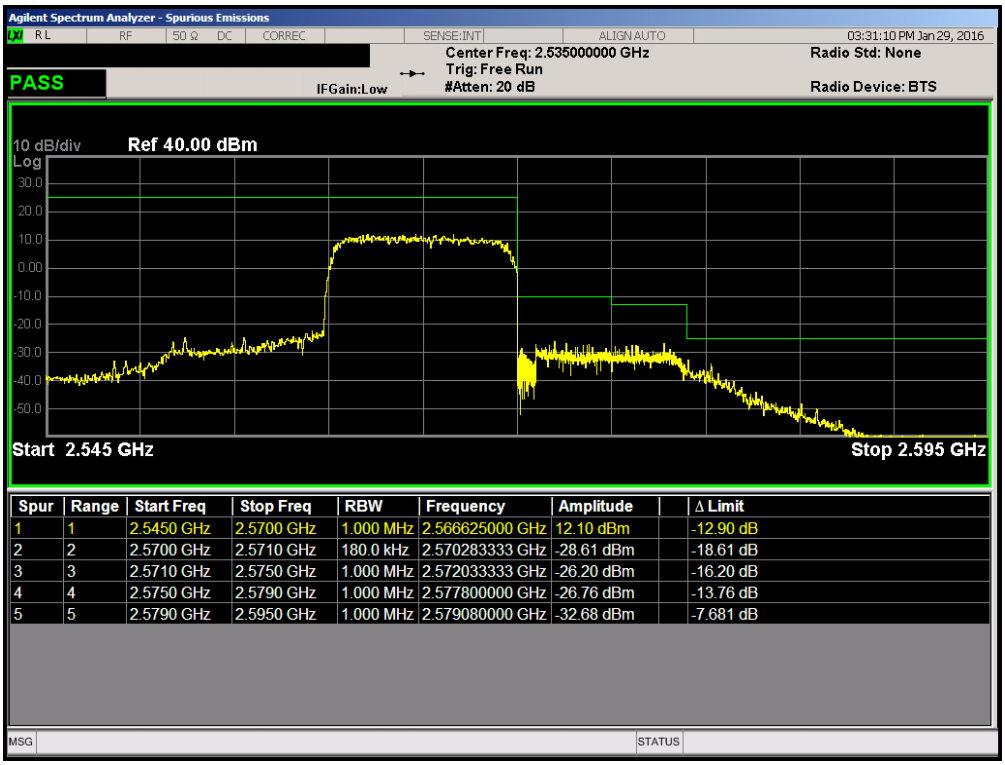
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.567500000 GHz	14.72 dBm	-10.28 dB
2	2	2.5700 GHz	2.5710 GHz	91.00 kHz	2.570011667 GHz	-28.13 dBm	-18.13 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571033333 GHz	-23.01 dBm	-13.01 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575105000 GHz	-33.18 dBm	-20.18 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.577931667 GHz	-36.30 dBm	-11.30 dB

Plot 7-230. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



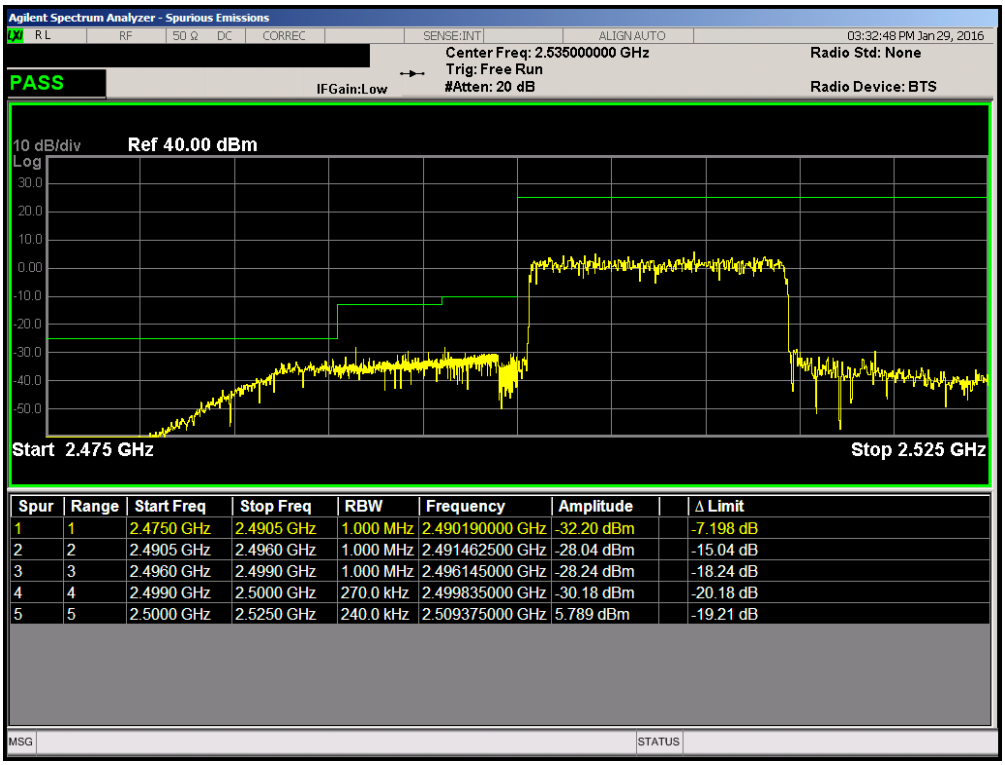
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490138333 GHz	-33.75 dBm	-8.748 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.492910833 GHz	-26.74 dBm	-13.74 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.496240000 GHz	-27.44 dBm	-17.44 dB
4	4	2.4990 GHz	2.5000 GHz	180.0 kHz	2.499951667 GHz	-30.22 dBm	-20.22 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.500833333 GHz	6.673 dBm	-18.33 dB

Plot 7-231. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



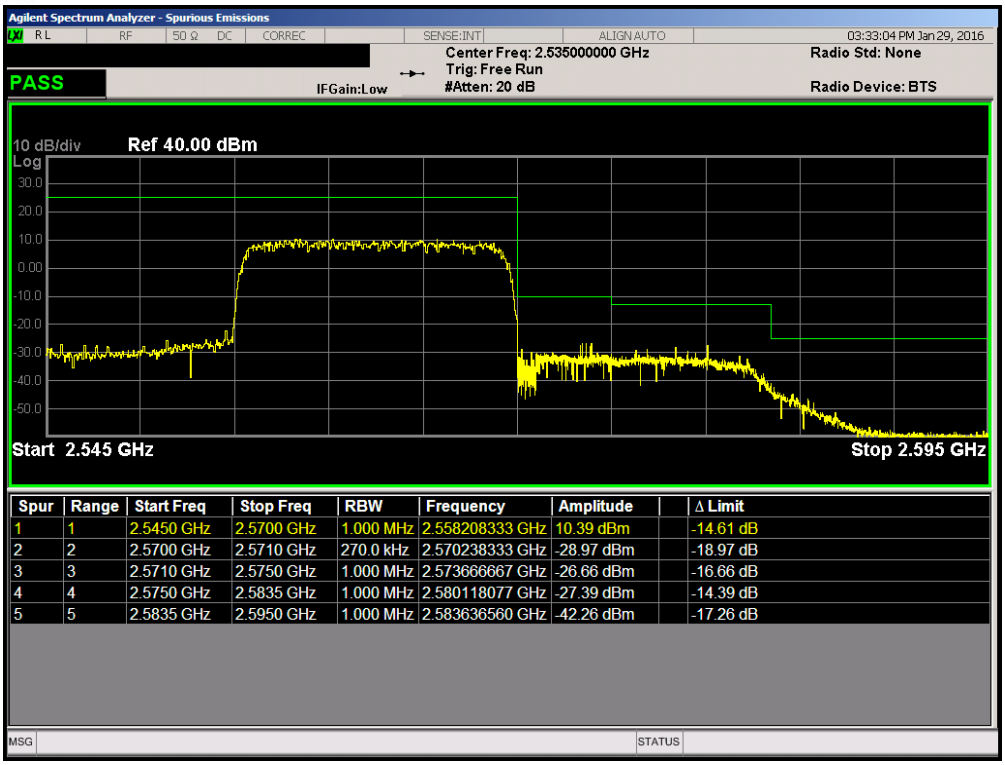
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.566625000 GHz	12.10 dBm	-12.90 dB
2	2	2.5700 GHz	2.5710 GHz	180.0 kHz	2.570283333 GHz	-28.61 dBm	-18.61 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.572033333 GHz	-26.20 dBm	-16.20 dB
4	4	2.5750 GHz	2.5790 GHz	1.000 MHz	2.577800000 GHz	-26.76 dBm	-13.76 dB
5	5	2.5790 GHz	2.5950 GHz	1.000 MHz	2.579080000 GHz	-32.68 dBm	-7.681 dB

Plot 7-232. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



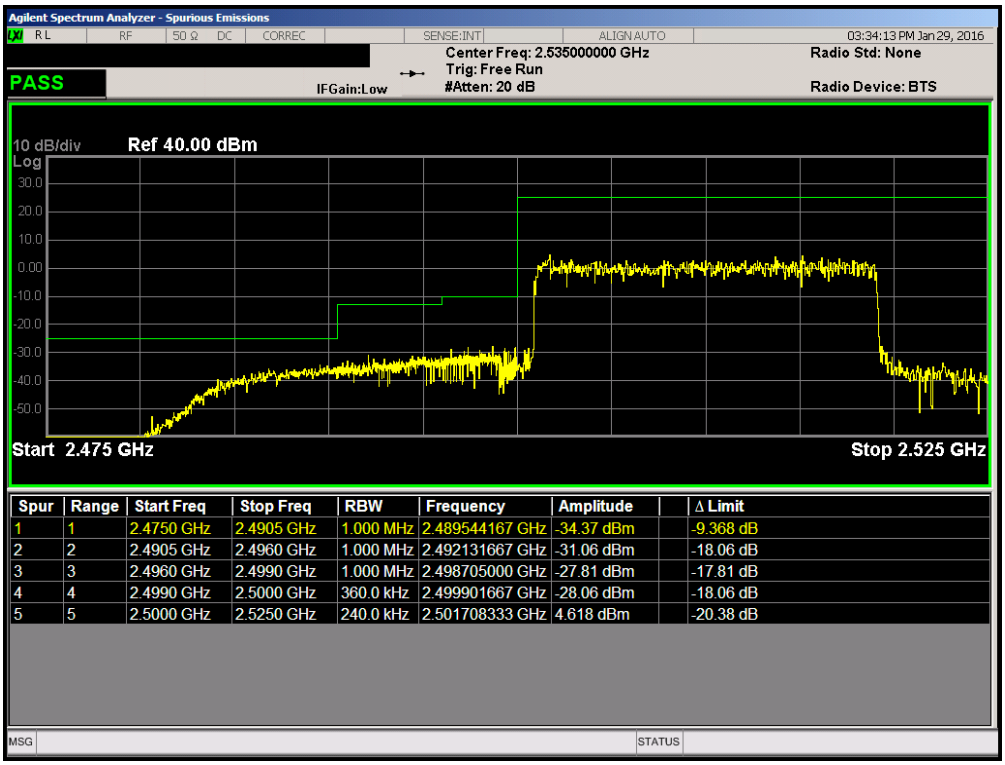
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490190000 GHz	-32.20 dBm	-7.198 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.491462500 GHz	-28.04 dBm	-15.04 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.496145000 GHz	-28.24 dBm	-18.24 dB
4	4	2.4990 GHz	2.5000 GHz	270.0 kHz	2.499835000 GHz	-30.18 dBm	-20.18 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.509375000 GHz	5.789 dBm	-19.21 dB

Plot 7-233. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



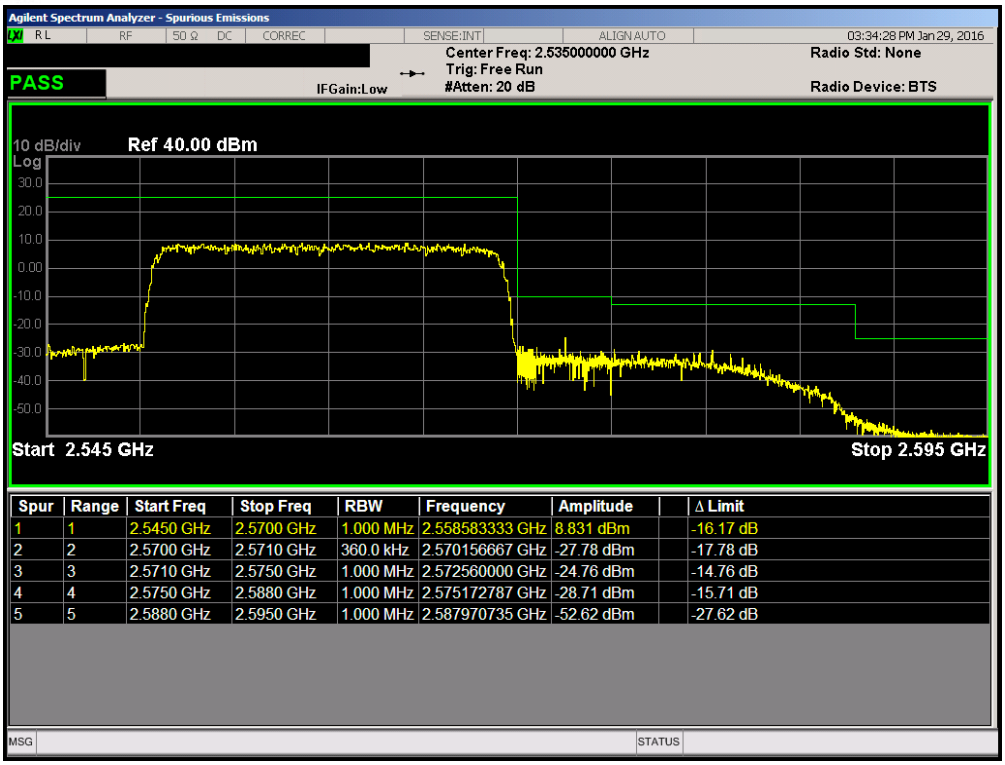
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.558208333 GHz	10.39 dBm	-14.61 dB
2	2	2.5700 GHz	2.5710 GHz	270.0 kHz	2.570238333 GHz	-28.97 dBm	-18.97 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.573666667 GHz	-26.66 dBm	-16.66 dB
4	4	2.5750 GHz	2.5835 GHz	1.000 MHz	2.580118077 GHz	-27.39 dBm	-14.39 dB
5	5	2.5835 GHz	2.5950 GHz	1.000 MHz	2.583636560 GHz	-42.26 dBm	-17.26 dB

Plot 7-234. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489544167 GHz	-34.37 dBm	-9.368 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.492131667 GHz	-31.06 dBm	-18.06 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498705000 GHz	-27.81 dBm	-17.81 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499901667 GHz	-28.06 dBm	-18.06 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.501708333 GHz	4.618 dBm	-20.38 dB

Plot 7-235. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)



Plot 7-236. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

7.5 Peak-Average Ratio

§24.232(d)

Test Overview

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

Test Procedure Used

KDB 971168 v02r02 – Section 5.7.1

Test Settings

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

Test Setup

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

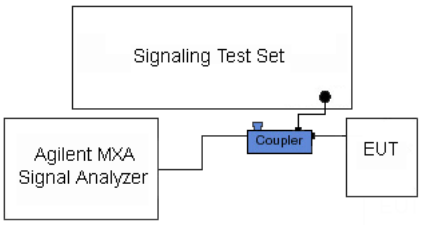
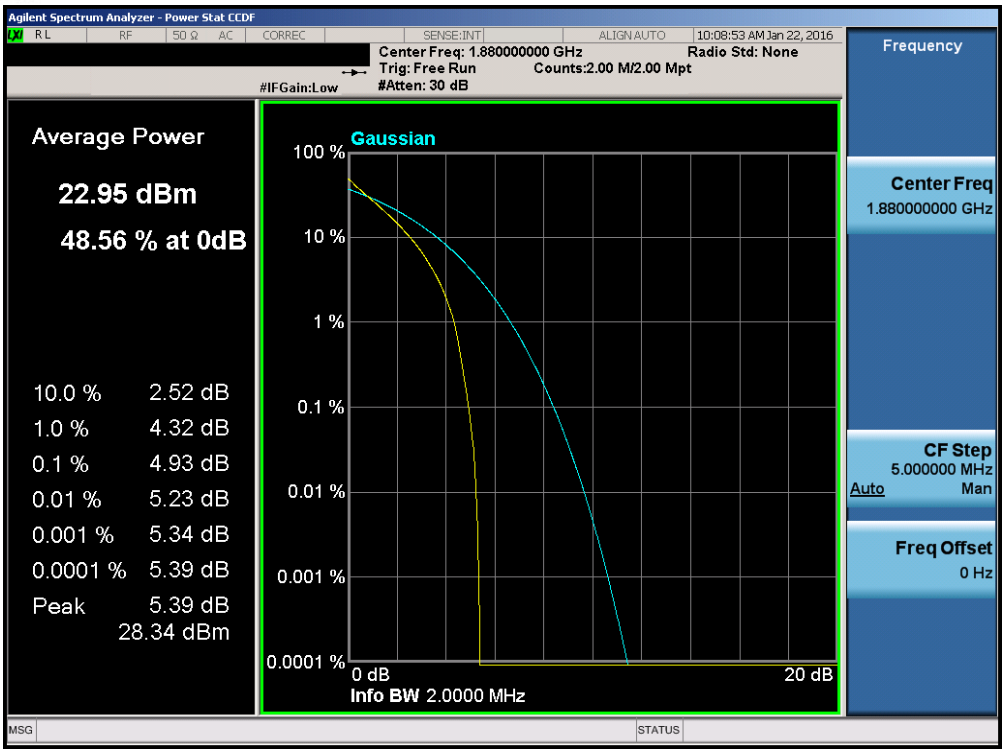


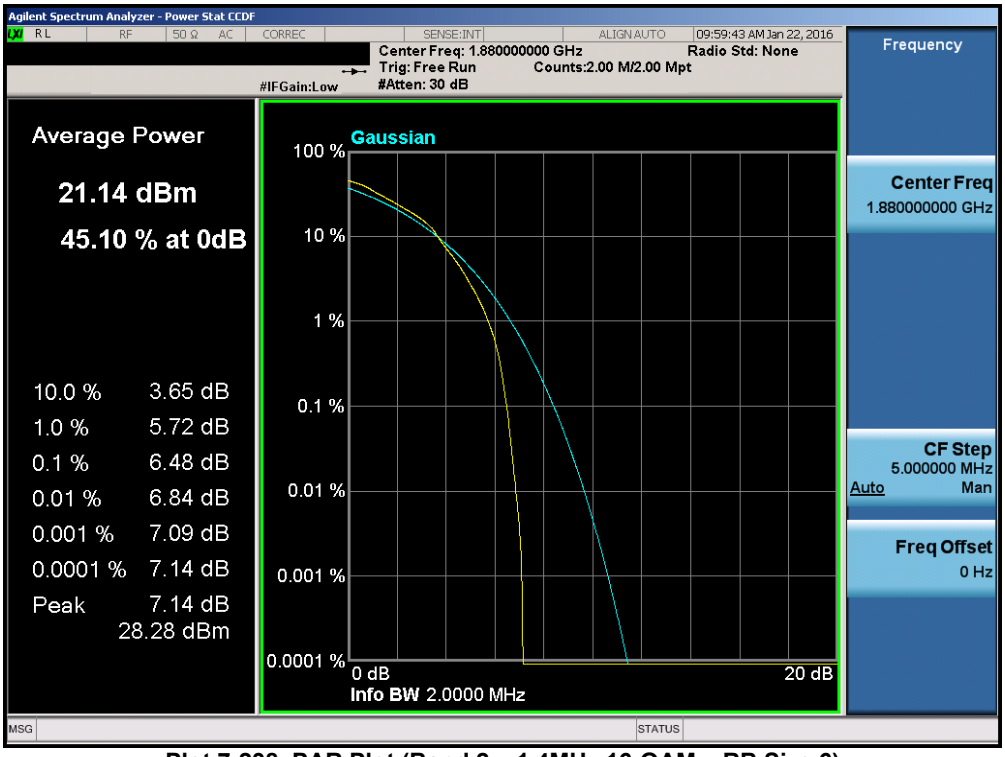
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

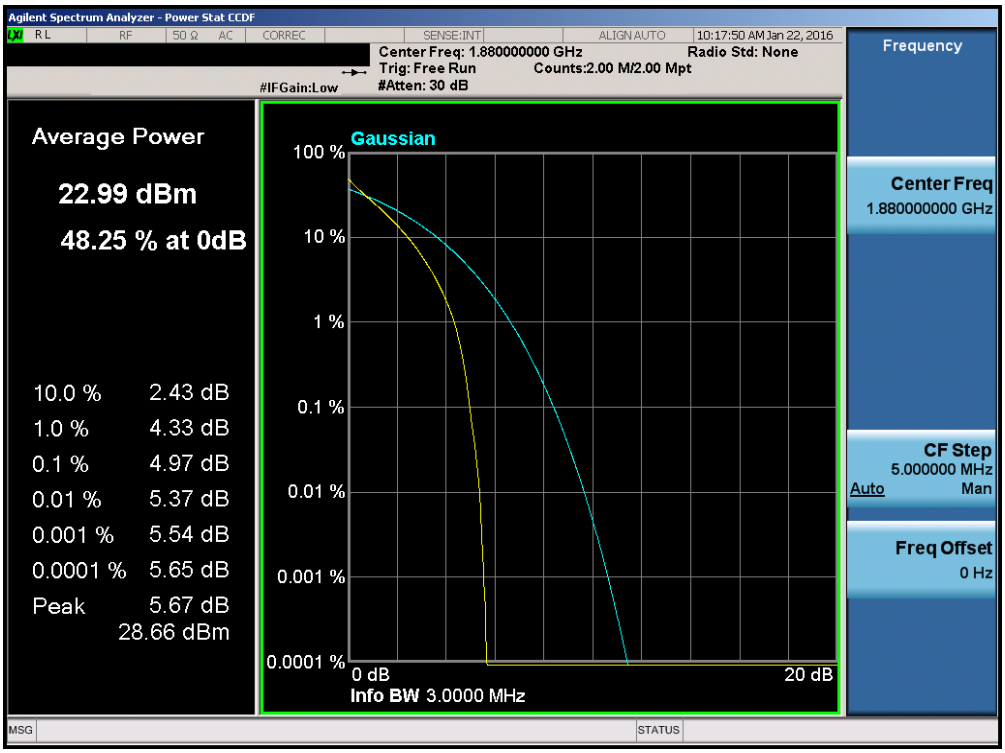
None.



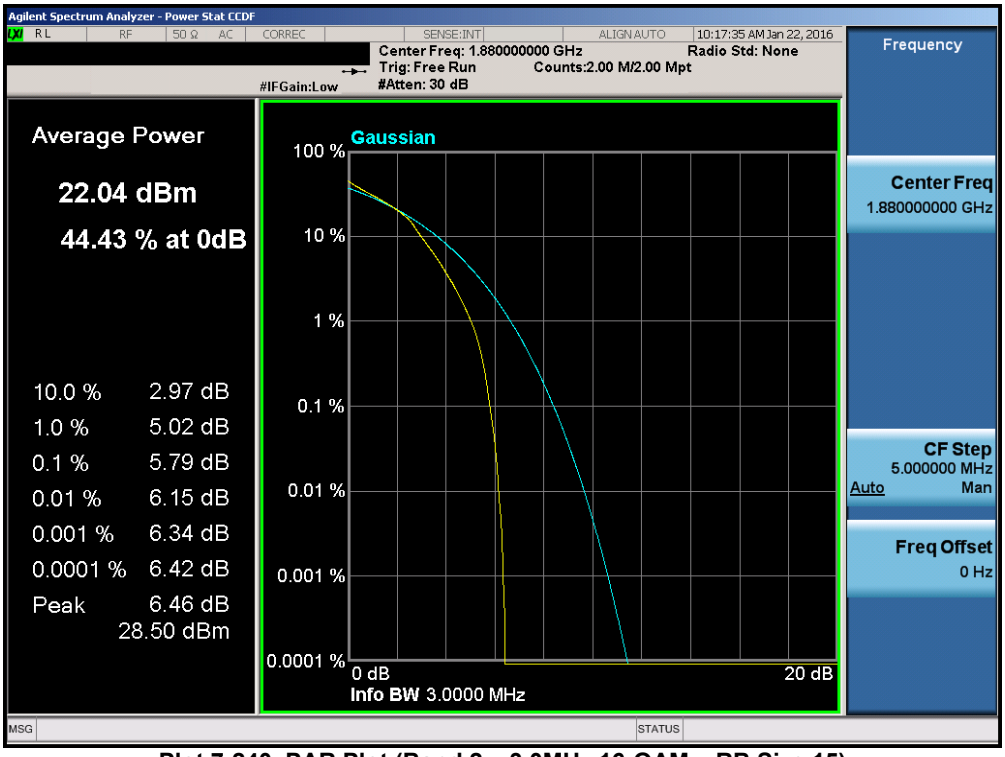
Plot 7-237. PAR Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



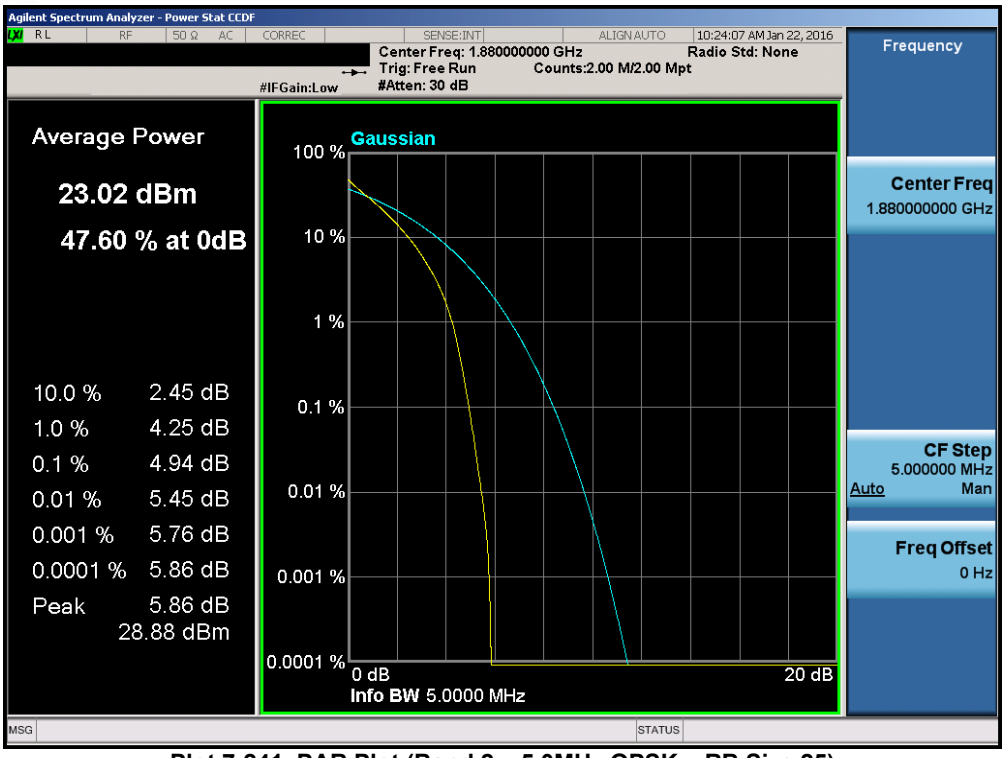
Plot 7-238. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)



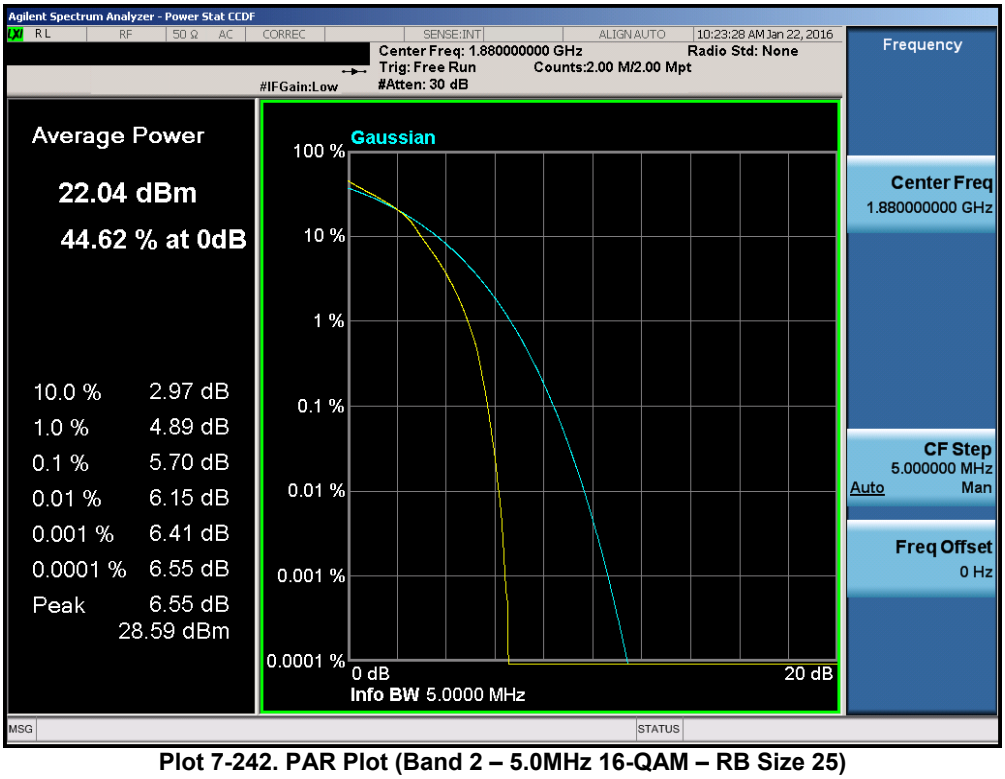
Plot 7-239. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



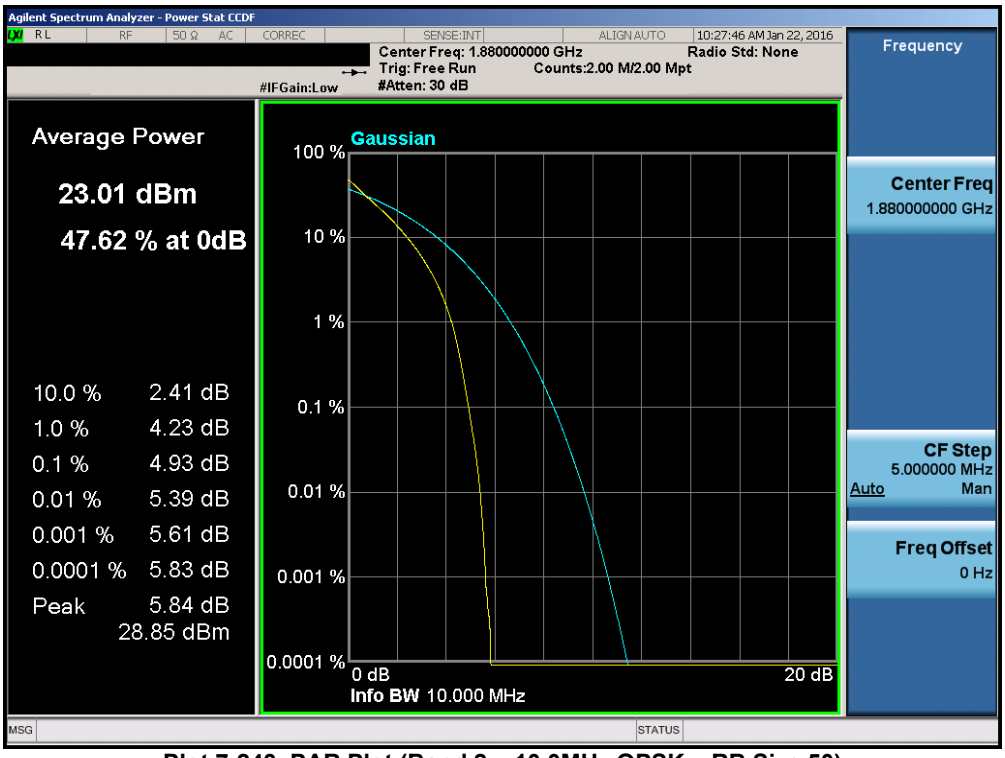
Plot 7-240. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)



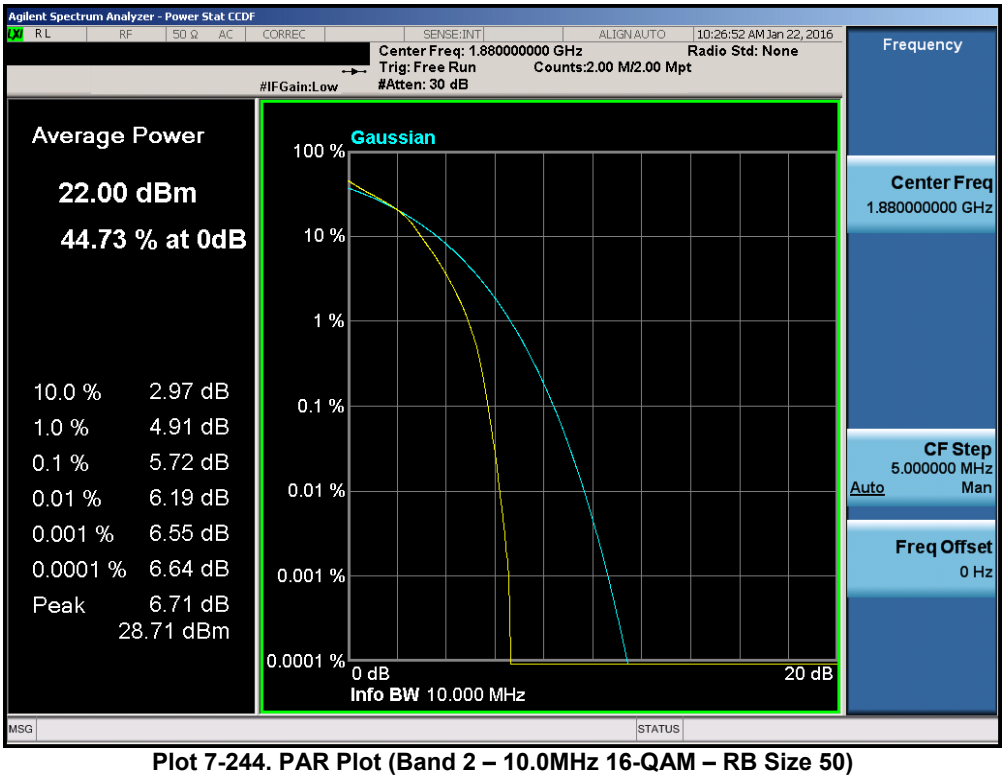
Plot 7-241. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



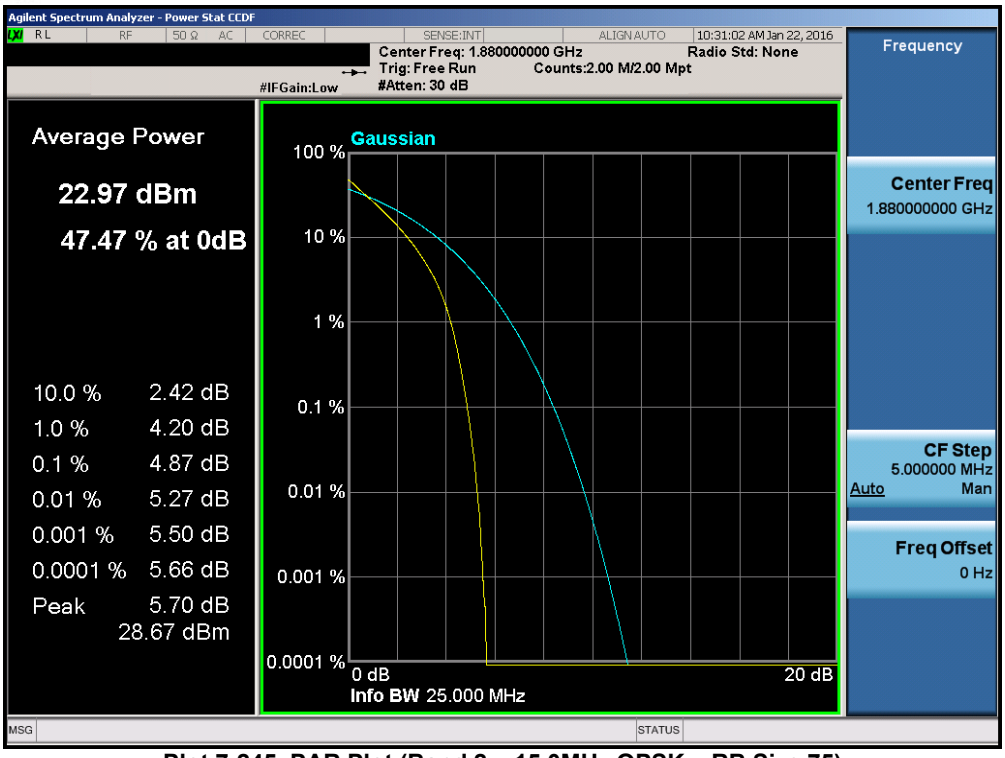
Plot 7-242. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)



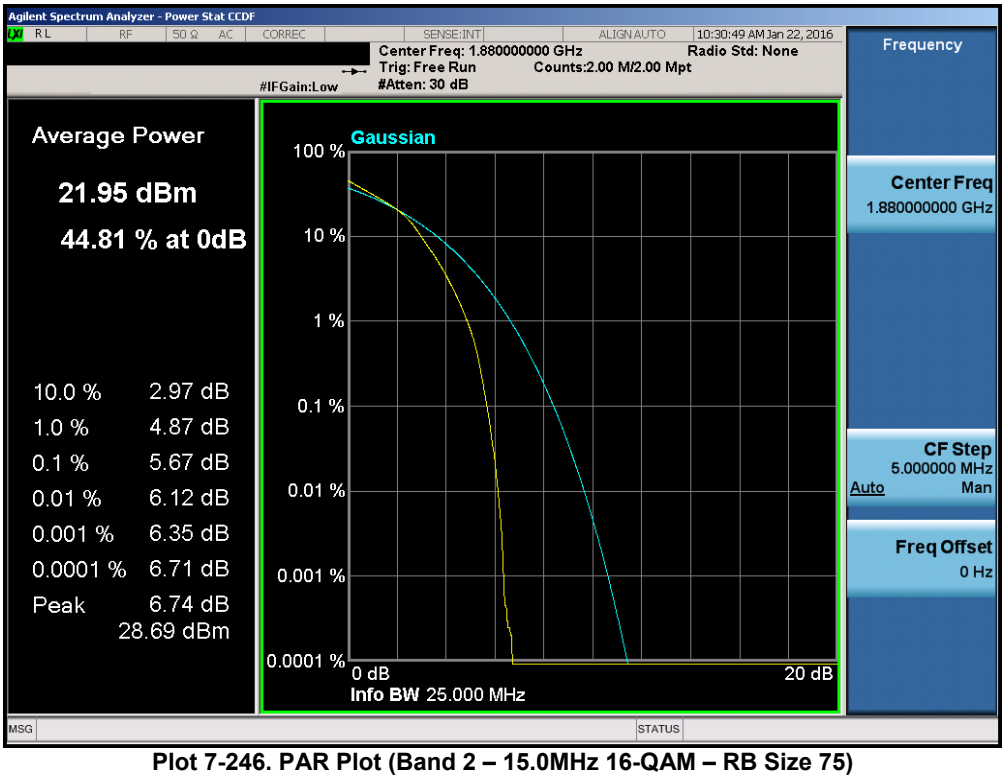
Plot 7-243. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



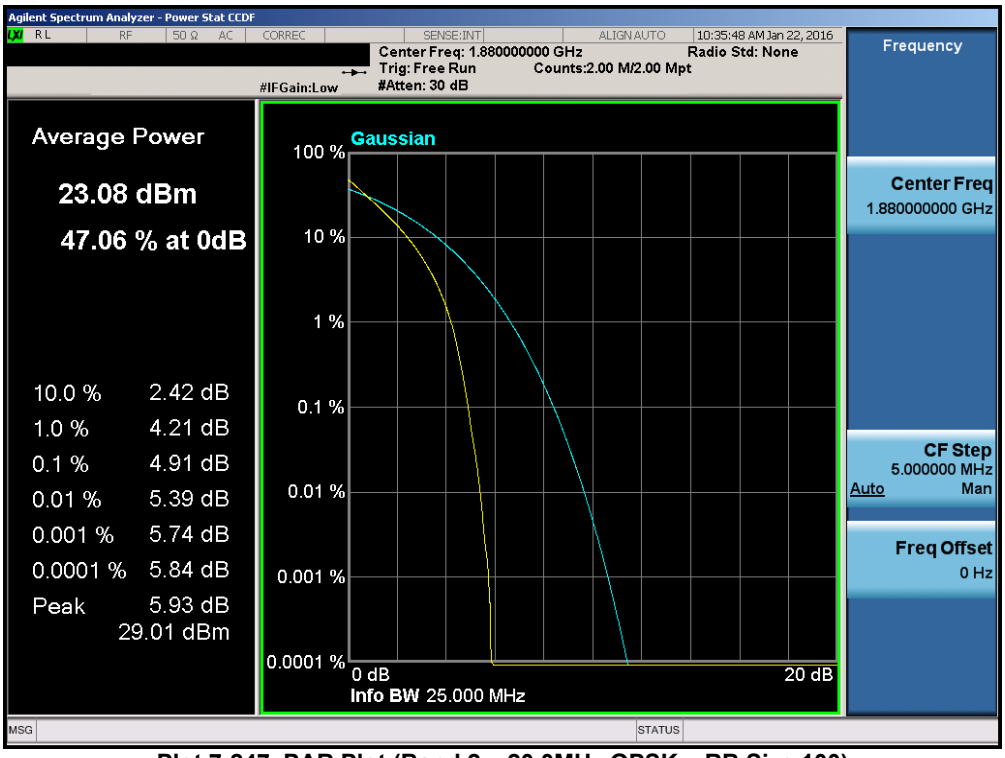
Plot 7-244. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)



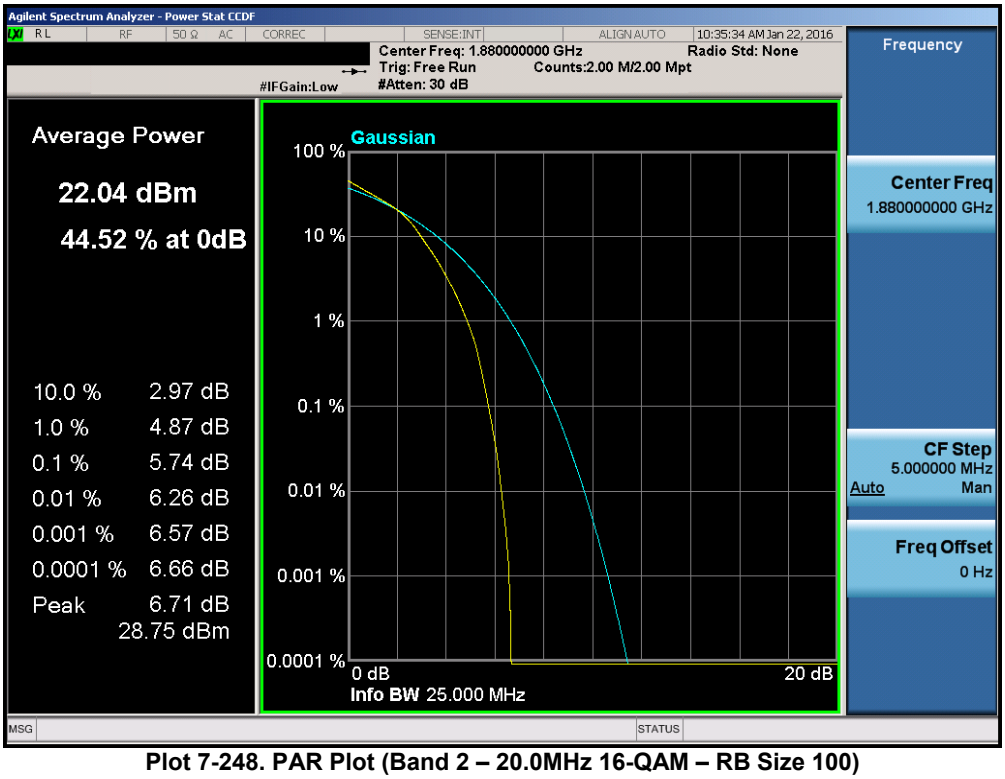
Plot 7-245. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



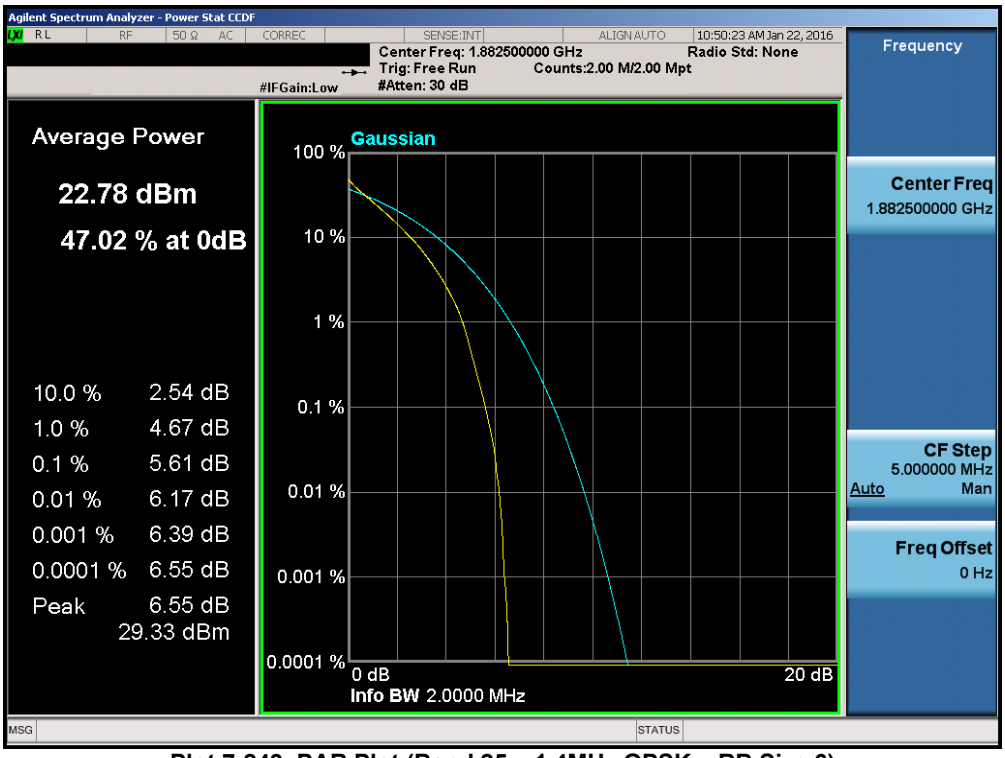
Plot 7-246. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)



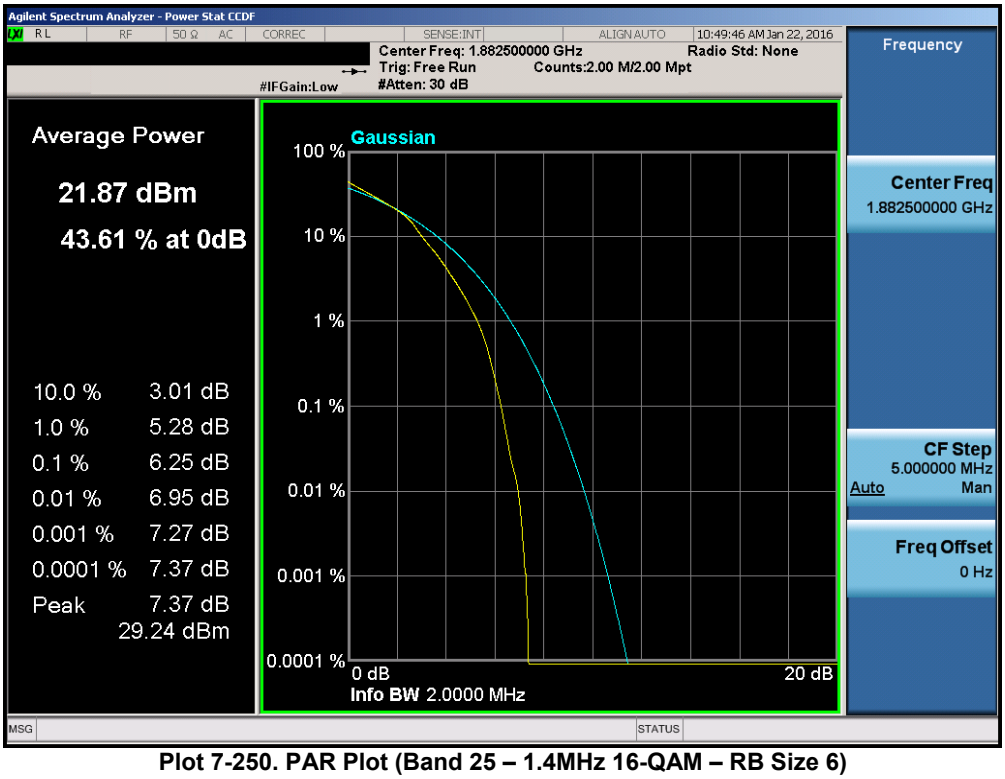
Plot 7-247. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



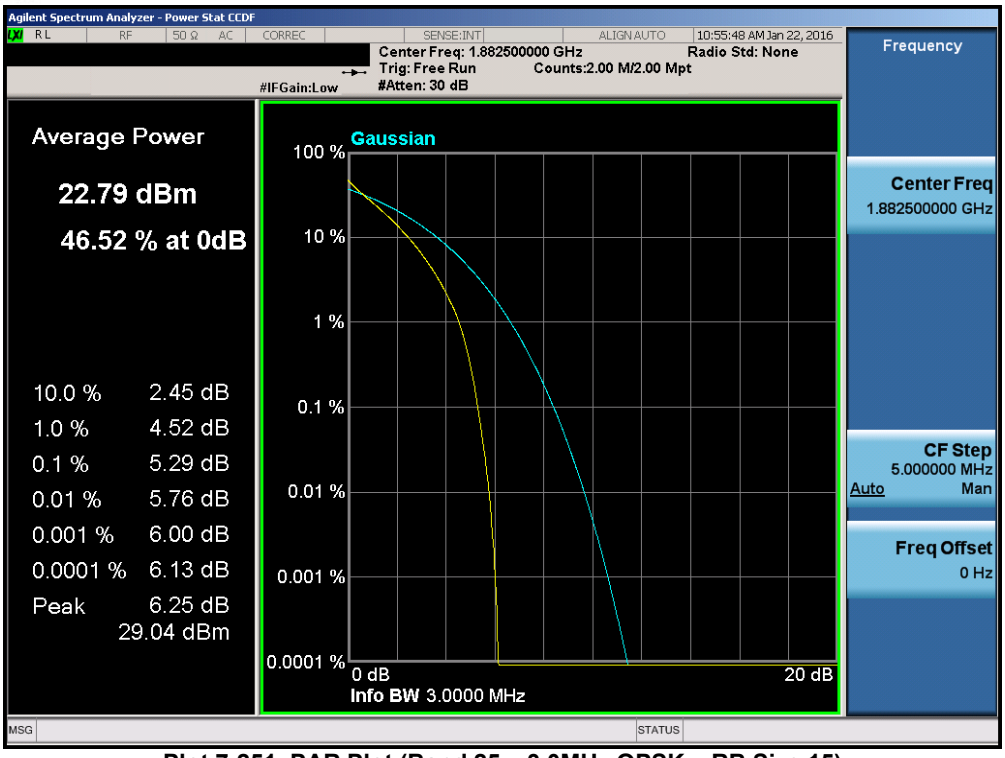
Plot 7-248. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)



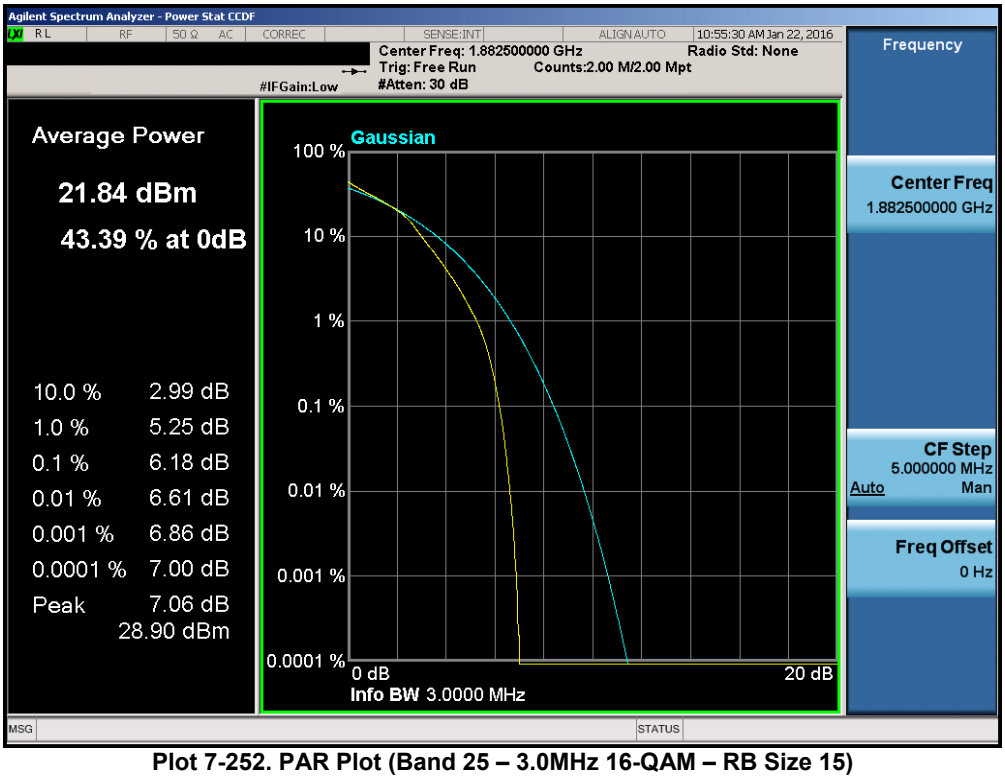
Plot 7-249. PAR Plot (Band 25 – 1.4MHz QPSK – RB Size 6)



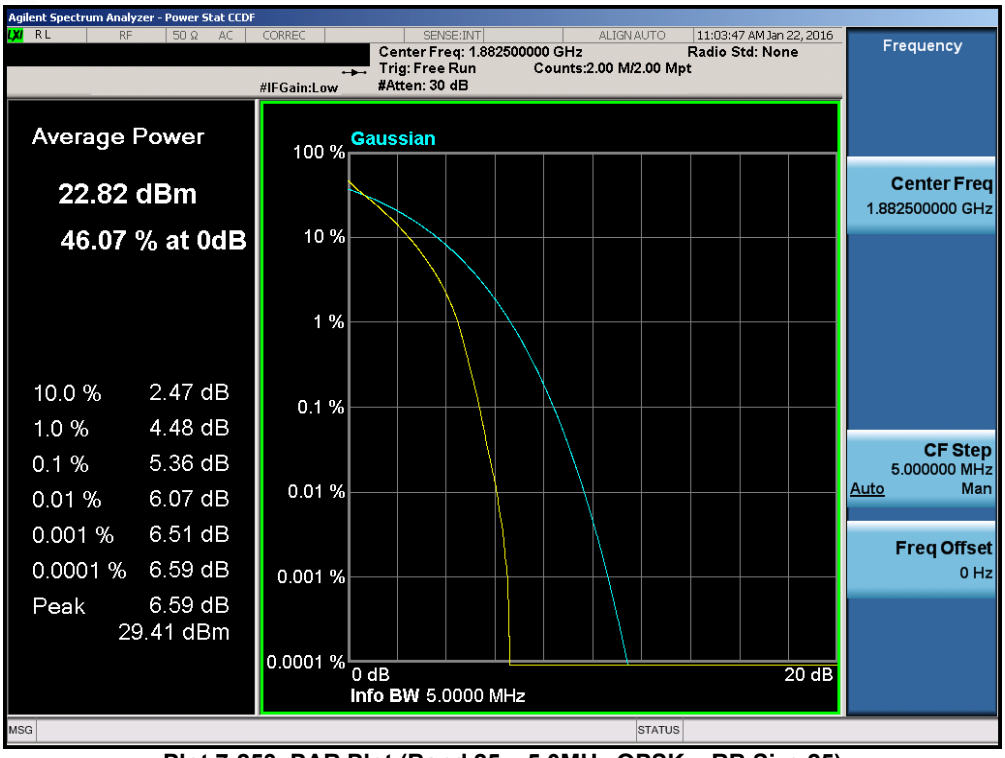
Plot 7-250. PAR Plot (Band 25 – 1.4MHz 16-QAM – RB Size 6)



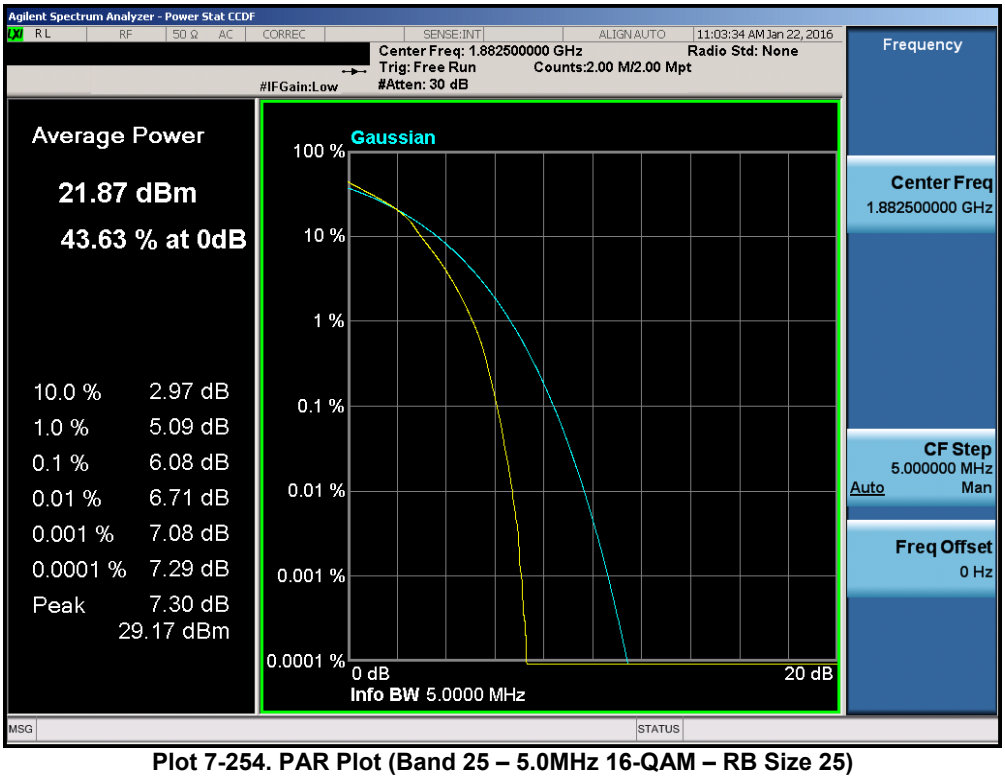
Plot 7-251. PAR Plot (Band 25 – 3.0MHz QPSK – RB Size 15)



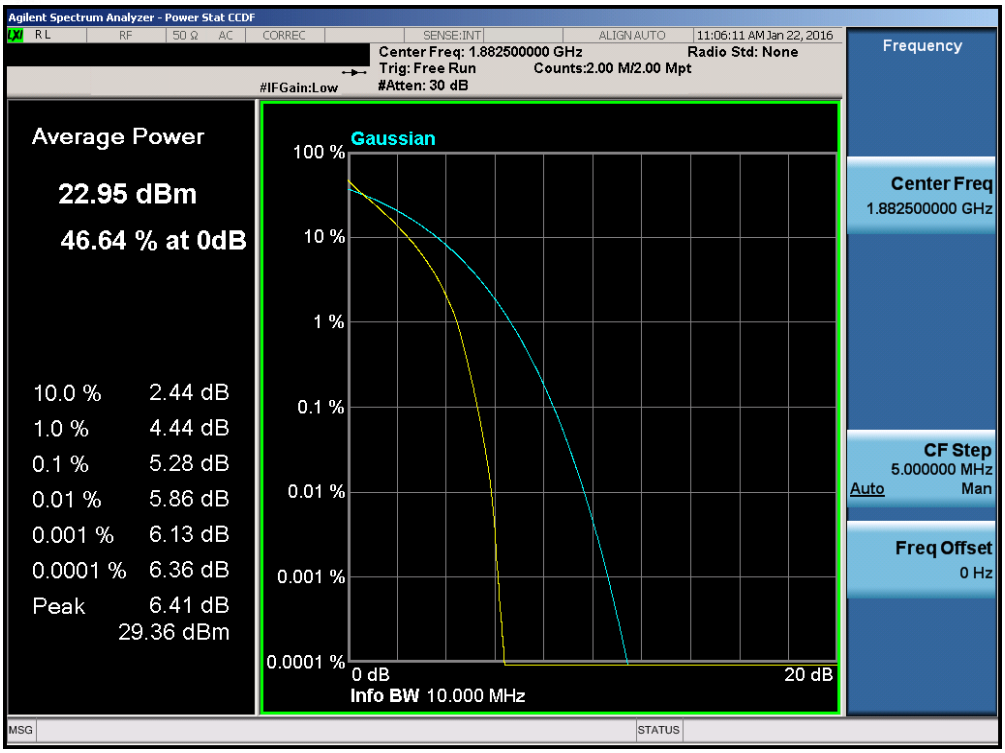
Plot 7-252. PAR Plot (Band 25 – 3.0MHz 16-QAM – RB Size 15)



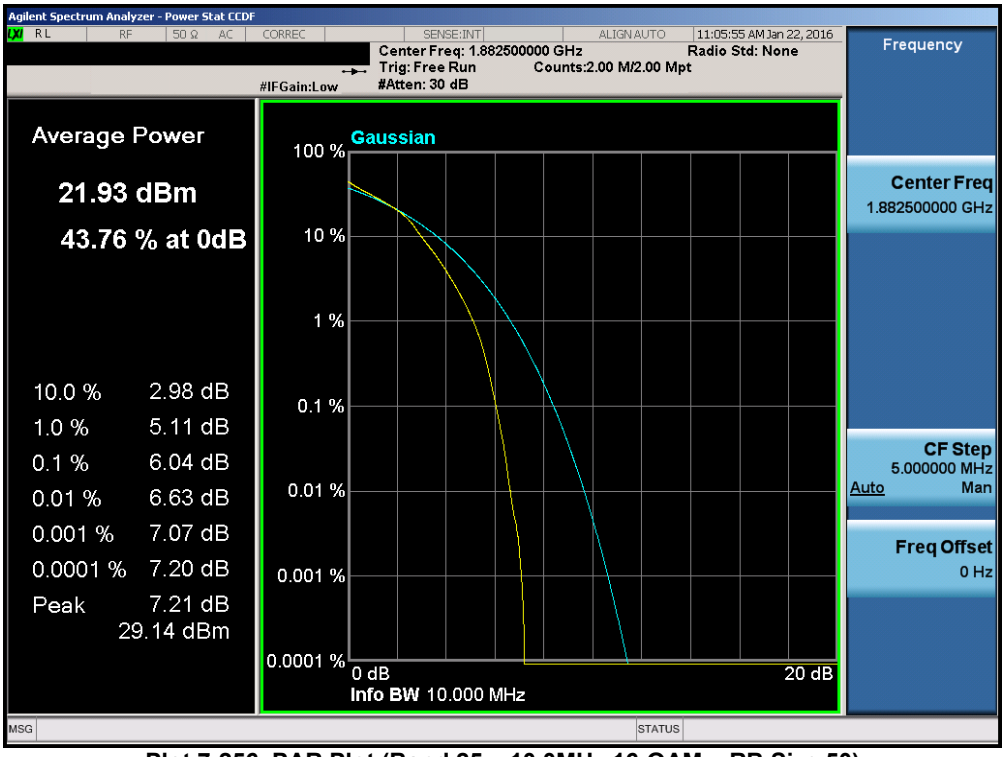
Plot 7-253. PAR Plot (Band 25 – 5.0MHz QPSK – RB Size 25)



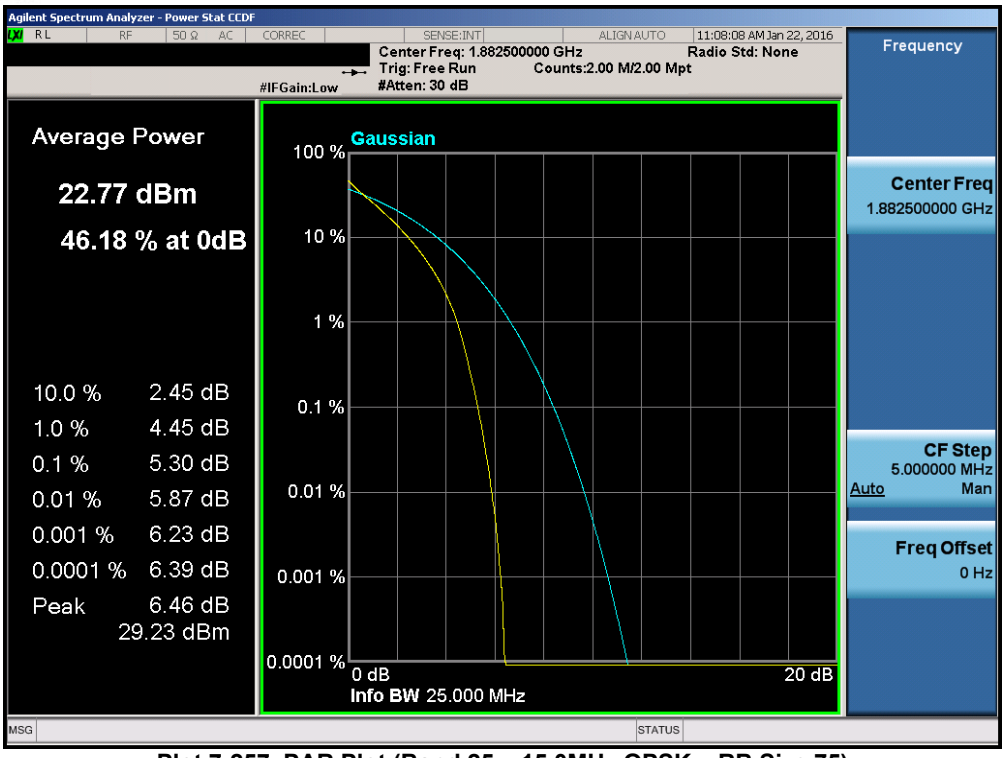
Plot 7-254. PAR Plot (Band 25 – 5.0MHz 16-QAM – RB Size 25)



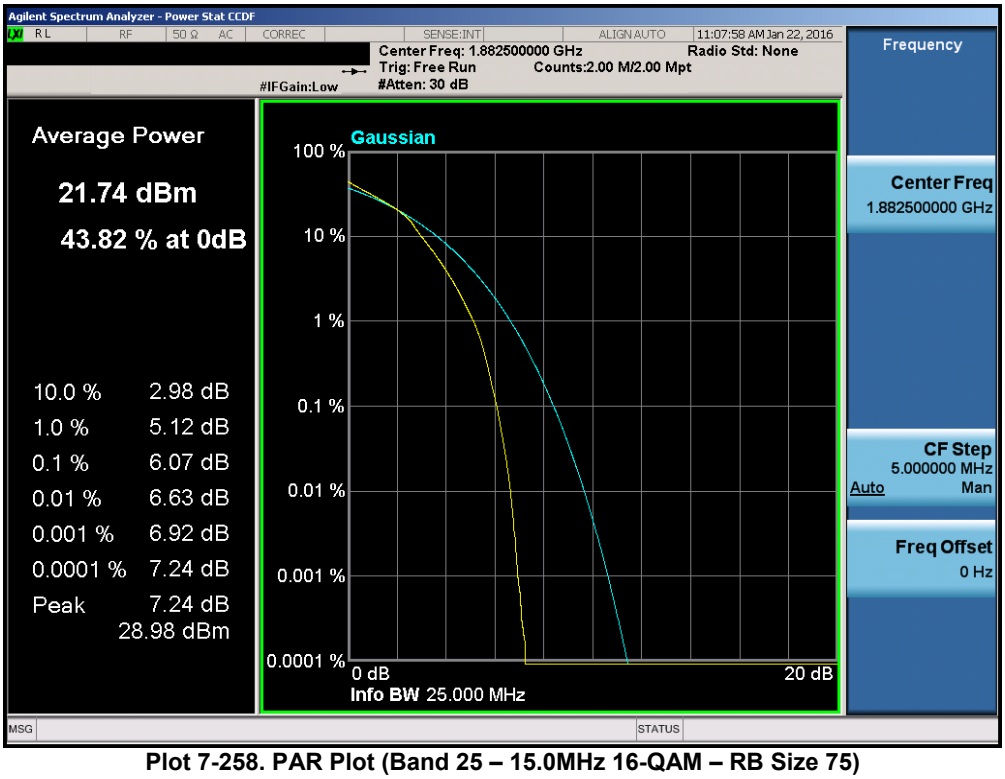
Plot 7-255. PAR Plot (Band 25 – 10.0MHz QPSK – RB Size 50)



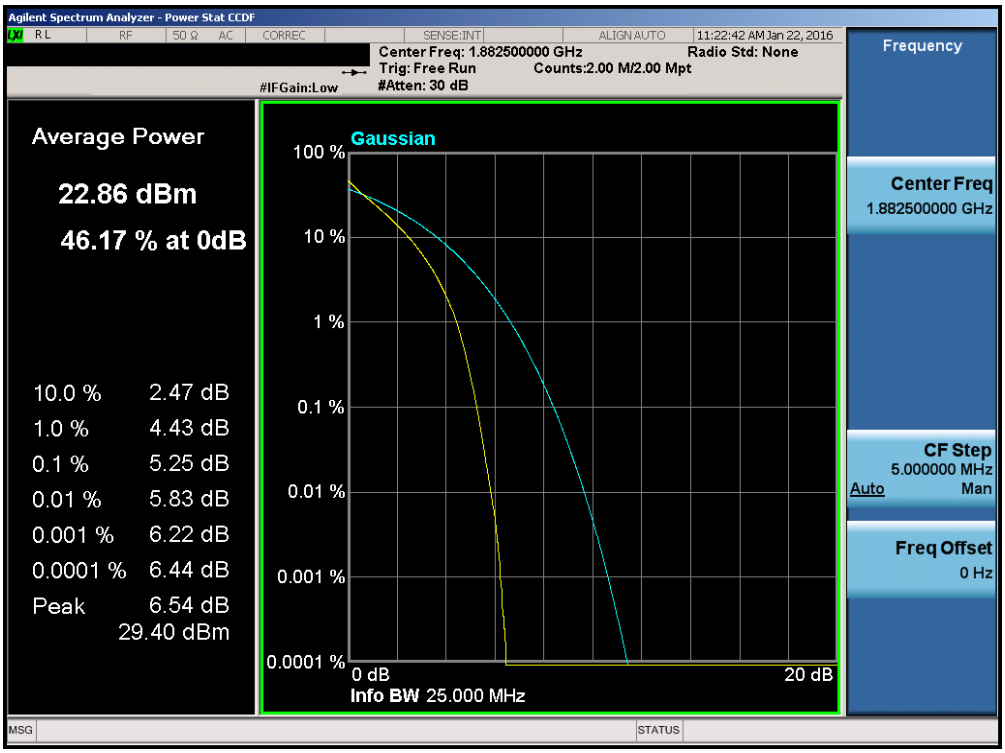
Plot 7-256. PAR Plot (Band 25 – 10.0MHz 16-QAM – RB Size 50)



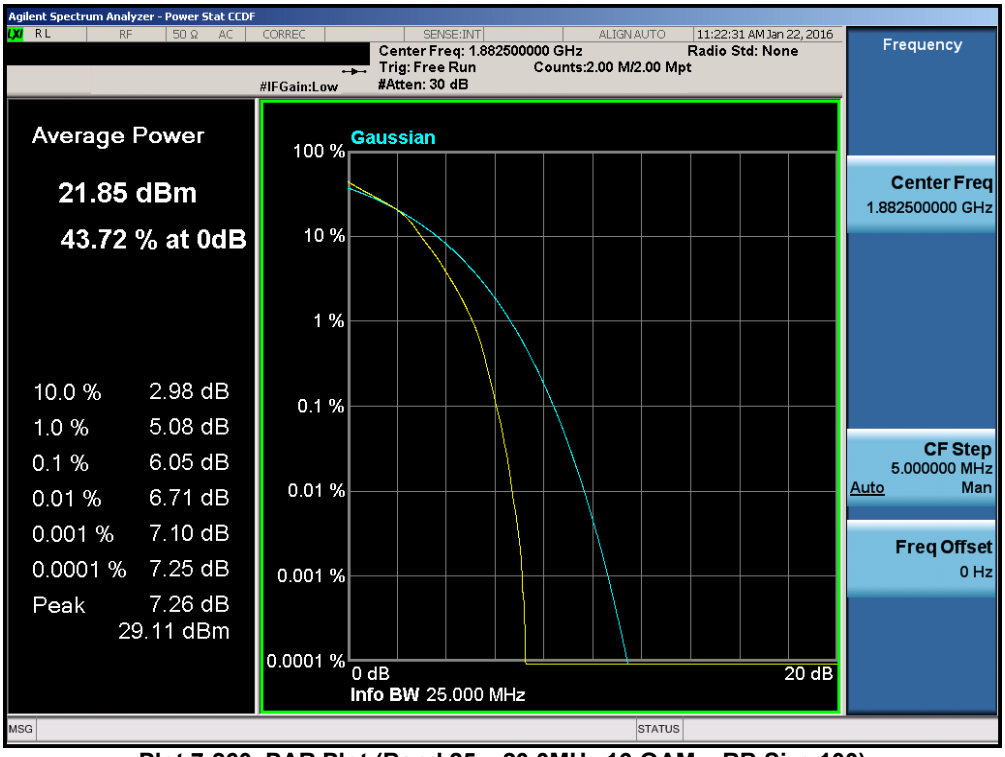
Plot 7-257. PAR Plot (Band 25 – 15.0MHz QPSK – RB Size 75)



Plot 7-258. PAR Plot (Band 25 – 15.0MHz 16-QAM – RB Size 75)



Plot 7-259. PAR Plot (Band 25 – 20.0MHz QPSK – RB Size 100)



Plot 7-260. PAR Plot (Band 25 – 20.0MHz 16-QAM – RB Size 100)

7.6 Radiated Power (ERP/EIRP)

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

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r02 – Section 5.2.1

ANSI/TIA-603-C-2004 – Section 2.2.17

Test Settings

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

Test Setup

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

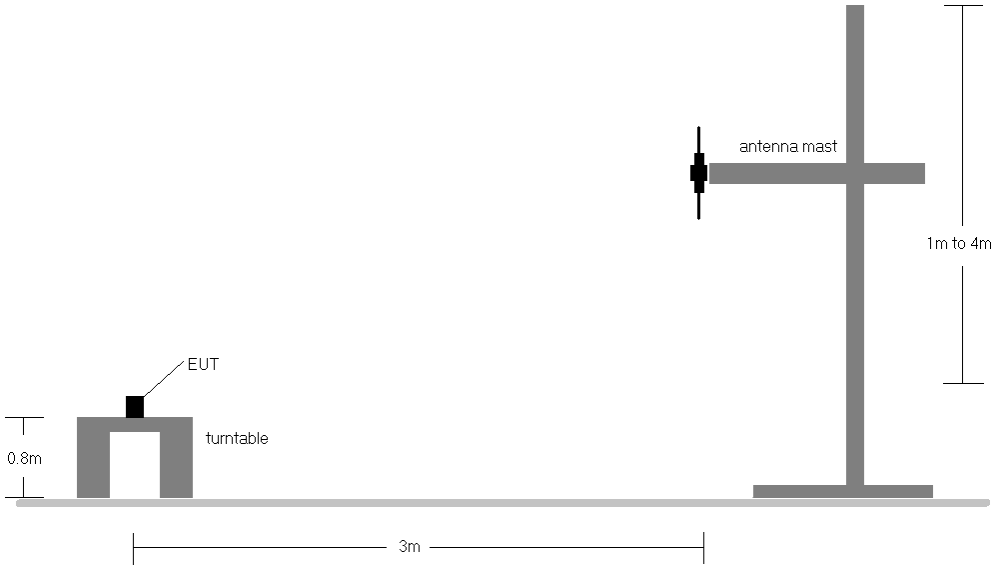


Figure 7-5. Radiated Test Setup <1GHz

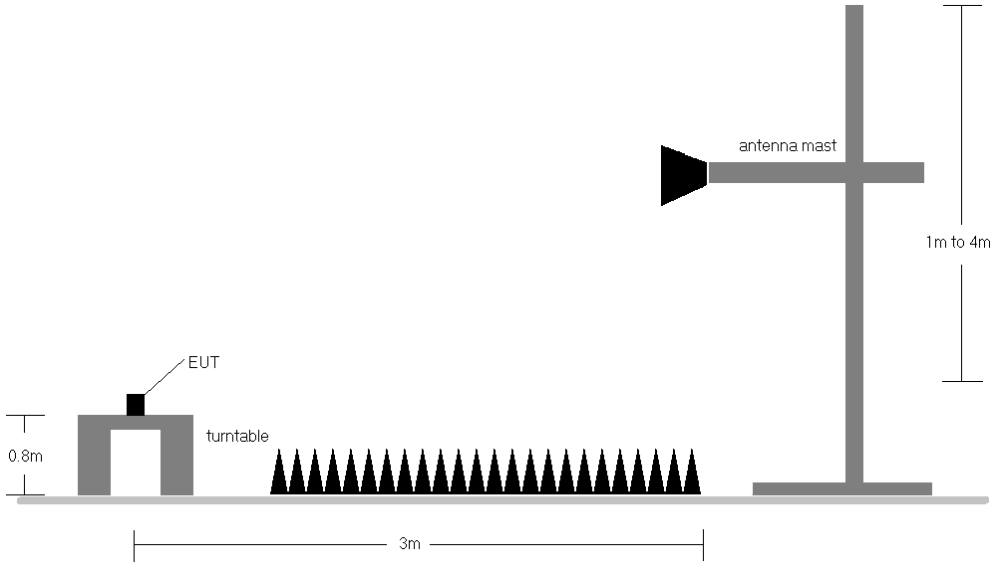


Figure 7-6. Radiated Test Setup >1GHz

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.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	2.06	6	1 / 5	13.57	2.71	16.28	34.77	-18.49
707.50	1.4	QPSK	H	2.11	6	1 / 0	14.25	2.71	16.96	34.77	-17.81
715.30	1.4	QPSK	H	2.06	6	1 / 0	15.13	2.71	17.84	34.77	-16.93
699.70	1.4	16-QAM	H	2.06	6	1 / 5	12.37	2.71	15.08	34.77	-19.69
707.50	1.4	16-QAM	H	2.11	6	1 / 0	13.13	2.71	15.84	34.77	-18.93
715.30	1.4	16-QAM	H	2.06	6	1 / 0	13.93	2.71	16.64	34.77	-18.13
700.50	3	QPSK	H	2.06	6	1 / 14	15.00	2.71	17.71	34.77	-17.06
707.50	3	QPSK	H	2.06	6	1 / 0	15.87	2.71	18.58	34.77	-16.19
714.50	3	QPSK	H	2.06	6	1 / 0	16.24	2.71	18.95	34.77	-15.82
700.50	3	16-QAM	H	2.06	6	1 / 14	14.10	2.71	16.81	34.77	-17.96
707.50	3	16-QAM	H	2.06	6	1 / 0	14.54	2.71	17.25	34.77	-17.52
714.50	3	16-QAM	H	2.06	6	1 / 0	15.22	2.71	17.93	34.77	-16.84

Table 7-4. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
701.50	5	QPSK	Standard	H	2.06	6	1 / 14	15.55	2.71	18.26	34.77	-16.51
707.50	5	QPSK	Standard	H	2.06	6	1 / 0	16.05	2.71	18.76	34.77	-16.01
713.50	5	QPSK	Standard	H	2.06	6	1 / 14	16.81	2.71	19.52	34.77	-15.25
701.50	5	16-QAM	Standard	H	2.06	6	1 / 14	14.34	2.71	17.05	34.77	-17.72
707.50	5	16-QAM	Standard	H	2.06	6	1 / 0	14.72	2.71	17.43	34.77	-17.34
713.50	5	16-QAM	Standard	H	2.06	6	1 / 14	15.24	2.71	17.95	34.77	-16.82
701.50	5	QPSK	Camera	H	2.07	4	1/14	16.26	2.59	18.85	34.77	-15.92
707.50	5	QPSK	Camera	H	2.07	4	1/0	16.76	2.59	19.35	34.77	-15.42
713.50	5	QPSK	Camera	H	2.07	4	1 / 14	17.52	2.59	20.23	34.77	-14.54
701.50	5	16-QAM	Camera	H	2.07	4	1/14	15.05	2.59	17.76	34.77	-17.01
707.50	5	16-QAM	Camera	H	2.07	4	1/0	15.43	2.59	18.14	34.77	-16.63
713.50	5	16-QAM	Camera	H	2.07	4	1 / 14	15.95	2.59	18.66	34.77	-16.11
704.00	10	QPSK	Standard	H	2.06	6	1 / 49	15.54	2.71	18.25	34.77	-16.52
707.50	10	QPSK	Standard	H	2.06	6	1 / 49	16.13	2.71	18.84	34.77	-15.93
711.00	10	QPSK	Standard	H	2.06	6	1 / 49	16.37	2.71	19.08	34.77	-15.69
704.00	10	16-QAM	Standard	H	2.06	6	1 / 49	14.10	2.71	16.81	34.77	-17.96
707.50	10	16-QAM	Standard	H	2.06	6	1 / 49	14.65	2.71	17.36	34.77	-17.41
711.00	10	16-QAM	Standard	H	2.06	6	1 / 49	14.87	2.71	17.58	34.77	-17.19

Table 7-5. ERP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	Standard	H	2.01	76	1 / 0	19.69	2.71	22.40	34.77	-12.37
782.00	5	QPSK	Standard	H	2.01	76	1 / 0	19.84	2.71	22.55	34.77	-12.22
784.50	5	QPSK	Standard	H	2.01	76	1 / 0	19.81	2.71	22.52	34.77	-12.25
779.50	5	16QAM	Standard	H	2.01	76	1 / 0	18.91	2.71	21.62	34.77	-13.15
782.00	5	16QAM	Standard	H	2.01	76	1 / 0	18.28	2.71	20.99	34.77	-13.78
784.50	5	16QAM	Standard	H	2.01	76	1 / 0	18.48	2.71	21.19	34.77	-13.58
779.50	5	QPSK	Camera	H	1.91	277	1 / 49	20.07	3.88	23.95	34.77	-10.82
782.00	5	QPSK	Camera	H	1.91	277	1 / 49	20.22	3.88	22.93	34.77	-11.84
784.50	5	QPSK	Camera	H	1.91	277	1 / 49	20.19	3.88	24.07	34.77	-10.70
779.50	5	16QAM	Camera	H	1.91	277	1 / 49	19.29	3.88	23.17	34.77	-11.60
782.00	5	16QAM	Camera	H	1.91	277	1 / 49	18.66	3.88	21.37	34.77	-13.40
784.50	5	16QAM	Camera	H	1.91	277	1 / 49	18.86	3.88	22.74	34.77	-12.03
782.00	10	QPSK	Standard	H	2.01	76	1 / 0	19.76	2.71	22.47	34.77	-12.30
782.00	10	16QAM	Standard	H	2.01	76	1 / 0	18.17	2.71	20.88	34.77	-13.89

Table 7-6. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	Standard	H	1.75	80	1 / 5	17.82	5.16	22.98	38.45	-15.48
836.50	1.4	QPSK	Standard	H	1.69	63	1 / 0	18.60	3.15	21.75	38.45	-16.71
848.30	1.4	QPSK	Standard	H	1.75	80	1 / 0	18.39	3.28	21.67	38.45	-16.78
824.70	1.4	16-QAM	Standard	H	1.75	80	1 / 5	16.54	3.01	19.55	38.45	-18.91
836.50	1.4	16-QAM	Standard	H	1.69	63	1 / 0	17.42	3.15	20.57	38.45	-17.89
848.30	1.4	16-QAM	Standard	H	1.75	80	1 / 0	17.38	3.28	20.66	38.45	-17.79
825.50	3	QPSK	Standard	H	1.75	80	1 / 0	18.99	3.02	22.01	38.45	-16.45
836.50	3	QPSK	Standard	H	1.75	80	1 / 0	19.40	3.15	22.55	38.45	-15.91
847.50	3	QPSK	Standard	H	1.75	80	1 / 14	19.58	3.27	22.85	38.45	-15.60
825.50	3	16-QAM	Standard	H	1.75	80	1 / 0	17.50	3.02	20.52	38.45	-17.94
836.50	3	16-QAM	Standard	H	1.75	80	1 / 0	18.33	3.15	21.48	38.45	-16.98
847.50	3	16-QAM	Standard	H	1.75	80	1 / 14	18.46	3.27	21.73	38.45	-16.72
826.50	5	QPSK	Standard	H	1.75	80	1 / 14	19.48	3.03	22.51	38.45	-15.94
836.50	5	QPSK	Standard	H	1.75	80	1 / 14	19.48	3.15	22.63	38.45	-15.83
846.50	5	QPSK	Standard	H	1.75	80	1 / 0	20.11	3.26	23.37	38.45	-15.08
826.50	5	16-QAM	Standard	H	1.75	80	1 / 14	18.00	3.03	21.03	38.45	-17.42
836.50	5	16-QAM	Standard	H	1.75	80	1 / 14	18.27	3.15	21.42	38.45	-17.04
846.50	5	16-QAM	Standard	H	1.75	80	1 / 0	18.19	3.26	21.45	38.45	-17.00
826.50	5	QPSK	Camera	H	2.69	9	1 / 14	16.61	4.99	21.60	38.45	-16.85
836.50	5	QPSK	Camera	H	2.69	9	1 / 14	16.61	4.99	21.60	38.45	-16.85
846.50	5	QPSK	Camera	H	2.69	9	1 / 0	17.24	4.99	22.23	38.45	-16.22
826.50	5	16-QAM	Camera	H	2.69	9	1 / 14	15.13	4.99	20.12	38.45	-18.33
836.50	5	16-QAM	Camera	H	2.69	9	1 / 14	15.40	4.99	20.39	38.45	-18.06
846.50	5	16-QAM	Camera	H	2.69	9	1 / 0	15.32	4.99	20.31	38.45	-18.14
829.00	10	QPSK	Standard	H	1.80	79	1 / 0	19.45	3.06	22.51	38.45	-15.94
836.50	10	QPSK	Standard	H	1.75	80	1 / 49	19.45	3.15	22.60	38.45	-15.86
844.00	10	QPSK	Standard	H	1.80	79	1 / 0	19.56	3.23	22.79	38.45	-15.66
829.00	10	16-QAM	Standard	H	1.80	79	1 / 0	17.50	3.06	20.56	38.45	-17.89
836.50	10	16-QAM	Standard	H	1.75	80	1 / 49	17.96	3.15	21.11	38.45	-17.35
844.00	10	16-QAM	Standard	H	1.80	79	1 / 0	17.86	3.23	21.09	38.45	-17.36

Table 7-7. ERP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Antenna	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	Main	Standard	H	1.12	333	1 / 0	13.62	9.29	22.91	30.00	-7.09
1732.50	1.4	QPSK	Main	Standard	H	1.12	333	1 / 5	13.94	9.34	23.28	30.00	-6.72
1754.30	1.4	QPSK	Main	Standard	H	1.12	333	1 / 5	14.75	9.38	24.13	30.00	-5.87
1710.70	1.4	16-QAM	Main	Standard	H	1.12	333	1 / 0	12.48	9.29	21.77	30.00	-8.23
1732.50	1.4	16-QAM	Main	Standard	H	1.12	333	1 / 5	12.79	9.34	22.13	30.00	-7.87
1754.30	1.4	16-QAM	Main	Standard	H	1.12	333	1 / 5	13.72	9.38	23.10	30.00	-6.90
1711.50	3	QPSK	Main	Standard	H	1.12	333	1 / 0	14.95	9.30	24.25	30.00	-5.75
1732.50	3	QPSK	Main	Standard	H	1.12	333	1 / 0	15.01	9.34	24.35	30.00	-5.65
1753.50	3	QPSK	Main	Standard	H	1.12	333	1 / 14	15.71	9.38	25.09	30.00	-4.91
1711.50	3	16-QAM	Main	Standard	H	1.12	333	1 / 0	13.95	9.30	23.25	30.00	-6.75
1732.50	3	16-QAM	Main	Standard	H	1.12	333	1 / 0	13.96	9.34	23.30	30.00	-6.70
1753.50	3	16-QAM	Main	Standard	H	1.12	333	1 / 14	14.75	9.38	24.13	30.00	-5.87
1712.50	5	QPSK	Main	Standard	H	1.12	333	1 / 0	15.35	9.30	24.65	30.00	-5.35
1732.50	5	QPSK	Main	Standard	H	1.12	333	1 / 24	15.21	9.34	24.55	30.00	-5.45
1752.50	5	QPSK	Main	Standard	H	1.12	333	1 / 24	16.05	9.38	25.43	30.00	-4.57
1712.50	5	16-QAM	Main	Standard	H	1.12	333	1 / 0	14.02	9.30	23.32	30.00	-6.68
1732.50	5	16-QAM	Main	Standard	H	1.12	333	1 / 24	13.95	9.34	23.29	30.00	-6.71
1752.50	5	16-QAM	Main	Standard	H	1.12	333	1 / 24	14.78	9.38	24.16	30.00	-5.84
1715.00	10	QPSK	Main	Standard	H	1.12	333	1 / 0	15.30	9.30	24.60	30.00	-5.40
1732.50	10	QPSK	Main	Standard	H	1.12	333	1 / 49	15.18	9.34	24.52	30.00	-5.48
1750.00	10	QPSK	Main	Standard	H	1.12	333	1 / 49	15.89	9.37	25.26	30.00	-4.74
1715.00	10	16-QAM	Main	Standard	H	1.12	333	1 / 0	13.95	9.30	23.25	30.00	-6.75
1732.50	10	16-QAM	Main	Standard	H	1.12	333	1 / 49	13.96	9.34	23.30	30.00	-6.70
1750.00	10	16-QAM	Main	Standard	H	1.12	333	1 / 49	14.62	9.37	23.99	30.00	-6.01
1717.50	15	QPSK	Main	Standard	H	1.12	333	1 / 0	16.48	9.31	25.79	30.00	-4.21
1732.50	15	QPSK	Main	Standard	H	1.12	333	1 / 49	16.52	9.34	25.86	30.00	-4.14
1747.50	15	QPSK	Main	Standard	H	1.12	333	1 / 0	17.10	9.37	26.47	30.00	-3.53
1717.50	15	16-QAM	Main	Standard	H	1.12	333	1 / 0	15.32	9.31	24.63	30.00	-5.37
1732.50	15	16-QAM	Main	Standard	H	1.12	333	1 / 49	15.34	9.34	24.68	30.00	-5.32
1747.50	15	16-QAM	Main	Standard	H	1.12	333	1 / 0	15.85	9.37	25.22	30.00	-4.78
1717.50	15	QPSK	Main	Camera	H	2.44	349	1 / 0	15.67	9.75	25.42	30.00	-4.58
1732.50	15	QPSK	Main	Camera	H	2.44	349	1 / 49	15.71	9.75	25.46	30.00	-4.54
1747.50	15	QPSK	Main	Camera	H	2.44	349	1 / 0	16.29	9.75	25.66	30.00	-4.34
1717.50	15	16-QAM	Main	Camera	H	2.44	349	1 / 0	14.51	9.75	24.26	30.00	-5.74
1732.50	15	16-QAM	Main	Camera	H	2.44	349	1 / 49	14.53	9.75	24.28	30.00	-5.72
1747.50	15	16-QAM	Main	Camera	H	2.44	349	1 / 49	15.04	9.75	24.41	30.00	-5.59
1720.00	20	QPSK	Main	Standard	H	1.12	333	1 / 0	15.69	9.31	25.00	30.00	-5.00
1732.50	20	QPSK	Main	Standard	H	1.12	333	1 / 99	15.69	9.34	25.03	30.00	-4.97
1745.00	20	QPSK	Main	Standard	H	1.12	333	1 / 0	16.05	9.36	25.41	30.00	-4.59
1720.00	20	16-QAM	Main	Standard	H	1.12	333	1 / 0	14.64	9.31	23.95	30.00	-6.05
1732.50	20	16-QAM	Main	Standard	H	1.12	333	1 / 99	14.46	9.34	23.80	30.00	-6.20
1745.00	20	16-QAM	Main	Standard	H	1.12	333	1 / 0	14.93	9.36	24.29	30.00	-5.71
1747.50	15	QPSK	Diversity	Standard	H	1.04	338	1 / 0	7.05	9.37	16.42	30.00	-13.58

Table 7-8. EIRP Data (Band 4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Antenna	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	Main	Standard	H	1.33	327	1 / 5	15.00	9.38	24.38	33.01	-8.63
1880.00	1.4	QPSK	Main	Standard	H	1.31	329	1 / 0	14.88	9.33	24.21	33.01	-8.80
1909.30	1.4	QPSK	Main	Standard	H	1.30	336	1 / 0	14.44	9.29	23.73	33.01	-9.28
1850.70	1.4	16-QAM	Main	Standard	H	1.33	327	1 / 5	13.47	9.38	22.85	33.01	-10.16
1880.00	1.4	16-QAM	Main	Standard	H	1.31	329	1 / 0	13.36	9.33	22.69	33.01	-10.32
1909.30	1.4	16-QAM	Main	Standard	H	1.30	336	1 / 0	13.10	9.29	22.39	33.01	-10.62
1851.50	3	QPSK	Main	Standard	H	1.33	326	1 / 0	16.13	9.38	25.51	33.01	-7.50
1880.00	3	QPSK	Main	Standard	H	1.30	336	1 / 0	14.93	9.33	24.26	33.01	-8.75
1908.50	3	QPSK	Main	Standard	H	1.33	326	1 / 0	15.57	9.29	24.86	33.01	-8.15
1851.50	3	16-QAM	Main	Standard	H	1.33	326	1 / 0	14.72	9.38	24.10	33.01	-8.91
1880.00	3	16-QAM	Main	Standard	H	1.30	336	1 / 0	13.84	9.33	23.17	33.01	-9.84
1908.50	3	16-QAM	Main	Standard	H	1.33	326	1 / 0	14.48	9.29	23.77	33.01	-9.24
1852.50	5	QPSK	Main	Standard	H	1.33	326	1 / 0	16.46	9.38	25.84	33.01	-7.17
1880.00	5	QPSK	Main	Standard	H	1.33	326	1 / 24	16.08	9.33	25.41	33.01	-7.60
1907.50	5	QPSK	Main	Standard	H	1.32	338	1 / 0	16.70	9.29	25.99	33.01	-7.02
1852.50	5	16-QAM	Main	Standard	H	1.33	326	1 / 0	14.80	9.38	24.18	33.01	-8.83
1880.00	5	16-QAM	Main	Standard	H	1.33	326	1 / 24	14.46	9.33	23.79	33.01	-9.22
1907.50	5	16-QAM	Main	Standard	H	1.32	338	1 / 0	15.06	9.29	24.35	33.01	-8.66
1855.00	10	QPSK	Main	Standard	H	1.33	329	1 / 0	16.40	9.37	25.77	33.01	-7.24
1880.00	10	QPSK	Main	Standard	H	1.33	329	1 / 49	16.53	9.33	25.86	33.01	-7.15
1905.00	10	QPSK	Main	Standard	H	1.33	329	1 / 0	16.26	9.29	25.55	33.01	-7.46
1855.00	10	16-QAM	Main	Standard	H	1.33	329	1 / 0	14.66	9.37	24.03	33.01	-8.98
1880.00	10	16-QAM	Main	Standard	H	1.33	329	1 / 49	14.70	9.33	24.03	33.01	-8.98
1905.00	10	16-QAM	Main	Standard	H	1.33	329	1 / 0	14.53	9.29	23.82	33.01	-9.19
1857.50	15	QPSK	Main	Standard	H	1.01	333	1 / 0	12.73	9.37	22.10	33.01	-10.91
1880.00	15	QPSK	Main	Standard	H	1.01	333	1 / 74	13.61	9.33	22.94	33.01	-10.07
1902.50	15	QPSK	Main	Standard	H	1.01	333	1 / 0	13.64	9.30	22.94	33.01	-10.07
1857.50	15	16-QAM	Main	Standard	H	1.01	333	1 / 0	11.17	9.37	20.54	33.01	-12.47
1880.00	15	16-QAM	Main	Standard	H	1.01	333	1 / 74	12.14	9.33	21.47	33.01	-11.54
1902.50	15	16-QAM	Main	Standard	H	1.01	333	1 / 0	12.12	9.30	21.42	33.01	-11.59
1860.00	20	QPSK	Main	Standard	H	1.01	333	1 / 0	16.84	9.37	26.21	33.01	-6.80
1880.00	20	QPSK	Main	Standard	H	1.01	333	1 / 99	16.54	9.33	25.87	33.01	-7.14
1900.00	20	QPSK	Main	Standard	H	1.01	333	1 / 0	16.25	9.30	25.55	33.01	-7.46
1860.00	20	16-QAM	Main	Standard	H	1.01	333	1 / 0	15.28	9.37	24.65	33.01	-8.36
1880.00	20	16-QAM	Main	Standard	H	1.01	333	1 / 99	15.30	9.33	24.63	33.01	-8.38
1900.00	20	16-QAM	Main	Standard	H	1.01	333	1 / 0	14.73	9.30	24.03	33.01	-8.98
1860.00	20	QPSK	Main	Camera	H	2.30	4	1 / 0	17.21	9.53	26.58	33.01	-6.43
1880.00	20	QPSK	Main	Camera	H	2.30	4	1 / 99	16.91	9.53	26.44	33.01	-6.57
1900.00	20	QPSK	Main	Camera	H	2.30	4	1 / 0	16.62	9.53	26.15	33.01	-6.86
1860.00	20	16-QAM	Main	Camera	H	2.30	4	1 / 0	15.65	9.53	25.02	33.01	-7.99
1880.00	20	16-QAM	Main	Camera	H	2.30	4	1 / 99	15.67	9.53	25.20	33.01	-7.81
1900.00	20	16-QAM	Main	Camera	H	2.30	4	1 / 0	15.10	9.53	24.63	33.01	-8.38
1860.00	20	QPSK	Diversity	Main	H	1.48	335	1 / 99	9.33	9.37	18.70	33.01	-14.31

Table 7-9. EIRP Data (Band 2)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	Standard	H	1.34	337	1 / 0	14.06	9.38	23.44	33.01	-9.57
1882.50	1.4	QPSK	Standard	H	1.11	345	1 / 0	13.53	9.33	22.86	33.01	-10.15
1914.30	1.4	QPSK	Standard	H	1.34	337	1 / 5	13.54	9.28	22.82	33.01	-10.19
1850.70	1.4	16-QAM	Standard	H	1.34	337	1 / 0	12.93	9.38	22.31	33.01	-10.70
1882.50	1.4	16-QAM	Standard	H	1.11	345	1 / 0	12.42	9.33	21.75	33.01	-11.26
1914.30	1.4	16-QAM	Standard	H	1.34	337	1 / 5	12.48	9.28	21.76	33.01	-11.25
1851.50	3	QPSK	Standard	H	1.34	337	1 / 0	14.86	9.38	24.24	33.01	-8.77
1882.50	3	QPSK	Standard	H	1.34	337	1 / 0	14.70	9.33	24.03	33.01	-8.98
1913.50	3	QPSK	Standard	H	1.34	337	1 / 14	14.41	9.28	23.69	33.01	-9.32
1851.50	3	16-QAM	Standard	H	1.34	337	1 / 0	14.06	9.38	23.44	33.01	-9.57
1882.50	3	16-QAM	Standard	H	1.34	337	1 / 0	13.67	9.33	23.00	33.01	-10.01
1913.50	3	16-QAM	Standard	H	1.34	337	1 / 14	13.52	9.28	22.80	33.01	-10.21
1852.50	5	QPSK	Standard	H	1.34	337	1 / 0	15.40	9.38	24.78	33.01	-8.23
1882.50	5	QPSK	Standard	H	1.34	337	1 / 0	15.01	9.33	24.34	33.01	-8.67
1912.50	5	QPSK	Standard	H	1.34	337	1 / 24	14.81	9.29	24.10	33.01	-8.92
1852.50	5	16-QAM	Standard	H	1.34	337	1 / 0	14.14	9.38	23.52	33.01	-9.49
1882.50	5	16-QAM	Standard	H	1.34	337	1 / 0	13.74	9.33	23.07	33.01	-9.94
1912.50	5	16-QAM	Standard	H	1.34	337	1 / 24	13.75	9.29	23.04	33.01	-9.98
1855.00	10	QPSK	Standard	H	1.34	337	1 / 0	15.60	9.37	24.97	33.01	-8.04
1882.50	10	QPSK	Standard	H	1.34	337	1 / 49	14.92	9.33	24.25	33.01	-8.76
1910.00	10	QPSK	Standard	H	1.34	337	1 / 0	15.37	9.29	24.66	33.01	-8.35
1855.00	10	16-QAM	Standard	H	1.34	337	1 / 0	14.17	9.37	23.54	33.01	-9.47
1882.50	10	16-QAM	Standard	H	1.34	337	1 / 49	13.62	9.33	22.95	33.01	-10.06
1910.00	10	16-QAM	Standard	H	1.34	337	1 / 0	13.81	9.29	23.10	33.01	-9.91
1857.50	15	QPSK	Standard	H	1.34	337	1 / 0	15.60	9.37	24.97	33.01	-8.04
1882.50	15	QPSK	Standard	H	1.34	337	1 / 74	14.43	9.33	23.76	33.01	-9.25
1907.50	15	QPSK	Standard	H	1.34	337	1 / 0	15.31	9.29	24.60	33.01	-8.41
1857.50	15	16-QAM	Standard	H	1.34	337	1 / 0	14.17	9.37	23.54	33.01	-9.47
1882.50	15	16-QAM	Standard	H	1.34	337	1 / 74	13.11	9.33	22.44	33.01	-10.57
1907.50	15	16-QAM	Standard	H	1.34	337	1 / 0	14.00	9.29	23.29	33.01	-9.72
1860.00	20	QPSK	Standard	H	1.34	337	1 / 0	15.97	9.37	25.34	33.01	-7.67
1882.50	20	QPSK	Standard	H	1.34	337	1 / 0	14.63	9.33	23.96	33.01	-9.05
1905.00	20	QPSK	Standard	H	1.34	337	1 / 0	15.30	9.29	24.59	33.01	-8.42
1860.00	20	16-QAM	Standard	H	1.34	337	1 / 0	14.68	9.37	24.05	33.01	-8.96
1882.50	20	16-QAM	Standard	H	1.34	337	1 / 0	13.36	9.33	22.69	33.01	-10.32
1905.00	20	16-QAM	Standard	H	1.34	337	1 / 0	14.03	9.29	23.32	33.01	-9.69
1860.00	20	QPSK	Camera	H	2.29	3	1 / 0	19.17	9.53	28.54	33.01	-4.47
1882.50	20	QPSK	Camera	H	2.29	3	1 / 0	17.83	9.53	27.36	33.01	-5.65
1905.00	20	QPSK	Camera	H	2.29	3	1 / 0	18.50	9.53	28.03	33.01	-4.98
1860.00	20	16-QAM	Camera	H	2.29	3	1 / 0	17.23	9.53	27.25	33.01	-5.76
1882.50	20	16-QAM	Camera	H	2.29	3	1 / 0	16.56	9.53	26.09	33.01	-6.92
1905.00	20	16-QAM	Camera	H	2.29	3	1 / 0	17.23	9.53	26.76	33.01	-6.25

Table 7-10. EIRP Data (Band 25)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Module	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	Standard	H	1.00	10	1 / 24	8.67	9.00	17.67	33.01	-15.34
2535.00	5	QPSK	Standard	H	1.00	10	1 / 24	8.39	8.92	17.31	33.01	-15.70
2567.50	5	QPSK	Standard	H	1.00	10	1 / 0	9.27	8.83	18.10	33.01	-14.91
2502.50	5	16-QAM	Standard	H	1.00	10	1 / 24	7.34	9.00	16.34	33.01	-16.67
2535.00	5	16-QAM	Standard	H	1.00	10	1 / 24	7.24	8.92	16.16	33.01	-16.85
2567.50	5	16-QAM	Standard	H	1.00	10	1 / 0	7.90	8.83	16.73	33.01	-16.28
2505.00	10	QPSK	Standard	H	1.00	10	1 / 0	8.56	9.00	17.56	33.01	-15.45
2535.00	10	QPSK	Standard	H	1.00	10	1 / 49	9.19	8.92	18.11	33.01	-14.90
2565.00	10	QPSK	Standard	H	1.00	10	1 / 0	9.77	8.83	18.60	33.01	-14.41
2505.00	10	16-QAM	Standard	H	1.00	10	1 / 0	6.95	9.00	15.95	33.01	-17.06
2535.00	10	16-QAM	Standard	H	1.00	10	1 / 49	7.77	8.92	16.69	33.01	-16.32
2565.00	10	16-QAM	Standard	H	1.00	10	1 / 0	8.31	8.83	17.14	33.01	-15.87
2507.50	15	QPSK	Standard	H	1.00	10	1 / 0	8.38	9.00	17.38	33.01	-15.63
2535.00	15	QPSK	Standard	H	1.00	10	1 / 74	9.78	8.92	18.70	33.01	-14.31
2562.50	15	QPSK	Standard	H	1.00	10	1 / 0	10.11	8.83	18.94	33.01	-14.07
2507.50	15	16-QAM	Standard	H	1.00	10	1 / 0	7.30	9.00	16.30	33.01	-16.71
2535.00	15	16-QAM	Standard	H	1.00	10	1 / 74	8.47	8.92	17.39	33.01	-15.62
2562.50	15	16-QAM	Standard	H	1.00	10	1 / 0	8.70	8.83	17.53	33.01	-15.48
2510.00	20	QPSK	Standard	H	1.00	10	1 / 0	8.38	9.00	17.38	33.01	-15.63
2535.00	20	QPSK	Standard	H	1.00	10	1 / 99	10.11	8.92	19.03	33.01	-13.98
2560.00	20	QPSK	Standard	H	1.00	10	1 / 0	10.98	8.83	19.81	33.01	-13.20
2510.00	20	16-QAM	Standard	H	1.00	10	1 / 0	7.56	9.00	16.56	33.01	-16.45
2535.00	20	16-QAM	Standard	H	1.00	10	1 / 99	8.90	8.92	17.82	33.01	-15.19
2560.00	20	16-QAM	Standard	H	1.00	10	1 / 0	9.60	8.83	18.43	33.01	-14.58
2510.00	20	QPSK	Camera	H	1.35	0	1 / 0	7.76	8.56	16.32	33.01	-16.69
2535.00	20	QPSK	Camera	H	1.35	0	1 / 99	9.49	8.56	18.05	33.01	-14.96
2560.00	20	QPSK	Camera	H	1.35	0	1 / 0	10.63	8.56	19.19	33.01	-13.82
2510.00	20	16-QAM	Camera	H	1.35	0	1 / 0	6.94	8.56	15.50	33.01	-17.51
2535.00	20	16-QAM	Camera	H	1.35	0	1 / 99	8.28	8.56	16.84	33.01	-16.17
2560.00	20	16-QAM	Camera	H	1.35	0	1 / 0	9.56	8.56	18.12	33.01	-14.89

Table 7-11. EIRP Data (Band 7)

7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(g) §27.53(h) §27.53(m)

Test Overview

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

Test Procedures Used

KDB 971168 v02r02 – Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = Peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

Test Setup

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

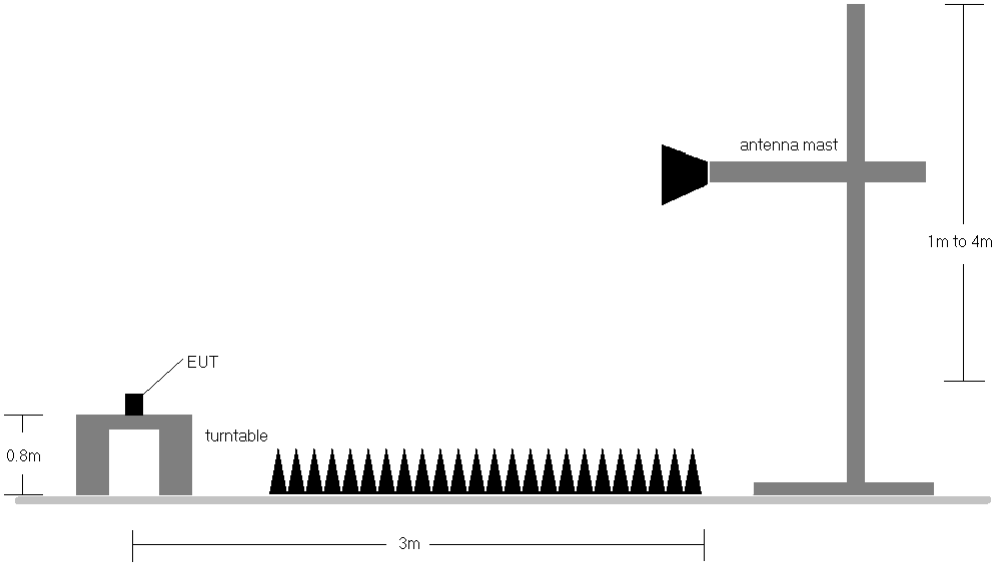


Figure 7-7. Test Instrument & Measurement Setup

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.

OPERATING FREQUENCY:	701.50	MHz			
CHANNEL:	23035				
MEASURED OUTPUT POWER:	18.26	dBm	=	0.067	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.26	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	1.94	309	-60.07	5.66	-54.41	72.7
2104.50	H	1.94	307	-38.83	6.63	-32.20	50.5
2806.00	H	1.94	307	-59.85	7.84	-52.01	70.3
3507.50	H	-	-	-59.27	7.58	-51.69	70.0

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

OPERATING FREQUENCY:	707.50	MHz			
CHANNEL:	23095				
MEASURED OUTPUT POWER:	18.76	dBm	=	0.075	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.76	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	1.94	320	-59.96	5.73	-54.23	73.0
2122.50	H	1.94	320	-40.57	6.73	-33.84	52.6
2830.00	H	1.90	320	-60.06	7.80	-52.26	71.0
3537.50	H	-	-	-59.79	7.59	-52.20	71.0

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

OPERATING FREQUENCY:	713.50	MHz		
CHANNEL:	23155			
MEASURED OUTPUT POWER:	19.52	dBm	=	0.090 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	32.52	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	1.87	320	-63.98	5.80	-58.18	77.7
2140.50	H	1.87	320	-42.72	6.83	-35.89	55.4
2854.00	H	1.87	320	-61.58	7.76	-53.82	73.3
3567.50	H	-	-	-60.19	7.60	-52.59	72.1

Table 7-14. Radiated Spurious Data (Band 12/17 – High Channel)

OPERATING FREQUENCY:	707.50	MHz		
CHANNEL:	23095			
MEASURED OUTPUT POWER:	18.76	dBm	=	0.076 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W)	31.76	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	1.80	31	-49.68	2.59	-47.09	65.9
2122.50	H	1.80	31	-44.62	3.02	-41.60	60.4
2830.00	H	-	-	-48.61	4.74	-43.87	62.6

Table 7-15. Radiated Spurious Data with Camera Module (Band 12/17 – Mid Channel)

OPERATING FREQUENCY:	779.50	MHz			
CHANNEL:	23205				
MEASURED OUTPUT POWER:	22.40	dBm	=	0.174	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.40	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2338.50	H	1.06	337	-53.16	7.28	-45.88	68.3
3118.00	H	-	-	-62.21	7.25	-54.96	77.4

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

OPERATING FREQUENCY:	782.00	MHz			
CHANNEL:	23230				
MEASURED OUTPUT POWER:	22.55	dBm	=	0.180	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.55	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	1.03	307	-51.58	7.26	-44.32	66.9
3128.00	H	-	-	-60.34	7.26	-53.08	75.6

Table 7-17. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY:	784.50	MHz		
CHANNEL:	23255			
MEASURED OUTPUT POWER:	22.52	dBm	=	0.179 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.52	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	1.01	332	-46.93	7.25	-39.68	62.2
3138.00	H	-	-	-60.78	7.27	-53.51	76.0

Table 7-18. Radiated Spurious Data (Band 13 – High Channel)

OPERATING FREQUENCY:	779.50	MHz		
CHANNEL:	23205			
MEASURED OUTPUT POWER:	22.40	dBm	=	0.174 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W)	35.40	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2338.50	H	1.22	164	-55.85	7.28	-48.57	71.0
3118.00	H	-	-	-63.04	7.25	-55.79	78.2

Table 7-19. Radited Spurious Data with Camera Module (Band 13 – Low Channel)

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 [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	1.04	16	-56.51	6.42	-50.09	-10.1
1564.00	H	1.31	297	-59.66	6.44	-53.22	-13.2
1569.00	H	1.38	295	-57.96	6.46	-51.50	-11.5

Table 7-20. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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 [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	1.22	164	-62.96	6.42	-56.54	-16.5

Table 7-21. Radiated Spurious Data with Camera Module (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY:	826.50	MHz		
CHANNEL:	20425			
MEASURED OUTPUT POWER:	22.51	dBm	=	0.178 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.51	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	1.06	349	-61.29	6.56	-54.73	77.2
2479.50	H	2.27	355	-62.37	7.31	-55.07	77.6
3306.00	H	-	-	-59.87	7.38	-52.49	75.0

Table 7-22. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz		
CHANNEL:	20525			
MEASURED OUTPUT POWER:	22.63	dBm	=	0.183 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.63	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	1.34	349	-56.63	6.55	-50.08	72.7
2509.50	H	2.16	337	-61.90	7.34	-54.55	77.2
3346.00	H	-	-	-60.92	7.44	-53.48	76.1

Table 7-23. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	846.50	MHz		
CHANNEL:	20625			
MEASURED OUTPUT POWER:	23.37	dBm	=	0.217 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.37	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	1.26	340	-53.64	6.55	-47.09	70.5
2539.50	H	-	-	-63.07	7.36	-55.71	79.1

Table 7-24. Radiated Spurious Data (Band 5 – High Channel)

OPERATING FREQUENCY:	846.50	MHz		
CHANNEL:	20625			
MEASURED OUTPUT POWER:	23.37	dBm	=	0.217 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log10 (W)	36.37	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	1.36	165	-48.87	3.46	-45.41	66.6
2539.50	H	2.27	314	-43.55	3.63	-39.92	61.1
3386.00	H	-	-	-58.10	5.89	-52.21	73.4

Table 7-25. Radiated Spurious Data with Camera Module (Band 5 – High Channel)

OPERATING FREQUENCY:	1717.50	MHz		
CHANNEL:	20025			
MEASURED OUTPUT POWER:	25.79	dBm	=	0.379 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	15.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.79	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3435.00	H	1.49	107	-49.91	9.69	-40.22	66.0
5152.50	H	1.64	89	-55.12	10.65	-44.47	70.3
6870.00	H	-	-	-57.21	11.74	-45.47	71.3

Table 7-26. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	MHz		
CHANNEL:	20175			
MEASURED OUTPUT POWER:	25.86	dBm	=	0.385 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	15.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.86	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.00	H	1.43	82	-48.20	9.71	-38.50	64.4
5197.50	H	-	-	-56.92	10.59	-46.34	72.2

Table 7-27. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY:	1747.50	MHz		
CHANNEL:	20325			
MEASURED OUTPUT POWER:	26.47	dBm	=	0.443 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	15.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	39.47	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3495.00	H	1.43	92	-46.08	9.72	-36.36	62.8
5242.50	H	-	-	-55.86	10.62	-45.24	71.7

Table 7-28. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY:	1747.50	MHz			
CHANNEL:	20325				
MEASURED OUTPUT POWER:	25.86	dBm	=	0.385	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	15.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 log10 (W)	38.86	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3495.00	H	1.84	90	-43.37	9.72	-33.65	59.3
5242.50	H	1.32	317	-50.43	10.62	-39.80	65.5
6990.00	H	-	-	-52.12	11.76	-40.36	66.0

Table 7-29. Radiated Spurious Data with Camera Module (Band 4 – High Channel)

OPERATING FREQUENCY:	1860.00	MHz			
CHANNEL:	18700				
MEASURED OUTPUT POWER:	26.21	dBm	=	0.417	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	39.21	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3720.00	H	1.79	350	-44.01	9.43	-34.58	60.8
5580.00	H	1.62	28	-55.06	10.80	-44.26	70.5
7440.00	H	-	-	-55.43	10.71	-44.72	70.9

Table 7-30. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	18900			
MEASURED OUTPUT POWER:	25.87	dBm	=	0.387 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.87	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	H	1.61	13	-46.81	9.28	-37.53	63.4
5640.00	H	1.43	25	-53.66	11.03	-42.62	68.5
7520.00	H	-	-	-53.75	10.97	-42.78	68.7

Table 7-31. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY:	1900.00	MHz		
CHANNEL:	19100			
MEASURED OUTPUT POWER:	25.55	dBm	=	0.359 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.55	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3800.00	H	1.55	19	-48.48	9.19	-39.29	64.8
5700.00	H	1.10	32	-57.09	11.27	-45.81	71.4
7600.00	H	1.57	359	-52.03	11.17	-40.86	66.4
9500.00	H	-	-	-51.61	11.80	-39.81	65.4

Table 7-32. Radiated Spurious Data (Band 2 – High Channel)

OPERATING FREQUENCY:	1860.00	MHz		
CHANNEL:	18700			
MEASURED OUTPUT POWER:	25.55	dBm	=	0.359 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.55	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3720.00	H	1.57	355	-42.85	9.27	-33.58	59.1
5580.00	H	-	-	-54.54	10.98	-43.56	69.1

Table 7-33. Radiated Spurious Data with Camera Module (Band 2 – Low Channel)

OPERATING FREQUENCY:	1860.00	MHz		
CHANNEL:	26140			
MEASURED OUTPUT POWER:	25.34	dBm	=	0.342 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	38.34	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3720.00	H	1.81	347	-42.16	9.39	-32.77	58.1
5580.00	H	-	-	-58.53	10.85	-47.68	73.0

Table 7-34. Radiated Spurious Data (Band 25 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz		
CHANNEL:	26365			
MEASURED OUTPUT POWER:	23.96	dBm	=	0.249 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.96	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3765.00	H	1.59	348	-42.57	9.27	-33.30	57.3
5647.50	H	-	-	-57.46	11.06	-46.40	70.4

Table 7-35. Radiated Spurious Data (Band 25 – Mid Channel)

OPERATING FREQUENCY:	1905.00	MHz		
CHANNEL:	26590			
MEASURED OUTPUT POWER:	24.59	dBm	=	0.288 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	37.59	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3810.00	H	1.75	349	-38.10	9.19	-28.91	53.5
5715.00	H	-	-	-57.95	11.26	-46.69	71.3

Table 7-36. Radiated Spurious Data (Band 25 – High Channel)

OPERATING FREQUENCY:	1905.00	MHz			
CHANNEL:	26590				
MEASURED OUTPUT POWER:	24.59	dBm	=	0.288	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 log10 (W)	37.59	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3810.00	H	1.85	351	-34.74	9.19	-25.56	50.1
5715.00	H	1.69	188	-54.55	11.26	-43.29	67.9
7620.00	H	-	-	-51.47	11.16	-40.31	64.9

Table 7-37. Radiated Spurious Data with Camera Module (Band 25- High Channel)

OPERATING FREQUENCY:	2510.00	MHz			
CHANNEL:	20850				
MEASURED OUTPUT POWER:	17.38	dBm	=	0.055	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	42.38	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5020.00	H	1.79	6	-40.41	10.89	-29.52	46.9
7530.00	H	1.36	246	-42.22	10.99	-31.22	48.6
10040.00	H	-	-	-50.76	12.06	-38.70	56.1

Table 7-38. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY:	2535.00	MHz			
CHANNEL:	21100				
MEASURED OUTPUT POWER:	19.03	dBm	=	0.080	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	44.03	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5070.00	H	1.61	8	-41.84	10.79	-31.04	50.1
7605.00	H	1.31	3	-50.97	11.15	-39.82	58.9
10140.00	H	-	-	-52.11	12.14	-39.97	59.0

Table 7-39. Radiated Spurious Data (Band 7 – Mid Channel)

OPERATING FREQUENCY:	2560.00	MHz			
CHANNEL:	21350				
MEASURED OUTPUT POWER:	19.81	dBm	=	0.096	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	44.81	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5120.00	H	1.60	2	-54.70	10.70	-43.99	63.8
7680.00	H	1.40	1	-46.49	11.21	-35.28	55.1
10240.00	H	-	-	-51.87	12.22	-39.65	59.5

Table 7-40. Radiated Spurious Data (Band 7 – High Channel)

OPERATING FREQUENCY:	2510.00	MHz			
CHANNEL:	20850				
MEASURED OUTPUT POWER:	17.38	dBm	=	0.055	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W	42.38	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5020.00	H	1.38	213	-43.98	10.16	-33.83	51.2
7530.00	H	-	-	-56.00	12.11	-43.88	61.3

Table 7-41. Radiated Spurious Data with Camera Module (Band 7 – Low Channel)

OPERATING FREQUENCY:	2535.00	MHz			
CHANNEL:	21100				
MEASURED OUTPUT POWER:	19.03	dBm	=	0.080	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W	44.03	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5070.00	H	1.85	220	-44.13	10.19	-33.94	33.9
7605.00	H	-	-	-55.31	12.18	-43.12	43.1

Table 7-42. . Radiated Spurious Data with Camera Module (Band 7 – Mid Channel)

OPERATING FREQUENCY:	2560.00	MHz		
CHANNEL:	21350			
MEASURED OUTPUT POWER:	19.19	dBm	=	0.083 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	55 + 10 log10 (W	44.19	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5120.00	H	1.00	204	-46.35	10.24	-36.11	36.1
7680.00	H	-	-	-55.55	12.26	-43.29	43.3

Table 7-43. Radiated Spurious Data with Camera Module (Band 7 – High Channel)

7.8 Frequency Stability / Temperature Variation

§2.1055 §22.355 §24.235 §27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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

Test Procedure Used

ANSI/TIA-603-C-2004

Test Settings

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

Test Setup

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

Test Notes

None

Band 12 Frequency Stability Measurements

§2.1055 §27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,500,061	61	0.0000086
100 %		- 30	707,500,047	47	0.0000066
100 %		- 20	707,499,954	-46	-0.0000065
100 %		- 10	707,500,079	79	0.0000112
100 %		0	707,499,908	-92	-0.0000130
100 %		+ 10	707,499,693	-307	-0.0000434
100 %		+ 20	707,499,972	-28	-0.0000040
100 %		+ 30	707,499,748	-252	-0.0000356
100 %		+ 40	707,500,081	81	0.0000114
100 %		+ 50	707,500,059	59	0.0000083
BATT. ENDPOINT	3.45	+ 20	707,499,963	-37	-0.0000052

Table 7-44. Frequency Stability Data (Band 12)

Note:

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

Band 12 Frequency Stability Measurements

§2.1055 §27.54

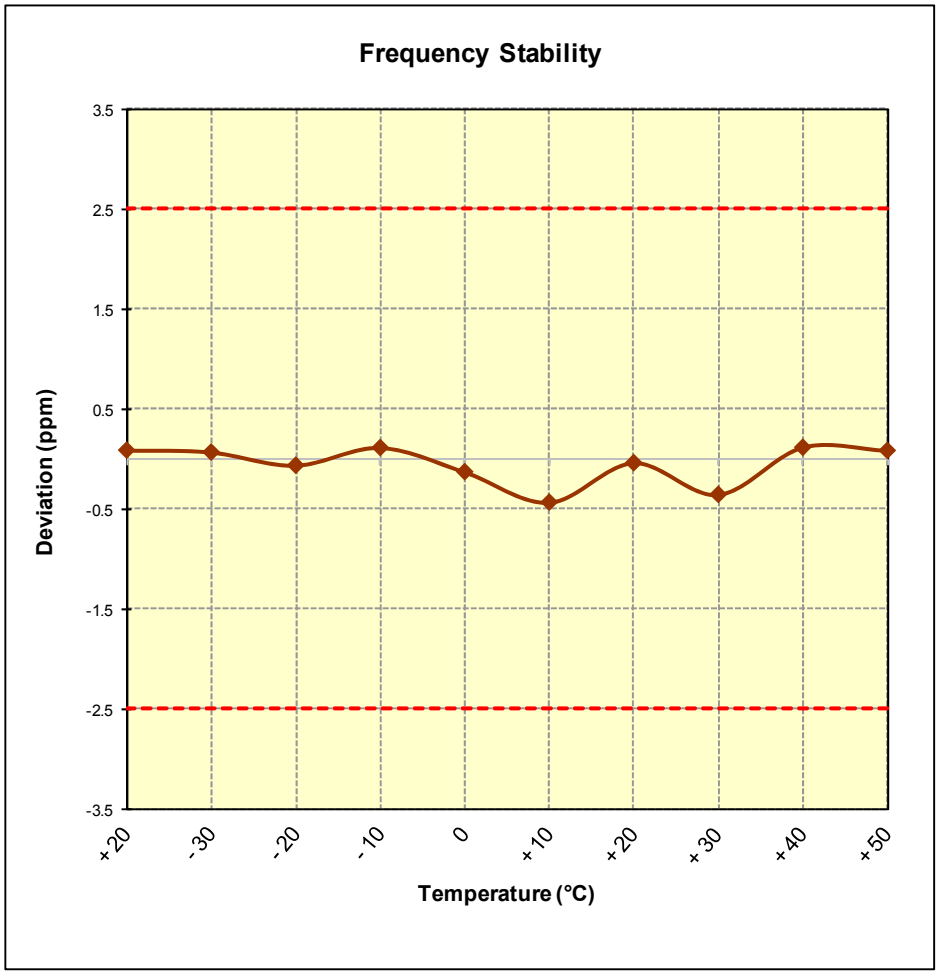


Figure 7-8. Frequency Stability Graph (Band 12)

Band 17 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	710,000,000	Hz
CHANNEL:	23090	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	709,999,877	-123	-0.0000173
100 %		- 30	709,999,870	-130	-0.0000183
100 %		- 20	710,000,006	6	0.0000008
100 %		- 10	710,000,031	31	0.0000044
100 %		0	710,000,119	119	0.0000168
100 %		+ 10	710,000,004	4	0.0000006
100 %		+ 20	710,000,276	276	0.0000389
100 %		+ 30	709,999,992	-8	-0.0000011
100 %		+ 40	709,999,816	-184	-0.0000259
100 %		+ 50	709,999,824	-176	-0.0000248
BATT. ENDPOINT	3.45	+ 20	709,999,796	-204	-0.0000287

Table 7-45. Frequency Stability Data (Band 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.

Band 17 Frequency Stability Measurements

§2.1055 §27.54

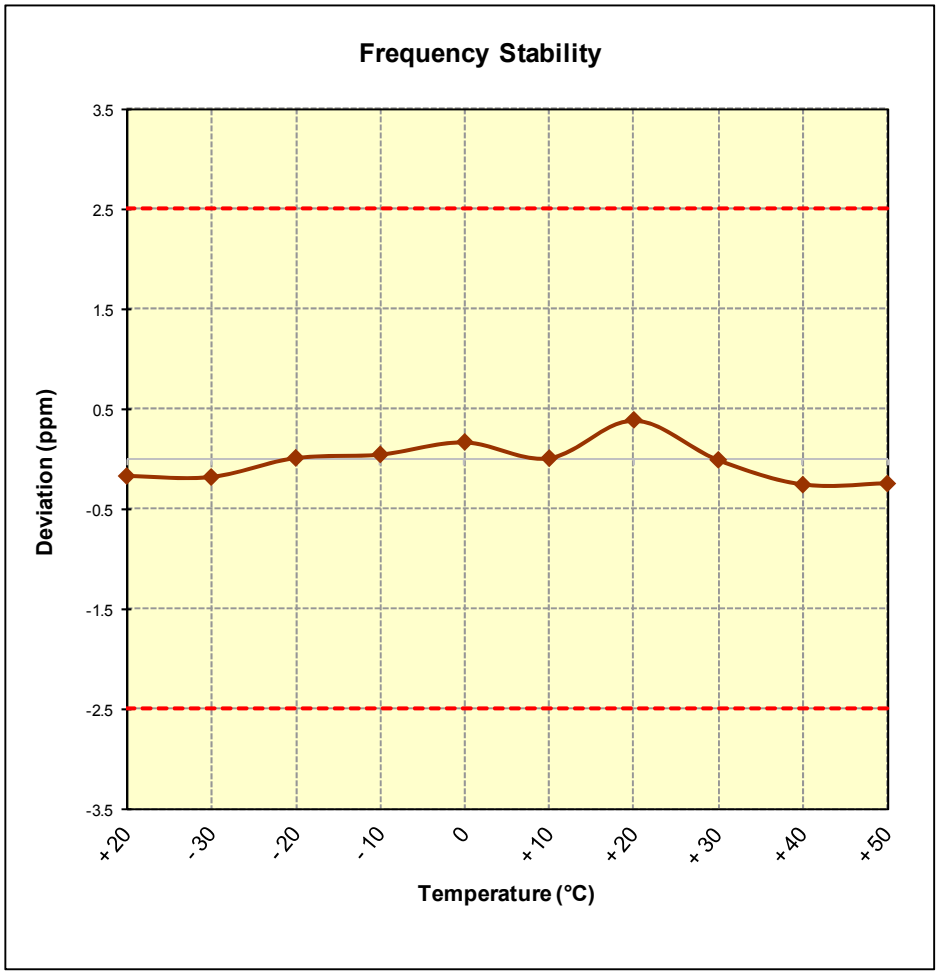


Figure 7-9. Frequency Stability Graph (Band 17)

Band 13 Frequency Stability Measurements

§2.1055 §27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	782,000,049	49	0.0000063
100 %		- 30	782,000,088	88	0.0000113
100 %		- 20	781,999,945	-55	-0.0000070
100 %		- 10	782,000,147	147	0.0000188
100 %		0	782,000,416	416	0.0000532
100 %		+ 10	781,999,893	-107	-0.0000137
100 %		+ 20	781,999,738	-262	-0.0000335
100 %		+ 30	782,000,062	62	0.0000079
100 %		+ 40	781,999,855	-145	-0.0000185
100 %		+ 50	782,000,034	34	0.0000043
BATT. ENDPOINT	3.45	+ 20	781,999,778	-222	-0.0000284

Table 7-46. 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.

Band 13 Frequency Stability Measurements

§2.1055 §27.54

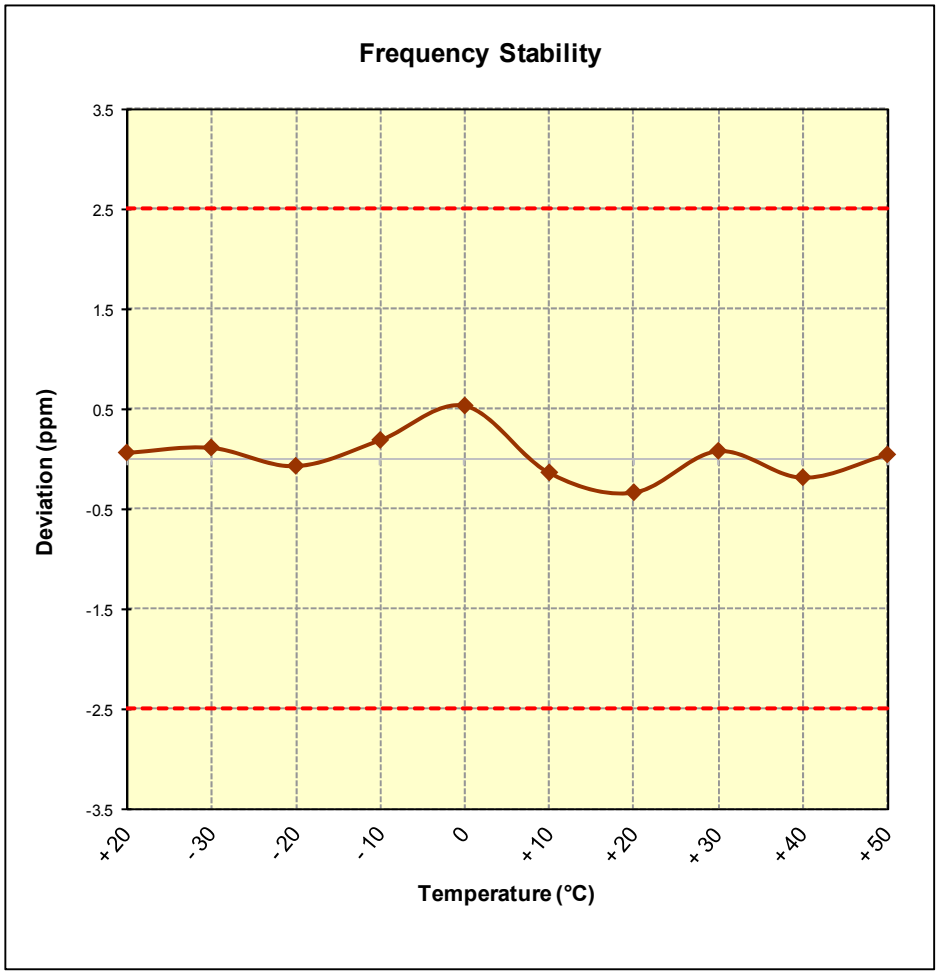


Figure 7-10. Frequency Stability Graph (Band 13)

Band 5 Frequency Stability Measurements

§2.1055 §22.355

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,499,993	-7	-0.0000008
100 %		- 30	836,500,051	51	0.0000061
100 %		- 20	836,500,326	326	0.0000390
100 %		- 10	836,499,634	-366	-0.0000438
100 %		0	836,499,843	-157	-0.0000188
100 %		+ 10	836,500,088	88	0.0000105
100 %		+ 20	836,499,892	-108	-0.0000129
100 %		+ 30	836,500,159	159	0.0000190
100 %		+ 40	836,500,112	112	0.0000134
100 %		+ 50	836,499,930	-70	-0.0000084
BATT. ENDPOINT	3.45	+ 20	836,499,995	-5	-0.0000006

Table 7-47. Frequency Stability Data (Band 5)

Band 5 Frequency Stability Measurements

§2.1055 §22.355

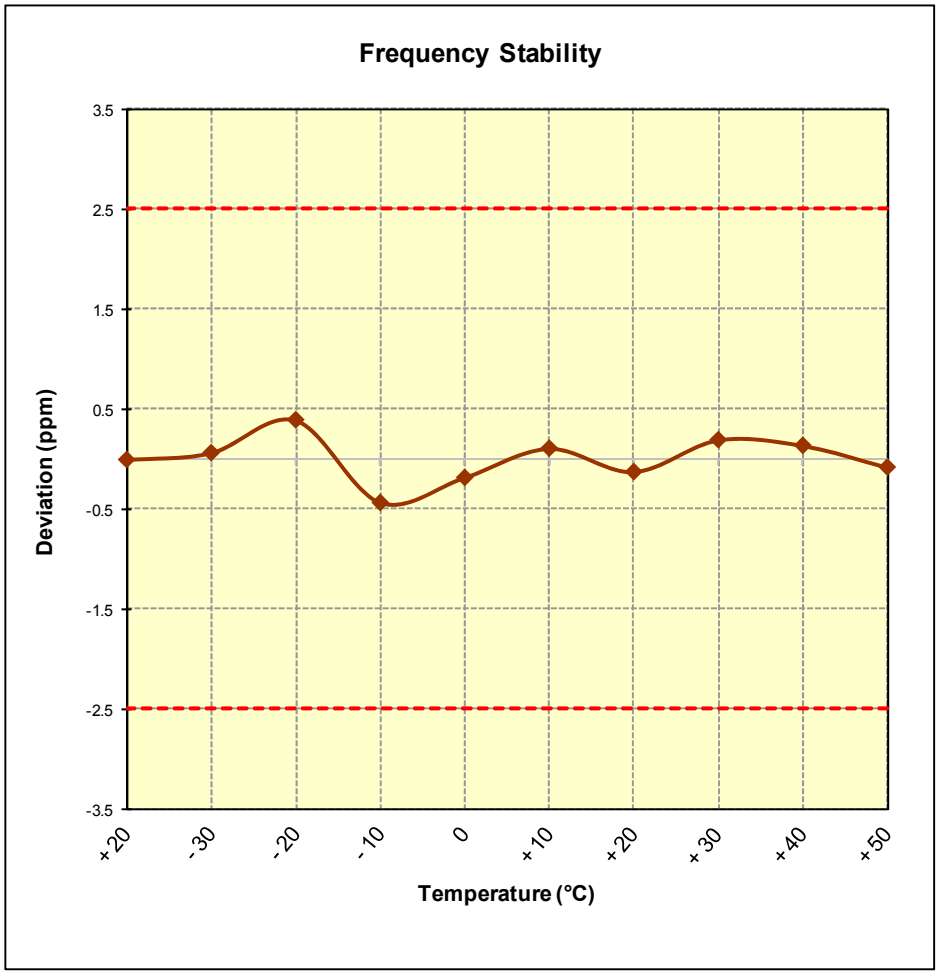


Figure 7-11. Frequency Stability Graph (Band 5)

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,732,500,171	171	0.0000099
100 %		- 30	1,732,500,008	8	0.0000005
100 %		- 20	1,732,499,940	-60	-0.0000035
100 %		- 10	1,732,499,878	-122	-0.0000070
100 %		0	1,732,499,926	-74	-0.0000043
100 %		+ 10	1,732,500,035	35	0.0000020
100 %		+ 20	1,732,500,088	88	0.0000051
100 %		+ 30	1,732,499,679	-321	-0.0000185
100 %		+ 40	1,732,500,148	148	0.0000085
100 %		+ 50	1,732,499,821	-179	-0.0000103
BATT. ENDPOINT	3.45	+ 20	1,732,500,057	57	0.0000033

Table 7-48. Frequency Stability Data (Band 4)

Note:

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

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

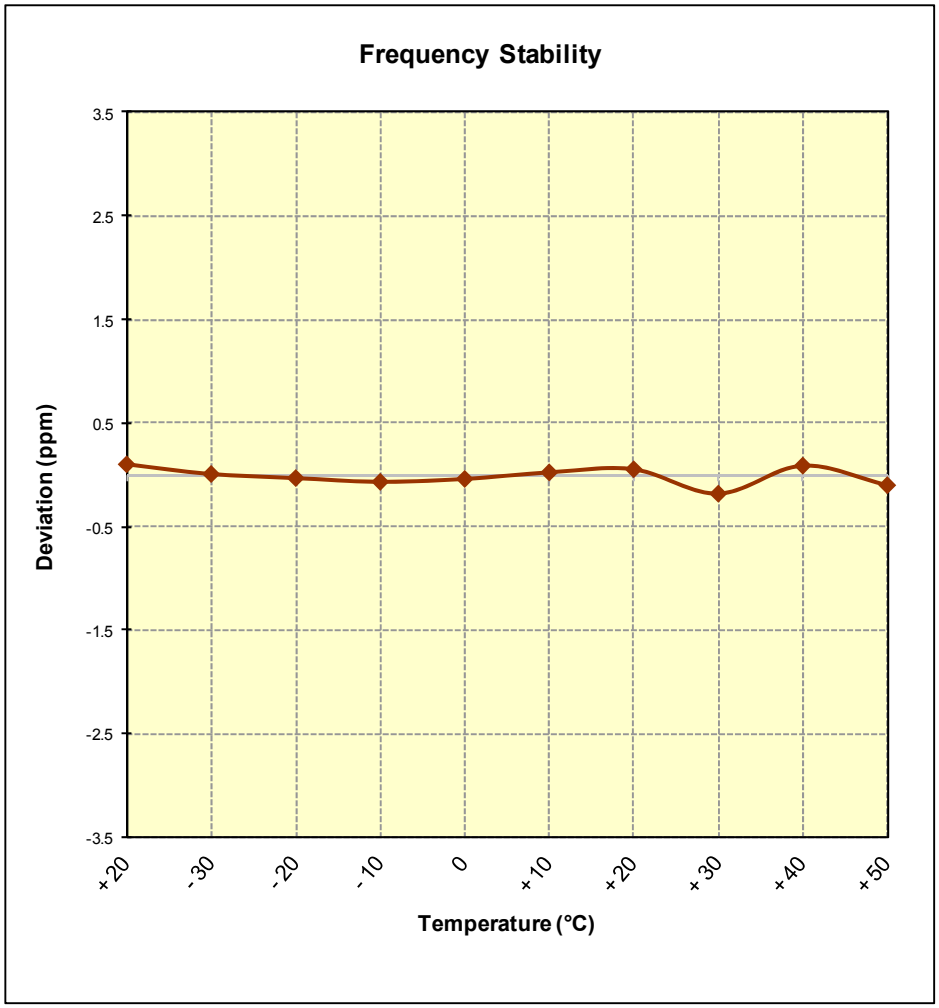


Figure 7-12. Frequency Stability Graph (Band 4)

Band 2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,984	-16	-0.0000009
100 %		- 30	1,879,999,907	-93	-0.0000049
100 %		- 20	1,879,999,709	-291	-0.0000155
100 %		- 10	1,879,999,737	-263	-0.0000140
100 %		0	1,880,000,046	46	0.0000024
100 %		+ 10	1,880,000,193	193	0.0000103
100 %		+ 20	1,879,999,899	-101	-0.0000054
100 %		+ 30	1,880,000,031	31	0.0000016
100 %		+ 40	1,880,000,006	6	0.0000003
100 %		+ 50	1,880,000,058	58	0.0000031
BATT. ENDPOINT	3.45	+ 20	1,880,000,397	397	0.0000211

Table 7-49. Frequency Stability Data (Band 2)

Note:

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

Band 2 Frequency Stability Measurements

§2.1055 §24.235

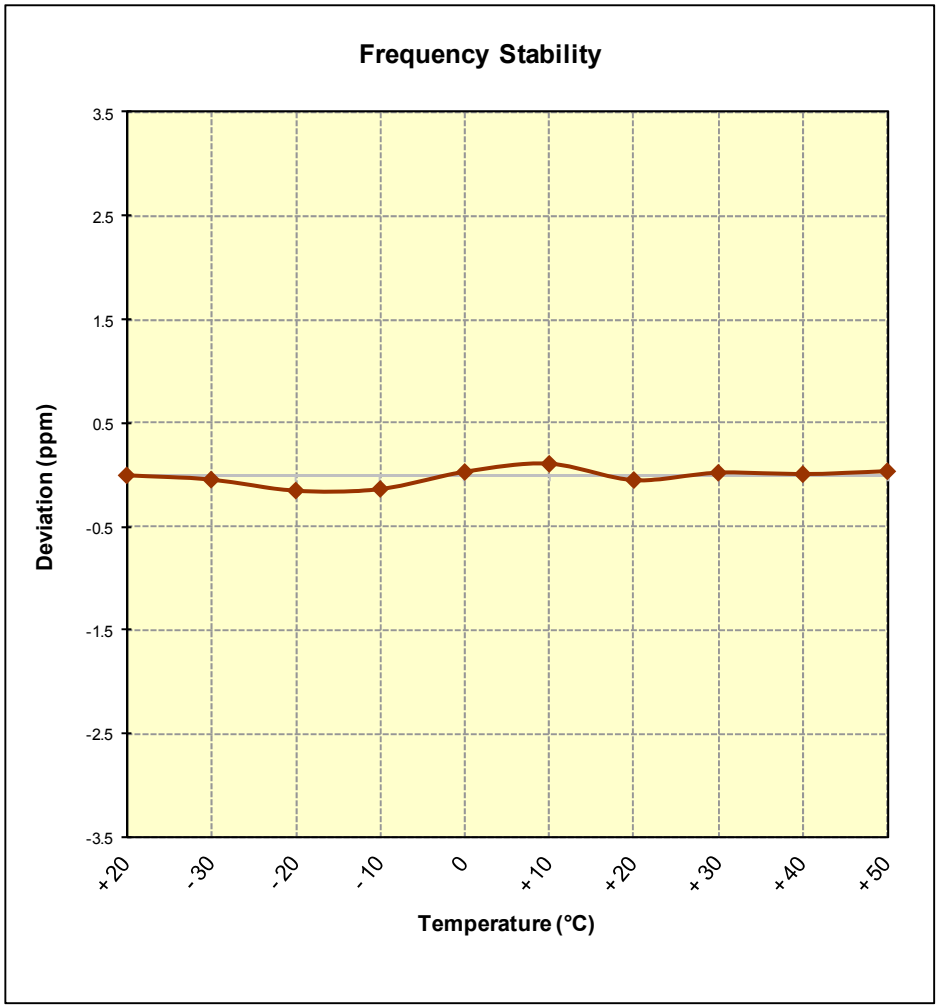


Figure 7-13. Frequency Stability Graph (Band 2)

Band 25 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,882,500,060	60	0.0000032
100 %		- 30	1,882,500,102	102	0.0000054
100 %		- 20	1,882,500,178	178	0.0000095
100 %		- 10	1,882,499,820	-180	-0.0000096
100 %		0	1,882,500,358	358	0.0000190
100 %		+ 10	1,882,500,195	195	0.0000104
100 %		+ 20	1,882,499,705	-295	-0.0000157
100 %		+ 30	1,882,499,755	-245	-0.0000130
100 %		+ 40	1,882,499,960	-40	-0.0000021
100 %		+ 50	1,882,500,120	120	0.0000064
BATT. ENDPOINT	3.45	+ 20	1,882,499,654	-346	-0.0000184

Table 7-50. Frequency Stability Data (Band 25)

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.

Band 25 Frequency Stability Measurements

§2.1055 §24.235

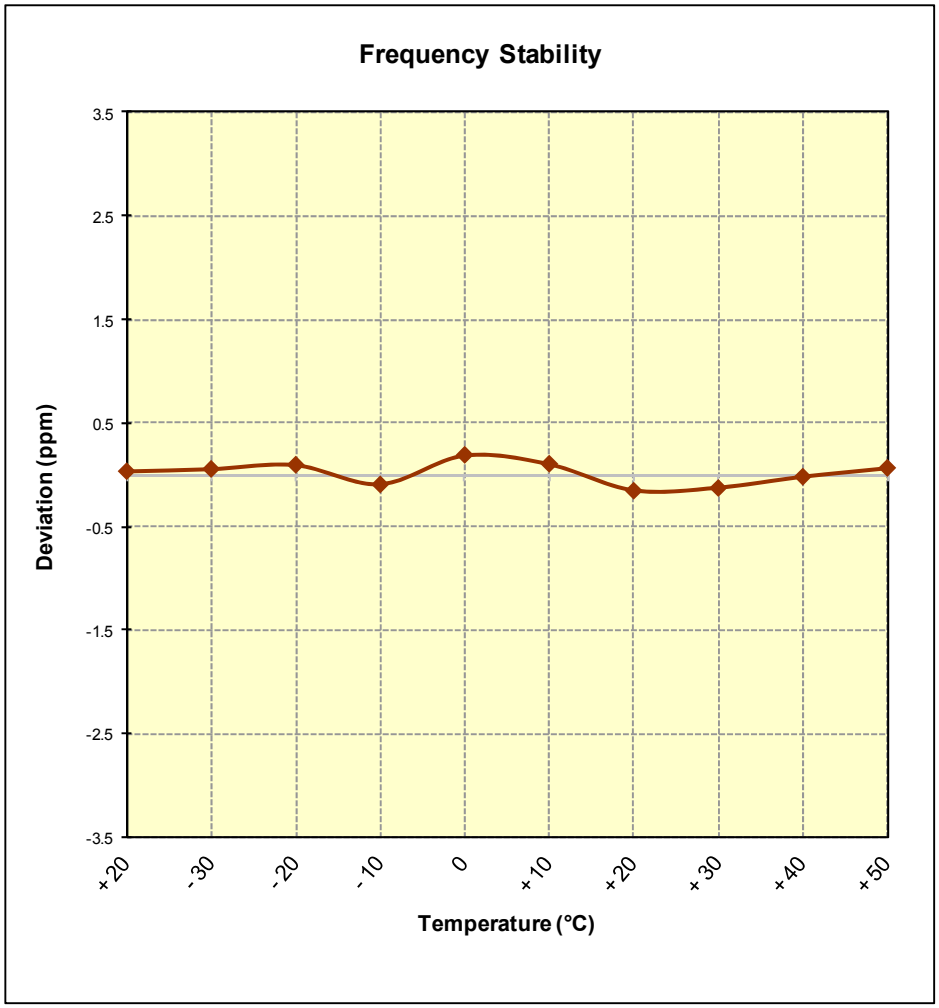


Figure 7-14. Frequency Stability Graph (Band 25)

Band 7 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,534,999,878	-122	-0.0000048
100 %		- 30	2,535,000,165	165	0.0000065
100 %		- 20	2,535,000,153	153	0.0000060
100 %		- 10	2,535,000,067	67	0.0000026
100 %		0	2,534,999,717	-283	-0.0000112
100 %		+ 10	2,534,999,897	-103	-0.0000041
100 %		+ 20	2,535,000,222	222	0.0000088
100 %		+ 30	2,535,000,159	159	0.0000063
100 %		+ 40	2,534,999,876	-124	-0.0000049
100 %		+ 50	2,535,000,401	401	0.0000158
BATT. ENDPOINT	3.45	+ 20	2,534,999,616	-384	-0.0000151

Table 7-51. 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.

Band 7 Frequency Stability Measurements

§2.1055 §27.54

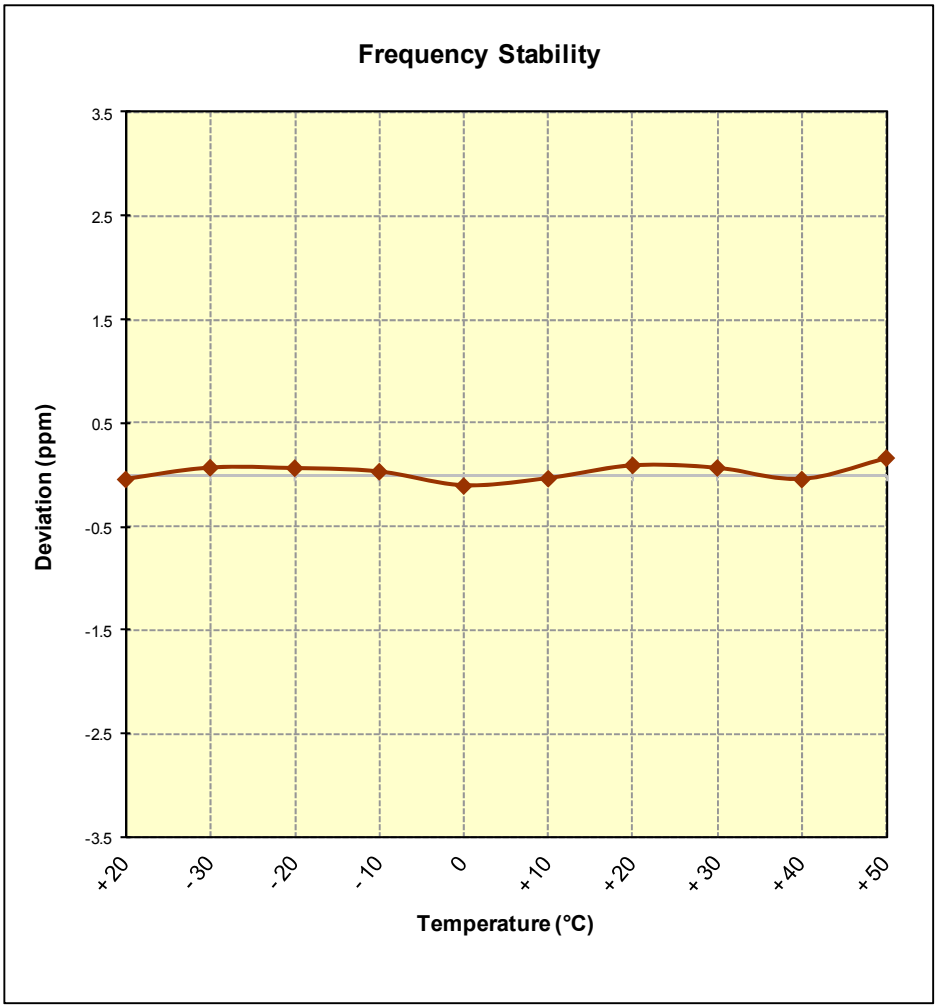


Figure 7-15. Frequency Stability Graph (Band 7)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFVS987** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.