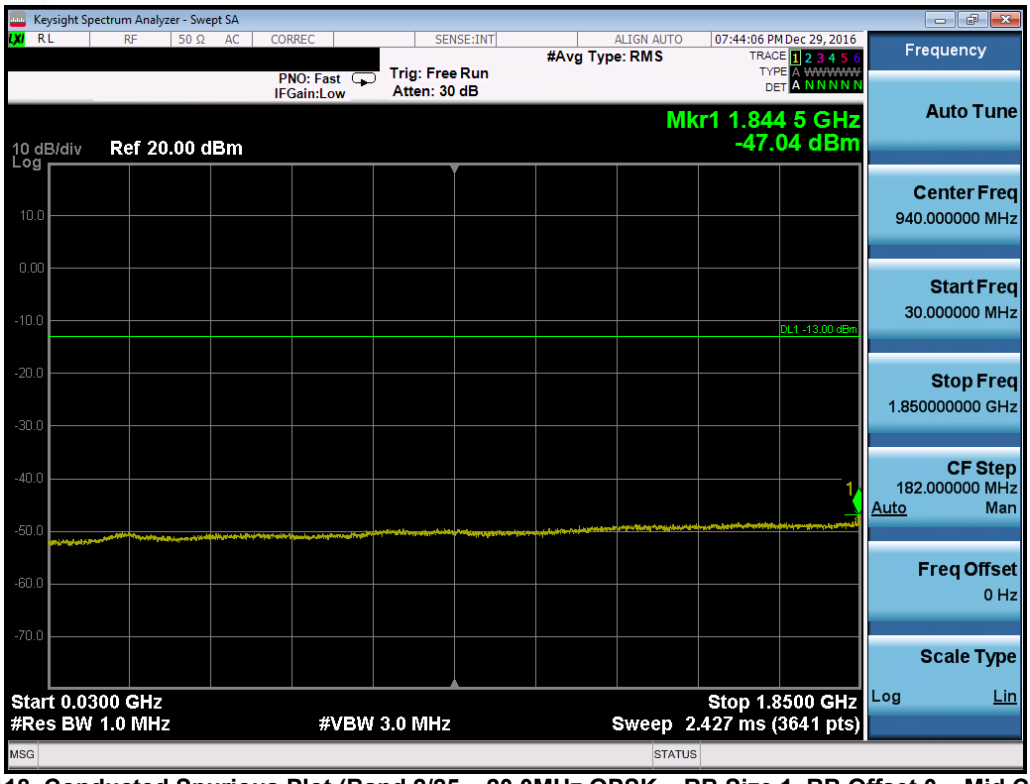
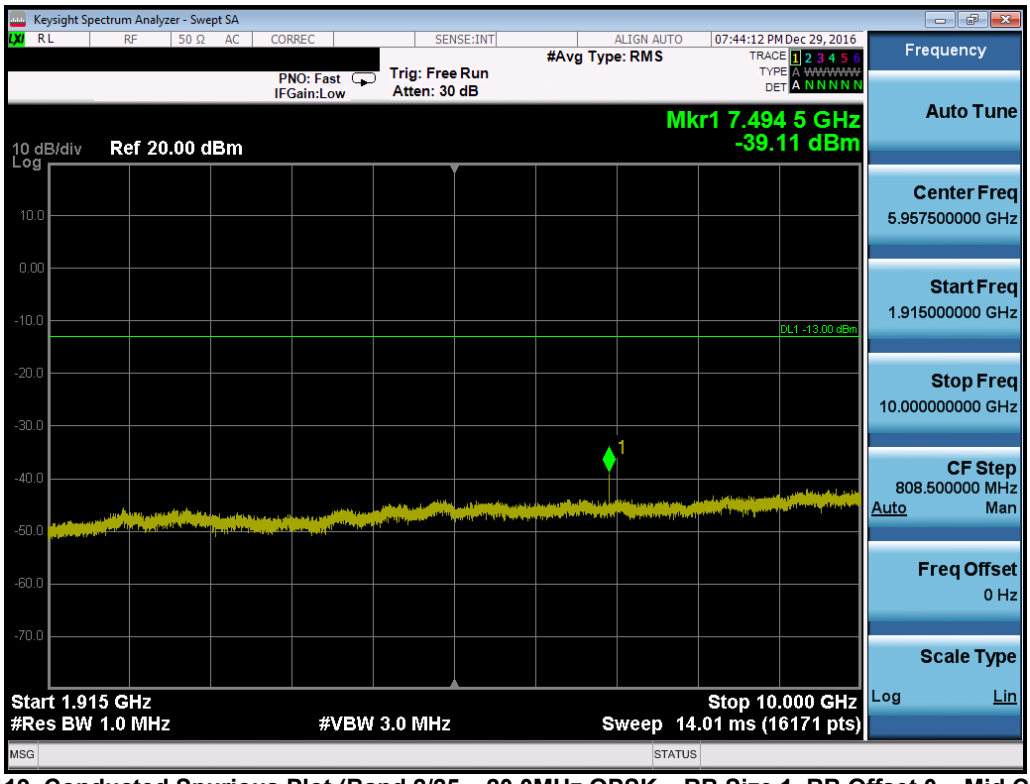


Plot 7-118. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-119. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

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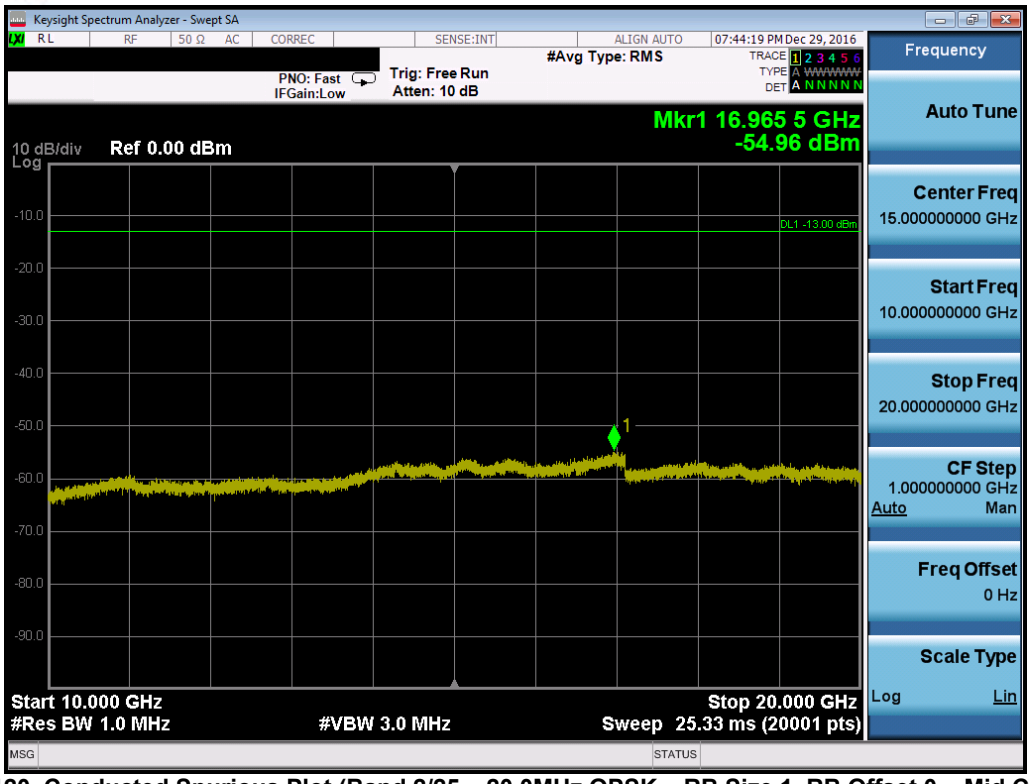
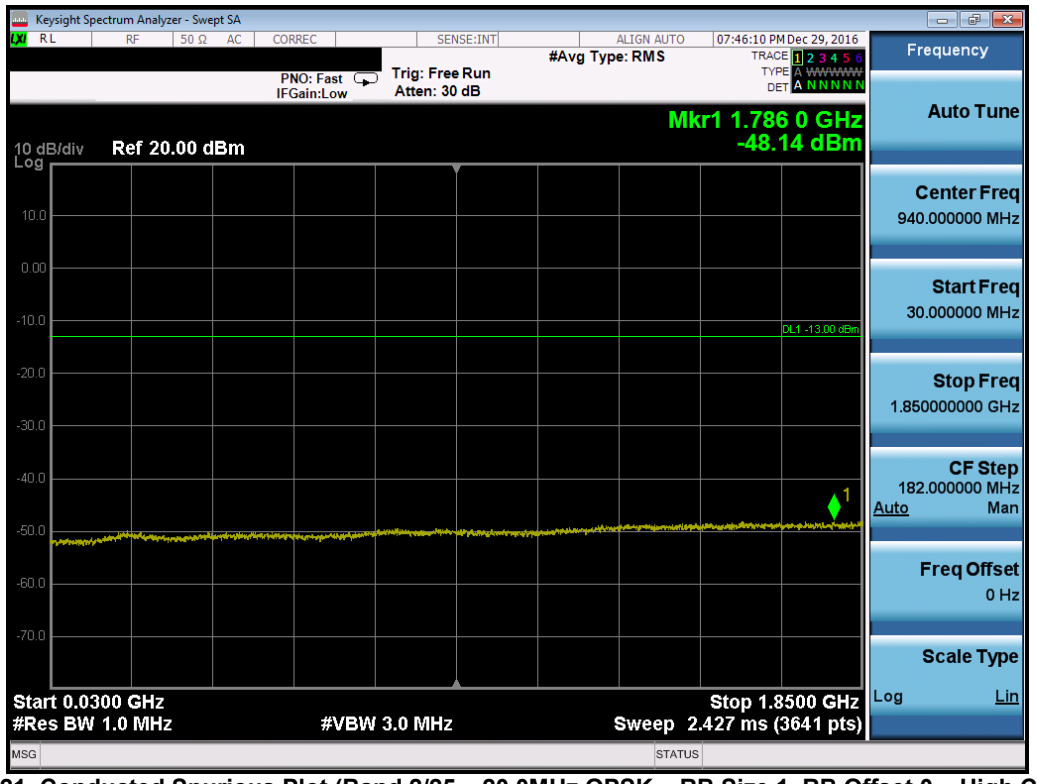


Plot 7-120. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-121. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

V 6.1
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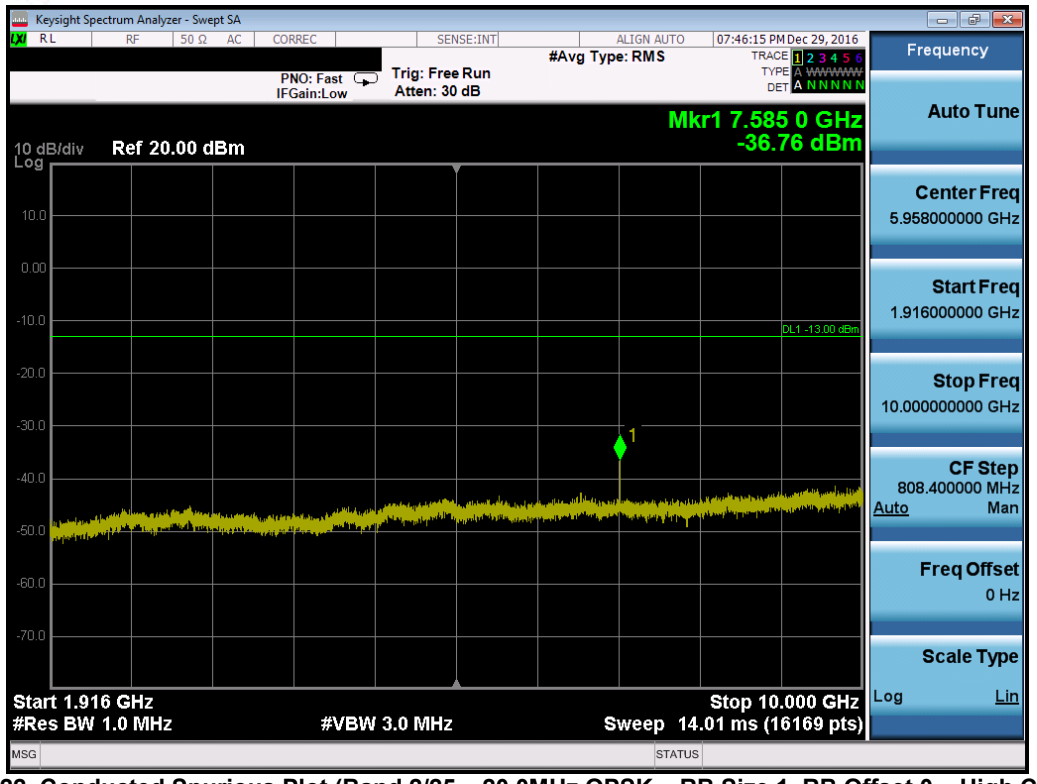
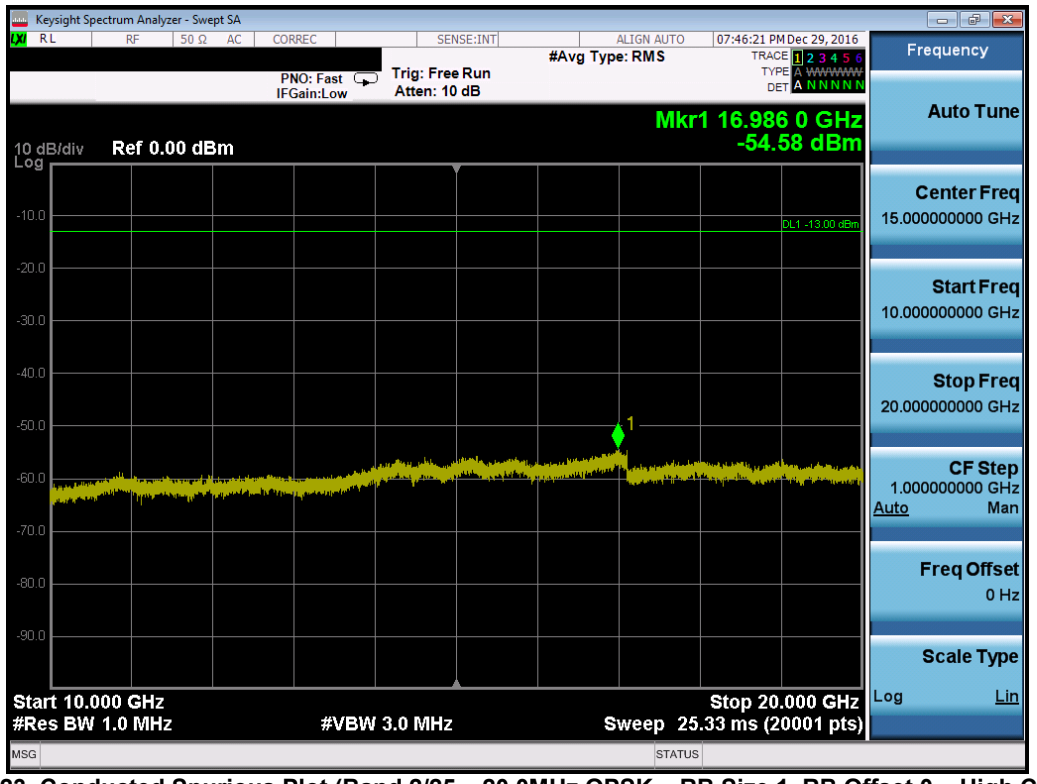


Plot 7-122. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-123. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

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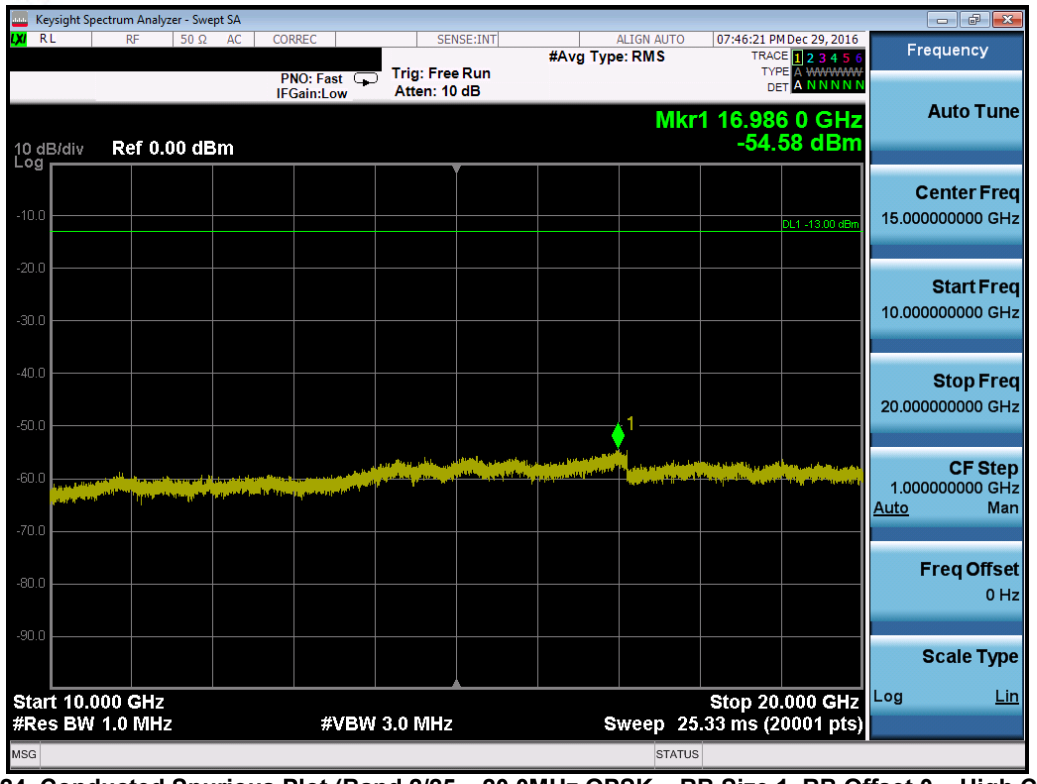
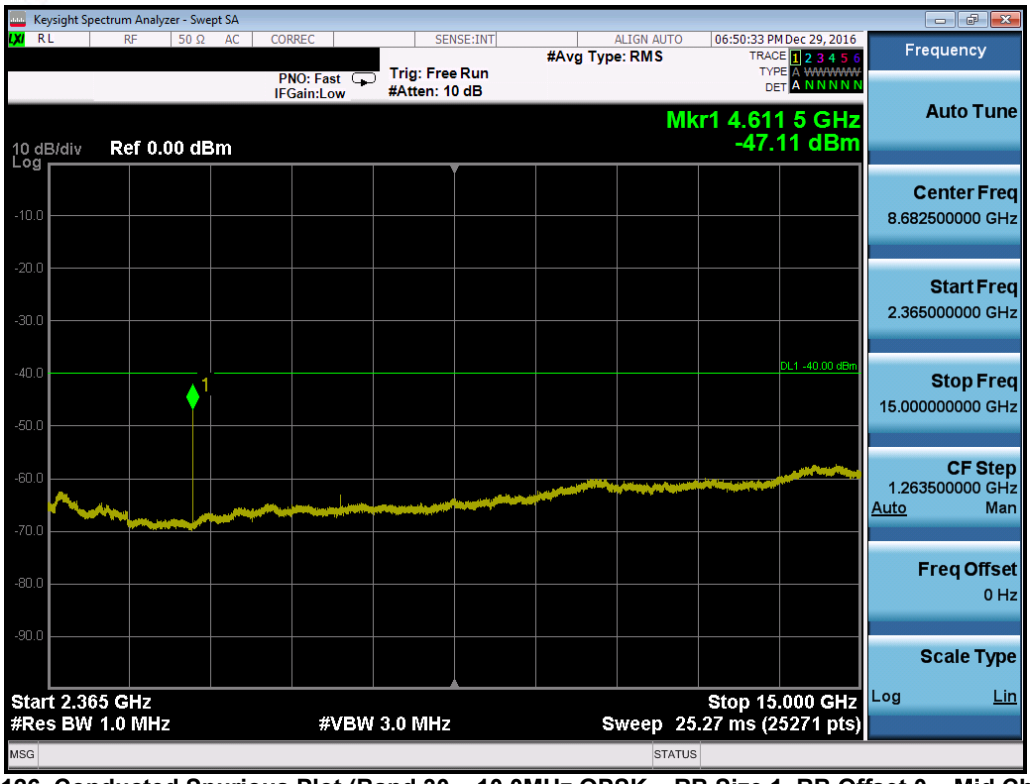


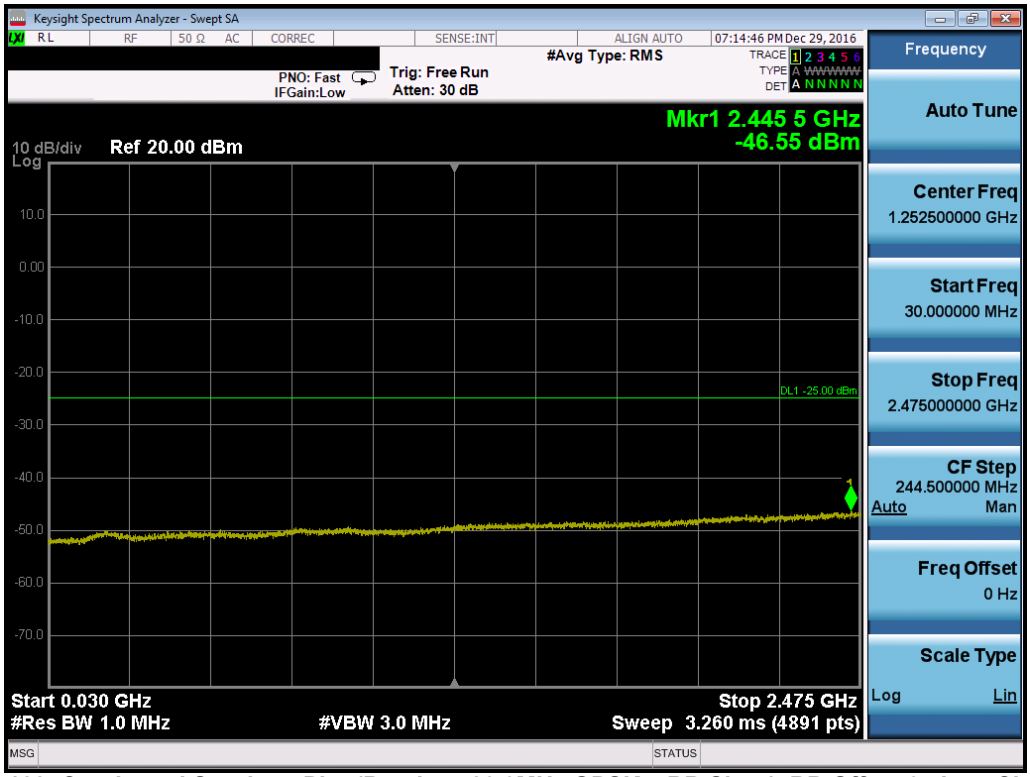
Plot 7-124. Conducted Spurious Plot (Band 2/25 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

Plot 7-125. Conducted Spurious Plot (Band 30 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

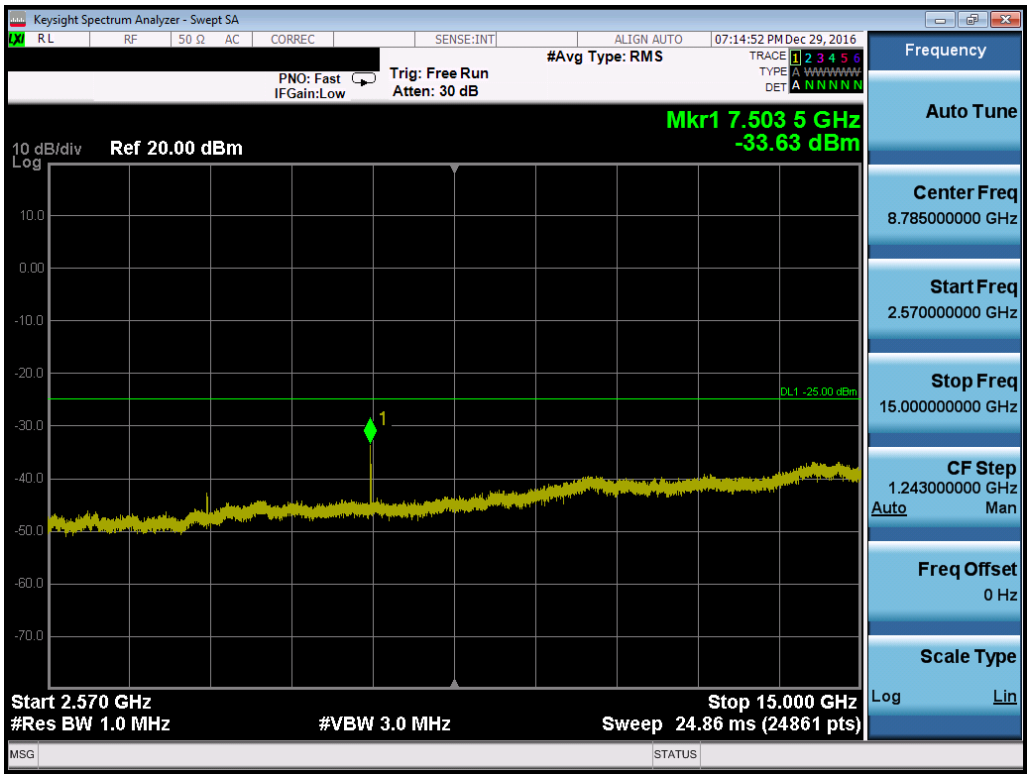


Plot 7-126. Conducted Spurious Plot (Band 30 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

Plot 7-127. Conducted Spurious Plot (Band 30 – 10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

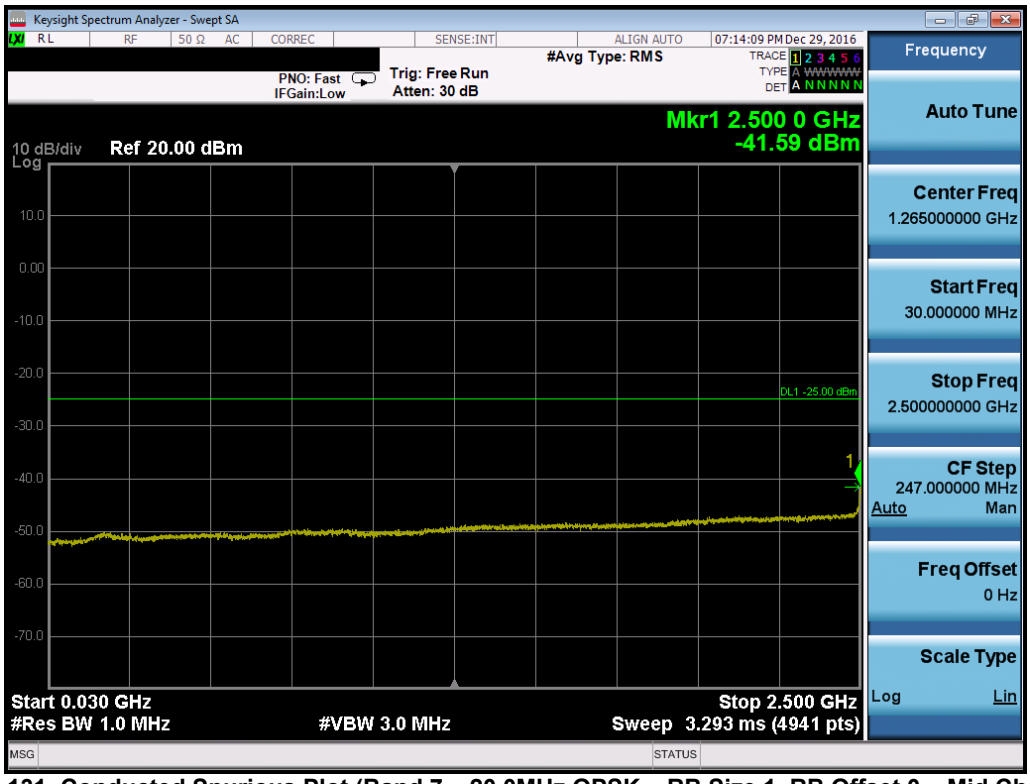


Plot 7-128. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)



Plot 7-129. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

Plot 7-130. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



Plot 7-131. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

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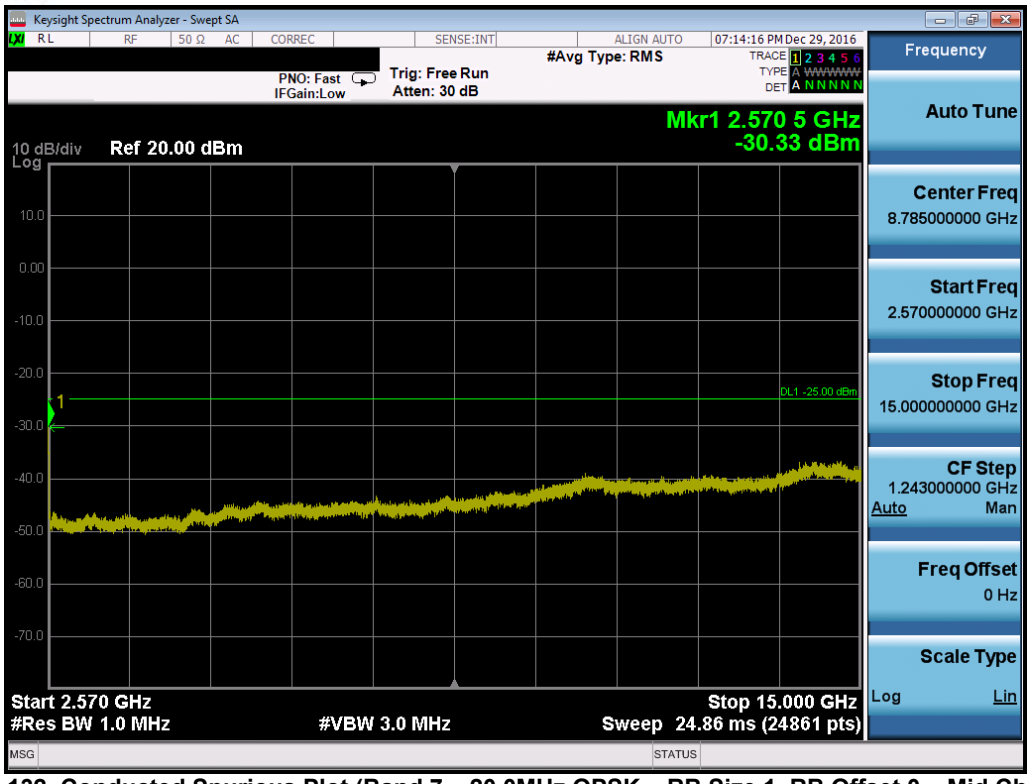
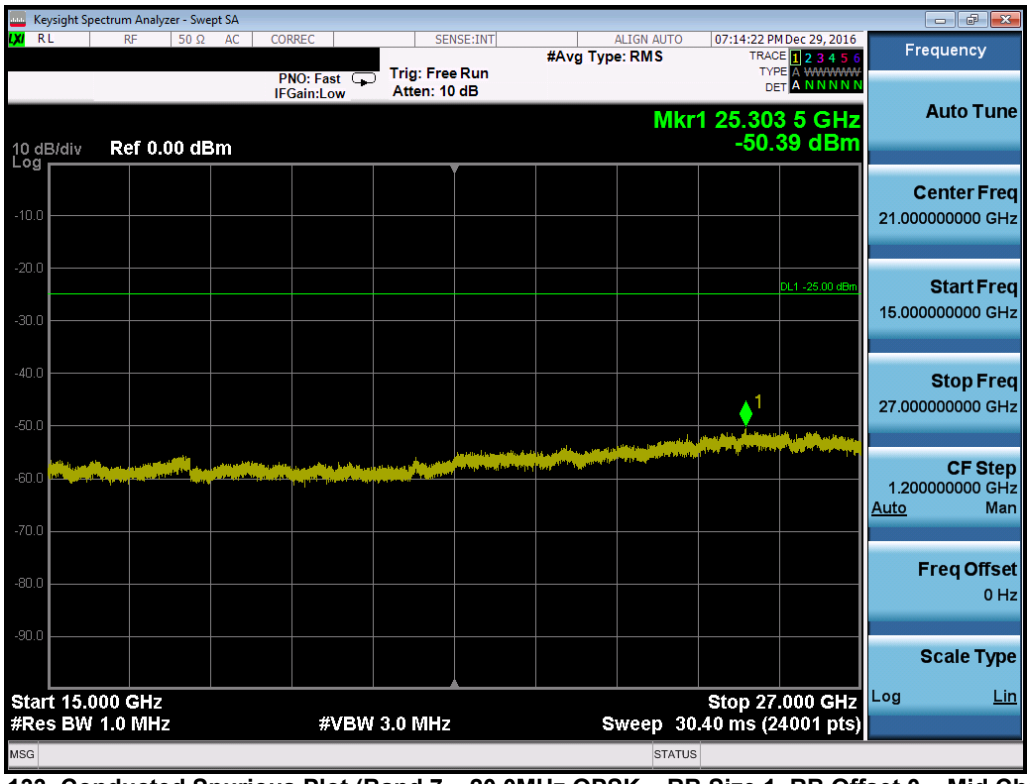
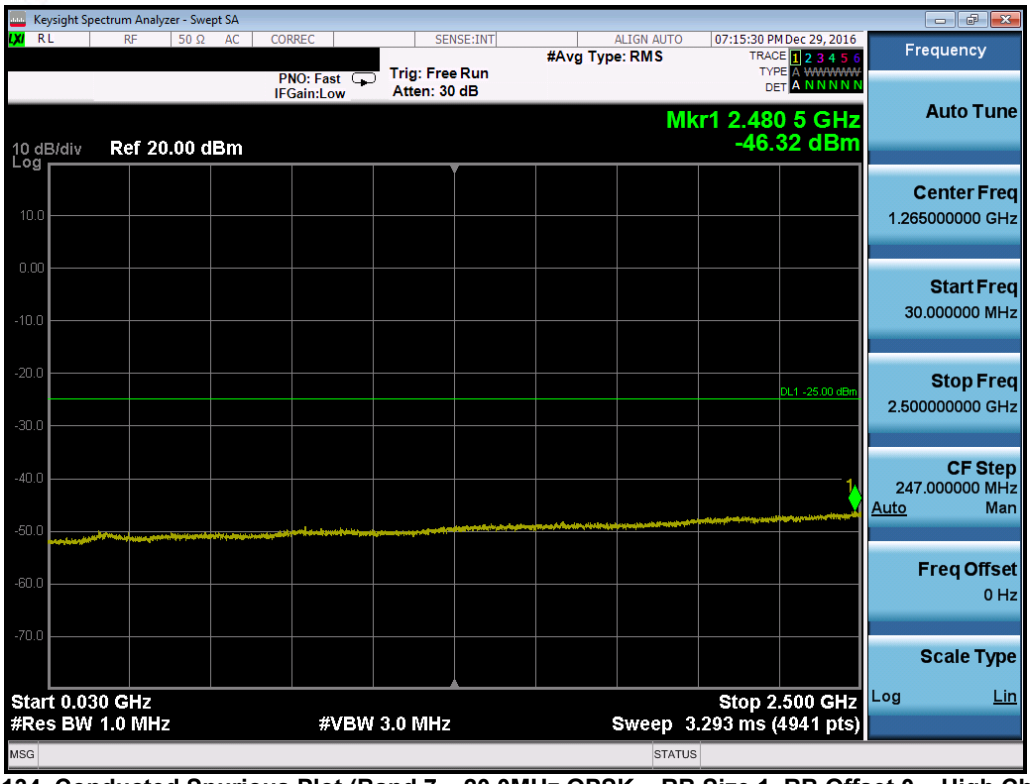


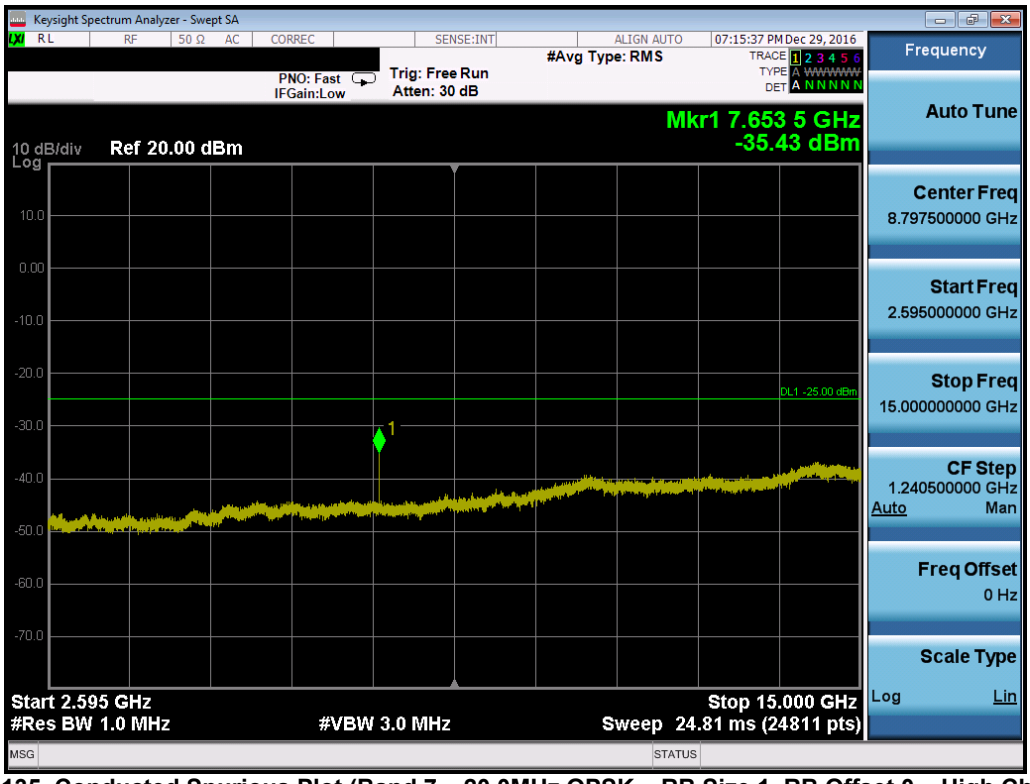
Plot 7-132. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-133. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-134. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-135. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

Plot 7-136. Conducted Spurious Plot (Band 7 – 20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

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) §27.53(a.4)

Test Overview

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

The minimum permissible attenuation level for Band 30 is > 43 + 10log10 (P[Watts] at 2300-2305MHz & 2345-2360MHz, > 55 + 10log10 (P[Watts]) at 2320-2324MHz & 2341-2345MHz, > 61 + 10log10 (P[Watts]) at 2324-2328MHz & 2337-2341MHz, > 67 + 10log10 (P[Watts]) at 2288-2292MHz & 2328-2337MHz, and > 70 + 10log10 (P[Watts]) at frequencies < 2288MHz & >2365MHz.

The minimum permissible attenuation level for Band 7 and 41 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 D01 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.

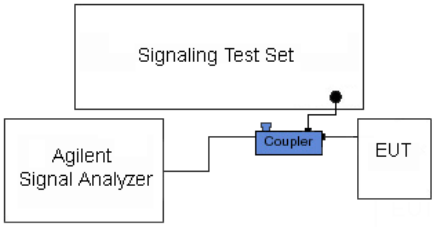


Figure 7-3. Test Instrument & Measurement Setup

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.

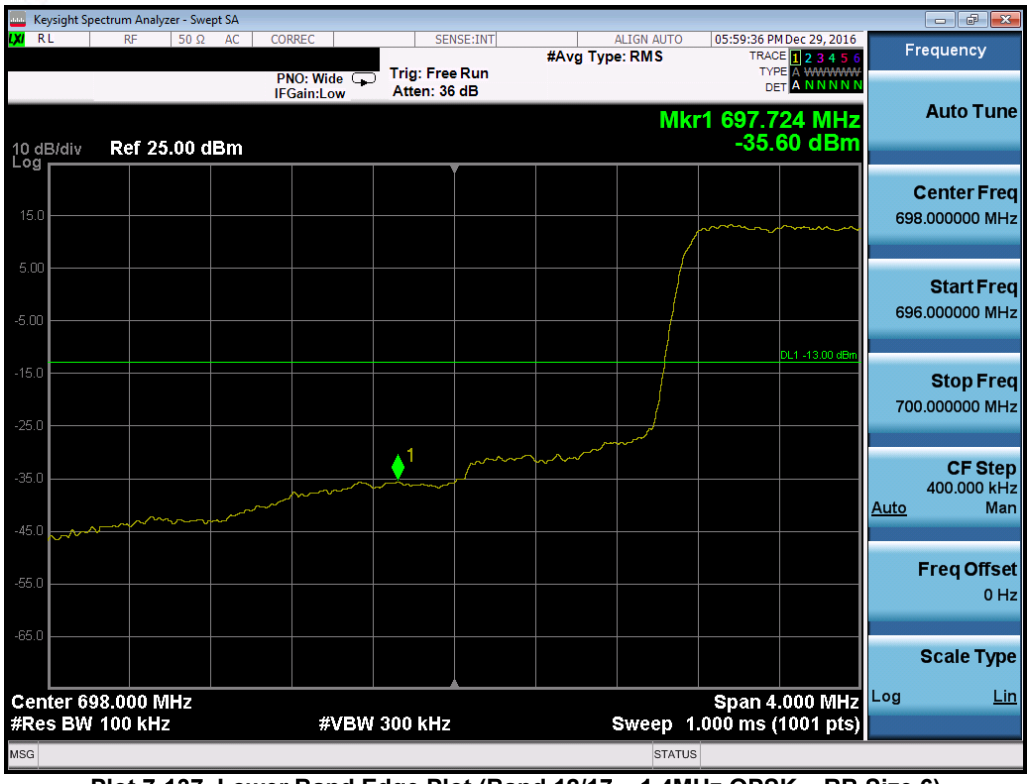
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

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 $65 + 10\log_{10}(P) = -35$dBm in a 6.25kHz bandwidth.

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

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



Plot 7-137. Lower Band Edge Plot (Band 12/17 – 1.4MHz QPSK – RB Size 6)

Plot 7-138. Upper Band Edge Plot (Band 12/17 – 1.4MHz QPSK – RB Size 6)

Plot 7-139. Lower Band Edge Plot (Band 12/17 – 3.0MHz QPSK – RB Size 15)

Plot 7-140. Upper Band Edge Plot (Band 12/17 – 3.0MHz QPSK – RB Size 15)

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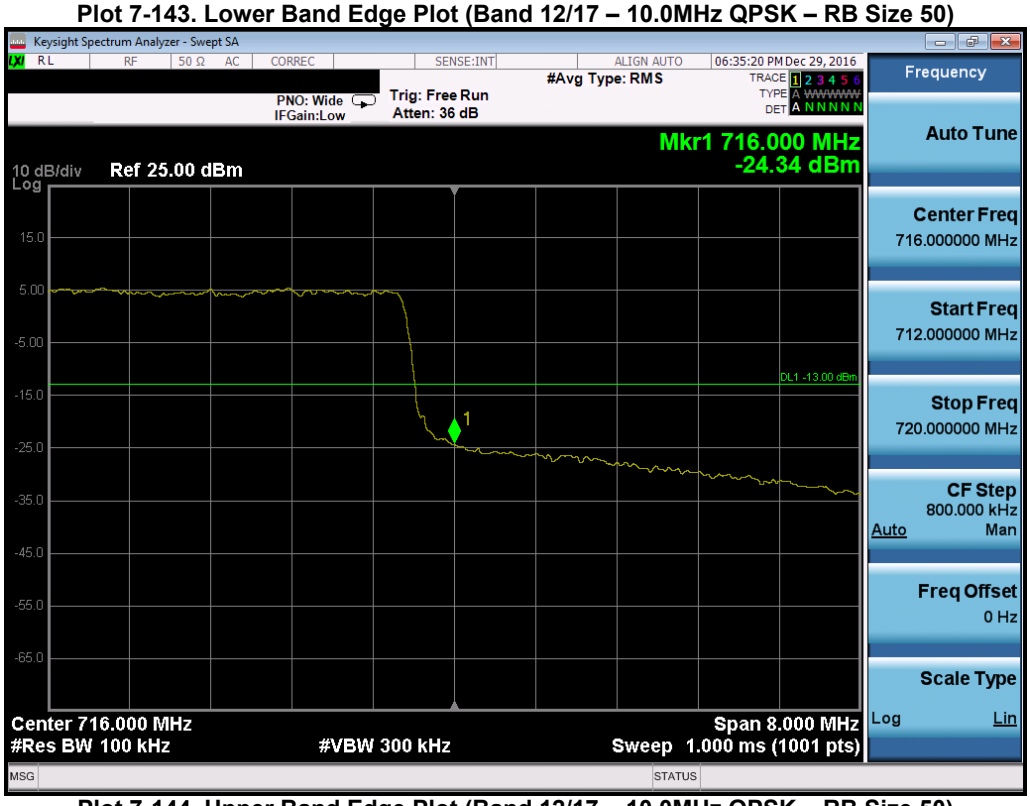
Plot 7-141. Lower Band Edge Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

Plot 7-142. Upper Band Edge Plot (Band 12/17 – 5.0MHz QPSK – RB Size 25)

Plot 7-143. Lower Band Edge Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)



Plot 7-144. Upper Band Edge Plot (Band 12/17 – 10.0MHz QPSK – RB Size 50)

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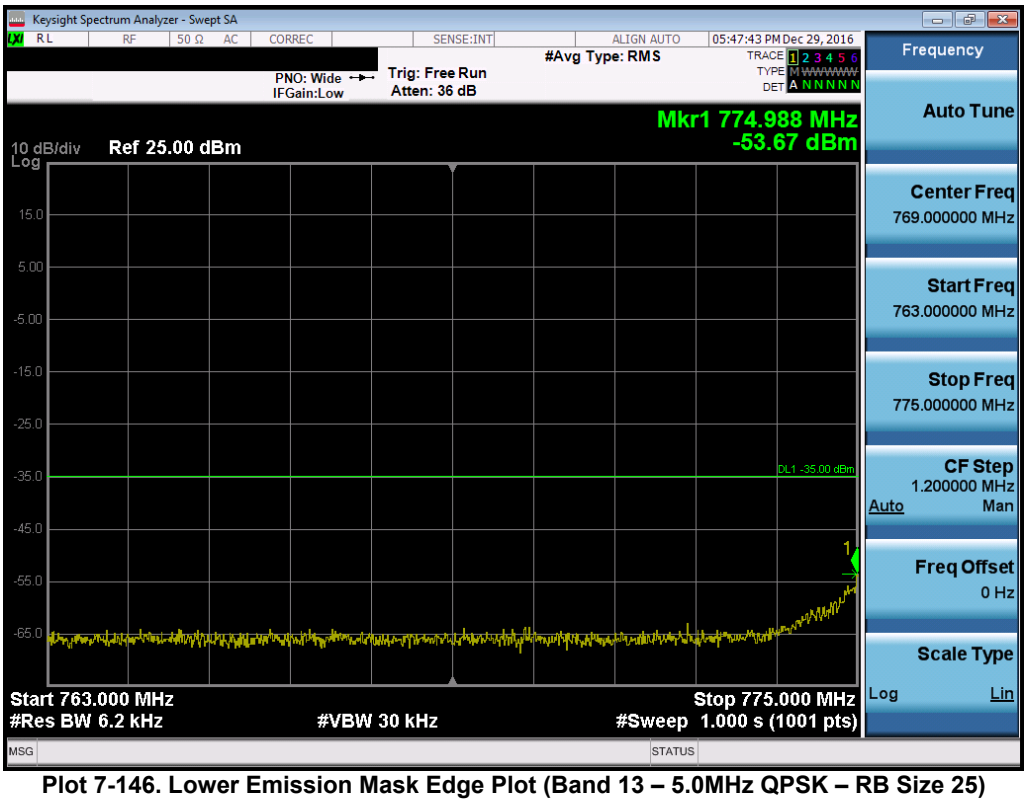
Plot 7-145. Lower Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



Plot 7-146. Lower Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

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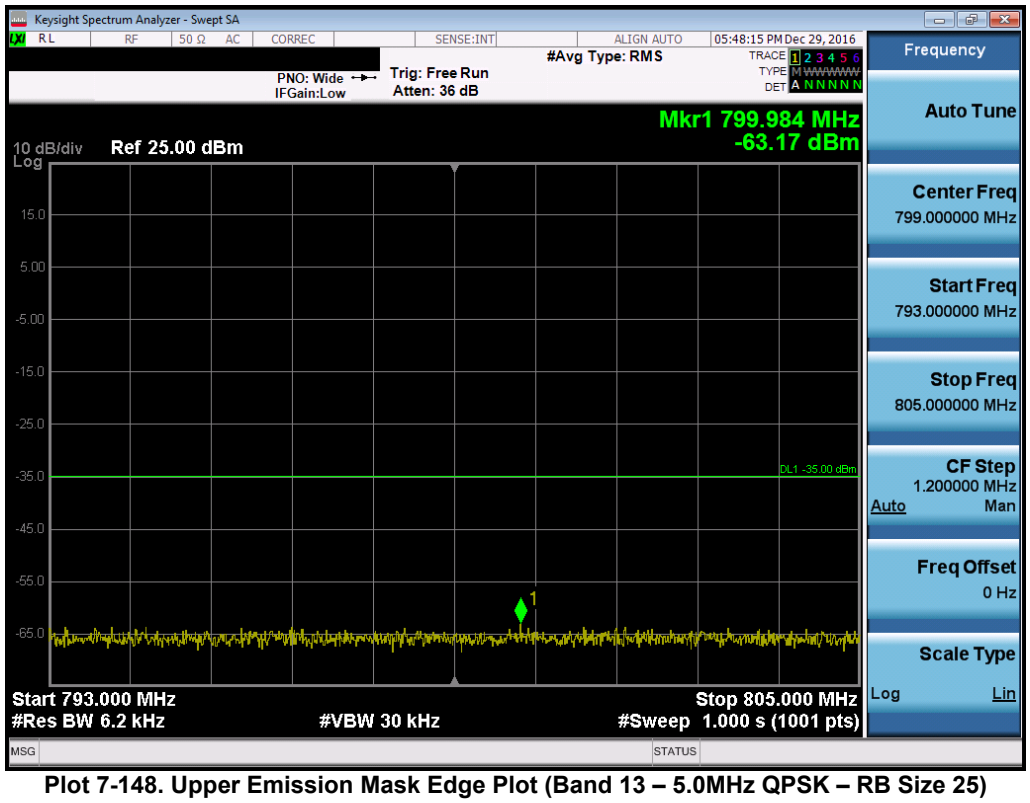
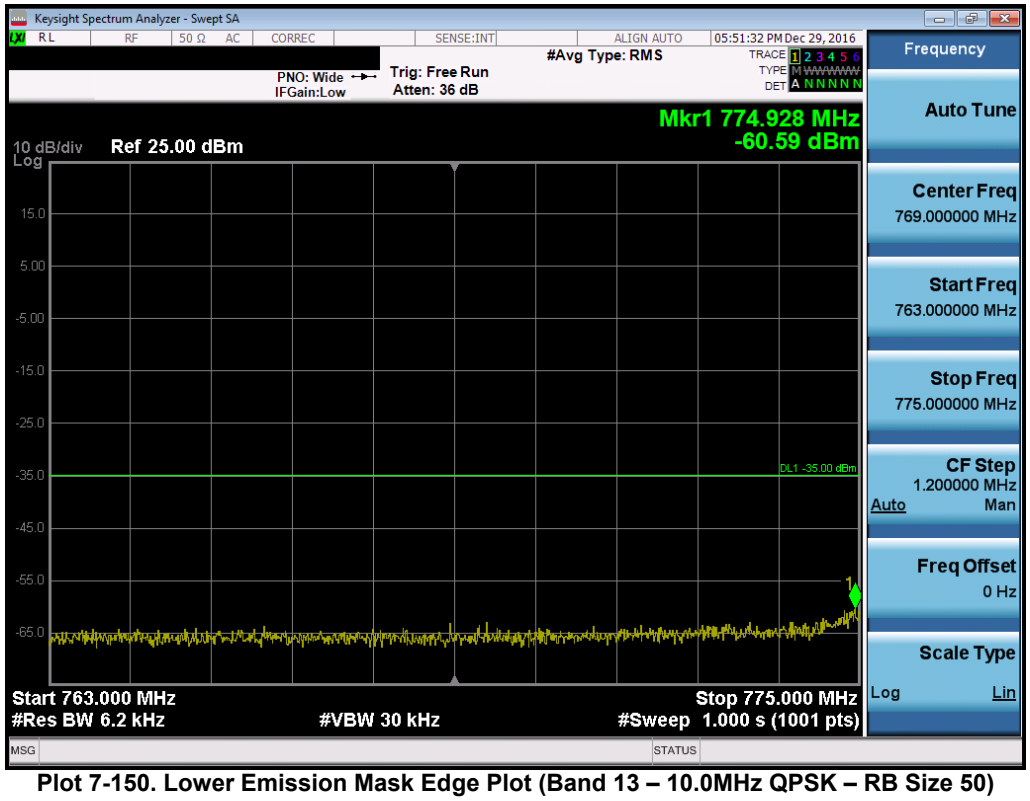
Plot 7-147. Upper Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)



Plot 7-148. Upper Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

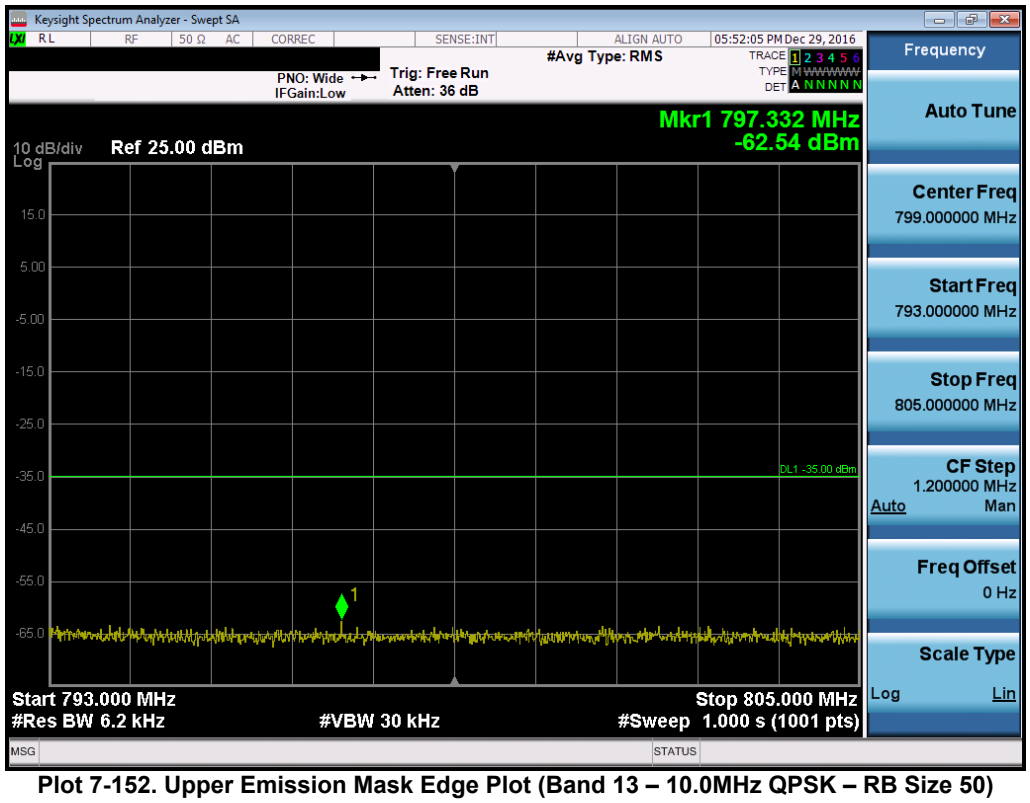
Plot 7-149. Lower Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)



Plot 7-150. Lower Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

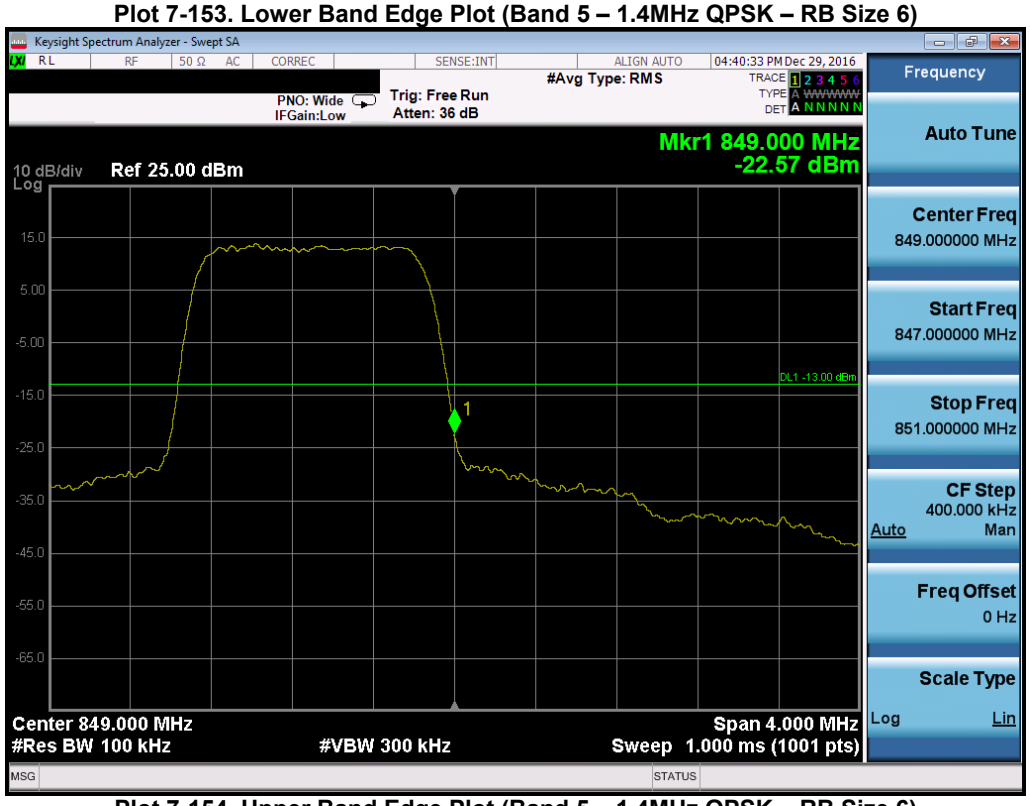
Plot 7-151. Upper Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)



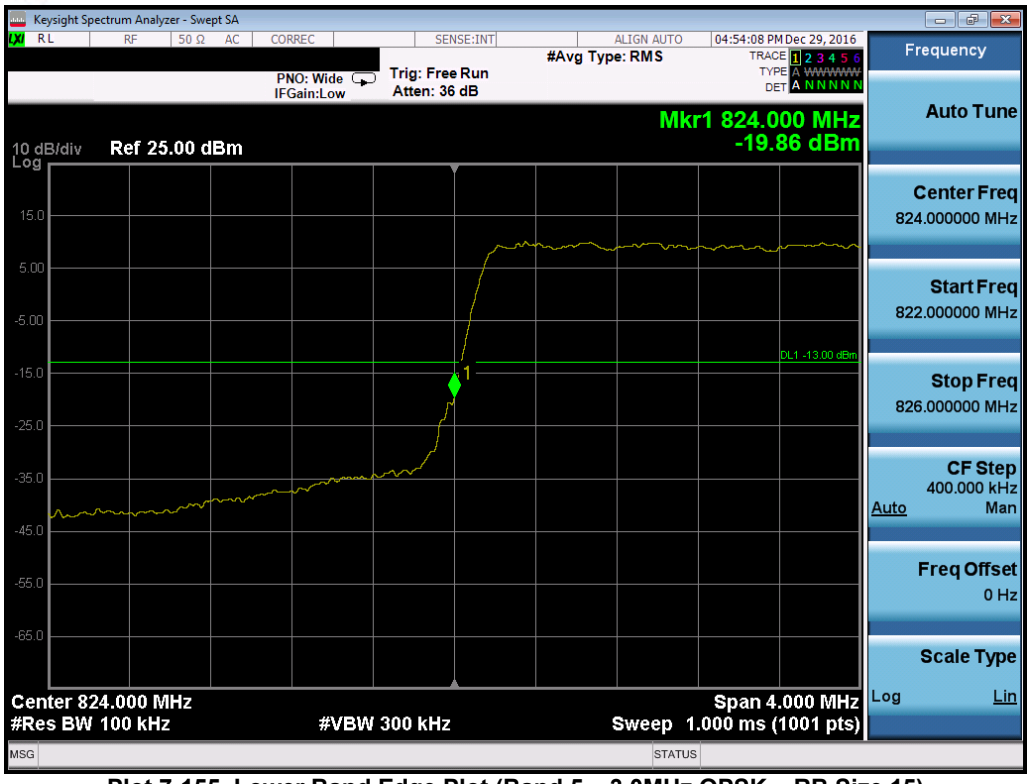
Plot 7-152. Upper Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

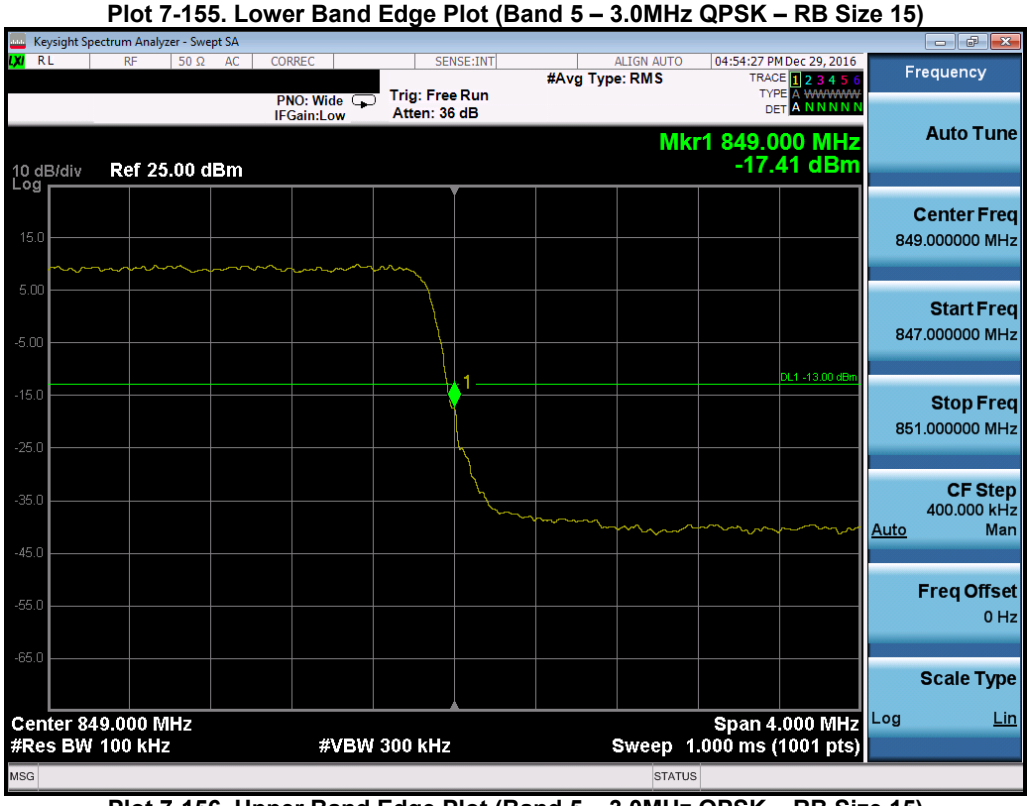
Plot 7-153. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



Plot 7-154. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



Plot 7-155. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



Plot 7-156. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

V 6.1
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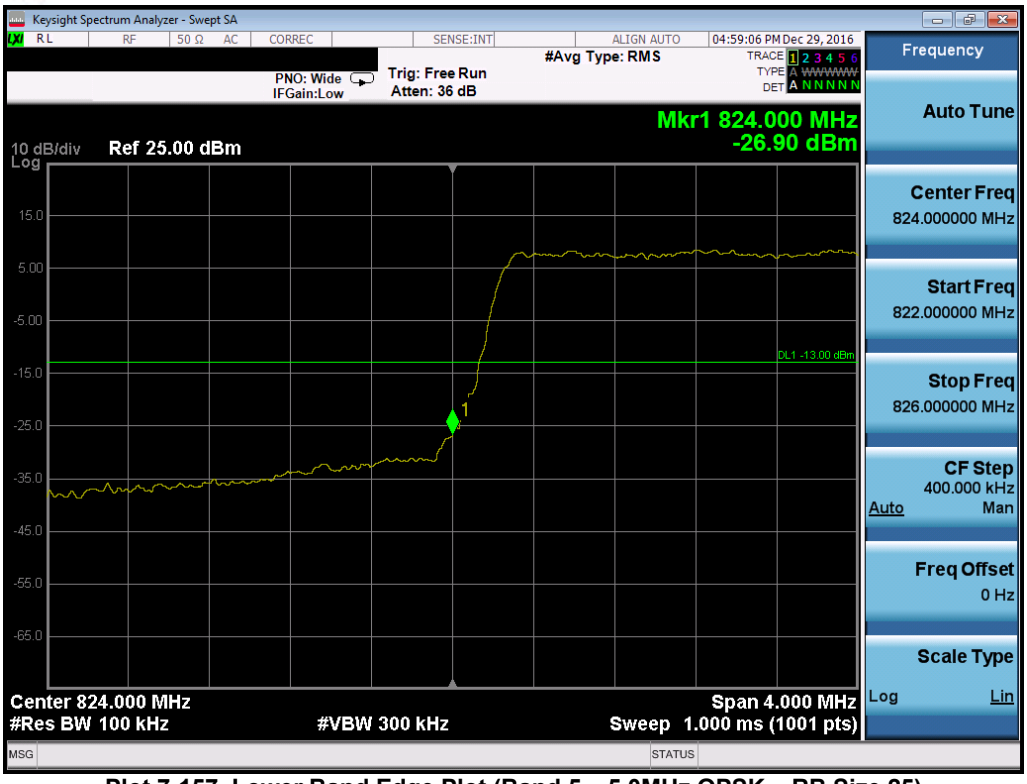
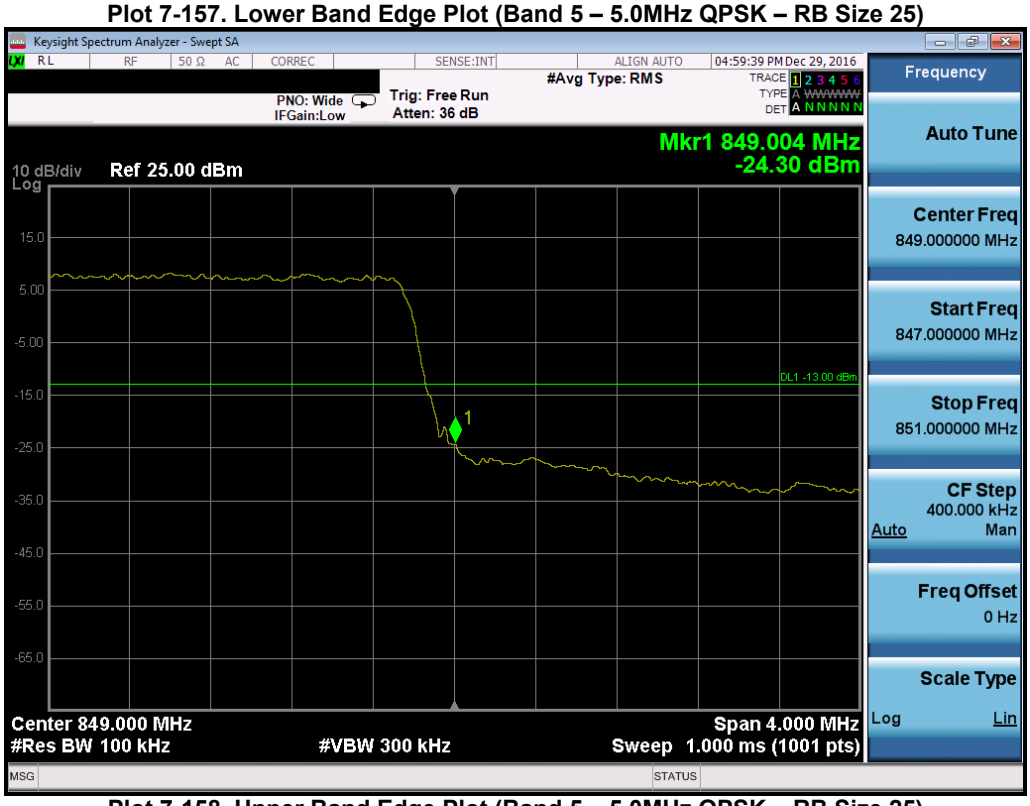
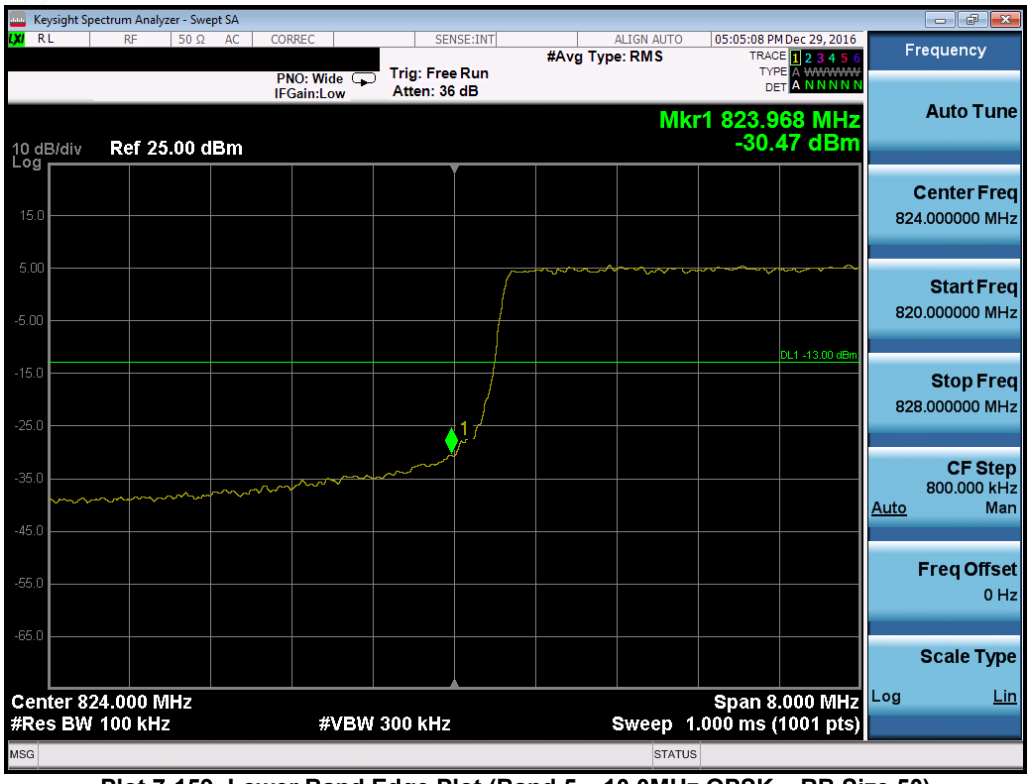


Plot 7-157. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

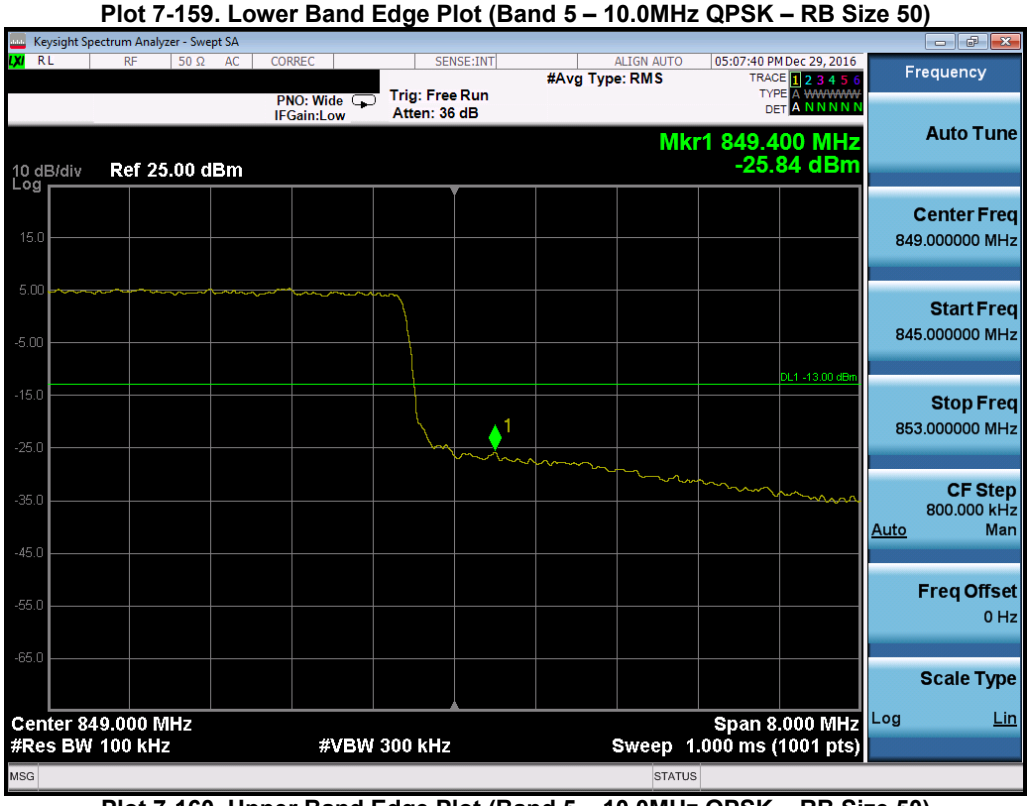


Plot 7-158. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

V 6.1
12/26/2016



Plot 7-159. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-160. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

V 6.1
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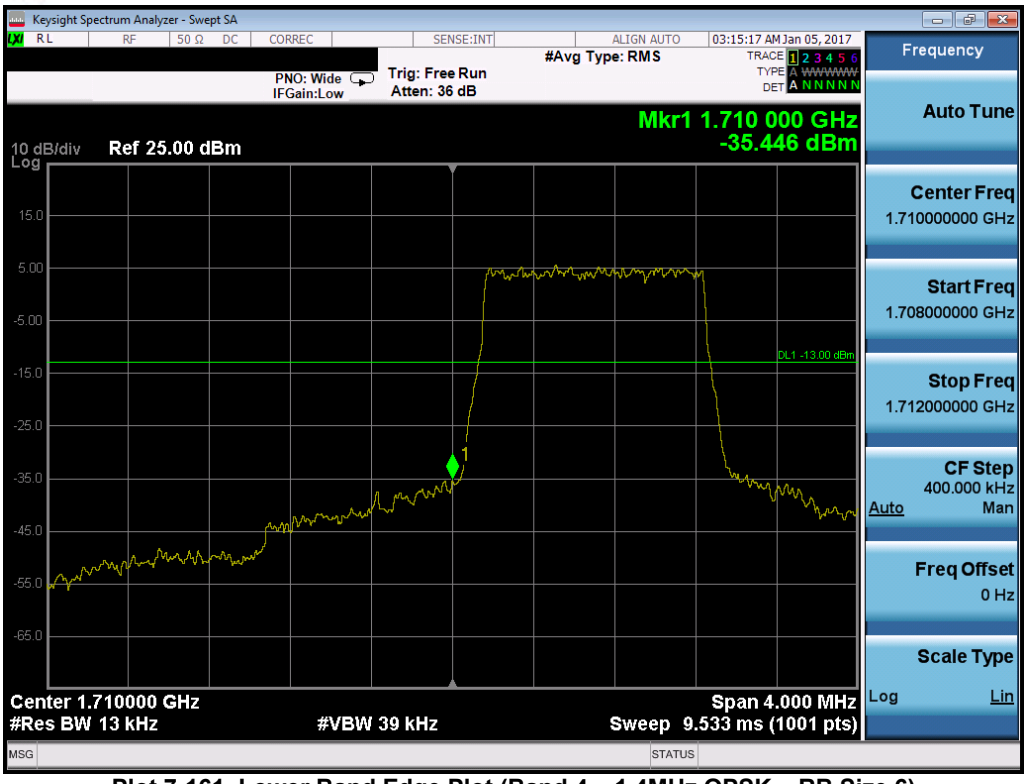
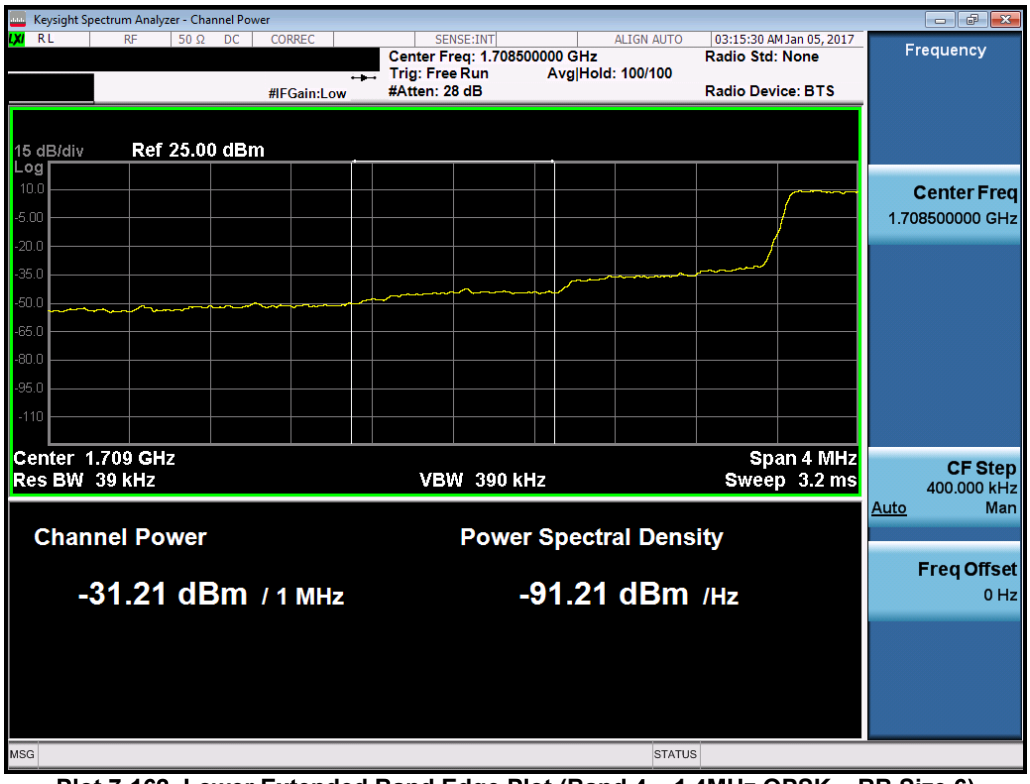
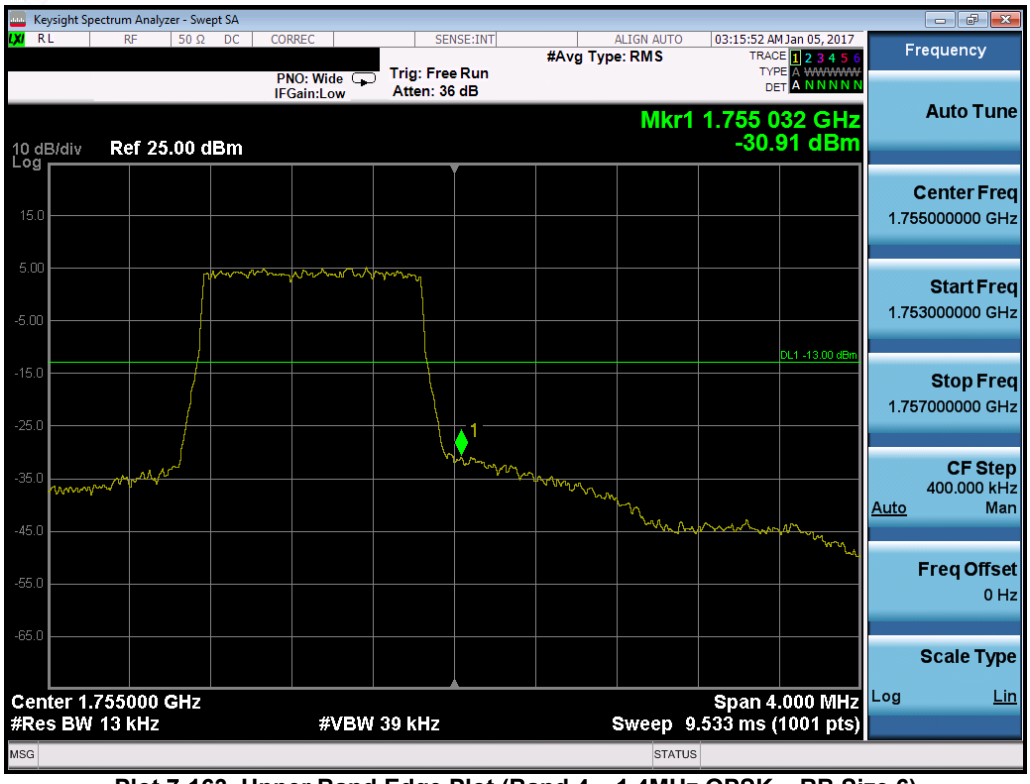


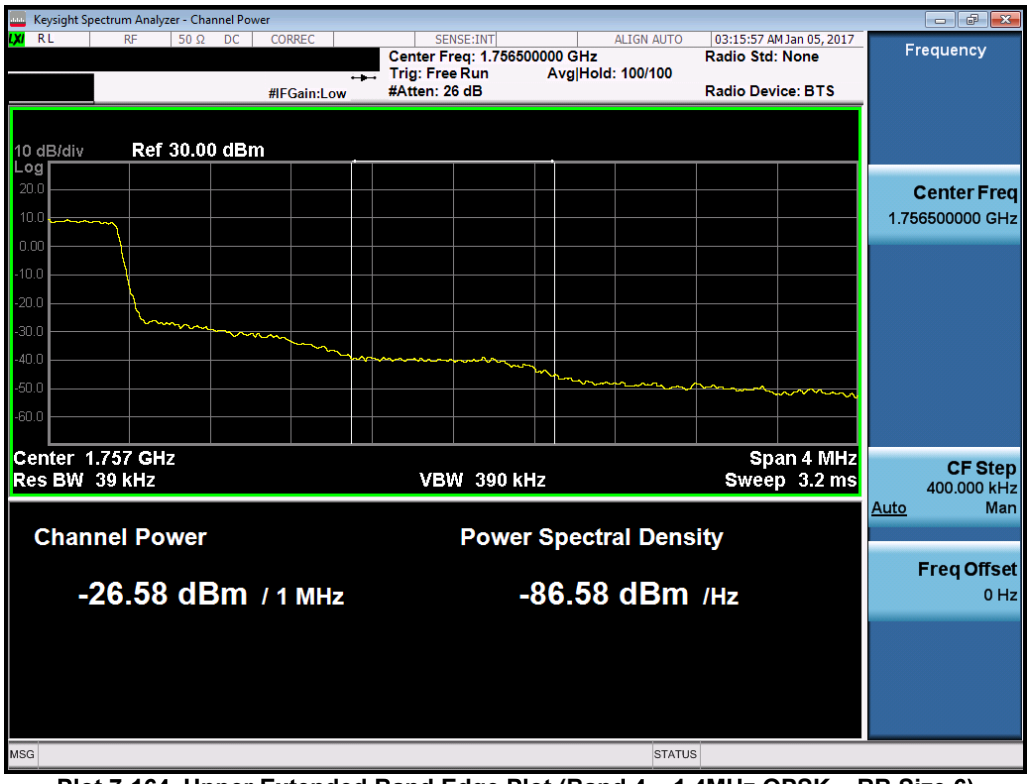
Plot 7-161. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



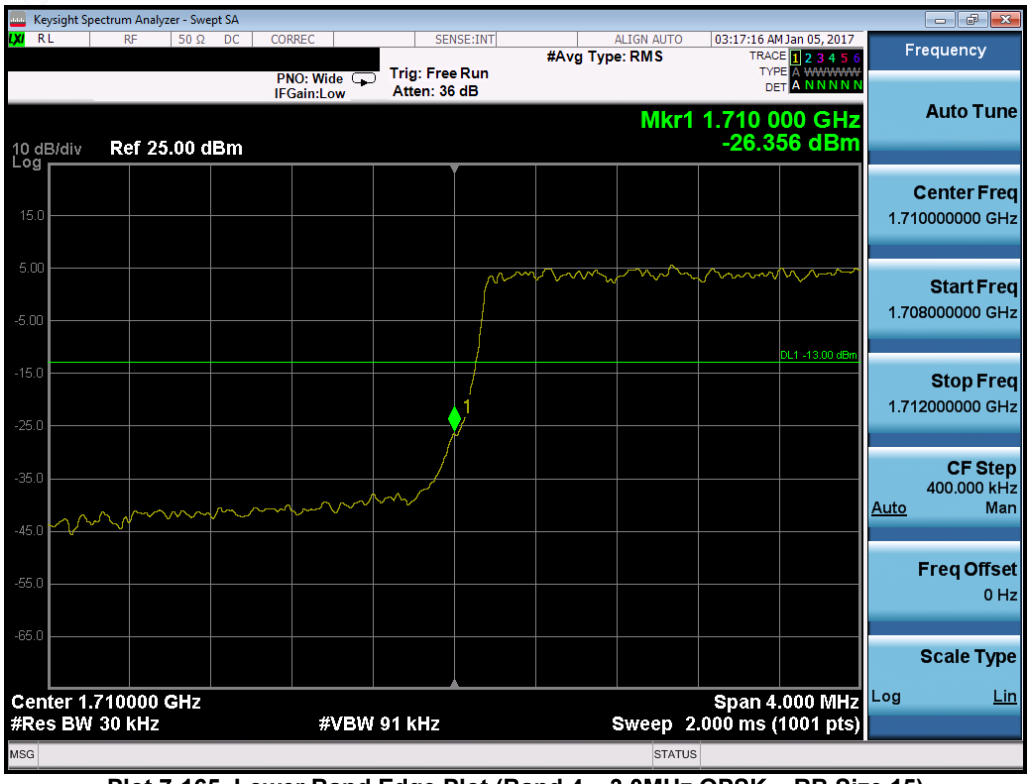
Plot 7-162. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



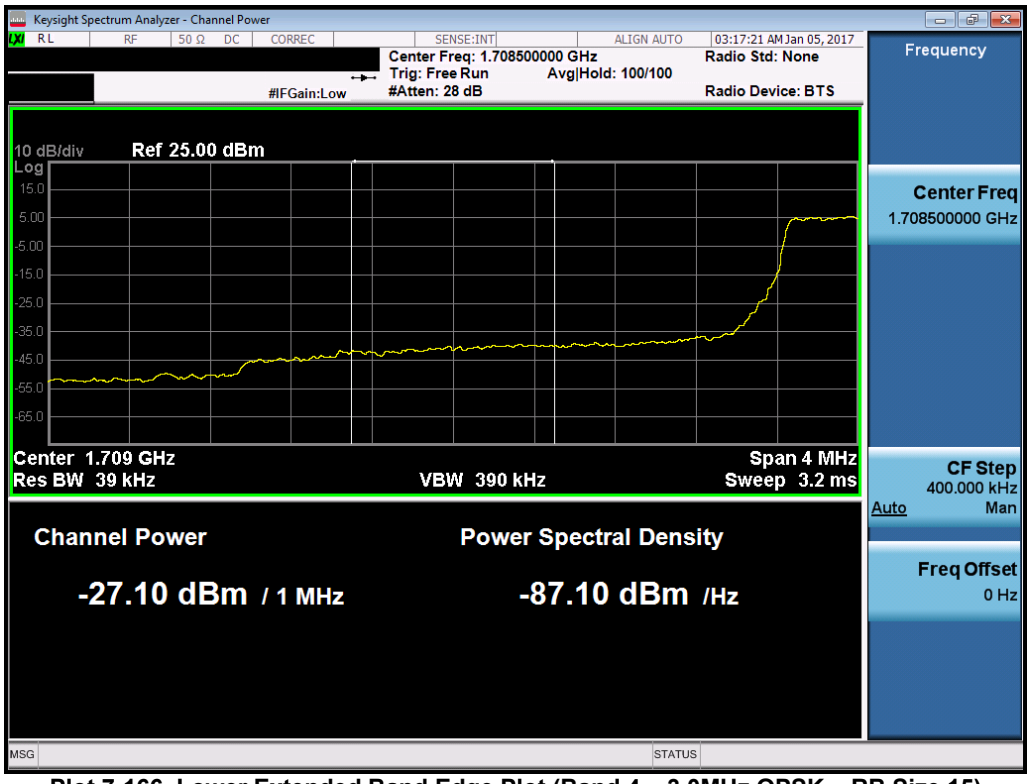
Plot 7-163. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



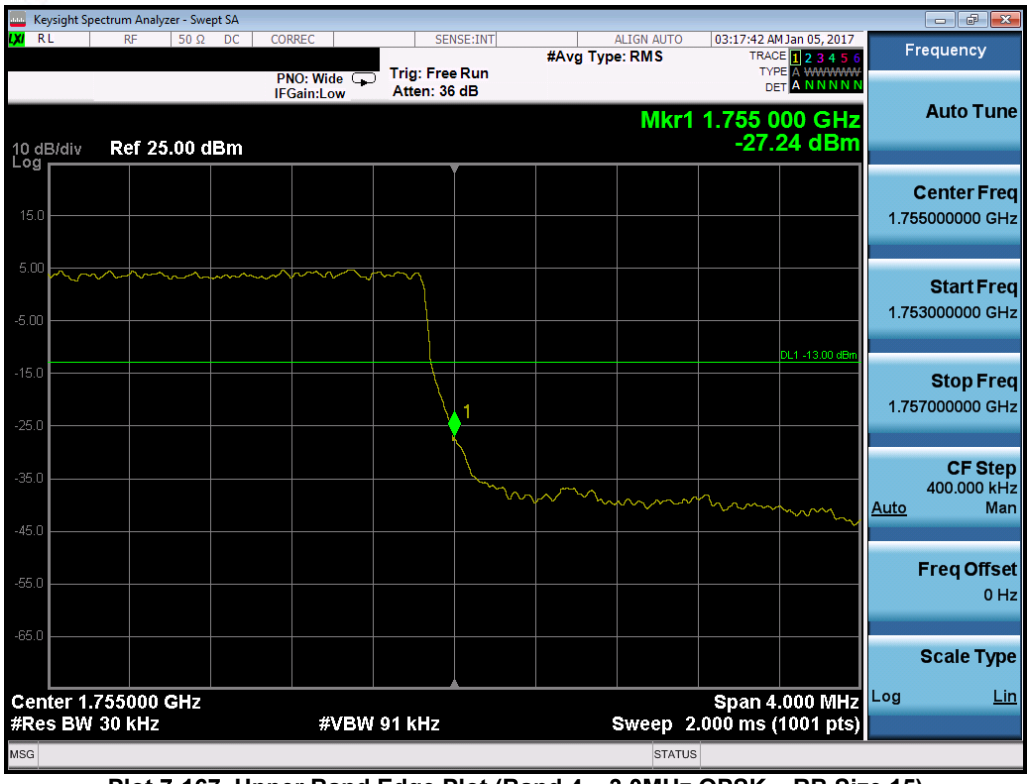
Plot 7-164. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



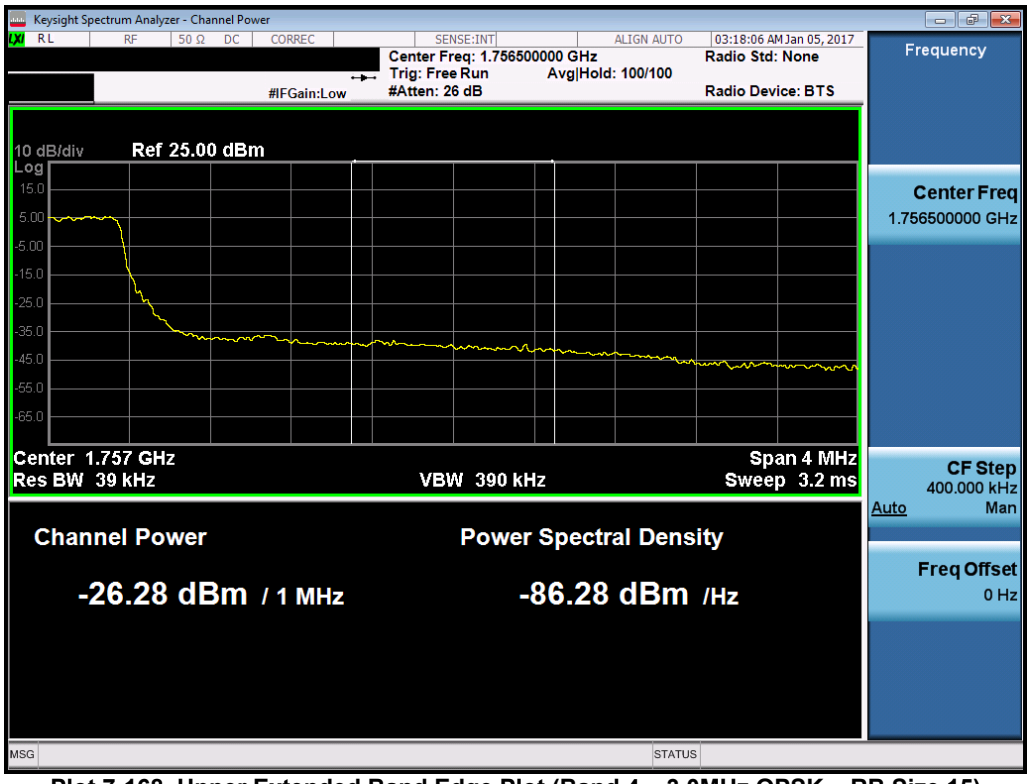
Plot 7-165. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



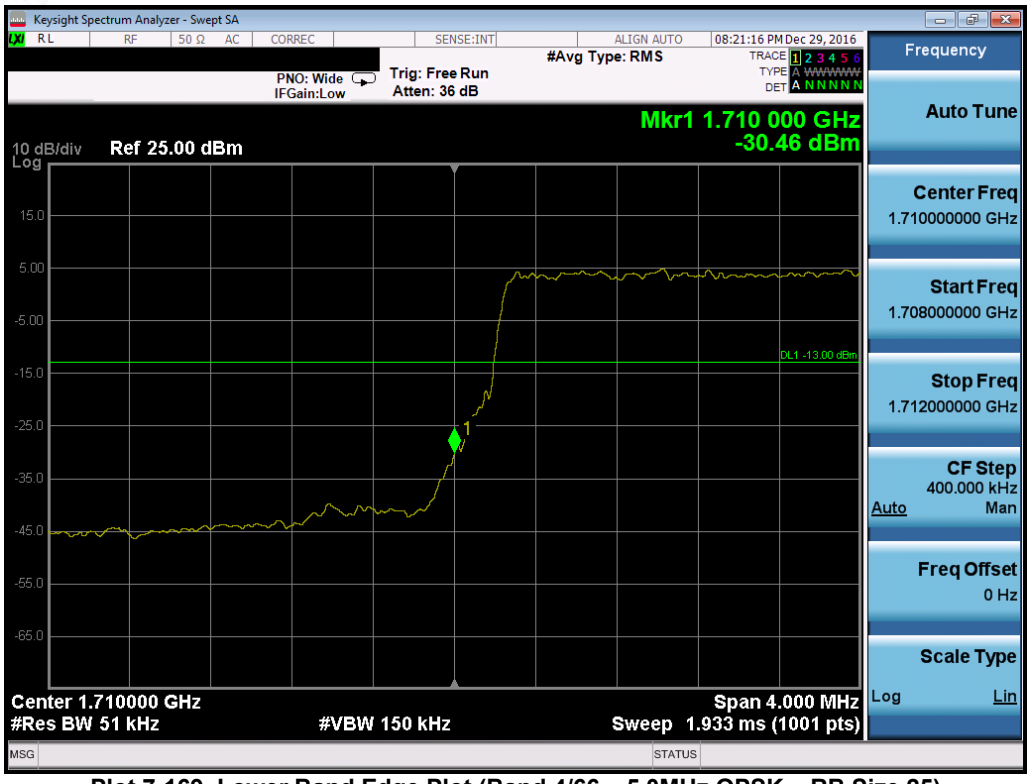
Plot 7-166. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



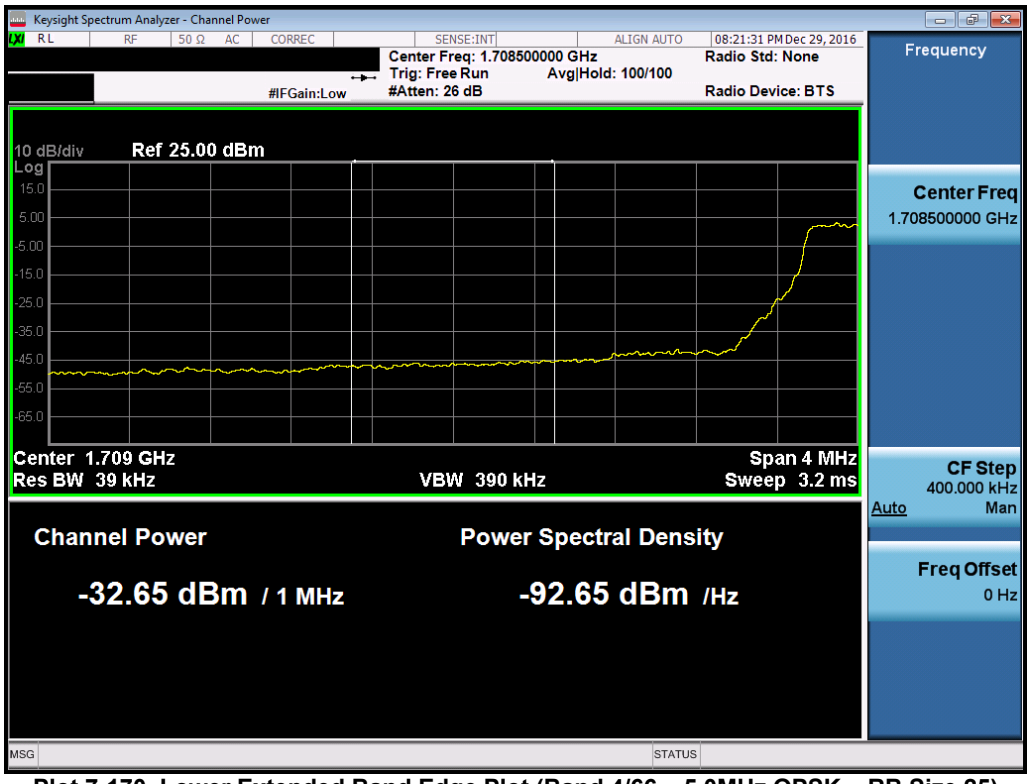
Plot 7-167. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



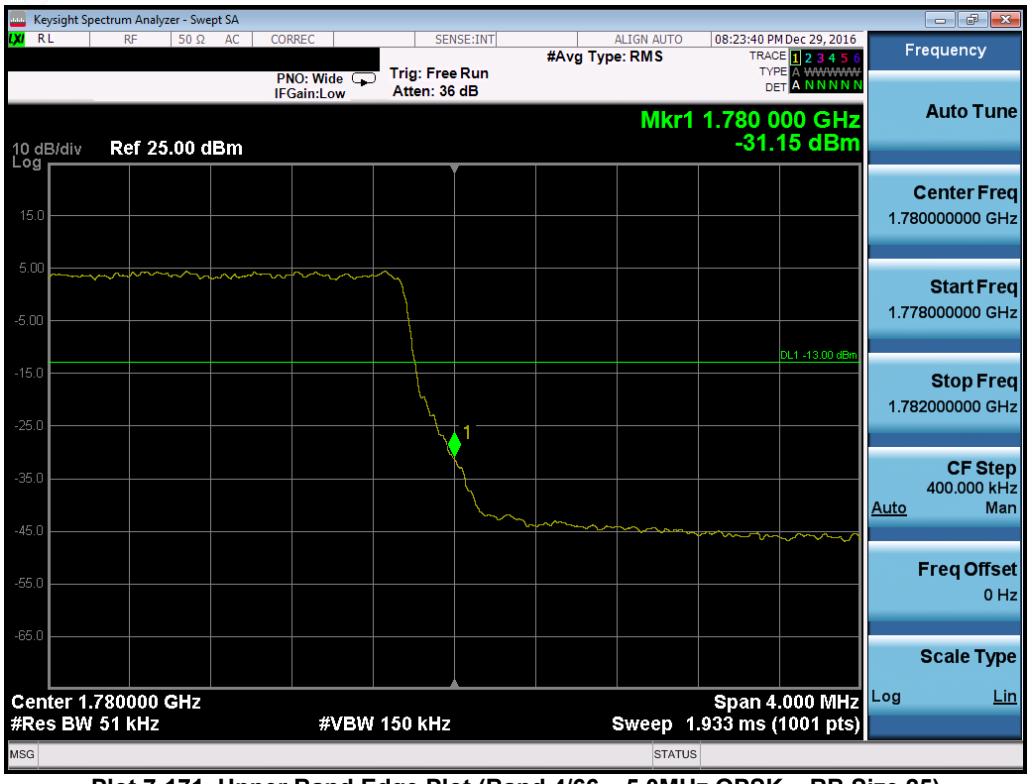
Plot 7-168. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



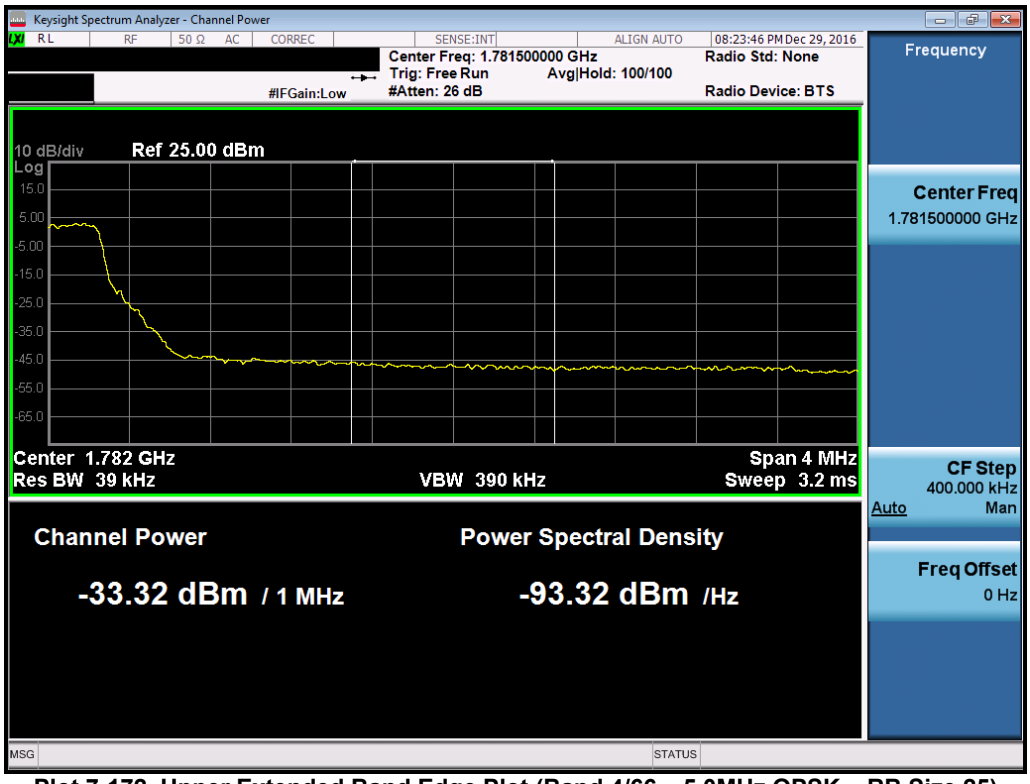
Plot 7-169. Lower Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)



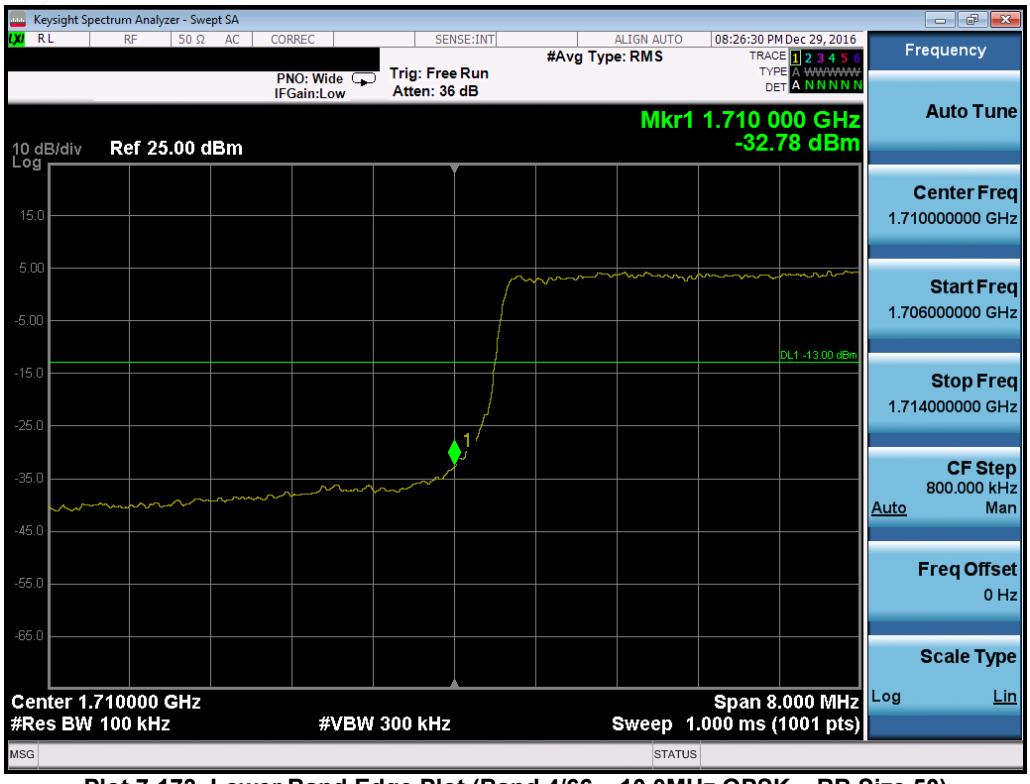
Plot 7-170. Lower Extended Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)



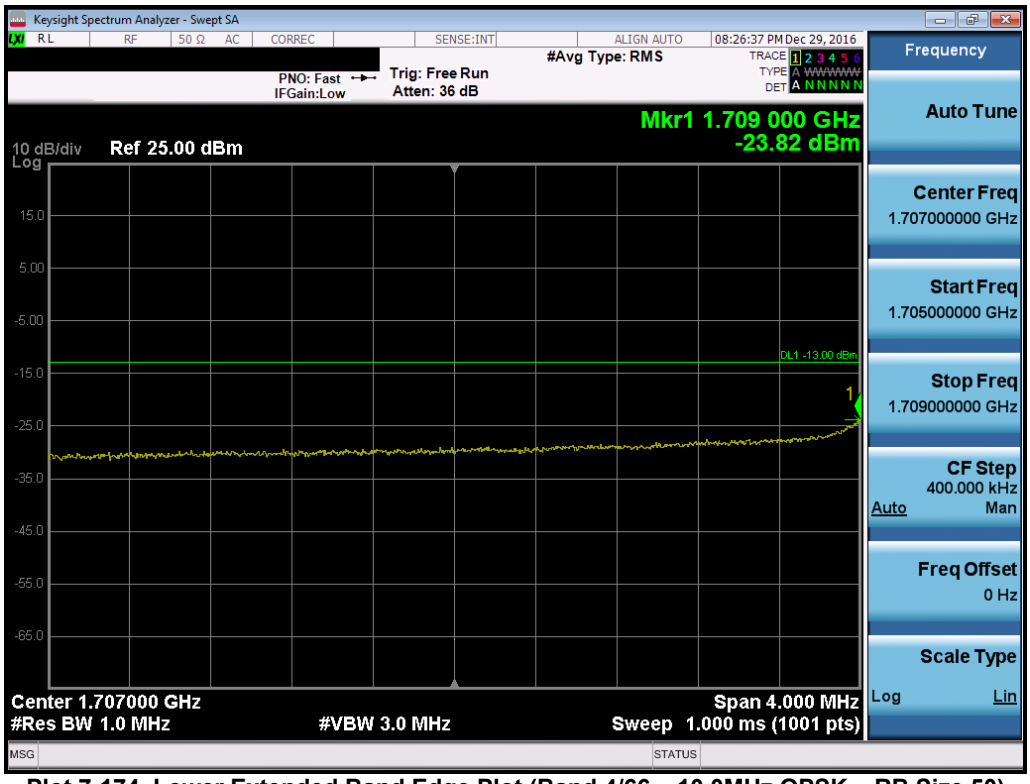
Plot 7-171. Upper Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)



Plot 7-172. Upper Extended Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)

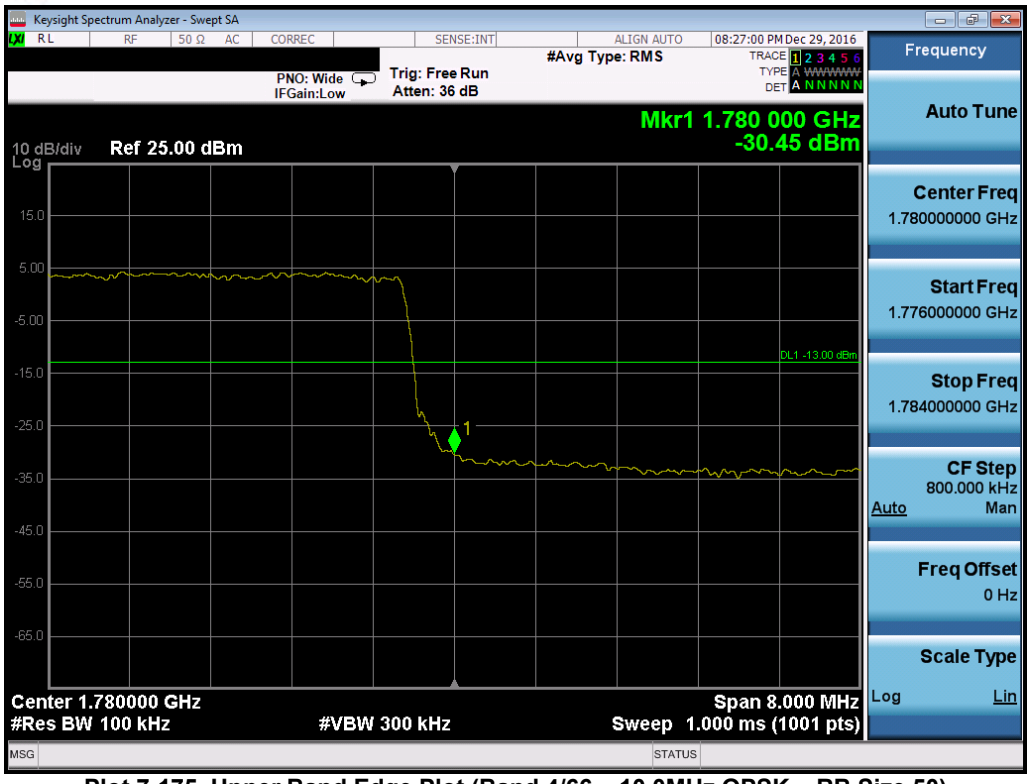


Plot 7-173. Lower Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

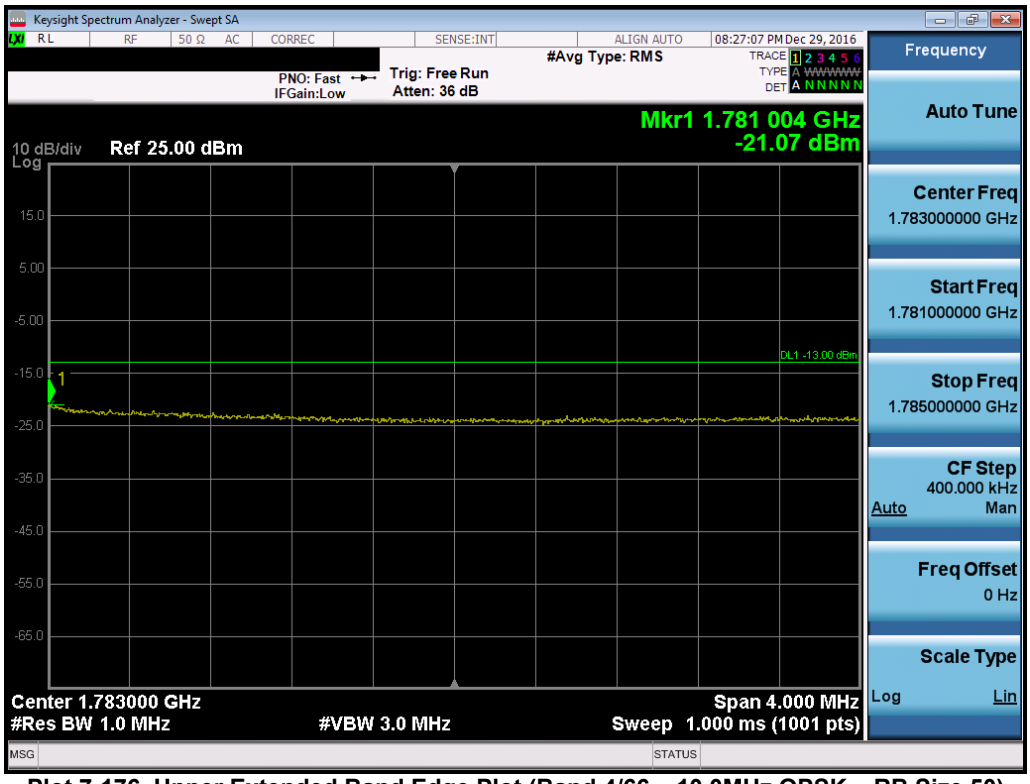


Plot 7-174. Lower Extended Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

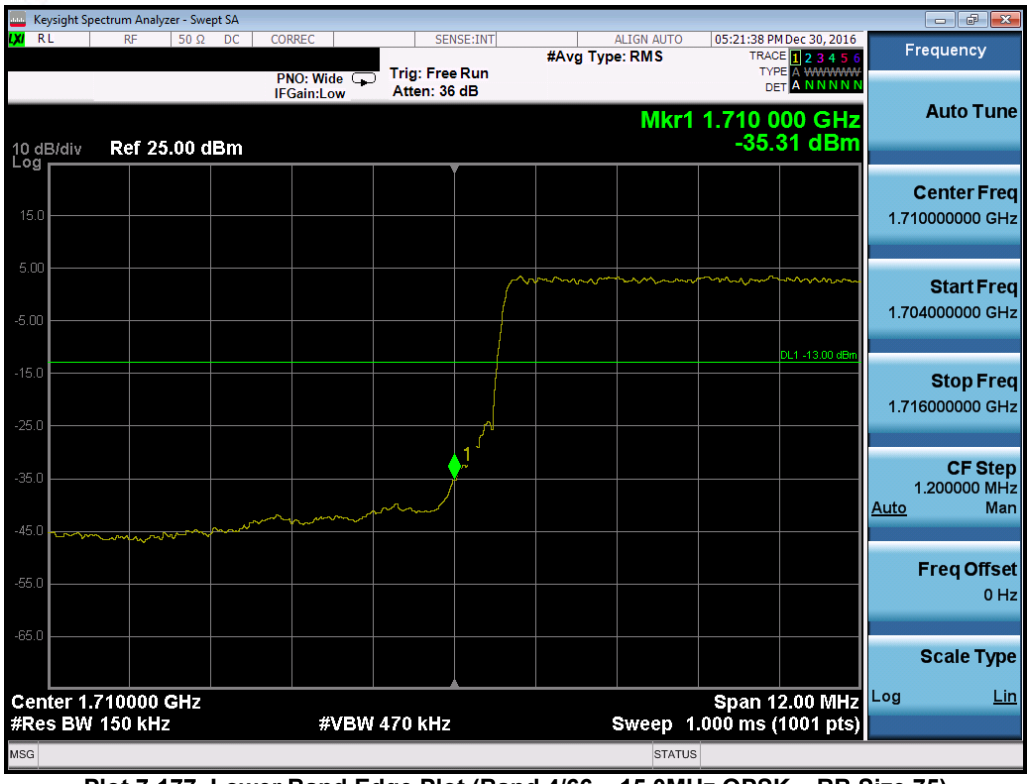


Plot 7-175. Upper Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

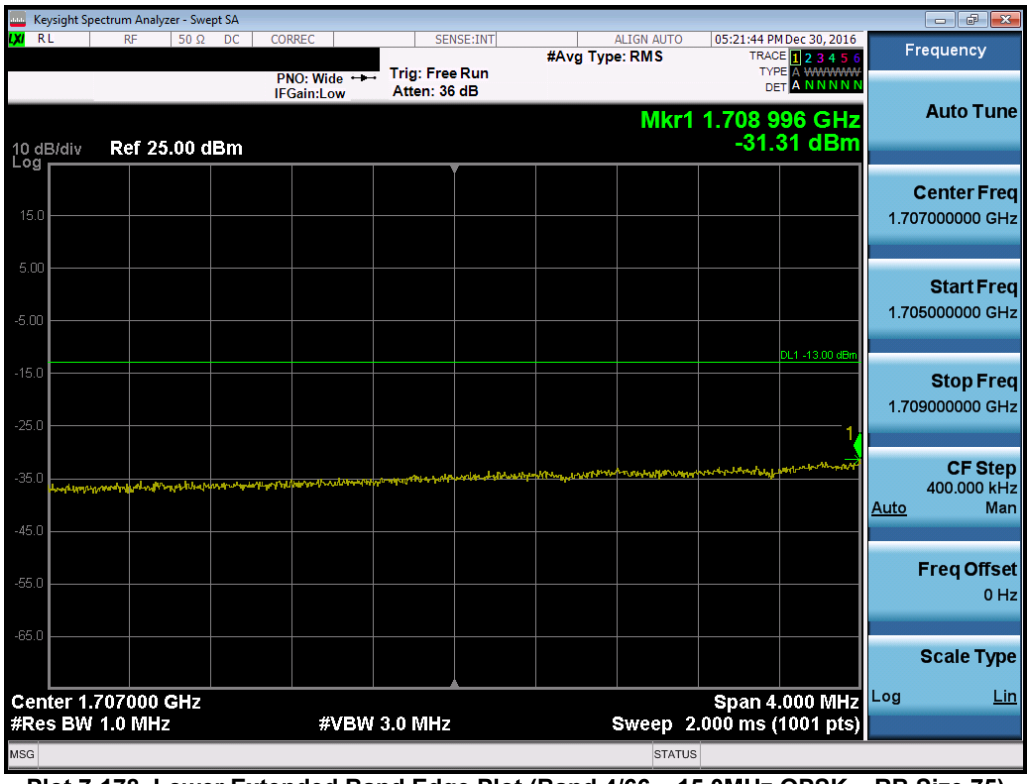


Plot 7-176. Upper Extended Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

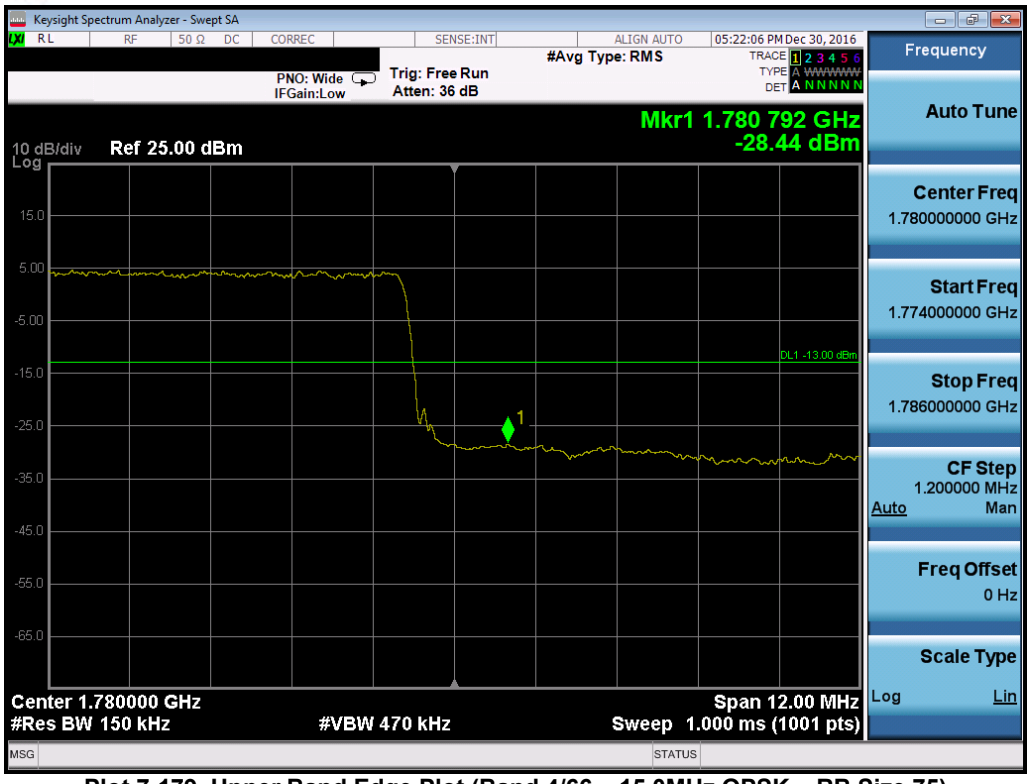


Plot 7-177. Lower Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

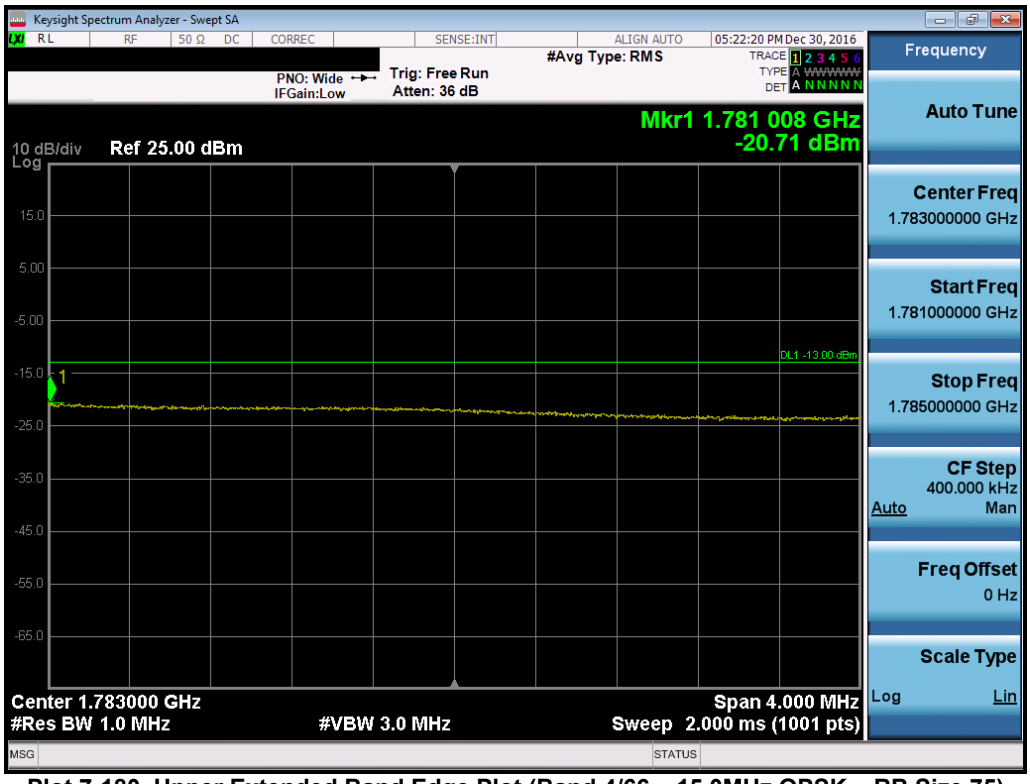


Plot 7-178. Lower Extended Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

V 6.1
12/26/2016

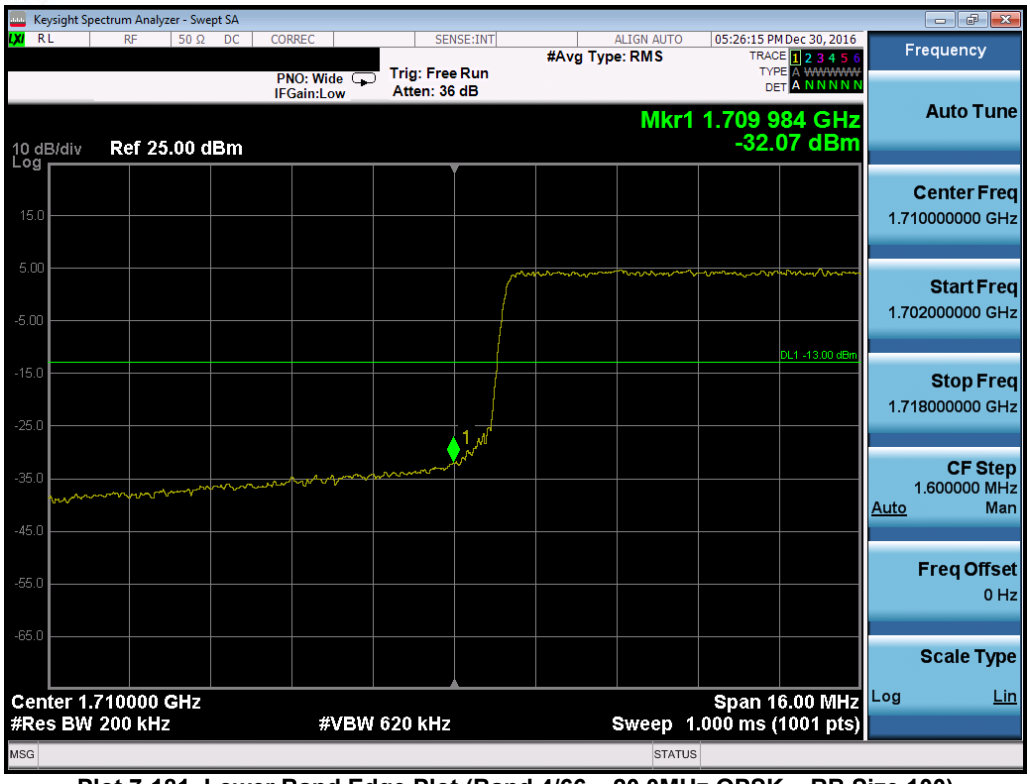


Plot 7-179. Upper Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

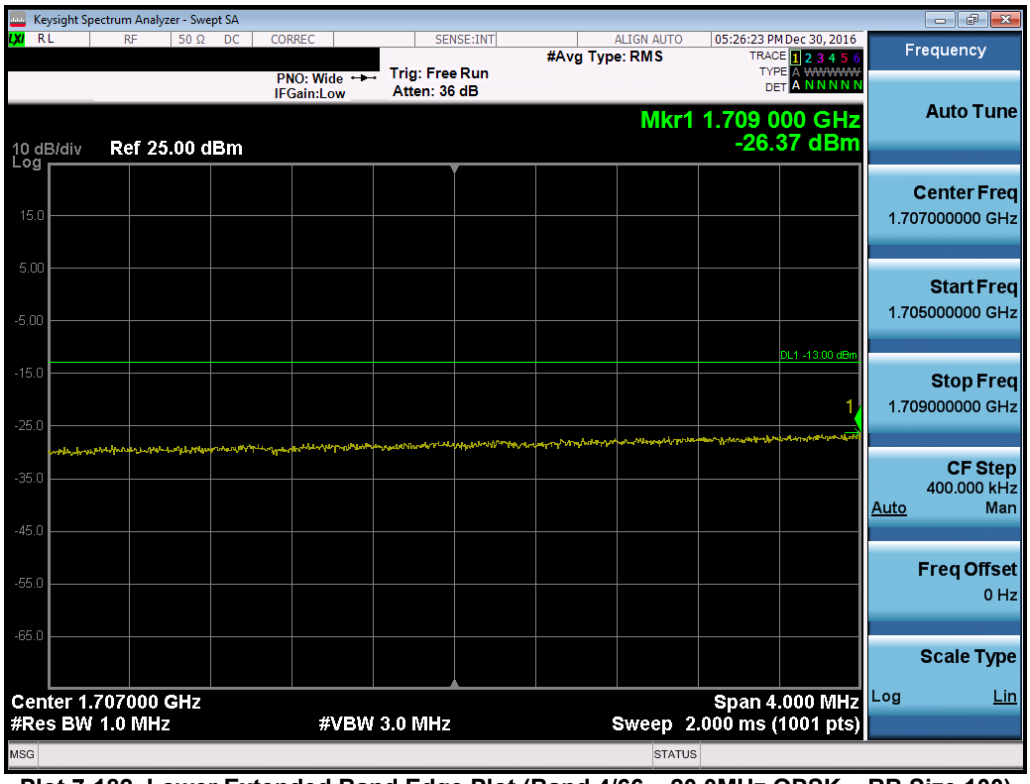


Plot 7-180. Upper Extended Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

V 6.1
12/26/2016

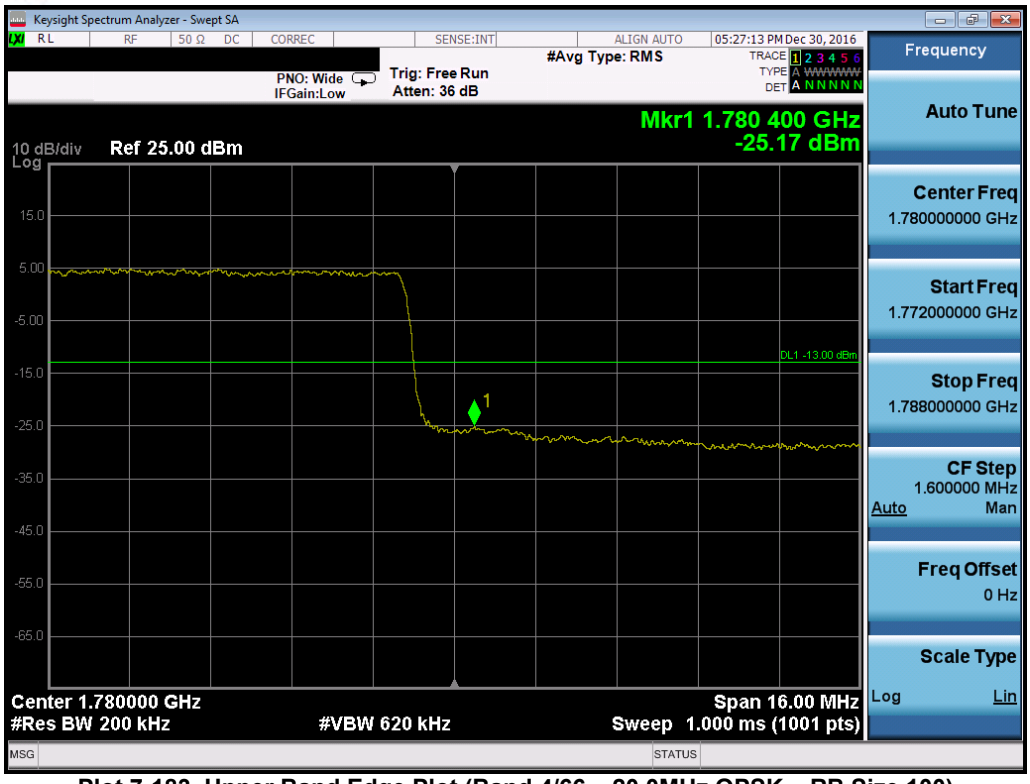


Plot 7-181. Lower Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

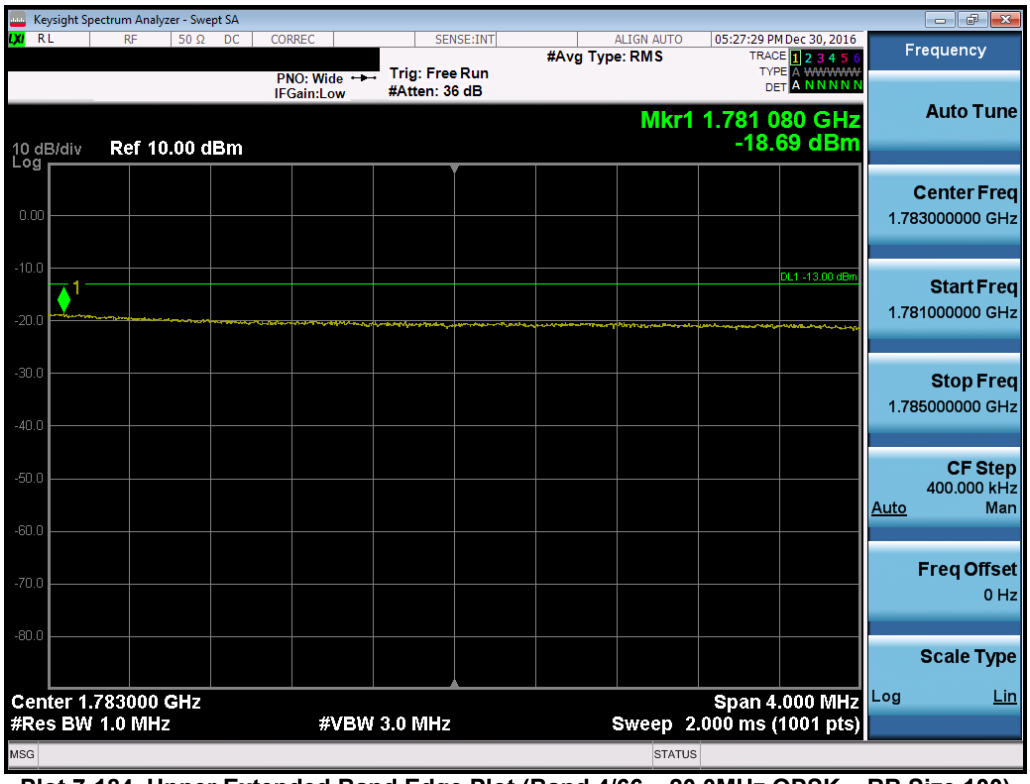


Plot 7-182. Lower Extended Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

V 6.1
12/26/2016

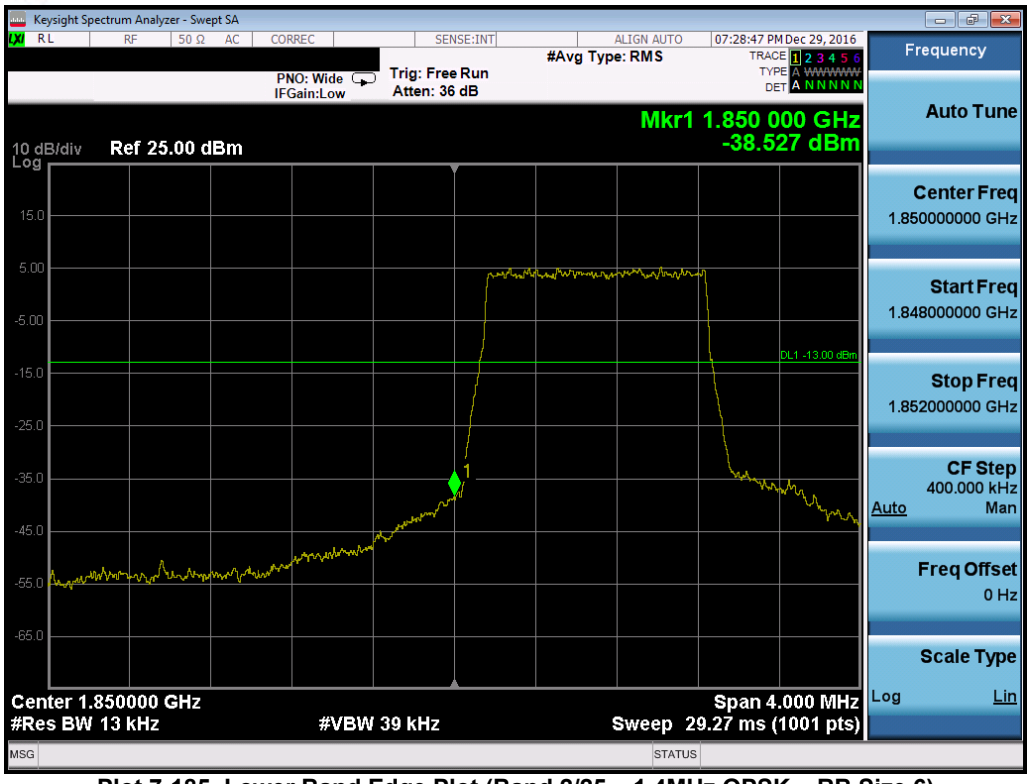


Plot 7-183. Upper Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

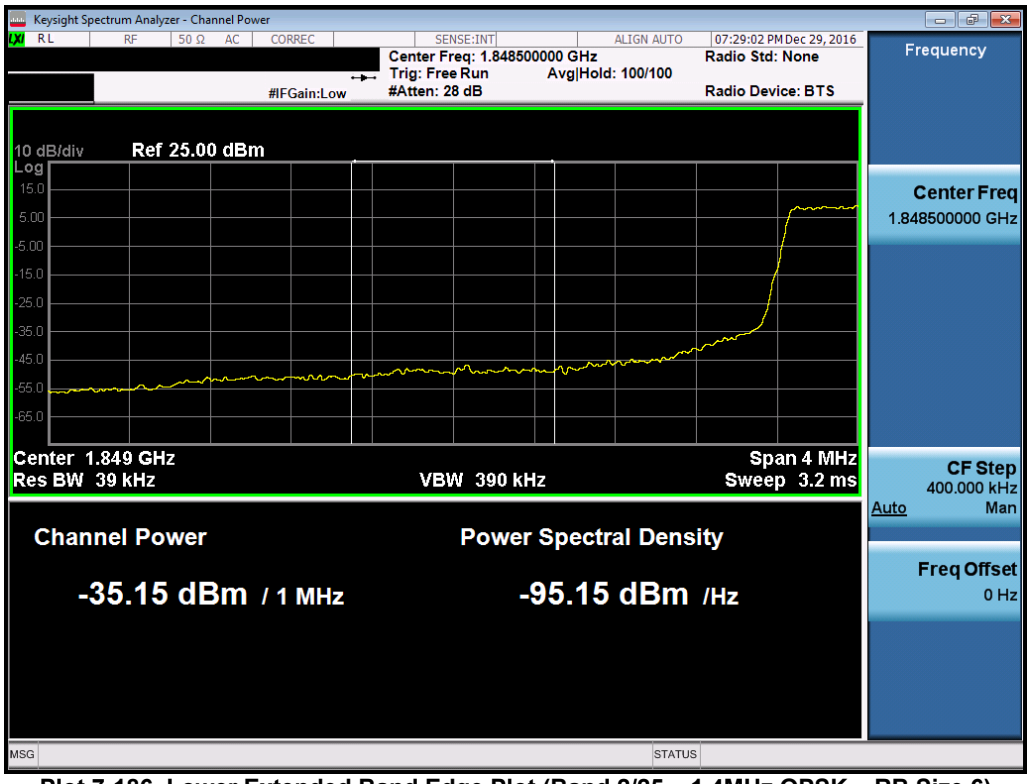


Plot 7-184. Upper Extended Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

V 6.1
12/26/2016

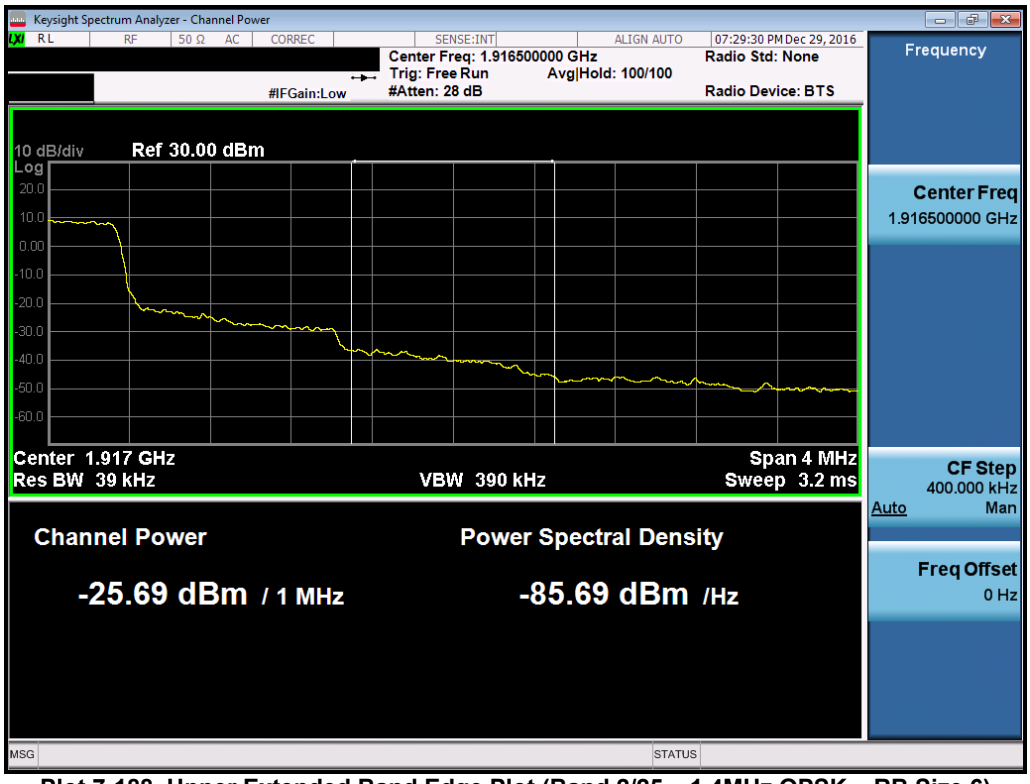


Plot 7-185. Lower Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)



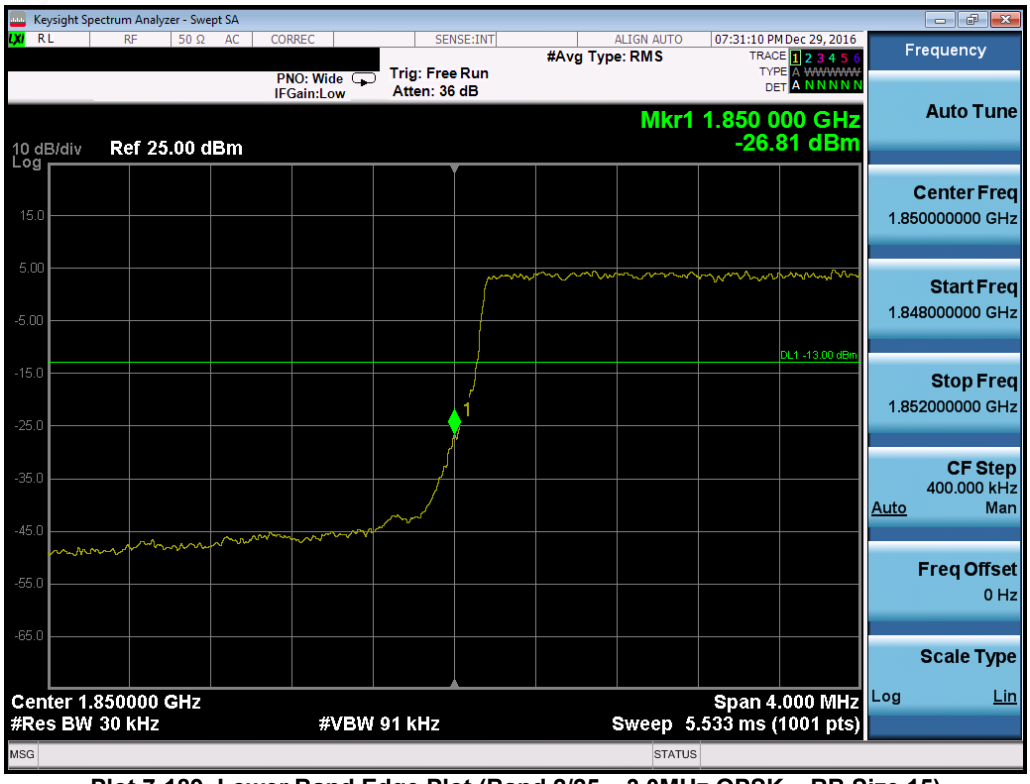
Plot 7-186. Lower Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

Plot 7-187. Upper Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

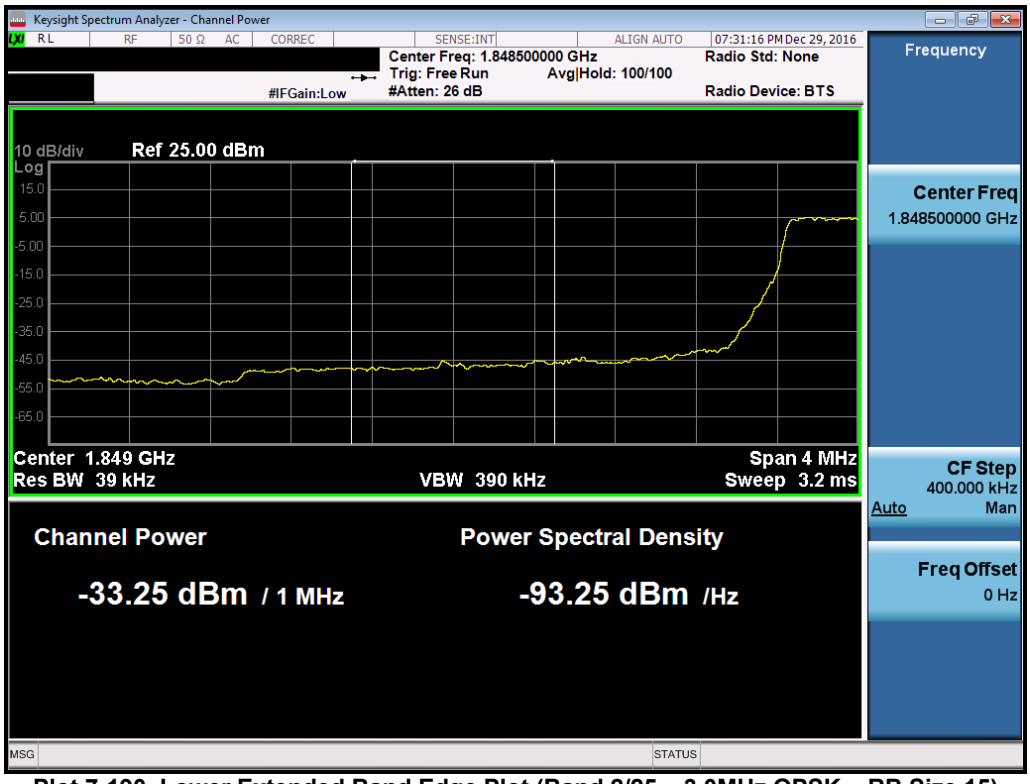


Plot 7-188. Upper Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

V 6.1
12/26/2016

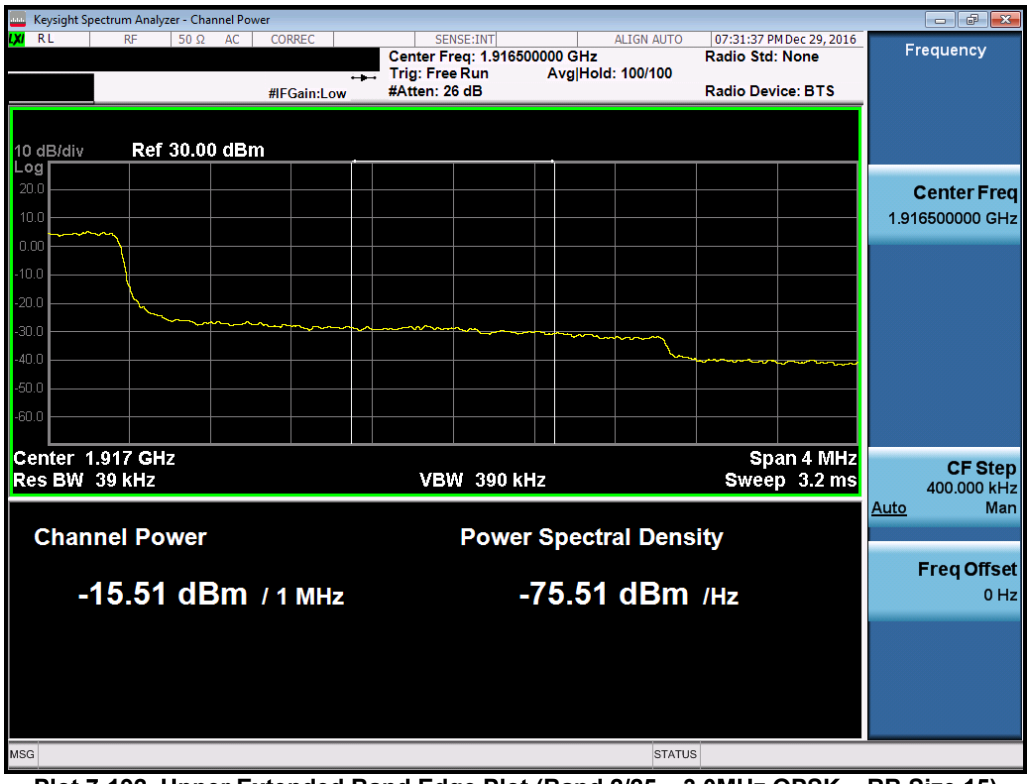


Plot 7-189. Lower Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



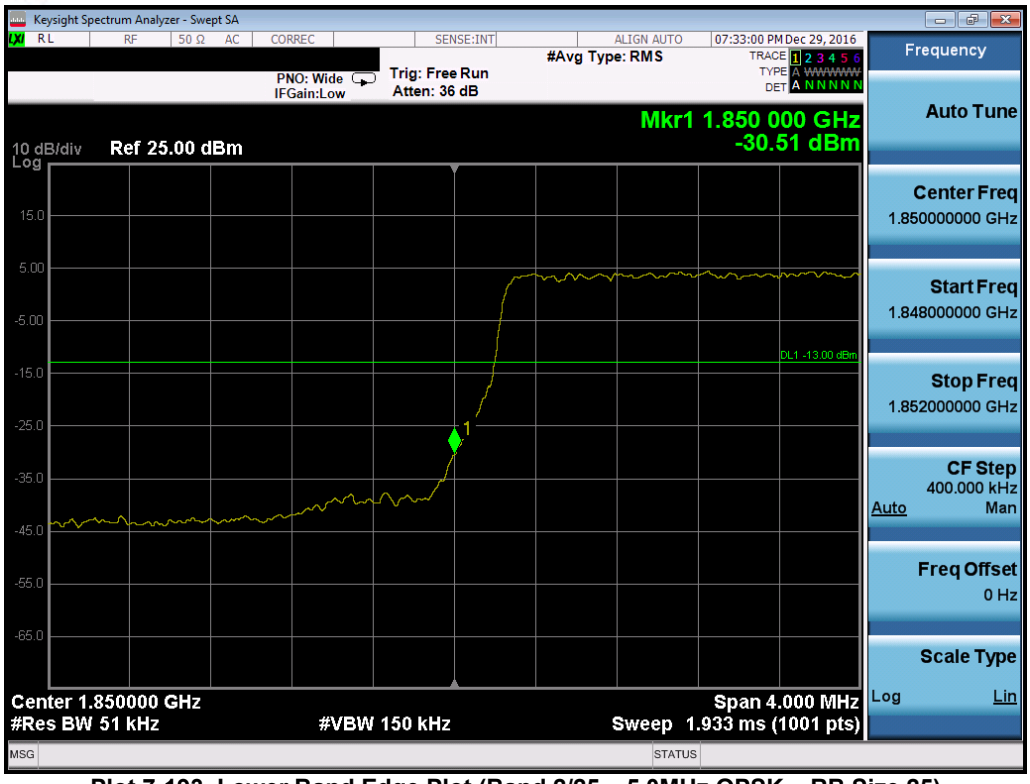
Plot 7-190. Lower Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

Plot 7-191. Upper Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

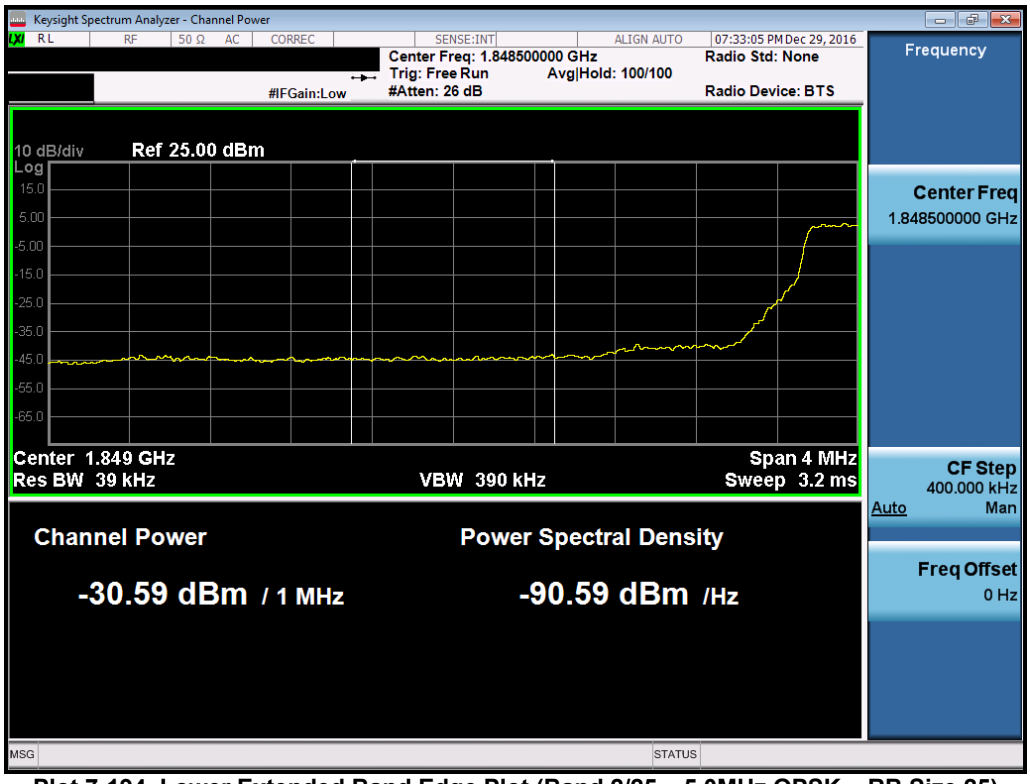


Plot 7-192. Upper Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

V 6.1
12/26/2016

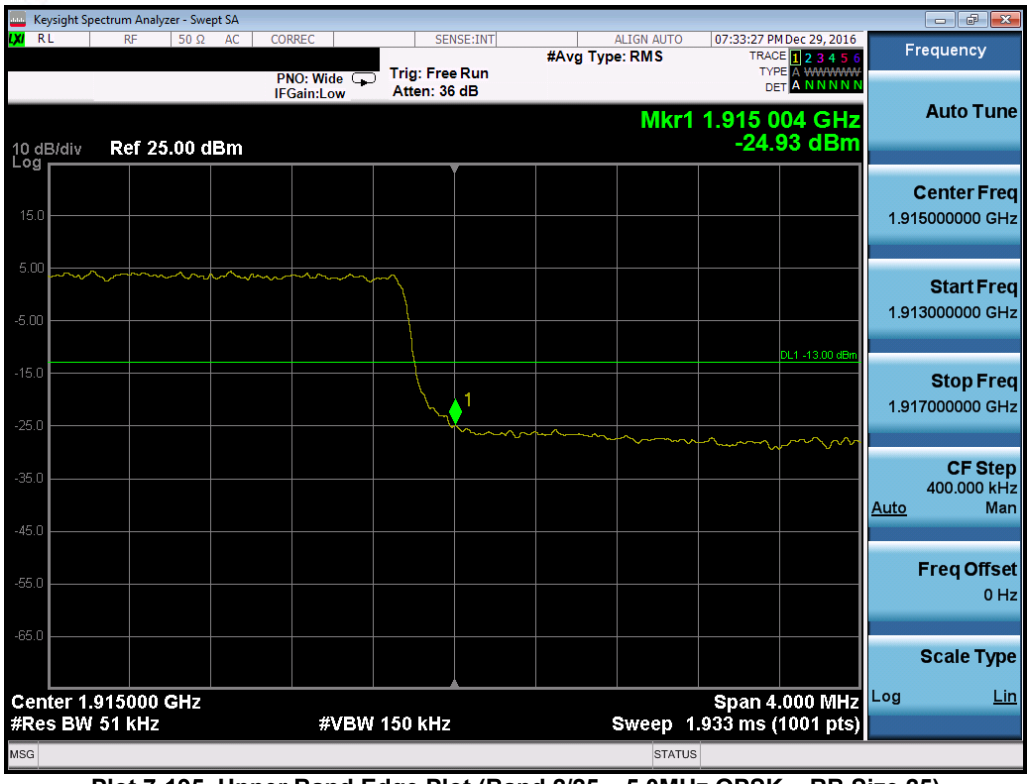


Plot 7-193. Lower Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



Plot 7-194. Lower Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

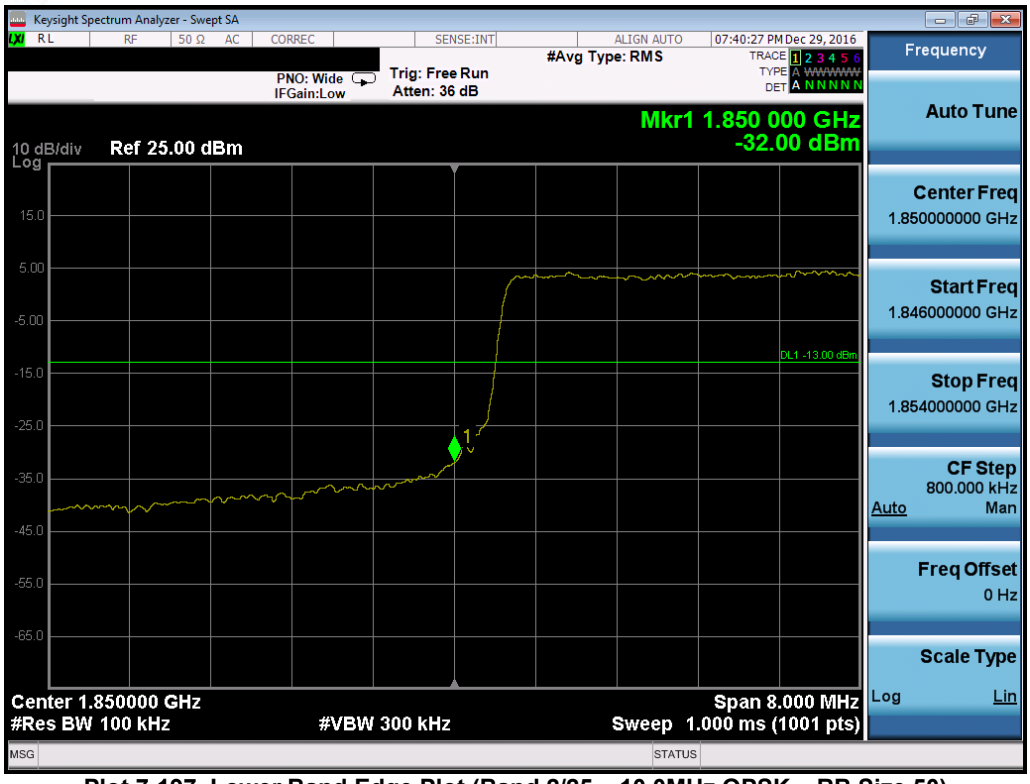
V 6.1
12/26/2016



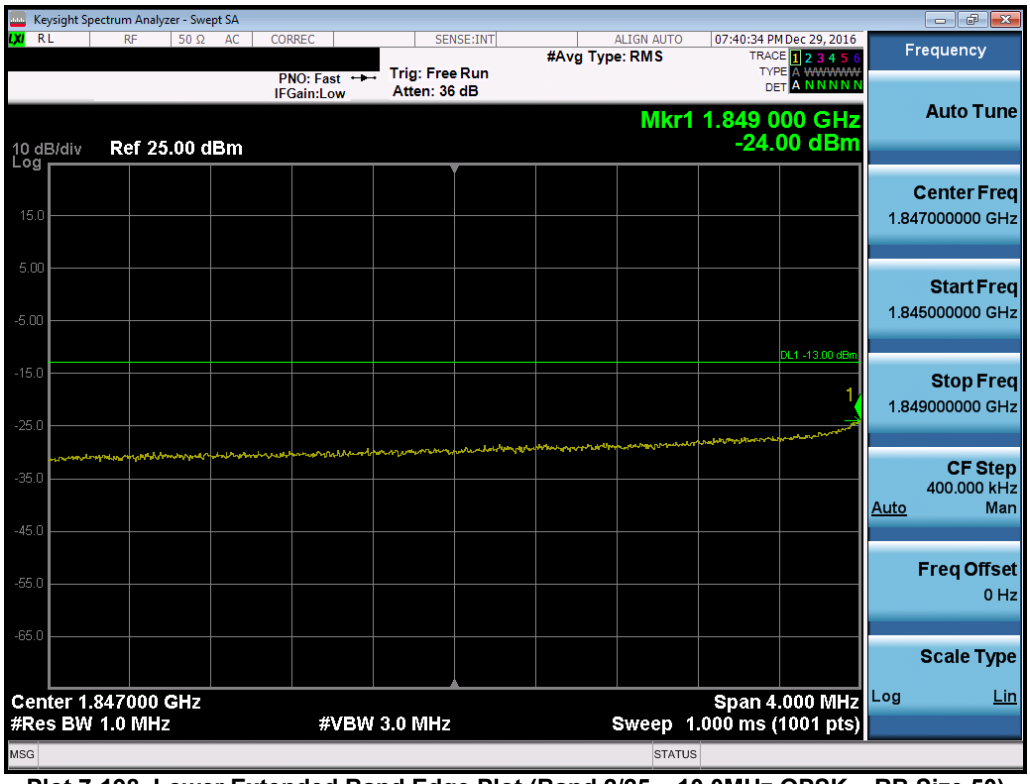
Plot 7-195. Upper Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

Plot 7-196. Upper Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

V 6.1
12/26/2016

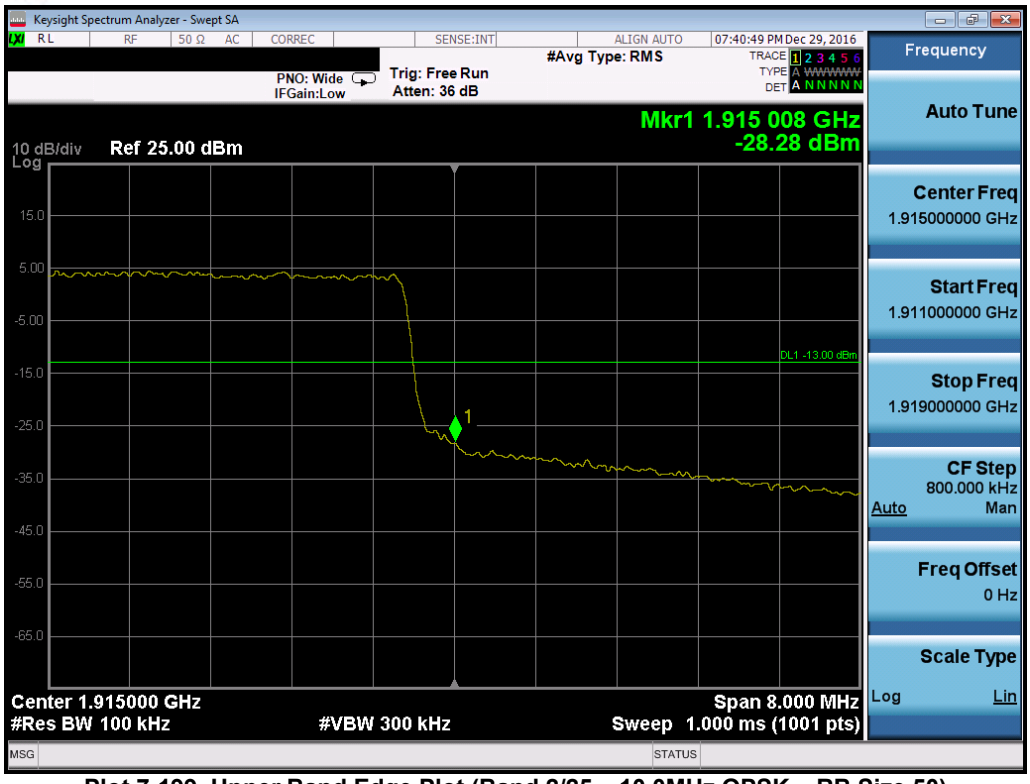


Plot 7-197. Lower Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)



Plot 7-198. Lower Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

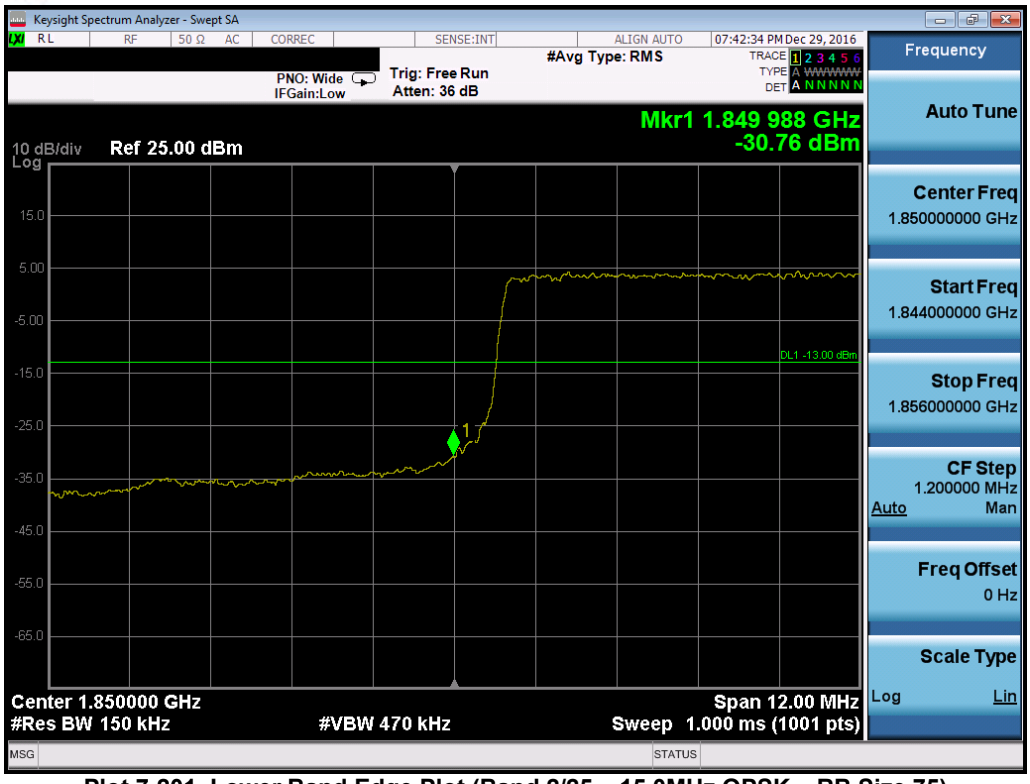
V 6.1
12/26/2016



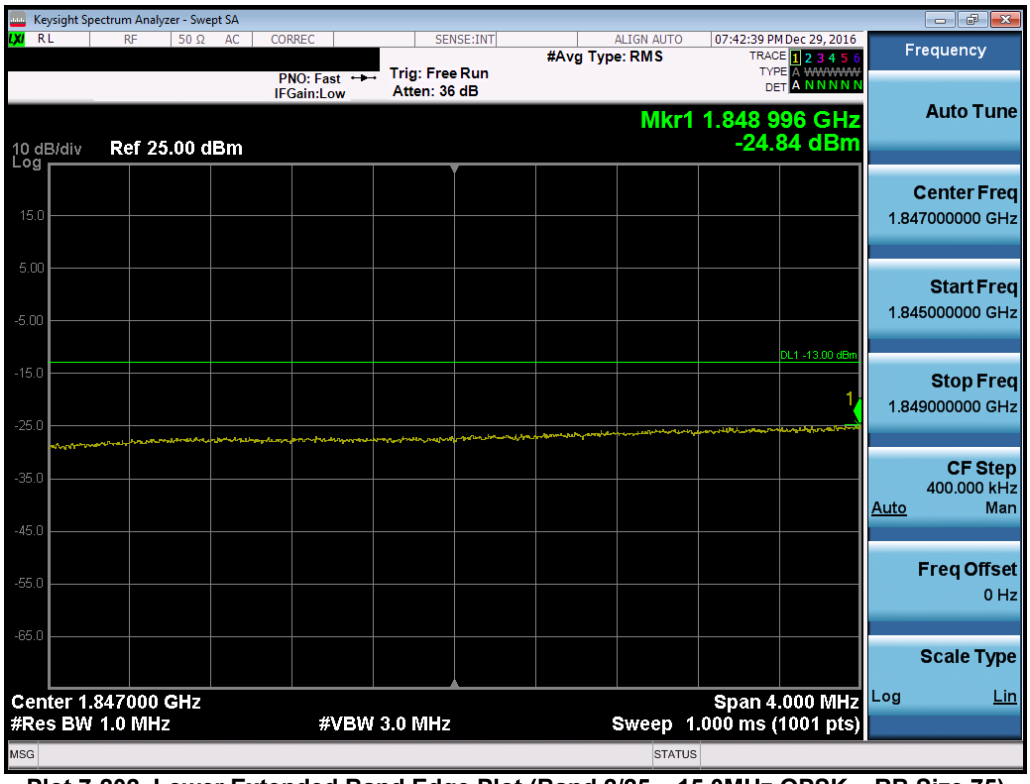
Plot 7-199. Upper Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

Plot 7-200. Upper Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

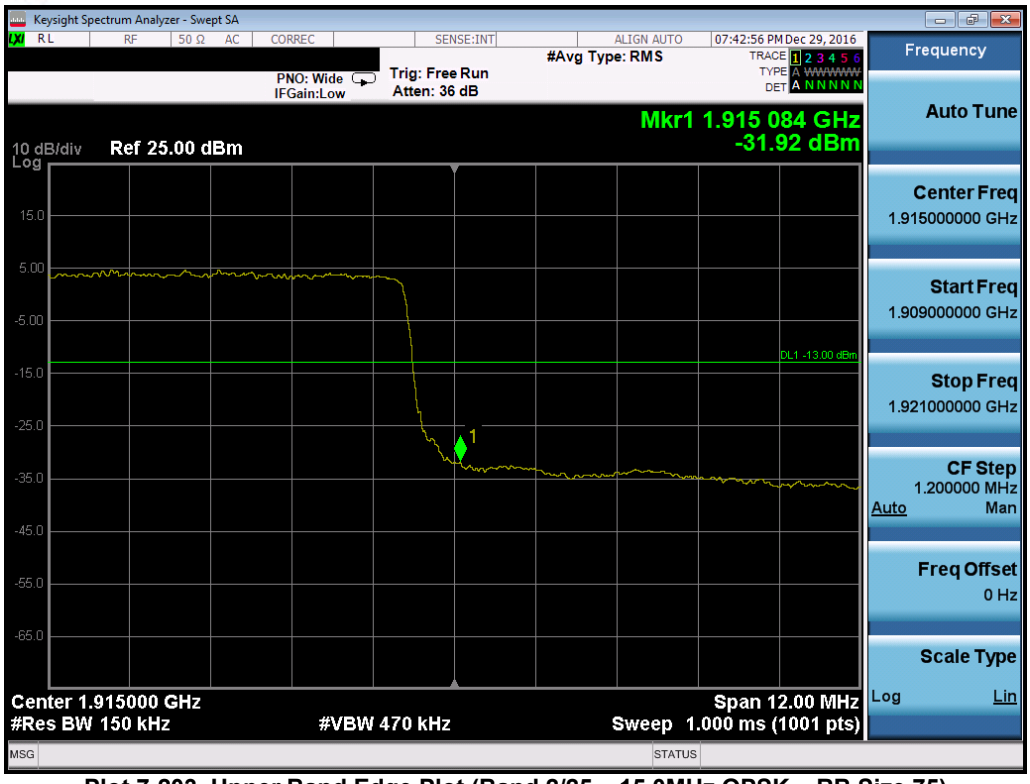


Plot 7-201. Lower Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

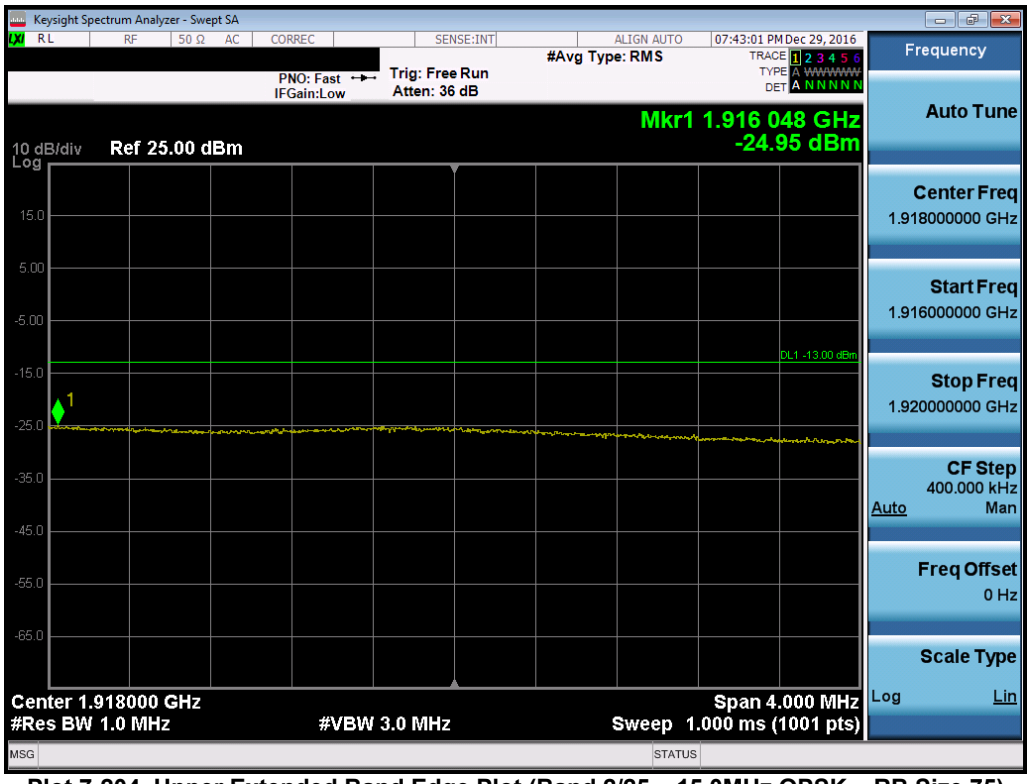


Plot 7-202. Lower Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

V 6.1
12/26/2016

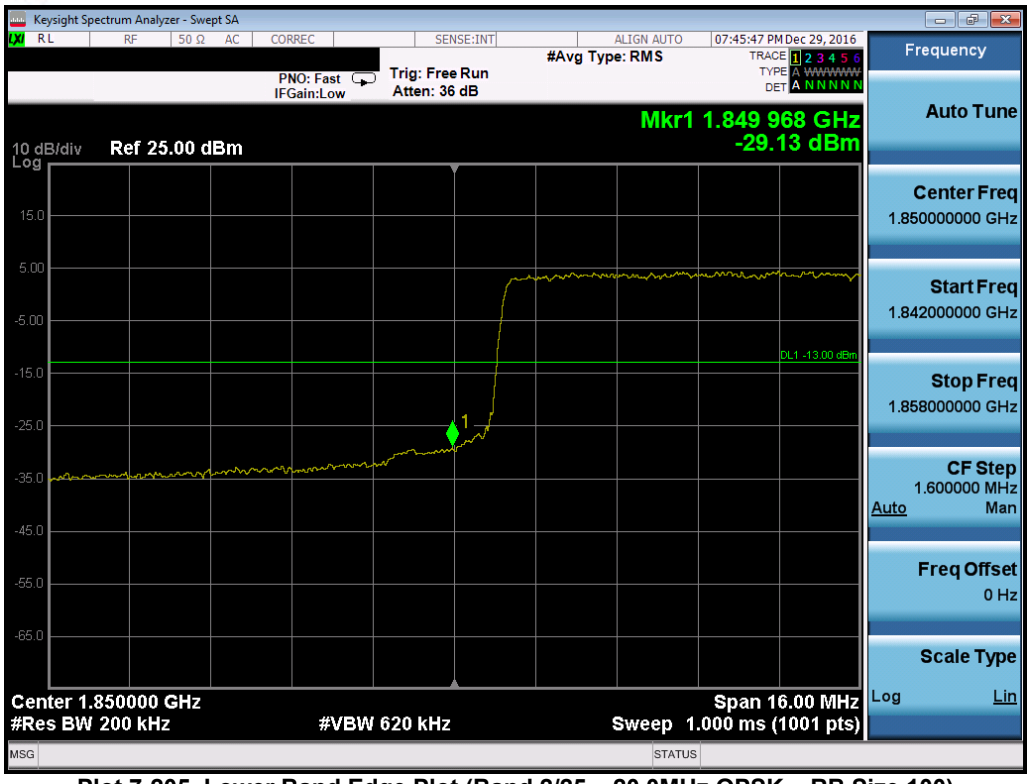


Plot 7-203. Upper Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

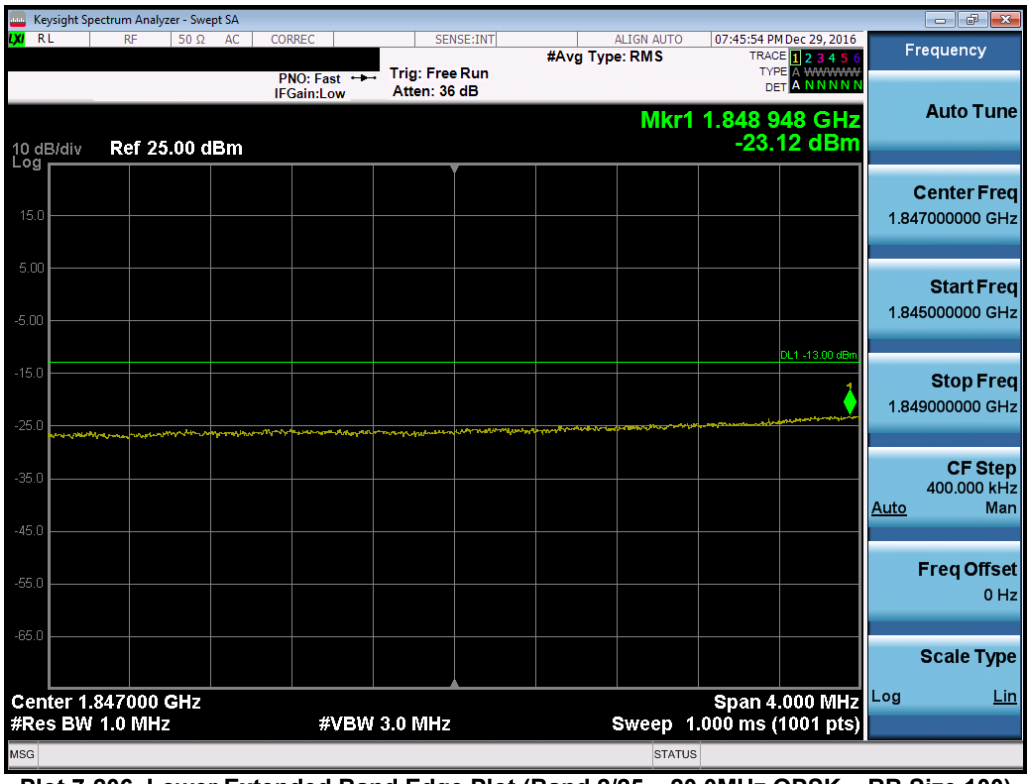


Plot 7-204. Upper Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

V 6.1
12/26/2016



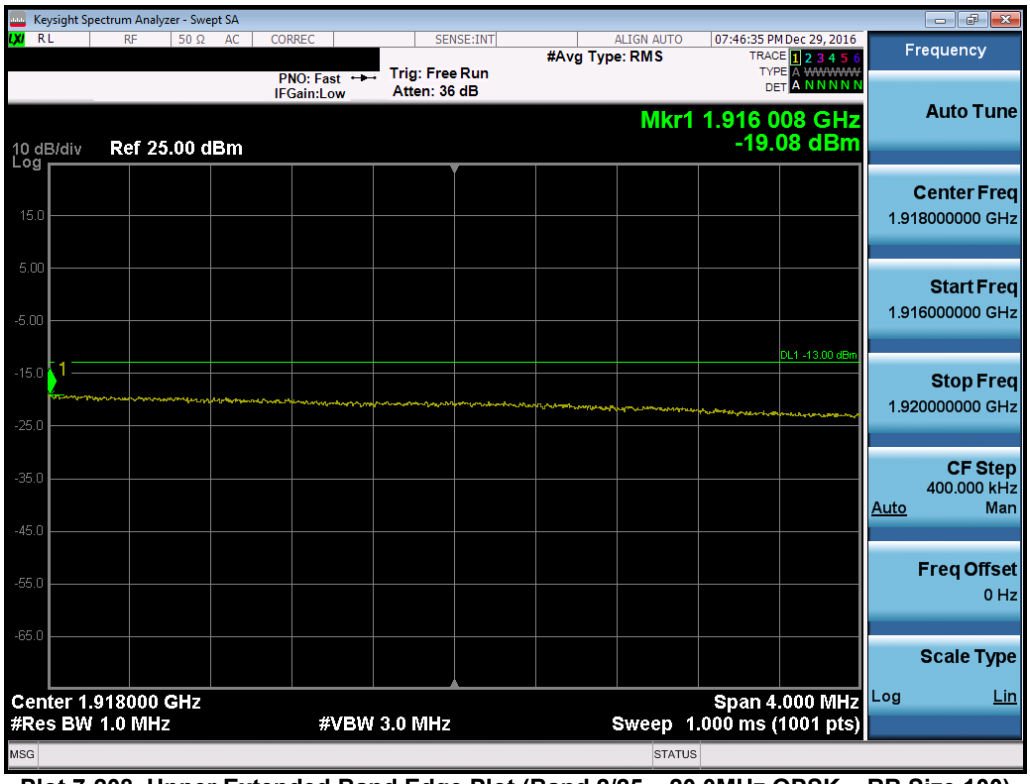
Plot 7-205. Lower Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-206. Lower Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

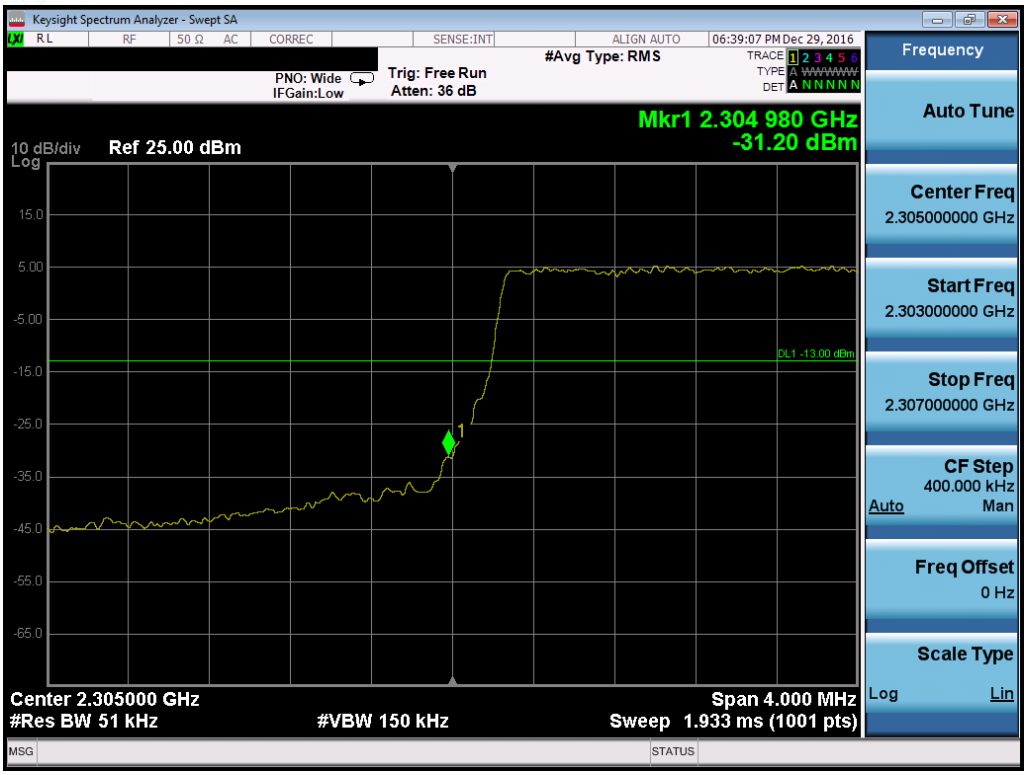
V 6.1
12/26/2016

Plot 7-207. Upper Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

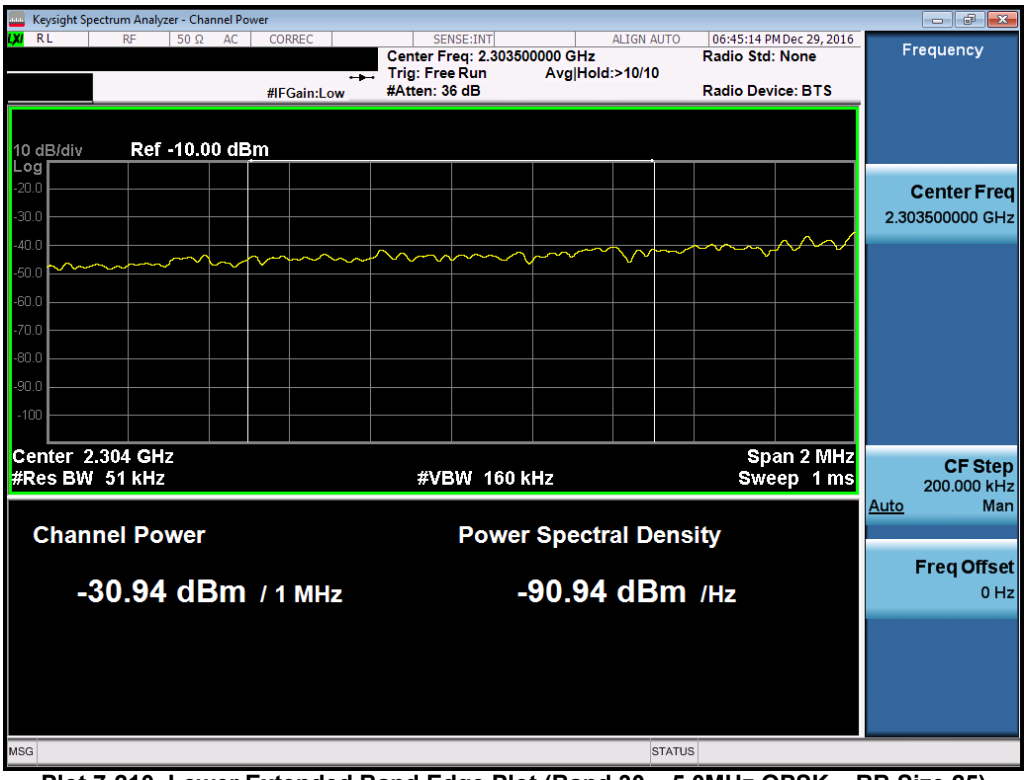


Plot 7-208. Upper Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

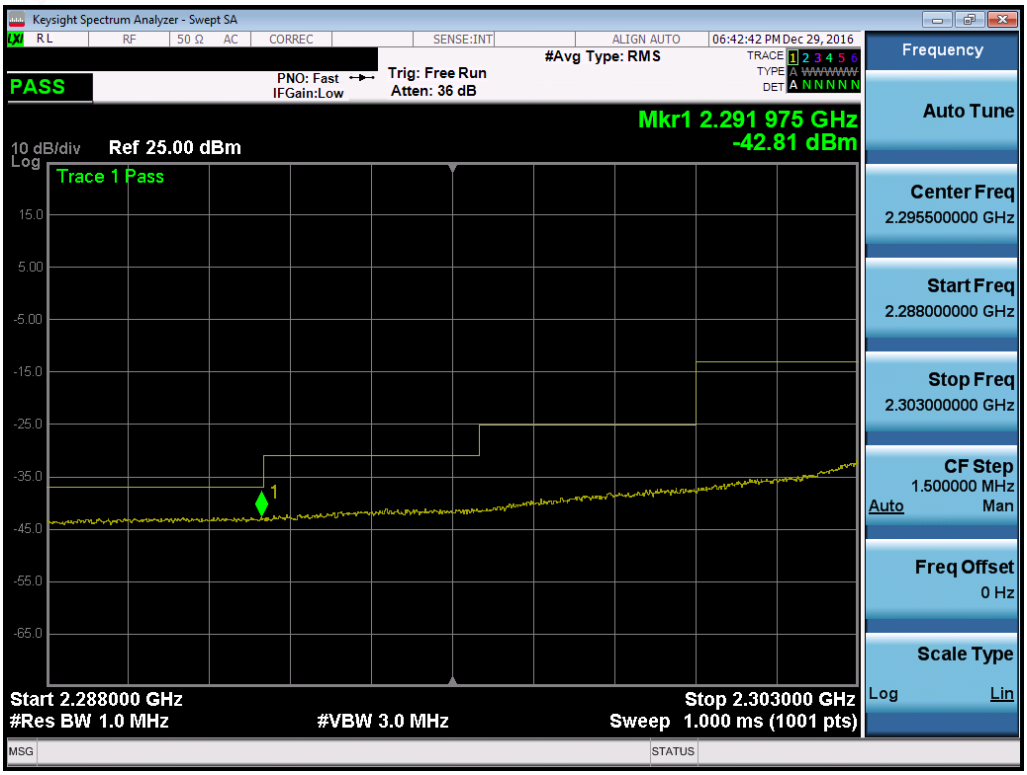
V 6.1
12/26/2016



Plot 7-209. Lower Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

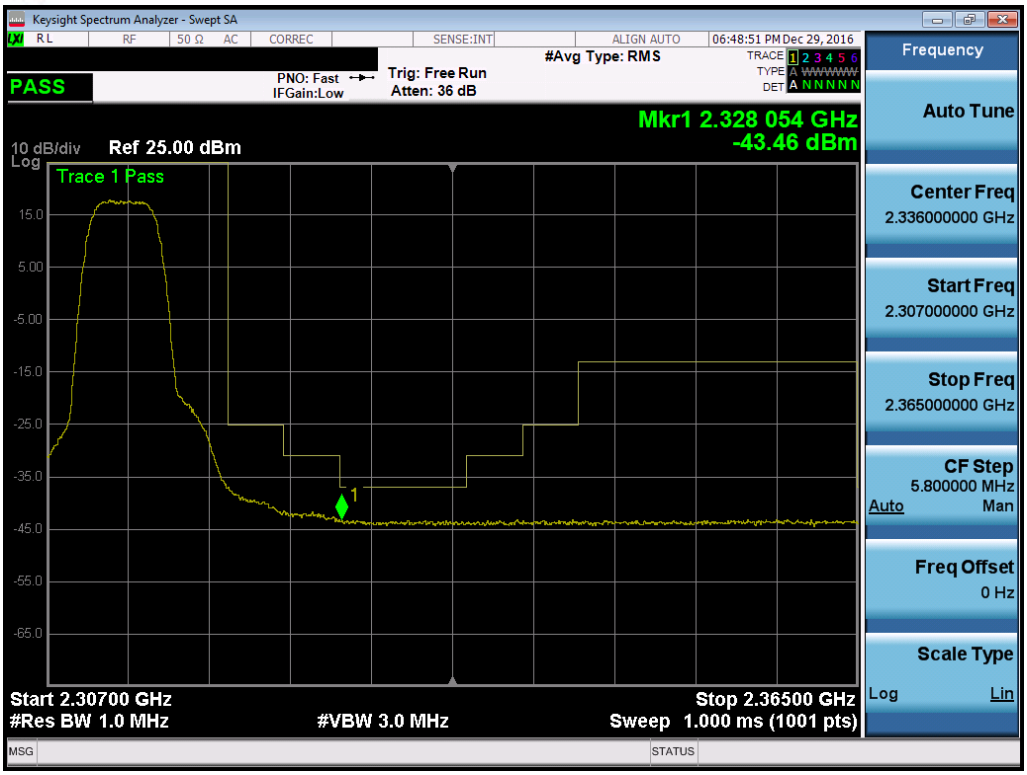


Plot 7-210. Lower Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

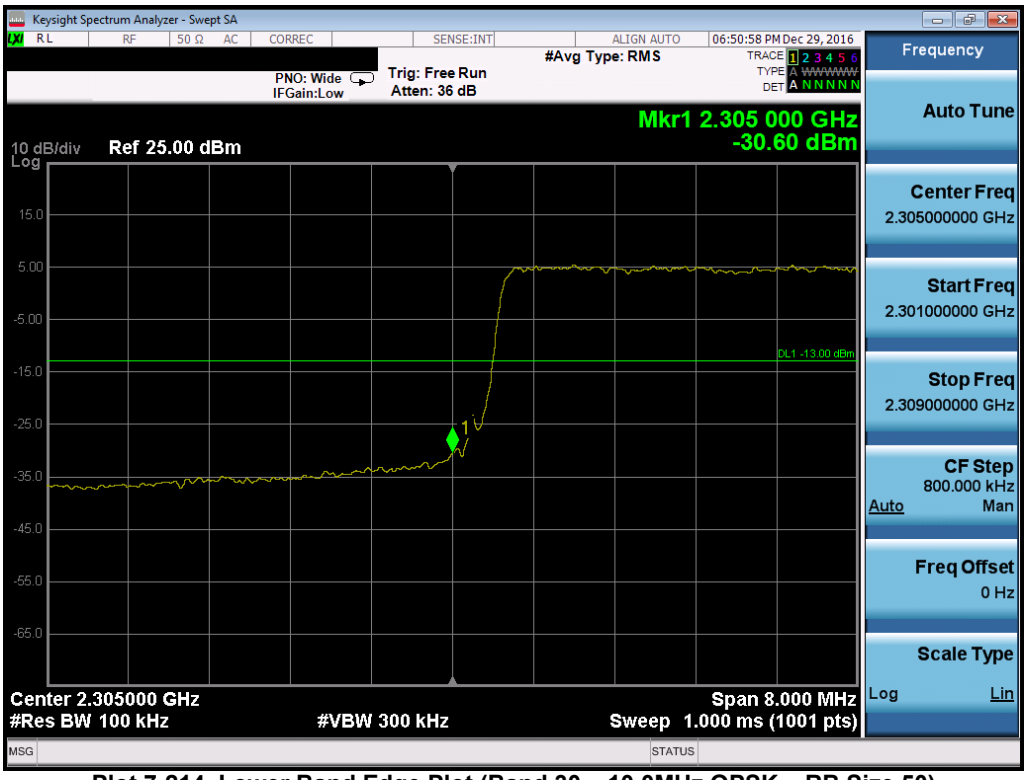


Plot 7-211. Lower Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

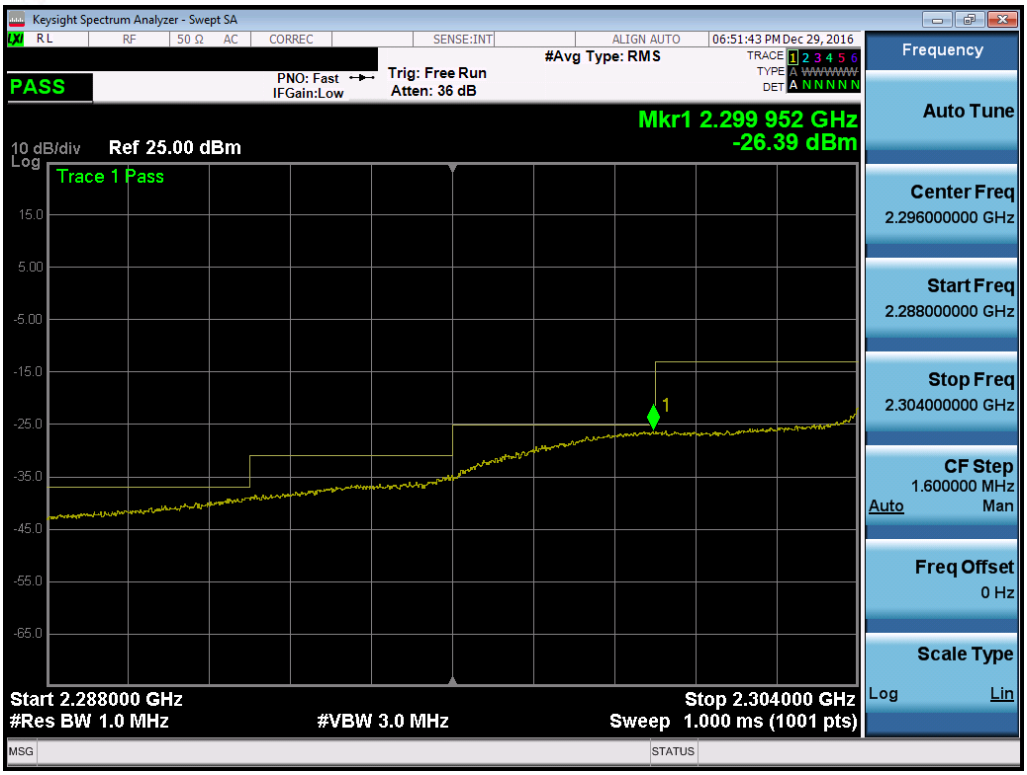
Plot 7-212. Upper Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)



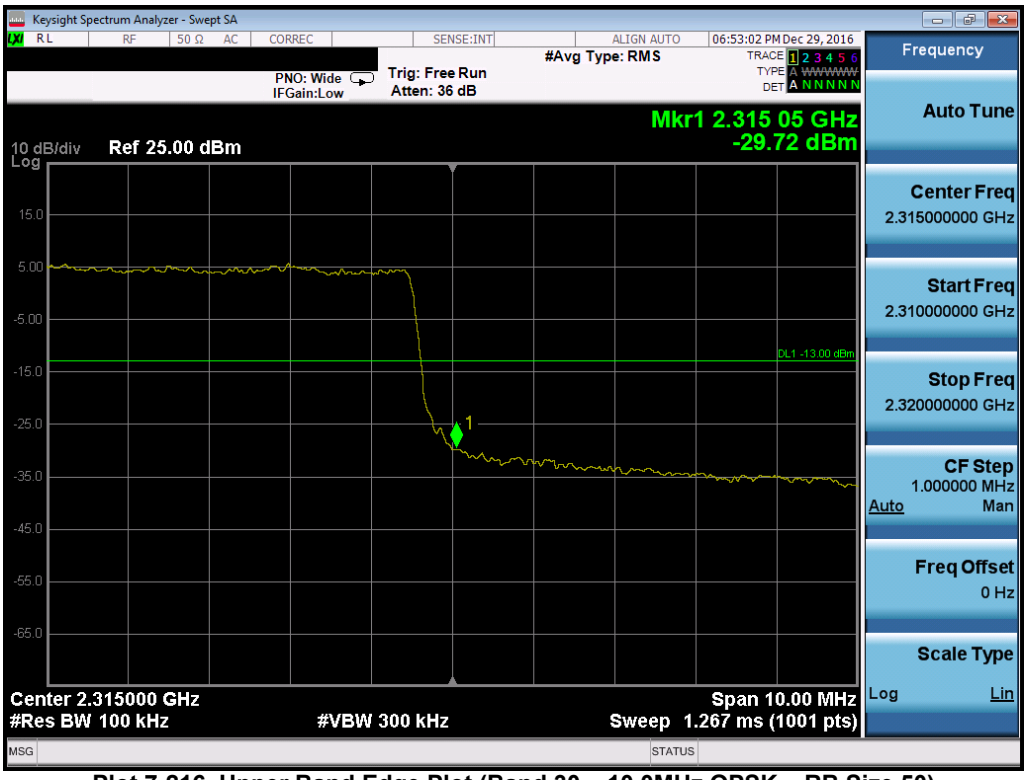
Plot 7-213. Upper Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)



Plot 7-214. Lower Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

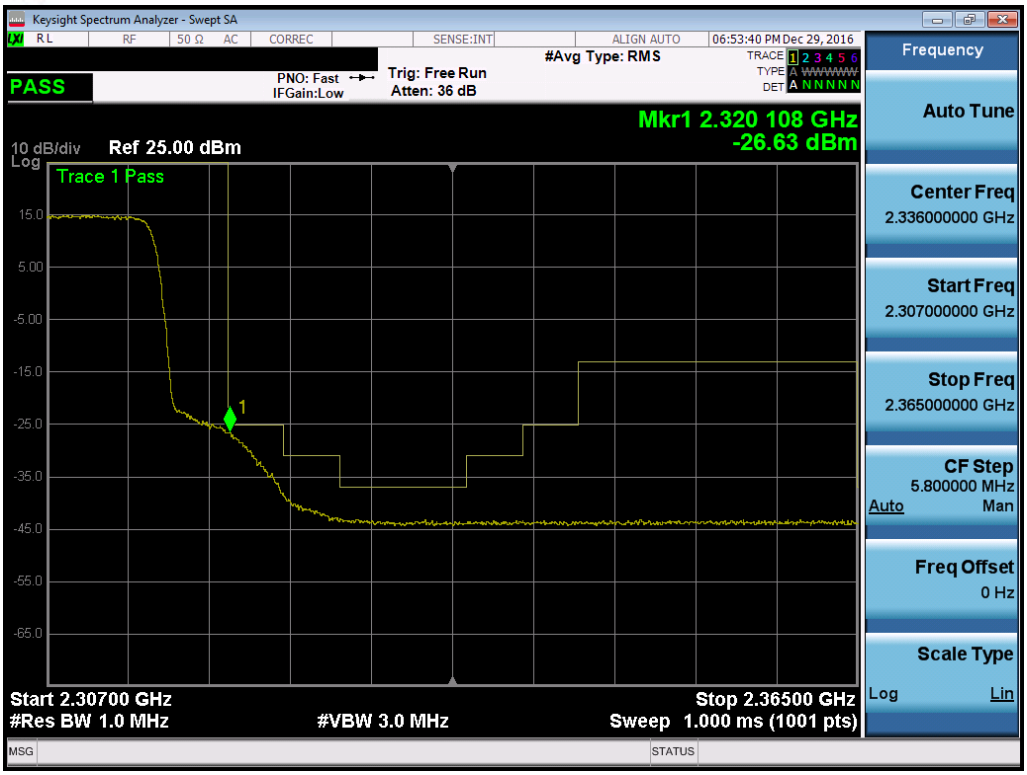


Plot 7-215. Lower Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

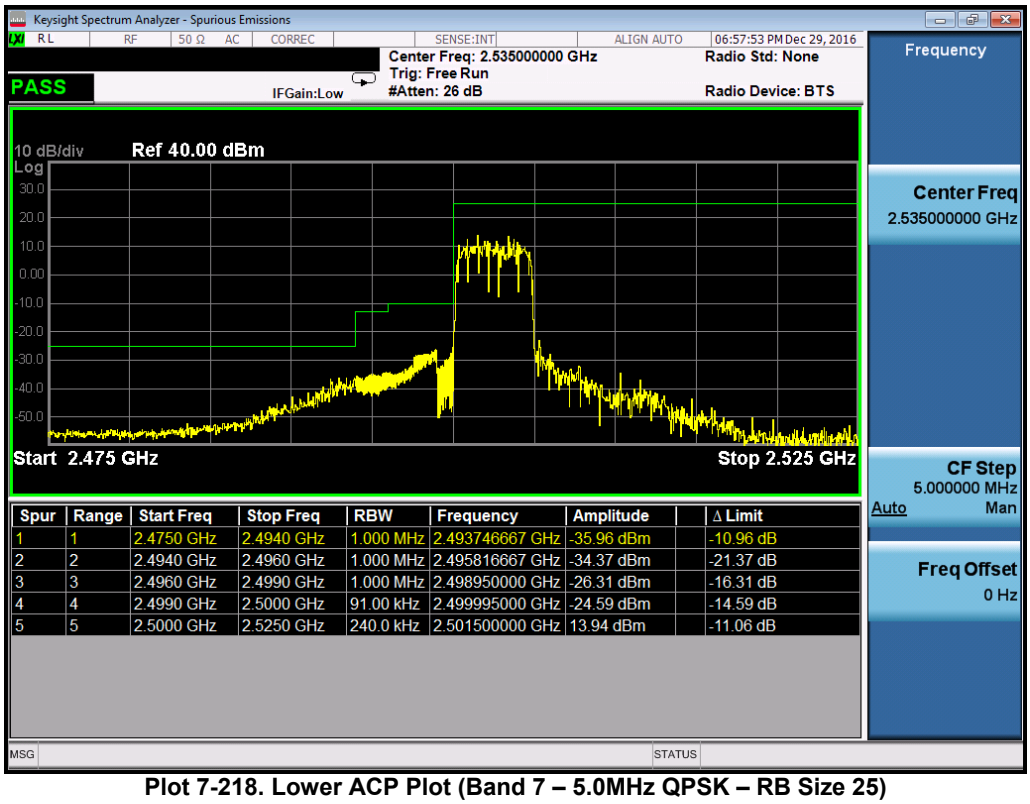


Plot 7-216. Upper Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

V 6.1
12/26/2016

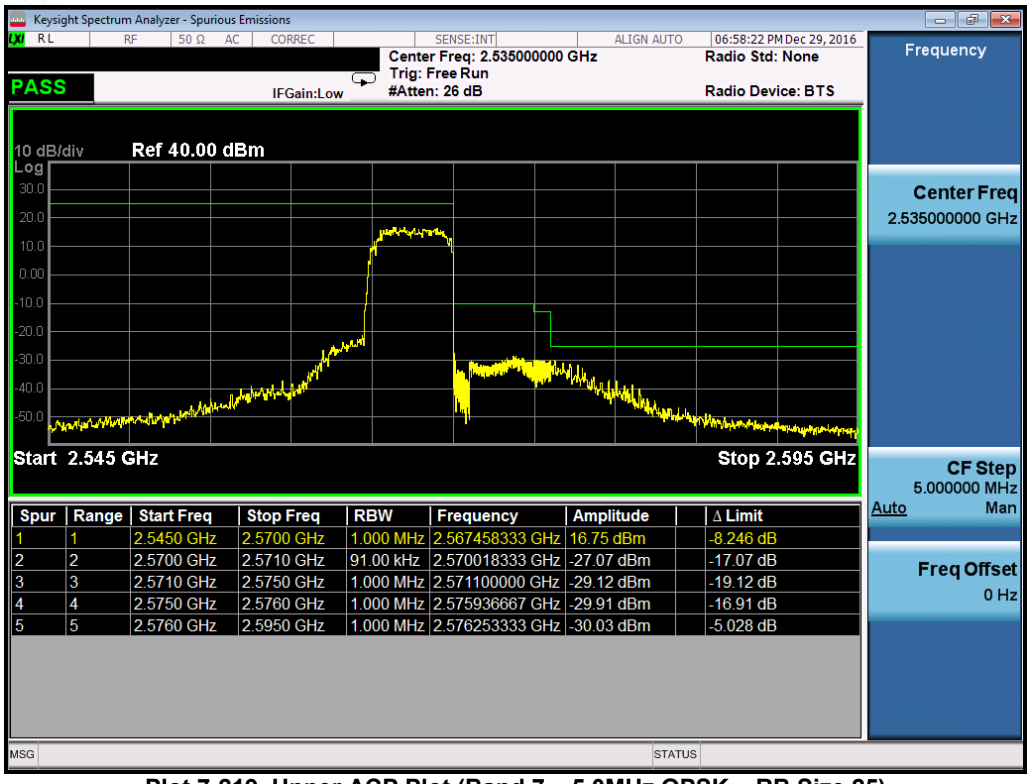


Plot 7-217. Upper Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)



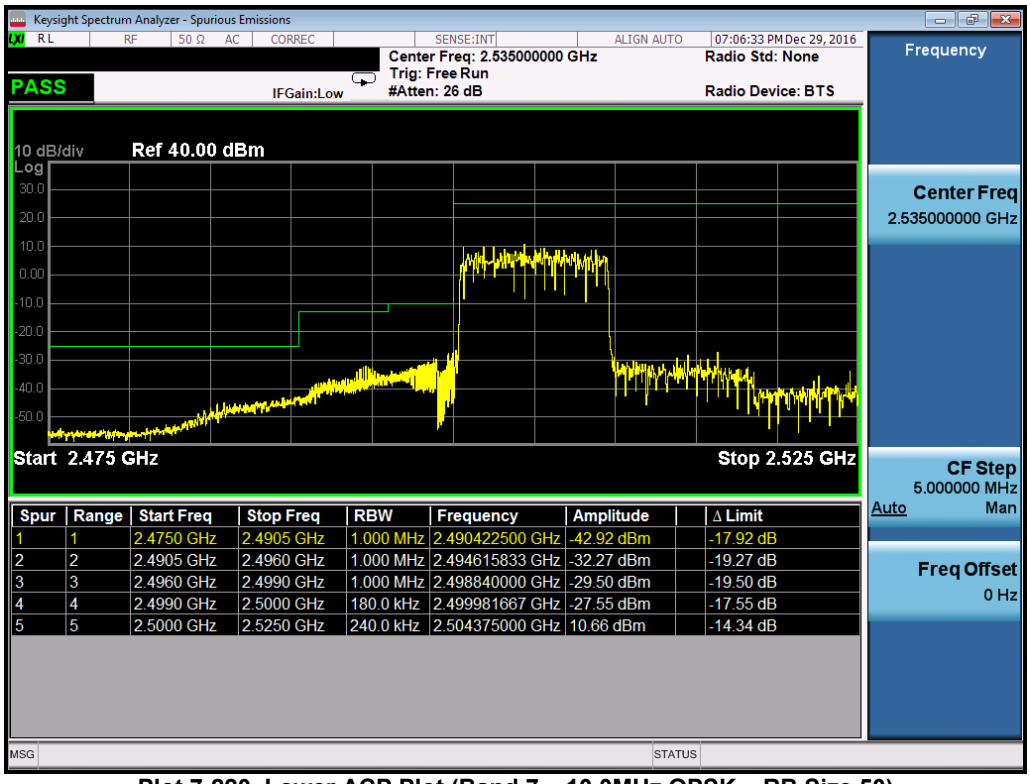
Plot 7-218. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

V 6.1
12/26/2016



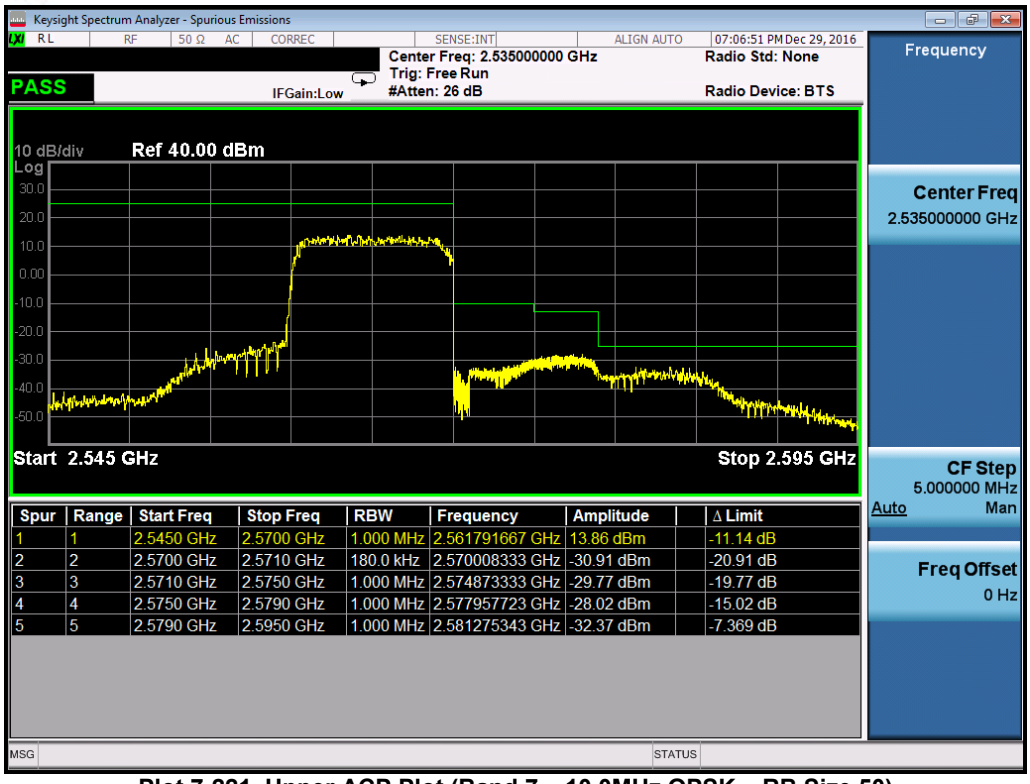
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.567458333 GHz	16.75 dBm	-8.246 dB
2	2	2.5700 GHz	2.5710 GHz	91.00 kHz	2.570018333 GHz	-27.07 dBm	-17.07 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571100000 GHz	-29.12 dBm	-19.12 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575936667 GHz	-29.91 dBm	-16.91 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576253333 GHz	-30.03 dBm	-5.028 dB

Plot 7-219. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



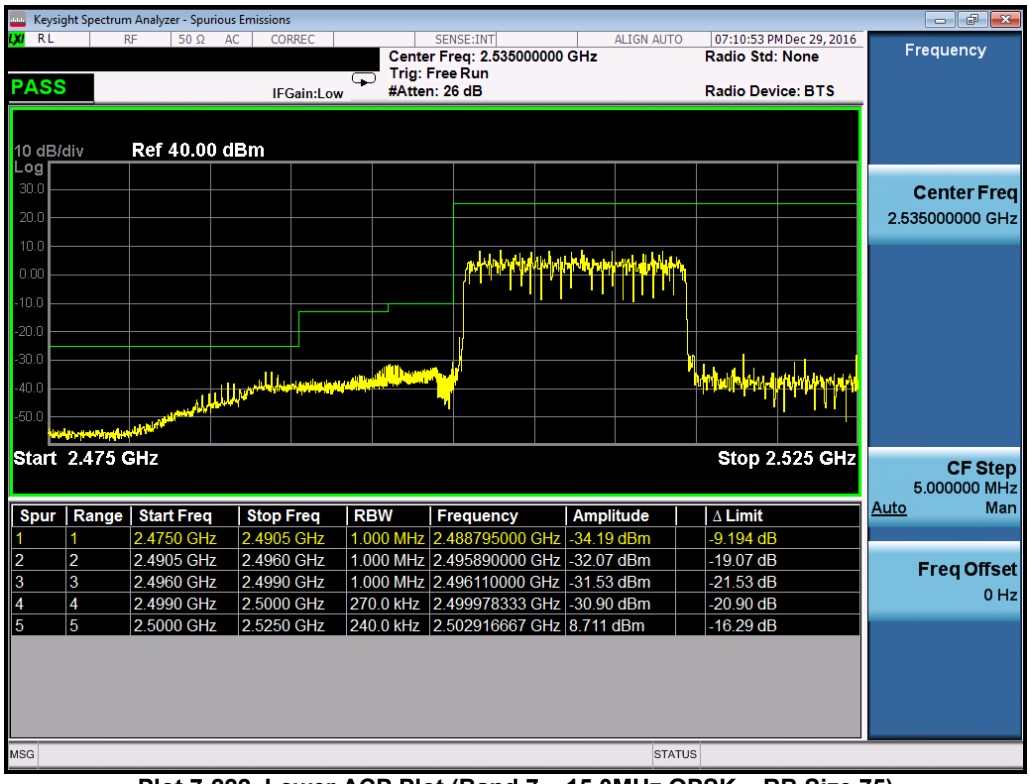
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490422500 GHz	-42.92 dBm	-17.92 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.494615833 GHz	-32.27 dBm	-19.27 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498840000 GHz	-29.50 dBm	-19.50 dB
4	4	2.4990 GHz	2.5000 GHz	180.0 kHz	2.499981667 GHz	-27.55 dBm	-17.55 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.504375000 GHz	10.66 dBm	-14.34 dB

Plot 7-220. 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	2.561791667 GHz	13.86 dBm	-11.14 dB
2	2	2.5700 GHz	2.5710 GHz	180.0 kHz	2.570008333 GHz	-30.91 dBm	-20.91 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.574873333 GHz	-29.77 dBm	-19.77 dB
4	4	2.5750 GHz	2.5790 GHz	1.000 MHz	2.577957723 GHz	-28.02 dBm	-15.02 dB
5	5	2.5790 GHz	2.5950 GHz	1.000 MHz	2.581275343 GHz	-32.37 dBm	-7.369 dB

Plot 7-221. 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	2.488795000 GHz	-34.19 dBm	-9.194 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495890000 GHz	-32.07 dBm	-19.07 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.496110000 GHz	-31.53 dBm	-21.53 dB
4	4	2.4990 GHz	2.5000 GHz	270.0 kHz	2.499978333 GHz	-30.90 dBm	-20.90 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.502916667 GHz	8.711 dBm	-16.29 dB

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

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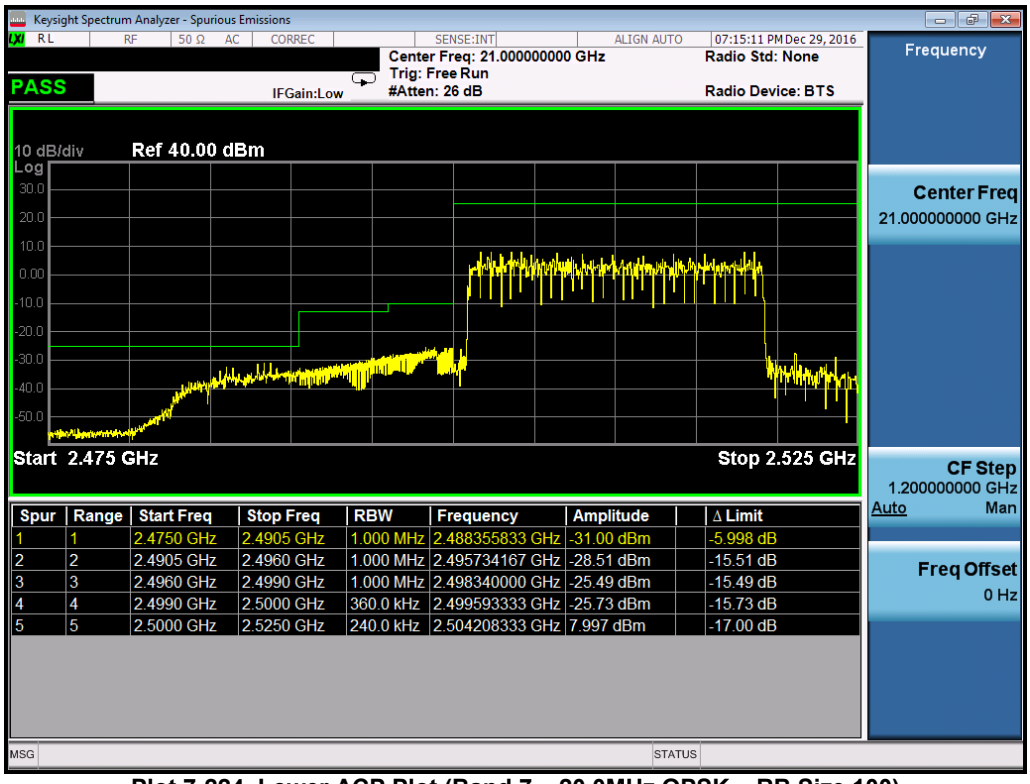
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.565958333 GHz	11.90 dBm	-13.10 dB
2	2	2.5700 GHz	2.5710 GHz	270.0 kHz	2.570775000 GHz	-24.25 dBm	-14.25 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571040000 GHz	-23.31 dBm	-13.31 dB
4	4	2.5750 GHz	2.5835 GHz	1.000 MHz	2.576538353 GHz	-28.66 dBm	-15.66 dB
5	5	2.5835 GHz	2.5950 GHz	1.000 MHz	2.584390560 GHz	-31.98 dBm	-6.976 dB

Plot 7-223. 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	2.488355833 GHz	-31.00 dBm	-5.998 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495734167 GHz	-28.51 dBm	-15.51 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498340000 GHz	-25.49 dBm	-15.49 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499593333 GHz	-25.73 dBm	-15.73 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.504208333 GHz	7.997 dBm	-17.00 dB

Plot 7-224. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.561708333 GHz	11.01 dBm	-13.99 dB
2	2	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570891667 GHz	-25.75 dBm	-15.75 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571066667 GHz	-25.06 dBm	-15.06 dB
4	4	2.5750 GHz	2.5880 GHz	1.000 MHz	2.583726293 GHz	-30.82 dBm	-17.82 dB
5	5	2.5880 GHz	2.5950 GHz	1.000 MHz	2.588739520 GHz	-38.17 dBm	-13.17 dB

Plot 7-225. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

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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 D01 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.

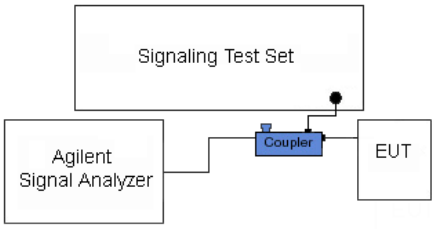
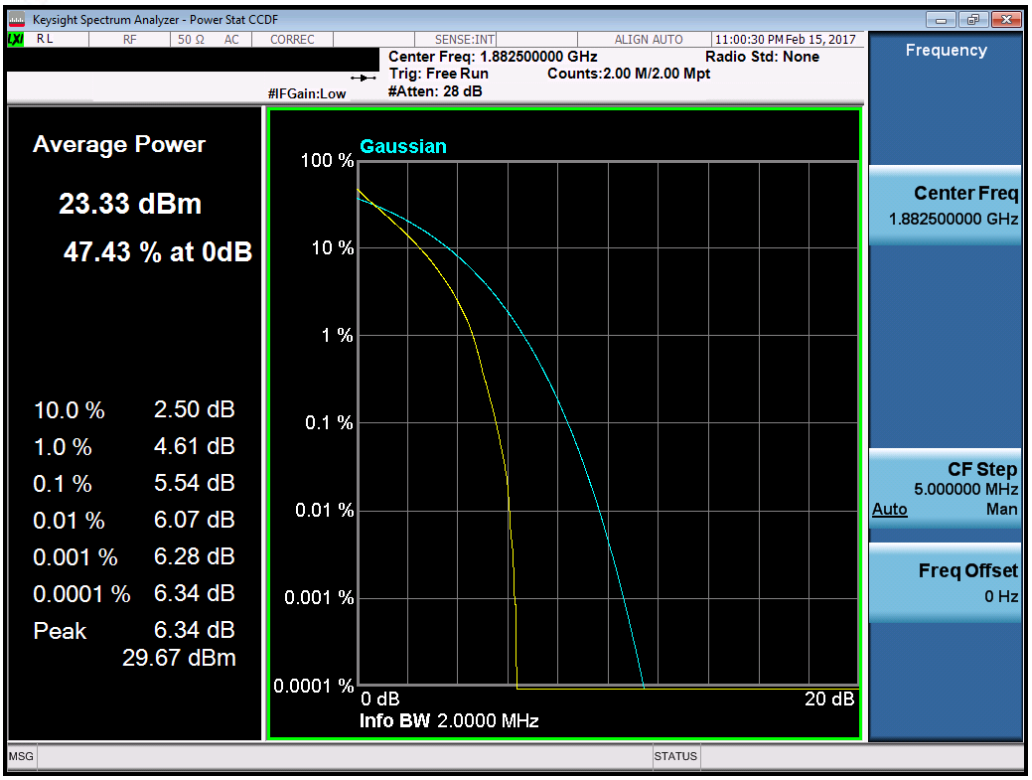


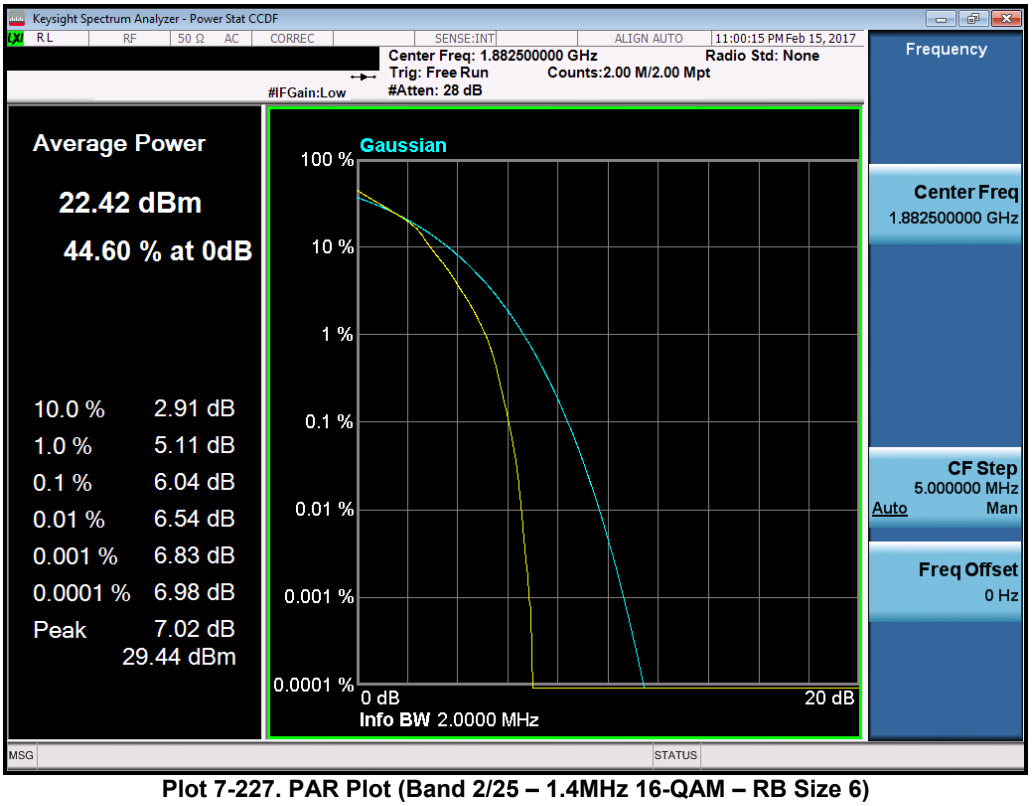
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

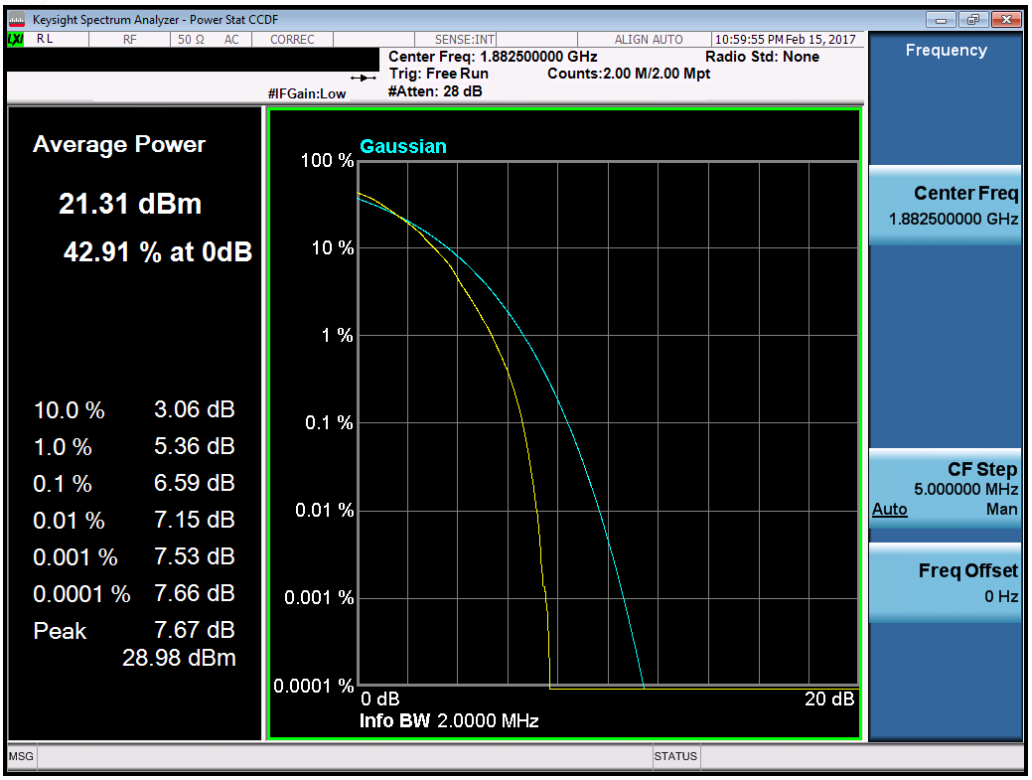
None



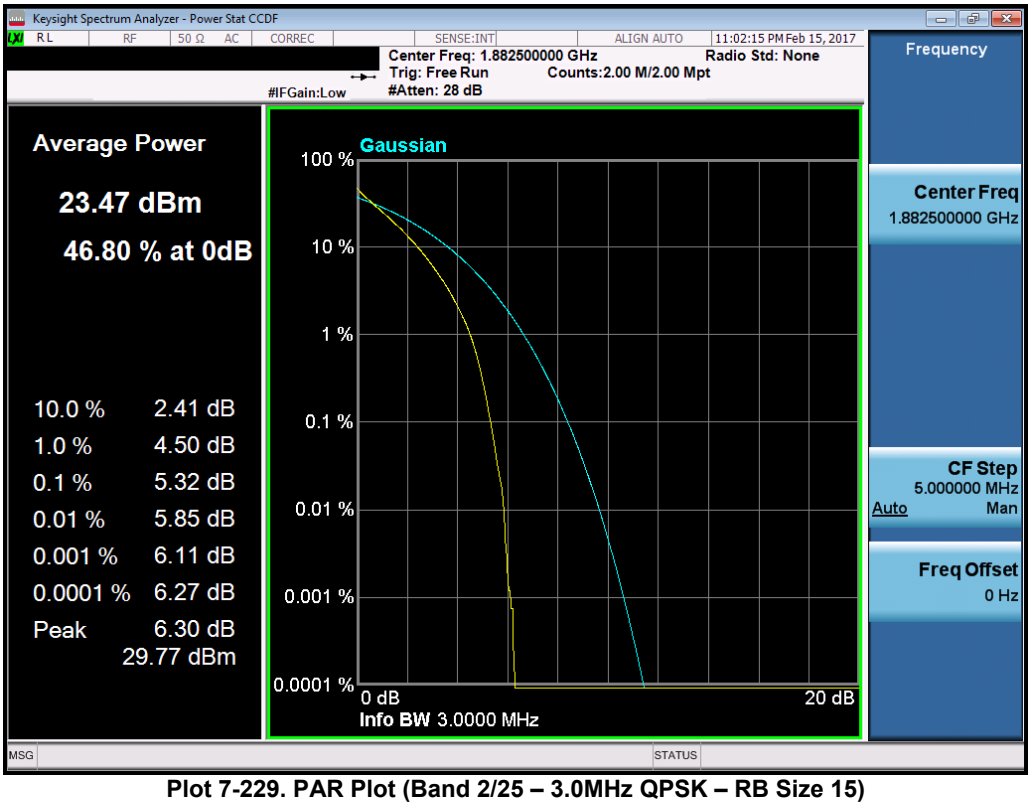
Plot 7-226. PAR Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)



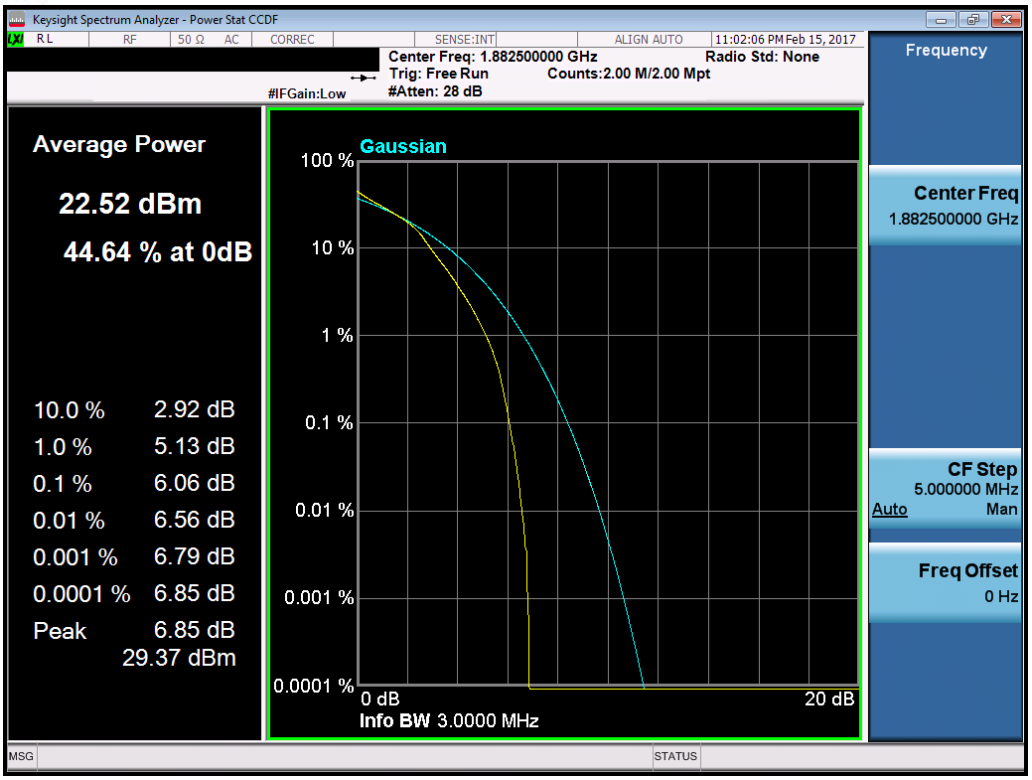
Plot 7-227. PAR Plot (Band 2/25 – 1.4MHz 16-QAM – RB Size 6)



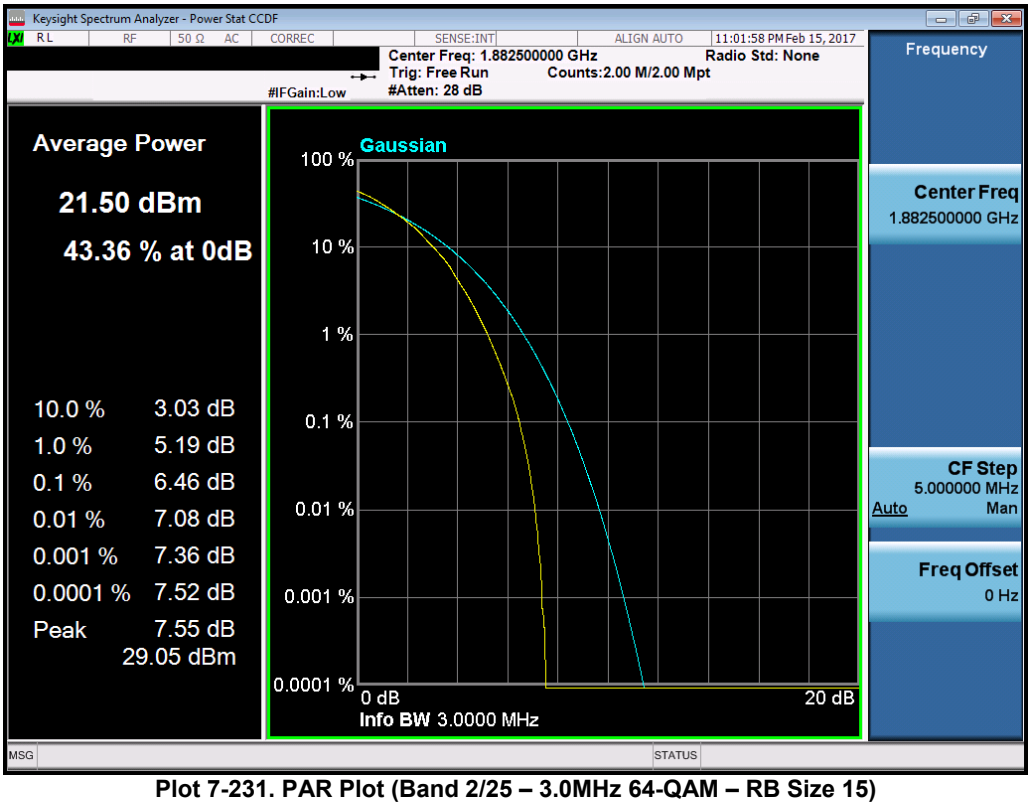
Plot 7-228. PAR Plot (Band 2/25 – 1.4MHz 64-QAM – RB Size 6)



Plot 7-229. PAR Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



Plot 7-230. PAR Plot (Band 2/25 – 3.0MHz 16-QAM – RB Size 15)



Plot 7-231. PAR Plot (Band 2/25 – 3.0MHz 64-QAM – RB Size 15)

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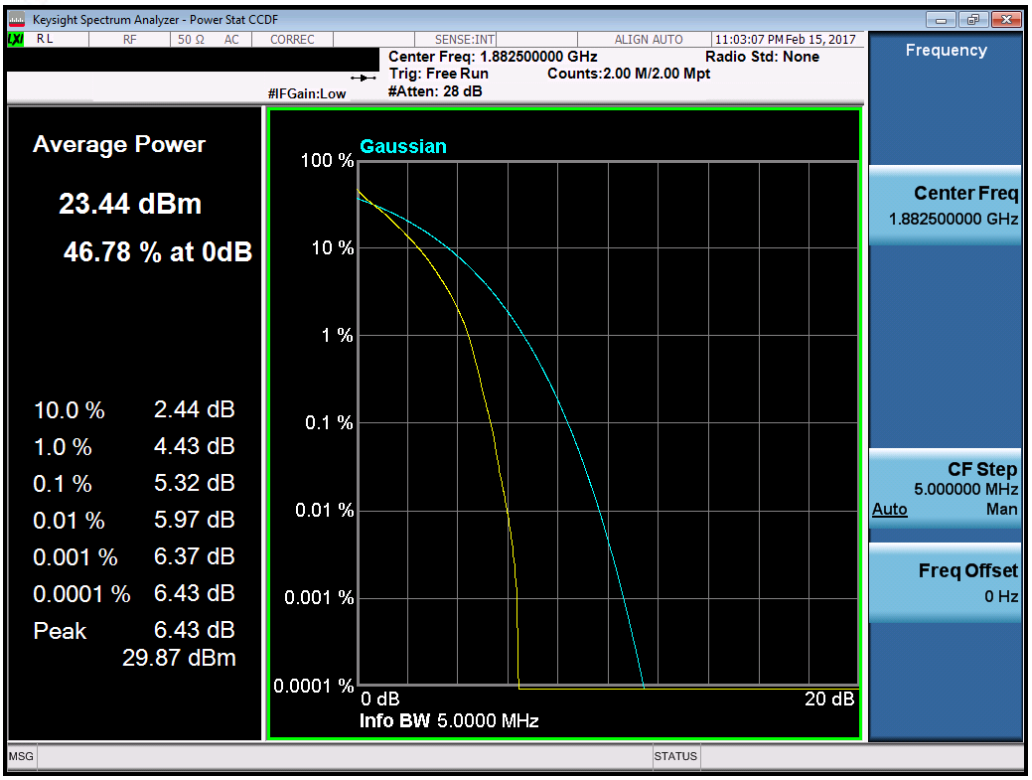
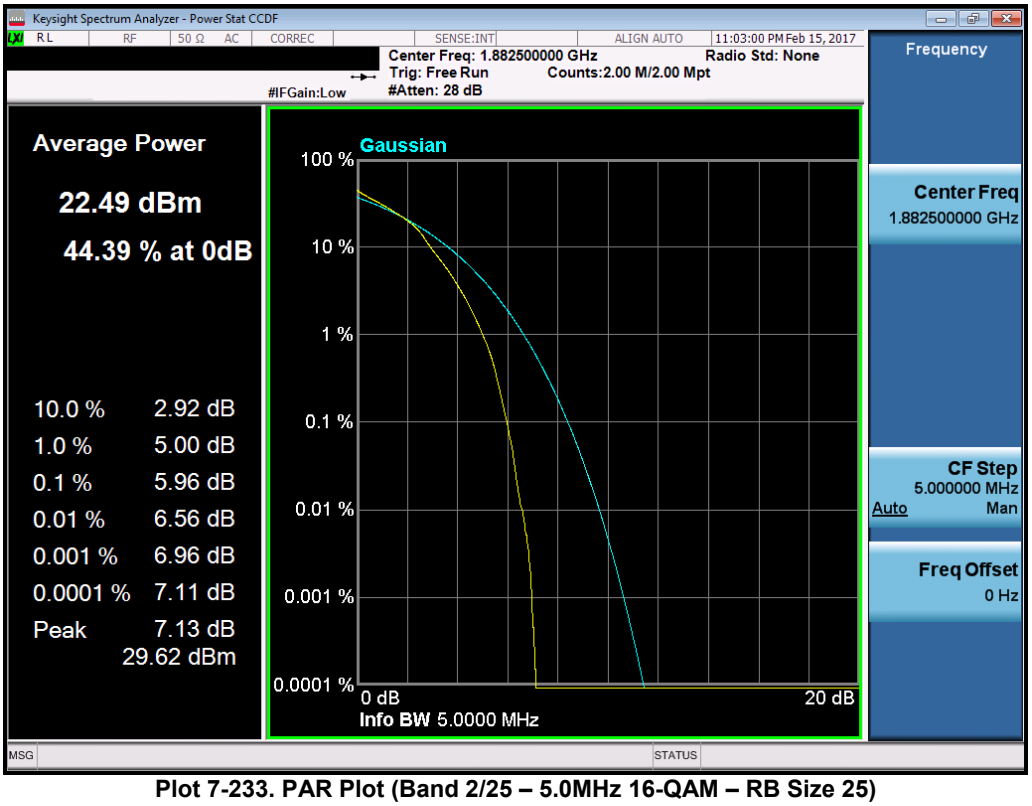
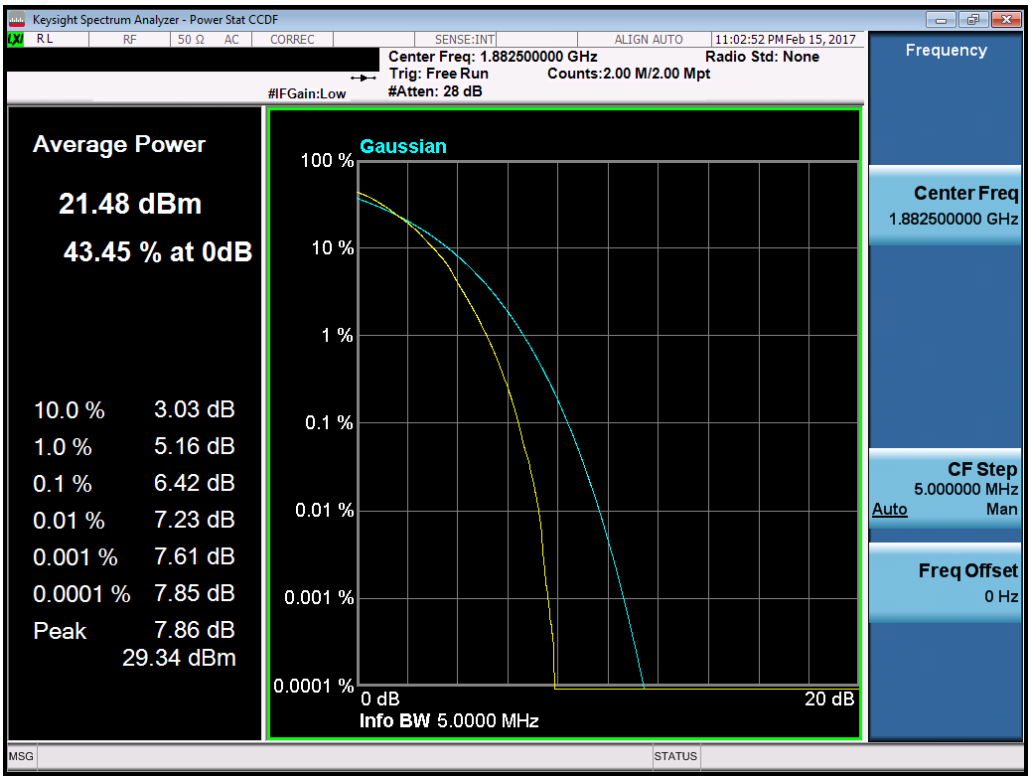


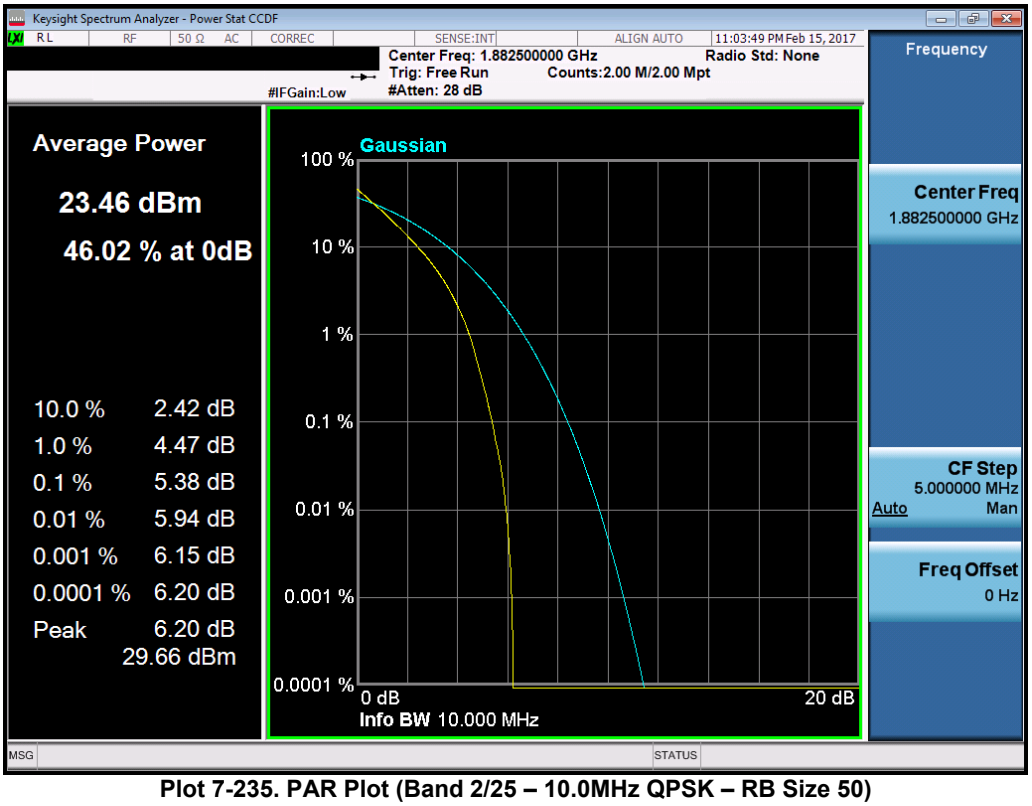
Plot 7-232. PAR Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



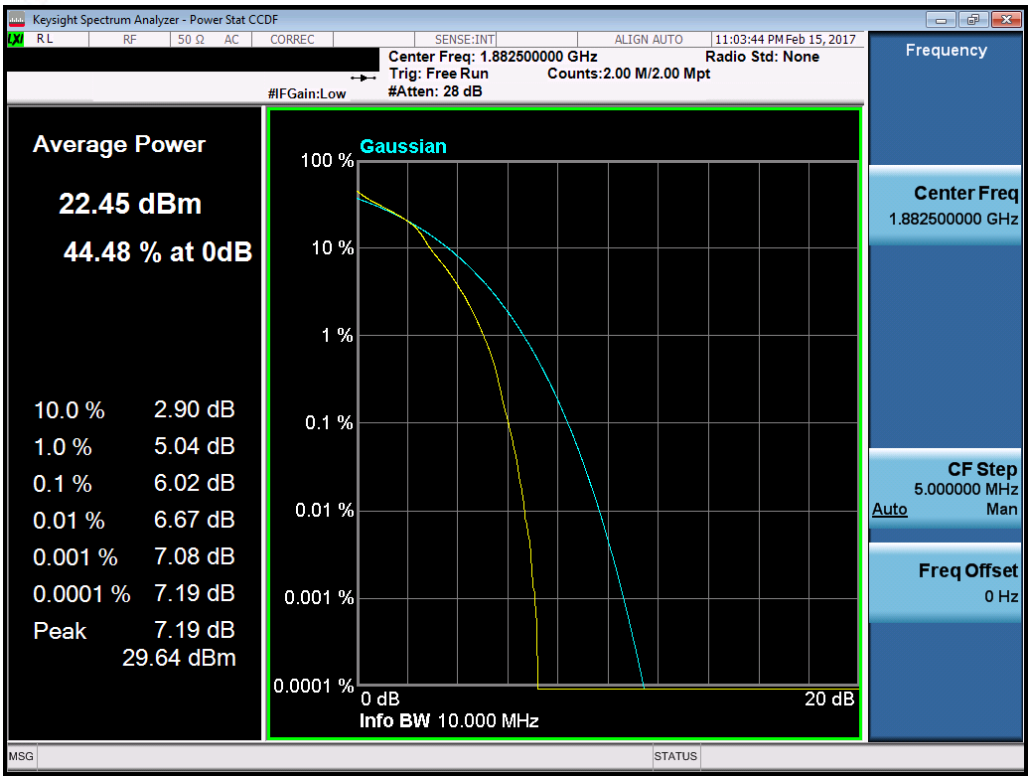
Plot 7-233. PAR Plot (Band 2/25 – 5.0MHz 16-QAM – RB Size 25)



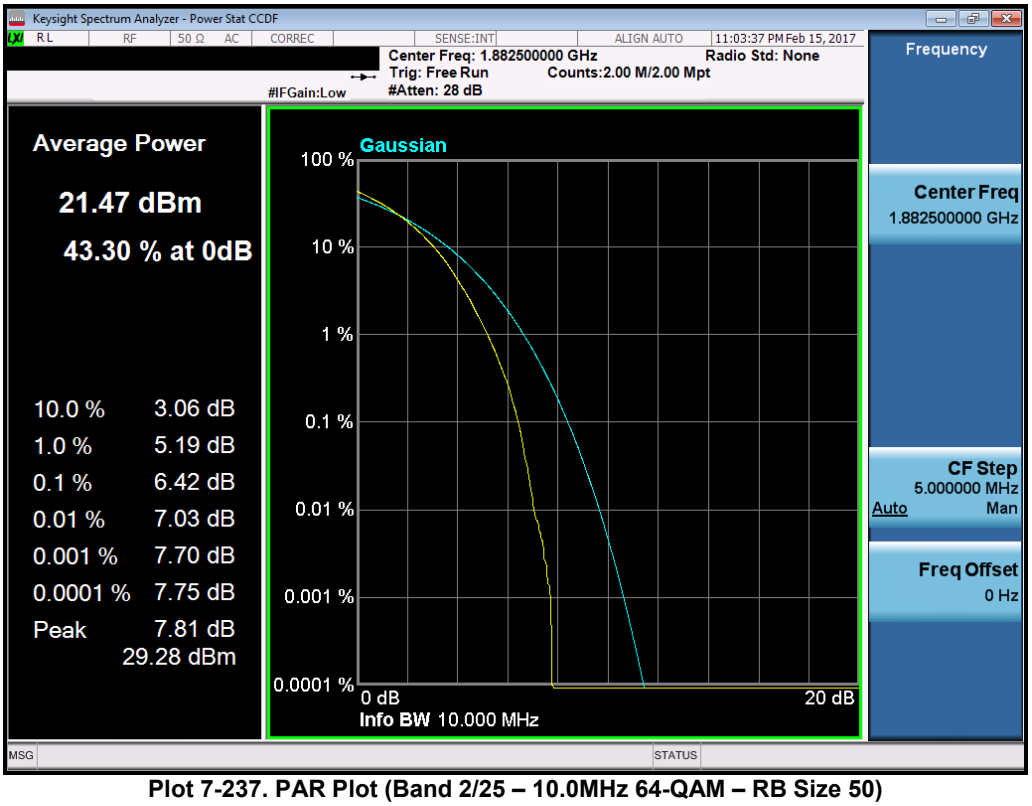
Plot 7-234. PAR Plot (Band 2/25 – 5.0MHz 64-QAM – RB Size 25)



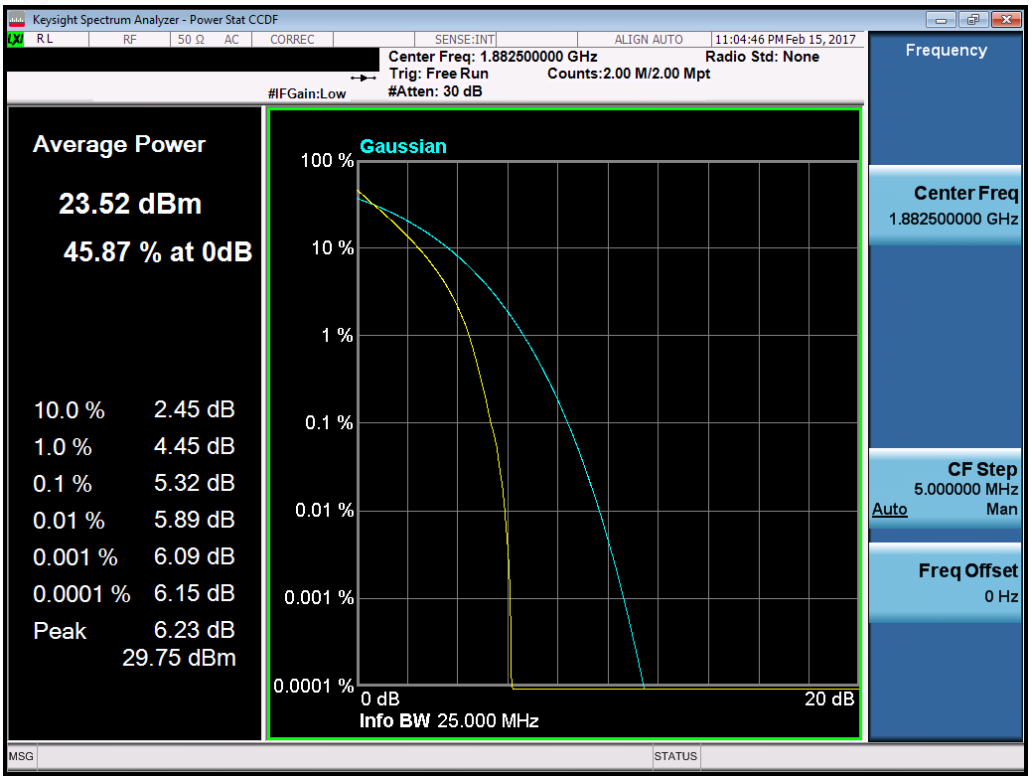
Plot 7-235. PAR Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)



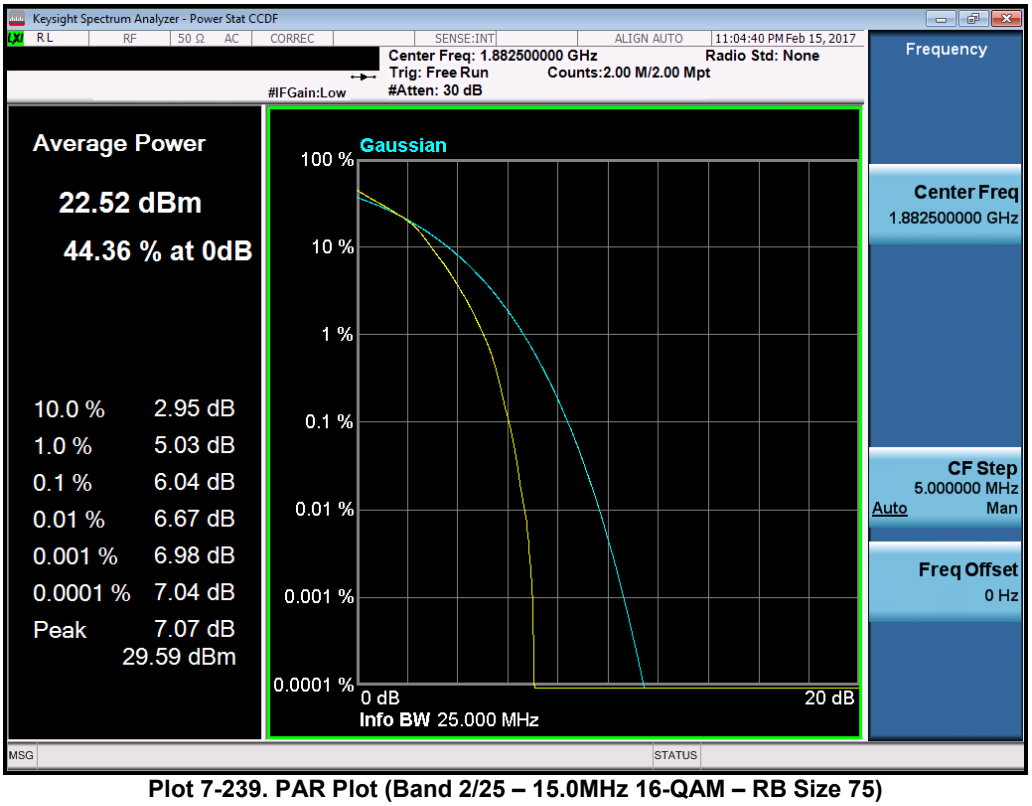
Plot 7-236. PAR Plot (Band 2/25 – 10.0MHz 16-QAM – RB Size 50)



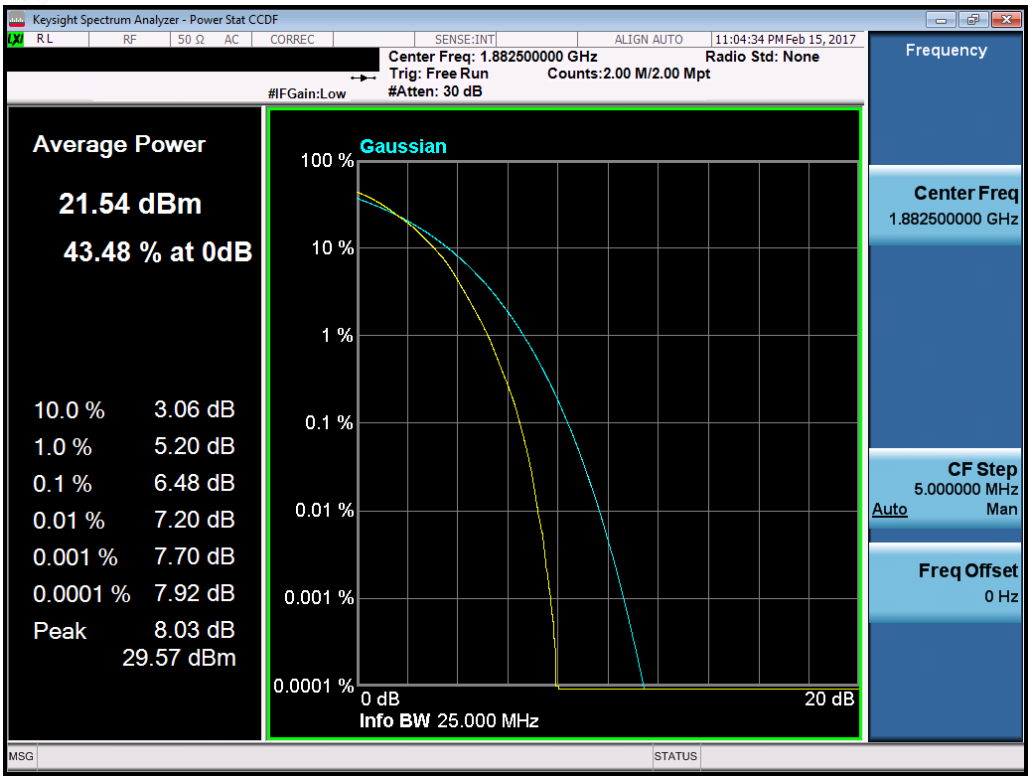
Plot 7-237. PAR Plot (Band 2/25 – 10.0MHz 64-QAM – RB Size 50)



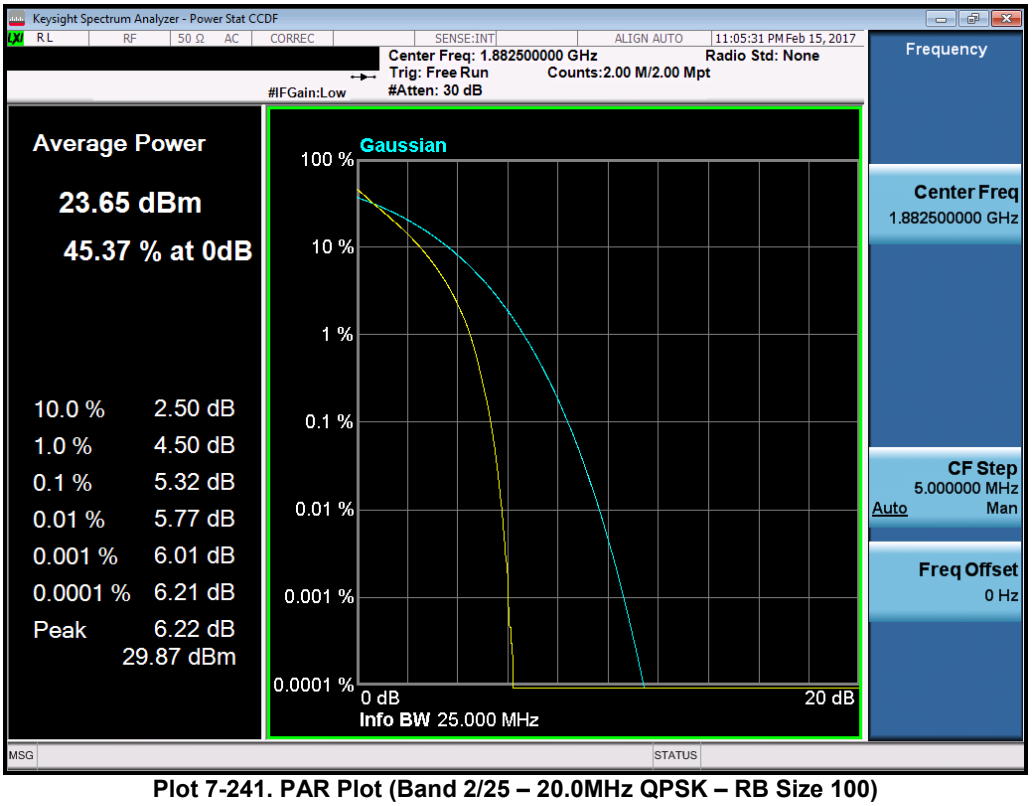
Plot 7-238. PAR Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)



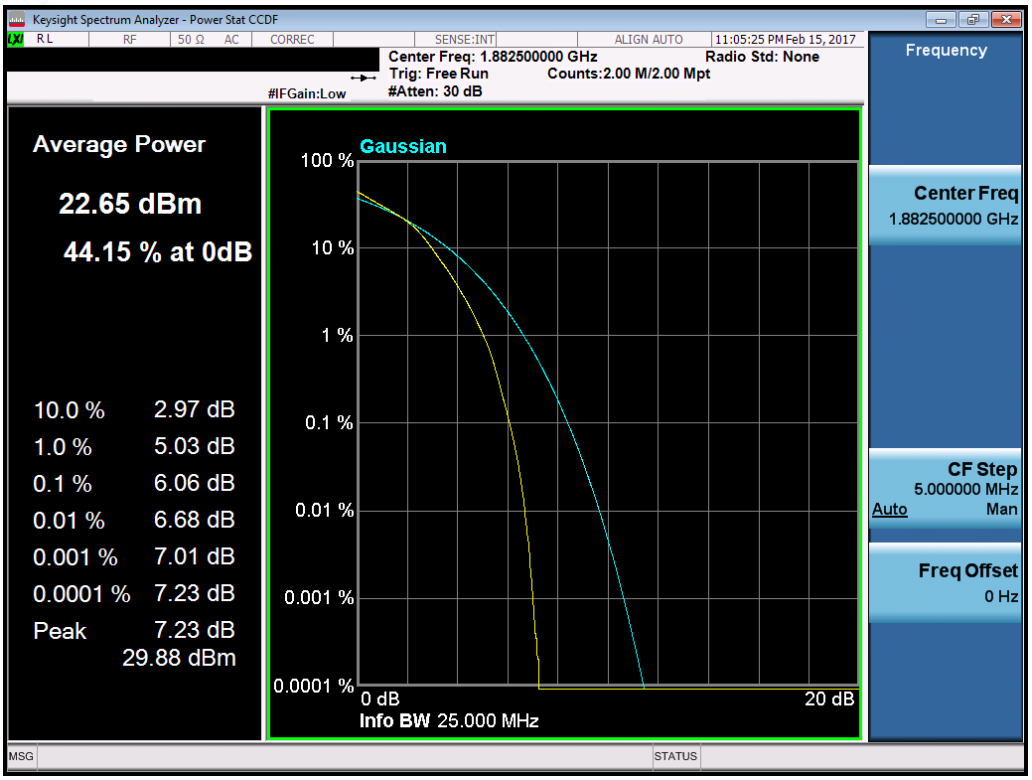
Plot 7-239. PAR Plot (Band 2/25 – 15.0MHz 16-QAM – RB Size 75)



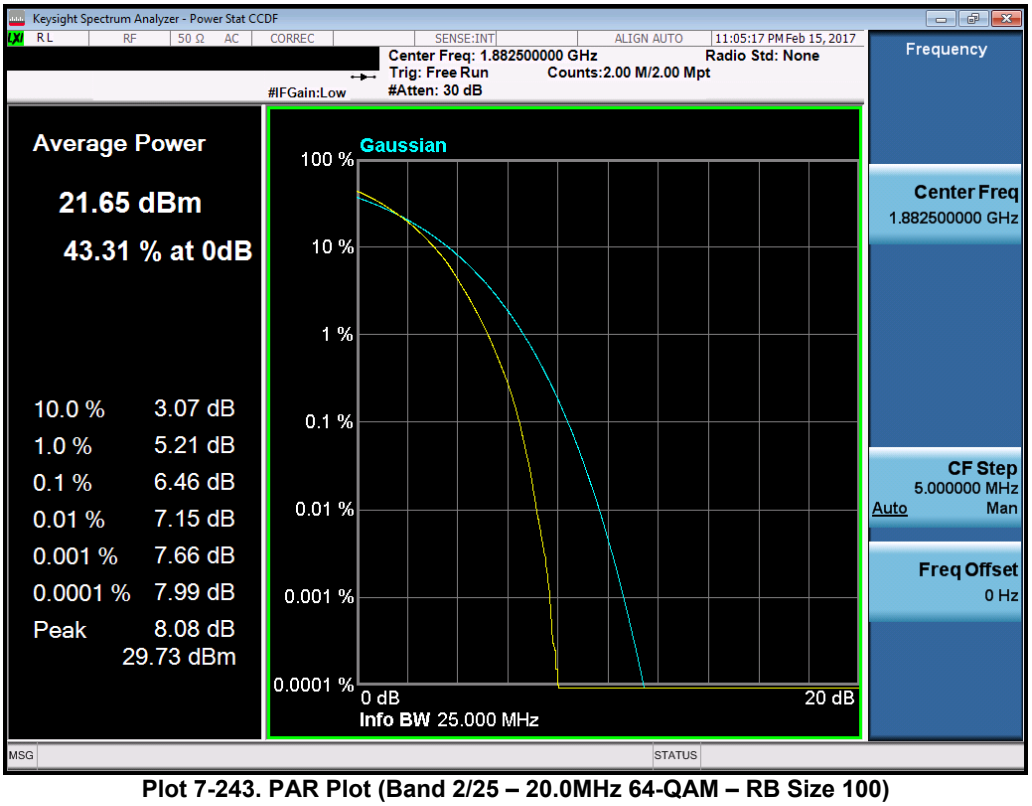
Plot 7-240. PAR Plot (Band 2/25 – 15.0MHz 64-QAM – RB Size 75)



Plot 7-241. PAR Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-242. PAR Plot (Band 2/25 – 20.0MHz 16-QAM – RB Size 100)



Plot 7-243. PAR Plot (Band 2/25 – 20.0MHz 64-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) §27.50(a.3)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – 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.

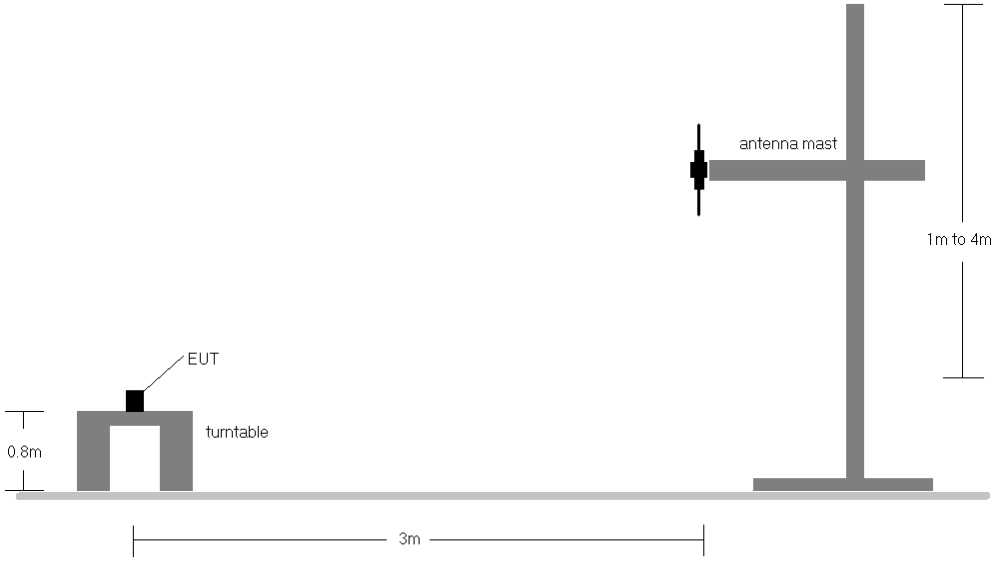


Figure 7-5. Radiated Test Setup <1GHz

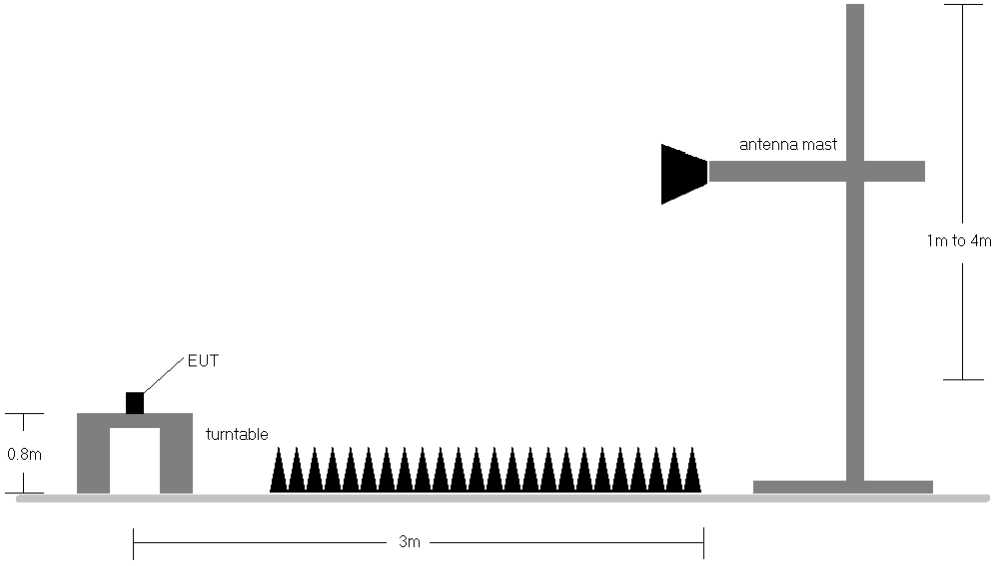


Figure 7-6. Radiated Test Setup >1GHz

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]	Positioner Azimuth [degree]	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	301	168	1 / 5	14.45	2.48	16.93	34.77	-17.84
707.50	1.4	QPSK	H	292	193	3 / 2	15.79	2.56	18.35	34.77	-16.42
715.30	1.4	QPSK	H	312	190	1 / 0	15.01	2.60	17.61	34.77	-17.17
707.50	1.4	16-QAM	H	292	193	3 / 2	14.88	2.56	17.44	34.77	-17.33
707.50	1.4	64-QAM	H	292	193	3 / 2	13.85	2.56	16.41	34.77	-18.36
700.50	3	QPSK	H	290	188	1 / 14	15.02	2.48	17.50	34.77	-17.27
707.50	3	QPSK	H	292	196	1 / 14	15.88	2.56	18.44	34.77	-16.33
714.50	3	QPSK	H	273	212	1 / 0	15.12	2.60	17.72	34.77	-17.05
707.50	3	16-QAM	H	292	196	1 / 14	15.07	2.56	17.63	34.77	-17.14
707.50	3	64-QAM	H	292	196	1 / 14	13.90	2.56	16.46	34.77	-18.31

Table 7-2. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	263	168	1 / 24	15.54	2.49	18.03	34.77	-16.74
707.50	5	QPSK	H	292	197	1 / 24	16.17	2.56	18.73	34.77	-16.04
713.50	5	QPSK	H	304	206	1 / 0	15.84	2.60	18.44	34.77	-16.33
707.50	5	16-QAM	H	292	197	1 / 24	15.43	2.56	17.99	34.77	-16.78
707.50	5	64-QAM	H	292	197	1 / 24	14.22	2.56	16.78	34.77	-17.99
704.00	10	QPSK	H	292	188	1 / 49	15.58	2.51	18.09	34.77	-16.68
707.50	10	QPSK	H	290	197	1 / 49	16.10	2.56	18.66	34.77	-16.11
711.00	10	QPSK	H	290	167	1 / 0	15.81	2.60	18.41	34.77	-16.37
711.00	10	16-QAM	H	290	167	1 / 0	14.87	2.60	17.47	34.77	-17.31
707.50	10	64-QAM	H	290	197	1 / 49	14.09	2.56	16.65	34.77	-18.12
707.50	5	QPSK	V	131	92	1 / 0	14.50	2.99	17.49	34.77	-17.28
707.50	5 (WCP)	QPSK	H	286	165	1 / 24	15.14	2.56	17.70	34.77	-17.07

Table 7-3. ERP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	169	202	1 / 24	13.38	2.47	15.85	34.77	-18.92
782.00	5	QPSK	H	136	281	1 / 0	13.60	2.54	16.14	34.77	-18.63
784.50	5	QPSK	H	240	176	1 / 0	13.32	2.63	15.95	34.77	-18.82
782.00	5	16-QAM	H	136	281	1 / 0	12.97	2.54	15.51	34.77	-19.26
782.00	5	64-QAM	H	136	281	1 / 0	11.65	2.54	14.19	34.77	-20.58
782.00	10	QPSK	H	238	180	1 / 0	13.52	2.54	16.06	34.77	-18.71
782.00	10	16-QAM	H	238	180	1 / 0	12.75	2.54	15.29	34.77	-19.48
782.00	10	64-QAM	H	238	180	1 / 0	11.58	2.54	14.12	34.77	-20.65
782.00	5	QPSK	V	149	262	1 / 0	12.05	3.92	15.97	34.77	-18.80
782.00	5 (WCP)	QPSK	H	200	137	1 / 0	12.61	2.54	15.15	34.77	-19.62

Table 7-4. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	200	179	1 / 0	14.14	5.51	19.65	38.45	-18.80
836.50	1.4	QPSK	H	206	274	3 / 2	14.01	5.14	19.15	38.45	-19.30
848.30	1.4	QPSK	H	211	261	1 / 0	13.41	4.68	18.09	38.45	-20.36
824.70	1.4	16-QAM	H	200	179	1 / 0	13.28	5.51	18.79	38.45	-19.66
824.70	1.4	64-QAM	H	200	179	1 / 0	12.10	5.51	17.61	38.45	-20.84
825.50	3	QPSK	H	190	311	1 / 14	14.08	5.52	19.60	38.45	-18.85
836.50	3	QPSK	H	208	284	1 / 14	14.04	5.14	19.18	38.45	-19.27
847.50	3	QPSK	H	200	293	1 / 0	13.61	4.67	18.28	38.45	-20.17
825.50	3	16-QAM	H	190	311	1 / 14	13.25	5.52	18.77	38.45	-19.68
825.50	3	64-QAM	H	190	311	1 / 14	12.06	5.52	17.58	38.45	-20.87
826.50	5	QPSK	H	200	259	1 / 24	14.82	5.51	20.33	38.45	-18.12
836.50	5	QPSK	H	208	276	1 / 0	14.28	5.14	19.42	38.45	-19.03
846.50	5	QPSK	H	211	231	1 / 24	13.60	4.66	18.26	38.45	-20.19
826.50	5	16-QAM	H	200	259	1 / 24	14.05	5.51	19.56	38.45	-18.89
826.50	5	64-QAM	H	200	259	1 / 24	12.79	5.51	18.30	38.45	-20.15
829.00	10	QPSK	H	201	242	1 / 49	13.99	5.49	19.48	38.45	-18.97
836.50	10	QPSK	H	208	267	1 / 0	14.29	5.14	19.43	38.45	-19.02
844.00	10	QPSK	H	223	250	1 / 0	13.75	4.70	18.45	38.45	-20.00
829.00	10	16-QAM	H	201	242	1 / 49	13.18	5.49	18.67	38.45	-19.78
829.00	10	64-QAM	H	201	242	1 / 49	11.27	5.49	16.76	38.45	-21.69
826.50	5	QPSK	V	112	192	1 / 0	12.89	5.34	18.23	38.45	-20.22
826.50	5 (WCP)	QPSK	H	200	197	1 / 0	12.48	5.51	17.99	38.45	-20.46

Table 7-5. ERP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	15	206	3 / 2	17.08	5.56	22.64	30.00	-7.36
1745.00	1.4	QPSK	H	22	206	3 / 2	17.33	5.32	22.65	30.00	-7.35
1779.30	1.4	QPSK	H	18	200	3 / 2	16.44	5.09	21.53	30.00	-8.47
1745.00	1.4	16-QAM	H	22	206	3 / 2	16.35	5.32	21.67	30.00	-8.33
1745.00	1.4	64-QAM	H	22	206	3 / 2	15.34	5.32	20.66	30.00	-9.34
1711.50	3	QPSK	H	20	199	1 / 0	17.09	5.55	22.64	30.00	-7.36
1745.00	3	QPSK	H	20	196	1 / 0	17.53	5.32	22.85	30.00	-7.15
1778.50	3	QPSK	H	29	203	1 / 0	16.70	5.10	21.80	30.00	-8.20
1745.00	3	16-QAM	H	20	196	1 / 0	16.62	5.32	21.94	30.00	-8.06
1745.00	3	64-QAM	H	20	196	1 / 0	15.56	5.32	20.88	30.00	-9.12
1712.50	5	QPSK	H	25	211	1 / 24	17.48	5.55	23.03	30.00	-6.97
1745.00	5	QPSK	H	20	200	1 / 0	17.95	5.32	23.27	30.00	-6.73
1777.50	5	QPSK	H	20	214	1 / 0	17.21	5.10	22.31	30.00	-7.69
1745.00	5	16-QAM	H	20	200	1 / 0	17.02	5.32	22.34	30.00	-7.66
1745.00	5	64-QAM	H	20	200	1 / 0	15.99	5.32	21.31	30.00	-8.69
1715.00	10	QPSK	H	12	219	1 / 49	17.38	5.53	22.91	30.00	-7.09
1745.00	10	QPSK	H	19	211	1 / 49	17.62	5.32	22.94	30.00	-7.06
1775.00	10	QPSK	H	12	207	1 / 0	17.00	5.12	22.12	30.00	-7.88
1745.00	10	16-QAM	H	19	211	1 / 49	16.68	5.32	22.00	30.00	-8.00
1745.00	10	64-QAM	H	19	211	1 / 49	15.62	5.32	20.94	30.00	-9.06
1717.50	15	QPSK	H	20	200	1 / 74	17.57	5.51	23.08	30.00	-6.92
1745.00	15	QPSK	H	5	206	1 / 0	17.79	5.32	23.11	30.00	-6.89
1772.50	15	QPSK	H	16	216	1 / 0	17.32	5.14	22.46	30.00	-7.54
1745.00	15	16-QAM	H	5	206	1 / 0	16.59	5.32	21.91	30.00	-8.09
1745.00	15	64-QAM	H	5	206	1 / 0	15.85	5.32	21.17	30.00	-8.83
1720.00	20	QPSK	H	3	206	1 / 99	18.03	5.49	23.52	30.00	-6.48
1745.00	20	QPSK	H	0	199	1 / 0	18.29	5.32	23.61	30.00	-6.39
1770.00	20	QPSK	H	10	201	1 / 0	17.66	5.15	22.81	30.00	-7.19
1745.00	20	16-QAM	H	0	199	1 / 0	17.37	5.32	22.69	30.00	-7.31
1745.00	20	64-QAM	H	0	199	1 / 0	16.27	5.32	21.59	30.00	-8.41
1745.00	20	QPSK	V	86	110	1 / 0	16.34	5.27	21.61	30.00	-8.39
1745.00	20 (WCP)	QPSK	H	11	221	1 / 0	17.69	5.32	23.01	30.00	-6.99

Table 7-6. EIRP Data (Band 4/66)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	0	210	1 / 0	18.59	4.82	23.41	33.01	-9.60
1882.50	1.4	QPSK	H	0	218	3 / 2	18.27	4.73	23.00	33.01	-10.01
1914.30	1.4	QPSK	H	0	225	3 / 2	18.08	4.68	22.76	33.01	-10.25
1850.70	1.4	16-QAM	H	0	210	1 / 0	17.72	4.82	22.54	33.01	-10.47
1850.70	1.4	64-QAM	H	0	210	1 / 0	16.56	4.82	21.38	33.01	-11.63
1851.50	3	QPSK	H	0	219	1 / 0	18.66	4.82	23.48	33.01	-9.53
1882.50	3	QPSK	H	0	217	1 / 0	18.19	4.73	22.92	33.01	-10.09
1913.50	3	QPSK	H	0	217	1 / 0	18.13	4.68	22.81	33.01	-10.20
1851.50	3	16-QAM	H	0	219	1 / 0	17.69	4.82	22.51	33.01	-10.50
1851.50	3	64-QAM	H	0	219	1 / 0	16.61	4.82	21.43	33.01	-11.58
1852.50	5	QPSK	H	0	215	1 / 0	19.03	4.81	23.84	33.01	-9.17
1882.50	5	QPSK	H	0	220	1 / 0	18.69	4.73	23.42	33.01	-9.59
1912.50	5	QPSK	H	0	217	1 / 0	18.51	4.68	23.19	33.01	-9.82
1852.50	5	16-QAM	H	0	215	1 / 0	18.15	4.81	22.96	33.01	-10.05
1852.50	5	64-QAM	H	0	215	1 / 0	16.71	4.81	21.52	33.01	-11.49
1855.00	10	QPSK	H	0	221	1 / 0	18.72	4.81	23.53	33.01	-9.48
1882.50	10	QPSK	H	0	215	1 / 0	18.37	4.73	23.10	33.01	-9.91
1910.00	10	QPSK	H	5	218	1 / 0	18.33	4.68	23.01	33.01	-10.00
1855.00	10	16-QAM	H	0	221	1 / 0	17.75	4.81	22.56	33.01	-10.45
1855.00	10	64-QAM	H	0	221	1 / 0	16.70	4.81	21.51	33.01	-11.50
1857.50	15	QPSK	H	2	220	1 / 74	18.86	4.80	23.66	33.01	-9.35
1882.50	15	QPSK	H	9	220	1 / 74	18.64	4.73	23.37	33.01	-9.64
1907.50	15	QPSK	H	4	213	1 / 74	18.35	4.68	23.03	33.01	-9.98
1857.50	15	16-QAM	H	2	220	1 / 74	17.99	4.80	22.79	33.01	-10.22
1857.50	15	64-QAM	H	2	220	1 / 74	16.83	4.80	21.63	33.01	-11.38
1860.00	20	QPSK	H	0	218	1 / 99	18.90	4.79	23.69	33.01	-9.32
1882.50	20	QPSK	H	0	226	1 / 99	18.82	4.73	23.55	33.01	-9.46
1905.00	20	QPSK	H	6	220	1 / 0	18.36	4.68	23.04	33.01	-9.97
1860.00	20	16-QAM	H	0	218	1 / 99	17.95	4.79	22.74	33.01	-10.27
1860.00	20	64-QAM	H	0	218	1 / 99	16.85	4.79	21.64	33.01	-11.37
1852.50	5	QPSK	V	92	134	1 / 0	17.99	4.79	22.78	33.01	-10.23
1852.50	5 (WCP)	QPSK	H	0	215	1 / 0	18.23	4.81	23.04	33.01	-9.97

Table 7-7. EIRP Data (Band 2/25)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2307.50	5	QPSK	H	331	342	1 / 24	12.21	5.74	17.95	23.98	-6.03
2310.00	5	QPSK	H	340	333	1 / 0	12.16	5.74	17.90	23.98	-6.08
2312.50	5	QPSK	H	340	336	1 / 0	12.20	5.74	17.94	23.98	-6.04
2307.50	5	16-QAM	H	331	342	1 / 24	11.17	5.74	16.91	23.98	-7.07
2307.50	5	64-QAM	H	331	342	1 / 24	10.23	5.74	15.97	23.98	-8.01
2310.00	10	QPSK	H	347	340	1 / 49	12.27	5.74	18.01	23.98	-5.97
2310.00	10	16-QAM	H	347	340	1 / 49	11.36	5.74	17.10	23.98	-6.88
2310.00	10	64-QAM	H	347	340	1 / 49	10.32	5.74	16.06	23.98	-7.92
2310.00	10	QPSK	V	154	34	1 / 99	11.37	4.79	16.16	23.98	-7.82
2310.00	10 (WCP)	QPSK	H	351	348	1 / 99	11.94	4.81	16.75	23.98	-7.23

Table 7-8. EIRP Data (Band 30)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Positioner Azimuth [degree]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	4	201	1 / 0	12.72	5.74	18.46	33.01	-14.55
2535.00	5	QPSK	H	2	190	1 / 0	12.02	5.86	17.88	33.01	-15.13
2567.50	5	QPSK	H	5	209	1 / 0	11.45	5.98	17.43	33.01	-15.58
2502.50	5	16-QAM	H	4	201	1 / 0	11.77	5.74	17.51	33.01	-15.50
2502.50	5	64-QAM	H	4	201	1 / 0	10.73	5.74	16.47	33.01	-16.54
2505.00	10	QPSK	H	0	199	1 / 0	12.48	5.75	18.23	33.01	-14.78
2535.00	10	QPSK	H	0	192	1 / 0	11.99	5.86	17.85	33.01	-15.16
2565.00	10	QPSK	H	10	213	1 / 0	11.50	5.97	17.47	33.01	-15.54
2505.00	10	16-QAM	H	0	199	1 / 0	11.53	5.75	17.28	33.01	-15.73
2505.00	10	64-QAM	H	0	199	1 / 0	10.49	5.75	16.24	33.01	-16.77
2507.50	15	QPSK	H	11	187	1 / 0	12.69	5.76	18.45	33.01	-14.56
2535.00	15	QPSK	H	6	191	1 / 0	12.19	5.86	18.05	33.01	-14.96
2562.50	15	QPSK	H	0	190	1 / 0	11.58	5.96	17.54	33.01	-15.47
2507.50	15	16-QAM	H	11	187	1 / 0	11.73	5.76	17.49	33.01	-15.52
2507.50	15	64-QAM	H	11	187	1 / 0	10.22	5.76	15.98	33.01	-17.03
2510.00	20	QPSK	H	0	211	1 / 0	12.82	5.77	18.59	33.01	-14.42
2535.00	20	QPSK	H	0	189	1 / 0	11.39	5.86	17.25	33.01	-15.76
2560.00	20	QPSK	H	0	190	1 / 99	10.33	5.95	16.28	33.01	-16.73
2510.00	20	16-QAM	H	0	211	1 / 0	11.92	5.77	17.69	33.01	-15.32
2510.00	20	64-QAM	H	0	211	1 / 0	10.79	5.77	16.56	33.01	-16.45
2510.00	20	QPSK	V	43	311	1 / 0	10.29	5.66	15.95	33.01	-17.06
2510.00	20 (WCP)	QPSK	H	0	200	1 / 0	11.83	5.77	17.60	33.01	-15.41

Table 7-9. 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) §27.53(a.4)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – 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 = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

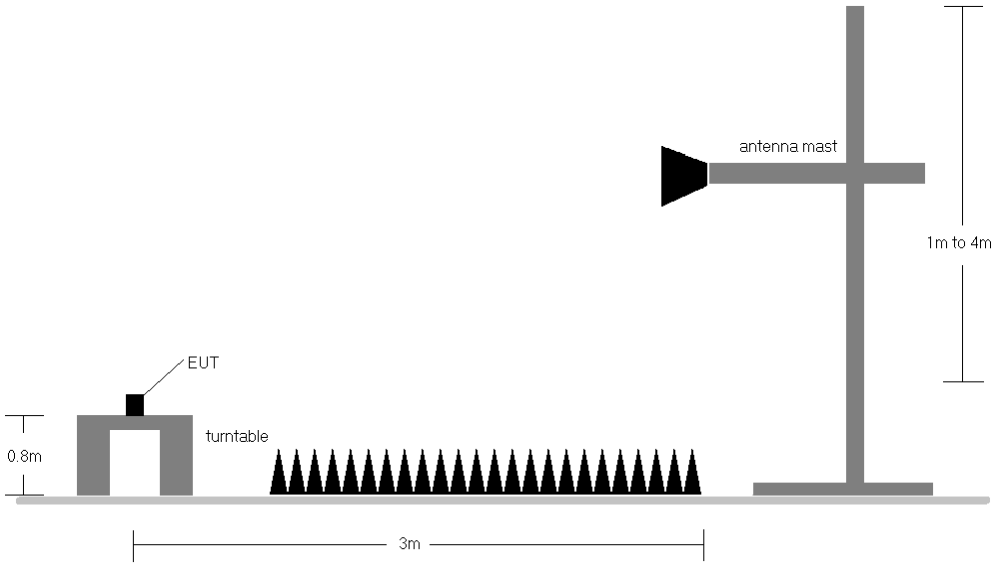


Figure 7-7. Test Instrument & Measurement Setup

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.

5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

OPERATING FREQUENCY:	701.50	MHz		
CHANNEL:	23035			
MEASURED OUTPUT POWER:	18.03	dBm	=	0.064 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.03	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	114	181	-62.83	5.92	-56.91	74.9
2104.50	H	117	212	-57.93	6.80	-51.13	69.2
2806.00	H	-	-	-72.04	8.12	-63.92	82.0

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

OPERATING FREQUENCY:	707.50	MHz		
CHANNEL:	23095			
MEASURED OUTPUT POWER:	18.73	dBm	=	0.075 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.73	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	100	205	-65.89	5.96	-59.92	78.7
2122.50	H	103	178	-62.97	6.84	-56.13	74.9
2830.00	H	-	-	-71.79	8.13	-63.65	82.4

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

OPERATING FREQUENCY:	713.50	MHz			
CHANNEL:	23155				
MEASURED OUTPUT POWER:	18.44	dBm	=	0.070	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	31.44	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	141	183	-65.39	6.01	-59.39	77.8
2140.50	H	143	178	-59.26	6.89	-52.37	70.8
2854.00	H	-	-	-72.01	8.15	-63.86	82.3

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

OPERATING FREQUENCY:	707.50	MHz			
CHANNEL:	23095				
MEASURED OUTPUT POWER:	17.70	dBm	=	0.059	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	30.70	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	101	191	-67.61	5.96	-61.64	79.3
2122.50	H	109	182	-60.16	6.84	-53.32	71.0
2830.00	H	-	-	-74.14	8.13	-66.00	83.7

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

OPERATING FREQUENCY:	779.50	MHz			
CHANNEL:	23205				
MEASURED OUTPUT POWER:	15.85	dBm	=	0.038	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	28.85	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2338.50	H	101	167	-70.23	7.01	-63.22	79.1
3118.00	H	-	-	-71.14	7.23	-63.91	79.8

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

OPERATING FREQUENCY:	782.00	MHz			
CHANNEL:	23230				
MEASURED OUTPUT POWER:	16.14	dBm	=	0.041	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	29.14	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	104	164	-67.90	7.00	-60.90	77.0
3128.00	H	-	-	-68.99	7.21	-61.78	77.9

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

OPERATING FREQUENCY:	784.50	MHz		
CHANNEL:	23255			
MEASURED OUTPUT POWER:	15.95	dBm	=	0.039 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	28.95	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2353.50	H	101	167	-67.13	6.99	-60.15	76.1
3138.00	H	-	-	-68.91	7.20	-61.71	77.7

Table 7-16. Radiated Spurious Data (Band 13 – High 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 [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	112	210	-63.55	6.40	-57.15	-17.2
1564.00	H	110	182	-63.89	6.41	-57.48	-17.5
1569.00	H	103	189	-65.18	6.42	-58.76	-18.8

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

OPERATING FREQUENCY:	782.00	MHz		
CHANNEL:	23230			
MEASURED OUTPUT POWER:	15.15	dBm	=	0.033 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	28.15	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
2346.00	H	103	171	-70.14	7.00	-63.14	78.3
3128.00	H	-	-	-69.06	7.21	-61.85	77.0

Table 7-18. Radiated Spurious Data with WCP (Band 13 – Mid 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 [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	114	257	-66.20	6.41	-59.79	-19.8

Table 7-19. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY:	826.50	MHz			
CHANNEL:	20425				
MEASURED OUTPUT POWER:	20.33	dBm	=	0.108	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	33.33	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	100	223	-56.23	6.28	-49.95	70.3
2479.50	H	106	201	-55.49	6.84	-48.65	69.0
3306.00	H	136	191	-66.99	7.14	-59.85	80.2
4132.50	H	119	127	-68.15	7.74	-60.41	80.7
4959.00	H	-	-	-69.20	9.11	-60.09	80.4
5785.50	H	-	-	-67.66	9.30	-58.37	78.7

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

OPERATING FREQUENCY:	836.50	MHz			
CHANNEL:	20525				
MEASURED OUTPUT POWER:	19.42	dBm	=	0.088	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	32.42	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	100	214	-56.63	6.21	-50.42	69.8
2509.50	H	101	354	-56.36	6.86	-49.51	68.9
3346.00	H	234	230	-67.94	7.26	-60.68	80.1
4182.50	H	-	-	-68.24	8.07	-60.17	79.6

Table 7-21. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	846.50	MHz			
CHANNEL:	20625				
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 [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	100	301	-59.94	6.14	-53.80	72.1
2539.50	H	106	201	-54.58	6.95	-47.63	65.9
3386.00	H	136	191	-66.45	7.38	-59.07	77.3
4232.50	H	119	127	-68.23	8.34	-59.89	78.2
5079.00	H	-	-	-67.32	8.87	-58.46	76.7
5925.50	H	-	-	-66.64	9.26	-57.37	75.6

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

OPERATING FREQUENCY:	826.50	MHz			
CHANNEL:	20425				
MEASURED OUTPUT POWER:	17.99	dBm	=	0.063	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	30.99	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	100	211	-56.89	6.28	-50.61	68.6
2479.50	H	100	352	-58.06	6.84	-51.22	69.2
3306.00	H	100	226	-67.04	7.14	-59.90	77.9
4132.50	H	-	-	-68.19	7.74	-60.45	78.4

Table 7-23. Radiated Spurious Data with WCP (Band 5 – Low Channel)

OPERATING FREQUENCY:	1720.00	MHz			
CHANNEL:	132072				
MEASURED OUTPUT POWER:	23.52	dBm	=	0.225	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.52	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3440.00	H	-	-	-69.06	9.70	-59.37	82.9
5160.00	H	176	36	-64.05	10.87	-53.17	76.7
6880.00	H	-	-	-60.30	10.80	-49.50	73.0

Table 7-24. Radiated Spurious Data (Band 4/66 – Low Channel)

OPERATING FREQUENCY:	1745.00	MHz			
CHANNEL:	132322				
MEASURED OUTPUT POWER:	23.61	dBm	=	0.230	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.61	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	H	-	-	-69.20	9.85	-59.35	83.0
5235.00	H	175	20	-62.75	10.88	-51.88	75.5
6980.00	H	-	-	-60.68	11.00	-49.68	73.3

Table 7-25. Radiated Spurious Data (Band 4/66 – Mid Channel)

OPERATING FREQUENCY:	1770.00	MHz		
CHANNEL:	132572			
MEASURED OUTPUT POWER:	22.81	dBm	=	0.191 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.81	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3540.00	H	-	-	-69.45	9.95	-59.51	82.3
5310.00	H	100	350	-64.00	11.02	-52.99	75.8
7080.00	H	-	-	-61.28	11.12	-50.16	73.0

Table 7-26. Radiated Spurious Data (Band 4/66 – High Channel)

OPERATING FREQUENCY:	1745.00	MHz		
CHANNEL:	132322			
MEASURED OUTPUT POWER:	23.01	dBm	=	0.200 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	20.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.01	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	H	152	355	-68.87	9.85	-59.02	82.0
5235.00	H	152	16	-64.58	10.88	-53.71	76.7
6980.00	H	-	-	-60.71	11.00	-49.71	72.7

Table 7-27. Radiated Spurious Data with WCP (Band 4/66 – Mid Channel)

OPERATING FREQUENCY:	1852.50	MHz		
CHANNEL:	26065			
MEASURED OUTPUT POWER:	23.84	dBm	=	0.242 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.84	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3705.00	H	103	142	-65.55	10.01	-55.54	79.4
5557.50	H	103	168	-60.86	11.20	-49.66	73.5
7410.00	H	-	-	-60.33	10.88	-49.45	73.3
9262.50	H	-	-	-59.92	12.36	-47.56	71.4

Table 7-28. Radiated Spurious Data (Band 2/25 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz		
CHANNEL:	26365			
MEASURED OUTPUT POWER:	23.42	dBm	=	0.220 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.42	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3765.00	H	100	143	-64.39	9.76	-54.63	78.0
5647.50	H	101	288	-59.68	11.36	-48.32	71.7
7530.00	H	-	-	-61.15	11.25	-49.90	73.3
9412.50	H	-	-	-58.79	12.31	-46.48	69.9

Table 7-29. Radiated Spurious Data (Band 2/25 – Mid Channel)

OPERATING FREQUENCY:	1912.50	MHz		
CHANNEL:	26665			
MEASURED OUTPUT POWER:	23.19	dBm	=	0.208 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	$43 + 10 \log_{10} (W) =$	36.19	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3825.00	H	100	222	-64.41	9.54	-54.87	78.1
5737.50	H	103	342	-58.22	11.44	-46.79	70.0
7650.00	H	-	-	-61.01	11.51	-49.50	72.7
9562.50	H	-	-	-58.92	12.40	-46.52	69.7

Table 7-30. Radiated Spurious Data (Band 2/25 – High Channel)

OPERATING FREQUENCY:	1852.50	MHz		
CHANNEL:	26065			
MEASURED OUTPUT POWER:	23.04	dBm	=	0.202 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	$43 + 10 \log_{10} (W) =$	36.04	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3705.00	H	101	136	-60.01	10.01	-50.00	73.0
5557.50	H	103	130	-61.67	11.20	-50.47	73.5
7410.00	H	-	-	-60.43	10.88	-49.55	72.6
9262.50	H	-	-	-59.87	12.36	-47.51	70.6

Table 7-31. Radiated Spurious Data with WCP (Band 2/25 – Low Channel)

OPERATING FREQUENCY:	2310.00	MHz		
CHANNEL:	27710			
MEASURED OUTPUT POWER:	18.01	dBm	=	0.063 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	$70 + 10 \log_{10} (W) =$	58.01	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
4620.00	H	100	310	-67.57	11.33	-56.23	74.2
6930.00	H	-	-	-59.84	10.89	-48.96	67.0
9240.00	H	-	-	-57.91	12.38	-45.52	63.5
11550.00	H	-	-	-57.94	13.40	-44.54	62.5

Table 7-32. Radiated Spurious Data (Band 30 – Mid Channel)

OPERATING FREQUENCY:	2310.00	MHz		
CHANNEL:	26065			
MEASURED OUTPUT POWER:	18.01	dBm	=	0.063 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	-40.00	dBm		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
4620.00	H	103	186	-63.70	10.01	-53.69	13.7
6930.00	H	101	220	-62.55	11.20	-51.35	11.4
9240.00	H	-	-	-60.86	10.88	-49.98	10.0
11550.00	H	-	-	-61.22	12.36	-48.86	8.9

Table 7-33. Radiated Spurious Data with WCP (Band 30 – Mid Channel)

OPERATING FREQUENCY:	2510.00	MHz			
CHANNEL:	20850				
MEASURED OUTPUT POWER:	18.59	dBm	=	0.072	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	43.59	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5020.00	H	110	241	-65.48	11.15	-54.33	72.9
7530.00	H	-	-	-60.37	11.25	-49.12	67.7
10040.00	H	-	-	-59.04	12.59	-46.45	65.0

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

OPERATING FREQUENCY:	2535.00	MHz			
CHANNEL:	21100				
MEASURED OUTPUT POWER:	17.25	dBm	=	0.053	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	42.25	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5070.00	H	110	260	-66.03	11.04	-54.99	72.2
7605.00	H	-	-	-60.36	11.47	-48.89	66.1
10140.00	H	-	-	-59.17	12.67	-46.50	63.8

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

OPERATING FREQUENCY:	2560.00	MHz			
CHANNEL:	21350				
MEASURED OUTPUT POWER:	16.28	dBm	=	0.042	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	41.28	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5120.00	H	110	209	-64.36	10.94	-53.42	69.7
7680.00	H	110	170	-56.31	11.54	-44.77	61.1
10240.00	H	-	-	-59.08	12.74	-46.34	62.6

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

OPERATING FREQUENCY:	2510.00	MHz			
CHANNEL:	20850				
MEASURED OUTPUT POWER:	17.60	dBm	=	0.058	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	20.0	MHz			
DISTANCE:	3	meters			
LIMIT:	55 + 10 log10 (W)	42.60	dBc		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5020.00	H	104	359	-57.89	11.15	-46.74	64.3
7530.00	H	127	80	-59.74	11.25	-48.49	66.1
10040.00	H	128	202	-58.17	12.59	-45.58	63.2
12550.00	H	-	-	-56.43	13.10	-43.33	60.9

Table 7-37. Radiated Spurious Data with WCP (Band 7 – Mid 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-D-2010. 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-D-2010

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:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	707,499,733	-267	-0.0000377
100 %		- 30	707,499,926	-74	-0.0000105
100 %		- 20	707,499,958	-42	-0.0000059
100 %		- 10	707,499,879	-121	-0.0000171
100 %		0	707,499,857	-143	-0.0000202
100 %		+ 10	707,499,890	-110	-0.0000155
100 %		+ 20	707,499,532	-468	-0.0000661
100 %		+ 30	707,500,030	30	0.0000042
100 %		+ 40	707,499,924	-76	-0.0000107
100 %		+ 50	707,499,975	-25	-0.0000035
BATT. ENDPOINT	3.40	+ 20	707,500,170	170	0.0000240

Table 7-38. Frequency Stability Data (Band 12)

Band 12 Frequency Stability Measurements

§2.1055 §27.54

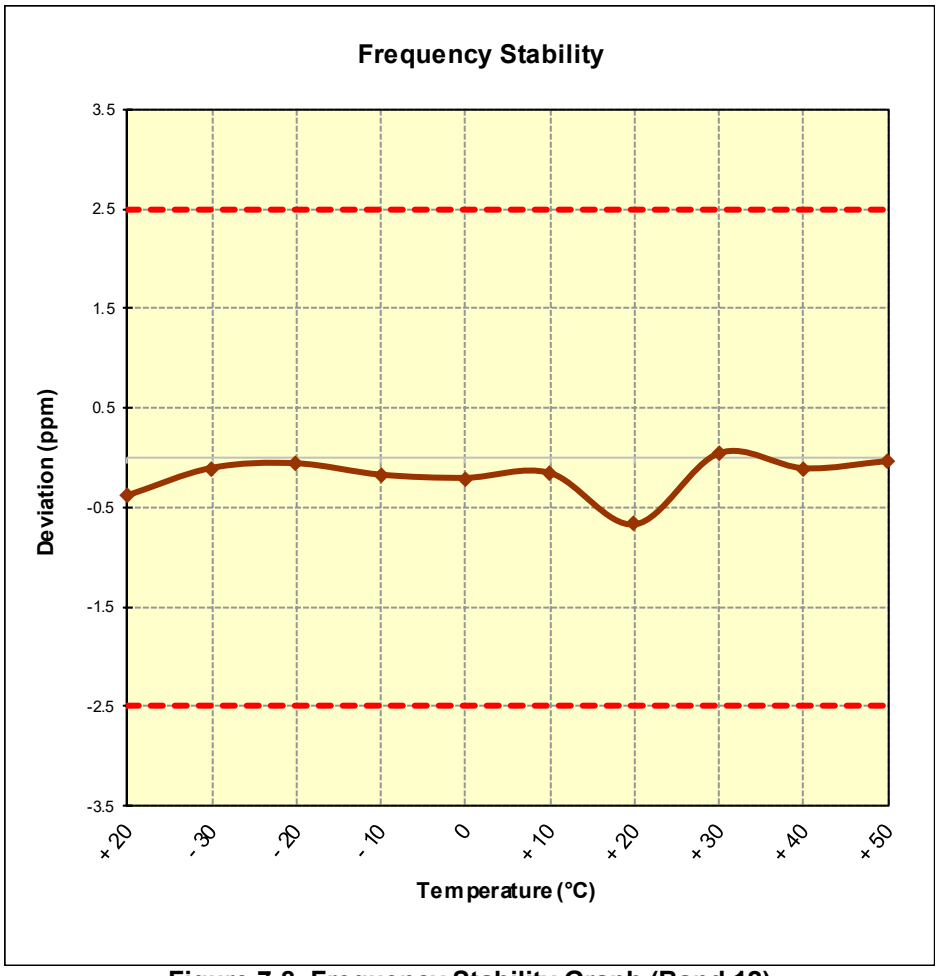


Figure 7-8. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	781,999,980	-20	-0.0000026
100 %		- 30	781,999,828	-172	-0.0000220
100 %		- 20	781,999,943	-57	-0.0000073
100 %		- 10	781,999,869	-131	-0.0000168
100 %		0	781,999,882	-118	-0.0000151
100 %		+ 10	782,000,311	311	0.0000398
100 %		+ 20	782,000,319	319	0.0000408
100 %		+ 30	782,000,115	115	0.0000147
100 %		+ 40	781,999,834	-166	-0.0000212
100 %		+ 50	782,000,230	230	0.0000294
BATT. ENDPOINT	3.40	+ 20	781,999,900	-100	-0.0000128

Table 7-39. Frequency Stability Data (Band 13)

Band 13 Frequency Stability Measurements

§2.1055 §27.54

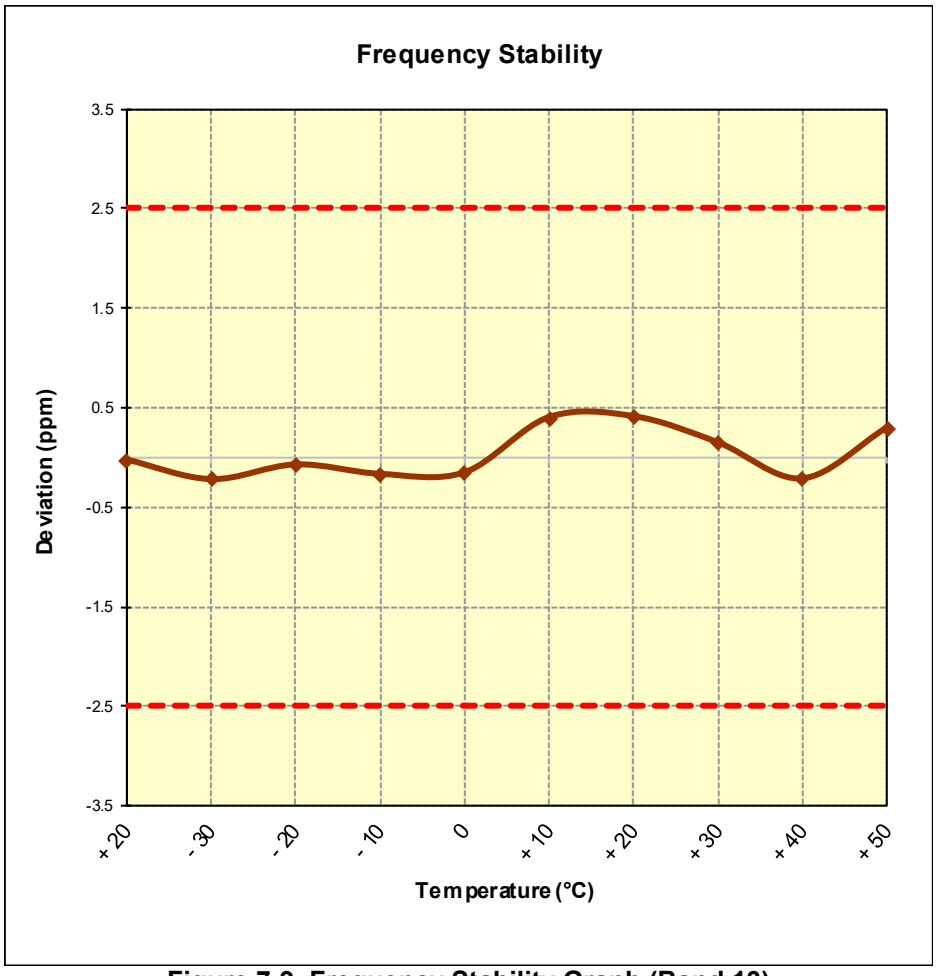


Figure 7-9. Frequency Stability Graph (Band 13)

Band 5 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,500,040	40	0.0000048
100 %		- 30	836,499,659	-341	-0.0000408
100 %		- 20	836,499,975	-25	-0.0000030
100 %		- 10	836,499,756	-244	-0.0000292
100 %		0	836,499,872	-128	-0.0000153
100 %		+ 10	836,500,236	236	0.0000282
100 %		+ 20	836,500,021	21	0.0000025
100 %		+ 30	836,499,764	-236	-0.0000282
100 %		+ 40	836,499,566	-434	-0.0000519
100 %		+ 50	836,500,150	150	0.0000179
BATT. ENDPOINT	3.40	+ 20	836,500,117	117	0.0000140

Table 7-40. Frequency Stability Data (Band 5)

Band 5 Frequency Stability Measurements

§2.1055 §22.355

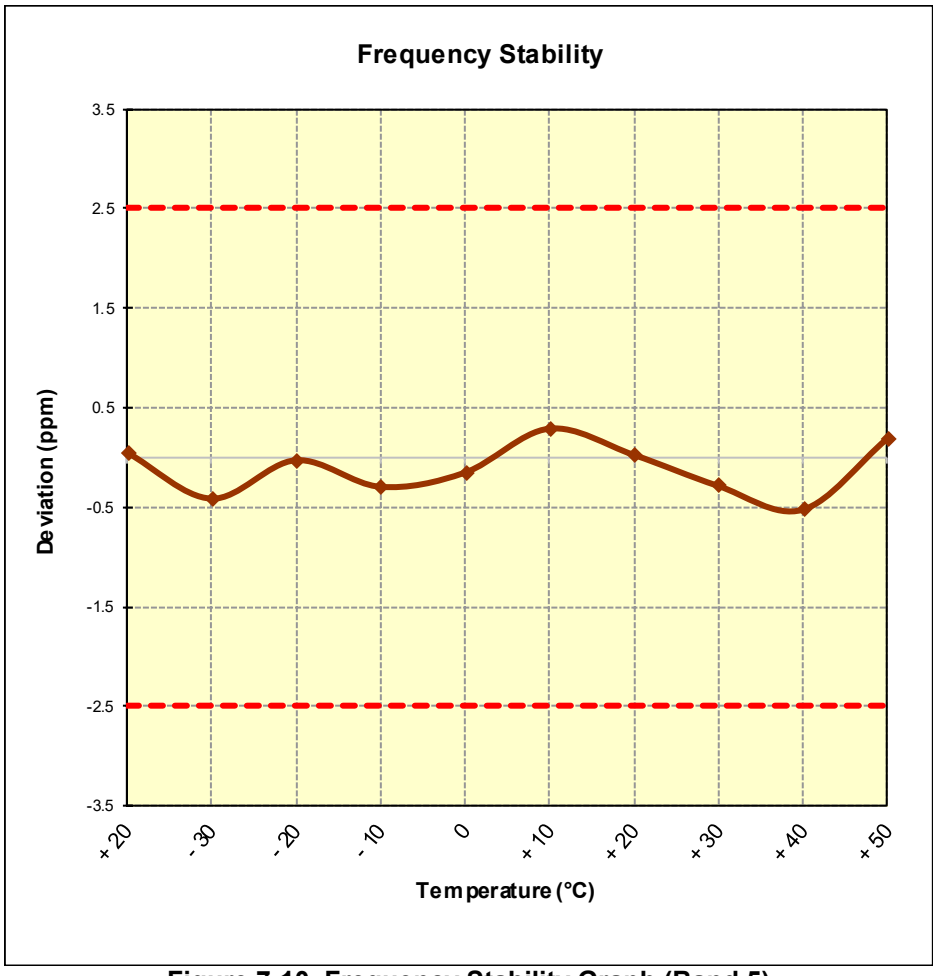


Figure 7-10. Frequency Stability Graph (Band 5)

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,500,210	210	0.0000121
100 %		- 30	1,732,499,943	-57	-0.0000033
100 %		- 20	1,732,499,791	-209	-0.0000121
100 %		- 10	1,732,500,167	167	0.0000096
100 %		0	1,732,500,274	274	0.0000158
100 %		+ 10	1,732,499,613	-387	-0.0000223
100 %		+ 20	1,732,499,933	-67	-0.0000039
100 %		+ 30	1,732,500,222	222	0.0000128
100 %		+ 40	1,732,499,998	-2	-0.0000001
100 %		+ 50	1,732,499,841	-159	-0.0000092
BATT. ENDPOINT	3.40	+ 20	1,732,500,242	242	0.0000140

Table 7-41. 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

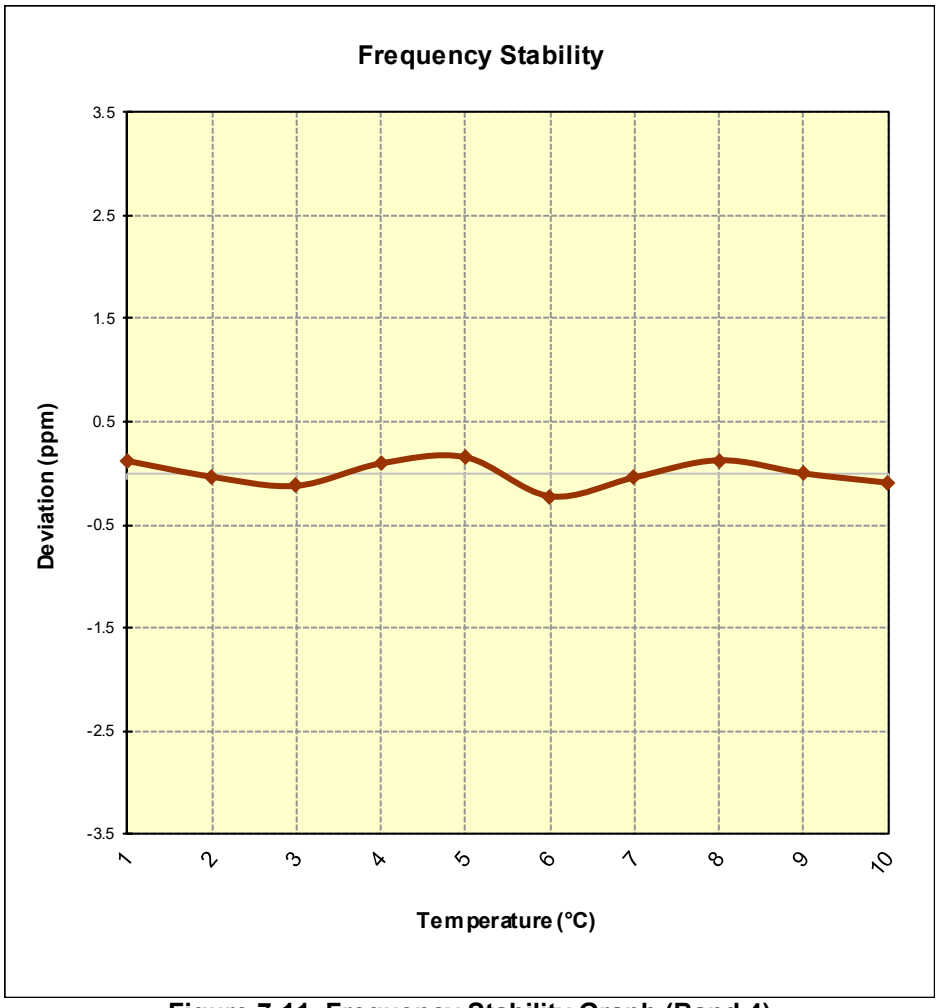


Figure 7-11. Frequency Stability Graph (Band 4)

Band 4/66 Frequency Stability Measurements

§2.1055 §§27.54

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,744,999,720	-280	-0.0000160
100 %		- 30	1,744,999,684	-316	-0.0000181
100 %		- 20	1,744,999,922	-78	-0.0000045
100 %		- 10	1,745,000,208	208	0.0000119
100 %		0	1,744,999,825	-175	-0.0000100
100 %		+ 10	1,745,000,029	29	0.0000017
100 %		+ 20	1,745,000,299	299	0.0000171
100 %		+ 30	1,745,000,144	144	0.0000083
100 %		+ 40	1,744,999,640	-360	-0.0000206
100 %		+ 50	1,745,000,092	92	0.0000053
BATT. ENDPOINT	3.40	+ 20	1,744,999,723	-277	-0.0000159

Table 7-42. Frequency Stability Data (Band 66)

Note:

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

Band 66 Frequency Stability Measurements

§2.1055 §§27.54

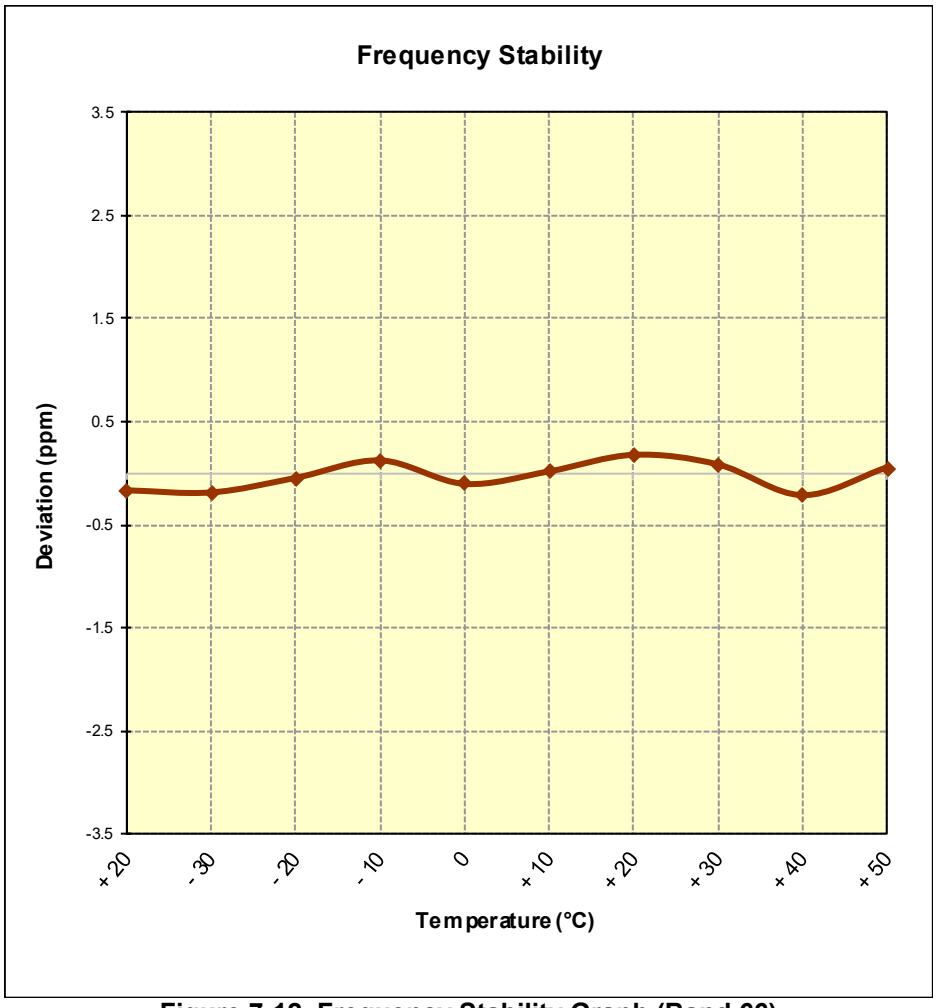


Figure 7-12. Frequency Stability Graph (Band 66)

Band 25 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,877	-123	-0.0000065
100 %		- 30	1,879,999,725	-275	-0.0000146
100 %		- 20	1,880,000,075	75	0.0000040
100 %		- 10	1,880,000,159	159	0.0000085
100 %		0	1,880,000,024	24	0.0000013
100 %		+ 10	1,880,000,047	47	0.0000025
100 %		+ 20	1,880,000,346	346	0.0000184
100 %		+ 30	1,879,999,682	-318	-0.0000169
100 %		+ 40	1,879,999,965	-35	-0.0000019
100 %		+ 50	1,880,000,142	142	0.0000076
BATT. ENDPOINT	3.40	+ 20	1,879,999,994	-6	-0.0000003

Table 7-43. 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

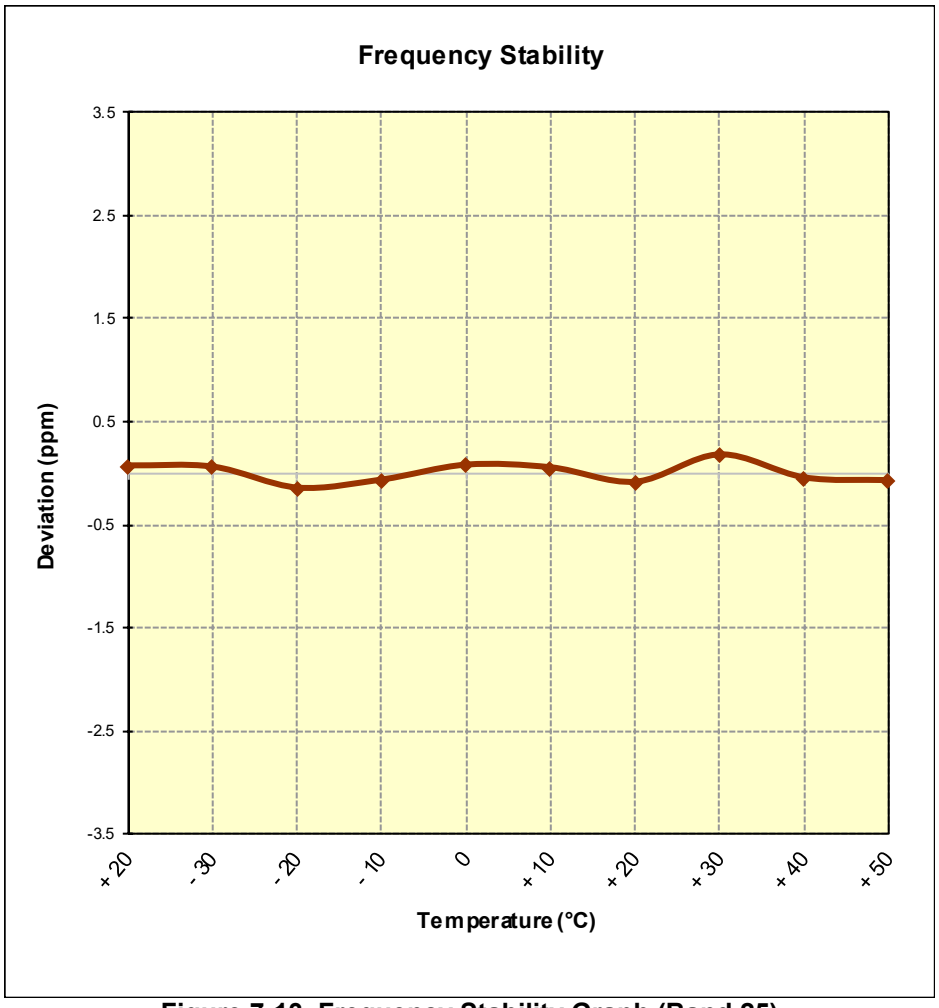


Figure 7-13. Frequency Stability Graph (Band 25)

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Band 30 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	2,310,000,000	Hz
CHANNEL:	27710	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,309,999,963	-37	-0.0000016
100 %		- 30	2,310,000,295	295	0.0000128
100 %		- 20	2,309,999,774	-226	-0.0000098
100 %		- 10	2,310,000,239	239	0.0000103
100 %		0	2,309,999,902	-98	-0.0000042
100 %		+ 10	2,309,999,854	-146	-0.0000063
100 %		+ 20	2,309,999,962	-38	-0.0000016
100 %		+ 30	2,309,999,722	-278	-0.0000120
100 %		+ 40	2,309,999,914	-86	-0.0000037
100 %		+ 50	2,309,999,990	-10	-0.0000004
BATT. ENDPOINT	3.40	+ 20	2,310,000,070	70	0.0000030

Table 7-44. Frequency Stability Data (Band 30)

Note:

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

Band 30 Frequency Stability Measurements

§2.1055 §24.235

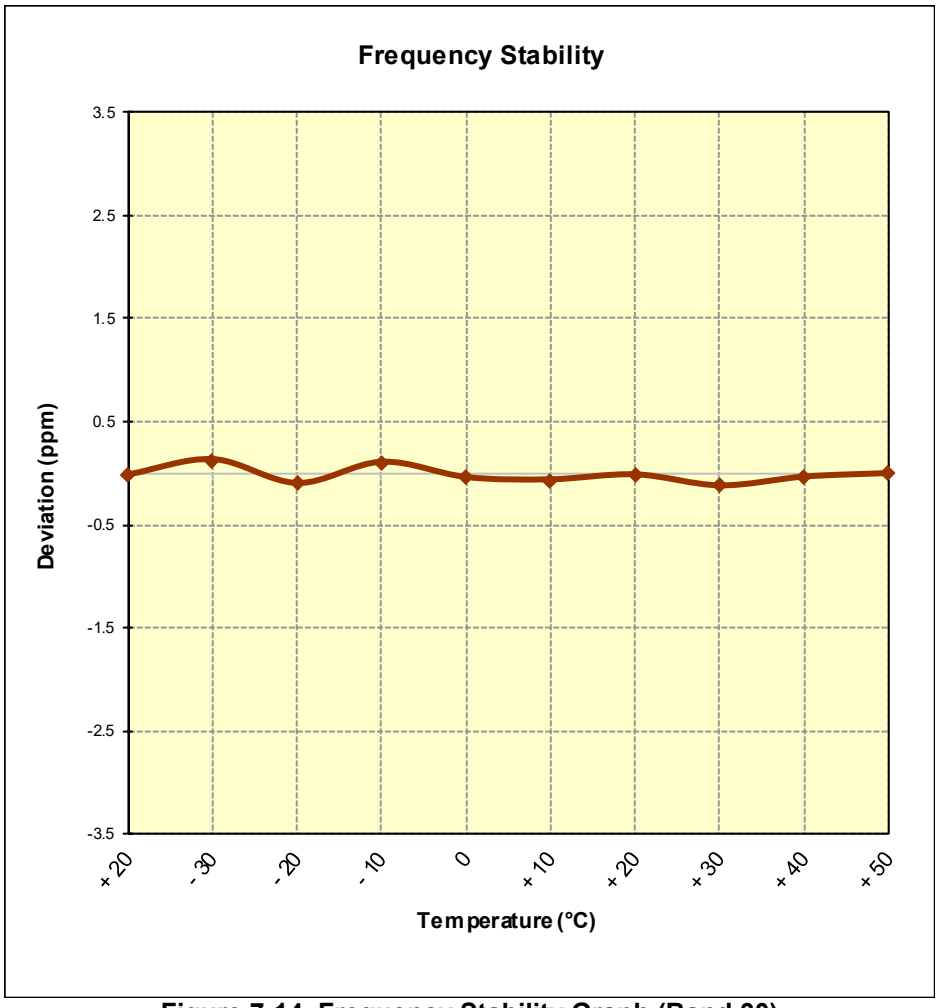

Figure 7-14. Frequency Stability Graph (Band 30)

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Band 7 Frequency Stability Measurements

§2.1055 §27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,535,000,043	43	0.0000017
100 %		- 30	2,535,000,039	39	0.0000015
100 %		- 20	2,535,000,316	316	0.0000125
100 %		- 10	2,535,000,241	241	0.0000095
100 %		0	2,535,000,050	50	0.0000020
100 %		+ 10	2,535,000,056	56	0.0000022
100 %		+ 20	2,535,000,151	151	0.0000060
100 %		+ 30	2,534,999,975	-25	-0.0000010
100 %		+ 40	2,535,000,030	30	0.0000012
100 %		+ 50	2,535,000,027	27	0.0000011
BATT. ENDPOINT	3.40	+ 20	2,534,999,987	-13	-0.0000005

Table 7-45. 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.

V 6.1
12/26/2016

Band 7 Frequency Stability Measurements

§2.1055 §27.54

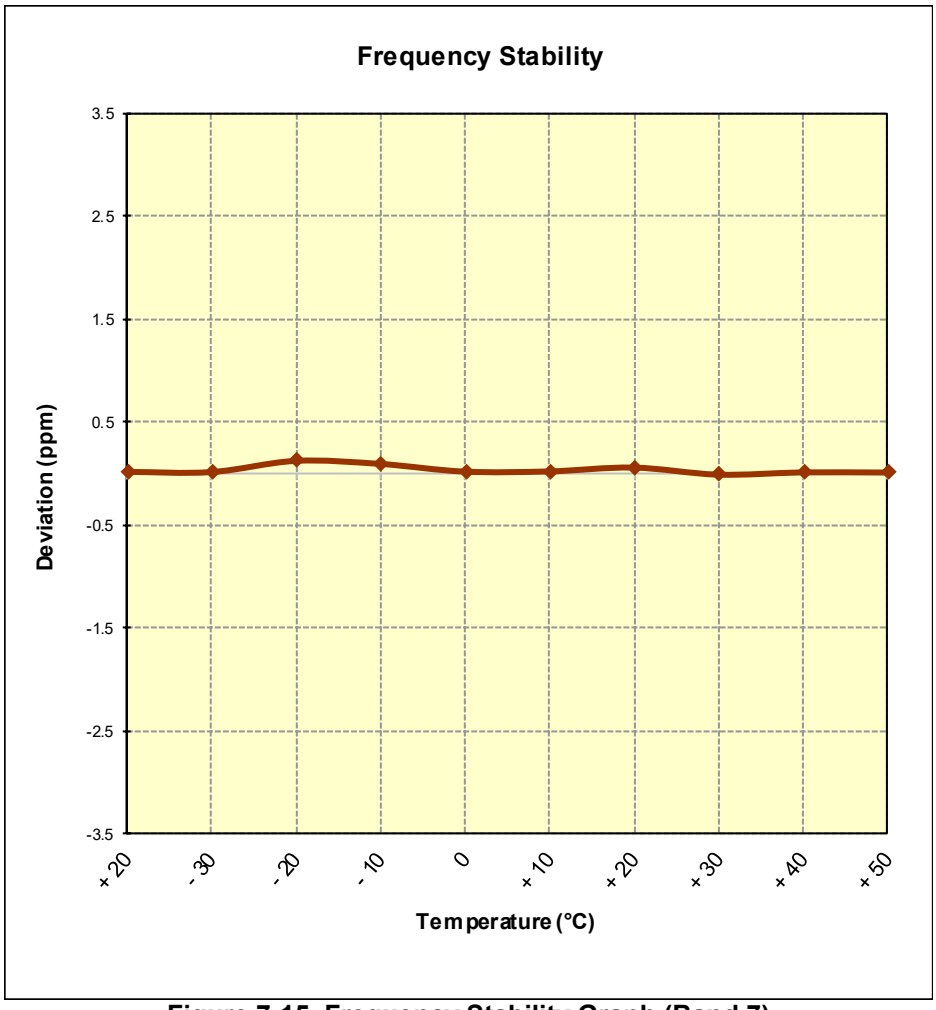

Figure 7-15. Frequency Stability Graph (Band 7)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH871** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.