

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

The minimum permissible attenuation level for Band 41 is as noted in the Test Notes on the following page.

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P[\text{Watts}])$, 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 $\geq 1\%$ of the emission bandwidth
4. VBW $\geq 3 \times$ RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times$ Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

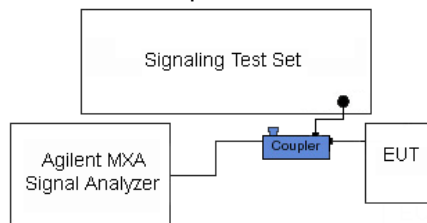


Figure 7-3. Test Instrument & Measurement Setup

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Test Notes

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

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

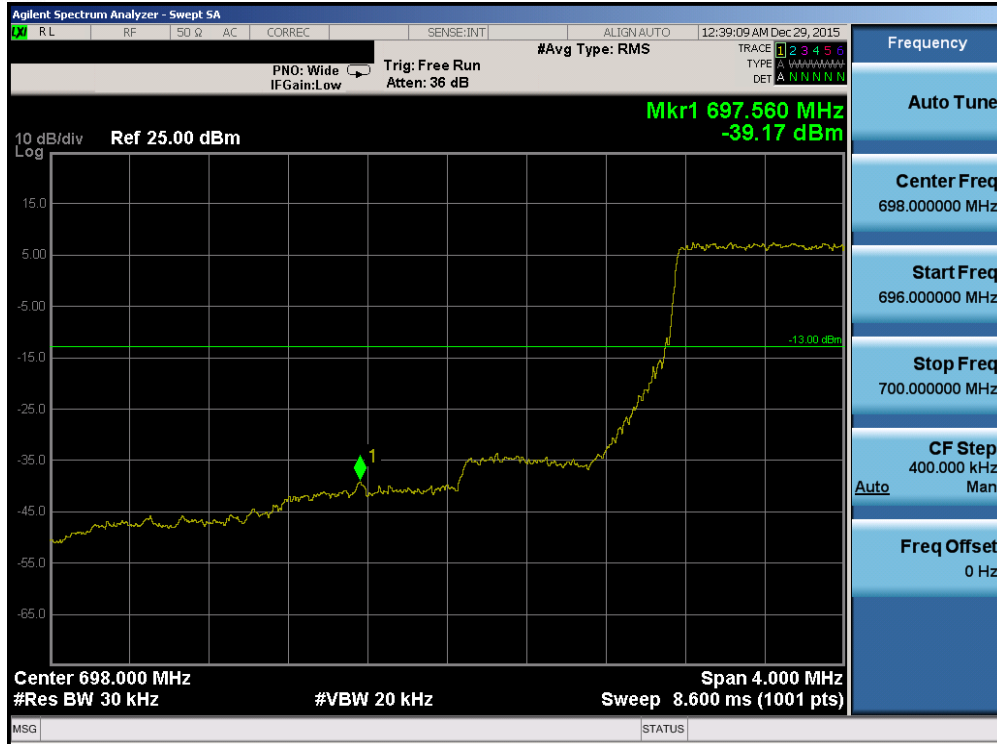
Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

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

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.

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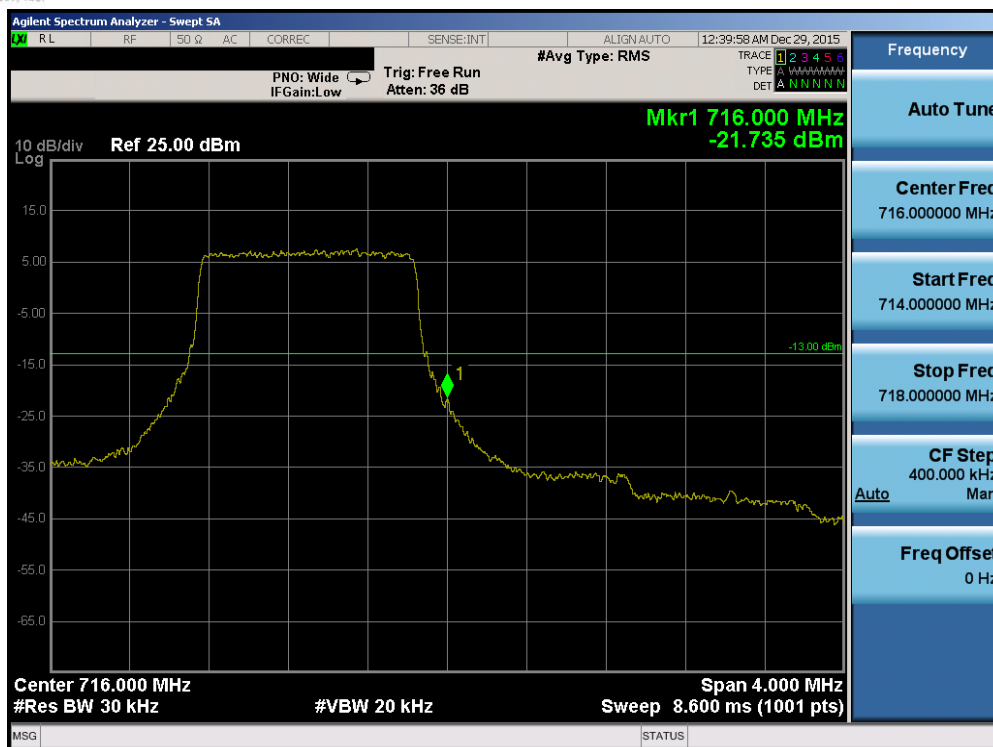


Plot 7-127. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



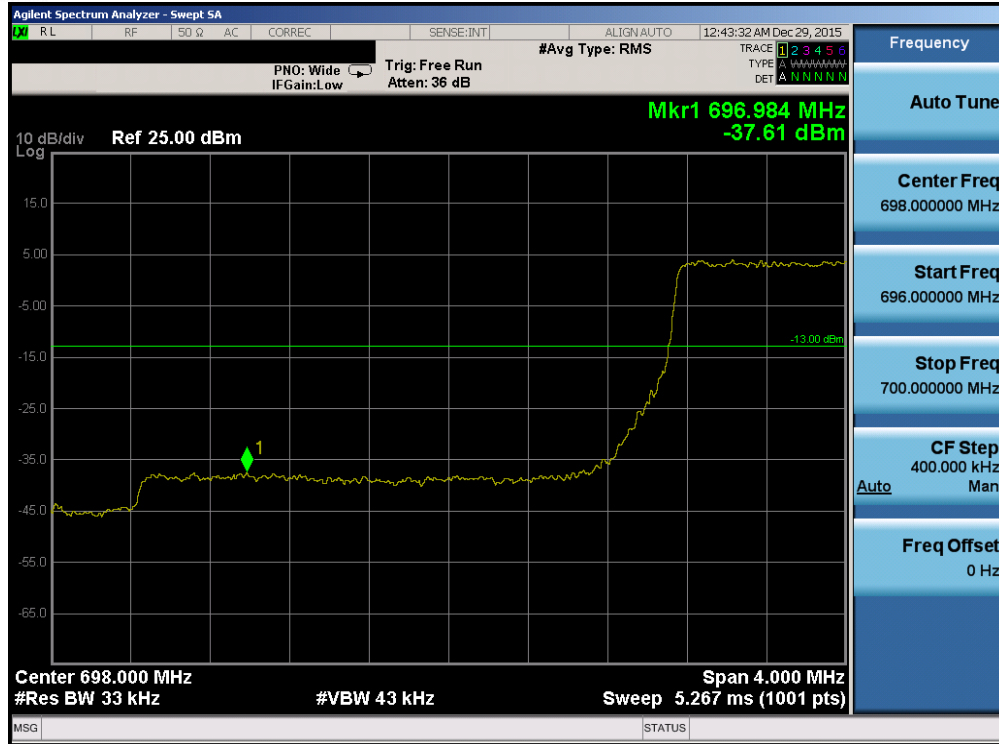
Plot 7-128. Lower Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

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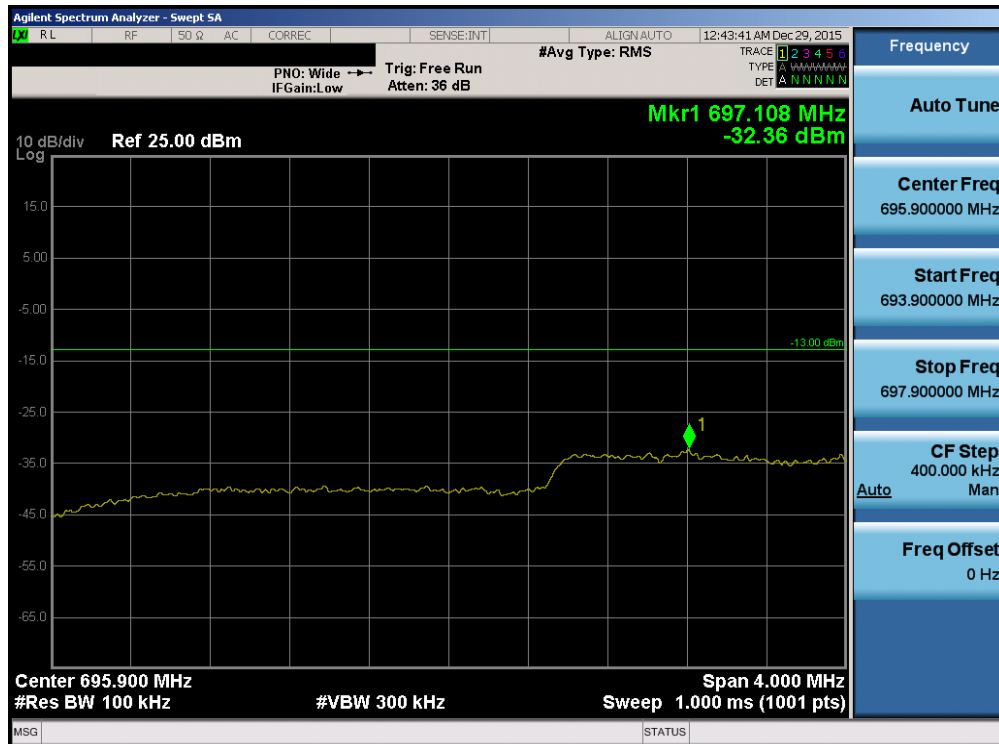


Plot 7-129. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

Plot 7-130. Upper Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

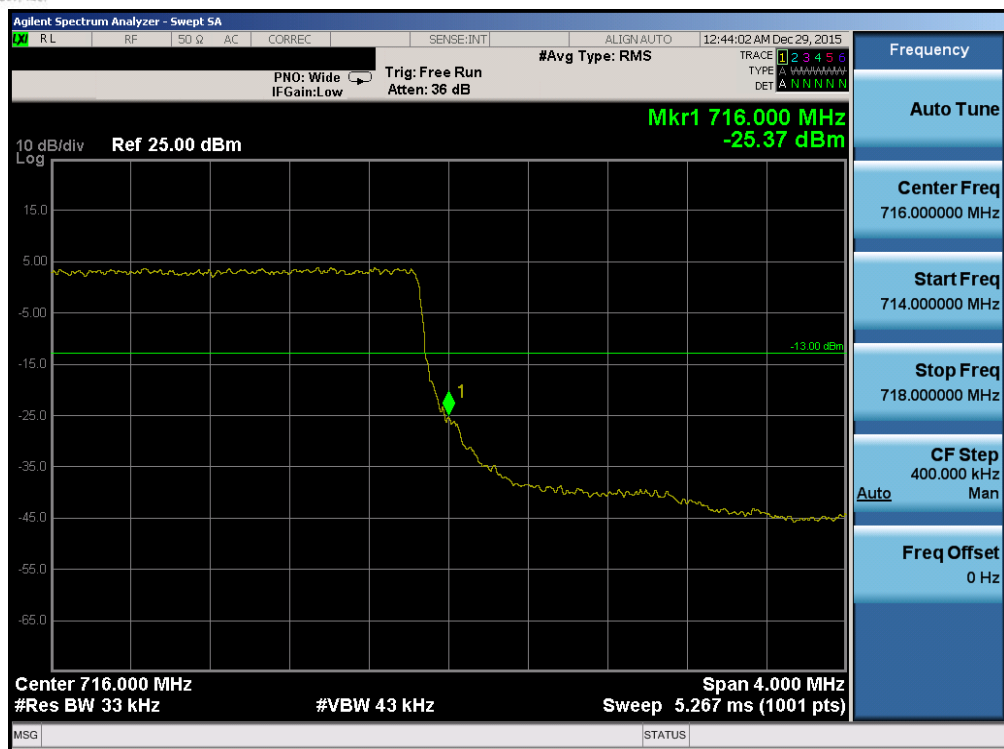


Plot 7-131. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

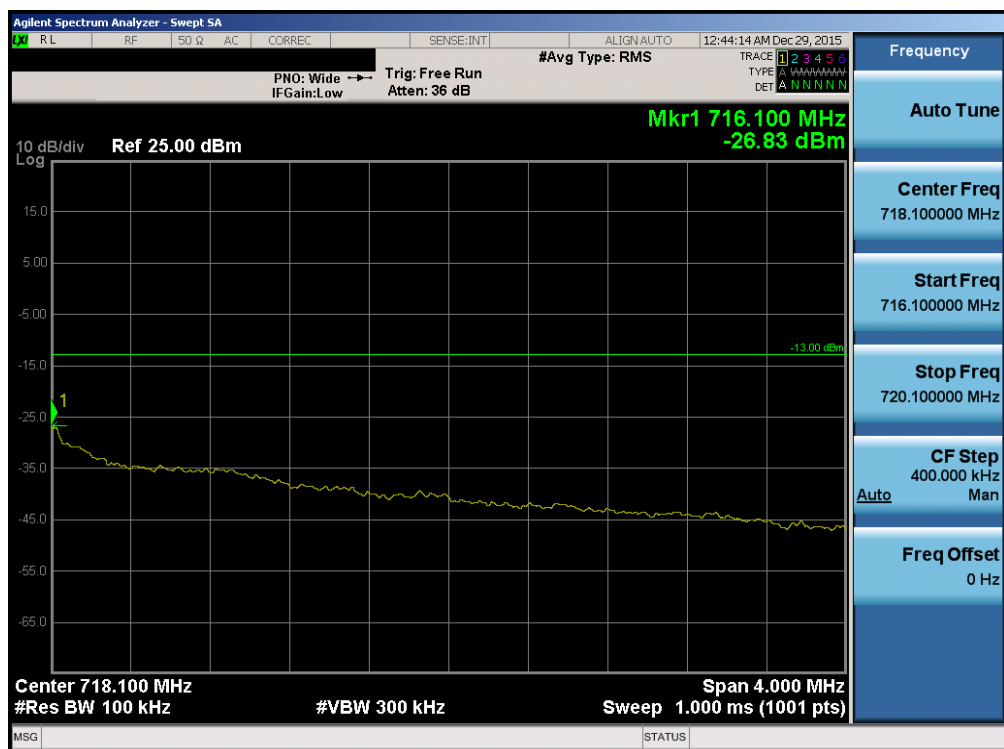


Plot 7-132. Lower Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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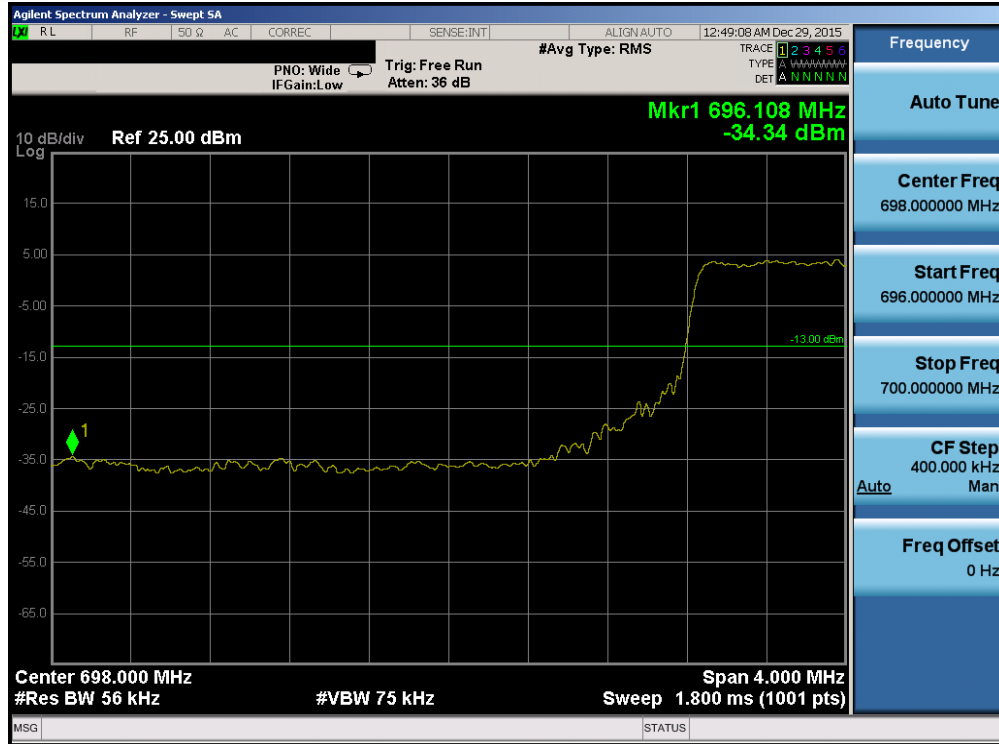


Plot 7-133. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

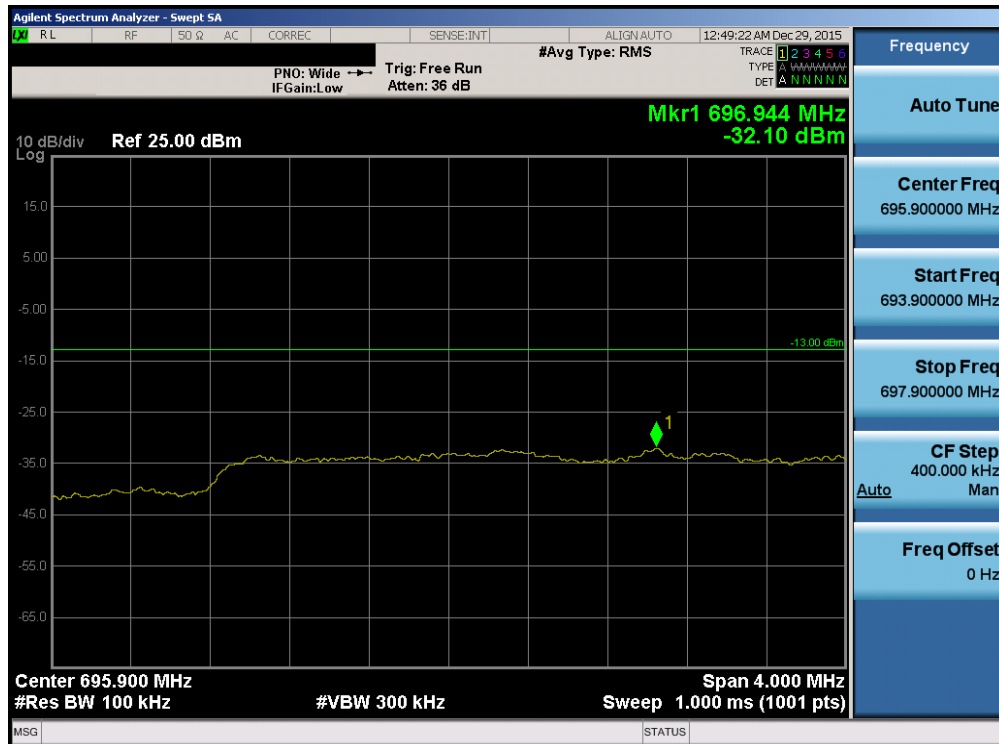


Plot 7-134. Upper Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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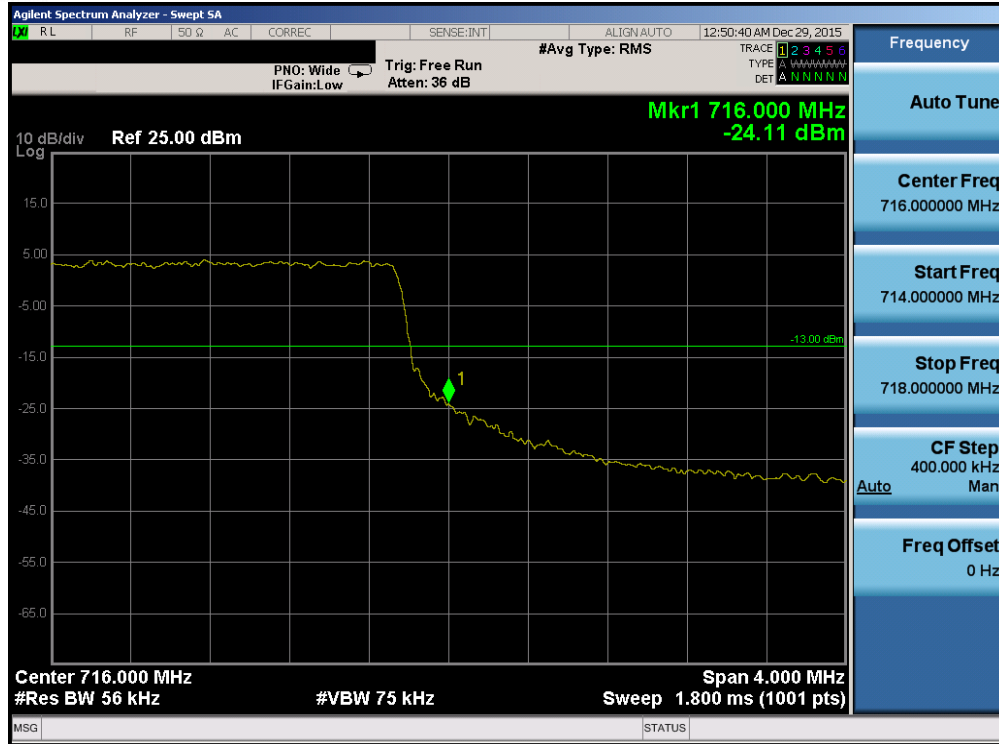


Plot 7-135. Lower Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 7-136. Lower Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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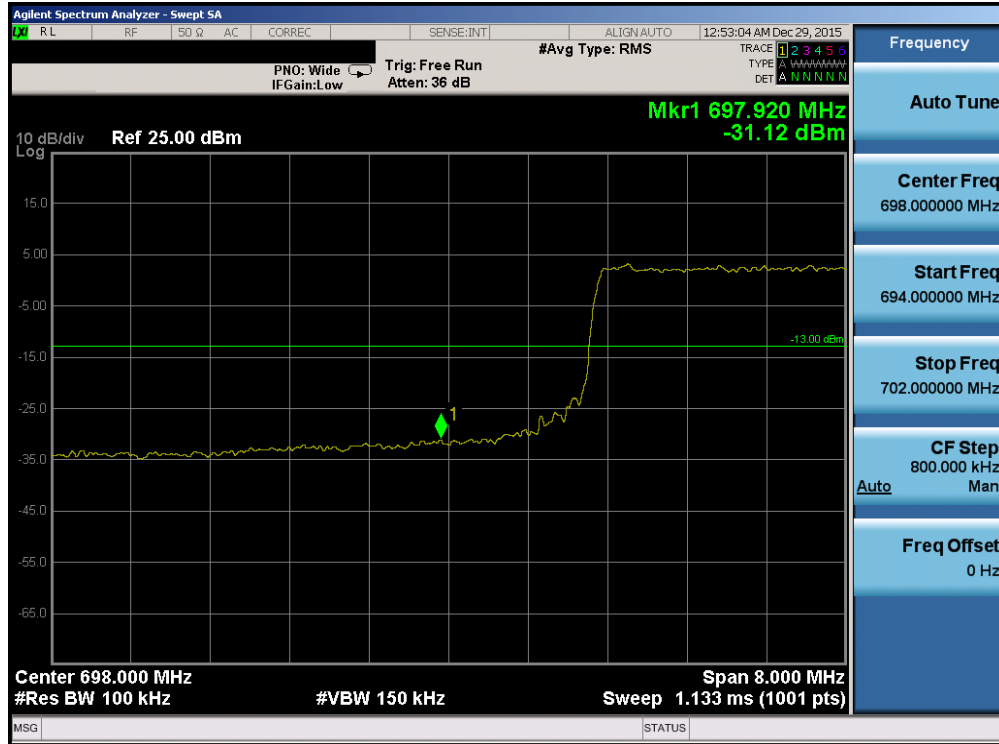


Plot 7-137. Upper Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 7-138. Upper Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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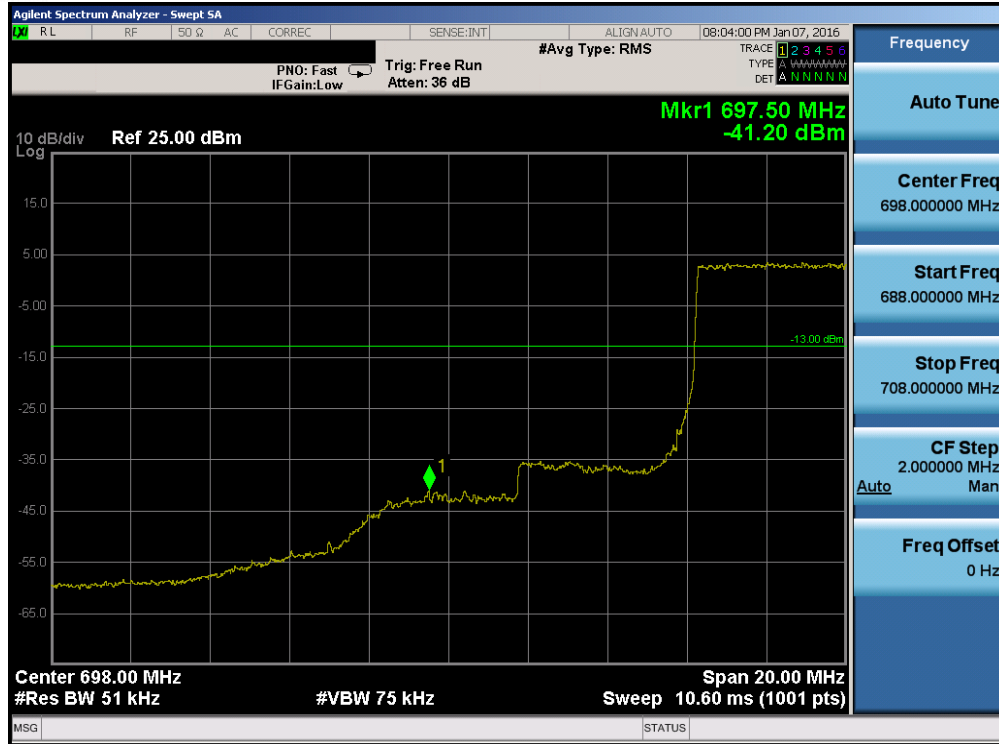


Plot 7-139. Lower Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

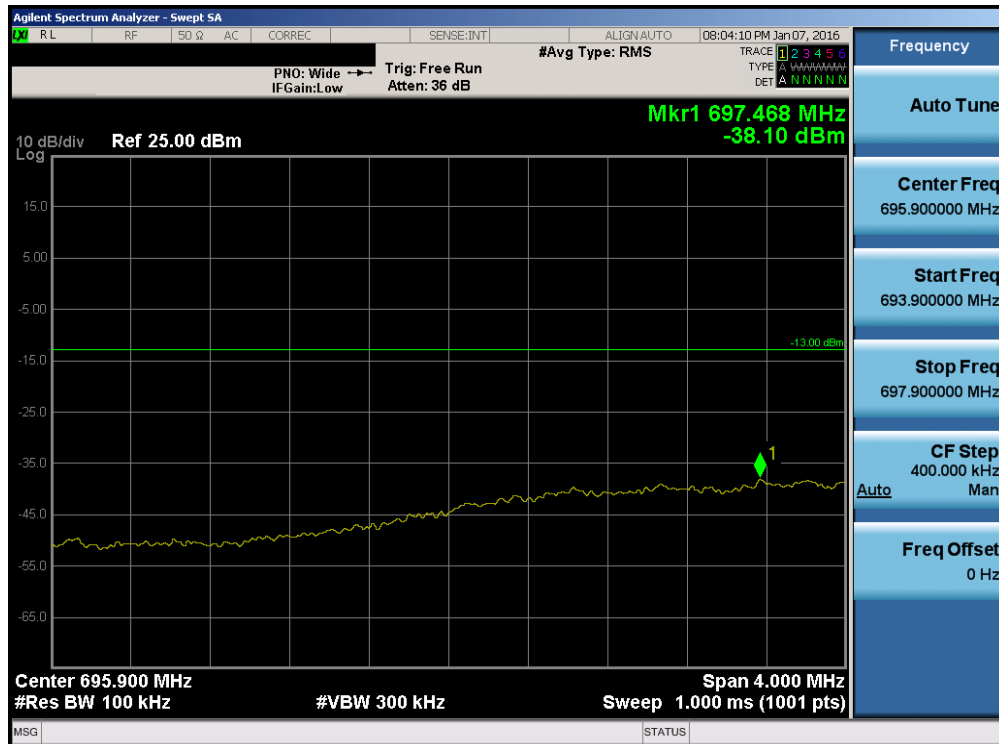


Plot 7-140. Upper Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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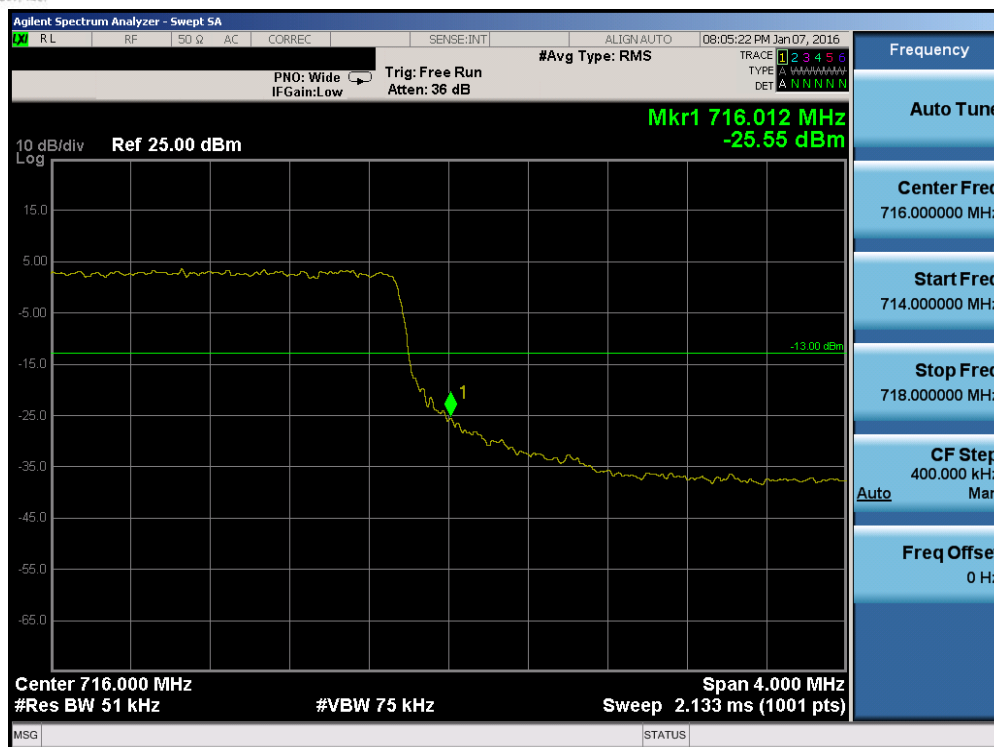


Plot 7-141. Lower Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)

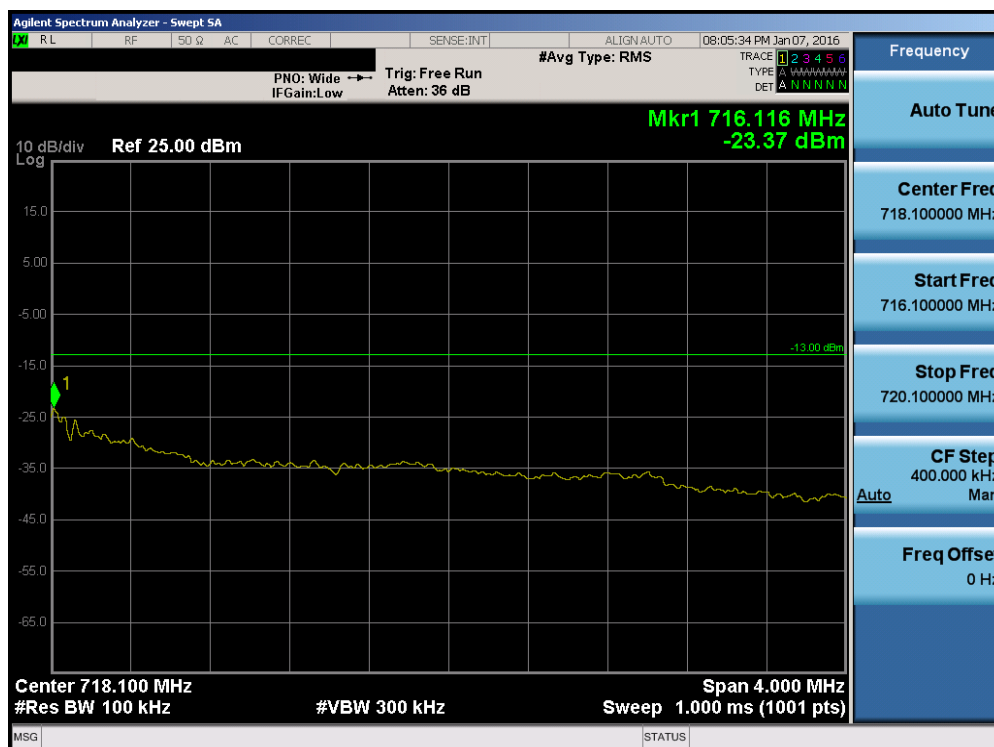


Plot 7-142. Lower Extended Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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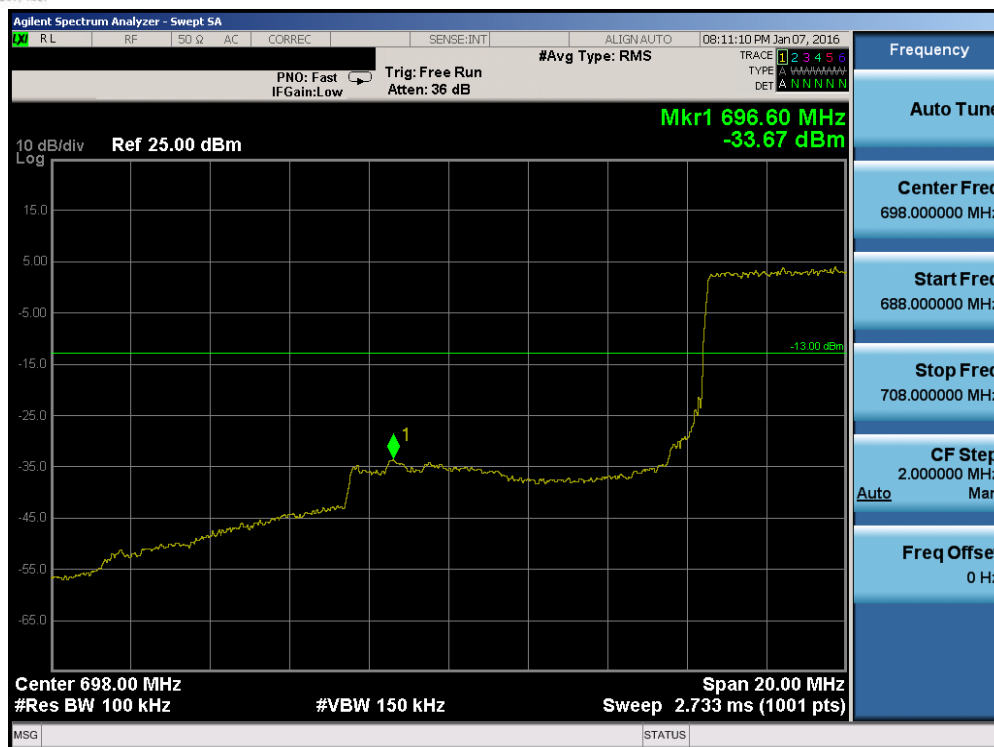


Plot 7-143. Upper Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)



Plot 7-144. Upper Extended Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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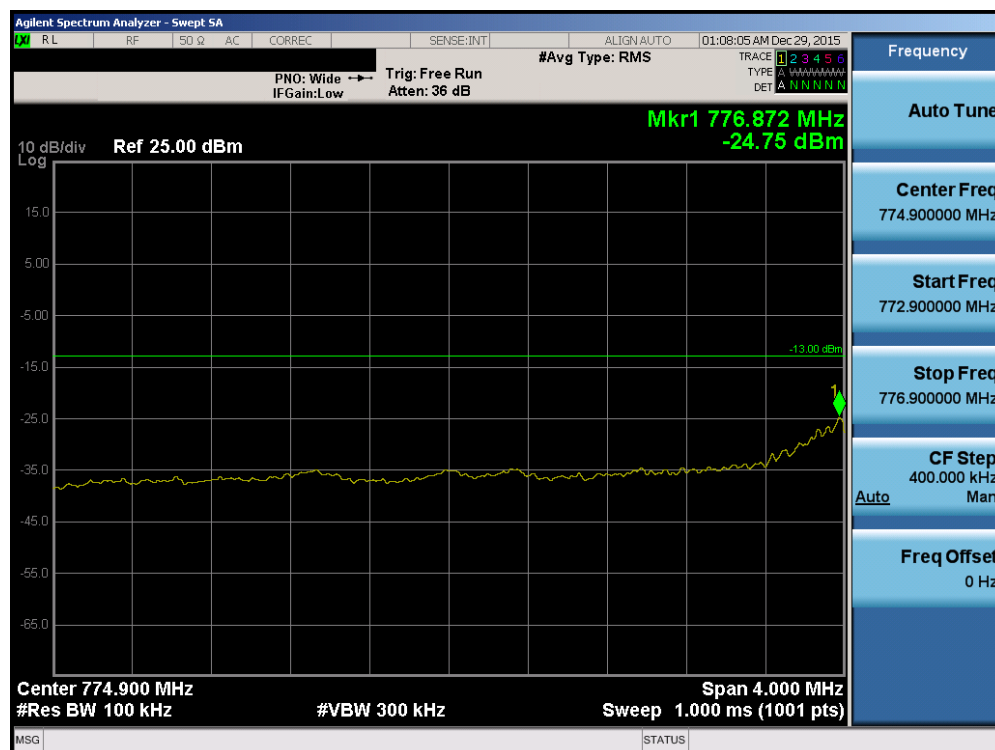
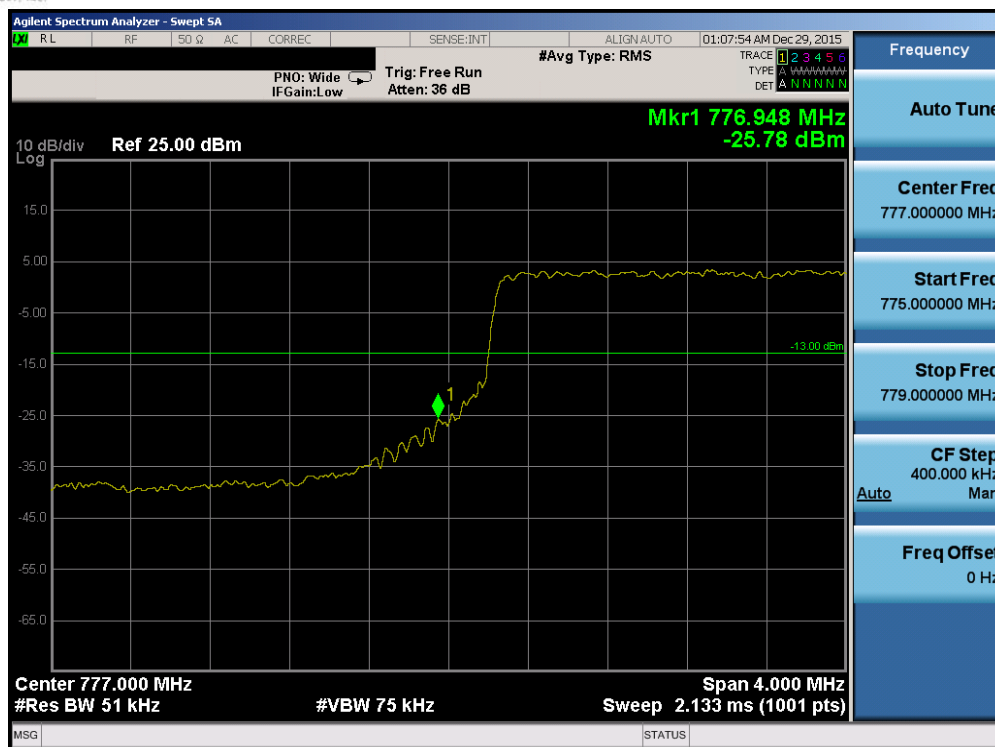


Plot 7-145. Lower Band Edge Plot (Band 17 – 10.0MHz QPSK – RB Size 50)

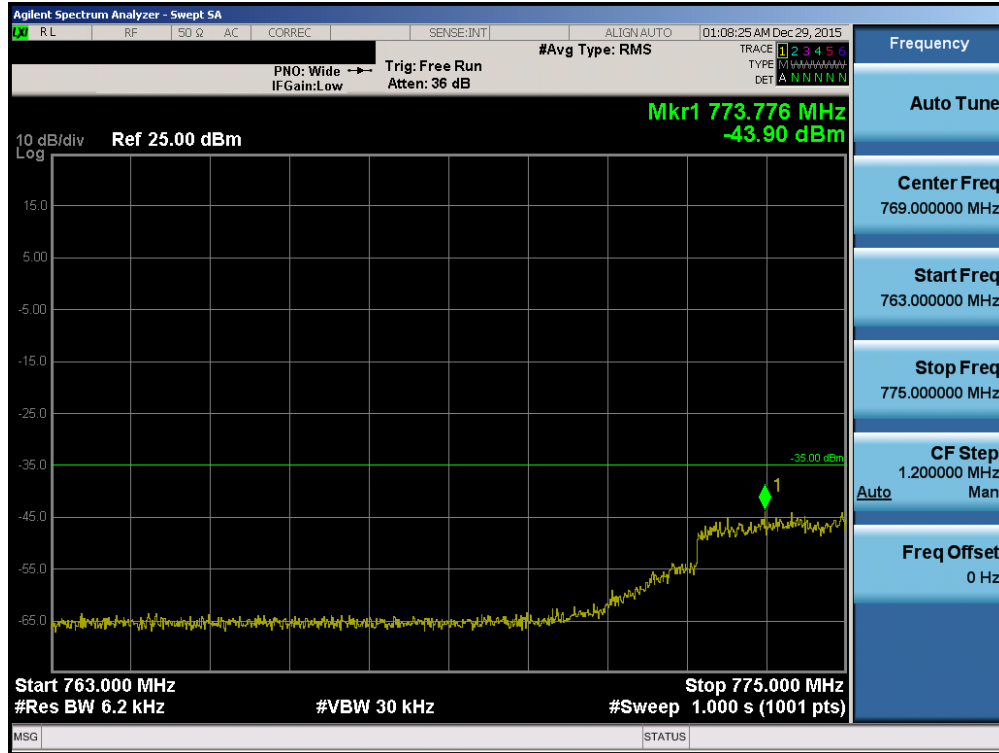


Plot 7-146. Upper Band Edge Plot (Band 17 – 10.0MHz QPSK – RB Size 50)

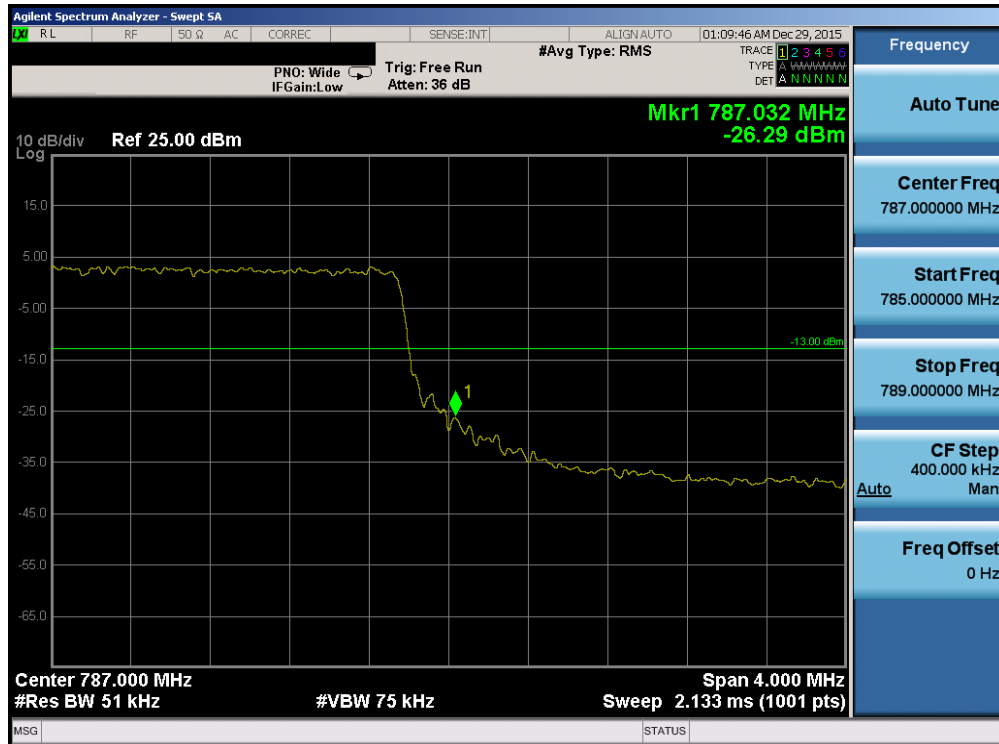
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Plot 7-149. Lower Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

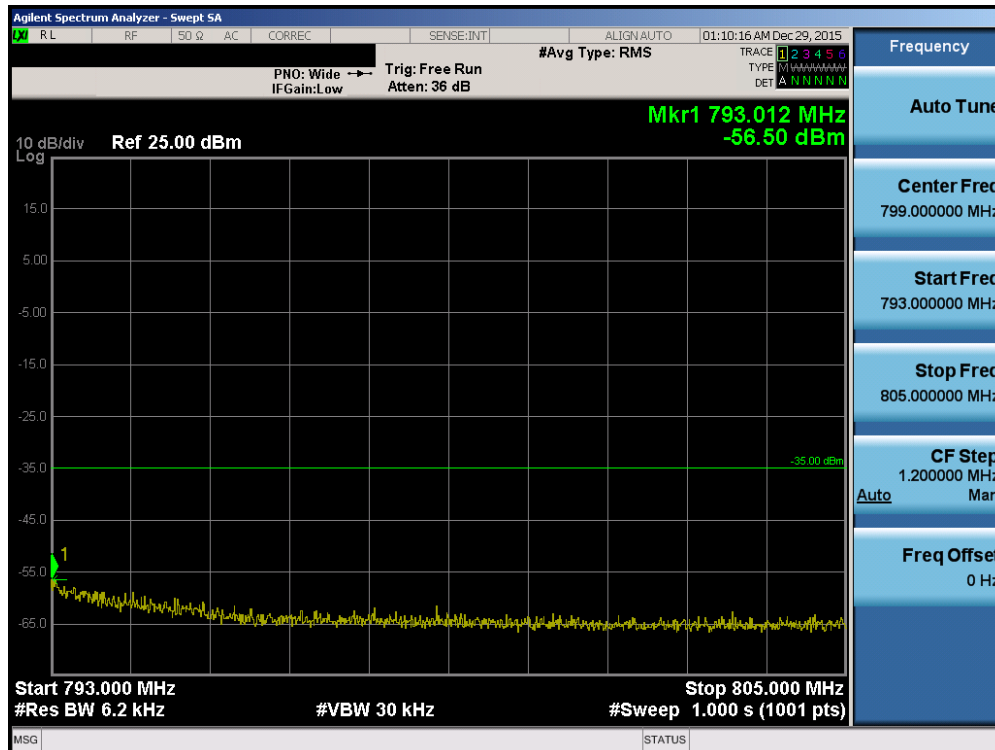


Plot 7-150. Upper Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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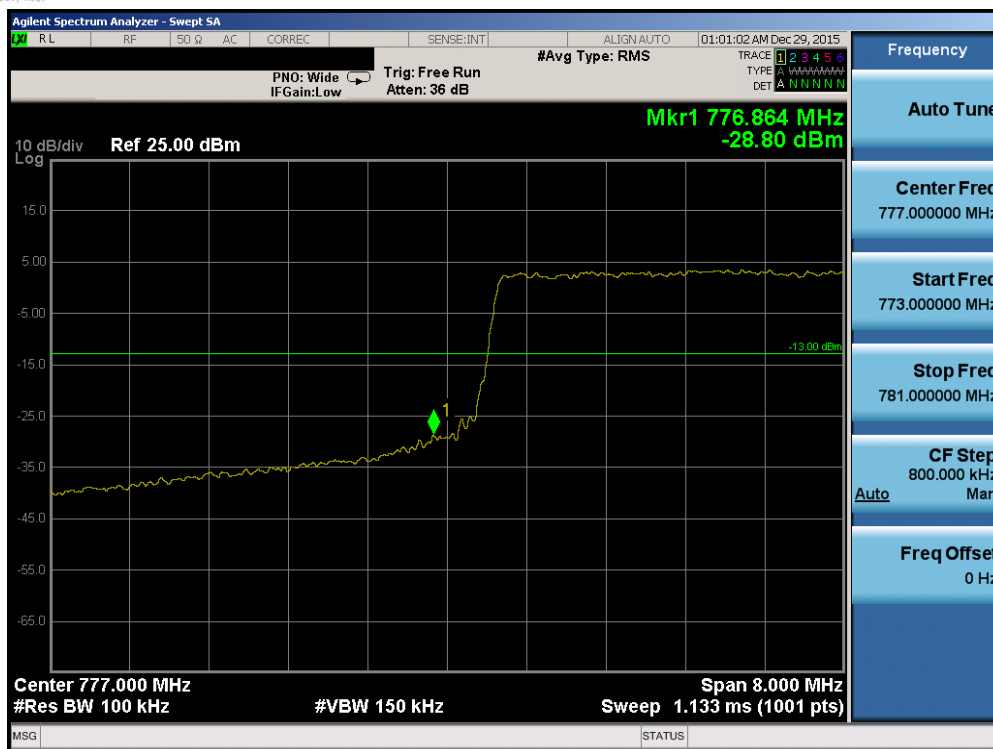


Plot 7-151. Upper Extended Band Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

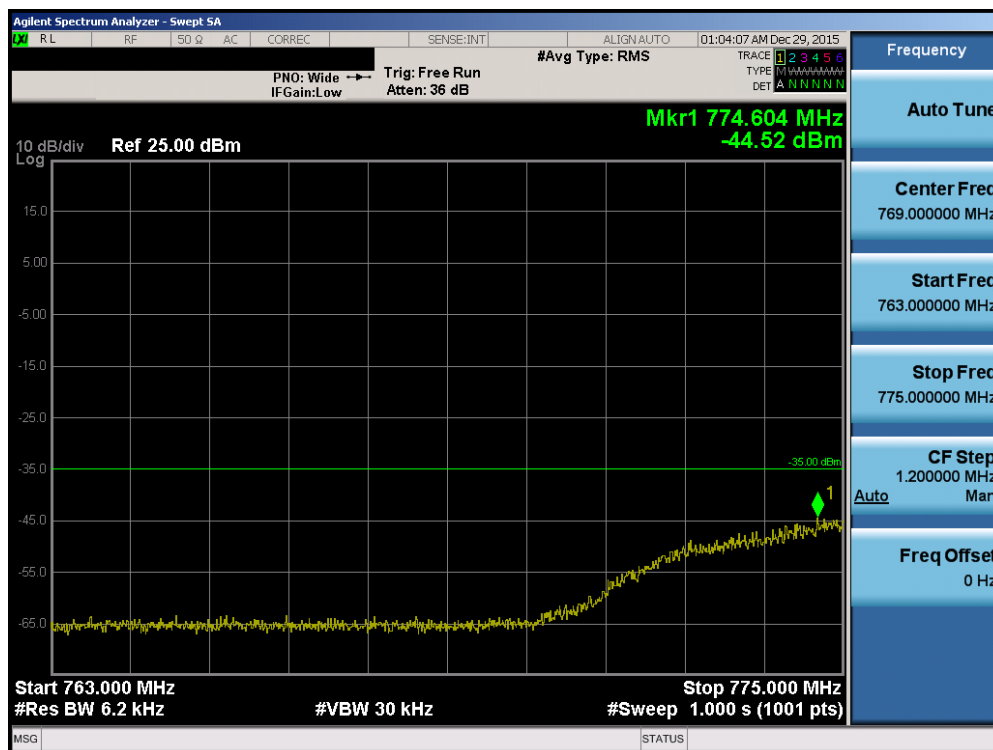


Plot 7-152. Upper Emission Mask Edge Plot (Band 13 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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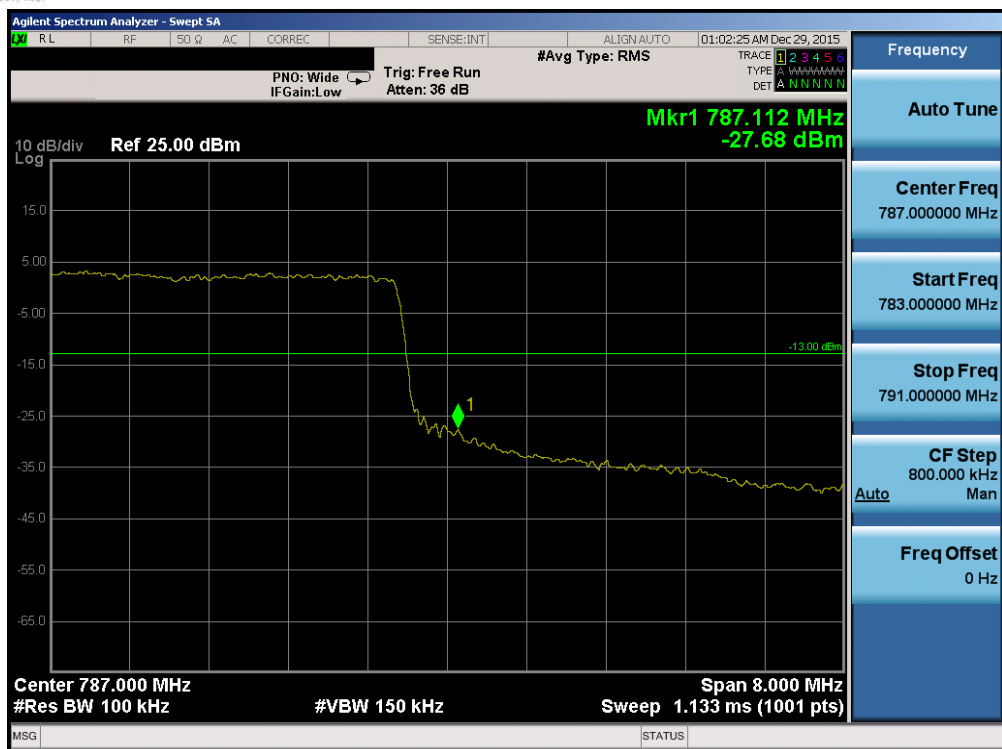


Plot 7-153. Lower Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

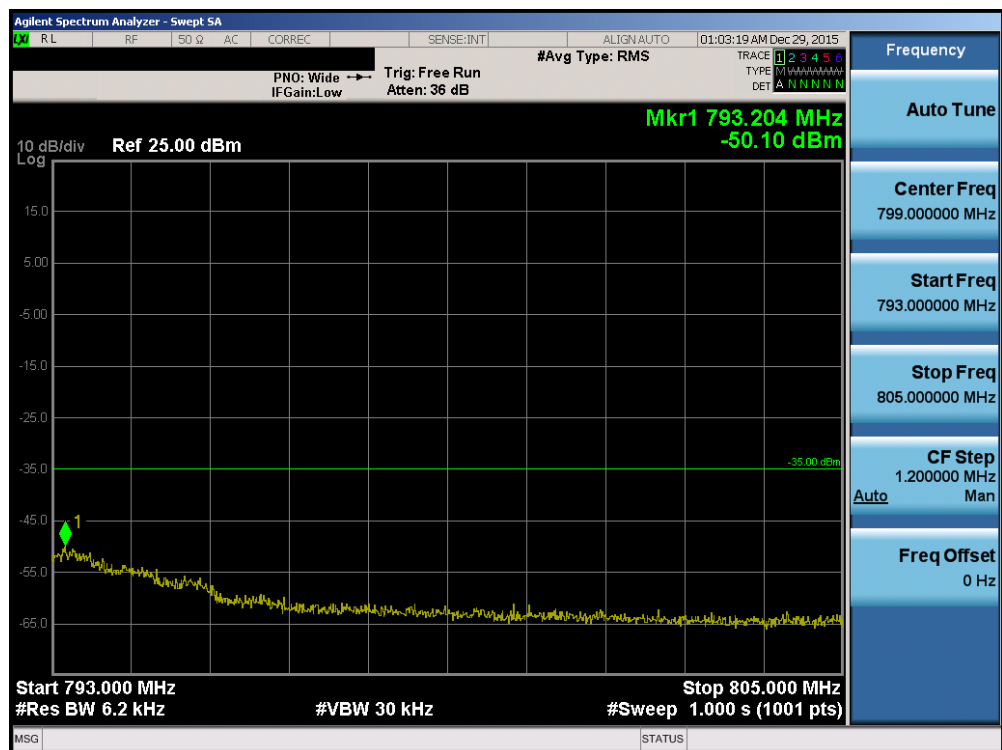


Plot 7-154. Lower Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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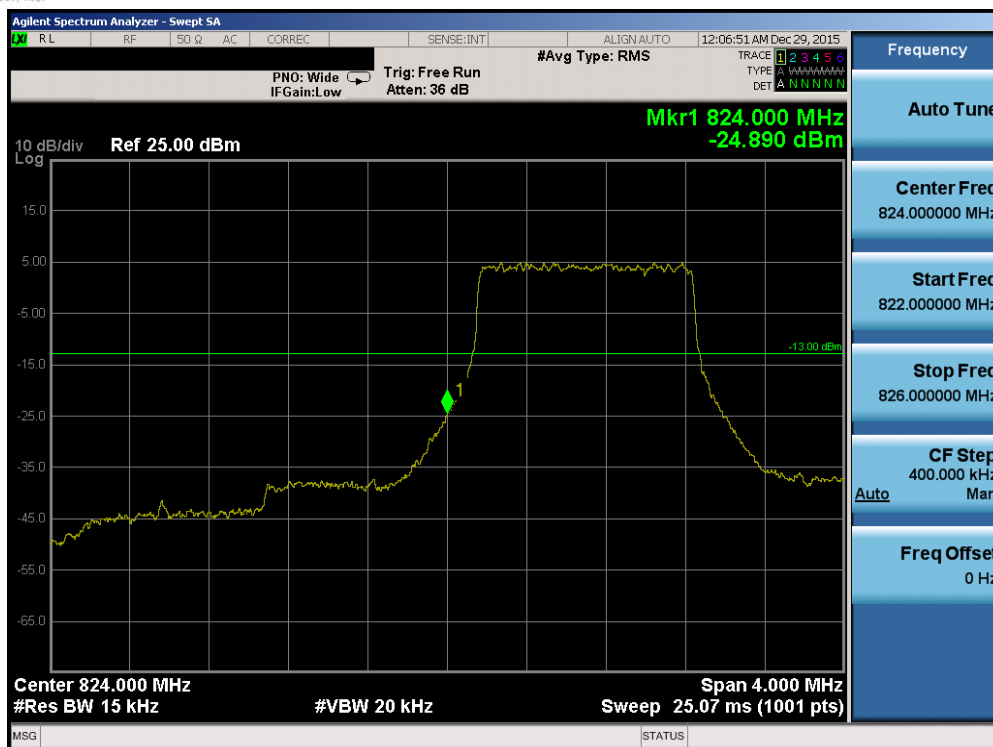


Plot 7-155. Upper Band Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)



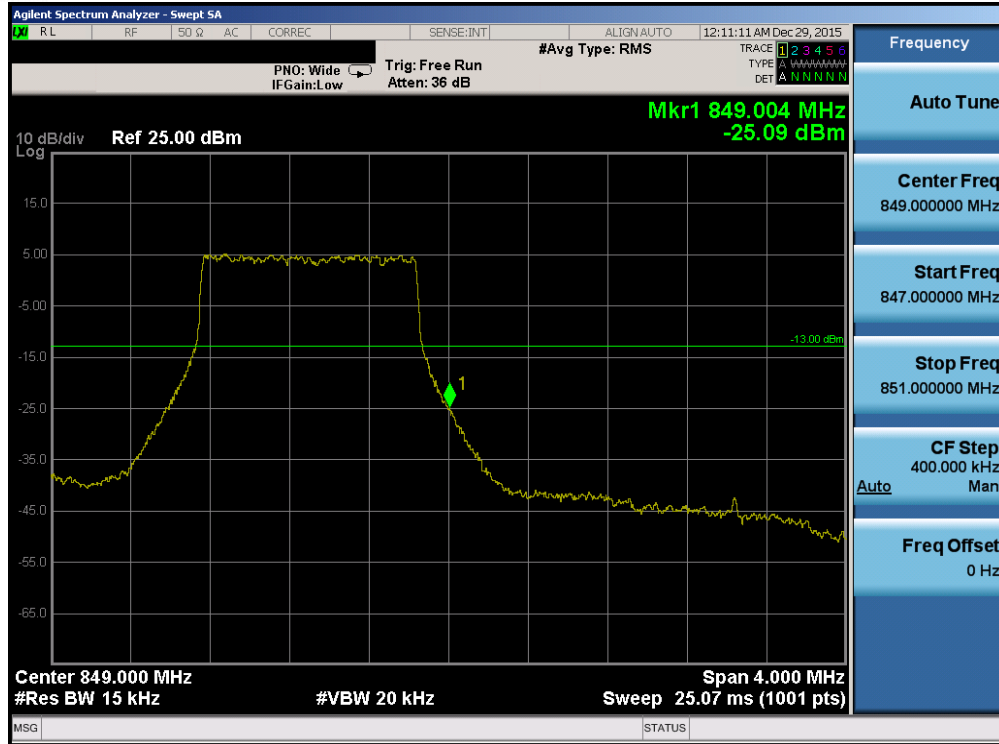
Plot 7-156. Upper Emission Mask Edge Plot (Band 13 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-157. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

Plot 7-158. Lower Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

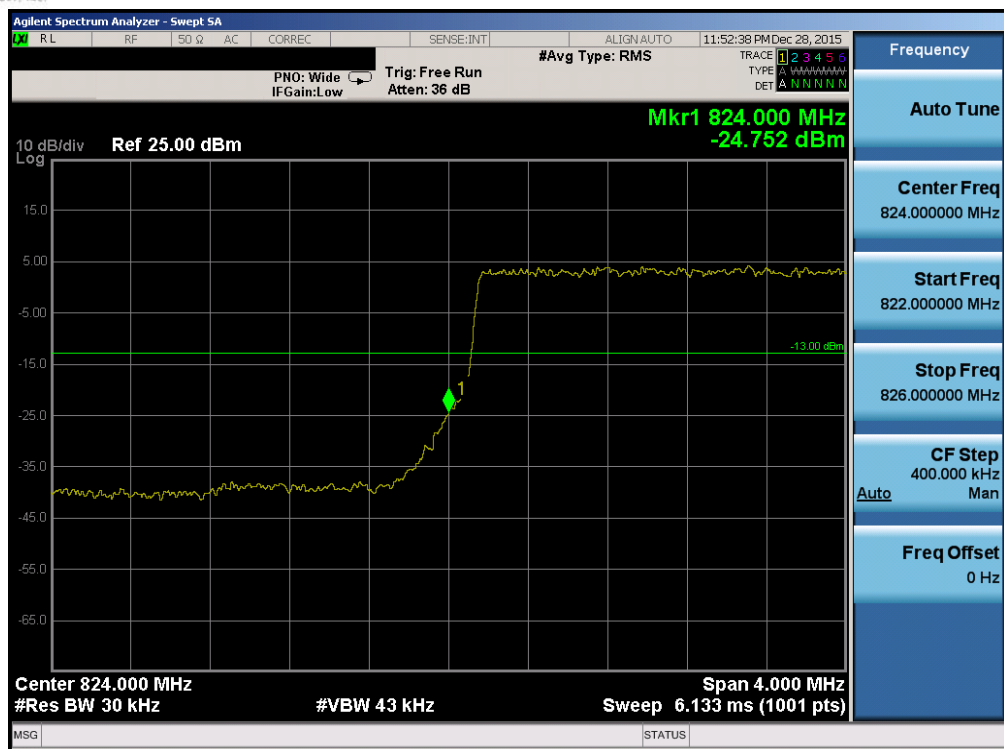


Plot 7-159. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

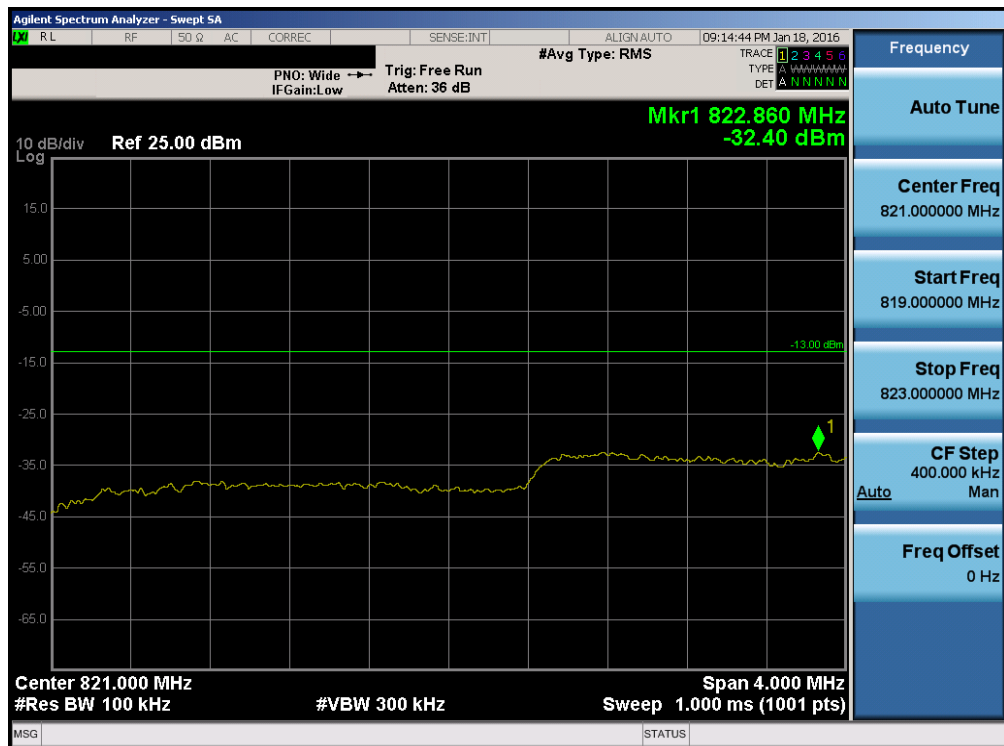


Plot 7-160. Upper Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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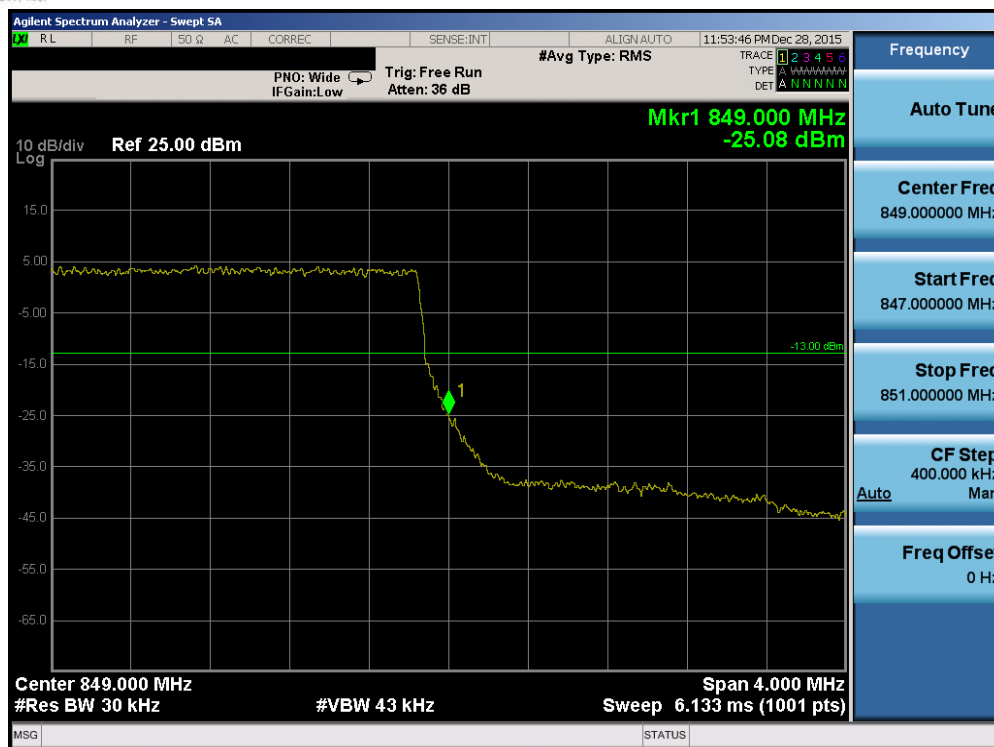


Plot 7-161. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

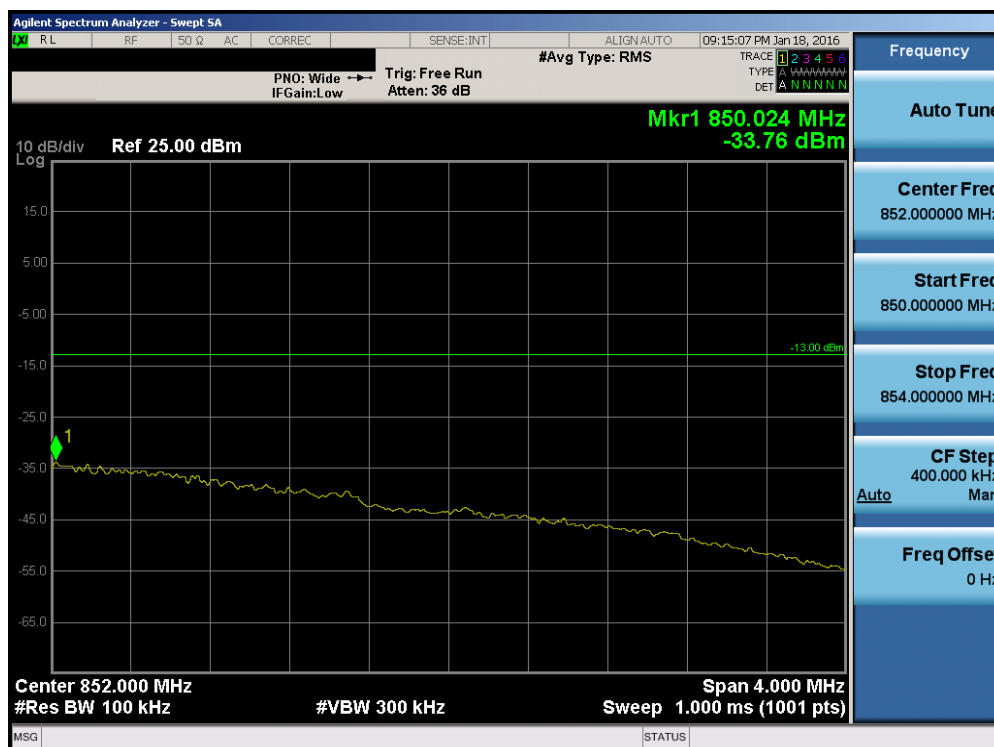


Plot 7-162. Lower Extended Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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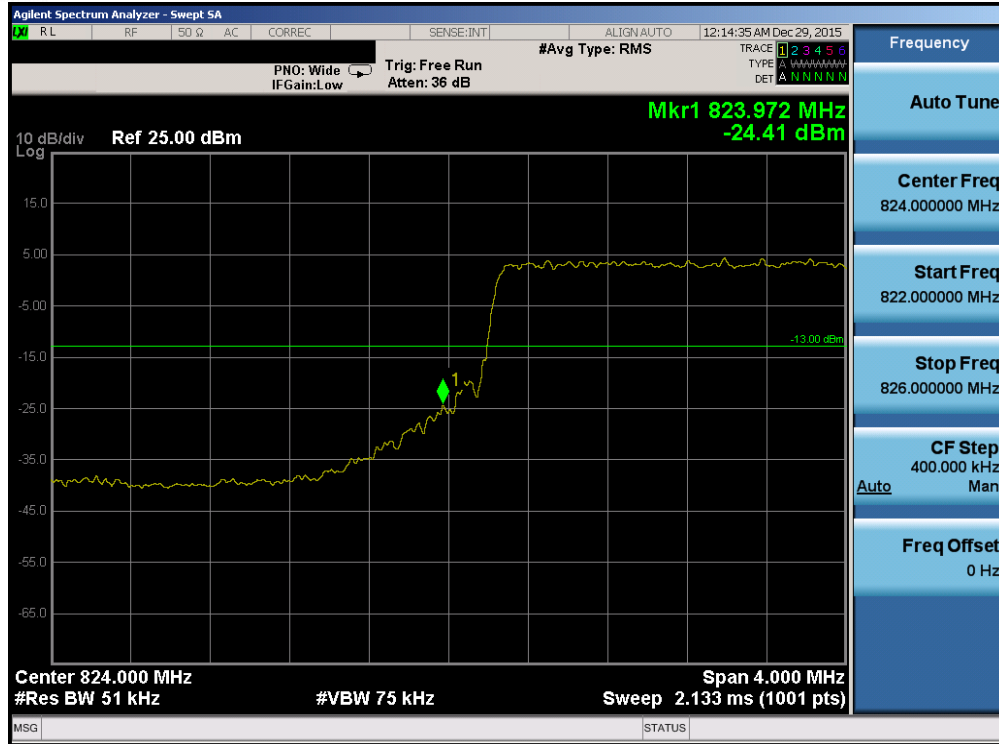


Plot 7-163. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - RB Size 15)

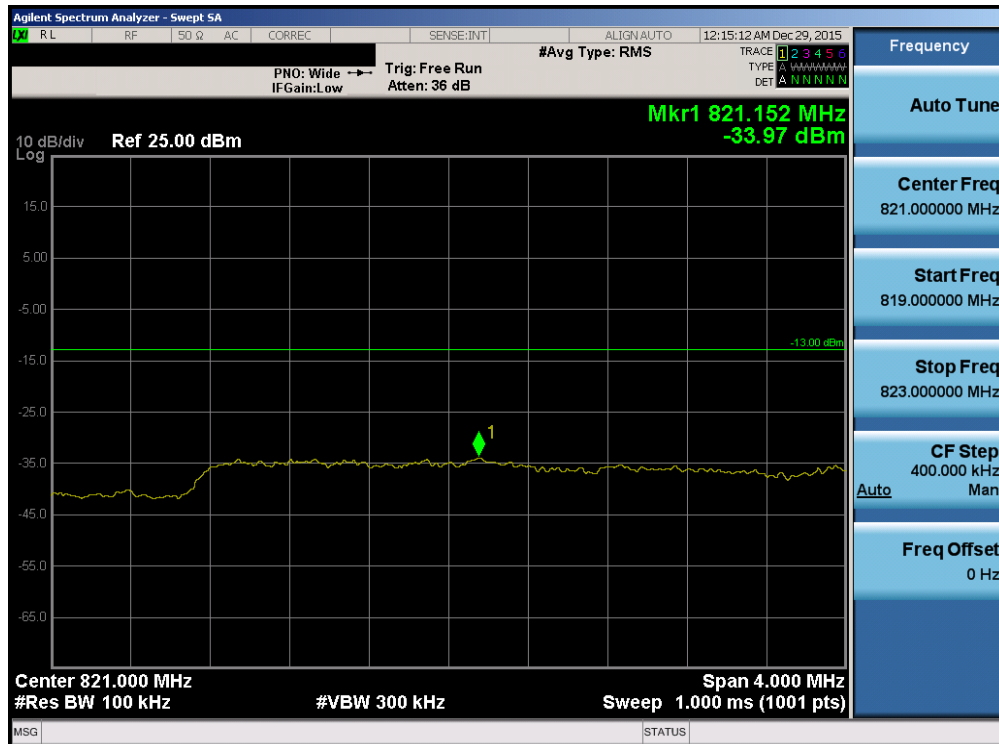


Plot 7-164. Upper Extended Band Edge Plot (Band 5 - Band 5 - 3.0MHz QPSK - RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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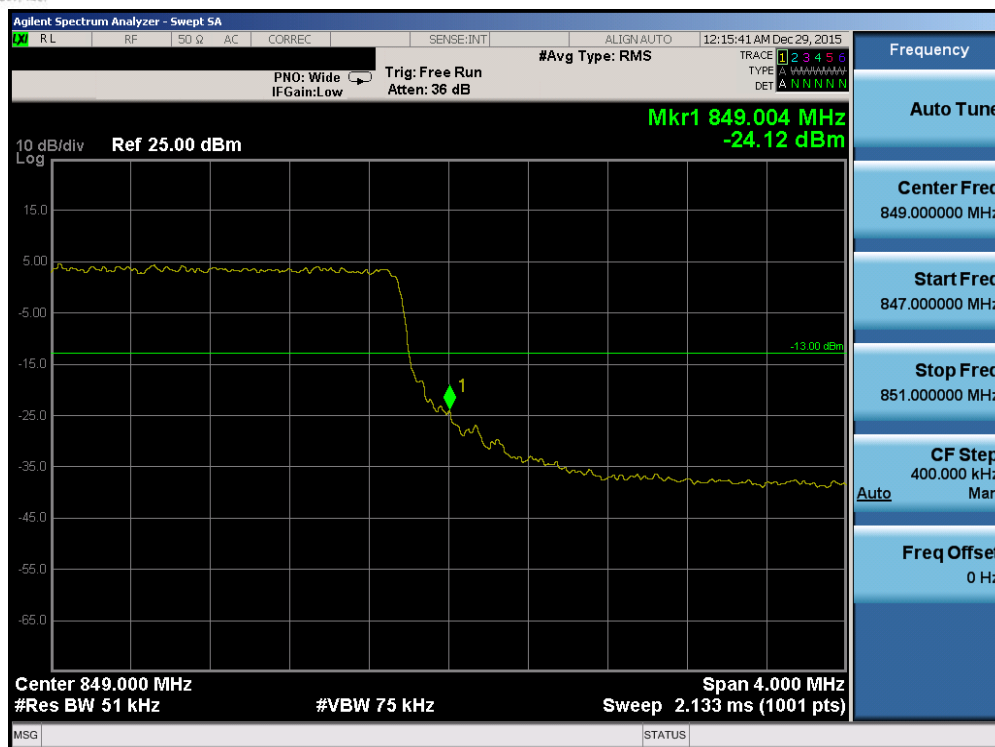


Plot 7-165. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - RB Size 25)

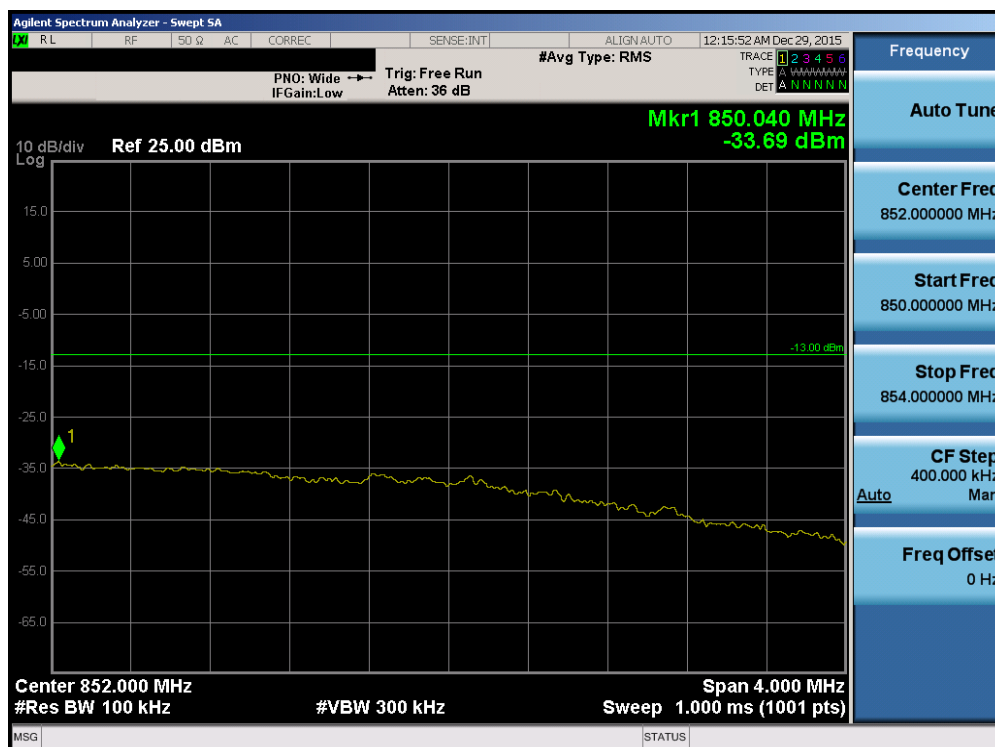


Plot 7-166. Lower Extended Band Edge Plot (Band 5 - 5.0MHz QPSK - RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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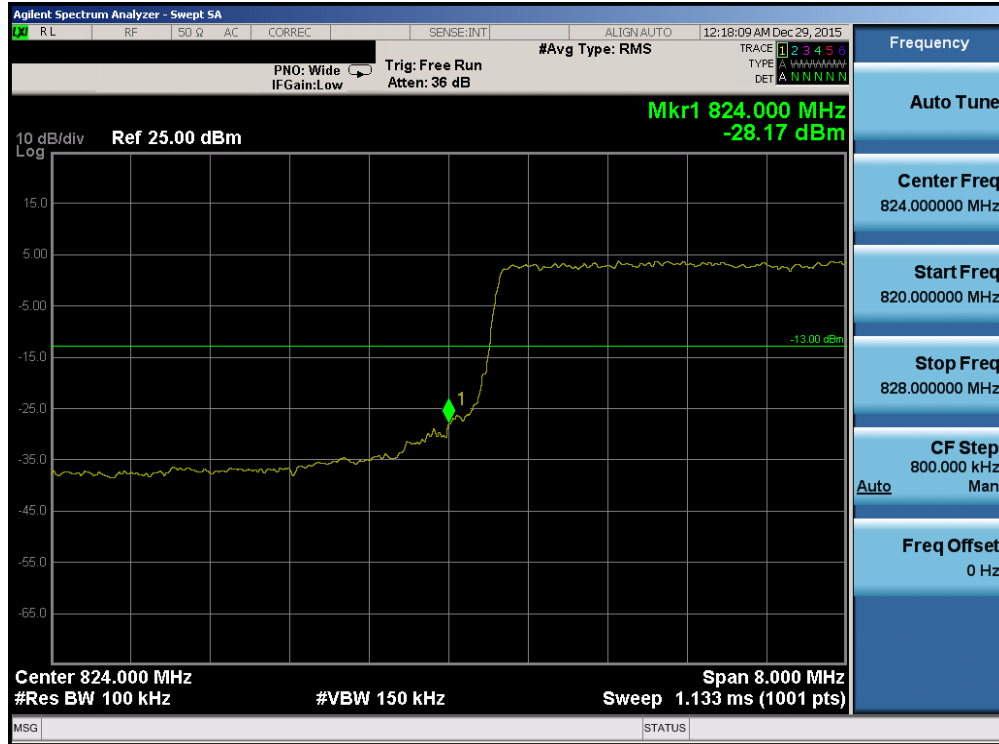


Plot 7-167. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

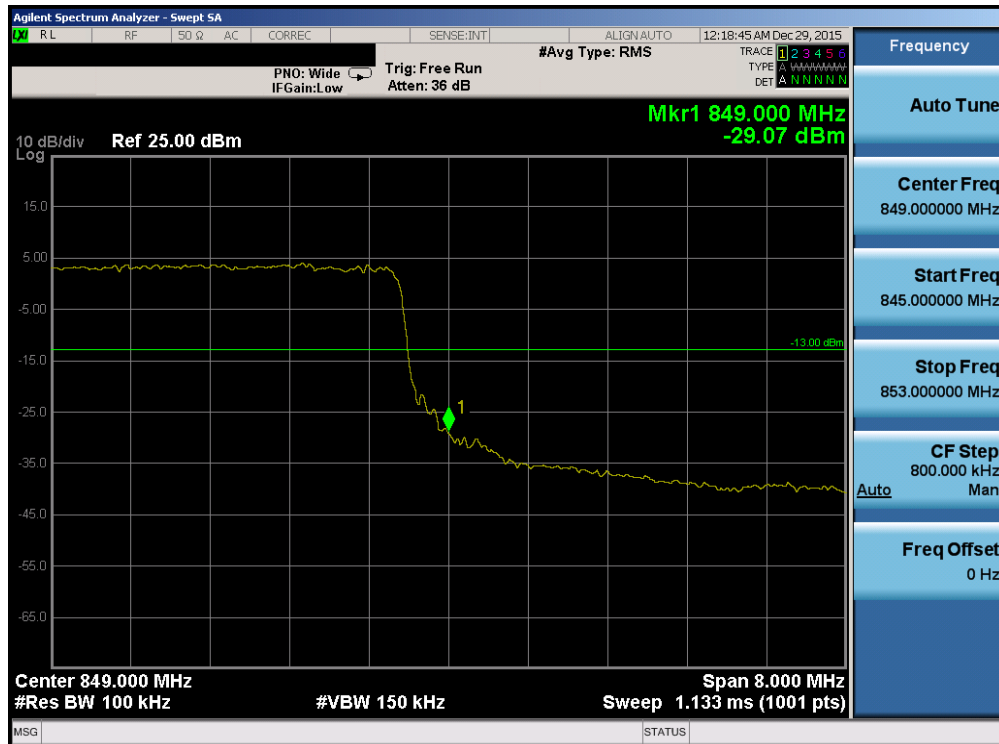


Plot 7-168. Upper Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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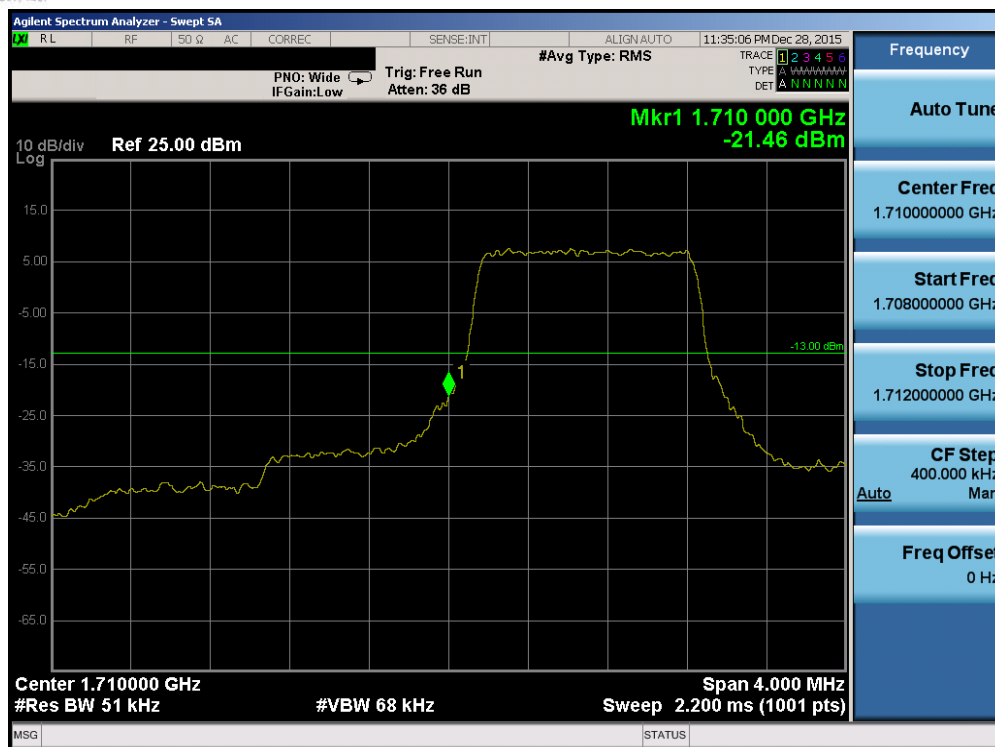


Plot 7-169. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

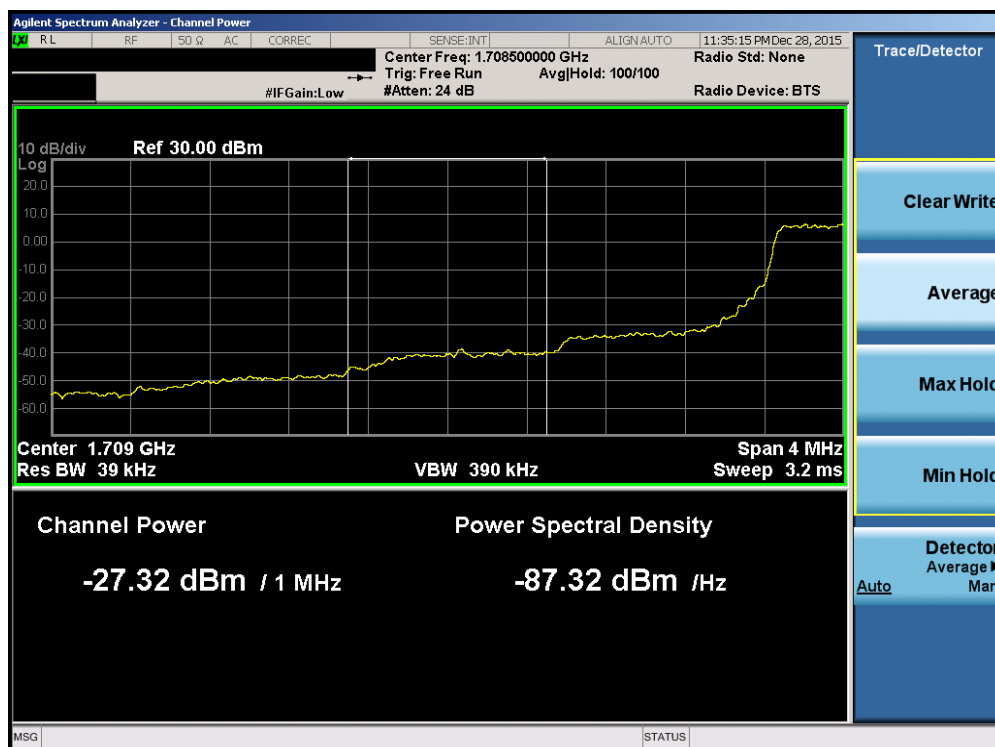


Plot 7-170. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-171. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

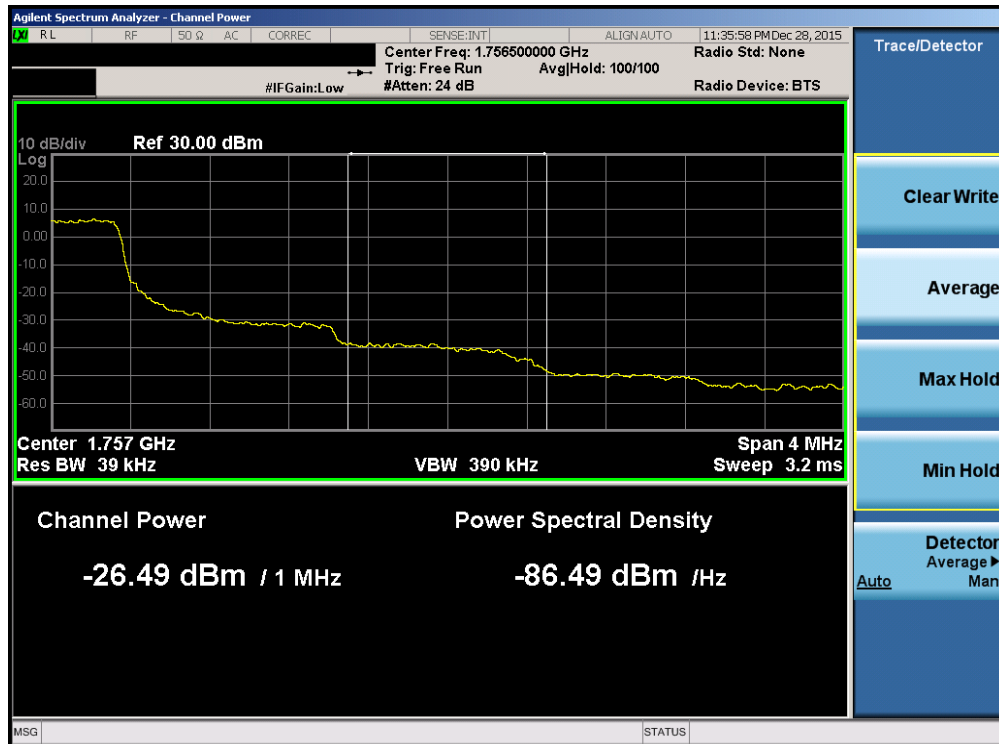


Plot 7-172. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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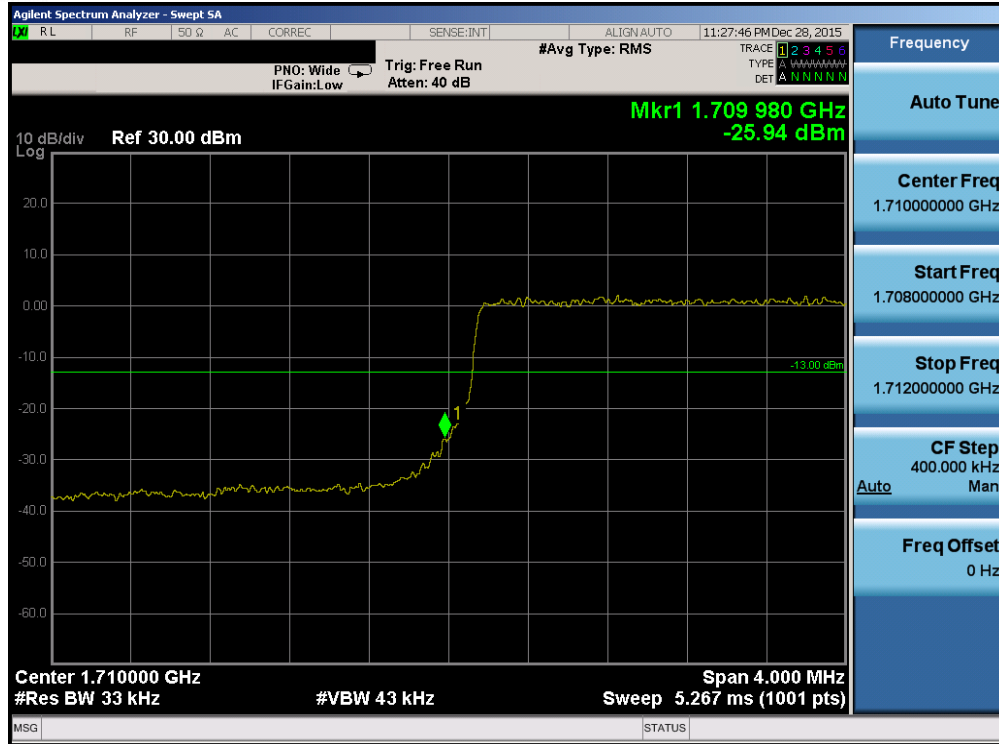


Plot 7-173. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

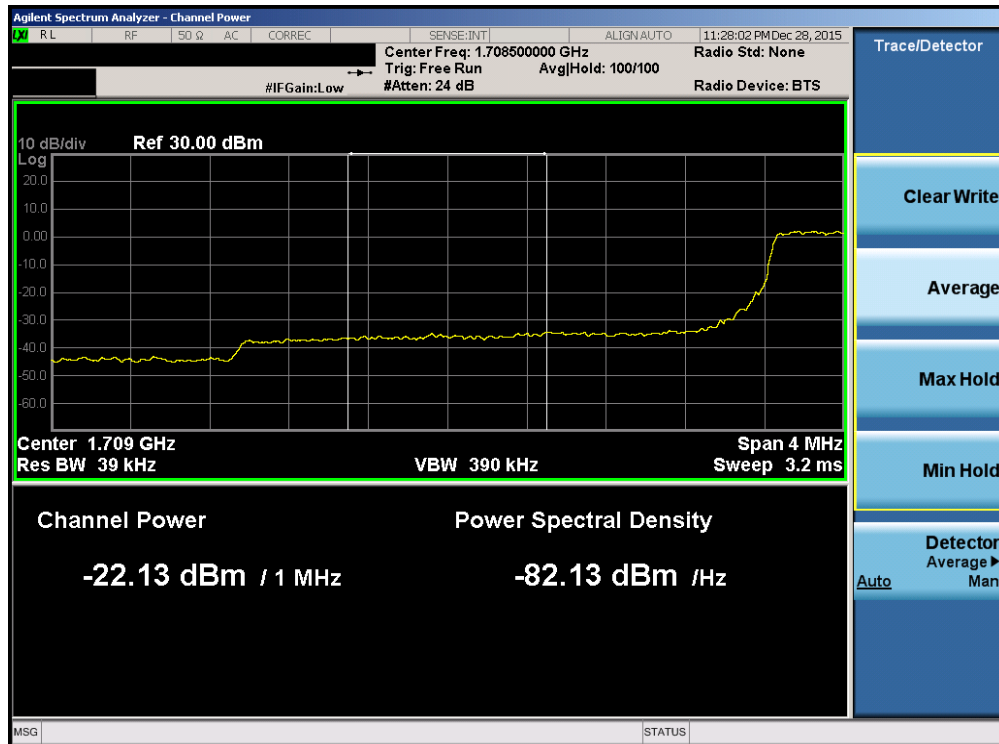


Plot 7-174. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 105 of 187

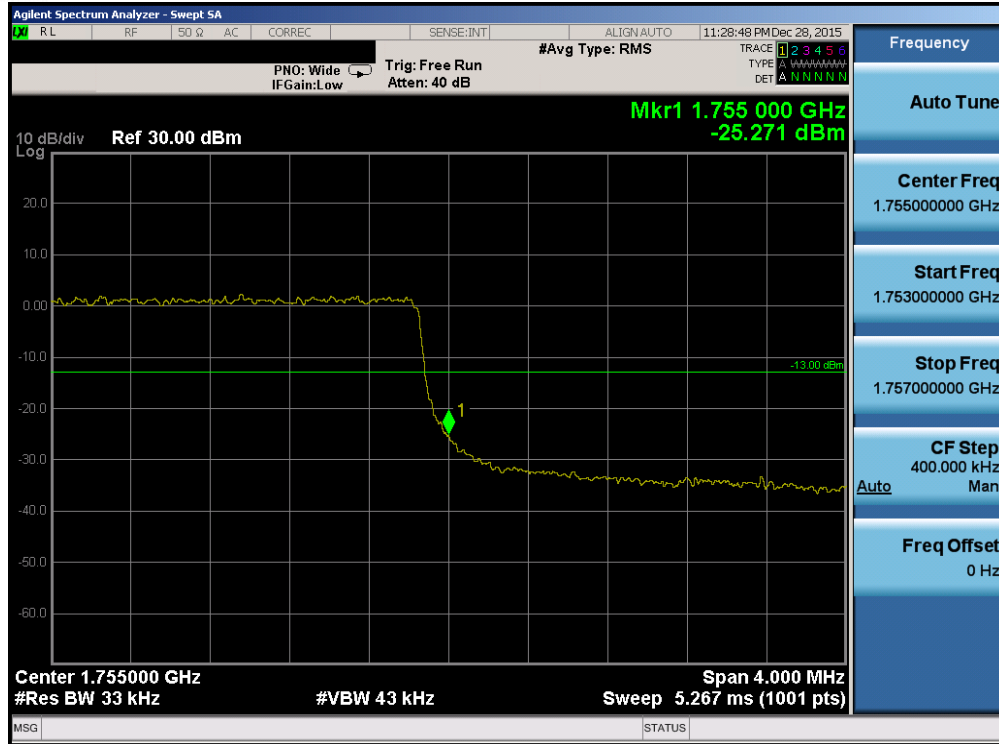


Plot 7-175. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

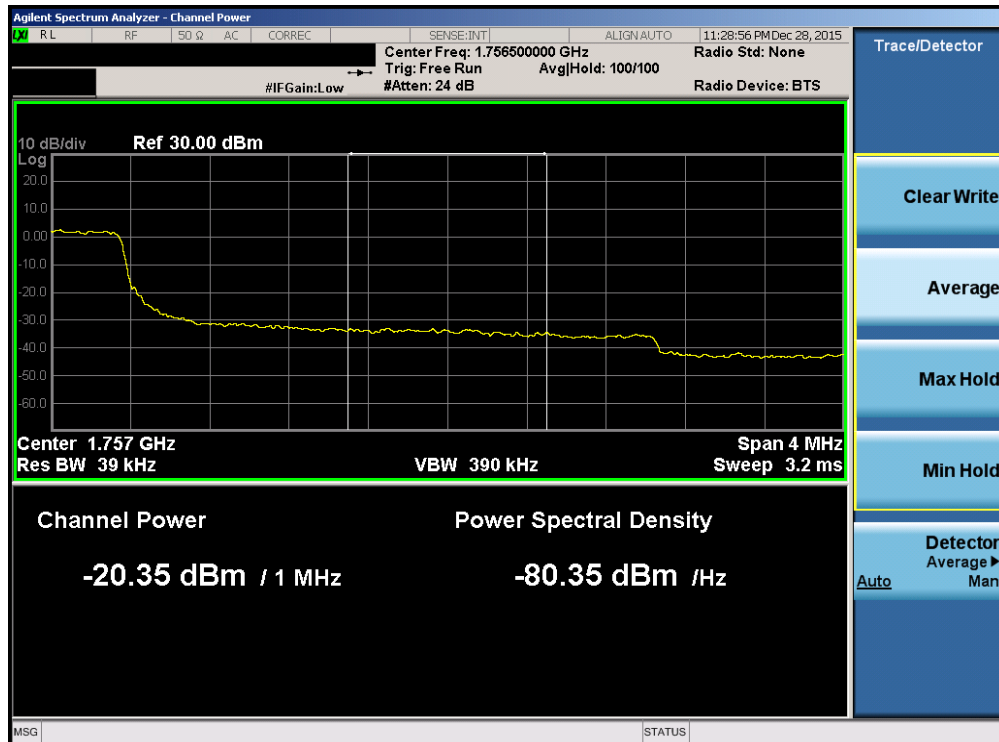


Plot 7-176. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 106 of 187

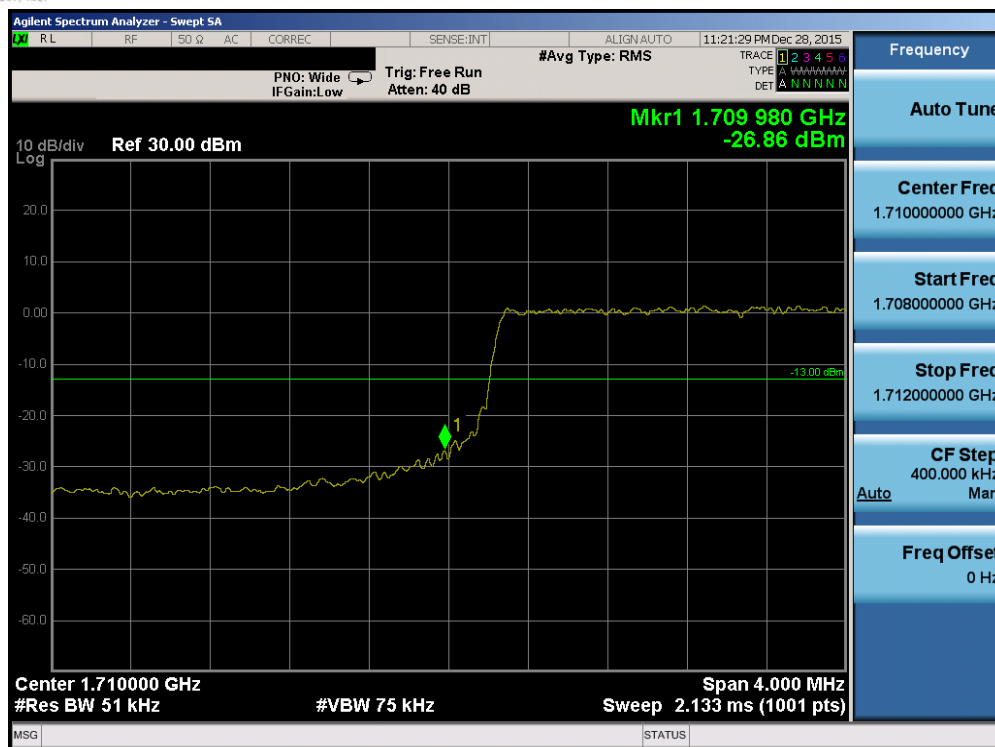


Plot 7-177. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

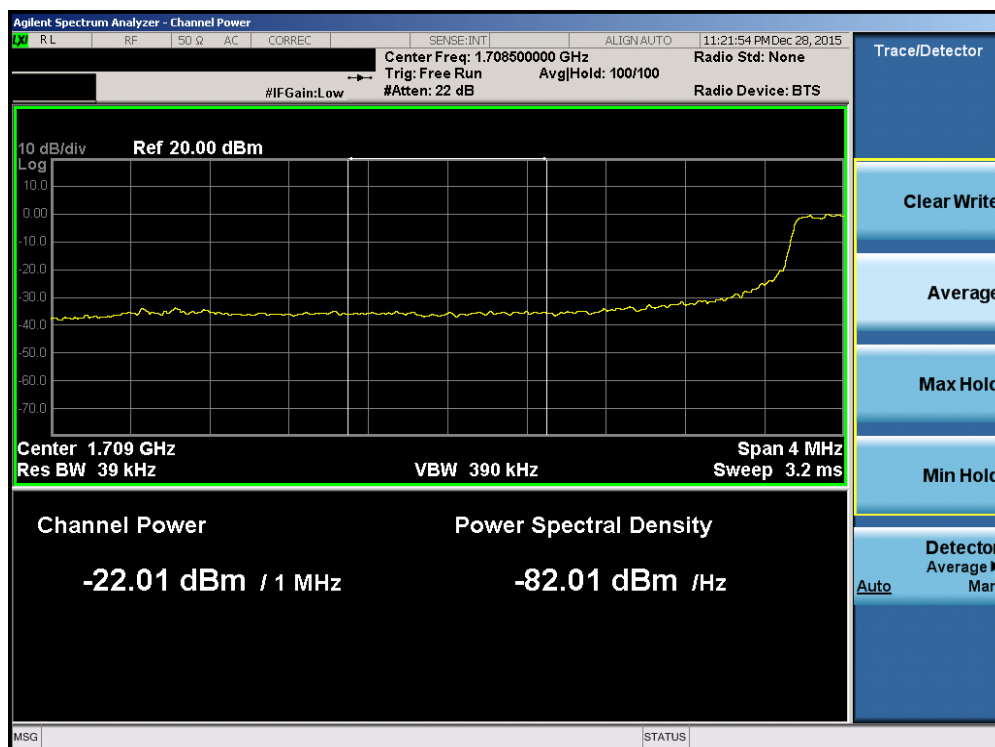


Plot 7-178. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 107 of 187

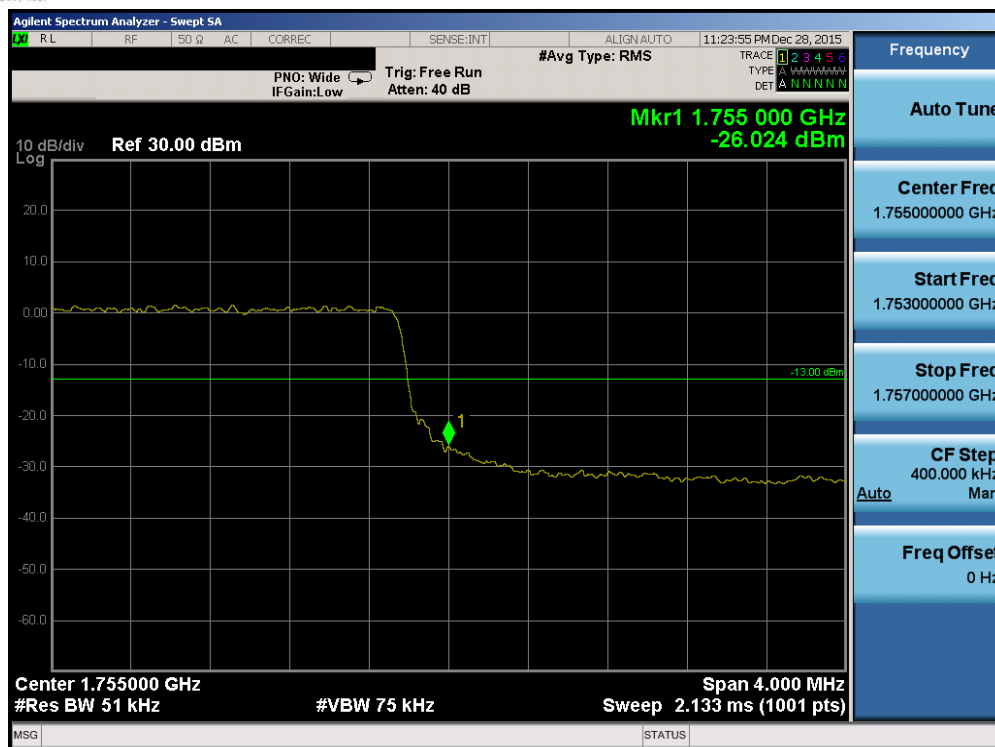


Plot 7-179. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

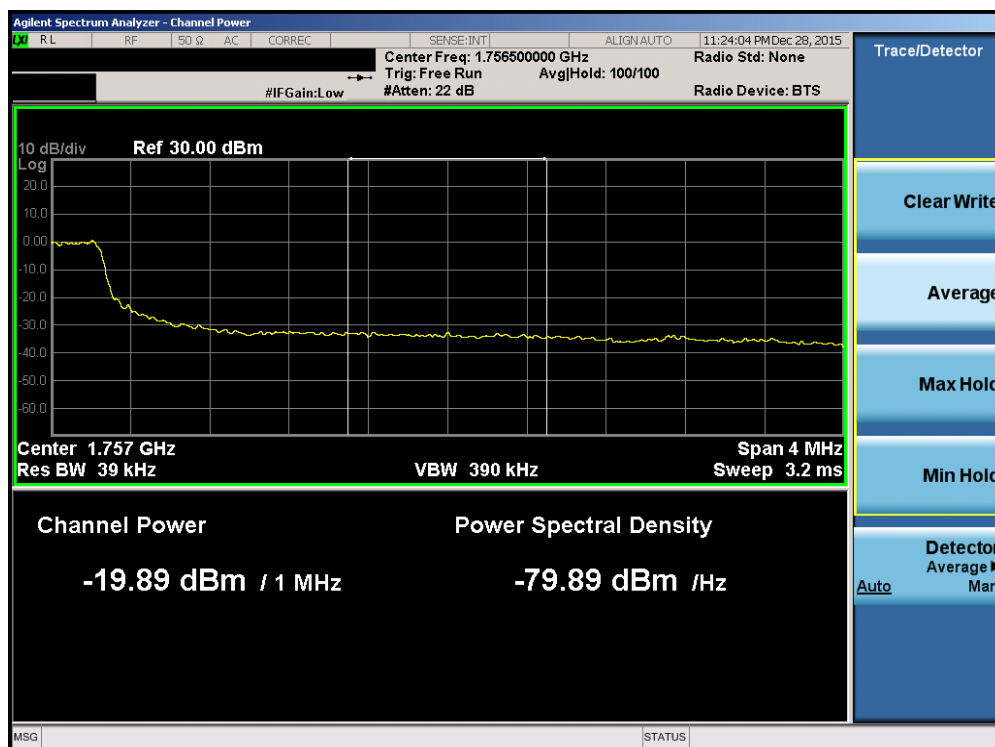


Plot 7-180. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 108 of 187

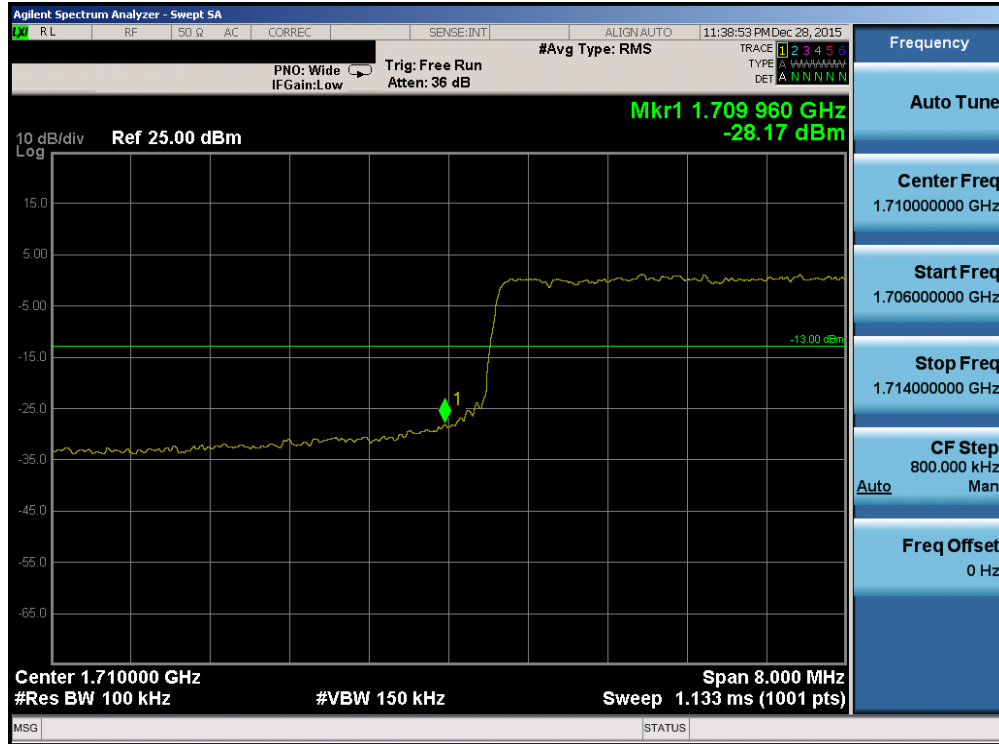


Plot 7-181. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

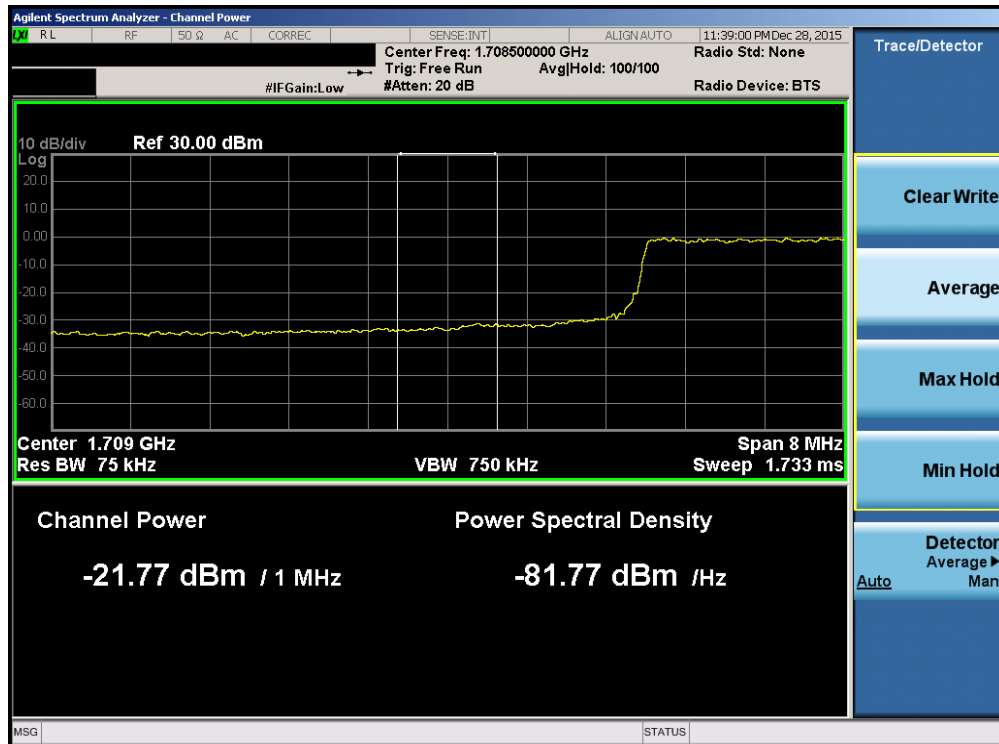


Plot 7-182. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 109 of 187

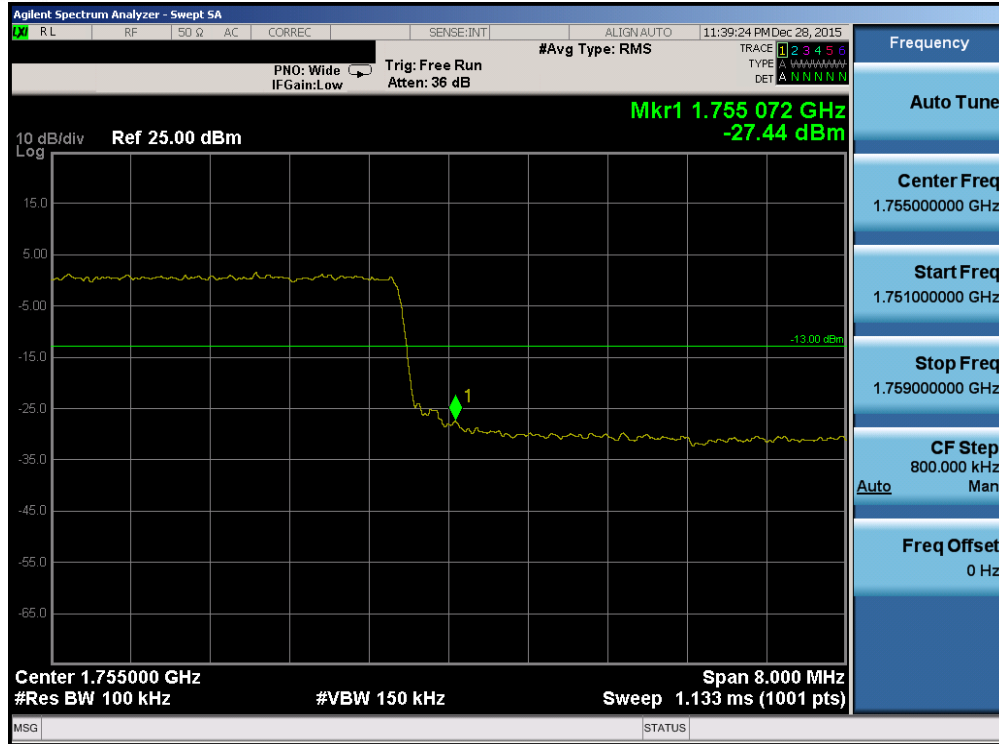


Plot 7-183. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

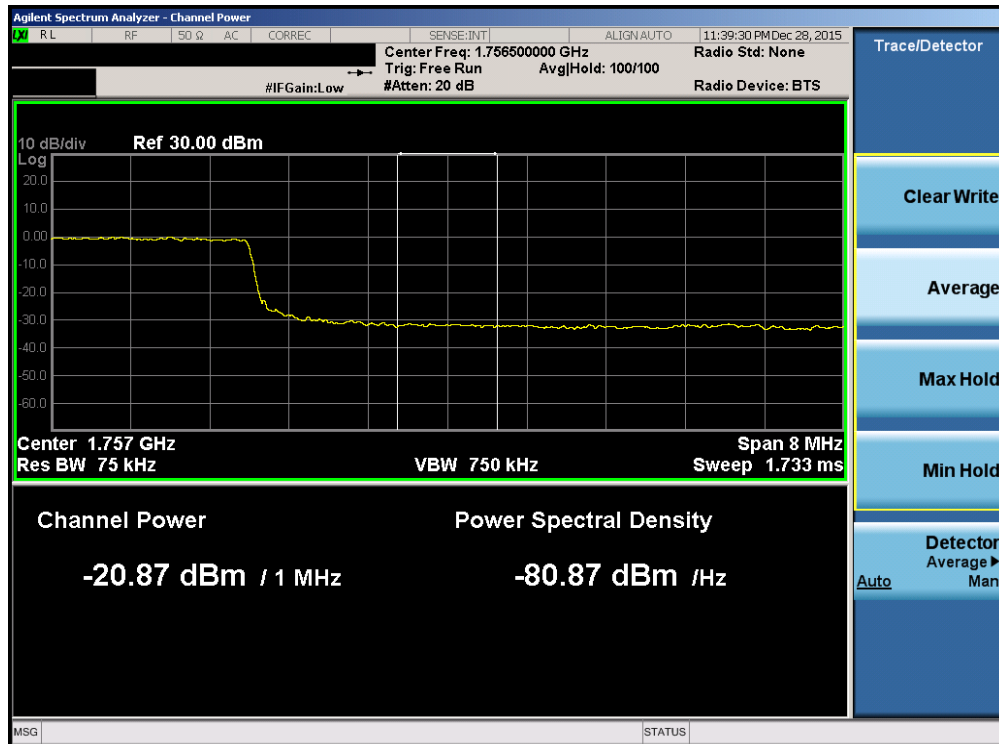


Plot 7-184. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 110 of 187

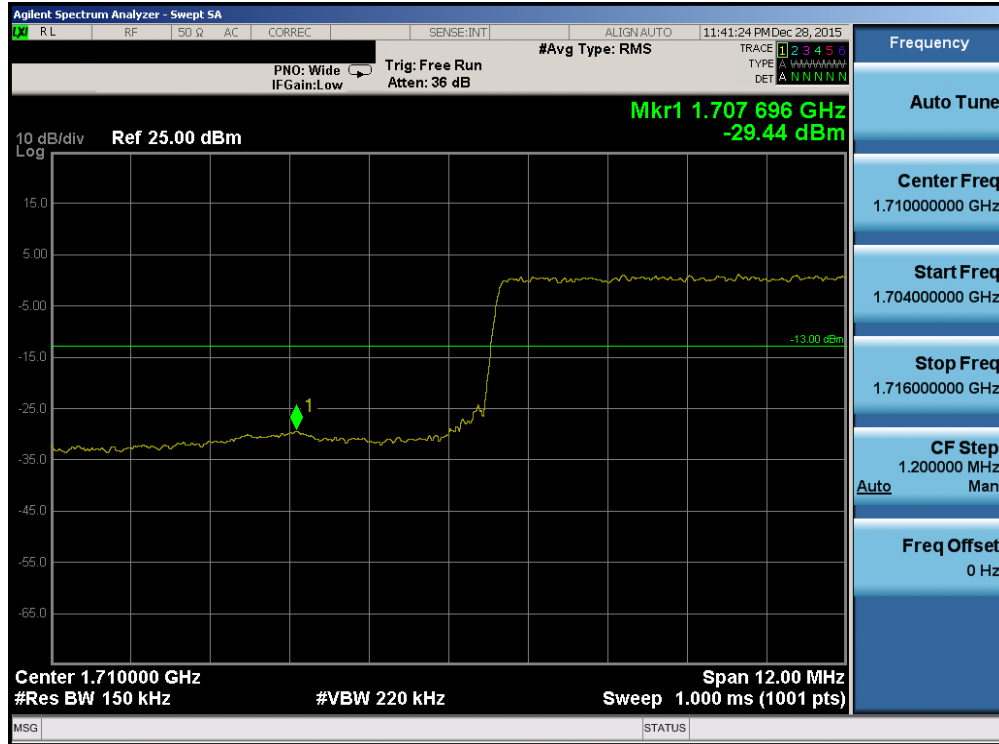


Plot 7-185. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

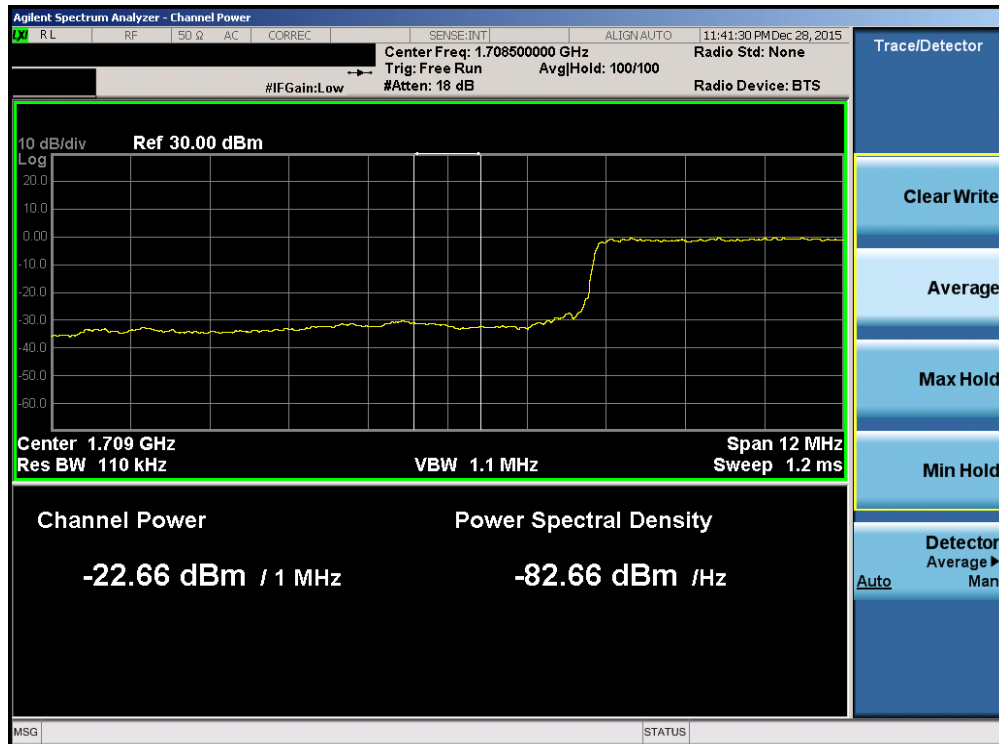


Plot 7-186. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 111 of 187

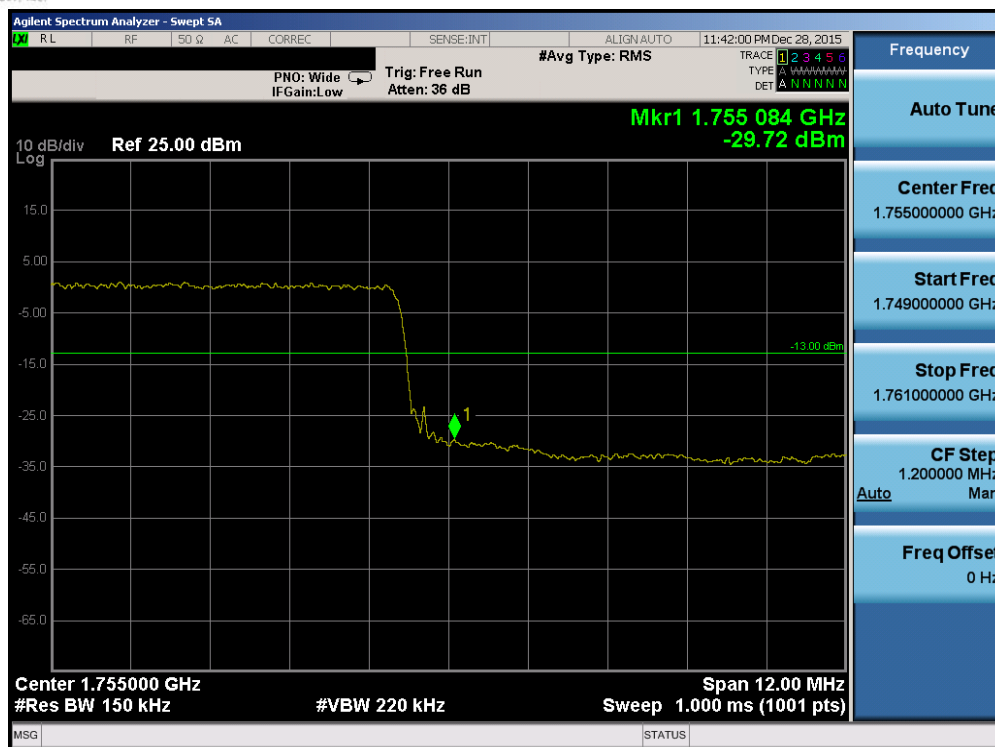


Plot 7-187. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

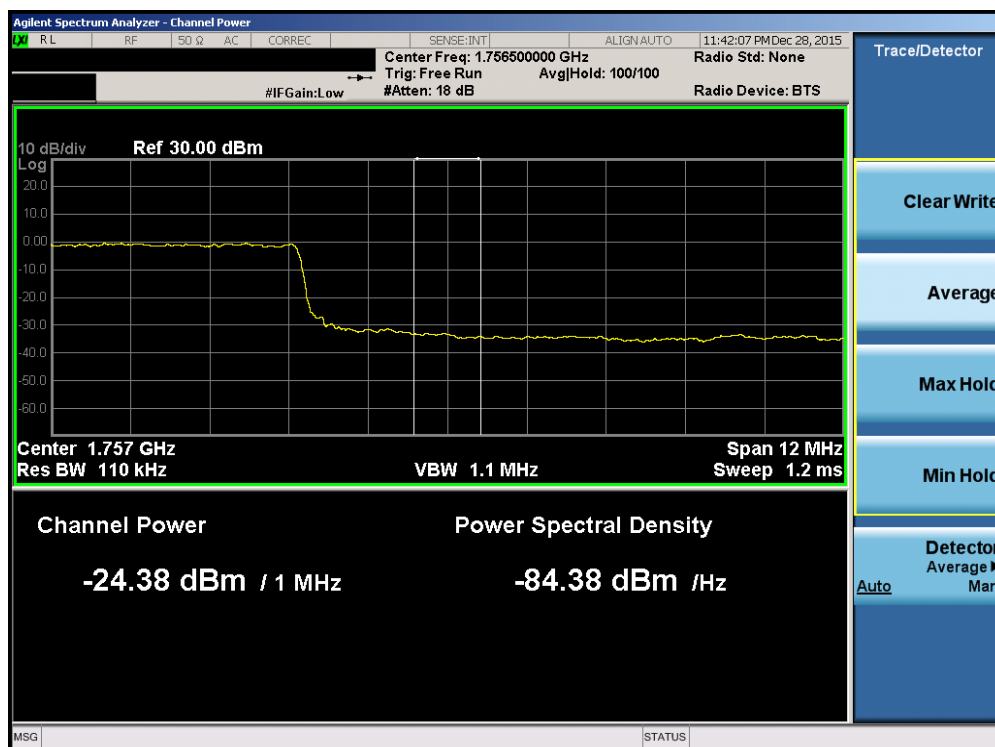


Plot 7-188. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 112 of 187

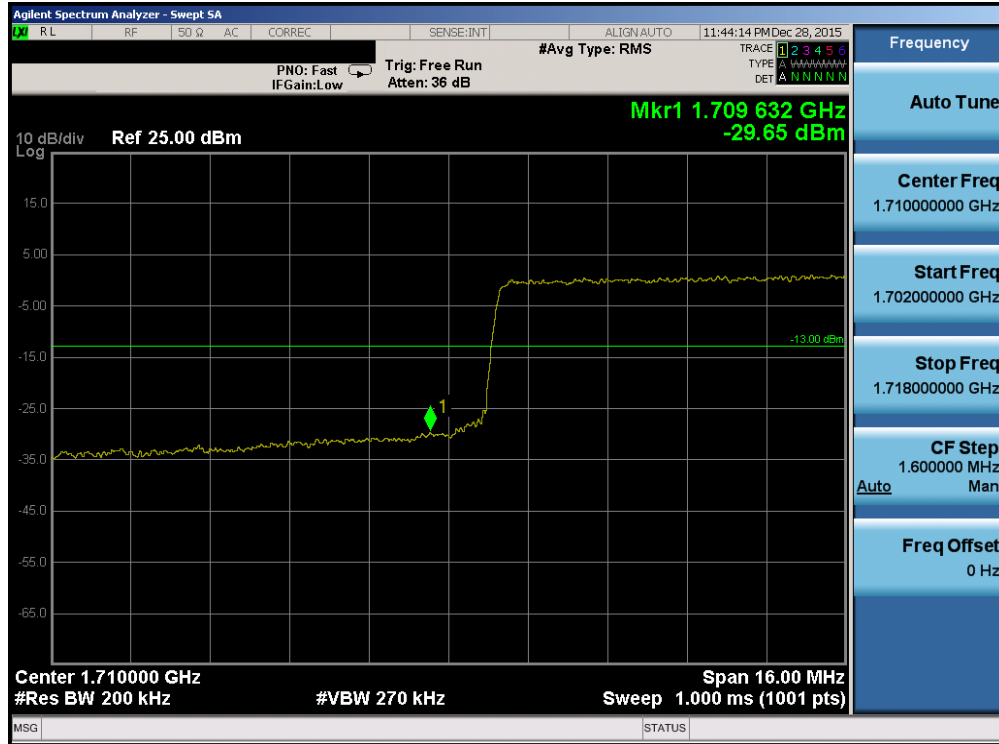


Plot 7-189. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

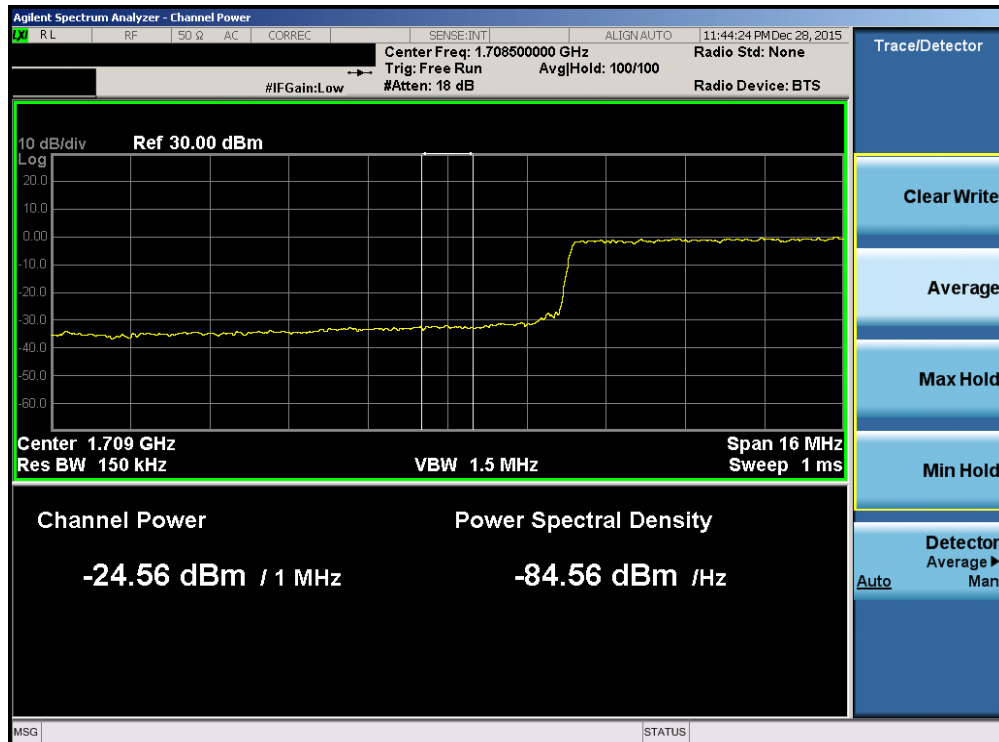


Plot 7-190. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 113 of 187

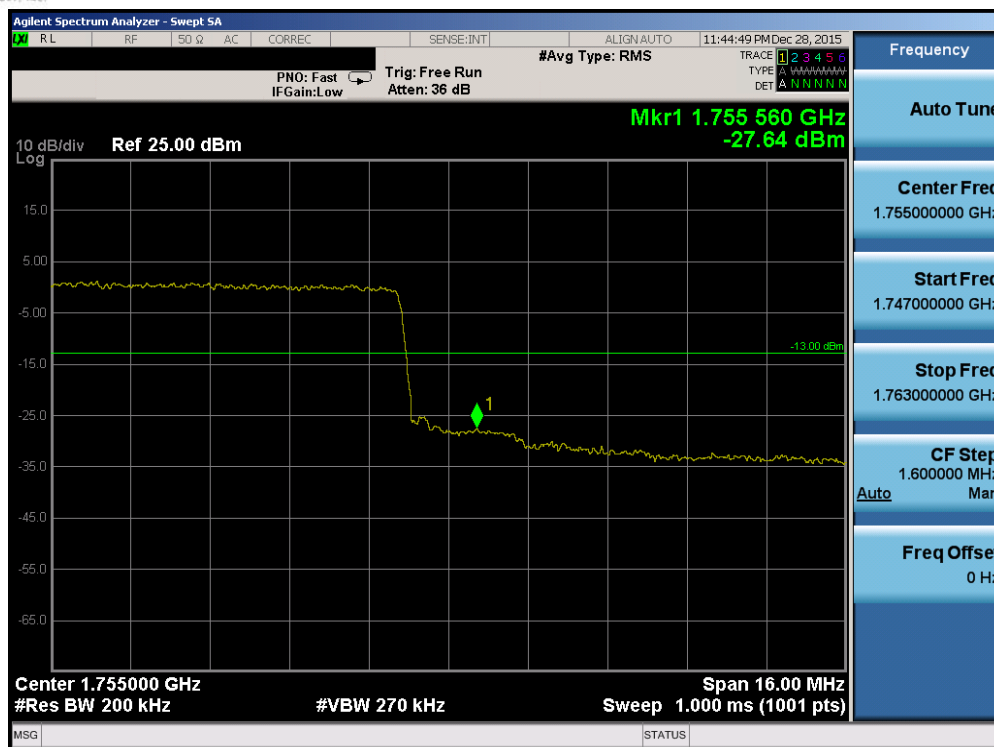


Plot 7-191. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

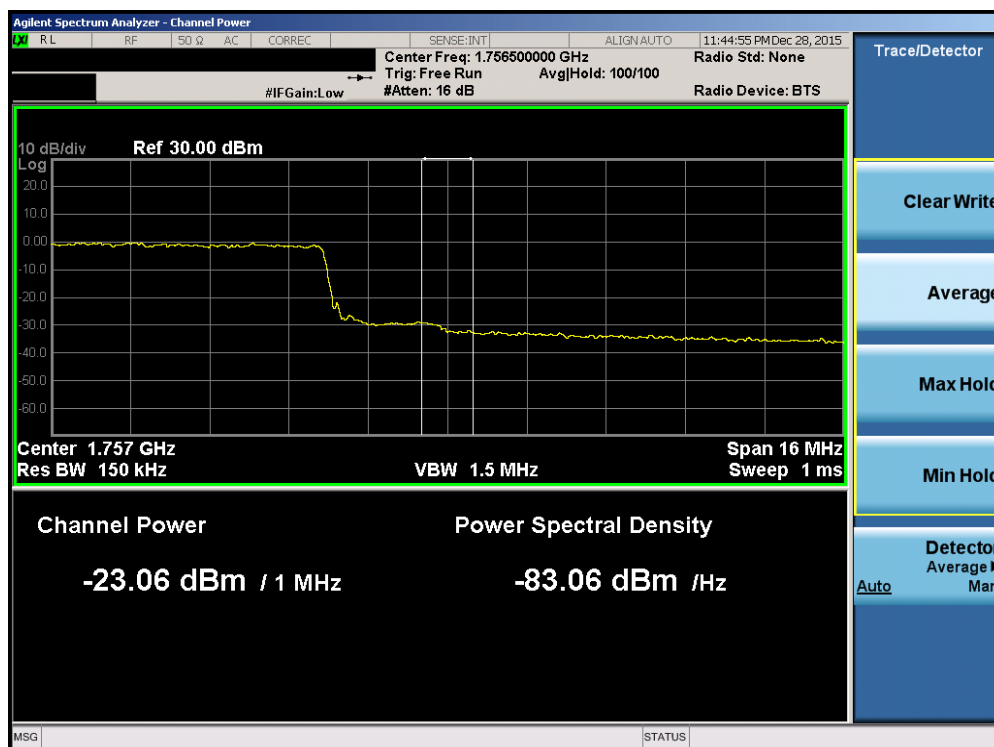


Plot 7-192. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 114 of 187

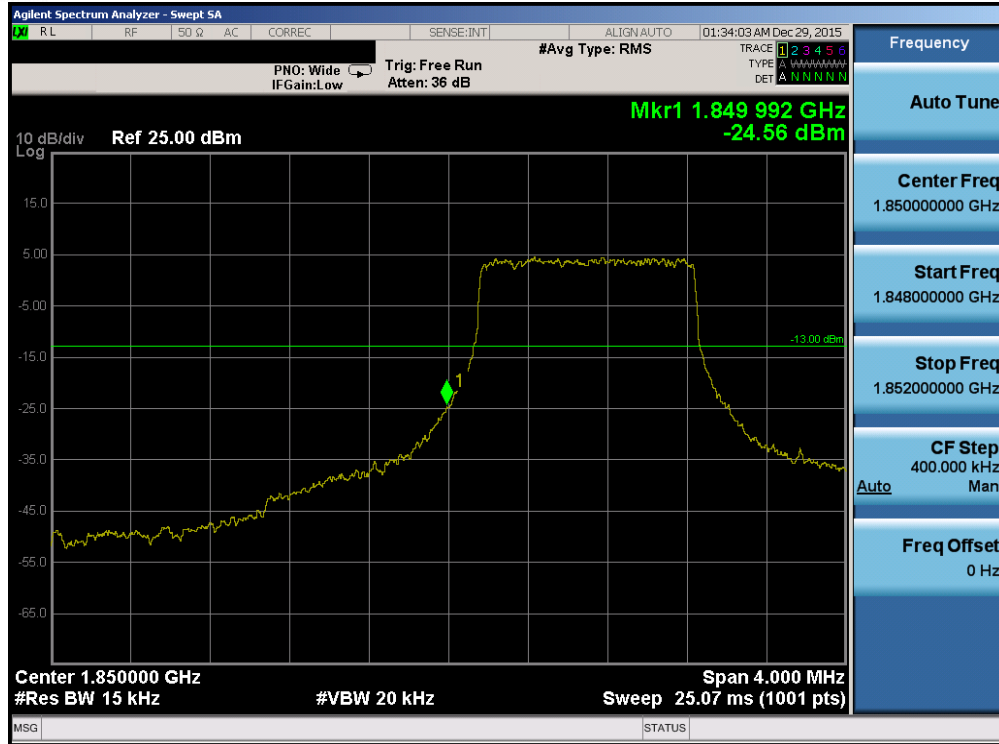


Plot 7-193. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

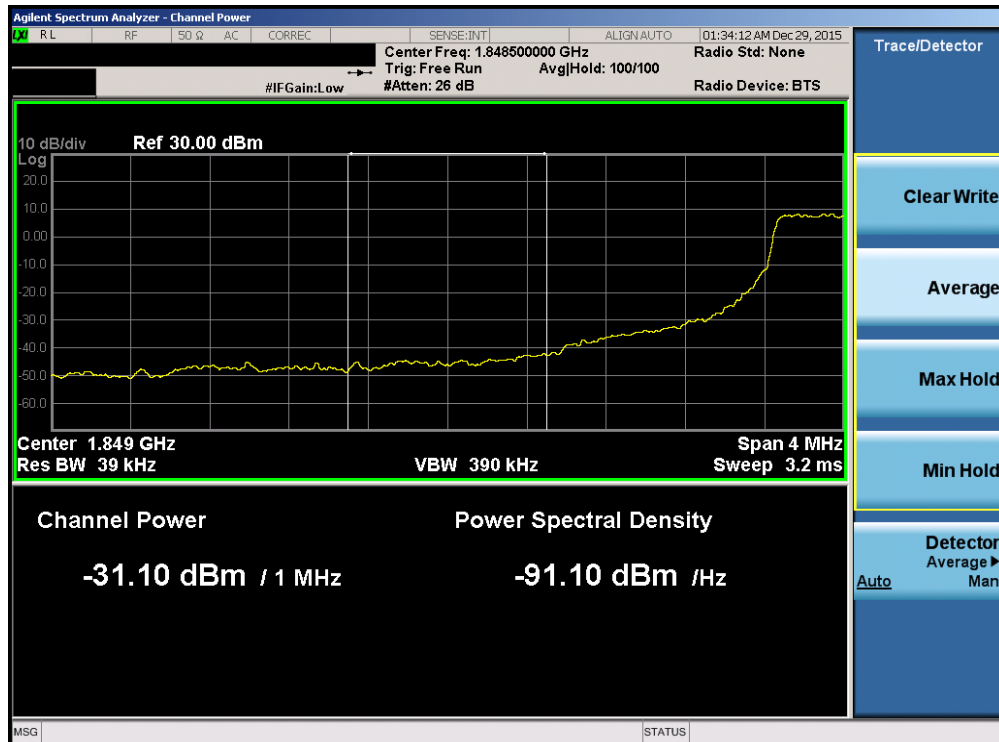


Plot 7-194. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 115 of 187

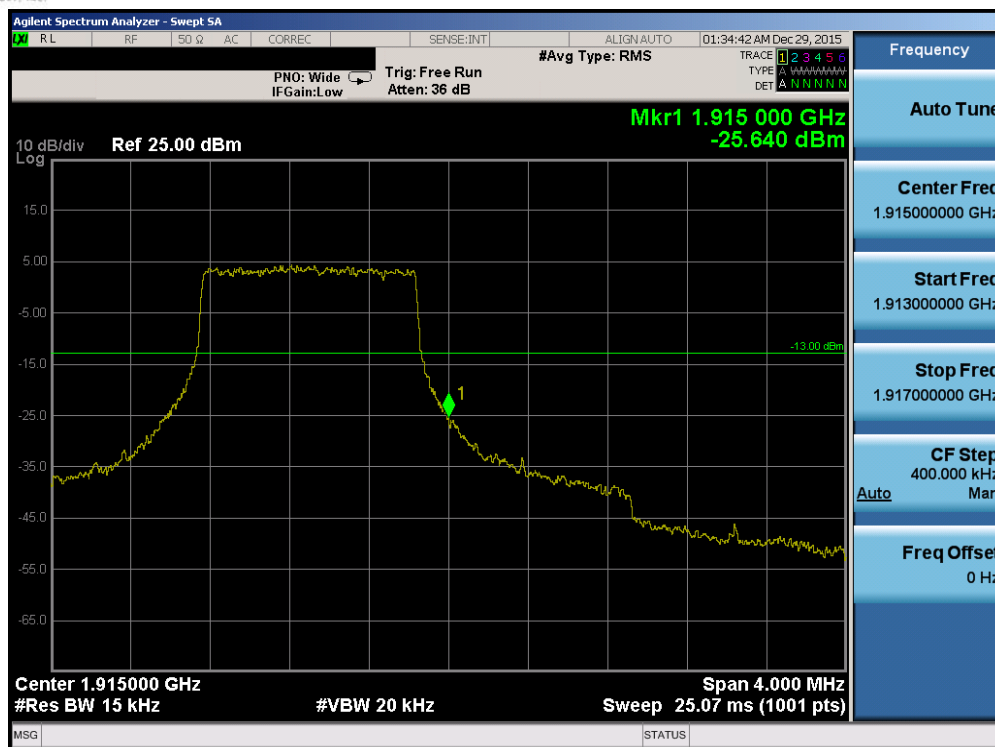


Plot 7-195. Lower Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

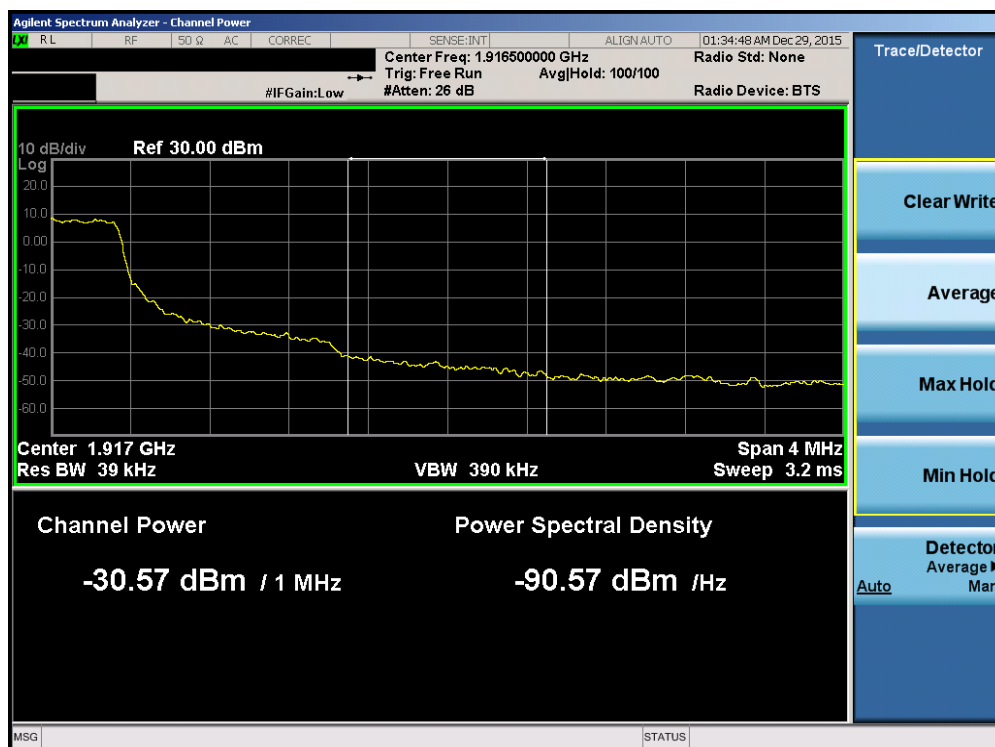


Plot 7-196. Lower Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 116 of 187

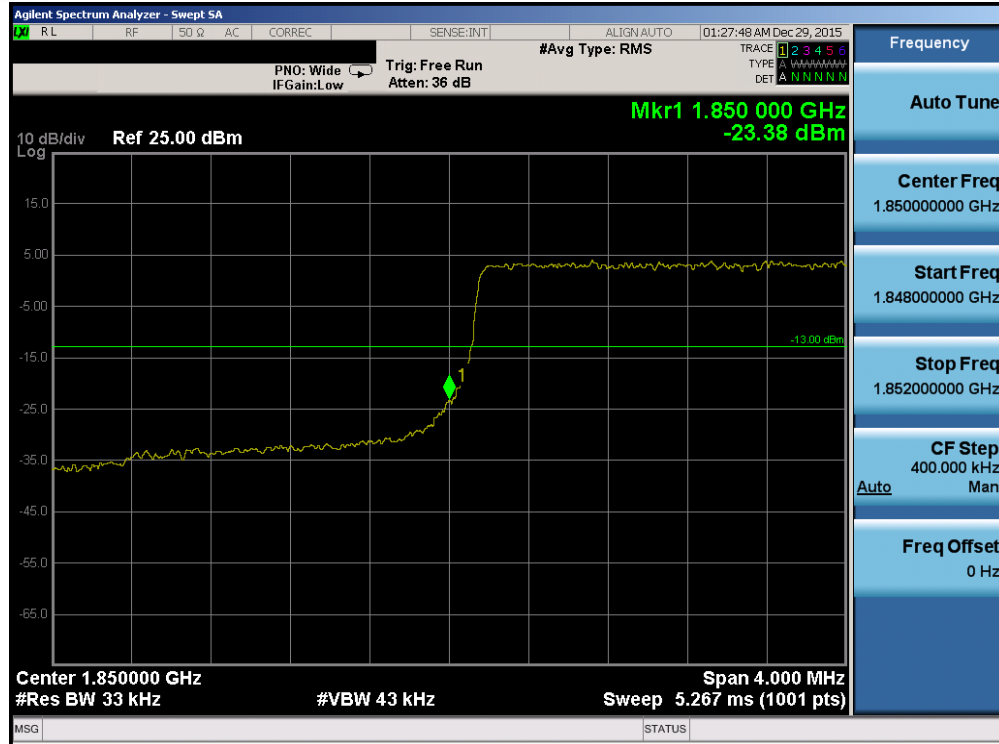


Plot 7-197. Upper Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

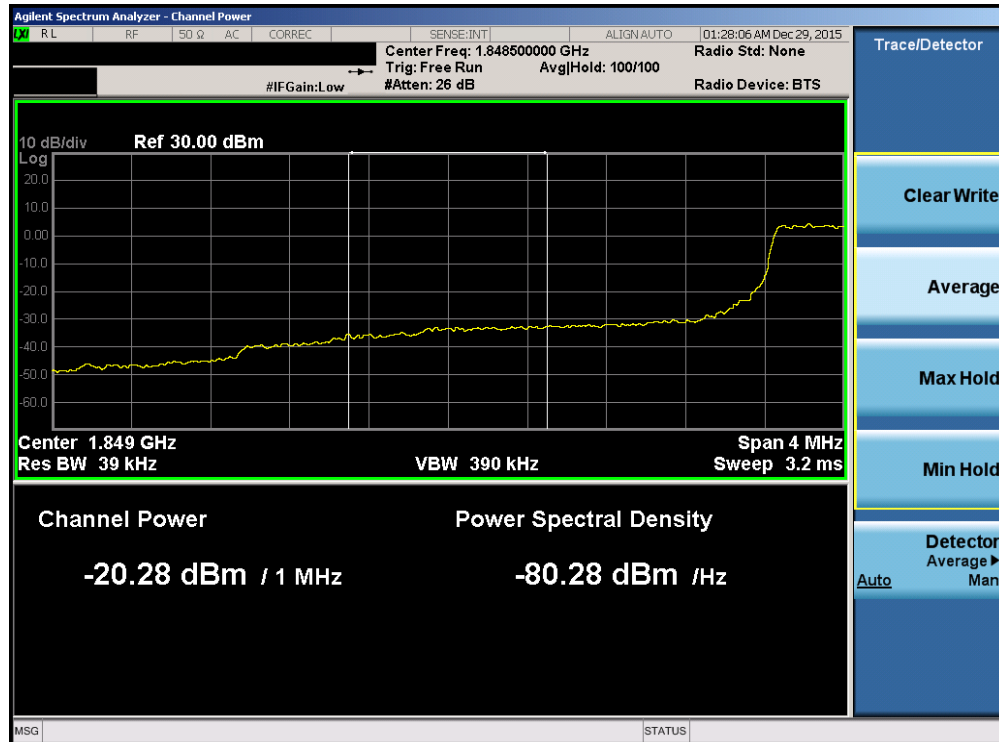


Plot 7-198. Upper Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 117 of 187



Plot 7-199. Lower Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

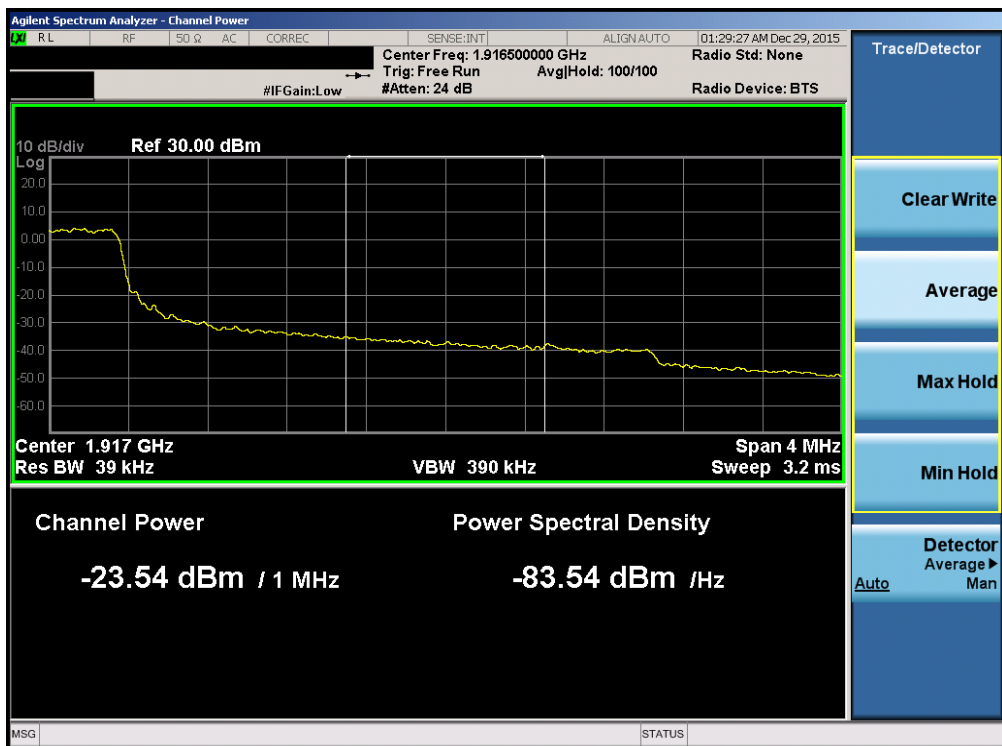


Plot 7-200. Lower Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 118 of 187

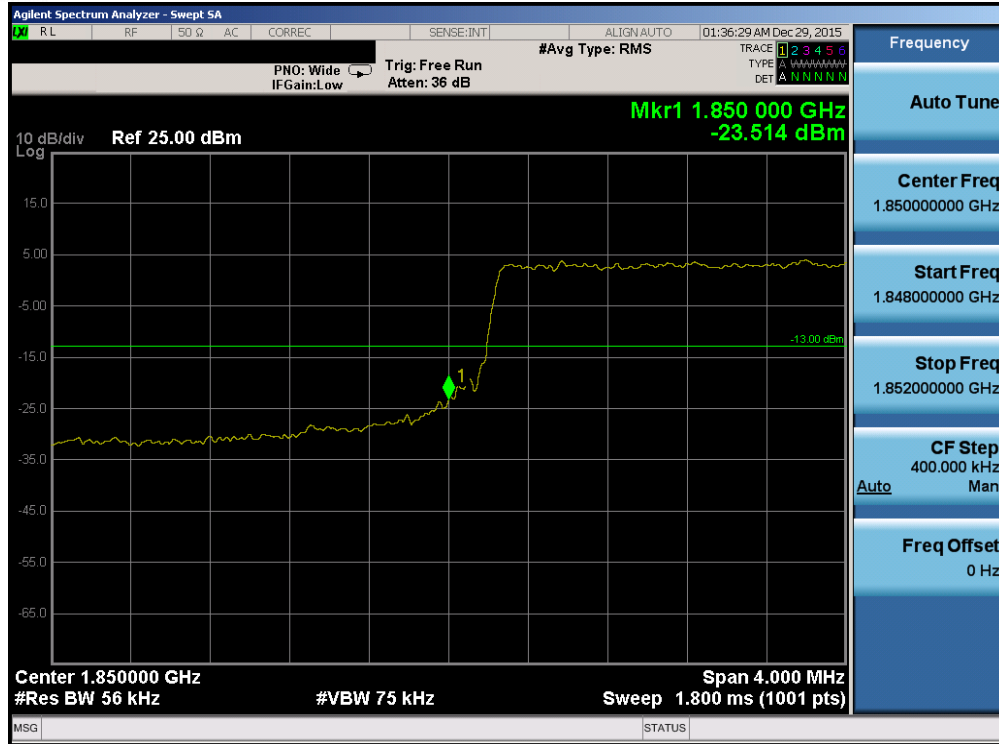


Plot 7-201. Upper Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

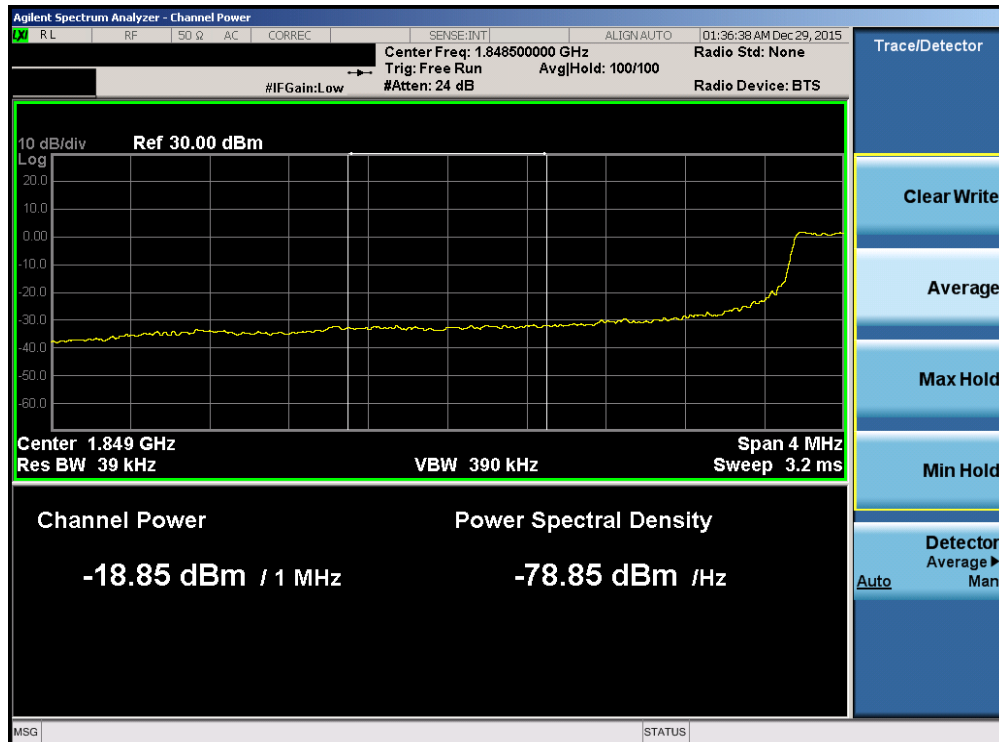


Plot 7-202. Upper Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 119 of 187

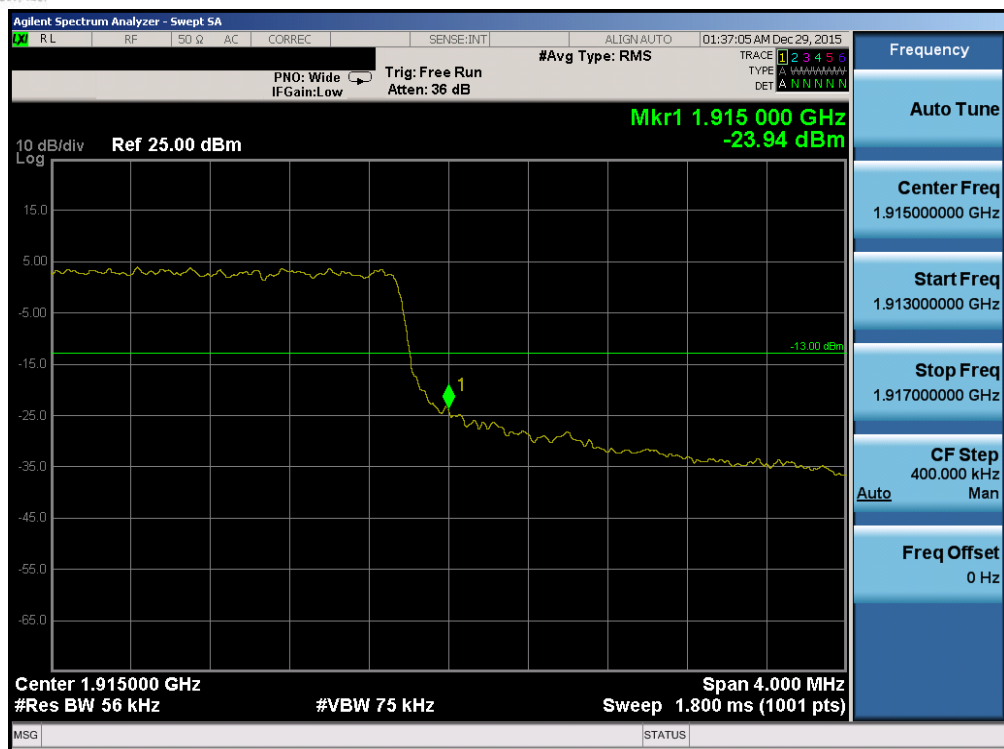


Plot 7-203. Lower Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

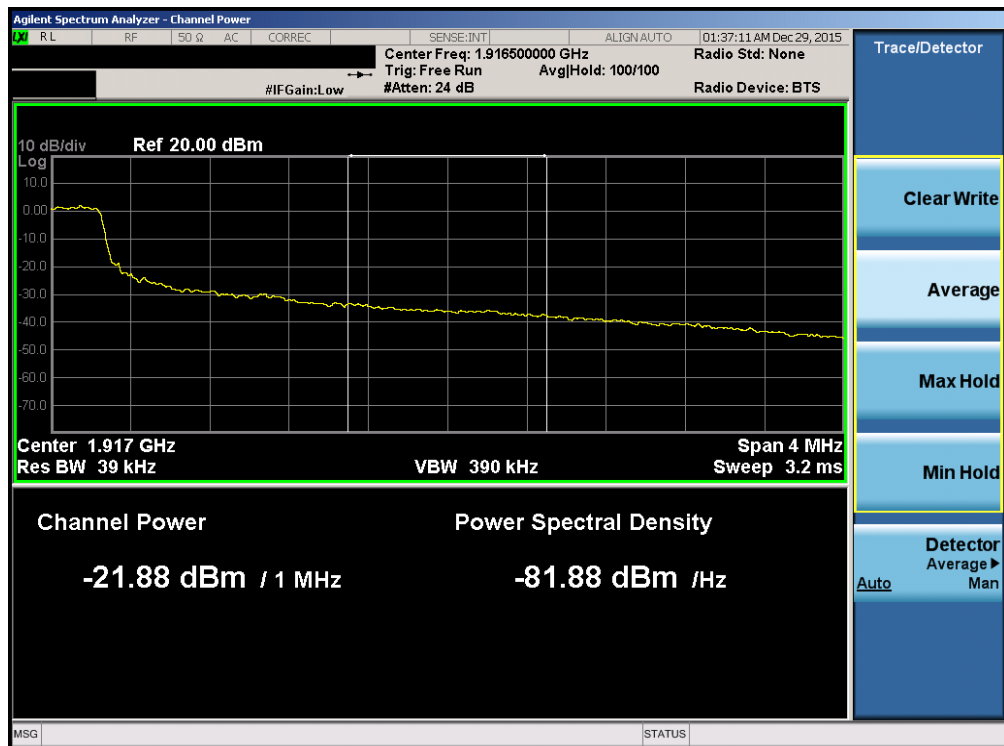


Plot 7-204. Lower Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 120 of 187

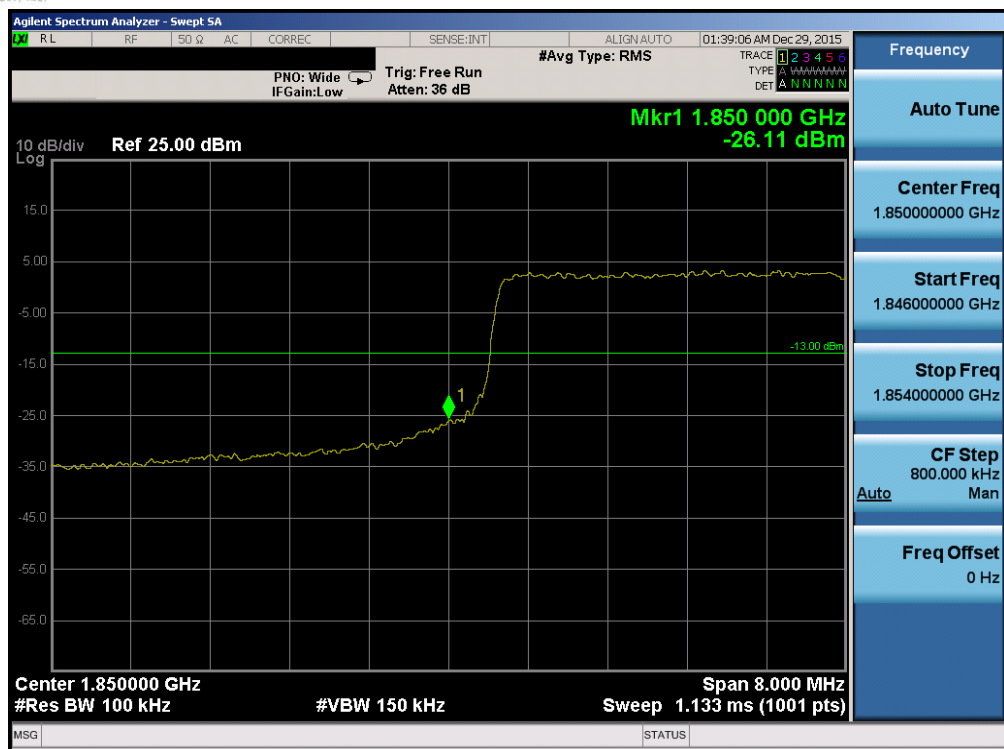


Plot 7-205. Upper Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

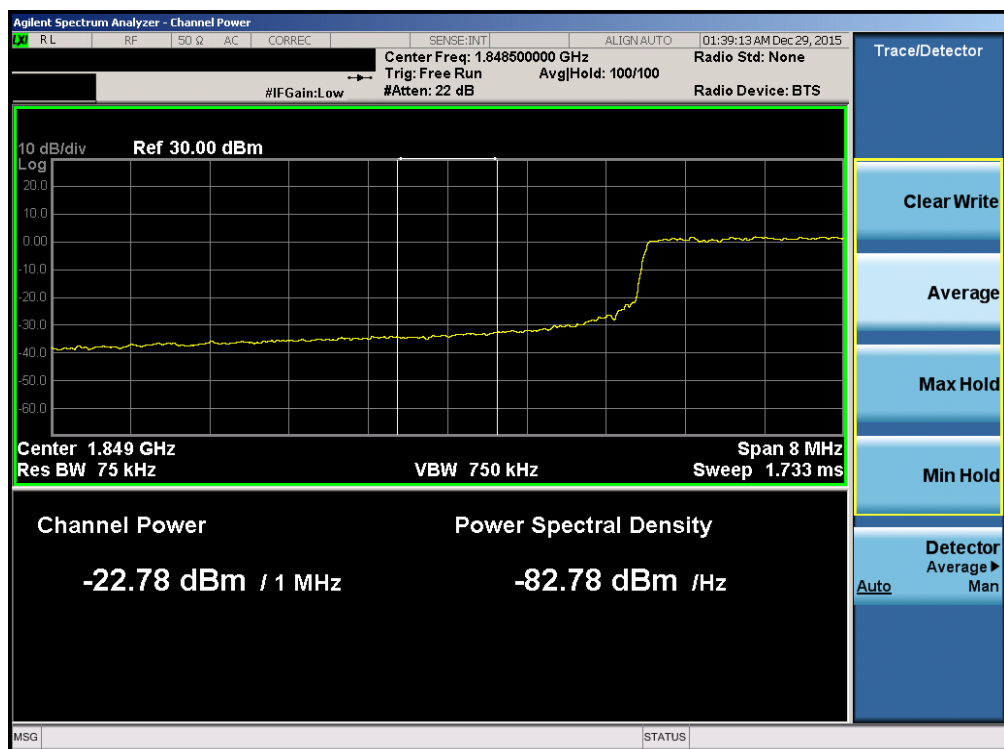


Plot 7-206. Upper Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 121 of 187

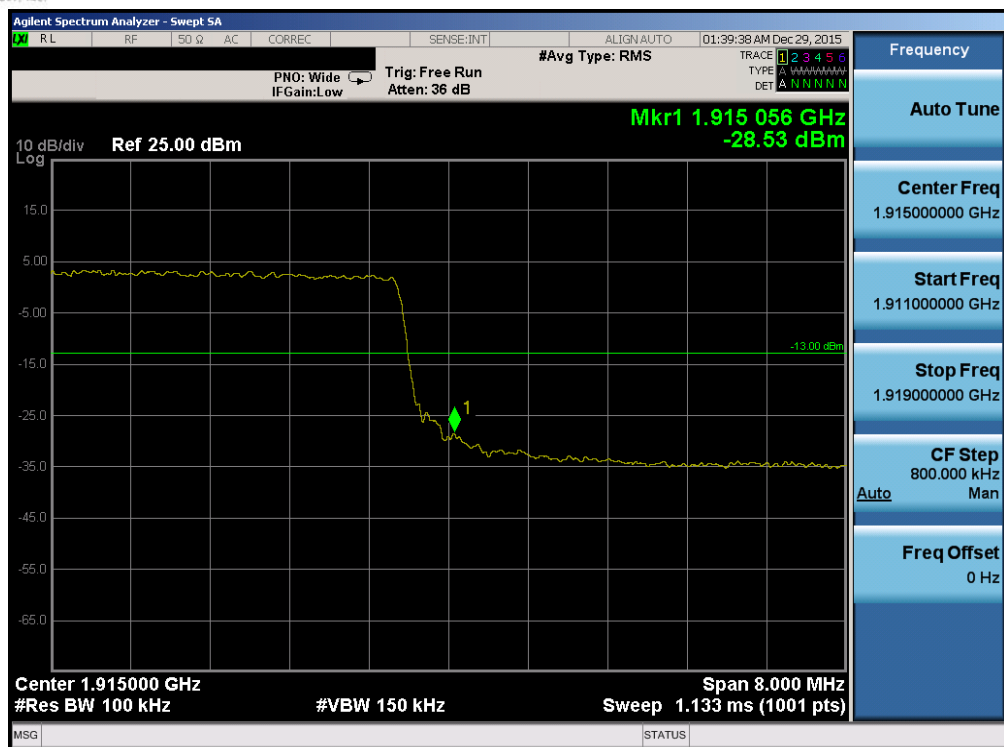


Plot 7-207. Lower Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

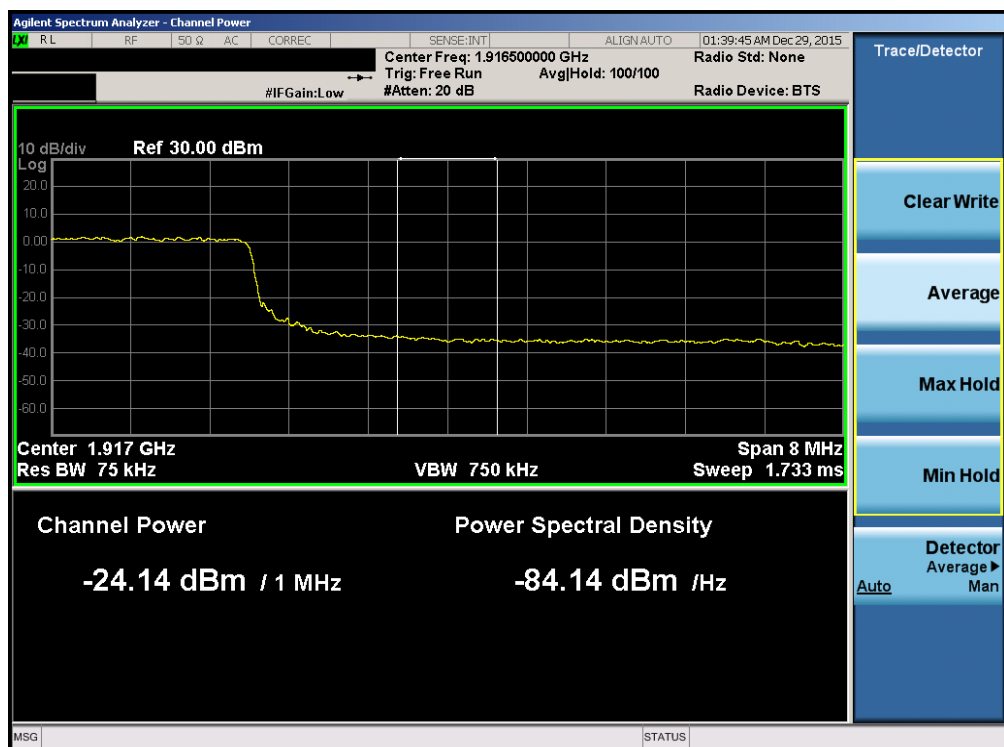


Plot 7-208. Lower Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 122 of 187

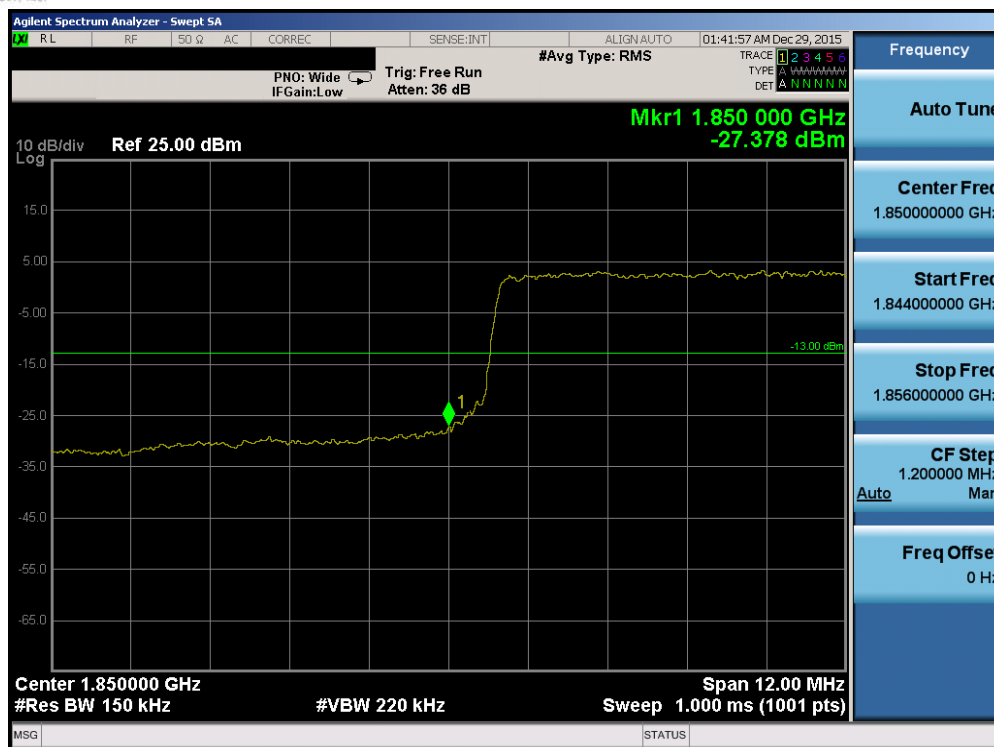


Plot 7-209. Upper Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

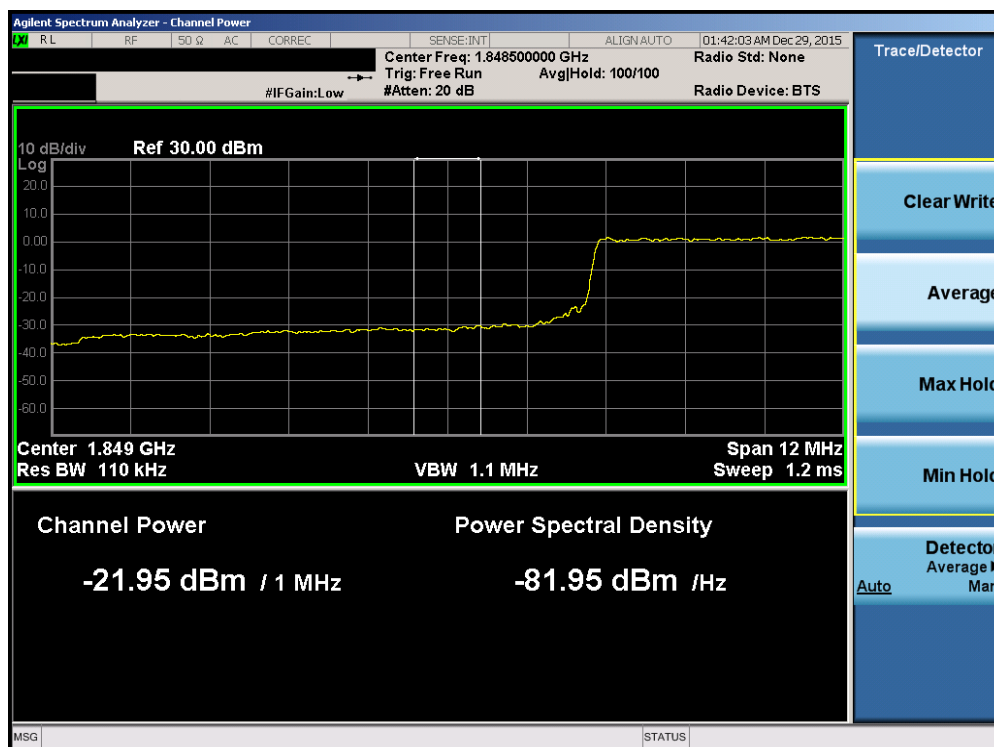


Plot 7-210. Upper Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 123 of 187

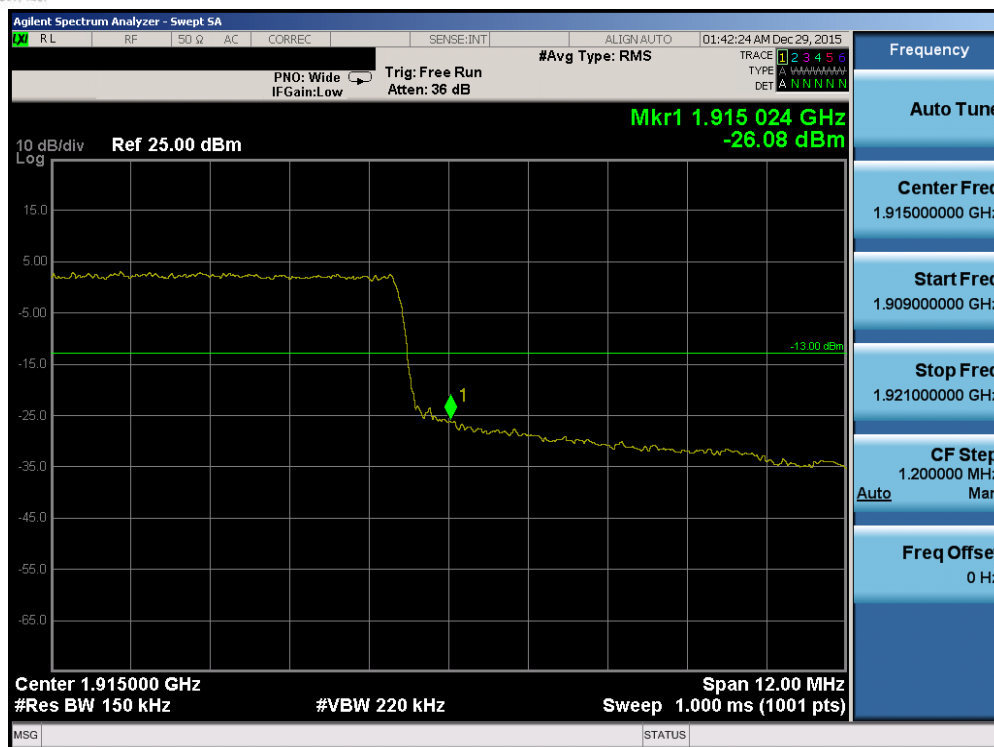


Plot 7-211. Lower Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

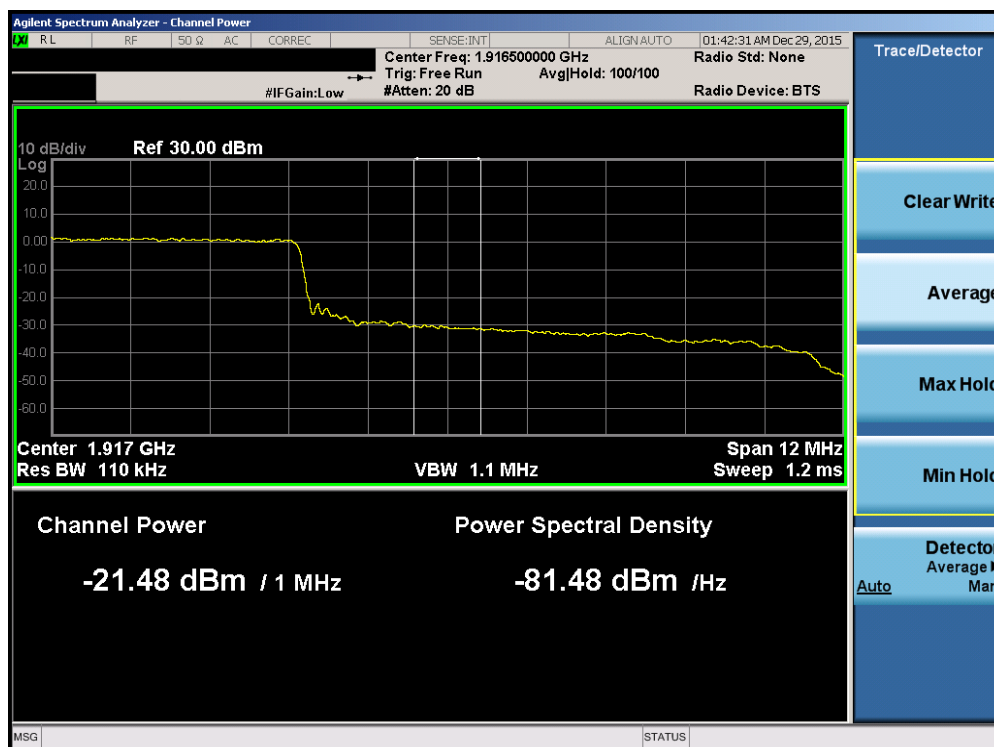


Plot 7-212. Lower Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 124 of 187

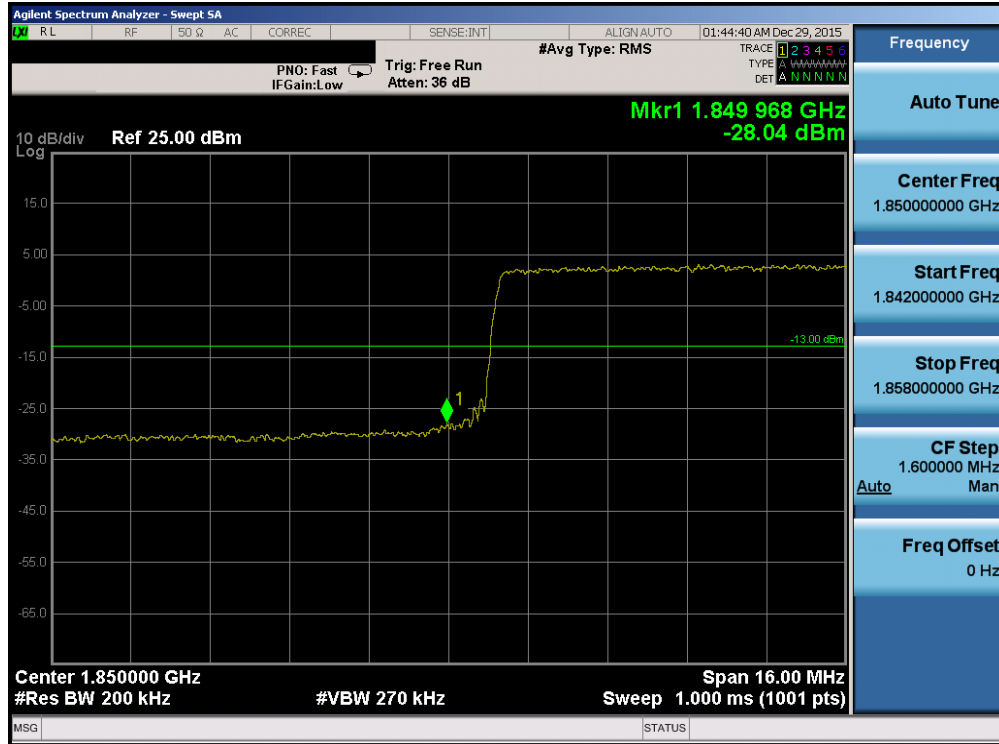


Plot 7-213. Upper Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

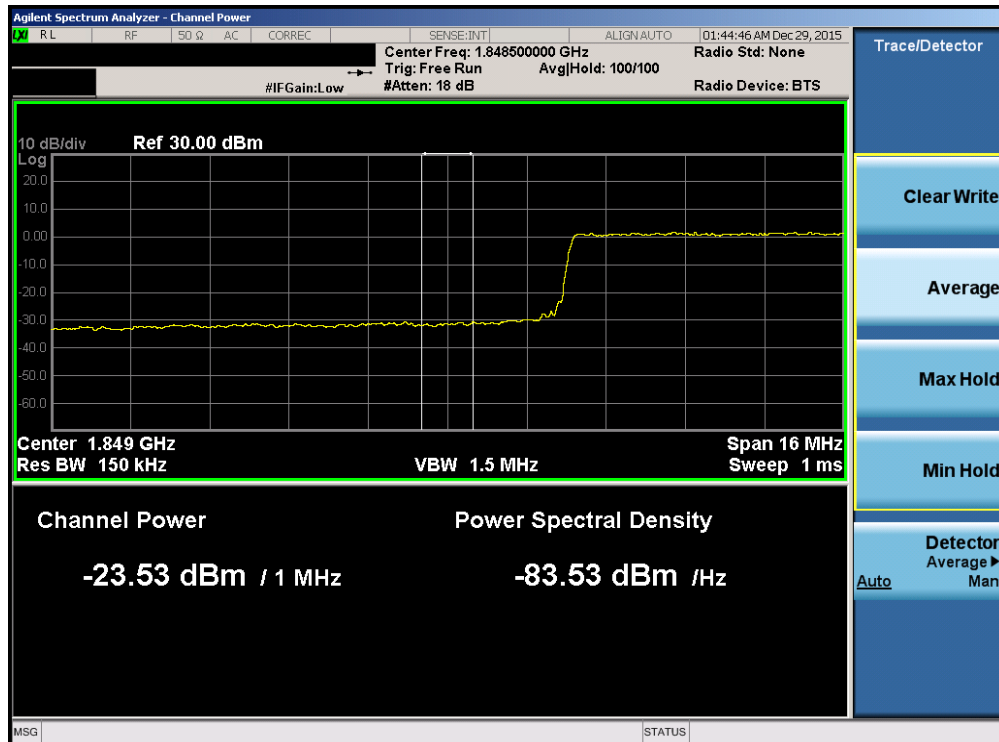


Plot 7-214. Upper Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-215. Lower Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

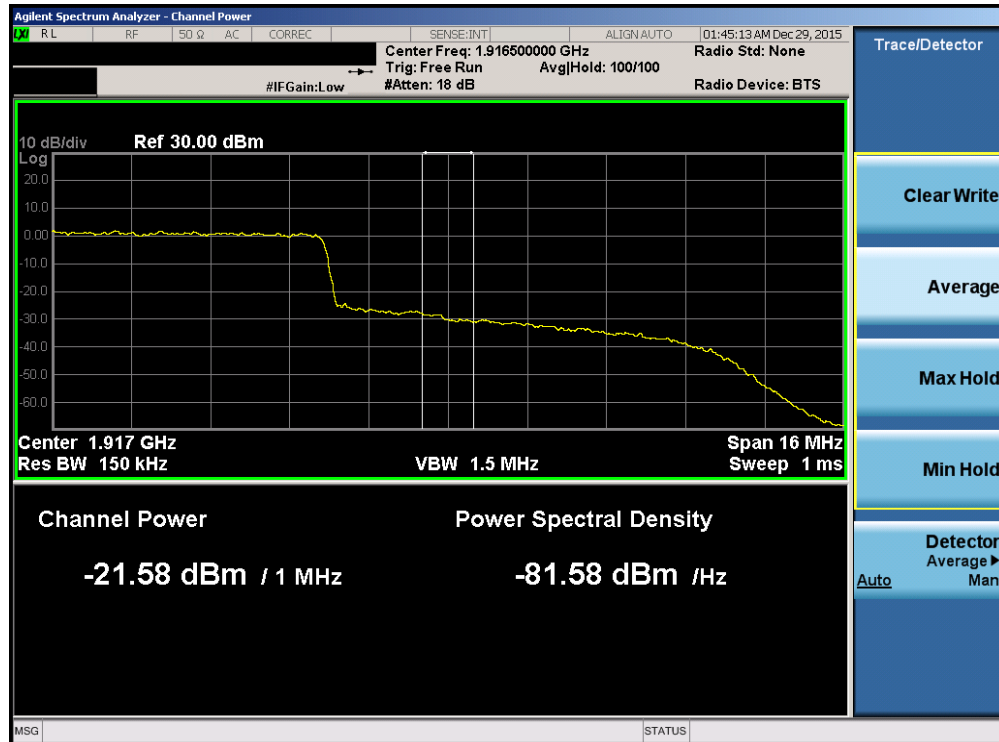


Plot 7-216. Lower Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 126 of 187

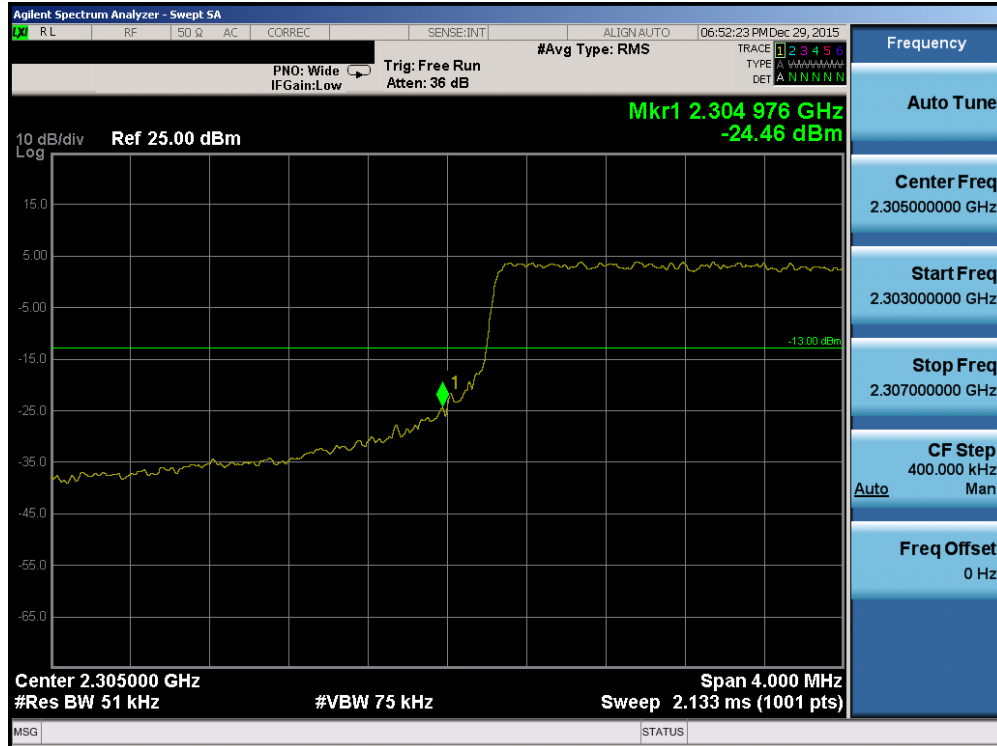


Plot 7-217. Upper Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-218. Upper Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 127 of 187

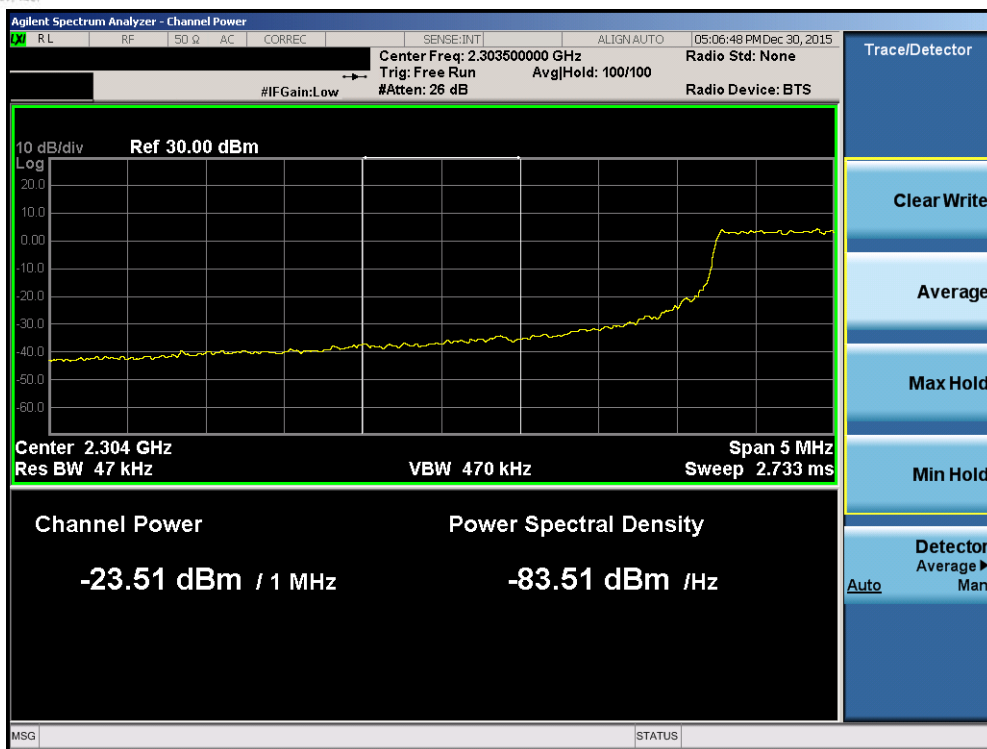


Plot 7-219. Lower Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)



Plot 7-220. Lower Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 128 of 187

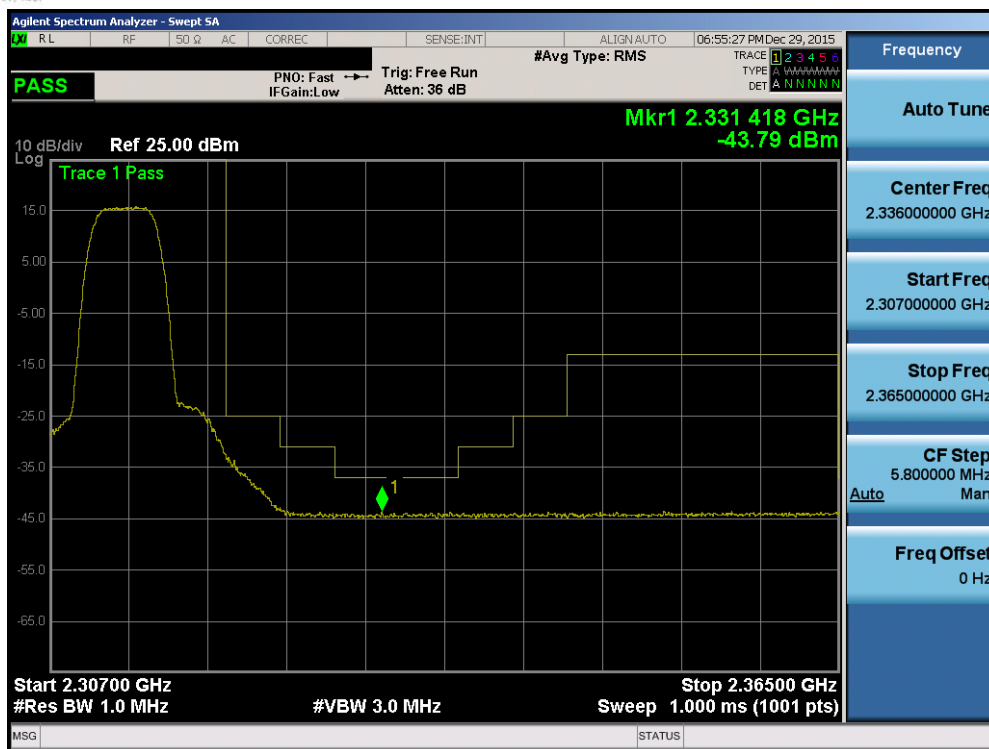


Plot 7-221. Lower Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

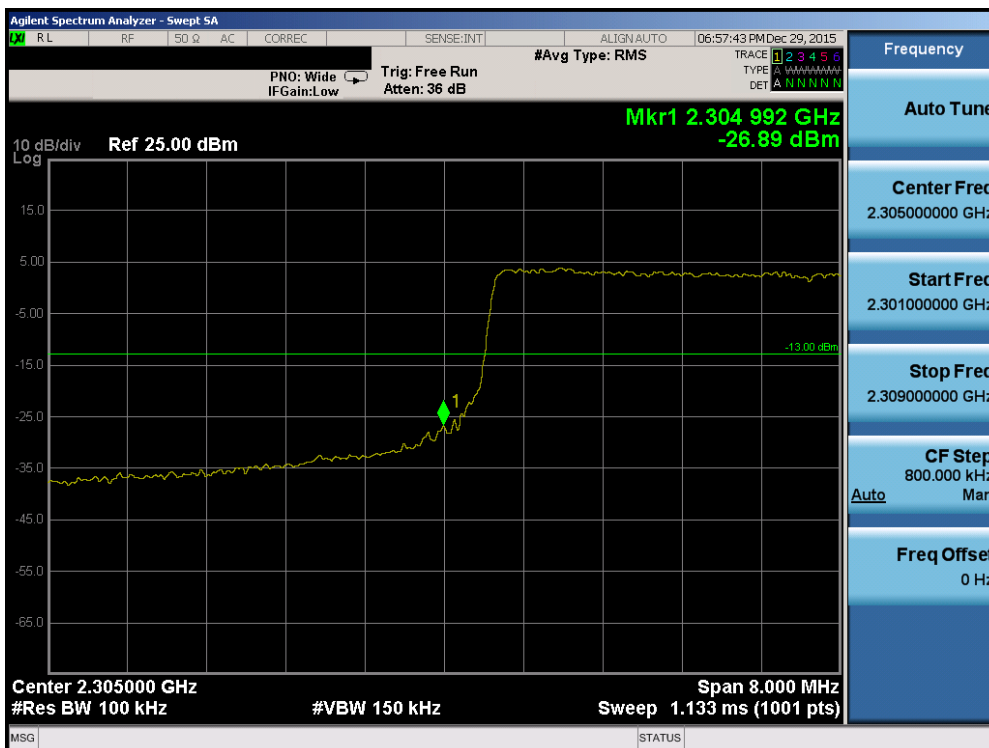


Plot 7-222. Upper Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 129 of 187



Plot 7-223. Upper Extended Band Edge Plot (Band 30 – 5.0MHz QPSK – RB Size 25)

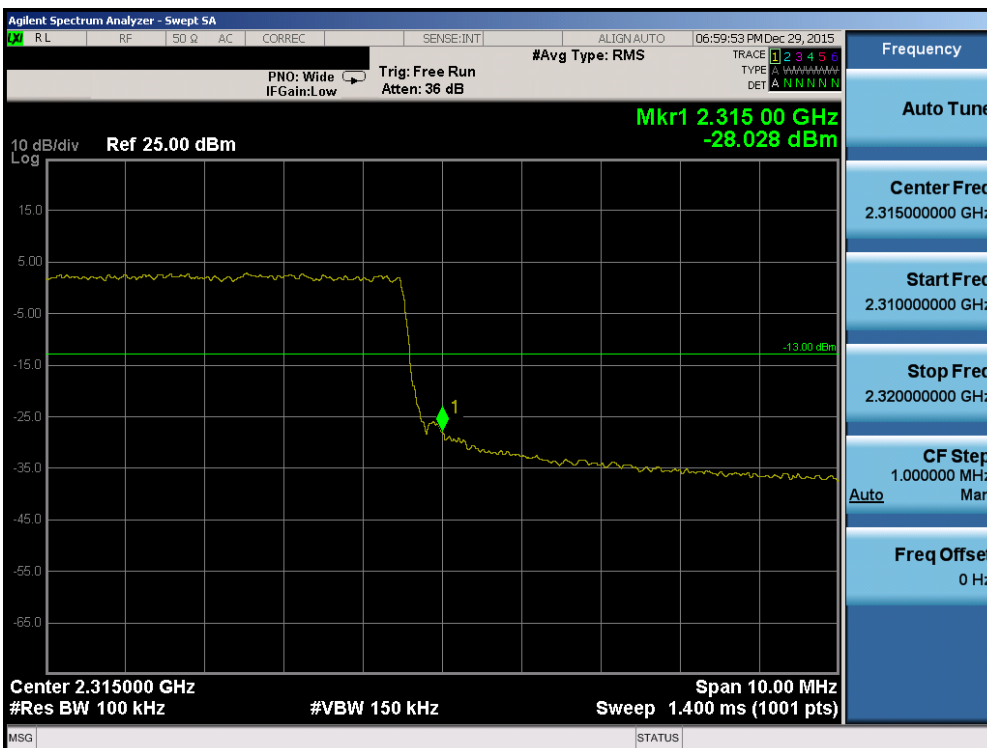


Plot 7-224. Lower Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 130 of 187

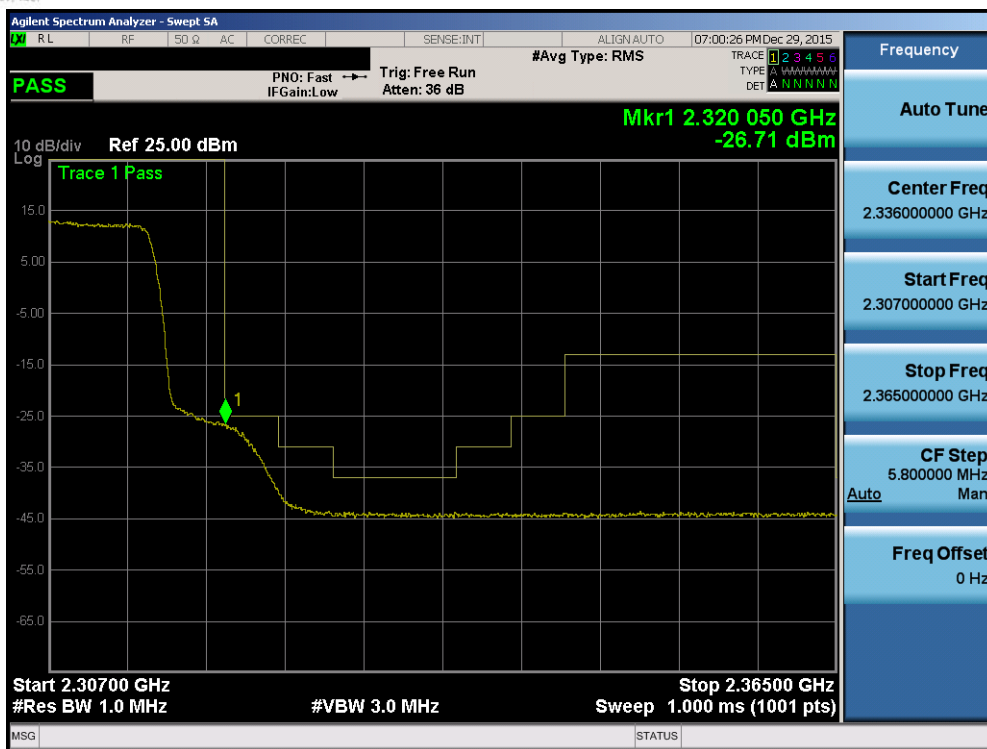


Plot 7-225. Lower Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

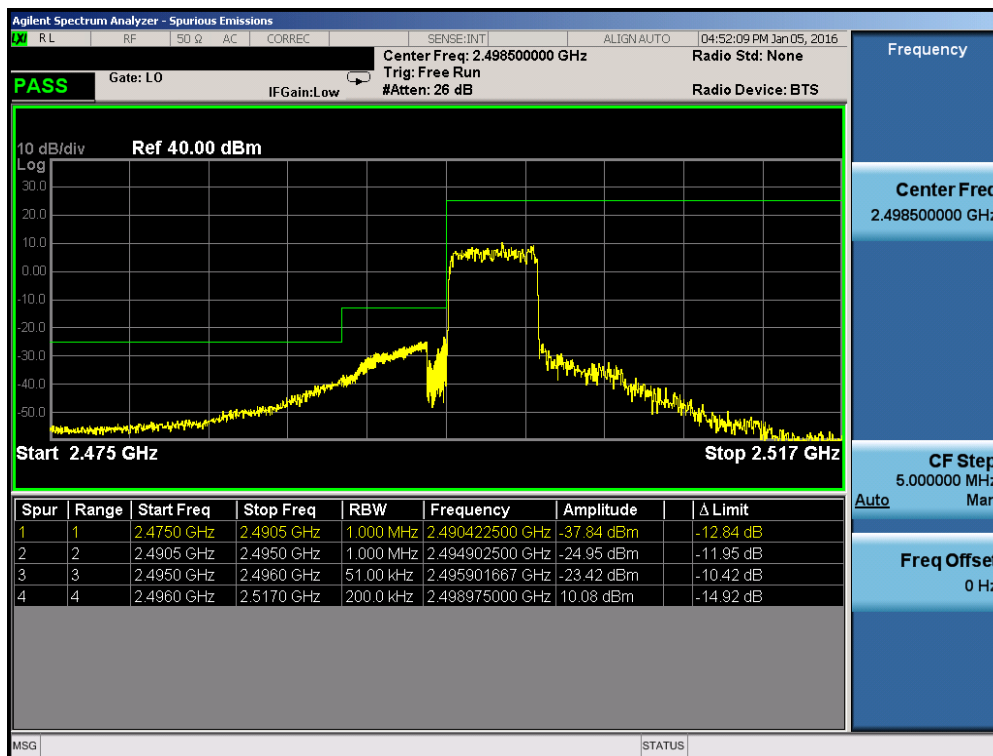


Plot 7-226. Upper Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 131 of 187

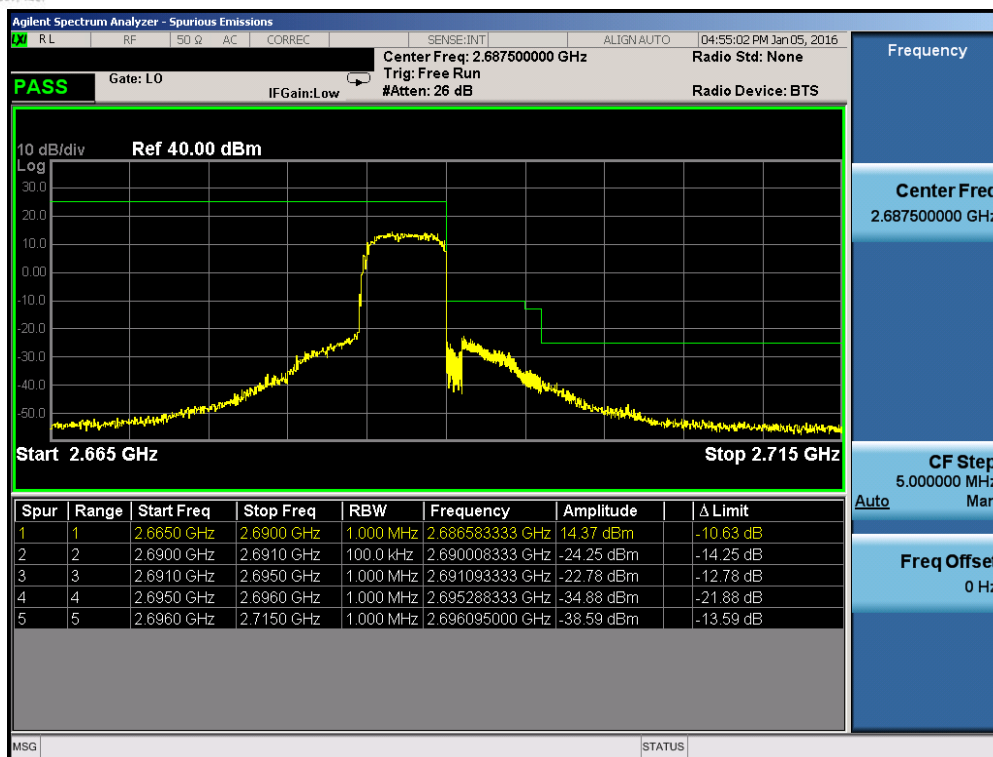


Plot 7-227. Upper Extended Band Edge Plot (Band 30 – 10.0MHz QPSK – RB Size 50)

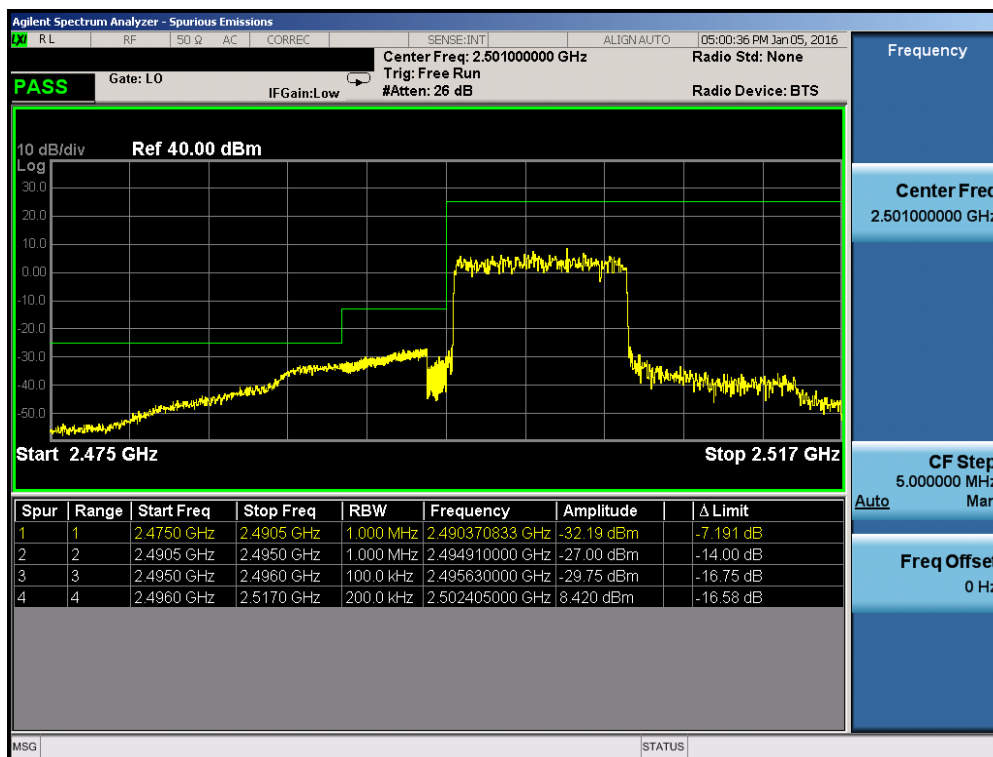


Plot 7-228. Lower ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 132 of 187

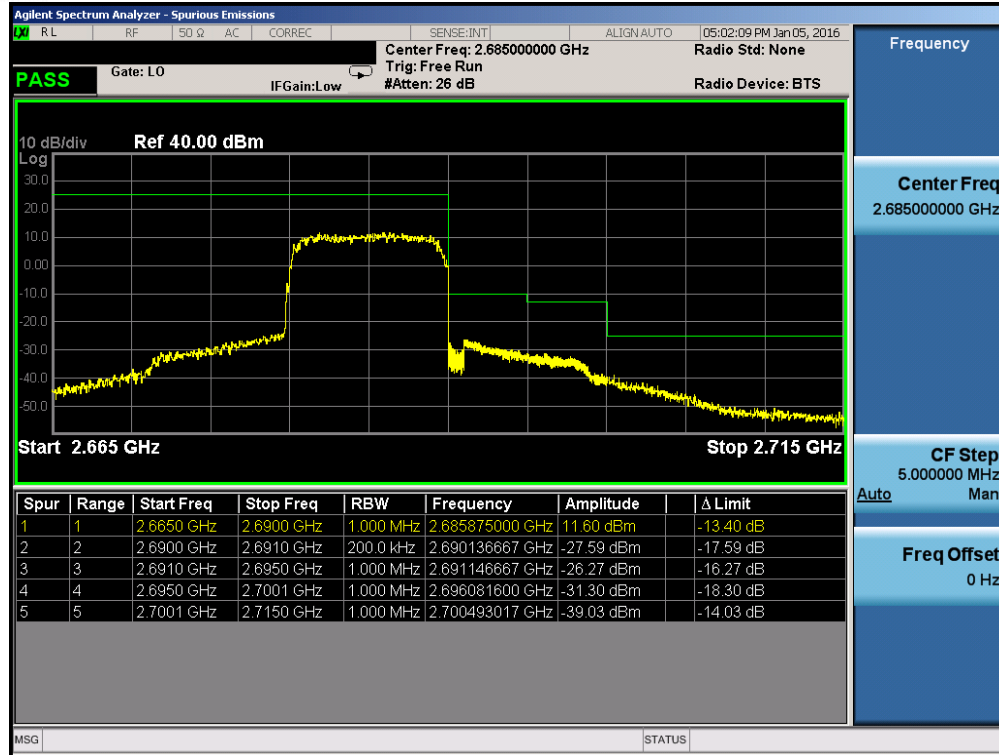


Plot 7-229. Upper ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)



Plot 7-230. Lower ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 133 of 187

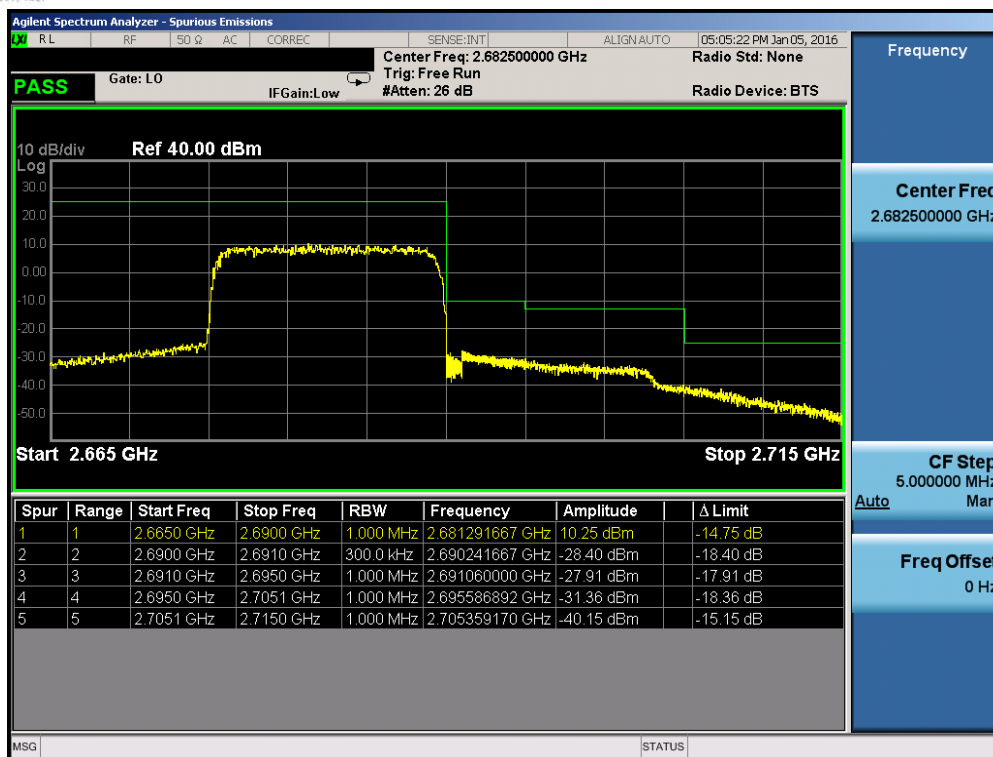


Plot 7-231. Upper ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

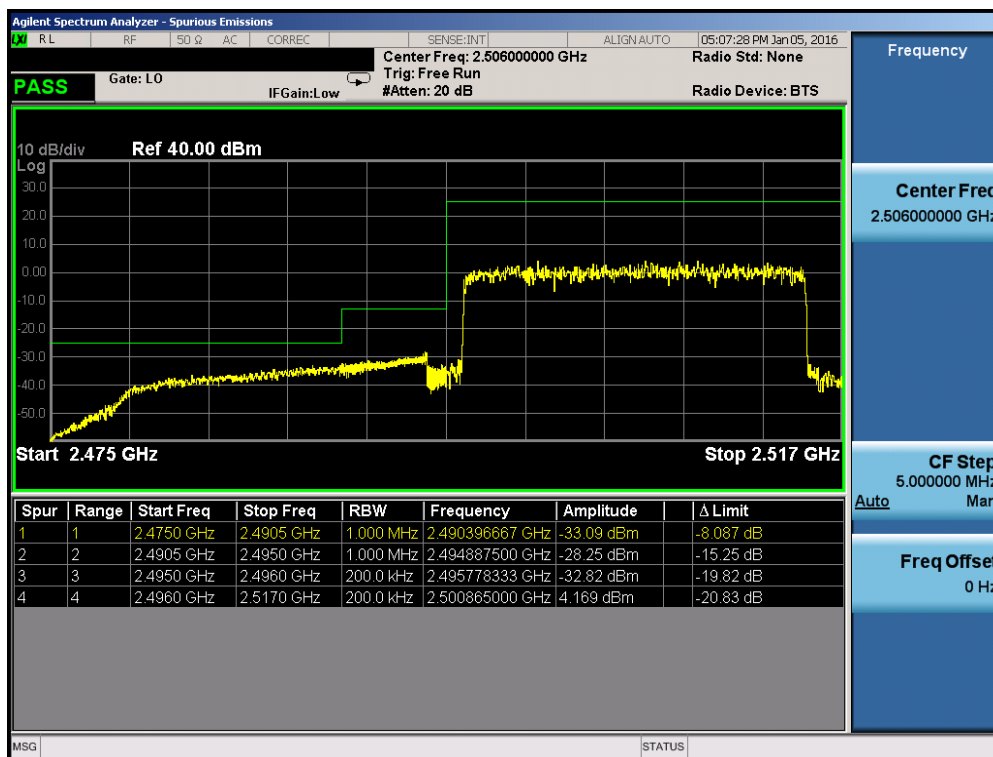


Plot 7-232. Lower ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 134 of 187

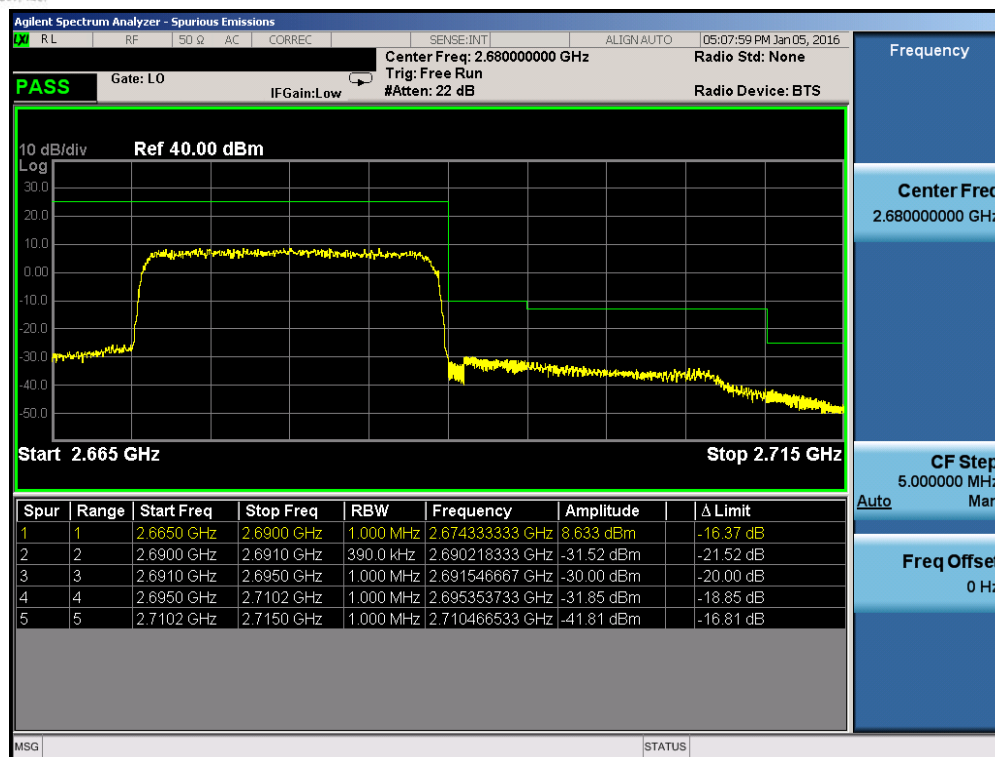


Plot 7-233. Upper ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



Plot 7-234. Lower ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 135 of 187



Plot 7-235. Upper ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 136 of 187

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. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

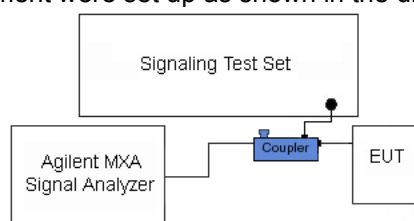
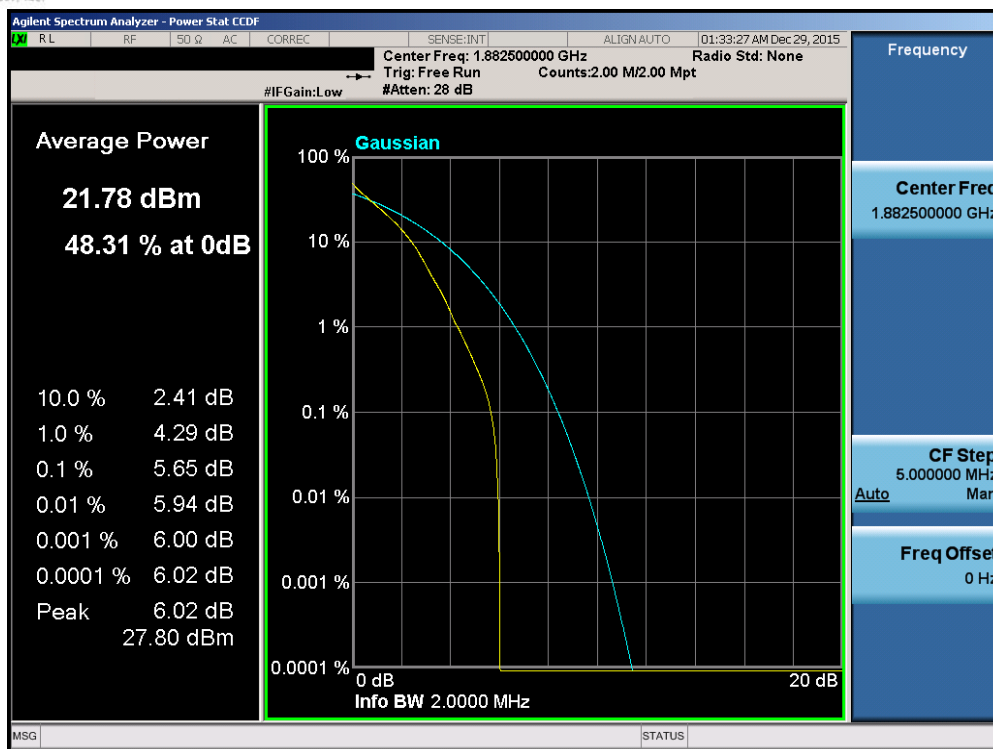


Figure 7-4. Test Instrument & Measurement Setup

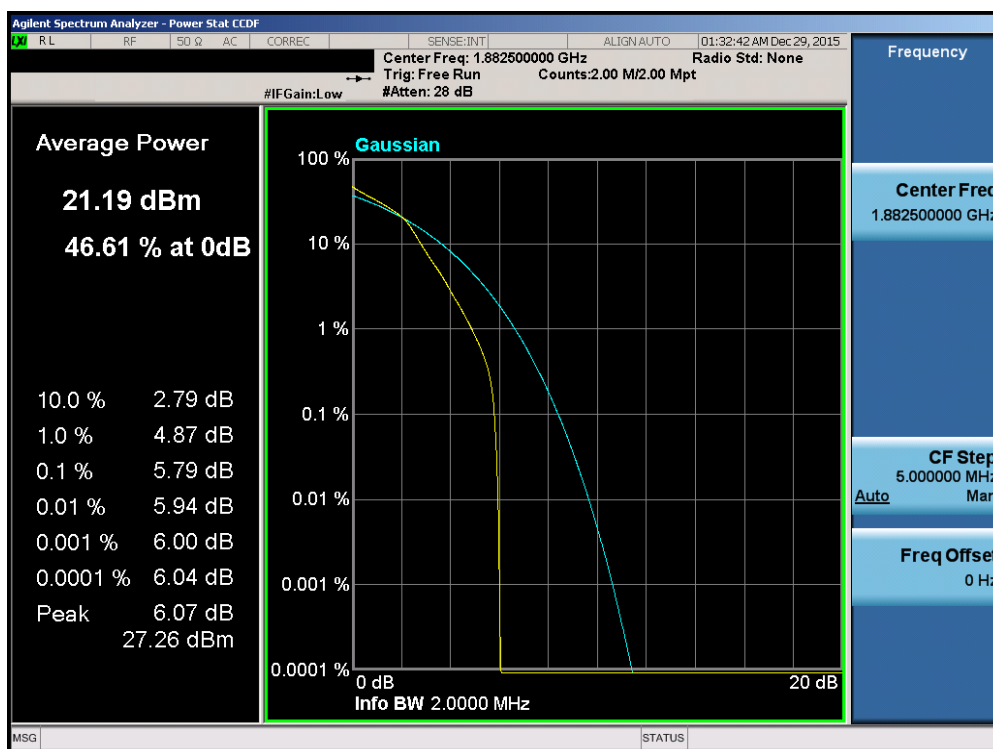
Test Notes

None.

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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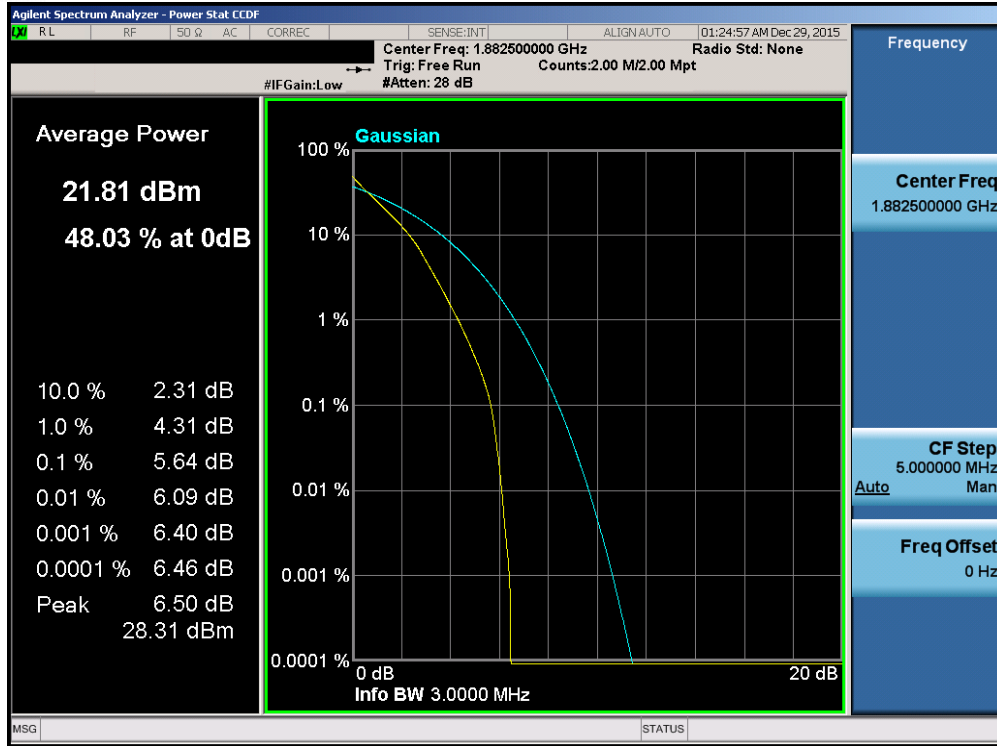


Plot 7-236. PAR Plot (Band 2/25 - 1.4MHz QPSK - RB Size 6)

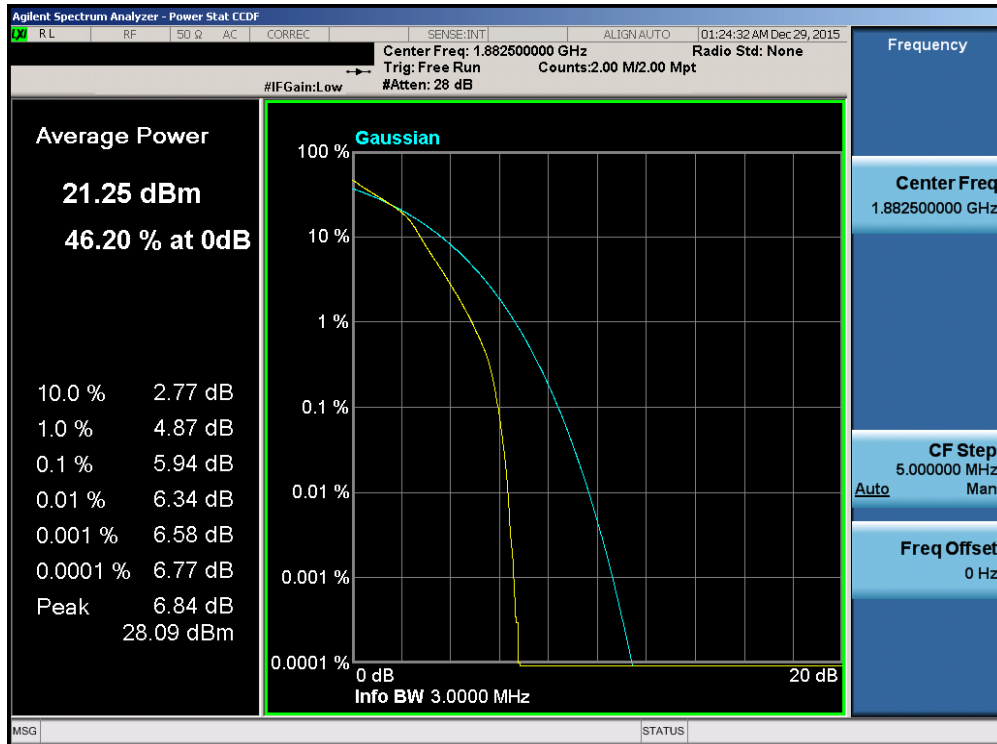


Plot 7-237. PAR Plot (Band 2/25 - 1.4MHz 16-QAM - RB Size 6)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 138 of 187

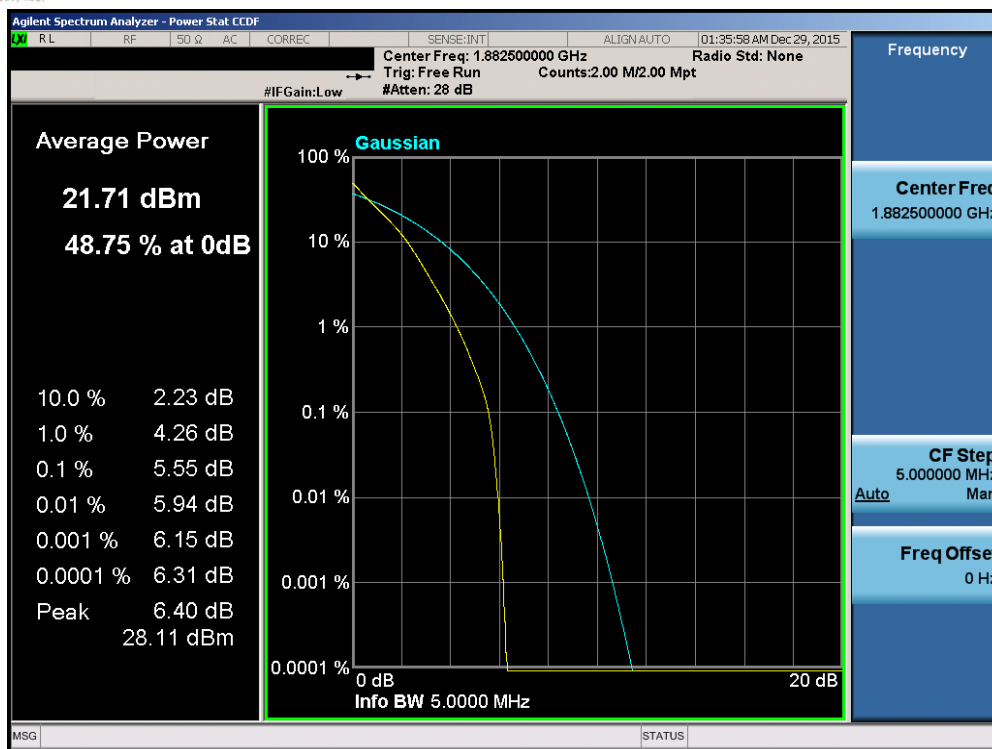


Plot 7-238. PAR Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)

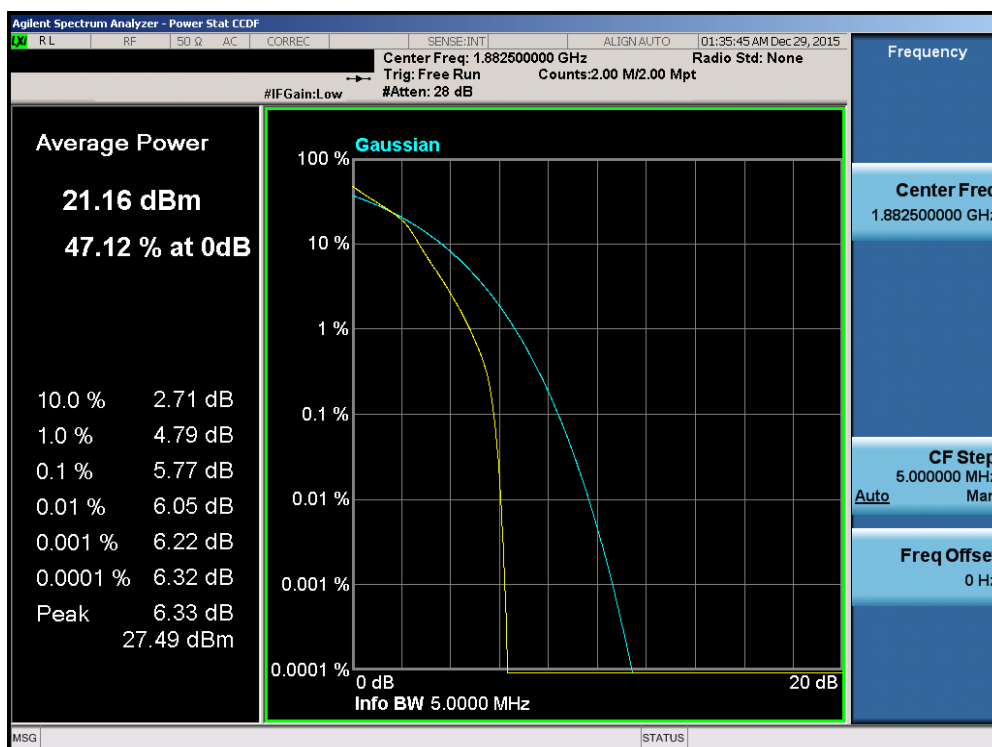


Plot 7-239. PAR Plot (Band 2/25 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 139 of 187

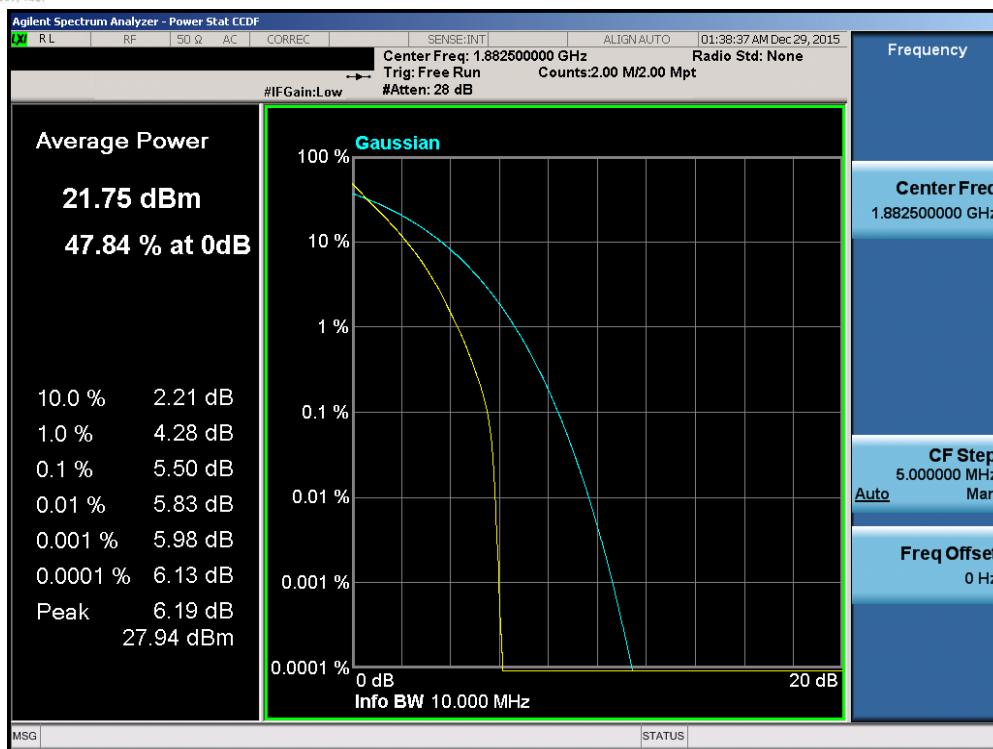


Plot 7-240. PAR Plot (Band 2/25 - 5.0MHz QPSK - RB Size 25)

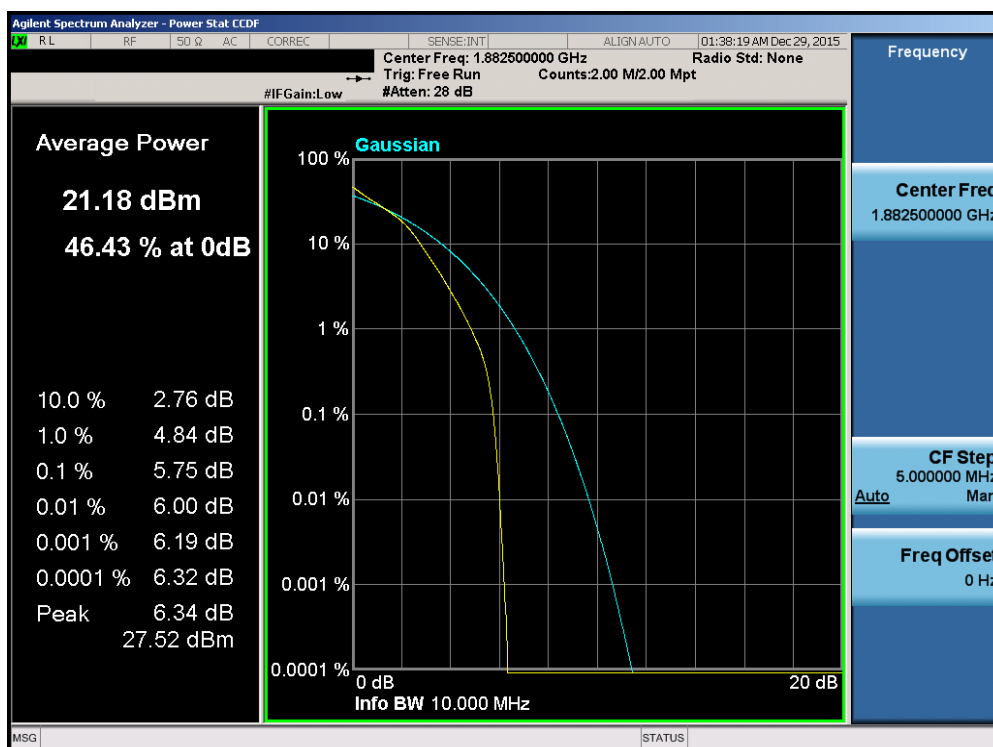


Plot 7-241. PAR Plot (Band 2/25 - 5.0MHz 16-QAM - RB Size 25)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 140 of 187

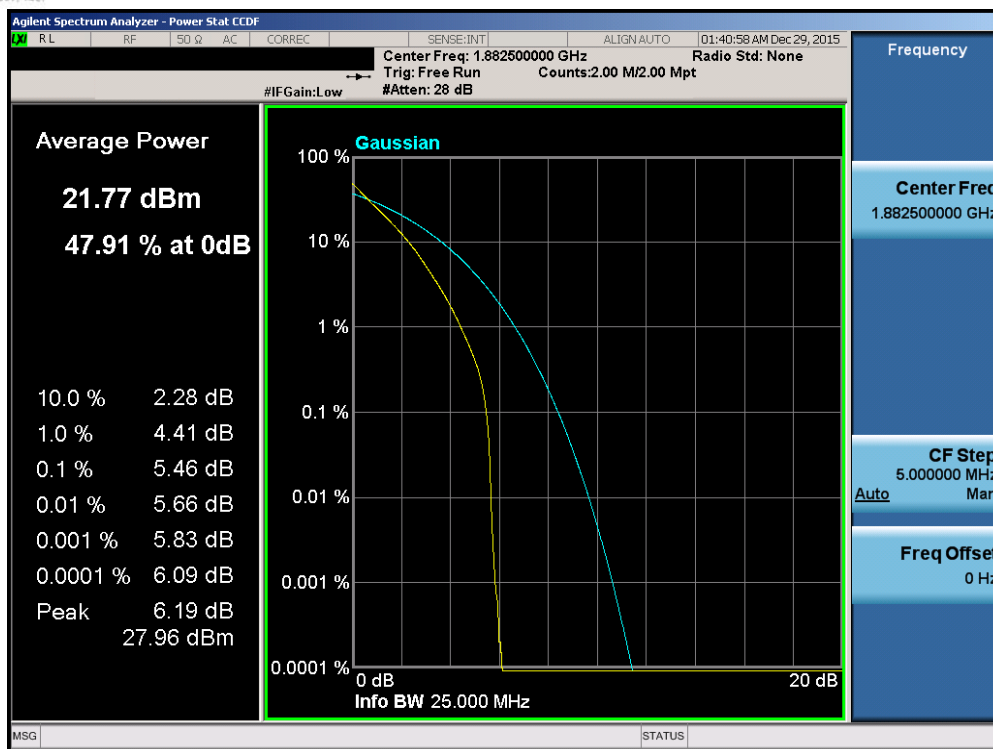


Plot 7-242. PAR Plot (Band 2/25 - 10.0MHz QPSK - RB Size 50)

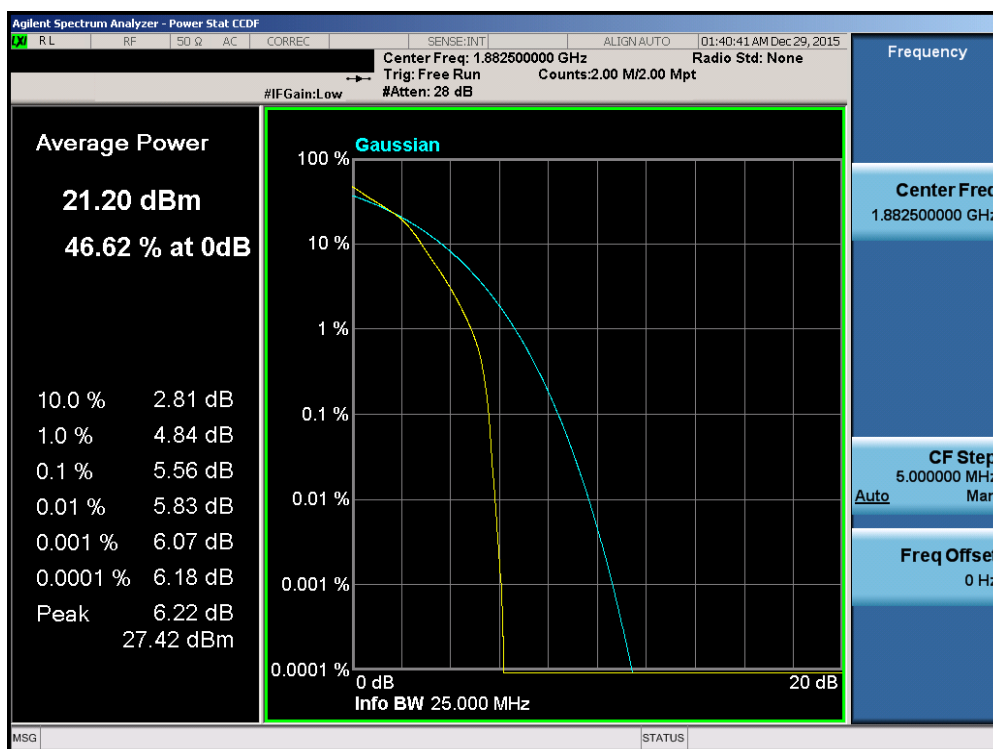


Plot 7-243. PAR Plot (Band 2/25 - 10.0MHz 16-QAM - RB Size 50)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 141 of 187

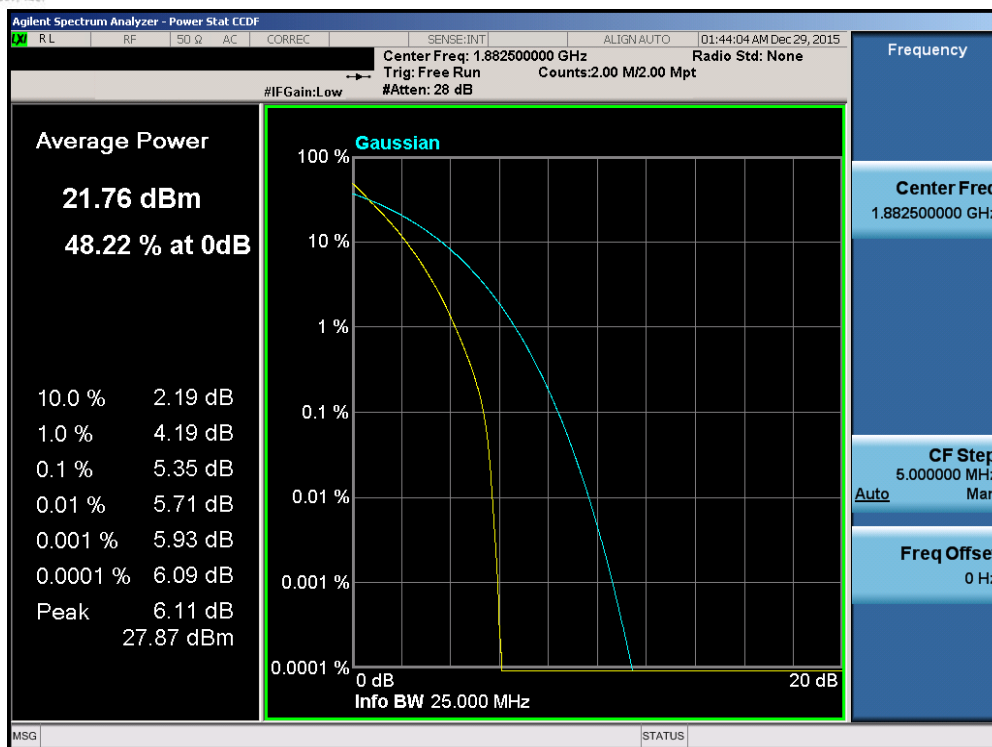


Plot 7-244. PAR Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

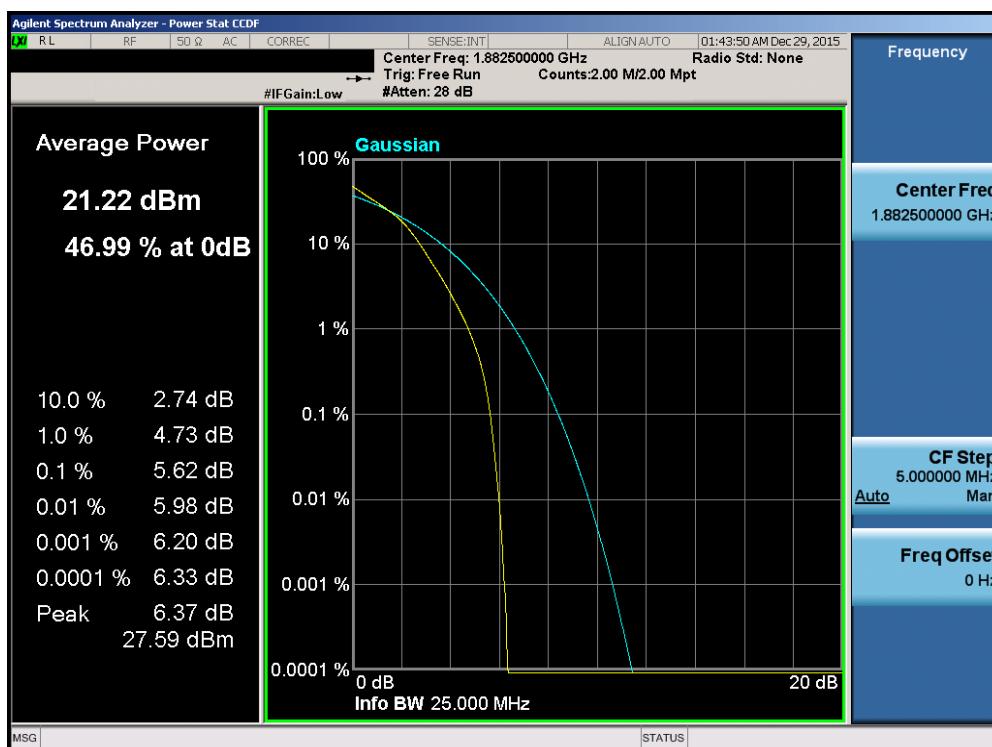


Plot 7-245. PAR Plot (Band 2/25 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 142 of 187



Plot 7-246. PAR Plot (Band 2/25 - 20.0MHz QPSK - RB Size 100)



Plot 7-247. PAR Plot (Band 2/25 - 20.0MHz 16-QAM - RB Size 100)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 143 of 187

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-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 D01 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. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

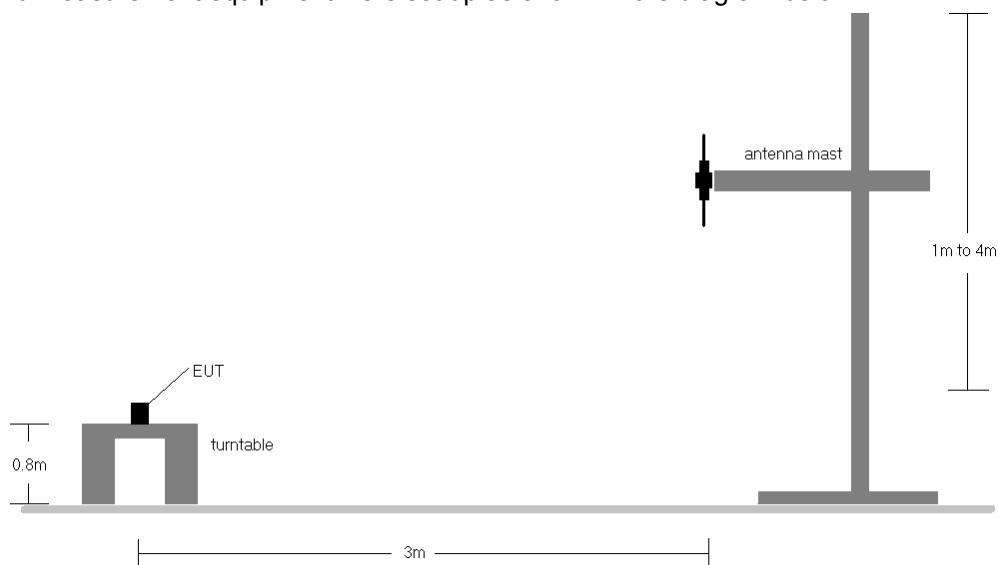


Figure 7-5. Radiated Test Setup <1GHz

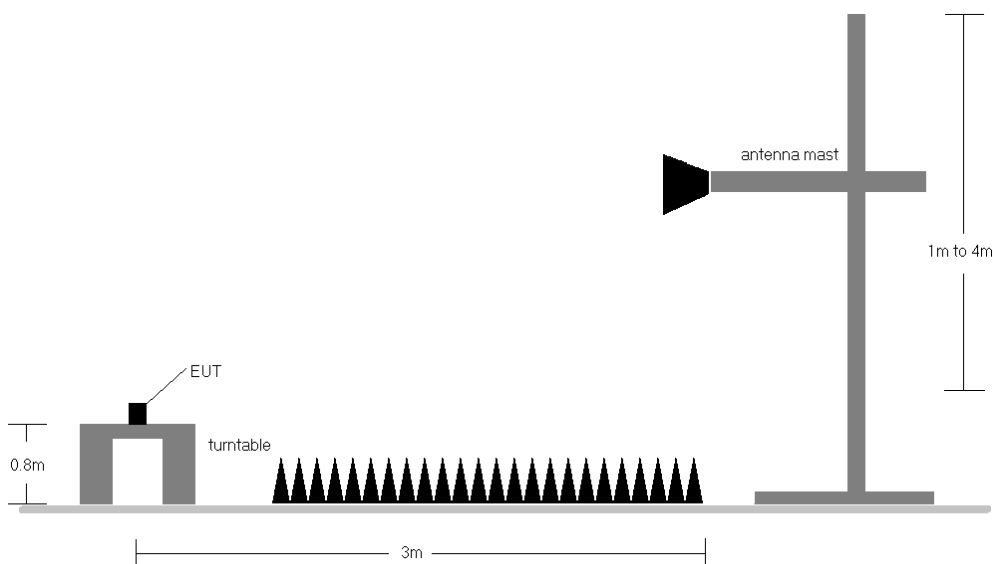


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [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	V	1.48	290	1 / 5	15.21	0.92	16.13	34.77	-18.64
707.50	1.4	QPSK	V	1.57	243	3 / 2	15.52	1.07	16.59	34.77	-18.18
715.30	1.4	QPSK	V	1.55	219	3 / 2	15.77	1.23	17.00	34.77	-17.78
699.70	1.4	16-QAM	V	1.48	290	1 / 5	13.62	0.92	14.54	34.77	-20.23
707.50	1.4	16-QAM	V	1.57	243	3 / 2	14.26	1.07	15.33	34.77	-19.44
715.30	1.4	16-QAM	V	1.55	219	3 / 2	14.32	1.23	15.55	34.77	-19.23
700.50	3	QPSK	V	1.51	303	1 / 14	15.88	0.92	16.80	34.77	-17.97
707.50	3	QPSK	V	1.54	294	1 / 14	16.11	1.07	17.18	34.77	-17.59
714.50	3	QPSK	V	1.56	216	1 / 0	16.07	1.21	17.28	34.77	-17.49
700.50	3	16-QAM	V	1.51	303	1 / 14	14.42	0.92	15.34	34.77	-19.43
707.50	3	16-QAM	V	1.54	294	1 / 14	15.02	1.07	16.09	34.77	-18.68
714.50	3	16-QAM	V	1.56	216	1 / 0	14.57	1.21	15.78	34.77	-18.99
701.50	5	QPSK	V	1.52	306	1 / 24	15.69	0.94	16.63	34.77	-18.14
707.50	5	QPSK	V	1.54	283	1 / 24	16.17	1.07	17.24	34.77	-17.53
713.50	5	QPSK	V	1.54	220	1 / 0	16.35	1.19	17.54	34.77	-17.23
701.50	5	16-QAM	V	1.52	306	1 / 24	14.45	0.94	15.39	34.77	-19.38
707.50	5	16-QAM	V	1.54	283	1 / 24	15.15	1.07	16.22	34.77	-18.55
713.50	5	16-QAM	V	1.54	220	1 / 0	15.18	1.19	16.37	34.77	-18.40
704.00	10	QPSK	V	1.54	304	1 / 49	15.75	1.00	16.75	34.77	-18.02
707.50	10	QPSK	V	1.54	250	1 / 49	15.98	1.07	17.05	34.77	-17.72
711.00	10	QPSK	V	1.57	296	1 / 49	15.88	1.14	17.02	34.77	-17.75
704.00	10	16-QAM	V	1.54	304	1 / 49	14.62	1.00	15.62	34.77	-19.15
707.50	10	16-QAM	V	1.54	250	1 / 49	14.89	1.07	15.96	34.77	-18.81
711.00	10	16-QAM	V	1.57	296	1 / 49	14.75	1.14	15.89	34.77	-18.88

Table 7-2. ERP Data (Band 12)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)				Reviewed by: Quality Manager
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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]
706.50	5	QPSK	V	1.45	20	1 / 0	14.98	1.05	16.03	34.77	-18.74
710.00	5	QPSK	V	1.60	322	1 / 24	15.66	1.12	16.78	34.77	-17.99
713.50	5	QPSK	V	1.30	30	1 / 0	14.92	1.19	16.11	34.77	-18.66
706.50	5	16-QAM	V	1.45	20	1 / 0	14.06	1.05	15.11	34.77	-19.66
710.00	5	16-QAM	V	1.60	322	1 / 24	14.56	1.12	15.68	34.77	-19.09
713.50	5	16-QAM	V	1.30	30	1 / 0	13.90	1.19	15.09	34.77	-19.68
709.00	10	QPSK	V	1.33	32	1 / 49	15.15	1.10	16.25	34.77	-18.52
710.00	10	QPSK	V	1.38	29	1 / 49	15.11	1.12	16.23	34.77	-18.54
711.00	10	QPSK	V	1.35	32	1 / 49	15.19	1.14	16.33	34.77	-18.44
709.00	10	16-QAM	V	1.33	32	1 / 49	14.04	1.10	15.14	34.77	-19.63
710.00	10	16-QAM	V	1.38	29	1 / 49	14.20	1.12	15.32	34.77	-19.45
711.00	10	16-QAM	V	1.35	32	1 / 49	14.19	1.14	15.33	34.77	-19.44

Table 7-3. ERP Data (Band 17)

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]
779.50	5	QPSK	V	1.34	287	1 / 24	13.75	2.47	16.22	34.77	-18.55
782.00	5	QPSK	V	1.40	285	1 / 24	14.16	2.51	16.67	34.77	-18.10
784.50	5	QPSK	V	1.35	264	1 / 24	14.00	2.56	16.56	34.77	-18.21
779.50	5	16QAM	V	1.34	287	1 / 24	12.50	2.47	14.97	34.77	-19.80
782.00	5	16QAM	V	1.40	285	1 / 24	13.06	2.51	15.57	34.77	-19.20
784.50	5	16QAM	V	1.35	264	1 / 24	12.85	2.56	15.41	34.77	-19.36
782.00	10	QPSK	V	1.38	283	1 / 49	13.54	2.51	16.05	34.77	-18.72
782.00	10	16QAM	V	1.38	283	1 / 49	12.24	2.51	14.75	34.77	-20.02

Table 7-4. ERP Data (Band 13)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 147 of 187

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]
824.70	1.4	QPSK	V	1.24	298	1 / 5	14.32	2.98	17.30	38.45	-21.15
836.50	1.4	QPSK	V	1.33	248	3 / 2	15.96	3.04	19.00	38.45	-19.45
848.30	1.4	QPSK	V	1.32	297	3 / 2	16.32	3.10	19.42	38.45	-19.03
824.70	1.4	16-QAM	V	1.24	298	1 / 5	12.88	2.98	15.86	38.45	-22.59
836.50	1.4	16-QAM	V	1.33	248	3 / 2	14.66	3.04	17.70	38.45	-20.75
848.30	1.4	16-QAM	V	1.32	297	3 / 2	15.04	3.10	18.14	38.45	-20.31
825.50	3	QPSK	V	1.24	294	1 / 14	14.91	2.98	17.89	38.45	-20.56
836.50	3	QPSK	V	1.31	250	1 / 14	16.21	3.04	19.25	38.45	-19.20
847.50	3	QPSK	V	1.32	298	1 / 0	16.49	3.10	19.59	38.45	-18.86
825.50	3	16-QAM	V	1.24	294	1 / 14	13.65	2.98	16.63	38.45	-21.82
836.50	3	16-QAM	V	1.31	250	1 / 14	15.06	3.04	18.10	38.45	-20.35
847.50	3	16-QAM	V	1.32	298	1 / 0	15.36	3.10	18.46	38.45	-19.99
826.50	5	QPSK	V	1.25	259	1 / 24	15.04	2.99	18.03	38.45	-20.42
836.50	5	QPSK	V	1.24	304	1 / 24	16.04	3.04	19.08	38.45	-19.37
846.50	5	QPSK	V	1.26	300	1 / 0	16.36	3.09	19.45	38.45	-19.00
826.50	5	16-QAM	V	1.25	259	1 / 24	13.94	2.99	16.93	38.45	-21.52
836.50	5	16-QAM	V	1.24	304	1 / 24	14.91	3.04	17.95	38.45	-20.50
846.50	5	16-QAM	V	1.26	300	1 / 24	14.95	3.09	18.04	38.45	-20.41
829.00	10	QPSK	V	1.29	288	1 / 49	15.69	3.00	18.69	38.45	-19.76
836.50	10	QPSK	V	1.29	246	1 / 49	16.13	3.04	19.17	38.45	-19.28
844.00	10	QPSK	V	1.29	300	1 / 0	16.46	3.08	19.54	38.45	-18.91
829.00	10	16-QAM	V	1.29	288	1 / 49	14.52	3.00	17.52	38.45	-20.93
836.50	10	16-QAM	V	1.29	246	1 / 49	14.92	3.04	17.96	38.45	-20.49
844.00	10	16-QAM	V	1.29	300	1 / 0	15.26	3.08	18.34	38.45	-20.11

Table 7-5. ERP Data (Band 5)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset			Page 148 of 187

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	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	H	1.93	281	3 / 2	11.17	9.83	21.00	30.00	-9.00
1732.50	1.4	QPSK	H	1.49	64	3 / 2	11.38	9.78	21.16	30.00	-8.84
1754.30	1.4	QPSK	H	1.09	238	1 / 0	11.67	9.74	21.41	30.00	-8.59
1710.70	1.4	16-QAM	H	1.93	281	3 / 2	9.97	9.83	19.81	30.00	-10.19
1732.50	1.4	16-QAM	H	1.49	64	3 / 2	10.38	9.78	20.17	30.00	-9.83
1754.30	1.4	16-QAM	H	1.09	238	1 / 0	10.31	9.74	20.05	30.00	-9.95
1711.50	3	QPSK	H	2.87	3	1 / 0	10.90	9.83	20.73	30.00	-9.27
1732.50	3	QPSK	H	1.39	333	1 / 0	11.82	9.78	21.60	30.00	-8.40
1753.50	3	QPSK	H	1.41	126	1 / 0	11.99	9.74	21.73	30.00	-8.27
1711.50	3	16-QAM	H	2.87	3	1 / 0	10.02	9.83	19.85	30.00	-10.15
1732.50	3	16-QAM	H	1.39	333	1 / 0	10.46	9.78	20.24	30.00	-9.76
1753.50	3	16-QAM	H	1.41	126	1 / 0	10.82	9.74	20.56	30.00	-9.44
1712.50	5	QPSK	H	1.65	19	1 / 0	11.52	9.83	21.36	30.00	-8.64
1732.50	5	QPSK	H	1.74	32	1 / 0	12.08	9.78	21.86	30.00	-8.14
1752.50	5	QPSK	H	2.48	308	1 / 24	11.97	9.74	21.71	30.00	-8.29
1712.50	5	16-QAM	H	1.65	19	1 / 0	10.62	9.83	20.45	30.00	-9.55
1732.50	5	16-QAM	H	1.74	32	1 / 0	11.06	9.78	20.85	30.00	-9.15
1752.50	5	16-QAM	H	2.48	308	1 / 24	11.01	9.74	20.75	30.00	-9.25
1715.00	10	QPSK	H	1.52	118	1 / 49	11.10	9.83	20.94	30.00	-9.06
1732.50	10	QPSK	H	2.37	84	1 / 0	11.48	9.78	21.27	30.00	-8.73
1750.00	10	QPSK	H	1.00	31	1 / 0	11.27	9.74	21.00	30.00	-9.00
1715.00	10	16-QAM	H	1.52	118	1 / 49	10.13	9.83	19.96	30.00	-10.04
1732.50	10	16-QAM	H	2.37	84	1 / 0	10.41	9.78	20.20	30.00	-9.80
1750.00	10	16-QAM	H	1.00	31	1 / 0	10.14	9.74	19.87	30.00	-10.13
1717.50	15	QPSK	H	1.45	279	1 / 74	10.51	9.83	20.34	30.00	-9.66
1732.50	15	QPSK	H	2.12	344	1 / 0	11.38	9.78	21.16	30.00	-8.84
1747.50	15	QPSK	H	1.02	52	1 / 74	11.79	9.74	21.53	30.00	-8.47
1717.50	15	16-QAM	H	1.45	279	1 / 74	9.29	9.83	19.12	30.00	-10.88
1732.50	15	16-QAM	H	2.12	344	1 / 0	10.37	9.78	20.16	30.00	-9.84
1747.50	15	16-QAM	H	1.02	52	1 / 74	10.64	9.74	20.38	30.00	-9.62
1720.00	20	QPSK	H	1.87	44	1 / 99	11.19	9.83	21.03	30.00	-8.97
1732.50	20	QPSK	H	1.15	257	1 / 0	10.97	9.78	20.75	30.00	-9.25
1745.00	20	QPSK	H	2.29	30	1 / 99	11.58	9.74	21.32	30.00	-8.68
1720.00	20	16-QAM	H	1.87	44	1 / 99	9.79	9.83	19.62	30.00	-10.38
1732.50	20	16-QAM	H	1.15	257	1 / 0	9.86	9.78	19.65	30.00	-10.35
1745.00	20	16-QAM	H	2.29	30	1 / 99	10.69	9.74	20.43	30.00	-9.57

Table 7-6. EIRP Data (Band 4)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: OY1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 149 of 187

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	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	H	1.93	321	3 / 2	12.85	9.54	22.39	33.01	-10.62
1882.50	1.4	QPSK	H	1.01	180	3 / 2	13.10	9.49	22.59	33.01	-10.42
1914.30	1.4	QPSK	H	1.36	122	3 / 2	12.77	9.49	22.26	33.01	-10.75
1850.70	1.4	16-QAM	H	1.93	321	3 / 2	11.49	9.54	21.04	33.01	-11.98
1882.50	1.4	16-QAM	H	1.01	180	3 / 2	11.99	9.49	21.48	33.01	-11.53
1914.30	1.4	16-QAM	H	1.36	122	3 / 2	11.71	9.49	21.20	33.01	-11.81
1851.50	3	QPSK	H	1.21	187	1 / 14	13.07	9.54	22.61	33.01	-10.40
1882.50	3	QPSK	H	1.39	333	1 / 0	13.51	9.49	23.00	33.01	-10.01
1913.50	3	QPSK	H	1.25	333	1 / 0	13.22	9.49	22.71	33.01	-10.30
1851.50	3	16-QAM	H	1.21	187	1 / 14	11.71	9.54	21.25	33.01	-11.76
1882.50	3	16-QAM	H	1.39	333	1 / 0	12.49	9.49	21.98	33.01	-11.03
1913.50	3	16-QAM	H	1.25	333	1 / 0	11.96	9.49	21.45	33.01	-11.56
1852.50	5	QPSK	H	2.48	210	1 / 24	13.29	9.54	22.83	33.01	-10.18
1882.50	5	QPSK	H	2.28	237	1 / 0	13.30	9.49	22.79	33.01	-10.22
1912.50	5	QPSK	H	2.71	85	1 / 24	13.15	9.49	22.64	33.01	-10.37
1852.50	5	16-QAM	H	2.48	210	1 / 24	12.10	9.54	21.64	33.01	-11.37
1882.50	5	16-QAM	H	2.28	237	1 / 0	12.12	9.49	21.61	33.01	-11.40
1912.50	5	16-QAM	H	2.71	85	1 / 24	11.97	9.49	21.46	33.01	-11.55
1855.00	10	QPSK	H	1.66	140	1 / 0	12.93	9.54	22.47	33.01	-10.54
1882.50	10	QPSK	H	1.12	307	1 / 0	12.83	9.49	22.32	33.01	-10.69
1910.00	10	QPSK	H	1.90	303	1 / 49	12.74	9.49	22.23	33.01	-10.78
1855.00	10	16-QAM	H	1.66	140	1 / 0	11.86	9.54	21.40	33.01	-11.61
1882.50	10	16-QAM	H	1.12	307	1 / 0	11.56	9.49	21.06	33.01	-11.95
1910.00	10	16-QAM	H	1.90	303	1 / 49	11.59	9.49	21.08	33.01	-11.93
1857.50	15	QPSK	H	1.65	228	1 / 0	13.01	9.54	22.56	33.01	-10.45
1882.50	15	QPSK	H	1.29	290	1 / 0	12.42	9.49	21.91	33.01	-11.10
1907.50	15	QPSK	H	1.90	74	1 / 0	12.28	9.49	21.76	33.01	-11.25
1857.50	15	16-QAM	H	1.65	228	1 / 0	11.72	9.54	21.26	33.01	-11.75
1882.50	15	16-QAM	H	1.29	290	1 / 0	11.28	9.49	20.77	33.01	-12.24
1907.50	15	16-QAM	H	1.90	74	1 / 0	11.15	9.49	20.64	33.01	-12.37
1860.00	20	QPSK	H	2.48	96	1 / 0	11.87	9.54	21.42	33.01	-11.59
1882.50	20	QPSK	H	1.41	310	1 / 0	11.14	9.49	20.63	33.01	-12.38
1905.00	20	QPSK	H	1.37	353	1 / 0	10.48	9.49	19.97	33.01	-13.04
1860.00	20	16-QAM	H	2.48	96	1 / 0	10.95	9.54	20.49	33.01	-12.52
1882.50	20	16-QAM	H	1.41	310	1 / 0	10.08	9.49	19.58	33.01	-13.43
1905.00	20	16-QAM	H	1.37	353	1 / 0	9.38	9.49	18.86	33.01	-14.15

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	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]
2307.50	5	QPSK	V	1.06	281	1 / 0	11.88	8.00	19.88	23.98	-4.10
2310.00	5	QPSK	V	1.07	272	1 / 0	11.08	8.00	19.08	23.98	-4.90
2312.50	5	QPSK	V	1.06	283	1 / 0	11.71	8.00	19.71	23.98	-4.27
2307.50	5	16-QAM	V	1.06	281	1 / 0	11.18	8.00	19.18	23.98	-4.80
2310.00	5	16-QAM	V	1.07	272	1 / 0	10.00	8.00	18.00	23.98	-5.98
2312.50	5	16-QAM	V	1.06	283	1 / 0	10.55	8.00	18.55	23.98	-5.43
2310.00	10	QPSK	V	1.01	333	1 / 0	12.10	8.00	20.10	23.98	-3.88
2310.00	10	16-QAM	V	1.01	333	1 / 0	11.04	8.00	19.04	23.98	-4.94

Table 7-8. EIRP Data (Band 30)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	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]
2498.50	5	QPSK	V	1.00	312	1 / 24	14.98	7.09	22.07	33.01	-10.94
2593.00	5	QPSK	V	1.00	360	1 / 0	13.40	7.55	20.95	33.01	-12.06
2687.50	5	QPSK	V	1.04	12	1 / 24	9.96	7.82	17.78	33.01	-15.23
2498.50	5	16-QAM	V	1.00	312	1 / 24	13.53	7.09	20.62	33.01	-12.39
2593.00	5	16-QAM	V	1.00	360	1 / 0	12.26	7.55	19.81	33.01	-13.20
2687.50	5	16-QAM	V	1.04	12	1 / 24	8.99	7.82	16.81	33.01	-16.20
2501.00	10	QPSK	V	1.00	344	1 / 0	13.60	7.08	20.68	33.01	-12.33
2593.00	10	QPSK	V	1.00	0	1 / 49	12.71	7.55	20.26	33.01	-12.75
2685.00	10	QPSK	V	1.03	24	1 / 0	9.66	7.81	17.47	33.01	-15.54
2501.00	10	16-QAM	V	1.00	344	1 / 0	12.36	7.08	19.44	33.01	-13.57
2593.00	10	16-QAM	V	1.00	0	1 / 49	11.72	7.55	19.27	33.01	-13.74
2685.00	10	16-QAM	V	1.03	24	1 / 0	8.65	7.81	16.46	33.01	-16.55
2503.50	15	QPSK	V	1.01	358	36 / 18	14.00	7.10	21.10	33.01	-11.91
2593.00	15	QPSK	V	1.01	360	1 / 0	12.81	7.55	20.36	33.01	-12.65
2682.50	15	QPSK	V	1.01	309	1 / 0	9.26	7.81	17.07	33.01	-15.94
2503.50	15	16-QAM	V	1.01	358	36 / 18	13.01	7.10	20.11	33.01	-12.90
2593.00	15	16-QAM	V	1.01	360	1 / 0	11.62	7.55	19.17	33.01	-13.84
2682.50	15	16-QAM	V	1.01	309	1 / 0	8.22	7.81	16.03	33.01	-16.98
2506.00	20	QPSK	V	1.01	1	1 / 99	14.60	7.11	21.71	33.01	-11.30
2593.00	20	QPSK	V	1.04	9	1 / 0	13.54	7.55	21.09	33.01	-11.92
2680.00	20	QPSK	V	1.01	6	1 / 0	9.84	7.80	17.64	33.01	-15.37
2506.00	20	16-QAM	V	1.01	1	1 / 99	12.70	7.11	19.81	33.01	-13.20
2593.00	20	16-QAM	V	1.04	9	1 / 0	12.51	7.55	20.06	33.01	-12.95
2680.00	20	16-QAM	V	1.01	6	1 / 0	8.91	7.80	16.71	33.01	-16.30

Table 7-9. EIRP Data (Band 41)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
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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-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 D01 v02r02 – Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

Test Settings

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

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Test Setup

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

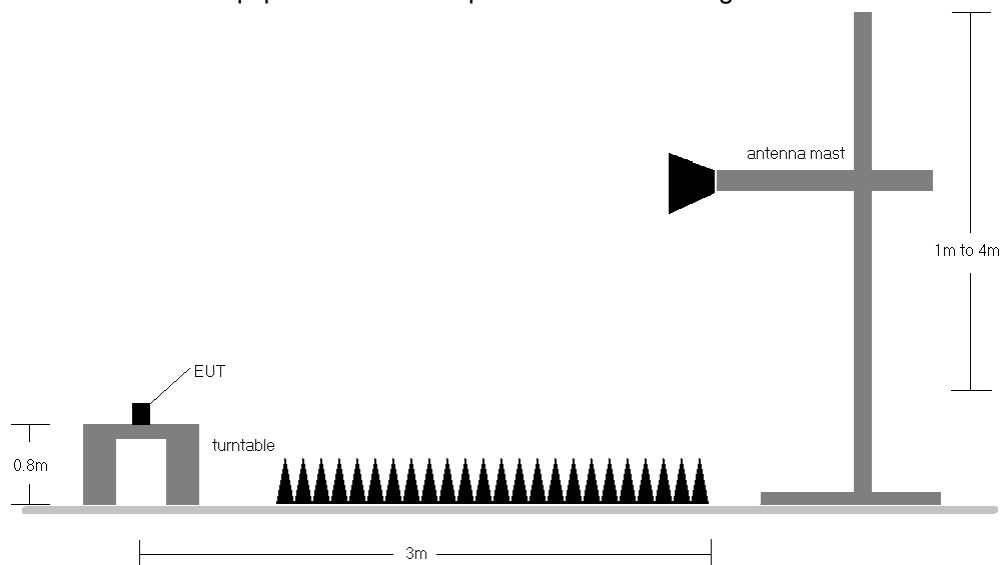


Figure 7-7. Test Instrument & Measurement Setup

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.

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OPERATING FREQUENCY: 701.50 MHz
 CHANNEL: 23035
 MEASURED OUTPUT POWER: 16.63 dBm = 0.046 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 29.63 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]
1403.00	H	1.01	60	-57.37	5.66	-51.71	68.3
2104.50	H	1.01	82	-61.89	6.63	-55.26	71.9
2806.00	H	-	-	-62.08	7.84	-54.24	70.9

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

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MEASURED OUTPUT POWER: 17.24 dBm = 0.053 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 30.24 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	1.01	83	-58.32	5.73	-52.58	69.8
2122.50	H	1.01	85	-62.57	6.73	-55.84	73.1
2830.00	H	-	-	-62.06	7.80	-54.26	71.5

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

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MEASURED OUTPUT POWER: 17.54 dBm = 0.057 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.54 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	1.01	55	-56.94	5.80	-51.14	68.7
2140.50	H	1.01	57	-61.07	6.83	-54.24	71.8
2854.00	H	-	-	-62.61	7.76	-54.84	72.4

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

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MEASURED OUTPUT POWER: 17.54 dBm = 0.057 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.54 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	1.01	78	-56.42	5.80	-50.62	68.2
2140.50	H	1.01	68	-60.83	6.83	-54.00	71.5
2854.00	H	-	-	-64.90	7.76	-57.13	74.7

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

OPERATING FREQUENCY: 706.50 MHz
 CHANNEL: 23755
 MEASURED OUTPUT POWER: 16.03 dBm = 0.040 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.03 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]
1413.00	H	1.01	29	-56.77	5.72	-51.05	67.1
2119.50	H	1.16	50	-58.16	6.71	-51.45	67.5
2826.00	H	-	-	-62.59	7.81	-54.78	70.8

Table 7-14. Radiated Spurious Data (Band 17 – Low Channel)

OPERATING FREQUENCY: 710.00 MHz
 CHANNEL: 23790
 MEASURED OUTPUT POWER: 16.78 dBm = 0.048 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.78 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]
1420.00	H	1.32	159	-55.47	5.76	-49.71	66.5
2130.00	H	1.15	302	-58.60	6.77	-51.83	68.6
2840.00	H	-	-	-63.28	7.78	-55.50	72.3

Table 7-15. Radiated Spurious Data (Band 17 – Mid Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23825
 MEASURED OUTPUT POWER: 16.11 dBm = 0.041 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.11 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	1.32	164	-56.62	5.80	-50.82	66.9
2140.50	H	1.01	36	-57.79	6.83	-50.96	67.1
2854.00	H	-	-	-63.45	7.76	-55.68	71.8

Table 7-16. Radiated Spurious Data (Band 17 – High Channel)

OPERATING FREQUENCY: 710.00 MHz
 CHANNEL: 23790
 MEASURED OUTPUT POWER: 16.78 dBm = 0.048 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.78 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]
1420.00	H	1.01	153	-56.21	5.76	-50.45	67.2
2130.00	H	1.01	198	-58.27	6.77	-51.50	68.3
2840.00	H	-	-	-63.80	7.78	-56.02	72.8

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 779.50 MHz
 CHANNEL: 23205
 MEASURED OUTPUT POWER: 16.22 dBm = 0.042 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 29.22 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	2.30	115	-53.86	3.67	-50.19	66.4
3118.00	H	-	-	-59.56	5.13	-54.42	70.6

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

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MEASURED OUTPUT POWER: 16.67 dBm = 0.046 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 29.67 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	1.10	20	-53.02	3.67	-49.35	66.0
3128.00	H	-	-	-58.01	5.17	-52.84	69.5

Table 7-19. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 784.50 MHz
 CHANNEL: 23255
 MEASURED OUTPUT POWER: 16.56 dBm = 0.045 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.56 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	2.92	115	-51.07	3.66	-47.41	64.0
3138.00	H	-	-	-56.72	5.21	-51.51	68.1

Table 7-20. 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 [m]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	H	2.20	115	-53.40	3.68	-49.72	-9.7
1564.00	H	1.00	56	-54.72	3.69	-51.03	-11.0
1569.00	H	1.90	108	-51.31	3.71	-47.61	-7.6

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

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 MEASURED OUTPUT POWER: 16.67 dBm = 0.046 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.67 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	1.31	96	-55.23	3.67	-51.56	68.2
3128.00	H	-	-	-56.15	5.17	-50.98	67.7

Table 7-22. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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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	2.08	90	-60.78	3.68	-57.10	-17.1
1564.00	H	1.31	10	-59.39	3.69	-55.70	-15.7
1569.00	H	1.70	55	-59.25	3.71	-55.55	-15.5

Table 7-23. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 825.50 MHz
 CHANNEL: 20415
 MEASURED OUTPUT POWER: 17.89 dBm = 0.062 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) = 30.89$ 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]
1651.00	H	1.19	312	-57.31	6.56	-50.75	68.6
2476.50	H	1.19	226	-58.85	7.30	-51.55	69.4
3302.00	H	-	-	-59.38	7.37	-52.01	69.9

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MEASURED OUTPUT POWER: 19.25 dBm = 0.084 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.25 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	1.17	277	-60.82	6.55	-54.27	73.5
2509.50	H	1.17	220	-58.84	7.34	-51.49	70.7
3346.00	H	-	-	-59.85	7.44	-52.41	71.7

Table 7-25. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY: 847.50 MHz
 CHANNEL: 20635
 MEASURED OUTPUT POWER: 19.59 dBm = 0.091 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.59 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]
1695.00	H	1.00	175	-55.14	6.55	-48.59	68.2
2542.50	H	1.00	170	-57.35	7.36	-49.99	69.6
3390.00	H	-	-	-60.03	7.51	-52.52	72.1

Table 7-26. Radiated Spurious Data (Band 5 – High Channel)

OPERATING FREQUENCY: 847.50 MHz
 CHANNEL: 20635
 MEASURED OUTPUT POWER: 19.59 dBm = 0.091 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.59 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]
1695.00	H	1.13	74	-46.17	6.55	-39.62	59.2
2542.50	H	1.10	237	-62.17	7.36	-54.81	74.4
3390.00	H	-	-	-59.40	7.51	-51.89	71.5

Table 7-27. Radiated Spurious Data with WCP (Band 5 – High Channel)

OPERATING FREQUENCY: 1712.50 MHz
 CHANNEL: 19975
 MEASURED OUTPUT POWER: 21.36 dBm = 0.137 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.36 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]
3425.00	H	1.18	73	-61.46	9.68	-51.78	73.1
5137.50	H	-	-	-57.27	10.68	-46.59	68.0

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 21.86 dBm = 0.154 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.86 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	1.13	360	-60.00	9.71	-50.30	72.2
5197.50	H	-	-	-56.40	10.59	-45.82	67.7

Table 7-29. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20375
 MEASURED OUTPUT POWER: 21.71 dBm = 0.148 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.71 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]
3505.00	H	1.18	155	-59.84	9.73	-50.11	71.8
5257.50	H	-	-	-56.20	10.64	-45.56	67.3

Table 7-30. Radiated Spurious Data (Band 4 – High Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 18.91 dBm = 0.078 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 31.91 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	1.33	70	-59.22	9.71	-49.52	68.4
5197.50	H	-	-	-56.58	10.59	-46.00	64.9

Table 7-31. Radiated Spurious Data with WCP (Band 4 – Mid Channel)

OPERATING FREQUENCY: 1851.50 MHz
 CHANNEL: 26055
 MEASURED OUTPUT POWER: 22.61 dBm = 0.183 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 35.61 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]
3703.00	H	1.55	214	-54.48	8.40	-46.08	68.7
5554.50	H	-	-	-55.42	10.56	-44.85	67.5

Table 7-32. Radiated Spurious Data with WCP (Band 2/25 – Low Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1882.50 MHz
 CHANNEL: 26365
 MEASURED OUTPUT POWER: 23.00 dBm = 0.200 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.00 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	1.54	82	-54.72	8.38	-46.34	69.3
5647.50	H	-	-	-55.42	10.70	-44.72	67.7

Table 7-33. Radiated Spurious Data with WCP (Band 2/25 – Mid Channel)

OPERATING FREQUENCY: 1913.50 MHz
 CHANNEL: 26675
 MEASURED OUTPUT POWER: 22.71 dBm = 0.187 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 3.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 35.71 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]
3827.00	H	1.38	120	-54.76	8.42	-46.35	69.1
5740.50	H	-	-	-55.67	10.77	-44.90	67.6

Table 7-34. Radiated Spurious Data with WCP (Band 2/25 – High Channel)

OPERATING FREQUENCY: 2310.00 MHz
 CHANNEL: 27710
 MEASURED OUTPUT POWER: 20.10 dBm = 0.102 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $70 + 10 \log_{10} (W) =$ 60.10 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]
4620.00	H	1.32	226	-53.84	9.52	-44.32	64.4
6930.00	H	-	-	-54.69	11.49	-43.21	63.3

Table 7-35. Radiated Spurious Data (Band 30 – Mid Channel)

OPERATING FREQUENCY: 2310.00 MHz
 CHANNEL: 27710
 MEASURED OUTPUT POWER: 20.10 dBm = 0.102 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $70 + 10 \log_{10} (W) =$ 60.10 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]
4620.00	H	1.32	226	-53.76	9.52	-44.24	64.3
6930.00	H	-	-	-55.20	11.49	-43.72	63.8

Table 7-36. Radiated Spurious Data with WCP (Band 30 – Mid Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 2498.50 MHz
 CHANNEL: 39675
 MEASURED OUTPUT POWER: 22.07 dBm = 0.161 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W)$ 47.07 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]
4997.00	H	1.01	2	-51.72	10.93	-40.79	62.9
7495.50	H	-	-	-52.34	10.92	-41.42	63.5

Table 7-37. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MEASURED OUTPUT POWER: 20.95 dBm = 0.124 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W)$ 45.95 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]
5186.00	H	1.01	3	-38.96	10.60	-28.36	49.3
7779.00	H	1.01	2	-44.99	11.22	-33.77	54.7
10372.00	H	-	-	-50.82	12.36	-38.46	59.4

Table 7-38. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 2687.50 MHz
 CHANNEL: 41565
 MEASURED OUTPUT POWER: 17.78 dBm = 0.060 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 42.78 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]
5375.00	H	1.01	7	-40.32	10.58	-29.74	47.5
8062.50	H	1.01	-45	-40.73	11.10	-29.63	47.4
10750.00	H	-	-	-51.97	12.60	-39.37	57.2

Table 7-39. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY: 2498.50 MHz
 CHANNEL: 39675
 MEASURED OUTPUT POWER: 22.07 dBm = 0.161 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 47.07 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]
4997.00	H	1.01	0	-53.62	10.93	-42.69	64.8
7495.50	H	-	-	-53.06	10.92	-42.14	64.2

Table 7-40. Radiated Spurious Data with WCP (Band 41 – Low 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 $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-C-2004

Test Settings

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

Test Setup

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

Test Notes

None

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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)	707,499,996	-4	-0.0000006
100 %		- 30	707,500,065	65	0.0000092
100 %		- 20	707,500,097	97	0.0000137
100 %		- 10	707,500,143	143	0.0000202
100 %		0	707,500,127	127	0.0000180
100 %		+ 10	707,500,160	160	0.0000226
100 %		+ 20	707,499,908	-92	-0.0000130
100 %		+ 30	707,499,607	-393	-0.0000555
100 %		+ 40	707,499,880	-120	-0.0000170
100 %		+ 50	707,499,971	-29	-0.0000041
BATT. ENDPOINT	3.45	+ 20	707,500,087	87	0.0000123

Table 7-41. 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.

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Band 12 Frequency Stability Measurements

§2.1055 §27.54

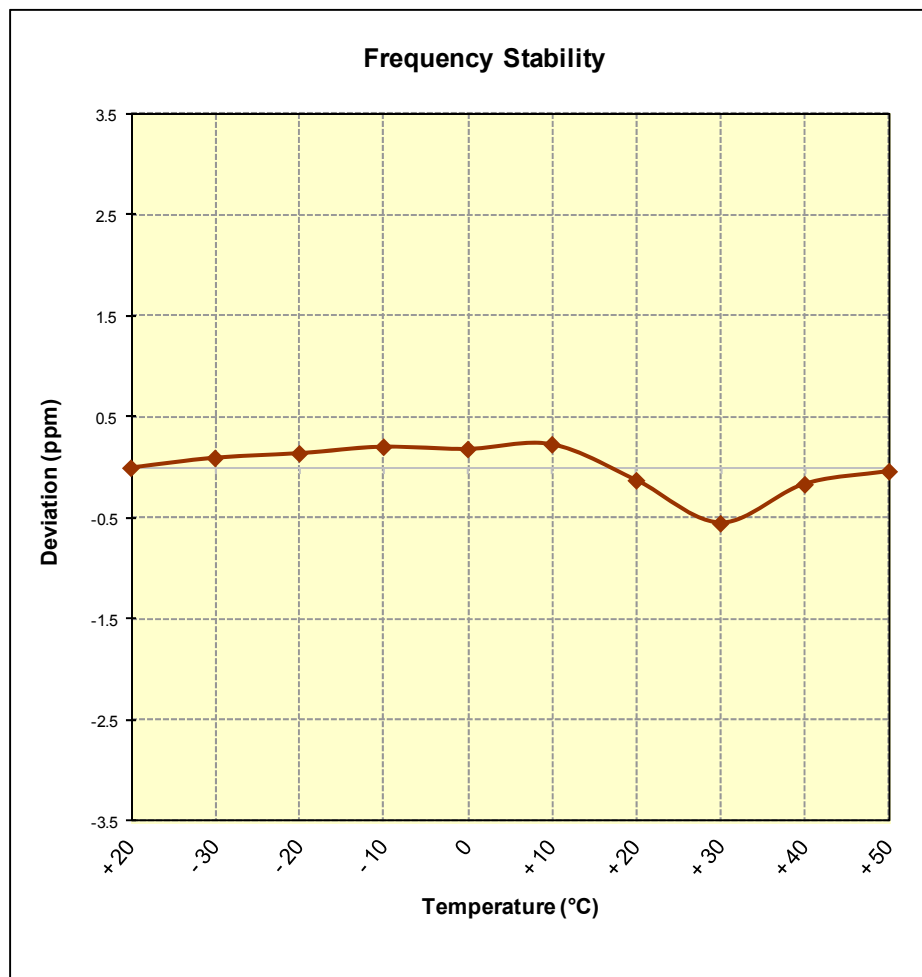


Figure 7-8. Frequency Stability Graph (Band 12)

FCC ID: A3LSMG930W8	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset		Page 172 of 187

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)	710,000,045	45	0.0000063
100 %		- 30	710,000,231	231	0.0000325
100 %		- 20	710,000,051	51	0.0000072
100 %		- 10	710,000,141	141	0.0000199
100 %		0	709,999,989	-11	-0.0000015
100 %		+ 10	709,999,850	-150	-0.0000211
100 %		+ 20	710,000,268	268	0.0000377
100 %		+ 30	709,999,701	-299	-0.0000421
100 %		+ 40	709,999,906	-94	-0.0000132
100 %		+ 50	709,999,918	-82	-0.0000115
BATT. ENDPOINT	3.45	+ 20	710,000,202	202	0.0000285

Table 7-42. 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.

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 17 Frequency Stability Measurements

§2.1055 §27.54

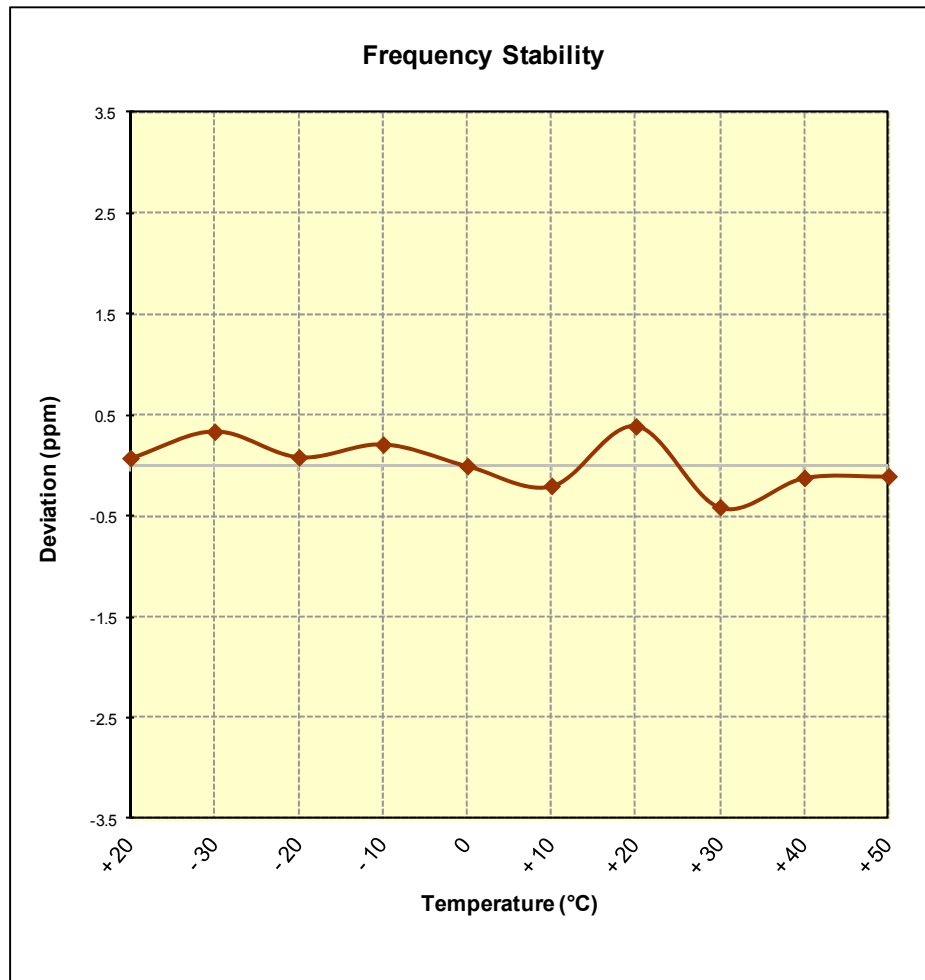


Figure 7-9. Frequency Stability Graph (Band 17)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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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)	781,999,833	-167	-0.0000214
100 %		- 30	781,999,682	-318	-0.0000407
100 %		- 20	781,999,820	-180	-0.0000230
100 %		- 10	781,999,822	-178	-0.0000228
100 %		0	782,000,077	77	0.0000098
100 %		+ 10	781,999,877	-123	-0.0000157
100 %		+ 20	782,000,374	374	0.0000478
100 %		+ 30	781,999,919	-81	-0.0000104
100 %		+ 40	781,999,904	-96	-0.0000123
100 %		+ 50	781,999,930	-70	-0.0000090
BATT. ENDPOINT	3.45	+ 20	781,999,625	-375	-0.0000480

Table 7-43. Frequency Stability Data (Band 13)

Note:

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 13 Frequency Stability Measurements **§2.1055 §27.54**

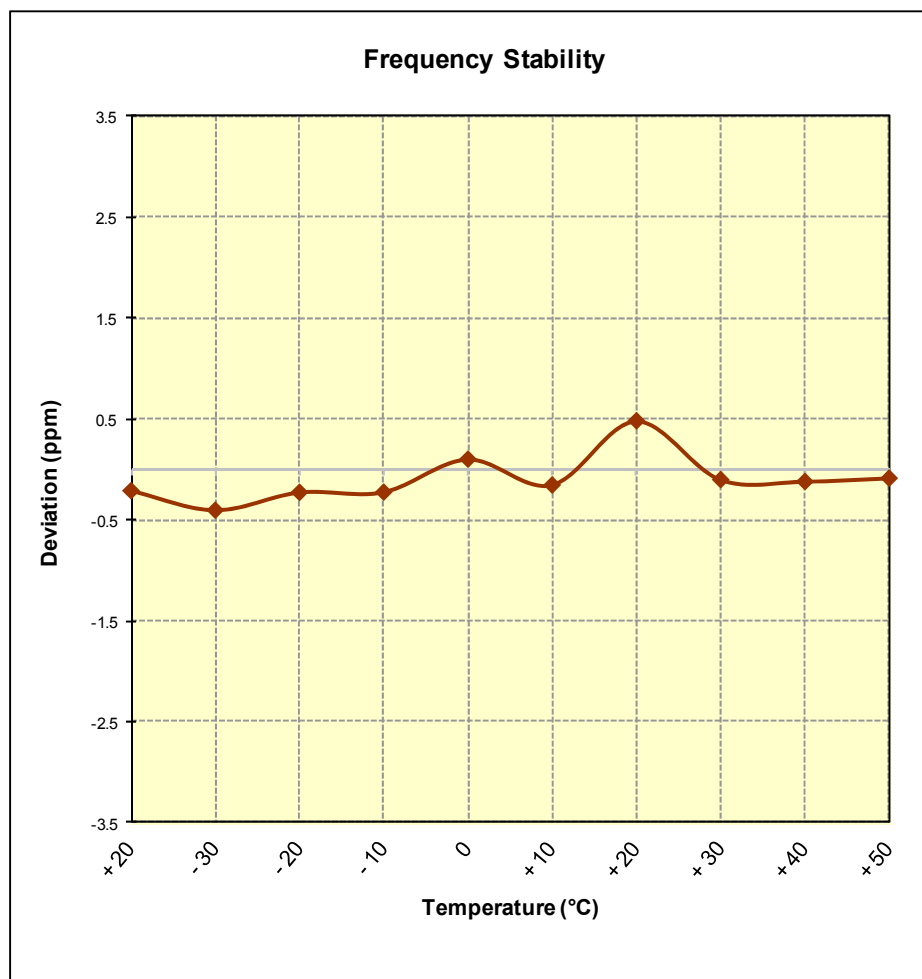


Figure 7-10. Frequency Stability Graph (Band 13)

FCC ID: A3LSMG930W8			FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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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)	836,500,244	244	0.0000292
100 %		- 30	836,499,569	-431	-0.0000515
100 %		- 20	836,499,724	-276	-0.0000330
100 %		- 10	836,499,825	-175	-0.0000209
100 %		0	836,500,106	106	0.0000127
100 %		+ 10	836,500,261	261	0.0000312
100 %		+ 20	836,500,106	106	0.0000127
100 %		+ 30	836,500,148	148	0.0000177
100 %		+ 40	836,500,075	75	0.0000090
100 %		+ 50	836,500,212	212	0.0000253
BATT. ENDPOINT	3.45	+ 20	836,499,972	-28	-0.0000033

Table 7-44. Frequency Stability Data (Band 5)

Band 5 Frequency Stability Measurements

§2.1055 §22.355

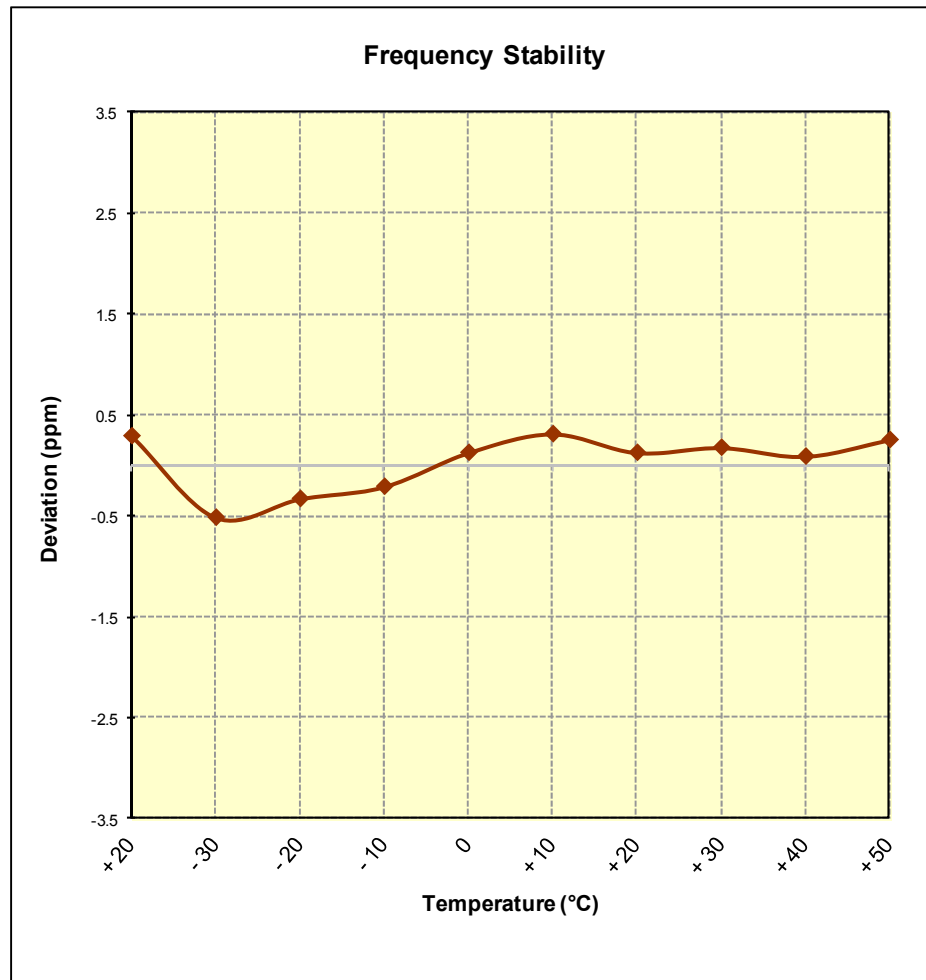


Figure 7-11. Frequency Stability Graph (Band 5)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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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)	1,732,499,965	-35	-0.0000020
100 %		- 30	1,732,500,297	297	0.0000171
100 %		- 20	1,732,500,053	53	0.0000031
100 %		- 10	1,732,499,812	-188	-0.0000109
100 %		0	1,732,500,031	31	0.0000018
100 %		+ 10	1,732,499,537	-463	-0.0000267
100 %		+ 20	1,732,500,158	158	0.0000091
100 %		+ 30	1,732,499,916	-84	-0.0000048
100 %		+ 40	1,732,499,779	-221	-0.0000128
100 %		+ 50	1,732,500,142	142	0.0000082
BATT. ENDPOINT	3.45	+ 20	1,732,499,806	-194	-0.0000112

Table 7-45. Frequency Stability Data (Band 4)

Note:

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 4 Frequency Stability Measurements

§2.1055 §27.54

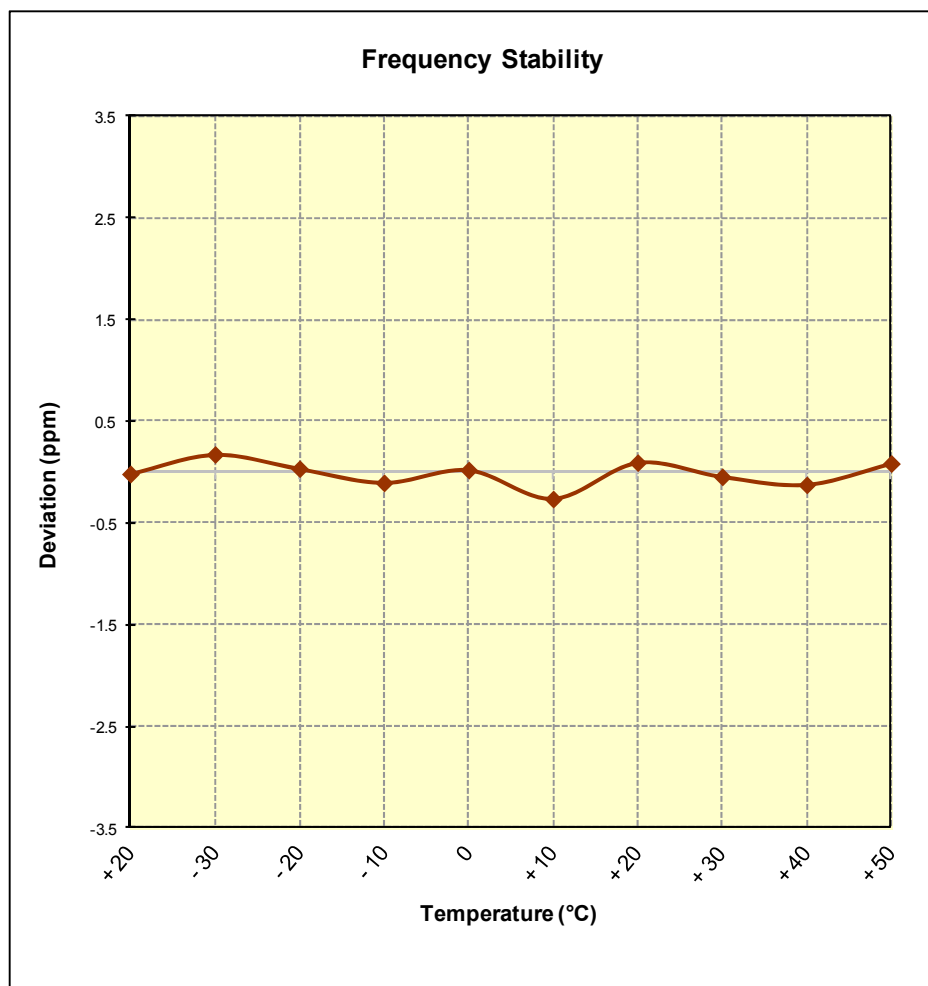


Figure 7-12. Frequency Stability Graph (Band 4)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 2/25 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)	1,882,500,285	285	0.0000151
100 %		- 30	1,882,500,064	64	0.0000034
100 %		- 20	1,882,499,997	-3	-0.0000002
100 %		- 10	1,882,500,043	43	0.0000023
100 %		0	1,882,499,844	-156	-0.0000083
100 %		+ 10	1,882,500,019	19	0.0000010
100 %		+ 20	1,882,500,061	61	0.0000032
100 %		+ 30	1,882,499,768	-232	-0.0000123
100 %		+ 40	1,882,500,267	267	0.0000142
100 %		+ 50	1,882,499,995	-5	-0.0000003
BATT. ENDPOINT	3.45	+ 20	1,882,500,085	85	0.0000045

Table 7-46. Frequency Stability Data (Band 2/25)

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.

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 2/25 Frequency Stability Measurements

§2.1055 §24.235

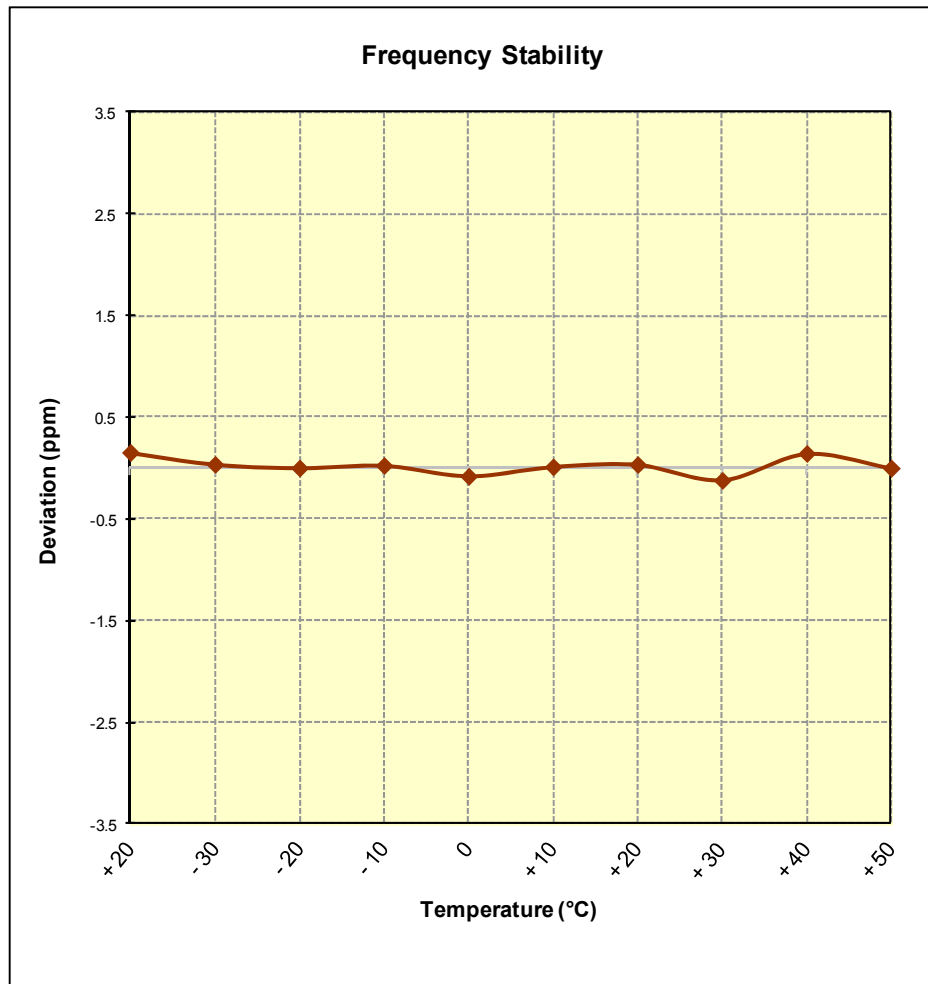


Figure 7-13. Frequency Stability Graph (Band 2/25)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 30 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 2,310,000,000 Hz

CHANNEL: 27710

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,310,000,038	38	0.0000016
100 %		- 30	2,309,999,839	-161	-0.0000070
100 %		- 20	2,310,000,096	96	0.0000042
100 %		- 10	2,309,999,998	-2	-0.0000001
100 %		0	2,310,000,076	76	0.0000033
100 %		+ 10	2,310,000,002	2	0.0000001
100 %		+ 20	2,310,000,116	116	0.0000050
100 %		+ 30	2,309,999,637	-363	-0.0000157
100 %		+ 40	2,309,999,877	-123	-0.0000053
100 %		+ 50	2,310,000,021	21	0.0000009
BATT. ENDPOINT	3.45	+ 20	2,310,000,109	109	0.0000047

Table 7-47. Frequency Stability Data (Band 30)

Note:

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
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Band 30 Frequency Stability Measurements

§2.1055 §24.235

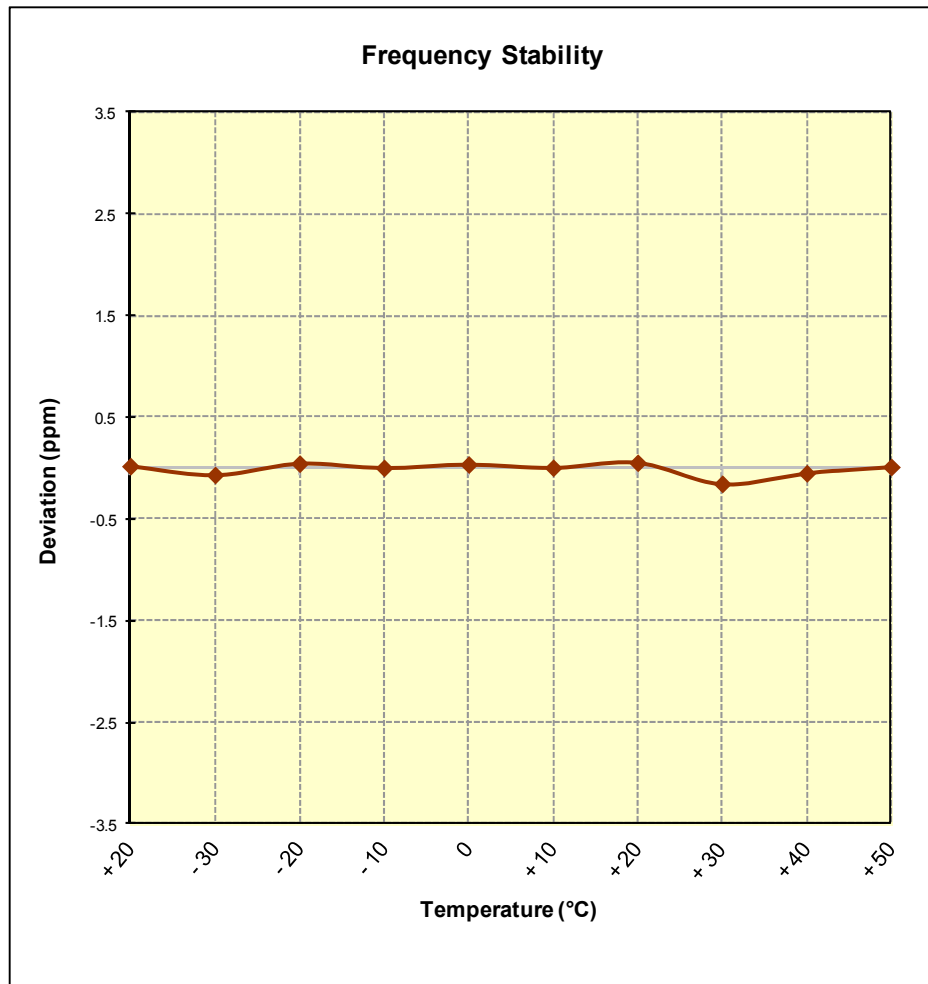


Figure 7-14. Frequency Stability Graph (Band 30)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 41 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,593,000,145	145	0.0000056
100 %		- 30	2,593,000,245	245	0.0000094
100 %		- 20	2,592,999,814	-186	-0.0000072
100 %		- 10	2,592,999,592	-408	-0.0000157
100 %		0	2,592,999,937	-63	-0.0000024
100 %		+ 10	2,592,999,831	-169	-0.0000065
100 %		+ 20	2,592,999,914	-86	-0.0000033
100 %		+ 30	2,593,000,104	104	0.0000040
100 %		+ 40	2,593,000,040	40	0.0000015
100 %		+ 50	2,592,999,842	-158	-0.0000061
BATT. ENDPOINT	3.45	+ 20	2,593,000,011	11	0.0000004

Table 7-48. Frequency Stability Data (Band 41)

Note:

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

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 41 Frequency Stability Measurements

§2.1055 §27.54

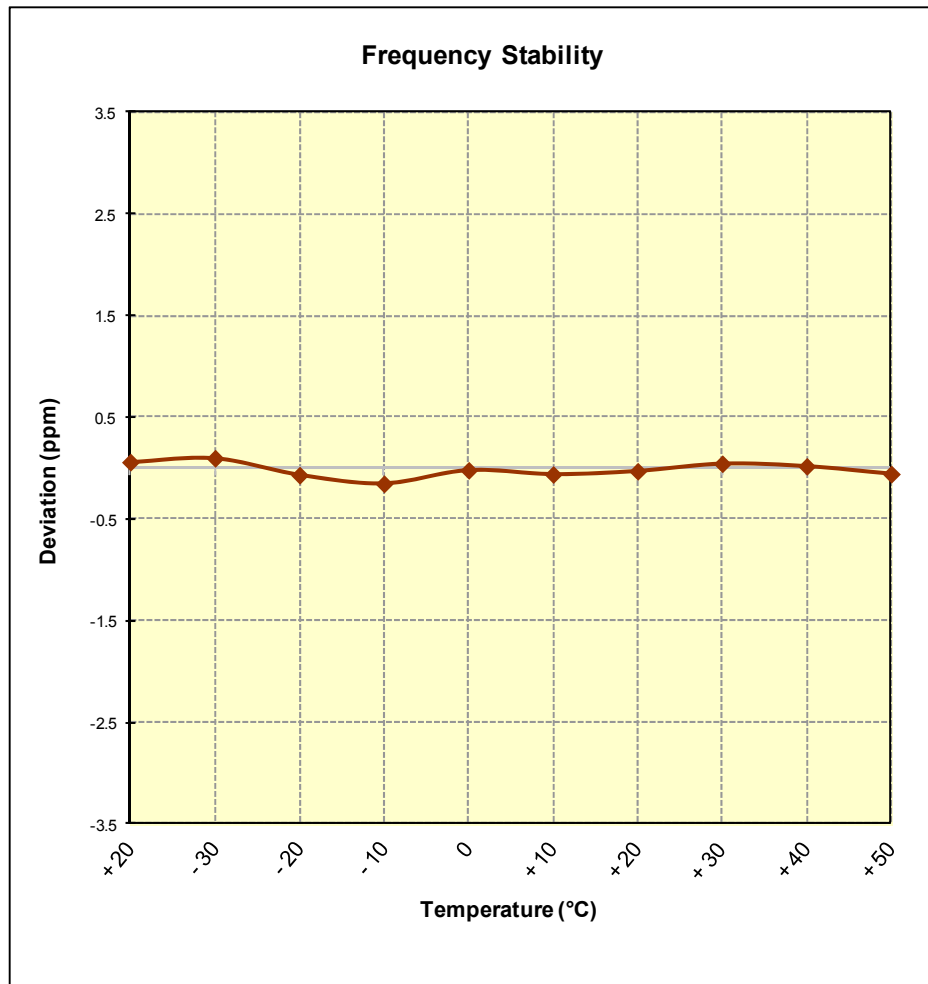


Figure 7-15. Frequency Stability Graph (Band 41)

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG930W8** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: A3LSMG930W8		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1512232219-R2.A3L	Test Dates: 12/24/2015-1/11/2016	EUT Type: Portable Handset	Page 187 of 187	