

7.4 Band Edge Emissions at Antenna Terminal

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

Test Overview

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

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

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

Test Procedure Used

KDB 971168 D01 v02r02 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW $\geq 1\%$ 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.

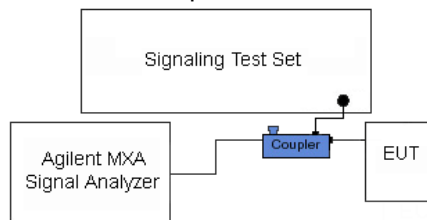


Figure 7-3. Test Instrument & Measurement Setup

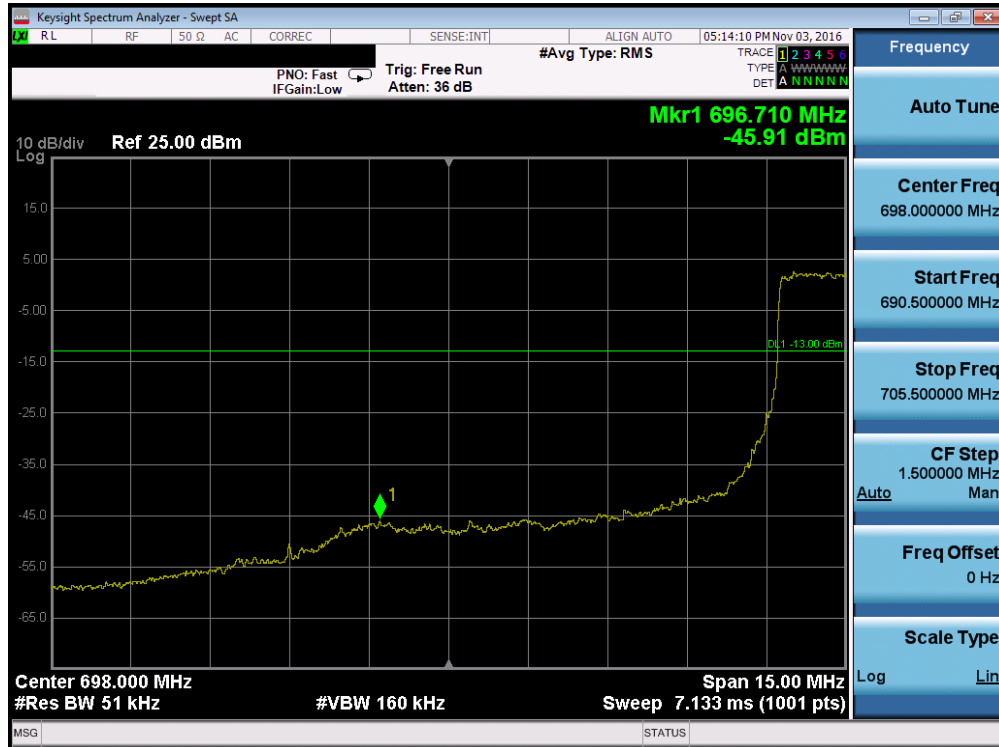
Test Notes

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.

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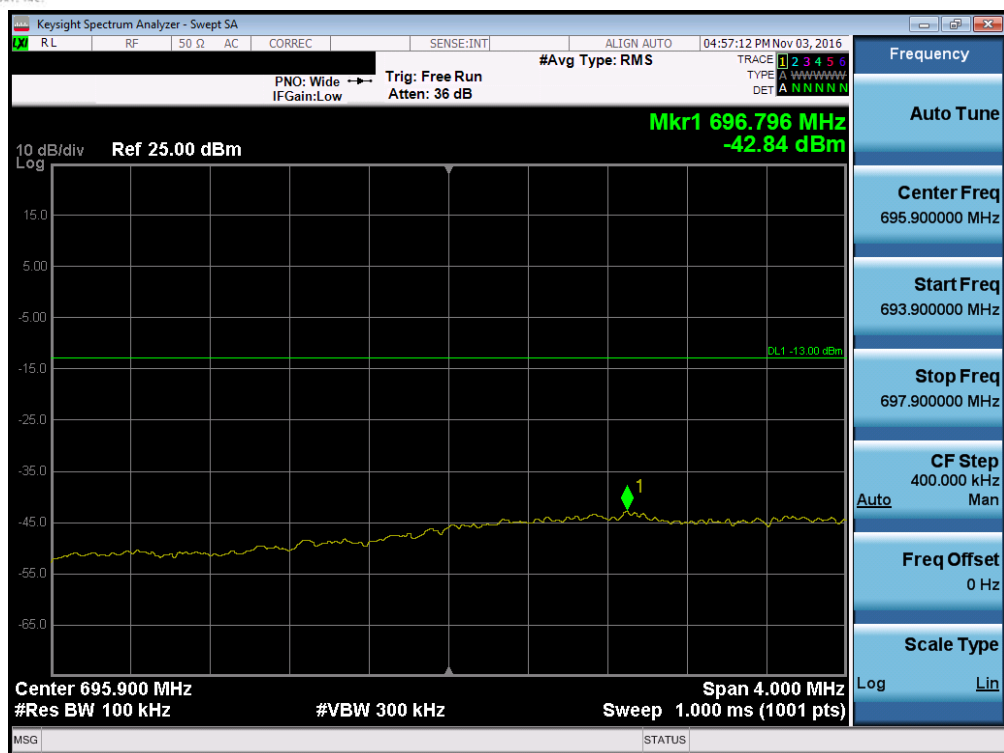
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(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 than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz.



Plot 7-90. Lower Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)

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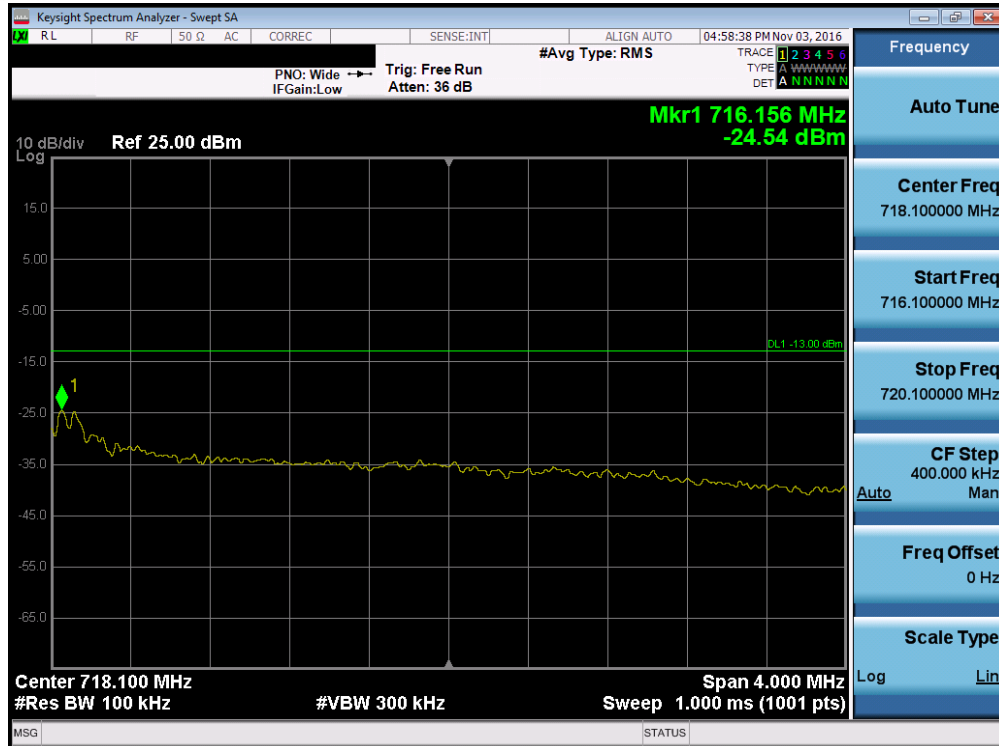


Plot 7-91. Lower Extended Band Edge Plot (Band 17 - 5.0MHz QPSK - RB Size 25)

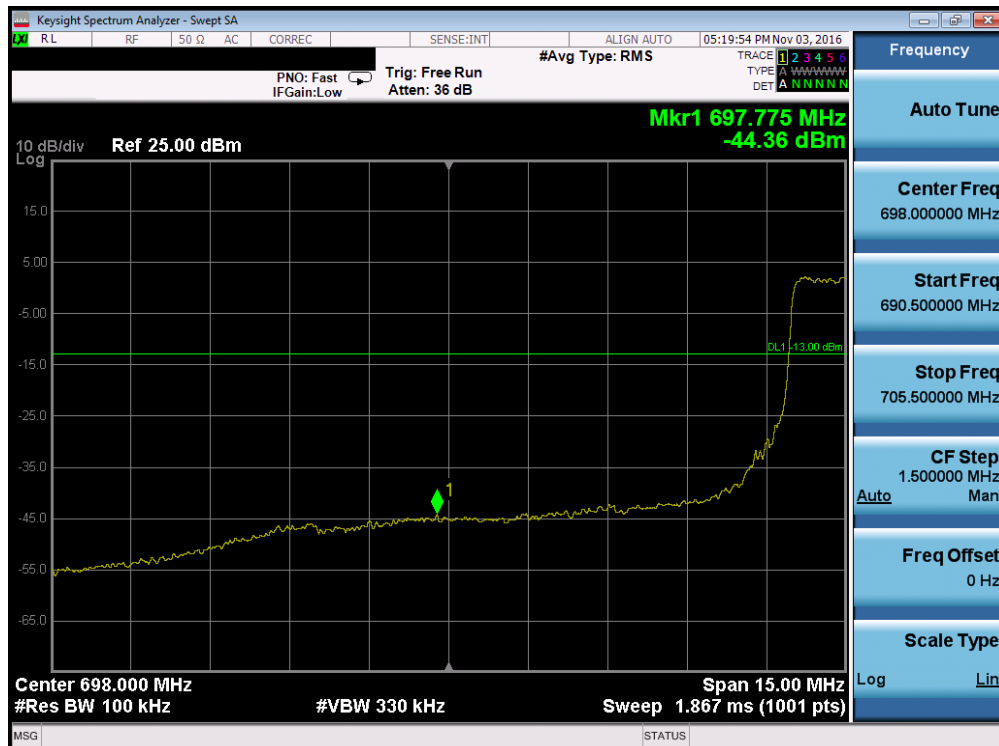


Plot 7-92. Upper Band Edge Plot (Band 17 - 5.0MHz QPSK - RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-93. Upper Extended Band Edge Plot (Band 17 – 5.0MHz QPSK – RB Size 25)



Plot 7-94. Lower Band Edge Plot (Band 17 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-95. Upper Band Edge Plot (Band 17 – 10.0MHz QPSK – RB Size 50)

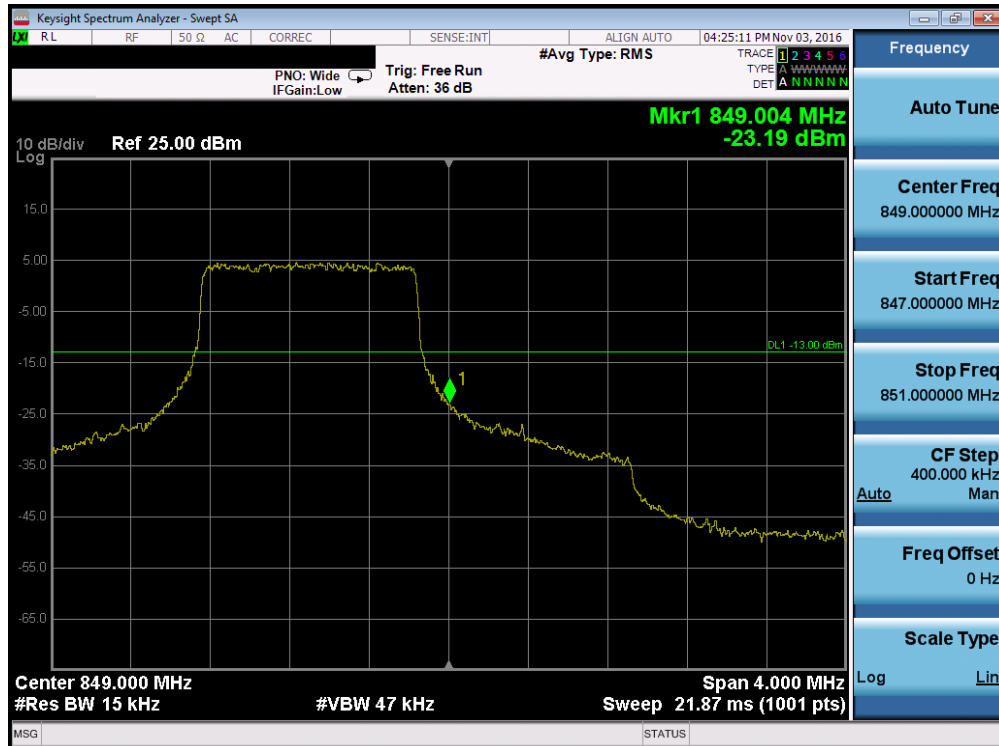


Plot 7-96. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-97. Lower Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

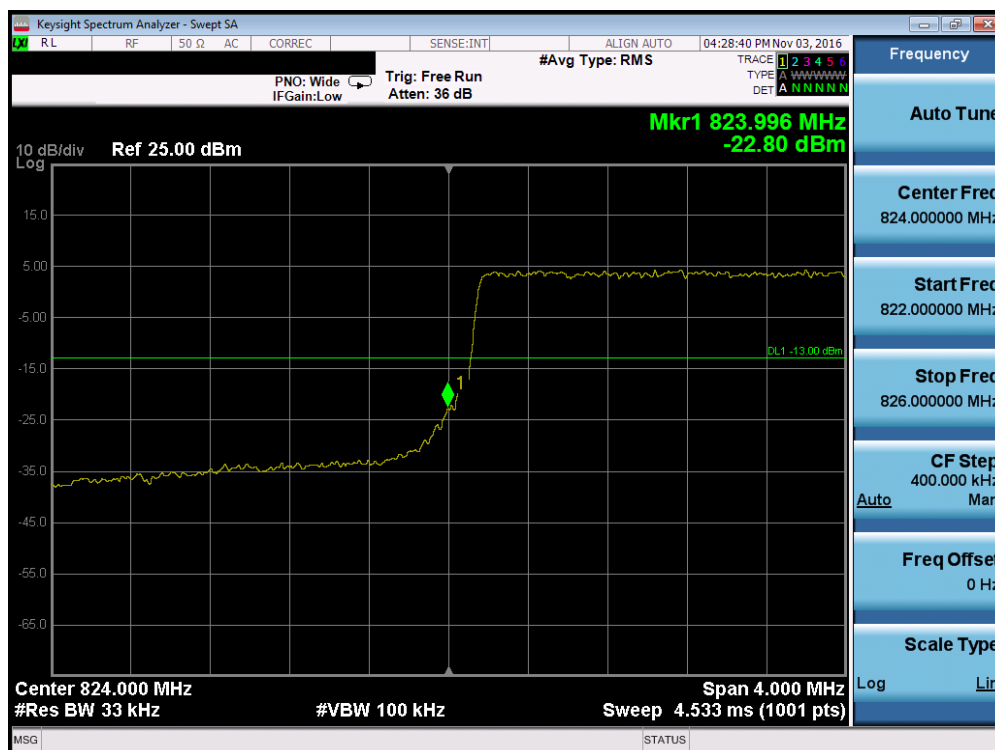


Plot 7-98. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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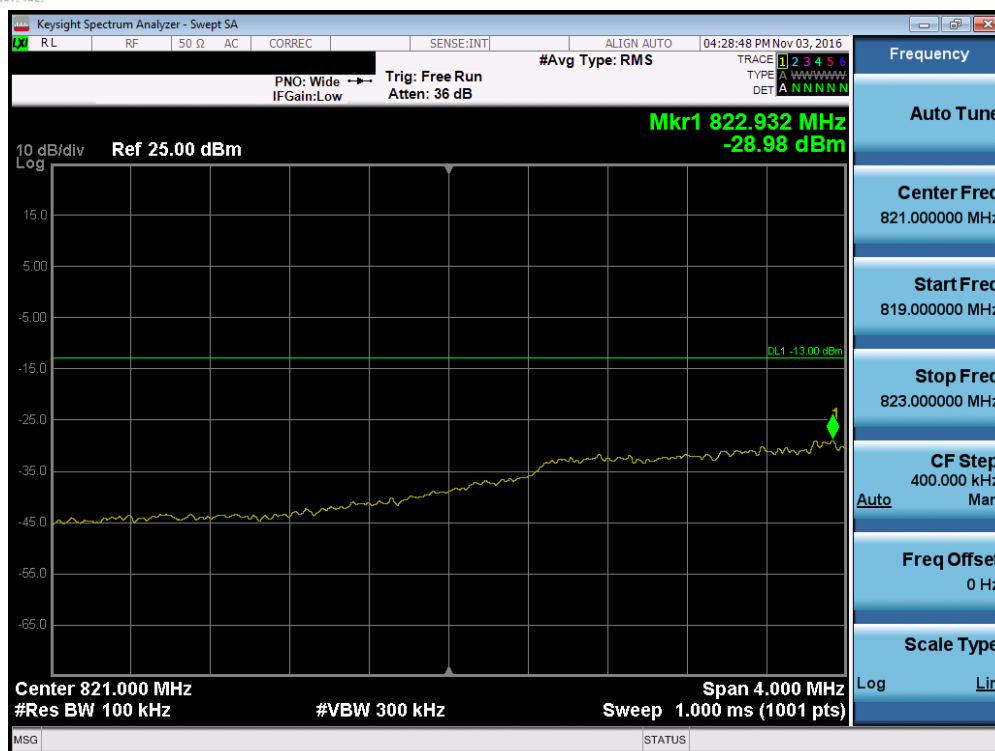


Plot 7-99. Upper Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

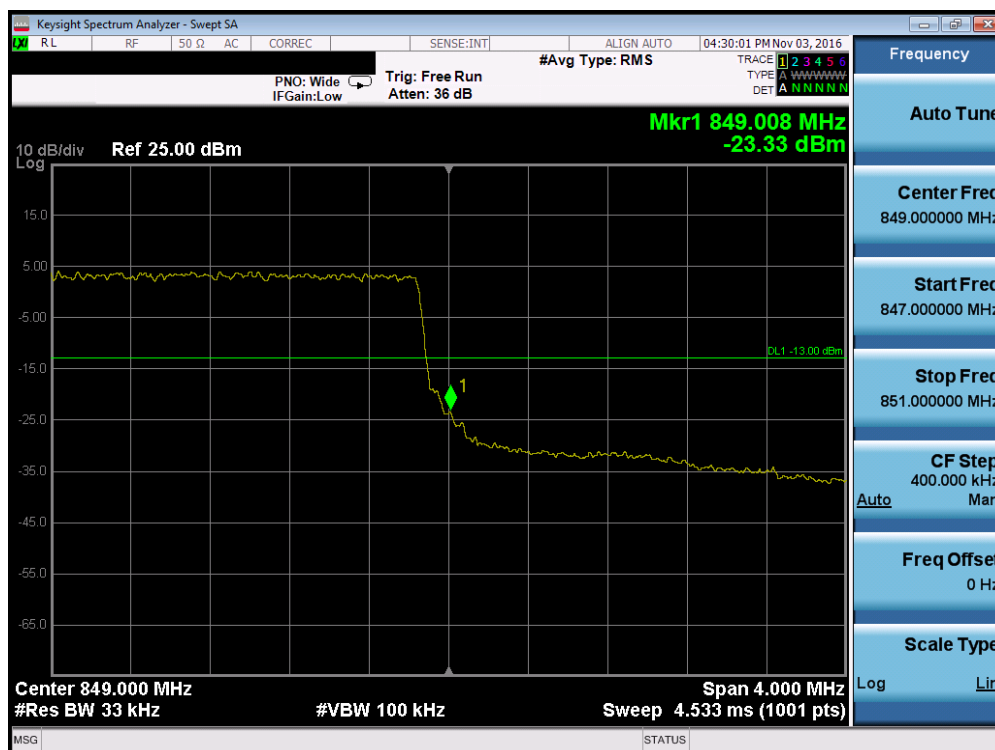


Plot 7-100. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-101. Lower Extended Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

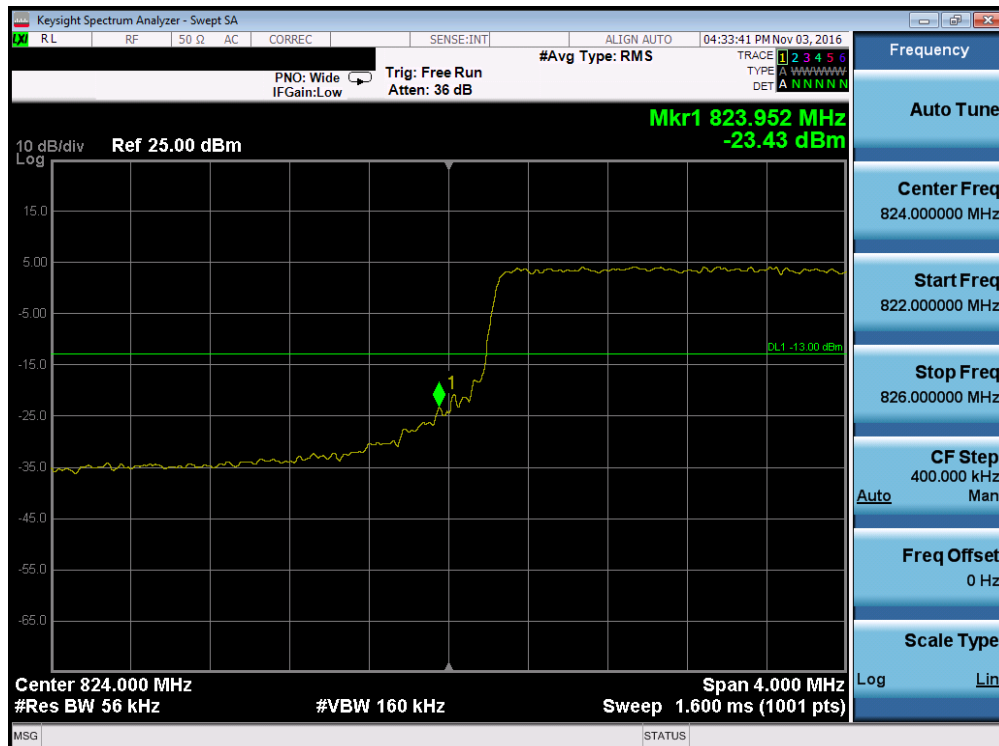


Plot 7-102. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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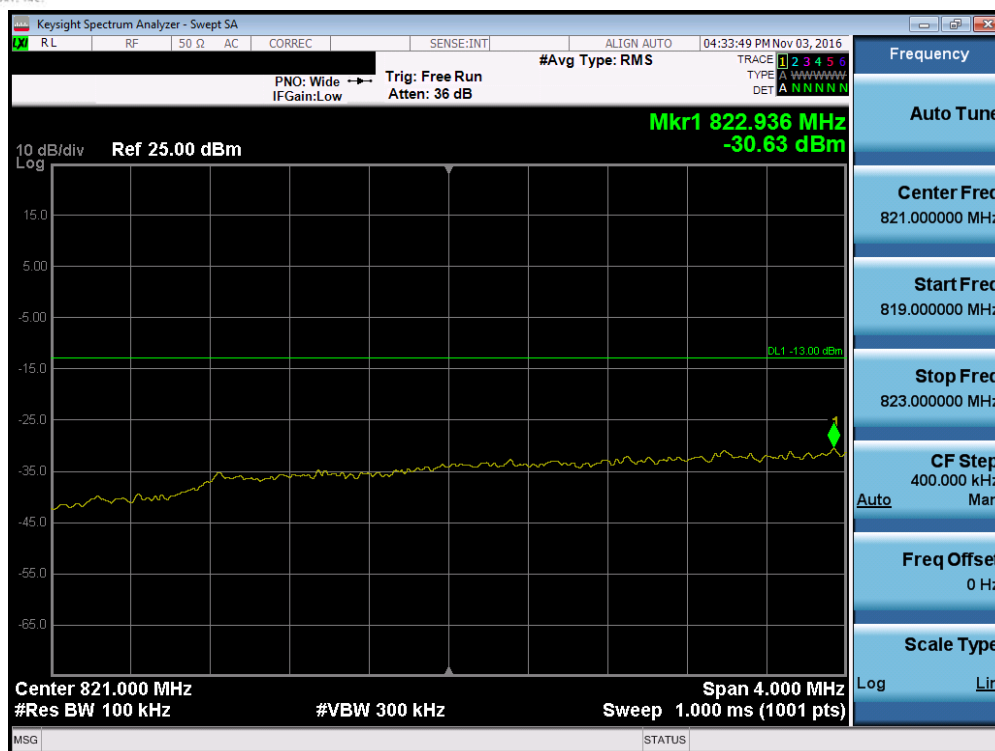


Plot 7-103. Upper Extended Band Edge Plot (Band 5 – Band 5 – 3.0MHz QPSK – RB Size 15)

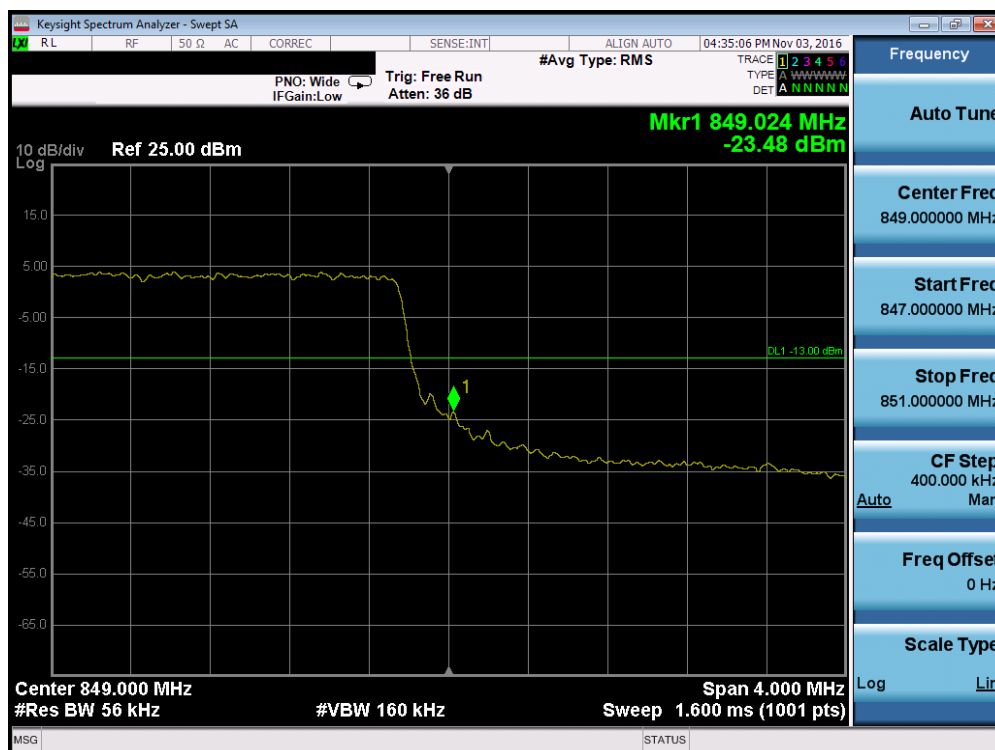


Plot 7-104. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-105. Lower Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

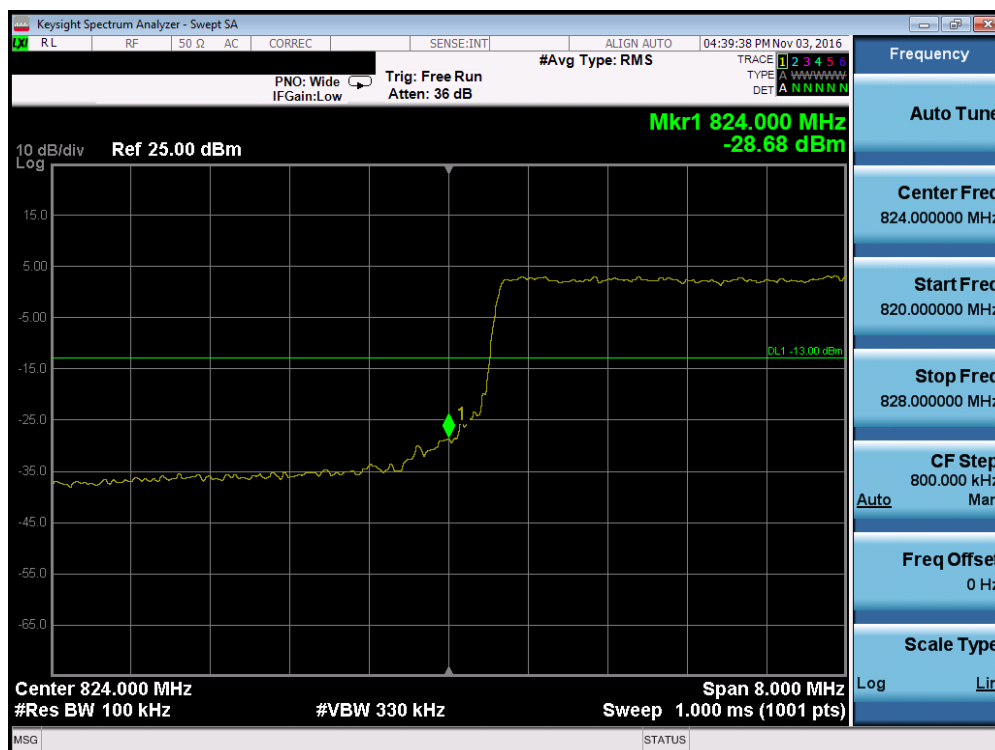


Plot 7-106. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-107. Upper Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

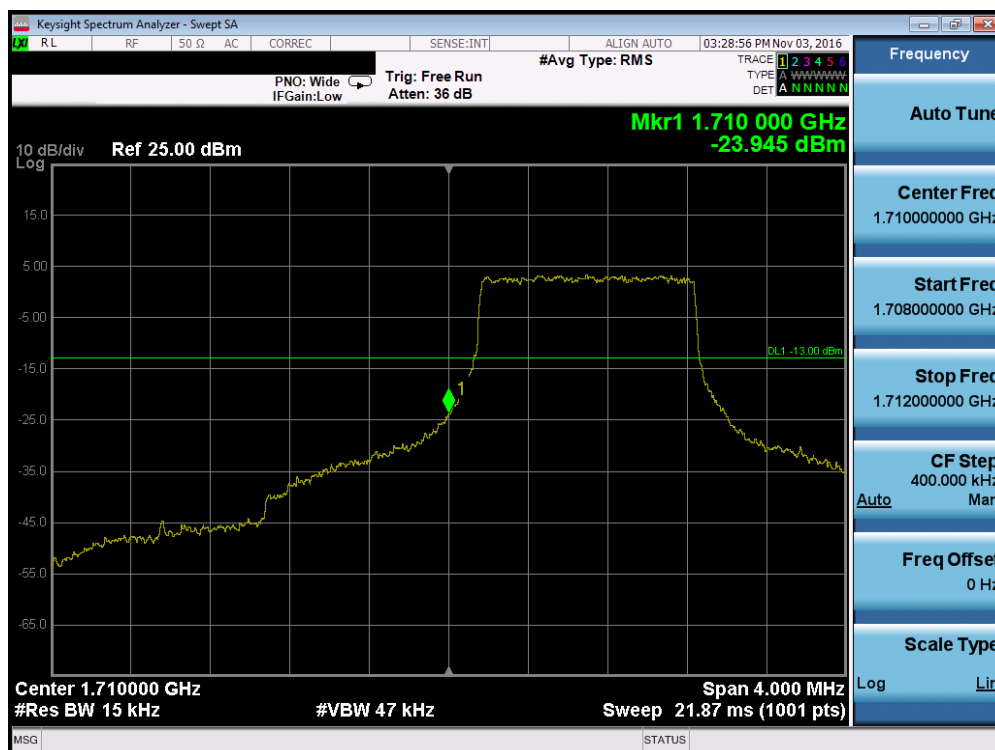


Plot 7-108. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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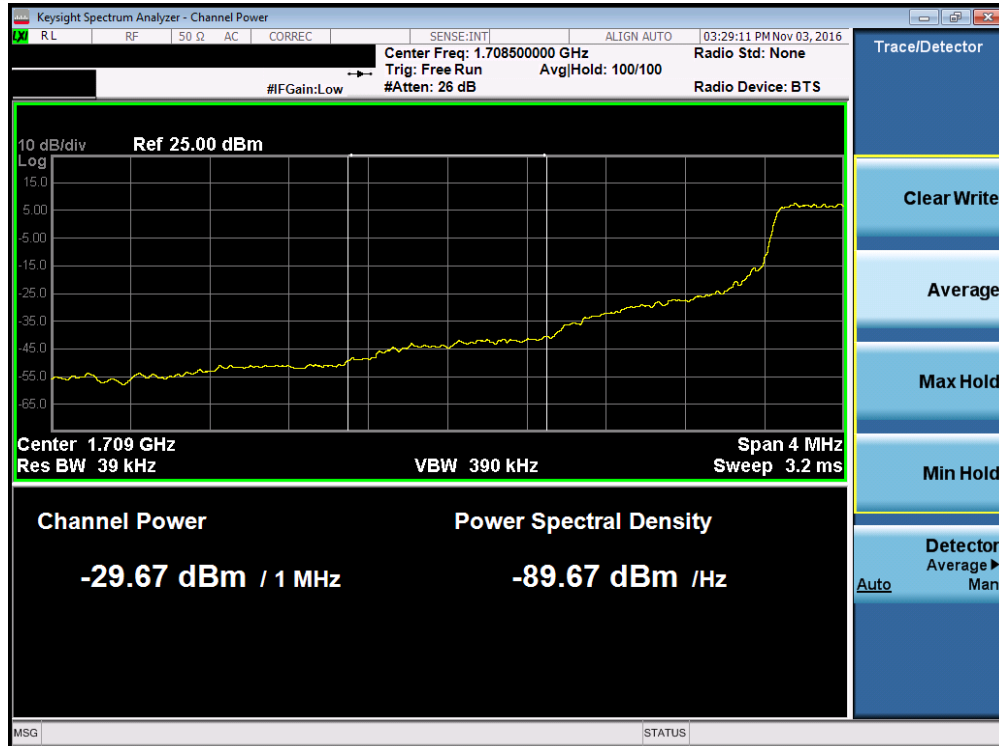


Plot 7-109. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-110. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-111. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

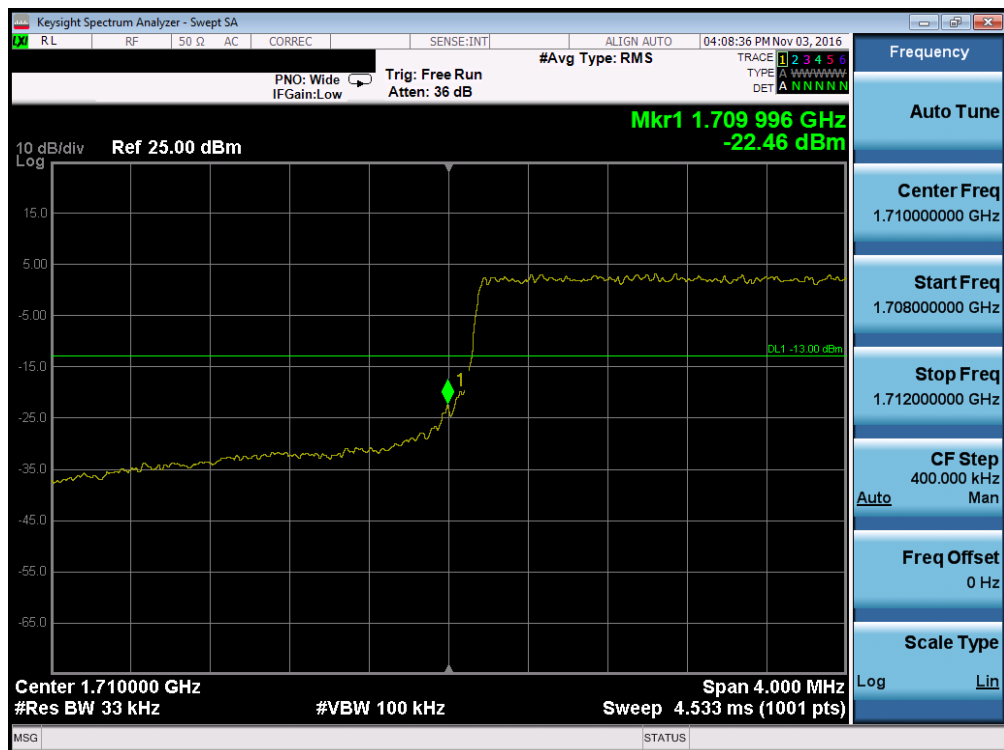


Plot 7-112. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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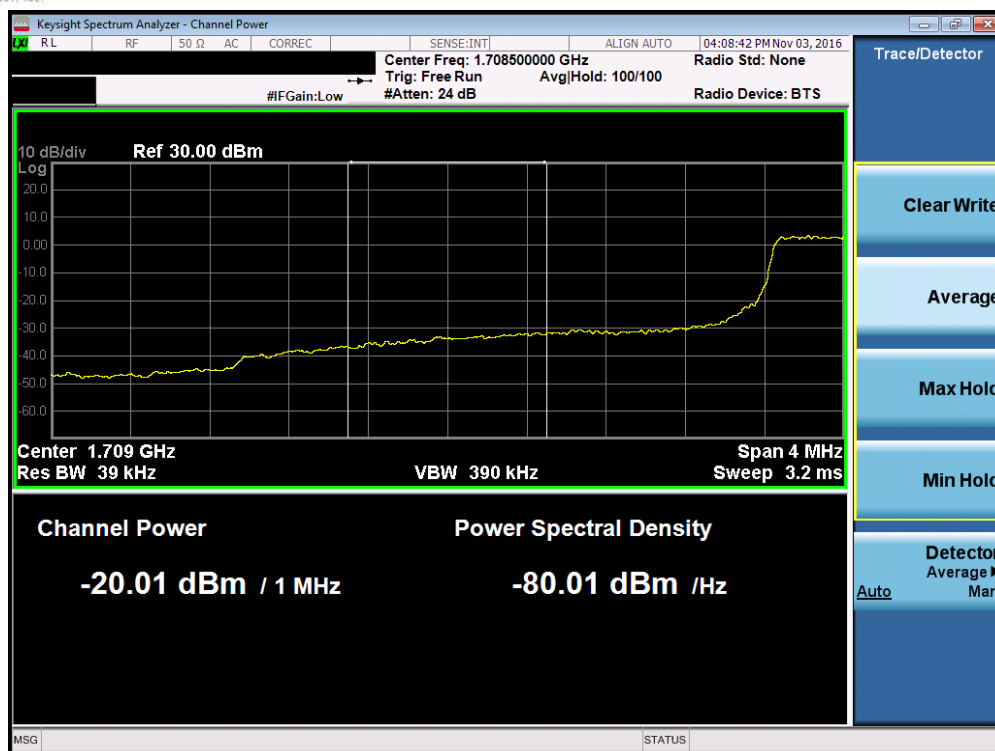


Plot 7-113. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

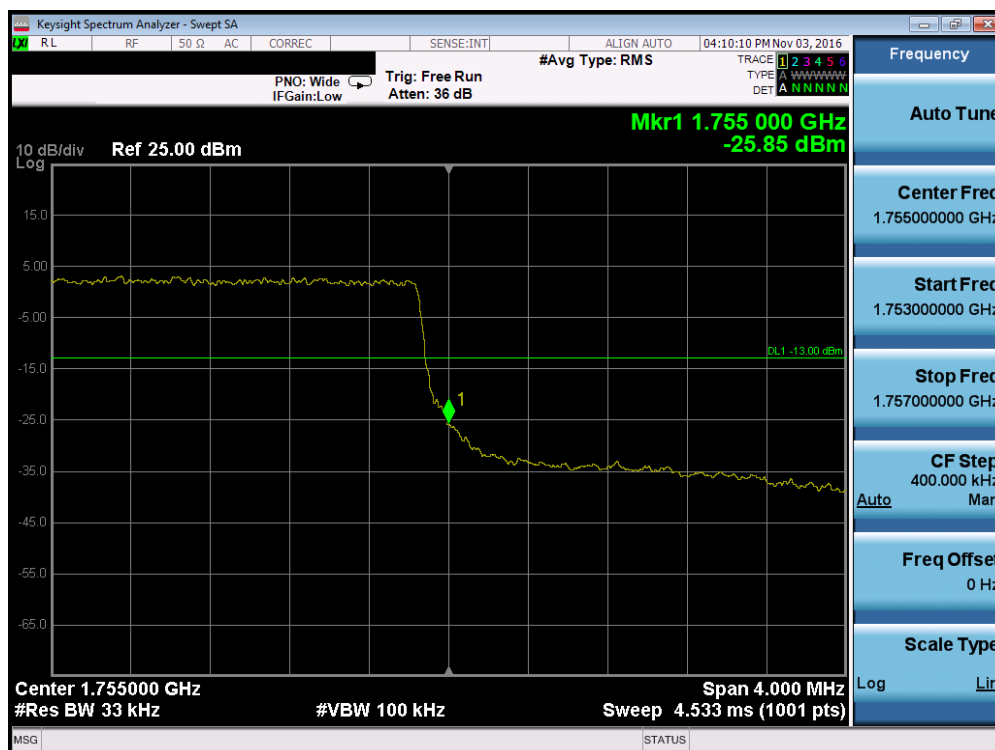


Plot 7-114. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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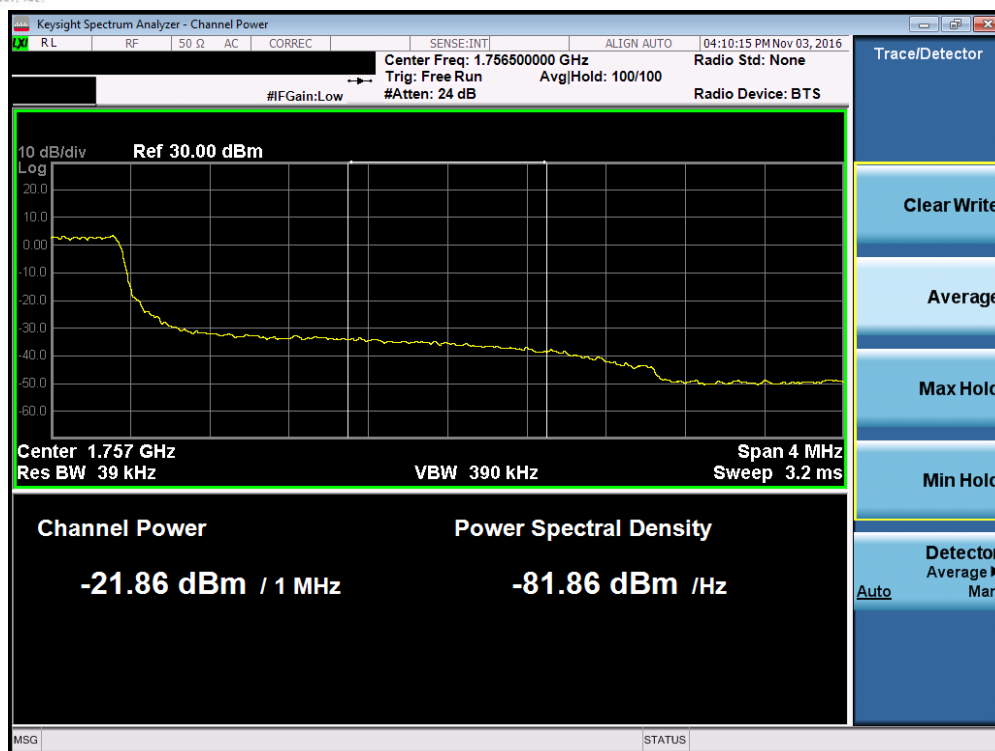


Plot 7-115. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

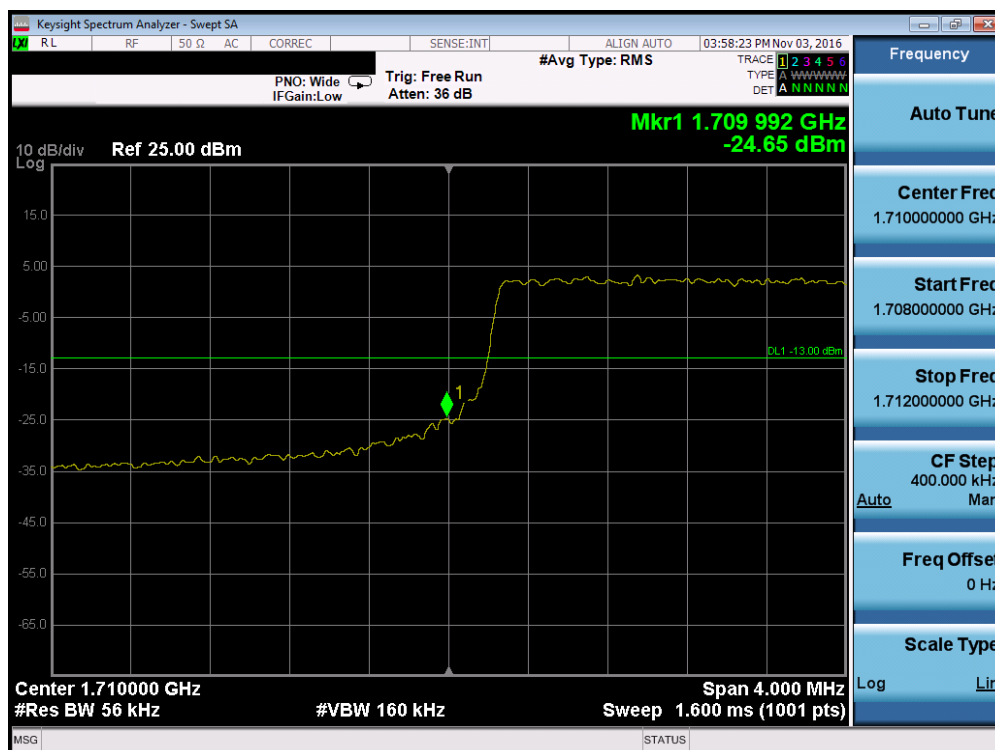


Plot 7-116. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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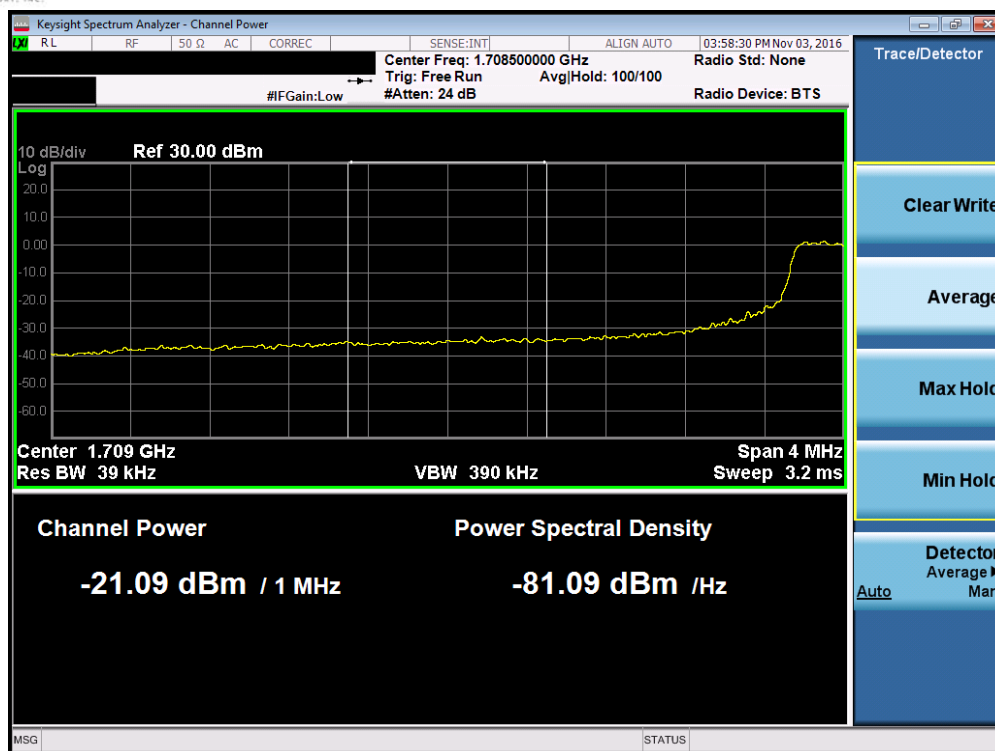


Plot 7-117. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

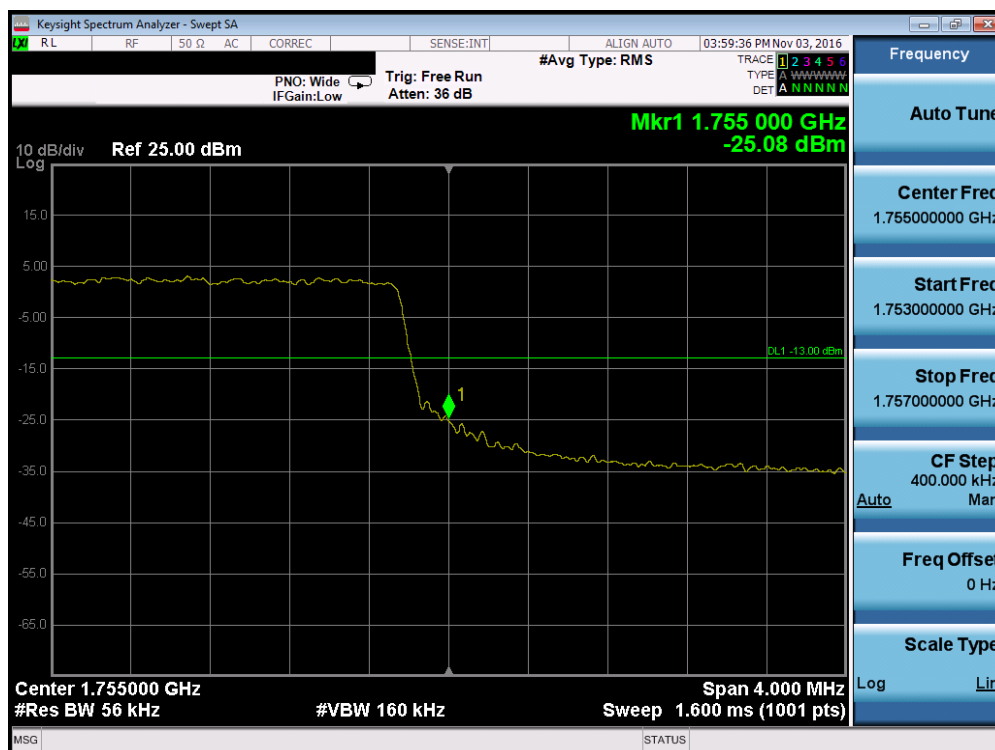


Plot 7-118. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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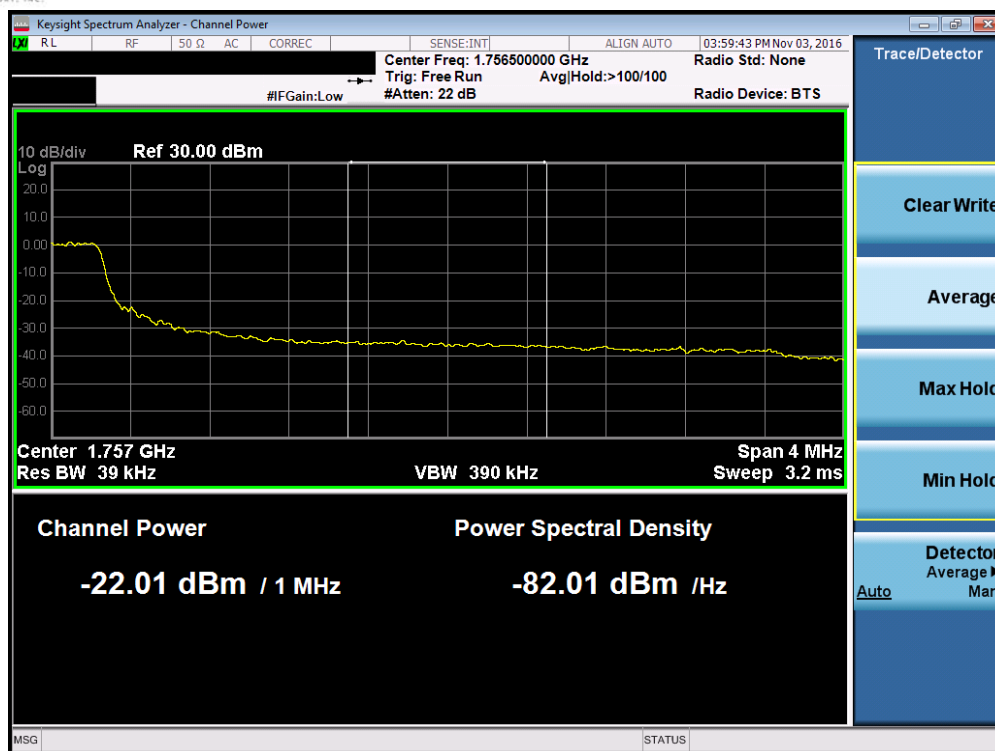


Plot 7-119. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

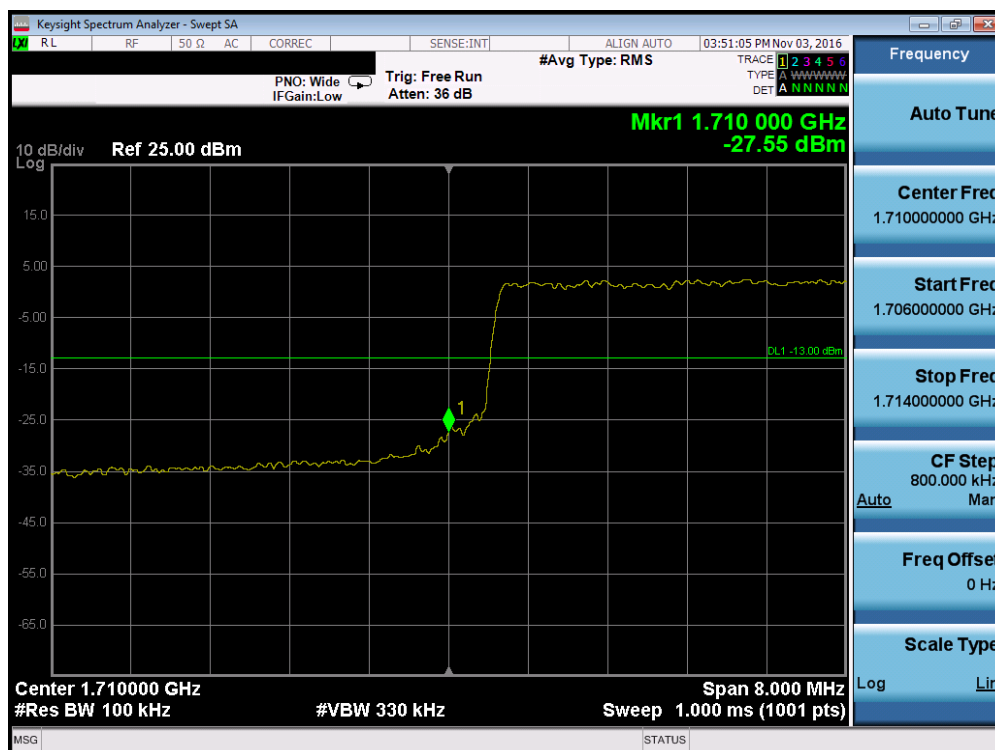


Plot 7-120. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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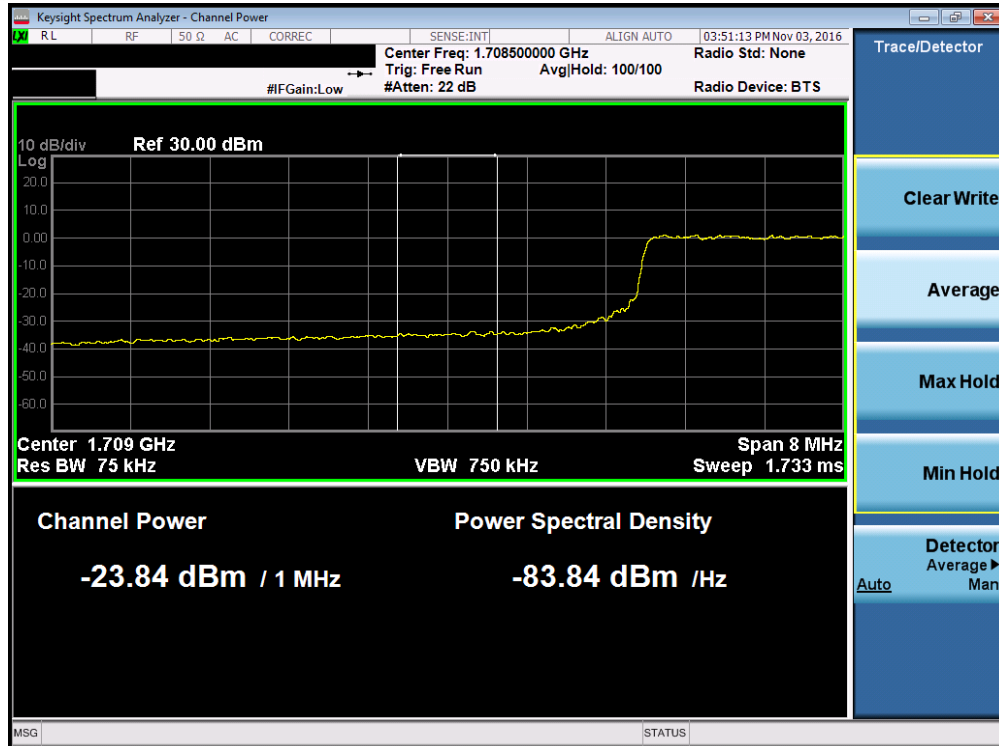


Plot 7-121. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



Plot 7-122. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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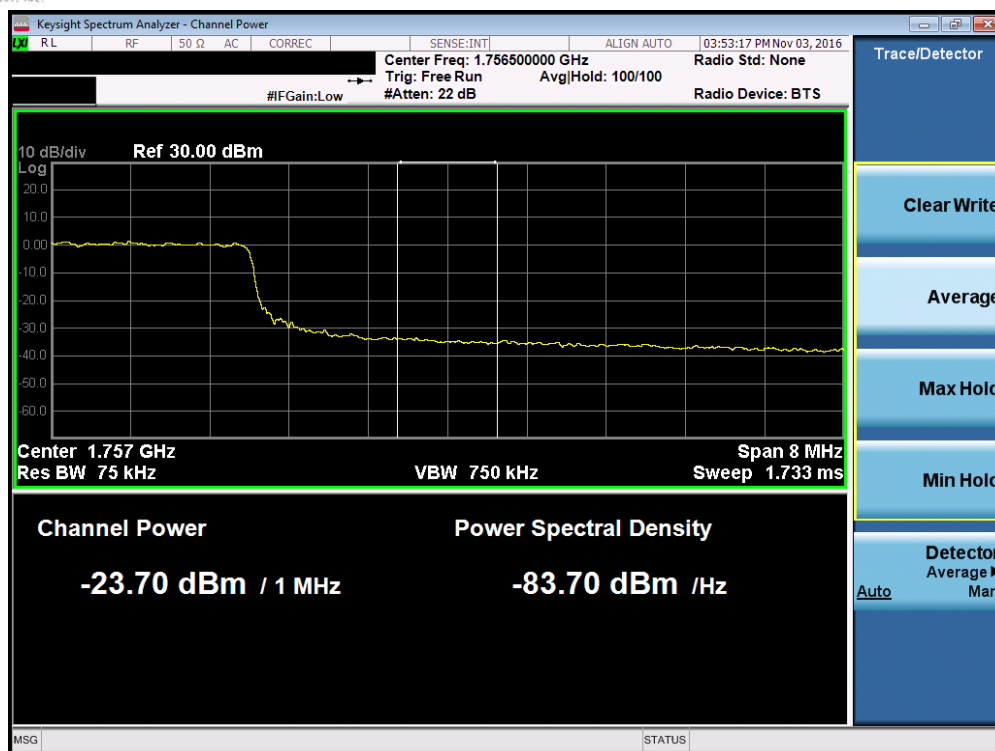


Plot 7-123. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

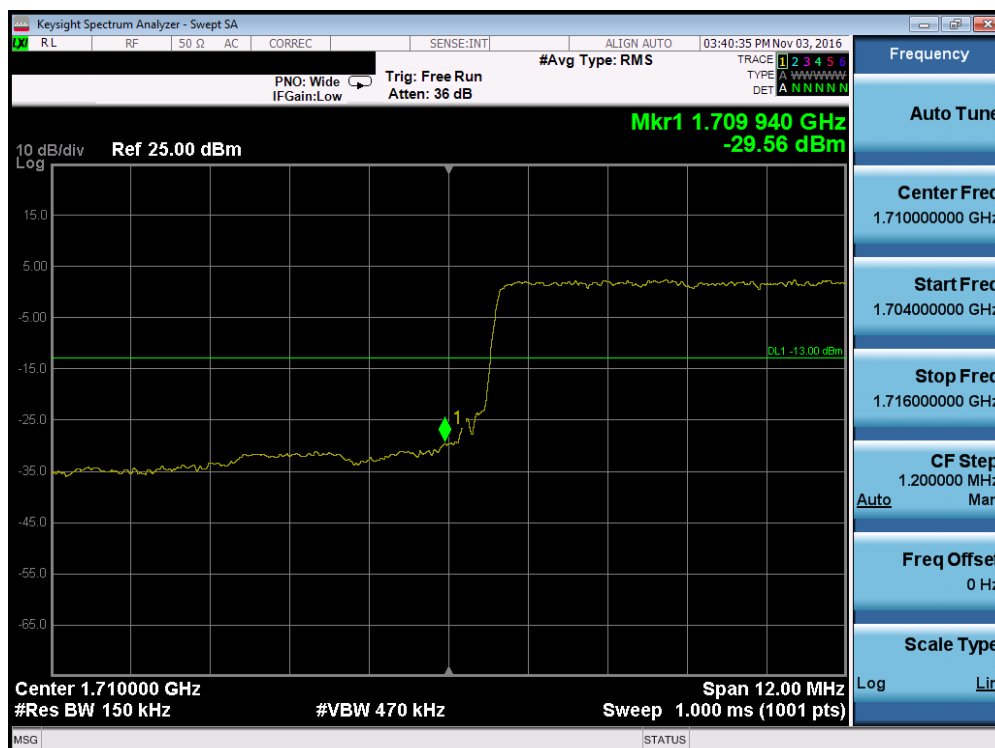


Plot 7-124. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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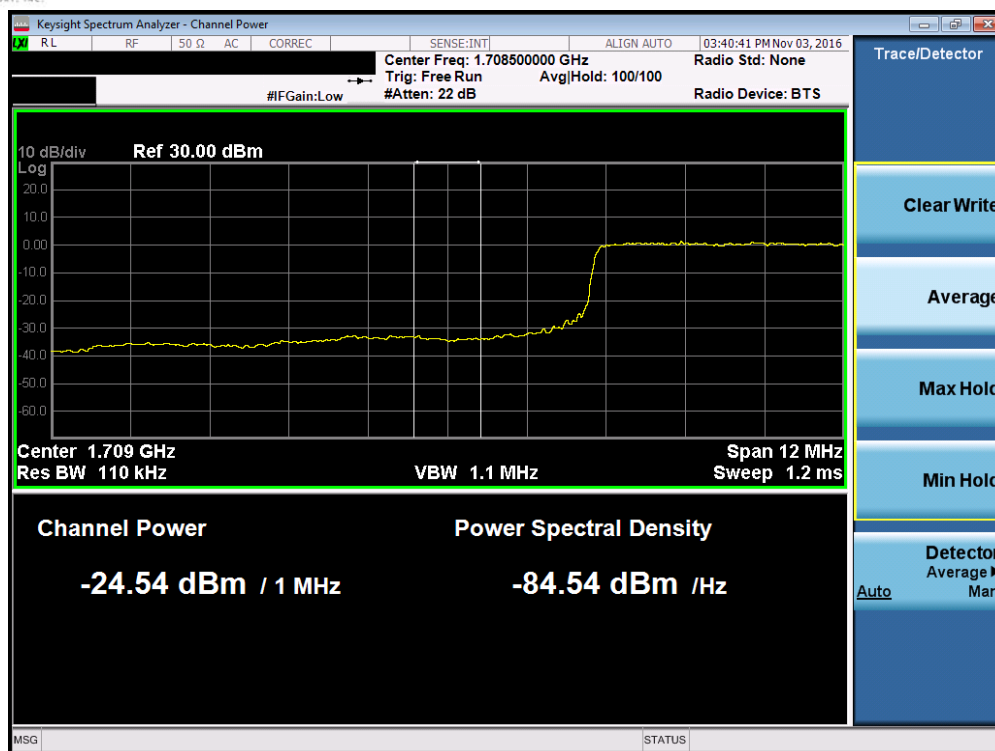


Plot 7-125. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

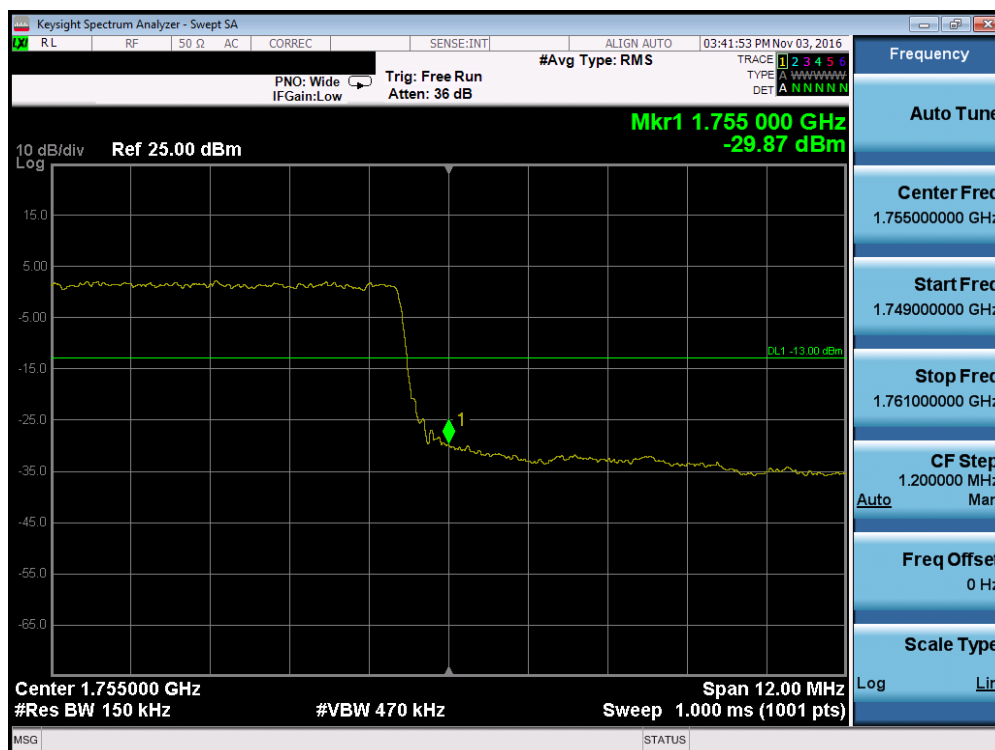


Plot 7-126. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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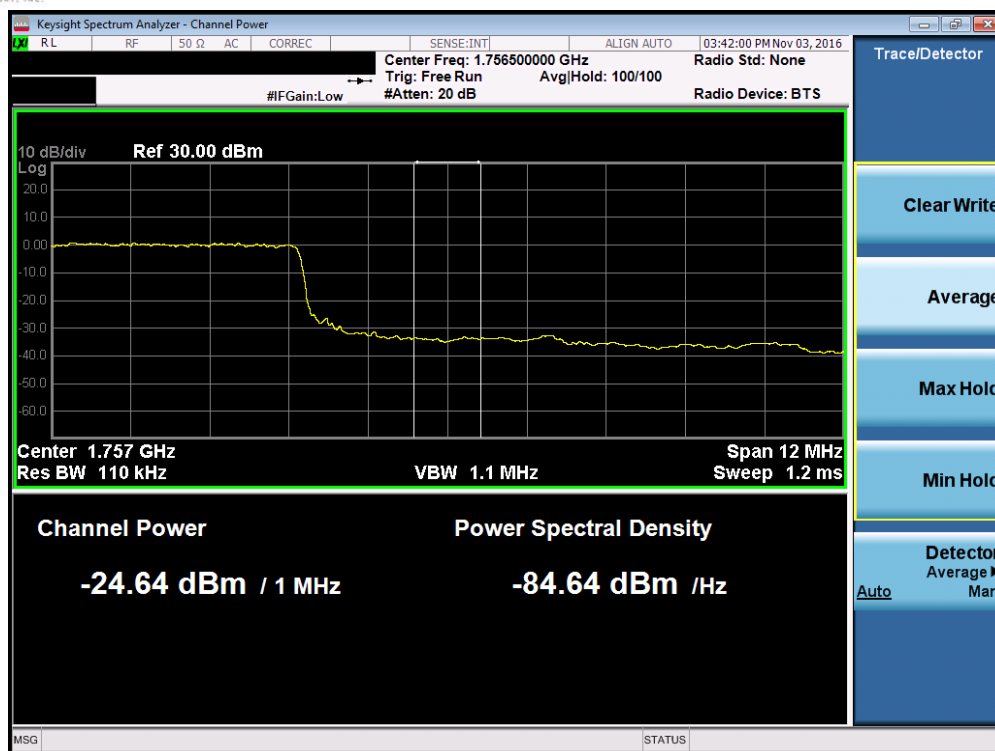


Plot 7-127. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

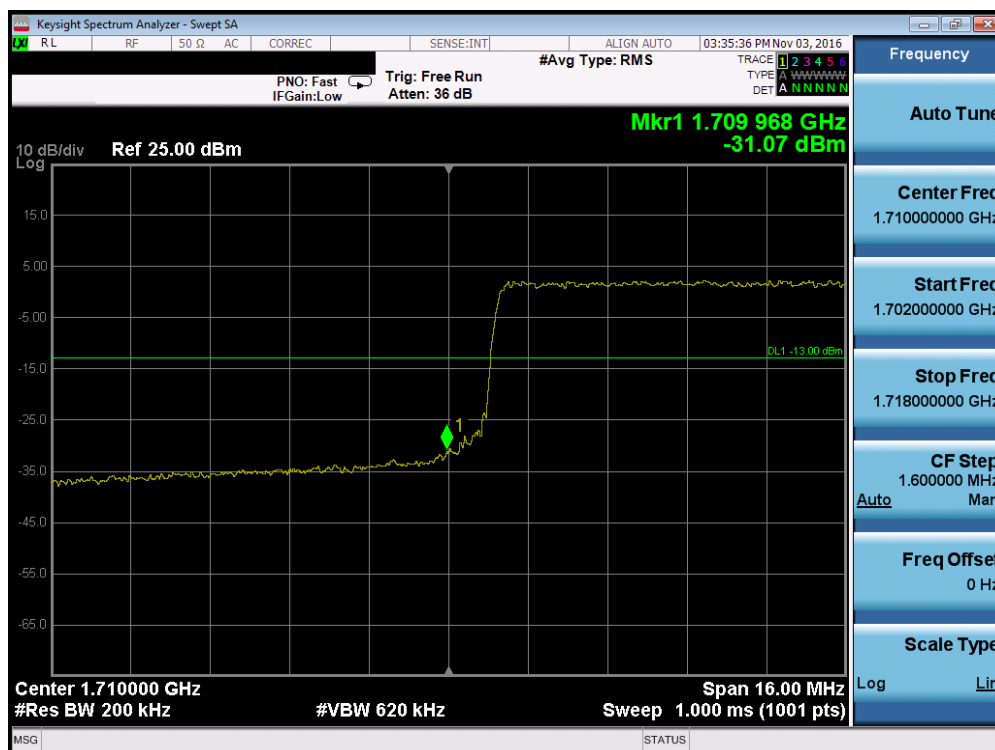


Plot 7-128. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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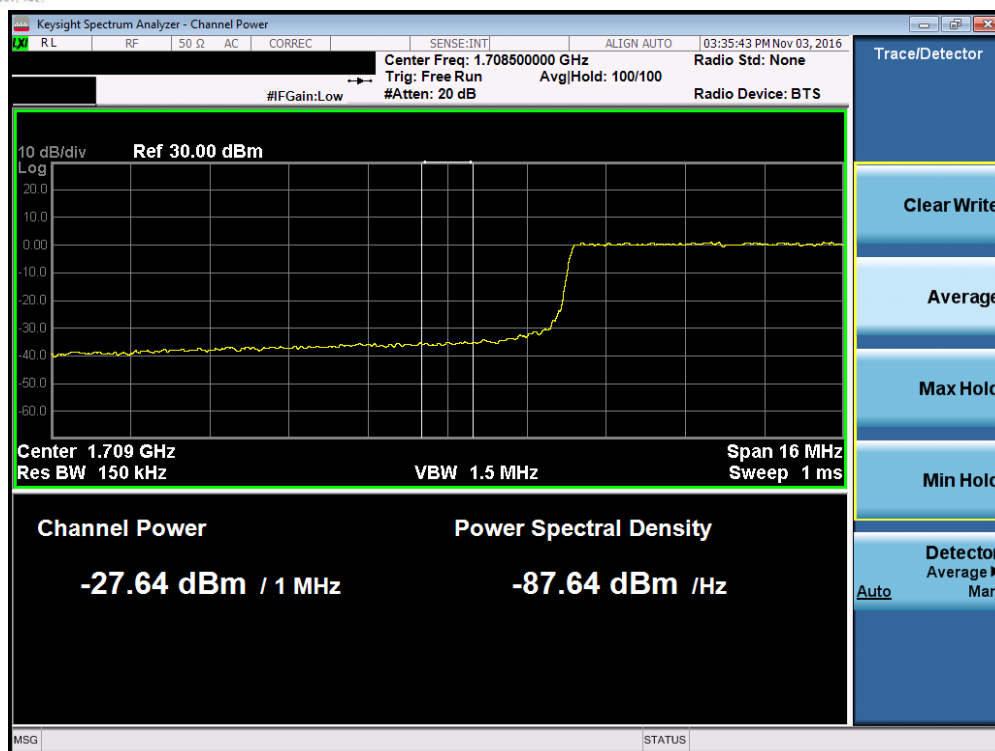


Plot 7-129. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

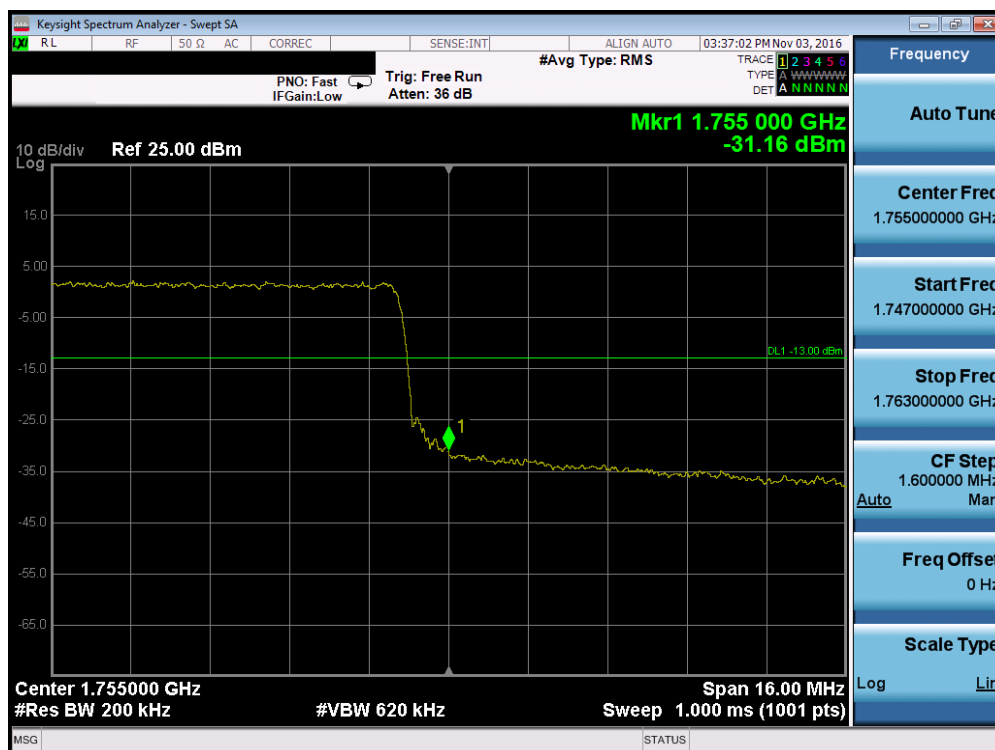


Plot 7-130. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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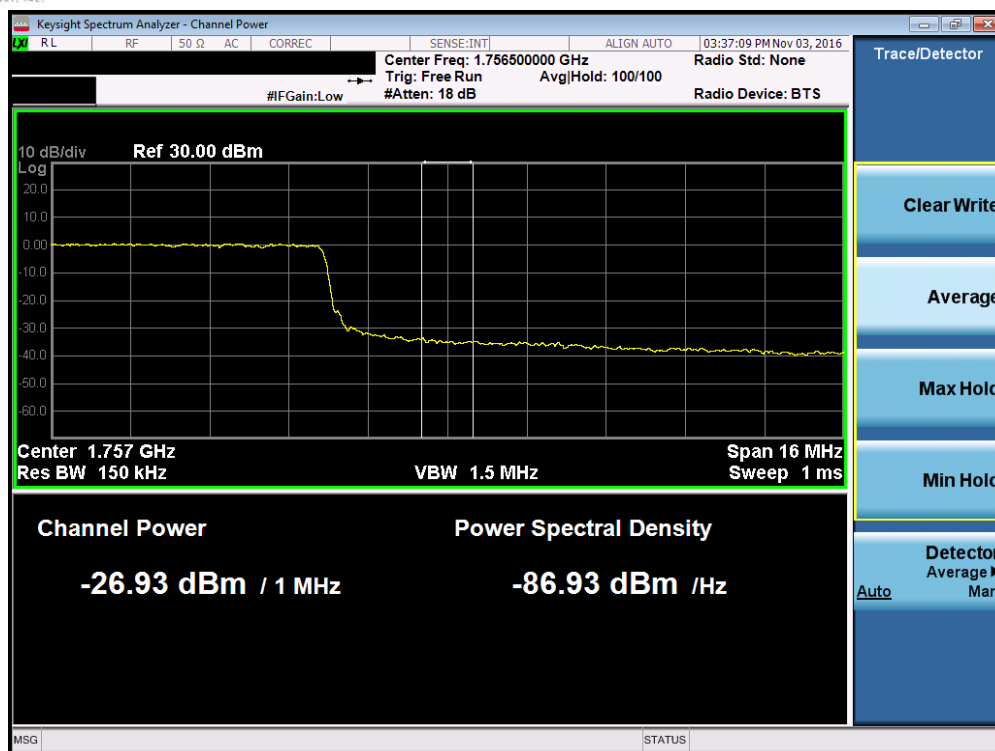


Plot 7-131. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

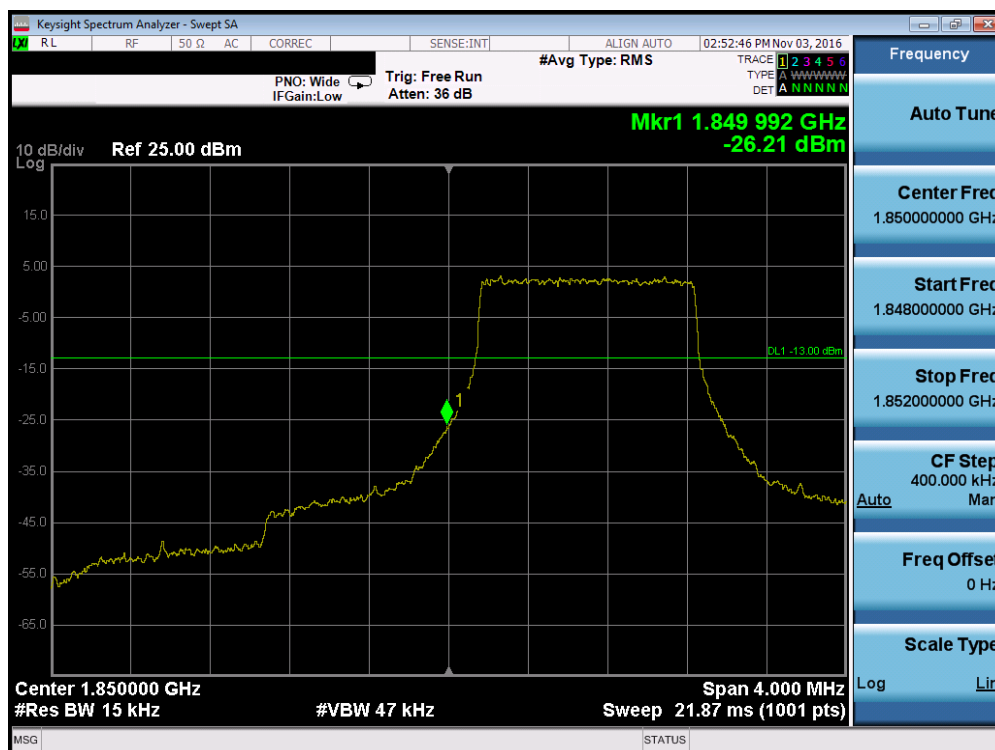


Plot 7-132. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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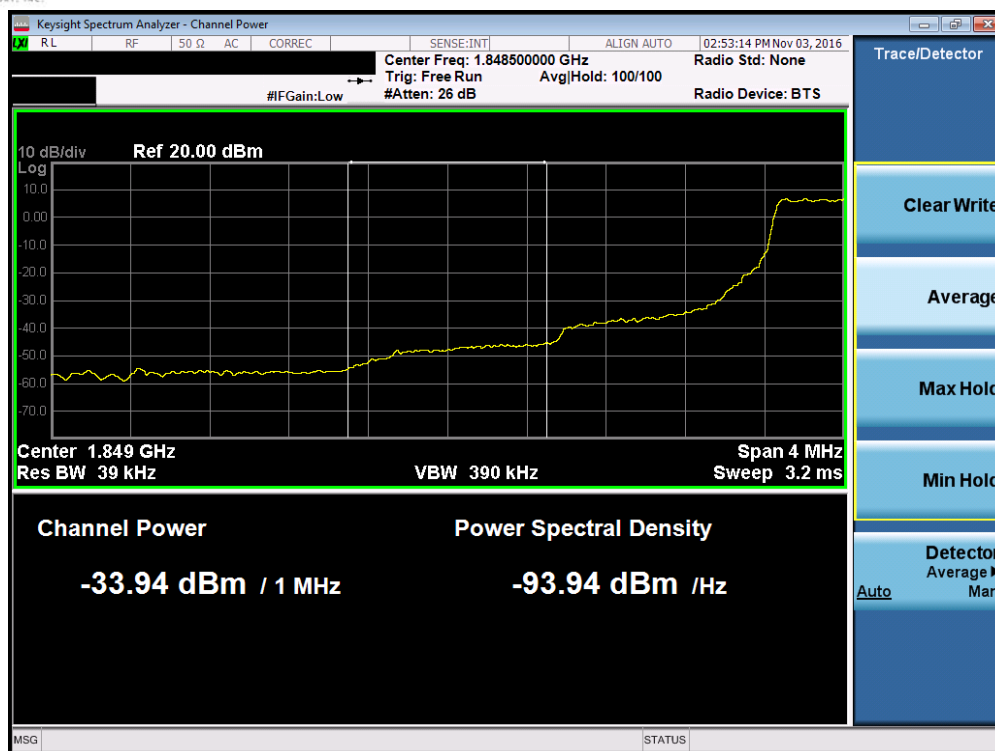


Plot 7-133. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



Plot 7-134. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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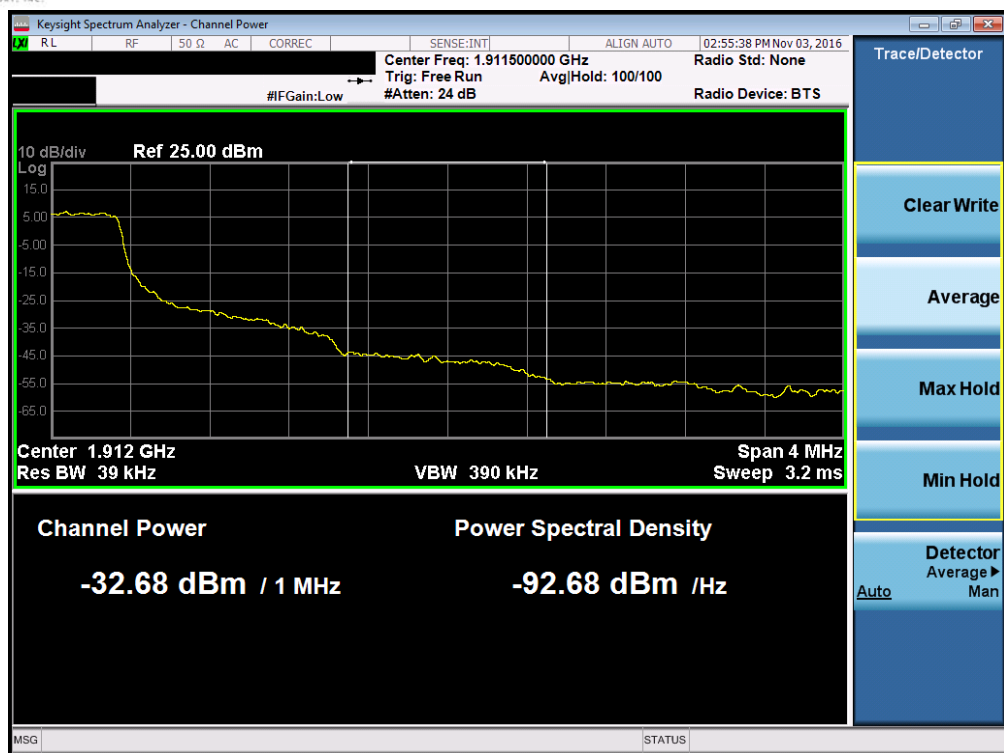


Plot 7-135. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

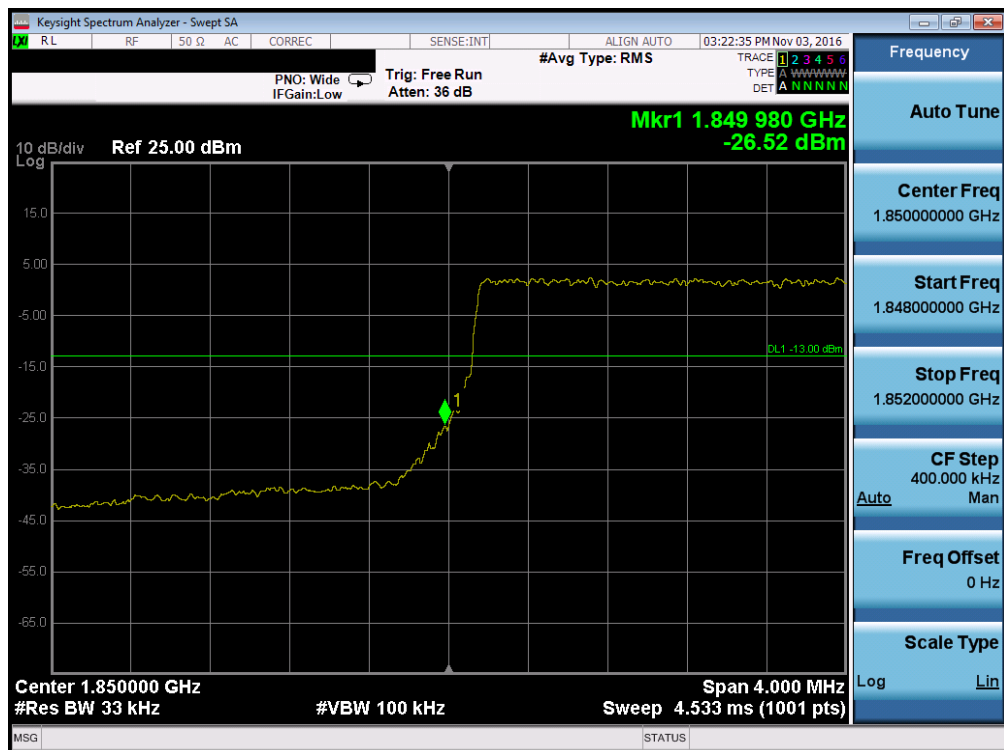


Plot 7-136. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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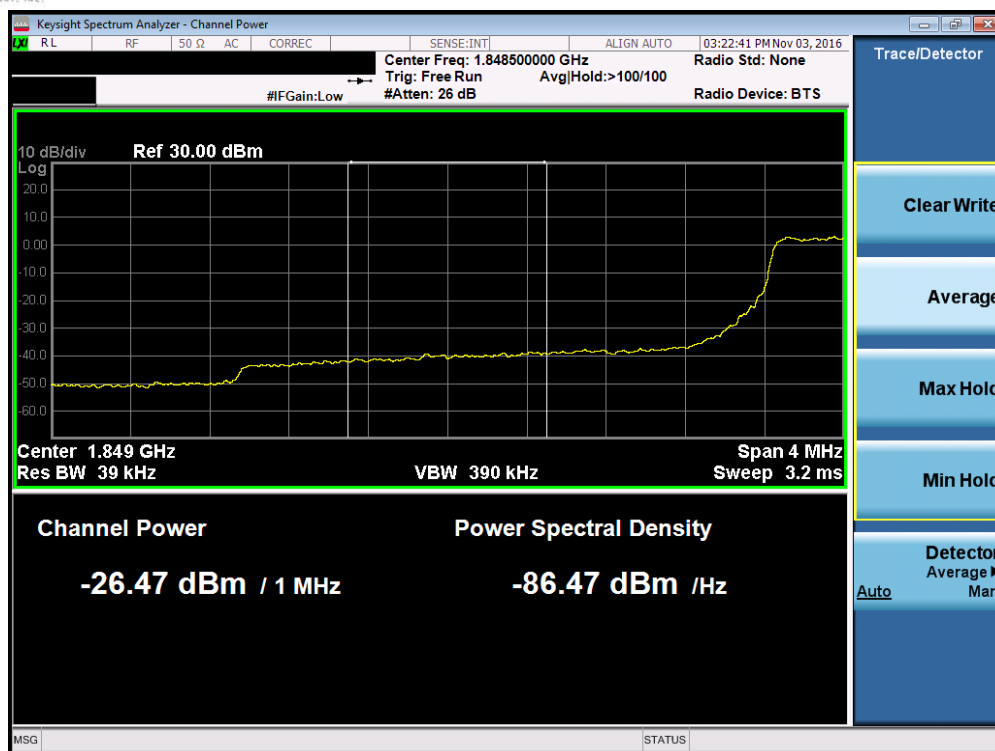


Plot 7-137. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

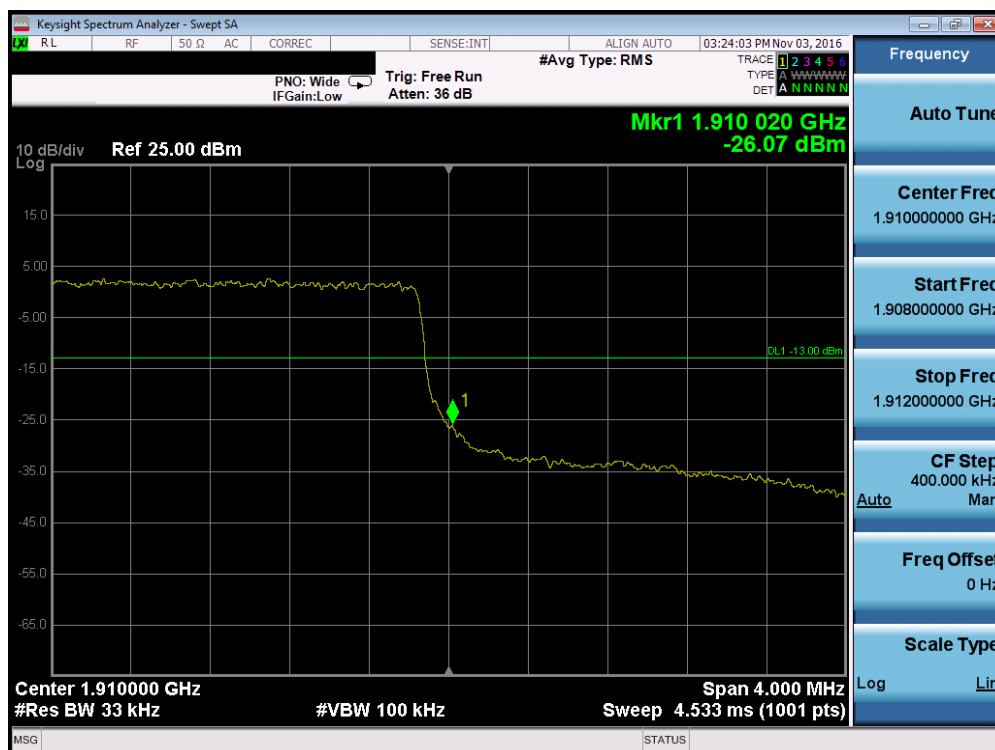


Plot 7-138. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 87 of 137

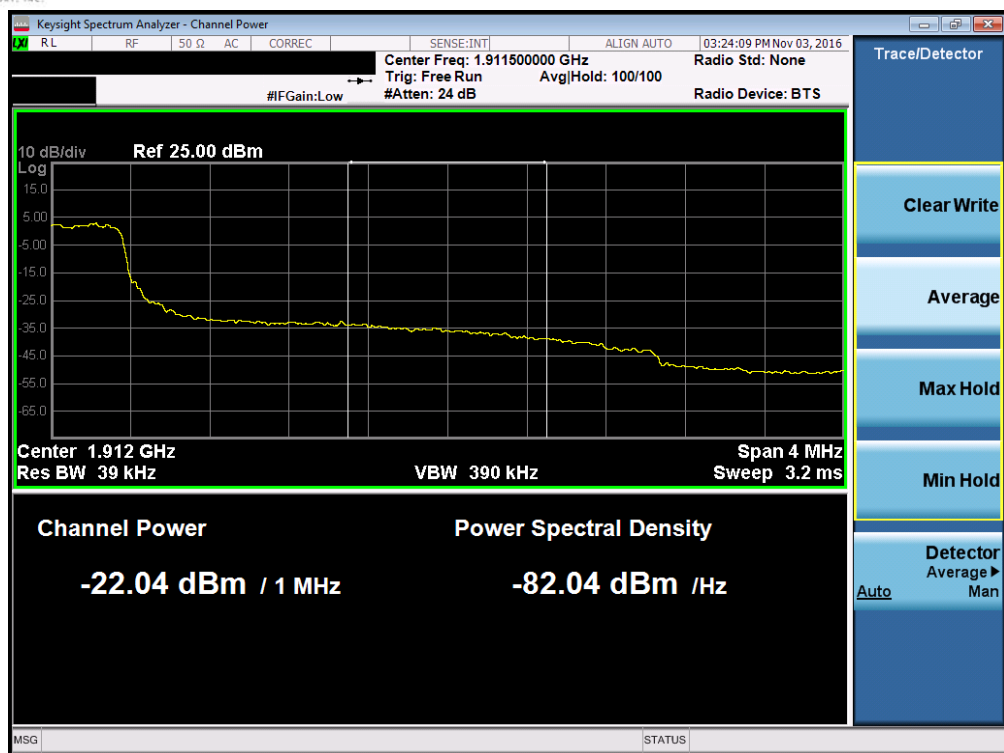


Plot 7-139. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

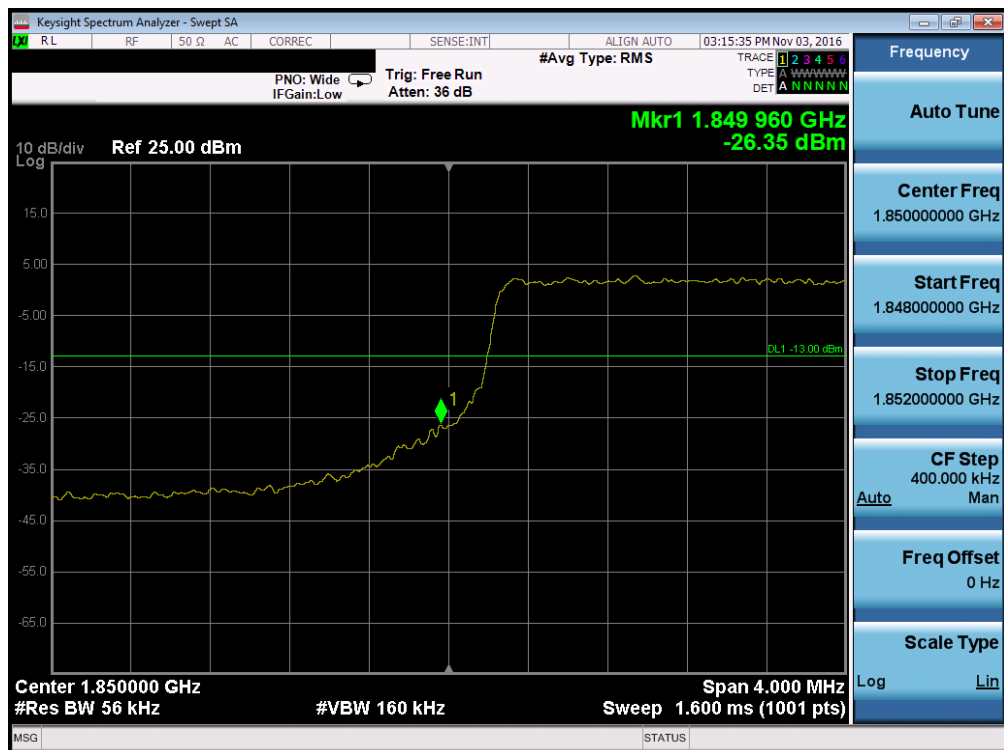


Plot 7-140. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 88 of 137

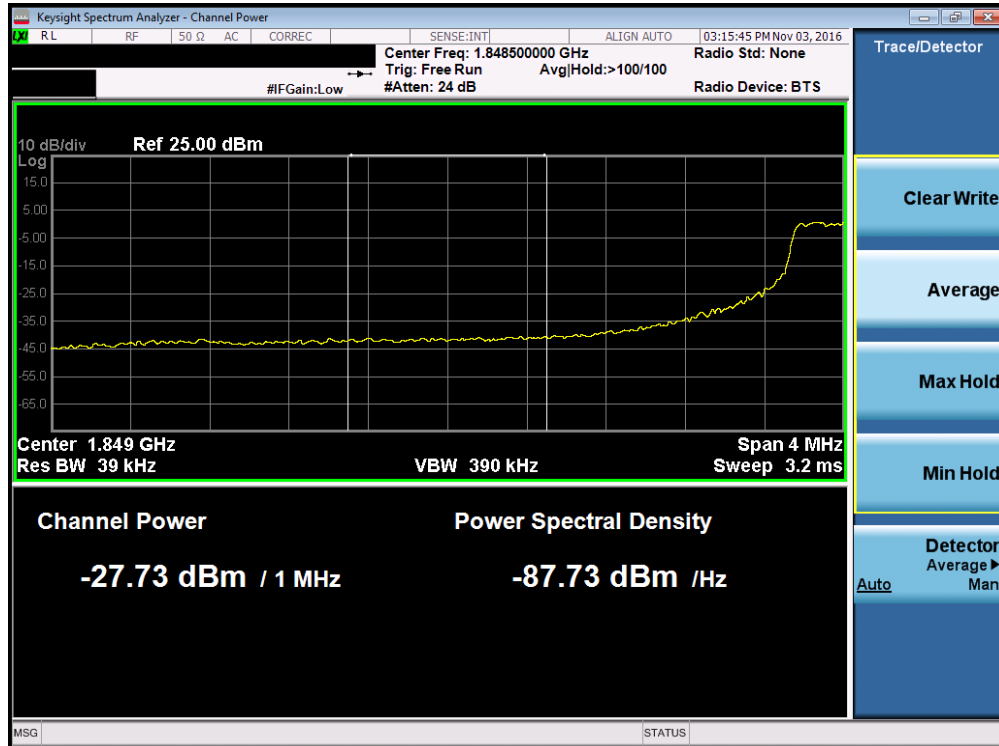


Plot 7-141. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



Plot 7-142. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 89 of 137

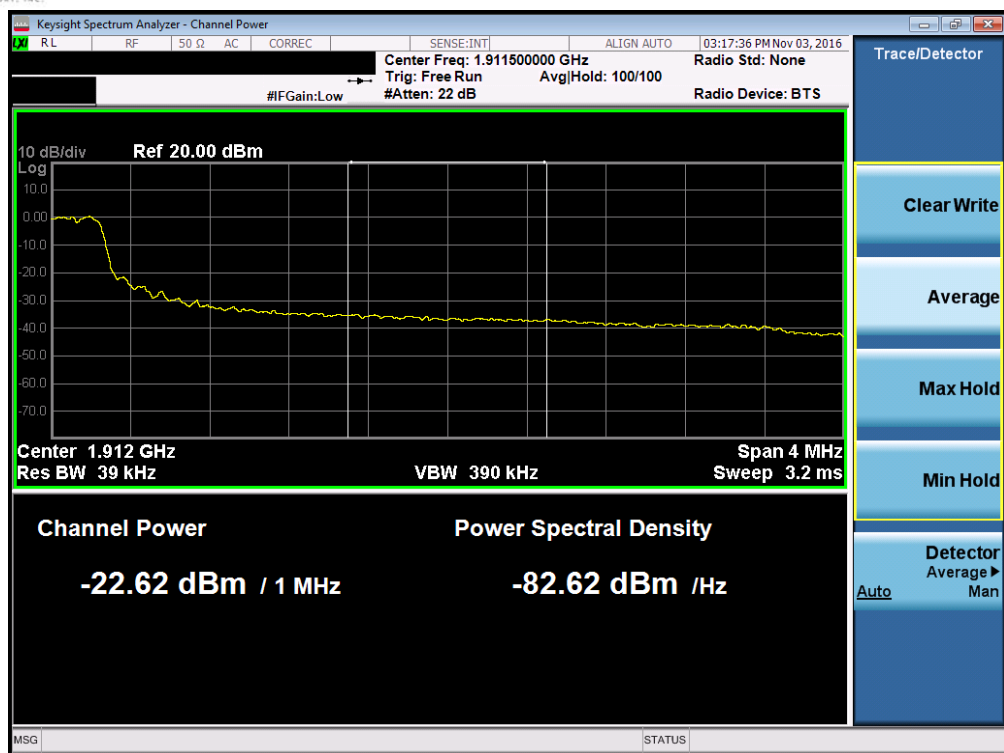


Plot 7-143. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

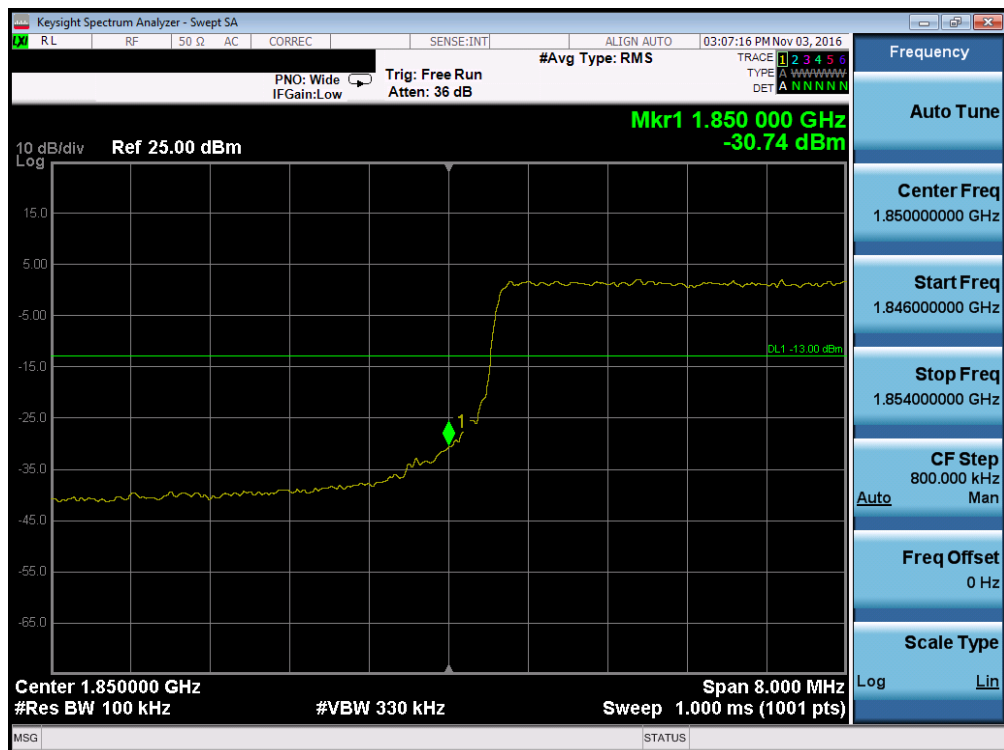


Plot 7-144. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 90 of 137

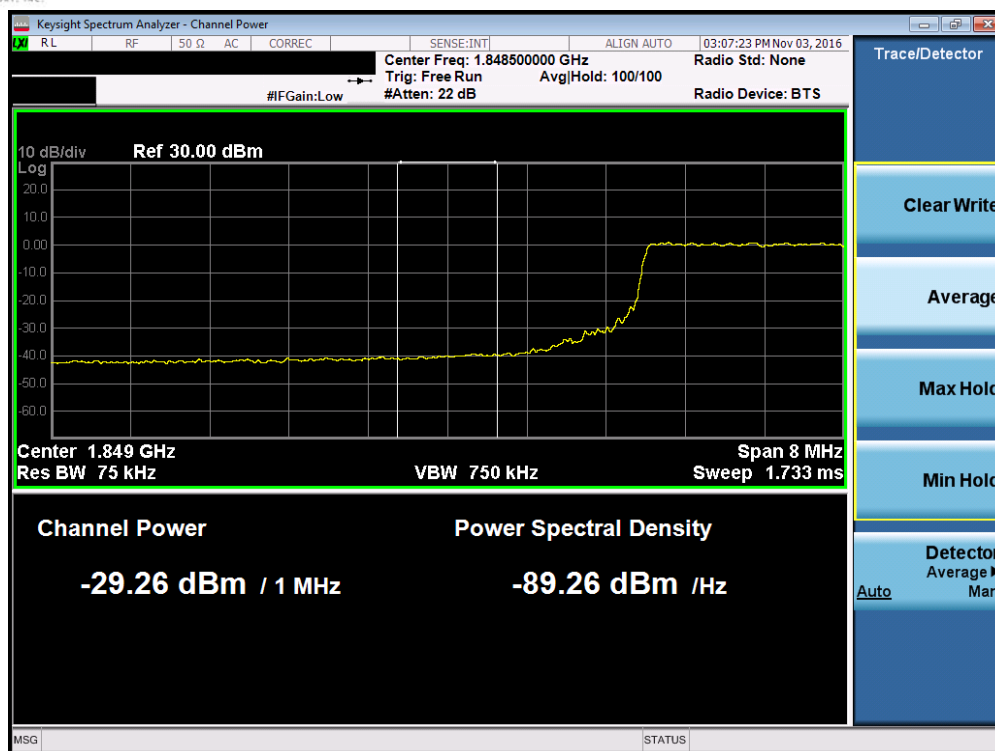


Plot 7-145. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

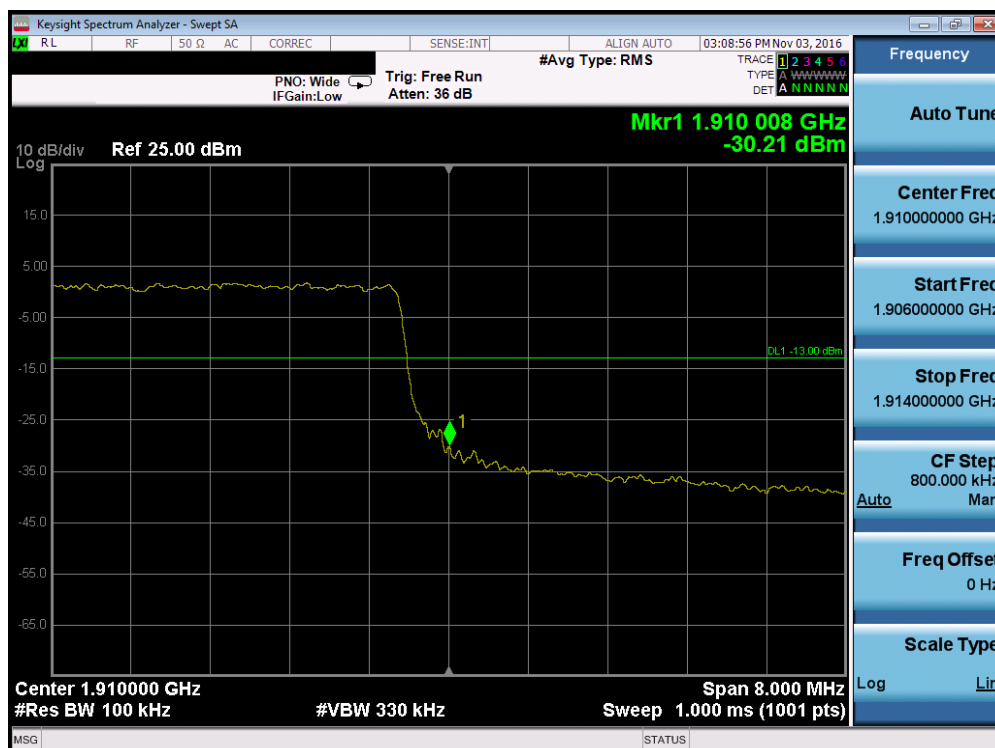


Plot 7-146. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 91 of 137

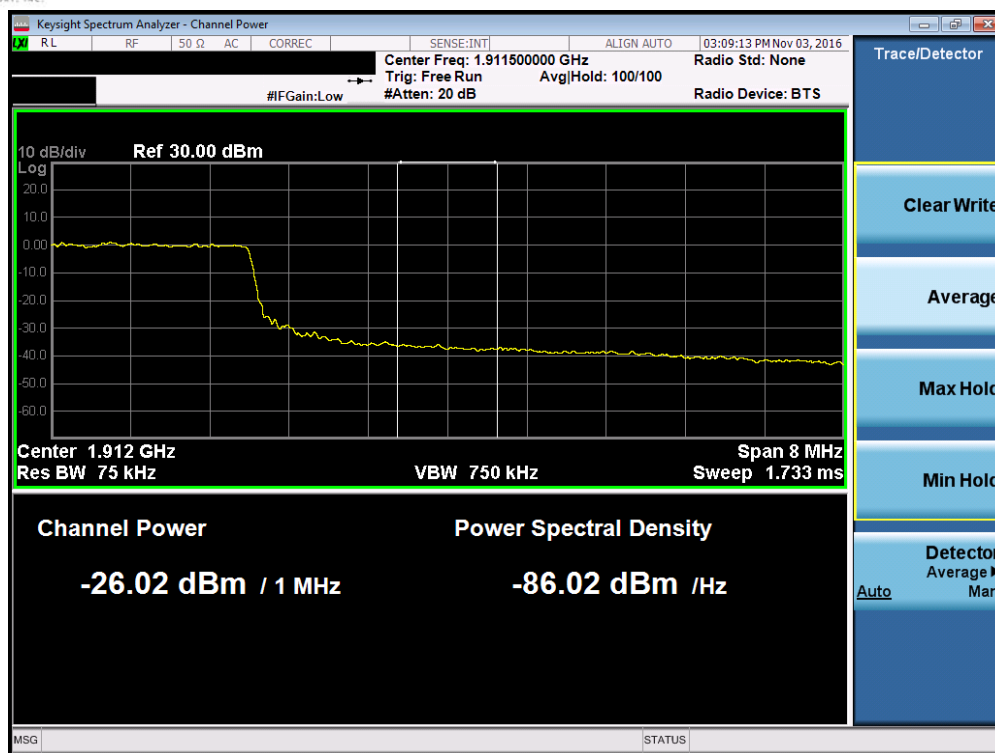


Plot 7-147. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

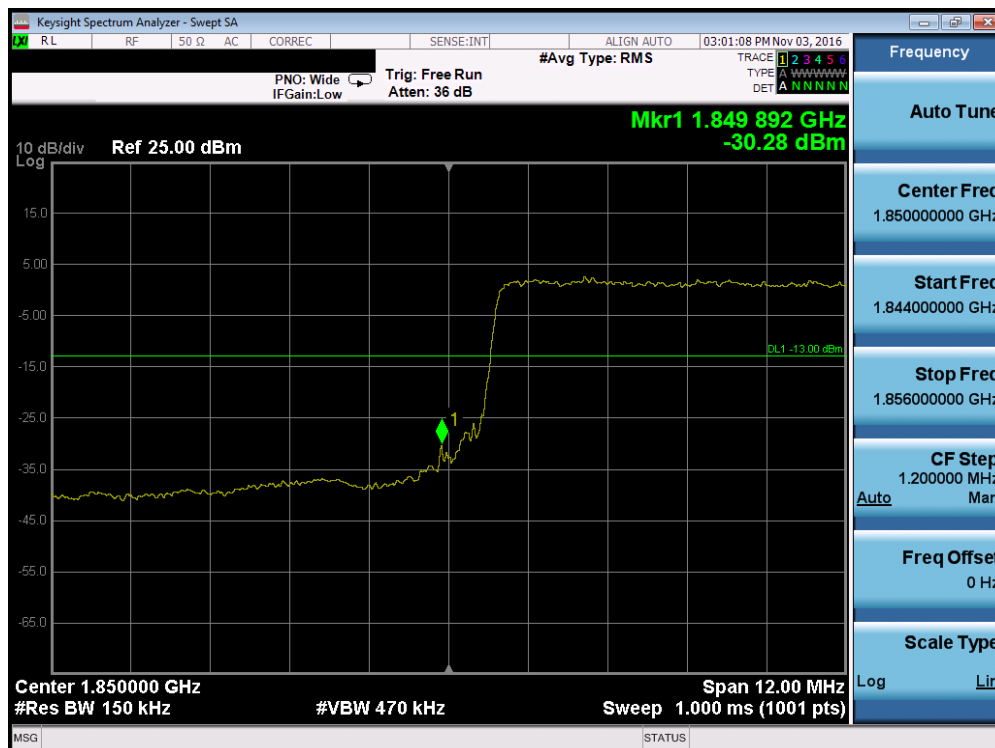


Plot 7-148. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 92 of 137

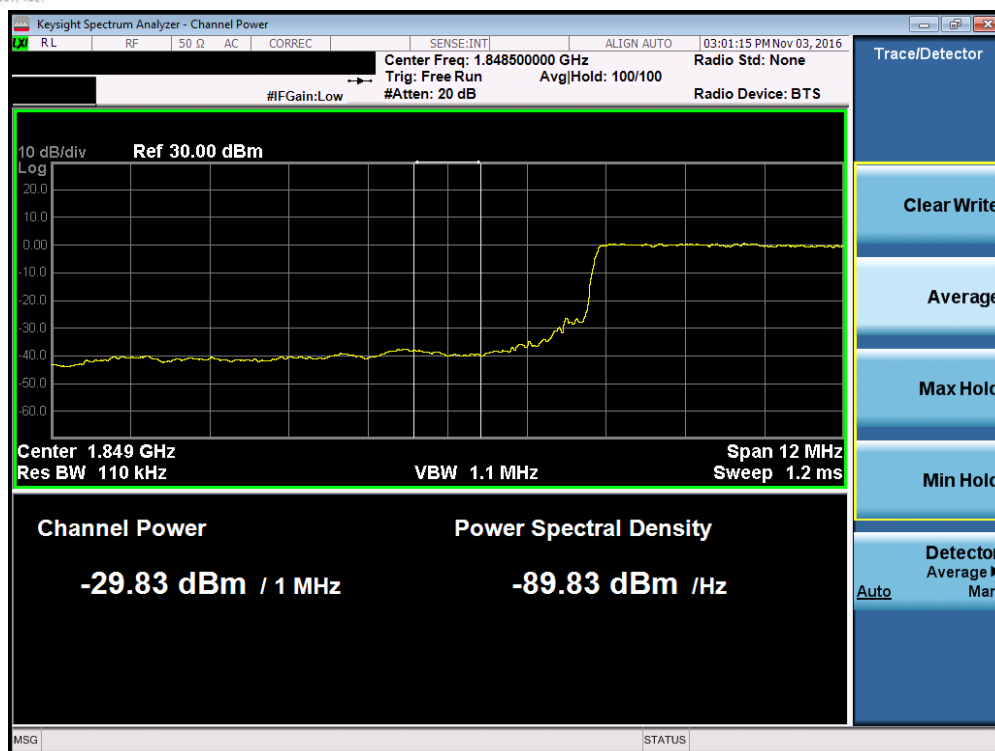


Plot 7-149. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



Plot 7-150. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 93 of 137

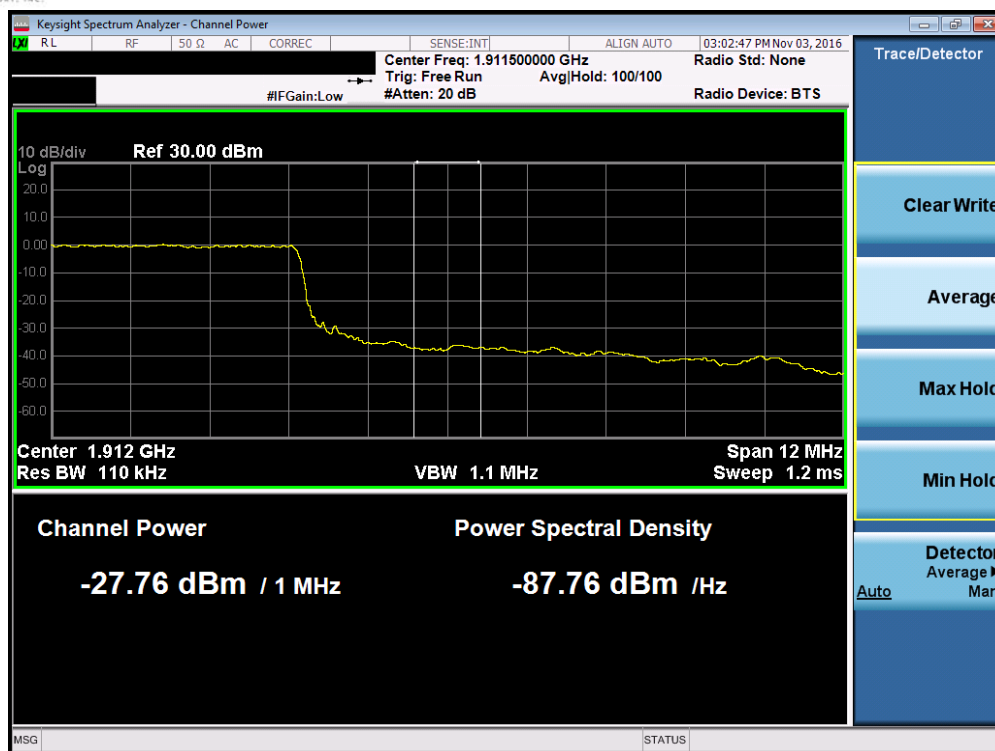


Plot 7-151. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

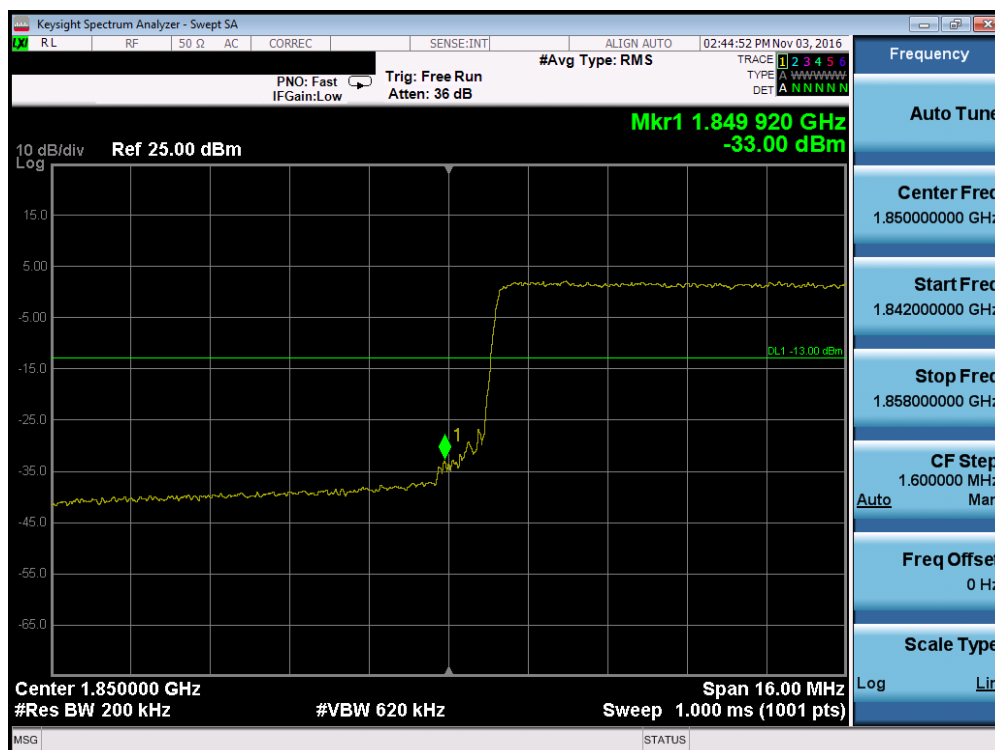


Plot 7-152. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 94 of 137

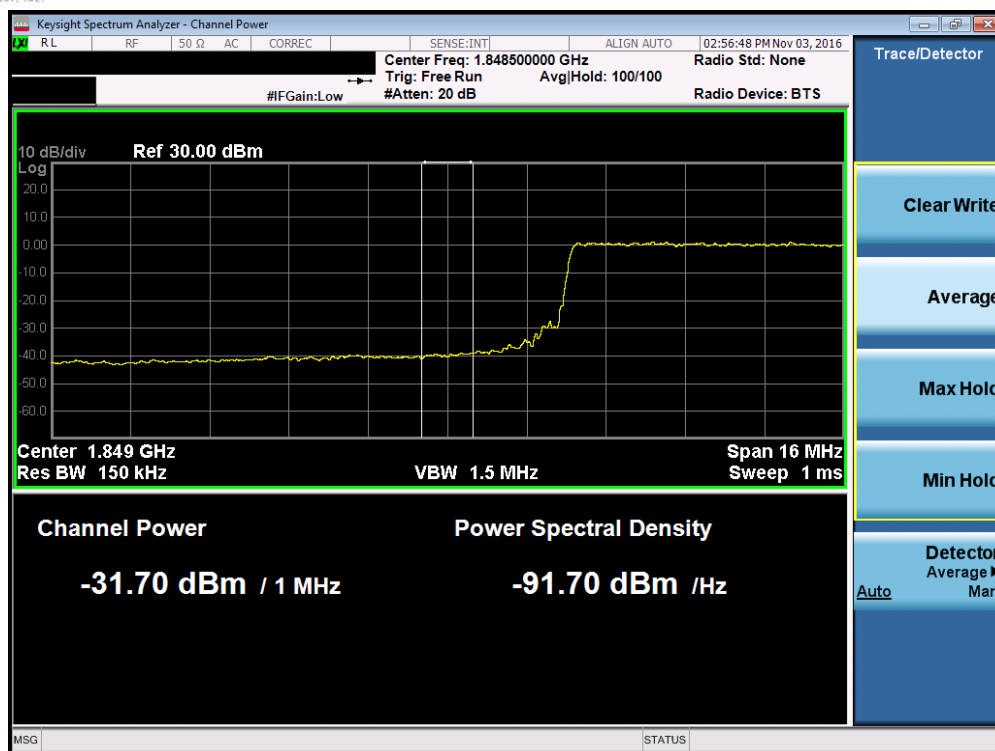


Plot 7-153. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



Plot 7-154. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 95 of 137

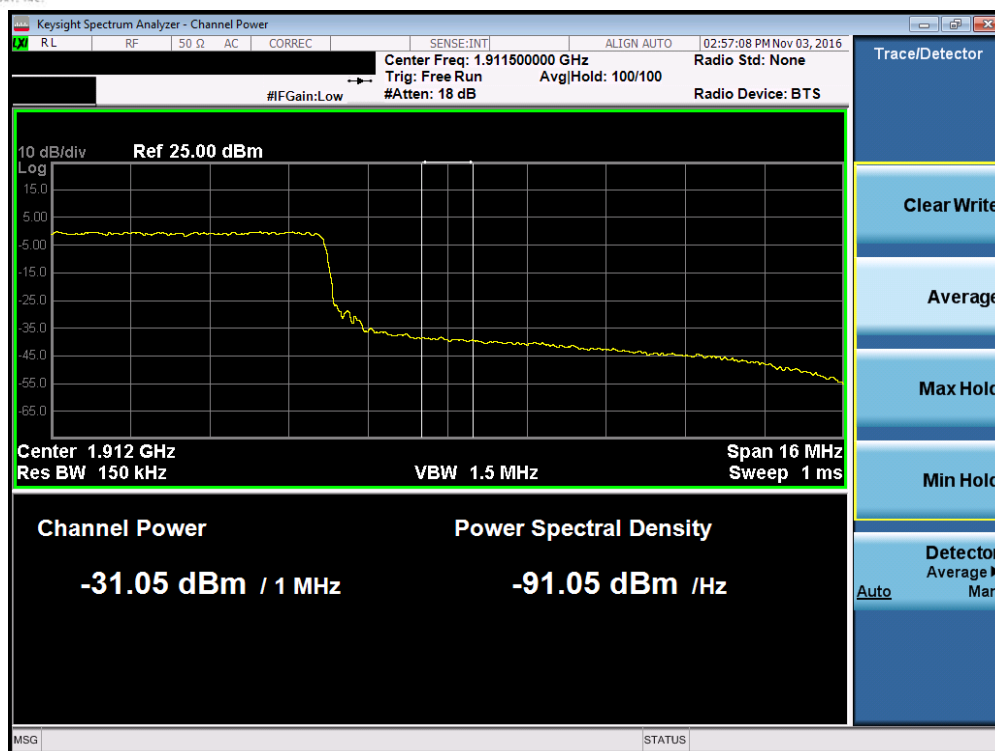


Plot 7-155. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

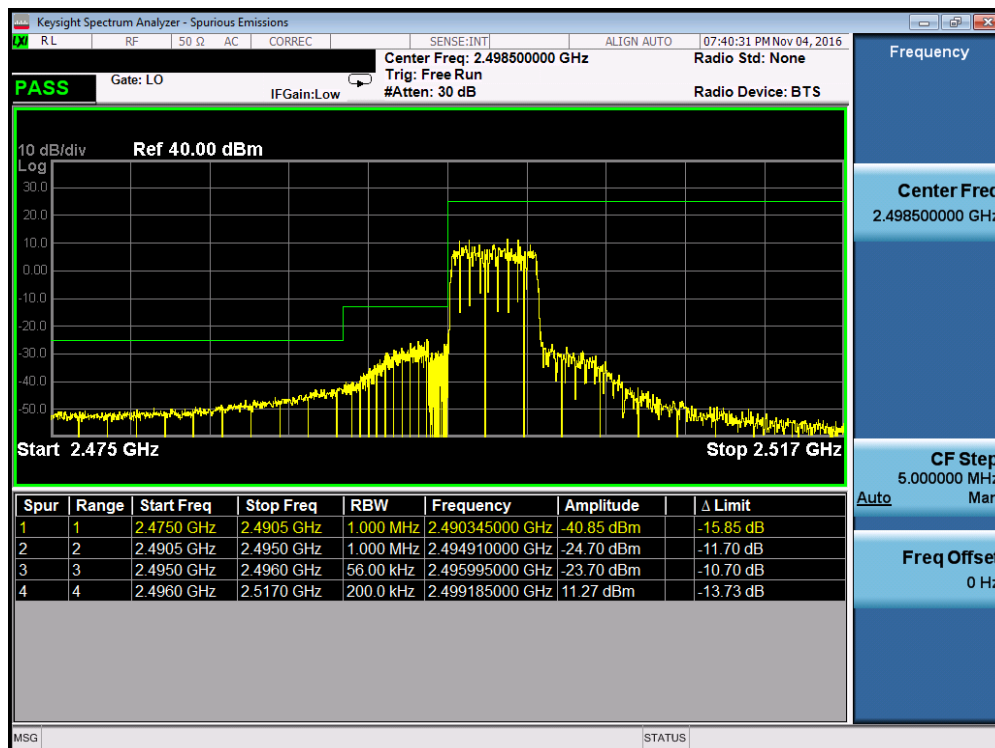


Plot 7-156. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 96 of 137

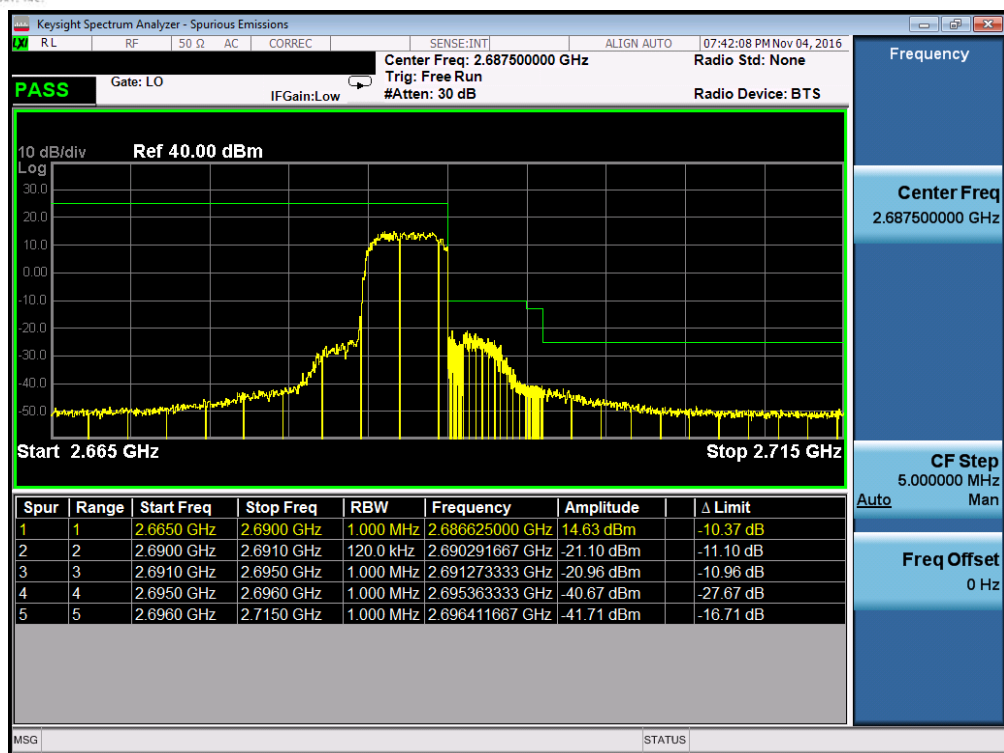


Plot 7-157. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

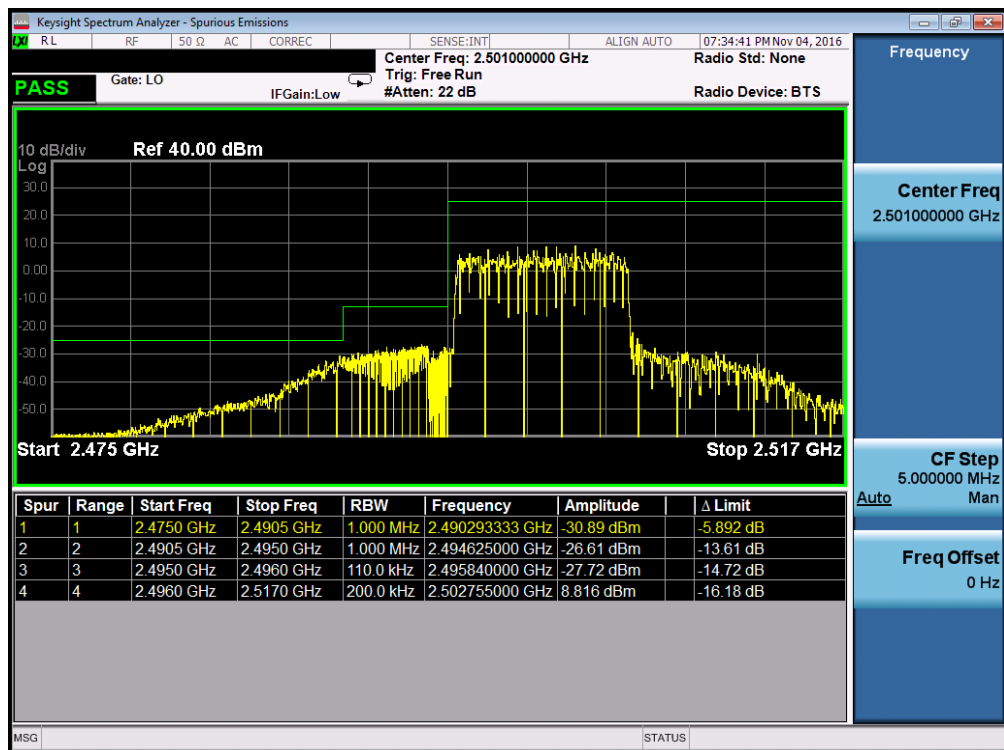


Plot 7-158. Lower ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 97 of 137	

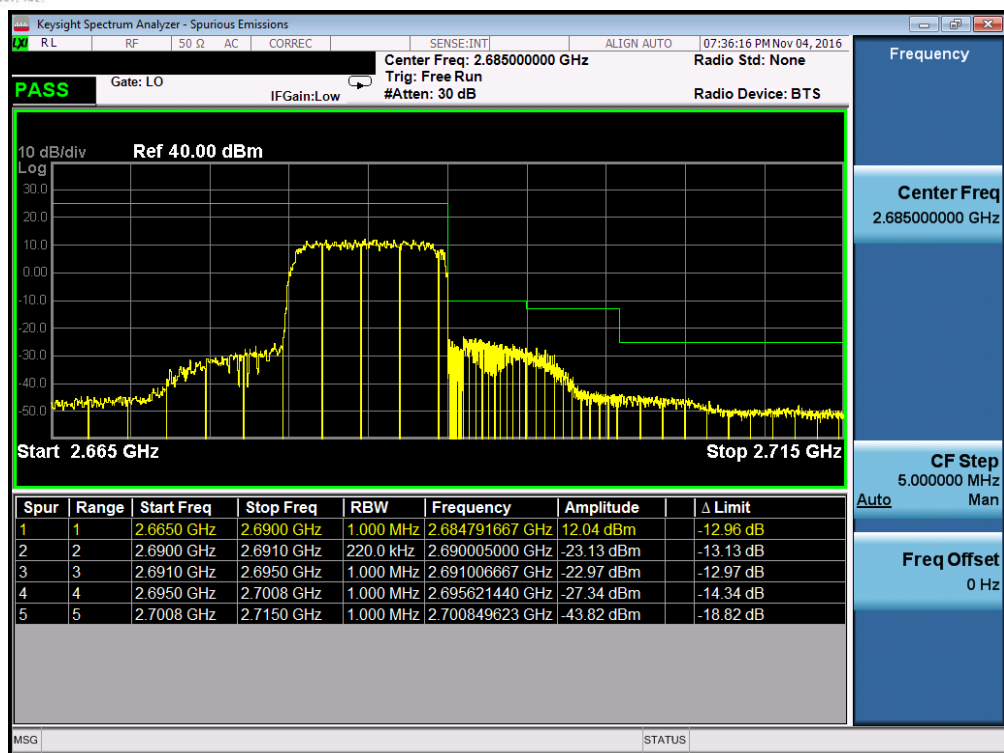


Plot 7-159. Upper ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

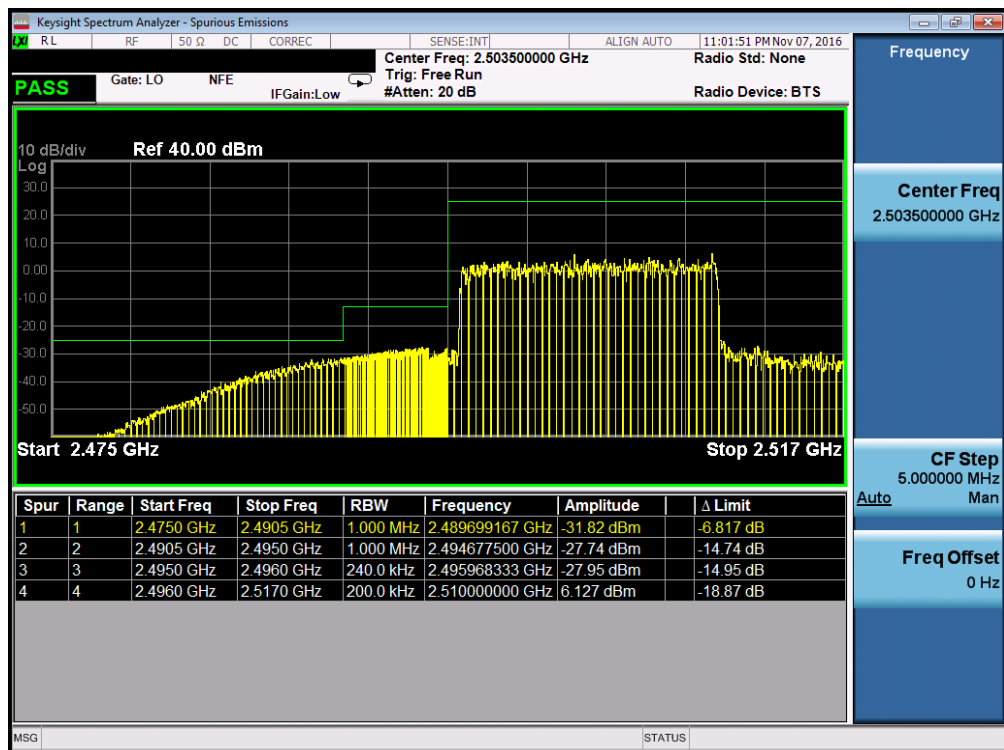


Plot 7-160. Lower ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 98 of 137	

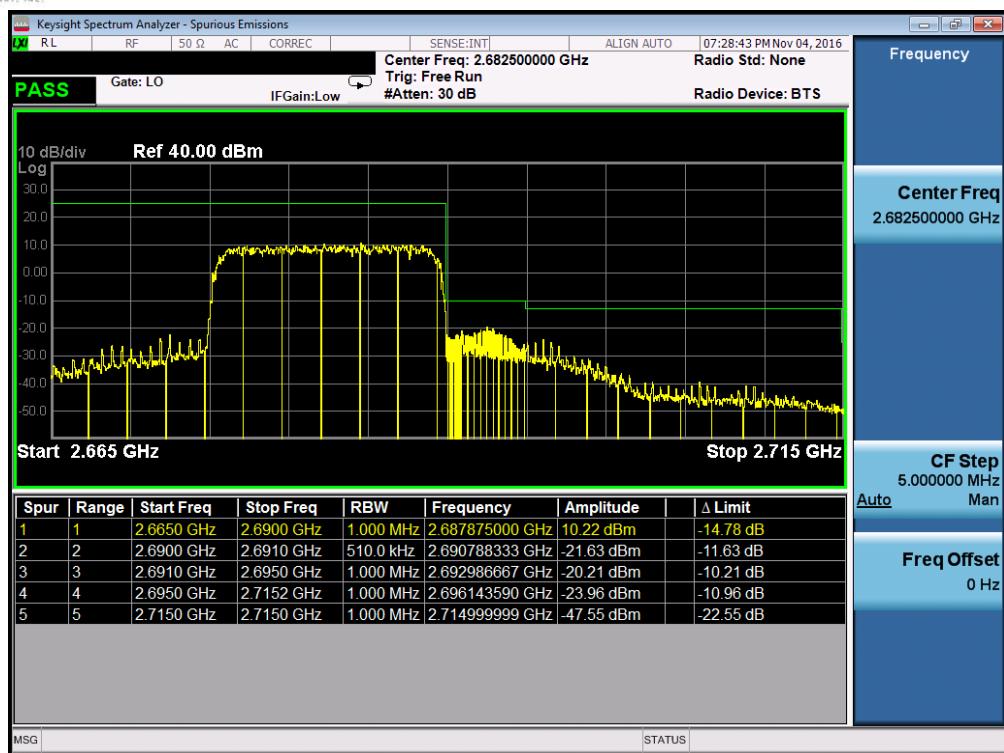


Plot 7-161. Upper ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

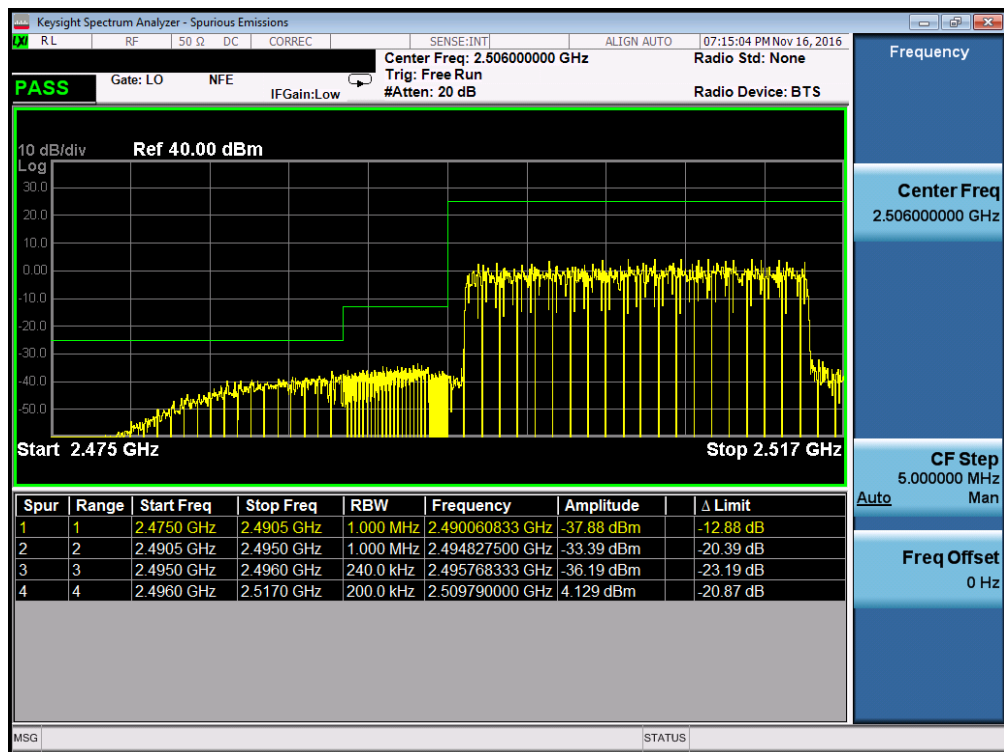


Plot 7-162. Lower ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 99 of 137

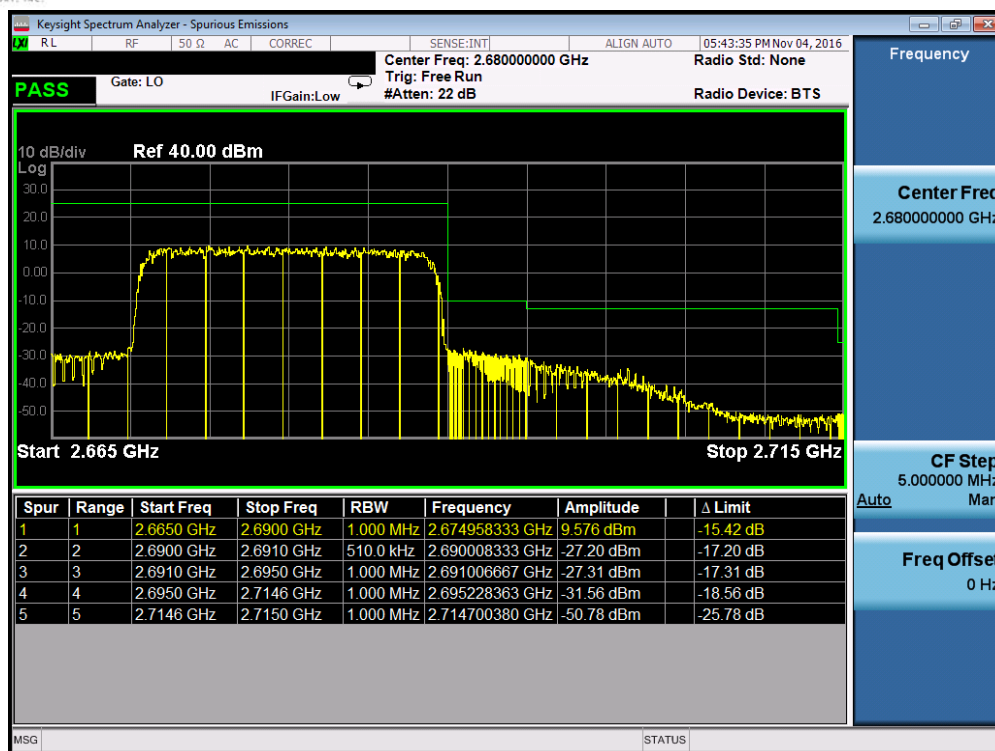


Plot 7-163. Upper ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



Plot 7-164. Lower ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 100 of 137



Plot 7-165. Upper ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMA720F	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 101 of 137

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.

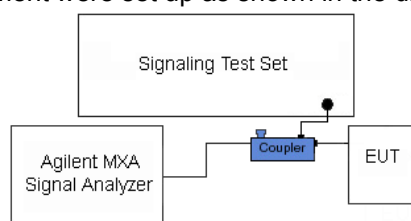
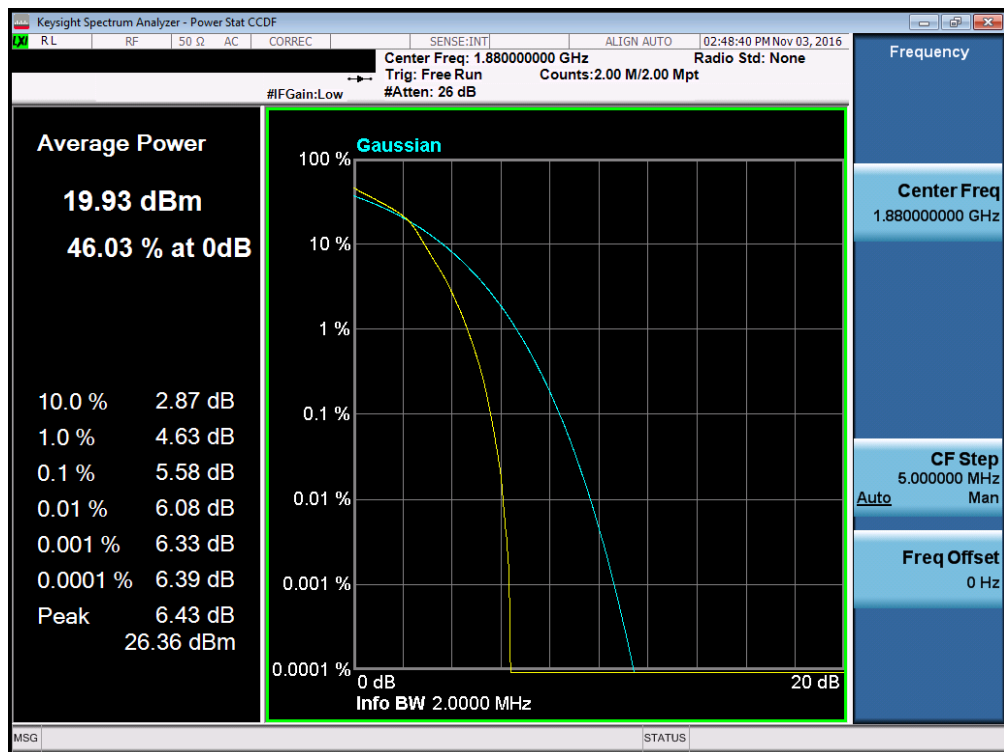
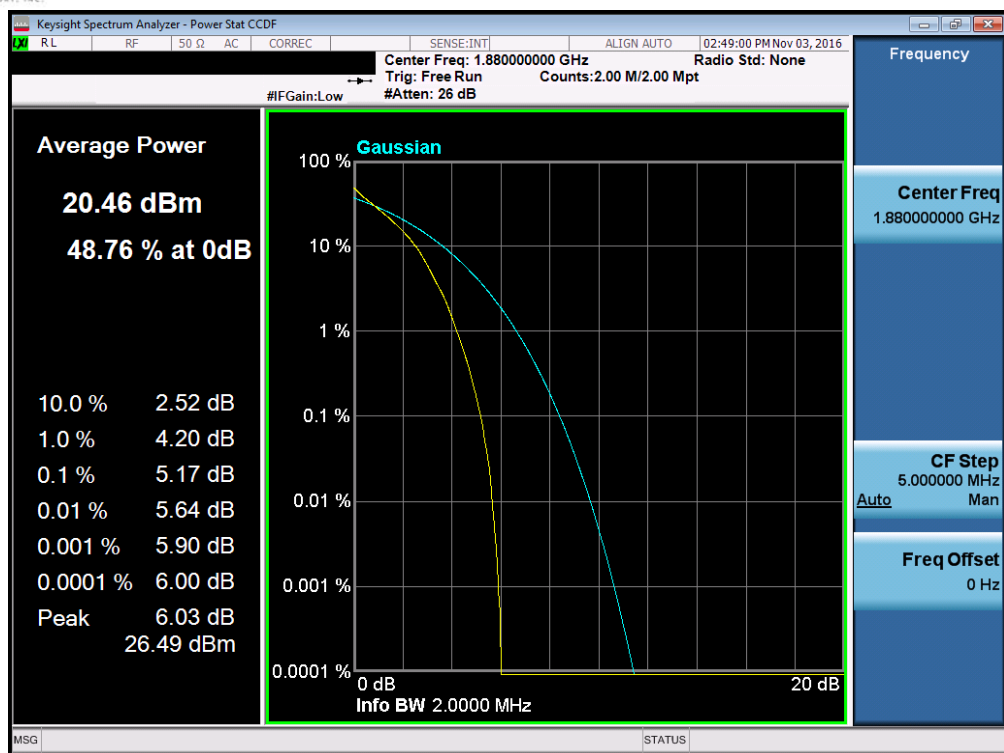


Figure 7-4. Test Instrument & Measurement Setup

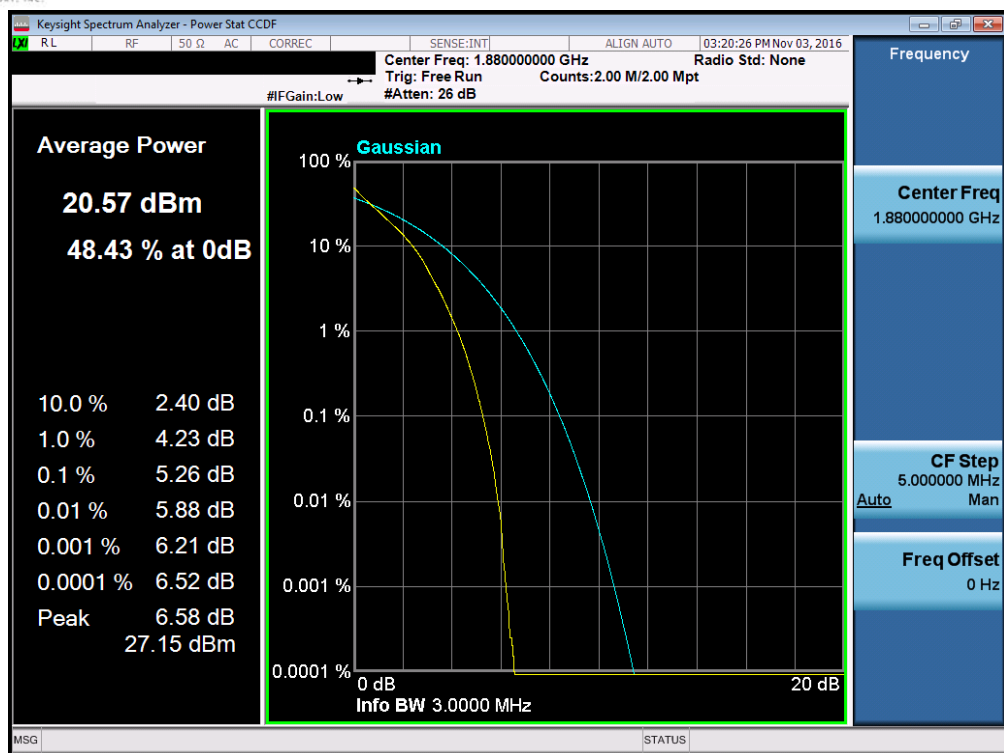
Test Notes

None.

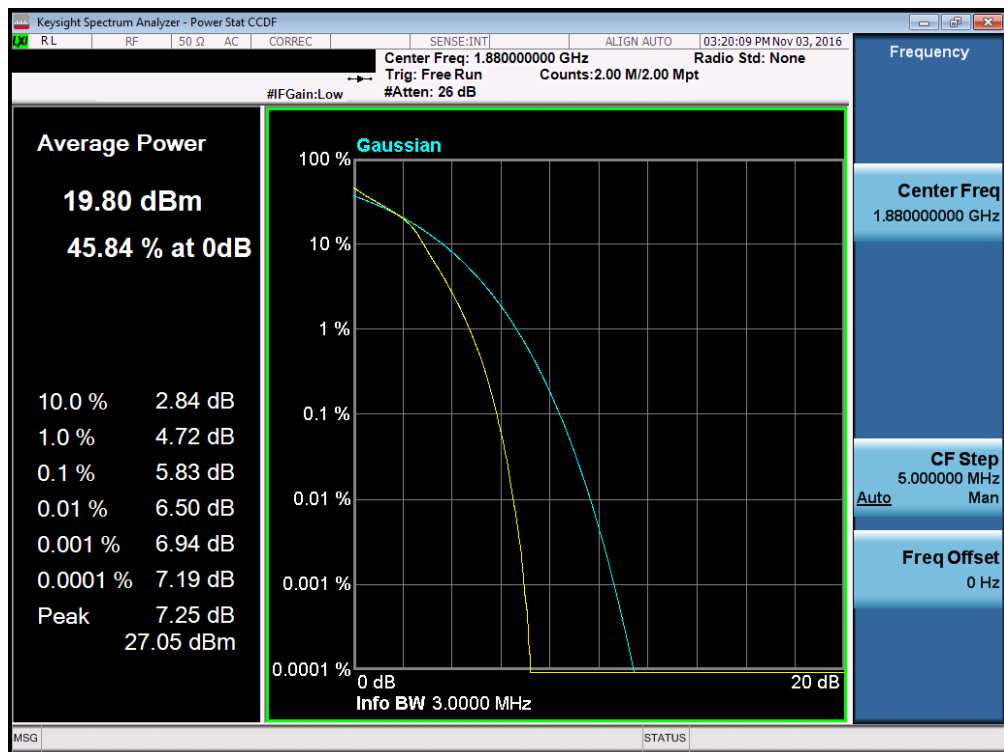
FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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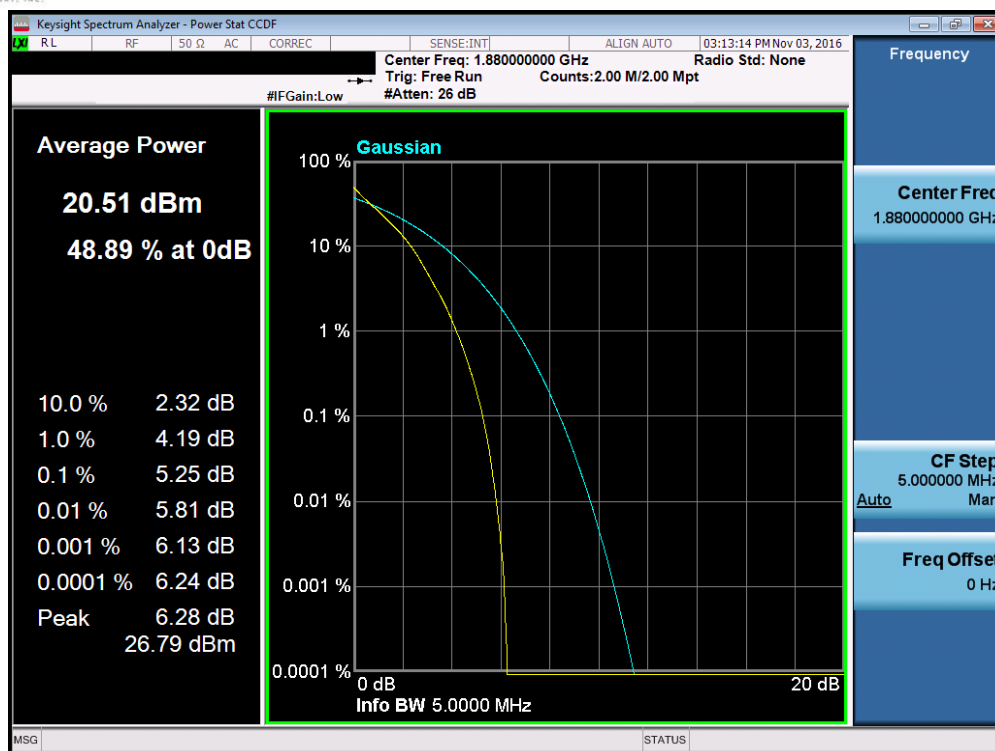


Plot 7-168. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

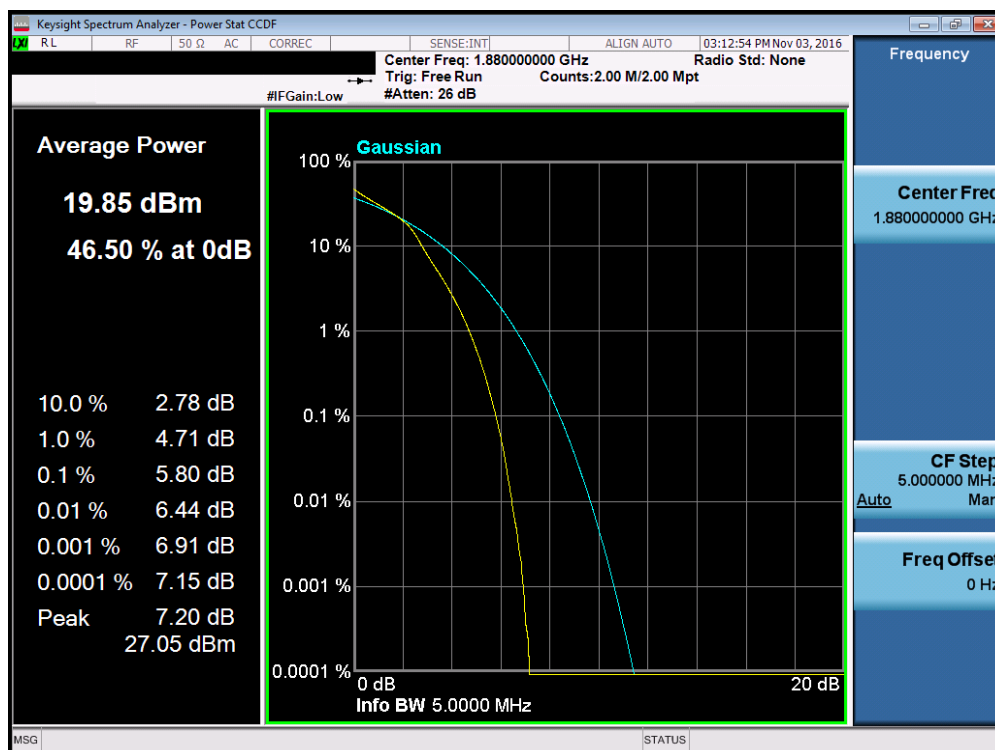


Plot 7-169. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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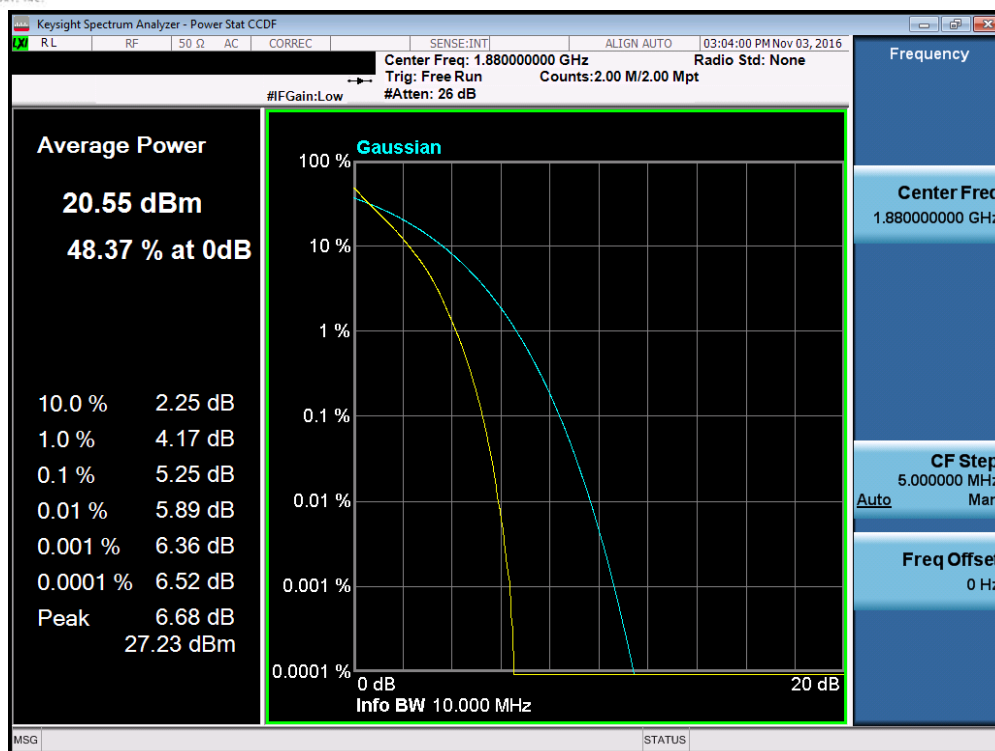


Plot 7-170. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

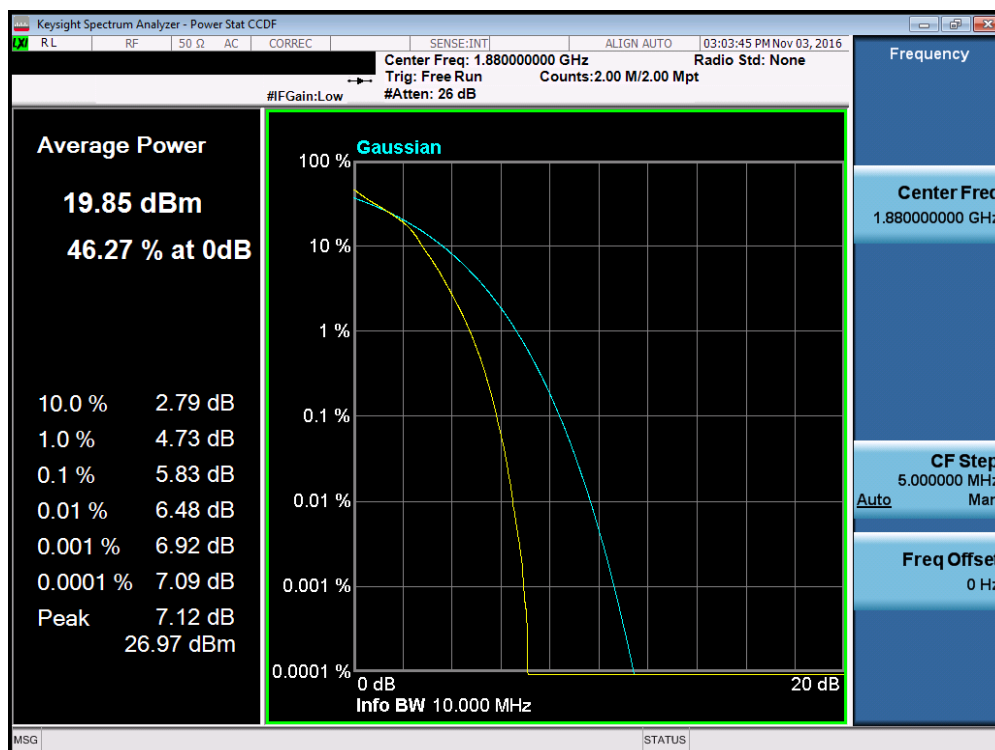


Plot 7-171. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 105 of 137

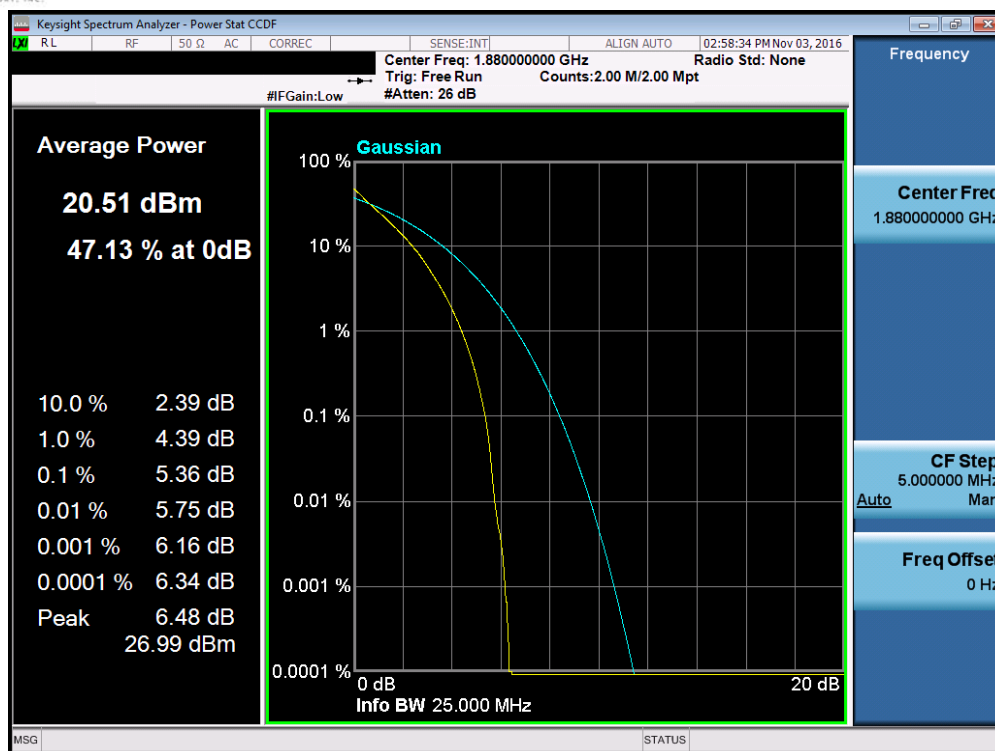


Plot 7-172. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

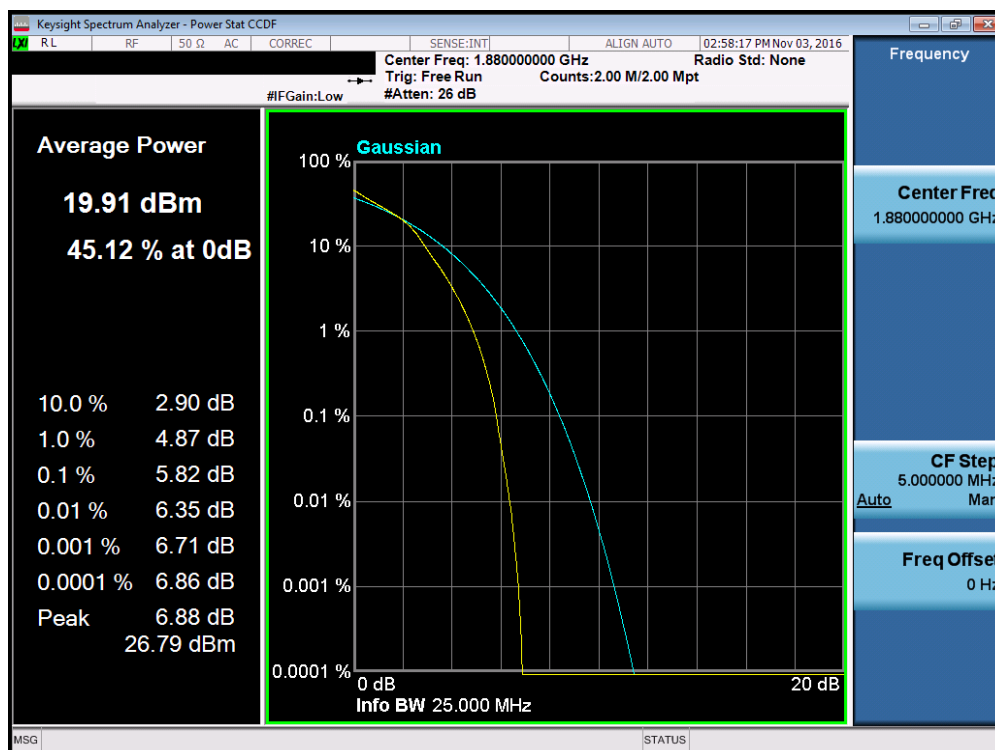


Plot 7-173. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 106 of 137

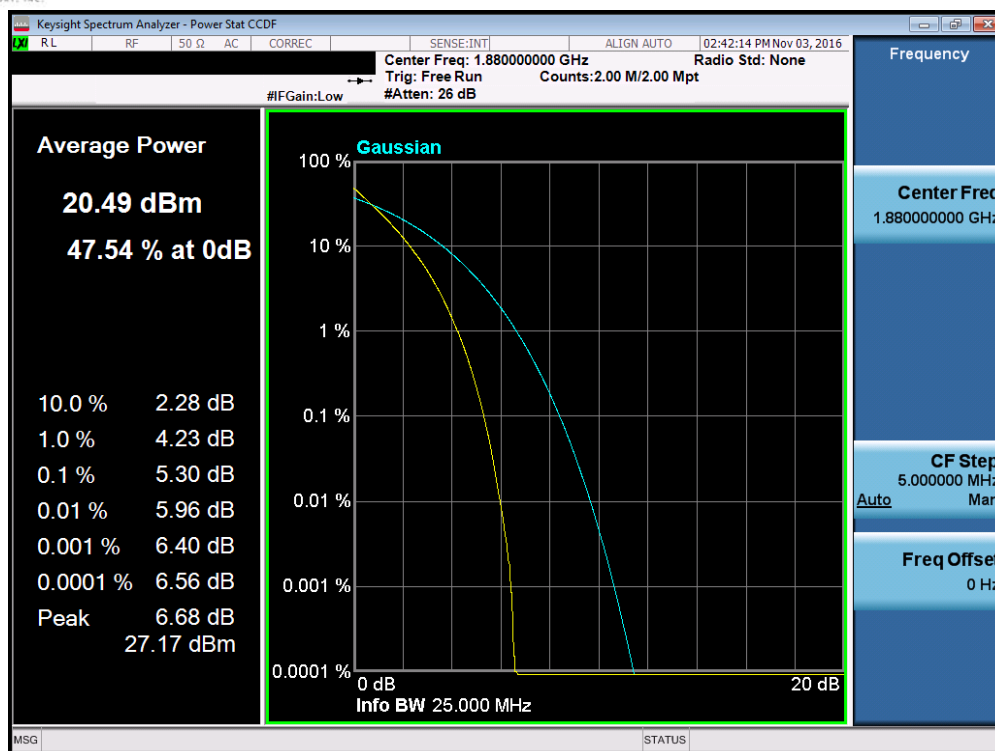


Plot 7-174. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

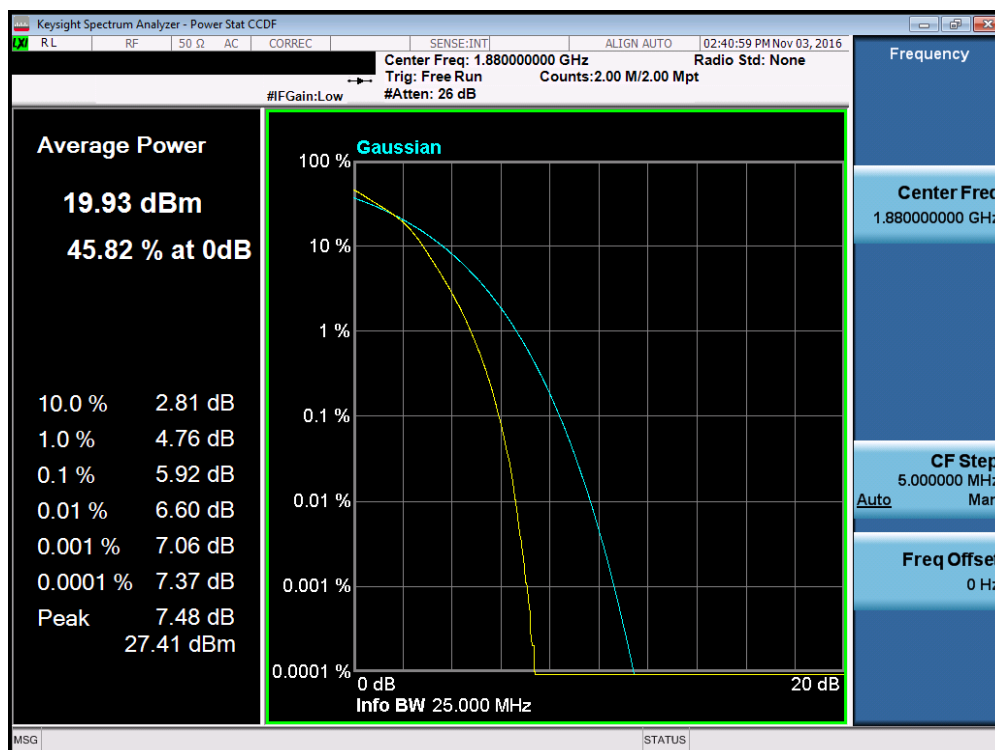


Plot 7-175. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-176. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-177. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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7.6 Radiated Power (ERP/EIRP)

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

Test Overview

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

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. 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.

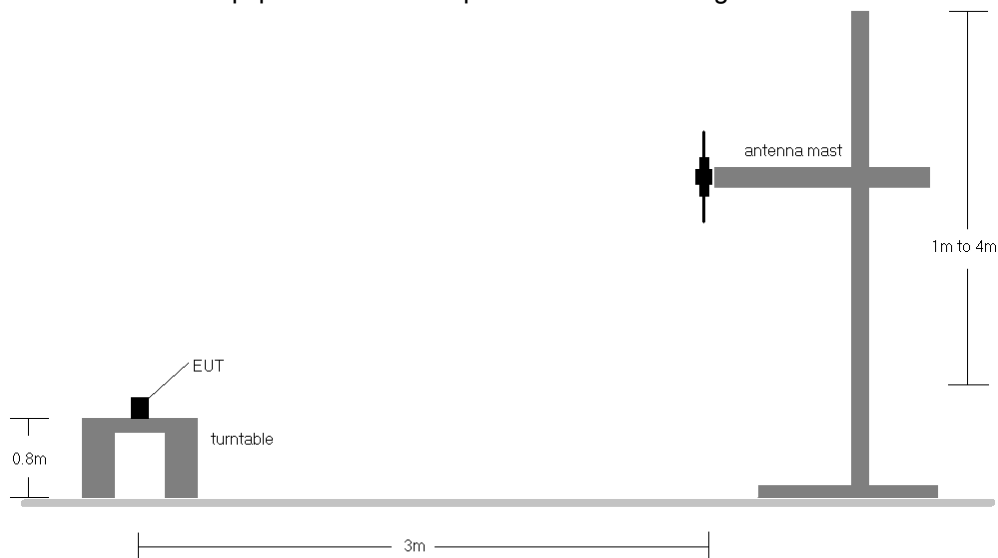


Figure 7-5. Radiated Test Setup <1GHz

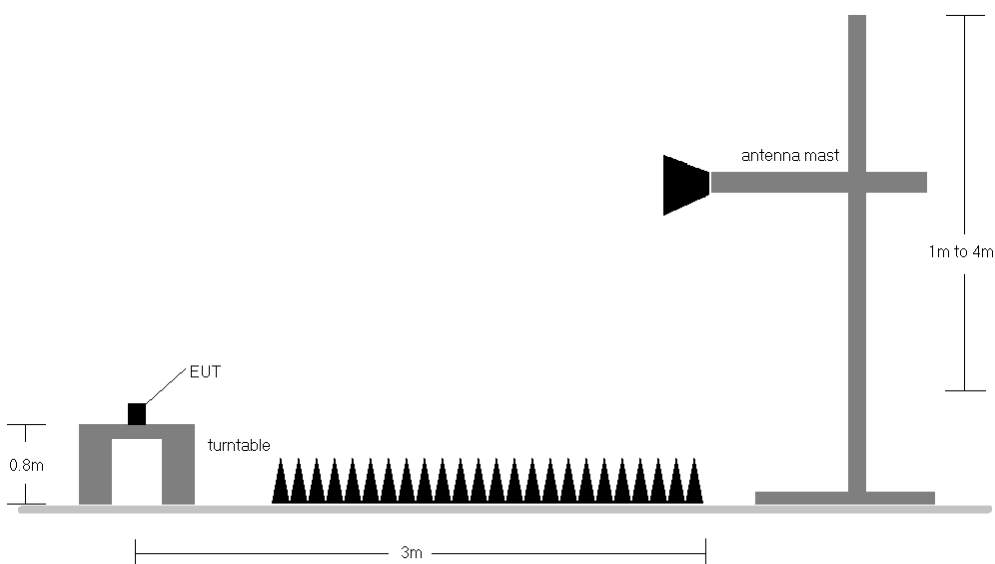


Figure 7-6. Radiated Test Setup >1GHz

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.

FCC ID: A3LSMA720F	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
706.50	5	QPSK	H	270	230	1 / 24	16.94	2.28	19.22	34.77	-15.55
710.00	5	QPSK	H	274	232	1 / 24	17.34	2.38	19.72	34.77	-15.05
713.50	5	QPSK	H	272	235	1 / 24	17.55	2.48	20.03	34.77	-14.75
706.50	5	16-QAM	H	270	230	1 / 24	15.79	2.28	18.07	34.77	-16.70
710.00	5	16-QAM	H	274	232	1 / 24	16.16	2.38	18.54	34.77	-16.23
713.50	5	16-QAM	H	272	235	1 / 24	16.60	2.48	19.08	34.77	-15.70
709.00	10	QPSK	H	273	234	1 / 49	17.45	2.35	19.80	34.77	-14.97
710.00	10	QPSK	H	270	235	1 / 49	17.48	2.38	19.86	34.77	-14.91
711.00	10	QPSK	H	273	234	1 / 49	17.60	2.41	20.01	34.77	-14.76
709.00	10	16-QAM	H	273	234	1 / 49	16.19	2.35	18.54	34.77	-16.23
710.00	10	16-QAM	H	270	235	1 / 49	16.15	2.38	18.53	34.77	-16.24
711.00	10	16-QAM	H	273	234	1 / 49	16.18	2.41	18.59	34.77	-16.18
713.50	5	QPSK	V	165	226	1 / 74	15.98	2.48	18.46	34.77	-16.32

Table 7-2. ERP Data (Band 17)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset		Page 111 of 137

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	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	145	289	1 / 0	16.57	5.01	21.58	38.45	-16.87
836.50	1.4	QPSK	V	148	280	1 / 0	15.96	5.16	21.12	38.45	-17.33
848.30	1.4	QPSK	V	135	282	1 / 0	15.76	5.30	21.06	38.45	-17.39
824.70	1.4	16-QAM	V	145	289	1 / 0	15.52	5.01	20.53	38.45	-17.92
836.50	1.4	16-QAM	V	148	280	1 / 0	14.80	5.16	19.96	38.45	-18.49
848.30	1.4	16-QAM	V	135	282	1 / 0	14.74	5.30	20.04	38.45	-18.41
825.50	3	QPSK	V	152	300	1 / 0	16.84	5.02	21.86	38.45	-16.59
836.50	3	QPSK	V	148	278	1 / 0	16.11	5.16	21.27	38.45	-17.18
847.50	3	QPSK	V	156	290	1 / 14	15.71	5.29	21.00	38.45	-17.45
825.50	3	16-QAM	V	152	300	1 / 0	15.82	5.02	20.84	38.45	-17.61
836.50	3	16-QAM	V	148	278	1 / 0	14.91	5.16	20.07	38.45	-18.38
847.50	3	16-QAM	V	156	290	1 / 14	14.53	5.29	19.82	38.45	-18.63
826.50	5	QPSK	V	145	285	1 / 0	16.71	5.03	21.74	38.45	-16.71
836.50	5	QPSK	V	143	274	1 / 0	16.16	5.16	21.32	38.45	-17.13
846.50	5	QPSK	V	138	277	1 / 24	16.00	5.28	21.28	38.45	-17.17
826.50	5	16-QAM	V	145	285	1 / 0	15.62	5.03	20.65	38.45	-17.80
836.50	5	16-QAM	V	143	274	1 / 0	14.98	5.16	20.14	38.45	-18.31
846.50	5	16-QAM	V	138	277	1 / 24	14.93	5.28	20.21	38.45	-18.24
829.00	10	QPSK	V	149	275	1 / 0	16.79	5.06	21.85	38.45	-16.60
836.50	10	QPSK	V	150	278	1 / 0	16.41	5.16	21.57	38.45	-16.88
844.00	10	QPSK	V	155	285	1 / 0	16.84	5.25	22.09	38.45	-16.36
829.00	10	16-QAM	V	149	275	1 / 0	15.58	5.06	20.64	38.45	-17.81
836.50	10	16-QAM	V	150	278	1 / 0	15.20	5.16	20.36	38.45	-18.09
844.00	10	16-QAM	V	155	285	1 / 0	15.66	5.25	20.91	38.45	-17.54
844.00	10	QPSK	H	212	235	1 / 0	15.65	5.25	20.90	38.45	-17.55

Table 7-3. ERP Data (Band 5)

FCC ID: A3LSMA720F	 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 [cm]	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	109	27	1 / 5	14.24	9.66	23.90	30.00	-6.10
1732.50	1.4	QPSK	H	293	19	1 / 0	15.54	9.61	25.15	30.00	-4.85
1754.30	1.4	QPSK	H	109	27	1 / 5	14.65	9.57	24.22	30.00	-5.78
1710.70	1.4	16-QAM	H	109	27	1 / 0	13.28	9.66	22.94	30.00	-7.06
1732.50	1.4	16-QAM	H	293	19	1 / 0	14.53	9.61	24.14	30.00	-5.86
1754.30	1.4	16-QAM	H	109	27	1 / 0	13.62	9.57	23.19	30.00	-6.81
1711.50	3	QPSK	H	291	20	1 / 14	13.99	9.65	23.64	30.00	-6.36
1732.50	3	QPSK	H	293	24	1 / 14	15.31	9.61	24.92	30.00	-5.08
1753.50	3	QPSK	H	295	32	1 / 0	13.21	9.57	22.78	30.00	-7.22
1711.50	3	16-QAM	H	291	20	1 / 14	13.01	9.65	22.66	30.00	-7.34
1732.50	3	16-QAM	H	293	24	1 / 14	14.20	9.61	23.81	30.00	-6.19
1753.50	3	16-QAM	H	295	32	1 / 0	12.08	9.57	21.65	30.00	-8.35
1712.50	5	QPSK	H	100	23	1 / 0	13.80	9.65	23.45	30.00	-6.55
1732.50	5	QPSK	H	292	24	1 / 0	15.36	9.61	24.97	30.00	-5.03
1752.50	5	QPSK	H	100	23	1 / 24	15.19	9.57	24.76	30.00	-5.24
1712.50	5	16-QAM	H	100	23	1 / 0	12.70	9.65	22.35	30.00	-7.65
1732.50	5	16-QAM	H	292	24	1 / 0	14.14	9.61	23.75	30.00	-6.25
1752.50	5	16-QAM	H	100	23	1 / 24	13.91	9.57	23.48	30.00	-6.52
1715.00	10	QPSK	H	294	22	1 / 49	14.25	9.65	23.90	30.00	-6.10
1732.50	10	QPSK	H	293	22	1 / 49	15.27	9.61	24.88	30.00	-5.12
1750.00	10	QPSK	H	294	20	1 / 0	14.50	9.58	24.08	30.00	-5.92
1715.00	10	16-QAM	H	294	22	1 / 49	13.16	9.65	22.81	30.00	-7.19
1732.50	10	16-QAM	H	293	22	1 / 49	13.79	9.61	23.40	30.00	-6.60
1750.00	10	16-QAM	H	294	20	1 / 0	13.33	9.58	22.91	30.00	-7.09
1717.50	15	QPSK	H	293	24	1 / 74	14.34	9.64	23.98	30.00	-6.02
1732.50	15	QPSK	H	293	28	1 / 74	14.99	9.61	24.60	30.00	-5.40
1747.50	15	QPSK	H	109	21	1 / 74	15.30	9.58	24.88	30.00	-5.12
1717.50	15	16-QAM	H	293	24	1 / 74	13.06	9.64	22.70	30.00	-7.30
1732.50	15	16-QAM	H	293	28	1 / 74	13.68	9.61	23.29	30.00	-6.71
1747.50	15	16-QAM	H	109	21	1 / 0	14.18	9.58	23.76	30.00	-6.24
1720.00	20	QPSK	H	285	24	1 / 99	15.33	9.64	24.97	30.00	-5.03
1732.50	20	QPSK	H	292	19	1 / 99	15.03	9.61	24.64	30.00	-5.36
1745.00	20	QPSK	H	300	45	1 / 0	15.25	9.59	24.84	30.00	-5.16
1720.00	20	16-QAM	H	285	24	1 / 99	14.08	9.64	23.72	30.00	-6.28
1732.50	20	16-QAM	H	292	19	1 / 99	13.69	9.61	23.30	30.00	-6.70
1745.00	20	16-QAM	H	300	45	1 / 0	14.03	9.59	23.62	30.00	-6.38
1732.50	1.4	QPSK	V	100	228	50 / 25	13.54	9.61	23.15	30.00	-6.85

Table 7-4. EIRP Data (Band 4)

FCC ID: A3LSMA720F		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 [cm]	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	111	242	1 / 0	11.91	9.35	21.26	33.01	-11.75
1880.00	1.4	QPSK	H	110	78	1 / 0	11.49	9.27	20.76	33.01	-12.25
1909.30	1.4	QPSK	H	113	84	1 / 5	9.72	9.25	18.97	33.01	-14.04
1850.70	1.4	16-QAM	H	111	242	1 / 0	10.58	9.35	19.93	33.01	-13.08
1880.00	1.4	16-QAM	H	110	78	1 / 0	10.17	9.27	19.44	33.01	-13.57
1909.30	1.4	16-QAM	H	113	84	1 / 5	8.53	9.25	17.78	33.01	-15.23
1851.50	3	QPSK	H	111	246	1 / 14	12.02	9.35	21.37	33.01	-11.64
1880.00	3	QPSK	H	112	82	1 / 0	11.14	9.27	20.41	33.01	-12.60
1908.50	3	QPSK	H	111	83	1 / 0	10.17	9.25	19.42	33.01	-13.59
1851.50	3	16-QAM	H	111	246	1 / 14	10.59	9.35	19.94	33.01	-13.07
1880.00	3	16-QAM	H	112	82	1 / 0	9.68	9.27	18.95	33.01	-14.06
1908.50	3	16-QAM	H	111	83	1 / 0	8.67	9.25	17.92	33.01	-15.09
1852.50	5	QPSK	H	115	245	1 / 24	12.24	9.34	21.58	33.01	-11.43
1880.00	5	QPSK	H	110	78	1 / 0	11.74	9.27	21.01	33.01	-12.00
1907.50	5	QPSK	H	112	82	1 / 0	10.40	9.24	19.64	33.01	-13.37
1852.50	5	16-QAM	H	115	245	1 / 24	10.68	9.34	20.02	33.01	-12.99
1880.00	5	16-QAM	H	110	78	1 / 0	10.25	9.27	19.52	33.01	-13.49
1907.50	5	16-QAM	H	112	82	1 / 0	9.05	9.24	18.29	33.01	-14.72
1855.00	10	QPSK	H	110	80	1 / 49	12.02	9.34	21.36	33.01	-11.65
1880.00	10	QPSK	H	110	77	1 / 49	11.77	9.27	21.04	33.01	-11.97
1905.00	10	QPSK	H	110	80	1 / 0	11.17	9.24	20.41	33.01	-12.60
1855.00	10	16-QAM	H	110	80	1 / 49	10.37	9.34	19.71	33.01	-13.30
1880.00	10	16-QAM	H	110	77	1 / 49	10.02	9.27	19.29	33.01	-13.72
1905.00	10	16-QAM	H	110	80	1 / 0	9.47	9.24	18.71	33.01	-14.30
1857.50	15	QPSK	H	111	80	1 / 0	11.31	9.33	20.64	33.01	-12.37
1880.00	15	QPSK	H	110	78	1 / 74	12.05	9.27	21.32	33.01	-11.69
1902.50	15	QPSK	H	111	82	1 / 0	11.03	9.23	20.26	33.01	-12.75
1857.50	15	16-QAM	H	111	80	1 / 0	11.80	9.33	21.13	33.01	-11.88
1880.00	15	16-QAM	H	110	78	1 / 74	10.32	9.27	19.59	33.01	-13.42
1902.50	15	16-QAM	H	111	82	1 / 0	9.57	9.23	18.80	33.01	-14.21
1860.00	20	QPSK	H	112	80	1 / 99	11.32	9.32	20.64	33.01	-12.37
1880.00	20	QPSK	H	112	73	1 / 0	11.42	9.27	20.69	33.01	-12.32
1900.00	20	QPSK	H	110	77	1 / 0	11.17	9.22	20.39	33.01	-12.62
1860.00	20	16-QAM	H	112	80	1 / 99	9.75	9.32	19.07	33.01	-13.94
1880.00	20	16-QAM	H	112	73	1 / 0	9.77	9.27	19.04	33.01	-13.97
1900.00	20	16-QAM	H	110	77	1 / 0	9.64	9.22	18.86	33.01	-14.15
1852.50	5	QPSK	V	166	129	1 / 99	12.03	9.34	21.37	33.01	-11.64

Table 7-5. EIRP Data (Band 2)

FCC ID: A3LSMA720F	 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 [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	197	290	1 / 24	14.07	8.60	22.67	33.01	-10.34
2593.00	5	QPSK	H	117	285	1 / 0	12.57	8.53	21.10	33.01	-11.91
2687.50	5	QPSK	H	122	300	1 / 24	9.77	8.79	18.56	33.01	-14.45
2498.50	5	16-QAM	H	197	290	1 / 24	11.77	8.60	20.37	33.01	-12.64
2593.00	5	16-QAM	H	117	285	1 / 0	10.86	8.53	19.39	33.01	-13.62
2687.50	5	16-QAM	H	122	300	1 / 24	8.77	8.79	17.56	33.01	-15.45
2501.00	10	QPSK	H	100	293	1 / 49	15.30	8.60	23.90	33.01	-9.11
2593.00	10	QPSK	H	100	54	1 / 49	14.45	8.53	22.98	33.01	-10.03
2685.00	10	QPSK	H	105	274	1 / 0	8.77	8.78	17.55	33.01	-15.46
2501.00	10	16-QAM	H	100	293	1 / 49	14.37	8.60	22.97	33.01	-10.04
2593.00	10	16-QAM	H	100	54	1 / 49	13.79	8.53	22.32	33.01	-10.69
2685.00	10	16-QAM	H	105	274	1 / 0	7.17	8.78	15.95	33.01	-17.06
2503.50	15	QPSK	H	100	286	1 / 74	15.27	8.59	23.86	33.01	-9.15
2593.00	15	QPSK	H	100	97	1 / 0	11.77	8.53	20.30	33.01	-12.71
2682.50	15	QPSK	H	100	273	1 / 74	10.07	8.77	18.84	33.01	-14.17
2503.50	15	16-QAM	H	100	286	1 / 74	13.57	8.59	22.16	33.01	-10.85
2593.00	15	16-QAM	H	100	97	1 / 0	11.57	8.53	20.10	33.01	-12.91
2682.50	15	16-QAM	H	100	273	1 / 74	7.57	8.77	16.34	33.01	-16.67
2506.00	20	QPSK	H	100	285	1 / 99	14.82	8.59	23.41	33.01	-9.60
2593.00	20	QPSK	H	118	285	1 / 99	12.68	8.53	21.21	33.01	-11.80
2680.00	20	QPSK	H	111	272	1 / 0	10.39	8.77	19.16	33.01	-13.85
2506.00	20	16-QAM	H	100	285	1 / 99	11.57	8.59	20.16	33.01	-12.85
2593.00	20	16-QAM	H	118	285	1 / 99	11.57	8.53	20.10	33.01	-12.91
2680.00	20	16-QAM	H	111	272	1 / 0	8.57	8.77	17.34	33.01	-15.67
2501.00	10	QPSK	V	100	64	1 / 0	11.86	8.60	20.46	33.01	-12.55

Table 7-6. EIRP Data (Band 41)

FCC ID: A3LSMA720F		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(g) §27.53(h) §27.53(m)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

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

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Test Setup

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

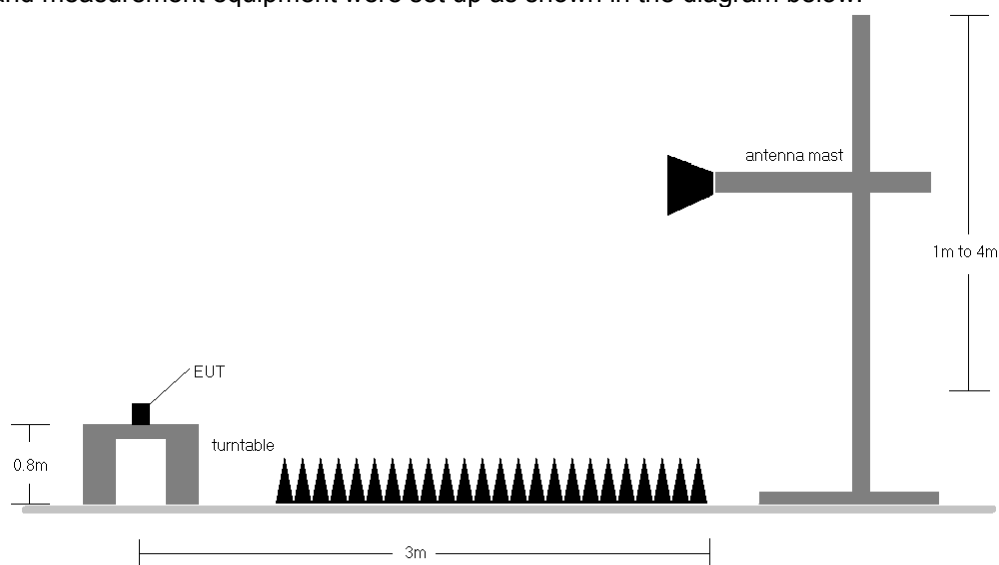


Figure 7-7. Test Instrument & Measurement Setup

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: 706.50 MHz
 CHANNEL: 23755
 MEASURED OUTPUT POWER: 19.22 dBm = 0.084 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.22 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1413.00	H	100	148	-56.97	5.68	-51.29	70.5
2119.50	H	-	-	-69.14	6.73	-62.40	81.6

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

OPERATING FREQUENCY: 710.00 MHz
 CHANNEL: 23790
 MEASURED OUTPUT POWER: 19.72 dBm = 0.094 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 32.72 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1420.00	H	100	146	-60.22	5.73	-54.49	74.2
2130.00	H	-	-	-68.28	6.78	-61.50	81.2

Table 7-8. Radiated Spurious Data (Band 17 – Mid Channel)

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23825
 MEASURED OUTPUT POWER: 20.03 dBm = 0.101 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 33.03 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	100	123	-60.00	5.79	-54.21	74.2
2140.50	H	100	79	-67.71	6.82	-60.89	80.9

Table 7-9. Radiated Spurious Data (Band 17 – High Channel)

OPERATING FREQUENCY: 829.00 MHz
 CHANNEL: 20450
 MEASURED OUTPUT POWER: 21.85 dBm = 0.153 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.85 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1658.00	V	101	257	-64.46	6.70	-57.76	79.6
2487.00	V	-	-	-71.81	7.58	-64.24	86.1
3316.00	V	-	-	-65.29	7.42	-57.88	79.7
4145.00	V	100	301	-64.58	8.13	-56.45	78.3

Table 7-10. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: A3LSMA720F		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: 21.57 dBm = 0.143 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.57 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	V	100	264	-62.51	6.70	-55.82	77.4
2509.50	V	-	-	-68.46	7.63	-60.83	82.4
3346.00	V	-	-	-65.95	7.51	-58.44	80.0
4182.50	V	182	364	-65.52	8.23	-57.29	78.9

Table 7-11. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY: 844.00 MHz
 CHANNEL: 20600
 MEASURED OUTPUT POWER: 22.09 dBm = 0.162 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.09 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1688.00	V	100	78	-63.08	6.70	-56.38	78.5
2532.00	V	-	-	-68.91	7.61	-61.30	83.4
3376.00	V	-	-	-64.71	7.61	-57.10	79.2
4220.00	V	100	20	-65.17	8.33	-56.84	78.9

Table 7-12. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1710.70 MHz
 CHANNEL: 19957
 MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.90 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3421.40	H	100	280	-58.22	8.14	-50.08	74.0
5132.10	H	100	362	-62.08	10.36	-51.72	75.6

Table 7-13. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 25.15 dBm = 0.328 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 38.15 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3465.00	H	-	-	-65.79	8.26	-57.53	82.7
5197.50	H	-	-	-63.73	10.41	-53.31	78.5

Table 7-14. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY: 1754.30 MHz
 CHANNEL: 20393
 MEASURED OUTPUT POWER: 24.22 dBm = 0.264 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 1.4 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.22 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3508.60	H	100	319	-59.29	8.37	-50.92	75.1
5262.90	H	-	-	-62.87	10.35	-52.52	76.7

Table 7-15. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY: 1852.50 MHz
 CHANNEL: 18625
 MEASURED OUTPUT POWER: 21.58 dBm = 0.144 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.58 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3705.00	H	125	352	-65.64	9.52	-56.12	77.7
5557.50	H	111	339	-65.68	11.03	-54.65	76.2
7410.00	H	142	315	-58.76	10.95	-47.81	69.4
9262.50	H	-	-	-58.22	11.53	-46.69	68.3

Table 7-16. Radiated Spurious Data (Band 2 – Low Channel)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 21.01 dBm = 0.126 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.01 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	H	198	254	-61.97	9.39	-52.59	73.6
5640.00	H	159	115	-64.73	11.22	-53.51	74.5
7520.00	H	150	320	-52.90	11.10	-41.80	62.8
9400.00	H	-	-	-56.65	11.54	-45.11	66.1

Table 7-17. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY: 1907.50 MHz
 CHANNEL: 19175
 MEASURED OUTPUT POWER: 19.64 dBm = 0.092 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.64 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3815.00	H	185	291	-58.02	9.32	-48.70	68.3
5722.50	H	-	-	-65.88	11.35	-54.53	74.2

Table 7-18. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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OPERATING FREQUENCY: 2501.00 MHz
 CHANNEL: 39700
 MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 48.90 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5002.00	H	-	-	-63.91	10.16	-53.75	77.6
7503.00	H	-	-	-62.64	12.04	-50.60	74.5

Table 7-19. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MEASURED OUTPUT POWER: 22.98 dBm = 0.199 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 47.98 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5186.00	H	-	-	-64.57	10.40	-54.17	77.2
7779.00	H	-	-	-62.83	12.24	-50.59	73.6

Table 7-20. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY: 2685.00 MHz
 CHANNEL: 41540
 MEASURED OUTPUT POWER: 17.55 dBm = 0.057 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W)$ 42.55 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5370.00	H	-	-	-63.71	10.36	-53.34	70.9
8055.00	H	-	-	-61.79	12.52	-49.27	66.8

Table 7-21. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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7.8 Frequency Stability / Temperature Variation

\$2.1055 \$22.355 \$24.235 \$27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. The frequency stability of the transmitter is measured by:

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

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 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-D-2010

Test Settings

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

Test Setup

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

Test Notes

None

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Band 17 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY: 710,000,000 Hz

CHANNEL: 23090

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	709,999,835	-165	-0.0000233
100 %		- 30	709,999,873	-127	-0.0000179
100 %		- 20	709,999,860	-140	-0.0000197
100 %		- 10	709,999,925	-75	-0.0000106
100 %		0	709,999,928	-72	-0.0000102
100 %		+ 10	709,999,816	-184	-0.0000259
100 %		+ 20	709,999,849	-151	-0.0000213
100 %		+ 30	709,999,825	-175	-0.0000246
100 %		+ 40	709,999,832	-168	-0.0000237
100 %		+ 50	709,999,853	-147	-0.0000207
BATT. ENDPOINT	3.45	+ 20	709,999,910	-90	-0.0000127

Table 7-22. Frequency Stability Data (Band 17)

FCC ID: A3LSMA720F		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

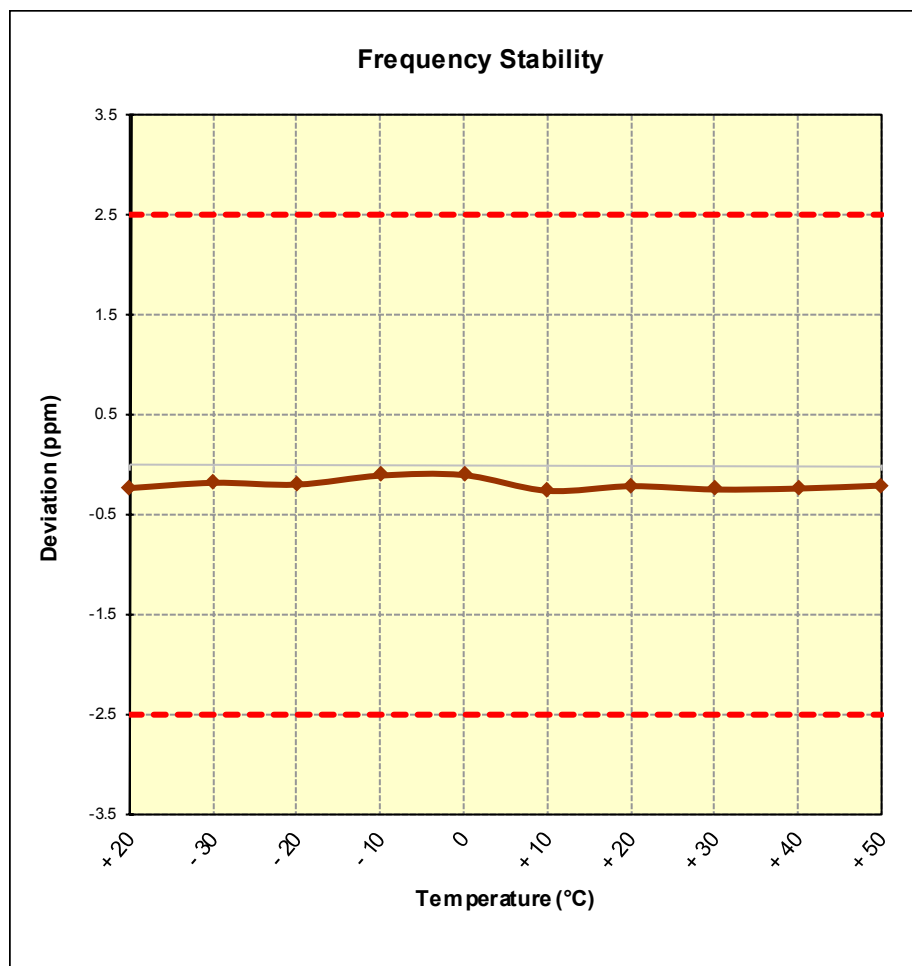


Figure 7-8. Frequency Stability Graph (Band 17)

FCC ID: A3LSMA720F		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)	836,499,843	-157	-0.0000188
100 %		- 30	836,499,841	-159	-0.0000190
100 %		- 20	836,499,979	-21	-0.0000025
100 %		- 10	836,499,931	-69	-0.0000082
100 %		0	836,499,895	-105	-0.0000126
100 %		+ 10	836,499,829	-171	-0.0000204
100 %		+ 20	836,499,881	-119	-0.0000142
100 %		+ 30	836,499,933	-67	-0.0000080
100 %		+ 40	836,499,930	-70	-0.0000083
100 %		+ 50	836,499,856	-144	-0.0000173
BATT. ENDPOINT	3.45	+ 20	836,499,989	-11	-0.0000013

Table 7-23. Frequency Stability Data (Band 5)

FCC ID: A3LSMA720F		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

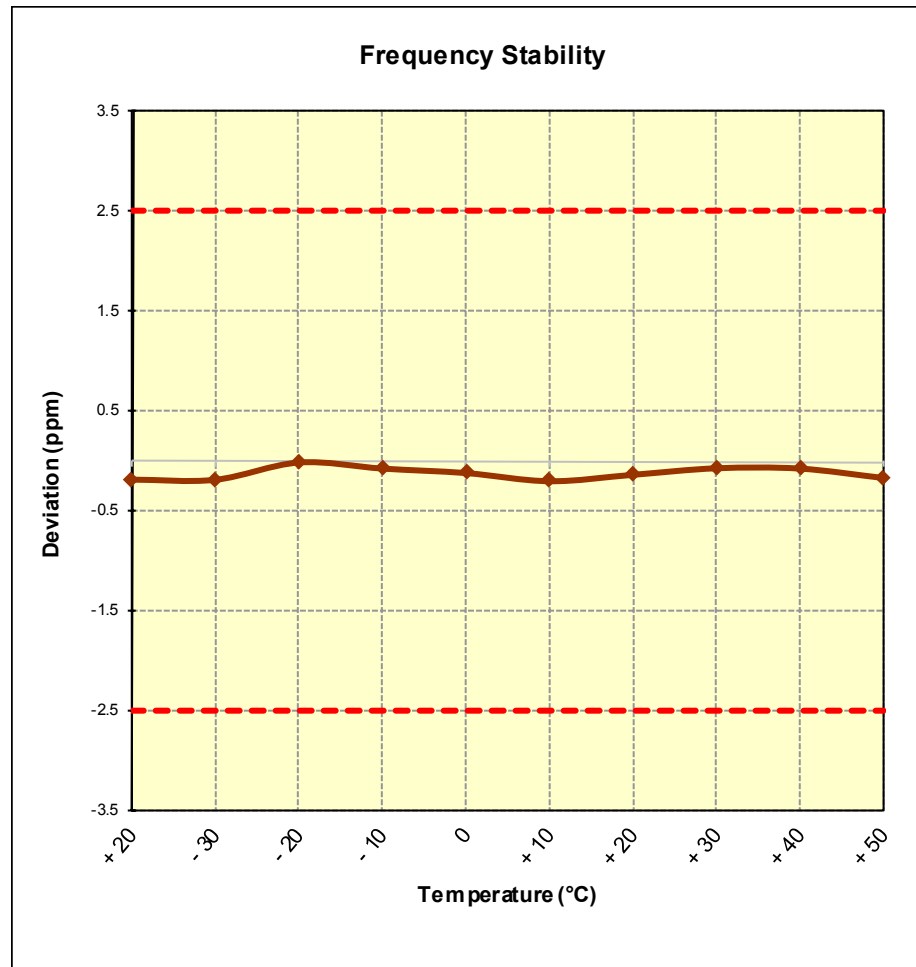


Figure 7-9. Frequency Stability Graph (Band 5)

FCC ID: A3LSMA720F			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)	1,732,499,906	-94	-0.0000054
100 %		- 30	1,732,499,980	-20	-0.0000012
100 %		- 20	1,732,499,828	-172	-0.0000099
100 %		- 10	1,732,499,869	-131	-0.0000075
100 %		0	1,732,499,860	-140	-0.0000081
100 %		+ 10	1,732,499,825	-175	-0.0000101
100 %		+ 20	1,732,499,827	-173	-0.0000100
100 %		+ 30	1,732,499,957	-43	-0.0000025
100 %		+ 40	1,732,499,881	-119	-0.0000069
100 %		+ 50	1,732,499,900	-100	-0.0000058
BATT. ENDPOINT	3.45	+ 20	1,732,499,807	-193	-0.0000111

Table 7-24. 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.

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Band 4 Frequency Stability Measurements

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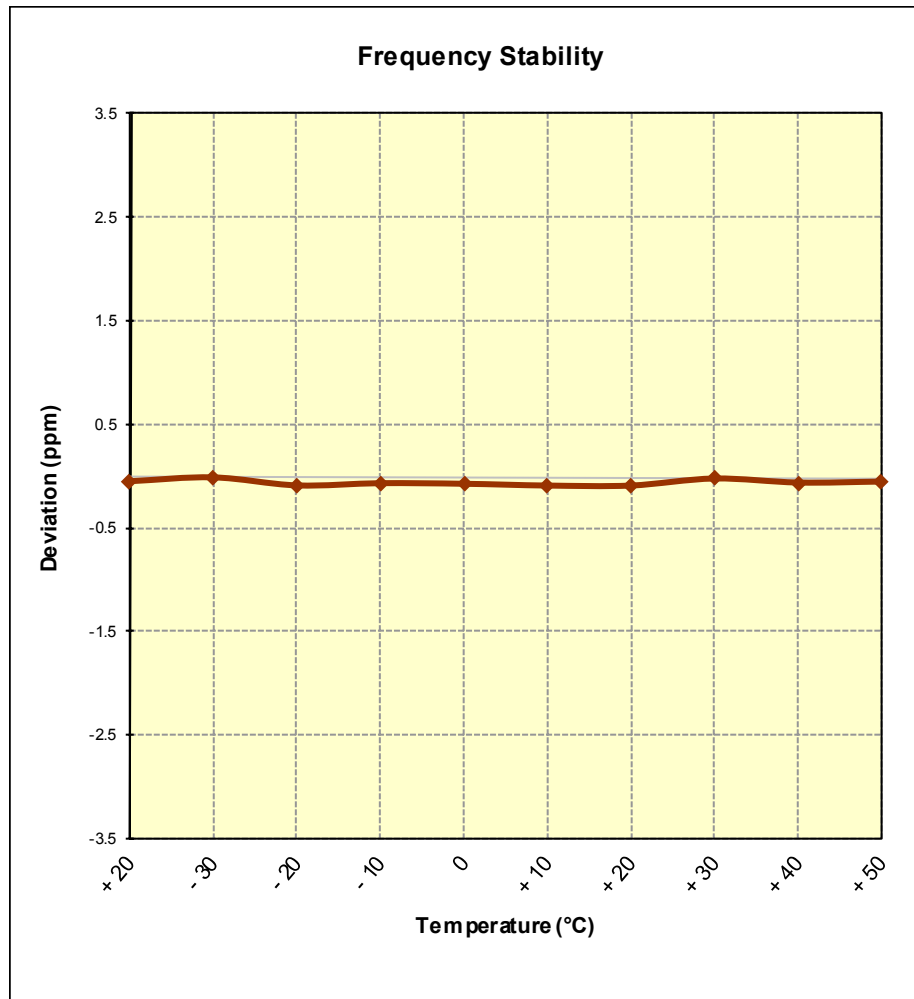


Figure 7-10. Frequency Stability Graph (Band 4)

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,947	-53	-0.0000028
100 %		- 30	1,879,999,938	-62	-0.0000033
100 %		- 20	1,879,999,905	-95	-0.0000050
100 %		- 10	1,879,999,853	-147	-0.0000078
100 %		0	1,879,999,926	-74	-0.0000039
100 %		+ 10	1,879,999,970	-30	-0.0000016
100 %		+ 20	1,879,999,974	-26	-0.0000014
100 %		+ 30	1,879,999,932	-68	-0.0000036
100 %		+ 40	1,879,999,961	-39	-0.0000021
100 %		+ 50	1,879,999,891	-109	-0.0000058
BATT. ENDPOINT	3.45	+ 20	1,879,999,823	-177	-0.0000094

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

Note:

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

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Band 2 Frequency Stability Measurements

§2.1055 §24.235

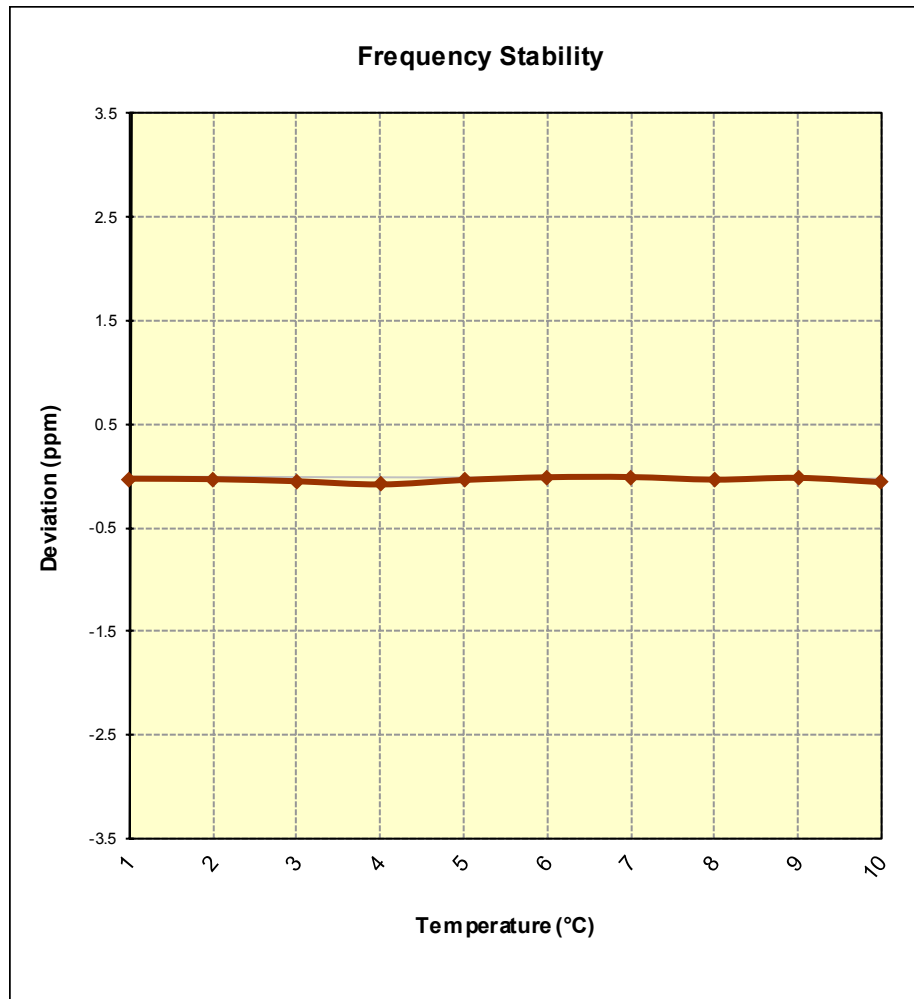


Figure 7-11. Frequency Stability Graph (Band 2)

FCC ID: A3LSMA720F		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)	2,592,999,838	-162	-0.0000063
100 %		- 30	2,592,999,889	-111	-0.0000043
100 %		- 20	2,592,999,937	-63	-0.0000024
100 %		- 10	2,592,999,852	-148	-0.0000057
100 %		0	2,592,999,874	-126	-0.0000048
100 %		+ 10	2,592,999,887	-113	-0.0000044
100 %		+ 20	2,592,999,836	-164	-0.0000063
100 %		+ 30	2,592,999,860	-140	-0.0000054
100 %		+ 40	2,592,999,894	-106	-0.0000041
100 %		+ 50	2,592,999,836	-164	-0.0000063
BATT. ENDPOINT	3.45	+ 20	2,592,999,921	-79	-0.0000030

Table 7-26. 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.

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Band 41 Frequency Stability Measurements
§2.1055 §27.54

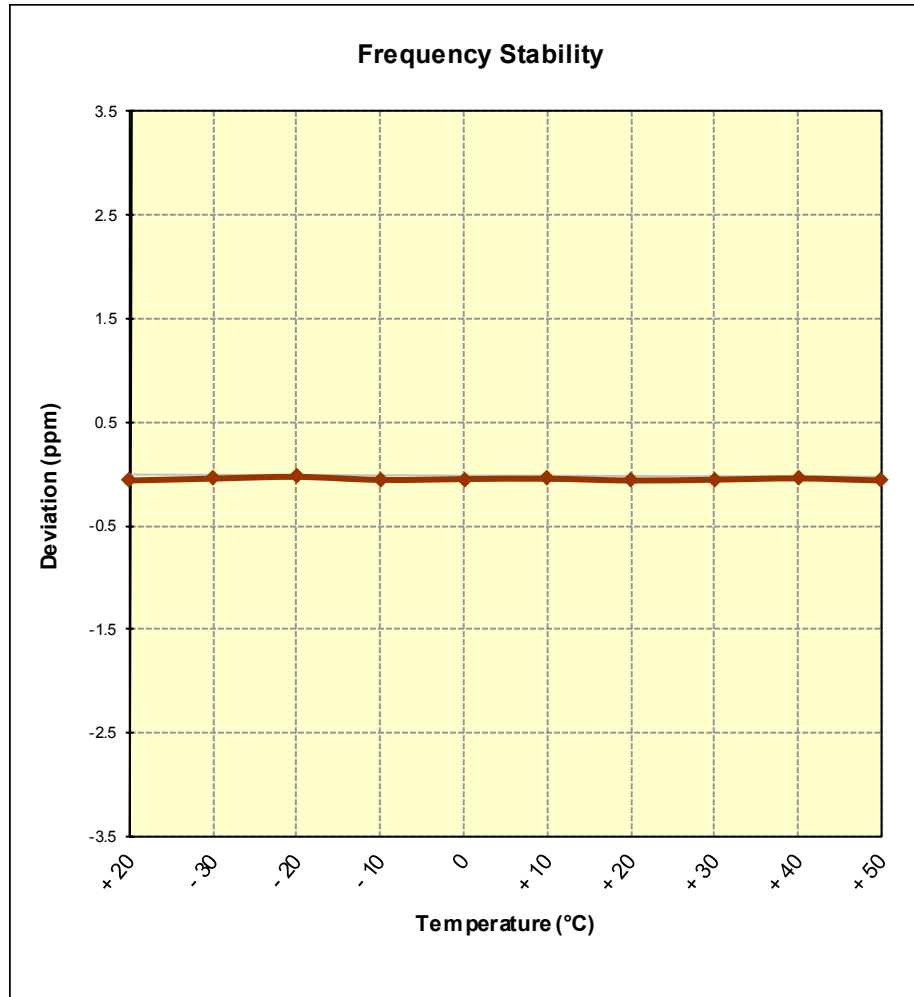


Figure 7-12. Frequency Stability Graph (Band 41)

FCC ID: A3LSMA720F		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: A3LSMA720F** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: A3LSMA720F		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1611041685.A3L	Test Dates: 11/3 - 11/19/2016	EUT Type: Portable Handset	Page 137 of 137	