

## 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 7 is as noted in the Test Notes on the following page.***

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

### Test Procedure Used

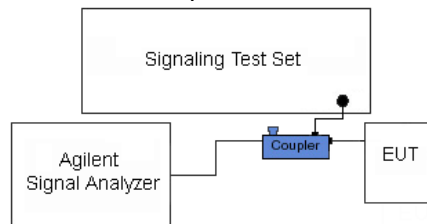
KDB 971168 D01 v02r02 – Section 6.0

### 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 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq$  2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Test Setup

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



**Figure 7-3. Test Instrument & Measurement Setup**

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

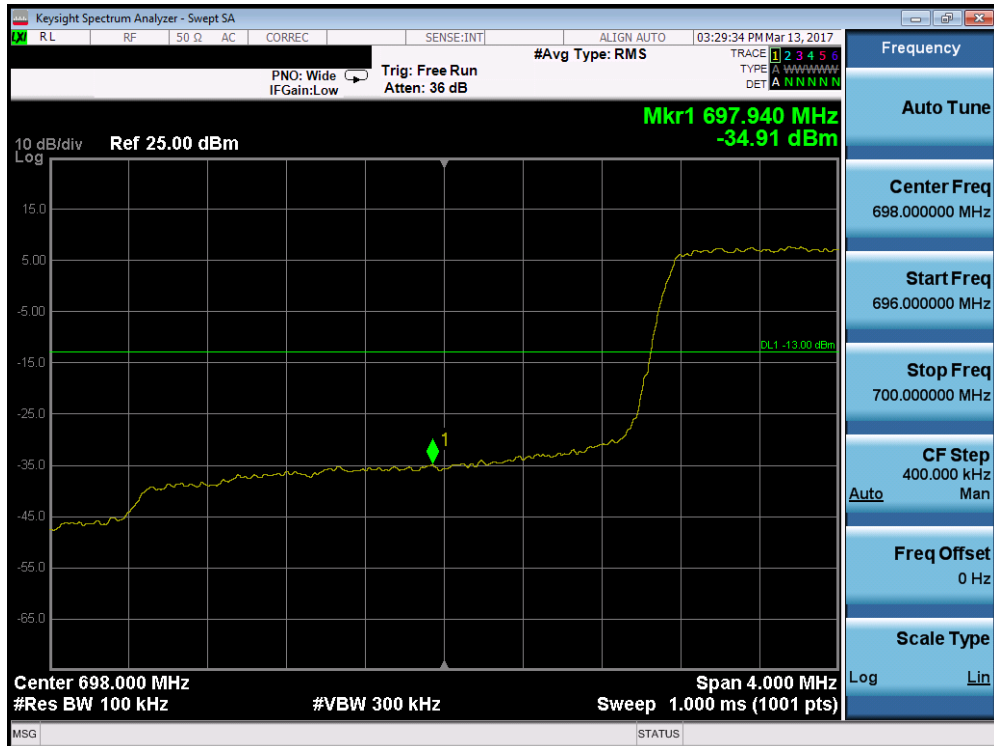


Plot 7-94. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-95. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

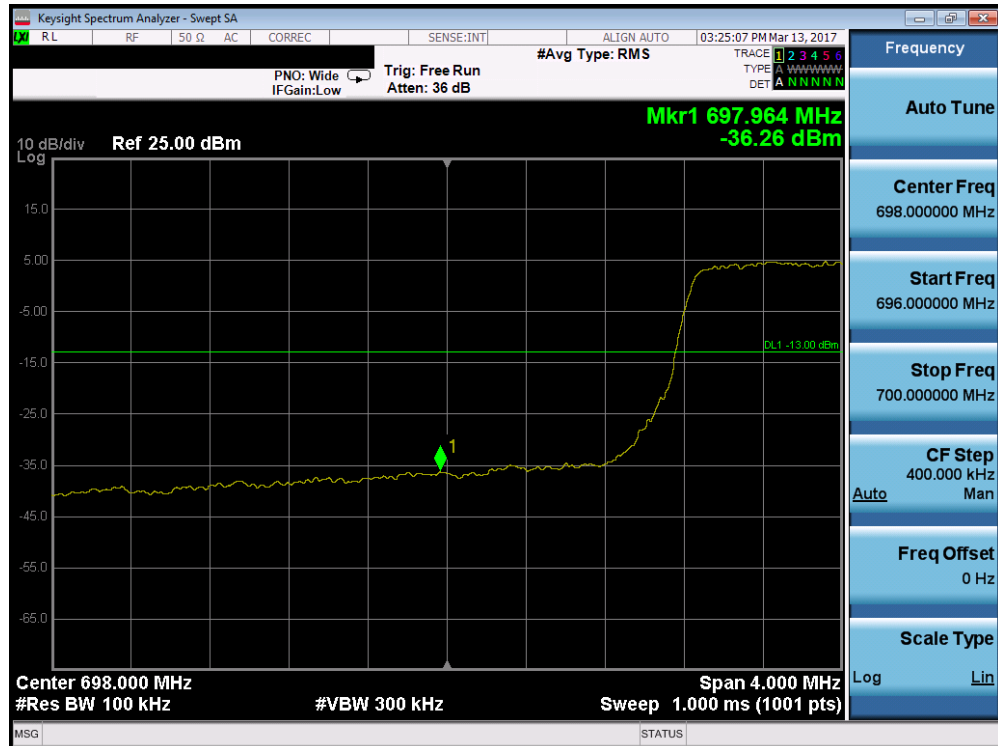


Plot 7-96. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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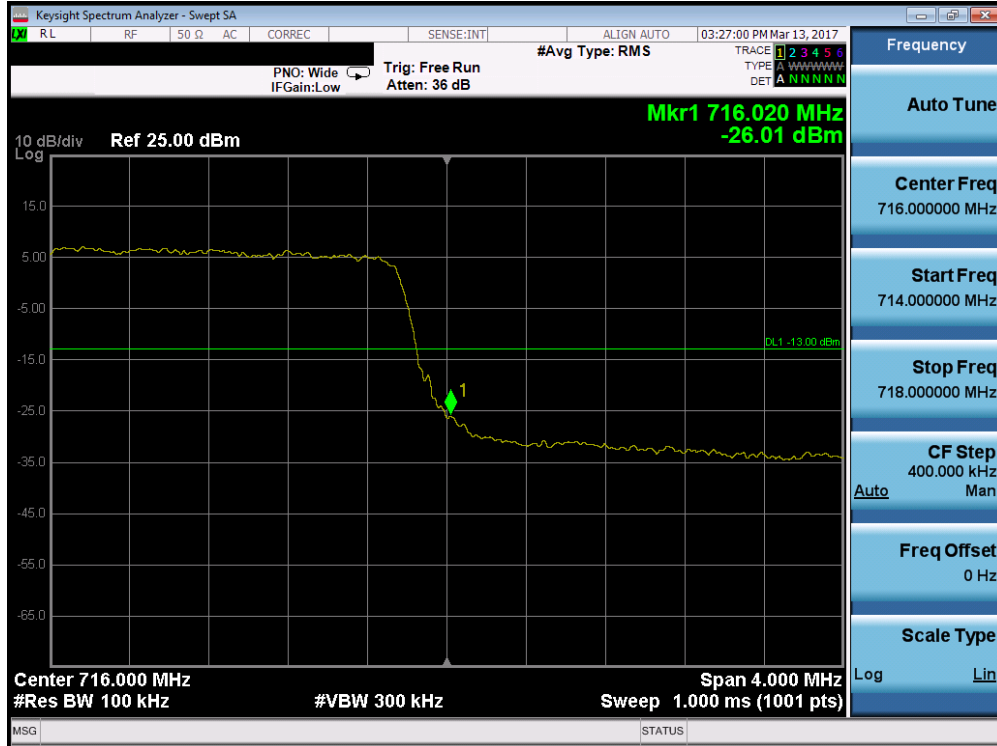


Plot 7-97. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

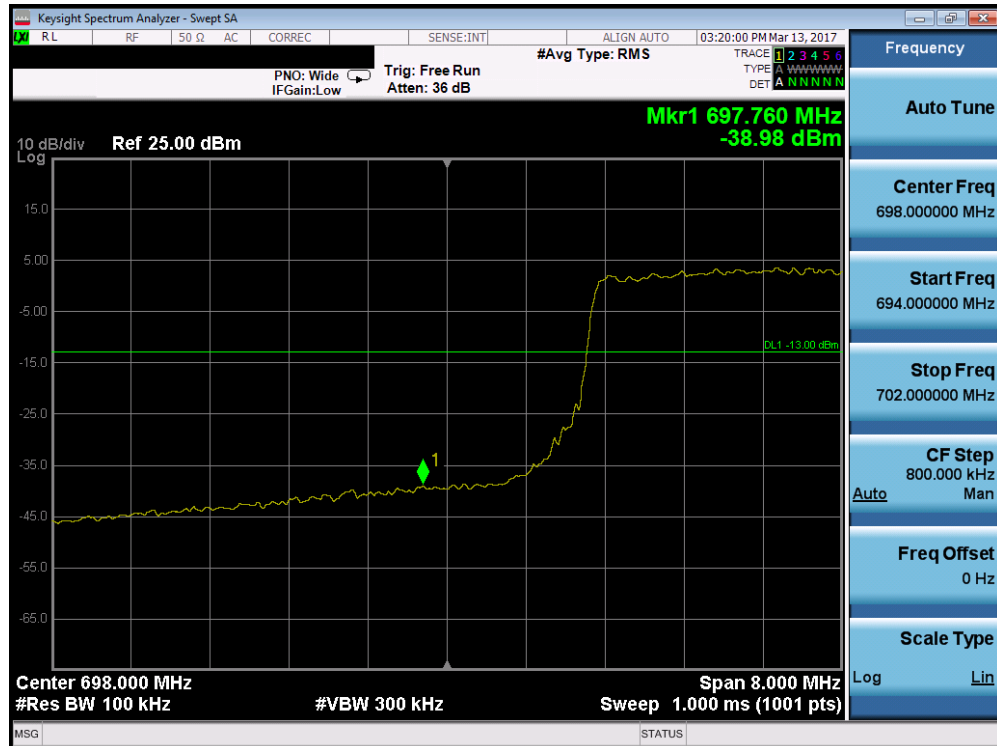


Plot 7-98. Lower Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-99. Upper Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

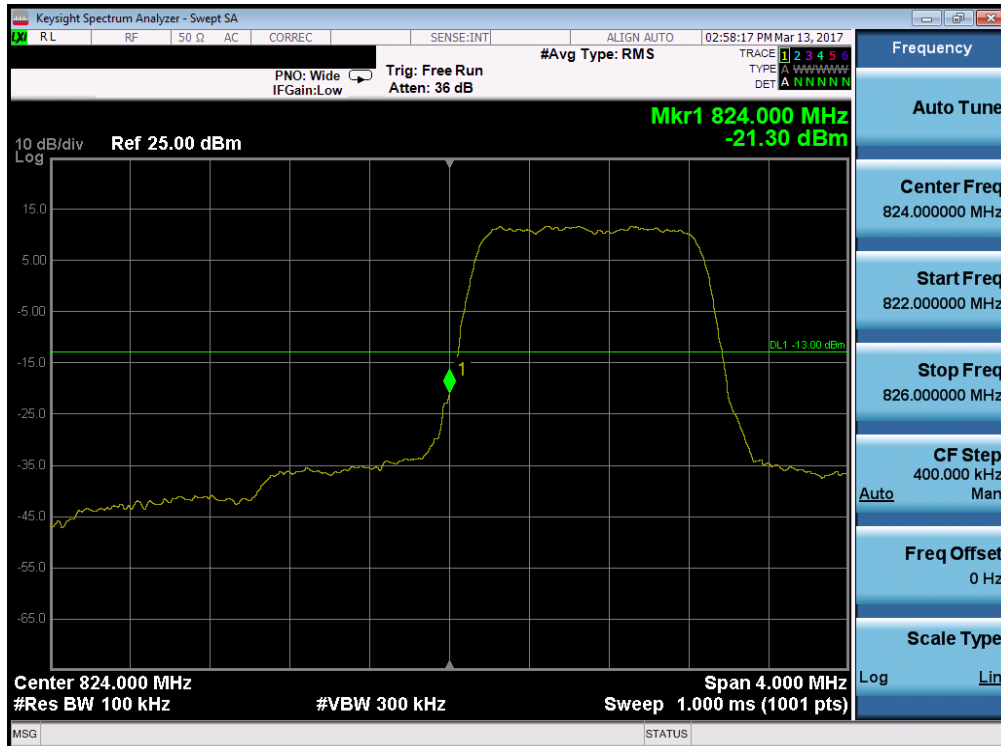


Plot 7-100. Lower Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-101. Upper Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

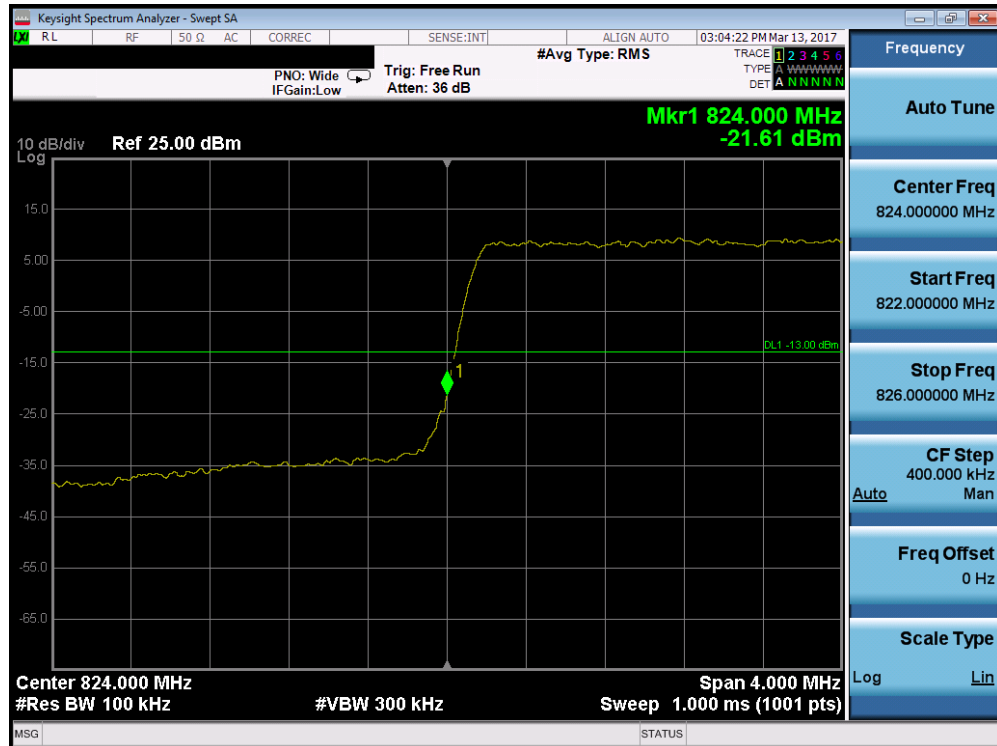


Plot 7-102. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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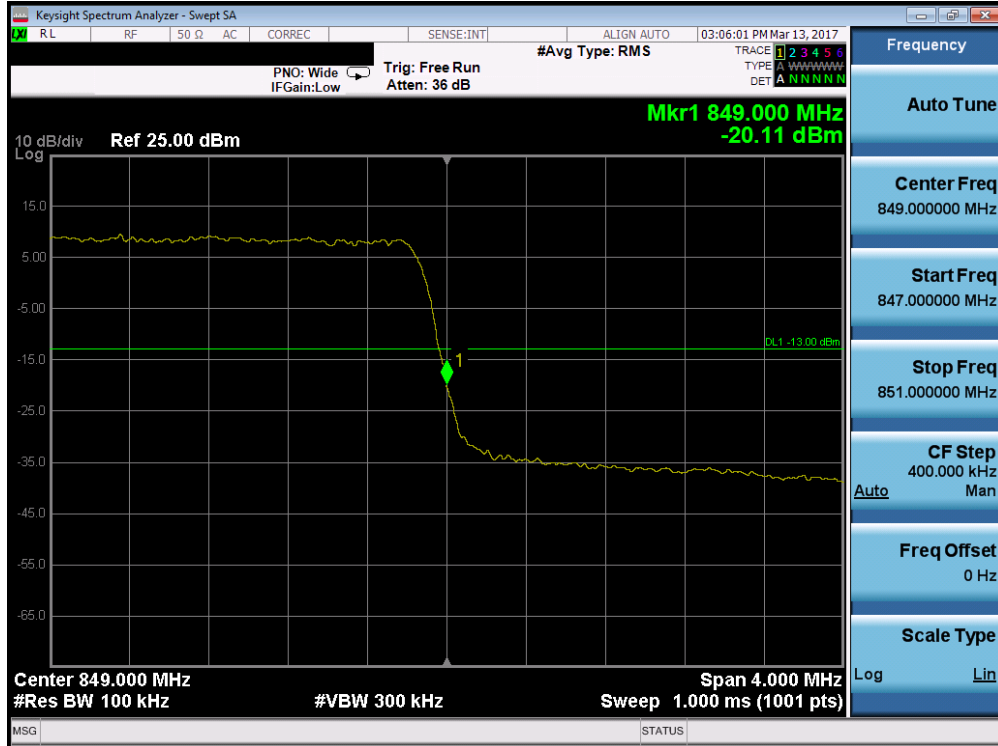


Plot 7-103. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

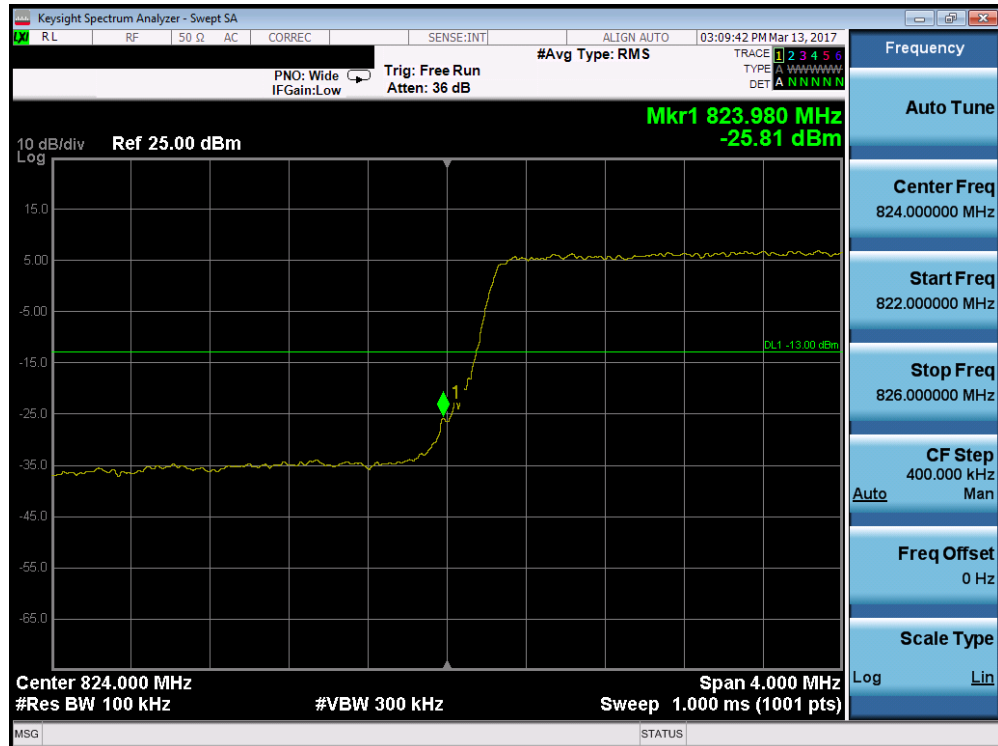


Plot 7-104. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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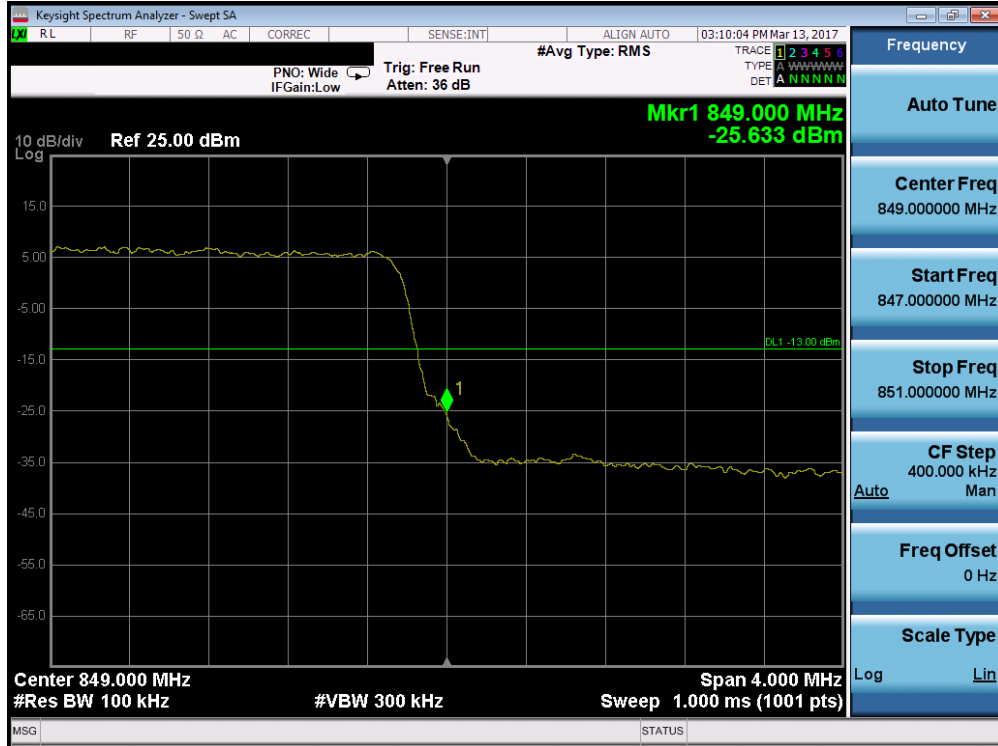
Plot 7-105. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



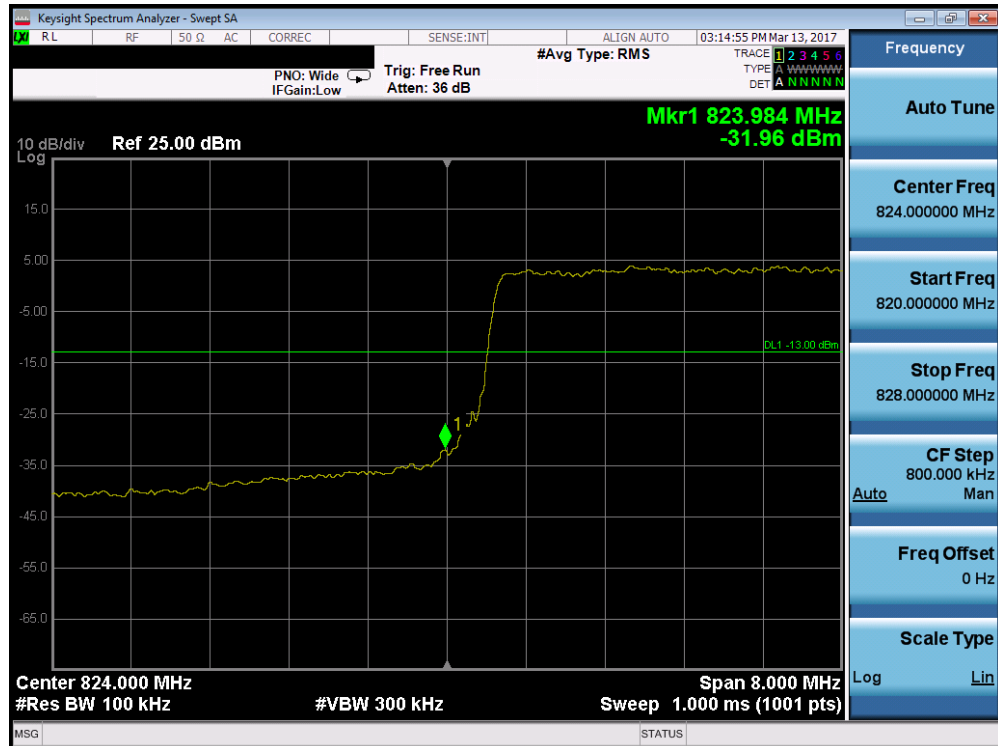
Plot 7-106. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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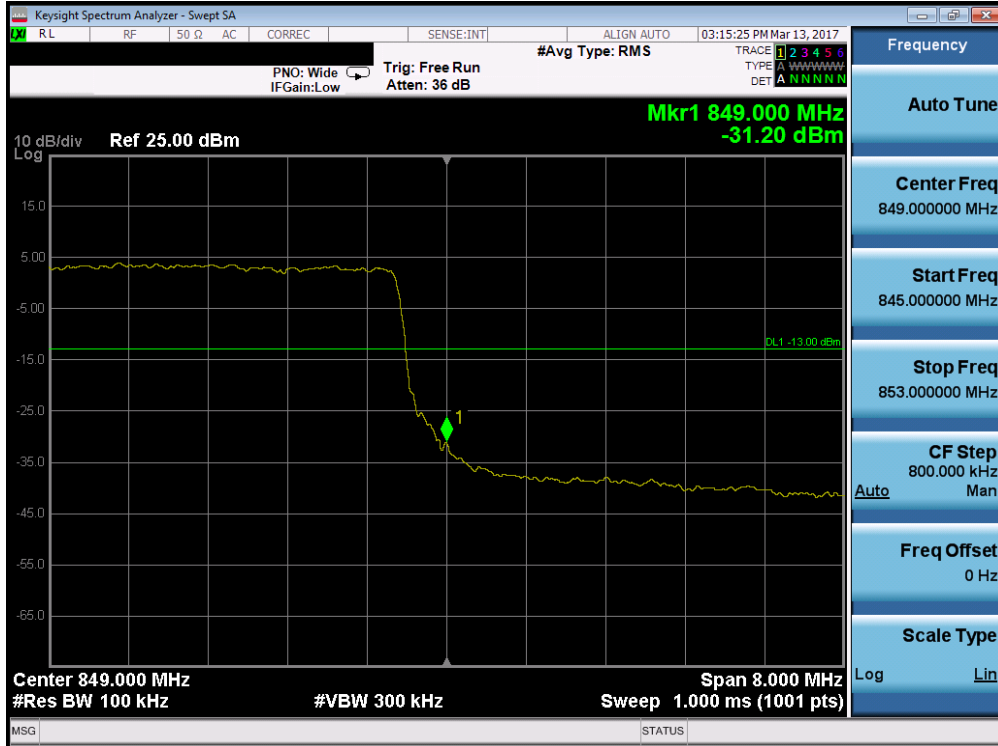


Plot 7-107. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

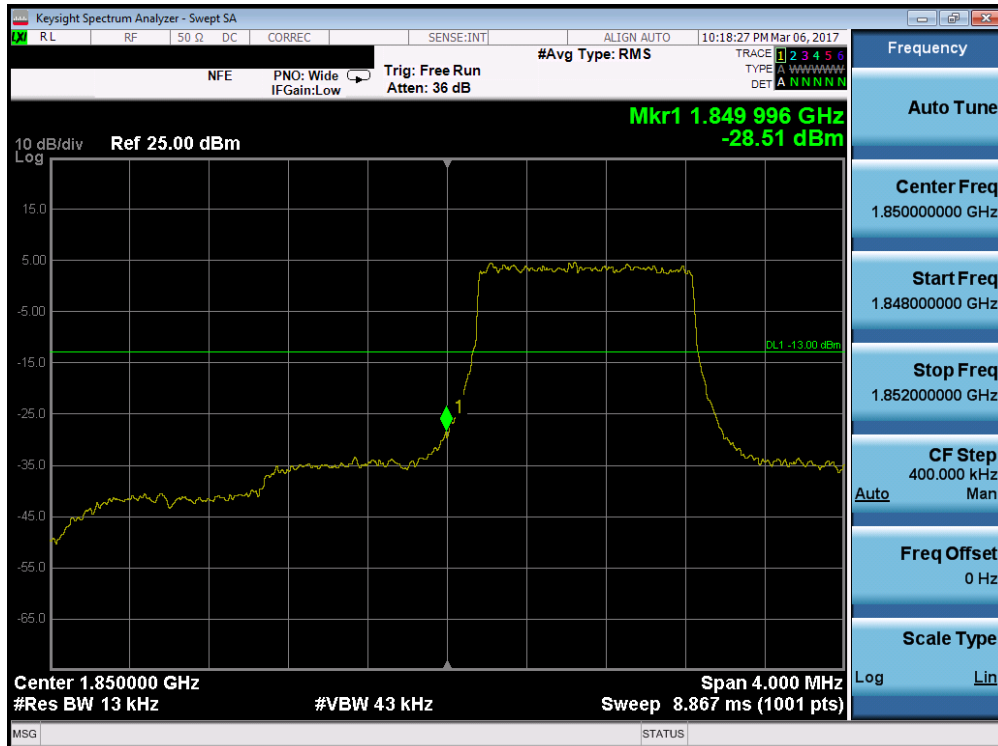


Plot 7-108. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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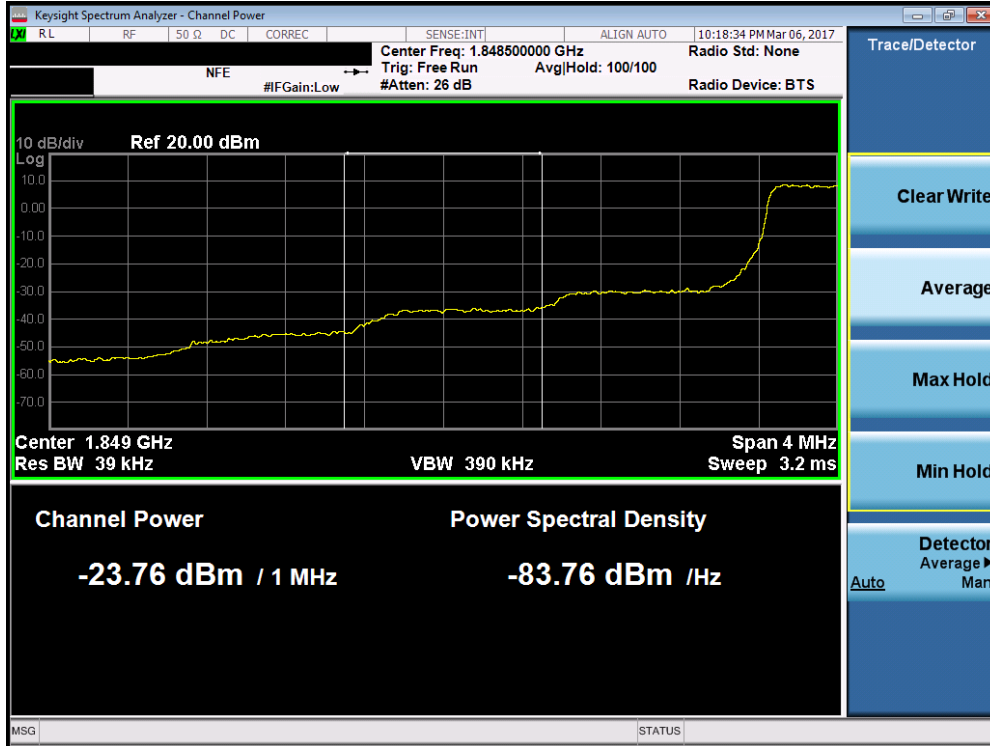


Plot 7-109. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 7-110. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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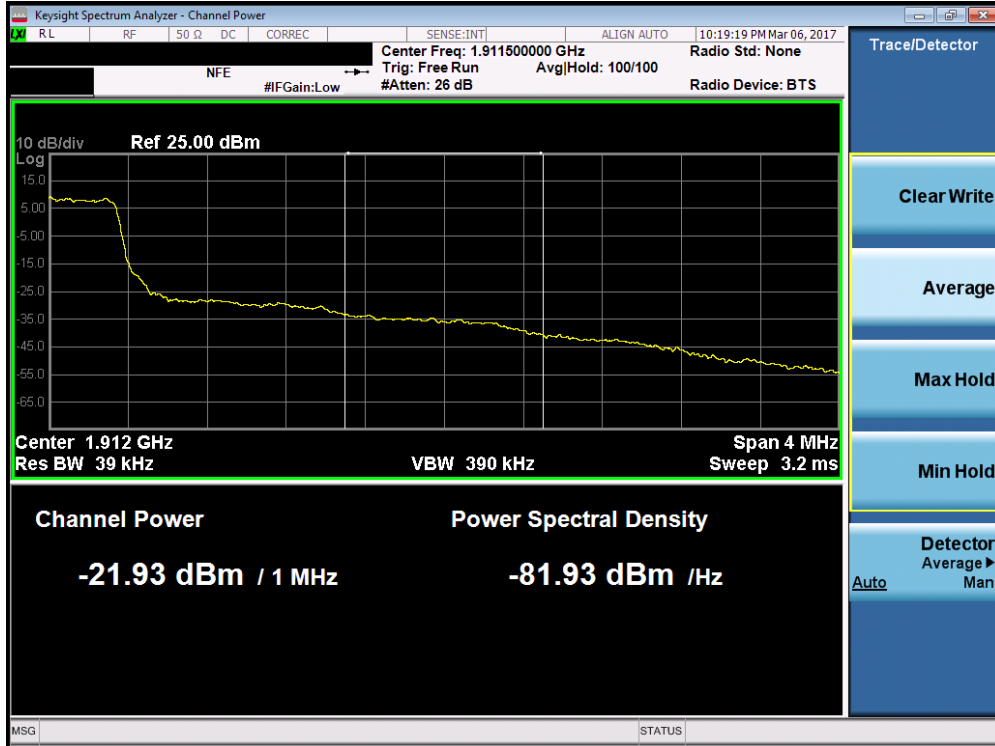


Plot 7-111. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

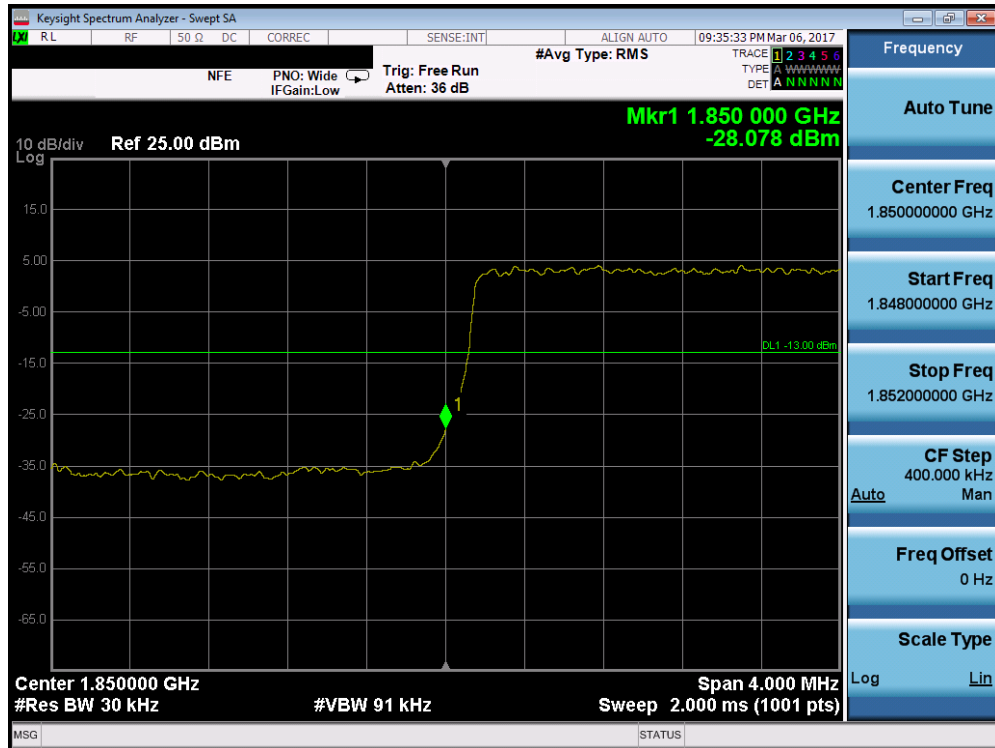


Plot 7-112. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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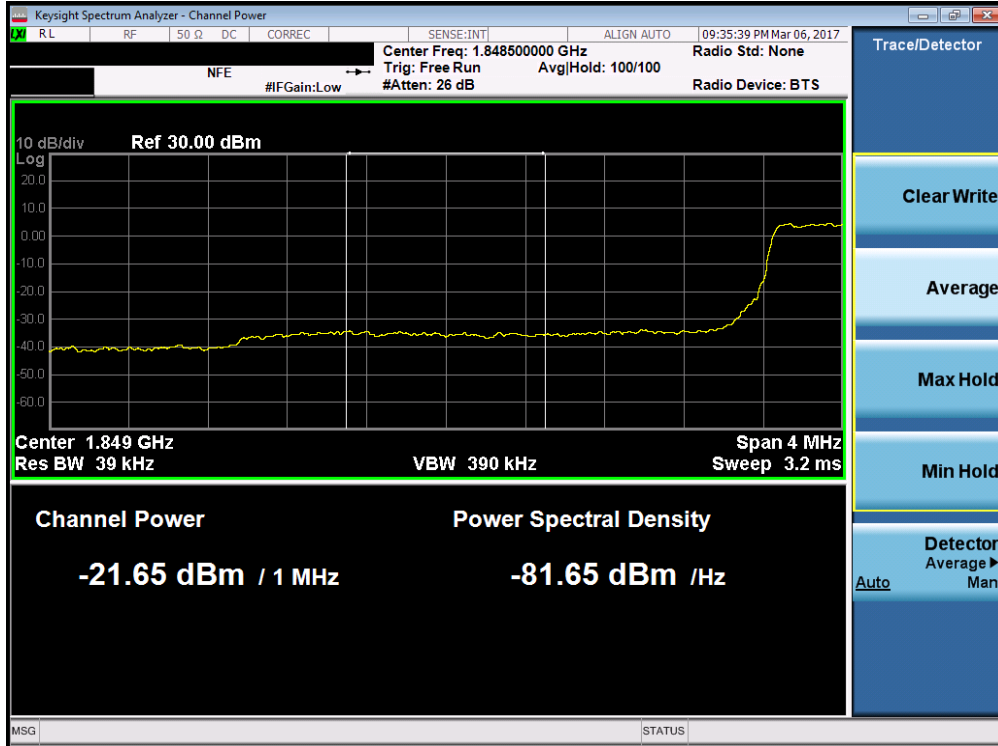


Plot 7-113. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

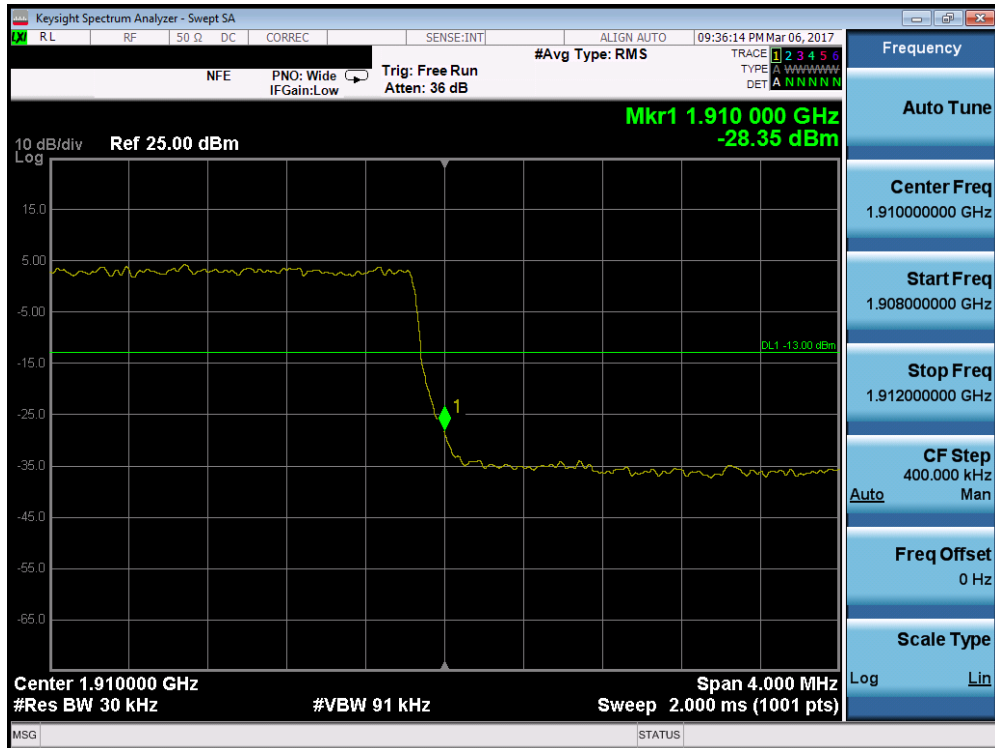


Plot 7-114. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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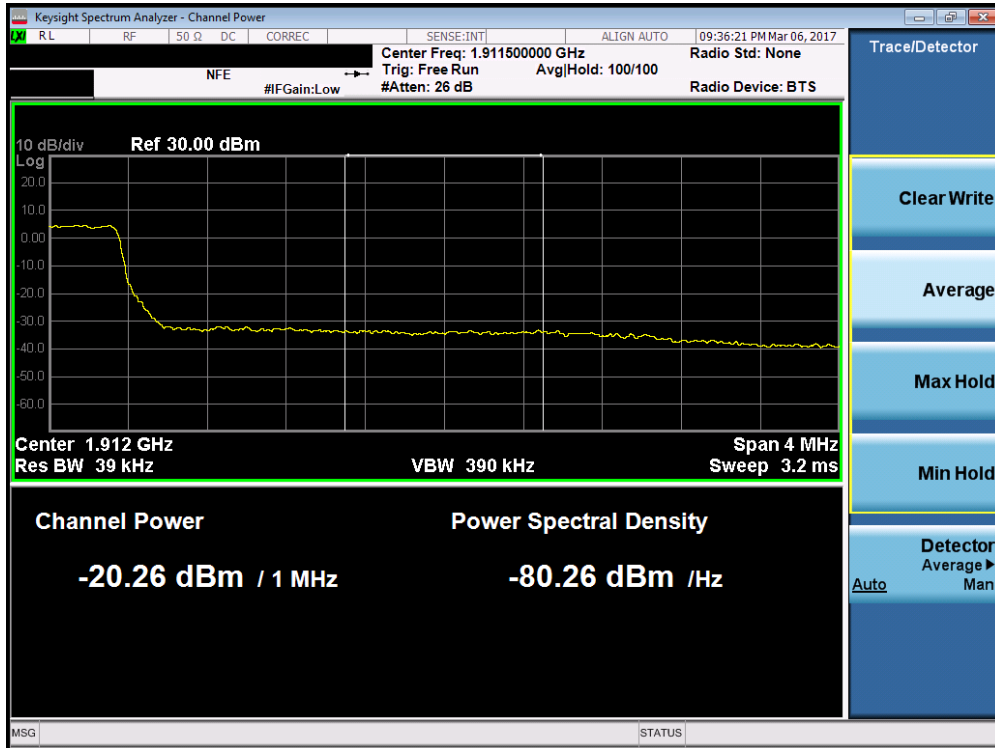


Plot 7-115. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

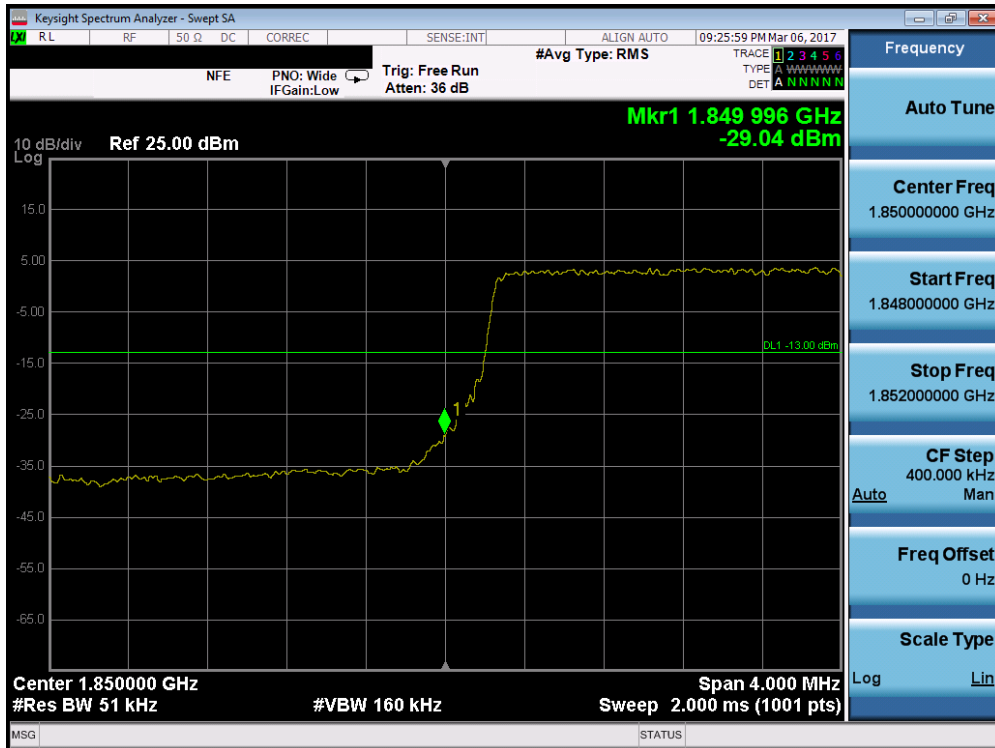


Plot 7-116. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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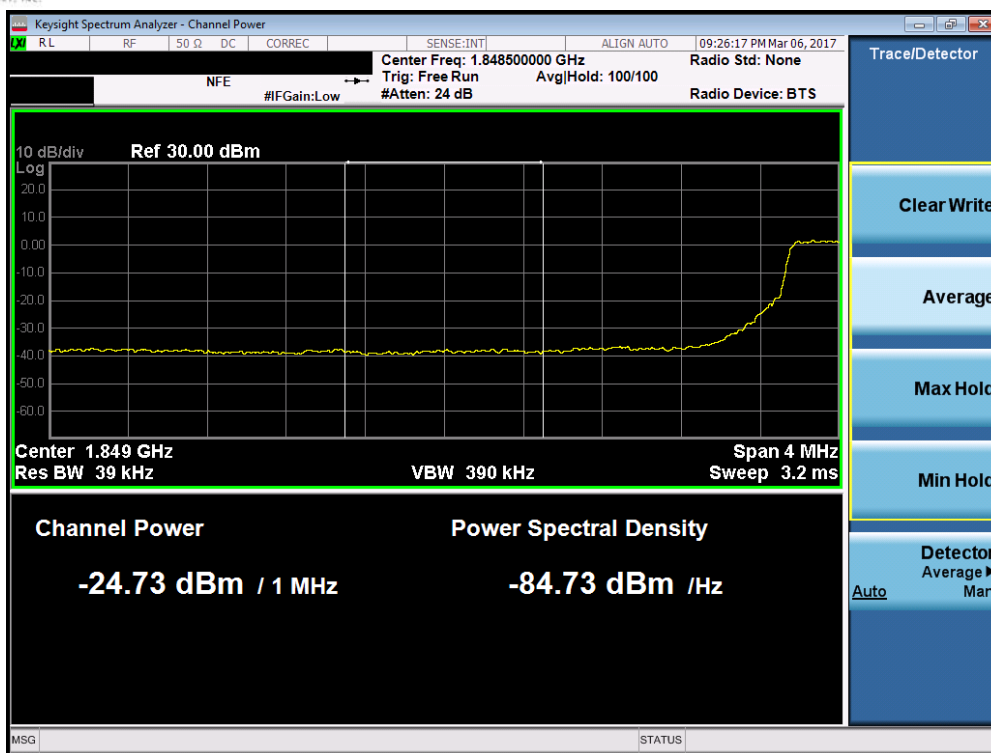


Plot 7-117. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

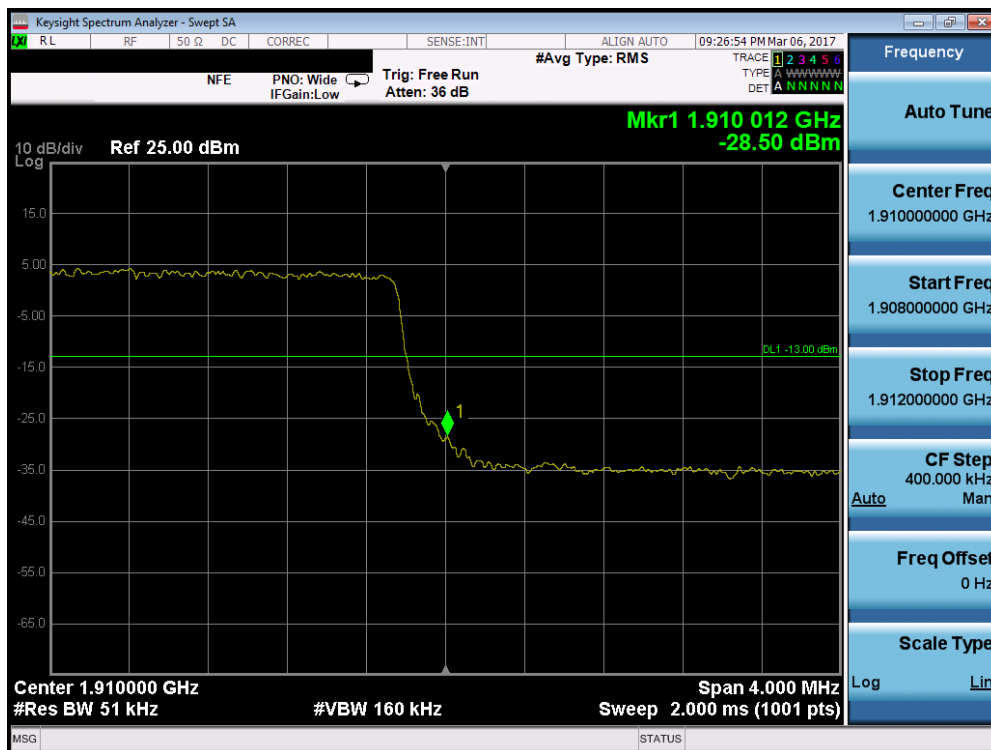


Plot 7-118. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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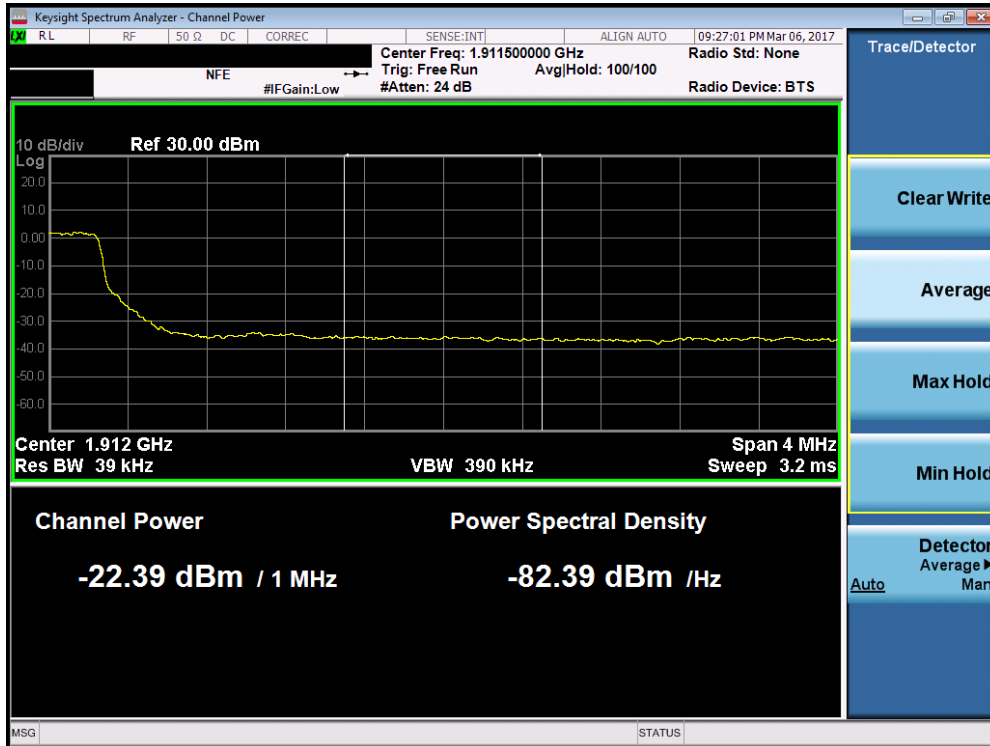


Plot 7-119. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

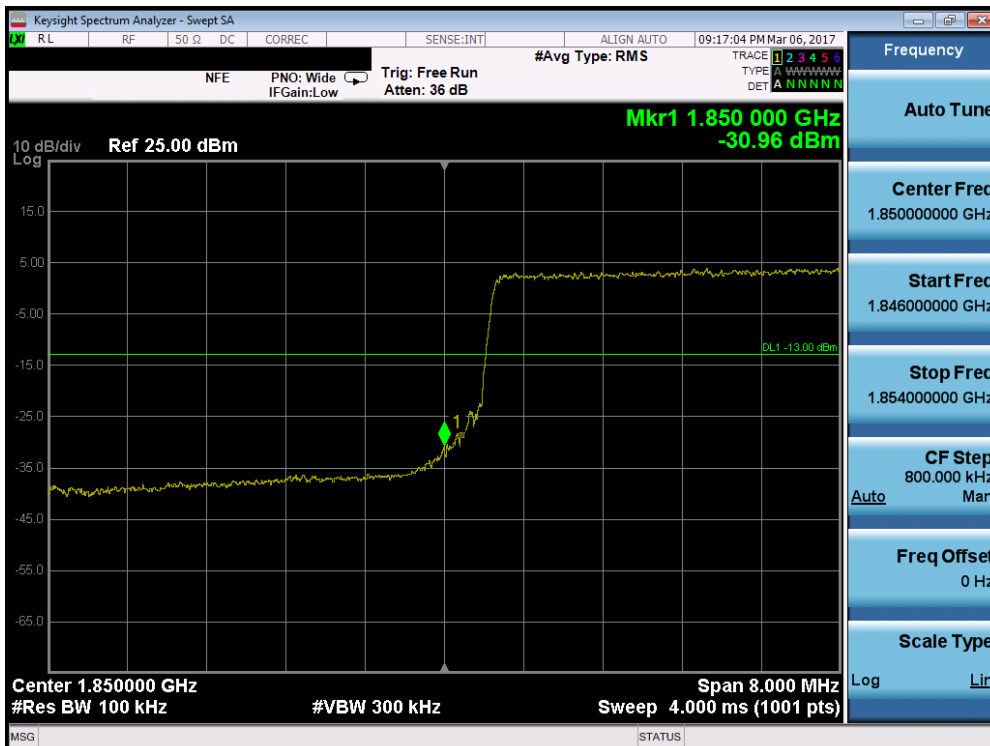


Plot 7-120. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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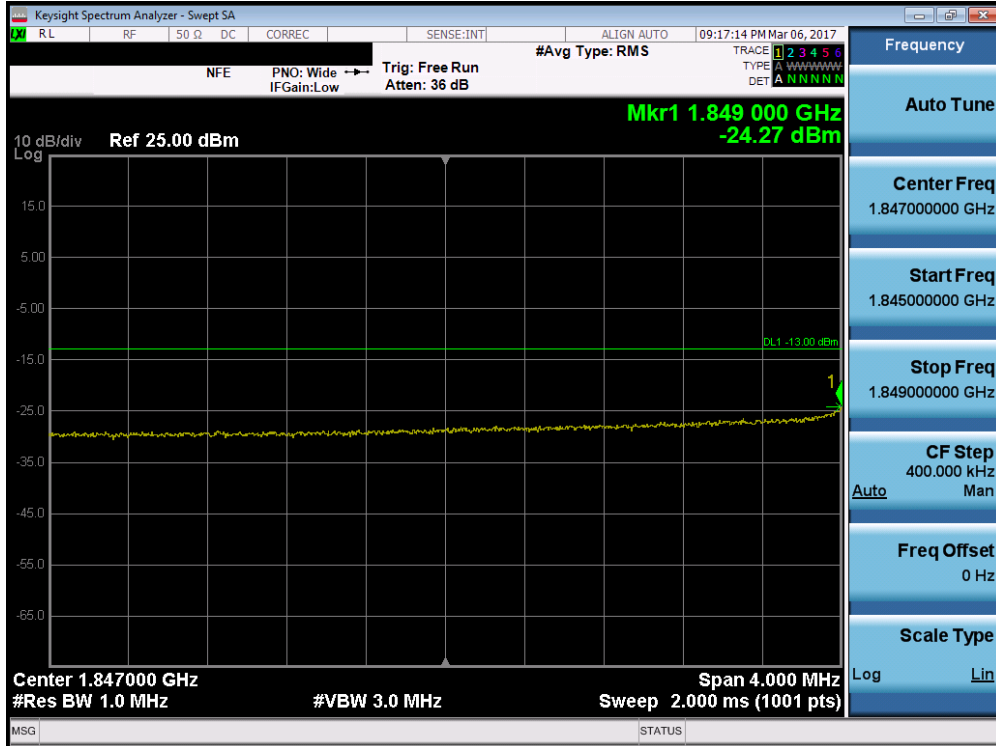
Plot 7-121. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



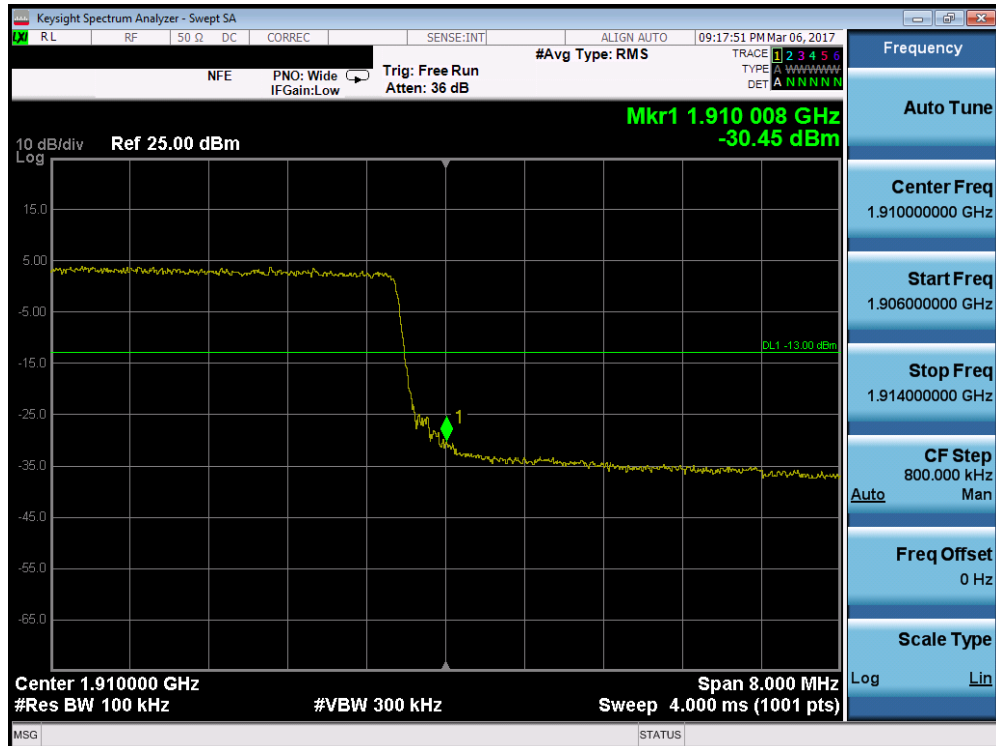
Plot 7-122. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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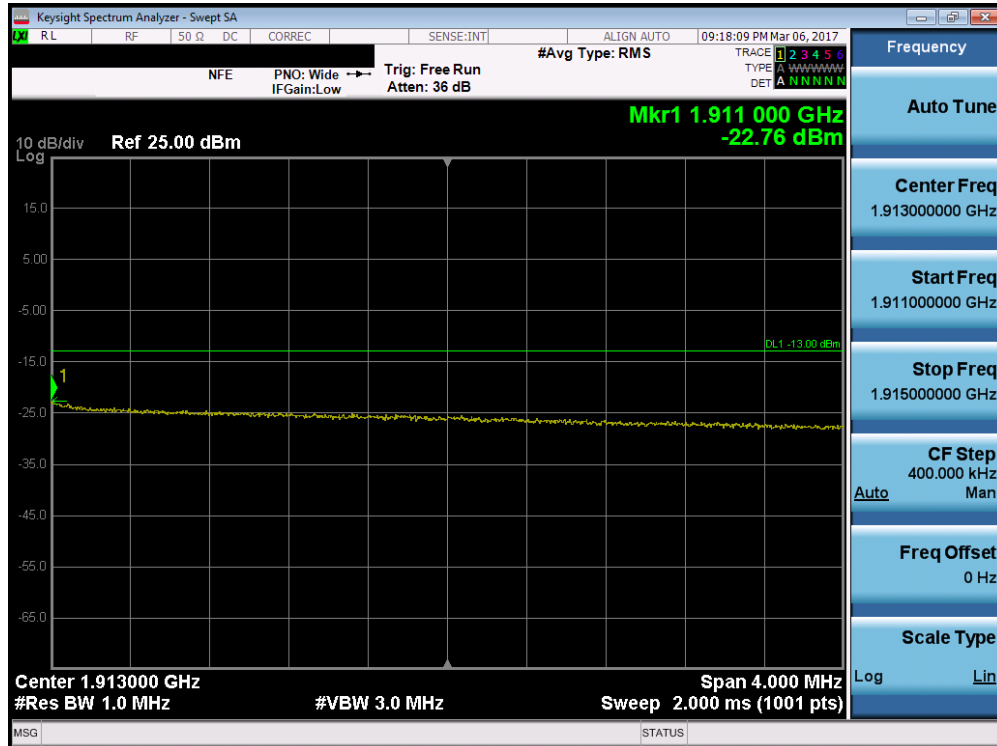


Plot 7-123. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

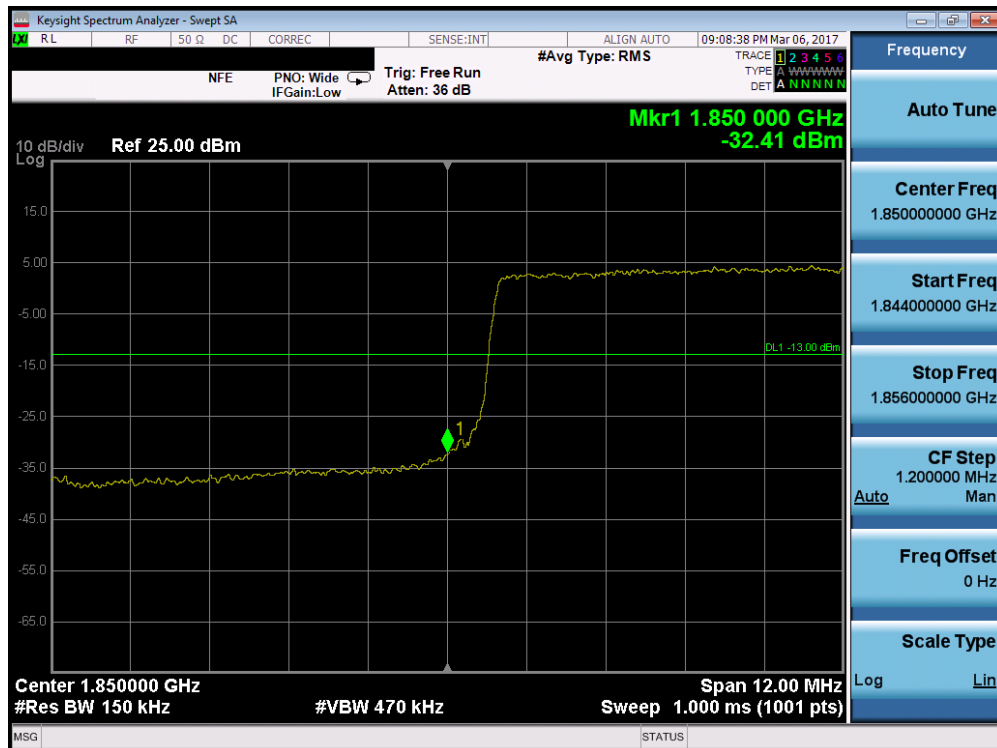


Plot 7-124. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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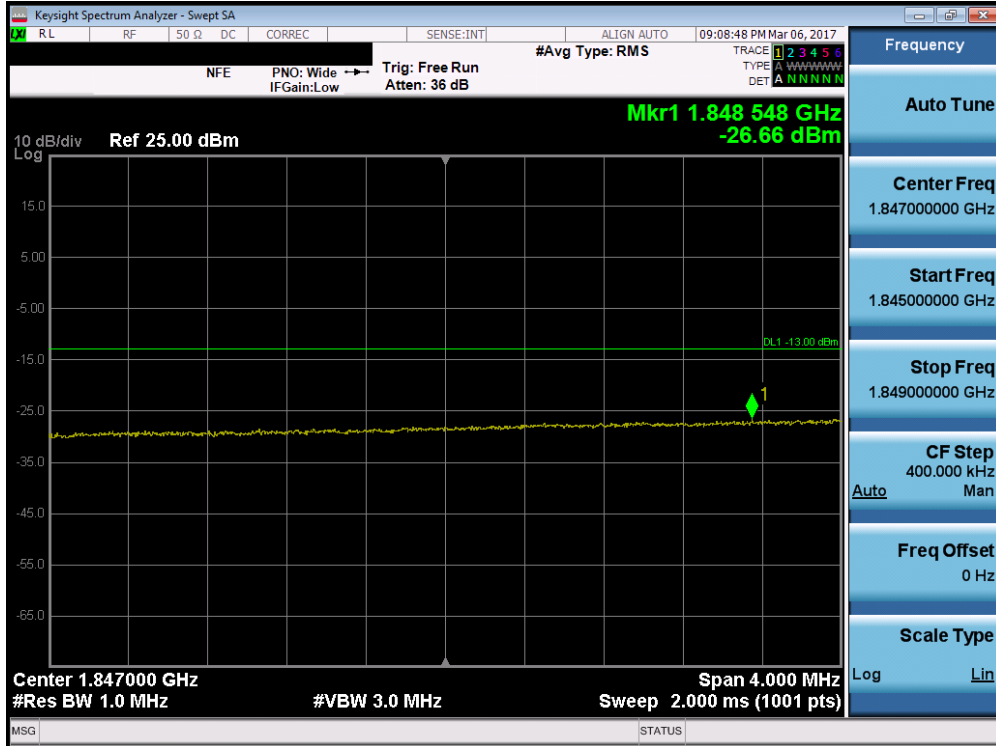


Plot 7-125. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

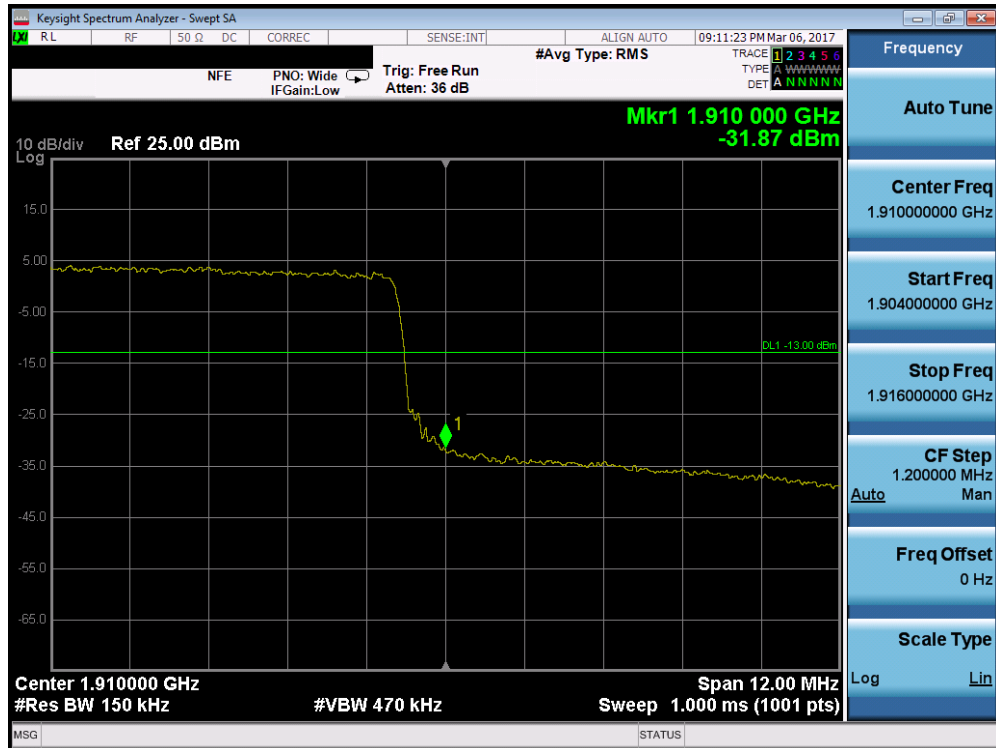


Plot 7-126. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-127. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

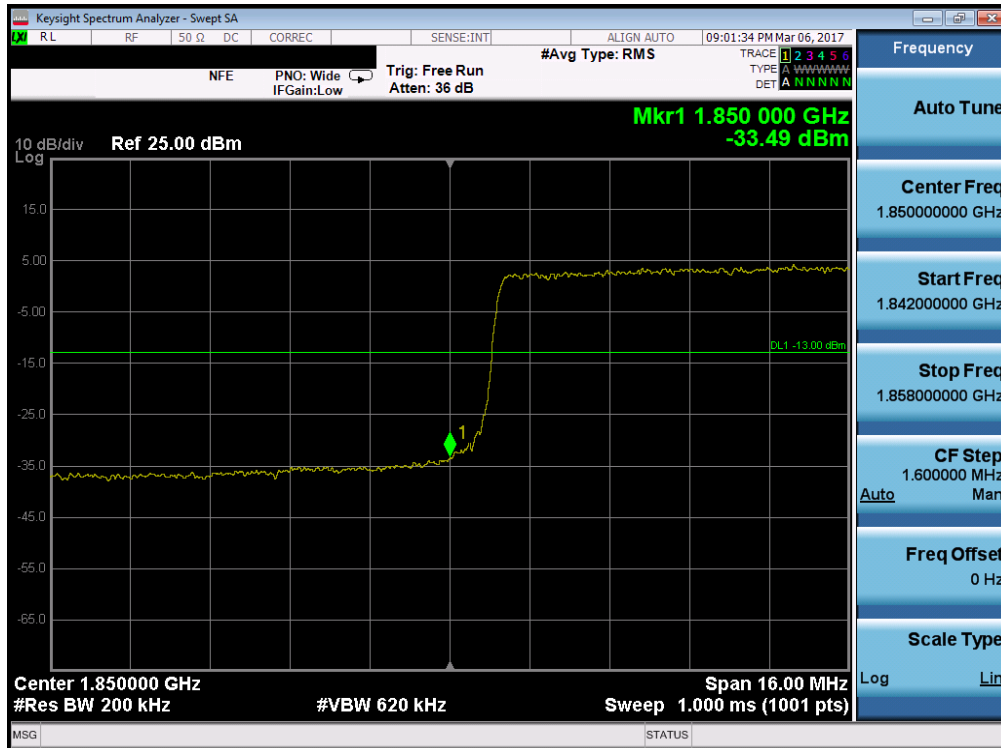


Plot 7-128. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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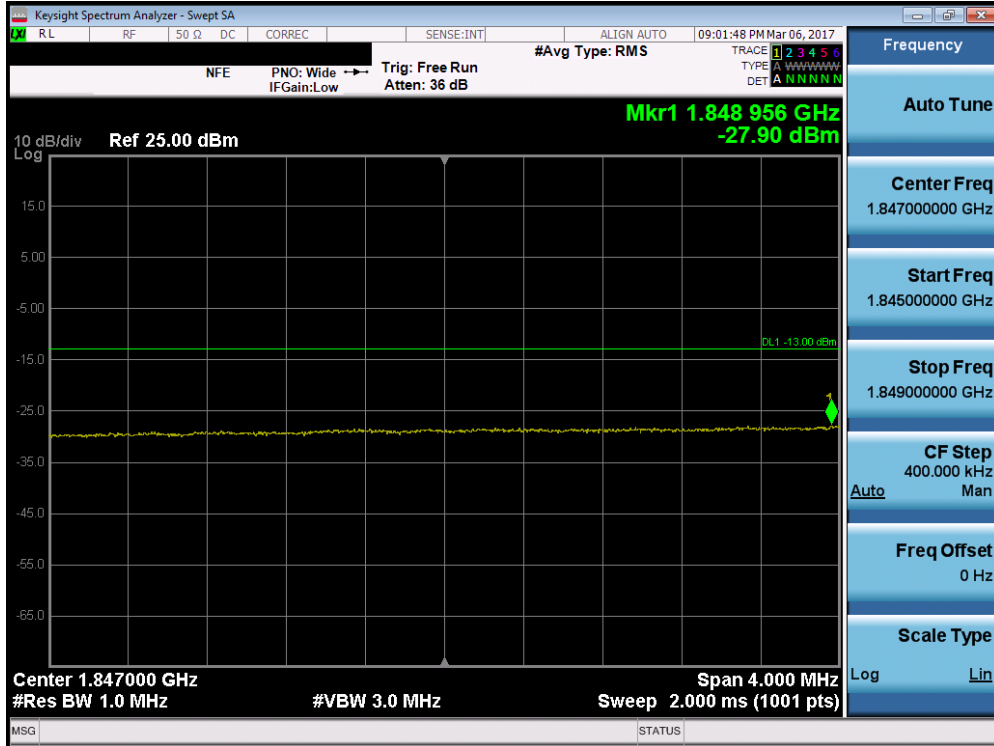


Plot 7-129. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

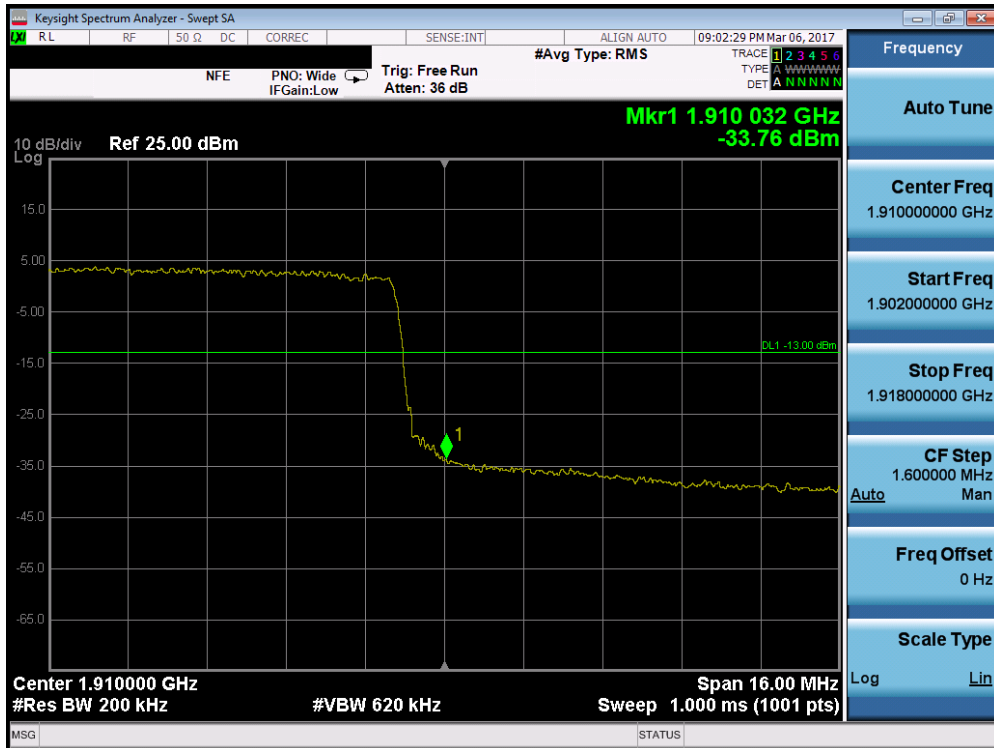


Plot 7-130. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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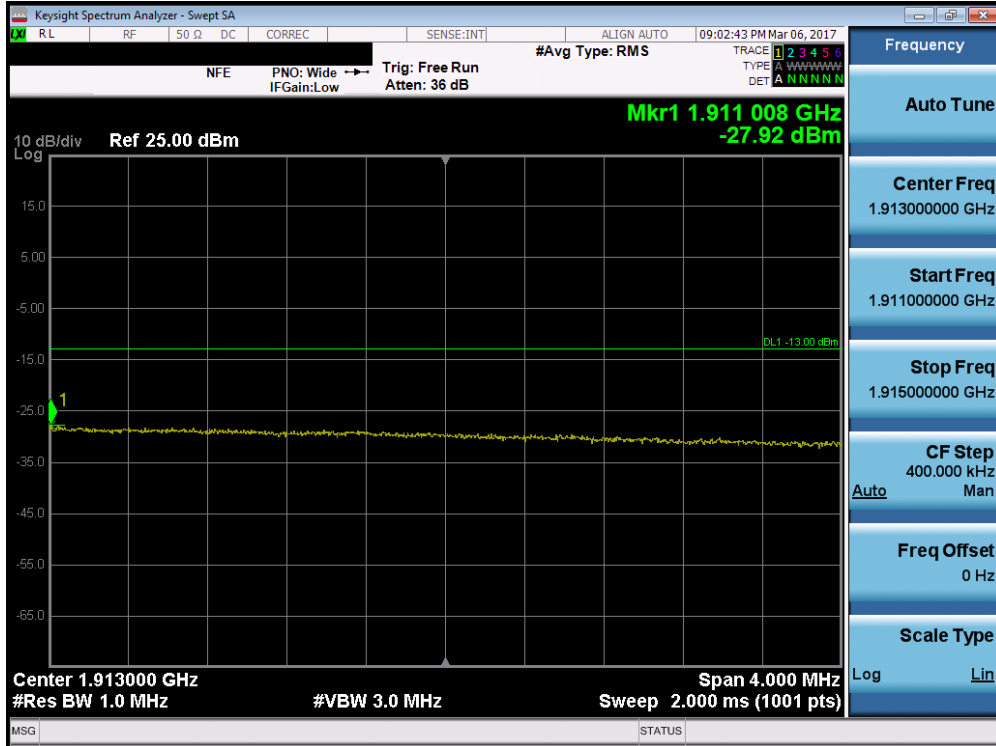


Plot 7-131. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

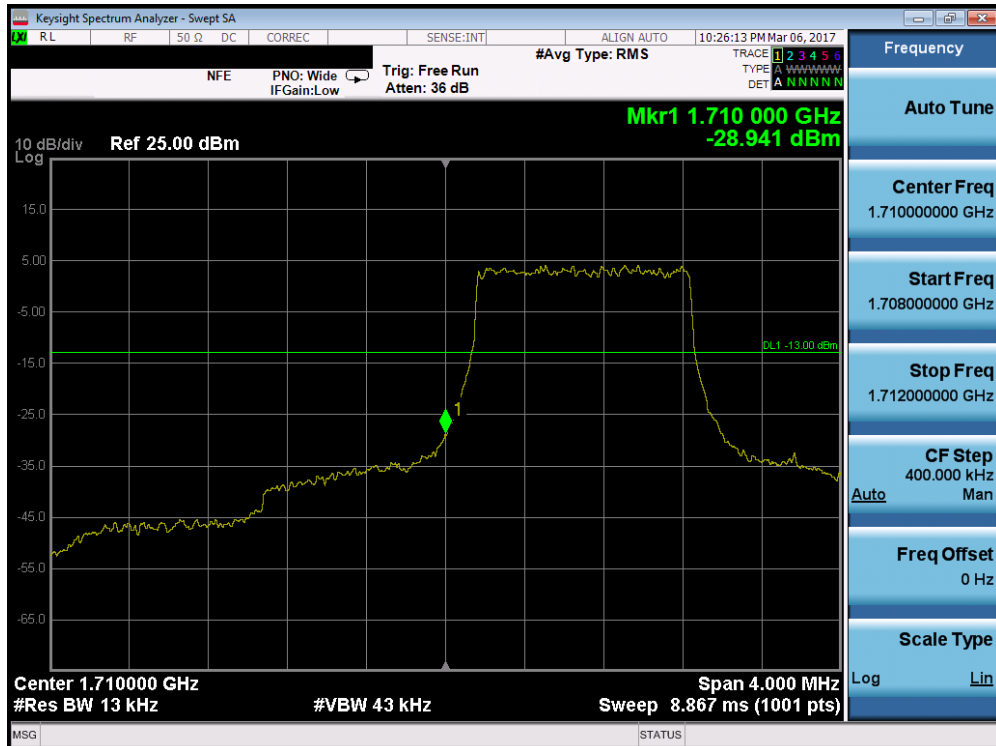


Plot 7-132. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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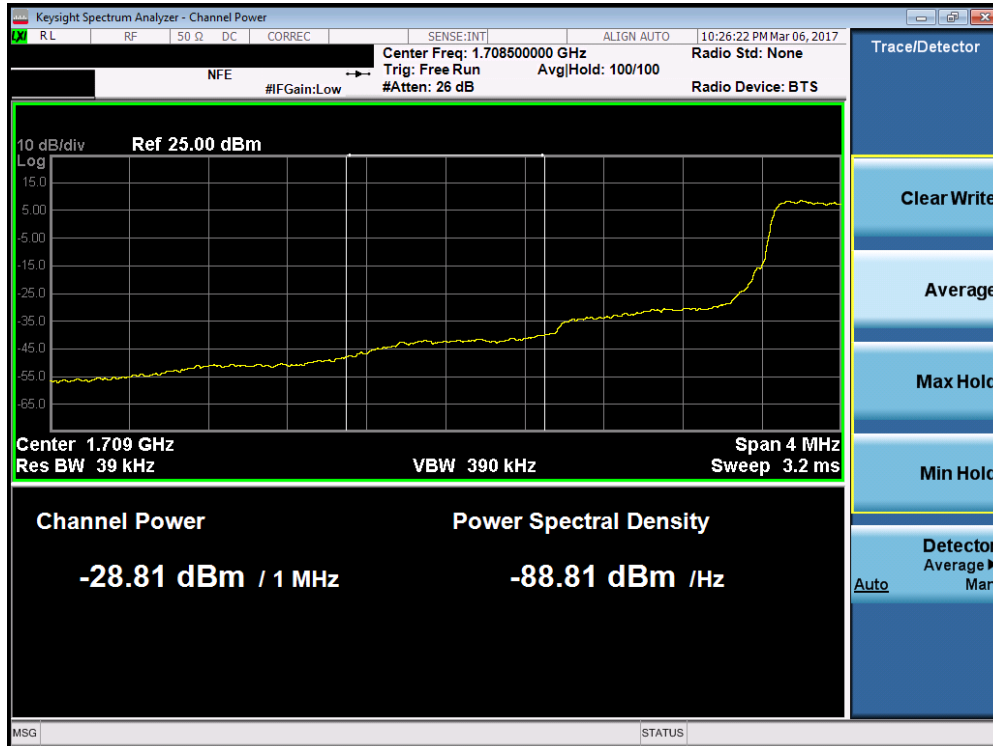


Plot 7-133. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 7-134. Lower Band Edge Plot (Band 66 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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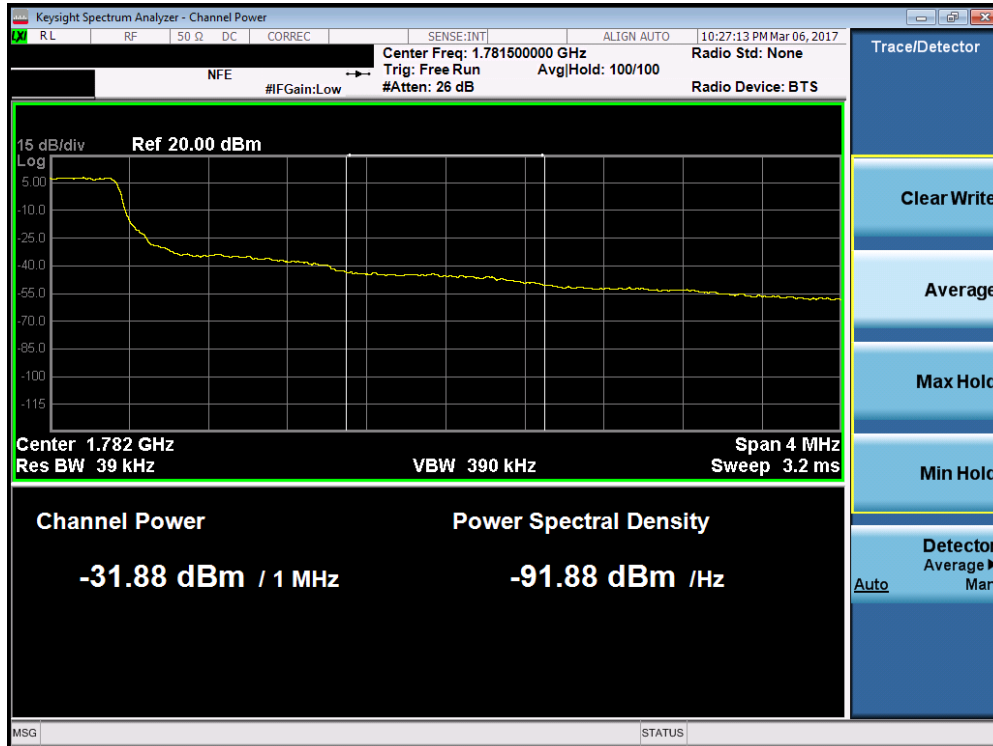


Plot 7-135. Lower Extended Band Edge Plot (Band 66 – 1.4MHz QPSK – RB Size 6)

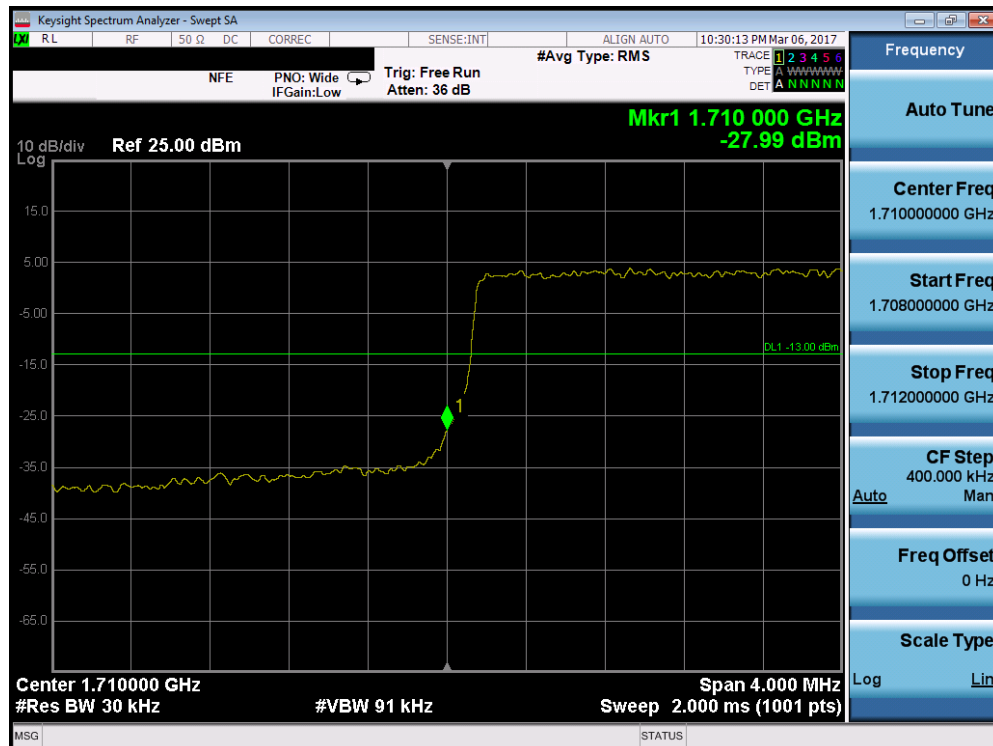


Plot 7-136. Upper Band Edge Plot (Band 66 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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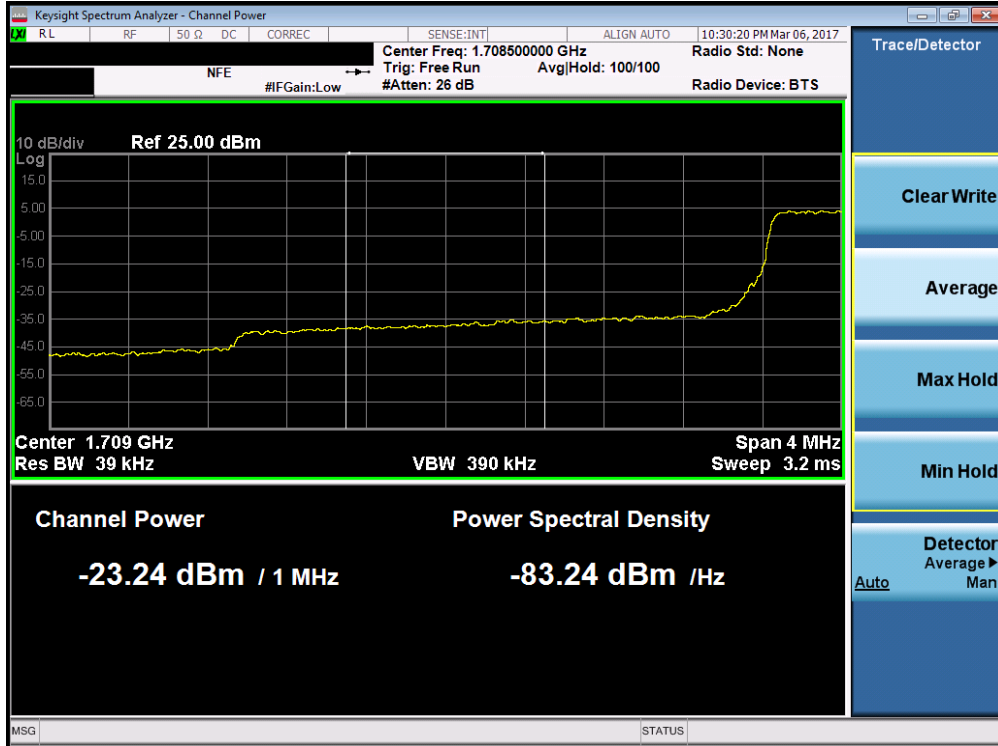
Plot 7-137. Upper Extended Band Edge Plot (Band 66 – 1.4MHz QPSK – RB Size 6)



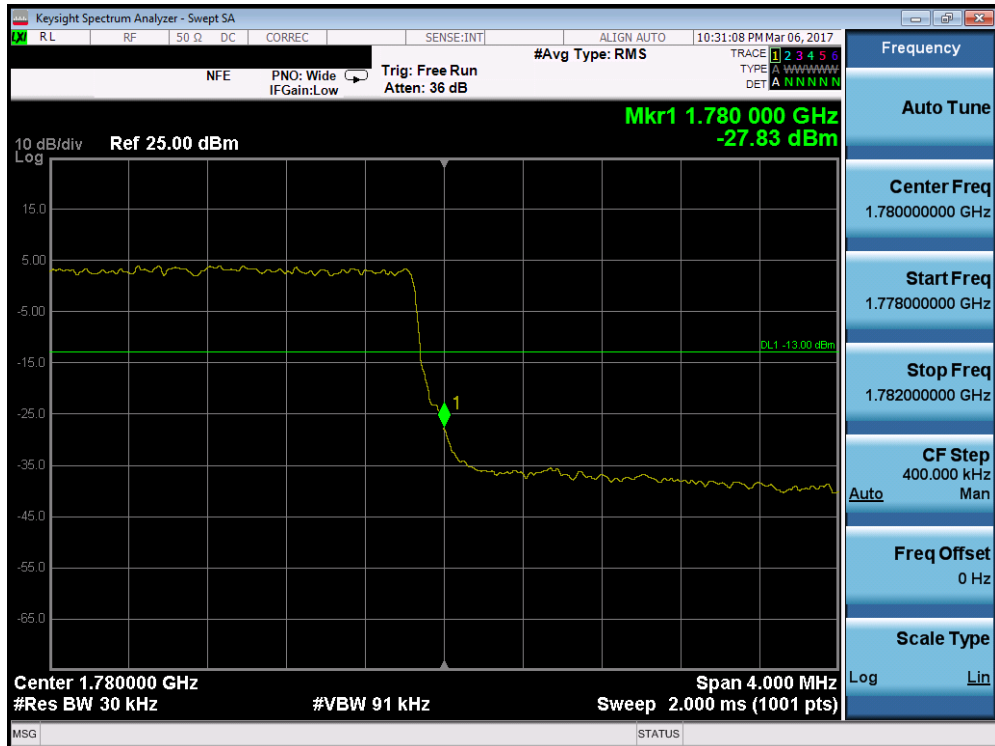
Plot 7-138. Lower Band Edge Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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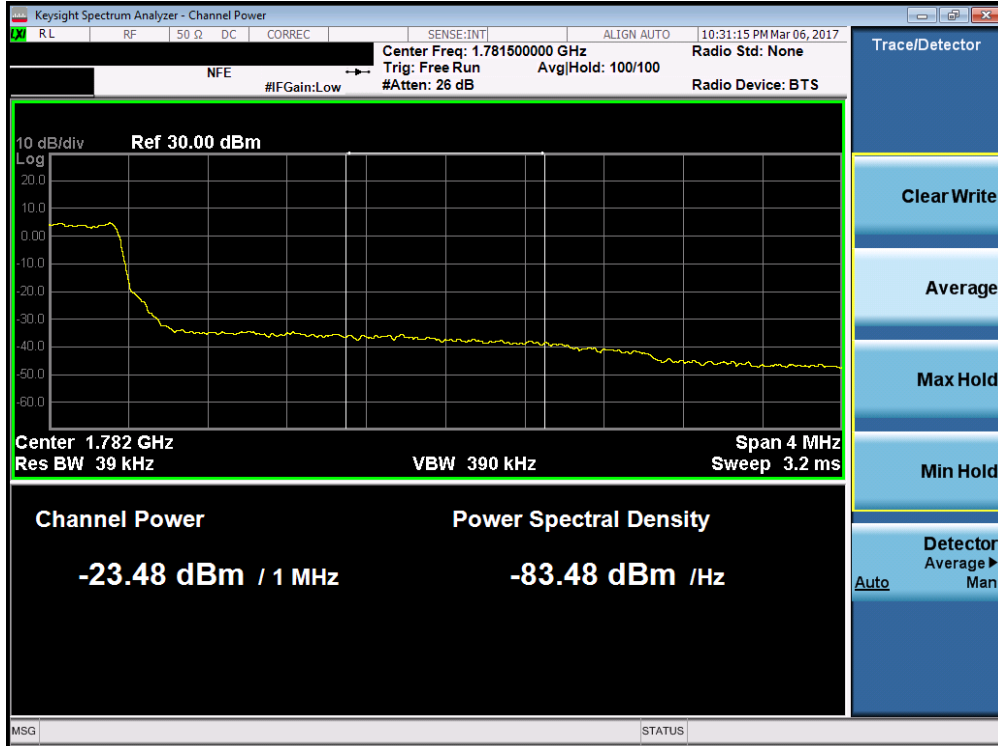


Plot 7-139. Lower Extended Band Edge Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

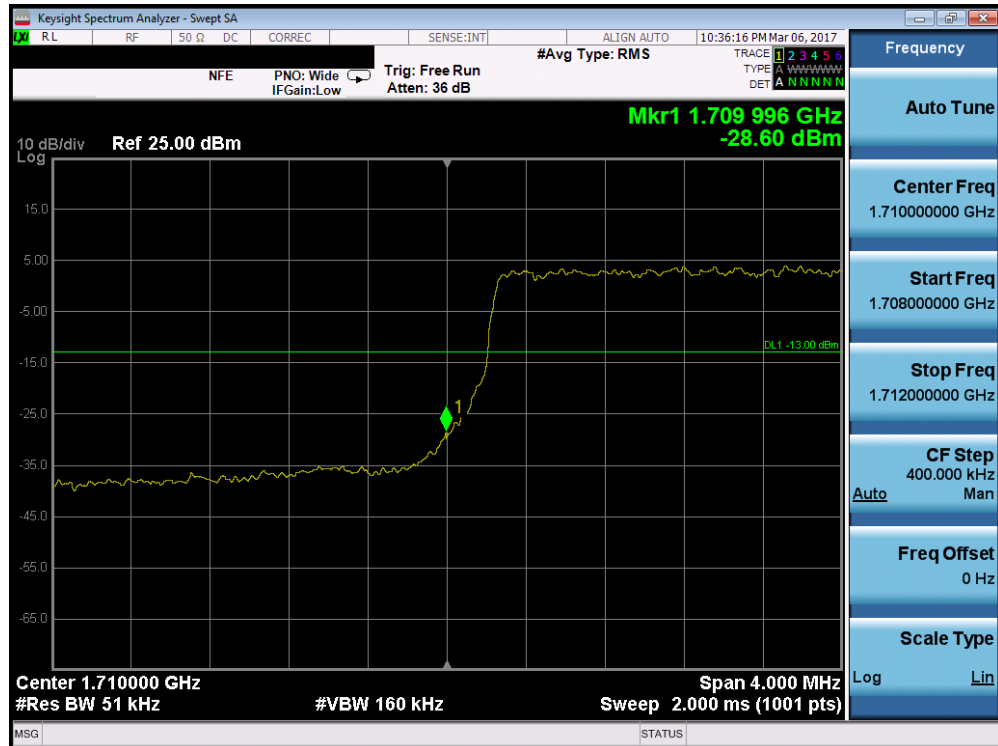


Plot 7-140. Upper Band Edge Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 88 of 153

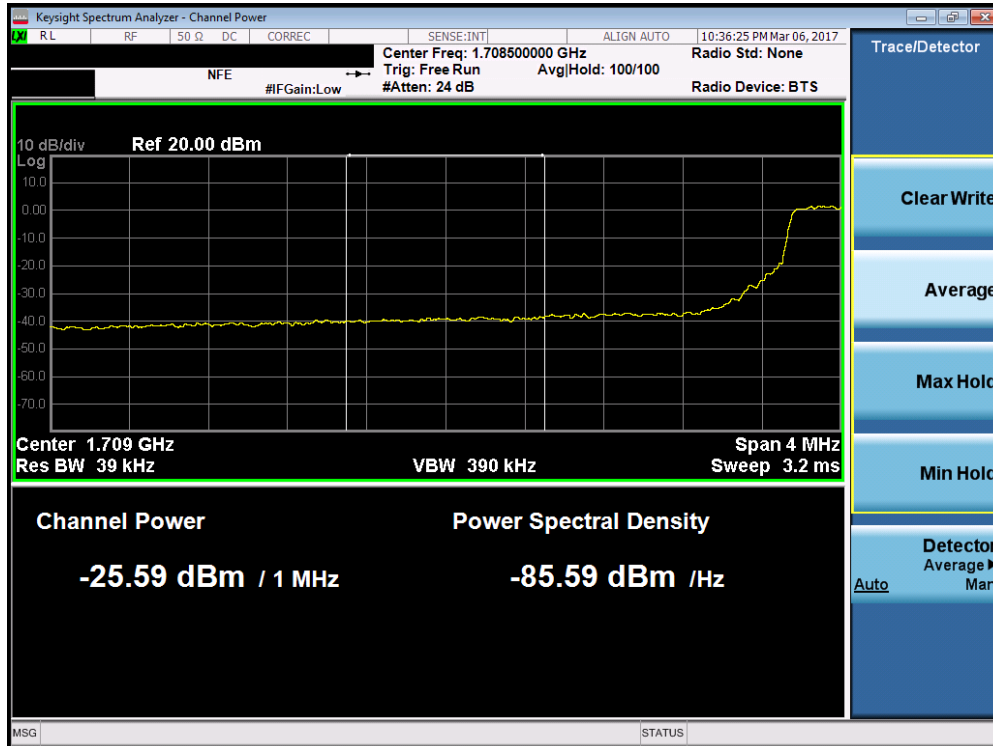


Plot 7-141. Upper Extended Band Edge Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

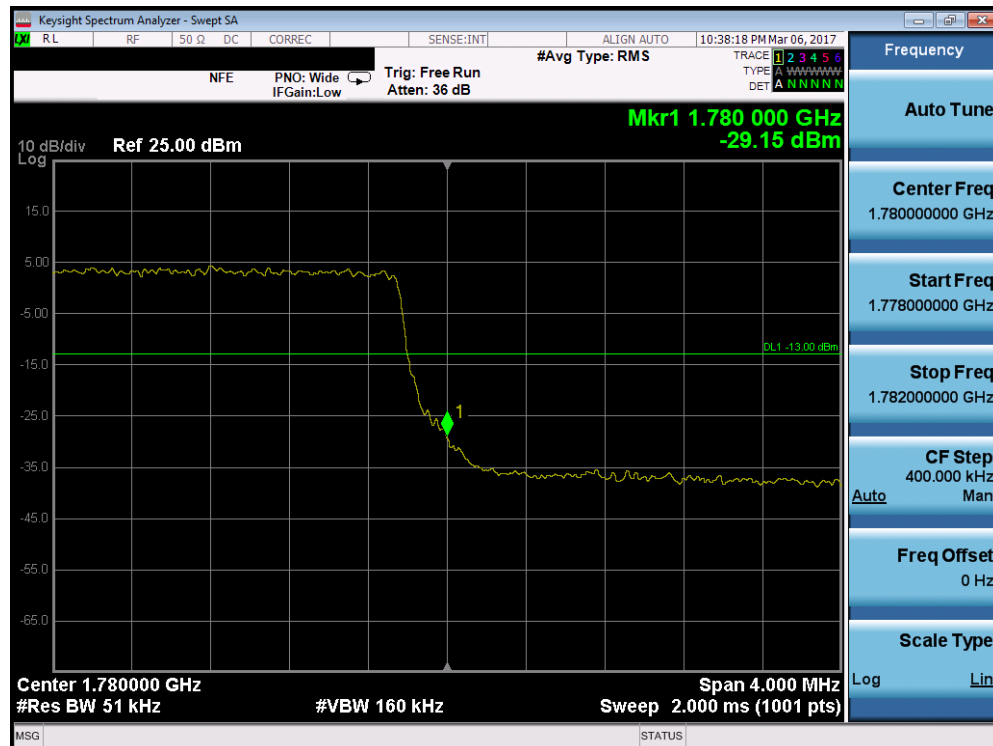


Plot 7-142. Lower Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 89 of 153

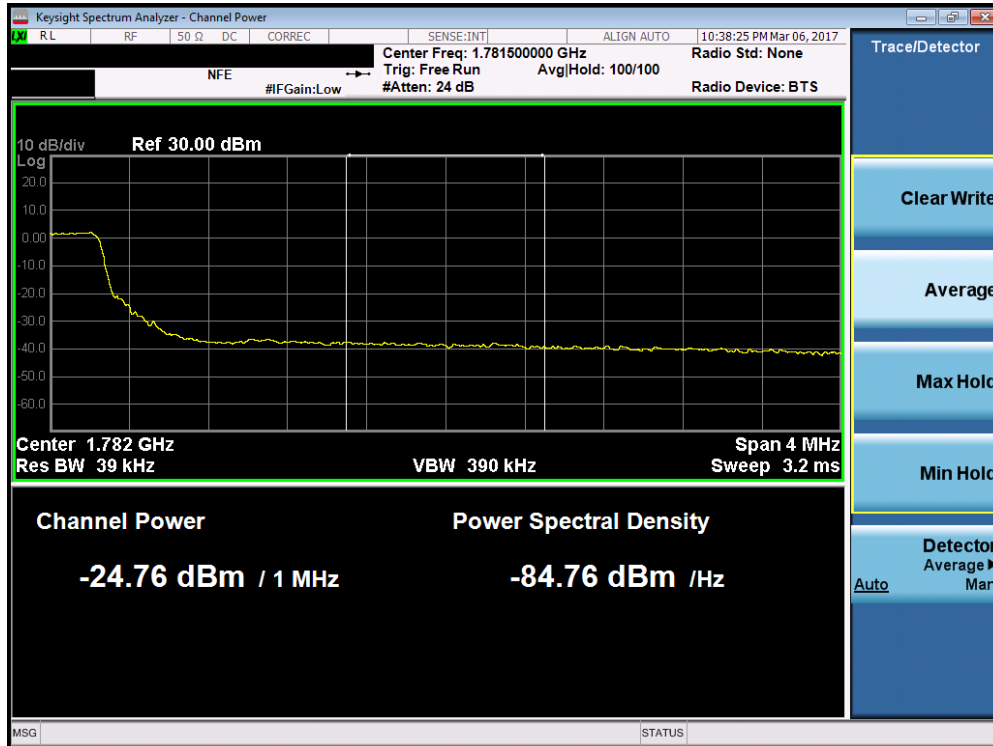


Plot 7-143. Lower Extended Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

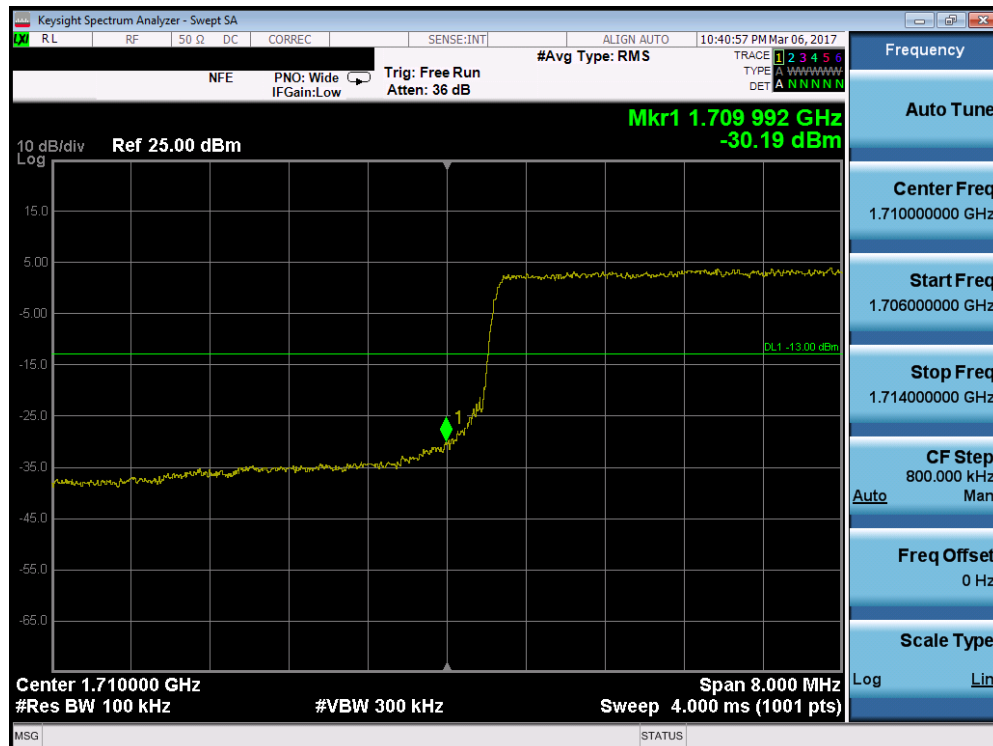


Plot 7-144. Upper Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 90 of 153

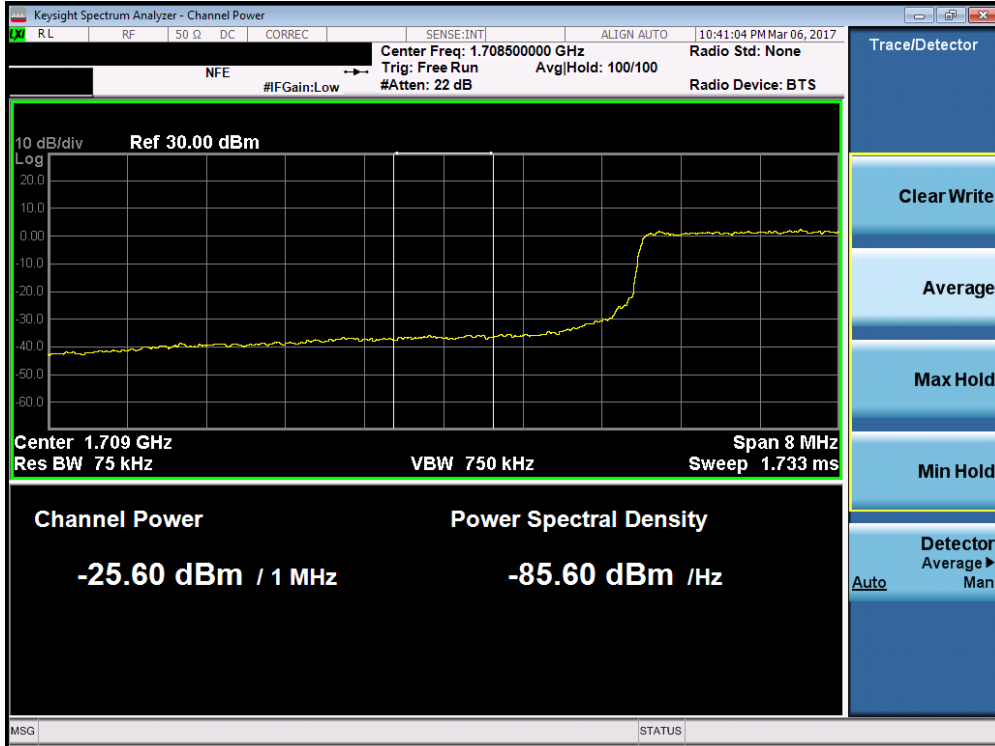


Plot 7-145. Upper Extended Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

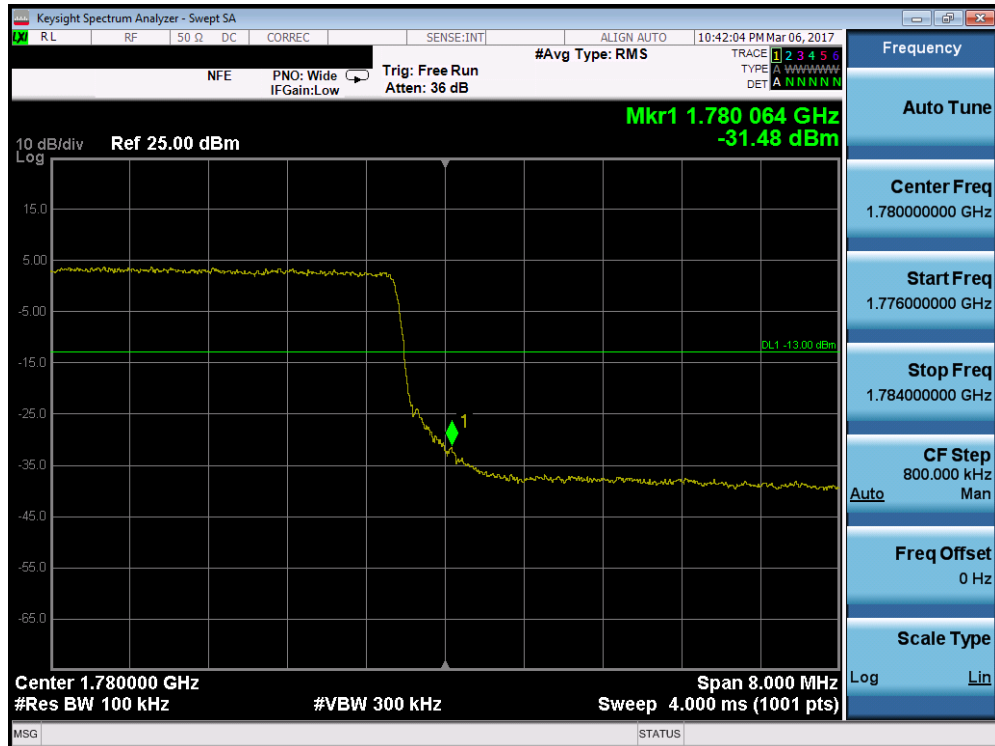


Plot 7-146. Lower Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 91 of 153

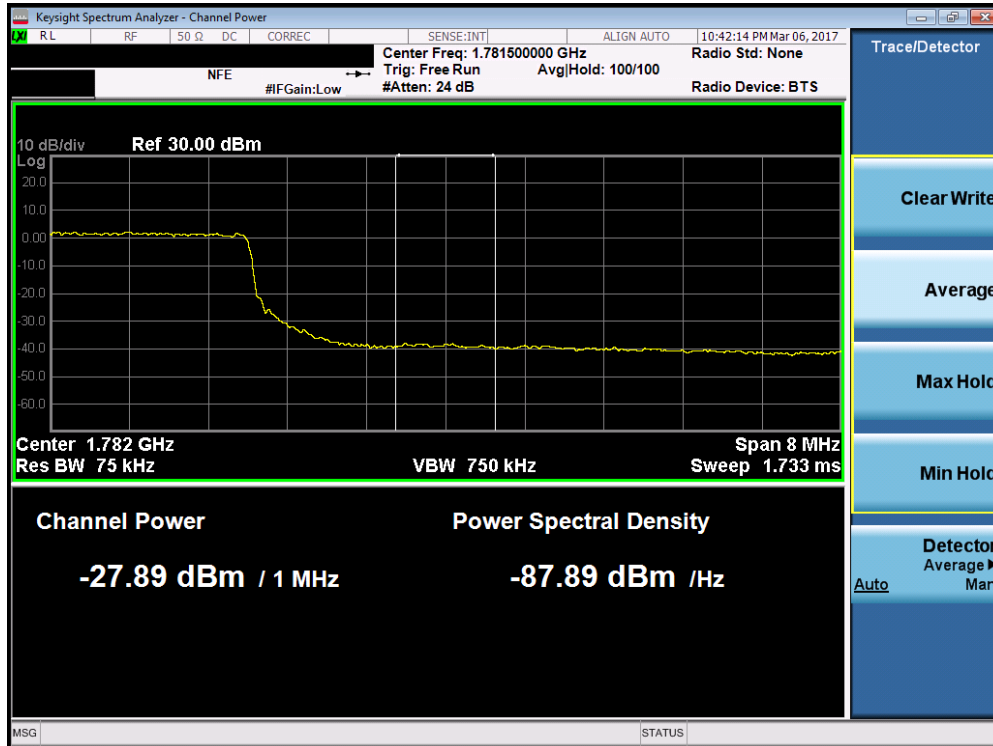


Plot 7-147. Lower Extended Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

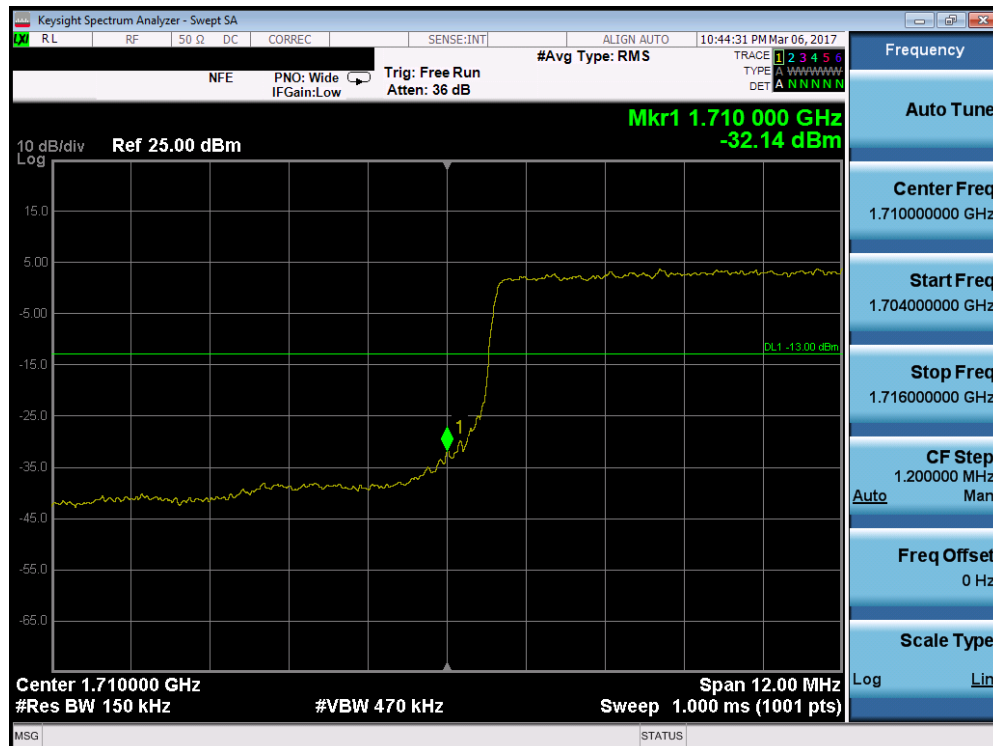


Plot 7-148. Upper Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 92 of 153

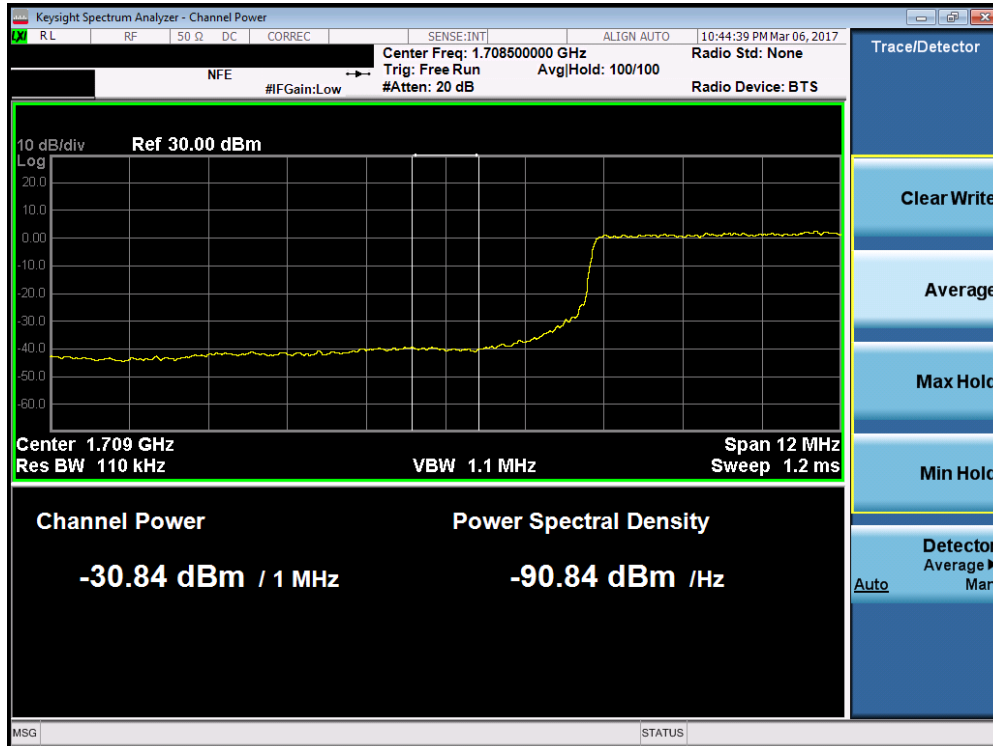


Plot 7-149. Upper Extended Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

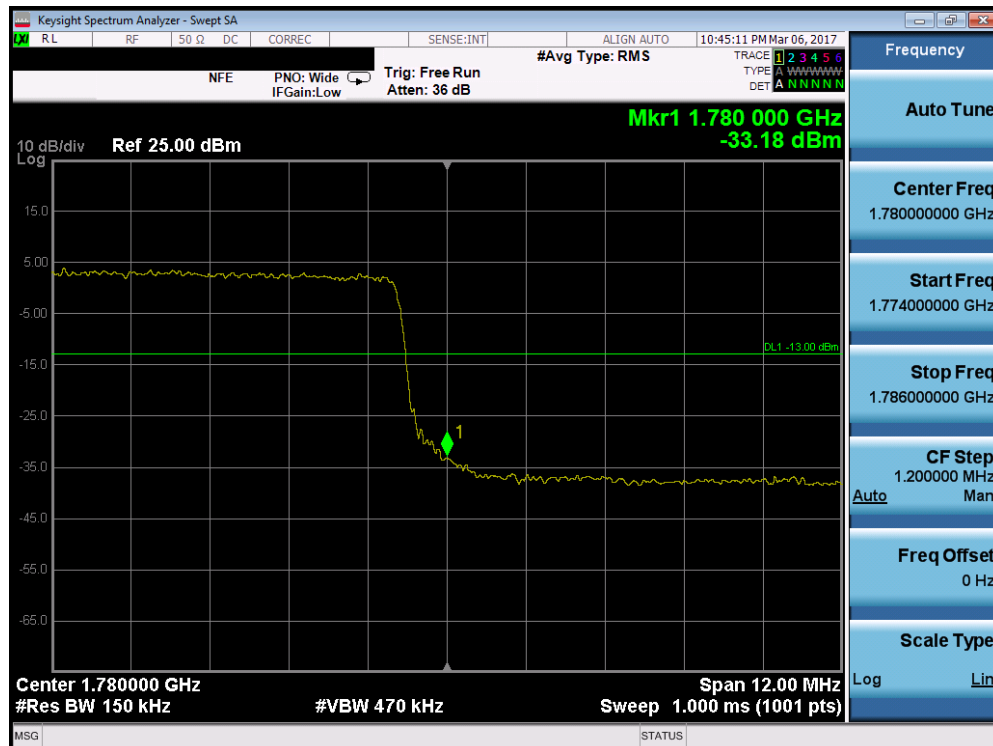


Plot 7-150. Lower Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 93 of 153

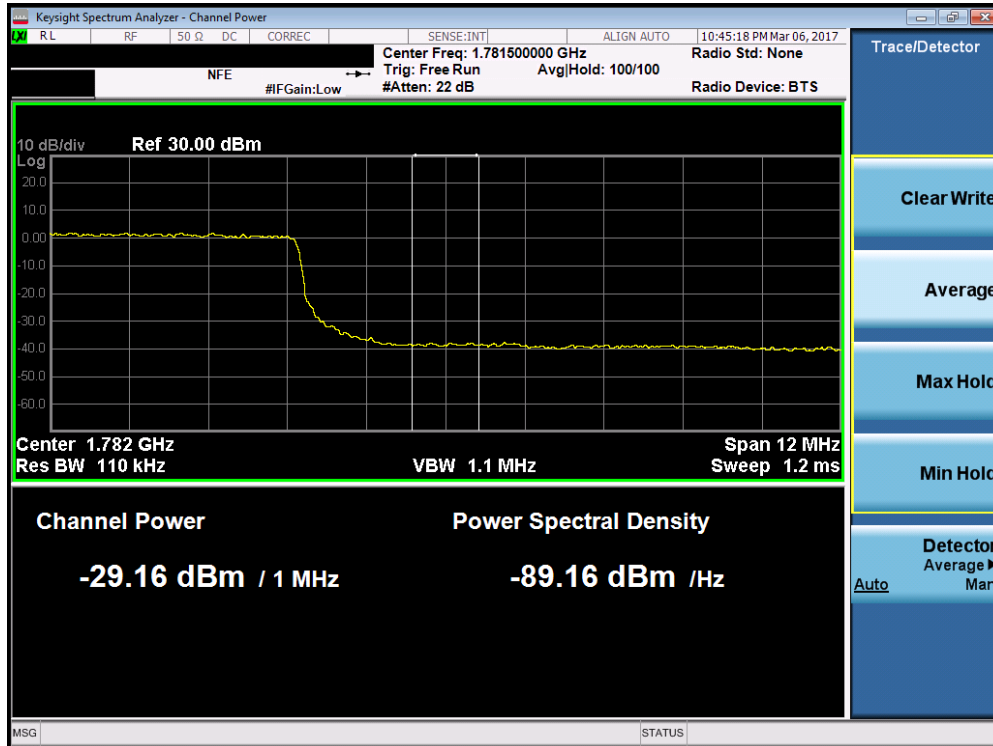


Plot 7-151. Lower Extended Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)

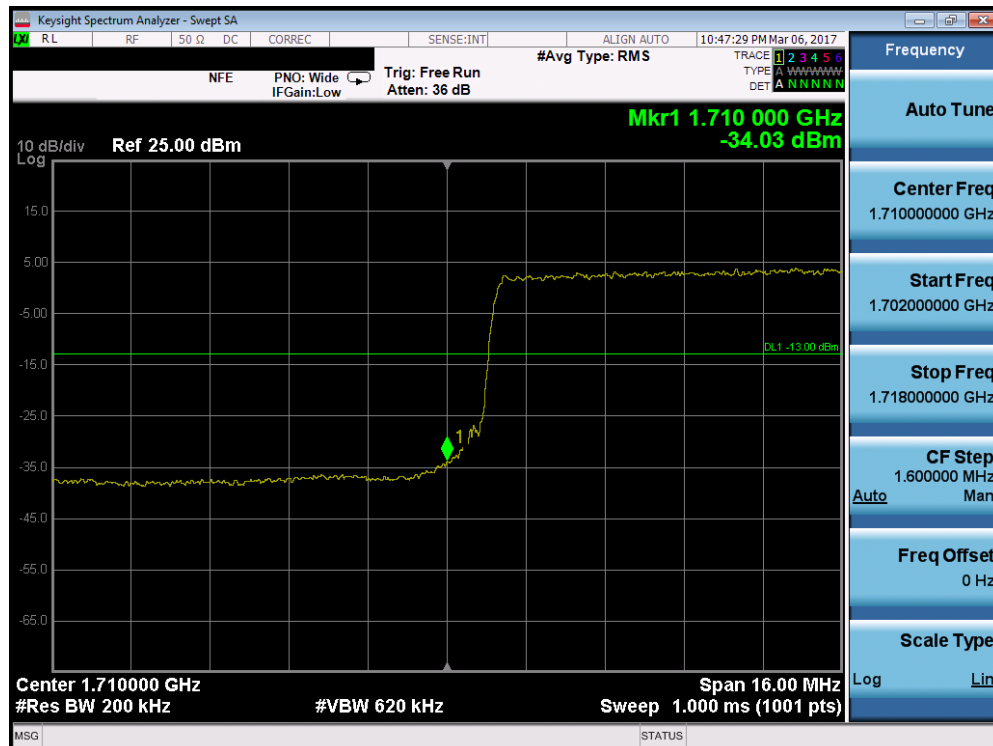


Plot 7-152. Upper Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 94 of 153



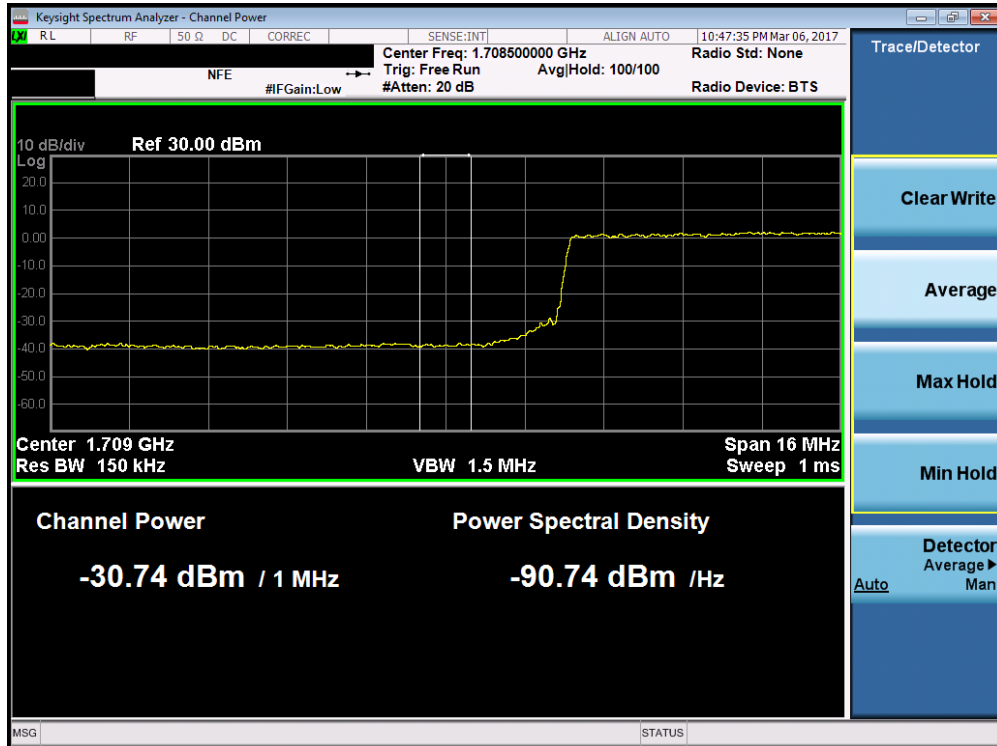
Plot 7-153. Upper Extended Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)



Plot 7-154. Lower Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 95 of 153



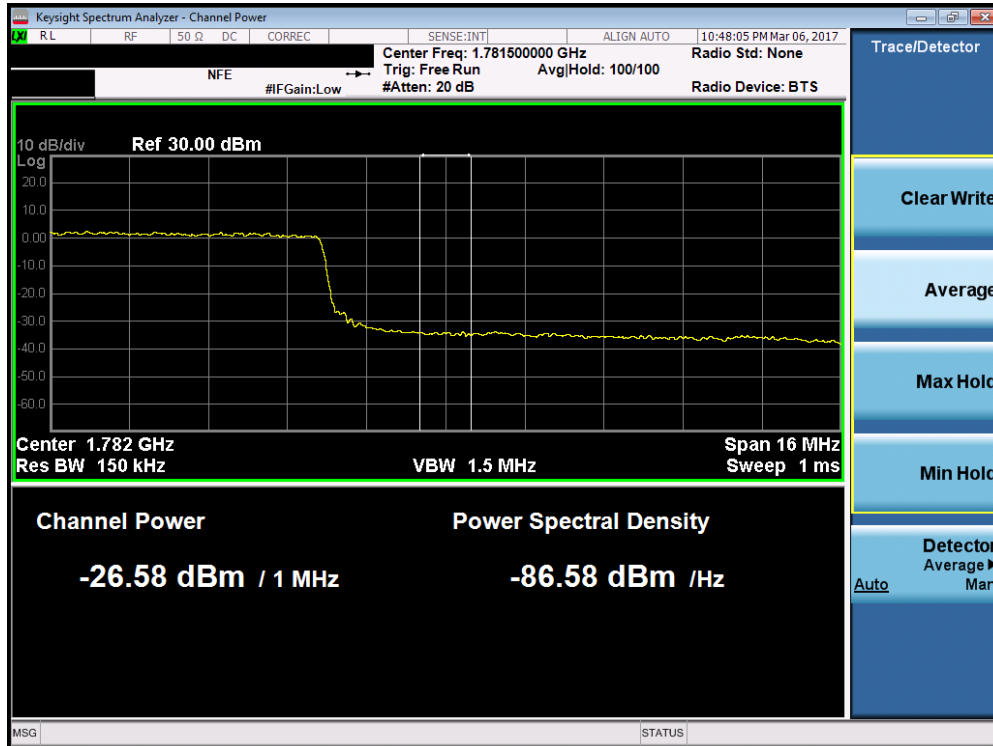


Plot 7-155. Lower Extended Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

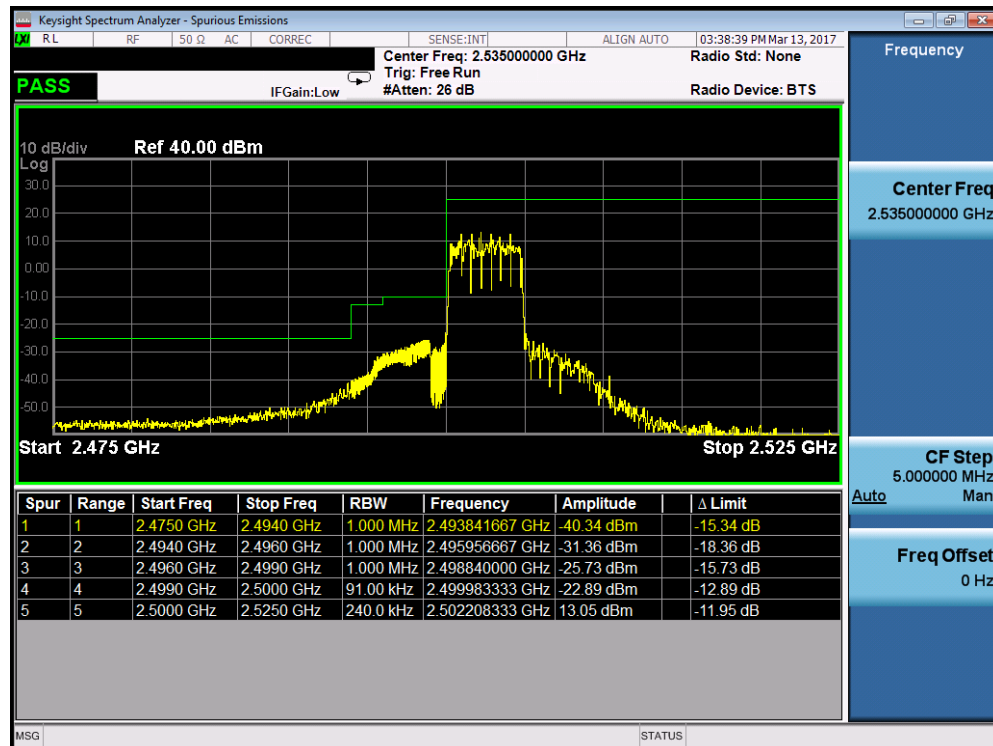


Plot 7-156. Upper Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 96 of 153

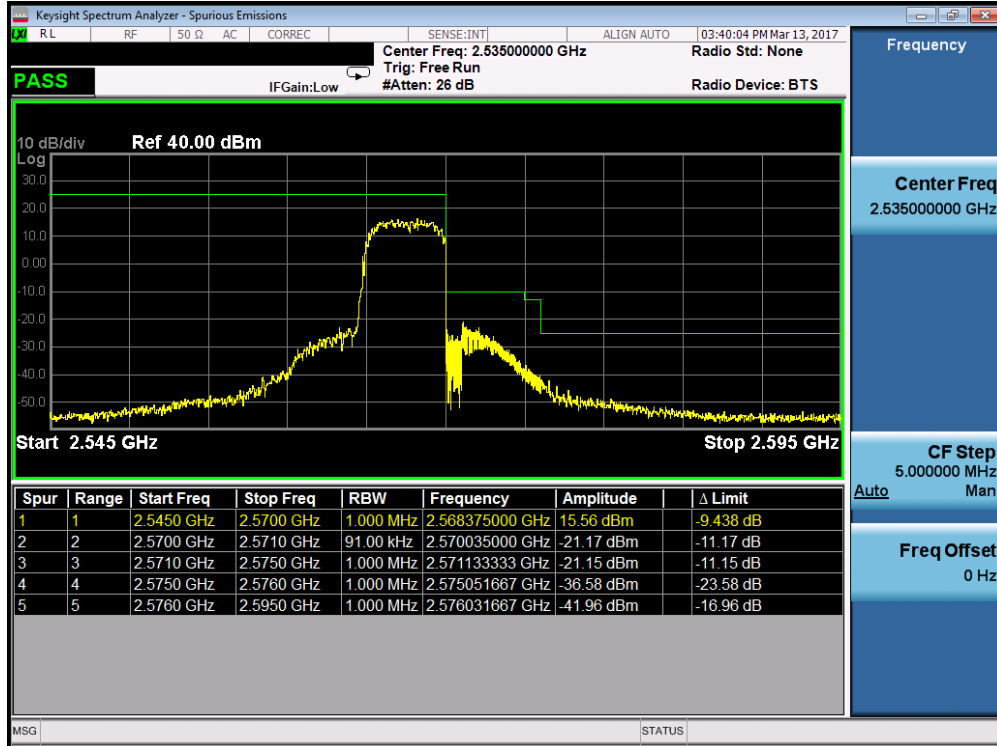


Plot 7-157. Upper Extended Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

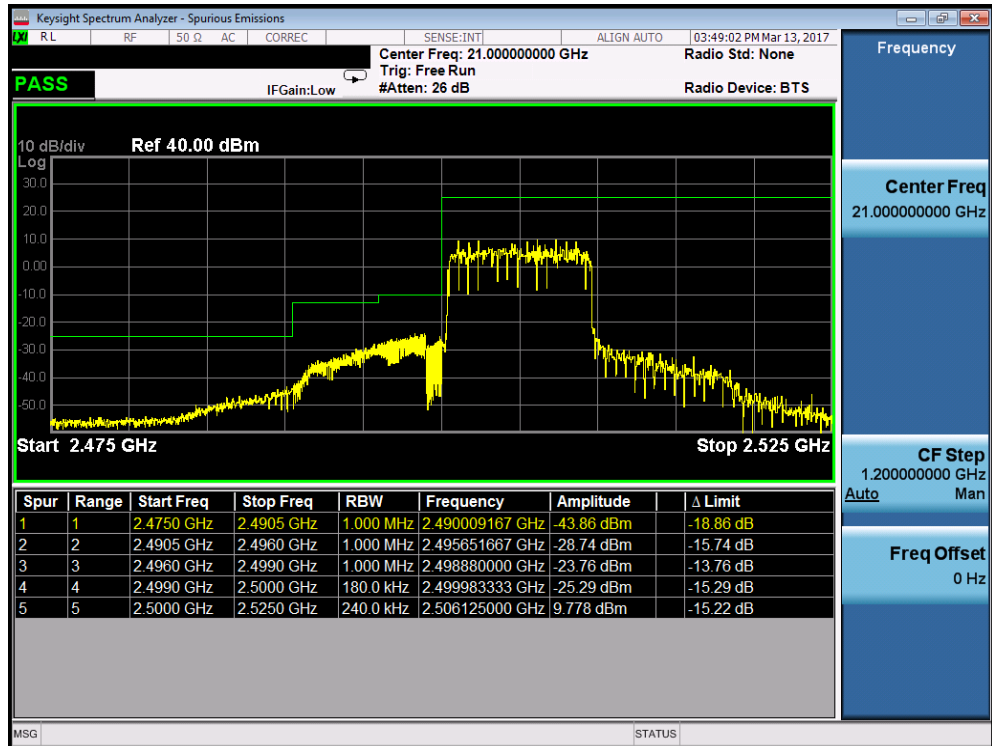


Plot 7-158. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 97 of 153

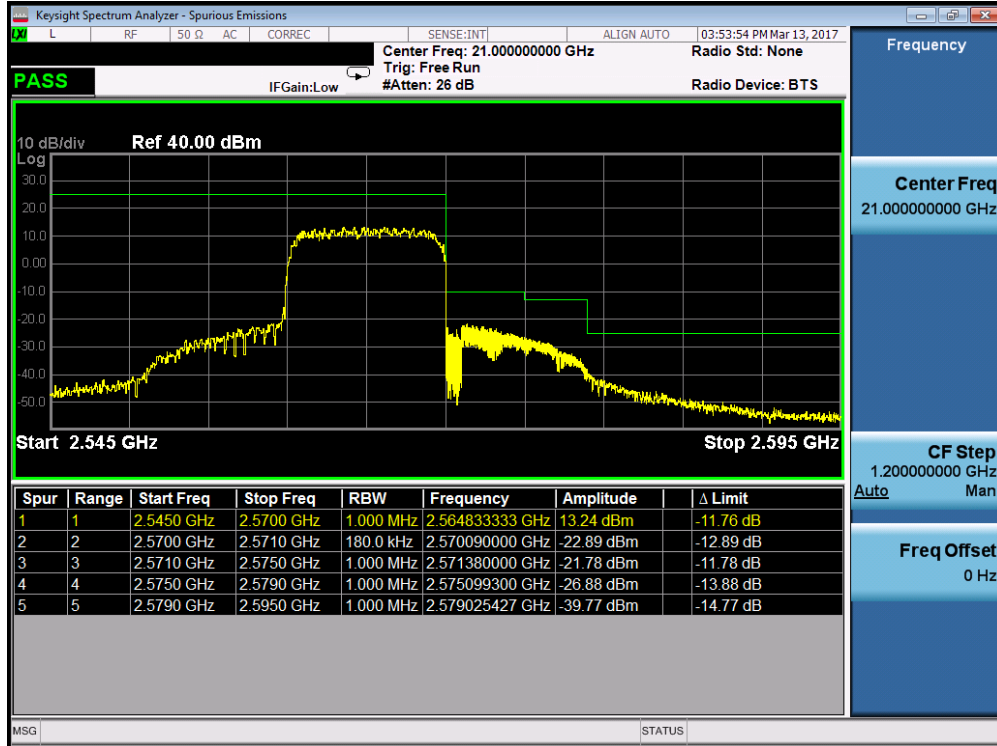


Plot 7-159. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

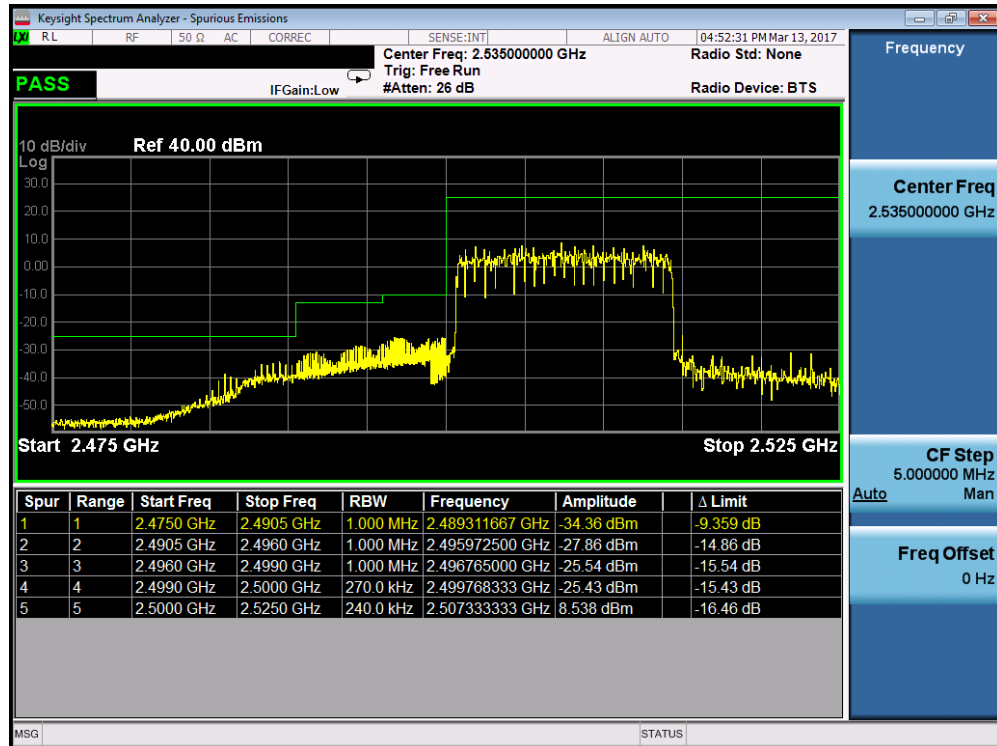


Plot 7-160. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 98 of 153

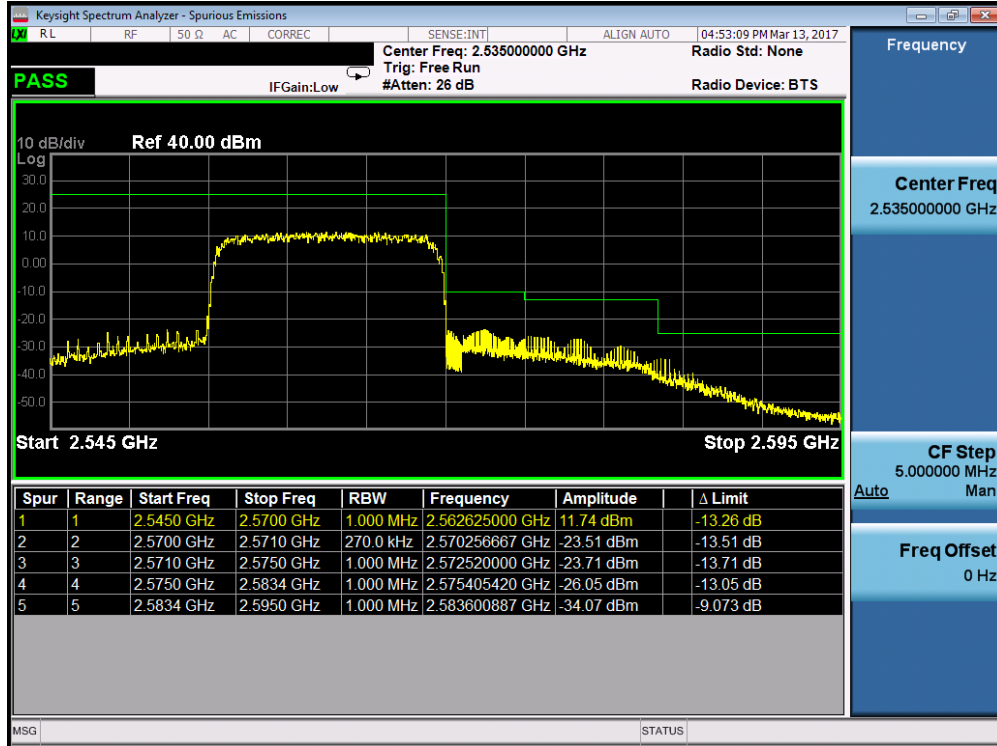


Plot 7-161. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

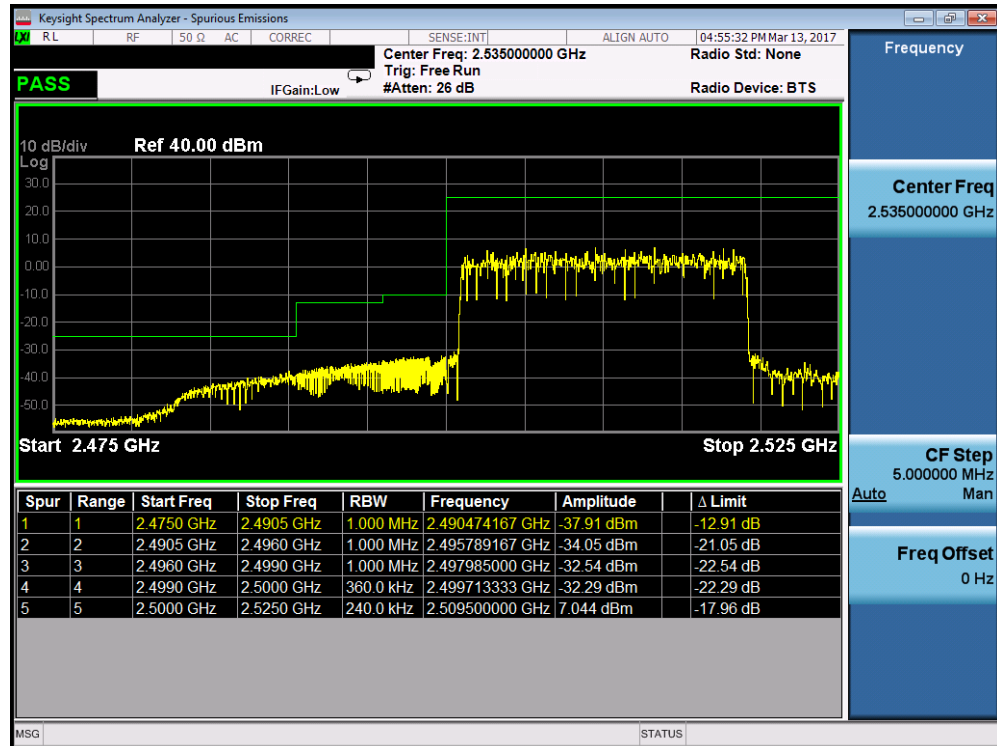


Plot 7-162. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 99 of 153

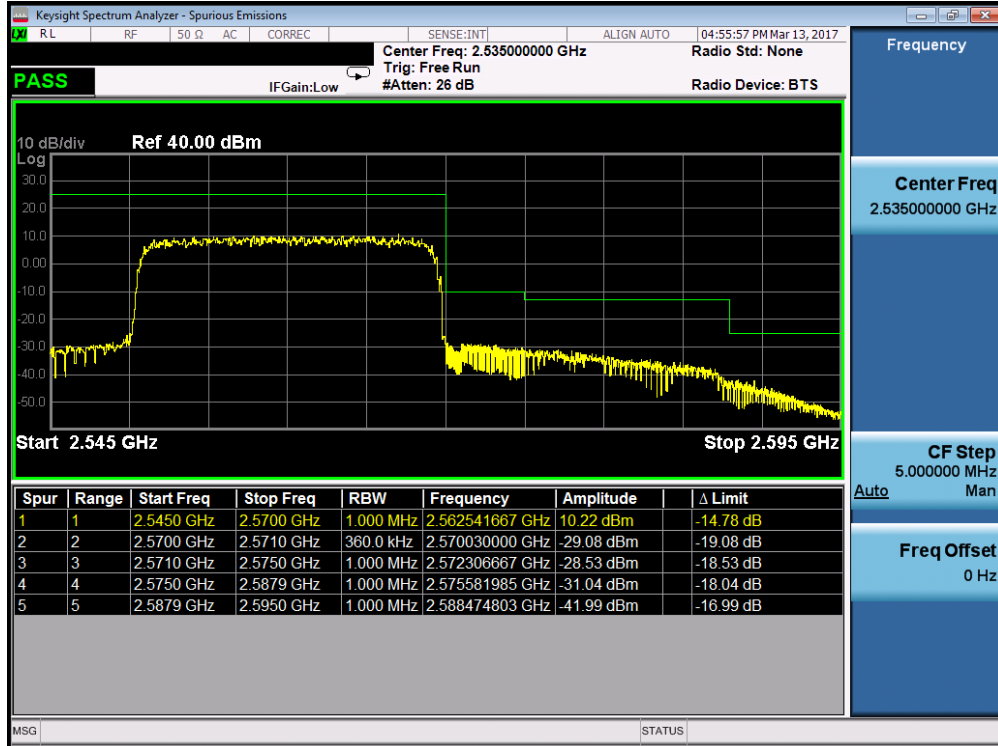


Plot 7-163. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



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

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 100 of 153



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

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 101 of 153

## 7.5 Peak-Average Ratio

### §24.232(d)

#### Test Overview

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

#### Test Procedure Used

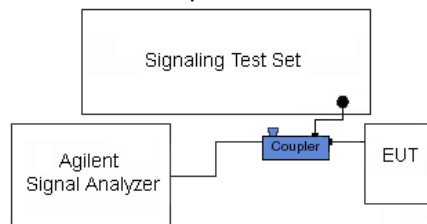
KDB 971168 D01 v02r02 – Section 5.7.1

#### Test Settings

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

#### Test Setup



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

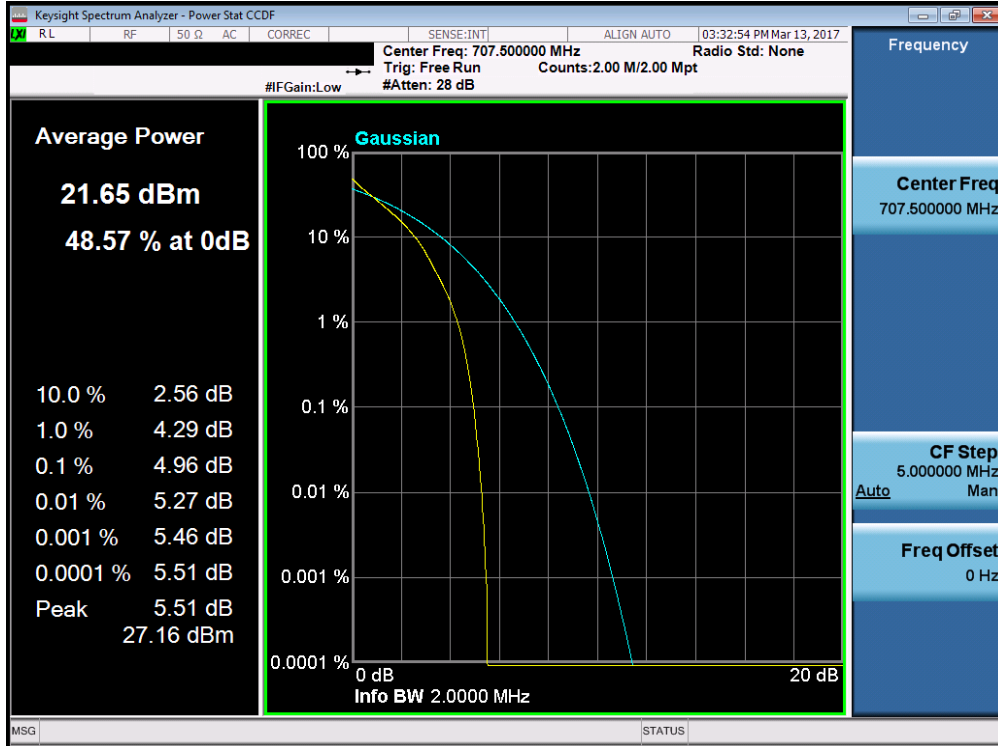


**Figure 7-4. Test Instrument & Measurement Setup**

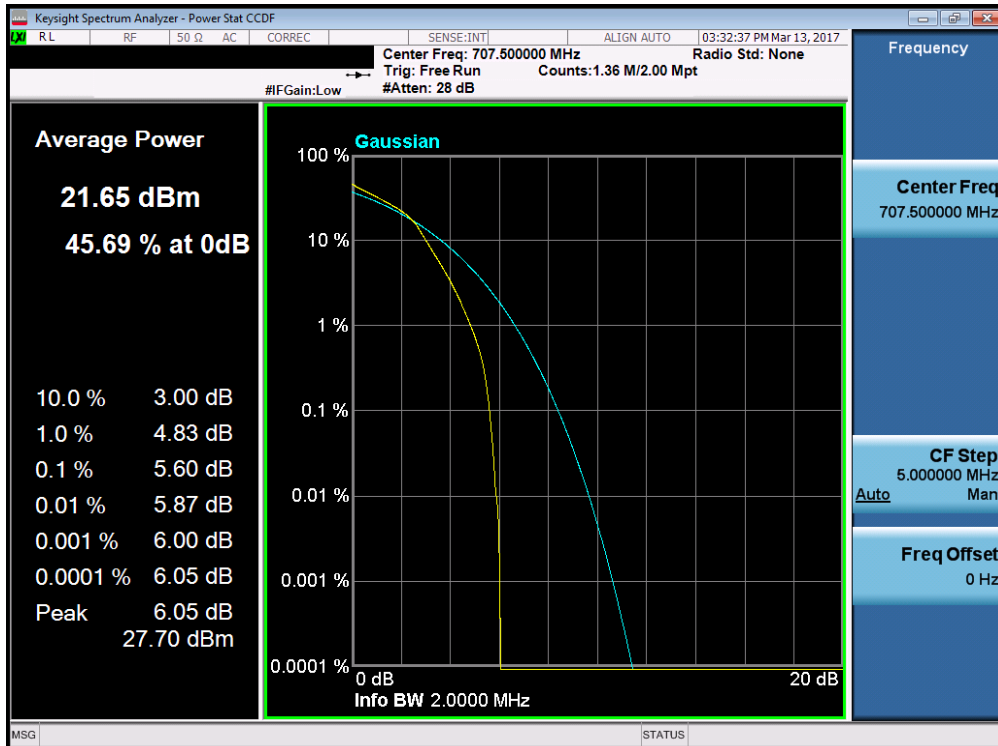
#### Test Notes

None.

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 102 of 153	



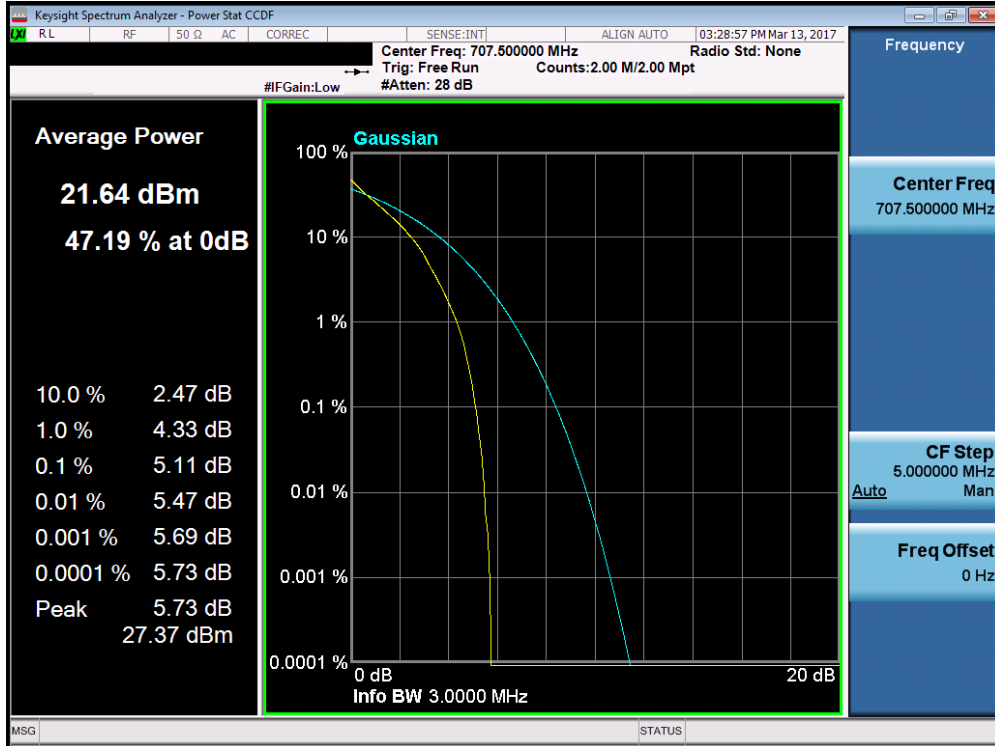
Plot 7-166. PAR Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



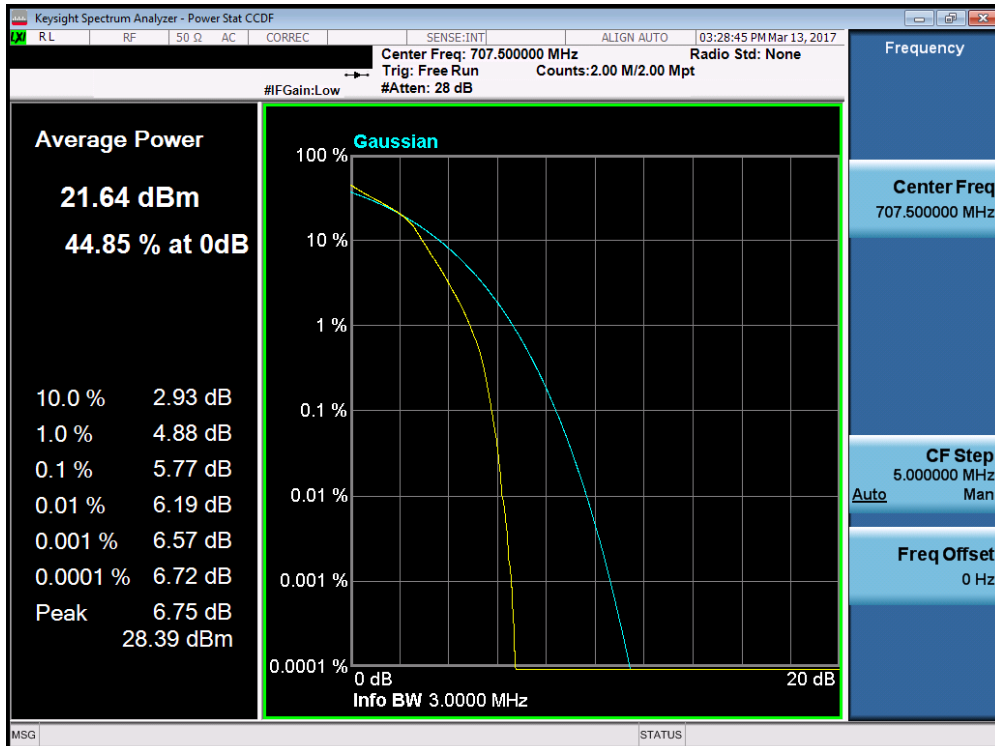
Plot 7-167. PAR Plot (Band 12 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 103 of 153



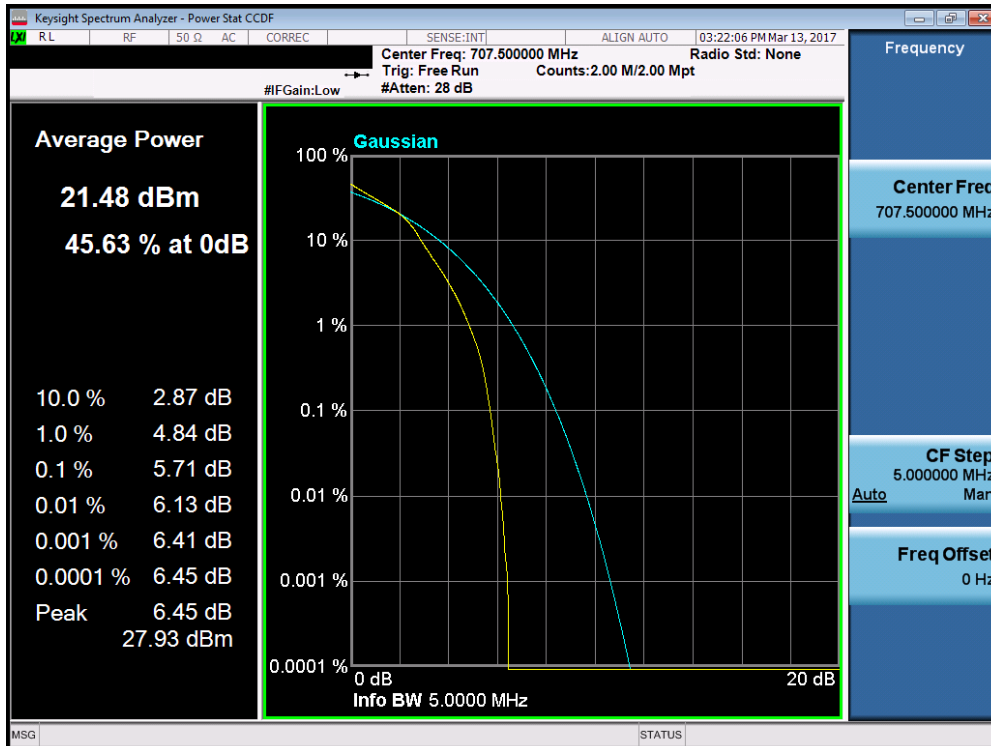
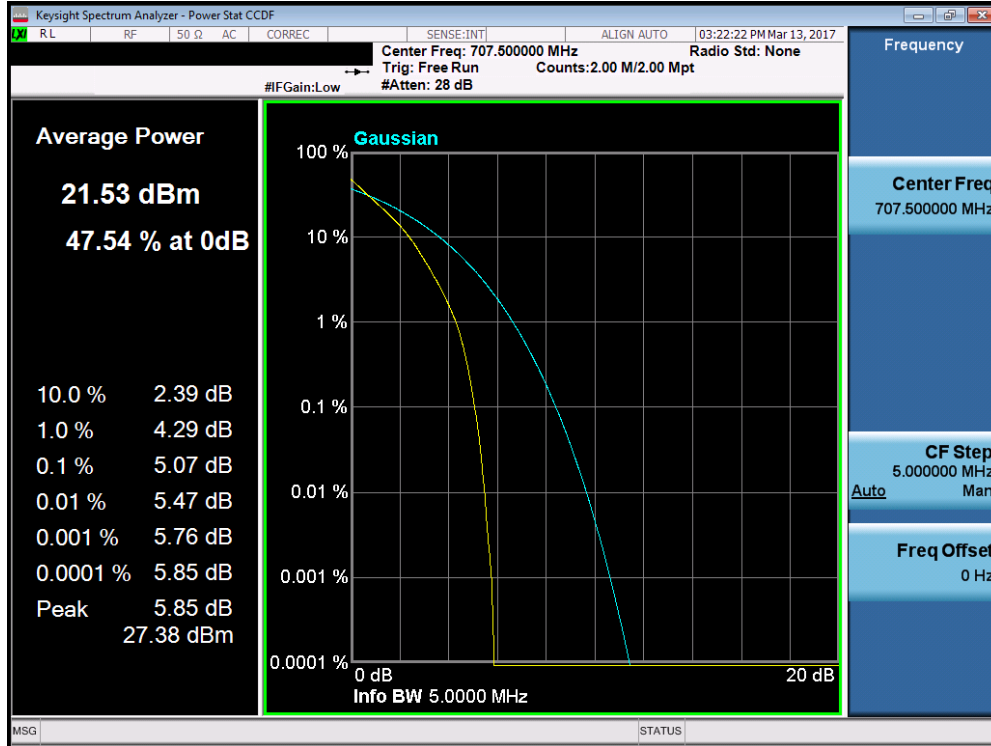


Plot 7-168. PAR Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

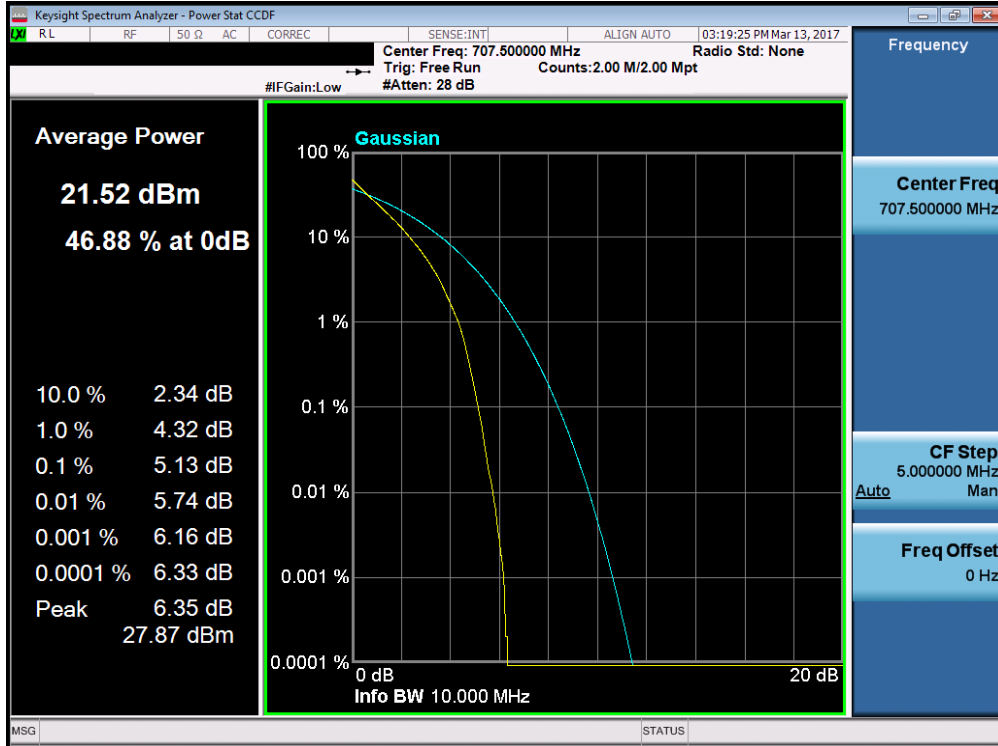


Plot 7-169. PAR Plot (Band 12 – 3.0MHz 16-QAM – RB Size 15)

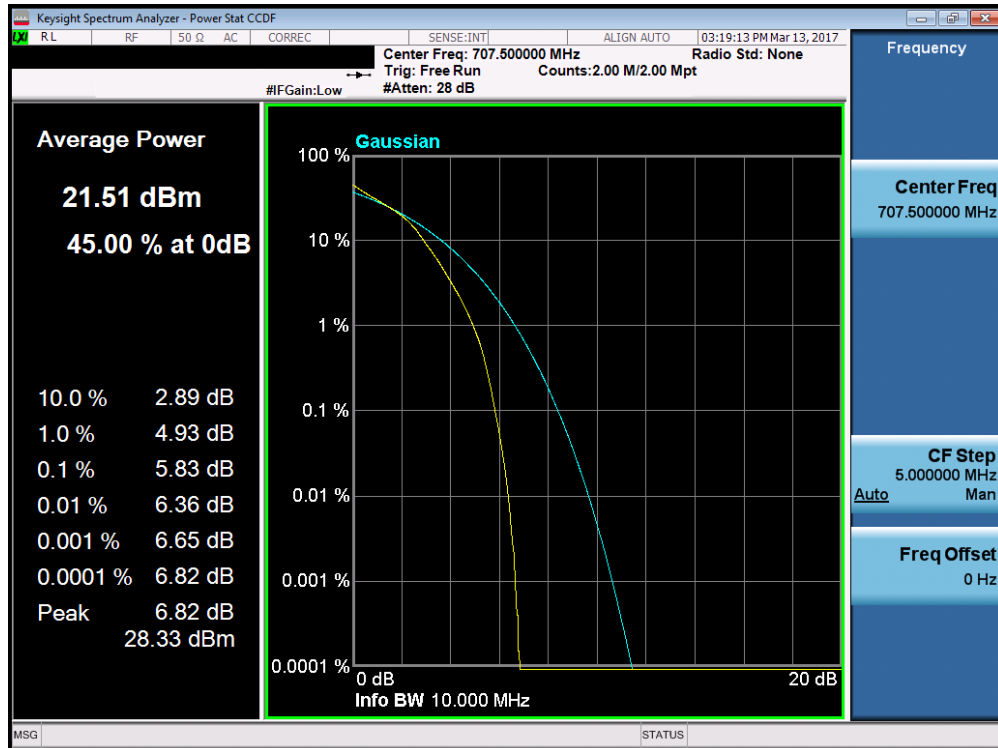
FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 104 of 153



FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 105 of 153

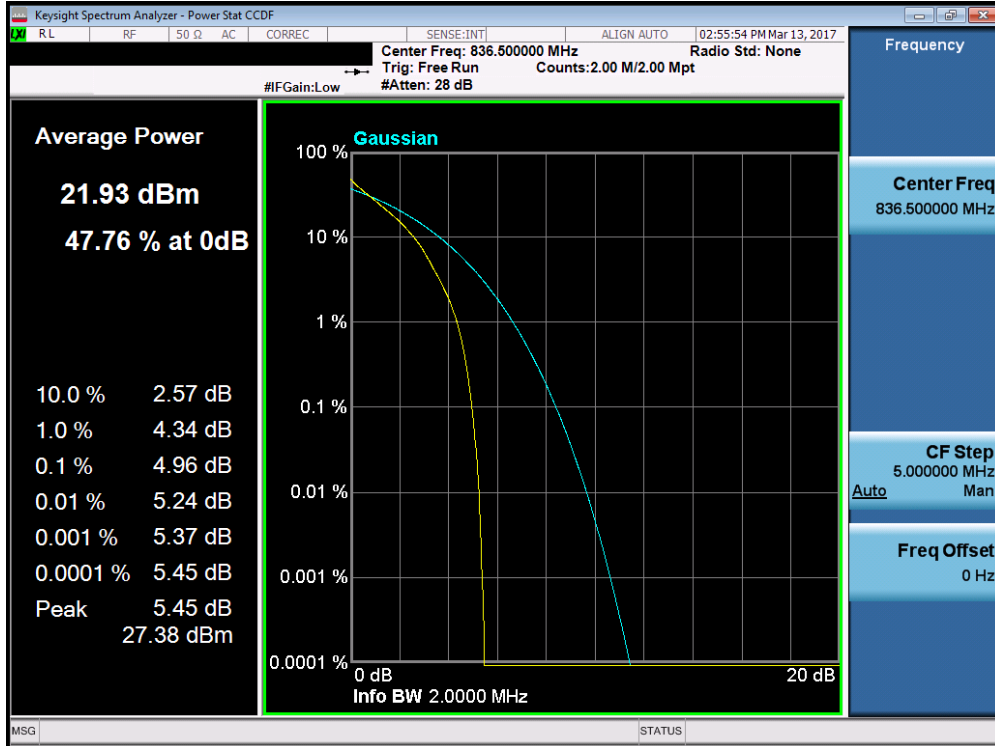


Plot 7-172. PAR Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

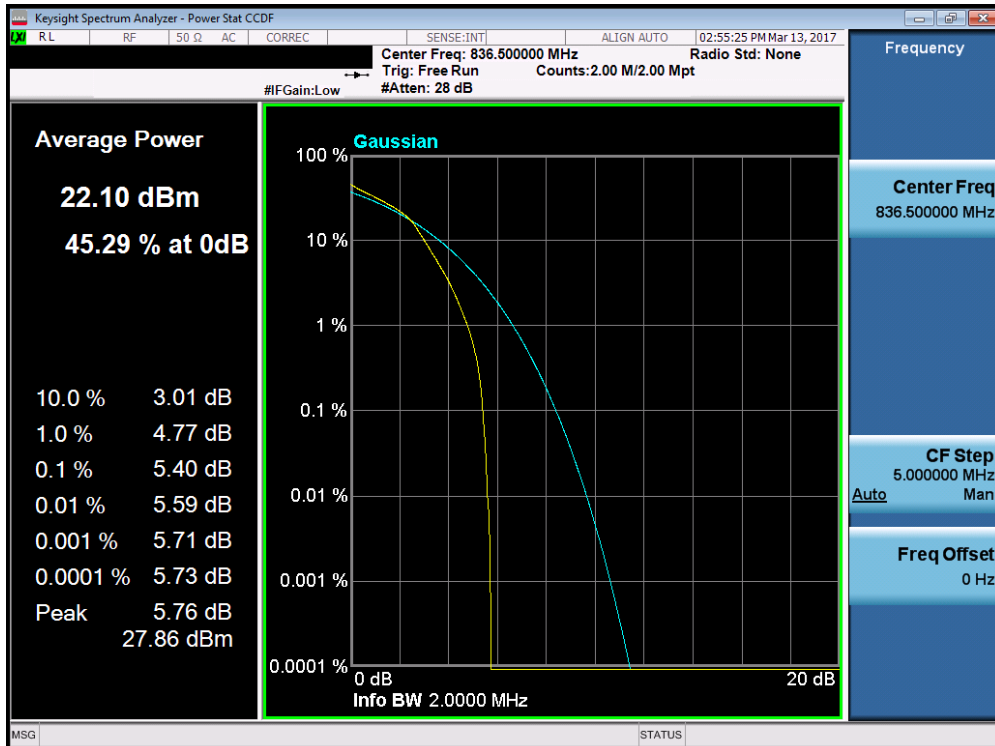


Plot 7-173. PAR Plot (Band 12 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 106 of 153

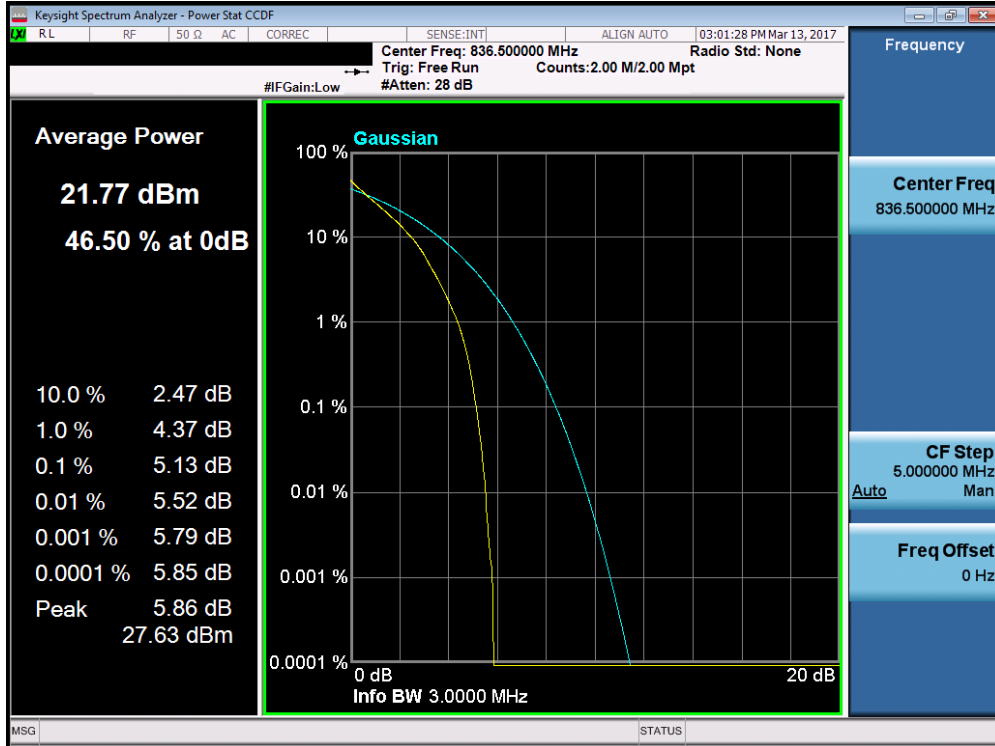


Plot 7-174. PAR Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

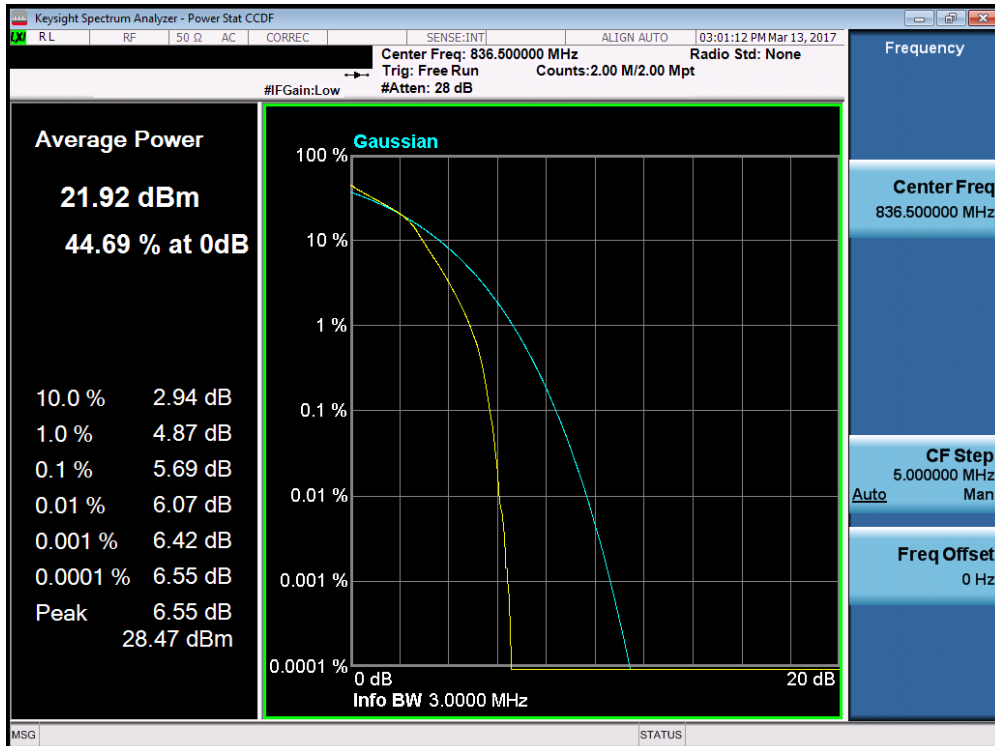


Plot 7-175. PAR Plot (Band 5 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 107 of 153

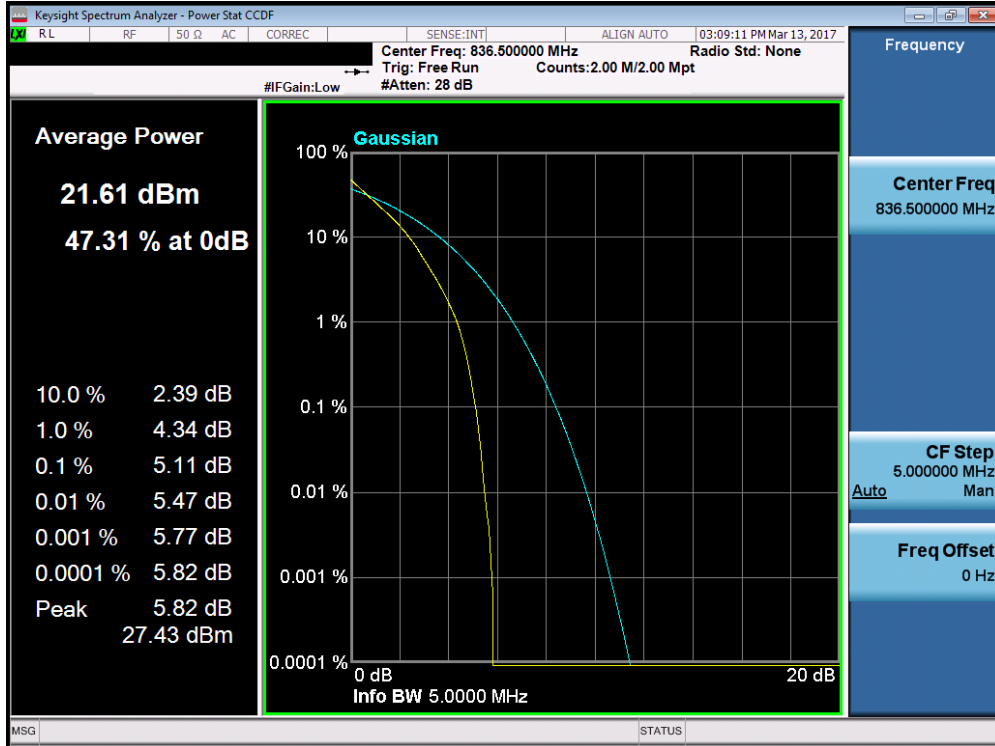


Plot 7-176. PAR Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

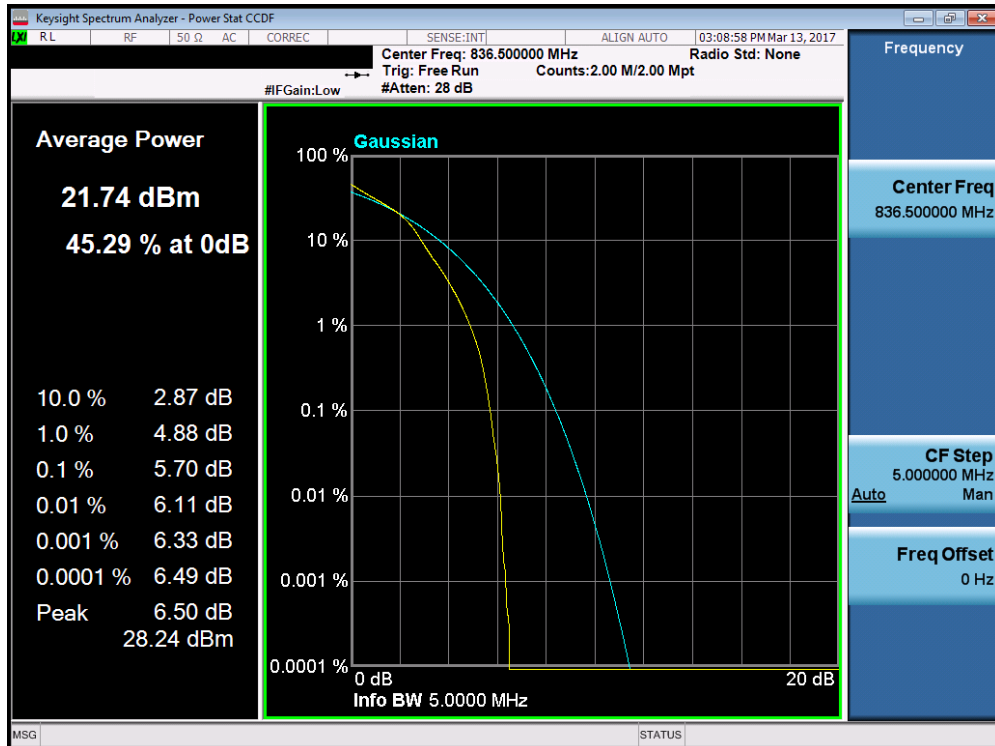


Plot 7-177. PAR Plot (Band 5 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 108 of 153

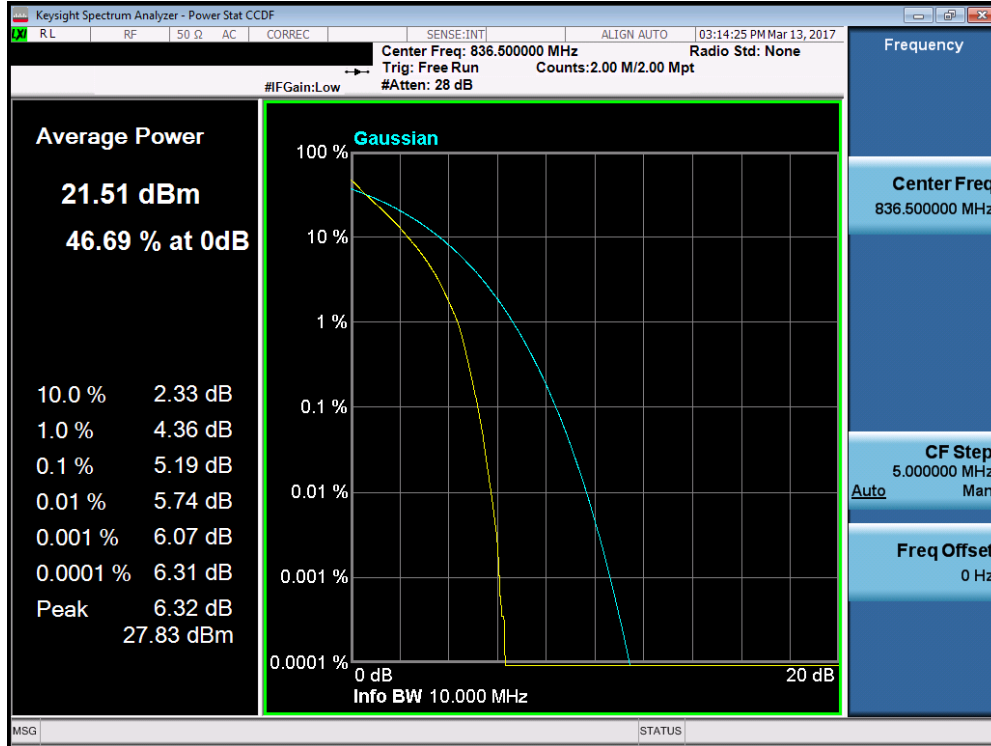


Plot 7-178. PAR Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

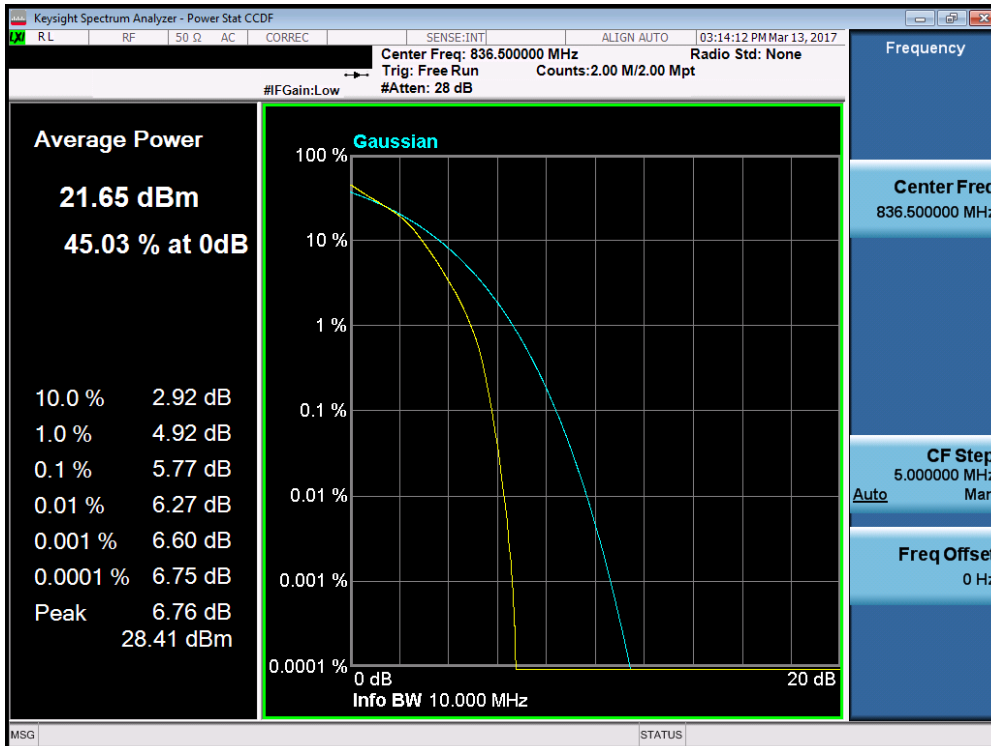


Plot 7-179. PAR Plot (Band 5 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 109 of 153

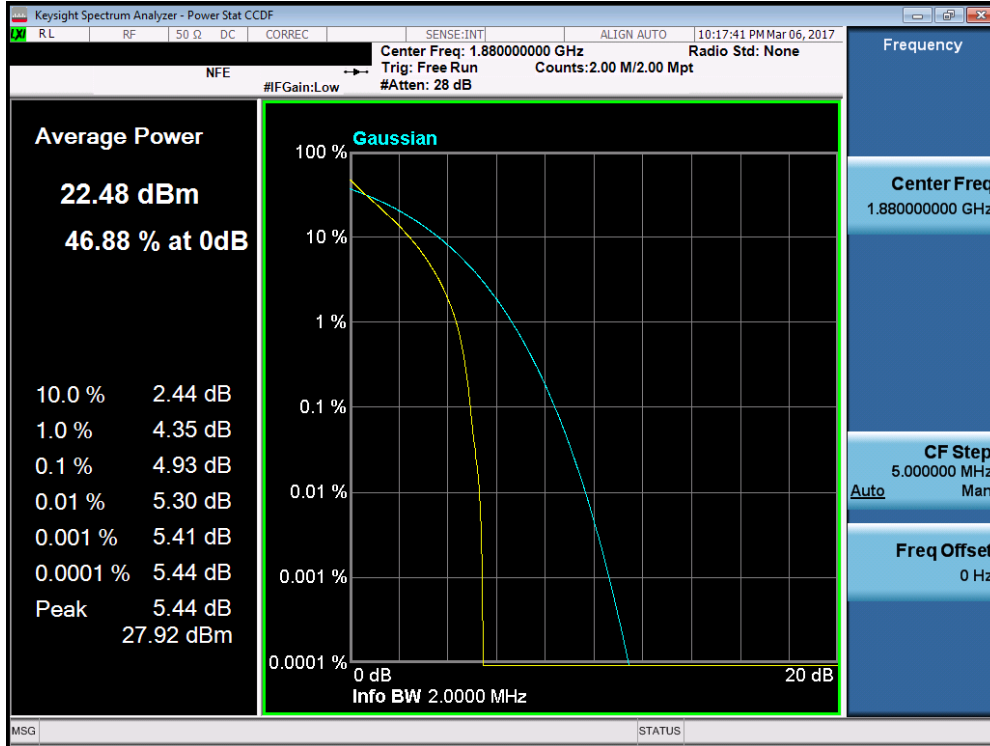


Plot 7-180. PAR Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

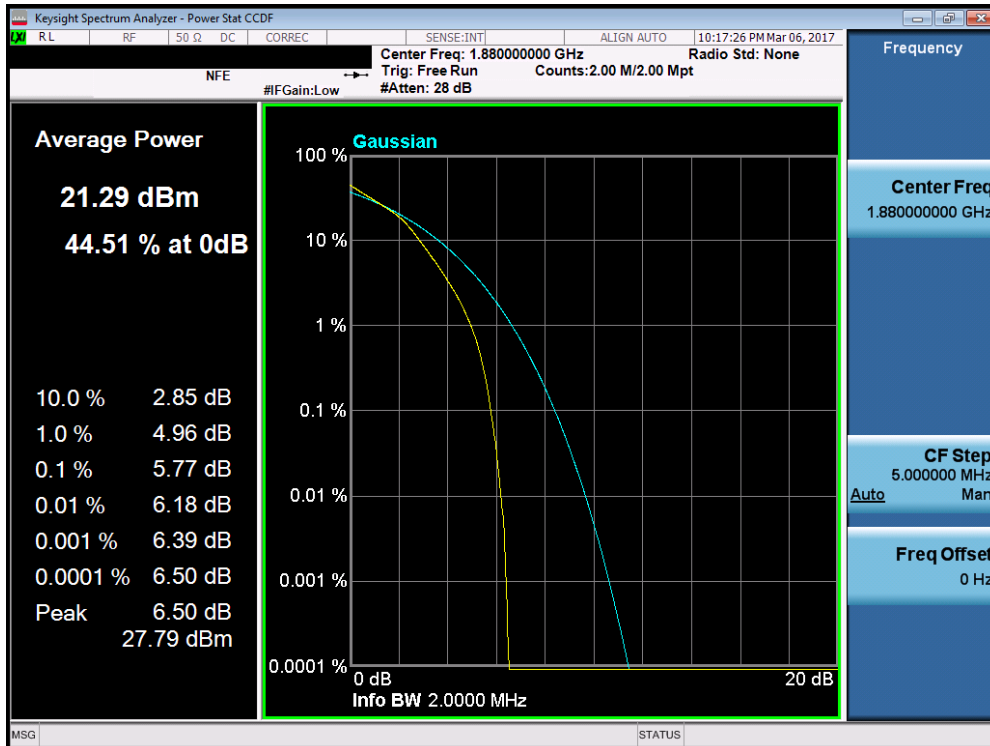


Plot 7-181. PAR Plot (Band 5 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 110 of 153



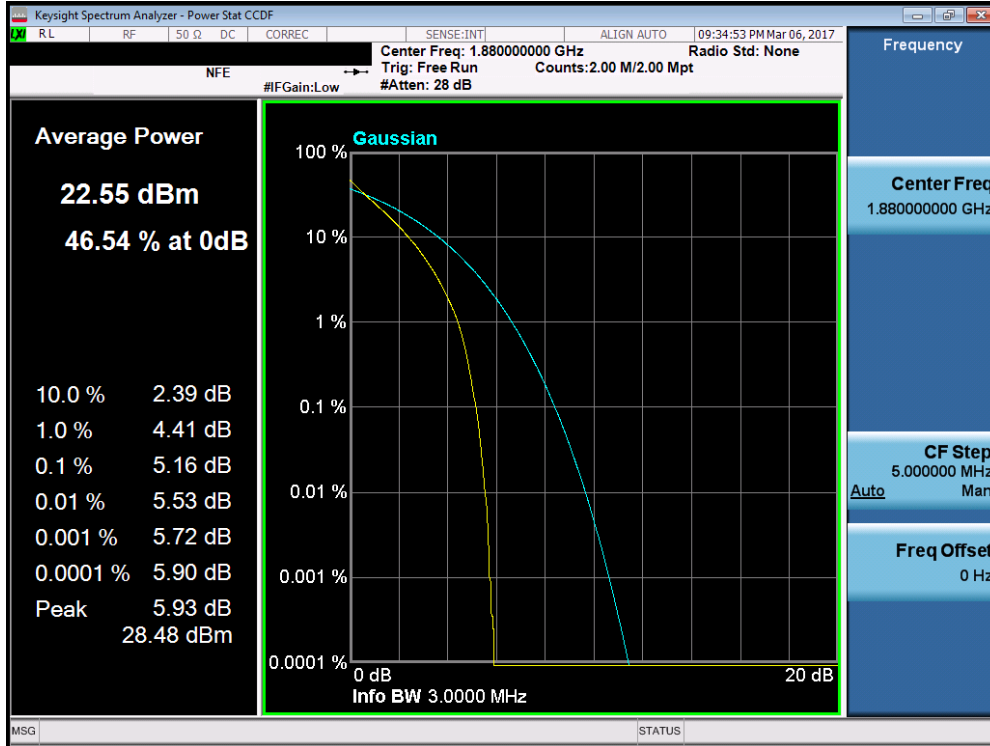
Plot 7-182. PAR Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



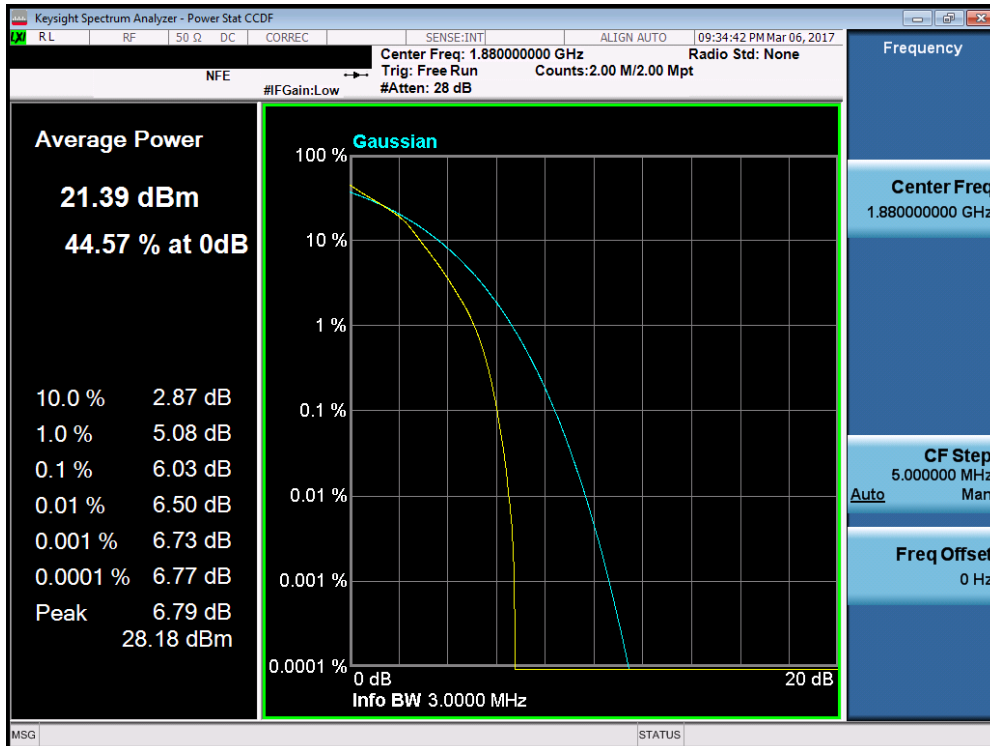
Plot 7-183. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 111 of 153



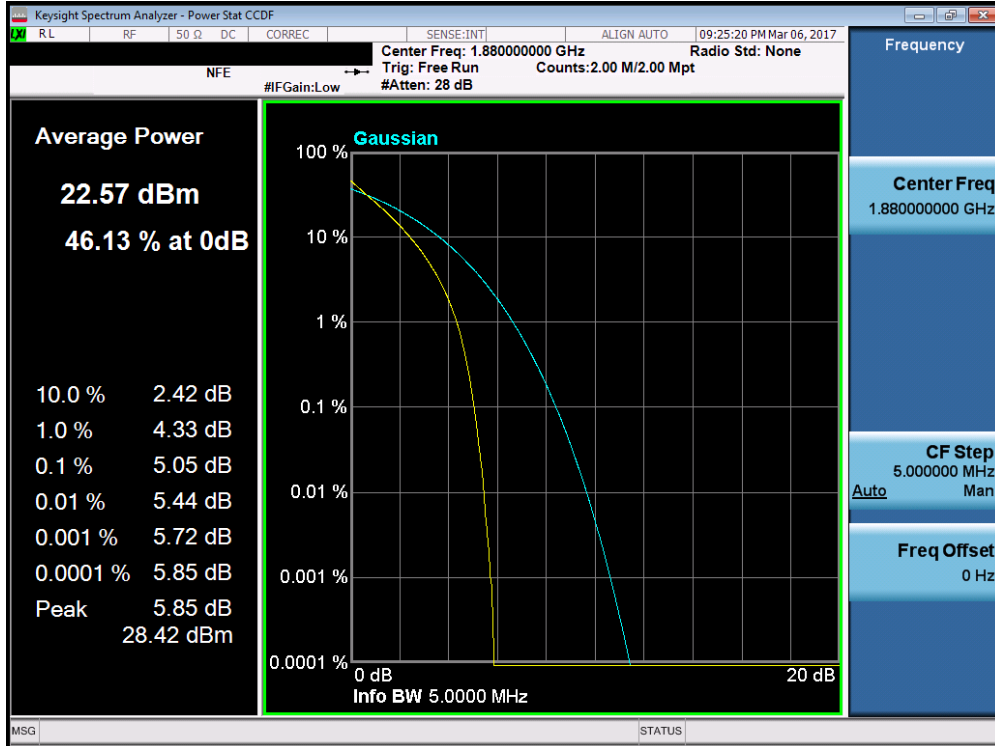


Plot 7-184. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

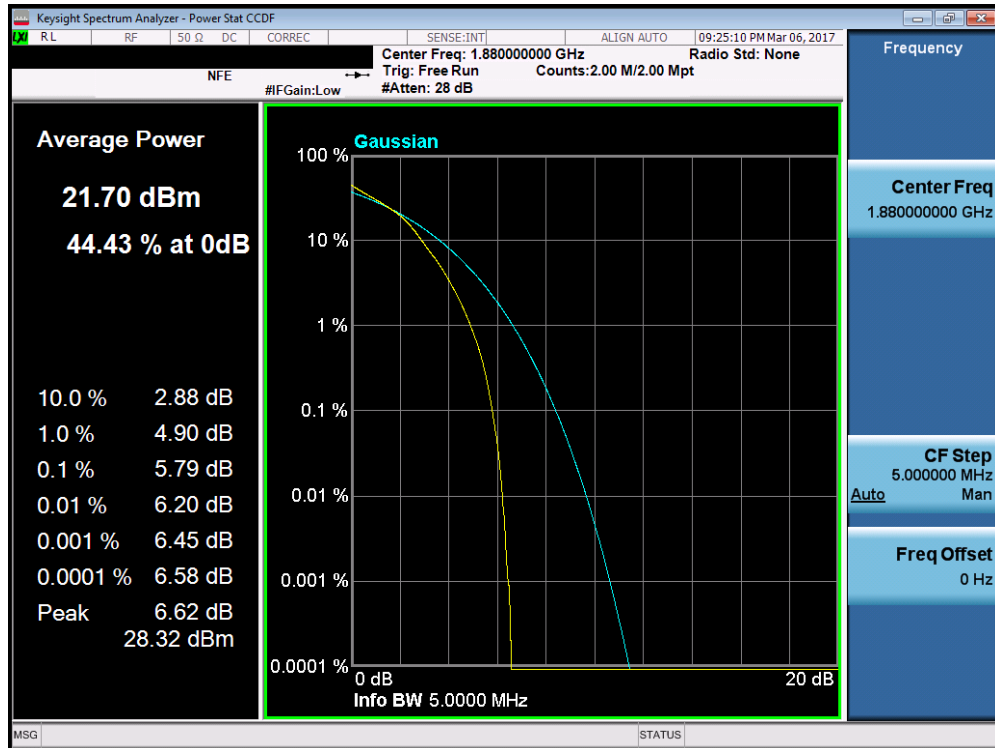


Plot 7-185. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 112 of 153

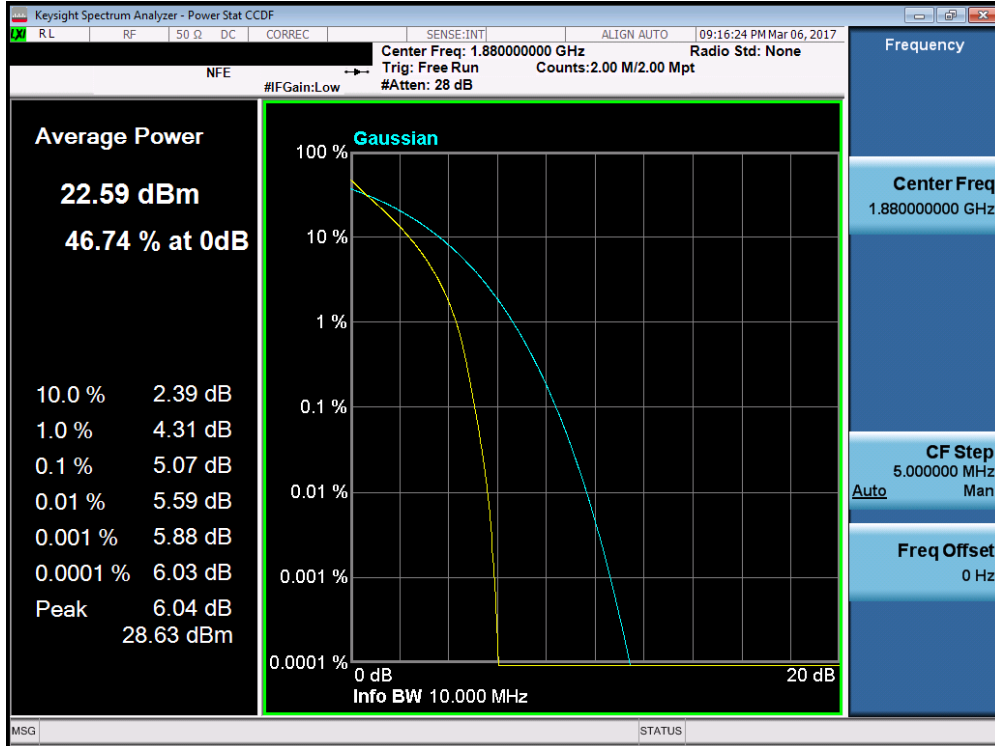


Plot 7-186. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

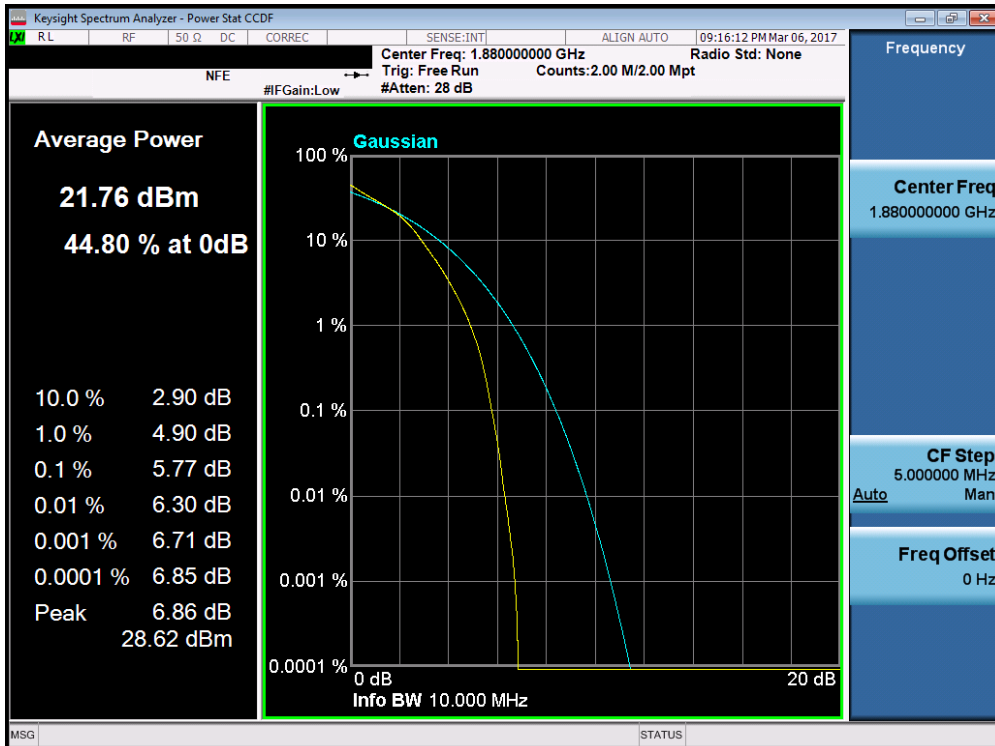


Plot 7-187. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 113 of 153

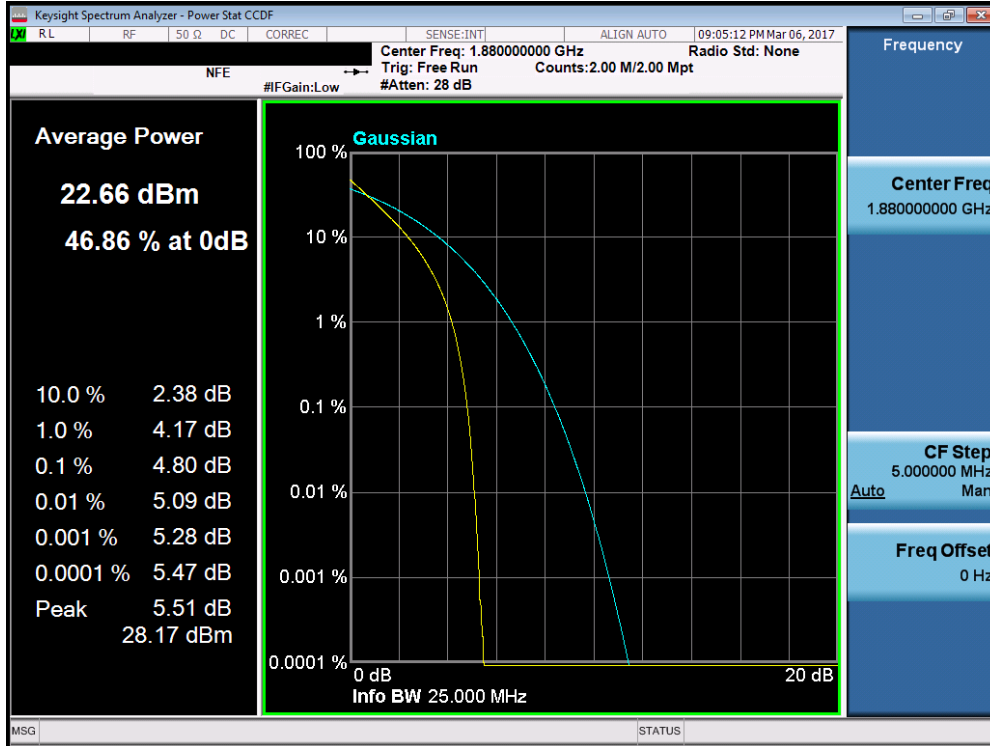


Plot 7-188. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

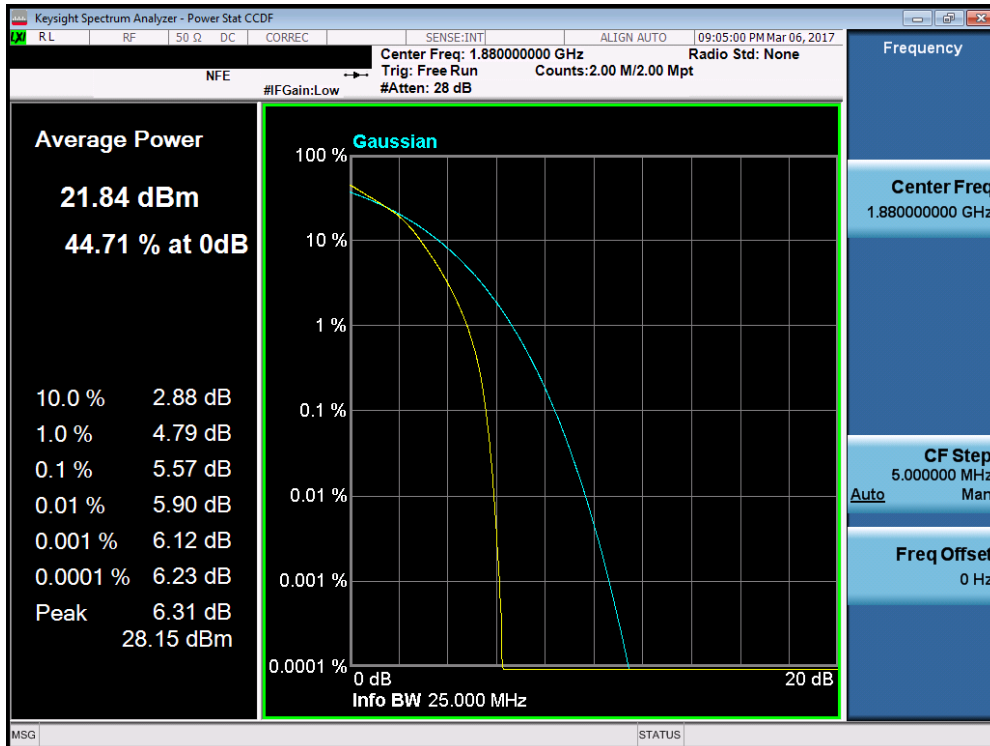


Plot 7-189. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 114 of 153

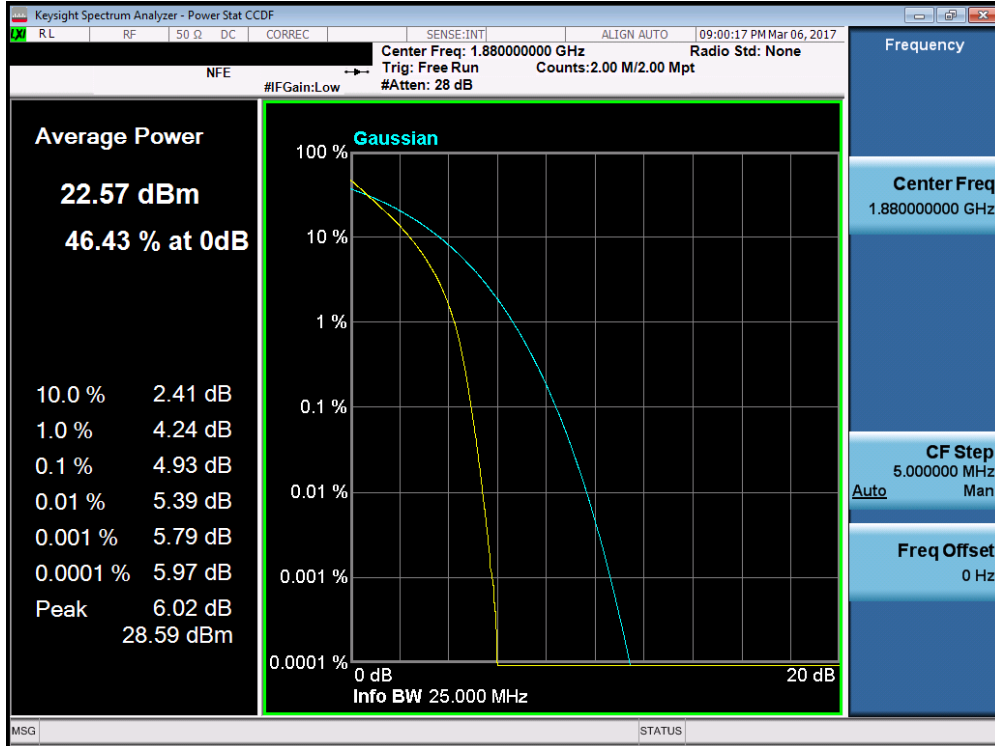


Plot 7-190. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

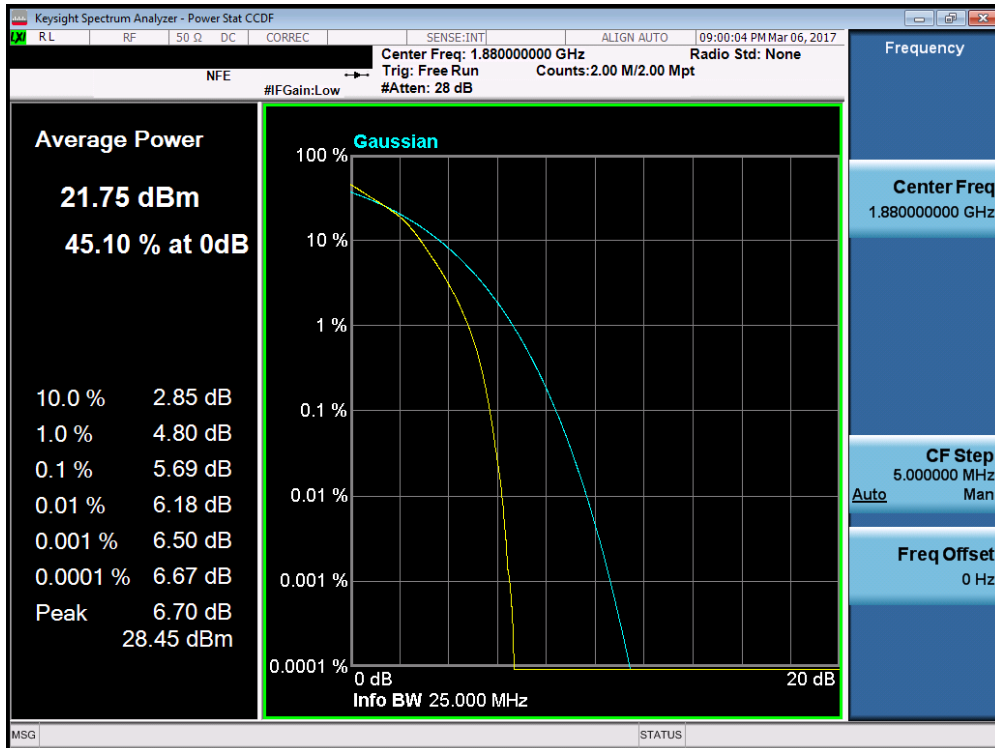


Plot 7-191. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 115 of 153

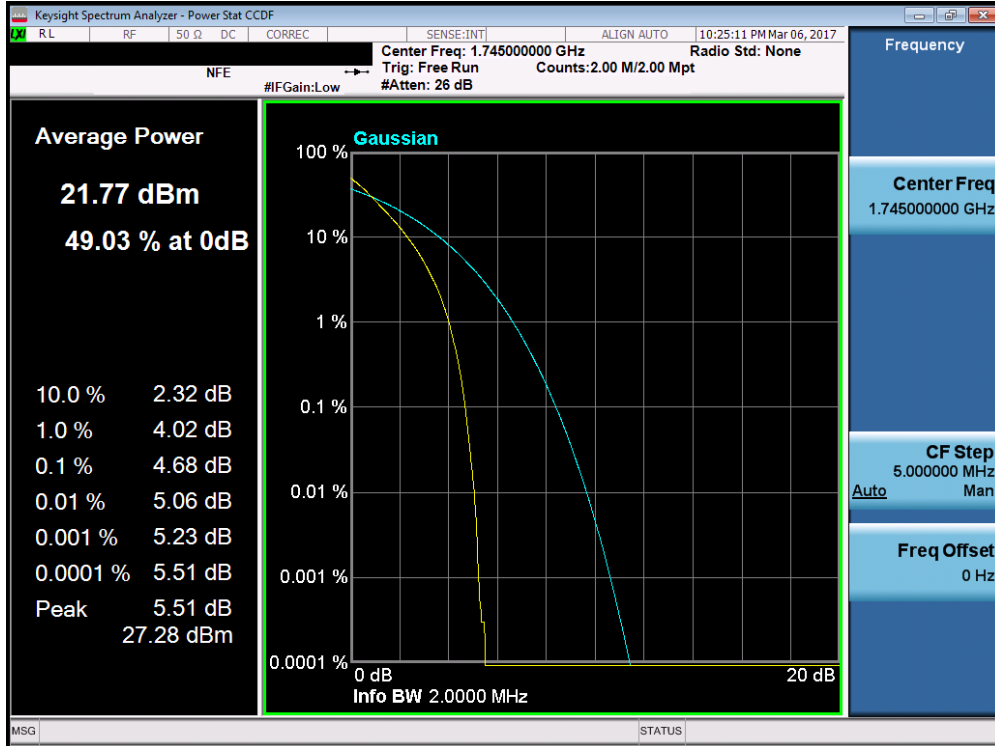


Plot 7-192. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

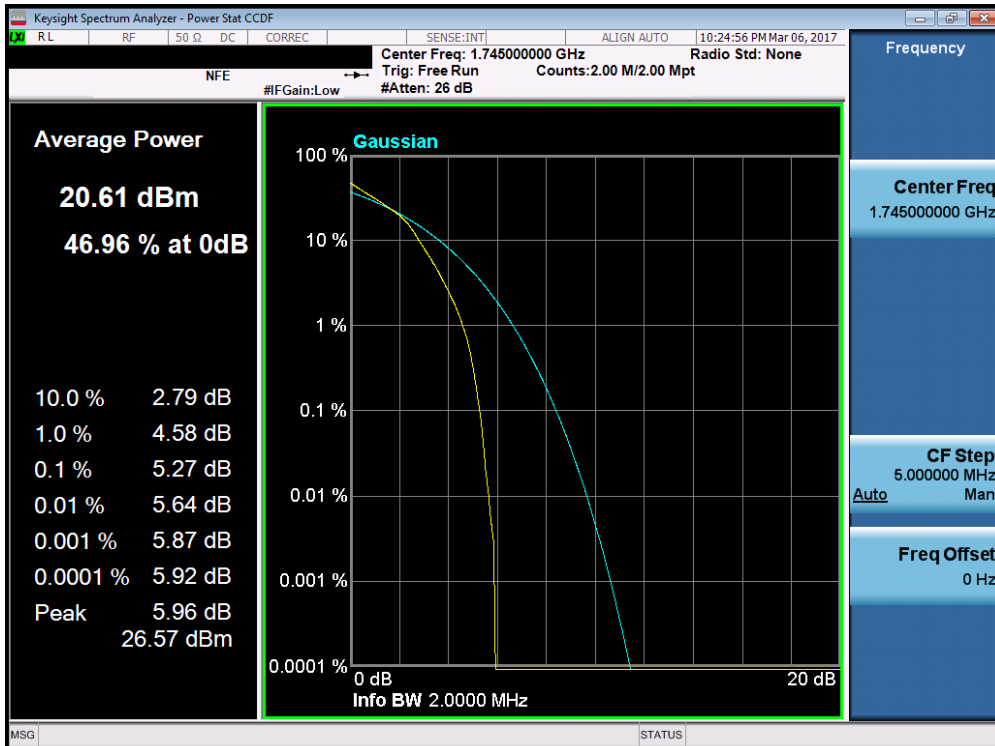


Plot 7-193. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 116 of 153

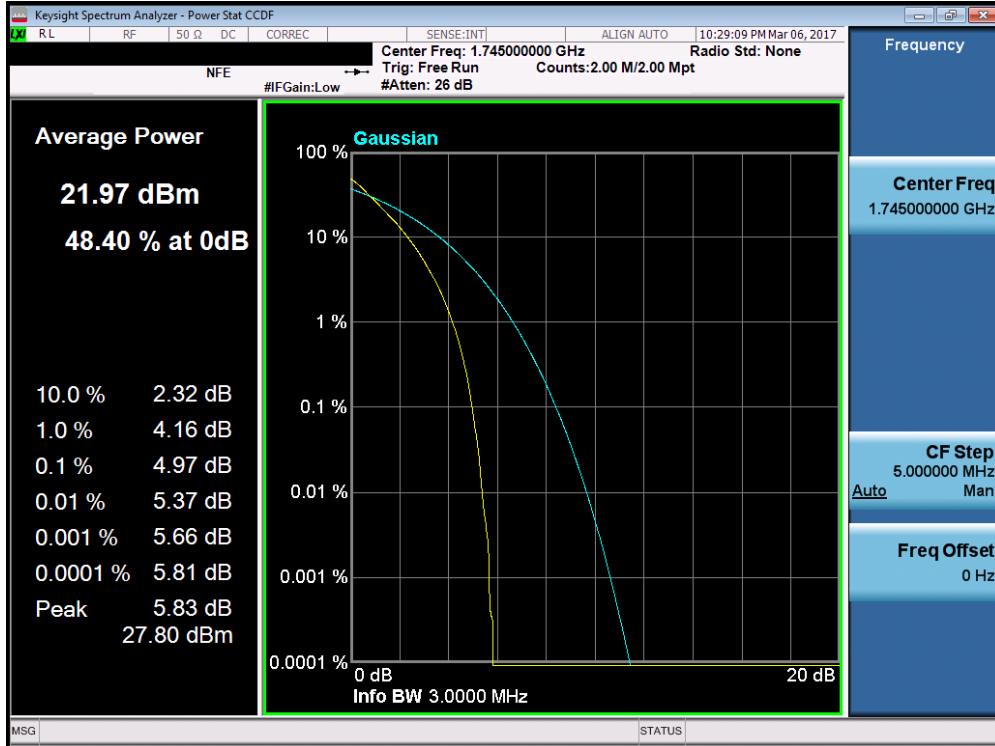


Plot 7-194. PAR Plot (Band 66 – 1.4MHz QPSK – RB Size 6)

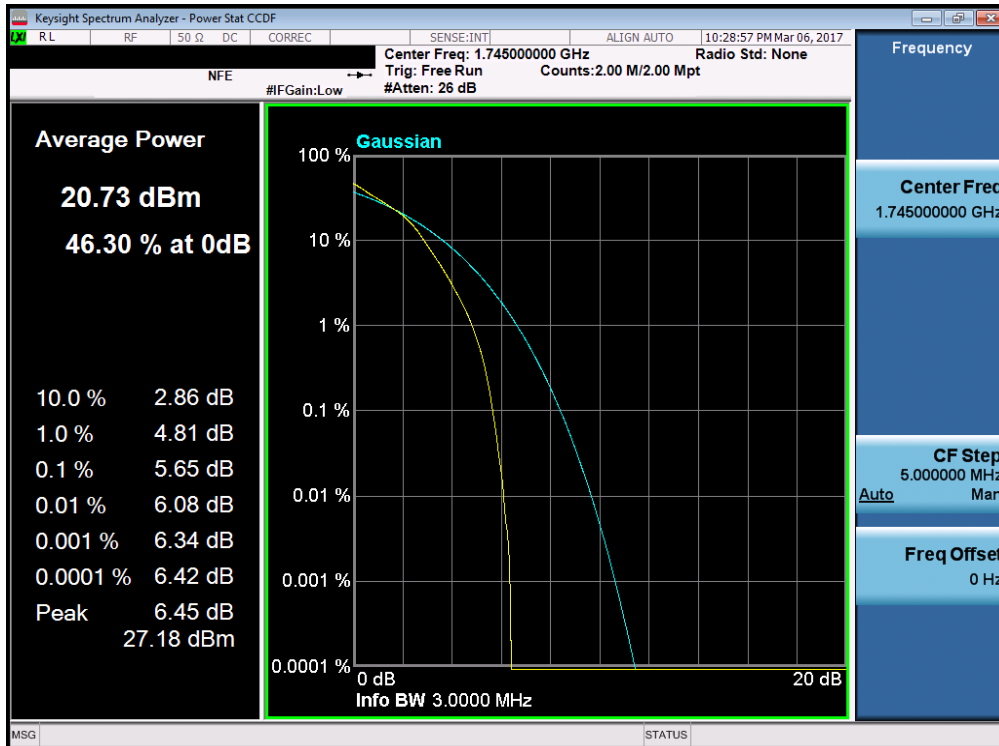


Plot 7-195. PAR Plot (Band 66 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 117 of 153

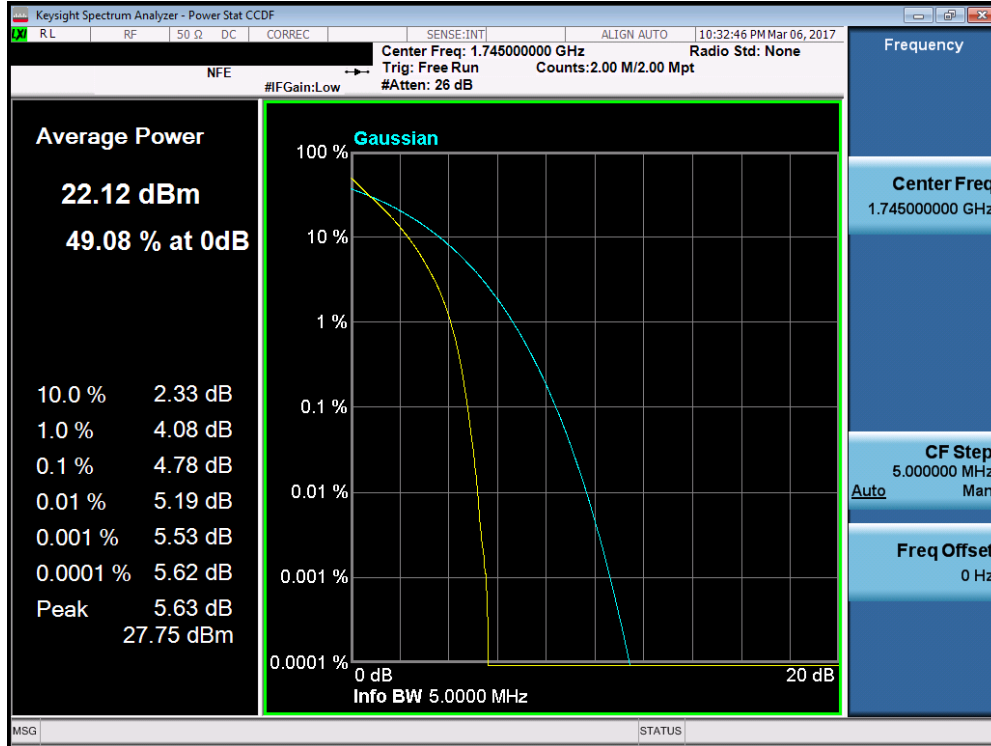


Plot 7-196. PAR Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

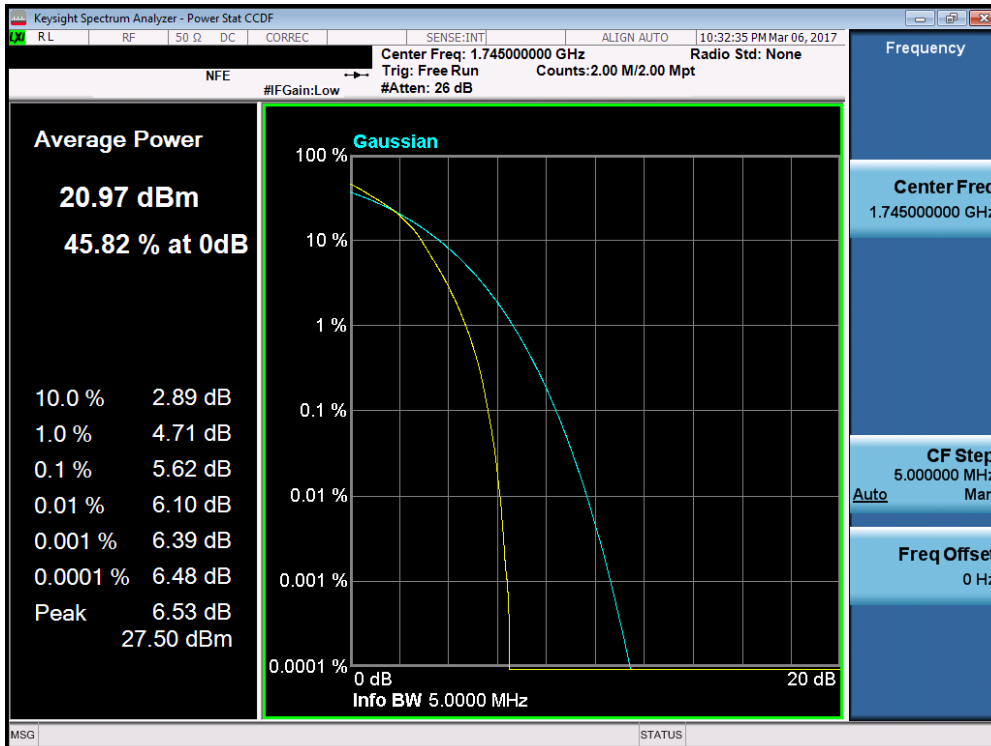


Plot 7-197. PAR Plot (Band 66 – 3.0MHz 16-QAM – RB Size 15)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 118 of 153



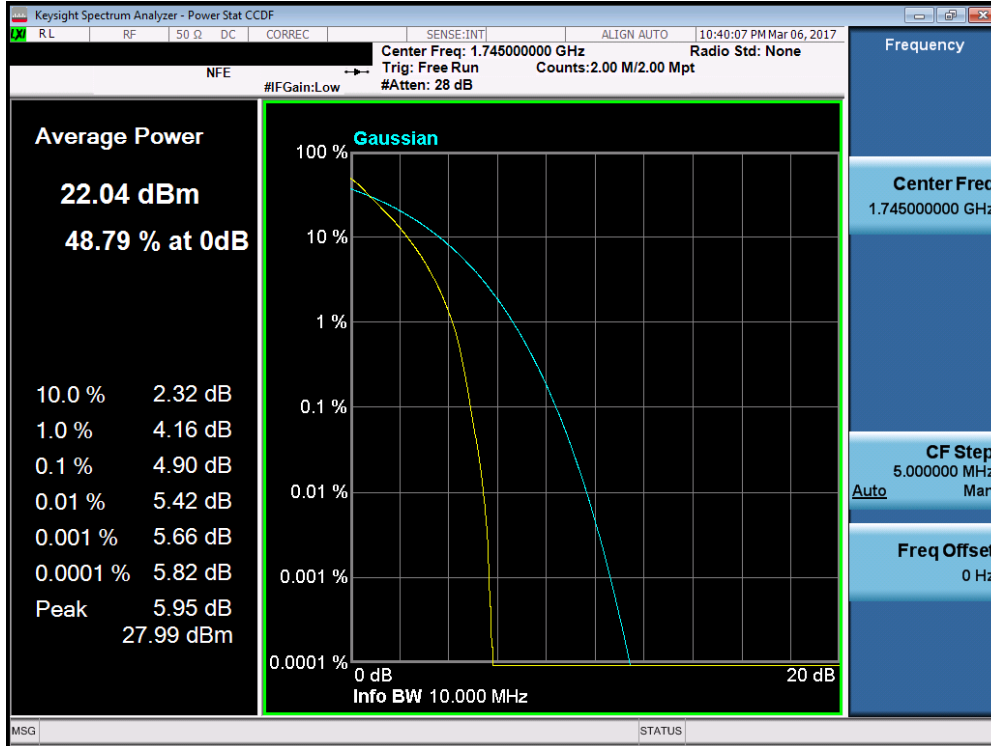
Plot 7-198. PAR Plot (Band 66 – 5.0MHz QPSK – RB Size 25)



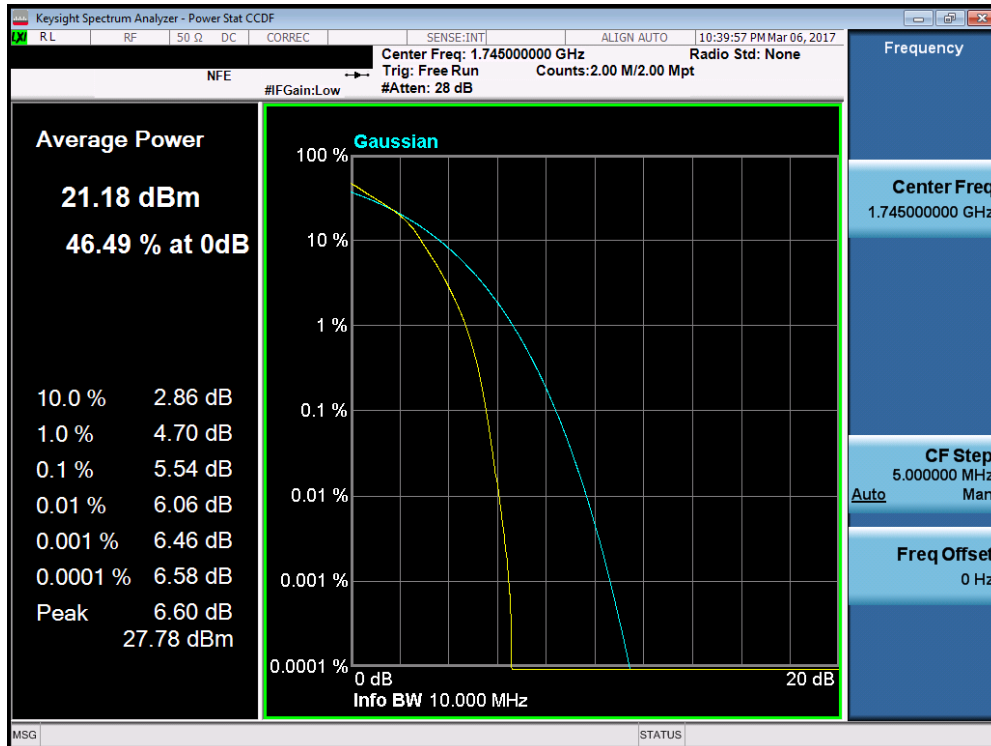
Plot 7-199. PAR Plot (Band 66 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 119 of 153



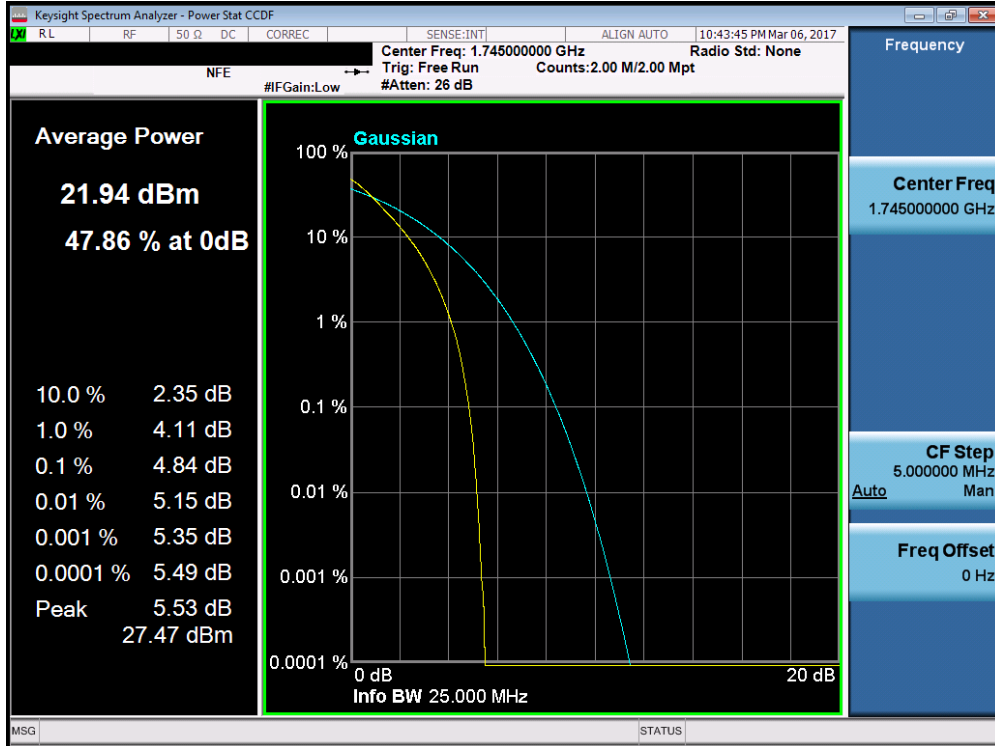


Plot 7-200. PAR Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

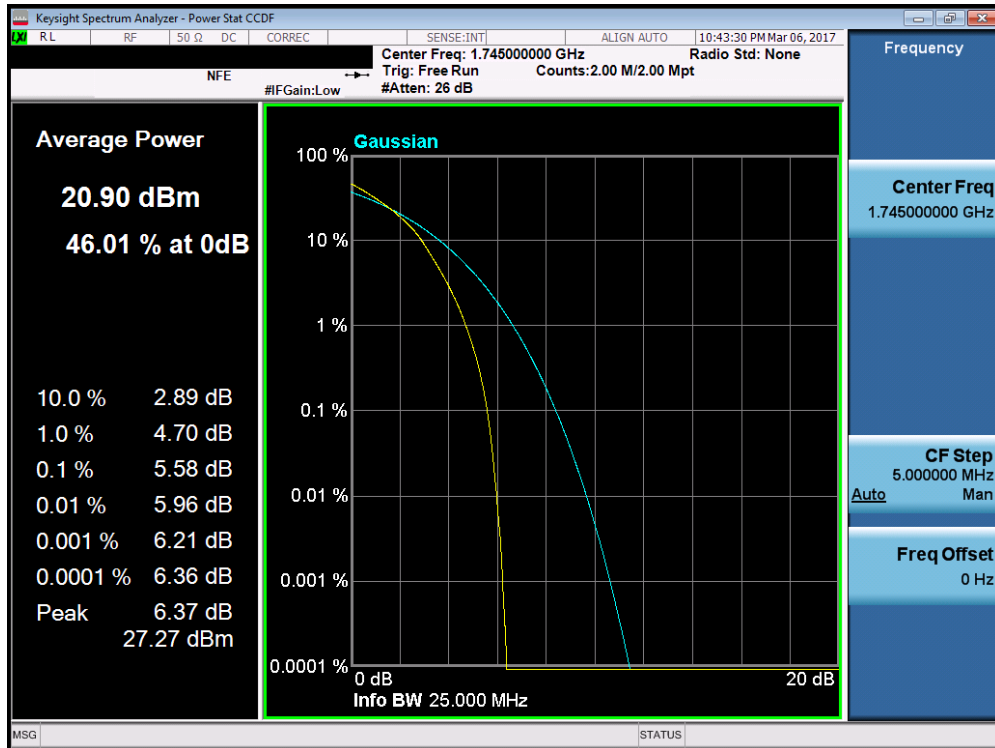


Plot 7-201. PAR Plot (Band 66 – 10.0MHz 16-QAM – RB Size 50)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 120 of 153

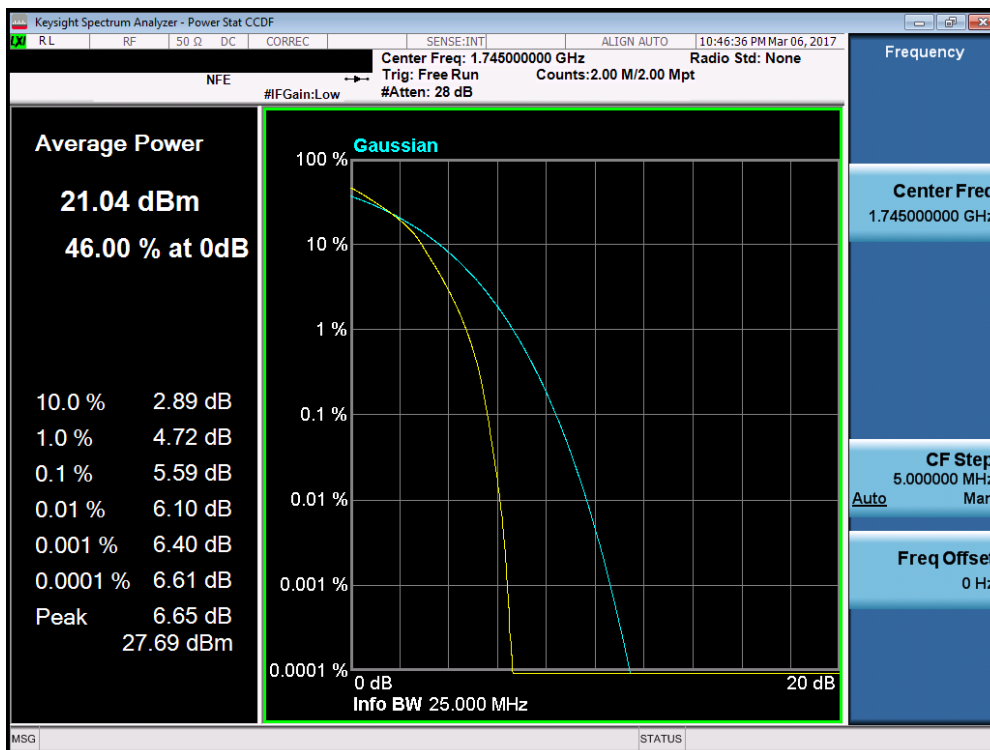
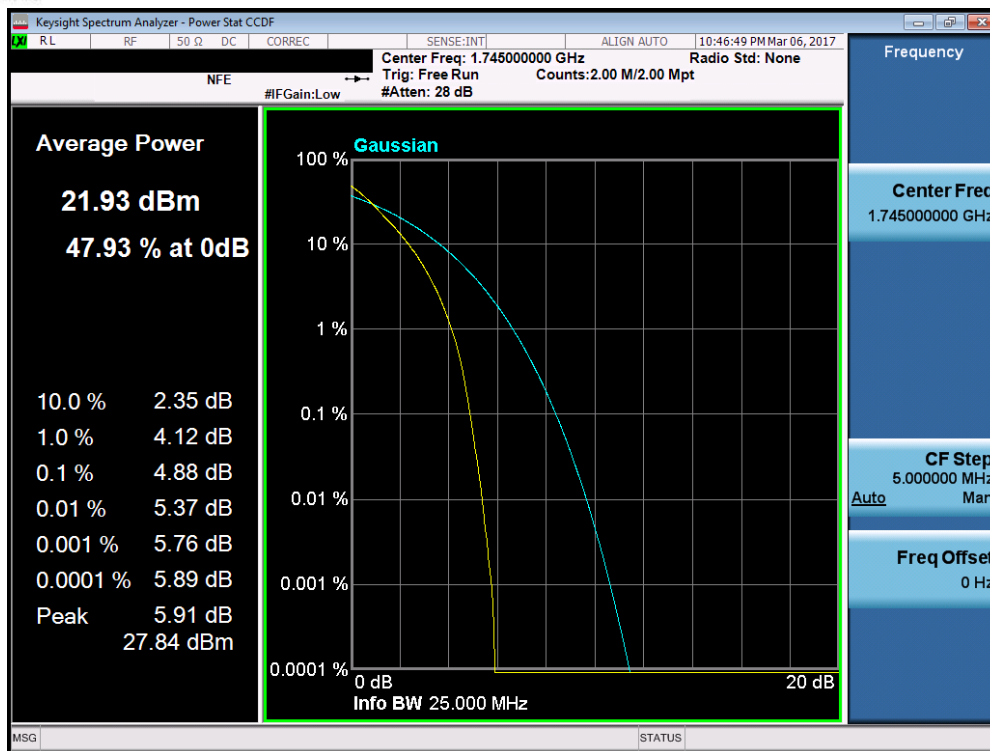


Plot 7-202. PAR Plot (Band 66 – 15.0MHz QPSK – RB Size 75)



Plot 7-203. PAR Plot (Band 66 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 121 of 153



FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 122 of 153

## 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

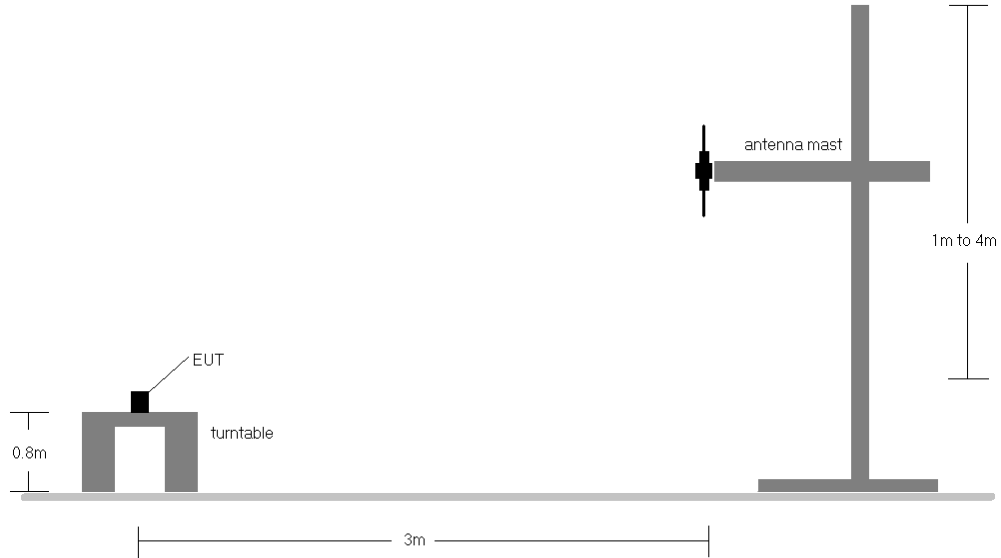
### Test Settings

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

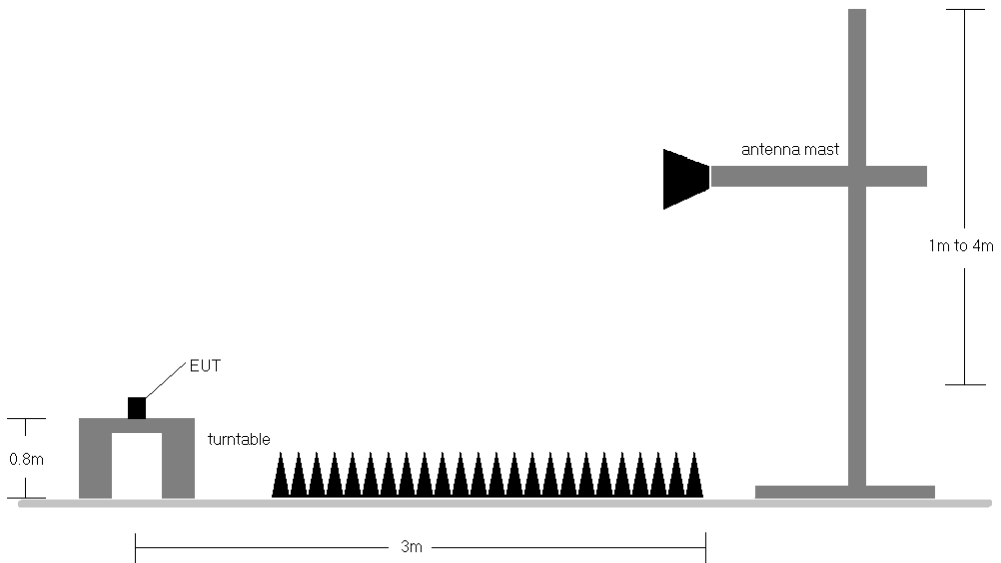
FCC ID: ZNFV530	 <b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 <b>LG</b>	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet	Page 123 of 153	

### 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: ZNFV530	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 124 of 153



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]
699.70	1.4	QPSK	H	147	159	1 / 3	16.94	2.48	19.42	34.77	-15.35
707.50	1.4	QPSK	H	145	151	1 / 3	17.06	2.56	19.62	34.77	-15.15
715.30	1.4	QPSK	H	289	146	1 / 3	18.14	2.60	20.74	34.77	-14.04
699.70	1.4	16-QAM	H	147	159	1 / 3	16.13	2.48	18.61	34.77	-16.16
707.50	1.4	16-QAM	H	145	151	1 / 3	16.20	2.56	18.76	34.77	-16.01
715.30	1.4	16-QAM	H	289	146	1 / 3	17.34	2.60	19.94	34.77	-14.84
700.50	3	QPSK	H	147	159	1 / 7	17.33	2.48	19.81	34.77	-14.96
707.50	3	QPSK	H	145	151	1 / 14	17.36	2.56	19.92	34.77	-14.85
714.50	3	QPSK	H	289	146	1 / 7	18.01	2.60	20.61	34.77	-14.16
700.50	3	16-QAM	H	147	159	1 / 7	16.48	2.48	18.96	34.77	-15.81
707.50	3	16-QAM	H	145	151	1 / 14	16.53	2.56	19.09	34.77	-15.68
714.50	3	16-QAM	H	289	146	1 / 7	17.23	2.60	19.83	34.77	-14.94
701.50	5	QPSK	H	147	159	1 / 12	17.49	2.49	19.98	34.77	-14.79
707.50	5	QPSK	H	145	151	1 / 24	17.59	2.56	20.15	34.77	-14.62
713.50	5	QPSK	H	289	146	1 / 12	18.22	2.60	20.82	34.77	-13.95
701.50	5	16-QAM	H	147	159	1 / 12	16.71	2.49	19.20	34.77	-15.57
707.50	5	16-QAM	H	145	151	1 / 24	16.73	2.56	19.29	34.77	-15.48
713.50	5	16-QAM	H	289	146	1 / 12	17.49	2.60	20.09	34.77	-14.68
704.00	10	QPSK	H	147	159	1 / 25	17.35	2.51	19.86	34.77	-14.91
707.50	10	QPSK	H	145	151	1 / 25	17.33	2.56	19.89	34.77	-14.88
711.00	10	QPSK	H	289	146	1 / 25	17.91	2.60	20.51	34.77	-14.27
704.00	10	16-QAM	H	147	159	1 / 25	16.62	2.51	19.13	34.77	-15.64
707.50	10	16-QAM	H	145	151	1 / 25	16.56	2.56	19.12	34.77	-15.65
711.00	10	16-QAM	H	289	146	1 / 25	17.18	2.60	19.78	34.77	-15.00
713.50	5	QPSK	V	300	286	1 / 0	15.54	2.60	18.14	34.77	-16.63
713.50	5 (Sound Pack)	QPSK	H	271	150	1 / 0	18.06	2.60	20.66	34.77	-14.11

**Table 7-2. ERP Data (Band 12)**

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 125 of 153	



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	H	219	157	1 / 0	16.83	5.51	22.34	38.45	-16.11
836.50	1.4	QPSK	H	204	161	1 / 0	18.28	5.14	23.42	38.45	-15.03
848.30	1.4	QPSK	H	206	161	1 / 0	17.69	4.68	22.37	38.45	-16.08
824.70	1.4	16-QAM	H	219	157	1 / 0	15.82	5.51	21.33	38.45	-17.12
836.50	1.4	16-QAM	H	204	161	1 / 0	17.17	5.14	22.31	38.45	-16.14
848.30	1.4	16-QAM	H	206	161	1 / 0	16.89	4.68	21.57	38.45	-16.88
825.50	3	QPSK	H	219	157	1 / 0	16.99	5.52	22.51	38.45	-15.94
836.50	3	QPSK	H	204	161	1 / 0	18.47	5.14	23.61	38.45	-14.84
847.50	3	QPSK	H	206	161	1 / 0	17.80	4.67	22.47	38.45	-15.98
825.50	3	16-QAM	H	219	157	1 / 0	15.70	5.52	21.22	38.45	-17.23
836.50	3	16-QAM	H	204	161	1 / 0	17.36	5.14	22.50	38.45	-15.95
847.50	3	16-QAM	H	206	161	1 / 0	16.41	4.67	21.08	38.45	-17.37
826.50	5	QPSK	H	219	157	1 / 12	16.87	5.51	22.38	38.45	-16.07
836.50	5	QPSK	H	204	161	1 / 12	18.52	5.14	23.66	38.45	-14.79
846.50	5	QPSK	H	206	161	1 / 12	17.85	4.66	22.51	38.45	-15.94
826.50	5	16-QAM	H	219	157	1 / 12	15.43	5.51	20.94	38.45	-17.51
836.50	5	16-QAM	H	204	161	1 / 12	17.06	5.14	22.20	38.45	-16.25
846.50	5	16-QAM	H	206	161	1 / 12	16.26	4.66	20.92	38.45	-17.53
829.00	10	QPSK	H	219	157	1 / 25	17.67	5.49	23.16	38.45	-15.29
836.50	10	QPSK	H	204	161	1 / 25	17.93	5.14	23.07	38.45	-15.38
844.00	10	QPSK	H	206	161	1 / 0	17.77	4.70	22.47	38.45	-15.98
829.00	10	16-QAM	H	219	157	1 / 25	16.72	5.49	22.21	38.45	-16.24
836.50	10	16-QAM	H	204	161	1 / 25	17.11	5.14	22.25	38.45	-16.20
844.00	10	16-QAM	H	206	161	1 / 0	16.97	4.70	21.67	38.45	-16.78
836.50	5	QPSK	V	304	199	1 / 0	15.51	5.14	20.65	38.45	-17.80
836.50	5 (Sound Pack)	QPSK	H	217	150	1 / 0	18.42	5.14	23.56	38.45	-14.89

**Table 7-3. ERP Data (Band 5)**

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 126 of 153	

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	100	335	1 / 0	16.59	9.62	26.21	30.00	-3.79
1745.00	1.4	QPSK	H	100	336	1 / 0	17.28	9.43	26.71	30.00	-3.29
1779.30	1.4	QPSK	H	100	327	1 / 0	16.60	9.25	25.85	30.00	-4.15
1710.70	1.4	16-QAM	H	100	335	1 / 0	15.68	9.62	25.30	30.00	-4.70
1745.00	1.4	16-QAM	H	100	336	1 / 0	16.30	9.43	25.73	30.00	-4.27
1779.30	1.4	16-QAM	H	100	327	1 / 0	15.86	9.25	25.11	30.00	-4.89
1711.50	3	QPSK	H	100	335	1 / 7	16.79	9.62	26.41	30.00	-3.59
1745.00	3	QPSK	H	100	336	1 / 7	17.43	9.43	26.86	30.00	-3.14
1778.50	3	QPSK	H	100	327	1 / 0	16.67	9.26	25.93	30.00	-4.07
1711.50	3	16-QAM	H	100	335	1 / 7	15.86	9.62	25.48	30.00	-4.52
1745.00	3	16-QAM	H	100	336	1 / 7	16.25	9.43	25.68	30.00	-4.32
1778.50	3	16-QAM	H	100	327	1 / 0	15.38	9.26	24.64	30.00	-5.36
1712.50	5	QPSK	H	100	335	1 / 0	16.70	9.61	26.31	30.00	-3.69
1745.00	5	QPSK	H	100	336	1 / 0	17.09	9.43	26.52	30.00	-3.48
1777.50	5	QPSK	H	100	327	1 / 0	16.61	9.26	25.87	30.00	-4.13
1712.50	5	16-QAM	H	100	335	1 / 0	15.98	9.61	25.59	30.00	-4.41
1745.00	5	16-QAM	H	100	336	1 / 0	16.35	9.43	25.78	30.00	-4.22
1777.50	5	16-QAM	H	100	327	1 / 0	15.81	9.26	25.07	30.00	-4.93
1715.00	10	QPSK	H	100	335	1 / 0	16.63	9.60	26.23	30.00	-3.77
1745.00	10	QPSK	H	100	336	1 / 0	17.14	9.43	26.57	30.00	-3.43
1775.00	10	QPSK	H	100	327	1 / 0	16.56	9.28	25.84	30.00	-4.16
1715.00	10	16-QAM	H	100	335	1 / 0	15.41	9.60	25.01	30.00	-4.99
1745.00	10	16-QAM	H	100	336	1 / 0	15.92	9.43	25.35	30.00	-4.65
1775.00	10	16-QAM	H	100	327	1 / 0	15.56	9.28	24.84	30.00	-5.16
1717.50	15	QPSK	H	100	335	1 / 0	16.78	9.58	26.36	30.00	-3.64
1745.00	15	QPSK	H	100	336	1 / 0	16.82	9.43	26.25	30.00	-3.75
1772.50	15	QPSK	H	100	327	1 / 0	16.91	9.29	26.20	30.00	-3.80
1717.50	15	16-QAM	H	100	335	1 / 0	15.49	9.58	25.07	30.00	-4.93
1745.00	15	16-QAM	H	100	336	1 / 0	15.44	9.43	24.87	30.00	-5.13
1772.50	15	16-QAM	H	100	327	1 / 0	15.70	9.29	24.99	30.00	-5.01
1720.00	20	QPSK	H	100	335	1 / 50	16.83	9.57	26.40	30.00	-3.60
1745.00	20	QPSK	H	100	336	1 / 50	16.87	9.43	26.30	30.00	-3.70
1770.00	20	QPSK	H	100	327	1 / 0	16.99	9.30	26.29	30.00	-3.71
1720.00	20	16-QAM	H	100	335	1 / 50	15.60	9.57	25.17	30.00	-4.83
1745.00	20	16-QAM	H	100	336	1 / 50	15.58	9.43	25.01	30.00	-4.99
1770.00	20	16-QAM	H	100	327	1 / 0	15.76	9.30	25.06	30.00	-4.94
1745.00	3	QPSK	V	233	227	1 / 0	14.59	9.43	24.02	30.00	-5.98
1745.00	3 (Sound Pack)	QPSK	H	100	338	1 / 0	17.23	9.43	26.66	30.00	-3.34



**Table 7-4. EIRP Data (Band 66)**

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 127 of 153	





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	100	331	1 / 0	17.31	9.12	26.43	33.01	-6.58
1880.00	1.4	QPSK	H	100	329	1 / 0	16.50	9.10	25.60	33.01	-7.41
1909.30	1.4	QPSK	H	100	327	1 / 0	15.99	9.16	25.15	33.01	-7.86
1850.70	1.4	16-QAM	H	100	331	1 / 0	16.58	9.12	25.70	33.01	-7.31
1880.00	1.4	16-QAM	H	100	329	1 / 0	15.89	9.10	24.99	33.01	-8.02
1909.30	1.4	16-QAM	H	100	327	1 / 0	15.22	9.16	24.38	33.01	-8.63
1851.50	3	QPSK	H	100	331	1 / 0	17.25	9.12	26.37	33.01	-6.64
1880.00	3	QPSK	H	100	329	1 / 0	16.62	9.10	25.72	33.01	-7.29
1908.50	3	QPSK	H	100	327	1 / 0	16.16	9.15	25.31	33.01	-7.70
1851.50	3	16-QAM	H	100	331	1 / 0	16.53	9.12	25.65	33.01	-7.36
1880.00	3	16-QAM	H	100	329	1 / 0	15.87	9.10	24.97	33.01	-8.04
1908.50	3	16-QAM	H	100	327	1 / 0	15.38	9.15	24.53	33.01	-8.48
1852.50	5	QPSK	H	100	331	1 / 0	17.76	9.12	26.88	33.01	-6.13
1880.00	5	QPSK	H	100	329	1 / 0	17.12	9.10	26.22	33.01	-6.79
1907.50	5	QPSK	H	100	327	1 / 0	16.42	9.15	25.57	33.01	-7.44
1852.50	5	16-QAM	H	100	331	1 / 0	16.74	9.12	25.86	33.01	-7.15
1880.00	5	16-QAM	H	100	329	1 / 0	15.95	9.10	25.05	33.01	-7.96
1907.50	5	16-QAM	H	100	327	1 / 0	15.03	9.15	24.18	33.01	-8.83
1855.00	10	QPSK	H	100	331	1 / 0	17.72	9.12	26.84	33.01	-6.17
1880.00	10	QPSK	H	100	329	1 / 0	17.24	9.10	26.34	33.01	-6.67
1905.00	10	QPSK	H	100	327	1 / 0	16.51	9.13	25.64	33.01	-7.37
1855.00	10	16-QAM	H	100	331	1 / 0	17.07	9.12	26.19	33.01	-6.82
1880.00	10	16-QAM	H	100	329	1 / 0	16.49	9.10	25.59	33.01	-7.42
1905.00	10	16-QAM	H	100	327	1 / 0	15.85	9.13	24.98	33.01	-8.03
1857.50	15	QPSK	H	100	331	1 / 37	17.89	9.11	27.00	33.01	-6.01
1880.00	15	QPSK	H	100	329	1 / 0	17.29	9.10	26.39	33.01	-6.62
1902.50	15	QPSK	H	100	327	1 / 0	16.29	9.11	25.40	33.01	-7.61
1857.50	15	16-QAM	H	100	331	1 / 37	16.98	9.11	26.09	33.01	-6.92
1880.00	15	16-QAM	H	100	329	1 / 0	16.20	9.10	25.30	33.01	-7.71
1902.50	15	16-QAM	H	100	327	1 / 0	15.09	9.11	24.20	33.01	-8.81
1860.00	20	QPSK	H	100	331	1 / 0	17.80	9.11	26.91	33.01	-6.10
1880.00	20	QPSK	H	100	329	1 / 0	17.35	9.10	26.45	33.01	-6.56
1900.00	20	QPSK	H	100	327	1 / 0	16.39	9.09	25.48	33.01	-7.53
1860.00	20	16-QAM	H	100	331	1 / 0	17.11	9.11	26.22	33.01	-6.79
1880.00	20	16-QAM	H	100	329	1 / 0	16.64	9.10	25.74	33.01	-7.27
1900.00	20	16-QAM	H	100	327	1 / 0	15.47	9.09	24.56	33.01	-8.45
1857.50	15	QPSK	V	114	29	1 / 0	14.71	9.11	23.82	33.01	-9.19
1857.50	15 (Sound Pack)	QPSK	H	100	317	1 / 0	15.83	9.11	24.94	33.01	-8.07

**Table 7-5. EIRP Data (Band 2)**

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> 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]
2502.50	5	QPSK	H	120	29	1 / 24	10.90	8.42	19.32	33.01	-13.69
2535.00	5	QPSK	H	115	32	1 / 0	12.62	8.50	21.12	33.01	-11.89
2567.50	5	QPSK	H	114	30	1 / 0	12.99	8.59	21.58	33.01	-11.43
2502.50	5	16-QAM	H	120	29	1 / 24	9.46	8.42	17.88	33.01	-15.13
2535.00	5	16-QAM	H	115	32	1 / 0	11.08	8.50	19.58	33.01	-13.43
2567.50	5	16-QAM	H	114	30	1 / 0	11.19	8.59	19.78	33.01	-13.23
2505.00	10	QPSK	H	120	29	1 / 49	11.66	8.42	20.08	33.01	-12.93
2535.00	10	QPSK	H	115	32	1 / 0	12.35	8.50	20.85	33.01	-12.16
2565.00	10	QPSK	H	114	30	1 / 0	12.81	8.58	21.39	33.01	-11.62
2505.00	10	16-QAM	H	120	29	1 / 49	10.09	8.42	18.51	33.01	-14.50
2535.00	10	16-QAM	H	115	32	1 / 0	10.90	8.50	19.40	33.01	-13.61
2565.00	10	16-QAM	H	114	30	1 / 0	11.39	8.58	19.97	33.01	-13.04
2507.50	15	QPSK	H	120	29	1 / 0	11.03	8.43	19.46	33.01	-13.55
2535.00	15	QPSK	H	115	32	1 / 0	12.16	8.50	20.66	33.01	-12.35
2562.50	15	QPSK	H	114	30	1 / 0	12.53	8.57	21.10	33.01	-11.91
2507.50	15	16-QAM	H	120	29	1 / 0	9.57	8.43	18.00	33.01	-15.01
2535.00	15	16-QAM	H	115	32	1 / 0	10.86	8.50	19.36	33.01	-13.65
2562.50	15	16-QAM	H	114	30	1 / 0	11.01	8.57	19.58	33.01	-13.43
2510.00	20	QPSK	H	120	29	1 / 0	12.44	8.44	20.88	33.01	-12.13
2535.00	20	QPSK	H	115	32	1 / 0	9.24	8.50	17.74	33.01	-15.27
2560.00	20	QPSK	H	114	30	1 / 0	10.76	8.57	19.33	33.01	-13.68
2510.00	20	16-QAM	H	120	29	1 / 0	11.12	8.44	19.56	33.01	-13.45
2535.00	20	16-QAM	H	115	32	1 / 0	9.96	8.50	18.46	33.01	-14.55
2560.00	20	16-QAM	H	114	30	1 / 0	9.89	8.57	18.46	33.01	-14.55
2567.50	5	QPSK	V	199	207	1 / 0	10.54	8.59	19.13	33.01	-13.88
2567.50	5 (Sound Pack)	QPSK	H	120	33	1 / 0	12.57	8.59	21.16	33.01	-11.85

**Table 7-6. EIRP Data (Band 7)**

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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

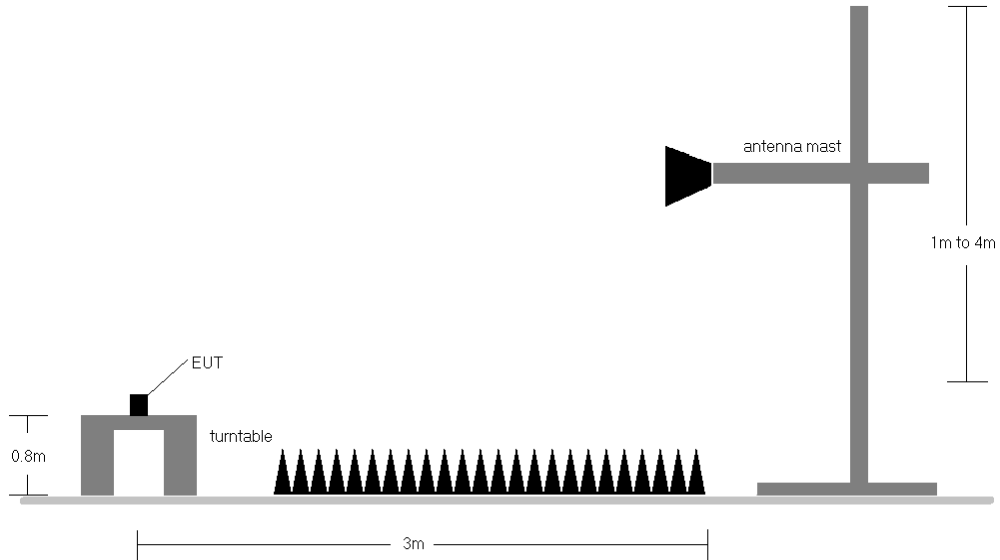
ANSI/TIA-603-D-2010 – Section 2.2.12

### 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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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: 19.98 dBm = 0.100 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  32.98 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	-	-	-63.83	5.60	-58.23	78.2
2104.50	H	110	12	-61.49	6.67	-54.82	74.8
2806.00	H	-	-	-61.91	7.92	-53.99	74.0

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

OPERATING FREQUENCY: 707.50 MHz  
 CHANNEL: 23095  
 MEASURED OUTPUT POWER: 20.15 dBm = 0.103 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  33.15 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	-	-	-64.79	5.69	-59.10	79.2
2122.50	H	110	10	-60.60	6.75	-53.86	74.0
2830.00	H	-	-	-61.96	7.90	-54.06	74.2

**Table 7-8. Radiated Spurious Data (Band 12 – Mid Channel)**

FCC ID: ZNFV530	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 713.50 MHz  
 CHANNEL: 23155  
 MEASURED OUTPUT POWER: 20.82 dBm = 0.121 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  33.82 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	-	-	-64.56	5.79	-58.77	79.6
2140.50	H	110	12	-61.44	6.82	-54.62	75.4
2854.00	H	-	-	-61.51	7.88	-53.63	74.5

**Table 7-9. Radiated Spurious Data (Band 12 – High Channel)**

OPERATING FREQUENCY: 713.50 MHz  
 CHANNEL: 23155  
 MEASURED OUTPUT POWER: 20.66 dBm = 0.116 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  33.66 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	-	-	-65.37	5.79	-59.58	80.2
2140.50	H	136	110	-62.47	6.82	-55.65	76.3
2854.00	H	-	-	-62.59	7.88	-54.71	75.4

**Table 7-10. Radiated Spurious Data with Sound Pack (Band 12 – High Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 20425  
 MEASURED OUTPUT POWER: 22.38 dBm = 0.173 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  35.38 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	110	356	-64.48	6.70	-57.78	80.2
2479.50	H	110	170	-62.32	7.54	-54.78	77.2
3306.00	H	-	-	-58.25	7.38	-50.87	73.2

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

OPERATING FREQUENCY: 836.50 MHz  
 CHANNEL: 20525  
 MEASURED OUTPUT POWER: 23.66 dBm = 0.232 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  36.66 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	110	350	-63.92	6.70	-57.22	80.9
2509.50	H	110	166	-61.12	7.63	-53.49	77.2
3346.00	H	-	-	-58.60	7.51	-51.09	74.7

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

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 846.50 MHz  
 CHANNEL: 20625  
 MEASURED OUTPUT POWER: 22.51 dBm = 0.178 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  35.51 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	110	162	-62.26	6.70	-55.57	78.1
2539.50	H	139	165	-61.39	7.60	-53.79	76.3
3386.00	H	-	-	-58.69	7.65	-51.04	73.6

**Table 7-13. Radiated Spurious Data (Band 5 – High Channel)**

OPERATING FREQUENCY: 836.50 MHz  
 CHANNEL: 20525  
 MEASURED OUTPUT POWER: 23.56 dBm = 0.227 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  36.56 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	110	170	-63.92	6.70	-57.22	80.8
2509.50	H	144	161	-60.66	7.63	-53.03	76.6
3346.00	H	-	-	-58.94	7.51	-51.43	75.0

**Table 7-14. Radiated Spurious Data with Sound Pack (Band 5 – Mid Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1711.50 MHz  
 CHANNEL: 131987  
 MEASURED OUTPUT POWER: 26.41 dBm = 0.437 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  39.41 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]
3423.00	H	117	355	-59.22	9.87	-49.35	75.8
5134.50	H	113	5	-56.55	10.76	-45.80	72.2
6846.00	H	112	18	-49.00	11.67	-37.33	63.7

**Table 7-15. Radiated Spurious Data (Band 66 – Low Channel)**

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MEASURED OUTPUT POWER: 26.86 dBm = 0.486 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  39.86 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	H	116	355	-58.66	9.94	-48.72	75.6
5235.00	H	119	12	-55.47	10.72	-44.74	71.6
6980.00	H	110	10	-49.02	11.82	-37.20	64.1

**Table 7-16. Radiated Spurious Data (Band 66 – Mid Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1778.50 MHz  
 CHANNEL: 132657  
 MEASURED OUTPUT POWER: 25.93 dBm = 0.391 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  38.93 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]
3557.00	H	113	2	-58.41	9.96	-48.45	74.4
5335.50	H	120	17	-55.17	10.72	-44.45	70.4
7114.00	H	110	2	-49.30	11.73	-37.57	63.5

**Table 7-17. Radiated Spurious Data (Band 66 – High Channel)**

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MEASURED OUTPUT POWER: 26.66 dBm = 0.464 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  39.66 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	H	125	15	-58.70	9.94	-48.76	75.4
5235.00	H	121	15	-55.80	10.72	-45.07	71.7
6980.00	H	112	22	-50.01	11.82	-38.19	64.9

**Table 7-18. Radiated Spurious Data with Sound Pack (Band 66 – Mid Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet	Page 137 of 153	

OPERATING FREQUENCY: 1857.50 MHz  
 CHANNEL: 18675  
 MEASURED OUTPUT POWER: 27.00 dBm = 0.502 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  40.00 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]
3715.00	H	110	359	-55.89	9.49	-46.40	73.4
5572.50	H	110	4	-55.79	11.08	-44.71	71.7
7430.00	H	110	355	-46.86	10.98	-35.88	62.9

**Table 7-19. Radiated Spurious Data (Band 2 – Low Channel)**

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 MEASURED OUTPUT POWER: 26.39 dBm = 0.436 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  39.39 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	114	2	-55.13	9.39	-45.75	72.1
5640.00	H	114	357	-55.85	11.22	-44.63	71.0
7520.00	H	110	350	-46.39	11.10	-35.28	61.7

**Table 7-20. Radiated Spurious Data (Band 2 – Mid Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1902.50 MHz  
 CHANNEL: 19125  
 MEASURED OUTPUT POWER: 25.40 dBm = 0.347 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  38.40 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]
3805.00	H	115	359	-54.96	9.30	-45.66	71.1
5707.50	H	110	3	-55.26	11.31	-43.96	69.4
7610.00	H	110	3	-46.68	11.30	-35.38	60.8

**Table 7-21. Radiated Spurious Data (Band 2 – High Channel)**

OPERATING FREQUENCY: 1857.50 MHz  
 CHANNEL: 18675  
 MEASURED OUTPUT POWER: 24.94 dBm = 0.312 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  37.94 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]
3715.00	H	110	196	-56.47	9.49	-46.98	71.9
5572.50	H	110	47	-54.07	11.08	-42.99	67.9
7430.00	H	110	49	-47.54	10.98	-36.56	61.5

**Table 7-22. Radiated Spurious Data with Sound Pack (Band 2 – Low Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2502.50 MHz  
 CHANNEL: 20775  
 MEASURED OUTPUT POWER: 19.32 dBm = 0.085 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W)$  44.32 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]
5005.00	H	117	33	-53.03	11.18	-41.85	61.2
7507.50	H	118	27	-48.91	11.18	-37.74	57.1
10010.00	H	-	-	-57.23	12.56	-44.67	64.0

**Table 7-23. Radiated Spurious Data (Band 7 – Low Channel)**

OPERATING FREQUENCY: 2535.00 MHz  
 CHANNEL: 21100  
 MEASURED OUTPUT POWER: 21.12 dBm = 0.129 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W)$  46.12 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5070.00	H	124	22	-52.82	11.04	-41.78	62.9
7605.00	H	118	28	-49.45	11.47	-37.97	59.1
10140.00	H	-	-	-56.85	12.67	-44.18	65.3

**Table 7-24. Radiated Spurious Data (Band 7 – Mid Channel)**

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2567.50 MHz  
 CHANNEL: 21425  
 MEASURED OUTPUT POWER: 21.58 dBm = 0.144 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W)$  46.58 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]
5135.00	H	110	39	-51.93	10.92	-41.01	62.6
7702.50	H	110	40	-51.38	11.56	-39.82	61.4
10270.00	H	-	-	-57.98	12.75	-45.23	66.8

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

OPERATING FREQUENCY: 2567.50 MHz  
 CHANNEL: 21425  
 MEASURED OUTPUT POWER: 21.16 dBm = 0.130 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W)$  46.16 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]
5135.00	H	107	31	-51.46	10.92	-40.54	61.7
7702.50	H	105	33	-51.29	11.56	-39.73	60.9
10270.00	H	-	-	-57.90	12.75	-45.15	66.3

**Table 7-26. Radiated Spurious Data with Sound Pack (Band 7 – High Channel)**

FCC ID: ZNFV530	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet	Page 141 of 153	

## 7.8 Frequency Stability / Temperature Variation

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

### Test Overview and Limit

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

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

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

### Test Procedure Used

ANSI/TIA-603-D-2010

### Test Settings



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

### Test Setup

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

### Test Notes

None

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<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 142 of 153	



## Band 12 Frequency Stability Measurements

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

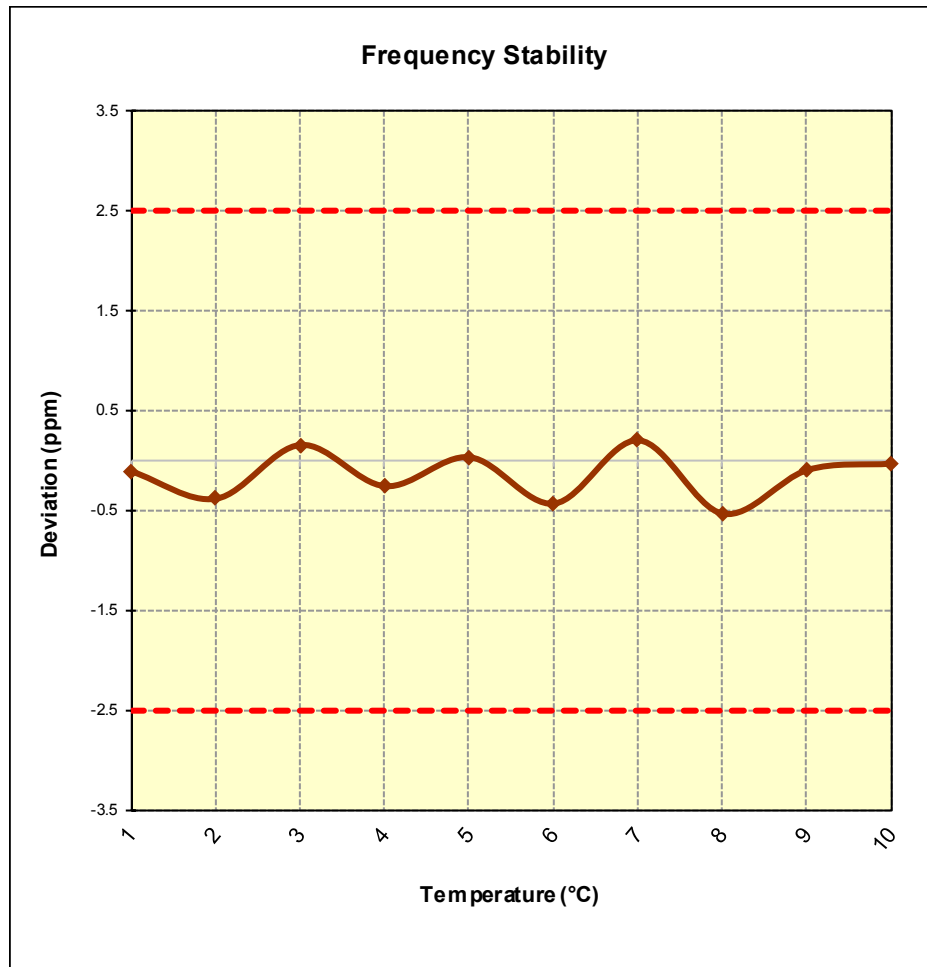
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,919	-81	-0.0000114
100 %		- 30	707,499,728	-272	-0.0000384
100 %		- 20	707,500,108	108	0.0000153
100 %		- 10	707,499,816	-184	-0.0000260
100 %		0	707,500,021	21	0.0000030
100 %		+ 10	707,499,693	-307	-0.0000434
100 %		+ 20	707,500,140	140	0.0000198
100 %		+ 30	707,499,622	-378	-0.0000534
100 %		+ 40	707,499,930	-70	-0.0000099
100 %		+ 50	707,499,976	-24	-0.0000034
BATT. ENDPOINT		3.45	+ 20	707,499,882	-118

**Table 7-27. Frequency Stability Data (Band 12)**



FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 143 of 153	



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

FCC ID: ZNFV530		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet	Page 144 of 153	



## Band 5 Frequency Stability Measurements

§2.1055 §22.355

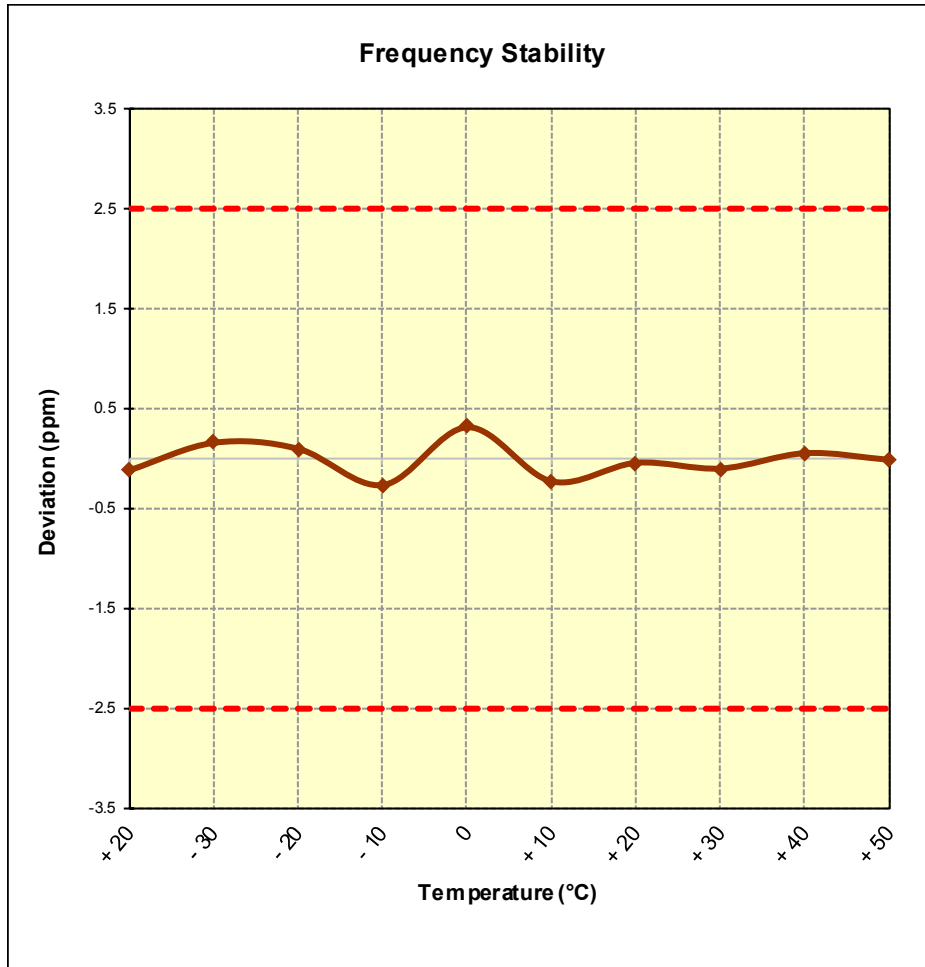
OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,499,896	-104	-0.0000124
100 %		- 30	836,500,131	131	0.0000157
100 %		- 20	836,500,078	78	0.0000093
100 %		- 10	836,499,768	-232	-0.0000277
100 %		0	836,500,264	264	0.0000316
100 %		+ 10	836,499,798	-202	-0.0000241
100 %		+ 20	836,499,959	-41	-0.0000049
100 %		+ 30	836,499,910	-90	-0.0000108
100 %		+ 40	836,500,041	41	0.0000049
100 %		+ 50	836,499,984	-16	-0.0000019
BATT. ENDPOINT	3.45	+ 20	836,500,091	91	0.0000109

Table 7-28. Frequency Stability Data (Band 5)

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
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**Band 5 Frequency Stability Measurements**  
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**Figure 7-9. Frequency Stability Graph (Band 5)**

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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## Band 2 Frequency Stability Measurements

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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)	1,879,999,943	-57	-0.0000030
100 %		- 30	1,879,999,904	-96	-0.0000051
100 %		- 20	1,880,000,059	59	0.0000031
100 %		- 10	1,880,000,067	67	0.0000036
100 %		0	1,879,999,963	-37	-0.0000020
100 %		+ 10	1,880,000,306	306	0.0000163
100 %		+ 20	1,880,000,065	65	0.0000035
100 %		+ 30	1,880,000,009	9	0.0000005
100 %		+ 40	1,880,000,033	33	0.0000018
100 %		+ 50	1,880,000,217	217	0.0000115
85 %	3.27	+ 20	1,879,999,861	-139	-0.0000074
BATT. ENDPOINT	3.45	+ 20	1,879,999,945	-55	-0.0000029

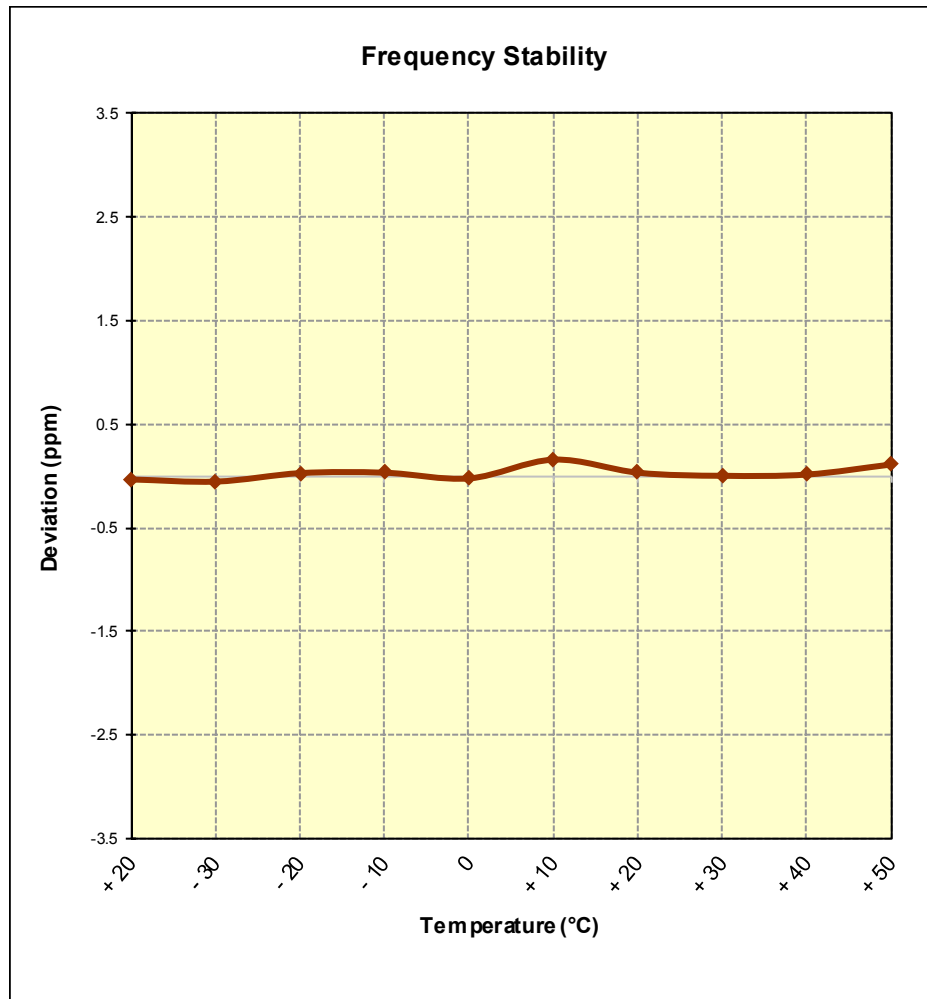
**Table 7-29. Frequency Stability Data (Band 2)**

**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.

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 147 of 153	

**Band 2 Frequency Stability Measurements**  
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**Figure 7-10. Frequency Stability Graph (Band 2)**

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 148 of 153

**Band 66 Frequency Stability Measurements**  
§2.1055 §§27.54



OPERATING FREQUENCY: 1,745,000,000 Hz  
 CHANNEL: 132322  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,744,999,658	-342	-0.0000196
100 %		- 30	1,745,000,125	125	0.0000072
100 %		- 20	1,744,999,738	-262	-0.0000150
100 %		- 10	1,745,000,237	237	0.0000136
100 %		0	1,745,000,327	327	0.0000187
100 %		+ 10	1,745,000,077	77	0.0000044
100 %		+ 20	1,745,000,190	190	0.0000109
100 %		+ 30	1,744,999,933	-67	-0.0000038
100 %		+ 40	1,745,000,361	361	0.0000207
100 %		+ 50	1,744,999,807	-193	-0.0000111
BATT. ENDPOINT		3.45	+ 20	1,744,999,947	-53

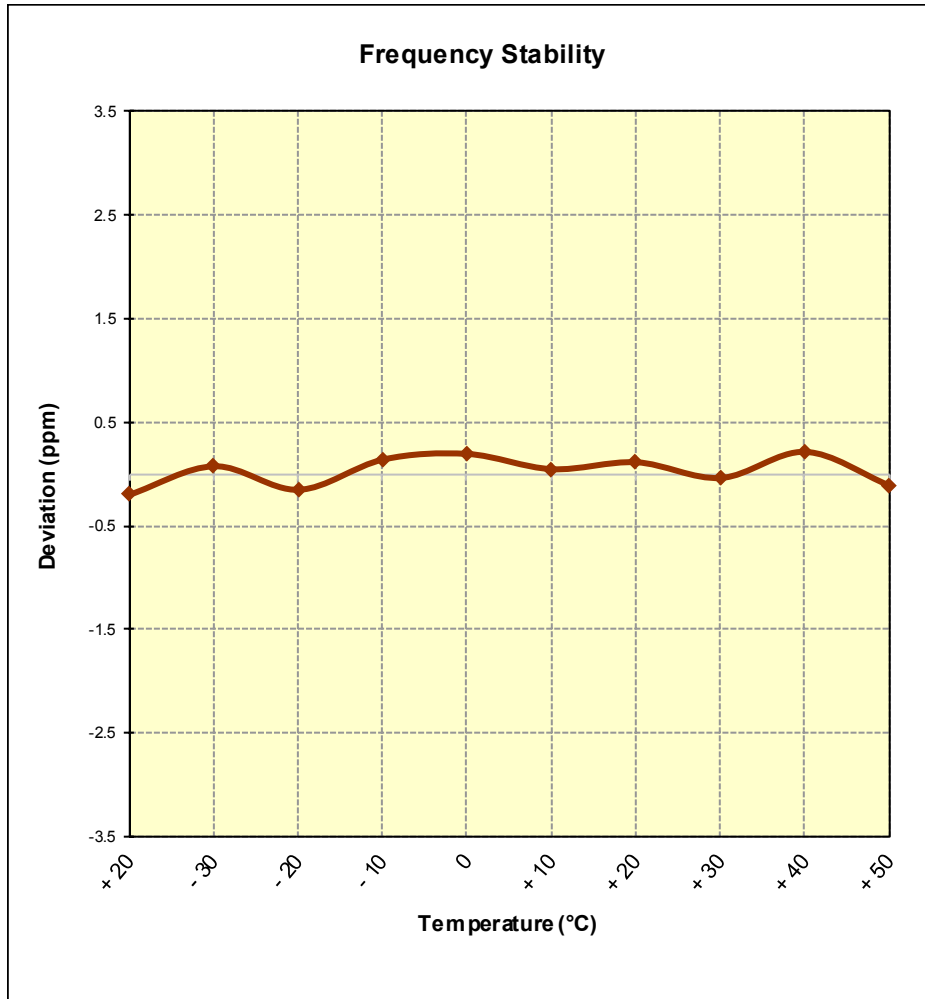
**Table 7-30. Frequency Stability Data (Band 66)**

**Note:**



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

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 149 of 153	

**Band 66 Frequency Stability Measurements**  
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**Figure 7-11. Frequency Stability Graph (Band 66)**

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
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## Band 7 Frequency Stability Measurements

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,534,999,825	-175	-0.0000069
100 %		- 30	2,534,999,958	-42	-0.0000017
100 %		- 20	2,535,000,308	308	0.0000121
100 %		- 10	2,535,000,079	79	0.0000031
100 %		0	2,534,999,961	-39	-0.0000015
100 %		+ 10	2,534,999,923	-77	-0.0000030
100 %		+ 20	2,535,000,236	236	0.0000093
100 %		+ 30	2,534,999,893	-107	-0.0000042
100 %		+ 40	2,534,999,981	-19	-0.0000007
100 %		+ 50	2,534,999,982	-18	-0.0000007
BATT. ENDPOINT	3.45	+ 20	2,534,999,798	-202	-0.0000080

Table 7-31. Frequency Stability Data (Band 7)

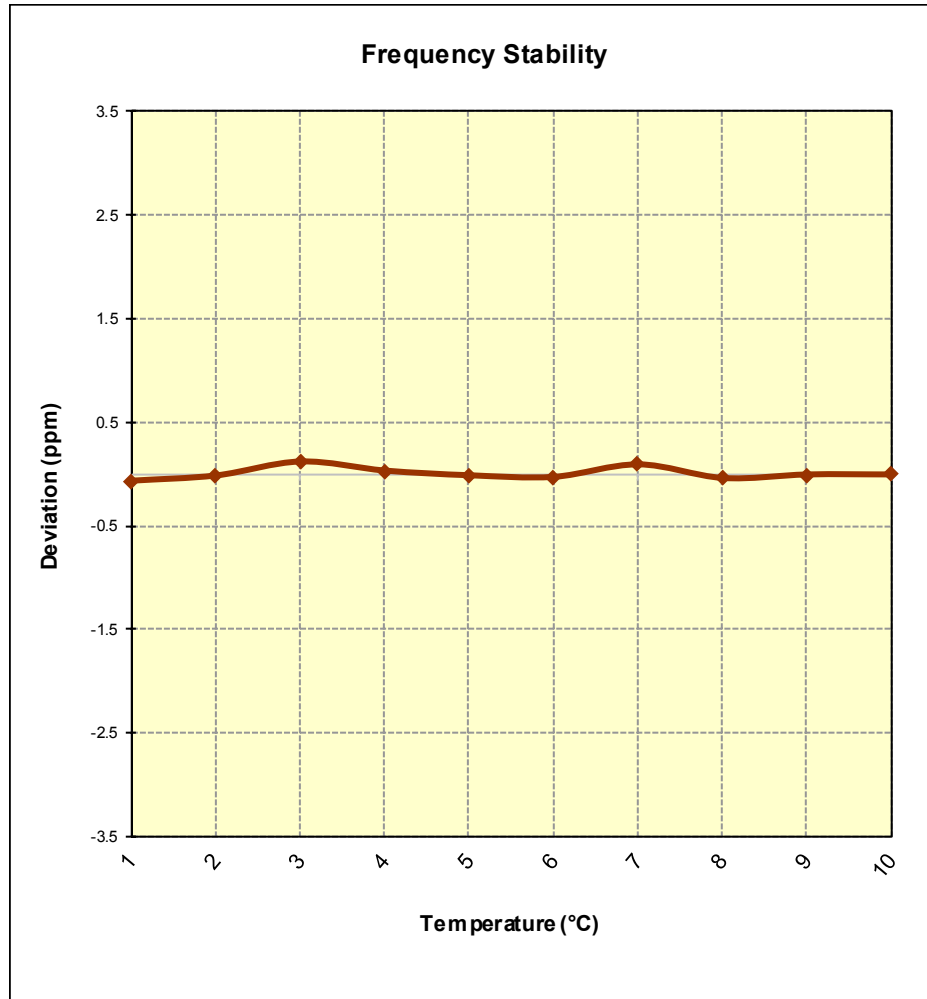
**Note:**

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

FCC ID: ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet	Page 151 of 153	



**Band 7 Frequency Stability Measurements**  
**§2.1055 §27.54**





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

FCC ID: ZNFV530	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1702270074-03.ZNF	Test Dates: 3/1 - 3/13/2017	EUT Type: Portable Tablet		Page 152 of 153

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Tablet FCC ID: ZNFV530** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

<b>FCC ID:</b> ZNFV530	 <b>FCC Pt. 22, 24, &amp; 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>		 <b>LG</b>	<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1702270074-03.ZNF	<b>Test Dates:</b> 3/1 - 3/13/2017	<b>EUT Type:</b> Portable Tablet		Page 153 of 153