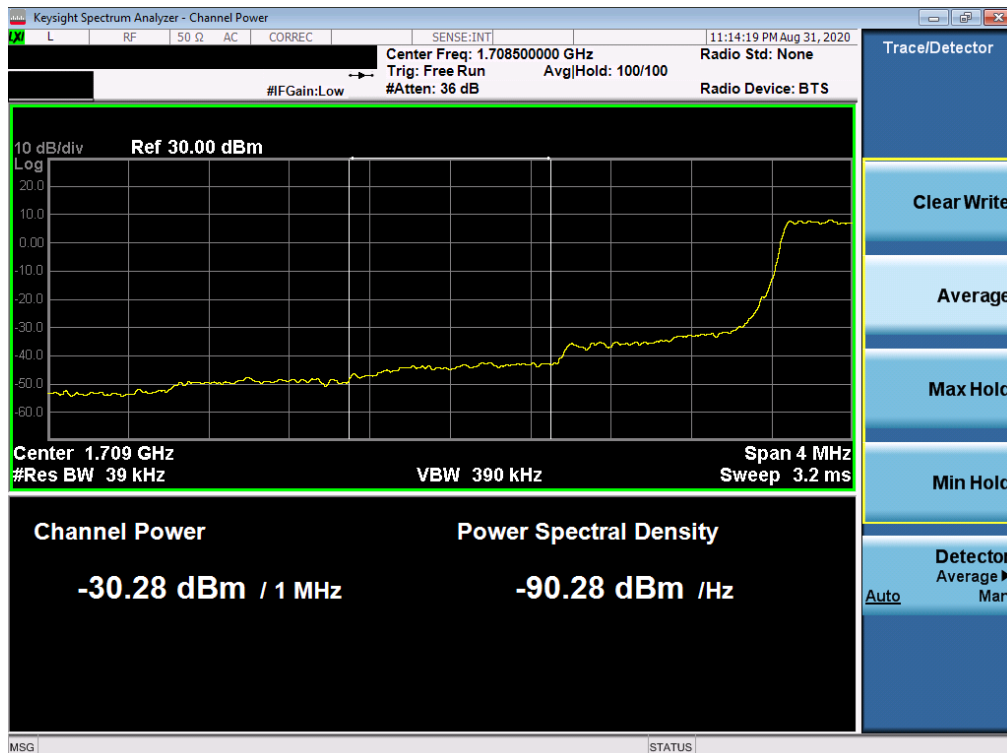




Plot 7-108. Lower Band Edge Plot (LTE Band 66/4 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-109. Lower Extended Band Edge Plot (LTE Band 66/4 – 1.4MHz QPSK – Full RB Configuration)

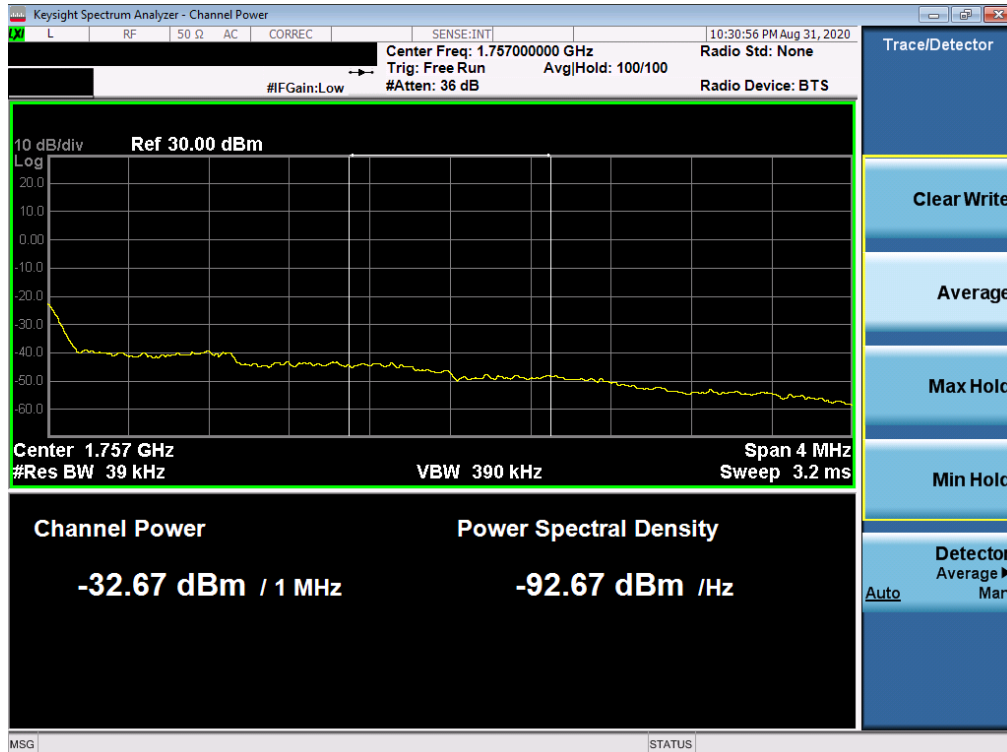
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 67 of 126

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Plot 7-110. Upper Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-111. Upper Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)

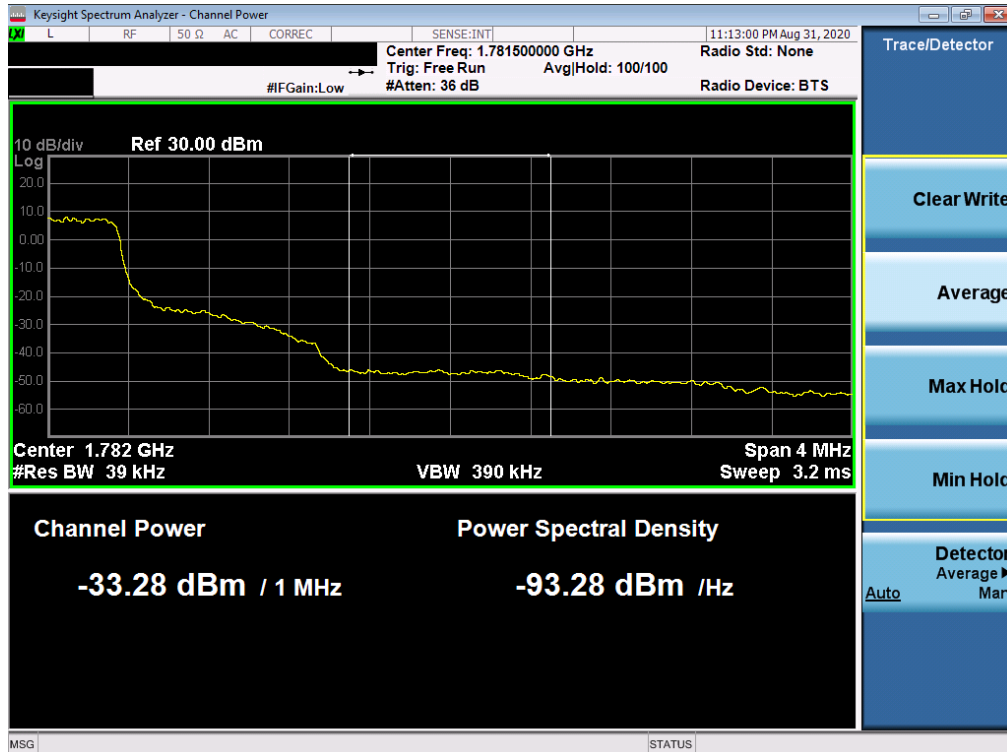
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 68 of 126

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Plot 7-112. Upper Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-113. Upper Extended Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 69 of 126

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7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. 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 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 of any spurious emission is $43 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (separated into at least two plots per channel)
2. RBW \geq 100kHz
3. VBW \geq 3 x RBW
4. Detector = RMS
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Test Setup

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

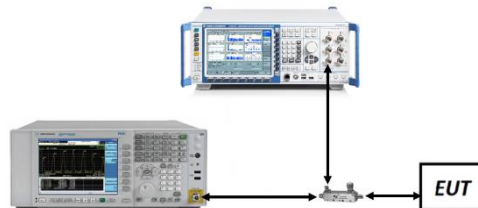


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

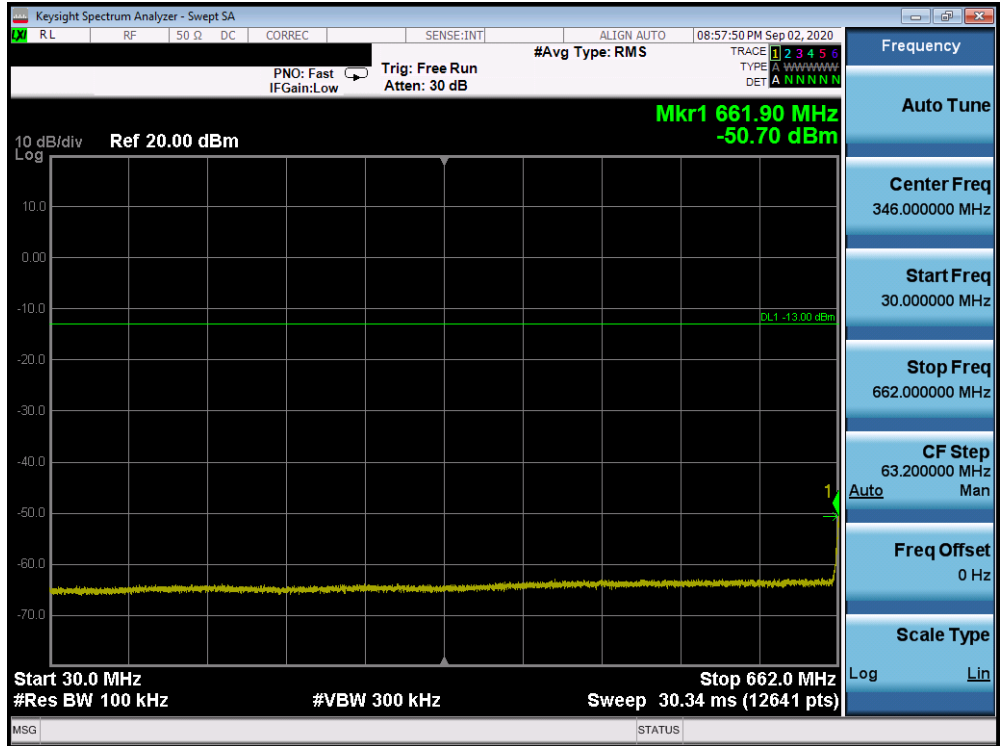
1. Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 70 of 126

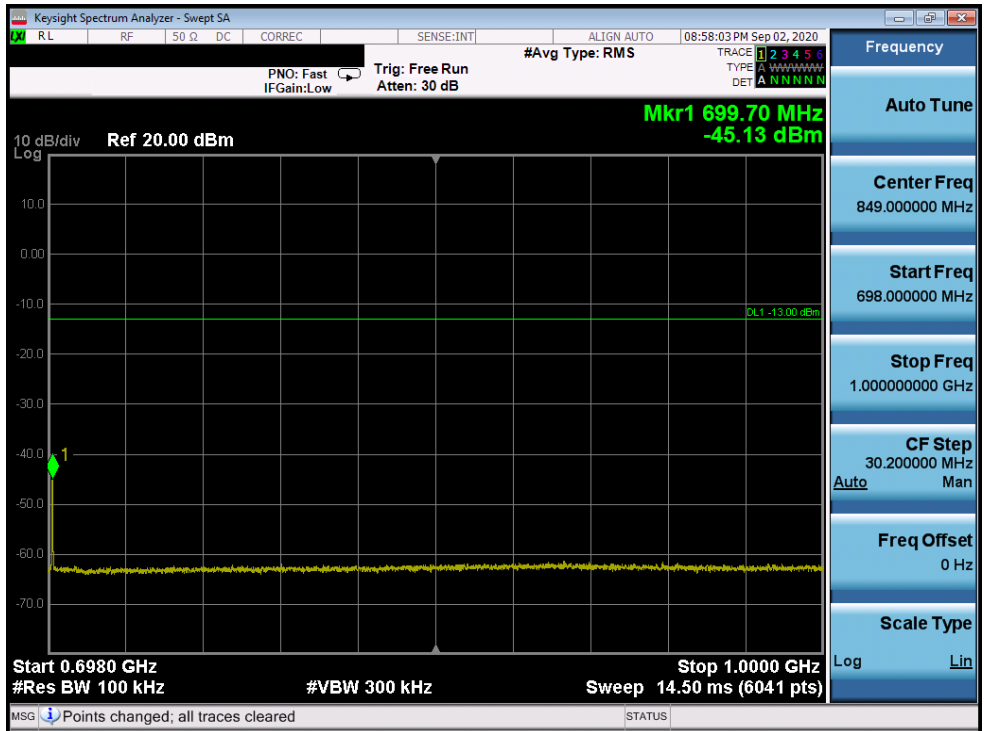
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LTE Band 71



Plot 7-114. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

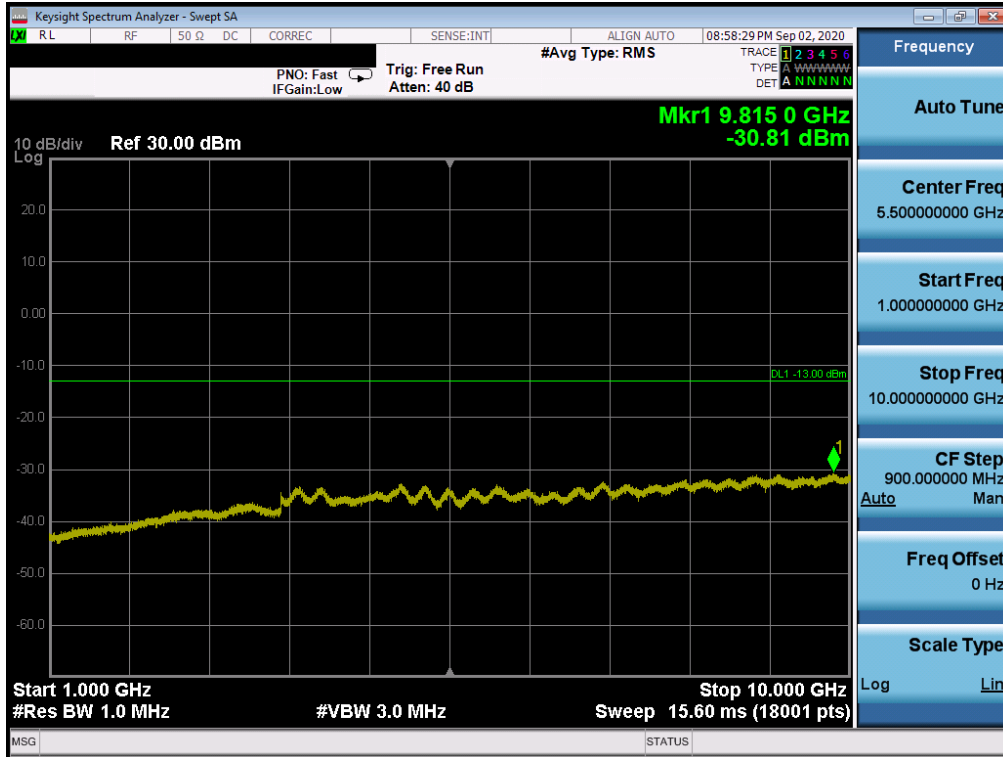


Plot 7-115. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

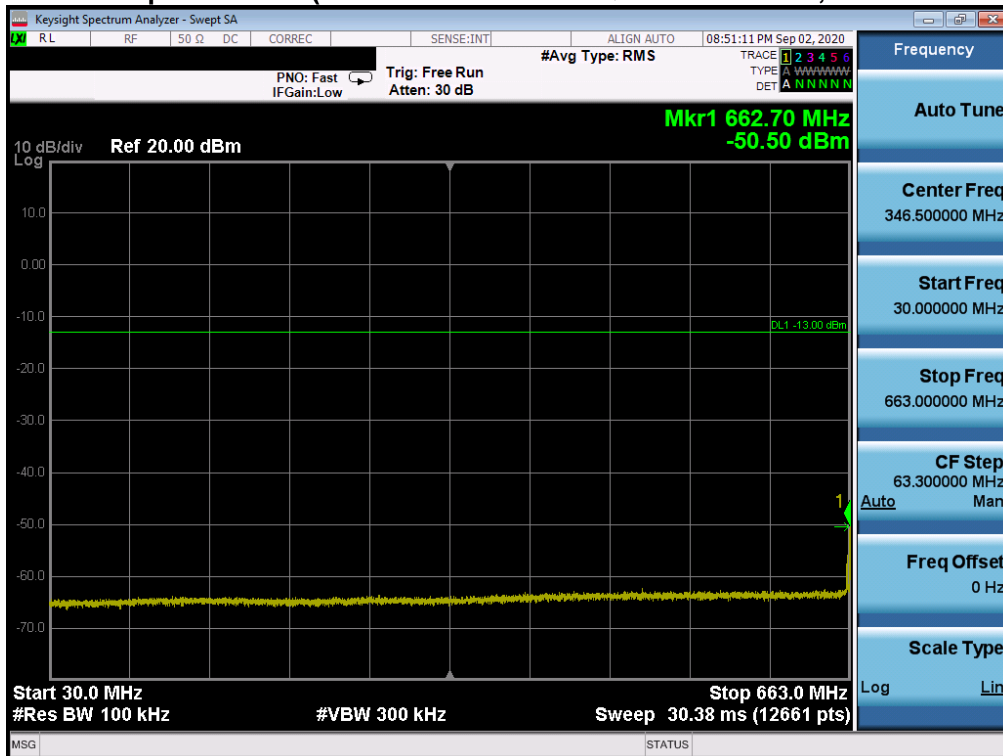
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 71 of 126

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Plot 7-116. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

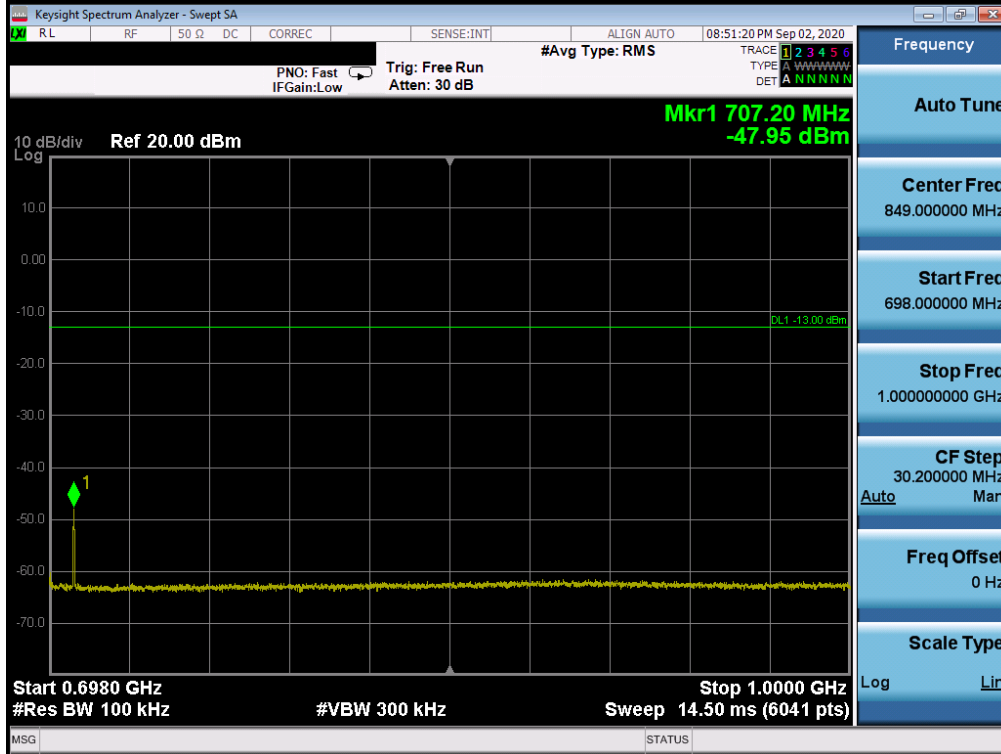


Plot 7-117. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

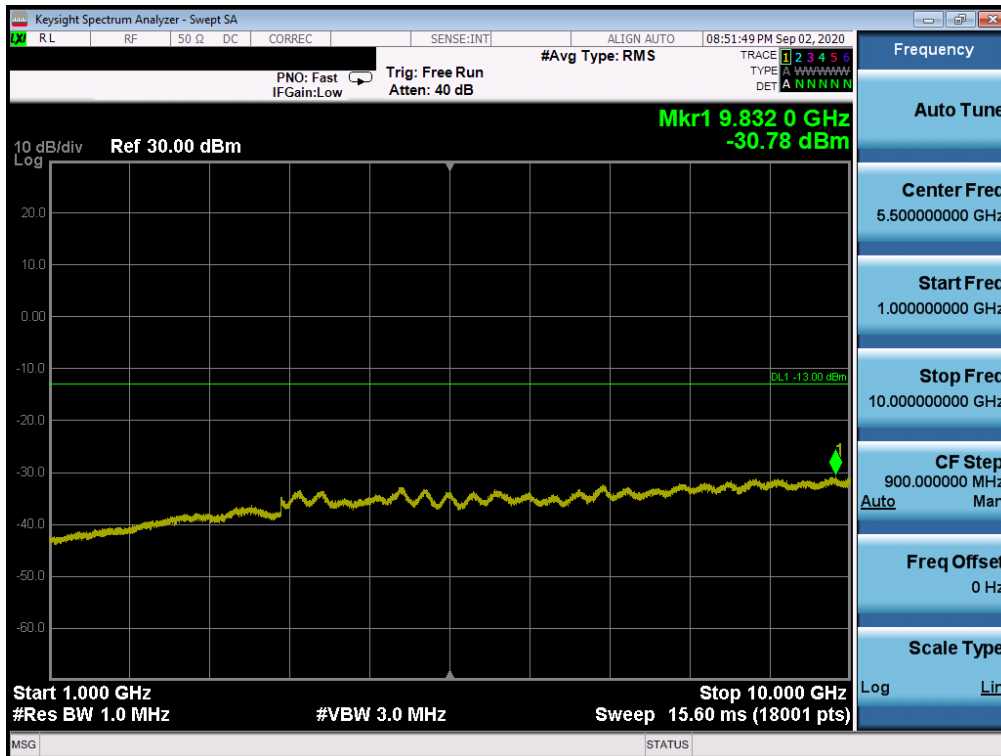
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 72 of 126

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Plot 7-118. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-119. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

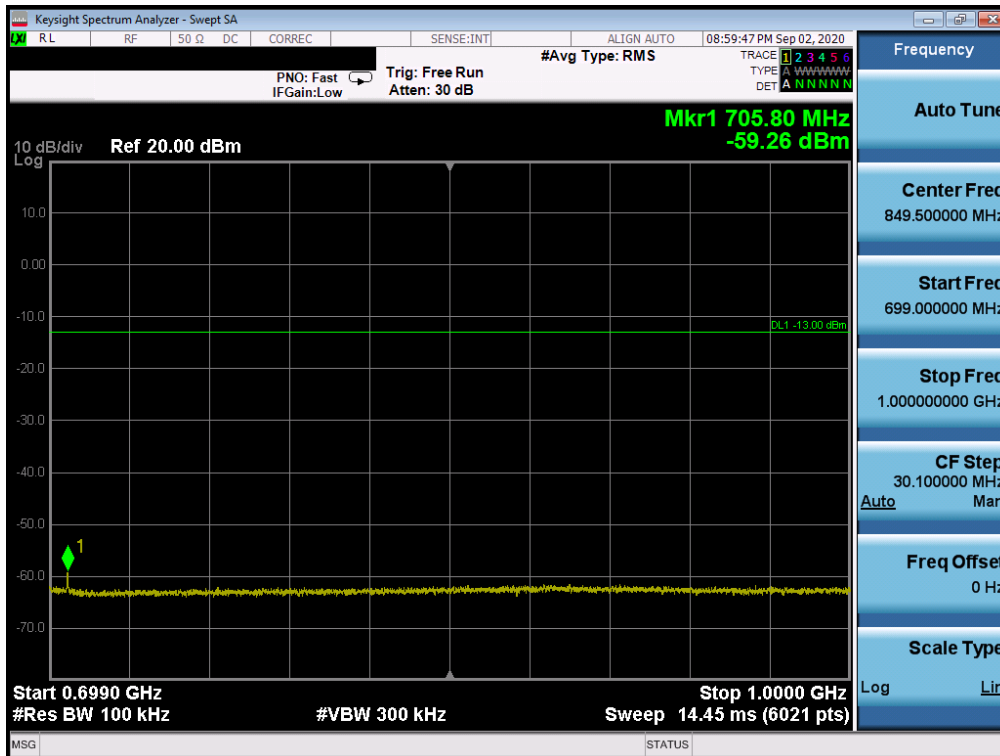
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 73 of 126

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Plot 7-120. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-121. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

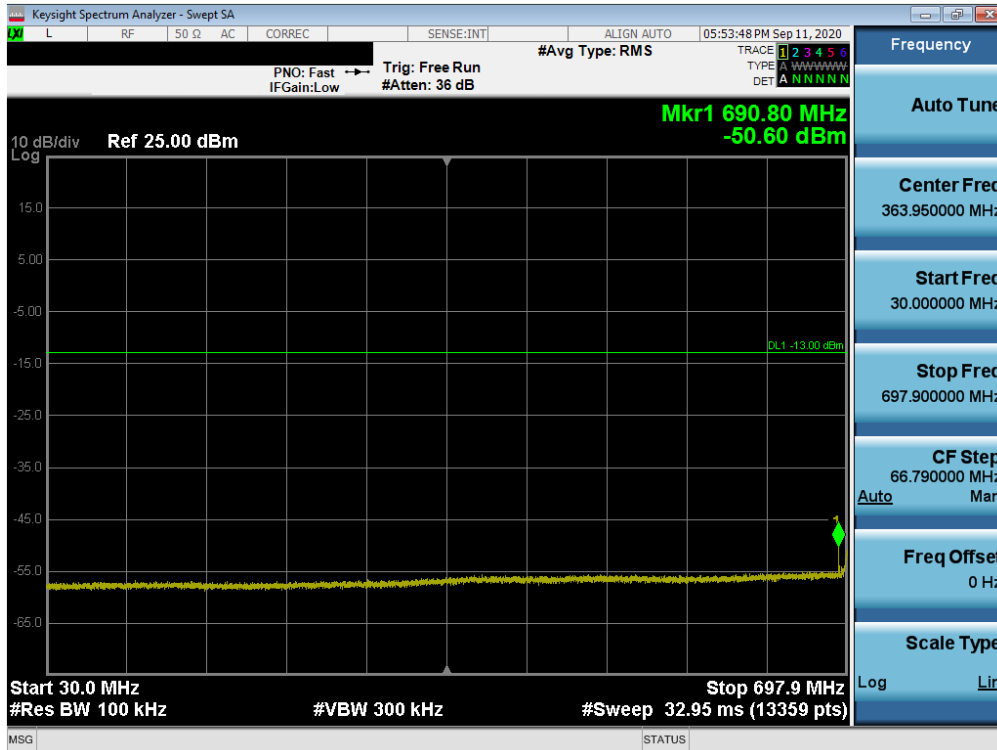
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 74 of 126



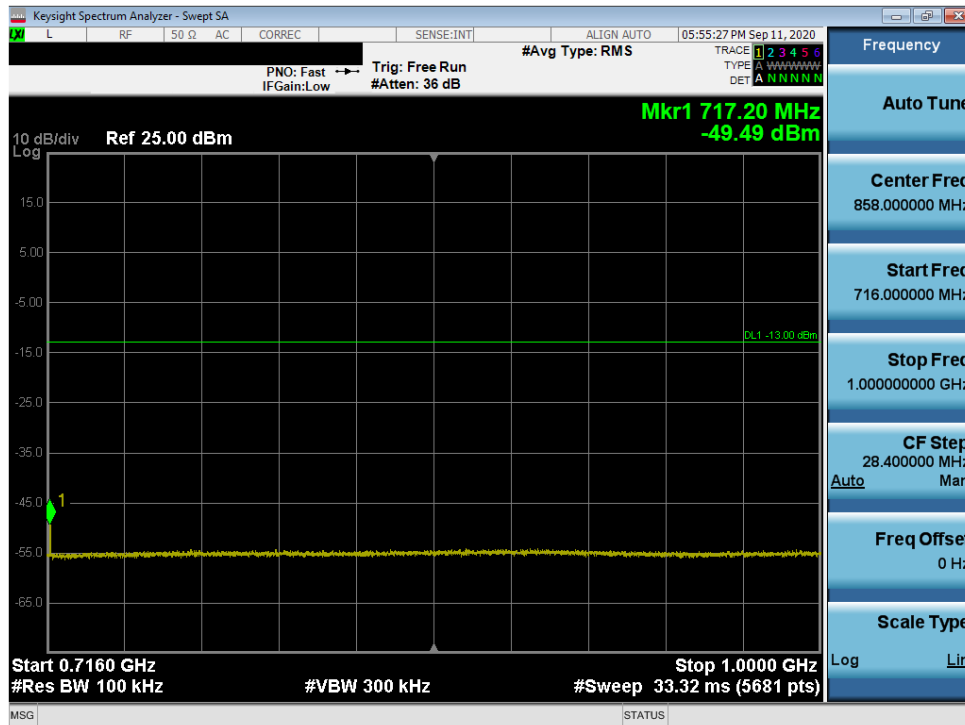
Plot 7-122. Conducted Spurious Plot (LTE Band 71 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 75 of 126

LTE Band 12



Plot 7-123. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

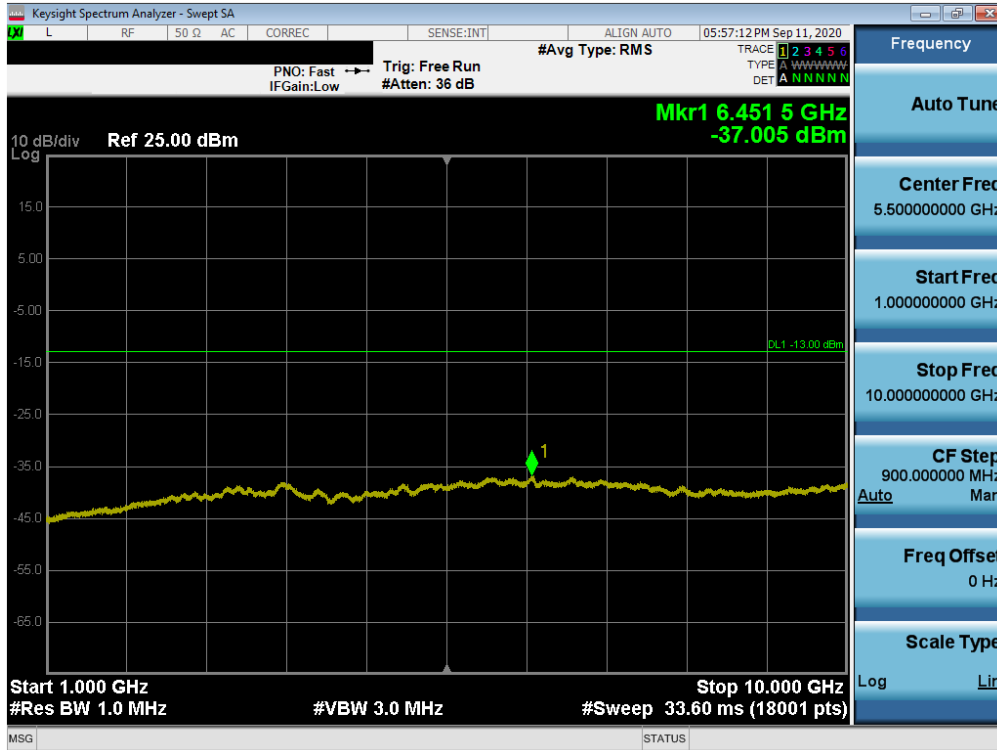


Plot 7-124. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

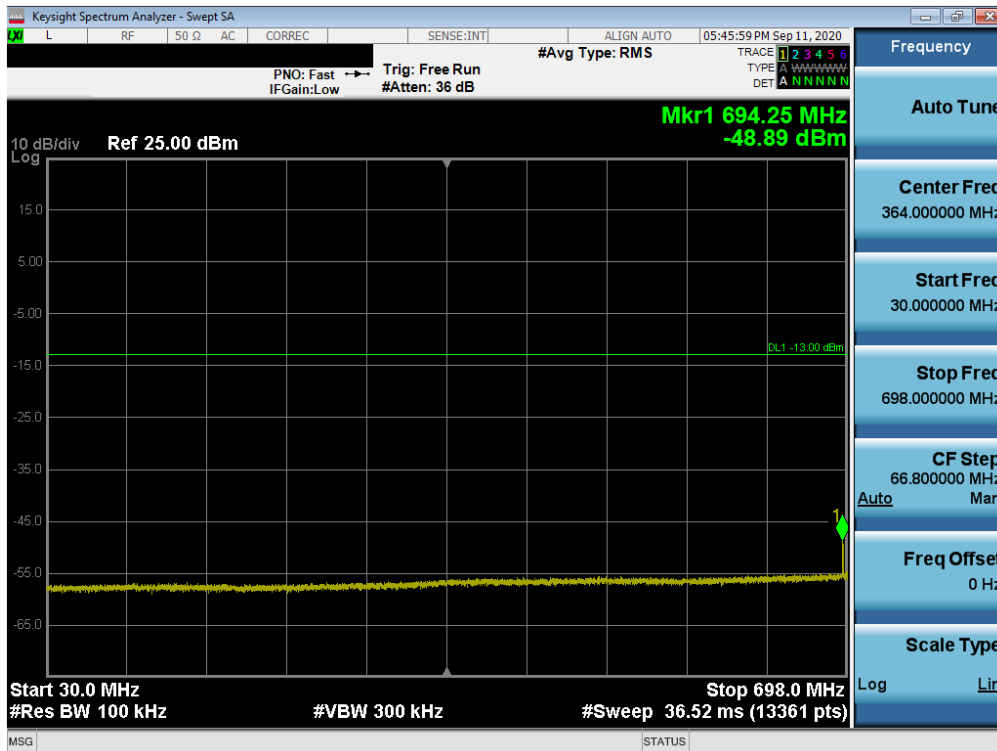
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 76 of 126

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Plot 7-125. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

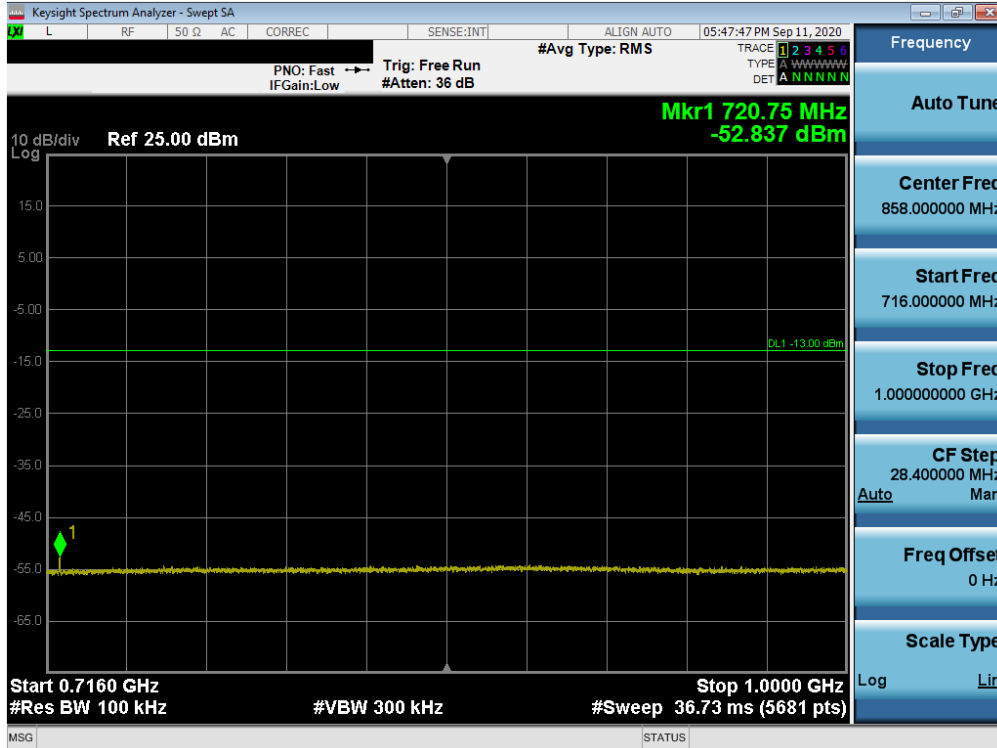


Plot 7-126. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

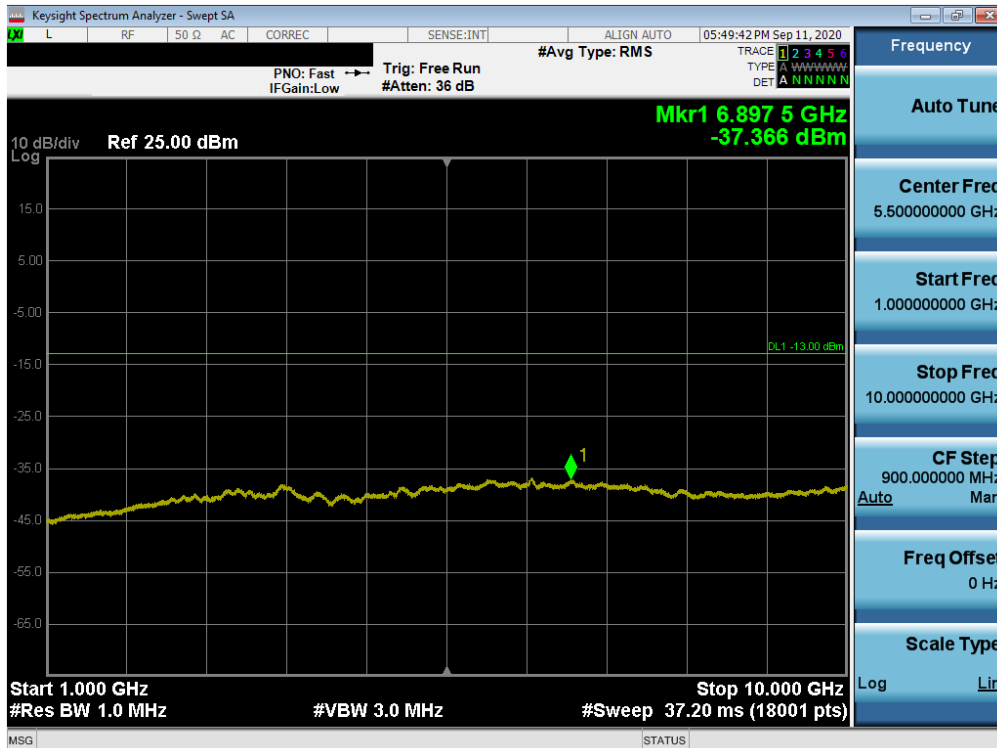
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 77 of 126

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Plot 7-127. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

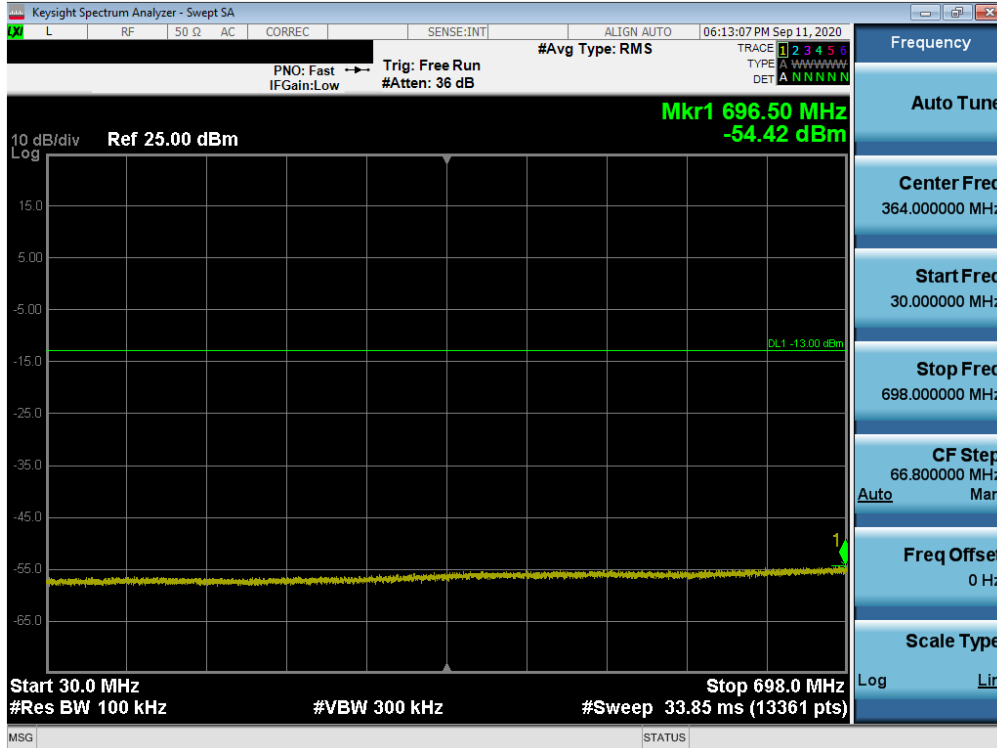


Plot 7-128. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

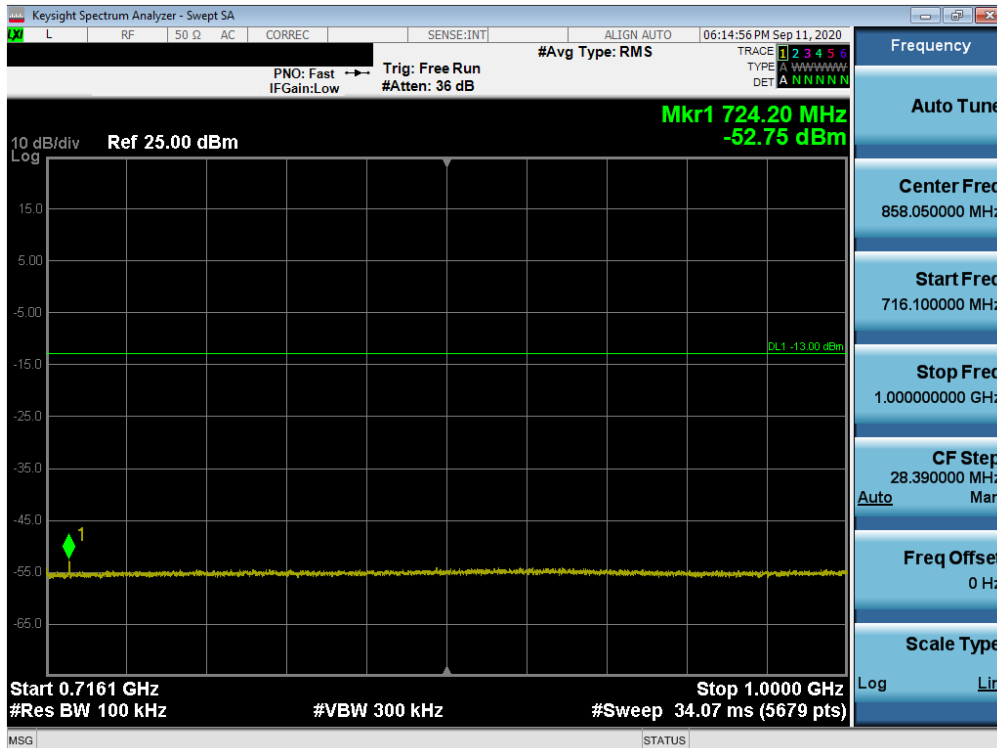
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 78 of 126

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Plot 7-129. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

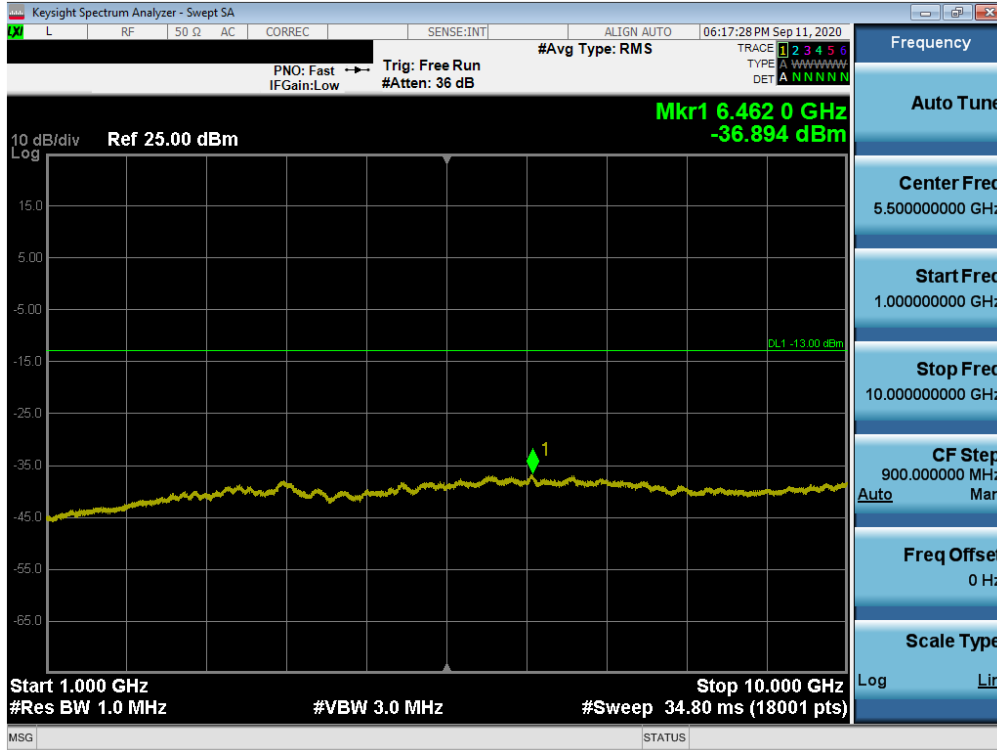


Plot 7-130. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 79 of 126

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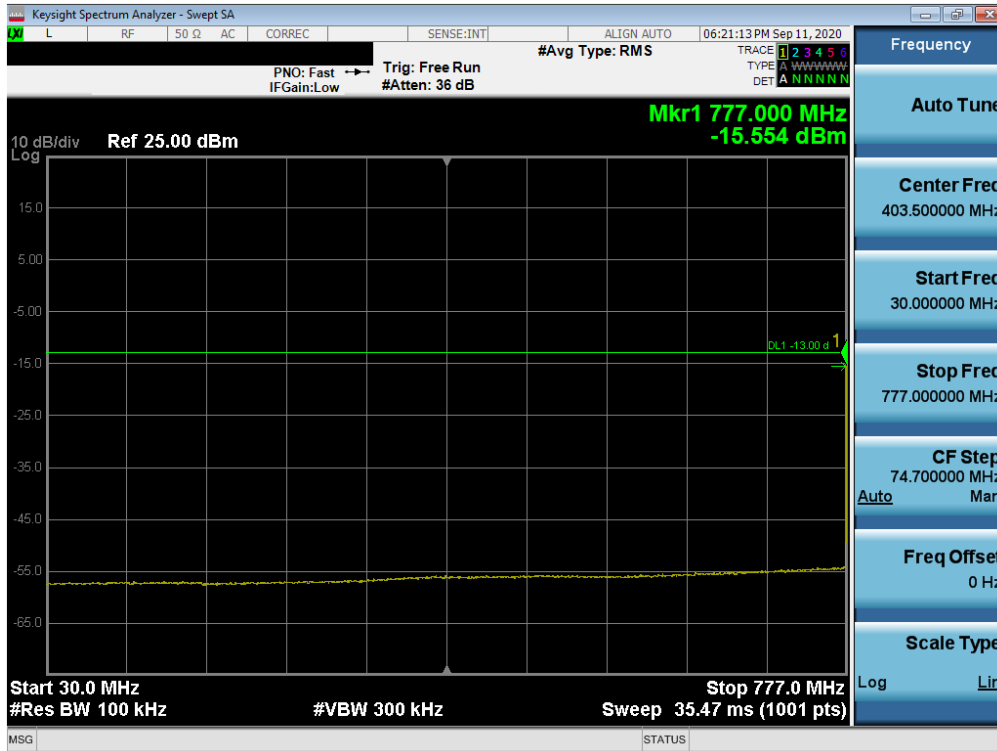
Plot 7-131. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 80 of 126

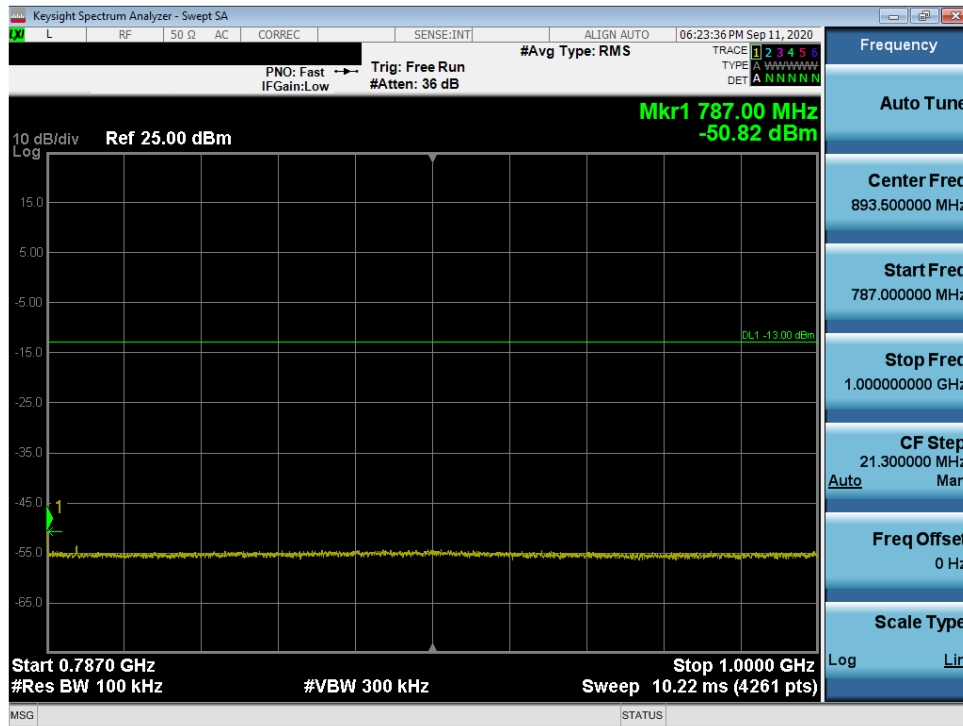
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LTE Band 13



Plot 7-132. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

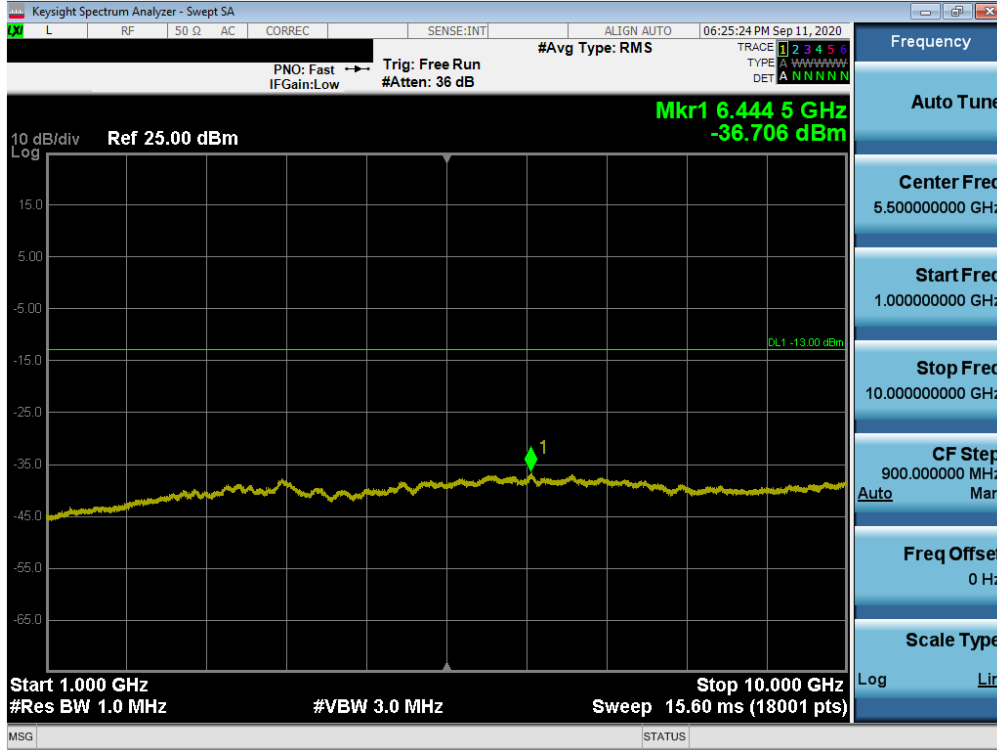


Plot 7-133. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 81 of 126

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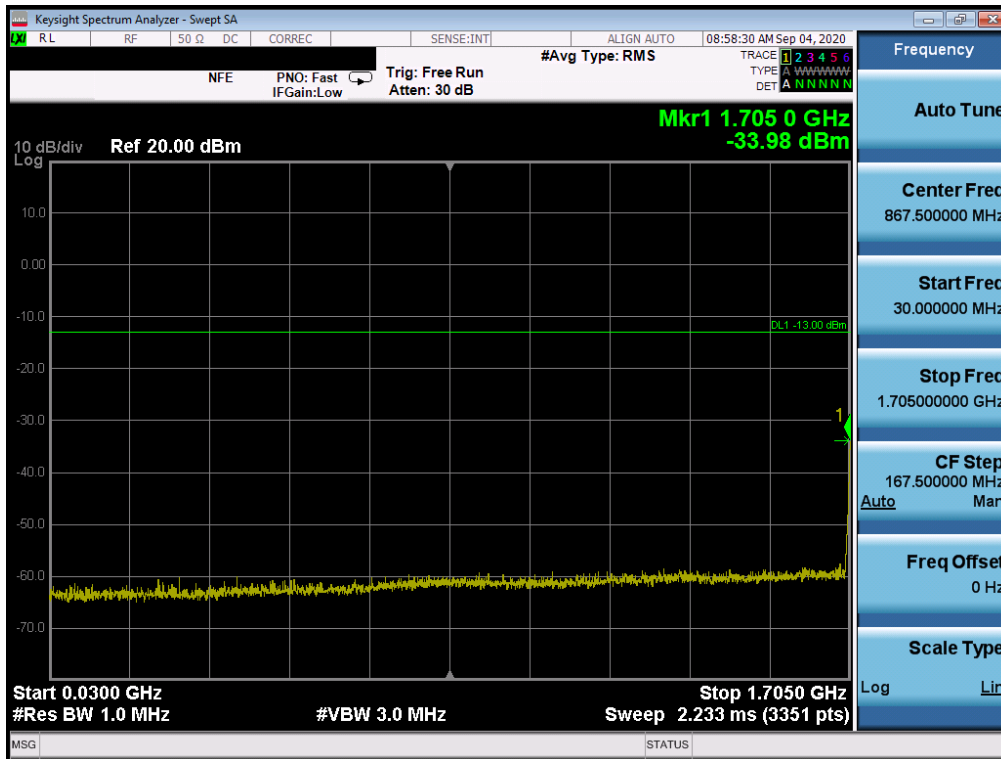
Plot 7-134. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 82 of 126

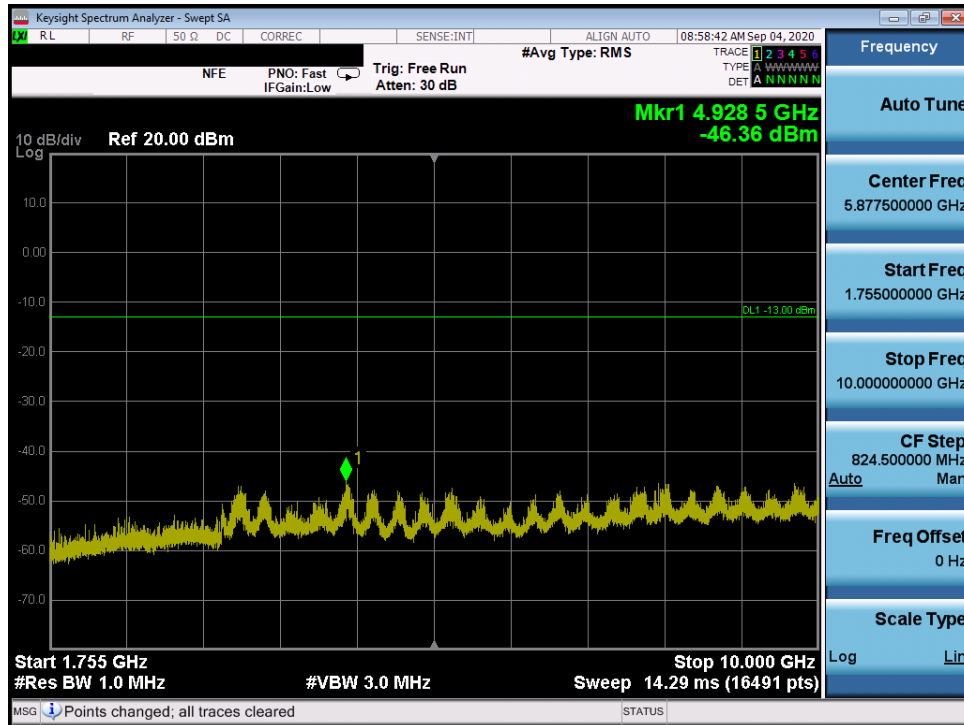
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WCDMA AWS



Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

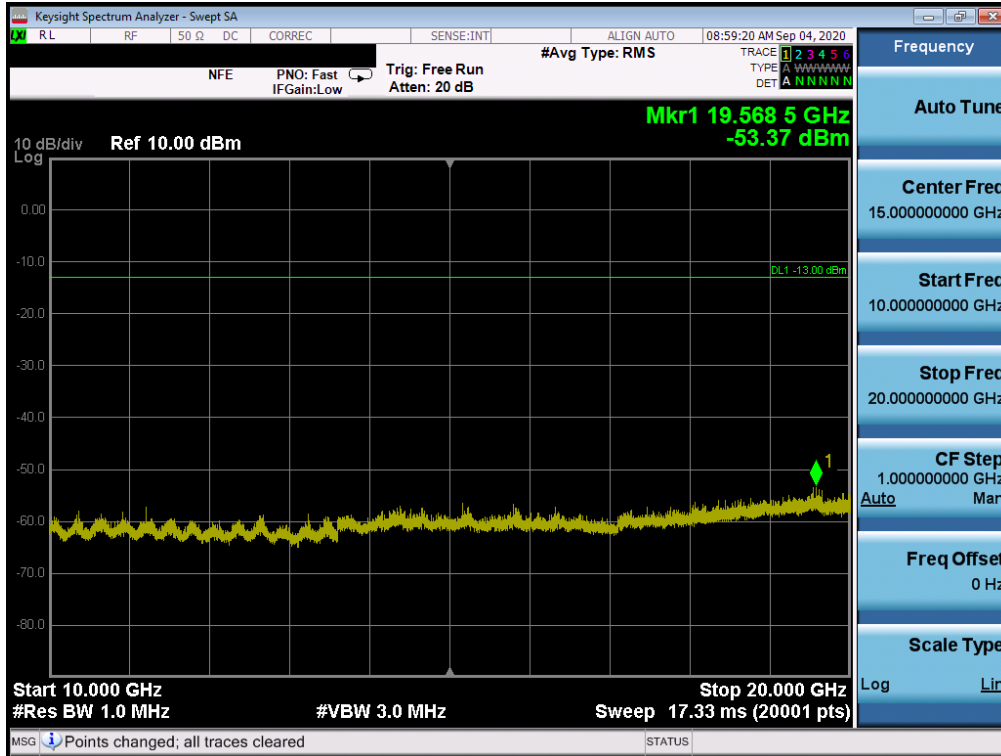


Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

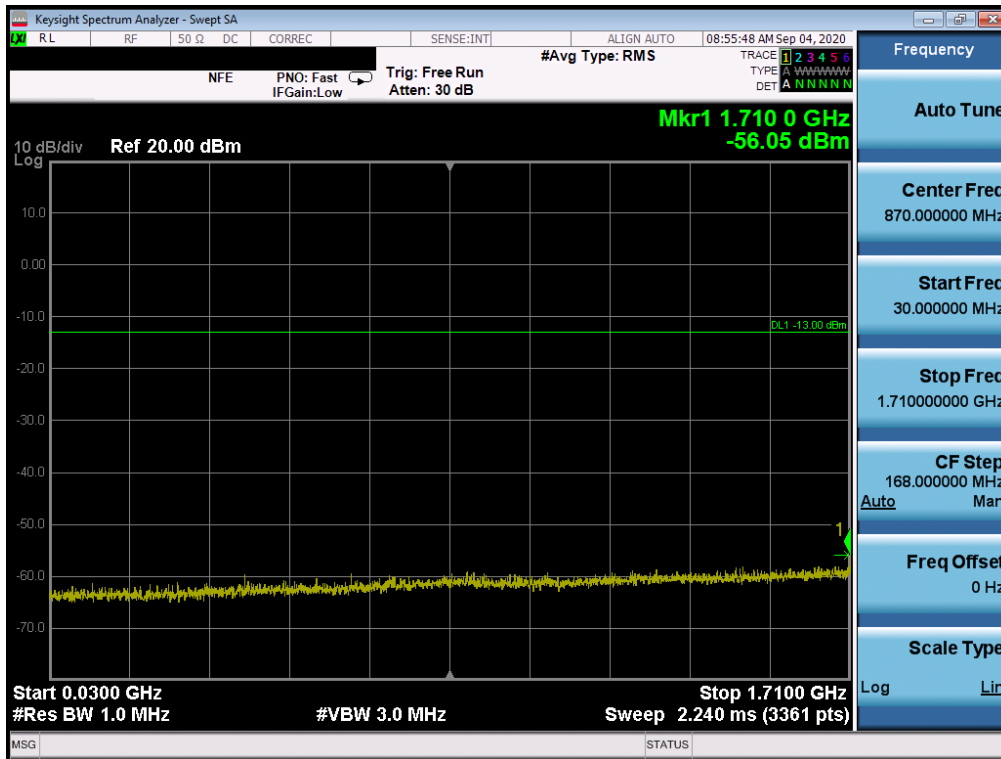
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 83 of 126

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Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

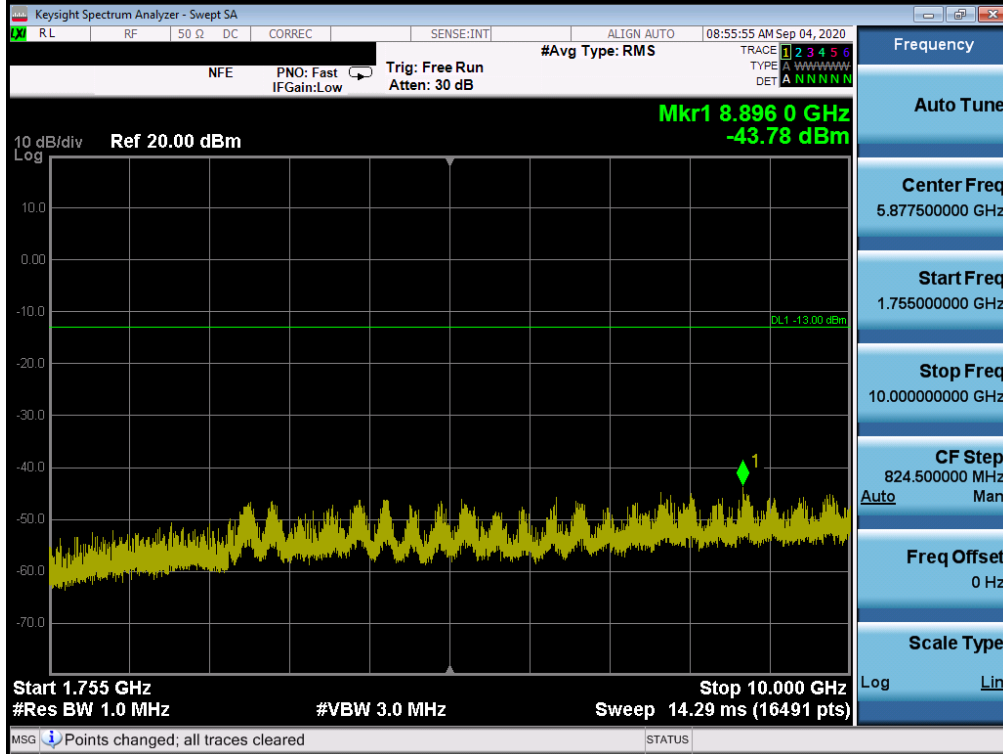


Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

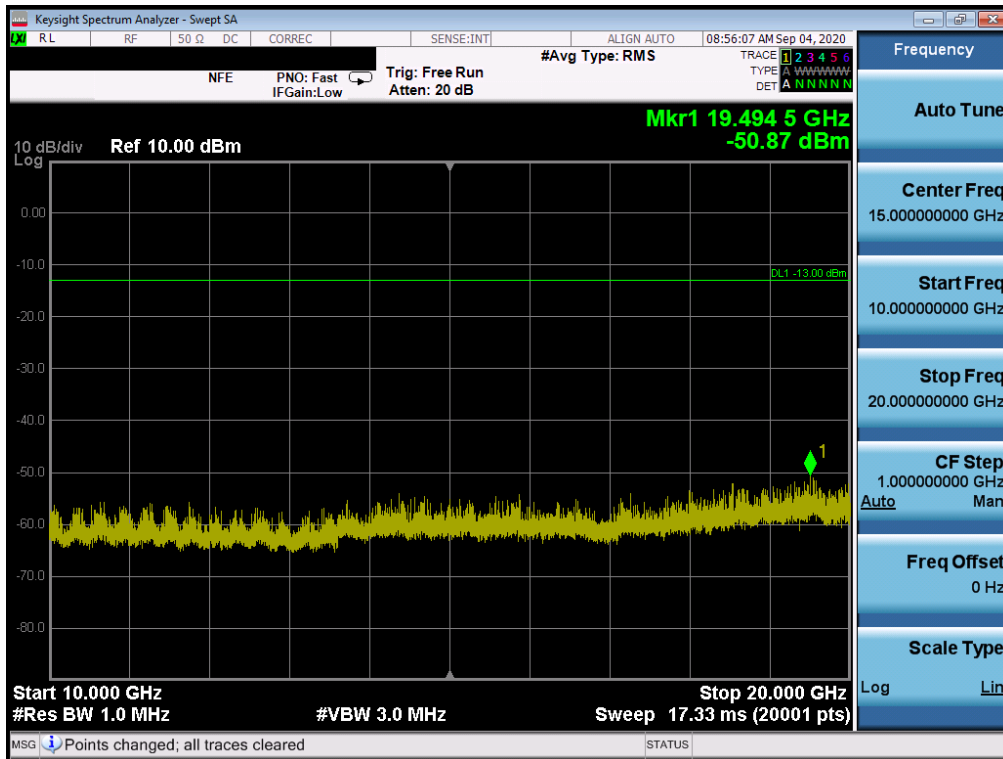
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 84 of 126

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Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

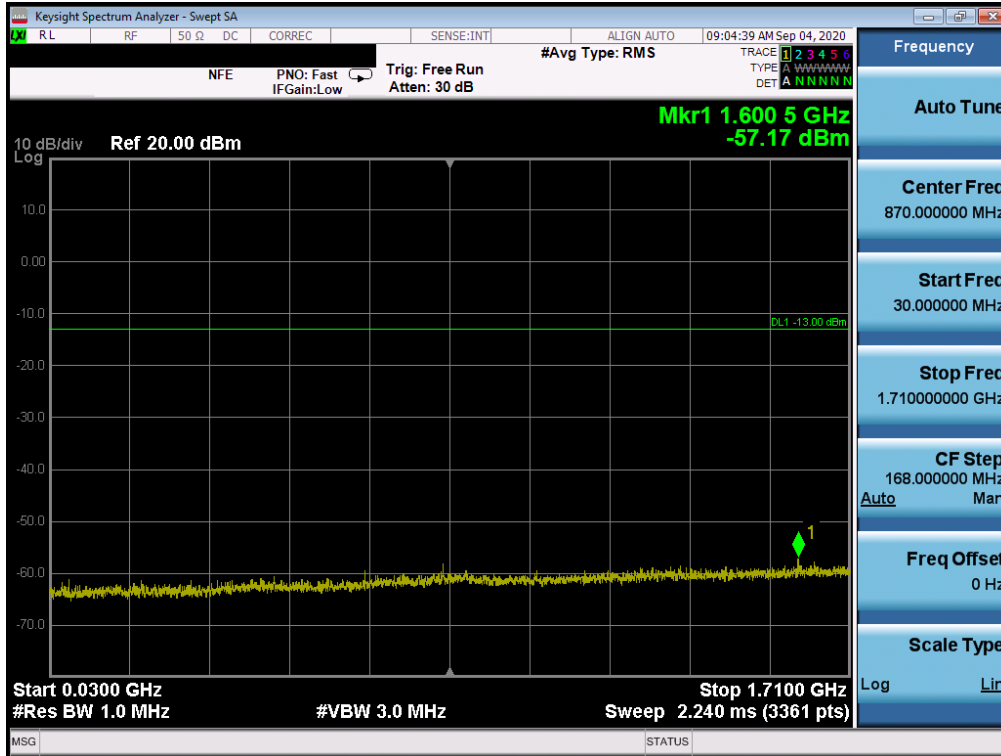


Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

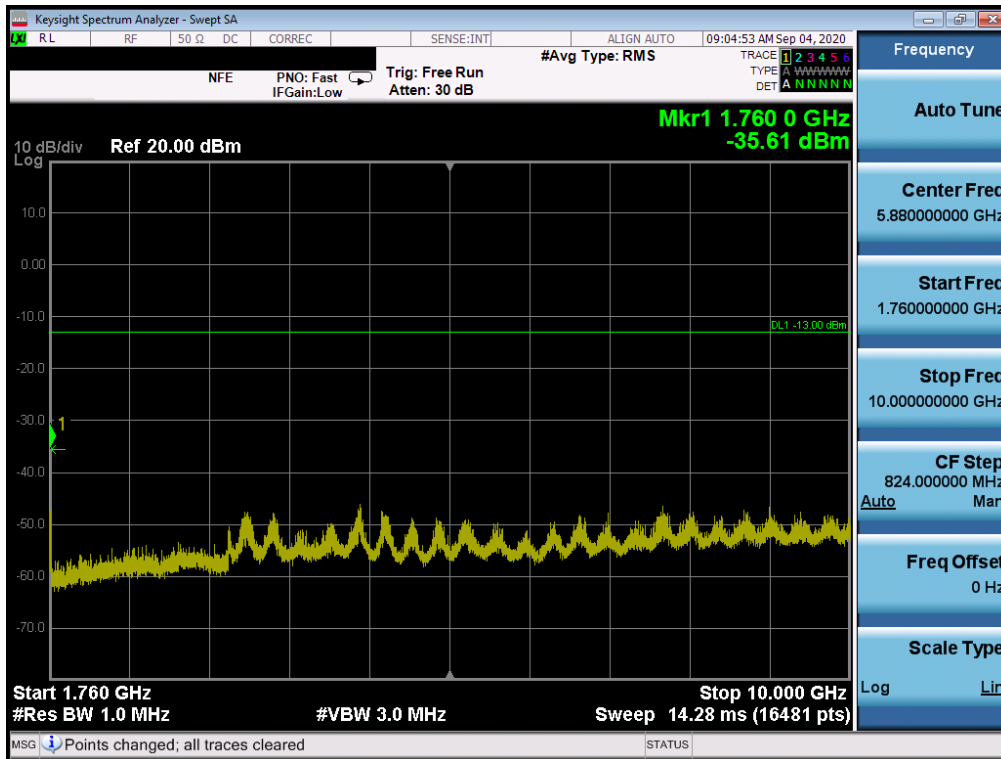
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 85 of 126

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Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

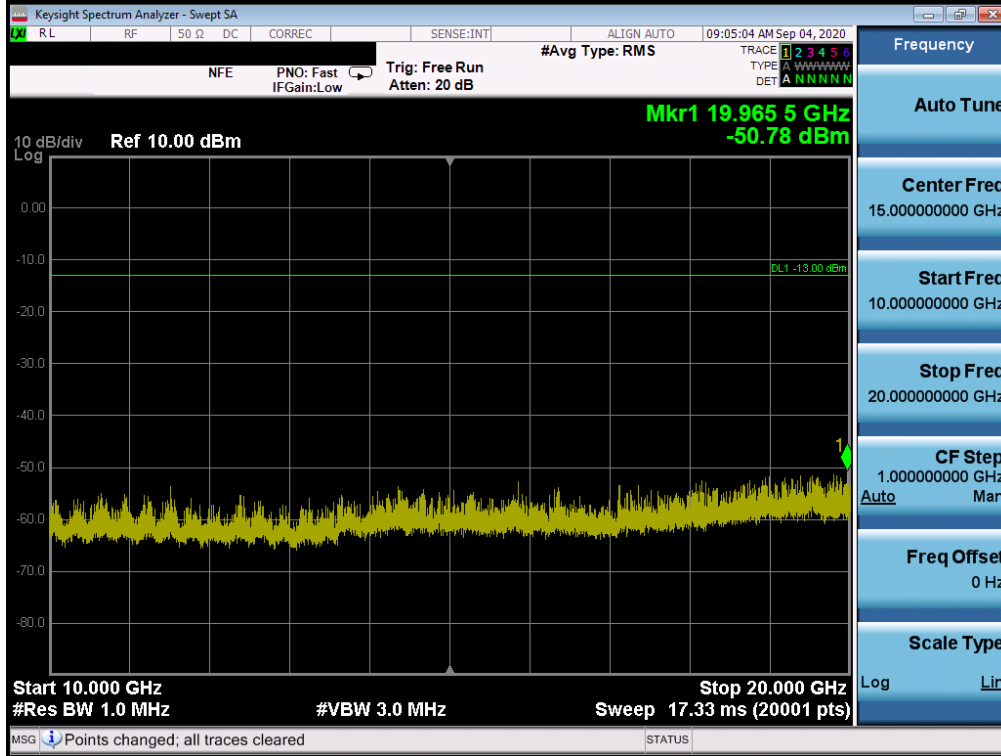


Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 86 of 126

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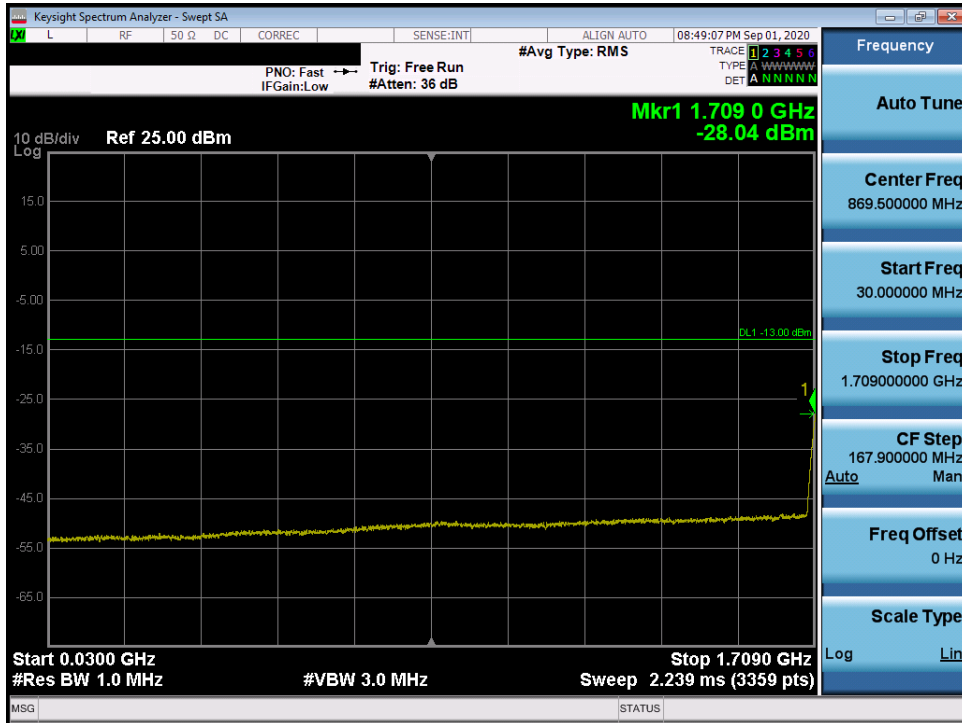
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 87 of 126

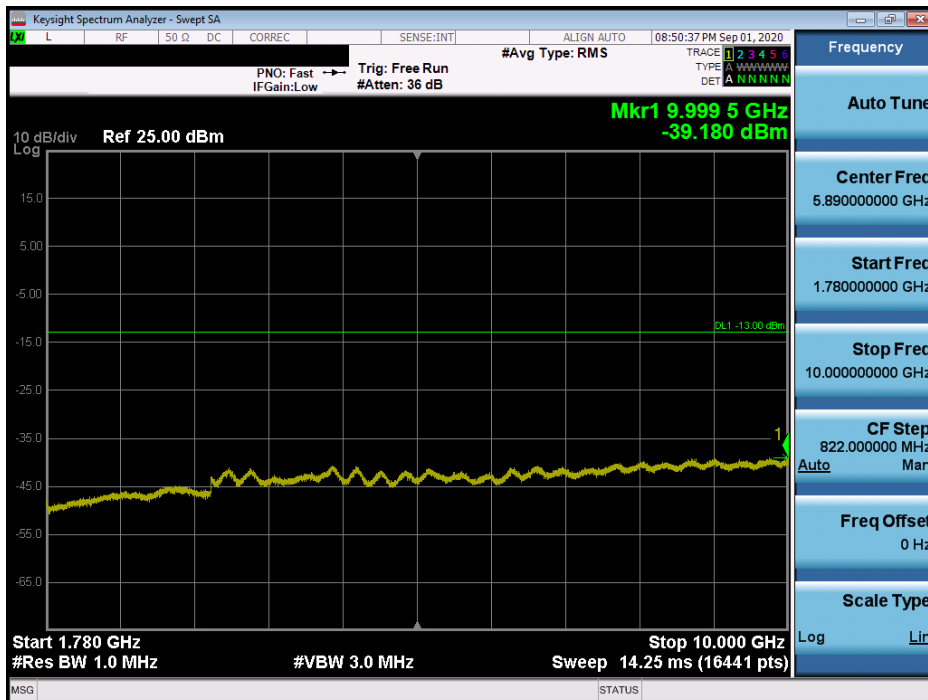
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LTE Band 66/4



Plot 7-135. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

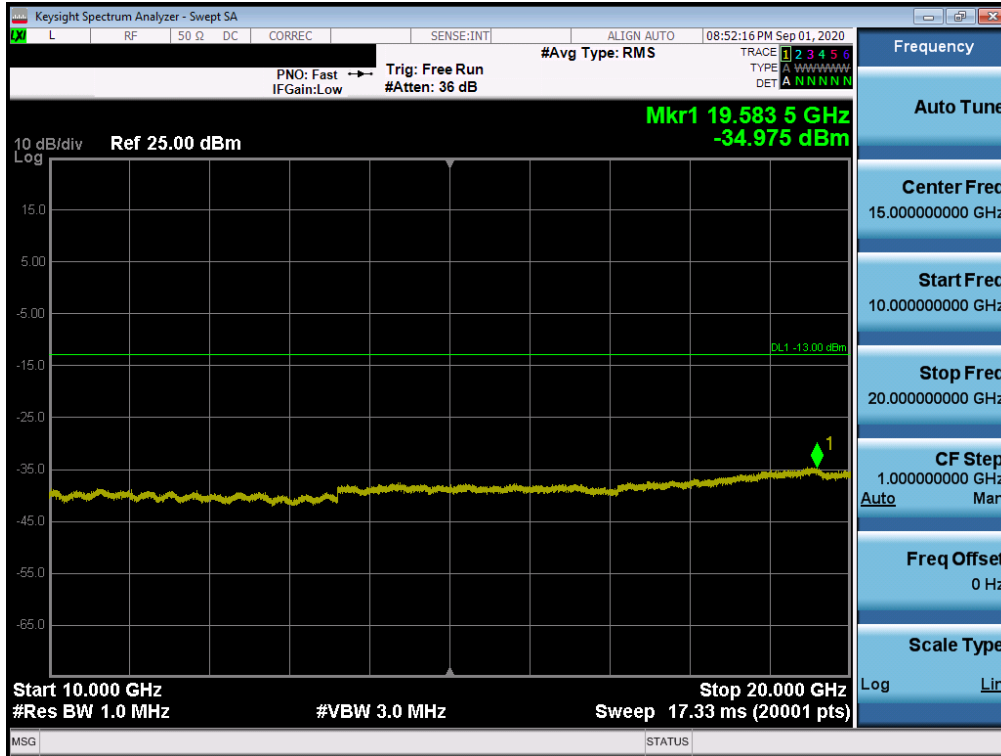


Plot 7-136. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 88 of 126

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Plot 7-137. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

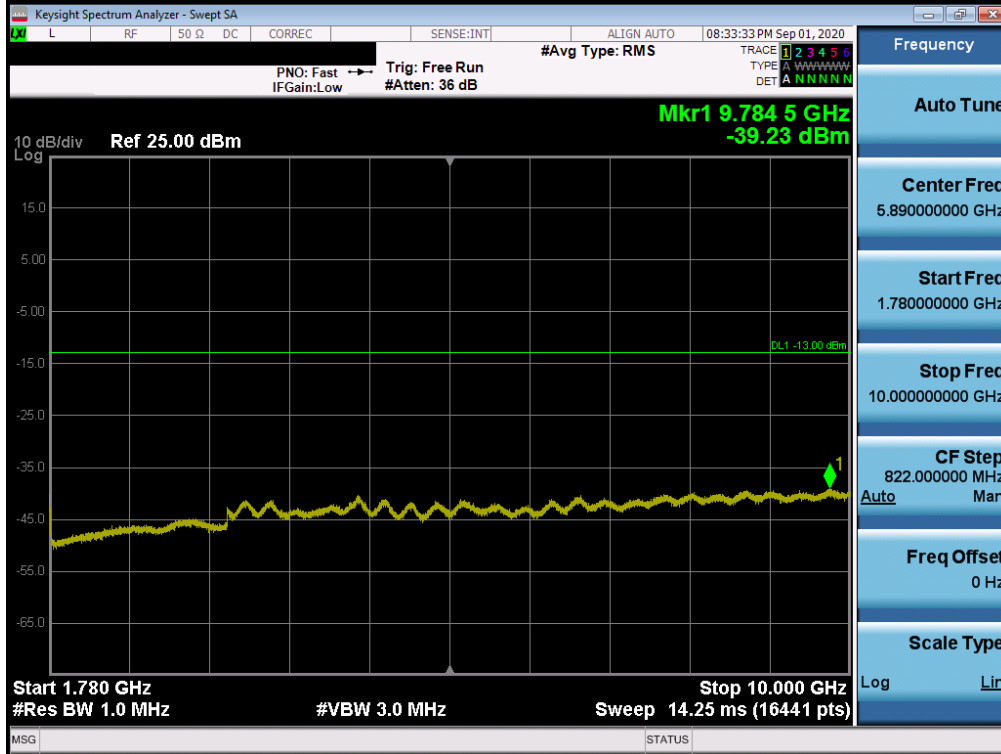


Plot 7-138. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - MidChannel)

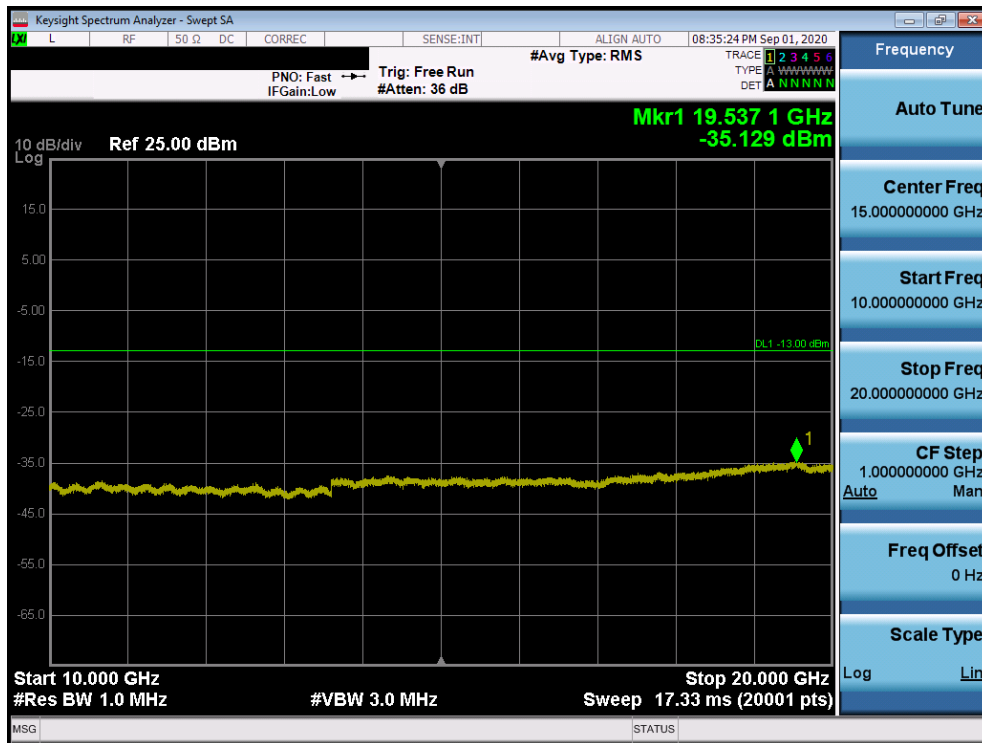
FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 89 of 126

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Plot 7-139. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

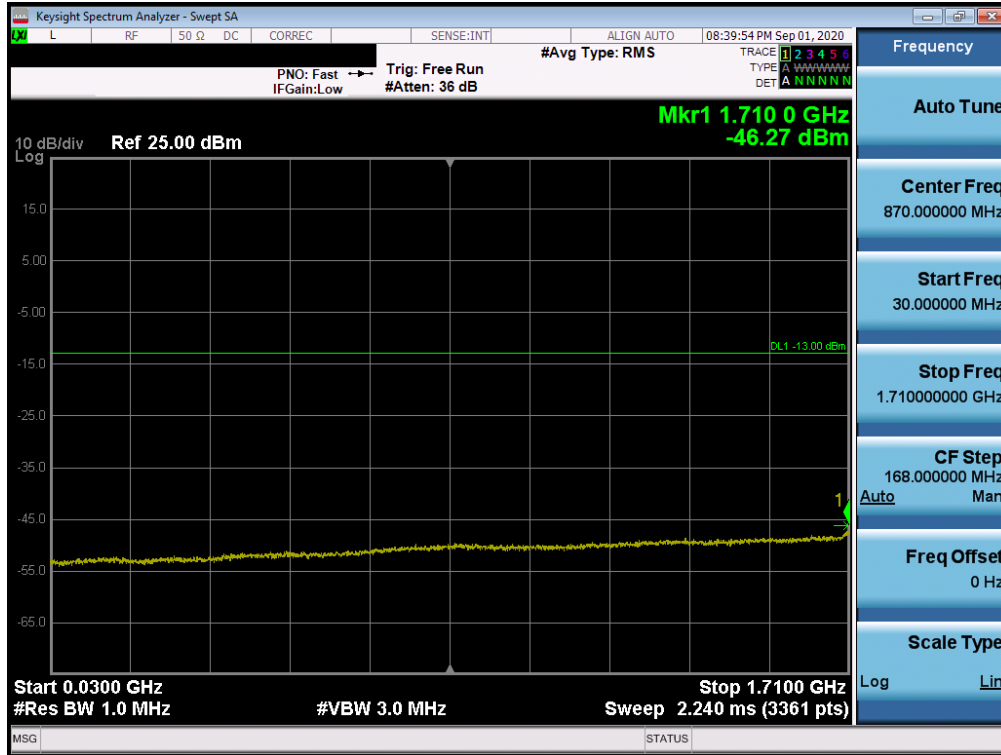


Plot 7-140. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

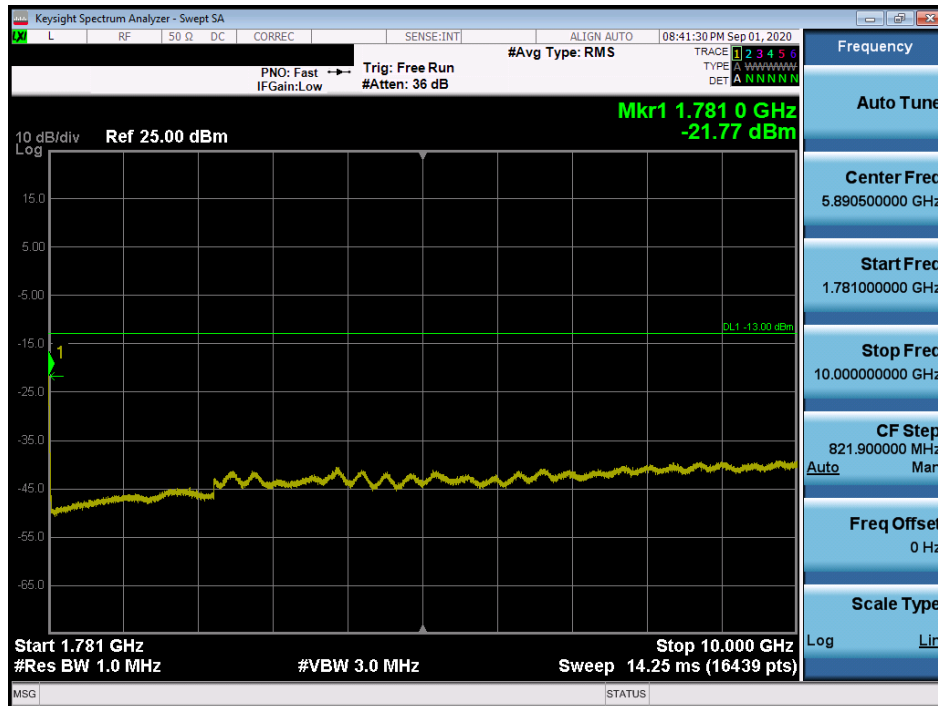
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 90 of 126

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Plot 7-141. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

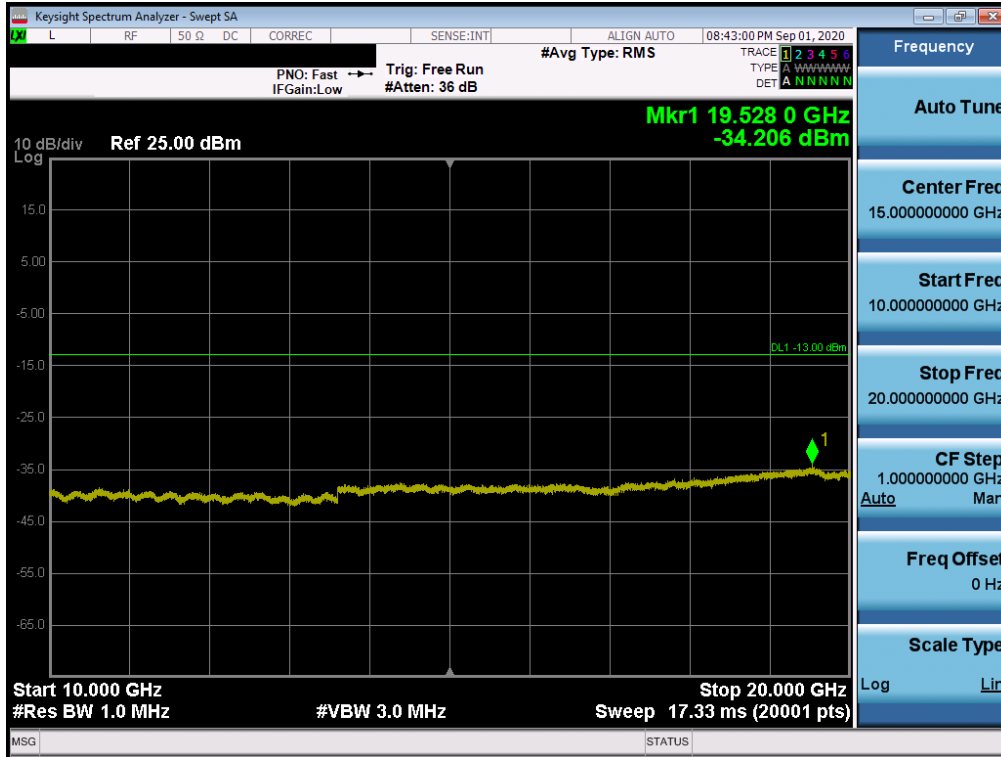


Plot 7-142. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 91 of 126

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Plot 7-143. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 92 of 126

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7.5 Peak-Average Ratio

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 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW \geq OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

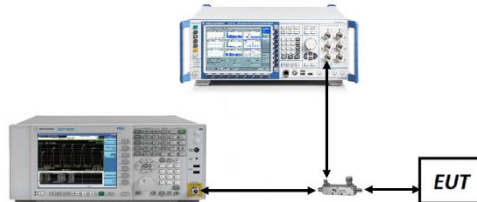


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

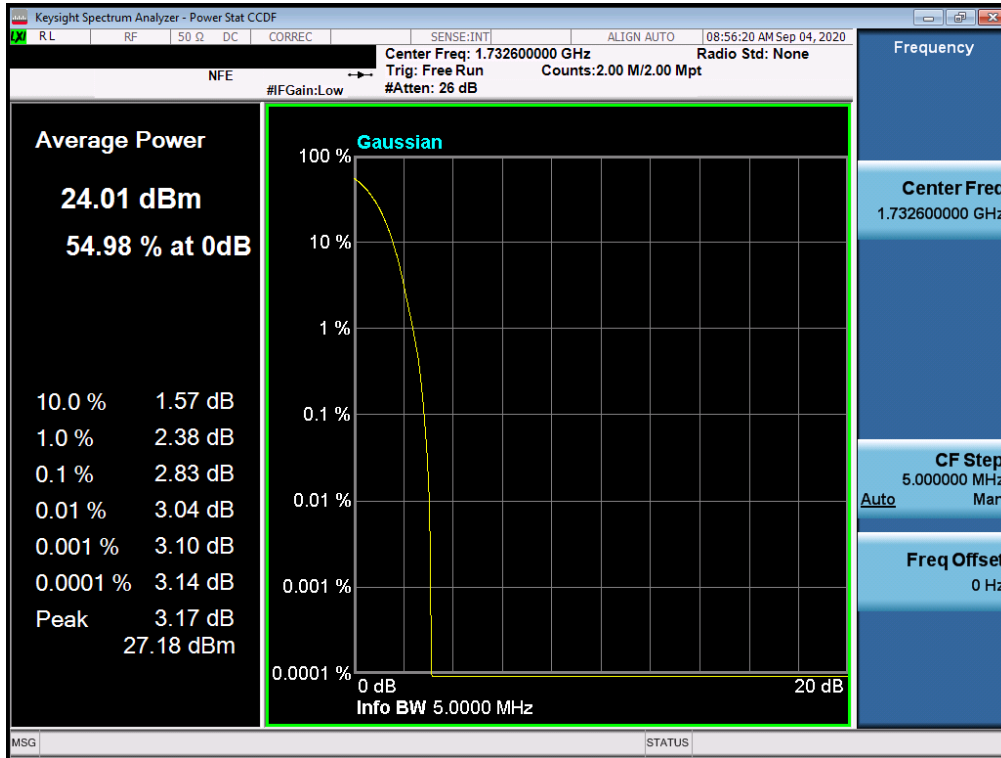
None.

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 93 of 126

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WCDMA AWS



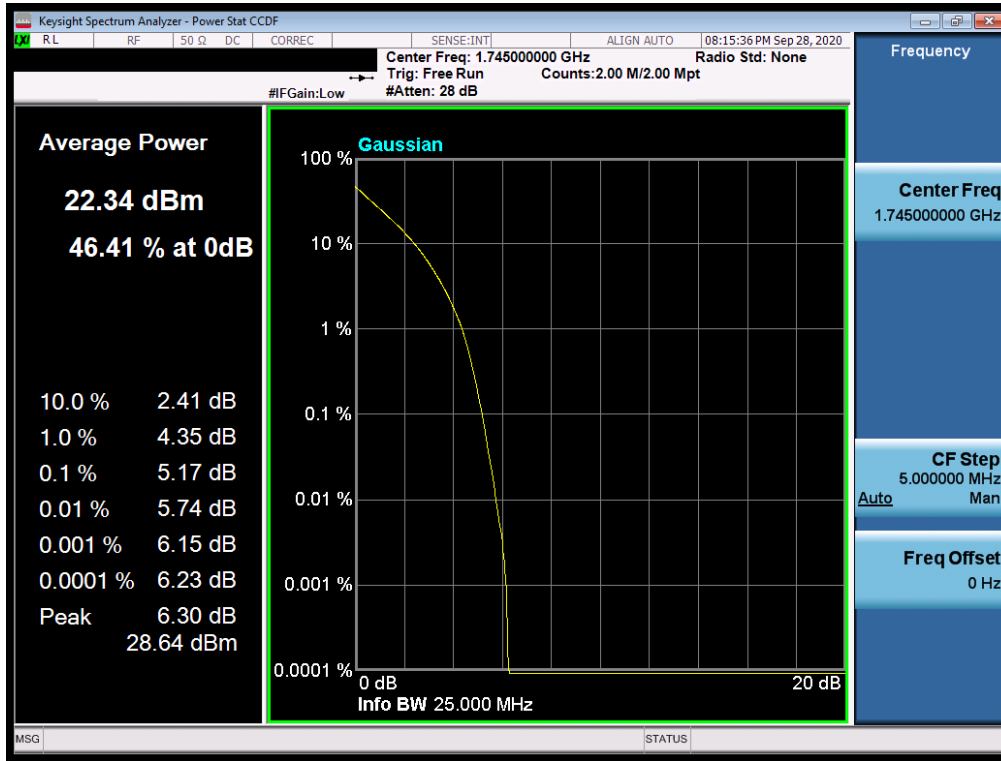
Plot 7-144. PAR Plot (WCDMA, Ch. 1413)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 94 of 126

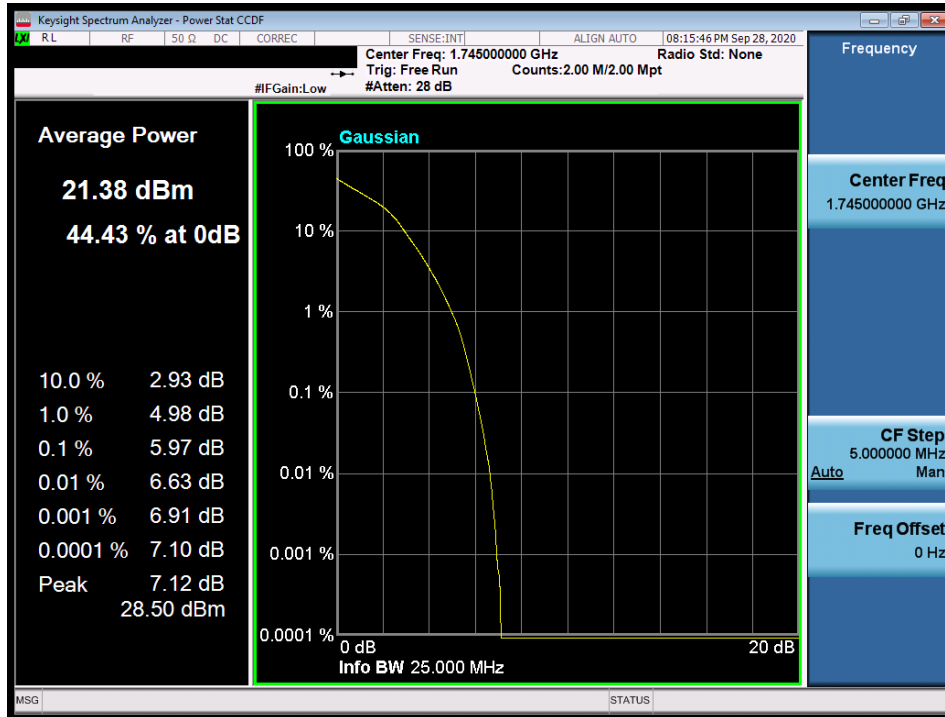
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LTE Band 66/4



Plot 7-145. PAR Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)

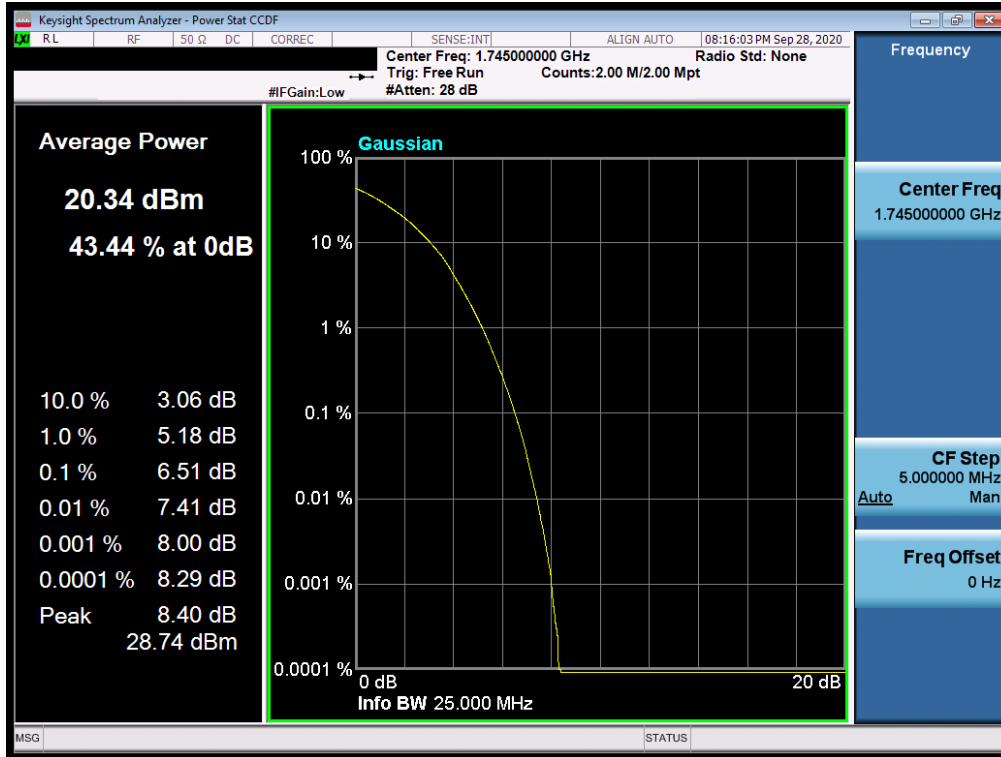


Plot 7-146. PAR Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)

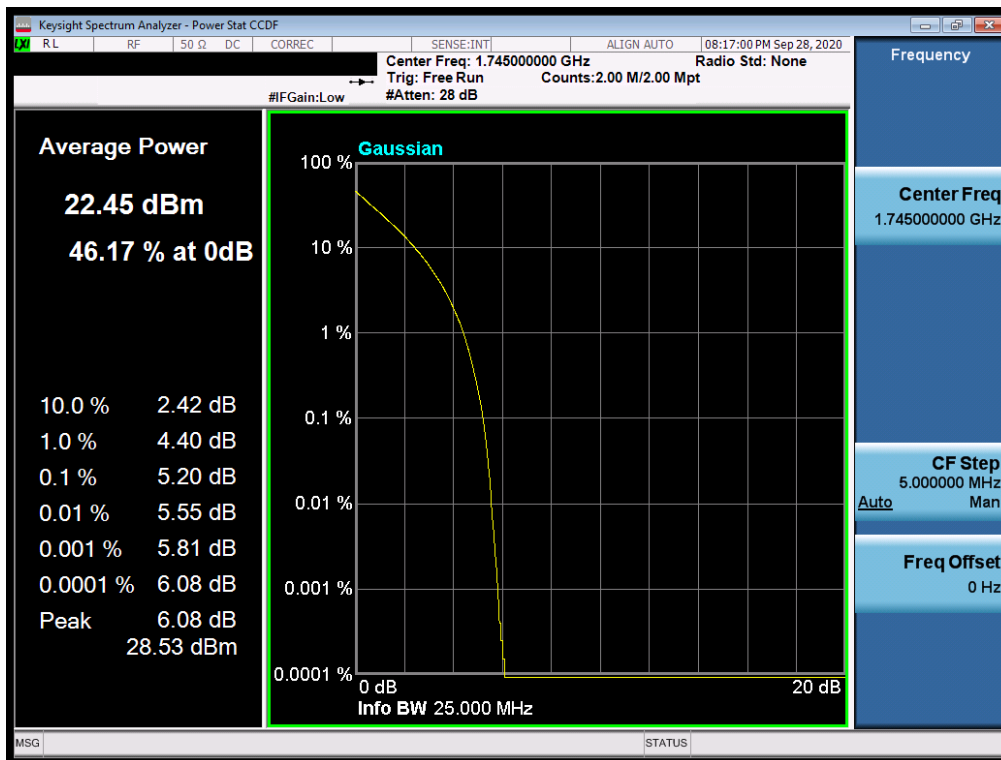
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 95 of 126

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Plot 7-147. PAR Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB Configuration)

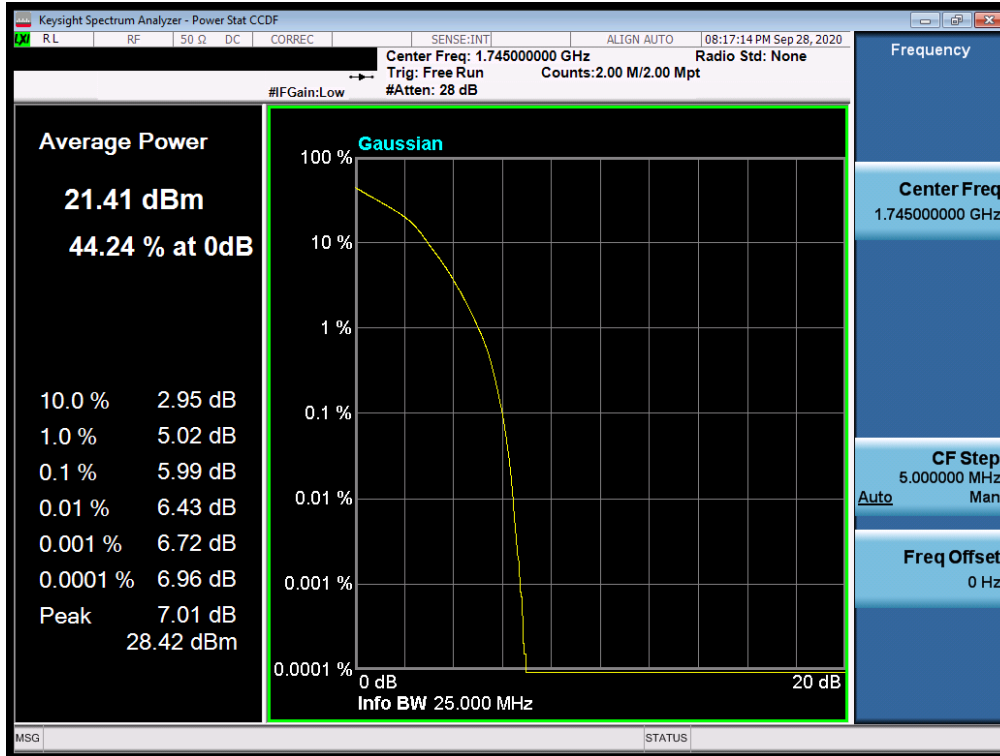


Plot 7-148. PAR Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)

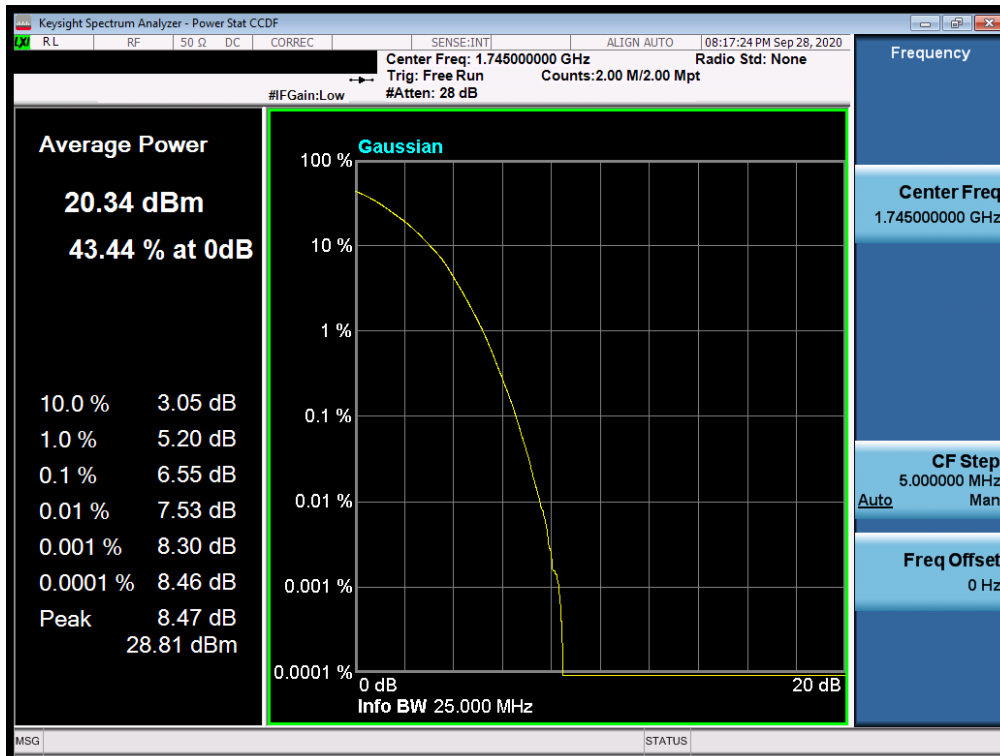
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 96 of 126

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Plot 7-149. PAR Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB Configuration)

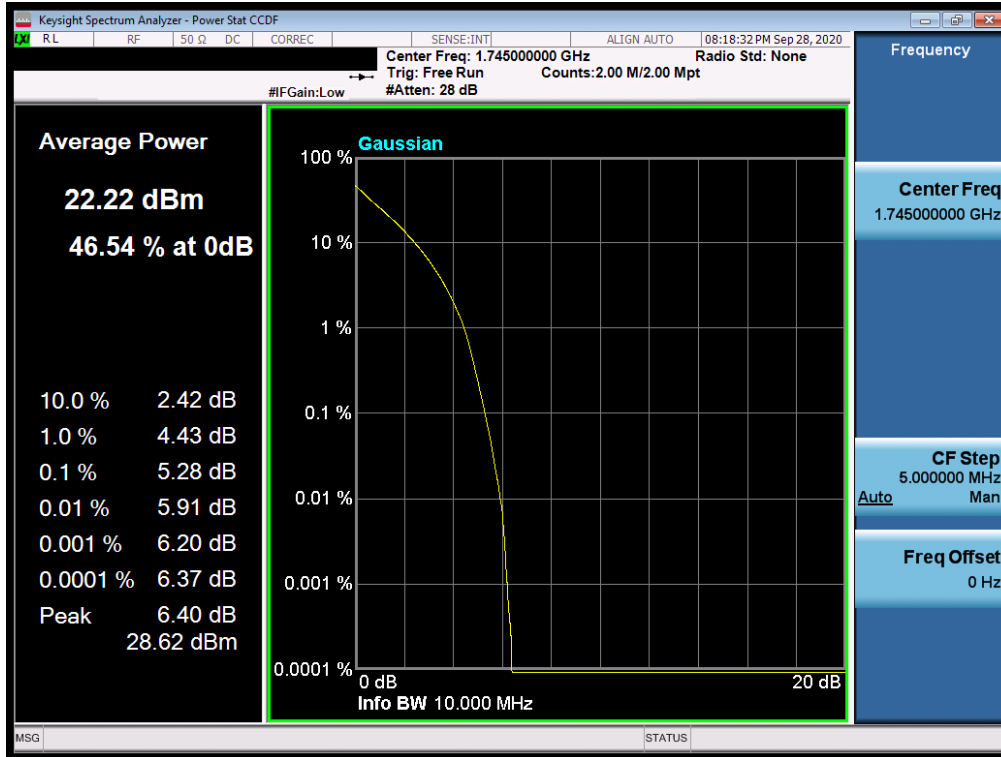


Plot 7-150. PAR Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)

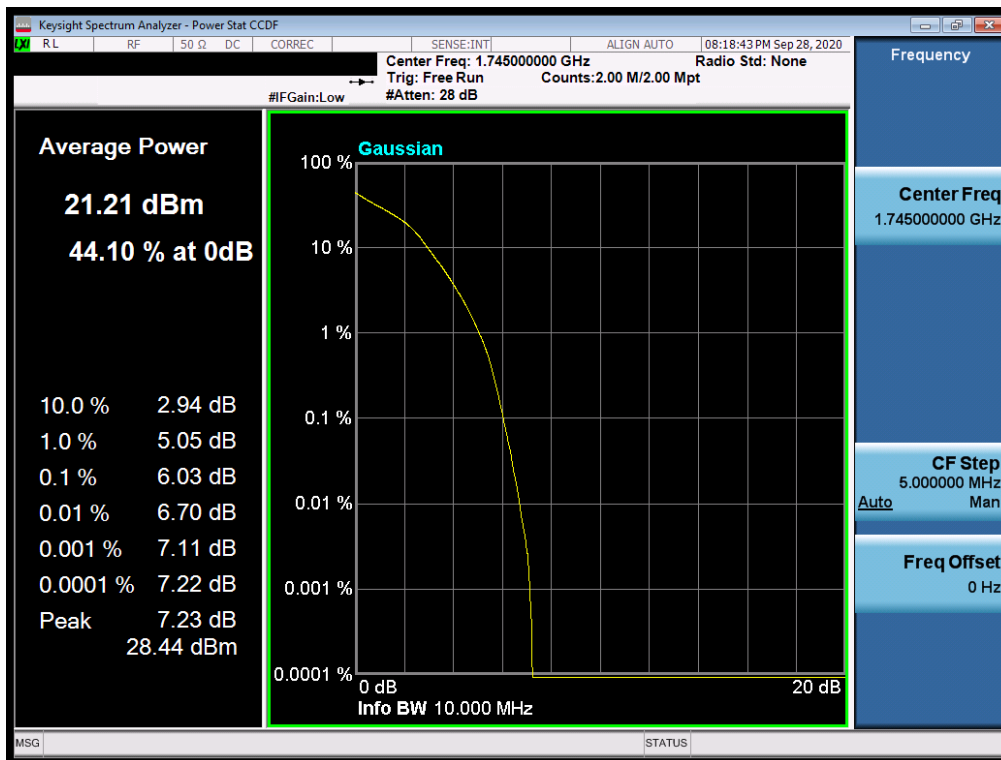
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 97 of 126

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Plot 7-151. PAR Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)

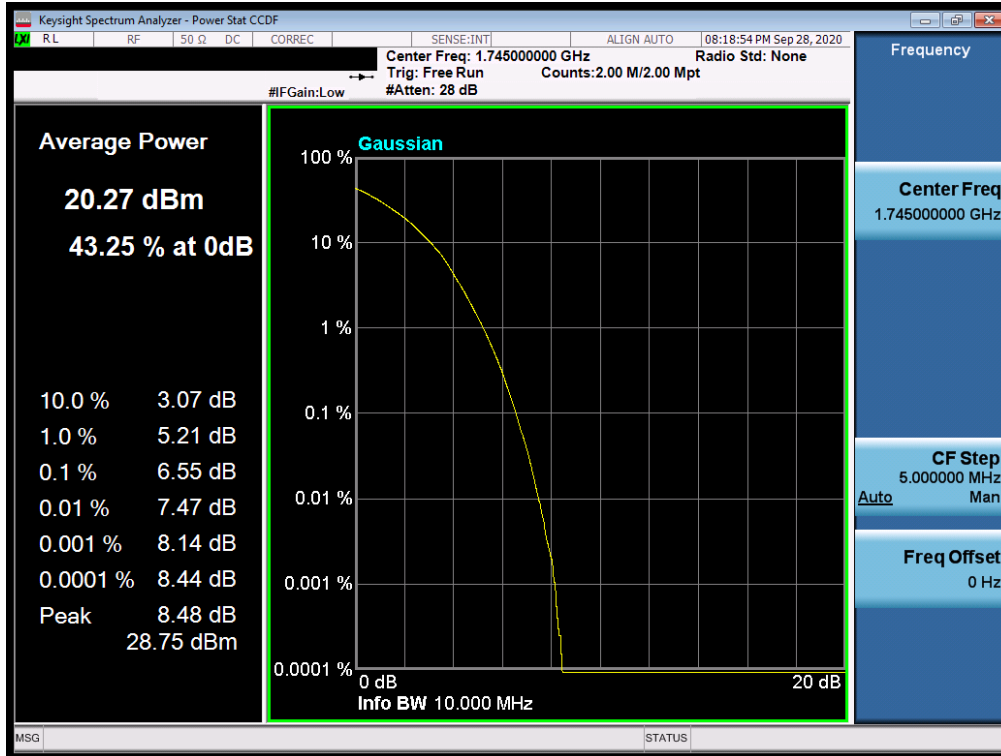


Plot 7-152. PAR Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)

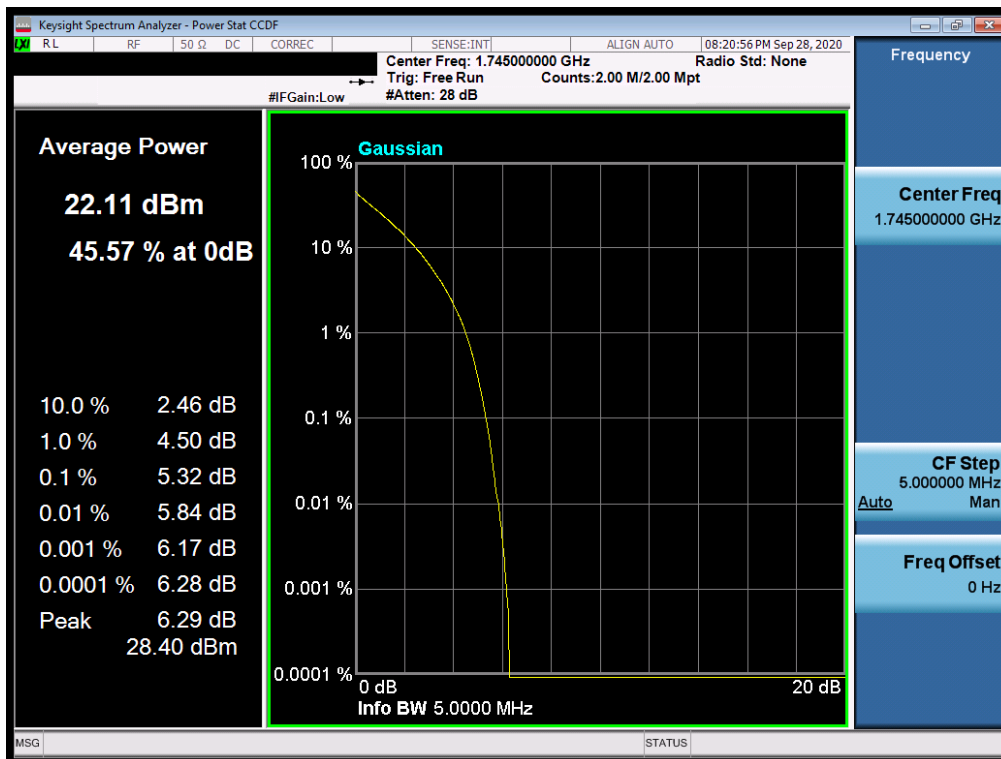
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 98 of 126

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Plot 7-153. PAR Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB Configuration)

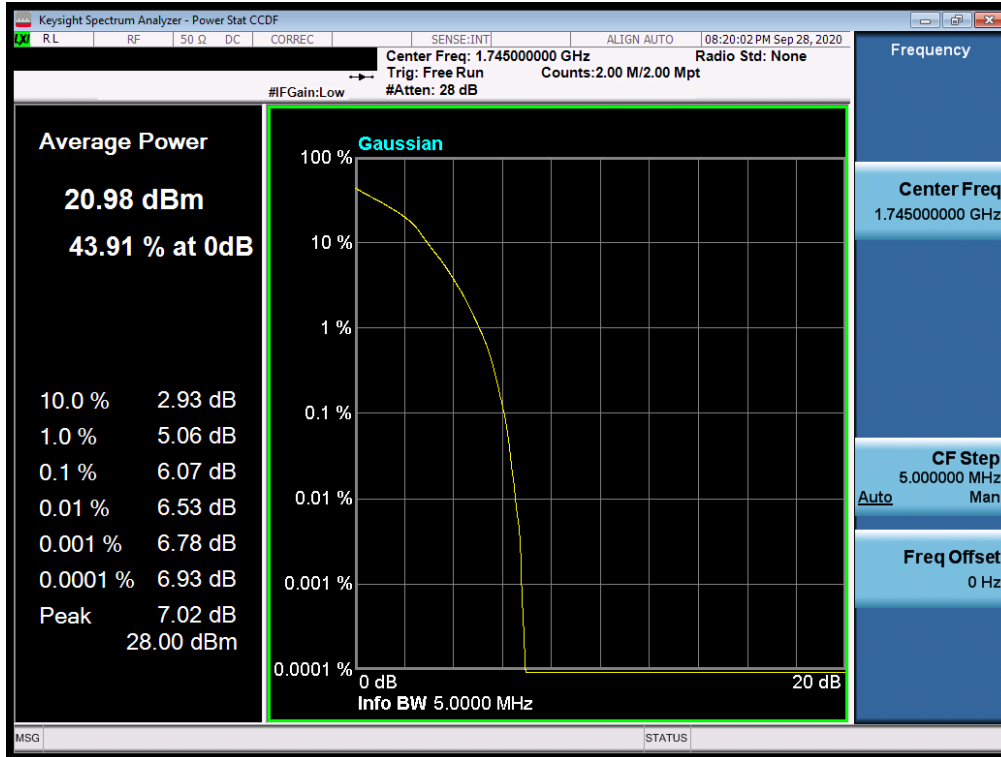


Plot 7-154. PAR Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)

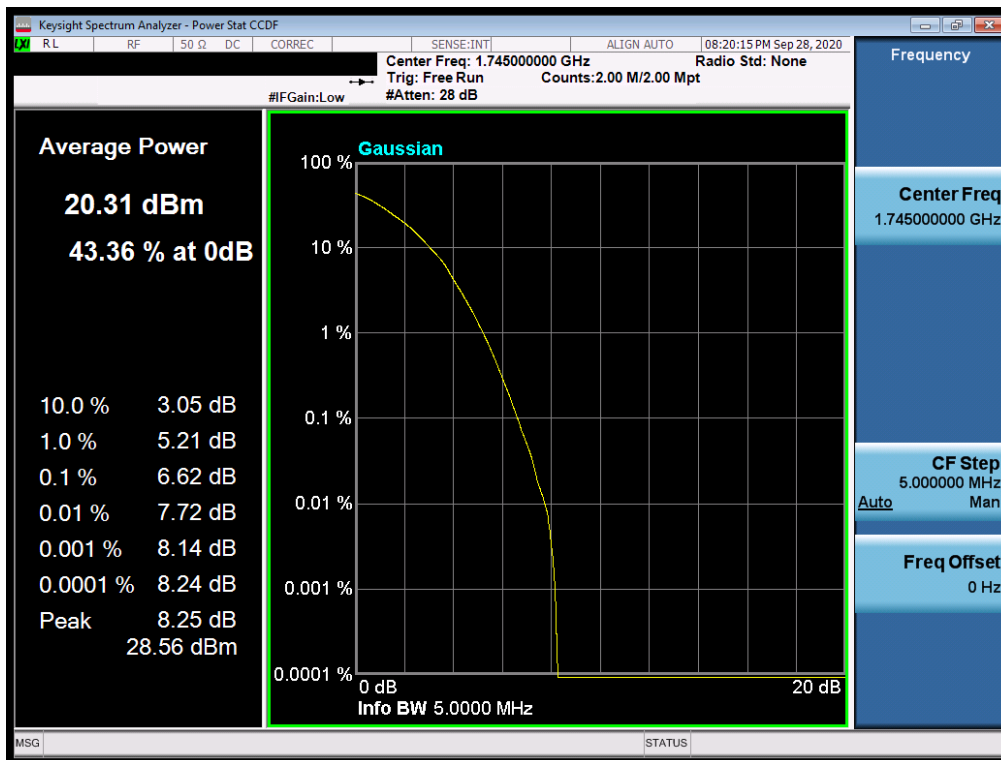
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 99 of 126

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Plot 7-155. PAR Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB Configuration)

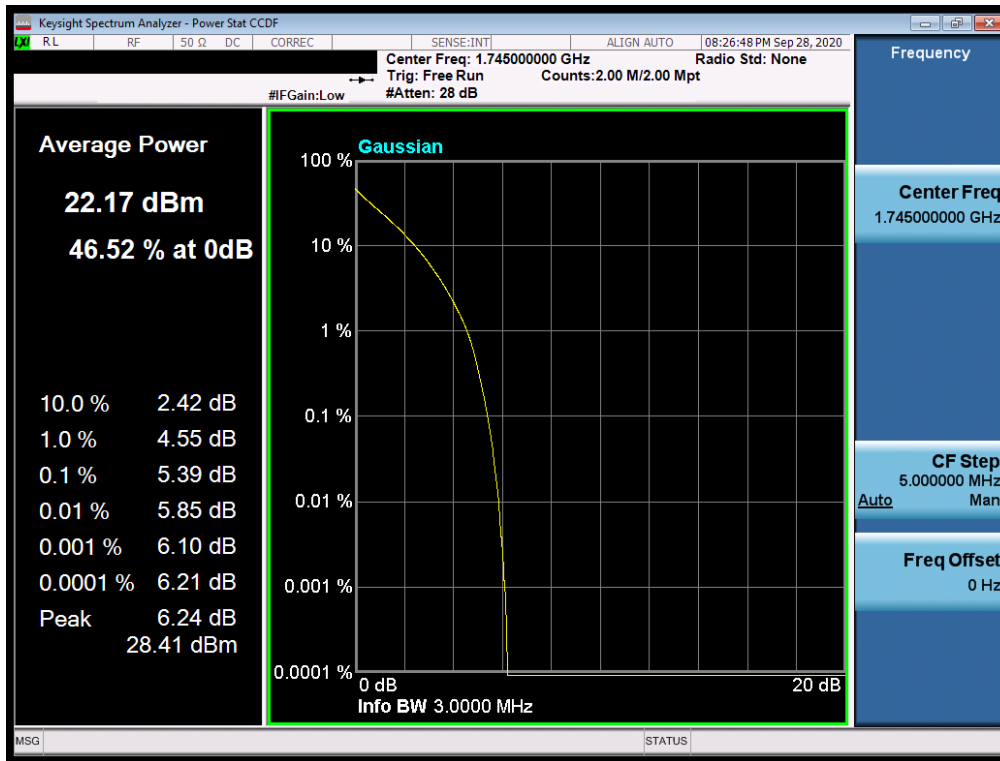


Plot 7-156. PAR Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)

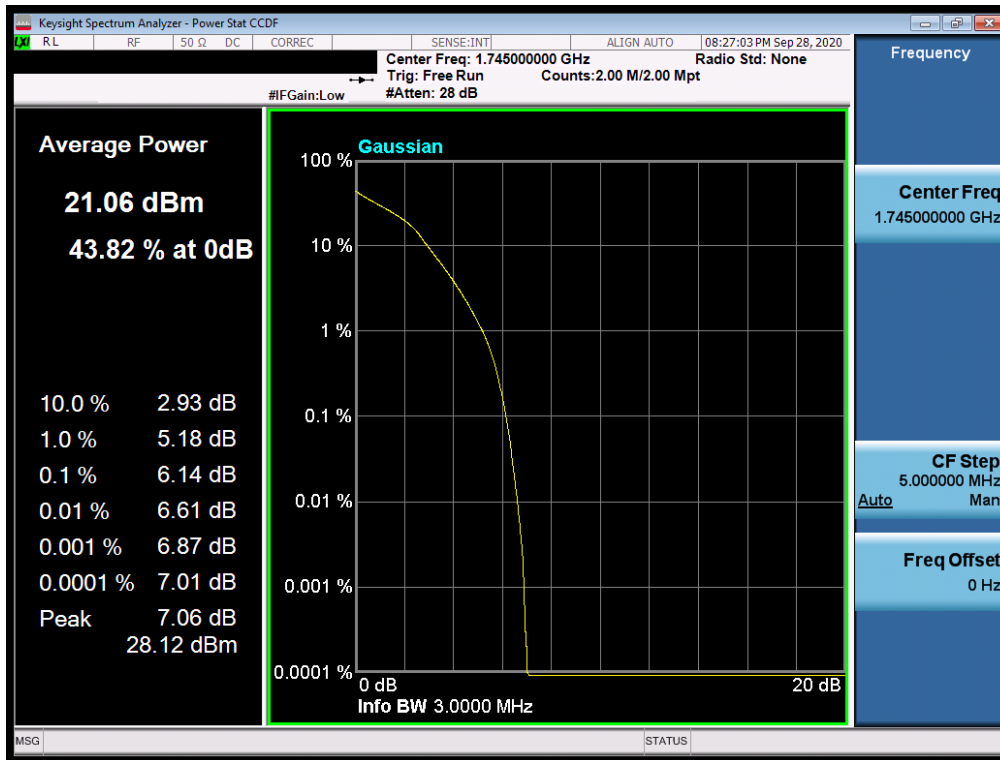
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 100 of 126

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Plot 7-157. PAR Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)

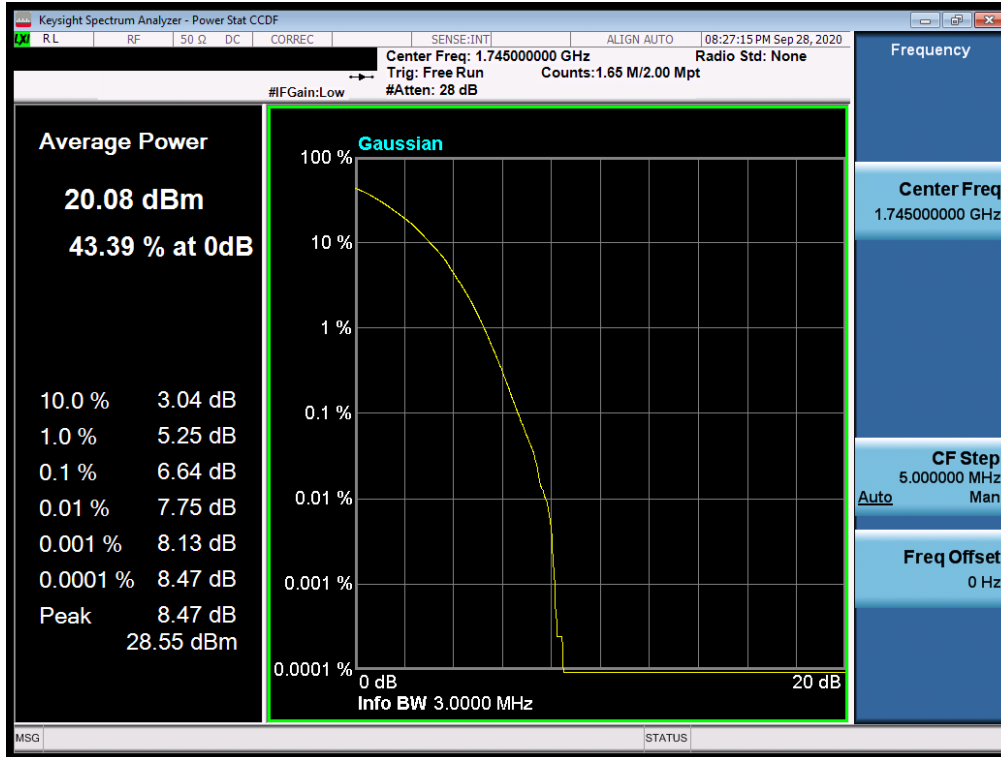


Plot 7-158. PAR Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)

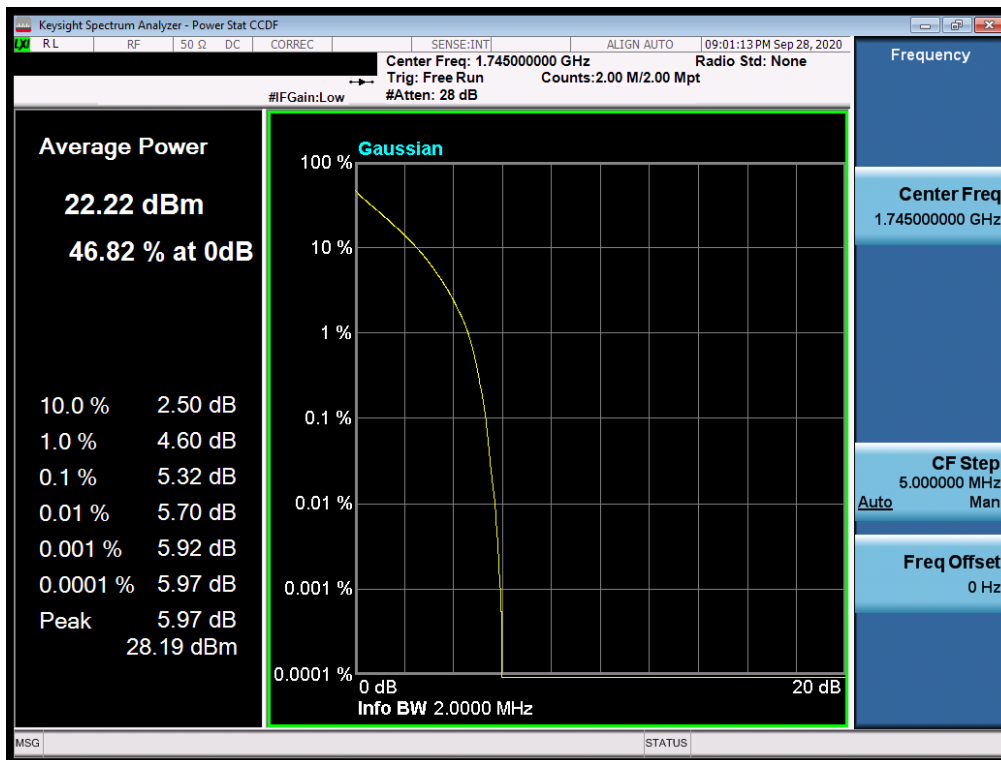
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 101 of 126

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Plot 7-159. PAR Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB Configuration)

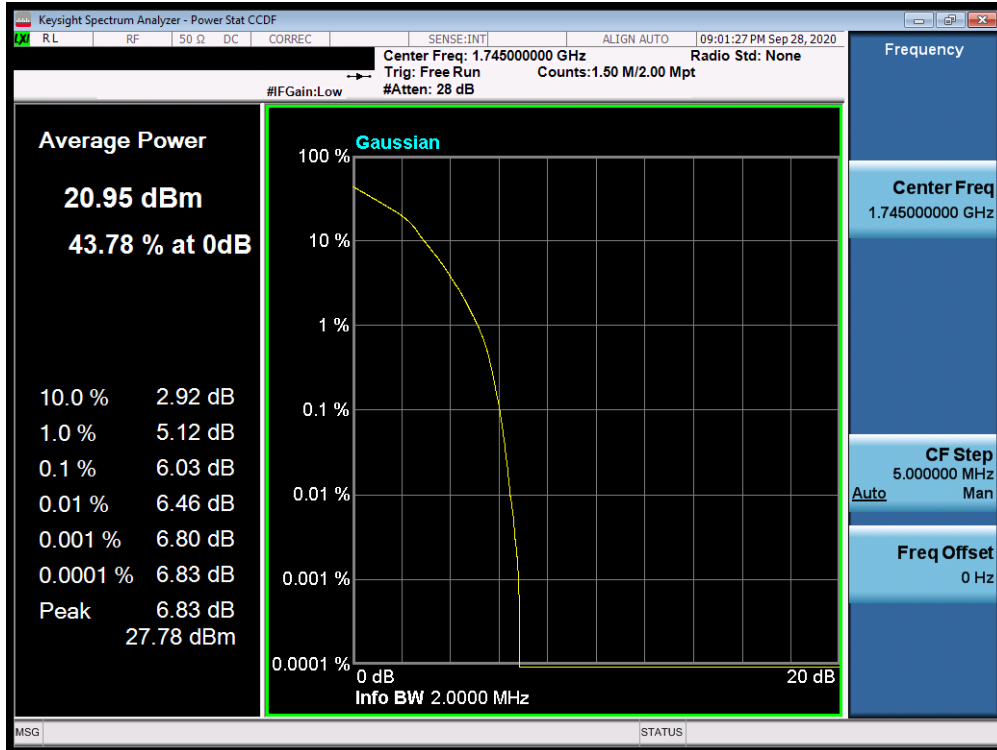


Plot 7-160. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

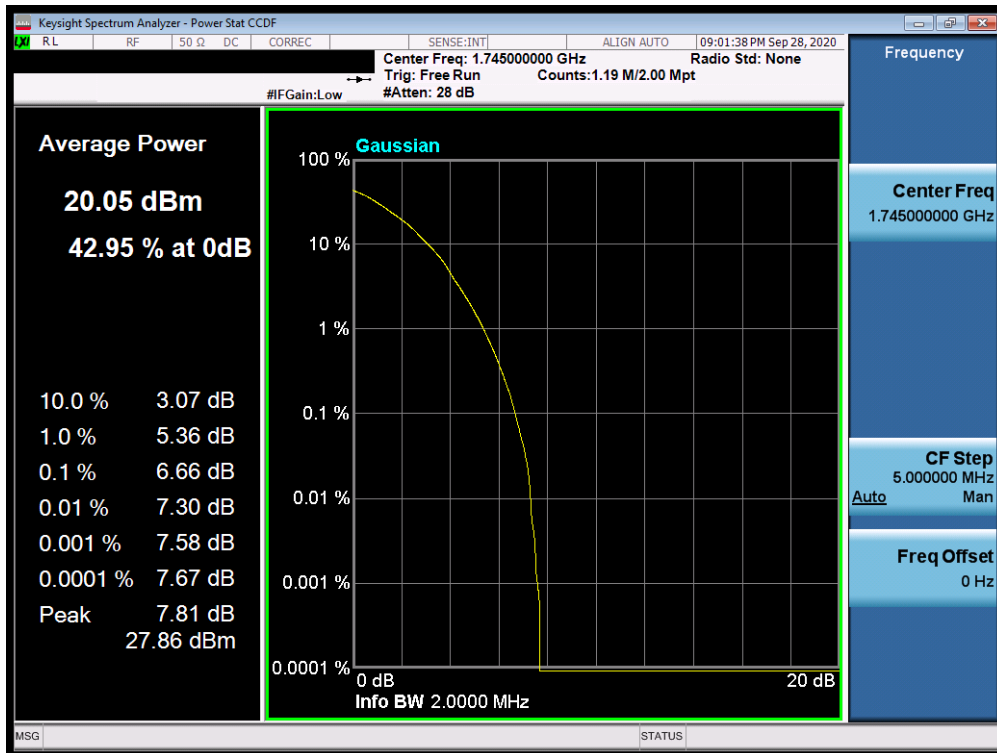
FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 102 of 126

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Plot 7-161. PAR Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)



Plot 7-162. PAR Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 103 of 126

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7.6 Radiated Power (EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole 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 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – 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: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 104 of 126

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Test Setup

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

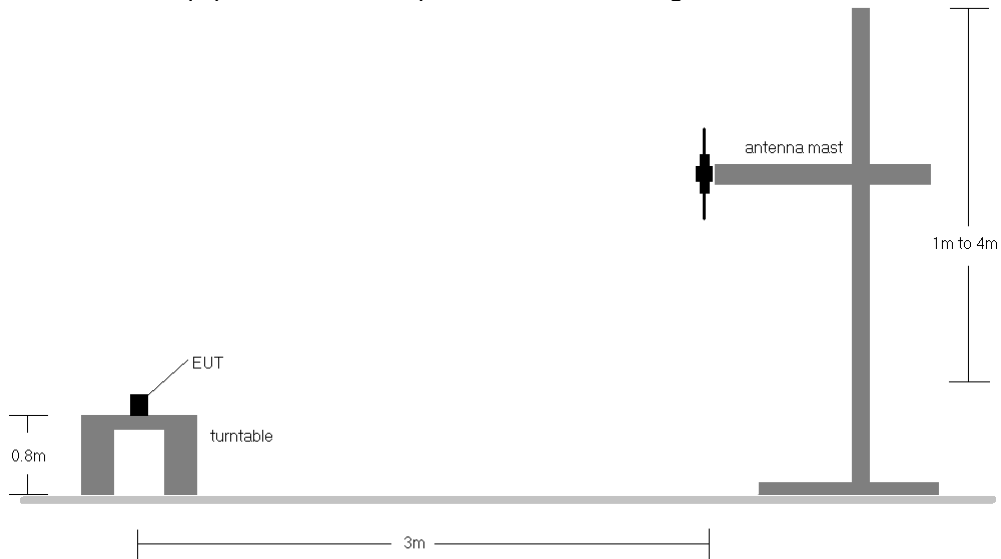


Figure 7-3. Radiated Test Setup <1GHz

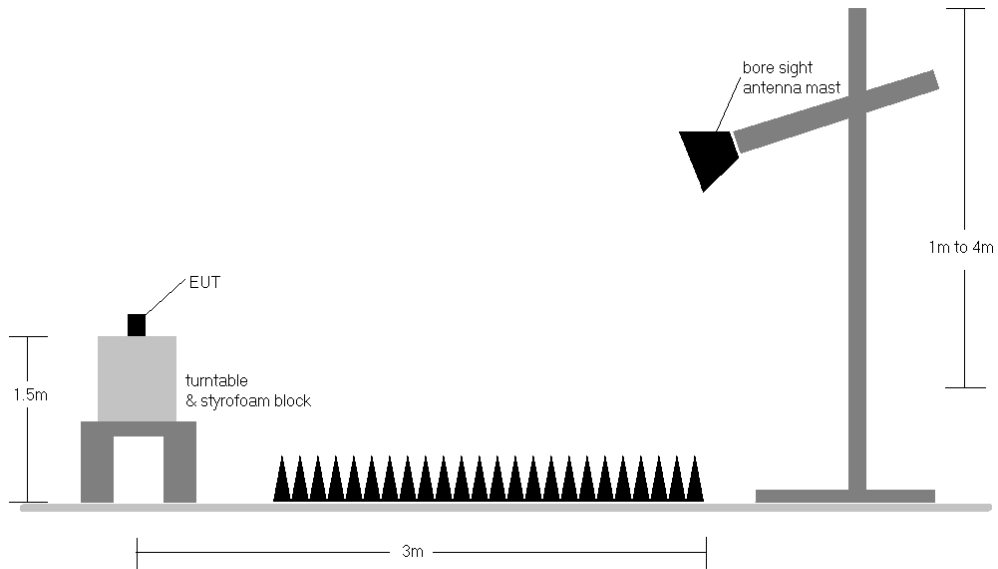


Figure 7-4. Radiated Test Setup >1GHz



FCC ID: ZNFK200TM		PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 105 of 126	

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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) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT 		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 106 of 126

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	QPSK	673.0	H	138.0	287.0	3.09	1 / 50	15.15	18.24	0.067	36.99	-18.75	16.09	0.041	34.77	-18.68
		680.5	H	138.0	284.0	3.19	1 / 0	15.68	18.87	0.077	36.99	-18.12	16.72	0.047	34.77	-18.06
		688.0	H	153.0	289.0	3.28	1 / 0	14.80	18.08	0.064	36.99	-18.91	15.93	0.039	34.77	-18.84
	16-QAM	680.5	H	138.0	284.0	3.19	1 / 0	14.28	17.47	0.056	36.99	-19.52	15.32	0.034	34.77	-19.46
680.5		H	138.0	284.0	3.19	1 / 0	14.33	17.52	0.056	36.99	-19.47	15.37	0.034	34.77	-19.41	
15 MHz	QPSK	670.5	H	138.0	287.0	3.06	1 / 74	15.99	19.05	0.080	36.99	-17.94	16.90	0.049	34.77	-17.87
		680.5	H	138.0	284.0	3.19	1 / 0	16.13	19.32	0.085	36.99	-17.67	17.17	0.052	34.77	-17.61
		690.5	H	153.0	289.0	3.31	1 / 0	13.14	16.45	0.044	36.99	-20.54	14.30	0.027	34.77	-20.47
	16-QAM	680.5	H	138.0	284.0	3.19	1 / 0	14.74	17.93	0.062	36.99	-19.06	15.78	0.038	34.77	-19.00
680.5		H	138.0	284.0	3.19	1 / 0	14.44	17.63	0.058	36.99	-19.36	15.48	0.035	34.77	-19.30	
10 MHz	QPSK	668.0	H	138.0	287.0	3.02	1 / 49	16.18	19.20	0.083	36.99	-17.78	17.05	0.051	34.77	-17.72
		680.5	H	138.0	284.0	3.19	1 / 0	16.36	19.55	0.090	36.99	-17.44	17.40	0.055	34.77	-17.38
		693.0	H	153.0	289.0	3.34	1 / 0	15.52	18.86	0.077	36.99	-18.13	16.71	0.047	34.77	-18.06
	16-QAM	680.5	H	138.0	284.0	3.19	1 / 0	15.11	18.30	0.068	36.99	-18.69	16.15	0.041	34.77	-18.63
680.5		H	138.0	284.0	3.19	1 / 0	14.29	17.48	0.056	36.99	-19.51	15.33	0.034	34.77	-19.45	
5 MHz	QPSK	665.5	H	138.0	287.0	2.99	1 / 0	14.89	17.88	0.061	36.99	-19.11	15.73	0.037	34.77	-19.04
		680.5	H	138.0	284.0	3.19	1 / 0	16.46	19.65	0.092	36.99	-17.34	17.50	0.056	34.77	-17.28
		695.5	H	153.0	289.0	3.38	1 / 0	14.61	17.99	0.063	36.99	-19.00	15.84	0.038	34.77	-18.94
	16-QAM	680.5	H	138.0	284.0	3.19	1 / 0	15.49	18.68	0.074	36.99	-18.31	16.53	0.045	34.77	-18.25
680.5		H	138.0	284.0	3.19	1 / 0	14.31	17.50	0.056	36.99	-19.49	15.35	0.034	34.77	-19.43	
	Opposite Pol.	680.5	V	164.0	304.0	4.24	1 / 0	14.73	18.97	0.079	36.99	-18.02	16.82	0.048	34.77	-17.95



Table 7-163. ERP Data (LTE Band 71)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	V	172.0	152.0	4.58	1 / 0	17.82	22.40	0.174	36.99	-14.59	20.25	0.106	34.77	-14.52
		707.5	V	157.0	158.0	4.62	1 / 0	17.11	21.73	0.149	36.99	-15.26	19.58	0.091	34.77	-15.19
		711.0	V	157.0	153.0	4.67	1 / 0	16.92	21.59	0.144	36.99	-15.40	19.44	0.088	34.77	-15.33
	16-QAM	704.0	V	172.0	152.0	4.58	1 / 0	16.25	20.83	0.121	36.99	-16.16	18.68	0.074	34.77	-16.09
704.0		V	172.0	152.0	4.58	1 / 0	16.05	20.63	0.116	36.99	-16.36	18.48	0.070	34.77	-16.29	
5 MHz	QPSK	701.5	V	172.0	152.0	4.60	1/49	17.85	22.65	0.176	36.99	-14.54	20.30	0.107	34.77	-14.47
		707.5	V	157.0	158.0	4.62	1/25	17.31	21.93	0.156	36.99	-15.06	19.78	0.095	34.77	-14.99
		713.5	V	157.0	153.0	4.70	1/49	16.71	21.41	0.138	36.99	-15.58	19.26	0.084	34.77	-15.51
	16-QAM	701.5	V	172.0	152.0	4.60	1/25	16.26	20.86	0.122	36.99	-16.13	18.71	0.074	34.77	-16.06
701.5		V	172.0	152.0	4.60	1/0	16.03	20.63	0.116	36.99	-16.36	18.48	0.070	34.77	-16.29	
3 MHz	QPSK	700.5	V	172.0	152.0	4.59	1/0	17.69	22.28	0.169	36.99	-14.71	20.13	0.103	34.77	-14.64
		707.5	V	157.0	158.0	4.62	1/25	17.03	21.65	0.146	36.99	-15.34	19.50	0.089	34.77	-15.27
		714.5	V	157.0	153.0	4.71	1/25	17.06	21.77	0.150	36.99	-15.22	19.62	0.092	34.77	-15.15
	16-QAM	700.5	V	172.0	152.0	4.59	1/25	16.44	21.03	0.127	36.99	-15.96	18.88	0.077	34.77	-15.89
700.5		V	172.0	152.0	4.59	1/0	15.79	20.38	0.109	36.99	-16.61	18.23	0.067	34.77	-16.54	
1.4 MHz	QPSK	699.7	V	172.0	152.0	4.56	1/49	17.88	22.44	0.175	36.99	-14.55	20.29	0.107	34.77	-14.48
		707.5	V	157.0	158.0	4.62	1/25	16.92	21.54	0.143	36.99	-15.45	19.39	0.087	34.77	-15.38
		715.3	V	157.0	153.0	4.72	1/49	17.20	21.92	0.155	36.99	-15.07	19.77	0.095	34.77	-15.00
	16-QAM	699.7	V	172.0	152.0	4.56	1/25	16.57	21.13	0.130	36.99	-15.86	18.98	0.079	34.77	-15.79
699.7		V	172.0	152.0	4.56	1/25	15.77	20.33	0.108	36.99	-16.66	18.18	0.066	34.77	-16.59	
	Opposite Pol.	704.0	H	150.0	266.0	3.58	1 / 0	13.80	17.38	0.055	36.99	-19.61	15.23	0.033	34.77	-19.54

Table 7-164. ERP Data (LTE Band 12)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	H	237.0	296.0	5.89	1 / 49	17.55	23.44	0.221	36.99	-13.55	21.29	0.135	34.77	-13.48
		782.0	H	237.0	296.0	5.89	1 / 0	16.32	22.21	0.166	36.99	-14.78	20.06	0.101	34.77	-14.71
		782.0	H	237.0	296.0	5.89	1 / 49	15.21	21.10	0.129	36.99	-15.89	18.95	0.079	34.77	-15.82
5 MHz	QPSK	779.5	H	237.0	296.0	5.82	1 / 0	17.23	23.05	0.202	36.99	-13.94	20.90	0.123	34.77	-13.88
		782.0	H	237.0	296.0	5.89	1 / 0	17.18	23.07	0.203	36.99	-13.92	20.92	0.124	34.77	-13.85
		784.5	H	237.0	296.0	5.92	1 / 24	17.17	23.09	0.204	36.99	-13.90	20.94	0.124	34.77	-13.83
	16-QAM	784.5	H	237.0	296.0	5.92	1 / 24	16.36	22.28	0.169	36.99	-14.71	20.13	0.103	34.77	-14.64
784.5		H	237.0	296.0	5.92	25 / 0	15.60	21.52	0.142	36.99	-15.47	19.37	0.087	34.77	-15.40	
	Opposite Pol.	782.0	V	141.0	355.0	5.82	1 / 49	13.96	19.78	0.095	36.99	-17.21	17.63	0.058	34.77	-17.14

Table 7-165. ERP Data (LTE Band 13)



FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 107 of 126

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	H	149	34	13.42	9.46	22.88	0.194	30.00	-7.12
1732.60	WCDMA1700	H	176	235	13.88	9.34	23.22	0.210	30.00	-6.78
1752.60	WCDMA1700	H	178	29	13.57	9.24	22.81	0.191	30.00	-7.19
1732.60	WCDMA1700	V	367	236	12.15	9.22	21.37	0.137	30.00	-8.63

Table 7-166. EIRP Data (WCDMA AWS)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	1720.0	H	150.0	27.0	9.41	1 / 99	14.29	23.70	0.235	30.00	-6.30
		1745.0	H	141.0	29.0	9.26	1 / 0	13.78	23.04	0.201	30.00	-6.96
		1770.0	H	142.0	28.0	9.27	1 / 0	12.63	21.90	0.155	30.00	-8.10
	16-QAM	1720.0	H	150.0	27.0	9.41	1 / 0	13.67	23.08	0.203	30.00	-6.92
	64-QAM	1720.0	H	150.0	27.0	9.41	1 / 99	12.69	22.10	0.162	30.00	-7.90
15 MHz	QPSK	1717.5	H	150.0	27.0	9.43	1/36	14.29	23.72	0.236	30.00	-6.28
		1745.0	H	141.0	29.0	9.26	1/0	13.29	22.55	0.180	30.00	-7.45
		1772.5	H	142.0	28.0	9.27	1/74	12.56	21.83	0.152	30.00	-8.17
	16-QAM	1717.5	H	150.0	27.0	9.43	1/36	13.18	22.61	0.183	30.00	-7.39
	64-QAM	1717.5	H	150.0	27.0	9.43	1/36	12.14	21.57	0.144	30.00	-8.43
10 MHz	QPSK	1715.0	H	150.0	27.0	9.44	1/0	14.28	23.72	0.236	30.00	-6.28
		1745.0	H	141.0	29.0	9.26	1/0	13.49	22.75	0.188	30.00	-7.25
		1775.0	H	142.0	28.0	9.28	1/25	12.88	22.16	0.164	30.00	-7.84
	16-QAM	1715.0	H	150.0	27.0	9.44	1/25	13.24	22.68	0.186	30.00	-7.32
	64-QAM	1715.0	H	150.0	27.0	9.44	1/25	12.39	21.83	0.153	30.00	-8.17
5 MHz	QPSK	1712.5	H	150.0	27.0	9.46	1/12	14.53	23.99	0.251	30.00	-6.01
		1745.0	H	141.0	29.0	9.26	1/12	13.59	22.85	0.193	30.00	-7.15
		1777.5	H	142.0	28.0	9.28	1/12	12.23	21.51	0.142	30.00	-8.49
	16-QAM	1745.0	H	141.0	29.0	9.26	1/24	13.52	22.78	0.190	30.00	-7.22
	64-QAM	1712.5	H	150.0	27.0	9.46	1/12	12.73	22.19	0.166	30.00	-7.81
3 MHz	QPSK	1711.5	H	150.0	27.0	9.47	1/7	14.28	23.74	0.237	30.00	-6.26
		1745.0	H	141.0	29.0	9.26	1/7	13.46	22.72	0.187	30.00	-7.28
		1778.5	H	142.0	28.0	9.28	1/14	12.43	21.72	0.149	30.00	-8.28
	16-QAM	1711.5	H	150.0	27.0	9.47	1/0	13.33	22.79	0.190	30.00	-7.21
	64-QAM	1711.5	H	150.0	27.0	9.47	1/7	12.09	21.55	0.143	30.00	-8.45
1.4 MHz	QPSK	1710.7	H	150.0	27.0	9.47	1/2	14.32	23.79	0.240	30.00	-6.21
		1745.0	H	141.0	29.0	9.26	1/5	13.30	22.56	0.180	30.00	-7.44
		1779.3	H	142.0	28.0	9.29	1/2	12.50	21.79	0.151	30.00	-8.21
	16-QAM	1710.7	H	150.0	27.0	9.47	1/5	13.21	22.68	0.186	30.00	-7.32
	64-QAM	1710.7	H	150.0	27.0	9.47	1/2	12.20	21.67	0.147	30.00	-8.33
	Opposite Pol.	1720.0	V	136.0	42.0	9.41	1 / 99	12.66	22.07	0.161	30.00	-7.93

Table 7-167. EIRP Data (LTE Band 66/4)

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 108 of 126

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically 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 maximum power, and at the appropriate frequencies.



Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – 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

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 109 of 126	

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Test Setup

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

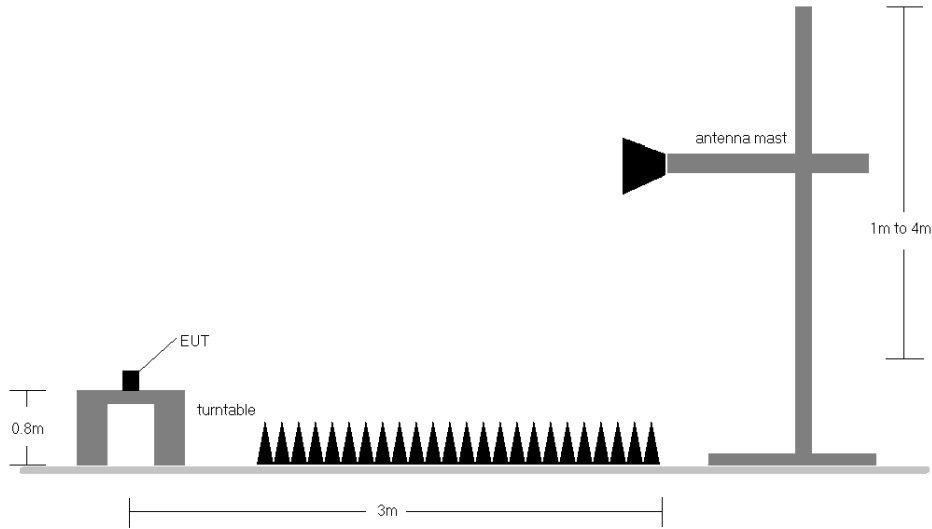


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

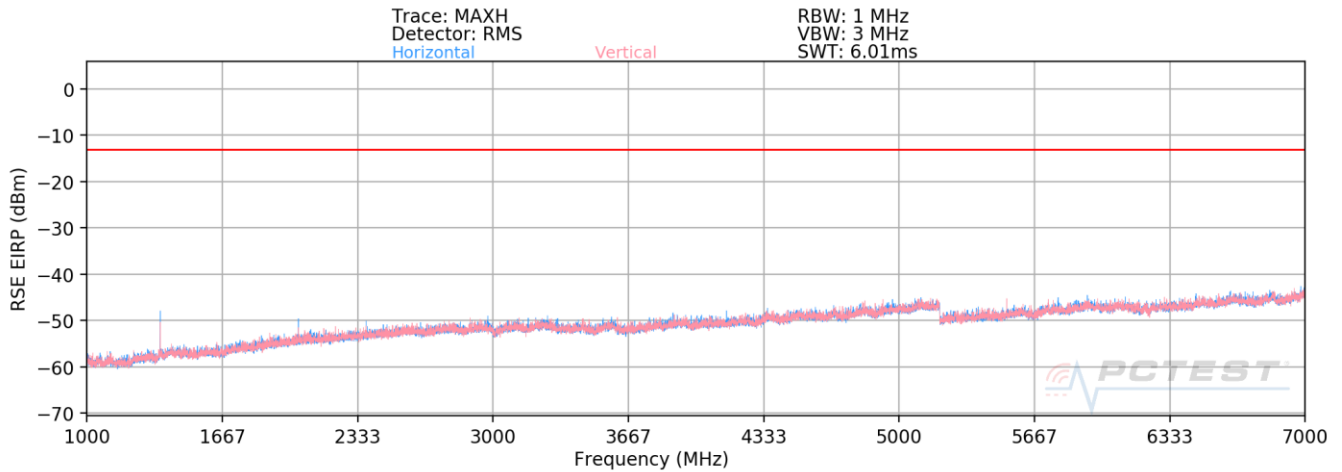
- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 - b) $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 - d) $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$; where D is the measurement distance in meters.
- 2) 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.
- 3) This unit was tested with its standard battery.
- 4) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) 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.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 110 of 126

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LTE Band 71





Plot 7-168. Radiated Spurious Plot (LTE Band 71)

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	H	107	320	-64.52	-1.23	41.25	-54.01	-13.00	-41.01
2019.0	H	153	194	-71.06	3.24	39.18	-56.08	-13.00	-43.08
2692.0	H	-	-	-79.30	5.33	33.03	-62.23	-13.00	-49.23
3365.0	H	-	-	-79.90	6.77	33.87	-61.39	-13.00	-48.39
4038.0	H	-	-	-80.64	8.45	34.81	-60.45	-13.00	-47.45

Table 7-2. Radiated Spurious Data (LTE Band 71 – Low Channel)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 111 of 126

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Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 50



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	H	119	312	-64.17	-0.47	42.36	-52.89	-13.00	-39.89
2041.5	H	118	182	-71.73	3.43	38.70	-56.55	-13.00	-43.55
2722.0	H	-	-	-79.68	5.93	33.25	-62.01	-13.00	-49.01
3402.5	H	-	-	-80.22	7.05	33.83	-61.43	-13.00	-48.43
4083.0	H	-	-	-80.28	7.82	34.54	-60.72	-13.00	-47.72

Table 7-3. Radiated Spurious Data (LTE Band 71 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	H	166	307	-62.32	-0.59	44.09	-51.17	-13.00	-38.17
2064.0	H	292	28	-67.59	3.66	43.07	-52.19	-13.00	-39.19
2752.0	H	-	-	-79.70	6.09	33.39	-61.87	-13.00	-48.87
3440.0	H	-	-	-80.02	7.24	34.22	-61.04	-13.00	-48.04
4128.0	H	-	-	-80.20	7.70	34.50	-60.76	-13.00	-47.76

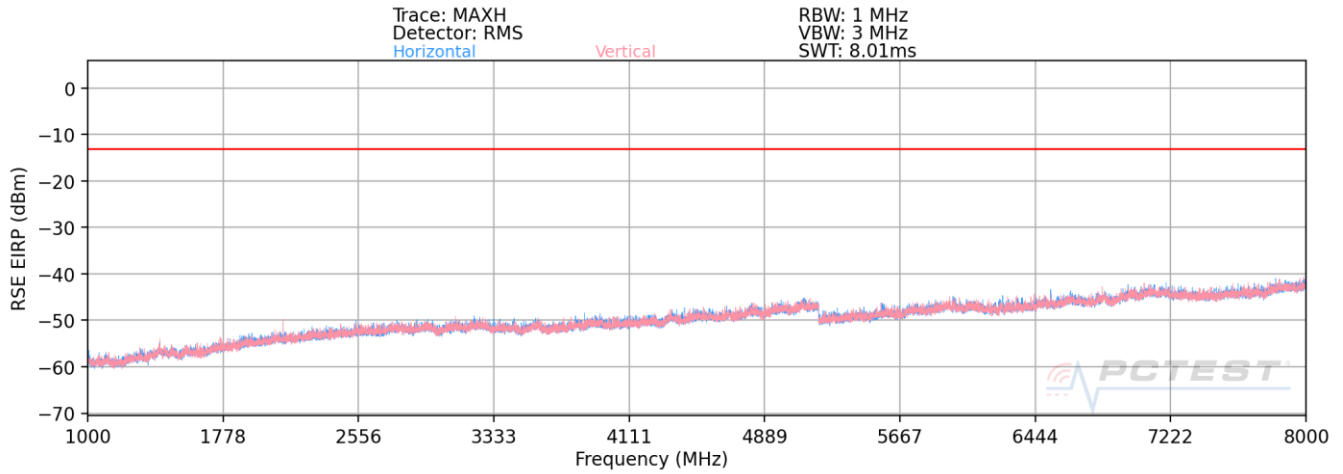
Table 7-4. Radiated Spurious Data (LTE Band 71 – High Channel)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 112 of 126

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LTE Band 12





Plot 7-169. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.0	H	357	146	-71.19	0.55	36.36	-58.90	-13.00	-45.90
2112.0	H	128	43	-72.50	3.67	38.17	-57.08	-13.00	-44.08
2816.0	H	-	-	-79.17	5.59	33.42	-61.84	-13.00	-48.84
3520.0	H	-	-	-79.81	6.96	34.15	-61.11	-13.00	-48.11
4224.0	H	-	-	-80.34	8.08	34.74	-60.52	-13.00	-47.52

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

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 113 of 126

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Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	H	127	94	-78.06	0.61	29.55	-65.71	-13.00	-52.71
2122.5	H	384	122	-72.87	3.64	37.77	-57.49	-13.00	-44.49
2830.0	H	-	-	-78.88	5.63	33.75	-61.50	-13.00	-48.50
3537.5	H	-	-	-80.18	7.34	34.16	-61.10	-13.00	-48.10
4245.0	H	-	-	-80.11	7.75	34.64	-60.62	-13.00	-47.62

Table 7-6. Radiated Spurious Data (LTE Band 12 – Mid Channel)

Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1422.0	H	6	23	-73.88	0.31	33.43	-61.83	-13.00	-48.83
2133.0	H	165	137	-73.32	3.60	37.28	-57.97	-13.00	-44.97
2844.0	H	-	-	-78.99	5.55	33.56	-61.70	-13.00	-48.70
3555.0	H	-	-	-80.31	7.80	34.49	-60.77	-13.00	-47.77
4266.0	H	-	-	-80.17	7.86	34.69	-60.57	-13.00	-47.57

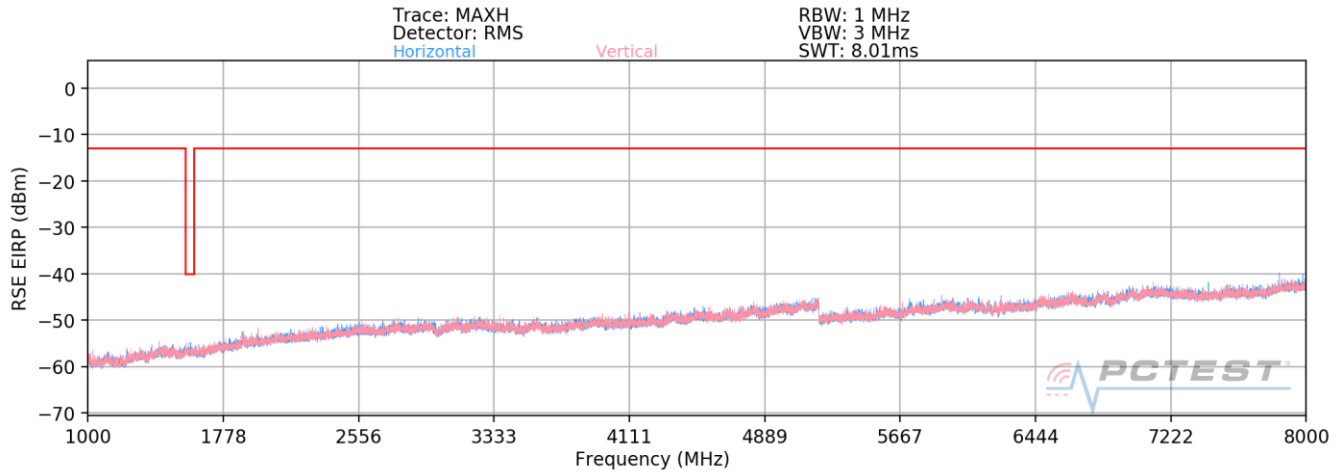
Table 7-7. Radiated Spurious Data (LTE Band 12 – High Channel)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 114 of 126

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LTE Band 13





Plot 7-170. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.0	H	128	135	-68.43	4.23	42.80	-52.46	-40.00	-12.46
2346.0	H	-	-	-79.65	6.55	33.90	-61.35	-13.00	-48.35
3128.0	H	-	-	-80.41	8.06	34.65	-60.61	-13.00	-47.61
3910.0	H	-	-	-80.69	9.10	35.41	-59.85	-13.00	-46.85

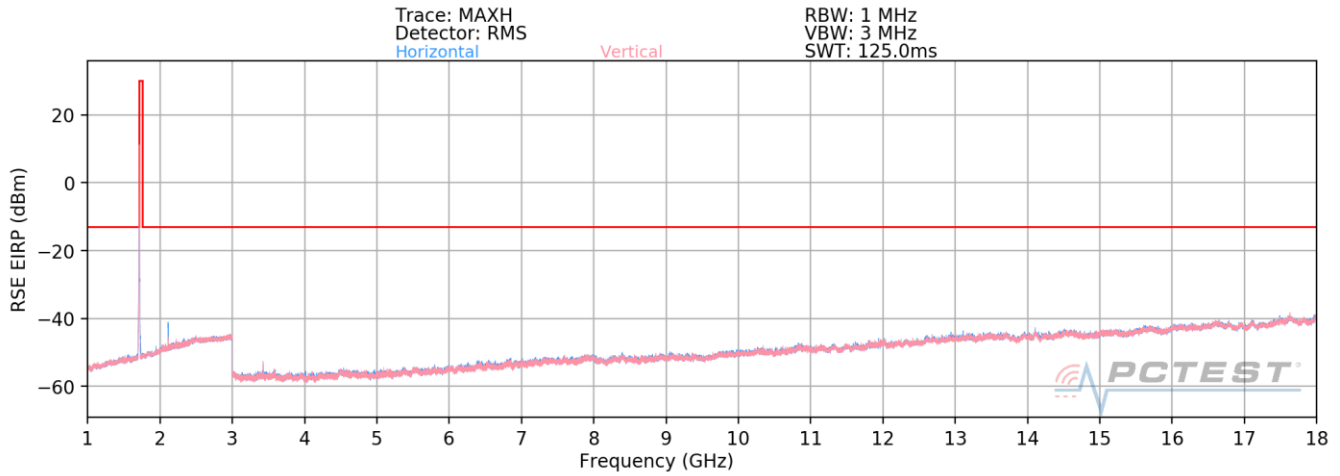
Plot 7-171. Radiated Spurious Data (LTE Band 13)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 115 of 126

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WCDMA AWS



Plot 7-172. Radiated Spurious Plot (WCDMA AWS)

Mode:	WCDMA RMC								
Channel:	1312								
Frequency (MHz):	1712.4								
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3424.8	H	190	20	-64.94	1.47	43.53	-51.73	-13.00	-38.73
5137.2	H	147	30	-76.01	4.07	35.06	-60.20	-13.00	-47.20
6849.6	H	163	328	-78.03	7.77	36.74	-58.51	-13.00	-45.51
8562.0	H	-	-	-81.32	10.40	36.08	-59.17	-13.00	-46.17
10274.4	H	228	321	-74.97	11.74	43.77	-51.49	-13.00	-38.49
11986.8	H	-	-	-81.65	14.06	39.41	-55.85	-13.00	-42.85
13699.2	H	-	-	-82.17	15.75	40.58	-54.68	-13.00	-41.68
15411.6	H	-	-	-81.96	13.62	38.66	-56.60	-13.00	-43.60

7-8. Radiated Spurious Data (WCDMA AWS – Low Channel)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 116 of 126

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Mode:	WCDMA RMC
Channel:	1413
Frequency (MHz):	1732.6



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3465.2	H	229	27	-65.72	0.73	42.01	-53.24	-13.00	-40.24
5197.8	H	22	28	-78.71	4.52	32.81	-62.45	-13.00	-49.45
6930.4	H	170	339	-77.84	6.67	35.83	-59.42	-13.00	-46.42
8663.0	H	-	-	-80.06	10.67	37.61	-57.65	-13.00	-44.65
10395.6	H	133	318	-75.85	11.89	43.04	-52.22	-13.00	-39.22
12128.2	H	-	-	-81.78	13.43	38.65	-56.61	-13.00	-43.61
13860.8	H	-	-	-83.05	17.29	41.24	-54.02	-13.00	-41.02
15593.4	H	-	-	-82.14	13.42	38.28	-56.97	-13.00	-43.97

Table 7-9. Radiated Spurious Data (WCDMA AWS – Mid Channel)

Mode:	WCDMA RMC
Channel:	1513
Frequency (MHz):	1752.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3505.2	H	253	29	-62.26	1.21	45.95	-49.31	-13.00	-36.31
5257.8	H	167	297	-77.61	4.13	33.52	-61.74	-13.00	-48.74
7010.4	H	193	333	-77.69	6.39	35.70	-59.56	-13.00	-46.56
8763.0	H	-	-	-80.51	10.57	37.06	-58.20	-13.00	-45.20
10515.6	H	215	320	-75.14	11.83	43.69	-51.57	-13.00	-38.57
12268.2	H	-	-	-81.24	12.99	38.75	-56.51	-13.00	-43.51
14020.8	H	-	-	-82.01	16.12	41.11	-54.15	-13.00	-41.15
15773.4	H	-	-	-83.35	14.83	38.48	-56.78	-13.00	-43.78

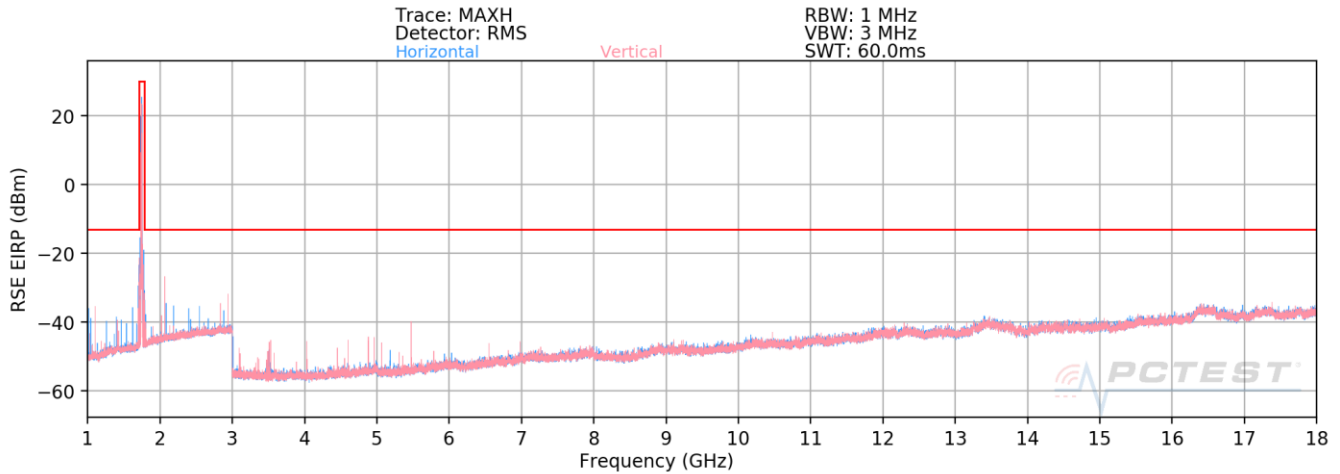
Table 7-10. Radiated Spurious Data (WCDMA AWS – High Channel)

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 117 of 126

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LTE Band 66/4



Plot 7-173. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	20								
Frequency (MHz):	1720.0								
RB / Offset:	1 / 50								
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	H	145	163	-64.38	7.45	50.07	-45.19	-13.00	-32.19
5160.0	H	155	185	-75.53	10.05	41.52	-53.74	-13.00	-40.74
6880.0	H	112	174	-78.11	13.39	42.28	-52.98	-13.00	-39.98
8600.0	H	-	-	-83.35	16.37	40.02	-55.24	-13.00	-42.24
10320.0	H	100	197	-77.49	19.46	48.97	-46.29	-13.00	-33.29
12040.0	H	-	-	-83.21	22.07	45.86	-49.40	-13.00	-36.40
13760.0	H	-	-	-84.16	25.63	48.47	-46.78	-13.00	-33.78
15480.0	H	-	-	-84.17	27.15	49.98	-45.28	-13.00	-32.28

Table 7-11. Radiated Spurious Data (LTE Band 66/4 – Low Channel)

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 118 of 126

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Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	H	100	152	-65.00	7.19	49.19	-46.06	-13.00	-33.06
5235.0	H	102	183	-74.72	10.02	42.30	-52.96	-13.00	-39.96
6980.0	H	126	323	-77.92	14.36	43.44	-51.81	-13.00	-38.81
8725.0	H	-	-	-82.86	16.59	40.73	-54.52	-13.00	-41.52
10470.0	H	101	194	-77.94	19.77	48.83	-46.43	-13.00	-33.43
12215.0	H	-	-	-83.67	21.79	45.12	-50.13	-13.00	-37.13
13960.0	H	-	-	-84.66	24.37	46.71	-48.55	-13.00	-35.55
15705.0	H	-	-	-84.89	27.81	49.92	-45.34	-13.00	-32.34

Table 7-12. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	H	1126	101	-64.49	7.78	50.29	-44.97	-13.00	-31.97
5310.00	H	115	183	-70.24	10.44	47.20	-48.06	-13.00	-35.06
7080.00	H	328	331	-80.31	14.58	41.27	-53.98	-13.00	-40.98
8850.00	H	-	-	-82.83	16.79	40.96	-54.30	-13.00	-41.30
10620.00	H	104	12	-80.40	19.88	46.48	-48.77	-13.00	-35.77
12390.00	H	-	-	-83.64	22.67	46.03	-49.23	-13.00	-36.23
14160.00	H	-	-	-84.62	25.67	48.05	-47.21	-13.00	-34.21
15930.00	H	-	-	-84.75	27.77	50.02	-45.24	-13.00	-32.24

Table 7-13. Radiated Spurious Data (LTE Band 66/4 – High Channel)

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 119 of 126

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7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. 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 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-E-2016

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

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 120 of 126

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Frequency Stability / Temperature Variation

LTE Band 71					
Operating Frequency (Hz):		680,500,000			
Ref. Voltage (VDC):		3.79			
Deviation Limit:		± 0.00025% or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.79	- 30	680,500,289	289	0.0000425
		- 20	680,499,908	-92	-0.0000135
		- 10	680,499,784	-216	-0.0000317
		0	680,499,591	-409	-0.0000601
		+ 10	680,500,244	244	0.0000359
		+ 20 (Ref)	680,499,718	-282	-0.0000414
		+ 30	680,499,943	-57	-0.0000084
		+ 40	680,499,903	-97	-0.0000143
Battery Endpoint	3.04	+ 20	680,500,340	340	0.0000500

Table 7-9. LTE Band 71 Frequency Stability Data

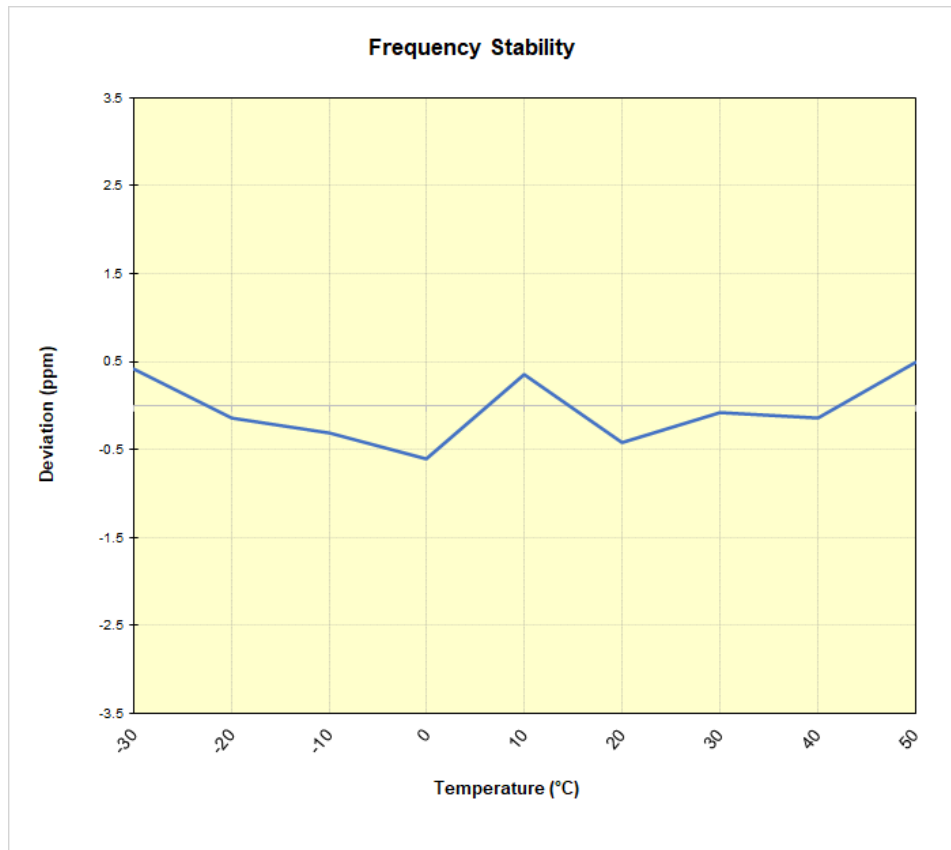


Table 7-9. LTE Band 71 Frequency Stability Chart

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 121 of 126

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Frequency Stability / Temperature Variation

LTE Band 12					
Operating Frequency (Hz):		707,500,000			
Ref. Voltage (VDC):		3.79			
Deviation Limit:		± 0.00025% or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.79	- 30	707,500,144	144	0.0000204
		- 20	707,499,944	-56	-0.0000079
		- 10	707,500,121	121	0.0000171
		0	707,499,986	-14	-0.0000020
		+ 10	707,499,906	-94	-0.0000133
		+ 20 (Ref)	707,500,137	137	0.0000194
		+ 30	707,500,255	255	0.0000360
		+ 40	707,500,168	168	0.0000237
Battery Endpoint	3.04	+ 20	707,499,997	-3	-0.0000004

Table 7-9. LTE Band 12 Frequency Stability Data

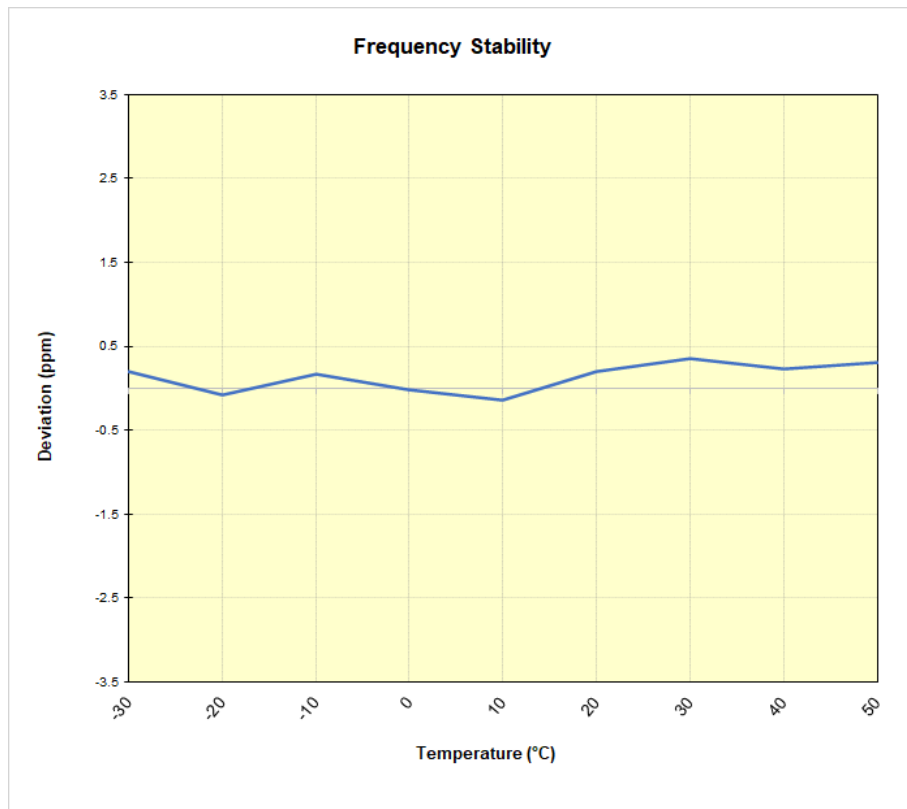




Table 7-9. LTE Band 12 Frequency Stability Chart

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 122 of 126

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Frequency Stability / Temperature Variation

LTE Band 13					
Operating Frequency (Hz):		782,000,000			
Ref. Voltage (VDC):		3.79			
Deviation Limit:		± 0.00025% or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.79	- 30	781,999,701	-299	-0.0000382
		- 20	781,999,886	-114	-0.0000146
		- 10	782,000,250	250	0.0000320
		0	782,000,143	143	0.0000183
		+ 10	782,000,469	469	0.0000600
		+ 20 (Ref)	782,000,020	20	0.0000026
		+ 30	782,000,185	185	0.0000237
		+ 40	782,000,177	177	0.0000226
Battery Endpoint	3.04	+ 20	781,999,830	-170	-0.0000217

Table 7-9. LTE Band 13 Frequency Stability Data

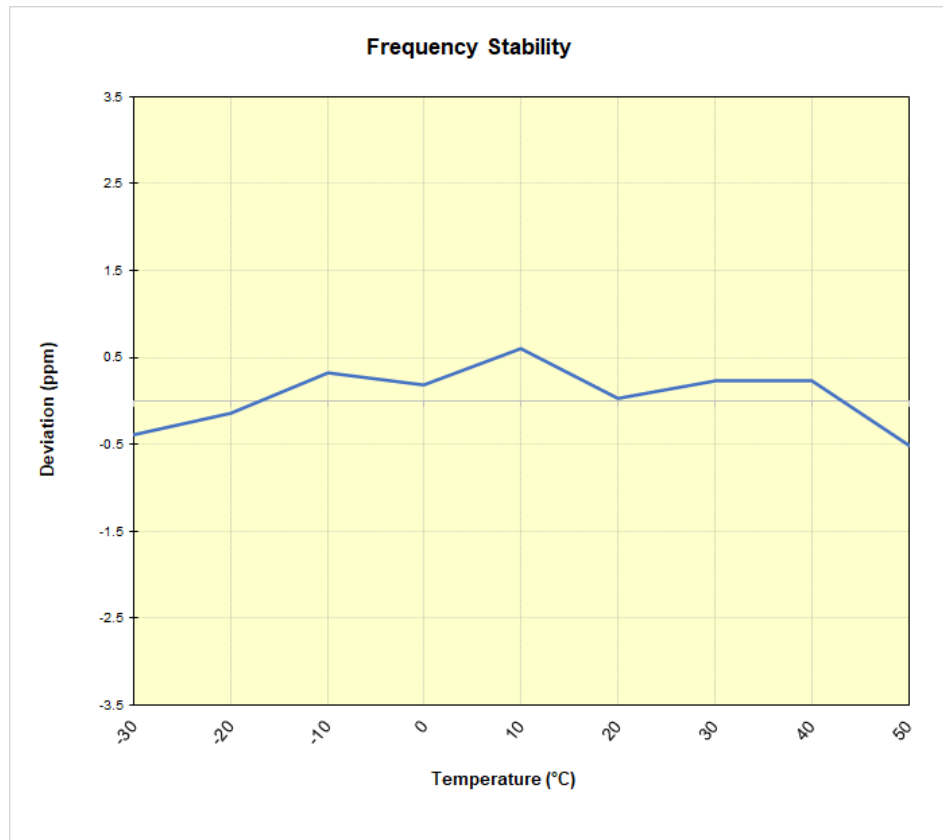




Table 7-9. LTE Band 13 Frequency Stability Chart

FCC ID: ZNFK200TM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 123 of 126	

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Frequency Stability / Temperature Variation

WCDMA AWS					
Operating Frequency (Hz):		1,732,600,000			
Ref. Voltage (VDC):		3.79			
Deviation Limit:		± 0.00025% or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.79	- 30	1,732,600,046	46	0.0000027
		- 20	1,732,599,834	-166	-0.0000096
		- 10	1,732,600,077	77	0.0000044
		0	1,732,600,128	128	0.0000074
		+ 10	1,732,600,072	72	0.0000042
		+ 20 (Ref)	1,732,600,082	82	0.0000047
		+ 30	1,732,600,008	8	0.0000005
		+ 40	1,732,600,197	197	0.0000114
Battery Endpoint	3.04	+ 20	1,732,599,720	-280	-0.0000162

Table 7-9. WCDMA AWS Frequency Stability Data

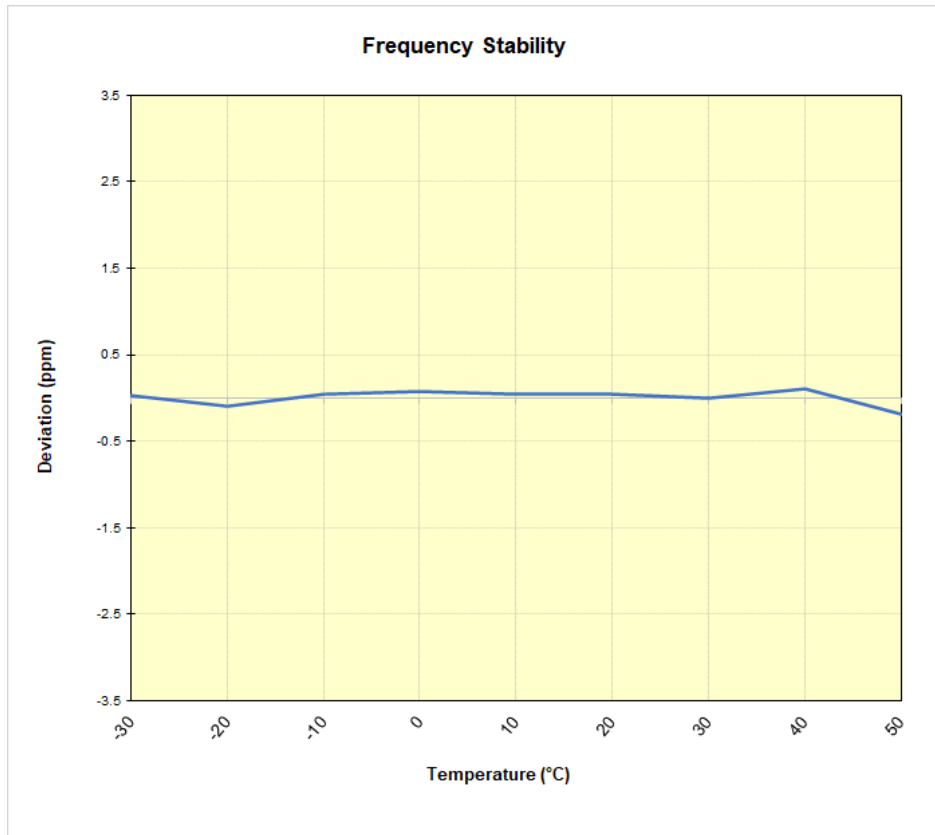


Table 7-9. WCDMA AWS Frequency Stability Chart

FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 124 of 126

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Frequency Stability / Temperature Variation

LTE Band 66/4					
Operating Frequency (Hz):		1,745,000,000			
Ref. Voltage (VDC):		3.79			
Deviation Limit:		± 0.00025% or 2.5 ppm			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.79	- 30	1,745,000,002	2	0.0000001
		- 20	1,744,999,831	-169	-0.0000097
		- 10	1,745,000,130	130	0.0000074
		0	1,745,000,147	147	0.0000084
		+ 10	1,745,000,083	83	0.0000048
		+ 20 (Ref)	1,744,999,870	-130	-0.0000074
		+ 30	1,744,999,836	-164	-0.0000094
		+ 40	1,745,000,372	372	0.0000213
Battery Endpoint	3.04	+ 20	1,744,999,978	-22	-0.0000013

Table 7-9. LTE Band 66/4 Frequency Stability Data

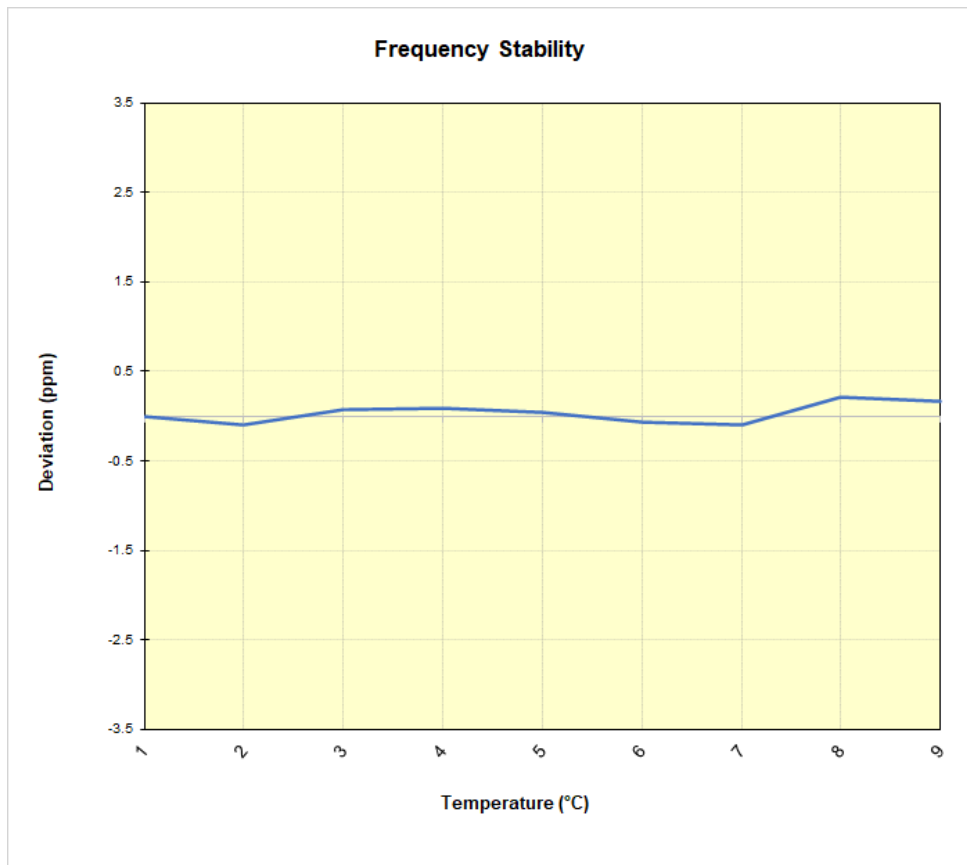


Table 7-9. LTE Band 66/4 Frequency Stability Chart



FCC ID: ZNFK200TM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset		Page 125 of 126

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFK200TM** complies with all the requirements of Part 27 of the FCC rules.

FCC ID: ZNFK200TM	 PART 27 MEASUREMENT REPORT 		Approved by: Quality Manager
Test Report S/N: 1M2009170151-10.ZNF	Test Dates: 8/26/2020 - 9/28/2020	EUT Type: Portable Handset	Page 126 of 126

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