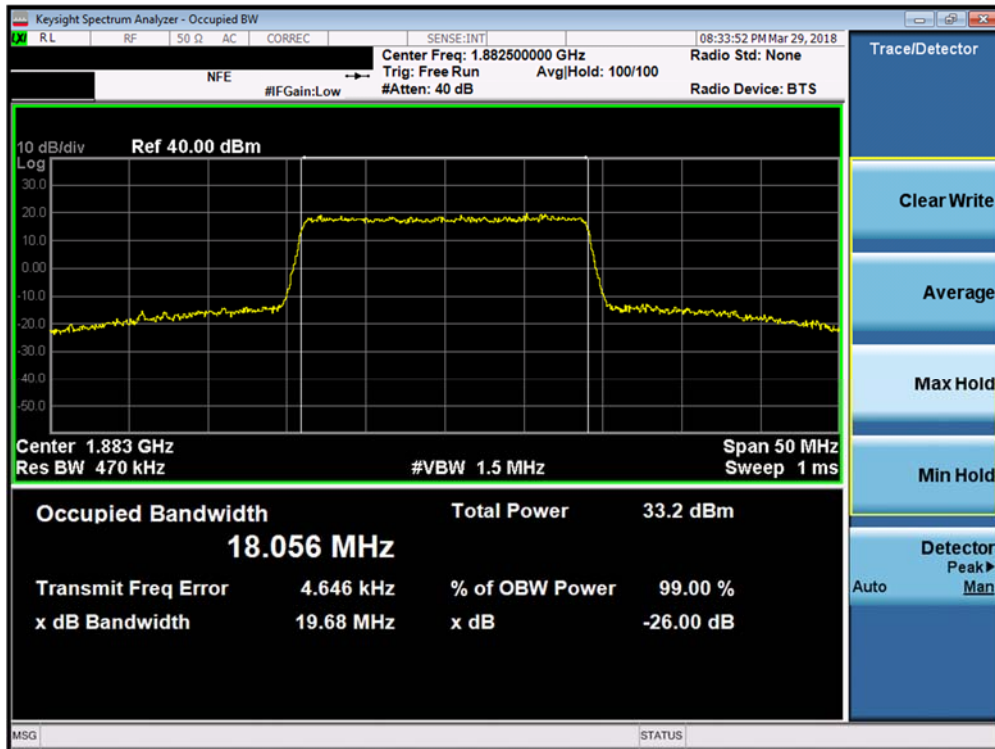




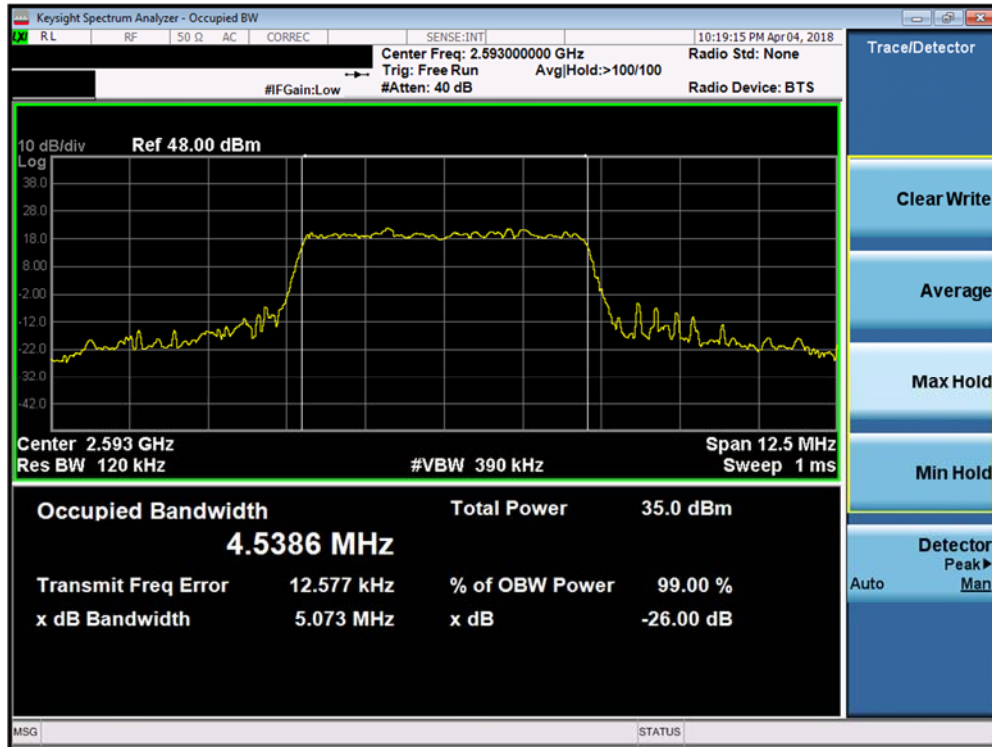
Plot 7-45. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



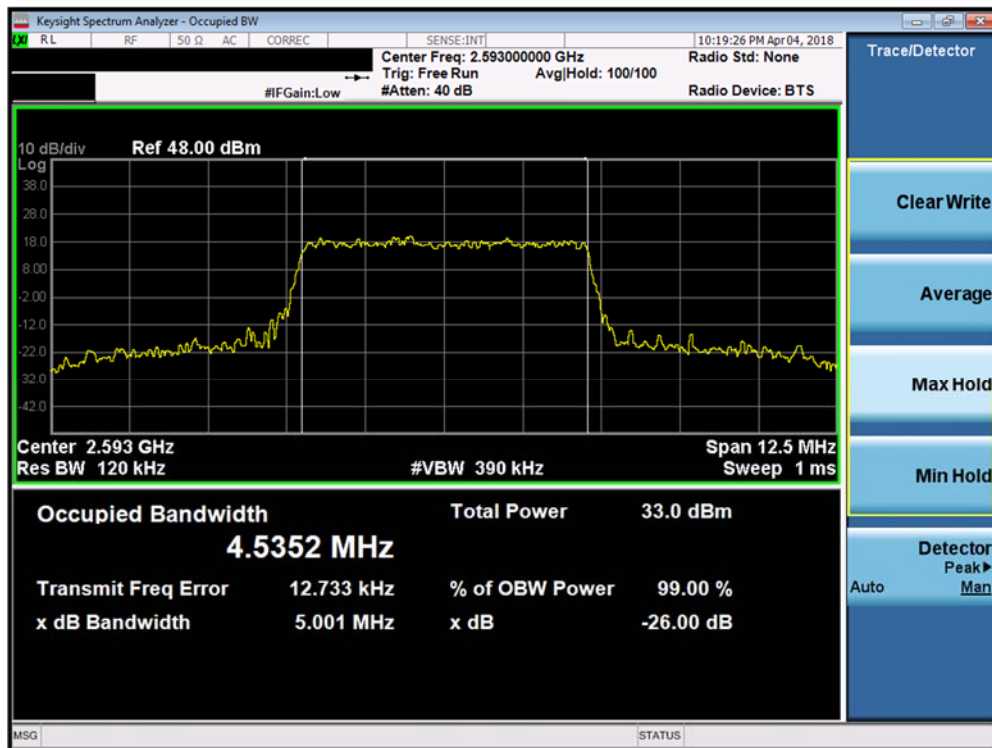
Plot 7-46. Occupied Bandwidth Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 39 of 179

Band 41 PC2

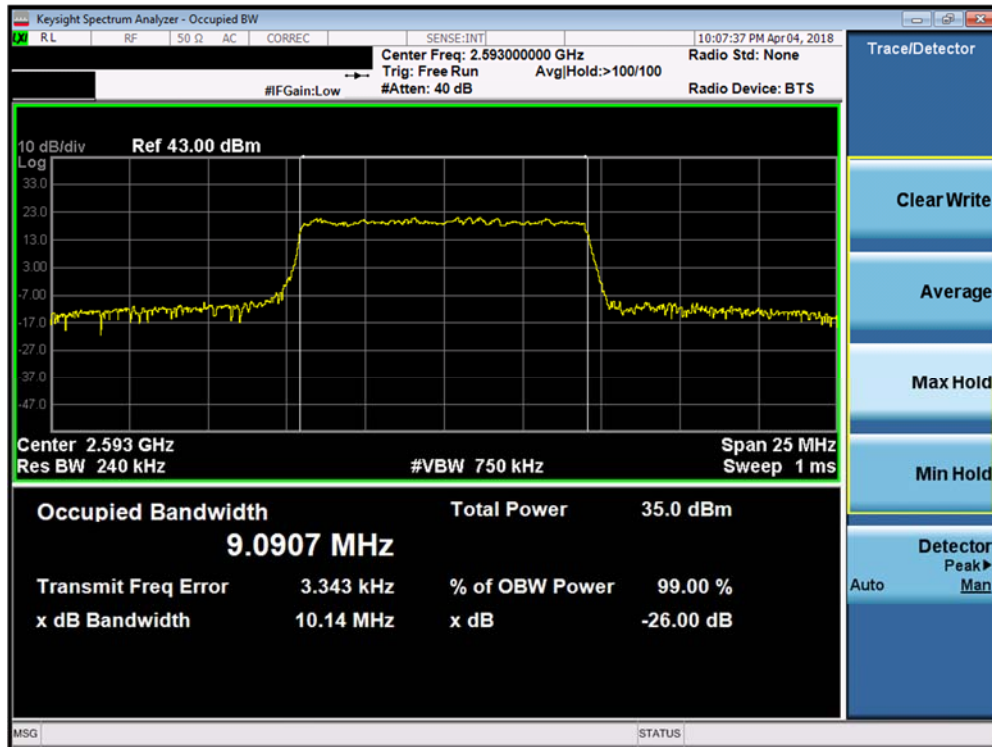


Plot 7-47. Occupied Bandwidth Plot (Band 41 PC2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-48. Occupied Bandwidth Plot (Band 41 PC2- 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 40 of 179



Plot 7-49. Occupied Bandwidth Plot (Band 41 PC2- 10.0MHz QPSK - Full RB Configuration)

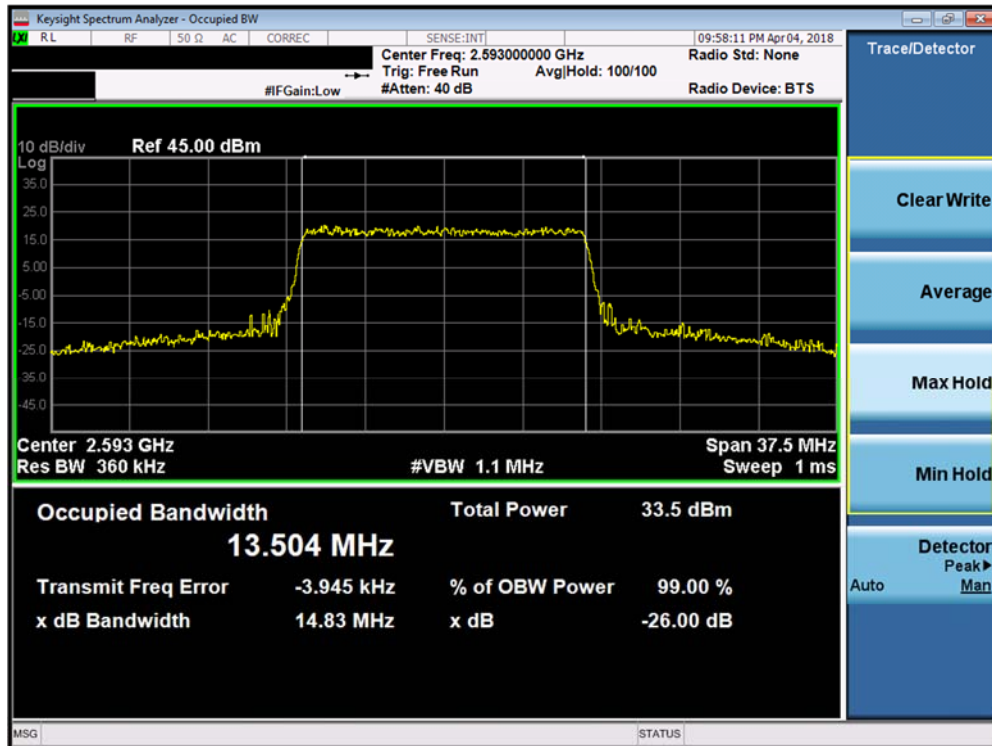


Plot 7-50. Occupied Bandwidth Plot (Band 41 PC2- 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 41 of 179



Plot 7-51. Occupied Bandwidth Plot (Band 41 PC2- 15.0MHz QPSK - Full RB Configuration)

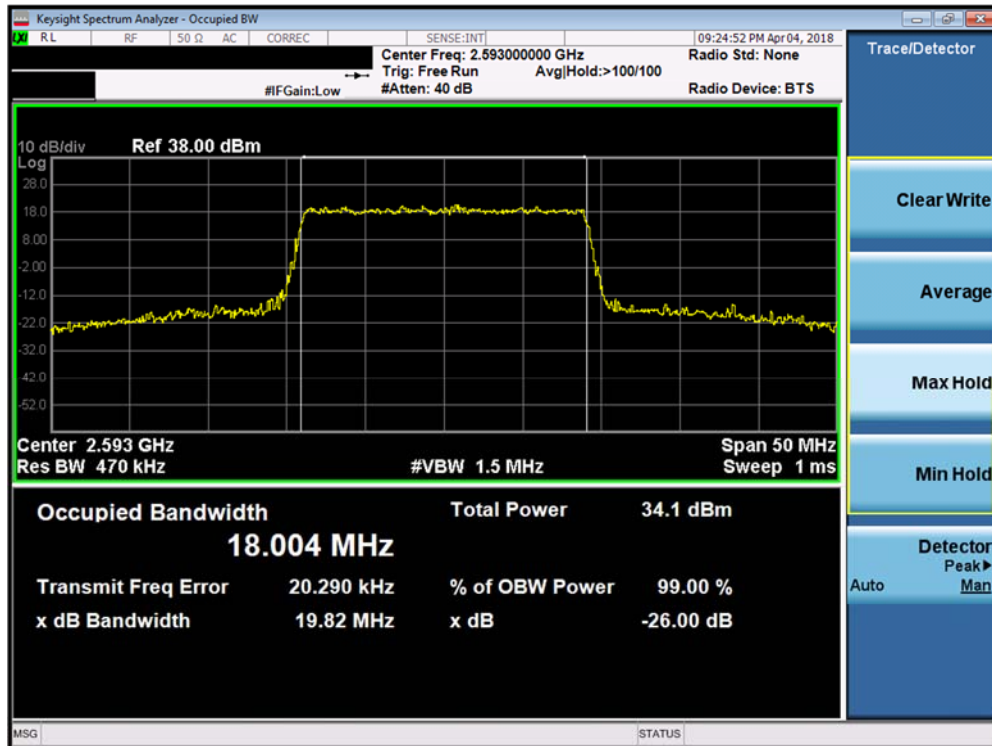


Plot 7-52. Occupied Bandwidth Plot (Band 41 PC2- 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 42 of 179



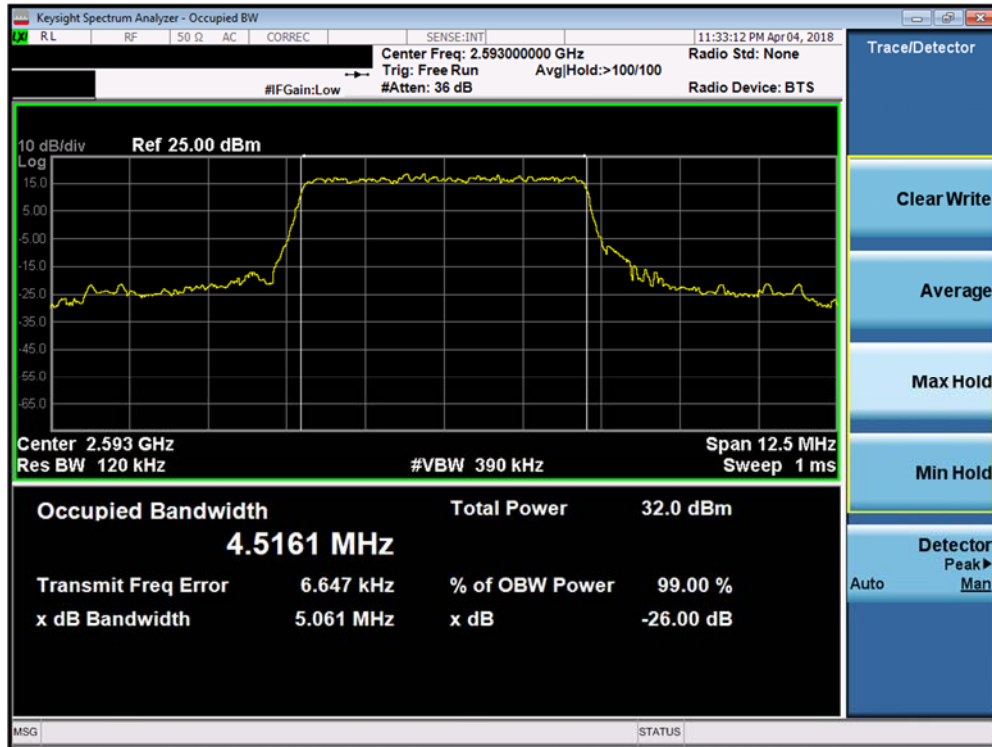
Plot 7-53. Occupied Bandwidth Plot (Band 41 PC2- 20.0MHz QPSK - Full RB Configuration)



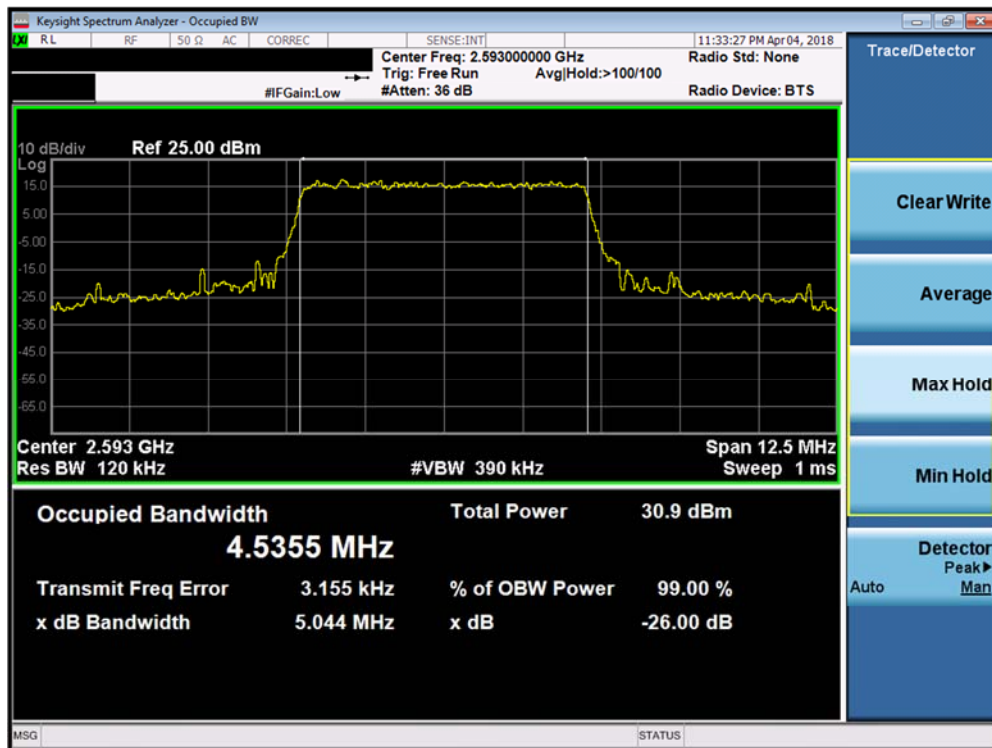
Plot 7-54. Occupied Bandwidth Plot (Band 41 PC2- 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 43 of 179

B41 PC3

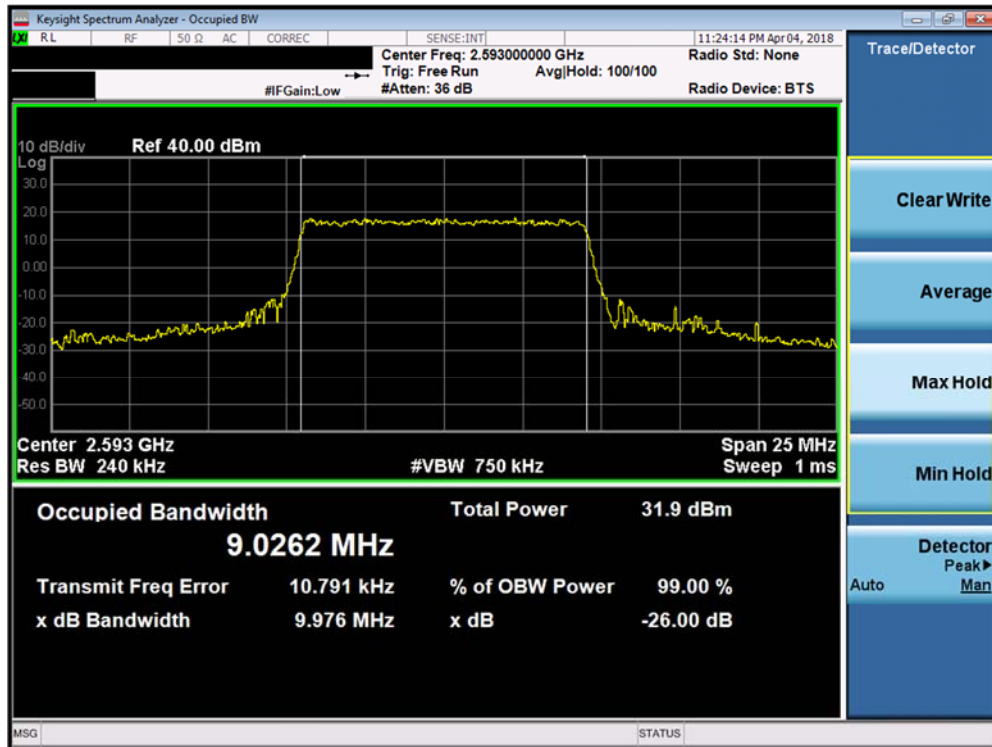


Plot 7-55. Occupied Bandwidth Plot (Band 41 PC3- 5.0MHz QPSK- Full RB Configuration)

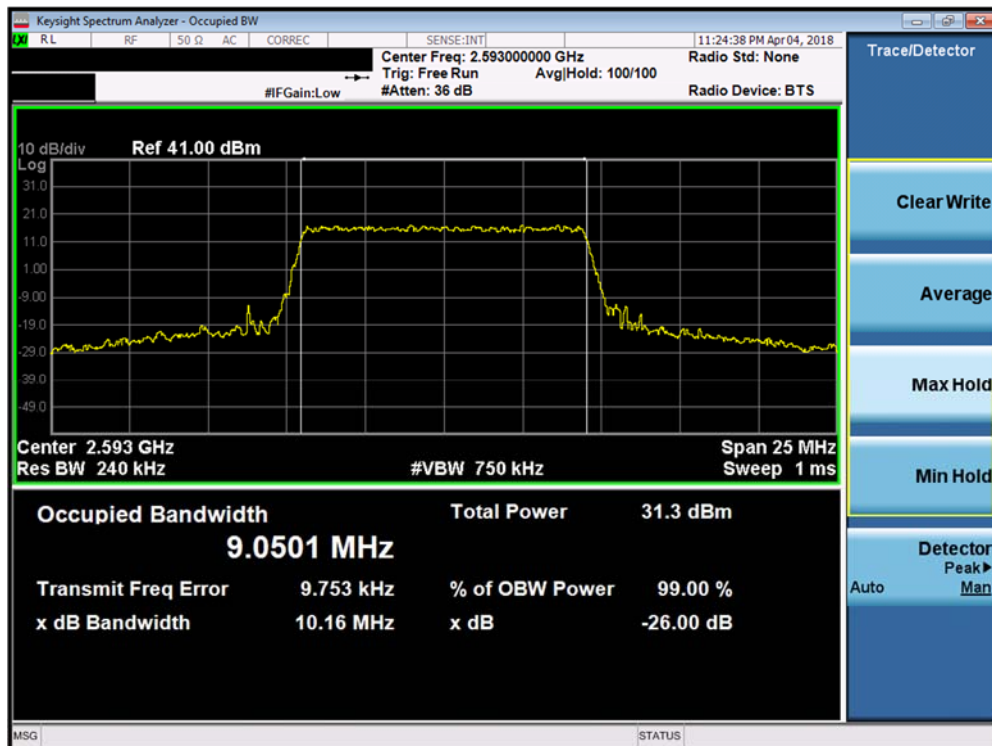


Plot 7-56. Occupied Bandwidth Plot (Band 41 PC3- 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 44 of 179

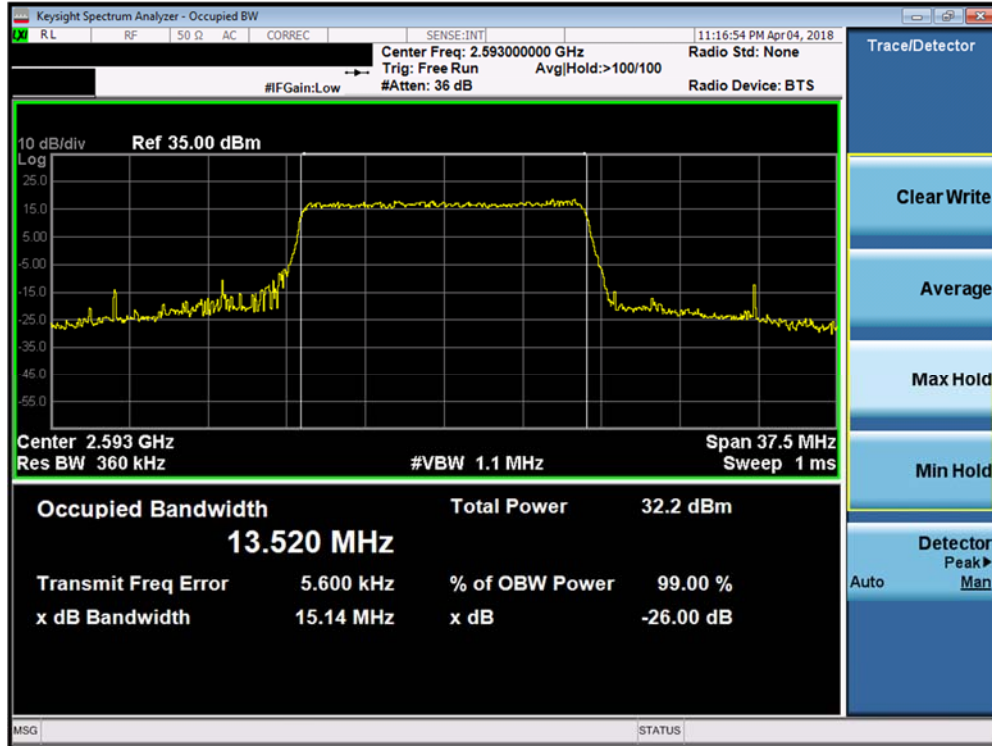


Plot 7-57. Occupied Bandwidth Plot (Band 41 PC3- 10.0MHz QPSK - Full RB Configuration)

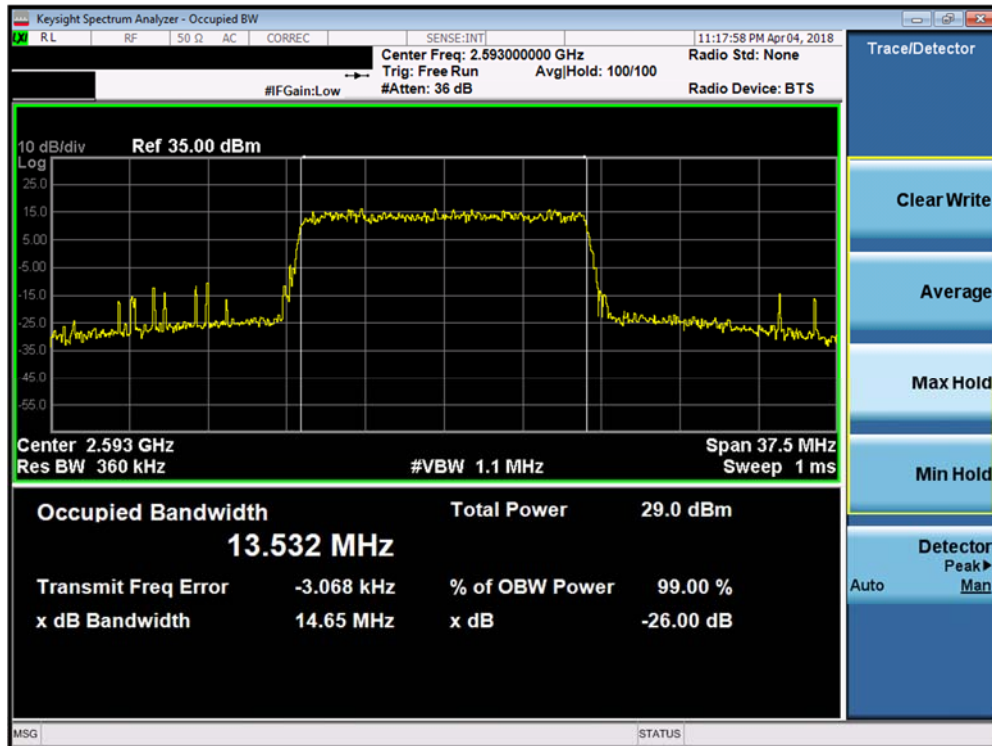


Plot 7-58. Occupied Bandwidth Plot (Band 41 PC3- 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 45 of 179

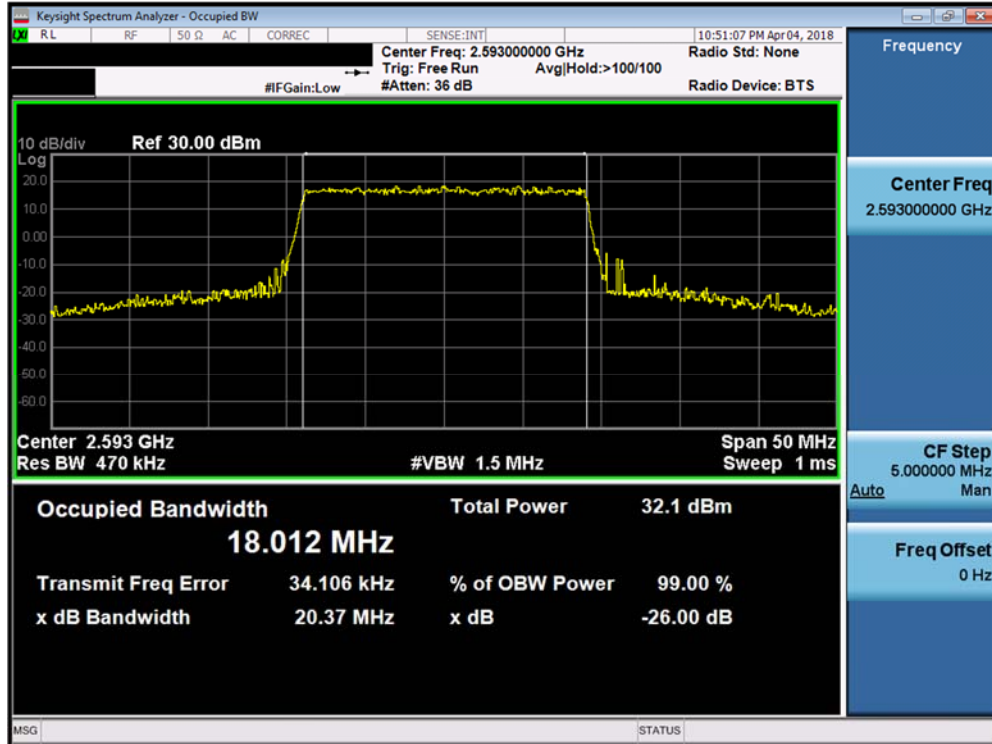


Plot 7-59. Occupied Bandwidth Plot (Band 41 PC3- 15.0MHz QPSK - Full RB Configuration)

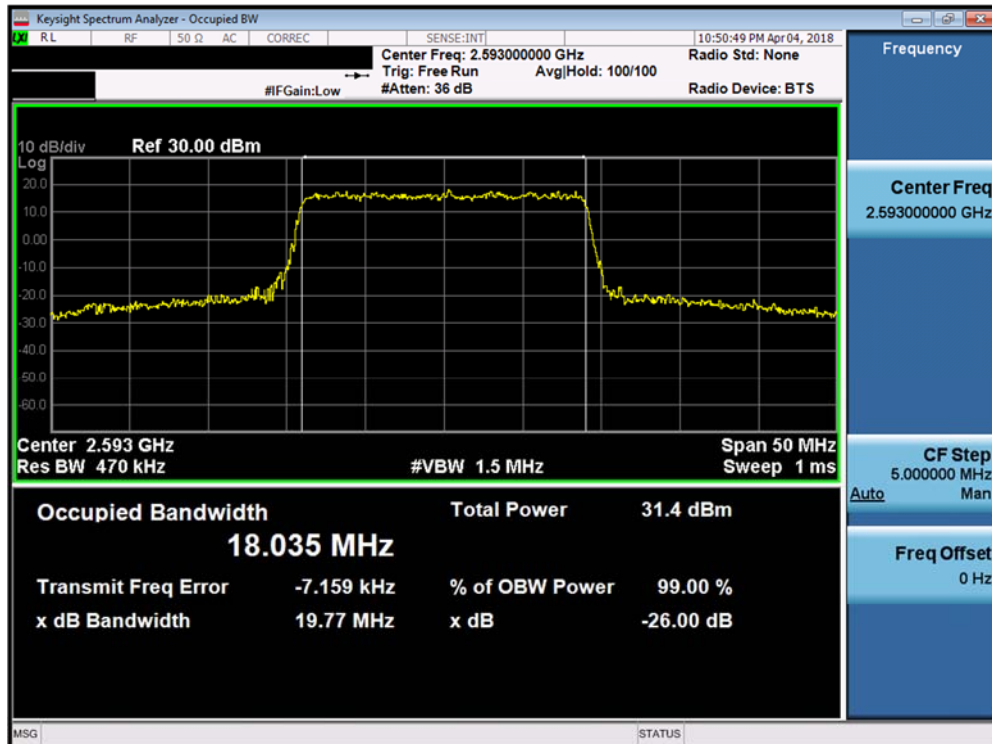


Plot 7-60. Occupied Bandwidth Plot (Band 41 PC3- 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 46 of 179



Plot 7-61. Occupied Bandwidth Plot (Band 41 PC3- 20.0MHz QPSK - Full RB Configuration)



Plot 7-62. Occupied Bandwidth Plot (Band 41 PC3- 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 47 of 179

7.3 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 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 of any spurious emission is $43 + \log_{10}(P_{\text{Watts}})$, where P is the transmitter power in Watts.

For Band 41, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P_{\text{Watts}})$.

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 at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

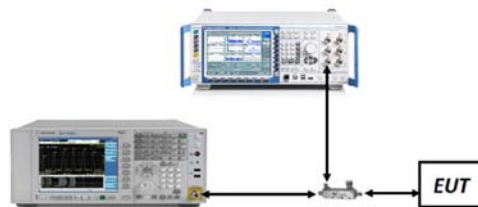


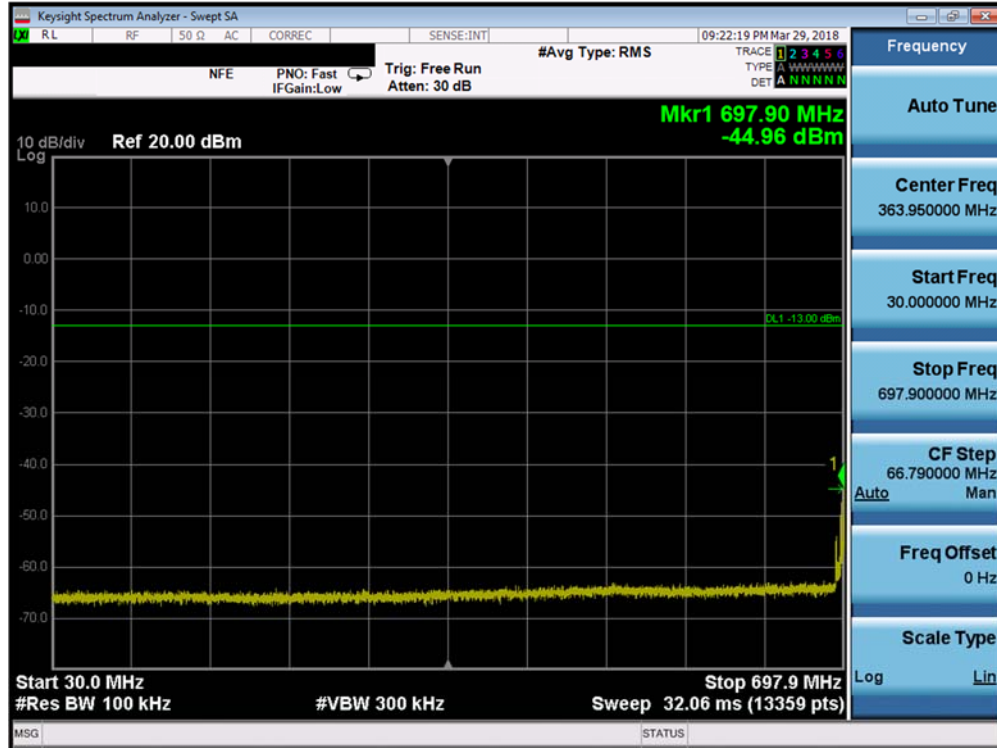
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

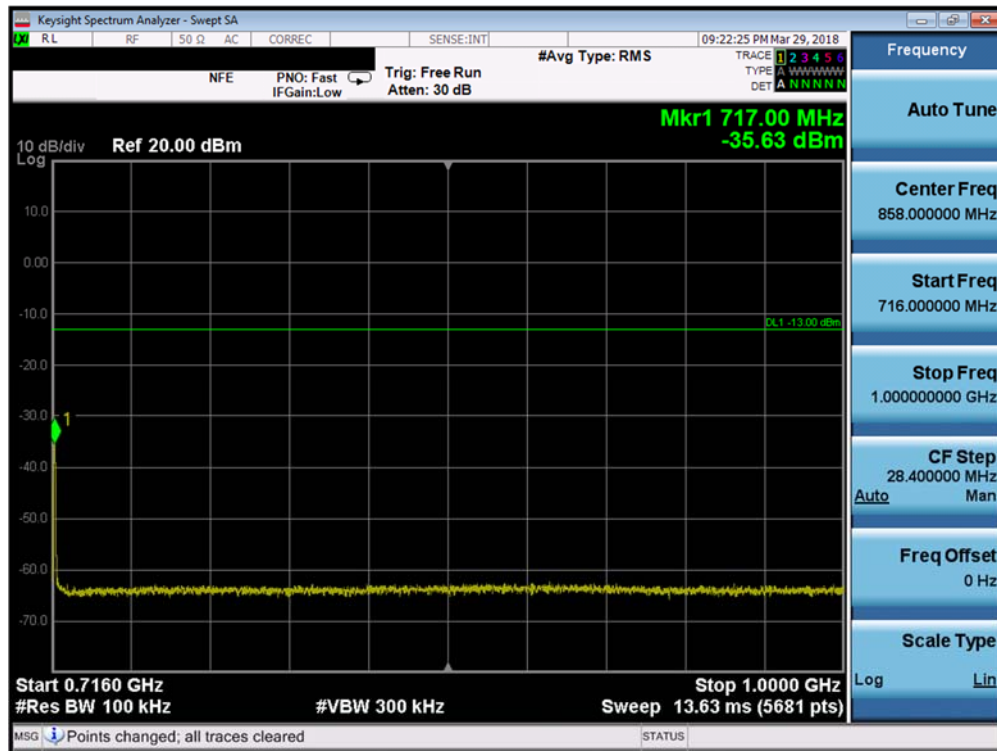
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the 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: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 48 of 179

Band 12/17

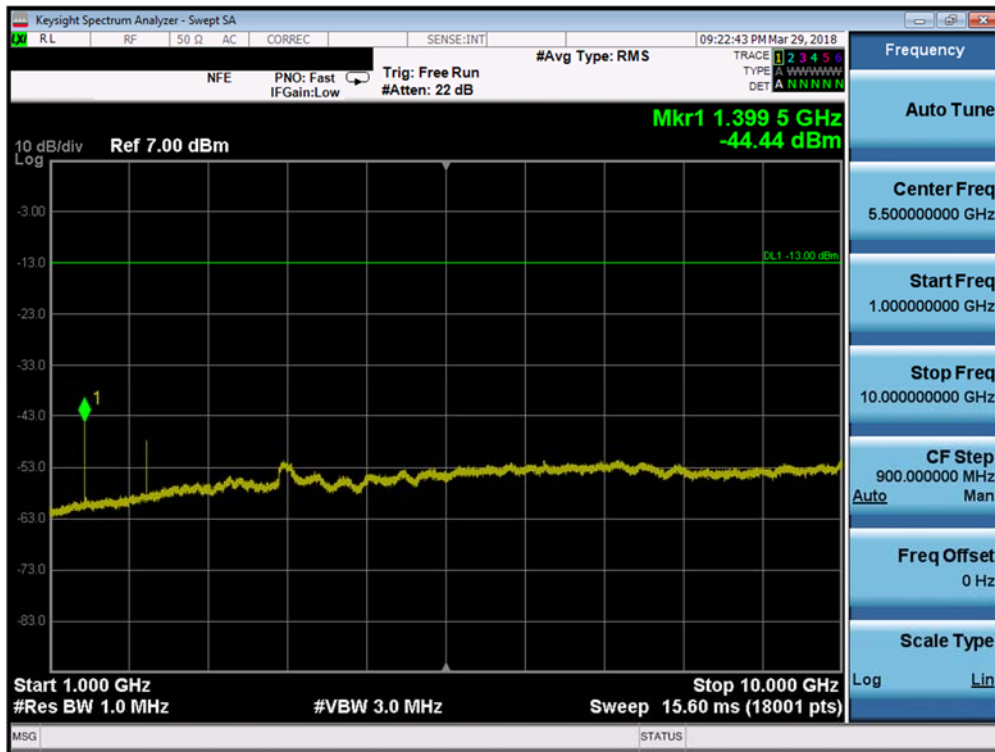


Plot 7-63. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

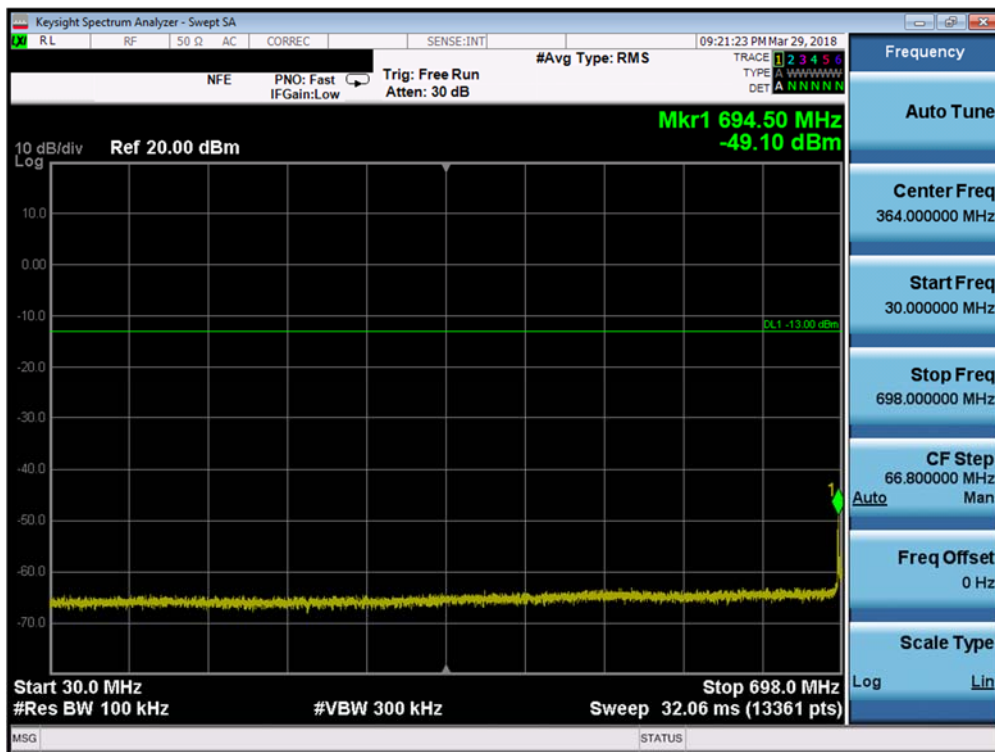


Plot 7-64. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 49 of 179

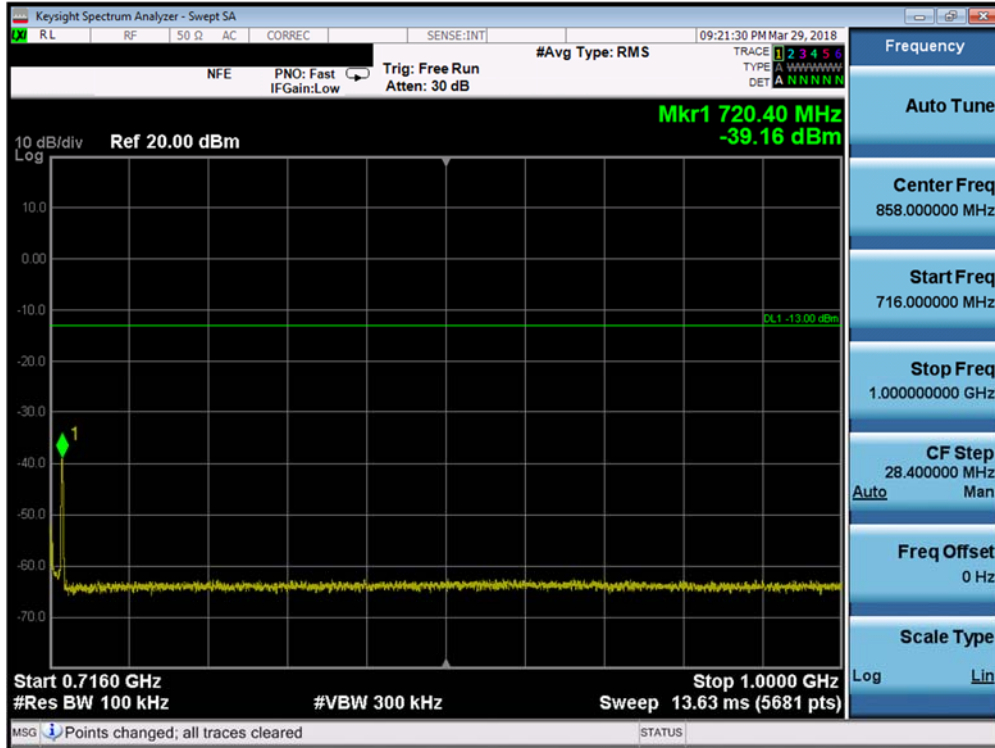


Plot 7-65. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

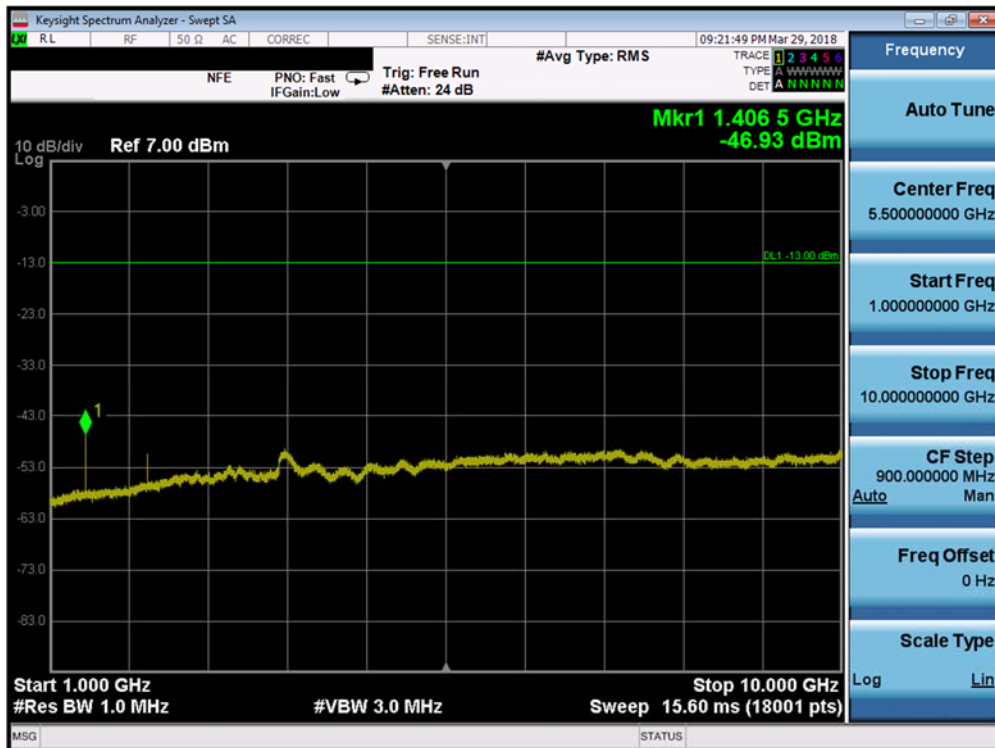


Plot 7-66. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 50 of 179

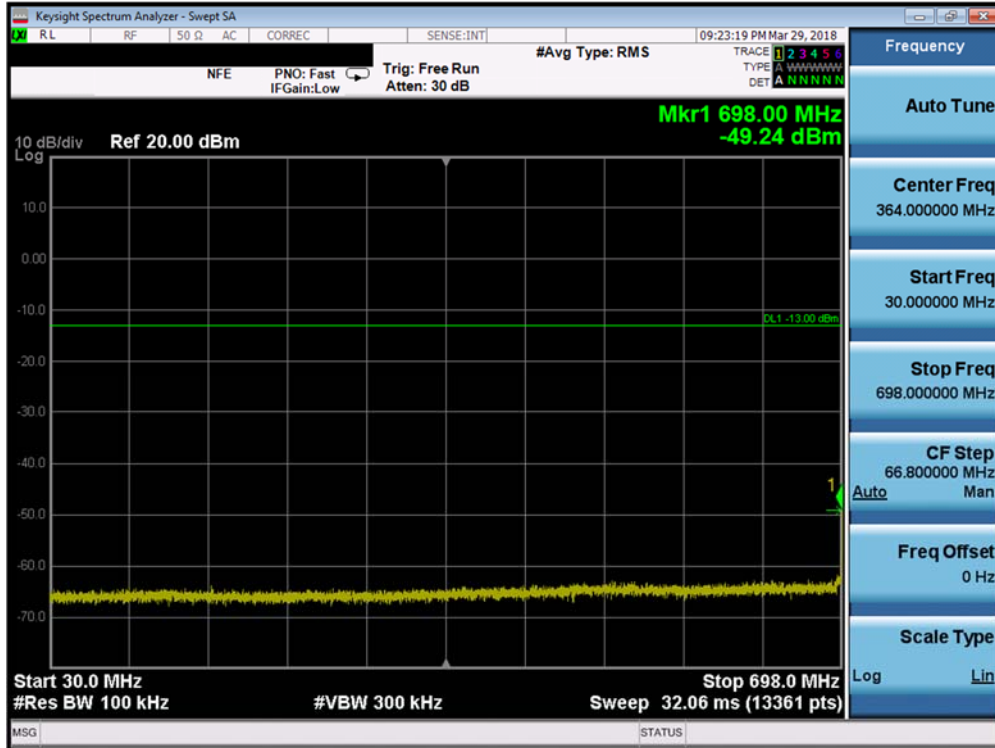


Plot 7-67. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

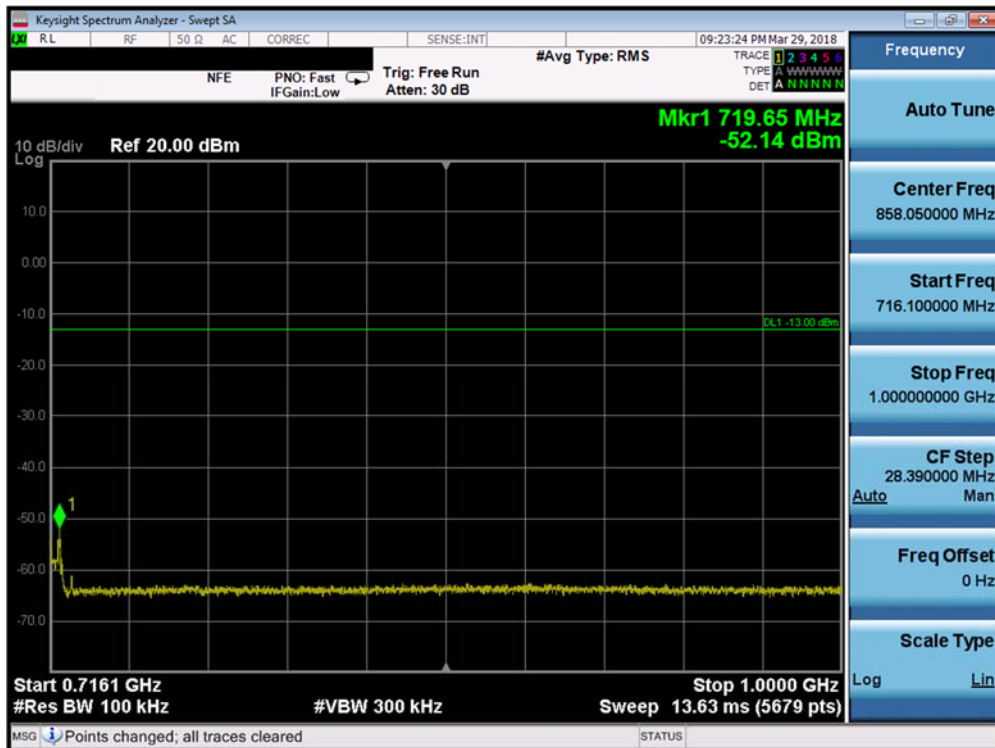


Plot 7-68. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 51 of 179



Plot 7-69. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-70. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

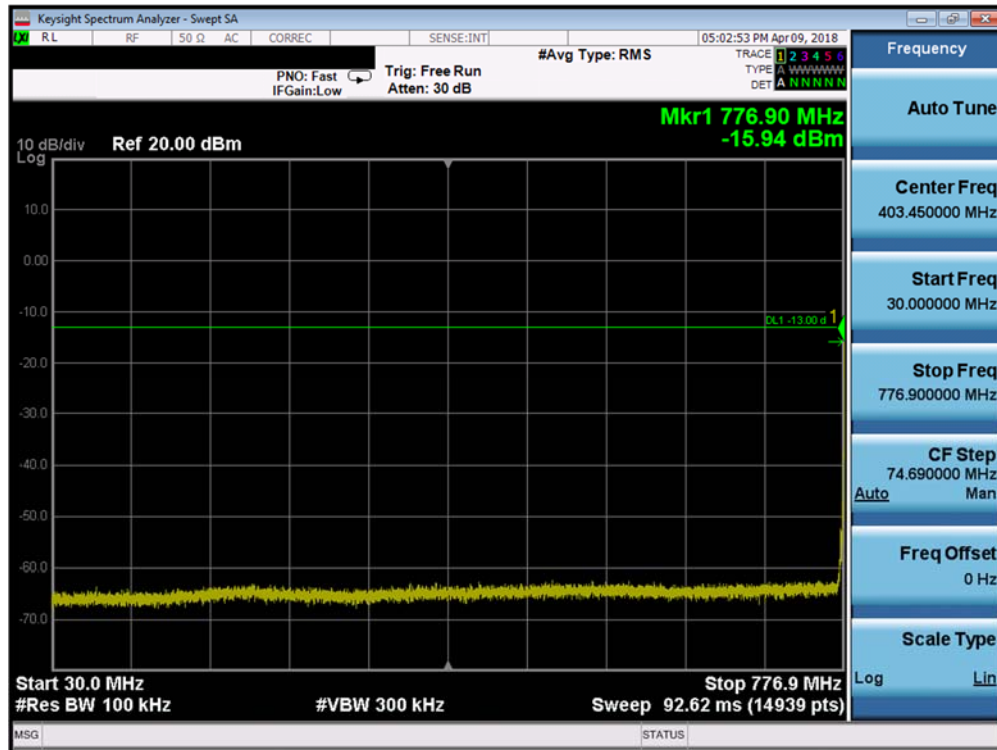
FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 52 of 179



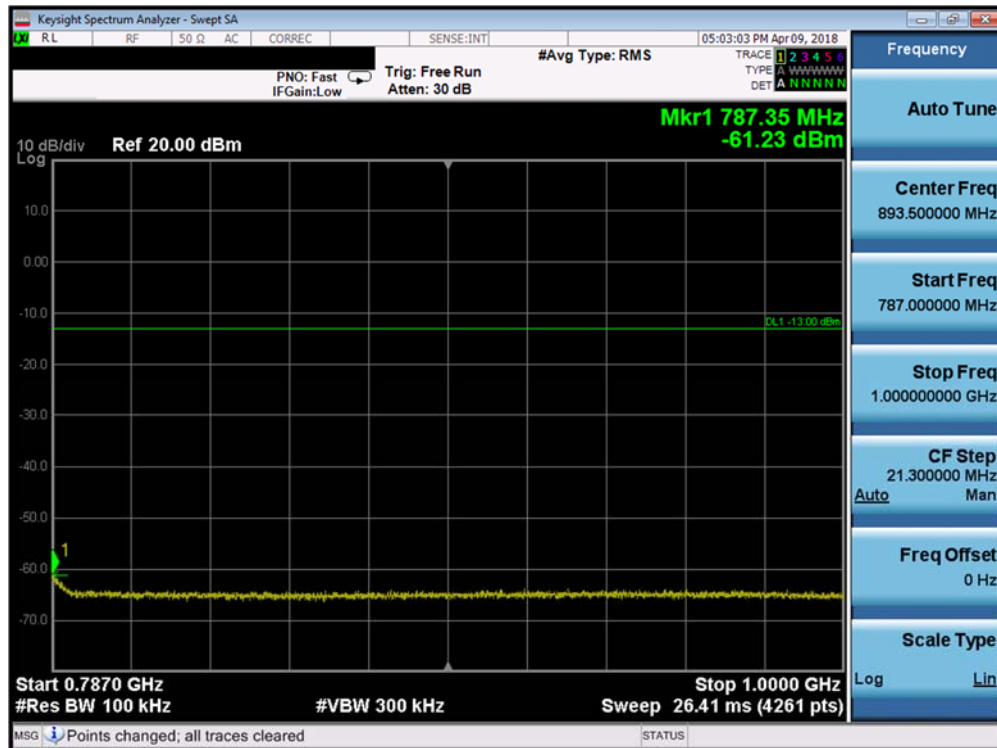
Plot 7-71. Conducted Spurious Plot (Band 12/17 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 53 of 179

Band 13

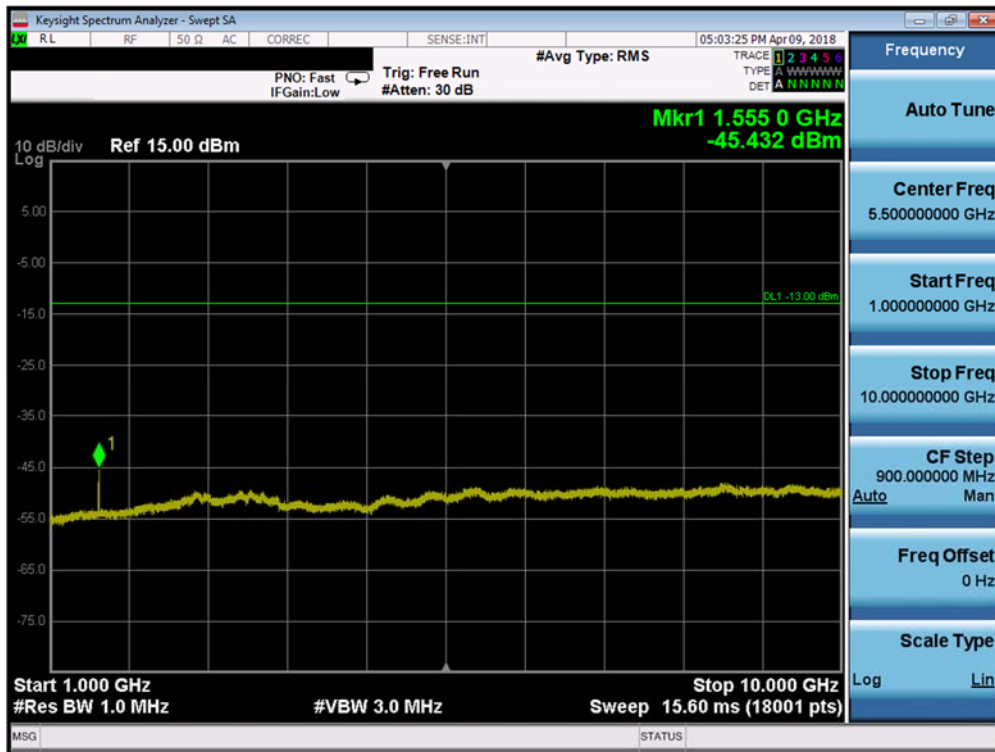


Plot 7-72. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

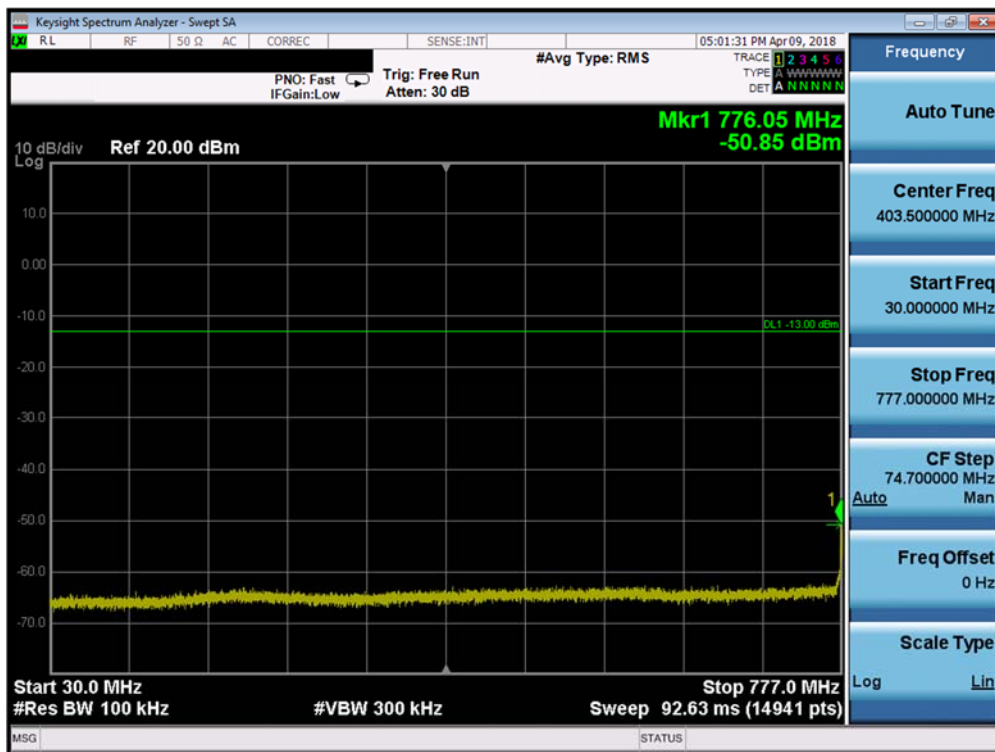


Plot 7-73. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 54 of 179

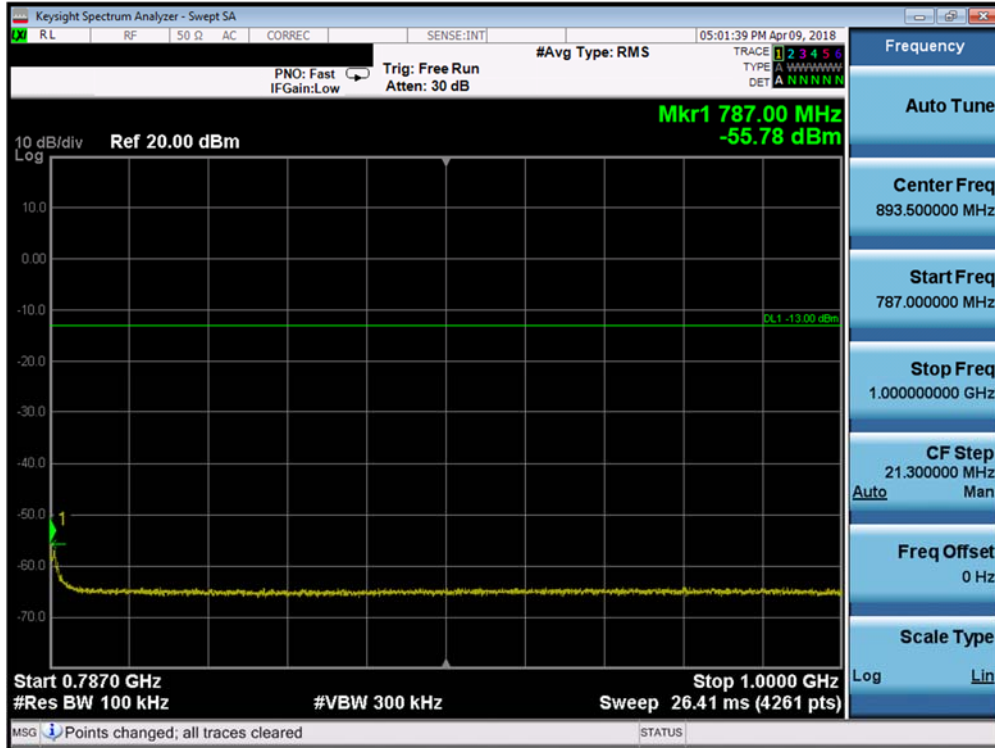


Plot 7-74. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

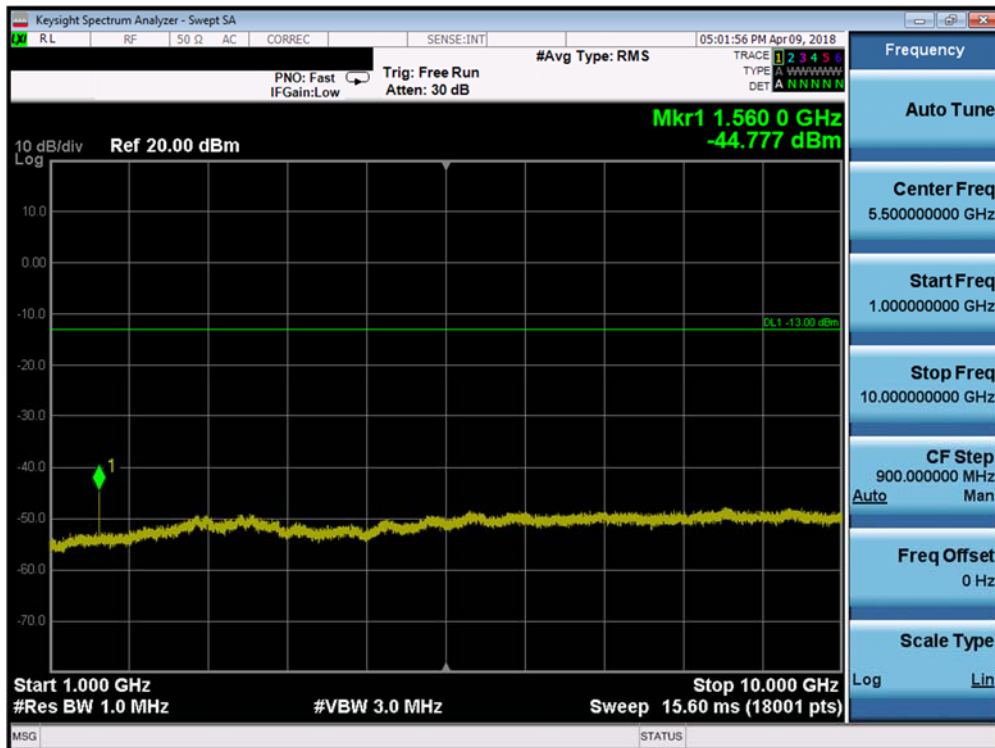


Plot 7-75. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 55 of 179

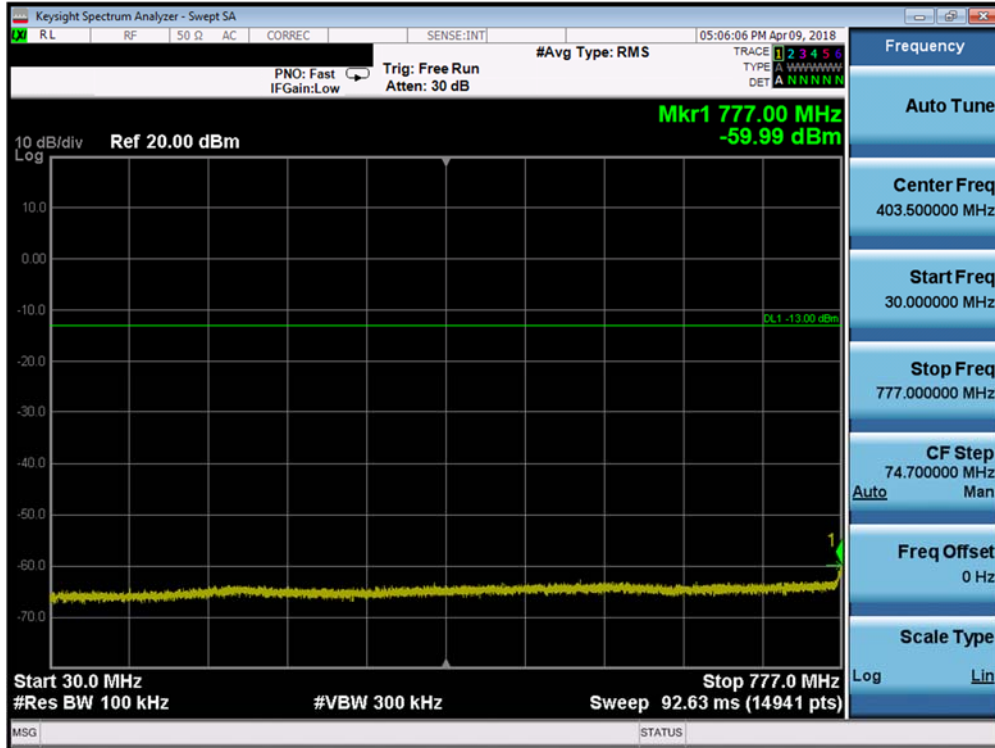


Plot 7-76. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

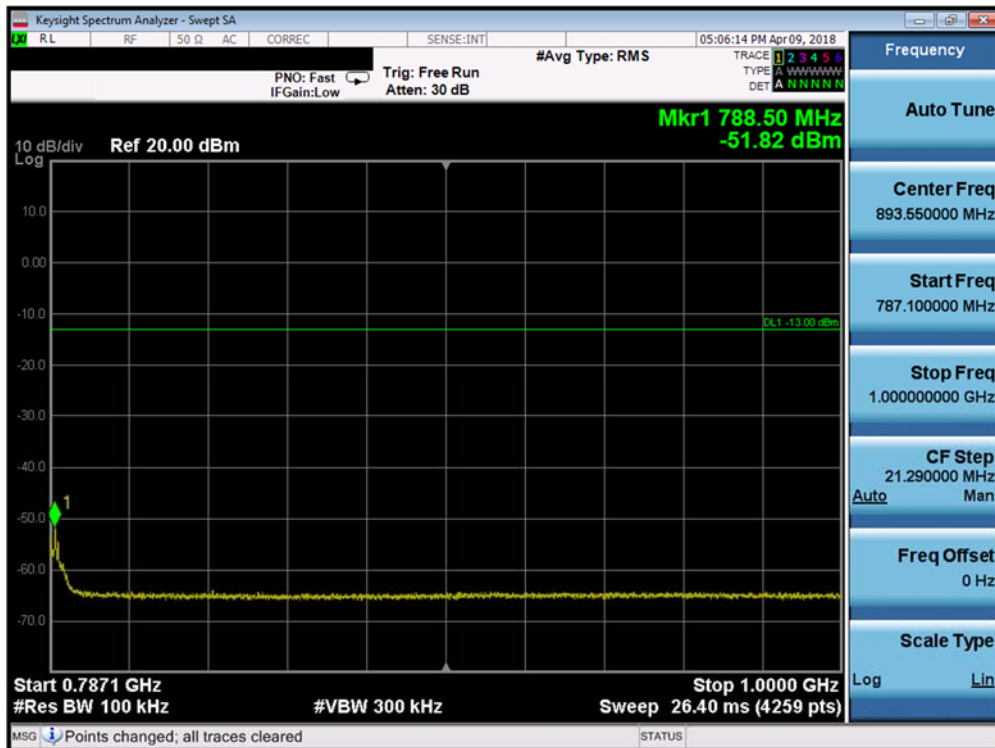


Plot 7-77. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 56 of 179

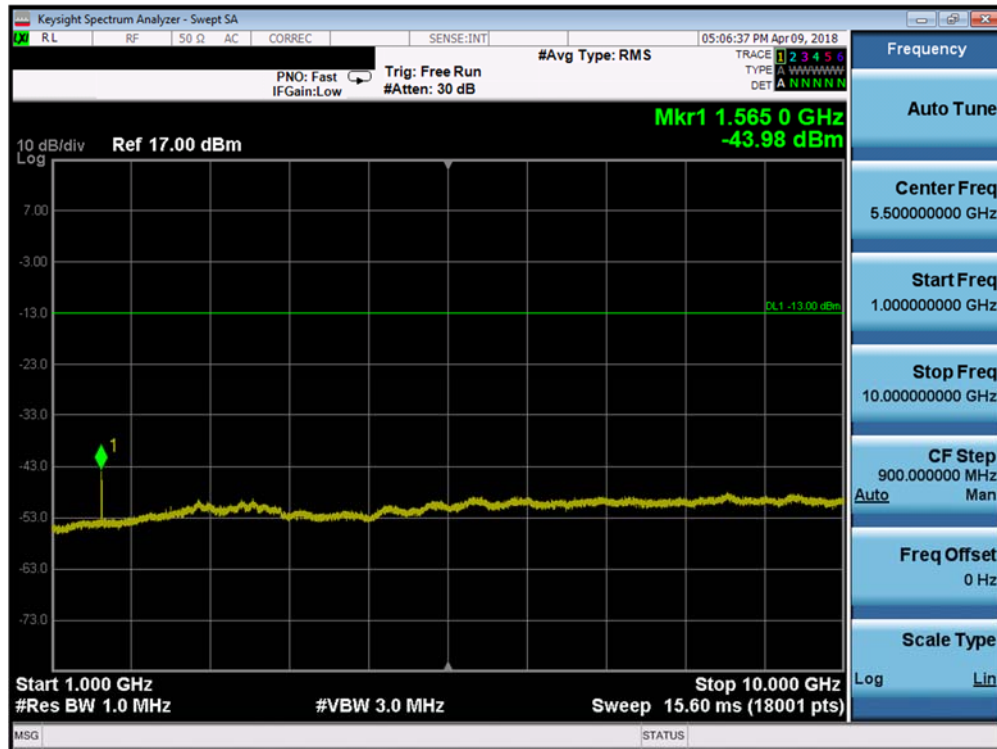


Plot 7-78. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-79. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

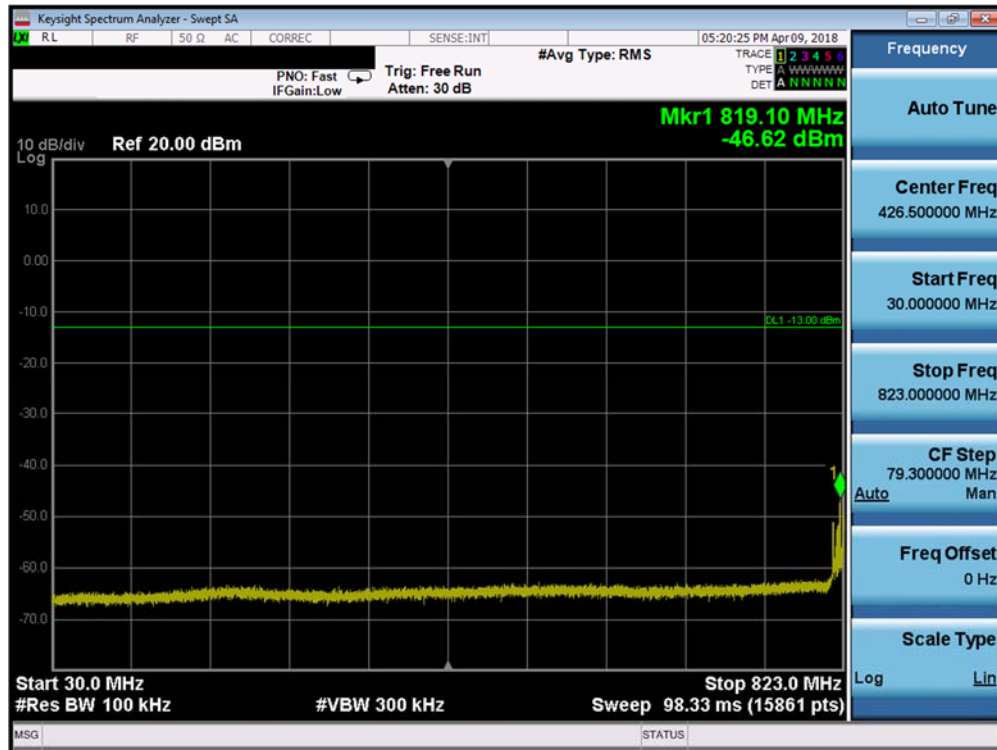
FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 57 of 179



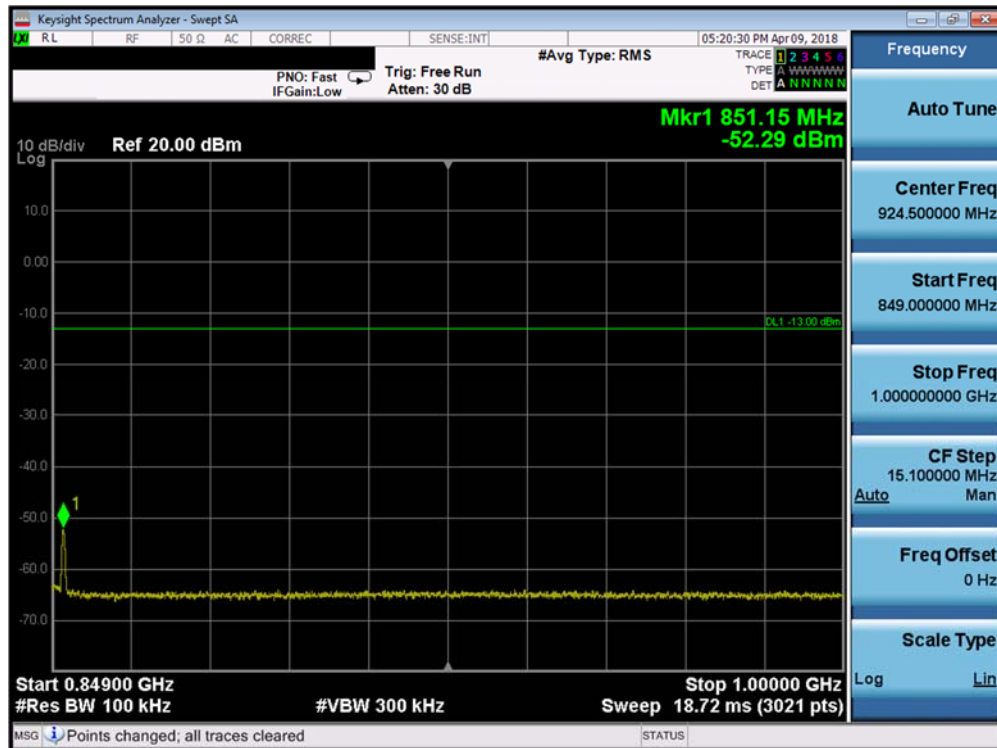
Plot 7-80. Conducted Spurious Plot (Band 13 - 5.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 58 of 179

Band 26/5

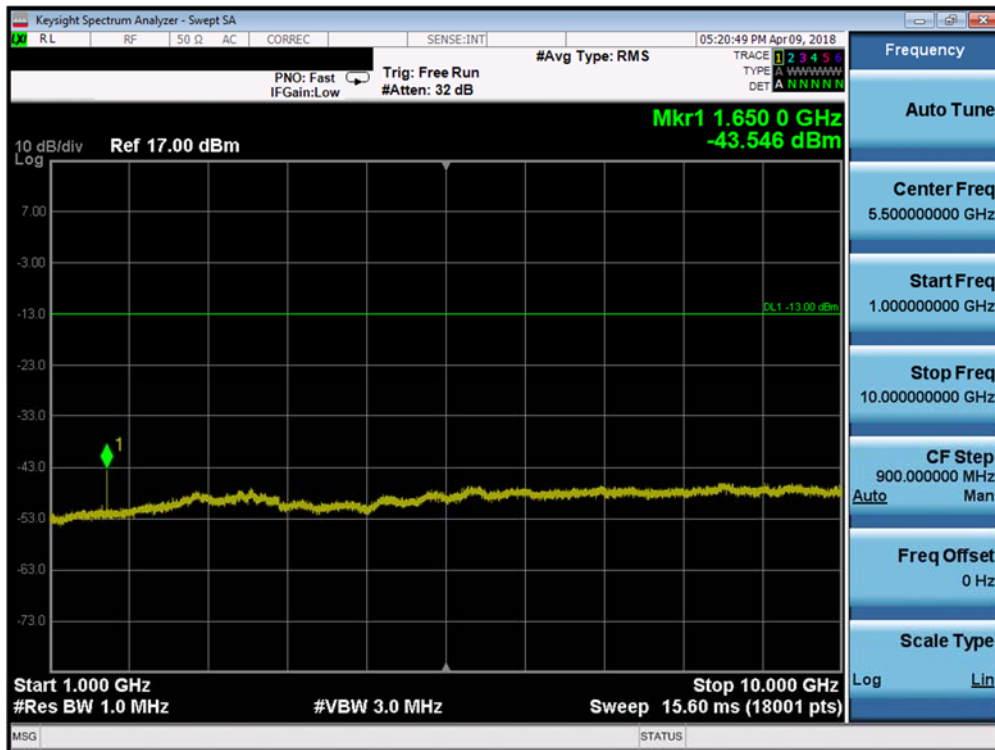


Plot 7-81. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

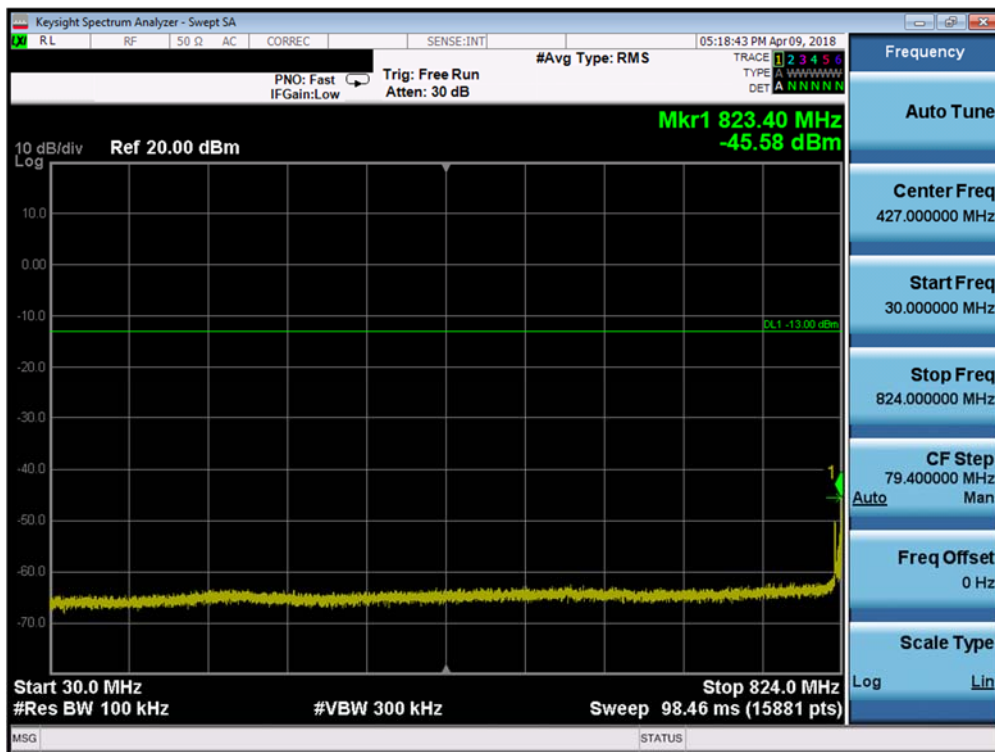


Plot 7-82. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 59 of 179

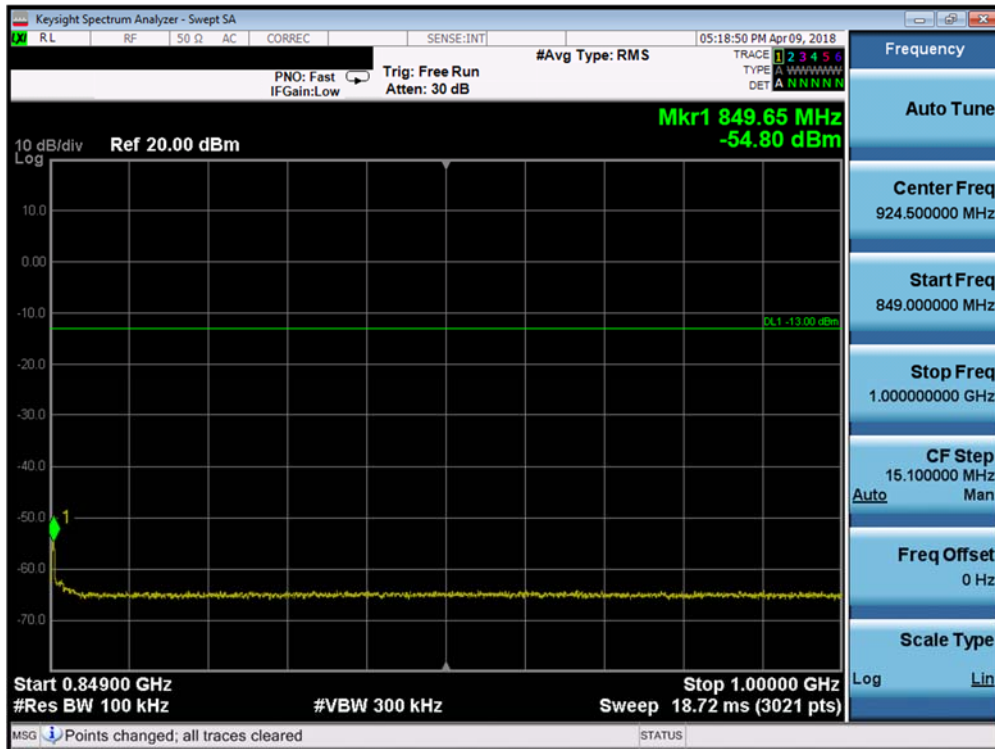


Plot 7-83. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

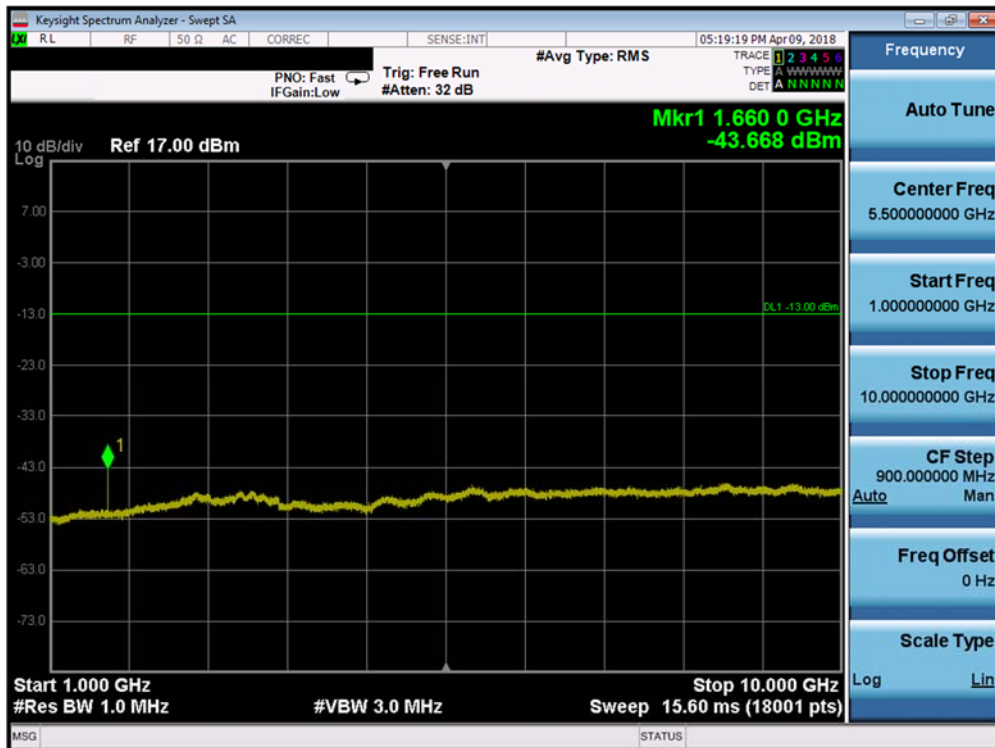


Plot 7-84. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 60 of 179

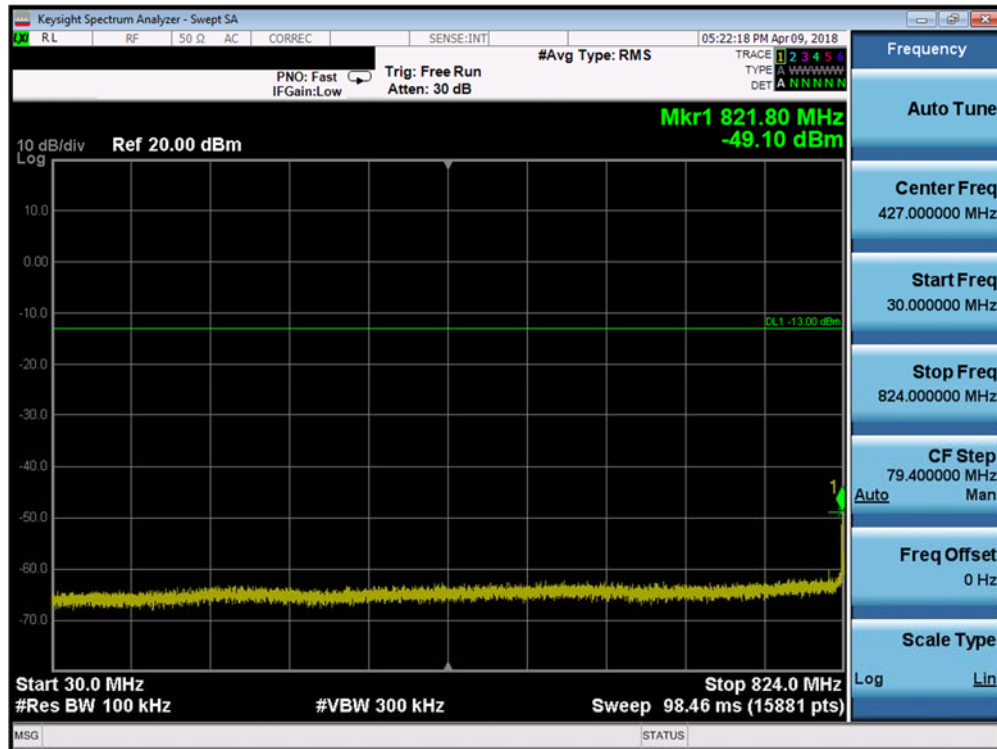


Plot 7-85. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

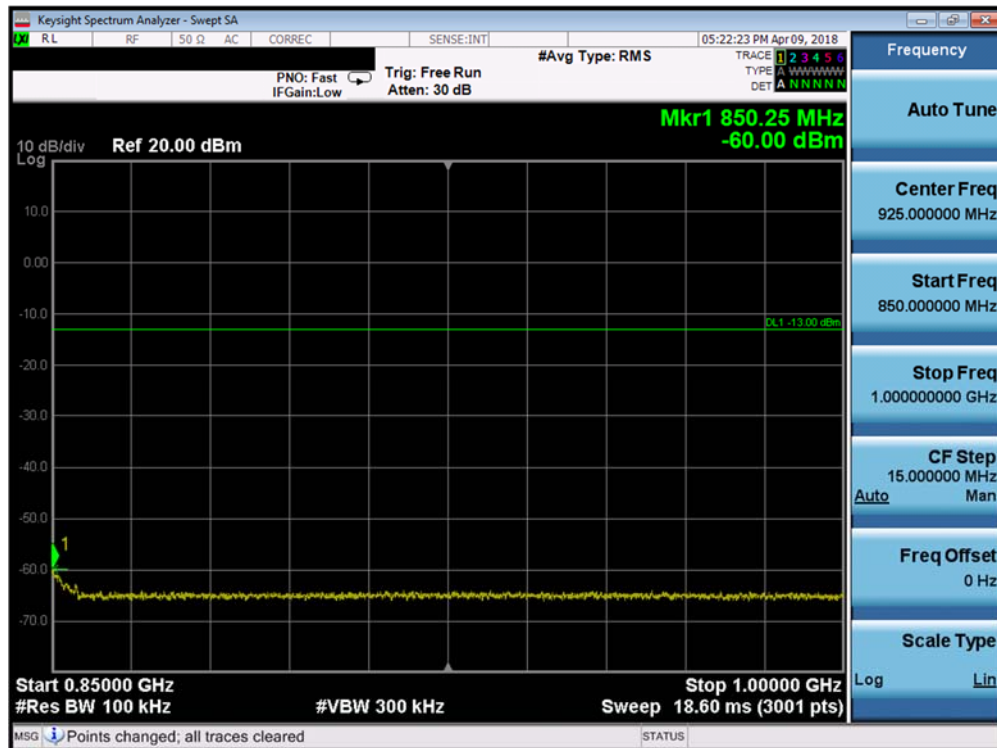


Plot 7-86. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 61 of 179

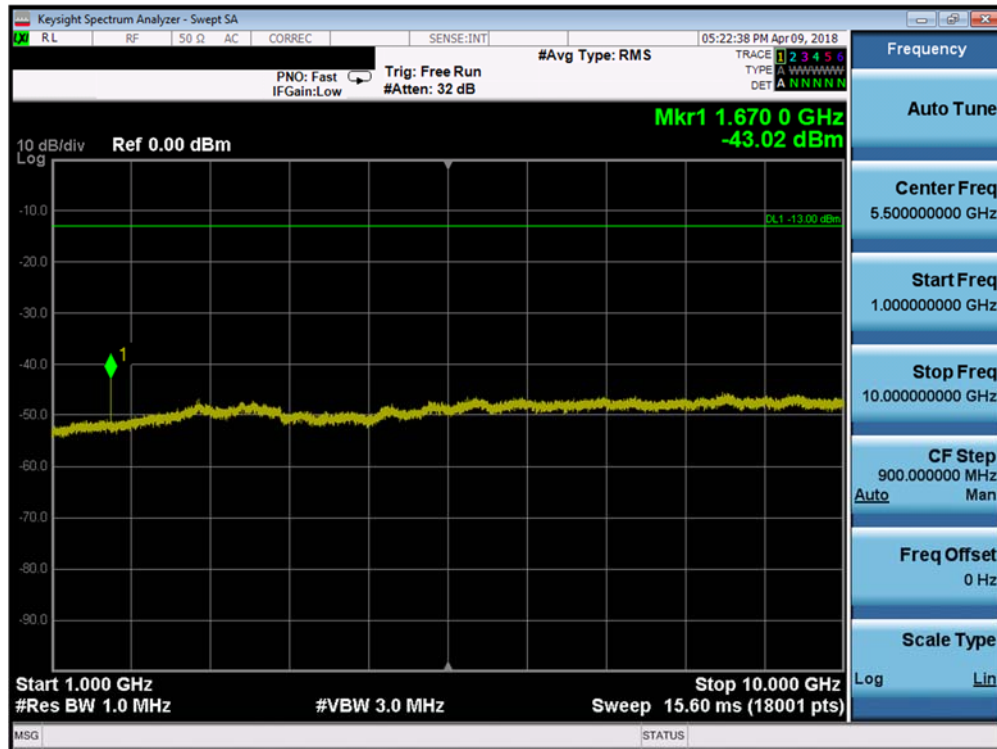


Plot 7-87. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-88. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

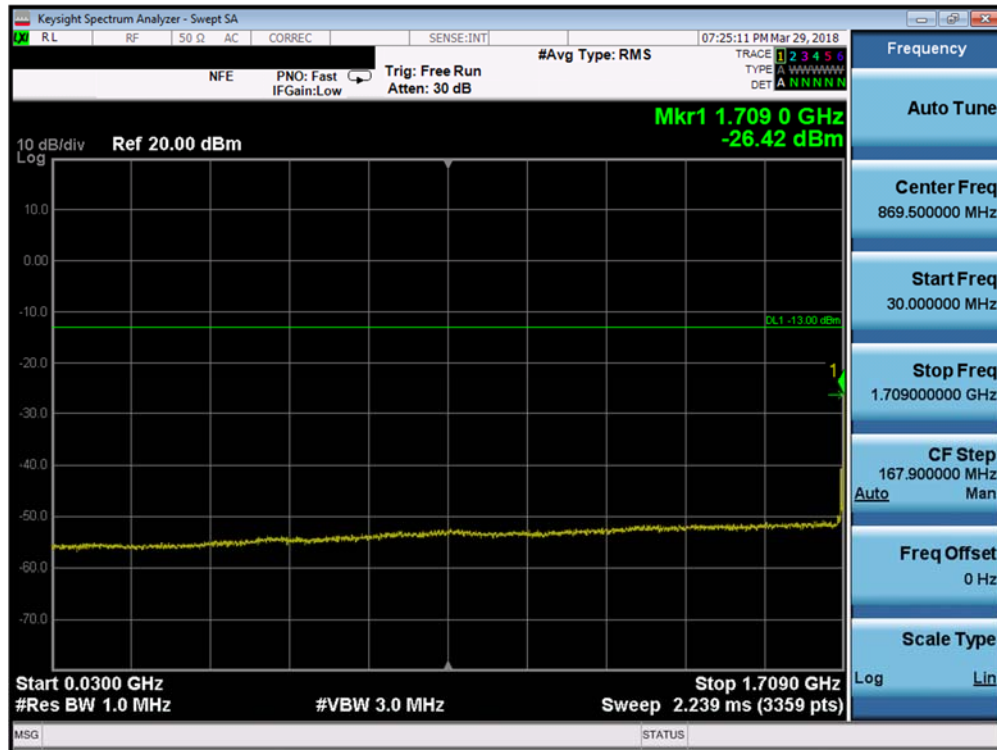
FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1-ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 62 of 179



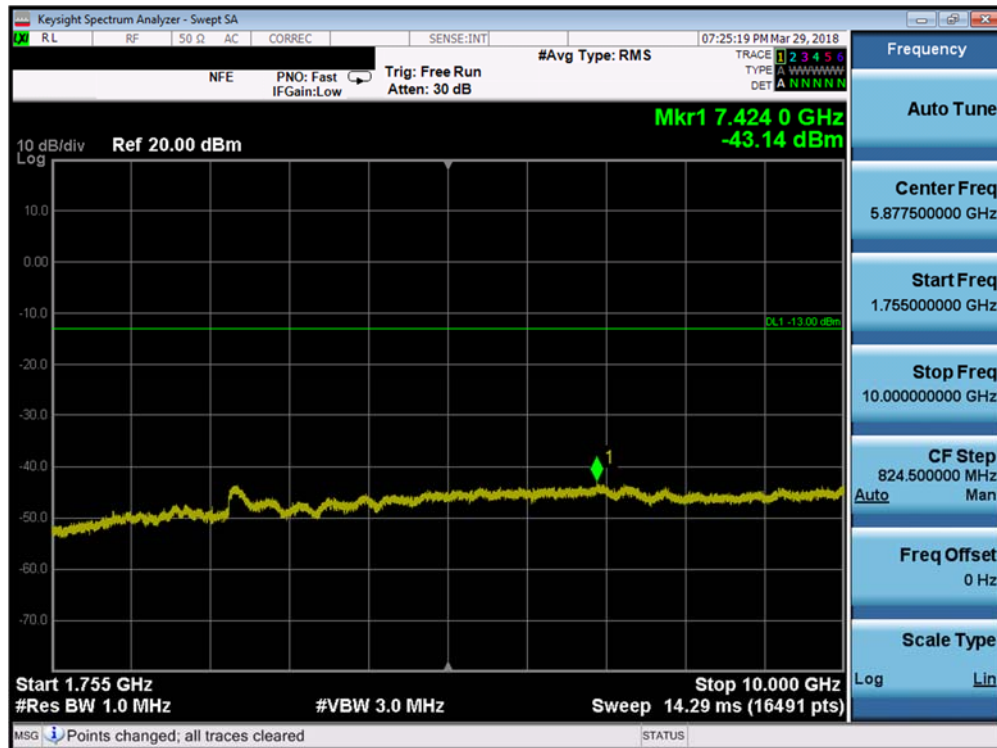
Plot 7-89. Conducted Spurious Plot (Band 26 - 10.0MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFQ710AL	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1804240083-03-R1.ZNF	Test Dates: 3/22-5/17/2018	EUT Type: Portable Handset		Page 63 of 179

Band 4

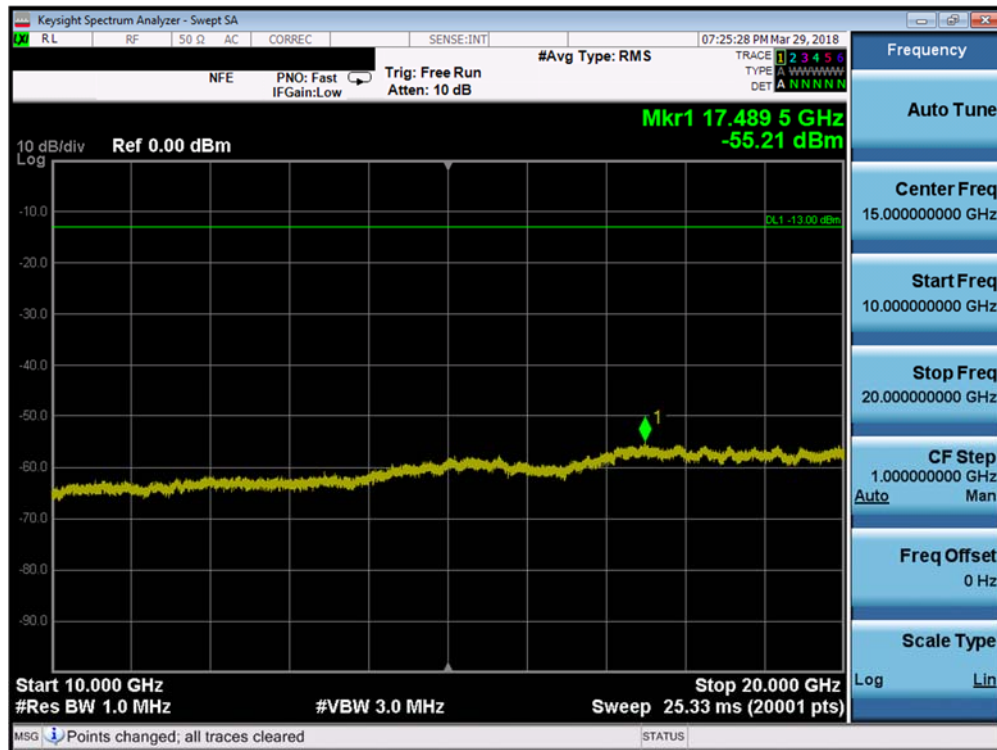


Plot 7-90. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

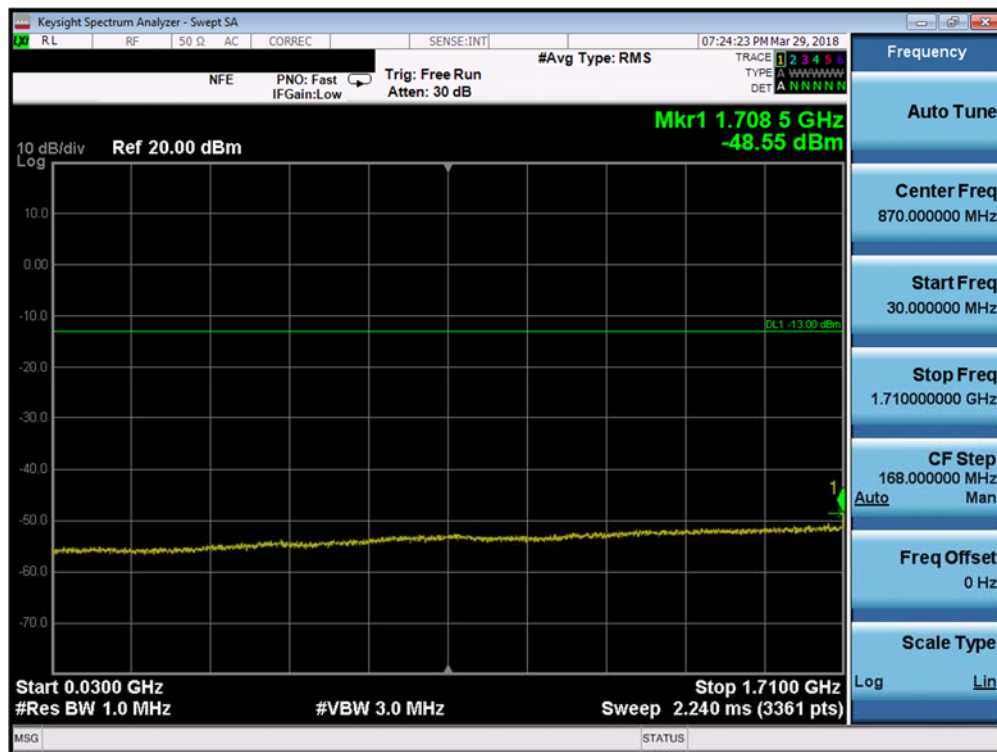


Plot 7-91. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

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Plot 7-92. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-93. Conducted Spurious Plot (Band 4 - 20.0MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

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