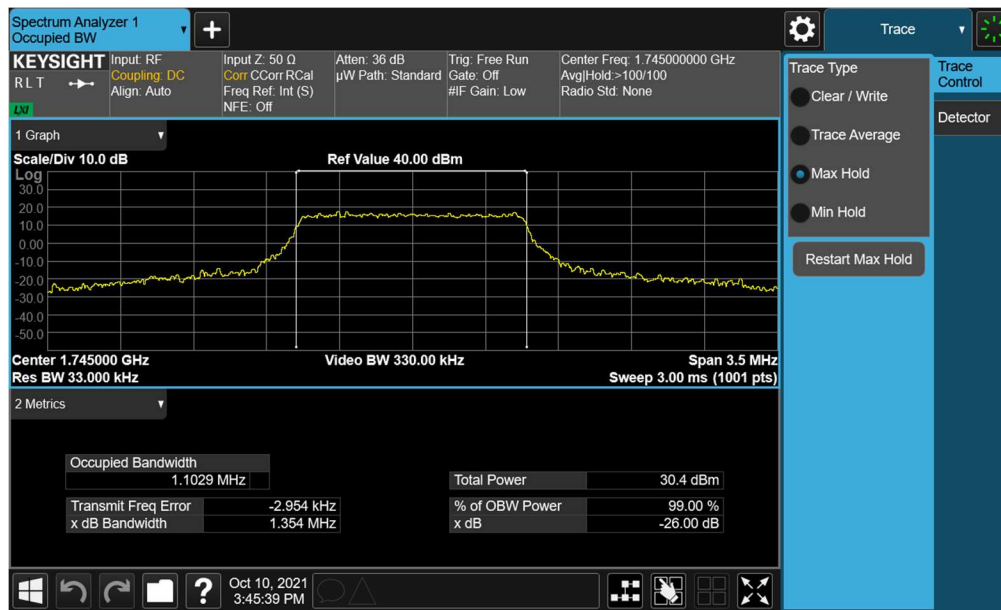


Plot 7-24. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



Plot 7-25. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB)

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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 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.

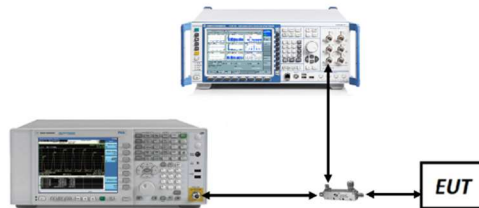


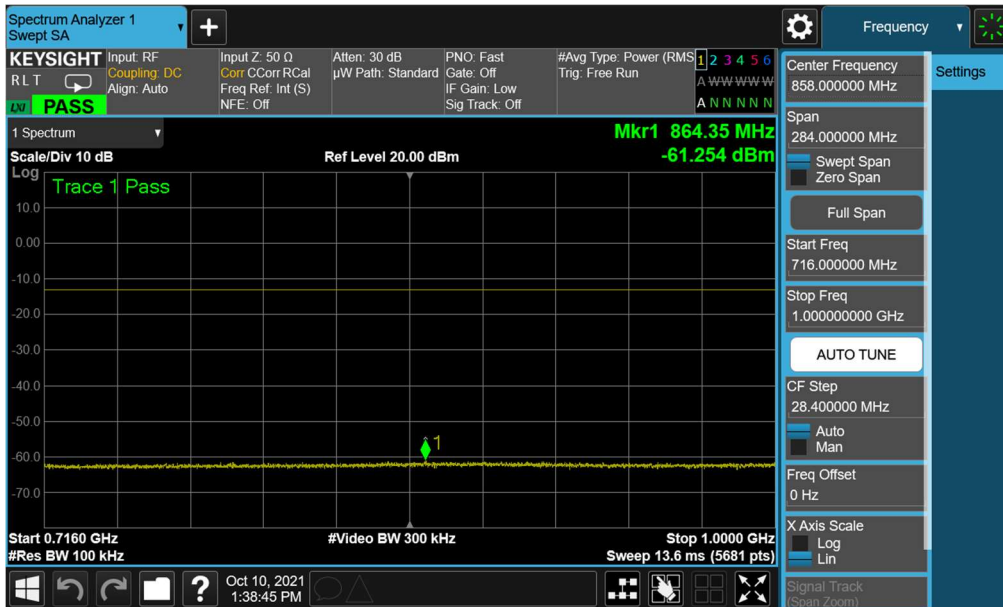
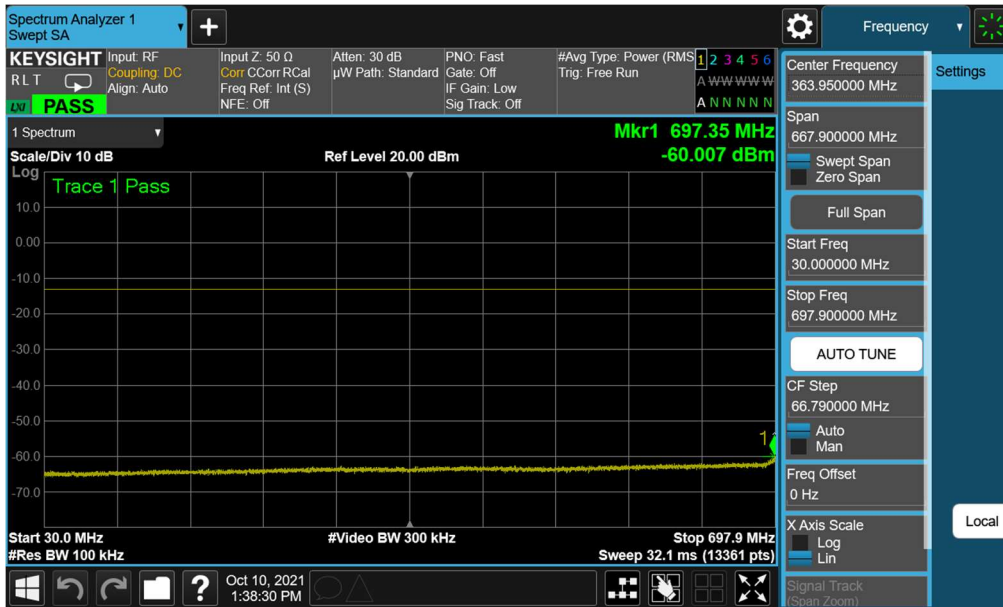
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

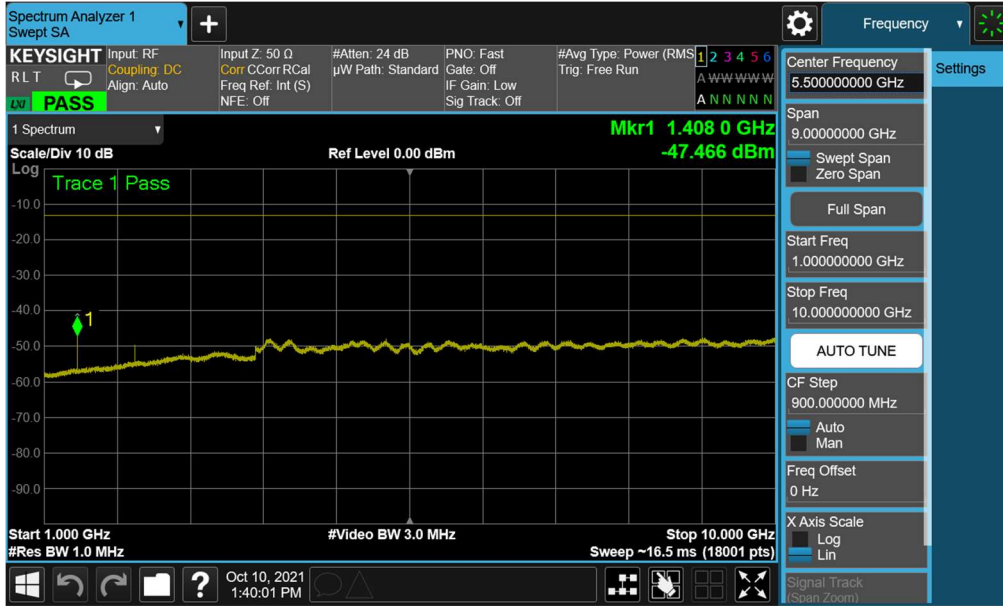
Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth 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: A3LSMS908E	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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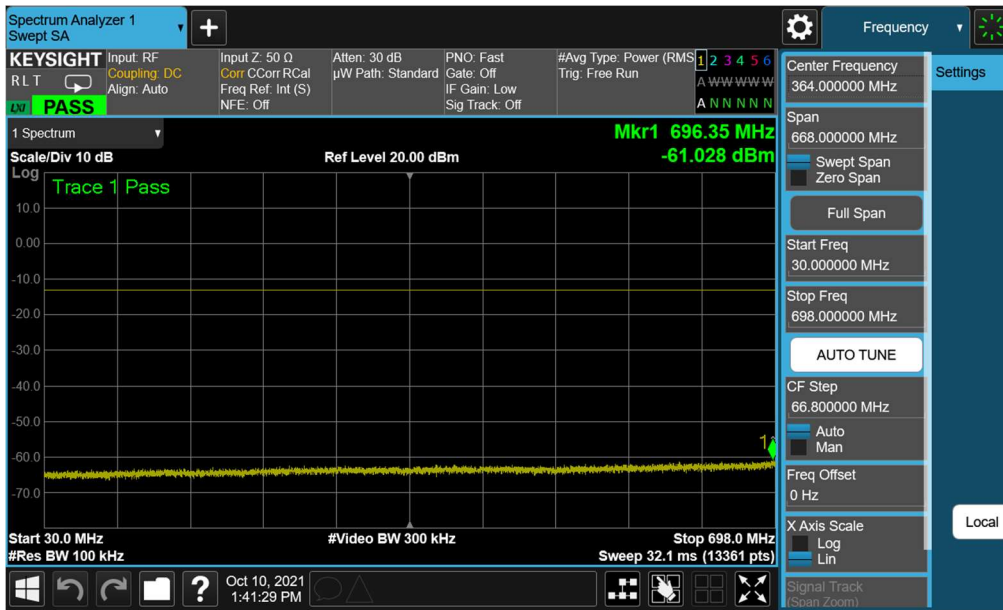
LTE Band 12/17



FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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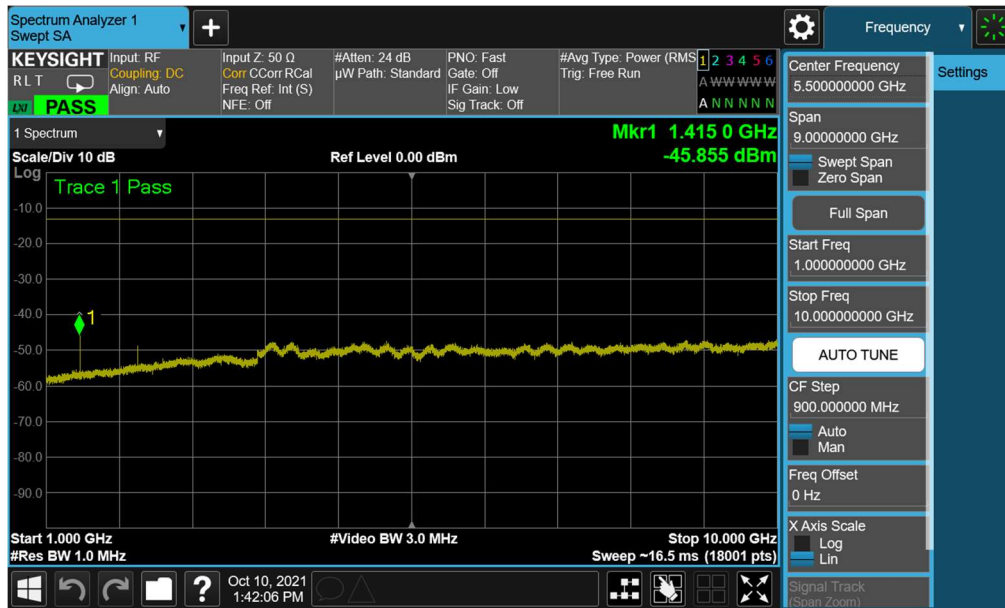
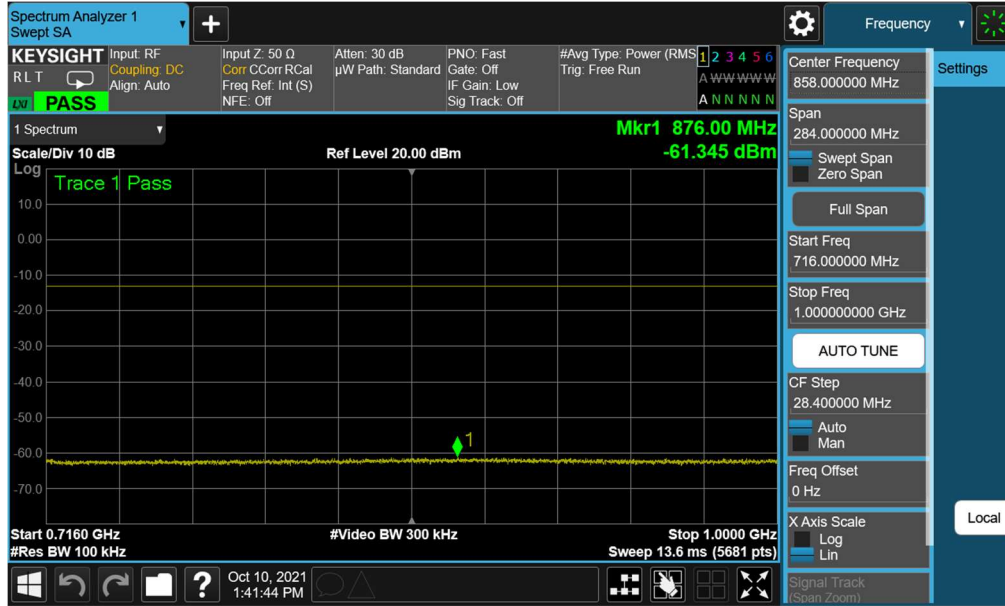


Plot 7-28. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - 1 RB - Low Channel)

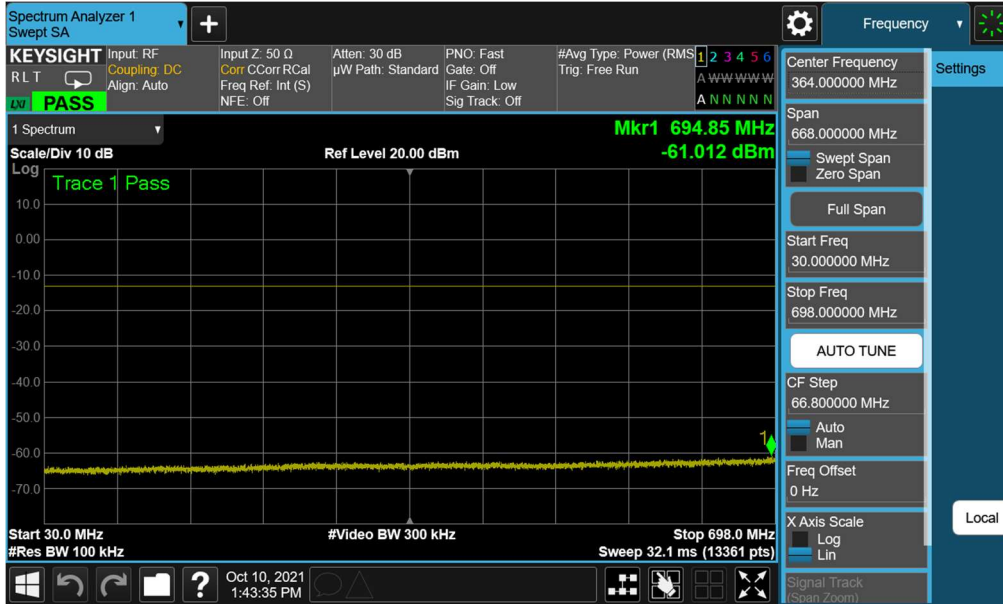


Plot 7-29. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - 1 RB - Mid Channel)

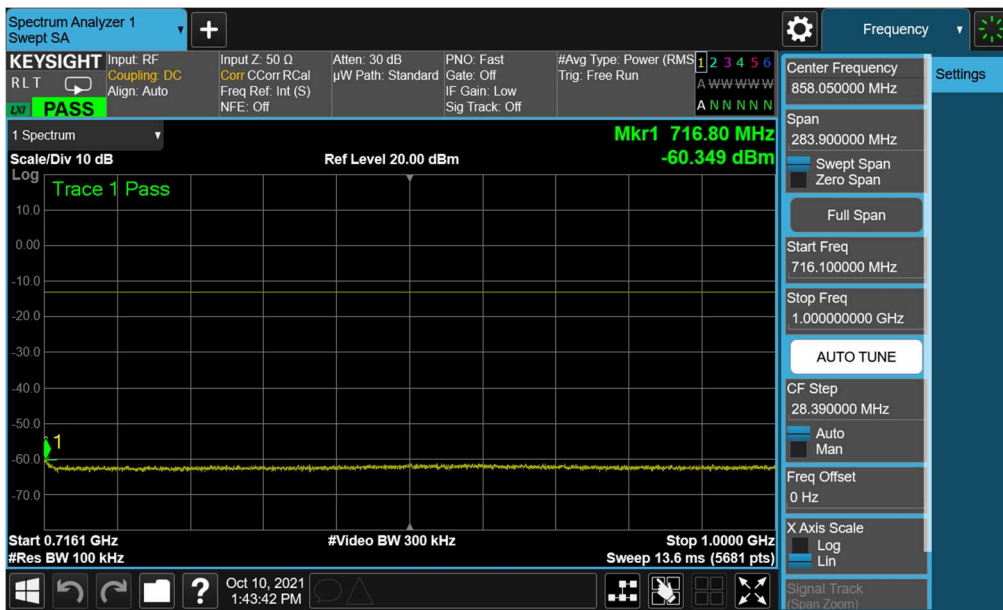
FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 28 of 101



FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 29 of 101

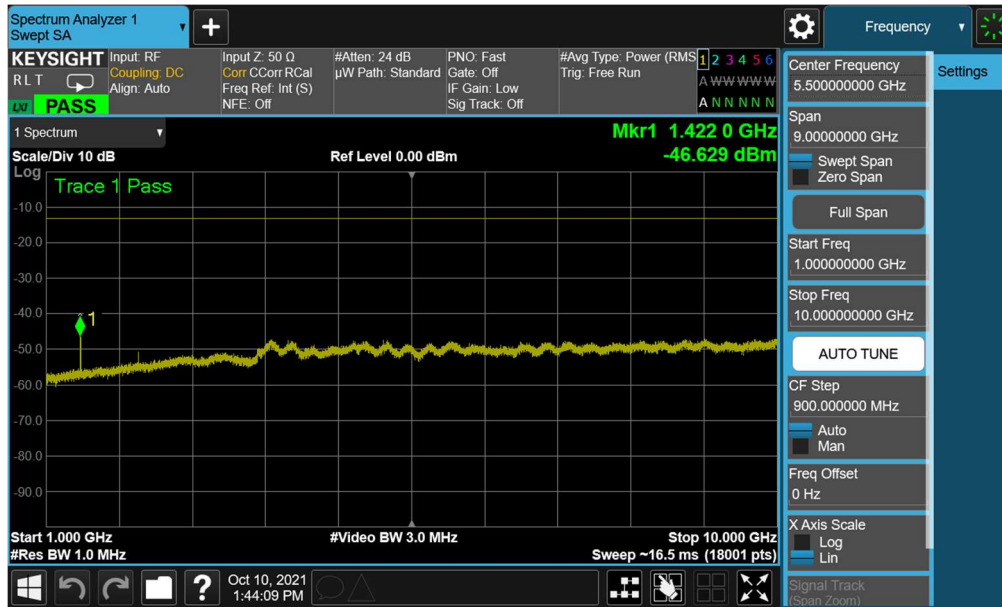


Plot 7-32. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - 1 RB - High Channel)



Plot 7-33. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - 1 RB - High Channel)

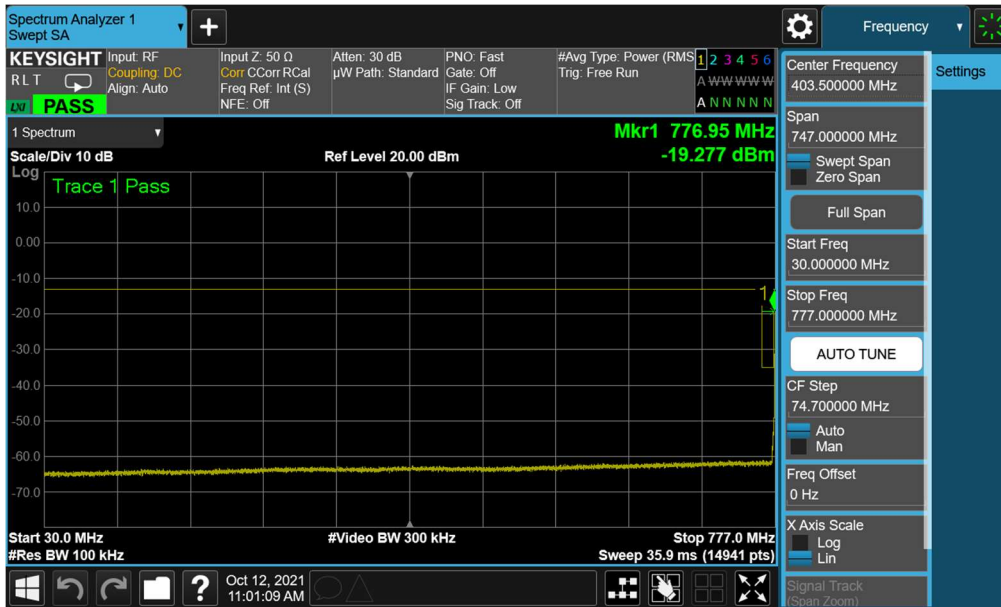
FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 30 of 101



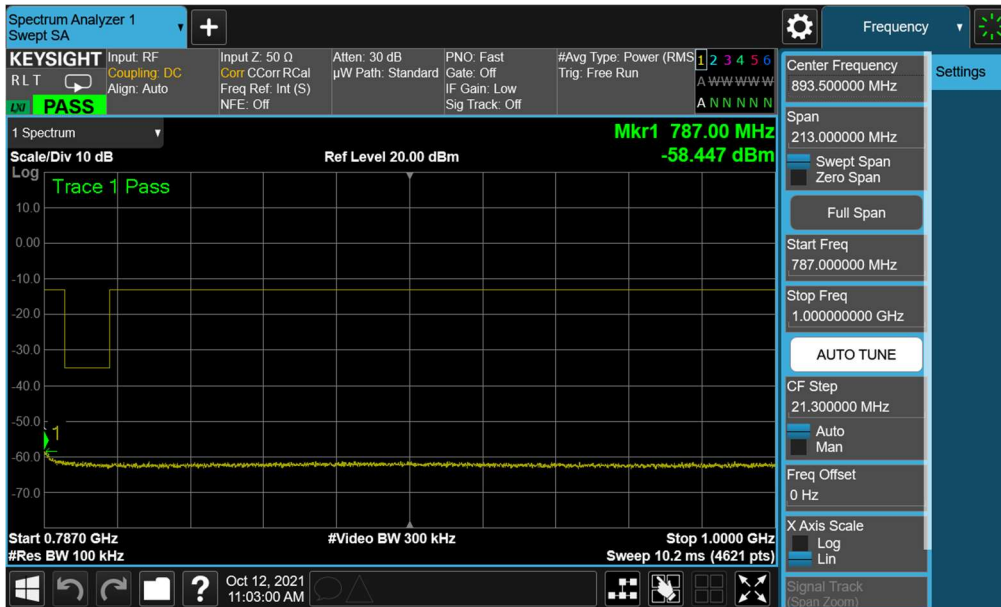
Plot 7-34. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - 1 RB - High Channel)

FCC ID: A3LSMS908E		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 13

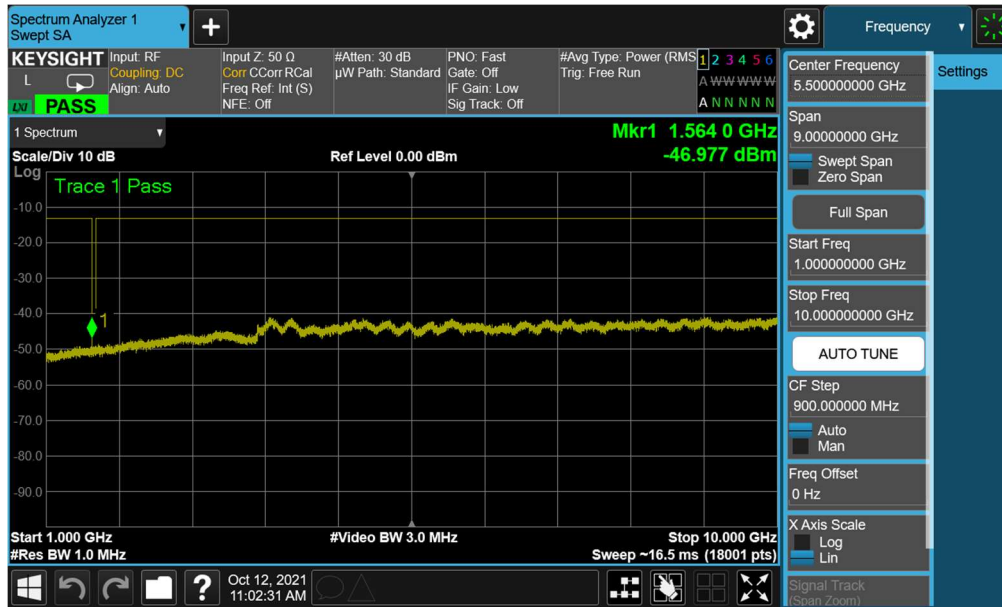


Plot 7-35. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)



Plot 7-36. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)

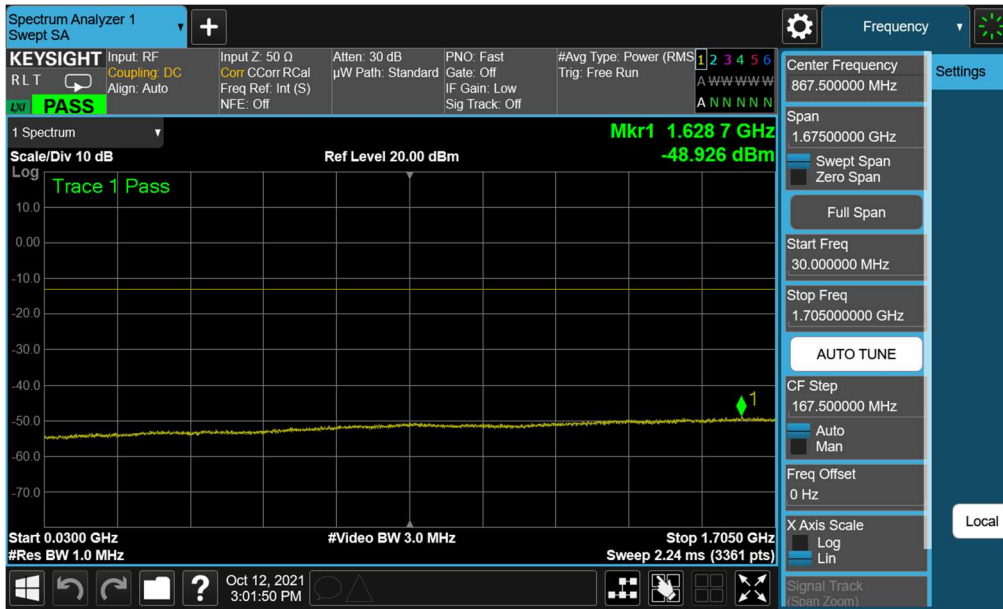
FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 32 of 101



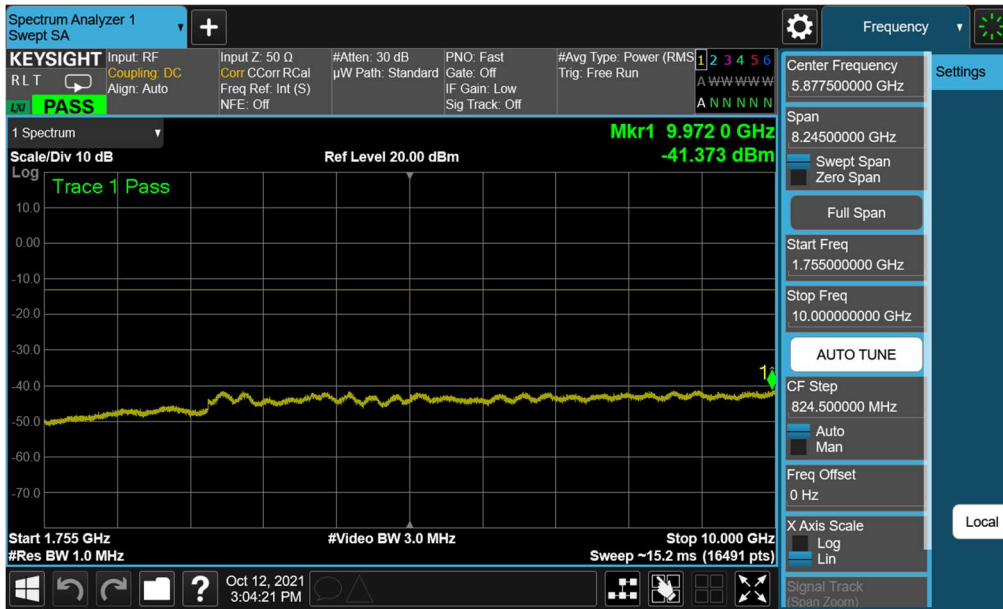
Plot 7-37. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - 1 RB)

<p>FCC ID: A3LSMS908E</p>		<p>PART 27 MEASUREMENT REPORT</p>	<p>Approved by: Technical Manager</p>
<p>Test Report S/N: 1M2109220110-29.A3L</p>	<p>Test Dates: 10/8/2021 - 11/10/2021</p>	<p>EUT Type: Portable Handset</p>	<p>Page 33 of 101</p>

WCDMA AWS

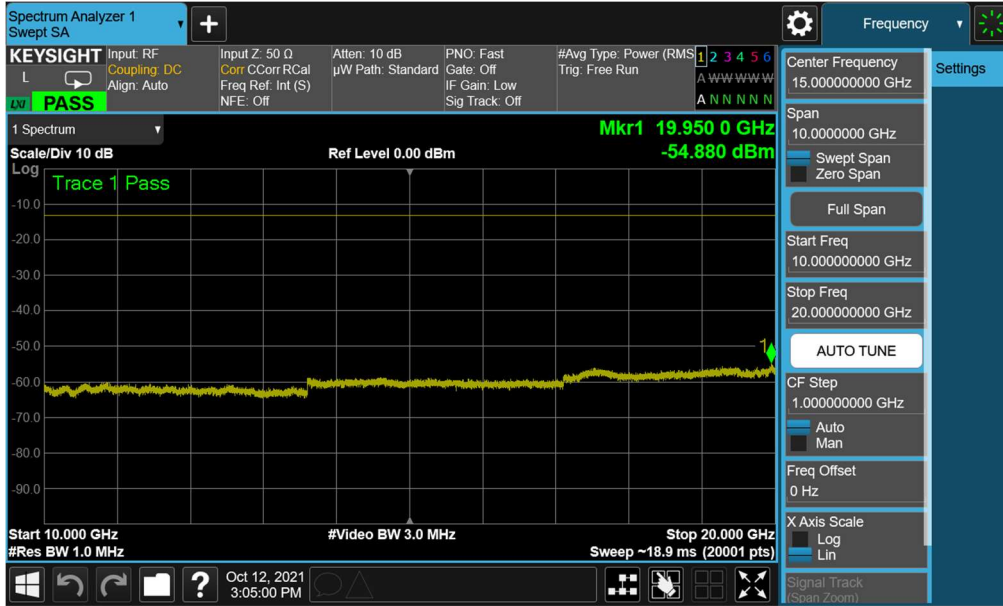


Plot 7-38. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

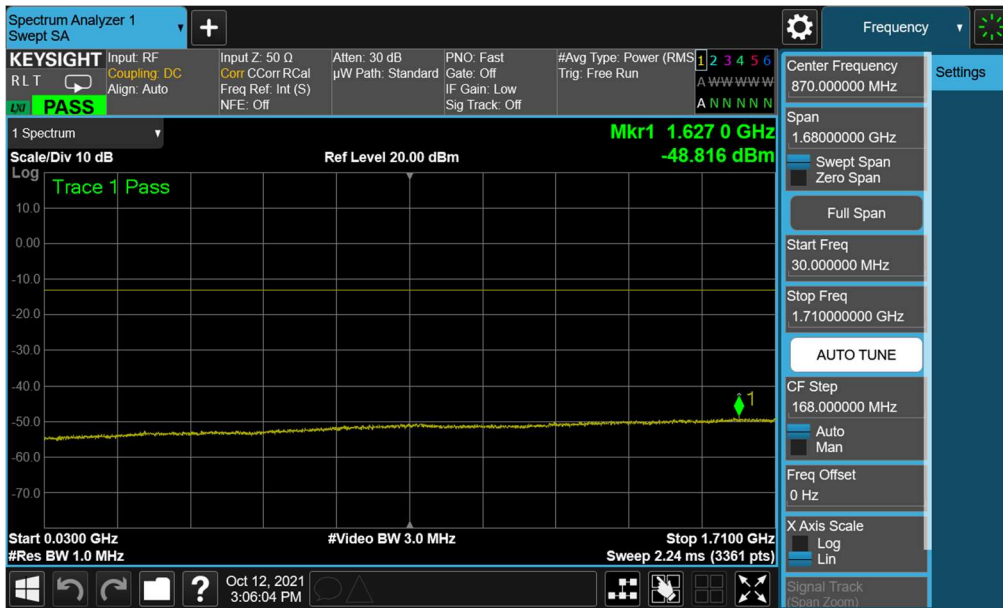


Plot 7-39. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 34 of 101

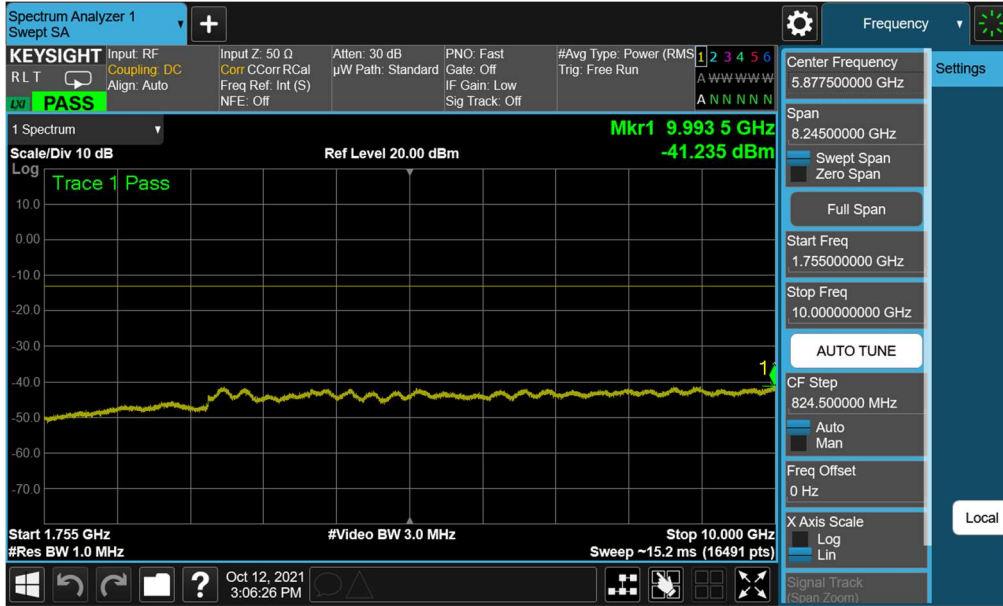


Plot 7-40. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

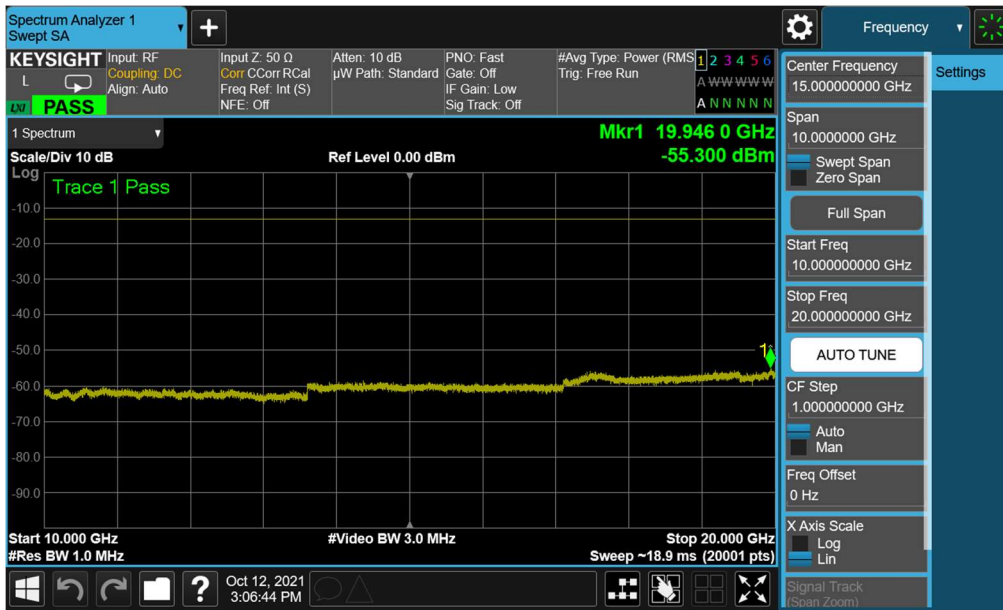


Plot 7-41. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-42. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

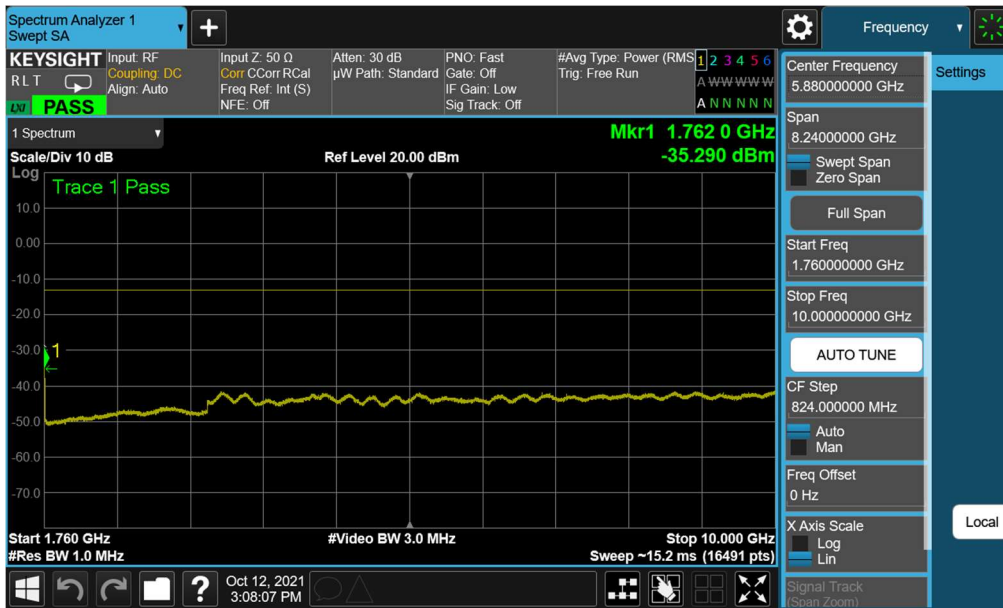


Plot 7-43. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 36 of 101

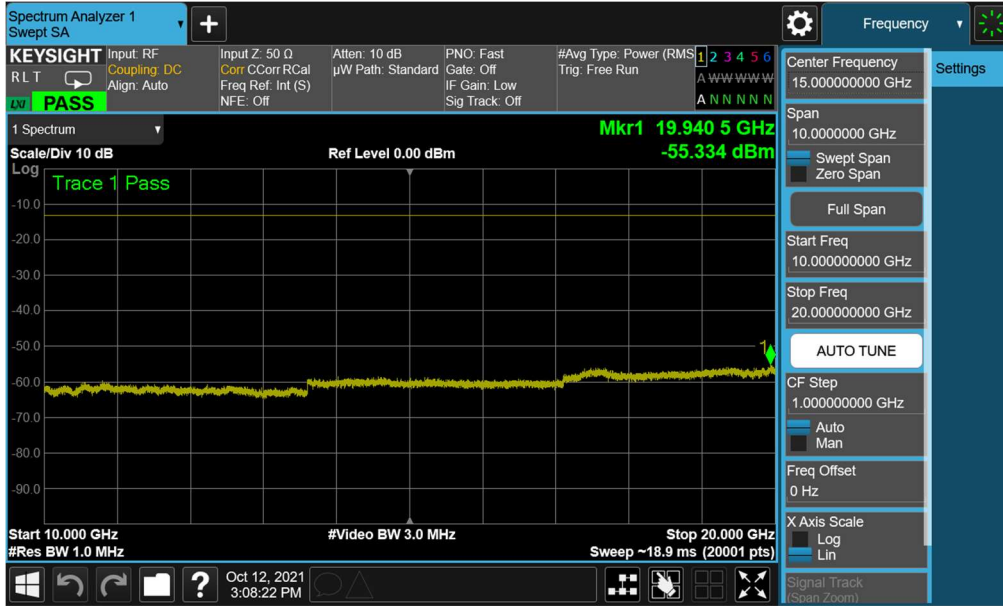


Plot 7-44. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



Plot 7-45. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 37 of 101



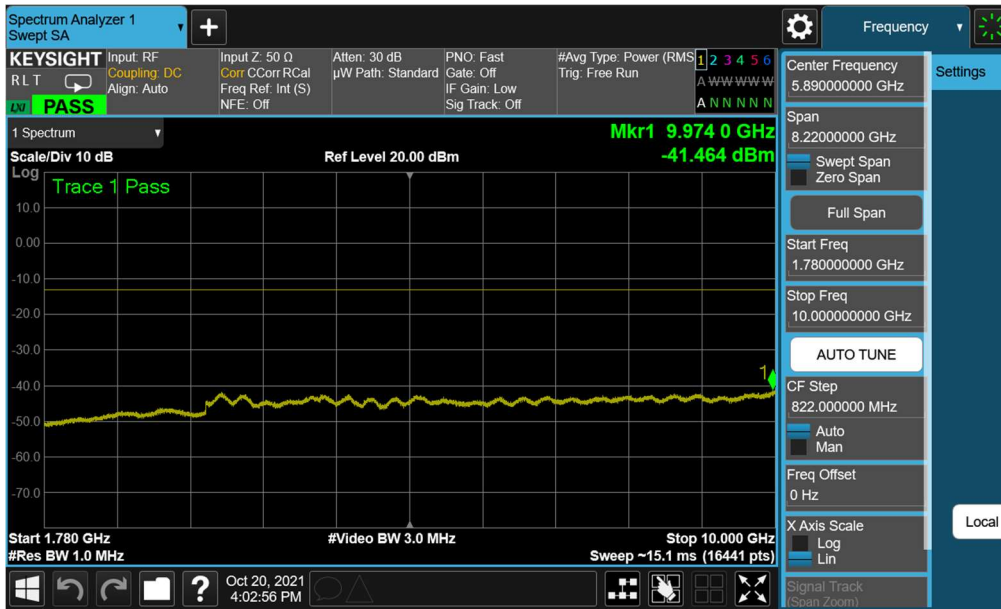
Plot 7-46. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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LTE Band 66/4

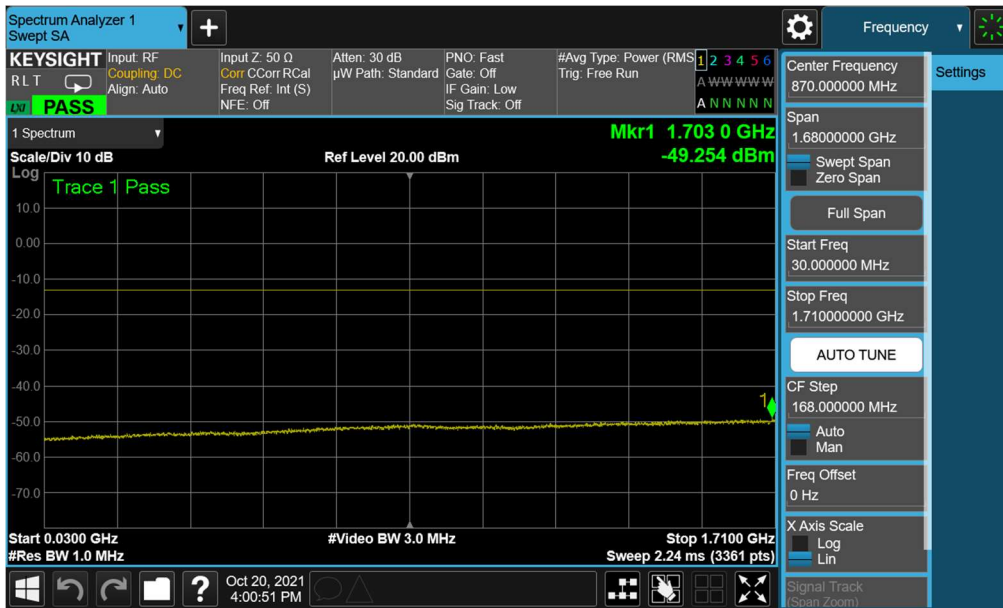
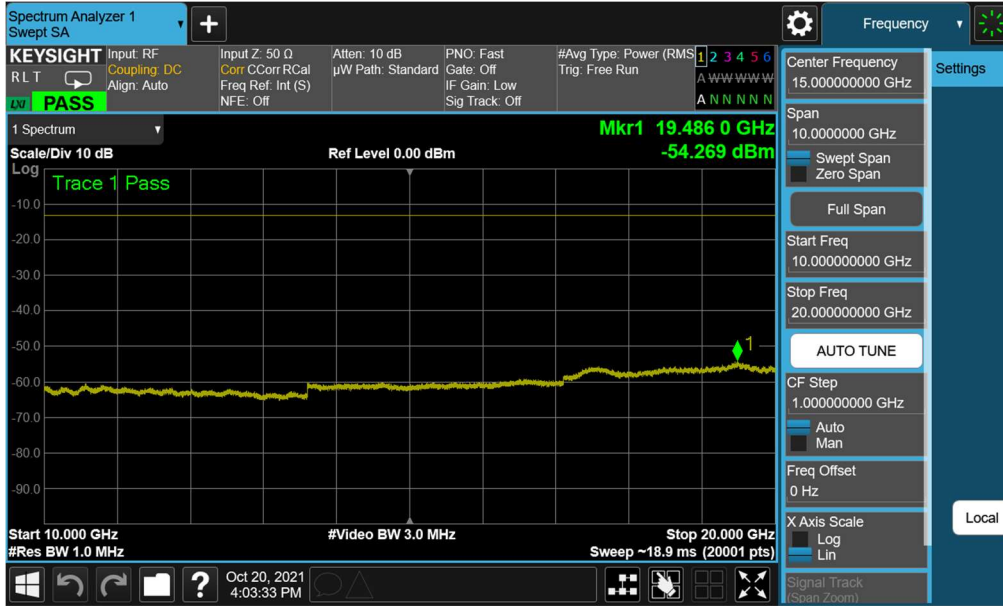


Plot 7-47. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - 1 RB - Low Channel)

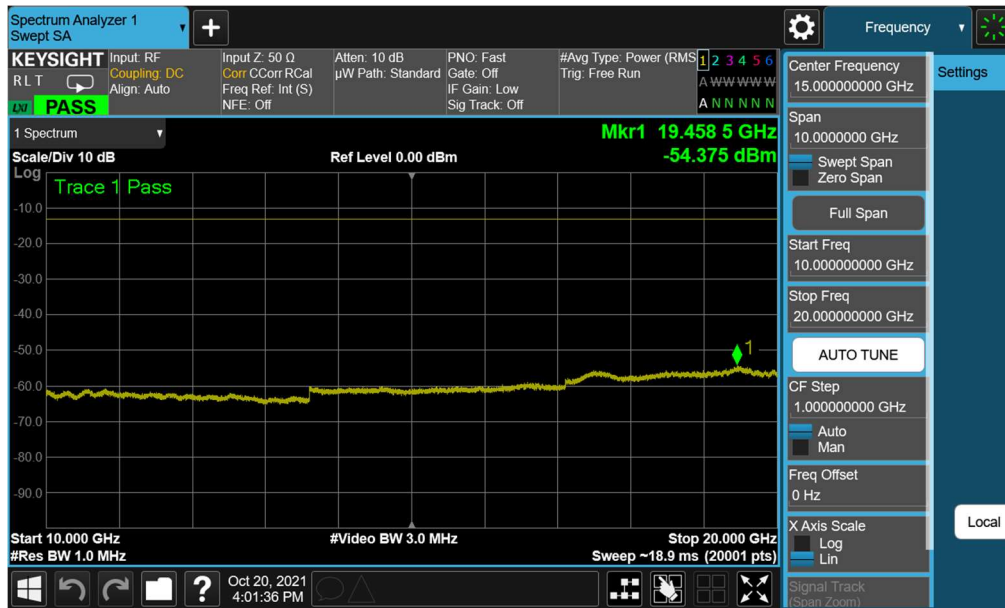
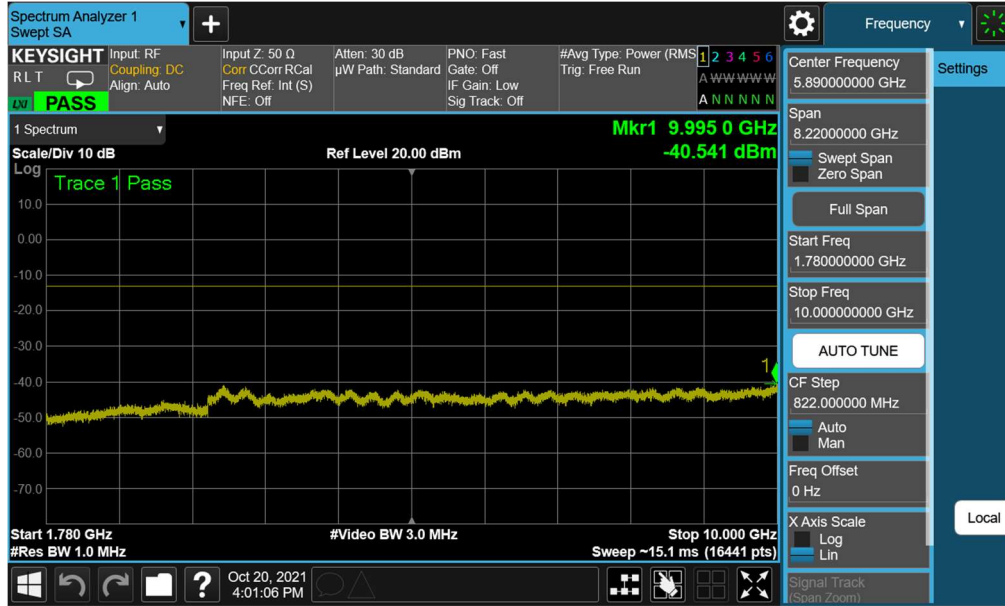


Plot 7-48. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - 1 RB - Low Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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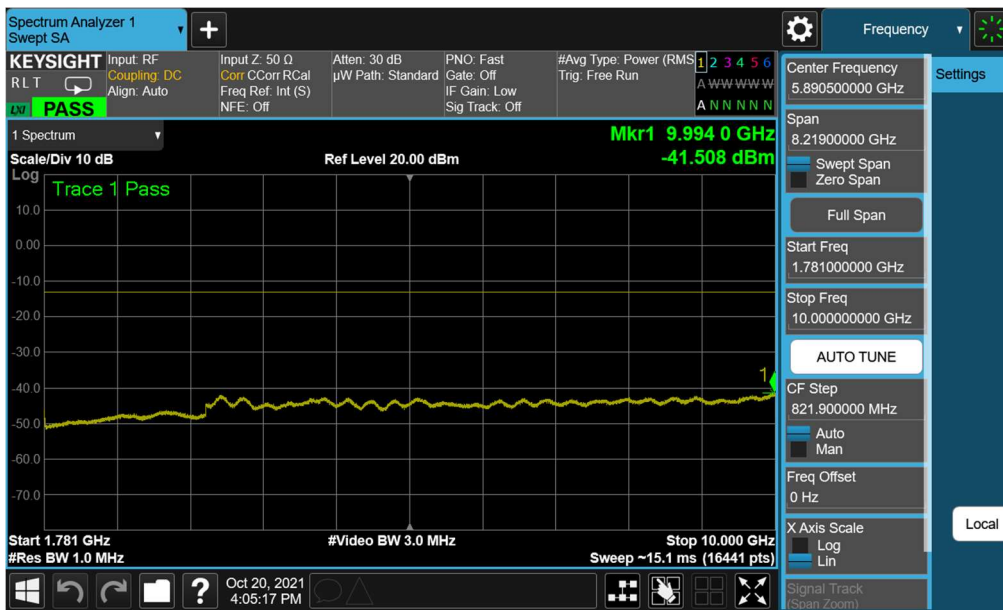
FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 41 of 101

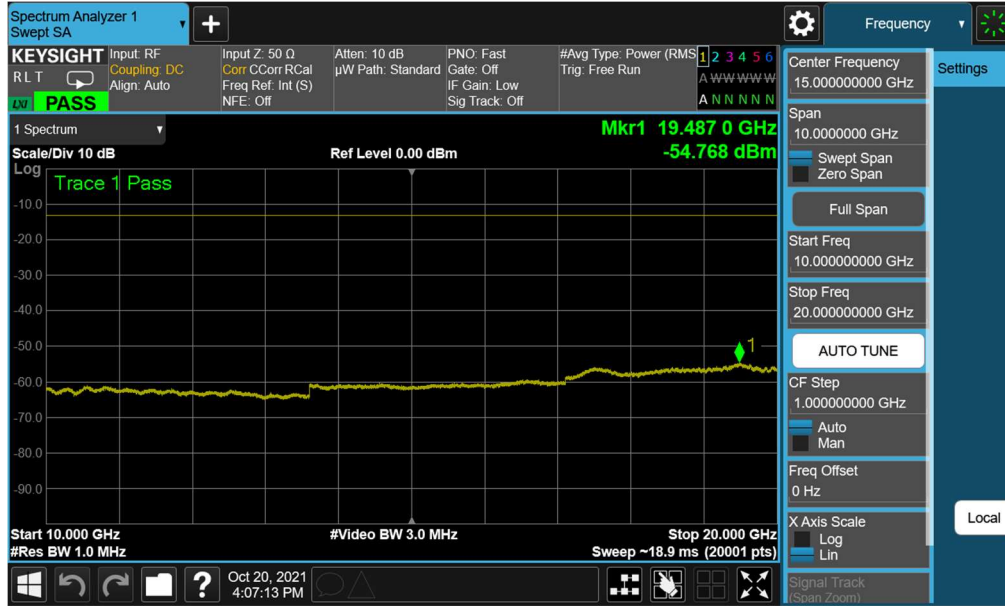


Plot 7-53. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - 1 RB - High Channel)



Plot 7-54. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - 1 RB - High Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
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Plot 7-55. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - 1 RB - High Channel)

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2109220110-29.A3L	Test Dates: 10/8/2021 - 11/10/2021	EUT Type: Portable Handset		Page 43 of 101

7.4 Band Edge Emissions at Antenna Terminal

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

Test Procedure Used

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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.

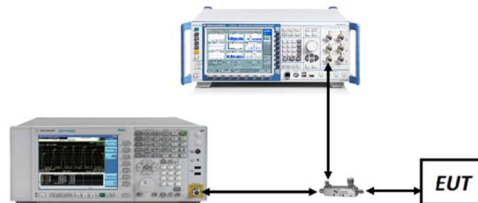


Figure 7-3. Test Instrument & Measurement Setup

FCC ID: A3LSMS908E	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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Test Notes

Per 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 663 - 698 MHz and 698 – 746MHz bands, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

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

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

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