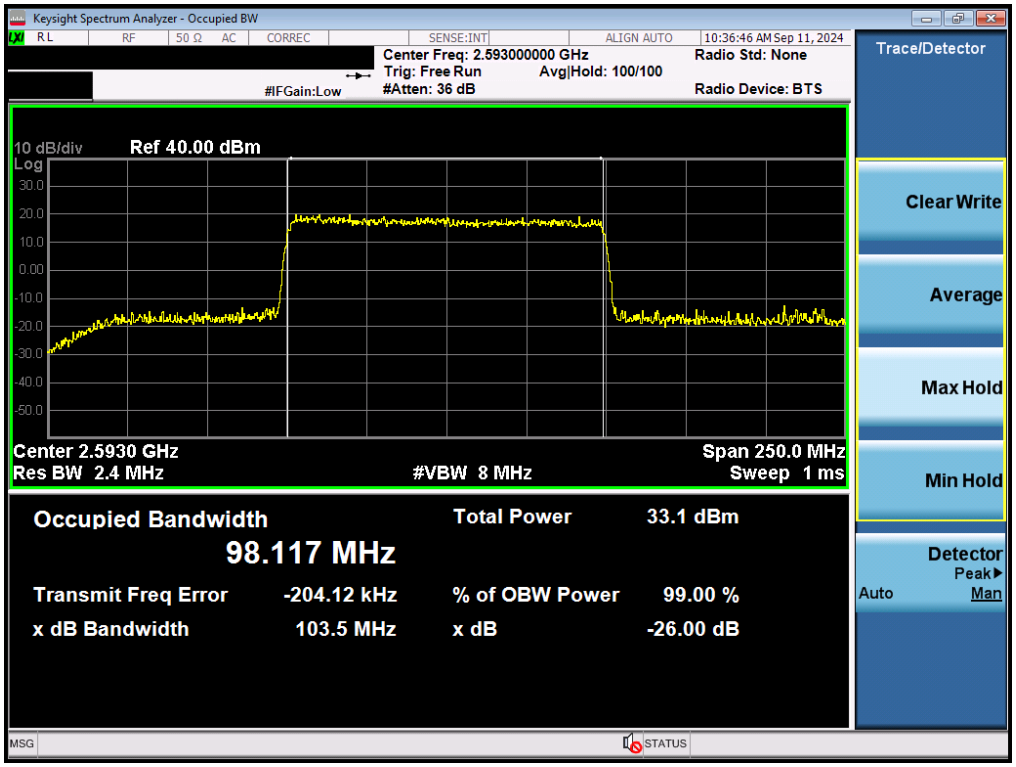
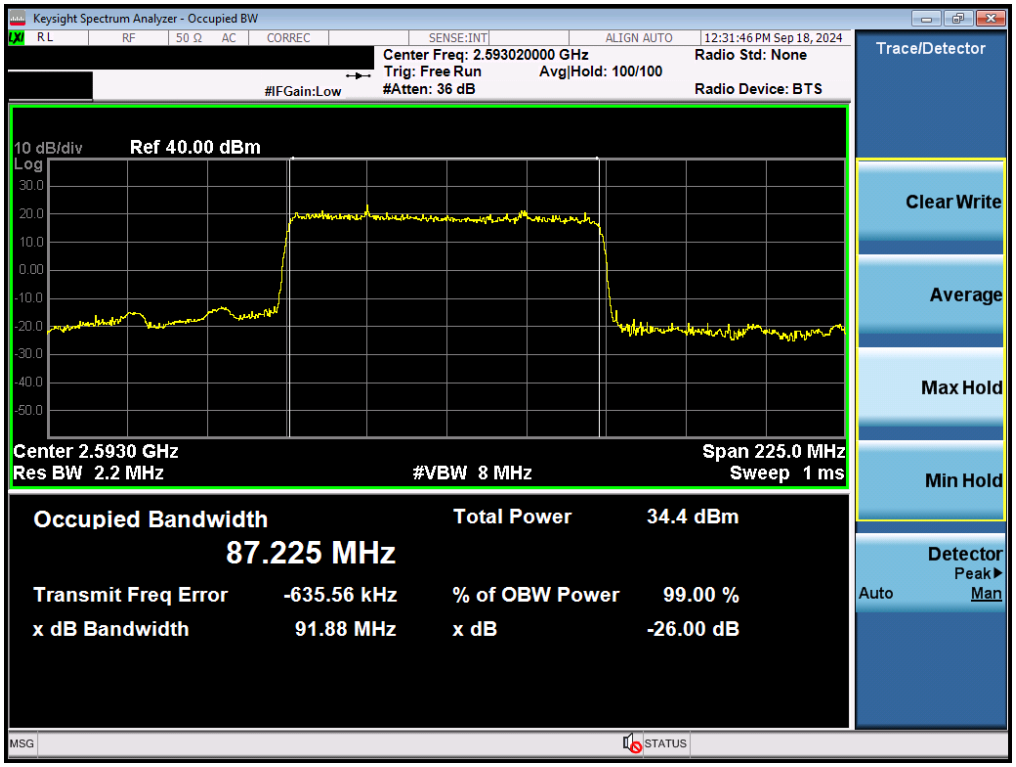
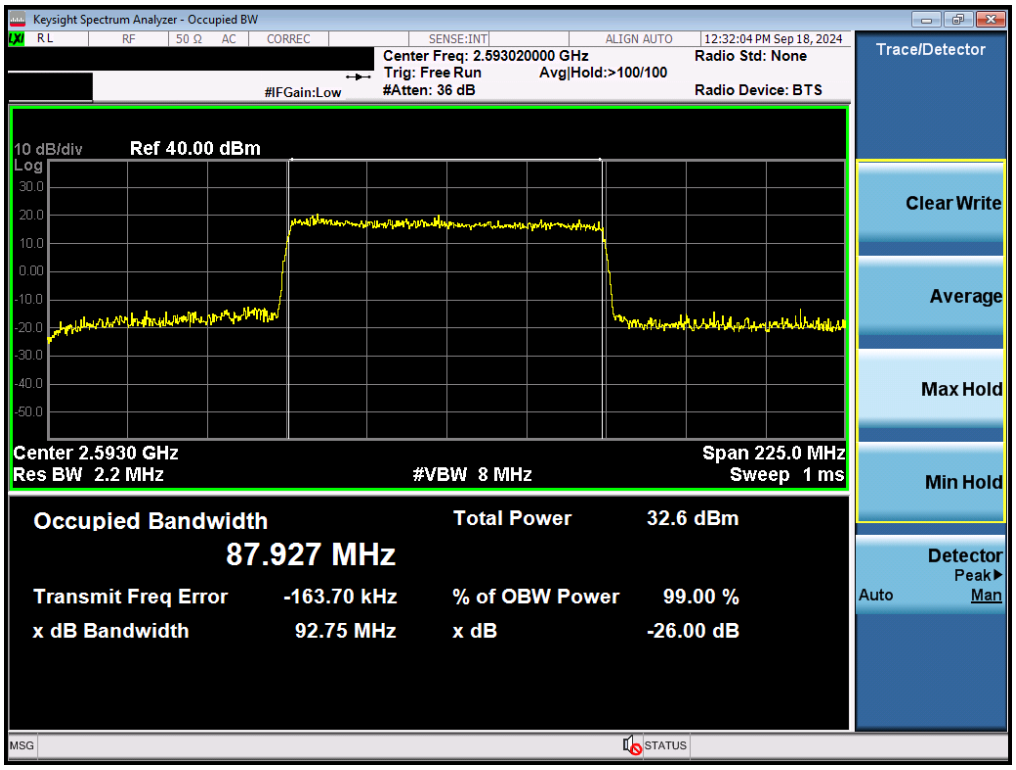


Plot 7-89. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant B)

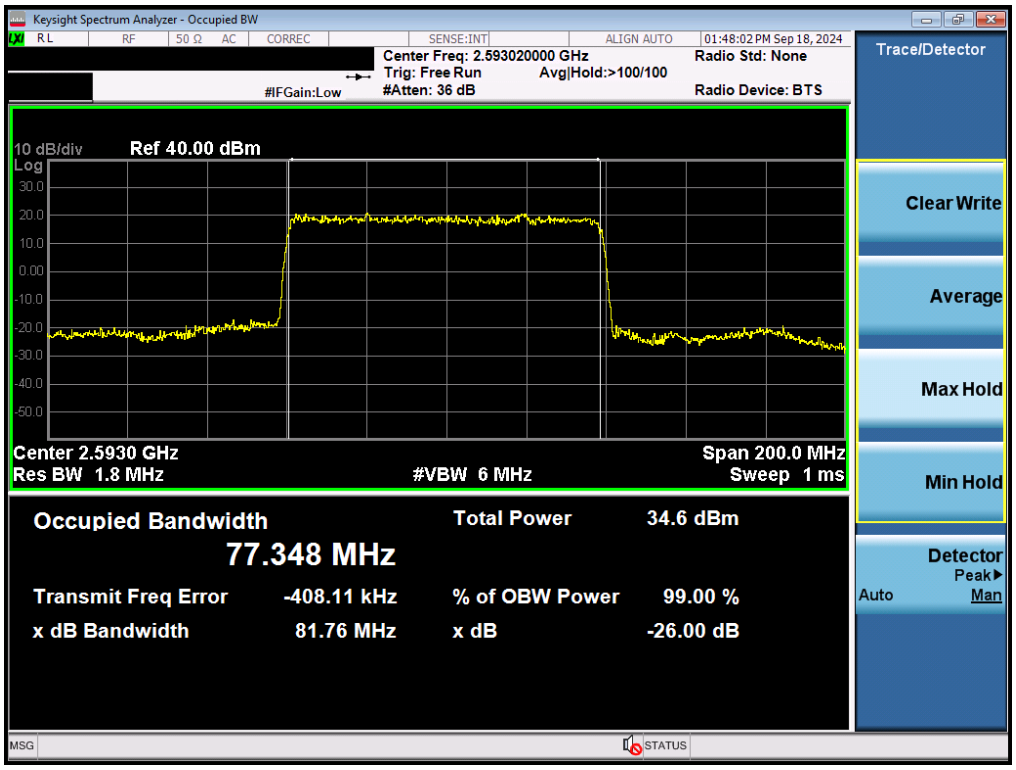


Plot 7-90. Occupied Bandwidth Plot (NR Band n41 - 90MHz π/2 BPSK - Full RB - Ant B)



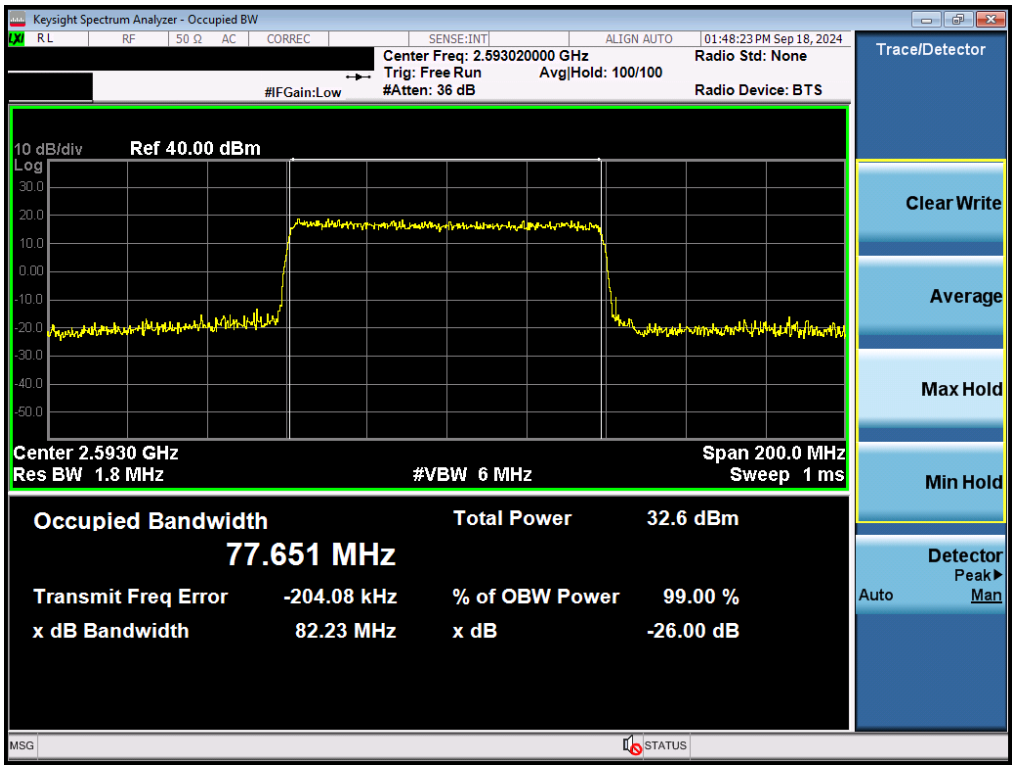
Plot 7-91. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB - Ant B)

Plot 7-92. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB - Ant B)

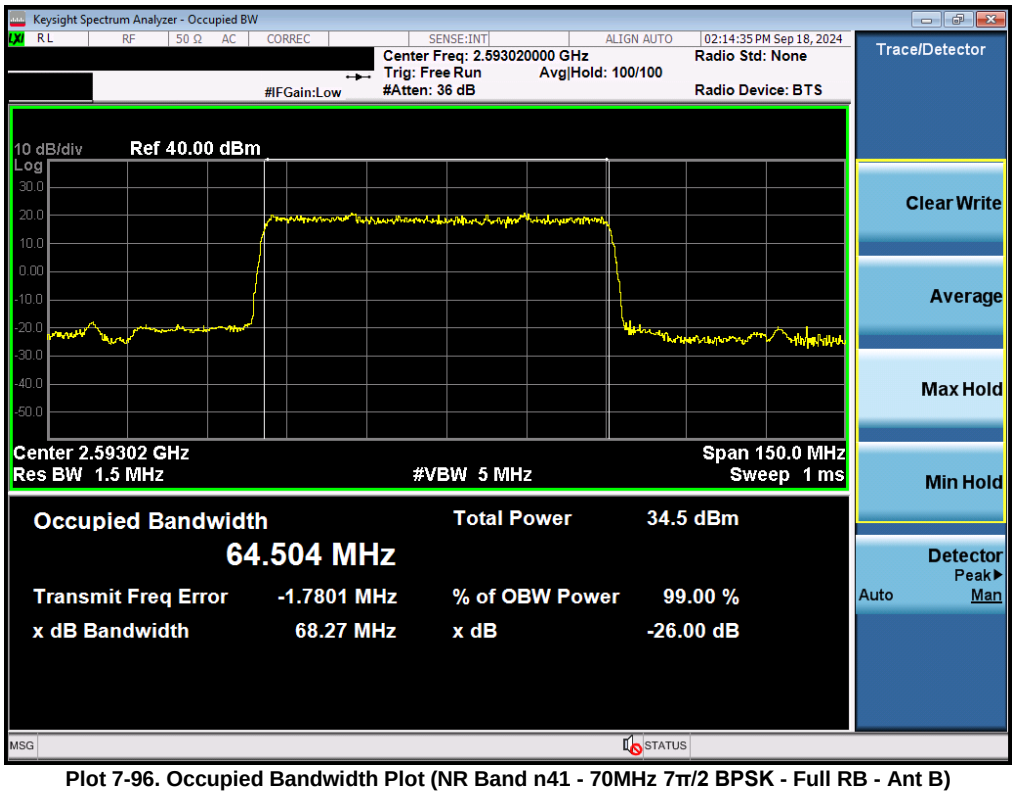


Plot 7-93. Occupied Bandwidth Plot (NR Band n41 - 80MHz π/2 BPSK - Full RB - Ant B)

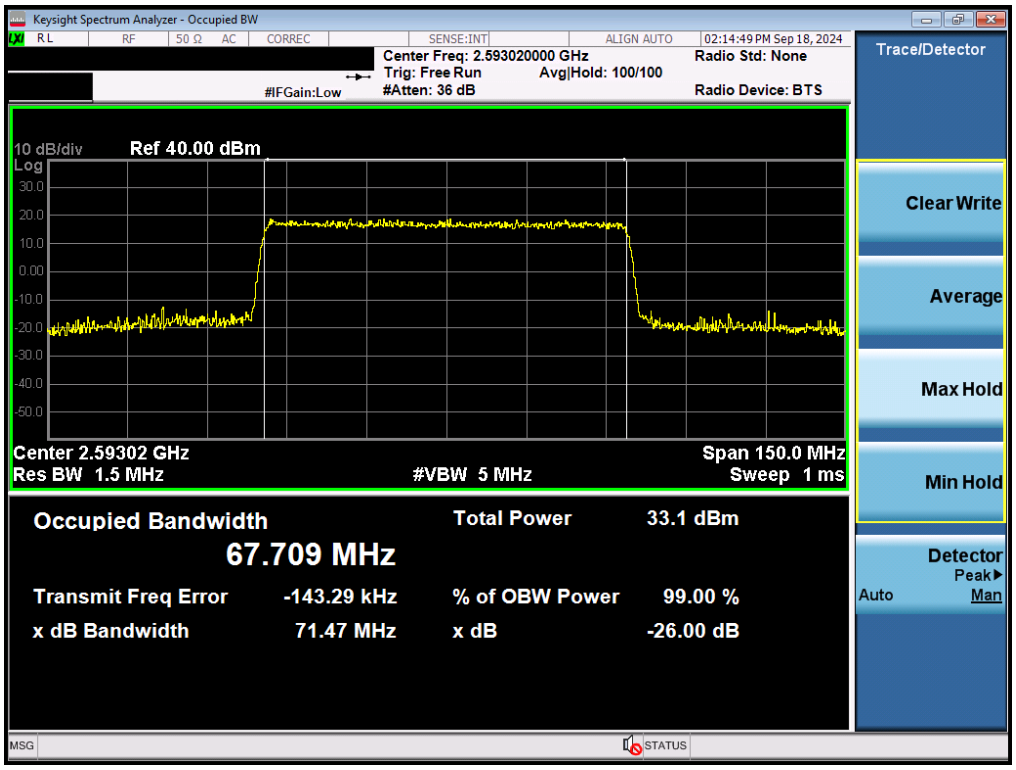
Plot 7-94. Occupied Bandwidth Plot (NR Band n41 - 80MHz QPSK - Full RB - Ant B)



Plot 7-95. Occupied Bandwidth Plot (NR Band n41 - 80MHz 16-QAM - Full RB - Ant B)



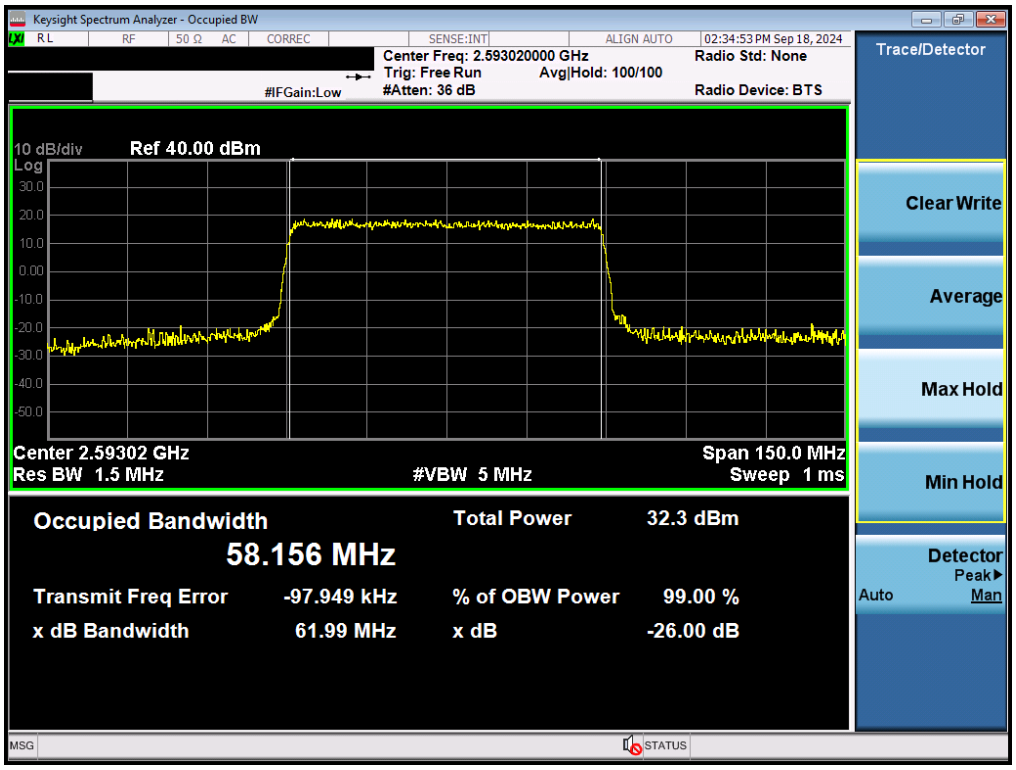
Plot 7-96. Occupied Bandwidth Plot (NR Band n41 - 70MHz 7π/2 BPSK - Full RB - Ant B)



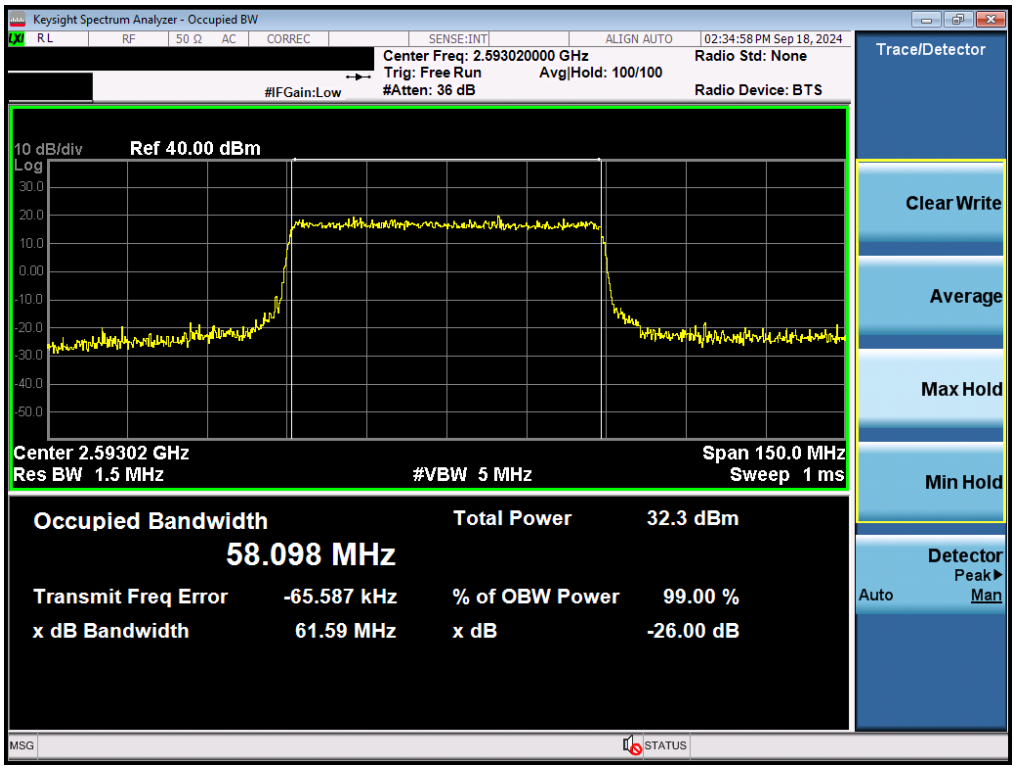
Plot 7-97. Occupied Bandwidth Plot (NR Band n41 - 70MHz QPSK - Full RB - Ant B)

Plot 7-98. Occupied Bandwidth Plot (NR Band n41 - 70MHz 16-QAM - Full RB - Ant B)

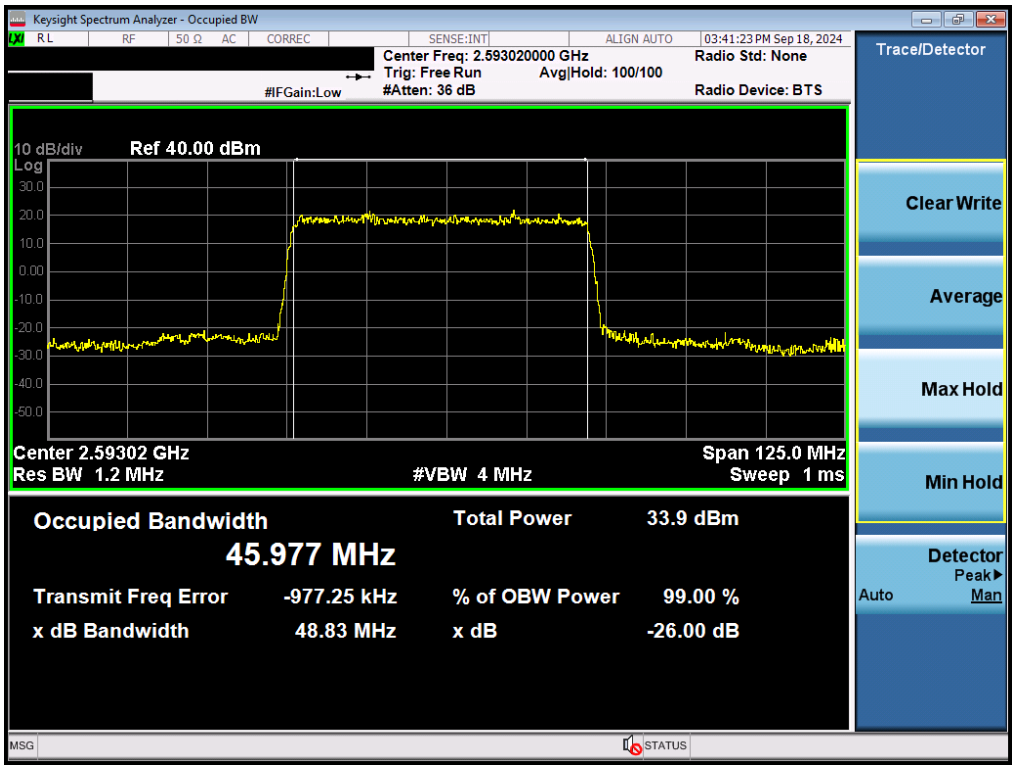
Plot 7-99. Occupied Bandwidth Plot (NR Band n41 - 60MHz π/2 BPSK - Full RB - Ant B)



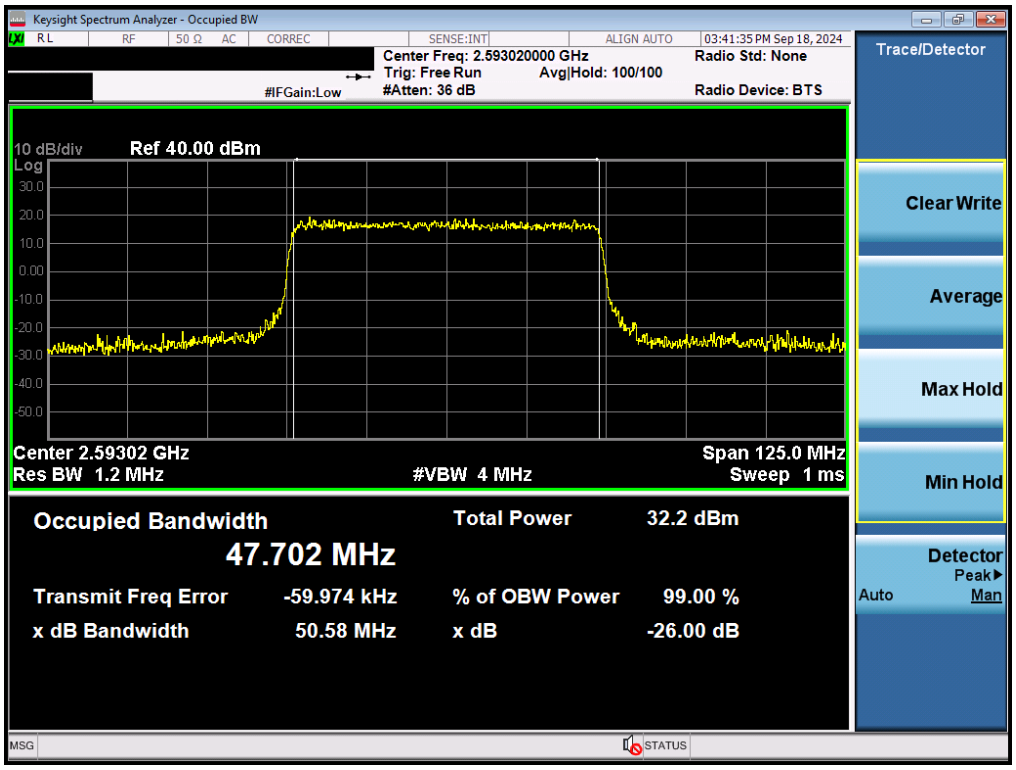
Plot 7-100. Occupied Bandwidth Plot (NR Band n41 - 60MHz QPSK - Full RB - Ant B)



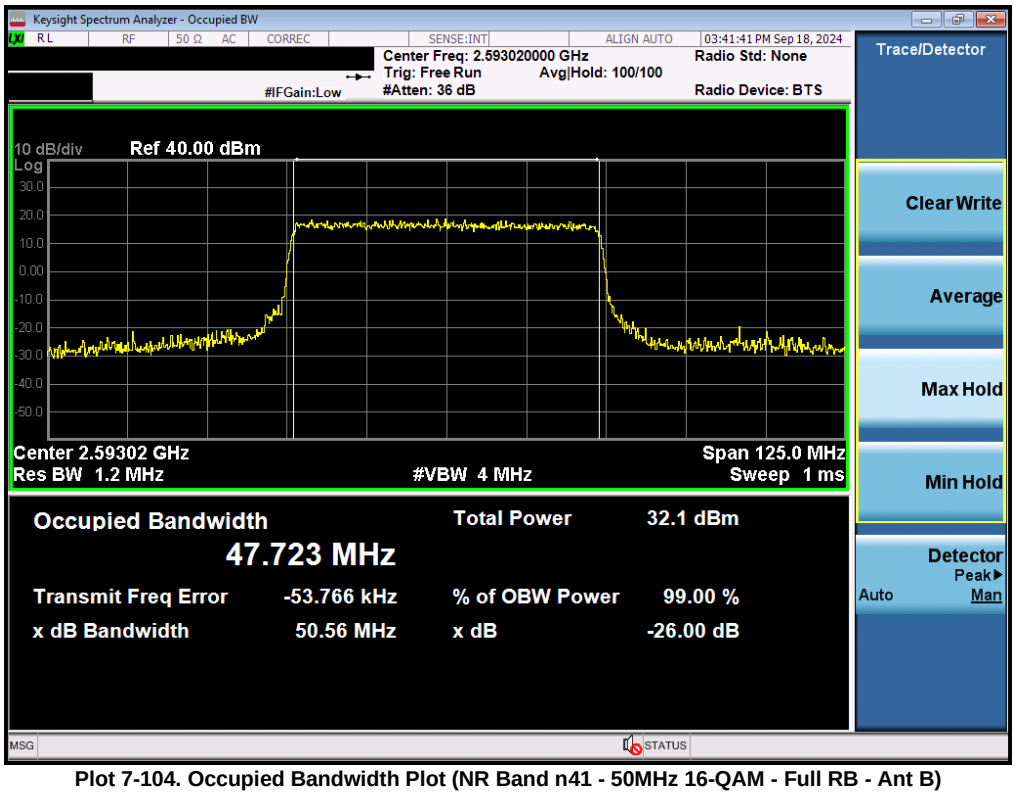
Plot 7-101. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB - Ant B)



Plot 7-102. Occupied Bandwidth Plot (NR Band n41 - 50MHz π/2 BPSK - Full RB - Ant B)

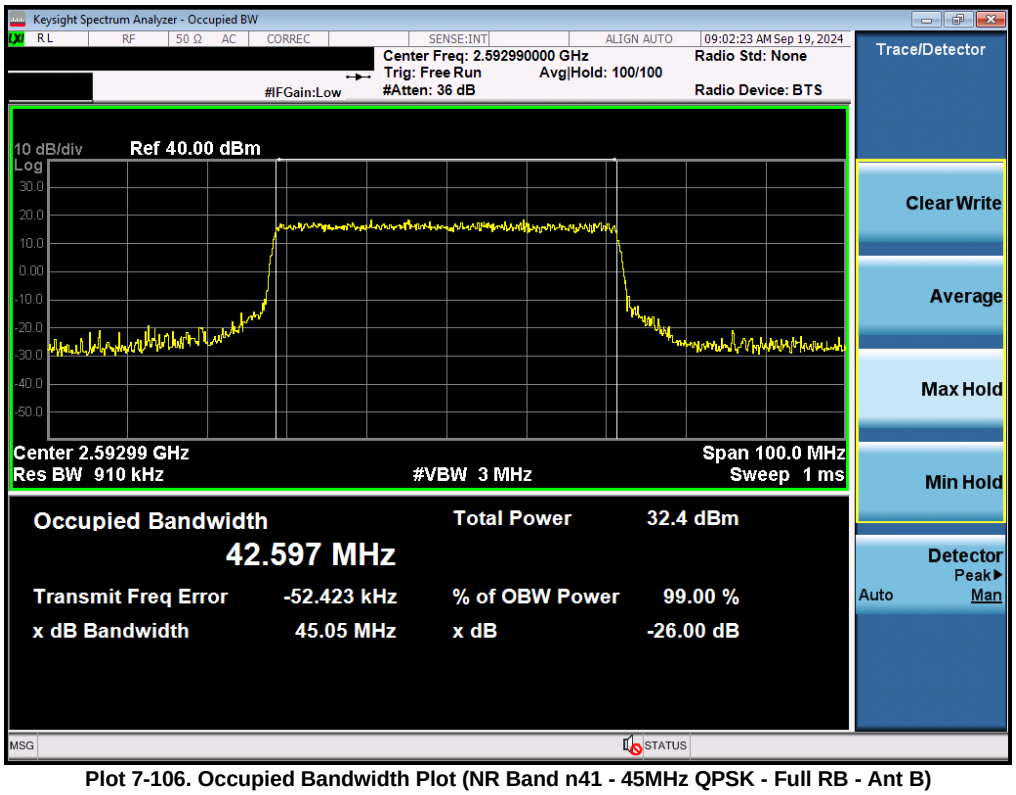


Plot 7-103. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB - Ant B)

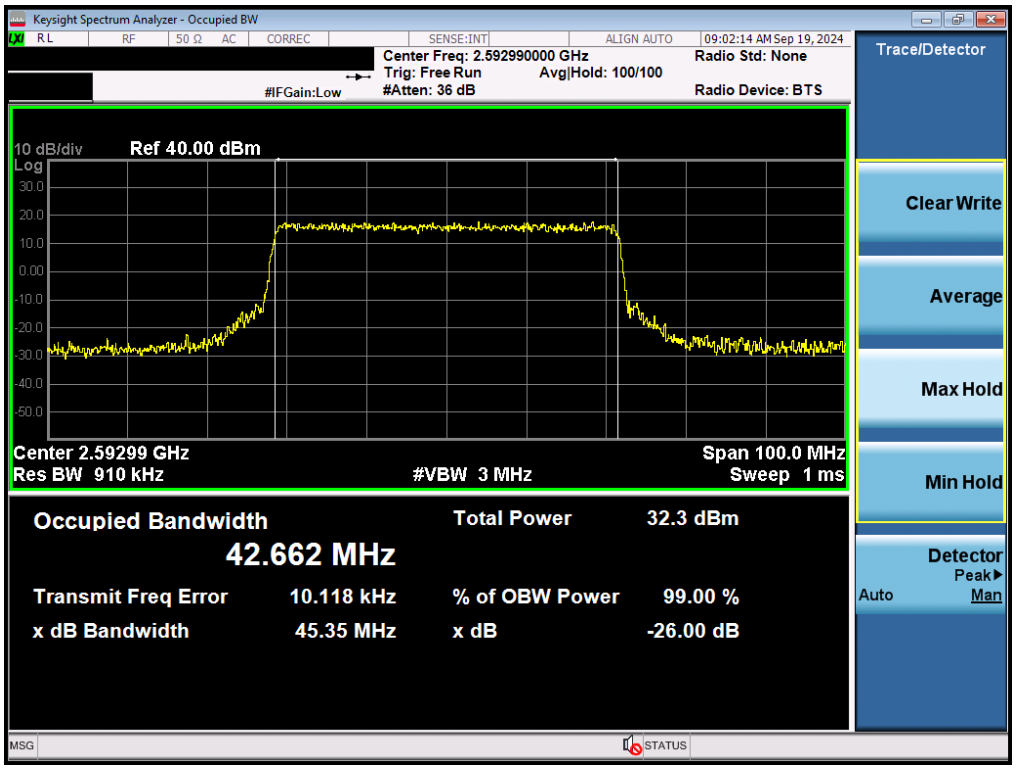


Plot 7-104. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB - Ant B)

Plot 7-105. Occupied Bandwidth Plot (NR Band n41 - 45MHz π/2 BPSK - Full RB - Ant B)

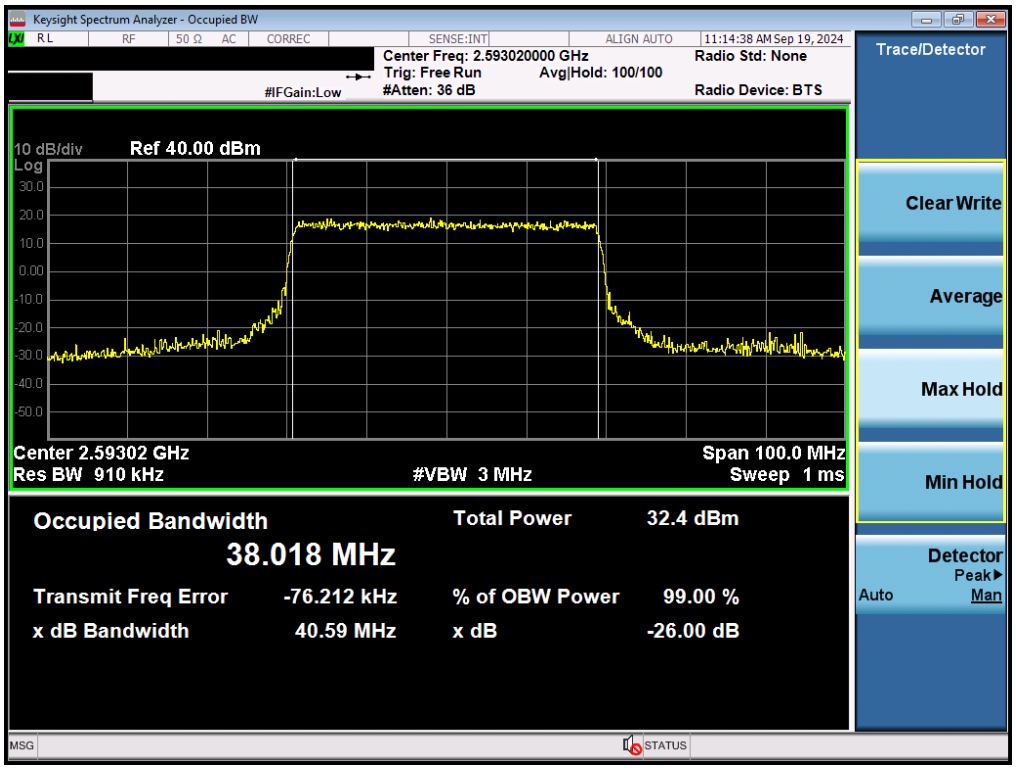


Plot 7-106. Occupied Bandwidth Plot (NR Band n41 - 45MHz QPSK - Full RB - Ant B)

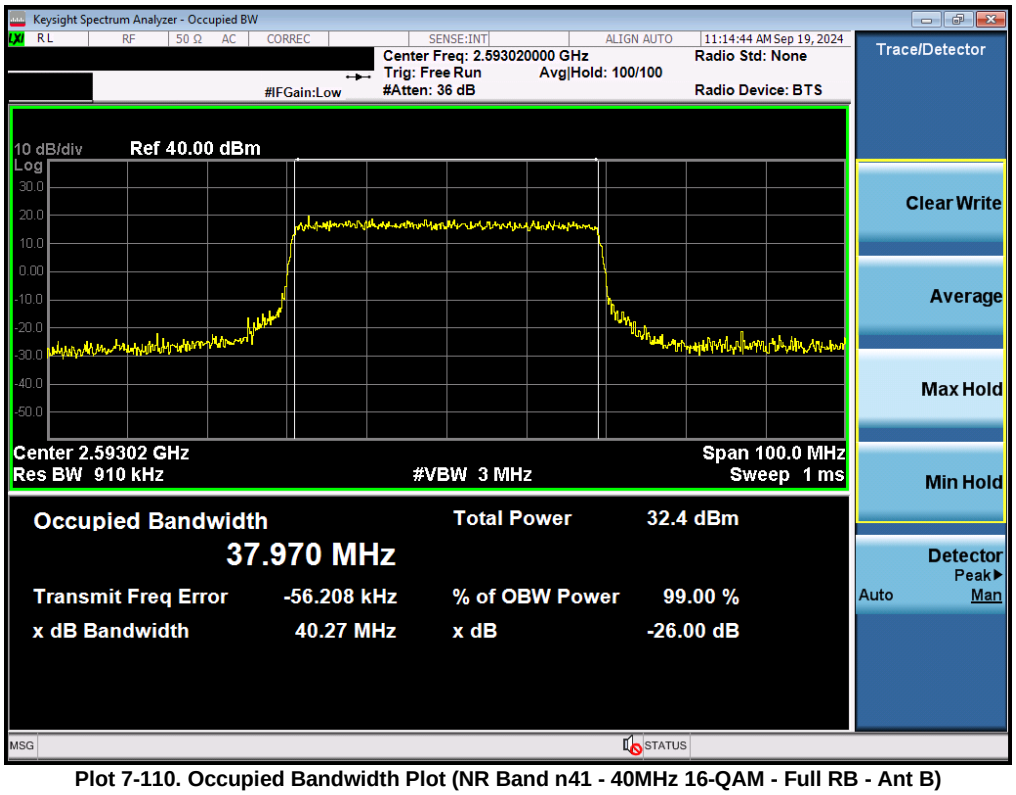


Plot 7-107. Occupied Bandwidth Plot (NR Band n41 - 45MHz 16-QAM - Full RB - Ant B)

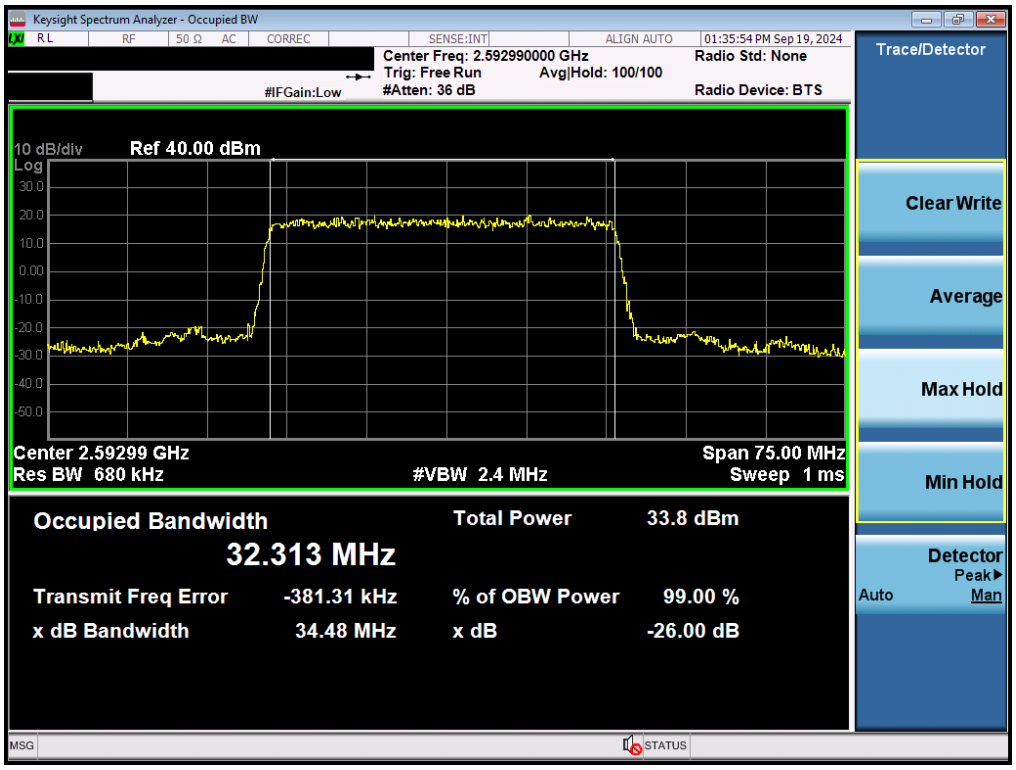
Plot 7-108. Occupied Bandwidth Plot (NR Band n41 - 40MHz π/2 BPSK - Full RB - Ant B)



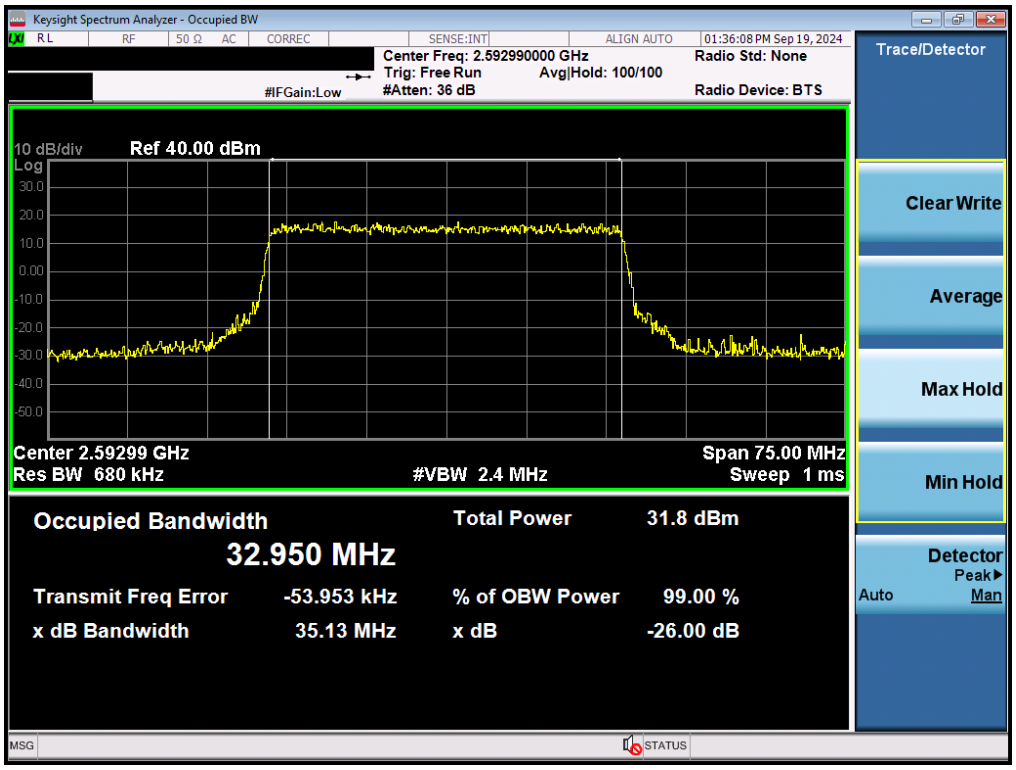
Plot 7-109. Occupied Bandwidth Plot (NR Band n41 - 40MHz QPSK - Full RB - Ant B)



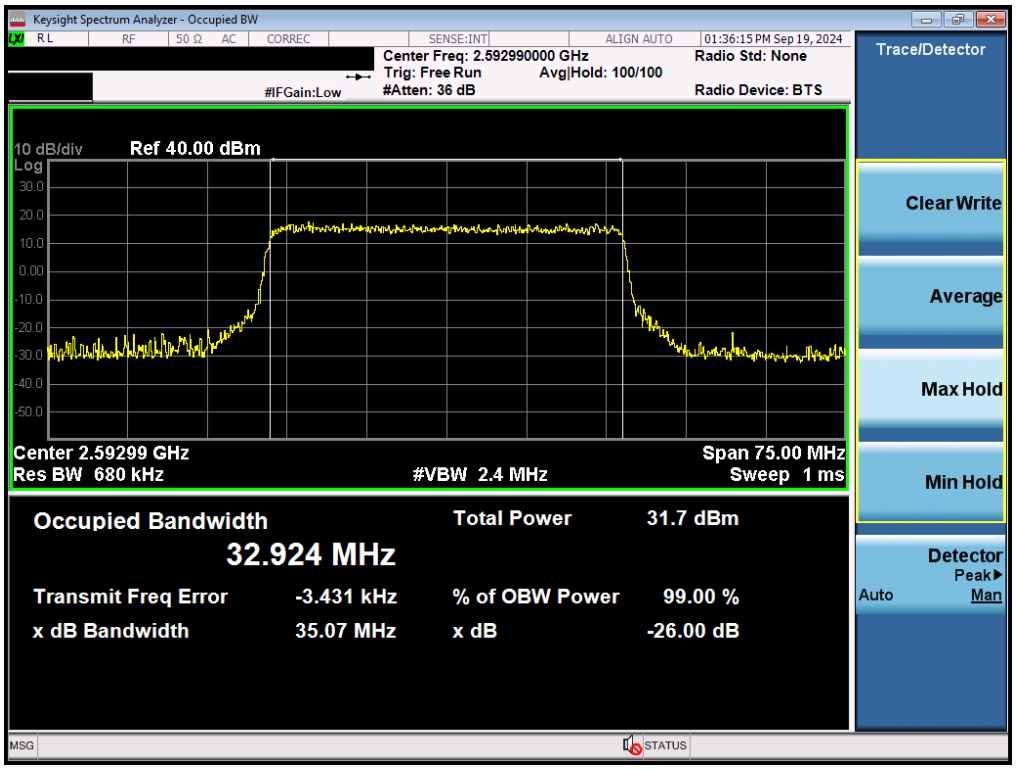
Plot 7-110. Occupied Bandwidth Plot (NR Band n41 - 40MHz 16-QAM - Full RB - Ant B)



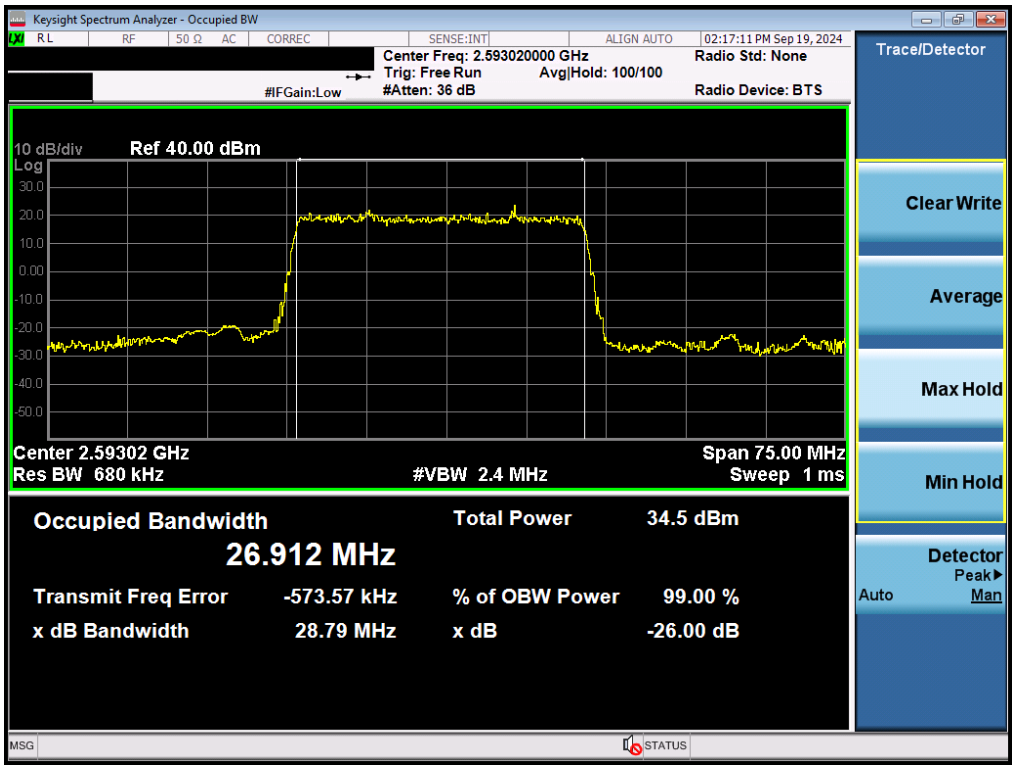
Plot 7-111. Occupied Bandwidth Plot (NR Band n41 - 35MHz π/2 BPSK - Full RB - Ant B)



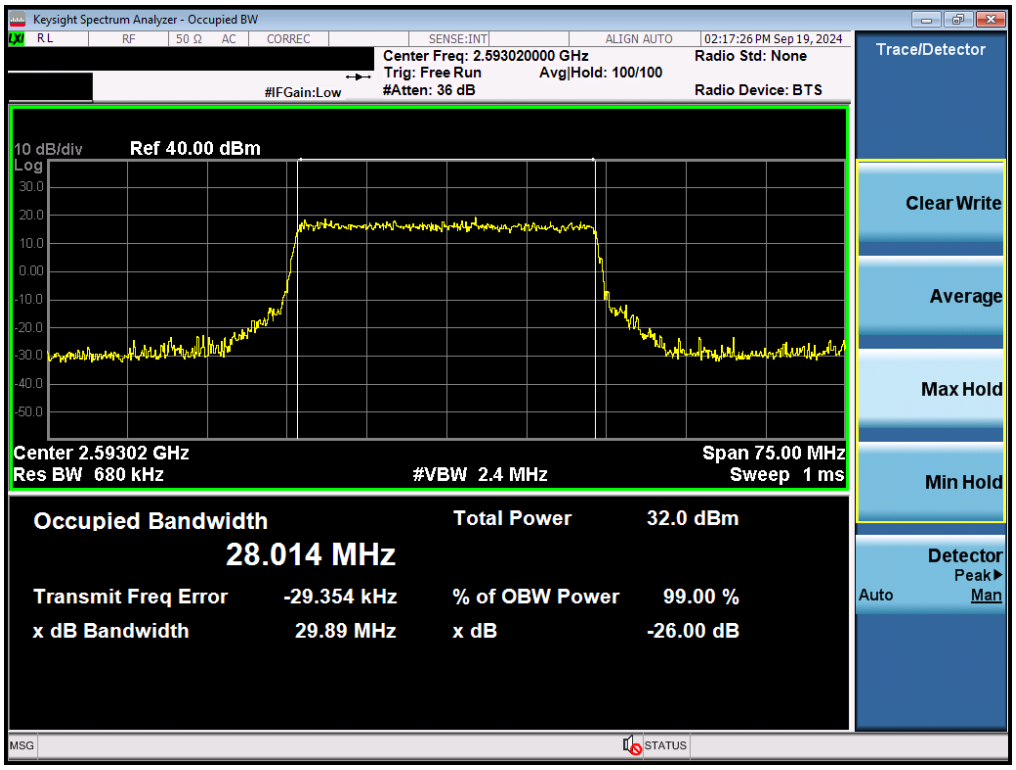
Plot 7-112. Occupied Bandwidth Plot (NR Band n41 - 35MHz QPSK - Full RB - Ant B)



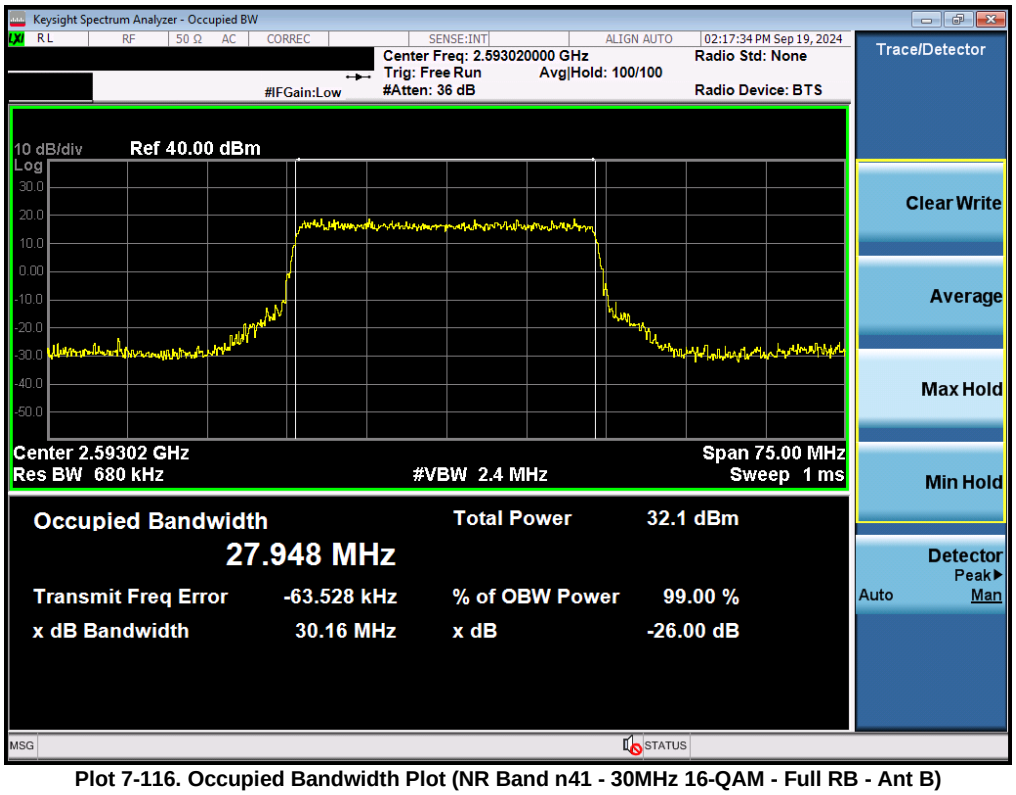
Plot 7-113. Occupied Bandwidth Plot (NR Band n41 - 35MHz 16-QAM - Full RB - Ant B)



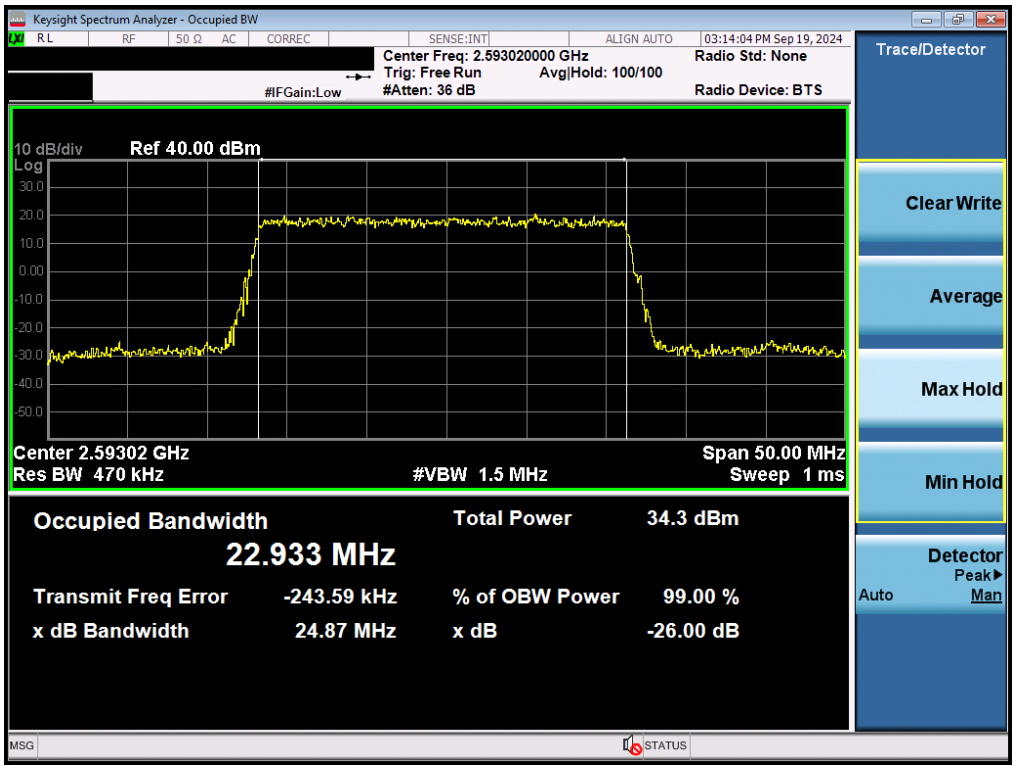
Plot 7-114. Occupied Bandwidth Plot (NR Band n41 - 30MHz π/2 BPSK - Full RB - Ant B)



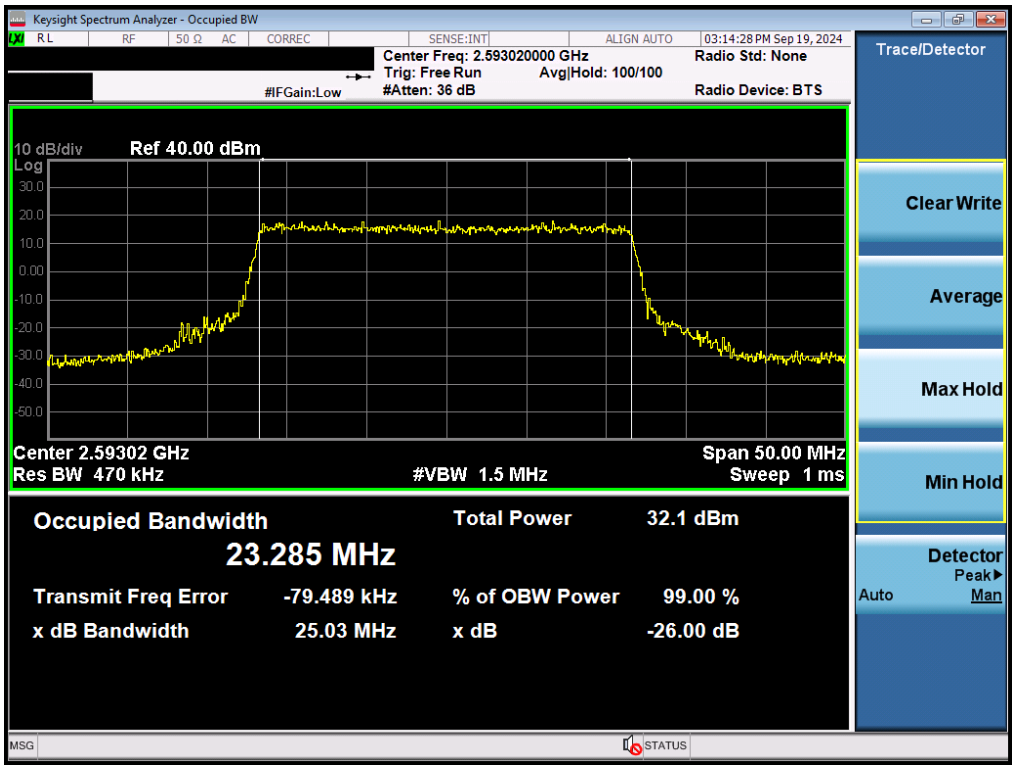
Plot 7-115. Occupied Bandwidth Plot (NR Band n41 - 30MHz QPSK - Full RB - Ant B)



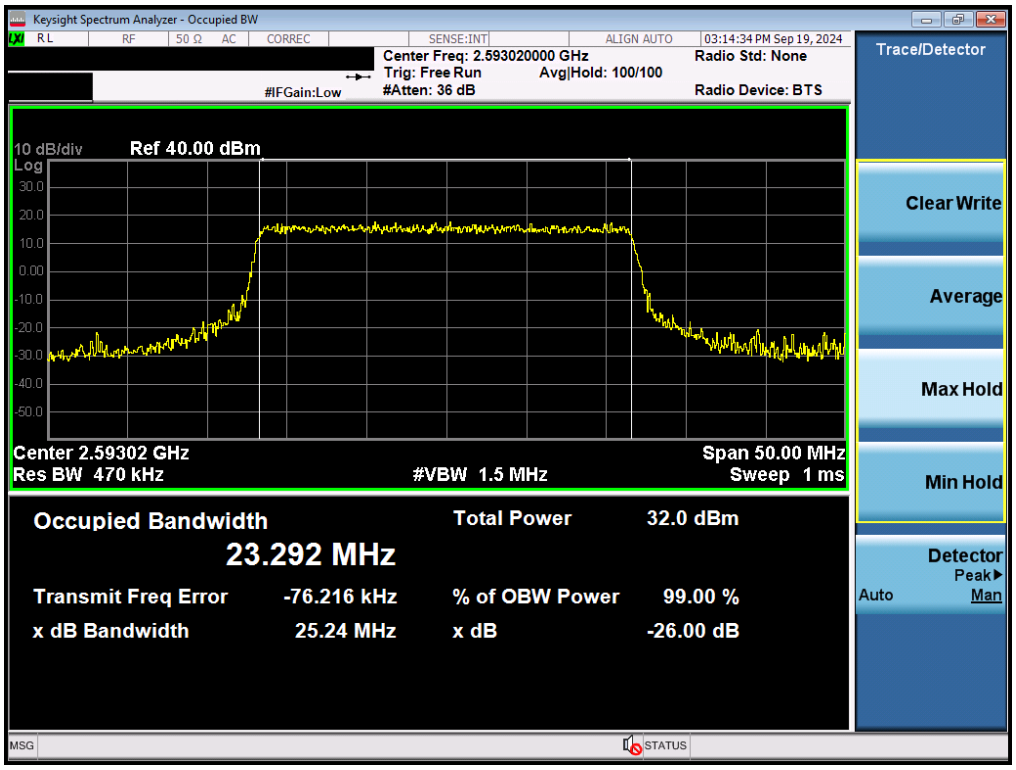
Plot 7-116. Occupied Bandwidth Plot (NR Band n41 - 30MHz 16-QAM - Full RB - Ant B)



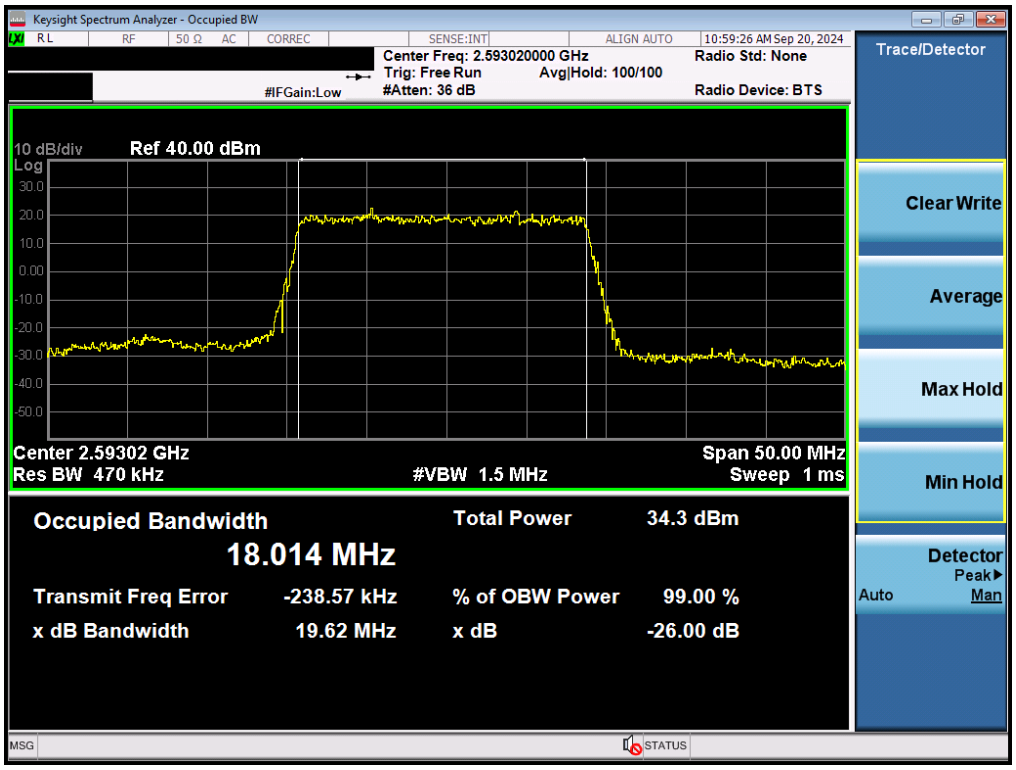
Plot 7-117. Occupied Bandwidth Plot (NR Band n41 - 25MHz π/2 BPSK - Full RB - Ant B)



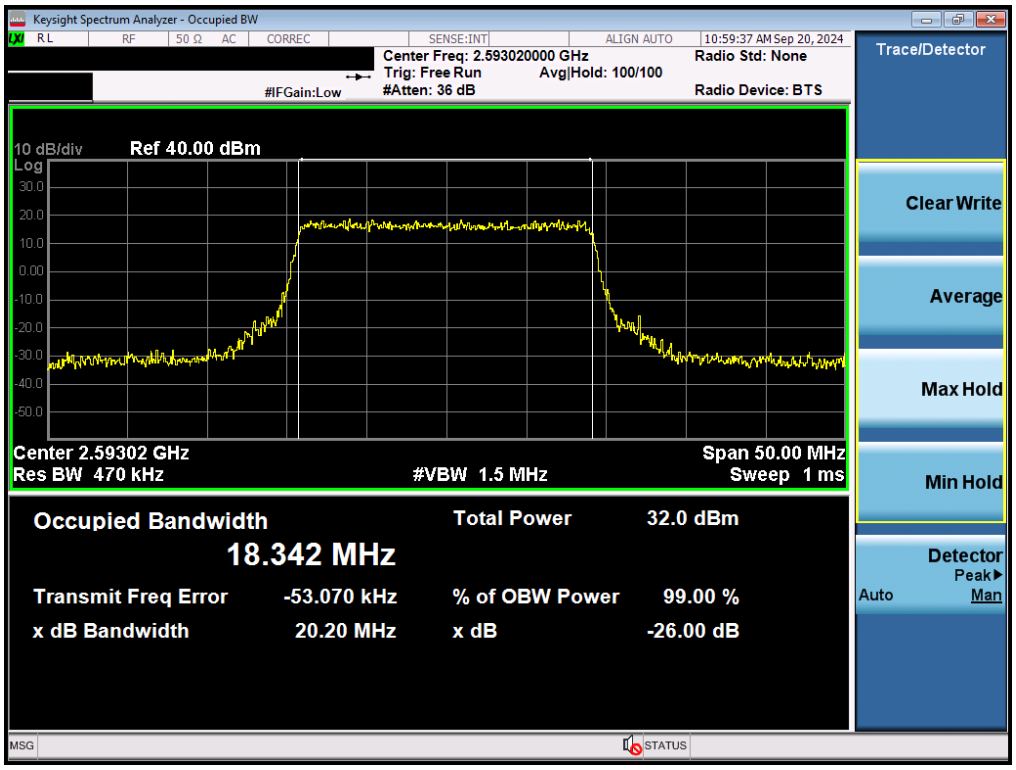
Plot 7-118. Occupied Bandwidth Plot (NR Band n41 - 25MHz QPSK - Full RB - Ant B)



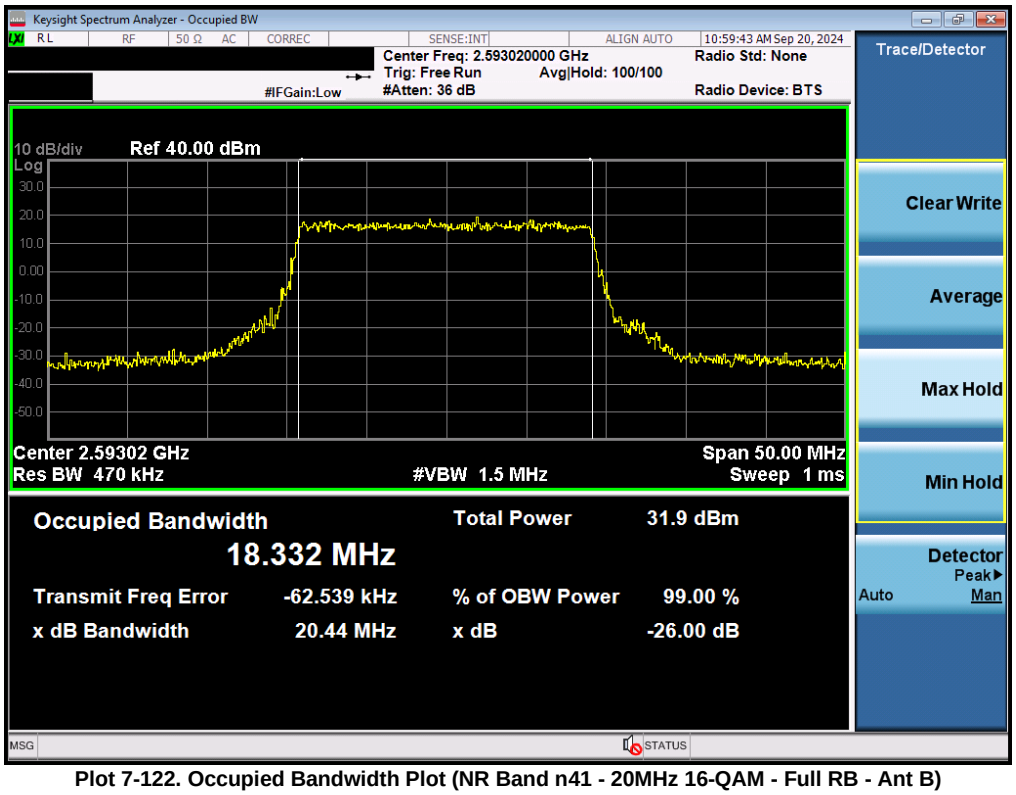
Plot 7-119. Occupied Bandwidth Plot (NR Band n41 - 25MHz 16-QAM - Full RB - Ant B)



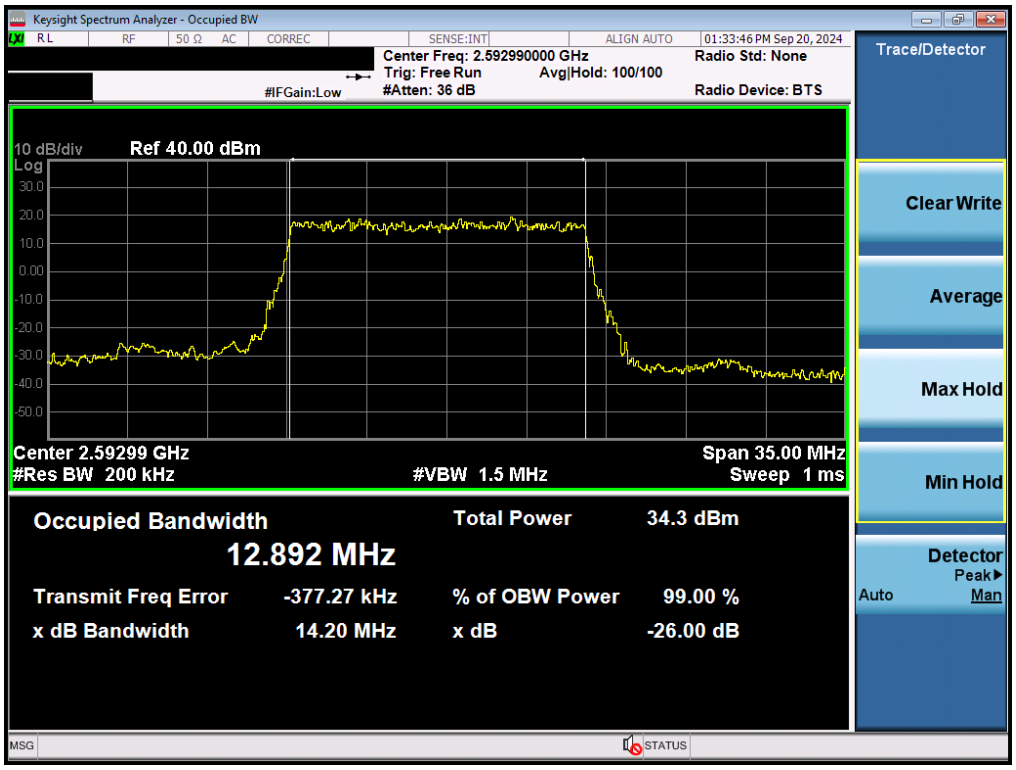
Plot 7-120. Occupied Bandwidth Plot (NR Band n41 - 20MHz π/2 BPSK - Full RB - Ant B)



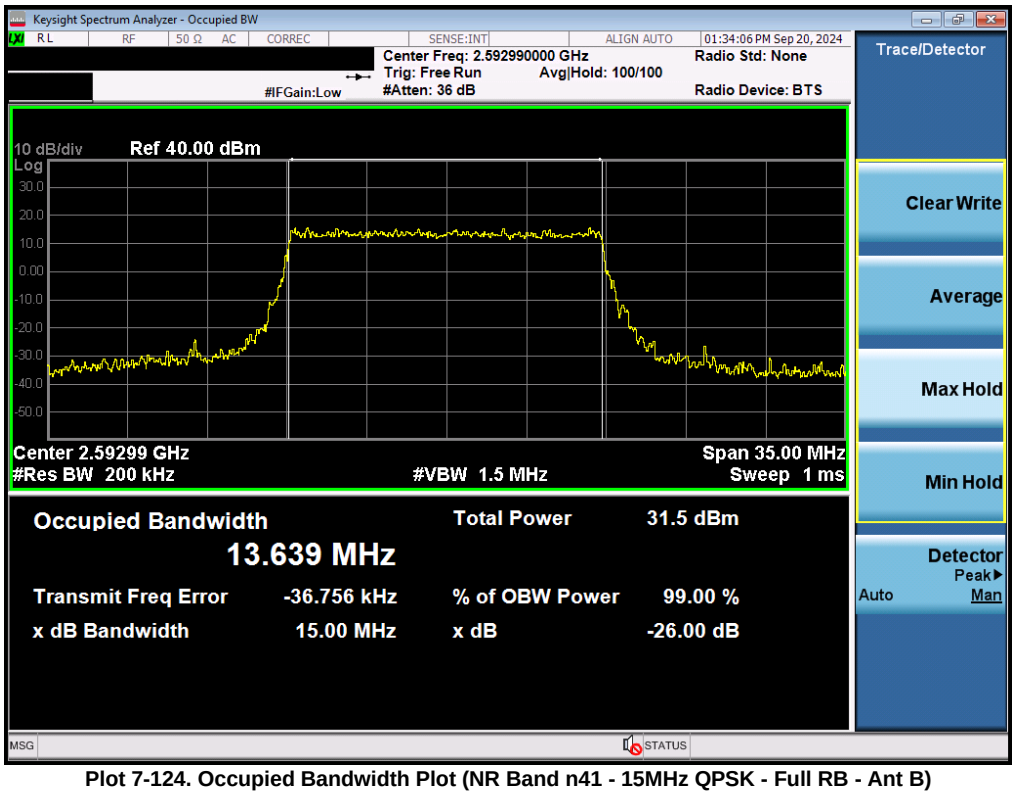
Plot 7-121. Occupied Bandwidth Plot (NR Band n41 - 20MHz QPSK - Full RB - Ant B)



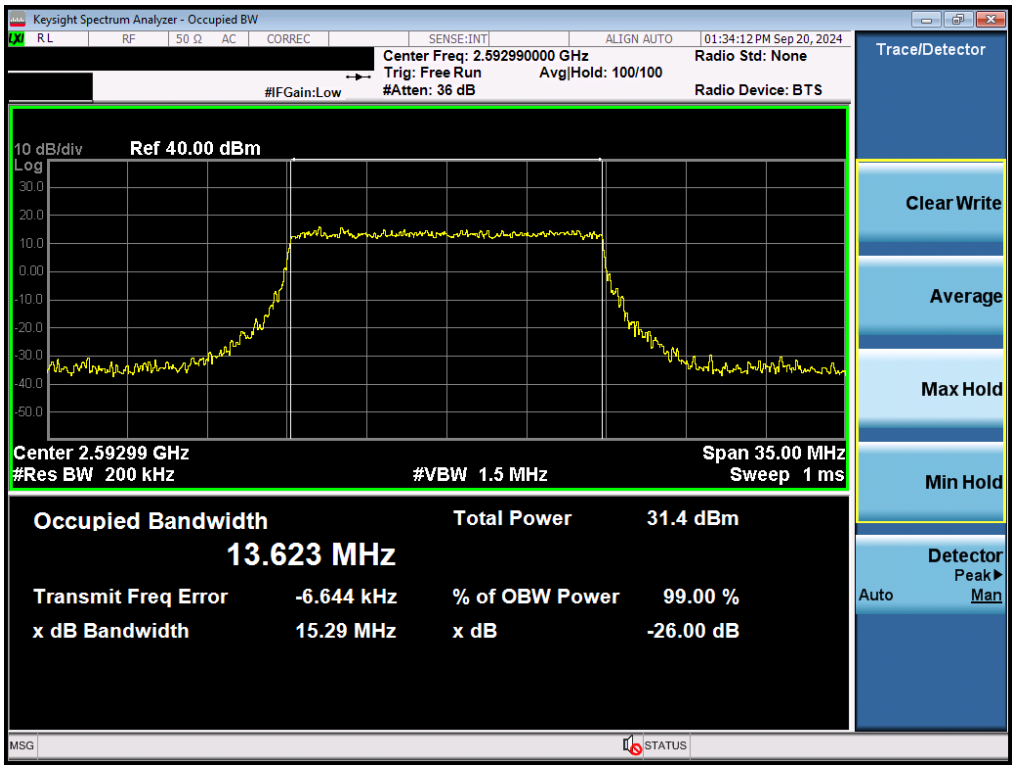
Plot 7-122. Occupied Bandwidth Plot (NR Band n41 - 20MHz 16-QAM - Full RB - Ant B)



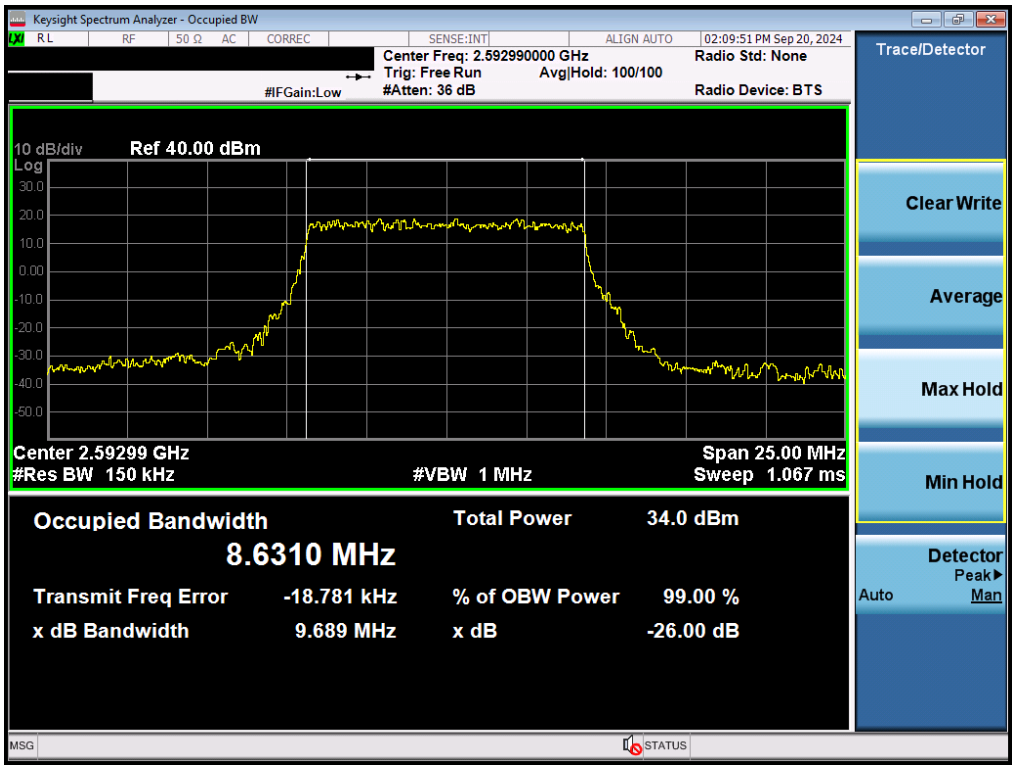
Plot 7-123. Occupied Bandwidth Plot (NR Band n41 - 15MHz π/2 BPSK - Full RB - Ant B)



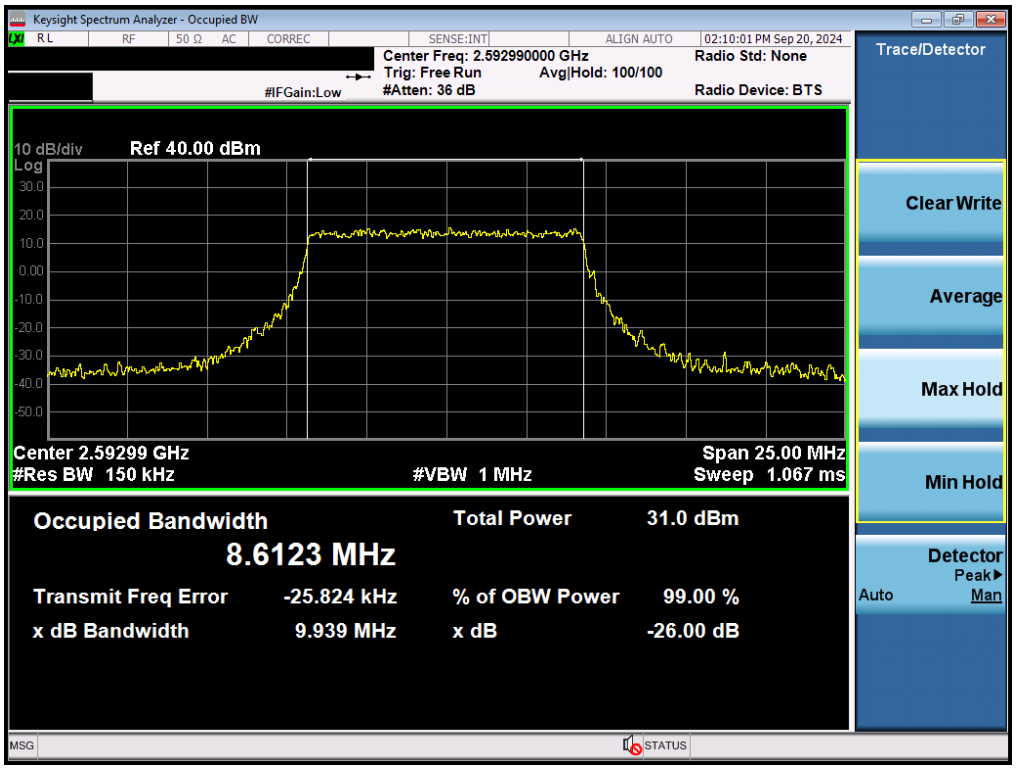
Plot 7-124. Occupied Bandwidth Plot (NR Band n41 - 15MHz QPSK - Full RB - Ant B)



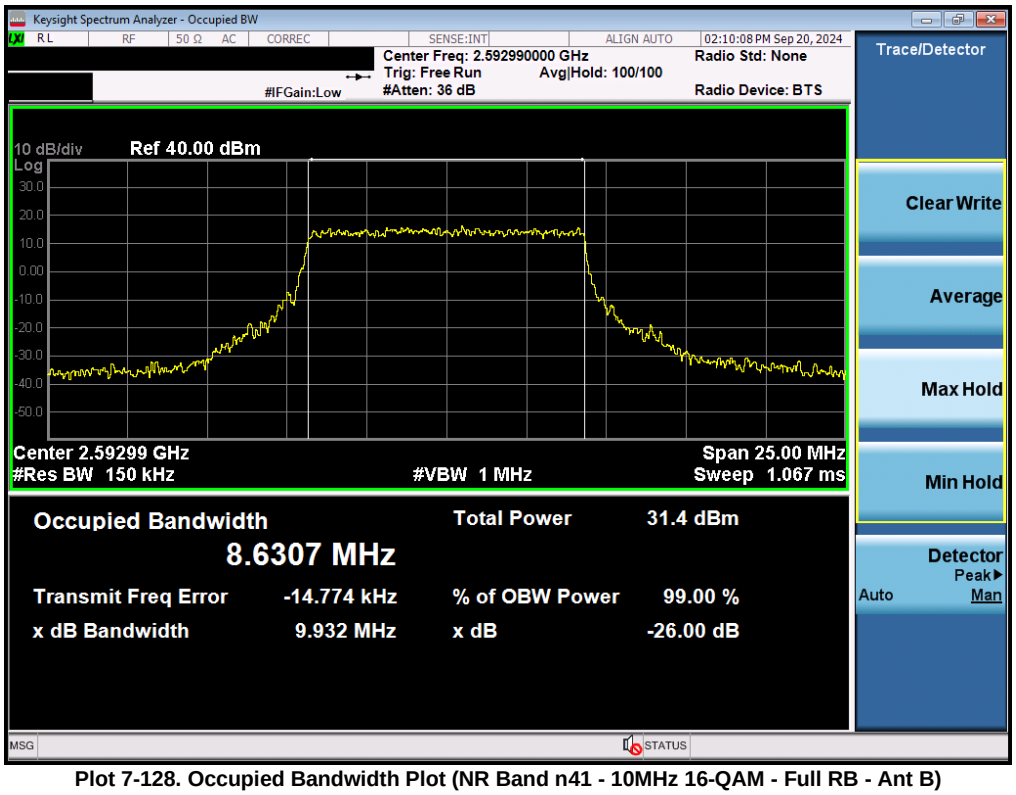
Plot 7-125. Occupied Bandwidth Plot (NR Band n41 - 15MHz 16-QAM - Full RB - Ant B)



Plot 7-126. Occupied Bandwidth Plot (NR Band n41 - 10MHz π/2 BPSK - Full RB - Ant B)



Plot 7-127. Occupied Bandwidth Plot (NR Band n41 - 10MHz QPSK - Full RB - Ant B)



Plot 7-128. Occupied Bandwidth Plot (NR Band n41 - 10MHz 16-QAM - Full RB - Ant B)

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	97.07
		QPSK	98.29
		16QAM	98.27

Table 7-8. Occupied Bandwidth Test Results – NR – Ant B – Default

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	96.79
		QPSK	97.75
		16QAM	97.72

Table 7-9. Occupied Bandwidth Test Results – NR – Ant F – Switching

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	96.94
		QPSK	98.11
		16QAM	98.04

Table 7-10. Occupied Bandwidth Test Results – NR – Ant E – Default

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	96.64
		QPSK	97.81
		16QAM	97.79

Table 7-11. Occupied Bandwidth Test Results – NR – Ant D – Switching

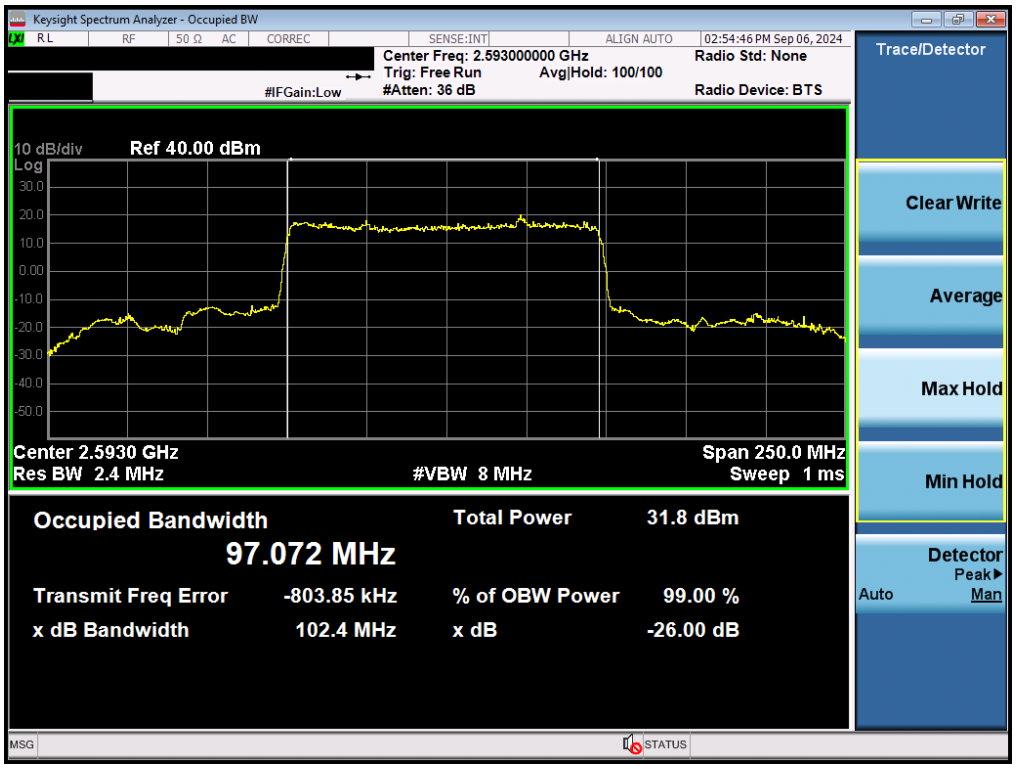
Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	97.09
		QPSK	98.07
		16QAM	98.35

Table 7-12. Occupied Bandwidth Test Results – NR – Ant D – Default

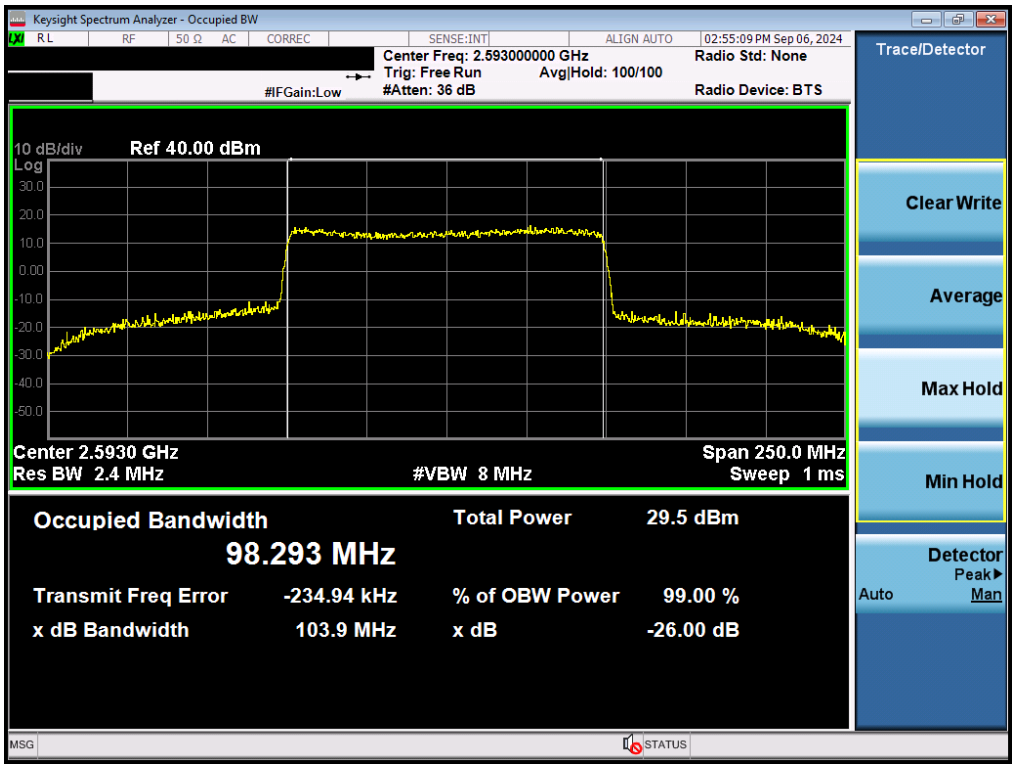
Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC2	100MHz	π/2 BPSK	96.86
		QPSK	97.80
		16QAM	97.91

Table 7-13. Occupied Bandwidth Test Results – NR – Ant E – Switching

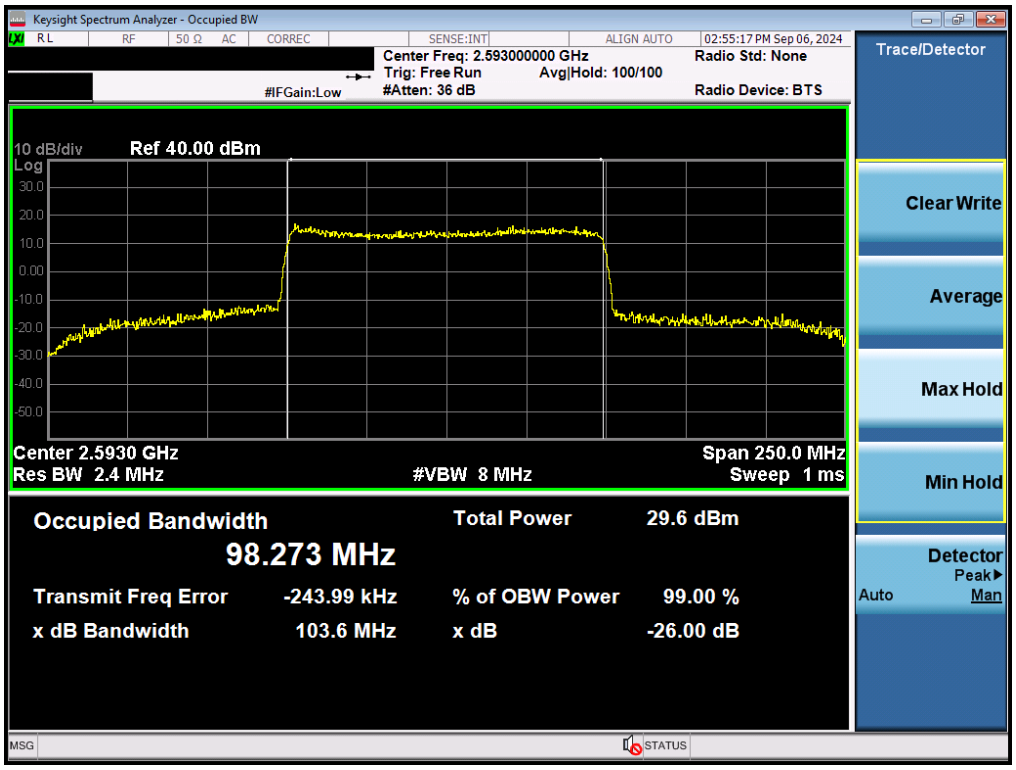
NR Band n41(PC2) – Ant B – Default



Plot 7-129. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant B)



Plot 7-130. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant B)

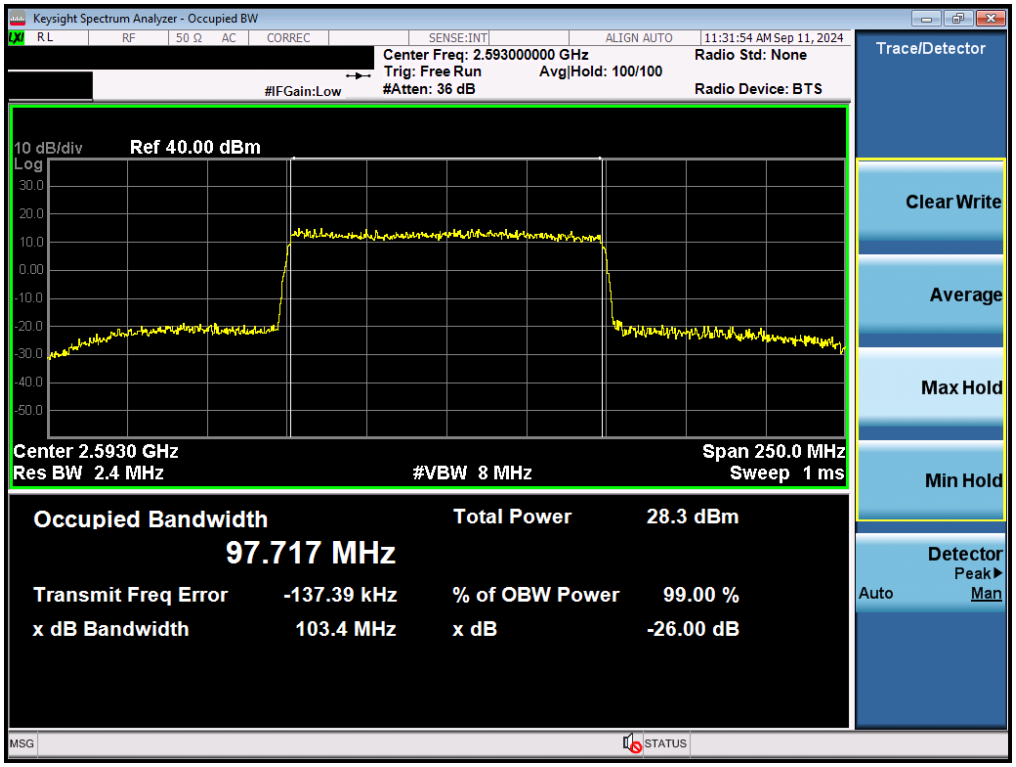


Plot 7-131. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant B)

NR Band n41(PC2) – Ant F – Switching

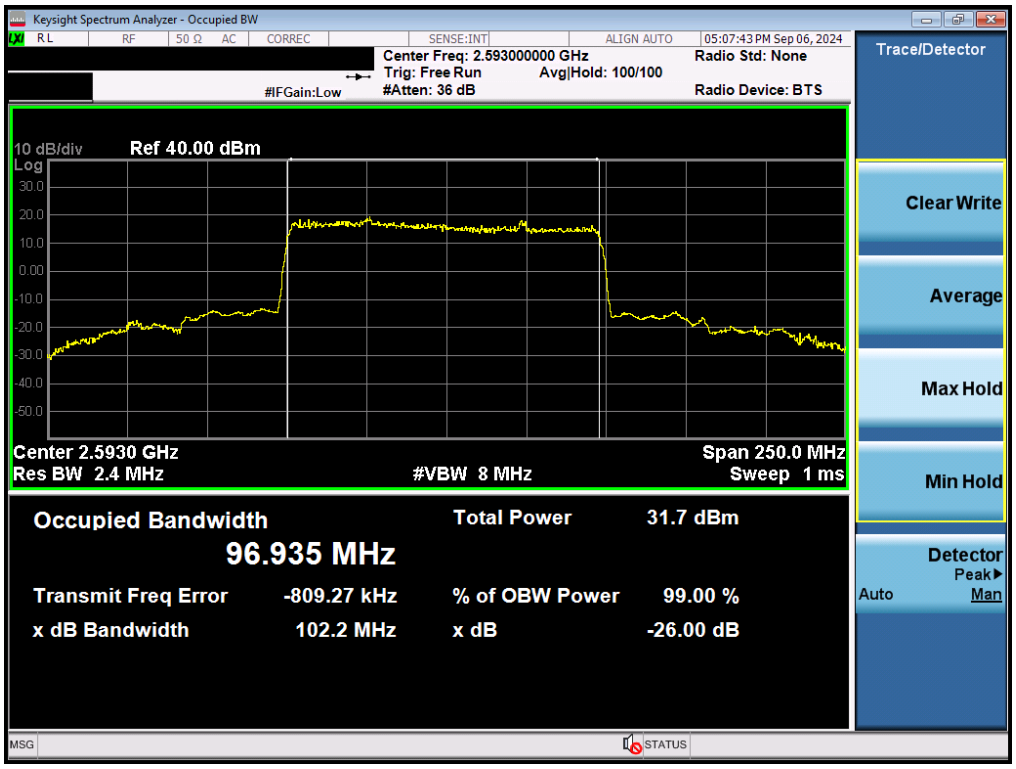
Plot 7-132. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant F)

Plot 7-133. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant F)



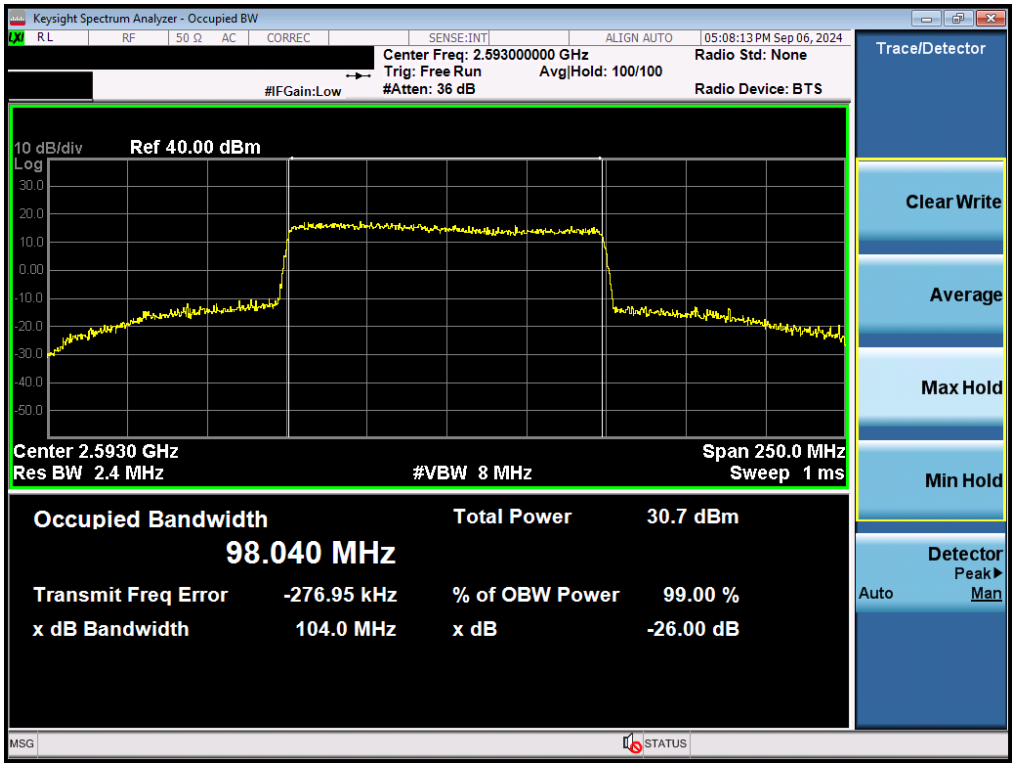
Plot 7-134. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant F)

NR Band n41(PC2) – Ant E – Default



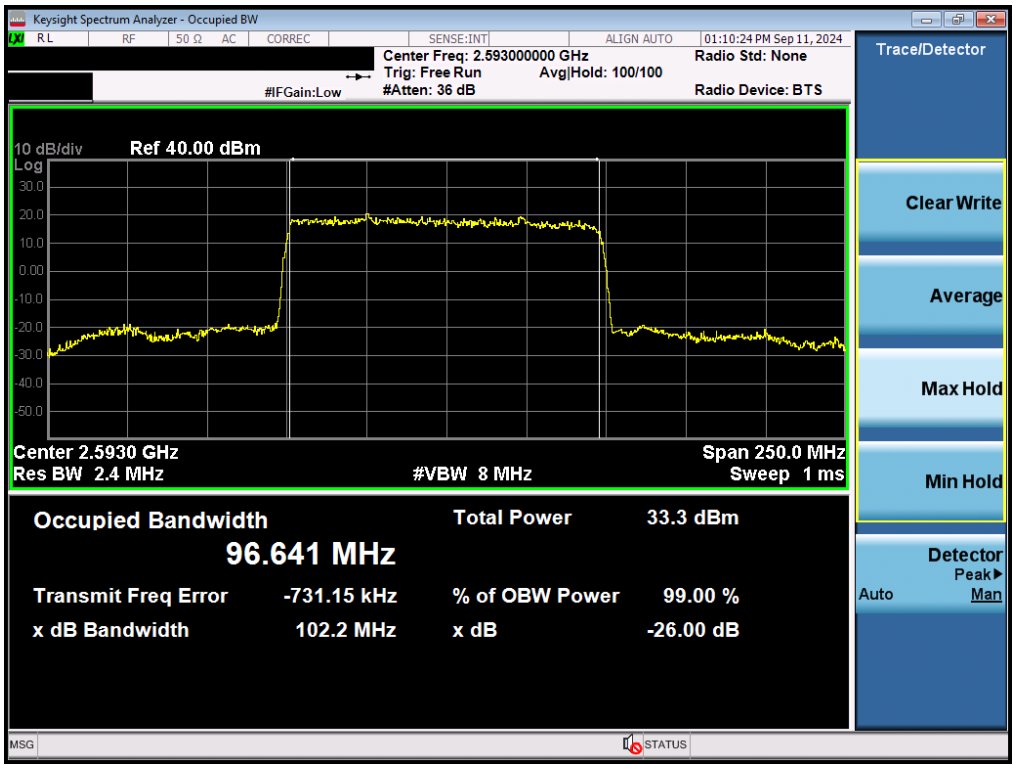
Plot 7-135. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant E)

Plot 7-136. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant E)



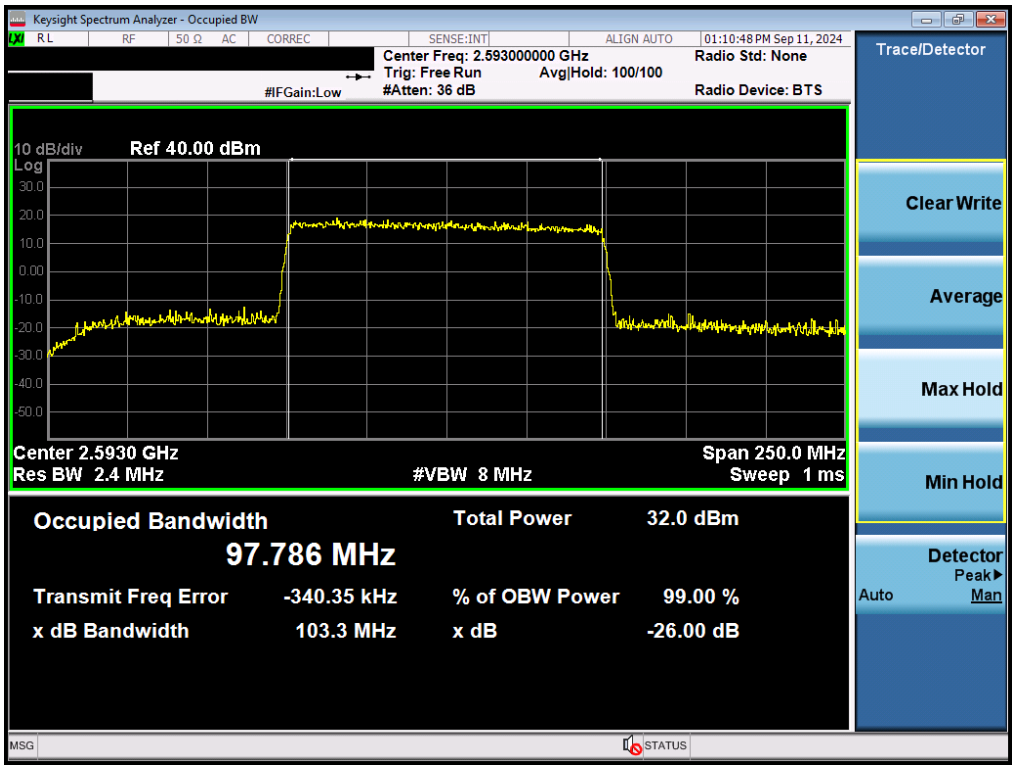
Plot 7-137. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant E)

NR Band n41(PC2) – Ant D – Switching



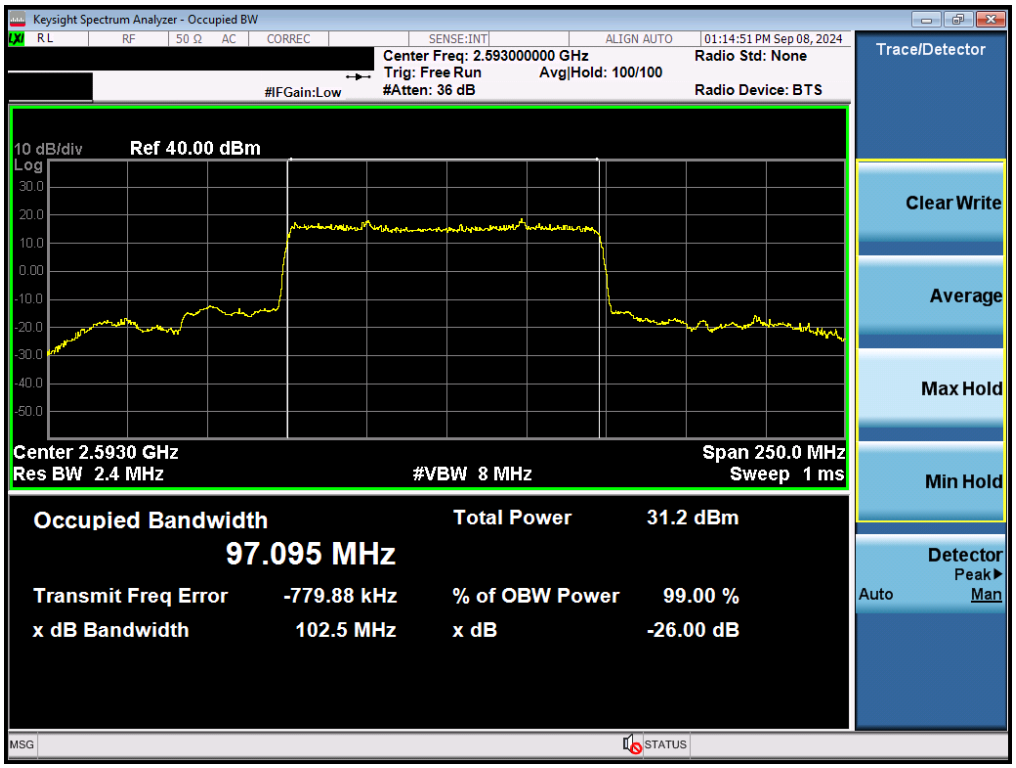
Plot 7-138. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant D)

Plot 7-139. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant D)



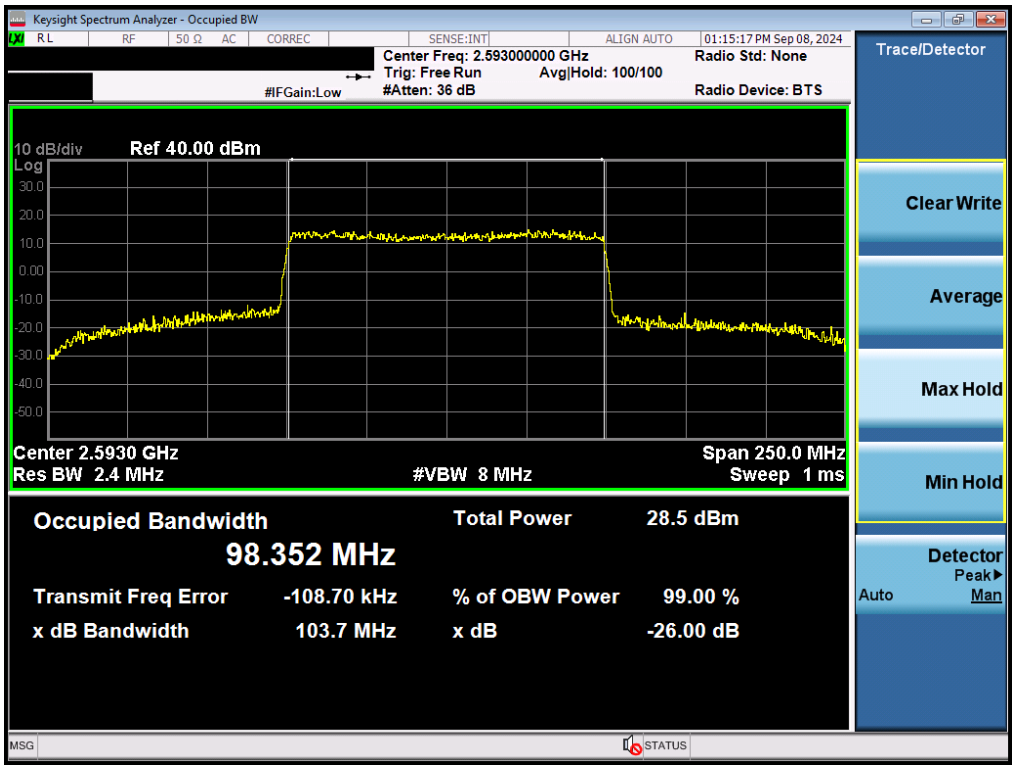
Plot 7-140. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant D)

NR Band n41(PC2) – Ant D – Default



Plot 7-141. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant D)

Plot 7-142. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant D)

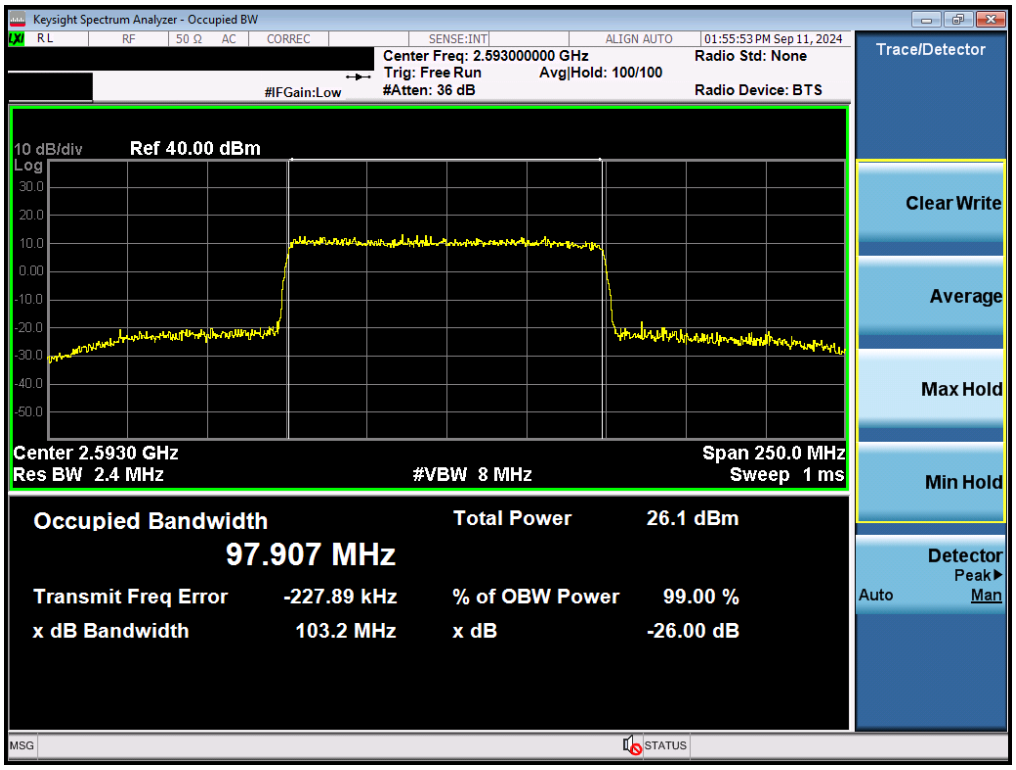


Plot 7-143. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant D)

NR Band n41(PC2) – Ant E – Switching

Plot 7-144. Occupied Bandwidth Plot (NR Band n41 - 100MHz π/2 BPSK - Full RB - Ant E)

Plot 7-145. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant E)



Plot 7-146. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant E)

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.

For Band 30, the minimum permissible attenuation level of any spurious emission <2288MHz and >2365MHz is 70 + 10 $log_{10}(P_{[Watts]})$.

For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is 55 + 10$log_{10}(P_{[Watts]})$.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (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.

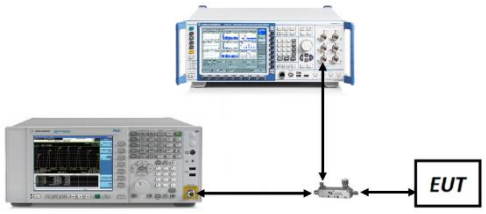


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

1. Per Part 27, RSS-195 and RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.

2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

3. Per ANSI C63.26-2015, MIMO compliance was addressed by adding 10log(2) = 3dB to the output of each antenna. A visual inspection of the plots for each antenna shows that the emissions are still compliant even after adding 3dB.

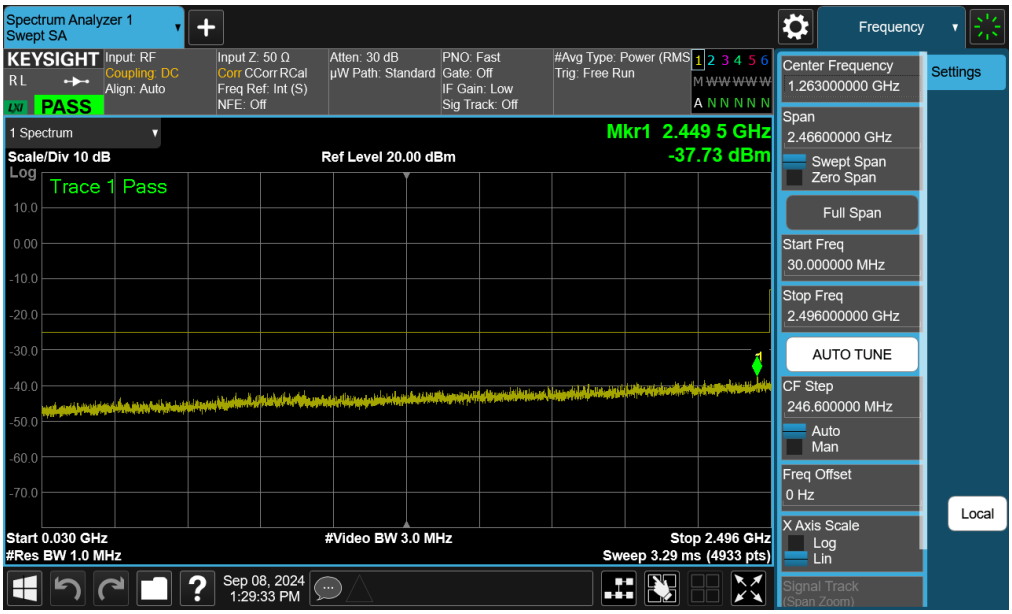
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC2	20MHz	Low	30.0 - 2475.0	-37.60	-25	-12.60
		Low	2690.0 - 15000.0	-35.99	-25	-10.99
		Low	15000.0 - 27000.0	-45.84	-25	-20.84
		Mid	30.0 - 2496.0	-37.73	-25	-12.73
		Mid	2690.0 - 15000.0	-34.36	-25	-9.36
		Mid	15000.0 - 27000.0	-45.36	-25	-20.36
		High	30.0 - 2500.0	-37.20	-25	-12.20
		High	2690.0 - 15000.0	-36.15	-25	-11.15
		High	15000.0 - 27000.0	-45.55	-25	-20.55

Table 7-14. Conducted Emission Test Results – LTE – Ant B

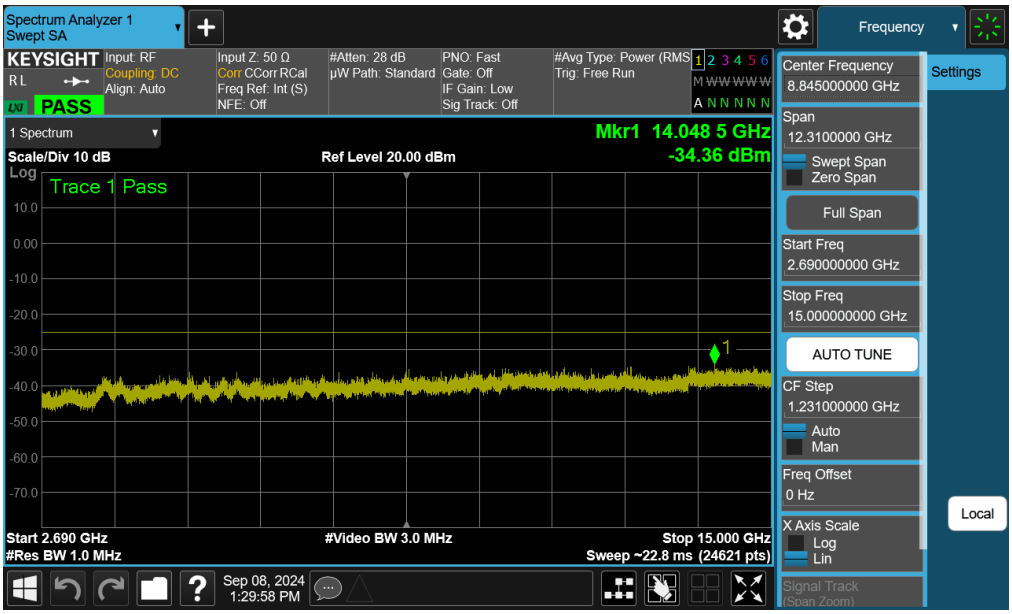
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC2	20MHz	Low	30.0 - 2475.0	-38.28	-25.0	-13.28
		Low	2690.0 - 15000.0	-34.99	-25.0	-9.99
		Low	15000.0 - 27000.0	-45.86	-25	-20.86
		Mid	30.0 - 2500.0	-37.18	-25	-12.18
		Mid	2690.0 - 15000.0	-36.42	-25	-11.42
		Mid	15000.0 - 27000.0	-45.08	-25	-20.08
		High	30.0 - 2500.0	-38.63	-25	-13.63
		High	2690.0 - 15000.0	-35.48	-25	-10.48
		High	15000.0 - 27000.0	-45.49	-25	-20.49

Table 7-15. Conducted Emission Test Results – LTE – Ant F

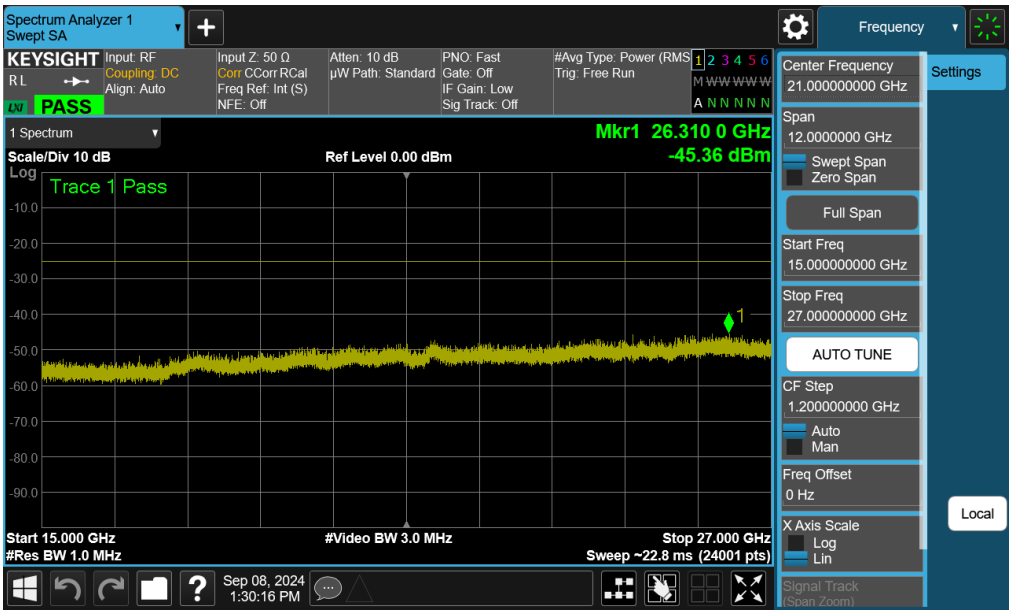
LTE Band 41(PC2) – Ant B



Plot 7-147. Conducted Spurious Plot (LTE Band 41(PC2)- 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)

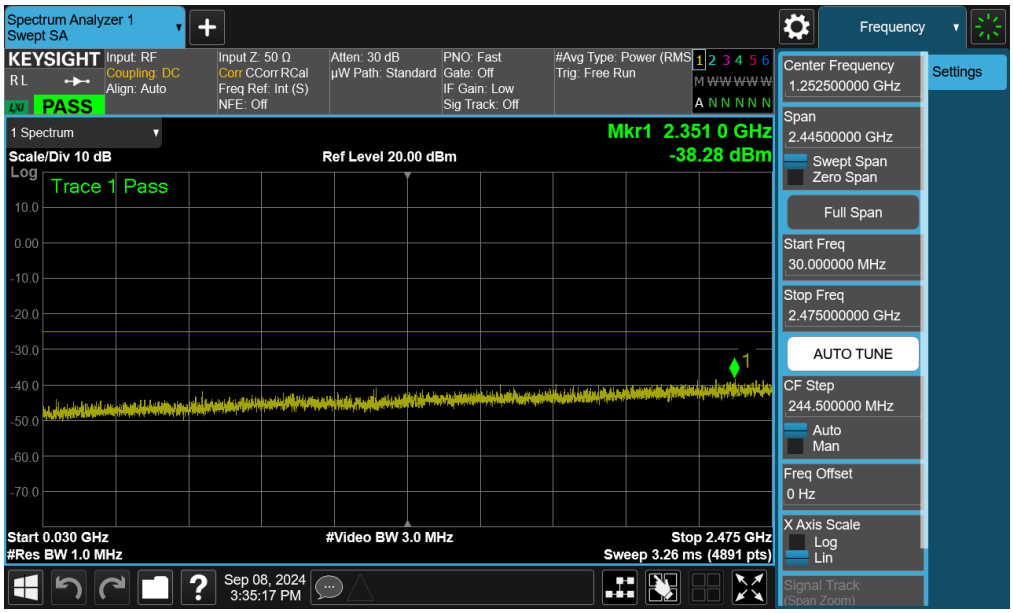


Plot 7-148. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)

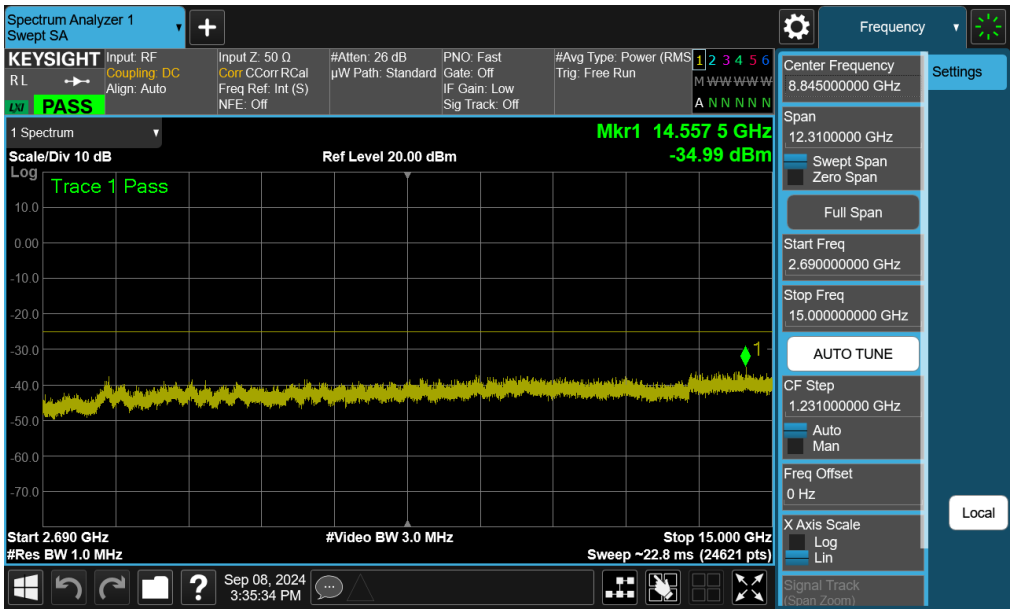


Plot 7-149. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)

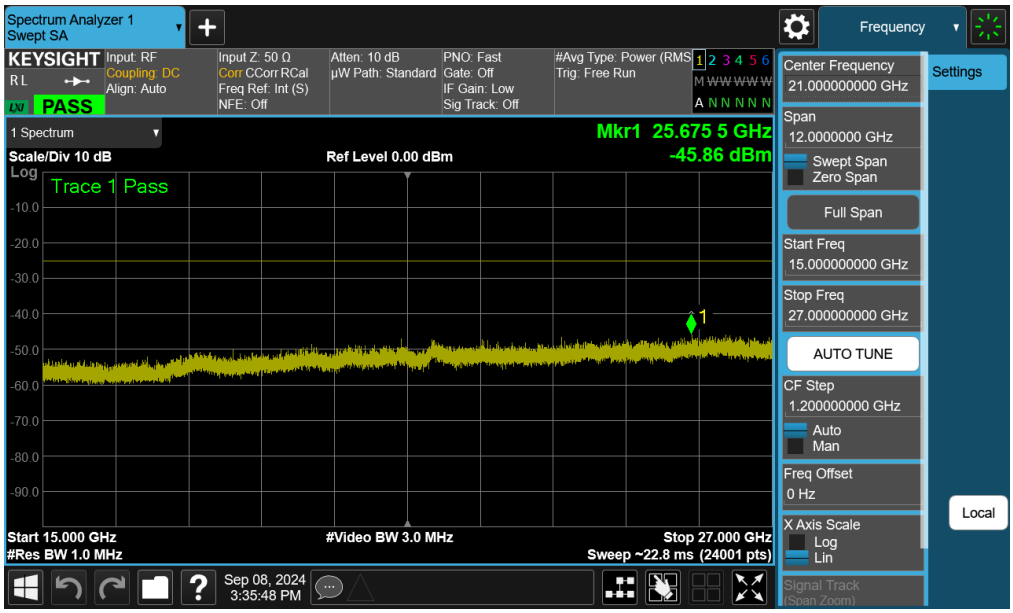
LTE Band 41(PC2) – Ant F



Plot 7-150. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant F)



Plot 7-151. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 – Low Channel - Ant F)



Plot 7-152. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low **Channel - Ant F)**

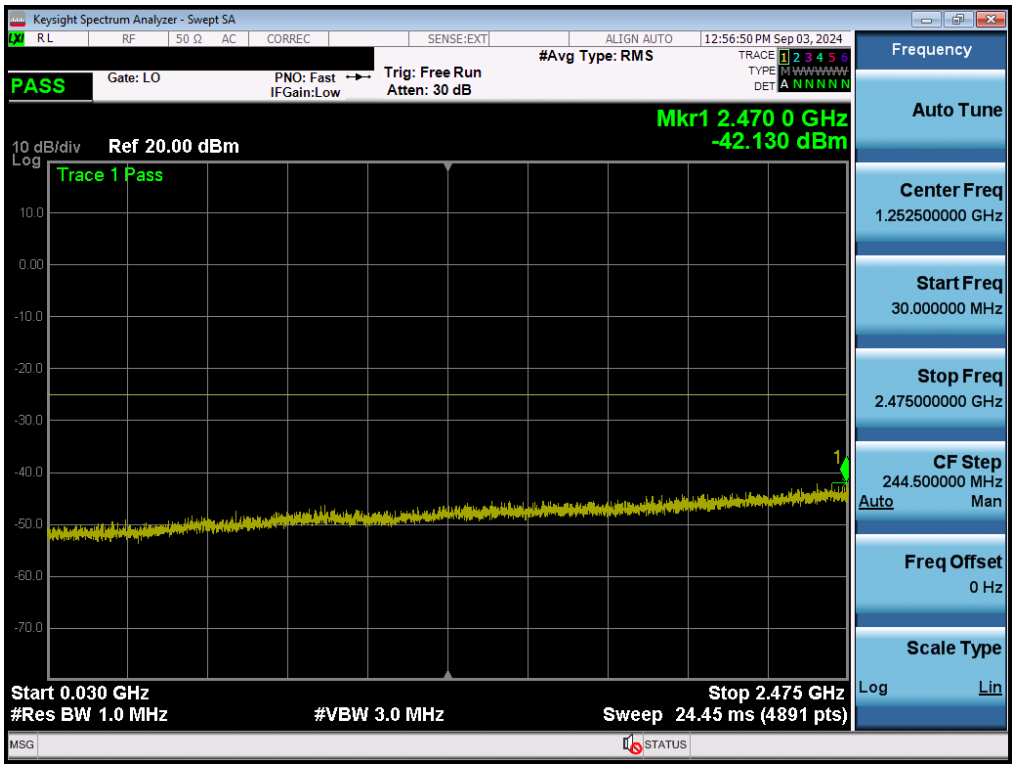
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC3	20MHz	Low	30.0 - 2288.0	-42.13	-25	-17.13
		Low	2365.0 - 15000.0	-43.21	-25	-18.21
		Low	15000.0 - 27000.0	-46.05	-25	-21.05
		Mid	30.0 - 2288.0	-42.95	-25	-17.95
		Mid	2570.0 - 15000.0	-43.83	-25	-18.83
		Mid	15000.0 - 27000.0	-46.56	-25	-21.56
		High	30.0 - 2288.0	-43.06	-25	-18.06
		High	2570.0 - 15000.0	-44.17	-25	-19.17
		High	15000.0 - 27000.0	-46.43	-25	-21.43

Table 7-16. Conducted Emission Test Results – LTE – Ant B

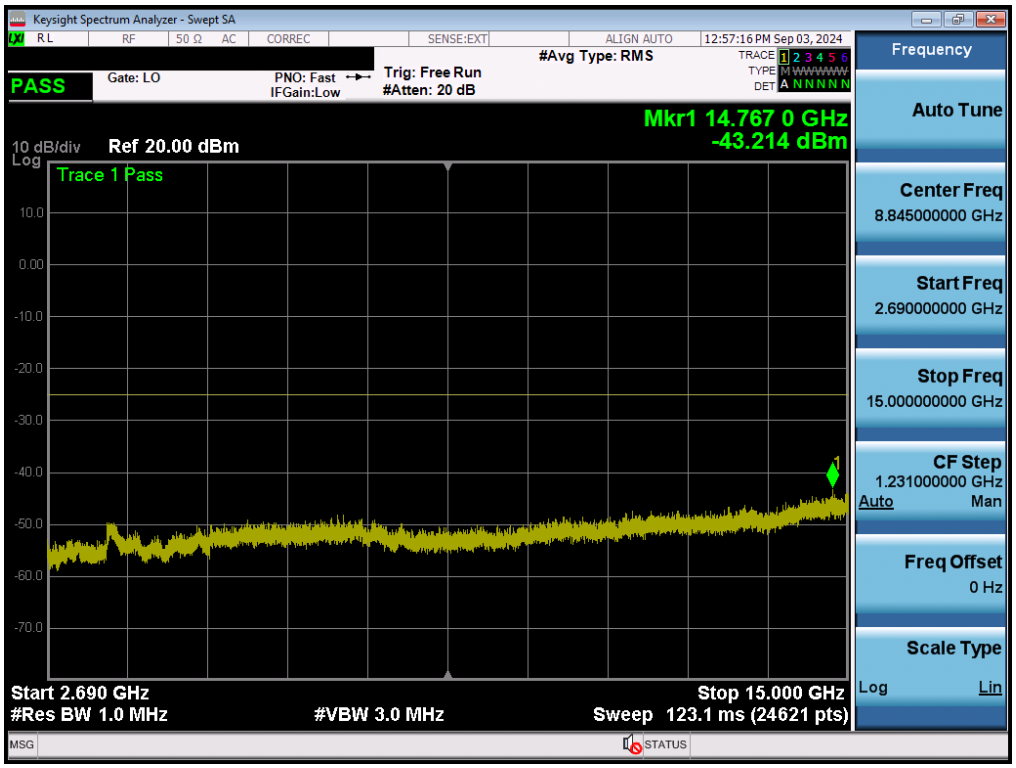
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC3	20MHz	Low	30.0 - 2288.0	-43.12	-25	-18.12
		Low	2365.0 - 15000.0	-43.84	-25	-18.83
		Low	15000.0 - 27000.0	-46.59	-25	-21.58
		Mid	30.0 - 2288.0	-42.76	-25	-17.75
		Mid	2570.0 - 15000.0	-43.72	-25	-18.72
		Mid	15000.0 - 27000.0	-46.30	-25	-21.30
		High	30.0 - 2288.0	-41.90	-25	-16.90
		High	2570.0 - 15000.0	-43.55	-25	-18.55
		High	15000.0 - 27000.0	-47.55	-25	-22.55

Table 7-17. Conducted Emission Test Results – LTE – Ant F

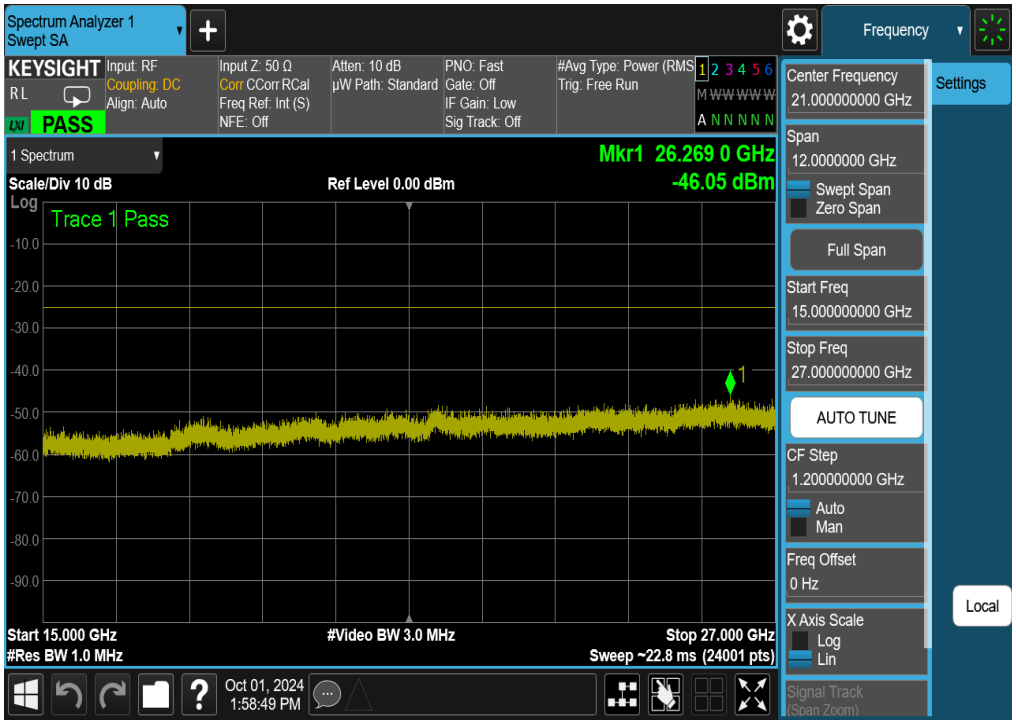
LTE Band 41(PC3) – Ant B



Plot 7-153. Conducted Spurious Plot (LTE Band 41(PC3)- 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)

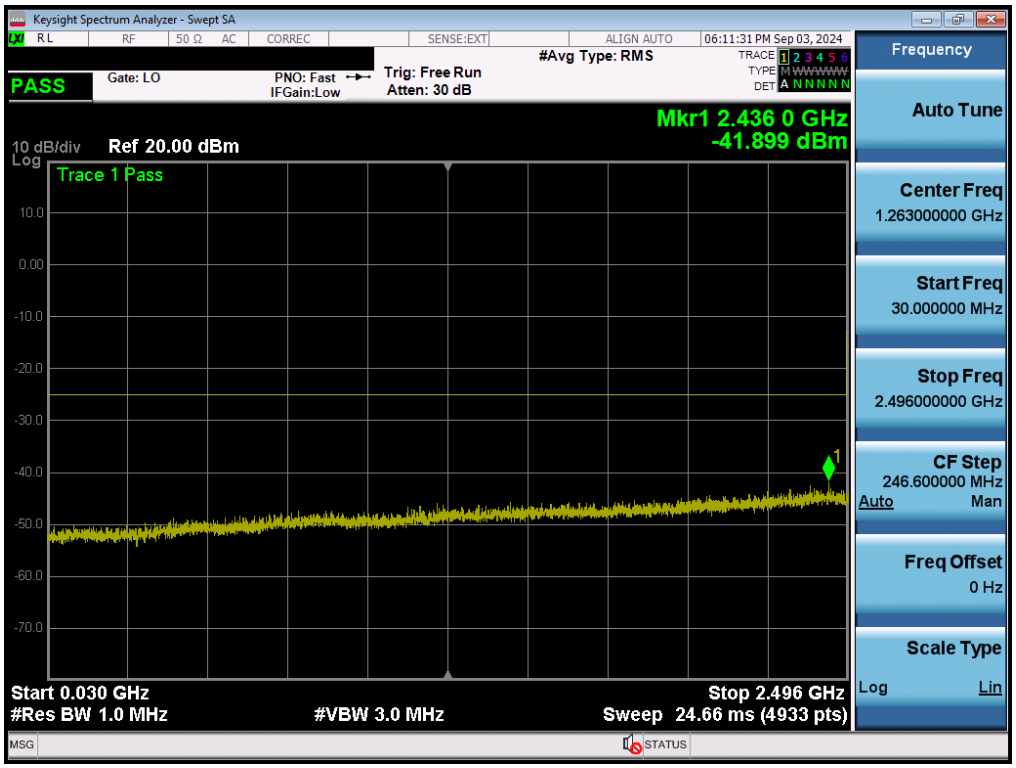


Plot 7-154. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)

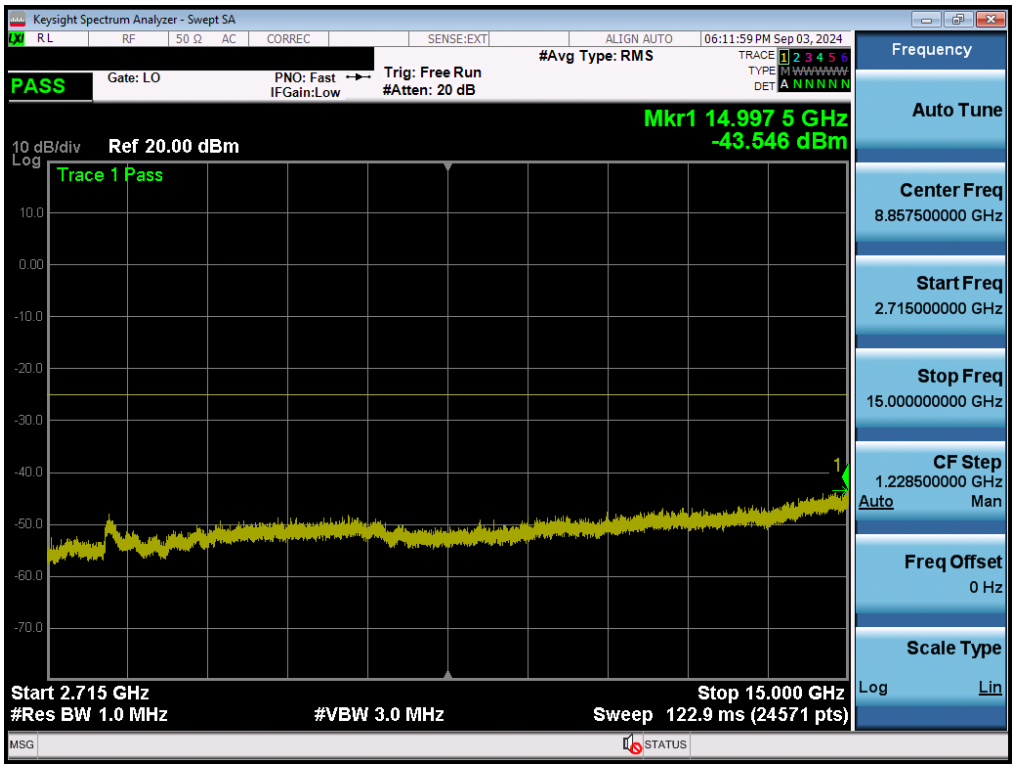


Plot 7-155. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel - Ant B)

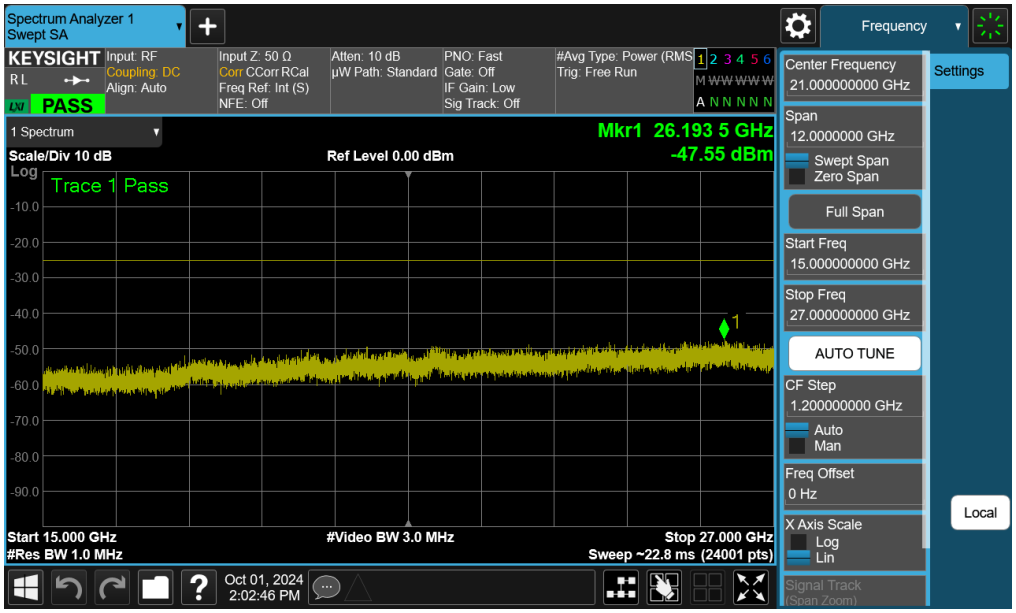
LTE Band 41(PC3) – Ant F



Plot 7-156. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant F)



Plot 7-157. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant F)



Plot 7-158. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High **Channel - Ant F)**

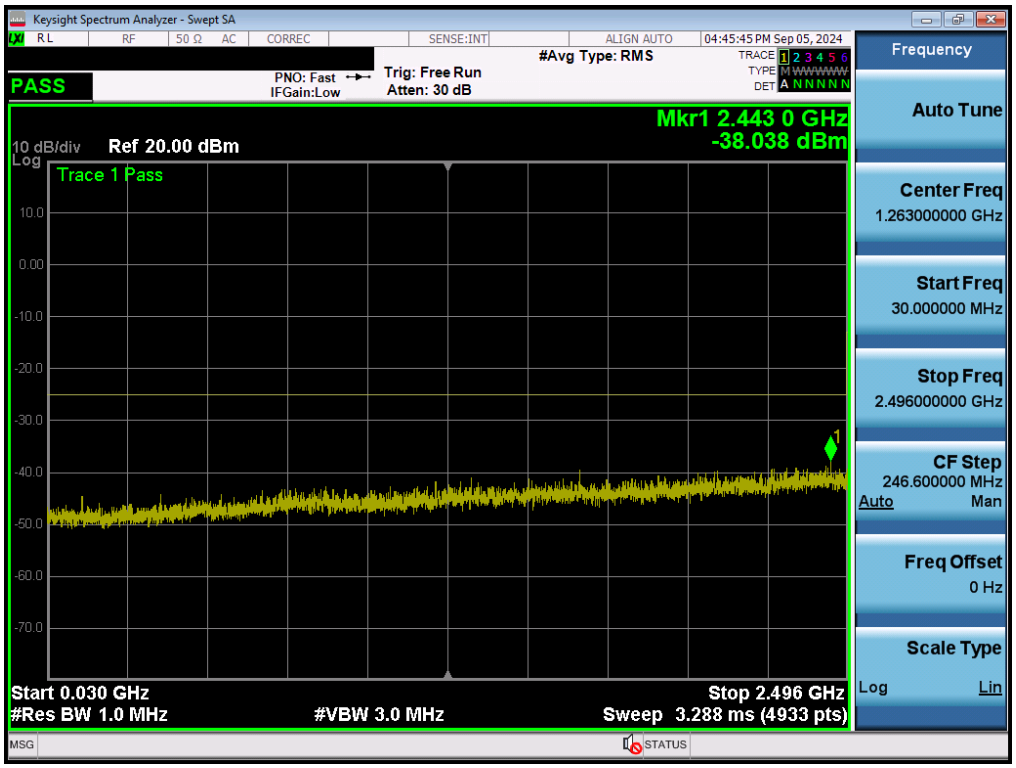
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.17	-25	-13.17
		Low	2690.0 - 15000.0	-38.55	-25	-13.55
		Low	15000.0 - 27000.0	-46.45	-25	-21.45
		Mid	30.0 - 2470.0	-38.04	-25	-13.04
		Mid	2690.0 - 15000.0	-40.04	-25	-15.03
		Mid	15000.0 - 27000.0	-47.24	-25	-22.24
		High	30.0 - 2470.0	-38.13	-25	-13.13
		High	2690.0 - 15000.0	-39.72	-25	-14.72
		High	15000.0 - 27000.0	-46.79	-25	-21.79

Table 7-18. Conducted Emission Test Results – NR – Ant F

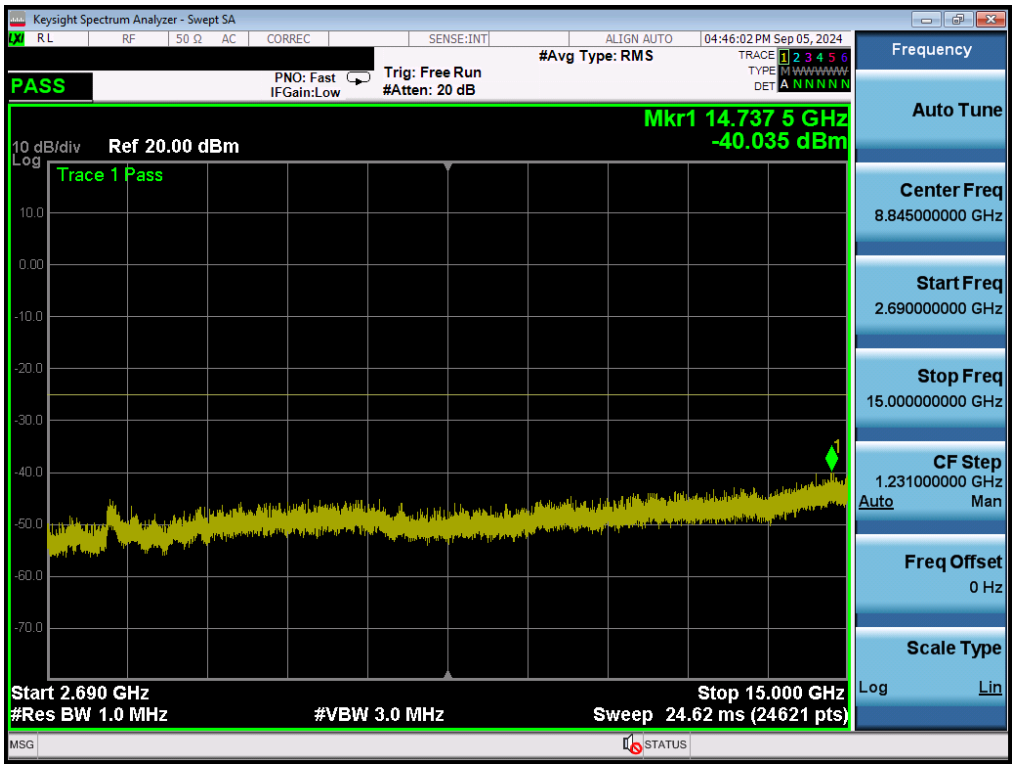
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.42	-25	-13.42
		Low	2690.0 - 15000.0	-38.34	-25	-13.34
		Low	15000.0 - 27000.0	-47.15	-25	-22.15
		Mid	30.0 - 2470.0	-38.38	-25	-13.38
		Mid	2690.0 - 15000.0	-39.34	-25	-14.34
		Mid	15000.0 - 27000.0	-46.65	-25	-21.65
		High	30.0 - 2470.0	-37.21	-25	-12.21
		High	2690.0 - 15000.0	-40.06	-25	-15.06
		High	15000.0 - 27000.0	-46.98	-25	-21.98

Table 7-19. Conducted Emission Test Results – NR – Ant B

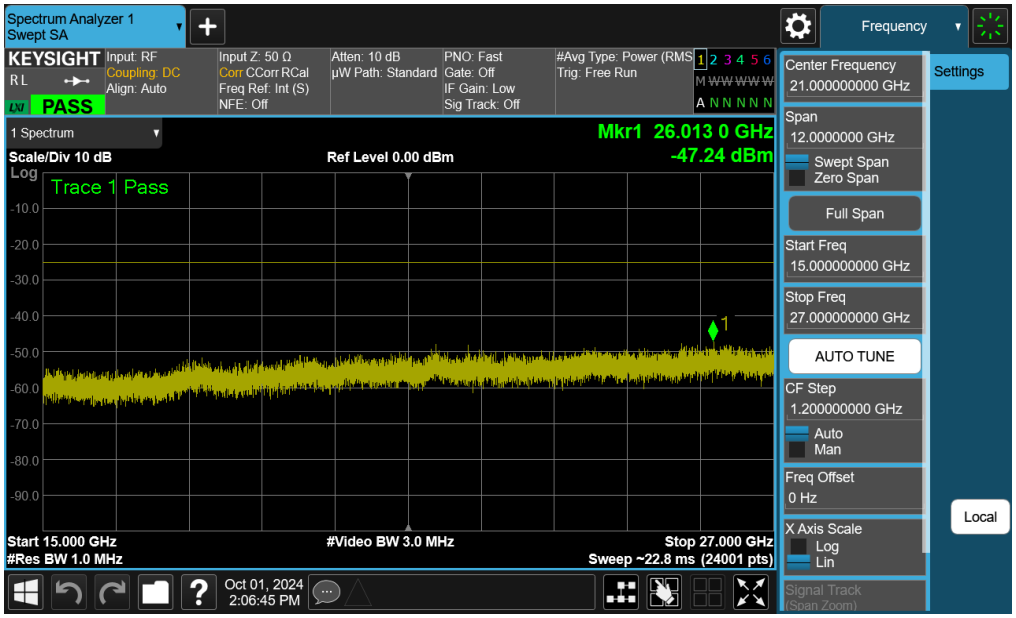
NR Band n41 – Ant F – Default



Plot 7-159. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant F)

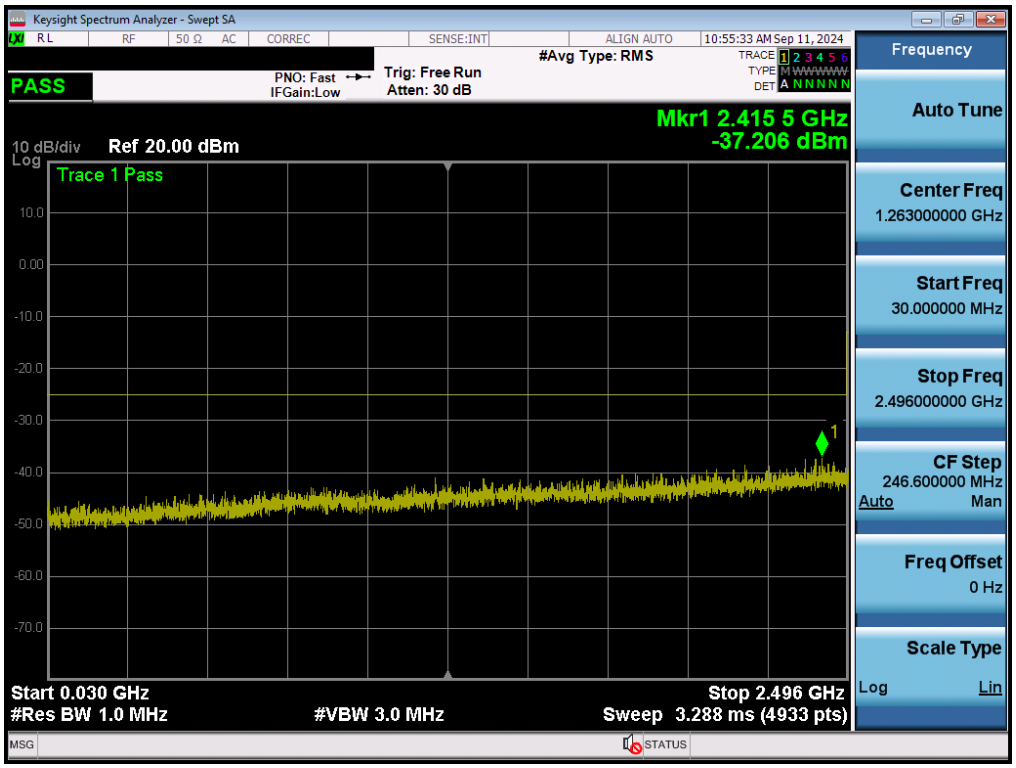


Plot 7-160. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant F)

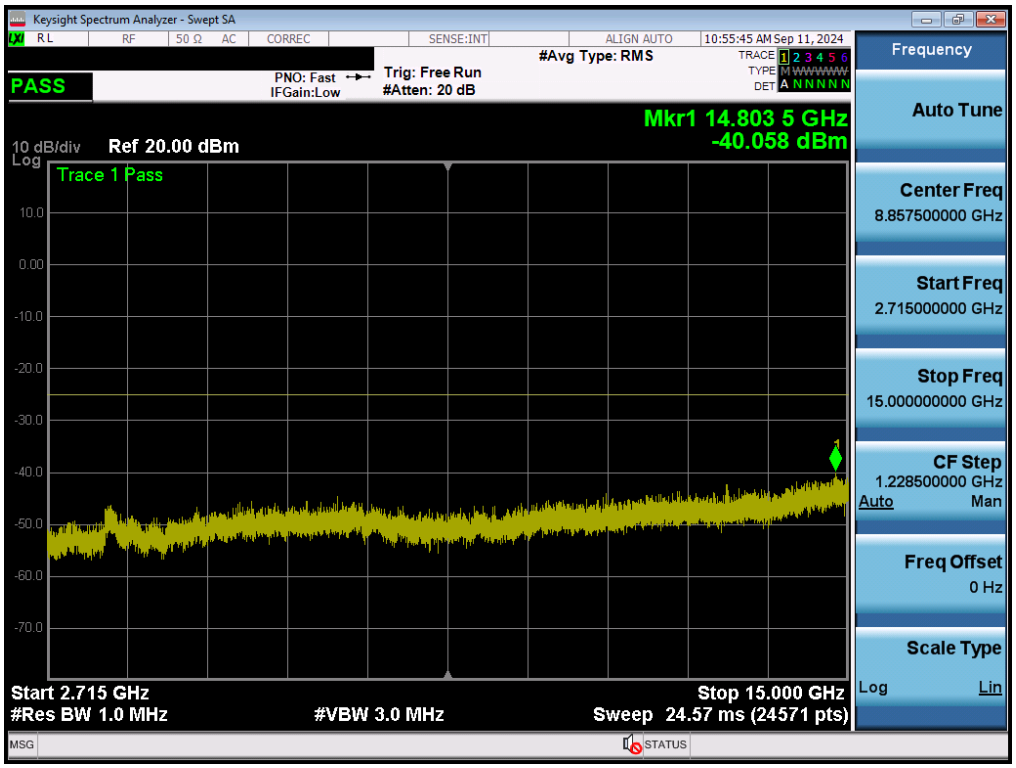


Plot 7-161. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel Ant F)

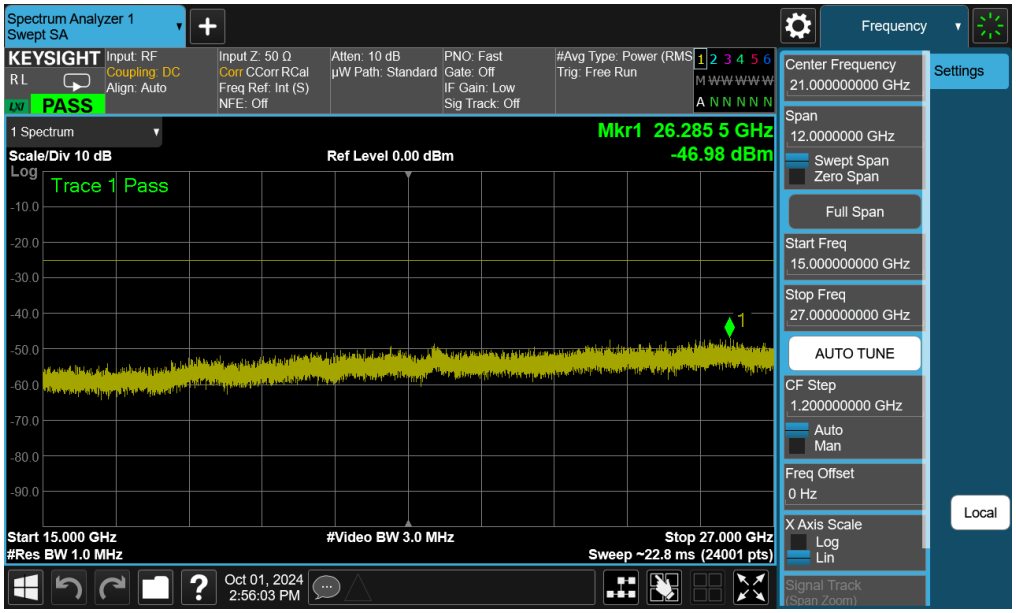
NR Band n41 – Ant B – Switching



Plot 7-162. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)



Plot 7-163. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)



Plot 7-164. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-37.5	-25	-12.50
		Low	2690.0 - 15000.0	-40.69	-25	-15.69
		Low	15000.0 - 27000.0	-47.06	-25	-22.06
		Mid	30.0 - 2470.0	-37.14	-25	-12.14
		Mid	2690.0 - 15000.0	-39.72	-25	-14.72
		Mid	15000.0 - 27000.0	-46.56	-25	-21.56
		High	30.0 - 2470.0	-36.64	-25	-11.64
		High	2715.0 - 15000.0	-40.52	-25	-15.52
		High	15000.0 - 27000.0	-46.79	-25	-21.79

Table 7-20. Conducted Emission Test Results – NR – Ant B

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.98	-25	-13.98
		Low	2690.0 - 15000.0	-39.74	-25	-14.74
		Low	15000.0 - 27000.0	-47.30	-25	-22.30
		Mid	30.0 - 2470.0	-38.00	-25	-13.00
		Mid	2690.0 - 15000.0	-40.58	-25	-15.58
		Mid	15000.0 - 27000.0	-46.76	-25	-21.76
		High	30.0 - 2470.0	-37.39	-25	-12.39
		High	2715.0 - 15000.0	-40.54	-25	-15.54
		High	15000.0 - 27000.0	-47.13	-25	-22.13

Table 7-21. Conducted Emission Test Results – NR – Ant F– Switching

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-39.36	-25	-14.36
		Low	2690.0 - 15000.0	-41.33	-25	-16.33
		Low	15000.0 - 27000.0	-46.96	-25	-21.95
		Mid	30.0 - 2470.0	-39.04	-25	-14.04
		Mid	2690.0 - 15000.0	-40.9	-25	-15.90
		Mid	15000.0 - 27000.0	-46.82	-25	-21.82
		High	30.0 - 2470.0	-37.3	-25	-12.30
		High	2715.0 - 15000.0	-40.64	-25	-15.64
		High	15000.0 - 27000.0	-47.23	-25	-22.23

Table 7-22. Conducted Emission Test Results – NR – Ant E

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.51	-25	-13.51
		Low	2690.0 - 15000.0	-40.29	-25	-15.29
		Low	15000.0 - 27000.0	-46.62	-25	-21.62
		Mid	30.0 - 2470.0	-38.76	-25	-13.76
		Mid	2690.0 - 15000.0	-39.41	-25	-14.41
		Mid	15000.0 - 27000.0	-46.86	-25	-21.86
		High	30.0 - 2470.0	-39.03	-25	-14.03
		High	2715.0 - 15000.0	-40.55	-25	-15.55
		High	15000.0 - 27000.0	-47.09	-25	-22.09

Table 7-23. Conducted Emission Test Results – NR – Ant D – Switching

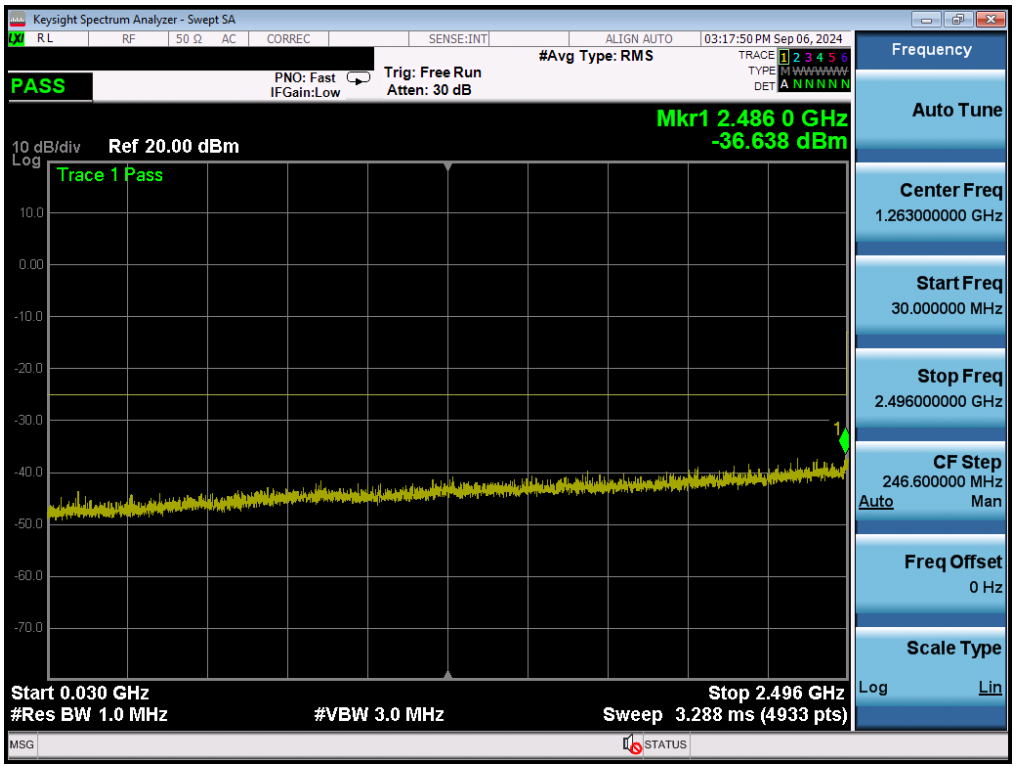
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.97	-25	-13.97
		Low	2690.0 - 15000.0	-40	-25	-15.00
		Low	15000.0 - 27000.0	-46.98	-25	-21.98
		Mid	30.0 - 2470.0	-38.72	-25	-13.71
		Mid	2690.0 - 15000.0	-40.47	-25	-15.47
		Mid	15000.0 - 27000.0	-55.55	-34.21	-21.34
		High	30.0 - 2470.0	-38.24	-25	-13.24
		High	2715.0 - 15000.0	-40.74	-25	-15.74
		High	15000.0 - 27000.0	-47.06	-25	-22.06

Table 7-24. Conducted Emission Test Results – NR – Ant D

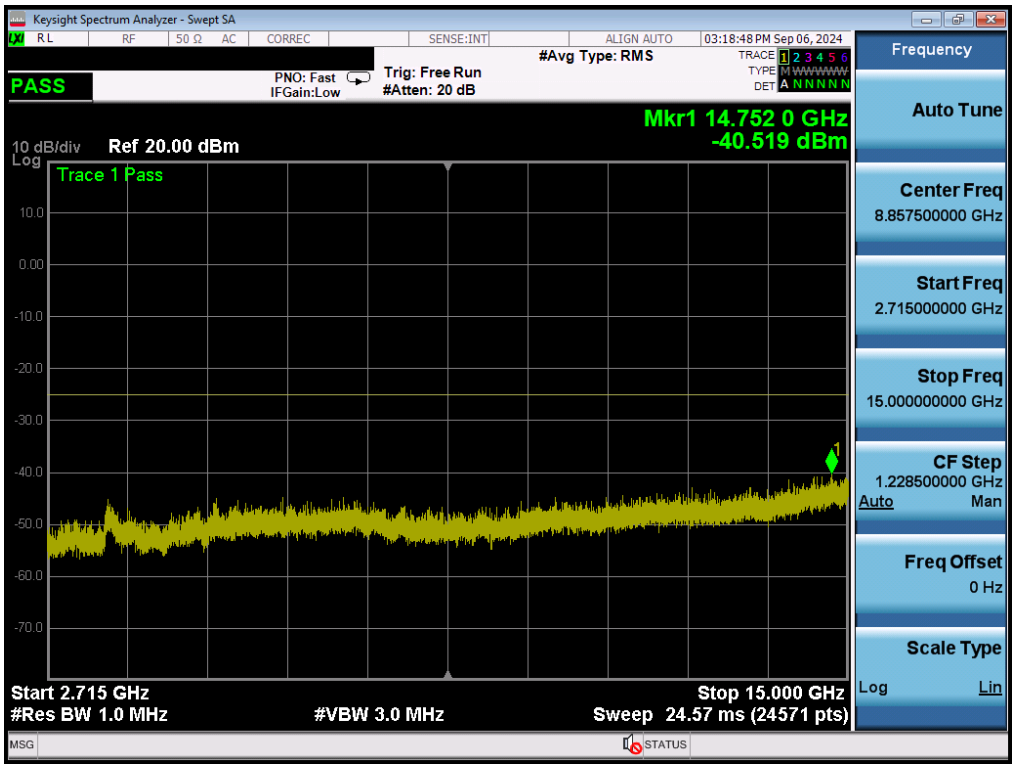
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC2	100MHz	Low	30.0 - 2470.0	-38.44	-25	-13.44
		Low	2690.0 - 15000.0	-39.85	-25	-14.85
		Low	15000.0 - 27000.0	-46.95	-25	-21.95
		Mid	30.0 - 2470.0	-38.43	-25	-13.43
		Mid	2690.0 - 15000.0	-40.44	-25	-15.44
		Mid	15000.0 - 27000.0	-47.44	-25	-22.44
		High	30.0 - 2470.0	-38.07	-25	-13.07
		High	2715.0 - 15000.0	-40.06	-25	-15.06
		High	15000.0 - 27000.0	-47.30	-25	-22.30

Table 7-25. Conducted Emission Test Results – NR – Ant E – Switching

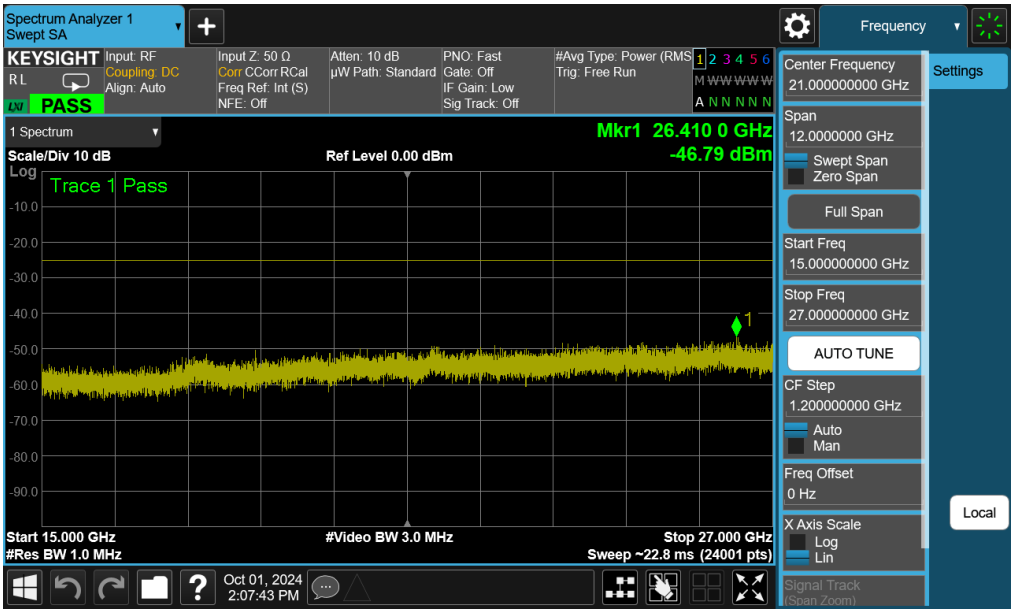
NR Band n41 – Ant B - Default



Plot 7-165. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)

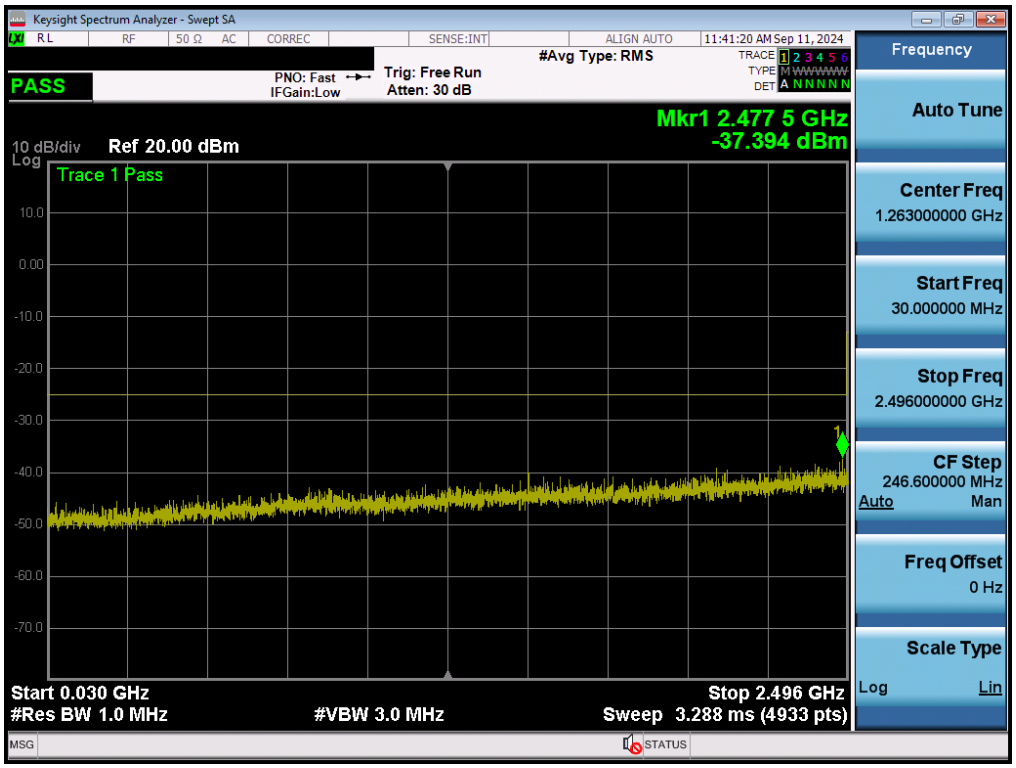


Plot 7-166. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant B)

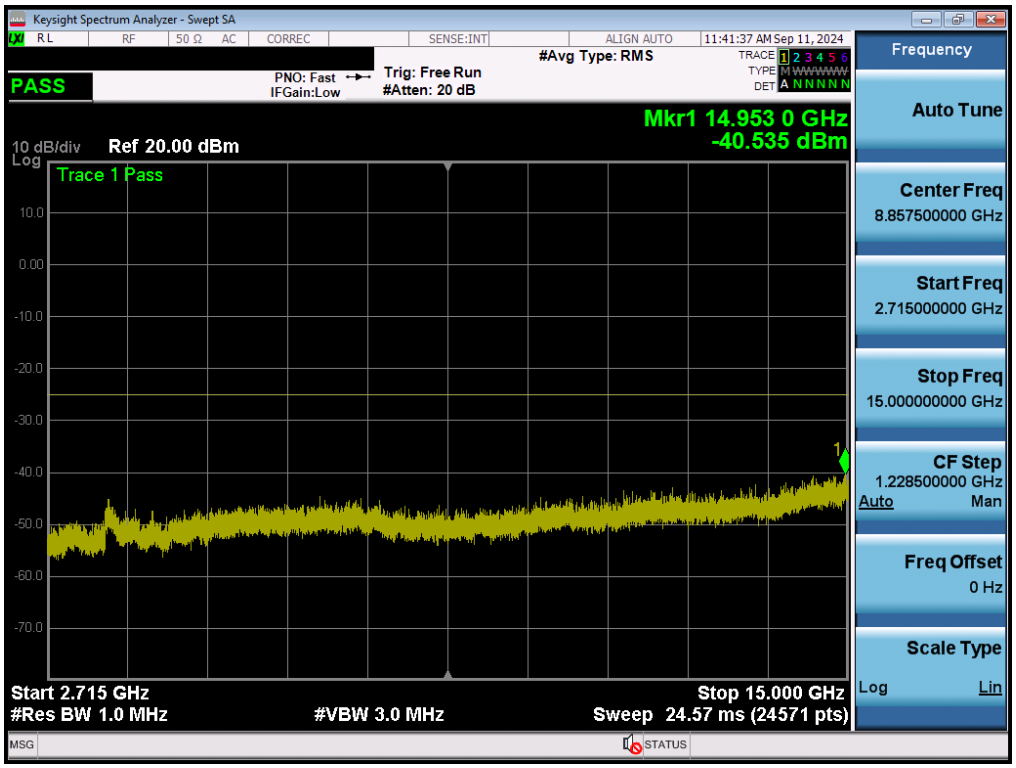


Plot 7-167. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High **Channel Ant B)**

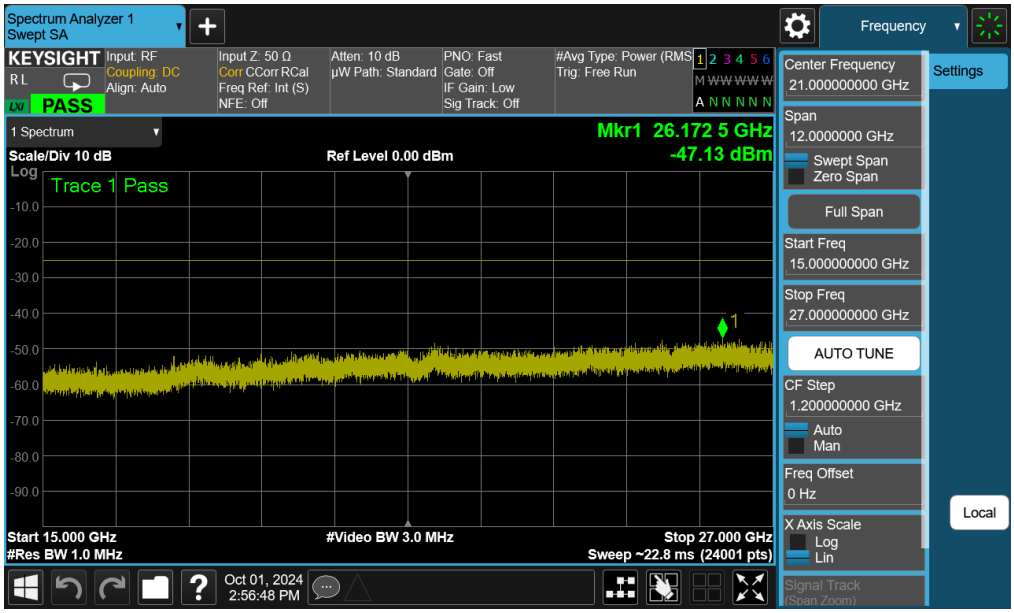
NR Band n41 – Ant F - Switching



Plot 7-168. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant F)

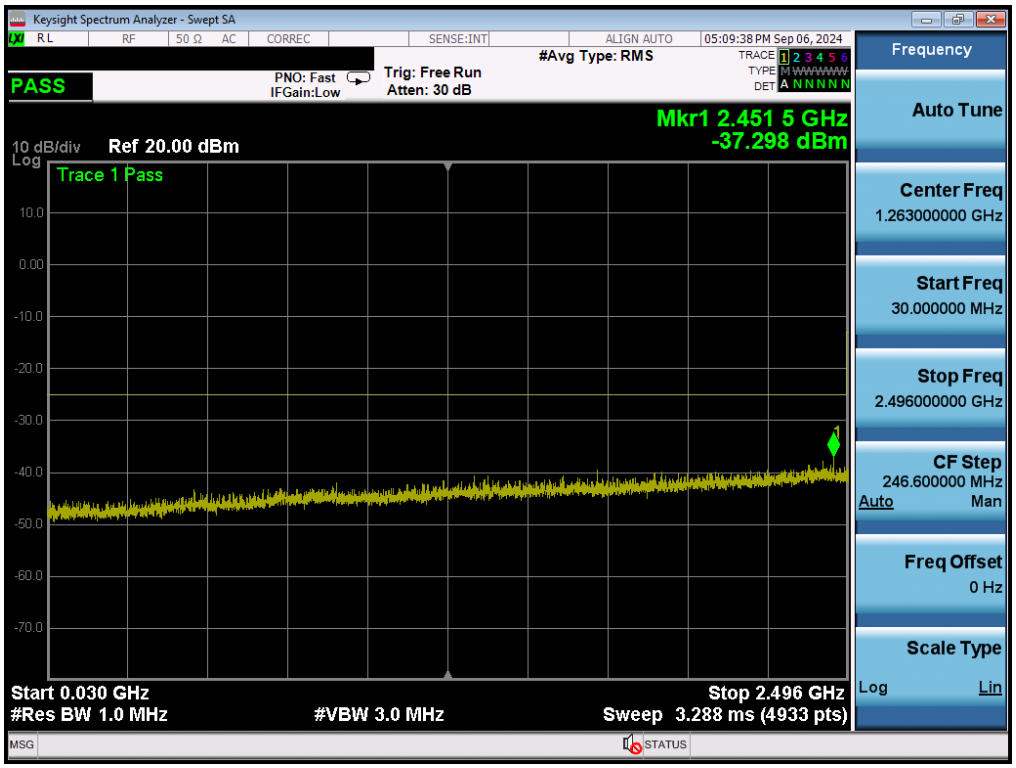


Plot 7-169. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant F)

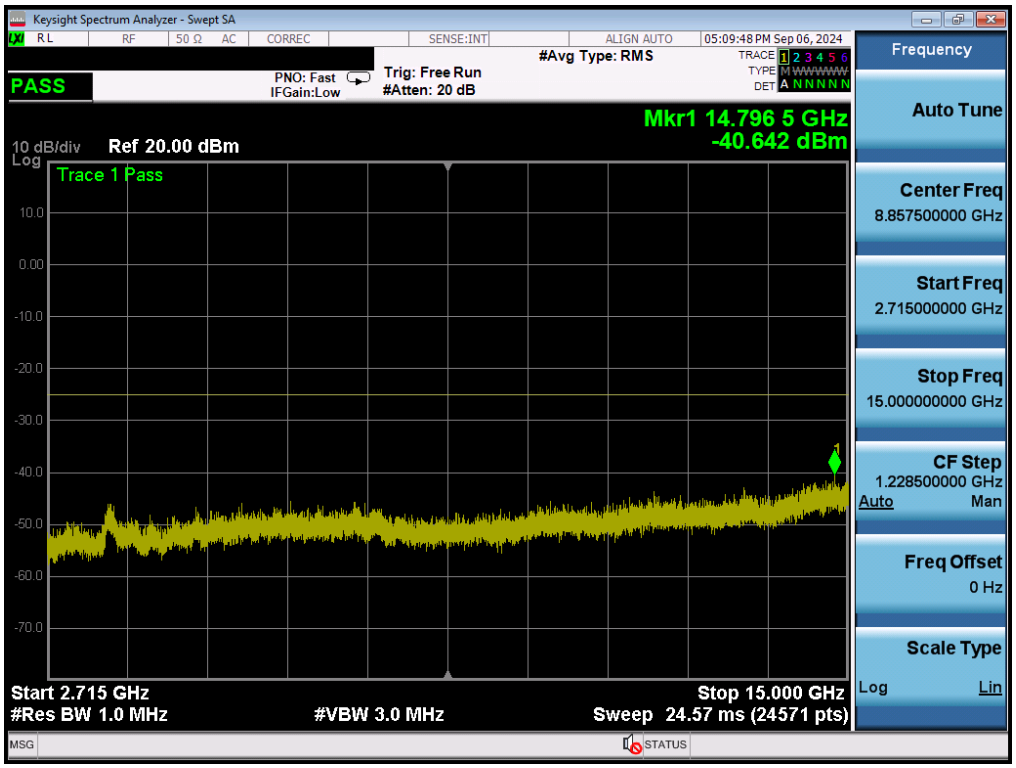


Plot 7-170. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High **Channel Ant F)**

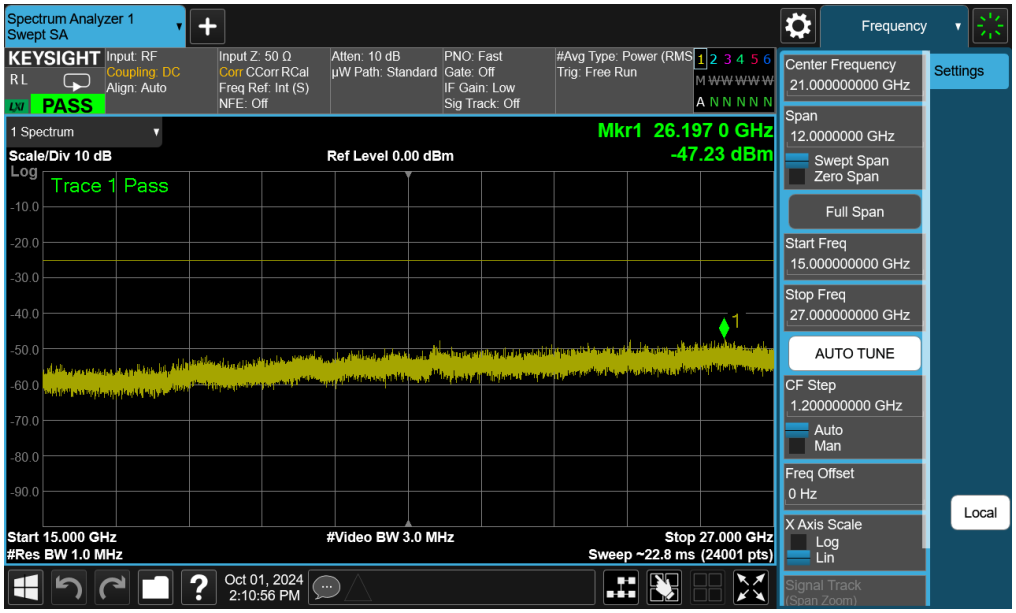
NR Band n41 – Ant E - Default



Plot 7-171. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant E)

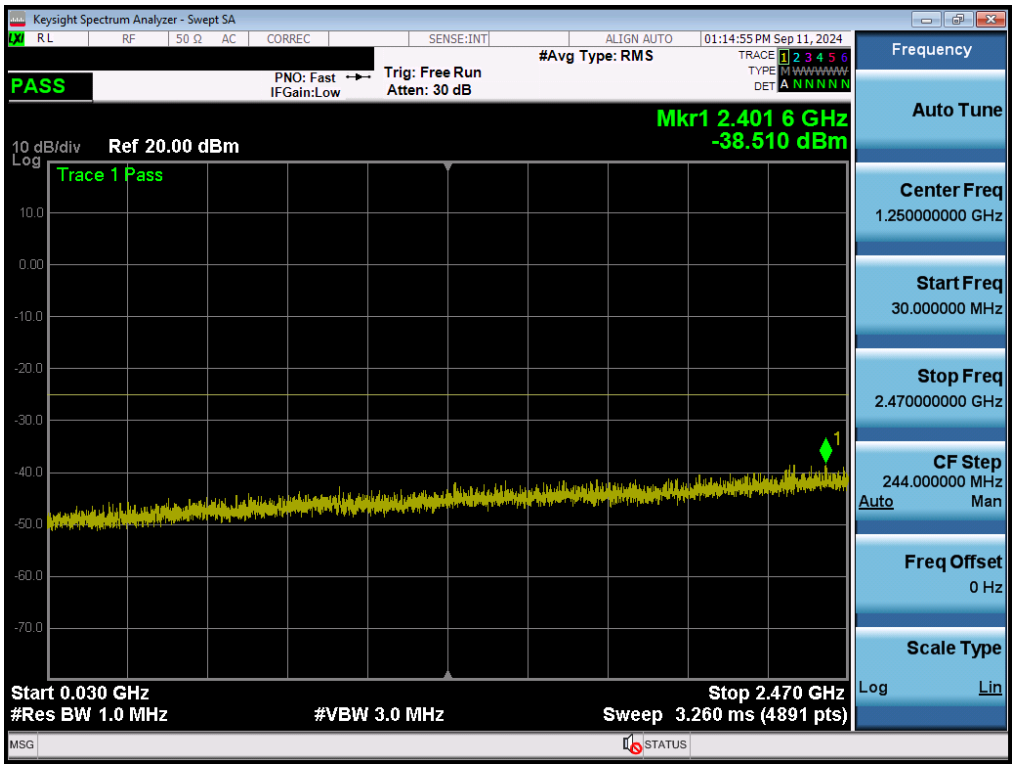


Plot 7-172. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 – High Channel Ant E)

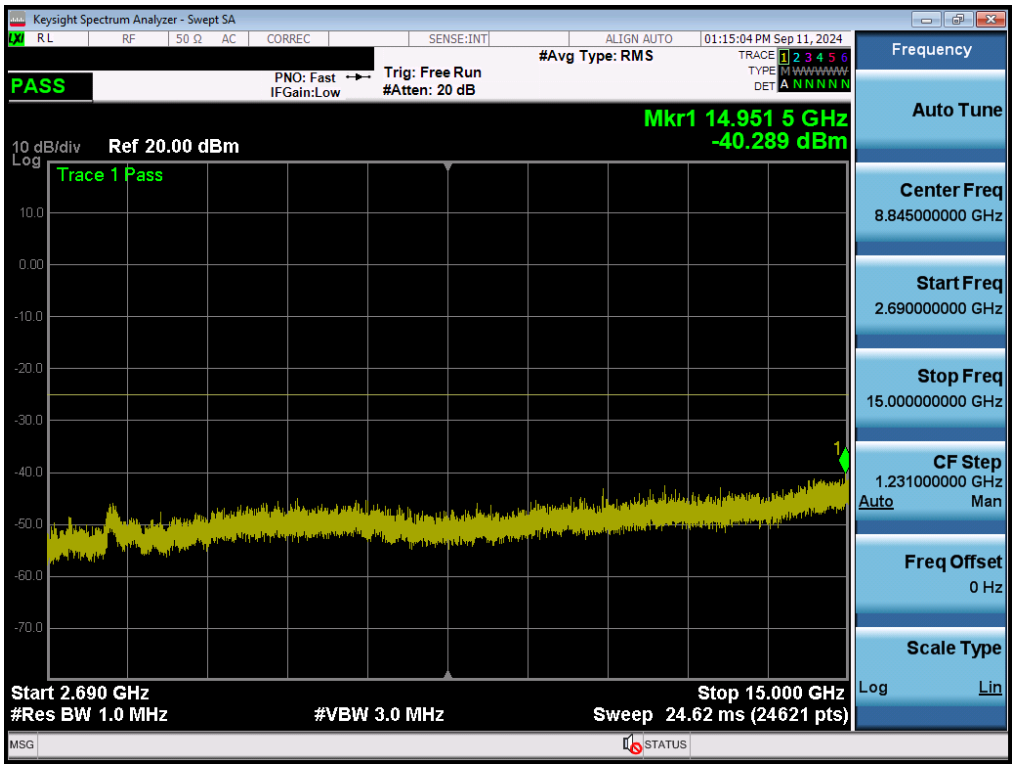


Plot 7-173. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High **Channel Ant E)**

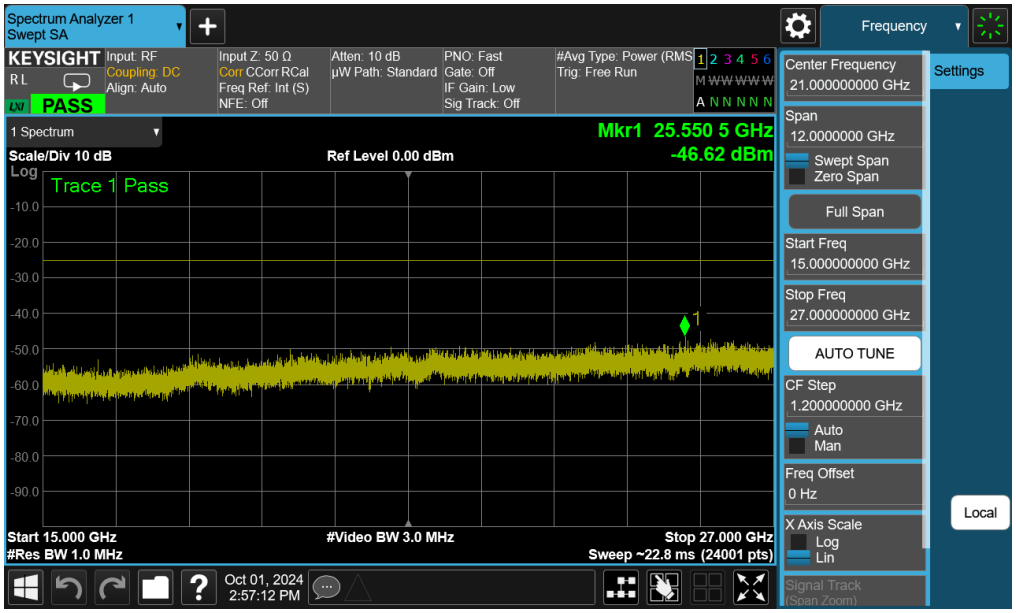
NR Band n41 – Ant D - Switching



Plot 7-174. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant D)

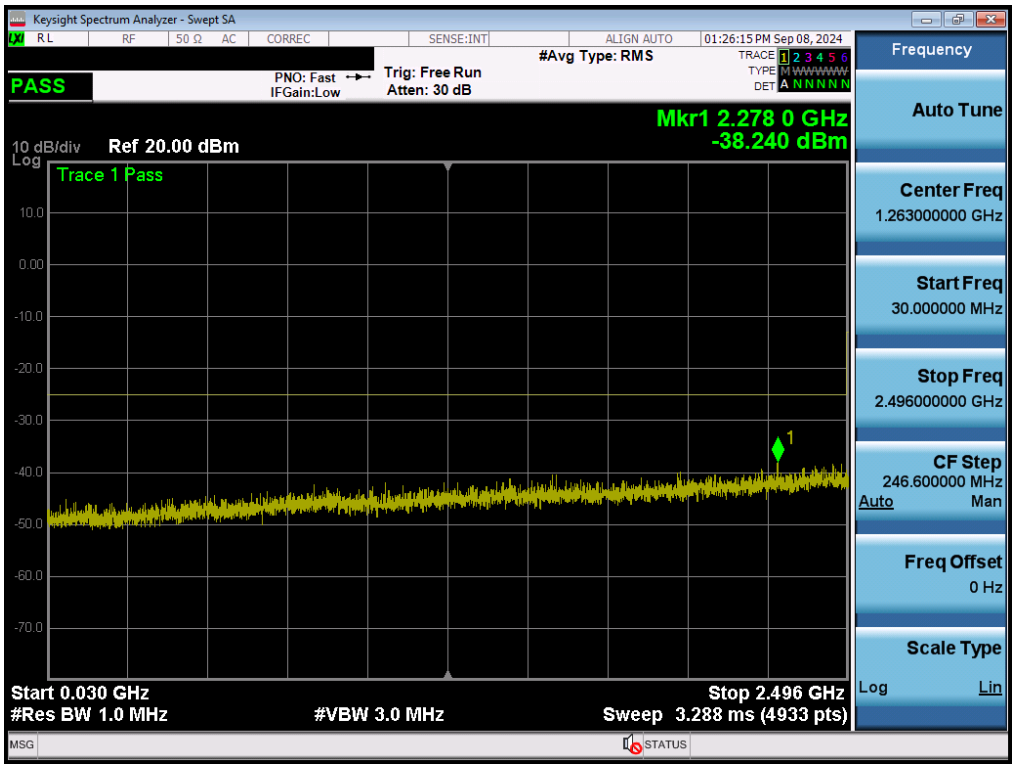


Plot 7-175. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 – Low Channel Ant D)

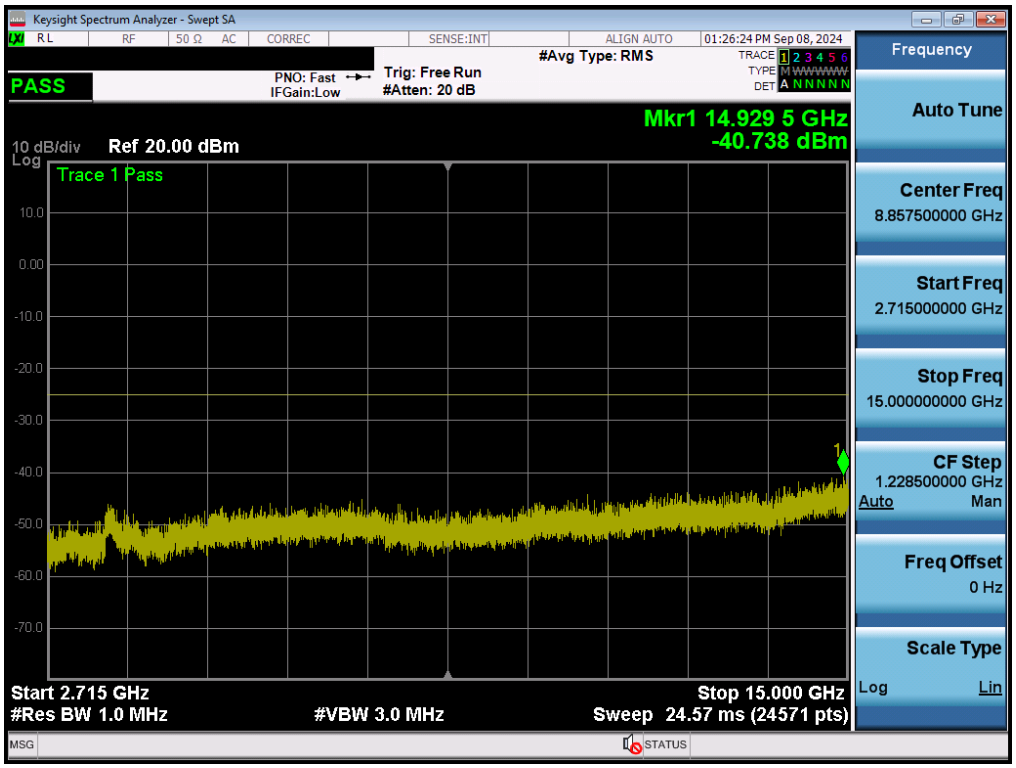


Plot 7-176. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low **Channel Ant D)**

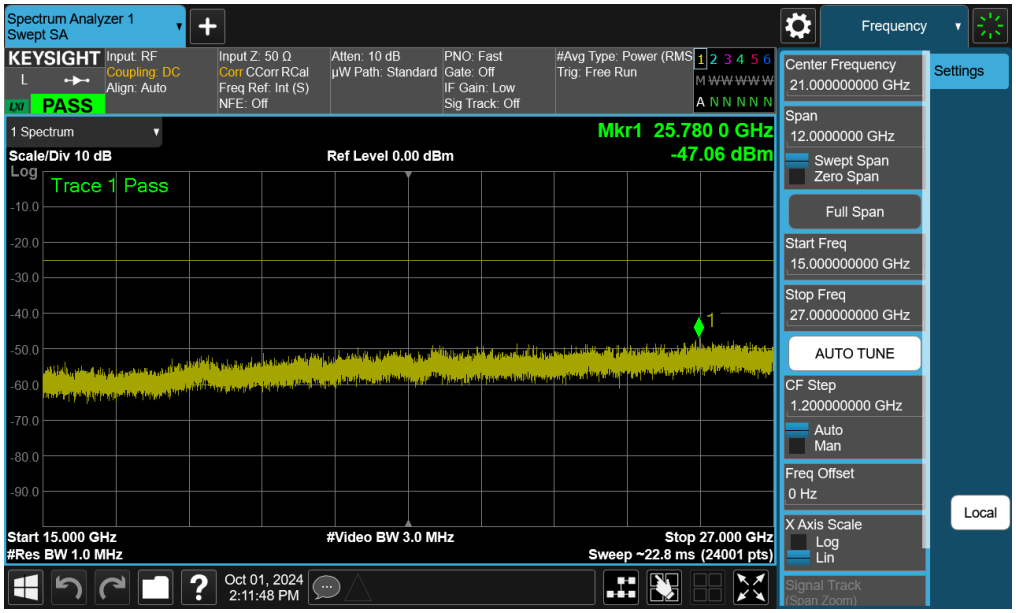
NR Band n41 – Ant D - Default



Plot 7-177. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant D)

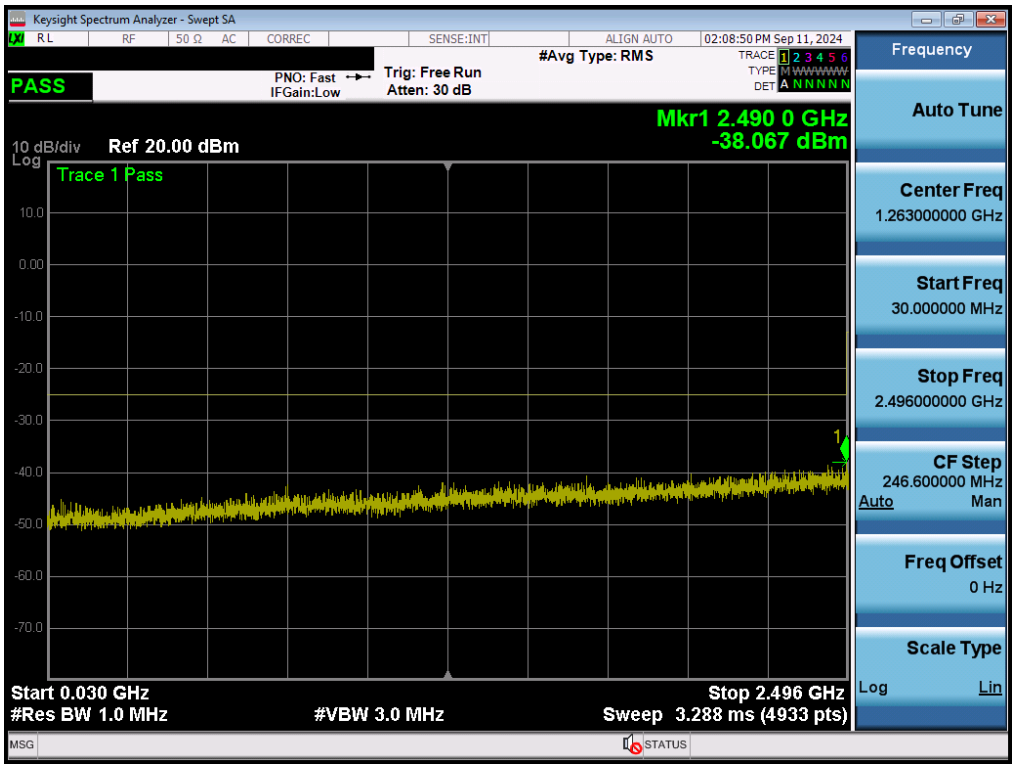


Plot 7-178. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant D)

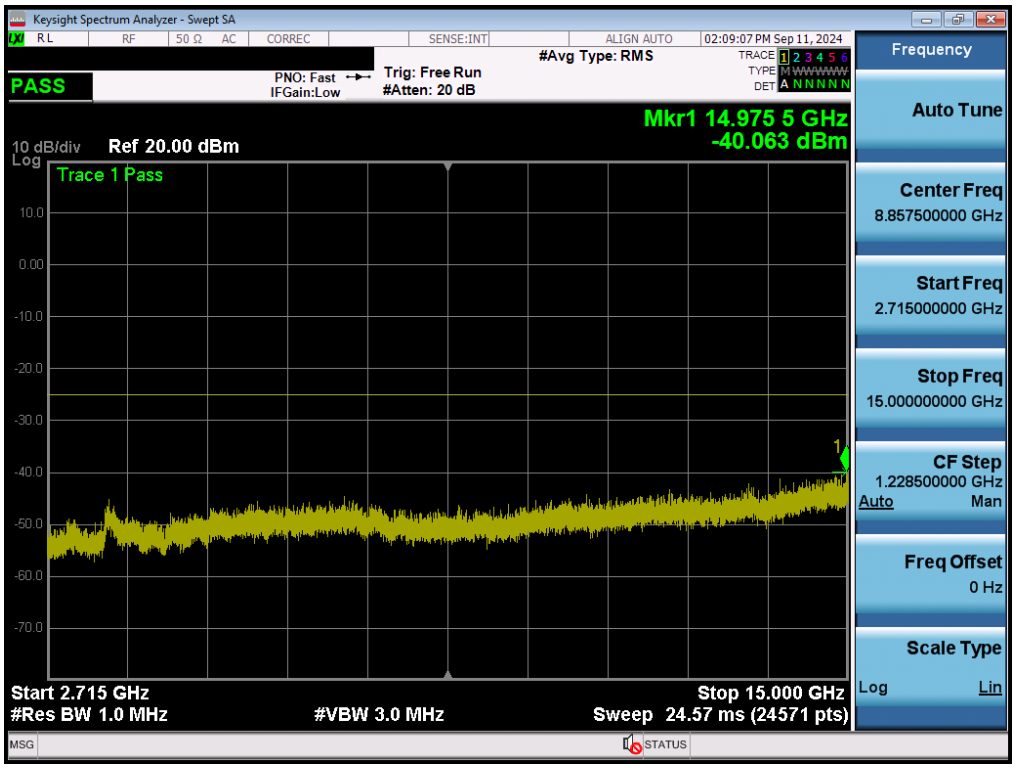


Plot 7-179. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High **Channel Ant D)**

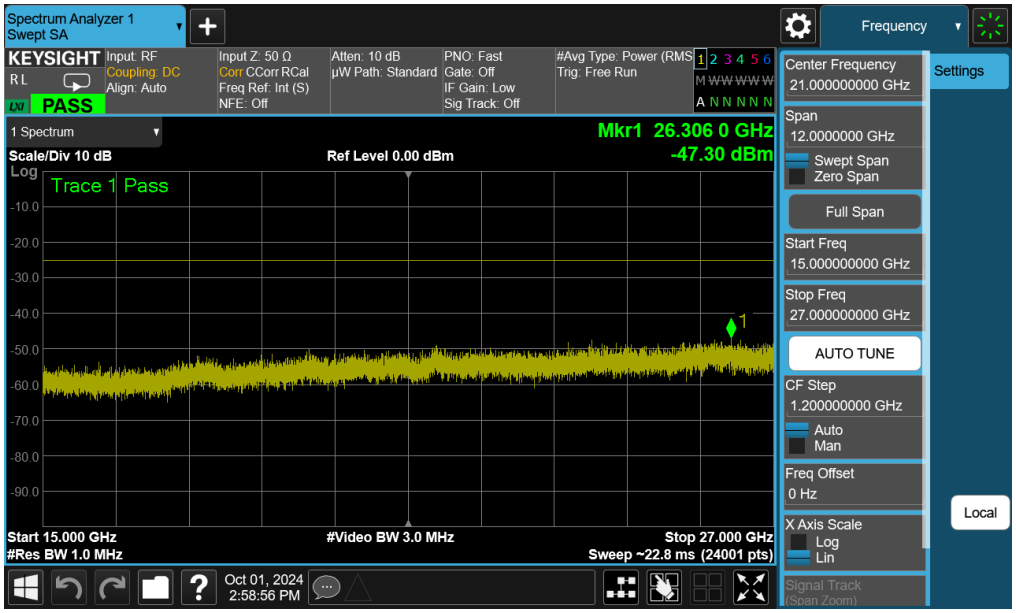
NR Band n41 – Ant E - Switching



Plot 7-180. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant E)



Plot 7-181. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant E)



Plot 7-182. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant E)

7.5 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 maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

The minimum permissible attenuation level for Band 30 is > 43 + 10 log10 (P[Watts] at 2300-2305MHz & 2345-2360MHz, > 55 + 10 log10 (P[Watts]) at 2320-2324MHz & 2341-2345MHz, > 61 + 10 log10 (P[Watts]) at 2324-2328MHz & 2337-2341MHz, > 67 + 10 log10 (P[Watts]) at 2288-2292MHz & 2328-2337MHz, and > 70 + 10 log10 (P[Watts]) at frequencies < 2288MHz & >2365MHz.

The minimum permissible attenuation level for Band 7 and 41 is as noted in the Test Notes on the following page.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

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 ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 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.

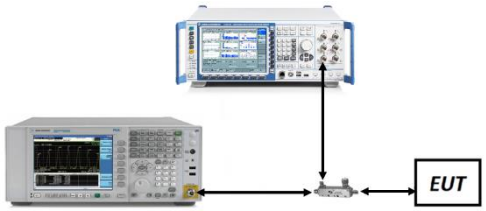


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

1. Per 27.53(a)(5) in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 1 MHz). 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 emissions are attenuated at least 26 dB below the transmitter power.

2. Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

3. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

4. Per ANSI C63.26-2015, MIMO compliance was addressed by adding 10log(2) = 3dB to the output of each antenna. A visual inspection of the plots for each antenna shows that the emissions are still compliant even after adding 3dB.

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC2	20MHz	Low	Band Edge	-37.78	-25	-12.78
		High	Band Edge	-45.89	-25	-20.89
	15MHz	Low	Band Edge	-38.17	-25	-13.17
		High	Band Edge	-41.38	-25	-16.38
	10MHz	Low	Band Edge	-37.91	-25	-12.91
		High	Band Edge	-42.84	-25	-17.84
	5MHz	Low	Band Edge	-40.28	-25	-15.28
		High	Band Edge	-41.58	-25	-16.58

Table 7-26. Conducted Band Edge Test Results – LTE – Ant B

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41PC2	20MHz	Low	Band Edge	-36.79	-25	-11.79
		High	Band Edge	-30.98	-13	-17.98
	15MHz	Low	Band Edge	-37.96	-25	-12.96
		High	Band Edge	-26.53	-10	-16.53
	10MHz	Low	Band Edge	-37.31	-25	-12.31
		High	Band Edge	-27.12	-10	-17.12
	5MHz	Low	Band Edge	-38.74	-25	-13.74
		High	Band Edge	-41.36	-25	-16.36

Table 7-27. Conducted Band Edge Test Results – LTE – Ant F