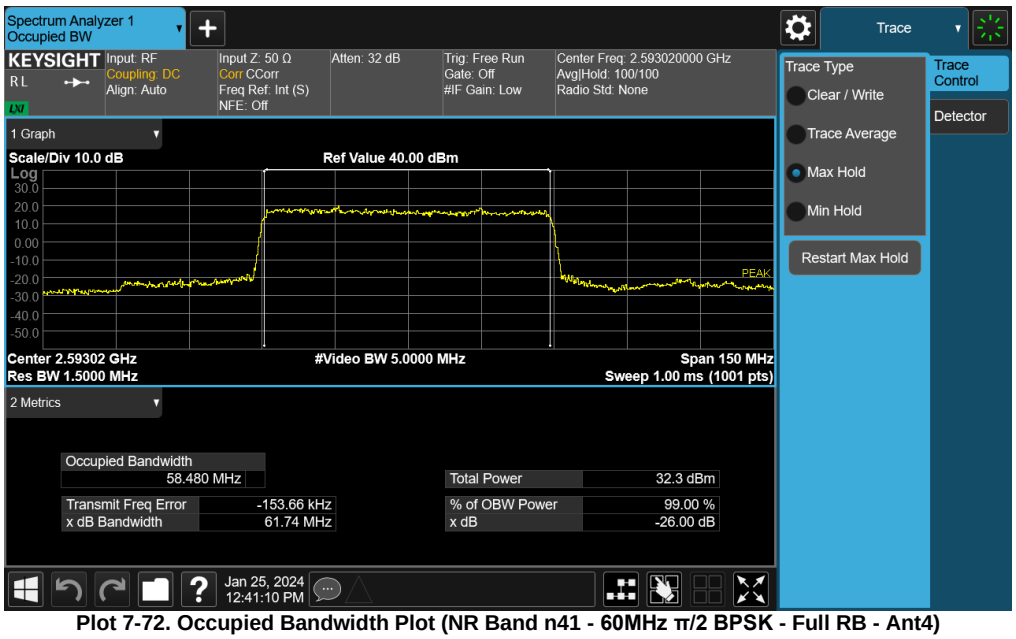
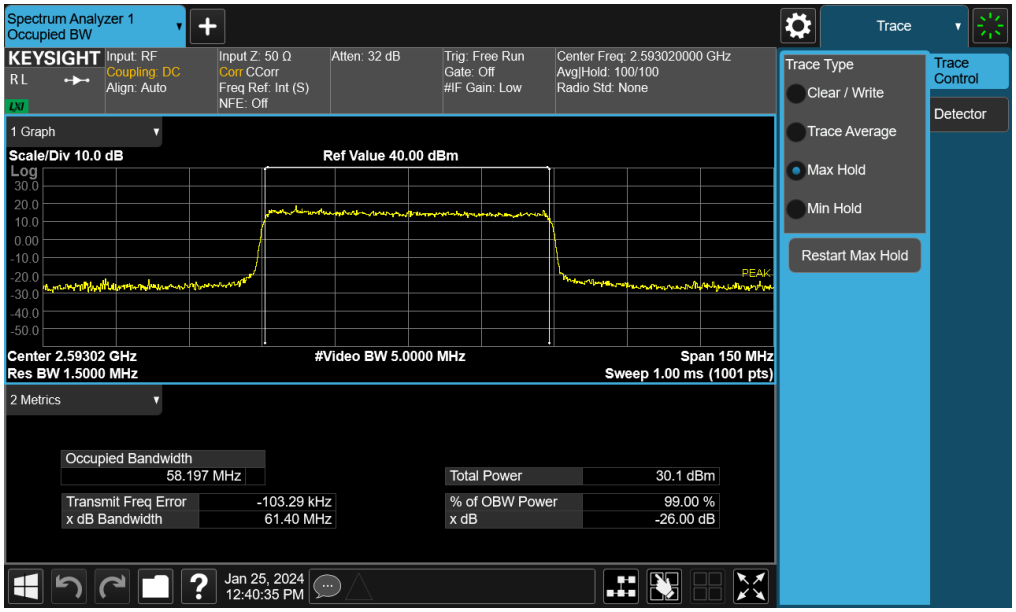
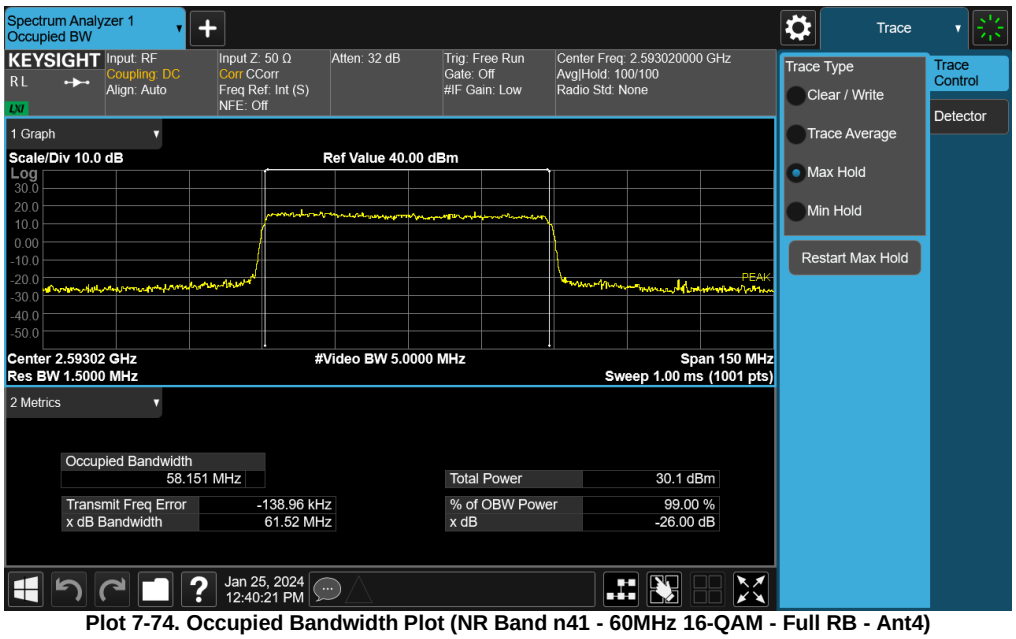


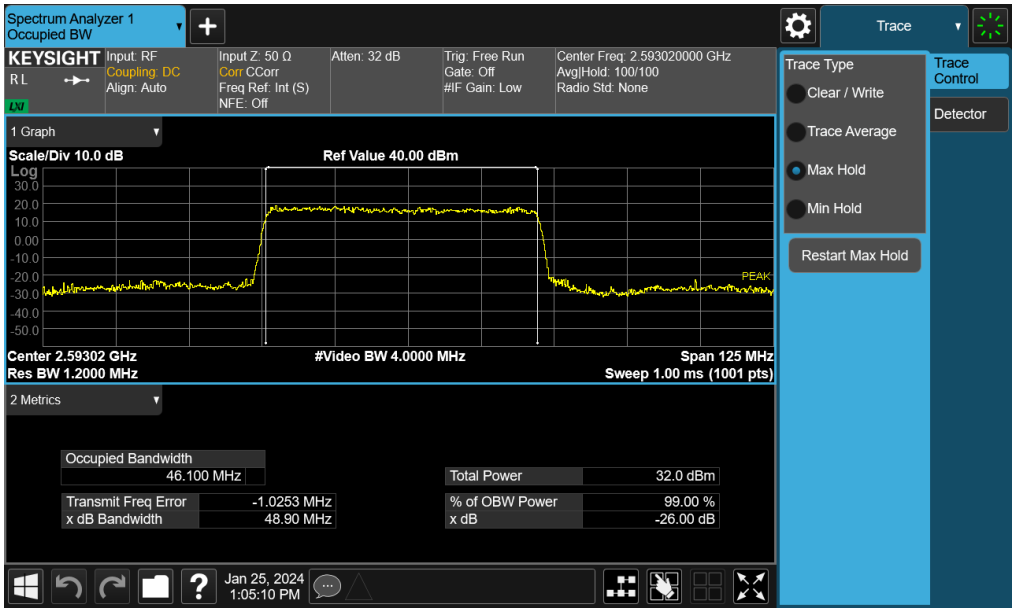
Plot 7-72. Occupied Bandwidth Plot (NR Band n41 - 60MHz π/2 BPSK - Full RB - Ant4)



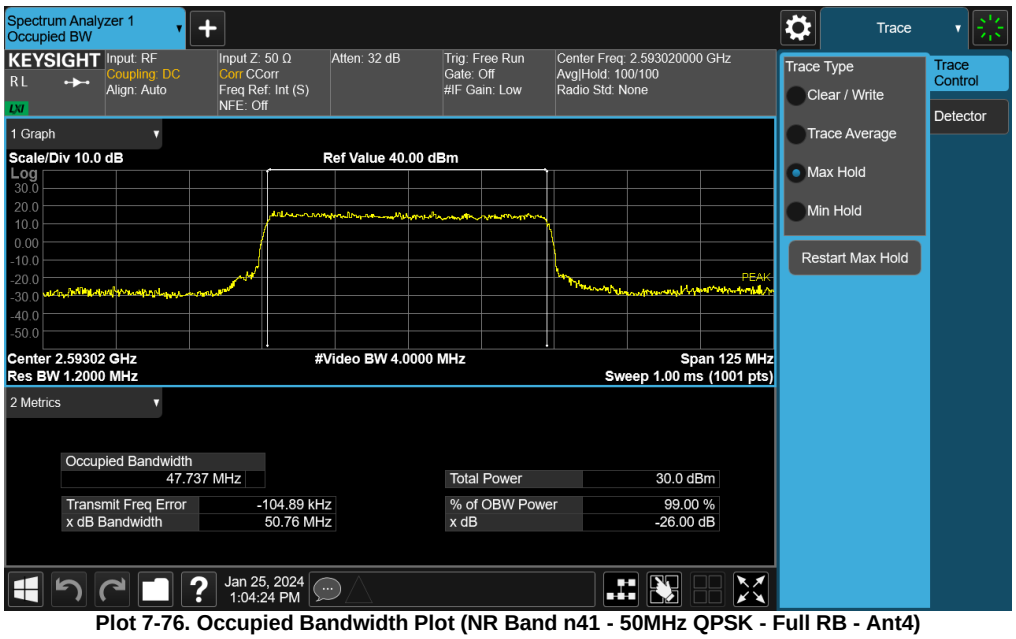
Plot 7-73. Occupied Bandwidth Plot (NR Band n41 - 60MHz QPSK - Full RB - Ant4)



Plot 7-74. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB - Ant4)

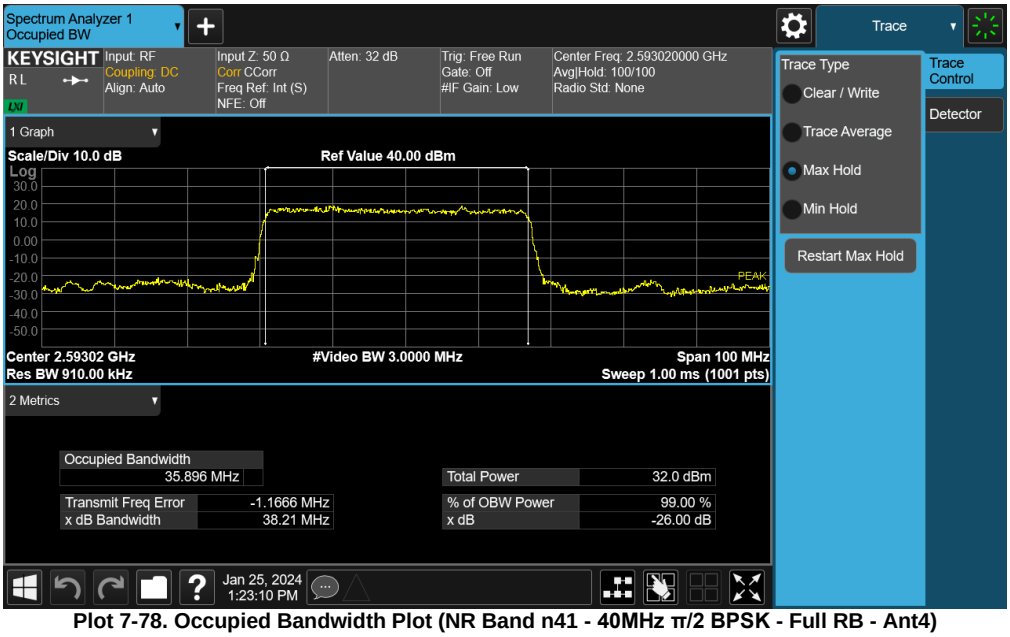


Plot 7-75. Occupied Bandwidth Plot (NR Band n41 - 50MHz π/2 BPSK - Full RB - Ant4)

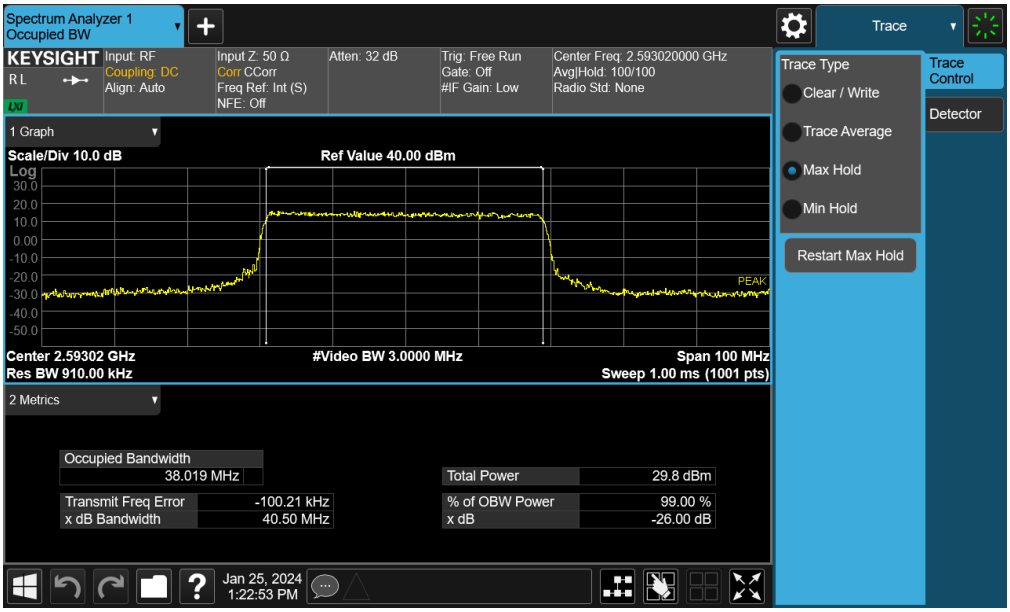


Plot 7-76. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB - Ant4)

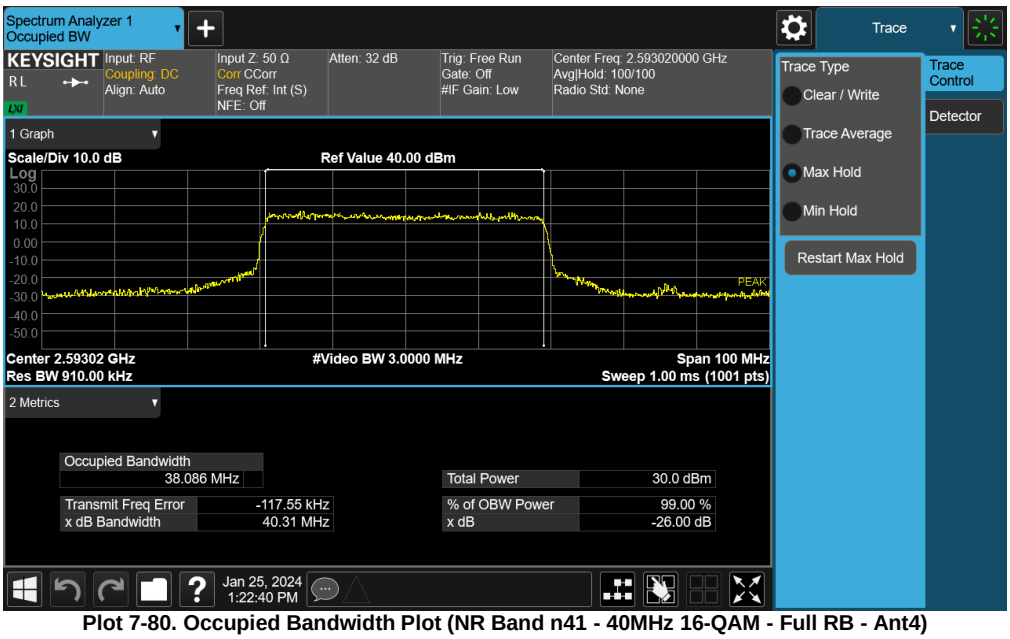
Plot 7-77. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB - Ant4)



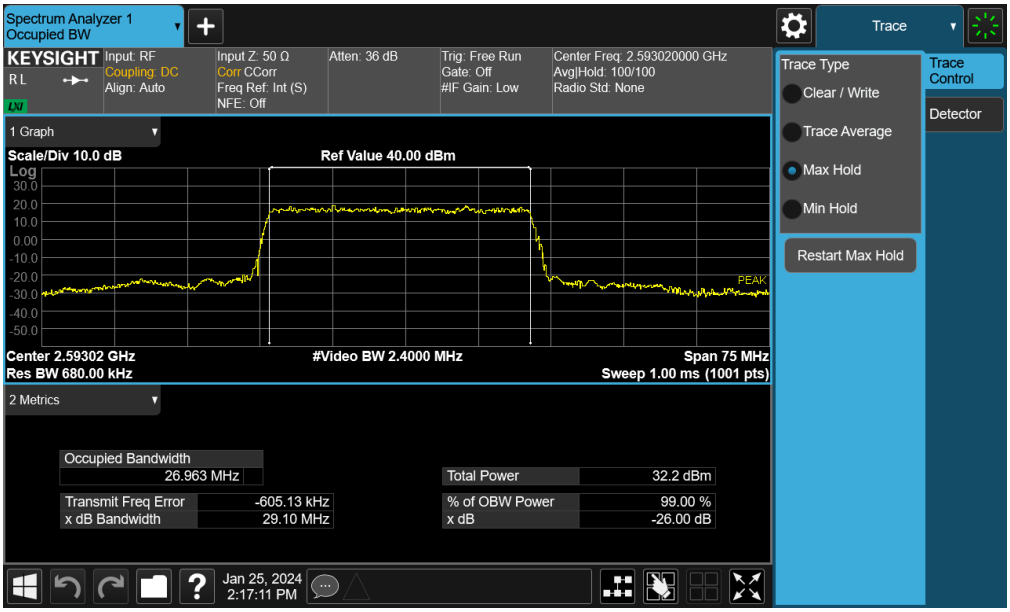
Plot 7-78. Occupied Bandwidth Plot (NR Band n41 - 40MHz π/2 BPSK - Full RB - Ant4)



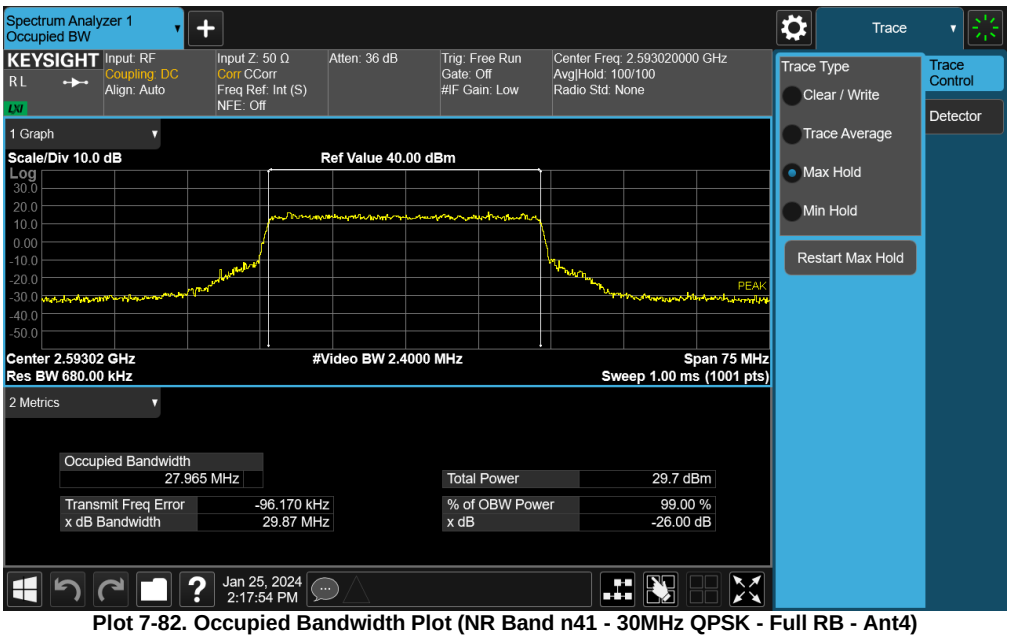
Plot 7-79. Occupied Bandwidth Plot (NR Band n41 - 40MHz QPSK - Full RB - Ant4)



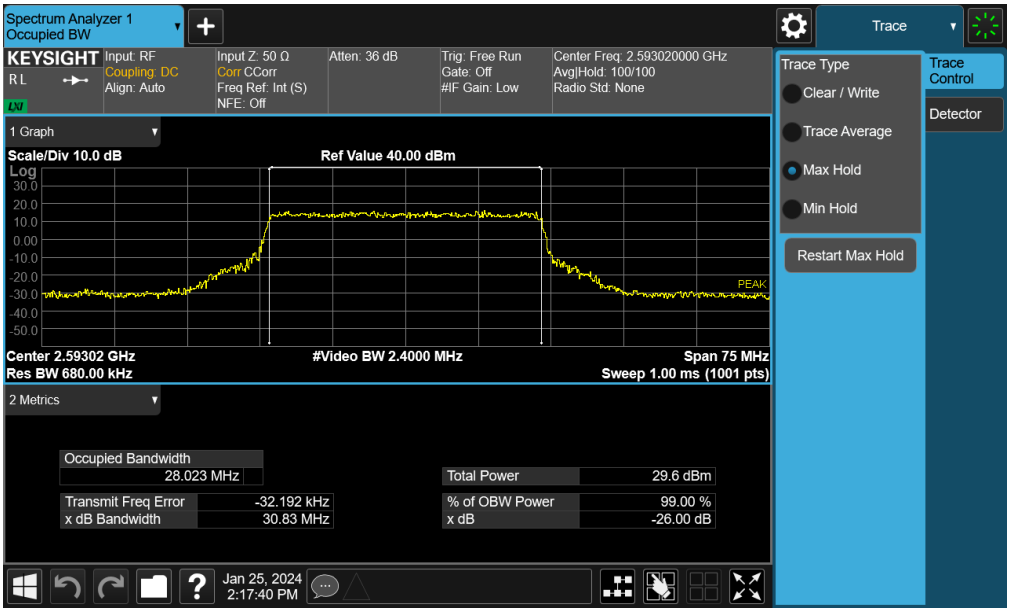
Plot 7-80. Occupied Bandwidth Plot (NR Band n41 - 40MHz 16-QAM - Full RB - Ant4)



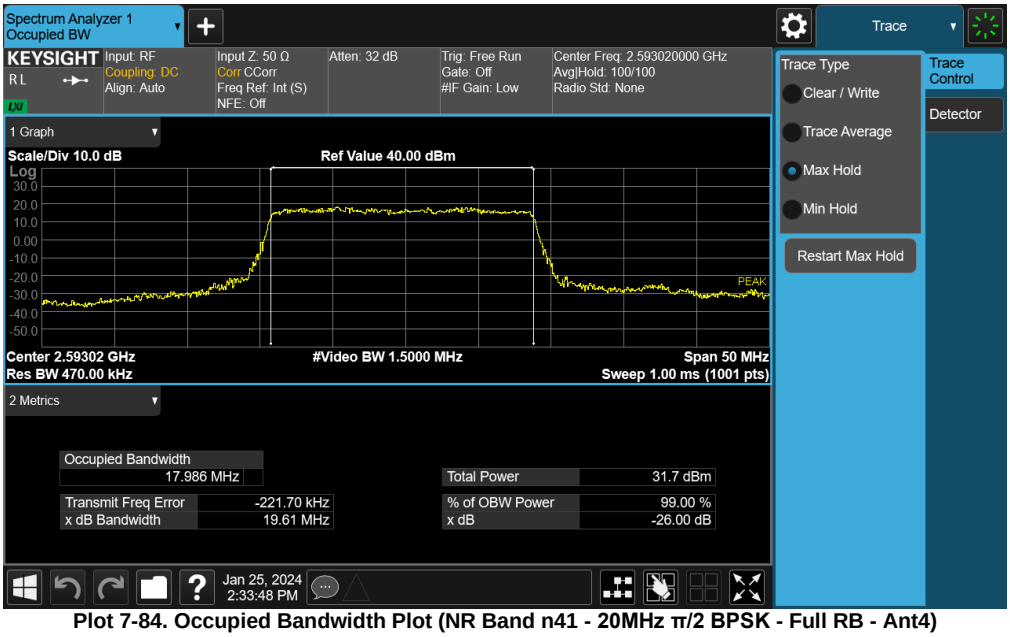
Plot 7-81. Occupied Bandwidth Plot (NR Band n41 - 30MHz π/2 BPSK - Full RB - Ant4)



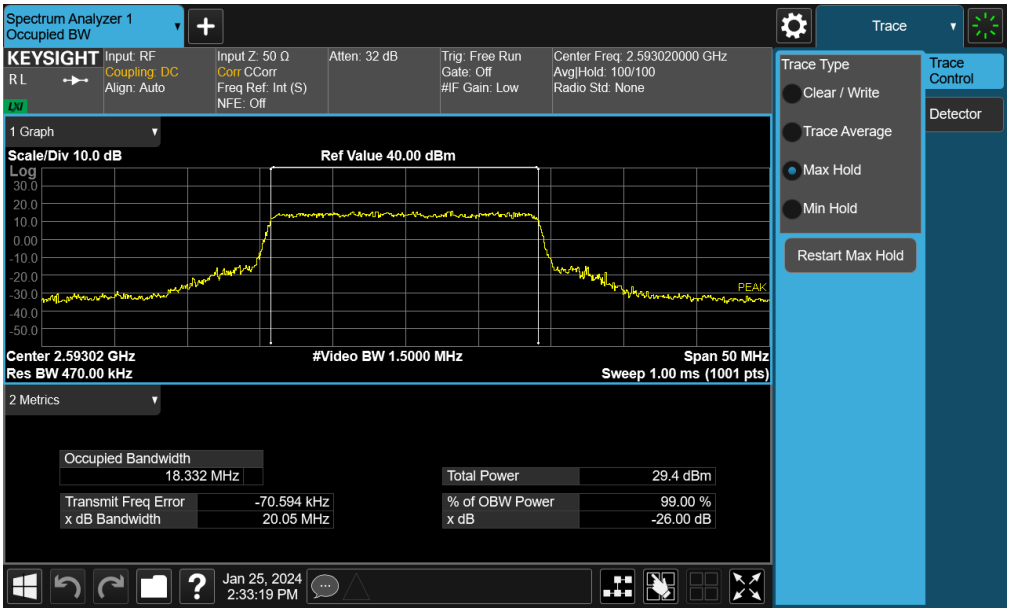
Plot 7-82. Occupied Bandwidth Plot (NR Band n41 - 30MHz QPSK - Full RB - Ant4)



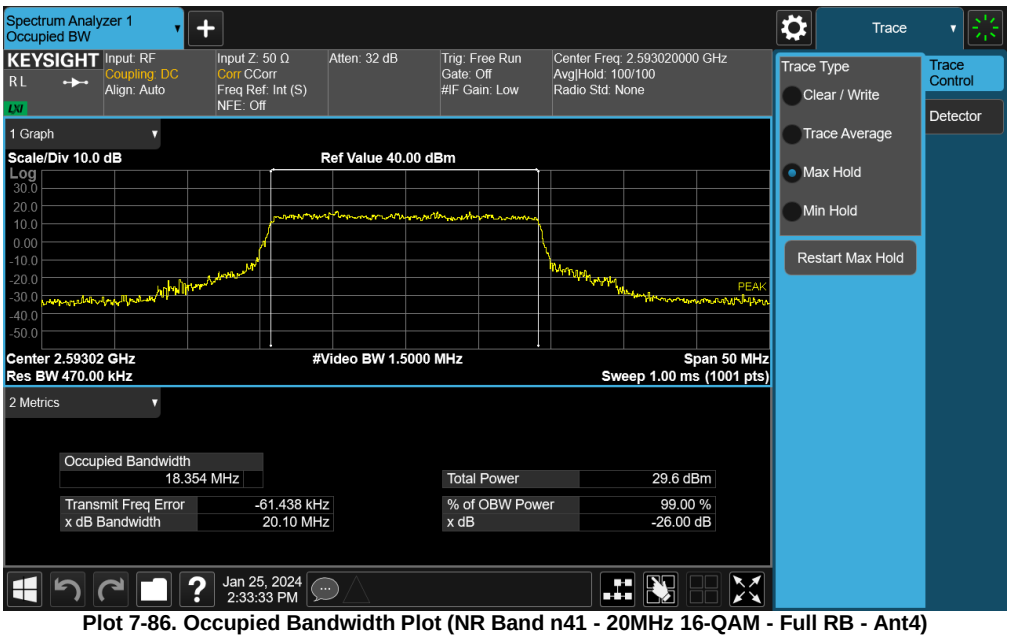
Plot 7-83. Occupied Bandwidth Plot (NR Band n41 - 30MHz 16-QAM - Full RB - Ant4)



Plot 7-84. Occupied Bandwidth Plot (NR Band n41 - 20MHz π/2 BPSK - Full RB - Ant4)



Plot 7-85. Occupied Bandwidth Plot (NR Band n41 - 20MHz QPSK - Full RB - Ant4)



Plot 7-86. Occupied Bandwidth Plot (NR Band n41 - 20MHz 16-QAM - Full RB - Ant4)

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 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.

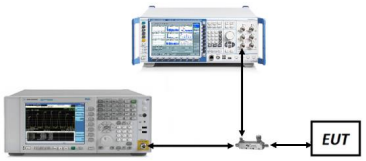


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

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

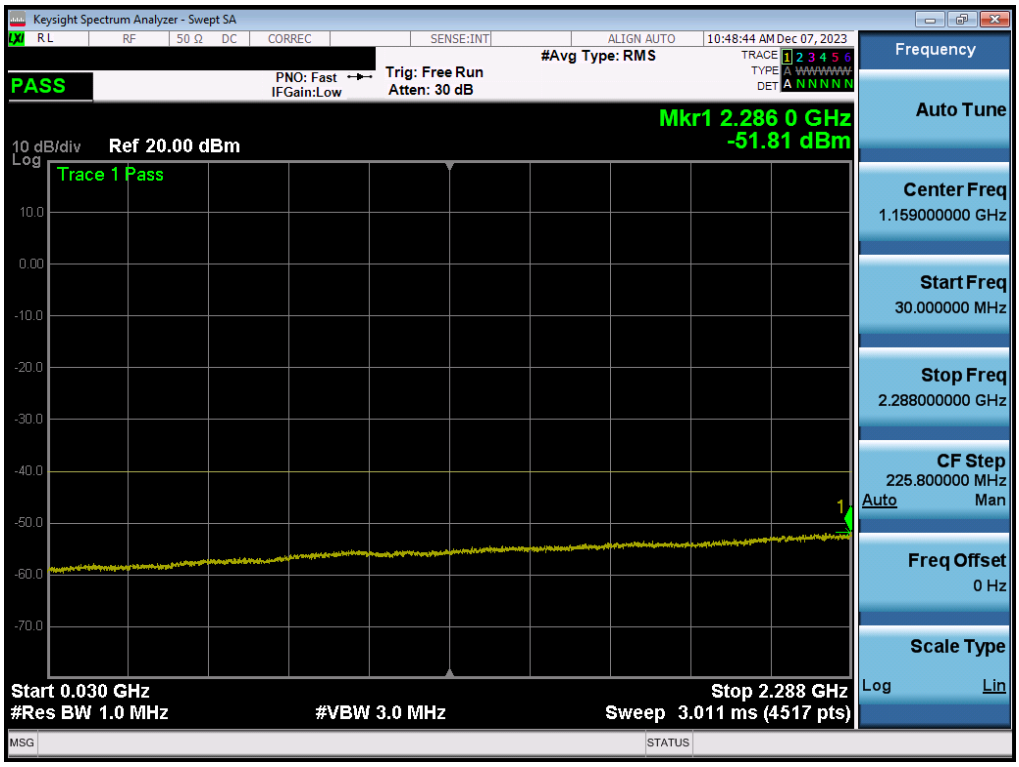
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

3. Since standalone targets of Ant 1 and Ant 4 have higher targets than UL-MIMO n41 data is not included in the report. Also, UL-MIMO n41 conducted spurious emissions has been checked and was found not to be the worst case.

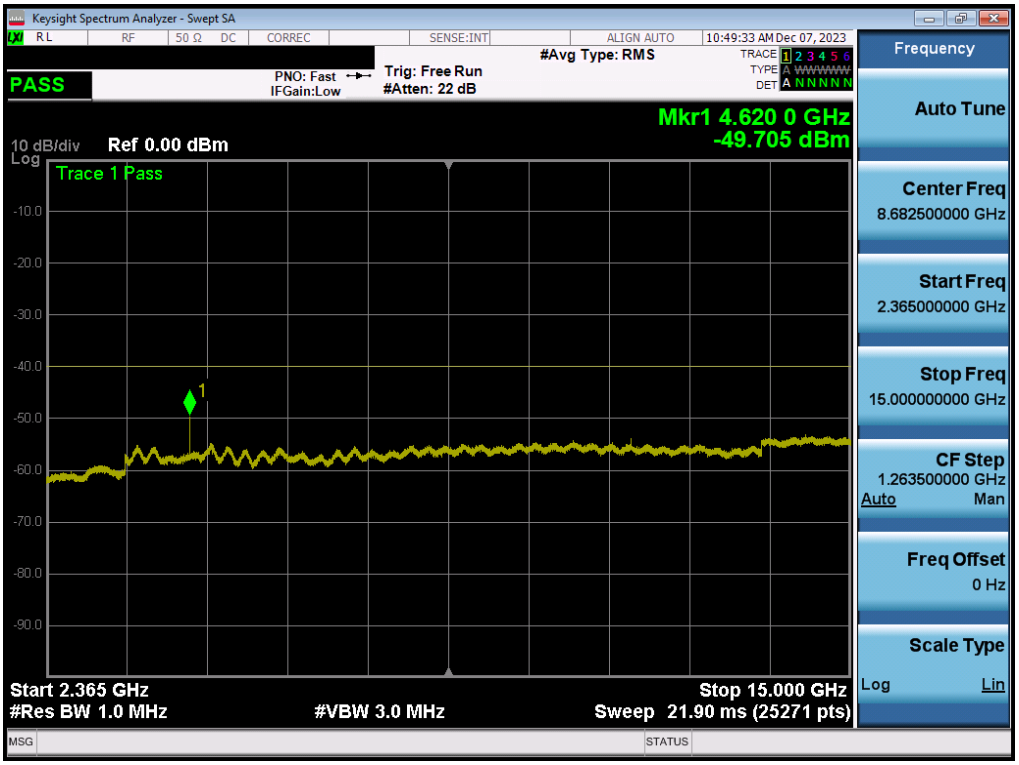
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B30	10MHz	Mid	30.0 - 2288.0	-51.81	-40	-11.81
		Mid	2365.0 - 15000.0	-49.71	-40	-9.70
		Mid	15000.0 - 27000.0	-58.86	-40	-18.86
LTE-B41 PC2	20MHz	Low	30.0 - 2475.0	-42.71	-25	-17.71
		Low	2690.0 - 15000.0	-37.54	-25	-12.54
		Low	15000.0 - 27000.0	-51.30	-25	-26.30
		Mid	30.0 - 2500.0	-42.71	-25	-17.71
		Mid	2690.0 - 15000.0	-37.63	-25	-12.63
		Mid	15000.0 - 27000.0	-51.24	-25	-26.24
		High	30.0 - 2500.0	-42.68	-25	-17.68
		High	2690.0 - 15000.0	-37.42	-25	-12.42
		High	15000.0 - 27000.0	-51.60	-25	-26.60
LTE-B41 PC3	20MHz	Low	30.0 - 2475.0	-42.08	-25	-17.08
		Low	2690.0 - 15000.0	-36.93	-25	-11.93
		Low	15000.0 - 27000.0	-51.19	-25	-26.19
		Mid	30.0 - 2500.0	-41.63	-25	-17.19
		Mid	2690.0 - 15000.0	-37.04	-25	-12.04
		Mid	15000.0 - 27000.0	-50.81	-25	-25.81
		High	30.0 - 2500.0	-42.19	-25	-17.19
		High	2690.0 - 15000.0	-37.06	-25	-12.06
		High	15000.0 - 27000.0	-51.37	-25	-26.37
LTE-B41 PC3 ULCA	20+20MHz	Low	30.0 - 2475.0	-43.37	-25	-18.37
		Low	2496.0 - 2690.0	18.78	-	-
		Low	2690.0 - 15000.0	-37.64	-25	-12.63
		Low	15000.0 - 27000.0	-51.43	-25	-26.43
		Mid	30.0 - 2475.0	-42.51	-25	-17.51
		Mid	2496.0 - 2690.0	17.80	-	-
		Mid	2690.0 - 15000.0	-37.72	-25	-12.72
		Mid	15000.0 - 27000.0	-50.87	-25	-25.87
		High	30.0 - 2496.0	-42.73	-25	-17.73
		High	2496.0 - 2690.0	17.30	-	-
		High	2690.0 - 15000.0	-37.17	-25	-12.17
		High	15000.0 - 27000.0	-50.73	-25	-25.73

Table 7-14. Conducted Spurious Emission Results – LTE – Ant 1

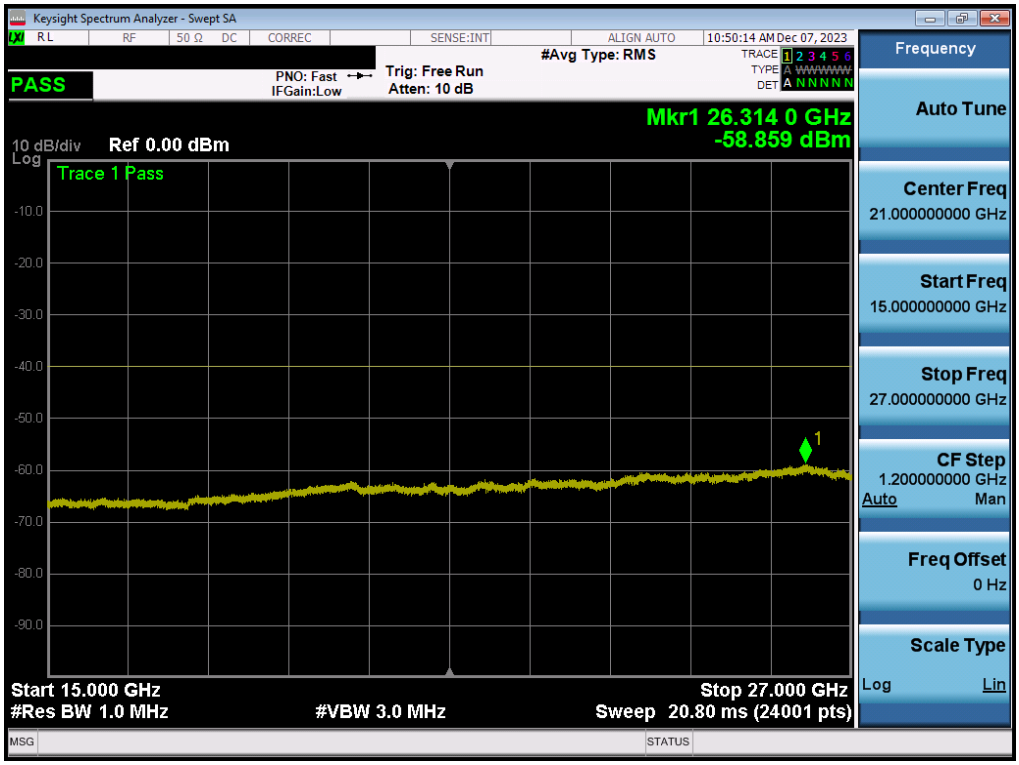
LTE Band 30 – Ant1



Plot 7-87. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0 - Ant1)

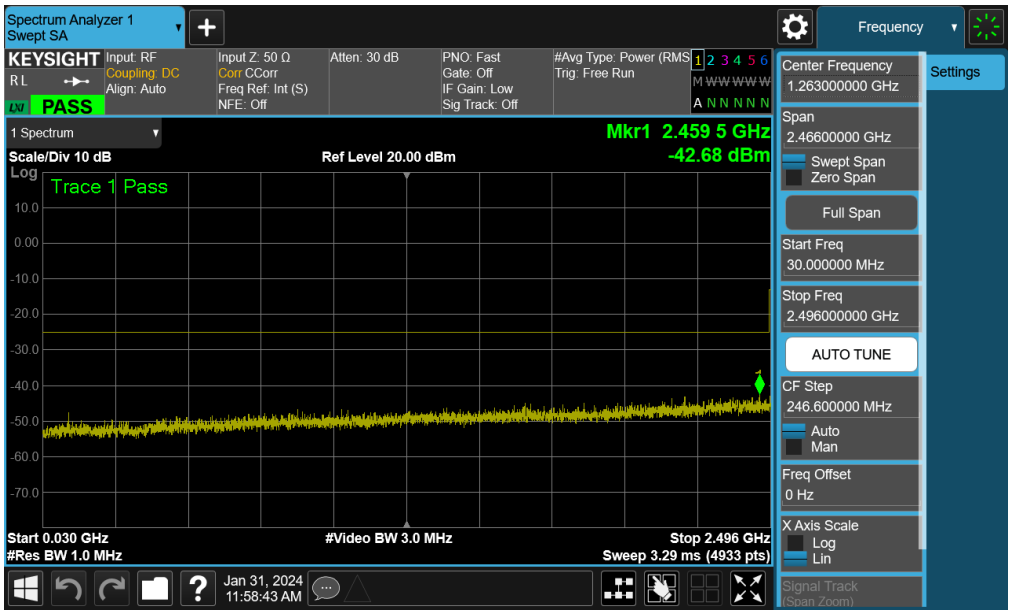


Plot 7-88. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0 - Ant1)

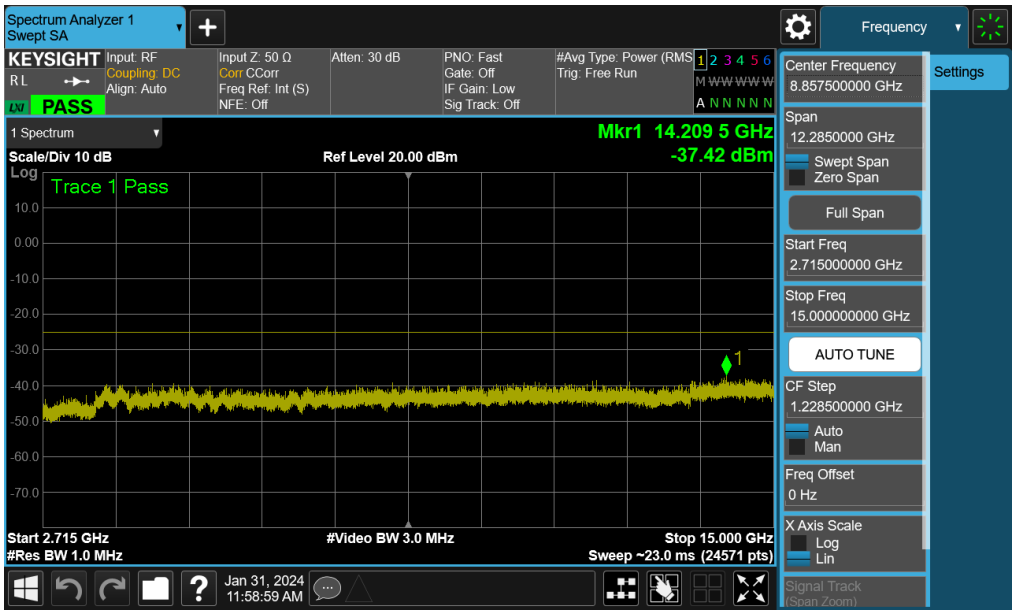


Plot 7-89. Conducted Spurious Plot (LTE Band 30 - 10MHz QPSK - RB Size 1, RB Offset 0 - Ant1)

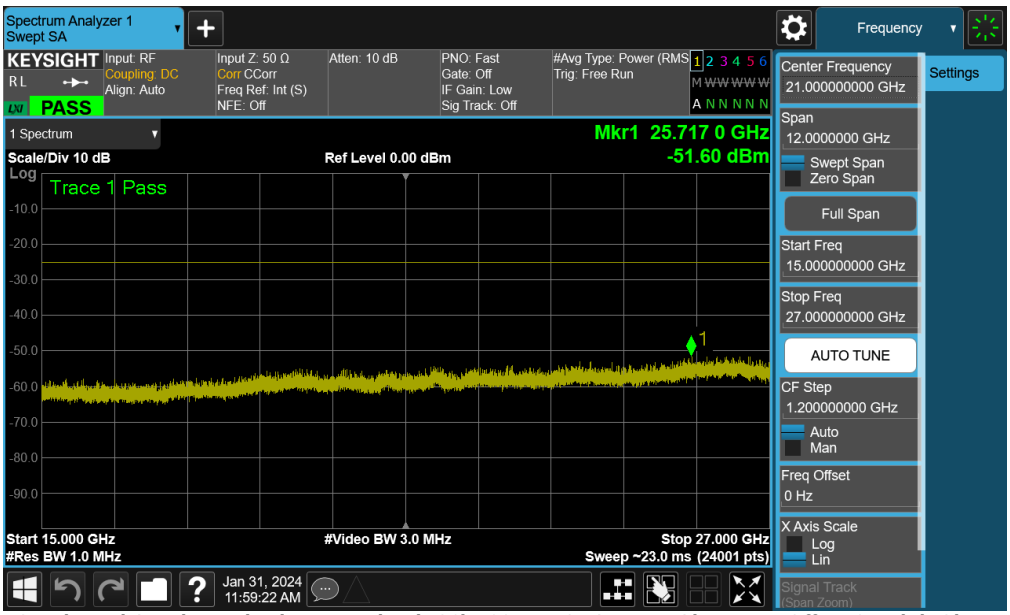
LTE Band 41(PC2) – Ant1



Plot 7-90. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant1)

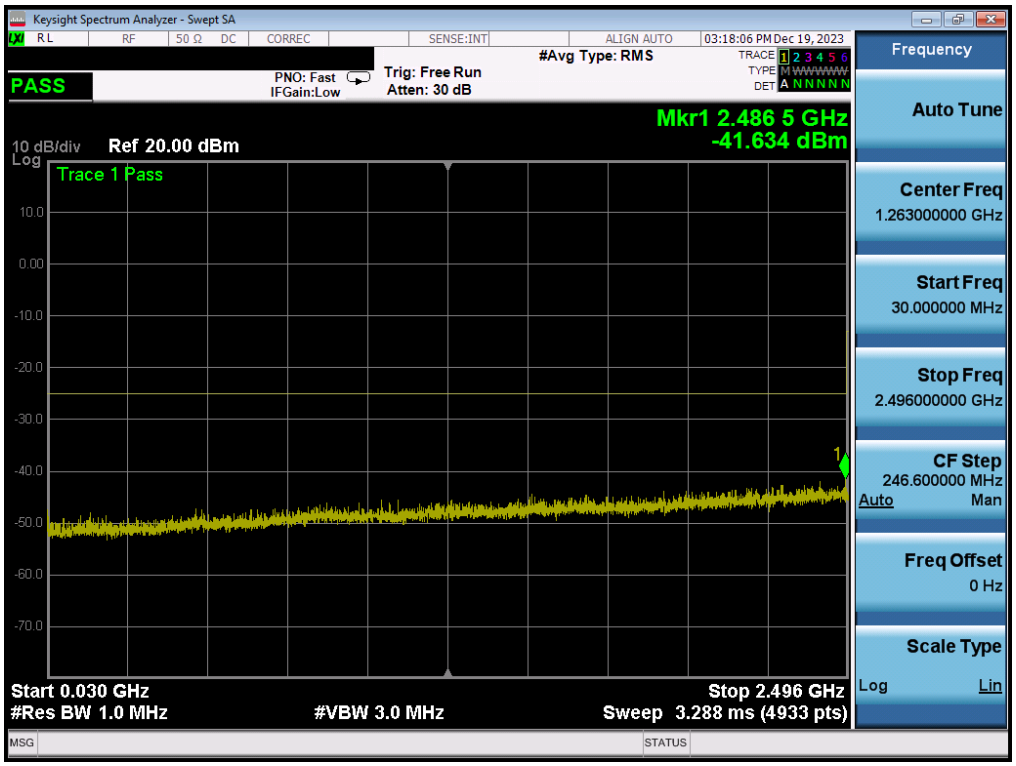


Plot 7-91. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant1)

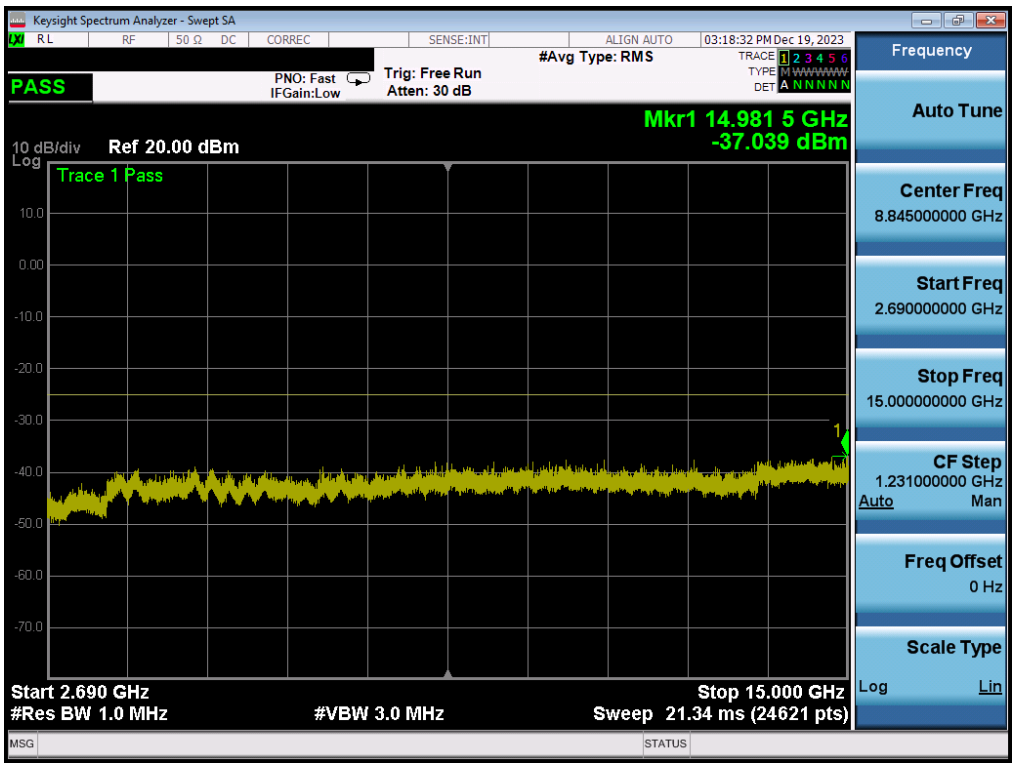


Plot 7-92. Conducted Spurious Plot (LTE Band 41(PC2) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel - Ant1)

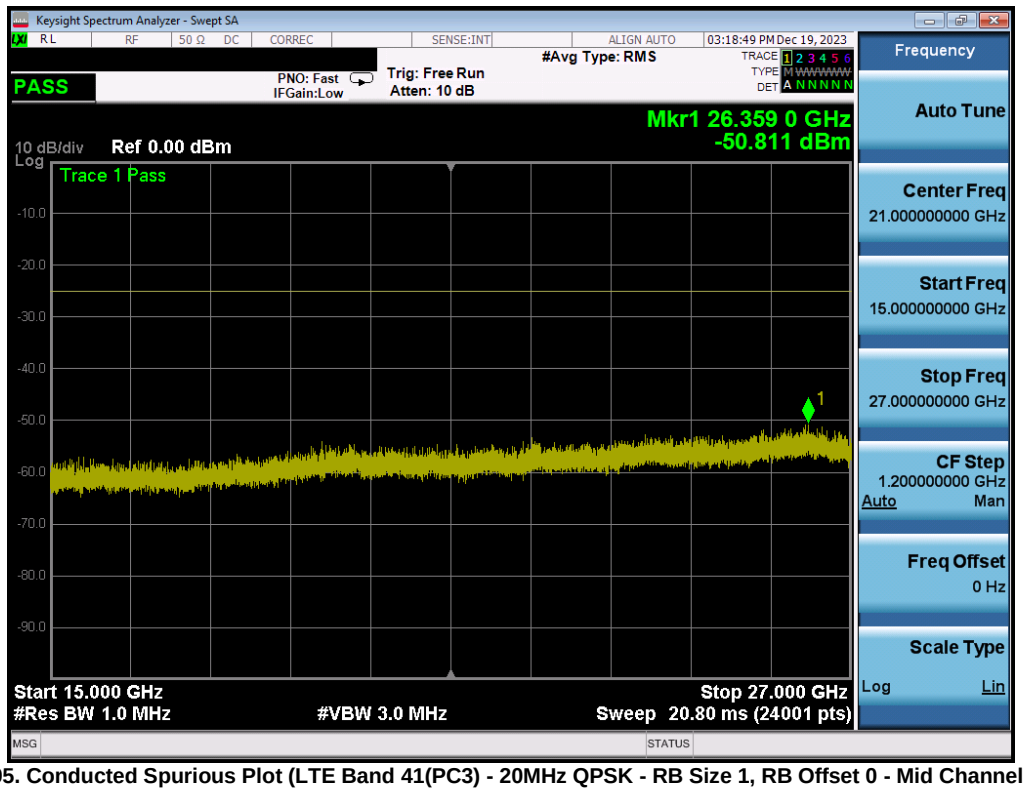
LTE Band 41(PC3) – Ant1



Plot 7-93. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)

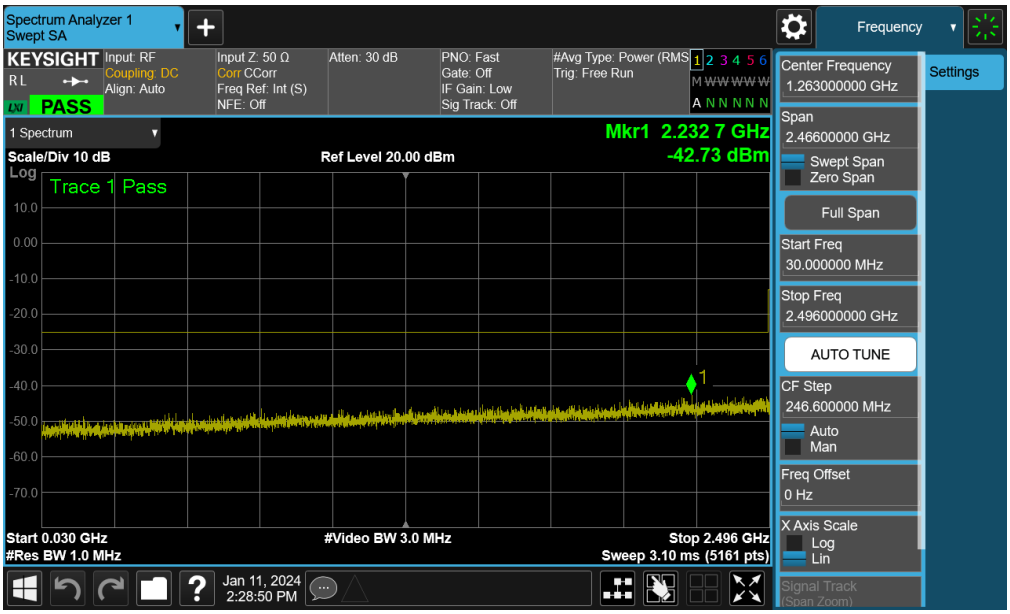


Plot 7-94. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)

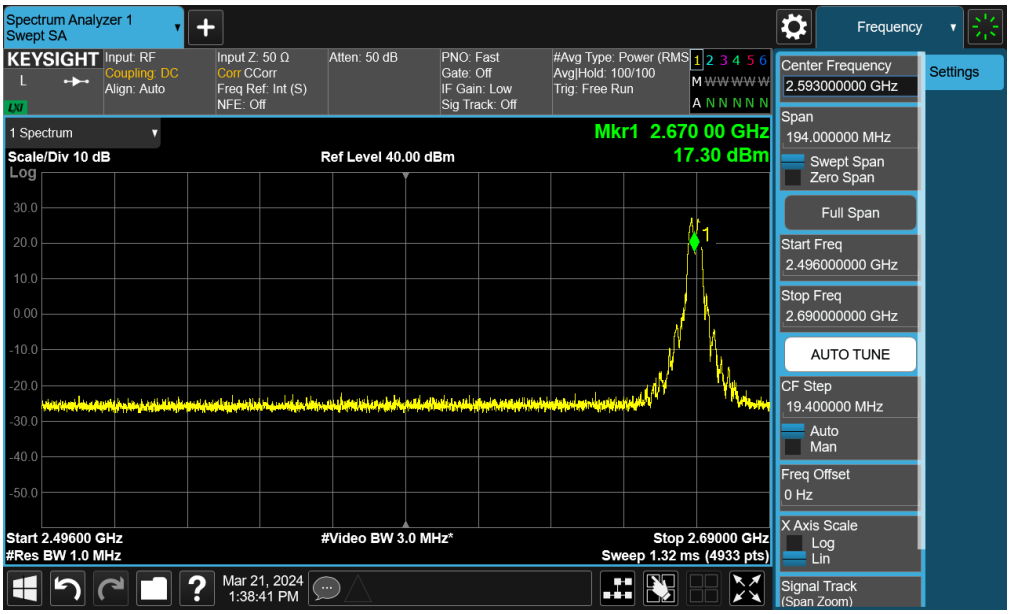


Plot 7-95. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)

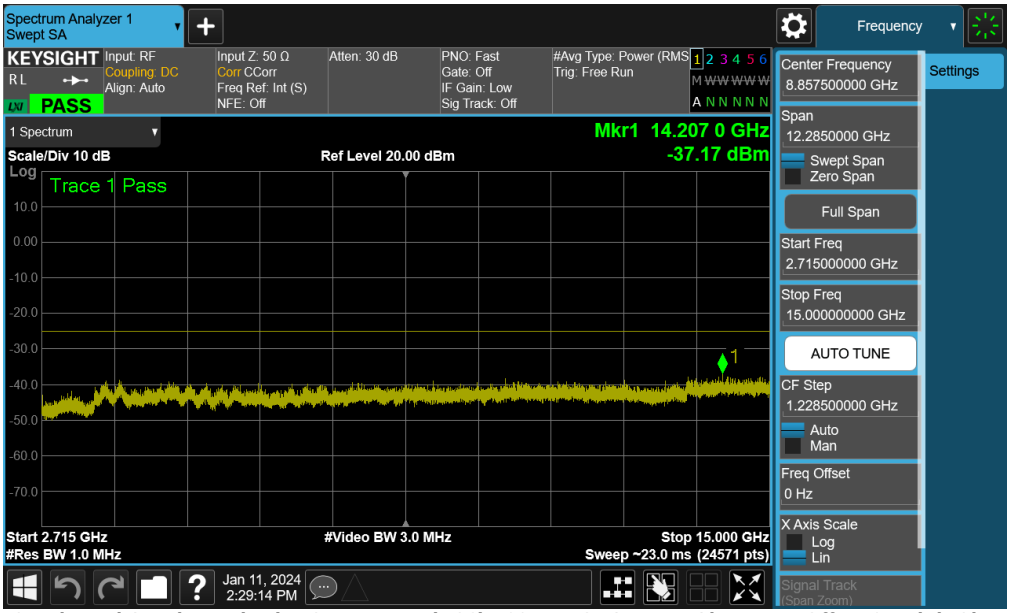
ULCA - LTE B41(PC3) – Ant1



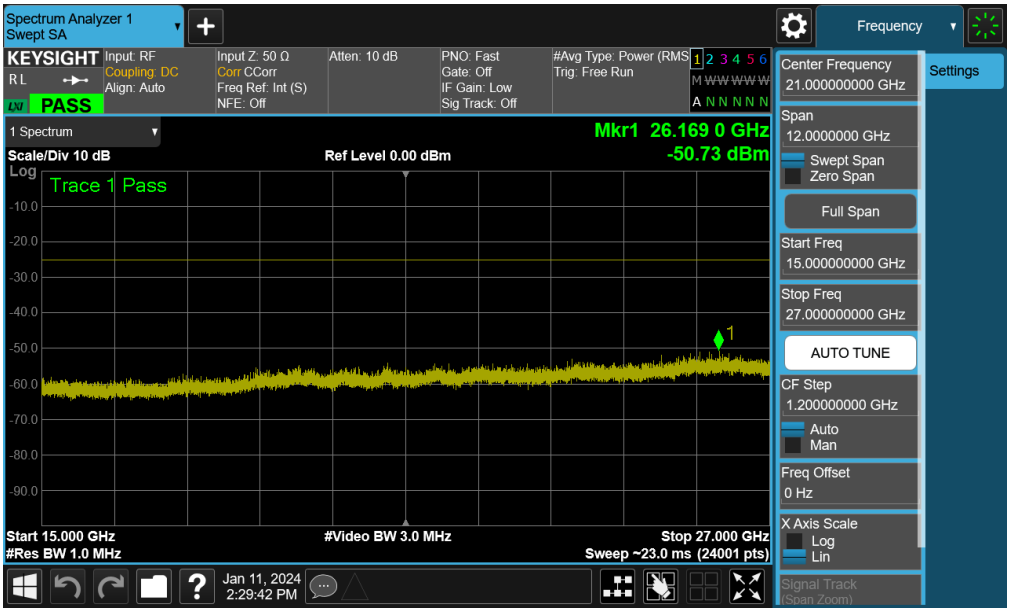
Plot 7-96. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant1)



Plot 7-97. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant1)



Plot 7-98. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant1)

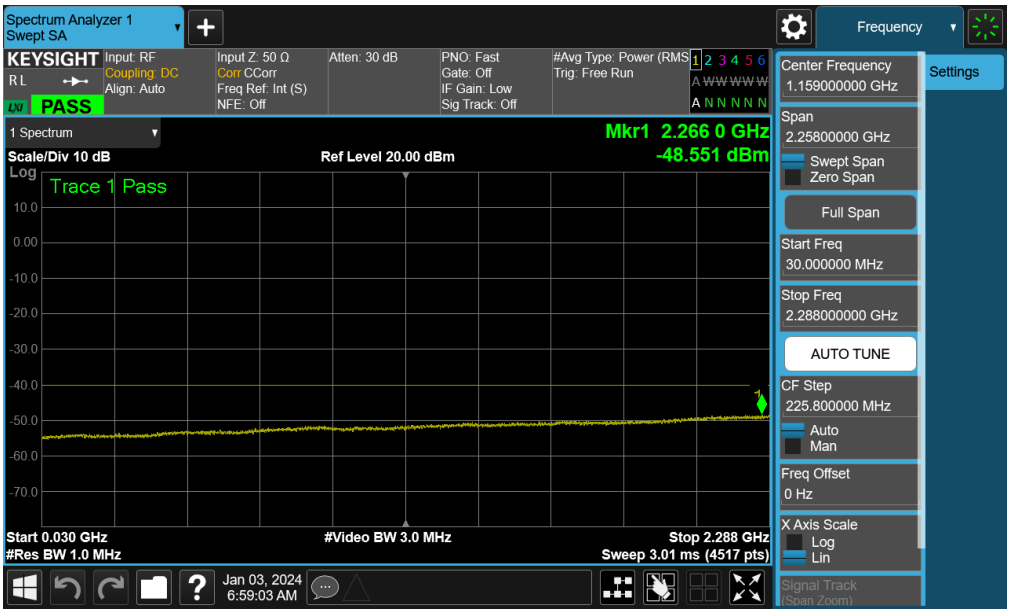


Plot 7-99. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel Ant1)

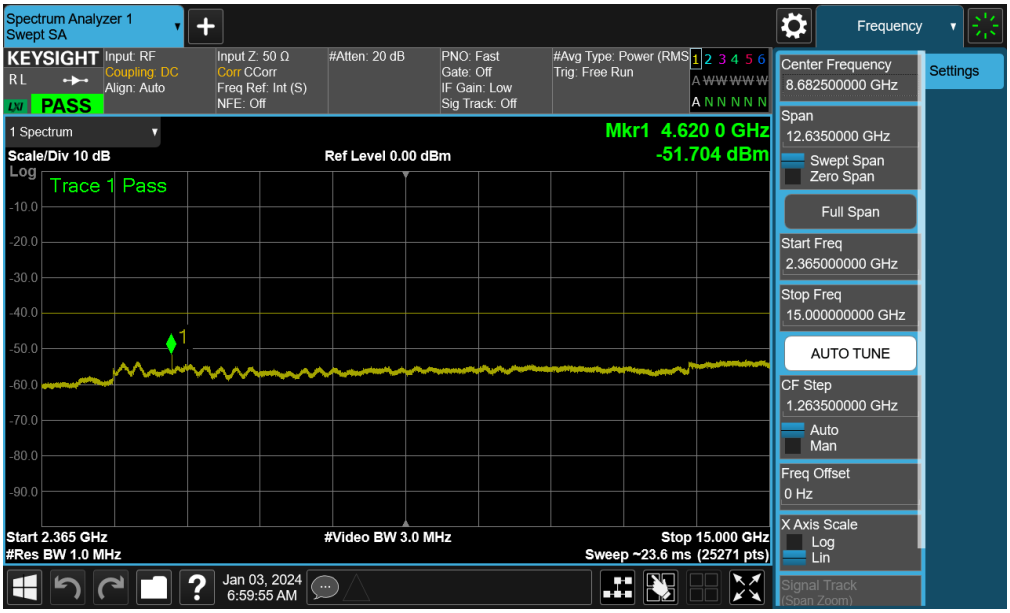
Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n30	10MHz	Mid	30.0 - 2288.0	-48.55	-40	-8.55
		Mid	2365.0 - 15000.0	-51.70	-40	-11.70
		Mid	15000.0 - 27000.0	-57.08	-40	-17.08
NR-n41PC3	100MHz	Low	30.0 - 2470.0	-38.43	-25	-13.43
		Low	2690.0 - 15000.0	-34.37	-25	-9.37
		Low	15000.0 - 27000.0	-49.38	-25	-24.38
		Mid	30.0 - 2496.0	-38.95	-25	-13.95
		Mid	2690.0 - 15000.0	-35.02	-25	-10.02
		Mid	15000.0 - 27000.0	-49.41	-25	-24.41
		High	30.0 - 2496.0	-39.72	-25	-14.72
		High	2715.0 - 15000.0	-34.82	-25	-9.82
		High	15000.0 - 27000.0	-49.63	-25	-24.63

Table 7-15. Occupied Bandwidth Results – NR – Ant 1

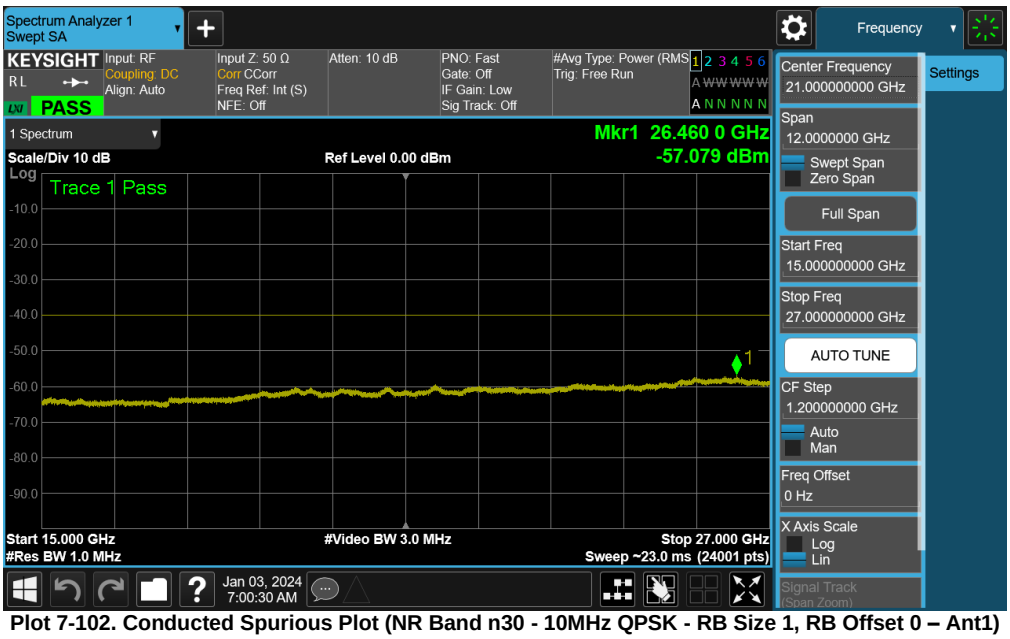
NR Band n30 – Ant1



Plot 7-100. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant1)

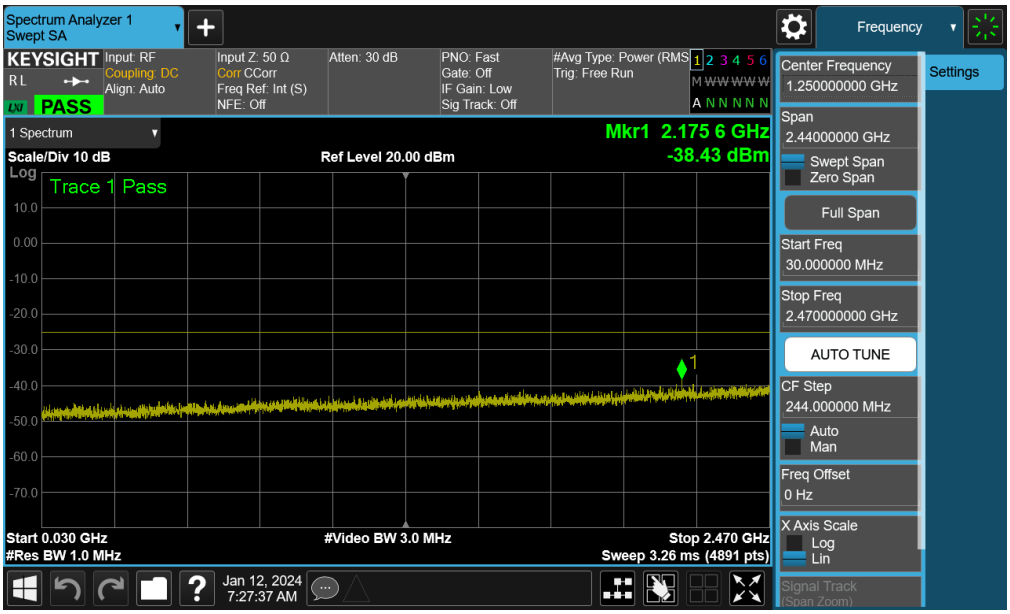


Plot 7-101. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant1)

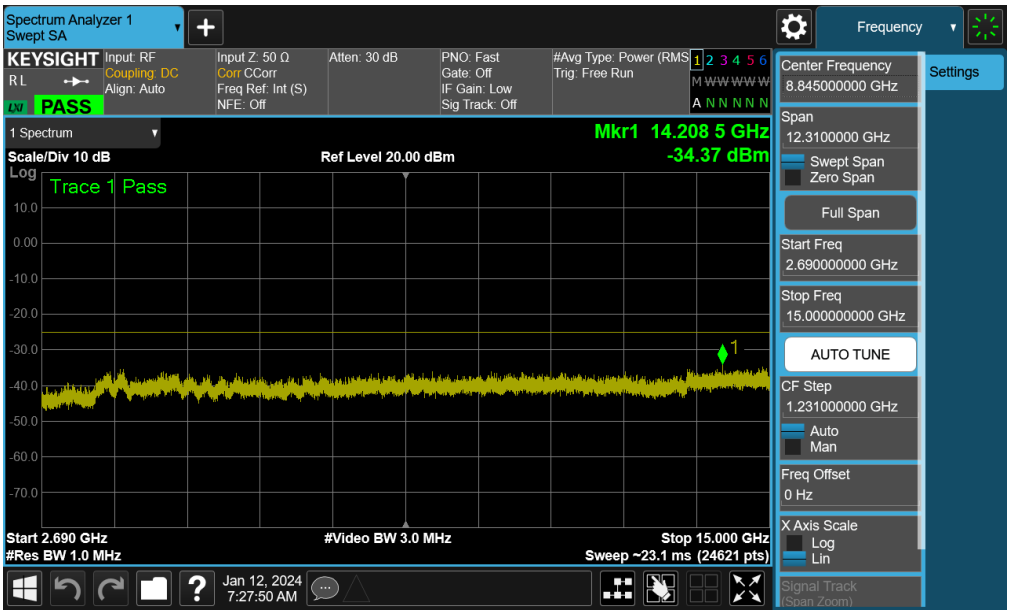


Plot 7-102. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant1)

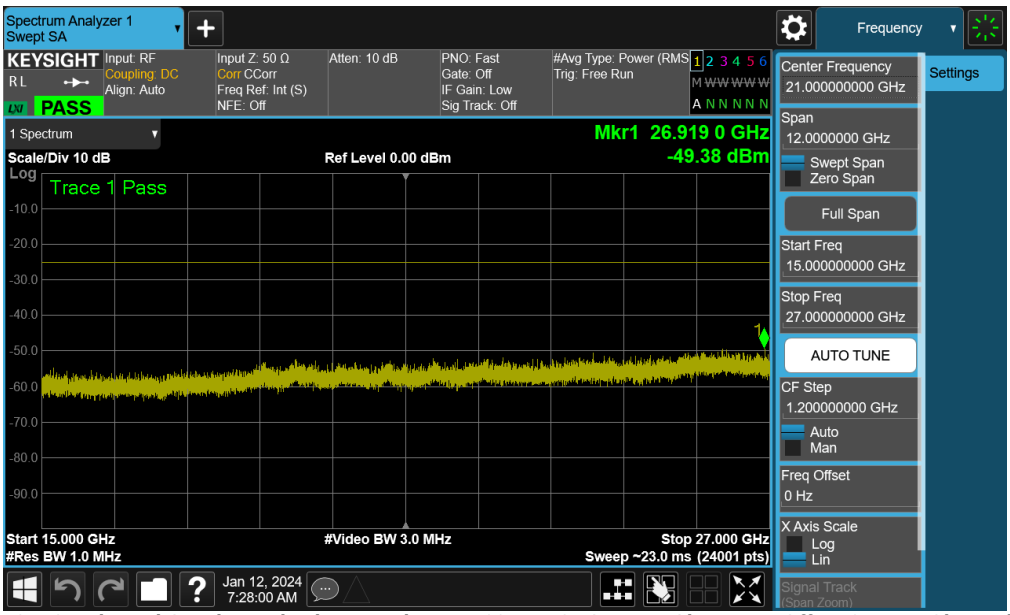
NR Band n41 – Ant1



Plot 7-103. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant1)



Plot 7-104. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant1)



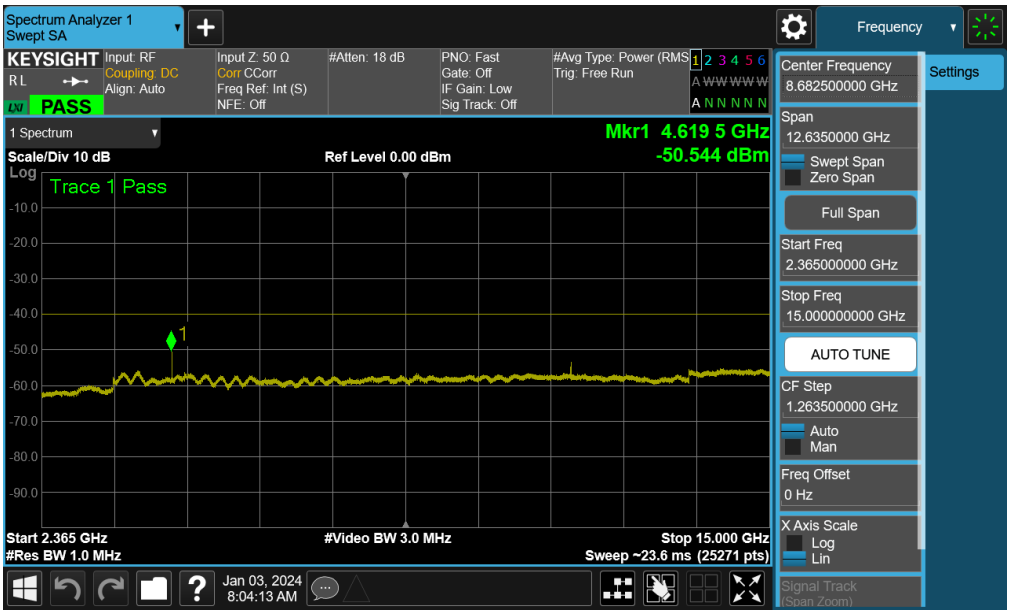
Plot 7-105. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant1)

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n30	10MHz	Mid	30.0 - 2288.0	-48.90	-40	-8.90
		Mid	2365.0 - 15000.0	-50.54	-40	-10.54
		Mid	15000.0 - 27000.0	-57.12	-40	-17.12
NR-N41PC3	100MHz	Low	30.0 - 2470.0	-39.25	-25	-14.25
		Low	2690.0 - 15000.0	-33.29	-25	-8.29
		Low	15000.0 - 27000.0	-47.80	-25	-22.80
		Mid	30.0 - 2496.0	-39.47	-25	-14.47
		Mid	2690.0 - 15000.0	-35.04	-25	-10.04
		Mid	15000.0 - 27000.0	-48.96	-25	-23.96
		High	30.0 - 2496.0	-39.09	-25	-14.09
		High	2715.0 - 15000.0	-35.65	-25	-10.65
		High	15000.0 - 27000.0	-50.04	-25	-25.04

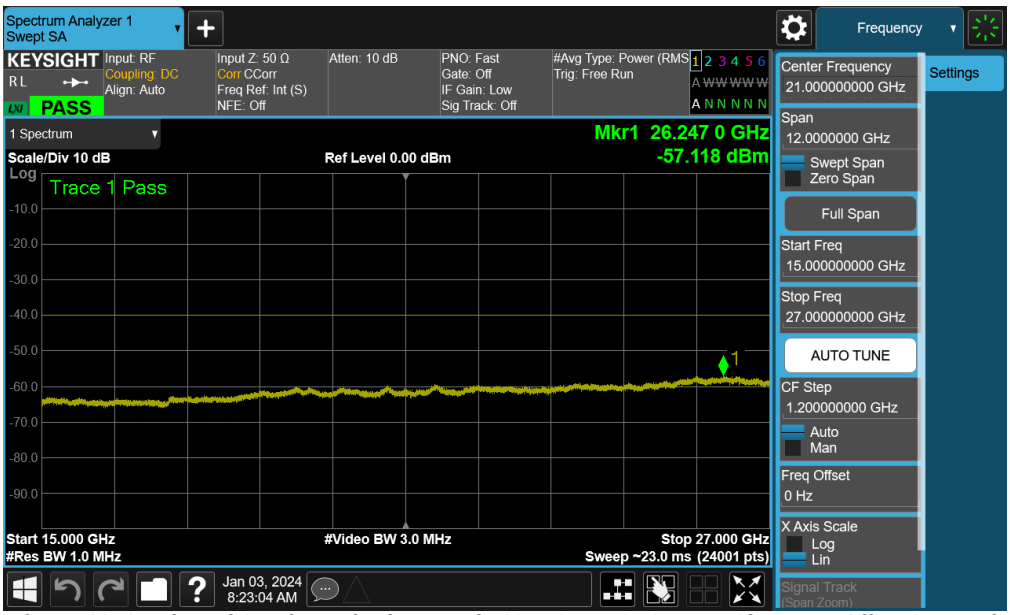
Table 7-16. Occupied Bandwidth Results – NR – Ant 4

NR Band n30 – Ant4

Plot 7-106. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant4)

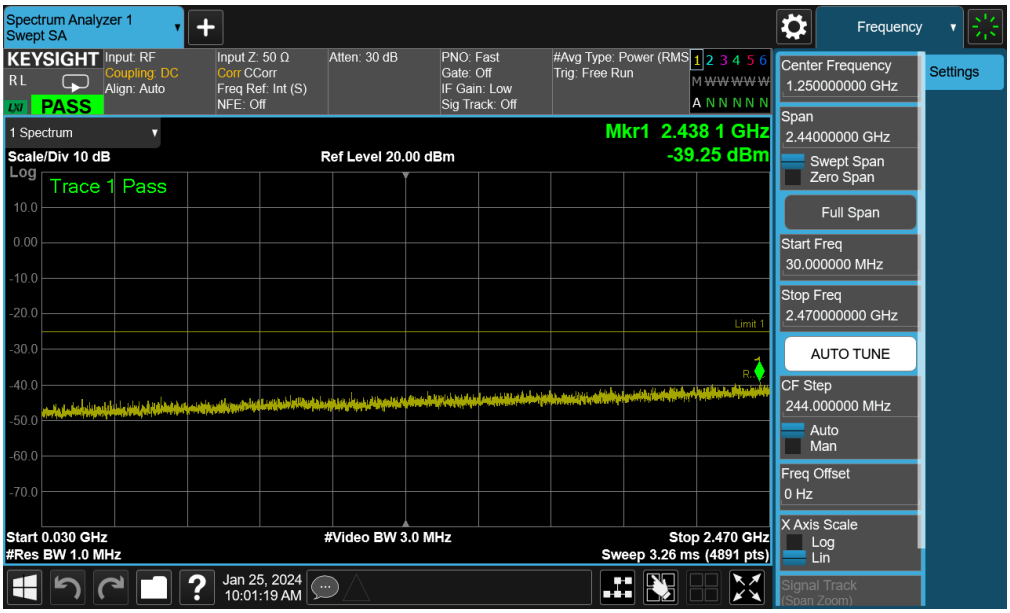


Plot 7-107. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant4)

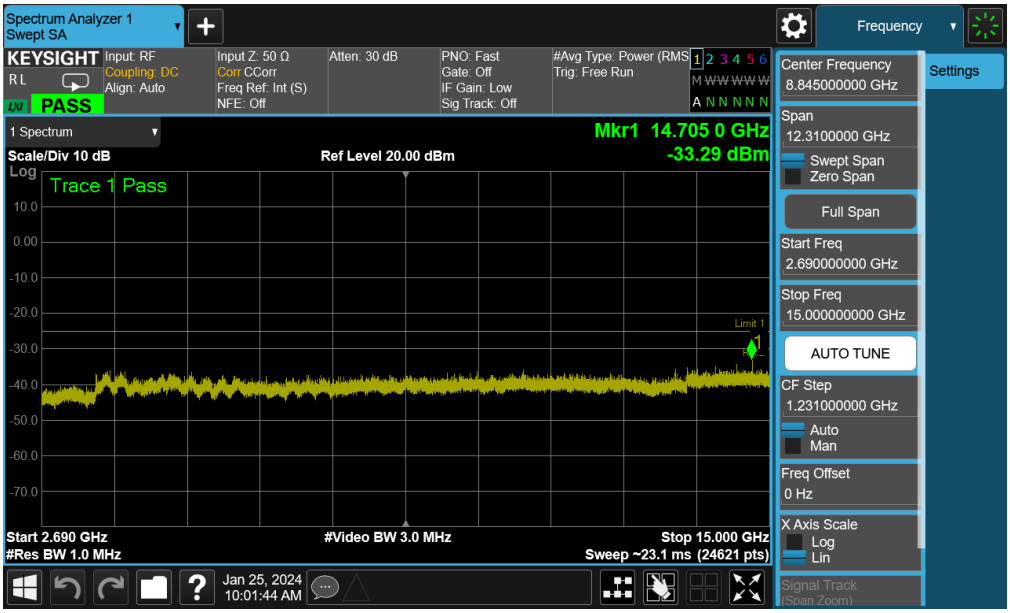


Plot 7-108. Conducted Spurious Plot (NR Band n30 - 10MHz QPSK - RB Size 1, RB Offset 0 – Ant4)

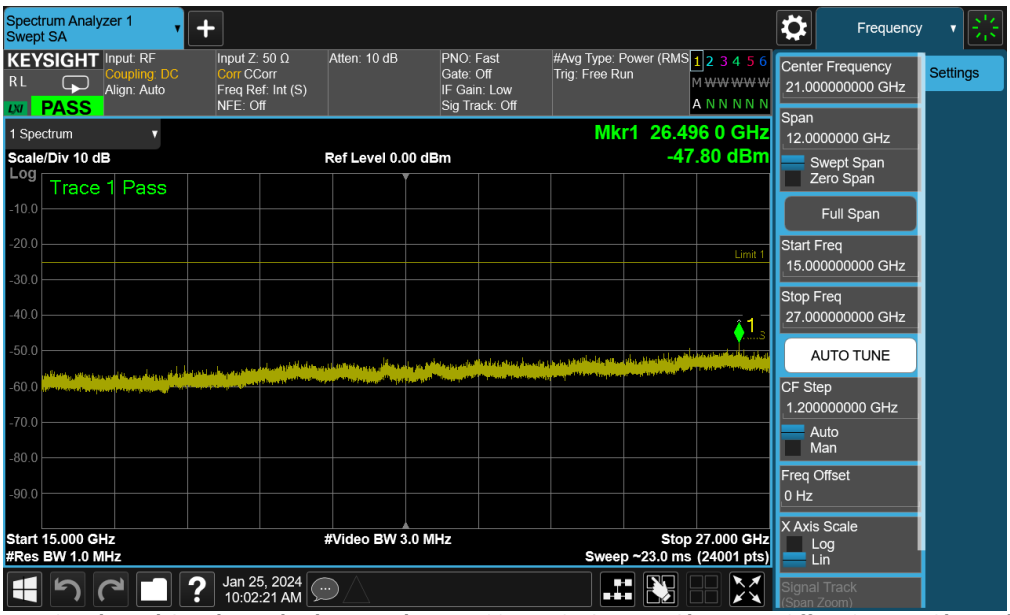
NR Band n41 – Ant4



Plot 7-109. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant4)



Plot 7-110. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant4)



Plot 7-111. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel Ant4)

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 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.

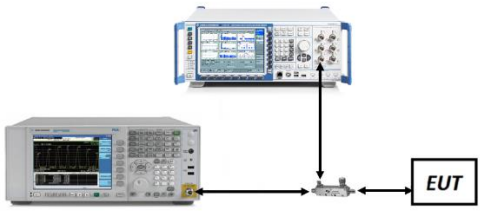


Figure 7-4. Test Instrument & Measurement Setup

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.

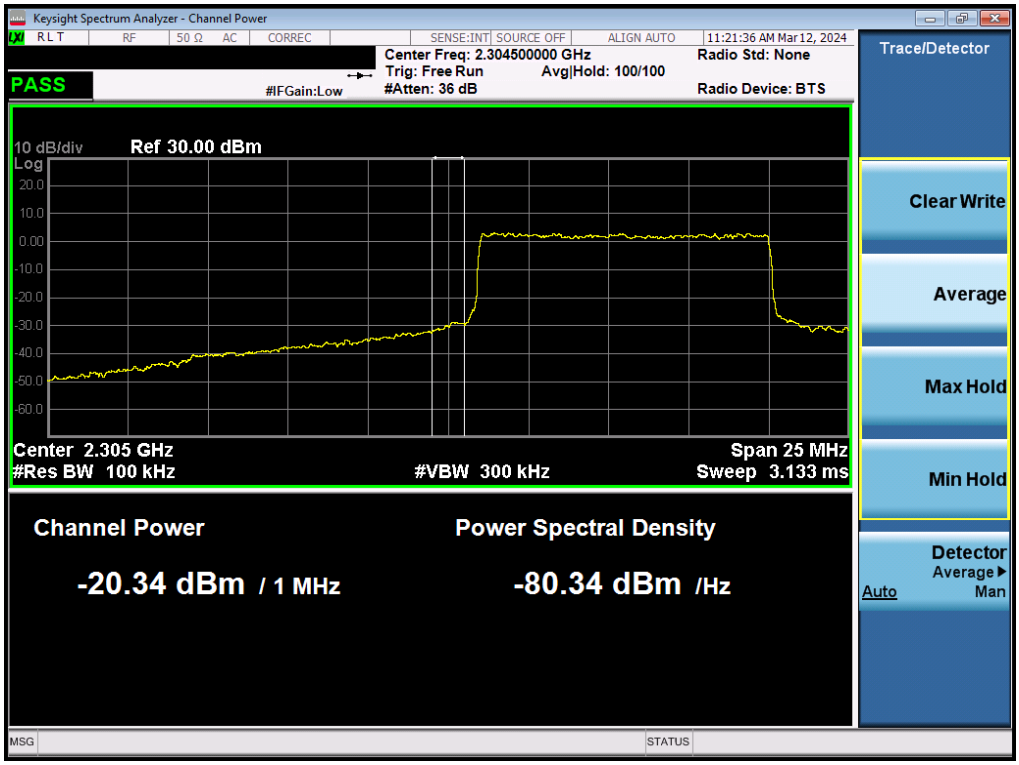
3. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

4. Since standalone targets of Ant 1 and Ant 4 have higher targets than UL-MIMO n41 data is not included in the report. Also, UL-MIMO n41 conducted band edge has been checked and was found not to be the worst case.

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE B30	10 MHz	Low	Band Edge	-20.34	-13	-7.34
		Low	Extended	-32.84	-31	-1.59
		High	Band Edge	-20.01	-13	-7.01
		High	Extended	-42.67	-38	-4.67
	5 MHz	Low	Band Edge	-20.23	-13	-7.23
		Low	Extended	-14.94	-13	-1.94
		High	Band Edge	-19.94	-13	-6.94
		High	Extended	-42.99	-38	-4.93
LTE B41 PC2	20 MHz	Low	Band Edge	-27.30	-25	-2.30
		High	Band Edge	-19.15	-10	-9.15
	15 MHz	Low	Band Edge	-28.79	-25	-3.79
		High	Band Edge	-19.42	-13	-6.42
	10 MHz	Low	Band Edge	-29.53	-25	-4.53
		High	Band Edge	-16.19	-10	-6.19
	5 MHz	Low	Band Edge	-17.45	-13	-4.45
		High	Band Edge	-11.84	-10	-1.84
LTE B41 PC3	20 MHz	Low	Band Edge	-30.34	-25	-5.34
		High	Band Edge	-24.89	-13	-11.89
	15 MHz	Low	Band Edge	-31.12	-25	-6.12
		High	Band Edge	-23.88	-13	-10.88
	10 MHz	Low	Band Edge	-28.14	-25	-3.14
		High	Band Edge	-19.79	-10	-9.79
	5 MHz	Low	Band Edge	-38.03	-25	-13.03
		High	Band Edge	-19.16	-10	-9.16
LTE-B41 PC3 ULCA	20+20MHz	Low	Band Edge	-27.33	-25	-2.33
		High	Band Edge	-26.59	-25	-1.59

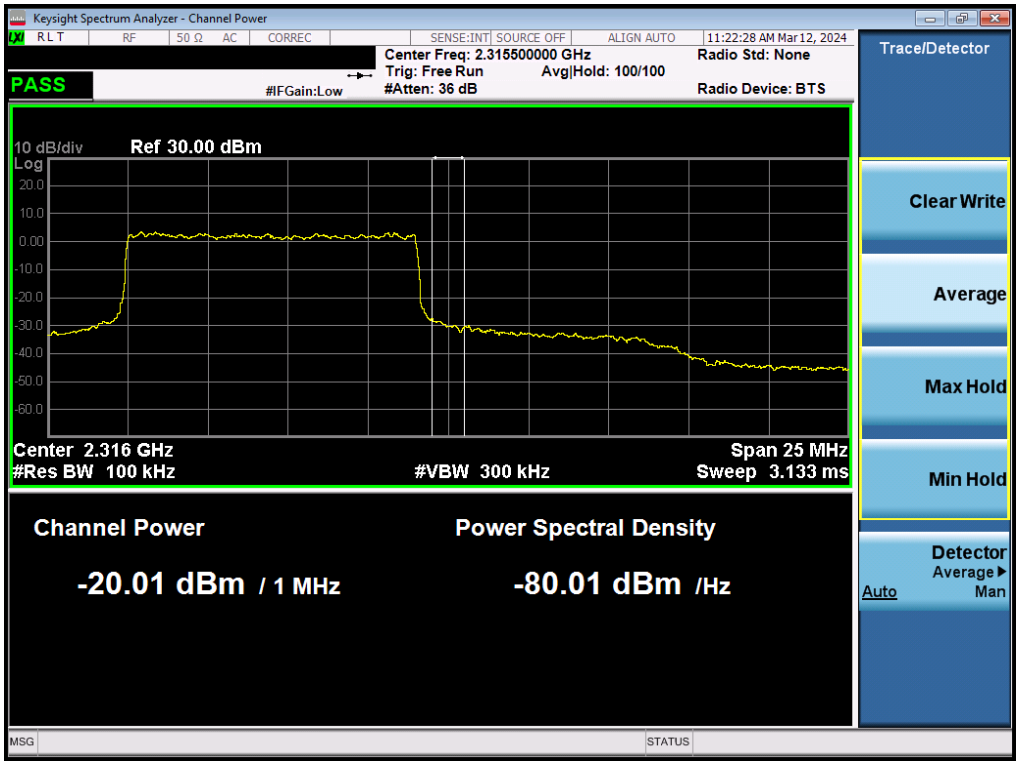
Table 7-17. Conducted Band Edge Test Results – LTE – Ant 1

LTE Band 30 – Ant1

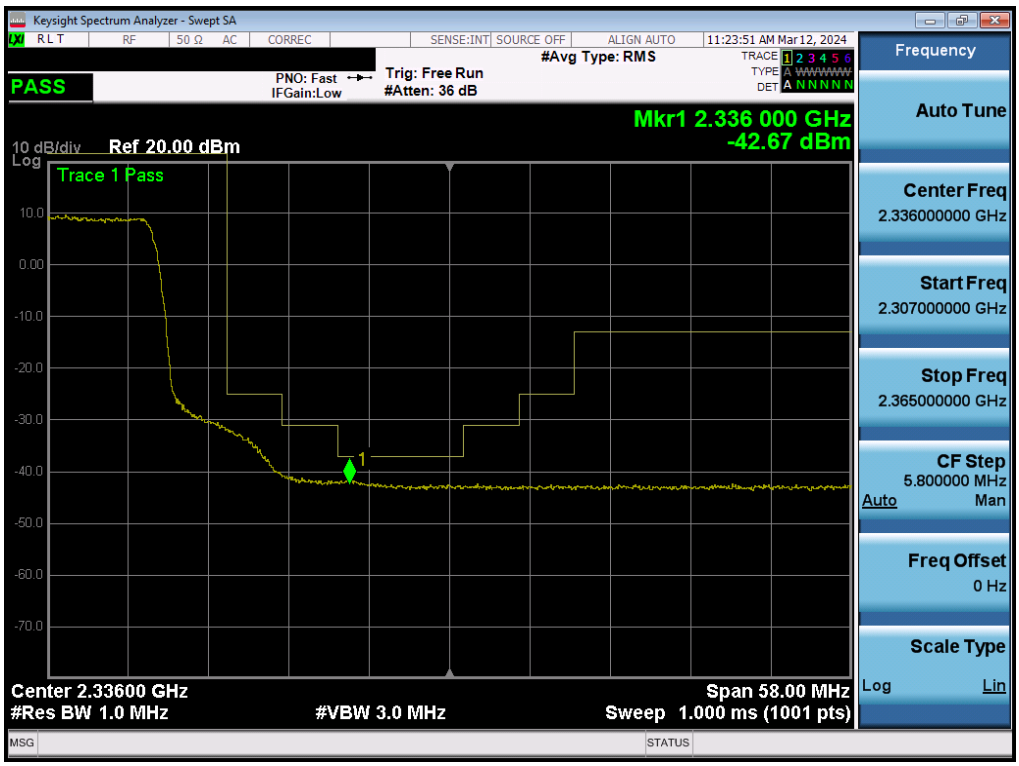


Plot 7-112. Lower Band Edge Plot (LTE Band 30 - 10MHz QPSK – Full RB - Ant1)

Plot 7-113. Extended Lower Band Edge Plot (LTE Band 30 - 10MHz QPSK – Full RB - Ant1)

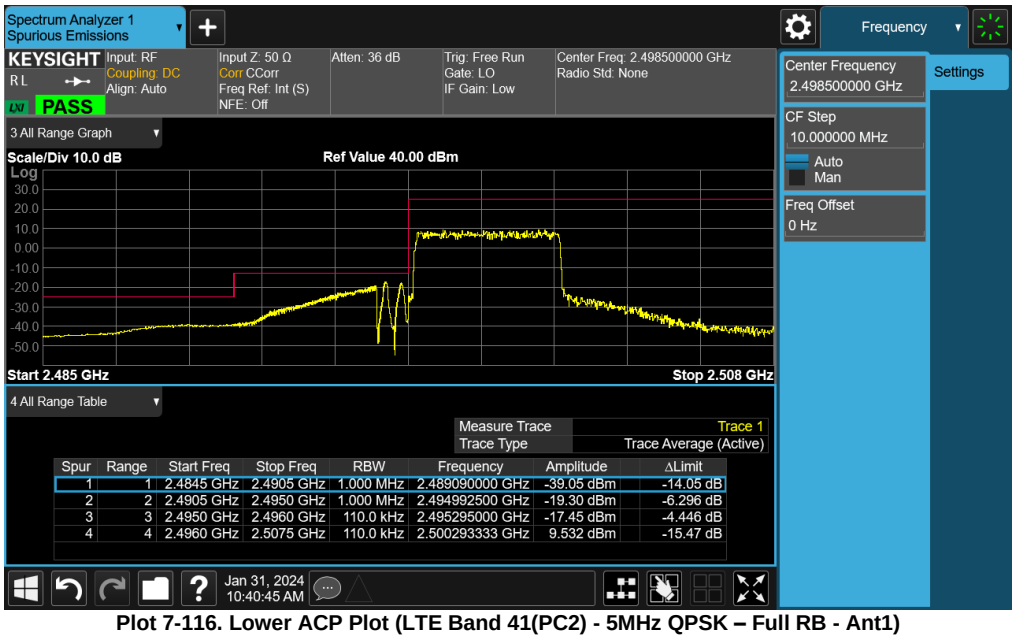


Plot 7-114. Upper Band Edge Plot (LTE Band 30 - 10MHz QPSK – Full RB - Ant1)

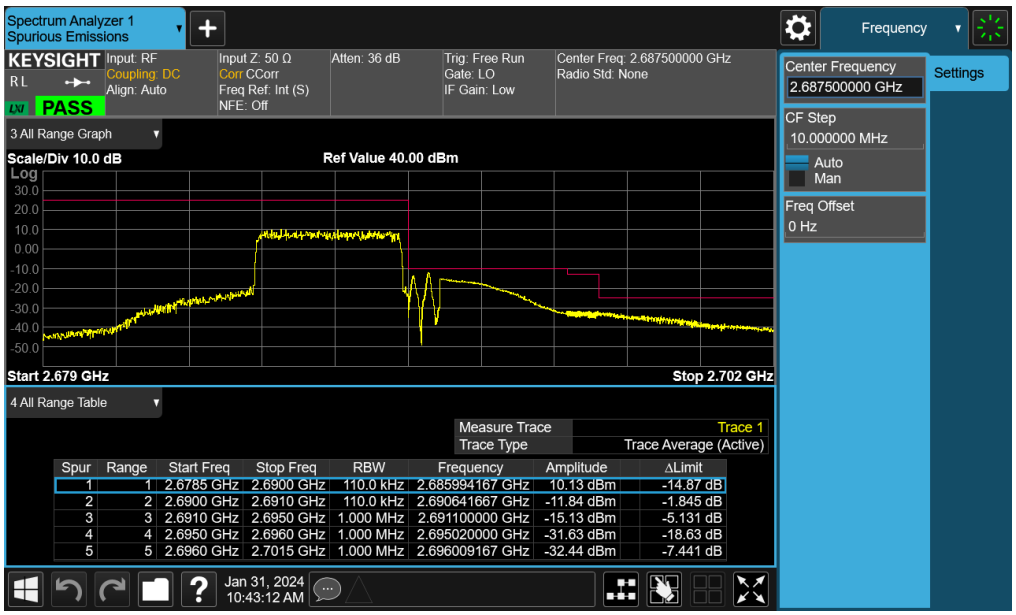


Plot 7-115. Extended Upper Band Edge Plot (LTE Band 30 - 10MHz QPSK – Full RB - Ant1)

LTE Band 41(PC2) – Ant1

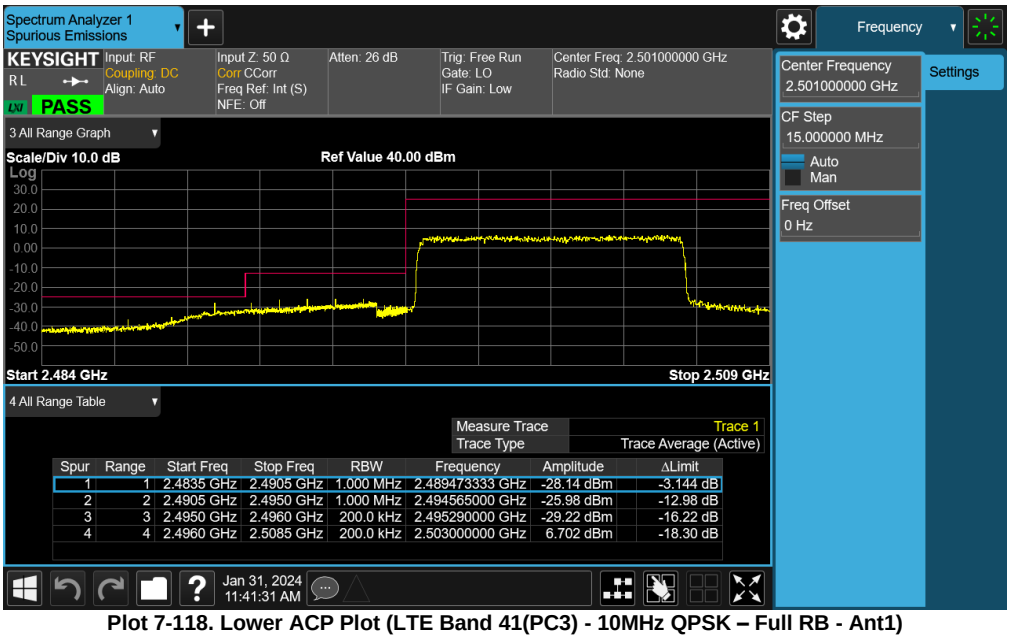


Plot 7-116. Lower ACP Plot (LTE Band 41(PC2) - 5MHz QPSK – Full RB - Ant1)

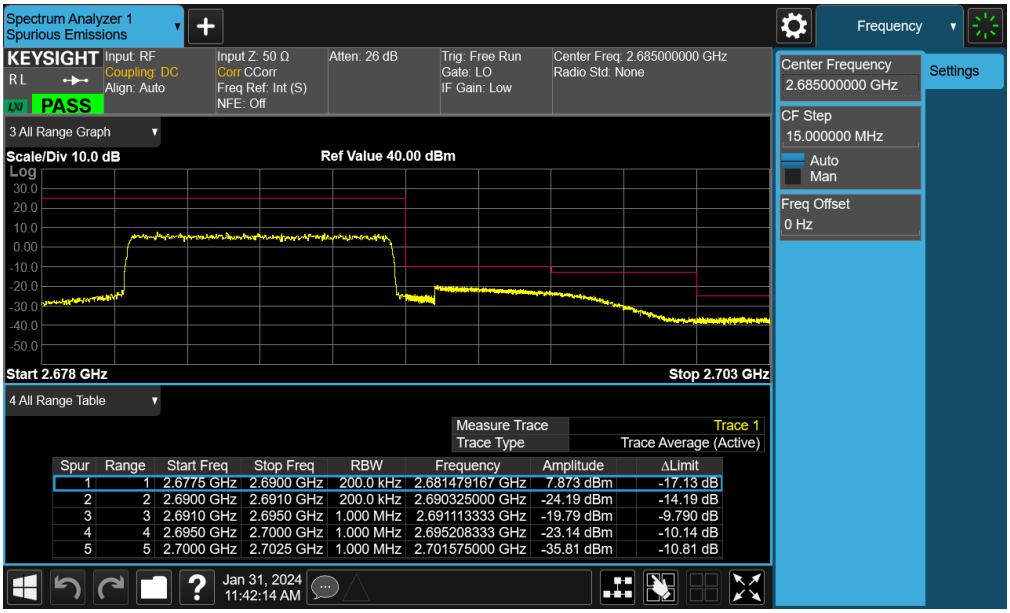


Plot 7-117. Upper ACP Plot (LTE Band 41(PC2) - 5MHz QPSK – Full RB - Ant1)

LTE Band 41(PC3) – Ant1

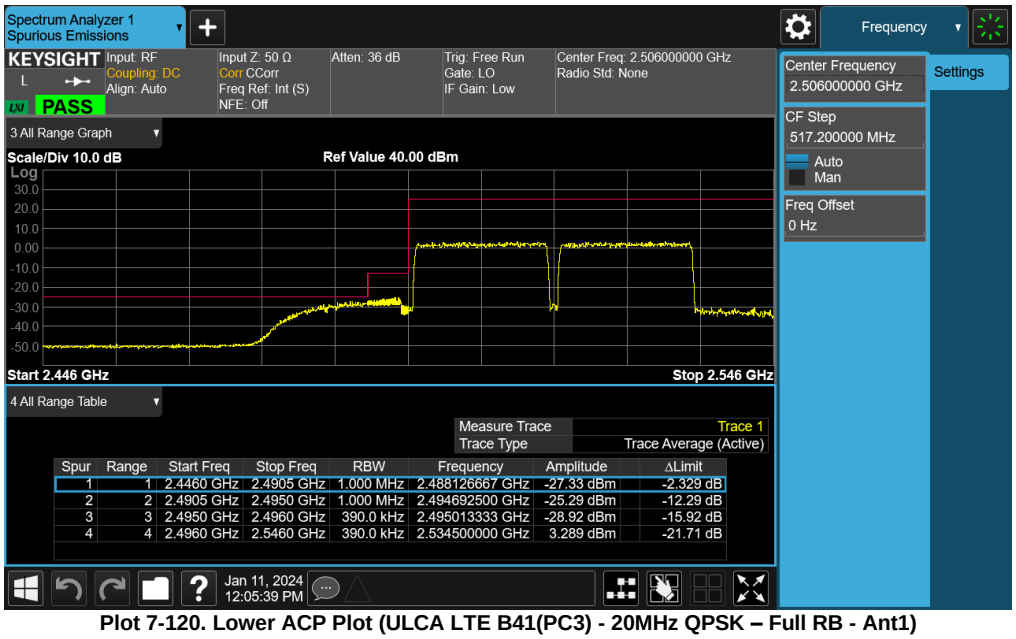


Plot 7-118. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant1)

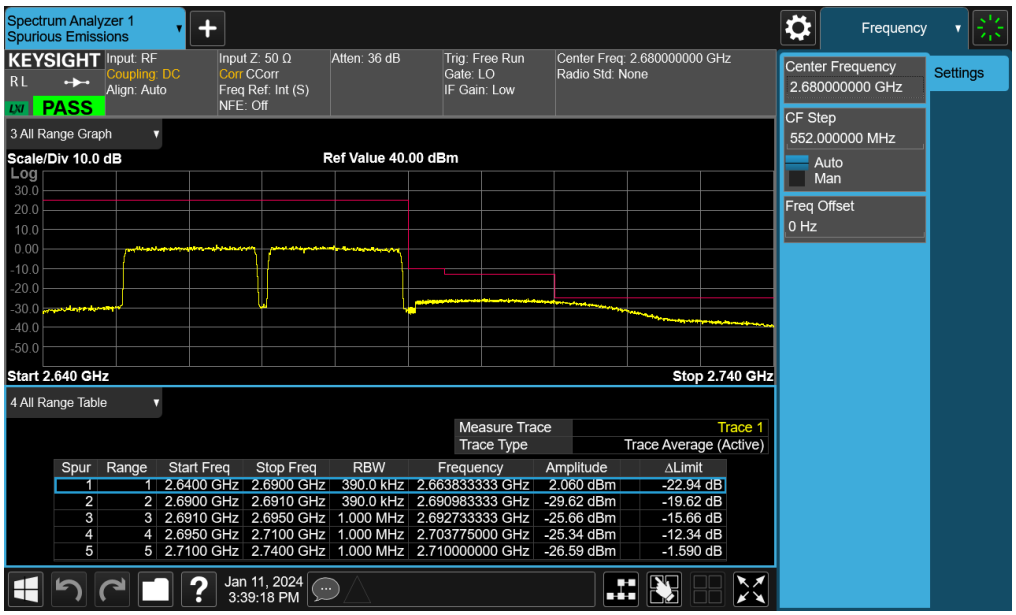


Plot 7-119. Upper ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant1)

ULCA - LTE Band 41(PC3) – Ant1



Plot 7-120. Lower ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK – Full RB - Ant1)

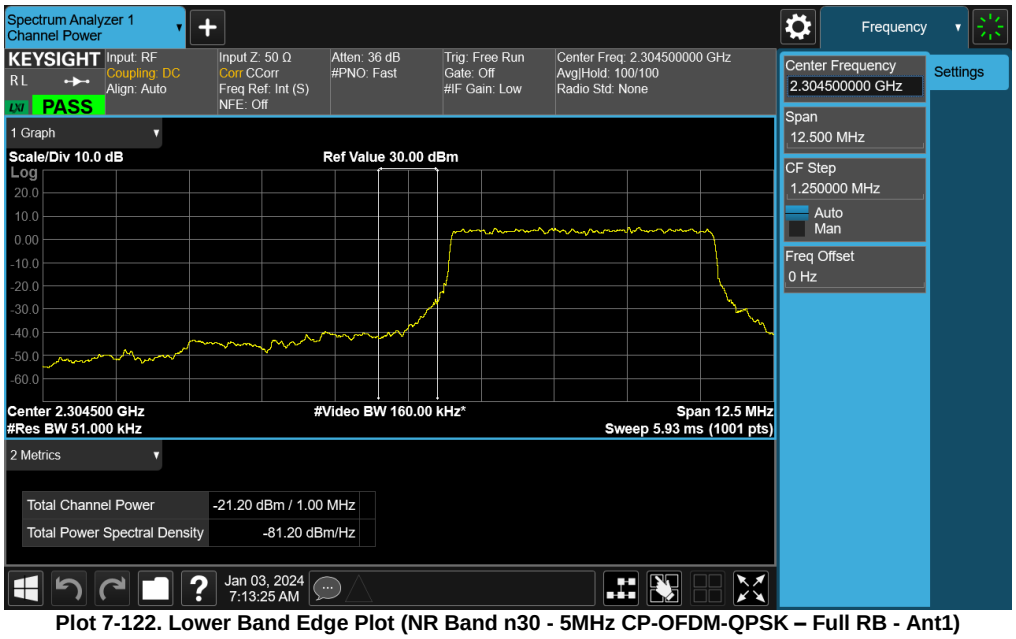


Plot 7-121. Upper ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK – Full RB - Ant1)

Mode	Bandwidth	Channel	Level [dBm]	Limit [dBm]	Margin [dB]
NR n30	10 MHz	Low	-25.57	-13	-12.57
		Low	-45.00	-37	-8.00
		High	-26.62	-13	-13.62
		High	-41.41	-37	-4.41
	5 MHz	Low	-21.20	-13	-8.20
		Low	-14.50	-13	-1.49
		High	-21.40	-13	-8.40
		High	-52.43	-38	-14.43
NR n41	100 MHz	Low	-35.81	-25	-10.81
		High	-30.33	-10	-20.33
	90 MHz	Low	-35.75	-25	-10.75
		High	-29.65	-10	-19.65
	80 MHz	Low	-37.84	-25	-12.84
		High	-31.71	-10	-21.71
	70 MHz	Low	-28.02	-25	-3.02
		High	-23.43	-10	-13.43
	60 MHz	Low	-32.59	-25	-7.59
		High	-22.93	-10	-12.93
	50 MHz	Low	-37.60	-25	-12.60
		High	-42.84	-25	-17.84
	40 MHz	Low	-37.34	-25	-12.34
		High	-43.64	-25	-18.64
	30 MHz	Low	-37.56	-25	-12.56
		High	-43.91	-25	-18.91
	20 MHz	Low	-36.36	-25	-11.36
		High	-42.23	-25	-17.23

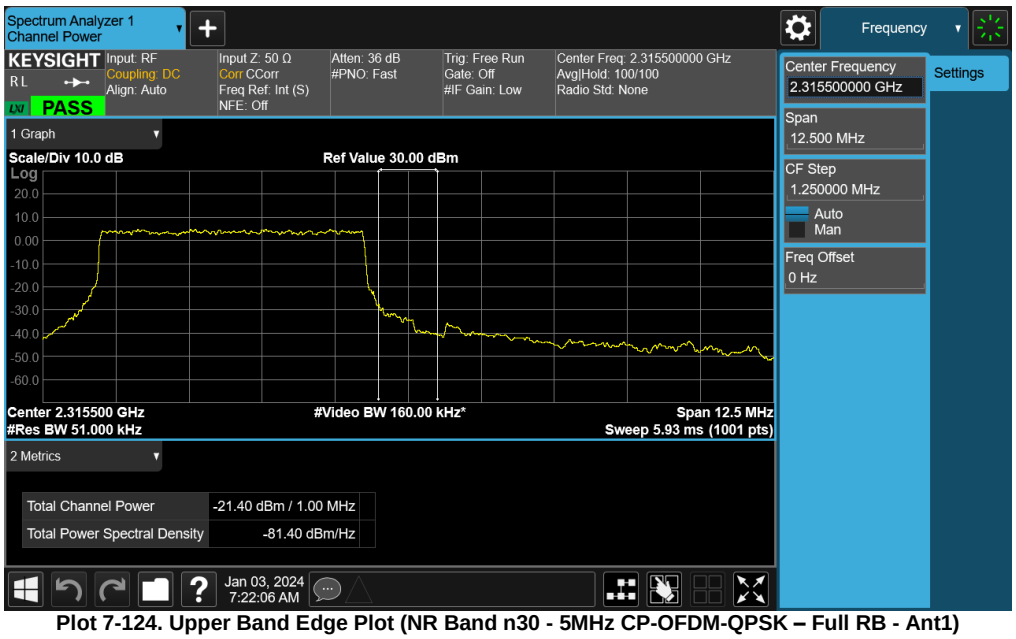
Table 7-18. Conducted Band Edge Test Results – NR – Ant 1

NR Band n30 – Ant1



Plot 7-122. Lower Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant1)

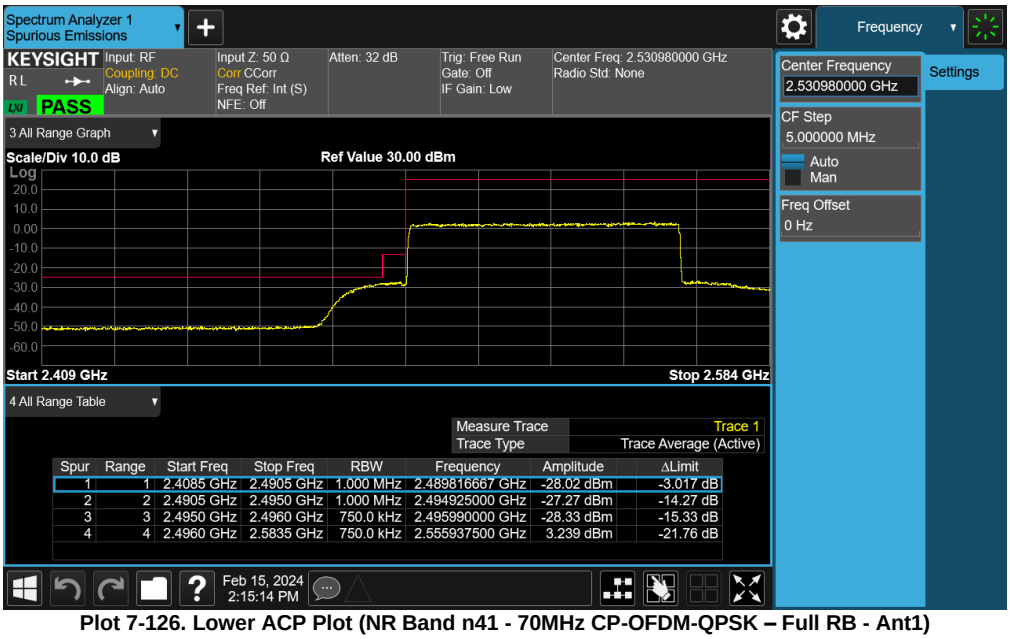
Plot 7-123. Extended Lower Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant1)



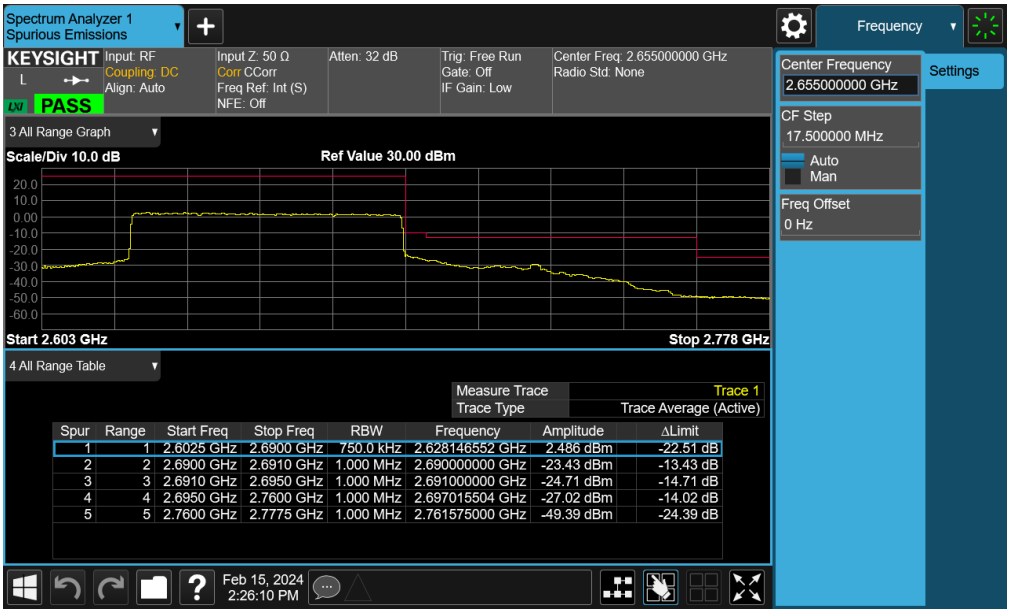
Plot 7-124. Upper Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant1)

Plot 7-125. Extended Upper Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant1)

NR Band n41 – Ant1



Plot 7-126. Lower ACP Plot (NR Band n41 - 70MHz CP-OFDM-QPSK – Full RB - Ant1)

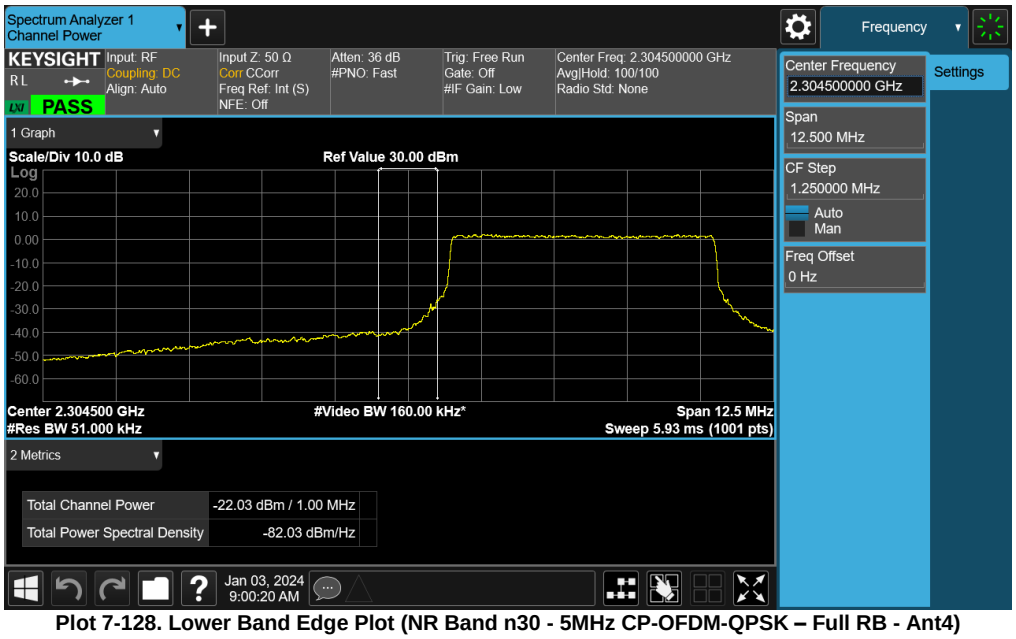


Plot 7-127. Upper ACP Plot (NR Band n41 - 70MHz CP-OFDM-QPSK – Full RB - Ant1)

Mode	Bandwidth	Channel	Level [dBm]	Limit [dBm]	Margin [dB]
NR n30	10 MHz	Low	-21.16	-13	-8.16
		Low	-37.12	-30	-7.12
		High	-26.53	-13	-13.53
		High	-40.50	-38	-2.50
	5 MHz	Low	-22.03	-13	-9.03
		Low	-14.90	-13	-1.90
		High	-23.39	-13	-10.39
		High	-31.97	-25	-6.97
NR n41	100 MHz	Low	-35.07	-25	-10.07
		High	-29.83	-10	-19.83
	90 MHz	Low	-33.55	-25	-8.55
		High	-33.51	-10	-23.51
	80 MHz	Low	-30.07	-25	-5.07
		High	-48.91	-25	-23.91
	70 MHz	Low	-29.37	-25	-4.37
		High	-26.37	-10	-16.37
	60 MHz	Low	-26.06	-25	-1.06
		High	-25.21	-10	-15.21
	50 MHz	Low	-30.34	-25	-5.34
		High	-43.81	-25	-18.81
	40 MHz	Low	-39.67	-25	-14.67
		High	-44.42	-25	-19.42
	30 MHz	Low	-30.81	-25	-5.81
		High	-31.15	-13	-18.15
	20 MHz	Low	-36.54	-25	-11.54
		High	-43.88	-25	-18.88

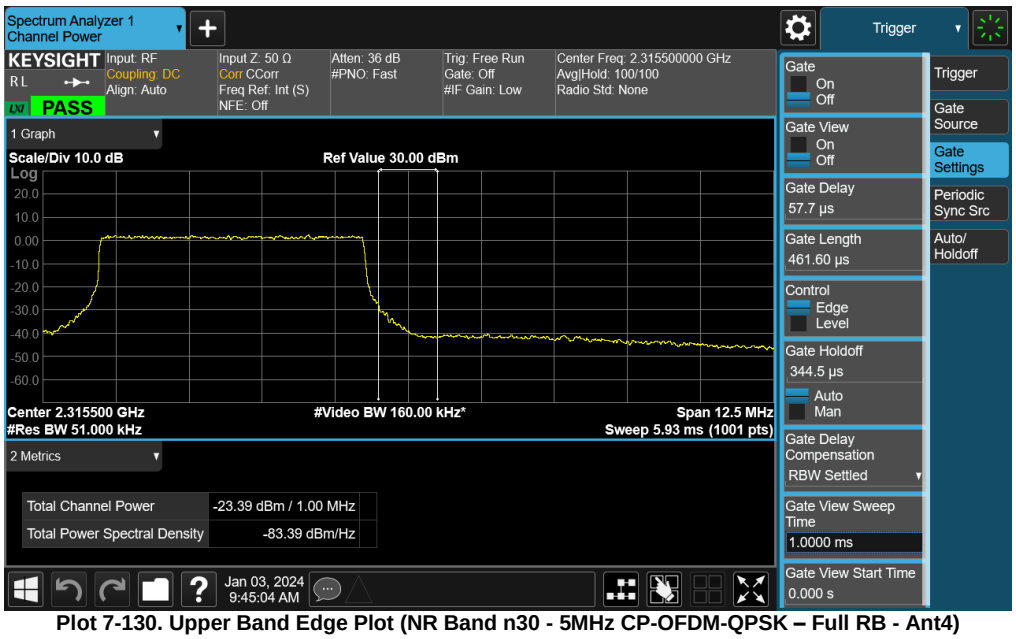
Table 7-19. Conducted Band Edge Test Results – NR – Ant 4

NR Band n30 – Ant4



Plot 7-128. Lower Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant4)

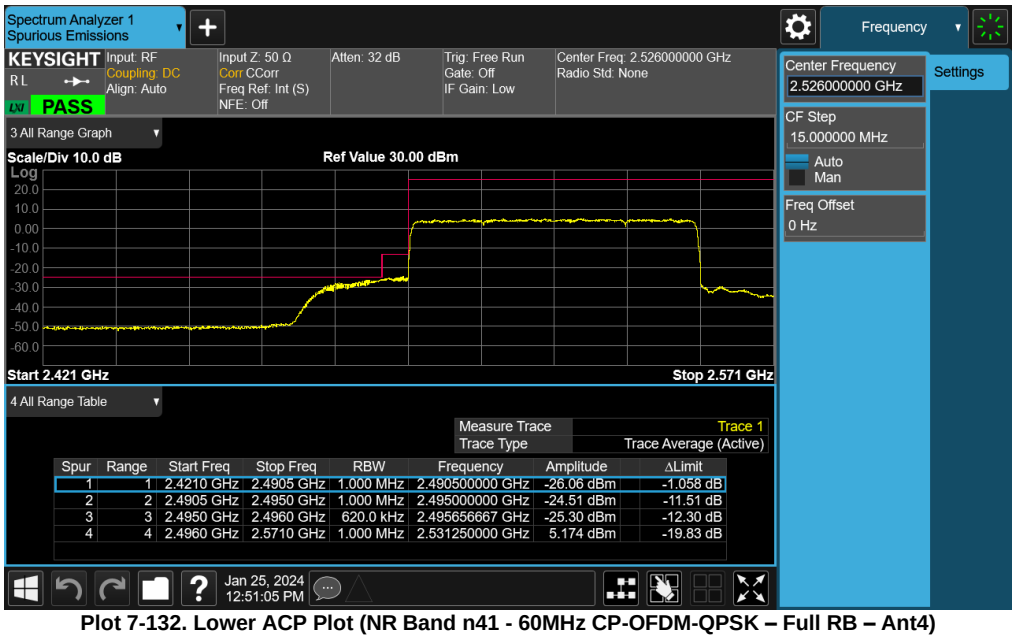
Plot 7-129. Extended Lower Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant4)



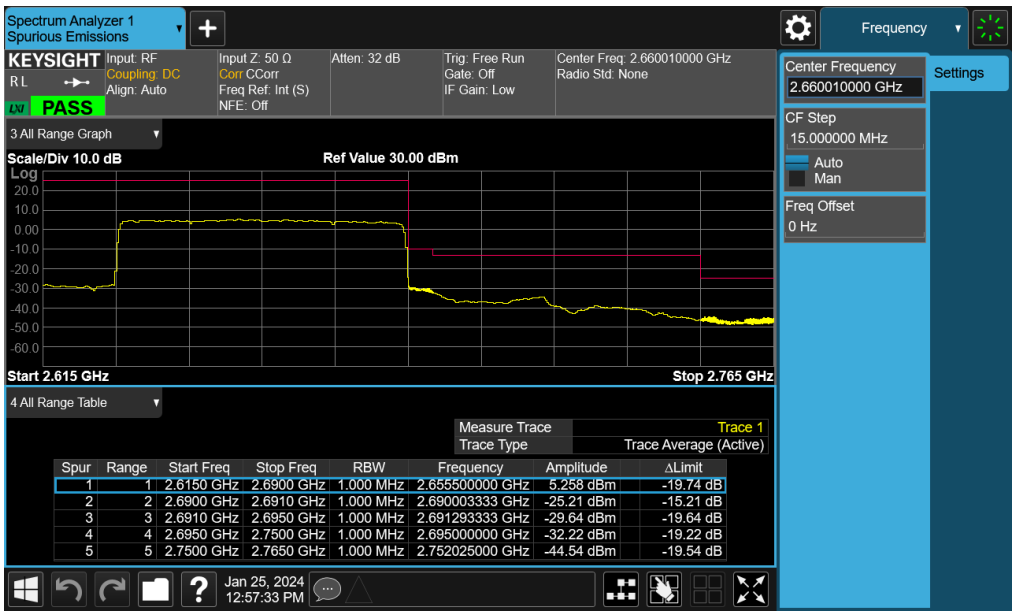
Plot 7-130. Upper Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant4)

Plot 7-131. Extended Upper Band Edge Plot (NR Band n30 - 5MHz CP-OFDM-QPSK – Full RB - Ant4)

NR Band n41 – Ant4



Plot 7-132. Lower ACP Plot (NR Band n41 - 60MHz CP-OFDM-QPSK – Full RB – Ant4)



Plot 7-133. Upper ACP Plot (NR Band n41 - 60MHz CP-OFDM-QPSK – Full RB – Ant4)

7.6 Radiated Power (EIRP)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 – Section 5.2.4.4

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize.

Test Setup

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

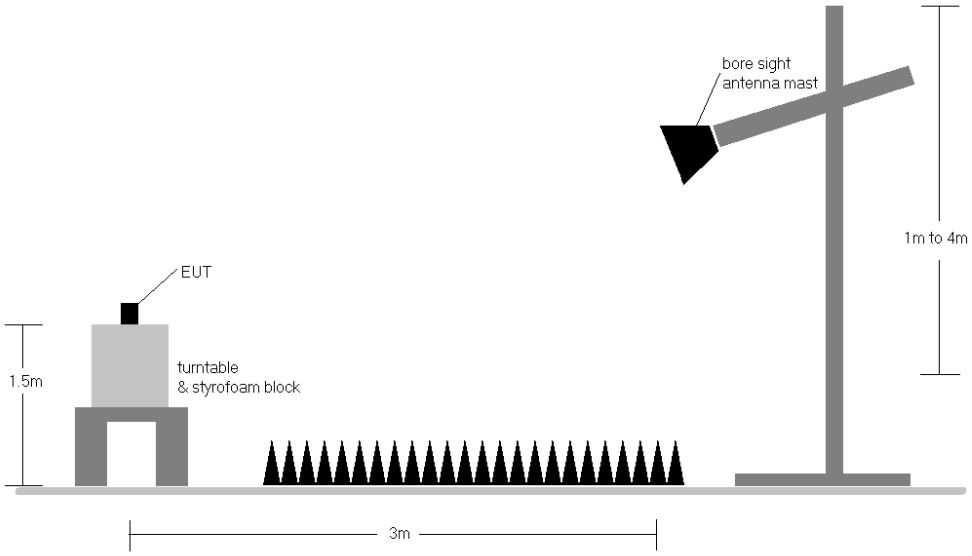


Figure 7-5. Radiated Test Setup >1GHz

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested with its standard battery.

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.

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]
10 M	QPSK	2310.0	H	124	304	3.66	1 / 25	18.85	**22.51**	0.178	23.98	-1.47
	16-QAM	2310.0	H	124	304	3.66	1 / 25	18.65	22.31	0.170	23.98	-1.67
5 MHz	QPSK	2307.5	H	124	304	3.66	1 / 12	18.74	22.40	0.174	23.98	-1.58
	QPSK	2310.0	H	124	304	3.66	1 / 12	19.19	**22.85**	0.193	23.98	-1.12
	QPSK	2312.5	H	124	304	3.67	1 / 24	18.81	22.48	0.177	23.98	-1.50
	16-QAM	2310.0	H	124	304	3.66	1 / 12	19.14	22.81	0.191	23.98	-1.17

Table 7-20. EIRP Data (LTE Band 30 – Ant1)

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	2506.0	H	130	297	4.17	1 / 99	23.63	**27.80**	0.603	33.01	-5.21
	QPSK	2593.0	H	117	304	4.00	1 / 99	23.33	27.33	0.541	33.01	-5.68
	QPSK	2680.0	H	133	299	4.50	1 / 50	21.96	26.46	0.443	33.01	-6.55
	16-QAM	2506.0	H	130	297	4.17	1 / 99	22.76	26.93	0.494	33.01	-6.08
15 MHz	QPSK	2503.5	H	130	297	4.17	1 / 0	23.61	**27.78**	0.600	33.01	-5.23
	QPSK	2593.0	H	117	304	4.00	1 / 0	23.26	27.26	0.532	33.01	-5.75
	QPSK	2682.5	H	133	299	4.51	1 / 37	21.97	26.48	0.445	33.01	-6.53
	16-QAM	2503.5	H	130	297	4.17	1 / 37	22.61	26.78	0.477	33.01	-6.23
10 MHz	QPSK	2501.0	H	130	297	4.17	1 / 0	23.77	**27.94**	0.623	33.01	-5.07
	QPSK	2593.0	H	117	304	4.00	1 / 25	23.42	27.42	0.552	33.01	-5.59
	QPSK	2685.0	H	133	299	4.52	1 / 49	22.02	26.54	0.451	33.01	-6.47
	16-QAM	2501.0	H	130	297	4.17	1 / 49	22.85	27.02	0.504	33.01	-5.99
5 MHz	QPSK	2498.5	H	130	297	4.16	#REF!	23.78	**27.94**	0.623	33.01	-5.07
	QPSK	2593.0	H	117	304	4.00	#REF!	23.53	27.53	0.566	33.01	-5.48
	QPSK	2687.5	H	133	299	4.53	#REF!	21.94	26.47	0.444	33.01	-6.54
	16-QAM	2498.5	H	130	297	4.16	#REF!	22.96	27.12	0.516	33.01	-5.89

Table 7-21. EIRP Data (LTE Band 41(PC2) – Ant1)

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	2506.0	H	123	297	4.17	1 / 99	21.47	**25.64**	0.367	33.01	-7.37
	QPSK	2593.0	H	120	302	4.00	1 / 50	21.37	25.37	0.344	33.01	-7.64
	QPSK	2680.0	H	138	299	4.50	1 / 50	19.98	24.48	0.281	33.01	-8.53
	16-QAM	2506.0	H	123	297	4.17	1 / 99	20.72	24.89	0.309	33.01	-8.12
15 MHz	QPSK	2503.5	H	123	297	4.17	1 / 37	21.44	**25.61**	0.364	33.01	-7.40
	QPSK	2593.0	H	120	302	4.00	1 / 37	21.28	25.28	0.337	33.01	-7.73
	QPSK	2682.5	H	138	299	4.51	1 / 37	19.88	24.39	0.275	33.01	-8.62
	16-QAM	2503.5	H	123	297	4.17	1 / 0	20.78	24.95	0.313	33.01	-8.06
10 MHz	QPSK	2501.0	H	123	297	4.17	1 / 0	21.62	**25.79**	0.380	33.01	-7.22
	QPSK	2593.0	H	120	302	4.00	1 / 25	21.46	25.46	0.351	33.01	-7.55
	QPSK	2685.0	H	138	299	4.52	1 / 49	20.03	24.55	0.285	33.01	-8.46
	16-QAM	2501.0	H	123	297	4.17	1 / 0	20.88	25.05	0.320	33.01	-7.96
5 MHz	QPSK	2498.5	H	123	297	4.16	#REF!	21.61	**25.77**	0.378	33.01	-7.24
	QPSK	2593.0	H	120	302	4.00	#REF!	21.47	25.47	0.352	33.01	-7.54
	QPSK	2687.5	H	138	299	4.53	#REF!	19.91	24.44	0.278	33.01	-8.57
	16-QAM	2593.0	H	120	302	4.00	#REF!	20.93	24.93	0.311	33.01	-8.08

Table 7-22. EIRP Data (LTE Band 41(PC3) – Ant1)

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]
10 MHz	π/2 BPSK	2310.0	H	117	292	3.66	1 / 1	19.15	**22.81**	0.191	23.98	-1.17
	QPSK	2310.0	H	117	292	3.66	1 / 1	18.95	22.61	0.182	23.98	-1.37
	16-QAM	2310.0	H	117	292	3.66	1 / 1	18.39	22.05	0.160	23.98	-1.93
5 MHz	π/2 BPSK	2307.5	H	117	292	3.66	1 / 1	19.02	22.67	0.185	23.98	-1.31
	π/2 BPSK	2310.0	H	117	292	3.66	1 / 1	19.32	**22.98**	0.199	23.98	-1.00
	π/2 BPSK	2312.5	H	117	292	3.67	1 / 12	19.29	22.95	0.197	23.98	-1.03
	QPSK	2307.5	H	117	292	3.66	1 / 1	19.06	22.72	0.187	23.98	-1.26
	QPSK	2310.0	H	117	292	3.66	1 / 1	18.99	22.65	0.184	23.98	-1.33
	QPSK	2312.5	H	117	292	3.67	1 / 12	19.12	22.78	0.190	23.98	-1.20
	16-QAM	2312.5	H	117	292	3.67	1 / 12	18.54	22.21	0.166	23.98	-1.77
10 MHz	QPSK (CP-OFDM)	2310.0	H	117	292	3.66	1/26	18.75	22.41	0.174	23.98	-1.57

Table 7-23. EIRP Data (NR Band n30 – Ant1)

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]
100 MHz	π/2 BPSK	2546.01	H	100	287	4.19	1 / 136	22.62	26.81	0.480	33.01	-6.20
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 136	23.53	27.53	0.566	33.01	-5.48
	π/2 BPSK	2640.00	H	106	302	4.31	1 / 136	22.85	27.16	0.520	33.01	-5.85
	QPSK	2546.01	H	100	287	4.19	1 / 136	22.56	26.75	0.473	33.01	-6.26
	QPSK	2592.99	H	113	295	4.00	1 / 136	23.76	**27.76**	0.597	33.01	-5.25
	QPSK	2640.00	H	106	302	4.31	1 / 136	22.91	27.22	0.528	33.01	-5.79
	16-QAM	2592.99	H	113	295	4.00	1 / 136	22.84	26.84	0.483	33.01	-6.17
90 MHz	π/2 BPSK	2541.00	H	100	287	4.19	1 / 122	22.59	26.78	0.476	33.01	-6.23
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 243	23.86	27.86	0.611	33.01	-5.15
	π/2 BPSK	2644.98	H	106	302	4.36	1 / 122	22.79	27.14	0.518	33.01	-5.87
	QPSK	2541.00	H	100	287	4.19	1 / 122	22.48	26.67	0.465	33.01	-6.34
	QPSK	2592.99	H	113	295	4.00	1 / 243	24.03	**28.03**	0.636	33.01	-4.98
	QPSK	2644.98	H	106	302	4.36	1 / 122	22.87	27.22	0.528	33.01	-5.79
	16-QAM	2592.99	H	113	295	4.00	1 / 243	22.94	26.94	0.494	33.01	-6.07
80 MHz	π/2 BPSK	2536.02	H	100	287	4.19	1 / 108	22.62	26.81	0.480	33.01	-6.20
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 1	23.80	27.80	0.602	33.01	-5.21
	π/2 BPSK	2649.99	H	106	302	4.40	1 / 108	22.89	27.29	0.536	33.01	-5.72
	QPSK	2536.02	H	100	287	4.19	1 / 108	22.51	26.70	0.468	33.01	-6.31
	QPSK	2592.99	H	113	295	4.00	1 / 1	24.07	**28.07**	0.642	33.01	-4.94
	QPSK	2649.99	H	106	302	4.40	1 / 108	22.81	27.21	0.526	33.01	-5.80
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.26	27.26	0.532	33.01	-5.75
70 MHz	π/2 BPSK	2531.01	H	100	287	4.18	1 / 187	22.59	26.78	0.476	33.01	-6.23
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 1	23.80	27.80	0.603	33.01	-5.21
	π/2 BPSK	2655.00	H	106	302	4.42	1 / 1	22.24	26.66	0.463	33.01	-6.35
	QPSK	2531.01	H	100	287	4.18	1 / 187	22.57	26.75	0.474	33.01	-6.26
	QPSK	2592.99	H	113	295	4.00	1 / 1	23.96	**27.95**	0.624	33.01	-5.06
	QPSK	2655.00	H	106	302	4.42	1 / 1	22.69	27.11	0.514	33.01	-5.90
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.21	27.21	0.526	33.01	-5.80
60 MHz	π/2 BPSK	2526.00	H	100	287	4.18	1 / 81	22.86	27.05	0.506	33.01	-5.96
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 160	23.94	27.94	0.622	33.01	-5.07
	π/2 BPSK	2659.98	H	106	302	4.43	1 / 81	22.92	27.35	0.544	33.01	-5.66
	QPSK	2526.00	H	100	287	4.18	1 / 81	22.57	26.75	0.474	33.01	-6.26
	QPSK	2592.99	H	113	295	4.00	1 / 160	24.04	**28.04**	0.637	33.01	-4.97
	QPSK	2659.98	H	106	302	4.43	1 / 81	22.93	27.36	0.544	33.01	-5.65
	16-QAM	2592.99	H	113	295	4.00	1 / 160	23.43	27.43	0.553	33.01	-5.58
50 MHz	π/2 BPSK	2521.02	H	100	287	4.18	1 / 66	22.79	26.97	0.498	33.01	-6.04
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 1	23.98	27.98	0.628	33.01	-5.03
	π/2 BPSK	2664.99	H	106	302	4.45	1 / 66	22.77	27.22	0.527	33.01	-5.79
	QPSK	2521.02	H	100	287	4.18	1 / 66	22.70	26.88	0.487	33.01	-6.13
	QPSK	2592.99	H	113	295	4.00	1 / 1	24.22	**28.22**	0.663	33.01	-4.79
	QPSK	2664.99	H	106	302	4.45	1 / 66	22.81	27.26	0.533	33.01	-5.75
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.42	27.42	0.553	33.01	-5.59
40 MHz	π/2 BPSK	2516.01	H	100	287	4.18	1 / 1	22.79	26.97	0.498	33.01	-6.04
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 1	23.81	27.81	0.604	33.01	-5.20
	π/2 BPSK	2670.00	H	106	302	4.47	1 / 104	22.87	27.34	0.542	33.01	-5.67
	QPSK	2516.01	H	100	287	4.18	1 / 1	22.75	26.93	0.493	33.01	-6.08
	QPSK	2592.99	H	113	295	4.00	1 / 1	24.10	**28.09**	0.645	33.01	-4.92
	QPSK	2670.00	H	106	302	4.47	1 / 104	22.91	27.37	0.546	33.01	-5.64
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.38	27.38	0.547	33.01	-5.63
30 MHz	π/2 BPSK	2511.00	H	100	287	4.18	1 / 76	22.80	26.98	0.498	33.01	-6.03
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 76	23.83	27.83	0.606	33.01	-5.19
	π/2 BPSK	2674.98	H	106	302	4.48	1 / 76	22.80	27.28	0.535	33.01	-5.73
	QPSK	2511.00	H	100	287	4.18	1 / 76	22.72	26.89	0.489	33.01	-6.12
	QPSK	2592.99	H	113	295	4.00	1 / 76	24.11	**28.10**	0.646	33.01	-4.91
	QPSK	2674.98	H	106	302	4.48	1 / 76	22.82	27.30	0.537	33.01	-5.71
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.16	27.16	0.520	33.01	-5.85
20 MHz	π/2 BPSK	2506.02	H	100	287	4.17	1 / 25	22.75	26.92	0.492	33.01	-6.09
	π/2 BPSK	2592.99	H	113	295	4.00	1 / 1	23.83	27.83	0.606	33.01	-5.18
	π/2 BPSK	2679.99	H	106	302	4.50	1 / 49	22.71	27.21	0.526	33.01	-5.80
	QPSK	2506.02	H	100	287	4.17	1 / 25	22.68	26.85	0.485	33.01	-6.16
	QPSK	2592.99	H	113	295	4.00	1 / 1	24.07	**28.07**	0.641	33.01	-4.94
	QPSK	2679.99	H	106	302	4.50	1 / 49	22.72	27.22	0.527	33.01	-5.79
	16-QAM	2592.99	H	113	295	4.00	1 / 1	23.28	27.28	0.534	33.01	-5.73
100 MHz	QPSK (CP-OFDM)	2592.99	H	113	295	4.00	1 / 136	22.03	26.03	0.401	33.01	-6.98

Table 7-24. EIRP Data (NR Band n41 (PC3) – Ant1)

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]
10 MHz	π/2 BPSK	2310.0	H	108	63	3.66	1 / 26	18.70	22.36	0.172	23.98	-1.62
	QPSK	2310.0	H	108	63	3.66	1 / 26	18.88	**22.54**	0.180	23.98	-1.44
	16-QAM	2310.0	H	108	63	3.66	1 / 26	17.56	21.22	0.132	23.98	-2.76
5 MHz	π/2 BPSK	2307.5	H	108	63	3.66	1 / 12	18.82	22.47	0.177	23.98	-1.51
	π/2 BPSK	2310.0	H	108	63	3.66	1 / 12	18.79	22.45	0.176	23.98	-1.53
	π/2 BPSK	2312.5	H	108	63	3.67	1 / 12	18.60	22.27	0.169	23.98	-1.71
	QPSK	2307.5	H	108	63	3.66	1 / 12	18.66	22.31	0.170	23.98	-1.67
	QPSK	2310.0	H	108	63	3.66	1 / 12	18.94	**22.60**	0.182	23.98	-1.38
	QPSK	2312.5	H	108	63	3.67	1 / 12	18.70	22.37	0.173	23.98	-1.61
	16-QAM	2312.5	H	108	63	3.67	1 / 12	18.13	21.79	0.151	23.98	-2.19
10 MHz	QPSK (CP-OFDM)	2310.0	H	108	63	3.66	1/26	17.36	21.02	0.127	23.98	-2.96

Table 7-25. EIRP Data (NR Band n30 – Ant4)

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]
100 MHz	π/2 BPSK	2546.01	H	100	73	4.19	1 / 271	20.62	24.81	0.303	33.01	-8.20
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 136	22.12	26.12	0.409	33.01	-6.89
	π/2 BPSK	2640.00	H	100	68	4.31	1 / 136	22.47	26.78	0.477	33.01	-6.23
	QPSK	2546.01	H	100	73	4.19	1 / 271	20.68	24.87	0.307	33.01	-8.14
	QPSK	2592.99	H	115	65	4.00	1 / 136	22.09	26.09	0.406	33.01	-6.92
	QPSK	2640.00	H	100	68	4.31	1 / 136	22.51	**26.82**	0.481	33.01	-6.19
	16-QAM	2640.00	H	100	68	4.31	1 / 136	21.67	25.98	0.397	33.01	-7.03
90 MHz	π/2 BPSK	2541.00	H	100	73	4.19	1 / 243	20.57	24.76	0.299	33.01	-8.25
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 122	22.16	26.16	0.413	33.01	-6.85
	π/2 BPSK	2644.98	H	100	68	4.36	1 / 122	22.54	**26.90**	0.490	33.01	-6.11
	QPSK	2541.00	H	100	73	4.19	1 / 243	20.55	24.74	0.298	33.01	-8.27
	QPSK	2592.99	H	115	65	4.00	1 / 122	22.09	26.08	0.406	33.01	-6.93
	QPSK	2644.98	H	100	68	4.36	1 / 122	22.48	26.83	0.482	33.01	-6.18
	16-QAM	2644.98	H	100	68	4.36	1 / 122	21.99	26.34	0.431	33.01	-6.67
80 MHz	π/2 BPSK	2536.02	H	100	73	4.19	1 / 215	20.59	24.77	0.300	33.01	-8.24
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 108	22.11	26.11	0.409	33.01	-6.90
	π/2 BPSK	2649.99	H	100	68	4.40	1 / 108	22.58	**26.98**	0.499	33.01	-6.03
	QPSK	2536.02	H	100	73	4.19	1 / 215	20.76	24.95	0.312	33.01	-8.06
	QPSK	2592.99	H	115	65	4.00	1 / 108	22.09	26.09	0.406	33.01	-6.93
	QPSK	2649.99	H	100	68	4.40	1 / 108	22.37	26.77	0.475	33.01	-6.24
	16-QAM	2649.99	H	100	68	4.40	1 / 108	21.35	25.75	0.376	33.01	-7.26
70 MHz	π/2 BPSK	2531.01	H	100	73	4.18	1 / 187	20.74	24.92	0.311	33.01	-8.09
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 1	22.23	26.23	0.420	33.01	-6.78
	π/2 BPSK	2655.00	H	100	68	4.42	1 / 94	22.33	**26.75**	0.473	33.01	-6.26
	QPSK	2531.01	H	100	73	4.18	1 / 187	20.74	24.92	0.311	33.01	-8.09
	QPSK	2592.99	H	115	65	4.00	1 / 1	22.17	26.17	0.414	33.01	-6.84
	QPSK	2655.00	H	100	68	4.42	1 / 94	22.32	26.74	0.472	33.01	-6.27
	16-QAM	2655.00	H	100	68	4.42	1 / 94	21.45	25.87	0.386	33.01	-7.14
60 MHz	π/2 BPSK	2526.00	H	100	73	4.18	1 / 160	20.74	24.93	0.311	33.01	-8.09
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 81	22.38	26.37	0.434	33.01	-6.64
	π/2 BPSK	2659.98	H	100	68	4.43	1 / 81	22.76	**27.20**	0.524	33.01	-5.82
	QPSK	2526.00	H	100	73	4.18	1 / 160	20.75	24.93	0.311	33.01	-8.08
	QPSK	2592.99	H	115	65	4.00	1 / 81	22.34	26.34	0.430	33.01	-6.67
	QPSK	2659.98	H	100	68	4.43	1 / 81	22.66	27.09	0.512	33.01	-5.92
	16-QAM	2659.98	H	100	68	4.43	1 / 81	21.72	26.16	0.413	33.01	-6.86
50 MHz	π/2 BPSK	2521.02	H	100	73	4.18	1 / 1	20.87	25.05	0.320	33.01	-7.96
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 1	22.55	26.55	0.451	33.01	-6.47
	π/2 BPSK	2664.99	H	100	68	4.45	1 / 1	22.64	**27.09**	0.512	33.01	-5.92
	QPSK	2521.02	H	100	73	4.18	1 / 1	20.89	25.07	0.322	33.01	-7.94
	QPSK	2592.99	H	115	65	4.00	1 / 1	22.43	26.43	0.439	33.01	-6.59
	QPSK	2664.99	H	100	68	4.45	1 / 1	22.64	27.09	0.511	33.01	-5.92
	16-QAM	2664.99	H	100	68	4.45	1 / 1	21.75	26.20	0.417	33.01	-6.81
40 MHz	π/2 BPSK	2516.01	H	100	73	4.18	1 / 1	20.86	25.03	0.319	33.01	-7.98
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 1	22.57	26.57	0.453	33.01	-6.45
	π/2 BPSK	2670.00	H	100	68	4.47	1 / 1	22.68	27.14	0.518	33.01	-5.87
	QPSK	2516.01	H	100	73	4.18	1 / 1	20.99	25.17	0.329	33.01	-7.84
	QPSK	2592.99	H	115	65	4.00	1 / 1	22.49	26.49	0.445	33.01	-6.52
	QPSK	2670.00	H	100	68	4.47	1 / 1	22.75	**27.22**	0.527	33.01	-5.79
	16-QAM	2670.00	H	100	68	4.47	1 / 1	22.06	26.52	0.449	33.01	-6.49
30 MHz	π/2 BPSK	2511.00	H	100	73	4.18	1 / 1	20.86	25.03	0.319	33.01	-7.98
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 1	22.58	26.58	0.455	33.01	-6.43
	π/2 BPSK	2674.98	H	100	68	4.48	1 / 1	22.78	**27.26**	0.532	33.01	-5.75
	QPSK	2511.00	H	100	73	4.18	1 / 1	20.96	25.14	0.326	33.01	-7.87
	QPSK	2592.99	H	115	65	4.00	1 / 1	22.53	26.53	0.450	33.01	-6.48
	QPSK	2674.98	H	100	68	4.48	1 / 1	22.61	27.10	0.512	33.01	-5.92
	16-QAM	2674.98	H	100	68	4.48	1 / 1	22.10	26.58	0.455	33.01	-6.43
20 MHz	π/2 BPSK	2506.02	H	100	73	4.17	1 / 49	20.84	25.01	0.317	33.01	-8.00
	π/2 BPSK	2592.99	H	115	65	4.00	1 / 49	22.49	26.49	0.446	33.01	-6.52
	π/2 BPSK	2679.99	H	100	68	4.50	1 / 25	22.62	**27.12**	0.516	33.01	-5.89
	QPSK	2506.02	H	100	73	4.17	1 / 49	20.90	25.07	0.321	33.01	-7.94
	QPSK	2592.99	H	115	65	4.00	1 / 49	22.41	26.41	0.437	33.01	-6.60
	QPSK	2679.99	H	100	68	4.50	1 / 25	22.31	26.81	0.480	33.01	-6.20
	16-QAM	2679.99	H	100	68	4.50	1 / 25	21.46	25.97	0.395	33.01	-7.05
100 MHz	QPSK (CP-OFDM)	2640.0	H	100	68	4.31	1 / 136	20.87	25.18	0.330	33.01	-7.83

Table 7-26. EIRP Data (NR Band n41 (PC3) – Ant4)

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]
100 MHz	QPSK	2546.01	H	164	295	4.19	1 / 271	18.53	22.72	0.187	33.01	-10.29
	QPSK	2592.99	H	149	296	4.00	1 / 271	18.51	22.51	0.178	33.01	-10.50
	QPSK	2640.00	H	157	305	4.31	1 / 136	19.19	**23.50**	0.224	33.01	-9.51
	16-QAM	2640.00	H	157	305	4.31	1 / 136	17.24	21.55	0.143	33.01	-11.46
	64-QAM	2640.00	H	157	305	4.31	1 / 136	15.77	20.08	0.102	33.01	-12.93
	256-QAM	2640.00	H	157	305	4.31	1 / 136	13.06	17.37	0.055	33.01	-15.64

Table 7-27. EIRP Data (UL-MIMO NR Band n41 (PC3) – Ant1 and Ant4)

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

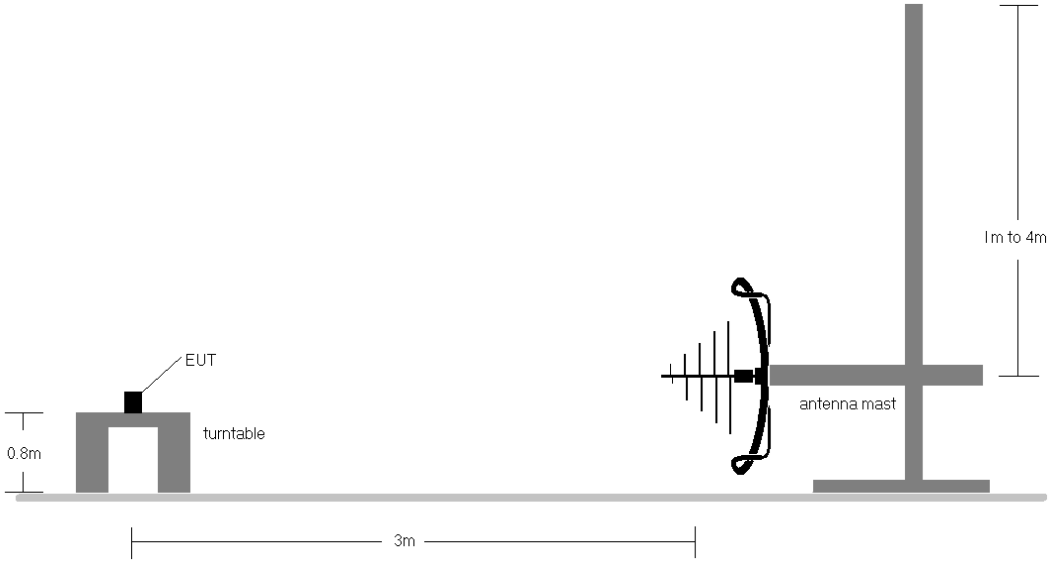


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

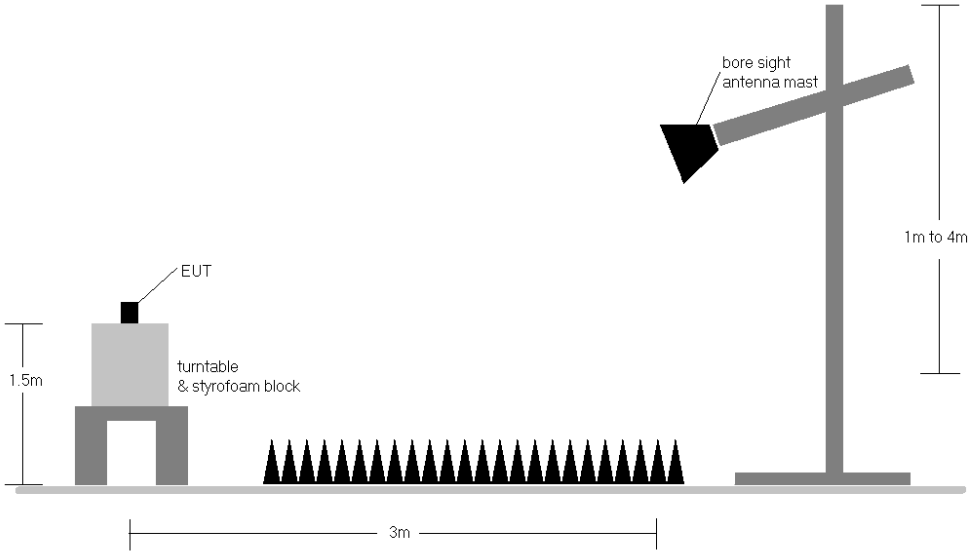


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 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) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

5) 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.

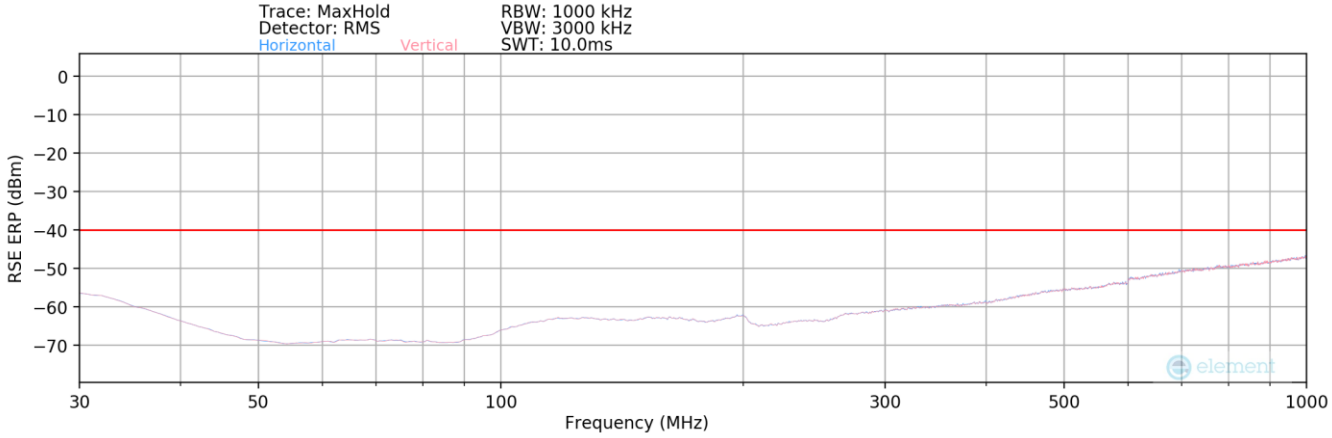
6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

7) ULCA spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.

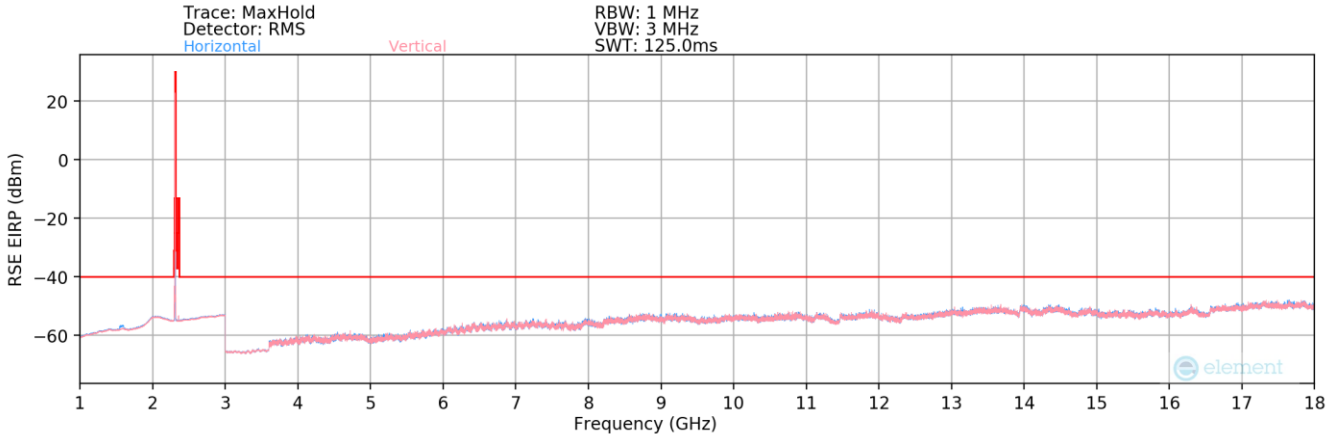
8) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

9) Spurious emission in EN-DC Operating mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor) has been checked and was found to not to be the worst case. Spurious emissions from the NR carrier device are subject to the rules under which the NR carrier operates. Spurious emissions caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

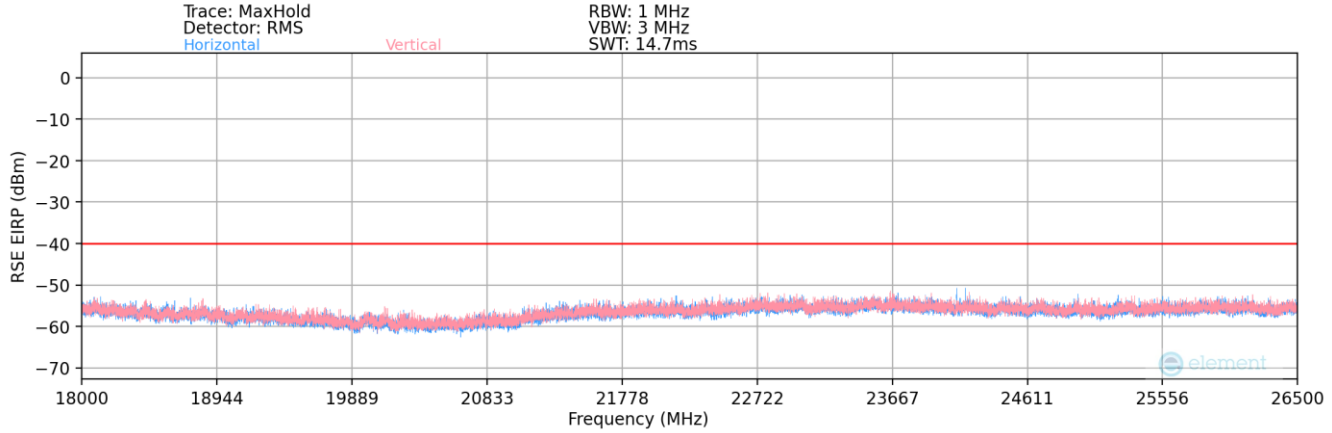
LTE Band 30 – Ant1



Plot 7-134. Radiated Spurious Plot (LTE Band 30 – Ant1)



Plot 7-135. Radiated Spurious Plot (LTE Band 30 – Ant1)



Plot 7-136. Radiated Spurious Plot (LTE Band 30 – Ant1)

Bandwidth (MHz):	10
Frequency (MHz):	2310.0
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]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
600.75	H	-	-	-89.96	26.88	43.92	-53.49	-40.00	-13.49

Table 7-28. Radiated Spurious Data (LTE Band 30 – Below 1GHz - Mid Channel– Ant1)

Bandwidth (MHz):	10
Frequency (MHz):	2310.0
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]
4620.00	H	-	-	-77.96	3.08	32.12	-63.14	-40.00	-23.14
6930.00	H	-	-	-79.34	8.39	36.05	-59.21	-40.00	-19.21
9240.00	H	-	-	-80.23	10.92	37.69	-57.57	-40.00	-17.57

Table 7-29. Radiated Spurious Data (LTE Band 30 – Mid Channel – Ant1)