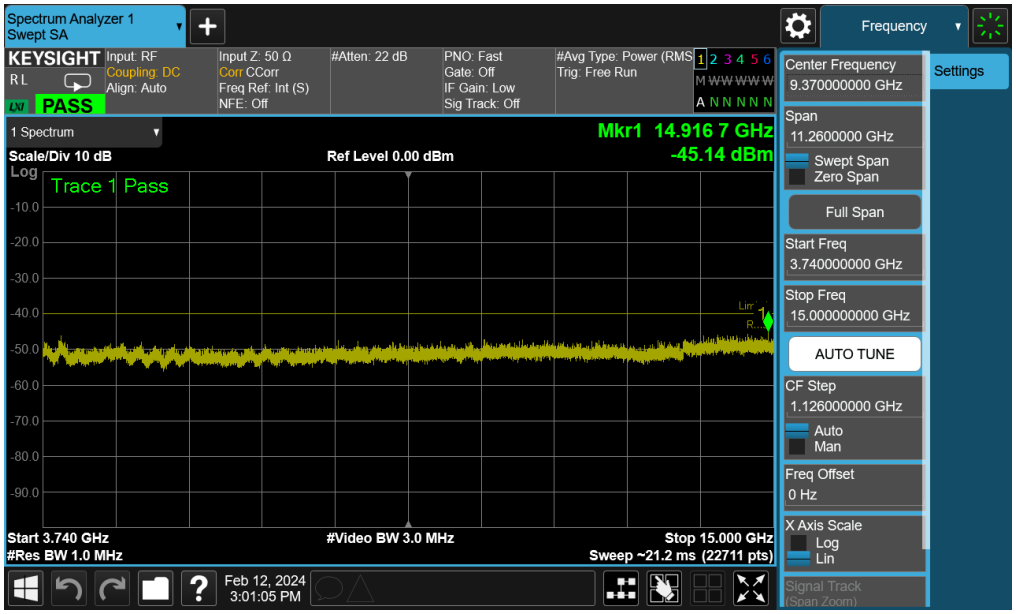
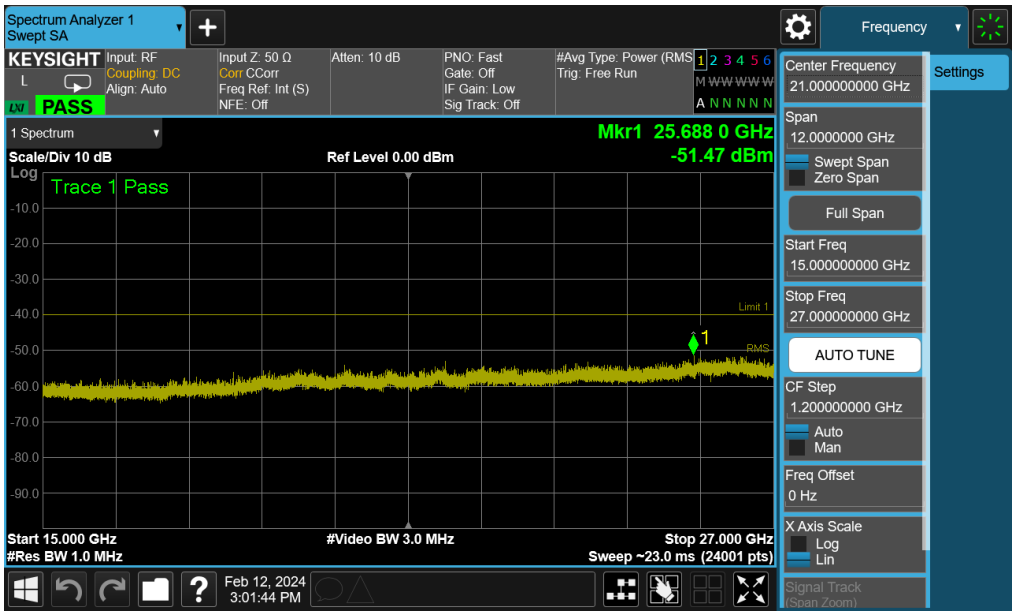
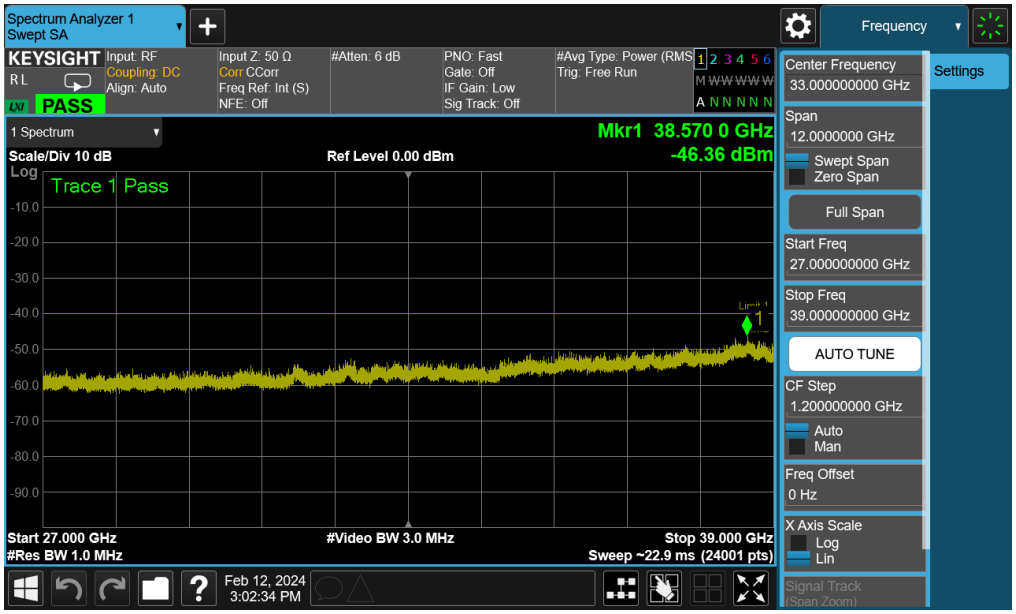


Plot 7-65. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



Plot 7-66. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

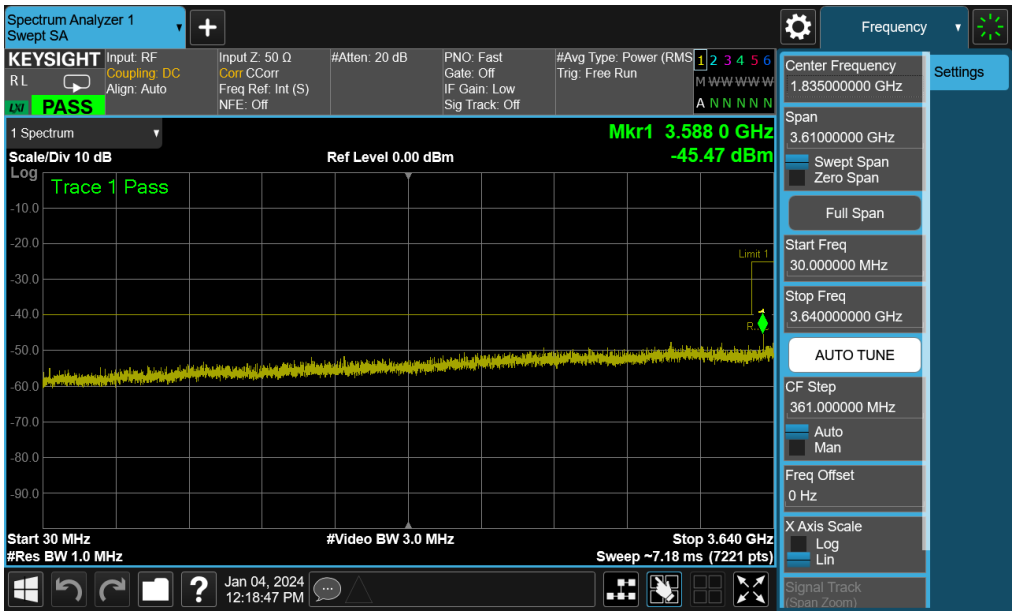


Plot 7-67. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

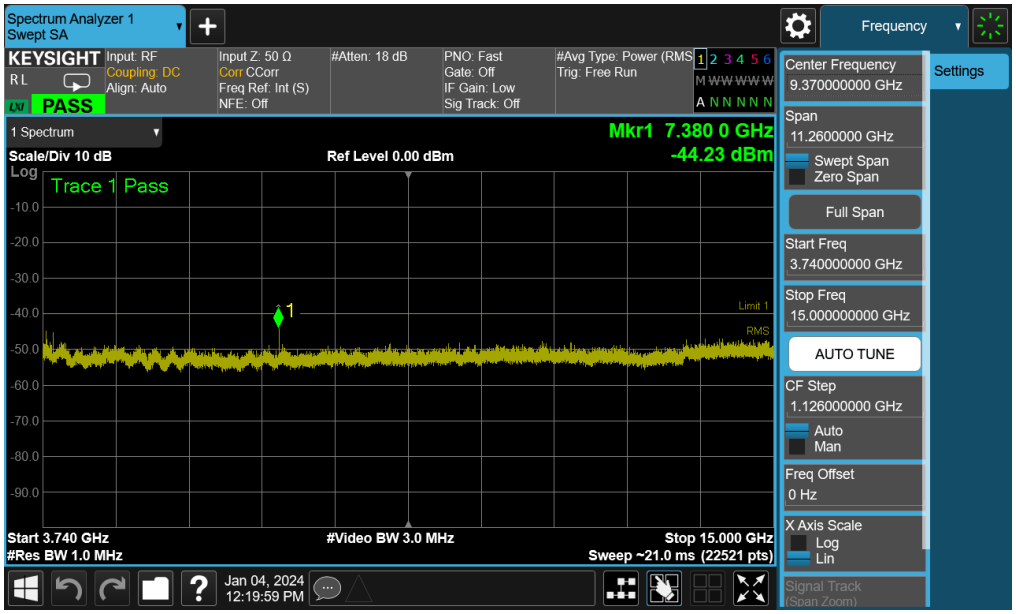
LTE B48 – Ant 3

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48	20MHz	Low	30.0 - 3510.0	-44.77	-40	-4.77
		Low	3610.0-15000.0	-44.71	-40	-4.71
		Low	15000.0-27000.0	-49.08	-40	-9.08
		Low	27000.0-37000.0	-47.98	-40	-7.98
		Mid	30.0 - 3575.0	-46.88	-40	-6.88
		Mid	3675.0-15000.0	-44.30	-40	-4.30
		Mid	15000.0-27000.0	-48.13	-40	-8.13
		Mid	27000.0-39000.0	-46.24	-40	-6.24
		High	30.0 - 3640.0	-45.47	-40	-5.47
		High	3740.0-15000.0	-44.23	-40	-4.23
		High	15000.0-27000.0	-48.88	-40	-8.88
		High	27000.0-39000.0	-44.93	-40	-4.93

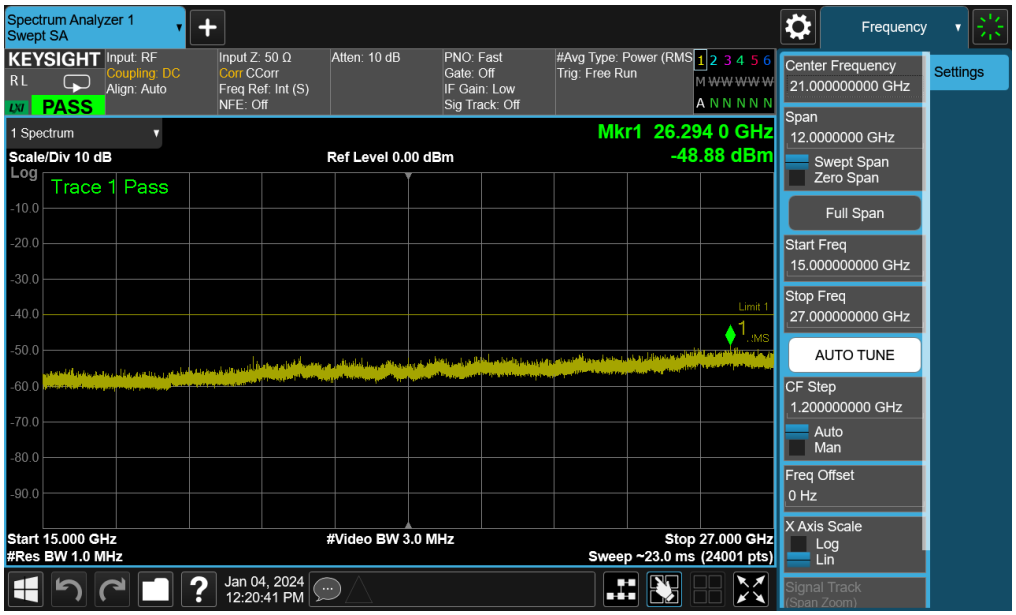
Table 7-18. Conducted Spurious Emission Results (LTE B48 – Ant 3)



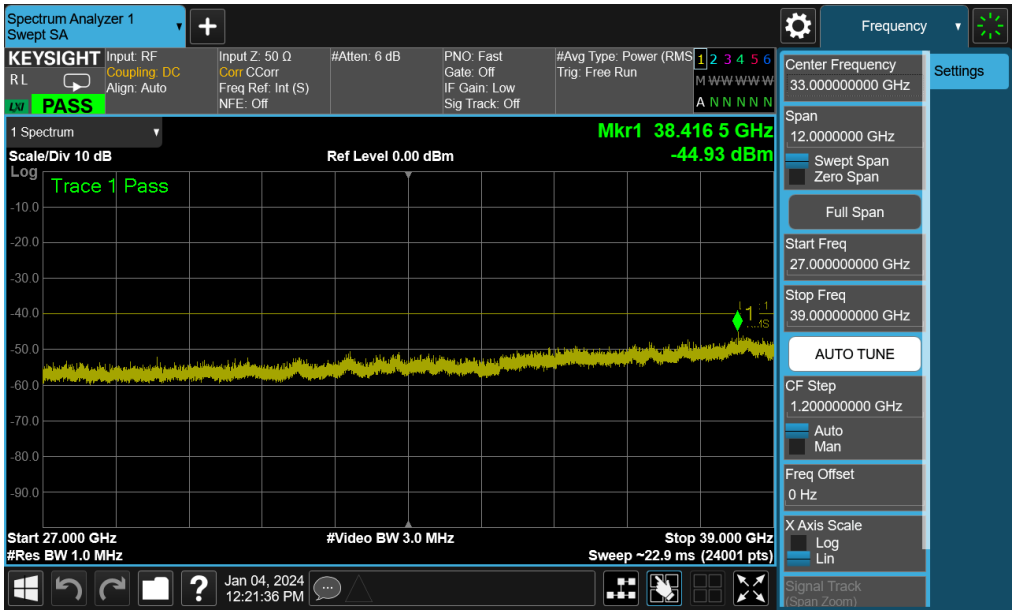
Plot 7-68. Conducted Spurious Plot (LTE Band 48 – 20MHz QPSK – High Channel)



Plot 7-69. Conducted Spurious Plot (LTE Band 48 – 20MHz QPSK – High Channel)



Plot 7-70. Conducted Spurious Plot (LTE Band 48 – 20MHz QPSK – High Channel)

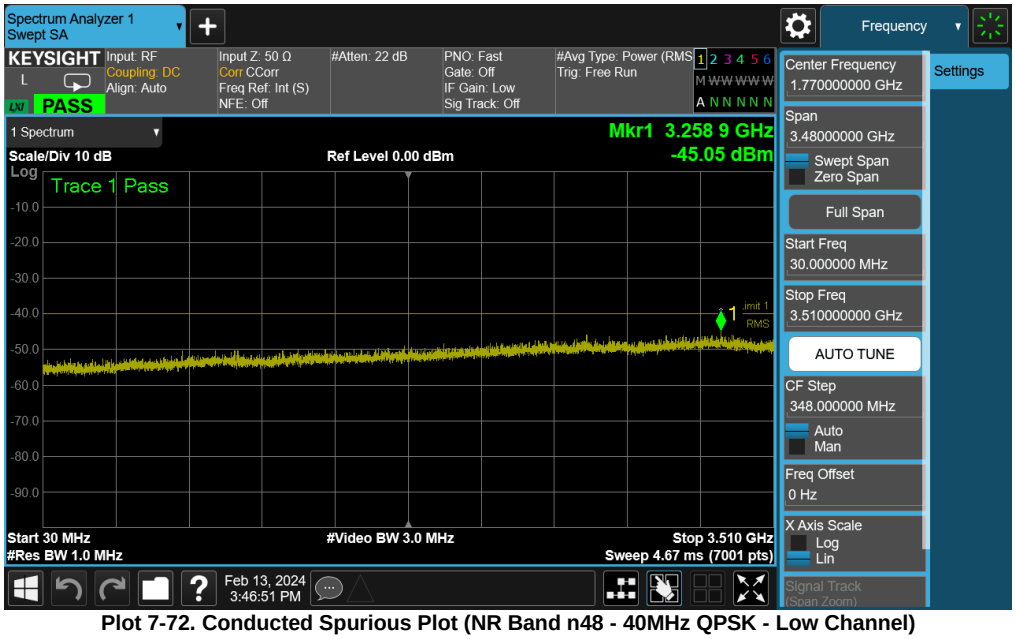


Plot 7-71. Conducted Spurious Plot (LTE Band 48 – 20MHz QPSK – High Channel)

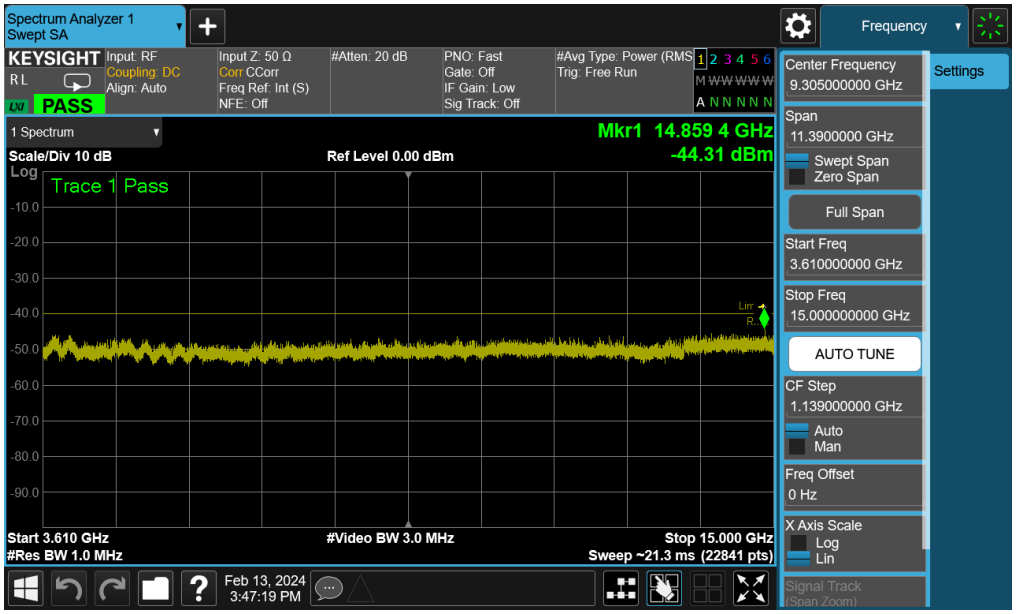
NR Band n48 – Ant 3

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	30.0 - 3510.0	-45.05	-40	-5.05
		Low	3610.0-15000.0	-44.31	-40	-4.31
		Low	15000.0-27000.0	-49.07	-40	-9.07
		Low	27000.0-37000.0	-47.34	-40	-7.34
		Mid	30.0 - 3575.0	-44.97	-40	-4.97
		Mid	3675.0-15000.0	-44.60	-40	-4.60
		Mid	15000.0-27000.0	-49.24	-40	-9.24
		Mid	27000.0-39000.0	-46.22	-40	-6.22
		High	30.0 - 3640.0	-46.00	-40	-6.00
		High	3740.0-15000.0	-44.56	-40	-4.56
		High	15000.0-27000.0	-49.33	-40	-9.33
		High	27000.0-39000.0	-46.32	-40	-6.32

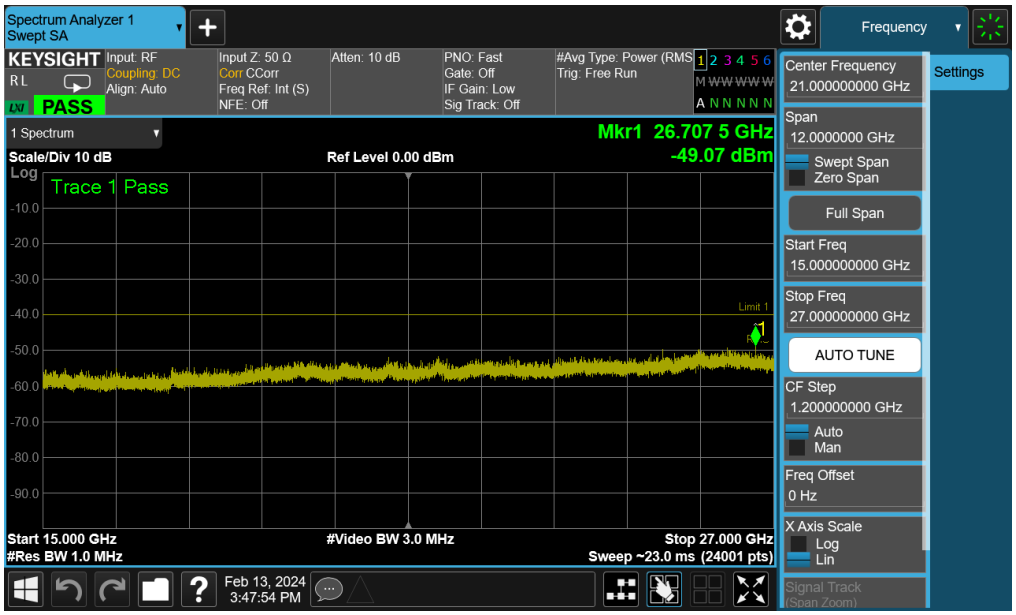
Table 7-19. Conducted Spurious Emission Results (NR Band n48 – Ant 3)



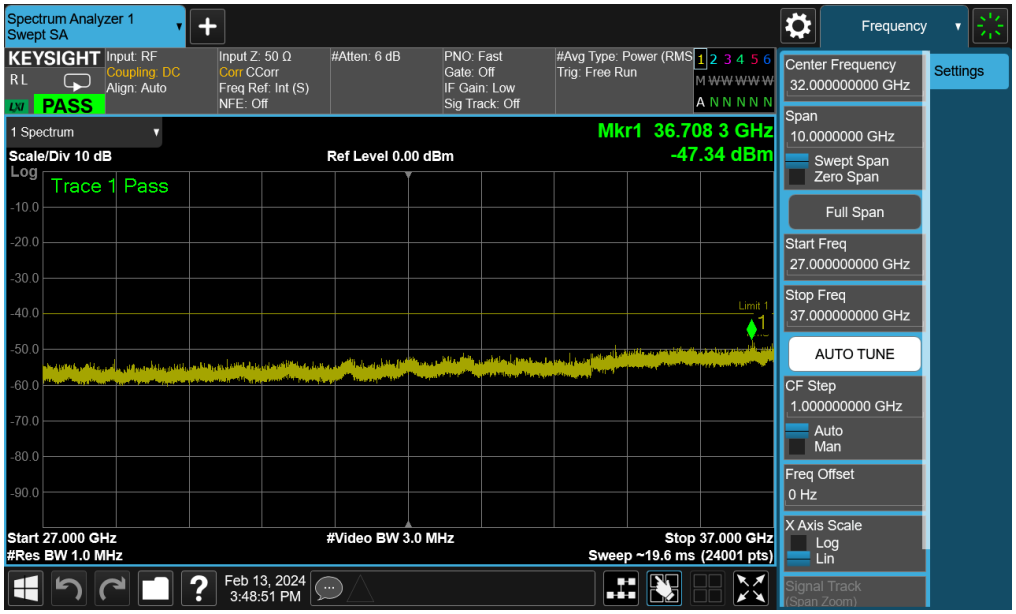
Plot 7-72. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-73. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-74. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)

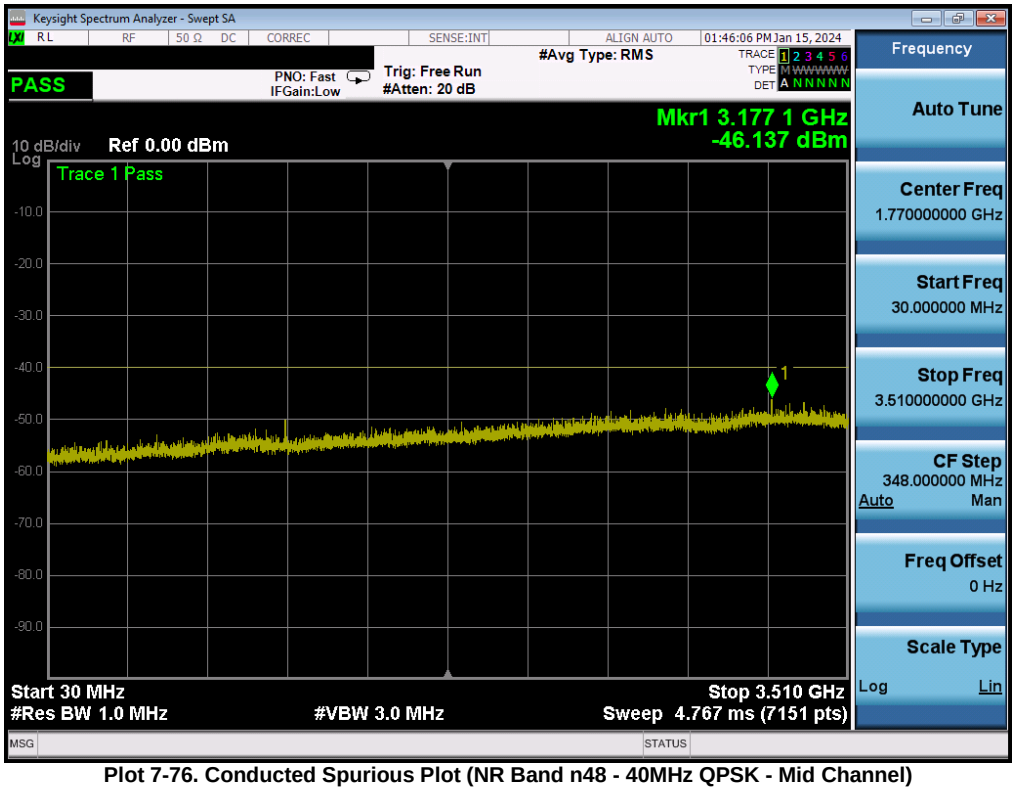


Plot 7-75. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)

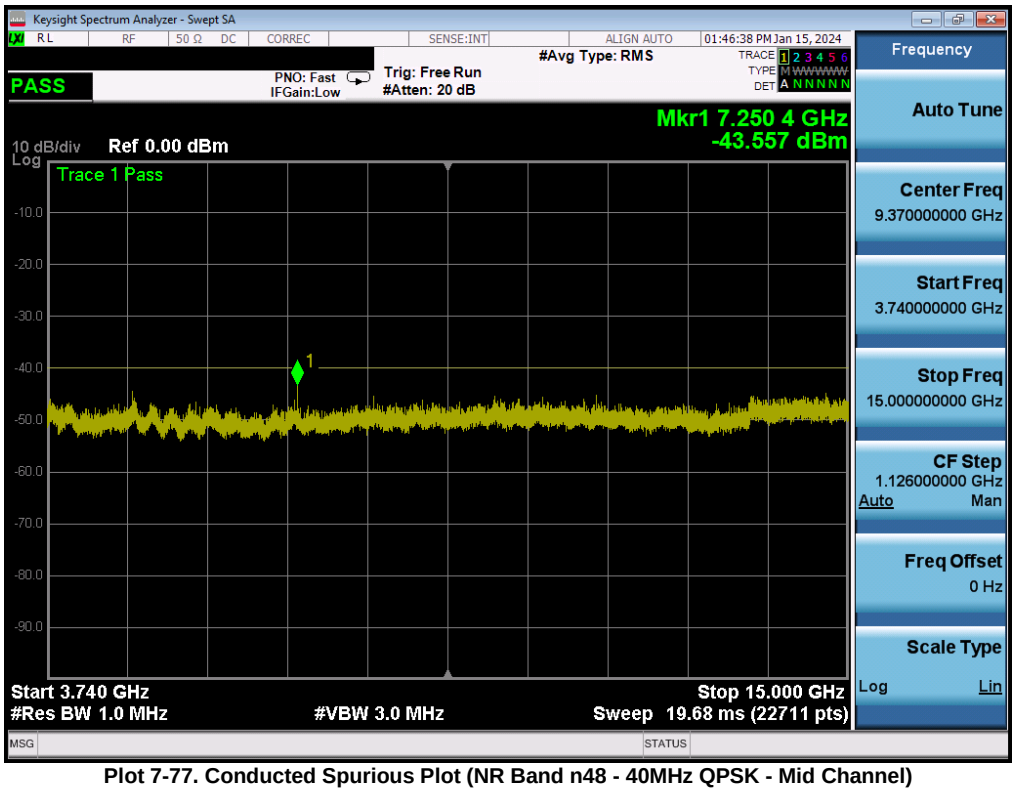
NR Band n48 – Ant 5

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	30.0 - 3510.0	-43.64	-40	-3.64
		Low	3610.0-15000.0	-44.23	-40	-4.23
		Low	15000.0-27000.0	-49.26	-40	-9.26
		Low	27000.0-37000.0	-47.13	-40	-7.13
		Mid	30.0 - 3575.0	-46.14	-40	-6.14
		Mid	3675.0-15000.0	-43.56	-40	-3.56
		Mid	15000.0-27000.0	-45.17	-40	-5.17
		Mid	27000.0-39000.0	-45.97	-40	-5.97
		High	30.0 - 3640.0	-45.51	-40	-5.51
		High	3740.0-15000.0	-43.80	-40	-3.80
		High	15000.0-27000.0	-48.53	-40	-8.53
		High	27000.0-39000.0	-47.02	-40	-7.02

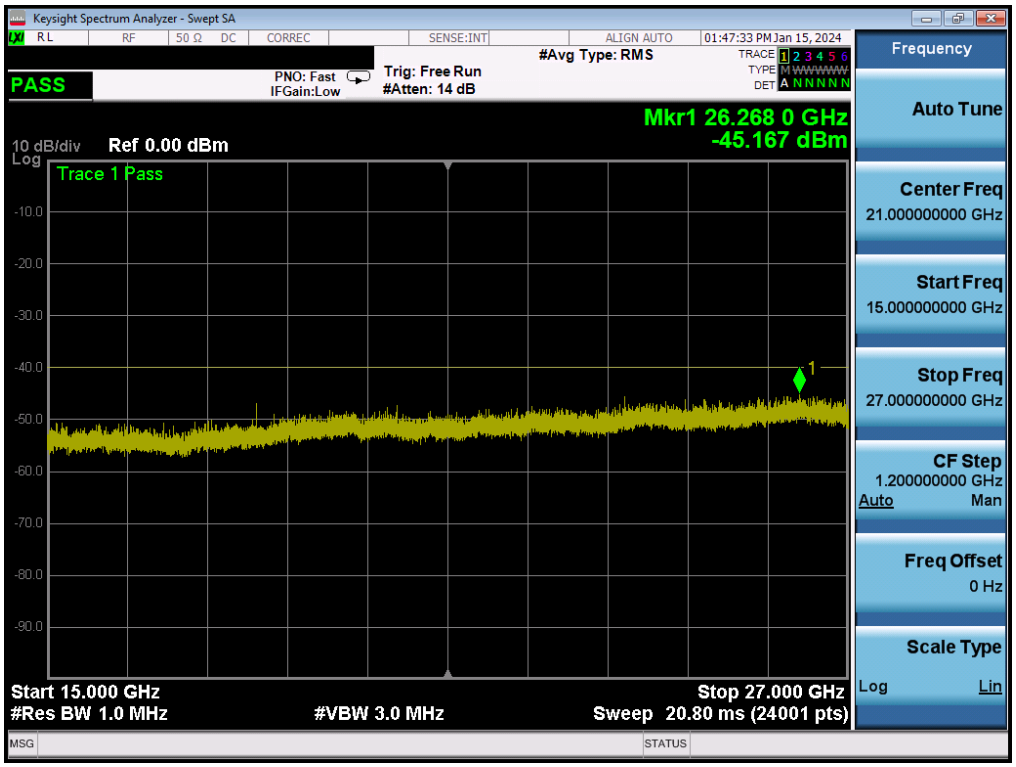
Table 7-20. Conducted Spurious Emission Results (NR Band n48 – Ant 5)



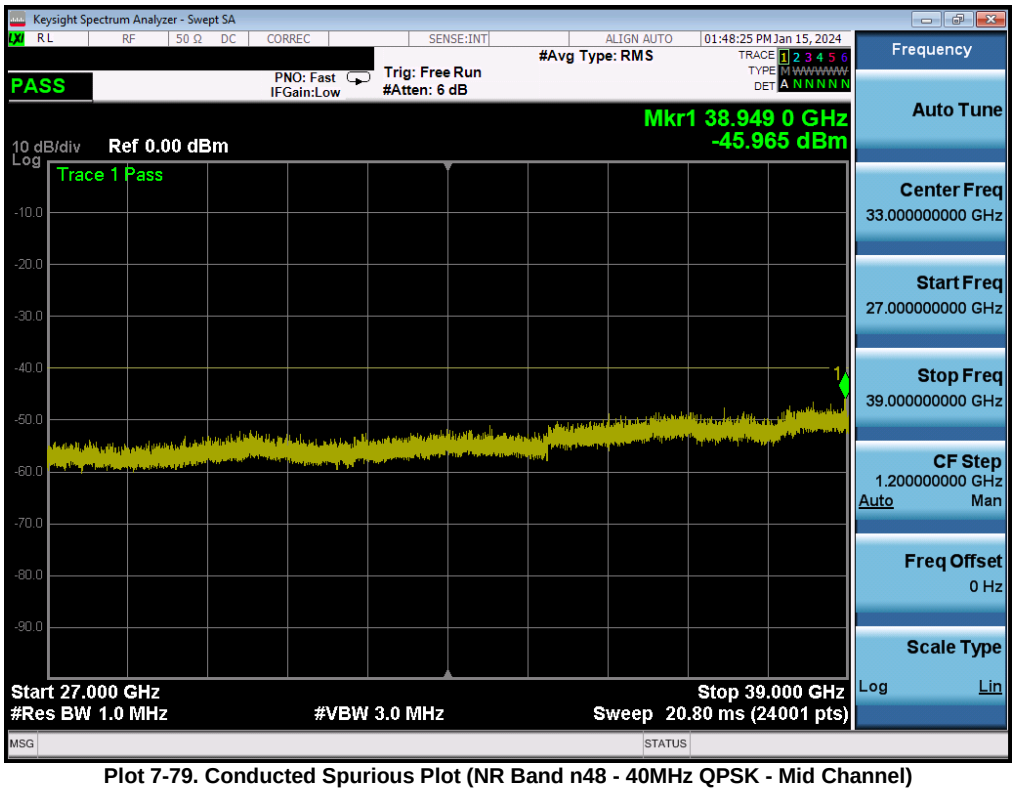
Plot 7-76. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



Plot 7-77. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



Plot 7-78. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

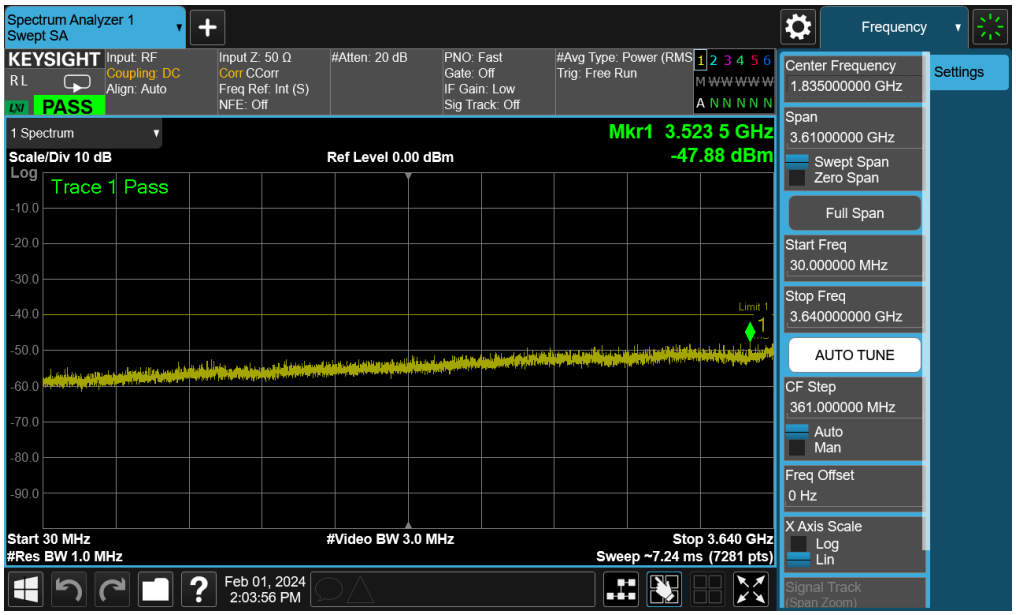


Plot 7-79. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

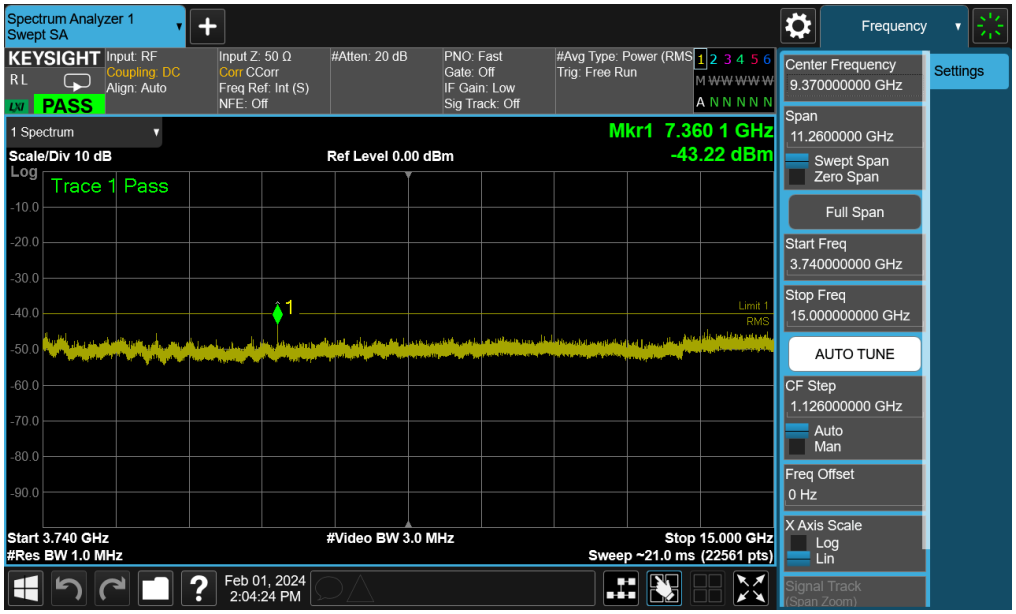
NR Band n48 – Ant 8

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	30.0 - 3510.0	-47.35	-40	-7.35
		Low	3610.0-15000.0	-44.56	-40	-4.56
		Low	15000.0-27000.0	-49.18	-40	-9.18
		Low	27000.0-37000.0	-47.84	-40	-7.84
		Mid	30.0 - 3575.0	-46.75	-40	-6.75
		Mid	3675.0-15000.0	-44.91	-40	-4.91
		Mid	15000.0-27000.0	-48.69	-40	-8.69
		Mid	27000.0-39000.0	-45.37	-40	-5.37
		High	30.0 - 3640.0	-47.88	-40	-7.88
		High	3740.0-15000.0	-43.22	-40	-3.22
		High	15000.0-27000.0	-49.52	-40	-9.52
		High	27000.0-39000.0	-44.38	-40	-4.38

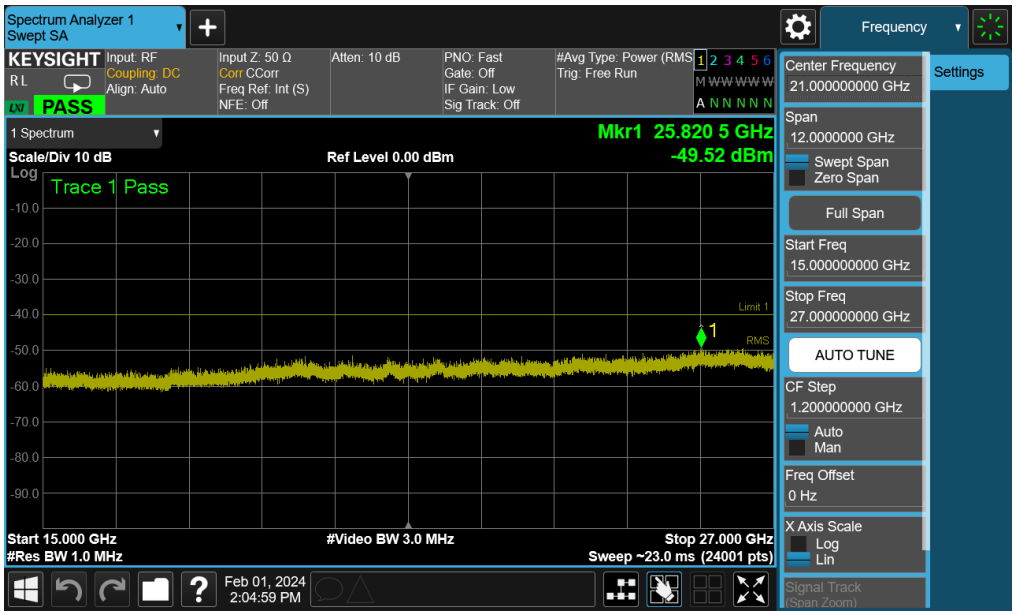
Table 7-21. Conducted Spurious Emission Results (NR Band n48 – Ant 8)



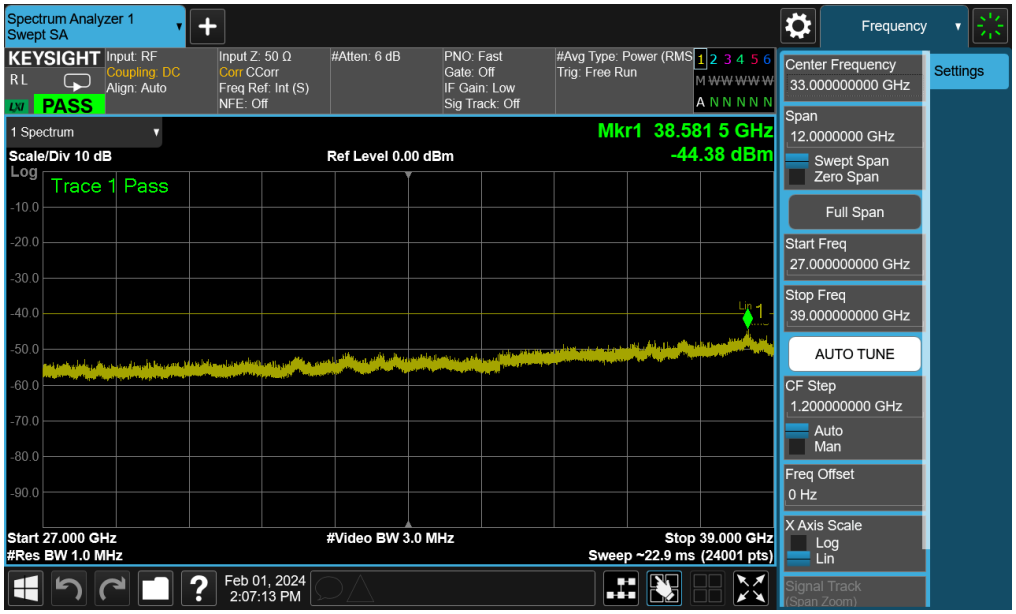
Plot 7-80. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - High Channel)



Plot 7-81. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - High Channel)



Plot 7-82. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - High Channel)



Plot 7-83. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - High Channel)

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

For an End User Device, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B MHz (where B is the bandwidth in MHz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B MHz below the lower CBSD-assigned channel edge. At all frequencies greater than B MHz above the upper CBSD assigned channel edge and less than B MHz below the lower CBSD-assigned channel edge, the conducted power of any end user device emission shall not exceed −25 dBm/MHz. The conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

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
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.

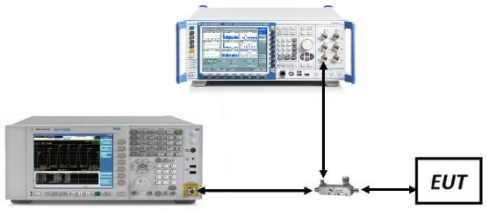


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

1. Per 96.41(e)(3)(i), compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth 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 reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental 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.

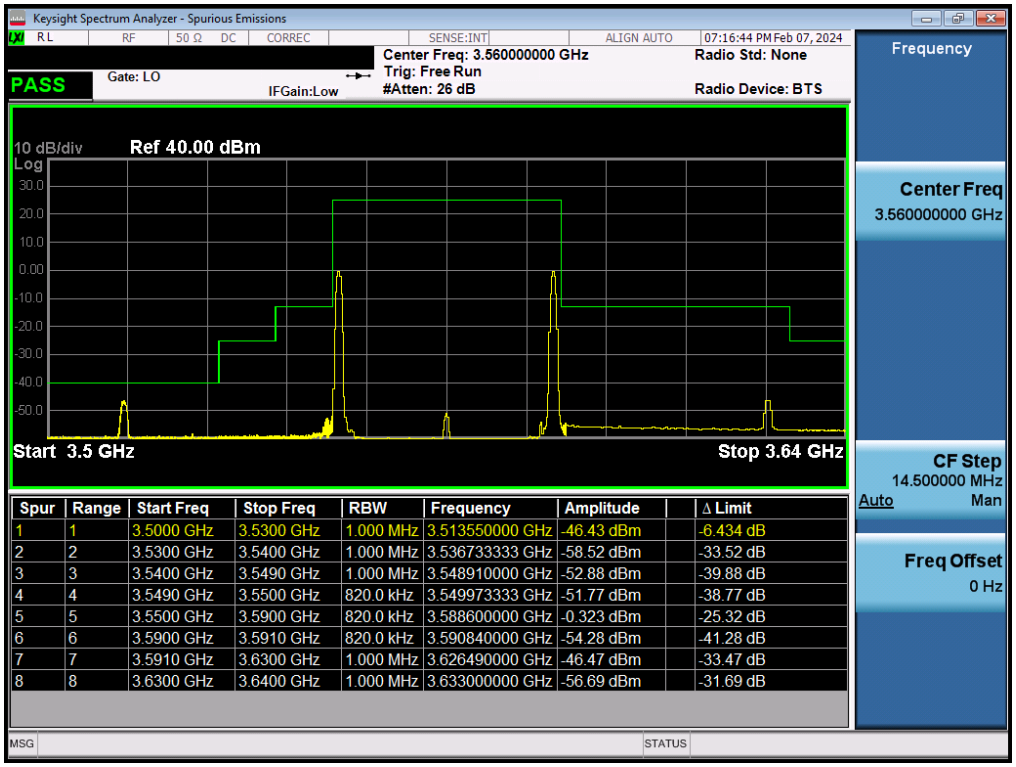
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

3. Since standalone targets of Ant 2 and Ant 3 have higher targets than UL-MIMO n48 data is not included in the report. Also, UL-MIMO n48 conducted band edge has been checked and was found not to be the worst case.

ULCA LB48

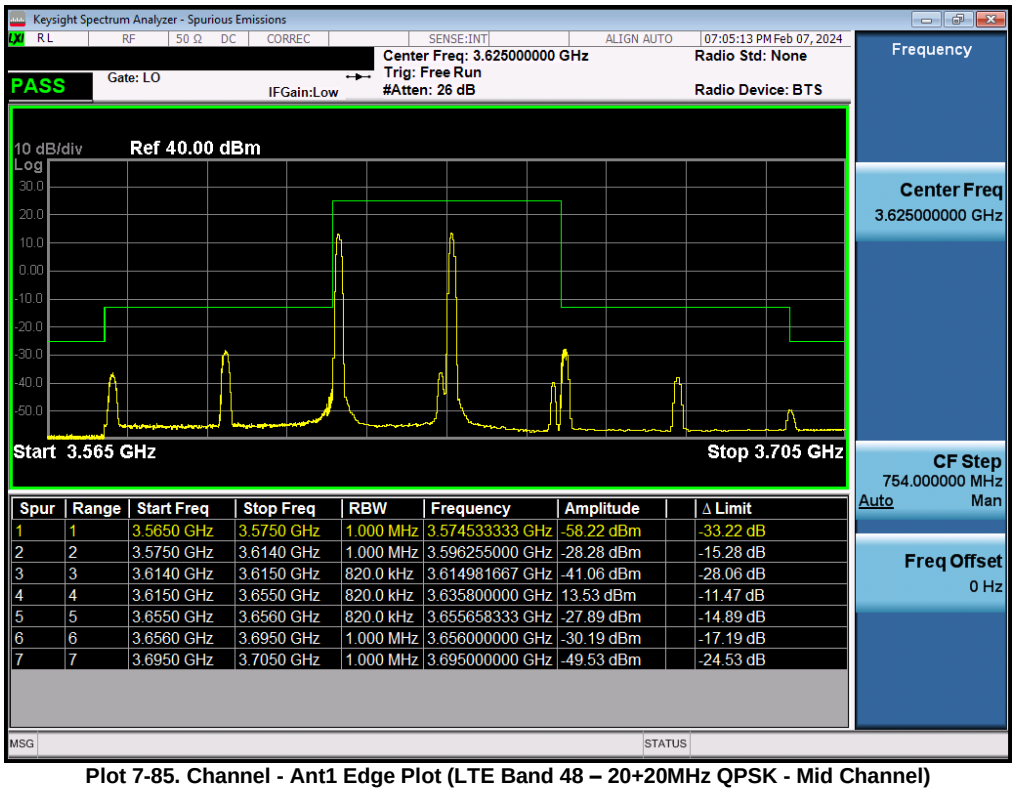
Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48 (2CC ULCA)	40MHz	Low	Band Edge	-46.43	-40	-6.43
		Mid	Band Edge	-27.89	-13	-14.89
		High	Band Edge	-46.63	-40	-6.63

Table 7-22. Conducted Band Edge Emission Results (ULCA LB48)



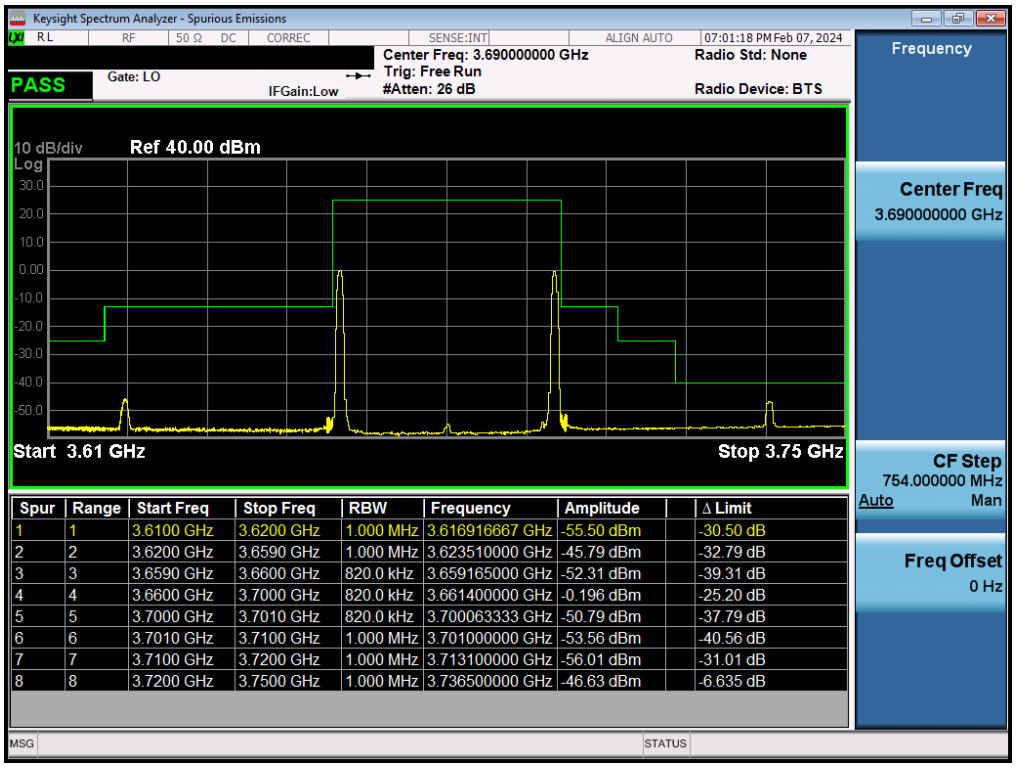
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5000 GHz	3.5300 GHz	1.000 MHz	3.513550000 GHz	-46.43 dBm	-6.434 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.536733333 GHz	-58.52 dBm	-33.52 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548910000 GHz	-52.88 dBm	-39.88 dB
4	4	3.5490 GHz	3.5500 GHz	820.0 kHz	3.549973333 GHz	-51.77 dBm	-38.77 dB
5	5	3.5500 GHz	3.5900 GHz	820.0 kHz	3.588600000 GHz	-0.323 dBm	-25.32 dB
6	6	3.5900 GHz	3.5910 GHz	820.0 kHz	3.590840000 GHz	-54.28 dBm	-41.28 dB
7	7	3.5910 GHz	3.6300 GHz	1.000 MHz	3.626490000 GHz	-46.47 dBm	-33.47 dB
8	8	3.6300 GHz	3.6400 GHz	1.000 MHz	3.633000000 GHz	-56.69 dBm	-31.69 dB

Plot 7-84. Channel - Ant1 Edge Plot (LTE Band 48 – 20+20MHz QPSK - Low Channel)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5650 GHz	3.5750 GHz	1.000 MHz	3.574533333 GHz	-58.22 dBm	-33.22 dB
2	2	3.5750 GHz	3.6140 GHz	1.000 MHz	3.596255000 GHz	-28.28 dBm	-15.28 dB
3	3	3.6140 GHz	3.6150 GHz	820.0 kHz	3.614981667 GHz	-41.06 dBm	-28.06 dB
4	4	3.6150 GHz	3.6550 GHz	820.0 kHz	3.635800000 GHz	13.53 dBm	-11.47 dB
5	5	3.6550 GHz	3.6560 GHz	820.0 kHz	3.655658333 GHz	-27.89 dBm	-14.89 dB
6	6	3.6560 GHz	3.6950 GHz	1.000 MHz	3.656000000 GHz	-30.19 dBm	-17.19 dB
7	7	3.6950 GHz	3.7050 GHz	1.000 MHz	3.695000000 GHz	-49.53 dBm	-24.53 dB

Plot 7-85. Channel - Ant1 Edge Plot (LTE Band 48 – 20+20MHz QPSK - Mid Channel)



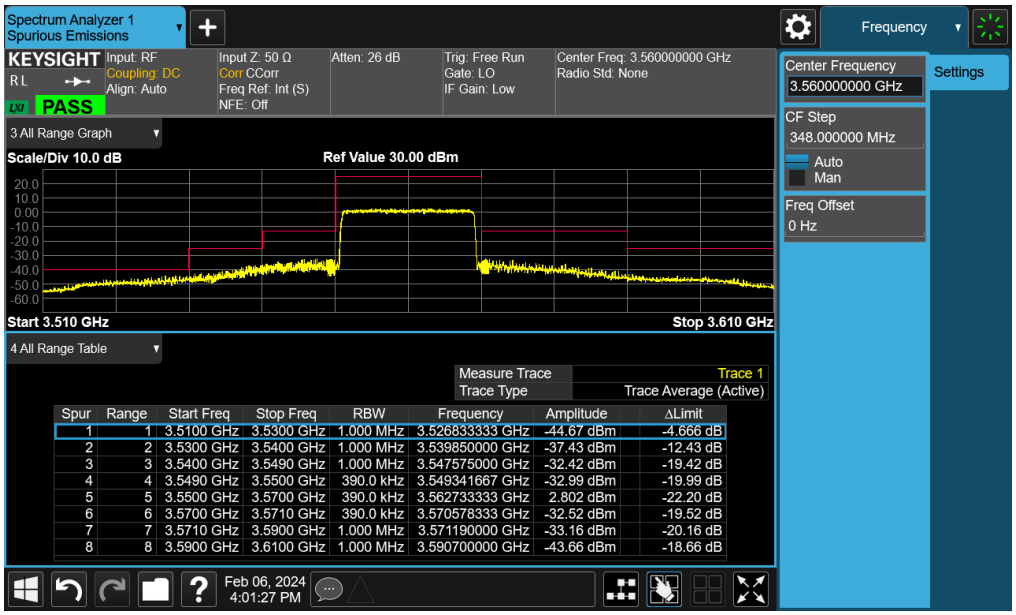
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6100 GHz	3.6200 GHz	1.000 MHz	3.616916667 GHz	-55.50 dBm	-30.50 dB
2	2	3.6200 GHz	3.6590 GHz	1.000 MHz	3.623510000 GHz	-45.79 dBm	-32.79 dB
3	3	3.6590 GHz	3.6600 GHz	820.0 kHz	3.659165000 GHz	-52.31 dBm	-39.31 dB
4	4	3.6600 GHz	3.7000 GHz	820.0 kHz	3.661400000 GHz	-0.196 dBm	-25.20 dB
5	5	3.7000 GHz	3.7010 GHz	820.0 kHz	3.700063333 GHz	-50.79 dBm	-37.79 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-53.56 dBm	-40.56 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.713100000 GHz	-56.01 dBm	-31.01 dB
8	8	3.7200 GHz	3.7500 GHz	1.000 MHz	3.736500000 GHz	-46.63 dBm	-6.635 dB

Plot 7-86. Channel - Ant1 Edge Plot (LTE Band 48 – 20+20MHz QPSK - High Channel)

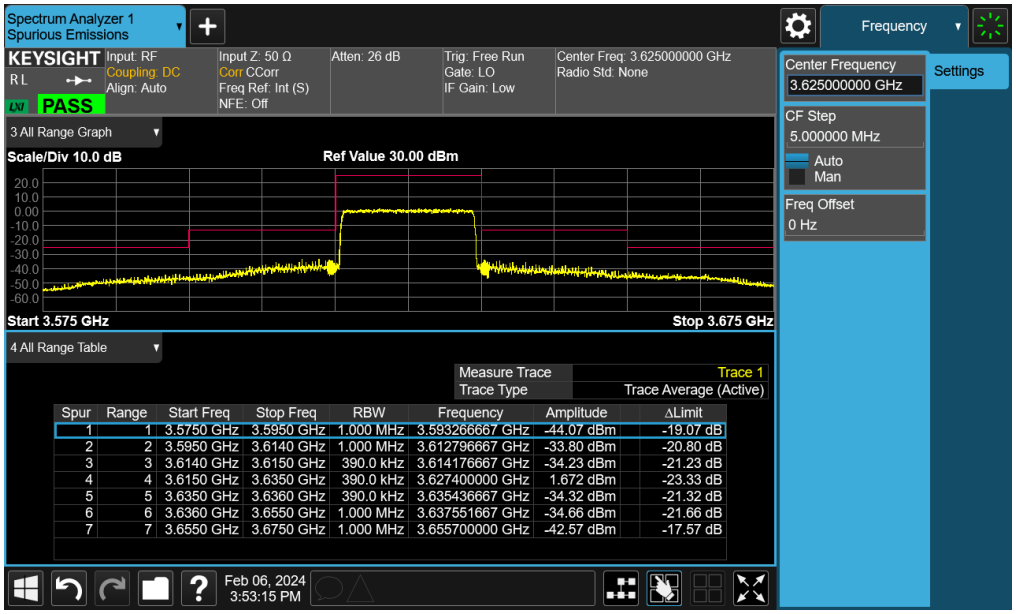
LTE B48 – Ant 2

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48	20MHz	Low	Band Edge	-44.67	-40	-4.67
		Mid	Band Edge	-42.57	-25	-17.57
		High	Band Edge	-42.81	-40	-2.81
	15MHz	Low	Band Edge	-46.86	-40	-6.86
		Mid	Band Edge	-43.22	-25	-18.22
		High	Band Edge	-45.09	-40	-5.09
	10MHz	Low	Band Edge	-51.01	-40	-11.01
		Mid	Band Edge	-40.65	-25	-15.65
		High	Band Edge	-49.11	-40	-9.11
	5MHz	Low	Band Edge	-56.59	-40	-16.59
		Mid	Band Edge	-25.99	-13	-12.99
		High	Band Edge	-54.38	-40	-14.38

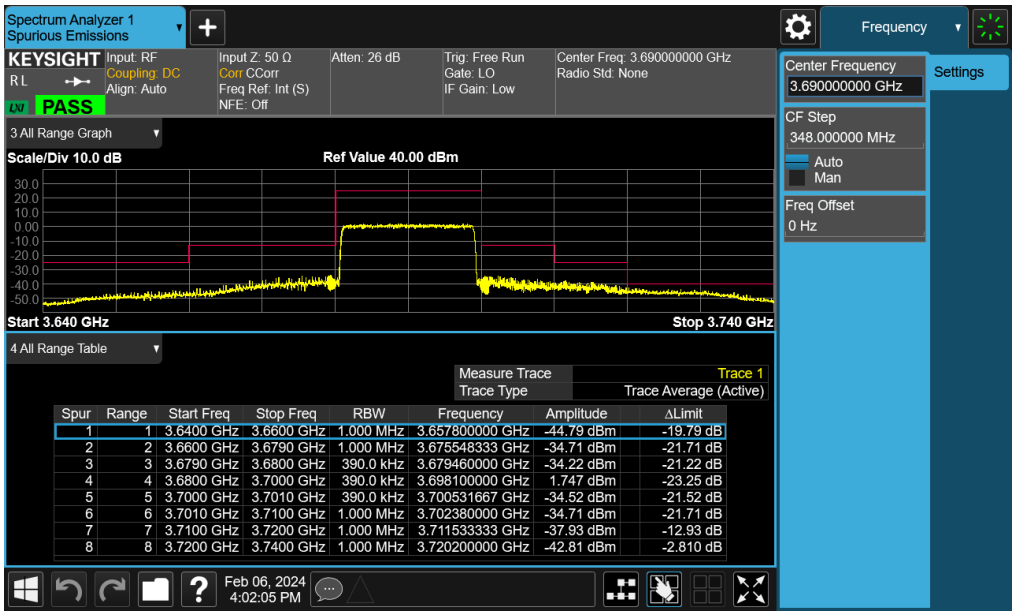
Table 7-23. Conducted Band Edge Emission Results (LTE B48 – Ant 2)



Plot 7-87. Channel - Ant1 Edge Plot (LTE Band 48 - 20MHz QPSK - Low Channel)



Plot 7-88. Channel - Ant1 Edge Plot (LTE Band 48 - 20MHz QPSK - Mid Channel)

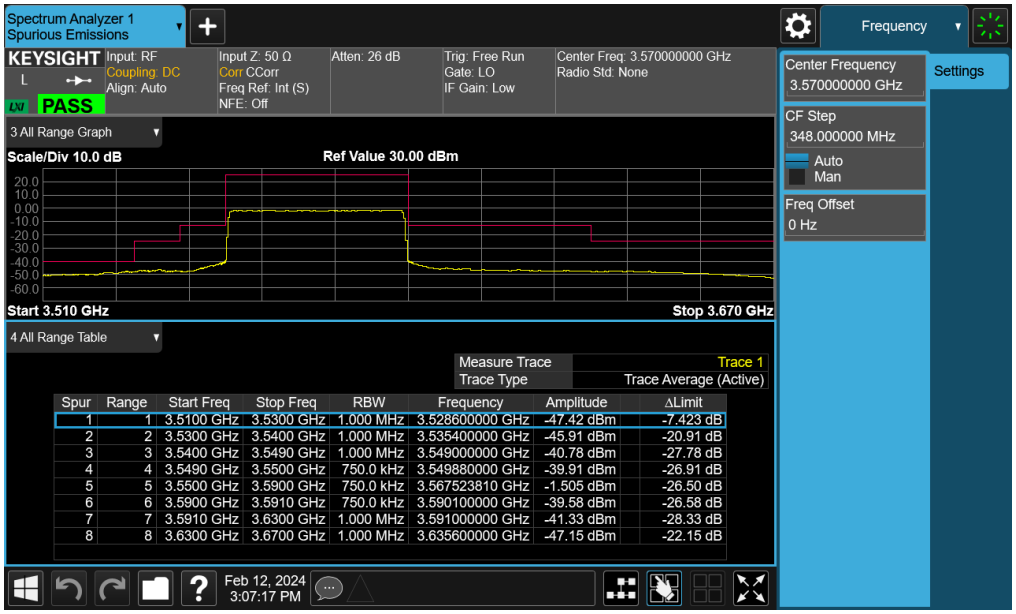


Plot 7-89. Channel - Ant1 Edge Plot (LTE Band 48 - 20MHz QPSK - High Channel)

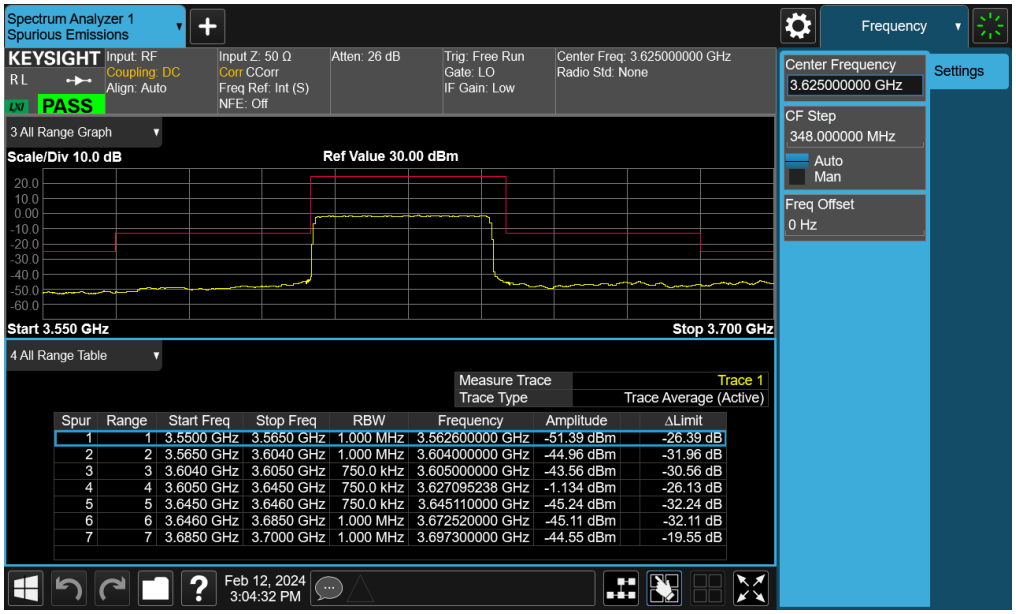
NR Band n48 – Ant 2

Bandwidth	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	Band Edge	-47.42	-40	-7.42
		Mid	Band Edge	-44.55	-25	-19.55
		High	Band Edge	-41.07	-40	-1.07
	30MHz	Low	Band Edge	-45.73	-40	-5.73
		Mid	Band Edge	-46.08	-25	-21.08
		High	Band Edge	-42.75	-40	-2.75
	20MHz	Low	Band Edge	-48.36	-40	-8.36
		Mid	Band Edge	-44.21	-25	-19.21
		High	Band Edge	-44.66	-40	-4.66
	15MHz	Low	Band Edge	-19.37	-40	20.63
		Mid	Band Edge	-47.18	-25	-22.18
		High	Band Edge	-46.92	-40	-6.92
	10MHz	Low	Band Edge	-50.67	-40	-10.67
		Mid	Band Edge	-43.93	-25	-18.93
		High	Band Edge	-49.20	-40	-9.20

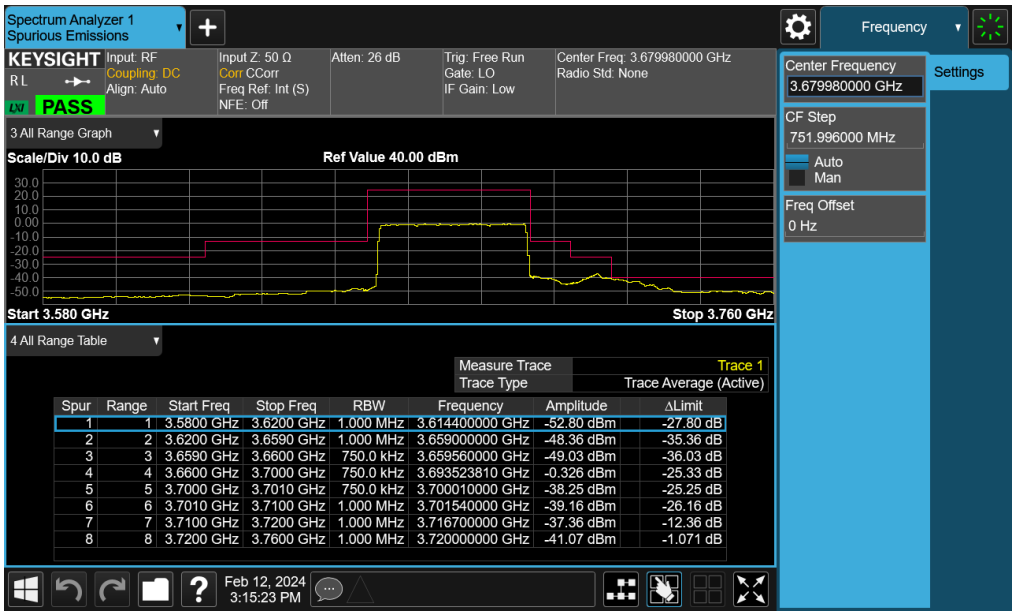
Table 7-24. Conducted Band Edge Emission Results (NR Band n48 – Ant 2)



Plot 7-90. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-91. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

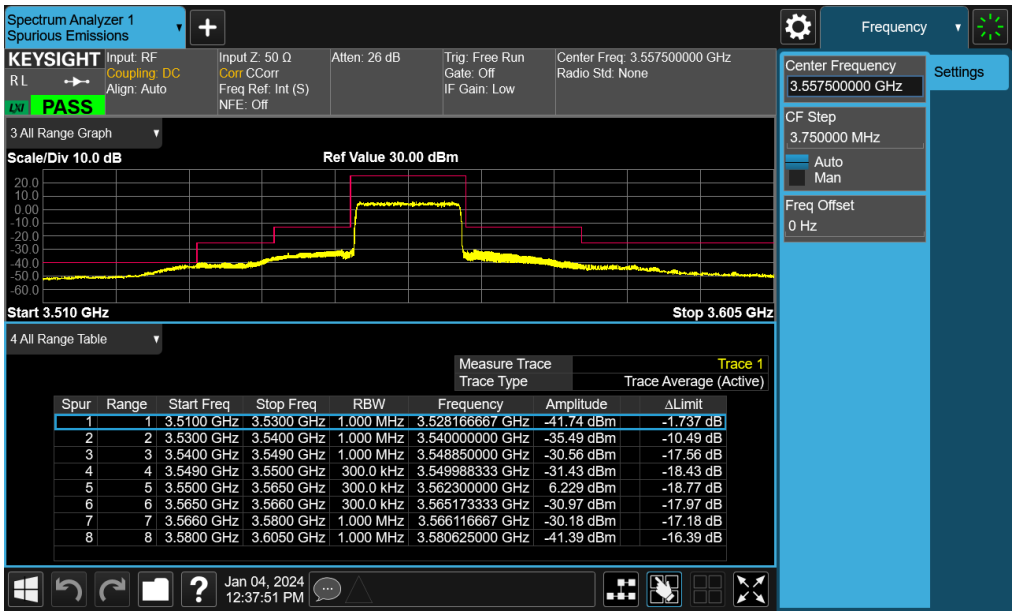


Plot 7-92. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

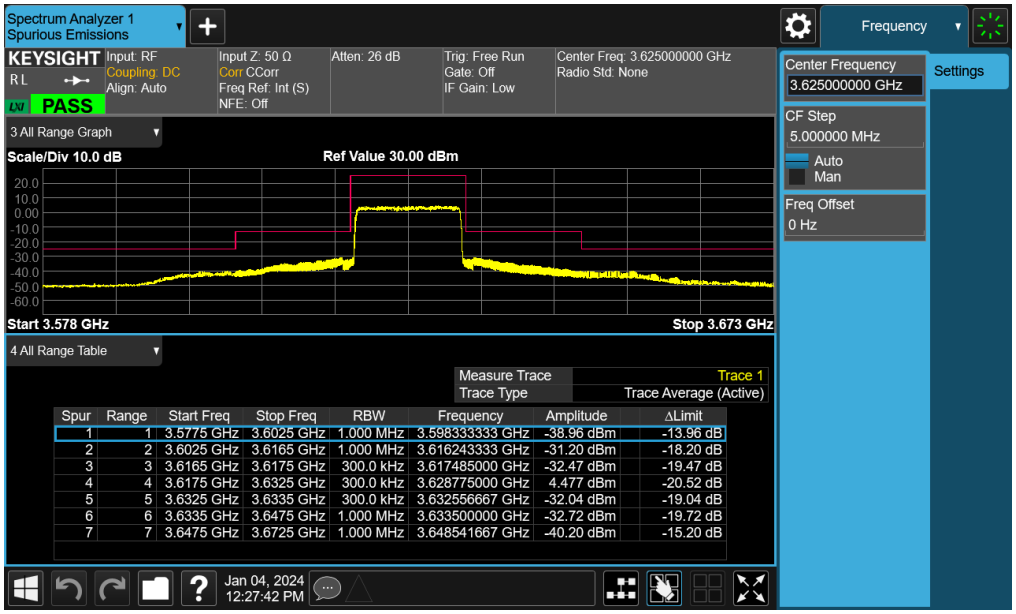
LTE B48 – Ant 3

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE Band 48	20MHz	Low	Band Edge	-42.10	-40	-2.10
		Mid	Band Edge	-41.44	-25	-16.44
		High	Band Edge	-42.47	-40	-2.47
	15MHz	Low	Band Edge	-41.74	-40	-1.74
		Mid	Band Edge	-40.32	-25	-15.32
		High	Band Edge	-43.93	-40	-3.93
	10MHz	Low	Band Edge	-48.86	-40	-8.86
		Mid	Band Edge	-41.15	-25	-16.15
		High	Band Edge	-47.57	-40	-7.57
	5MHz	Low	Band Edge	-52.79	-40	-12.79
		Mid	Band Edge	-27.52	-13	-14.52
		High	Band Edge	-50.52	-40	-10.52

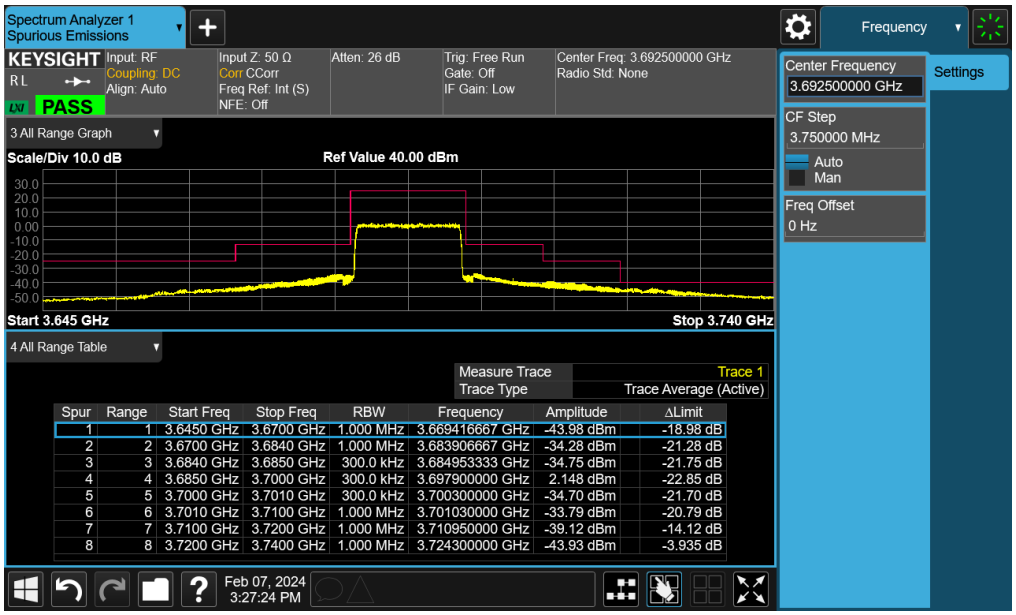
Table 7-25. Conducted Band Edge Emission Results (LTE B48 – Ant 3)



Plot 7-93. Channel - Ant1 Edge Plot (LTE Band 48 - 15MHz QPSK - Low Channel)



Plot 7-94. Channel - Ant1 Edge Plot (LTE Band 48 - 15MHz QPSK - Mid Channel)

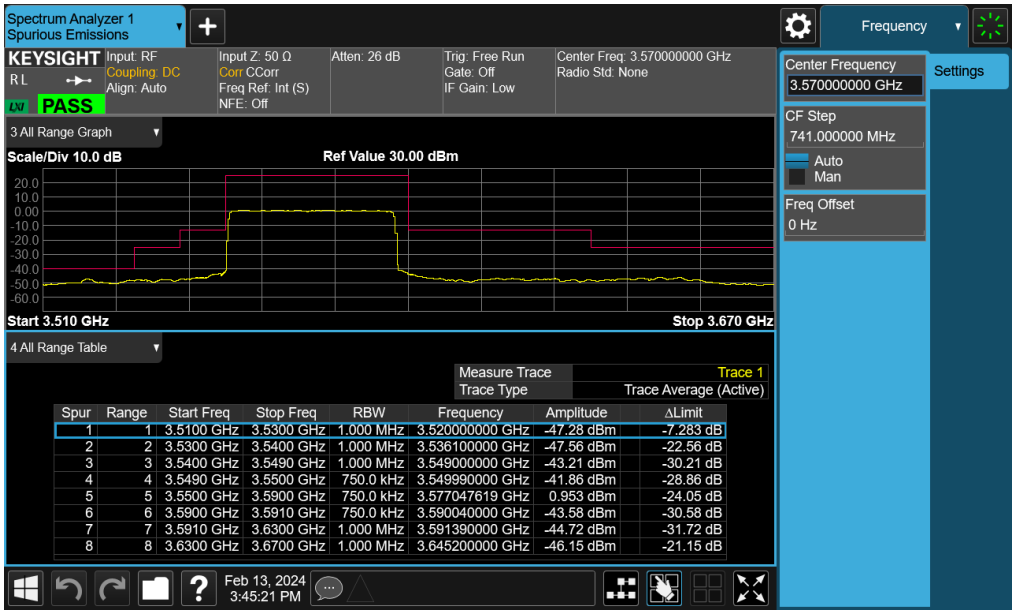


Plot 7-95. Channel - Ant1 Edge Plot (LTE Band 48 - 15MHz QPSK - High Channel)

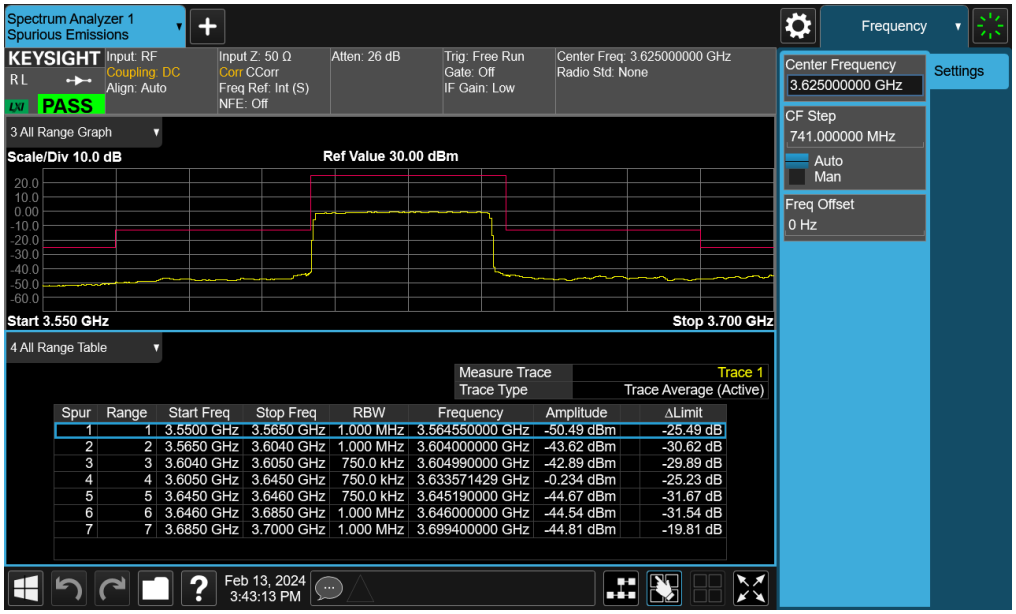
NR Band n48 – Ant 3

Bandwidth	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	Band Edge	-47.28	-40	-7.28
		Mid	Band Edge	-44.81	-25	-19.81
		High	Band Edge	-41.44	-40	-1.44
	30MHz	Low	Band Edge	-44.42	-40	-4.42
		Mid	Band Edge	-47.94	-25	-22.94
		High	Band Edge	-43.93	-40	-3.93
	20MHz	Low	Band Edge	-46.57	-40	-6.57
		Mid	Band Edge	-44.49	-25	-19.49
		High	Band Edge	-44.95	-40	-4.95
	15MHz	Low	Band Edge	-47.15	-40	-7.15
		Mid	Band Edge	-46.70	-25	-21.70
		High	Band Edge	-45.56	-40	-5.56
	10MHz	Low	Band Edge	-49.38	-40	-9.38
		Mid	Band Edge	-44.50	-25	-19.50
		High	Band Edge	-48.90	-40	-8.90

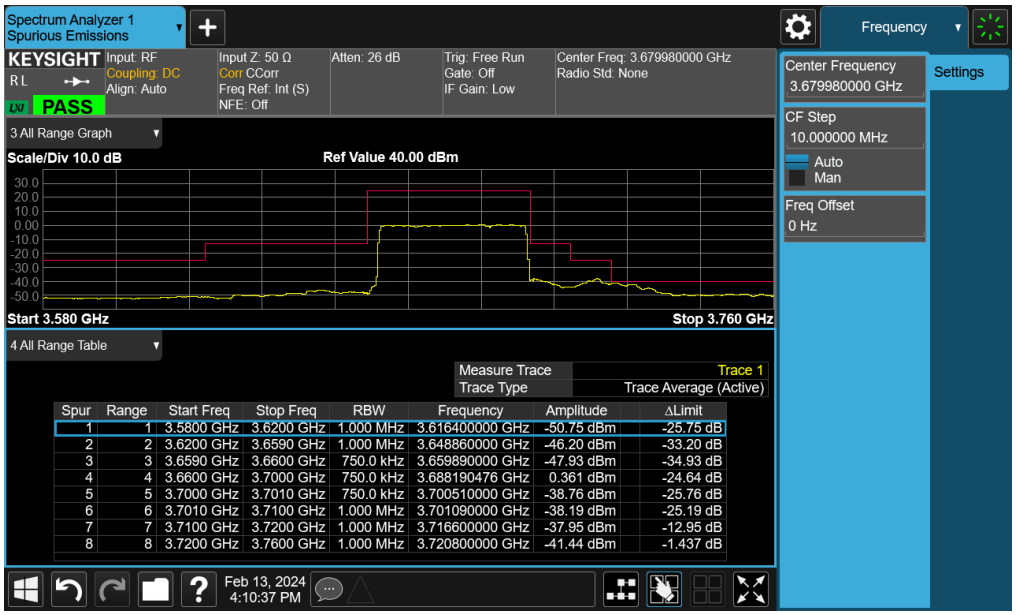
Table 7-26. Conducted Band Edge Emission Results (NR Band n48 – Ant 3)



Plot 7-96. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-97. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

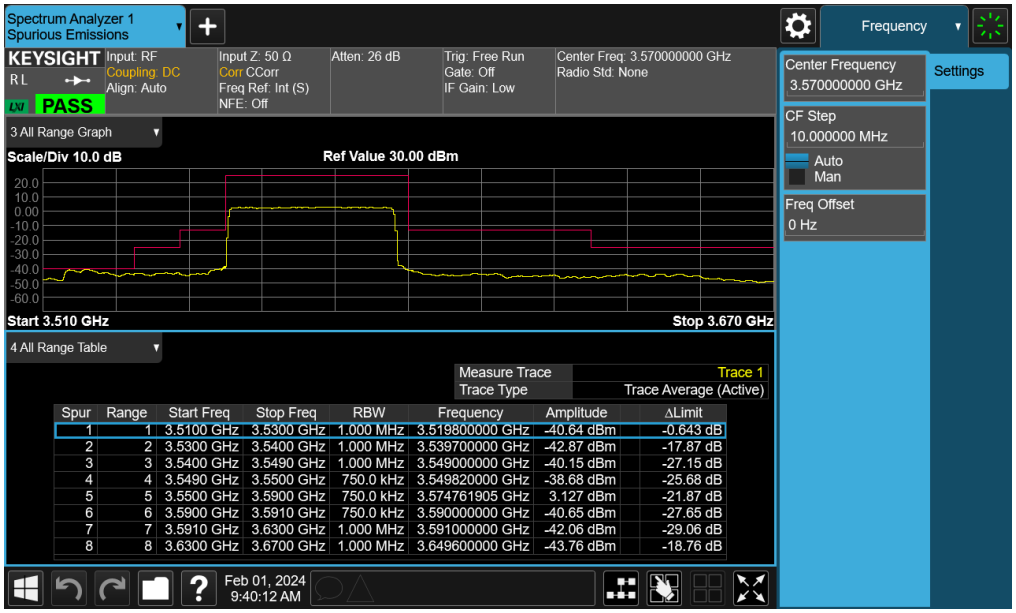


Plot 7-98. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

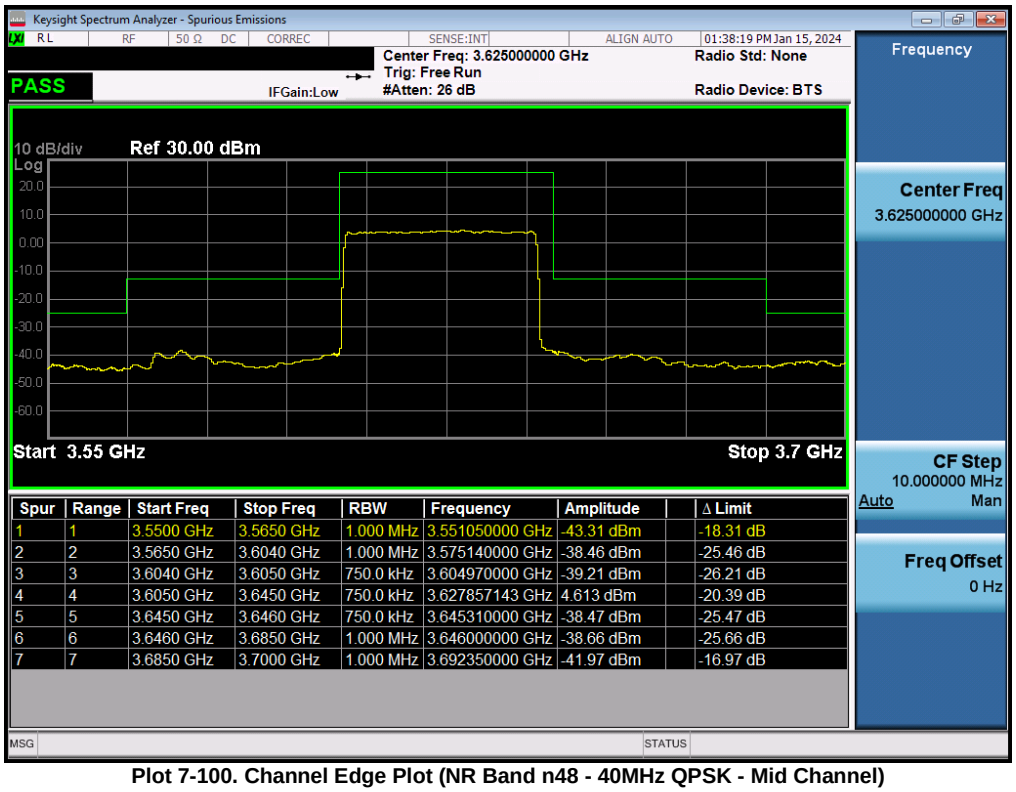
NR Band n48 – Ant 5

Bandwidth	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	Band Edge	-40.64	-40	-0.64
		Mid	Band Edge	-41.97	-25	-16.97
		High	Band Edge	-41.74	-40	-1.74

Table 7-27. Conducted Band Edge Emission Results (NR Band n48 – Ant 5)

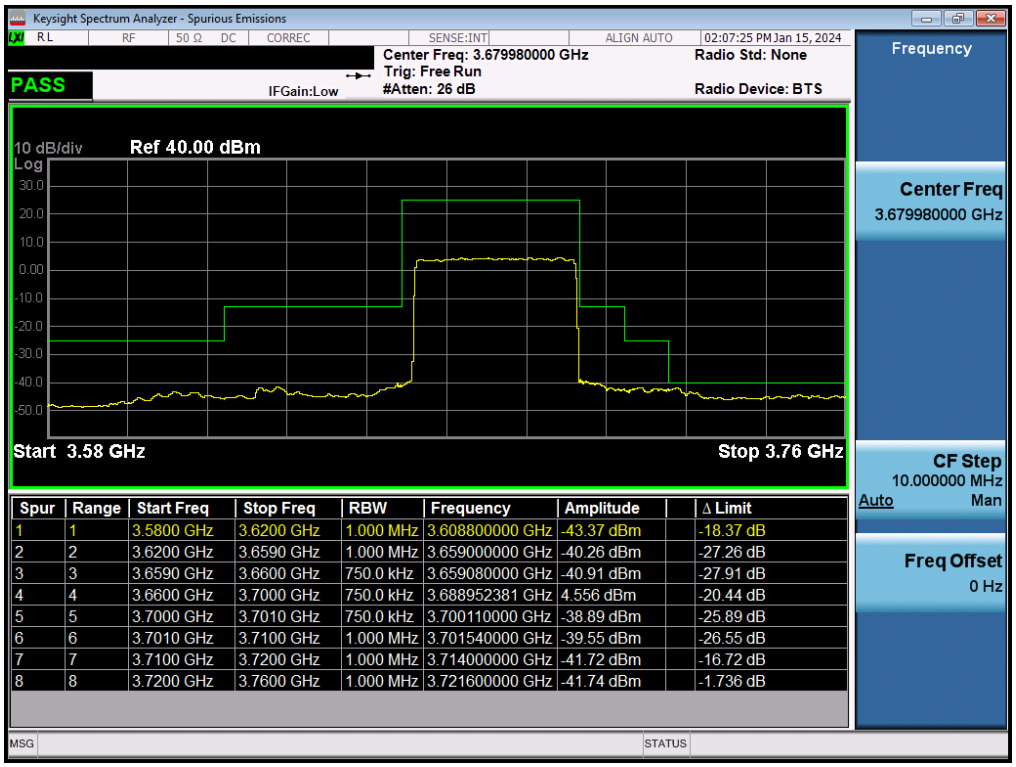


Plot 7-99. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5500 GHz	3.5650 GHz	1.000 MHz	3.551050000 GHz	-43.31 dBm	-18.31 dB
2	2	3.5650 GHz	3.6040 GHz	1.000 MHz	3.575140000 GHz	-38.46 dBm	-25.46 dB
3	3	3.6040 GHz	3.6050 GHz	750.0 kHz	3.604970000 GHz	-39.21 dBm	-26.21 dB
4	4	3.6050 GHz	3.6450 GHz	750.0 kHz	3.627857143 GHz	4.613 dBm	-20.39 dB
5	5	3.6450 GHz	3.6460 GHz	750.0 kHz	3.645310000 GHz	-38.47 dBm	-25.47 dB
6	6	3.6460 GHz	3.6850 GHz	1.000 MHz	3.646000000 GHz	-38.66 dBm	-25.66 dB
7	7	3.6850 GHz	3.7000 GHz	1.000 MHz	3.692350000 GHz	-41.97 dBm	-16.97 dB

Plot 7-100. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



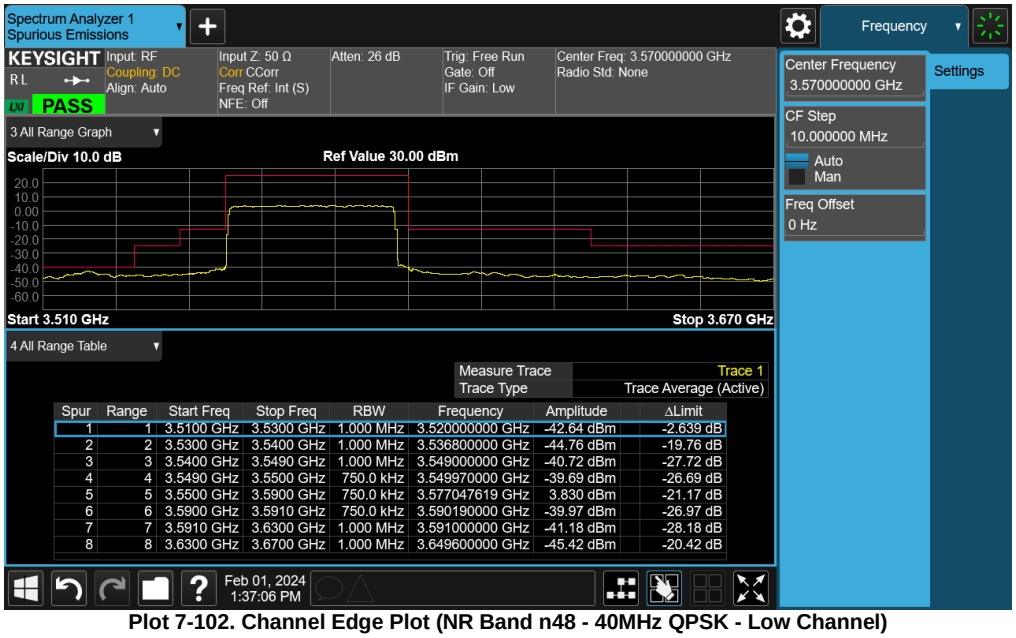
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5800 GHz	3.6200 GHz	1.000 MHz	3.608800000 GHz	-43.37 dBm	-18.37 dB
2	2	3.6200 GHz	3.6590 GHz	1.000 MHz	3.659000000 GHz	-40.26 dBm	-27.26 dB
3	3	3.6590 GHz	3.6600 GHz	750.0 kHz	3.659080000 GHz	-40.91 dBm	-27.91 dB
4	4	3.6600 GHz	3.7000 GHz	750.0 kHz	3.688952381 GHz	4.556 dBm	-20.44 dB
5	5	3.7000 GHz	3.7010 GHz	750.0 kHz	3.700110000 GHz	-38.89 dBm	-25.89 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701540000 GHz	-39.55 dBm	-26.55 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.714000000 GHz	-41.72 dBm	-16.72 dB
8	8	3.7200 GHz	3.7600 GHz	1.000 MHz	3.721600000 GHz	-41.74 dBm	-1.736 dB

Plot 7-101. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

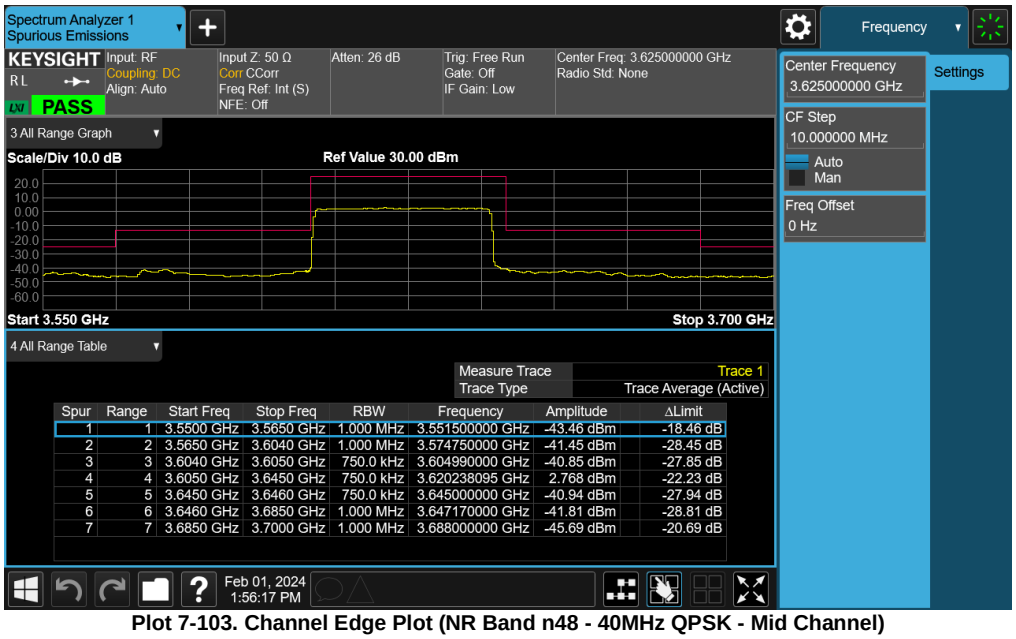
NR Band n48 – Ant 8

Bandwidth	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR Band n48	40MHz	Low	Band Edge	-42.64	-40	-2.64
		Mid	Band Edge	-43.71	-25	-18.71
		High	Band Edge	-42.11	-40	-2.11

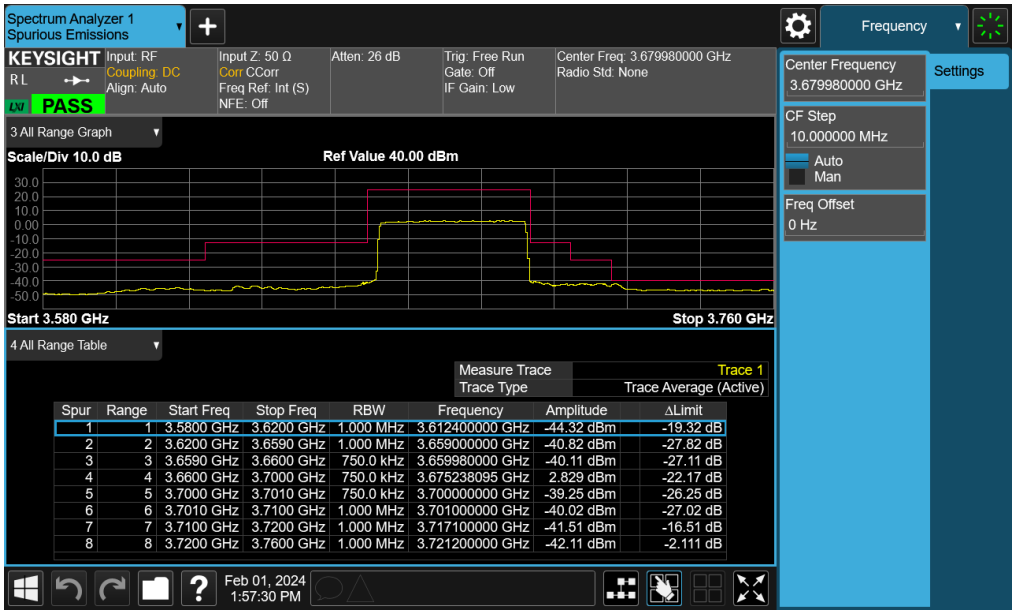
Table 7-28. Conducted Band Edge Emission Results (NR Band n48 – Ant 8)



Plot 7-102. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-103. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.5800 GHz	3.6200 GHz	1.000 MHz	3.612400000 GHz	-44.32 dBm	-19.32 dB
2	2	3.6200 GHz	3.6590 GHz	1.000 MHz	3.659000000 GHz	-40.82 dBm	-27.82 dB
3	3	3.6590 GHz	3.6600 GHz	750.0 kHz	3.659980000 GHz	-40.11 dBm	-27.11 dB
4	4	3.6600 GHz	3.7000 GHz	750.0 kHz	3.675238095 GHz	2.829 dBm	-22.17 dB
5	5	3.7000 GHz	3.7010 GHz	750.0 kHz	3.700000000 GHz	-39.25 dBm	-26.25 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-40.02 dBm	-27.02 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.717100000 GHz	-41.51 dBm	-16.51 dB
8	8	3.7200 GHz	3.7600 GHz	1.000 MHz	3.721200000 GHz	-42.11 dBm	-2.111 dB

Plot 7-104. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

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.
2. RBW = 1 – 5% of the expected OBW
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 set equal to 10MHz. 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.

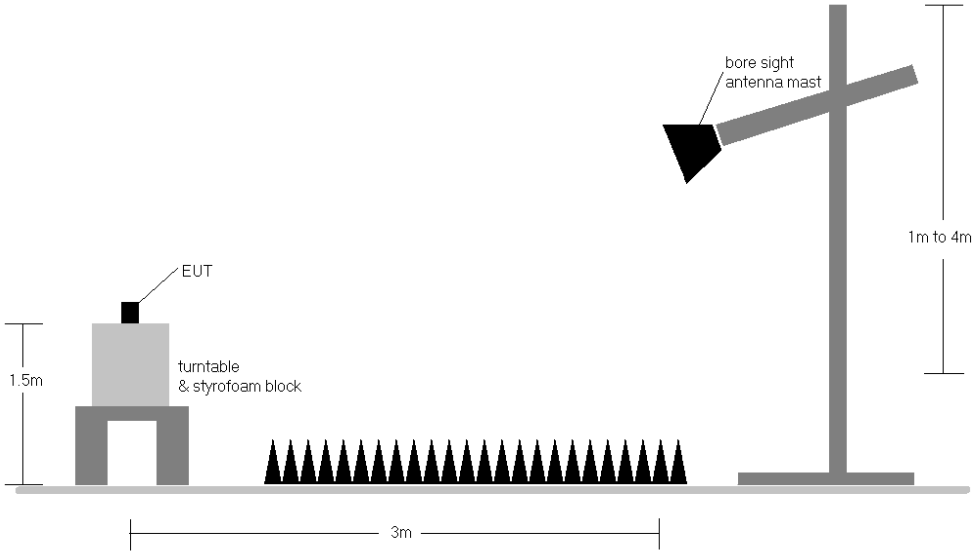


Figure 7-5. Radiated Test Setup >1GHz

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.

4) The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz).

Bandwidth	Modulation	PCC			SCC			Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Ant. Gain [dBi]	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
		Bandwidth [MHz]	Frequency [MHz]	RB / Offset	Bandwidth [MHz]	Frequency [MHz]	RB / Offset									
40 MHz	QPSK	20	3560.0	1 / 99	20	3579.8	1 / 0	H	119	59	6.51	13.98	20.49	0.112	23.00	-2.51
		20	3625.0	1 / 99	20	3644.8	1 / 0	H	126	59	6.70	14.96	21.66	0.147	23.00	-1.34
		20	3690.0	1 / 0	20	3670.2	1 / 99	H	122	57	6.86	15.14	22.00	0.158	23.00	-1.00
	16-QAM	20	3690.0	1 / 0	20	3670.2	1 / 99	H	122	57	6.86	14.91	21.77	0.150	23.00	-1.23
35 MHz	QPSK	20	3557.5	1 / 99	15	3577.1	1 / 0	H	119	59	6.51	13.96	20.46	0.111	23.00	-2.54
		20	3625.0	1 / 99	15	3642.1	1 / 0	H	126	59	6.70	15.00	21.70	0.148	23.00	-1.30
		20	3692.5	1 / 0	15	3672.9	1 / 74	H	122	57	6.86	15.12	21.98	0.158	23.00	-1.02
	16-QAM	20	3692.5	1 / 0	15	3672.9	1 / 74	H	122	57	6.86	14.90	21.76	0.150	23.00	-1.24
30 MHz	QPSK	20	3555.0	1 / 99	10	3574.4	1 / 0	H	119	59	6.50	13.95	20.45	0.111	23.00	-2.55
		20	3625.0	1 / 99	10	3639.4	1 / 0	H	126	59	6.70	14.91	21.61	0.145	23.00	-1.39
		20	3695.0	1 / 0	10	3678.3	1 / 49	H	122	57	6.86	15.16	22.03	0.159	23.00	-0.97
	16-QAM	20	3695.0	1 / 0	10	3678.3	1 / 49	H	122	57	6.86	14.92	21.79	0.151	23.00	-1.21
25 MHz	QPSK	20	3552.5	1 / 99	5	3571.7	1 / 0	H	119	59	6.50	13.97	20.46	0.111	23.00	-2.54
		20	3625.0	1 / 99	5	3636.7	1 / 0	H	126	59	6.70	14.88	21.58	0.144	23.00	-1.42
		20	3697.5	1 / 0	5	3678.3	1 / 24	H	122	57	6.87	15.06	21.93	0.156	23.00	-1.07
	16-QAM	20	3697.5	1 / 0	5	3678.3	1 / 24	H	122	57	6.87	14.90	21.77	0.150	23.00	-1.23

Table 7-29. EIRP Data (ULCA Band 48 –Ant 2)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
20 MHz	QPSK	3560.00	H	133	59	6.51	1 / 50	14.65	21.16	0.131	23.00	-1.84
	QPSK	3625.00	H	140	57	6.70	1 / 99	15.10	21.80	0.151	23.00	-1.20
	QPSK	3690.00	H	146	56	6.86	1 / 99	15.05	**21.91**	**0.155**	23.00	-1.09
	16-QAM	3690.00	H	146	56	6.86	1 / 99	14.79	21.65	0.146	23.00	-1.35
15 MHz	QPSK	3557.50	H	133	59	6.51	1 / 74	14.51	21.01	0.126	23.00	-1.99
	QPSK	3625.00	H	140	57	6.70	1 / 0	15.09	21.79	0.151	23.00	-1.21
	QPSK	3692.50	H	146	56	6.86	1 / 37	14.98	**21.84**	**0.153**	23.00	-1.16
	16-QAM	3625.00	H	140	57	6.70	1 / 0	14.99	21.69	0.148	23.00	-1.31
10 MHz	QPSK	3555.00	H	133	59	6.50	1 / 49	14.89	21.39	0.138	23.00	-1.61
	QPSK	3625.00	H	140	57	6.70	1 / 25	15.28	21.98	0.158	23.00	-1.02
	QPSK	3695.00	H	146	56	6.86	1 / 25	15.13	**22.00**	**0.158**	23.00	-1.00
	16-QAM	3625.00	H	140	57	6.70	1 / 25	15.29	21.99	0.158	23.00	-1.01
5 MHz	QPSK	3552.50	H	133	59	6.50	1 / 12	14.73	21.22	0.132	23.00	-1.78
	QPSK	3625.00	H	140	57	6.70	1 / 12	15.31	22.01	0.159	23.00	-0.99
	QPSK	3697.50	H	146	56	6.87	1 / 12	15.50	**22.37**	**0.172**	23.00	-0.63
	16-QAM	3697.50	H	146	56	6.87	1 / 12	14.82	21.69	0.147	23.00	-1.31

Table 7-30. EIRP Data (LTE Band 48 – Ant2)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
40 MHz	π/2 BPSK	3570.00	H	143	57	6.53	1 / 1	14.68	21.21	0.132	23.00	-1.79
	π/2 BPSK	3625.00	H	150	59	6.70	1 / 1	13.91	20.61	0.115	23.00	-2.39
	π/2 BPSK	3680.00	H	146	59	6.84	1 / 104	15.45	**22.29**	**0.170**	23.00	-0.71
	QPSK	3570.00	H	143	57	6.53	1 / 1	14.70	21.23	0.133	23.00	-1.77
	QPSK	3625.00	H	150	59	6.70	1 / 1	13.93	20.63	0.116	23.00	-2.37
	QPSK	3680.00	H	146	59	6.84	1 / 104	15.30	22.14	0.164	23.00	-0.86
	16-QAM	3680.00	H	146	59	6.84	1 / 104	14.97	21.81	0.152	23.00	-1.19
30 MHz	π/2 BPSK	3565.00	H	143	57	6.52	1 / 76	14.64	21.16	0.131	23.00	-1.84
	π/2 BPSK	3625.00	H	150	59	6.70	1 / 76	13.82	20.52	0.113	23.00	-2.48
	π/2 BPSK	3685.00	H	146	59	6.85	1 / 39	15.44	**22.29**	**0.170**	23.00	-0.71
	QPSK	3565.00	H	143	57	6.52	1 / 76	14.67	21.19	0.132	23.00	-1.81
	QPSK	3625.00	H	150	59	6.70	1 / 76	13.88	20.58	0.114	23.00	-2.42
	QPSK	3685.00	H	146	59	6.85	1 / 39	15.37	22.22	0.167	23.00	-0.78
	16-QAM	3685.00	H	146	59	6.85	1 / 39	15.04	21.89	0.155	23.00	-1.11
20 MHz	π/2 BPSK	3560.00	H	143	57	6.51	1 / 49	14.54	21.05	0.127	23.00	-1.95
	π/2 BPSK	3625.00	H	150	59	6.70	1 / 49	13.74	20.44	0.111	23.00	-2.56
	π/2 BPSK	3690.00	H	146	59	6.86	1 / 49	15.47	**22.32**	**0.171**	23.00	-0.68
	QPSK	3560.00	H	143	57	6.51	1 / 49	14.59	21.10	0.129	23.00	-1.90
	QPSK	3625.00	H	150	59	6.70	1 / 49	13.79	20.49	0.112	23.00	-2.51
	QPSK	3690.00	H	146	59	6.86	1 / 49	15.32	22.17	0.165	23.00	-0.83
	16-QAM	3690.00	H	146	59	6.86	1 / 49	14.93	21.78	0.151	23.00	-1.22
15 MHz	π/2 BPSK	3557.50	H	143	57	6.51	1 / 1	14.57	21.07	0.128	23.00	-1.93
	π/2 BPSK	3625.00	H	150	59	6.70	1 / 36	13.79	20.49	0.112	23.00	-2.51
	π/2 BPSK	3692.50	H	146	59	6.86	1 / 36	15.46	**22.32**	**0.171**	23.00	-0.68
	QPSK	3557.50	H	143	57	6.51	1 / 1	14.59	21.09	0.129	23.00	-1.91
	QPSK	3625.00	H	150	59	6.70	1 / 36	13.78	20.48	0.112	23.00	-2.52
	QPSK	3692.50	H	146	59	6.86	1 / 36	15.32	22.18	0.165	23.00	-0.82
	16-QAM	3692.50	H	146	59	6.86	1 / 36	14.93	21.79	0.151	23.00	-1.21
10 MHz	π/2 BPSK	3555.00	H	143	57	6.50	1 / 1	14.43	20.93	0.124	23.00	-2.07
	π/2 BPSK	3625.00	H	150	59	6.70	1 / 22	13.71	20.41	0.110	23.00	-2.59
	π/2 BPSK	3695.00	H	146	59	6.86	1 / 1	15.34	**22.20**	**0.166**	23.00	-0.80
	QPSK	3555.00	H	143	57	6.50	1 / 1	14.47	20.97	0.125	23.00	-2.03
	QPSK	3625.00	H	150	59	6.70	1 / 22	13.75	20.45	0.111	23.00	-2.55
	QPSK	3695.00	H	146	59	6.86	1 / 1	15.10	21.96	0.157	23.00	-1.04
	16-QAM	3695.00	H	146	59	6.86	1 / 1	14.84	21.70	0.148	23.00	-1.30
40 MHz	QPSK (CP-OFDM)	3680.00	H	146	59	6.84	1 / 104	14.41	**21.25**	**0.133**	23.00	-1.75

Table 7-31. EIRP Data (NR Band n48 – Ant2)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
20 MHz	QPSK	3560.00	V	342	119	6.62	1 / 0	13.08	19.70	0.093	23.00	-3.30
	QPSK	3625.00	V	332	124	6.68	1 / 0	13.19	**19.87**	**0.097**	23.00	-3.13
	QPSK	3690.00	V	348	125	6.99	1 / 0	12.86	19.85	0.097	23.00	-3.15
	16-QAM	3625.00	V	332	124	6.68	1 / 0	12.57	19.25	0.084	23.00	-3.75
15 MHz	QPSK	3557.50	V	342	119	6.62	1 / 0	13.05	19.67	0.093	23.00	-3.33
	QPSK	3625.00	V	332	124	6.68	1 / 37	12.99	19.67	0.093	23.00	-3.33
	QPSK	3692.50	V	348	125	7.00	1 / 74	12.88	**19.88**	**0.097**	23.00	-3.12
	16-QAM	3692.50	V	348	125	7.00	1 / 74	12.16	19.16	0.082	23.00	-3.84
10 MHz	QPSK	3555.00	V	342	119	6.62	1 / 25	13.35	**19.97**	**0.099**	23.00	-3.03
	QPSK	3625.00	V	332	124	6.68	1 / 0	12.34	19.02	0.080	23.00	-3.98
	QPSK	3695.00	V	348	125	7.01	1 / 0	12.59	19.60	0.091	23.00	-3.40
	16-QAM	3555.00	V	342	119	6.62	1 / 25	12.55	19.18	0.083	23.00	-3.82
5 MHz	QPSK	3552.50	V	342	119	6.62	1 / 12	13.45	**20.08**	**0.102**	23.00	-2.92
	QPSK	3625.00	V	332	124	6.68	1 / 12	11.80	18.49	0.071	23.00	-4.51
	QPSK	3697.50	V	348	125	7.02	1 / 12	12.47	19.49	0.089	23.00	-3.51
	16-QAM	3552.50	V	342	119	6.62	1 / 12	12.80	19.43	0.088	23.00	-3.57

Table 7-32. EIRP Data (LTE Band 48 – Ant3)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
40 MHz	π/2 BPSK	3570.00	V	344	120	6.60	1 / 53	12.76	19.36	0.086	23.00	-3.64
	π/2 BPSK	3625.00	V	329	125	6.68	1 / 104	12.79	19.47	0.089	23.00	-3.53
	π/2 BPSK	3680.00	V	354	124	6.94	1 / 1	12.53	19.47	0.089	23.00	-3.53
	QPSK	3570.00	V	344	120	6.60	1 / 53	12.77	19.37	0.087	23.00	-3.63
	QPSK	3625.00	V	329	125	6.68	1 / 104	12.90	**19.58**	**0.091**	23.00	-3.42
	QPSK	3680.00	V	354	124	6.94	1 / 1	12.26	19.20	0.083	23.00	-3.80
	16-QAM	3680.00	V	354	124	6.94	1 / 1	11.92	18.86	0.077	23.00	-4.14
30 MHz	π/2 BPSK	3565.00	V	344	120	6.61	1 / 39	13.42	**20.03**	**0.101**	23.00	-2.97
	π/2 BPSK	3625.00	V	329	125	6.68	1 / 1	13.02	19.70	0.093	23.00	-3.30
	π/2 BPSK	3685.00	V	354	124	6.96	1 / 76	12.50	19.46	0.088	23.00	-3.54
	QPSK	3565.00	V	344	120	6.61	1 / 39	13.14	19.75	0.094	23.00	-3.25
	QPSK	3625.00	V	329	125	6.68	1 / 1	13.28	19.96	0.099	23.00	-3.04
	QPSK	3685.00	V	354	124	6.96	1 / 76	12.11	19.07	0.081	23.00	-3.93
	16-QAM	3625.00	V	329	125	6.68	1 / 1	12.64	19.33	0.086	23.00	-3.67
20 MHz	π/2 BPSK	3560.00	V	344	120	6.62	1 / 1	13.01	19.63	0.092	23.00	-3.37
	π/2 BPSK	3625.00	V	329	125	6.68	50 / 0	13.04	**19.72**	**0.094**	23.00	-3.28
	π/2 BPSK	3690.00	V	354	124	6.99	50 / 0	12.70	19.69	0.093	23.00	-3.31
	QPSK	3560.00	V	344	120	6.62	1 / 1	12.73	19.35	0.086	23.00	-3.65
	QPSK	3625.00	V	329	125	6.68	50 / 0	12.71	19.39	0.087	23.00	-3.61
	QPSK	3690.00	V	354	124	6.99	50 / 0	11.66	18.65	0.073	23.00	-4.35
	16-QAM	3560.00	V	344	120	6.62	1 / 1	12.14	18.76	0.075	23.00	-4.24
15 MHz	π/2 BPSK	3557.50	V	344	120	6.62	1 / 1	13.09	**19.71**	**0.093**	23.00	-3.29
	π/2 BPSK	3625.00	V	329	125	6.68	1 / 1	12.75	19.44	0.088	23.00	-3.56
	π/2 BPSK	3692.50	V	354	124	7.00	1 / 36	12.36	19.36	0.086	23.00	-3.64
	QPSK	3557.50	V	344	120	6.62	1 / 1	12.86	19.47	0.089	23.00	-3.53
	QPSK	3625.00	V	329	125	6.68	1 / 1	12.90	19.58	0.091	23.00	-3.42
	QPSK	3692.50	V	354	124	7.00	1 / 36	11.98	18.98	0.079	23.00	-4.02
	16-QAM	3625.00	V	329	125	6.68	1 / 1	12.39	19.07	0.081	23.00	-3.93
10 MHz	π/2 BPSK	3555.00	V	344	120	6.62	1 / 19	12.96	**19.58**	**0.091**	23.00	-3.42
	π/2 BPSK	3625.00	V	329	125	6.68	1 / 36	12.28	18.97	0.079	23.00	-4.03
	π/2 BPSK	3695.00	V	354	124	7.01	1 / 19	12.06	19.07	0.081	23.00	-3.93
	QPSK	3555.00	V	344	120	6.62	1 / 1	12.63	19.25	0.084	23.00	-3.75
	QPSK	3625.00	V	329	125	6.68	1 / 1	12.25	18.94	0.078	23.00	-4.06
	QPSK	3695.00	V	354	124	7.01	1 / 19	11.51	18.52	0.071	23.00	-4.48
	16-QAM	3555.00	V	344	120	6.62	1 / 1	11.72	18.34	0.068	23.00	-4.66
40 MHz	QPSK (Opposite Pol.)	3625.00	V	329	125	6.68	1 / 104	12.32	**19.00**	**0.079**	23.00	-4.00

Table 7-33. EIRP Data (NR Band n48 – Ant3)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
40 MHz	π/2 BPSK	3570.00	H	127	300	6.53	1 / 104	11.24	17.77	0.060	23.00	-5.23
	π/2 BPSK	3625.00	H	118	298	6.70	1 / 104	10.42	17.12	0.052	23.00	-5.88
	π/2 BPSK	3680.00	H	111	302	6.84	1 / 1	10.37	17.21	0.053	23.00	-5.79
	QPSK	3570.00	H	127	300	6.53	1 / 104	11.28	**17.81**	**0.060**	23.00	-5.19
	QPSK	3625.00	H	118	298	6.70	1 / 104	10.31	17.01	0.050	23.00	-5.99
	QPSK	3680.00	H	111	302	6.84	1 / 1	10.23	17.07	0.051	23.00	-5.93
	16-QAM	3570.00	H	127	300	6.53	1 / 104	10.36	16.89	0.049	23.00	-6.11
40 MHz	QPSK (CP-OFDM)	3570.00	H	121	299	6.53	1 / 104	8.57	15.10	0.032	23.00	-7.90

Table 7-34. EIRP Data (NR Band n48 – Ant5)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
40 MHz	π/2 BPSK	3570.00	H	146	37	6.53	1 / 53	11.59	18.12	0.065	23.00	-4.88
	π/2 BPSK	3625.00	H	152	30	6.70	1 / 1	11.14	17.84	0.061	23.00	-5.16
	π/2 BPSK	3680.00	H	152	32	6.84	1 / 1	10.80	17.64	0.058	23.00	-5.36
	QPSK	3570.00	H	146	37	6.53	1 / 53	11.78	**18.31**	**0.068**	23.00	-4.69
	QPSK	3625.00	H	152	30	6.70	1 / 1	11.10	17.80	0.060	23.00	-5.20
	QPSK	3680.00	H	152	32	6.84	1 / 1	10.63	17.47	0.056	23.00	-5.53
	16-QAM	3570.00	H	146	37	6.53	1 / 53	10.79	17.32	0.054	23.00	-5.68
40 MHz	QPSK (CP-OFDM)	3570.00	H	146	37	6.53	1 / 53	10.40	**16.93**	**0.049**	23.00	-6.07

Table 7-35. EIRP Data (NR Band n48 – Ant8)

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/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
40 MHz	QPSK	3570.00	V	159	27	6.60	1 / 104	9.59	16.19	0.042	23.00	-6.81
	QPSK	3625.00	V	156	13	6.68	1 / 104	9.84	16.52	0.045	23.00	-6.48
	QPSK	3680.00	V	159	18	6.94	1 / 1	10.16	17.10	0.051	23.00	-5.90
	16-QAM	3680.00	V	159	18	6.94	1 / 1	9.78	16.72	0.047	23.00	-6.28
	64-QAM	3680.00	V	159	18	6.94	1 / 1	8.59	15.53	0.036	23.00	-7.47
	256-QAM	3680.00	V	159	18	6.94	1 / 1	5.30	12.24	**0.017**	23.00	-10.76

Table 7-36. EIRP Data (UL-MIMO NR Band n48 – Ant2 and Ant3)

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 = Max Hold (In cases where the level is within 2dB of the limit, the final measurement is taken using triggering/gating and trace averaging.)
7. The trace was allowed to stabilize

Test Setup

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

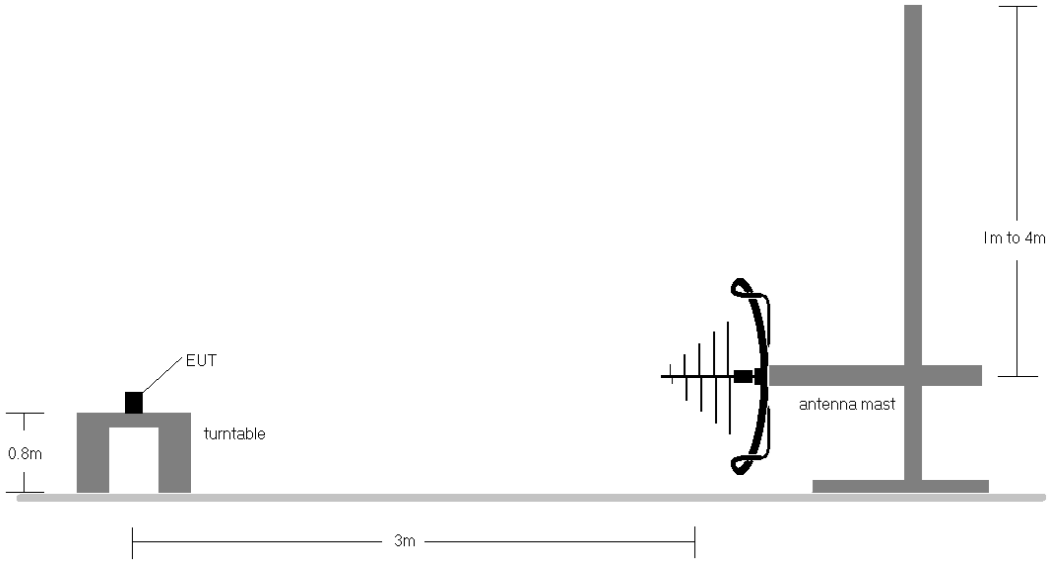


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

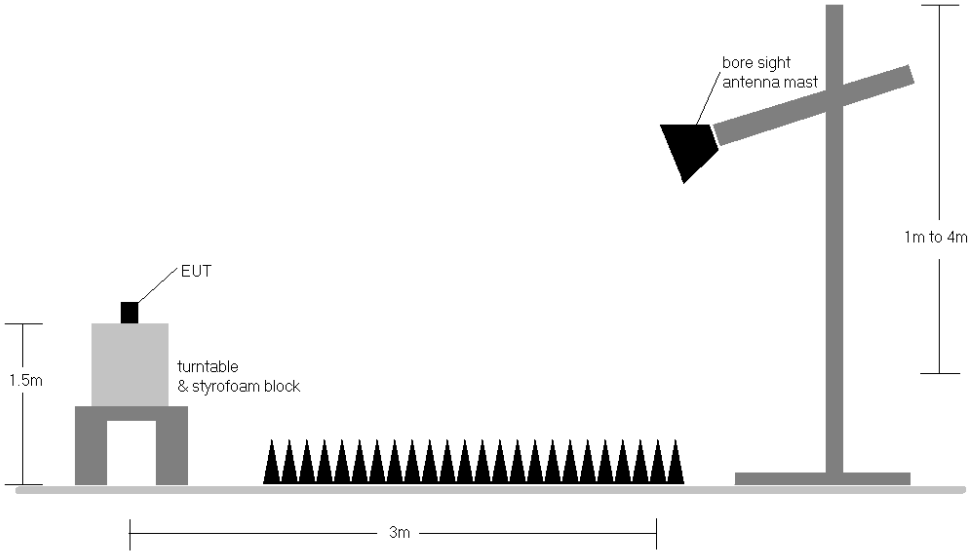


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

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.

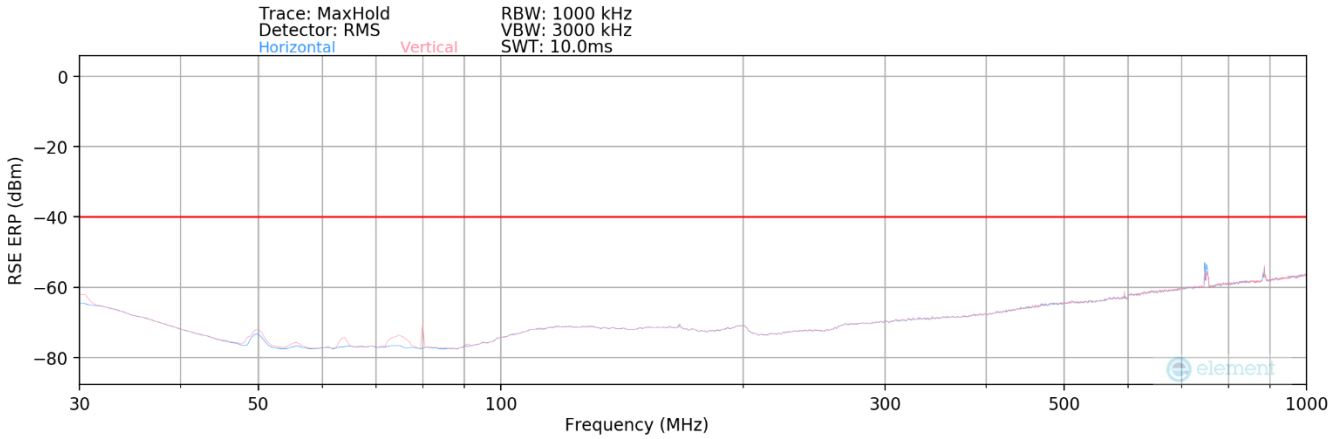
5) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

7) 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.

8) 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 48 – Ant 2

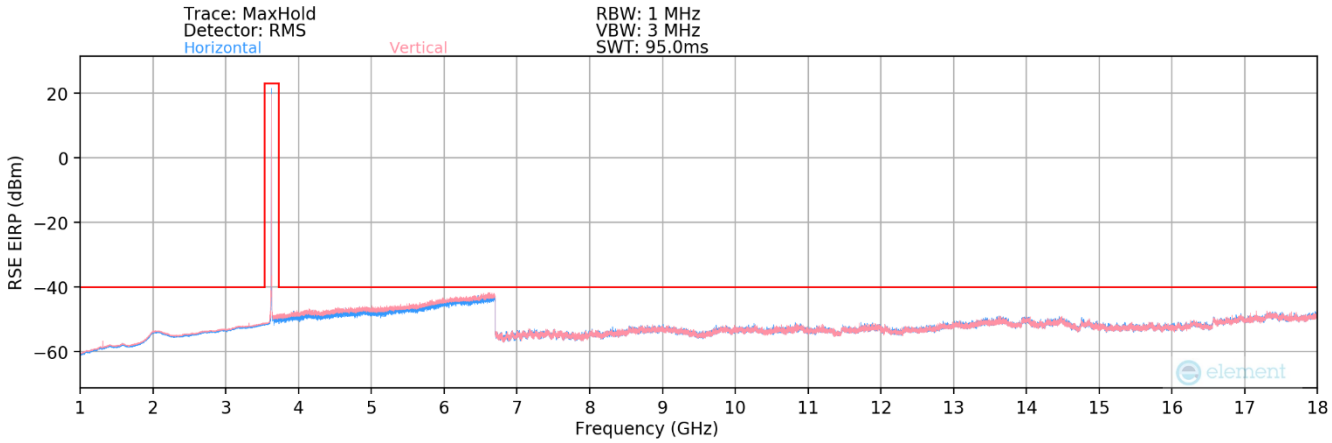


Plot 7-105. Radiated Spurious – Below 1GHz Plot (LTE Band 48)

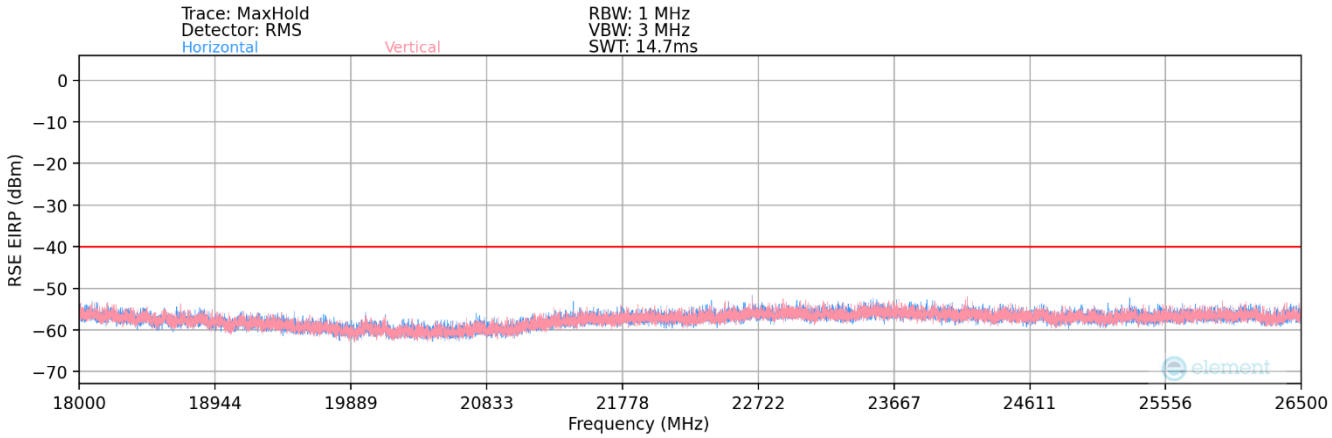
Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
752.56	H	172	46	-89.97	29.47	46.50	-50.91	-40.00	-10.91
885.84	H	398	44	-92.93	30.97	45.04	-52.37	-40.00	-12.37

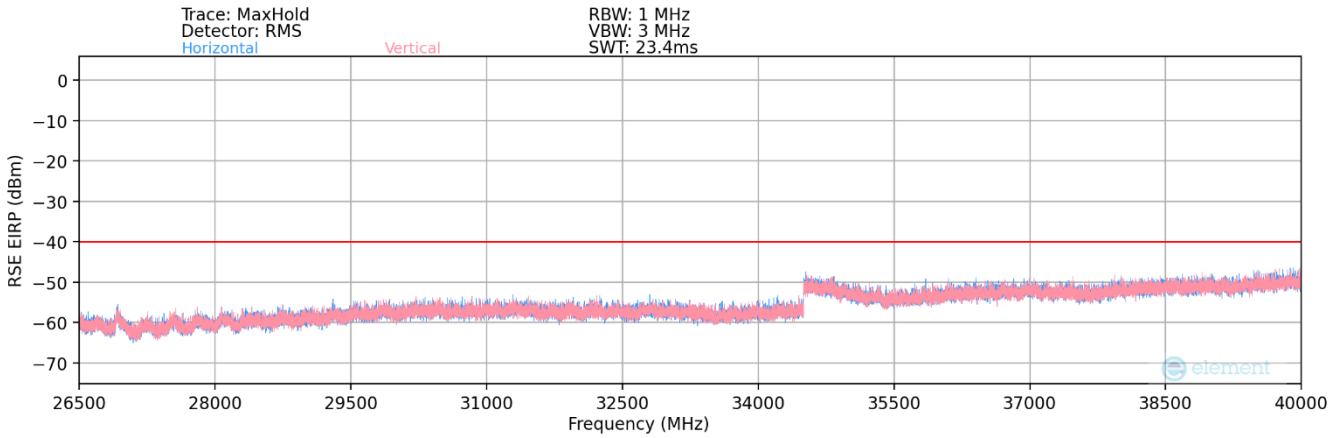
Table 7-37. Radiated Spurious Data (LTE Band 48 – Mid Channel)



Plot 7-106. Radiated Spurious Plot – 1GHz - 18GHz (LTE Band 48)



Plot 7-107. Radiated Spurious Plot – 18GHz - 26.5GHz (LTE Band 48)



Plot 7-108. Radiated Spurious Plot – 26GHz - 40GHz (LTE Band 48)

Bandwidth (MHz):	20
Frequency (MHz):	3560.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7120.00	H	-	-	-76.05	9.64	40.59	-54.67	-40.00	-14.67
10680.00	H	-	-	-78.71	13.17	41.46	-53.80	-40.00	-13.80
14240.00	H	-	-	-78.07	15.57	44.50	-50.76	-40.00	-10.76

Table 7-38. Radiated Spurious Data (LTE Band 48 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7250.00	H	-	-	-75.76	9.58	40.82	-54.43	-40.00	-14.43
10875.00	H	-	-	-77.92	12.84	41.92	-53.34	-40.00	-13.34
14500.00	H	-	-	-78.66	15.45	43.79	-51.47	-40.00	-11.47
18125.00	H	-	-	-55.66	1.31	52.65	-52.15	-40.00	-12.15

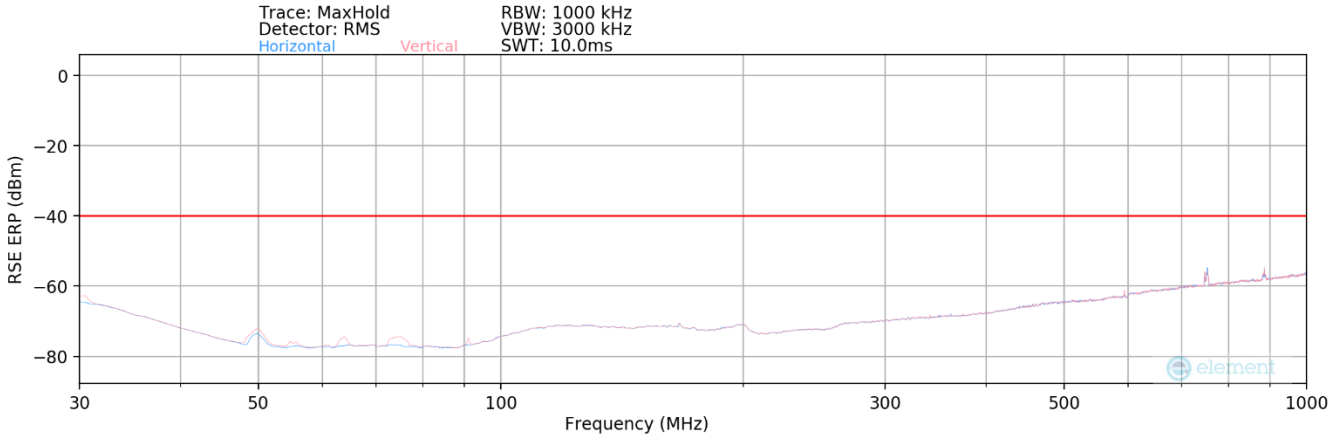
Table 7-39. Radiated Spurious Data (LTE Band 48 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3690.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7380.00	H	170	110	-75.65	10.03	41.38	-53.88	-40.00	-13.88
11070.00	H	-	-	-77.78	12.72	41.94	-53.32	-40.00	-13.32
14760.00	H	156	246	-77.68	15.33	44.65	-50.61	-40.00	-10.61
18450.00	H	150	200	-55.52	1.62	53.10	-51.70	-40.00	-11.70
22140.00	H	-	-	-57.10	3.56	53.47	-51.33	-40.00	-11.33
25830.00	H	-	-	-55.92	4.36	55.44	-49.36	-40.00	-9.36
29520.00	H	-	-	-56.31	5.62	56.30	-48.50	-40.00	-8.50

Table 7-40. Radiated Spurious Data (LTE Band 48 – High Channel)

ULCA LB48

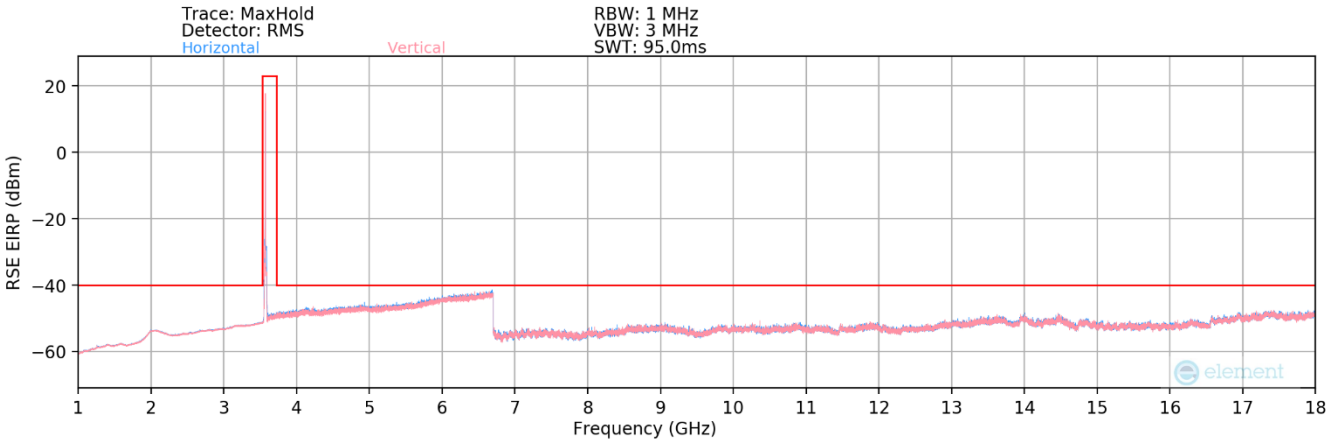


Plot 7-109. Radiated Spurious Plot – Below 1GHz (ULCA LB48 – Mid Channel)

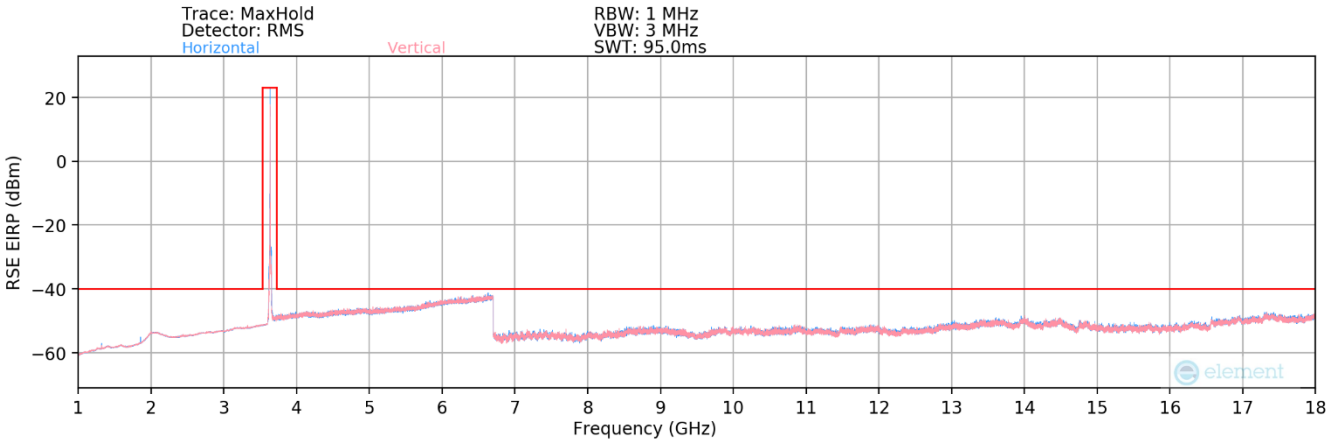
PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3625.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3644.8
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK

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]
747.35	H	165	34	-90.03	29.54	46.51	-50.89	-40.00	-10.89
885.60	H	176	224	-91.26	31.01	46.75	-50.66	-40.00	-10.66

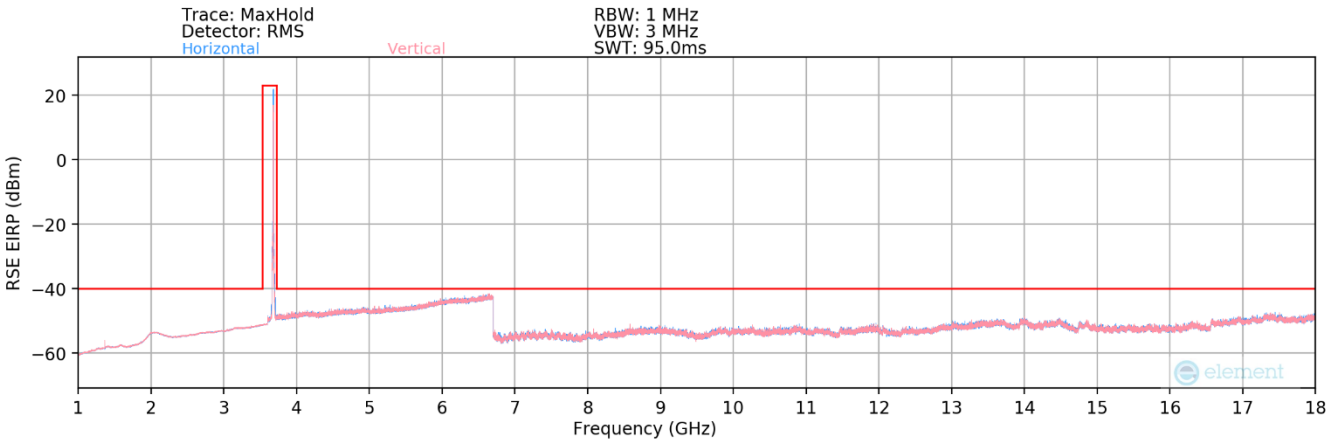
Table 7-41. Radiated Spurious Data (ULCA LB48 – Mid Channel)



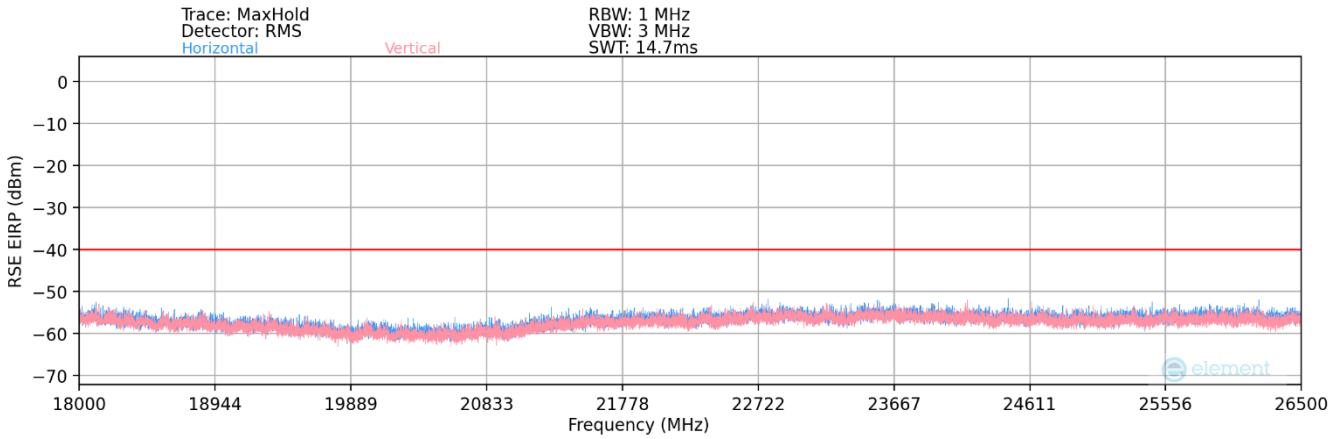
Plot 7-110. Radiated Spurious Plot – 1GHz - 18GHz (ULCA LB48 – Low Channel)



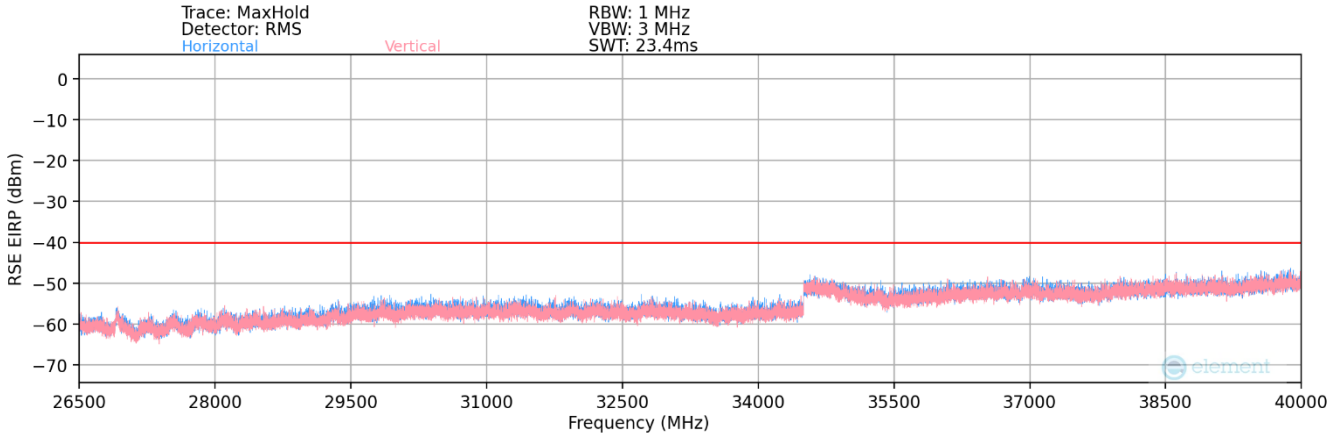
Plot 7-111. Radiated Spurious Plot – 1GHz - 18GHz (ULCA LB48 – Mid Channel)



Plot 7-112. Radiated Spurious Plot – 1GHz - 18GHz (ULCA LB48 – High Channel)



Plot 7-113. Radiated Spurious Plot – 18GHz - 26.5GHz (ULCA LB48 – Mid Channel)



Plot 7-114. Radiated Spurious Plot – 26GHz - 40GHz (ULCA LB48 – Mid Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3560.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3579.8
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK

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]
7120.00	H	-	-	-76.56	9.64	40.08	-55.18	-40.00	-15.18
10680.00	H	-	-	-78.94	13.17	41.23	-54.03	-40.00	-14.03
14240.00	H	-	-	-78.95	15.57	43.62	-51.64	-40.00	-11.64

Table 7-42. Radiated Spurious Data (ULCA LB48 – Low Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3625.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3644.8
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK

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]
7250.00	H	144	246	-74.48	9.58	42.10	-53.15	-40.00	-13.15
10875.00	H	181	136	-77.24	12.84	42.60	-52.66	-40.00	-12.66
14500.00	H	-	-	-78.44	15.45	44.01	-51.25	-40.00	-11.25
18125.00	H	-	-	-56.62	1.31	51.68	-53.12	-40.00	-13.12
21750.00	H	-	-	-56.41	3.68	54.28	-50.52	-40.00	-10.52

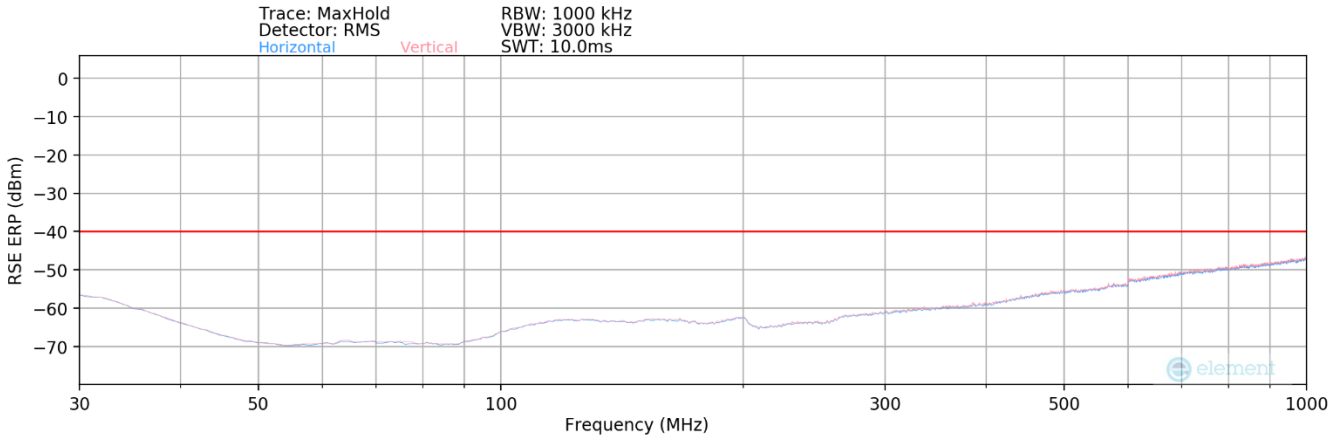
Table 7-43. Radiated Spurious Data (ULCA LB48 – Mid Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3690.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3670.2
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK

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]
7380.00	H	150	110	-73.42	10.03	43.61	-51.65	-40.00	-11.65
11070.00	H	219	135	-76.94	12.72	42.78	-52.48	-40.00	-12.48
14760.00	H	161	232	-78.66	15.33	43.67	-51.59	-40.00	-11.59
18450.00	H	-	-	-55.68	1.62	52.94	-51.86	-40.00	-11.86
22140.00	H	-	-	-57.09	3.56	53.47	-51.33	-40.00	-11.33
25830.00	H	-	-	-56.35	4.36	55.02	-49.78	-40.00	-9.78

Table 7-44. Radiated Spurious Data (ULCA LB48 – High Channel)

NR Band n48 - Ant 2

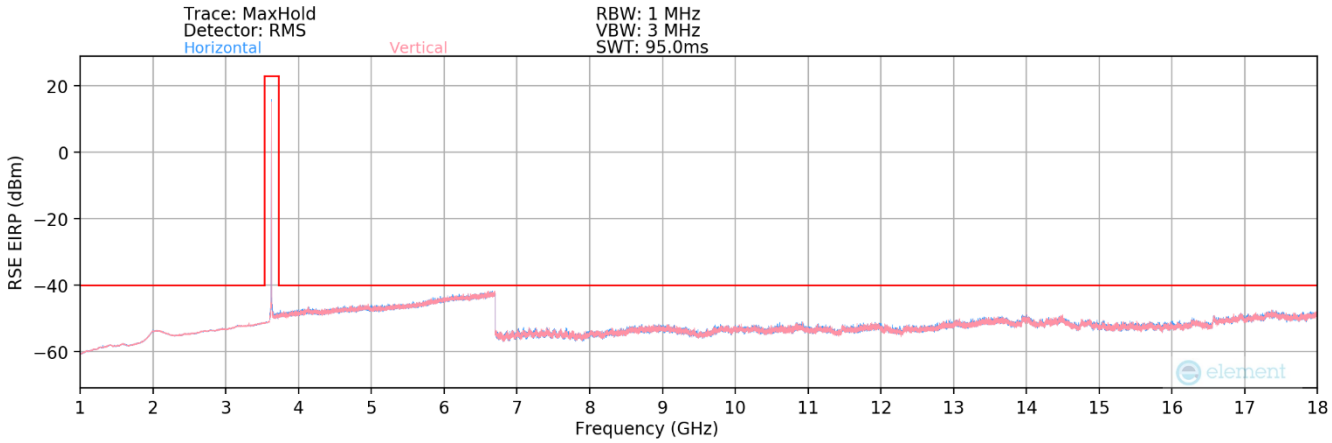


Plot 7-115. Radiated Spurious Plot (NR Band n48 – Below 1GHz)

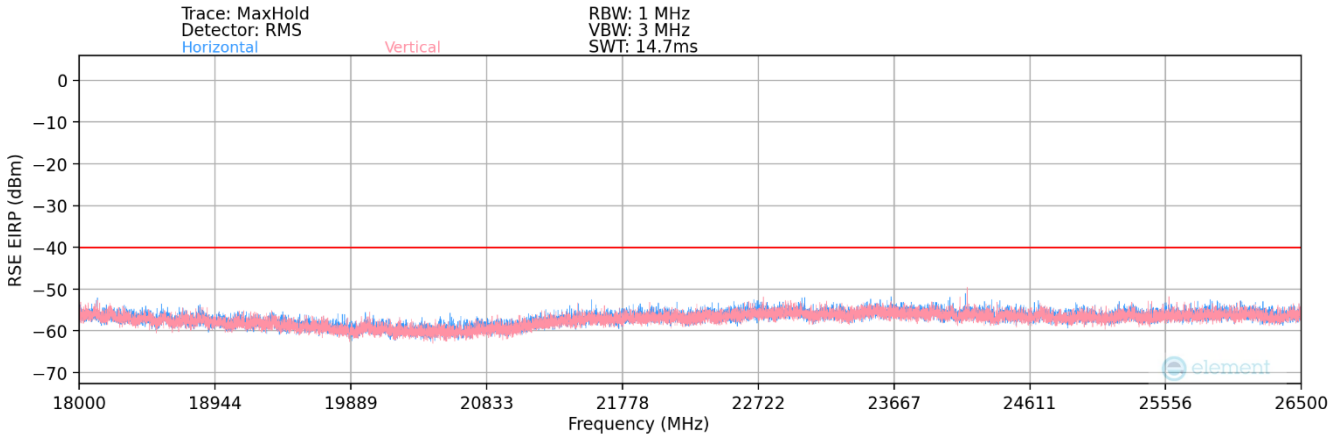
Bandwidth (MHz):	40
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 53

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]
676.99	H	-	-	-88.38	28.32	46.94	-50.47	-40.00	-10.47

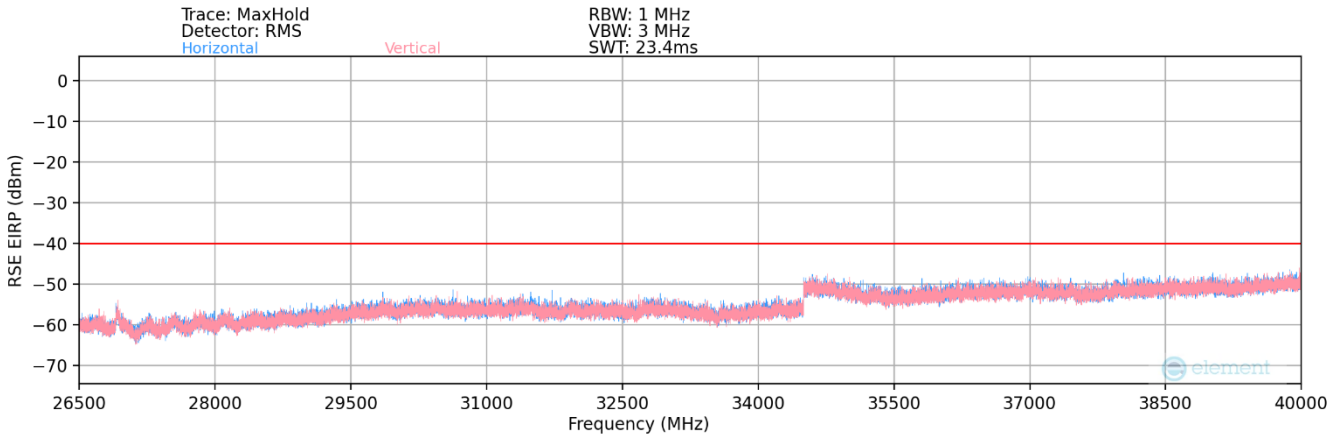
Table 7-45. Radiated Spurious Data (NR Band n48 – Mid Channel)



Plot 7-116. Radiated Spurious Plot (NR Band n48 – 1GHz - 18GHz)



Plot 7-117. Radiated Spurious Plot (NR Band n48 – 18GHz - 26.5GHz)



Plot 7-118. Radiated Spurious Plot (NR Band n48 – 26GHz - 40GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3570.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 53

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]
7140.00	H	-	-	-76.85	9.87	40.02	-55.24	-40.00	-15.24
10710.00	H	-	-	-78.36	13.13	41.77	-53.49	-40.00	-13.49
14280.00	H	-	-	-79.08	15.68	43.60	-51.65	-40.00	-11.65

Table 7-46. Radiated Spurious Data (NR Band n48 – Low Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 53

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]
7250.00	H	-	-	-76.09	9.58	40.49	-54.76	-40.00	-14.76
10875.00	H	-	-	-78.04	12.84	41.80	-53.46	-40.00	-13.46
14500.00	H	-	-	-78.60	15.45	43.85	-51.41	-40.00	-11.41

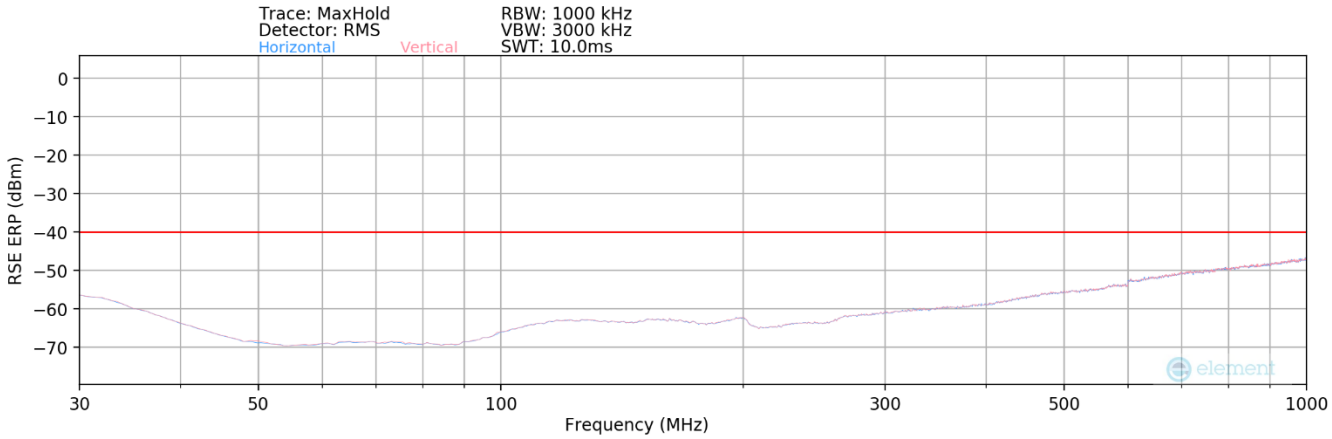
Table 7-47. Radiated Spurious Data (NR Band n48 – Mid Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3680.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 53

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]
7360.00	H	-	-	-76.60	9.95	40.35	-54.91	-40.00	-14.91
11040.00	H	-	-	-77.69	12.53	41.84	-53.42	-40.00	-13.42
14720.00	H	-	-	-79.52	15.05	42.53	-52.73	-40.00	-12.73

Table 7-48. Radiated Spurious Data (NR Band n48 – High Channel)

LTE Band 48 – Ant 3

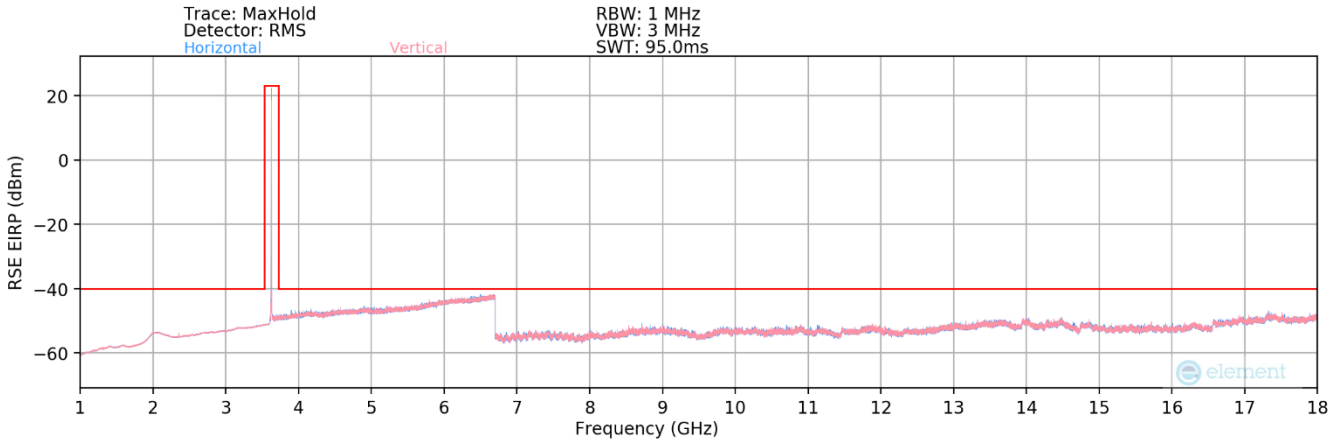


Plot 7-119. Radiated Spurious – Below 1GHz Plot (LTE Band 48)

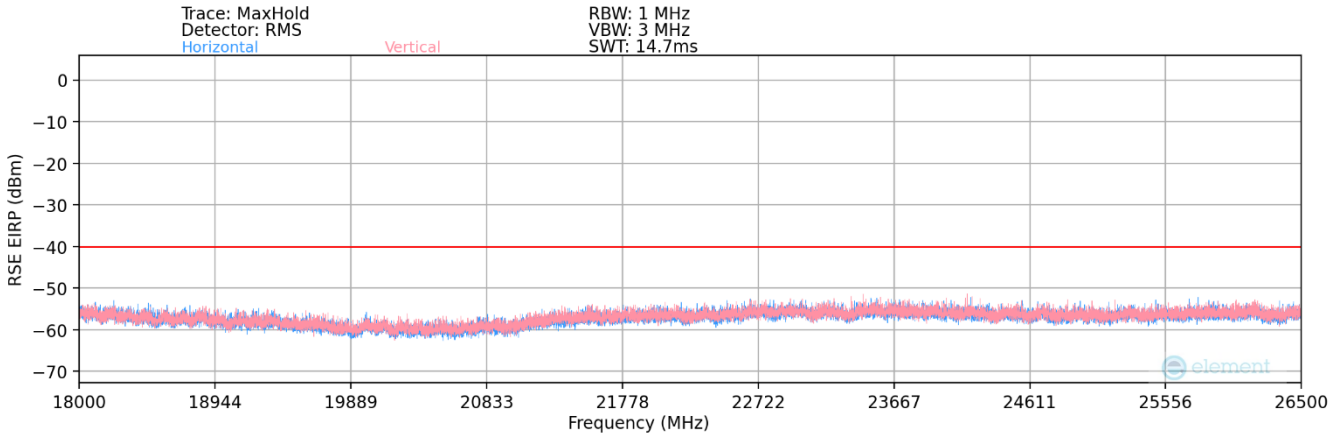
Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
36	V	-	-	-95.30	29.81	41.51	-55.90	-40.00	-15.90

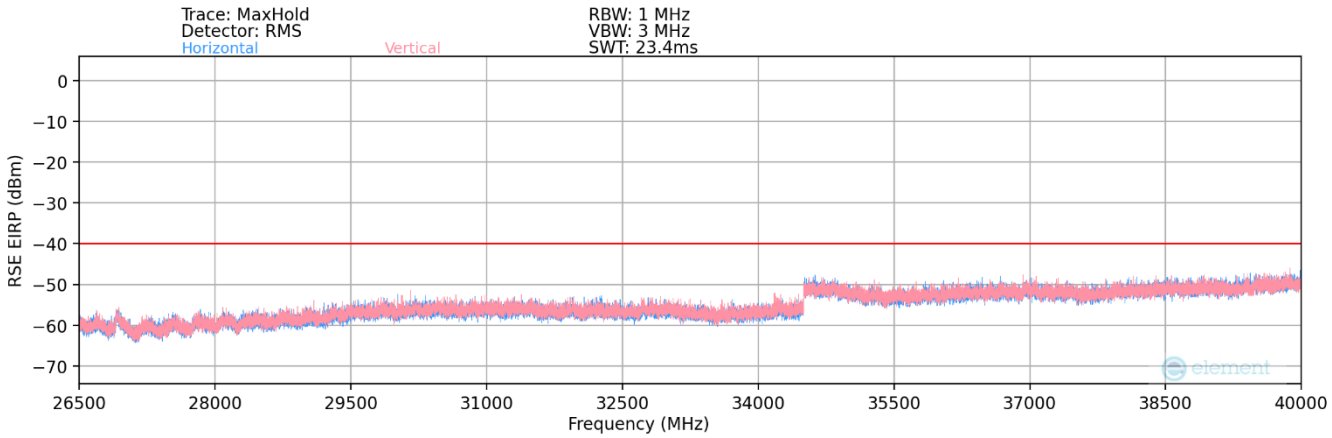
Table 7-49. Radiated Spurious Data (LTE Band 48 – Mid Channel)



Plot 7-120. Radiated Spurious Plot – 1GHz - 18GHz (LTE Band 48)



Plot 7-121. Radiated Spurious Plot – 18GHz - 26.5GHz (LTE Band 48)



Plot 7-122. Radiated Spurious Plot – 26GHz - 40GHz (LTE Band 48)

Bandwidth (MHz):	20
Frequency (MHz):	3560.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
00	V	-	-	-76.91	9.64	39.73	-55.53	-40.00	-15.53
.00	V	-	-	-79.51	13.17	40.66	-54.60	-40.00	-14.60
.00	V	-	-	-79.16	15.57	43.41	-51.85	-40.00	-11.85

Table 7-50. Radiated Spurious Data (LTE Band 48 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
00	V	-	-	-77.04	9.58	39.54	-55.71	-40.00	-15.71
.00	V	-	-	-78.31	12.84	41.53	-53.73	-40.00	-13.73
.00	V	-	-	-79.07	15.45	43.38	-51.88	-40.00	-11.88

Table 7-51. Radiated Spurious Data (LTE Band 48 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3690.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
00	V	-	-	-77.24	10.03	39.79	-55.47	-40.00	-15.47
.00	V	-	-	-78.17	12.72	41.55	-53.71	-40.00	-13.71
.00	V	-	-	-79.89	15.33	42.44	-52.82	-40.00	-12.82

Table 7-52. Radiated Spurious Data (LTE Band 48 – High Channel)