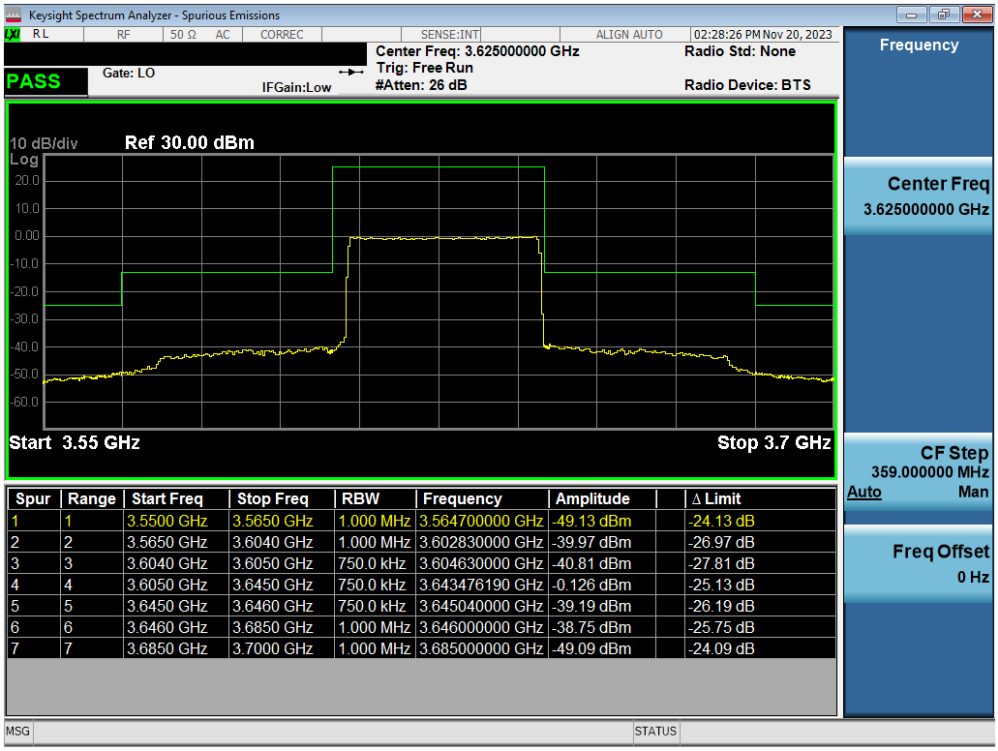
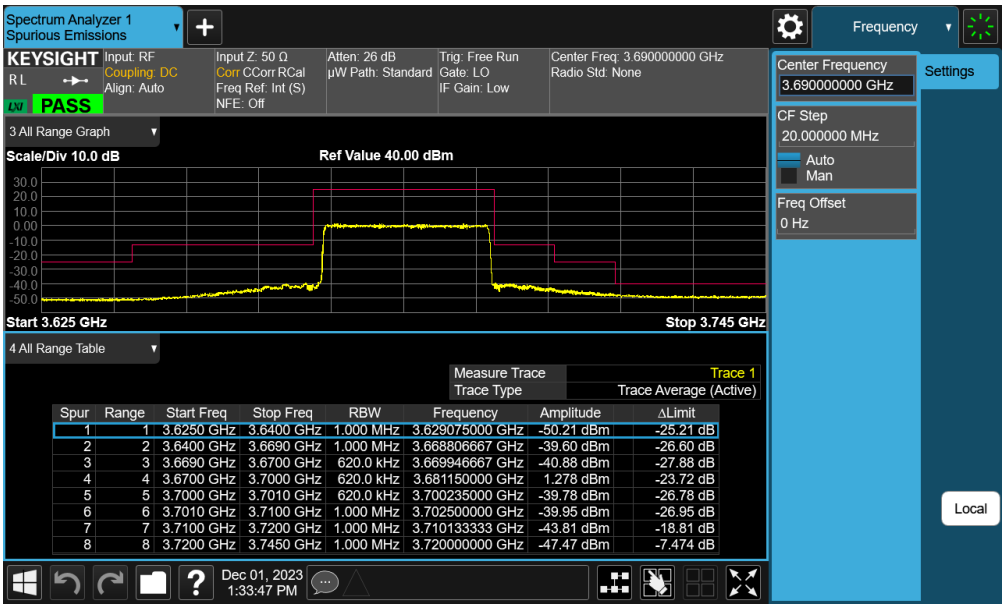


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5500 GHz	3.5650 GHz	1.000 MHz	3.564700000 GHz	-49.13 dBm	-24.13 dB
2	2	3.5650 GHz	3.6040 GHz	1.000 MHz	3.602830000 GHz	-39.97 dBm	-26.97 dB
3	3	3.6040 GHz	3.6050 GHz	750.0 kHz	3.604630000 GHz	-40.81 dBm	-27.81 dB
4	4	3.6050 GHz	3.6450 GHz	750.0 kHz	3.643476190 GHz	-0.126 dBm	-25.13 dB
5	5	3.6450 GHz	3.6460 GHz	750.0 kHz	3.645040000 GHz	-39.19 dBm	-26.19 dB
6	6	3.6460 GHz	3.6850 GHz	1.000 MHz	3.646000000 GHz	-38.75 dBm	-25.75 dB
7	7	3.6850 GHz	3.7000 GHz	1.000 MHz	3.685000000 GHz	-49.09 dBm	-24.09 dB

Plot 7-64. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



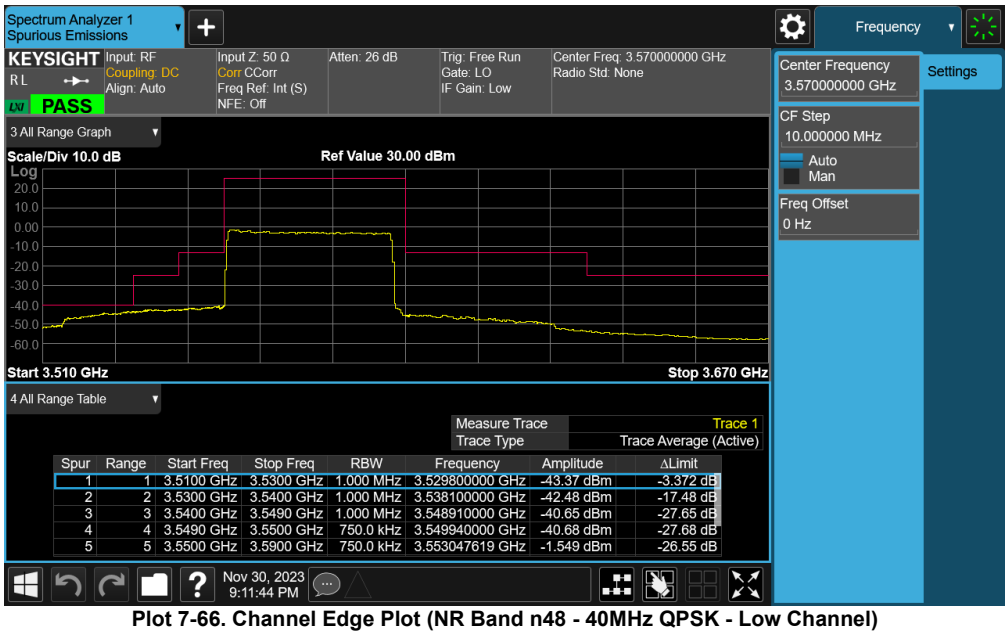
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.6250 GHz	3.6400 GHz	1.000 MHz	3.629075000 GHz	-50.21 dBm	-25.21 dB
2	2	3.6400 GHz	3.6690 GHz	1.000 MHz	3.668806667 GHz	-39.60 dBm	-26.60 dB
3	3	3.6690 GHz	3.6700 GHz	620.0 kHz	3.669946667 GHz	-40.88 dBm	-27.88 dB
4	4	3.6700 GHz	3.7000 GHz	620.0 kHz	3.681150000 GHz	1.278 dBm	-23.72 dB
5	5	3.7000 GHz	3.7010 GHz	620.0 kHz	3.700235000 GHz	-39.78 dBm	-26.78 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.702500000 GHz	-39.95 dBm	-26.95 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710133333 GHz	-43.81 dBm	-18.81 dB
8	8	3.7200 GHz	3.7450 GHz	1.000 MHz	3.720000000 GHz	-47.47 dBm	-7.474 dB

Plot 7-65. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

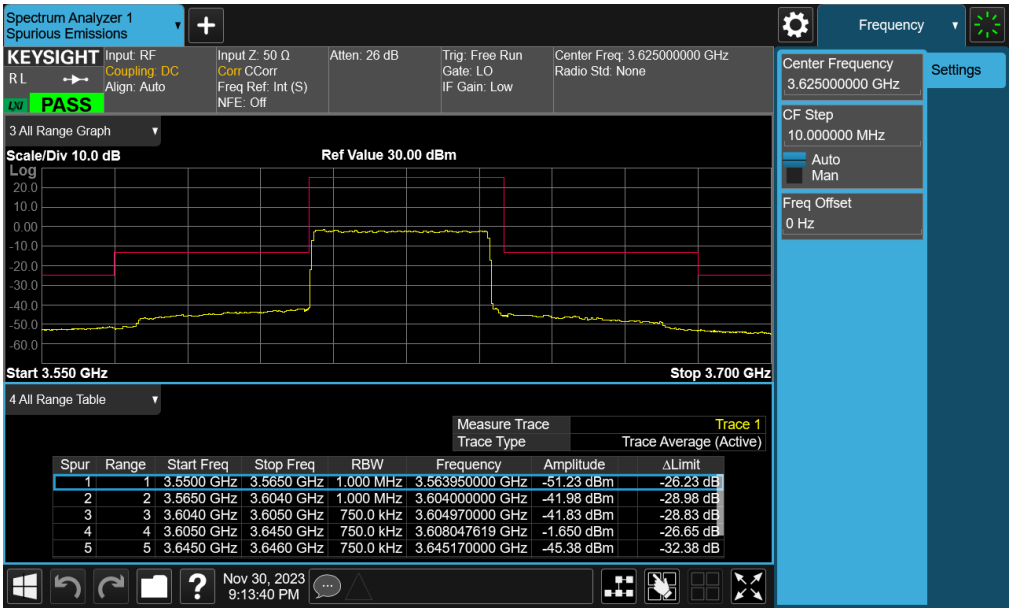
NR Band n48 ANT B

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n48	40MHz	Low	Band Edge	-43.3717	-40	-3.37
		Mid	Band Edge	-51.2326	-25	-26.23
		High	Band Edge	-47.3765	-40	-7.38

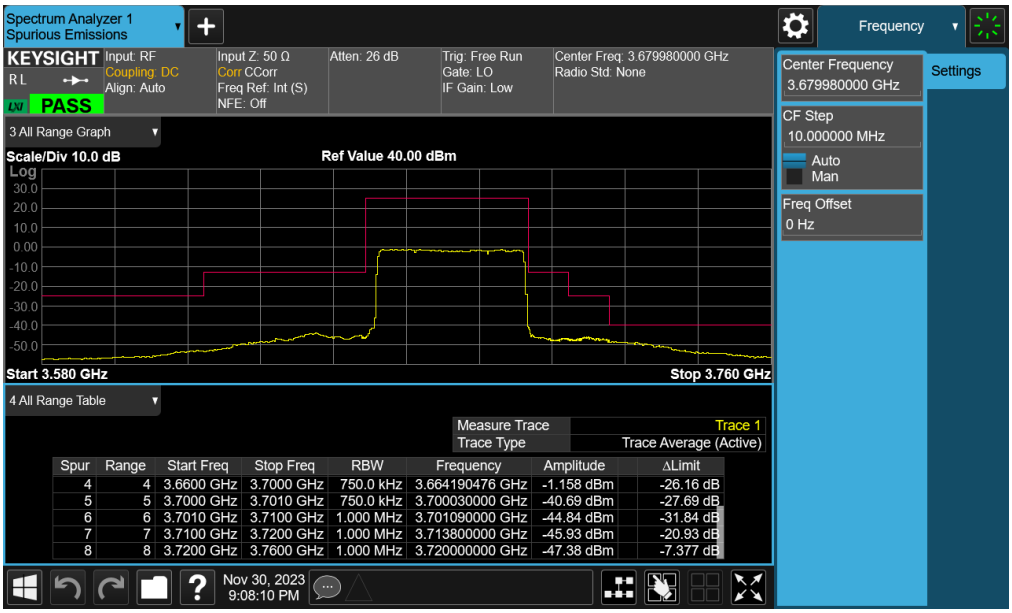
Table 7-20. Band Edge Emissions Test Result (NR Band n48)



Plot 7-66. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



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

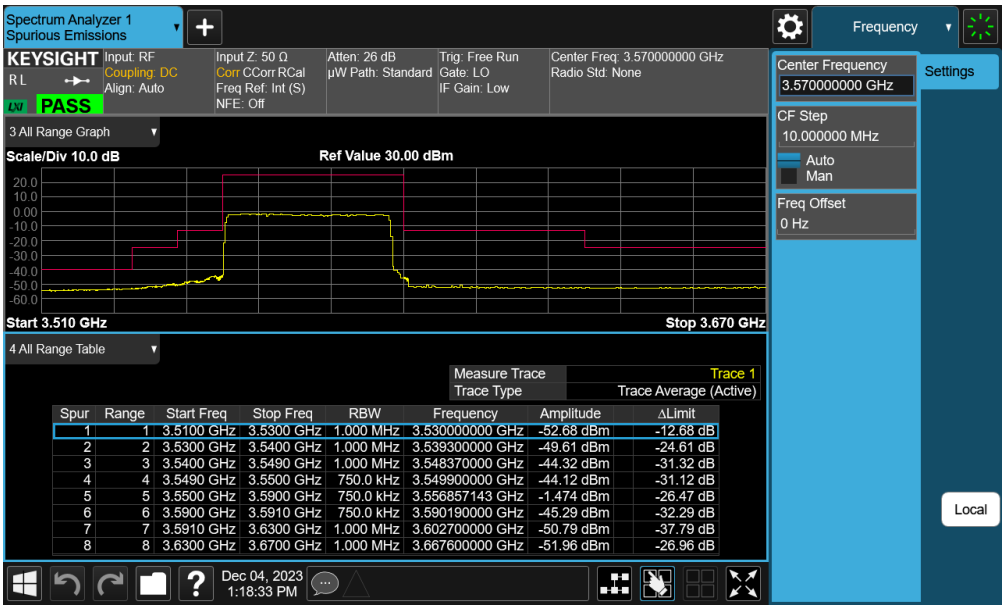


Plot 7-68. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

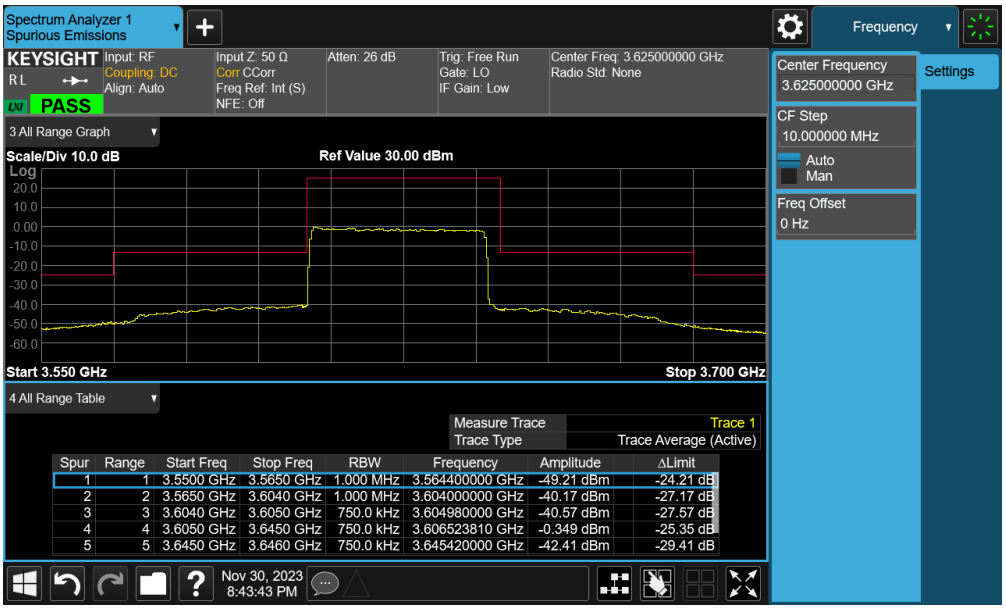
NR Band n48 ANT K

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n48	40MHz	Low	Band Edge	-52.68	-40	-12.68
		Mid	Band Edge	-49.21	-25	-24.21
		High	Band Edge	-45.58	-40	-5.58

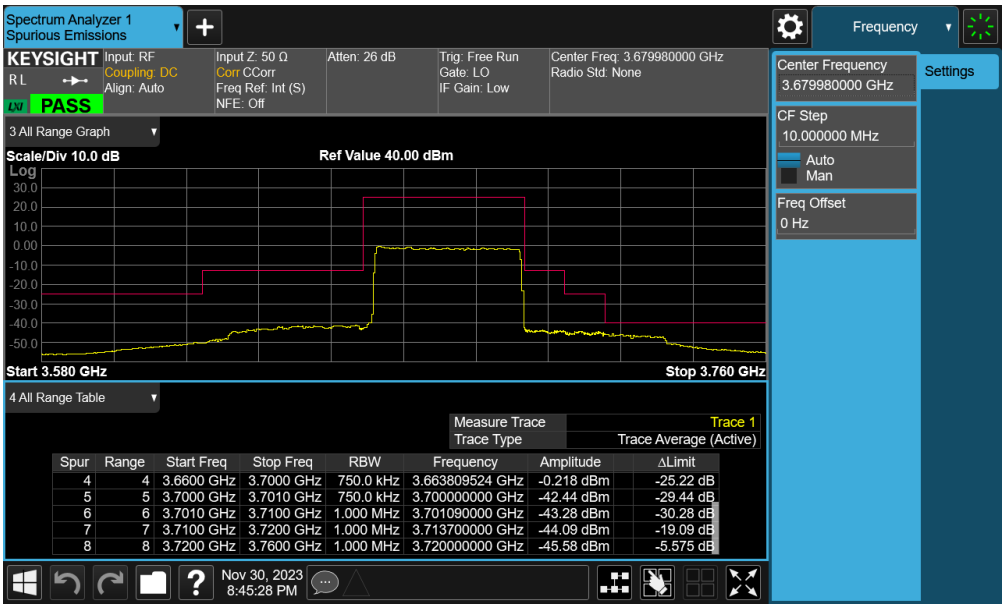
Table 7-21. Band Edge Emissions Test Result (NR Band n48)



Plot 7-69. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-70. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)

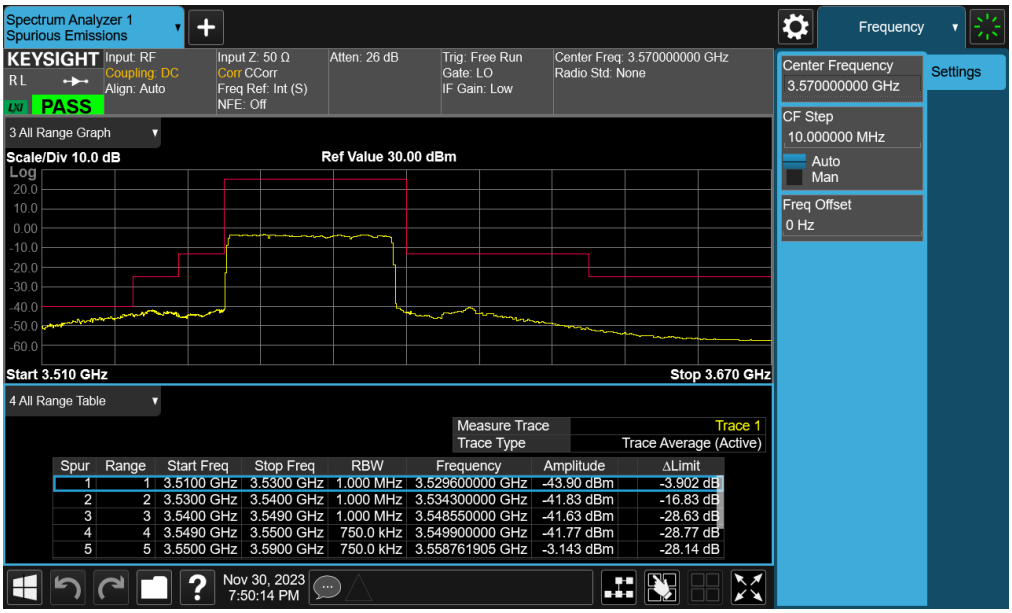


Plot 7-71. Channel Edge Plot (NR Band n48 - 40MHz QPSK - High Channel)

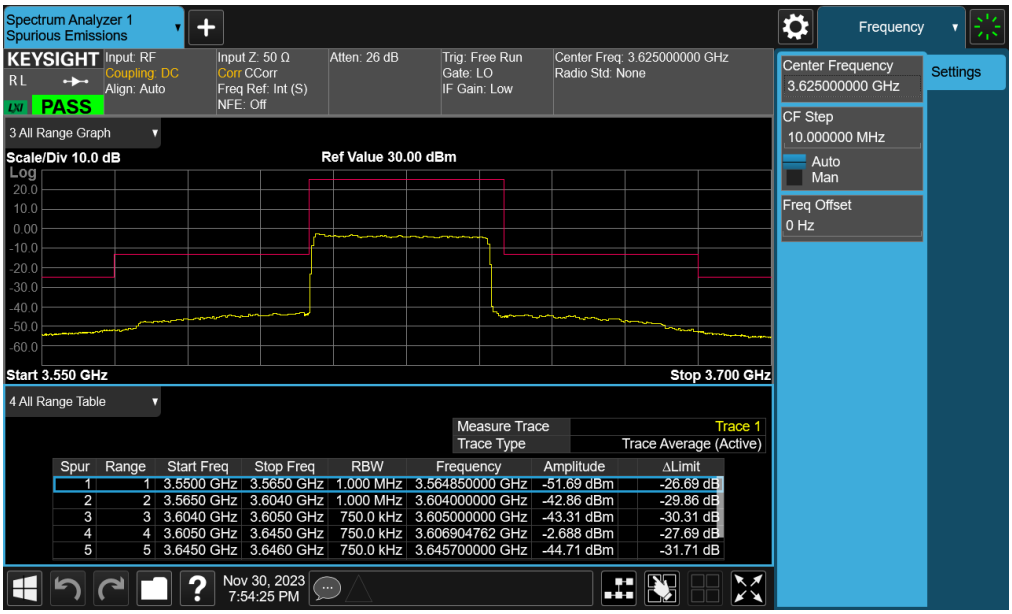
NR Band n48 ANT L

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n48	40MHz	Low	Band Edge	-43.9023	-40	-3.90
		Mid	Band Edge	-51.6869	-25	-26.69
		High	Band Edge	-47.0753	-40	-7.08

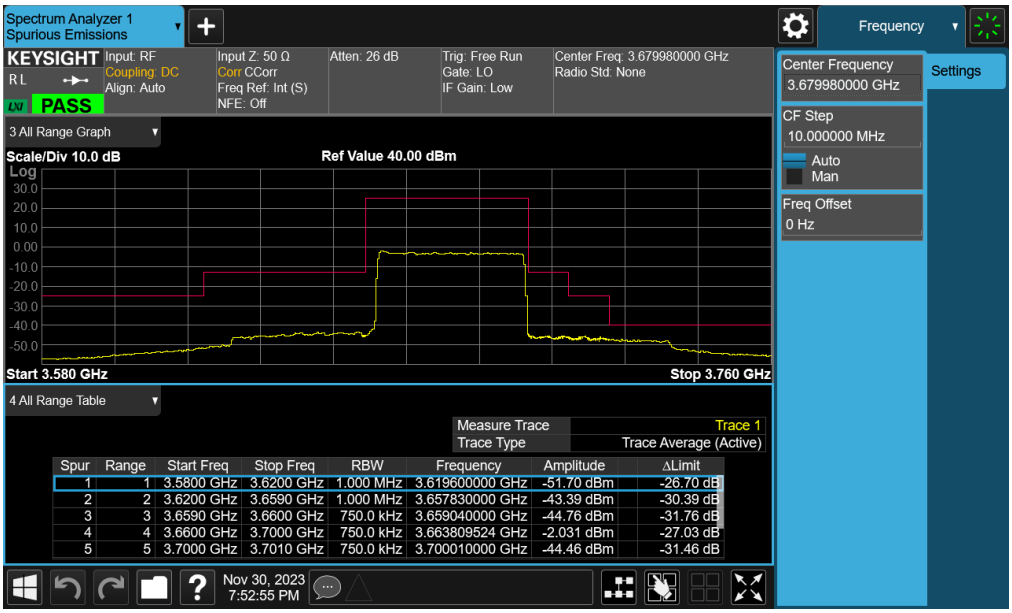
Table 7-22. Band Edge Emissions Test Result (NR Band n48)



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



Plot 7-73. Channel Edge Plot (NR Band n48 - 40MHz QPSK - Mid Channel)



Plot 7-74. 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.

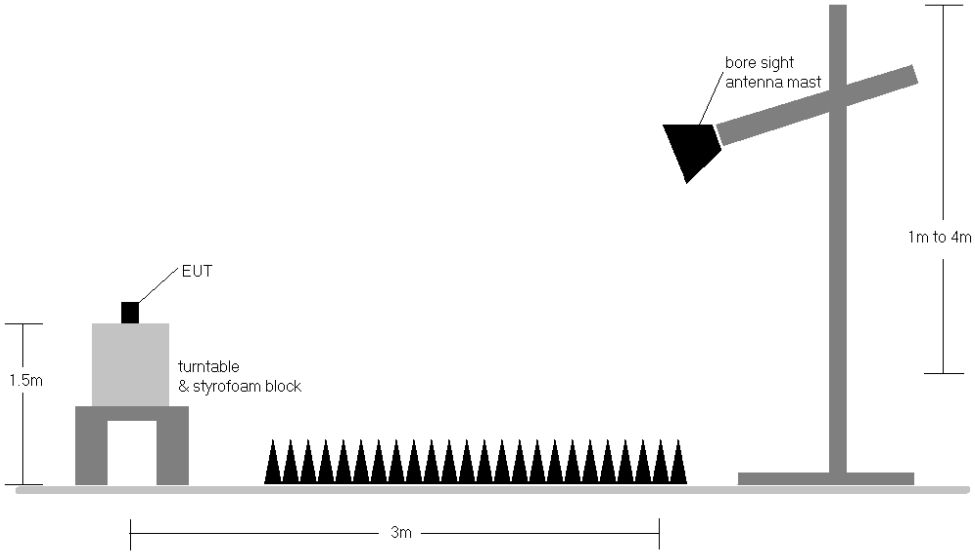


Figure 7-5. Radiated Test Setup >1GHz

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/NR 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) and NR Band n48 (i.e. 10, 15, 20, 30, 40MHz).

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	127	301	6.51	14.29	20.80	0.120	23.00	-2.20
		20	3625.0	1 / 99	20	3644.8	1 / 0	H	127	299	6.70	12.59	19.29	0.085	23.00	-3.71
		20	3690.0	1 / 0	20	3670.2	1 / 99	H	120	299	6.86	12.09	18.95	0.078	23.00	-4.05
	16-QAM	20	3560.0	1 / 99	20	3579.8	1 / 0	H	127	301	6.51	14.57	21.08	0.128	23.00	-1.92
35 MHz	QPSK	20	3557.5	1 / 99	15	3577.1	1 / 0	H	127	301	6.51	14.32	21.06	0.128	23.00	-1.94
		20	3625.0	1 / 99	15	3642.1	1 / 0	H	127	299	6.70	12.57	19.27	0.085	23.00	-3.73
		20	3692.5	1 / 0	15	3672.9	1 / 74	H	120	299	6.86	12.07	19.13	0.082	23.00	-3.87
	16-QAM	20	3625.0	1 / 99	15	3642.1	1 / 0	H	127	299	6.70	13.03	19.81	0.096	23.00	-3.19
30 MHz	QPSK	20	3555.0	1 / 99	10	3574.4	1 / 0	H	127	301	6.50	14.32	20.91	0.123	23.00	-2.09
		20	3625.0	1 / 99	10	3639.4	1 / 0	H	127	299	6.70	12.62	19.32	0.085	23.00	-3.68
		20	3695.0	1 / 0	10	3678.3	1 / 49	H	120	299	6.86	11.97	19.13	0.082	23.00	-3.87
	16-QAM	20	3555.0	1 / 99	10	3574.4	1 / 0	H	127	301	6.50	14.57	21.03	0.127	23.00	-1.97
25 MHz	QPSK	20	3552.5	1 / 99	5	3571.7	1 / 0	H	127	301	6.50	14.32	20.88	0.123	23.00	-2.12
		20	3625.0	1 / 99	5	3636.7	1 / 0	H	127	299	6.70	12.53	19.20	0.083	23.00	-3.80
		20	3697.5	1 / 0	5	3678.3	1 / 24	H	120	299	6.87	12.10	18.97	0.079	23.00	-4.03
	16-QAM	20	3697.5	1 / 0	5	3678.3	1 / 24	H	120	299	6.87	12.05	19.02	0.080	23.00	-3.98

Table 7-23. EIRP Data (LTE ULCA Band 48)

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	129	303	6.51	1 / 0	13.97	20.48	0.112	23.00	-2.52
	QPSK	3625.00	H	126	301	6.70	1 / 99	14.09	**20.79**	**0.120**	23.00	-2.21
	QPSK	3690.00	H	141	299	6.86	1 / 50	13.85	20.71	0.118	23.00	-2.29
	16-QAM	3560.00	H	129	303	6.51	1 / 0	13.03	19.54	0.090	23.00	-3.46
	16-QAM	3625.00	H	126	301	6.70	1 / 99	13.25	19.95	0.099	23.00	-3.05
	16-QAM	3690.00	H	141	299	6.86	1 / 50	12.85	19.71	0.093	23.00	-3.29
15 MHz	QPSK	3557.50	H	129	303	6.51	1 / 19	14.01	20.51	0.113	23.00	-2.49
	QPSK	3625.00	H	126	301	6.70	1 / 19	14.18	**20.88**	**0.122**	23.00	-2.12
	QPSK	3692.50	H	141	299	6.86	1 / 19	14.00	20.86	0.122	23.00	-2.14
	16-QAM	3557.50	H	129	303	6.51	1 / 19	12.98	19.48	0.089	23.00	-3.52
	16-QAM	3625.00	H	126	301	6.70	1 / 36	13.27	19.97	0.099	23.00	-3.03
	16-QAM	3692.50	H	141	299	6.86	1 / 36	12.85	19.71	0.093	23.00	-3.29
10 MHz	QPSK	3555.00	H	129	303	6.50	1 / 22	13.83	20.33	0.108	23.00	-2.67
	QPSK	3625.00	H	126	301	6.70	1 / 22	14.12	**20.82**	**0.121**	23.00	-2.18
	QPSK	3695.00	H	141	299	6.86	1 / 22	13.77	20.64	0.116	23.00	-2.36
	16-QAM	3555.00	H	129	303	6.50	1 / 1	12.90	19.40	0.087	23.00	-3.60
	16-QAM	3625.00	H	126	301	6.70	1 / 22	13.37	20.07	0.102	23.00	-2.93
	16-QAM	3695.00	H	141	299	6.86	1 / 22	12.77	19.64	0.092	23.00	-3.36
5 MHz	QPSK	3552.50	H	129	303	6.50	1 / 5	14.01	20.50	0.112	23.00	-2.50
	QPSK	3625.00	H	126	301	6.70	1 / 5	14.22	**20.92**	**0.124**	23.00	-2.08
	QPSK	3697.50	H	141	299	6.87	1 / 5	13.99	20.86	0.122	23.00	-2.14
	16-QAM	3552.50	H	129	303	6.50	1 / 1	12.79	19.28	0.085	23.00	-3.72
	16-QAM	3625.00	H	126	301	6.70	1 / 9	13.47	20.17	0.104	23.00	-2.83
	16-QAM	3697.50	H	141	299	6.87	1 / 1	13.43	20.30	0.107	23.00	-2.70

Table 7-24. EIRP Data (LTE Band 48)

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	124	307	6.53	1 / 53	13.61	20.14	0.103	23.00	-2.86
	π/2 BPSK	3625.00	H	124	303	6.70	1 / 53	13.61	20.31	0.107	23.00	-2.69
	π/2 BPSK	3680.00	H	121	305	6.84	1 / 104	13.08	19.92	0.098	23.00	-3.08
	QPSK	3570.00	H	124	307	6.53	1 / 53	13.59	20.12	0.103	23.00	-2.88
	QPSK	3625.00	H	124	303	6.70	1 / 53	13.64	**20.34**	**0.108**	23.00	-2.66
	QPSK	3680.00	H	121	305	6.84	1 / 104	13.00	19.84	0.096	23.00	-3.16
	16-QAM	3570.00	H	124	307	6.53	1 / 53	11.85	18.38	0.069	23.00	-4.62
	16-QAM	3625.00	H	124	303	6.70	1 / 53	11.71	18.41	0.069	23.00	-4.59
	16-QAM	3680.00	H	121	305	6.84	1 / 104	11.12	17.96	0.063	23.00	-5.04
30 MHz	π/2 BPSK	3565.00	H	124	307	6.52	1 / 39	13.53	20.05	0.101	23.00	-2.95
	π/2 BPSK	3625.00	H	124	303	6.70	1 / 39	13.60	20.30	0.107	23.00	-2.70
	π/2 BPSK	3685.00	H	121	305	6.85	1 / 39	13.10	19.95	0.099	23.00	-3.05
	QPSK	3565.00	H	124	307	6.52	1 / 39	13.54	20.06	0.101	23.00	-2.94
	QPSK	3625.00	H	124	303	6.70	1 / 39	13.63	20.33	**0.108**	23.00	-2.67
	QPSK	3685.00	H	121	305	6.85	1 / 39	13.07	19.92	0.098	23.00	-3.08
	16-QAM	3565.00	H	124	307	6.52	1 / 39	11.58	18.10	0.065	23.00	-4.90
	16-QAM	3625.00	H	124	303	6.70	1 / 39	11.67	18.37	0.069	23.00	-4.63
	16-QAM	3685.00	H	121	305	6.85	1 / 39	11.10	17.95	0.062	23.00	-5.05
20 MHz	π/2 BPSK	3560.00	H	124	307	6.51	1 / 25	13.52	20.03	0.101	23.00	-2.97
	π/2 BPSK	3625.00	H	124	303	6.70	1 / 25	13.43	20.13	0.103	23.00	-2.87
	π/2 BPSK	3690.00	H	121	305	6.86	1 / 25	13.12	19.97	0.099	23.00	-3.03
	QPSK	3560.00	H	124	307	6.51	1 / 25	13.59	20.10	0.102	23.00	-2.90
	QPSK	3625.00	H	124	303	6.70	1 / 25	13.59	20.29	**0.107**	23.00	-2.71
	QPSK	3690.00	H	121	305	6.86	1 / 25	12.96	19.81	0.096	23.00	-3.19
	16-QAM	3560.00	H	124	307	6.51	1 / 25	11.60	18.11	0.065	23.00	-4.89
	16-QAM	3625.00	H	124	303	6.70	1 / 25	11.65	18.35	0.068	23.00	-4.65
	16-QAM	3690.00	H	121	305	6.86	1 / 25	11.07	17.92	0.062	23.00	-5.08
15 MHz	π/2 BPSK	3557.50	H	124	307	6.51	1 / 19	13.43	19.93	0.098	23.00	-3.07
	π/2 BPSK	3625.00	H	124	303	6.70	1 / 19	13.55	20.25	0.106	23.00	-2.75
	π/2 BPSK	3692.50	H	121	305	6.86	1 / 19	13.09	19.95	0.099	23.00	-3.05
	QPSK	3557.50	H	124	307	6.51	1 / 19	13.54	20.04	0.101	23.00	-2.96
	QPSK	3625.00	H	124	303	6.70	1 / 19	13.59	20.29	**0.107**	23.00	-2.71
	QPSK	3692.50	H	121	305	6.86	1 / 19	12.98	19.84	0.096	23.00	-3.16
	16-QAM	3557.50	H	124	307	6.51	1 / 19	11.66	18.16	0.066	23.00	-4.84
	16-QAM	3625.00	H	124	303	6.70	1 / 19	11.67	18.37	0.069	23.00	-4.63
	16-QAM	3692.50	H	121	305	6.86	1 / 19	11.10	17.96	0.063	23.00	-5.04
10 MHz	π/2 BPSK	3555.00	H	124	307	6.50	1 / 12	13.44	19.94	0.099	23.00	-3.06
	π/2 BPSK	3625.00	H	124	303	6.70	1 / 12	13.57	20.27	0.106	23.00	-2.73
	π/2 BPSK	3695.00	H	121	305	6.86	1 / 12	13.18	20.04	0.101	23.00	-2.96
	QPSK	3555.00	H	124	307	6.50	1 / 12	13.48	19.98	0.100	23.00	-3.02
	QPSK	3625.00	H	124	303	6.70	1 / 12	13.64	**20.34**	**0.108**	23.00	-2.66
	QPSK	3695.00	H	121	305	6.86	1 / 12	13.04	19.90	0.098	23.00	-3.10
	16-QAM	3555.00	H	124	307	6.50	1 / 12	11.59	18.09	0.064	23.00	-4.91
	16-QAM	3625.00	H	124	303	6.70	1 / 12	11.60	18.30	0.068	23.00	-4.70
	16-QAM	3695.00	H	121	305	6.86	1 / 12	11.13	17.99	0.063	23.00	-5.01

Table 7-25. EIRP Data (NR Band n48) – ANT G

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	165	335	6.53	1 / 53	1.75	8.28	0.007	23.00	-14.72
	π/2 BPSK	3625.00	H	152	337	6.70	1 / 53	4.13	**10.83**	**0.012**	23.00	-12.17
	π/2 BPSK	3680.00	H	156	346	6.84	1 / 104	3.62	10.46	0.011	23.00	-12.54
	QPSK	3570.00	H	165	335	6.53	1 / 53	1.83	8.36	0.007	23.00	-14.64
	QPSK	3625.00	H	152	337	6.70	1 / 53	4.03	10.73	0.012	23.00	-12.27
	QPSK	3680.00	H	156	346	6.84	1 / 104	3.64	10.48	0.011	23.00	-12.52
	16-QAM	3570.00	H	165	335	6.53	1 / 53	-0.18	6.35	0.004	23.00	-16.65
	16-QAM	3625.00	H	152	337	6.70	1 / 53	2.10	8.80	0.008	23.00	-14.20
	16-QAM	3680.00	H	156	346	6.84	1 / 104	1.75	8.59	0.007	23.00	-14.41

Table 7-26. EIRP Data (NR Band n48) – ANT B

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	124	301	6.53	1 / 1	1.52	8.05	0.006	23.00	-14.95
	π/2 BPSK	3625.00	H	123	313	6.70	1 / 104	1.01	7.71	0.006	23.00	-15.29
	π/2 BPSK	3680.00	H	129	304	6.84	1 / 104	4.61	11.45	**0.014**	23.00	-11.55
	QPSK	3570.00	H	124	301	6.53	1 / 1	1.50	8.03	0.006	23.00	-14.97
	QPSK	3625.00	H	123	313	6.70	1 / 104	1.05	7.75	0.006	23.00	-15.25
	QPSK	3680.00	H	129	304	6.84	1 / 104	4.58	11.42	0.014	23.00	-11.58
	16-QAM	3570.00	H	124	301	6.53	1 / 1	-0.73	5.80	0.004	23.00	-17.20
	16-QAM	3625.00	H	123	313	6.70	1 / 104	-0.93	5.77	0.004	23.00	-17.23
	16-QAM	3680.00	H	129	304	6.84	1 / 104	2.59	9.43	0.009	23.00	-13.57

Table 7-27. EIRP Data (NR Band n48) – ANT K

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	204	340	6.60	1 / 53	1.30	**7.90**	**0.006**	23.00	-15.10
	π/2 BPSK	3625.00	V	201	343	6.68	1 / 53	-0.01	6.67	0.005	23.00	-16.33
	π/2 BPSK	3680.00	V	204	340	6.94	1 / 53	-3.18	3.76	0.002	23.00	-19.24
	QPSK	3570.00	V	204	340	6.60	1 / 53	1.16	7.76	0.006	23.00	-15.24
	QPSK	3625.00	V	201	343	6.68	1 / 53	-0.07	6.61	0.005	23.00	-16.39
	QPSK	3680.00	V	204	340	6.94	1 / 53	-3.19	3.75	0.002	23.00	-19.25
	16-QAM	3570.00	V	204	340	6.60	1 / 53	-0.73	5.87	0.004	23.00	-17.13
	16-QAM	3625.00	V	201	343	6.68	1 / 53	-2.04	4.64	0.003	23.00	-18.36
	16-QAM	3680.00	V	204	340	6.94	1 / 53	-5.21	1.73	0.001	23.00	-21.27

Table 7-28. EIRP Data (NR Band n48) - ANT L

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.

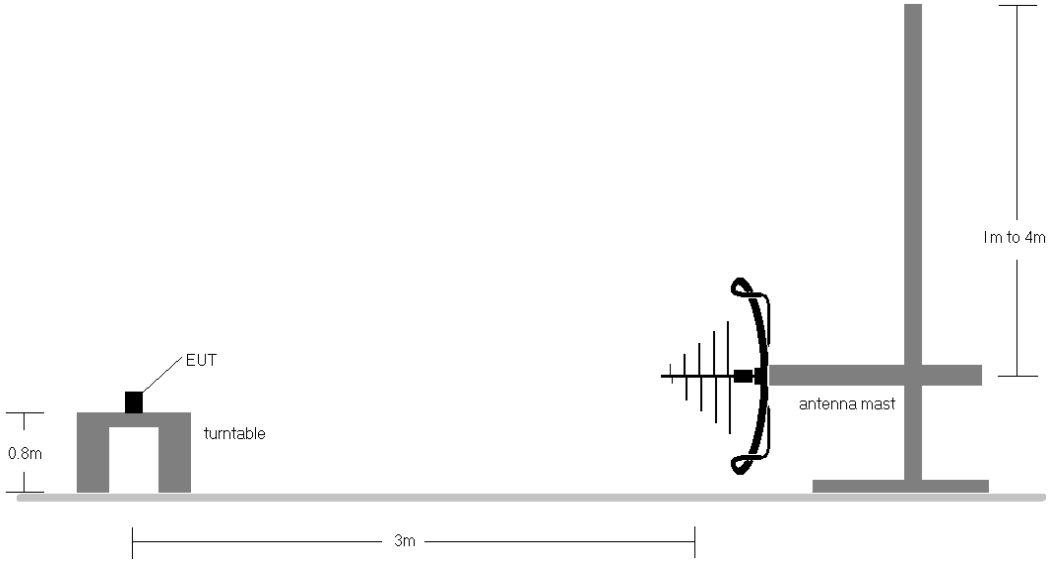


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

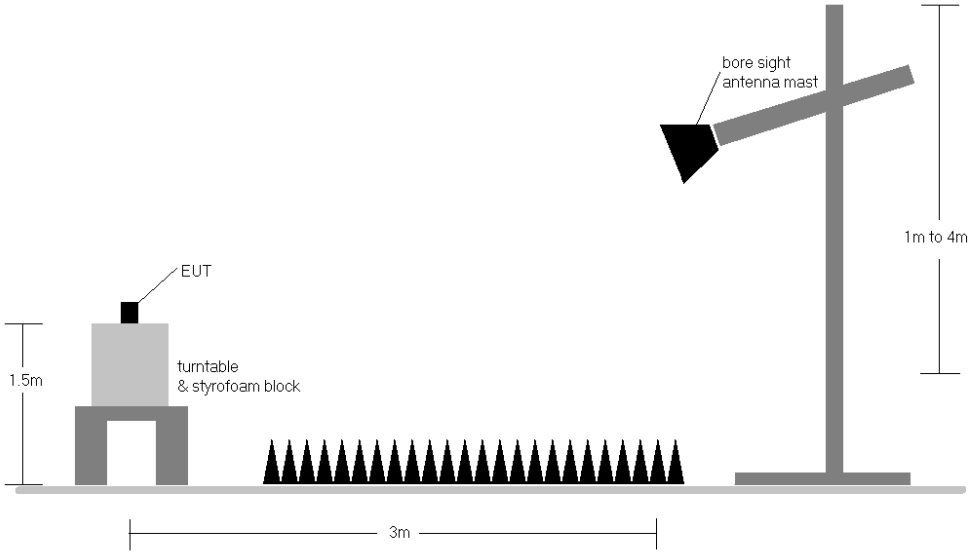


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

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.

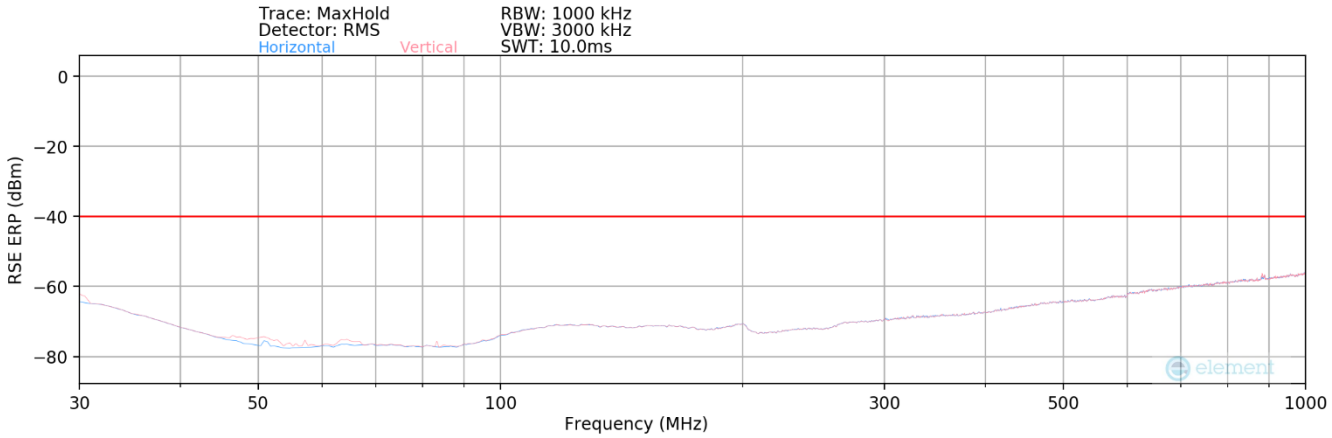
5) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

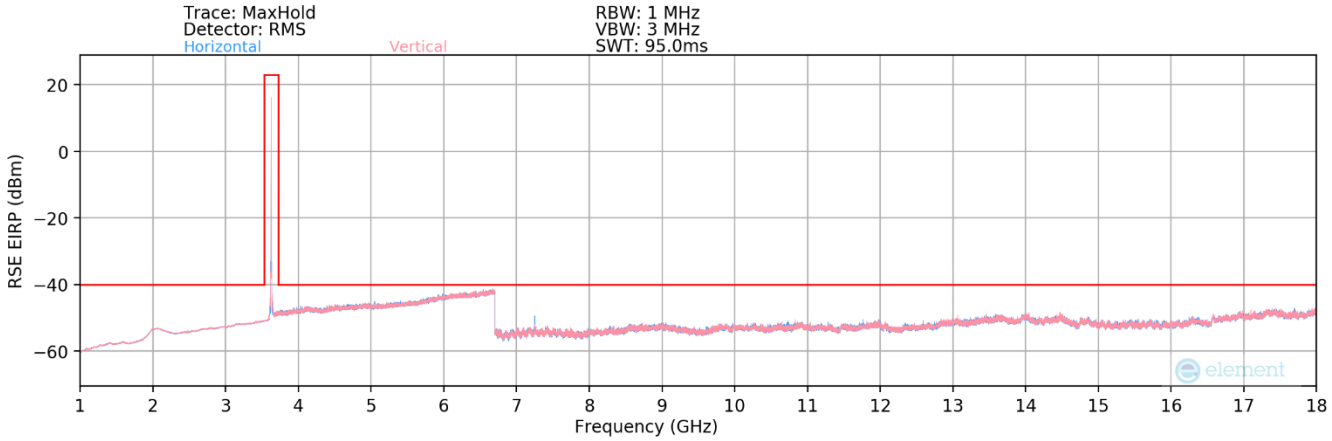
7) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

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.

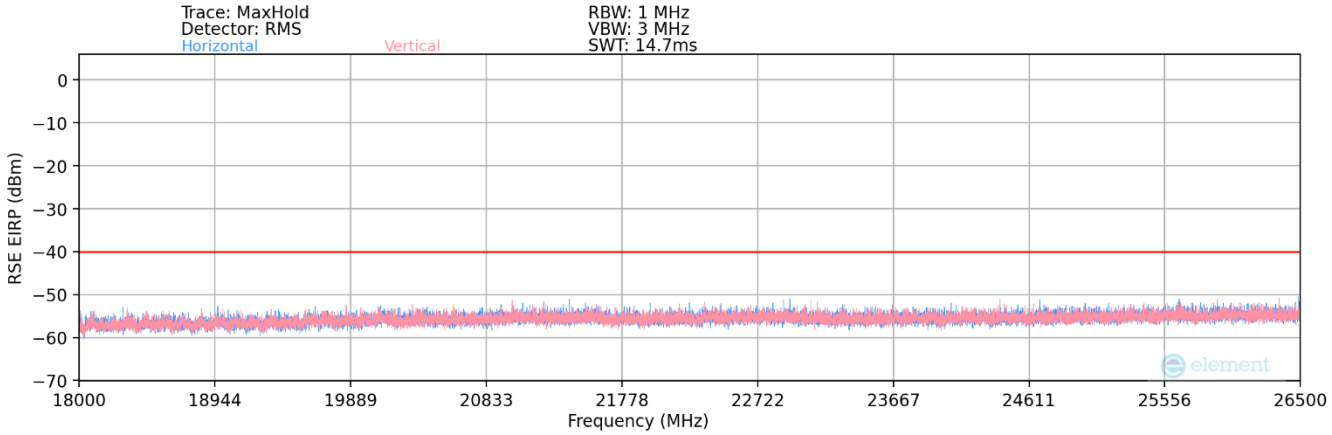
LTE Band 48



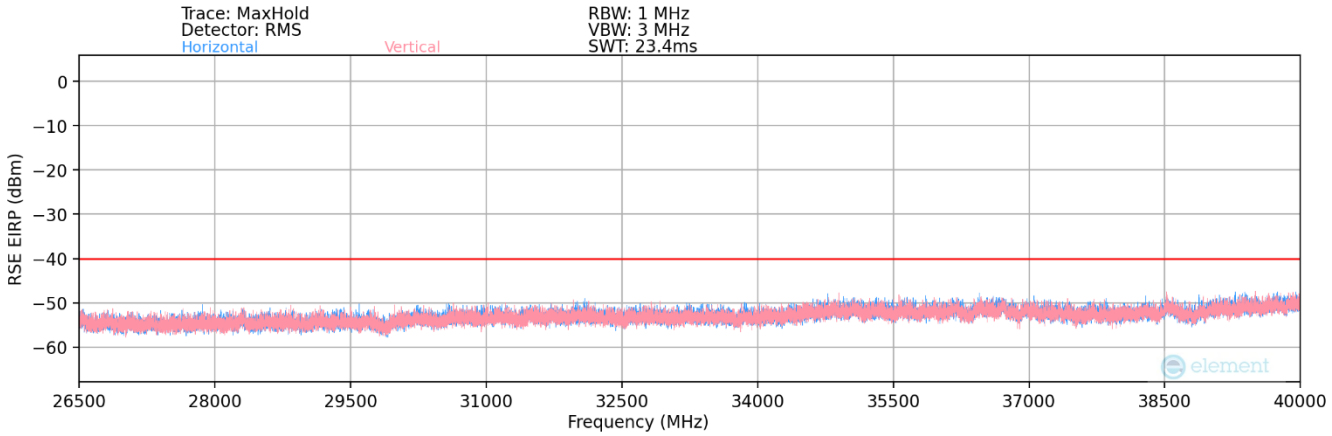
Plot 7-75. Radiated Spurious Plot (LTE Band 48 – Below 1GHz)



Plot 7-76. Radiated Spurious Plot (LTE Band 48– 1GHz -18GHz)



Plot 7-77. Radiated Spurious Plot (LTE Band 48 – 18GHz -26.5GHz)



Plot 7-78. Radiated Spurious Plot (LTE Band 48 – 26.5GHz-40GHz)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
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]
32.00	V	-	-	-99.77	26.32	33.55	-63.86	-40.00	-23.86
51.00	V	322	159	-95.45	14.70	26.25	-71.16	-40.00	-31.16
57.00	V	-	-	-97.27	14.20	23.93	-73.48	-40.00	-33.48
67.00	V	291	167	-97.09	14.68	24.59	-72.82	-40.00	-32.82
83.00	V	-	-	-99.24	14.37	22.13	-75.27	-40.00	-35.27
881.00	V	359	84	-94.99	30.77	42.78	-54.63	-40.00	-14.63

Table 7-29. Radiated Spurious Data (LTE Band 48 – Below 1GHz)

Bandwidth (MHz):	20
Frequency (MHz):	3560.0
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	V	120	286	-66.71	9.64	49.93	-45.33	-40.00	-5.33
10680.00	V	122	351	-79.47	13.17	40.70	-54.56	-40.00	-14.56
14240.00	V	-	-	-79.56	15.57	43.01	-52.25	-40.00	-12.25
17800.00	V	-	-	-80.05	17.24	44.19	-51.07	-40.00	-11.07
21360.00	V	-	-	-55.95	3.81	54.86	-49.94	-40.00	-9.94

Table 7-30. Radiated Spurious Data (LTE Band 48 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
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	V	116	259	-68.07	9.58	48.51	-46.74	-40.00	-6.74
10875.00	V	333	5	-77.77	12.84	42.07	-53.19	-40.00	-13.19
14500.00	V	-	-	-79.72	15.45	42.73	-52.53	-40.00	-12.53
18125.00	V	-	-	-55.52	1.31	52.79	-52.01	-40.00	-12.01
21750.00	V	-	-	-55.51	3.68	55.18	-49.62	-40.00	-9.62

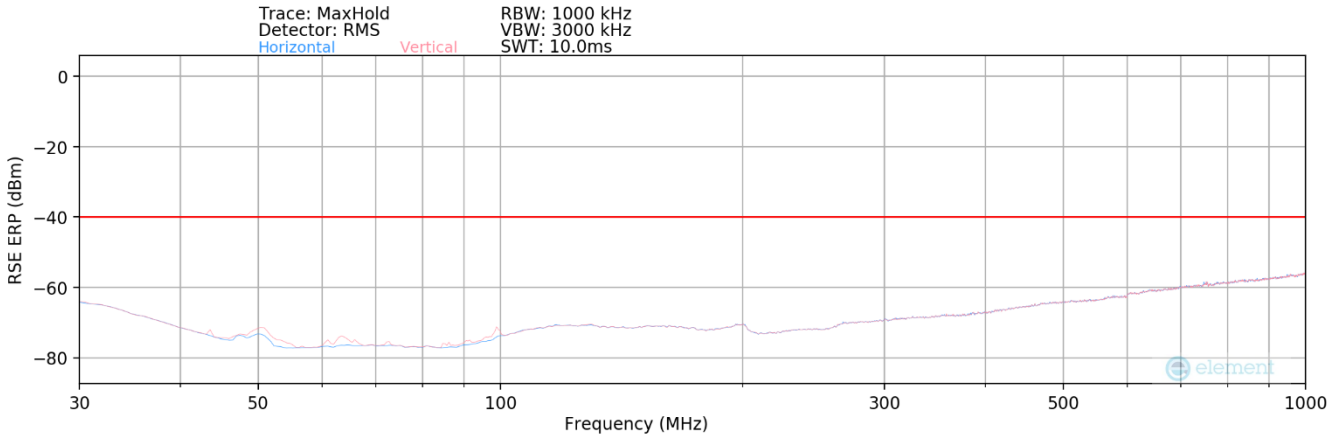
Table 7-31. Radiated Spurious Data (LTE Band 48 – Mid Channel)

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

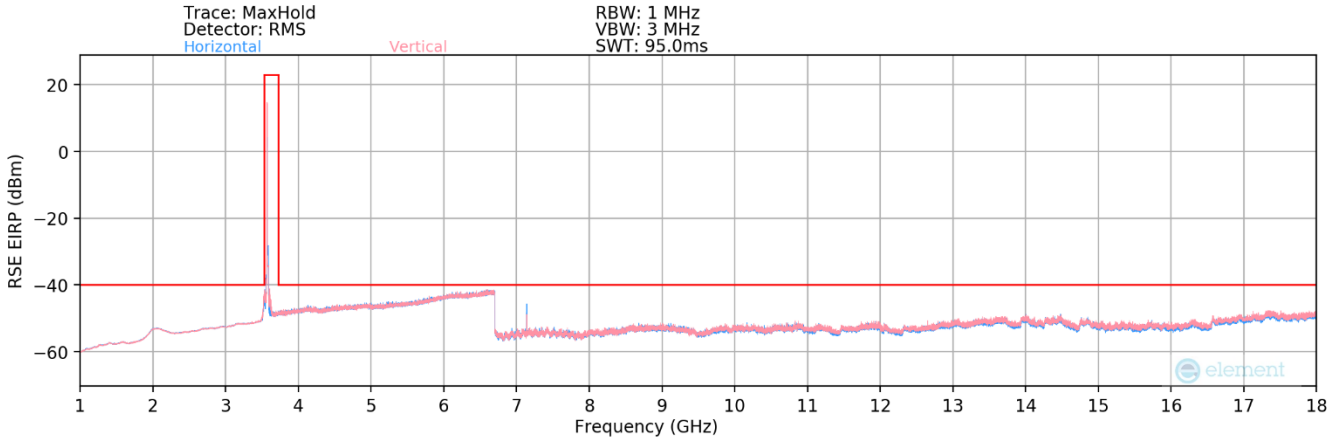
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7380.00	V	113	293	-65.32	10.03	51.71	-43.55	-40.00	-3.55
11070.00	V	-	-	-78.66	12.72	41.06	-54.20	-40.00	-14.20
14760.00	V	-	-	-79.90	15.33	42.43	-52.83	-40.00	-12.83
18450.00	V	-	-	-55.59	1.62	53.03	-51.77	-40.00	-11.77

Table 7-32. Radiated Spurious Data (LTE Band 48 – High Channel)

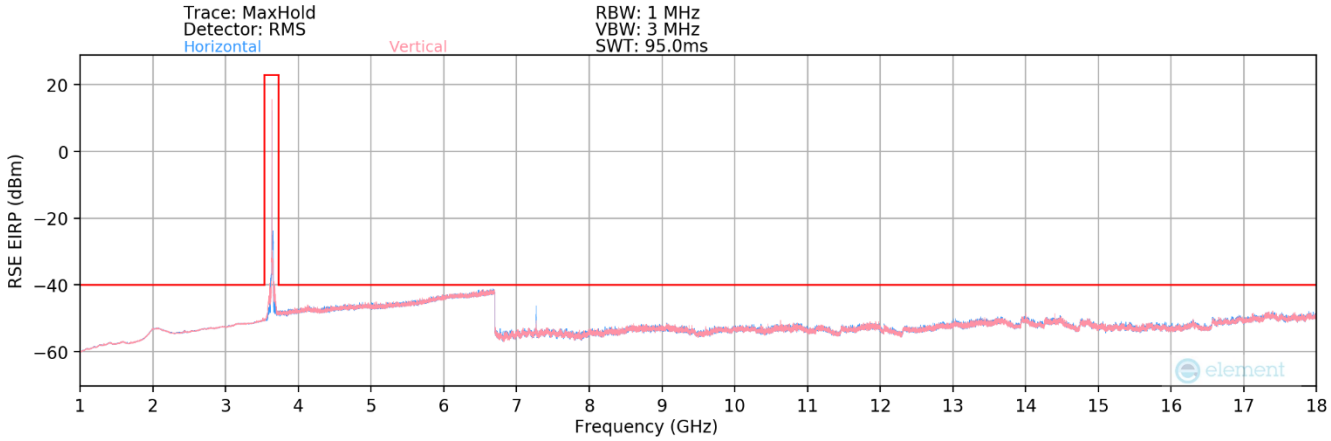
ULCA LTE Band 48



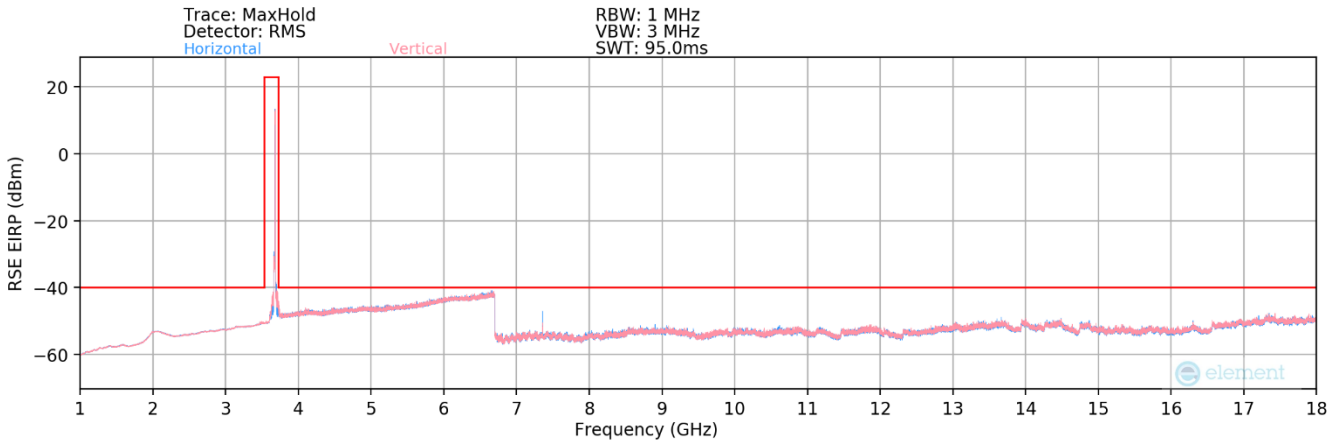
Plot 7-79. Radiated Spurious Plot (ULCA LTE Band 48 – Mid channel – Below 1GHz)



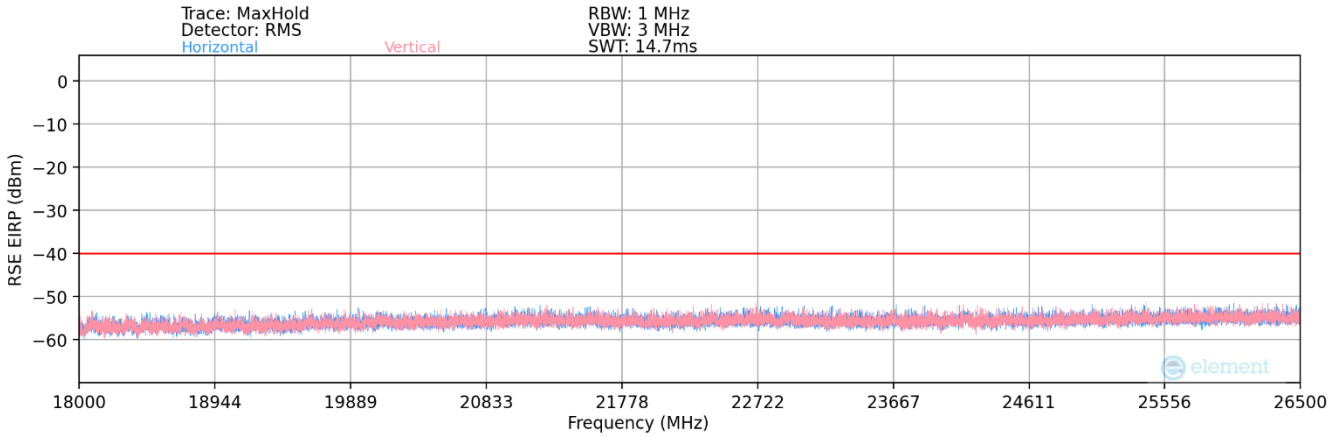
Plot 7-80. Radiated Spurious Plot (ULCA LTE Band 48 – Low channel – 1GHz -18GHz)



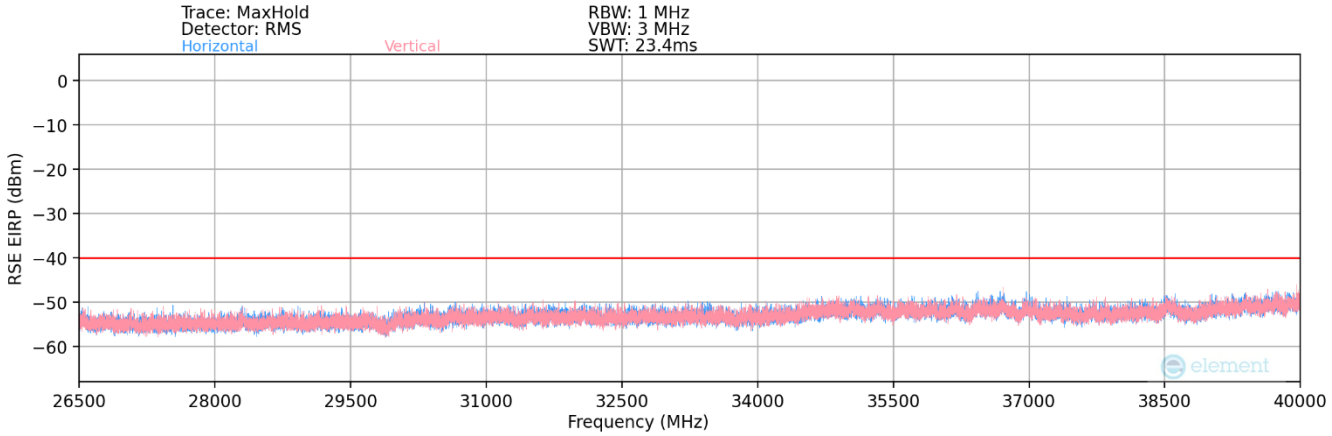
Plot 7-81. Radiated Spurious Plot (ULCA LTE Band 48 – Mid channel – 1GHz -18GHz)



Plot 7-82. Radiated Spurious Plot (ULCA LTE Band 48 – High Channel – 1GHz -18GHz)



Plot 7-83. Radiated Spurious Plot (ULCA LTE Band 48 – Mid channel – 18GHz -26.5GHz)



Plot 7-84. Radiated Spurious Plot (ULCA LTE Band 48 – Mid Channel - 26.5GHz-40GHz)

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

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]
43.00	V	-	-	-92.79	18.18	32.39	-65.02	-40.00	-25.02
50.00	V	109	249	-91.63	14.80	30.17	-67.24	-40.00	-27.24
63.00	V	-	-	-94.04	14.69	27.65	-69.75	-40.00	-29.75
72.00	V	-	-	-93.65	14.76	28.11	-69.30	-40.00	-29.30
88.00	V	-	-	-93.87	14.24	27.37	-70.04	-40.00	-30.04
99.00	V	399	307	-93.80	16.98	30.18	-67.23	-40.00	-27.23

Table 7-33. Radiated Spurious Data (ULCA LTE Band 48 – Below 1GHz)

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

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]
7139.80	H	259	1	-65.39	9.87	51.48	-43.78	-40.00	-3.78
10709.70	H	141	68	-76.44	13.13	43.69	-51.57	-40.00	-11.57
14279.60	H	-	-	-79.98	15.68	42.70	-52.55	-40.00	-12.55
17849.50	H	-	-	-80.25	17.24	43.99	-51.27	-40.00	-11.27
21419.40	H	-	-	-57.68	3.77	53.09	-51.71	-40.00	-11.71

Table 7-34. Radiated Spurious Data (ULCA LTE Band 48 – 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

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]
7269.80	H	257	52	-64.49	9.41	51.92	-43.34	-40.00	-3.34
10904.70	V	114	183	-75.69	12.77	44.08	-51.18	-40.00	-11.18
14539.60	H	-	-	-79.04	15.26	43.22	-52.04	-40.00	-12.04
18174.50	H	-	-	-57.50	1.27	50.77	-54.03	-40.00	-14.03
21809.40	H	-	-	-57.49	3.73	53.24	-51.56	-40.00	-11.56

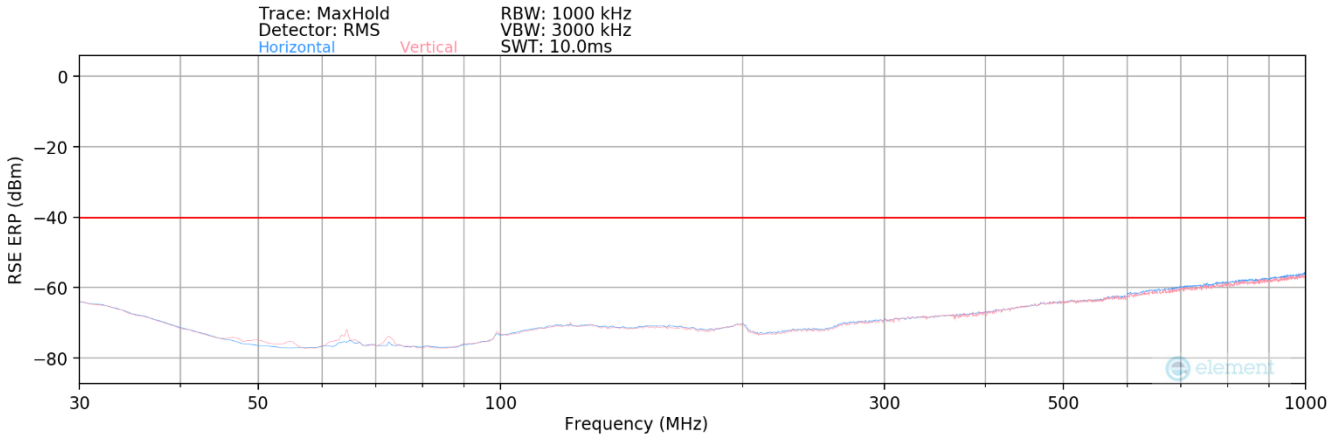
Table 7-35. Radiated Spurious Data (ULCA LTE Band 48 – Mid Channel)

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

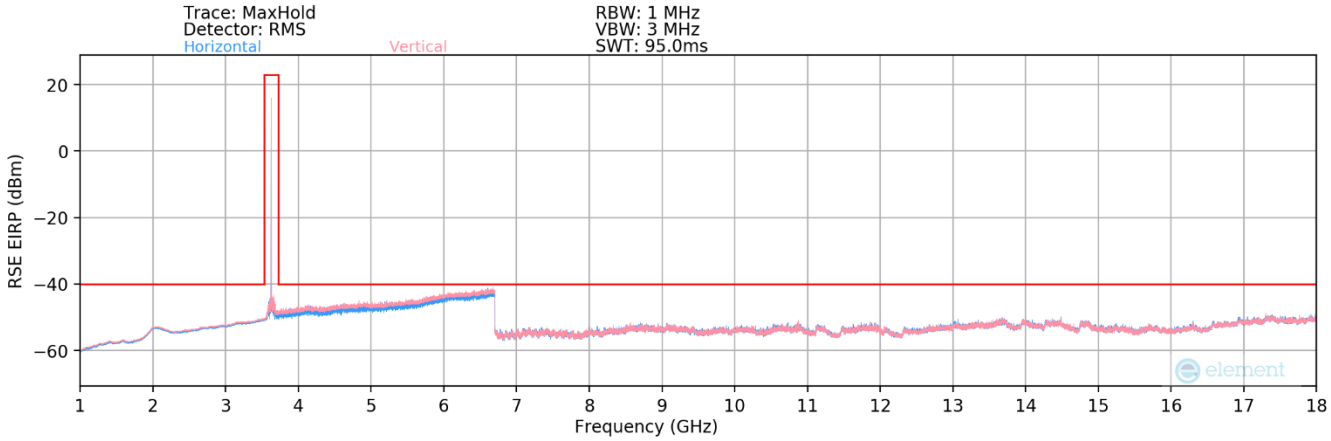
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.20	H	254	62	-66.23	9.95	50.72	-44.53	-40.00	-4.53
11040.30	H	-	-	-78.11	12.53	41.42	-53.84	-40.00	-13.84
14760.00	H	-	-	-80.24	15.33	42.09	-53.17	-40.00	-13.17
18400.50	H	-	-	-57.93	1.18	50.26	-54.54	-40.00	-14.54

Table 7-36. Radiated Spurious Data (ULCA LTE Band 48 – High Channel)

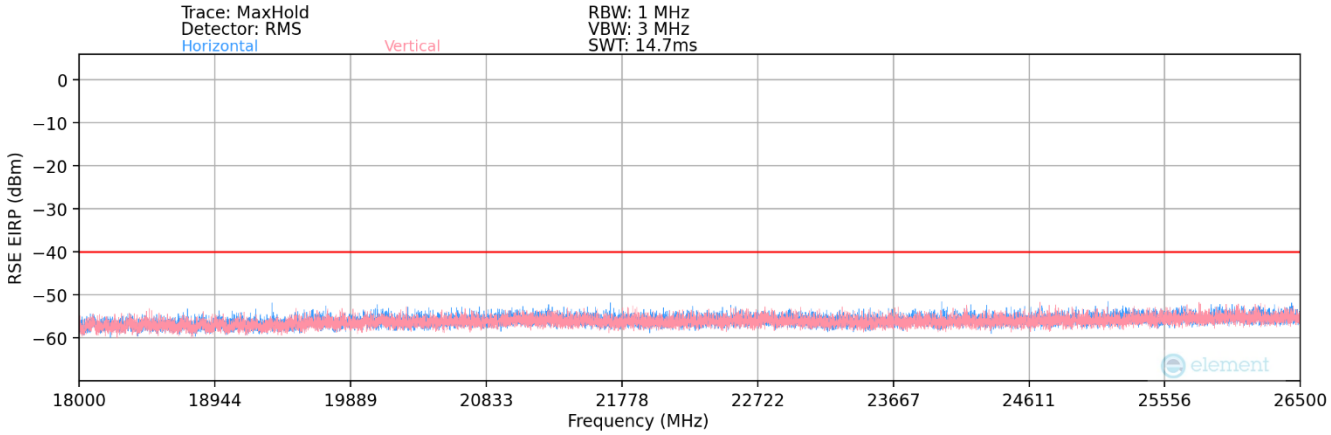
NR Band n48 ANT G



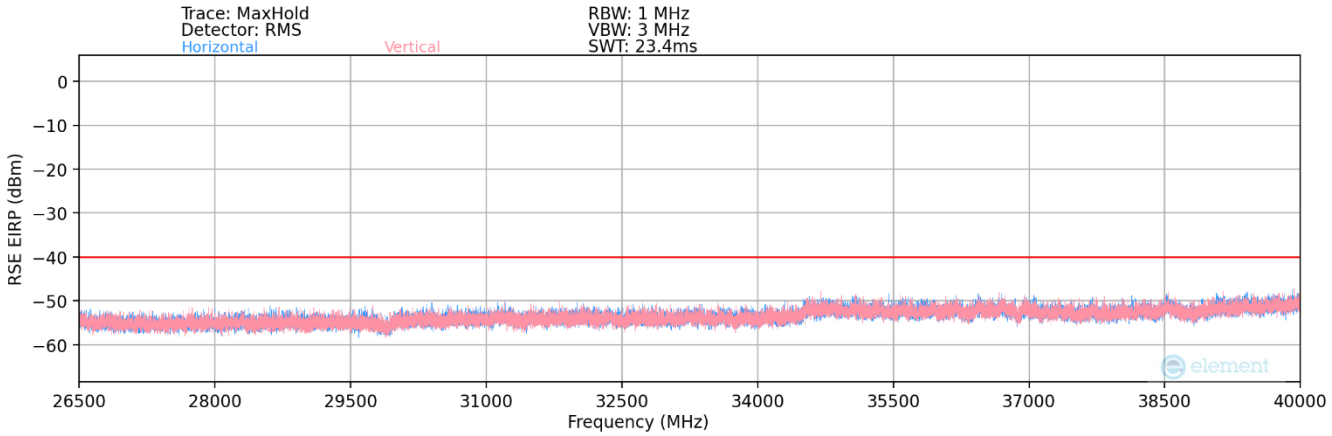
Plot 7-85. Radiated Spurious Plot (NR Band n48 – Below 1GHz)



Plot 7-86. Radiated Spurious Plot (NR Band n48– 1GHz -18GHz)



Plot 7-87. Radiated Spurious Plot (NR Band n48 – 18GHz -26.5GHz)



Plot 7-88. Radiated Spurious Plot (NR Band n48 – 26.5GHz-40GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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]
64.44	V	-	-	-90.39	14.74	31.35	-66.06	-40.00	-26.06
205.00	V	-	-	-89.59	18.15	35.56	-61.85	-40.00	-21.85

Table 7-37. Radiated Spurious Data (NR Band n48 – Below 1GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3570.0
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	V	-	-	-76.62	9.87	40.25	-55.01	-40.00	-15.01
10710.00	V	126	172	-76.12	13.13	44.01	-51.25	-40.00	-11.25
14280.00	V	-	-	-79.66	15.68	43.02	-52.23	-40.00	-12.23
17850.00	V	-	-	-80.52	17.25	43.73	-51.53	-40.00	-11.53
21420.00	V	-	-	-55.64	3.77	55.12	-49.68	-40.00	-9.68

Table 7-38. Radiated Spurious Data (NR Band n48 – Low Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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	V	-	-	-75.96	9.58	40.62	-54.63	-40.00	-14.63
10875.00	V	271	200	-72.87	12.84	46.97	-48.29	-40.00	-8.29
14500.00	V	-	-	-78.90	15.45	43.55	-51.71	-40.00	-11.71
18125.00	V	-	-	-55.34	1.31	52.97	-51.83	-40.00	-11.83
21750.00	V	-	-	-55.85	3.68	54.83	-49.97	-40.00	-9.97

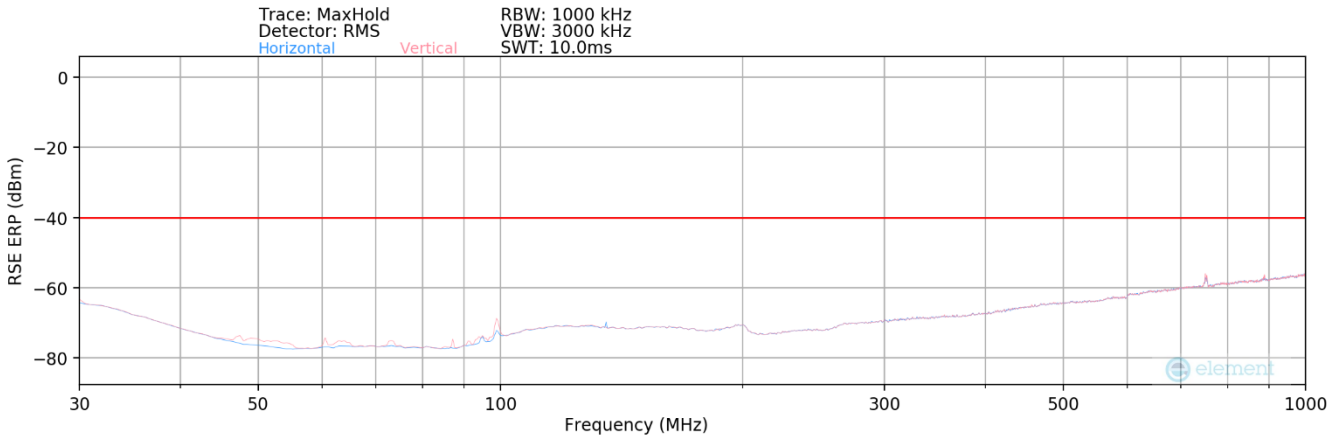
Table 7-39. Radiated Spurious Data (NR Band n48 – Mid Channel)

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

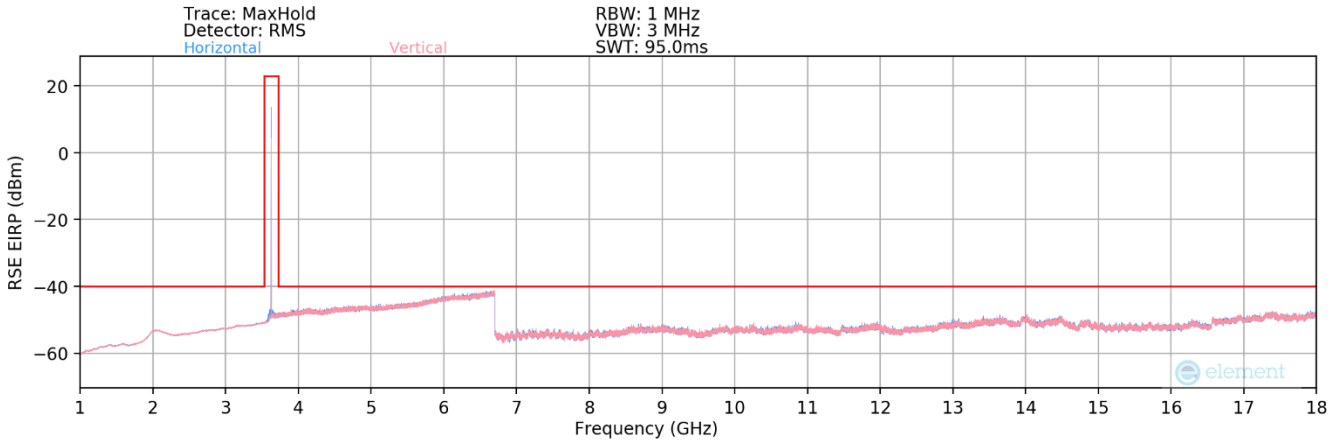
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.00	V	-	-	-76.59	9.95	40.36	-54.90	-40.00	-14.90
11040.00	V	265	205	-70.56	12.53	48.97	-46.29	-40.00	-6.29
14720.00	V	-	-	-80.25	15.05	41.80	-53.46	-40.00	-13.46
18400.00	V	-	-	-54.54	1.18	53.64	-51.16	-40.00	-11.16
22080.00	V	-	-	-55.97	3.59	54.62	-50.18	-40.00	-10.18

Table 7-40. Radiated Spurious Data (NR Band n48 – High Channel)

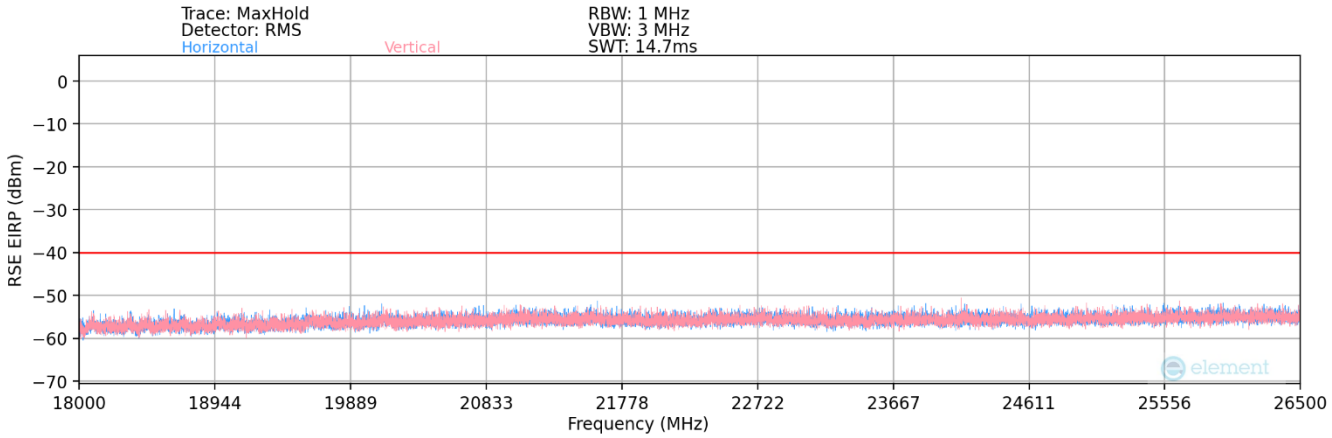
NR Band n48 ANT B



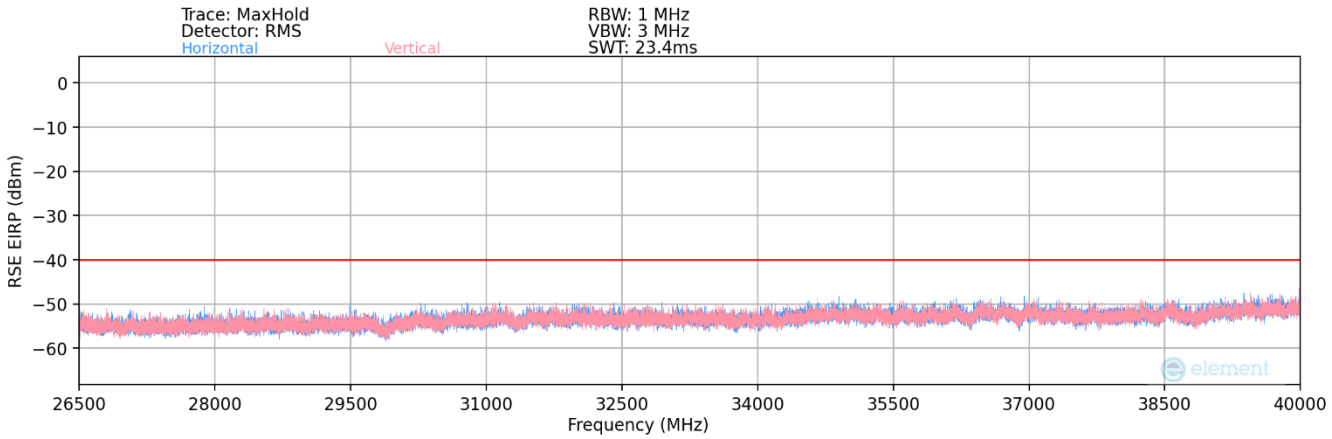
Plot 7-89. Radiated Spurious Plot (NR Band n48 – Below 1GHz)



Plot 7-90. Radiated Spurious Plot (NR Band n48– 1GHz -18GHz)



Plot 7-91. Radiated Spurious Plot (NR Band n48 – 18GHz -26.5GHz)



Plot 7-92. Radiated Spurious Plot (NR Band n48 – 26.5GHz-40GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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]
50.00	V	-	-	-94.71	14.80	27.09	-70.32	-40.00	-30.32
67.00	V	388	186	-94.21	14.68	27.47	-69.94	-40.00	-29.94
74.00	V	-	-	-91.42	14.82	30.40	-67.01	-40.00	-27.01
99.00	V	185	342	-89.00	16.98	34.98	-62.43	-40.00	-22.43
750.70	V	-	-	-90.15	29.42	46.27	-51.14	-40.00	-11.14
897.00	V	-	-	-87.88	31.09	50.21	-47.19	-40.00	-7.19

Table 7-41. Radiated Spurious Data (NR Band n48 – Below 1GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3570.0
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	V	-	-	-77.44	9.87	39.43	-55.83	-40.00	-15.83
10710.00	V	-	-	-79.36	13.13	40.77	-54.49	-40.00	-14.49
14280.00	V	-	-	-79.69	15.68	42.99	-52.26	-40.00	-12.26

Table 7-42. Radiated Spurious Data (NR Band n48 – Low Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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	V	112	308	-76.48	9.58	40.10	-55.15	-40.00	-15.15
10875.00	V	-	-	-78.45	12.84	41.39	-53.87	-40.00	-13.87
14500.00	V	-	-	-79.55	15.45	42.90	-52.36	-40.00	-12.36
18125.00	V	-	-	-56.21	1.31	52.10	-52.70	-40.00	-12.70
21750.00	V	-	-	-56.80	3.68	53.89	-50.91	-40.00	-10.91

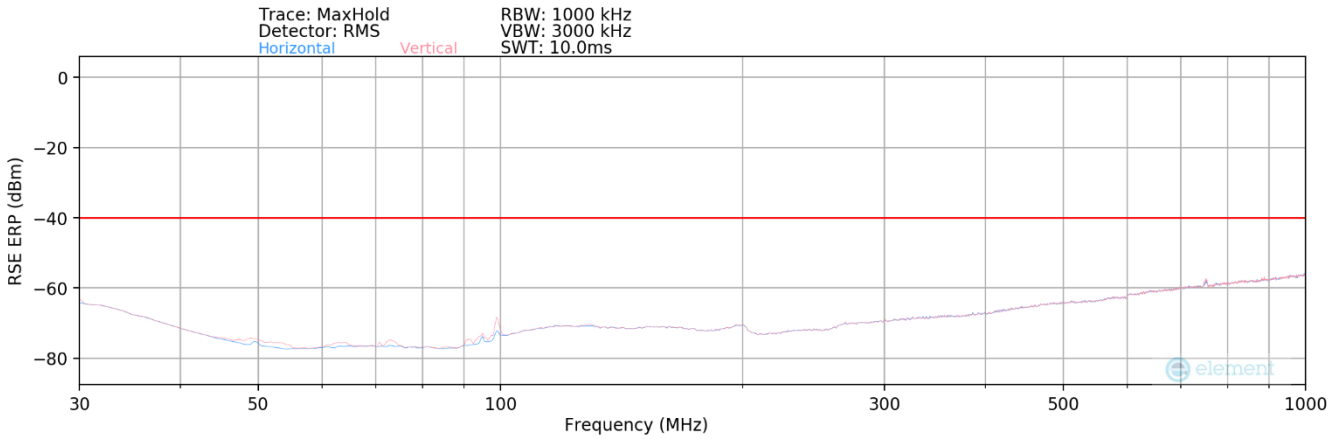
Table 7-43. Radiated Spurious Data (NR Band n48 – Mid Channel)

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

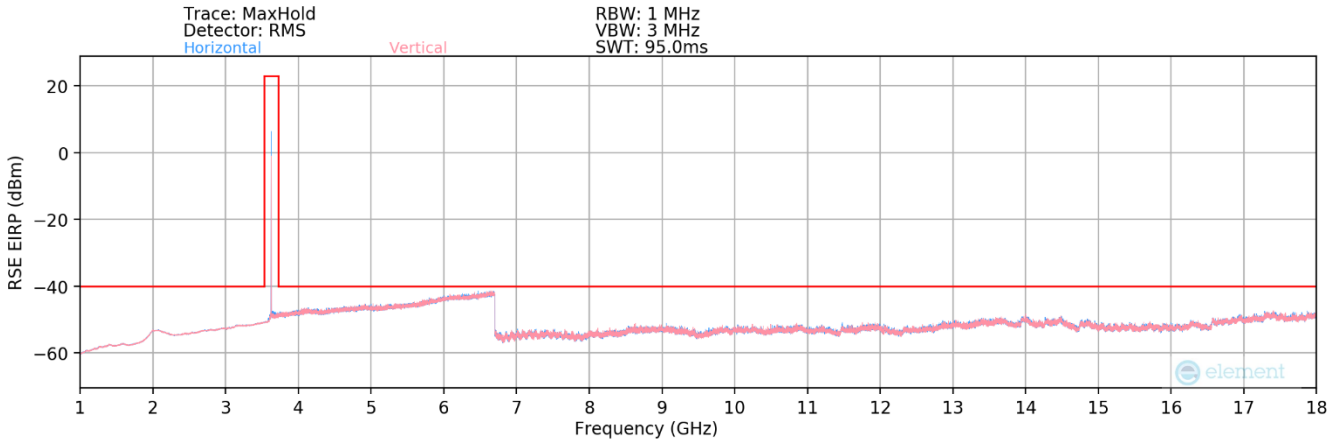
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.00	V	128	354	-75.86	9.95	41.09	-54.17	-40.00	-14.17
11040.00	V	-	-	-78.25	12.53	41.28	-53.98	-40.00	-13.98
14720.00	V	-	-	-79.78	15.05	42.27	-52.99	-40.00	-12.99
18400.00	V	-	-	-55.44	1.18	52.74	-52.06	-40.00	-12.06

Table 7-44. Radiated Spurious Data (NR Band n48 – High Channel)

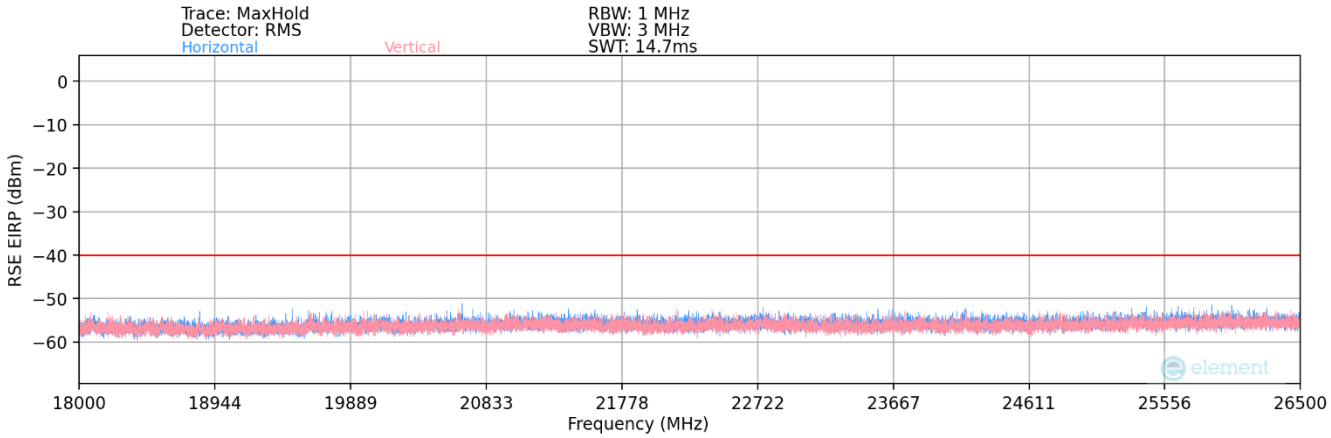
NR Band n48 ANT K



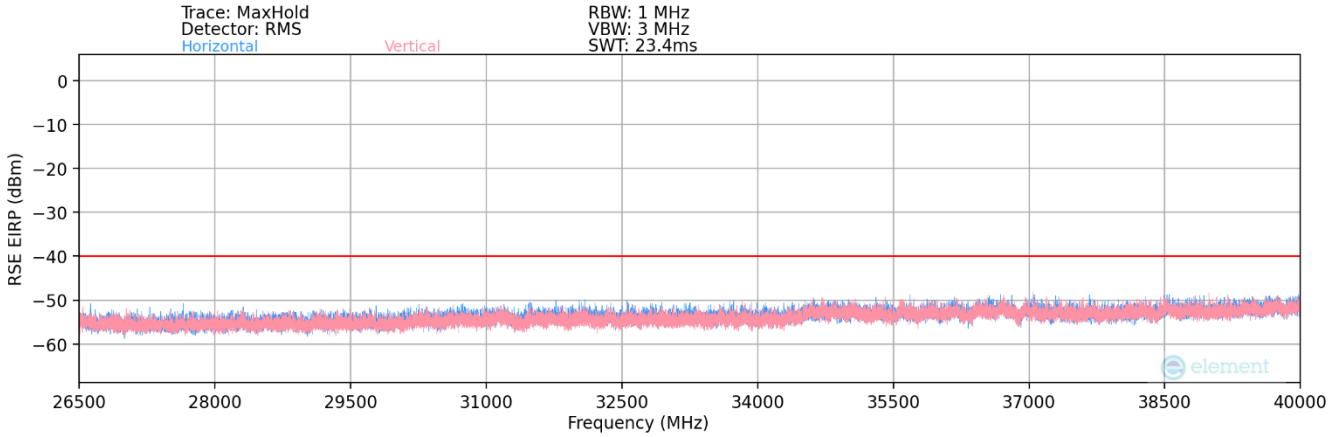
Plot 7-93. Radiated Spurious Plot (NR Band n48 – Below 1GHz)



Plot 7-94. Radiated Spurious Plot (NR Band n48– 1GHz -18GHz)



Plot 7-95. Radiated Spurious Plot (NR Band n48 – 18GHz -26.5GHz)



Plot 7-96. Radiated Spurious Plot (NR Band n48 – 26.5GHz-40GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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]
99.00	V	199	142	-91.92	16.98	32.06	-65.35	-40.00	-25.35
750.00	V	399	331	-89.26	29.44	47.18	-50.22	-40.00	-10.22

Table 7-45. Radiated Spurious Data (NR Band n48 – Below 1GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3570.0
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	-	-	-77.86	9.87	39.01	-56.25	-40.00	-16.25
10710.00	H	-	-	-79.68	13.13	40.45	-54.81	-40.00	-14.81
14280.00	H	-	-	-79.68	15.68	43.00	-52.25	-40.00	-12.25

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

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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	-	-	-77.00	9.58	39.58	-55.67	-40.00	-15.67
10875.00	H	-	-	-78.67	12.84	41.17	-54.09	-40.00	-14.09
14500.00	H	-	-	-79.49	15.45	42.96	-52.30	-40.00	-12.30
18125.00	H	-	-	-55.74	1.31	52.57	-52.23	-40.00	-12.23

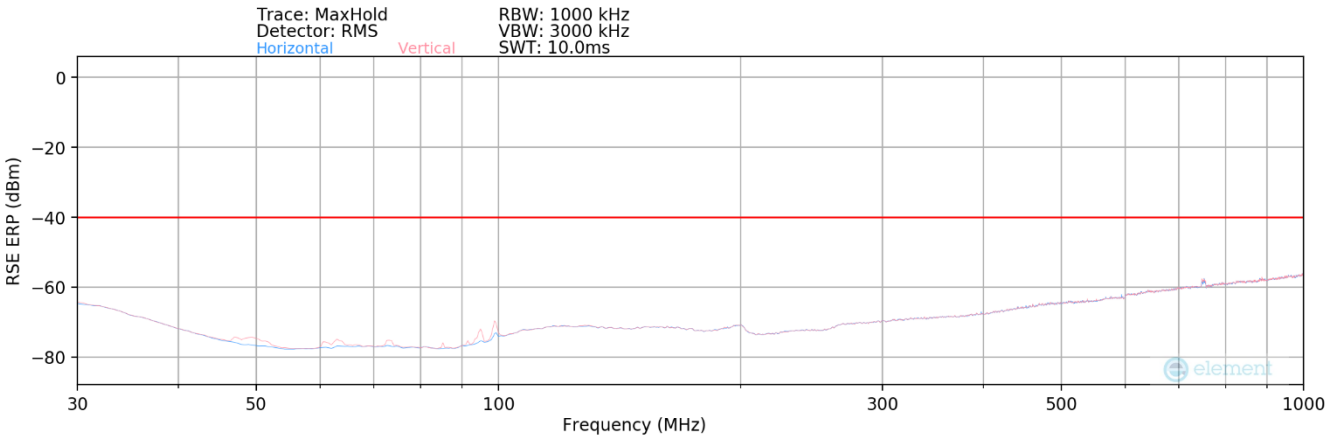
Table 7-47. Radiated Spurious Data (NR Band n48 – Mid Channel)

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

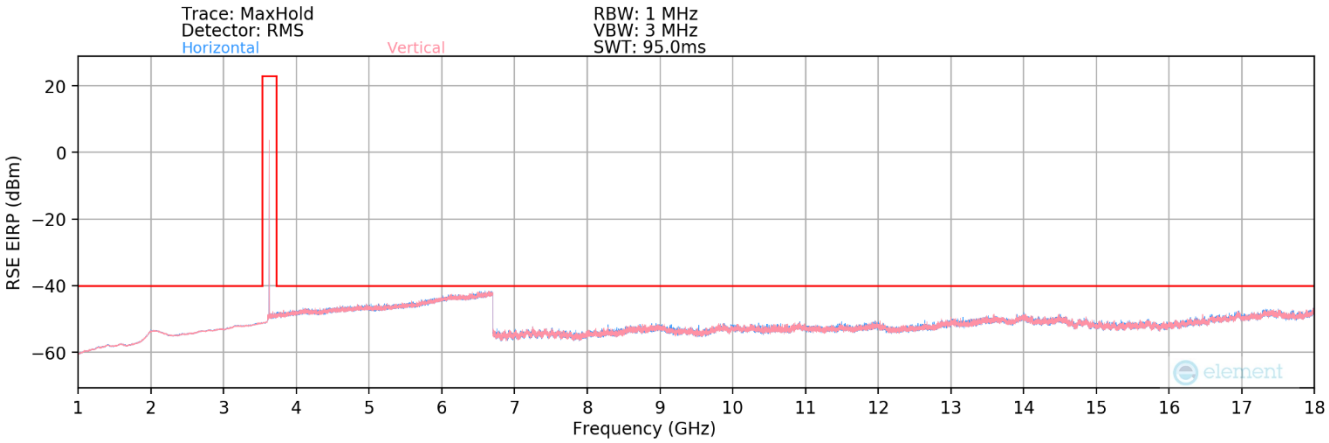
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.00	H	-	-	-77.59	9.95	39.36	-55.90	-40.00	-15.90
11040.00	H	-	-	-78.36	12.53	41.17	-54.09	-40.00	-14.09
14720.00	H	-	-	-80.39	15.05	41.66	-53.60	-40.00	-13.60
18400.00	H	-	-	-55.96	1.18	52.22	-52.58	-40.00	-12.58

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

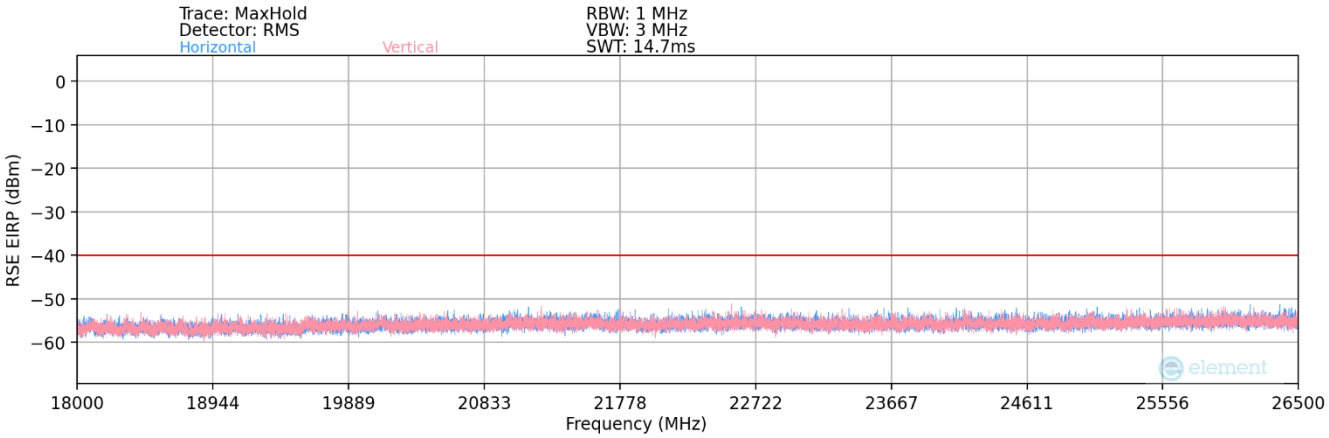
NR Band n48 ANT L



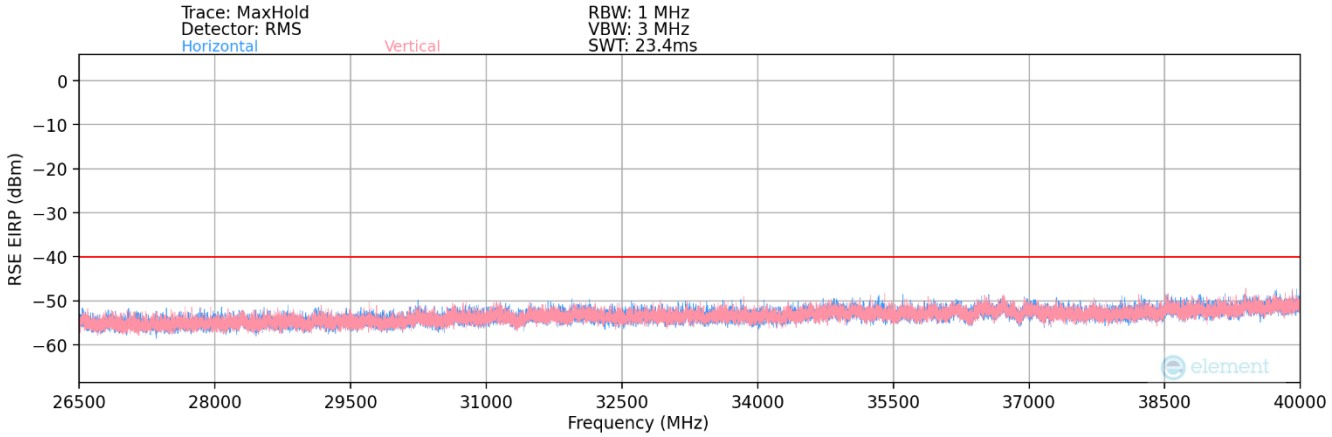
Plot 7-97. Radiated Spurious Plot (NR Band n48 – Below 1GHz)



Plot 7-98. Radiated Spurious Plot (NR Band n48– 1GHz -18GHz)



Plot 7-99. Radiated Spurious Plot (NR Band n48 – 18GHz -26.5GHz)



Plot 7-100. Radiated Spurious Plot (NR Band n48 – 26.5GHz-40GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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]
50.00	V	125	157	-94.54	14.80	27.26	-70.15	-40.00	-30.15
63.00	V	-	-	-94.31	14.69	27.38	-70.02	-40.00	-30.02
72.00	V	-	-	-94.68	14.76	27.08	-70.33	-40.00	-30.33
86.00	V	-	-	-93.13	14.30	28.17	-69.24	-40.00	-29.24
99.00	V	124	258	-90.87	16.98	33.11	-64.30	-40.00	-24.30
754.00	V	-	-	-90.14	29.59	46.45	-50.96	-40.00	-10.96

Table 7-49. Radiated Spurious Data (NR Band n48 – Below 1GHz)

Bandwidth (MHz):	40
Frequency (MHz):	3570.0
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	137	309	-74.80	9.87	42.07	-53.19	-40.00	-13.19
10710.00	H	-	-	-79.34	13.13	40.79	-54.47	-40.00	-14.47
14280.00	H	-	-	-79.74	15.68	42.94	-52.31	-40.00	-12.31
17850.00	H	-	-	-79.99	17.25	44.26	-51.00	-40.00	-11.00
21420.00	H	-	-	-54.47	3.77	56.29	-48.51	-40.00	-8.51

Table 7-50. Radiated Spurious Data (NR Band n48 – Low Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3625.0
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	264	23	-72.51	9.58	44.07	-51.18	-40.00	-11.18
10875.00	H	-	-	-78.95	12.84	40.89	-54.37	-40.00	-14.37
14500.00	H	-	-	-80.07	15.45	42.38	-52.88	-40.00	-12.88
18125.00	H	150	60	-54.99	1.31	53.31	-51.49	-40.00	-11.49
21750.00	H	-	-	-56.47	3.68	54.21	-50.59	-40.00	-10.59
25375.00	H	-	-	-57.07	3.96	53.89	-50.91	-40.00	-10.91
29000.00	H	-	-	-56.90	5.21	55.31	-49.49	-40.00	-9.49

Table 7-51. Radiated Spurious Data (NR Band n48 – Mid Channel)

Bandwidth (MHz):	40
Frequency (MHz):	3680.0
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	295	22	-73.02	9.95	43.93	-51.33	-40.00	-11.33
11040.00	H	-	-	-78.61	12.53	40.92	-54.34	-40.00	-14.34
14720.00	H	-	-	-79.87	15.05	42.18	-53.08	-40.00	-13.08
18400.00	H	150	71	-55.22	1.18	52.96	-51.84	-40.00	-11.84
22080.00	H	-	-	-56.20	3.59	54.39	-50.41	-40.00	-10.41
25760.00	H	-	-	-56.70	4.25	54.55	-50.25	-40.00	-10.25
29440.00	H	-	-	-56.87	5.56	55.70	-49.10	-40.00	-9.10

Table 7-52. Radiated Spurious Data (NR Band n48 – High Channel)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 96, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI C63.26-2015 – Section 5.6

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

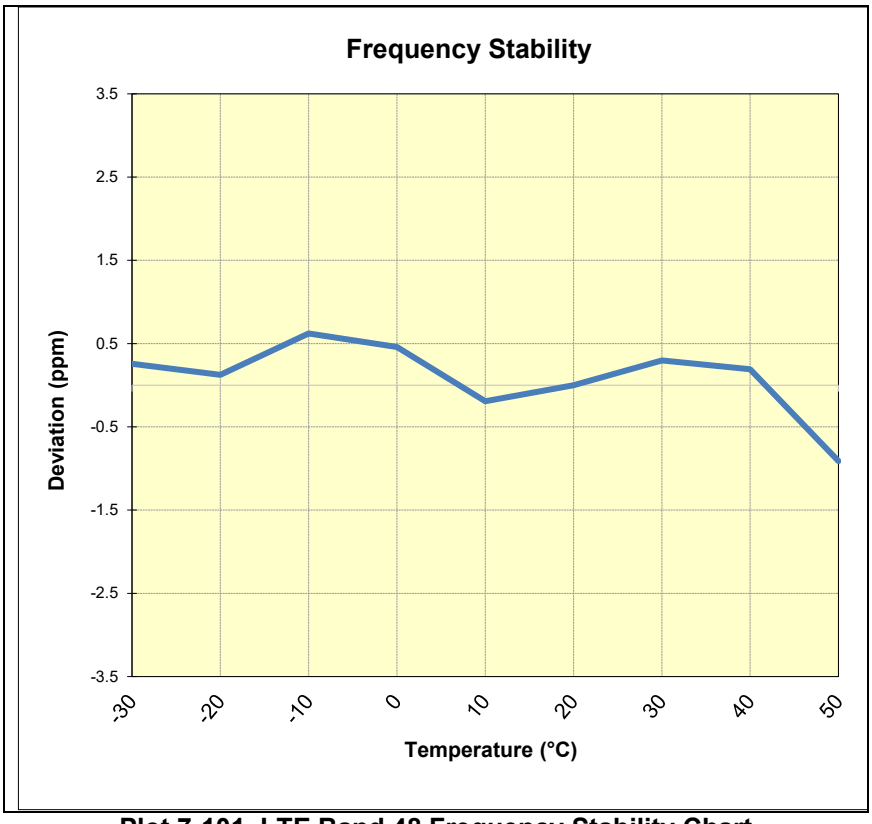
Frequency Stability / Temperature Variation

LTE Band 48

Operating Frequency (Hz):	3,625,000,000
Ref. Voltage (VDC):	4.411

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.411	- 30	3,625,001,851	935	0.0000258
		- 20	3,625,001,367	451	0.0000124
		- 10	3,625,003,170	2,253	0.0000622
		0	3,625,002,581	1,664	0.0000459
		+ 10	3,625,000,215	-701	-0.0000193
		+ 20 (Ref)	3,625,000,917	0	0.0000000
		+ 30	3,625,001,992	1,076	0.0000297
		+ 40	3,625,001,613	697	0.0000192
		+ 50	3,624,997,613	-3,303	-0.0000911
Battery Endpoint	3.59	+ 20	3,625,000,180	-737	-0.0000203

Table 7-53. LTE Band 48 Frequency Stability Data



Plot 7-101. LTE Band 48 Frequency Stability Chart

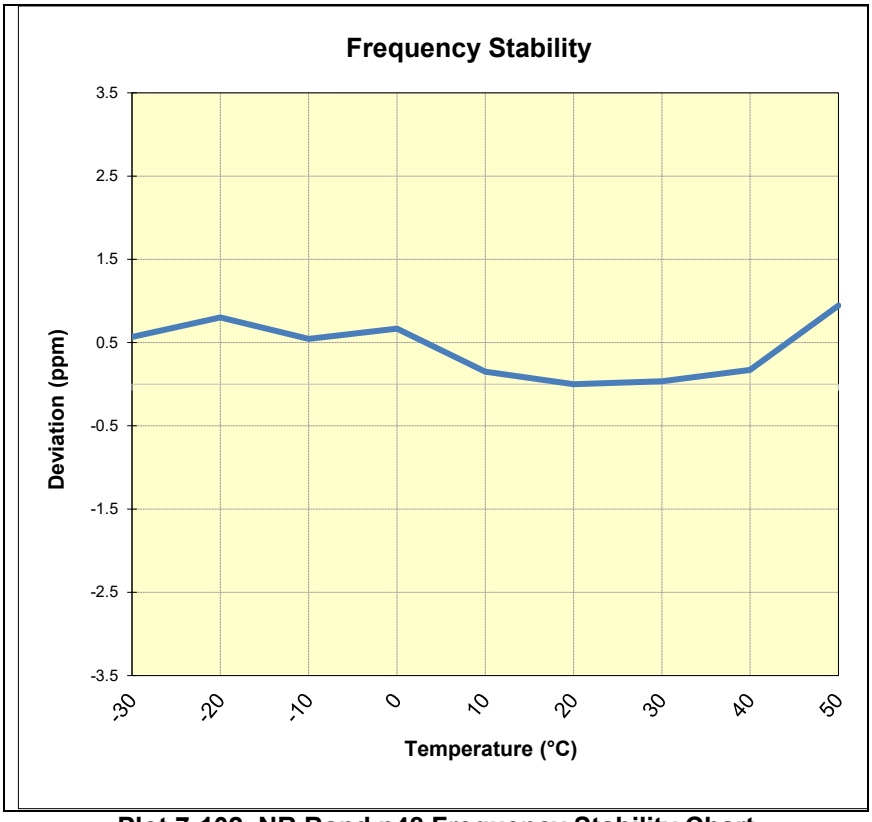
Frequency Stability / Temperature Variation

NR Band n48

Operating Frequency (Hz):	3,625,000,000
Ref. Voltage (VDC):	4.411

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.411	- 30	3,625,156,180	2,058	0.0000568
		- 20	3,625,157,032	2,910	0.0000803
		- 10	3,625,156,096	1,973	0.0000544
		0	3,625,156,543	2,420	0.0000668
		+ 10	3,625,154,668	545	0.0000150
		+ 20 (Ref)	3,625,154,123	0	0.0000000
		+ 30	3,625,154,251	128	0.0000035
		+ 40	3,625,154,743	621	0.0000171
		+ 50	3,625,157,548	3,425	0.0000945
Battery Endpoint	3.59	+ 20	3,625,155,708	1,585	0.0000437

Table 7-54. NR Band n48 Frequency Stability Data



Plot 7-102. NR Band n48 Frequency Stability Chart

7.9 End User Device Additional Requirement (CBSD Protocol)

Test Overview and Limit

End user device additional requirements are tested per the test procedures listed below. During testing, the EUT is connected to a certified LTE CBSD (Ruckus FCC ID: S9GQ910US00) and an NR CBSD (Airspan FCC ID: PIDAV2700) as a companion device to show compliance with Part 96.47.

End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.

An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

Test Procedure Used

KDB 940660 D01 v03, WINNF-18-IN-00178 v1.0.0.00

Test Setup/Method

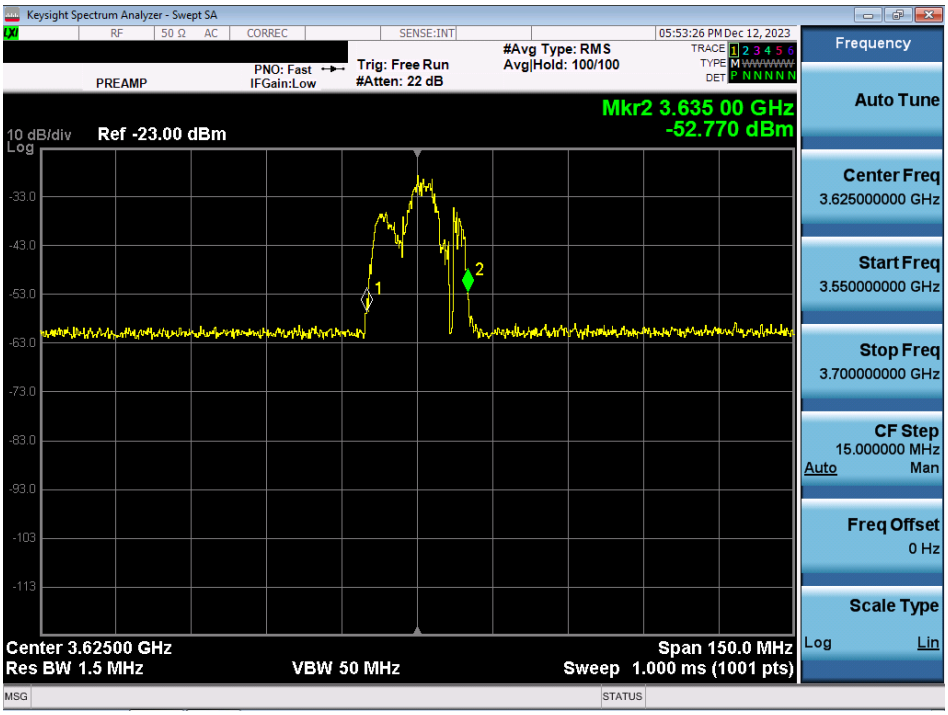
The EUT was connected via an RF cable to a certified CBSD and spectrum analyzer. The following procedure is performed by applying WINNF-TS-0122 CBRS CBSD Test Specification.

1. Run#1:
    a. Setup WINNF.PT.C.HBT.1 with 3615MHz – 3635MHz.
    b. Enable AP service from Ruckus Cloud management.
    c. Check EUT Tx frequency.
    d. Disable AP service from Ruckus Cloud management and check EUT stop transmission within 10s.
2. Run#2:
    a. Setup WINNF.PT.C.HBT.1 with 3660MHz – 3680MHz.
    b. Enable AP service from Ruckus Cloud management.
    c. Check EUT Tx frequency.
    d. Disable AP service from Ruckus Cloud management and check EUT stop transmission within 10s.

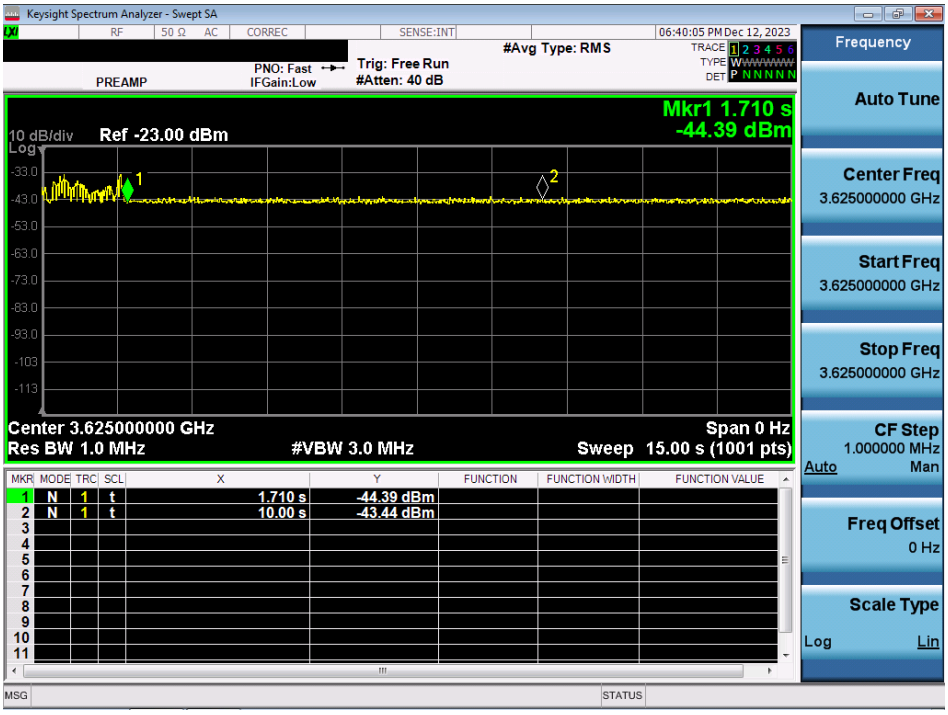
Test Notes

The EUT is an End User Device.

Run#1 – LTE Band 48:



Plot 7-103. Run#1 End User Device Frequency of Operations

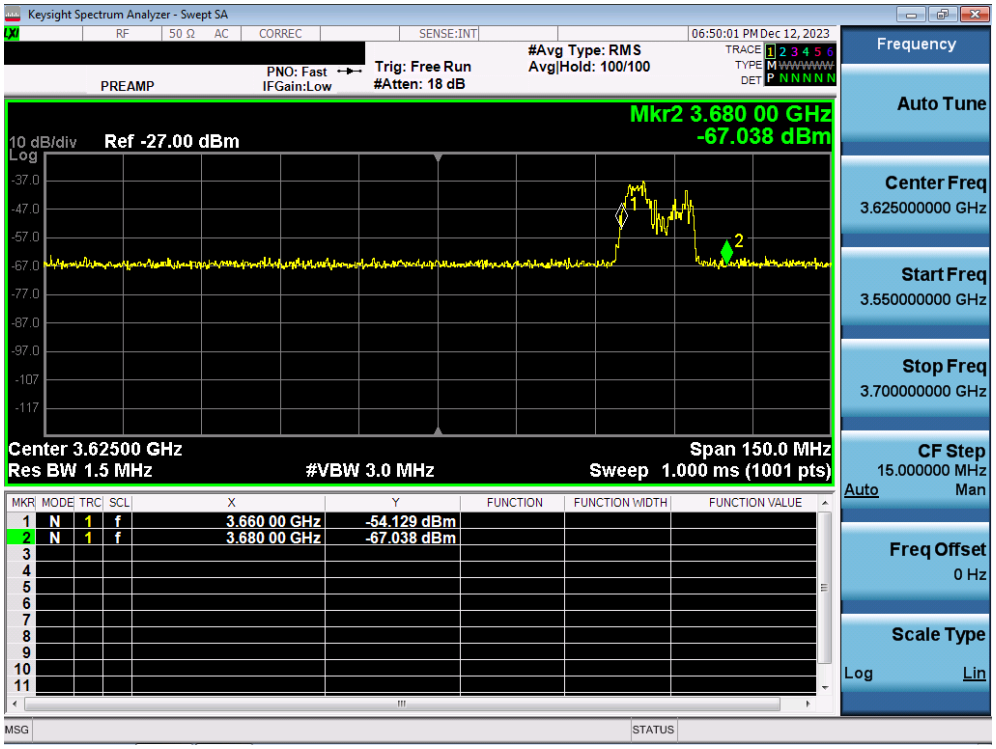


Plot 7-104. Run#1 End User Device Discontinues Operations within 10s

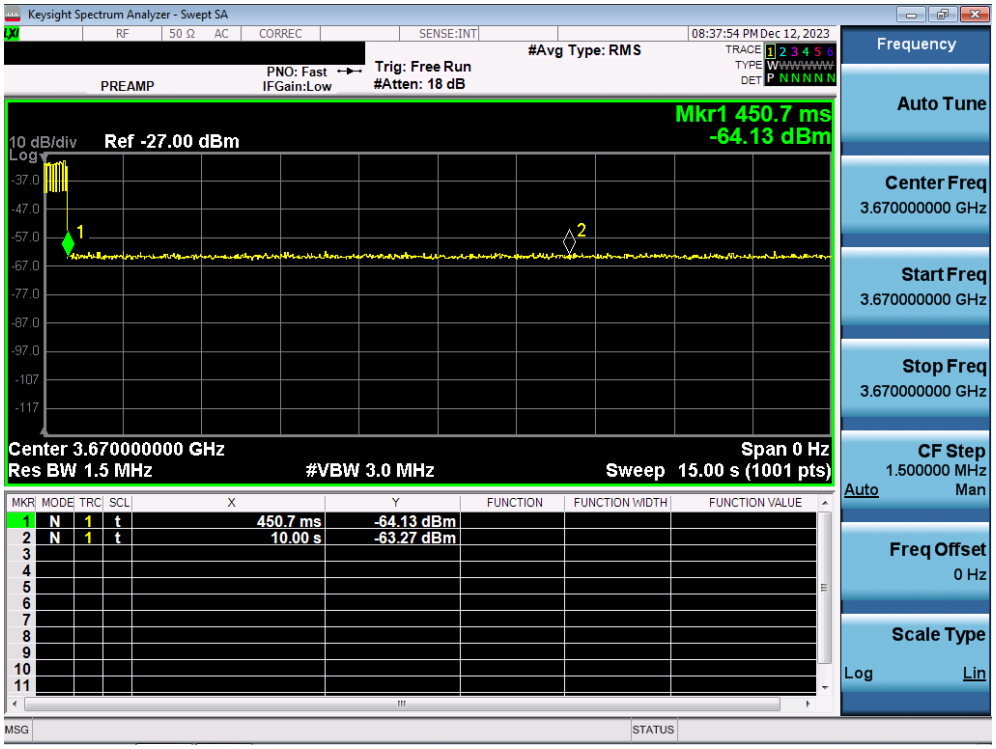
Note:

Start Freq: CBSD sends instructions to discontinue LTE operations.
Marker 1: EUT discontinues operation.
Marker 2: 10 seconds elapsed time from CBSD sending instructions to EUT.

Run#2 – LTE Band 48:



Plot 7-105. Run#2 End User Device Frequency of Operations



Plot 7-106. Run#2 End User Device Discontinues Operations within 10s

Note:

Marker 1: CBSD sends instructions to discontinue LTE operations.
Marker 2: EUT discontinues operation.
Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.