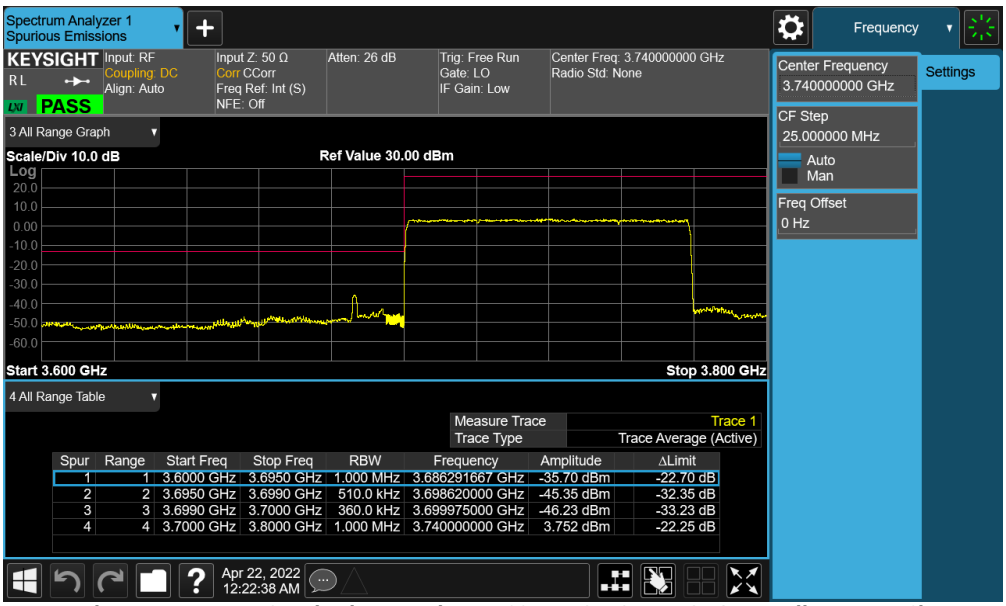
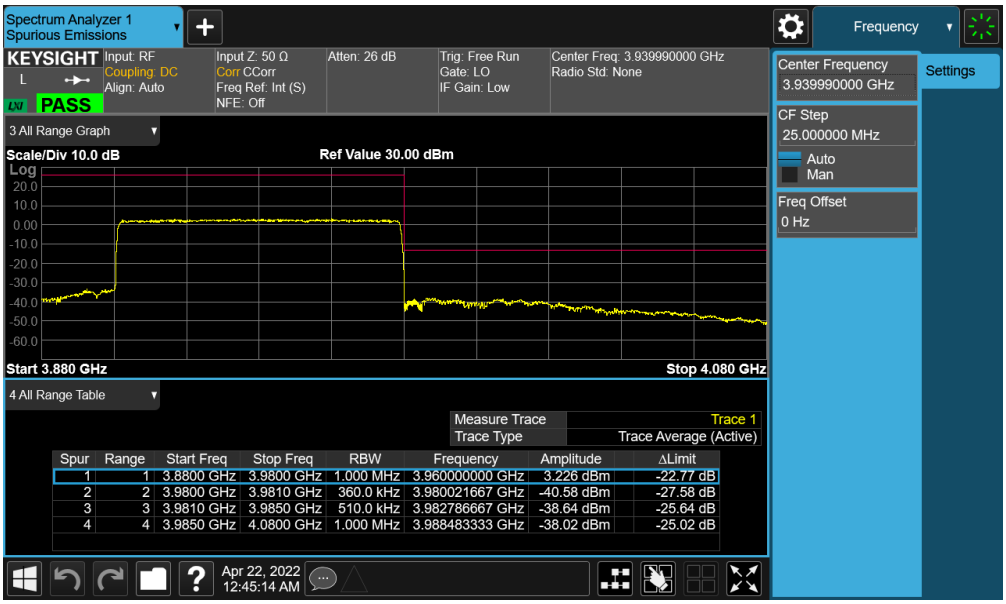
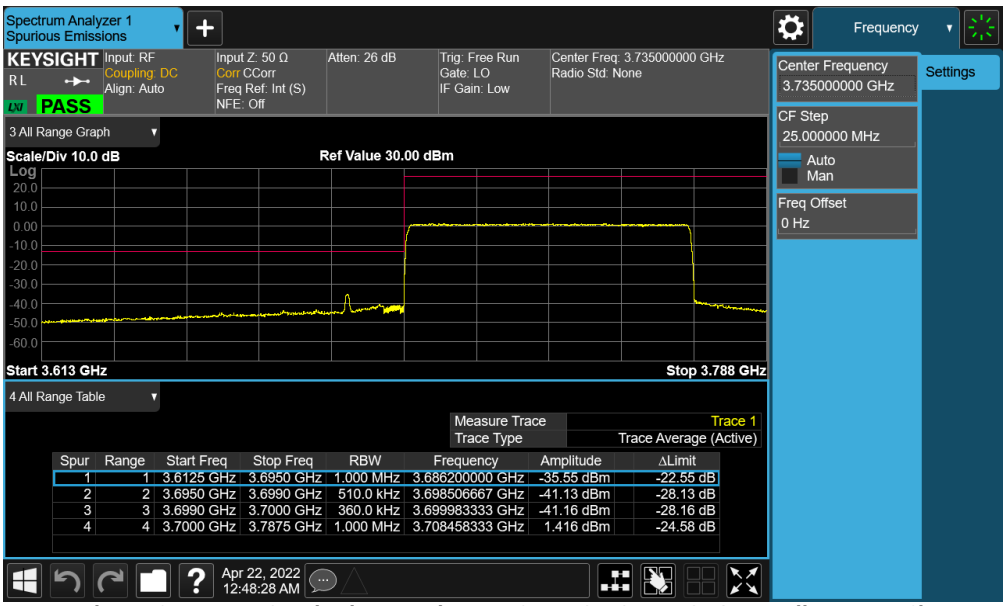


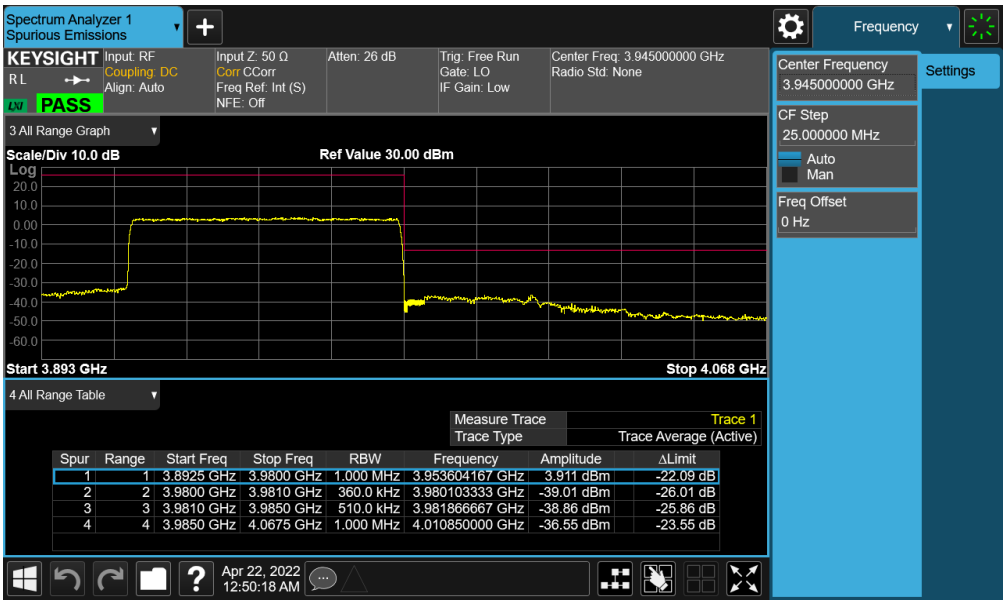
Plot 7-77. Lower ACP Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB - ANT2)



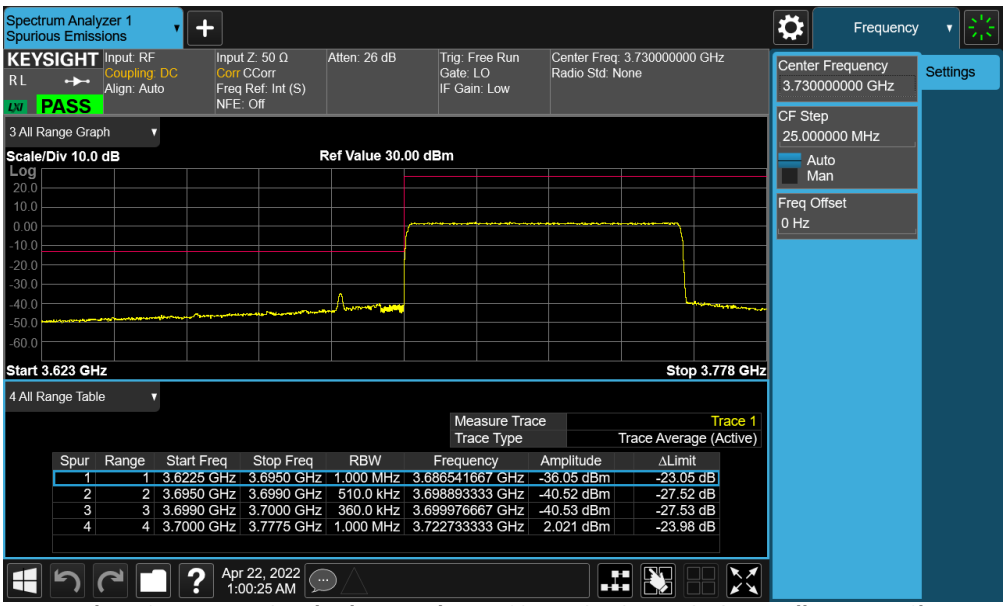
Plot 7-78. Upper ACP Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB - ANT2)



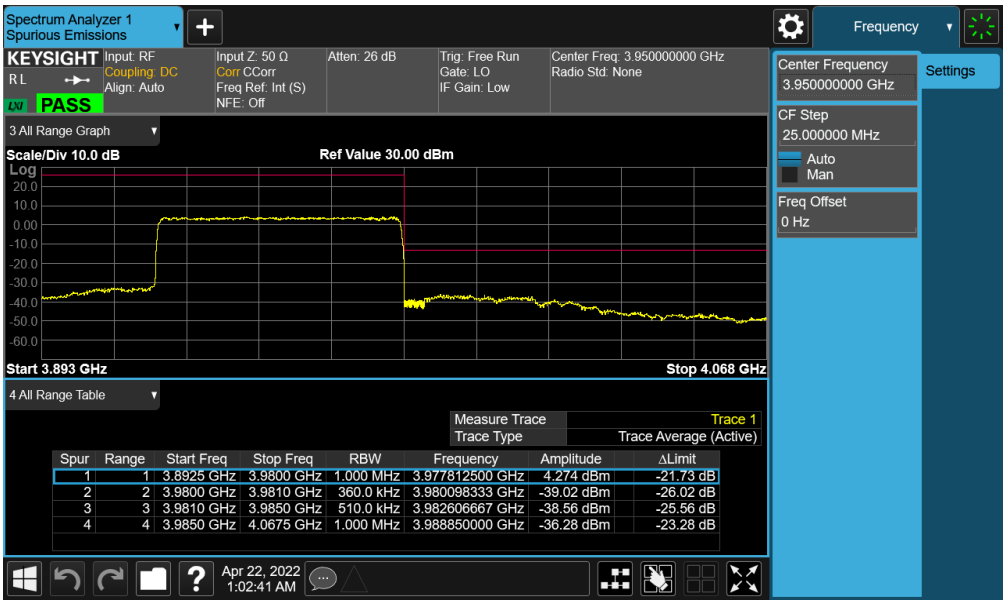
Plot 7-79. Lower ACP Plot (NR Band n77 - 70MHz CP-OFDM-QPSK – Full RB - ANT2)



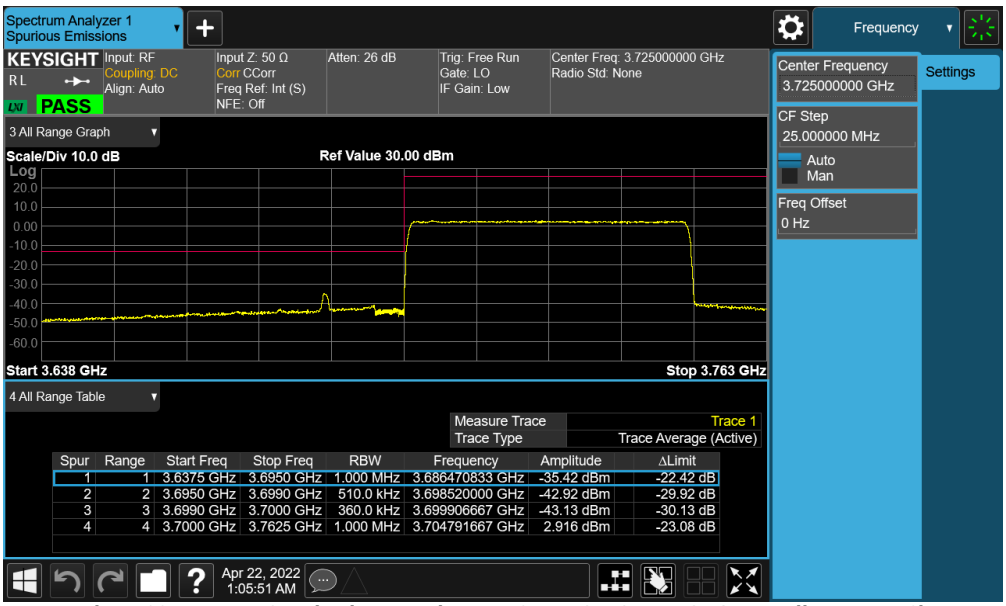
Plot 7-80. Upper ACP Plot (NR Band n77 - 70MHz CP-OFDM-QPSK – Full RB - ANT2)



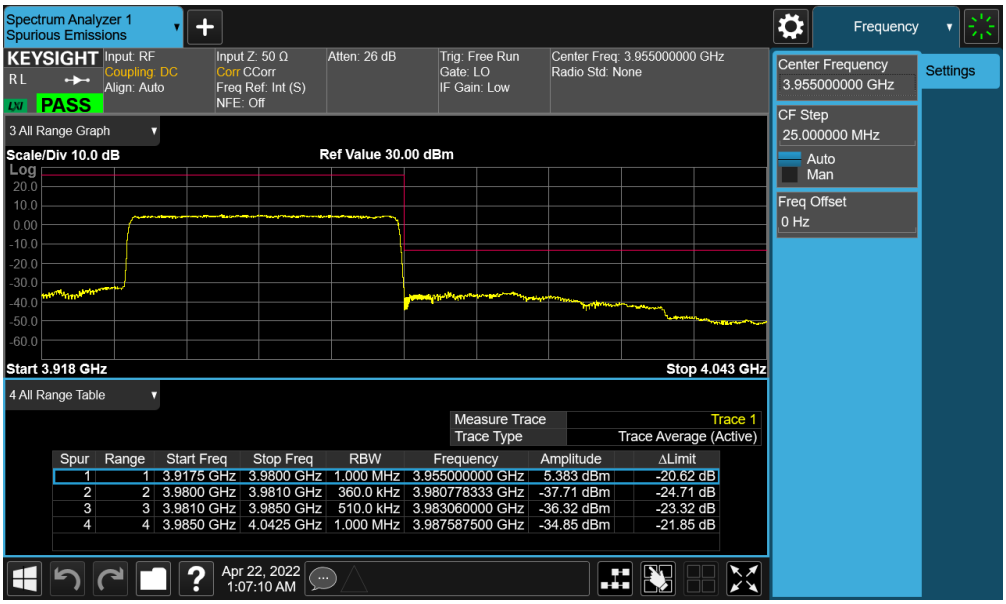
Plot 7-81. Lower ACP Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB - ANT2)



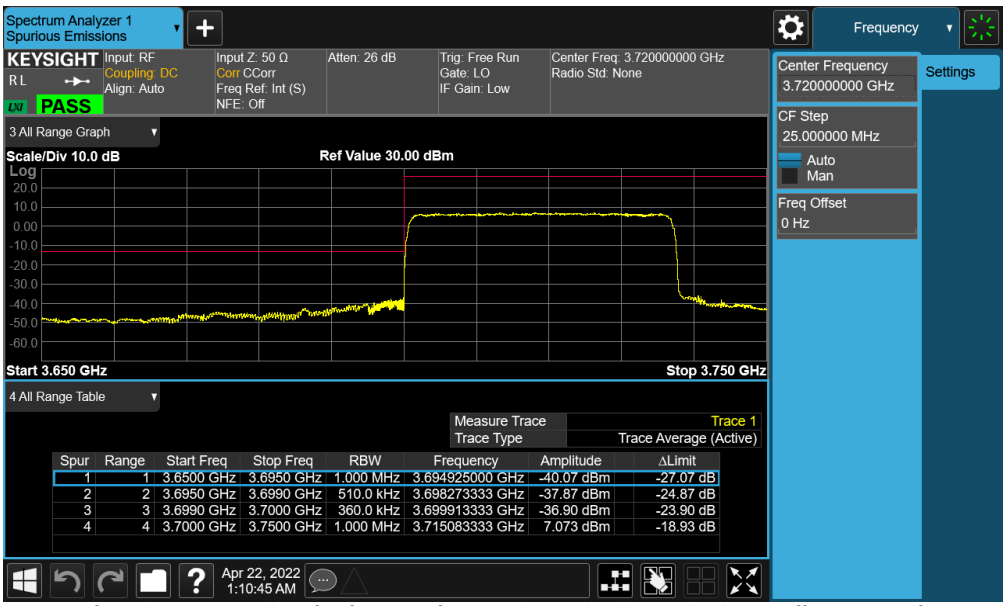
Plot 7-82. Upper ACP Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB - ANT2)



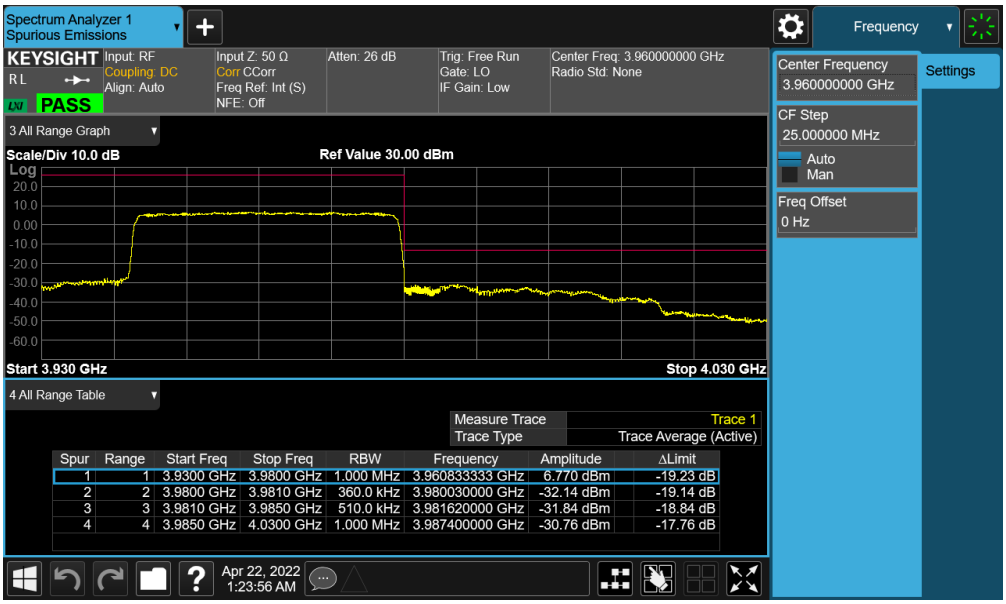
Plot 7-83. Lower ACP Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB - ANT2)



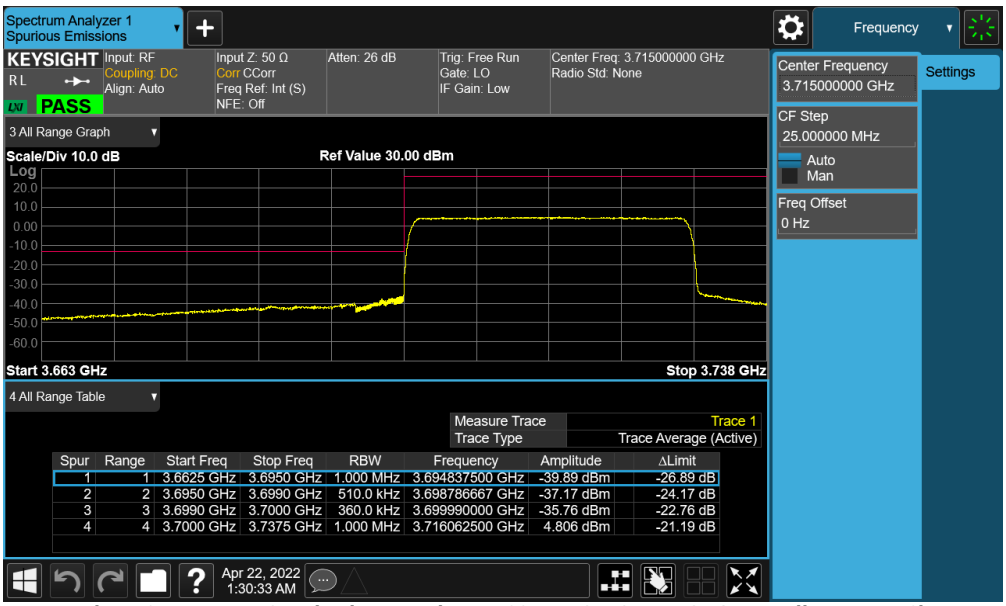
Plot 7-84. Upper ACP Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB - ANT2)



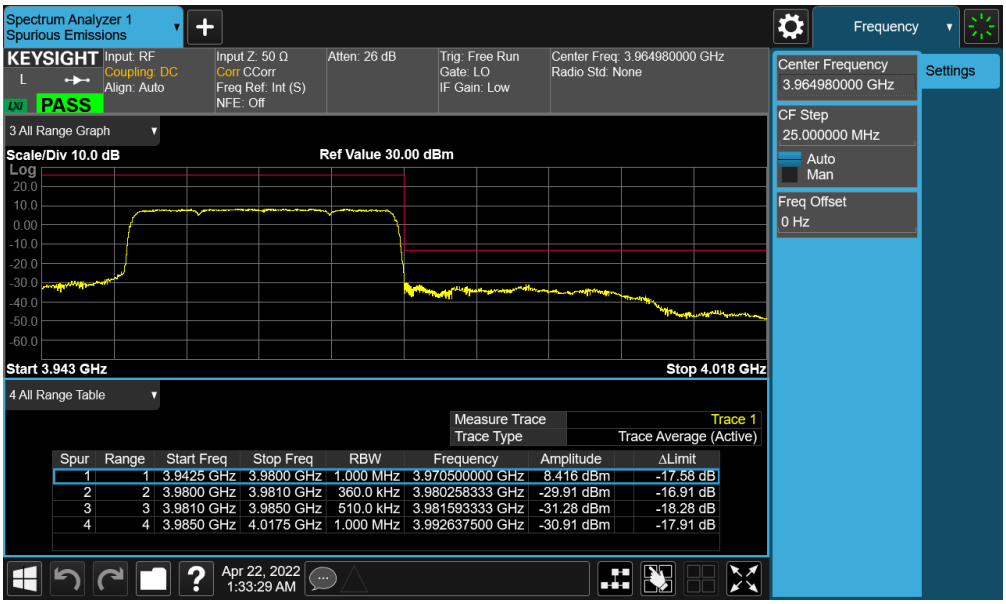
Plot 7-85. Lower ACP Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB - ANT2)



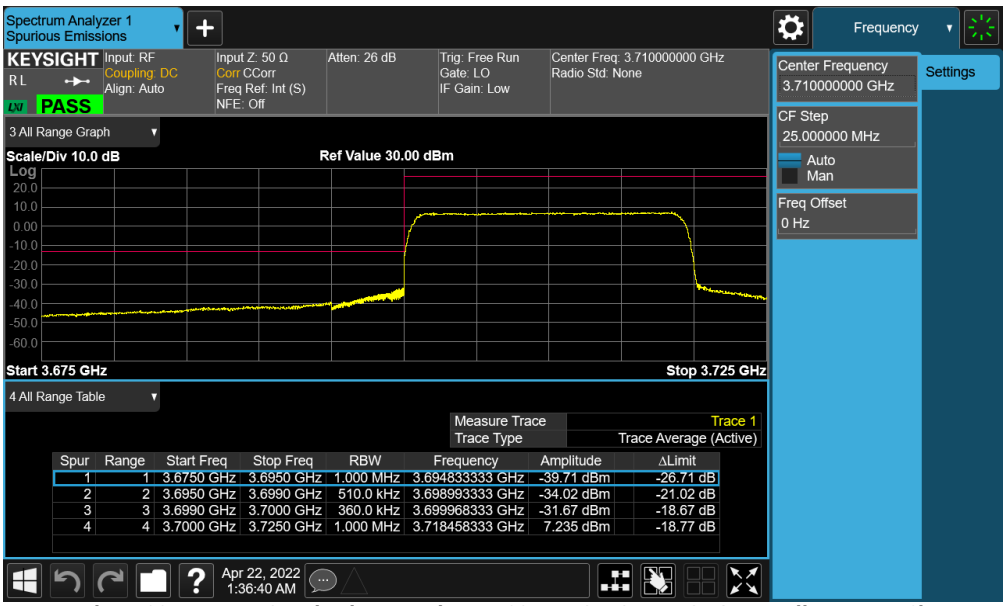
Plot 7-86. Upper ACP Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB - ANT2)



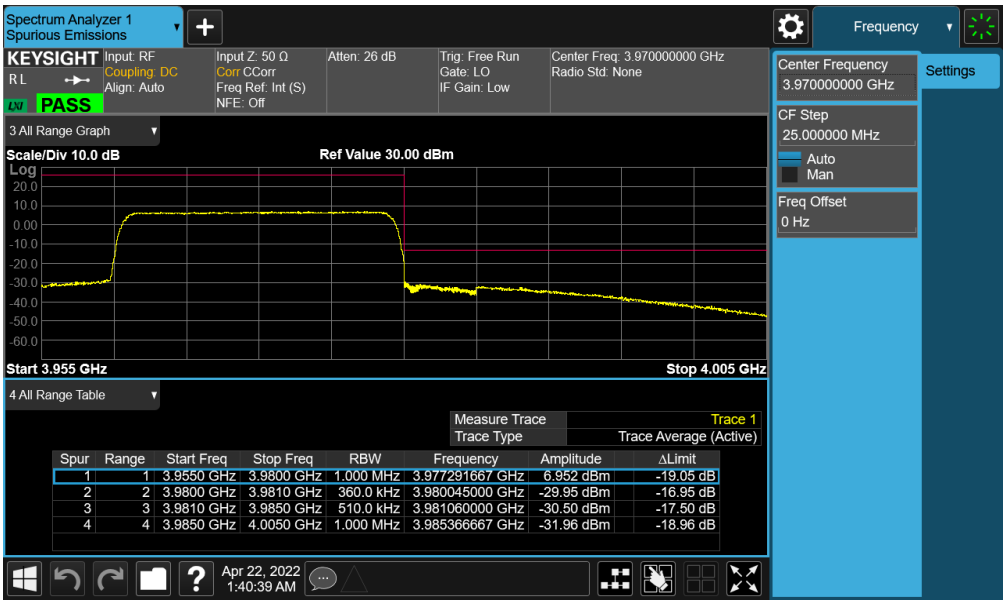
Plot 7-87. Lower ACP Plot (NR Band n77 - 30MHz CP-OFDM-QPSK – Full RB - ANT2)



Plot 7-88. Upper ACP Plot (NR Band n77 - 30MHz CP-OFDM-QPSK – Full RB - ANT2)

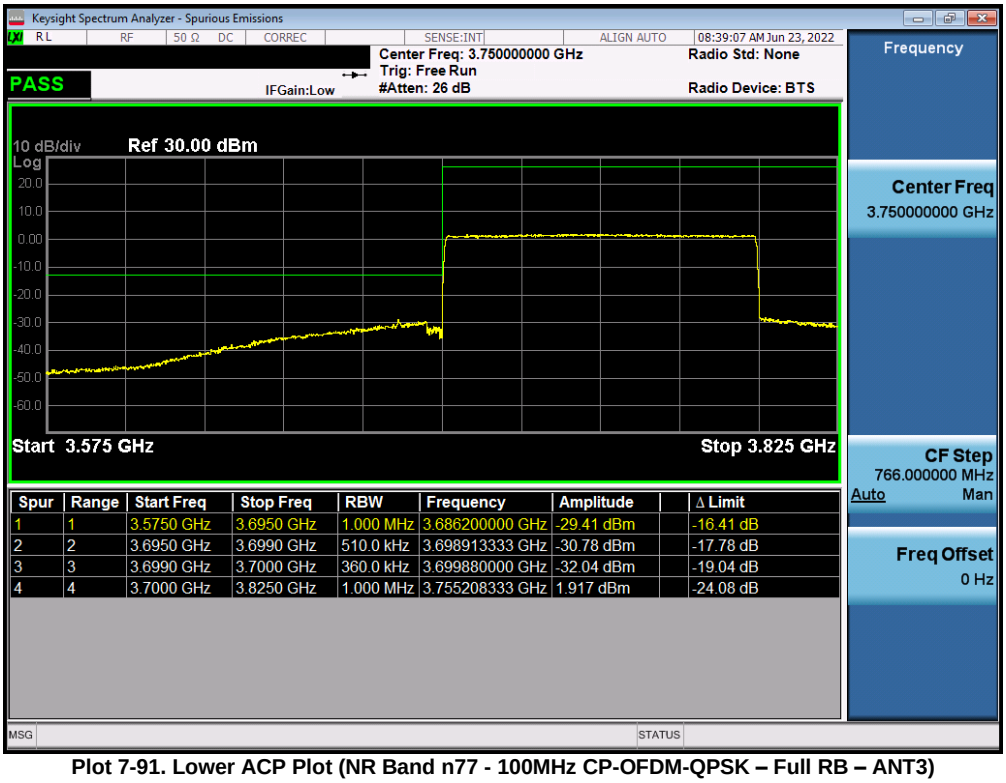


Plot 7-89. Lower ACP Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB - ANT2)



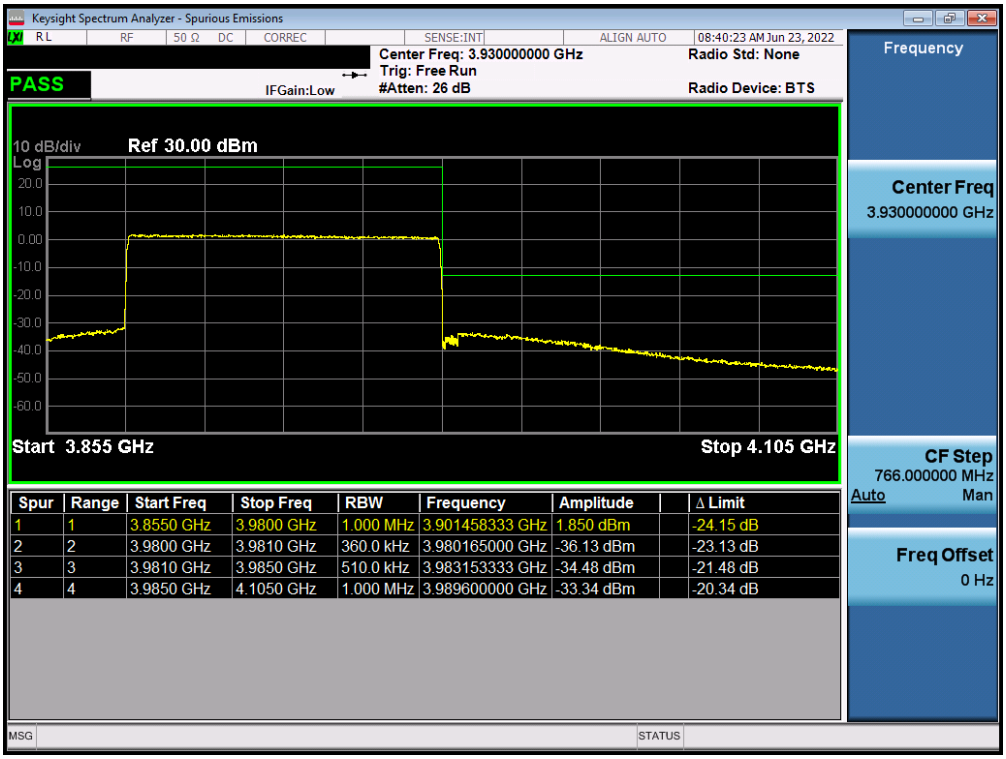
Plot 7-90. Upper ACP Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB - ANT2)

NR Band n77 – ANT3



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5750 GHz	3.6950 GHz	1.000 MHz	3.686200000 GHz	-29.41 dBm	-16.41 dB
2	2	3.6950 GHz	3.6990 GHz	510.0 kHz	3.698913333 GHz	-30.78 dBm	-17.78 dB
3	3	3.6990 GHz	3.7000 GHz	360.0 kHz	3.699880000 GHz	-32.04 dBm	-19.04 dB
4	4	3.7000 GHz	3.8250 GHz	1.000 MHz	3.755208333 GHz	1.917 dBm	-24.08 dB

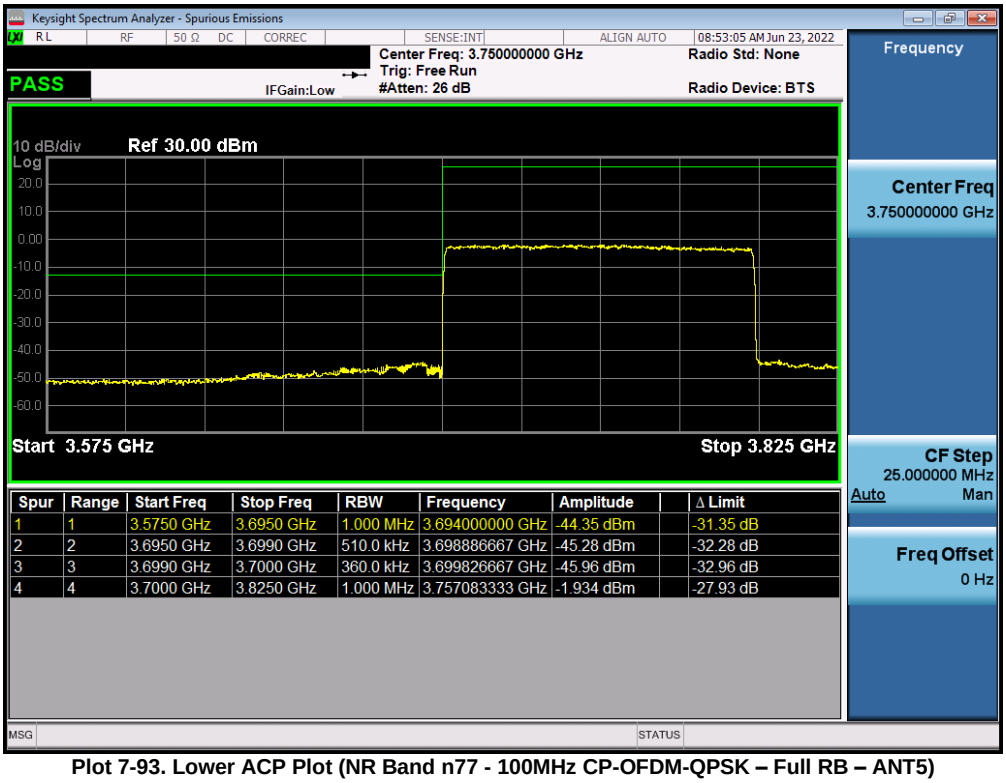
Plot 7-91. Lower ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT3)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.8550 GHz	3.9800 GHz	1.000 MHz	3.901458333 GHz	1.850 dBm	-24.15 dB
2	2	3.9800 GHz	3.9810 GHz	360.0 kHz	3.980165000 GHz	-36.13 dBm	-23.13 dB
3	3	3.9810 GHz	3.9850 GHz	510.0 kHz	3.983153333 GHz	-34.48 dBm	-21.48 dB
4	4	3.9850 GHz	4.1050 GHz	1.000 MHz	3.989600000 GHz	-33.34 dBm	-20.34 dB

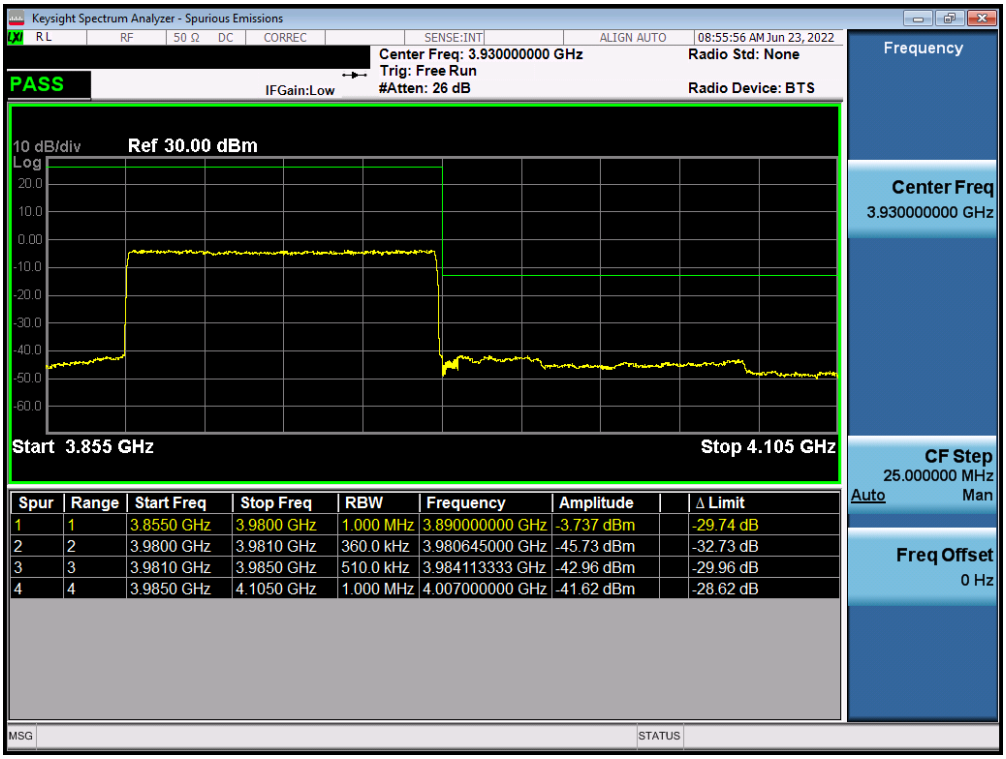
Plot 7-92. Upper ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT3)

NR Band n77 – ANT5



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5750 GHz	3.6950 GHz	1.000 MHz	3.694000000 GHz	-44.35 dBm	-31.35 dB
2	2	3.6950 GHz	3.6990 GHz	510.0 kHz	3.698886667 GHz	-45.28 dBm	-32.28 dB
3	3	3.6990 GHz	3.7000 GHz	360.0 kHz	3.699826667 GHz	-45.96 dBm	-32.96 dB
4	4	3.7000 GHz	3.8250 GHz	1.000 MHz	3.757083333 GHz	-1.934 dBm	-27.93 dB

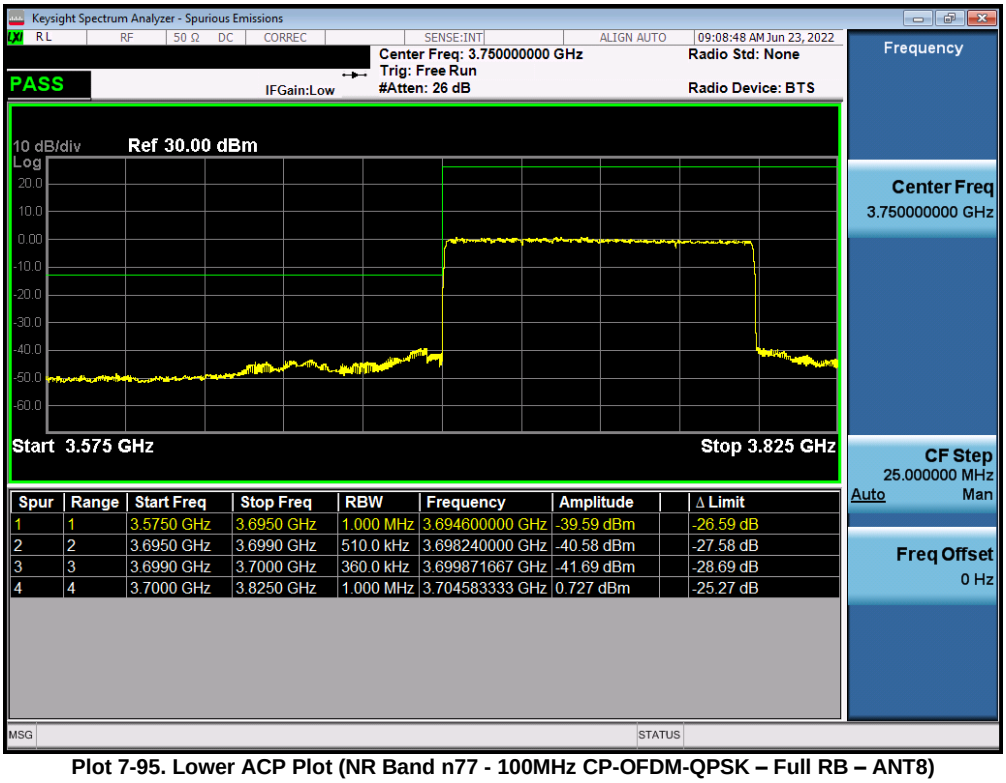
Plot 7-93. Lower ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT5)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.8550 GHz	3.9800 GHz	1.000 MHz	3.890000000 GHz	-3.737 dBm	-29.74 dB
2	2	3.9800 GHz	3.9810 GHz	360.0 kHz	3.980645000 GHz	-45.73 dBm	-32.73 dB
3	3	3.9810 GHz	3.9850 GHz	510.0 kHz	3.984113333 GHz	-42.96 dBm	-29.96 dB
4	4	3.9850 GHz	4.1050 GHz	1.000 MHz	4.007000000 GHz	-41.62 dBm	-28.62 dB

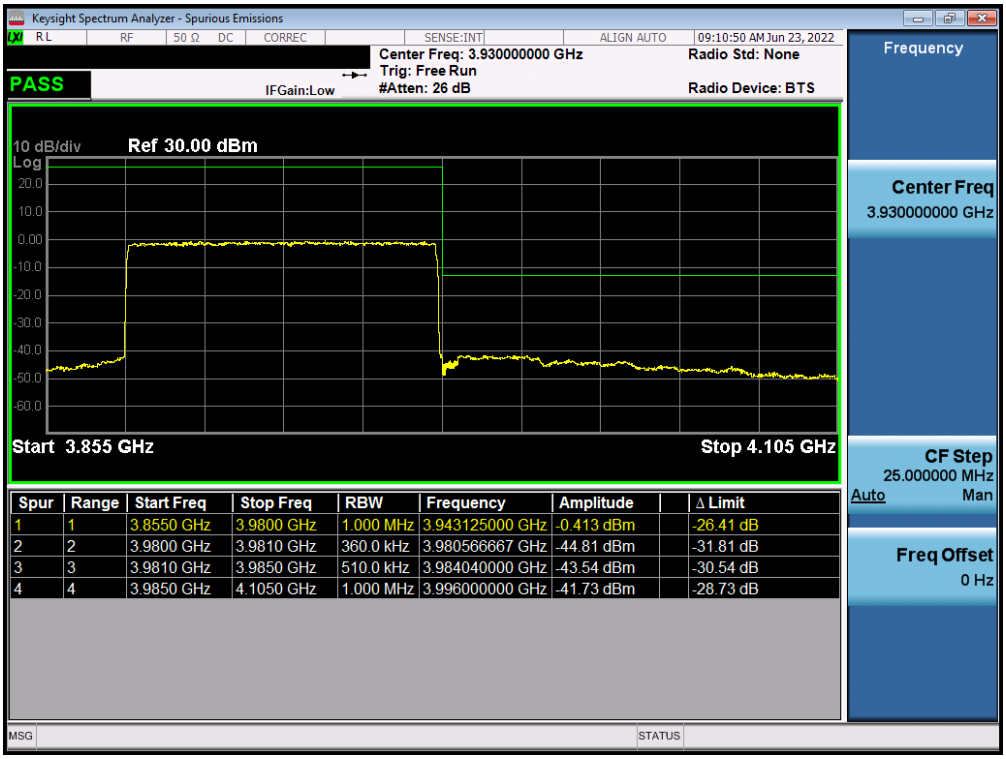
Plot 7-94. Upper ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT5)

NR Band n77 – ANT8



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5750 GHz	3.6950 GHz	1.000 MHz	3.694600000 GHz	-39.59 dBm	-26.59 dB
2	2	3.6950 GHz	3.6990 GHz	510.0 kHz	3.698240000 GHz	-40.58 dBm	-27.58 dB
3	3	3.6990 GHz	3.7000 GHz	360.0 kHz	3.699871667 GHz	-41.69 dBm	-28.69 dB
4	4	3.7000 GHz	3.8250 GHz	1.000 MHz	3.704583333 GHz	0.727 dBm	-25.27 dB

Plot 7-95. Lower ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT8)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.8550 GHz	3.9800 GHz	1.000 MHz	3.943125000 GHz	-0.413 dBm	-26.41 dB
2	2	3.9800 GHz	3.9810 GHz	360.0 kHz	3.980566667 GHz	-44.81 dBm	-31.81 dB
3	3	3.9810 GHz	3.9850 GHz	510.0 kHz	3.984040000 GHz	-43.54 dBm	-30.54 dB
4	4	3.9850 GHz	4.1050 GHz	1.000 MHz	3.996000000 GHz	-41.73 dBm	-28.73 dB

Plot 7-96. Upper ACP Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB – ANT8)

7.6 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

Test Procedure Used

ANSI C63.26-2015 – Section 5.2.3.4

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

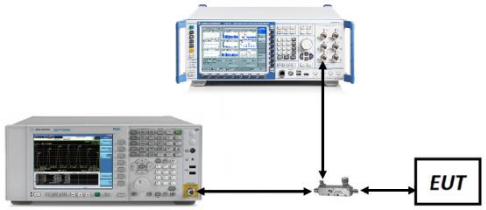
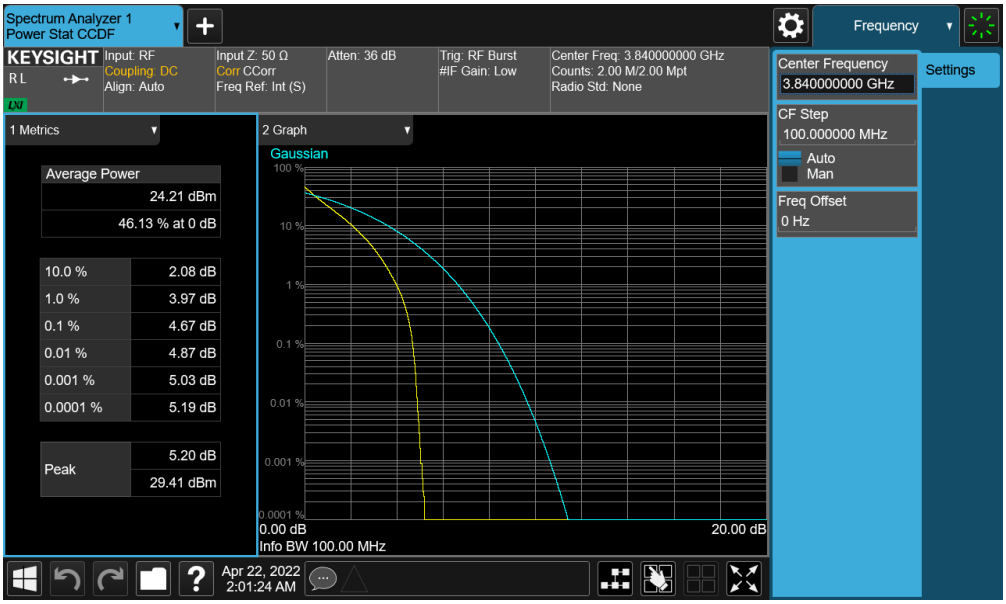


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

NR Band n77 – ANT2



Plot 7-97. PAR Plot (NR Band n77 - 100MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-98. PAR Plot (NR Band n77 - 100MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-99. PAR Plot (NR Band n77 - 100MHz CP-OFDM 256-QAM - Full RB - ANT2)

Plot 7-100. PAR Plot (NR Band n77 - 90MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-101. PAR Plot (NR Band n77 - 90MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-102. PAR Plot (NR Band n77 - 90MHz CP-OFDM 256-QAM - Full RB - ANT2)

Plot 7-103. PAR Plot (NR Band n77 - 80MHz DFT-s-OFDM BPSK - Full RB - ANT2)

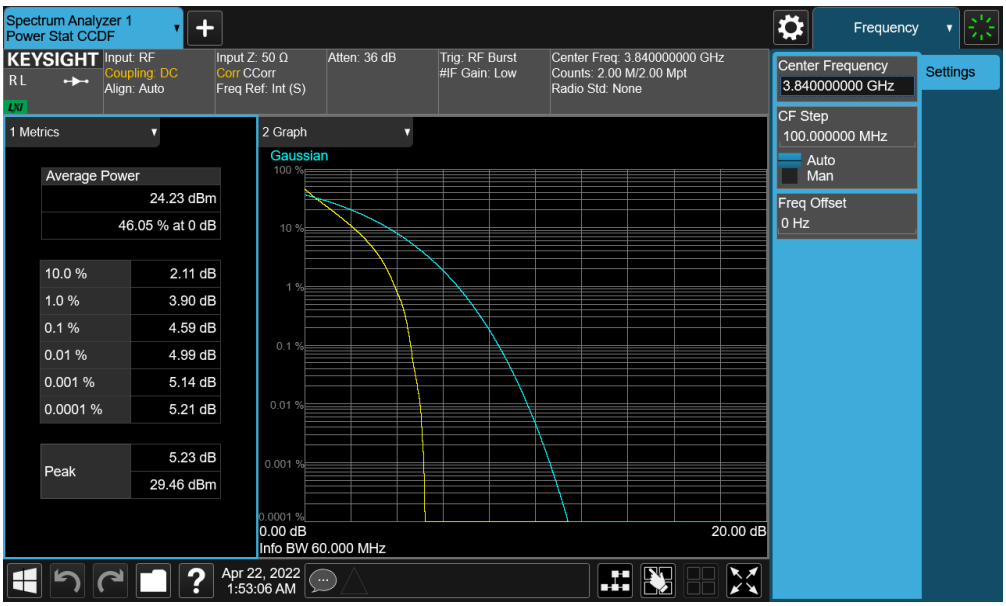
Plot 7-104. PAR Plot (NR Band n77 - 80MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-105. PAR Plot (NR Band n77 - 80MHz CP-OFDM 256-QAM - Full RB - ANT2)

Plot 7-106. PAR Plot (NR Band n77 - 70MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-107. PAR Plot (NR Band n77 - 70MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-108. PAR Plot (NR Band n77 - 70MHz CP-OFDM 256-QAM - Full RB - ANT2)



Plot 7-109. PAR Plot (NR Band n77 - 60MHz DFT-s-OFDM BPSK - Full RB - ANT2)

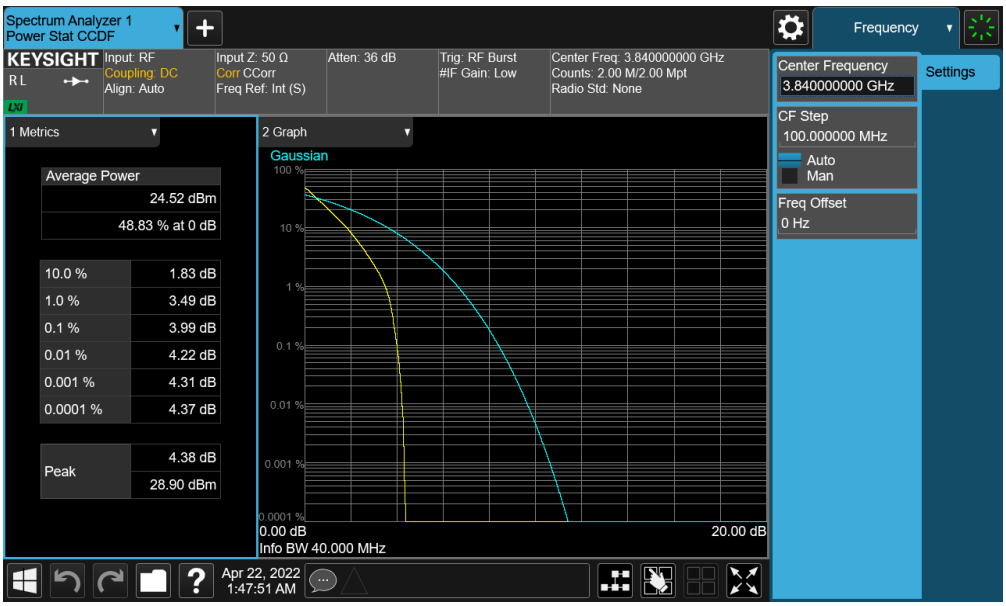
Plot 7-110. PAR Plot (NR Band n77 - 60MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-111. PAR Plot (NR Band n77 - 60MHz CP-OFDM 256-QAM - Full RB - ANT2)

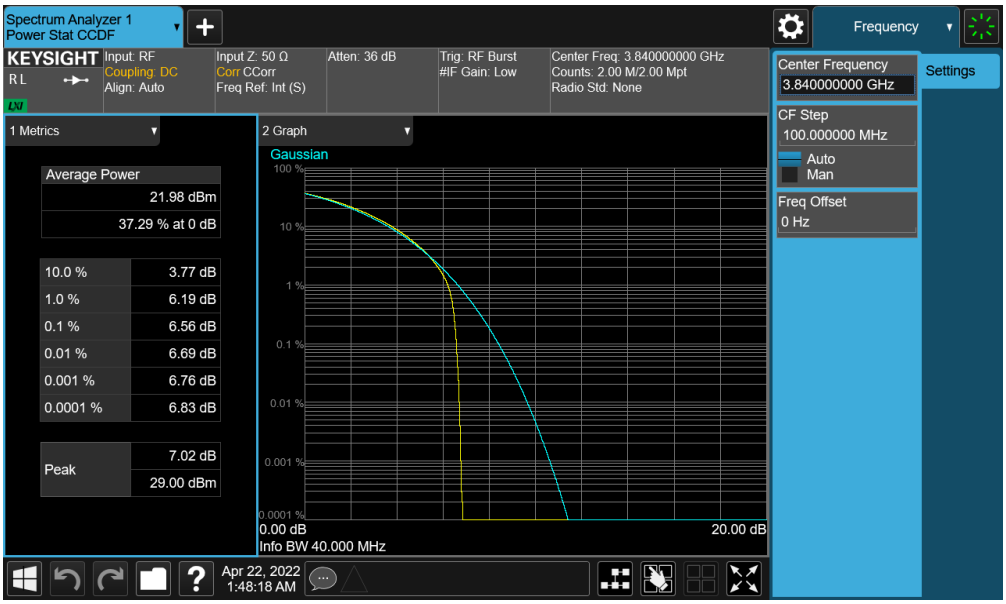
Plot 7-112. PAR Plot (NR Band n77 - 50MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-113. PAR Plot (NR Band n77 - 50MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-114. PAR Plot (NR Band n77 - 50MHz CP-OFDM 256-QAM - Full RB - ANT2)



Plot 7-115. PAR Plot (NR Band n77 - 40MHz DFT-s-OFDM BPSK - Full RB - ANT2)



Plot 7-116. PAR Plot (NR Band n77 - 40MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-117. PAR Plot (NR Band n77 - 40MHz CP-OFDM 256-QAM - Full RB - ANT2)

Plot 7-118. PAR Plot (NR Band n77 - 30MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-119. PAR Plot (NR Band n77 - 30MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-120. PAR Plot (NR Band n77 - 30MHz CP-OFDM 256-QAM - Full RB - ANT2)

Plot 7-121. PAR Plot (NR Band n77 - 20MHz DFT-s-OFDM BPSK - Full RB - ANT2)

Plot 7-122. PAR Plot (NR Band n77 - 20MHz CP-OFDM QPSK - Full RB - ANT2)

Plot 7-123. PAR Plot (NR Band n77 - 20MHz CP-OFDM 256-QAM - Full RB - ANT2)

7.7 Radiated Power (EIRP)

Test Overview

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

Test Procedures Used

ANSI C63.26-2015 – Section 5.2.4.4

Test Settings

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

Test Setup

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

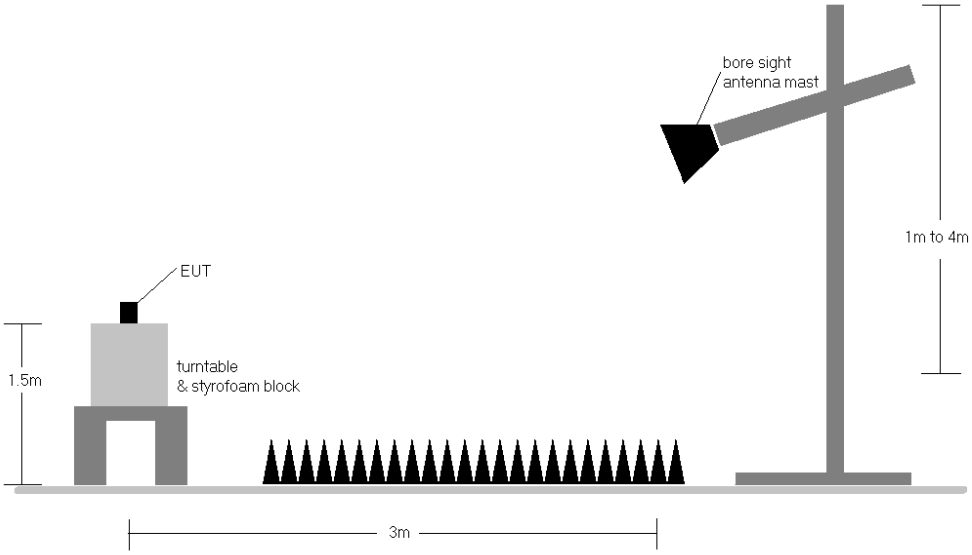


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

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

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.0	V	328	281	6.83	1 / 204	14.42	**21.25**	0.133	30.00	-8.75
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 204	14.77	21.24	0.133	30.00	-8.76
	π/2 BPSK	3930.0	V	339	280	6.49	1 / 68	13.97	20.46	0.111	30.00	-9.54
	QPSK	3750.0	V	328	281	6.83	1 / 204	14.32	21.15	0.130	30.00	-8.85
	QPSK	3840.0	V	313	275	6.47	1 / 204	14.65	21.12	0.130	30.00	-8.88
	QPSK	3930.0	V	339	280	6.49	1 / 68	13.94	20.43	0.111	30.00	-9.57
	16-QAM	3840.0	V	313	275	6.47	1 / 204	13.52	19.99	0.100	30.00	-10.01
90 MHz	π/2 BPSK	3745.0	V	328	281	6.81	1 / 122	14.40	21.21	0.132	30.00	-8.79
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 183	14.80	**21.27**	0.134	30.00	-8.73
	π/2 BPSK	3935.0	V	339	280	6.49	1 / 183	13.95	20.44	0.111	30.00	-9.56
	QPSK	3745.0	V	328	281	6.81	1 / 122	14.36	21.17	0.131	30.00	-8.83
	QPSK	3840.0	V	313	275	6.47	1 / 183	14.64	21.11	0.129	30.00	-8.89
	QPSK	3935.0	V	339	280	6.49	1 / 183	13.95	20.44	0.111	30.00	-9.56
	16-QAM	3840.0	V	313	275	6.47	1 / 183	13.49	19.96	0.099	30.00	-10.04
80 MHz	π/2 BPSK	3740.0	V	328	281	6.78	1 / 54	14.51	**21.29**	0.134	30.00	-8.71
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 162	14.80	21.27	0.134	30.00	-8.73
	π/2 BPSK	3940.0	V	339	280	6.48	1 / 162	13.93	20.41	0.110	30.00	-9.59
	QPSK	3740.0	V	328	281	6.78	1 / 54	14.38	21.16	0.131	30.00	-8.84
	QPSK	3840.0	V	313	275	6.47	1 / 162	14.56	21.03	0.127	30.00	-8.97
	QPSK	3940.0	V	339	280	6.48	1 / 162	13.93	20.41	0.110	30.00	-9.59
	16-QAM	3840.0	V	313	275	6.47	1 / 162	13.54	20.01	0.100	30.00	-9.99
70 MHz	π/2 BPSK	3735.0	V	328	281	6.76	1 / 47	14.53	**21.29**	0.135	30.00	-8.71
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 141	14.80	21.27	0.134	30.00	-8.73
	π/2 BPSK	3945.0	V	339	280	6.47	1 / 141	14.05	20.52	0.113	30.00	-9.48
	QPSK	3735.0	V	328	281	6.76	1 / 47	14.51	21.27	0.134	30.00	-8.73
	QPSK	3840.0	V	313	275	6.47	1 / 141	14.64	21.11	0.129	30.00	-8.89
	QPSK	3945.0	V	339	280	6.47	1 / 141	14.01	20.48	0.112	30.00	-9.52
	16-QAM	3840.0	V	313	275	6.47	1 / 141	13.48	19.95	0.099	30.00	-10.05
60 MHz	π/2 BPSK	3730.0	V	328	281	6.73	1 / 121	14.56	21.29	0.135	30.00	-8.71
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 121	14.87	**21.34**	0.136	30.00	-8.66
	π/2 BPSK	3950.0	V	339	280	6.46	1 / 121	14.07	20.53	0.113	30.00	-9.47
	QPSK	3730.0	V	328	281	6.73	1 / 121	14.47	21.20	0.132	30.00	-8.80
	QPSK	3840.0	V	313	275	6.47	1 / 121	14.73	21.20	0.132	30.00	-8.80
	QPSK	3950.0	V	339	280	6.46	1 / 121	13.93	20.39	0.109	30.00	-9.61
	16-QAM	3840.0	V	313	275	6.47	1 / 121	13.46	19.93	0.098	30.00	-10.07
50 MHz	π/2 BPSK	3725.0	V	328	281	6.71	1 / 33	14.51	21.22	0.132	30.00	-8.78
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 99	14.76	**21.23**	0.133	30.00	-8.77
	π/2 BPSK	3955.0	V	339	280	6.43	1 / 66	13.96	20.39	0.109	30.00	-9.61
	QPSK	3725.0	V	328	281	6.71	1 / 33	14.42	21.13	0.130	30.00	-8.87
	QPSK	3840.0	V	313	275	6.47	1 / 99	14.65	21.12	0.129	30.00	-8.88
	QPSK	3955.0	V	339	280	6.43	1 / 66	13.87	20.30	0.107	30.00	-9.70
	16-QAM	3840.0	V	313	275	6.47	1 / 99	13.53	20.00	0.100	30.00	-10.00
40 MHz	π/2 BPSK	3720.0	V	328	281	6.68	1 / 26	14.91	**21.59**	0.144	30.00	-8.41
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 79	15.05	21.52	0.142	30.00	-8.48
	π/2 BPSK	3960.0	V	339	280	6.41	1 / 26	14.41	20.82	0.121	30.00	-9.18
	QPSK	3720.0	V	328	281	6.68	1 / 26	14.80	21.48	0.141	30.00	-8.52
	QPSK	3840.0	V	313	275	6.47	1 / 79	14.90	21.37	0.137	30.00	-8.63
	QPSK	3960.0	V	339	280	6.41	1 / 26	14.30	20.71	0.118	30.00	-9.29
	16-QAM	3720.0	V	328	281	6.68	1 / 26	13.69	20.37	0.109	30.00	-9.63
30 MHz	π/2 BPSK	3715.0	V	328	281	6.66	1 / 19	14.99	**21.65**	0.146	30.00	-8.35
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 58	15.09	21.56	0.143	30.00	-8.44
	π/2 BPSK	3965.0	V	339	280	6.39	1 / 19	14.29	20.68	0.117	30.00	-9.32
	QPSK	3715.0	V	328	281	6.66	1 / 19	14.73	21.39	0.138	30.00	-8.61
	QPSK	3840.0	V	313	275	6.47	1 / 58	14.88	21.35	0.137	30.00	-8.65
	QPSK	3965.0	V	339	280	6.39	1 / 19	14.22	20.61	0.115	30.00	-9.39
	16-QAM	3840.0	V	313	275	6.47	1 / 58	13.89	20.36	0.109	30.00	-9.64
20 MHz	π/2 BPSK	3710.0	V	328	281	6.63	1 / 25	14.69	**21.32**	0.136	30.00	-8.68
	π/2 BPSK	3840.0	V	313	275	6.47	1 / 25	14.82	21.29	0.135	30.00	-8.71
	π/2 BPSK	3970.0	V	339	280	6.37	1 / 37	14.21	20.58	0.114	30.00	-9.42
	QPSK	3710.0	V	328	281	6.63	1 / 25	14.52	21.15	0.130	30.00	-8.85
	QPSK	3840.0	V	313	275	6.47	1 / 25	14.54	21.01	0.126	30.00	-8.99
	QPSK	3970.0	V	339	280	6.37	1 / 37	13.99	20.36	0.109	30.00	-9.64
	16-QAM	3710.0	V	328	281	6.63	1 / 25	13.51	20.14	0.103	30.00	-9.86
100 MHz	QPSK (CP-OFDM)	3750.0	V	308	277	6.83	1 / 37	12.86	19.69	0.093	30.00	-10.31
	QPSK (Opposite Pol.)	3750.0	H	102	297	5.98	1 / 13	14.22	20.20	0.105	30.00	-9.80

Table 7-5. EIRP Data (NR Band n77 – 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]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.0	H	137	13	6.83	1 / 136	14.95	**21.78**	0.151	30.00	-8.22
	π/2 BPSK	3840.0	H	108	9	6.47	1 / 136	13.99	20.46	0.111	30.00	-9.54
	π/2 BPSK	3930.0	H	152	10	6.49	1 / 68	13.55	20.04	0.101	30.00	-9.96
	QPSK	3750.0	H	137	13	6.83	1 / 136	14.46	21.29	0.135	30.00	-8.71
	QPSK	3840.0	H	108	9	6.47	1 / 136	13.45	19.92	0.098	30.00	-10.08
	QPSK	3930.0	H	152	10	6.49	1 / 136	13.02	19.51	0.089	30.00	-10.49
	16-QAM	3750.0	H	137	13	6.83	1 / 136	13.55	20.38	0.109	30.00	-9.62
100 MHz	QPSK (CP-OFDM)	3750.0	H	155	25	5.98	1 / 136	14.45	20.43	0.110	30.00	-9.57
	QPSK (Opposite Pol.)	3750.0	V	246	123	6.83	1 / 136	13.55	20.38	0.109	30.00	-9.62

Table 7-6. EIRP Data (NR Band n77 – 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]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.0	H	121	33	5.98	1 / 204	8.36	14.34	0.027	30.00	-15.66
	π/2 BPSK	3840.0	H	114	37	6.02	1 / 136	8.61	**14.63**	0.029	30.00	-15.37
	π/2 BPSK	3930.0	H	126	41	5.99	1 / 68	7.60	13.59	0.023	30.00	-16.41
	QPSK	3750.0	H	121	33	5.98	1 / 204	7.33	13.31	0.021	30.00	-16.69
	QPSK	3840.0	H	114	37	6.02	1 / 136	7.44	13.46	0.022	30.00	-16.54
	QPSK	3930.0	H	126	41	5.99	1 / 68	6.99	12.98	0.020	30.00	-17.02
	16-QAM	3750.0	H	121	33	5.98	1 / 204	6.77	12.75	0.019	30.00	-17.25
100 MHz	QPSK (CP-OFDM)	3840.0	H	135	40	6.02	1 / 136	7.43	13.45	0.022	30.00	-16.55
	QPSK (Opposite Pol.)	3840.0	V	294	49	6.47	1 / 136	6.86	13.33	0.022	30.00	-16.67

Table 7-7. EIRP Data (NR Band n77 – 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]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.0	H	112	333	5.98	1 / 204	8.79	14.77	0.030	30.00	-15.23
	π/2 BPSK	3840.0	H	103	333	6.02	1 / 204	9.00	**15.02**	0.032	30.00	-14.98
	π/2 BPSK	3930.0	H	148	232	5.99	1 / 68	8.52	14.51	0.028	30.00	-15.49
	QPSK	3750.0	H	112	333	5.98	1 / 204	8.86	14.84	0.030	30.00	-15.16
	QPSK	3840.0	H	103	333	6.02	1 / 204	8.75	14.77	0.030	30.00	-15.23
	QPSK	3930.0	H	148	232	5.99	1 / 136	8.78	14.77	0.030	30.00	-15.23
	16-QAM	3840.0	H	103	333	6.02	1 / 204	8.49	14.51	0.028	30.00	-15.49
100 MHz	QPSK (CP-OFDM)	3840.0	H	117	330	6.02	1 / 204	8.31	14.33	0.027	30.00	-15.67
	QPSK (Opposite Pol.)	3840.0	V	251	91	6.47	1 / 204	7.79	14.26	0.027	30.00	-15.74

Table 7-8. EIRP Data (NR Band n77 – ANT8)

7.8 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

Test Settings

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

Test Setup

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

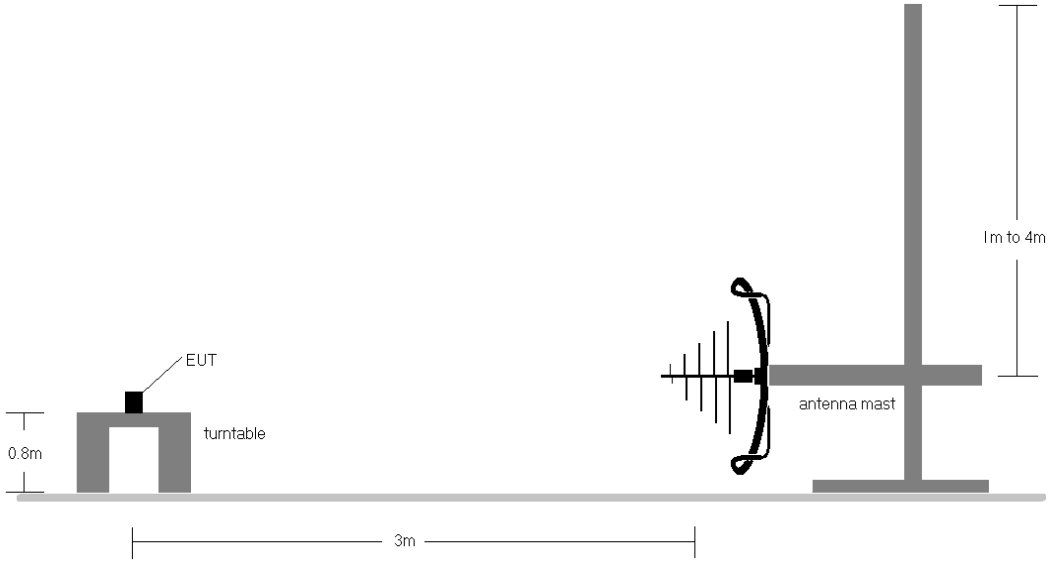


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

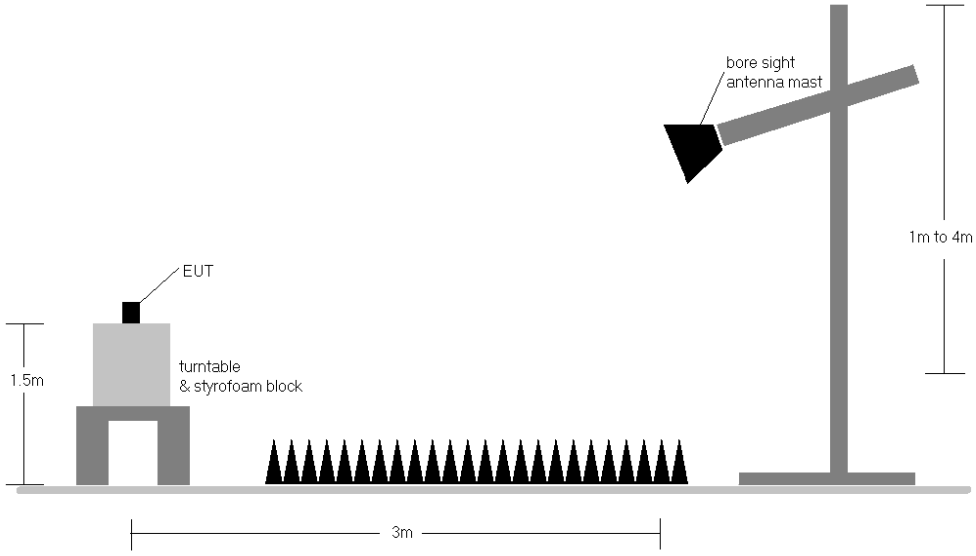


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

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.

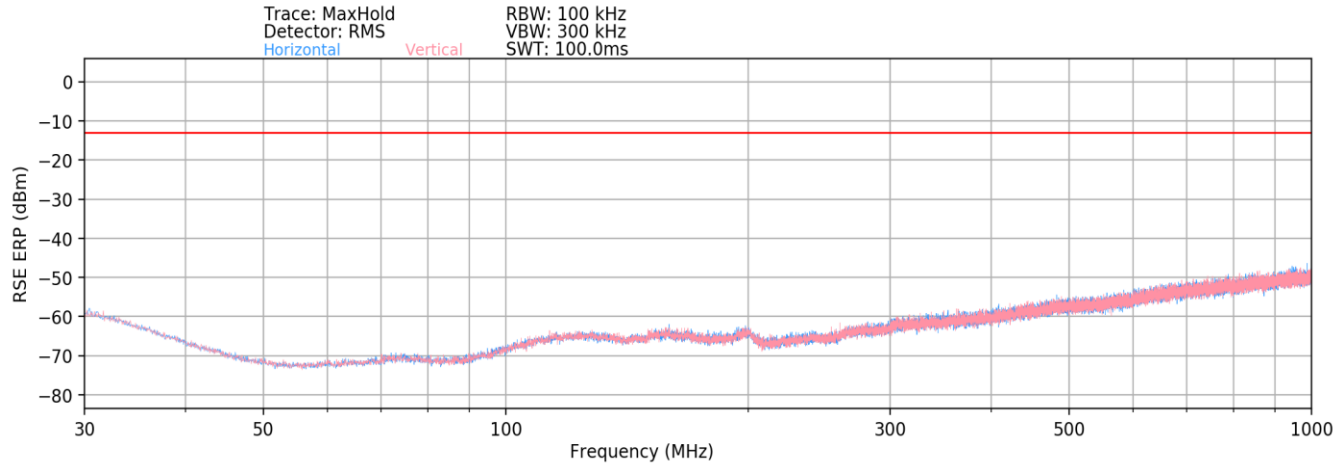
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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 emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is 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.

NR Band n77 – ANT2

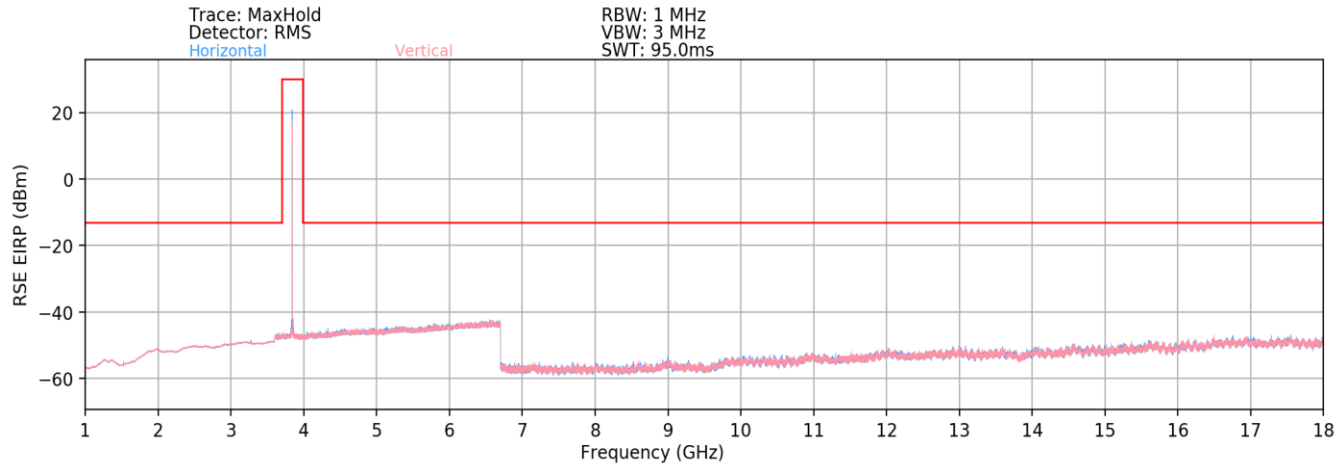


Plot 7-124. Radiated Spurious Plot Below 1GHz (NR Band n77 – ANT2)

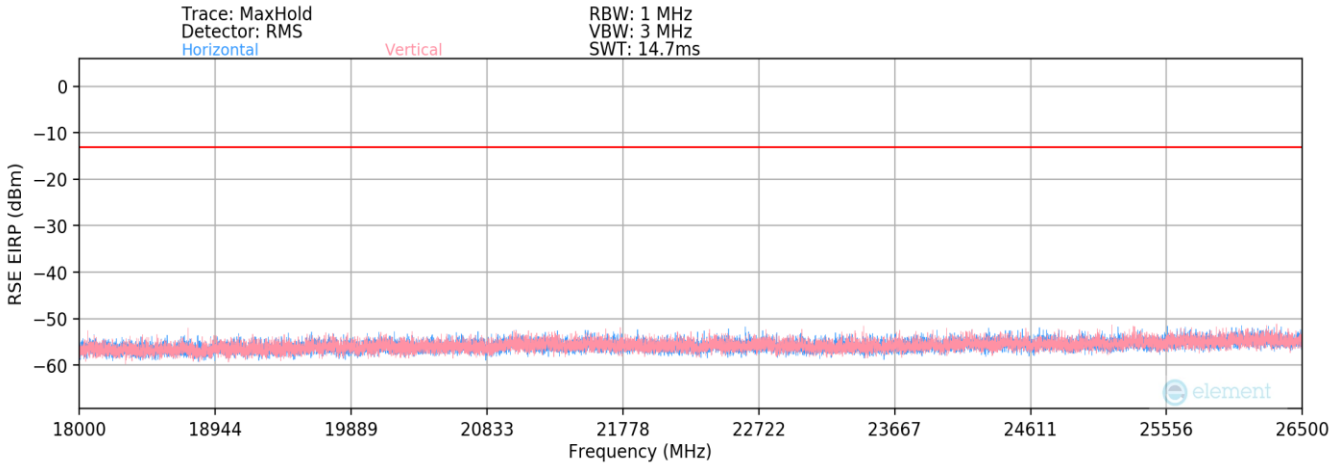
Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand-alone

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]
168.8	H	-	-	-89.52	19.69	37.17	-60.24	-13.00	-47.24
503.4	H	-	-	-86.03	25.79	46.76	-50.64	-13.00	-37.64

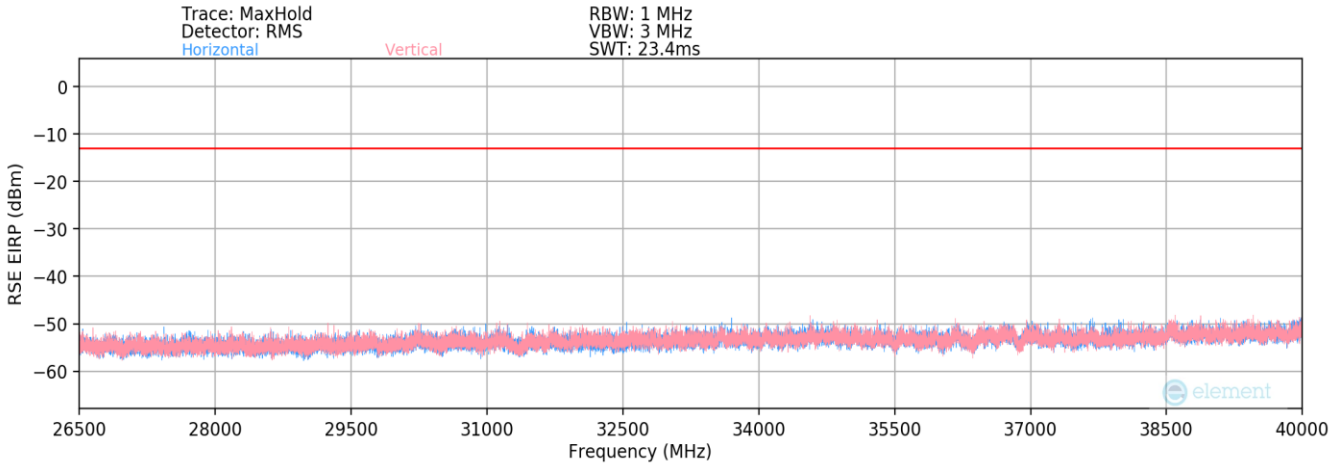
Table 7-9. Radiated Spurious Data (NR Band n77 – ANT2)



Plot 7-125. Radiated Spurious Plot Above 1GHz (NR Band n77 – ANT2)



Plot 7-126. Radiated Spurious Plot- 18-26.5GHz (NR Band n77 – ANT2)



Plot 7-127. Radiated Spurious Plot- 26.5-40GHz (NR Band n77 – ANT2)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7500.0	H	-	-	-78.53	8.39	36.86	-58.40	-13.00	-45.40
11250.0	H	334	149	-76.24	12.73	43.49	-51.77	-13.00	-38.77
15000.0	H	-	-	-80.15	15.87	42.72	-52.54	-13.00	-39.54

Table 7-10. Radiated Spurious Data (NR Band n77 – Low Channel – ANT2)

Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7680.0	H	-	-	-77.08	7.60	37.52	-57.74	-13.00	-44.74
11520.0	H	290	59	-73.68	13.33	46.65	-48.61	-13.00	-35.61
15360.0	H	-	-	-79.23	16.42	44.19	-51.07	-13.00	-38.07

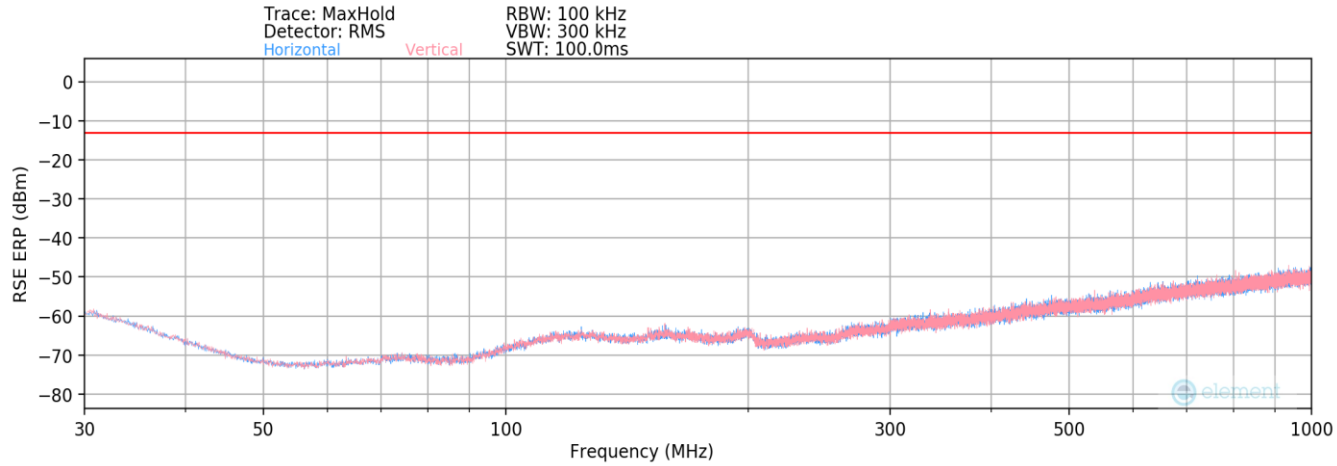
Table 7-11. Radiated Spurious Data (NR Band n77 – Mid Channel – ANT2)

Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7860.0	H	-	-	-77.58	8.39	37.81	-57.45	-13.00	-44.45
11790.0	H	307	63	-76.00	13.64	44.64	-50.62	-13.00	-37.62
15720.0	H	-	-	-80.12	17.52	44.40	-50.85	-13.00	-37.85

Table 7-12. Radiated Spurious Data (NR Band n77 – High Channel – ANT2)

NR Band n77 – ANT3

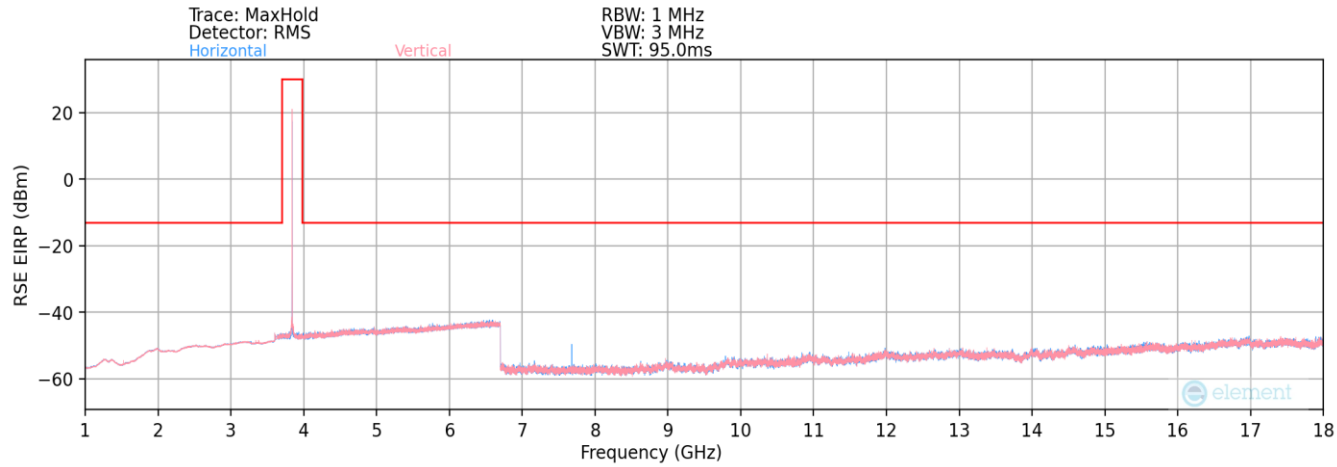


Plot 7-128. Radiated Spurious Plot Below 1GHz (NR Band n77 – ANT3)

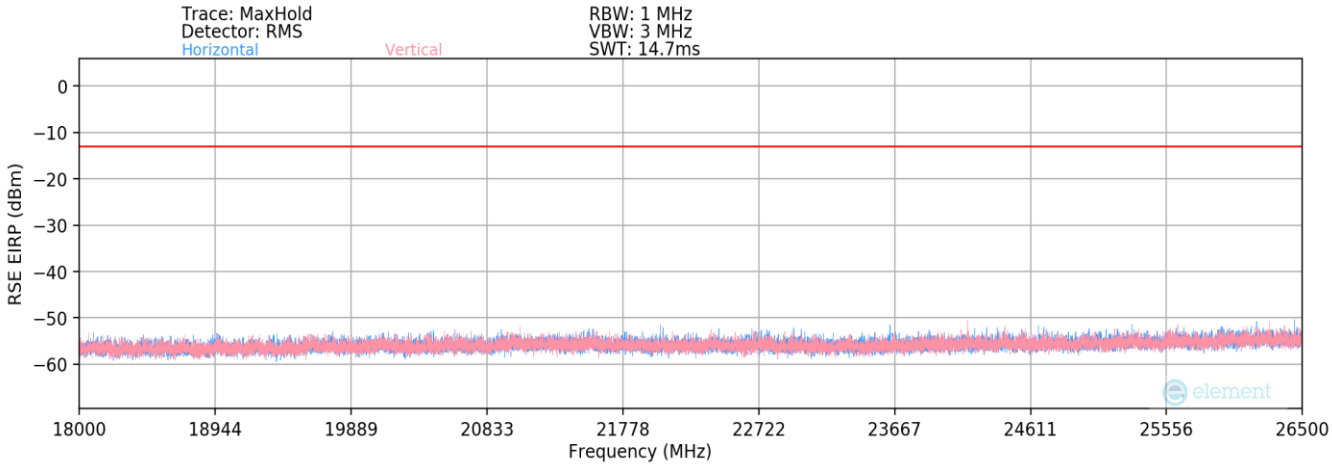
Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
667.7	H	-	-	-85.24	28.47	50.23	-47.18	-13.00	-34.18
896.1	H	-	-	-84.12	31.25	54.13	-43.28	-13.00	-30.28

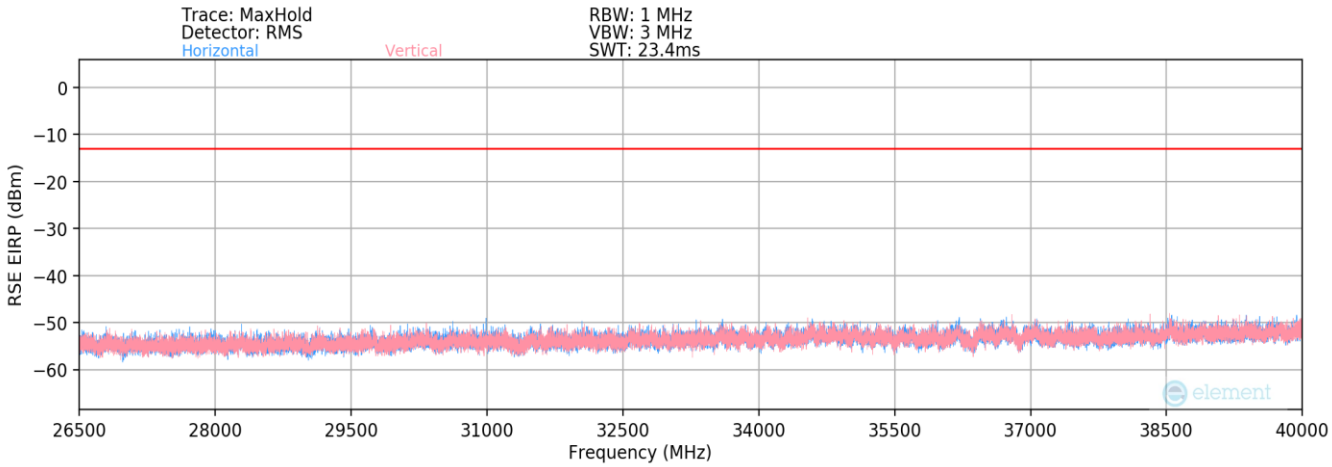
Table 7-13. Radiated Spurious Data (NR Band n77 – ANT3)



Plot 7-129. Radiated Spurious Plot Above 1GHz (NR Band n77 – ANT3)



Plot 7-130. Radiated Spurious Plot – 18- 26.5GHz (NR Band n77 – ANT3)



Plot 7-131. Radiated Spurious Plot – 26.5-40GHz (NR Band n77 – ANT3)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7500.0	H	204	358	-68.12	8.39	47.27	-47.99	-13.00	-34.99
11250.0	H	-	-	-79.79	12.73	39.94	-55.32	-13.00	-42.32
15000.0	H	-	-	-80.69	15.87	42.18	-53.08	-13.00	-40.08

Table 7-14. Radiated Spurious Data (NR Band n77 – Low Channel – ANT3)

Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7680.0	H	155	12	-69.63	7.60	44.97	-50.29	-13.00	-37.29
11520.0	H	-	-	-80.17	13.33	40.16	-55.10	-13.00	-42.10
15360.0	H	-	-	-80.02	16.42	43.40	-51.86	-13.00	-38.86

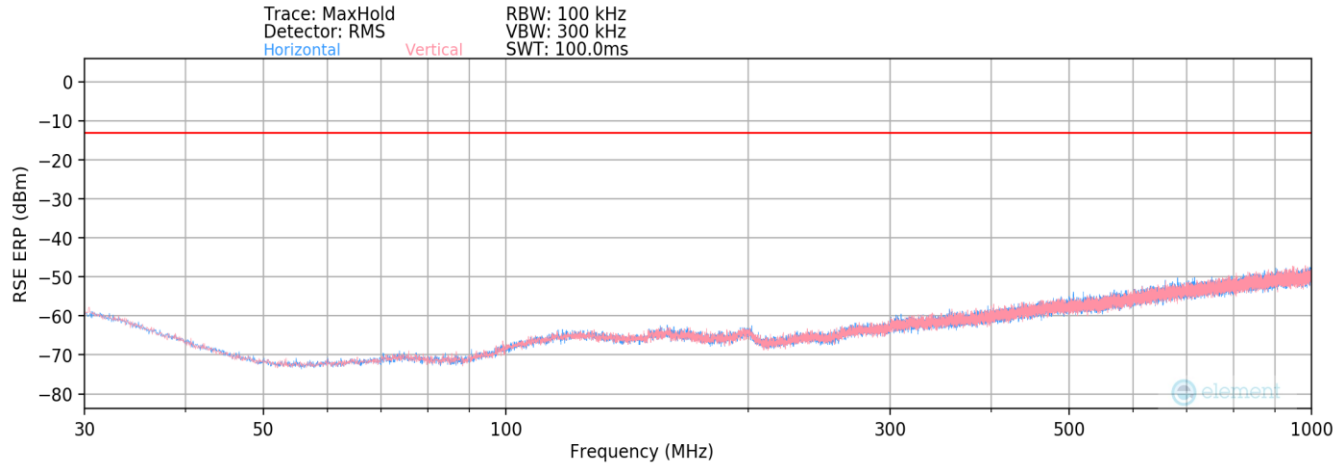
Table 7-15. Radiated Spurious Data (NR Band n77 – Mid Channel – ANT3)

Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7860.0	H	138	344	-71.98	8.39	43.41	-51.85	-13.00	-38.85
11790.0	H	-	-	-79.16	13.64	41.48	-53.78	-13.00	-40.78
15720.0	H	-	-	-80.44	17.52	44.08	-51.17	-13.00	-38.17

Table 7-16. Radiated Spurious Data (NR Band n77 – High Channel – ANT3)

NR Band n77 – ANT5

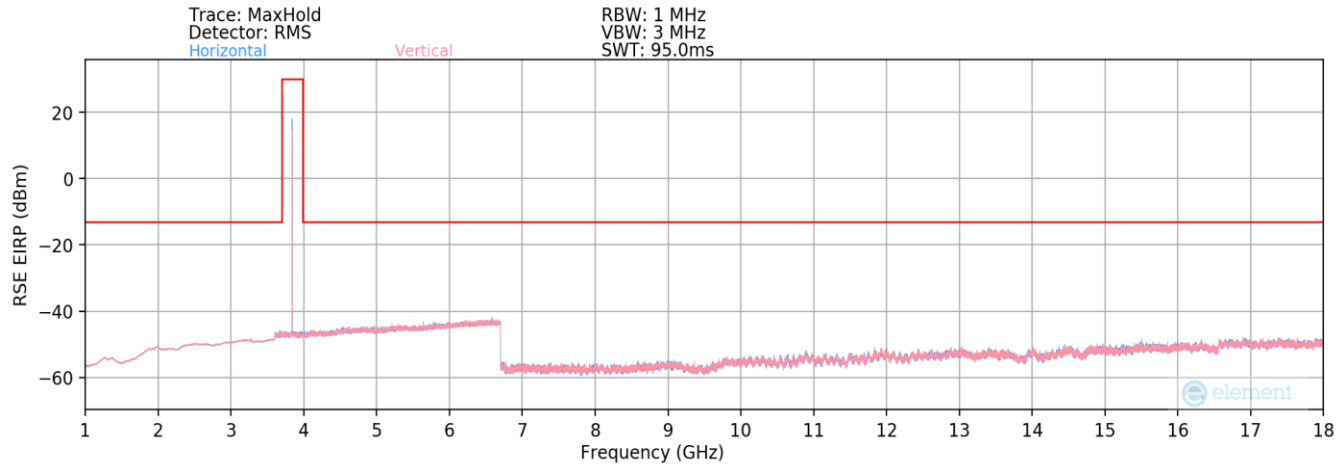


Plot 7-132. Radiated Spurious Plot Below 1GHz (NR Band n77 – ANT5)

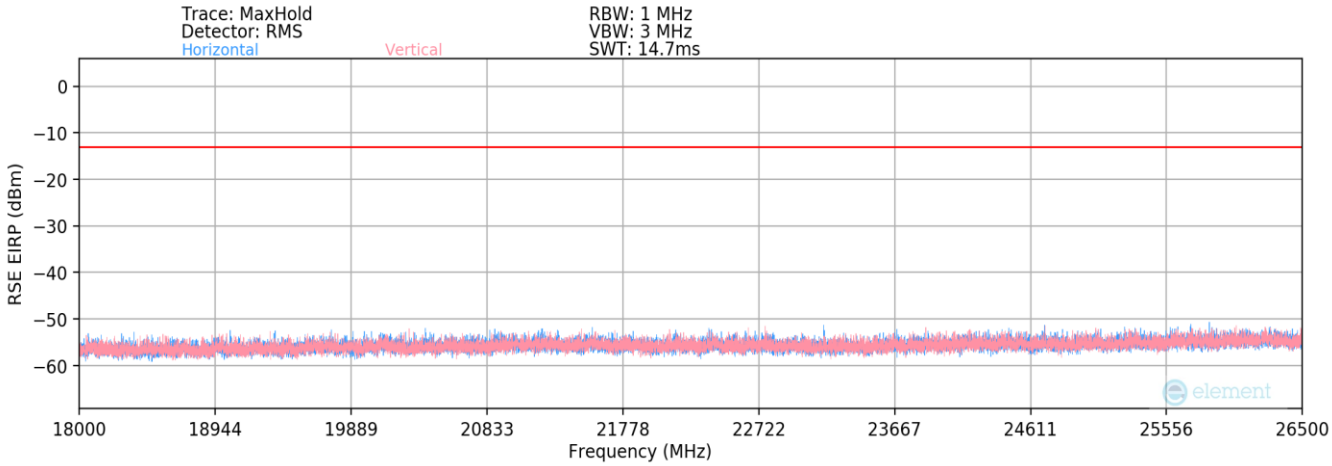
Bandwidth (MHz):	100MHz
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
264.9	V	-	-	-84.23	20.41	43.18	-54.23	-13.00	-41.23
819.7	V	-	-	-86.40	30.38	50.98	-46.43	-13.00	-33.43

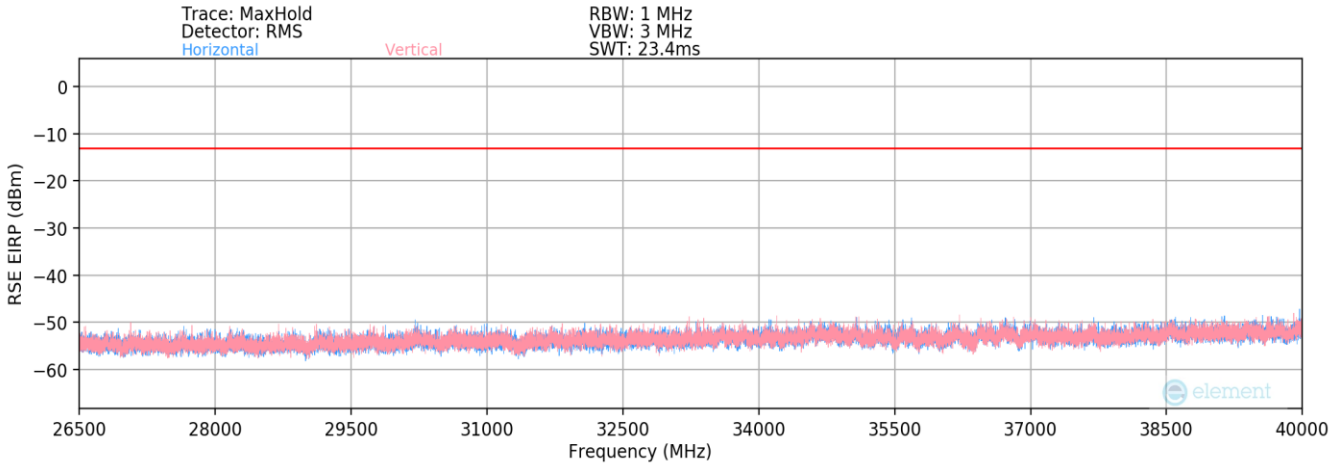
Table 7-17. Radiated Spurious Data (NR Band n77 – ANT5)



Plot 7-133. Radiated Spurious Plot Above 1GHz (NR Band n77 – ANT5)



Plot 7-134. Radiated Spurious Plot- 18-26.5GHz (NR Band n77 – ANT5)



Plot 7-135. Radiated Spurious Plot- 26.5-40GHz (NR Band n77 – ANT5)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7500.0	V	283	212	-77.59	8.39	37.80	-57.46	-13.00	-44.46
11250.0	V	-	-	-79.23	12.73	40.50	-54.76	-13.00	-41.76
15000.0	V	-	-	-79.94	15.87	42.93	-52.33	-13.00	-39.33

Table 7-18. Radiated Spurious Data (NR Band n77 – Low Channel – ANT5)

Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7680.0	V	307	287	-75.61	7.60	38.99	-56.27	-13.00	-43.27
11520.0	V	-	-	-80.02	13.33	40.31	-54.95	-13.00	-41.95
15360.0	V	-	-	-80.34	16.42	43.08	-52.18	-13.00	-39.18

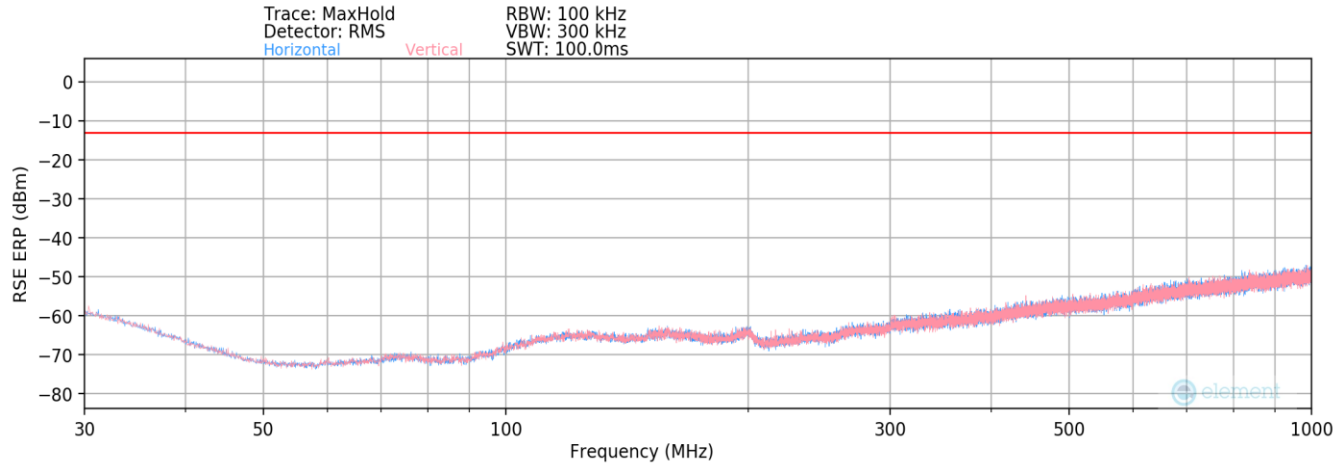
Table 7-19. Radiated Spurious Data (NR Band n77 – Mid Channel – ANT5)

Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7860.0	V	298	227	-76.73	8.39	38.66	-56.60	-13.00	-43.60
11790.0	V	-	-	-80.25	13.64	40.39	-54.87	-13.00	-41.87
15720.0	V	-	-	-80.69	17.52	43.83	-51.42	-13.00	-38.42

Table 7-20. Radiated Spurious Data (NR Band n77 – High Channel – ANT5)

NR Band n77 – ANT8

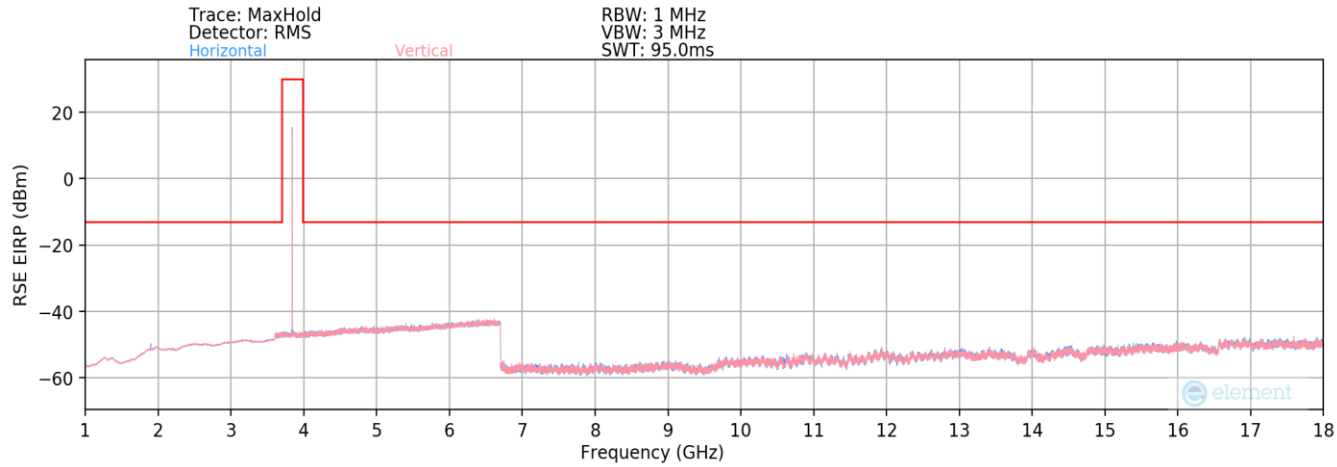


Plot 7-136. Radiated Spurious Plot Below 1GHz (NR Band n77 – ANT8)

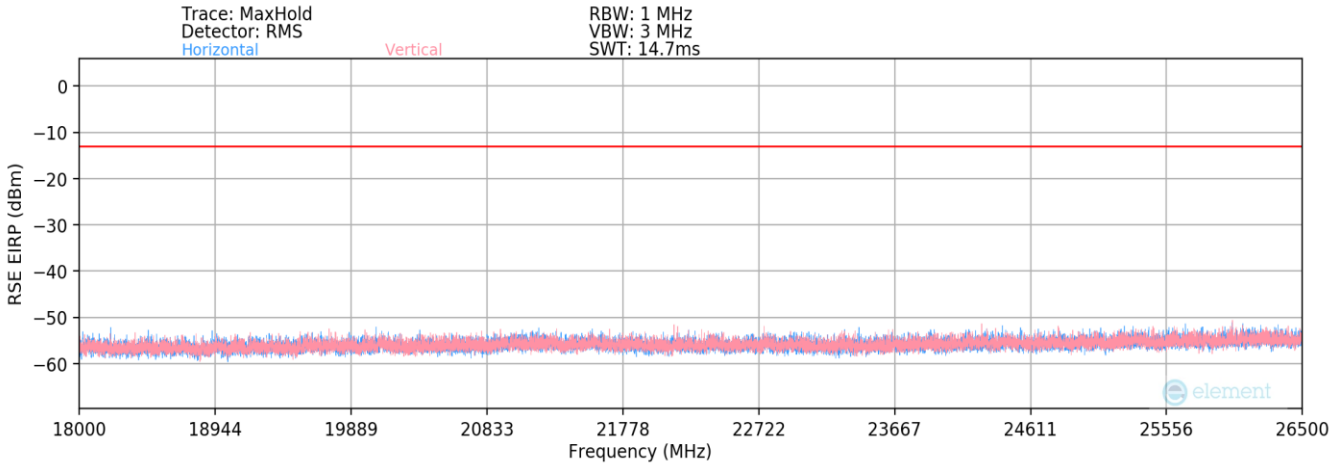
Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
181.0	V	-	-	-84.34	18.56	41.22	-56.18	-13.00	-43.18
469.6	V	-	-	-84.07	25.21	48.14	-49.27	-13.00	-36.27

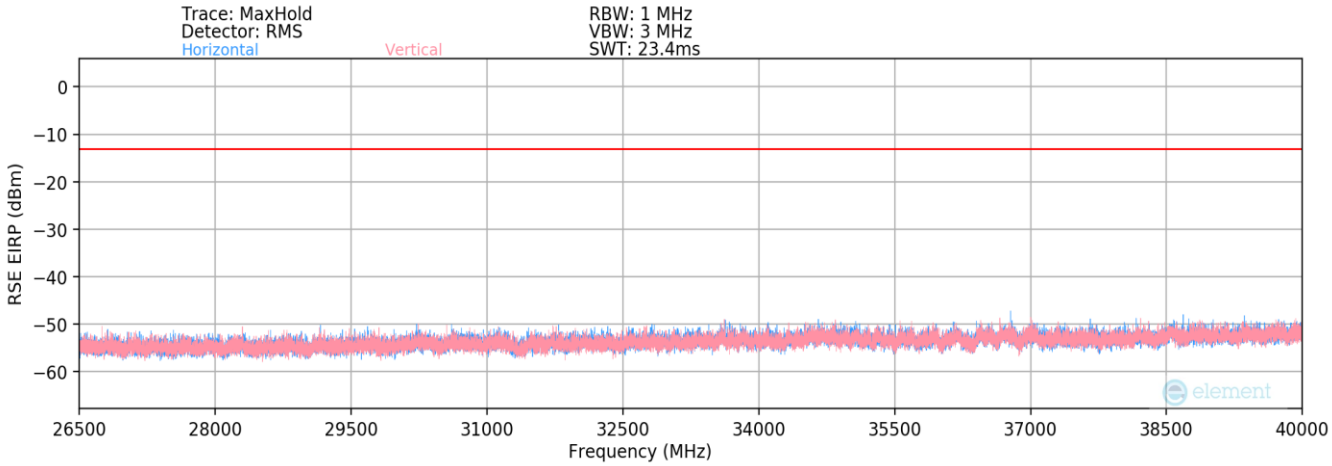
Table 7-21. Radiated Spurious Data (NR Band n77 – ANT8)



Plot 7-137. Radiated Spurious Plot Above 1GHz (NR Band n77 – ANT8)



Plot 7-138. Radiated Spurious Plot- 18-26.5GHz (NR Band n77 – ANT8)



Plot 7-139. Radiated Spurious Plot- 26.5-40GHz (NR Band n77 – ANT8)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7500.0	V	289	64	-76.17	8.39	39.22	-56.04	-13.00	-43.04
11250.0	V	359	292	-76.41	12.73	43.32	-51.94	-13.00	-38.94
15000.0	V	-	-	-80.07	15.87	42.80	-52.46	-13.00	-39.46

Table 7-22. Radiated Spurious Data (NR Band n77 – Low Channel – ANT8)

Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7680.0	V	131	69	-76.57	7.60	38.03	-57.23	-13.00	-44.23
11520.0	V	362	270	-76.40	13.33	43.93	-51.33	-13.00	-38.33
15360.0	V	-	-	-79.96	16.42	43.46	-51.80	-13.00	-38.80

Table 7-23. Radiated Spurious Data (NR Band n77 – Mid Channel – ANT8)

Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1/136
Mode:	Stand Alone

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]
7860.0	V	292	85	-76.53	8.39	38.86	-56.40	-13.00	-43.40
11790.0	V	-	-	-79.76	13.64	40.88	-54.38	-13.00	-41.38
15720.0	V	-	-	-80.59	17.52	43.93	-51.32	-13.00	-38.32

Table 7-24. Radiated Spurious Data (NR Band n77 – High Channel – ANT8)