7.5 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

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

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

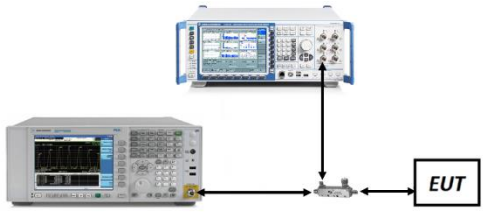


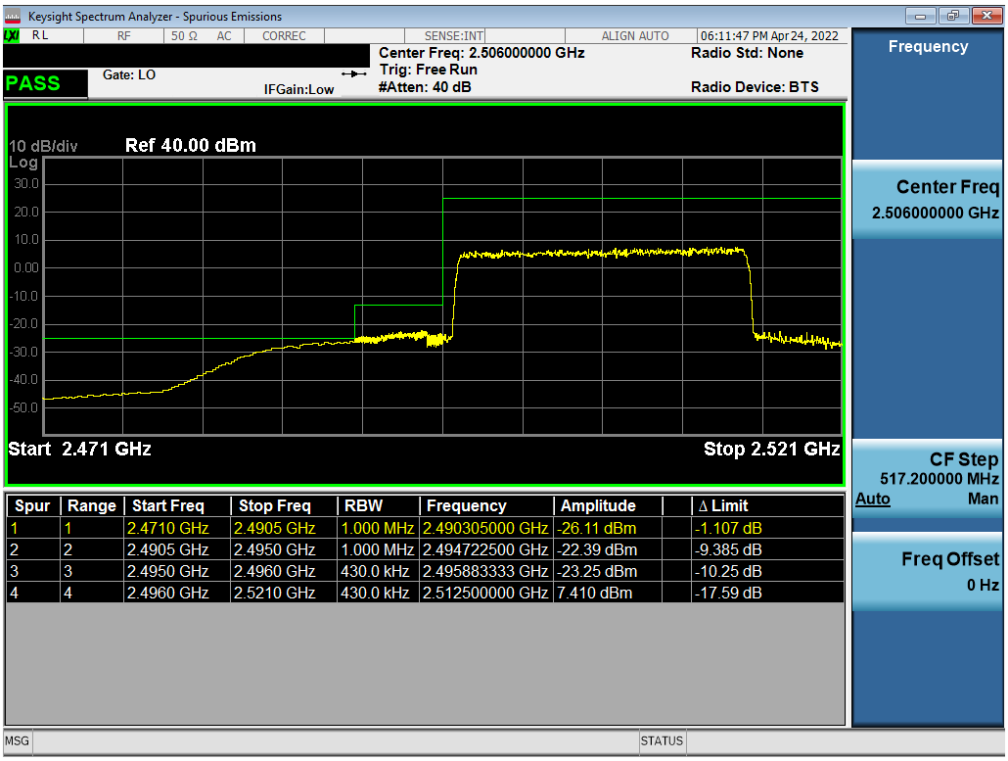
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

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

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.

LTE Band 41(PC2) – Ant F

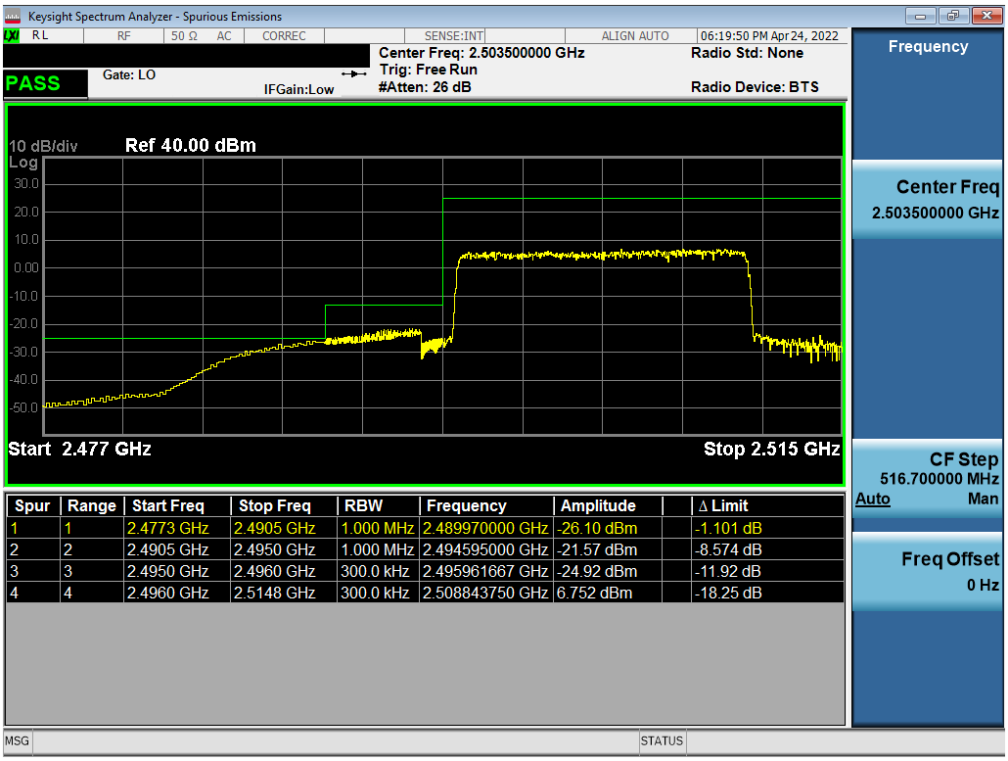


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4710 GHz	2.4905 GHz	1.000 MHz	2.490305000 GHz	-26.11 dBm	-1.107 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494722500 GHz	-22.39 dBm	-9.385 dB
3	3	2.4950 GHz	2.4960 GHz	430.0 kHz	2.495883333 GHz	-23.25 dBm	-10.25 dB
4	4	2.4960 GHz	2.5210 GHz	430.0 kHz	2.512500000 GHz	7.410 dBm	-17.59 dB

Plot 7-87. Lower ACP Plot (LTE Band 41(PC2) - 20MHz QPSK – Full RB - Ant F)

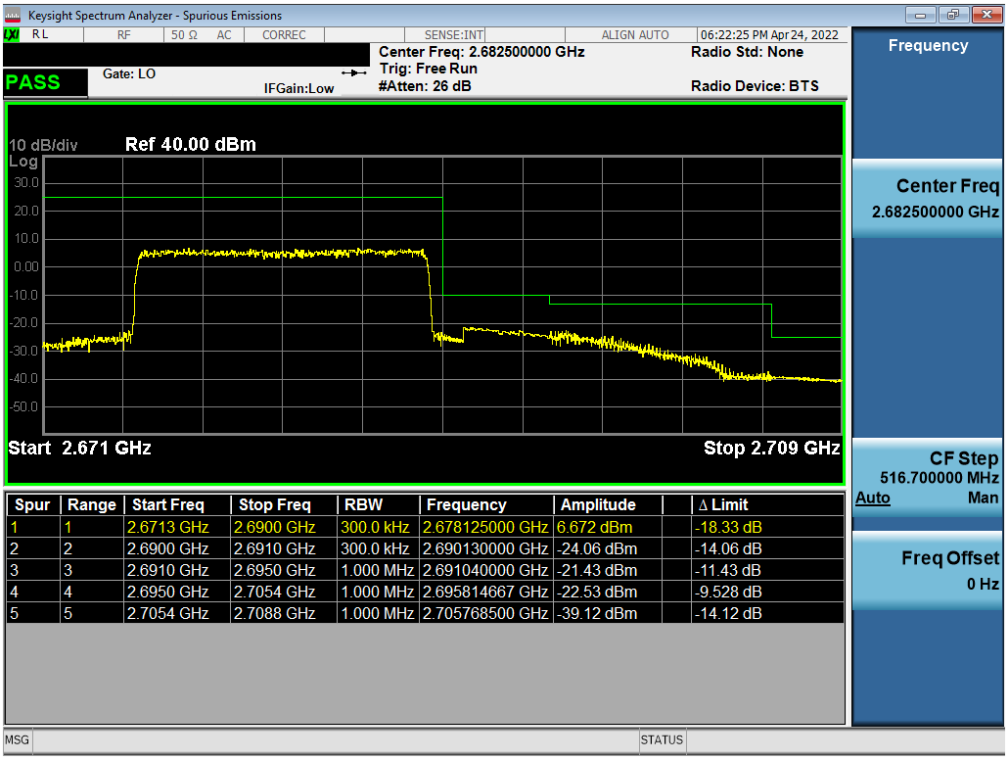
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	430.0 kHz	2.685291667 GHz	7.170 dBm	-17.83 dB
2	2	2.6900 GHz	2.6910 GHz	430.0 kHz	2.690116667 GHz	-23.81 dBm	-13.81 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691540000 GHz	-20.74 dBm	-10.74 dB
4	4	2.6950 GHz	2.7108 GHz	1.000 MHz	2.696711667 GHz	-24.34 dBm	-11.34 dB
5	5	2.7108 GHz	2.7150 GHz	1.000 MHz	2.711367000 GHz	-38.68 dBm	-13.68 dB

Plot 7-88. Upper ACP Plot (LTE Band 41(PC2) - 20MHz QPSK – Full RB - Ant F)



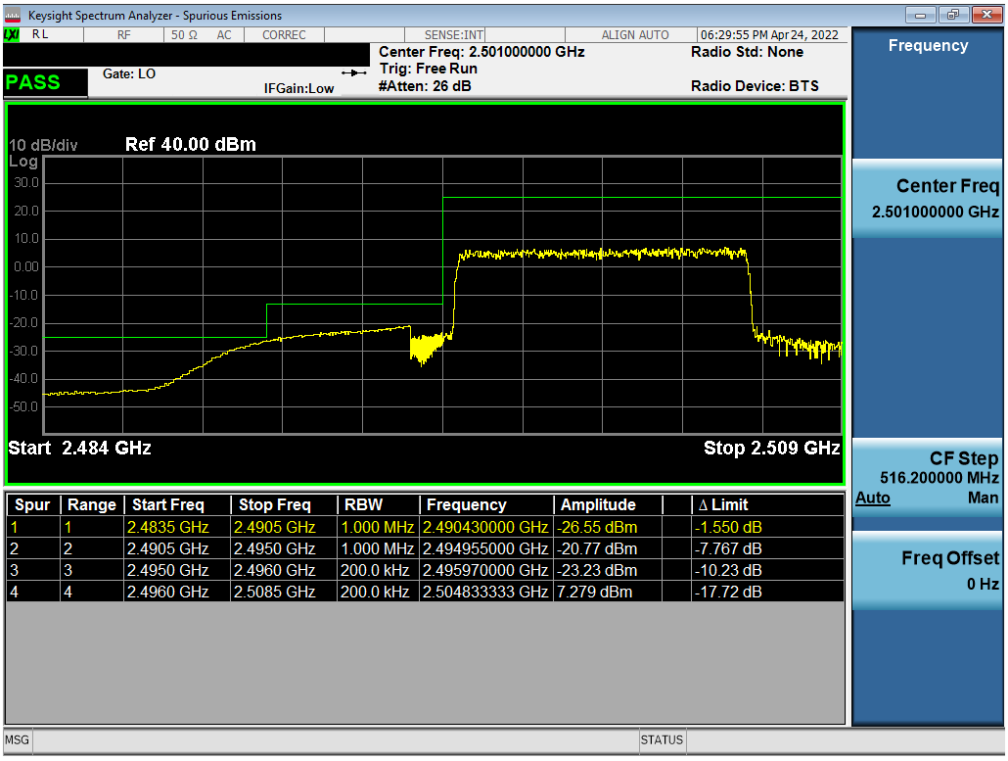
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4773 GHz	2.4905 GHz	1.000 MHz	2.489970000 GHz	-26.10 dBm	-1.101 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494595000 GHz	-21.57 dBm	-8.574 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495961667 GHz	-24.92 dBm	-11.92 dB
4	4	2.4960 GHz	2.5148 GHz	300.0 kHz	2.508843750 GHz	6.752 dBm	-18.25 dB

Plot 7-89. Lower ACP Plot (LTE Band 41(PC2) - 15MHz QPSK – Full RB - Ant F)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6713 GHz	2.6900 GHz	300.0 kHz	2.678125000 GHz	6.672 dBm	-18.33 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690130000 GHz	-24.06 dBm	-14.06 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691040000 GHz	-21.43 dBm	-11.43 dB
4	4	2.6950 GHz	2.7054 GHz	1.000 MHz	2.695814667 GHz	-22.53 dBm	-9.528 dB
5	5	2.7054 GHz	2.7088 GHz	1.000 MHz	2.705768500 GHz	-39.12 dBm	-14.12 dB

Plot 7-90. Upper ACP Plot (LTE Band 41(PC2) - 15MHz QPSK – Full RB - Ant F)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4835 GHz	2.4905 GHz	1.000 MHz	2.490430000 GHz	-26.55 dBm	-1.550 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494955000 GHz	-20.77 dBm	-7.767 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495970000 GHz	-23.23 dBm	-10.23 dB
4	4	2.4960 GHz	2.5085 GHz	200.0 kHz	2.504833333 GHz	7.279 dBm	-17.72 dB

Plot 7-91. Lower ACP Plot (LTE Band 41(PC2) - 10MHz QPSK – Full RB - Ant F)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6775 GHz	2.6900 GHz	200.0 kHz	2.685812500 GHz	6.941 dBm	-18.06 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690111667 GHz	-19.29 dBm	-9.294 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691093333 GHz	-16.11 dBm	-6.105 dB
4	4	2.6950 GHz	2.7000 GHz	1.000 MHz	2.695025000 GHz	-21.92 dBm	-8.923 dB
5	5	2.7000 GHz	2.7025 GHz	1.000 MHz	2.700362500 GHz	-33.84 dBm	-8.835 dB

Plot 7-92. Upper ACP Plot (LTE Band 41(PC2) - 10MHz QPSK – Full RB - Ant F)

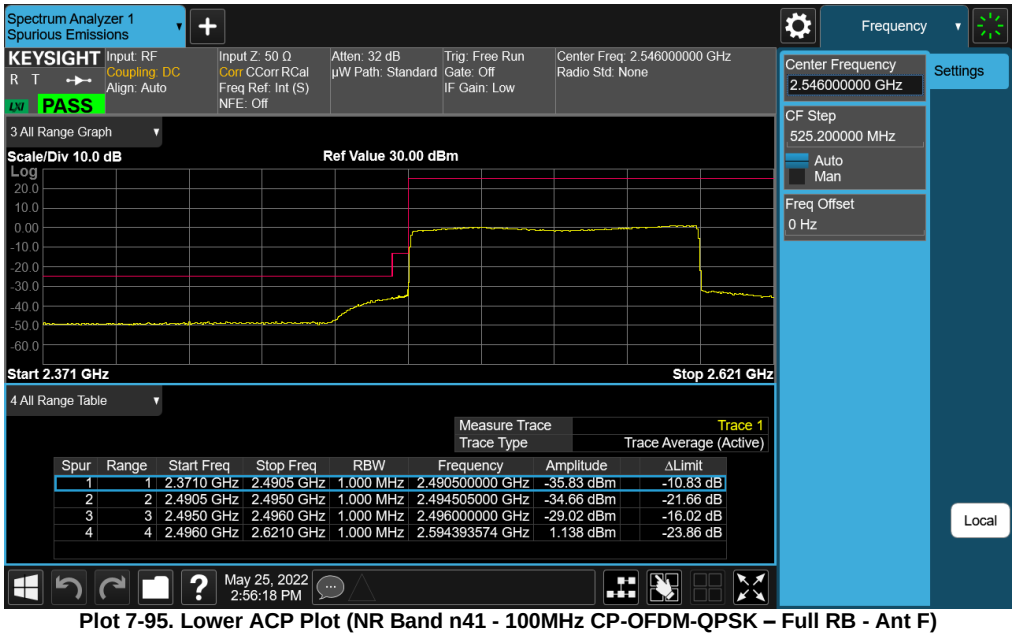
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4845 GHz	2.4905 GHz	1.000 MHz	2.488400000 GHz	-40.96 dBm	-15.96 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494895000 GHz	-18.71 dBm	-5.706 dB
3	3	2.4950 GHz	2.4960 GHz	110.0 kHz	2.495079040 GHz	-19.44 dBm	-6.442 dB
4	4	2.4960 GHz	2.5075 GHz	110.0 kHz	2.498185000 GHz	8.933 dBm	-16.07 dB

Plot 7-93. Lower ACP Plot (LTE Band 41(PC2) - 5MHz QPSK – Full RB - Ant F)

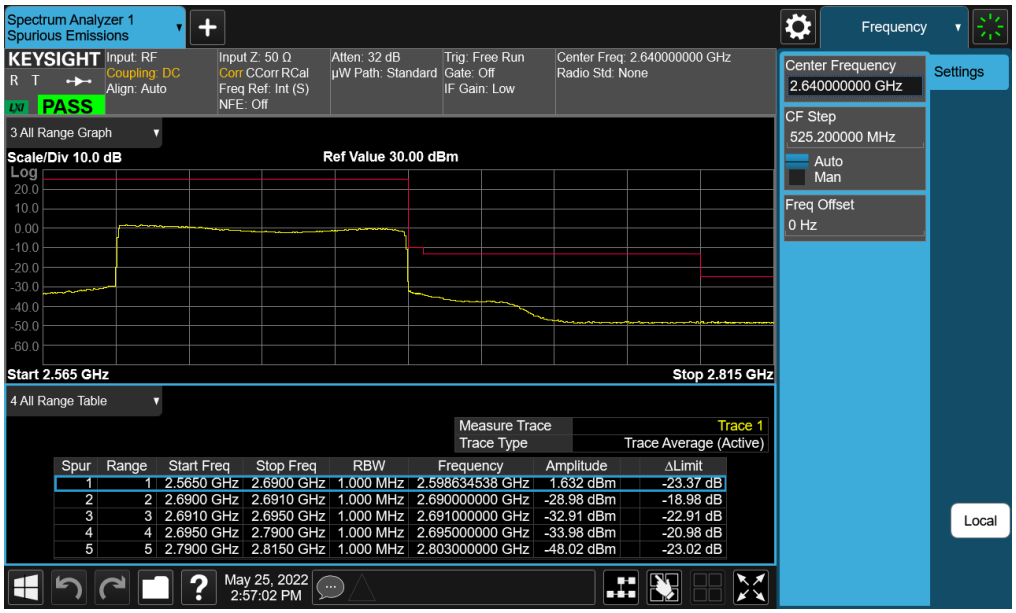
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6785 GHz	2.6900 GHz	110.0 kHz	2.688485833 GHz	8.381 dBm	-16.62 dB
2	2	2.6900 GHz	2.6910 GHz	110.0 kHz	2.690253333 GHz	-16.67 dBm	-6.665 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691053333 GHz	-16.95 dBm	-6.951 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695126667 GHz	-33.33 dBm	-20.33 dB
5	5	2.6960 GHz	2.7015 GHz	1.000 MHz	2.696055000 GHz	-34.09 dBm	-9.092 dB

Plot 7-94. Upper ACP Plot (LTE Band 41(PC2) - 5MHz QPSK – Full RB - Ant F)

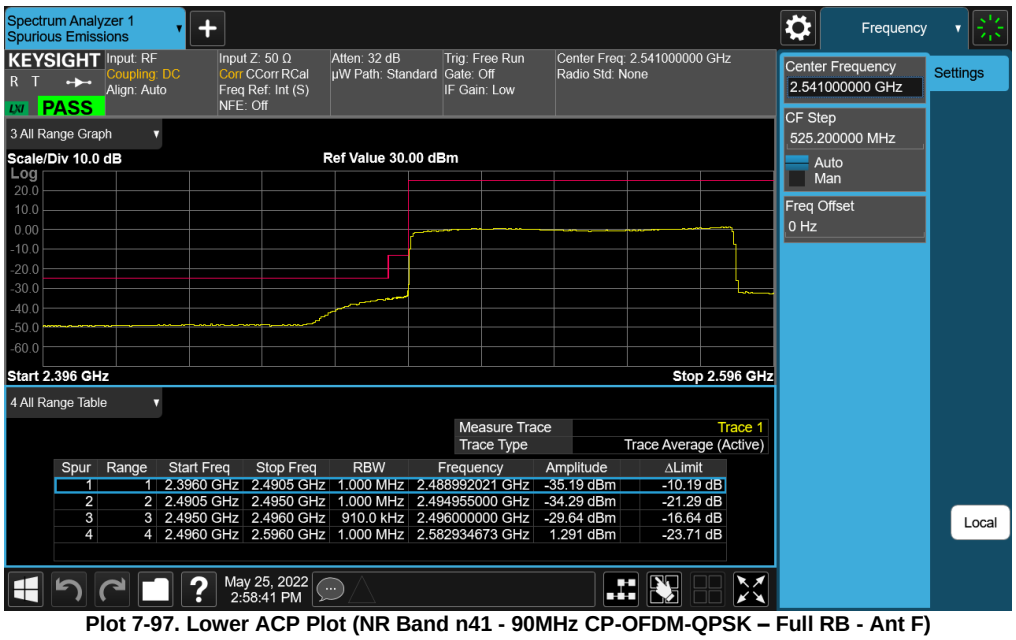
NR Band n41 – Ant F



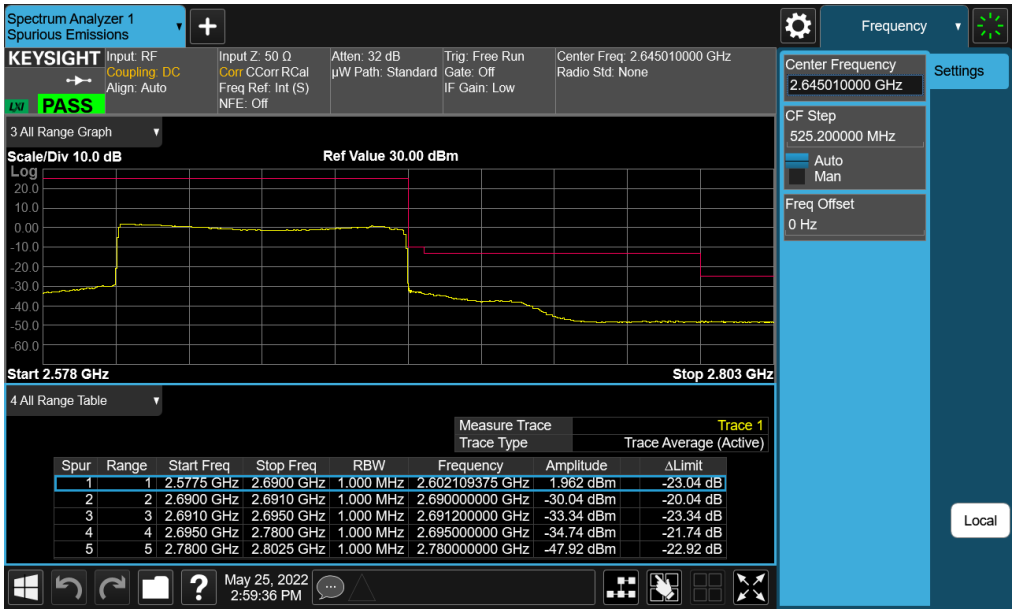
Plot 7-95. Lower ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant F)



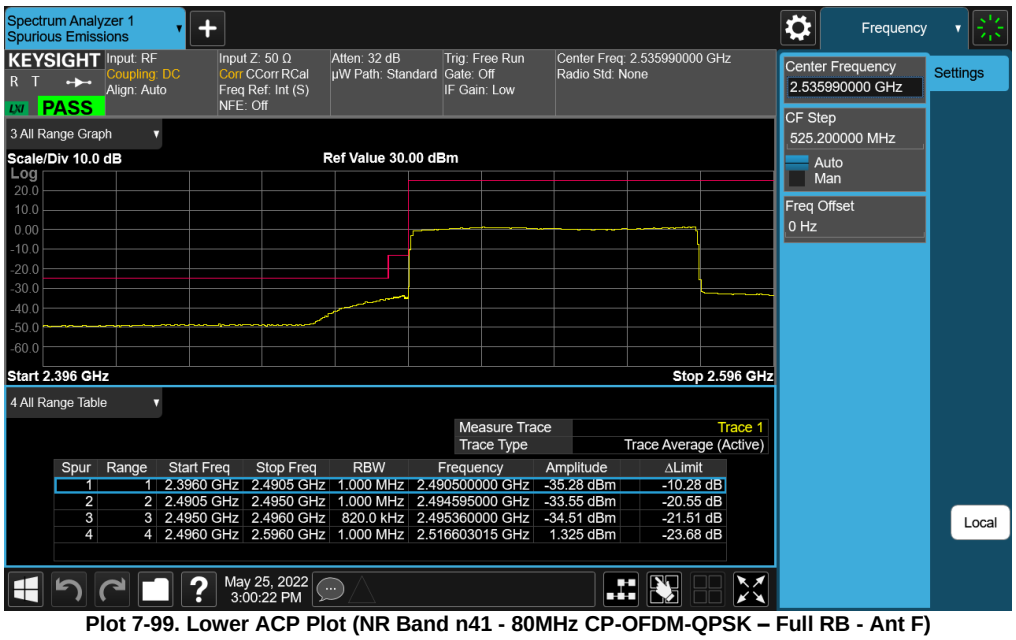
Plot 7-96. Upper ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant F)



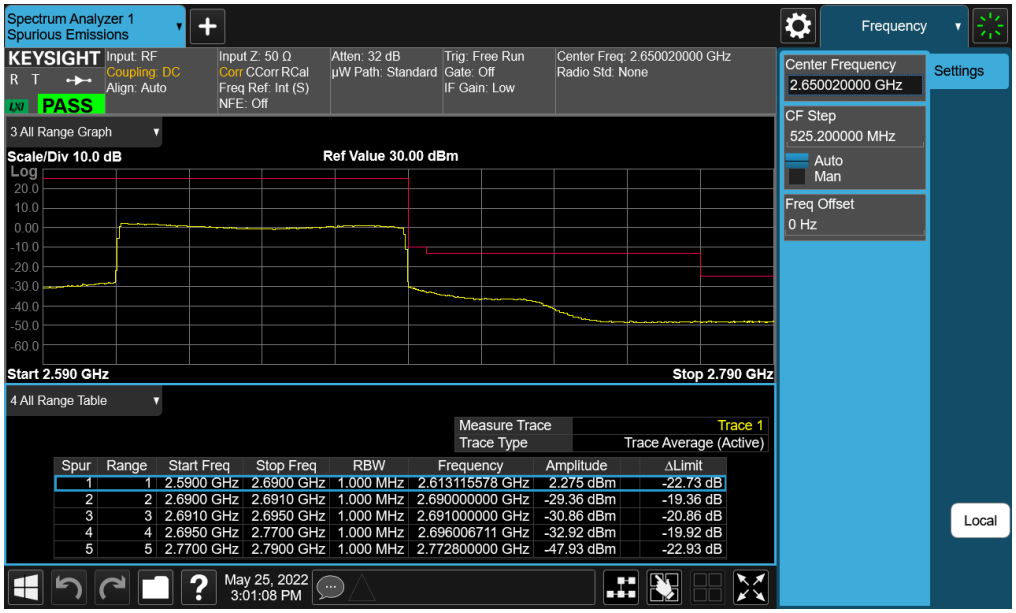
Plot 7-97. Lower ACP Plot (NR Band n41 - 90MHz CP-OFDM-QPSK – Full RB - Ant F)



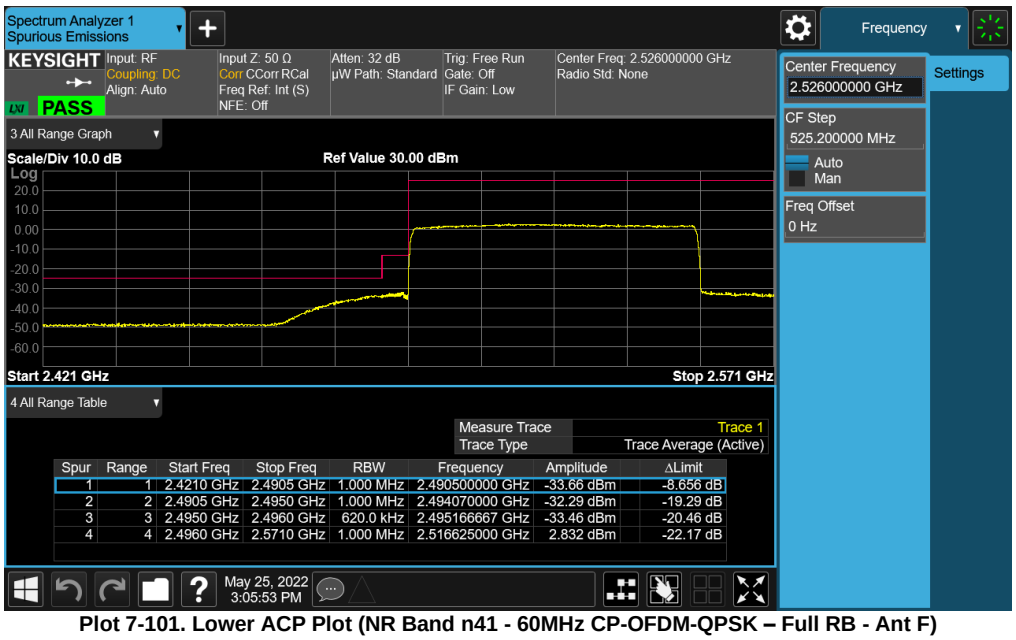
Plot 7-98. Upper ACP Plot (NR Band n41 - 90MHz CP-OFDM-QPSK – Full RB - Ant F)



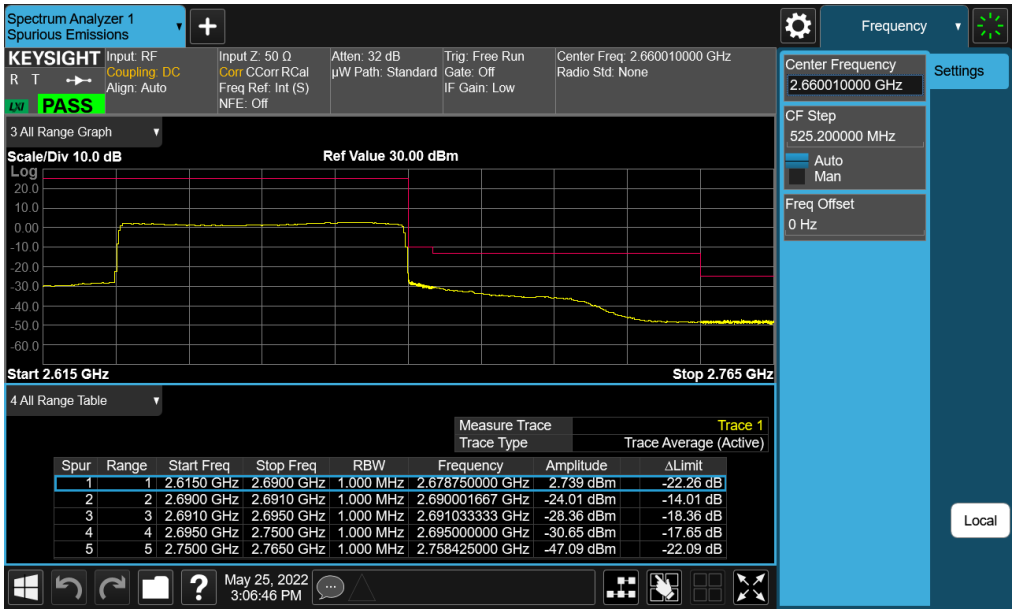
Plot 7-99. Lower ACP Plot (NR Band n41 - 80MHz CP-OFDM-QPSK – Full RB - Ant F)



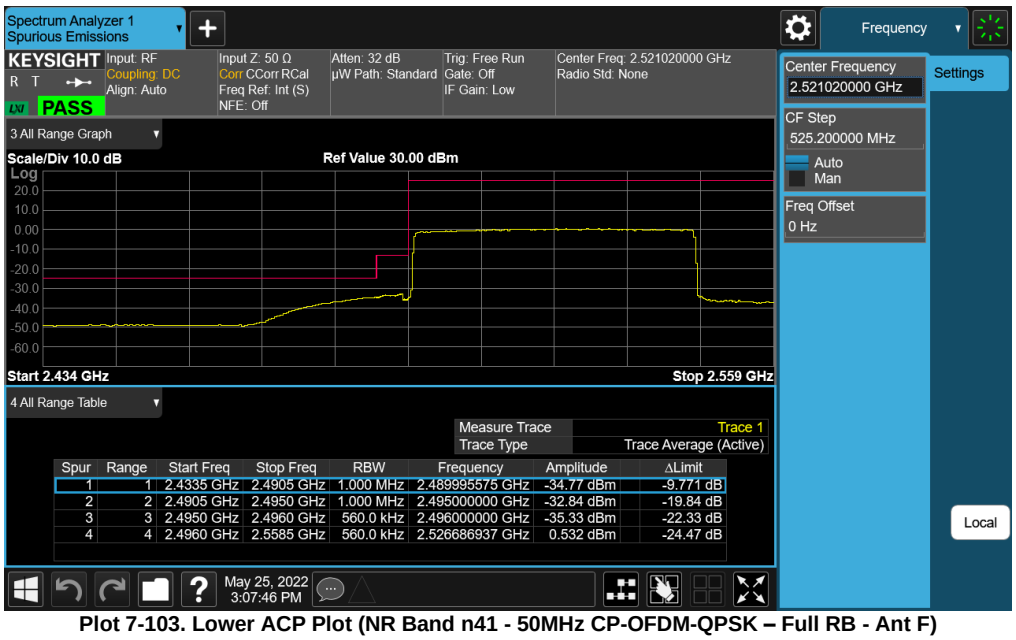
Plot 7-100. Upper ACP Plot (NR Band n41 - 80MHz CP-OFDM-QPSK – Full RB - Ant F)



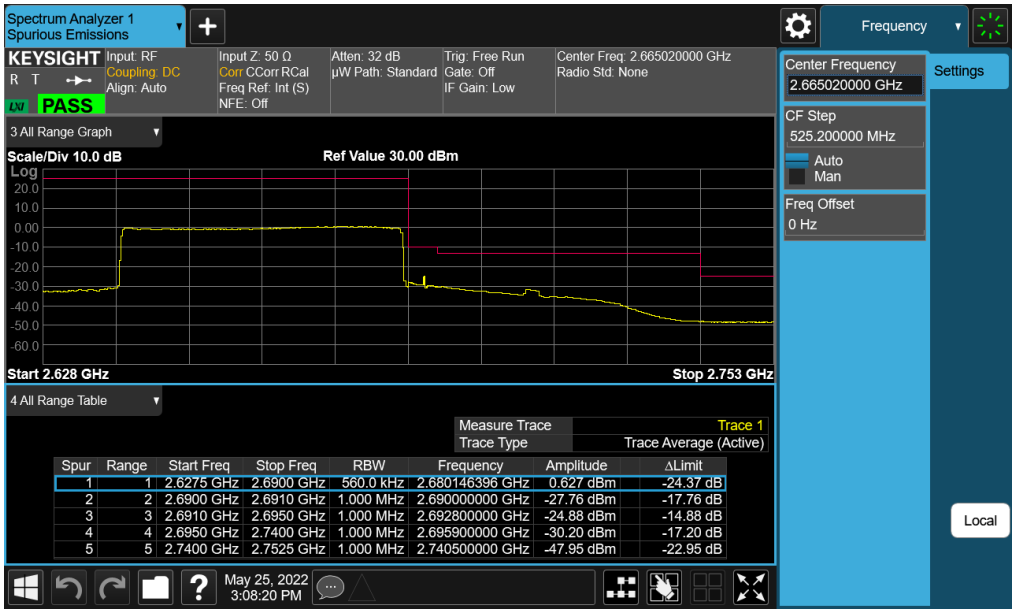
Plot 7-101. Lower ACP Plot (NR Band n41 - 60MHz CP-OFDM-QPSK – Full RB - Ant F)



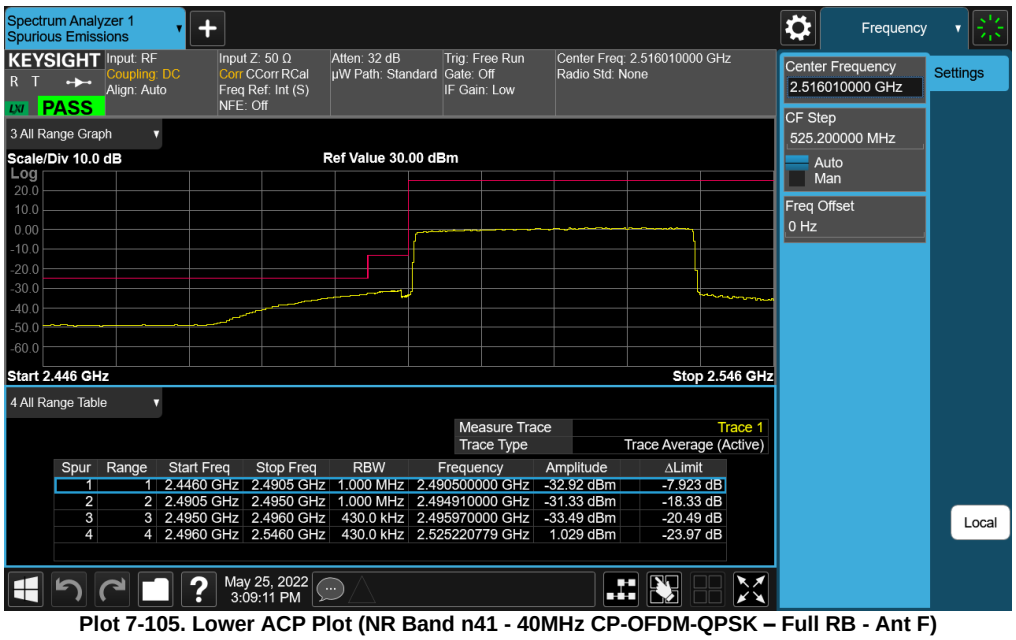
Plot 7-102. Upper ACP Plot (NR Band n41 - 60MHz CP-OFDM-QPSK – Full RB - Ant F)



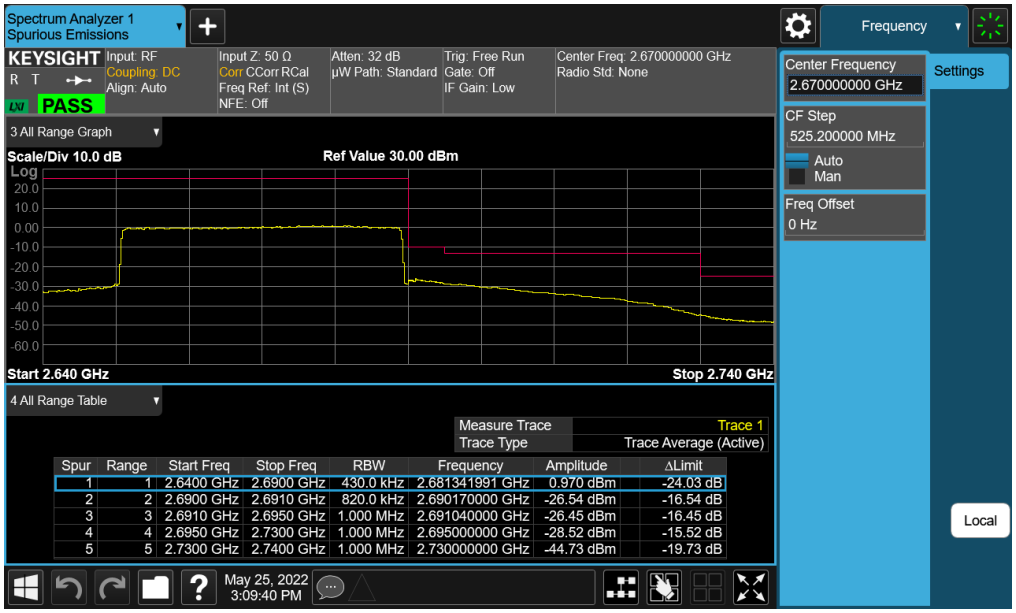
Plot 7-103. Lower ACP Plot (NR Band n41 - 50MHz CP-OFDM-QPSK – Full RB - Ant F)



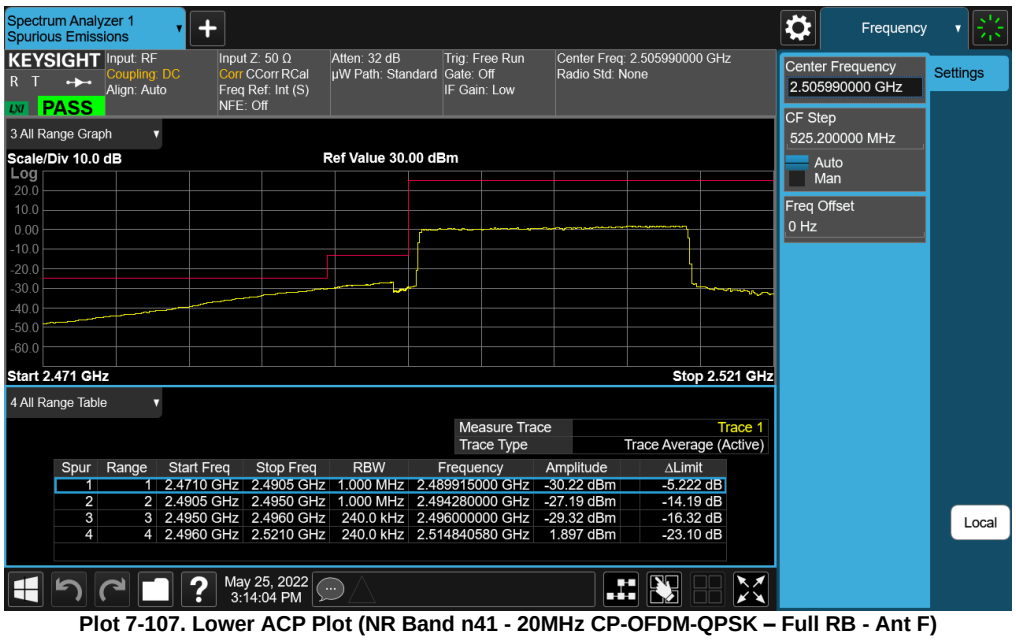
Plot 7-104. Upper ACP Plot (NR Band n41 - 50MHz CP-OFDM-QPSK – Full RB - Ant F)



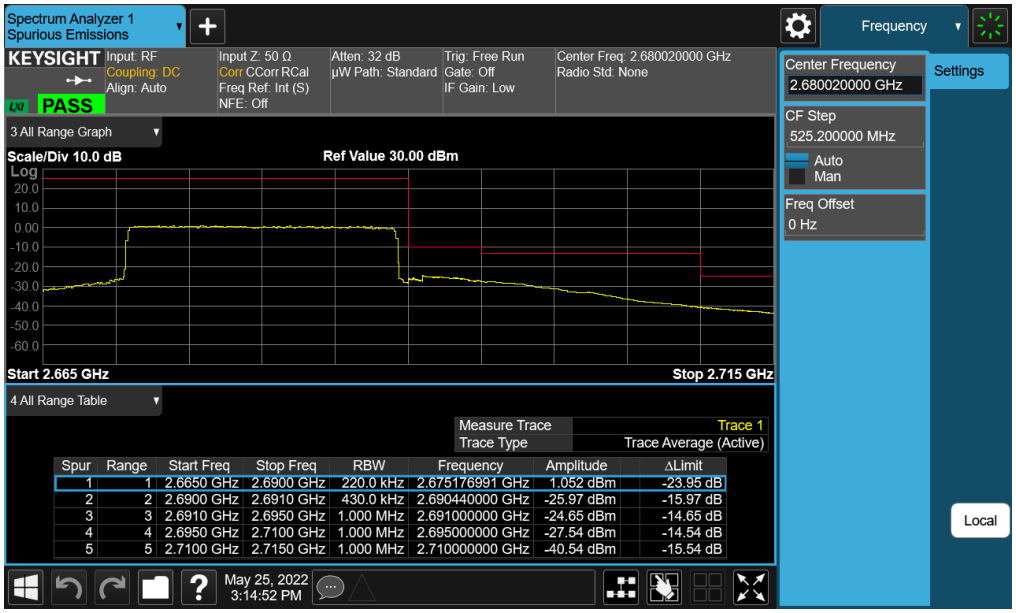
Plot 7-105. Lower ACP Plot (NR Band n41 - 40MHz CP-OFDM-QPSK – Full RB - Ant F)



Plot 7-106. Upper ACP Plot (NR Band n41 - 40MHz CP-OFDM-QPSK – Full RB - Ant F)

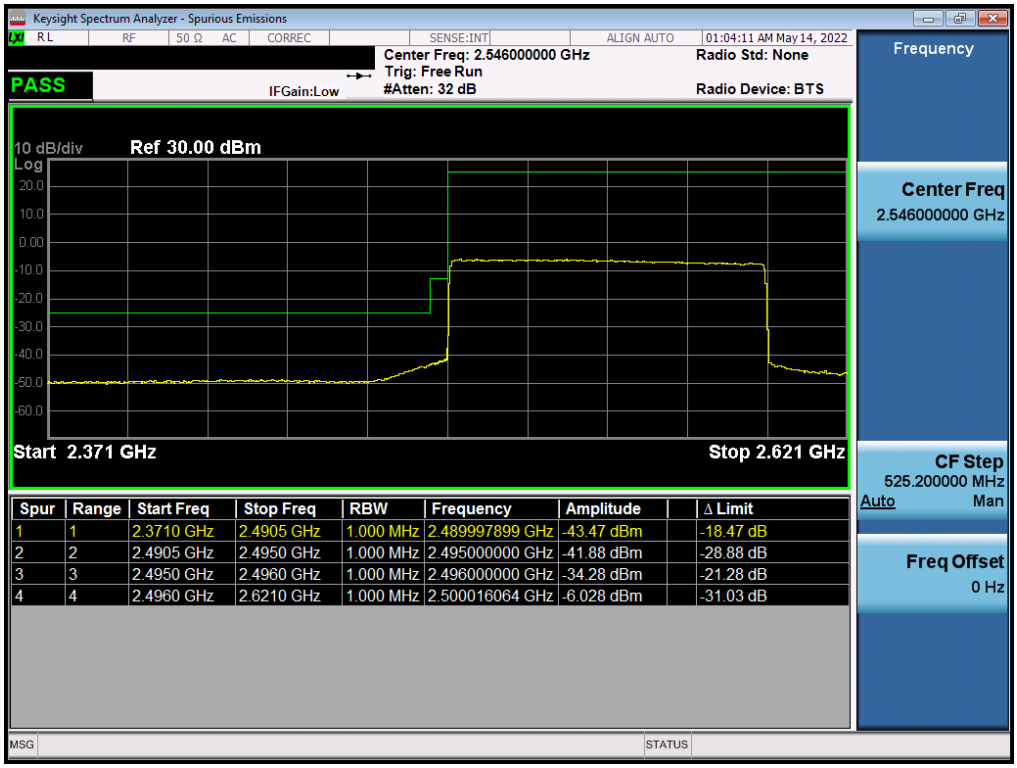


Plot 7-107. Lower ACP Plot (NR Band n41 - 20MHz CP-OFDM-QPSK – Full RB - Ant F)



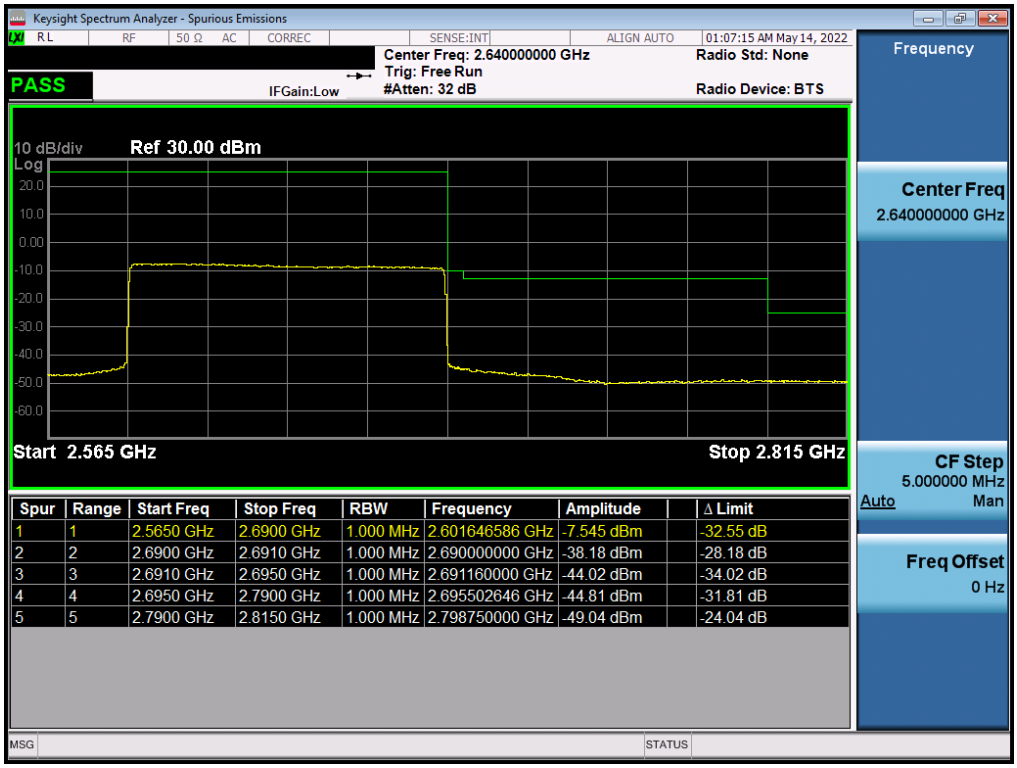
Plot 7-108. Upper ACP Plot (NR Band n41 - 20MHz CP-OFDM-QPSK – Full RB - Ant F)

NR Band n41 – Ant B



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.3710 GHz	2.4905 GHz	1.000 MHz	2.489997899 GHz	-43.47 dBm	-18.47 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.495000000 GHz	-41.88 dBm	-28.88 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-34.28 dBm	-21.28 dB
4	4	2.4960 GHz	2.6210 GHz	1.000 MHz	2.500016064 GHz	-6.028 dBm	-31.03 dB

Plot 7-109. Lower ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant B)



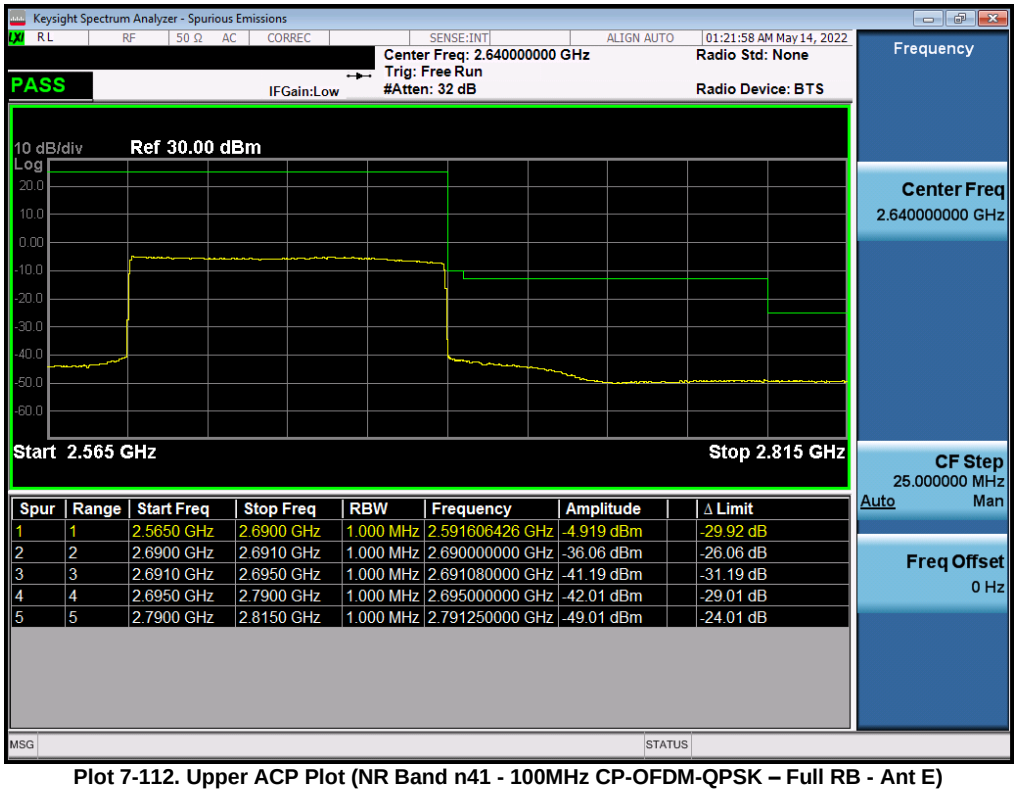
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5650 GHz	2.6900 GHz	1.000 MHz	2.601646586 GHz	-7.545 dBm	-32.55 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690000000 GHz	-38.18 dBm	-28.18 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691160000 GHz	-44.02 dBm	-34.02 dB
4	4	2.6950 GHz	2.7900 GHz	1.000 MHz	2.695502646 GHz	-44.81 dBm	-31.81 dB
5	5	2.7900 GHz	2.8150 GHz	1.000 MHz	2.798750000 GHz	-49.04 dBm	-24.04 dB

Plot 7-110. Upper ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant B)

NR Band n41 – Ant E

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.3710 GHz	2.4905 GHz	1.000 MHz	2.490500000 GHz	-38.05 dBm	-13.05 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494955000 GHz	-36.40 dBm	-23.40 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-30.29 dBm	-17.29 dB
4	4	2.4960 GHz	2.6210 GHz	1.000 MHz	2.559755020 GHz	-3.051 dBm	-28.05 dB

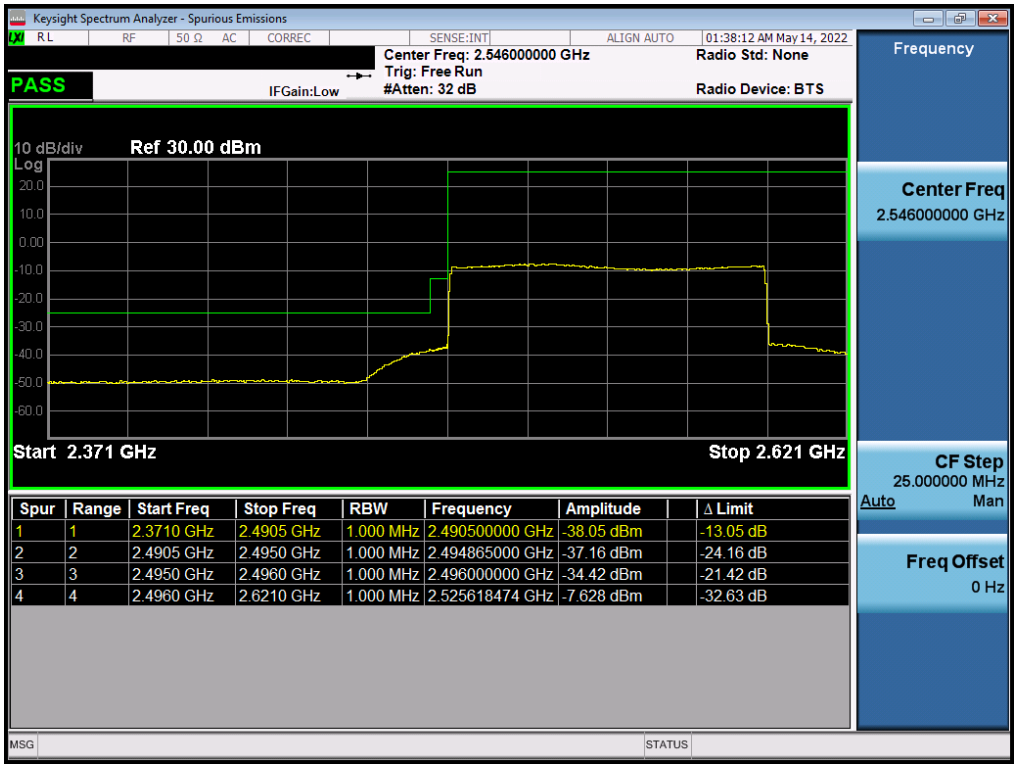
Plot 7-111. Lower ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant E)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5650 GHz	2.6900 GHz	1.000 MHz	2.591606426 GHz	-4.919 dBm	-29.92 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690000000 GHz	-36.06 dBm	-26.06 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691080000 GHz	-41.19 dBm	-31.19 dB
4	4	2.6950 GHz	2.7900 GHz	1.000 MHz	2.695000000 GHz	-42.01 dBm	-29.01 dB
5	5	2.7900 GHz	2.8150 GHz	1.000 MHz	2.791250000 GHz	-49.01 dBm	-24.01 dB

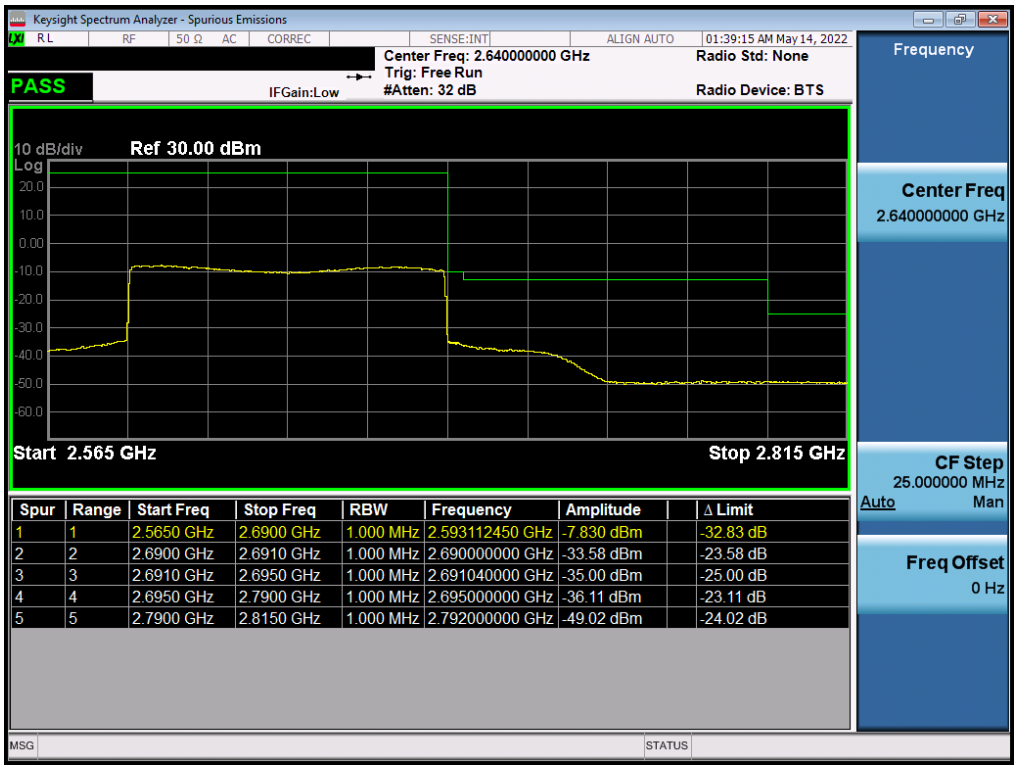
Plot 7-112. Upper ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant E)

NR Band n41 – Ant C



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.3710 GHz	2.4905 GHz	1.000 MHz	2.490500000 GHz	-38.05 dBm	-13.05 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494865000 GHz	-37.16 dBm	-24.16 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-34.42 dBm	-21.42 dB
4	4	2.4960 GHz	2.6210 GHz	1.000 MHz	2.525618474 GHz	-7.628 dBm	-32.63 dB

Plot 7-113. Lower ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant C)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5650 GHz	2.6900 GHz	1.000 MHz	2.593112450 GHz	-7.830 dBm	-32.83 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690000000 GHz	-33.58 dBm	-23.58 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691040000 GHz	-35.00 dBm	-25.00 dB
4	4	2.6950 GHz	2.7900 GHz	1.000 MHz	2.695000000 GHz	-36.11 dBm	-23.11 dB
5	5	2.7900 GHz	2.8150 GHz	1.000 MHz	2.792000000 GHz	-49.02 dBm	-24.02 dB

Plot 7-114. Upper ACP Plot (NR Band n41 - 100MHz CP-OFDM-QPSK – Full RB - Ant C)

7.6 Radiated Power (EIRP)

Test Overview

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

Test Procedures Used

ANSI C63.26-2015 – Section 5.2.4.4

Test Settings

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

Test Setup

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

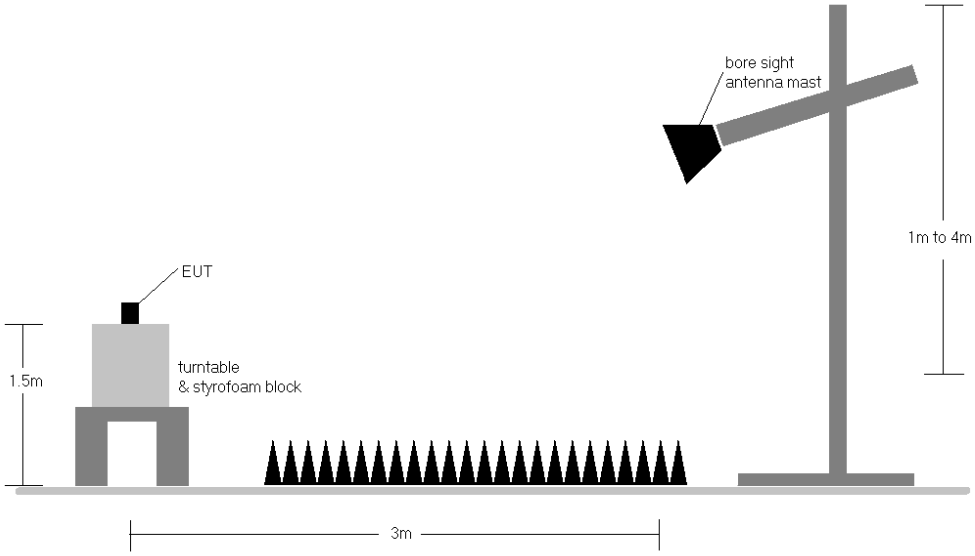


Figure 7-5. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

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

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	2506.0	H	125	170	9.50	1 / 50	16.14	25.64	0.367	33.01	-7.37
	QPSK	2593.0	H	115	155	9.49	1 / 0	16.27	**25.76**	0.377	33.01	-7.25
	QPSK	2680.0	H	121	165	9.87	1 / 99	15.23	25.10	0.324	33.01	-7.91
	16-QAM	2506.0	H	125	170	9.50	1 / 50	15.22	24.72	0.297	33.01	-8.29
15 MHz	QPSK	2503.5	H	125	170	9.50	1 / 0	16.37	25.87	0.386	33.01	-7.14
	QPSK	2593.0	H	115	155	9.49	1 / 37	16.57	**26.07**	0.404	33.01	-6.95
	QPSK	2682.5	H	121	165	9.87	1 / 37	14.89	24.75	0.299	33.01	-8.26
	16-QAM	2503.5	H	125	170	9.50	1 / 0	15.28	24.77	0.300	33.01	-8.24
10 MHz	QPSK	2501.0	H	125	170	9.49	1 / 25	16.66	**26.16**	0.413	33.01	-6.85
	QPSK	2593.0	H	115	155	9.49	1 / 25	16.02	25.52	0.356	33.01	-7.50
	QPSK	2685.0	H	121	165	9.86	1 / 25	15.49	25.35	0.343	33.01	-7.66
	16-QAM	2501.0	H	125	170	9.49	1 / 25	15.13	24.62	0.290	33.01	-8.39
5 MHz	QPSK	2498.5	H	125	170	9.49	1 / 0	16.44	**25.93**	0.391	33.01	-7.08
	QPSK	2593.0	H	115	155	9.49	1 / 12	16.42	25.91	0.390	33.01	-7.10
	QPSK	2687.5	H	121	165	9.86	1 / 24	15.37	25.22	0.333	33.01	-7.79
	16-QAM	2498.5	H	125	170	9.49	1 / 0	15.18	24.67	0.293	33.01	-8.34
20 MHz	Opposite Pol.	2593.0	V	152	308	9.54	1 / 50	15.90	25.44	0.350	33.01	-7.57
	Open	2593.0	H	120	207	9.50	1 / 0	15.66	25.16	0.328	33.01	-7.85
	WCP	2593.0	H	251	144	9.50	1 / 99	13.42	22.92	0.196	33.01	-10.09

Table 7-9. EIRP Data (LTE Band 41(PC2) – Ant F)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	2546.0	H	134	330	9.38	1 / 204	13.12	22.50	0.178	33.01	-10.51
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 204	12.68	22.17	0.165	33.01	-10.84
	π/2 BPSK	2640.0	H	107	338	9.89	1 / 204	13.15	23.04	0.201	33.01	-9.97
	QPSK	2546.0	H	134	330	9.38	1 / 204	12.86	22.24	0.167	33.01	-10.77
	QPSK	2593.0	H	105	340	9.49	1 / 204	12.66	22.15	0.164	33.01	-10.86
	QPSK	2640.0	H	107	338	9.89	1 / 68	13.52	**23.41**	0.219	33.01	-9.60
	16-QAM	2640.0	H	107	338	9.89	1 / 68	12.24	22.13	0.163	33.01	-10.88
90 MHz	π/2 BPSK	2541.0	H	134	330	9.39	1 / 183	13.66	23.05	0.202	33.01	-9.96
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 122	12.22	21.71	0.148	33.01	-11.30
	π/2 BPSK	2645.0	H	107	338	9.91	1 / 61	13.80	23.72	0.235	33.01	-9.29
	QPSK	2541.0	H	134	330	9.39	1 / 183	13.50	22.88	0.194	33.01	-10.13
	QPSK	2593.0	H	105	340	9.49	1 / 122	12.52	22.01	0.159	33.01	-11.00
	QPSK	2645.0	H	107	338	9.91	1 / 61	13.81	**23.73**	0.236	33.01	-9.28
	16-QAM	2645.0	H	107	338	9.91	1 / 61	13.23	23.14	0.206	33.01	-9.87
80 MHz	π/2 BPSK	2536.0	H	134	330	9.40	1 / 162	13.74	23.14	0.206	33.01	-9.87
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 162	12.63	22.12	0.163	33.01	-10.89
	π/2 BPSK	2650.0	H	107	338	9.93	1 / 54	13.78	23.72	0.235	33.01	-9.29
	QPSK	2536.0	H	134	330	9.40	1 / 108	12.93	22.33	0.171	33.01	-10.68
	QPSK	2593.0	H	105	340	9.49	1 / 162	12.65	22.15	0.164	33.01	-10.86
	QPSK	2650.0	H	107	338	9.93	1 / 54	13.95	**23.89**	0.245	33.01	-9.12
	16-QAM	2650.0	H	107	338	9.93	1 / 54	13.08	23.01	0.200	33.01	-10.00
60 MHz	π/2 BPSK	2526.0	H	134	330	9.43	1 / 40	13.23	22.67	0.185	33.01	-10.34
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 40	12.37	21.86	0.153	33.01	-11.15
	π/2 BPSK	2660.0	H	107	338	9.85	1 / 40	13.79	23.64	0.231	33.01	-9.37
	QPSK	2526.0	H	134	330	9.43	1 / 121	13.11	22.54	0.180	33.01	-10.47
	QPSK	2593.0	H	105	340	9.49	1 / 40	12.44	21.93	0.156	33.01	-11.08
	QPSK	2660.0	H	107	338	9.85	1 / 81	13.96	**23.81**	0.241	33.01	-9.20
	16-QAM	2660.0	H	107	338	9.85	1 / 40	13.00	22.85	0.193	33.01	-10.16
50 MHz	π/2 BPSK	2521.0	H	134	330	9.45	1 / 99	13.71	23.16	0.207	33.01	-9.85
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 99	12.42	21.91	0.155	33.01	-11.10
	π/2 BPSK	2665.0	H	107	338	9.84	1 / 66	13.57	23.40	0.219	33.01	-9.61
	QPSK	2521.0	H	134	330	9.45	1 / 99	13.39	22.84	0.192	33.01	-10.17
	QPSK	2593.0	H	105	340	9.49	1 / 99	12.55	22.04	0.160	33.01	-10.97
	QPSK	2665.0	H	107	338	9.84	1 / 99	14.14	**23.98**	0.250	33.01	-9.03
	16-QAM	2665.0	H	107	338	9.84	1 / 66	12.85	22.69	0.186	33.01	-10.32
40 MHz	π/2 BPSK	2516.0	H	134	330	9.48	1 / 79	14.28	23.76	0.237	33.01	-9.25
	π/2 BPSK	2593.0	H	105	340	9.49	106 / 0	11.84	21.33	0.136	33.01	-11.68
	π/2 BPSK	2670.0	H	107	338	9.82	1 / 79	13.81	23.63	0.231	33.01	-9.38
	QPSK	2516.0	H	134	330	9.48	1 / 79	13.49	22.97	0.198	33.01	-10.04
	QPSK	2593.0	H	105	340	9.49	1 / 79	12.20	21.70	0.148	33.01	-11.31
	QPSK	2670.0	H	107	338	9.82	1 / 26	14.07	**23.89**	0.245	33.01	-9.12
	16-QAM	2670.0	H	107	338	9.82	1 / 79	12.40	22.23	0.167	33.01	-10.78
30 MHz	π/2 BPSK	2511.0	H	134	330	9.50	1 / 58	13.56	23.06	0.202	33.01	-9.95
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 19	12.39	21.88	0.154	33.01	-11.13
	π/2 BPSK	2675.0	H	107	338	9.85	1 / 19	13.35	23.19	0.209	33.01	-9.82
	QPSK	2511.0	H	134	330	9.50	1 / 19	13.46	22.96	0.198	33.01	-10.05
	QPSK	2593.0	H	105	340	9.49	1 / 19	12.36	21.85	0.153	33.01	-11.16
	QPSK	2675.0	H	107	338	9.85	1 / 19	14.16	**24.00**	0.251	33.01	-9.01
	16-QAM	2675.0	H	107	338	9.85	1 / 19	13.04	22.88	0.194	33.01	-10.13
20 MHz	π/2 BPSK	2506.0	H	134	330	9.50	1 / 37	12.71	22.21	0.166	33.01	-10.80
	π/2 BPSK	2593.0	H	105	340	9.49	1 / 25	12.41	21.90	0.155	33.01	-11.11
	π/2 BPSK	2680.0	H	107	338	9.87	1 / 37	13.09	22.96	0.198	33.01	-10.05
	QPSK	2506.0	H	134	330	9.50	1 / 25	13.48	22.98	0.199	33.01	-10.03
	QPSK	2593.0	H	105	340	9.49	1 / 13	12.42	21.91	0.155	33.01	-11.10
	QPSK	2680.0	H	107	338	9.87	1 / 25	14.23	**24.10**	0.257	33.01	-8.91
	16-QAM	2680.0	H	107	338	9.87	1 / 25	12.85	22.72	0.187	33.01	-10.29
100 MHz	QPSK (CP-OFDM)	2640.0	H	108	338	9.89	1 / 68	11.43	21.32	0.136	33.01	-11.69
	QPSK (Opposite Pol.)	2640.0	V	263	25	9.50	1 / 136	10.68	20.18	0.104	33.01	-12.83
	Half	2640.0	V	143	38	9.50	1 / 136	10.45	19.95	0.099	33.01	-13.06
	QPSK (WCP)	2640.0	H	114	309	9.89	1 / 204	10.08	19.97	0.099	33.01	-13.04

Table 7-10. EIRP Data (NR Band n41 – Ant F)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	2546.0	V	130	313	9.40	1 / 68	9.72	19.12	0.082	33.01	-13.89
	π/2 BPSK	2593.0	V	105	309	9.46	1 / 136	9.32	18.78	0.076	33.01	-14.23
	π/2 BPSK	2640.0	V	130	304	9.50	1 / 68	8.72	18.22	0.066	33.01	-14.79
	QPSK	2546.0	V	130	313	9.40	1 / 68	9.74	**19.14**	0.082	33.01	-13.87
	QPSK	2593.0	V	105	309	9.46	1 / 136	9.40	18.86	0.077	33.01	-14.15
	QPSK	2640.0	V	130	304	9.50	1 / 68	8.73	18.23	0.067	33.01	-14.78
	16-QAM	2546.0	V	130	313	9.40	1 / 68	9.08	18.48	0.070	33.01	-14.53
100 MHz	QPSK (CP-OFDM)	2546.0	V	129	308	9.40	1 / 68	8.95	18.35	0.068	33.01	-14.66
	QPSK (Opposite Pol.)	2546.0	H	103	166	9.38	1 / 68	8.30	17.68	0.059	33.01	-15.33
	Open	2546.0	H	220	155	9.38	1 / 68	8.94	18.32	0.068	33.01	-14.69
	QPSK (WCP)	2546.0	V	151	107	9.40	1 / 68	7.02	16.42	0.044	33.01	-16.59

Table 7-11. EIRP Data (NR Band n41 – 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]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	2550.0	H	143	70	9.38	1 / 204	1.94	11.32	0.014	33.01	-21.69
	π/2 BPSK	2593.0	H	107	65	9.49	1 / 204	2.75	12.24	0.017	33.01	-20.77
	π/2 BPSK	2640.0	H	105	59	9.89	1 / 204	3.09	12.98	0.020	33.01	-20.03
	QPSK	2550.0	H	143	70	9.38	1 / 204	1.91	11.29	0.013	33.01	-21.72
	QPSK	2593.0	H	107	65	9.49	1 / 204	2.79	12.28	0.017	33.01	-20.73
	QPSK	2640.0	H	105	59	9.89	1 / 204	3.12	**13.01**	0.020	33.01	-20.00
	16-QAM	2640.0	H	105	59	9.89	1 / 204	2.52	12.41	0.017	33.01	-20.60
100 MHz	QPSK (CP-OFDM)	2640.0	H	105	59	9.89	1 / 204	2.35	12.24	0.017	33.01	-20.77
	QPSK (Opposite Pol.)	2640.0	V	390	133	9.50	1 / 204	2.76	12.26	0.017	33.01	-20.75
	Half	2640.0	H	140	44	9.89	1 / 204	2.21	12.10	0.016	33.01	-20.91
	QPSK (WCP)	2640.0	H	201	307	9.89	1 / 204	0.38	10.27	0.011	33.01	-22.74

Table 7-12. EIRP Data (NR Band n41 – Ant E)

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	2550.0	H	177	334	9.37	1 / 204	-6.94	2.43	0.002	33.01	-30.58
	π/2 BPSK	2593.0	H	138	330	9.49	1 / 204	-4.51	4.98	0.003	33.01	-28.03
	π/2 BPSK	2640.0	H	105	326	9.89	1 / 204	-2.02	7.87	0.006	33.01	-25.14
	QPSK	2550.0	H	177	334	9.37	1 / 204	-6.90	2.47	0.002	33.01	-30.54
	QPSK	2593.0	H	138	330	9.49	1 / 204	-4.55	4.94	0.003	33.01	-28.07
	QPSK	2640.0	H	105	326	9.89	1 / 204	-1.99	**7.90**	0.006	33.01	-25.11
	16-QAM	2640.0	H	105	326	9.89	1 / 204	-2.48	7.41	0.006	33.01	-25.60
100 MHz	QPSK (CP-OFDM)	2640.0	H	105	326	9.89	1 / 204	-3.64	6.25	0.004	33.01	-26.76
	QPSK (Opposite Pol.)	2640.0	V	229	45	9.50	1 / 204	-3.76	5.74	0.004	33.01	-27.27
	Closed	2640.0	H	135	328	9.89	1 / 204	-3.49	6.40	0.004	33.01	-26.61
	QPSK (WCP)	2640.0	H	210	51	9.89	1 / 204	-5.95	3.94	0.002	33.01	-29.07

Table 7-13. EIRP Data (NR Band n41 – Ant C)

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

Test Settings

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

Test Setup

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

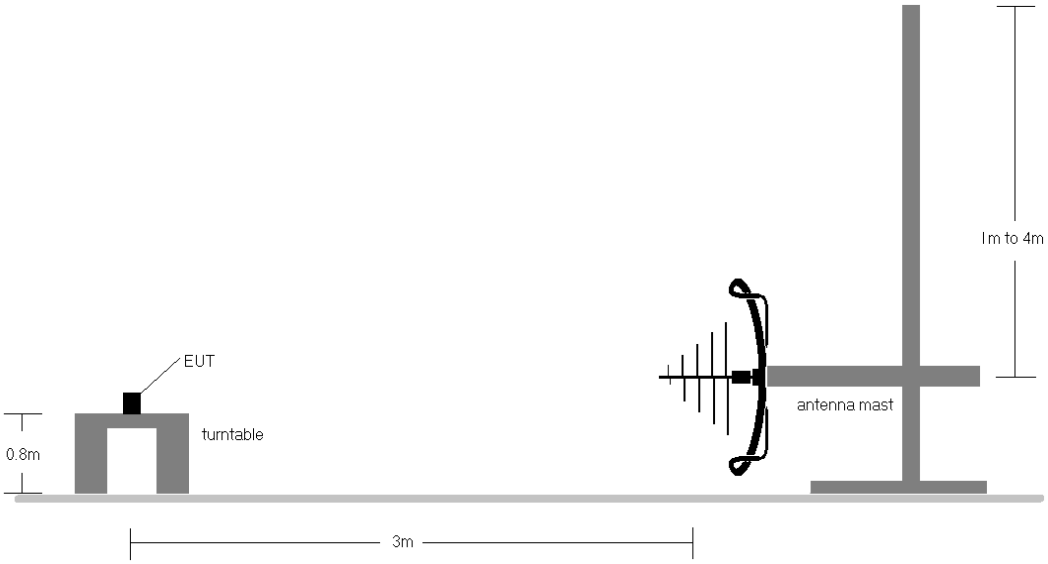


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

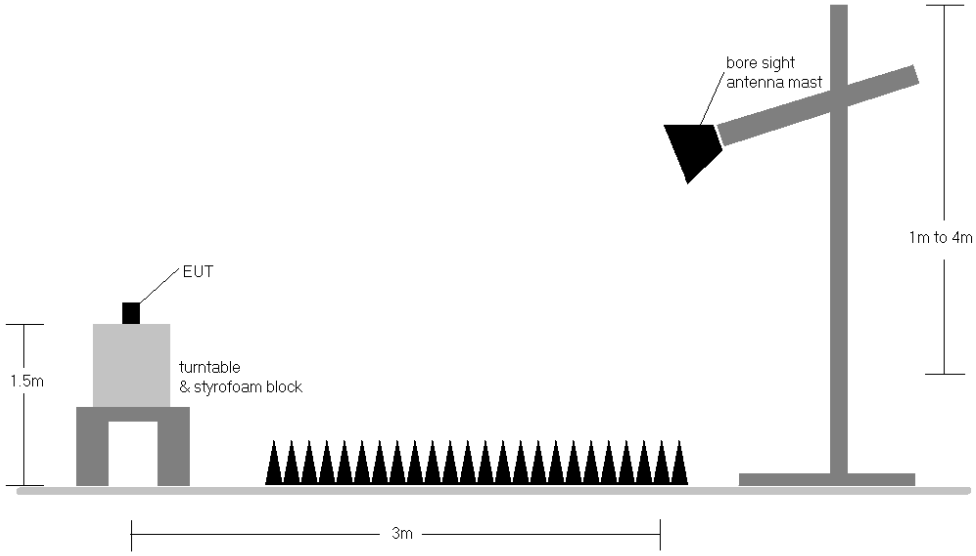


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

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

3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

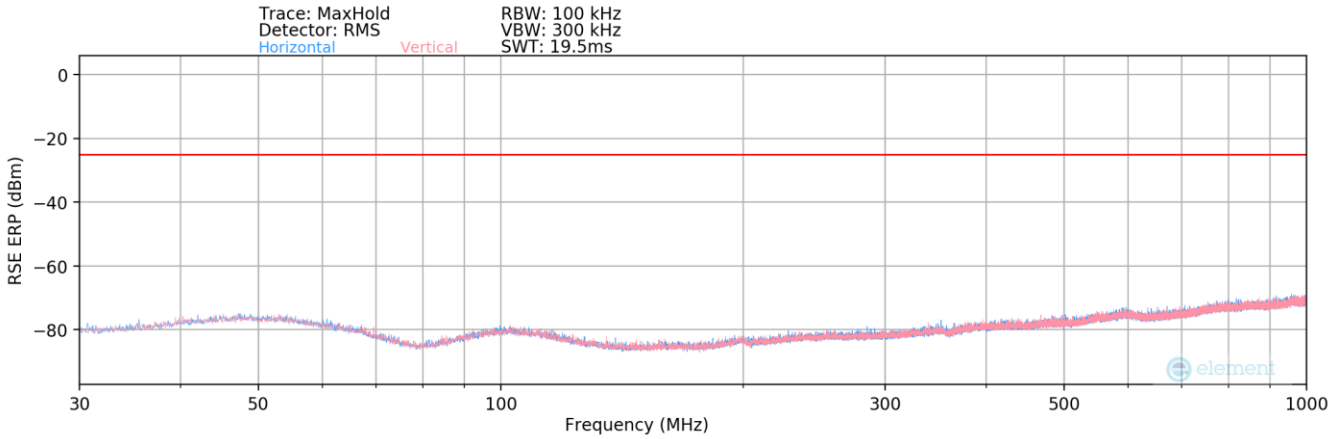
4) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

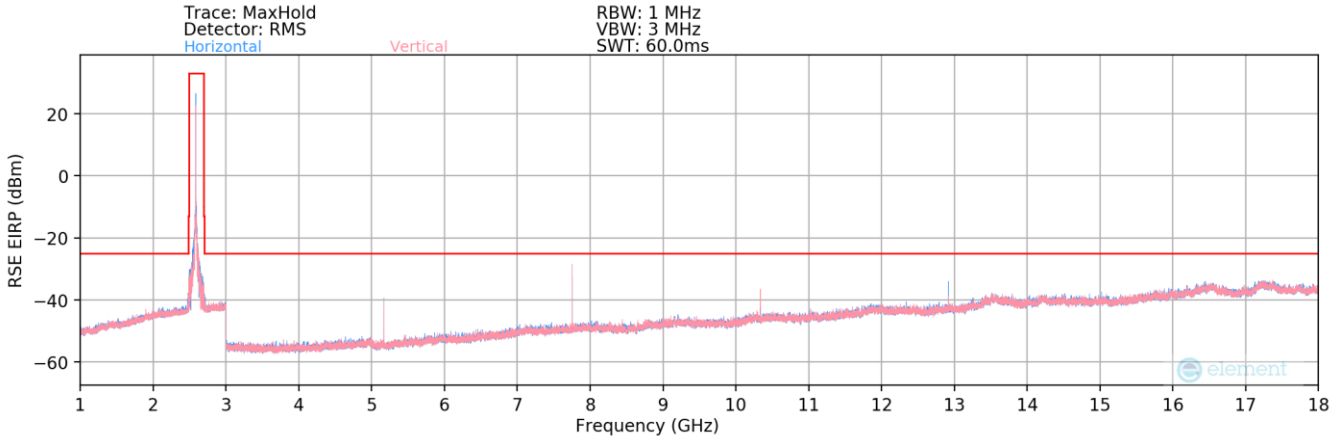
6) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

7) 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.

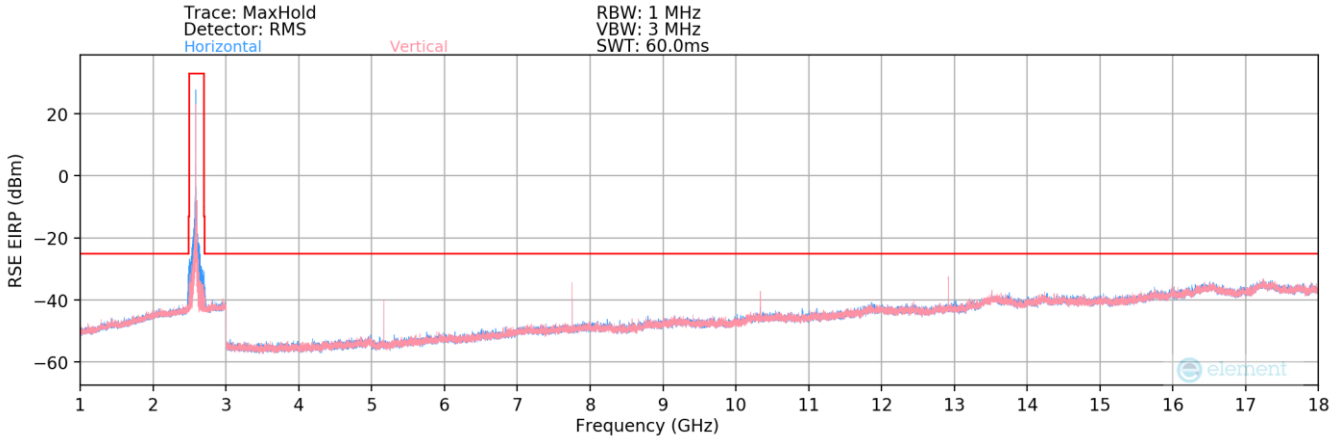
LTE Band 41(PC2) – Ant F



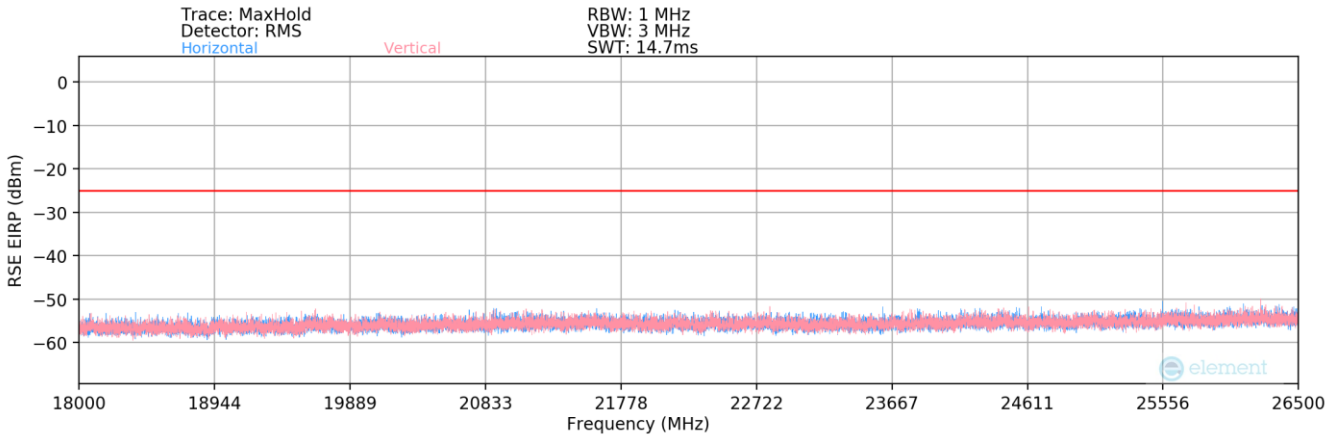
Plot 7-115. Radiated Spurious Plot (LTE Band 41(PC2) – Ant F) below 1GHz



Plot 7-116. Radiated Spurious Plot (LTE Band 41(PC2) – Ant F) above 1GHz – Closed



Plot 7-117. Radiated Spurious Plot (LTE Band 41(PC2) – Ant F) above 1GHz – Open



Plot 7-118. Radiated Spurious Plot (LTE Band 41(PC2) – Ant F) above 18GHz

Bandwidth (MHz):	20
Frequency (MHz):	2506.0
RB / 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]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
835.33	H	-	-	-72.14	-4.02	30.84	-64.42	-25.00	-39.42
5012.00	H	168	27	-55.61	10.15	61.54	-33.72	-25.00	-8.72
7518.00	H	108	14	-56.96	16.11	66.15	-29.10	-25.00	-4.10
10024.00	H	255	347	-71.25	19.73	55.48	-39.78	-25.00	-14.78
12530.00	H	103	345	-68.67	23.85	62.18	-33.08	-25.00	-8.08
15036.00	H	105	23	-73.92	27.64	60.72	-34.54	-25.00	-9.54
17542.00	H	-	-	-76.57	31.27	61.70	-43.10	-25.00	-18.10
20048.00	H	-	-	-60.31	2.95	49.64	-55.16	-25.00	-30.16

Table 7-14. Radiated Spurious Data (LTE Band 41(PC2) – Low Channel – Ant F) - Closed

Bandwidth (MHz):	20
Frequency (MHz):	2593.0
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]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
864.33	H	-	-	-72.93	-3.86	30.21	-65.05	-25.00	-40.05
5186.00	H	168	24	-58.62	10.52	58.90	-36.36	-25.00	-11.36
7779.00	H	104	178	-59.94	16.41	63.47	-31.79	-25.00	-6.79
10372.00	H	249	311	-70.69	20.35	56.66	-38.60	-25.00	-13.60
12965.00	H	104	344	-66.68	24.73	65.05	-30.21	-25.00	-5.21
15558.00	H	-	-	-76.84	28.70	58.86	-45.94	-25.00	-20.94
18151.00	H	-	-	-60.31	1.74	48.43	-56.37	-25.00	-31.37
20744.00	H	-	-	-59.64	3.33	50.69	-54.11	-25.00	-29.11

Table 7-15. Radiated Spurious Data (LTE Band 41(PC2) – Mid Channel – Ant F) - Closed

Bandwidth (MHz):	20
Frequency (MHz):	2680.0
RB / Offset:	1 / 99

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
893.33	H	-	-	-72.31	-3.72	30.97	-64.29	-25.00	-39.29
5360.00	H	112	19	-57.07	11.22	61.15	-34.10	-25.00	-9.10
8040.00	H	400	238	-58.13	16.73	65.60	-29.66	-25.00	-4.66
10720.00	H	311	66	-78.65	20.87	49.22	-46.04	-25.00	-21.04
13400.00	H	107	22	-79.24	25.68	53.44	-41.81	-25.00	-16.81
16080.00	H	-	-	-85.99	29.74	50.75	-54.05	-25.00	-29.05
18760.00	H	-	-	-60.89	2.06	48.17	-56.63	-25.00	-31.63
21440.00	H	-	-	-59.88	3.96	51.08	-53.72	-25.00	-28.72

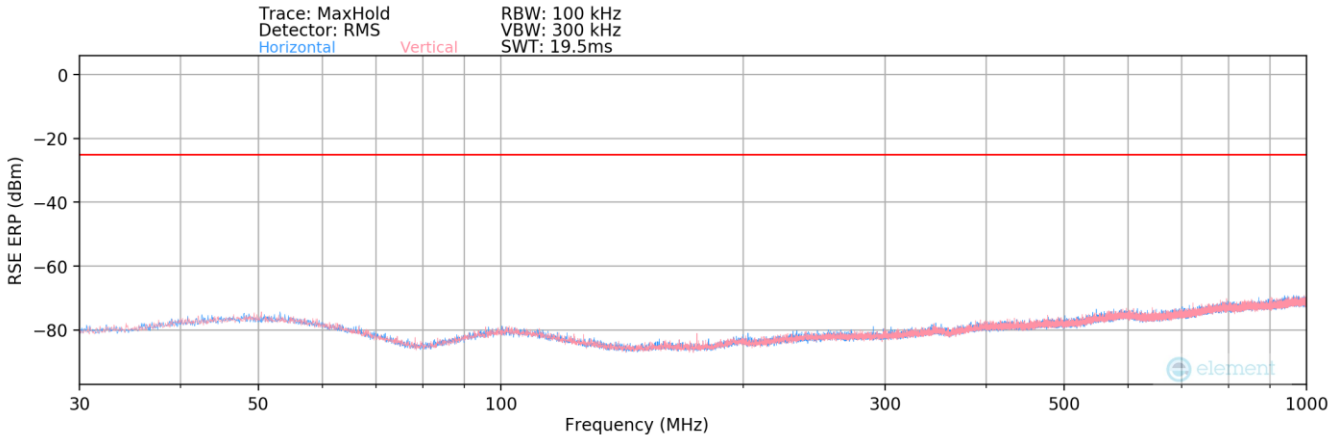
Table 7-16. Radiated Spurious Data (LTE Band 41(PC2) – High Channel – Ant F) - Closed

Bandwidth (MHz):	20
Frequency (MHz):	2506.0
RB / Offset:	1 / 50

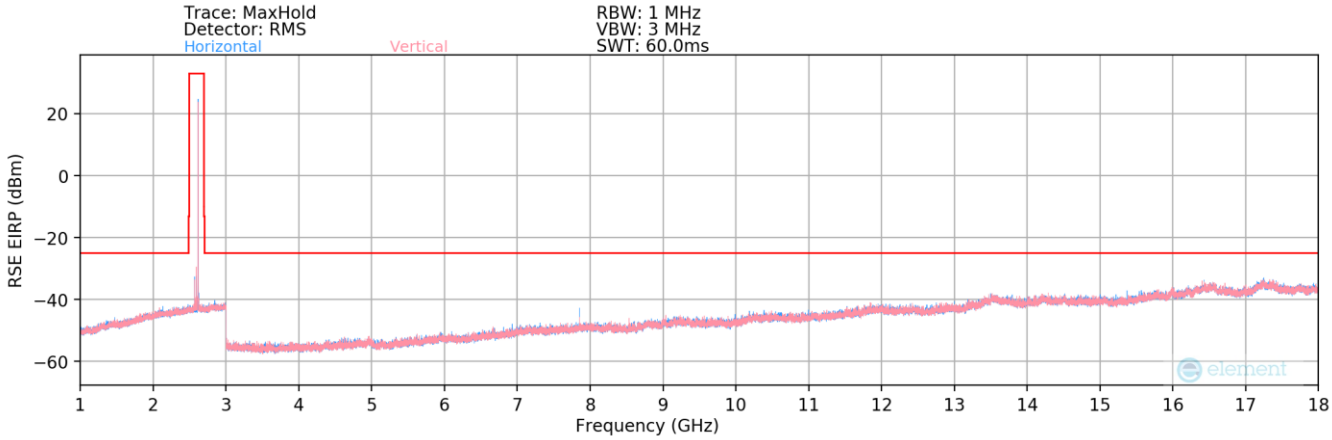
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
835.33	H	-	-	-72.09	-4.02	30.89	-64.37	-25.00	-39.37
5012.00	H	199	1	-60.11	10.15	57.04	-38.22	-25.00	-13.22
7518.00	H	151	273	-62.29	16.11	60.82	-34.43	-25.00	-9.43
10024.00	H	167	23	-78.11	19.73	48.62	-46.64	-25.00	-21.64
12530.00	H	201	345	-74.63	23.85	56.22	-39.04	-25.00	-14.04
15036.00	H	-	-	-78.21	27.64	56.43	-38.83	-25.00	-13.83
17542.00	H	-	-	-76.57	31.27	61.70	-33.55	-25.00	-8.55
20048.00	H	-	-	-61.23	2.95	48.72	-46.54	-25.00	-21.54

Table 7-17. Radiated Spurious Data with WCP (LTE Band 41(PC2) – Ant F) - Closed

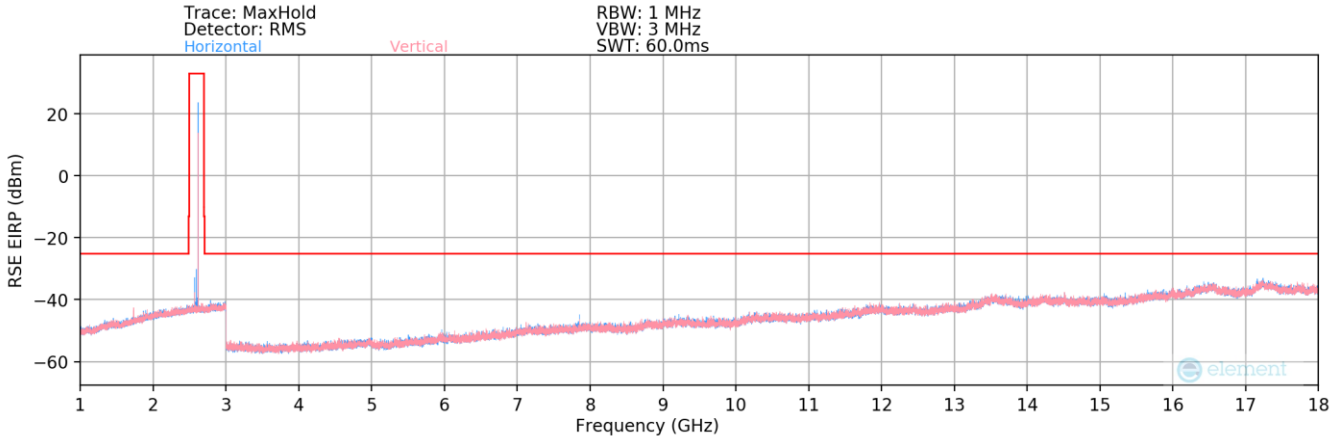
NR Band n41 – Ant F



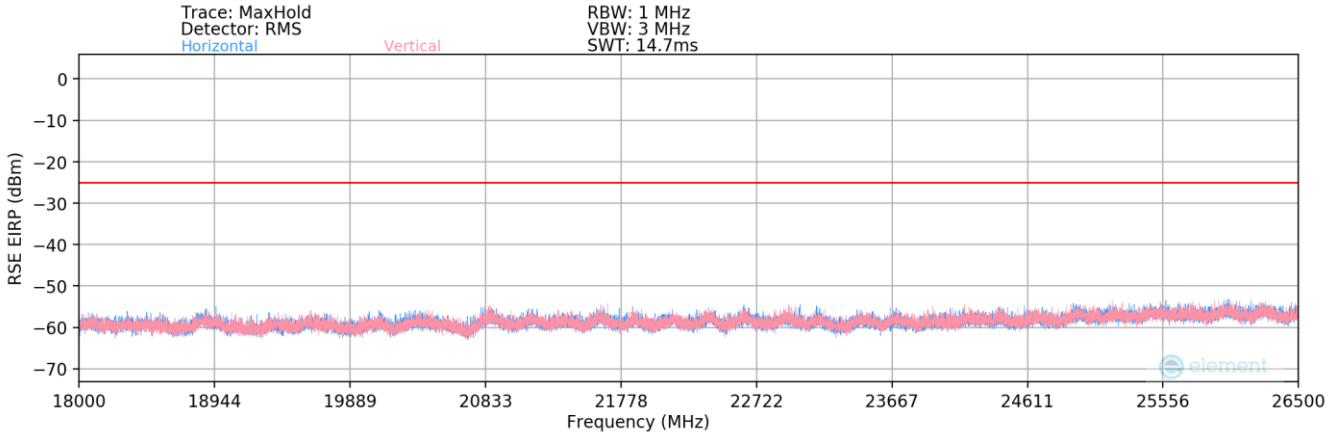
Plot 7-119. Radiated Spurious Plot (NR Band n41 – Ant F) below 1GHz



Plot 7-120. Radiated Spurious Plot (NR Band n41 – Ant F) above 1GHz – Half



Plot 7-121. Radiated Spurious Plot (NR Band n41 – Ant F) above 1GHz – Open



Plot 7-122. Radiated Spurious Plot (NR Band n41 – Ant F) above 18GHz

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1 / 204

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
848.67	H	-	-	-72.14	-4.02	30.84	-64.42	-25.00	-39.42
5092.00	H	-	-	-71.11	10.02	45.91	-49.34	-25.00	-24.34
7638.00	H	169	338	-65.19	16.63	58.44	-36.82	-25.00	-11.82
10184.00	H	-	-	-74.72	21.27	53.55	-41.71	-25.00	-16.71
12730.00	H	120	310	-74.31	23.75	56.44	-38.81	-25.00	-13.81
15276.00	H	-	-	-76.05	28.13	59.08	-36.18	-25.00	-11.18
17822.00	H	-	-	-76.15	31.08	61.93	-33.33	-25.00	-8.33
20368.00	H	-	-	-60.05	3.15	50.10	-54.70	-25.00	-29.70

Table 7-18. Radiated Spurious Data (NR Band n41 – Low Channel – Ant F) - Half

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 204

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
864.33	H	-	-	-72.93	-3.86	30.21	-65.05	-25.00	-40.05
5186.00	H	-	-	-73.09	10.52	44.43	-50.83	-25.00	-25.83
7779.00	H	105	334	-67.16	16.41	56.25	-39.01	-25.00	-14.01
10372.00	H	-	-	-75.36	20.35	51.99	-43.27	-25.00	-18.27
12965.00	H	-	-	-75.11	24.73	56.62	-38.64	-25.00	-13.64
15558.00	H	-	-	-76.29	28.70	59.41	-35.85	-25.00	-10.85
18151.00	H	-	-	-59.25	1.74	49.49	-55.31	-25.00	-30.31
20744.00	H	-	-	-60.24	3.33	50.09	-54.71	-25.00	-29.71

Table 7-19. Radiated Spurious Data (NR Band n41 – Mid Channel – Ant F) - Half

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 68

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
880.00	H	-	-	-72.31	-3.72	30.97	-64.29	-25.00	-39.29
5280.00	H	120	3	-70.46	10.61	47.15	-48.11	-25.00	-23.11
7920.00	H	140	334	-68.40	16.47	55.07	-40.19	-25.00	-15.19
10560.00	H	-	-	-75.28	20.68	52.40	-42.86	-25.00	-17.86
13200.00	H	-	-	-75.59	25.31	56.72	-38.54	-25.00	-13.54
15840.00	H	-	-	-76.11	29.05	59.94	-35.31	-25.00	-10.31
18480.00	H	-	-	-60.37	1.70	48.33	-56.47	-25.00	-31.47
21120.00	H	-	-	-60.87	3.68	49.81	-54.99	-25.00	-29.99

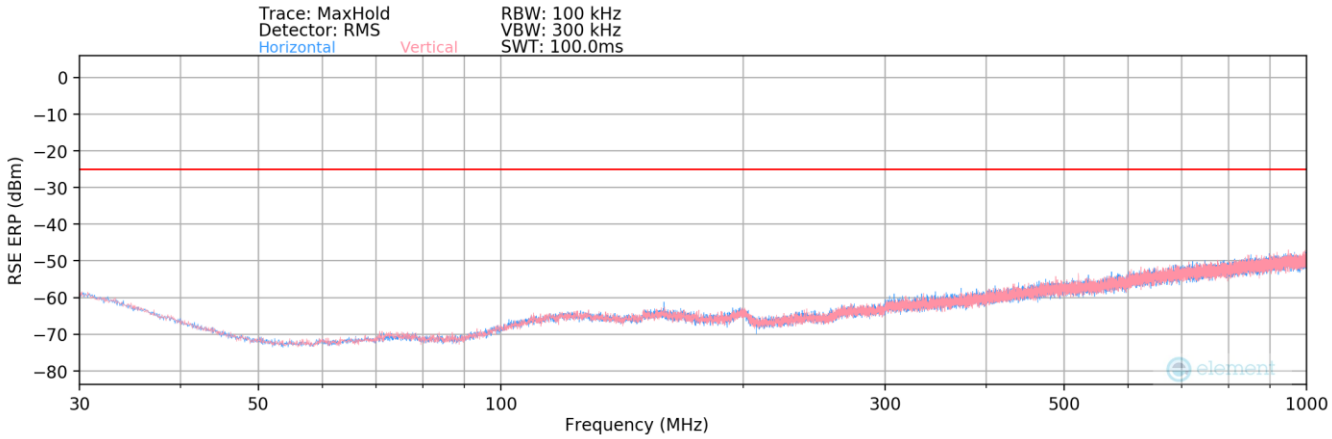
Table 7-20. Radiated Spurious Data (NR Band n41 – High Channel – Ant F) - Half

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 204

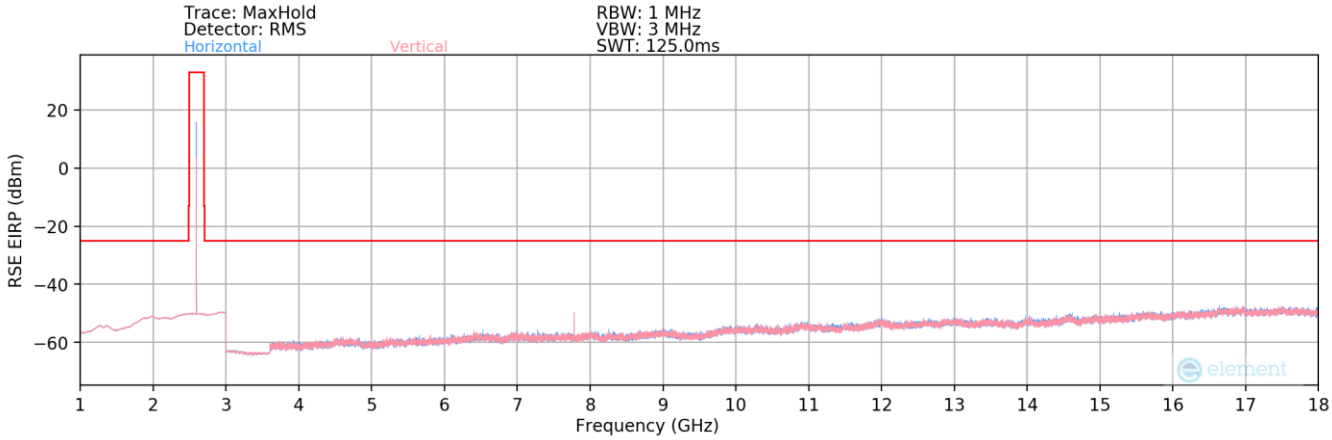
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
848.67	H	-	-	-71.98	-4.02	31.00	-64.26	-25.00	-39.26
5092.00	H	-	-	-70.99	10.02	46.03	-49.22	-25.00	-24.22
7638.00	H	169	338	-73.16	16.63	50.47	-44.79	-25.00	-19.79
10184.00	H	-	-	-74.72	21.27	53.55	-41.71	-25.00	-16.71
12730.00	H	-	-	-75.09	23.75	55.66	-39.59	-25.00	-14.59
15276.00	H	-	-	-77.01	28.13	58.12	-37.14	-25.00	-12.14
17822.00	H	-	-	-76.56	31.08	61.52	-33.74	-25.00	-8.74
20368.00	H	-	-	-61.02	3.15	49.13	-55.67	-25.00	-30.67

Table 7-21. Radiated Spurious Data with WCP (NR Band n41 – Ant F) - Half

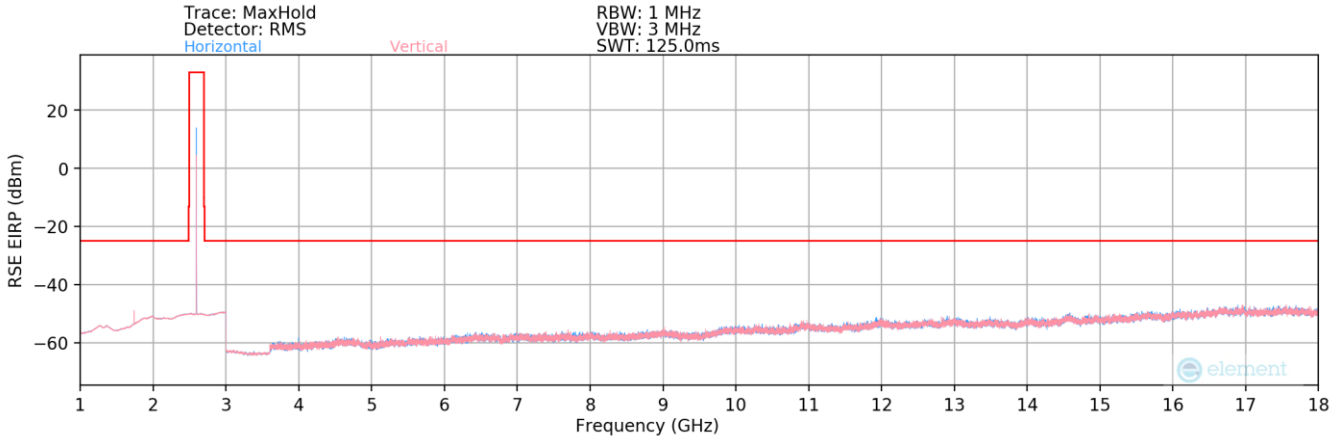
NR Band n41 – Ant B



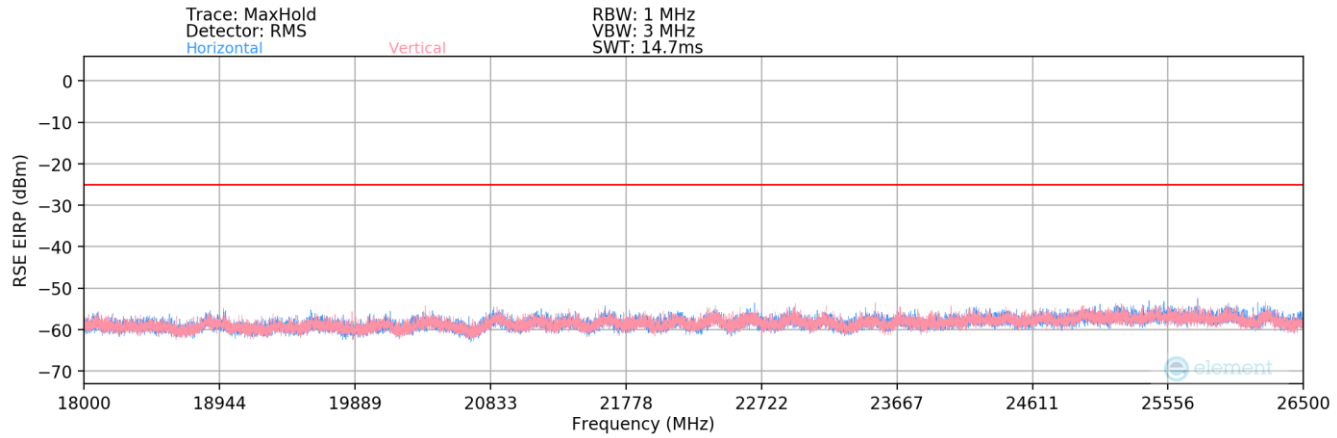
Plot 7-123. Radiated Spurious Plot (NR Band n41 – Ant B) below 1GHz



Plot 7-124. Radiated Spurious Plot (NR Band n41 – Ant B) above 1GHz – Closed



Plot 7-125. Radiated Spurious Plot (NR Band n41 – Ant B) above 1GHz – Open



Plot 7-126. Radiated Spurious Plot (NR Band n41 – Ant B) above 18GHz

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
848.67	V	-	-	-86.21	30.81	51.60	-43.66	-25.00	-18.66
5092.00	V	138	292	-74.87	4.49	36.62	-58.64	-25.00	-33.64
7638.00	V	123	23	-63.23	7.96	51.73	-43.53	-25.00	-18.53
10184.00	V	120	207	-73.87	11.45	44.58	-50.68	-25.00	-25.68
12730.00	V	121	199	-76.80	14.30	44.50	-50.76	-25.00	-25.76
15276.00	V	-	-	-78.13	16.14	45.01	-50.25	-25.00	-25.25
17822.00	V	-	-	-78.24	18.71	47.47	-47.79	-25.00	-22.79
22914.00	V	-	-	-61.36	3.72	49.36	-55.44	-25.00	-30.44

Table 7-22. Radiated Spurious Data (NR Band n41 – Low Channel – Ant B) - Closed

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
864.33	V	-	-	-85.11	30.87	52.76	-42.49	-25.00	-17.49
5186.00	V	150	222	-75.57	5.18	36.61	-58.65	-25.00	-33.65
7779.00	V	285	14	-63.01	7.47	51.46	-43.80	-25.00	-18.80
10372.00	V	124	201	-76.17	11.18	42.01	-53.24	-25.00	-28.24
12965.00	V	-	-	-78.40	14.27	42.87	-52.38	-25.00	-27.38
15558.00	V	-	-	-78.61	16.00	44.39	-50.87	-25.00	-25.87
18151.00	V	-	-	-61.26	1.74	47.48	-57.32	-25.00	-32.32
20744.00	V	-	-	-60.54	3.33	49.79	-55.01	-25.00	-30.01

Table 7-23. Radiated Spurious Data (NR Band n41 – Mid Channel – Ant B) - Closed

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
880.00	V	-	-	-85.31	31.14	52.83	-42.43	-25.00	-17.43
5280.00	V	131	221	-75.18	5.00	36.82	-58.44	-25.00	-33.44
7920.00	V	120	14	-60.11	8.08	54.97	-40.28	-25.00	-15.28
10560.00	V	125	186	-74.00	11.84	44.84	-50.41	-25.00	-25.41
13200.00	V	125	191	-76.91	13.65	43.74	-51.51	-25.00	-26.51
15840.00	V	-	-	-78.40	17.27	45.87	-49.39	-25.00	-24.39
18480.00	V	-	-	-59.65	1.70	49.05	-55.75	-25.00	-30.75
23760.00	V	-	-	-62.14	3.91	48.77	-56.03	-25.00	-31.03

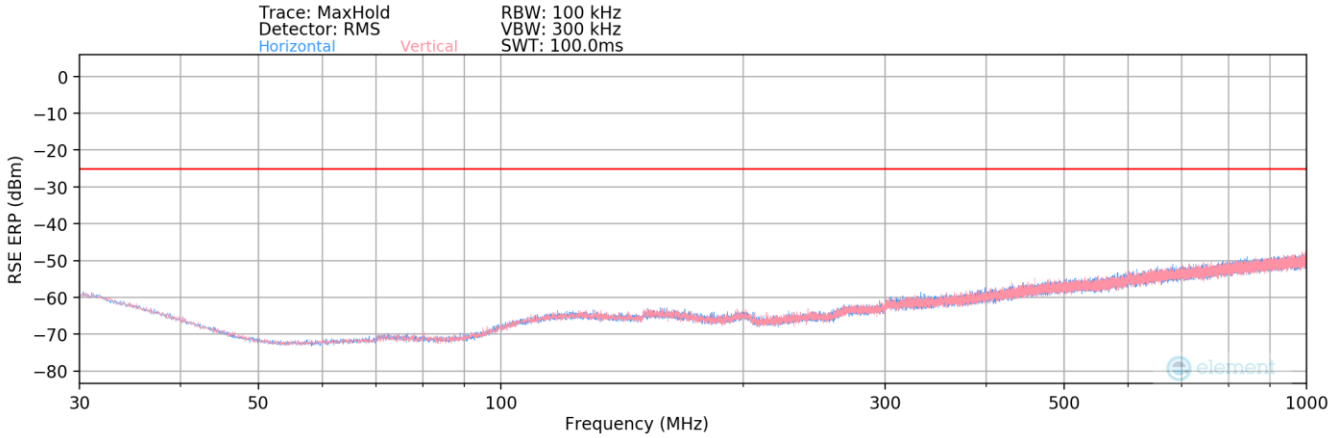
Table 7-24. Radiated Spurious Data (NR Band n41 – High Channel – Ant B) - Closed

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 204

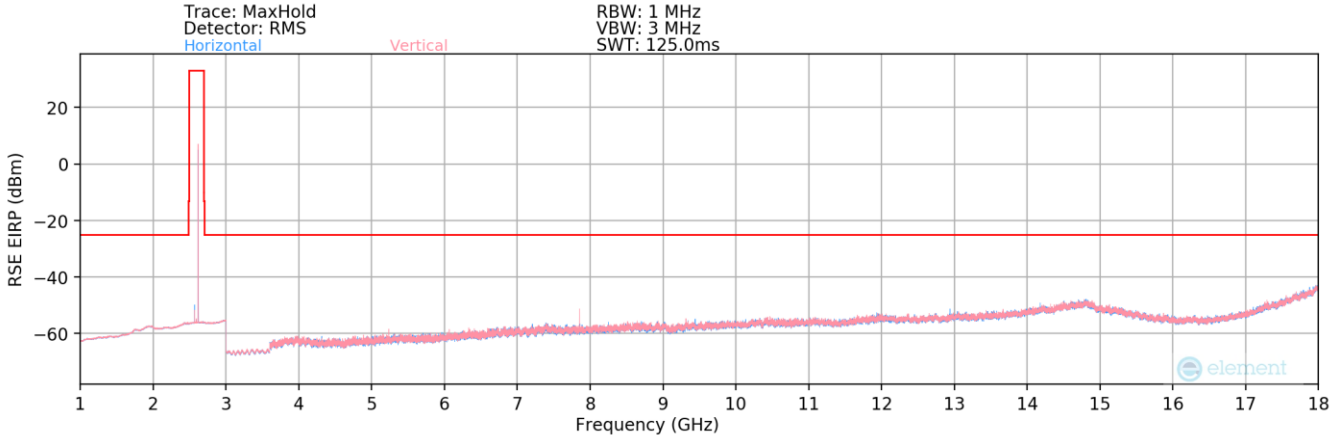
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
880.00	V	-	-	-85.31	31.14	52.83	-42.43	-25.00	-17.43
5280.00	V	151	357	-79.00	5.00	33.00	-62.26	-25.00	-37.26
7920.00	V	115	247	-65.31	8.08	49.77	-45.48	-25.00	-20.48
10560.00	V	-	-	-76.88	11.84	41.96	-53.29	-25.00	-28.29
13200.00	V	-	-	-78.11	13.65	42.54	-52.71	-25.00	-27.71
15840.00	V	-	-	-78.40	17.27	45.87	-49.39	-25.00	-24.39
18480.00	V	-	-	-61.00	1.70	47.70	-47.55	-25.00	-22.55
23760.00	V	-	-	-61.29	3.91	49.62	-45.64	-25.00	-20.64

Table 7-25. Radiated Spurious Data with WCP (NR Band n41 – Ant B) - Closed

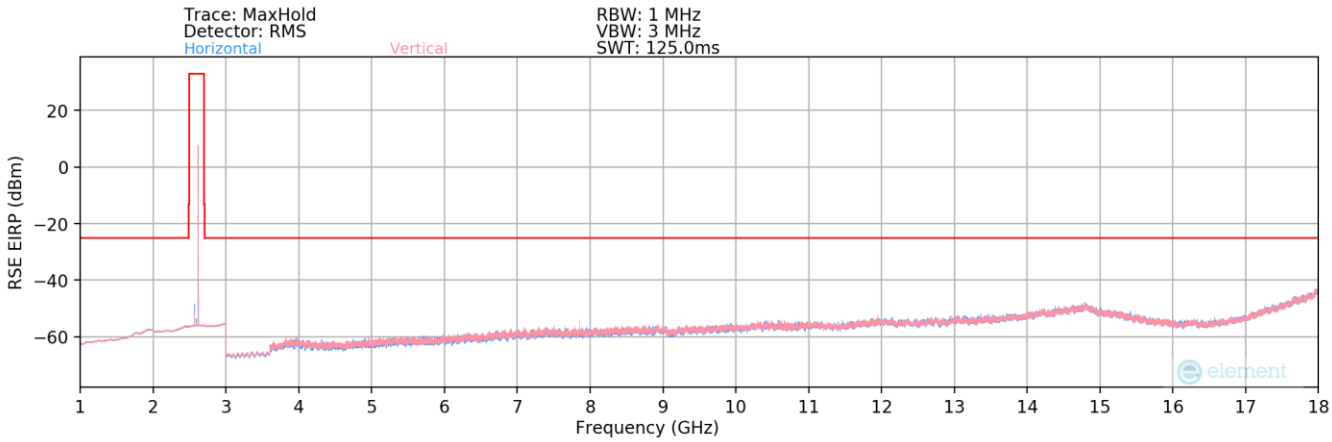
NR Band n41 – Ant E



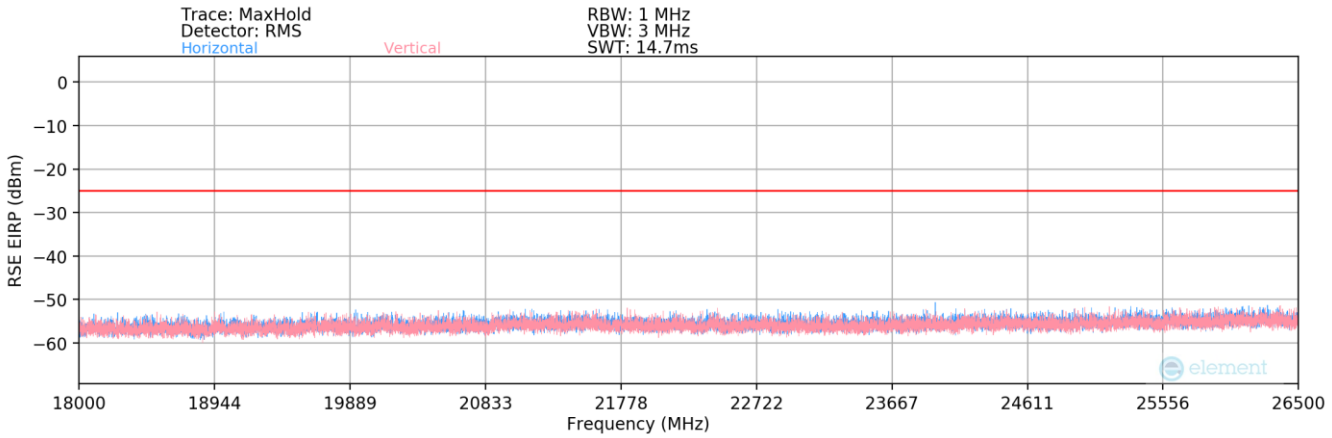
Plot 7-127. Radiated Spurious Plot (NR Band n41 – Ant E) below 1GHz



Plot 7-128. Radiated Spurious Plot (NR Band n41 – Ant E) above 1GHz – Open



Plot 7-129. Radiated Spurious Plot (NR Band n41 – Ant E) above 1GHz – Half



Plot 7-130. Radiated Spurious Plot (NR Band n41 – Ant E) above 18GHz

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
848.67	V	-	-	-83.12	30.14	54.02	-41.23	-25.00	-16.23
5092.00	V	-	-	-73.92	2.15	35.23	-60.03	-25.00	-35.03
7638.00	V	218	353	-60.20	7.10	53.90	-41.36	-25.00	-16.36
10184.00	V	-	-	-77.48	11.06	40.58	-54.68	-25.00	-29.68
12730.00	V	-	-	-76.44	12.49	43.05	-52.21	-25.00	-27.21
15276.00	V	-	-	-76.87	14.16	44.29	-50.97	-25.00	-25.97
17822.00	V	-	-	-75.76	19.57	50.81	-44.45	-25.00	-19.45
20368.00	V	-	-	-61.58	3.15	48.57	-56.23	-25.00	-31.23

Table 7-26. Radiated Spurious Data (NR Band n41 – Low Channel – Ant E) - Open

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 204

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
864.33	V	-	-	-83.66	30.50	53.84	-41.41	-25.00	-16.41
5186.00	V	-	-	-76.86	2.13	32.27	-62.98	-25.00	-37.98
7779.00	V	165	330	-61.93	7.19	52.26	-43.00	-25.00	-18.00
10372.00	V	-	-	-77.91	11.25	40.34	-54.92	-25.00	-29.92
12965.00	V	-	-	-78.27	13.10	41.83	-53.43	-25.00	-28.43
15558.00	V	-	-	-76.68	13.20	43.52	-51.74	-25.00	-26.74
18151.00	V	-	-	-61.98	1.74	46.76	-58.04	-25.00	-33.04
20744.00	V	-	-	-61.56	3.33	48.77	-56.03	-25.00	-31.03

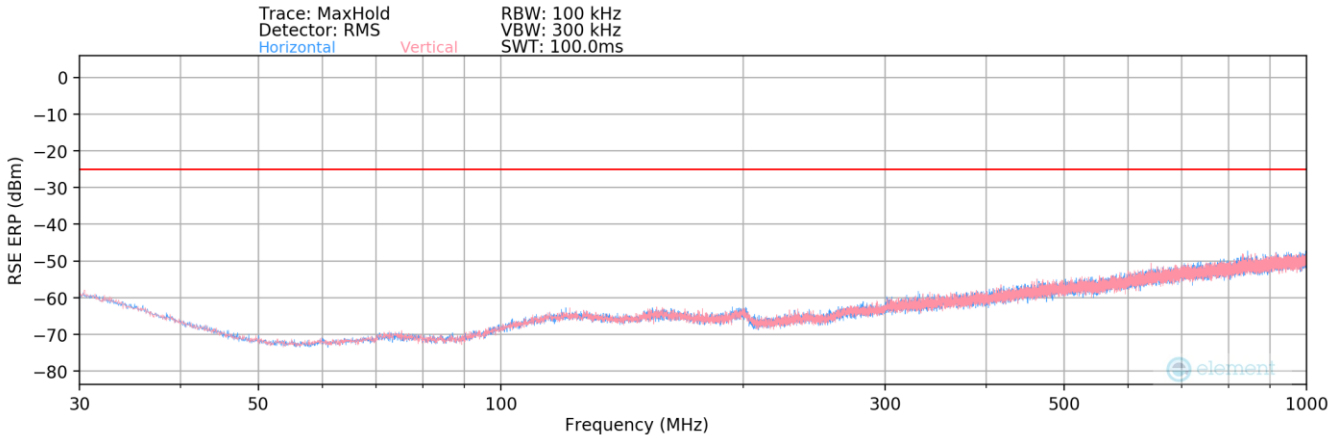
Table 7-27. Radiated Spurious Data (NR Band n41 – Mid Channel – Ant E) - Open

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 68

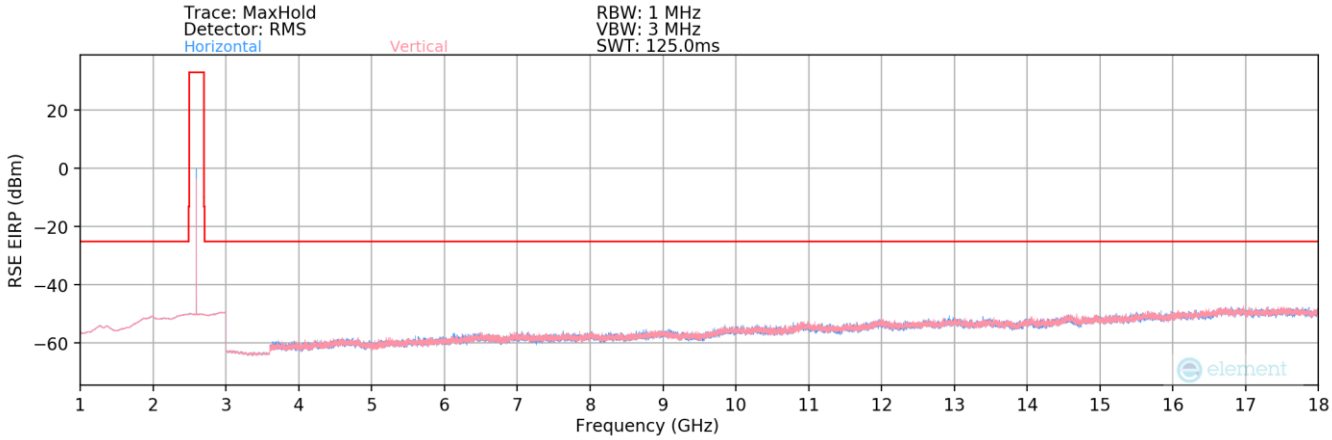
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
880.00	V	-	-	-84.28	30.43	53.15	-42.11	-25.00	-17.11
5280.00	V	-	-	-73.11	2.39	36.28	-58.98	-25.00	-33.98
7920.00	V	150	332	-69.10	7.05	44.95	-50.31	-25.00	-25.31
10560.00	V	-	-	-76.36	11.41	42.05	-53.21	-25.00	-28.21
13200.00	V	-	-	-77.48	13.30	42.82	-52.44	-25.00	-27.44
15840.00	V	-	-	-75.31	12.06	43.75	-51.51	-25.00	-26.51
18480.00	V	-	-	-58.66	1.70	50.04	-54.76	-25.00	-29.76
21120.00	V	-	-	-59.64	3.68	51.04	-53.76	-25.00	-28.76

Table 7-28. Radiated Spurious Data (NR Band n41 – High Channel – Ant E) - Open

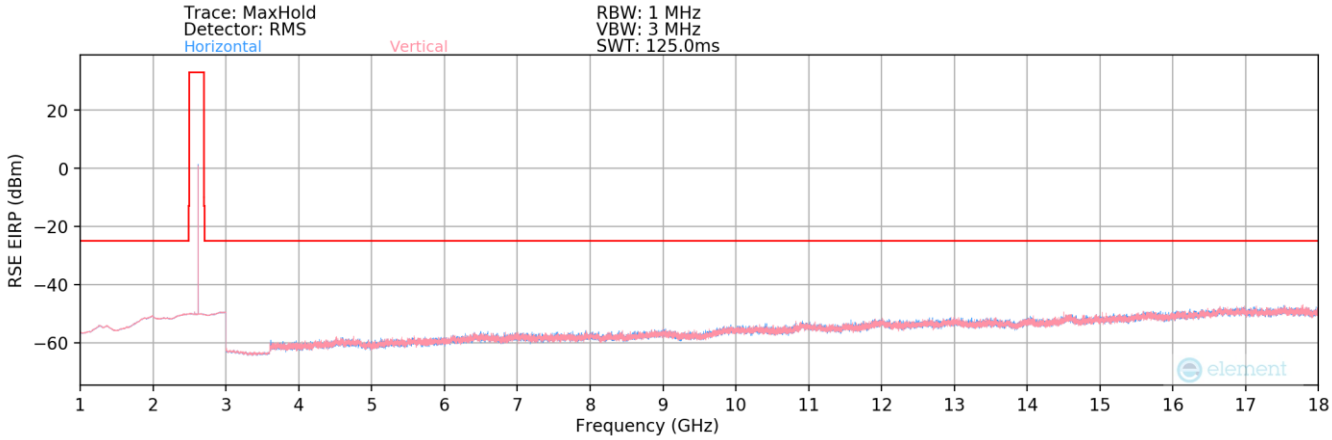
NR Band n41 – Ant C



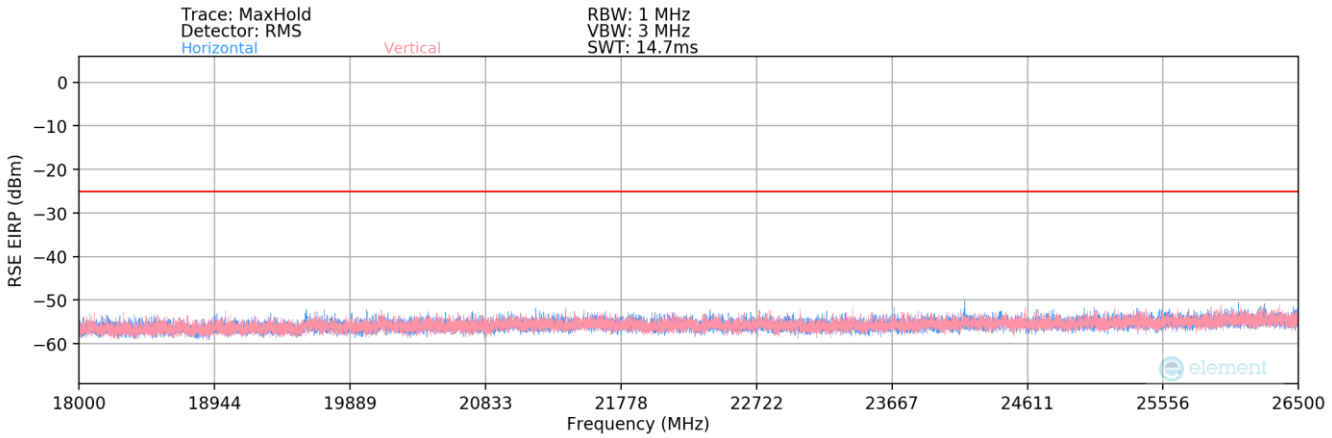
Plot 7-131. Radiated Spurious Plot (NR Band n41 – Ant C) below 1GHz



Plot 7-132. Radiated Spurious Plot (NR Band n41 – Ant C) above 1GHz – Closed



Plot 7-133. Radiated Spurious Plot (NR Band n41 – Ant C) above 1GHz – Open



Plot 7-134. Radiated Spurious Plot (NR Band n41 – Ant C) above 18GHz

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1 / 68

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
848.67	H	-	-	-86.21	30.81	51.60	-43.66	-25.00	-18.66
5092.00	H	-	-	-75.56	4.49	35.93	-59.33	-25.00	-34.33
7638.00	H	148	23	-75.66	7.96	39.30	-55.96	-25.00	-30.96
10184.00	H	-	-	-77.45	11.45	41.00	-54.26	-25.00	-29.26
12730.00	H	171	318	-75.87	14.30	45.43	-49.83	-25.00	-24.83
15276.00	H	-	-	-78.19	16.14	44.95	-50.31	-25.00	-25.31
17822.00	H	-	-	-78.69	18.71	47.02	-48.24	-25.00	-23.24
20400.00	H	-	-	-62.55	3.04	47.49	-57.31	-25.00	-32.31

Table 7-29. Radiated Spurious Data (NR Band n41 – Low Channel – Ant C) - Closed

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 204

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
864.33	H	-	-	-85.11	30.87	52.76	-42.49	-25.00	-17.49
5186.00	H	-	-	-75.66	5.18	36.52	-58.74	-25.00	-33.74
7779.00	H	132	13	-74.41	7.47	40.06	-55.20	-25.00	-30.20
10372.00	H	312	368	-77.17	11.18	41.01	-54.24	-25.00	-29.24
12965.00	H	162	312	-77.41	14.27	43.86	-51.39	-25.00	-26.39
15558.00	H	-	-	-78.44	16.00	44.56	-50.70	-25.00	-25.70
18151.00	H	-	-	-62.02	1.74	46.72	-58.08	-25.00	-33.08
20744.00	H	-	-	-59.87	3.33	50.46	-54.34	-25.00	-29.34

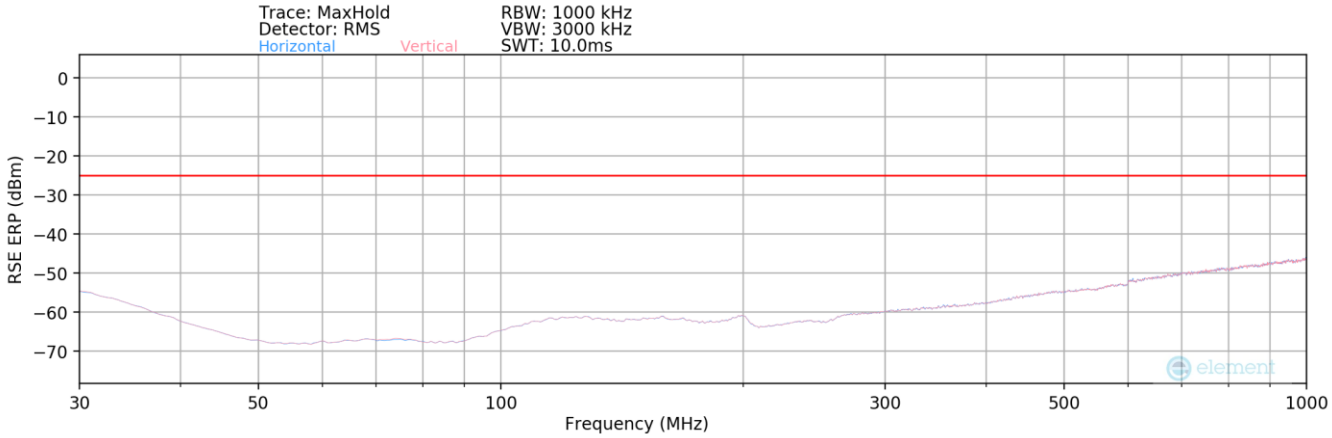
Table 7-30. Radiated Spurious Data (NR Band n41 – Mid Channel – Ant C) - Closed

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1 / 136

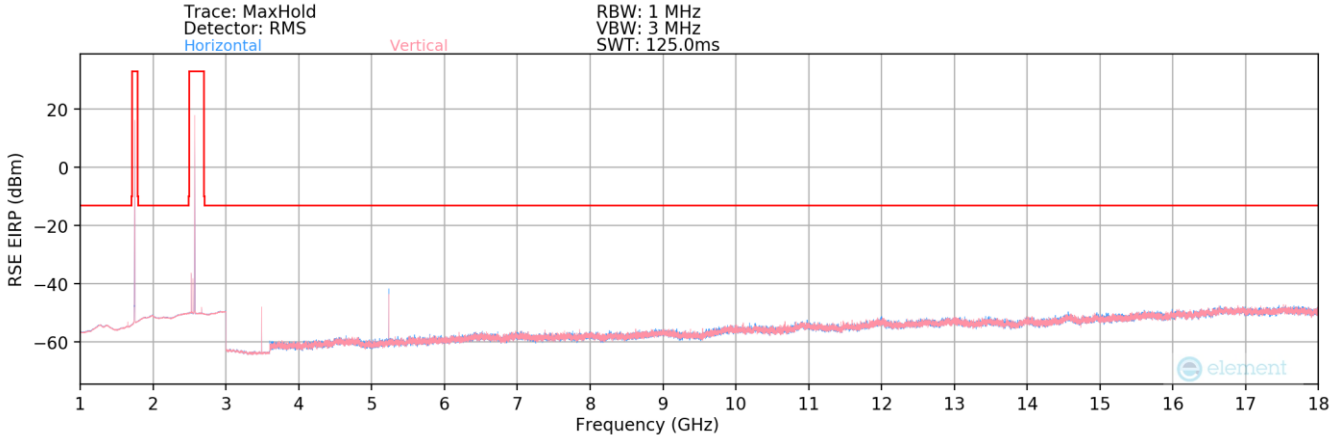
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
880.00	H	-	-	-85.31	31.14	52.83	-42.43	-25.00	-17.43
5280.00	H	-	-	-75.99	5.00	36.01	-59.25	-25.00	-34.25
7920.00	H	136	17	-74.39	8.08	40.69	-54.56	-25.00	-29.56
10560.00	H	242	365	-73.14	11.84	45.70	-49.55	-25.00	-24.55
13200.00	H	230	310	-75.99	13.65	44.66	-50.59	-25.00	-25.59
15840.00	H	-	-	-78.34	17.27	45.93	-49.33	-25.00	-24.33
18480.00	H	-	-	-61.23	1.70	47.47	-57.33	-25.00	-32.33
21120.00	H	-	-	-62.31	3.68	48.37	-56.43	-25.00	-31.43

Table 7-31. Radiated Spurious Data (NR Band n41 – High Channel – Ant C) - Closed

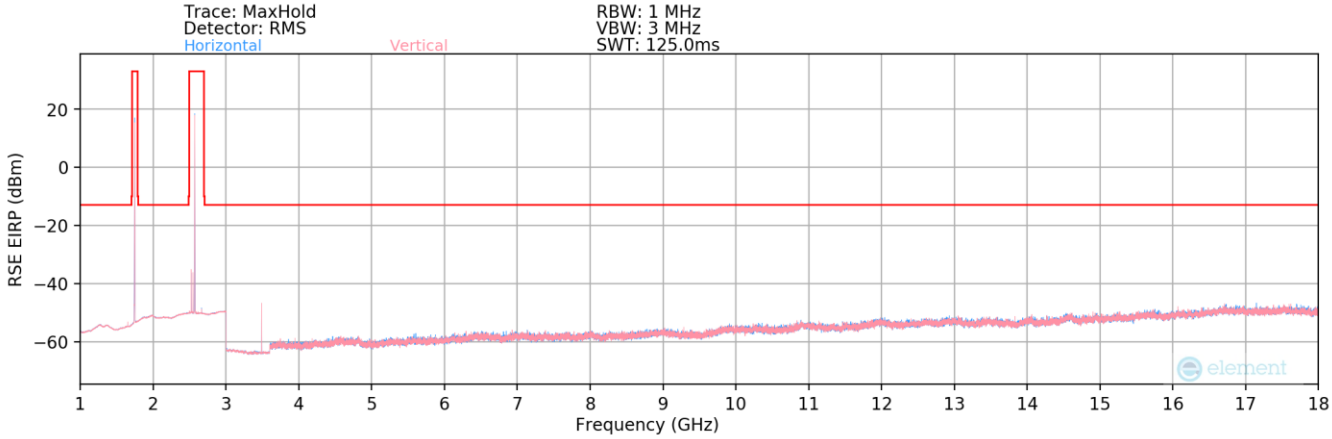
EN-DC NR Band n41 – LTE Band 66



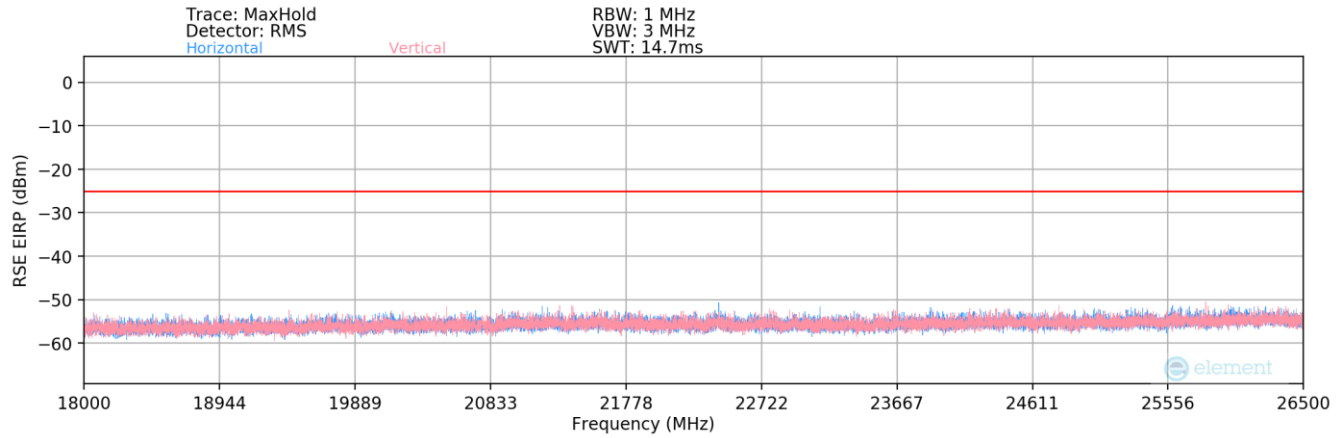
Plot 7-135. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 66) below 1GHz



Plot 7-136. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 66) above 1GHz – Closed



Plot 7-137. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 66) above 1GHz – Half



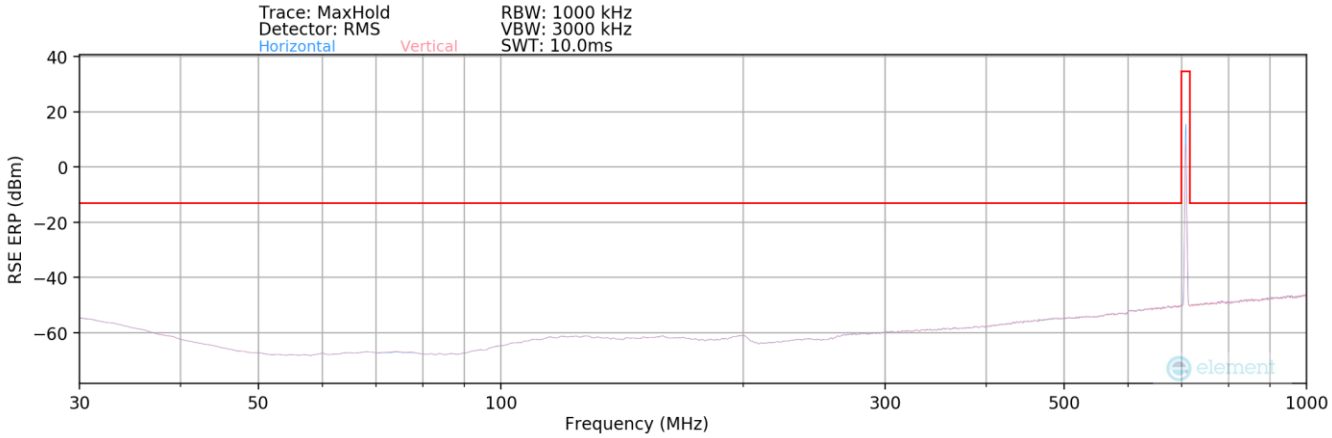
Plot 7-138. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 66) above 18GHz

Bandwidth (MHz):	100 & 20
Frequency (MHz):	2546 & 1745
RB / Offset:	1 / 204 & 1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 66

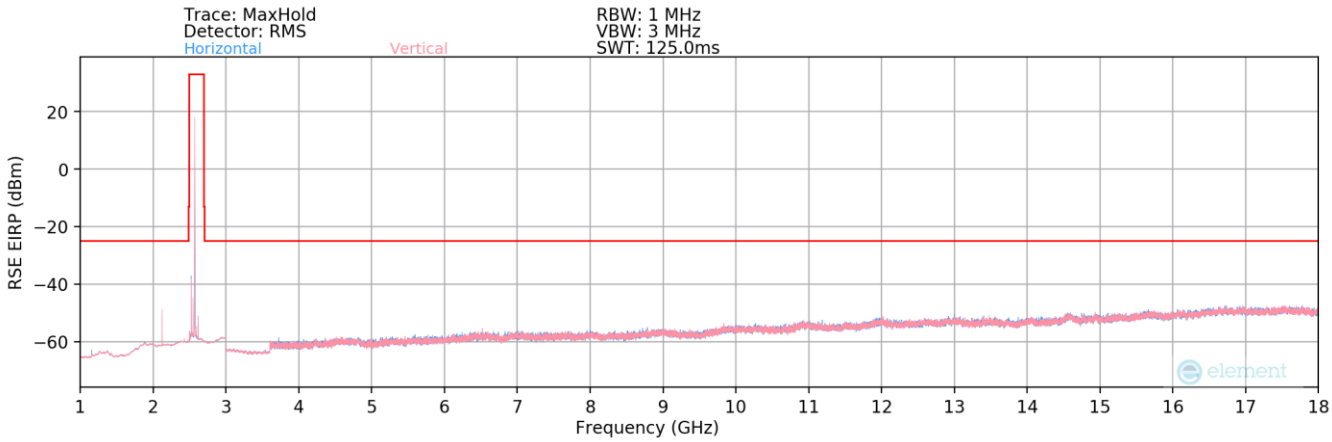
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
944.00	H	-	-	-85.38	31.83	53.45	-41.80	-13.00	-28.80
1459.00	H	-	-	-72.18	15.02	49.84	-45.42	-13.00	-32.42
2521.50	H	314	335	-64.57	20.66	63.09	-32.17	-13.00	-19.17
3490.00	H	122	335	-53.15	2.69	56.54	-38.72	-13.00	-25.72
5235.50	H	326	148	-60.22	5.02	51.80	-43.46	-13.00	-30.46
5750.00	H	-	-	-76.09	5.42	36.33	-58.92	-13.00	-45.92
20368.00	H	-	-	-59.88	3.15	50.27	-54.53	-13.00	-41.53

Table 7-32. Radiated Spurious Data (EN-DC NR Band n41 – LTE Band 66) - Closed

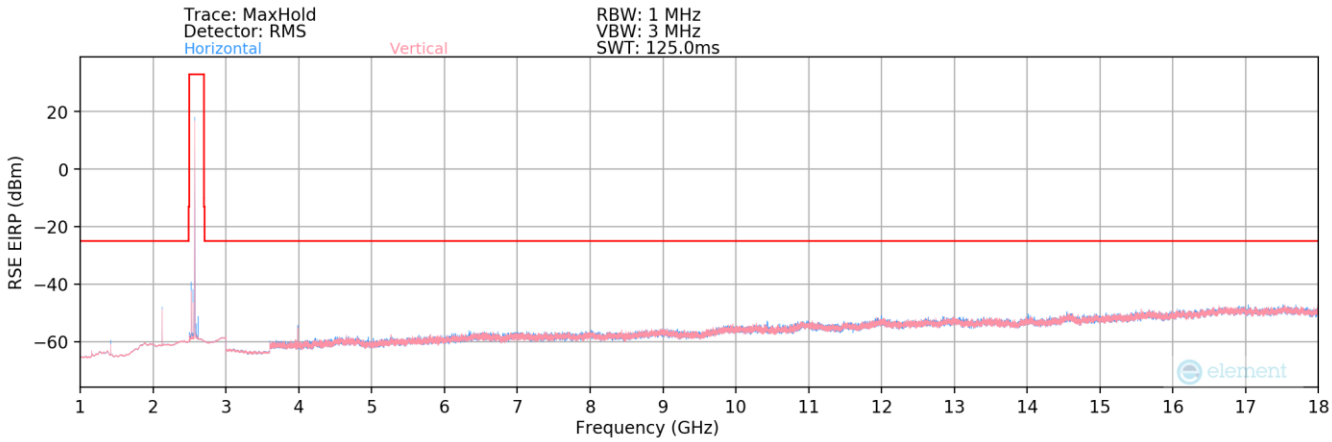
EN-DC NR Band n41 – LTE Band 12



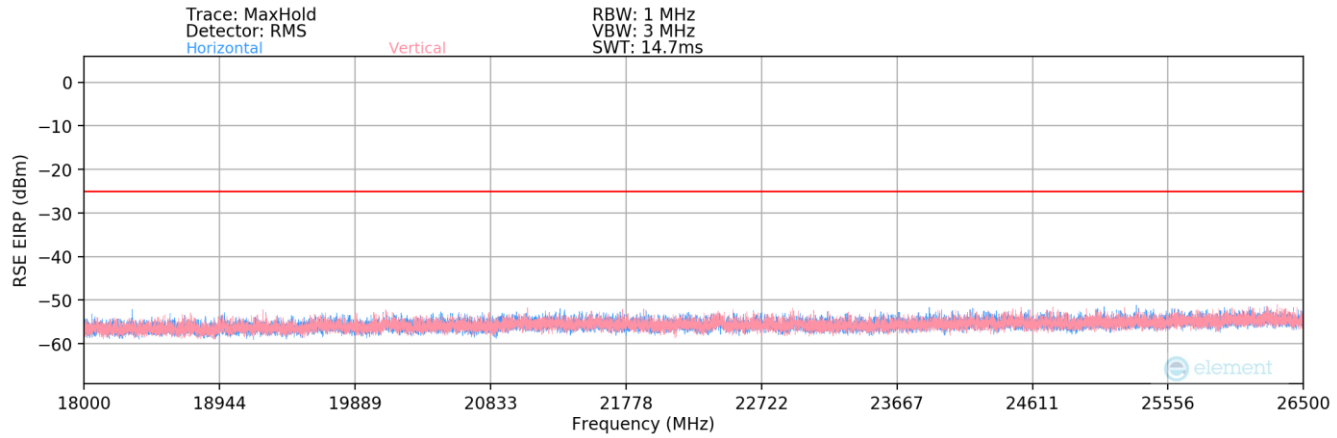
Plot 7-139. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 12) below 1GHz



Plot 7-140. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 12) above 1GHz – Closed



Plot 7-141. Radiated Spurious Plot (EN-DC NR Band n41 – LTE Band 12) above 1GHz – Half



Plot 7-142. Radiated Spurious Plot (EN-DC NR Band n41 –LTE Band 12) above 18GHz

Bandwidth (MHz):	100 & 10
Frequency (MHz):	2546 & 707.5
RB / Offset:	1 / 204 & 1 / 25
Mode:	EN-DC
Anchor Band:	LTE Band 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
980.00	H	-	-	-85.19	31.26	53.07	-42.19	-13.00	-29.19
1415.00	H	128	229	-67.47	-9.41	30.12	-65.14	-13.00	-52.14
2123.00	H	138	248	-68.07	-6.38	32.55	-62.71	-13.00	-49.71
2521.50	H	150	292	-51.77	-3.70	51.53	-43.73	-13.00	-30.73
3985.50	H	107	229	-66.74	1.02	41.28	-53.98	-13.00	-40.98
5151.00	H	-	-	-74.52	2.13	34.61	-60.65	-13.00	-47.65
6974.50	H	-	-	-78.05	6.88	35.83	-59.42	-13.00	-46.42
20368.00	H	-	-	-60.13	3.15	50.02	-54.78	-13.00	-41.78

Table 7-33. Radiated Spurious Data (EN-DC NR Band n41 – LTE Band 12) – Closed

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 27, 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" 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

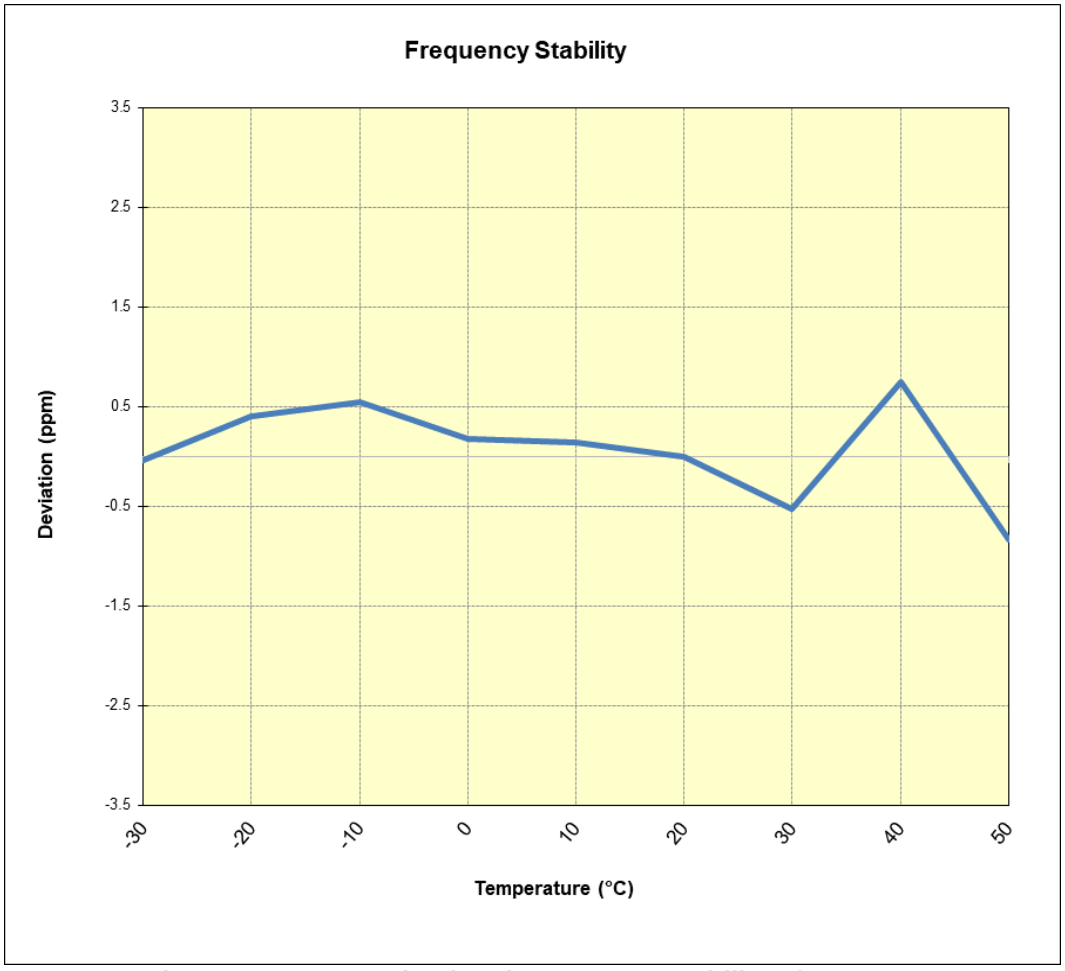
None

LTE Band 41

Operating Frequency (Hz):	2,593,000,000
Ref. Voltage (VDC):	4.27

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.27	- 30	2,593,018,175	-92	-0.0000035
		- 20	2,593,019,326	1,059	0.0000408
		- 10	2,593,019,696	1,429	0.0000551
		0	2,593,018,740	473	0.0000182
		+ 10	2,593,018,651	384	0.0000148
		+ 20 (Ref)	2,593,018,267	0	0.0000000
		+ 30	2,593,016,896	-1,371	-0.0000529
		+ 40	2,593,020,219	1,952	0.0000753
		+ 50	2,593,016,108	-2,159	-0.0000833
Battery Endpoint	3.75	+ 20	2,593,018,740	473	0.0000182

Table 7-34. LTE Band 41(PC2) Frequency Stability Data – Ant F



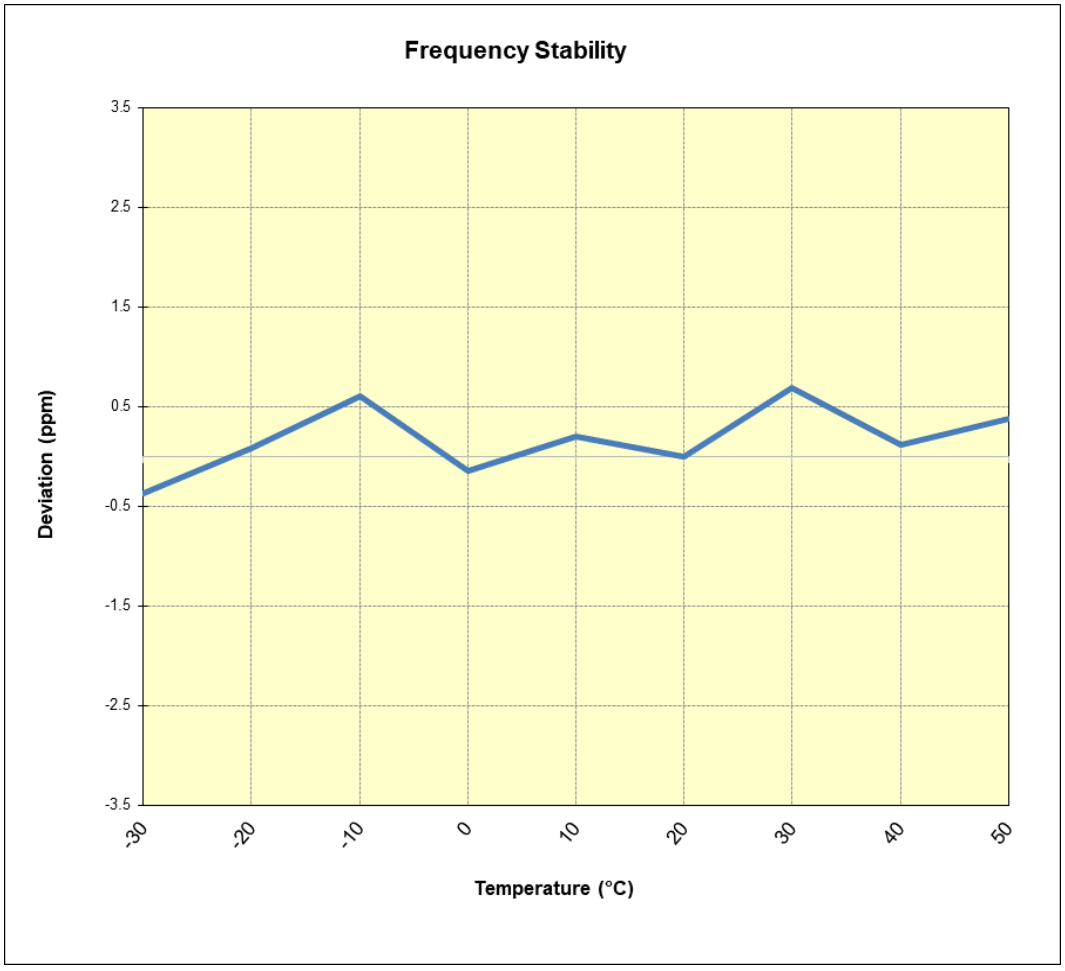
Plot 7-143. LTE Band 41(PC2) Frequency Stability Chart – Ant

NR Band n41

Operating Frequency (Hz):	2,593,000,000
Ref. Voltage (VDC):	4.27

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.27	- 30	2,593,014,175	-942	-0.0000363
		- 20	2,593,015,326	209	0.0000081
		- 10	2,593,016,696	1,579	0.0000609
		0	2,593,014,740	-377	-0.0000145
		+ 10	2,593,015,651	534	0.0000206
		+ 20 (Ref)	2,593,015,117	0	0.0000000
		+ 30	2,593,016,896	1,779	0.0000686
		+ 40	2,593,015,419	302	0.0000116
		+ 50	2,593,016,108	991	0.0000382
Battery Endpoint	3.75	+ 20	2,593,017,740	2,623	0.0001012

Table 7-35. NR Band 41 Frequency Stability Data – Ant F



Plot 7-144. NR Band 41Frequency Stability Chart – Ant F

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF936B** complies with all the requirements of Part 27 of the FCC rules.