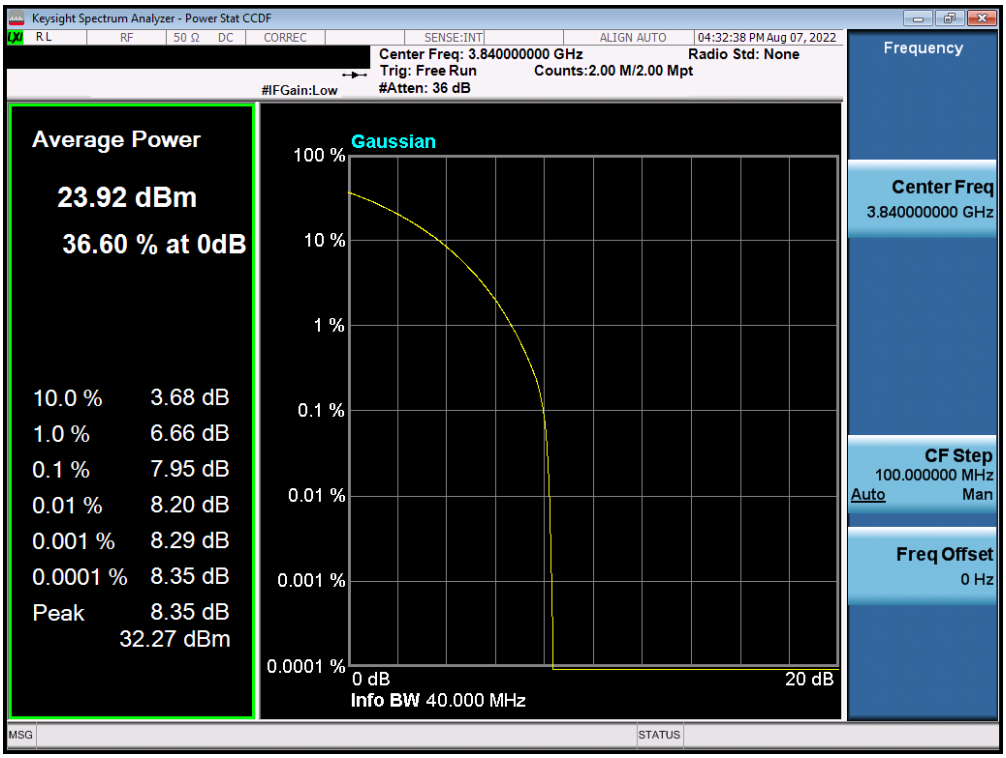
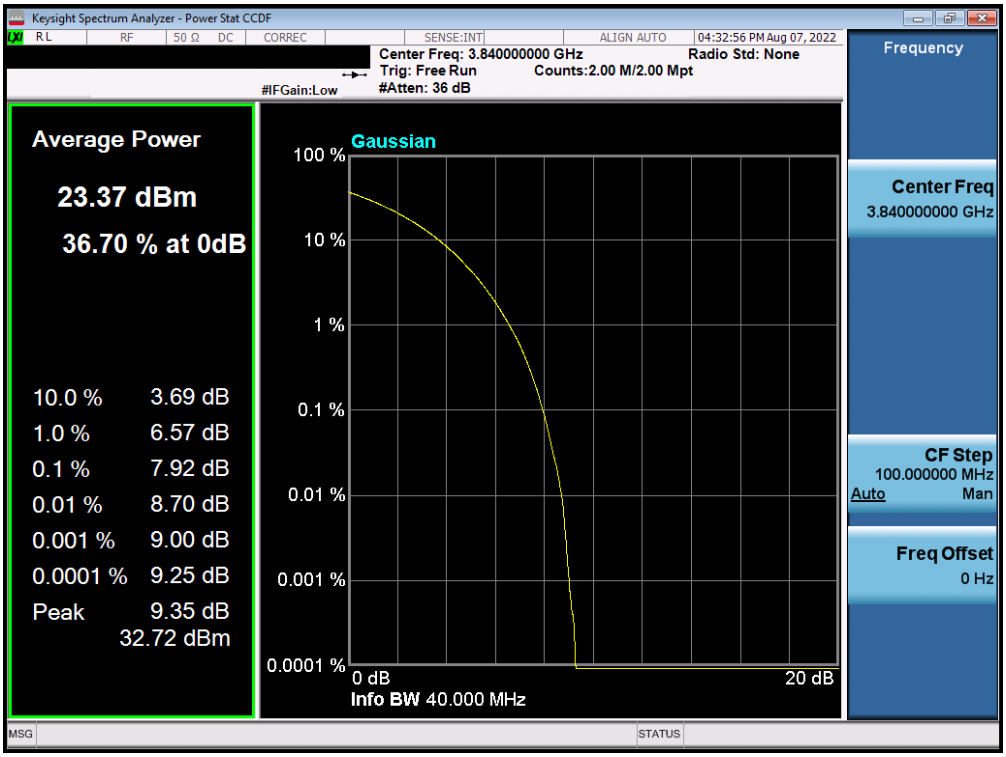
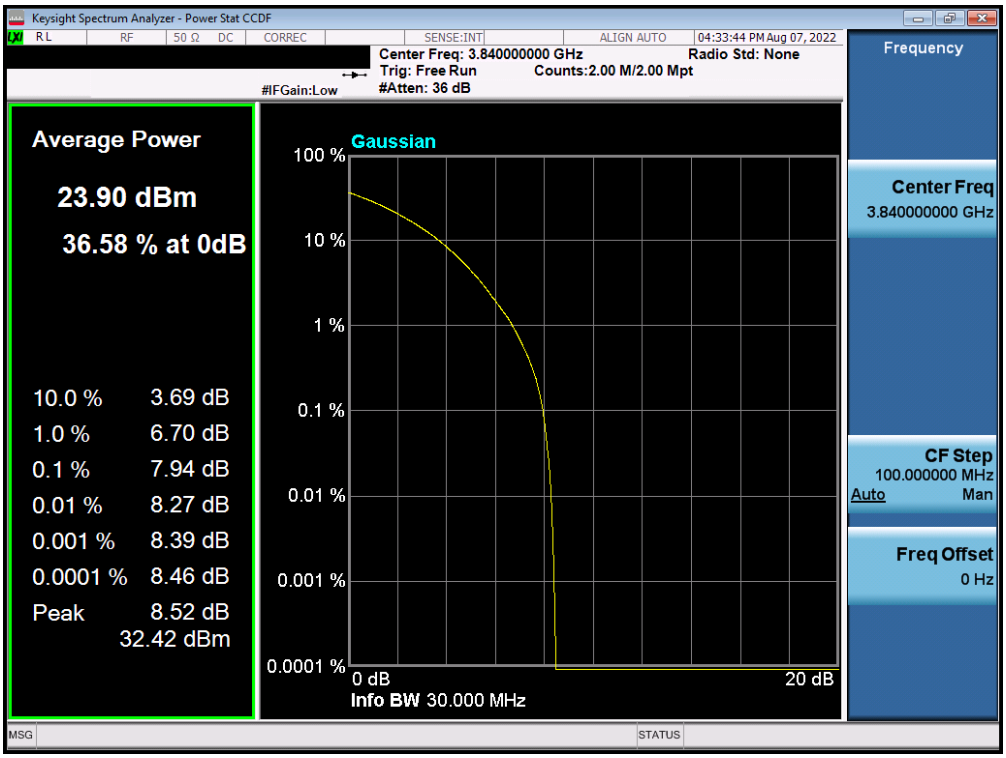


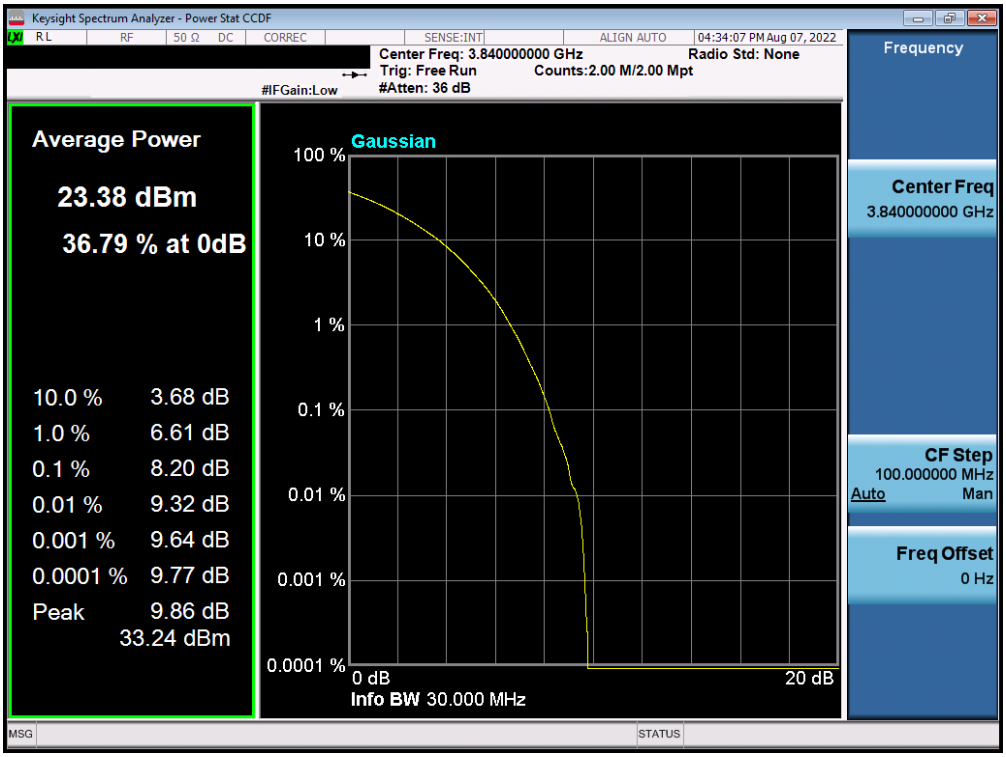
Plot 7-163. PAR Plot (NR Band n77 - 40MHz CP-OFDM QPSK - Full RB - Sub ANT (UL-MIMO))



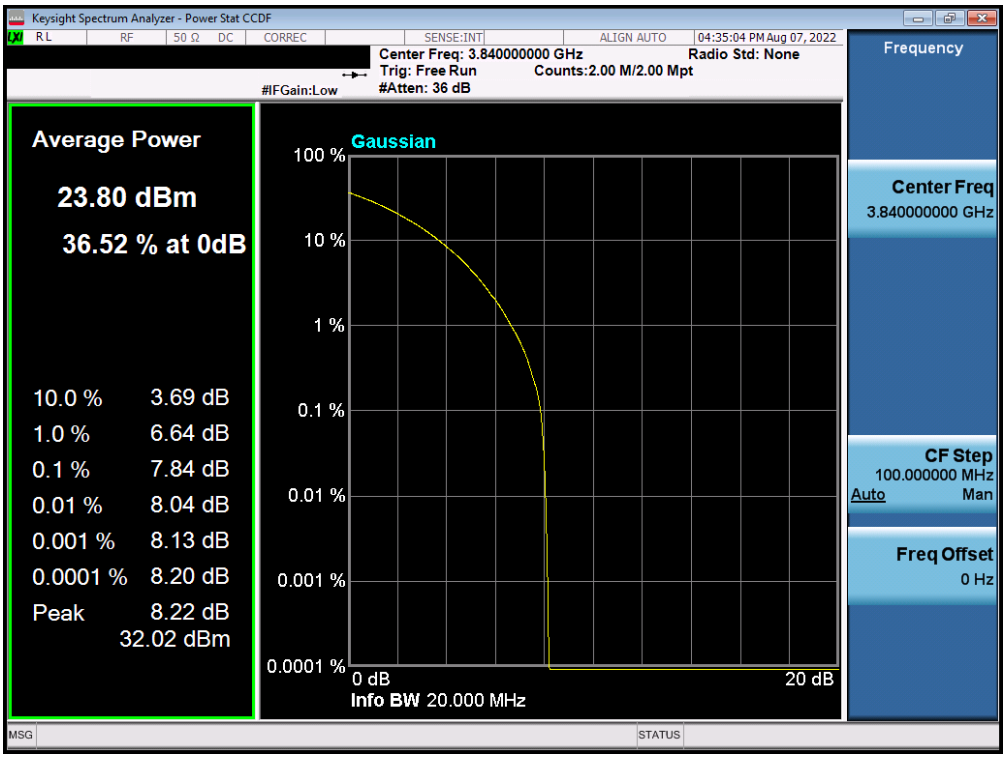
Plot 7-164. PAR Plot (NR Band n77 - 40MHz CP-OFDM 256-QAM - Full RB - Sub ANT (UL-MIMO))



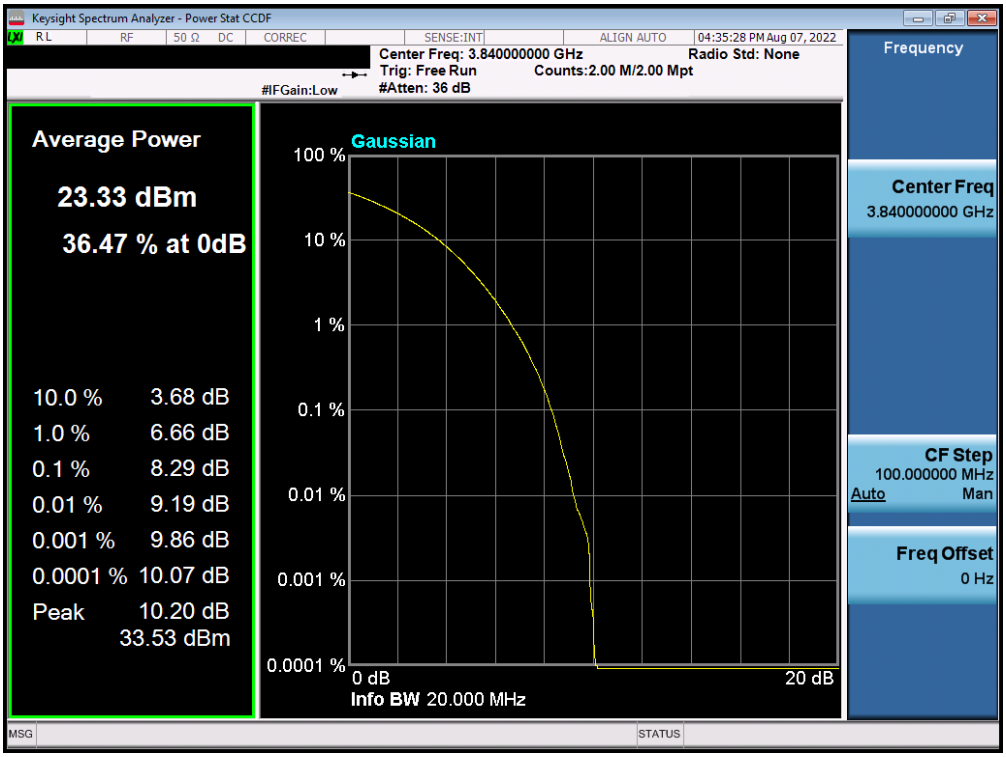
Plot 7-165. PAR Plot (NR Band n77 - 30MHz CP-OFDM QPSK - Full RB - Sub ANT (UL-MIMO))



Plot 7-166. PAR Plot (NR Band n77 - 30MHz CP-OFDM 256-QAM - Full RB - Sub ANT (UL-MIMO))



Plot 7-167. PAR Plot (NR Band n77 - 20MHz CP-OFDM QPSK - Full RB - Sub ANT (UL-MIMO))



Plot 7-168. PAR Plot (NR Band n77 - 20MHz CP-OFDM 256-QAM - Full RB - Sub ANT (UL-MIMO))

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.

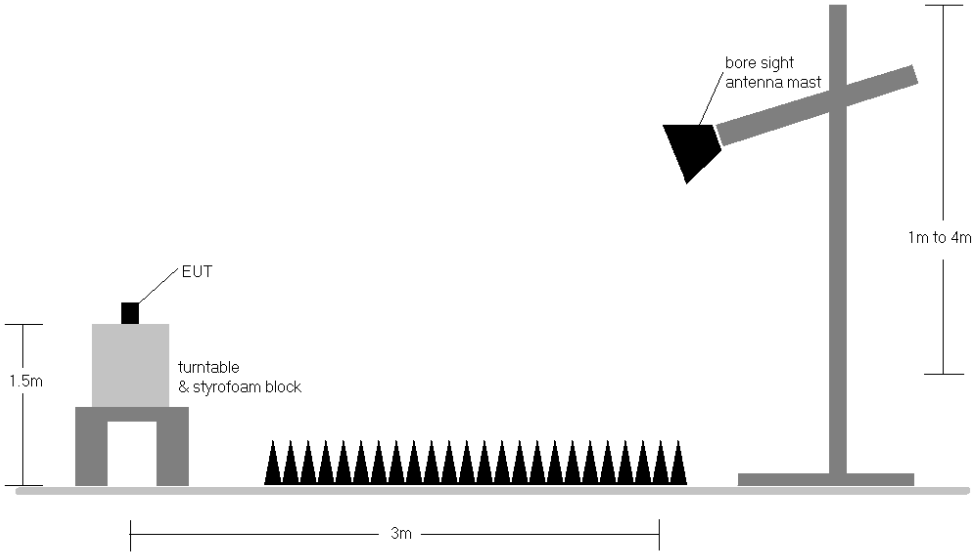


Figure 7-6. Radiated Test Setup >1GHz

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.

4) For radiated power (EIRP), UL-MIMO test cases have both the main and sub antenna transmitting simultaneously.

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	102	5	6.83	1 / 136	12.16	18.99	0.079	30.00	-11.01
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 136	13.41	19.88	0.097	30.00	-10.12
	π/2 BPSK	3930.0	V	104	4	6.49	1 / 136	12.01	18.50	0.071	30.00	-11.50
	QPSK	3750.0	V	102	5	6.83	1 / 136	12.95	19.78	0.095	30.00	-10.22
	QPSK	3840.0	V	102	11	6.47	1 / 136	13.42	**19.89**	0.098	30.00	-10.11
	QPSK	3930.0	V	104	4	6.49	1 / 136	12.48	18.97	0.079	30.00	-11.03
	16-QAM	3750.0	V	102	5	6.83	1 / 136	12.09	18.92	0.078	30.00	-11.08
80 MHz	π/2 BPSK	3740.0	V	102	5	6.78	1 / 108	12.35	19.14	0.082	30.00	-10.86
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 162	13.19	19.66	0.092	30.00	-10.34
	π/2 BPSK	3940.0	V	104	4	6.48	1 / 108	11.99	18.47	0.070	30.00	-11.53
	QPSK	3740.0	V	102	5	6.78	1 / 108	13.18	**19.96**	0.099	30.00	-10.04
	QPSK	3840.0	V	102	11	6.47	1 / 108	13.31	19.78	0.095	30.00	-10.22
	QPSK	3940.0	V	104	4	6.48	1 / 108	12.39	18.86	0.077	30.00	-11.14
	16-QAM	3740.0	V	102	5	6.78	1 / 108	12.66	19.44	0.088	30.00	-10.56
60 MHz	π/2 BPSK	3730.0	V	102	5	6.73	1 / 81	12.40	19.13	0.082	30.00	-10.87
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 81	13.37	19.84	0.096	30.00	-10.16
	π/2 BPSK	3950.0	V	104	4	6.46	1 / 81	12.33	18.79	0.076	30.00	-11.21
	QPSK	3730.0	V	102	5	6.73	1 / 81	13.18	19.92	0.098	30.00	-10.08
	QPSK	3840.0	V	102	11	6.47	1 / 81	13.56	**20.03**	0.101	30.00	-9.97
	QPSK	3950.0	V	104	4	6.46	1 / 81	12.71	19.16	0.083	30.00	-10.84
	16-QAM	3730.0	V	102	5	6.73	1 / 81	12.72	19.45	0.088	30.00	-10.55
40 MHz	π/2 BPSK	3720.0	V	102	5	6.68	1 / 79	12.88	19.56	0.090	30.00	-10.44
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 79	13.83	20.30	0.107	30.00	-9.70
	π/2 BPSK	3960.0	V	104	4	6.41	1 / 79	12.67	19.08	0.081	30.00	-10.92
	QPSK	3720.0	V	102	5	6.68	1 / 79	13.65	**20.33**	0.108	30.00	-9.67
	QPSK	3840.0	V	102	11	6.47	1 / 79	13.81	20.28	0.107	30.00	-9.72
	QPSK	3960.0	V	104	4	6.41	1 / 79	12.95	19.36	0.086	30.00	-10.64
	16-QAM	3720.0	V	102	5	6.68	1 / 79	13.12	19.80	0.096	30.00	-10.20
30 MHz	π/2 BPSK	3715.0	V	102	5	6.66	1 / 58	12.90	19.55	0.090	30.00	-10.45
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 39	13.69	20.17	0.104	30.00	-9.83
	π/2 BPSK	3965.0	V	104	4	6.39	1 / 39	12.48	18.88	0.077	30.00	-11.12
	QPSK	3715.0	V	102	5	6.66	1 / 58	13.63	**20.29**	0.107	30.00	-9.71
	QPSK	3840.0	V	102	11	6.47	1 / 58	13.73	20.20	0.105	30.00	-9.80
	QPSK	3965.0	V	104	4	6.39	1 / 58	12.96	19.35	0.086	30.00	-10.65
	16-QAM	3715.0	V	102	5	6.66	1 / 39	13.11	19.77	0.095	30.00	-10.23
20 MHz	π/2 BPSK	3710.0	V	102	5	6.63	1 / 37	12.98	19.61	0.091	30.00	-10.39
	π/2 BPSK	3840.0	V	102	11	6.47	1 / 37	13.86	**20.33**	0.108	30.00	-9.67
	π/2 BPSK	3970.0	V	104	4	6.37	1 / 37	12.62	18.99	0.079	30.00	-11.01
	QPSK	3710.0	V	102	5	6.63	1 / 37	13.36	19.99	0.100	30.00	-10.01
	QPSK	3840.0	V	102	11	6.47	1 / 25	13.84	20.31	0.107	30.00	-9.69
	QPSK	3970.0	V	104	4	6.37	1 / 37	13.10	19.47	0.088	30.00	-10.53
	16-QAM	3710.0	V	102	5	6.63	1 / 25	12.92	19.55	0.090	30.00	-10.45
100 MHz	QPSK (CP-OFDM)	3840.0	V	102	9	6.47	1 / 136	11.82	18.29	0.067	30.00	-11.71
	QPSK (Opposite Pol.)	3840.0	H	374	17	6.02	1 / 136	13.26	19.28	0.085	30.00	-10.72
	QPSK (WCP)	3840.0	H	373	10	6.02	1 / 136	13.80	19.82	0.096	30.00	-10.18

Table 7-7. EIRP Data (NR Band n77 – Main ANT)

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	305	351	6.83	1 / 136	6.13	12.96	0.020	30.00	-17.04
	π/2 BPSK	3840.0	V	304	360	6.47	1 / 136	7.72	**14.19**	0.026	30.00	-15.81
	π/2 BPSK	3930.0	V	118	9	6.49	1 / 136	7.58	14.07	0.026	30.00	-15.93
	QPSK	3750.0	V	305	351	6.83	1 / 136	6.20	13.03	0.020	30.00	-16.97
	QPSK	3840.0	V	304	360	6.47	1 / 136	7.58	14.05	0.025	30.00	-15.95
	QPSK	3930.0	V	118	9	6.49	1 / 136	7.66	14.15	0.026	30.00	-15.85
	16-QAM	3930.0	V	118	9	6.49	1 / 136	6.85	13.34	0.022	30.00	-16.66
80 MHz	π/2 BPSK	3740.0	V	305	351	6.78	1 / 162	6.40	13.18	0.021	30.00	-16.82
	π/2 BPSK	3840.0	V	304	360	6.47	1 / 108	8.26	**14.73**	0.030	30.00	-15.27
	π/2 BPSK	3940.0	V	118	9	6.48	1 / 108	7.58	14.06	0.025	30.00	-15.94
	QPSK	3740.0	V	305	351	6.78	1 / 162	6.55	13.33	0.022	30.00	-16.67
	QPSK	3840.0	V	304	360	6.47	1 / 108	8.12	14.59	0.029	30.00	-15.41
	QPSK	3940.0	V	118	9	6.48	1 / 108	7.56	14.04	0.025	30.00	-15.96
	16-QAM	3940.0	V	118	9	6.48	1 / 108	7.44	13.91	0.025	30.00	-16.09
60 MHz	π/2 BPSK	3730.0	V	305	351	6.73	1 / 81	6.27	13.00	0.020	30.00	-17.00
	π/2 BPSK	3840.0	V	304	360	6.47	1 / 81	8.47	**14.94**	0.031	30.00	-15.06
	π/2 BPSK	3950.0	V	118	9	6.46	1 / 81	7.31	13.77	0.024	30.00	-16.23
	QPSK	3730.0	V	305	351	6.73	1 / 81	6.43	13.16	0.021	30.00	-16.84
	QPSK	3840.0	V	304	360	6.47	1 / 81	8.18	14.65	0.029	30.00	-15.35
	QPSK	3950.0	V	118	9	6.46	1 / 81	7.22	13.67	0.023	30.00	-16.33
	16-QAM	3950.0	V	118	9	6.46	1 / 81	7.65	14.11	0.026	30.00	-15.89
40 MHz	π/2 BPSK	3720.0	V	305	351	6.68	1 / 79	6.77	13.46	0.022	30.00	-16.54
	π/2 BPSK	3840.0	V	304	360	6.47	1 / 53	8.53	**15.01**	0.032	30.00	-14.99
	π/2 BPSK	3960.0	V	118	9	6.41	1 / 53	6.84	13.26	0.021	30.00	-16.74
	QPSK	3720.0	V	305	351	6.68	1 / 79	6.92	13.60	0.023	30.00	-16.40
	QPSK	3840.0	V	304	360	6.47	1 / 53	8.02	14.50	0.028	30.00	-15.50
	QPSK	3960.0	V	118	9	6.41	1 / 53	6.71	13.12	0.021	30.00	-16.88
	16-QAM	3840.0	V	304	360	6.47	1 / 53	7.46	13.93	0.025	30.00	-16.07
30 MHz	π/2 BPSK	3715.0	V	305	351	6.66	1 / 58	6.43	13.09	0.020	30.00	-16.91
	π/2 BPSK	3840.0	V	304	360	6.47	78 / 0	8.27	**14.74**	0.030	30.00	-15.26
	π/2 BPSK	3965.0	V	118	9	6.39	1 / 39	7.04	13.43	0.022	30.00	-16.57
	QPSK	3715.0	V	305	351	6.66	1 / 58	6.62	13.28	0.021	30.00	-16.72
	QPSK	3840.0	V	304	360	6.47	1 / 39	7.59	14.06	0.025	30.00	-15.94
	QPSK	3965.0	V	118	9	6.39	1 / 39	6.76	13.15	0.021	30.00	-16.85
	16-QAM	3840.0	V	304	360	6.47	1 / 39	7.74	14.21	0.026	30.00	-15.79
20 MHz	π/2 BPSK	3710.0	V	305	351	6.63	51 / 0	6.43	13.06	0.020	30.00	-16.94
	π/2 BPSK	3840.0	V	304	360	6.47	51 / 0	7.73	14.20	0.026	30.00	-15.80
	π/2 BPSK	3970.0	V	118	9	6.37	1 / 25	7.37	13.74	0.024	30.00	-16.26
	QPSK	3710.0	V	305	351	6.63	1 / 37	6.10	12.73	0.019	30.00	-17.27
	QPSK	3840.0	V	304	360	6.47	1 / 25	7.57	14.04	0.025	30.00	-15.96
	QPSK	3970.0	V	118	9	6.37	1 / 37	7.26	13.63	0.023	30.00	-16.37
	16-QAM	3840.0	V	304	360	6.47	1 / 37	8.00	**14.47**	0.028	30.00	-15.53
100 MHz	QPSK (CP-OFDM)	3840.0	V	304	360	6.47	1 / 136	5.92	12.39	0.017	30.00	-17.61
	QPSK (Opposite Pol.)	3840.0	H	142	346	6.02	1 / 136	7.77	13.79	0.024	30.00	-16.21
	QPSK (WCP)	3840.0	V	103	209	6.47	1 / 204	4.22	10.69	0.012	30.00	-19.31

Table 7-8. EIRP Data (NR Band n77 – As-Div ANT)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	QPSK	3750.0	H	118	133	5.98	1 / 68	7.83	13.81	0.024	30.00	-16.19
	QPSK	3840.0	H	117	36	6.02	1 / 68	8.07	**14.09**	0.026	30.00	-15.91
	QPSK	3930.0	H	132	27	5.99	1 / 68	6.72	12.71	0.019	30.00	-17.29
	16-QAM	3840.0	H	117	36	6.02	1 / 68	7.55	13.57	0.023	30.00	-16.43
80 MHz	QPSK	3740.0	H	118	133	5.99	1 / 108	7.23	13.22	0.021	30.00	-16.78
	QPSK	3840.0	H	117	36	6.02	217 / 0	7.78	**13.80**	0.024	30.00	-16.20
	QPSK	3940.0	H	132	27	6.04	1 / 54	6.51	12.55	0.018	30.00	-17.45
	16-QAM	3740.0	H	118	133	5.99	1 / 108	7.20	13.20	0.021	30.00	-16.80
60 MHz	QPSK	3730.0	H	118	133	6.00	1 / 121	7.20	13.20	0.021	30.00	-16.80
	QPSK	3840.0	H	117	36	6.02	1 / 81	7.50	**13.52**	0.022	30.00	-16.48
	QPSK	3950.0	H	132	27	6.10	1 / 121	7.14	13.24	0.021	30.00	-16.76
	16-QAM	3840.0	H	117	36	6.02	1 / 81	6.74	12.75	0.019	30.00	-17.25
40 MHz	QPSK	3720.0	H	118	133	6.01	1 / 79	7.33	13.35	0.022	30.00	-16.65
	QPSK	3840.0	H	117	36	6.02	1 / 79	7.87	**13.89**	0.024	30.00	-16.11
	QPSK	3960.0	H	132	27	6.15	1 / 26	7.31	13.46	0.022	30.00	-16.54
	16-QAM	3720.0	H	118	133	6.01	1 / 79	7.13	13.14	0.021	30.00	-16.86
30 MHz	QPSK	3715.0	H	118	133	6.02	1 / 39	7.87	**13.89**	0.025	30.00	-16.11
	QPSK	3840.0	H	117	36	6.02	1 / 58	7.52	13.54	0.023	30.00	-16.46
	QPSK	3965.0	H	132	27	6.18	78 / 0	7.18	13.35	0.022	30.00	-16.65
	16-QAM	3715.0	H	118	133	6.02	1 / 39	7.38	13.40	0.022	30.00	-16.60
20 MHz	QPSK	3710.0	H	118	133	6.03	1 / 25	7.84	**13.87**	0.024	30.00	-16.13
	QPSK	3840.0	H	117	36	6.02	1 / 13	7.81	13.83	0.024	30.00	-16.17
	QPSK	3970.0	H	132	27	6.20	1 / 37	7.32	13.52	0.023	30.00	-16.48
	16-QAM	3840.0	H	117	36	6.02	1 / 13	7.12	13.14	0.021	30.00	-16.86
100 MHz	QPSK (Opposite Pol.)	3840.0	V	377	21	6.47	273 / 0	3.20	9.67	0.009	30.00	-20.33
	QPSK (WCP)	3840.0	H	118	133	6.02	1 / 204	5.56	11.58	0.014	30.00	-18.42

Table 7-9. EIRP Data (UL-MIMO NR Band n77 (PC3))

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.

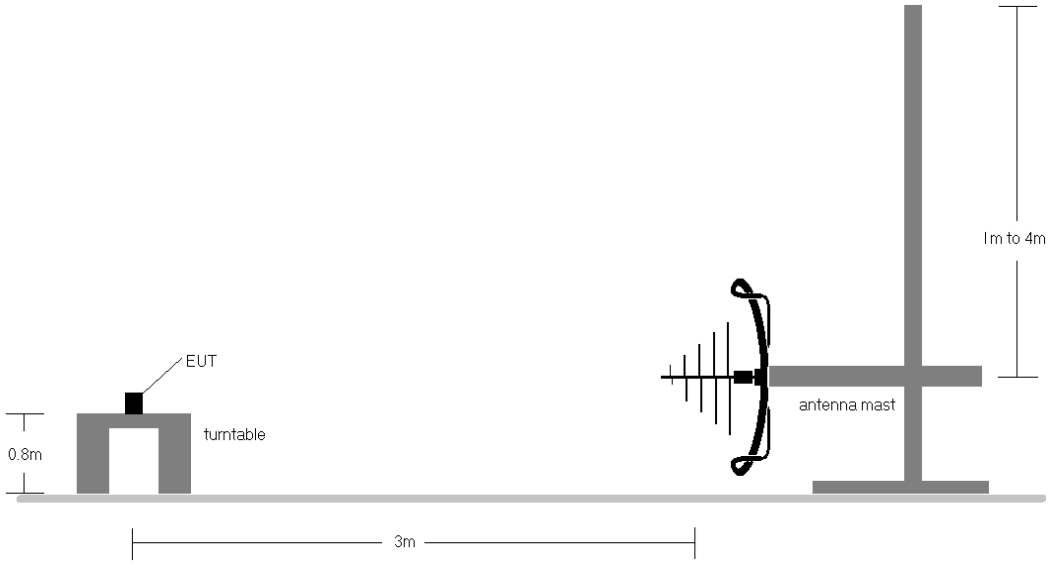


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

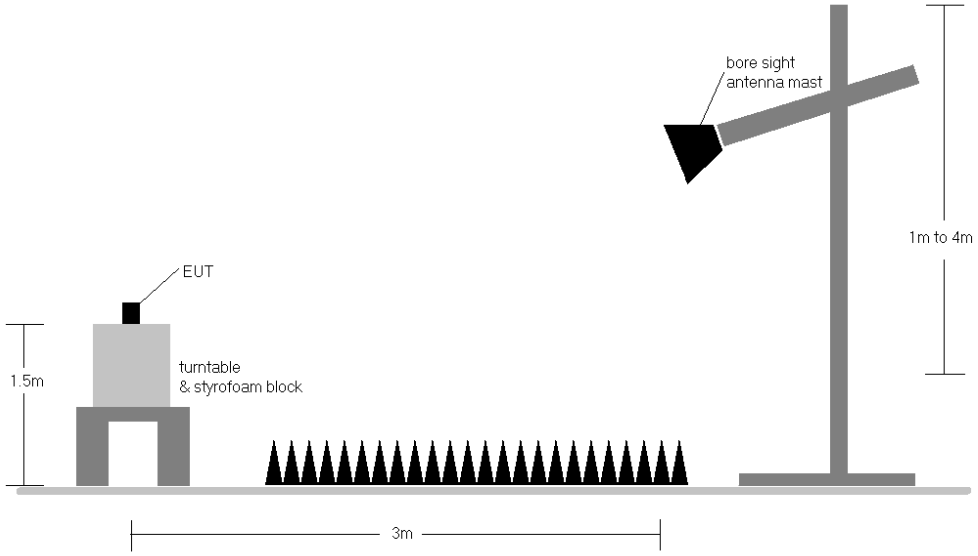


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

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.

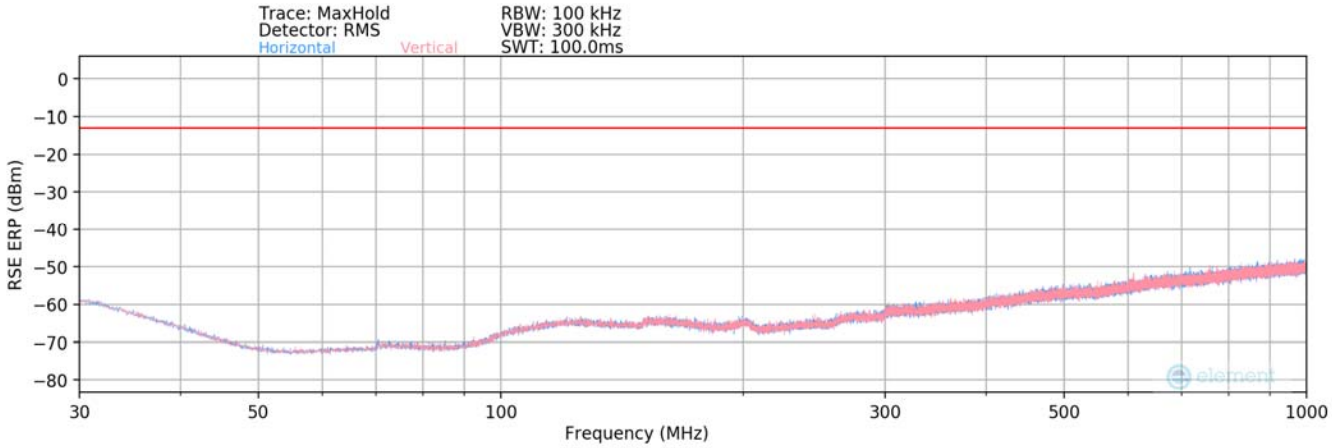
6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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.

9) For radiated spurious emissions measurements, UL-MIMO test cases have both the main and sub antenna transmitting simultaneously.

NR Band n77 – Main ANT

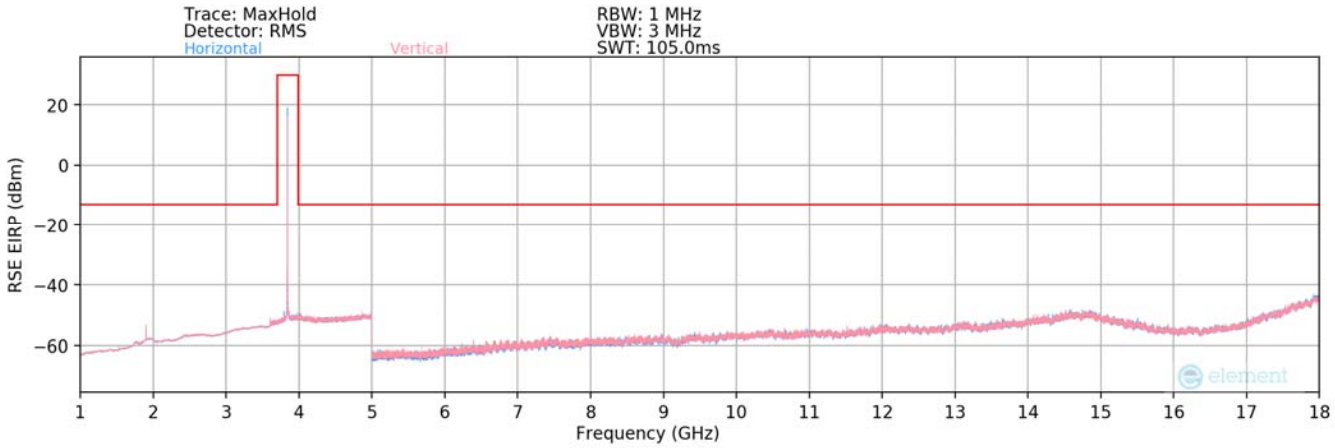


Plot 7-169. Radiated Spurious Plot Below 1GHz (NR Band n77 – Main ANT)

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

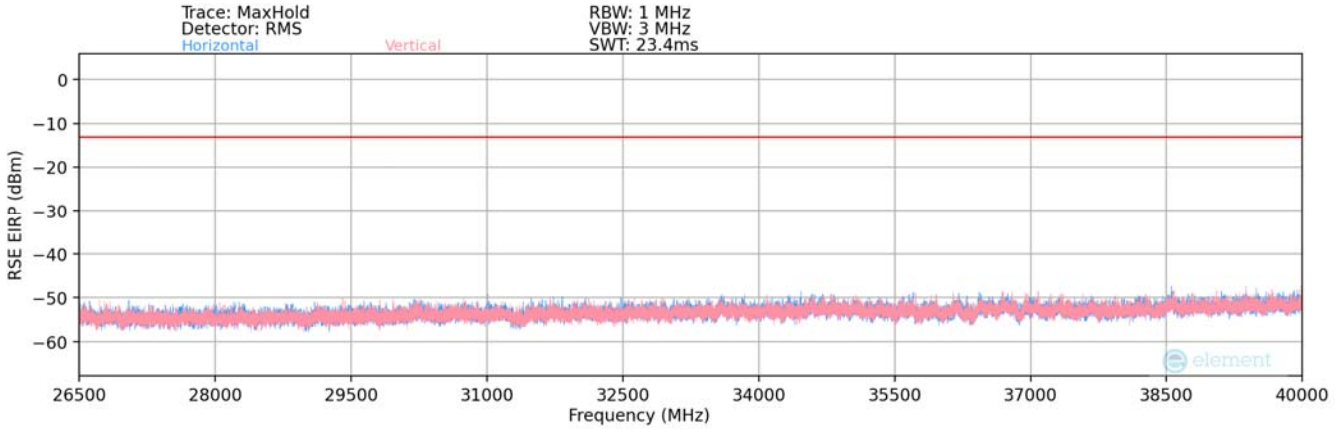
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
504.2	H	-	-	-75.11	25.51	57.40	-40.01	-13.00	-27.01

Table 7-10. Radiated Spurious Data Below 1GHz (NR Band n77 – Main ANT)



Plot 7-170. Radiated Spurious Plot (NR Band n77 – Main ANT – 1-18GHz)

Plot 7-171. Radiated Spurious Plot (NR Band n77 – Main ANT – 18-26.5GHz)



Plot 7-172. Radiated Spurious Plot (NR Band n77 – Main ANT – 26.5-40GHz)

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	117	4	-77.99	7.36	36.37	-58.88	-13.00	-45.88
11250.0	H	159	357	-72.03	10.74	45.71	-49.55	-13.00	-36.55
15000.0	H	216	326	-76.91	15.25	45.34	-49.92	-13.00	-36.92

Table 7-11. Radiated Spurious Data (NR Band n77 – Low Channel – Main ANT)

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	-	-	-79.75	6.75	34.00	-61.25	-13.00	-48.25
11520.0	H	254	55	-77.36	11.27	40.91	-54.35	-13.00	-41.35
15360.0	H	158	41	-76.85	13.96	44.11	-51.15	-13.00	-38.15

Table 7-12. Radiated Spurious Data (NR Band n77 – Mid Channel – Main ANT)

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	-	-	-81.07	7.18	33.11	-62.14	-13.00	-49.14
11790.0	H	246	25	-77.57	12.04	41.47	-53.79	-13.00	-40.79
15720.0	H	135	5	-76.86	11.67	41.81	-53.45	-13.00	-40.45

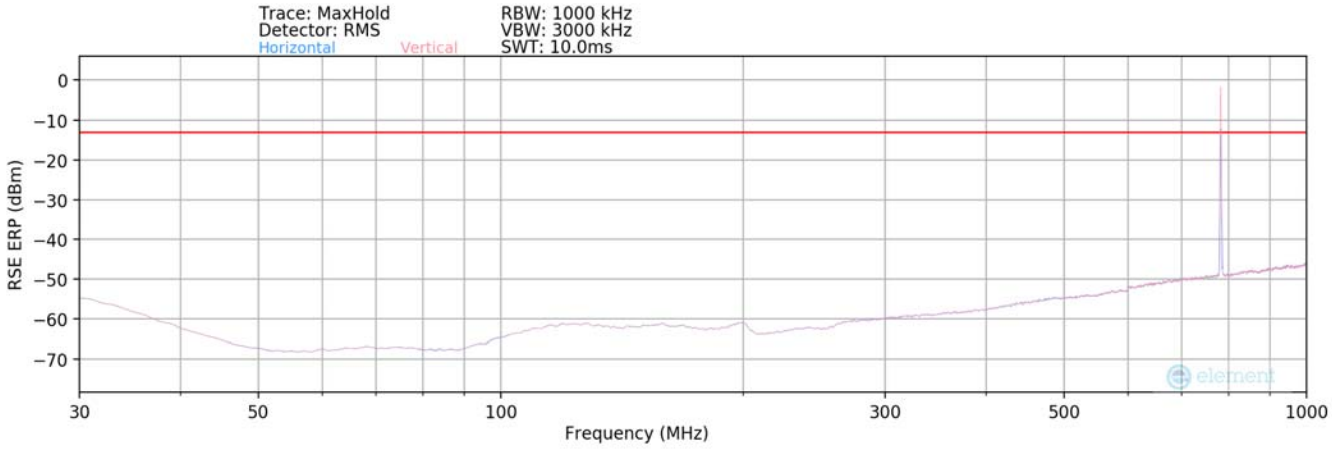
Table 7-13. Radiated Spurious Data (NR Band n77 – High Channel – Main ANT)

Case:	w/ Wireless Charging Pad
Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1 / 136
Mode:	Stand Alone

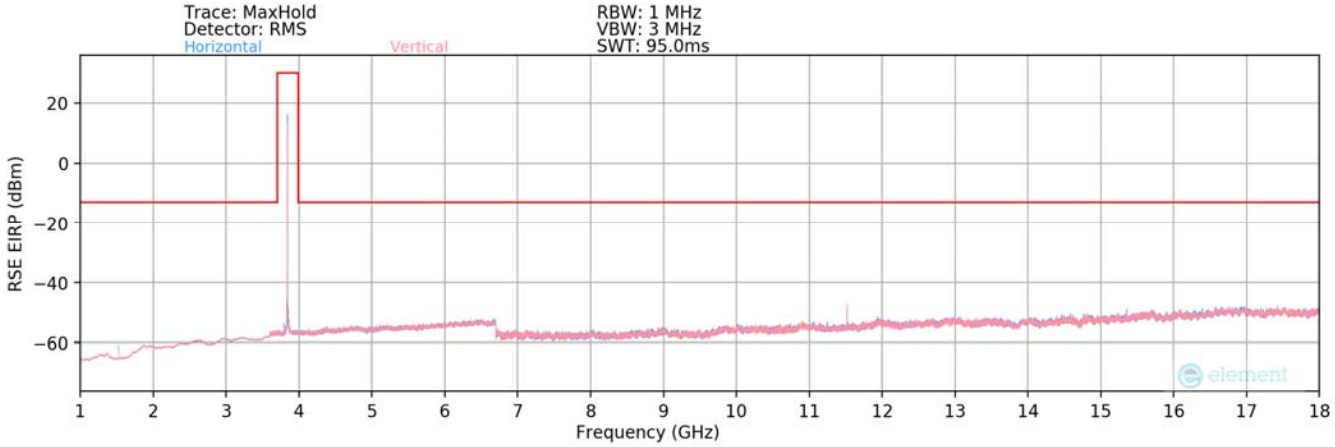
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7500.0	V	-	-	-80.04	7.36	34.32	-60.93	-13.00	-47.93
11250.0	V	122	187	-76.32	10.74	41.42	-53.84	-13.00	-40.84
15000.0	V	-	-	-81.15	15.25	41.10	-54.16	-13.00	-41.16

Table 7-14. Radiated Spurious Data with WCP (NR Band n77 – Main ANT)

EN-DC: NR Band n77 (Main ANT) – LTE Band 13



Plot 7-173. Radiated Spurious Plot Below 1GHz (EN-DC: NR Band n77 (Main ANT) – LTE Band 13)



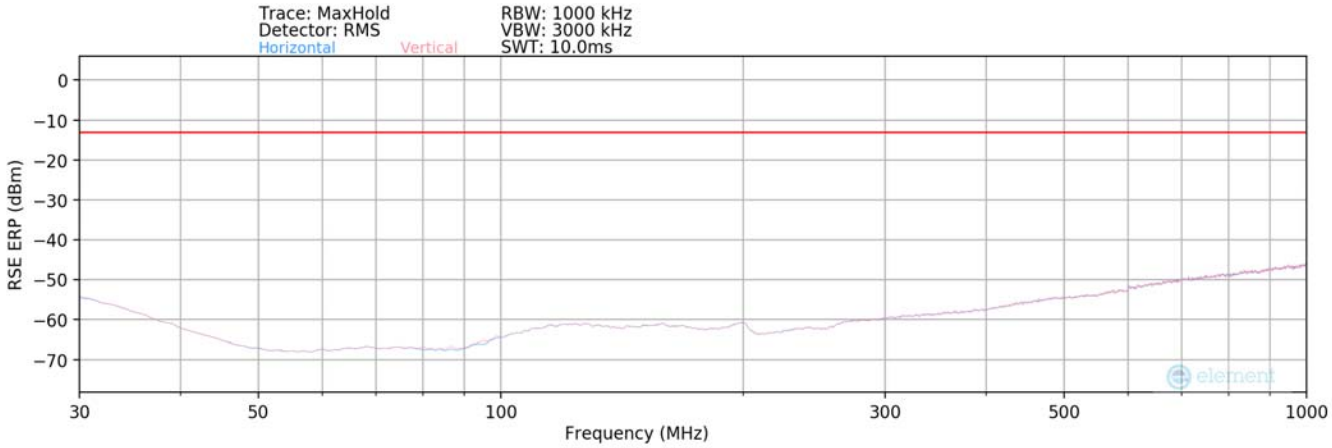
Plot 7-174. Radiated Spurious Plot (EN-DC: NR Band n77 (Main ANT) – LTE Band 13)

Case:	n77 (Main) + B13
Bandwidth (MHz):	100 & 10
Frequency (MHz):	3840 & 782
RB / Offset:	1 / 136 & 1 / 25
Mode:	EN-DC
Anchor Band:	LTE Band 13

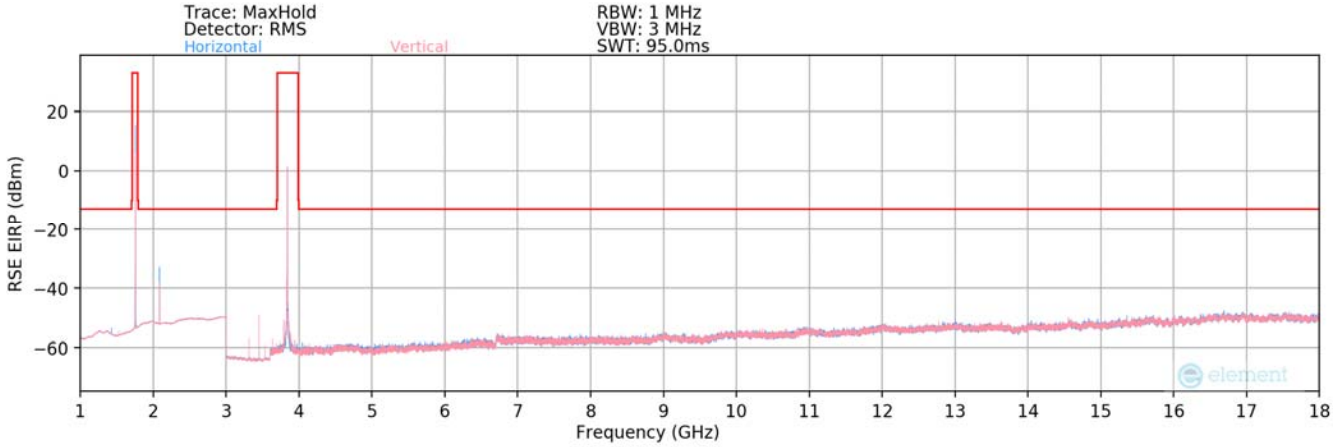
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
70.0	H	-	-	-81.03	14.73	40.70	-54.56	-13.00	-41.56
1564.0	H	-	-	-76.67	-3.87	26.46	-68.80	-13.00	-55.80
2276.0	H	-	-	-77.10	-0.21	29.69	-75.11	-13.00	-62.11
3058.0	H	-	-	-77.05	1.80	31.75	-73.05	-13.00	-60.05
6898.0	H	314	72	-78.20	8.33	37.13	-67.67	-13.00	-54.67
11520.0	V	143	13	-76.77	13.33	43.56	-61.24	-13.00	-48.24
15360.0	H	336	304	-76.07	16.42	47.35	-57.45	-13.00	-44.45

Table 7-15. Radiated Spurious Data (EN-DC: NR Band n77 (Main ANT) – LTE Band 13)

EN-DC: NR Band n77 (Main ANT) – LTE Band 66



Plot 7-175. Radiated Spurious Plot Below 1GHz (EN-DC: NR Band n77 (Main ANT) – LTE Band 66)



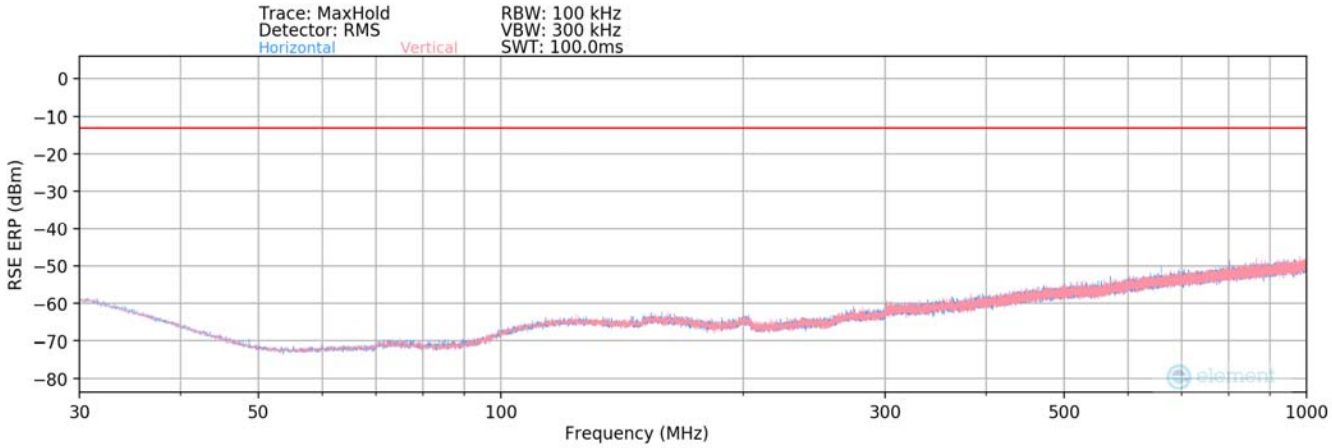
Plot 7-176. Radiated Spurious Plot (EN-DC: NR Band n77 (Main ANT) – LTE Band 66)

Case:	n77 (Main) - B66
Bandwidth (MHz):	100 & 20
Frequency (MHz):	3840 & 1745
RB / Offset:	1 / 136 & 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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
350.0	H	-	-	-83.84	22.10	45.26	-50.00	-13.00	-37.00
2095.0	H	188	24	-49.81	9.13	66.32	-28.94	-13.00	-15.94
3356.0	V	178	58	-74.48	2.70	35.22	-60.04	-13.00	-47.04
3533.0	V	391	61	-69.87	2.40	39.53	-65.27	-13.00	-52.27
5585.0	V	-	-	-76.24	5.20	35.96	-68.84	-13.00	-55.84
5935.0	V	-	-	-77.11	6.33	36.22	-68.58	-13.00	-55.58

Table 7-16. Radiated Spurious Data (EN-DC: NR Band n77 (Main ANT) – LTE Band 66)

NR Band n77 – As-Div ANT

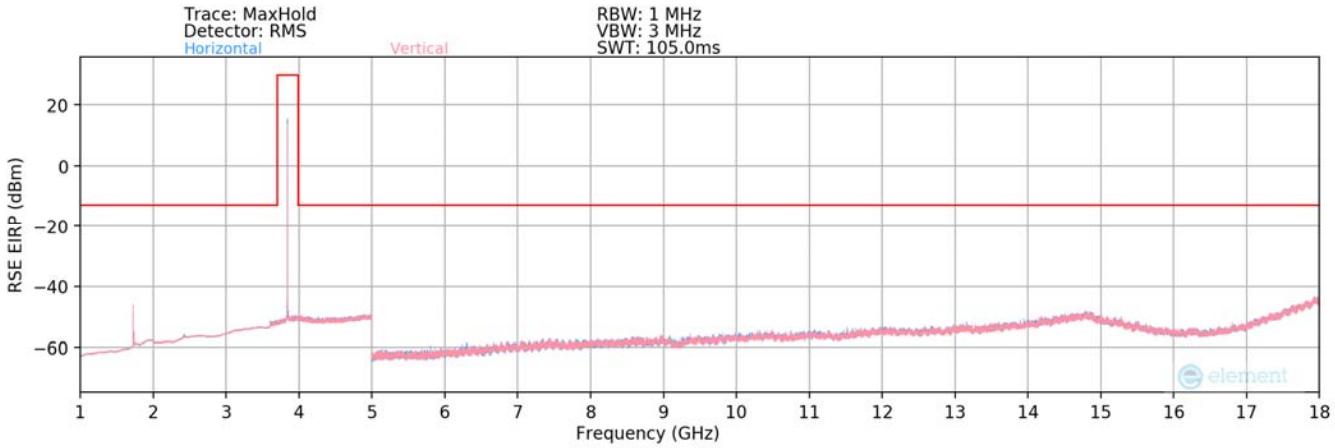


Plot 7-177. Radiated Spurious Plot Below 1GHz (NR Band n77 – As-Div ANT)

Bandwidth (MHz):	100
Frequency (MHz):	3750.00
RB / Offset:	1 / 136
Mode:	Standalone

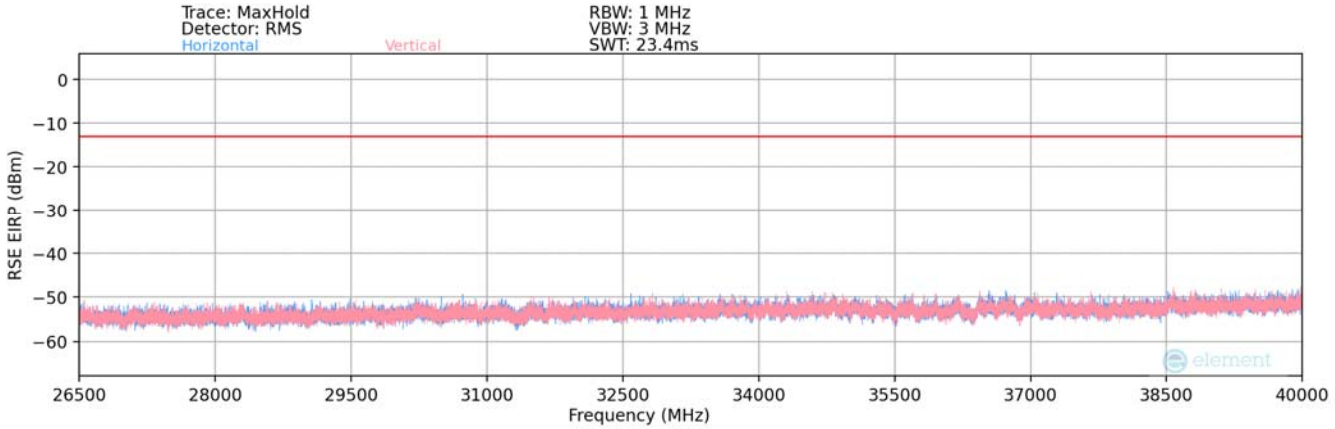
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
502.0	H	-	-	-71.77	25.48	60.71	-36.70	-13.00	-23.70

Table 7-17. Radiated Spurious Data Below 1GHz (NR Band n77 – As-Div ANT)



Plot 7-178. Radiated Spurious Plot (NR Band n77 – As-Div ANT – 1-18GHz)

Plot 7-179. Radiated Spurious Plot (NR Band n77 – As-Div ANT – 18-26.5GHz)



Plot 7-180. Radiated Spurious Plot (NR Band n77 – As-Div ANT – 26.5-40GHz)

Bandwidth (MHz):	100
Frequency (MHz):	3750.00
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	-	-	-80.09	7.36	34.27	-60.98	-13.00	-47.98
11250.0	H	321	342	-74.59	10.74	43.15	-52.11	-13.00	-39.11
15000.0	H	-	-	-80.93	15.25	41.32	-53.94	-13.00	-40.94

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

Bandwidth (MHz):	100
Frequency (MHz):	3840.00
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	-	-	-80.02	6.75	33.73	-61.52	-13.00	-48.52
11520.0	H	254	21	-78.12	11.27	40.15	-55.11	-13.00	-42.11
15360.0	H	-	-	-81.15	13.96	39.81	-55.45	-13.00	-42.45

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

Bandwidth (MHz):	100
Frequency (MHz):	3930.00
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	-	-	-81.75	7.18	32.43	-62.82	-13.00	-49.82
11790.0	H	271	54	-78.82	12.04	40.22	-55.04	-13.00	-42.04
15720.0	H	148	58	-75.60	11.67	43.07	-52.19	-13.00	-39.19

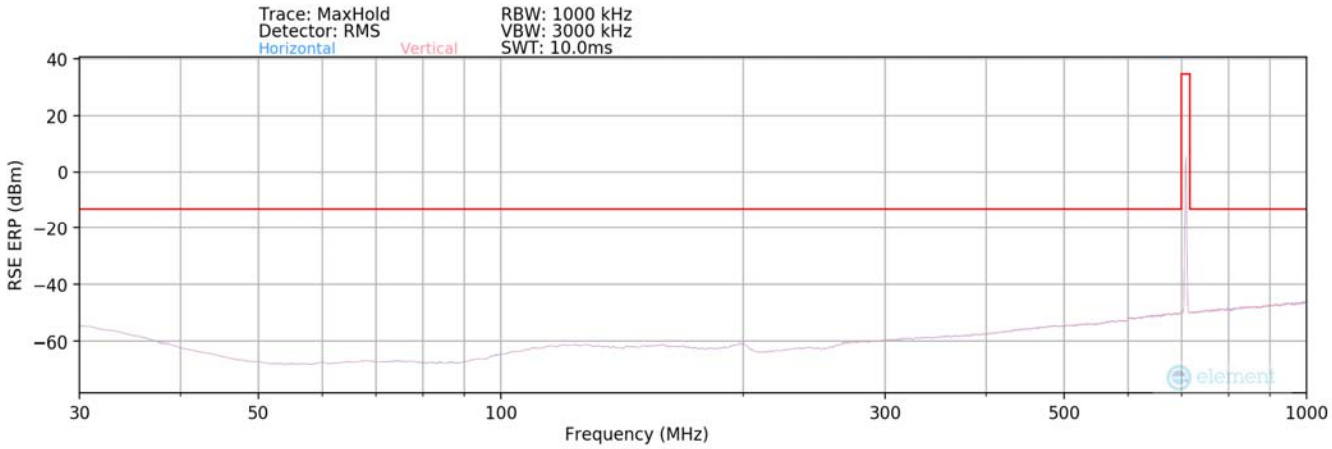
Table 7-20. Radiated Spurious Data (NR Band n77 – High Channel – As-Div ANT)

Case:	w/ Wireless Charging Pad
Bandwidth (MHz):	100
Frequency (MHz):	3750.00
RB / Offset:	1 / 136
Mode:	Standalone

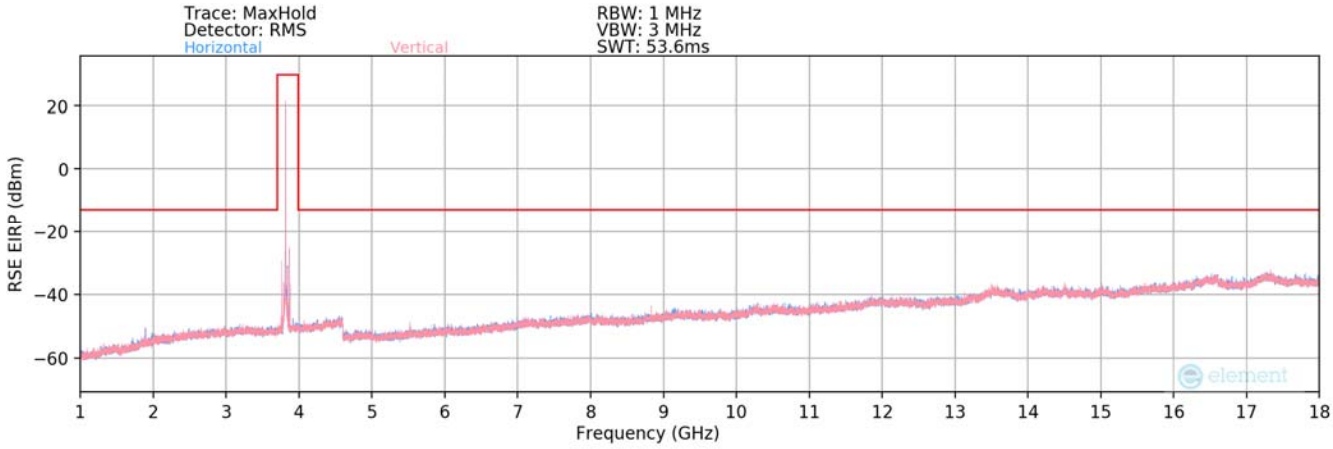
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7500.0	V	-	-	-80.25	7.36	34.11	-61.14	-13.00	-48.14
11250.0	V	137	225	-73.82	10.74	43.92	-51.34	-13.00	-38.34
15000.0	V	-	-	-80.75	15.25	41.50	-53.76	-13.00	-40.76

Table 7-21. Radiated Spurious Data with WCP (NR Band n77 – As-Div ANT)

EN-DC: NR Band n77 (As-Div ANT) – LTE Band 12



Plot 7-181. Radiated Spurious Plot Below 1GHz (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 12)



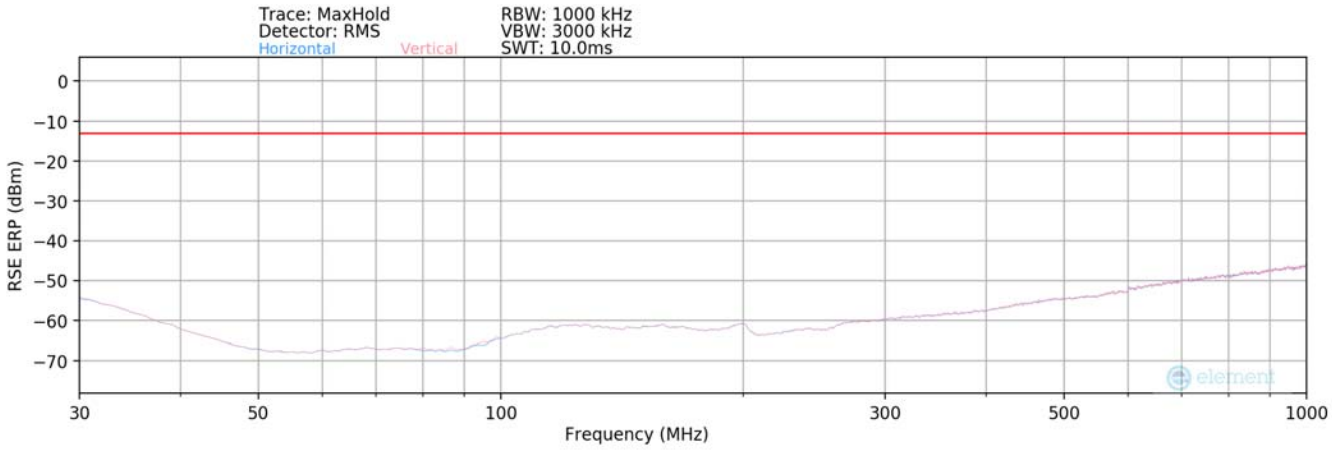
Plot 7-182. Radiated Spurious Plot (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 12)

Case:	n77 (As-Div) - B12
Bandwidth (MHz):	100 & 10
Frequency (MHz):	3840 & 707.5
RB / Offset:	1 / 136 & 1 / 25
Mode:	EN-DC
Anchor Band:	12

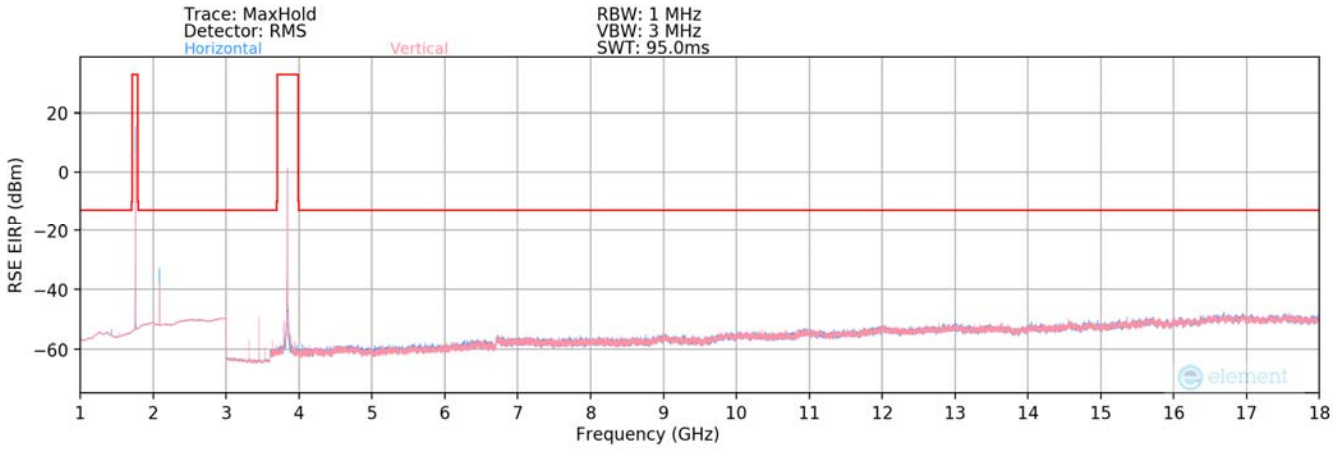
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
405.0	V	-	-	-90.12	23.40	40.28	-54.98	-13.00	-41.98
1893.0	V	-	-	-70.39	2.94	39.55	-55.71	-13.00	-42.71
5557.5	V	-	-	-74.58	13.03	45.45	-49.81	-13.00	-36.81
8792.5	V	-	-	-76.44	18.87	49.43	-55.37	-13.00	-42.37
11925.0	V	-	-	-76.02	23.63	54.61	-50.19	-13.00	-37.19

Table 7-22. Radiated Spurious Data (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 12)

EN-DC: NR Band n77 (As-Div ANT) – LTE Band 66



Plot 7-183. Radiated Spurious Plot Below 1GHz (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 66)



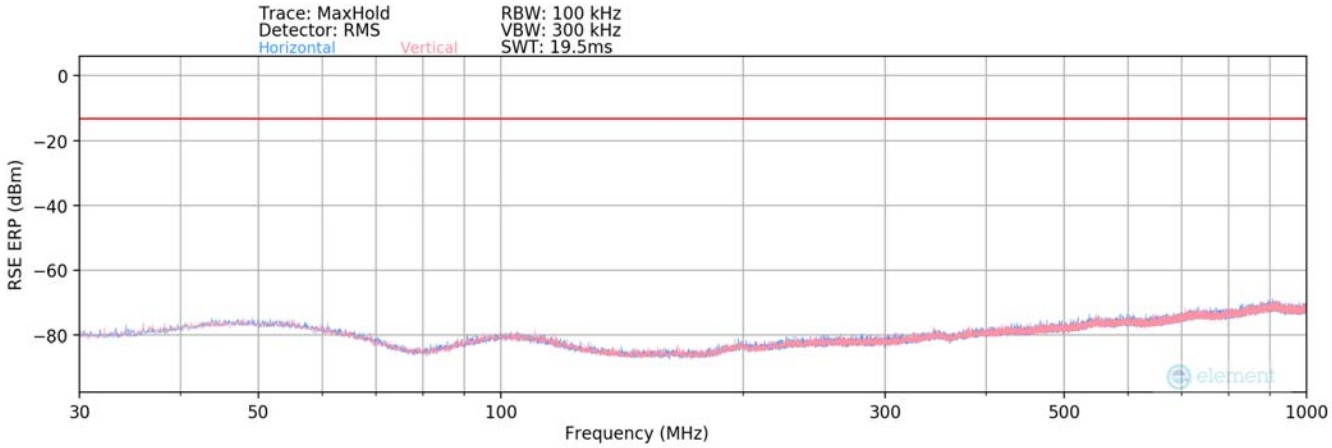
Plot 7-184. Radiated Spurious Plot (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 66)

Case:	n77 (As-Div) - B66
Bandwidth (MHz):	100 & 20
Frequency (MHz):	3840 & 1745
RB / Offset:	1/136 & 1/50
Mode:	EN-DC
Anchor Band:	66

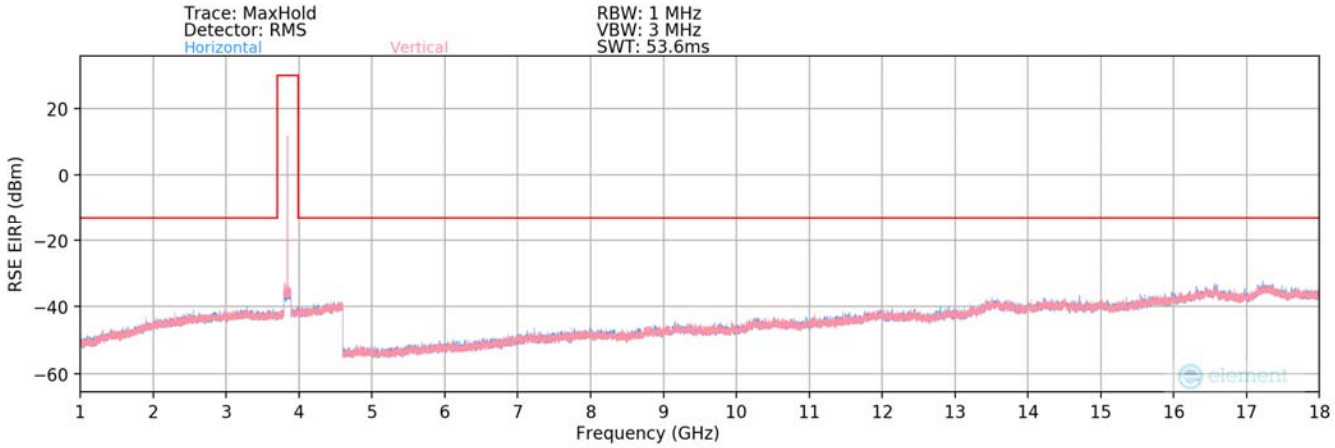
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
350.0	H	-	-	-84.93	22.10	44.17	-51.09	-13.00	-38.09
2095.0	H	200	346	-51.24	8.91	64.67	-30.58	-13.00	-17.58
3450.5	H	173	332	-71.00	2.91	38.91	-56.35	-13.00	-43.35
11520.0	H	198	344	-75.53	12.44	43.91	-60.89	-13.00	-47.89
12915.0	H	-	-	-79.85	14.00	41.15	-63.65	-13.00	-50.65
16405.0	H	-	-	-79.77	16.67	43.90	-60.90	-13.00	-47.90
17800.0	H	-	-	-80.02	17.66	44.64	-60.16	-13.00	-47.16

Table 7-23. Radiated Spurious Data (EN-DC: NR Band n77 (As-Div ANT) – LTE Band 66)

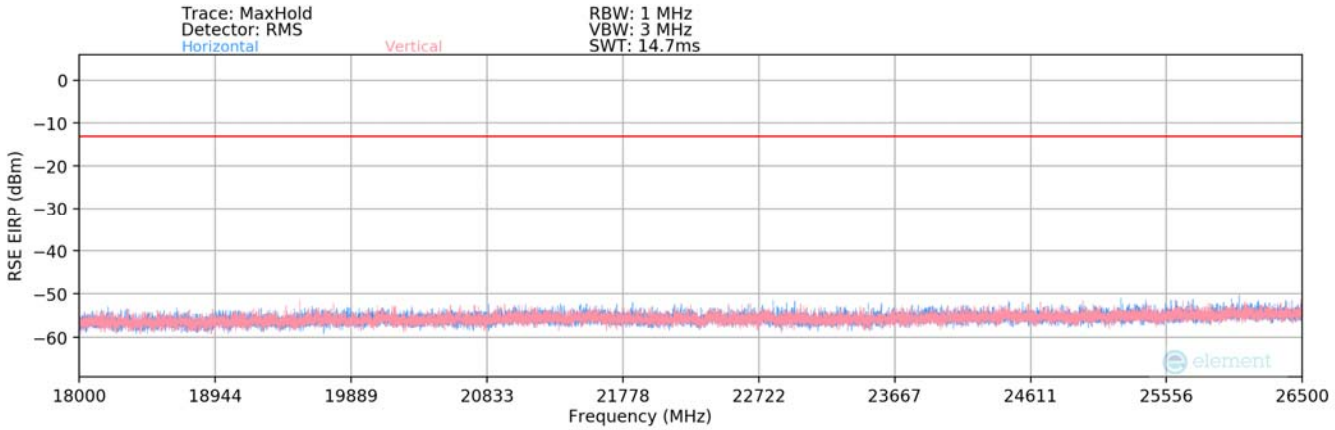
UL-MIMO NR Band n77 (PC3)



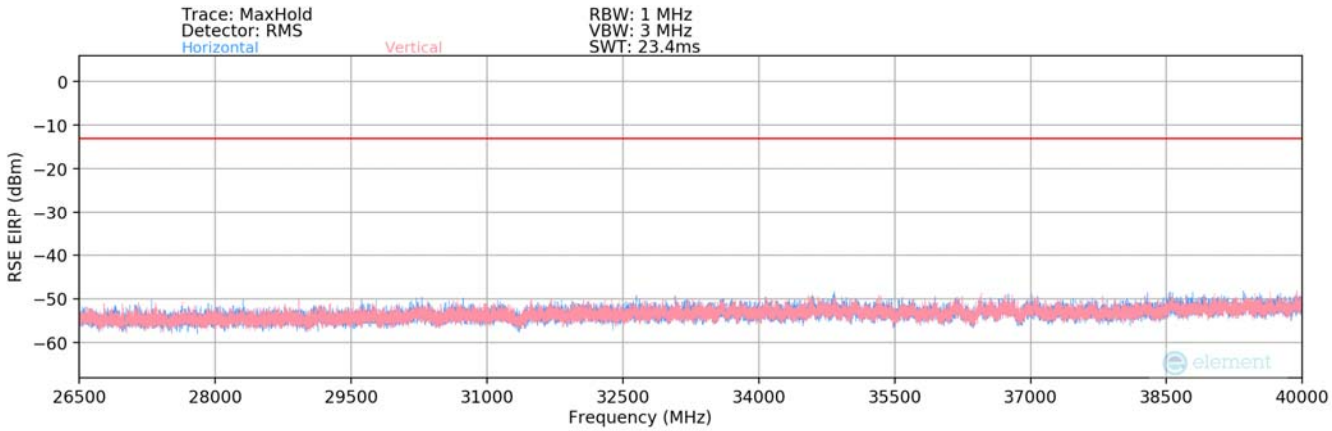
Plot 7-185. Radiated Spurious Plot Below 1GHz (UL-MIMO NR Band n77 – 30MHz-1GHz)



Plot 7-186. Radiated Spurious Plot (UL-MIMO NR Band n77-1-18GHz)



Plot 7-187. Radiated Spurious Plot (UL-MIMO NR Band n77- 18-26.5GHz-26.5GHz)



Plot 7-188. Radiated Spurious Plot (UL-MIMO NR Band n77-26.5-40GHz)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1 / 136
Mode:	UL-MIMO

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	-	-	-73.88	16.95	50.07	-45.19	-13.00	-32.19
11250.0	H	238	20	-71.46	22.34	57.88	-37.38	-13.00	-24.38
15000.0	H	-	-	-77.40	28.68	58.28	-36.98	-13.00	-23.98

Table 7-24. Radiated Spurious Data (NR Band n77 – Low Channel – Main ANT (UL-MIMO))

Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1 / 136
Mode:	UL-MIMO

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	-	-	-73.51	17.13	50.62	-44.64	-13.00	-31.64
11520.0	H	-	-	-75.88	23.11	54.23	-41.03	-13.00	-28.03
15360.0	H	-	-	-76.66	28.52	58.86	-36.40	-13.00	-23.40

Table 7-25. Radiated Spurious Data (NR Band n77 – Mid Channel – Main ANT (UL-MIMO))

Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1 / 136
Mode:	UL-MIMO

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	171	162	-68.27	16.77	55.50	-39.76	-13.00	-26.76
11790.0	H	-	-	-75.29	23.17	54.88	-40.38	-13.00	-27.38
15720.0	H	-	-	-76.89	29.74	59.85	-35.41	-13.00	-22.41

Table 7-26. Radiated Spurious Data (NR Band n77 – High Channel – Main ANT (UL-MIMO))

7.9 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" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

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

Test Notes

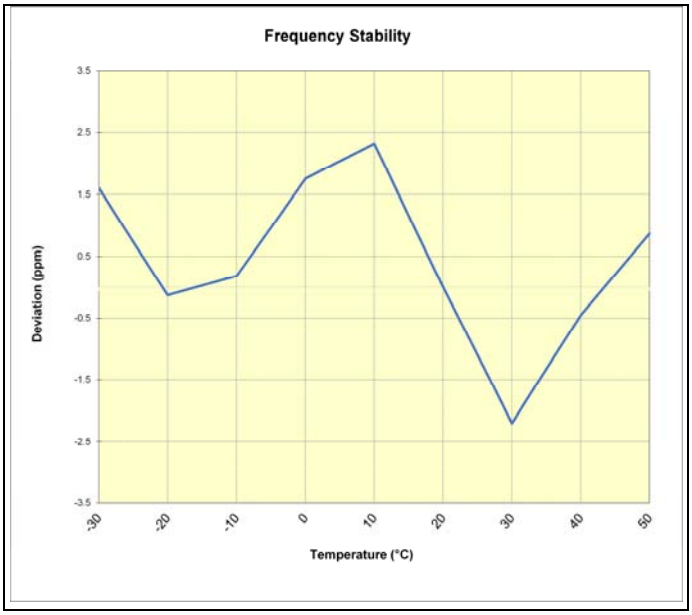
None.

NR Band n77

NR Band n77	
Operating Frequency (Hz):	3,840,000,000
Ref. Voltage (VDC):	4.28

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.28	- 30	3,839,987,395	6,183	0.0001610
		- 20	3,839,980,714	-498	-0.0000130
		- 10	3,839,981,913	701	0.0000183
		0	3,839,987,947	6,735	0.0001754
		+ 10	3,839,990,123	8,911	0.0002321
		+ 20 (Ref)	3,839,981,212	0	0.0000000
		+ 30	3,839,972,755	-8,457	-0.0002202
		+ 40	3,839,979,461	-1,751	-0.0000456
		+ 50	3,839,984,554	3,342	0.0000870
Battery Endpoint	3.69	+ 20	3,839,980,468	-744	-0.0000194

Table 7-27. NR Band n77 Frequency Stability Data



Plot 7-189. NR Band n77 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Sony Corporation Portable Handset FCC ID: PY7-76056F** complies with all the requirements of Part 27 of the FCC rules.