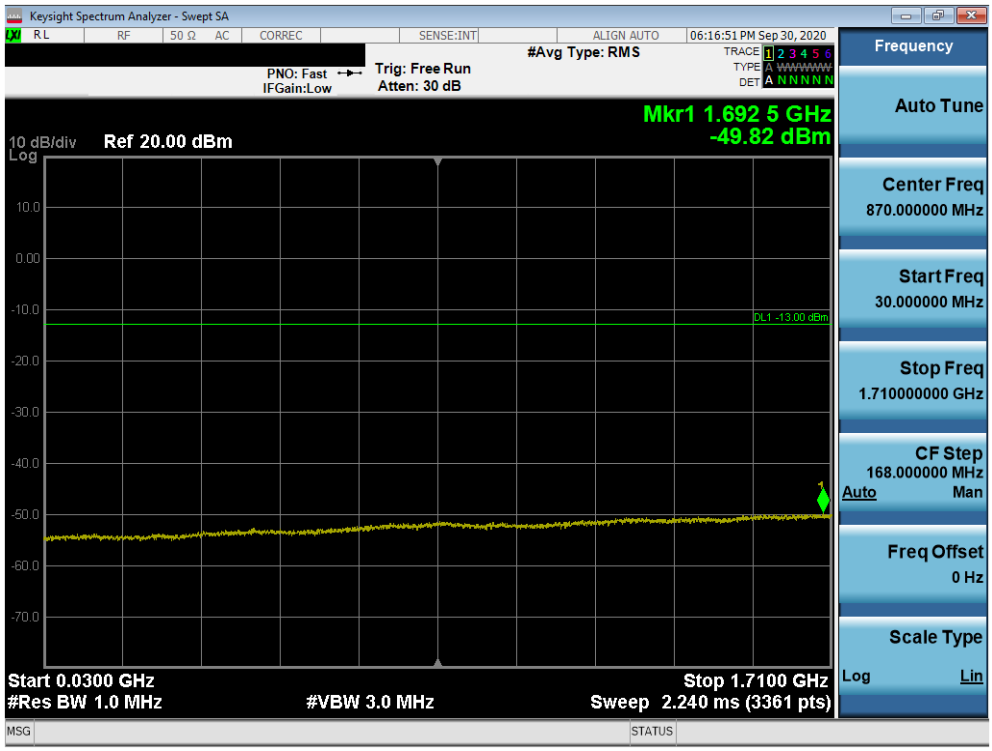
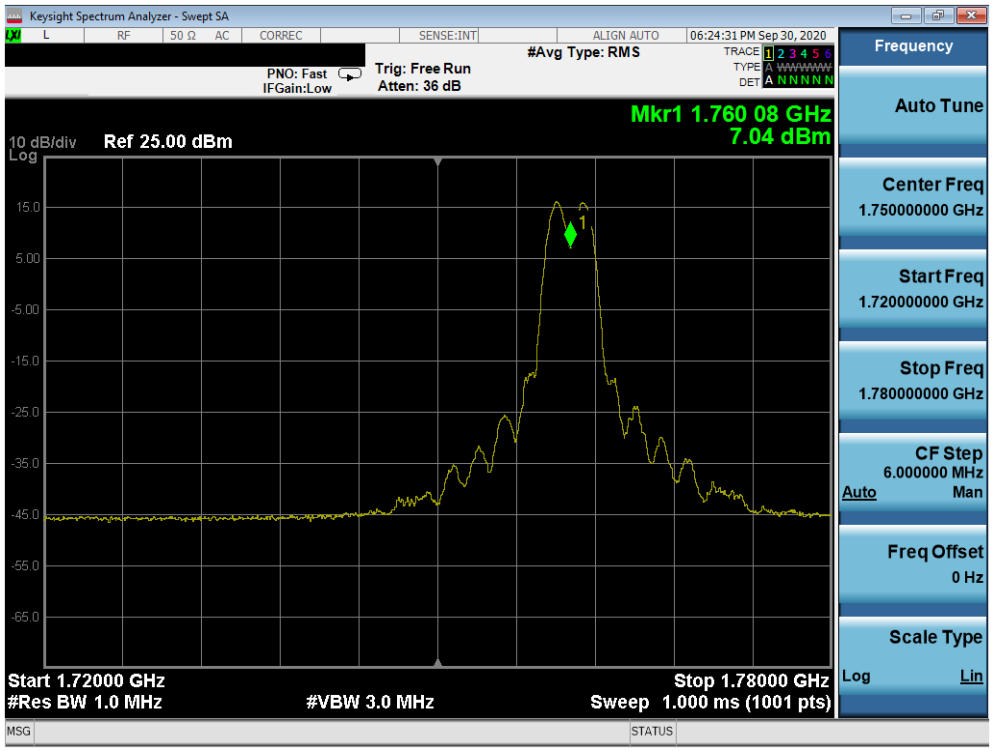
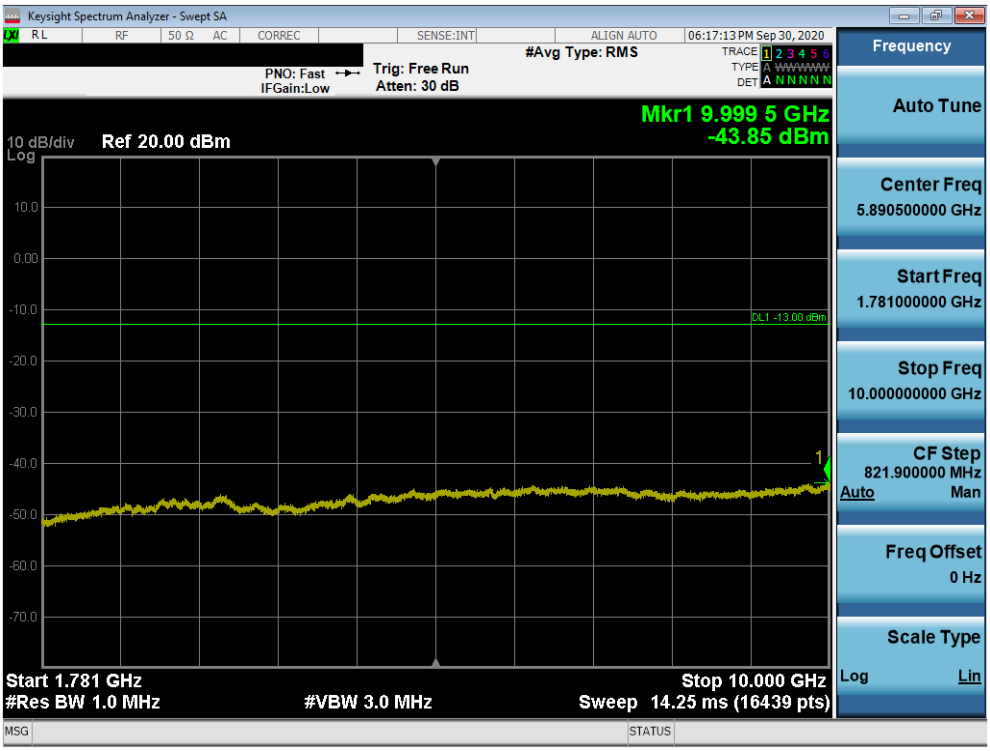


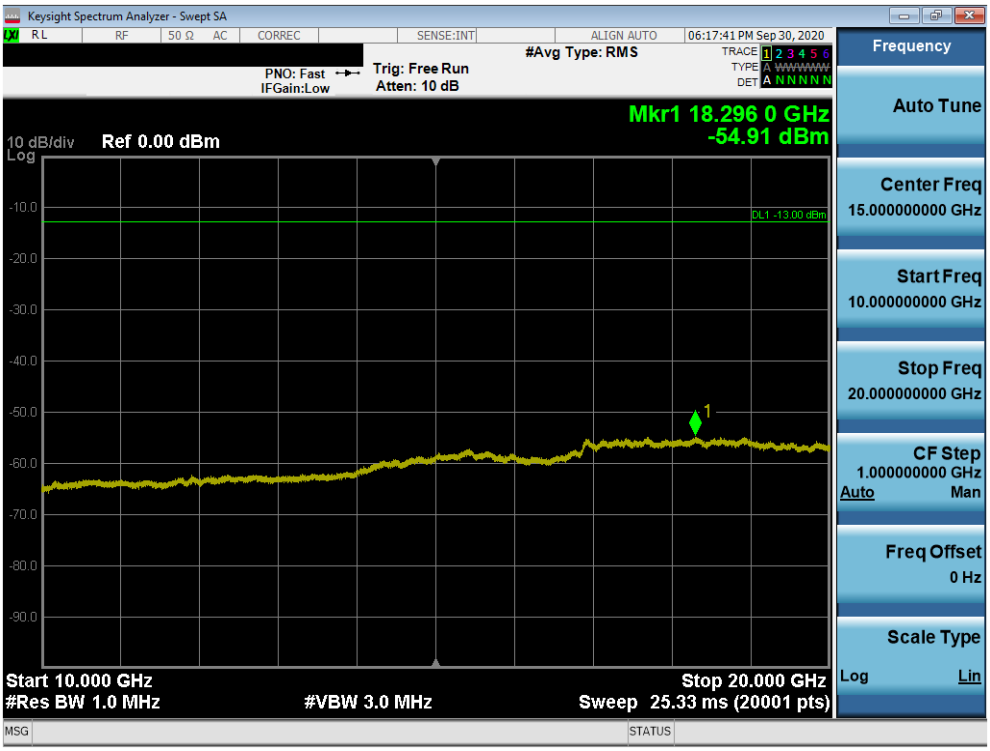
Plot 7-500. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



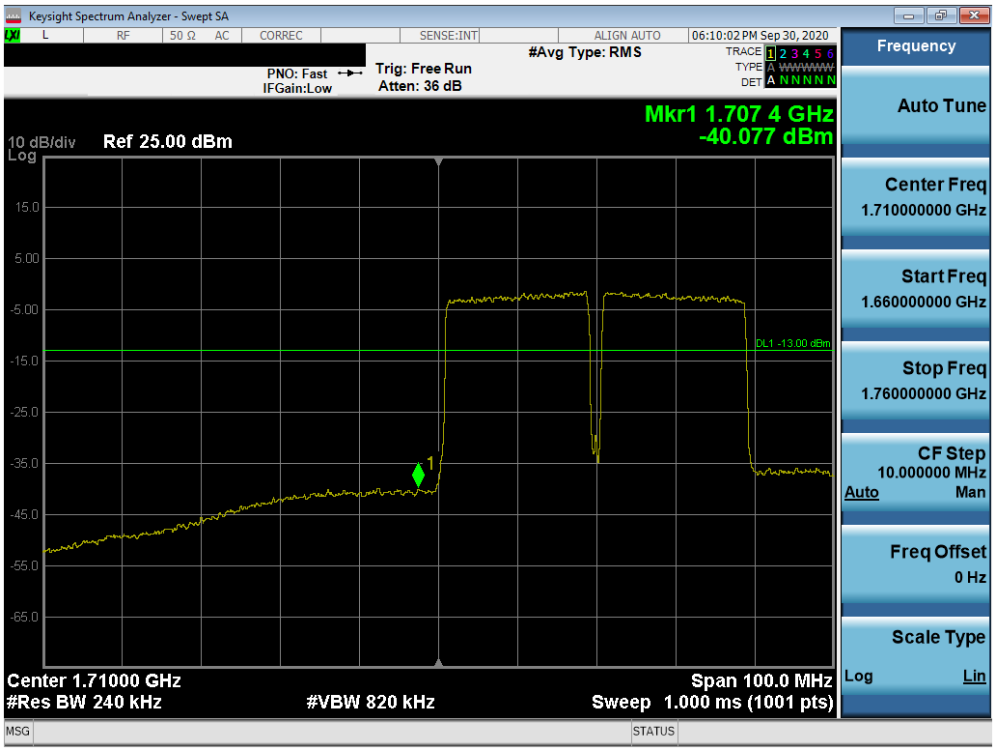
Plot 7-501. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



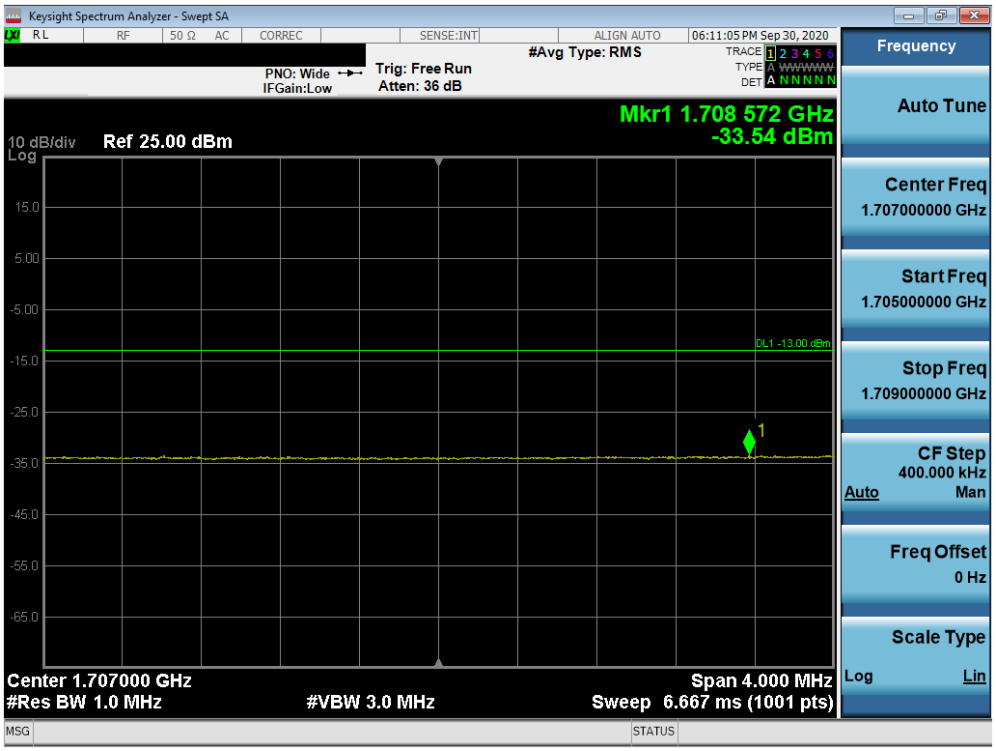
Plot 7-502. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



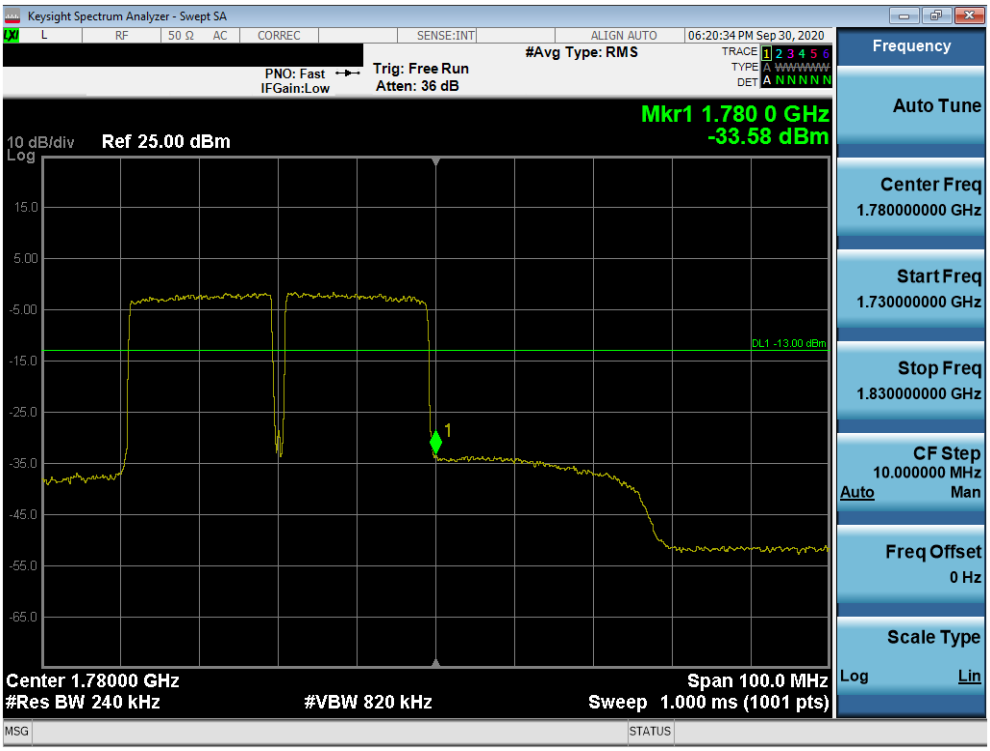
Plot 7-503. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



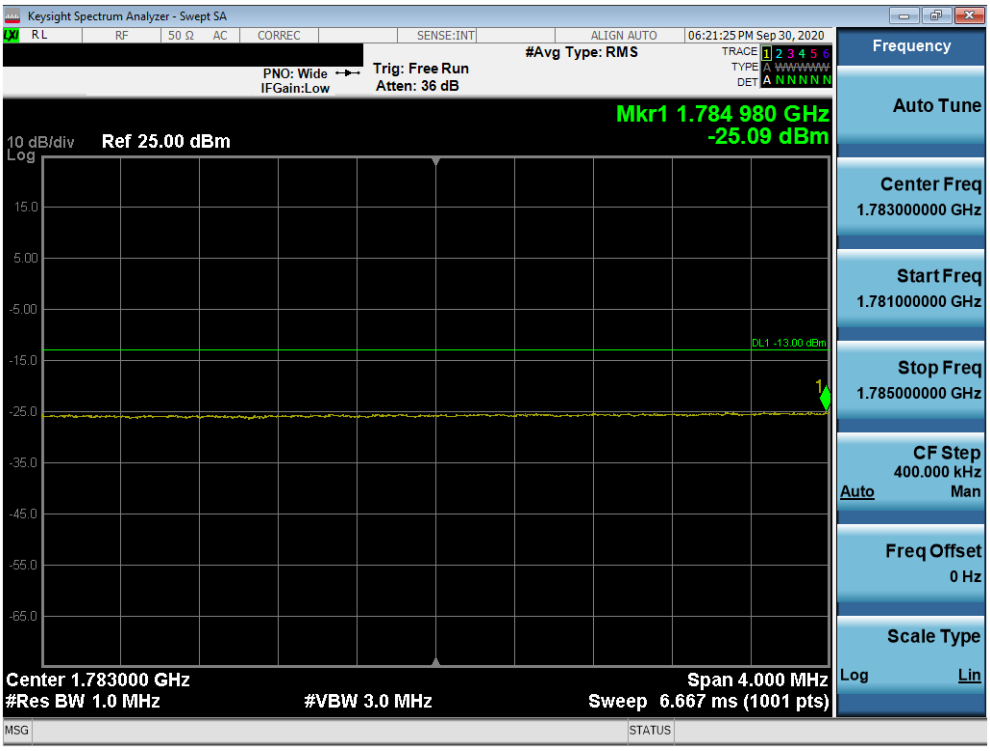
Plot 7-504. Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-505. Extended Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-506. Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-507. Extended Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

7.7 Radiated Power (EIRP)

§27.50(b) §27.50(c) §27.50(d)

Test Overview

Effective Radiated Power (ERP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, 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".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
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.

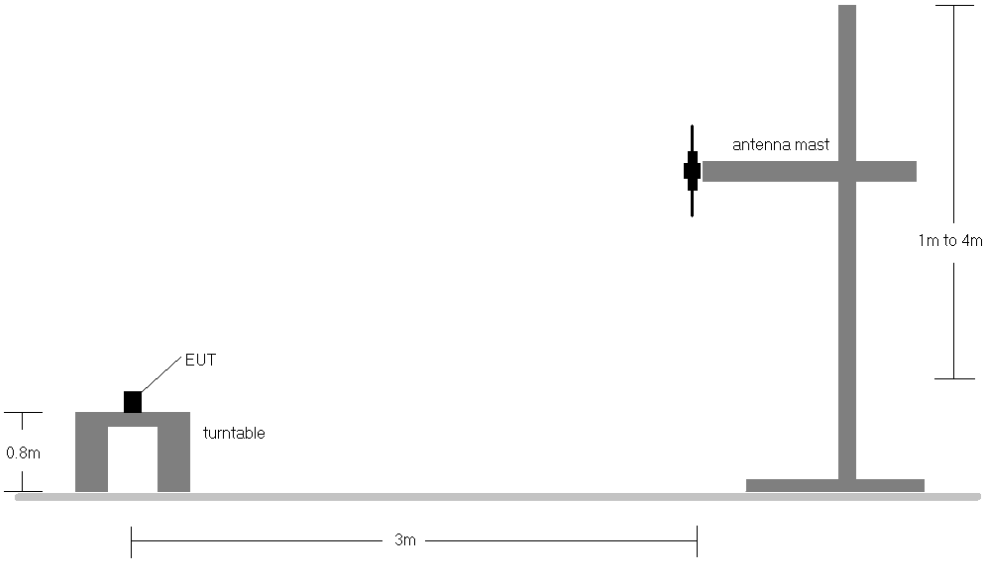


Figure 7-6. Radiated Test Setup <1GHz

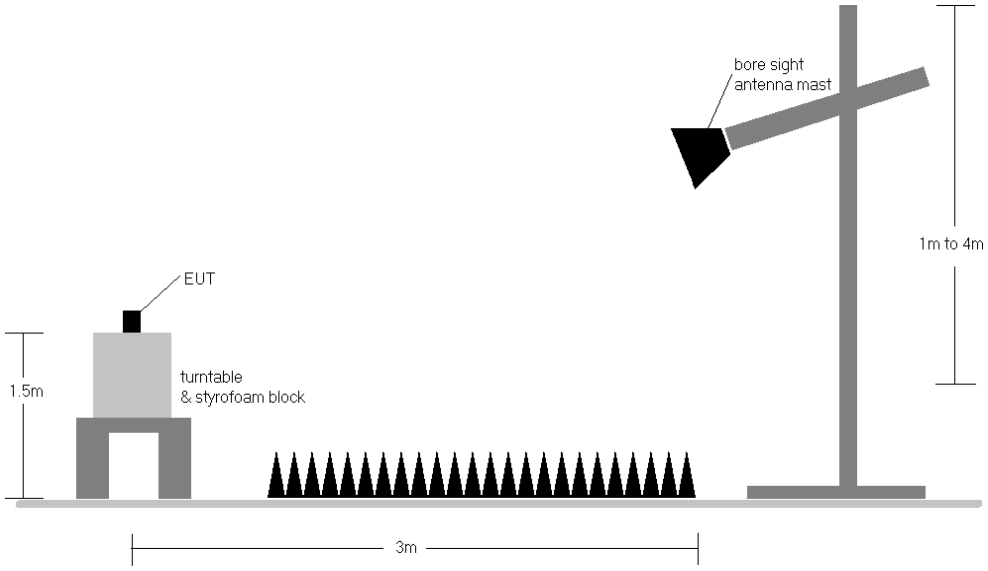


Figure 7-7. Radiated Test Setup >1GHz

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) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

4) 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	1720.0	V	142	331	9.31	1 / 50	14.78	**24.09**	0.257	30.00	-5.91
		1745.0	V	103	314	9.14	1 / 50	12.95	22.09	0.162	30.00	-7.91
		1770.0	V	101	321	9.17	1 / 50	14.21	23.38	0.218	30.00	-6.62
	16-QAM	1720.0	V	142	331	9.31	1 / 50	13.91	**23.22**	0.210	30.00	-6.78
	64-QAM	1720.0	V	142	331	9.31	1 / 50	12.78	**22.09**	0.162	30.00	-7.91
	256-QAM	1720.0	V	142	331	9.31	1 / 50	9.97	**19.28**	0.085	30.00	-10.72
15 MHz	QPSK	1717.5	V	142	331	9.33	1 / 36	14.79	**24.12**	0.258	30.00	-5.88
		1745.0	V	103	314	9.14	1 / 36	13.17	22.31	0.170	30.00	-7.69
		1772.5	V	101	321	9.18	1 / 36	14.15	23.33	0.215	30.00	-6.67
	16-QAM	1717.5	V	142	331	9.33	1 / 36	14.05	**23.38**	0.218	30.00	-6.62
	64-QAM	1717.5	V	142	331	9.33	1 / 36	12.78	**22.11**	0.163	30.00	-7.89
	256-QAM	1717.5	V	142	331	9.33	1 / 36	11.15	**20.48**	0.112	30.00	-9.52
10 MHz	QPSK	1715.0	V	142	331	9.35	1 / 25	14.60	**23.95**	0.248	30.00	-6.05
		1745.0	V	103	314	9.14	1 / 25	13.12	22.26	0.168	30.00	-7.74
		1775.0	V	101	321	9.18	1 / 25	14.21	23.40	0.219	30.00	-6.60
	16-QAM	1715.0	V	142	331	9.35	1 / 25	14.07	**23.42**	0.220	30.00	-6.58
	64-QAM	1715.0	V	142	331	9.35	1 / 25	12.26	**21.61**	0.145	30.00	-8.39
	256-QAM	1715.0	V	142	331	9.35	1 / 25	9.46	**18.81**	0.076	30.00	-11.19
5 MHz	QPSK	1712.5	V	142	331	9.37	1 / 12	14.75	**24.11**	0.258	30.00	-5.89
		1745.0	V	103	314	9.14	1 / 12	13.28	22.42	0.174	30.00	-7.58
		1777.5	V	101	321	9.19	1 / 12	14.13	23.32	0.215	30.00	-6.68
	16-QAM	1712.5	V	142	331	9.37	1 / 12	14.04	**23.40**	0.219	30.00	-6.60
	64-QAM	1712.5	V	142	331	9.37	1 / 12	12.62	**21.98**	0.158	30.00	-8.02
	256-QAM	1712.5	V	142	331	9.37	1 / 12	10.06	**19.42**	0.088	30.00	-10.58
3 MHz	QPSK	1711.5	V	142	331	9.37	1 / 0	14.68	**24.05**	0.254	30.00	-5.95
		1745.0	V	103	314	9.14	1 / 0	13.21	22.35	0.172	30.00	-7.65
		1778.5	V	101	321	9.20	1 / 0	14.15	23.35	0.216	30.00	-6.65
	16-QAM	1711.5	V	142	331	9.37	1 / 0	14.16	**23.53**	0.226	30.00	-6.47
	64-QAM	1711.5	V	142	331	9.37	1 / 0	12.37	**21.74**	0.149	30.00	-8.26
	256-QAM	1711.5	V	142	331	9.37	15/0	9.80	**19.17**	0.083	30.00	-10.83
1.4 MHz	QPSK	1710.7	V	142	331	9.38	1 / 2	14.66	**24.04**	0.254	30.00	-5.96
		1745.0	V	103	314	9.14	1 / 2	13.15	22.29	0.169	30.00	-7.71
		1779.3	V	101	321	9.20	1 / 2	14.15	23.35	0.216	30.00	-6.65
	16-QAM	1710.7	V	142	331	9.38	1 / 2	13.68	**23.06**	0.202	30.00	-6.94
	64-QAM	1710.7	V	142	331	9.38	1 / 2	12.17	**21.55**	0.143	30.00	-8.45
	256-QAM	1710.7	V	142	331	9.38	1 / 2	9.53	**18.91**	0.078	30.00	-11.09
20 MHz	Opposite Pol.	1720.0	H	172	215	9.31	1 / 99	11.36	20.67	0.117	30.00	-9.33
	WCP	1720.0	H	164	25	9.31	1 / 99	11.85	21.16	0.131	30.00	-8.84

Table 7-508. EIRP Data (LTE Band 66/4)

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]
40 MHz	π/2 BPSK	1730.0	V	145	337	9.24	1 / 108	16.02	**25.26**	0.336	30.00	-4.74
		1745.0	V	139	330	9.14	1 / 108	15.61	24.75	0.298	30.00	-5.25
		1760.0	V	139	340	9.14	1 / 1	15.94	25.08	0.322	30.00	-4.92
	QPSK	1730.0	V	145	337	9.24	1 / 108	16.03	**25.27**	0.337	30.00	-4.73
		1745.0	V	139	330	9.14	1 / 108	16.03	25.17	0.329	30.00	-4.83
		1760.0	V	139	340	9.14	1 / 1	15.98	25.12	0.325	30.00	-4.88
	16-QAM	1730.0	V	145	337	9.24	1 / 108	14.85	**24.09**	0.257	30.00	-5.91
	64-QAM	1730.0	V	145	337	9.24	1 / 108	13.90	**23.14**	0.206	30.00	-6.86
	256-QAM	1730.0	V	145	337	9.24	1 / 108	11.80	**21.04**	0.127	30.00	-8.96
30 MHz	π/2 BPSK	1745.0	V	139	330	9.14	1 / 108	15.52	**24.66**	0.292	30.00	-5.34
	QPSK	1745.0	V	139	330	9.14	1 / 108	16.18	**25.31**	0.340	30.00	-4.69
	16-QAM	1745.0	V	139	330	9.14	1 / 108	15.00	**24.13**	0.259	30.00	-5.87
	64-QAM	1745.0	V	139	330	9.14	1 / 108	13.50	**22.64**	0.184	30.00	-7.36
	256-QAM	1745.0	V	139	330	9.14	1 / 108	11.56	**20.70**	0.117	30.00	-9.30
20 MHz	π/2 BPSK	1745.0	V	139	330	9.14	1 / 108	15.02	**24.16**	0.260	30.00	-5.84
	QPSK	1745.0	V	139	330	9.14	1 / 108	15.78	**24.92**	0.311	30.00	-5.08
	16-QAM	1745.0	V	139	330	9.14	1 / 108	14.48	**23.62**	0.230	30.00	-6.38
	64-QAM	1745.0	V	139	330	9.14	1 / 108	13.47	**22.61**	0.182	30.00	-7.39
	256-QAM	1745.0	V	139	330	9.14	1 / 108	11.25	**20.38**	0.109	30.00	-9.62
15 MHz	π/2 BPSK	1745.0	V	139	330	9.14	1 / 108	15.28	**24.42**	0.277	30.00	-5.58
	QPSK	1745.0	V	139	330	9.14	1 / 108	15.87	**25.01**	0.317	30.00	-4.99
	16-QAM	1745.0	V	139	330	9.14	1 / 108	14.61	**23.75**	0.237	30.00	-6.25
	64-QAM	1745.0	V	139	330	9.14	1 / 108	13.44	**22.57**	0.181	30.00	-7.43
	256-QAM	1745.0	V	139	330	9.14	1 / 108	11.46	**20.60**	0.115	30.00	-9.40
10 MHz	π/2 BPSK	1745.0	V	139	330	9.14	1 / 108	15.24	**24.38**	0.274	30.00	-5.62
	QPSK	1745.0	V	139	330	9.14	1 / 108	15.82	**24.96**	0.313	30.00	-5.04
	16-QAM	1745.0	V	139	330	9.14	1 / 108	14.67	**23.81**	0.240	30.00	-6.19
	64-QAM	1745.0	V	139	330	9.14	1 / 108	13.67	**22.81**	0.191	30.00	-7.19
	256-QAM	1745.0	V	139	330	9.14	1 / 108	11.35	**20.49**	0.112	30.00	-9.51
5 MHz	π/2 BPSK	1745.0	V	139	330	9.14	1 / 108	15.33	**24.47**	0.280	30.00	-5.53
	QPSK	1745.0	V	139	330	9.14	1 / 108	15.86	**25.00**	0.316	30.00	-5.00
	16-QAM	1745.0	V	139	330	9.14	1 / 108	14.68	**23.82**	0.241	30.00	-6.18
	64-QAM	1745.0	V	139	330	9.14	1 / 108	13.63	**22.77**	0.189	30.00	-7.23
	256-QAM	1745.0	V	139	330	9.14	1 / 108	11.54	**20.68**	0.117	30.00	-9.32
40 MHz	QPSK (CP-OFDM)	1730.0	V	145	337	9.24	1 / 108	14.72	**23.96**	0.249	30.00	-6.04
	QPSK (Opposite Pol.)	1730.0	H	141	192	9.24	1 / 108	14.59	23.83	0.242	30.00	-6.17
	QPSK (WCP)	1730.0	V	201	144	9.24	1 / 108	12.78	22.02	0.159	30.00	-7.98

Table 7-509. EIRP Data (NR Band n66 – ANT A)

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]
40 MHz	π/2 BPSK	1720.0	V	116	27	9.24	1 / 108	12.69	21.93	0.156	30.00	-8.07
		1745.0	V	103	21	9.14	1 / 1	12.21	21.35	0.136	30.00	-8.65
		1770.0	V	145	23	9.14	1 / 108	13.89	**23.03**	0.201	30.00	-6.97
	QPSK	1720.0	V	116	27	9.24	1 / 108	11.96	21.20	0.132	30.00	-8.80
		1745.0	V	103	21	9.14	1 / 1	11.18	20.32	0.108	30.00	-9.68
		1770.0	V	145	23	9.14	1 / 108	12.85	**21.99**	0.158	30.00	-8.01
	16-QAM	1720.0	V	116	27	9.24	1 / 108	12.39	**21.63**	0.146	30.00	-8.37
	64-QAM	1720.0	V	116	27	9.24	1 / 108	10.95	**20.19**	0.105	30.00	-9.81
	256-QAM	1720.0	V	116	27	9.24	1 / 108	9.65	**18.89**	0.077	30.00	-11.11
30 MHz	π/2 BPSK	1745.0	V	145	337	9.14	1/108	15.17	**24.31**	0.270	30.00	-5.69
	QPSK	1745.0	V	145	337	9.14	1/108	15.20	**24.34**	0.272	30.00	-5.66
	16-QAM	1745.0	V	145	337	9.14	1/108	14.11	**23.25**	0.211	30.00	-6.75
	64-QAM	1745.0	V	145	337	9.14	1/108	12.50	**21.63**	0.146	30.00	-8.37
	256-QAM	1745.0	V	145	337	9.14	1/108	10.58	**19.72**	0.094	30.00	-10.28
20 MHz	π/2 BPSK	1745.0	V	145	337	9.14	1/108	14.67	**23.81**	0.240	30.00	-6.19
	QPSK	1745.0	V	145	337	9.14	1/108	14.81	**23.95**	0.248	30.00	-6.05
	16-QAM	1745.0	V	145	337	9.14	1/108	13.60	**22.73**	0.188	30.00	-7.27
	64-QAM	1745.0	V	145	337	9.14	1/108	12.46	**21.60**	0.144	30.00	-8.40
	256-QAM	1745.0	V	145	337	9.14	1/108	10.26	**19.40**	0.087	30.00	-10.60
15 MHz	π/2 BPSK	1745.0	V	103	21	9.14	1/108	14.93	**24.07**	0.255	30.00	-5.93
	QPSK	1745.0	V	103	21	9.14	1/108	14.90	**24.03**	0.253	30.00	-5.97
	16-QAM	1745.0	V	103	21	9.14	1/108	13.73	**22.86**	0.193	30.00	-7.14
	64-QAM	1745.0	V	103	21	9.14	1/108	12.43	**21.56**	0.143	30.00	-8.44
	256-QAM	1745.0	V	103	21	9.14	1/108	10.48	**19.61**	0.091	30.00	-10.39
10 MHz	π/2 BPSK	1745.0	V	103	21	9.14	1/108	14.89	**24.03**	0.253	30.00	-5.97
	QPSK	1745.0	V	103	21	9.14	1/108	14.85	**23.98**	0.250	30.00	-6.02
	16-QAM	1745.0	V	103	21	9.14	1/108	13.78	**22.92**	0.196	30.00	-7.08
	64-QAM	1745.0	V	103	21	9.14	1/108	12.66	**21.80**	0.151	30.00	-8.20
	256-QAM	1745.0	V	103	21	9.14	1/108	10.37	**19.51**	0.089	30.00	-10.49
5 MHz	π/2 BPSK	1745.0	V	103	21	9.14	1/108	14.98	**24.12**	0.258	30.00	-5.88
	QPSK	1745.0	V	103	21	9.14	1/108	14.89	**24.03**	0.253	30.00	-5.97
	16-QAM	1745.0	V	103	21	9.14	1/108	13.79	**22.93**	0.196	30.00	-7.07
	64-QAM	1745.0	V	103	21	9.14	1/108	12.62	**21.76**	0.150	30.00	-8.24
	256-QAM	1745.0	V	103	21	9.14	1/108	10.56	**19.70**	0.093	30.00	-10.30
40 MHz	QPSK (CP-OFDM)	1760.0	V	145	23	9.14	1 / 108	11.60	**20.74**	0.118	30.00	-9.26
	QPSK (WCP)	1760.0	V	134	162	9.14	1 / 108	10.70	19.84	0.096	30.00	-10.16

Table 7-510. EIRP Data (NR Band n66 – ANT I)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	V	155	247	4.58	1 / 49	14.96	19.54	0.090	36.99	-17.45	17.39	0.055	34.77	-17.38
		707.5	V	158	249	4.62	1 / 49	15.65	**20.27**	0.107	36.99	-16.72	**18.12**	0.065	34.77	-16.65
		711.0	V	150	249	4.67	1 / 25	15.45	20.12	0.103	36.99	-16.87	17.97	0.063	34.77	-16.80
	16-QAM	707.5	V	158	249	4.62	1 / 49	15.13	**19.75**	0.094	36.99	-17.24	**17.60**	0.058	34.77	-17.17
	64-QAM	707.5	V	158	249	4.62	1 / 49	13.42	**18.04**	0.064	36.99	-18.95	**15.89**	0.039	34.77	-18.88
	256-QAM	711.0	V	150	249	4.67	1 / 25	10.74	**15.41**	0.035	36.99	-21.58	**13.26**	0.021	34.77	-21.51
5 MHz	QPSK	707.5	V	158	249	4.62	1 / 12	15.80	**20.43**	0.110	36.99	-16.56	**18.28**	0.067	34.77	-16.50
	16-QAM	707.5	V	158	249	4.62	1 / 12	15.69	**20.31**	0.107	36.99	-16.68	**18.16**	0.066	34.77	-16.61
	64-QAM	707.5	V	158	249	4.62	1 / 12	13.78	**18.40**	0.069	36.99	-18.59	**16.25**	0.042	34.77	-18.52
	256-QAM	707.5	V	158	249	4.62	1 / 12	11.03	**15.65**	0.037	36.99	-21.34	**13.50**	0.022	34.77	-21.27
3 MHz	QPSK	707.5	V	158	249	4.62	1 / 7	15.70	**20.33**	0.108	36.99	-16.66	**18.18**	0.066	34.77	-16.60
	16-QAM	707.5	V	158	249	4.62	1 / 7	15.14	**19.76**	0.095	36.99	-17.23	**17.61**	0.058	34.77	-17.16
	64-QAM	707.5	V	158	249	4.62	1 / 7	13.48	**18.10**	0.065	36.99	-18.89	**15.95**	0.039	34.77	-18.82
	256-QAM	707.5	V	158	249	4.62	1 / 7	10.70	**15.32**	0.034	36.99	-21.67	**13.17**	0.021	34.77	-21.60
1.4 MHz	QPSK	707.5	V	158	249	4.62	1 / 5	15.60	**20.23**	0.105	36.99	-16.76	**18.08**	0.064	34.77	-16.70
	16-QAM	707.5	V	158	249	4.62	1 / 5	15.05	**19.67**	0.093	36.99	-17.32	**17.52**	0.057	34.77	-17.25
	64-QAM	707.5	V	158	249	4.62	1 / 5	13.41	**18.03**	0.064	36.99	-18.96	**15.88**	0.039	34.77	-18.89
	256-QAM	707.5	V	158	249	4.62	1 / 5	10.62	**15.24**	0.033	36.99	-21.75	**13.09**	0.020	34.77	-21.68
10 MHz	Opposite Pol.	707.5	H	229	190	4.62	1 / 49	5.15	9.77	0.009	36.99	-27.22	7.62	0.006	34.77	-27.15
	WCP	707.5	V	150	264	4.62	1 / 49	9.47	14.09	0.026	36.99	-22.90	11.94	0.016	34.77	-22.83

Table 7-511. ERP Data (LTE Band 12/17)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
15 MHz	π/2 BPSK	706.5	V	147	112	4.61	1 / 77	15.33	19.94	0.099	36.99	-17.05	17.79	0.060	34.77	-16.98
		707.5	V	142	96	4.62	1 / 77	15.25	19.87	0.097	36.99	-17.12	17.72	0.059	34.77	-17.05
		708.5	V	145	104	4.64	1 / 77	15.68	**20.32**	0.108	36.99	-16.67	**18.17**	0.066	34.77	-16.61
	QPSK	706.5	V	147	112	4.61	1 / 77	14.91	19.52	0.090	36.99	-17.47	17.37	0.055	34.77	-17.40
		707.5	V	142	96	4.62	1 / 77	14.71	19.33	0.086	36.99	-17.66	17.18	0.052	34.77	-17.59
		708.5	V	145	104	4.64	1 / 77	14.90	**19.54**	0.090	36.99	-17.45	**17.39**	0.055	34.77	-17.39
	16-QAM	708.5	V	145	104	4.64	1 / 77	13.75	**18.39**	0.069	36.99	-18.60	**16.24**	0.042	34.77	-18.54
	64-QAM	706.5	V	147	112	4.61	1 / 77	12.02	**16.63**	0.046	36.99	-20.36	**14.48**	0.028	34.77	-20.29
	256-QAM	708.5	V	145	104	4.64	1 / 77	10.02	**14.66**	0.029	36.99	-22.33	**12.51**	0.018	34.77	-22.27
10 MHz	π/2 BPSK	707.5	V	142	96	4.62	1/77	15.19	**19.82**	0.096	36.99	-17.17	**17.67**	0.058	34.77	-17.10
	QPSK	707.5	V	142	96	4.62	1/77	14.81	**19.43**	0.088	36.99	-17.56	**17.28**	0.053	34.77	-17.49
	16-QAM	707.5	V	142	96	4.62	1/77	13.82	**18.45**	0.070	36.99	-18.54	**16.30**	0.043	34.77	-18.47
	64-QAM	707.5	V	142	96	4.62	1/77	11.01	**15.63**	0.037	36.99	-21.36	**13.48**	0.022	34.77	-21.29
	256-QAM	707.5	V	142	96	4.62	1/77	10.42	**15.04**	0.032	36.99	-21.95	**12.89**	0.019	34.77	-21.88
5 MHz	π/2 BPSK	707.5	V	142	96	4.62	1/77	14.98	**19.60**	0.091	36.99	-17.39	**17.45**	0.056	34.77	-17.32
	QPSK	707.5	V	142	96	4.62	1/77	14.67	**19.30**	0.085	36.99	-17.69	**17.15**	0.052	34.77	-17.62
	16-QAM	707.5	V	142	96	4.62	1/77	13.53	**18.16**	0.065	36.99	-18.83	**16.01**	0.040	34.77	-18.76
	64-QAM	707.5	V	142	96	4.62	1/77	10.94	**15.57**	0.036	36.99	-21.42	**13.42**	0.022	34.77	-21.36
	256-QAM	707.5	V	142	96	4.62	1/77	9.91	**14.54**	0.028	36.99	-22.45	**12.39**	0.017	34.77	-22.38
15 MHz	Opposite Pol.	708.5	V	145	104	4.64	1 / 77	12.41	17.05	0.051	36.99	-19.94	14.90	0.031	34.77	-19.87
	WCP	708.5	H	134	282	3.69	1 / 77	15.68	19.37	0.086	36.99	-17.62	17.22	0.053	34.77	-17.55

Table 7-512. ERP Data (Band n12)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	V	142	269	5.79	1 / 49	15.36	**21.15**	0.130	36.99	-15.84	**19.00**	0.079	34.77	-15.77
	16-QAM	782.0	V	142	269	5.79	50 / 0	14.97	**20.76**	0.119	36.99	-16.23	**18.61**	0.073	34.77	-16.16
	64-QAM	782.0	V	142	269	5.79	1 / 49	13.58	**19.37**	0.087	36.99	-17.62	**17.22**	0.053	34.77	-17.55
	256-QAM	782.0	V	142	269	5.79	1 / 49	10.37	**16.16**	0.041	36.99	-20.83	**14.01**	0.025	34.77	-20.76
5 MHz	QPSK	779.5	V	142	269	5.77	1 / 24	15.43	21.19	0.132	36.99	-15.80	19.04	0.080	34.77	-15.73
		782.0	V	142	269	5.79	1 / 24	15.52	**21.31**	0.135	36.99	-15.68	**19.16**	0.082	34.77	-15.61
		784.5	V	142	269	5.82	1 / 24	15.36	21.18	0.131	36.99	-15.81	19.03	0.080	34.77	-15.74
	16-QAM	782.0	V	142	269	5.79	1 / 24	15.03	**20.82**	0.121	36.99	-16.17	**18.67**	0.074	34.77	-16.10
	64-QAM	779.5	V	142	269	5.77	1 / 24	13.90	**19.66**	0.093	36.99	-17.33	**17.51**	0.056	34.77	-17.26
	256-QAM	784.5	V	142	269	5.82	1 / 24	10.93	**16.75**	0.047	36.99	-20.24	**14.60**	0.029	34.77	-20.17
10 MHz	Opposite Pol.	782.0	H	208	-9	5.79	1 / 49	5.07	10.86	0.012	36.99	-26.13	8.71	0.007	34.77	-26.06
	WCP	782.0	H	207	258	5.79	1 / 49	9.72	15.51	0.036	36.99	-21.48	13.36	0.022	34.77	-21.41

Table 7-513. ERP Data (LTE Band 13)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	QPSK	673.0	V	185	229	3.09	1 / 50	14.40	17.49	0.056	36.99	-19.50	15.34	0.034	34.77	-19.43
		680.5	V	182	219	3.19	1 / 50	14.38	17.57	0.057	36.99	-19.42	15.42	0.035	34.77	-19.36
		688.0	V	170	244	3.28	1 / 50	14.47	**17.75**	0.060	36.99	-19.24	**15.60**	0.036	34.77	-19.17
	16-QAM	688.0	V	170	244	3.28	1 / 50	13.79	**17.07**	0.051	36.99	-19.92	**14.92**	0.031	34.77	-19.85
	64-QAM	680.5	V	182	219	3.19	1 / 50	12.09	**15.28**	0.034	36.99	-21.71	**13.13**	0.021	34.77	-21.65
	256-QAM	688.0	V	170	244	3.28	1 / 50	9.73	**13.01**	0.020	36.99	-23.98	**10.86**	0.012	34.77	-23.91
15 MHz	QPSK	670.5	V	185	229	3.06	1 / 0	14.77	**17.83**	0.061	36.99	-19.16	**15.68**	0.037	34.77	-19.09
		680.5	V	182	219	3.19	1 / 0	14.37	17.56	0.057	36.99	-19.43	15.41	0.035	34.77	-19.37
		690.5	V	170	244	3.31	1 / 0	14.26	17.57	0.057	36.99	-19.42	15.42	0.035	34.77	-19.35
	16-QAM	690.5	V	170	244	3.31	1 / 0	13.88	**17.19**	0.052	36.99	-19.80	**15.04**	0.032	34.77	-19.73
	64-QAM	690.5	V	170	244	3.31	1 / 0	11.98	**15.29**	0.034	36.99	-21.70	**13.14**	0.021	34.77	-21.63
	256-QAM	690.5	V	170	244	3.31	1 / 0	9.75	**13.06**	0.020	36.99	-23.93	**10.91**	0.012	34.77	-23.86
10 MHz	QPSK	668.0	V	185	229	3.02	1 / 49	14.71	**17.74**	0.059	36.99	-19.25	**15.59**	0.036	34.77	-19.18
		680.5	V	182	219	3.19	1 / 0	14.37	17.56	0.057	36.99	-19.43	15.41	0.035	34.77	-19.37
		693.0	V	170	244	3.34	1 / 0	14.15	17.49	0.056	36.99	-19.50	15.34	0.034	34.77	-19.43
	16-QAM	693.0	V	170	244	3.34	1 / 0	13.80	**17.14**	0.052	36.99	-19.85	**14.99**	0.032	34.77	-19.78
	64-QAM	693.0	V	170	244	3.34	1 / 0	11.78	**15.12**	0.033	36.99	-21.87	**12.97**	0.020	34.77	-21.80
	256-QAM	693.0	V	170	244	3.34	1 / 0	9.57	**12.91**	0.020	36.99	-24.08	**10.76**	0.012	34.77	-24.01
5 MHz	QPSK	665.5	V	185	229	2.99	1 / 24	14.79	**17.78**	0.060	36.99	-19.21	**15.63**	0.037	34.77	-19.14
		680.5	V	182	219	3.19	1 / 12	14.48	17.67	0.058	36.99	-19.32	15.52	0.036	34.77	-19.26
		695.5	V	170	244	3.38	1 / 12	13.85	17.22	0.053	36.99	-19.77	15.07	0.032	34.77	-19.70
	16-QAM	680.5	V	182	219	3.19	1 / 12	13.85	**17.04**	0.051	36.99	-19.95	**14.89**	0.031	34.77	-19.89
	64-QAM	680.5	V	182	219	3.19	1 / 12	12.20	**15.39**	0.035	36.99	-21.60	**13.24**	0.021	34.77	-21.54
	256-QAM	680.5	V	182	219	3.19	1 / 12	9.59	**12.78**	0.019	36.99	-24.21	**10.63**	0.012	34.77	-24.15
20 MHz	Opposite Pol.	688.0	H	134	284	3.28	1 / 50	14.59	17.87	0.061	36.99	-19.12	15.72	0.037	34.77	-19.05
	WCP	688.0	H	105	94	3.28	1 / 50	9.51	12.79	0.019	36.99	-24.20	10.64	0.012	34.77	-24.13

Table 7-514. ERP Data (LTE Band 71)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	673.0	V	160	107	4.09	1 / 53	13.23	17.32	0.054	36.99	-19.67	15.17	0.033	34.77	-19.60
		680.5	V	162	102	4.24	1 / 53	13.53	17.77	0.060	36.99	-19.22	15.62	0.036	34.77	-19.16
		688.0	V	147	105	4.48	1 / 104	13.38	**17.86**	0.061	36.99	-19.13	**15.71**	0.037	34.77	-19.06
	QPSK	673.0	V	160	107	4.09	1 / 53	13.13	17.22	0.053	36.99	-19.77	15.07	0.032	34.77	-19.70
		680.5	V	162	102	4.24	1 / 1	13.47	**17.71**	0.059	36.99	-19.28	**15.56**	0.036	34.77	-19.22
		688.0	V	147	105	4.48	1 / 104	13.16	17.64	0.058	36.99	-19.35	15.49	0.035	34.77	-19.28
	16-QAM	680.5	V	162	102	4.24	1 / 53	12.30	**16.54**	0.045	36.99	-20.45	**14.39**	0.027	34.77	-20.39
	64-QAM	688.0	V	147	105	4.48	1 / 104	9.92	**14.40**	0.028	36.99	-22.59	**12.25**	0.017	34.77	-22.52
	256-QAM	680.5	V	162	102	4.24	1 / 53	8.48	**12.72**	0.019	36.99	-24.27	**10.57**	0.011	34.77	-24.21
15 MHz	π/2 BPSK	680.5	V	162	102	4.24	1 / 40	13.65	**17.89**	0.061	36.99	-19.10	**15.74**	0.037	34.77	-19.03
	QPSK	680.5	V	162	102	4.24	1 / 40	13.51	**17.74**	0.059	36.99	-19.25	**15.59**	0.036	34.77	-19.18
	16-QAM	680.5	V	162	102	4.24	1 / 40	12.43	**16.67**	0.046	36.99	-20.32	**14.52**	0.028	34.77	-20.25
	64-QAM	680.5	V	162	102	4.24	1 / 40	10.94	**15.17**	0.033	36.99	-21.82	**13.02**	0.020	34.77	-21.75
	256-QAM	680.5	V	162	102	4.24	1 / 40	8.32	**12.55**	0.018	36.99	-24.44	**10.40**	0.011	34.77	-24.37
10 MHz	π/2 BPSK	680.5	V	162	102	4.24	1 / 26	13.54	**17.78**	0.060	36.99	-19.21	**15.63**	0.037	34.77	-19.14
	QPSK	680.5	V	162	102	4.24	1 / 26	13.46	**17.70**	0.059	36.99	-19.29	**15.55**	0.036	34.77	-19.23
	16-QAM	680.5	V	162	102	4.24	1 / 26	12.67	**16.90**	0.049	36.99	-20.09	**14.75**	0.030	34.77	-20.02
	64-QAM	680.5	V	162	102	4.24	1 / 26	10.56	**14.80**	0.030	36.99	-22.19	**12.65**	0.018	34.77	-22.12
	256-QAM	680.5	V	162	102	4.24	1 / 26	8.31	**12.55**	0.018	36.99	-24.44	**10.40**	0.011	34.77	-24.38
5 MHz	π/2 BPSK	680.5	V	162	102	4.24	1 / 13	13.70	**17.93**	0.062	36.99	-19.06	**15.78**	0.038	34.77	-18.99
	QPSK	680.5	V	162	102	4.24	1 / 13	13.46	**17.69**	0.059	36.99	-19.30	**15.54**	0.036	34.77	-19.23
	16-QAM	680.5	V	162	102	4.24	1 / 13	12.81	**17.05**	0.051	36.99	-19.94	**14.90**	0.031	34.77	-19.88
	64-QAM	680.5	V	162	102	4.24	1 / 13	10.96	**15.20**	0.033	36.99	-21.79	**13.05**	0.020	34.77	-21.73
	256-QAM	680.5	V	162	102	4.24	1 / 13	8.31	12.55	0.018	36.99	-24.44	10.40	0.011	34.77	-24.37
20 MHz	QPSK (CP-OFDM)	688.0	V	147	105	4.58	1 / 53	9.94	**14.52**	0.028	36.99	-22.47	**12.37**	0.017	34.77	-22.40
	QPSK (Opposite Pol.)	688.0	H	145	292	3.28	1 / 53	14.40	17.68	0.059	36.99	-19.31	15.53	0.036	34.77	-19.24
	QPSK (WCP)	688.0	V	183	253	4.58	1 / 1	9.09	13.67	0.023	36.99	-23.32	11.52	0.014	34.77	-23.25

Table 7-515. ERP Data (Band n71)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	V	152	327	14.20	9.37	23.57	0.227	30.00	-6.43
1732.60	WCDMA1700	V	143	331	15.42	9.22	**24.64**	**0.291**	30.00	-5.36
1752.60	WCDMA1700	V	129	332	14.12	9.11	23.23	0.210	30.00	-6.77
1732.60	WCDMA1700	H	273	192	12.78	9.22	22.00	0.159	30.00	-8.00
1732.60	WCDMA1700 (WCP)	V	104	36	9.75	9.22	18.97	0.079	30.00	-11.03

Table 7-516. EIRP Data (WCDMA AWS)

Radiated Spurious Emissions Measurements

§2.1053 §27.53

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

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.

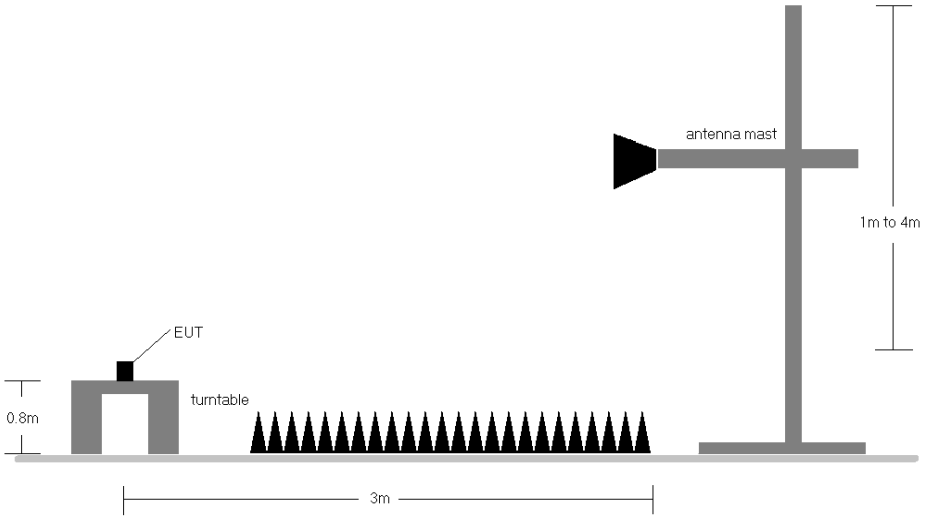


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
   b) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   d) 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 EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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

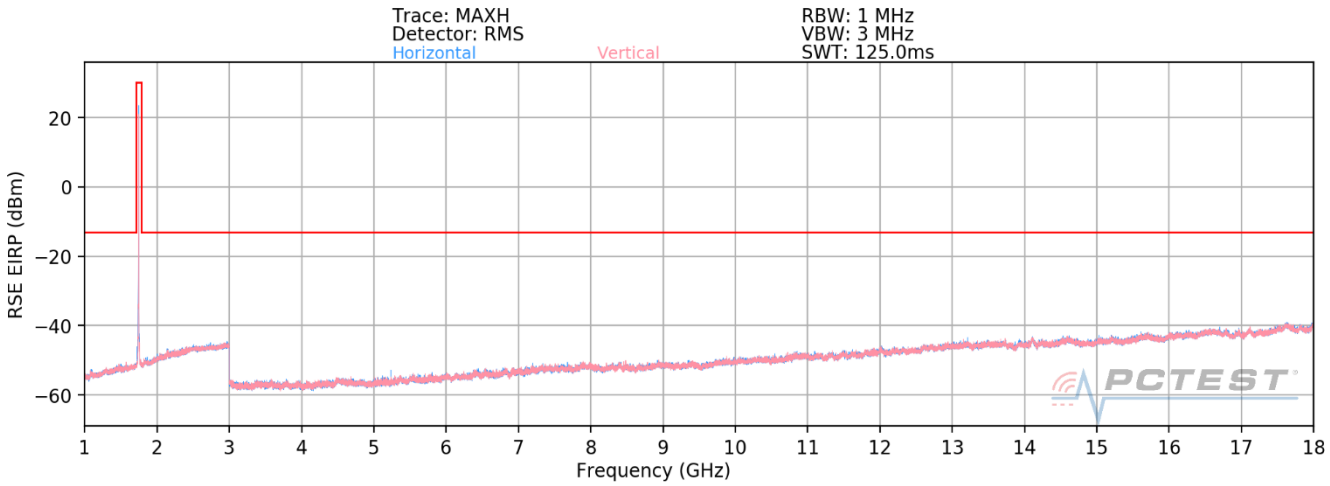
6) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

8) 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.

9) 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 emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

LTE Band 66/4



Plot 7-517. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	V	-	-	-77.64	1.49	30.85	-64.40	-13.00	-51.40
5160.0	V	120	20	-73.05	4.45	38.40	-56.86	-13.00	-43.86
6880.0	V	-	-	-80.51	8.34	34.83	-60.43	-13.00	-47.43
8600.0	V	-	-	-80.89	11.25	37.36	-57.90	-13.00	-44.90

Table 7-3. Radiated Spurious Data (LTE Band 66/4 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	V	-	-	-77.66	1.30	30.64	-64.62	-13.00	-51.62
5235.0	V	113	14	-72.95	4.65	38.70	-56.56	-13.00	-43.56
6980.0	V	-	-	-80.06	7.11	34.05	-61.21	-13.00	-48.21
8725.0	V	-	-	-80.88	10.88	37.00	-58.25	-13.00	-45.25

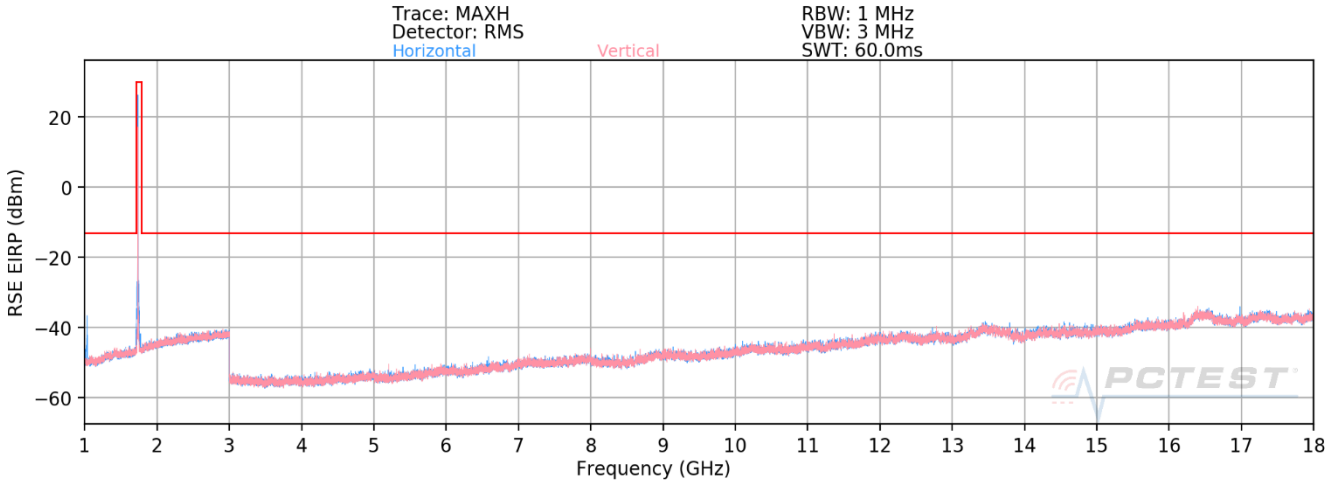
Table 7-4. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	V	-	-	-77.42	1.18	30.76	-64.50	-13.00	-51.50
5310.00	V	121	359	-72.89	4.35	38.46	-56.79	-13.00	-43.79
7080.00	V	-	-	-80.05	7.22	34.17	-61.09	-13.00	-48.09
8850.00	V	-	-	-80.59	10.86	37.27	-57.99	-13.00	-44.99

Table 7-5. Radiated Spurious Data (LTE Band 66/4 – High Channel)

NR Band n66 – ANTA



Plot 7-518. Radiated Spurious Plot (NR Band n66) – ANTA

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3720.0	H	-	-	-67.47	7.68	47.21	-48.04	-13.00	-35.04
5580.0	H	-	-	-67.45	11.37	50.92	-44.34	-13.00	-31.34
7440.0	H	-	-	-67.55	15.22	54.67	-40.59	-13.00	-27.59

Table 7-6. Radiated Spurious Data (NR Band n66 – Low Channel) – ANTA

Bandwidth (MHz):	20
Frequency (MHz):	1880.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	H	-	-	-67.48	7.91	47.43	-47.83	-13.00	-34.83
5640.0	H	-	-	-69.23	10.76	48.53	-46.73	-13.00	-33.73
7520.0	H	-	-	-69.20	15.34	53.14	-42.12	-13.00	-29.12

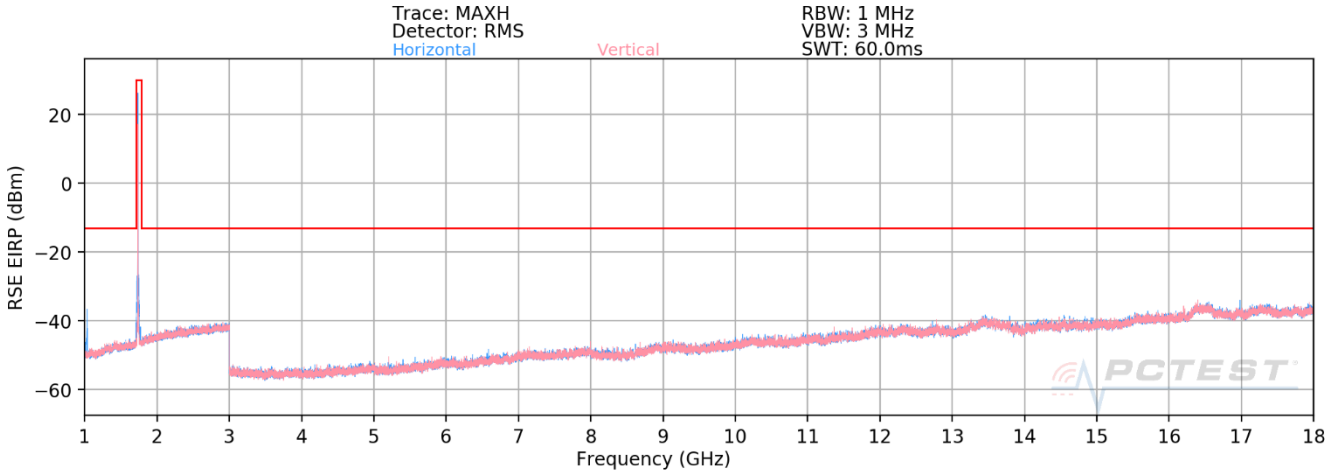
Table 7-7. Radiated Spurious Data (NR Band n66 – Mid Channel) – ANTA

Bandwidth (MHz):	20
Frequency (MHz):	1900.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3800.0	H	-	-	-67.55	8.51	47.96	-47.29	-13.00	-34.29
5700.0	H	-	-	-69.55	11.18	48.63	-46.63	-13.00	-33.63
7600.0	H	-	-	-69.54	15.57	53.03	-42.22	-13.00	-29.22

Table 7-8. Radiated Spurious Data (NR Band n66 – High Channel) – ANTA

NR Band n66 – ANTI



Plot 7-519. Radiated Spurious Plot (NR Band n66) – ANTI

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
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]	EIRP Spurious Emission Level	Limit [dBm]	Margin [dB]
3720.0	V	312	309	-71.72	7.82	43.10	-52.16	-13.00	-39.16
5580.0	V	133	341	-68.22	11.90	50.68	-44.58	-13.00	-31.58
7440.0	V	-	-	-70.11	16.00	52.89	-42.37	-13.00	-29.37

Table 7-9. Radiated Spurious Data (NR Band n66 – Low Channel) – ANTI

Bandwidth (MHz):	20
Frequency (MHz):	1880.0
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]	EIRP Spurious Emission Level	Limit [dBm]	Margin [dB]
3760.0	H	312	309	-71.28	8.26	43.98	-51.28	-13.00	-38.28
5640.0	H	133	341	-70.23	11.02	47.79	-47.47	-13.00	-34.47
7520.0	H	-	-	-70.68	15.78	52.10	-43.16	-13.00	-30.16

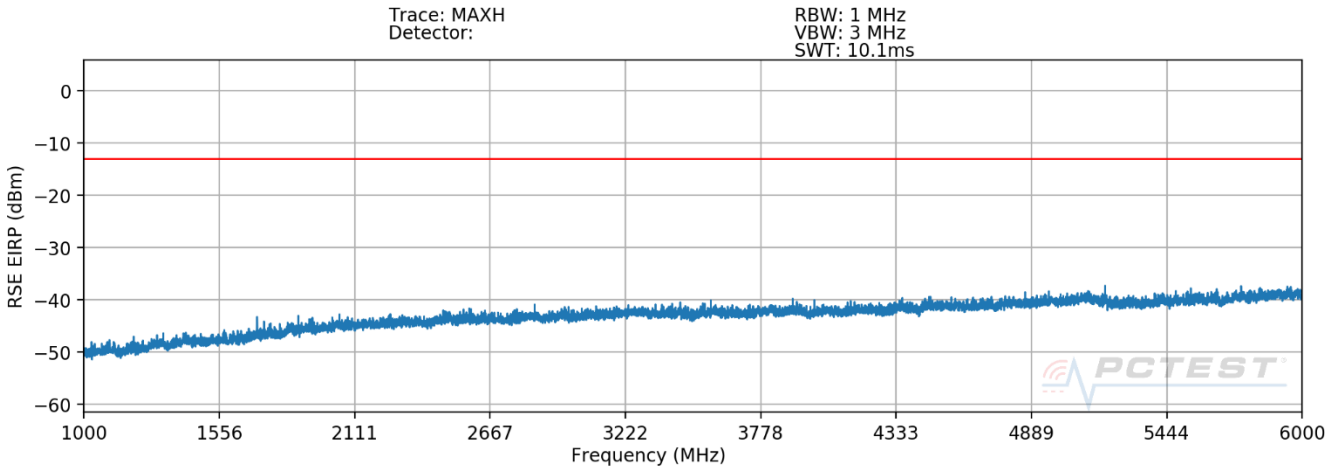
Table 7-10. Radiated Spurious Data (NR Band n66 – Mid Channel) – ANTI

Bandwidth (MHz):	20
Frequency (MHz):	1900.0
RB / Offset:	1 / 50

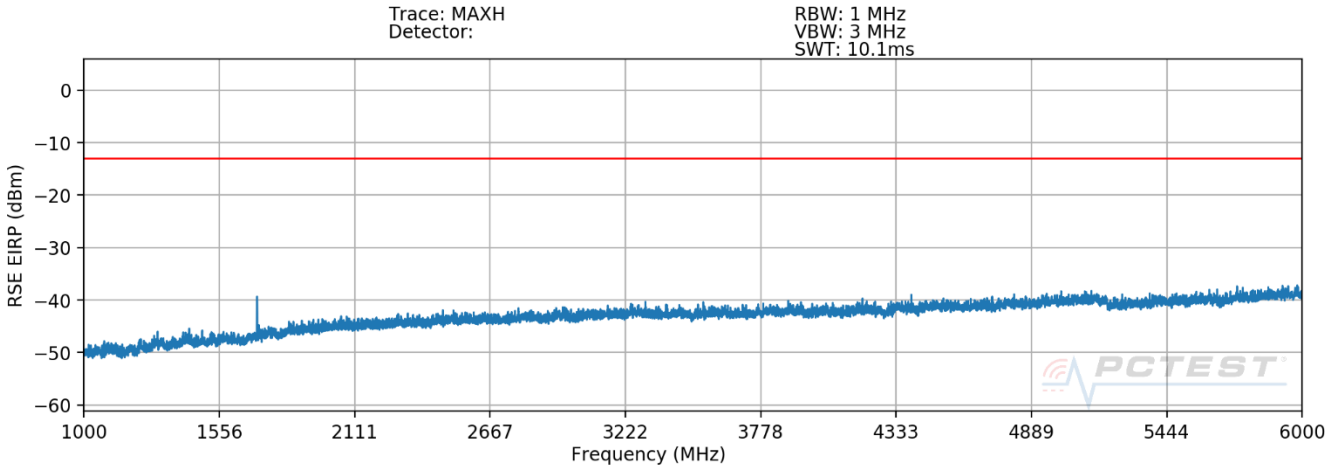
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level	Limit [dBm]	Margin [dB]
3800.0	H	210	344	-71.55	8.22	43.67	-51.59	-13.00	-38.59
5700.0	H	124	201	-72.24	11.10	45.86	-49.39	-13.00	-36.39
7600.0	H	-	-	-71.33	16.34	52.01	-43.25	-13.00	-30.25

Table 7-11. Radiated Spurious Data (NR Band n66 – High Channel) – ANTI

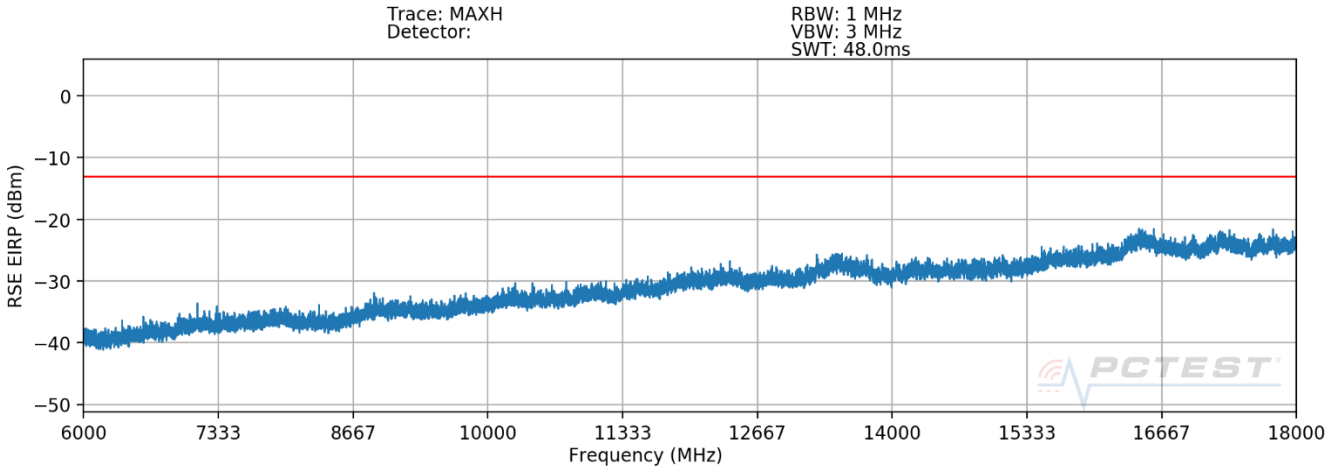
EN-DC – n66 + Anchor B14



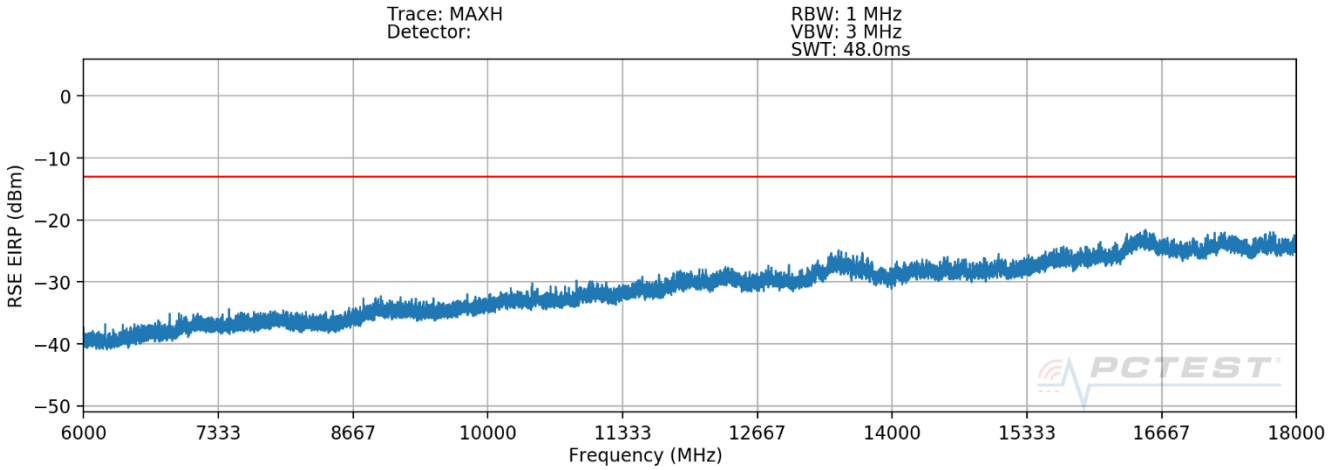
Plot 7-520. Radiated Spurious Plot (n66 + Anchor B14 – EN-DC) – HX



Plot 7-521. Radiated Spurious Plot (n66 + Anchor B14 – EN-DC) – VX



Plot 7-522. Radiated Spurious Plot (n66 + Anchor B14 – EN-DC) – HX



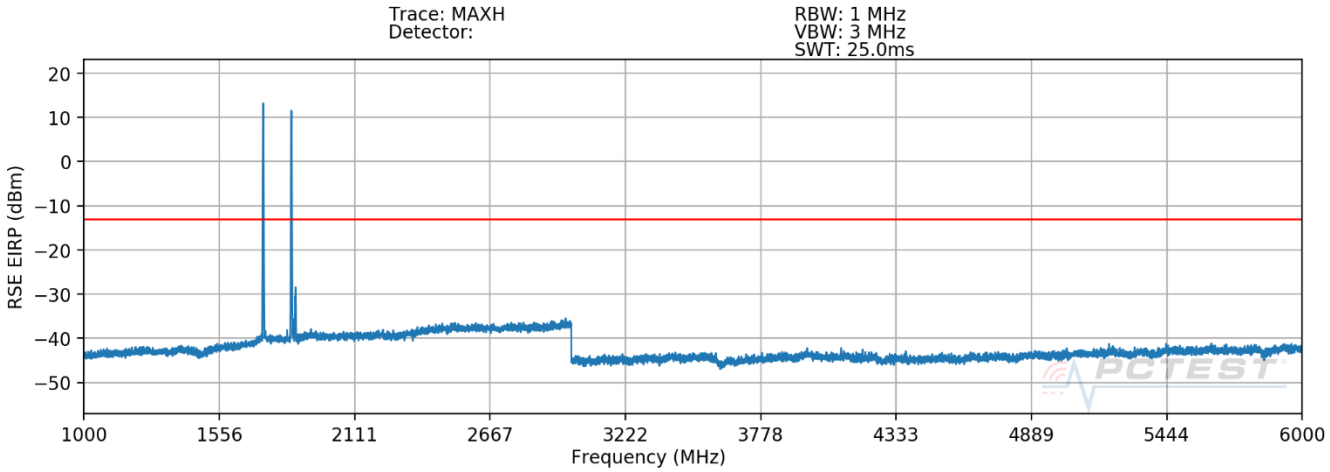
Plot 7-523. Radiated Spurious Plot (n66 + Anchor B14 – EN-DC) – VX

Mode:	EN-DC
Anchor Band:	14

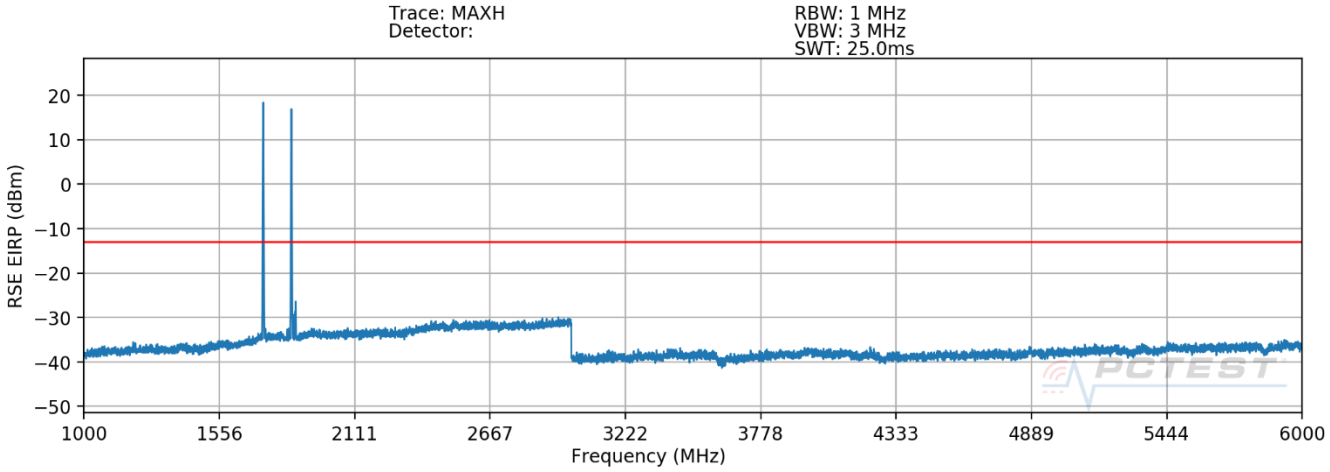
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	H	-	-	-78.47	1.30	29.83	-65.43	-13.00	-52.43
5235.0	H	-	-	-77.91	4.65	33.74	-61.52	-13.00	-48.52
6980.0	H	-	-	-79.57	7.11	34.54	-60.72	-13.00	-47.72
8725.0	H	-	-	-81.16	10.88	36.72	-58.53	-13.00	-45.53

Table 7-12. Radiated Spurious Data (n66 + Anchor B14 – EN-DC)

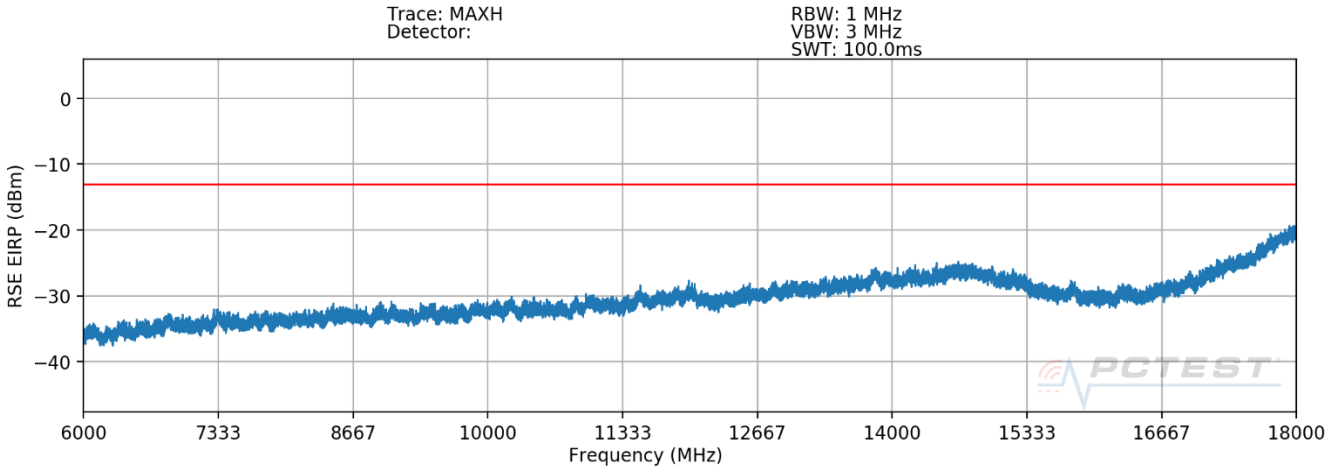
EN-DC – n66 + Anchor B2



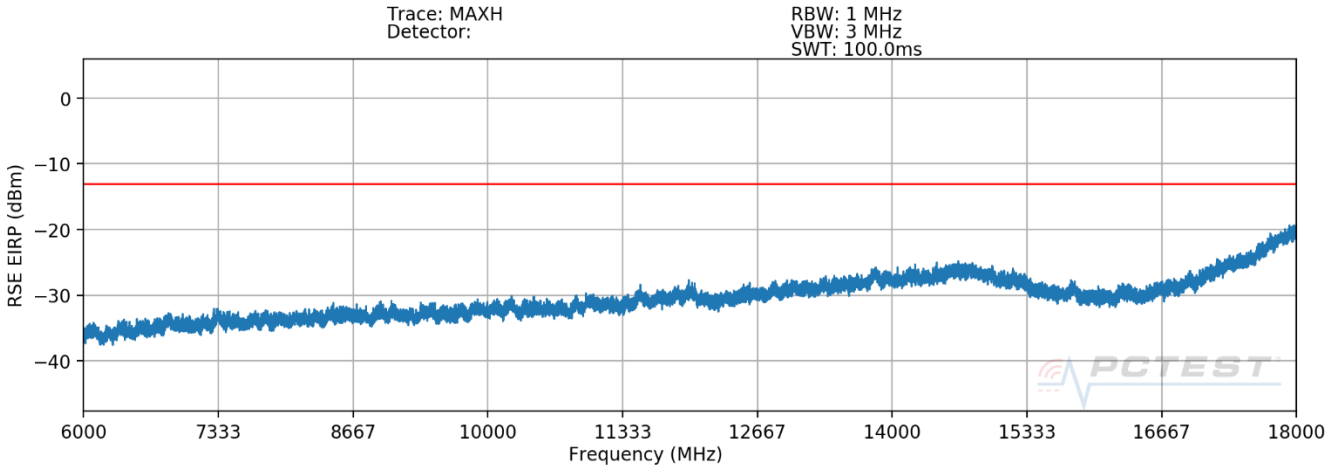
Plot 7-524. Radiated Spurious Plot (n66 + Anchor B2 – EN-DC) – HX



Plot 7-525. Radiated Spurious Plot (n66 + Anchor B2 – EN-DC) – VX



Plot 7-526. Radiated Spurious Plot (n66 + Anchor B2 – EN-DC) – HX



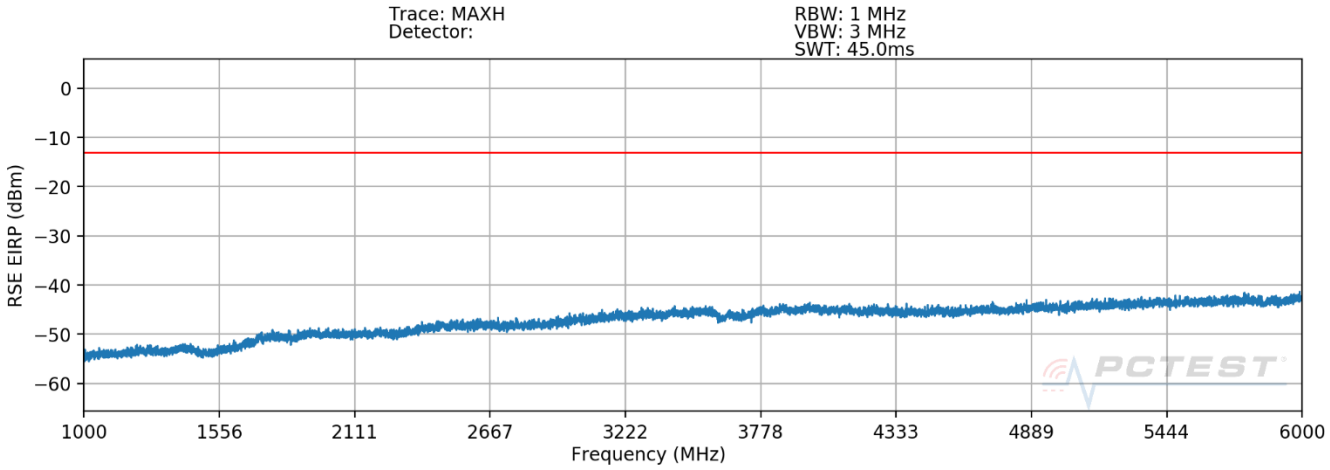
Plot 7-527. Radiated Spurious Plot (n66 + Anchor B2 – EN-DC) – HX

Mode:	EN-DC
Anchor Band:	2

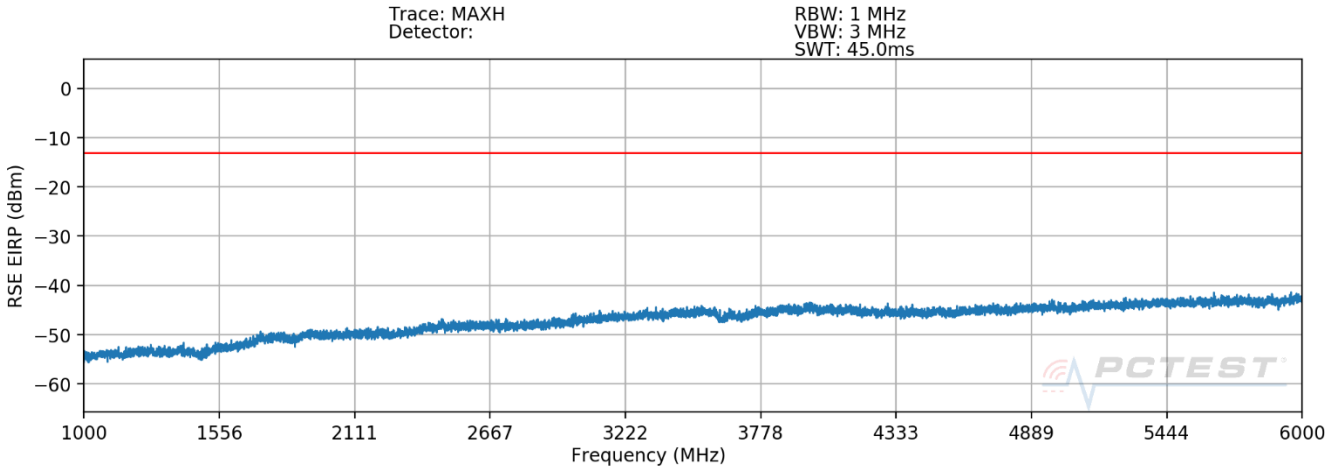
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level	Limit [dBm]	Margin [dB]
4612.0	V	-	-	-79.55	12.18	39.63	-55.62	-13.00	-42.62
6918.0	V	-	-	-80.54	17.49	43.95	-51.30	-13.00	-38.30
9224.0	V	-	-	-81.38	19.85	45.47	-49.79	-13.00	-36.79

Table 7-13. Radiated Spurious Data (n66 + Anchor B2 – EN-DC)

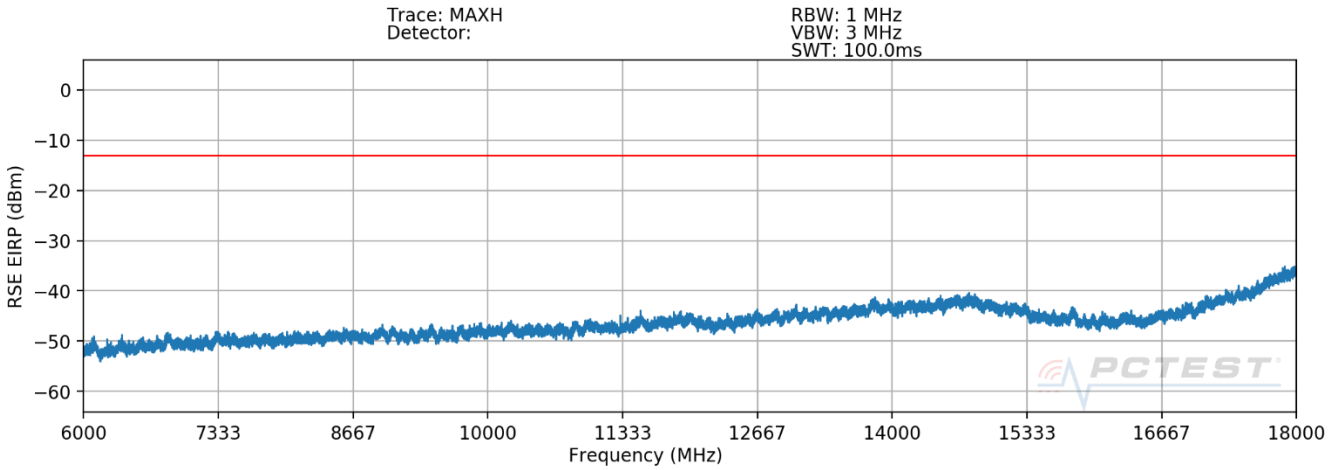
EN-DC – n66 + Anchor B30



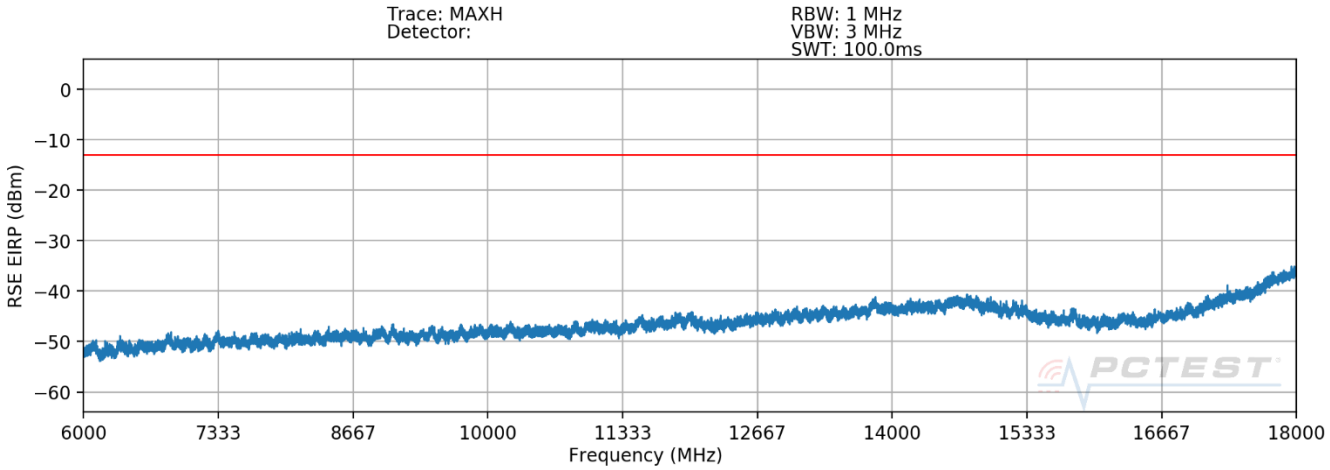
Plot 7-528. Radiated Spurious Plot (n66 + Anchor B30 – EN-DC) – HX



Plot 7-529. Radiated Spurious Plot (n66 + Anchor B30 – EN-DC) – VX

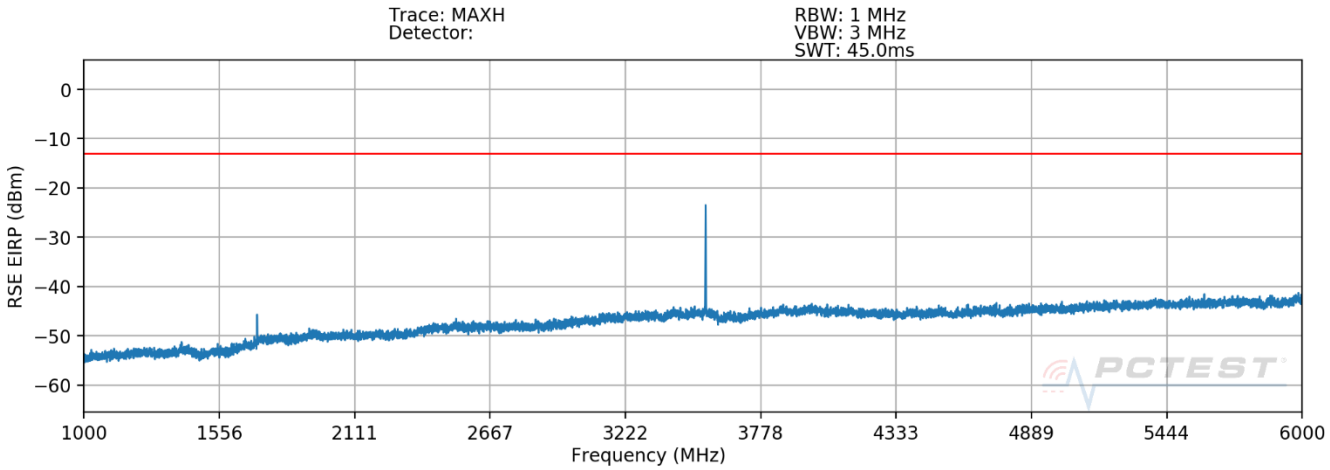


Plot 7-530. Radiated Spurious Plot (n66 + Anchor B30 – EN-DC) – HX

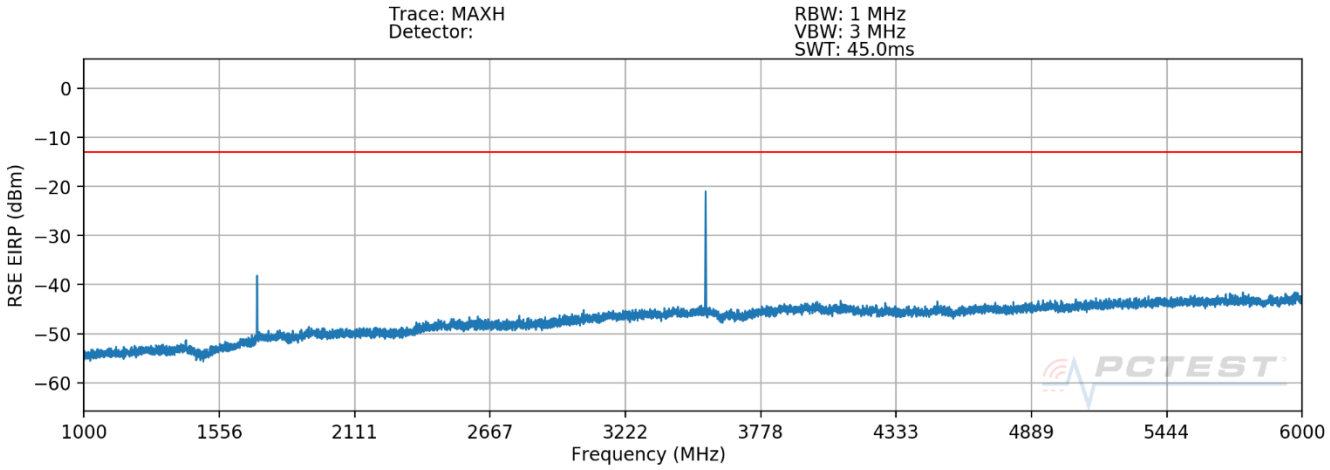


Plot 7-531. Radiated Spurious Plot (n66 + Anchor B30 – EN-DC) – VX

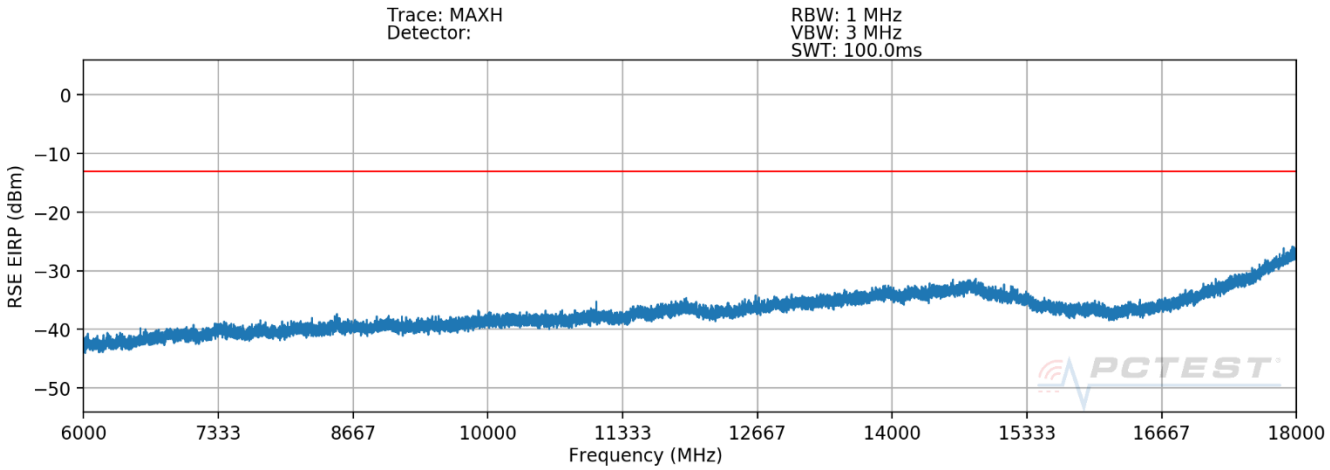
EN-DC – n66 (ANTA) + Anchor B48



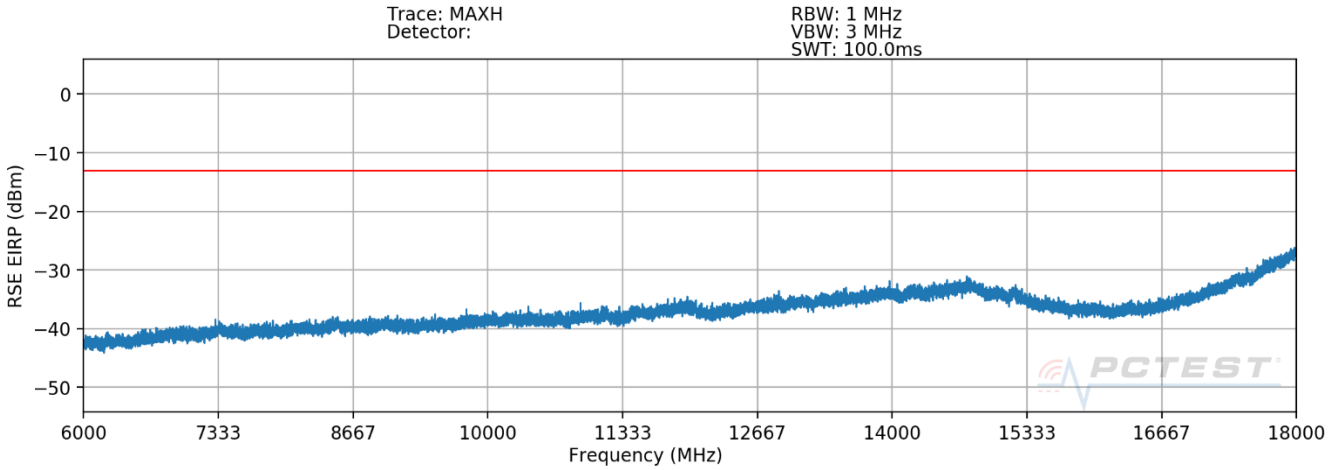
Plot 7-532. Radiated Spurious Plot (n66 (ANTA) + Anchor B48 – EN-DC) – HX



Plot 7-533. Radiated Spurious Plot (n66 (ANTA) + Anchor B48 – EN-DC) – VX



Plot 7-534. Radiated Spurious Plot (n66 (ANTA) + Anchor B48 – EN-DC) – HX



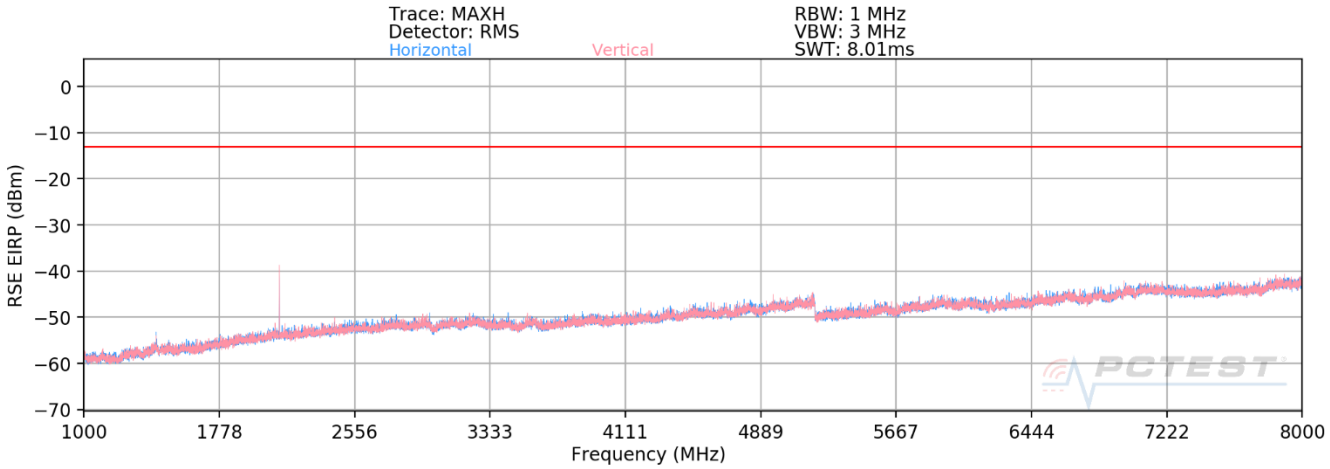
Plot 7-535. Radiated Spurious Plot (n66 (ANTA) + Anchor B48 – EN-DC) – VX

Mode:	EN-DC
Anchor Band:	48

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]
7103.0	H	-	-	-79.51	17.46	44.95	-50.30	-13.00	-37.30
10654.0	H	-	-	-80.90	21.30	47.40	-47.86	-13.00	-34.86
14206.0	H	-	-	-81.01	25.86	51.85	-43.40	-13.00	-30.40

Table 7-14. Radiated Spurious Data (n66 + Anchor B48 – EN-DC)

LTE Band 12



Plot 7-536. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25

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]
1408.0	V	128	277	-74.84	0.55	32.71	-62.55	-13.00	-49.55
2112.0	V	116	297	-59.14	3.67	51.53	-43.72	-13.00	-30.72
2816.0	V	-	-	-78.90	5.59	33.69	-61.57	-13.00	-48.57
3520.0	V	-	-	-79.88	6.96	34.08	-61.18	-13.00	-48.18
4224.0	V	-	-	-80.53	8.08	34.55	-60.71	-13.00	-47.71

Table 7-15. Radiated Spurious Data (LTE Band 12 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25

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]
1415.0	V	149	317	-73.58	0.61	34.03	-61.23	-13.00	-48.23
2122.5	V	109	312	-58.80	3.64	51.84	-43.42	-13.00	-30.42
2830.0	V	-	-	-79.09	5.63	33.54	-61.71	-13.00	-48.71
3537.5	V	-	-	-80.30	7.34	34.04	-61.22	-13.00	-48.22
4245.0	V	-	-	-80.07	7.75	34.68	-60.58	-13.00	-47.58

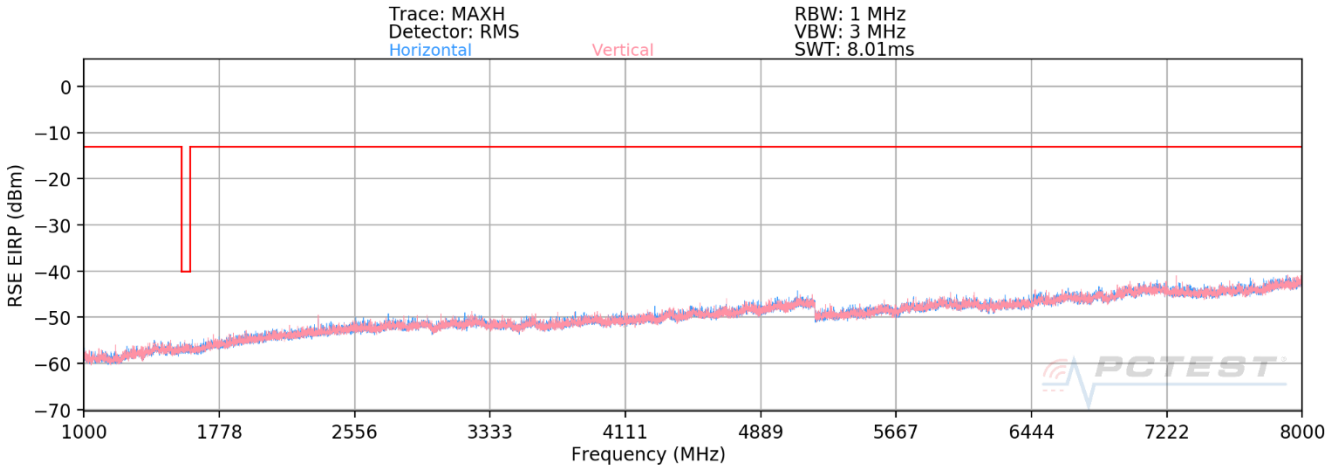
Table 7-16. Radiated Spurious Data (LTE Band 12 – Mid Channel)

Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

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]
1422.0	V	145	321	-72.84	0.31	34.47	-60.79	-13.00	-47.79
2133.0	V	163	283	-59.14	3.60	51.46	-43.79	-13.00	-30.79
2844.0	V	-	-	-78.98	5.55	33.57	-61.69	-13.00	-48.69
3555.0	V	-	-	-80.45	7.80	34.35	-60.91	-13.00	-47.91
4266.0	V	-	-	-80.34	7.86	34.52	-60.74	-13.00	-47.74

Table 7-17. Radiated Spurious Data (LTE Band 12 – High Channel)

LTE Band 13



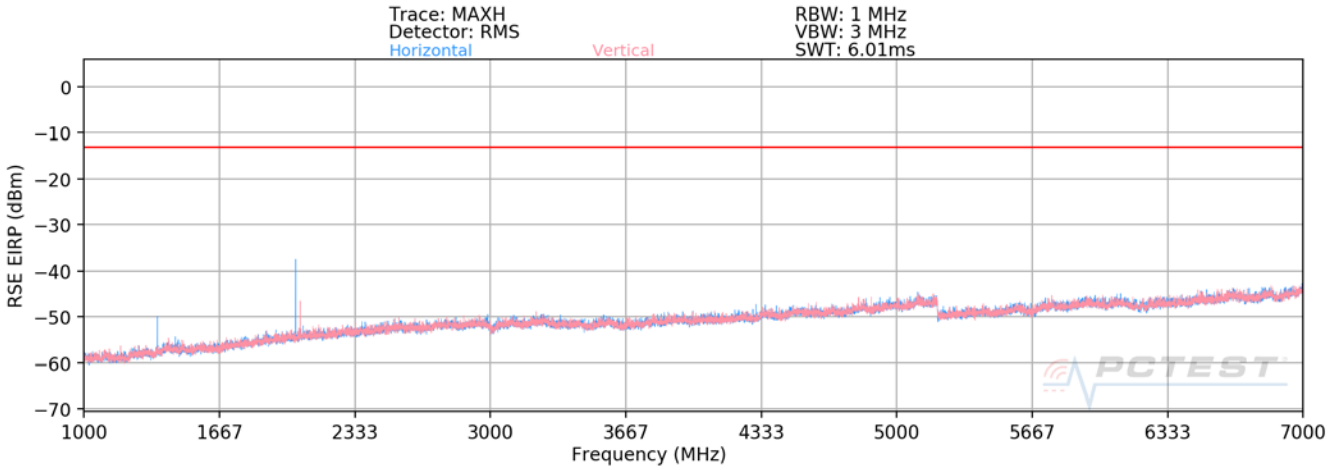
Plot 7-537. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25

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]
1564.0	H	-	-	-78.11	0.66	29.55	-65.70	-40.00	-25.70
2346.0	H	122	23	-73.46	4.23	37.77	-57.49	-13.00	-44.49
3128.0	H	-	-	-79.74	6.55	33.81	-61.44	-13.00	-48.44
3910.0	H	-	-	-80.43	8.06	34.63	-60.63	-13.00	-47.63
4692.0	H	-	-	-80.62	9.10	35.48	-59.78	-13.00	-46.78

Table 7-18. Radiated Spurious Data (LTE Band 13 – Mid Channel)

LTE Band 71



Plot 7-538. Radiated Spurious Plot (LTE Band 71)

Bandwidth (MHz):	20
Frequency (MHz):	673.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	H	115	206	-66.71	-0.77	39.52	-55.74	-13.00	-42.74
2019.0	H	117	214	-59.12	4.16	52.04	-43.22	-13.00	-30.22
2692.0	H	-	-	-79.18	5.81	33.63	-61.63	-13.00	-48.63
3365.0	H	-	-	-79.76	6.54	33.78	-61.48	-13.00	-48.48
4038.0	H	-	-	-80.65	8.35	34.70	-60.56	-13.00	-47.56

Table 7-19. Radiated Spurious Data (LTE Band 71 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	680.5
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	H	111	188	-68.68	-0.01	38.31	-56.95	-13.00	-43.95
2041.5	H	128	214	-59.43	4.32	51.89	-43.37	-13.00	-30.37
2722.0	H	-	-	-79.38	6.35	33.97	-61.29	-13.00	-48.29
3402.5	H	-	-	-80.02	6.86	33.84	-61.42	-13.00	-48.42
4083.0	H	-	-	-80.50	7.77	34.27	-60.99	-13.00	-47.99

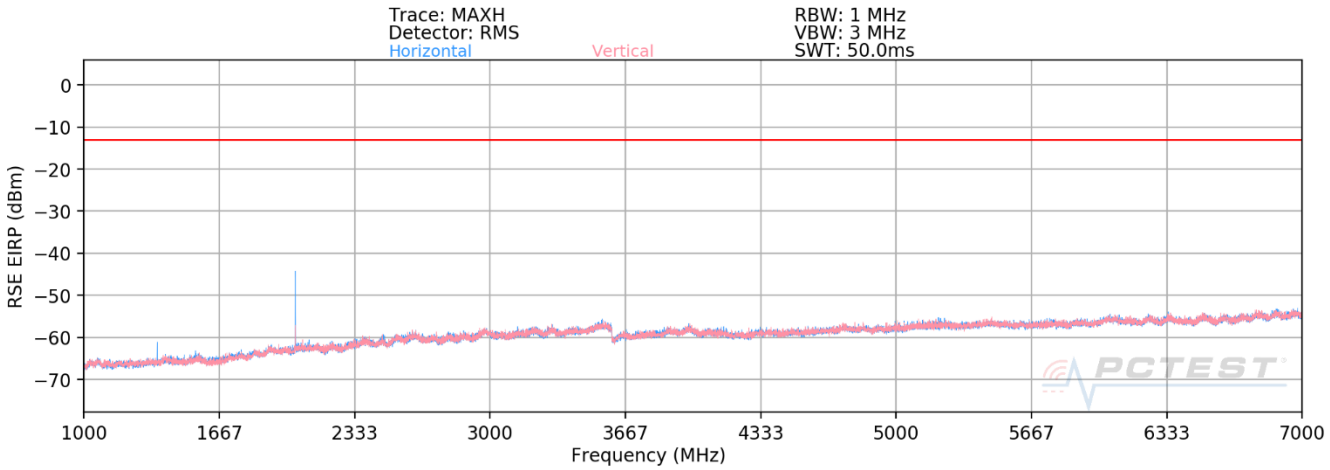
Table 7-20. Radiated Spurious Data (LTE Band 71 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	688.0
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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	H	115	206	-73.14	-0.16	33.70	-61.56	-13.00	-48.56
2064.0	H	116	180	-61.08	4.51	50.43	-44.83	-13.00	-31.83
2752.0	H	-	-	-79.45	6.43	33.98	-61.27	-13.00	-48.27
3440.0	H	-	-	-79.82	7.11	34.29	-60.96	-13.00	-47.96
4128.0	H	-	-	-80.35	7.64	34.29	-60.97	-13.00	-47.97

Table 7-21. Radiated Spurious Data (LTE Band 71 – High Channel)

Band n71



Plot 7-539. Radiated Spurious Plot (NR Band n71)

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 53

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	H	172	181	-66.36	-6.23	34.41	-60.85	-13.00	-47.85
2019.0	H	118	185	-55.18	-3.68	48.14	-47.12	-13.00	-34.12
2692.0	H	-	-	-77.62	-1.48	27.90	-67.36	-13.00	-54.36

Table 7-22. Radiated Spurious Data (NR Band n71 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 53

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	H	155	180	-70.20	-6.21	30.59	-64.67	-13.00	-51.67
2041.5	H	115	166	-59.31	-3.40	44.29	-50.97	-13.00	-37.97
2722.0	H	-	-	-77.14	-1.38	28.48	-66.77	-13.00	-53.77

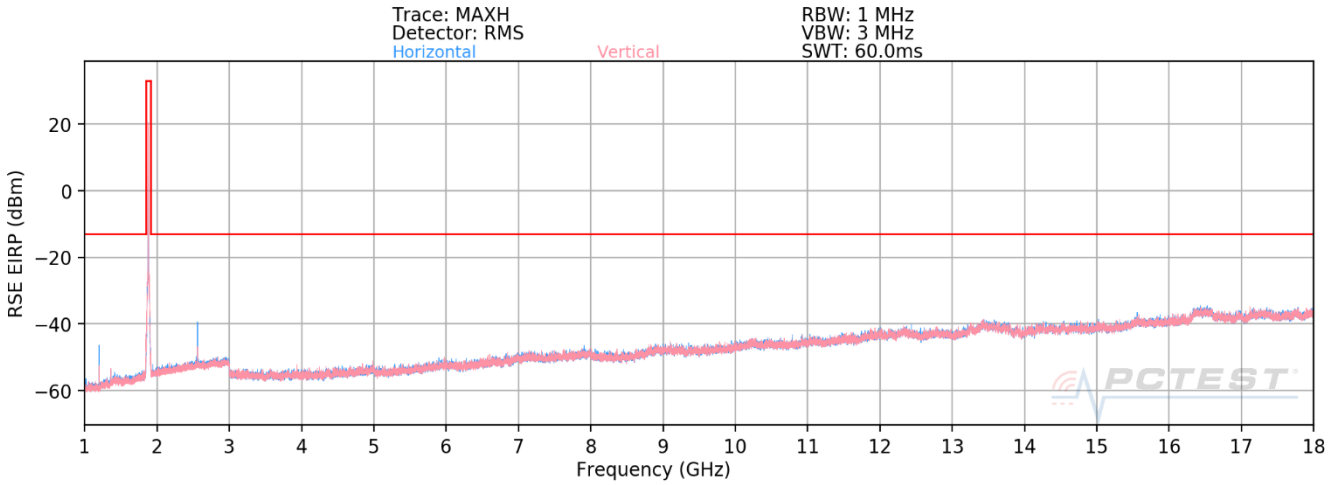
Table 7-23. Radiated Spurious Data (NR Band n71 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 53

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	H	111	183	-65.23	-6.04	35.73	-59.53	-13.00	-46.53
2064.0	H	111	189	-54.39	-3.40	49.21	-46.04	-13.00	-33.04
2752.0	H	-	-	-77.81	-1.71	27.48	-67.77	-13.00	-54.77

Table 7-24. Radiated Spurious Data (NR Band n71 – High Channel)

EN-DC - n71 + Anchor B2



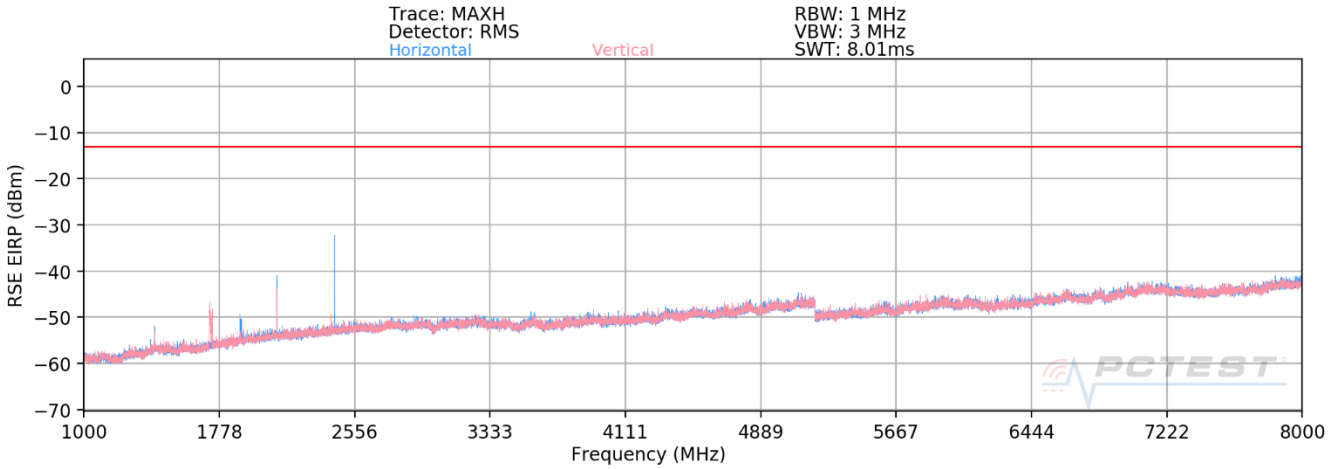
Plot 7-540. Radiated Spurious Plot above 1GHz (n71 + Anchor B2 – EN-DC)

Bandwidth (MHz):	20
Frequency (MHz):	1880 / 673
RB / Offset:	1 / mid
Mode:	EN-DC
Anchor Band:	2

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]
1741.0	H	269	211	-72.04	7.91	42.87	-52.39	-13.00	-39.39
2948.0	H	-	-	-71.68	13.22	48.54	-46.72	-13.00	-33.72
3087.0	H	-	-	-71.92	13.46	48.54	-46.72	-13.00	-33.72
4155.0	H	-	-	-71.96	15.09	50.13	-45.13	-13.00	-32.13

Table 7-25. Radiated Spurious Data (n71 + Anchor B2 – EN-DC)

Band n12



Plot 7-541. Radiated Spurious Plot above 1GHz (n12)

Bandwidth (MHz):	10
Frequency (MHz):	709.0
RB / Offset:	1 / 25

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]
1418.0	H	100	226	-67.96	0.48	39.52	-55.74	-13.00	-42.74
2127.0	H	100	245	-59.97	3.62	50.65	-44.60	-13.00	-31.60
2836.0	H	-	-	-69.99	5.62	42.63	-52.63	-13.00	-39.63
3545.0	H	-	-	-71.72	7.58	42.86	-52.39	-13.00	-39.39

Table 7-26. Radiated Spurious Data (Band n12 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	710.0
RB / Offset:	1 / 25

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]
1420.0	H	272	249	-68.07	0.39	39.32	-55.93	-13.00	-42.93
2130.0	H	127	243	-59.43	3.61	51.18	-44.08	-13.00	-31.08
2840.0	H	-	-	-69.97	5.59	42.62	-52.64	-13.00	-39.64
3550.0	H	-	-	-71.72	7.75	43.03	-52.23	-13.00	-39.23

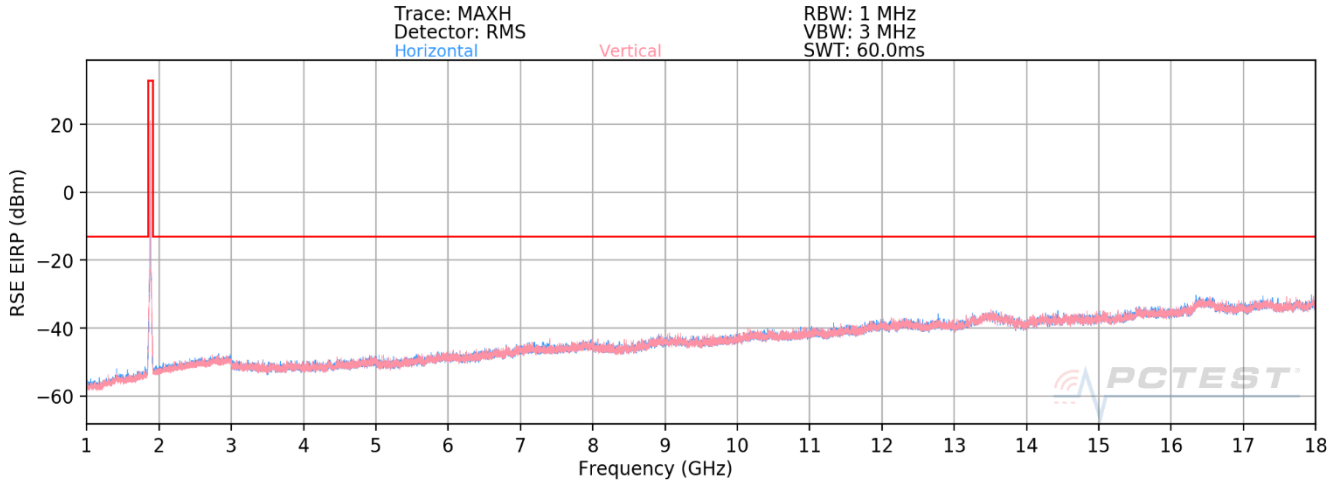
Table 7-27. Radiated Spurious Data (Band n12 – Mid Channel)

Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

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]
1422.0	H	100	242	-68.03	0.31	39.28	-55.98	-13.00	-42.98
2133.0	H	127	242	-59.52	3.60	51.08	-44.17	-13.00	-31.17
2844.0	H	-	-	-70.01	5.55	42.54	-52.72	-13.00	-39.72
3555.0	H	-	-	-71.70	7.80	43.10	-52.16	-13.00	-39.16

Table 7-28. Radiated Spurious Data (Band n12 – High Channel)

EN-DC – n12 + Anchor B2



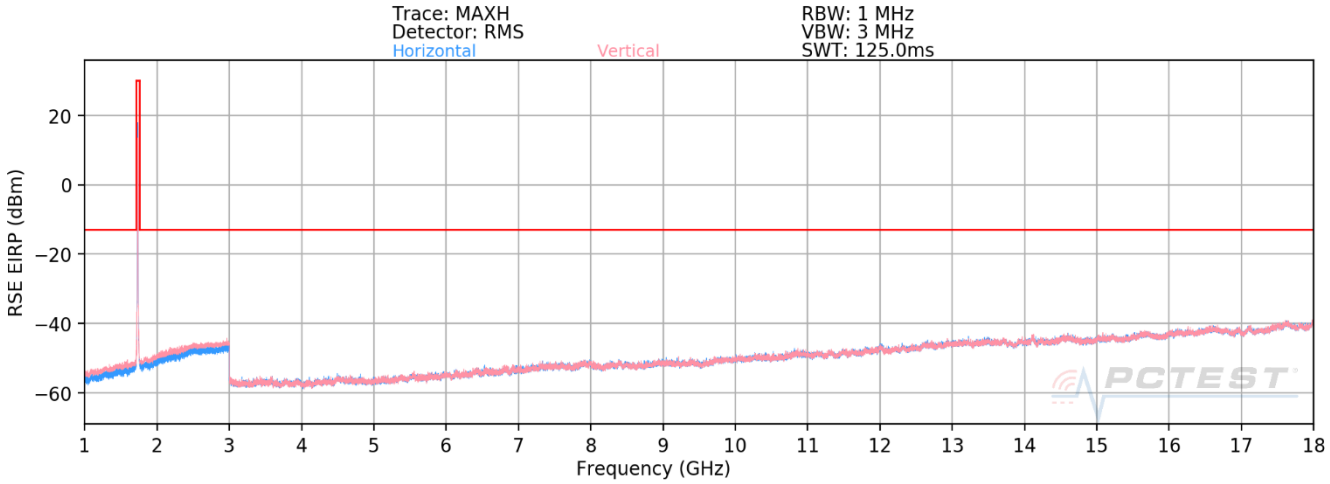
Plot 7-542. Radiated Spurious Plot above 1GHz (n12 + Anchor B2 – EN-DC)

Mode	EN-DC
Anchor Band	2

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]
1648.0	H	-	-	-70.53	7.69	44.16	-51.10	-13.00	-38.10
2824.0	H	-	-	-71.35	12.65	48.30	-46.95	-13.00	-33.95
3056.0	H	-	-	-73.17	13.61	47.44	-47.82	-13.00	-34.82
4000.0	H	-	-	-77.20	14.76	44.56	-50.70	-13.00	-37.70

Table 7-29. Radiated Spurious Data (n12 + Anchor B2 – EN-DC – Mid Channel)

WCDMA AWS



Plot 7-543. Radiated Spurious Plot (WCDMA AWS)

Mode:	WCDMA RMC
Channel:	1312
Frequency (MHz):	1712.4

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]
3424.8	V	-	-	-78.34	5.46	34.12	-61.14	-13.00	-48.14
5137.2	V	122	16	-79.16	8.14	35.98	-59.28	-13.00	-46.28
6849.6	V	-	-	-80.98	11.30	37.32	-57.94	-13.00	-44.94
8562.0	V	-	-	-81.40	12.42	38.02	-57.24	-13.00	-44.24

7-30. Radiated Spurious Data (WCDMA AWS – Low Channel)

Mode:	WCDMA RMC
Channel:	1413
Frequency (MHz):	1732.6

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]
3465.2	V	-	-	-78.68	5.55	33.87	-61.39	-13.00	-48.39
5197.8	V	104	23	-78.23	7.36	36.13	-59.13	-13.00	-46.13
6930.4	V	-	-	-80.64	11.34	37.70	-57.55	-13.00	-44.55
8663.0	V	-	-	-81.73	12.95	38.22	-57.04	-13.00	-44.04

Table 7-31. Radiated Spurious Data (WCDMA AWS – Mid Channel)

Mode:	WCDMA RMC
Channel:	1513
Frequency (MHz):	1752.6

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]
3505.2	V	-	-	-78.35	5.13	33.78	-61.47	-13.00	-48.47
5257.8	V	109	15	-78.82	7.51	35.69	-59.57	-13.00	-46.57
7010.4	V	-	-	-80.04	10.85	37.81	-57.44	-13.00	-44.44
8763.0	V	-	-	-81.62	12.81	38.19	-57.07	-13.00	-44.07

Table 7-32. Radiated Spurious Data (WCDMA AWS – High Channel)

7.9 Uplink Carrier Aggregation Radiated Measurements

§2.1053,

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

Test Setup

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

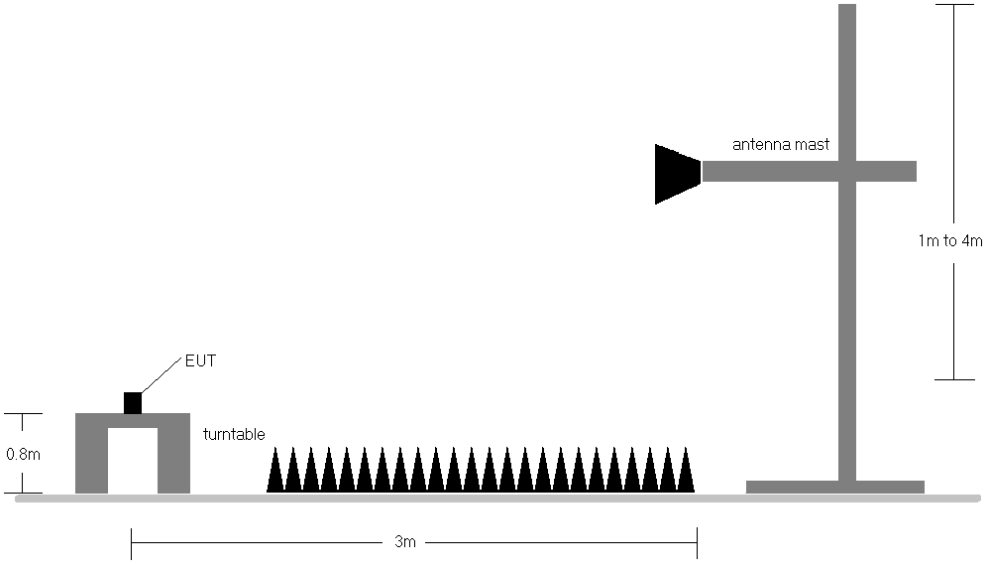


Figure 7-9. Test Instrument & Measurement Setup

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.

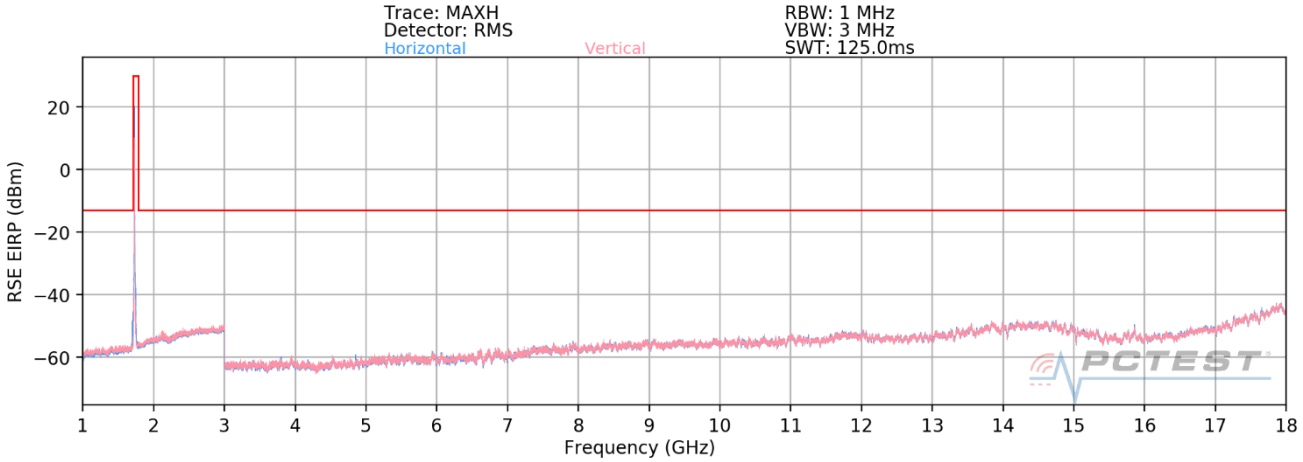
3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

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

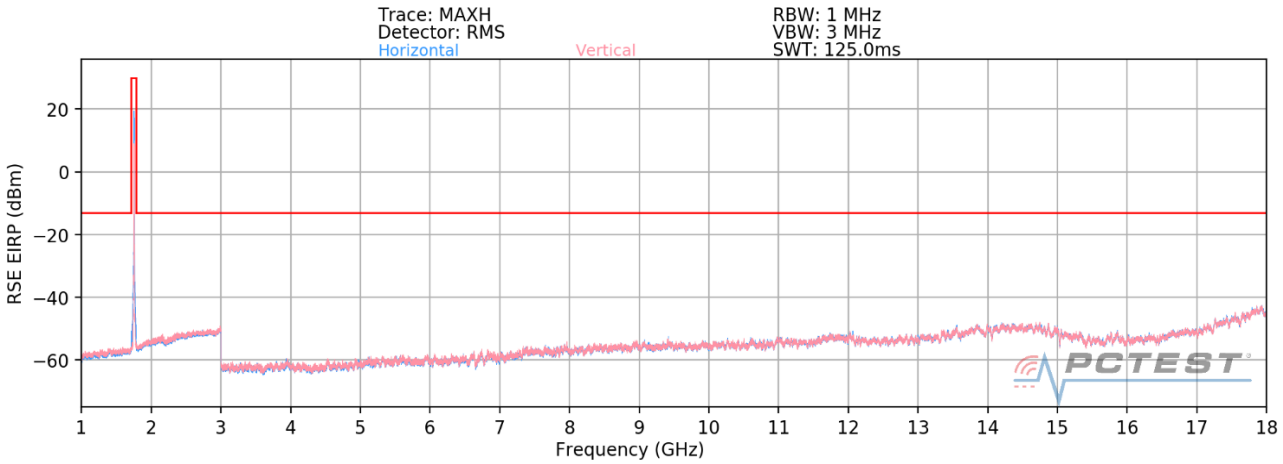
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

6) No significant emissions were found as a result of two uplink carriers operating contiguously.

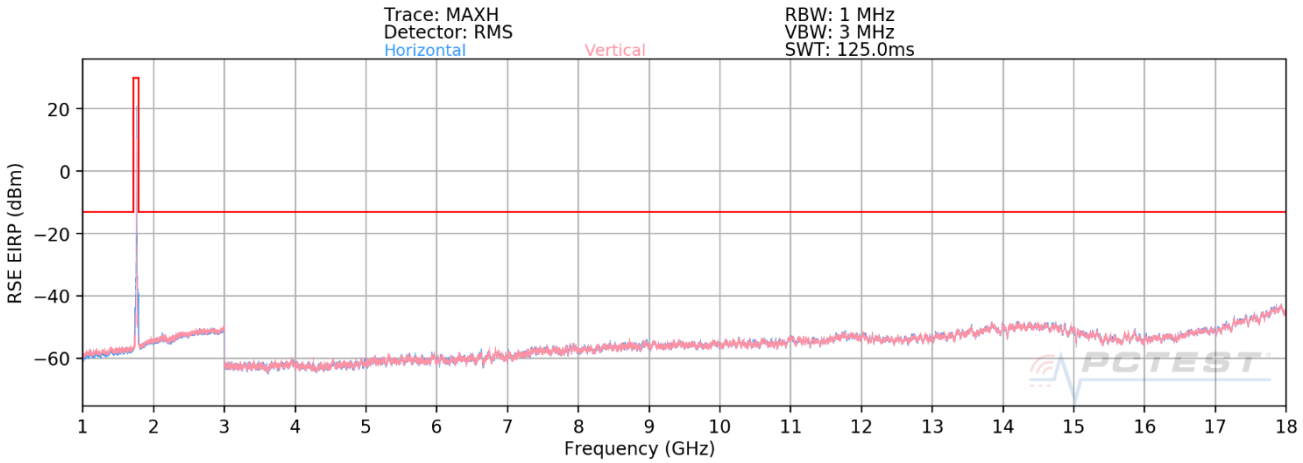
ULCA Band 66



Plot 7-544. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Low Channel – PCC/SCC: 1RB)



Plot 7-545. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Mid Channel – PCC/SCC: 1RB)



Plot 7-546. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 High Channel – PCC/SCC: 1RB)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1720.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1739.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3460.0	V	-	-	-78.41	5.50	34.09	-61.17	-13.00	-48.17
5190.0	V	114	12	-74.67	7.62	39.95	-55.31	-13.00	-42.31
6920.0	V	-	-	-80.88	11.27	37.39	-57.87	-13.00	-44.87
8650.0	V	-	-	-81.87	12.84	37.97	-57.28	-13.00	-44.28

Plot 7-33. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1745.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1764.8
SCC RB / Offset:	1 / 0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3510.0	V	-	-	-78.42	5.09	33.67	-61.59	-13.00	-48.59
5265.0	V	101	6	-73.57	7.45	40.88	-54.38	-13.00	-41.38
7020.0	V	-	-	-80.06	10.93	37.87	-57.39	-13.00	-44.39
8775.0	V	-	-	-81.71	12.98	38.27	-56.98	-13.00	-43.98

Plot 7-34. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	1770.0
PCC RB / Offset:	1 / 0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	1750.2
SCC 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]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3520.0	V	-	-	-78.28	5.08	33.80	-61.46	-13.00	-48.46
5280.0	V	122	1	-73.30	7.35	41.05	-54.20	-13.00	-41.20
7040.0	V	-	-	-80.17	10.94	37.77	-57.49	-13.00	-44.49
8800.0	V	-	-	-81.68	13.08	38.40	-56.86	-13.00	-43.86

Plot 7-35. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

7.10 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. 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/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

Frequency Stability / Temperature Variation

LTE Band 66/4

Operating Frequency (Hz):	1,745,000,000
Ref. Voltage (VDC):	4.41
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.41	- 30	1,745,000,073	121	0.0000069
		- 20	1,745,000,110	158	0.0000091
		- 10	1,744,999,965	13	0.0000007
		0	1,744,999,943	-9	-0.0000005
		+ 10	1,745,000,196	244	0.0000140
		+ 20 (Ref)	1,744,999,952	0	0.0000000
		+ 30	1,745,000,192	240	0.0000138
		+ 40	1,745,000,086	134	0.0000077
		+ 50	1,744,999,962	10	0.0000006
Battery Endpoint	3.37	+ 20	1,745,000,002	50	0.0000029

Table 7-9. LTE Band 66/4 Frequency Stability Data

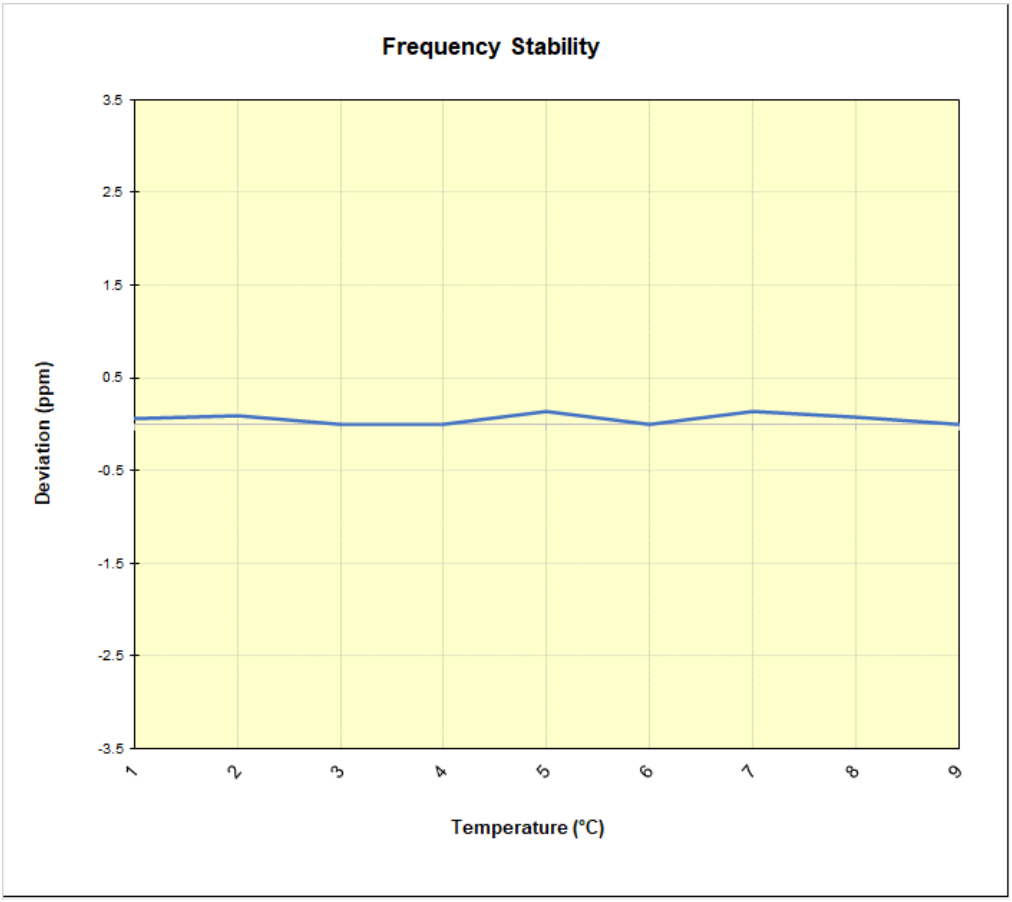


Table 7-9. LTE Band 66/4 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 12	
Operating Frequency (Hz):	707,500,000
Ref. Voltage (VDC):	4.41
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.41	- 30	707,500,263	76	0.0000107
		- 20	707,499,925	-262	-0.0000370
		- 10	707,499,915	-272	-0.0000384
		0	707,499,942	-245	-0.0000346
		+ 10	707,500,236	49	0.0000069
		+ 20 (Ref)	707,500,187	0	0.0000000
		+ 30	707,499,997	-190	-0.0000269
		+ 40	707,500,352	165	0.0000233
		+ 50	707,499,899	-288	-0.0000407
Battery Endpoint	3.37	+ 20	707,499,756	-431	-0.0000609

Table 7-9. LTE Band 12 Frequency Stability Data

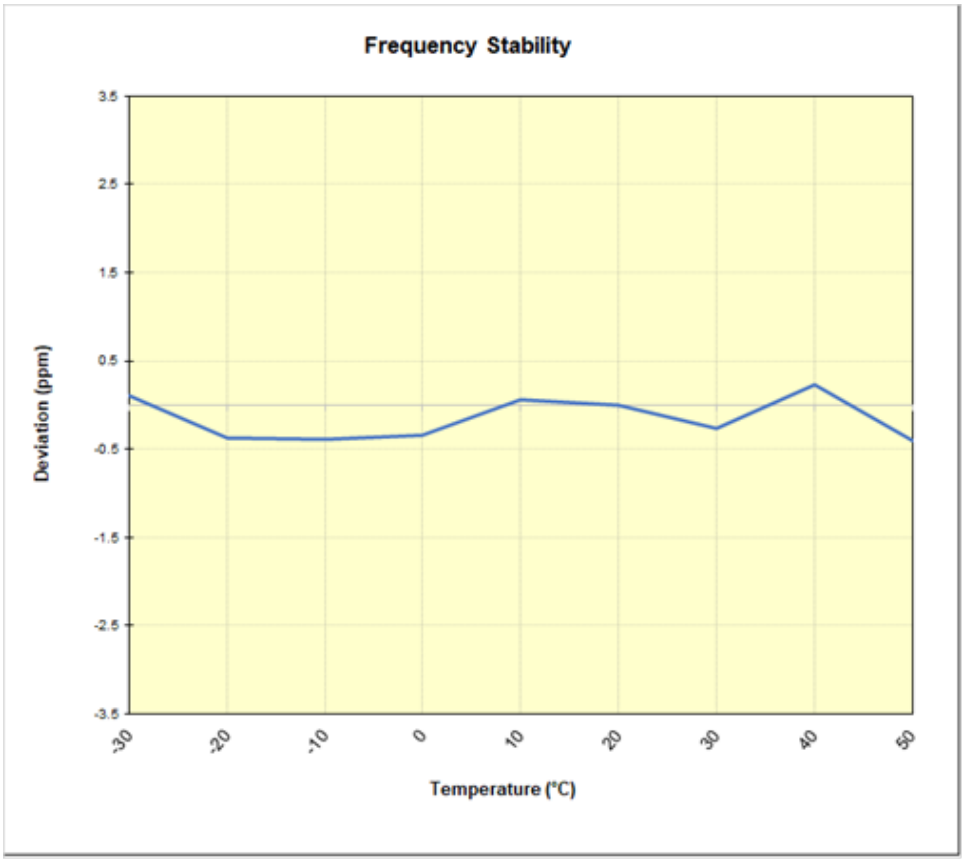


Table 7-9. LTE Band 12 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 13

Operating Frequency (Hz):	782,000,000
Ref. Voltage (VDC):	4.41
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.41	- 30	782,000,463	593	0.0000758
		- 20	781,999,915	45	0.0000058
		- 10	781,999,693	-177	-0.0000226
		0	782,000,072	202	0.0000258
		+ 10	781,999,971	101	0.0000129
		+ 20 (Ref)	781,999,870	0	0.0000000
		+ 30	781,999,930	60	0.0000077
		+ 40	781,999,839	-31	-0.0000040
		+ 50	781,999,980	110	0.0000141
Battery Endpoint	3.37	+ 20	782,000,055	185	0.0000237

Table 7-9. LTE Band 13 Frequency Stability Data

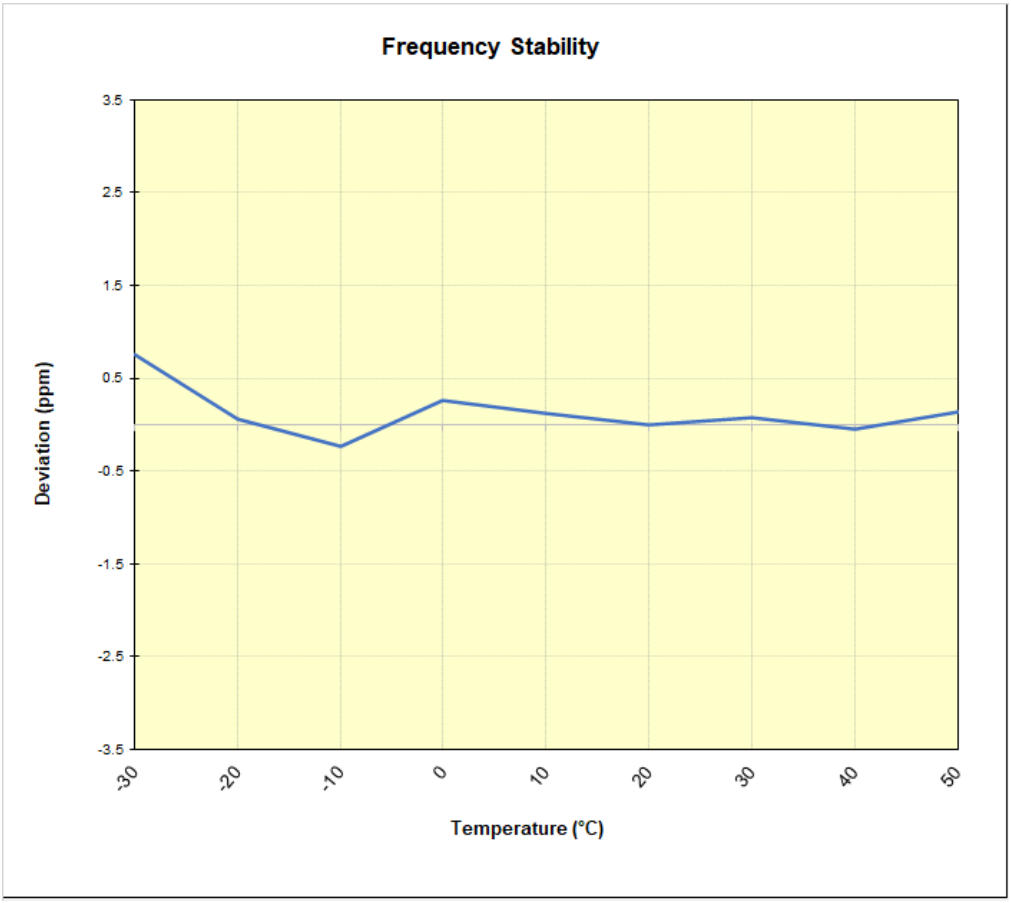


Table 7-9. LTE Band 13 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 71

Operating Frequency (Hz):	680,500,000
Ref. Voltage (VDC):	4.41
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.41	- 30	680,500,006	92	0.0000135
		- 20	680,500,073	159	0.0000234
		- 10	680,499,941	27	0.0000040
		0	680,499,720	-194	-0.0000285
		+ 10	680,500,197	283	0.0000416
		+ 20 (Ref)	680,499,914	0	0.0000000
		+ 30	680,500,175	261	0.0000384
		+ 40	680,499,713	-201	-0.0000295
		+ 50	680,499,908	-6	-0.0000009
Battery Endpoint	3.37	+ 20	680,500,171	257	0.0000378

Table 7-9. LTE Band 71 Frequency Stability Data

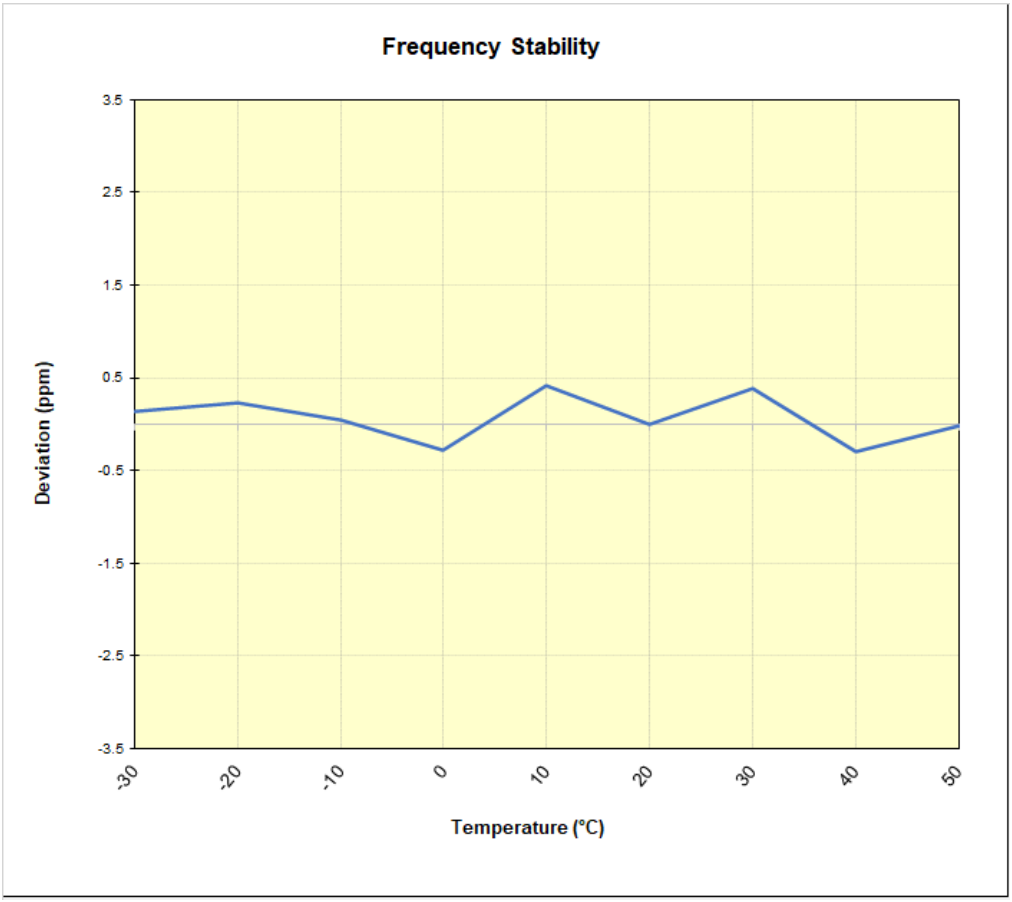


Table 7-9. LTE Band 71 Frequency Stability Chart

Frequency Stability / Temperature Variation

WCDMA AWS

Operating Frequency (Hz):	1,732,600,000
Ref. Voltage (VDC):	4.41
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.41	- 30	1,732,599,865	-343	-0.0000198
		- 20	1,732,599,847	-361	-0.0000208
		- 10	1,732,599,998	-210	-0.0000121
		0	1,732,600,412	204	0.0000118
		+ 10	1,732,599,837	-371	-0.0000214
		+ 20 (Ref)	1,732,600,208	0	0.0000000
		+ 30	1,732,600,270	62	0.0000036
		+ 40	1,732,599,992	-216	-0.0000125
		+ 50	1,732,600,365	157	0.0000091
Battery Endpoint	3.37	+ 20	1,732,600,094	-114	-0.0000066

Table 7-9. WCDMA AWS Frequency Stability Data

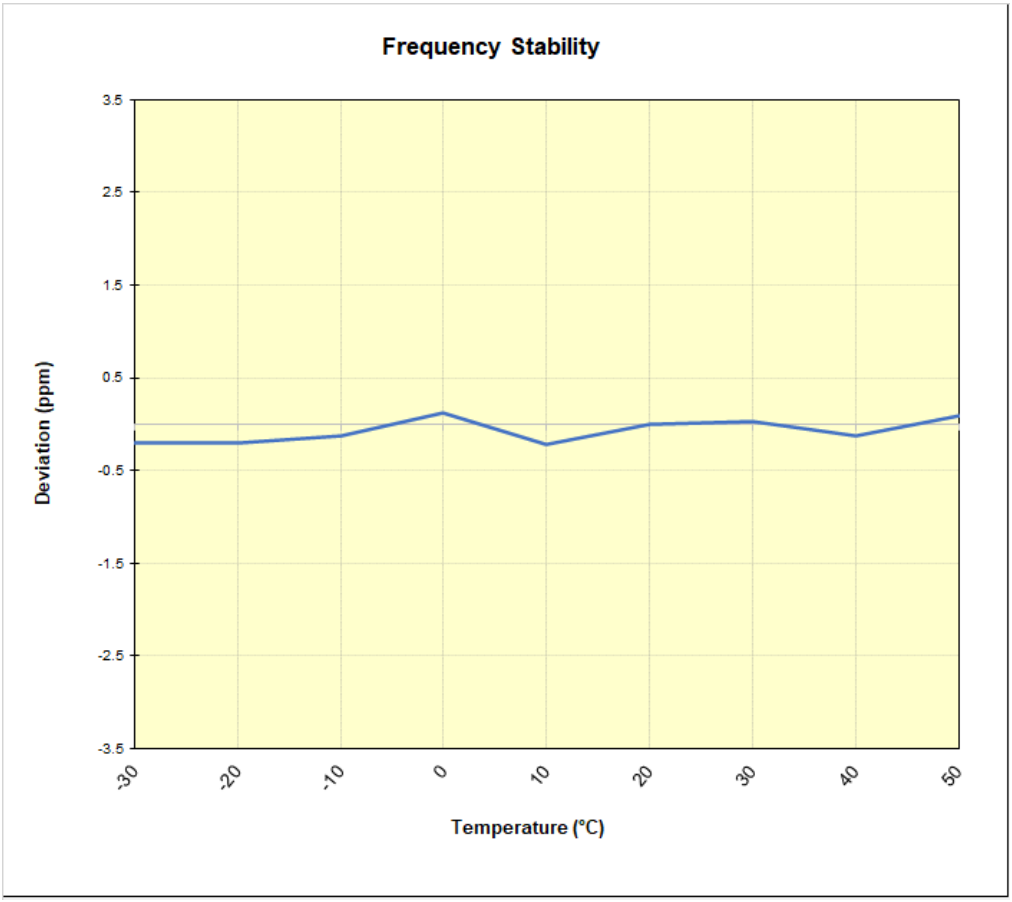


Table 7-9. WCDMA AWS Frequency Stability Chat

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG996U** complies with all the requirements of Part 27 of the FCC rules.