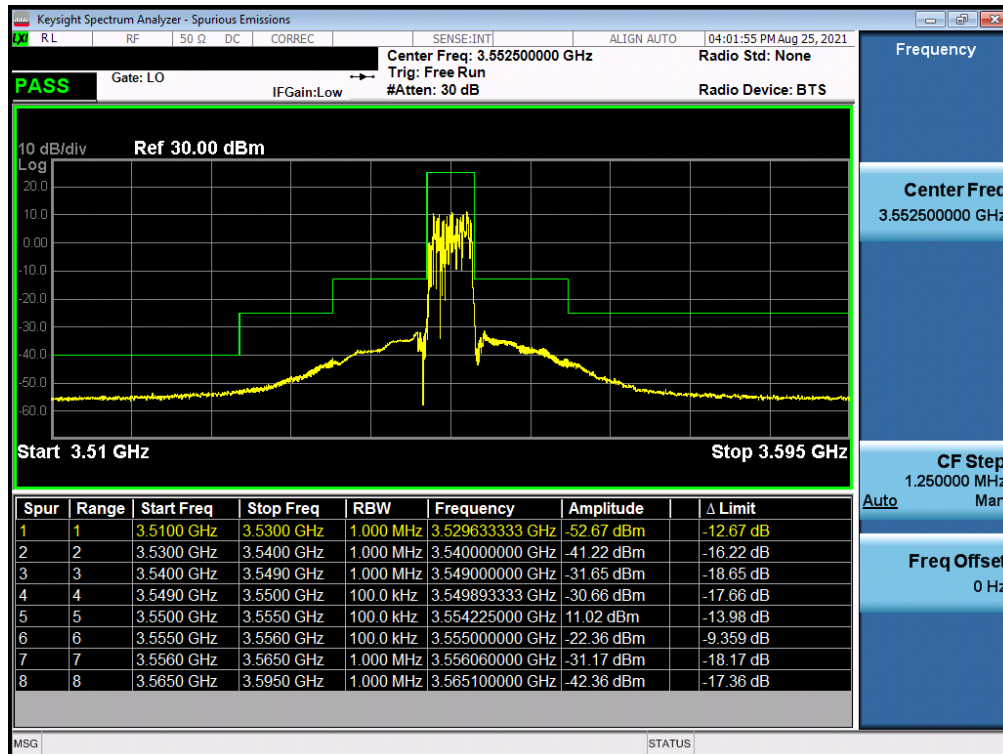
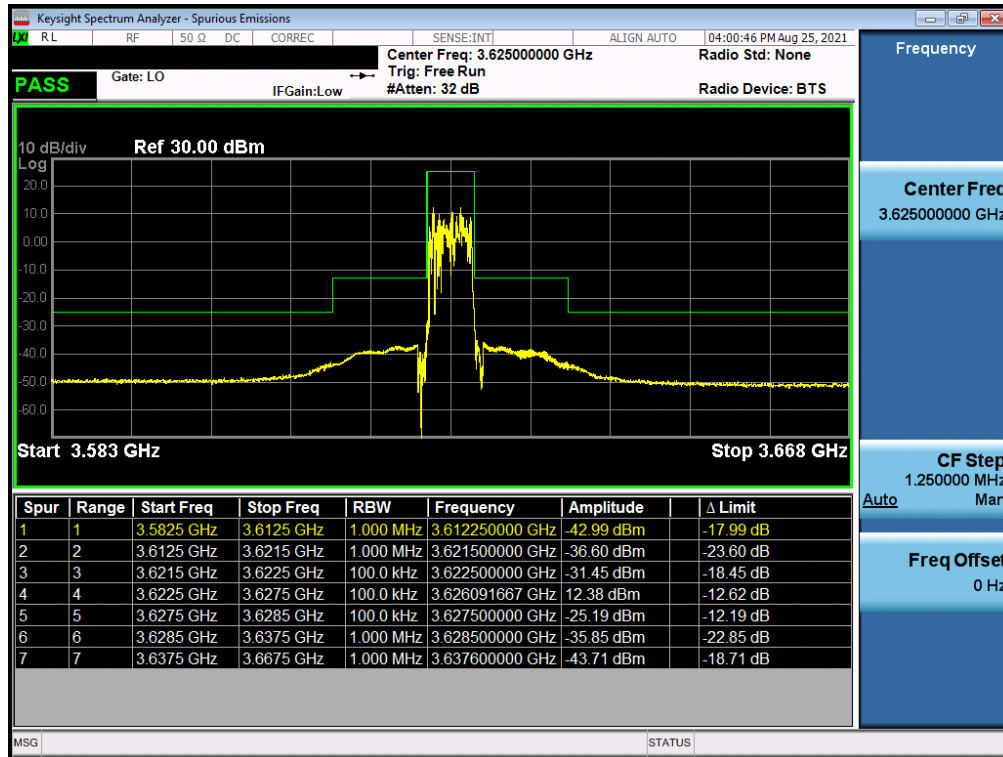


Plot 7-75. Channel Edge Plot (LTE Band 48 - 10MHz QPSK - High Channel)

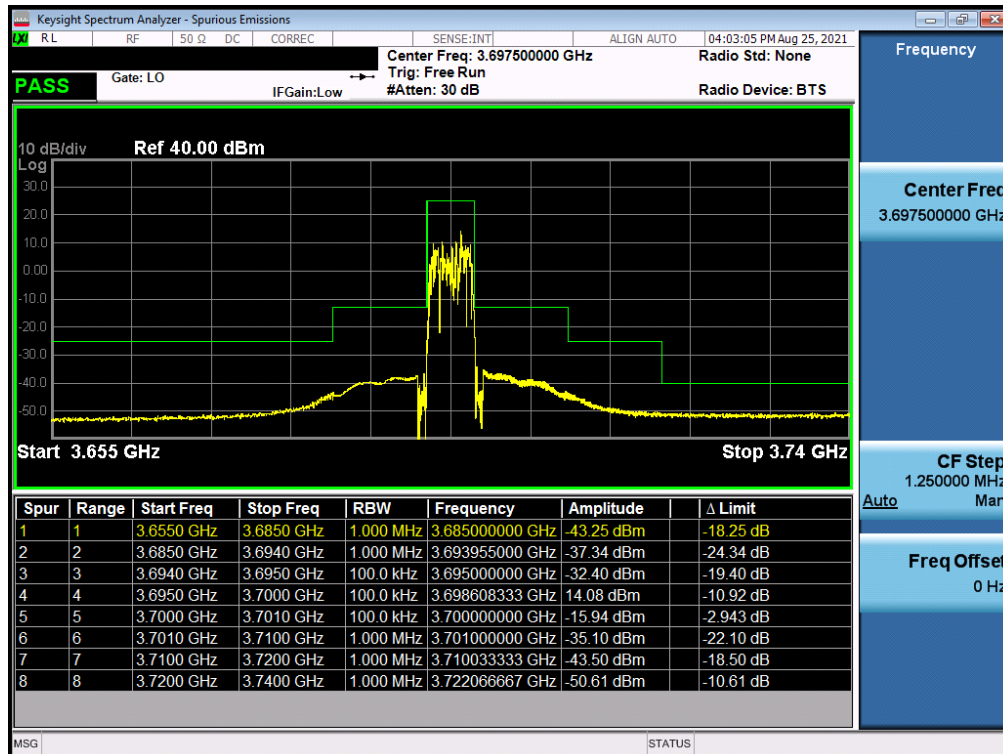


Plot 7-76. Channel Edge Plot (LTE Band 48 - 5MHz QPSK - Low Channel)

FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
Test Report S/N: 1M2105200048-07-R1.C3K	Test Dates: 5/25/2021 - 9/2/2021	EUT Type: Portable Handset		Page 56 of 81



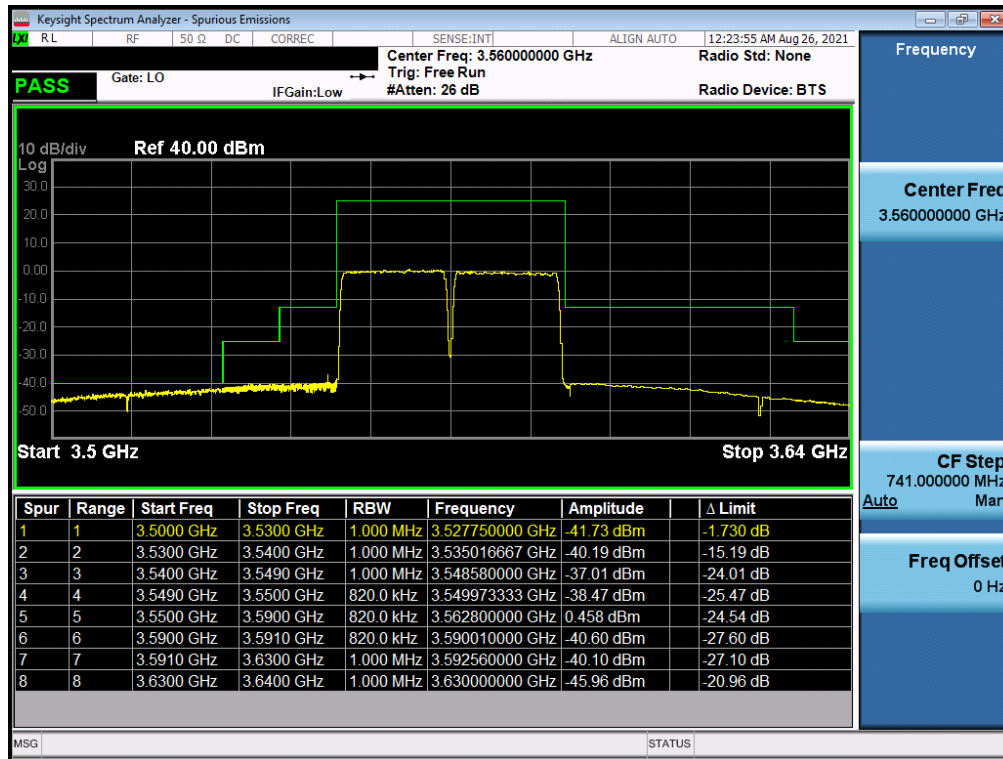
Plot 7-77. Channel Edge Plot (LTE Band 48 - 5MHz QPSK - Mid Channel)



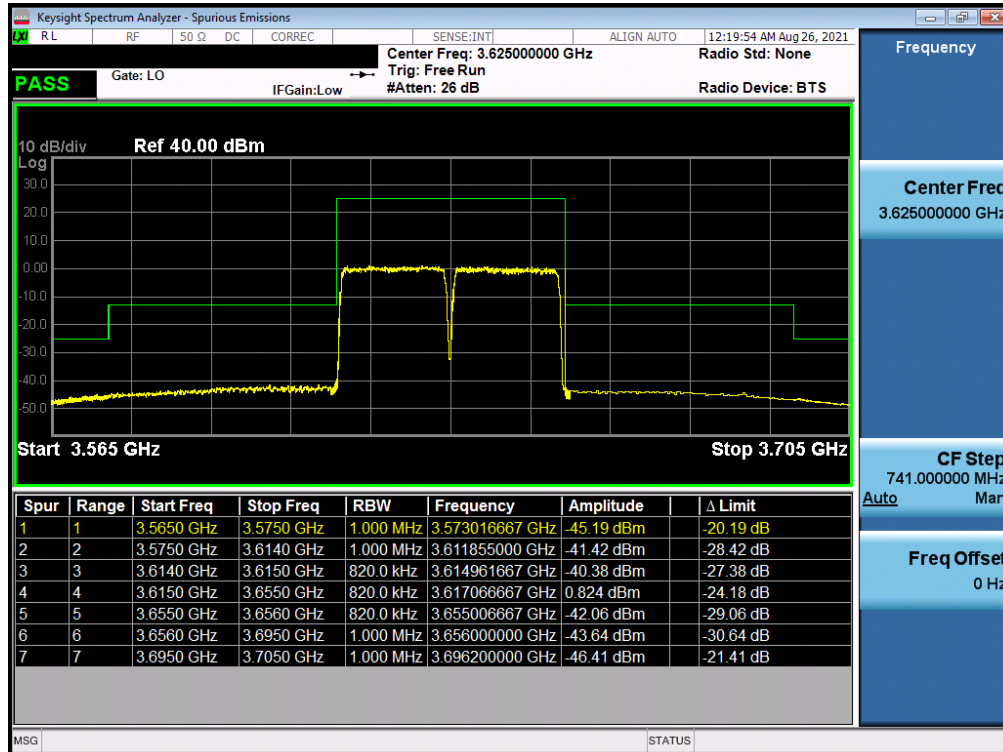
Plot 7-78. Channel Edge Plot (LTE Band 48 - 5MHz QPSK - High Channel)

FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
Test Report S/N: 1M2105200048-07-R1.C3K	Test Dates: 5/25/2021 - 9/2/2021	EUT Type: Portable Handset		Page 57 of 81

ULCA LB48

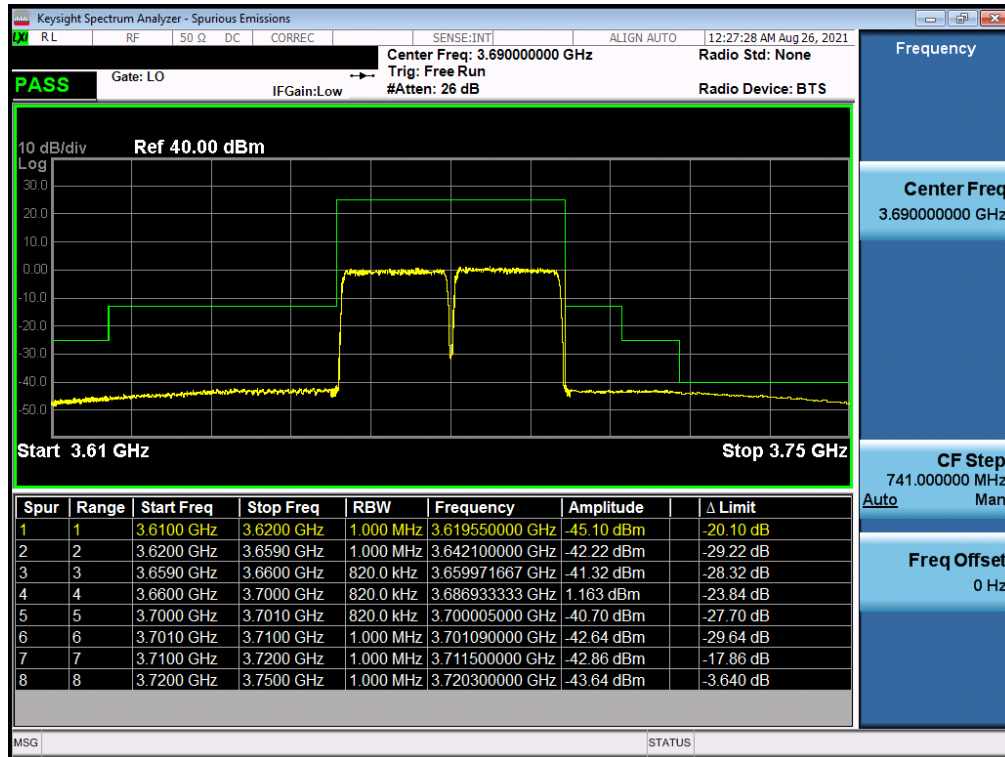


Plot 7-79. Channel Edge Plot (LTE Band 48 – 20+20MHz QPSK - Low Channel)



Plot 7-80. Channel Edge Plot (LTE Band 48 – 20+20MHz QPSK - Mid Channel)

FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-81. Channel Edge Plot (LTE Band 48 – 20+20MHz QPSK - High Channel)

7.6 Radiated Power (EIRP)

\$96.41(b)

FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
Test Report S/N: 1M2105200048-07-R1.C3K	Test Dates: 5/25/2021 - 9/2/2021	EUT Type: Portable Handset		Page 59 of 81

Test Overview

Equivalent Isotropic Radiated Power (EIRP) 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 above 1GHz are performed using vertically and horizontally polarized broadband horn 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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ 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 set equal to 10MHz.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: C3K1995	 PCTEST Proud to be part of 	PART 96 MEASUREMENT REPORT	 Microsoft	Approved by: Technical Manager
Test Report S/N: 1M2105200048-07-R1.C3K	Test Dates: 5/25/2021 - 9/2/2021	EUT Type: Portable Handset	Page 60 of 81	

Test Setup

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

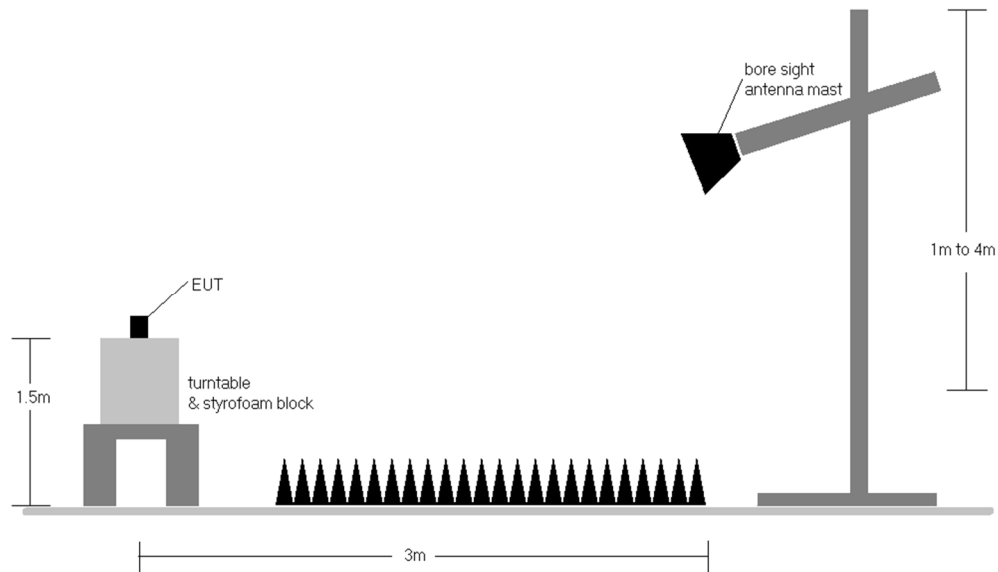




Figure 7-5. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz).

FCC ID: C3K1995	 PART 96 MEASUREMENT REPORT 	Approved by: Technical Manager
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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
20 MHz	QPSK	3560.0	V	286	270	7.15	100 / 0	10.90	18.05	0.064	23.00	-4.95
		3625.0	V	273	284	6.91	100 / 0	12.08	18.99	0.079	23.00	-4.01
		3690.0	V	272	272	6.60	100 / 0	10.29	16.89	0.049	23.00	-6.11
	16-QAM	3625.0	V	273	284	6.91	100 / 0	11.03	17.94	0.062	23.00	-5.06
15 MHz	QPSK	3557.5	V	286	270	7.15	75 / 0	10.87	18.02	0.063	23.00	-4.98
		3625.0	V	273	284	6.91	75 / 0	12.07	18.98	0.079	23.00	-4.02
		3692.5	V	272	272	6.60	75 / 0	10.32	16.91	0.049	23.00	-6.09
	16-QAM	3625.0	V	273	284	6.91	75 / 0	10.95	17.86	0.061	23.00	-5.14
10 MHz	QPSK	3555.0	V	286	270	7.15	50 / 0	10.87	18.02	0.063	23.00	-4.98
		3625.0	V	273	284	6.91	50 / 0	12.07	18.98	0.079	23.00	-4.02
		3695.0	V	272	272	6.59	50 / 0	10.40	16.99	0.050	23.00	-6.01
	16-QAM	3625.0	V	273	284	6.91	50 / 0	10.99	17.90	0.062	23.00	-5.10
5 MHz	QPSK	3552.5	V	286	270	7.16	25 / 0	10.80	17.96	0.063	23.00	-5.04
		3625.0	V	273	284	6.91	25 / 0	12.06	18.97	0.079	23.00	-4.03
		3697.5	V	272	272	6.59	25 / 0	10.43	17.01	0.050	23.00	-5.99
	16-QAM	3625.0	V	273	284	6.91	25 / 0	10.94	17.85	0.061	23.00	-5.15
20 MHz	QPSK (Opposite Pol.)	3625.0	H	133	355	6.77	100 / 0	8.77	15.54	0.036	23.00	-7.46
	QPSK (Closed)	3625.0	V	104	229	6.91	100 / 0	10.76	17.67	0.058	23.00	-5.33



Table 7-8. EIRP Data (LTE Band 48 - FULL RB Case)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
20 MHz	QPSK	3560.0	V	286	270	7.15	1 / 50	9.92	17.07	0.051	23.00	-5.93
		3625.0	V	273	284	6.91	1 / 99	11.13	18.04	0.064	23.00	-4.96
		3690.0	V	272	272	6.60	1 / 50	9.32	15.92	0.039	23.00	-7.08
	16-QAM	3625.0	V	273	284	6.91	1 / 0	11.59	18.50	0.071	23.00	-4.50
15 MHz	QPSK	3557.5	V	286	270	7.15	1 / 74	9.97	17.12	0.052	23.00	-5.88
		3625.0	V	273	284	6.91	1 / 74	11.19	18.10	0.065	23.00	-4.90
		3692.5	V	272	272	6.60	1 / 0	9.31	15.90	0.039	23.00	-7.10
	16-QAM	3625.0	V	273	284	6.91	1 / 74	11.48	18.39	0.069	23.00	-4.61
10 MHz	QPSK	3555.0	V	286	270	7.15	1 / 49	9.96	17.11	0.051	23.00	-5.89
		3625.0	V	273	284	6.91	1 / 49	11.16	18.07	0.064	23.00	-4.93
		3695.0	V	272	272	6.59	1 / 0	9.39	15.98	0.040	23.00	-7.02
	16-QAM	3625.0	V	273	284	6.91	1 / 25	11.41	18.32	0.068	23.00	-4.68
5 MHz	QPSK	3552.5	V	286	270	7.16	1 / 12	9.99	17.15	0.052	23.00	-5.85
		3625.0	V	273	284	6.91	1 / 24	11.23	18.14	0.065	23.00	-4.86
		3697.5	V	272	272	6.59	1 / 24	9.44	16.02	0.040	23.00	-6.98
	16-QAM	3625.0	V	273	284	6.91	1 / 24	11.62	18.53	0.071	23.00	-4.47
20 MHz	QPSK (Opposite Pol.)	3625.0	H	133	355	6.77	1 / 99	7.95	14.72	0.030	23.00	-8.28
	QPSK (Closed)	3625.0	V	104	229	6.91	1 / 99	9.93	16.84	0.048	23.00	-6.16

Table 7-9. EIRP Data (LTE Band 48 - 1 RB Case)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
20 MHz	QPSK	3560.0	V	286	270	7.15	8 / 0	11.99	19.14	0.082	23.00	-3.86
		3625.0	V	273	284	6.91	8 / 46	13.13	20.04	0.101	23.00	-2.96
		3690.0	V	272	272	6.60	8 / 46	11.40	18.00	0.063	23.00	-5.90
	16-QAM	3625.0	V	273	284	6.91	8 / 92	12.11	19.02	0.080	23.00	-3.98
15 MHz	QPSK	3557.5	V	286	270	7.15	8 / 67	11.97	19.12	0.082	23.00	-3.88
		3625.0	V	273	284	6.91	8 / 34	13.09	20.00	0.100	23.00	-3.00
		3692.5	V	272	272	6.60	8 / 0	11.47	18.06	0.064	23.00	-4.94
	16-QAM	3625.0	V	273	284	6.91	8 / 67	11.99	18.90	0.078	23.00	-4.10
10 MHz	QPSK	3555.0	V	286	270	7.15	8 / 42	12.03	19.18	0.083	23.00	-3.82
		3625.0	V	273	284	6.91	8 / 42	13.11	20.02	0.100	23.00	-2.98
		3695.0	V	272	272	6.59	8 / 21	11.54	18.13	0.065	23.00	-4.87
	16-QAM	3625.0	V	273	284	6.91	8 / 42	12.12	19.03	0.080	23.00	-3.97
5 MHz	QPSK	3552.5	V	286	270	7.16	8 / 0	12.00	19.16	0.082	23.00	-3.84
		3625.0	V	273	284	6.91	8 / 17	13.15	20.06	0.101	23.00	-2.94
		3697.5	V	272	272	6.59	8 / 9	11.54	18.12	0.065	23.00	-4.88
	16-QAM	3625.0	V	273	284	6.91	8 / 9	12.05	18.96	0.079	23.00	-4.04
20 MHz	QPSK (Opposite Pol.)	3625.0	H	133	355	6.77	1/50	9.91	16.68	0.047	23.00	-6.32
	QPSK (Closed)	3625.0	V	104	229	6.91	1/50	12.03	18.94	0.078	23.00	-4.06

Table 7-10. EIRP Data (LTE Band 48 - 8 RB Case)



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Bandwidth	Modulation	PCC			SCC			Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Ant. Gain [dBi]	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
		Bandwidth [MHz]	Frequency [MHz]	RB / Offset	Bandwidth [MHz]	Frequency [MHz]	RB / Offset									
40 MHz	QPSK	20	3560.0	1 / 99	20	3579.8	1 / 0	H	107	200	7.37	10.28	17.65	0.058	23.00	-5.35
		20	3625.0	1 / 99	20	3644.8	1 / 0	H	101	197	6.77	10.68	17.45	0.056	23.00	-5.55
		20	3690.0	1 / 0	20	3670.2	1 / 99	H	101	197	6.15	10.79	16.94	0.049	23.00	-6.06
	16-QAM	20	3560.0	1 / 99	20	3579.8	1 / 0	H	107	200	7.37	9.95	17.32	0.054	23.00	-5.68
35 MHz	QPSK	20	3557.5	1 / 99	15	3577.1	1 / 0	H	107	200	7.40	10.40	17.80	0.060	23.00	-5.20
		20	3625.0	1 / 99	15	3642.1	1 / 0	H	101	197	6.77	10.77	17.54	0.057	23.00	-5.46
		20	3692.5	1 / 0	15	3672.9	1 / 74	H	101	197	6.12	11.01	17.13	0.052	23.00	-5.87
	16-QAM	20	3557.5	1 / 99	15	3577.1	1 / 0	H	107	200	7.40	10.13	17.53	0.057	23.00	-5.47
30 MHz	QPSK	20	3555.0	1 / 99	10	3574.4	1 / 0	H	107	200	7.43	10.40	17.83	0.061	23.00	-5.17
		20	3625.0	1 / 99	10	3639.4	1 / 0	H	101	197	6.77	10.78	17.55	0.057	23.00	-5.45
		20	3695.0	1 / 0	10	3678.3	1 / 49	H	101	197	6.09	11.05	17.14	0.052	23.00	-5.86
	16-QAM	20	3555.0	1 / 99	10	3574.4	1 / 0	H	107	200	7.43	10.20	17.63	0.058	23.00	-5.37
25 MHz	QPSK	20	3552.5	1 / 99	5	3571.7	1 / 0	H	107	200	7.45	10.40	17.85	0.061	23.00	-5.15
		20	3625.0	1 / 99	5	3636.7	1 / 0	H	101	197	6.77	10.76	17.53	0.057	23.00	-5.47
		20	3697.5	1 / 0	5	3678.3	1 / 24	H	101	197	6.06	11.10	17.16	0.052	23.00	-5.84
	16-QAM	20	3552.5	1 / 99	5	3571.7	1 / 0	H	107	200	7.45	10.14	17.59	0.057	23.00	-5.41

Table 7-11. EIRP Data (LTE ULCA Band 48 - 1 RB Case)

Bandwidth	Modulation	PCC			SCC			Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Ant. Gain [dBi]	Substitute Level [dBm]	EIRP [dBm/10MHz]	EIRP [Watts/10MHz]	EIRP Limit [dBm/10MHz]	Margin [dB]
		Bandwidth [MHz]	Frequency [MHz]	RB / Offset	Bandwidth [MHz]	Frequency [MHz]	RB / Offset									
40 MHz	QPSK	20	3560.0	8 / 92	20	3579.8	8 / 0	H	109	197	7.37	12.05	19.42	0.088	23.00	-3.58
		20	3625.0	8 / 92	20	3644.8	8 / 0	H	101	197	6.77	12.91	19.68	0.093	23.00	-3.32
		20	3690.0	8 / 0	20	3670.2	8 / 92	H	100	210	6.15	12.28	18.43	0.070	23.00	-4.57
	16-QAM	20	3560.0	8 / 92	20	3579.8	8 / 0	H	109	197	7.37	11.18	18.55	0.072	23.00	-4.45
35 MHz	QPSK	20	3560.0	8 / 92	15	3577.1	8 / 0	H	109	197	7.40	12.45	19.85	0.097	23.00	-3.15
		20	3625.0	8 / 92	15	3642.1	8 / 0	H	101	197	6.77	13.32	20.09	0.102	23.00	-2.91
		20	3690.0	8 / 0	15	3672.9	8 / 67	H	100	210	6.12	12.25	18.37	0.069	23.00	-4.63
	16-QAM	20	3560.0	8 / 92	15	3577.1	8 / 0	H	109	197	7.40	11.51	18.91	0.078	23.00	-4.09
30 MHz	QPSK	20	3560.0	8 / 92	10	3574.4	8 / 0	H	109	197	7.43	11.68	19.10	0.081	23.00	-3.90
		20	3625.0	8 / 92	10	3639.4	8 / 0	H	101	197	6.77	12.53	19.30	0.085	23.00	-3.70
		20	3690.0	8 / 0	10	3675.6	8 / 42	H	100	210	6.09	11.99	18.09	0.064	23.00	-4.91
	16-QAM	20	3560.0	8 / 92	10	3574.4	8 / 0	H	109	197	7.43	10.85	18.27	0.067	23.00	-4.73
25 MHz	QPSK	20	3560.0	8 / 92	5	3571.7	8 / 0	H	109	197	7.45	11.83	19.28	0.085	23.00	-3.72
		20	3625.0	8 / 92	5	3636.7	8 / 0	H	101	197	6.77	12.61	19.38	0.087	23.00	-3.62
		20	3690.0	8 / 0	5	3678.3	1 / 17	H	100	210	6.06	12.07	18.14	0.065	23.00	-4.86
	16-QAM	20	3560.0	8 / 92	5	3571.7	8 / 0	H	109	197	7.45	10.89	18.34	0.068	23.00	-4.66

Table 7-12. EIRP Data (LTE ULCA Band 48 - 8 RB Case)

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7.7 Radiated Spurious Emissions Measurements

§2.1053 §96.41(e)

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 vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.



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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Max Hold (In cases where the level is within 2dB of the limit, the final measurement is taken using triggering/gating and trace averaging.)
7. The trace was allowed to stabilize

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Test Setup

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

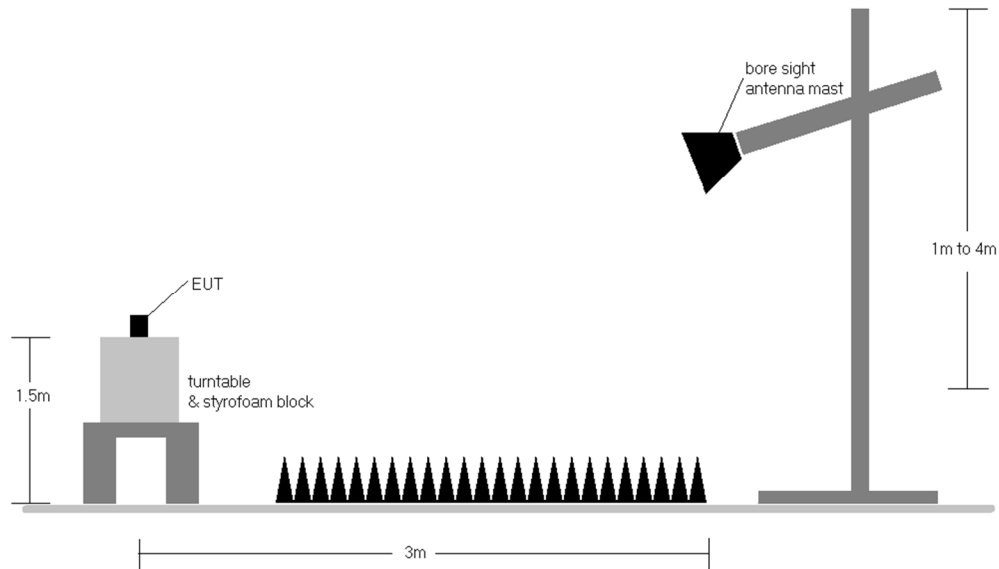




Figure 7-6. Test Instrument & Measurement Setup

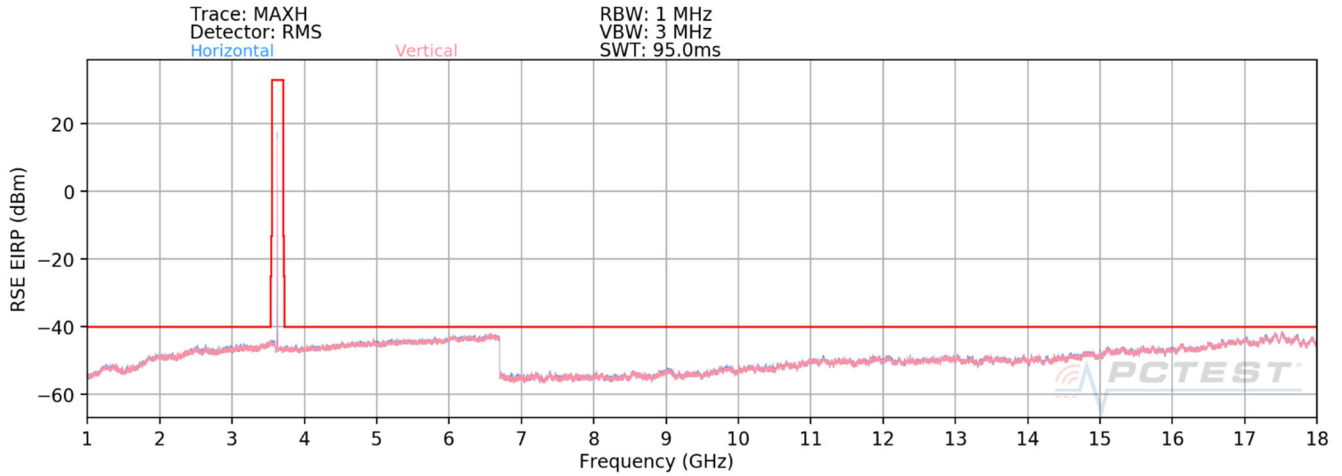
Test Notes

- 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) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 6) Per KDB 971168, Field Strength Level (dBμV/m) is converted to EIRP Spurious Emission Level (dBm) using the formula in Section 5.8.4 (d):

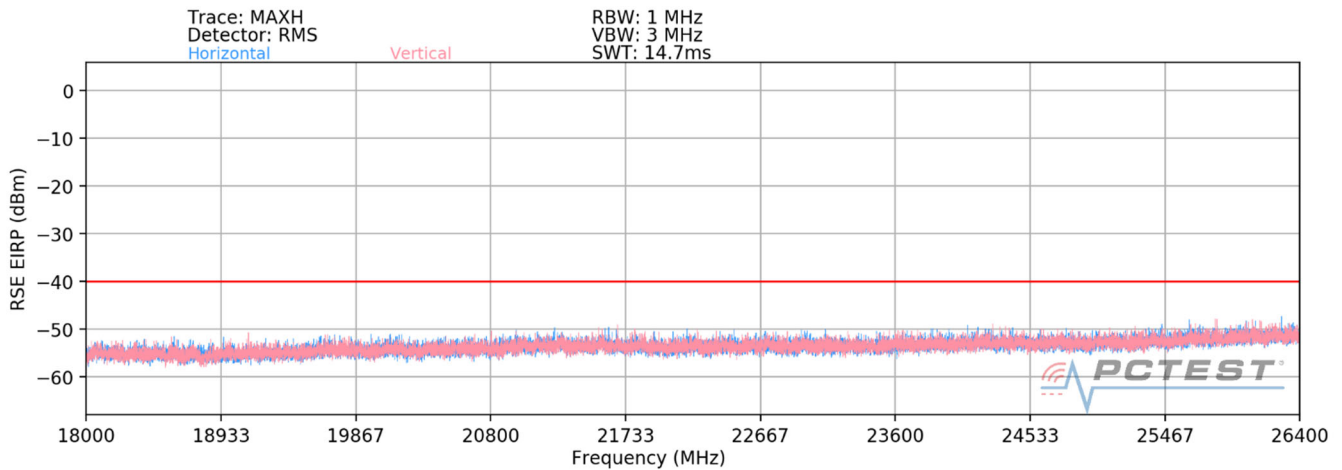
$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where } D \text{ is the measurement distance in meters}$$

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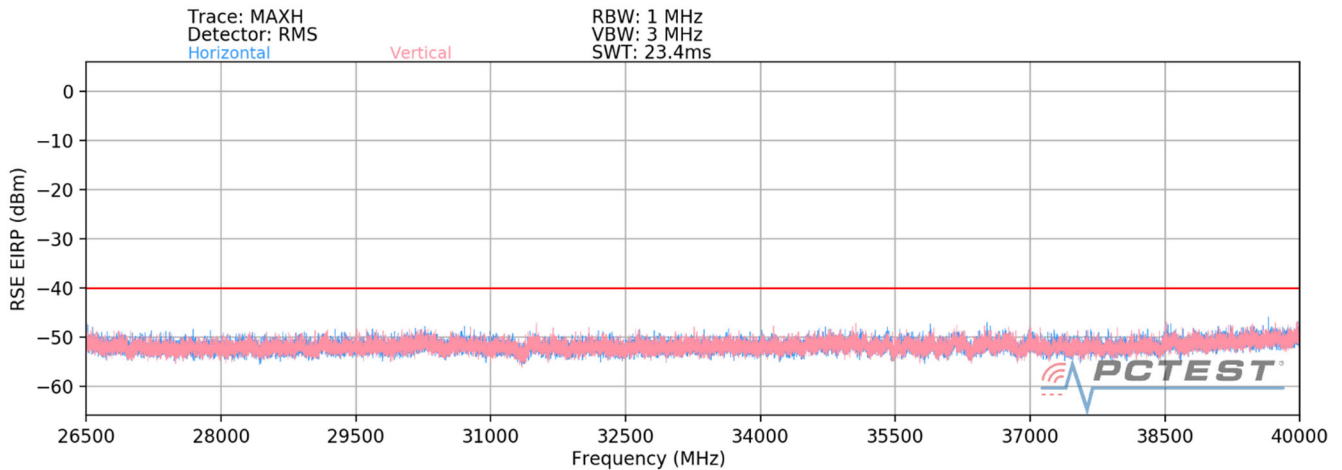
LTE Band 48



Plot 7-82. Radiated Spurious Plot (LTE Band 48 - Closed)

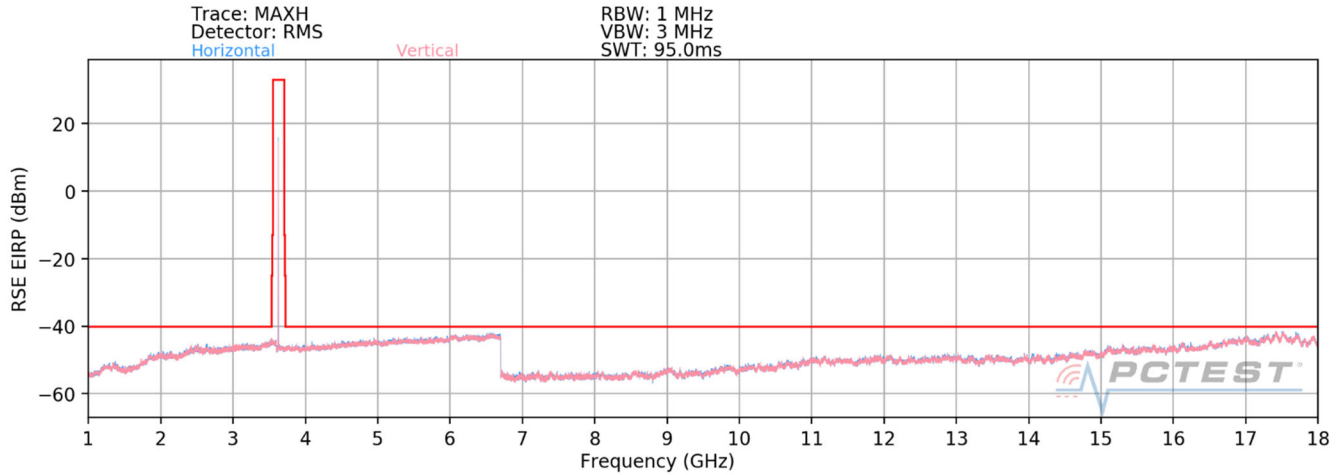


Plot 7-83. Radiated Spurious Plot (LTE Band 48 - Closed)

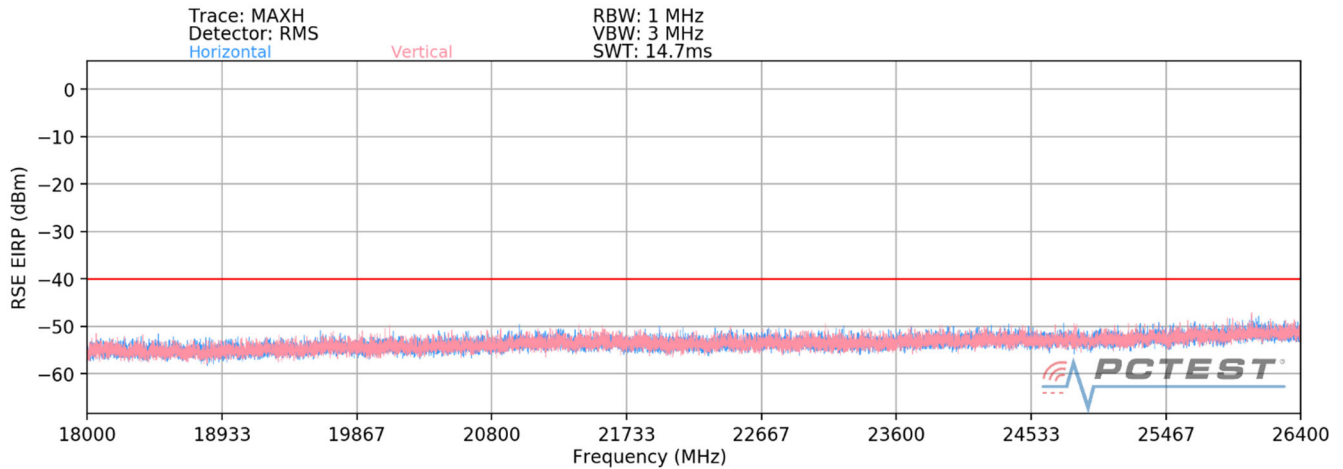


Plot 7-84. Radiated Spurious Plot (LTE Band 48 - Closed)

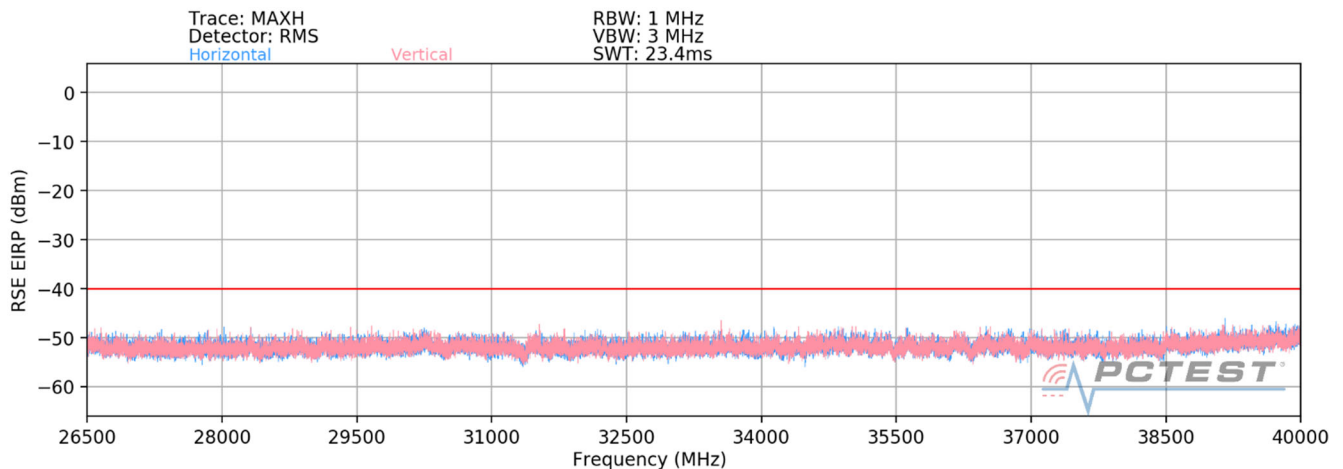
FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Plot 7-85. Radiated Spurious Plot (LTE Band 48 - Flip)



Plot 7-86. Radiated Spurious Plot (LTE Band 48 - Flip)



Plot 7-87. Radiated Spurious Plot (LTE Band 48 - Flip)

FCC ID: C3K1995	 PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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Bandwidth (MHz):	20
Frequency (MHz):	3560.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7120.0	H	260	273	-72.04	8.52	43.48	-51.78	-40.00	-11.78
10680.0	H	-	-	-78.93	13.71	41.78	-53.48	-40.00	-13.48
14240.0	H	-	-	-78.88	14.86	42.98	-52.28	-40.00	-12.28
17800.0	H	-	-	-78.93	20.20	48.27	-46.99	-40.00	-6.99

Table 7-13. Radiated Spurious Data (LTE Band 48 – Low Channel – 1 RB - Closed)

Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7250.0	H	158	46	-71.31	7.69	43.38	-51.88	-40.00	-11.88
10875.0	H	-	-	-78.32	13.34	42.02	-53.24	-40.00	-13.24
14500.0	H	-	-	-78.70	15.18	43.48	-51.78	-40.00	-11.78

Table 7-14. Radiated Spurious Data (LTE Band 48 – Mid Channel – 1 RB Case - Closed)

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



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7380.00	H	232	15	-69.67	9.57	46.90	-48.35	-40.00	-8.35
11070.00	H	-	-	-77.83	13.86	43.03	-52.23	-40.00	-12.23
14760.00	H	-	-	-79.25	16.46	44.21	-51.05	-40.00	-11.05

Table 7-15. Radiated Spurious Data (LTE Band 48 – High Channel – 1 RB Case – Closed)

Bandwidth (MHz):	20
Frequency (MHz):	3560.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	8 / 46

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7120.0	H	266	269	-73.30	8.52	42.22	-53.04	-40.00	-13.04
10680.0	H	-	-	-78.45	13.71	42.26	-53.00	-40.00	-13.00
14240.0	H	-	-	-79.06	14.86	42.80	-52.46	-40.00	-12.46
17800.0	H	-	-	-78.77	20.20	48.43	-46.83	-40.00	-6.83

Table 7-16. Radiated Spurious Data (LTE Band 48 – Low Channel – 8 RB Case - Closed)

FCC ID: C3K1995	 PART 96 MEASUREMENT REPORT 	Approved by: Technical Manager
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Bandwidth (MHz):	20
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	8 / 46




Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7250.0	H	163	-46	-72.17	7.69	42.52	-52.74	-40.00	-12.74
10875.0	H	-	-	-78.13	13.34	42.21	-53.05	-40.00	-13.05
14500.0	H	-	-	-78.50	15.18	43.68	-51.58	-40.00	-11.58

Table 7-17. Radiated Spurious Data (LTE Band 48 – Mid Channel – 8 RB Case- Closed)

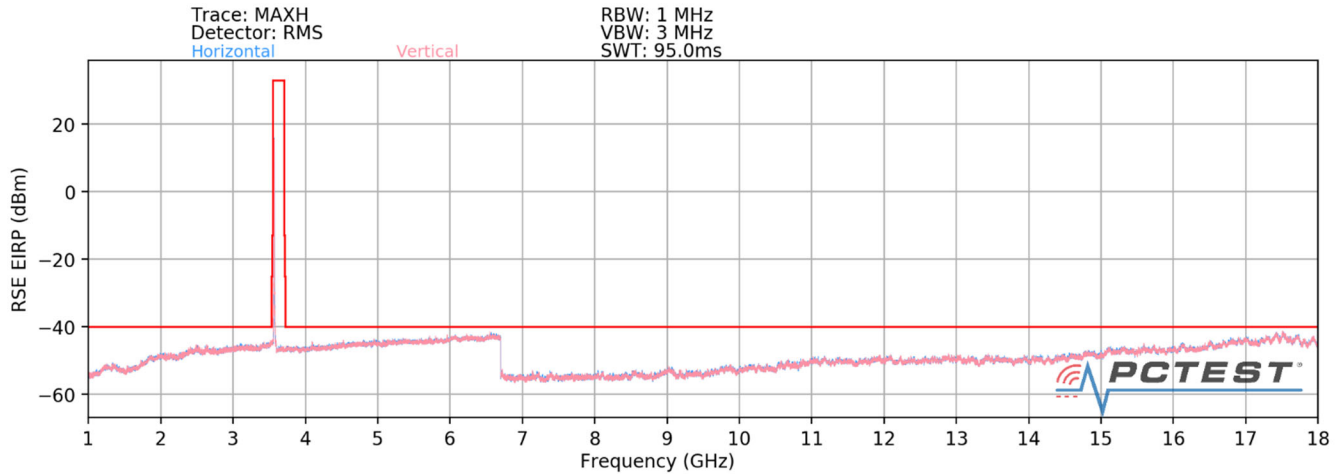
Bandwidth (MHz):	20
Frequency (MHz):	3690.0
Modulation Signal:	QPSK
RB Config (Size / Offset):	8 / 46

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7380.00	H	233	15	-71.60	9.57	44.97	-50.28	-40.00	-10.28
11070.00	H	-	-	-77.79	13.86	43.07	-52.19	-40.00	-12.19
14760.00	H	-	-	-79.27	16.46	44.19	-51.07	-40.00	-11.07

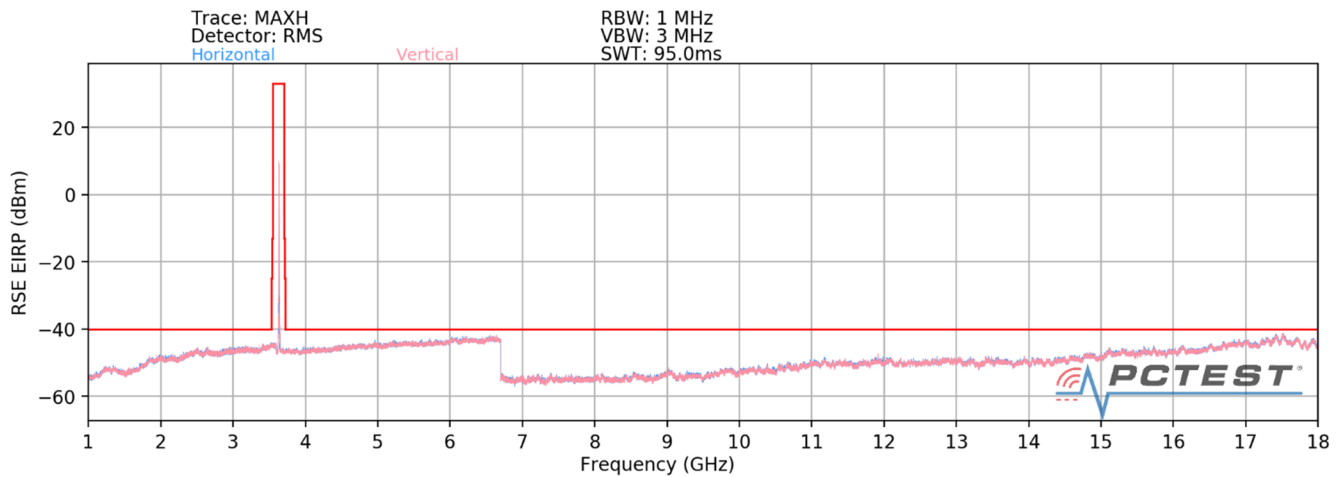
Table 7-18. Radiated Spurious Data (LTE Band 48 – High Channel – 8 RB Case - Closed)

FCC ID: C3K1995	 PCTEST Proud to be part of 	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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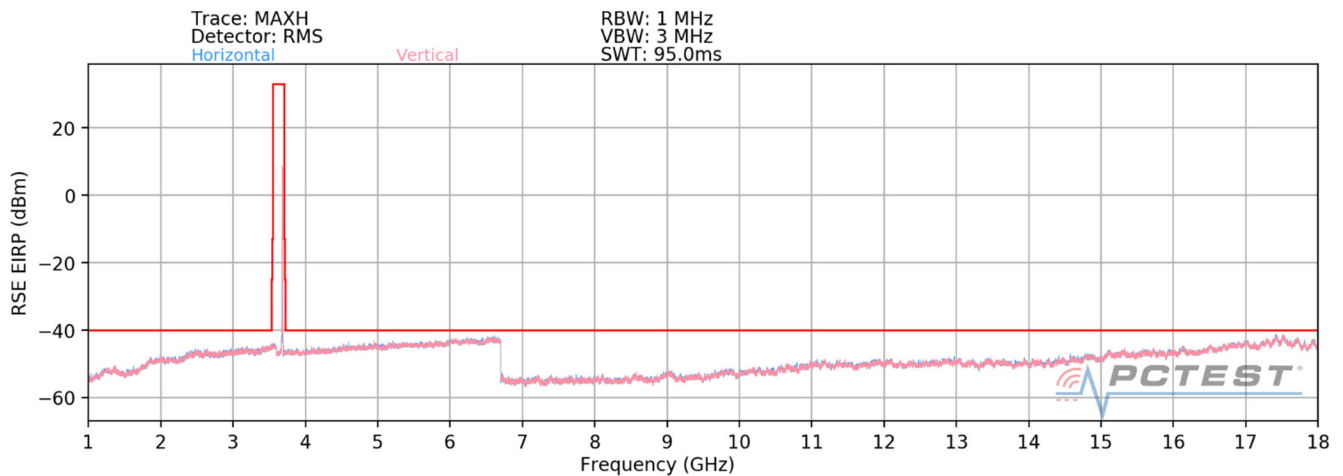
ULCA LB48






Plot 7-88. Radiated Spurious Plot (ULCA LB48 – Low Channel - Closed)

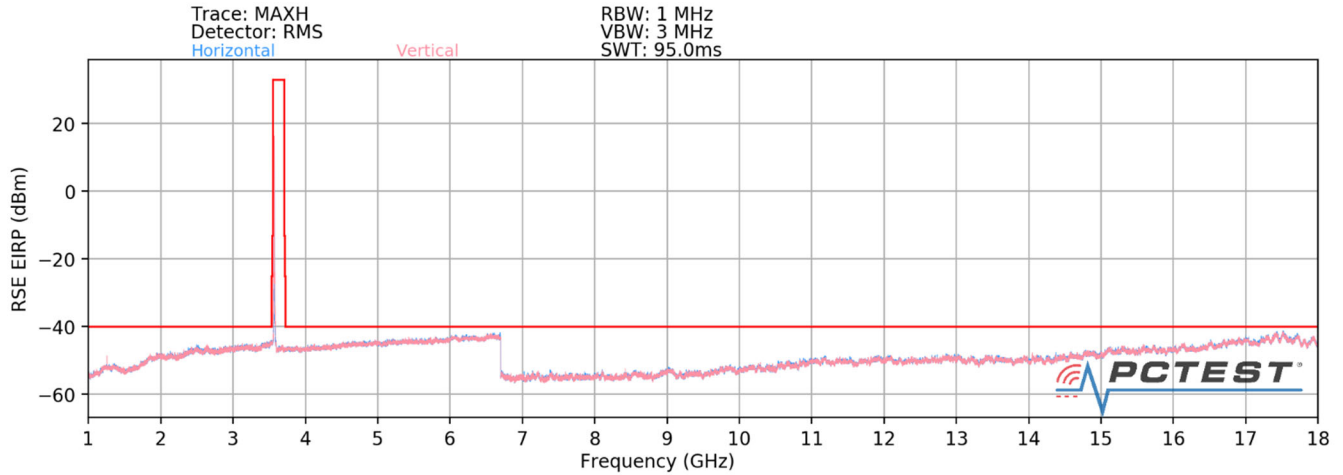


Plot 7-89. Radiated Spurious Plot (ULCA LB48 - Mid Channel - Closed)

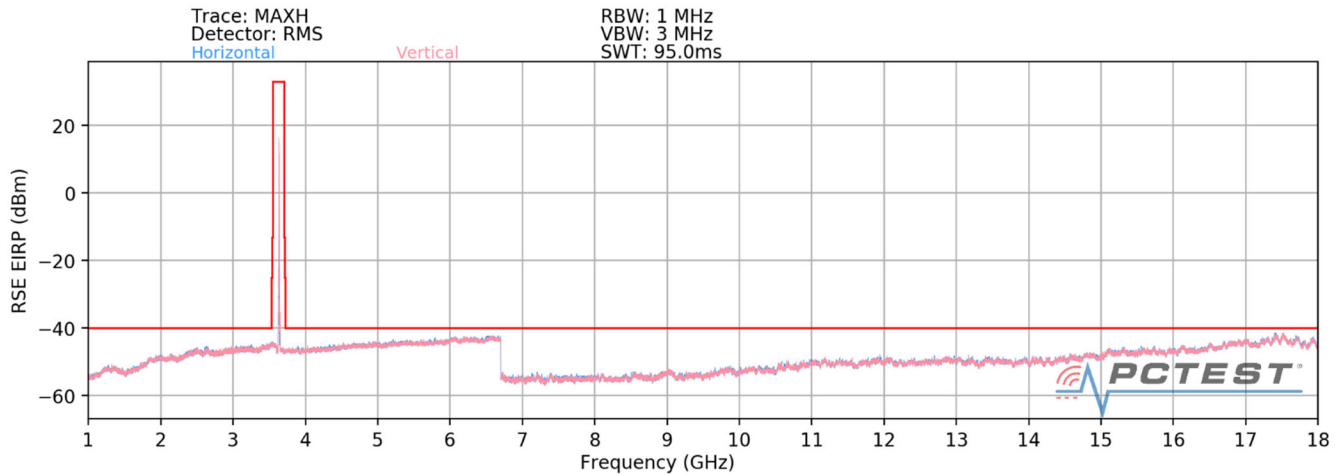


Plot 7-90. Radiated Spurious Plot (ULCA LB48 – High Channel - Closed)

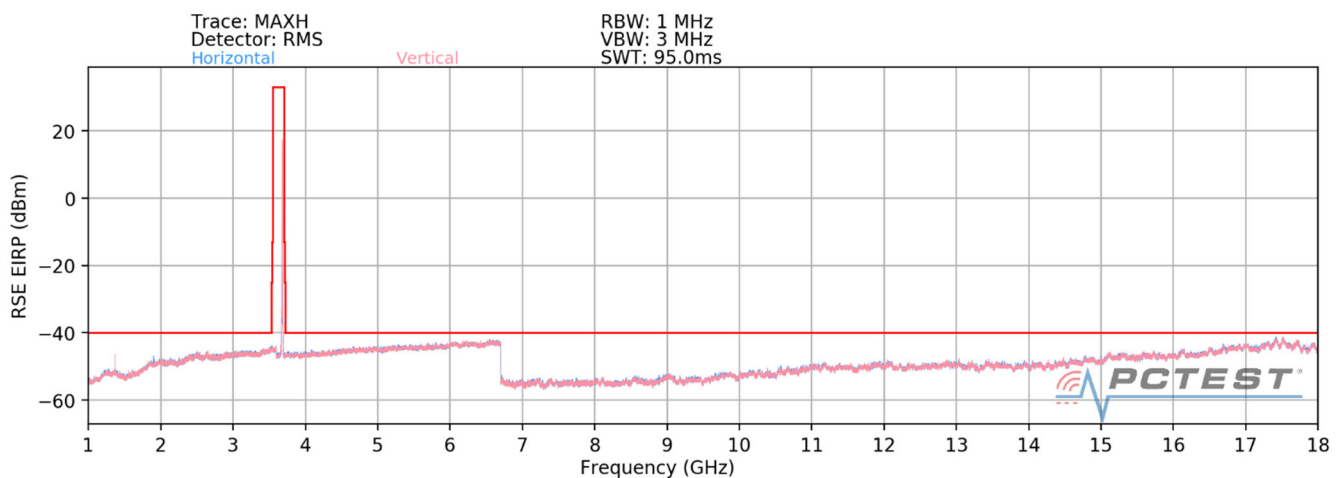
FCC ID: C3K1995	 PCTEST Proud to be part of 	PART 96 MEASUREMENT REPORT	 Microsoft	Approved by: Technical Manager
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Plot 7-91. Radiated Spurious Plot (ULCA LB48 – Low Channel - Open)



Plot 7-92. Radiated Spurious Plot (ULCA LB48 – Mid Channel - Open)



Plot 7-93. Radiated Spurious Plot (ULCA LB48 – High Channel - Open)

FCC ID: C3K1995	 PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3560.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3579.8
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7139.8	H	115	71	-72.27	8.56	43.29	-51.96	-40.00	-11.96
10709.7	H	-	-	-78.33	12.74	41.41	-53.84	-40.00	-13.84
14279.6	H	-	-	-78.58	15.13	43.55	-51.70	-40.00	-11.70
17849.5	H	-	-	-79.27	19.30	47.03	-48.23	-40.00	-8.23

Table 7-19. Radiated Spurious Data (ULCA LB48 – Low Channel - 1 RB Case - Closed)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3625.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3644.8
SCC RB / Offset:	1 / 0
Modulation Signal:	QPSK




Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7269.8	H	227	306	-71.35	8.37	44.02	-51.23	-40.00	-11.23
10904.7	H	-	-	-78.54	12.82	41.28	-53.97	-40.00	-13.97
14539.6	H	-	-	-78.93	14.49	42.56	-52.70	-40.00	-12.70

Table 7-20. Radiated Spurious Data (ULCA LB48 – Mid Channel - 1 RB Case - Closed)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3690.0
PCC RB / Offset:	1 / 0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3670.2
SCC RB / Offset:	1 / 99
Modulation Signal:	QPSK

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.2	H	223	9	-73.84	8.57	41.73	-53.52	-40.00	-13.52
11040.3	H	-	-	-77.96	13.85	42.89	-52.37	-40.00	-12.37
14720.4	H	-	-	-79.24	15.71	43.47	-51.79	-40.00	-11.79

Table 7-21. Radiated Spurious Data (ULCA LB48 – High Channel - 1 RB Case - Closed)

FCC ID: C3K1995	 PCTEST Proud to be part of 	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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ULCA LB48 – 8 RB Case

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3560.0
PCC RB / Offset:	8 / 92
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3579.8
SCC RB / Offset:	8 / 0
Modulation Signal:	QPSK

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7139.8	H	113	74	-72.64	8.56	42.92	-52.33	-40.00	-12.33
10709.7	H	-	-	-78.42	12.74	41.32	-53.93	-40.00	-13.93
14279.6	H	-	-	-78.75	15.13	43.38	-51.87	-40.00	-11.87
17849.5	H	-	-	-79.23	19.30	47.07	-48.19	-40.00	-8.19

Table 7-22. Radiated Spurious Data (ULCA LB48 – Low Channel - 8 RB Case - Closed)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3625.0
PCC RB / Offset:	8 / 92
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3644.8
SCC RB / Offset:	8 / 0
Modulation Signal:	QPSK




Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7269.8	H	223	304	-72.94	8.37	42.43	-52.82	-40.00	-12.82
10904.7	H	-	-	-78.14	12.82	41.68	-53.57	-40.00	-13.57
14539.6	H	-	-	-78.90	14.49	42.59	-52.67	-40.00	-12.67

Table 7-23. Radiated Spurious Data (ULCA LB48 – Mid Channel - 8 RB Case - Closed)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	3690.0
PCC RB / Offset:	8 / 0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	3670.2
SCC RB / Offset:	8 / 92
Modulation Signal:	QPSK

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7360.2	H	223	10	-74.69	8.57	40.88	-54.37	-40.00	-14.37
11040.3	H	-	-	-77.88	13.85	42.97	-52.29	-40.00	-12.29
14720.4	H	-	-	-79.34	15.71	43.37	-51.89	-40.00	-11.89

Table 7-24. Radiated Spurious Data (ULCA LB48 – High Channel - 8 RB Case - Closed)

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7.8 Frequency Stability / Temperature Variation

\$2.1055

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 96, 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

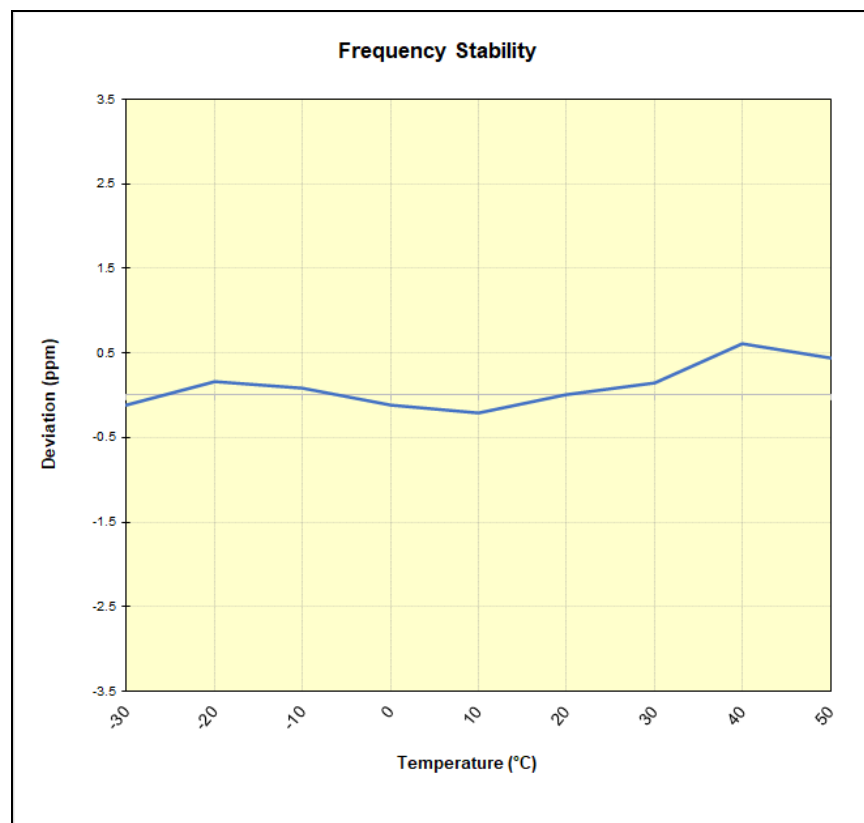
None

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Frequency Stability / Temperature Variation

LTE Band 48					
		Operating Frequency (Hz):		3,625,000,000	
		Ref. Voltage (VDC):		4.24	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.24	- 30	3,625,001,064	-404	-0.0000111
		- 20	3,625,002,069	601	0.0000166
		- 10	3,625,001,746	278	0.0000077
		0	3,625,001,049	-419	-0.0000116
		+ 10	3,625,000,685	-783	-0.0000216
		+ 20 (Ref)	3,625,001,468	0	0.0000000
		+ 30	3,625,002,003	535	0.0000148
		+ 40	3,625,003,684	2,216	0.0000611
		+ 50	3,625,003,053	1,585	0.0000437
Battery Endpoint	3.70	+ 20	3,625,000,943	-525	-0.0000145

Table 7-25. LTE Band 48 Frequency Stability Data



Plot 7-94. LTE Band 48 Frequency Stability Chart

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7.9 End User Device Additional Requirement (CBSD Protocol)

\$96.47

Test Overview and Limit

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

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

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

Test Procedure Used

KDB 940660 D01 v02, WINNF-TS-0122 V1.0.0.



Test Setup/Method

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

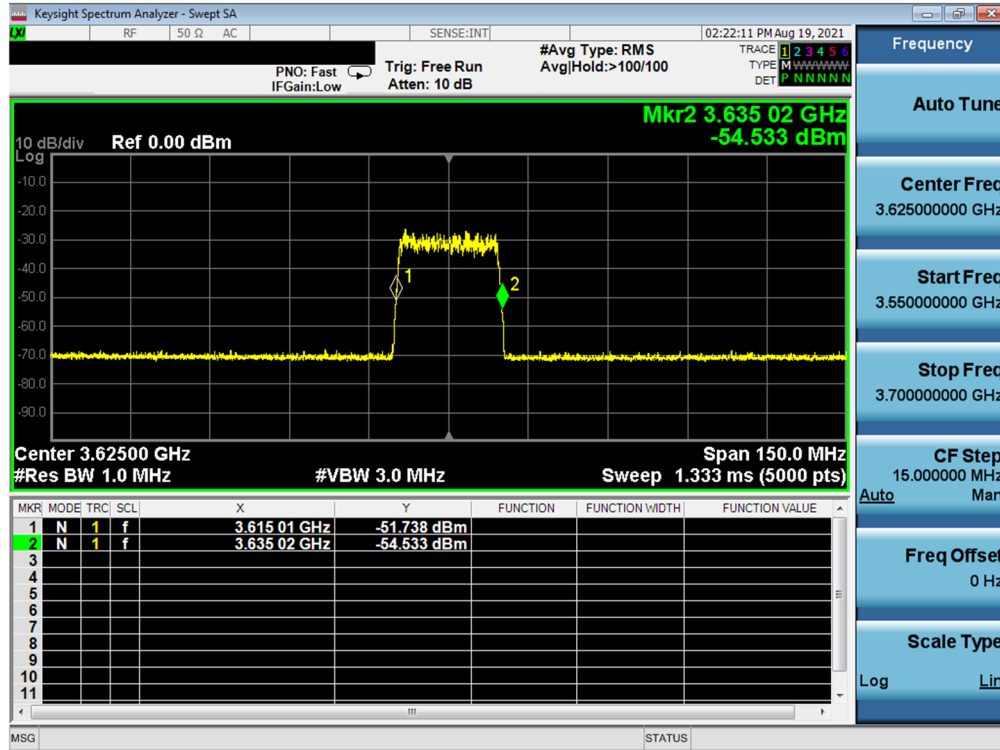
1. Run#1:
 - a. Setup WINNF.PT.C.HBT.1 with 3615MHz – 3635MHz.
 - b. Enable AP service from Ruckus Cloud management.
 - c. Check EUT Tx frequency.
 - d. Disable AP service from Ruckus Cloud management and check EUT stop transmission within 10s.
2. Run#2:
 - a. Setup WINNF.PT.C.HBT.1 with 3660MHz – 3680MHz.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

Test Notes

The EUT is an End User Device.

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Run#1:



Plot 7-95. Run#1 End User Device Frequency of Operations

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Plot 7-96. Run#1 End User Device Discontinues Operations within 10s

Note:

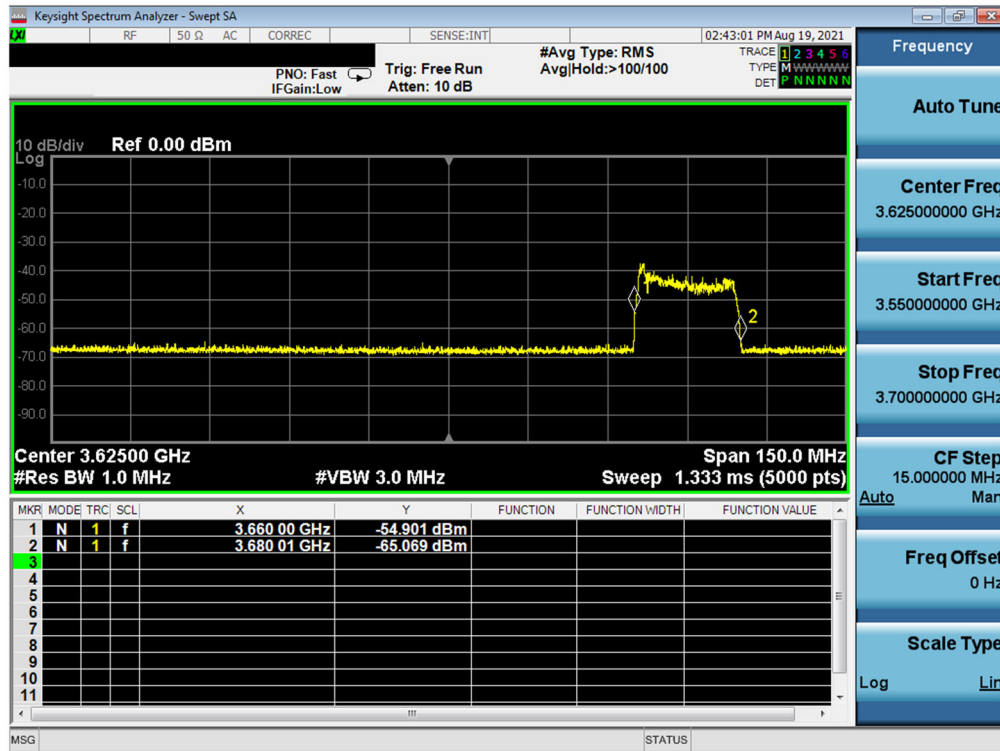
Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

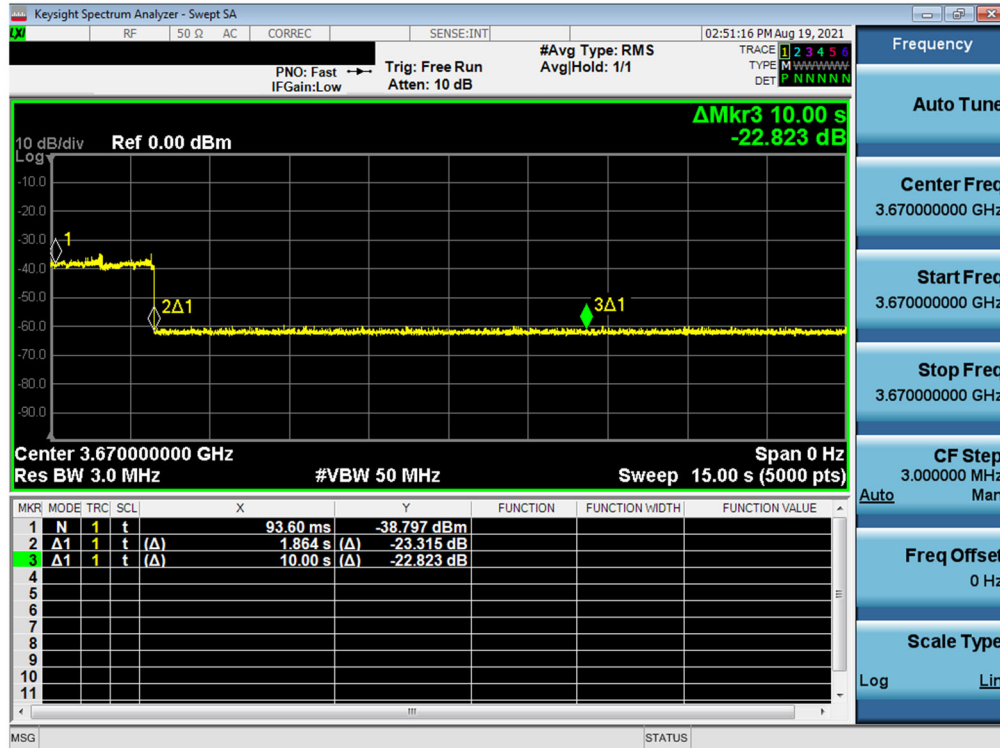
FCC ID: C3K1995	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT	Microsoft	Approved by: Technical Manager
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Run#2:



Plot 7-97. Run#2 End User Device Frequency of Operations

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Plot 7-98. Run#2 End User Device Discontinues Operations within 10s




Note:

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

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Microsoft Corporation Portable Handset FCC ID:C3K1995** complies with all of the End User Device requirements of Part 96 of the FCC Rules for LTE operation only.

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