

Appendix A:Test Data

QCN5024

Duty cycle						
Band	Frequency (MHz)	On time (ms)	On+off time (ms)	Duty cycle (%)	Duty Factor (dB)	1/T Minimun VBW (kHz)
802.11b	2412	0.654	0.892	73.318	1.348	1.529
802.11g	2412	1.395	1.510	92.384	0.344	0.717
802.11ax HE20	2412	5.480	5.740	95.470	0.201	0.182
802.11ax HE40	2422	5.480	5.720	95.804	0.186	0.182

2.4 GHz Band								
Mod.	Freq. (MHz)		Data Rate	RF power setting in Test SW				Test SW Version
				Ant-0	Ant-1	Ant-2	Ant-3	
802.11b	2412		1M	19.00	19.00	19.00	19.00	QSPR 5.0-00188
802.11b	2437		1M	19.00	19.00	19.00	19.00	
802.11b	2462		1M	19.00	19.00	19.00	19.00	
802.11g	2412		6M	16.00	16.00	16.00	16.00	
802.11g	2437		6M	20.00	20.00	20.00	20.00	
802.11g	2462		6M	15.00	15.00	15.00	15.00	
802.11n HT20	2412		26M	15.50	15.50	15.50	15.50	
802.11n HT20	2437		26M	19.50	19.50	19.50	19.50	
802.11n HT20	2462		26M	14.00	14.00	14.00	14.00	
802.11n HT40	2422		54M	14.00	14.00	14.00	14.00	
802.11n HT40	2437		54M	15.50	15.50	15.50	15.50	
802.11n HT40	2452		54M	14.00	14.00	14.00	14.00	
802.11n VHT20	2412		26M	15.50	15.50	15.50	15.50	
802.11n VHT20	2437		26M	19.50	19.50	19.50	19.50	
802.11n VHT20	2462		26M	14.00	14.00	14.00	14.00	
802.11n VHT40	2422		54M	14.00	14.00	14.00	14.00	
802.11n VHT40	2437		54M	15.50	15.50	15.50	15.50	
802.11n VHT40	2452		54M	14.00	14.00	14.00	14.00	
Mod.	Freq. (MHz)	RU	Data Rate	RF power setting in Test SW				
				Ant-0	Ant-1	Ant-2	Ant-3	
802.11ax HE20	2412	Full	MCS0	15.50	15.50	15.50	15.50	
802.11ax HE20	2437	Full	MCS0	19.50	19.50	19.50	19.50	
802.11ax HE20	2462	Full	MCS0	14.00	14.00	14.00	14.00	
802.11ax HE40	2422	Full	MCS0	14.00	14.00	14.00	14.00	
802.11ax HE40	2437	Full	MCS0	15.50	15.50	15.50	15.50	
802.11ax HE40	2452	Full	MCS0	14.00	14.00	14.00	14.00	

2.4 GHz Band																		
Mod.	CH	Freq. (MHz)	Data Rate	Avg Conducted Power (dBm)					Peak Conducted Power (dBm)					Conducted Power Limit (dBm)				
				Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11b	1	2412	1M	19.95	20.24	19.52	20.01	25.96	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11b	6	2437	1M	19.58	19.90	19.52	19.75	25.71	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11b	11	2462	1M	19.70	20.01	20.12	19.82	25.94	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11g	1	2412	6M	16.92	17.05	16.76	16.95	22.94	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11g	6	2437	6M	20.41	20.42	20.32	20.37	26.40	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11g	11	2462	6M	15.98	16.01	15.92	16.00	22.00	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT20	1	2412	26M	16.25	16.38	16.27	16.30	22.32	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT20	6	2437	26M	19.77	20.01	19.86	19.95	25.92	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT20	11	2462	26M	14.71	14.81	14.70	14.87	20.79	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT40	3	2422	54M	14.81	14.92	14.87	14.96	20.91	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT40	6	2437	54M	16.30	16.23	16.32	16.28	22.30	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n HT40	9	2452	54M	14.83	14.90	14.92	14.93	20.92	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT20	1	2412	26M	16.31	16.46	16.38	16.38	22.40	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT20	6	2437	26M	19.88	20.12	19.95	20.01	26.01	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT20	11	2462	26M	14.79	14.94	14.79	14.96	20.89	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT40	3	2422	54M	14.92	15.03	14.97	15.03	21.01	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT40	6	2437	54M	16.37	16.30	16.41	16.37	22.38	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11n VHT40	9	2452	54M	14.90	14.97	15.03	15.00	21.00	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00

Mod.	CH	Freq. (MHz)	RU	Data Rate	Avg Conducted Power (dBm)					Peak Conducted Power (dBm)					Conducted Power Limit (dBm)				
					Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11ax HE20	1	2412	Full	MCS0	16.37	16.60	16.43	16.43	22.48	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11ax HE20	6	2437	Full	MCS0	19.93	20.20	20.03	20.06	26.08	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11ax HE20	11	2462	Full	MCS0	14.87	15.03	14.86	15.02	20.97	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11ax HE40	3	2422	Full	MCS0	15.03	15.10	15.05	15.10	21.09	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11ax HE40	6	2437	Full	MCS0	16.48	16.41	16.50	16.43	22.48	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00
802.11ax HE40	9	2452	Full	MCS0	14.98	15.03	15.11	15.09	21.07	-	-	-	-	-	30.00	30.00	30.00	30.00	30.00

6 dB Bandwidth						
Mod.	Freq. (MHz)	6 dB Bandwidth (kHz)				6 dB Bandwidth Min.Limit (kHz)
		Ant-0	Ant-1	Ant-2	Ant-3	
802.11b	2412	8092	8075	8052	8065	≥ 500
802.11b	2437	8077	7620	8092	8089	≥ 500
802.11b	2462	8078	8094	8092	8092	≥ 500
802.11g	2412	16360	16320	16330	16380	≥ 500
802.11g	2437	16350	16020	15800	16340	≥ 500
802.11g	2462	16370	16380	16380	16350	≥ 500
802.11ax HE20	2412	18940	19030	18970	18950	≥ 500
802.11ax HE20	2437	18740	19010	18950	18940	≥ 500
802.11ax HE20	2462	18670	19040	18940	18870	≥ 500
802.11ax HE40	2422	37850	37860	38010	37800	≥ 500
802.11ax HE40	2437	37980	37800	38070	37910	≥ 500
802.11ax HE40	2452	37920	37950	37990	37900	≥ 500

99 % Occupied BW					
Mod.	Freq. (MHz)	99 % Occupied BW (MHz)			
		Ant-0	Ant-1	Ant-2	Ant-3
802.11b	2412	12.869	12.965	12.904	12.869
802.11b	2437	13.047	12.997	12.945	12.913
802.11b	2462	13.090	13.040	13.061	12.960
802.11g	2412	16.495	16.382	16.393	16.437
802.11g	2437	17.107	17.017	16.976	17.122
802.11g	2462	16.523	16.455	16.464	16.424
802.11ax HE20	2412	18.921	18.993	18.968	18.931
802.11ax HE20	2437	19.122	19.268	19.216	19.168
802.11ax HE20	2462	18.862	18.998	18.946	18.917
802.11ax HE40	2422	37.897	37.831	37.939	37.837
802.11ax HE40	2437	37.866	37.887	37.959	37.910
802.11ax HE40	2452	37.900	37.813	37.910	37.914

Maximum Power Spectral Density Measurement

Mod.	Freq. (MHz)	Measurement (dBm/3 kHz)					Max.Limit (dBm/ 3 kHz)				
		Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11b	2412	-2.61	-2.53	-2.71	-2.79	3.36	8.00	8.00	8.00	8.00	3.74
802.11b	2437	-2.67	-2.69	-2.75	-2.78	3.30	8.00	8.00	8.00	8.00	3.74
802.11b	2462	-2.53	-2.71	-2.47	-2.72	3.41	8.00	8.00	8.00	8.00	3.74
802.11g	2412	-9.49	-9.39	-9.57	-9.27	-3.41	8.00	8.00	8.00	8.00	3.74
802.11g	2437	-5.33	-5.10	-5.48	-5.59	0.65	8.00	8.00	8.00	8.00	3.74
802.11g	2462	-10.45	-10.34	-10.37	-10.06	-4.28	8.00	8.00	8.00	8.00	3.74
802.11ax HE20	2412	-9.21	-10.02	-9.56	-10.12	-3.69	8.00	8.00	8.00	8.00	3.74
802.11ax HE20	2437	-6.12	-6.51	-4.49	-5.38	0.47	8.00	8.00	8.00	8.00	3.74
802.11ax HE20	2462	-11.45	-11.37	-9.27	-11.29	-4.72	8.00	8.00	8.00	8.00	3.74
802.11ax HE40	2422	-13.34	-13.24	-13.19	-13.32	-7.25	8.00	8.00	8.00	8.00	3.74
802.11ax HE40	2437	-11.14	-11.98	-11.60	-11.60	-5.55	8.00	8.00	8.00	8.00	3.74
802.11ax HE40	2452	-13.25	-13.56	-13.20	-12.41	-7.06	8.00	8.00	8.00	8.00	3.74

QCN5024_Beamforming on

2.4 GHz Band								
Mod.	Freq. (MHz)		Data Rate	RF power setting in Test SW				Test SW Version
				Ant-0	Ant-1	Ant-2	Ant-3	
802.11n HT20	2412		26M	9.00	9.00	9.00	9.00	QSPR 5.0-00188
802.11n HT20	2437		26M	13.00	13.00	13.00	13.00	
802.11n HT20	2462		26M	8.00	8.00	8.00	8.00	
802.11n HT40	2422		54M	8.00	8.00	8.00	8.00	
802.11n HT40	2437		54M	9.50	9.50	9.50	9.50	
802.11n HT40	2452		54M	8.00	8.00	8.00	8.00	
802.11n VHT20	2412		26M	9.00	9.00	9.00	9.00	
802.11n VHT20	2437		26M	13.00	13.00	13.00	13.00	
802.11n VHT20	2462		26M	8.00	8.00	8.00	8.00	
802.11n VHT40	2422		54M	8.00	8.00	8.00	8.00	
802.11n VHT40	2437		54M	9.50	9.50	9.50	9.50	
802.11n VHT40	2452		54M	8.00	8.00	8.00	8.00	
Mod.	Freq. (MHz)	RU	Data Rate	RF power setting in Test SW				
				Ant-0	Ant-1	Ant-2	Ant-3	
802.11ax HE20	2412	Full	MCS0	9.00	9.00	9.00	9.00	
802.11ax HE20	2437	Full	MCS0	13.00	13.00	13.00	13.00	
802.11ax HE20	2462	Full	MCS0	8.00	8.00	8.00	8.00	
802.11ax HE40	2422	Full	MCS0	8.00	8.00	8.00	8.00	
802.11ax HE40	2437	Full	MCS0	9.50	9.50	9.50	9.50	
802.11ax HE40	2452	Full	MCS0	8.00	8.00	8.00	8.00	

2.4 GHz Band																		
Mod.	CH	Freq. (MHz)	Data Rate	Avg Conducted Power (dBm)					Peak Conducted Power (dBm)					Conducted Power Limit (dBm)				
				Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11n HT20	1	2412	26M	9.77	9.83	9.76	9.70	15.79	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n HT20	6	2437	26M	13.96	13.81	13.61	13.79	19.81	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n HT20	11	2462	26M	8.49	8.64	8.54	8.57	14.58	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n HT40	3	2422	54M	8.67	8.67	8.67	8.74	14.71	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n HT40	6	2437	54M	10.17	10.02	10.14	10.17	16.15	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n HT40	9	2452	54M	8.54	8.58	8.74	8.69	14.66	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT20	1	2412	26M	9.88	9.99	9.89	9.80	15.91	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT20	6	2437	26M	14.11	13.93	13.79	13.87	19.95	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT20	11	2462	26M	8.57	8.81	8.67	8.70	14.71	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT40	3	2422	54M	8.79	8.84	8.84	8.89	14.86	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT40	6	2437	54M	10.28	10.14	10.29	10.24	16.26	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11n VHT40	9	2452	54M	8.67	8.69	8.89	8.87	14.80	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74

Mod.	CH	Freq. (MHz)	RU	Data Rate	Avg Conducted Power (dBm)					Peak Conducted Power (dBm)					Conducted Power Limit (dBm)				
					Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11ax HE20	1	2412	Full	MCS0	9.98	10.12	10.03	9.92	16.03	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11ax HE20	6	2437	Full	MCS0	14.28	14.10	13.90	13.96	20.08	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11ax HE20	11	2462	Full	MCS0	8.68	8.93	8.81	8.87	14.84	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11ax HE40	3	2422	Full	MCS0	8.92	8.93	8.95	9.00	14.97	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11ax HE40	6	2437	Full	MCS0	10.41	10.28	10.44	10.37	16.40	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74
802.11ax HE40	9	2452	Full	MCS0	8.80	8.82	9.03	9.02	14.94	-	-	-	-	-	25.74	25.74	25.74	25.74	25.74

QCA9889

Duty cycle						
Band	Frequency (MHz)	On time (ms)	On+off time (ms)	Duty cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	2412	12.270	12.330	99.513	0.021	0.010
802.11g	2412	2.040	2.180	93.578	0.288	0.490
802.11n VHT20	2412	1.905	2.045	93.154	0.308	0.525
802.11n VHT40	2422	0.948	1.092	86.813	0.614	1.055

2.4 GHz Band							
Mod.	Freq. (MHz)	Data Rate	RF power setting in Test SW				Test SW Version
			Ant-0	Ant-1	Ant-2	Ant-3	
802.11b	2412	1M	14.50	-	-	-	QSPR 5.0-00188
802.11b	2437	1M	16.50	-	-	-	
802.11b	2462	1M	16.50	-	-	-	
802.11g	2412	6M	12.00	-	-	-	
802.11g	2437	6M	20.00	-	-	-	
802.11g	2462	6M	16.50	-	-	-	
802.11n HT20	2412	6.5M	11.00	-	-	-	
802.11n HT20	2437	6.5M	20.50	-	-	-	
802.11n HT20	2462	6.5M	16.50	-	-	-	
802.11n HT40	2422	13.5M	7.00	-	-	-	
802.11n HT40	2437	13.5M	14.00	-	-	-	
802.11n HT40	2452	13.5M	7.50	-	-	-	
802.11n VHT20	2412	6.5M	11.00	-	-	-	
802.11n VHT20	2437	6.5M	20.50	-	-	-	
802.11n VHT20	2462	6.5M	16.50	-	-	-	
802.11n VHT40	2422	13.5M	7.00	-	-	-	
802.11n VHT40	2437	13.5M	14.00	-	-	-	
802.11n VHT40	2452	13.5M	7.50	-	-	-	

2.4 GHz Band																		
Mod.	CH	Freq. (MHz)	Data Rate	Avg Conducted Power (dBm)					Peak Conducted Power (dBm)					Conducted Power Limit (dBm)				
				Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11b	1	2412	1M	15.78	-	-	-	-	18.73	-	-	-	-	30.00	-	-	-	-
802.11b	6	2437	1M	17.00	-	-	-	-	19.77	-	-	-	-	30.00	-	-	-	-
802.11b	11	2462	1M	16.90	-	-	-	-	19.69	-	-	-	-	30.00	-	-	-	-
802.11g	1	2412	6M	13.31	-	-	-	-	17.53	-	-	-	-	30.00	-	-	-	-
802.11g	6	2437	6M	19.27	-	-	-	-	22.21	-	-	-	-	30.00	-	-	-	-
802.11g	11	2462	6M	16.61	-	-	-	-	20.22	-	-	-	-	30.00	-	-	-	-
802.11n HT20	1	2412	6.5M	12.26	-	-	-	-	16.72	-	-	-	-	30.00	-	-	-	-
802.11n HT20	6	2437	6.5M	19.40	-	-	-	-	22.36	-	-	-	-	30.00	-	-	-	-
802.11n HT20	11	2462	6.5M	16.41	-	-	-	-	20.12	-	-	-	-	30.00	-	-	-	-
802.11n HT40	3	2422	13.5M	7.83	-	-	-	-	13.27	-	-	-	-	30.00	-	-	-	-
802.11n HT40	6	2437	13.5M	14.08	-	-	-	-	18.51	-	-	-	-	30.00	-	-	-	-
802.11n HT40	9	2452	13.5M	7.86	-	-	-	-	13.36	-	-	-	-	30.00	-	-	-	-
802.11n VHT20	1	2412	6.5M	12.31	-	-	-	-	16.78	-	-	-	-	30.00	-	-	-	-
802.11n VHT20	6	2437	6.5M	19.46	-	-	-	-	22.42	-	-	-	-	30.00	-	-	-	-
802.11n VHT20	11	2462	6.5M	16.50	-	-	-	-	20.19	-	-	-	-	30.00	-	-	-	-
802.11n VHT40	3	2422	13.5M	7.90	-	-	-	-	13.39	-	-	-	-	30.00	-	-	-	-
802.11n VHT40	6	2437	13.5M	14.17	-	-	-	-	18.59	-	-	-	-	30.00	-	-	-	-
802.11n VHT40	9	2452	13.5M	7.93	-	-	-	-	13.45	-	-	-	-	30.00	-	-	-	-

6 dB Bandwidth						
Mod.	Freq. (MHz)	6 dB Bandwidth (kHz)				6 dB Bandwidth Min.Limit (kHz)
		Ant-0	Ant-1	Ant-2	Ant-3	
802.11b	2412	7119	-	-	-	≥ 500
802.11b	2437	7120	-	-	-	≥ 500
802.11b	2462	7123	-	-	-	≥ 500
802.11g	2412	16360	-	-	-	≥ 500
802.11g	2437	16380	-	-	-	≥ 500
802.11g	2462	16360	-	-	-	≥ 500
802.11n VHT20	2412	17540	-	-	-	≥ 500
802.11n VHT20	2437	17570	-	-	-	≥ 500
802.11n VHT20	2462	17570	-	-	-	≥ 500
802.11n VHT40	2422	35570	-	-	-	≥ 500
802.11n VHT40	2437	35390	-	-	-	≥ 500
802.11n VHT40	2452	36110	-	-	-	≥ 500

99 % Occupied BW					
Mod.	Freq. (MHz)	99 % Occupied BW (MHz)			
		Ant-0	Ant-1	Ant-2	Ant-3
802.11b	2412	12.463	-	-	-
802.11b	2437	12.788	-	-	-
802.11b	2462	12.657	-	-	-
802.11g	2412	17.142	-	-	-
802.11g	2437	24.502	-	-	-
802.11g	2462	18.684	-	-	-
802.11n VHT20	2412	18.113	-	-	-
802.11n VHT20	2437	25.904	-	-	-
802.11n VHT20	2462	19.220	-	-	-
802.11n VHT40	2422	37.123	-	-	-
802.11n VHT40	2437	37.569	-	-	-
802.11n VHT40	2452	37.366	-	-	-

Maximum Power Spectral Density Measurement

Mod.	Freq. (MHz)	Measurement (dBm/3 kHz)					Max.Limit (dBm/ 3 kHz)				
		Ant-0	Ant-1	Ant-2	Ant-3	SUM	Ant-0	Ant-1	Ant-2	Ant-3	SUM
802.11b	2412	-5.99	-	-	-		8.00	-	-	-	8.00
802.11b	2437	-5.81	-	-	-		8.00	-	-	-	8.00
802.11b	2462	-3.83	-	-	-		8.00	-	-	-	8.00
802.11g	2412	-11.32	-	-	-		8.00	-	-	-	8.00
802.11g	2437	-6.45	-	-	-		8.00	-	-	-	8.00
802.11g	2462	-7.61	-	-	-		8.00	-	-	-	8.00
802.11n VHT20	2412	-12.80	-	-	-		8.00	-	-	-	8.00
802.11n VHT20	2437	-6.45	-	-	-		8.00	-	-	-	8.00
802.11n VHT20	2462	-9.17	-	-	-		8.00	-	-	-	8.00
802.11n VHT40	2422	-19.75	-	-	-		8.00	-	-	-	8.00
802.11n VHT40	2437	-12.09	-	-	-		8.00	-	-	-	8.00
802.11n VHT40	2452	-19.55	-	-	-		8.00	-	-	-	8.00