



Appendix A. Radiated Spurious Emission

Test Engineer :	Derreck Chen, Ken Wu and Nick Yu	Temperature :	23~25°C
		Relative Humidity :	48~51%

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2325.12	57.59	-16.41	74	52.12	32.09	7.6	34.22	144	22	P	H
		2389.65	44.68	-9.32	54	39.02	32.18	7.75	34.27	144	22	A	H
	*	2412	105.55	-	-	99.9	32.2	7.75	34.3	144	22	P	H
	*	2412	102.1	-	-	96.45	32.2	7.75	34.3	144	22	A	H
													H
													H
		2388.75	57.83	-16.17	74	52.17	32.18	7.75	34.27	153	245	P	V
		2389.83	44.85	-9.15	54	39.22	32.18	7.75	34.3	153	245	A	V
	*	2412	103.53	-	-	97.88	32.2	7.75	34.3	153	245	P	V
	*	2412	100.06	-	-	94.41	32.2	7.75	34.3	153	245	A	V
													V
													V
802.11b CH 06 2437MHz		2322.6	57.54	-16.46	74	52.07	32.09	7.6	34.22	138	21	P	H
		2354.82	45.08	-8.92	54	39.52	32.13	7.68	34.25	138	21	A	H
	*	2437	105.01	-	-	99.29	32.24	7.83	34.35	138	21	P	H
	*	2437	101.46	-	-	95.74	32.24	7.83	34.35	138	21	A	H
		2492.24	58.33	-15.67	74	52.6	32.3	7.91	34.48	138	21	P	H
		2486.36	45.24	-8.76	54	39.48	32.28	7.91	34.43	138	21	A	H
		2332.77	58.19	-15.81	74	52.72	32.09	7.6	34.22	179	30	P	V
		2310.36	44.79	-9.21	54	39.31	32.07	7.6	34.19	179	30	A	V
	*	2438.159	104.07	-	-	98.35	32.24	7.83	34.35	179	30	P	V
	*	2436.323	100.64	-	-	94.94	32.22	7.83	34.35	179	30	A	V
		2498.52	58.42	-15.58	74	52.69	32.3	7.91	34.48	179	30	P	V
		2493.96	45.41	-8.59	54	39.68	32.3	7.91	34.48	179	30	A	V



802.11b CH 11 2462MHz	*	2460.872	105.19	-	-	99.41	32.26	7.91	34.39	157	330	P	H
	*	2461.289	101.75	-	-	95.97	32.26	7.91	34.39	157	330	A	H
		2483.6	59.19	-14.81	74	53.43	32.28	7.91	34.43	157	330	P	H
		2492	45.72	-8.28	54	39.99	32.3	7.91	34.48	157	330	A	H
													H
													H
	*	2460.705	103.35	-	-	97.57	32.26	7.91	34.39	100	33	P	V
	*	2461.289	99.85	-	-	94.07	32.26	7.91	34.39	100	33	A	V
		2499.56	58.58	-15.42	74	52.85	32.3	7.91	34.48	100	33	P	V
		2485.72	45.45	-8.55	54	39.69	32.28	7.91	34.43	100	33	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4824	49.49	-24.51	74	63	34.26	11.16	58.93	100	0	P	H
													H
													H
													H
		4824	48.41	-25.59	74	61.92	34.26	11.16	58.93	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4872	44.02	-29.98	74	57.34	34.3	11.21	58.83	100	0	P	H
		7311	47.15	-26.85	74	54.2	35.6	15.08	57.73	100	0	P	H
													H
													H
		4872	44.33	-29.67	74	57.65	34.3	11.21	58.83	100	0	P	V
		7311	48.11	-25.89	74	55.16	35.6	15.08	57.73	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4926	48.18	-25.82	74	61.3	34.34	11.27	58.73	100	0	P	H
		7386	46.83	-27.17	74	53.89	35.6	15.14	57.8	100	0	P	H
													H
													H
		4924	46.35	-27.65	74	59.47	34.34	11.27	58.73	100	0	P	V
		7386	47.89	-26.11	74	54.95	35.6	15.14	57.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.29	60.78	-13.22	74	55.12	32.18	7.75	34.27	175	24	P	H
		2390	45.92	-8.08	54	40.29	32.18	7.75	34.3	175	24	A	H
	*	2412	107.01	-	-	101.36	32.2	7.75	34.3	175	24	P	H
	*	2412	95.71	-	-	90.06	32.2	7.75	34.3	175	24	A	H
													H
													H
		2389.2	61.63	-12.37	74	55.97	32.18	7.75	34.27	136	242	P	V
		2389.92	45.65	-8.35	54	40.02	32.18	7.75	34.3	136	242	A	V
	*	2412	104.33	-	-	98.68	32.2	7.75	34.3	136	242	P	V
	*	2412	93.94	-	-	88.29	32.2	7.75	34.3	136	242	A	V
													V
													V
802.11g CH 06 2437MHz		2327.19	57.91	-16.09	74	52.44	32.09	7.6	34.22	207	352	P	H
		2385.42	44.61	-9.39	54	38.97	32.16	7.75	34.27	207	352	A	H
	*	2435	107.17	-	-	101.47	32.22	7.83	34.35	207	352	P	H
	*	2435	96.78	-	-	91.08	32.22	7.83	34.35	207	352	A	H
		2489.52	58.44	-15.56	74	52.66	32.3	7.91	34.43	207	352	P	H
		2489.44	46.04	-7.96	54	40.26	32.3	7.91	34.43	207	352	A	H
		2331.33	58.41	-15.59	74	52.94	32.09	7.6	34.22	106	272	P	V
		2383.71	44.57	-9.43	54	38.93	32.16	7.75	34.27	106	272	A	V
	*	2435	105.43	-	-	99.73	32.22	7.83	34.35	106	272	P	V
	*	2435	94.28	-	-	88.58	32.22	7.83	34.35	106	272	A	V
		2489.96	58.7	-15.3	74	52.92	32.3	7.91	34.43	106	272	P	V
		2490.16	45.13	-8.87	54	39.35	32.3	7.91	34.43	106	272	A	V



802.11g CH 11 2462MHz	*	2464	106.97	-	-	101.19	32.26	7.91	34.39	221	350	P	H
	*	2464	96.46	-	-	90.68	32.26	7.91	34.39	221	350	A	H
		2483.64	73.58	-0.42	74	67.82	32.28	7.91	34.43	221	350	P	H
		2483.56	53.1	-0.9	54	47.34	32.28	7.91	34.43	221	350	A	H
													H
													H
	*	2464	103.87	-	-	98.09	32.26	7.91	34.39	100	276	P	V
	*	2464	93.41	-	-	87.63	32.26	7.91	34.39	100	276	A	V
		2483.84	71.67	-2.33	74	65.91	32.28	7.91	34.43	100	276	P	V
		2483.64	50.95	-3.05	54	45.19	32.28	7.91	34.43	100	276	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4824	45.28	-28.72	74	58.79	34.26	11.16	58.93	100	0	P	H
													H
													H
													H
		4824	46.2	-27.8	74	59.71	34.26	11.16	58.93	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4872	41.77	-32.23	74	55.09	34.3	11.21	58.83	100	0	P	H
		7311	46.5	-27.5	74	53.55	35.6	15.08	57.73	100	0	P	H
													H
													H
		4874	41.53	-32.47	74	54.85	34.3	11.21	58.83	100	0	P	V
		7308	48.59	-25.41	74	55.64	35.6	15.08	57.73	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4926	45.85	-28.15	74	58.97	34.34	11.27	58.73	100	0	P	H
		7386	46.61	-27.39	74	53.67	35.6	15.14	57.8	100	0	P	H
													H
													H
		4926	43.72	-30.28	74	56.84	34.34	11.27	58.73	100	0	P	V
		7386	48.94	-25.06	74	56	35.6	15.14	57.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		2390	61.84	-12.16	74	56.21	32.18	7.75	34.3	218	360	P	H
		2389.92	47.25	-6.75	54	41.62	32.18	7.75	34.3	218	360	A	H
	*	2410	106.23	-	-	100.58	32.2	7.75	34.3	218	360	P	H
	*	2410	94.83	-	-	89.18	32.2	7.75	34.3	218	360	A	H
													H
													H
		2389.02	62.14	-11.86	74	56.48	32.18	7.75	34.27	108	269	P	V
		2389.92	46.52	-7.48	54	40.89	32.18	7.75	34.3	108	269	A	V
	*	2410	103.03	-	-	97.38	32.2	7.75	34.3	108	269	P	V
	*	2410	92.6	-	-	86.95	32.2	7.75	34.3	108	269	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2345.64	57.99	-16.01	74	52.45	32.11	7.68	34.25	259	322	P	H
		2385.06	44.57	-9.43	54	38.93	32.16	7.75	34.27	259	322	A	H
	*	2435	106.76	-	-	101.06	32.22	7.83	34.35	259	322	P	H
	*	2435	95.76	-	-	90.06	32.22	7.83	34.35	259	322	A	H
		2489.2	58.69	-15.31	74	52.91	32.3	7.91	34.43	259	322	P	H
		2488.88	46.22	-7.78	54	40.44	32.3	7.91	34.43	259	322	A	H
		2369.49	57.57	-16.43	74	52	32.16	7.68	34.27	103	269	P	V
		2385.24	44.57	-9.43	54	38.93	32.16	7.75	34.27	103	269	A	V
	*	2435	103.41	-	-	97.71	32.22	7.83	34.35	103	269	P	V
	*	2435	93	-	-	87.3	32.22	7.83	34.35	103	269	A	V
		2484.2	58.11	-15.89	74	52.35	32.28	7.91	34.43	103	269	P	V
		2489.16	45.38	-8.62	54	39.6	32.3	7.91	34.43	103	269	A	V



802.11n HT20 CH 11 2462MHz	*	2464	106.15	-	-	100.37	32.26	7.91	34.39	283	337	P	H
	*	2464	95.82	-	-	90.04	32.26	7.91	34.39	283	337	A	H
		2484.24	72.45	-1.55	74	66.69	32.28	7.91	34.43	283	337	P	H
		2483.6	53.43	-0.57	54	47.67	32.28	7.91	34.43	283	337	A	H
													H
													H
	*	2464	103.12	-	-	97.34	32.26	7.91	34.39	100	275	P	V
	*	2464	91.41	-	-	85.63	32.26	7.91	34.39	100	275	A	V
		2484.24	69.29	-4.71	74	63.53	32.28	7.91	34.43	100	275	P	V
		2483.52	50.1	-3.9	54	44.34	32.28	7.91	34.43	100	275	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	45.19	-28.81	74	58.7	34.26	11.16	58.93	100	0	P	H
													H
													H
													H
		4824	44.02	-29.98	74	57.53	34.26	11.16	58.93	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4872	41.47	-32.53	74	54.79	34.3	11.21	58.83	100	0	P	H
		7311	46.58	-27.42	74	53.63	35.6	15.08	57.73	100	0	P	H
													H
													H
		4872	41.68	-32.32	74	55	34.3	11.21	58.83	100	0	P	V
		7311	47.96	-26.04	74	55.01	35.6	15.08	57.73	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4926	43.26	-30.74	74	56.38	34.34	11.27	58.73	100	0	P	H
		7386	44.73	-29.27	74	51.79	35.6	15.14	57.8	100	0	P	H
													H
													H
		4926	41.54	-32.46	74	54.66	34.34	11.27	58.73	100	0	P	V
		7386	47.9	-26.1	74	54.96	35.6	15.14	57.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

[illegible]

**Note symbol**

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is over limit line.
P/A	P eak or A verage
H/V	H orizontal or V ertical



A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.