



Appendix B. Radiated Spurious Emission

Test Engineer :	Ray Lee and Tsung Lee	Temperature :	23~24°C
		Relative Humidity :	44~45%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2385.96	55.15	-18.85	74	55.77	27.23	5.39	33.24	148	354	P	H
		2385.96	45.97	-8.03	54	46.59	27.23	5.39	33.24	148	354	A	H
	*	2411.857	102.27	-	-	102.79	27.28	5.42	33.22	148	354	P	H
	*	2412	99.59	-	-	100.11	27.28	5.42	33.22	148	354	A	H
													H
													H
		2385.87	56.94	-17.06	74	57.56	27.23	5.39	33.24	126	302	P	V
		2385.87	47.88	-6.12	54	48.5	27.23	5.39	33.24	126	302	A	V
	*	2411.857	106.06	-	-	106.58	27.28	5.42	33.22	126	302	P	V
	*	2412	103.37	-	-	103.89	27.28	5.42	33.22	126	302	A	V
													V
													V
802.11b CH 06 2437MHz		2360.67	55.7	-18.3	74	56.48	27.14	5.33	33.25	262	310	P	H
		2357.88	47.23	-6.77	54	48.01	27.14	5.33	33.25	262	310	A	H
	*	2436.907	106.33	-	-	106.75	27.37	5.42	33.21	262	310	P	H
	*	2437	103.62	-	-	104.04	27.37	5.42	33.21	262	310	A	H
		2484.88	53.71	-20.29	74	53.97	27.46	5.46	33.18	262	310	P	H
		2484.44	42.94	-11.06	54	43.2	27.46	5.46	33.18	262	310	A	H
		2325.84	52.71	-21.29	74	53.59	27.05	5.33	33.26	277	322	P	V
		2357.79	42.09	-11.91	54	42.87	27.14	5.33	33.25	277	322	A	V
	*	2436.823	97.41	-	-	97.83	27.37	5.42	33.21	277	322	P	V
	*	2437.658	94.64	-	-	95.06	27.37	5.42	33.21	277	322	A	V
		2495.88	53.27	-20.73	74	53.48	27.5	5.46	33.17	277	322	P	V
		2484.08	42.29	-11.71	54	42.55	27.46	5.46	33.18	277	322	A	V



802.11b CH 11 2462MHz	*	2461.874	100.82	-	-	101.17	27.41	5.44	33.2	132	358	P	H
	*	2462	98.13	-	-	98.48	27.41	5.44	33.2	132	358	A	H
		2487.56	54.43	-19.57	74	54.65	27.5	5.46	33.18	132	358	P	H
		2487.76	43.83	-10.17	54	44.05	27.5	5.46	33.18	132	358	A	H
													H
													H
	*	2461.874	104.56	-	-	104.91	27.41	5.44	33.2	100	301	P	V
	*	2462	101.9	-	-	102.25	27.41	5.44	33.2	100	301	A	V
		2486	56.33	-17.67	74	56.59	27.46	5.46	33.18	100	301	P	V
		2487.56	45.12	-8.88	54	45.34	27.5	5.46	33.18	100	301	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	43.93	-30.07	74	65.5	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	46.98	-27.02	74	68.55	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		3654	48.96	-25.04	74	74.41	29.11	6.51	61.07	100	0	P	H
		4874	47.05	-26.95	74	68.31	31.56	7.7	60.52	100	0	P	H
		7311	55.03	-18.97	74	70.29	36.18	9.49	60.93	170	285	P	H
		7311	50.57	-3.43	54	65.83	36.18	9.49	60.93	170	285	A	H
		3654	49.75	-24.25	74	75.2	29.11	6.51	61.07	100	0	P	V
		4320	46.96	-27.04	74	70.5	30.43	7.16	61.13	100	0	P	V
		4874	49.56	-24.44	74	70.82	31.56	7.7	60.52	100	0	P	V
		7311	52.88	-21.12	74	68.14	36.18	9.49	60.93	254	355	P	V
802.11b CH 11 2462MHz		4926	43.3	-30.7	74	64.13	31.66	7.93	60.42	100	0	P	H
		7386	54.9	-19.1	74	70.19	36.37	9.53	61.19	100	122	P	H
		7386	51.37	-2.63	54	66.66	36.37	9.53	61.19	100	122	A	H
													H
		4926	47.71	-26.29	74	68.54	31.66	7.93	60.42	100	0	P	V
		7386	54.21	-19.79	74	69.5	36.37	9.53	61.19	104	164	P	V
		7386	52.21	-1.79	54	67.5	36.37	9.53	61.19	104	164	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.47	66.61	-7.39	74	67.23	27.23	5.39	33.24	111	356	P	H
		2390	51.75	-2.25	54	52.35	27.23	5.39	33.22	111	356	A	H
	*	2412	104.07	-	-	104.59	27.28	5.42	33.22	111	356	P	H
	*	2411.022	95.77	-	-	96.29	27.28	5.42	33.22	111	356	A	H
													H
													H
		2389.92	68.32	-5.68	74	68.92	27.23	5.39	33.22	100	302	P	V
		2390	53.73	-0.27	54	54.33	27.23	5.39	33.22	100	302	A	V
	*	2411.439	107.03	-	-	107.55	27.28	5.42	33.22	100	302	P	V
	*	2412	98.58	-	-	99.1	27.28	5.42	33.22	100	302	A	V
													V
													V
802.11g CH 06 2437MHz		2342.58	53.39	-20.61	74	54.21	27.1	5.33	33.25	108	357	P	H
		2359.32	43.55	-10.45	54	44.33	27.14	5.33	33.25	108	357	A	H
	*	2436.823	104.14	-	-	104.56	27.37	5.42	33.21	108	357	P	H
	*	2437	94.28	-	-	94.7	27.37	5.42	33.21	108	357	A	H
		2496.28	53.49	-20.51	74	53.7	27.5	5.46	33.17	108	357	P	H
		2486.28	43.29	-10.71	54	43.55	27.46	5.46	33.18	108	357	A	H
		2388.03	55.07	-18.93	74	55.69	27.23	5.39	33.24	100	301	P	V
		2389.56	44.49	-9.51	54	45.11	27.23	5.39	33.24	100	301	A	V
	*	2437.157	105.4	-	-	105.82	27.37	5.42	33.21	100	301	P	V
	*	2437	97.08	-	-	97.5	27.37	5.42	33.21	100	301	A	V
		2485.6	53.18	-20.82	74	53.44	27.46	5.46	33.18	100	301	P	V
		2484.2	43.64	-10.36	54	43.9	27.46	5.46	33.18	100	301	A	V



802.11g CH 11 2462MHz	*	2462	101.66	-	-	102.01	27.41	5.44	33.2	132	357	P	H
	*	2462	93.78	-	-	94.13	27.41	5.44	33.2	132	357	A	H
		2484.12	58.84	-15.16	74	59.1	27.46	5.46	33.18	132	357	P	H
		2483.52	47.19	-6.81	54	47.45	27.46	5.46	33.18	132	357	A	H
													H
													H
	*	2462	105.71	-	-	106.06	27.41	5.44	33.2	100	300	P	V
	*	2460.788	97.44	-	-	97.79	27.41	5.44	33.2	100	300	A	V
		2485	62.12	-11.88	74	62.38	27.46	5.46	33.18	100	300	P	V
		2483.72	49.94	-4.06	54	50.2	27.46	5.46	33.18	100	300	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	40	-34	74	61.57	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	41.69	-32.31	74	63.26	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4872	40.45	-33.55	74	61.71	31.56	7.7	60.52	100	0	P	H
		7309	57.67	-16.33	74	72.93	36.18	9.49	60.93	100	123	P	H
		7309	50.39	-3.61	54	65.65	36.18	9.49	60.93	100	123	A	H
													H
		4872	41.65	-32.35	74	62.91	31.56	7.7	60.52	100	0	P	V
		7313	59.31	-14.69	74	74.57	36.18	9.49	60.93	107	164	P	V
		7313	51.16	-2.84	54	66.42	36.18	9.49	60.93	107	164	A	V
													V
802.11g CH 11 2462MHz		4922	43	-31	74	63.83	31.66	7.93	60.42	100	0	P	H
		7384	51.2	-22.8	74	66.49	36.37	9.53	61.19	100	131	P	H
		7384	44.94	-9.06	54	60.23	36.37	9.53	61.19	100	131	A	H
													H
		4926	43.72	-30.28	74	64.55	31.66	7.93	60.42	100	0	P	V
		7386	51.9	-22.1	74	67.19	36.37	9.53	61.19	103	164	P	V
		7386	45.29	-8.71	54	60.58	36.37	9.53	61.19	103	164	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2388.12	63.84	-10.16	74	64.46	27.23	5.39	33.24	112	356	P	H
		2389.83	51.04	-2.96	54	51.64	27.23	5.39	33.22	112	356	A	H
	*	2411.69	102.05	-	-	102.57	27.28	5.42	33.22	112	356	P	H
	*	2411.189	94.66	-	-	95.18	27.28	5.42	33.22	112	356	A	H
													H
													H
		2389.02	65.22	-8.78	74	65.84	27.23	5.39	33.24	126	302	P	V
		2389.92	52.77	-1.23	54	53.37	27.23	5.39	33.22	126	302	A	V
	*	2411.105	105.57	-	-	106.09	27.28	5.42	33.22	126	302	P	V
	*	2412	98.12	-	-	98.64	27.28	5.42	33.22	126	302	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2343.66	53.43	-20.57	74	54.25	27.1	5.33	33.25	112	354	P	H
		2359.41	43.44	-10.56	54	44.22	27.14	5.33	33.25	112	354	A	H
	*	2437	100.86	-	-	101.28	27.37	5.42	33.21	112	354	P	H
	*	2437	93.49	-	-	93.91	27.37	5.42	33.21	112	354	A	H
		2483.56	53.19	-20.81	74	53.45	27.46	5.46	33.18	112	354	P	H
		2483.76	43.24	-10.76	54	43.5	27.46	5.46	33.18	112	354	A	H
		2364.99	53.22	-20.78	74	53.93	27.14	5.39	33.24	145	300	P	V
		2389.92	43.8	-10.2	54	44.4	27.23	5.39	33.22	145	300	A	V
	*	2436.656	104.28	-	-	104.7	27.37	5.42	33.21	145	300	P	V
	*	2437	96.89	-	-	97.31	27.37	5.42	33.21	145	300	A	V
		2497.04	53.66	-20.34	74	53.87	27.5	5.46	33.17	145	300	P	V
		2483.96	43.47	-10.53	54	43.73	27.46	5.46	33.18	145	300	A	V



802.11n HT20 CH 11 2462MHz	*	2462	100.69	-	-	101.04	27.41	5.44	33.2	163	356	P	H
	*	2462	92.94	-	-	93.29	27.41	5.44	33.2	163	356	A	H
		2486.56	57.59	-16.41	74	57.85	27.46	5.46	33.18	163	356	P	H
		2483.52	46.26	-7.74	54	46.52	27.46	5.46	33.18	163	356	A	H
													H
													H
	*	2461.79	104.02	-	-	104.37	27.41	5.44	33.2	100	300	P	V
	*	2462	96.85	-	-	97.2	27.41	5.44	33.2	100	300	A	V
		2483.68	61.27	-12.73	74	61.53	27.46	5.46	33.18	100	300	P	V
		2483.6	48.6	-5.4	54	48.86	27.46	5.46	33.18	100	300	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	41.29	-32.71	74	62.86	31.46	7.58	60.61	100	0	P	H
													H
													H
													H
		4824	41.56	-32.44	74	63.13	31.46	7.58	60.61	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	41.47	-32.53	74	62.73	31.56	7.7	60.52	100	0	P	H
		7311	58.21	-15.79	74	73.47	36.18	9.49	60.93	100	217	P	H
		7311	48.58	-5.42	54	63.84	36.18	9.49	60.93	100	217	A	H
													H
		4872	40.85	-33.15	74	62.11	31.56	7.7	60.52	100	0	P	V
		7311	55.91	-18.09	74	71.17	36.18	9.49	60.93	100	294	P	V
		7311	46.73	-7.27	54	61.99	36.18	9.49	60.93	100	294	A	V
													V
802.11n HT20 CH 11 2462MHz		4926	39.71	-34.29	74	60.54	31.66	7.93	60.42	100	0	P	H
		7386	50.08	-23.92	74	65.37	36.37	9.53	61.19	100	0	P	H
													H
													H
		4926	41.38	-32.62	74	62.21	31.66	7.93	60.42	100	0	P	V
		7384	51.51	-22.49	74	66.8	36.37	9.53	61.19	100	163	P	V
		7384	42.75	-11.25	54	58.04	36.37	9.53	61.19	100	163	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

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)	
2.4GHz 802.11g LF		38.91	19.38	-20.62	40	36.47	15.06	0.65	32.8			P	H	
		115.86	23.99	-19.51	43.5	43.78	11.72	1.14	32.65			P	H	
		214.41	34	-9.5	43.5	54.79	10.32	1.62	32.73			P	H	
		385.4	35.84	-10.16	46	50.41	16.12	2.13	32.82			P	H	
		538	40.18	-5.82	46	52.09	18.58	2.47	32.96			P	H	
		864.2	40.65	-5.35	46	47.31	22.7	3.16	32.52	100	42	P	H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
		38.91	29.07	-10.93	40	46.16	15.06	0.65	32.8				P	V
		73.2	24.69	-15.31	40	49.3	7.17	0.93	32.71				P	V
		214.41	26.69	-16.81	43.5	47.48	10.32	1.62	32.73				P	V
		385.4	31.87	-14.13	46	46.44	16.12	2.13	32.82				P	V
		556.9	35.29	-10.71	46	46.98	18.82	2.47	32.98				P	V
		864.2	41.91	-4.09	46	48.57	22.7	3.16	32.52	100	16		P	V
														V
														V
														V
														V
														V
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical

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		(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”.