



Appendix B. Radiated Spurious Emission

Test Engineer :	Nick Yu, Ken Wu, and James Chiu	Temperature :	23~25°C
		Relative Humidity :	44~46%

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		2389.92	58.49	-15.51	74	52.86	32.18	7.75	34.3	100	88	P	H	
		2390	48.85	-5.15	54	43.22	32.18	7.75	34.3	100	88	A	H	
	*	2412	105.23	-	-	99.58	32.2	7.75	34.3	100	88	P	H	
	*	2412	101.87	-	-	96.22	32.2	7.75	34.3	100	88	A	H	
													H	
														H
			2387.94	58.07	-15.93	74	52.41	32.18	7.75	34.27	103	281	P	V
			2389.74	45.62	-8.38	54	39.96	32.18	7.75	34.27	103	281	A	V
	*		2412	101.32	-	-	95.67	32.2	7.75	34.3	103	281	P	V
	*		2412	97.92	-	-	92.27	32.2	7.75	34.3	103	281	A	V
														V
														V
802.11b CH 06 2437MHz		2344.29	57.94	-16.06	74	52.4	32.11	7.68	34.25	102	96	P	H	
		2361.21	45.28	-8.72	54	39.72	32.13	7.68	34.25	102	96	A	H	
	*	2437	104.33	-	-	98.61	32.24	7.83	34.35	102	96	P	H	
	*	2437	100.54	-	-	94.82	32.24	7.83	34.35	102	96	A	H	
			2491.08	58.21	-15.79	74	52.43	32.3	7.91	34.43	102	96	P	H
			2486.92	45.31	-8.69	54	39.55	32.28	7.91	34.43	102	96	A	H
			2360.67	57.77	-16.23	74	52.21	32.13	7.68	34.25	102	272	P	V
			2335.11	45.24	-8.76	54	39.75	32.11	7.6	34.22	102	272	A	V
	*		2437	97.28	-	-	91.56	32.24	7.83	34.35	102	272	P	V
	*		2437	93.31	-	-	87.59	32.24	7.83	34.35	102	272	A	V
			2487.28	58.08	-15.92	74	52.32	32.28	7.91	34.43	102	272	P	V
			2485.08	45.56	-8.44	54	39.8	32.28	7.91	34.43	102	272	A	V



802.11b CH 11 2462MHz	*	2462	103.31	-	-	97.53	32.26	7.91	34.39	100	97	P	H
	*	2462	99.68	-	-	93.9	32.26	7.91	34.39	100	97	A	H
		2490	58	-16	74	52.22	32.3	7.91	34.43	100	97	P	H
		2487.32	45.39	-8.61	54	39.63	32.28	7.91	34.43	100	97	A	H
													H
													H
	*	2462	98.43	-	-	92.65	32.26	7.91	34.39	100	228	P	V
	*	2462	94.97	-	-	89.19	32.26	7.91	34.39	100	228	A	V
		2493.32	58.35	-15.65	74	52.62	32.3	7.91	34.48	100	228	P	V
		2490.28	45.31	-8.69	54	39.53	32.3	7.91	34.43	100	228	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	50.34	-23.66	74	64.56	34.26	11.16	59.64	100	0	P	H
													H
													H
													H
		4824	48.24	-25.76	74	62.46	34.26	11.16	59.64	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4872	50.25	-23.75	74	64.31	34.3	11.21	59.57	100	0	P	H
		7308	43.26	-30.74	74	51.05	35.6	15.08	58.47	100	0	P	H
													H
													H
		4872	45.2	-28.8	74	59.26	34.3	11.21	59.57	100	0	P	V
		7308	43.35	-30.65	74	51.14	35.6	15.08	58.47	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4926	53.95	-20.05	74	67.84	34.34	11.27	59.5	100	239	P	H
		4926	51.2	-2.8	54	65.09	34.34	11.27	59.5	100	239	A	H
		7386	43.35	-30.65	74	51.19	35.6	15.14	58.58	100	0	P	H
													H
		4926	47.68	-26.32	74	61.57	34.34	11.27	59.5	100	0	P	V
		7386	43.15	-30.85	74	50.99	35.6	15.14	58.58	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		2389.83	68.16	-5.84	74	62.53	32.18	7.75	34.3	100	100	P	H	
		2389.92	52.8	-1.2	54	47.17	32.18	7.75	34.3	100	100	A	H	
	*	2412	105.75	-	-	100.1	32.2	7.75	34.3	100	100	P	H	
	*	2412	95.49	-	-	89.84	32.2	7.75	34.3	100	100	A	H	
													H	
													H	
			2389.92	61.29	-12.71	74	55.66	32.18	7.75	34.3	110	353	P	V
			2390	47.05	-6.95	54	41.42	32.18	7.75	34.3	110	353	A	V
	*		2412	99.49	-	-	93.84	32.2	7.75	34.3	110	353	P	V
	*		2412	88.47	-	-	82.82	32.2	7.75	34.3	110	353	A	V
													V	
													V	
802.11g CH 06 2437MHz		2315.31	58.18	-15.82	74	52.73	32.07	7.6	34.22	101	80	P	H	
		2347.17	44.88	-9.12	54	39.34	32.11	7.68	34.25	101	80	A	H	
	*	2437	103.56	-	-	97.84	32.24	7.83	34.35	101	80	P	H	
	*	2437	93.15	-	-	87.43	32.24	7.83	34.35	101	80	A	H	
			2493.24	58.82	-15.18	74	53.09	32.3	7.91	34.48	101	80	P	H
			2492.72	44.89	-9.11	54	39.16	32.3	7.91	34.48	101	80	A	H
			2358.06	58.1	-15.9	74	52.54	32.13	7.68	34.25	100	270	P	V
			2364.36	44.87	-9.13	54	39.33	32.13	7.68	34.27	100	270	A	V
	*		2437	99.21	-	-	93.49	32.24	7.83	34.35	100	270	P	V
	*		2437	89.23	-	-	83.51	32.24	7.83	34.35	100	270	A	V
			2483.84	57.87	-16.13	74	52.11	32.28	7.91	34.43	100	270	P	V
			2492.92	44.95	-9.05	54	39.22	32.3	7.91	34.48	100	270	A	V



802.11g CH 11 2462MHz	*	2462	102.51	-	-	96.73	32.26	7.91	34.39	115	324	P	H
	*	2462	92.08	-	-	86.3	32.26	7.91	34.39	115	324	A	H
		2483.68	66.63	-7.37	74	60.87	32.28	7.91	34.43	115	324	P	H
		2483.52	46.46	-7.54	54	40.7	32.28	7.91	34.43	115	324	A	H
													H
													H
	*	2462	98.36	-	-	92.58	32.26	7.91	34.39	100	257	P	V
	*	2462	87.43	-	-	81.65	32.26	7.91	34.39	100	257	A	V
		2492.04	58.19	-15.81	74	52.46	32.3	7.91	34.48	100	257	P	V
		2483.76	45.1	-8.9	54	39.34	32.28	7.91	34.43	100	257	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	43.16	-30.84	74	57.38	34.26	11.16	59.64	100	0	P	H
													H
													H
													H
		4824	41.32	-32.68	74	55.54	34.26	11.16	59.64	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4872	42.46	-31.54	74	56.52	34.3	11.21	59.57	100	0	P	H
		7308	43.82	-30.18	74	51.61	35.6	15.08	58.47	100	0	P	H
													H
													H
		4872	41.83	-32.17	74	55.89	34.3	11.21	59.57	100	0	P	V
		7308	42.9	-31.1	74	50.69	35.6	15.08	58.47	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4926	45.47	-28.53	74	59.36	34.34	11.27	59.5	100	0	P	H
		7386	43.06	-30.94	74	50.9	35.6	15.14	58.58	100	0	P	H
													H
													H
		4926	42.44	-31.56	74	56.33	34.34	11.27	59.5	100	0	P	V
		7386	42.33	-31.67	74	50.17	35.6	15.14	58.58	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		2389.92	63.77	-10.23	74	58.14	32.18	7.75	34.3	100	86	P	H	
		2390	48.94	-5.06	54	43.31	32.18	7.75	34.3	100	86	A	H	
	*	2412	102.37	-	-	96.72	32.2	7.75	34.3	100	86	P	H	
	*	2412	91.69	-	-	86.04	32.2	7.75	34.3	100	86	A	H	
													H	
													H	
			2388.93	59.7	-14.3	74	54.04	32.18	7.75	34.27	100	249	P	V
			2389.83	46.63	-7.37	54	41	32.18	7.75	34.3	100	249	A	V
		*	2412	98.35	-	-	92.7	32.2	7.75	34.3	100	249	P	V
		*	2412	87.61	-	-	81.96	32.2	7.75	34.3	100	249	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2321.88	57.78	-16.22	74	52.31	32.09	7.6	34.22	103	84	P	H	
		2334.12	44.88	-9.12	54	39.41	32.09	7.6	34.22	103	84	A	H	
		* 2437	100.94	-	-	95.22	32.24	7.83	34.35	103	84	P	H	
		* 2437	90.95	-	-	85.23	32.24	7.83	34.35	103	84	A	H	
		2491.68	58.15	-15.85	74	52.37	32.3	7.91	34.43	103	84	P	H	
		2489.32	44.91	-9.09	54	39.13	32.3	7.91	34.43	103	84	A	H	
		2370.39	58.01	-15.99	74	52.44	32.16	7.68	34.27	100	231	P	V	
		2344.02	44.81	-9.19	54	39.27	32.11	7.68	34.25	100	231	A	V	
		* 2437	95.92	-	-	90.2	32.24	7.83	34.35	100	231	P	V	
		* 2437	85.74	-	-	80.02	32.24	7.83	34.35	100	231	A	V	
	2494.68	57.95	-16.05	74	52.22	32.3	7.91	34.48	100	231	P	V		
	2485.36	44.97	-9.03	54	39.21	32.28	7.91	34.43	100	231	A	V		



802.11n HT20 CH 11 2462MHz	*	2462	101.15	-	-	95.37	32.26	7.91	34.39	144	243	P	H
	*	2462	90.53	-	-	84.75	32.26	7.91	34.39	144	243	A	H
		2484.2	65.2	-8.8	74	59.44	32.28	7.91	34.43	144	243	P	H
		2483.56	46.19	-7.81	54	40.43	32.28	7.91	34.43	144	243	A	H
													H
													H
	*	2462	98.17	-	-	92.39	32.26	7.91	34.39	100	258	P	V
	*	2462	87.61	-	-	81.83	32.26	7.91	34.39	100	258	A	V
		2484.84	62.09	-11.91	74	56.33	32.28	7.91	34.43	100	258	P	V
		2483.56	45.42	-8.58	54	39.66	32.28	7.91	34.43	100	258	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	42.01	-31.99	74	56.23	34.26	11.16	59.64	100	0	P	H
													H
													H
													H
		4824	41.36	-32.64	74	55.58	34.26	11.16	59.64	400	0	P	V
													V
													V
802.11n HT20 CH 06 2437MHz		4872	42.97	-31.03	74	57.03	34.3	11.21	59.57	100	0	P	H
		7308	43.14	-30.86	74	50.93	35.6	15.08	58.47	100	0	P	H
													H
													H
		4872	42.29	-31.71	74	56.35	34.3	11.21	59.57	100	0	P	V
		7308	42.96	-31.04	74	50.75	35.6	15.08	58.47	100	0	P	V
													V
802.11n HT20 CH 11 2462MHz		4926	44.5	-29.5	74	58.39	34.34	11.27	59.5	100	0	P	H
		7386	44.12	-29.88	74	51.96	35.6	15.14	58.58	100	0	P	H
													H
													H
		4926	41.63	-32.37	74	55.52	34.34	11.27	59.5	100	0	P	V
		7386	43.39	-30.61	74	51.23	35.6	15.14	58.58	100	0	P	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)

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		88.59	20.09	-23.41	43.5	40.67	8.46	2.06	31.1	-	-	P	H	
		196.32	20.95	-22.55	43.5	40.38	8.98	2.69	31.1	-	-	P	H	
		258.96	16.39	-29.61	46	30.59	13.84	2.96	31	-	-	P	H	
		448.4	24.73	-21.27	46	34.6	17.24	3.63	30.74	-	-	P	H	
		722.8	25.61	-20.39	46	30.04	21.56	4.41	30.4	-	-	P	H	
		941.2	28.26	-17.74	46	29.39	24.31	4.94	30.38	136	56	P	H	
														H
														H
														H
														H
														H
														H
														H
			91.02	17.31	-26.19	43.5	37.55	8.8	2.06	31.1	-	-	P	V
			193.35	14.68	-28.82	43.5	34.2	8.89	2.69	31.1	-	-	P	V
			259.5	16.34	-29.66	46	30.38	14	2.96	31	-	-	P	V
			448.4	22.27	-23.73	46	32.14	17.24	3.63	30.74	-	-	P	V
			657	25.97	-20.03	46	31.91	20.33	4.22	30.49	-	-	P	V
			914.6	27.99	-18.01	46	29.79	23.73	4.8	30.33	103	169	P	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 per 15.209(c).
!	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+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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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".