



Appendix B. Radiated Spurious Emission

Test Engineer :	Wei Chen, Ken Wu and James Chiu	Temperature :	21~23°C
		Relative Humidity :	60~63%

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		2346.9	59.67	-14.33	74	54.13	32.11	7.68	34.25	100	233	P	H
		2386.95	45.39	-8.61	54	39.73	32.18	7.75	34.27	100	233	A	H
	*	2410.688	105.74	-	-	100.09	32.2	7.75	34.3	100	233	P	H
	*	2411.272	101.62	-	-	95.97	32.2	7.75	34.3	100	233	A	H
													H
													H
		2358.6	59.26	-14.74	74	53.7	32.13	7.68	34.25	100	155	P	V
		2388.3	45.21	-8.79	54	39.55	32.18	7.75	34.27	100	155	A	V
	*	2410.604	100.49	-	-	94.84	32.2	7.75	34.3	100	155	P	V
	*	2411.189	96.82	-	-	91.17	32.2	7.75	34.3	100	155	A	V
													V
													V
802.11b CH 06 2437MHz		2312.88	59.47	-14.53	74	53.99	32.07	7.6	34.19	100	247	P	H
		2383.53	45.24	-8.76	54	39.6	32.16	7.75	34.27	100	247	A	H
	*	2438.159	107.39	-	-	101.67	32.24	7.83	34.35	100	247	P	H
	*	2437.742	103.67	-	-	97.95	32.24	7.83	34.35	100	247	A	H
		2490.56	59.21	-14.79	74	53.43	32.3	7.91	34.43	100	247	P	H
		2483.64	45.44	-8.56	54	39.68	32.28	7.91	34.43	100	247	A	H
		2375.7	58.75	-15.25	74	53.18	32.16	7.68	34.27	102	91	P	V
		2330.61	45.19	-8.81	54	39.72	32.09	7.6	34.22	102	91	A	V
	*	2438.159	100.51	-	-	94.79	32.24	7.83	34.35	102	91	P	V
	*	2437.658	96.71	-	-	90.99	32.24	7.83	34.35	102	91	A	V
		2487.28	59.5	-14.5	74	53.74	32.28	7.91	34.43	102	91	P	V
		2483.8	45.28	-8.72	54	39.52	32.28	7.91	34.43	102	91	A	V



802.11b CH 11 2462MHz	*	2460.788	107.4	-	-	101.62	32.26	7.91	34.39	112	237	P	H
	*	2461.289	103.58	-	-	97.8	32.26	7.91	34.39	112	237	A	H
		2487.68	59.75	-14.25	74	53.97	32.3	7.91	34.43	112	237	P	H
		2483.52	45.5	-8.5	54	39.74	32.28	7.91	34.43	112	237	A	H
													H
													H
	*	2460.538	101.12	-	-	95.34	32.26	7.91	34.39	100	220	P	V
	*	2461.289	97.17	-	-	91.39	32.26	7.91	34.39	100	220	A	V
		2495.52	59.14	-14.86	74	53.41	32.3	7.91	34.48	100	220	P	V
		2483.6	45.36	-8.64	54	39.6	32.28	7.91	34.43	100	220	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	56.52	-17.48	74	70.74	34.26	11.16	59.64	100	242	P	H
		4824	50.62	-3.38	54	64.84	34.26	11.16	59.64	100	242	A	H
													H
													H
		4824	47.63	-26.37	74	61.85	34.26	11.16	59.64	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	54.69	-19.31	74	68.75	34.3	11.21	59.57	100	267	P	H
		4874	48.55	-5.45	54	62.61	34.3	11.21	59.57	100	267	A	H
		7311	48.42	-25.58	74	56.21	35.6	15.08	58.47	100	0	P	H
													H
		4874	45.63	-28.37	74	59.69	34.3	11.21	59.57	100	0	P	V
		7311	50.89	-23.11	74	58.68	35.6	15.08	58.47	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	52.59	-21.41	74	66.48	34.34	11.27	59.5	119	245	P	H
		4924	50.56	-3.44	54	64.45	34.34	11.27	59.5	119	245	A	H
		7386	45.92	-28.08	74	53.76	35.6	15.14	58.58	396	0	P	H
													H
		4926	47.73	-26.27	74	61.62	34.34	11.27	59.5	397	0	P	V
		7386	46.27	-27.73	74	54.11	35.6	15.14	58.58	397	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	63.7	-10.3	74	58.07	32.18	7.75	34.3	100	252	P	H
		2389.74	48.07	-5.93	54	42.41	32.18	7.75	34.27	100	252	A	H
	*	2412	108.06	-	-	102.41	32.2	7.75	34.3	100	252	P	H
	*	2412	97.79	-	-	92.14	32.2	7.75	34.3	100	252	A	H
													H
													H
		2326.02	59.19	-14.81	74	53.72	32.09	7.6	34.22	103	144	P	V
		2390	45.87	-8.13	54	40.24	32.18	7.75	34.3	103	144	A	V
	*	2412	101.28	-	-	95.63	32.2	7.75	34.3	103	144	P	V
	*	2412	90.89	-	-	85.24	32.2	7.75	34.3	103	144	A	V
													V
													V
802.11g CH 06 2437MHz		2310.9	59.07	-14.93	74	53.59	32.07	7.6	34.19	138	235	P	H
		2385.15	45.77	-8.23	54	40.13	32.16	7.75	34.27	138	235	A	H
	*	2437	108.31	-	-	102.59	32.24	7.83	34.35	138	235	P	H
	*	2437	98.23	-	-	92.51	32.24	7.83	34.35	138	235	A	H
		2488.56	59.19	-14.81	74	53.41	32.3	7.91	34.43	138	235	P	H
		2484.44	45.73	-8.27	54	39.97	32.28	7.91	34.43	138	235	A	H
		2318.1	59.56	-14.44	74	54.09	32.09	7.6	34.22	132	159	P	V
		2323.23	45.55	-8.45	54	40.08	32.09	7.6	34.22	132	159	A	V
	*	2437	101.69	-	-	95.97	32.24	7.83	34.35	132	159	P	V
	*	2437	91.61	-	-	85.89	32.24	7.83	34.35	132	159	A	V
		2485.56	59.75	-14.25	74	53.99	32.28	7.91	34.43	132	159	P	V
		2485.44	45.74	-8.26	54	39.98	32.28	7.91	34.43	132	159	A	V



802.11g CH 11 2462MHz	*	2462	107.52	-	-	101.74	32.26	7.91	34.39	210	269	P	H
	*	2462	97.33	-	-	91.55	32.26	7.91	34.39	210	269	A	H
		2483.52	62.08	-11.92	74	56.32	32.28	7.91	34.43	210	269	P	H
		2483.52	47.17	-6.83	54	41.41	32.28	7.91	34.43	210	269	A	H
													H
													H
	*	2462	104.41	-	-	98.63	32.26	7.91	34.39	349	40	P	V
	*	2462	94.36	-	-	88.58	32.26	7.91	34.39	349	40	A	V
		2483.96	60.14	-13.86	74	54.38	32.28	7.91	34.43	349	40	P	V
		2483.56	46.39	-7.61	54	40.63	32.28	7.91	34.43	349	40	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	49.68	-24.32	74	63.9	34.26	11.16	59.64	100	0	P	H
													H
													H
													H
		4824	44.16	-29.84	74	58.38	34.26	11.16	59.64	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	46.23	-27.77	74	60.29	34.3	11.21	59.57	100	0	P	H
		7311	44.67	-29.33	74	52.46	35.6	15.08	58.47	100	0	P	H
													H
													H
		4874	43.09	-30.91	74	57.15	34.3	11.21	59.57	100	0	P	V
		7311	45.53	-28.47	74	53.32	35.6	15.08	58.47	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	49.15	-24.85	74	63.04	34.34	11.27	59.5	100	0	P	H
		7386	45.49	-28.51	74	53.33	35.6	15.14	58.58	100	0	P	H
													H
													H
		4924	44.23	-29.77	74	58.12	34.34	11.27	59.5	100	0	P	V
		7386	44.65	-29.35	74	52.49	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	66.09	-7.91	74	60.46	32.18	7.75	34.3	100	249	P	H
		2389.92	49.2	-4.8	54	43.57	32.18	7.75	34.3	100	249	A	H
	*	2412	107.05	-	-	101.4	32.2	7.75	34.3	100	249	P	H
	*	2412	96.42	-	-	90.77	32.2	7.75	34.3	100	249	A	H
													H
													H
		2389.38	61.21	-12.79	74	55.55	32.18	7.75	34.27	330	42	P	V
		2389.92	46.98	-7.02	54	41.35	32.18	7.75	34.3	330	42	A	V
	*	2412	102.18	-	-	96.53	32.2	7.75	34.3	330	42	P	V
	*	2412	92.24	-	-	86.59	32.2	7.75	34.3	330	42	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2369.4	58.52	-15.48	74	52.95	32.16	7.68	34.27	141	156	P	H
		2385.06	45.92	-8.08	54	40.28	32.16	7.75	34.27	141	156	A	H
	*	2437	107.32	-	-	101.6	32.24	7.83	34.35	141	156	P	H
	*	2437	96.46	-	-	90.74	32.24	7.83	34.35	141	156	A	H
		2498.08	59.15	-14.85	74	53.42	32.3	7.91	34.48	141	156	P	H
		2483.8	45.83	-8.17	54	40.07	32.28	7.91	34.43	141	156	A	H
		2331.15	58.63	-15.37	74	53.16	32.09	7.6	34.22	324	319	P	V
		2330.07	45.6	-8.4	54	40.13	32.09	7.6	34.22	324	319	A	V
	*	2437	102.21	-	-	96.49	32.24	7.83	34.35	324	319	P	V
	*	2437	92.01	-	-	86.29	32.24	7.83	34.35	324	319	A	V
		2483.52	58.86	-15.14	74	53.1	32.28	7.91	34.43	324	319	P	V
		2495.52	45.64	-8.36	54	39.91	32.3	7.91	34.48	324	319	A	V



802.11n HT20 CH 11 2462MHz	*	2462	105.81	-	-	100.03	32.26	7.91	34.39	100	158	P	H
	*	2462	95.59	-	-	89.81	32.26	7.91	34.39	100	158	A	H
		2483.6	61.14	-12.86	74	55.38	32.28	7.91	34.43	100	158	P	H
		2483.6	47.25	-6.75	54	41.49	32.28	7.91	34.43	100	158	A	H
													H
													H
	*	2462	102.11	-	-	96.33	32.26	7.91	34.39	379	170	P	V
	*	2462	91.1	-	-	85.32	32.26	7.91	34.39	379	170	A	V
		2498.12	59.81	-14.19	74	54.08	32.3	7.91	34.48	379	170	P	V
		2484.4	45.73	-8.27	54	39.97	32.28	7.91	34.43	379	170	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	48.79	-25.21	74	63.01	34.26	11.16	59.64	100	0	P	H
													H
													H
													H
		4824	44.01	-29.99	74	58.23	34.26	11.16	59.64	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	46.55	-27.45	74	60.61	34.3	11.21	59.57	100	0	P	H
		7311	44.01	-29.99	74	51.8	35.6	15.08	58.47	100	0	P	H
													H
													H
		4874	43.71	-30.29	74	57.77	34.3	11.21	59.57	100	0	P	V
		7311	44.23	-29.77	74	52.02	35.6	15.08	58.47	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	47	-27	74	60.89	34.34	11.27	59.5	100	0	P	H
		7386	44.09	-29.91	74	51.93	35.6	15.14	58.58	100	0	P	H
													H
													H
		4924	44.4	-29.6	74	58.29	34.34	11.27	59.5	100	0	P	V
		7386	44.04	-29.96	74	51.88	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 Emission below 1GHz

2.4GHz WIFI 802.11b (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 802.11b LF		59.43	22.97	-17.03	40	46.4	6.08	1.77	31.28	168	221	P	H
		106.95	21.33	-22.17	43.5	39.5	10.62	2.38	31.17	-	-	P	H
		156.63	25.53	-17.97	43.5	43.47	10.62	2.61	31.17	-	-	P	H
		414.8	24.52	-21.48	46	35.37	16.45	3.52	30.82	-	-	P	H
		733.3	26.52	-19.48	46	30.45	22.06	4.41	30.4	-	-	P	H
		974.1	29.6	-24.4	54	30.09	24.88	4.94	30.31	-	-	P	H
													H
													H
													H
													H
													H
													H
		31.62	32.02	-7.98	40	43.91	17.76	1.77	31.42	116	82	P	V
		106.95	22.79	-20.71	43.5	40.96	10.62	2.38	31.17	-	-	P	V
		159.6	19.14	-24.36	43.5	37.23	10.5	2.61	31.2	-	-	P	V
		498.1	22.71	-23.29	46	31.58	17.98	3.77	30.62	-	-	P	V
		718.6	26.28	-19.72	46	30.91	21.36	4.41	30.4	-	-	P	V
		957.3	29.44	-16.56	46	30.25	24.62	4.94	30.37	-	-	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 per 15.209(c).
!	Test result is over limit line.
P/A	Peak or Average
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”.