



Appendix B. Radiated Spurious Emission

Test Engineer :	Wilson Wu	Temperature :	24~25°C
		Relative Humidity :	50~52%

2.4GHz 2400~2483.5MHz

WiFi 802.11b (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)	
802.11b CH 01 2412MHz		2372.685	51.32	-22.68	74	51.98	27.19	5.39	33.24	296	115	P	H	
		2384.13	42.19	-11.81	54	42.85	27.19	5.39	33.24	296	115	A	H	
	*	2412	99.09	-	-	99.61	27.28	5.42	33.22	296	115	P	H	
	*	2412	93.3	-	-	93.82	27.28	5.42	33.22	296	115	A	H	
													H	
													H	
			2389.8	50.9	-23.1	74	51.5	27.23	5.39	33.22	343	15	P	V
			2388.75	42.09	-11.91	54	42.71	27.23	5.39	33.24	343	15	A	V
	*		2412	98.14	-	-	98.66	27.28	5.42	33.22	343	15	P	V
	*		2412	92.64	-	-	93.16	27.28	5.42	33.22	343	15	A	V
													V	
													V	
802.11b CH 06 2437MHz		2381.82	51.09	-22.91	74	51.75	27.19	5.39	33.24	327	118	P	H	
		2385.88	41.84	-12.16	54	42.46	27.23	5.39	33.24	327	118	A	H	
	*	2437	99.72	-	-	100.14	27.37	5.42	33.21	327	118	P	H	
	*	2437	94.49	-	-	94.91	27.37	5.42	33.21	327	118	A	H	
			2489.43	51.58	-22.42	74	51.8	27.5	5.46	33.18	327	118	P	H
			2495.59	42.19	-11.81	54	42.4	27.5	5.46	33.17	327	118	A	H
			2372.72	51.7	-22.3	74	52.36	27.19	5.39	33.24	328	21	P	V
			2381.4	41.58	-12.42	54	42.24	27.19	5.39	33.24	328	21	A	V
	*		2437	99.28	-	-	99.7	27.37	5.42	33.21	328	21	P	V
	*		2437	93.84	-	-	94.26	27.37	5.42	33.21	328	21	A	V
			2491.95	51.16	-22.84	74	51.37	27.5	5.46	33.17	328	21	P	V
			2485.44	42.12	-11.88	54	42.38	27.46	5.46	33.18	328	21	A	V



802.11b CH 11 2462MHz	*	2462	100.45	-	-	100.8	27.41	5.44	33.2	320	109	P	H
	*	2462	95.03	-	-	95.38	27.41	5.44	33.2	320	109	A	H
		2497.44	51.01	-22.99	74	51.22	27.5	5.46	33.17	320	109	P	H
		2491.68	42.64	-11.36	54	42.86	27.5	5.46	33.18	320	109	A	H
													H
													H
	*	2462	100.37	-	-	100.72	27.41	5.44	33.2	355	52	P	V
	*	2462	94.81	-	-	95.16	27.41	5.44	33.2	355	52	A	V
		2499.04	51.27	-22.73	74	51.48	27.5	5.46	33.17	355	52	P	V
		2484.24	42.45	-11.55	54	42.71	27.46	5.46	33.18	355	52	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	38.14	-35.86	74	50.28	31.46	7.58	51.18	100	0	P	H	
													H	
													H	
													H	
			4824	36.5	-37.5	74	48.64	31.46	7.58	51.18	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	38.45	-35.55	74	50.34	31.56	7.7	51.15	100	0	P	H	
		7311	43.67	-30.33	74	48.8	36.18	9.49	50.8	100	0	P	H	
													H	
													H	
			4874	36.59	-37.41	74	48.48	31.56	7.7	51.15	100	0	P	V
			7311	42.54	-31.46	74	47.67	36.18	9.49	50.8	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	38.88	-35.12	74	50.42	31.66	7.93	51.13	100	0	P	H	
		7386	42.9	-31.1	74	47.8	36.37	9.53	50.8	100	0	P	H	
													H	
													H	
			4924	37.47	-36.53	74	49.01	31.66	7.93	51.13	100	0	P	V
			7386	43.21	-30.79	74	48.11	36.37	9.53	50.8	100	0	P	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		2387.28	57.24	-16.76	74	57.86	27.23	5.39	33.24	331	116	P	H	
		2384.97	43.58	-10.42	54	44.24	27.19	5.39	33.24	331	116	A	H	
	*	2412	98.43	-	-	98.95	27.28	5.42	33.22	331	116	P	H	
	*	2412	90.74	-	-	91.26	27.28	5.42	33.22	331	116	A	H	
													H	
														H
			2389.485	55.55	-18.45	74	56.17	27.23	5.39	33.24	332	60	P	V
			2389.065	43.7	-10.3	54	44.32	27.23	5.39	33.24	332	60	A	V
	*		2412	96.76	-	-	97.28	27.28	5.42	33.22	332	60	P	V
	*		2412	89.82	-	-	90.34	27.28	5.42	33.22	332	60	A	V
														V
														V
802.11g CH 06 2437MHz		2376.78	50.92	-23.08	74	51.58	27.19	5.39	33.24	328	116	P	H	
		2389.66	42.09	-11.91	54	42.71	27.23	5.39	33.24	328	116	A	H	
	*	2437	100.29	-	-	100.71	27.37	5.42	33.21	328	116	P	H	
	*	2437	92.34	-	-	92.76	27.37	5.42	33.21	328	116	A	H	
			2494.05	51.63	-22.37	74	51.84	27.5	5.46	33.17	328	116	P	H
			2484.53	42.18	-11.82	54	42.44	27.46	5.46	33.18	328	116	A	H
			2383.78	50.6	-23.4	74	51.26	27.19	5.39	33.24	367	50	P	V
			2382.66	41.69	-12.31	54	42.35	27.19	5.39	33.24	367	50	A	V
	*		2437	97.96	-	-	98.38	27.37	5.42	33.21	367	50	P	V
	*		2437	90.7	-	-	91.12	27.37	5.42	33.21	367	50	A	V
			2493.28	51.16	-22.84	74	51.37	27.5	5.46	33.17	367	50	P	V
			2484.81	42.13	-11.87	54	42.39	27.46	5.46	33.18	367	50	A	V



802.11g CH 11 2462MHz	*	2462	100.65	-	-	101	27.41	5.44	33.2	321	113	P	H
	*	2462	92.57	-	-	92.92	27.41	5.44	33.2	321	113	A	H
		2484.92	60.72	-13.28	74	60.98	27.46	5.46	33.18	321	113	P	H
		2483.52	44.61	-9.39	54	44.87	27.46	5.46	33.18	321	113	A	H
													H
													H
	*	2462	99.37	-	-	99.72	27.41	5.44	33.2	360	52	P	V
	*	2462	92.03	-	-	92.38	27.41	5.44	33.2	360	52	A	V
		2484.68	54.65	-19.35	74	54.91	27.46	5.46	33.18	360	52	P	V
		2483.76	44.13	-9.87	54	44.39	27.46	5.46	33.18	360	52	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	36.54	-37.46	74	48.68	31.46	7.58	51.18	100	0	P	H	
													H	
													H	
													H	
			4824	37.29	-36.71	74	49.43	31.46	7.58	51.18	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	36.67	-37.33	74	48.56	31.56	7.7	51.15	100	0	P	H	
		7311	41.64	-32.36	74	46.77	36.18	9.49	50.8	100	0	P	H	
													H	
													H	
			4874	35.71	-38.29	74	47.6	31.56	7.7	51.15	100	0	P	V
			7311	43.99	-30.01	74	49.12	36.18	9.49	50.8	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	37.81	-36.19	74	49.35	31.66	7.93	51.13	100	0	P	H	
		7386	41.99	-32.01	74	46.89	36.37	9.53	50.8	100	0	P	H	
													H	
													H	
			4926	37.63	-36.37	74	49.17	31.66	7.93	51.13	100	0	P	V
			7386	42.22	-31.78	74	47.12	36.37	9.53	50.8	100	0	P	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		2376.255	62.1	-11.9	74	62.76	27.19	5.39	33.24	295	111	P	H	
		2389.8	48.09	-5.91	54	48.69	27.23	5.39	33.22	295	111	A	H	
	*	2412	98.8	-	-	99.32	27.28	5.42	33.22	295	111	P	H	
	*	2412	90.97	-	-	91.49	27.28	5.42	33.22	295	111	A	H	
													H	
														H
			2389.8	62.11	-11.89	74	62.71	27.23	5.39	33.22	343	16	P	V
			2390	48.11	-5.89	54	48.71	27.23	5.39	33.22	343	16	A	V
		*	2412	97.19	-	-	97.71	27.28	5.42	33.22	343	16	P	V
		*	2412	90.25	-	-	90.77	27.28	5.42	33.22	343	16	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2387.84	59.65	-14.35	74	60.27	27.23	5.39	33.24	299	113	P	H	
		2389.38	44.49	-9.51	54	45.11	27.23	5.39	33.24	299	113	A	H	
	*	2437	100.33	-	-	100.75	27.37	5.42	33.21	299	113	P	H	
	*	2437	93.2	-	-	93.62	27.37	5.42	33.21	299	113	A	H	
			2484.88	57.55	-16.45	74	57.81	27.46	5.46	33.18	299	113	P	H
			2485.23	43.77	-10.23	54	44.03	27.46	5.46	33.18	299	113	A	H
			2386.44	58.05	-15.95	74	58.67	27.23	5.39	33.24	303	43	P	V
			2386.44	44.26	-9.74	54	44.88	27.23	5.39	33.24	303	43	A	V
		*	2437	101	-	-	101.42	27.37	5.42	33.21	303	43	P	V
		*	2437	92.84	-	-	93.26	27.37	5.42	33.21	303	43	A	V
		2484.46	54.85	-19.15	74	55.11	27.46	5.46	33.18	303	43	P	V	
		2484.46	42.91	-11.09	54	43.17	27.46	5.46	33.18	303	43	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	101.62	-	-	101.97	27.41	5.44	33.2	329	123	P	H
	*	2462	93.15	-	-	93.5	27.41	5.44	33.2	329	123	A	H
		2484.04	66.32	-7.68	74	66.58	27.46	5.46	33.18	329	123	P	H
		2484.76	50.06	-3.94	54	50.32	27.46	5.46	33.18	329	123	A	H
													H
													H
	*	2462	100.35	-	-	100.7	27.41	5.44	33.2	296	23	P	V
	*	2462	93.18	-	-	93.53	27.41	5.44	33.2	296	23	A	V
		2484.96	65.37	-8.63	74	65.63	27.46	5.46	33.18	296	23	P	V
		2483.52	49.8	-4.2	54	50.06	27.46	5.46	33.18	296	23	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	35.91	-38.09	74	48.05	31.46	7.58	51.18	100	0	P	H	
													H	
													H	
													H	
			4824	36.56	-37.44	74	48.7	31.46	7.58	51.18	100	0	P	V
														V
														V
802.11n HT20 CH 06 2437MHz		4874	35.31	-38.69	74	47.2	31.56	7.7	51.15	100	0	P	H	
													H	
			7311	43.04	-30.96	74	48.17	36.18	9.49	50.8	100	0	P	H
														H
			4874	35.95	-38.05	74	47.84	31.56	7.7	51.15	100	0	P	V
			7311	43.42	-30.58	74	48.55	36.18	9.49	50.8	100	0	P	V
														V
802.11n HT20 CH 11 2462MHz		4924	37.57	-36.43	74	49.11	31.66	7.93	51.13	100	0	P	H	
													H	
			7386	43.01	-30.99	74	47.91	36.37	9.53	50.8	100	0	P	H
														H
			4924	37.05	-36.95	74	48.59	31.66	7.93	51.13	100	0	P	V
			7386	43	-31	74	47.9	36.37	9.53	50.8	100	0	P	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 802.11n HT20 (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 802.11n HT20 LF		31.62	23.79	-16.21	40	30.98	24.98	0.65	32.82	-	-	P	H	
		206.31	30.45	-13.05	43.5	45.37	16.19	1.62	32.73	100	66	P	H	
		257.34	28.16	-17.84	46	39.63	19.5	1.76	32.73	-	-	P	H	
		305.6	25.28	-20.72	46	36.27	19.87	1.88	32.74	-	-	P	H	
		586.3	26.28	-19.72	46	31.49	25.23	2.57	33.01	-	-	P	H	
		876.1	31.47	-14.53	46	32.06	28.7	3.16	32.45	-	-	P	H	
														H
														H
														H
														H
														H
														H
			32.43	29.72	-10.28	40	37.47	24.42	0.65	32.82	100	33	P	V
			181.2	26.63	-16.87	43.5	42.35	15.51	1.48	32.71	-	-	P	V
			262.74	22.04	-23.96	46	33.33	19.68	1.76	32.73	-	-	P	V
			511.4	26.3	-19.7	46	32.64	24.26	2.33	32.93	-	-	P	V
			746.6	28.6	-17.4	46	31.2	27.43	2.91	32.94	-	-	P	V
			954.5	32.07	-13.93	46	30.5	30	3.29	31.72	-	-	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.
!	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

- 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”.