



## Appendix B. Radiated Spurious Emission

Test Engineer :	J.C. Liang and Jacky Hung	Temperature :	20~23°C
		Relative Humidity :	58~63%

### 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		2386.23	55.22	-18.78	74	53.07	27.25	8.89	33.99	382	184	P	H	
		2386.335	45.83	-8.17	54	43.68	27.25	8.89	33.99	382	184	A	H	
	*	2412	105.96	-	-	103.76	27.29	8.89	33.98	382	184	P	H	
	*	2412	101.71	-	-	99.51	27.29	8.89	33.98	382	184	A	H	
													H	
														H
			2386.545	56.2	-17.8	74	54.05	27.25	8.89	33.99	266	289	P	V
			2386.335	47.1	-6.9	54	44.95	27.25	8.89	33.99	266	289	A	V
	*		2412	105.36	-	-	103.16	27.29	8.89	33.98	266	289	P	V
	*		2412	101.69	-	-	99.49	27.29	8.89	33.98	266	289	A	V
														V
														V
802.11b CH 06 2437MHz		2367.54	53.94	-20.06	74	51.94	27.17	8.82	33.99	288	240	P	H	
		2386.44	42.83	-11.17	54	40.68	27.25	8.89	33.99	288	240	A	H	
	*	2437	105.97	-	-	103.62	27.38	8.94	33.97	288	240	P	H	
	*	2437	102.34	-	-	99.99	27.38	8.94	33.97	288	240	A	H	
			2488.17	53.72	-20.28	74	51.19	27.5	8.98	33.95	288	240	P	H
			2487.61	43.23	-10.77	54	40.7	27.5	8.98	33.95	288	240	A	H
			2386.86	54.01	-19.99	74	51.86	27.25	8.89	33.99	292	288	P	V
			2385.46	43.01	-10.99	54	40.9	27.21	8.89	33.99	292	288	A	V
	*		2437	104.78	-	-	102.43	27.38	8.94	33.97	292	288	P	V
	*		2437	101.09	-	-	98.74	27.38	8.94	33.97	292	288	A	V
			2484.95	53.68	-20.32	74	51.19	27.46	8.98	33.95	292	288	P	V
			2488.24	43.04	-10.96	54	40.51	27.5	8.98	33.95	292	288	A	V



<b>802.11b CH 11 2462MHz</b>	*	2462	106.97	-	-	104.53	27.42	8.98	33.96	251	232	P	H
	*	2462	103.52	-	-	101.08	27.42	8.98	33.96	251	232	A	H
		2487.48	56.06	-17.94	74	53.57	27.46	8.98	33.95	251	232	P	H
		2487.72	47.64	-6.36	54	45.11	27.5	8.98	33.95	251	232	A	H
													H
													H
	*	2462	104.28	-	-	101.84	27.42	8.98	33.96	255	275	P	V
	*	2462	100.73	-	-	98.29	27.42	8.98	33.96	255	275	A	V
		2487.44	56.38	-17.62	74	53.89	27.46	8.98	33.95	255	275	P	V
		2487.72	45.98	-8.02	54	43.45	27.5	8.98	33.95	255	275	A	V
													V
													V
<b>Remark</b>	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	33.34	-40.66	74	42.34	31.32	10.77	51.09	100	0	P	H	
													H	
													H	
													H	
			4824	32.59	-41.41	74	41.59	31.32	10.77	51.09	100	0	P	V
														V
														V
802.11b CH 06 2437MHz		4874	33.57	-40.43	74	42.34	31.41	10.88	51.06	100	0	P	H	
		7311	38.83	-35.17	74	40.28	36.27	12.79	50.51	100	0	P	H	
													H	
													H	
			4874	32.4	-41.6	74	41.17	31.41	10.88	51.06	100	0	P	V
			7311	38.75	-35.25	74	40.2	36.27	12.79	50.51	100	0	P	V
														V
802.11b CH 11 2462MHz		4924	33.46	-40.54	74	42.01	31.49	11	51.04	100	0	P	H	
		7386	38.5	-35.5	74	39.62	36.51	12.88	50.51	100	0	P	H	
													H	
													H	
			4924	32.77	-41.23	74	41.32	31.49	11	51.04	100	0	P	V
			7386	38.62	-35.38	74	39.74	36.51	12.88	50.51	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		2385.18	60.01	-13.99	74	57.9	27.21	8.89	33.99	382	182	P	H	
		2389.065	45.41	-8.59	54	43.26	27.25	8.89	33.99	382	182	A	H	
	*	2412	105.6	-	-	103.4	27.29	8.89	33.98	382	182	P	H	
	*	2412	96.39	-	-	94.19	27.29	8.89	33.98	382	182	A	H	
													H	
														H
			2383.92	62.11	-11.89	74	60	27.21	8.89	33.99	265	288	P	V
			2389.59	47.26	-6.74	54	45.11	27.25	8.89	33.99	265	288	A	V
	*		2412	104.12	-	-	101.92	27.29	8.89	33.98	265	288	P	V
	*		2412	95.75	-	-	93.55	27.29	8.89	33.98	265	288	A	V
														V
														V
802.11g CH 06 2437MHz		2389.52	53.72	-20.28	74	51.57	27.25	8.89	33.99	171	232	P	H	
		2389.94	44.97	-9.03	54	42.81	27.25	8.89	33.98	171	232	A	H	
	*	2437	104.29	-	-	101.94	27.38	8.94	33.97	171	232	P	H	
	*	2437	96.27	-	-	93.92	27.38	8.94	33.97	171	232	A	H	
			2489.57	54.88	-19.12	74	52.35	27.5	8.98	33.95	171	232	P	H
			2485.79	45.08	-8.92	54	42.59	27.46	8.98	33.95	171	232	A	H
			2389.94	55.37	-18.63	74	53.21	27.25	8.89	33.98	293	289	P	V
			2388.12	45.57	-8.43	54	43.42	27.25	8.89	33.99	293	289	A	V
	*		2437	103.93	-	-	101.58	27.38	8.94	33.97	293	289	P	V
	*		2437	95.4	-	-	93.05	27.38	8.94	33.97	293	289	A	V
			2486.49	54.57	-19.43	74	52.08	27.46	8.98	33.95	293	289	P	V
			2484.74	44.68	-9.32	54	42.19	27.46	8.98	33.95	293	289	A	V



<b>802.11g CH 11 2462MHz</b>	*	2462	106.11	-	-	103.67	27.42	8.98	33.96	254	237	P	H
	*	2462	97.78	-	-	95.34	27.42	8.98	33.96	254	237	A	H
		2485.12	64.89	-9.11	74	62.4	27.46	8.98	33.95	254	237	P	H
		2483.96	48.3	-5.7	54	45.81	27.46	8.98	33.95	254	237	A	H
													H
													H
	*	2462	102.73	-	-	100.29	27.42	8.98	33.96	255	275	P	V
	*	2462	94.55	-	-	92.11	27.42	8.98	33.96	255	275	A	V
		2484.4	61.65	-12.35	74	59.16	27.46	8.98	33.95	255	275	P	V
		2483.64	47.4	-6.6	54	44.91	27.46	8.98	33.95	255	275	A	V
													V
													V
<b>Remark</b>	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	32.83	-41.17	74	41.83	31.32	10.77	51.09	100	0	P	H	
													H	
													H	
													H	
			4824	32.92	-41.08	74	41.92	31.32	10.77	51.09	100	0	P	V
														V
														V
802.11g CH 06 2437MHz		4874	35.13	-38.87	74	43.9	31.41	10.88	51.06	100	0	P	H	
		7311	38.24	-35.76	74	39.69	36.27	12.79	50.51	100	0	P	H	
													H	
													H	
			4874	34.5	-39.5	74	43.27	31.41	10.88	51.06	100	0	P	V
			7311	38.57	-35.43	74	40.02	36.27	12.79	50.51	100	0	P	V
														V
802.11g CH 11 2462MHz		4924	33.41	-40.59	74	41.96	31.49	11	51.04	100	0	P	H	
		7386	37.92	-36.08	74	39.04	36.51	12.88	50.51	100	0	P	H	
													H	
													H	
			4924	33.02	-40.98	74	41.57	31.49	11	51.04	100	0	P	V
			7386	39.29	-34.71	74	40.41	36.51	12.88	50.51	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		2389.485	60.81	-13.19	74	58.66	27.25	8.89	33.99	383	181	P	H	
		2390	45.67	-8.33	54	43.51	27.25	8.89	33.98	383	181	A	H	
	*	2412	104.07	-	-	101.87	27.29	8.89	33.98	383	181	P	H	
	*	2412	94.75	-	-	92.55	27.29	8.89	33.98	383	181	A	H	
													H	
														H
			2388.96	63.18	-10.82	74	61.03	27.25	8.89	33.99	262	290	P	V
			2389.275	46.26	-7.74	54	44.11	27.25	8.89	33.99	262	290	A	V
		*	2412	102.48	-	-	100.28	27.29	8.89	33.98	262	290	P	V
		*	2412	94.03	-	-	91.83	27.29	8.89	33.98	262	290	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2374.4	53.92	-20.08	74	51.88	27.21	8.82	33.99	291	233	P	H	
		2388.54	44.59	-9.41	54	42.44	27.25	8.89	33.99	291	233	A	H	
	*	2437	103.77	-	-	101.42	27.38	8.94	33.97	291	233	P	H	
	*	2437	95.87	-	-	93.52	27.38	8.94	33.97	291	233	A	H	
			2483.83	54.45	-19.55	74	51.96	27.46	8.98	33.95	291	233	P	H
			2483.83	44.87	-9.13	54	42.38	27.46	8.98	33.95	291	233	A	H
			2388.26	56.01	-17.99	74	53.86	27.25	8.89	33.99	291	277	P	V
			2386.16	44.86	-9.14	54	42.71	27.25	8.89	33.99	291	277	A	V
		*	2437	101.93	-	-	99.58	27.38	8.94	33.97	291	277	P	V
		*	2437	93.48	-	-	91.13	27.38	8.94	33.97	291	277	A	V
		2497.55	54.78	-19.22	74	52.24	27.5	8.98	33.94	291	277	P	V	
		2490.13	44.52	-9.48	54	41.99	27.5	8.98	33.95	291	277	A	V	



<b>802.11n</b> <b>HT20</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	104.15	-	-	101.71	27.42	8.98	33.96	253	236	P	H
	*	2462	95.89	-	-	93.45	27.42	8.98	33.96	253	236	A	H
		2484.88	59.15	-14.85	74	56.66	27.46	8.98	33.95	253	236	P	H
		2483.68	47.03	-6.97	54	44.54	27.46	8.98	33.95	253	236	A	H
													H
													H
	*	2462	101.97	-	-	99.53	27.42	8.98	33.96	254	277	P	V
	*	2462	93.31	-	-	90.87	27.42	8.98	33.96	254	277	A	V
		2488.6	58.91	-15.09	74	56.38	27.5	8.98	33.95	254	277	P	V
		2483.56	46.38	-7.62	54	43.89	27.46	8.98	33.95	254	277	A	V
													V
												V	
<b>Remark</b>	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	32.27	-41.73	74	41.27	31.32	10.77	51.09	100	0	P	H	
													H	
													H	
													H	
			4824	32.57	-41.43	74	41.57	31.32	10.77	51.09	100	0	P	V
														V
														V
802.11n HT20 CH 06 2437MHz		4874	35.19	-38.81	74	43.96	31.41	10.88	51.06	100	0	P	H	
		7311	37.69	-36.31	74	39.14	36.27	12.79	50.51	100	0	P	H	
													H	
													H	
			4874	33.52	-40.48	74	42.29	31.41	10.88	51.06	100	0	P	V
			7311	38.16	-35.84	74	39.61	36.27	12.79	50.51	100	0	P	V
														V
802.11n HT20 CH 11 2462MHz		4924	32.94	-41.06	74	41.49	31.49	11	51.04	100	0	P	H	
		7386	37.66	-36.34	74	38.78	36.51	12.88	50.51	100	0	P	H	
													H	
													H	
			4924	33.24	-40.76	74	41.79	31.49	11	51.04	100	0	P	V
			7386	37.54	-36.46	74	38.66	36.51	12.88	50.51	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

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

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 )	
2.4GHz 802.11g LF		30	24.56	-15.44	40	29.4	25.7	1.29	31.83			P	H	
		192	19.7	-23.8	43.5	33.94	15.44	2.1	31.78			P	H	
		224.94	22.13	-23.87	46	35.02	16.55	2.34	31.78			P	H	
		649.3	28.42	-17.58	46	30.47	26.19	3.8	32.04			P	H	
		862.1	32.39	-13.61	46	30.46	28.98	4.57	31.62			P	H	
		958	33.74	-12.26	46	29.44	30.58	4.69	30.97	192	158	P	H	
													H	
													H	
													H	
													H	
													H	
													H	
			32.7	31.73	-8.27	40	38.13	24.14	1.29	31.83	281	312	P	V
			62.4	24	-16	40	42.29	12	1.51	31.8			P	V
			152.04	23.39	-20.11	43.5	35.87	17.3	2	31.78			P	V
			482.7	25.88	-20.12	46	30.65	23.82	3.28	31.87			P	V
			878.2	32.92	-13.08	46	30.82	29.07	4.57	31.54			P	V
			956.6	33.45	-12.55	46	29.15	30.59	4.69	30.98			P	V
												V		
												V		
												V		
												V		
												V		
												V		
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



**Note symbol**

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



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”.