



Appendix B. Radiated Spurious Emission

Test Engineer :	Stan Hsieh, Ken Wu, Nick Yu, and James Chiu	Temperature :	21~23°C
		Relative Humidity :	47~49%

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		2386.41	60.54	-13.46	74	54.88	32.18	7.75	34.27	102	204	P	H	
		2385.78	50.05	-3.95	54	44.39	32.18	7.75	34.27	102	204	A	H	
	*	2413.36	105.34	-	-	99.69	32.2	7.75	34.3	102	204	P	H	
	*	2412.692	101.12	-	-	95.47	32.2	7.75	34.3	102	204	A	H	
													H	
														H
			2387.04	61.59	-12.41	74	55.93	32.18	7.75	34.27	104	157	P	V
			2385.78	51.25	-2.75	54	45.59	32.18	7.75	34.27	104	157	A	V
	*		2413.193	108.63	-	-	102.98	32.2	7.75	34.3	104	157	P	V
	*		2411.189	104.52	-	-	98.87	32.2	7.75	34.3	104	157	A	V
														V
														V
802.11b CH 06 2437MHz		2355.9	59.74	-14.26	74	54.18	32.13	7.68	34.25	100	203	P	H	
		2387.22	44.97	-9.03	54	39.31	32.18	7.75	34.27	100	203	A	H	
	*	2438.326	105.23	-	-	99.51	32.24	7.83	34.35	100	203	P	H	
	*	2437.742	101.12	-	-	95.4	32.24	7.83	34.35	100	203	A	H	
			2491.68	58.59	-15.41	74	52.81	32.3	7.91	34.43	100	203	P	H
			2488.12	44.96	-9.04	54	39.18	32.3	7.91	34.43	100	203	A	H
			2382.18	60.15	-13.85	74	54.51	32.16	7.75	34.27	100	159	P	V
			2389.02	45.23	-8.77	54	39.57	32.18	7.75	34.27	100	159	A	V
	*		2435.905	107.88	-	-	102.18	32.22	7.83	34.35	100	159	P	V
	*		2436.239	103.81	-	-	98.11	32.22	7.83	34.35	100	159	A	V
			2495.8	59.32	-14.68	74	53.59	32.3	7.91	34.48	100	159	P	V
			2487.28	45.17	-8.83	54	39.41	32.28	7.91	34.43	100	159	A	V



802.11b CH 11 2462MHz	*	2463.293	106.79	-	-	101.01	32.26	7.91	34.39	230	131	P	H
	*	2461.206	102.64	-	-	96.86	32.26	7.91	34.39	230	131	A	H
		2483.52	61.99	-12.01	74	56.23	32.28	7.91	34.43	230	131	P	H
		2488.36	51.52	-2.48	54	45.74	32.3	7.91	34.43	230	131	A	H
													H
													H
	*	2463.209	108.31	-	-	102.53	32.26	7.91	34.39	100	160	P	V
	*	2461.289	104.28	-	-	98.5	32.26	7.91	34.39	100	160	A	V
		2488.52	61.63	-12.37	74	55.85	32.3	7.91	34.43	100	160	P	V
		2488.28	50.07	-3.93	54	44.29	32.3	7.91	34.43	100	160	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	48.87	-25.13	74	62.38	34.26	11.16	58.93	100	0	P	H
													H
													H
													H
		4824	45.65	-28.35	74	59.16	34.26	11.16	58.93	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4872	49.06	-24.94	74	62.38	34.3	11.21	58.83	100	0	P	H
		7311	53.5	-20.5	74	60.55	35.6	15.08	57.73	270	337	P	H
		7311	48.6	-5.4	54	55.65	35.6	15.08	57.73	270	337	A	H
													H
		4872	44.09	-29.91	74	57.41	34.3	11.21	58.83	100	0	P	V
		7311	53.18	-20.82	74	60.23	35.6	15.08	57.73	141	0	P	V
		7311	47.87	-6.13	54	54.92	35.6	15.08	57.73	141	0	A	V
													V
802.11b CH 11 2462MHz		4926	50.4	-23.6	74	63.52	34.34	11.27	58.73	100	0	P	H
		7386	55.42	-18.58	74	62.48	35.6	15.14	57.8	110	46	P	H
		7386	49.83	-4.17	54	56.89	35.6	15.14	57.8	110	46	A	H
													H
		4926	46.4	-27.6	74	59.52	34.34	11.27	58.73	100	0	P	V
		7386	57.19	-16.81	74	64.25	35.6	15.14	57.8	362	19	P	V
		7386	52.75	-1.25	54	59.81	35.6	15.14	57.8	362	19	A	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		2390	73.39	-0.61	74	67.76	32.18	7.75	34.3	104	206	P	H	
		2390	51.97	-2.03	54	46.34	32.18	7.75	34.3	104	206	A	H	
	*	2414	106.28	-	-	100.63	32.2	7.75	34.3	104	206	P	H	
	*	2414	95.99	-	-	90.34	32.2	7.75	34.3	104	206	A	H	
													H	
													H	
			2389.92	73.15	-0.85	74	67.52	32.18	7.75	34.3	103	219	P	V
			2390	52.6	-1.4	54	46.97	32.18	7.75	34.3	103	219	A	V
	*		2414	108.87	-	-	103.22	32.2	7.75	34.3	103	219	P	V
	*		2414	98.66	-	-	93.01	32.2	7.75	34.3	103	219	A	V
													V	
													V	
802.11g CH 06 2437MHz		2389.83	63.58	-10.42	74	57.95	32.18	7.75	34.3	242	135	P	H	
		2390	47.24	-6.76	54	41.61	32.18	7.75	34.3	242	135	A	H	
	*	2435.321	109.63	-	-	103.93	32.22	7.83	34.35	242	135	P	H	
	*	2436.156	99.32	-	-	93.62	32.22	7.83	34.35	242	135	A	H	
			2487.12	63.93	-10.07	74	58.17	32.28	7.91	34.43	242	135	P	H
			2483.8	47.17	-6.83	54	41.41	32.28	7.91	34.43	242	135	A	H
			2389.2	63.36	-10.64	74	57.7	32.18	7.75	34.27	102	160	P	V
			2390	47.94	-6.06	54	42.31	32.18	7.75	34.3	102	160	A	V
	*		2435.321	109.56	-	-	103.86	32.22	7.83	34.35	102	160	P	V
	*		2435	99.41	-	-	93.71	32.22	7.83	34.35	102	160	A	V
			2486.16	62.87	-11.13	74	57.11	32.28	7.91	34.43	102	160	P	V
			2483.52	47.12	-6.88	54	41.36	32.28	7.91	34.43	102	160	A	V



802.11g CH 11 2462MHz	*	2467.218	107.65	-	-	101.91	32.26	7.91	34.43	204	174	P	H
	*	2464.128	97.39	-	-	91.61	32.26	7.91	34.39	204	174	A	H
		2483.64	72.8	-1.2	74	67.04	32.28	7.91	34.43	204	174	P	H
		2483.56	51.87	-2.13	54	46.11	32.28	7.91	34.43	204	174	A	H
													H
													H
	*	2460.204	108.19	-	-	102.41	32.26	7.91	34.39	101	161	P	V
	*	2464.128	97.89	-	-	92.11	32.26	7.91	34.39	101	161	A	V
		2483.52	72.25	-1.75	74	66.49	32.28	7.91	34.43	101	161	P	V
		2483.68	51.59	-2.41	54	45.83	32.28	7.91	34.43	101	161	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	45.23	-28.77	74	58.74	34.26	11.16	58.93	100	0	P	H
													H
													H
													H
		4824	42.24	-31.76	74	55.75	34.26	11.16	58.93	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	47.66	-26.34	74	60.98	34.3	11.21	58.83	100	0	P	H
		7311	58.71	-15.29	74	65.76	35.6	15.08	57.73	238	351	P	H
		7311	41.88	-12.12	54	48.93	35.6	15.08	57.73	238	351	A	H
													H
		4874	44.62	-29.38	74	57.94	34.3	11.21	58.83	100	0	P	V
		7311	57.85	-16.15	74	64.9	35.6	15.08	57.73	329	13	P	V
		7311	40.93	-13.07	54	47.98	35.6	15.08	57.73	329	13	A	V
													V
802.11g CH 11 2462MHz		4926	47.64	-26.36	74	60.76	34.34	11.27	58.73	100	0	P	H
		7386	57.59	-16.41	74	64.65	35.6	15.14	57.8	108	48	P	H
		7386	41.16	-12.84	54	48.22	35.6	15.14	57.8	108	48	A	H
													H
		4926	44.19	-29.81	74	57.31	34.34	11.27	58.73	100	0	P	V
		7386	59.18	-14.82	74	66.24	35.6	15.14	57.8	347	18	P	V
		7386	42.65	-11.35	54	49.71	35.6	15.14	57.8	347	18	A	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		2389.38	73.47	-0.53	74	67.81	32.18	7.75	34.27	102	207	P	H	
		2389.83	53.29	-0.71	54	47.66	32.18	7.75	34.3	102	207	A	H	
	*	2414	106.32	-	-	100.67	32.2	7.75	34.3	102	207	P	H	
	*	2414	95.61	-	-	89.96	32.2	7.75	34.3	102	207	A	H	
													H	
														H
			2389.47	73.22	-0.78	74	67.56	32.18	7.75	34.27	104	221	P	V
			2389.92	53.11	-0.89	54	47.48	32.18	7.75	34.3	104	221	A	V
		*	2414	108.38	-	-	102.73	32.2	7.75	34.3	104	221	P	V
		*	2414	98.29	-	-	92.64	32.2	7.75	34.3	104	221	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2387.94	60.48	-13.52	74	54.82	32.18	7.75	34.27	100	205	P	H	
		2388.12	46.96	-7.04	54	41.3	32.18	7.75	34.27	100	205	A	H	
		* 2439	106.47	-	-	100.75	32.24	7.83	34.35	100	205	P	H	
		* 2438.994	96.08	-	-	90.36	32.24	7.83	34.35	100	205	A	H	
			2483.52	60.21	-13.79	74	54.45	32.28	7.91	34.43	100	205	P	H
			2484.2	46.38	-7.62	54	40.62	32.28	7.91	34.43	100	205	A	H
			2389.92	63.49	-10.51	74	57.86	32.18	7.75	34.3	102	159	P	V
			2389.2	48	-6	54	42.34	32.18	7.75	34.27	102	159	A	V
		*	2435	109.75	-	-	104.05	32.22	7.83	34.35	102	159	P	V
		*	2439	98.96	-	-	93.24	32.24	7.83	34.35	102	159	A	V
		2484.64	63.59	-10.41	74	57.83	32.28	7.91	34.43	102	159	P	V	
		2483.56	47.22	-6.78	54	41.46	32.28	7.91	34.43	102	159	A	V	



802.11n HT20 CH 11 2462MHz	*	2464	107.91	-	-	102.13	32.26	7.91	34.39	201	176	P	H
	*	2464	97.17	-	-	91.39	32.26	7.91	34.39	201	176	A	H
		2484.8	73.11	-0.89	74	67.35	32.28	7.91	34.43	201	176	P	H
		2483.64	51	-3	54	45.24	32.28	7.91	34.43	201	176	A	H
													H
													H
	*	2463.293	107.9	-	-	102.12	32.26	7.91	34.39	102	160	P	V
	*	2460.287	96.96	-	-	91.18	32.26	7.91	34.39	102	160	A	V
		2484.84	73.71	-0.29	74	67.95	32.28	7.91	34.43	102	160	P	V
		2483.56	51.12	-2.88	54	45.36	32.28	7.91	34.43	102	160	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	45.76	-28.24	74	59.27	34.26	11.16	58.93	100	0	P	H	
													H	
													H	
													H	
		4824	42.82	-31.18	74	56.33	34.26	11.16	58.93	100	0	P	V	
														V
														V
802.11n HT20 CH 06 2437MHz		4874	47.45	-26.55	74	60.77	34.3	11.21	58.83	100	0	P	H	
		7311	56.75	-17.25	74	63.8	35.6	15.08	57.73	257	351	P	H	
		7311	41.58	-12.42	54	48.63	35.6	15.08	57.73	257	351	A	H	
													H	
		4874	45	-29	74	58.32	34.3	11.21	58.83	100	0	P	V	
		7311	56.99	-17.01	74	64.04	35.6	15.08	57.73	140	0	P	V	
		7311	41.16	-12.84	54	48.21	35.6	15.08	57.73	140	0	A	V	
802.11n HT20 CH 11 2462MHz		4924	46.53	-27.47	74	59.65	34.34	11.27	58.73	100	0	P	H	
		7386	49.65	-24.35	74	56.71	35.6	15.14	57.8	100	0	P	H	
													H	
													H	
		4924	43.89	-30.11	74	57.01	34.34	11.27	58.73	100	0	P	V	
		7386	56.72	-17.28	74	63.78	35.6	15.14	57.8	374	359	P	V	
		7386	40.88	-13.12	54	47.94	35.6	15.14	57.8	374	359	A	V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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”.