



Appendix A. Radiated Spurious Emission

Test Engineer :	Kyle Jhuang, Citta Ke, and Karl Hou	Temperature :	25~26°C
		Relative Humidity :	50~51%

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		2387.85	49.19	-24.81	74	45.45	32.77	4.62	33.65	100	125	P	H
		2387.94	38.67	-15.33	54	34.93	32.77	4.62	33.65	100	125	A	H
	*	2413	109.11	-	-	105.28	32.81	4.65	33.63	100	125	P	H
	*	2413	104.81	-	-	100.98	32.81	4.65	33.63	100	125	A	H
													H
													H
		2387.94	47.46	-26.54	74	43.72	32.77	4.62	33.65	100	102	P	V
		2387.76	36.55	-17.45	54	32.81	32.77	4.62	33.65	100	102	A	V
	*	2411	102.07	-	-	98.24	32.81	4.65	33.63	100	102	P	V
	*	2411	97.68	-	-	93.85	32.81	4.65	33.63	100	102	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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 06 2437MHz		2389.47	47.04	-26.96	74	43.3	32.77	4.62	33.65	100	121	P	H
		2390	36.33	-17.67	54	32.59	32.77	4.62	33.65	100	121	A	H
	*	2436	107.3	-	-	103.39	32.85	4.68	33.62	100	121	P	H
	*	2436	102.91	-	-	99	32.85	4.68	33.62	100	121	A	H
		2486.04	48.11	-25.89	74	43.99	32.96	4.73	33.57	100	121	P	H
		2483.72	37.02	-16.98	54	32.9	32.96	4.73	33.57	100	121	A	H
		2360.85	46.83	-27.17	74	43.21	32.7	4.6	33.68	100	98	P	V
		2390	35.96	-18.04	54	32.22	32.77	4.62	33.65	100	98	A	V
	*	2438	100.91	-	-	96.94	32.89	4.68	33.6	100	98	P	V
	*	2438	96.34	-	-	92.37	32.89	4.68	33.6	100	98	A	V
		2493.4	47.27	-26.73	74	43.1	33	4.73	33.56	100	98	P	V
		2485.52	36.46	-17.54	54	32.34	32.96	4.73	33.57	100	98	A	V
802.11b CH 11 2462MHz	*	2461	107.12	-	-	103.09	32.92	4.7	33.59	100	121	P	H
	*	2461	102.79	-	-	98.76	32.92	4.7	33.59	100	121	A	H
		2486.12	50.52	-23.48	74	46.4	32.96	4.73	33.57	100	121	P	H
		2486.12	39.94	-14.06	54	35.82	32.96	4.73	33.57	100	121	A	H
													H
													H
	*	2463	99.61	-	-	95.58	32.92	4.7	33.59	100	85	P	V
	*	2463	95.43	-	-	91.4	32.92	4.7	33.59	100	85	A	V
		2485.96	48.11	-25.89	74	43.99	32.96	4.73	33.57	100	85	P	V
		2486.16	37.45	-16.55	54	33.33	32.96	4.73	33.57	100	85	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	40.36	-33.64	74	57.4	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	40.33	-33.67	74	57.37	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	39.81	-34.19	74	56.75	35.02	6.56	58.52	100	0	P	H
		7311	41.71	-32.29	74	55.24	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	39.59	-34.41	74	56.53	35.02	6.56	58.52	100	0	P	V
		7311	41.52	-32.48	74	55.05	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	40.04	-33.96	74	56.85	35.01	6.6	58.42	100	0	P	H
		7386	47.43	-26.57	74	60.99	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	40.74	-33.26	74	57.55	35.01	6.6	58.42	100	0	P	V
		7386	41.55	-32.45	74	55.11	36.44	8.31	58.31	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		2390	68.9	-5.1	74	65.16	32.77	4.62	33.65	100	120	P	H
		2390	47.39	-6.61	54	43.65	32.77	4.62	33.65	100	120	A	H
	*	2414	109.6	-	-	105.77	32.81	4.65	33.63	100	120	P	H
	*	2414	97.48	-	-	93.65	32.81	4.65	33.63	100	120	A	H
													H
													H
		2389.74	59.7	-14.3	74	55.96	32.77	4.62	33.65	100	103	P	V
		2390	39.79	-14.21	54	36.05	32.77	4.62	33.65	100	103	A	V
	*	2410	101.73	-	-	97.9	32.81	4.65	33.63	100	103	P	V
	*	2410	89.72	-	-	85.89	32.81	4.65	33.63	100	103	A	V
													V
													V
802.11g CH 06 2437MHz		2367.87	46.86	-27.14	74	43.24	32.7	4.6	33.68	100	167	P	H
		2384.79	36.4	-17.6	54	32.71	32.73	4.62	33.66	100	167	A	H
	*	2435	107.12	-	-	103.21	32.85	4.68	33.62	100	167	P	H
	*	2435	94.91	-	-	91	32.85	4.68	33.62	100	167	A	H
		2490.04	49.08	-24.92	74	44.91	33	4.73	33.56	100	167	P	H
		2489.36	38.05	-15.95	54	33.88	33	4.73	33.56	100	167	A	H
		2361.39	46.62	-27.38	74	43	32.7	4.6	33.68	100	98	P	V
		2384.52	35.93	-18.07	54	32.24	32.73	4.62	33.66	100	98	A	V
	*	2439	100.56	-	-	96.59	32.89	4.68	33.6	100	98	P	V
	*	2439	88.61	-	-	84.64	32.89	4.68	33.6	100	98	A	V
		2490.44	47.41	-26.59	74	43.24	33	4.73	33.56	100	98	P	V
		2489.12	36.78	-17.22	54	32.61	33	4.73	33.56	100	98	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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 11 2462MHz	*	2460	107.77	-	-	103.74	32.92	4.7	33.59	100	123	P	H
	*	2460	95.66	-	-	91.63	32.92	4.7	33.59	100	123	A	H
		2484	66.05	-7.95	74	61.93	32.96	4.73	33.57	100	123	P	H
		2483.6	44.86	-9.14	54	40.74	32.96	4.73	33.57	100	123	A	H
													H
													H
	*	2460	100.21	-	-	96.18	32.92	4.7	33.59	100	101	P	V
	*	2460	88.36	-	-	84.33	32.92	4.7	33.59	100	101	A	V
		2484.8	58.91	-15.09	74	54.79	32.96	4.73	33.57	100	101	P	V
		2483.6	39.18	-14.82	54	35.06	32.96	4.73	33.57	100	101	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	41.07	-32.93	74	58.11	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	39.98	-34.02	74	57.02	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	40.11	-33.89	74	57.05	35.02	6.56	58.52	100	0	P	H
		7311	42.04	-31.96	74	55.57	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	40.11	-33.89	74	57.05	35.02	6.56	58.52	100	0	P	V
		7311	41.98	-32.02	74	55.51	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	40.39	-33.61	74	57.2	35.01	6.6	58.42	100	0	P	H
		7386	45.32	-28.68	74	58.88	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	40.72	-33.28	74	57.53	35.01	6.6	58.42	100	0	P	V
		7386	41.09	-32.91	74	54.65	36.44	8.31	58.31	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		2389.47	67.84	-6.16	74	64.1	32.77	4.62	33.65	100	122	P	H
		2390	48.18	-5.82	54	44.44	32.77	4.62	33.65	100	122	A	H
	*	2414	108.75	-	-	104.92	32.81	4.65	33.63	100	122	P	H
	*	2414	97.52	-	-	93.69	32.81	4.65	33.63	100	122	A	H
													H
													H
		2390	56.76	-17.24	74	53.02	32.77	4.62	33.65	100	102	P	V
		2390	40.21	-13.79	54	36.47	32.77	4.62	33.65	100	102	A	V
	*	2410	100.52	-	-	96.69	32.81	4.65	33.63	100	102	P	V
	*	2414	89.99	-	-	86.16	32.81	4.65	33.63	100	102	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2385.42	48.19	-25.81	74	44.5	32.73	4.62	33.66	100	125	P	H
		2385.24	36.98	-17.02	54	33.29	32.73	4.62	33.66	100	125	A	H
	*	2439	106.78	-	-	102.81	32.89	4.68	33.6	100	125	P	H
	*	2439	96.48	-	-	92.51	32.89	4.68	33.6	100	125	A	H
		2488.8	50.56	-23.44	74	46.39	33	4.73	33.56	100	125	P	H
		2488.68	39.33	-14.67	54	35.16	33	4.73	33.56	100	125	A	H
		2371.83	46.74	-27.26	74	43.07	32.73	4.6	33.66	100	97	P	V
		2385.6	36.17	-17.83	54	32.43	32.77	4.62	33.65	100	97	A	V
	*	2439	99.95	-	-	95.98	32.89	4.68	33.6	100	97	P	V
	*	2439	89.27	-	-	85.3	32.89	4.68	33.6	100	97	A	V
		2488.6	47.5	-26.5	74	43.33	33	4.73	33.56	100	97	P	V
		2488.52	37.05	-16.95	54	32.88	33	4.73	33.56	100	97	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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 11 2462MHz	*	2460	106.45	-	-	102.42	32.92	4.7	33.59	100	124	P	H
	*	2460	96.19	-	-	92.16	32.92	4.7	33.59	100	124	A	H
		2483.8	66.54	-7.46	74	62.42	32.96	4.73	33.57	100	124	P	H
		2483.52	44.62	-9.38	54	40.5	32.96	4.73	33.57	100	124	A	H
													H
													H
	*	2460	99.3	-	-	95.27	32.92	4.7	33.59	100	85	P	V
	*	2460	89.01	-	-	84.98	32.92	4.7	33.59	100	85	A	V
		2483.6	58.53	-15.47	74	54.41	32.96	4.73	33.57	100	85	P	V
		2483.52	39.32	-14.68	54	35.2	32.96	4.73	33.57	100	85	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	40.27	-33.73	74	57.31	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	41.02	-32.98	74	58.06	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	40.44	-33.56	74	57.38	35.02	6.56	58.52	100	0	P	H
		7311	41.65	-32.35	74	55.18	36.39	8.24	58.16	100	0	P	H
													H
													H
		4874	40.43	-33.57	74	57.37	35.02	6.56	58.52	100	0	P	V
		7311	40.88	-33.12	74	54.41	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	40.94	-33.06	74	57.75	35.01	6.6	58.42	100	0	P	H
		7386	42.87	-31.13	74	56.43	36.44	8.31	58.31	100	0	P	H
													H
													H
		4924	39.63	-34.37	74	56.44	35.01	6.6	58.42	100	0	P	V
		7386	41.28	-32.72	74	54.84	36.44	8.31	58.31	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 802.11g (LF)

[illegible]



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

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”.



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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.83	67.42	-6.58	74	63.68	32.77	4.62	33.65	100	115	P	H
		2390	48.44	-5.56	54	44.7	32.77	4.62	33.65	100	115	A	H
	*	2414	109.58	-	-	105.75	32.81	4.65	33.63	100	115	P	H
	*	2414	99.25	-	-	95.42	32.81	4.65	33.63	100	115	A	H
													H
													H
		2389.92	56.05	-17.95	74	52.31	32.77	4.62	33.65	100	86	P	V
		2390	40	-14	54	36.26	32.77	4.62	33.65	100	86	A	V
	*	2414	102.94	-	-	99.11	32.81	4.65	33.63	100	86	P	V
	*	2414	91.59	-	-	87.76	32.81	4.65	33.63	100	86	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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4824	40.64	-33.36	74	57.68	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	40.78	-33.22	74	57.82	35.03	6.54	58.61	100	0	P	V
													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 802.11g (LF)

[illegible]

**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

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”.