



Appendix A. Radiated Spurious Emission

Test Engineer :	Kyle Jhuang, Citta Ke, Karl Hou, and Chengjie Huang	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2385.78	61.81	-12.19	74	58.07	32.77	4.62	33.65	105	180	P	H
		2386.41	52.18	-1.82	54	48.44	32.77	4.62	33.65	105	180	A	H
	*	2413.44	113.01	-	-	109.18	32.81	4.65	33.63	105	180	P	H
	*	2412.69	108.3	-	-	104.47	32.81	4.65	33.63	105	180	A	H
													H
													H
		2384.25	59.64	-14.36	74	55.95	32.73	4.62	33.66	100	62	P	V
		2386.14	48.79	-5.21	54	45.05	32.77	4.62	33.65	100	62	A	V
	*	2413.11	109.37	-	-	105.54	32.81	4.65	33.63	100	62	P	V
	*	2411.11	104.69	-	-	100.86	32.81	4.65	33.63	100	62	A	V
													V
													V
802.11b CH 06 2437MHz		2382.9	57.66	-16.34	74	53.97	32.73	4.62	33.66	104	184	P	H
		2389.92	44.91	-9.09	54	41.17	32.77	4.62	33.65	104	184	A	H
	*	2437.99	113.12	-	-	109.15	32.89	4.68	33.6	104	184	P	H
	*	2437.74	108.17	-	-	104.2	32.89	4.68	33.6	104	184	A	H
		2490.32	59.85	-14.15	74	55.68	33	4.73	33.56	104	184	P	H
		2493.4	46.88	-7.12	54	42.71	33	4.73	33.56	104	184	A	H
		2383.53	56.58	-17.42	74	52.89	32.73	4.62	33.66	121	64	P	V
		2380.74	43.45	-10.55	54	39.76	32.73	4.62	33.66	121	64	A	V
	*	2438.58	110.6	-	-	106.63	32.89	4.68	33.6	121	64	P	V
	*	2436.24	105.9	-	-	101.99	32.85	4.68	33.62	121	64	A	V
		2489.8	58.25	-15.75	74	54.08	33	4.73	33.56	121	64	P	V
		2491.04	44.62	-9.38	54	40.45	33	4.73	33.56	121	64	A	V



802.11b CH 11 2462MHz	*	2463.46	113.12	-	-	109.09	32.92	4.7	33.59	102	180	P	H
	*	2462.71	108.02	-	-	103.99	32.92	4.7	33.59	102	180	A	H
		2488	62.87	-11.13	74	58.7	33	4.73	33.56	102	180	P	H
		2488.28	51.57	-2.43	54	47.4	33	4.73	33.56	102	180	A	H
													H
													H
	*	2460.96	108.93	-	-	104.9	32.92	4.7	33.59	149	251	P	V
	*	2461.21	104.66	-	-	100.63	32.92	4.7	33.59	149	251	A	V
		2488.72	59.48	-14.52	74	55.31	33	4.73	33.56	149	251	P	V
		2488.08	48.43	-5.57	54	44.26	33	4.73	33.56	149	251	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4824	41.18	-32.82	74	58.22	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	42.86	-31.14	74	59.9	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4875	41.95	-32.05	74	58.89	35.02	6.56	58.52	100	0	P	H
		7311	42.25	-31.75	74	55.78	36.39	8.24	58.16	100	0	P	H
													H
													H
		4875	41.18	-32.82	74	58.12	35.02	6.56	58.52	100	0	P	V
		7311	42.08	-31.92	74	55.61	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4923	40.32	-33.68	74	57.14	35.01	6.59	58.42	100	0	P	H
		7386	41.79	-32.21	74	55.35	36.44	8.31	58.31	100	0	P	H
													H
													H
		4923	41.11	-32.89	74	57.93	35.01	6.59	58.42	100	0	P	V
		7386	41.4	-32.6	74	54.96	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.74	70.48	-3.52	74	66.74	32.77	4.62	33.65	103	243	P	H
		2390	53.39	-0.61	54	49.65	32.77	4.62	33.65	103	243	A	H
	*	2414	111.68	-	-	107.85	32.81	4.65	33.63	103	243	P	H
	*	2414	101.77	-	-	97.94	32.81	4.65	33.63	103	243	A	H
													H
													H
		2390	62.2	-11.8	74	58.46	32.77	4.62	33.65	133	290	P	V
		2390	47.52	-6.48	54	43.78	32.77	4.62	33.65	133	290	A	V
	*	2410.44	107.34	-	-	103.51	32.81	4.65	33.63	133	290	P	V
	*	2410	97.43	-	-	93.6	32.81	4.65	33.63	133	290	A	V
													V
													V
802.11g CH 06 2437MHz		2351.04	56.49	-17.51	74	52.95	32.66	4.57	33.69	100	167	P	H
		2382.09	43.18	-10.82	54	39.49	32.73	4.62	33.66	100	167	A	H
	*	2439	112.29	-	-	108.32	32.89	4.68	33.6	100	167	P	H
	*	2435	101.8	-	-	97.89	32.85	4.68	33.62	100	167	A	H
		2483.72	59.88	-14.12	74	55.76	32.96	4.73	33.57	100	167	P	H
		2484.64	45.13	-8.87	54	41.01	32.96	4.73	33.57	100	167	A	H
		2327.73	54.86	-19.14	74	51.39	32.62	4.55	33.7	193	286	P	V
		2374.53	42.52	-11.48	54	38.85	32.73	4.6	33.66	193	286	A	V
	*	2439	106.8	-	-	102.83	32.89	4.68	33.6	193	286	P	V
	*	2439	96.71	-	-	92.74	32.89	4.68	33.6	193	286	A	V
		2483.88	56.08	-17.92	74	51.96	32.96	4.73	33.57	193	286	P	V
		2485.84	43.22	-10.78	54	39.1	32.96	4.73	33.57	193	286	A	V



802.11g CH 11 2462MHz	*	2460	112.09	-	-	108.06	32.92	4.7	33.59	100	172	P	H
	*	2460	102.13	-	-	98.1	32.92	4.7	33.59	100	172	A	H
		2483.56	72.01	-1.99	74	67.89	32.96	4.73	33.57	100	172	P	H
		2483.6	52.7	-1.3	54	48.58	32.96	4.73	33.57	100	172	A	H
													H
													H
	*	2464	107.59	-	-	103.56	32.92	4.7	33.59	152	280	P	V
	*	2464	96.89	-	-	92.86	32.92	4.7	33.59	152	280	A	V
		2483.56	61.73	-12.27	74	57.61	32.96	4.73	33.57	152	280	P	V
		2483.52	45.65	-8.35	54	41.53	32.96	4.73	33.57	152	280	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4824	39.64	-34.36	74	56.68	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		4875	39.91	-34.09	74	56.85	35.02	6.56	58.52	100	0	P	H
		7311	42.57	-31.43	74	56.1	36.39	8.24	58.16	100	0	P	H
													H
													H
		4875	41.64	-32.36	74	58.58	35.02	6.56	58.52	100	0	P	V
		7311	42.19	-31.81	74	55.72	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4923	41.77	-32.23	74	58.59	35.01	6.59	58.42	100	0	P	H
		7386	41.96	-32.04	74	55.52	36.44	8.31	58.31	100	0	P	H
													H
													H
		4923	41.16	-32.84	74	57.98	35.01	6.59	58.42	100	0	P	V
		7386	42.52	-31.48	74	56.08	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		2389.56	69.29	-4.71	74	65.55	32.77	4.62	33.65	191	230	P	H
		2390	52.96	-1.04	54	49.22	32.77	4.62	33.65	191	230	A	H
	*	2410	110.18	-	-	106.35	32.81	4.65	33.63	191	230	P	H
	*	2410	100.23	-	-	96.4	32.81	4.65	33.63	191	230	A	H
													H
													H
		2389.02	70.13	-3.87	74	66.39	32.77	4.62	33.65	117	159	P	V
		2390	52.48	-1.52	54	48.74	32.77	4.62	33.65	117	159	A	V
	*	2413	110.71	-	-	106.88	32.81	4.65	33.63	117	159	P	V
	*	2413	100.59	-	-	96.76	32.81	4.65	33.63	117	159	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2356.71	56.12	-17.88	74	52.5	32.7	4.6	33.68	189	228	P	H
		2384.97	43.22	-10.78	54	39.53	32.73	4.62	33.66	189	228	A	H
	*	2435	109.95	-	-	106.04	32.85	4.68	33.62	189	228	P	H
	*	2435	99.93	-	-	96.02	32.85	4.68	33.62	189	228	A	H
		2484.36	59.27	-14.73	74	55.15	32.96	4.73	33.57	189	228	P	H
		2488.16	44.71	-9.29	54	40.54	33	4.73	33.56	189	228	A	H
		2356.08	57.34	-16.66	74	53.72	32.7	4.6	33.68	121	129	P	V
		2386.86	43.57	-10.43	54	39.83	32.77	4.62	33.65	121	129	A	V
	*	2435	108.51	-	-	104.6	32.85	4.68	33.62	121	129	P	V
	*	2435	98.52	-	-	94.61	32.85	4.68	33.62	121	129	A	V
		2493.84	56.19	-17.81	74	52.02	33	4.73	33.56	121	129	P	V
		2486.96	43.39	-10.61	54	39.27	32.96	4.73	33.57	121	129	A	V



802.11n HT20 CH 11 2462MHz	*	2460.04	109.72	-	-	105.69	32.92	4.7	33.59	100	239	P	H
	*	2460.45	99.63	-	-	95.6	32.92	4.7	33.59	100	239	A	H
		2484.04	70.45	-3.55	74	66.33	32.96	4.73	33.57	100	239	P	H
		2483.52	52.2	-1.8	54	48.08	32.96	4.73	33.57	100	239	A	H
													H
													H
	*	2464	105.17	-	-	101.14	32.92	4.7	33.59	131	206	P	V
	*	2464	95.11	-	-	91.08	32.92	4.7	33.59	131	206	A	V
		2484.08	64.76	-9.24	74	60.64	32.96	4.73	33.57	131	206	P	V
		2483.52	47.7	-6.3	54	43.58	32.96	4.73	33.57	131	206	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	41.66	-32.34	74	58.7	35.03	6.54	58.61	100	0	P	H
													H
													H
													H
		4824	40.54	-33.46	74	57.58	35.03	6.54	58.61	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4875	39.69	-34.31	74	56.63	35.02	6.56	58.52	100	0	P	H
		7311	42.8	-31.2	74	56.33	36.39	8.24	58.16	100	0	P	H
													H
													H
		4875	40.71	-33.29	74	57.65	35.02	6.56	58.52	100	0	P	V
		7311	41.46	-32.54	74	54.99	36.39	8.24	58.16	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4923	39.98	-34.02	74	56.8	35.01	6.59	58.42	100	0	P	H
		7386	41.85	-32.15	74	55.41	36.44	8.31	58.31	100	0	P	H
													H
													H
		4923	40.58	-33.42	74	57.4	35.01	6.59	58.42	100	0	P	V
		7386	41.83	-32.17	74	55.39	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)

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 802.11g LF		108.84	39.42	-4.08	43.5	59.22	10.84	1.14	31.78	140	59	P	H
		125.31	18.37	-25.13	43.5	37.34	11.6	1.21	31.78			P	H
		140.97	35.23	-8.27	43.5	54.25	11.5	1.26	31.78			P	H
		360.9	26.85	-19.15	46	42.08	14.63	1.92	31.78			P	H
		461.7	34.87	-11.13	46	47.16	17.42	2.15	31.86			P	H
		985.3	26.87	-27.13	54	29.58	24.85	3.2	30.76			P	H
													H
													H
													H
													H
													H
													H
		125.04	33.77	-9.73	43.5	52.74	11.6	1.21	31.78	101	350	P	V
		190.92	20.68	-22.82	43.5	42.22	8.8	1.44	31.78			P	V
		250.05	34.82	-11.18	46	52.55	12.4	1.64	31.77			P	V
		501.6	16.06	-29.94	46	27.71	18.01	2.23	31.89			P	V
		750.8	20.77	-25.23	46	27.8	22.2	2.75	31.98			P	V
		985.3	24.42	-29.58	54	27.13	24.85	3.2	30.76			P	V
													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	P eak or A verage
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 CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		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”.