



Appendix A. Radiated Spurious Emission

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		2386.77	53.07	-20.93	74	47.73	31.3	6.17	32.13	195	342	P	H
		2386.32	39.55	-14.45	54	34.21	31.3	6.17	32.13	195	342	A	H
	*	2410.771	100.87	-	-	95.39	31.31	6.22	32.05	195	342	P	H
	*	2412.107	95.34	-	-	89.86	31.31	6.22	32.05	195	342	A	H
		2353.65	52.69	-21.31	74	47.47	31.26	6.12	32.16	151	256	P	V
		2355.54	38.08	-15.92	54	32.86	31.26	6.12	32.16	151	256	A	V
	*	2410.855	96.29	-	-	90.81	31.31	6.22	32.05	151	256	P	V
	*	2412.024	91	-	-	85.52	31.31	6.22	32.05	151	256	A	V
802.11b CH 06 2437MHz	*	2435.905	96.83	-	-	91.24	31.33	6.22	31.96	194	331	P	H
	*	2437.157	91.6	-	-	85.92	31.34	6.22	31.88	194	331	A	H
	*	2435.905	92.82	-	-	87.23	31.33	6.22	31.96	225	0	P	V
	*	2435.321	87.61	-	-	82.02	31.33	6.22	31.96	225	0	A	V
802.11b CH 11 2462MHz	*	2461.957	102.58	-	-	96.73	31.36	6.28	31.79	163	332	P	H
	*	2462.208	97.48	-	-	91.63	31.36	6.28	31.79	163	332	A	H
		2492.6	55.8	-18.2	74	49.7	31.39	6.33	31.62	163	332	P	H
		2483.52	43.13	-10.87	54	37.14	31.37	6.33	31.71	163	332	A	H
	*	2460.872	99.57	-	-	93.72	31.36	6.28	31.79	197	0	P	V
	*	2462.208	94.49	-	-	88.64	31.36	6.28	31.79	197	0	A	V
		2483.72	55.05	-18.95	74	49.06	31.37	6.33	31.71	197	0	P	V
		2483.52	41.35	-12.65	54	35.36	31.37	6.33	31.71	197	0	A	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	48.2	-25.8	74	38.6	34.89	8.73	34.02	155	218	P	H
		4824	45.84	-28.16	74	36.24	34.89	8.73	34.02	200	0	P	V
802.11b CH 06 2437MHz		4875	47.69	-26.31	74	38	34.92	8.76	33.99	188	213	P	H
		7311	46.01	-27.99	74	35.08	35.56	10.84	35.47	167	203	P	H
		4875	47.14	-26.86	74	37.45	34.92	8.76	33.99	210	85	P	V
		7311	45.79	-28.21	74	34.86	35.56	10.84	35.47	199	168	P	V
802.11b CH 11 2462MHz		4923	47.69	-26.31	74	37.91	34.95	8.79	33.96	210	54	P	H
		7386	45.1	-28.9	74	37.82	35.58	10.89	39.19	168	210	P	H
		4923	47.16	-26.84	74	37.38	34.95	8.79	33.96	154	0	P	V
		7386	45.97	-28.03	74	35.19	35.58	10.89	35.69	177	136	P	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		2390	58.87	-15.13	74	53.53	31.3	6.17	32.13	222	195	P	H
		2389.92	41.7	-12.3	54	36.36	31.3	6.17	32.13	222	195	A	H
	*	2417.034	103.78	-	-	98.3	31.31	6.22	32.05	222	195	P	H
	*	2417.117	92.35	-	-	86.87	31.31	6.22	32.05	222	195	A	H
		2325.21	53.26	-20.74	74	48.09	31.23	6.12	32.18	227	359	P	V
		2390	39.28	-14.72	54	33.94	31.3	6.17	32.13	227	359	A	V
	*	2416.616	98.05	-	-	92.57	31.31	6.22	32.05	227	359	P	V
	*	2416.95	85.89	-	-	80.41	31.31	6.22	32.05	227	359	A	V
802.11g CH 06 2437MHz	*	2443.754	80.87	-	-	75.13	31.34	6.28	31.88	197	30	P	H
	*	2443.42	69.55	-	-	63.81	31.34	6.28	31.88	197	30	A	H
	*	2442.585	95.28	-	-	89.54	31.34	6.28	31.88	221	5	P	V
	*	2443.002	83.64	-	-	77.9	31.34	6.28	31.88	221	5	A	V
802.11g CH 11 2462MHz	*	2457.365	103.45	-	-	97.6	31.36	6.28	31.79	153	197	P	H
	*	2458.784	91.86	-	-	86.01	31.36	6.28	31.79	153	197	A	H
		2483.52	63.12	-10.88	74	57.13	31.37	6.33	31.71	153	197	P	H
		2483.52	44.5	-9.5	54	38.51	31.37	6.33	31.71	153	197	A	H
	*	2459.285	97.58	-	-	91.73	31.36	6.28	31.79	151	100	P	V
	*	2459.034	84.49	-	-	78.64	31.36	6.28	31.79	151	100	A	V
		2484.12	54.06	-19.94	74	48.07	31.37	6.33	31.71	151	100	P	V
	2483.52	39.35	-14.65	54	33.36	31.37	6.33	31.71	151	100	A	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	48.27	-25.73	74	38.67	34.89	8.73	34.02	163	58	P	H
		4824	47.51	-26.49	74	37.91	34.89	8.73	34.02	203	337	P	V
802.11g CH 06 2437MHz		4875	48.88	-25.12	74	39.19	34.92	8.76	33.99	196	223	P	H
		7311	46.35	-27.65	74	35.42	35.56	10.84	35.47	188	0	P	H
		4875	47.59	-26.41	74	37.9	34.92	8.76	33.99	199	167	P	V
802.11g CH 11 2462MHz		7311	47.91	-26.09	74	36.98	35.56	10.84	35.47	148	256	P	V
		4923	47.44	-26.56	74	37.66	34.95	8.79	33.96	168	164	P	H
		7386	48.28	-25.72	74	37.5	35.58	10.89	35.69	199	205	P	H
		4923	47.52	-26.48	74	37.74	34.95	8.79	33.96	200	0	P	V
		7386	48.9	-25.1	74	38.12	35.58	10.89	35.69	168	167	P	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		2390	58.11	-15.89	74	52.77	31.3	6.17	32.13	199	140	P	H
		2390	41.1	-12.9	54	35.76	31.3	6.17	32.13	199	140	A	H
	*	2416.533	103.06	-	-	97.58	31.31	6.22	32.05	199	140	P	H
	*	2418.119	90.75	-	-	85.27	31.31	6.22	32.05	199	140	A	H
		2389.65	59.91	-14.09	74	54.57	31.3	6.17	32.13	179	119	P	V
		2390	42.24	-11.76	54	36.9	31.3	6.17	32.13	179	119	A	V
	*	2415.615	103.39	-	-	97.91	31.31	6.22	32.05	179	119	P	V
	*	2415.615	91.52	-	-	86.04	31.31	6.22	32.05	179	119	A	V
802.11n HT20 CH 06 2437MHz	*	2429.559	98.83	-	-	93.24	31.33	6.22	31.96	154	131	P	H
	*	2432.064	87.03	-	-	81.44	31.33	6.22	31.96	154	131	A	H
	*	2431.563	99.65	-	-	94.06	31.33	6.22	31.96	190	168	P	V
	*	2432.231	87.6	-	-	82.01	31.33	6.22	31.96	190	168	A	V
802.11n HT20 CH 11 2462MHz	*	2457.865	100.74	-	-	94.89	31.36	6.28	31.79	168	130	P	H
	*	2458.951	89.4	-	-	83.55	31.36	6.28	31.79	168	130	A	H
		2484.28	59.86	-14.14	74	53.87	31.37	6.33	31.71	168	130	P	H
		2483.6	42.32	-11.68	54	36.33	31.37	6.33	31.71	168	130	A	H
	*	2458.784	99.09	-	-	93.24	31.36	6.28	31.79	154	49	P	V
	*	2458.45	87.09	-	-	81.24	31.36	6.28	31.79	154	49	A	V
		2484.44	59.05	-14.95	74	53.06	31.37	6.33	31.71	154	49	P	V
	2483.52	41.49	-12.51	54	35.5	31.37	6.33	31.71	154	49	A	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	47.51	-26.49	74	37.91	34.89	8.73	34.02	163	223	P	H
		4824	47.01	-26.99	74	37.41	34.89	8.73	34.02	186	302	P	V
802.11n HT20 CH 06 2437MHz		4875	47.47	-26.53	74	37.78	34.92	8.76	33.99	196	25	P	H
		7311	48.72	-25.28	74	37.79	35.56	10.84	35.47	203	94	P	H
		4875	47.83	-26.17	74	38.14	34.92	8.76	33.99	166	331	P	V
		7311	49.11	-24.89	74	38.18	35.56	10.84	35.47	178	39	P	V
802.11n HT20 CH 11 2462MHz		4923	47.9	-26.1	74	38.12	34.95	8.79	33.96	168	226	P	H
		7386	48.92	-25.08	74	38.14	35.58	10.89	35.69	153	8	P	H
		4923	47.36	-26.64	74	37.58	34.95	8.79	33.96	162	261	P	V
		7386	49.02	-24.98	74	38.24	35.58	10.89	35.69	176	308	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz
2.4GHz WIFI 802.11b (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 802.11b LF		31.94	32.09	-7.91	40	45.73	18.22	0.79	32.65	168	261	P	H
		97.9	27.59	-15.91	43.5	48.09	11.08	1.04	32.62	-	-	P	H
		109.54	30.6	-12.9	43.5	50.63	11.38	1.23	32.64	-	-	P	H
		133.79	28.04	-15.46	43.5	47.83	11.57	1.23	32.59	-	-	P	H
		153.19	22.44	-21.06	43.5	41.97	11.59	1.44	32.56	-	-	P	H
		223.03	26.29	-19.71	46	46.31	10.86	1.61	32.49	-	-	P	H
		31.94	29.01	-10.99	40	42.65	18.22	0.79	32.65	100	239	P	V
		48.43	23.37	-16.63	40	45.49	9.72	0.79	32.63	-	-	P	V
		76.56	20.96	-19.04	40	43.8	8.77	1.04	32.65	-	-	P	V
		93.05	27.93	-15.57	43.5	48.96	10.53	1.04	32.6	-	-	P	V
		137.67	20.45	-23.05	43.5	40.19	11.6	1.23	32.57	-	-	P	V
		669.23	31.03	-14.97	46	40.3	19.63	3.05	31.95	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



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		31.94	21.78	-18.22	40	35.42	18.22	0.79	32.65	-	-	P	H
		106.63	28.2	-15.3	43.5	48.45	11.35	1.04	32.64	108	316	P	H
		138.64	25.31	-18.19	43.5	45.04	11.61	1.23	32.57	-	-	P	H
		157.07	20.19	-23.31	43.5	39.87	11.44	1.44	32.56	-	-	P	H
		199.75	23.84	-19.66	43.5	44.9	9.8	1.61	32.47	-	-	P	H
		223.03	25.35	-20.65	46	45.37	10.86	1.61	32.49	-	-	P	H
		31.94	29.25	-10.75	40	42.89	18.22	0.79	32.65	108	257	QP	V
		47.46	23.08	-16.92	40	44.7	10.23	0.79	32.64	-	-	P	V
		78.5	21.28	-18.72	40	43.95	8.94	1.04	32.65	-	-	P	V
		95.96	28.92	-14.58	43.5	49.62	10.86	1.04	32.6	-	-	P	V
		141.55	21.55	-21.95	43.5	41.25	11.63	1.23	32.56	-	-	P	V
		669.23	31.03	-14.97	46	40.3	19.63	3.05	31.95	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against 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		32.91	20.69	-19.31	40	34.81	17.73	0.79	32.64	-	-	P	H
		107.6	28.51	-14.99	43.5	48.75	11.36	1.04	32.64	102	334	P	H
		137.67	26.37	-17.13	43.5	46.11	11.6	1.23	32.57	-	-	P	H
		223.03	29.75	-16.25	46	49.77	10.86	1.61	32.49	-	-	P	H
		500.45	27.41	-18.59	46	40.01	17.1	2.51	32.21	-	-	P	H
		669.23	30.17	-15.83	46	39.44	19.63	3.05	31.95	-	-	P	H
	!	30	35.02	-4.98	40	47.69	19.2	0.79	32.66	168	261	P	V
		36.79	28.46	-11.54	40	44.51	15.77	0.79	32.61	-	-	P	V
		48.43	21.6	-18.4	40	43.72	9.72	0.79	32.63	-	-	P	V
		95.96	28.42	-15.08	43.5	49.12	10.86	1.04	32.6	-	-	P	V
		105.66	29.09	-14.41	43.5	49.34	11.35	1.04	32.64	-	-	P	V
	600.36	33.11	-12.89	46	43.5	18.8	2.83	32.02	-	-	P	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”.