



## Appendix A. Radiated Spurious Emission

Test Engineer :	Karl Hou, Kyle Jhuang and Jet Lui	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		2389.74	54.8	-19.2	74	51.06	32.77	4.62	33.65	100	350	P	H	
		2390	43.63	-10.37	54	39.89	32.77	4.62	33.65	100	350	A	H	
	*	2412	114.34	-	-	110.51	32.81	4.65	33.63	100	350	P	H	
	*	2412	109.9	-	-	106.07	32.81	4.65	33.63	100	350	A	H	
													H	
														H
			2330.7	54.39	-19.61	74	50.92	32.62	4.55	33.7	133	227	P	V
			2390	41.9	-12.1	54	38.16	32.77	4.62	33.65	133	227	A	V
	*		2412	108.78	-	-	104.95	32.81	4.65	33.63	133	227	P	V
	*		2412	104.42	-	-	100.59	32.81	4.65	33.63	133	227	A	V
														V
														V
802.11b CH 06 2437MHz		2369.49	54.87	-19.13	74	51.2	32.73	4.6	33.66	100	350	P	H	
		2389.83	41.76	-12.24	54	38.02	32.77	4.62	33.65	100	350	A	H	
	*	2437	116.1	-	-	112.13	32.89	4.68	33.6	100	350	P	H	
	*	2437	111.4	-	-	107.43	32.89	4.68	33.6	100	350	A	H	
			2484.44	55.11	-18.89	74	50.99	32.96	4.73	33.57	100	350	P	H
			2483.52	42.58	-11.42	54	38.46	32.96	4.73	33.57	100	350	A	H
			2384.25	54.8	-19.2	74	51.11	32.73	4.62	33.66	157	225	P	V
			2384.16	41.48	-12.52	54	37.79	32.73	4.62	33.66	157	225	A	V
	*		2437	110.66	-	-	106.69	32.89	4.68	33.6	157	225	P	V
	*		2437	105.8	-	-	101.83	32.89	4.68	33.6	157	225	A	V
			2490.4	54.73	-19.27	74	50.56	33	4.73	33.56	157	225	P	V
			2483.52	42.16	-11.84	54	38.04	32.96	4.73	33.57	157	225	A	V



<b>802.11b</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	112.56	-	-	108.53	32.92	4.7	33.59	121	355	P	H
	*	2462	108.25	-	-	104.22	32.92	4.7	33.59	121	355	A	H
		2483.76	58.13	-15.87	74	54.01	32.96	4.73	33.57	121	355	P	H
		2483.52	46.35	-7.65	54	42.23	32.96	4.73	33.57	121	355	A	H
													H
													H
	*	2462	108.81	-	-	104.78	32.92	4.7	33.59	128	254	P	V
	*	2462	104.14	-	-	100.11	32.92	4.7	33.59	128	254	A	V
		2484.6	56.6	-17.4	74	52.48	32.96	4.73	33.57	128	254	P	V
		2483.52	44.38	-9.62	54	40.26	32.96	4.73	33.57	128	254	A	V
													V
													V
<b>Remark</b>	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	47.89	-26.11	74	64.93	35.03	6.54	58.61	100	0	P	H	
													H	
													H	
													H	
		4824	49.09	-24.91	74	66.13	35.03	6.54	58.61	100	0	P	V	
		4824	47.89	-26.11	74	64.93	35.03	6.54	58.61	100	0	P	V	
		4824	49.09	-24.91	74	66.13	35.03	6.54	58.61	100	0	P	V	
														V
802.11b CH 06 2437MHz		4875	51.79	-2.21	54	68.73	35.02	6.56	58.52	114	59	A	H	
		4875	54.16	-19.84	74	71.1	35.02	6.56	58.52	114	59	P	H	
		7311	44.11	-29.89	74	57.64	36.39	8.24	58.16	100	0	P	H	
													H	
		4875	52.72	-1.28	54	69.66	35.02	6.56	58.52	109	37	A	V	
		4875	55.95	-18.05	74	72.89	35.02	6.56	58.52	109	37	P	V	
		7311	45.65	-28.35	74	59.18	36.39	8.24	58.16	100	0	P	V	
														V
802.11b CH 11 2462MHz		4926	53.11	-0.89	54	69.92	35.01	6.6	58.42	102	53	A	H	
		4926	54.45	-19.55	74	71.26	35.01	6.6	58.42	102	53	P	H	
		7386	42.46	-31.54	74	56.02	36.44	8.31	58.31	100	0	P	H	
													H	
		4923	50.28	-23.72	74	67.1	35.01	6.59	58.42	100	0	P	V	
		7386	44.84	-29.16	74	58.4	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		2389.38	66.16	-7.84	74	62.42	32.77	4.62	33.65	100	354	P	H	
		2390	50.59	-3.41	54	46.85	32.77	4.62	33.65	100	354	A	H	
	*	2412	115.58	-	-	111.75	32.81	4.65	33.63	100	354	P	H	
	*	2412	104.22	-	-	100.39	32.81	4.65	33.63	100	354	A	H	
													H	
													H	
			2389.47	60.24	-13.76	74	56.5	32.77	4.62	33.65	132	260	P	V
			2390	45.76	-8.24	54	42.02	32.77	4.62	33.65	132	260	A	V
	*		2412	109.47	-	-	105.64	32.81	4.65	33.63	132	260	P	V
	*		2412	98.96	-	-	95.13	32.81	4.65	33.63	132	260	A	V
													V	
													V	
802.11g CH 06 2437MHz		2389.65	56.66	-17.34	74	52.92	32.77	4.62	33.65	100	360	P	H	
		2389.92	42.66	-11.34	54	38.92	32.77	4.62	33.65	100	360	A	H	
	*	2437	116.77	-	-	112.8	32.89	4.68	33.6	100	360	P	H	
	*	2437	106.48	-	-	102.51	32.89	4.68	33.6	100	360	A	H	
			2484.32	58.67	-15.33	74	54.55	32.96	4.73	33.57	100	360	P	H
			2483.76	44.91	-9.09	54	40.79	32.96	4.73	33.57	100	360	A	H
			2386.68	55.12	-18.88	74	51.38	32.77	4.62	33.65	157	282	P	V
			2389.65	42.15	-11.85	54	38.41	32.77	4.62	33.65	157	282	A	V
	*		2437	113.26	-	-	109.29	32.89	4.68	33.6	157	282	P	V
	*		2437	103.43	-	-	99.46	32.89	4.68	33.6	157	282	A	V
			2484.08	56.35	-17.65	74	52.23	32.96	4.73	33.57	157	282	P	V
			2483.72	43.14	-10.86	54	39.02	32.96	4.73	33.57	157	282	A	V



<b>802.11g</b> <b>CH 11</b> <b>2462MHz</b>	*	2462	110.32	-	-	106.29	32.92	4.7	33.59	100	357	P	H
	*	2462	99.81	-	-	95.78	32.92	4.7	33.59	100	357	A	H
		2483.68	69.98	-4.02	74	65.86	32.96	4.73	33.57	100	357	P	H
		2483.6	48.42	-5.58	54	44.3	32.96	4.73	33.57	100	357	A	H
													H
													H
	*	2462	104.19	-	-	100.16	32.92	4.7	33.59	186	258	P	V
	*	2462	93.49	-	-	89.46	32.92	4.7	33.59	186	258	A	V
		2483.6	57.92	-16.08	74	53.8	32.96	4.73	33.57	186	258	P	V
		2483.64	43.83	-10.17	54	39.71	32.96	4.73	33.57	186	258	A	V
													V
													V
<b>Remark</b>	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	44.41	-29.59	74	61.45	35.03	6.54	58.61	100	0	P	H	
													H	
													H	
													H	
		4824	49.82	-24.18	74	66.86	35.03	6.54	58.61	100	0	P	V	
														V
														V
802.11g CH 06 2437MHz		4875	41.53	-12.47	54	58.47	35.02	6.56	58.52	103	57	A	H	
		4875	52.77	-21.23	74	69.71	35.02	6.56	58.52	103	57	P	H	
		7311	43.2	-30.8	74	56.73	36.39	8.24	58.16	100	0	P	H	
													H	
		4875	41.09	-12.91	54	58.03	35.02	6.56	58.52	108	42	A	V	
		4875	55.84	-18.16	74	72.78	35.02	6.56	58.52	108	42	P	V	
		7311	43.81	-30.19	74	57.34	36.39	8.24	58.16	100	0	P	V	
802.11g CH 11 2462MHz		4926	48.35	-25.65	74	65.16	35.01	6.6	58.42	100	0	P	H	
		7386	41.97	-32.03	74	55.53	36.44	8.31	58.31	100	0	P	H	
													H	
													H	
		4926	44.76	-29.24	74	61.57	35.01	6.6	58.42	100	0	P	V	
		7386	42.33	-31.67	74	55.89	36.44	8.31	58.31	100	0	P	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		2389.56	66.9	-7.1	74	63.16	32.77	4.62	33.65	100	352	P	H	
		2390	51.93	-2.07	54	48.19	32.77	4.62	33.65	100	352	A	H	
	*	2412	114.81	-	-	110.98	32.81	4.65	33.63	100	352	P	H	
	*	2412	103.84	-	-	100.01	32.81	4.65	33.63	100	352	A	H	
													H	
														H
			2389.92	60.85	-13.15	74	57.11	32.77	4.62	33.65	132	245	P	V
			2389.92	45.55	-8.45	54	41.81	32.77	4.62	33.65	132	245	A	V
		*	2412	108.75	-	-	104.92	32.81	4.65	33.63	132	245	P	V
		*	2412	97.81	-	-	93.98	32.81	4.65	33.63	132	245	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2367.42	54.61	-19.39	74	50.99	32.7	4.6	33.68	100	359	P	H	
		2389.29	42.28	-11.72	54	38.54	32.77	4.62	33.65	100	359	A	H	
	*	2437	113.89	-	-	109.92	32.89	4.68	33.6	100	359	P	H	
	*	2437	103.98	-	-	100.01	32.89	4.68	33.6	100	359	A	H	
			2493.8	54.96	-19.04	74	50.79	33	4.73	33.56	100	359	P	H
			2483.52	43.25	-10.75	54	39.13	32.96	4.73	33.57	100	359	A	H
			2332.05	54.84	-19.16	74	51.35	32.62	4.57	33.7	160	232	P	V
			2382.63	42.13	-11.87	54	38.44	32.73	4.62	33.66	160	232	A	V
		*	2437	109.61	-	-	105.64	32.89	4.68	33.6	160	232	P	V
		*	2437	98.74	-	-	94.77	32.89	4.68	33.6	160	232	A	V
			2493.96	54.96	-19.04	74	50.79	33	4.73	33.56	160	232	P	V
			2483.52	42.66	-11.34	54	38.54	4.73	33.57	160	232	A	V	



<b>802.11n HT20 CH 11 2462MHz</b>	*	2462	109.45	-	-	105.42	32.92	4.7	33.59	121	353	P	H
	*	2462	99.55	-	-	95.52	32.92	4.7	33.59	121	353	A	H
		2484.12	67.89	-6.11	74	63.77	32.96	4.73	33.57	121	353	P	H
		2483.6	48.49	-5.51	54	44.37	32.96	4.73	33.57	121	353	A	H
													H
													H
	*	2462	105.92	-	-	101.89	32.92	4.7	33.59	127	255	P	V
	*	2462	95.87	-	-	91.84	32.92	4.7	33.59	127	255	A	V
		2483.84	64.04	-9.96	74	59.92	32.96	4.73	33.57	127	255	P	V
		2483.72	45.34	-8.66	54	41.22	32.96	4.73	33.57	127	255	A	V
												V	
												V	
<b>Remark</b>	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		4822	49.44	-24.56	74	66.48	35.03	6.54	58.61	100	0	P	H	
													H	
													H	
													H	
		4822	50.14	-23.86	74	67.18	35.03	6.54	58.61	100	0	P	V	
														V
														V
802.11n HT20 CH 06 2437MHz		4872	48.1	-25.9	74	65.04	35.02	6.56	58.52	100	0	P	H	
		7311	43.01	-30.99	74	56.54	36.39	8.24	58.16	100	0	P	H	
													H	
													H	
		4875	50.52	-23.48	74	67.46	35.02	6.56	58.52	100	0	P	V	
		7313	43.54	-30.46	74	57.07	36.39	8.24	58.16	100	0	P	V	
														V
802.11n HT20 CH 11 2462MHz		4926	47.57	-26.43	74	64.38	35.01	6.6	58.42	100	0	P	H	
		7386	41.47	-32.53	74	55.03	36.44	8.31	58.31	100	0	P	H	
													H	
													H	
		4923	44.68	-29.32	74	61.5	35.01	6.59	58.42	100	0	P	V	
		7386	42.04	-31.96	74	55.6	36.44	8.31	58.31	100	0	P	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 802.11b

(LF @ 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)	
2.4GHz 802.11b LF		91.02	29.9	-13.6	43.5	51.75	8.88	1.05	31.78			P	H	
	!	243.3	40.36	-5.64	46	58.81	11.7	1.62	31.77	135	208	P	H	
	!	253.02	40.28	-5.72	46	57.55	12.85	1.65	31.77			P	H	
		325.9	33.91	-12.09	46	50.2	13.64	1.84	31.77			P	H	
		342	32.14	-13.86	46	47.88	14.16	1.88	31.78			P	H	
		731.9	32.75	-13.25	46	40.08	21.96	2.71	32			P	H	
														H
														H
														H
														H
														H
														H
		!	30.54	35.43	-4.57	40	48.16	18.38	0.71	31.82	147	258	P	V
			240.06	36.86	-9.14	46	55.62	11.4	1.61	31.77			P	V
			249.78	37.98	-8.02	46	55.71	12.4	1.64	31.77			P	V
			323.1	31.35	-14.65	46	47.76	13.52	1.84	31.77			P	V
			675.9	32.08	-13.92	46	41.15	20.36	2.61	32.04			P	V
			731.9	36.49	-9.51	46	43.82	21.96	2.71	32			P	V
														V
														V
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



Note symbol for Part 15C rule

15C 2.4GHz 2400~2483.5MHz

15C band 4 - 5725~5850MHz

*	<b>Fundamental Frequency</b> 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 <b>over limit</b> line.
@	Frequency falls in <b>non-restricted band</b> is passed and tested by conducted band edges and spurious emission measurement in the test report.
#	Peak measured value is <b>under 20dB</b> and complies with the average limit, so it is unnecessary to perform an average measurement per clause 6.5.4.2 of ANSI C63.10.
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

- 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”.