



Appendix A. Radiated Spurious Emission

Test Engineer :	Stan Hsieh and Karl Hou	Temperature :	24~25°C
		Relative Humidity :	53~54%

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	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)
BLE CH 00 2402MHz		2364.09	51.4	-22.6	74	52.12	27.14	5.39	33.25	100	291	P	H
		2383.44	41.99	-12.01	54	42.65	27.19	5.39	33.24	100	291	A	H
	*	2402	94.55	-	-	95.15	27.23	5.39	33.22	100	291	P	H
	*	2402	93.47	-	-	94.07	27.23	5.39	33.22	100	291	A	H
													H
													H
		2337.54	52.38	-21.62	74	53.21	27.1	5.33	33.26	102	90	P	V
		2383.44	42.24	-11.76	54	42.9	27.19	5.39	33.24	102	90	A	V
	*	2402	91.68	-	-	92.28	27.23	5.39	33.22	102	90	P	V
	*	2402	90.57	-	-	91.17	27.23	5.39	33.22	102	90	A	V
													V
													V
BLE CH 19 2440MHz		2385.24	51.36	-22.64	74	52.02	27.19	5.39	33.24	117	297	P	H
		2364.36	42	-12	54	42.71	27.14	5.39	33.24	117	297	A	H
	*	2440	96.11	-	-	96.53	27.37	5.42	33.21	117	297	P	H
	*	2440	94.93	-	-	95.35	27.37	5.42	33.21	117	297	A	H
		2499.92	52.29	-21.71	74	52.5	27.5	5.46	33.17	117	297	P	H
		2487.36	42.39	-11.61	54	42.65	27.46	5.46	33.18	117	297	A	H
		2355.9	51.57	-22.43	74	52.35	27.14	5.33	33.25	103	92	P	V
		2386.5	41.87	-12.13	54	42.49	27.23	5.39	33.24	103	92	A	V
	*	2440	90.06	-	-	90.48	27.37	5.42	33.21	103	92	P	V
	*	2440	89.23	-	-	89.65	27.37	5.42	33.21	103	92	A	V
		2485.2	51.67	-22.33	74	51.93	27.46	5.46	33.18	103	92	P	V
		2488.08	42.27	-11.73	54	42.49	27.5	5.46	33.18	103	92	A	V



BLE CH 39 2480MHz	*	2480	94.97	-	-	95.25	27.46	5.44	33.18	107	116	P	H
	*	2480	94.25	-	-	94.53	27.46	5.44	33.18	107	116	A	H
		2489.6	51.55	-22.45	74	51.77	27.5	5.46	33.18	107	116	P	H
		2491	42.46	-11.54	54	42.68	27.5	5.46	33.18	107	116	A	H
													H
													H
	*	2480	88.36	-	-	88.64	27.46	5.44	33.18	100	71	P	V
	*	2480	87.1	-	-	87.38	27.46	5.44	33.18	100	71	A	V
		2493.36	51.96	-22.04	74	52.17	27.5	5.46	33.17	100	71	P	V
		2486.92	42.52	-11.48	54	42.78	27.46	5.46	33.18	100	71	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	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)
BLE CH 00 2402MHz		4805	38	-36	74	59.64	31.42	7.58	60.64	100	0	P	H
													H
													H
													H
		4805	36.97	-37.03	74	58.61	31.42	7.58	60.64	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	37.43	-36.57	74	58.69	31.56	7.7	60.52	100	0	P	H
		7320	41.54	-32.46	74	56.81	36.22	9.49	60.98	100	0	P	H
													H
													H
		4880	38.22	-35.78	74	59.48	31.56	7.7	60.52	100	0	P	V
		7320	42.01	-31.99	74	57.28	36.22	9.49	60.98	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	39.02	-34.98	74	59.72	31.73	7.93	60.36	100	0	P	H
		7440	41.5	-32.5	74	56.74	36.49	9.61	61.34	100	0	P	H
													H
													H
		4960	39.39	-34.61	74	60.09	31.73	7.93	60.36	100	0	P	V
		7440	41.77	-32.23	74	57.01	36.49	9.61	61.34	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz BLE (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.
!	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”.