



Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang and James Chiu	Temperature :	22~23°C
		Relative Humidity :	45~52%

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	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		2356.305	55.23	-18.77	74	50.54	31.84	7.24	34.39	308	278	P	H
		2373.945	46.29	-7.71	54	41.52	31.89	7.24	34.36	308	278	A	H
	*	2402	93.9	-	-	88.97	31.93	7.31	34.31	308	278	P	H
	*	2402	93.42	-	-	88.49	31.93	7.31	34.31	308	278	A	H
													H
													H
		2371.11	55.37	-18.63	74	50.6	31.89	7.24	34.36	313	112	P	V
		2379.615	46.12	-7.88	54	41.34	31.89	7.24	34.35	313	112	A	V
	*	2402	87.23	-	-	82.3	31.93	7.31	34.31	313	112	P	V
	*	2402	86.61	-	-	81.68	31.93	7.31	34.31	313	112	A	V
													V
													V
BLE CH 19 2440MHz		2384.9	54.98	-19.02	74	50.12	31.89	7.31	34.34	302	292	P	H
		2356.62	45.86	-8.14	54	41.17	31.84	7.24	34.39	302	292	A	H
	*	2440	98.9	-	-	93.72	32.07	7.36	34.25	302	292	P	H
	*	2440	98.39	-	-	93.21	32.07	7.36	34.25	302	292	A	H
		2494.33	56.13	-17.87	74	50.69	32.2	7.4	34.16	302	292	P	H
		2486.42	45.89	-8.11	54	40.5	32.16	7.4	34.17	302	292	A	H
		2310.84	55.12	-18.88	74	50.69	31.71	7.18	34.46	349	92	P	V
		2386.72	46	-8	54	41.1	31.93	7.31	34.34	349	92	A	V
	*	2440	100.25	-	-	95.07	32.07	7.36	34.25	349	92	P	V
	*	2440	99.78	-	-	94.6	32.07	7.36	34.25	349	92	A	V
		2483.9	56.5	-17.5	74	51.12	32.16	7.4	34.18	349	92	P	V
		2494.26	45.69	-8.31	54	40.25	32.2	7.4	34.16	349	92	A	V



BLE CH 39 2480MHz	*	2480	98.06	-	-	92.68	32.16	7.4	34.18	240	96	P	H
	*	2480	97.62	-	-	92.24	32.16	7.4	34.18	240	96	A	H
		2488.48	56.2	-17.8	74	50.77	32.2	7.4	34.17	240	96	P	H
		2485.96	46.52	-7.48	54	41.13	32.16	7.4	34.17	240	96	A	H
													H
													H
	*	2480	99.67	-	-	94.29	32.16	7.4	34.18	368	118	P	V
	*	2480	98.66	-	-	93.28	32.16	7.4	34.18	368	118	A	V
		2489.6	55.64	-18.36	74	50.21	32.2	7.4	34.17	368	118	P	V
		2490.4	46.89	-7.11	54	41.46	32.2	7.4	34.17	368	118	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	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		4804	54.19	-19.81	74	67.25	34.19	11.83	59.08	286	307	P	H
		4804	50.46	-3.54	54	63.52	34.19	11.83	59.08	286	307	A	H
													H
													H
		4804	46.38	-27.62	74	59.44	34.19	11.83	59.08	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	48.1	-25.9	74	61.28	34.23	11.53	58.94	100	0	P	H
		7320	50.61	-23.39	74	59.16	35.6	13.81	57.96	100	0	P	H
													H
													H
		4880	43.57	-30.43	74	56.75	34.23	11.53	58.94	100	0	P	V
		7320	50.4	-23.6	74	58.95	35.6	13.81	57.96	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	43.36	-30.64	74	56.63	34.28	11.22	58.77	100	0	P	H
		7440	48.07	-25.93	74	56.55	35.6	14.05	58.13	100	0	P	H
													H
													H
		4960	43.56	-30.44	74	56.83	34.28	11.22	58.77	100	0	P	V
		7440	48.55	-25.45	74	57.03	35.6	14.05	58.13	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”.