Appendix B. Radiated Spurious Emission

Test Engineer :	Wilson Wu	Temperature :	24~25°C
		Relative Humidity :	50~52%

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 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		2343.81	51.46	-22.54	74	52.28	27.1	5.33	33.25	348	99	P	H
		2338.035	41.65	-12.35	54	42.48	27.1	5.33	33.26	348	99	A	H
	*	2402	94.83	-	-	95.43	27.23	5.39	33.22	348	99	P	H
	*	2402	94.09	-	-	94.69	27.23	5.39	33.22	348	99	A	H
													H
													H
		2381.4	51.12	-22.88	74	51.78	27.19	5.39	33.24	280	22	P	V
		2379.72	41.87	-12.13	54	42.53	27.19	5.39	33.24	280	22	A	V
	*	2402	95.11	-	-	95.71	27.23	5.39	33.22	280	22	P	V
	*	2402	94.43	-	-	95.03	27.23	5.39	33.22	280	22	A	V
													V
													V
BLE CH 19 2440MHz		2388.96	50.59	-23.41	74	51.21	27.23	5.39	33.24	336	133	P	H
		2380.42	41.52	-12.48	54	42.18	27.19	5.39	33.24	336	133	A	H
	*	2440	96.67	-	-	97.09	27.37	5.42	33.21	336	133	P	H
	*	2440	95.93	-	-	96.35	27.37	5.42	33.21	336	133	A	H
		2499.44	50.82	-23.18	74	51.03	27.5	5.46	33.17	336	133	P	H
		2485.51	42.14	-11.86	54	42.4	27.46	5.46	33.18	336	133	A	H
		2386.58	50.95	-23.05	74	51.57	27.23	5.39	33.24	303	30	P	V
		2388.68	41.52	-12.48	54	42.14	27.23	5.39	33.24	303	30	A	V
	*	2440	96.27	-	-	96.69	27.37	5.42	33.21	303	30	P	V
	*	2440	95.65	-	-	96.07	27.37	5.42	33.21	303	30	A	V
		2488.38	50.63	-23.37	74	50.85	27.5	5.46	33.18	303	30	P	V
		2493.49	42.2	-11.8	54	42.41	27.5	5.46	33.17	303	30	A	V

BLE CH 39 2480MHz	*	2480	97.25	-	-	97.53	27.46	5.44	33.18	290	123	P	H
	*	2480	96.14	-	-	96.42	27.46	5.44	33.18	290	123	A	H
		2484.12	51.5	-22.5	74	51.76	27.46	5.46	33.18	290	123	P	H
		2483.96	42.11	-11.89	54	42.37	27.46	5.46	33.18	290	123	A	H
													H
													H
	*	2480	97.19	-	-	97.47	27.46	5.44	33.18	261	30	P	V
	*	2480	96.46	-	-	96.74	27.46	5.44	33.18	261	30	A	V
		2490.08	51.54	-22.46	74	51.76	27.5	5.46	33.18	261	30	P	V
		2483.84	42.08	-11.92	54	42.34	27.46	5.46	33.18	261	30	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		4804	43.84	-30.16	74	56.02	31.42	7.58	51.18	100	0	P	H
													H
													H
													H
		4804	42.73	-31.27	74	54.91	31.42	7.58	51.18	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	43.55	-30.45	74	55.44	31.56	7.7	51.15	100	0	P	H
		7320	41.67	-32.33	74	46.76	36.22	9.49	50.8	100	0	P	H
													H
													H
		4880	41.15	-32.85	74	53.04	31.56	7.7	51.15	100	0	P	V
		7320	42.41	-31.59	74	47.5	36.22	9.49	50.8	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	42.83	-31.17	74	54.29	31.73	7.93	51.12	100	0	P	H
		7440	42.4	-31.6	74	47.1	36.49	9.61	50.8	100	0	P	H
													H
													H
		4960	41.3	-32.7	74	52.76	31.73	7.93	51.12	100	0	P	V
		7440	42.56	-31.44	74	47.26	36.49	9.61	50.8	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)

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)
2.4GHz BLE LF		65.91	28.67	-11.33	40	48.11	12.36	0.93	32.73	100	23	P	H
		100.2	25.08	-18.42	43.5	40.17	16.4	1.14	32.63	-	-	P	H
		271.92	21.26	-24.74	46	32.85	19.38	1.76	32.73	-	-	P	H
		505.8	26.11	-19.89	46	32.47	24.24	2.33	32.93	-	-	P	H
		720	28.23	-17.77	46	31.61	26.77	2.82	32.97	-	-	P	H
		951	31.29	-14.71	46	29.75	30	3.29	31.75	-	-	P	H
													H
													H
													H
													H
													H
													H
		41.88	28.58	-11.42	40	41.35	19.38	0.65	32.8	100	12	P	V
		167.97	22.7	-20.8	43.5	37.56	16.36	1.48	32.7	-	-	P	V
		259.23	22.76	-23.24	46	34.03	19.7	1.76	32.73	-	-	P	V
		521.9	27.5	-18.5	46	33.78	24.33	2.33	32.94	-	-	P	V
		747.3	28.75	-17.25	46	31.35	27.43	2.91	32.94	-	-	P	V
		956.6	31.8	-14.2	46	30.19	30	3.29	31.68	-	-	P	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.
!	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".