



Appendix B. Radiated Spurious Emission

Test Engineer :	James Chiu and Jesse Wang	Temperature :	21~23°C
		Relative Humidity :	46~49%

15C 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		2327.64	46.42	-27.58	74	40.95	32.09	7.6	34.22	216	332	P	H
		2365.89	34.26	-19.74	54	28.72	32.13	7.68	34.27	216	332	A	H
	*	2402	91.01	-	-	85.38	32.18	7.75	34.3	216	332	P	H
	*	2402	90.37	-	-	84.74	32.18	7.75	34.3	216	332	A	H
													H
													H
		2367.78	46.48	-27.52	74	40.94	32.13	7.68	34.27	116	107	P	V
		2388.84	33.97	-20.03	54	28.31	32.18	7.75	34.27	116	107	A	V
	*	2402	89.74	-	-	84.11	32.18	7.75	34.3	116	107	P	V
	*	2402	89.21	-	-	83.58	32.18	7.75	34.3	116	107	A	V
													V
													V
BLE CH 19 2440MHz		2313.51	46.23	-27.77	74	40.78	32.07	7.6	34.22	185	334	P	H
		2317.02	34.12	-19.88	54	28.67	32.07	7.6	34.22	185	334	A	H
	*	2440	90.38	-	-	84.66	32.24	7.83	34.35	185	334	P	H
	*	2440	89.66	-	-	83.94	32.24	7.83	34.35	185	334	A	H
		2488.72	46.58	-27.42	74	40.8	32.3	7.91	34.43	185	334	P	H
		2494.16	34.16	-19.84	54	28.43	32.3	7.91	34.48	185	334	A	H
		2332.41	46.41	-27.59	74	40.94	32.09	7.6	34.22	100	119	P	V
		2345.37	34.03	-19.97	54	28.49	32.11	7.68	34.25	100	119	A	V
	*	2440	90.62	-	-	84.9	32.24	7.83	34.35	100	119	P	V
	*	2440	89.94	-	-	84.22	32.24	7.83	34.35	100	119	A	V
		2484.76	46.53	-27.47	74	40.77	32.28	7.91	34.43	100	119	P	V
		2484.88	34.26	-19.74	54	28.5	32.28	7.91	34.43	100	119	A	V



BLE CH 39 2480MHz	*	2480	89.22	-	-	83.46	32.28	7.91	34.43	100	37	P	H
	*	2480	88.58	-	-	82.82	32.28	7.91	34.43	100	37	A	H
		2484.08	46.3	-27.7	74	40.54	32.28	7.91	34.43	100	37	P	H
		2488.56	34.29	-19.71	54	28.51	32.3	7.91	34.43	100	37	A	H
													H
													H
	*	2480	88.96	-	-	83.2	32.28	7.91	34.43	104	116	P	V
	*	2480	88.33	-	-	82.57	32.28	7.91	34.43	104	116	A	V
		2491.16	46.11	-27.89	74	40.33	32.3	7.91	34.43	104	116	P	V
		2486.12	34.27	-19.73	54	28.51	32.28	7.91	34.43	104	116	A	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

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		4806	40.5	-33.5	74	54.81	34.25	11.11	59.67	100	0	P	H
													H
													H
													H
		4806	40.35	-33.65	74	54.66	34.25	11.11	59.67	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	39.51	-34.49	74	53.57	34.3	11.21	59.57	100	0	P	H
		7320	41.71	-32.29	74	49.52	35.6	15.08	58.49	100	0	P	H
													H
													H
		4878	39.44	-34.56	74	53.5	34.3	11.21	59.57	100	0	P	V
		7320	41.2	-32.8	74	49.01	35.6	15.08	58.49	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4962	40.19	-33.81	74	53.95	34.37	11.32	59.45	100	0	P	H
		7440	41.26	-32.74	74	49.17	35.6	15.13	58.64	100	0	P	H
													H
													H
		4962	39.58	-34.42	74	53.34	34.37	11.32	59.45	100	0	P	V
		7440	40.63	-33.37	74	48.54	35.6	15.13	58.64	100	0	P	V
													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 BLE (LF @ 3m)

[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”.