



Appendix A. Radiated Spurious Emission

Test Engineer :	Nick Yu, Ken Wu, and James Chiu	Temperature :	23~24°C
		Relative Humidity :	56~60%

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		2379.48	46.56	-27.44	74	40.99	32.16	7.68	34.27	100	25	P	H
		2319.72	34.54	-19.46	54	29.07	32.09	7.6	34.22	100	25	A	H
	*	2401.75	90.93	-	-	85.3	32.18	7.75	34.3	100	25	P	H
	*	2402	90.22	-	-	84.59	32.18	7.75	34.3	100	25	A	H
													H
													H
		2317.38	47.5	-26.5	74	42.05	32.07	7.6	34.22	311	20	P	V
		2355.36	34.45	-19.55	54	28.89	32.13	7.68	34.25	311	20	A	V
	*	2402.25	87.55	-	-	81.92	32.18	7.75	34.3	311	20	P	V
	*	2402	86.84	-	-	81.21	32.18	7.75	34.3	311	20	A	V
													V
													V
BLE CH 19 2440MHz		2314.77	46.37	-27.63	74	40.92	32.07	7.6	34.22	100	21	P	H
		2366.61	34.41	-19.59	54	28.87	32.13	7.68	34.27	100	21	A	H
	*	2440.33	92.07	-	-	86.35	32.24	7.83	34.35	100	21	P	H
	*	2440	91.29	-	-	85.57	32.24	7.83	34.35	100	21	A	H
		2490.24	46.72	-27.28	74	40.94	32.3	7.91	34.43	100	21	P	H
		2494.28	34.5	-19.5	54	28.77	32.3	7.91	34.48	100	21	A	H
		2312.79	52.66	-21.34	74	47.18	32.07	7.6	34.19	300	62	P	V
		2314.59	40.42	-13.58	54	34.97	32.07	7.6	34.22	300	62	A	V
	*	2439.83	85.88	-	-	80.16	32.24	7.83	34.35	300	62	P	V
	*	2440.08	85.33	-	-	79.61	32.24	7.83	34.35	300	62	A	V
		2499.52	47.73	-26.27	74	42	32.3	7.91	34.48	300	62	P	V
		2499.88	34.58	-19.42	54	28.85	32.3	7.91	34.48	300	62	A	V



BLE CH 39 2480MHz	*	2479.83	89.88	-	-	84.12	32.28	7.91	34.43	100	27	P	H
	*	2479.99	89.51	-	-	83.75	32.28	7.91	34.43	100	27	A	H
		2489.76	47.12	-26.88	74	41.34	32.3	7.91	34.43	100	27	P	H
		2484.24	34.43	-19.57	54	28.67	32.28	7.91	34.43	100	27	A	H
													H
													H
	*	2479.83	85.72	-	-	79.96	32.28	7.91	34.43	375	38	P	V
	*	2480.08	84.96	-	-	79.2	32.28	7.91	34.43	375	38	A	V
		2494.12	46.39	-27.61	74	40.66	32.3	7.91	34.48	375	38	P	V
		2486.92	34.44	-19.56	54	28.68	32.28	7.91	34.43	375	38	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	40.91	-33.09	74	55.22	34.25	11.11	59.67	100	0	P	H
													H
													H
													H
		4804	41.11	-32.89	74	55.42	34.25	11.11	59.67	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	40.38	-33.62	74	54.44	34.3	11.21	59.57	100	0	P	H
		7320	42.62	-31.38	74	50.43	35.6	15.08	58.49	100	0	P	H
													H
													H
		4880	41.06	-32.94	74	55.12	34.3	11.21	59.57	100	0	P	V
		7320	42.19	-31.81	74	50	35.6	15.08	58.49	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4962	40.62	-33.38	74	54.38	34.37	11.32	59.45	100	0	P	H
		7440	42.03	-31.97	74	49.94	35.6	15.13	58.64	100	0	P	H
													H
													H
		4960	41.1	-32.9	74	54.86	34.37	11.32	59.45	100	0	P	V
		7440	41.82	-32.18	74	49.73	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.												

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	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		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”.