



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)

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		30	28.01	-11.99	40	32.29	26	1.07	31.35	-	-	P	H
		84	23.91	-16.09	40	39.8	14.38	1.28	31.55	-	-	P	H
		252.21	36.98	-9.02	46	47.08	19.2	2.07	31.37	100	0	P	H
		336.4	27.08	-18.92	46	35.08	20.82	2.41	31.23	-	-	P	H
		420.4	35.52	-10.48	46	41.09	22.68	2.89	31.14	-	-	P	H
		948.9	33.76	-12.24	46	30.04	30.18	4.07	30.53	-	-	P	H
													H
													H
													H
													H
													H
		30	29.7	-10.3	40	33.98	26	1.07	31.35	100	0	P	V
		71.85	29.45	-10.55	40	46.82	12.92	1.28	31.57	-	-	P	V
		252.21	35.65	-10.35	46	45.75	19.2	2.07	31.37	-	-	P	V
		420.4	31.72	-14.28	46	37.29	22.68	2.89	31.14	-	-	P	V
		588.4	33.14	-12.86	46	35.4	25.22	3.36	30.84	-	-	P	V
		986.7	34.29	-19.71	54	30.56	30.27	3.98	30.52	-	-	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	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”.