



Appendix B. Radiated Spurious Emission

Test Engineer :	Jacky Hung	Temperature :	20~23°C
		Relative Humidity :	50~55%

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		2388.225	52.9	-21.1	74	53.17	27.01	6.71	33.99	156	10	P	H
		2380.035	42.41	-11.59	54	42.73	26.96	6.71	33.99	156	10	A	H
	*	2402	98.82	-	-	99.08	27.01	6.71	33.98	156	10	P	H
	*	2402	91.74	-	-	92	27.01	6.71	33.98	156	10	A	H
													H
													H
		2328.69	52.34	-21.66	74	52.94	26.82	6.58	34	120	330	P	V
		2348.85	42.24	-11.76	54	42.71	26.87	6.65	33.99	120	330	A	V
	*	2402	92.84	-	-	93.1	27.01	6.71	33.98	120	330	P	V
	*	2402	91.07	-	-	91.33	27.01	6.71	33.98	120	330	A	V
													V
													V
BLE CH 19 2440MHz		2361.66	51.47	-22.53	74	51.9	26.91	6.65	33.99	176	10	P	H
		2389.8	43.16	-10.84	54	43.42	27.01	6.71	33.98	176	10	A	H
	*	2440	99.72	-	-	99.79	27.16	6.74	33.97	176	10	P	H
	*	2440	91.89	-	-	91.96	27.16	6.74	33.97	176	10	A	H
		2493.63	51.52	-22.48	74	51.39	27.3	6.77	33.94	176	10	P	H
		2487.82	43.13	-10.87	54	43.01	27.3	6.77	33.95	176	10	A	H
		2386.16	51.43	-22.57	74	51.7	27.01	6.71	33.99	113	339	P	V
		2375.8	42.34	-11.66	54	42.72	26.96	6.65	33.99	113	339	A	V
	*	2440	93.14	-	-	93.21	27.16	6.74	33.97	113	339	P	V
	*	2440	90.22	-	-	90.29	27.16	6.74	33.97	113	339	A	V
		2499.16	51.77	-22.23	74	51.64	27.3	6.77	33.94	113	339	P	V
		2498.25	42.94	-11.06	54	42.81	27.3	6.77	33.94	113	339	A	V



BLE CH 39 2480MHz	*	2480	98.82	-	-	98.75	27.25	6.77	33.95	176	10	P	H
	*	2480	96.9	-	-	96.83	27.25	6.77	33.95	176	10	A	H
		2483.64	62.72	-11.28	74	62.65	27.25	6.77	33.95	176	10	P	H
		2483.56	46.86	-7.14	54	46.79	27.25	6.77	33.95	176	10	A	H
													H
													H
	*	2480	93.98	-	-	93.91	27.25	6.77	33.95	100	336	P	V
	*	2480	91.82	-	-	91.75	27.25	6.77	33.95	100	336	A	V
		2483.8	58.18	-15.82	74	58.11	27.25	6.77	33.95	100	336	P	V
		2483.64	43.69	-10.31	54	43.62	27.25	6.77	33.95	100	336	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	42.27	-31.73	74	51.58	31.1	10.68	51.09	100	0	P	H
													H
													H
													H
		4804	42.92	-31.08	74	52.23	31.1	10.68	51.09	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	41.58	-32.42	74	50.95	31.21	10.48	51.06	100	0	P	H
		7320	38.14	-35.86	74	40.25	36.12	12.28	50.51	100	0	P	H
													H
													H
		4880	39.88	-34.12	74	49.25	31.21	10.48	51.06	100	0	P	V
		7320	38.74	-35.26	74	40.85	36.12	12.28	50.51	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	37.2	-36.8	74	46.6	31.34	10.29	51.03	100	0	P	H
		7440	38.62	-35.38	74	40.19	36.39	12.55	50.51	100	0	P	H
													H
													H
		4960	38.97	-35.03	74	48.37	31.34	10.29	51.03	100	0	P	V
		7440	39.1	-34.9	74	40.67	36.39	12.55	50.51	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”.