



Appendix A. Radiated Spurious Emission

Test Engineer :	Luke Chang	Temperature :	18~20°C
		Relative Humidity :	41~42%

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		2362.11	53.51	-20.49	74	50.1	31.92	6.14	34.65	243	26	P	H
		2362.02	46.4	-7.6	54	42.99	31.92	6.14	34.65	243	26	A	H
	*	2401.67	100.08	-	-	96.57	31.94	6.21	34.64	243	26	P	H
	*	2402.004	99.06	-	-	95.55	31.94	6.21	34.64	243	26	A	H
													H
													H
		2374.35	52	-22	74	48.55	31.93	6.17	34.65	170	210	P	V
		2362.38	41.18	-12.82	54	37.77	31.92	6.14	34.65	170	210	A	V
	*	2401.67	92.06	-	-	88.55	31.94	6.21	34.64	170	210	P	V
	*	2401.92	91.2	-	-	87.69	31.94	6.21	34.64	170	210	A	V
													V
													V
BLE CH 19 2440MHz		2379.75	52.76	-21.24	74	49.31	31.93	6.17	34.65	254	21	P	H
		2359.95	45.9	-8.1	54	42.49	31.92	6.14	34.65	254	21	A	H
	*	2439.746	98.94	-	-	95.37	31.97	6.24	34.64	254	21	P	H
	*	2439.997	98.09	-	-	94.52	31.97	6.24	34.64	254	21	A	H
		2499.8	54.13	-19.87	74	50.42	32	6.34	34.63	254	21	P	H
		2499.92	48.49	-5.51	54	44.78	32	6.34	34.63	254	21	A	H
		2383.53	52.89	-21.11	74	49.44	31.93	6.17	34.65	184	211	P	V
		2359.95	41.4	-12.6	54	37.99	31.92	6.14	34.65	184	211	A	V
	*	2439.746	92.64	-	-	89.07	31.97	6.24	34.64	184	211	P	V
	*	2439.997	91.8	-	-	88.23	31.97	6.24	34.64	184	211	A	V
		2492.16	52.04	-21.96	74	48.33	32	6.34	34.63	184	211	P	V
		2499.92	42.54	-11.46	54	38.83	32	6.34	34.63	184	211	A	V



BLE CH 39 2480MHz	*	2480.076	99.97	-	-	96.31	31.99	6.3	34.63	201	8	P	H
	*	2479.993	98.98	-	-	95.32	31.99	6.3	34.63	201	8	A	H
		2483.72	55.92	-18.08	74	52.26	31.99	6.3	34.63	201	8	P	H
		2483.52	49.2	-4.8	54	45.54	31.99	6.3	34.63	201	8	A	H
													H
													H
	*	2479.742	94.12	-	-	90.46	31.99	6.3	34.63	165	210	P	V
	*	2480.076	93.44	-	-	89.78	31.99	6.3	34.63	165	210	A	V
		2483.52	52.4	-21.6	74	48.74	31.99	6.3	34.63	165	210	P	V
		2483.52	44.93	-9.07	54	41.27	31.99	6.3	34.63	165	210	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		4804	35.71	-38.29	74	53.7	34.35	8.52	60.86	100	0	P	H
													H
													H
													H
		4804	36.73	-37.27	74	54.72	34.35	8.52	60.86	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	35.83	-38.17	74	53.35	34.4	8.77	60.69	100	0	P	H
		7320	40.46	-33.54	74	53.31	35.73	11.95	60.53	100	0	P	H
													H
													H
		4880	36.25	-37.75	74	53.77	34.4	8.77	60.69	100	0	P	V
		7320	39.65	-34.35	74	52.5	35.73	11.95	60.53	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	39.12	-34.88	74	56.11	34.47	9.02	60.48	100	0	P	H
		7440	39.47	-34.53	74	52.33	35.71	12.01	60.58	100	0	P	H
													H
													H
		4960	37.86	-36.14	74	54.85	34.47	9.02	60.48	100	0	P	V
		7440	39.49	-34.51	74	52.35	35.71	12.01	60.58	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)

[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 per 15.209(c).
!	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”.