



Appendix B. Radiated Spurious Emission

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		2344.2	46.73	-27.27	74	41.19	32.11	7.68	34.25	141	337	P	H
		2334.84	35.03	-18.97	54	29.54	32.11	7.6	34.22	141	337	A	H
	*	2402.254	90.3	-	-	84.67	32.18	7.75	34.3	141	337	P	H
	*	2401.92	89.53	-	-	83.9	32.18	7.75	34.3	141	337	A	H
													H
													H
		2386.32	47.14	-26.86	74	41.48	32.18	7.75	34.27	200	272	P	V
		2348.7	35.31	-18.69	54	29.77	32.11	7.68	34.25	200	272	A	V
	*	2402.254	91.68	-	-	86.05	32.18	7.75	34.3	200	272	P	V
	*	2402.004	90.9	-	-	85.27	32.18	7.75	34.3	200	272	A	V
													V
													V
BLE CH 19 2440MHz		2349.6	47.33	-26.67	74	41.79	32.11	7.68	34.25	121	200	P	H
		2311.26	35.19	-18.81	54	29.71	32.07	7.6	34.19	121	200	A	H
	*	2439.83	89.37	-	-	83.65	32.24	7.83	34.35	121	200	P	H
	*	2439.997	88.6	-	-	82.88	32.24	7.83	34.35	121	200	A	H
		2491.72	47.55	-26.45	74	41.77	32.3	7.91	34.43	121	200	P	H
		2489.52	35.42	-18.58	54	29.64	32.3	7.91	34.43	121	200	A	H
		2326.29	47.09	-26.91	74	41.62	32.09	7.6	34.22	184	269	P	V
		2310.27	35.42	-18.58	54	29.94	32.07	7.6	34.19	184	269	A	V
	*	2440.247	89.61	-	-	83.89	32.24	7.83	34.35	184	269	P	V
	*	2439.997	88.84	-	-	83.12	32.24	7.83	34.35	184	269	A	V
		2489.48	47.64	-26.36	74	41.86	32.3	7.91	34.43	184	269	P	V
		2484.12	35.35	-18.65	54	29.59	32.28	7.91	34.43	184	269	A	V



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 39 2480MHz	*	2480.327	87.56	-	-	81.8	32.28	7.91	34.43	100	348	P	H
	*	2480.076	86.78	-	-	81.02	32.28	7.91	34.43	100	348	A	H
		2485.92	47.85	-26.15	74	42.09	32.28	7.91	34.43	100	348	P	H
		2496.32	35.45	-18.55	54	29.72	32.3	7.91	34.48	100	348	A	H
													H
													H
	*	2480.243	88.9	-	-	83.14	32.28	7.91	34.43	197	268	P	V
	*	2480.076	88.06	-	-	82.3	32.28	7.91	34.43	197	268	A	V
		2497.2	47.49	-26.51	74	41.76	32.3	7.91	34.48	197	268	P	V
		2493.56	35.06	-18.94	54	29.33	32.3	7.91	34.48	197	268	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	42.97	-31.03	74	57.28	34.25	11.11	59.67	100	0	P	H
													H
													H
													H
		4804	43.25	-30.75	74	57.56	34.25	11.11	59.67	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	41.99	-32.01	74	56.05	34.3	11.21	59.57	100	0	P	H
		7320	44.41	-29.59	74	52.22	35.6	15.08	58.49	100	0	P	H
													H
													H
		4880	42.84	-31.16	74	56.9	34.3	11.21	59.57	100	0	P	V
		7320	44.12	-29.88	74	51.93	35.6	15.08	58.49	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4962	41.27	-32.73	74	55.03	34.37	11.32	59.45	100	0	P	H
		7440	42.94	-31.06	74	50.85	35.6	15.13	58.64	100	0	P	H
													H
													H
		4960	41.95	-32.05	74	55.71	34.37	11.32	59.45	100	0	P	V
		7440	43.21	-30.79	74	51.12	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)

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		47.01	22.25	-17.75	40	42.23	9.45	1.77	31.2			P	H
		155.82	22.17	-21.33	43.5	40.06	10.66	2.61	31.16			P	H
		235.47	17.87	-28.13	46	35.09	10.82	2.96	31			P	H
		414.8	24.73	-21.27	46	35.58	16.45	3.52	30.82			P	H
		650	24.49	-21.51	46	30.37	20.4	4.22	30.5			P	H
		927.2	29.05	-16.95	46	30.39	24.21	4.8	30.35	170	335	P	H
													H
													H
													H
													H
													H
													H
		44.85	28.36	-11.64	40	47.29	10.5	1.77	31.2	117	61	P	V
		106.95	23.44	-20.06	43.5	41.61	10.62	2.38	31.17			P	V
		207.39	18.68	-24.82	43.5	37.92	9.17	2.69	31.1			P	V
		452.6	21.42	-24.58	46	31.22	17.33	3.63	30.76			P	V
		741	26.27	-19.73	46	30	22.19	4.48	30.4			P	V
		934.2	29.15	-16.85	46	30.42	24.3	4.8	30.37			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 per 15.209(c).
!	Test result is over limit line.
P/A	Peak or Average
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”.