



Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang	Temperature :	21~23°C
		Relative Humidity :	54~56%

15C 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	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
					Line	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
BLE CH 00 2402MHz		2376.78	49.06	-24.94	74	43.58	5.48	7.68	34.36	360	20	P	H	
		2330.7	36.54	-17.46	54	31.29	5.25	7.6	34.44	360	20	A	H	
	*	2402	94.11	-	-	88.5	5.61	7.75	34.32	360	20	P	H	
	*	2402	93.51	-	-	87.9	5.61	7.75	34.32	360	20	A	H	
													H	
														H
			2377.05	52.23	-21.77	74	46.75	5.48	7.68	34.36	263	326	P	V
			2389.02	37.41	-16.59	54	31.84	5.57	7.75	34.36	263	326	A	V
	*		2402	98.88	-	-	93.27	5.61	7.75	34.32	263	326	P	V
	*		2402	98.28	-	-	92.67	5.61	7.75	34.32	263	326	A	V
														V
													V	
BLE CH 19 2440MHz		2326.02	48.62	-25.38	74	43.37	5.25	7.6	34.44	100	357	P	H	
		2348.61	36.29	-17.71	54	30.9	5.39	7.68	34.4	100	357	A	H	
	*	2440	91.9	-	-	86.1	5.8	7.83	34.27	343	12	P	H	
	*	2440	91.28	-	-	85.48	5.8	7.83	34.27	343	12	A	H	
			2496.4	48.96	-25.04	74	42.9	6.06	7.91	34.15	100	357	P	H
			2493.52	37.02	-16.98	54	30.96	6.06	7.91	34.15	100	357	A	H
			2389.02	49.35	-24.65	74	43.78	5.57	7.75	34.36	237	335	P	V
			2330.07	36.48	-17.52	54	31.23	5.25	7.6	34.44	237	335	A	V
	*		2440	97.69	-	-	91.89	5.8	7.83	34.27	237	335	P	V
	*		2440	97.02	-	-	91.22	5.8	7.83	34.27	237	335	A	V
			2485.24	49.76	-24.24	74	43.76	6	7.91	34.19	237	335	P	V
		2484.2	37.06	-16.94	54	31.06	6	7.91	34.19	237	335	A	V	



BLE CH 39 2480MHz	*	2480	91.48	-	-	85.48	6	7.91	34.19	373	18	P	H
	*	2480	90.82	-	-	84.82	6	7.91	34.19	373	18	P	H
		2484.96	49.82	-24.18	74	43.82	6	7.91	34.19	373	18	P	H
		2483.6	37.13	-16.87	54	31.13	6	7.91	34.19	373	18	A	H
													H
													H
	*	2480	97.53	-	-	91.53	6	7.91	34.19	225	338	P	V
	*	2480	97.21	-	-	91.21	6	7.91	34.19	225	338	P	V
		2493.4	49.57	-24.43	74	43.51	6.06	7.91	34.15	225	338	P	V
		2492.76	37.66	-16.34	54	31.6	6.06	7.91	34.15	225	338	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.
		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 00 2402MHz		4804	42.68	-31.32	74	56.99	-14.31	11.11	59.67	100	0	P	H
													H
													H
													H
		4804	41.4	-32.6	74	55.71	-14.31	11.11	59.67	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	41.67	-32.33	74	55.73	-14.06	11.21	59.57	100	0	P	H
		7320	46.88	-27.12	74	54.69	-7.81	15.08	58.49	100	0	P	H
													H
													H
		4880	40.36	-33.64	74	54.42	-14.06	11.21	59.57	100	0	P	V
		7320	43.44	-30.56	74	51.25	-7.81	15.08	58.49	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	41.92	-32.08	74	55.68	-13.76	11.32	59.45	100	0	P	H
		7440	47.16	-26.84	74	55.07	-7.91	15.13	58.64	100	0	P	H
													H
													H
		4960	41.18	-32.82	74	54.94	-13.76	11.32	59.45	100	0	P	V
		7440	42.78	-31.22	74	50.69	-7.91	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.												



15C 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	24.48	-15.52	40	34.31	-9.83	1.77	31.5	100	0	P	H	
		119.1	16.79	-26.71	43.5	32.85	-16.06	2.38	31.1			P	H	
		226.83	22.56	-23.44	46	39.51	-16.95	2.96	31			P	H	
		845.3	27.69	-18.31	46	31.92	-4.23	4.7	30.39			P	H	
		857.2	28.56	-17.44	46	32.66	-4.1	4.7	30.38			P	H	
		937.7	29.24	-16.76	46	32.59	-3.35	4.8	30.38			P	H	
														H
														H
														H
														H
														H
														H
			30.27	24.47	-15.53	40	34.3	-9.83	1.77	31.5	100	0	P	V
			152.31	17.93	-25.57	43.5	35.33	-17.4	2.61	31.13			P	V
			261.66	19.66	-26.34	46	33.5	-13.84	3.16	31			P	V
			882.4	28.38	-17.62	46	32.23	-3.85	4.66	30.34			P	V
			918.1	28.62	-17.38	46	32.05	-3.43	4.8	30.34			P	V
			943.3	29.67	-16.33	46	32.86	-3.19	4.94	30.39			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	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		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
2412MHz													

- Level(dBμV/m) =
Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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”.