



Appendix A. Radiated Spurious Emission

Test Engineer :	Nick Yu, Ken Wu and Bill Kuo	Temperature :	21~23°C
		Relative Humidity :	56~60%

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		2325.12	52.12	-21.88	74	53.18	27.05	5.95	34.06	212	58	P	H
		2325.12	46.06	-7.94	54	47.12	27.05	5.95	34.06	212	58	A	H
	*	2402.254	99.26	-	-	100.06	27.23	6.01	34.04	212	58	P	H
	*	2402.087	98.81	-	-	99.61	27.23	6.01	34.04	212	58	A	H
													H
													H
		2325.12	52.6	-21.4	74	53.66	27.05	5.95	34.06	324	95	P	V
		2325.3	46.79	-7.21	54	47.85	27.05	5.95	34.06	324	95	A	V
	*	2402.254	98.14	-	-	98.94	27.23	6.01	34.04	324	95	P	V
	*	2402.004	97.67	-	-	98.47	27.23	6.01	34.04	324	95	A	V
													V
													V
BLE CH 19 2440MHz		2363.55	53.47	-20.53	74	54.37	27.14	6.01	34.05	201	58	P	H
		2363.19	48.53	-5.47	54	49.49	27.14	5.95	34.05	201	58	A	H
	*	2439.83	98.64	-	-	99.26	27.37	6.04	34.03	201	58	P	H
	*	2440.08	98.2	-	-	98.82	27.37	6.04	34.03	201	58	A	H
		2486.04	50.97	-23.03	74	51.43	27.46	6.09	34.01	201	58	P	H
		2494.08	42.18	-11.82	54	42.59	27.5	6.09	34	201	58	A	H
		2363.1	53.01	-20.99	74	53.97	27.14	5.95	34.05	329	102	P	V
		2363.19	47.9	-6.1	54	48.86	27.14	5.95	34.05	329	102	A	V
	*	2439.83	97.95	-	-	98.57	27.37	6.04	34.03	329	102	P	V
	*	2439.997	97.46	-	-	98.08	27.37	6.04	34.03	329	102	A	V
		2499.16	51.81	-22.19	74	52.22	27.5	6.09	34	329	102	P	V
		2485.4	42.1	-11.9	54	42.56	27.46	6.09	34.01	329	102	A	V



BLE CH 39 2480MHz	*	2479.826	99.8	-	-	100.28	27.46	6.07	34.01	206	54	P	H
	*	2480.076	99.31	-	-	99.79	27.46	6.07	34.01	206	54	A	H
		2489.64	58.09	-15.91	74	58.51	27.5	6.09	34.01	206	54	P	H
		2489.6	49.36	-4.64	54	49.78	27.5	6.09	34.01	206	54	A	H
													H
													H
	*	2479.826	99.08	-	-	99.56	27.46	6.07	34.01	287	84	P	V
	*	2480.076	98.64	-	-	99.12	27.46	6.07	34.01	287	84	A	V
		2489.48	56.68	-17.32	74	57.1	27.5	6.09	34.01	287	84	P	V
		2489.44	49.26	-4.74	54	49.68	27.5	6.09	34.01	287	84	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		4806	36.22	-37.78	74	61.36	31.3	8.65	65.09	100	0	P	H
													H
													H
													H
		4806	35.72	-38.28	74	60.86	31.3	8.65	65.09	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4878	35.8	-38.2	74	60.72	31.41	8.69	65.02	100	0	P	H
		7320	41.08	-32.92	74	59.44	36.32	10.39	65.07	100	0	P	H
													H
													H
		4878	36.01	-37.99	74	60.93	31.41	8.69	65.02	100	0	P	V
		7320	40.46	-33.54	74	58.82	36.32	10.39	65.07	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4962	36.48	-37.52	74	61.04	31.54	8.83	64.93	100	0	P	H
		7440	39.88	-34.12	74	57.86	36.59	10.52	65.09	100	0	P	H
													H
													H
		4962	36.85	-37.15	74	61.41	31.54	8.83	64.93	100	0	P	V
		7440	40.05	-33.95	74	58.03	36.59	10.52	65.09	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	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”.