



## Appendix B. Radiated Spurious Emission

Test Engineer :	Elvis Chen and Tsung Lee	Temperature :	20~21°C
		Relative Humidity :	44~45%

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 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		2369.04	52.56	-21.44	74	53.22	27.19	5.39	33.24	100	55	P	H
		2368.68	41.86	-12.14	54	42.52	27.19	5.39	33.24	100	55	A	H
	*	2401.753	88.6	-	-	89.2	27.23	5.39	33.22	100	55	P	H
	*	2402.004	87.54	-	-	88.14	27.23	5.39	33.22	100	55	A	H
													H
													H
		2368.86	58.63	-15.37	74	59.29	27.19	5.39	33.24	105	294	P	V
		2368.77	46.88	-7.12	54	47.54	27.19	5.39	33.24	105	294	A	V
	*	2401.753	96.35	-	-	96.95	27.23	5.39	33.22	105	294	P	V
	*	2402.004	95.3	-	-	95.9	27.23	5.39	33.22	105	294	A	V
													V
													V
BLE CH 19 2440MHz		2334.39	50.7	-23.3	74	51.58	27.05	5.33	33.26	100	52	P	H
		2382.45	41.03	-12.97	54	41.69	27.19	5.39	33.24	100	52	A	H
	*	2439.746	87.86	-	-	88.28	27.37	5.42	33.21	100	52	P	H
	*	2439.997	86.79	-	-	87.21	27.37	5.42	33.21	100	52	A	H
		2492.8	51.31	-22.69	74	51.52	27.5	5.46	33.17	100	52	P	H
		2492.56	41.59	-12.41	54	41.8	27.5	5.46	33.17	100	52	A	H
		2380.11	50.31	-23.69	74	50.97	27.19	5.39	33.24	109	293	P	V
		2336.91	41.12	-12.88	54	41.95	27.1	5.33	33.26	109	293	A	V
	*	2440.247	94.68	-	-	95.1	27.37	5.42	33.21	109	293	P	V
	*	2439.997	93.68	-	-	94.1	27.37	5.42	33.21	109	293	A	V
		2492.92	56.73	-17.27	74	56.94	27.5	5.46	33.17	109	293	P	V
		2492.72	44.88	-9.12	54	45.09	27.5	5.46	33.17	109	293	A	V



<b>BLE CH 39 2480MHz</b>	*	2479.742	85.25	-	-	85.53	27.46	5.44	33.18	100	0	P	H
	*	2479.993	84.2	-	-	84.48	27.46	5.44	33.18	100	0	A	H
		2492.44	51.92	-22.08	74	52.13	27.5	5.46	33.17	100	0	P	H
		2492.6	42.88	-11.12	54	43.09	27.5	5.46	33.17	100	0	A	H
													H
													H
	*	2479.742	93.66	-	-	93.94	27.46	5.44	33.18	123	282	P	V
	*	2479.993	92.63	-	-	92.91	27.46	5.44	33.18	123	282	A	V
		2492.44	56.72	-17.28	74	56.93	27.5	5.46	33.17	123	282	P	V
		2492.56	47.23	-6.77	54	47.44	27.5	5.46	33.17	123	282	A	V
													V
													V
<b>Remark</b>	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		4805	38.05	-35.95	74	59.69	31.42	7.58	60.64	100	0	P	H
													H
													H
													H
		4803	41.29	-32.71	74	62.93	31.42	7.58	60.64	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4482	37.87	-36.13	74	60.97	30.77	7.32	61.19	100	0	P	H
		7320	43.18	-30.82	74	58.45	36.22	9.49	60.98	100	0	P	H
													H
													H
		4481	40.78	-33.22	74	63.88	30.77	7.32	61.19	100	0	P	V
		7320	42.22	-31.78	74	57.49	36.22	9.49	60.98	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4961	38.27	-35.73	74	58.97	31.73	7.93	60.36	100	0	P	H
		7440	43.59	-30.41	74	58.83	36.49	9.61	61.34	100	0	P	H
													H
													H
		4961	38.01	-35.99	74	58.71	31.73	7.93	60.36	100	0	P	V
		7440	43.26	-30.74	74	58.5	36.49	9.61	61.34	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		31.89	16.67	-23.33	40	29.92	18.92	0.65	32.82			P	H
		106.41	10.78	-32.72	43.5	31.18	11.1	1.14	32.64			P	H
		255.45	14.07	-31.93	46	31.69	13.35	1.76	32.73			P	H
		733.3	22.61	-23.39	46	31.38	21.27	2.91	32.95			P	H
		837.6	24.98	-21.02	46	32.16	22.41	3.07	32.66			P	H
		944.7	26.49	-19.51	46	30.83	24.19	3.29	31.82	100	58	P	H
													H
													H
													H
													H
													H
													H
													H
		31.62	27.52	-12.48	40	40.77	18.92	0.65	32.82	100	167	P	V
		40.53	25.96	-14.04	40	44.17	13.94	0.65	32.8			P	V
		107.22	12.09	-31.41	43.5	32.39	11.2	1.14	32.64			P	V
		727.7	22.01	-23.99	46	30.91	21.15	2.91	32.96			P	V
		836.9	24.19	-21.81	46	31.39	22.4	3.07	32.67			P	V
		948.2	27	-19	46	31.21	24.28	3.29	31.78			P	V
													V
													V
													V
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



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”.**