



## Appendix A. Radiated Spurious Emission

Test Engineer :	Citta Ke	Temperature :	21~23°C
		Relative Humidity :	49~51%

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		2374.08	62	-12	74	55.97	33.04	6.65	33.66	121	33	P	H
		2374.17	46.91	-7.09	54	40.88	33.04	6.65	33.66	121	33	A	H
	*	2402	99.74	-	-	93.72	33.02	6.65	33.65	121	33	P	H
	*	2402	98.84	-	-	92.82	33.02	6.65	33.65	121	33	A	H
													H
													H
		2373.81	58.65	-15.35	74	52.62	33.04	6.65	33.66	106	201	P	V
		2373.9	46.2	-7.8	54	40.17	33.04	6.65	33.66	106	201	A	V
	*	2402	95.56	-	-	89.54	33.02	6.65	33.65	106	201	P	V
	*	2402	94.62	-	-	88.6	33.02	6.65	33.65	106	201	A	V
													V
													V
BLE CH 19 2440MHz		2372.46	56.9	-17.1	74	50.87	33.04	6.65	33.66	296	39	P	H
		2376.78	45.98	-8.02	54	39.95	33.04	6.65	33.66	296	39	A	H
	*	2440	97.91	-	-	91.85	32.96	6.7	33.6	296	39	P	H
	*	2440	97.01	-	-	90.95	32.96	6.7	33.6	296	39	A	H
		2497.12	58.8	-15.2	74	52.65	32.9	6.81	33.56	296	39	P	H
		2496.52	45.78	-8.22	54	39.63	32.9	6.81	33.56	296	39	A	H
		2343.93	57.6	-16.4	74	51.61	33.09	6.59	33.69	123	234	P	V
		2365.35	45.77	-8.23	54	39.79	33.07	6.59	33.68	123	234	A	V
	*	2440	94.53	-	-	88.47	32.96	6.7	33.6	123	234	P	V
	*	2440	93.6	-	-	87.54	32.96	6.7	33.6	123	234	A	V
		2496.64	57.04	-16.96	74	50.89	32.9	6.81	33.56	123	234	P	V
		2485.96	45.89	-8.11	54	39.78	32.92	6.76	33.57	123	234	A	V



<b>BLE CH 39 2480MHz</b>	*	2480	97.47	-	-	91.36	32.92	6.76	33.57	142	215	P	H
	*	2480	96.61	-	-	90.5	32.92	6.76	33.57	142	215	A	H
		2497.32	59.56	-14.44	74	53.41	32.9	6.81	33.56	142	215	P	H
		2497.28	47.21	-6.79	54	41.06	32.9	6.81	33.56	142	215	A	H
													H
													H
	*	2480	92.57	-	-	86.46	32.92	6.76	33.57	107	227	P	V
	*	2480	91.7	-	-	85.59	32.92	6.76	33.57	107	227	A	V
		2497.36	57.59	-16.41	74	51.44	32.9	6.81	33.56	107	227	P	V
		2497.12	46.25	-7.75	54	40.1	32.9	6.81	33.56	107	227	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	39.58	-34.42	74	56.06	32.51	9.65	58.64	100	0	P	H
													H
													H
													H
		4804	39.23	-34.77	74	55.71	32.51	9.65	58.64	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	42.55	-31.45	74	58.75	32.58	9.74	58.52	100	0	P	H
		7320	42.94	-31.06	74	55.21	34.07	11.85	58.19	100	0	P	H
													H
													H
		4880	41.37	-32.63	74	57.57	32.58	9.74	58.52	100	0	P	V
		7320	43.35	-30.65	74	55.62	34.07	11.85	58.19	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	40.68	-33.32	74	56.54	32.67	9.83	58.36	100	0	P	H
		7440	42	-32	74	54.26	34.09	12.06	58.41	100	0	P	H
													H
													H
		4960	40.79	-33.21	74	56.65	32.67	9.83	58.36	100	0	P	V
		7440	42.93	-31.07	74	55.19	34.09	12.06	58.41	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		98.31	31.63	-11.87	43.5	50.64	9.92	1.48	30.41			P	H
		179.31	31.12	-12.38	43.5	50.61	8.97	1.89	30.35			P	H
		287.04	32.22	-13.78	46	47.24	13.01	2.14	30.17			P	H
		720	38.2	-7.8	46	42.86	21.4	3.4	29.46	117	56	P	H
		790.7	35.14	-10.86	46	38.81	22	3.72	29.39			P	H
		864.2	33.74	-12.26	46	36.06	23.06	3.84	29.22			P	H
													H
													H
													H
													H
													H
		179.58	36.07	-7.43	43.5	55.56	8.97	1.89	30.35	145	120	P	V
		215.49	35.6	-7.9	43.5	54.63	9.25	2.02	30.3			P	V
		287.04	37.47	-8.53	46	52.49	13.01	2.14	30.17			P	V
		322.4	35.45	-10.55	46	49.79	13.48	2.3	30.12			P	V
		647.9	37.29	-8.71	46	43.1	20.4	3.33	29.54			P	V
		720	36.42	-9.58	46	41.08	21.4	3.4	29.46			P	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 per 15.209(c).
!	Test result is <b>over limit</b> line.
P/A	<b>P</b> eak or <b>A</b> verage
H/V	<b>H</b> orizontal or <b>V</b> 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		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”.**