



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



BLE CH 39 2480MHz	*	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
													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
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													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	P eak or A verage
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		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”.