



## **Appendix A. Radiated Spurious Emission**



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		2385.15	40.52	-33.48	74	36.83	32.73	4.62	33.66	133	266	P	H	
		2386.95	29.28	-24.72	54	25.54	32.77	4.62	33.65	133	266	A	H	
	*	2402	90.74	-	-	87	32.77	4.62	33.65	133	266	P	H	
	*	2402	90	-	-	86.26	32.77	4.62	33.65	133	266	A	H	
													H	
														H
			2373.36	41.44	-32.56	74	37.77	32.73	4.6	33.66	125	277	P	V
			2311.26	29.5	-24.5	54	26.09	32.58	4.55	33.72	125	277	A	V
	*		2402	93.78	-	-	90.04	32.77	4.62	33.65	125	277	P	V
	*		2402	93.24	-	-	89.5	32.77	4.62	33.65	125	277	A	V
														V
														V



<b>BLE CH 19 2440MHz</b>		2381.91	40.63	-33.37	74	36.94	32.73	4.62	33.66	107	141	P	H
		2377.23	29.3	-24.7	54	25.63	32.73	4.6	33.66	107	141	A	H
	*	2440	101.19	-	-	97.22	32.89	4.68	33.6	107	141	P	H
	*	2440	100.48	-	-	96.51	32.89	4.68	33.6	107	141	A	H
		2498.2	41.05	-32.95	74	36.88	33	4.73	33.56	107	141	P	H
		2492.36	29.45	-24.55	54	25.28	33	4.73	33.56	107	141	A	H
		2350.41	41.01	-32.99	74	37.47	32.66	4.57	33.69	100	278	P	V
		2365.98	29.21	-24.79	54	25.59	32.7	4.6	33.68	100	278	A	V
	*	2440	97.81	-	-	93.84	32.89	4.68	33.6	100	278	P	V
	*	2440	97.01	-	-	93.04	32.89	4.68	33.6	100	278	A	V
		2496.16	41.58	-32.42	74	37.41	33	4.73	33.56	100	278	P	V
		2485.6	29.91	-24.09	54	25.79	32.96	4.73	33.57	100	278	A	V
<b>BLE CH 39 2480MHz</b>	*	2480	99.99	-	-	95.87	32.96	4.73	33.57	132	135	P	H
	*	2480	99.26	-	-	95.14	32.96	4.73	33.57	132	135	A	H
		2483.52	47.69	-26.31	74	43.57	32.96	4.73	33.57	132	135	P	H
		2483.52	41.88	-12.12	54	37.76	32.96	4.73	33.57	132	135	A	H
													H
													H
	*	2480	96.11	-	-	91.99	32.96	4.73	33.57	100	279	P	V
	*	2480	95.39	-	-	91.27	32.96	4.73	33.57	100	279	A	V
		2483.64	45.84	-28.16	74	41.72	32.96	4.73	33.57	100	279	P	V
		2483.52	38.38	-15.62	54	34.26	32.96	4.73	33.57	100	279	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 )	Limit	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	37	-37	74	54.08	35.04	6.52	58.64	100	0	P	H
													H
													H
													H
		4804	36.79	-37.21	74	53.87	35.04	6.52	58.64	100	0	P	V
													V
													V
													V
BLE CH 19 2440MHz		4880	37.61	-36.39	74	54.53	35.02	6.58	58.52	100	0	P	H
		7320	39.06	-34.94	74	52.61	36.4	8.24	58.19	100	0	P	H
													H
													H
		4880	38.31	-35.69	74	55.23	35.02	6.58	58.52	100	0	P	V
		7320	38.82	-35.18	74	52.37	36.4	8.24	58.19	100	0	P	V
													V
													V
BLE CH 39 2480MHz		4960	37.71	-36.29	74	54.45	35.01	6.61	58.36	100	0	P	H
		7440	39.34	-34.66	74	52.92	36.47	8.36	58.41	100	0	P	H
													H
													H
		4960	37.35	-36.65	74	54.09	35.01	6.61	58.36	100	0	P	V
		7440	38.01	-35.99	74	51.59	36.47	8.36	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 @ 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 )	
2.4GHz BLE LF		33.24	24.9	-15.1	40	38.65	17.34	0.72	31.81	116	81	P	H	
		130.44	19.3	-24.2	43.5	37.87	11.98	1.23	31.78			P	H	
		259.5	12.43	-33.57	46	28.62	13.9	1.68	31.77			P	H	
		430.2	18.71	-27.29	46	31.54	16.91	2.09	31.83			P	H	
		700.4	20.95	-25.05	46	29.64	20.7	2.65	32.04			P	H	
		990.9	25.4	-28.6	54	28.1	24.79	3.22	30.71			P	H	
														H
														H
														H
														H
														H
														H
														H
			48.09	28.51	-11.49	40	50.51	9	0.8	31.8	195	354	P	V
			73.74	24.37	-15.63	40	48.5	6.72	0.94	31.79			P	V
			212.79	15.94	-27.56	43.5	36.98	9.22	1.52	31.78			P	V
			548.5	19.02	-26.98	46	29.08	19.58	2.32	31.96			P	V
			843.2	23.68	-22.32	46	29.28	23.2	2.91	31.71			P	V
			981.8	25.76	-28.24	54	28.49	24.88	3.18	30.79			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>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

- 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”.