



## Appendix A. Radiated Spurious Emission

Test Engineer :	Karl Hou, Peter Liao, Citta Ke, and Nick Yu	Temperature :	21~22°C
		Relative Humidity :	52~55%

### 2.4GHz 2400~2483.5MHz

#### BT (Band Edge @ 3m)

BT	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 )	
BT CH00 2402MHz		2384.445	55.82	-18.18	74	52.85	27.01	7.45	31.49	100	348	P	H	
		2384.445	30.95	-23.05	54	-	-	-	-	-	-	A	H	
	*	2402	92.07	-	-	89.06	27.05	7.45	31.49	100	348	P	H	
	*	2402	67.2	-	-	-	-	-	-	-	-	A	H	
													H	
													H	
			2374.575	55.41	-18.59	74	52.52	27.01	7.37	31.49	115	115	P	V
			2374.575	30.54	-23.46	54	-	-	-	-	-	-	A	V
	*		2402	93.02	-	-	90.01	27.05	7.45	31.49	115	115	P	V
	*		2402	68.15	-	-	-	-	-	-	-	-	A	V
														V
														V
BT CH 39 2441MHz		2354.52	55.94	-18.06	74	53.1	26.97	7.37	31.5	100	348	P	H	
		2354.52	31.07	-22.93	54	-	-	-	-	-	-	A	H	
	*	2442	91.12	-	-	87.92	27.18	7.49	31.47	100	348	P	H	
	*	2442	66.25	-	-	-	-	-	-	-	-	A	H	
			2496.29	56.33	-17.67	74	52.96	27.3	7.53	31.46	100	348	P	H
			2496.29	31.46	-22.54	54	-	-	-	-	-	-	A	H
			2357.88	55.57	-18.43	74	52.73	26.97	7.37	31.5	142	114	P	V
			2357.88	30.7	-23.3	54	-	-	-	-	-	-	A	V
	*		2442	92.81	-	-	89.61	27.18	7.49	31.47	142	114	P	V
	*		2442	67.94	-	-	-	-	-	-	-	-	A	V
			2499.72	56.34	-17.66	74	52.97	27.3	7.53	31.46	142	114	P	V
			2499.72	31.47	-22.53	54	-	-	-	-	-	-	A	V



<b>BT CH 78 2480MHz</b>	*	2480	90.76	-	-	87.44	27.26	7.53	31.47	115	349	P	H
	*	2480	65.89	-	-	-	-	-	-	-	-	A	H
		2493.8	55.79	-18.21	74	52.42	27.3	7.53	31.46	115	349	P	H
		2493.8	30.92	-23.08	54	-	-	-	-	-	-	A	H
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													H
	*	2480	93.1	-	-	89.78	27.26	7.53	31.47	100	120	P	V
	*	2480	68.23	-	-	-	-	-	-	-	-	A	V
		2492.84	55.87	-18.13	74	52.5	27.3	7.53	31.46	100	120	P	V
		2492.84	31	-23	54	-	-	-	-	-	-	A	V
													V
													V
<b>Remark</b>	<ol style="list-style-type: none"> <li>1. No other spurious found.</li> <li>2. All results are PASS against Peak and Average limit line.</li> </ol>												



2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	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 )	
BT CH 00 2402MHz		4804	37.29	-36.71	74	53.62	31.23	10.59	58.15	100	0	P	H	
		4804	12.42	-41.58	54	-	-	-	-	-	-	A	H	
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		4804	36.42	-37.58	74	52.75	31.23	10.59	58.15	100	0	P	V	
		4804	11.55	-42.45	54	-	-	-	-	-	-	-	A	V
														V
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BT CH 39 2441MHz		4882	36.97	-37.03	74	52.85	31.33	10.89	58.1	100	0	P	H	
		4882	12.1	-41.9	54	-	-	-	-	-	-	A	H	
		7323	40.79	-33.21	74	49.59	36.12	14.18	59.1	100	0	P	H	
		7323	15.92	-38.08	54	-	-	-	-	-	-	A	H	
		4882	36.79	-37.21	74	52.67	31.33	10.89	58.1	100	0	P	V	
		4882	11.92	-42.08	54	-	-	-	-	-	-	A	V	
		7323	41.33	-32.67	74	50.13	36.12	14.18	59.1	100	0	P	V	
		7323	16.46	-37.54	54	-	-	-	-	-	-	A	V	
BT CH 78 2480MHz		4960	37.52	-36.48	74	52.91	31.45	11.19	58.03	100	0	P	H	
		4960	12.65	-41.35	54	-	-	-	-	-	-	A	H	
		7440	42	-32	74	50.39	36.46	14.32	59.17	100	0	P	H	
		7440	17.13	-36.87	54	-	-	-	-	-	-	A	H	
		4960	37.22	-36.78	74	52.61	31.45	11.19	58.03	100	0	P	V	
		4960	12.35	-41.65	54	-	-	-	-	-	-	A	V	
		7440	41.75	-32.25	74	50.14	36.46	14.32	59.17	100	0	P	V	
		7440	16.88	-37.12	54	-	-	-	-	-	-	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Emission below 1GHz

2.4GHz BT (LF)

BT	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 BT LF		98.85	31.64	-11.86	43.5	47.13	15.88	1.06	32.43	-	-	P	H	
		123.15	35.74	-7.76	43.5	49.02	17.72	1.43	32.43	100	118	P	H	
		141.24	30.15	-13.35	43.5	43.07	17.75	1.75	32.42	-	-	P	H	
		605.9	28.5	-17.5	46	31.93	25.47	3.5	32.4	-	-	P	H	
		747.3	32.38	-13.62	46	33.19	27.53	3.97	32.31	-	-	P	H	
		953.8	32.78	-13.22	46	28.87	30.25	4.75	31.09	-	-	P	H	
														H
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			38.91	36.55	-3.45	40	47.37	20.86	0.78	32.46	-	-	P	V
			55.11	37.34	-2.66	40	55.67	13.35	0.78	32.46	100	39	P	V
			55.11	34.06	-5.94	40	52.39	13.35	0.78	32.46	100	39	QP	V
			66.72	36.55	-3.45	40	55.79	12.15	1.06	32.45	-	-	P	V
			738.2	37.09	-8.91	46	38.21	27.32	3.89	32.33	-	-	P	V
			939.8	33.24	-12.76	46	29.83	30.03	4.6	31.22	-	-	P	V
			984.6	32.66	-21.34	54	29.68	29.88	3.92	30.82	-	-	P	V
														V
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													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



<EUT with RJ-45>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	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 )
BT CH 39 2441MHz		2326.94	55.4	-18.6	74	52.72	26.89	7.3	31.51	123	338	P	H
		2326.94	25.8	-28.2	54	-	-	-	-	-	-	A	H
	*	2442	90.34	-	-	87.14	27.18	7.49	31.47	123	338	P	H
	*	2442	60.74	-	-	-	-	-	-	-	-	A	H
		2485.37	55.33	-18.67	74	52.01	27.26	7.53	31.47	123	338	P	H
		2485.37	25.73	-28.27	54	-	-	-	-	-	-	A	H
		2374.4	55.75	-18.25	74	52.86	27.01	7.37	31.49	106	114	P	V
		2374.4	26.15	-27.85	54	-	-	-	-	-	-	A	V
	*	2442	92.77	-	-	89.57	27.18	7.49	31.47	106	114	P	V
	*	2442	63.17	-	-	-	-	-	-	-	-	A	V
		2490.9	55.05	-18.95	74	51.69	27.3	7.53	31.47	106	114	P	V
		2490.9	25.45	-28.55	54	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

BT (Harmonic @ 3m)

BT	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 )	
BT CH 39 2441MHz		4882	38.47	-35.53	74	54.35	31.33	10.89	58.1	100	0	P	H	
		4882	8.87	-45.13	54	-	-	-	-	-	-	A	H	
		7323	43.37	-30.63	74	52.17	36.12	14.18	59.1	100	0	P	H	
		7323	13.77	-40.23	54	-	-	-	-	-	-	A	H	
		4882	38.17	-35.83	74	54.05	31.33	10.89	58.1	100	0	P	V	
		4882	8.57	-45.43	54	-	-	-	-	-	-	-	A	V
		7323	43.13	-30.87	74	51.93	36.12	14.18	59.1	100	0	P	V	
		7323	13.53	-40.47	54	-	-	-	-	-	-	-	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.													



Emission below 1GHz

2.4GHz BT (LF)

BT	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 BT LF		46.74	23.42	-16.58	40	38.47	16.63	0.78	32.46	-	-	P	H	
		155.28	27.91	-15.59	43.5	41.33	17.25	1.75	32.42	-	-	P	H	
		188.22	28.74	-14.76	43.5	44.15	15.3	1.7	32.41	100	0	P	H	
		536.6	23.48	-22.52	46	28.33	24.36	3.19	32.4	-	-	P	H	
		686.4	25.6	-20.4	46	27.9	26.29	3.82	32.41	-	-	P	H	
		776.7	27.85	-18.15	46	28.42	27.71	3.97	32.25	-	-	P	H	
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														H
														H
			48.9	38.24	-1.76	40	54.15	15.77	0.78	32.46	100	188	P	V
			48.9	29.25	-10.75	40	45.16	15.77	0.78	32.46	100	188	QP	V
			77.25	30.27	-9.73	40	48.33	13.32	1.06	32.44	-	-	P	V
			121.8	29.82	-13.68	43.5	43.14	17.68	1.43	32.43	-	-	P	V
			466.6	22.87	-23.13	46	28.79	23.39	3.08	32.39	-	-	P	V
			682.9	26.18	-19.82	46	28.51	26.26	3.82	32.41	-	-	P	V
			839.7	28.71	-17.29	46	27.94	28.44	4.28	31.95	-	-	P	V
														V
													V	
													V	
													V	
													V	
Remark	3. No other spurious found. 4. 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

- 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”.