



## Appendix A. Radiated Spurious Emission

Test Engineer :	Elvis Chen, Stan Hsieh, Karl Hou, Lewis He, and Nick Yu	Temperature :	23~25°C
		Relative Humidity :	45~47%

<Sample 2>

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	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 )
BT CH00 2402MHz		2357.84	42.68	-31.32	74	43.46	27.14	5.33	33.25	117	35	P	H
		2357.84	17.89	-36.11	54							A	H
	*	2402.04	94.83	-	-	95.43	27.23	5.39	33.22	117	35	P	H
	*	2402.04	70.04	-	-							A	H
													H
													H
		2327.29	42.6	-31.4	74	43.48	27.05	5.33	33.26	129	360	P	V
		2327.29	17.81	-36.19	54							A	V
	*	2402.04	101.01	-	-	101.61	27.23	5.39	33.22	129	360	P	V
	*	2402.04	76.22	-	-							A	V
													V
													V
BT CH 39 2441MHz		2387.71	42.66	-31.34	74	43.28	27.23	5.39	33.24	123	32	P	H
		2387.71	17.87	-36.13	54							A	H
	*	2441.1	95.88	-	-	96.29	27.37	5.42	33.2	123	32	P	H
	*	2441.1	71.09	-	-							A	H
		2484.23	41.92	-32.08	74	42.18	27.46	5.46	33.18	123	32	P	H
		2484.23	17.13	-36.87	54							A	H
		2365.48	43.1	-30.9	74	43.81	27.14	5.39	33.24	175	299	P	V
		2365.48	18.31	-35.69	54							A	V
	*	2441.1	101.12	-	-	101.53	27.37	5.42	33.2	175	299	P	V
	*	2441.1	76.33	-	-							A	V
		2498.48	44.18	-29.82	74	44.39	27.5	5.46	33.17	175	299	P	V
		2498.48	19.39	-34.61	54							A	V



<b>BT CH 78 2480MHz</b>	*	2480.05	94.99	-	-	95.27	27.46	5.44	33.18	117	33	P	H
	*	2480.05	70.2	-	-							A	H
		2483.97	44.15	-29.85	74	44.41	27.46	5.46	33.18	117	33	P	H
		2483.97	19.36	-34.64	54							A	H
													H
													H
	*	2479.98	101.68	-	-	101.96	27.46	5.44	33.18	199	16	P	V
	*	2479.98	76.89	-	-							A	V
		2483.62	49.94	-24.06	74	50.2	27.46	5.46	33.18	199	16	P	V
		2483.62	25.15	-28.85	54							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

## 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	36.06	-37.94	74	57.7	31.42	7.58	60.64	100	0	P	H
		4804	11.27	-42.73	54	-	-	-	-	-	-	A	H
													H
													H
		4804	36.35	-37.65	74	57.99	31.42	7.58	60.64	100	0	P	V
		4804	11.56	-42.44	54	-	-	-	-	-	-	A	V
													V
													V
BT CH 39 2441MHz		4882	38.55	-35.45	74	59.69	31.56	7.82	60.52	100	0	P	H
		4882	13.76	-40.24	54	-	-	-	-	-	-	A	H
		7323	43.57	-30.43	74	58.82	36.22	9.51	60.98	100	0	P	H
		7323	18.78	-35.22	54	-	-	-	-	-	-	A	H
		4882	38.16	-35.84	74	59.3	31.56	7.82	60.52	100	0	P	V
		4882	13.37	-40.63	54	-	-	-	-	-	-	A	V
		7323	44.04	-29.96	74	59.29	36.22	9.51	60.98	100	0	P	V
		7323	19.25	-34.75	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz		4962	37.34	-36.66	74	57.92	31.73	8.05	60.36	100	0	P	H
		4962	12.55	-41.45	54	-	-	-	-	-	-	A	H
		7440	41.99	-32.01	74	57.23	36.49	9.61	61.34	100	0	P	H
		7440	17.2	-36.8	54	-	-	-	-	-	-	A	H
		4960	38.2	-35.8	74	58.9	31.73	7.93	60.36	100	0	P	V
		4960	13.41	-40.59	54	-	-	-	-	-	-	A	V
		7440	42.33	-31.67	74	57.57	36.49	9.61	61.34	100	0	P	V
		7440	17.54	-36.46	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 ( 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 )
2.4GHz BT LF		32.7	24.32	-15.68	40	38.1	18.38	0.65	32.81	155	96	P	H
		34.05	21.61	-18.39	40	35.93	17.84	0.65	32.81			P	H
		101.82	23.58	-19.92	43.5	44.47	10.6	1.14	32.63			P	H
		307	20.01	-25.99	46	36.85	14.02	1.88	32.74			P	H
		330.8	19.81	-26.19	46	35.97	14.66	1.94	32.76			P	H
		948.2	26.28	-19.72	46	30.49	24.28	3.29	31.78			P	H
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													H
													H
		30.27	34.57	-5.43	40	46.74	20	0.65	32.82	110	225	P	V
		31.62	33.26	-6.74	40	46.51	18.92	0.65	32.82			P	V
		41.34	30.09	-9.91	40	48.86	13.38	0.65	32.8			P	V
		442.1	21.28	-24.72	46	34.81	17.18	2.16	32.87			P	V
		713.7	24.55	-21.45	46	33.83	20.87	2.82	32.97			P	V
		897.8	27.87	-18.13	46	33.82	23.17	3.2	32.32			P	V
													V
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													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



&lt;Sample 1&gt;

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 78 2480MHz	*	2480.05	95.05	-	-	95.33	27.46	5.44	33.18	119	341	P	H
	*	2480.05	70.26	-	-							A	H
		2490.34	43.15	-30.85	74	43.37	27.5	5.46	33.18	119	341	P	H
		2490.34	18.36	-35.64	54							A	H
													H
													H
	*	2480.05	100.91	-	-	101.19	27.46	5.44	33.18	310	326	P	V
	*	2480.05	76.12	-	-							A	V
		2483.55	48.99	-25.01	74	49.25	27.46	5.46	33.18	310	326	P	V
		2483.55	24.2	-29.8	54							A	V
													V
													V
Remark	1. No other spurious found. 2. 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 )
<b>BT CH 78 2480MHz</b>		4962	38.07	-35.93	74	58.65	31.73	8.05	60.36	100	0	P	H
		4962	13.28	-40.72	54							A	H
		7440	42.28	-31.72	74	57.52	36.49	9.61	61.34	100	0	P	H
		7440	17.49	-36.51	54							A	H
		4962	37.43	-36.57	74	58.01	31.73	8.05	60.36	100	0	P	V
		4962	12.64	-41.36	54							A	V
		7440	42.38	-31.62	74	57.62	36.49	9.61	61.34	100	0	P	V
		7440	17.59	-36.41	54							A	V
<b>Remark</b>	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 ( 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 )
2.4GHz BT LF		30	22.82	-17.18	40	34.99	20	0.65	32.82			P	H
		84.81	23.52	-16.48	40	46.66	8.6	0.93	32.67			P	H
		106.14	31.76	-11.74	43.5	52.26	11	1.14	32.64	111	74	P	H
		308.4	17.28	-28.72	46	34.1	14.04	1.88	32.74			P	H
		746.6	34.22	-11.78	46	42.71	21.54	2.91	32.94			P	H
		951	25.53	-20.47	46	29.69	24.3	3.29	31.75			P	H
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		30	33.45	-6.55	40	45.62	20	0.65	32.82	189	66	P	V
		31.62	32.98	-7.02	40	46.23	18.92	0.65	32.82			P	V
		35.67	27.21	-12.79	40	42.63	16.74	0.65	32.81			P	V
		345.5	19.36	-26.64	46	35.13	15.07	1.94	32.78			P	V
		477.1	21.43	-24.57	46	34.25	17.78	2.3	32.9			P	V
		927.9	25.88	-20.12	46	30.76	23.83	3.29	32			P	V
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Remark	1. No other spurious found. 2. All results are PASS against limit line.												


**<Sample 3>**
**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 )
<b>BT CH 78 2480MHz</b>	*	2480.05	95.38	-	-	95.66	27.46	5.44	33.18	135	246	P	H
	*	2480.05	70.59	-	-							A	H
		2483.83	43.53	-30.47	74	43.79	27.46	5.46	33.18	135	246	P	H
		2483.83	18.74	-35.26	54							A	H
													H
													H
	*	2480.05	101.32	-	-	101.6	27.46	5.44	33.18	250	293	P	V
	*	2480.05	76.53	-	-							A	V
		2483.5	46.15	-27.85	74	46.41	27.46	5.46	33.18	250	293	P	V
		2483.5	21.36	-32.64	54							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****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 )
<b>BT CH 78 2480MHz</b>		4959	37.43	-36.57	74	58.13	31.73	7.93	60.36	100	0	P	H
		4959	12.64	-41.36	54							A	H
		7440	40.72	-33.28	74	55.96	36.49	9.61	61.34	100	0	P	H
		7440	15.93	-38.07	54							A	H
		4959	36.94	-37.06	74	57.64	31.73	7.93	60.36	100	0	P	V
		4959	12.15	-41.85	54							A	V
		7440	40.95	-33.05	74	31.34	-500	9.61	-500	100	0	P	V
		7440	16.16	-37.84	54							A	V
<b>Remark</b>	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 ( 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 )
2.4GHz BT LF		31.62	23.01	-16.99	40	36.26	18.92	0.65	32.82			P	H
		123.15	29.76	-13.74	43.5	49.34	11.93	1.14	32.65	130	314	P	H
		159.33	24.91	-18.59	43.5	45.12	11.15	1.33	32.69			P	H
		423.2	19.58	-26.42	46	33.41	16.87	2.16	32.86			P	H
		521.2	28.07	-17.93	46	40.27	18.41	2.33	32.94			P	H
		952.4	27.15	-18.85	46	31.31	24.29	3.29	31.74			P	H
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													H
													H
		32.16	36.37	-3.63	40	49.62	18.92	0.65	32.82	100	254	P	V
		68.34	27.91	-12.09	40	53.07	6.64	0.93	32.73			P	V
		112.08	24.82	-18.68	43.5	44.78	11.54	1.14	32.64			P	V
		424.6	25.83	-20.17	46	39.63	16.9	2.16	32.86			P	V
		477.1	23.29	-22.71	46	36.11	17.78	2.3	32.9			P	V
		966.4	26.77	-27.23	54	30.74	24.23	3.38	31.58			P	V
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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 Ant. 1+2	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 )
802.11b CH 01		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
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”.**