



Appendix C. Radiated Spurious Emission

Test Engineer :	Henry Li	Temperature :	22~23°C
		Relative Humidity :	41~42%

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamplifier Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz		2484.1	56.41	-17.59	74	50.65	31.13	7.27	32.64	140	101	P	H
		2484.1	31.71	-22.29	54	-	-	-	-	-	-	A	H
		2480	103.17	-	-	97.41	31.13	7.27	32.64	140	101	P	H
		2480	78.47	-	-	-	-	-	-	-	-	A	H
		2483.74	54.06	-19.94	74	48.3	31.13	7.27	32.64	399	59	P	V
		2483.74	29.36	-24.64	54	-	-	-	-	-	-	A	V
		2480	99.26	-	-	93.5	31.13	7.27	32.64	399	59	P	V
		2480	74.56	-	-	-	-	-	-	-	-	A	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz		4960	44.89	-29.11	74	59.66	34.81	10.43	60.01	300	0	P	H
		7440	44.04	-29.96	74	55.11	36.59	12.88	60.54	300	0	P	H
		4960	42.54	-31.46	74	57.31	34.81	10.43	60.01	100	0	P	V
		7440	44.32	-29.68	74	55.39	36.59	12.88	60.54	100	0	P	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz BT LF		30	27.34	-12.66	40	32.84	25.15	0.58	31.23	-	-	P	H
		97.9	26.16	-17.34	43.5	39.42	17.03	1.6	31.89	-	-	P	H
		284.14	24.5	-21.5	46	34.32	19	2.73	31.55	-	-	P	H
		520.82	30.64	-15.36	46	34.01	24.38	3.71	31.46	-	-	P	H
		613.94	33.3	-12.7	46	35.4	25.15	4.03	31.28	-	-	P	H
		927.25	39.98	-6.02	46	38.74	26.97	4.96	30.69	-	-	P	H
		30	27.71	-12.29	40	32.86	25.5	0.58	31.23	-	-	P	V
		96.93	27.77	-15.73	43.5	40.62	17.47	1.59	31.91	-	-	P	V
		228.85	24.58	-21.42	46	35.4	18.09	2.44	31.35	-	-	P	V
		498.51	32.21	-13.79	46	35.44	24.47	3.62	31.32	-	-	P	V
		837.04	36.65	-9.35	46	36.12	27.12	4.71	31.3	-	-	P	V
		927.25	39.4	-6.6	46	37.46	27.67	4.96	30.69	100	236	QP	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.
!	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:

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	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 CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path 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)

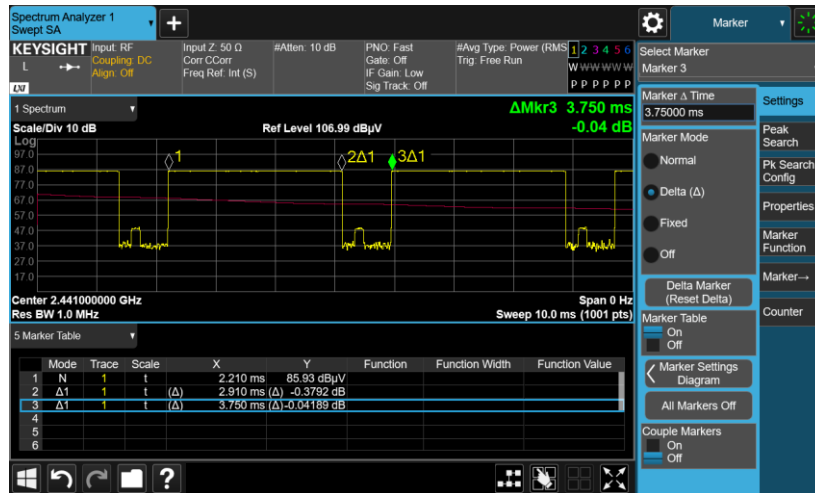
For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path 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”.

Appendix D. Duty Cycle Plots

3DH5 on time (One Pulse) Plot on Channel 39



3DH5 on time (Count Pulses) Plot on Channel 39



Note:

1. Worst case Duty cycle = on time/100 milliseconds = $2 * 2.91 / 100 = 5.82 \%$
2. Worst case Duty cycle correction factor = $20 * \log(\text{Duty cycle}) = -24.70 \text{ dB}$
3. 3DH5 has the highest duty cycle worst case and is reported.