



Appendix B. Radiated Spurious Emission

Test Engineer :	Nick Yu and Stan Hsieh	Temperature :	22~24°C
		Relative Humidity :	52~55%

<For Sample 1>

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5712.92	65.05	-8.95	74	56.89	32.52	8.3	32.66	100	67	P	H
		5724.44	74.54	-3.76	78.3	66.34	32.53	8.33	32.66	100	67	P	H
		5715	50.9	-3.1	54	42.74	32.52	8.3	32.66	100	67	A	H
	*	5747	112.33	-	-	104.13	32.54	8.33	32.67	100	67	P	H
	*	5747	103.54	-	-	95.34	32.54	8.33	32.67	100	67	A	H
													H
													H
													H
		5710.04	59.04	-14.96	74	50.88	32.52	8.3	32.66	100	322	P	V
		5723.8	69.3	-9	78.3	61.1	32.53	8.33	32.66	100	322	P	V
		5713.8	48.5	-5.5	54	40.34	32.52	8.3	32.66	100	322	A	V
	*	5747	108.73	-	-	100.53	32.54	8.33	32.67	100	322	P	V
	*	5747	100.03	-	-	91.83	32.54	8.33	32.67	100	322	A	V
													V
													V
													V



WIFI Ant. 1	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)
802.11a CH 157 5785MHz		5705.08	53.05	-20.95	74	44.89	32.52	8.3	32.66	224	352	P	H
		5722.44	54.27	-24.03	78.3	46.07	32.53	8.33	32.66	224	352	P	H
		5713.56	44.61	-9.39	54	36.45	32.52	8.3	32.66	224	352	A	H
	*	5783	110.88	-	-	102.64	32.57	8.35	32.68	224	352	P	H
	*	5783	105.09	-	-	96.85	32.57	8.35	32.68	224	352	A	H
		5857.36	52.63	-25.67	78.3	44.28	32.62	8.43	32.7	224	352	P	H
		5877.52	52.87	-21.13	74	44.52	32.63	8.43	32.71	224	352	P	H
		5861.04	44.64	-9.36	54	36.3	32.62	8.43	32.71	224	352	A	H
		5704.92	52.36	-21.64	74	44.2	32.52	8.3	32.66	242	0	P	V
		5721.8	51.05	-27.25	78.3	42.85	32.53	8.33	32.66	242	0	P	V
		5711	42.89	-11.11	54	34.73	32.52	8.3	32.66	242	0	A	V
	*	5783	106.99	-	-	98.75	32.57	8.35	32.68	242	0	P	V
	*	5783	101.35	-	-	93.11	32.57	8.35	32.68	242	0	A	V
		5852.72	51.85	-26.45	78.3	43.51	32.61	8.43	32.7	242	0	P	V
		5871.68	51.16	-22.84	74	42.81	32.63	8.43	32.71	242	0	P	V
		5863.04	42.68	-11.32	54	34.34	32.62	8.43	32.71	242	0	A	V



WIFI Ant. 1	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)
802.11a CH 165 5825MHz	*	5825	112.19	-	-	103.89	32.6	8.39	32.69	205	68	P	H
	*	5825	103.82	-	-	95.52	32.6	8.39	32.69	205	68	A	H
		5850.08	66.43	-11.87	78.3	58.09	32.61	8.43	32.7	205	68	P	H
		5861.12	59.54	-14.46	74	51.2	32.62	8.43	32.71	205	68	P	H
		5860	49.45	-4.55	54	41.11	32.62	8.43	32.71	205	68	A	H
													H
													H
													H
	*	5825	108.68	-	-	100.38	32.6	8.39	32.69	100	317	P	V
	*	5825	99.85	-	-	91.55	32.6	8.39	32.69	100	317	A	V
		5851.76	62.51	-15.79	78.3	54.17	32.61	8.43	32.7	100	317	P	V
		5867.52	57.6	-16.4	74	49.26	32.62	8.43	32.71	100	317	P	V
		5860.16	45.87	-8.13	54	37.53	32.62	8.43	32.71	100	317	A	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11a CH 149 5745MHz		11490	47.22	-26.78	74	57.43	40.01	12.58	62.8	100	0	P	H
		17235	49.47	-24.53	74	52.9	41.05	15.66	60.14	100	0	P	H
													H
													H
		11490	47.04	-26.96	74	57.25	40.01	12.58	62.8	100	0	P	V
		17235	53.31	-20.69	74	56.74	41.05	15.66	60.14	188	4	P	V
		17235	46.98	-7.02	54	50.41	41.05	15.66	60.14	188	4	A	V
													V
802.11a CH 157 5785MHz		11571	47.25	-26.75	74	57.45	39.88	12.66	62.74	100	0	P	H
		17355	55.52	-18.48	74	58.56	41.38	15.79	60.21	189	291	P	H
		17355	49.61	-4.39	54	52.65	41.38	15.79	60.21	189	291	A	H
													H
		11571	46.65	-27.35	74	56.85	39.88	12.66	62.74	100	0	P	V
		17355	54.43	-19.57	74	57.47	41.38	15.79	60.21	185	4	P	V
		17355	49.24	-4.76	54	52.28	41.38	15.79	60.21	185	4	A	V
													V
802.11a CH 165 5825MHz		11649	46.53	-27.47	74	56.74	39.75	12.73	62.69	100	0	P	H
		17475	57.82	-16.18	74	60.46	41.71	15.93	60.28	184	295	P	H
		17475	50.58	-3.42	54	53.22	41.71	15.93	60.28	184	295	A	H
													H
		11649	46.02	-27.98	74	56.23	39.75	12.73	62.69	100	0	P	V
		17475	55.42	-18.58	74	58.06	41.71	15.93	60.28	191	4	P	V
		17475	48.44	-5.56	54	51.08	41.71	15.93	60.28	191	4	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**Band 4 5725~5850MHz****WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant. 1	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)
802.11n HT20 CH 149 5745MHz		5714.68	61.36	-12.64	74	53.2	32.52	8.3	32.66	209	67	P	H
		5724.92	76.17	-2.13	78.3	67.97	32.53	8.33	32.66	209	67	P	H
		5715	48.22	-5.78	54	40.06	32.52	8.3	32.66	209	67	A	H
	*	5745	111.27	-	-	103.07	32.54	8.33	32.67	209	67	P	H
	*	5745	102.35	-	-	94.15	32.54	8.33	32.67	209	67	A	H
													H
													H
													H
		5713.32	58.86	-15.14	74	50.7	32.52	8.3	32.66	100	323	P	V
		5724.28	70.85	-7.45	78.3	62.65	32.53	8.33	32.66	100	323	P	V
		5715	46.1	-7.9	54	37.94	32.52	8.3	32.66	100	323	A	V
	*	5745	108.79	-	-	100.59	32.54	8.33	32.67	100	323	P	V
	*	5745	99.92	-	-	91.72	32.54	8.33	32.67	100	323	A	V
													V
													V
													V



WIFI Ant. 1	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)
802.11n HT20 CH 157 5785MHz		5710.36	55.45	-18.55	74	47.29	32.52	8.3	32.66	100	68	P	H
		5717.24	54.4	-23.9	78.3	46.24	32.52	8.3	32.66	100	68	P	H
		5702.2	42.86	-11.14	54	34.69	32.52	8.3	32.65	100	68	A	H
	*	5785	113.21	-	-	104.97	32.57	8.35	32.68	100	68	P	H
	*	5785	105.09	-	-	96.85	32.57	8.35	32.68	100	68	A	H
		5858.08	53.52	-24.78	78.3	45.18	32.62	8.43	32.71	100	68	P	H
		5871.76	53.66	-20.34	74	45.31	32.63	8.43	32.71	100	68	P	H
		5862	42.02	-11.98	54	33.68	32.62	8.43	32.71	100	68	A	H
		5713.96	52.23	-21.77	74	44.07	32.52	8.3	32.66	100	317	P	V
		5724.84	52.36	-25.94	78.3	44.16	32.53	8.33	32.66	100	317	P	V
		5703.24	40.98	-13.02	54	32.81	32.52	8.3	32.65	100	317	A	V
	*	5785	109.66	-	-	101.42	32.57	8.35	32.68	100	317	P	V
	*	5785	100.82	-	-	92.58	32.57	8.35	32.68	100	317	A	V
		5850.72	51.14	-27.16	78.3	42.8	32.61	8.43	32.7	100	317	P	V
		5871.12	51.43	-22.57	74	43.08	32.63	8.43	32.71	100	317	P	V
		5865.84	39.97	-14.03	54	31.63	32.62	8.43	32.71	100	317	A	V



WIFI Ant. 1	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)
802.11n HT20 CH 165 5825MHz	*	5825	112.64	-	-	104.34	32.6	8.39	32.69	100	66	P	H
	*	5825	103.64	-	-	95.34	32.6	8.39	32.69	100	66	A	H
		5852.32	68.1	-10.2	78.3	59.76	32.61	8.43	32.7	100	66	P	H
		5861.28	60.32	-13.68	74	51.98	32.62	8.43	32.71	100	66	P	H
		5860.48	46.72	-7.28	54	38.38	32.62	8.43	32.71	100	66	A	H
													H
													H
													H
	*	5825	108.92	-	-	100.62	32.6	8.39	32.69	100	281	P	V
	*	5825	100.11	-	-	91.81	32.6	8.39	32.69	100	281	A	V
		5850.32	67.41	-10.89	78.3	59.07	32.61	8.43	32.7	100	281	P	V
		5860.24	59.83	-14.17	74	51.49	32.62	8.43	32.71	100	281	P	V
		5860.72	44.42	-9.58	54	36.08	32.62	8.43	32.71	100	281	A	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11n HT20 CH 149 5745MHz		11490	48.79	-25.21	74	59	40.01	12.58	62.8	100	0	P	H
		17235	51.64	-22.36	74	55.07	41.05	15.66	60.14	174	341	P	H
		17235	43.35	-10.65	54	46.78	41.05	15.66	60.14	174	341	A	H
													H
		11490	47.25	-26.75	74	57.46	40.01	12.58	62.8	100	0	P	V
		17235	54.21	-19.79	74	57.64	41.05	15.66	60.14	172	5	P	V
		17235	46.2	-7.8	54	49.63	41.05	15.66	60.14	172	5	A	V
													V
802.11n HT20 CH 157 5785MHz		11571	46.83	-27.17	74	57.03	39.88	12.66	62.74	100	0	P	H
		17355	53.78	-20.22	74	56.82	41.38	15.79	60.21	184	296	P	H
		17355	47.92	-6.08	54	50.96	41.38	15.79	60.21	184	296	A	H
													H
		11571	47.24	-26.76	74	57.44	39.88	12.66	62.74	100	0	P	V
		17355	53.97	-20.03	74	57.01	41.38	15.79	60.21	190	4	P	V
		17355	48.95	-5.05	54	51.99	41.38	15.79	60.21	190	4	A	V
													V
802.11n HT20 CH 165 5825MHz		11649	47.27	-26.73	74	57.48	39.75	12.73	62.69	100	0	P	H
		17475	51.63	-22.37	74	54.27	41.71	15.93	60.28	187	297	P	H
		17475	49.79	-4.21	54	52.43	41.71	15.93	60.28	187	297	A	H
													H
		11649	46.78	-27.22	74	56.99	39.75	12.73	62.69	100	0	P	V
		17475	53.41	-20.59	74	56.05	41.71	15.93	60.28	185	3	P	V
		17475	46.99	-7.01	54	49.63	41.71	15.93	60.28	185	3	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF @ 3m)

WIFI Ant. 1	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)
5GHz 802.11n HT20 LF		121.53	23.45	-20.05	43.5	42.18	11.91	1.14	31.78	-	-	P	H
		191.19	24.12	-19.38	43.5	44.95	9.47	1.48	31.78	-	-	P	H
		234.12	22.54	-23.46	46	41.27	11.42	1.62	31.77	-	-	P	H
		412.7	25.36	-20.64	46	38.29	16.72	2.16	31.81	-	-	P	H
		577.9	32.77	-13.23	46	43.01	19.2	2.57	32.01	132	56	P	H
		952.4	28.3	-17.7	46	31.74	24.29	3.29	31.02	-	-	P	H
													H
													H
													H
													H
													H
													H
		30.81	20.4	-19.6	40	32.12	19.46	0.65	31.83	-	-	P	V
		204.96	20.54	-22.96	43.5	40.46	10.24	1.62	31.78	-	-	P	V
		262.74	24.25	-21.75	46	40.48	13.78	1.76	31.77	-	-	P	V
		585.6	24.23	-21.77	46	34.34	19.34	2.57	32.02	-	-	P	V
		827.8	25.56	-20.44	46	31.95	22.32	3.07	31.78	-	-	P	V
		949.6	28.21	-17.79	46	31.65	24.3	3.29	31.03	101	147	P	V
													V
													V
													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.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical

A calculation example for radiated spurious emission is shown as below:

WIFI Ant. 1	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		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”.