



Appendix B. Radiated Spurious Emission

Test Engineer :	Lewis He and Stan Hsieh	Temperature :	24~25°C
		Relative Humidity :	52~53%

Band 1 - 5150~5250MHz

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 36 5180MHz		5148.5	64.28	-9.72	74	56.93	31.98	32.57	7.94	100	195	P	H
		5150	52.26	-1.74	54	44.91	31.98	32.57	7.94	100	195	A	H
	*	5184	111.03	-	-	103.67	32.02	32.57	7.91	100	195	P	H
	*	5184	103.57	-	-	96.21	32.02	32.57	7.91	100	195	A	H
													H
													H
		5146.55	59.7	-14.3	74	52.35	31.98	32.57	7.94	104	243	P	V
		5150	50	-4	54	42.65	31.98	32.57	7.94	104	243	A	V
	*	5181	108.84	-	-	101.48	32.02	32.57	7.91	104	243	P	V
	*	5181	101.59	-	-	94.23	32.02	32.57	7.91	104	243	A	V
													V
													V
802.11a CH 44 5220MHz		5063.75	55.97	-18.03	74	48.67	31.88	32.57	7.99	110	199	P	H
		5141.9	45.69	-8.31	54	38.34	31.98	32.57	7.94	110	199	A	H
	*	5223	112.61	-	-	105.11	32.06	32.57	8.01	110	199	P	H
	*	5223	105.05	-	-	97.55	32.06	32.57	8.01	110	199	A	H
		5385.2	50.41	-23.59	74	42.43	32.26	32.57	8.29	110	199	P	H
		5350	41.8	-12.2	54	33.92	32.22	32.57	8.23	110	199	A	H
		5135	52.38	-21.62	74	45.05	31.96	32.57	7.94	140	249	P	V
		5142.05	42.89	-11.11	54	35.54	31.98	32.57	7.94	140	249	A	V
	*	5216	109.79	-	-	102.29	32.06	32.57	8.01	140	249	P	V
	*	5216	102.09	-	-	94.59	32.06	32.57	8.01	140	249	A	V
		5352.97	50.1	-23.9	74	42.22	32.22	32.57	8.23	140	249	P	V
		5350	41.42	-12.58	54	33.54	32.22	32.57	8.23	140	249	A	V



802.11a CH 48 5240MHz		5148.5	53.23	-20.77	74	45.88	31.98	32.57	7.94	100	207	P	H
		5136.05	43.63	-10.37	54	36.3	31.96	32.57	7.94	100	207	A	H
	*	5238	112.06	-	-	104.54	32.08	32.57	8.01	100	207	P	H
	*	5238	105.26	-	-	97.74	32.08	32.57	8.01	100	207	A	H
		5429.97	50.27	-23.73	74	42.23	32.32	32.57	8.29	100	207	P	H
		5350	41.89	-12.11	54	34.01	32.22	32.57	8.23	100	207	A	H
		5109.95	52.88	-21.12	74	45.55	31.94	32.57	7.96	100	246	P	V
		5135.9	42.52	-11.48	54	35.19	31.96	32.57	7.94	100	246	A	V
	*	5241	110.61	-	-	103.09	32.08	32.57	8.01	100	246	P	V
	*	5241	103.91	-	-	96.39	32.08	32.57	8.01	100	246	A	V
		5359.24	51.21	-22.79	74	43.33	32.22	32.57	8.23	100	246	P	V
		5350.33	42.04	-11.96	54	34.16	32.22	32.57	8.23	100	246	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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 36 5180MHz		10360	45.71	-28.29	74	57.17	39.69	63.11	11.96	100	0	P	H
		15540	45.17	-28.83	74	52.56	38.04	60.19	14.76	100	0	P	H
													H
													H
		10360	45.59	-28.41	74	57.05	39.69	63.11	11.96	100	0	P	V
		15540	46.74	-27.26	74	54.13	38.04	60.19	14.76	100	0	P	V
													V
													V
802.11a CH 44 5220MHz		10445	48.81	-25.19	74	60	39.82	63.04	12.03	100	0	P	H
		15666	56.4	-17.6	74	63.96	37.82	60.17	14.79	100	191	P	H
		15666	43.97	-10.03	54	51.53	37.82	60.17	14.79	100	191	A	H
													H
		10435	49.92	-24.08	74	61.18	39.79	63.05	12	100	0	P	V
		15654	63.15	-10.85	74	70.68	37.85	60.17	14.79	100	205	P	V
		15654	49.86	-4.14	54	57.39	37.85	60.17	14.79	100	205	A	V
													V
802.11a CH 48 5240MHz		10485	50.22	-23.78	74	61.3	39.87	63.01	12.06	100	0	P	H
		15708	57.25	-16.75	74	64.84	37.77	60.16	14.8	100	191	P	H
		15708	43.8	-10.2	54	51.39	37.77	60.16	14.8	100	191	A	H
													H
		10480	49.28	-24.72	74	60.36	39.87	63.01	12.06	100	0	P	V
		15714	60.05	-13.95	74	67.67	37.74	60.16	14.8	100	209	P	V
		15714	48.92	-5.08	54	56.54	37.74	60.16	14.8	100	209	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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 36 5180MHz		5147.75	62.15	-11.85	74	54.8	31.98	32.57	7.94	108	202	P	H
		5150	52.21	-1.79	54	44.86	31.98	32.57	7.94	108	202	A	H
	*	5181	111.5	-	-	104.14	32.02	32.57	7.91	108	202	P	H
	*	5181	106.13	-	-	98.77	32.02	32.57	7.91	108	202	A	H
													H
													H
		5148.95	62.44	-11.56	74	55.09	31.98	32.57	7.94	113	243	P	V
		5150	49.53	-4.47	54	42.18	31.98	32.57	7.94	113	243	A	V
	*	5185	109.08	-	-	101.72	32.02	32.57	7.91	113	243	P	V
	*	5185	105.14	-	-	97.78	32.02	32.57	7.91	113	243	A	V
													V
													V
802.11n HT20 CH 44 5220MHz		5142.5	52.92	-21.08	74	45.57	31.98	32.57	7.94	100	195	P	H
		5142.05	45.41	-8.59	54	38.06	31.98	32.57	7.94	100	195	A	H
	*	5218	112.5	-	-	105	32.06	32.57	8.01	100	195	P	H
	*	5218	104.9	-	-	97.4	32.06	32.57	8.01	100	195	A	H
		5355.94	50.42	-23.58	74	42.54	32.22	32.57	8.23	100	195	P	H
		5350	41.89	-12.11	54	34.01	32.22	32.57	8.23	100	195	A	H
		5139.8	52.59	-21.41	74	45.24	31.98	32.57	7.94	100	242	P	V
		5142.05	44.21	-9.79	54	36.86	31.98	32.57	7.94	100	242	A	V
	*	5219	111.63	-	-	104.13	32.06	32.57	8.01	100	242	P	V
	*	5219	104.09	-	-	96.59	32.06	32.57	8.01	100	242	A	V
		5372	57.17	-16.83	74	49.21	32.24	32.57	8.29	100	242	P	V
		5350	42.5	-11.5	54	34.62	32.22	32.57	8.23	100	242	A	V



802.11n HT20 CH 48 5240MHz		5129.75	53.65	-20.35	74	46.32	31.96	32.57	7.94	111	197	P	H
		5135.9	43.28	-10.72	54	35.95	31.96	32.57	7.94	111	197	A	H
	*	5239	112.6	-	-	105.08	32.08	32.57	8.01	111	197	P	H
	*	5239	104.61	-	-	97.09	32.08	32.57	8.01	111	197	A	H
		5395.1	59.3	-14.7	74	51.3	32.28	32.57	8.29	111	197	P	H
		5350.55	41.41	-12.59	54	33.53	32.22	32.57	8.23	111	197	A	H
		5133.05	51.97	-22.03	74	44.64	31.96	32.57	7.94	108	243	P	V
		5149.55	42.29	-11.71	54	34.94	31.98	32.57	7.94	108	243	A	V
	*	5242	110.61	-	-	102.96	32.1	32.57	8.12	108	243	P	V
	*	5242	103.9	-	-	96.25	32.1	32.57	8.12	108	243	A	V
		5355.83	52.2	-21.8	74	44.32	32.22	32.57	8.23	108	243	P	V
		5370.02	41.56	-12.44	54	33.6	32.24	32.57	8.29	108	243	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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 36 5180MHz		10360	46.86	-27.14	74	58.32	39.69	63.11	11.96	100	0	P	H
		15540	43.72	-30.28	74	51.11	38.04	60.19	14.76	100	0	P	H
													H
													H
		10360	45.69	-28.31	74	57.15	39.69	63.11	11.96	100	0	P	V
		15540	46.39	-27.61	74	53.78	38.04	60.19	14.76	100	0	P	V
													V
													V
802.11n HT20 CH 44 5220MHz		10440	46.76	-27.24	74	57.99	39.79	63.05	12.03	100	0	P	H
		15648	56.43	-17.57	74	63.96	37.85	60.17	14.79	100	242	P	H
		15648	47.25	-6.75	54	54.78	37.85	60.17	14.79	100	242	A	H
													H
		10440	47.57	-26.43	74	58.8	39.79	63.05	12.03	100	0	P	V
		15654	59.14	-14.86	74	66.67	37.85	60.17	14.79	100	205	P	V
		15654	49.77	-4.23	54	57.3	37.85	60.17	14.79	100	205	A	V
													V
802.11n HT20 CH 48 5240MHz		10480	48.68	-25.32	74	59.76	39.87	63.01	12.06	100	0	P	H
		15708	57.25	-16.75	74	64.84	37.77	60.16	14.8	100	242	P	H
		15708	48.49	-5.51	54	56.08	37.77	60.16	14.8	100	242	A	H
													H
		10480	50.49	-23.51	74	61.57	39.87	63.01	12.06	100	0	P	V
		15714	58.41	-15.59	74	66.03	37.74	60.16	14.8	100	204	P	V
		15714	49.85	-4.15	54	57.47	37.74	60.16	14.8	100	204	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

WIFI 802.11a (LF @ 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 36 5180MHz LF		85.08	31.89	-8.11	40	54.82	8.6	32.67	1.14	100	85	P	H
		109.92	28.6	-14.9	43.5	48.7	11.4	32.64	1.14			P	H
		139.89	26.47	-17.03	43.5	45.91	11.9	32.67	1.33			P	H
		307.7	16.37	-29.63	46	33.21	14.02	32.74	1.88			P	H
		463.1	17.55	-28.45	46	30.62	17.52	32.89	2.3			P	H
		844.6	23.5	-22.5	46	30.5	22.46	32.62	3.16			P	H
													H
													H
													H
													H
													H
													H
		31.35	26.36	-13.64	40	39.07	19.46	32.82	0.65			P	V
		88.32	35.72	-7.78	43.5	58.29	8.96	32.67	1.14	226	32	P	V
		117.75	27.69	-15.81	43.5	47.44	11.76	32.65	1.14			P	V
		363.7	15.31	-30.69	46	30.61	15.56	32.8	1.94			P	V
		584.9	19.68	-26.32	46	30.8	19.32	33.01	2.57			P	V
		923	25.26	-20.74	46	30.4	23.72	32.06	3.2			P	V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

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 44 5220MHz LF		84	33.01	-6.99	40	56.28	8.48	32.68	0.93	105	36	P	H
		109.92	29.12	-14.38	43.5	49.22	11.4	32.64	1.14			P	H
		166.62	25.11	-18.39	43.5	45.93	10.4	32.7	1.48			P	H
		469.4	18	-28	46	30.95	17.65	32.9	2.3			P	H
		749.4	22.47	-23.53	46	30.9	21.6	32.94	2.91			P	H
		959.4	26.24	-19.76	46	30.35	24.26	31.66	3.29			P	H
													H
													H
													H
													H
													H
													H
		44.85	23.47	-16.53	40	43.91	11.7	32.79	0.65			P	V
		92.1	36.25	-7.25	43.5	58.32	9.44	32.65	1.14	123	87	P	V
		155.28	20.45	-23.05	43.5	40.46	11.35	32.69	1.33			P	V
		541.5	18.99	-27.01	46	30.88	18.61	32.97	2.47			P	V
		650	21.95	-24.05	46	32.09	20.2	33.01	2.67			P	V
		842.5	23.78	-22.22	46	30.9	22.45	32.64	3.07			P	V
													V
													V
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

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 48 5240MHz LF		83.19	33.96	-6.04	40	57.35	8.36	32.68	0.93	111	332	P	H
		108.57	29.92	-13.58	43.5	50.12	11.3	32.64	1.14			P	H
		128.28	26.46	-17.04	43.5	45.81	11.98	32.66	1.33			P	H
		436.5	18.46	-27.54	46	32.09	17.08	32.87	2.16			P	H
		710.2	22.81	-23.19	46	32.17	20.8	32.98	2.82			P	H
		818.7	23.77	-22.23	46	31.22	22.25	32.77	3.07			P	H
													H
													H
													H
													H
													H
													H
		73.2	26.63	-13.37	40	51.24	7.17	32.71	0.93			P	V
		86.7	36.29	-3.71	40	59.1	8.72	32.67	1.14	100	5	P	V
		92.1	36.98	-6.52	43.5	59.05	9.44	32.65	1.14			P	V
		470.8	17.71	-28.29	46	30.65	17.66	32.9	2.3			P	V
		761.3	22.59	-23.41	46	30.88	21.72	32.92	2.91			P	V
		959.4	26.31	-19.69	46	30.42	24.26	31.66	3.29			P	V
													V
													V
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

WIFI 802.11n HT20 (LF @ 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)
802.11n HT20 CH 36 5180MHz LF		84	33.69	-6.31	40	56.96	8.48	32.68	0.93	100	325	P	H
		108.57	30.21	-13.29	43.5	50.41	11.3	32.64	1.14			P	H
		155.28	27.38	-16.12	43.5	47.39	11.35	32.69	1.33			P	H
		306.3	17.74	-28.26	46	34.61	13.99	32.74	1.88			P	H
		515.6	18.3	-27.7	46	30.55	18.36	32.94	2.33			P	H
		910.4	26.18	-19.82	46	31.74	23.44	32.2	3.2			P	H
													H
													H
													H
													H
													H
													H
		85.62	34.97	-5.03	40	57.9	8.6	32.67	1.14	121	225	P	V
		93.18	36.46	-7.04	43.5	58.41	9.56	32.65	1.14			P	V
		104.52	29.6	-13.9	43.5	50.19	10.9	32.63	1.14			P	V
		428.1	16.02	-29.98	46	29.77	16.95	32.86	2.16			P	V
		607.3	20.09	-25.91	46	30.82	19.68	33.03	2.62			P	V
		833.4	27.96	-18.04	46	35.21	22.37	32.69	3.07			P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		(MHz)	(dBμV/m)	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1				(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 44 5220MHz LF		85.08	33.48	-6.52	40	56.41	8.6	32.67	1.14	100	1	P	H
		109.92	30.46	-13.04	43.5	50.56	11.4	32.64	1.14			P	H
		157.71	27.06	-16.44	43.5	47.22	11.2	32.69	1.33			P	H
		304.2	17.27	-28.73	46	34.19	13.93	32.73	1.88			P	H
		315.4	16.8	-29.2	46	33.44	14.23	32.75	1.88			P	H
		633.9	20.39	-25.61	46	30.78	20.01	33.02	2.62			P	H
													H
													H
													H
													H
													H
													H
		44.85	23.12	-16.88	40	43.56	11.7	32.79	0.65			P	V
		80.22	35.28	-4.72	40	59.04	8	32.69	0.93	111	213	P	V
		91.02	36.68	-6.82	43.5	58.88	9.32	32.66	1.14			P	V
		470.1	18.2	-27.8	46	31.14	17.66	32.9	2.3			P	V
		668.9	20.71	-25.29	46	30.69	20.35	33	2.67			P	V
		883.8	24.16	-21.84	46	30.43	22.97	32.4	3.16			P	V
													V
													V
													V
													V
													V
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		(MHz)	(dBμV/m)	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1				(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 48 5240MHz LF		109.92	29.95	-13.55	43.5	50.05	11.4	32.64	1.14	109	36	P	H
		128.01	26.95	-16.55	43.5	46.3	11.98	32.66	1.33			P	H
		159.06	26.96	-16.54	43.5	47.17	11.15	32.69	1.33			P	H
		435.8	17.83	-28.17	46	31.47	17.07	32.87	2.16			P	H
		578.6	19.09	-26.91	46	30.31	19.22	33.01	2.57			P	H
		818	23.82	-22.18	46	31.29	22.24	32.78	3.07			P	H
													H
													H
													H
													H
													H
													H
													H
		42.69	23.85	-16.15	40	43.17	12.82	32.79	0.65			P	V
		85.62	35.33	-4.67	40	58.26	8.6	32.67	1.14	155	289	P	V
		92.64	36.17	-7.33	43.5	58.12	9.56	32.65	1.14			P	V
		364.4	14.98	-31.02	46	30.26	15.58	32.8	1.94			P	V
		559	18.58	-27.42	46	30.23	18.86	32.98	2.47			P	V
		754.3	22.03	-23.97	46	30.4	21.65	32.93	2.91			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	H orizontal or V ertical



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		(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

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”.