



Appendix B. Radiated Spurious Emission

Test Engineer :	Bill Chang and Ken Wu and J.C. Liang	Temperature :	20~23°C
		Relative Humidity :	54~56%

15E 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		5713.4	67.23	-6.77	74	59.19	32.29	9.39	33.64	100	116	P	H
		5723.64	70.17	-8.13	78.3	62.06	32.31	9.44	33.64	100	116	P	H
		5715	51.88	-2.12	54	43.84	32.29	9.39	33.64	100	116	A	H
	*	5744	105.79	-	-	97.66	32.34	9.44	33.65	100	116	P	H
	*	5744	98.28	-	-	90.15	32.34	9.44	33.65	100	116	A	H
													H
													H
													H
		5712.12	56.67	-17.33	74	48.63	32.29	9.39	33.64	355	0	P	V
		5724.6	66.22	-12.08	78.3	58.11	32.31	9.44	33.64	355	0	P	V
		5714.92	45.94	-8.06	54	37.9	32.29	9.39	33.64	355	0	A	V
	*	5744	98.57	-	-	90.44	32.34	9.44	33.65	355	0	P	V
	*	5744	92.09	-	-	83.96	32.34	9.44	33.65	355	0	A	V
													V
													V
													V



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 157 5785MHz		5711.56	57.76	-16.24	74	49.72	32.29	9.39	33.64	100	119	P	H
		5716.04	59.95	-18.35	78.3	51.91	32.29	9.39	33.64	100	119	P	H
		5715	47.51	-6.49	54	39.47	32.29	9.39	33.64	100	119	A	H
	*	5786	106.16	-	-	97.92	32.41	9.49	33.66	100	119	P	H
	*	5786	99.69	-	-	91.45	32.41	9.49	33.66	100	119	A	H
		5854.32	57.75	-20.55	78.3	49.38	32.51	9.54	33.68	100	119	P	H
		5860.56	54.22	-19.78	74	45.86	32.51	9.54	33.69	100	119	P	H
		5860.24	44.64	-9.36	54	36.28	32.51	9.54	33.69	100	119	A	H
		5713.48	51.48	-22.52	74	43.44	32.29	9.39	33.64	368	342	P	V
		5720.36	53.75	-24.55	78.3	45.69	32.31	9.39	33.64	368	342	P	V
		5713.08	41.65	-12.35	54	33.61	32.29	9.39	33.64	368	342	A	V
	*	5786	100.59	-	-	92.35	32.41	9.49	33.66	368	342	P	V
	*	5786	94.37	-	-	86.13	32.41	9.49	33.66	368	342	A	V
		5850.88	52.2	-26.1	78.3	43.86	32.48	9.54	33.68	368	342	P	V
		5861.76	49.65	-24.35	74	41.29	32.51	9.54	33.69	368	342	P	V
		5861.44	41.2	-12.8	54	32.84	32.51	9.54	33.69	368	342	A	V



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 165 5825MHz	*	5823	106.04	-	-	97.73	32.46	9.52	33.67	100	86	P	H
	*	5823	99.88	-	-	91.57	32.46	9.52	33.67	100	86	A	H
		5852.8	68	-10.3	78.3	59.66	32.48	9.54	33.68	100	86	P	H
		5861.12	61.62	-12.38	74	53.26	32.51	9.54	33.69	100	86	P	H
		5860	51.52	-2.48	54	43.16	32.51	9.54	33.69	100	86	A	H
													H
													H
													H
	*	5825	99.2	-	-	90.89	32.46	9.52	33.67	361	353	P	V
	*	5825	92.45	-	-	84.14	32.46	9.52	33.67	361	353	A	V
		5852	62.83	-15.47	78.3	54.49	32.48	9.54	33.68	361	353	P	V
		5864.96	55.22	-18.78	74	46.86	32.51	9.54	33.69	361	353	P	V
		5860.4	44.86	-9.14	54	36.5	32.51	9.54	33.69	361	353	A	V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 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		11490	45.26	-28.74	74	57.14	39.91	13.95	65.74	100	0	P	H
		17235	49.68	-24.32	74	55.81	41	16.95	64.08	100	0	P	H
													H
													H
		11490	47.77	-26.23	74	59.65	39.91	13.95	65.74	100	0	P	V
		17235	50.71	-23.29	74	56.84	41	16.95	64.08	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	46.62	-27.38	74	58.52	39.76	14	65.66	100	0	P	H
		17355	51.56	-22.44	74	57.4	41.35	17.03	64.22	100	0	P	H
													H
													H
		11570	53.14	-20.86	74	65.04	39.76	14	65.66	100	0	P	V
		17355	52.71	-21.29	74	58.55	41.35	17.03	64.22	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	45.43	-28.57	74	57.38	39.62	14.05	65.62	100	0	P	H
		17475	50.97	-23.03	74	56.53	41.7	17.1	64.36	100	0	P	H
													H
													H
		11650	51.94	-22.06	74	63.89	39.62	14.05	65.62	100	0	P	V
		17475	52.13	-21.87	74	57.69	41.7	17.1	64.36	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 4 5725~5850MHz

WIFI 802.11n HT20 (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)
802.11n HT20 CH 149 5745MHz		5714.12	63.99	-10.01	74	55.95	32.29	9.39	33.64	100	118	P	H
		5725	73.37	-4.93	78.3	65.26	32.31	9.44	33.64	100	118	P	H
		5714.92	53.34	-0.66	54	45.3	32.29	9.39	33.64	100	118	A	H
	*	5744	105.86	-	-	97.73	32.34	9.44	33.65	100	118	P	H
	*	5744	99.02	-	-	90.89	32.34	9.44	33.65	100	118	A	H
													H
													H
													H
		5690.84	55.96	-18.04	74	47.93	32.27	9.39	33.63	355	360	P	V
		5723.64	65.88	-12.42	78.3	57.77	32.31	9.44	33.64	355	360	P	V
		5714.44	46.6	-7.4	54	38.56	32.29	9.39	33.64	355	360	A	V
	*	5745	99.26	-	-	91.13	32.34	9.44	33.65	355	360	P	V
	*	5745	92.94	-	-	84.81	32.34	9.44	33.65	355	360	A	V
													V
													V
													V



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 157 5785MHz		5715	57.47	-16.53	74	49.43	32.29	9.39	33.64	100	114	P	H
		5715.56	62.85	-15.45	78.3	54.81	32.29	9.39	33.64	100	114	P	H
		5714.76	48.29	-5.71	54	40.25	32.29	9.39	33.64	100	114	A	H
	*	5786	105.95	-	-	97.71	32.41	9.49	33.66	100	114	P	H
	*	5786	99.36	-	-	91.12	32.41	9.49	33.66	100	114	A	H
		5852.88	56.57	-21.73	78.3	48.23	32.48	9.54	33.68	100	114	P	H
		5861.84	53.89	-20.11	74	45.53	32.51	9.54	33.69	100	114	P	H
		5860.4	44.99	-9.01	54	36.63	32.51	9.54	33.69	100	114	A	H
		5715	50.91	-23.09	74	42.87	32.29	9.39	33.64	368	344	P	V
		5723	55.31	-22.99	78.3	47.2	32.31	9.44	33.64	368	344	P	V
		5714.92	42.26	-11.74	54	34.22	32.29	9.39	33.64	368	344	A	V
	*	5786	100.55	-	-	92.31	32.41	9.49	33.66	368	344	P	V
	*	5786	93.81	-	-	85.57	32.41	9.49	33.66	368	344	A	V
		5851.68	51.36	-26.94	78.3	43.02	32.48	9.54	33.68	368	344	P	V
		5861.36	51.2	-22.8	74	42.84	32.51	9.54	33.69	368	344	P	V
		5861.2	41.67	-12.33	54	33.31	32.51	9.54	33.69	368	344	A	V



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 165 5825MHz	*	5825	105.43	-	-	97.12	32.46	9.52	33.67	100	87	P	H
	*	5825	98.76	-	-	90.45	32.46	9.52	33.67	100	87	A	H
		5853.28	65.65	-12.65	78.3	57.31	32.48	9.54	33.68	100	87	P	H
		5863.36	62.14	-11.86	74	53.78	32.51	9.54	33.69	100	87	P	H
		5861.12	50.85	-3.15	54	42.49	32.51	9.54	33.69	100	87	A	H
													H
													H
													H
	*	5825	99.12	-	-	90.81	32.46	9.52	33.67	362	351	P	V
	*	5825	93.57	-	-	85.26	32.46	9.52	33.67	362	351	A	V
		5853.44	59.71	-18.59	78.3	51.37	32.48	9.54	33.68	362	351	P	V
		5860.64	54.14	-19.86	74	45.78	32.51	9.54	33.69	362	351	P	V
		5860.24	44.98	-9.02	54	36.62	32.51	9.54	33.69	362	351	A	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 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 149 5745MHz		11490	44.57	-29.43	74	56.45	39.91	13.95	65.74	100	0	P	H
		17235	50.74	-23.26	74	56.87	41	16.95	64.08	100	0	P	H
													H
													H
		11490	49.7	-24.3	74	61.58	39.91	13.95	65.74	100	0	P	V
		17235	53.11	-20.89	74	59.24	41	16.95	64.08	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	45.52	-28.48	74	57.42	39.76	14	65.66	100	0	P	H
		17355	50.99	-23.01	74	56.83	41.35	17.03	64.22	100	0	P	H
													H
													H
		11570	52.82	-21.18	74	64.72	39.76	14	65.66	100	0	P	V
		17355	53.8	-20.2	74	59.64	41.35	17.03	64.22	100	0	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	46.05	-27.95	74	58	39.62	14.05	65.62	100	0	P	H
		17475	52.76	-21.24	74	58.32	41.7	17.1	64.36	100	0	P	H
													H
													H
		11650	51.42	-22.58	74	63.37	39.62	14.05	65.62	100	0	P	V
		17475	51.54	-22.46	74	57.1	41.7	17.1	64.36	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 4 5725~5850MHz

WIFI 802.11n HT40 (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)
802.11n HT40 CH 151 5755MHz		5713.24	64.84	-9.16	74	56.8	32.29	9.39	33.64	100	116	P	H
		5723.8	66.19	-12.11	78.3	58.08	32.31	9.44	33.64	100	116	P	H
		5713.24	52.96	-1.04	54	44.92	32.29	9.39	33.64	100	116	A	H
	*	5755	101.23	-	-	93.08	32.36	9.44	33.65	100	116	P	H
	*	5755	94.33	-	-	86.18	32.36	9.44	33.65	100	116	A	H
		5851.36	51.07	-27.23	78.3	42.73	32.48	9.54	33.68	100	116	P	H
		5862.88	51.18	-22.82	74	42.82	32.51	9.54	33.69	100	116	P	H
		5864.24	42.57	-11.43	54	34.21	32.51	9.54	33.69	100	116	A	H
		5708.52	53.93	-20.07	74	45.89	32.29	9.39	33.64	350	360	P	V
		5724.6	58.81	-19.49	78.3	50.7	32.31	9.44	33.64	350	360	P	V
		5713	43.61	-10.39	54	35.57	32.29	9.39	33.64	350	360	A	V
	*	5754	95.18	-	-	87.03	32.36	9.44	33.65	350	360	P	V
	*	5754	88.06	-	-	79.91	32.36	9.44	33.65	350	360	A	V
		5858.32	49.57	-28.73	78.3	41.21	32.51	9.54	33.69	350	360	P	V
		5887.2	48.8	-25.2	74	40.4	32.53	9.57	33.7	350	360	P	V
		5863.92	40.99	-13.01	54	32.63	32.51	9.54	33.69	350	360	A	V



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 HT40 CH 159 5795MHz		5713.72	55.7	-18.3	74	47.66	32.29	9.39	33.64	100	85	P	H
		5718.92	56.3	-22	78.3	48.24	32.31	9.39	33.64	100	85	P	H
		5714.36	46.06	-7.94	54	38.02	32.29	9.39	33.64	100	85	A	H
	*	5794	103.34	-	-	95.1	32.41	9.49	33.66	100	85	P	H
	*	5794	95.91	-	-	87.67	32.41	9.49	33.66	100	85	A	H
		5851.04	61.18	-17.12	78.3	52.84	32.48	9.54	33.68	100	85	P	H
		5861.44	59.23	-14.77	74	50.87	32.51	9.54	33.69	100	85	P	H
		5860.96	47.66	-6.34	54	39.3	32.51	9.54	33.69	100	85	A	H
		5694.92	50.29	-23.71	74	42.26	32.27	9.39	33.63	346	0	P	V
		5715.08	49.01	-29.29	78.3	40.97	32.29	9.39	33.64	346	0	P	V
		5701	41.51	-12.49	54	33.46	32.29	9.39	33.63	346	0	A	V
	*	5795	95.48	-	-	87.24	32.41	9.49	33.66	346	0	P	V
	*	5795	88.48	-	-	80.24	32.41	9.49	33.66	346	0	A	V
		5851.84	51.04	-27.26	78.3	42.7	32.48	9.54	33.68	346	0	P	V
		5866	50.05	-23.95	74	41.69	32.51	9.54	33.69	346	0	P	V
		5861.52	41.41	-12.59	54	33.05	32.51	9.54	33.69	346	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 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 HT40 CH 151 5755MHz		11510	43.22	-30.78	74	55.07	39.9	13.95	65.7	100	0	P	H
		17265	48.72	-25.28	74	54.79	41.1	16.95	64.12	100	0	P	H
													H
													H
		11510	45.51	-28.49	74	57.36	39.9	13.95	65.7	100	0	P	V
		17265	47.14	-26.86	74	53.21	41.1	16.95	64.12	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	44.08	-29.92	74	56	39.73	14	65.65	100	0	P	H
		17385	50.06	-23.94	74	55.84	41.45	17.03	64.26	100	0	P	H
													H
													H
		11590	46.44	-27.56	74	58.36	39.73	14	65.65	100	0	P	V
		17385	49.54	-24.46	74	55.32	41.45	17.03	64.26	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Emission below 1GHz

5GHz 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)
5GHz 802.11n HT20 LF		30	16.03	-23.97	40	29.19	18	0.67	31.83			P	H
		160.14	11.6	-31.9	43.5	32.33	9.59	1.46	31.78			P	H
		270.84	13.89	-32.11	46	31.32	12.4	1.94	31.77			P	H
		426	17.93	-28.07	46	30.76	16.58	2.41	31.82			P	H
		636.7	21.18	-24.82	46	31.19	19.07	2.96	32.04			P	H
		955.9	23.49	-22.51	46	30.32	20.48	3.68	30.99	100	250	P	H
													H
													H
													H
													H
													H
													H
		41.07	20.45	-19.55	40	39.54	12.06	0.67	31.82	156	83	P	V
		159.87	12.66	-30.84	43.5	33.37	9.61	1.46	31.78			P	V
		281.64	12.96	-33.04	46	30.25	12.53	1.94	31.76			P	V
		486.9	17.67	-28.33	46	29.64	17.27	2.64	31.88			P	V
		755	22.04	-23.96	46	31.01	19.75	3.25	31.97			P	V
		933.5	22.9	-23.1	46	30.08	20.31	3.68	31.17			P	V
													V
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													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	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

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”.