



Appendix B. Radiated Spurious Emission

Test Engineer :	Elvis Chen and Stan Hsieh and Karl Hou and Lewis He	Temperature :	21~23°C
		Relative Humidity :	41~42%

<For Sample 2>

Band 4 - 5725~5850MHz
WIFI 802.11a (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)
802.11a CH 149 5745MHz		5714.44	61.98	-12.02	74	53.82	32.52	8.3	32.66	100	335	P	H
		5692.6	52.05	-1.95	54	43.89	32.51	8.3	32.65	100	335	A	H
		5723.56	69.74	-8.56	78.3	61.54	32.53	8.33	32.66	100	335	P	H
	*	5743	112.04	-	-	103.84	32.54	8.33	32.67	100	335	P	H
	*	5743	105.07	-	-	96.87	32.54	8.33	32.67	100	335	A	H
													H
													H
													H
		5713.56	53.31	-20.69	74	45.15	32.52	8.3	32.66	137	81	P	V
		5692.6	45.46	-8.54	54	37.3	32.51	8.3	32.65	137	81	A	V
		5724.12	65.16	-13.14	78.3	56.96	32.53	8.33	32.66	137	81	P	V
	*	5747	104.99	-	-	96.79	32.54	8.33	32.67	137	81	P	V
	*	5747	98.08	-	-	89.88	32.54	8.33	32.67	137	81	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		5705.16	57.99	-16.01	74	49.83	32.52	8.3	32.66	100	337	P	H
		5693.8	45.99	-8.01	54	37.83	32.51	8.3	32.65	100	337	A	H
		5720.92	56.64	-21.66	78.3	48.47	32.53	8.3	32.66	100	337	P	H
	*	5783	115.58	-	-	107.34	32.57	8.35	32.68	100	337	P	H
	*	5783	108.33	-	-	100.09	32.57	8.35	32.68	100	337	A	H
		5850.16	54.25	-24.05	78.3	45.91	32.61	8.43	32.7	100	337	P	H
		5863.44	54.44	-19.56	74	46.1	32.62	8.43	32.71	100	337	P	H
		5860	42.37	-11.63	54	34.03	32.62	8.43	32.71	100	337	A	H
		5685.56	51.99	-22.01	74	43.83	32.51	8.3	32.65	103	67	P	V
		5693.96	42	-12	54	33.84	32.51	8.3	32.65	103	67	A	V
		5719.48	55.66	-22.64	78.3	47.49	32.53	8.3	32.66	103	67	P	V
	*	5787	108.14	-	-	99.89	32.58	8.35	32.68	103	67	P	V
	*	5787	100.95	-	-	92.7	32.58	8.35	32.68	103	67	A	V
		5850.4	51.02	-27.28	78.3	42.68	32.61	8.43	32.7	103	67	P	V
		5876.96	50.73	-23.27	74	42.38	32.63	8.43	32.71	103	67	P	V
		5880.88	41.12	-12.88	54	32.77	32.63	8.43	32.71	103	67	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	*	5827	113.91	-	-	105.61	32.6	8.39	32.69	100	331	P	H
	*	5827	106.41	-	-	98.11	32.6	8.39	32.69	100	331	A	H
		5851.04	75.48	-2.82	78.3	67.14	32.61	8.43	32.7	100	331	P	H
		5860.88	65.64	-8.36	74	57.3	32.62	8.43	32.71	100	331	P	H
		5860	51.12	-2.88	54	42.78	32.62	8.43	32.71	100	331	A	H
													H
													H
													H
	*	5824	106.51	-	-	98.21	32.6	8.39	32.69	100	63	P	V
	*	5824	99.28	-	-	90.98	32.6	8.39	32.69	100	63	A	V
		5851.6	69.97	-8.33	78.3	61.63	32.61	8.43	32.7	100	63	P	V
		5861.2	61.39	-12.61	74	53.05	32.62	8.43	32.71	100	63	P	V
		5877.28	45.29	-8.71	54	36.94	32.63	8.43	32.71	100	63	A	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	59.98	-14.02	74	70.19	40.01	12.58	62.8	100	0	P	H
		11490	48.27	-5.73	54	58.48	40.01	12.58	62.8	100	0	A	H
		17235	47.19	-26.81	74	50.62	41.05	15.66	60.14	100	0	P	H
													H
		11490	56.59	-17.41	74	66.8	40.01	12.58	62.8	104	339	P	V
		11490	45.85	-8.15	54	56.06	40.01	12.58	62.8	104	339	A	V
		17235	47.1	-26.9	74	50.53	41.05	15.66	60.14	100	0	P	V
													V
802.11a CH 157 5785MHz		11570	57.13	-16.87	74	67.33	39.88	12.66	62.74	100	4	P	H
		11570	47.98	-6.02	54	58.18	39.88	12.66	62.74	100	4	A	H
		17355	39.4	-34.6	74	42.44	41.38	15.79	60.21	100	0	P	H
													H
		11570	54.3	-19.7	74	64.5	39.88	12.66	62.74	102	340	P	V
		11570	44.68	-9.32	54	54.88	39.88	12.66	62.74	102	340	A	V
		17355	39.84	-34.16	74	42.88	41.38	15.79	60.21	100	0	P	V
													V
802.11a CH 165 5825MHz		11650	58.74	-15.26	74	68.95	39.75	12.73	62.69	100	321	P	H
		11650	46.32	-7.68	54	56.53	39.75	12.73	62.69	100	321	A	H
		17475	47.79	-26.21	74	50.43	41.71	15.93	60.28	100	0	P	H
													H
		11649	50.81	-23.19	74	61.02	39.75	12.73	62.69	100	0	P	V
		17475	46.75	-27.25	74	49.39	41.71	15.93	60.28	100	0	P	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 (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		5713.88	65.96	-8.04	74	57.8	32.52	8.3	32.66	100	338	P	H
		5693.16	52.7	-1.3	54	44.54	32.51	8.3	32.65	100	338	A	H
		5722.6	72	-6.3	78.3	63.8	32.53	8.33	32.66	100	338	P	H
	*	5743	112.38	-	-	104.18	32.54	8.33	32.67	100	338	P	H
	*	5743	104.85	-	-	96.65	32.54	8.33	32.67	100	338	A	H
													H
													H
													H
		5714.68	53.4	-20.6	74	45.24	32.52	8.3	32.66	104	80	P	V
		5693.16	46.6	-7.4	54	38.44	32.51	8.3	32.65	104	80	A	V
		5723.8	65.84	-12.46	78.3	57.64	32.53	8.33	32.66	104	80	P	V
	*	5743	104.14	-	-	95.94	32.54	8.33	32.67	104	80	P	V
	*	5743	96.97	-	-	88.77	32.54	8.33	32.67	104	80	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		5713	53.8	-20.2	74	45.64	32.52	8.3	32.66	100	28	P	H
		5693.08	43.65	-10.35	54	35.49	32.51	8.3	32.65	100	28	A	H
		5715.24	60.3	-18	78.3	52.14	32.52	8.3	32.66	100	28	P	H
	*	5783	111.73	-	-	103.49	32.57	8.35	32.68	100	28	P	H
	*	5783	104.78	-	-	96.54	32.57	8.35	32.68	100	28	A	H
		5851.52	52.97	-25.33	78.3	44.63	32.61	8.43	32.7	100	28	P	H
		5879.68	50.59	-23.41	74	42.24	32.63	8.43	32.71	100	28	P	H
		5880.88	41.6	-12.4	54	33.25	32.63	8.43	32.71	100	28	A	H
		5711.24	50.14	-23.86	74	41.98	32.52	8.3	32.66	100	66	P	V
		5695.96	41.44	-12.56	54	33.28	32.51	8.3	32.65	100	66	A	V
		5720.84	50.34	-27.96	78.3	42.17	32.53	8.3	32.66	100	66	P	V
	*	5788	108.87	-	-	100.62	32.58	8.35	32.68	100	66	P	V
	*	5788	101.67	-	-	93.42	32.58	8.35	32.68	100	66	A	V
		5856.48	50.79	-27.51	78.3	42.44	32.62	8.43	32.7	100	66	P	V
		5889.76	50.49	-23.51	74	42.1	32.64	8.47	32.72	100	66	P	V
		5880.88	41	-13	54	32.65	32.63	8.43	32.71	100	66	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	*	5824	114.27	-	-	105.97	32.6	8.39	32.69	100	337	P	H
	*	5824	106.18	-	-	97.88	32.6	8.39	32.69	100	337	A	H
		5852.32	74.65	-3.65	78.3	66.31	32.61	8.43	32.7	100	337	P	H
		5860.8	64.85	-9.15	74	56.51	32.62	8.43	32.71	100	337	P	H
		5860	52.73	-1.27	54	44.39	32.62	8.43	32.71	100	337	A	H
													H
													H
													H
	*	5827	106.24	-	-	97.94	32.6	8.39	32.69	100	63	P	V
	*	5827	98.99	-	-	90.69	32.6	8.39	32.69	100	63	A	V
		5852.08	67.11	-11.19	78.3	58.77	32.61	8.43	32.7	100	63	P	V
		5862.08	58.22	-15.78	74	49.88	32.62	8.43	32.71	100	63	P	V
		5860	46.83	-7.17	54	38.49	32.62	8.43	32.71	100	63	A	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	59.9	-14.1	74	70.11	40.01	12.58	62.8	100	1	P	H
		11490	47.66	-6.34	54	57.87	40.01	12.58	62.8	100	1	A	H
		17235	46.42	-27.58	74	49.85	41.05	15.66	60.14	100	0	P	H
													H
		11490	55.71	-18.29	74	65.92	40.01	12.58	62.8	105	346	P	V
		11490	45.58	-8.42	54	55.79	40.01	12.58	62.8	105	346	A	V
		17235	45.76	-28.24	74	49.19	41.05	15.66	60.14	100	0	P	V
													V
802.11n HT20 CH 157 5785MHz		11570	56.84	-17.16	74	67.04	39.88	12.66	62.74	100	8	P	H
		11570	46.54	-7.46	54	56.74	39.88	12.66	62.74	100	8	A	H
		17355	37.96	-36.04	74	41	41.38	15.79	60.21	100	0	P	H
													H
		11570	53.54	-20.46	74	63.74	39.88	12.66	62.74	103	342	P	V
		11570	43.18	-10.82	54	53.38	39.88	12.66	62.74	103	342	A	V
		17355	38.5	-35.5	74	41.54	41.38	15.79	60.21	100	0	P	V
													V
802.11n HT20 CH 165 5825MHz		11649	58.38	-15.62	74	68.59	39.75	12.73	62.69	110	1	P	H
		11649	46.98	-7.02	54	57.19	39.75	12.73	62.69	110	1	A	H
		17475	48.7	-25.3	74	51.34	41.71	15.93	60.28	100	0	P	H
													H
		11652	50.22	-23.78	74	60.45	39.72	12.73	62.68	100	0	P	V
		17475	46.67	-27.33	74	49.31	41.71	15.93	60.28	100	0	P	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 HT40 (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 HT40 CH 151 5755MHz		5708.6	62.86	-11.14	74	54.7	32.52	8.3	32.66	100	335	P	H
		5719.08	65.71	-12.59	78.3	57.54	32.53	8.3	32.66	100	335	P	H
		5715	49.87	-4.13	54	41.71	32.52	8.3	32.66	100	335	A	H
	*	5753	107.81	-	-	99.59	32.56	8.33	32.67	100	335	P	H
	*	5753	100.75	-	-	92.53	32.56	8.33	32.67	100	335	A	H
		5858.64	51.68	-26.62	78.3	43.34	32.62	8.43	32.71	100	335	P	H
		5875.68	51.32	-22.68	74	42.97	32.63	8.43	32.71	100	335	P	H
		5860	43.72	-10.28	54	35.38	32.62	8.43	32.71	100	335	A	H
		5708.68	58.58	-15.42	74	50.42	32.52	8.3	32.66	119	77	P	V
		5724.12	60.25	-18.05	78.3	52.05	32.53	8.33	32.66	119	77	P	V
		5715	44.6	-9.4	54	36.44	32.52	8.3	32.66	119	77	A	V
	*	5753	100.08	-	-	91.86	32.56	8.33	32.67	119	77	P	V
	*	5753	93.03	-	-	84.81	32.56	8.33	32.67	119	77	A	V
		5855.84	50.9	-27.4	78.3	42.55	32.62	8.43	32.7	119	77	P	V
		5886.32	49.77	-24.23	74	41.39	32.63	8.47	32.72	119	77	P	V
		5860	41.46	-12.54	54	33.12	32.62	8.43	32.71	119	77	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 HT40 CH 159 5795MHz		5691.64	55.13	-18.87	74	46.97	32.51	8.3	32.65	100	330	P	H
		5692.44	46.86	-7.14	54	38.7	32.51	8.3	32.65	100	330	A	H
		5715.4	53.55	-24.75	78.3	45.39	32.52	8.3	32.66	100	330	P	H
	*	5793	107.35	-	-	99.1	32.58	8.35	32.68	100	330	P	H
	*	5793	100.6	-	-	92.35	32.58	8.35	32.68	100	330	A	H
		5850.4	57.47	-20.83	78.3	49.13	32.61	8.43	32.7	100	330	P	H
		5865.52	53.04	-20.96	74	44.7	32.62	8.43	32.71	100	330	P	H
		5860	43.01	-10.99	54	34.67	32.62	8.43	32.71	100	330	A	H
		5685.72	50.62	-23.38	74	42.46	32.51	8.3	32.65	117	74	P	V
		5692.28	42.82	-11.18	54	34.66	32.51	8.3	32.65	117	74	A	V
		5719.4	50.04	-28.26	78.3	41.87	32.53	8.3	32.66	117	74	P	V
	*	5793	100.39	-	-	92.14	32.58	8.35	32.68	117	74	P	V
	*	5793	93.24	-	-	84.99	32.58	8.35	32.68	117	74	A	V
		5850.01	52.78	-25.52	78.3	44.44	32.61	8.43	32.7	117	74	P	V
		5881.2	49.81	-24.19	74	41.46	32.63	8.43	32.71	117	74	P	V
		5860	41.32	-12.68	54	32.98	32.62	8.43	32.71	117	74	A	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 HT40 (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 HT40 CH 151 5755MHz		11511	55.68	-18.32	74	65.9	40	12.58	62.8	100	1	P	H
		11511	44.96	-9.04	54	55.18	40	12.58	62.8	100	1	A	H
		17265	45.29	-28.71	74	48.64	41.15	15.66	60.16	100	0	P	H
													H
		11511	48.99	-25.01	74	59.21	40	12.58	62.8	100	0	P	V
		17265	46.61	-27.39	74	49.96	41.15	15.66	60.16	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11589	54.44	-19.56	74	64.67	39.84	12.66	62.73	100	1	P	H
		11589	44.14	-9.86	54	54.37	39.84	12.66	62.73	100	1	A	H
		17385	47.39	-26.61	74	50.36	41.47	15.79	60.23	100	0	P	H
													H
		11589	47.89	-26.11	74	58.12	39.84	12.66	62.73	100	0	P	V
		17385	46.38	-27.62	74	49.35	41.47	15.79	60.23	100	0	P	V
													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	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		31.08	17.35	-22.65	40	30.06	19.46	0.65	32.82			P	H
		42.15	12.01	-27.99	40	31.34	12.82	0.65	32.8			P	H
		109.11	11.73	-31.77	43.5	31.83	11.4	1.14	32.64			P	H
		477.1	23.62	-22.38	46	36.44	17.78	2.3	32.9			P	H
		540.8	23.62	-22.38	46	35.51	18.61	2.47	32.97			P	H
		770.4	31.21	-14.79	46	39.35	21.8	2.97	32.91	120	66	P	H
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		32.16	22.88	-17.12	40	36.13	18.92	0.65	32.82			P	V
		35.13	18.97	-21.03	40	33.83	17.3	0.65	32.81			P	V
		197.67	17.62	-25.88	43.5	38.91	9.96	1.48	32.73			P	V
		462.4	32.24	-13.76	46	45.31	17.52	2.3	32.89	100	99	P	V
		483.4	31.2	-14.8	46	43.92	17.89	2.3	32.91			P	V
		742.4	31.75	-14.25	46	40.34	21.44	2.91	32.94			P	V
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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		(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”.