



Appendix B. Radiated Spurious Emission

Test Engineer :	Peter Chiu, Nick Yu, Ricky Su, Citta Ke and Karl Hou	Temperature :	21~23°C
		Relative Humidity :	55~57%

<CDD Modes>

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		5148.72	64.68	-9.32	74	52.77	31.65	11.21	30.95	100	57	P	H	
		5149.76	52.1	-1.9	54	40.19	31.65	11.21	30.95	100	57	A	H	
	*	5182	109.36	-	-	97.45	31.68	11.18	30.95	100	57	P	H	
	*	5182	99.31	-	-	87.4	31.68	11.18	30.95	100	57	A	H	
													H	
														H
			5149.24	60.75	-13.25	74	48.84	31.65	11.21	30.95	100	92	P	V
			5149.76	50.1	-3.9	54	38.19	31.65	11.21	30.95	100	92	A	V
	*		5180	106.93	-	-	94.99	31.68	11.21	30.95	100	92	P	V
	*		5180	96.15	-	-	84.21	31.68	11.21	30.95	100	92	A	V
														V
														V
802.11a CH 44 5220MHz		5131.56	58.29	-15.71	74	46.37	31.63	11.24	30.95	272	45	P	H	
		5149.24	47.87	-6.13	54	35.96	31.65	11.21	30.95	272	45	A	H	
	*	5220	110.07	-	-	98.12	31.72	11.18	30.95	272	45	P	H	
	*	5220	99.17	-	-	87.22	31.72	11.18	30.95	272	45	A	H	
			5457.84	59.76	-14.24	74	47.12	31.95	11.64	30.95	272	45	P	H
			5432.4	48.41	-5.59	54	35.79	31.93	11.64	30.95	272	45	A	H
			5136.24	58.9	-15.1	74	46.98	31.63	11.24	30.95	100	103	P	V
			5144.04	47.83	-6.17	54	35.92	31.65	11.21	30.95	100	103	A	V
	*		5220	109.77	-	-	97.82	31.72	11.18	30.95	100	103	P	V
	*		5220	99.51	-	-	87.56	31.72	11.18	30.95	100	103	A	V
			5388.96	59.74	-14.26	74	47.21	31.88	11.6	30.95	100	103	P	V
			5438.88	48.46	-5.54	54	35.84	31.93	11.64	30.95	100	103	A	V



802.11a CH 48 5240MHz		5048.62	58.63	-15.37	74	46.72	31.55	11.31	30.95	100	127	P	H
		5134.94	47.63	-6.37	54	35.71	31.63	11.24	30.95	100	127	A	H
	*	5242	108.29	-	-	96.23	31.75	11.26	30.95	100	127	P	H
	*	5242	98.57	-	-	86.51	31.75	11.26	30.95	100	127	A	H
		5396.88	59.54	-14.46	74	46.99	31.9	11.6	30.95	100	127	P	H
		5454	48.27	-5.73	54	35.63	31.95	11.64	30.95	100	127	A	H
		5097.24	59.12	-14.88	74	47.2	31.6	11.27	30.95	100	110	P	V
		5148.2	47.61	-6.39	54	35.7	31.65	11.21	30.95	100	110	A	V
	*	5242	108.36	-	-	96.3	31.75	11.26	30.95	100	110	P	V
	*	5242	98.12	-	-	86.06	31.75	11.26	30.95	100	110	A	V
		5413.44	59.88	-14.12	74	47.31	31.92	11.6	30.95	100	110	P	V
		5454.96	48.23	-5.77	54	35.59	31.95	11.64	30.95	100	110	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	47.23	-26.77	74	47.98	39.59	17.13	57.47	100	0	P	H
		15540	45.83	-28.17	74	44.49	38.26	21.61	58.53	100	0	P	H
													H
													H
		10360	47.01	-26.99	74	47.76	39.59	17.13	57.47	100	0	P	V
		15540	45.04	-28.96	74	43.7	38.26	21.61	58.53	100	0	P	V
													V
													V
802.11a CH 44 5220MHz		10440	47.31	-26.69	74	47.73	39.69	17.22	57.33	100	0	P	H
		15660	44.74	-29.26	74	43.22	38.11	21.7	58.29	100	0	P	H
													H
													H
		10440	47.29	-26.71	74	47.71	39.69	17.22	57.33	100	0	P	V
		15660	44.25	-29.75	74	42.73	38.11	21.7	58.29	100	0	P	V
													V
													V
802.11a CH 48 5240MHz		10480	46.9	-27.1	74	47.09	39.77	17.27	57.23	100	0	P	H
		15720	46.86	-27.14	74	45.22	38.03	21.76	58.15	100	0	P	H
													H
													H
		10480	46.85	-27.15	74	47.04	39.77	17.27	57.23	100	0	P	V
		15720	45.83	-28.17	74	44.19	38.03	21.76	58.15	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz

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 52 5260MHz		5113.36	59.37	-14.63	74	47.46	31.62	11.24	30.95	305	40	P	H
		5104.26	47.49	-6.51	54	35.6	31.6	11.24	30.95	305	40	A	H
	*	5262	108.88	-	-	96.71	31.77	11.35	30.95	305	40	P	H
	*	5262	100.12	-	-	87.95	31.77	11.35	30.95	305	40	A	H
		5430.08	60.09	-13.91	74	47.47	31.93	11.64	30.95	305	40	P	H
		5373.92	48.29	-5.71	54	35.85	31.87	11.52	30.95	305	40	A	H
		5126.88	59.77	-14.23	74	47.85	31.63	11.24	30.95	121	103	P	V
		5015.6	47.46	-6.54	54	35.55	31.52	11.34	30.95	121	103	A	V
	*	5262	108.31	-	-	96.14	31.77	11.35	30.95	121	103	P	V
	*	5262	99.42	-	-	87.25	31.77	11.35	30.95	121	103	A	V
		5365.12	59.46	-14.54	74	47.02	31.87	11.52	30.95	121	103	P	V
		5363.2	48.25	-5.75	54	35.81	31.87	11.52	30.95	121	103	A	V
802.11a CH 60 5300MHz		5010.14	59.11	-14.89	74	47.2	31.52	11.34	30.95	302	40	P	H
		5124.8	47.41	-6.59	54	35.49	31.63	11.24	30.95	302	40	A	H
	*	5302	110.41	-	-	98.13	31.8	11.43	30.95	302	40	P	H
	*	5302	99.89	-	-	87.61	31.8	11.43	30.95	302	40	A	H
		5353.44	61.33	-12.67	74	48.91	31.85	11.52	30.95	302	40	P	H
		5350.24	50.03	-3.97	54	37.61	31.85	11.52	30.95	302	40	A	H
		5139.62	59.02	-14.98	74	47.08	31.65	11.24	30.95	107	102	P	V
		5065.78	47.49	-6.51	54	35.6	31.57	11.27	30.95	107	102	A	V
	*	5298	110.02	-	-	97.82	31.8	11.35	30.95	107	102	P	V
	*	5298	99.41	-	-	87.21	31.8	11.35	30.95	107	102	A	V
		5350.4	60.65	-13.35	74	48.23	31.85	11.52	30.95	107	102	P	V
		5350.08	49.96	-4.04	54	37.54	31.85	11.52	30.95	107	102	A	V



802.11a CH 64 5320MHz	*	5320	109.47	-	-	97.17	31.82	11.43	30.95	100	62	P	H
	*	5320	98.7	-	-	86.4	31.82	11.43	30.95	100	62	A	H
		5351.04	65.01	-8.99	74	52.59	31.85	11.52	30.95	100	62	P	H
		5350.08	52.73	-1.27	54	40.31	31.85	11.52	30.95	100	62	A	H
													H
													H
	*	5320	106.58	-	-	94.28	31.82	11.43	30.95	100	95	P	V
	*	5320	95.79	-	-	83.49	31.82	11.43	30.95	100	95	A	V
		5351.04	62.82	-11.18	74	50.4	31.85	11.52	30.95	100	95	P	V
		5350.08	50.61	-3.39	54	38.19	31.85	11.52	30.95	100	95	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

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 52 5260MHz		10520	48.37	-25.63	74	48.44	39.82	17.31	57.2	100	0	P	H
		15780	44.65	-29.35	74	42.94	37.97	21.79	58.05	100	0	P	H
													H
													H
		10520	47.31	-26.69	74	47.38	39.82	17.31	57.2	100	0	P	V
		15780	45.12	-28.88	74	43.41	37.97	21.79	58.05	100	0	P	V
													V
													V
802.11a CH 60 5300MHz		10600	47.41	-26.59	74	47.27	39.92	17.4	57.18	100	0	P	H
		15900	46.02	-27.98	74	44.13	37.82	21.88	57.81	100	0	P	H
													H
													H
		10600	47.51	-26.49	74	47.37	39.92	17.4	57.18	100	0	P	V
		15900	45.46	-28.54	74	43.57	37.82	21.88	57.81	100	0	P	V
													V
													V
802.11a CH 64 5320MHz		10640	46.97	-27.03	74	46.72	39.97	17.45	57.17	100	0	P	H
		15960	44.27	-29.73	74	42.26	37.74	21.94	57.67	100	0	P	H
													H
													H
		10640	46.78	-27.22	74	46.53	39.97	17.45	57.17	100	0	P	V
		15960	44.75	-29.25	74	42.74	37.74	21.94	57.67	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

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 100 5500MHz		5459.92	62.88	-11.12	74	50.24	31.95	11.64	30.95	100	61	P	H	
		5469.84	67.24	-1.06	68.3	54.55	31.97	11.67	30.95	100	61	P	H	
		5460	51.56	-2.44	54	38.92	31.95	11.64	30.95	100	61	A	H	
	*	5500	109.83	-	-	97.11	32	11.67	30.95	100	61	P	H	
	*	5500	100.06	-	-	87.34	32	11.67	30.95	100	61	A	H	
														H
			5458.64	60.19	-13.81	74	47.55	31.95	11.64	30.95	100	100	P	V
			5469.52	62.72	-5.58	68.3	50.03	31.97	11.67	30.95	100	100	P	V
			5458.32	49.73	-4.27	54	37.09	31.95	11.64	30.95	100	100	A	V
	*		5500	106.22	-	-	93.5	32	11.67	30.95	100	100	P	V
	*		5500	96.32	-	-	83.6	32	11.67	30.95	100	100	A	V
														V
802.11a CH 116 5580MHz		5440.48	59.21	-14.79	74	46.59	31.93	11.64	30.95	259	13	P	H	
		5464	58.54	-9.76	68.3	45.85	31.97	11.67	30.95	259	13	P	H	
		5431.12	48.27	-5.73	54	35.65	31.93	11.64	30.95	259	13	A	H	
	*	5578	110.66	-	-	97.8	32.1	11.74	30.98	259	13	P	H	
	*	5578	100.87	-	-	88.01	32.1	11.74	30.98	259	13	A	H	
			5758.88	60.41	-7.89	68.3	47.23	32.36	11.86	31.04	259	13	P	H
			5407.12	59.7	-14.3	74	47.15	31.9	11.6	30.95	132	102	P	V
			5463.28	58.92	-9.38	68.3	46.23	31.97	11.67	30.95	132	102	P	V
			5447.44	48.12	-5.88	54	35.48	31.95	11.64	30.95	132	102	A	V
	*		5578	108.8	-	-	95.94	32.1	11.74	30.98	132	102	P	V
	*		5578	98.31	-	-	85.45	32.1	11.74	30.98	132	102	A	V
			5726.33	59.87	-8.43	68.3	46.74	32.31	11.84	31.02	132	102	P	V



802.11a CH 140 5700MHz	*	5700	110.5	-	-	97.42	32.27	11.82	31.01	100	63	P	H
	*	5700	99.82	-	-	86.74	32.27	11.82	31.01	100	63	A	H
		5725.4	66.86	-1.44	68.3	53.73	32.31	11.84	31.02	100	63	P	H
													H
													H
													H
	*	5700	104.29	-	-	91.21	32.27	11.82	31.01	109	99	P	V
	*	5700	94.47	-	-	81.39	32.27	11.82	31.01	109	99	A	V
		5725.16	61.99	-6.31	68.3	48.86	32.31	11.84	31.02	109	99	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

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 100 5500MHz		11000	48.36	-25.64	74	47.2	40.4	17.86	57.1	100	0	P	H
		16500	45.99	-22.31	68.3	40.27	39.3	22.42	56	100	0	P	H
													H
													H
		11000	47.48	-26.52	74	46.32	40.4	17.86	57.1	100	0	P	V
		16500	45.98	-22.32	68.3	40.26	39.3	22.42	56	100	0	P	V
													V
													V
802.11a CH 116 5580MHz		11160	47.53	-26.47	74	46.52	40.3	18.04	57.33	100	0	P	H
		16740	48.41	-19.89	68.3	41.83	40.07	22.65	56.14	100	0	P	H
													H
													H
		11160	47.75	-26.25	74	46.74	40.3	18.04	57.33	100	0	P	V
		16740	47.28	-21.02	68.3	40.7	40.07	22.65	56.14	100	0	P	V
													V
													V
802.11a CH 140 5700MHz		11400	46.47	-27.53	74	45.66	40.16	18.31	57.66	100	0	P	H
		17100	48.54	-19.76	68.3	40.99	41.22	22.99	56.66	100	0	P	H
													H
													H
		11400	47.42	-26.58	74	46.61	40.16	18.31	57.66	100	0	P	V
		17100	48.34	-19.96	68.3	40.79	41.22	22.99	56.66	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - Straddle Channel

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 144 5720MHz	*	5720	110.69	-	-	97.56	32.31	11.84	31.02	291	10	P	H
	*	5720	100.2	-	-	87.07	32.31	11.84	31.02	291	10	A	H
													H
													H
													H
	*	5720	106.58	-	-	93.45	32.31	11.84	31.02	100	105	P	V
	*	5720	95.55	-	-	82.42	32.31	11.84	31.02	100	105	A	V
													V
													V
													V
													V
	Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.											



Band 3 - Straddle Channel

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 144 5720MHz		11440	46.03	-27.97	74	45.24	40.14	18.36	57.71	100	0	P	H	
		17160	48.06	-25.94	74	40.47	41.43	23.06	56.9	100	0	A	H	
													H	
													H	
			11440	45.41	-28.59	74	44.62	40.14	18.36	57.71	100	0	P	V
			17160	47.16	-26.84	74	39.57	41.43	23.06	56.9	100	0	A	V
														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 LF		202.53	24.75	-18.75	43.5	39.58	15.88	1.7	32.41	-	-	P	H	
		232.23	26.03	-19.97	46	39.67	16.88	1.83	32.35	-	-	P	H	
		285.96	29.56	-16.44	46	40.35	19.22	2.25	32.26	-	-	P	H	
		358.1	35.77	-10.23	46	44.45	21.19	2.44	32.31	100	61	P	H	
		849.5	31.16	-14.84	46	30.17	28.6	4.28	31.89	-	-	P	H	
		936.3	33.3	-12.7	46	30.03	29.92	4.6	31.25	-	-	P	H	
														H
														H
														H
														H
														H
														H
			31.89	34.23	-5.77	40	41.19	24.72	0.78	32.46	100	135	P	V
			67.8	23.26	-16.74	40	42.45	12.2	1.06	32.45	-	-	P	V
			200.37	26.05	-17.45	43.5	40.93	15.83	1.7	32.41	-	-	P	V
			363	33.44	-12.56	46	42.01	21.31	2.44	32.32	-	-	P	V
			786.5	30.27	-15.73	46	30.61	27.75	4.14	32.23	-	-	P	V
			943.3	33.25	-12.75	46	29.55	30.14	4.75	31.19	-	-	P	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	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”.