



Appendix B. Radiated Spurious Emission

Test Engineer :	Donny Tang	Temperature :	22~24°C
		Relative Humidity :	47~50%

15E 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		5138.45	57.96	-16.04	74	48.44	34.63	8.88	33.99	100	238	P	H	
		5134.4	44.86	-9.14	54	35.34	34.63	8.88	33.99	100	238	A	H	
	*	5180	105.91	-	-	96.46	34.68	8.76	33.99	100	238	P	H	
	*	5180	95.35	-	-	85.9	34.68	8.76	33.99	100	238	A	H	
													H	
														H
			5145.65	56.16	-17.84	74	46.68	34.65	8.82	33.99	100	144	P	V
			5132	42.73	-11.27	54	33.21	34.63	8.88	33.99	100	144	A	V
	*		5180	102.67	-	-	93.22	34.68	8.76	33.99	100	144	P	V
	*		5180	92.24	-	-	82.79	34.68	8.76	33.99	100	144	A	V
														V
														V
802.11a CH 44 5220MHz		5136.95	56.62	-17.38	74	47.1	34.63	8.88	33.99	112	237	P	H	
		5142.5	43.66	-10.34	54	34.12	34.65	8.88	33.99	112	237	A	H	
	*	5220	105.45	-	-	96.02	34.72	8.7	33.99	112	237	P	H	
	*	5220	95.02	-	-	85.59	34.72	8.7	33.99	112	237	A	H	
			5356.93	53.78	-20.22	74	44.19	34.85	8.72	33.98	112	237	P	H
			5353.3	41.58	-12.42	54	31.99	34.85	8.72	33.98	112	237	A	H
			5140.1	54.01	-19.99	74	44.47	34.65	8.88	33.99	103	142	P	V
			5144	41.83	-12.17	54	32.35	34.65	8.82	33.99	103	142	A	V
	*		5220	102.5	-	-	93.07	34.72	8.7	33.99	103	142	P	V
	*		5220	92.21	-	-	82.78	34.72	8.7	33.99	103	142	A	V
			5369.47	53.87	-20.13	74	44.26	34.87	8.72	33.98	103	142	P	V
			5362.87	41.33	-12.67	54	31.72	34.87	8.72	33.98	103	142	A	V



802.11a CH 48 5240MHz		5149.7	54.1	-19.9	74	44.62	34.65	8.82	33.99	122	242	P	H
		5149.55	42.07	-11.93	54	32.59	34.65	8.82	33.99	122	242	A	H
	*	5240	105.5	-	-	96.06	34.73	8.7	33.99	122	242	P	H
	*	5240	94.8	-	-	85.36	34.73	8.7	33.99	122	242	A	H
		5360.23	54.84	-19.16	74	45.25	34.85	8.72	33.98	122	242	P	H
		5350.88	42.7	-11.3	54	33.11	34.85	8.72	33.98	122	242	A	H
		5135.75	53	-21	74	43.48	34.63	8.88	33.99	100	144	P	V
		5148.95	40.57	-13.43	54	31.09	34.65	8.82	33.99	100	144	A	V
	*	5240	103.18	-	-	93.74	34.73	8.7	33.99	100	144	P	V
	*	5240	92.55	-	-	83.11	34.73	8.7	33.99	100	144	A	V
		5354.18	54.97	-19.03	74	45.38	34.85	8.72	33.98	100	144	P	V
		5362.32	42.59	-11.41	54	32.98	34.87	8.72	33.98	100	144	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 36 5180MHz		10359	42.95	-31.05	74	50.78	37.29	12.92	58.04	100	0	P	H	
		15540	52.32	-21.68	74	53.93	40.13	17.02	58.76	100	312	P	H	
		15540	41.15	-12.85	54	42.76	40.13	17.02	58.76	100	312	A	H	
													H	
		10359	43.38	-30.62	74	51.21	37.29	12.92	58.04	100	0	P	V	
		15540	49.34	-24.66	74	50.95	40.13	17.02	58.76	100	0	P	V	
														V
														V
802.11a CH 44 5220MHz		10440	43.17	-30.83	74	50.72	37.35	13.02	57.92	100	0	P	H	
		15663	53.59	-20.41	74	54.89	40.27	17.02	58.59	100	108	P	H	
		15663	41.19	-12.81	54	42.49	40.27	17.02	58.59	100	108	A	H	
													H	
		10440	42.97	-31.03	74	50.52	37.35	13.02	57.92			P	V	
		15663	51.91	-22.09	74	53.21	40.27	17.02	58.59	100	214	P	V	
		15663	40.4	-13.6	54	41.7	40.27	17.02	58.59	100	214	A	V	
														V
802.11a CH 48 5240MHz		10479	43.75	-30.25	74	51.1	37.39	13.09	57.83			P	H	
		15720	52.21	-21.79	74	53.39	40.32	17.03	58.53	100	228	P	H	
		15720	42.15	-11.85	54	43.33	40.32	17.03	58.53	100	228	A	H	
													H	
		10479	43.11	-30.89	74	50.46	37.39	13.09	57.83			P	V	
		15720	52.09	-21.91	74	53.27	40.32	17.03	58.53	100	256	P	V	
		15720	41.42	-12.58	54	42.6	40.32	17.03	58.53	100	256	A	V	
														V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



15E band 1 5150~5250MHz
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 36 5180MHz		5133.05	55.35	-18.65	74	45.83	34.63	8.88	33.99	113	235	P	H	
		5122.7	42.74	-11.26	54	33.22	34.63	8.88	33.99	113	235	A	H	
	*	5180	102.92	-	-	93.47	34.68	8.76	33.99	113	235	P	H	
	*	5180	92.54	-	-	83.09	34.68	8.76	33.99	113	235	A	H	
													H	
														H
			5123.45	54.24	-19.76	74	44.72	34.63	8.88	33.99	100	140	P	V
			5133.5	41.81	-12.19	54	32.29	34.63	8.88	33.99	100	140	A	V
		*	5180	100.01	-	-	90.56	34.68	8.76	33.99	100	140	P	V
		*	5180	90.37	-	-	80.92	34.68	8.76	33.99	100	140	A	V
													V	
													V	
802.11n HT20 CH 44 5220MHz		5140.25	54.43	-19.57	74	44.89	34.65	8.88	33.99	104	260	P	H	
		5143.4	42.05	-11.95	54	32.51	34.65	8.88	33.99	104	260	A	H	
	*	5218	102.54	-	-	93.11	34.72	8.7	33.99	104	260	P	H	
	*	5218	92.47	-	-	83.04	34.72	8.7	33.99	104	260	A	H	
			5403.13	53.36	-20.64	74	43.71	34.9	8.73	33.98	104	260	P	H
			5352.97	41.03	-12.97	54	31.44	34.85	8.72	33.98	104	260	A	H
			5140.85	53.28	-20.72	74	43.74	34.65	8.88	33.99	100	143	P	V
			5142.95	40.56	-13.44	54	31.02	34.65	8.88	33.99	100	143	A	V
		*	5220	99.76	-	-	90.33	34.72	8.7	33.99	100	143	P	V
		*	5220	89.15	-	-	79.72	34.72	8.7	33.99	100	143	A	V
		5366.39	53.18	-20.82	74	43.57	34.87	8.72	33.98	100	143	P	V	
		5352.53	40.75	-13.25	54	31.16	34.85	8.72	33.98	100	143	A	V	



802.11n HT20 CH 48 5240MHz		5142.05	53.5	-20.5	74	43.96	34.65	8.88	33.99	102	260	P	H
		5140.7	40.91	-13.09	54	31.37	34.65	8.88	33.99	102	260	A	H
	*	5240	103.39	-	-	93.95	34.73	8.7	33.99	102	260	P	H
	*	5240	92.84	-	-	83.4	34.73	8.7	33.99	102	260	A	H
		5363.97	53.99	-20.01	74	44.38	34.87	8.72	33.98	102	260	P	H
		5351.65	41.61	-12.39	54	32.02	34.85	8.72	33.98	102	260	A	H
		5057.45	52.56	-21.44	74	42.91	34.57	9.07	33.99	100	141	P	V
		5006.75	40.08	-13.92	54	30.36	34.52	9.19	33.99	100	141	A	V
	*	5240	100.36	-	-	90.92	34.73	8.7	33.99	100	141	P	V
	*	5240	89.61	-	-	80.17	34.73	8.7	33.99	100	141	A	V
		5359.57	53.4	-20.6	74	43.81	34.85	8.72	33.98	100	141	P	V
		5351.76	41	-13	54	31.41	34.85	8.72	33.98	100	141	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz

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 36 5180MHz		10360	42.64	-31.36	74	50.47	37.29	12.92	58.04	100	0	P	H
		15540	46.38	-27.62	74	47.99	40.13	17.02	58.76	100	0	P	H
													H
													H
		10360	43.03	-30.97	74	50.86	37.29	12.92	58.04	100	0	P	V
		15540	47.13	-26.87	74	48.74	40.13	17.02	58.76	100	0	P	V
802.11n HT20 CH 44 5220MHz		10440	42.82	-31.18	74	50.37	37.35	13.02	57.92	100	0	P	H
		15660	45.62	-28.38	74	46.95	40.26	17.02	58.61	100	0	P	H
													H
													H
		10440	42.55	-31.45	74	50.1	37.35	13.02	57.92	100	0	P	V
		15660	47.71	-26.29	74	49.04	40.26	17.02	58.61	100	0	P	V
802.11n HT20 CH 48 5240MHz		10479	41.03	-32.97	74	48.38	37.39	13.09	57.83	100	0	P	H
		15720	46.48	-27.52	74	47.66	40.32	17.03	58.53	100	0	P	H
													H
													H
		10479	42.03	-31.97	74	49.38	37.39	13.09	57.83	100	0	P	V
		15720	45.63	-28.37	74	46.81	40.32	17.03	58.53	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 38 5190MHz		5145.05	60.69	-13.31	74	51.21	34.65	8.82	33.99	101	212	P	H
		5150	47.16	-6.84	54	37.68	34.65	8.82	33.99	101	212	A	H
	*	5190	99.14	-	-	89.69	34.68	8.76	33.99	101	212	P	H
	*	5190	88.88	-	-	79.43	34.68	8.76	33.99	101	212	A	H
		5360.34	52.72	-21.28	74	43.13	34.85	8.72	33.98	101	212	P	H
		5357.92	40.96	-13.04	54	31.37	34.85	8.72	33.98	101	212	A	H
		5144.9	59.49	-14.51	74	50.01	34.65	8.82	33.99	101	143	P	V
		5149.55	44.83	-9.17	54	35.35	34.65	8.82	33.99	101	143	A	V
	*	5190	96.86	-	-	87.41	34.68	8.76	33.99	101	143	P	V
	*	5190	86.94	-	-	77.49	34.68	8.76	33.99	101	143	A	V
		5361.33	53.07	-20.93	74	43.46	34.87	8.72	33.98	101	143	P	V
		5361.11	41.18	-12.82	54	31.57	34.87	8.72	33.98	101	143	A	V
802.11n HT40 CH 46 5230MHz		5018.45	53.73	-20.27	74	44.07	34.52	9.13	33.99	100	213	P	H
		5149.85	42.31	-11.69	54	32.83	34.65	8.82	33.99	100	213	A	H
	*	5230	98.67	-	-	89.23	34.73	8.7	33.99	100	213	P	H
	*	5230	88.75	-	-	79.31	34.73	8.7	33.99	100	213	A	H
		5385.42	53.8	-20.2	74	44.17	34.88	8.73	33.98	100	213	P	H
		5352.53	41.83	-12.17	54	32.24	34.85	8.72	33.98	100	213	A	H
		5146.1	52.81	-21.19	74	43.33	34.65	8.82	33.99	100	141	P	V
		5144.45	41.01	-12.99	54	31.53	34.65	8.82	33.99	100	141	A	V
	*	5230	97.59	-	-	88.15	34.73	8.7	33.99	100	141	P	V
	*	5230	87.75	-	-	78.31	34.73	8.7	33.99	100	141	A	V
		5378.38	53.42	-20.58	74	43.79	34.88	8.73	33.98	100	141	P	V
		5350.11	41.58	-12.42	54	31.99	34.85	8.72	33.98	100	141	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz

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 38 5190MHz		10380	42.23	-31.77	74	49.98	37.31	12.95	58.01	100	0	P	H
		15570	47.27	-26.73	74	48.8	40.17	17.02	58.72	100	0	P	H
													H
													H
		10380	43.16	-30.84	74	50.91	37.31	12.95	58.01	100	0	P	V
		15570	46.61	-27.39	74	48.14	40.17	17.02	58.72	100	0	P	V
													V
802.11n HT40 CH 46 5230MHz		10461	42.61	-31.39	74	50.04	37.37	13.06	57.86	100	0	P	H
		15690	47	-27	74	48.25	40.29	17.03	58.57	100	0	P	H
													H
													H
		10461	43.27	-30.73	74	50.7	37.37	13.06	57.86	100	0	P	V
		15690	47.2	-26.8	74	48.45	40.29	17.03	58.57	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz

WIFI 802.11ac VHT80 (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)
802.11ac VHT80 CH 42 5210MHz		5118.5	59.97	-14.03	74	50.46	34.62	8.88	33.99	103	244	P	H
		5123.75	44.17	-9.83	54	34.65	34.63	8.88	33.99	103	244	A	H
	*	5210	96.92	-	-	87.49	34.72	8.7	33.99	103	244	P	H
	*	5210	86.47	-	-	77.04	34.72	8.7	33.99	103	244	A	H
		5350.99	53.99	-20.01	74	44.4	34.85	8.72	33.98	103	244	P	H
		5351.32	40.49	-13.51	54	30.9	34.85	8.72	33.98	103	244	A	H
		5120.9	57.66	-16.34	74	48.15	34.62	8.88	33.99	100	305	P	V
		5150	42.62	-11.38	54	33.14	34.65	8.82	33.99	100	305	A	V
	*	5210	96.33	-	-	86.9	34.72	8.7	33.99	100	305	P	V
	*	5210	86.93	-	-	77.5	34.72	8.7	33.99	100	305	A	V
		5359.02	54.55	-19.45	74	44.96	34.85	8.72	33.98	100	305	P	V
		5353.52	40.45	-13.55	54	30.86	34.85	8.72	33.98	100	305	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz

WIFI 802.11ac VHT80 (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)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT80 CH 42 5210MHz		10419	42.87	-31.13	74	50.5	37.33	12.99	57.95	100	0	P	H
		15630	47.77	-26.23	74	49.14	40.24	17.02	58.63	100	0	P	H
													H
													H
		10419	42.19	-31.81	74	49.82	37.33	12.99	57.95	100	0	P	V
		15630	48.34	-25.66	74	49.71	40.24	17.02	58.63	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Emission below 1GHz

WIFI 802.11n HT40 (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 HT40 LF		34.05	16.72	-23.28	40	30.95	16.88	0.68	31.79			P	H	
		107.76	22.01	-21.49	43.5	40.8	11.82	1.14	31.75			P	H	
		115.86	21.57	-21.93	43.5	40.25	11.88	1.19	31.75			P	H	
		760.6	23.63	-22.37	46	32.86	19.7	3.05	31.98			P	H	
		882.4	24.63	-21.37	46	32.44	20.48	3.32	31.61	100	88	P	H	
		954.5	24.36	-21.64	46	31.19	20.85	3.35	31.03			P	H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
			35.4	33.54	-6.46	40	48.73	15.9	0.7	31.79	100	145	P	V
			41.34	27.94	-12.06	40	46.88	12.1	0.75	31.79			P	V
			105.06	22.99	-20.51	43.5	42.22	11.4	1.12	31.75			P	V
			854.4	23.26	-22.74	46	31.49	20.25	3.24	31.72			P	V
			935.6	23.53	-22.47	46	30.71	20.66	3.36	31.2			P	V
			947.5	24.3	-21.7	46	31.26	20.78	3.35	31.09			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 per 15.209(c).
!	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

- Level(dBμV/m) =
Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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”.