



Appendix A. Radiated Spurious Emission



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		5714.76	67.97	-6.03	74	57.17	35.77	7.15	32.12	104	355	P	H
		5724.44	73.82	-4.48	78.3	63	35.78	7.16	32.12	104	355	P	H
		5714.36	46.24	-7.76	54	35.44	35.77	7.15	32.12	104	355	A	H
	*	5747	100.79	-	-	89.93	35.79	7.18	32.11	104	355	A	H
	*	5747	107.39	-	-	96.53	35.79	7.18	32.11	104	355	P	H
													H
													H
													H
		5704.76	68.04	-5.96	74	57.24	35.77	7.15	32.12	117	356	P	V
		5720.68	69.75	-8.55	78.3	58.93	35.78	7.16	32.12	117	356	P	V
		5692.92	44.73	-9.27	54	33.96	35.75	7.15	32.13	117	356	A	V
	*	5747	99.69	-	-	88.83	35.79	7.18	32.11	117	356	A	V
	*	5747	107.18	-	-	96.32	35.79	7.18	32.11	117	356	P	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		5698.52	65.96	-8.04	74	55.19	35.75	7.15	32.13	103	357	P	H
		5717.88	54.47	-23.83	78.3	43.65	35.78	7.16	32.12	103	357	P	H
		5691.24	41.02	-12.98	54	30.27	35.75	7.13	32.13	103	357	A	H
	*	5783	101.91	-	-	90.99	35.82	7.2	32.1	103	357	A	H
	*	5783	109.86	-	-	98.94	35.82	7.2	32.1	103	357	P	H
		5855.28	52.77	-25.53	78.3	41.69	35.89	7.26	32.07	103	357	P	H
		5886.24	53.09	-20.91	74	41.96	35.9	7.3	32.07	103	357	P	H
		5872.08	40.4	-13.6	54	29.29	35.9	7.28	32.07	103	357	A	H
		5701.08	52.82	-21.18	74	42.02	35.77	7.15	32.12	187	254	P	V
		5715.08	53.62	-24.68	78.3	42.82	35.77	7.15	32.12	187	254	P	V
		5687.96	40.75	-13.25	54	30	35.75	7.13	32.13	187	254	A	V
	*	5783	91.39	-	-	80.47	35.82	7.2	32.1	187	254	A	V
	*	5783	99.1	-	-	88.18	35.82	7.2	32.1	187	254	P	V
		5852.8	52.84	-25.46	78.3	41.78	35.88	7.26	32.08	187	254	P	V
		5861.44	53.07	-20.93	74	41.97	35.89	7.28	32.07	187	254	P	V
		5863.92	40.5	-13.5	54	29.4	35.89	7.28	32.07	187	254	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	100.89	-	-	89.88	35.86	7.24	32.09	102	355	A	H
	*	5823	108.76	-	-	97.75	35.86	7.24	32.09	102	355	P	H
		5850.24	70.97	-7.33	78.3	59.91	35.88	7.26	32.08	102	355	P	H
		5860.4	64.34	-9.66	74	53.24	35.89	7.28	32.07	102	355	P	H
		5877.52	44.22	-9.78	54	33.11	35.9	7.28	32.07	102	355	A	H
													H
													H
													H
	*	5823	91.58	-	-	80.57	35.86	7.24	32.09	199	253	A	V
	*	5823	100.1	-	-	89.09	35.86	7.24	32.09	199	253	P	V
		5850.48	62.8	-15.5	78.3	51.74	35.88	7.26	32.08	199	253	P	V
		5864	54.45	-19.55	74	43.35	35.89	7.28	32.07	199	253	P	V
		5860.16	42	-12	54	30.9	35.89	7.28	32.07	199	253	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	Preampl	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	41.92	-32.08	74	49.51	38.99	10.33	56.91	100	0	P	H
		17235	45.73	-28.27	74	48.78	42.01	12.65	57.71	100	0	P	H
													H
													H
		11490	40.51	-33.49	74	48.1	38.99	10.33	56.91	100	0	P	V
		17235	45.75	-28.25	74	48.8	42.01	12.65	57.71	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	40.67	-33.33	74	48.19	39.03	10.36	56.91	100	0	P	H
		17355	44.71	-29.29	74	47.91	41.96	12.85	58.01	100	0	P	H
													H
													H
		11570	40.46	-33.54	74	47.98	39.03	10.36	56.91	100	0	P	V
		17355	44.81	-29.19	74	48.01	41.96	12.85	58.01	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	40.11	-33.89	74	47.57	39.06	10.41	56.93	100	0	P	H
		17475	45.57	-28.43	74	48.93	41.91	13.04	58.31	100	0	P	H
													H
													H
		11650	39.23	-34.77	74	46.69	39.06	10.41	56.93	100	0	P	V
		17475	45.42	-28.58	74	48.78	41.91	13.04	58.31	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 Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 149 5745MHz		5705.56	67.76	-6.24	74	56.96	35.77	7.15	32.12	104	356	P	H
		5724.36	74.89	-3.41	78.3	64.07	35.78	7.16	32.12	104	356	P	H
		5693.08	48.01	-5.99	54	37.24	35.75	7.15	32.13	104	356	A	H
	*	5743	99.51	-	-	88.65	35.79	7.18	32.11	104	356	A	H
	*	5743	109.38	-	-	98.52	35.79	7.18	32.11	104	356	P	H
													H
													H
													H
		5713.88	58.54	-15.46	74	47.74	35.77	7.15	32.12	121	193	P	V
		5724.76	66.79	-11.51	78.3	55.97	35.78	7.16	32.12	121	193	P	V
		5713.96	42.76	-11.24	54	31.96	35.77	7.15	32.12	121	193	A	V
	*	5747	91.14	-	-	80.28	35.79	7.18	32.11	121	193	A	V
	*	5747	101.05	-	-	90.19	35.79	7.18	32.11	121	193	P	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		5710.36	53.64	-20.36	74	42.84	35.77	7.15	32.12	111	356	P	H
		5721.8	58.64	-19.66	78.3	47.82	35.78	7.16	32.12	111	356	P	H
		5688.92	40.73	-13.27	54	29.98	35.75	7.13	32.13	111	356	A	H
	*	5787	95.17	-	-	84.24	35.83	7.2	32.1	111	356	A	H
	*	5787	105.09	-	-	94.16	35.83	7.2	32.1	111	356	P	H
		5851.52	52.59	-25.71	78.3	41.53	35.88	7.26	32.08	111	356	P	H
		5863.28	53.1	-20.9	74	42	35.89	7.28	32.07	111	356	P	H
		5872.48	40.48	-13.52	54	29.37	35.9	7.28	32.07	111	356	A	H
		5705.8	52.76	-21.24	74	41.96	35.77	7.15	32.12	123	193	P	V
		5724.68	54.06	-24.24	78.3	43.24	35.78	7.16	32.12	123	193	P	V
		5695.4	40.73	-13.27	54	29.96	35.75	7.15	32.13	123	193	A	V
	*	5787	93.49	-	-	82.56	35.83	7.2	32.1	123	193	A	V
	*	5787	103.26	-	-	92.33	35.83	7.2	32.1	123	193	P	V
		5855.12	53.03	-25.27	78.3	41.95	35.89	7.26	32.07	123	193	P	V
		5876	52.51	-21.49	74	41.4	35.9	7.28	32.07	123	193	P	V
		5886.8	40.36	-13.64	54	29.23	35.9	7.3	32.07	123	193	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	*	5823	98.17	-	-	87.16	35.86	7.24	32.09	118	356	A	H
	*	5823	108.28	-	-	97.27	35.86	7.24	32.09	118	356	P	H
		5850.08	73.88	-4.42	78.3	62.82	35.88	7.26	32.08	118	356	P	H
		5860.08	65.52	-8.48	74	54.42	35.89	7.28	32.07	118	356	P	H
		5876.8	44.64	-9.36	54	33.53	35.9	7.28	32.07	118	356	A	H
													H
													H
													H
	*	5823	89.55	-	-	78.54	35.86	7.24	32.09	114	241	A	V
	*	5823	99.5	-	-	88.49	35.86	7.24	32.09	114	241	P	V
		5850.64	62.45	-15.85	78.3	51.39	35.88	7.26	32.08	114	241	P	V
		5867.12	55.77	-18.23	74	44.67	35.89	7.28	32.07	114	241	P	V
		5860	43.67	-10.33	54	32.59	35.89	7.26	32.07	114	241	A	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	Preampl	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	40.98	-33.02	74	48.57	38.99	10.33	56.91	100	0	P	H
		17235	45.02	-28.98	74	48.07	42.01	12.65	57.71	100	0	P	H
													H
													H
		11490	40.79	-33.21	74	48.38	38.99	10.33	56.91	100	0	P	V
		17235	45.05	-28.95	74	48.1	42.01	12.65	57.71	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	40.89	-33.11	74	48.41	39.03	10.36	56.91	100	0	P	H
		17355	43.89	-30.11	74	47.09	41.96	12.85	58.01	100	0	P	H
													H
													H
		11570	40.45	-33.55	74	47.97	39.03	10.36	56.91	100	0	P	V
		17355	45.01	-28.99	74	48.21	41.96	12.85	58.01	100	0	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	40.26	-33.74	74	47.72	39.06	10.41	56.93	100	0	P	H
		17475	44.42	-29.58	74	47.78	41.91	13.04	58.31	100	0	P	H
													H
													H
		11650	38.65	-35.35	74	46.11	39.06	10.41	56.93	100	0	P	V
		17475	44.3	-29.7	74	47.66	41.91	13.04	58.31	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		5714.68	67.35	-6.65	74	56.55	35.77	7.15	32.12	103	355	P	H
		5724.2	71.36	-6.94	78.3	60.54	35.78	7.16	32.12	103	355	P	H
		5714.6	49.28	-4.72	54	38.48	35.77	7.15	32.12	103	355	A	H
	*	5753	93.46	-	-	82.58	35.81	7.18	32.11	103	355	A	H
	*	5753	103.77	-	-	92.89	35.81	7.18	32.11	103	355	P	H
		5858	52.85	-25.45	78.3	41.77	35.89	7.26	32.07	103	355	P	H
		5862	53.59	-20.41	74	42.49	35.89	7.28	32.07	103	355	P	H
		5860.64	41.29	-12.71	54	30.19	35.89	7.28	32.07	103	355	A	H
		5709	55.48	-18.52	74	44.68	35.77	7.15	32.12	117	130	P	V
		5723.8	58.52	-19.78	78.3	47.7	35.78	7.16	32.12	117	130	P	V
		5714.6	42.78	-11.22	54	31.98	35.77	7.15	32.12	117	130	A	V
	*	5757	83.47	-	-	72.59	35.81	7.18	32.11	117	130	A	V
	*	5757	93.39	-	-	82.51	35.81	7.18	32.11	117	130	P	V
		5853.6	53.24	-25.06	78.3	42.16	35.89	7.26	32.07	117	130	P	V
		5860.08	52.85	-21.15	74	41.75	35.89	7.28	32.07	117	130	P	V
		5889.92	41.02	-12.98	54	29.86	35.92	7.3	32.06	117	130	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		5713.8	61.56	-12.44	74	50.76	35.77	7.15	32.12	100	355	P	H
		5722.12	56.8	-21.5	78.3	45.98	35.78	7.16	32.12	100	355	P	H
		5707.88	44.13	-9.87	54	33.33	35.77	7.15	32.12	100	355	A	H
	*	5793	94.59	-	-	83.64	35.83	7.22	32.1	100	355	A	H
	*	5793	104.95	-	-	94	35.83	7.22	32.1	100	355	P	H
		5853.44	67.22	-11.08	78.3	56.16	35.88	7.26	32.08	100	355	P	H
		5863.6	63.22	-10.78	74	52.12	35.89	7.28	32.07	100	355	P	H
		5864.32	48.16	-5.84	54	37.06	35.89	7.28	32.07	100	355	A	H
		5714.76	54.81	-19.19	74	44.01	35.77	7.15	32.12	116	140	P	V
		5721.4	55.05	-23.25	78.3	44.23	35.78	7.16	32.12	116	140	P	V
		5693.16	41.26	-12.74	54	30.49	35.75	7.15	32.13	116	140	A	V
	*	5797	88.17	-	-	77.22	35.83	7.22	32.1	116	140	A	V
	*	5797	98.07	-	-	87.12	35.83	7.22	32.1	116	140	P	V
		5853.36	57.01	-21.29	78.3	45.95	35.88	7.26	32.08	116	140	P	V
		5879.92	54.72	-19.28	74	43.61	35.9	7.28	32.07	116	140	P	V
		5869.28	42.6	-11.4	54	31.5	35.89	7.28	32.07	116	140	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	Preampl	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	39.79	-34.21	74	47.35	39	10.34	56.9	100	0	P	H
		17265	44.26	-29.74	74	47.33	41.99	12.73	57.79	100	0	P	H
													H
													H
		11510	39.93	-34.07	74	47.49	39	10.34	56.9	100	0	P	V
		17265	44.44	-29.56	74	47.51	41.99	12.73	57.79	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	40.5	-33.5	74	48.01	39.03	10.38	56.92	100	0	P	H
		17385	44.86	-29.14	74	48.08	41.95	12.93	58.1	100	0	P	H
													H
													H
		11590	40.74	-33.26	74	48.25	39.03	10.38	56.92	100	0	P	V
		17385	44.91	-29.09	74	48.13	41.95	12.93	58.1	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 802.11a

(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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11a LF		100.47	8.52	-34.98	43.5	28.76	10.44	1.1	31.78			P	H
		136.38	12.19	-31.31	43.5	31.22	11.5	1.25	31.78			P	H
		184.44	20.56	-22.94	43.5	42.02	8.9	1.42	31.78	109	336	P	H
		482.7	15.68	-30.32	46	27.59	17.76	2.2	31.87			P	H
		645.1	18.29	-27.71	46	27.37	20.4	2.56	32.04			P	H
		666.1	17.97	-28.03	46	27.11	20.3	2.6	32.04			P	H
													H
													H
													H
													H
													H
													H
		67.53	22.78	-17.22	40	47.42	6.24	0.91	31.79	125	101	P	V
		98.31	18.78	-24.72	43.5	39.55	9.92	1.09	31.78			P	V
		127.74	14.46	-29.04	43.5	33.12	11.9	1.22	31.78			P	V
		461.7	16.93	-29.07	46	29.22	17.42	2.15	31.86			P	V
		561.1	19.07	-26.93	46	28.65	20.05	2.35	31.98			P	V
		669.6	19.55	-26.45	46	28.69	20.3	2.6	32.04			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 per 15.209(c).
!	Test result is over limit line.
P/A	P eak or A verage
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+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”.