



Appendix B. 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		5691.64	52.32	-21.68	74	44.29	32.27	9.39	33.63	223	46	P	H	
		5724.28	64.64	-13.66	78.3	56.53	32.31	9.44	33.64	223	46	P	H	
		5714.12	43.09	-10.91	54	35.05	32.29	9.39	33.64	223	46	A	H	
	*	5745	103.45	-	-	95.32	32.34	9.44	33.65	223	46	P	H	
	*	5745	96.98	-	-	88.85	32.34	9.44	33.65	223	46	A	H	
														H
														H
														H
			5713.56	49.29	-24.71	74	41.25	32.29	9.39	33.64	388	358	P	V
			5724.92	54.98	-23.32	78.3	46.87	32.31	9.44	33.64	388	358	P	V
			5712.84	40.87	-13.13	54	32.83	32.29	9.39	33.64	388	358	A	V
	*		5745	99.38	-	-	91.25	32.34	9.44	33.65	388	358	P	V
	*		5745	91.7	-	-	83.57	32.34	9.44	33.65	388	358	A	V
														V
													V	
													V	



WIFI Ant.	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		5710.36	49.68	-24.32	74	41.64	32.29	9.39	33.64	236	61	P	H
		5723.4	49.2	-29.1	78.3	41.09	32.31	9.44	33.64	236	61	P	H
		5713	41.05	-12.95	54	33.01	32.29	9.39	33.64	236	61	A	H
	*	5785	103.31	-	-	95.09	32.39	9.49	33.66	236	61	P	H
	*	5785	96.46	-	-	88.24	32.39	9.49	33.66	236	61	A	H
		5854.08	49.77	-28.53	78.3	41.4	32.51	9.54	33.68	236	61	P	H
		5869.84	50.13	-23.87	74	41.77	32.51	9.54	33.69	236	61	P	H
		5868.64	42.18	-11.82	54	33.82	32.51	9.54	33.69	236	61	A	H
		5695.16	49.19	-24.81	74	41.16	32.27	9.39	33.63	400	359	P	V
		5718.52	48.58	-29.72	78.3	40.52	32.31	9.39	33.64	400	359	P	V
		5693.32	40.43	-13.57	54	32.4	32.27	9.39	33.63	400	359	A	V
	*	5785	99	-	-	90.78	32.39	9.49	33.66	400	359	P	V
	*	5785	91.44	-	-	83.22	32.39	9.49	33.66	400	359	A	V
		5855.2	47.9	-30.4	78.3	39.53	32.51	9.54	33.68	400	359	P	V
		5877.92	49.8	-24.2	74	41.42	32.53	9.54	33.69	400	359	P	V
	5881.12	40.65	-13.35	54	32.27	32.53	9.54	33.69	400	359	A	V	



WIFI Ant.	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	*	5825	105.07	-	-	96.76	32.46	9.52	33.67	236	52	P	H	
	*	5825	97.28	-	-	88.97	32.46	9.52	33.67	236	52	A	H	
		5858.96	52.45	-25.85	78.3	44.09	32.51	9.54	33.69	236	52	P	H	
		5872.48	50.44	-23.56	74	42.06	32.53	9.54	33.69	236	52	P	H	
		5860.8	42.57	-11.43	54	34.21	32.51	9.54	33.69	236	52	A	H	
														H
														H
														H
	*	5825	100.05	-	-	91.74	32.46	9.52	33.67	395	359	P	V	
	*	5825	92.33	-	-	84.02	32.46	9.52	33.67	395	359	A	V	
		5850.56	49.47	-28.83	78.3	41.13	32.48	9.54	33.68	395	359	P	V	
		5889.6	49.27	-24.73	74	40.84	32.56	9.57	33.7	395	359	P	V	
		5863.12	41	-13	54	32.64	32.51	9.54	33.69	395	359	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 802.11a (Harmonic @ 3m)

WIFI Ant.	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	46.65	-27.35	74	58.43	40.01	13.95	65.74	100	0	P	H
		17235	45.87	-28.13	74	51.59	41.41	16.95	64.08	100	0	P	H
													H
													H
		11490	45.34	-28.66	74	57.12	40.01	13.95	65.74	100	0	P	V
		17235	46.14	-27.86	74	51.86	41.41	16.95	64.08	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	44.81	-29.19	74	56.58	39.89	14	65.66	100	0	P	H
		17355	46.04	-27.96	74	51.56	41.67	17.03	64.22	100	0	P	H
													H
													H
		11570	44.48	-29.52	74	56.25	39.89	14	65.66	100	0	P	V
		17355	45.43	-28.57	74	50.95	41.67	17.03	64.22	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	45	-29	74	56.79	39.78	14.05	65.62	100	0	P	H
		17475	45.42	-28.58	74	50.75	41.93	17.1	64.36	100	0	P	H
													H
													H
		11650	44.88	-29.12	74	56.67	39.78	14.05	65.62	100	0	P	V
		17475	45.03	-28.97	74	50.36	41.93	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 Ant.	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	51.41	-22.59	74	43.37	32.29	9.39	33.64	235	52	P	H	
		5723.08	62.42	-15.88	78.3	54.31	32.31	9.44	33.64	235	52	P	H	
		5714.36	44.08	-9.92	54	36.04	32.29	9.39	33.64	235	52	A	H	
	*	5745	104.07	-	-	95.94	32.34	9.44	33.65	235	52	P	H	
	*	5745	97.21	-	-	89.08	32.34	9.44	33.65	235	52	A	H	
														H
														H
														H
			5709.16	49.7	-24.3	74	41.66	32.29	9.39	33.64	389	359	P	V
			5724.52	55.5	-22.8	78.3	47.39	32.31	9.44	33.64	389	359	P	V
			5714.36	41.27	-12.73	54	33.23	32.29	9.39	33.64	389	359	A	V
	*		5745	99.18	-	-	91.05	32.34	9.44	33.65	389	359	P	V
	*		5745	91.72	-	-	83.59	32.34	9.44	33.65	389	359	A	V
														V
													V	
													V	



WIFI Ant.	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		5693.64	49.82	-24.18	74	41.79	32.27	9.39	33.63	233	61	P	H
		5724.44	50.51	-27.79	78.3	42.4	32.31	9.44	33.64	233	61	P	H
		5705.48	41.1	-12.9	54	33.06	32.29	9.39	33.64	233	61	A	H
	*	5785	103.69	-	-	95.47	32.39	9.49	33.66	233	61	P	H
	*	5785	96.19	-	-	87.97	32.39	9.49	33.66	233	61	A	H
		5858	49.96	-28.34	78.3	41.6	32.51	9.54	33.69	233	61	P	H
		5884	49.87	-24.13	74	41.47	32.53	9.57	33.7	233	61	P	H
		5868.4	41.82	-12.18	54	33.46	32.51	9.54	33.69	233	61	A	H
		5686.76	49.94	-24.06	74	41.91	32.27	9.39	33.63	400	359	P	V
		5719.64	49.54	-28.76	78.3	41.48	32.31	9.39	33.64	400	359	P	V
		5692.12	40.33	-13.67	54	32.3	32.27	9.39	33.63	400	359	A	V
	*	5785	99.32	-	-	91.1	32.39	9.49	33.66	400	359	P	V
	*	5785	91.43	-	-	83.21	32.39	9.49	33.66	400	359	A	V
		5855.76	49.28	-29.02	78.3	40.91	32.51	9.54	33.68	400	359	P	V
		5870.4	48.98	-25.02	74	40.62	32.51	9.54	33.69	400	359	P	V
	5867.2	40.77	-13.23	54	32.41	32.51	9.54	33.69	400	359	A	V	



WIFI Ant.	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	*	5825	104.69	-	-	96.38	32.46	9.52	33.67	232	52	P	H	
	*	5825	97.02	-	-	88.71	32.46	9.52	33.67	232	52	A	H	
		5851.52	52.94	-25.36	78.3	44.6	32.48	9.54	33.68	232	52	P	H	
		5888.96	50.6	-23.4	74	42.17	32.56	9.57	33.7	232	52	P	H	
		5860.88	42.63	-11.37	54	34.27	32.51	9.54	33.69	232	52	A	H	
														H
														H
														H
	*	5825	99.07	-	-	90.76	32.46	9.52	33.67	394	360	P	V	
	*	5825	92.36	-	-	84.05	32.46	9.52	33.67	394	360	A	V	
		5855.2	50.26	-28.04	78.3	41.89	32.51	9.54	33.68	394	360	P	V	
		5863.52	49.64	-24.36	74	41.28	32.51	9.54	33.69	394	360	P	V	
		5860.56	40.95	-13.05	54	32.59	32.51	9.54	33.69	394	360	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 Ant.	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	45.7	-28.3	74	57.48	40.01	13.95	65.74	100	0	P	H
		17235	46.01	-27.99	74	51.73	41.41	16.95	64.08	100	0	P	H
													H
													H
		11490	45.44	-28.56	74	57.22	40.01	13.95	65.74	100	0	P	V
		17235	46.19	-27.81	74	51.91	41.41	16.95	64.08	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	45.4	-28.6	74	57.17	39.89	14	65.66	100	0	P	H
		17355	46.18	-27.82	74	51.7	41.67	17.03	64.22	100	0	P	H
													H
													H
		11570	45.47	-28.53	74	57.24	39.89	14	65.66	100	0	P	V
		17355	45.94	-28.06	74	51.46	41.67	17.03	64.22	100	0	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	44.98	-29.02	74	56.77	39.78	14.05	65.62	100	0	P	H
		17475	46.1	-27.9	74	51.43	41.93	17.1	64.36	100	0	P	H
													H
													H
		11650	44.65	-29.35	74	56.44	39.78	14.05	65.62	100	0	P	V
		17475	45.22	-28.78	74	50.55	41.93	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 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.		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
5GHz 802.11n HT20 LF		70.77	24.04	-15.96	40	49.51	5.28	1.04	31.79			P	H	
		174.99	26.24	-17.26	43.5	47.88	8.5	1.64	31.78			P	H	
		232.5	23.51	-22.49	46	43.69	9.8	1.79	31.77			P	H	
		398.7	30.71	-15.29	46	44.55	15.64	2.32	31.8	100	22	P	H	
		432.3	28.71	-17.29	46	41.68	16.45	2.41	31.83			P	H	
		720.7	24.9	-21.1	46	34.25	19.52	3.14	32.01			P	H	
														H
														H
														H
														H
														H
														H
														H
			31.62	36.36	-3.64	40	50.33	17.19	0.67	31.83	100	84	P	V
			88.05	32.07	-11.43	43.5	54.36	8.21	1.28	31.78			P	V
			232.5	26.3	-19.7	46	46.48	9.8	1.79	31.77			P	V
			365.1	32.49	-13.51	46	47.21	14.75	2.32	31.79			P	V
			465.2	32.77	-13.23	46	45.3	16.76	2.57	31.86			P	V
			714.4	27.69	-18.31	46	37.29	19.28	3.14	32.02			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”.