

9. RADIO FREQUENCY EXPOSURE

9.1. Limit

According to §1.1310 and §2.1091 RF exposure is calculated.

Table: Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (S) (mW/cm ²)
0.3–1.34	*(100)
1.34–30	*(180/f ²)
30–300	0.2
300–1500	f/1500
1500–100,000	1.0

F = frequency in MHz

* = Plane-wave equivalent power density

Maximum Permissible Exposure

The MPE was calculated at 20cm to show compliance with the power density limit.

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna.

Note:

1. Manufacturer declared that the maximum antenna gain for Wi-Fi is 5dBi(Max.)
2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.
3. Only record worst case data.

Band 1

Test Mode	Channel	Frequency (MHz)	Power (dBm, AV)			Max Power Tune Up (dBm)
			Ant 0	Ant 1	Sum	
802.11a	Low	5180	10.25	10.60	/	11.0±1.0
	Middle	5200	10.63	10.54	/	11.0±1.0
	High	5240	11.10	11.04	/	11.0±1.0
802.11n(HT20)	Low	5180	7.07	6.08	10.08	10.0±1.0
	Middle	5200	7.02	6.60	10.03	10.0±1.0
	High	5240	7.87	7.41	10.88	10.0±1.0
802.11n(HT40)	Low	5190	6.87	6.20	9.88	10.0±1.0
	High	5230	6.09	6.97	9.10	10.0±1.0

Band 3

Test Mode	Channel	Frequency (MHz)	Power (dBm, AV)			Max Power Tune Up (dBm)
			Ant 0	Ant 1	Sum	
802.11a	Low	5745	9.89	9.79	/	10.0±1.0
	Middle	5785	9.30	9.93	/	10.0±1.0
	High	5825	9.26	9.26	/	10.0±1.0
802.11n(HT20)	Low	5745	6.85	6.08	9.86	9.0±1.0
	Middle	5785	6.78	6.37	9.79	9.0±1.0
	High	5825	6.10	6.12	9.11	9.0±1.0
802.11n(HT40)	Low	5755	6.11	6.66	9.12	9.0±1.0
	High	5795	6.28	6.63	9.29	9.0±1.0

9.2 Test Results

Band 1

Test Mode	Channel	Max. Tune Up Power (dBm, Average)	Max. Tune Up Power (mW)	Antenna gain(numeric)	MPE (mW/cm ²)	Limit (mW/cm ²)
802.11a	Low	12.0	15.85	3.16	0.0100	1.0
	Middle	12.0	15.85	3.16	0.0100	1.0
	High	12.0	15.85	3.16	0.0100	1.0
802.11n(HT20)	Low	11.0	12.59	6.32	0.0158	1.0
	Middle	11.0	12.59	6.32	0.0158	1.0
	High	11.0	12.59	6.32	0.0158	1.0
802.11n(HT40)	Low	11.0	12.59	6.32	0.0158	1.0
	High	11.0	12.59	6.32	0.0158	1.0

Band 3

Test Mode	Channel	Max. Tune Up Power (dBm, Average)	Max. Tune Up Power (mW)	Antenna gain(numeric)	MPE (mW/cm ²)	Limit (mW/cm ²)
802.11a	Low	11.0	12.59	3.16	0.0079	1.0
	Middle	11.0	12.59	3.16	0.0079	1.0
	High	11.0	12.59	3.16	0.0079	1.0
802.11n(HT20)	Low	10.0	10.00	6.32	0.0126	1.0
	Middle	10.0	10.00	6.32	0.0126	1.0
	High	10.0	10.00	6.32	0.0126	1.0
802.11n(HT40)	Low	10.0	10.00	6.32	0.0126	1.0
	High	10.0	10.00	6.32	0.0126	1.0

Antenna Gain (typical): Wi-Fi: 5dBi, 3.16 (numeric)

Directinal Gain(typical):Wi-Fi:8.01dBi, 6.32(numeric)

Prediction distance: >=20cm

The power density level worst case at 20 cm is below the uncontrolled exposure limit.