

1. RADIO FREQUENCY EXPOSURE

1.1. 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/cm²)
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.

Test Mode	Channel	Frequency (MHz)	Power (dBm, AV)			Power Tune Up (dBm)
			Ant 1	Ant 2	Ant 1+Ant 2	
802.11a	Low	5180	23.33	23.38	/	23.0±1.0
	Middle	5220	22.89	22.42	/	22.0±1.0
	High	5240	22.76	23.02	/	23.0±1.0
802.11n(HT20)	Low	5180	18.75	17.85	21.33	21.0±1.0
	Middle	5220	19.98	18.64	22.37	22.0±1.0
	High	5240	18.52	21.93	23.56	23.0±1.0
802.11n(HT40)	Low	5190	20.17	17.92	22.20	22.0±1.0
	High	5230	18.90	20.17	22.59	22.0±1.0
802.11a	Low	5745	21.63	21.78	/	21.0±1.0
	Middle	5785	20.41	21.68	/	21.0±1.0
	High	5825	20.61	20.98	/	20.0±1.0
802.11n(HT20)	Low	5745	21.41	20.41	23.95	23.0±1.0
	Middle	5785	20.39	20.26	23.34	23.0±1.0
	High	5825	20.45	20.65	23.56	23.0±1.0
802.11n(HT40)	Low	5755	21.06	19.92	23.54	23.0±1.0
	High	5795	20.32	19.88	23.12	23.0±1.0

1.2 Test Results

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	24.0	251.19	3	0.15	1.0
	Middle	23.0	199.53	3	0.12	1.0
	High	24.0	251.19	3	0.15	1.0
802.11n(HT20)	Low	22.0	158.49	6	0.19	1.0
	Middle	23.0	199.53	6	0.24	1.0
	High	24.0	251.19	6	0.30	1.0
802.11n(HT40)	Low	23.0	199.53	6	0.24	1.0
	High	23.0	199.53	6	0.24	1.0
802.11a	Low	22.0	158.49	3	0.09	1.0
	Middle	22.0	158.49	3	0.09	1.0
	High	21.0	125.89	3	0.08	1.0
802.11n(HT20)	Low	24.0	251.19	6	0.30	1.0
	Middle	24.0	251.19	6	0.30	1.0
	High	24.0	251.19	6	0.30	1.0
802.11n(HT40)	Low	24.0	251.19	6	0.30	1.0
	High	24.0	251.19	6	0.30	1.0

Antenna Gain (typical): Wi-Fi: 5dBi, 3 (numeric)

For 802.11n mode, additional gain is $10 \cdot \log(2) = 3\text{dBi}$,

So for n mode, the total gain is $5 + 3 = 8\text{dBi}$, 6(numeric)

Prediction distance: $\geq 20\text{cm}$

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