

8. RADIO FREQUENCY EXPOSURE

8.1. 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 is 2dBi for TX.
2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.
3. Only record worst case data.
4. The max field strength of 2.4G radio part is (86.72dBuV = -20.28dBm), and its antenna gain is only 2dBi. So the 2.4G power is too low, and it don't need Simultaneously MPE evaluation.

802.11b

Conducted Peak output Power in dBm	12.84	dBm
Max. Conducted Peak output Power in mW	19.23	dBm
Prediction distance	20	cm
Prediction frequency	2462	MHz
Antenna Gain(typical)	2.0	dBi
Antenna Gain(numeric)	1.58	
Power density at prediction frequency(S)	0.0060	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1	mW/cm ²

802.11g

Conducted Peak output Power in dBm	10.98	dBm
Max. Conducted Peak output Power in mW	12.53	dBm
Prediction distance	20	cm
Prediction frequency	2462	MHz
Antenna Gain(typical)	2.0	dBi
Antenna Gain(numeric)	1.58	
Power density at prediction frequency(S)	0.0039	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1	mW/cm ²

802.11n(HT20)

Conducted Peak output Power in dBm	11.08	dBm
Max. Conducted Peak output Power in mW	12.82	dBm
Prediction distance	20	cm
Prediction frequency	2462	MHz
Antenna Gain(typical)	2.0	dBi
Antenna Gain(numeric)	1.58	
Power density at prediction frequency(S)	0.0040	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1	mW/cm ²

802.11n(HT40)

Conducted Peak output Power in dBm	9.89	dBm
Max. Conducted Peak output Power in mW	9.75	dBm
Prediction distance	20	cm
Prediction frequency	2462	MHz
Antenna Gain(typical)	2.0	dBi
Antenna Gain(numeric)	1.58	
Power density at prediction frequency(S)	0.0031	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1	mW/cm ²

8.2 Test Results

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