FCC §15.247(i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to FCC §15.247(i) and §1.1307(b)(1), §2.1091, systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mw/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

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

Where:

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally ***numeric*** gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

802.11b Mode

Maximum peak output power at antenna input terminal (dBm):	18.21
Maximum peak output power at antenna input terminal (mW):	66.222
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Antenna Gain, typical (dBi):	2.2
Maximum Antenna Gain (numeric):	1.66
The worst case is power density at predication frequency at 20 cm (mW/cm^2):	0.0219
MPE limit for general population exposure at prediction frequency (mW/cm^2):	1.0

802.11g Mode

Maximum peak output power at antenna input terminal (dBm):	14.58
Maximum peak output power at antenna input terminal (mW):	28.708
Prediction distance (cm):	20
Prediction frequency (MHz):	2437
Antenna Gain, typical (dBi):	2.2
Maximum Antenna Gain (numeric):	1.66
The worst case is power density at predication frequency at 20 cm (mW/cm^2)::	0.0095
MPE limit for general population exposure at prediction frequency (mW/cm^2):	1.0

802.11 n20 Mode

Maximum peak output power at antenna input terminal (dBm):	17.36
Maximum peak output power at antenna input terminal (mW):	54.450
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Antenna Gain, typical (dBi):	2.2
Maximum Antenna Gain (numeric):	1.66
The worst case is power density at predication frequency at 20 cm (mW/cm^2):	0.0180
MPE limit for general population exposure at prediction frequency (mW/cm^2):	1.0

802.11 n40 Mode

Maximum peak output power at antenna input terminal (dBm):	16.89
Maximum peak output power at antenna input terminal (mW):	48.865
Prediction distance (cm):	20
Prediction frequency (MHz):	2412
Antenna Gain, typical (dBi):	2.2
Maximum Antenna Gain (numeric):	1.66
The worst case is power density at predication frequency at 20 cm (mW/cm^2)::	0.0161
MPE limit for general population exposure at prediction frequency (mW/cm^2):	1.0

Result:

The predicted power density level at 20 cm is 0.0219 mw/cm^2 for 802.11b, 0.0095 mw/cm^2 for 802.11g, 0.0180 mw/cm^2 for 802.11n20 and 0.0161 mw/cm^2 for 802.11n40 which is below the uncontrolled exposure limit of 1.0 mw/cm^2, The EUT is used at least 20 cm away from user's body. It is determined as mobile equipment and complies with the MPE limit.