5.9 RF Exposure

1. Limits for Maximum Permissible Exposure (MPE) (2.1093)

(B) Limits for General Population/uncontrolled Exposures				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–3.0	614	1.63	*(100)	30
3.0–30	824/f	2.19/f	*(180/f)	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
$S = PG/4\pi R^2$
S = power density (in appropriate units, e.g. mW/cm2)
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)

2. Test Result of Maximum Permissible Exposure

For 802.11b:

Maximum peak output power at antenna input terminal: 18.31(dBm)
Maximum peak output power at antenna input terminal: 67.8(mW)
Prediction distance: >20 (cm)
Predication frequency: 2437 (MHz)
Antenna Gain (typical): 1.5 (dBi)
Antenna Gain (typical): 1.419 (numeric)
The worst case is power density at predication frequency at 20 cm : 0.0191 (mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm^2)

0.0191(mW/cm^2) < 1.0 (mW/cm^2)

Result: Pass

For 802.11g:

Maximum peak output power at antenna input terminal: 16.81(dBm)
Maximum peak output power at antenna input terminal: 47.97(mW)
Prediction distance: >20 (cm)
Predication frequency: 2412(MHz)
Antenna Gain (typical): 1.5 (dBi)
Antenna Gain (typical): 1.419 (numeric)
The worst case is power density at predication frequency at 20 cm : 0.0135 (mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm^2)

0.0135 (mW/cm^2) <1.0 (mW/cm^2)

Result: Pass