APPENDIX L

: MAXIMUM PERMISSIBLE EXPOSURE

Maximum Permissible Exposure

1.1 Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device

(A) Limits for Occupational / Controlled Exposure

Frequency range(MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density(S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (minutes)
0.3 ~ 3.0	614	1.63	(100)*	6
3.0~30	1842/f	4.89/f	(900/f)*	6
30~300	61.4	0.163	1.0	6
300 ~ 1,500	-	-	f/300	6
1,500 ~ 100,000	-	-	5.0	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency range(MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density(S) (mW/cm2)	Averaging Time |E|2, |H|2 or S (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 ~ 1,500	-	-	f/1500	30
1,500 ~ 100,000	-	-	1.0	30

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

1.2 MAXIMUM PERMISSIBLE EXPOSURE Prediction

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d}$$ Power Density: $$Pd(W/m^2) = \frac{E^2}{377}$$

E = Electric field (V/m)
P = Max Average output Power at antenna input terminal(W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

1.3 Calculated Result and Limit

Antenna type: PCB Pattern antenna
Antenna gain: 2.93 dBi
Evaluation distance: 20 cm

IEEE 802.11b

Frequency (MHz)	2412	2437	2462
Antenna gain (dBi)	2.93		
Antenna gain (numeric)	1.96		
Average output power (dBm)	3.88	3.74	3.85
Average output power (mW)	2.44	2.37	2.43
Power density (S) (mW/cm^2)	0.001	0.001	0.001
Limit of Power density (S) (mW/cm^2)	1.0	1.0	1.0

IEEE 802.11g

Frequency (MHz)	2412	2437	2462
Antenna gain (dBi)	2.93		
Antenna gain (numeric)	1.96		
Average output power (dBm)	4.49	4.41	2.76
Average output power (mW)	2.81	2.76	2.96
Power density (S) (mW/cm^2)	0.001	0.001	0.001
Limit of Power density (S) (mW/cm^2)	1.0	1.0	1.0

IEEE 802.11n

Frequency (MHz)	2412	2437	2462
Antenna gain (dBi)	2.93		
Antenna gain (numeric)	1.96		
Average output power (dBm)	4.49	4.63	4.56
Average output power (mW)	2.81	2.9	2.86
Power density (S) (mW/cm^2)	0.001	0.001	0.001
Limit of Power density (S) (mW/cm^2)	1.0	1.0	1.0

Note:

1) The power densities at a distance of 20 cm are below the uncontrolled exposure limits of 1.0 mW/cm^2.