APPENDIX A: MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES AND REGULATIONS PART 1.1307, 1.1310, 2.1091, 2.1093: RF EXPOSURE COMPLIANCE

1. GENERAL INFORMATION:

- FCCID: GU67410-02
- Environment: General Population/Uncontrolled Exposure
- Device category: Mobile per Part 2.1093

2. OPERATING CONFIGURATIONS AND TEST CONDITIONS:

2.1 ANTENNA TYPE(S):

Antenna	Type	Gain (dBi)
MAXRAD	Duck -90° angle	2

3. OPERATING CONDITIONS:

The 9850 is a wireless printer containing a PCMCIA card connected to a stub antenna to transmitin the frequency range 2412-2462 MHz, and the peak conducted and peak radiated (ERP) output power does not exceed 100 mW.

4. TEST SIGNAL, TIME-AVERAGING, MAX. MEASURED OUTPUT POWER:

Modulation Type/Modes: DSSS

Frequency Range	Freq. Tolerance (ppm)	Emission Designator
2412-2462 MHz	N/A	N/A

Output Power (Watt/dBm)	High (Watt)	High (dBm)	Time averaging (__% Duty Cycle)
ERP	N/A	N/A	N/A
Conducted	0.037	15.68	N/A

From FCC 1.1310 table 1A, the maximum permissible RF exposure for an uncontrolled environment is 1 mW/cm^2. The Electric field generated for a 1 mW/cm^2 exposure (S) is calculated as follows:

$S = E^2/Z$

where:
S = Power density
E = Electric field
Z = Impedance.

$$E = \sqrt{S \cdot Z}$$

1 mW/cm^2 = 10 W/m^2

The impedance of free space is 337 ohms, where E and H fields are perpendicular.

Thus:

$E = \sqrt{10 \cdot 377}$ = 61.4 V/m which is equivalent to 1 mW/cm^2

Using the relationship between Electric field E, Power in watts P, and distance in meters d, the corresponding Antenna numeric gain G and the transmitter output power.

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

MPE Calculation:
The maximum distance, from the antenna at which MPE is met or exceeded, is calculated from the equation relating field strength E in V/m, transmit power P in Watts, transmit antenna numeric gain G, and separation distance in meters above and solving for d below:

$$d = \sqrt{\frac{P \cdot 30 \cdot G}{E}}$$

The limit for general population/uncontrolled exposure environment from 300 to 1500MHz is f/1500 mW/cm^2.

SEPARATION DISTANCE:

Highest Antenna Gain = 1.58 Power[B] (Watt) = 0.037	
Separation Distance [A]	
(in)	(m)
0.8	0.022

Notes:
[A] = Distances are calculated for the largest (worst-case) separation distance as applicable
[B] = Measured output power conducted