# 8.8. MAXIMUM PERMISSIBLE EXPOSURE

#### CALCULATIONS

#### Given

 $E = \sqrt{(30 * P * G)} / d$ 

and

 $S = E^{2}/3770$ 

#### where

E = Field Strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = distance in meters

S = Power Density in milliwatts / square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

 $d = \sqrt{((30 * P * G) / (3770 * S))}$ 

Changing to units of mW and cm, using:

P(mW) = P(W) / 1000 and

d(cm) = 100 \* d(m)

yields

$$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

Page 53 of 97

COMPLIANCE CERTIFICATION SERVICESDOCUMENT NO: CCSUP4031A561F MONTEREY ROAD, MORGAN HILL, CA 95037 USATEL: (408) 463-0885 FAX: (408) 463-0888This report shall not be reproduced except in full, without the written approval of CCS. This document may<br/>be altered or revised by Compliance Certification Services personnel only, and shall be noted in the<br/>revision section of the document.

### REPORT NO: 03U1760-1B EUT: 802.11 a/b/g MINI PCI CARD Substituting the logarithmic form of power and gain using:

Equation (1)

 $P(mW) = 10 \wedge (P(dBm) / 10)$  and

G (numeric) = 
$$10 \wedge (G (dBi) / 10)$$

yields

 $d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$ 

where

d = MPE safe distance in cm

P = Power in dBm

G = Antenna Gain in dBi

 $S = Power Density Limit in mW / cm^2$ 

## **RESULTS**

No non-compliance noted:

EUT output power = 17.46 dBmAntenna Gain = 2.33 dBiS =  $1.0 \text{ mW} / \text{cm}^2 \text{ from } 1.1310 \text{ Table } 1$ 

Substituting these parameters into Equation (1) above:

MPE Safe Distance = 2.75 cm

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

Page 54 of 97

COMPLIANCE CERTIFICATION SERVICESDOCUMENT NO: CCSUP4031A561F MONTEREY ROAD, MORGAN HILL, CA 95037 USATEL: (408) 463-0885 FAX: (408) 463-0888This report shall not be reproduced except in full, without the written approval of CCS. This document may<br/>be altered or revised by Compliance Certification Services personnel only, and shall be noted in the<br/>revision section of the document.