5473A Clouds Rest Road : Mariposa, CA 95338 : Phone 209-966-5420 : Fax 209-742-6133

Maximum Permissible Exposure Calculations

Date of Report: Jan 31, 2003

Calculations prepared for:

IP Mobile Net
11909 East Telegraph Road
Santa Fe Springs, CA 90670

Calculations prepared by:

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Model Number: IP4HPV-GPS
FCC Identification: MI7-IPMNIP4H

Fundamental Operating Frequency: 509-512MHz

Maximum Rated Output Power: 40.00 Watts
Measured Output Power: 34.00 Watts

In accordance with 47CFR2.1093(d)(2), source based time averaging is allowed for this type of device:

Source Based Time Averaging = 10LOG(ON time/TOTAL time)
= 10LOG(389mS/(389+310 = 699mS)
= -2.54dB
Therefore the Power Output = 46.02dBm (40.00W) – 2.54dB = **43.48dBm** (**22.284W**)
At measured Power Output = 45.31(34.00W) - 2.54dB = 42.77dBm (18.92W)

MPE Limit in accordance with 1.1310(b): Limits for general population/uncontrolled exposure

MPE Limit for 509 MHz = 509/1500 = **0.3393** mW/cm^2 (3.339W/M^2)
MPE Limit for 512 MHz = 512/1500 = 0.3413 mW/ cm^2

	Power Output (Watts)	Power Density Limit (mW/cm^2)	Minimum Distance (Meters)
Rated power of 40W	**22.28**	**0.3393**	**1.0**
Measured power of 34W (Also this power listed on Grant)	**18.92**	**0.3393**	**0.6663**

Antenna gain = 3 dBi = linear gain of 2 with reference to an isotropic antenna.

Power Density (W/M^2) = (30 * P_t * G) / (d^2 * Zo)

P_t = Power Delivered to the Antenna
G = Antenna Gain
d = Distance in meters
Zo = Impedance of Free Space

The typical vehicle used by police was measured, and a separation distance of 1 meter was found to be an appropriate distance. Under normal operating conditions, the antenna will maintain a separation of

1 meter from all persons. As can be seen from the MPE results, at rated power, this device passes the limits specified in 1.1310 at a distance of 1.0 Meter.

3 dBi gain = 10 Log G

G = antilog (3/10) = ratio of 2 over Isotropic.

$$d = \sqrt{\frac{30 \text{ x } 22.28 \text{ x } 2}{3.339.\text{x } 377}}$$

D = 1.0 meter.